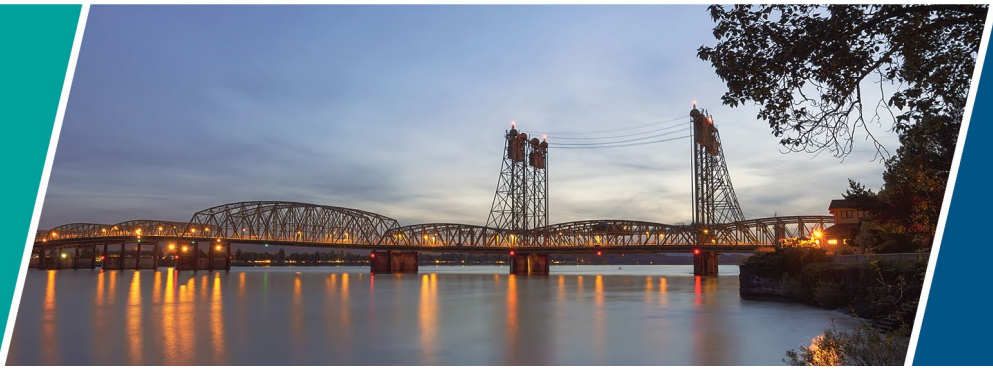
Interstate BRIDGE Replacement Program



Considering the importance of our natural environment





Water Quality and Hydrology Technical Report

March 2026

OREGON

For Americans with Disabilities Act (ADA) or Civil Rights Title VI accommodations, translation/interpretation services, or more information call 503-731-4128, TTY 800-735-2900 or Oregon Relay Service 7-1-1.

WASHINGTON

Accommodation requests for people with disabilities in Washington can be made by contacting the Washington State Department of Transportation (WSDOT) ADA Affairs team at wsdotada@wsdot.wa.gov or by calling toll-free, 855-362-4ADA (4232). Persons who are deaf or hard of hearing may make a request by calling the Washington State Relay at 711.

Water Quality and Hydrology Technical Report

CONTENTS

1. PROGRAM OVERVIEW 1-1
1.1 Components of the Modified LPA 1-2
1.1.1 Interstate 5 Mainline 1-7
1.1.2 Portland Mainland and Hayden Island (Subarea A) 1-12
1.1.3 Columbia River Bridges (Subarea B) 1-22
1.1.4 Downtown Vancouver (Subarea C) 1-43
1.1.5 Upper Vancouver (Subarea D) 1-51
1.1.6 Transit Support Facilities 1-54
1.1.7 Transit Operating Characteristics 1-58
1.1.8 Tolling 1-62
1.1.9 Transportation System- and Demand-Management Measures 1-65
1.1.10 Off-site Mitigation Sites 1-66
1.2 Modified LPA Construction 1-69
1.2.1 Construction Components, Packaging Plan, and Duration 1-69
1.2.2 Potential Staging Sites and Casting Yards 1-73
1.3 No-Build Alternative 1-74

2. METHODS 2-1
2.1 Study Area 2-1
2.1.1 Contributing Watersheds 2-4
2.1.2 Contributing Impervious Area 2-4
2.2 Relevant Laws and Regulations 2-4
2.2.1 Federal 2-4
2.2.2 State 2-6
2.2.3 Regional and Local 2-10
2.3 Effects Guidelines 2-12
2.4 Data Collection Methods 2-12
2.5 Analysis Methods 2-15
2.5.1 Long-Term Impacts 2-15
2.5.2 Temporary Construction Impacts 2-16
2.5.3 Indirect Impacts 2-16

3. AFFECTED ENVIRONMENT 3-1
3.1 Introduction 3-1
3.2 Regional Conditions 3-1
3.2.1 Surface Water Hydrology 3-1
3.2.2 Local Climate 3-4

3.2.3 Groundwater 3-4
3.2.4 Relevant Land Uses 3-5
3.2.5 Storm Drainage 3-5
3.3 Receiving Waters 3-8
3.3.1 Columbia Slough 3-8
3.3.2 Columbia River and North Portland Harbor 3-12
3.3.3 Burnt Bridge Creek 3-16
3.3.4 Fairview Creek 3-19
4. LONG-TERM EFFECTS 4-1
4.1 No-Build Alternative 4-1
4.2 Modified LPA Long-Term Effects 4-1
4.2.1 Hydrology 4-1
4.2.2 Water Quality 4-6
4.2.3 Stormwater 4-15
4.2.4 Design Options – Hydrology, Water Quality, and Stormwater 4-18
5. TEMPORARY EFFECTS 5-1
5.1 Modified LPA 5-1
5.1.1 Hydrology 5-1
5.1.2 Water Quality 5-3
5.1.3 Stormwater 5-7
5.1.4 Design Options 5-9
6. INDIRECT EFFECTS 6-1
7. AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION MEASURES 7-1
8. PERMITS AND APPROVALS 8-1
8.1 Federal Permits 8-1
8.1.1 National Pollutant Discharge Elimination System 8-1
8.1.2 Clean Water Act Section 404 8-1
8.1.3 Flood Control Facilities Disturbance 8-1
8.2 State Permits 8-2
8.2.1 Water Quality Certification 8-2
8.2.2 Safe Drinking Water Act Permits 8-2
8.2.3 Wetland/Waters Removal-Fill Permits 8-2
8.2.4 Waste Discharge General Permit 8-2
8.2.5 National Pollutant Discharge Elimination System 8-2
8.3 Local Permits 8-3
8.3.1 Clark County Code 40.420 “Flood Hazard Areas” 8-3

8.3.2 Vancouver Municipal Code 14.09. “Stormwater Management” 8-3
8.3.3 Vancouver Municipal Code 14.24 “Erosion Control” 8-3
8.3.4 Vancouver Municipal Code 14.25 “Stormwater Control” 8-3
8.3.5 Vancouver Municipal Code 14.26 “Water Resources Protection” 8-3
8.3.6 City of Portland Administrative Rule ENB-4.01, Stormwater Management Manual 8-4
8.3.7 Portland City Code 33.653 “Stormwater Management” 8-4
8.3.8 Portland City Code 17.38 “Drainage and Water Quality” 8-4
8.3.9 Portland City Code 24.50 “Flood Hazard Areas” 8-4

9. REFERENCES 9-1

FIGURES

Figure 1-1. IBR Program Location Overview 1-2
Figure 1-2. Modified LPA Components 1-6
Figure 1-3. Modified LPA – Geographic Subareas 1-7
Figure 1-4. Auxiliary Lane Configurations 1-9
Figure 1-5. Auxiliary Lane Configuration Footprint Differences 1-10
Figure 1-6. Portland Mainland and Hayden Island (Subarea A) 1-14
Figure 1-7. Levee Systems in Subarea A 1-15
Figure 1-8. Transit and Roadway Improvements in North Portland 1-16
Figure 1-9. Vehicle Circulation between Hayden Island and the Portland Mainland 1-20
Figure 1-10. Columbia River Bridges (Subarea B) 1-23
Figure 1-11. Bridge Foundation Concept 1-24
Figure 1-12. Existing Navigation Clearances of the Interstate Bridge 1-26
Figure 1-13. Navigation Clearances and Proposed Profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration 1-26
Figure 1-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration 1-27
Figure 1-15. Typical Cross Section of the Double-Deck Fixed-Span Configuration 1-28
Figure 1-16. Conceptual Drawings of Single-Level Fixed-Span Bridge Types 1-30
Figure 1-17. Typical Cross Section of the Single-Level Fixed-Span Configuration (Extradosed Type) 1-31
Figure 1-18. Typical Cross Section of the Single-Level Fixed-Span Configuration (Girder Type) 1-31
Figure 1-19. Conceptual Drawings of Single-Level Movable-Span Configurations in the Closed and Open Positions 1-33
Figure 1-20. Typical Cross Section of the Single-Level Movable-Span Bridge Type 1-34
Figure 1-21. Bridge Configuration Footprint Comparison 1-36
Figure 1-22. Bridge Configuration Profile Comparison 1-37
Figure 1-23. Downtown Vancouver (Subarea C) 1-44
Figure 1-24. Modified LPA With C Street Ramps 1-46
Figure 1-25. Collector-Distributor Roadways 1-47

Figure 1-26. Typical Cross Section of the Collector-Distributor Roadways 1-48
Figure 1-27. Upper Vancouver (Subarea D) 1-52
Figure 1-28. Ruby Junction Light-Rail Operations and Maintenance Facility Study Area 1-56
Figure 1-29. Expo Center Overnight LRV Facility 1-58
Figure 1-30. Toll Zone 1-64
Figure 1-31. Potential Compensatory Mitigation Sites 1-68
Figure 1-32. Preliminary Construction Packages 1-72
Figure 2-1. Water Quality and Hydrology Study Area and Study-Specific Watersheds 2-2
Figure 2-2. Full Extent of Study-Specific Watersheds 2-3
Figure 3-1. Federal Emergency Management Agency Floodplain Boundaries in the Study Area 3-3
Figure 3-2. Wellhead Protection Zones 3-6

TABLES

Table 1-1. Modified LPA Design Options 1-5
Table 1-2. Summary of Bridge Configurations 1-38
Table 1-3. Proposed TriMet and C-TRAN Bus Route Changes 1-61
Table 1-4. Preliminary Construction Packaging Plan 1-70
Table 3-1. Average Monthly Discharge (cubic feet per second) of Receiving Waters 3-2
Table 3-2. Existing Stormwater Drainage (acres) 3-7
Table 4-1. Changes in Base Flood Elevation – Ultimate Condition 4-2
Table 4-2. Changes in Impervious Surface Area from the Modified LPA 4-4
Table 4-3. Study Area Waterways with 303(d) Listings and Total Maximum Daily Loads 4-7
Table 4-4. Estimated Annual Pollutant Loads from Untreated and Treated Highway Runoff (pounds/year • acre) 4-9
Table 4-5. Annual Pollutant Load Estimates for Entire Project Contributing Impervious Areas 4-9
Table 4-6. Pollutant-Loading Estimate for the Columbia Slough Study-Specific Watershed 4-11
Table 4-7. Pollutant-Loading Estimate for the Columbia River South (Oregon) Study-Specific Watershed 4-12
Table 4-8. Pollutant-Loading Estimate for the Columbia River North (Washington) Study-Specific Watershed 4-13
Table 4-9. Pollutant-Loading Estimate for the Burnt Bridge Creek Study-Specific Watershed 4-13
Table 4-10. Pollutant-Loading Estimate for the Fairview Creek Study-Specific Watershed 4-14
Table 4-11. Changes in Impervious Surface Area from the Modified LPA with Single-Level Fixed-Span bridge configuration option 4-19
Table 6-1. Jurisdictional Stormwater Treatment Requirements 6-2
Table 7-1. Avoidance and Minimization Measures 7-1

APPENDICES

A Preliminary Location Hydraulic Study

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
AASHTO	American Association of State Highway and Transportation Officials
BES	City of Portland Bureau of Environmental Services
BMP	best management practice
BRT	bus rapid transit
BTEX	benzene, toluene, ethylbenzene, and xylene
CCFS	Columbia Corridor Flood Safety
CAD	computer-aided design
CCC	Clark County Code
C-D	collector-distributor
CECs	constituents of emerging concern
CESCL	certified erosion and sediment control lead
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIA	contributing impervious area
CPC	City of Portland Code
CRC	Columbia River Crossing
CTR	Commute Trip Reduction
C-TRAN	Clark County Public Transit Benefit Area Authority
CWA	Clean Water Act
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DEQ	Oregon Department of Environmental Quality
DSL	Oregon Department of State Lands
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency

Acronym/Abbreviation	Definition
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
FAHP	Federal Aid Highway Program
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	geographic information system
I-5	Interstate 5
IBR	Interstate Bridge Replacement
JPA	Joint Permit Application
LPA	Locally Preferred Alternative
LRT	light-rail transit
LRV	light-rail vehicle
MAX	Metropolitan Area Express
mg/L	milligrams per liter
MS4	Municipal Separate Storm Sewer System
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
OAR	Oregon Administrative Rules
°C	degrees Celsius
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation

Acronym/Abbreviation	Definition
°F	degrees Fahrenheit
OHWM	ordinary high-water mark
OMF	Operations and Maintenance Facility
ORS	Oregon Revised Statutes
OTC	Oregon Transportation Commission
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCC	Portland City Code
PDX	Portland International Airport
PEN 1	Peninsula Drainage District No.1
PEN 2	Peninsula Drainage District No.2
PMLS	Portland Metro Levee System
PNCD	Preliminary Navigation Clearance Determination
RM	river mile
ROD	Record of Decision
RTC	Southwest Washington Regional Transportation Council
RTP	Regional Transportation Plan
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SOV	single-occupancy vehicle
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SR	State Route
SSA	Sole Source Aquifer
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESCP	Temporary Erosion and Sediment Control Plan
TMDL	Total Maximum Daily Load
TriMet	Tri-County Metropolitan Transportation District

Acronym/Abbreviation	Definition
TSS	total suspended solids
UFSWQD	Urban Flood Safety and Water Quality District
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VNHR	Vancouver National Historic Reserve
VMC	Vancouver Municipal Code
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WPCF	water pollution control facility
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission

1. PROGRAM OVERVIEW

This technical report identifies, describes, and evaluates the direct long-term, direct temporary (i.e., short-term construction), and indirect effects related to water quality and hydrology from the Interstate Bridge Replacement (IBR) Program. The construction and operation of transportation infrastructure can have effects on, and can be affected by, water quality and hydrology resources. Where possible, the Modified Locally Preferred Alternative (LPA) would be designed to avoid or minimize these effects. This report provides proposed mitigation measures for potential effects when avoidance is not feasible.

The purpose of this report is to satisfy applicable portions of the National Environmental Policy Act (NEPA) 42 United States Code (U.S.C.) 4321 "to promote efforts which will prevent or eliminate damage to the environment." Information and potential environmental consequences described in this technical report will be used to support the Final Supplemental Environmental Impact Statement (SEIS) for the IBR Program pursuant to 42 U.S.C. 4332.

The objectives of this report are to:

- Define the study area and the methods of data collection and evaluation (Chapter 2).
- Describe existing water quality and hydrologic conditions (Chapter 3).
- Discuss potential long-term, temporary, and indirect effects of the Modified LPA and the No-Build Alternative to water quality and hydrological resources (Chapters 4, 5, and 6).
- Provide proposed avoidance and mitigation measures to help prevent, eliminate, or minimize environmental consequences from the Modified LPA (Chapter 7).
- Identify federal, state, and local permits that would be required (Chapter 8).

The IBR Program is a continuation of the previously suspended Columbia River Crossing (CRC) project with the same purpose to replace the aging Interstate Bridge across the Columbia River with a modern, seismically resilient multimodal structure. The proposed infrastructure improvements are located along a 5-mile stretch of the Interstate 5 (I-5) corridor that extends from approximately Victory Boulevard in Portland to State Route (SR) 500 in Vancouver, as shown in Figure 1-1.

Figure 1-1. IBR Program Location Overview



1.1 Components of the Modified LPA

The basic proposed components of the Modified LPA[1] include:

- A new pair of Columbia River bridges—one for northbound and one for southbound travel—built west of the existing bridge. The new bridges would each include three through lanes, safety shoulders, and one auxiliary lane in each direction. When all highway, transit, and active transportation would be moved to the new Columbia River bridges, the existing

[1] All transportation facilities would be designed to current AASHTO, WSDOT, and ODOT specifications.

Interstate Bridge (both spans) would be removed.[2] The primary navigation channel would be relocated approximately 500 feet south (measured by the channel centerline) of its existing location near the Vancouver shoreline.

- A 1.9-mile light-rail transit (LRT) extension of the current Metropolitan Area Express (MAX) Yellow Line from the Expo Center MAX Station in North Portland, where it currently ends, to a terminus near Evergreen Boulevard in Vancouver. Improvements would include new stations at Hayden Island, downtown Vancouver (Waterfront Station), and near Evergreen Boulevard (Evergreen Station), as well as reconstruction of the existing Expo Center MAX Station. The Tri-County Metropolitan Transportation District of Oregon (TriMet), which operates the MAX system, would also operate the Yellow Line extension.
- Associated LRT improvements such as traction power substations (TPSS),[3] an overhead catenary system, signal and communications support facilities, an overnight light-rail vehicle (LRV) facility at the Expo Center, 19 new LRVs, and an expanded maintenance facility at TriMet's existing Ruby Junction Light-Rail Operations and Maintenance Facility (OMF).
- Connections to local bus transit service, including bus rapid transit (BRT) and express bus routes, in collaboration with the Clark County Public Transit Benefit Area Authority (C-TRAN), in addition to the proposed new LRT service.
- Shoulders on I-5 from Interstate Avenue/Victory Boulevard to SR 500/39th Street to accommodate express bus-on-shoulder service in each direction.
- Associated bus transit service improvements, including three additional bus bays for new buses at the existing C-TRAN OMF (see Section 1.1.7, Transit Operating Characteristics, for more information about this service).
- Improvements to seven I-5 interchanges and I-5 mainline improvements between Interstate Avenue/ Victory Boulevard in Portland and SR 500/39th Street in Vancouver. Some adjacent local streets would be reconfigured to complement the new interchange designs and improve local east-west connections.
- Six new adjacent bridges across North Portland Harbor: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping with the existing bridge (which would be removed). The bridges would carry (from west to east) LRT tracks, southbound I-5 off-ramp to Marine Drive, southbound I-5 mainline, northbound I-5 mainline, northbound I-5 on-ramp from Marine Drive, and an arterial bridge for local traffic to Hayden Island with a shared-use path for pedestrians and bicyclists.
- A variety of improvements for people who walk, bike, and roll throughout the study area, including a system of shared-use paths, bicycle lanes, sidewalks, enhanced wayfinding, and facility improvements to comply with the Americans with Disabilities Act. These are referred to in this document as "active transportation improvements."

[2] For purposes of this report, the existing I-5 bridges over the Columbia River are referred to as the "Interstate Bridge." The new replacement I-5 bridges over the Columbia River are referred to as the "Columbia River bridges."

[3] Each TPSS would be approximately 75 feet by 50 feet, including parking and access areas.

- Variable-rate tolling, including signage and equipment, for motorists using the river crossing as a demand-management and financing tool.

In addition to the basic components described above, the Modified LPA includes five sets of design options. The design options are related to (1) the number of auxiliary lanes; (2) the bridge configuration; (3) the presence of the C Street ramps; (4) the I-5 alignment in downtown Vancouver; and (5) the park and rides. The Recommended Design Options are identified with bold text and an asterisk in Table 1-1.

- **Auxiliary Lanes.** Options for one or two auxiliary lanes. Auxiliary lanes are ramp-to-ramp connections on the highway that improve interchange safety by providing drivers with more space and time to merge, diverge, and weave at highway access points.
  - The one auxiliary lane design option would extend across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange.
  - The two auxiliary lane design option would extend a second auxiliary lane in each direction of I-5 in addition to the one auxiliary lane included in the Modified LPA. The second auxiliary lane would also extend across the Columbia River bridges in addition to and in combination with the existing auxiliary lanes from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street.
- **Bridge Configurations.** Three bridge configurations are under consideration.
  - Double-deck fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
  - Single-level fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
  - Single-level movable-span bridges: with the movable spans over the primary navigation channel: 178 feet of vertical navigation clearance in the open position and 90 feet in the closed position (the north barge channel would have 99 feet of vertical navigation clearance and the south barge channel would have 90 feet of vertical navigation clearance).
- **C Street Ramps.** Options that retain or eliminate the existing C Street ramps in downtown Vancouver.
- **I-5 Alignment in Downtown Vancouver.** Options that maintain the I-5 mainline at its current location or shift the I-5 mainline up to 40 feet westward in downtown Vancouver between the SR 14 interchange and Mill Plain Boulevard interchange.
- **Park and Rides.** Options to provide parking capacity to accommodate 1,270 vehicles at designated park and rides near the Waterfront Station and Evergreen Station to serve LRT riders.

Table 1-1. Modified LPA Design Options

Modified LPA Component	Design Options
Auxiliary lanes	• **One auxiliary lane in each direction on the new Columbia River bridges and nearby sections of I-5*** • Two auxiliary lanes in each direction of I-5 would extend across the Columbia River bridges in addition to and in combination with existing auxiliary lanes from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street
Bridge configuration	• Double-deck fixed-span bridge configuration • **Single-level fixed-span bridge configuration*** • Single-level movable-span bridge configuration
C Street ramps	• **With C Street ramps*** • Without C Street ramps
I-5 Alignment in downtown Vancouver	• **Centered I-5 alignment*** • Westward shift of I-5 alignment
Park and Rides	• Provide parking capacity to accommodate 1,270 vehicles distributed across just two park and rides: one park and ride with 570 parking spaces near the Waterfront Station and one park and ride with 700 parking spaces near the Evergreen Station. The locations for park and rides that were evaluated included: ➢ Potential Waterfront Station park and rides ▪ Columbia Way (below I-5) ▪ Columbia Street/SR 14 ▪ Columbia Street/Phil Arnold Way ➢ Potential Evergreen Station park and rides ▪ Library Square ▪ Columbia Credit Union • **Provide parking capacity to accommodate 1,270 vehicles dispersed among five park and rides listed above *[a]**

Notes:

* Recommended Design Options are in bold.

a Depending on final design considerations, the decision may be made to use fewer than the five sites. The analysis assumes all five sites as it encompasses all physical impacts.

The transportation improvements proposed for the Modified LPA and the design options are shown in Figure 1-2. The Modified LPA includes all of the components listed above. If there are differences in environmental effects or benefits between the design options, they are identified in the sections below.

Section 1.1.1, Interstate 5 Mainline, describes the overall configuration of the I-5 mainline through the study area, and Sections 1.1.2, Portland Mainland and Hayden Island (Subarea A), through Section 1.1.5, Upper Vancouver (Subarea D), provide additional detail on four geographic subareas (A through

D), which are shown on Figure 1-3. In each subarea, improvements to I-5, its interchanges, and the local roadways are described first, followed by transit and active transportation improvements. Design options are described under separate headings in the subareas in which they would be located. The description of the Modified LPA and design options are based on conceptual design and are subject to refinement as the design is finalized. The IBR Program will continue to consult with regulatory agencies, local agencies with jurisdiction, and tribes to seek opportunities for improvements and avoidance and minimization of impacts.

Figure 1-2. Modified LPA Components



Figure 1-3. Modified LPA – Geographic Subareas



1.1.1 Interstate 5 Mainline

Today, within the 5-mile corridor, I-5 has three, typically 12-foot-wide, through lanes in each direction, an approximately 6- to 12-foot-wide inside shoulder, and an approximately 6- to 12-foot-wide outside shoulder, with the exception of the Interstate Bridge, which has approximately 1- to 2-foot-wide inside and outside shoulders. There are currently intermittent one and two auxiliary lane sections between the Victory Boulevard and Hayden Island interchanges in Oregon and between SR 14 and SR 500 in Washington.

The Modified LPA would include three 12-foot through lanes from Interstate Avenue/Victory Boulevard to SR 500/39th Street and one or two 12-foot auxiliary lanes, as detailed below and shown on Figure 1-4. Many of the existing auxiliary lanes on I-5 between the SR 14 and Main Street interchanges in Vancouver would remain, although they would be reconfigured. The existing auxiliary lanes

between the Victory Boulevard and Hayden Island interchanges would be replaced with changes to on- and off-ramps and interchange reconfigurations. The existing Interstate Bridge over the Columbia River does not have auxiliary lanes; the Modified LPA would add one or two auxiliary lanes in each direction across the new Columbia River bridges.

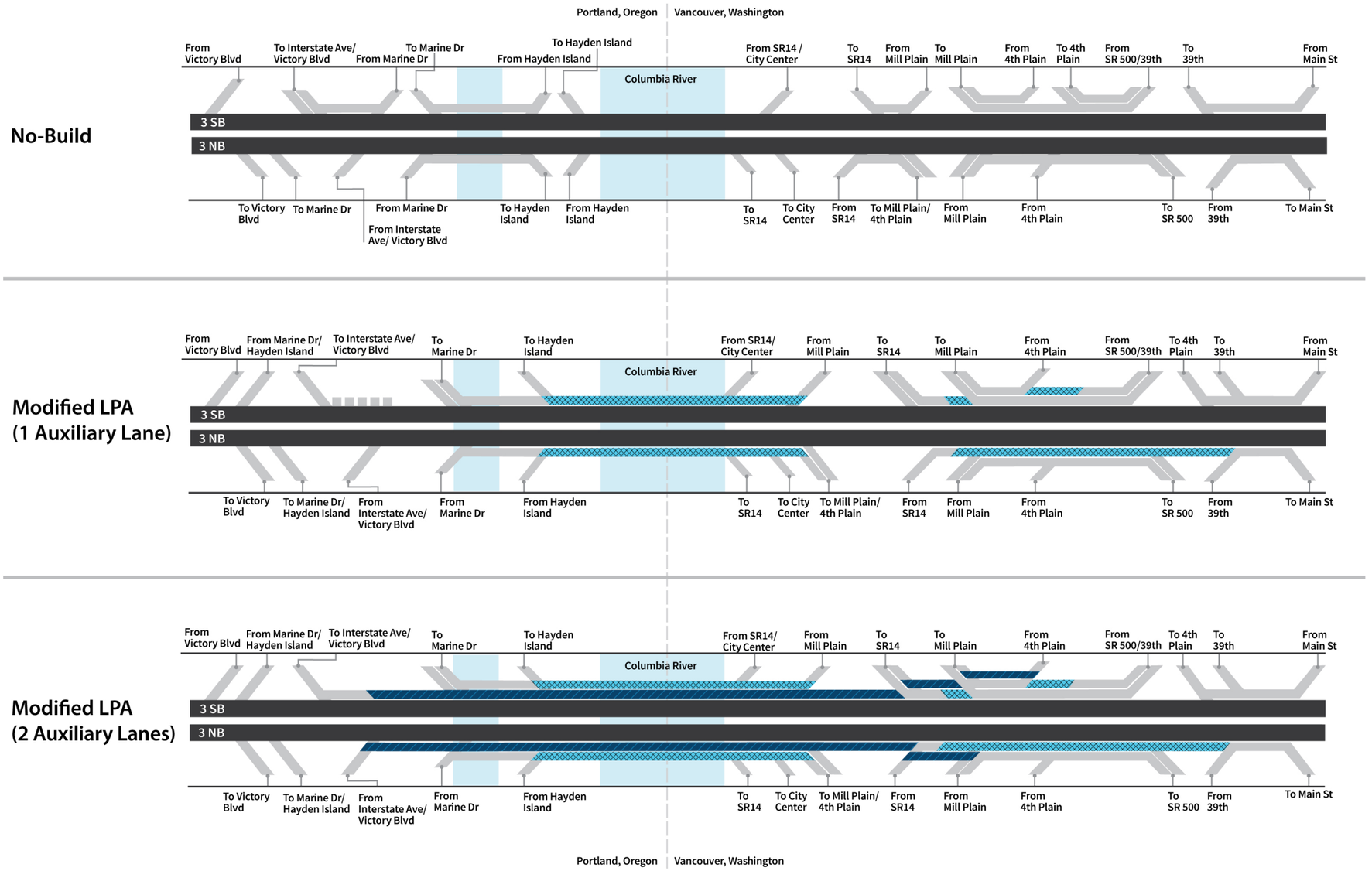
The Modified LPA would also include shoulders (11- to 14-foot inside shoulders and 10- to 14-foot outside shoulders) to be consistent with the design standards of the Oregon Department of Transportation (ODOT) and Washington State Department of Transportation (WSDOT). The inside shoulder would be used by express bus service to bypass mainline congestion, known as "bus on shoulder" (refer to Section 1.1.7, Transit Operating Characteristics). The shoulder would be available for express bus service when general-purpose speeds are below 35 miles per hour.

1.1.1.1 Auxiliary Lane Design Options

The Modified LPA includes design options for one auxiliary lane in each direction or two auxiliary lanes in each direction across the Columbia River bridges in addition to and in combination with existing auxiliary lanes in the area. The one auxiliary lane design option would include an auxiliary lane in each direction across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange. The two auxiliary lane design option would include a second auxiliary lane from the Interstate Avenue/Victory Boulevard interchange and the SR 500/39th Street interchange, including on the Columbia River bridges (see Figure 1-4). This section provides an overview of the one auxiliary lane and the two auxiliary lane design options.

Figure 1-5, which shows a single-level fixed-span bridge configuration for comparison purposes, shows that the scale of the physical impacts (footprint, or the limits of permanent improvements) would be similar for the Modified LPA with one auxiliary lane design option and the Modified LPA with two auxiliary lanes design option, except over the Columbia River and in downtown Vancouver. For all bridge configuration design options, the two auxiliary lane design option would add a net of approximately 16 feet (8 feet in each direction) in total roadway width to the Columbia River bridges compared to the one auxiliary lane design option.

Figure 1-4. Auxiliary Lane Configurations



Each scenario has three through lanes in each direction

- Existing Through Lanes
- Interchange Ramps and Existing Auxiliary Lanes
- Existing Auxiliary Lanes Removed
- One Auxiliary Lane added in Modified LPA
- Second Auxiliary Lane added in Modified LPA

Notes:

Collector Distributor Lanes not shown.

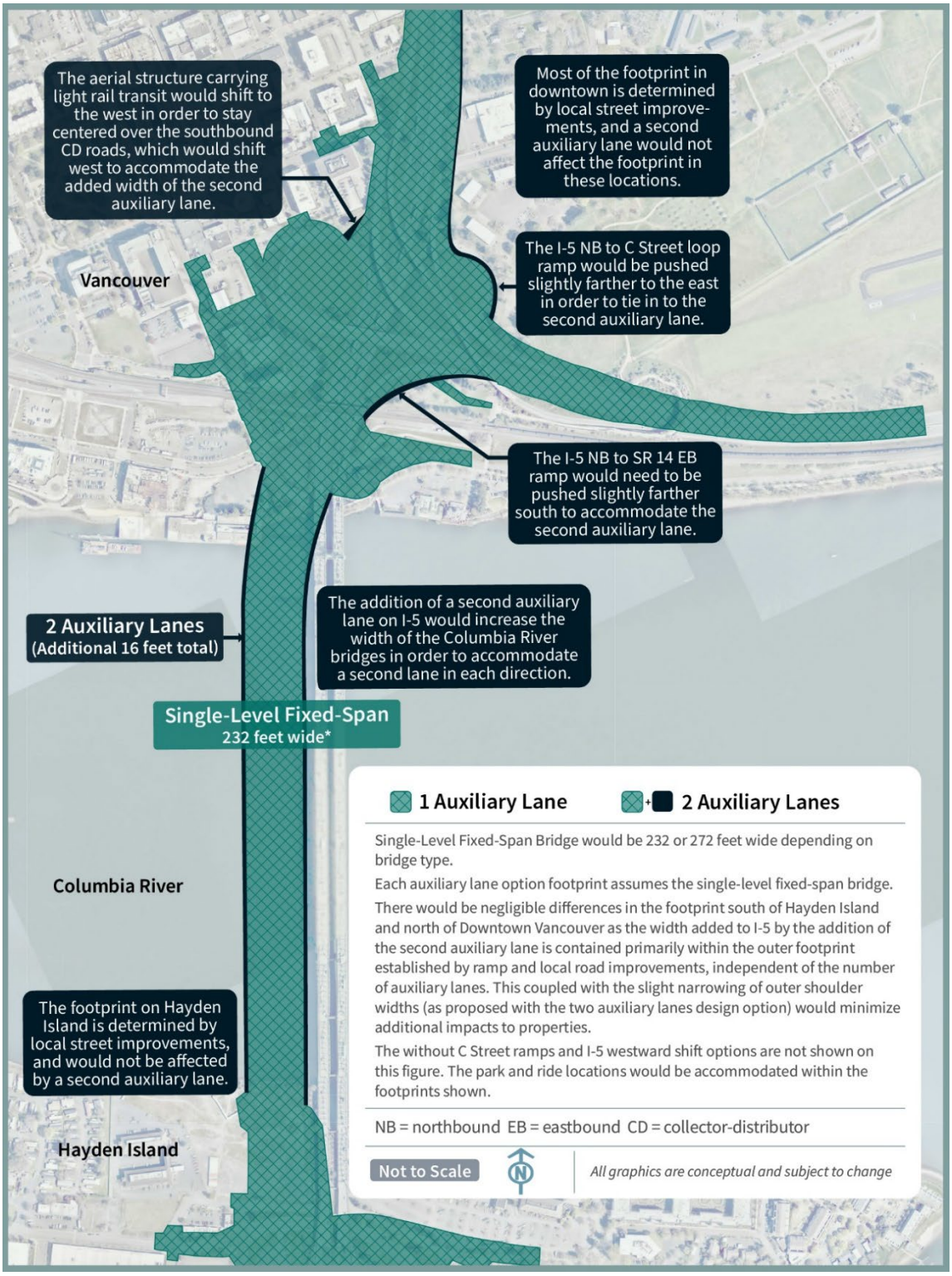
The traffic operations analysis incorporating both the one and two auxiliary lane design option applies equally to all bridge configuration options in this Draft SEIS.

The C Street ramp (NB to City Center) is an option.

Figure is not to scale.

10.26.2023 | Copyright 2023 Interstate Bridge Replacement Program

Figure 1-5. Auxiliary Lane Configuration Footprint Differences



Note: All dimensions are approximate.

ONE AUXILIARY LANE DESIGN OPTION – RECOMMENDED DESIGN OPTION

The one auxiliary lane design option would include a 12-foot-wide auxiliary lane in each direction across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange.

On northbound I-5, the auxiliary lane would extend the existing auxiliary from the Marine Drive on-ramp to the Hayden Island off-ramp to continue across the Columbia River bridge, and end at the combined off-ramp to Mill Plain/Fourth Plain Boulevard, north of SR 14 (see Figure 1-4). The existing auxiliary lane from the SR 14 on-ramp to the Mill Plain/Fourth Plain off-ramp would be extended to connect to the existing auxiliary lane from the 39th Street on-ramp to the Main Street off-ramp, creating an auxiliary lane beginning at the SR 14 on-ramp and ending at the Main Street off-ramp. The existing auxiliary lane located between the Mill Plain Boulevard on-ramp and the SR 500 off-ramp would remain.

The IBR Program recommends advancing the one auxiliary lane in each direction of I-5 design option. The one and two auxiliary lane design options would provide important benefits to highway operations and safety. Both options received a mix of positive and negative feedback from the public. The one auxiliary lane design option is recommended because it would reduce overall environmental impacts while improving transportation operations and safety. The one auxiliary lane design option is also supported by local transportation agencies.

On southbound I-5, the two existing auxiliary lanes between SR 500/39th Street and Mill Plain Boulevard would remain, with some reconfiguration due to the braided ramps between the SR 500/39th Street and Fourth Plain Boulevard interchanges. The new auxiliary lane across the Columbia River would begin at the Mill Plain Boulevard on-ramp and would continue across the Columbia River bridge, connecting to the existing auxiliary lane on Hayden Island and ending at the Marine Drive off-ramp. The existing southbound auxiliary lane between Marine Drive and Victory Boulevard/Interstate Avenue would be removed due to ramp reconfigurations as part of the Marine Drive braided ramp with the Victory Boulevard/Interstate Avenue off-ramp.

TWO AUXILIARY LANE DESIGN OPTION

The two auxiliary lane design option would include the same improvements as described under the one auxiliary lane design option and would add a second 12-foot-wide auxiliary lane in each direction of I-5 across the Columbia River bridges to further improve safety and operations in the corridor.

On northbound I-5, the inside auxiliary lane would extend from the combined Interstate Avenue/Victory Boulevard on-ramp, continue across the Columbia River bridge, and end at the SR 500/39th Street interchange, connecting to the existing auxiliary lane between the SR 14 on-ramp and Mill Plain on-ramp and the existing auxiliary lane between the 39th Street on-ramp and the Main Street off-ramp. The outside auxiliary lane would extend from the Marine Drive on-ramp across the Columbia River bridge and end at the Mill Plain/Fourth Plain Boulevard off-ramp. A new outside auxiliary lane would begin at the SR 14 on-ramp connecting to the existing auxiliary lane between the Mill Plain Boulevard on-ramp and the SR 500/39th Street off-ramp.

On southbound I-5, the two existing auxiliary lanes between SR 500/39th Street and Mill Plain Boulevard would remain, with some reconfiguration because of the braided ramps between the SR 500/39th Street and Fourth Plain Boulevard interchanges. In addition, there would be a third auxiliary lane between the Fourth Plain Boulevard on-ramp and the Mill Plain Boulevard off-ramp to improve operations and safety between these two closely spaced ramps. The existing auxiliary lane between the SR 500/39th Street on-ramp would extend to the SR 14 collector-distributor off-ramp. This auxiliary lane would then continue across the Columbia River bridge to the Interstate Avenue/Victory Boulevard off-ramp. The outside auxiliary lane would extend from the Mill Plain on-ramp across the Columbia River bridge to connect to the existing auxiliary lane between Hayden Island and the Marine Drive off-ramp.

1.1.2 Portland Mainland and Hayden Island (Subarea A)

This section discusses the geographic Subarea A (Figure 1-3 provides an overview of the geographic subareas). Figure 1-6 shows highway and interchange improvements in Subarea A, including the North Portland Harbor bridges.

1.1.2.1 Levee System Improvements

Within Subarea A, the IBR Program has the potential to alter three federally authorized levee systems:

- The Oregon Slough segment of the Peninsula Drainage District Number 1 levee (PEN 1).
- The Oregon Slough segment of the Peninsula Drainage District Number 2 levee (PEN 2).
- The PEN1/PEN2 Cross Levee segment of the PEN 1 levee (Cross Levee).

The levee systems are shown on Figure 1-7, and intersections with Modified LPA components are described throughout this section (Section 1.1.2, Portland Mainland and Hayden Island (Subarea A)), where appropriate. Within Subarea A, the IBR Program study area intersects with PEN 1 to the west of I-5 and with PEN 2 to the east of I-5. PEN 1 and PEN 2 include a main levee along the south side of North Portland Harbor and are part of a combination of levees and floodwalls. PEN 1 and PEN 2 are separated by the Cross Levee that is intended to isolate the two districts if one of them were to fail. The Cross Levee is located along the I-5 mainline embankment, except in the Marine Drive interchange area, where it is located on the west edge of the existing ramp from Marine Drive to southbound I-5.[4]

There are two concurrent projects underway that are planning improvements to PEN1, PEN2, and the Cross Levee to reduce flood risk:

- The U.S. Army Corps of Engineers (USACE) Portland Metro Levee System (PMLS) project.
- The Columbia Corridor Flood Safety (CCFS) projects (formerly known as “Flood Safe Columbia River” and “Levee Ready Columbia”).

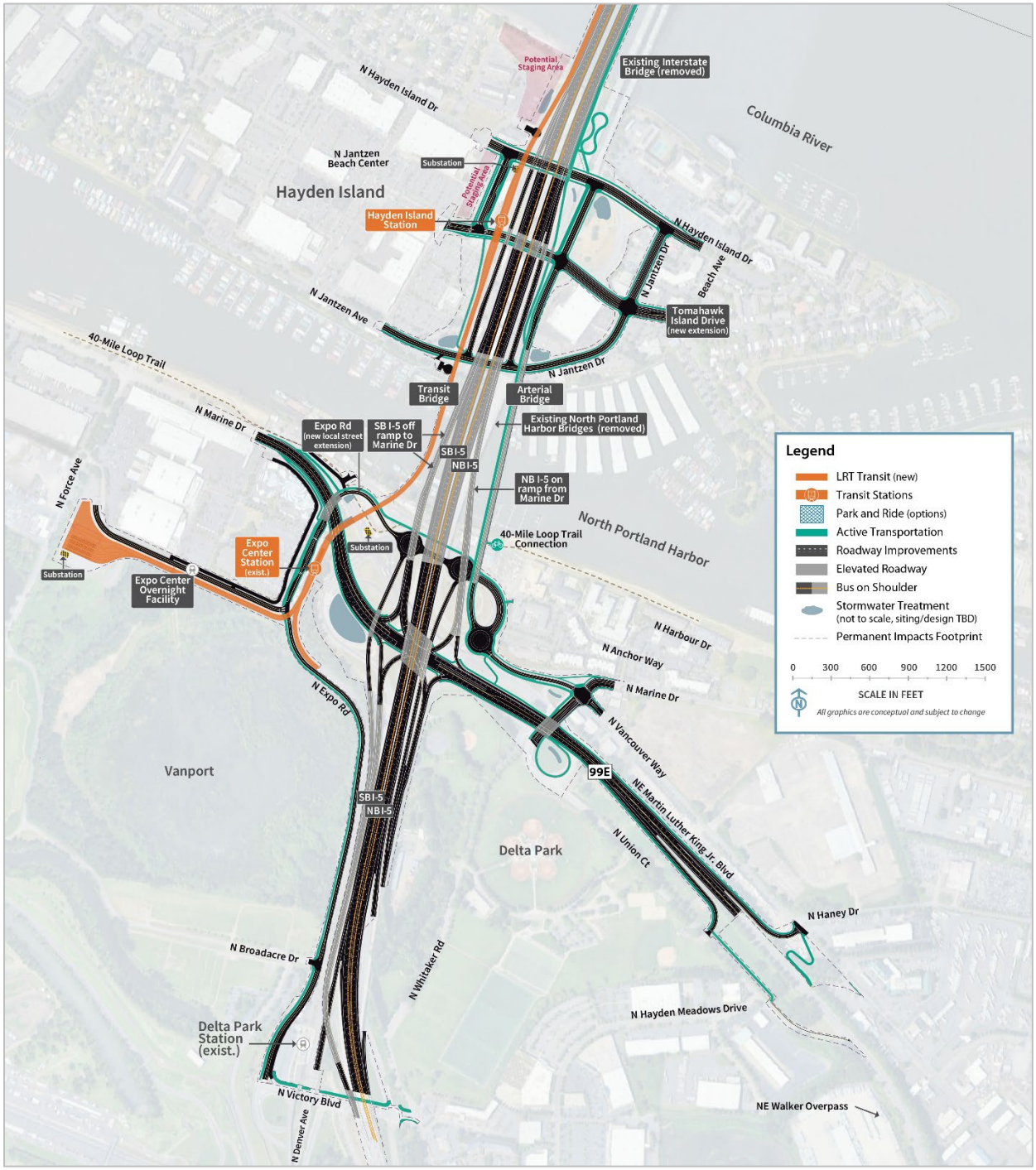
[4] The portion of the original Denver Avenue levee alignment within the Marine Drive interchange area is no longer considered part of the levee system by UFSWQD.

The Urban Flood Safety and Water Quality District (UFSWQD)[5] is working in partnership with the USACE on the PMLS project, which includes improvements at PEN 1 and PEN 2 (e.g., raising these levees to elevation 38.2 feet for earthen levees and 39.2 feet for flood walls North American Vertical Datum of 1988 [NAVD 88]).[6] Additionally, as part of the CCFS projects, UFSWQD has identified the need to raise a low spot in the Cross Levee on the southwest side of the Marine Drive interchange.

The IBR Program is in close coordination with UFSWQD and the USACE to ensure that the IBR Program's design efforts consider the timing and scope of the PMLS and the CCFS proposed modifications. The intersection of the IBR Program proposed actions to both the existing levee configuration and the anticipated future condition based on the proposed PMLS and CCFS projects are described below, where appropriate.

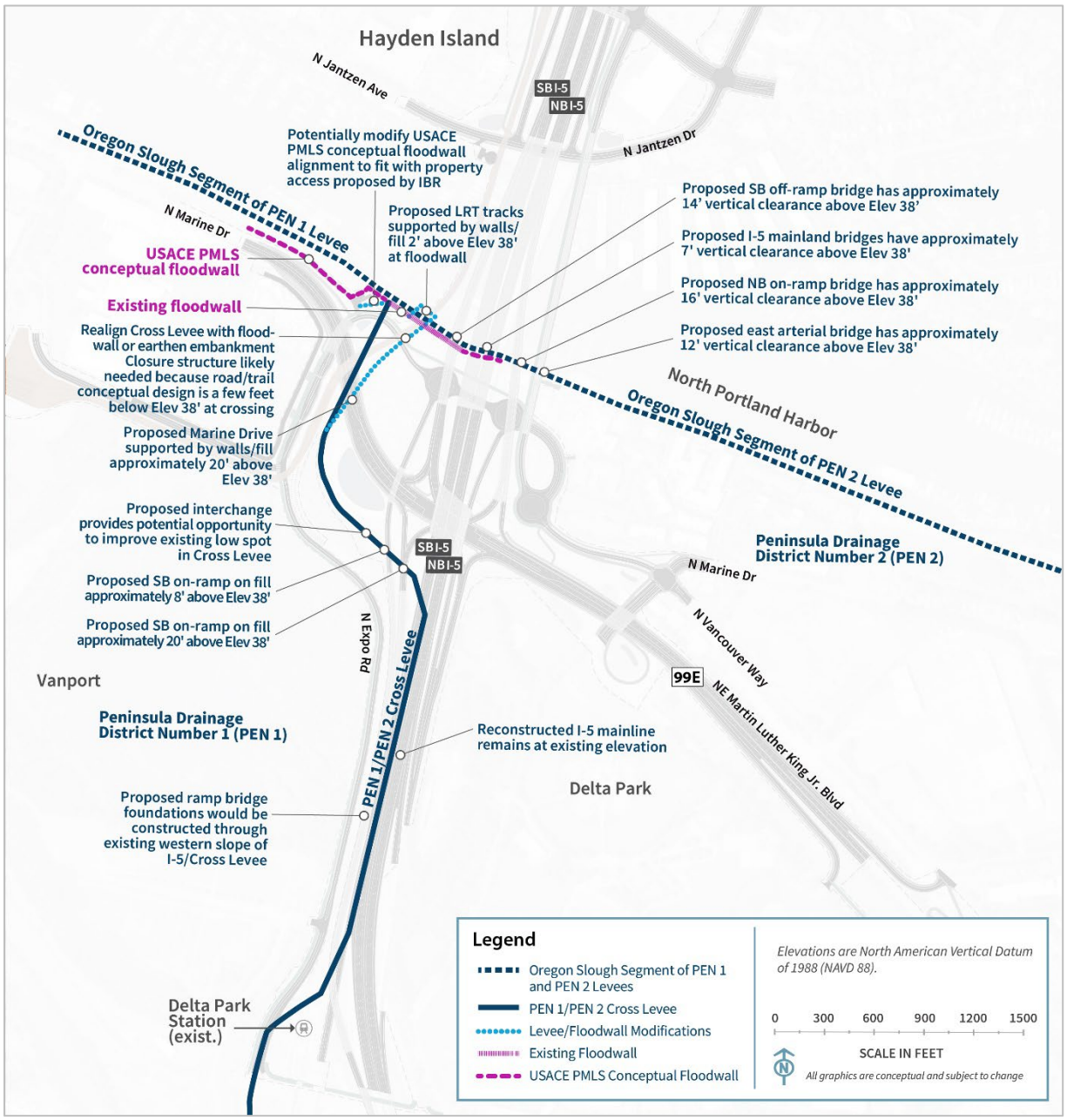
[5] UFSWQD includes PEN 1 and PEN 2, Urban Flood Safety and Water Quality District No. 1, and the Sandy Drainage Improvement Company.
[6] NAVD 88 is a vertical control datum (reference point) used by federal agencies for surveying.

Figure 1-6. Portland Mainland and Hayden Island (Subarea A)



LRT = light-rail transit; NB = northbound; SB = southbound; TBD = to be determined

Figure 1-7. Levee Systems in Subarea A



1.1.2.2 Highways, Interchanges, and Local Roadways

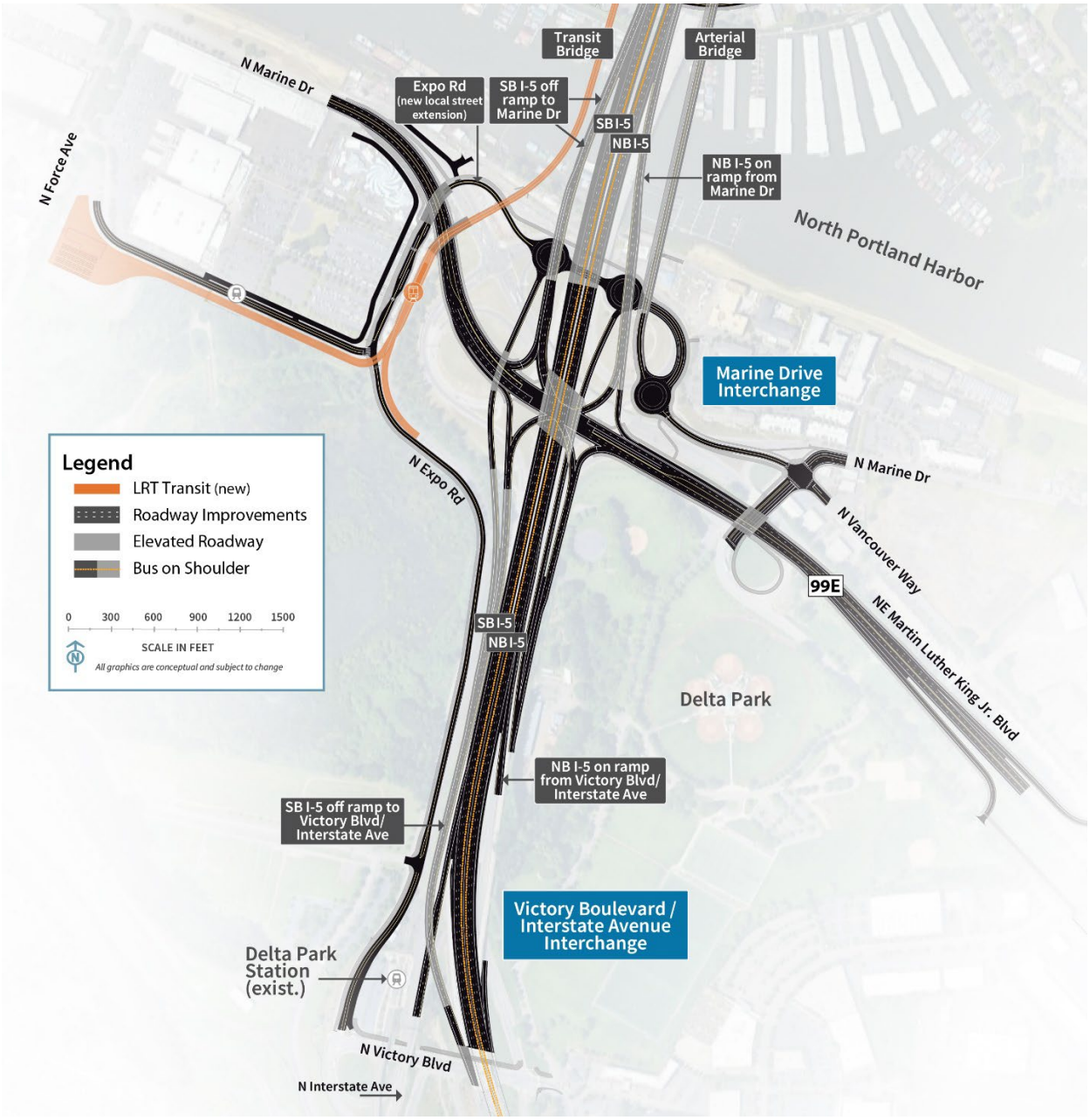
VICTORY BOULEVARD/INTERSTATE AVENUE INTERCHANGE AREA

The southern extent of the Modified LPA would improve two ramps at the Victory Boulevard/Interstate Avenue interchange (see Figure 1-6 and Figure 1-8). The first ramp improvement would be the southbound I-5 off-ramp to Victory Boulevard/Interstate Avenue; this off-ramp would be braided below (i.e., grade separated or pass below) the Marine Drive to the I-5 southbound on-ramp (see the

Marine Drive Interchange Area section below). The other ramp improvement would lengthen the merge distance for northbound traffic entering I-5 from Victory Boulevard and from Interstate Avenue.

The existing I-5 mainline between Victory Boulevard/Interstate Avenue and Marine Drive is part of the Cross Levee (see Figure 1-7). The Modified LPA would require some pavement reconstruction of the mainline in this area; however, the improvements would mostly consist of pavement overlay, and the profile and footprint would be similar to existing conditions.

Figure 1-8. Transit and Roadway Improvements in North Portland



MARINE DRIVE INTERCHANGE AREA

The next interchange north of the Victory Boulevard/Interstate Avenue interchange is at Marine Drive. All movements within this interchange would be reconfigured to improve safety and operations for motorists entering and exiting I-5, and all active transportation users accessing areas in the vicinity of the interchange. In addition, Marine Drive would be raised over the proposed LRT extension to separate motorist and transit users. The proposed Marine Drive interchange configuration would be a single-point urban interchange. Figure 1-8 shows Marine Drive interchange's layout and construction footprint.

Martin Luther King Jr. Boulevard would have new more direct connections to I-5. The new interchange configuration would change the westbound Marine Drive and westbound Vancouver Way connections to Martin Luther King Jr. Boulevard. An improved connection farther east of the interchange (near Haney Drive) would provide access to westbound Martin Luther King Jr. Boulevard for these two streets. The existing access to westbound Martin Luther King Jr. Boulevard from Vancouver Way east of Haney Drive would be closed. For eastbound travelers on Martin Luther King Jr. Boulevard exiting to Union Court, the existing loop connection would be replaced with a new connection farther east (between the access to the East Delta Park Owens Sports Complex and N Hayden Meadows Drive).

Expo Road from Victory Boulevard to the Expo Center would be reconstructed with improved active transportation facilities. North of the Expo Center, Expo Road would be extended under Marine Drive and continue under I-5 to the east, connecting with Marine Drive and Vancouver Way through three new connected intersections. The westernmost intersection would connect the new local street extension to I-5 southbound. The middle intersection would connect the I-5 northbound off-ramp to the local street extension. The easternmost intersection would connect the new local street extension to an arterial bridge crossing North Portland Harbor to Hayden Island. This intersection would also connect the local street extension to Marine Drive and Vancouver Way.

To access Hayden Island using the arterial bridge from the east on Martin Luther King Jr. Boulevard, motorists would exit Martin Luther King Jr. Boulevard at the existing off-ramp to Vancouver Way just west of the Walker Street overpass. Then motorists would travel west on Vancouver Way, through the intersection with Marine Drive and straight through the intersection to the arterial bridge.

From Hayden Island, motorists traveling south to Portland via Martin Luther King Jr. Boulevard would turn onto the arterial bridge southbound and travel straight through the intersection onto Vancouver Way. At the intersection of Vancouver Way and Marine Drive, motorists would turn right onto Union Court and follow the existing road southeast to the existing on-ramp onto Martin Luther King Jr. Boulevard.

The conceptual floodwall alignment from the proposed USACE PMLS project is located on the north side of Marine Drive, near two industrial properties, with three proposed closure structures[7] for property access. The Modified LPA would realign Marine Drive to the south to maintain traffic on existing Marine Drive during construction. The Modified LPA would provide access to the two industrial properties via the new local road extension from Expo Road. Therefore, the change in

[7] Levee closure structures are put in place at openings along the embankment/floodwall to provide flood protection during high water conditions.

access for the two industrial properties could require small modifications to the floodwall alignment (a potential shift of approximately 5 to 10 feet to the south) and closure structure locations. The IBR Program is coordinating with USACE PMLS and the UFSWQD on modifications to the floodwall alignment.

Marine Drive and the two southbound on-ramps would travel over the Cross Levee approximately 10 to 20 feet above the proposed elevation of the improved levee, and they would be supported by fill and retaining walls near an existing low spot in the Cross Levee.

The I-5 southbound on-ramp from Marine Drive would continue on a new bridge structure. Although the bridge's foundation locations have not been determined yet, they would be constructed through the western slope of the Cross Levee (between the existing I-5 mainline and the existing light-rail).

NORTH PORTLAND HARBOR BRIDGES

To the north of the Marine Drive interchange is the Hayden Island interchange area, which is shown in Figure 1-6. I-5 crosses over the North Portland Harbor when traveling between these two interchanges. The Modified LPA proposes to replace the existing I-5 bridge spanning North Portland Harbor to improve seismic resilience.

Six new parallel bridges would be built across the waterway under the Modified LPA: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping the location of the existing bridge (which would be removed). From west to east, these bridges would carry:

- The LRT tracks.
- The southbound I-5 off-ramp to Marine Drive.
- The southbound I-5 mainline.
- The northbound I-5 mainline.
- The northbound I-5 on-ramp from Marine Drive.
- An arterial bridge between the Portland mainland and Hayden Island with a shared-use path for pedestrians and bicyclists.

All new structures would have at least as much vertical navigation clearance over North Portland Harbor as the existing North Portland Harbor bridge.

All of the six bridges would be designed and constructed to have sufficient clearance over the levees for access and maintenance. The foundation locations for the five roadway bridges have not been determined at this stage of design, but some foundations could be constructed through landward or riverward levee slopes.

HAYDEN ISLAND INTERCHANGE AREA

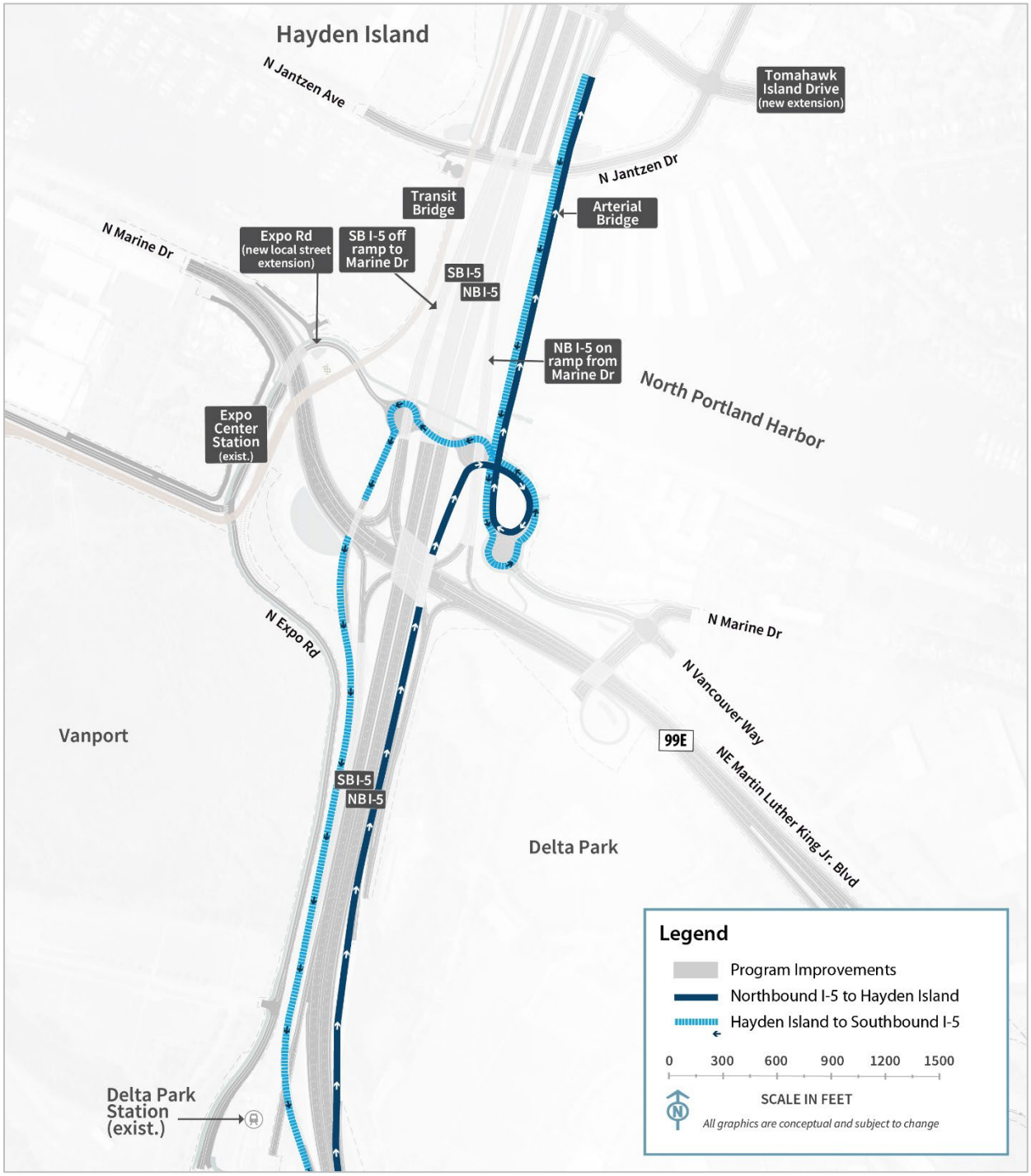
All traffic movements for the Hayden Island interchange would be reconfigured. Figure 1-6 shows the layout and construction footprint of the Hayden Island interchange. A partial interchange would be built on Hayden Island with a northbound I-5 on-ramp from Jantzen Drive and a southbound I-5 off-ramp to Jantzen Drive. This would improve ramp lengths to provide sufficient merging/diverging

areas compared to the existing substandard ramps that require acceleration and deceleration in a short distance. The I-5 mainline would be partially located on fill across the island and partially elevated to provide east–west connections on Hayden Island.

There would not be a southbound I-5 on-ramp or northbound I-5 off-ramp located on Hayden Island. Connections to Hayden Island for those movements would be via the local access (i.e., arterial) bridge connecting North Portland to Hayden Island (Figure 1-9). Vehicles traveling northbound on I-5 wanting to access Hayden Island would exit with traffic going to the Marine Drive interchange, cross under Martin Luther King Jr. Boulevard to the new intersection at the Expo Road local street extension, and use the arterial bridge to cross North Portland Harbor. Vehicles on Hayden Island looking to enter I-5 southbound would use the arterial bridge to cross North Portland Harbor, cross under I-5 using the new Expo Road local street extension to the westernmost intersection, cross under Marine Drive, merge with the Marine Drive southbound on-ramp, and merge with I-5 southbound south of Victory Boulevard.

Improvements to Jantzen Avenue may include additional left-turn and right-turn lanes at the interchange ramp terminals and active transportation facilities. Improvements to Hayden Island Drive would include new connections to the new arterial bridge over North Portland Harbor. The existing I-5 northbound and southbound access points from Hayden Island Drive would also be removed. A new extension of Tomahawk Island Drive would travel east–west through the middle of Hayden Island and under the I-5 interchange, thus improving connectivity across I-5 on the island.

Figure 1-9. Vehicle Circulation between Hayden Island and the Portland Mainland



NB = northbound; SB = southbound

1.1.2.3 Transit

A new light-rail alignment for northbound and southbound trains would be constructed within Subarea A (Figure 1-6) to extend from the existing Expo Center MAX Station over North Portland Harbor to a new station at Hayden Island. An overnight LRV facility would be constructed on the southwest corner of the Expo Center property (Figure 1-6) to provide storage for trains during hours when the MAX is not in service. This facility is described in Section 1.1.6, Transit Support Facilities. The existing Expo Center MAX Station would be modified to remove the westernmost track and platform. Other platform modifications, including track realignment and regrading the station, are anticipated to transition to the extension alignment. This could require reconstruction of the operator break facility, signal/communication buildings, and TPSSs. The existing TPSS at the end of TriMet's MAX Yellow Line would be decommissioned. A new TPSS would be constructed to the east of the LRT tracks and south of Expo Road, as well as at the overnight LRV facility, east of N Force Avenue. Immediately north of the Expo Center MAX Station, the LRT alignment would curve east toward I-5, pass beneath an elevated Marine Drive, cross the proposed Expo Road local street extension and the 40-Mile Loop Trail at grade, then rise over the existing levee onto a light-rail bridge to cross North Portland Harbor.

After crossing the new Expo Road extension, the new light-rail track would cross over the main levee (Figure 1-7). The light-rail profile is anticipated to provide sufficient clearance above the improved levees at the existing floodwall (and improved floodwall), and the tracks would be constructed on fill supported by retaining walls above the floodwall. North of the floodwall, the light-rail tracks would continue onto the new light-rail bridge over North Portland Harbor.

As the Modified LPA's light-rail extension would cross the north end of the existing Cross Levee, the IBR Program is proposing to realign the Cross Levee to the east of the light-rail alignment. This realigned Cross Levee would intersect the new Expo Road extension. A levee closure structure would be required because the proposed roadway is a few feet lower than the proposed elevation of the improved levee.

On Hayden Island, proposed transit components include northbound and southbound LRT tracks over Hayden Island; the tracks would be elevated at approximately the height of the new I-5 mainline. An elevated LRT station would also be built on the island immediately west of I-5. Active transportation facilities, described below, would connect to the new Hayden Island Station. A new TPSS would be constructed at the Hayden Island Station, north of the transit platform. If a single-level fixed-span or movable-span Columbia River bridge configuration were implemented, the light-rail alignment would extend north on Hayden Island along the western edge of I-5 before transitioning onto the outer (western) edge of the new western single-level bridge over the Columbia River. For the double-deck configuration, the light-rail alignment would transition to the lower level of the new double-deck southbound I-5 bridge over the Columbia River.

1.1.2.4 Active Transportation

In the Victory Boulevard interchange area (Figure 1-6), active transportation facilities would be provided on Victory Boulevard beneath I-5 and Interstate Avenue between Expo Road and the northbound on/off-ramp terminal east of I-5. Active transportation facilities would also be provided along Expo Road between Victory Boulevard and the Expo Center. These facilities would provide

direct connections between the Victory Boulevard and Marine Drive interchange areas, as well as links to the Delta Park and Expo Center MAX Stations.

New shared-use path connections throughout the Marine Drive interchange area would provide access between the Bridgeton neighborhood (on the east side of I-5), Hayden Island, and the Expo Center MAX Station. There would also be connections to the existing portions of the 40-Mile Loop Trail, which runs north of Marine Drive under I-5 through the interchange area. The path would continue along the extension of Expo Road under the interchange to the intersection of Marine Drive and Vancouver Way, where it would connect under Martin Luther King Jr. Boulevard to Delta Park.

East of the Marine Drive interchange, active transportation facilities on Martin Luther King Jr. Boulevard and on the parallel street, Union Court, would connect travelers to Marine Drive and across the arterial bridge to Hayden Island. The active transportation facilities on Martin Luther King Jr. Boulevard would provide westbound and eastbound cyclists and pedestrians with off-street crossings of the interchange and would also provide connections to both the Expo Center MAX Station and the 40-Mile Loop Trail to the west.

The new arterial bridge over North Portland Harbor would include a shared-use path for pedestrians and bicyclists (Figure 1-6). On Hayden Island, active transportation facilities would be provided on Jantzen Avenue, Hayden Island Drive, and Tomahawk Island Drive and would connect to the Hayden Island Station. The shared-use path on the arterial bridge would continue along the arterial bridge to the south side of Tomahawk Island Drive. A parallel, elevated path from the arterial bridge would continue adjacent to I-5 across Hayden Island and cross above Tomahawk Island Drive and Hayden Island Drive to connect to the outer edge of the new single-level, or lower level of the double-deck eastern bridge over the Columbia River. A ramp down to the north side of Hayden Island Drive would be provided from the elevated path.

1.1.3 Columbia River Bridges (Subarea B)

This section discusses the geographic Subarea B (Figure 1-3 provides an overview of the geographic subareas). Figure 1-10 shows highway and interchange improvements in Subarea B.

Figure 1-10. Columbia River Bridges (Subarea B)



1.1.3.1 Highways, Interchanges, and Local Roadways

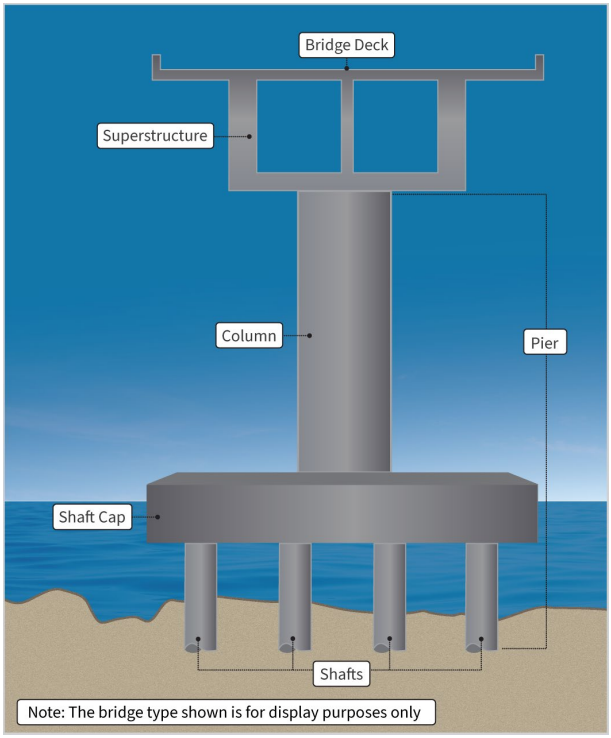
The two existing parallel northbound and southbound I-5 bridges that cross the Columbia River were constructed in 1917 and 1958, respectively. When the 1958 bridge was constructed, pier 5 of the 1917 bridge was removed and the profile was raised to match the new bridge. For the IBR Program, the two existing bridges would be replaced by two new parallel bridges, located west of the existing bridges (Figure 1-10). The new bridges would be designed to current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications and AASHTO Seismic Guide Specifications and in compliance with ODOT and WSDOT

design criteria. With all bridge configuration design options, the new eastern bridge would accommodate northbound highway traffic and a shared-use path. The new western bridge would carry southbound traffic and light-rail tracks. Whereas the existing bridges each have three lanes with no shoulders, each of the two new bridges would accommodate three through lanes, one or two auxiliary lanes, and shoulders on both sides of the highway. Lanes and shoulders would be built to full design standards.

As with the existing bridge (Figure 1-12), the new Columbia River bridges would provide three navigation channels: a primary navigation channel and two barge channels (Figure 1-13). The current location of the primary navigation channel is near the Vancouver shoreline where the existing lift spans are located. The IBR Program is coordinating with the USACE to obtain authorization to change the location of the primary navigation channel. Under the Modified LPA, the primary navigation channel would be shifted south approximately 500 feet (measured by channel centerlines), and the existing center barge channel would shift north and become the north barge channel. The new primary navigation channel would be 400 feet wide (this width includes a 300-foot USACE-authorized channel and a 50-foot channel maintenance buffer on each side of the authorized channel), and the two barge channels would also each be 400 feet wide.

The existing Interstate Bridge has nine in-water pier sets[8] and four pier sets on land (pier locations are shown on Figure 1-12). The new Columbia River bridges (any bridge configuration) would be built on six in-water pier sets, plus multiple piers on land (pier locations are shown on Figure 1-13). Each in-water pier set would be supported by a foundation of drilled shafts; each group of shafts would be tied together with a concrete shaft cap. Columns or pier walls would rise from the shaft caps and connect to the superstructures of the bridges (Figure 1-11).

Figure 1-11. Bridge Foundation Concept



BRIDGE CONFIGURATION OPTIONS

Three bridge configuration options are being considered: (1) double-deck fixed-span (with one bridge type); (2) a single-level fixed-span (with various potential bridge types); and (3) a single-level movable-span (with one bridge type). Both the double-deck and single-level fixed-span configurations would provide 116 feet of vertical navigation clearance at their respective highest spans, which was the vertical navigation clearance of the CRC LPA. The CRC LPA included a double-deck fixed-span bridge configuration. The single-

[8] A pier set consists of the pier supporting the northbound bridge and the pier supporting the southbound bridge at a given location.

level fixed-span configuration was developed and is being considered as part of the IBR Program in response to the physical and contextual changes (e.g., design and operational considerations) since 2013 that allowed for opportunities to examine a refinement in the double-deck bridge configuration (e.g., ingress and egress of transit from the lower level of the double-deck fixed-span configuration on the north end of the southbound bridge).

Consideration of the single-level movable-span configuration as part the IBR Program was necessitated by the U.S. Coast Guard's (USCG) review of the Program's navigation impacts on the Columbia River and issuance of a Preliminary Navigation Clearance Determination (PNCD) (USCG 2022). The USCG PNCD set the preliminary vertical navigation clearance recommended for the issuance of a bridge permit at 178 feet; this is the current vertical navigation clearance of the Interstate Bridge. On January 16, 2026, the USCG issued a revised PNCD for the new Columbia River bridges and set the preliminary vertical navigation clearance at 116 feet or greater (USCG 2026).

The IBR Program is carrying forward the three bridge configurations, each of which meets the IBR Program's Purpose and Need, to address changed conditions to ensure a permittable bridge configuration is within the range of options considered in the SEIS. Each of the bridge configuration design options provides at least 116 feet of vertical navigation clearance and is consistent with the January 2026 PNCD issued by the USCG. Additional discussion on pending actions to obtain authorizations from USCG and USACE for the Columbia River bridges' primary navigation channel location are described in Section 2.6, Additional Compliance, of the Final SEIS.

Each of the bridge configurations assumes one auxiliary lane; two auxiliary lanes could be applied to any of the bridge configurations. All typical sections with one auxiliary lane would provide 14-foot shoulders to accommodate bus on shoulder and maintain traffic during construction of the Modified LPA and future maintenance.

Figure 1-12. Existing Navigation Clearances of the Interstate Bridge

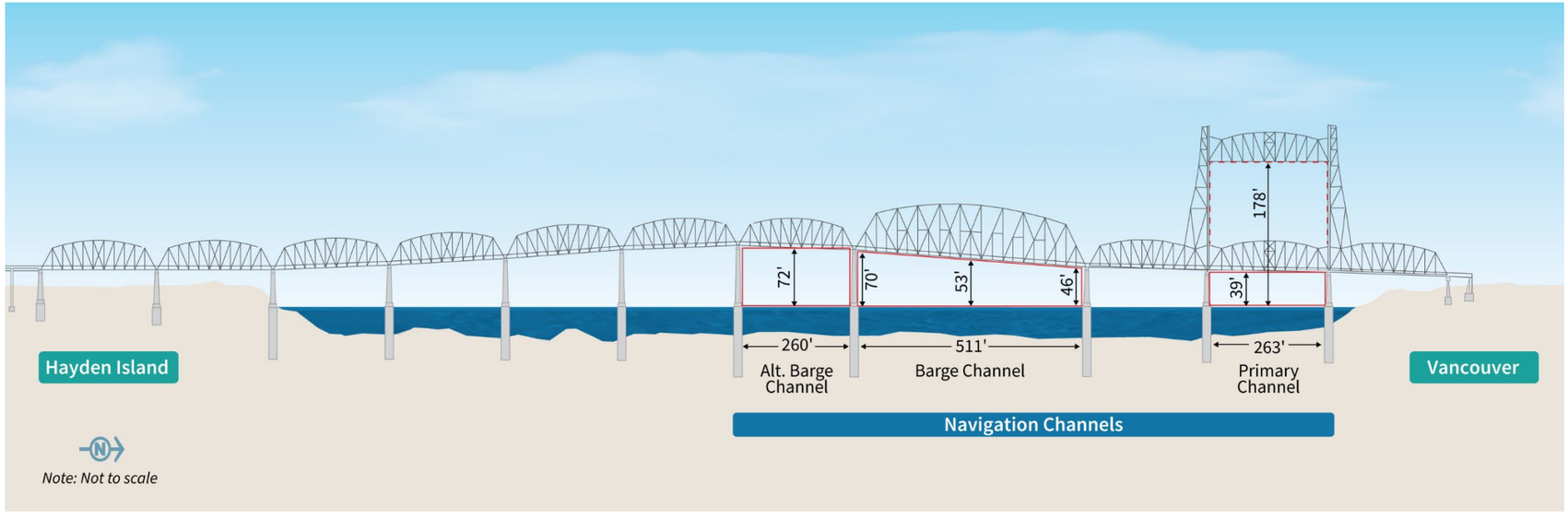
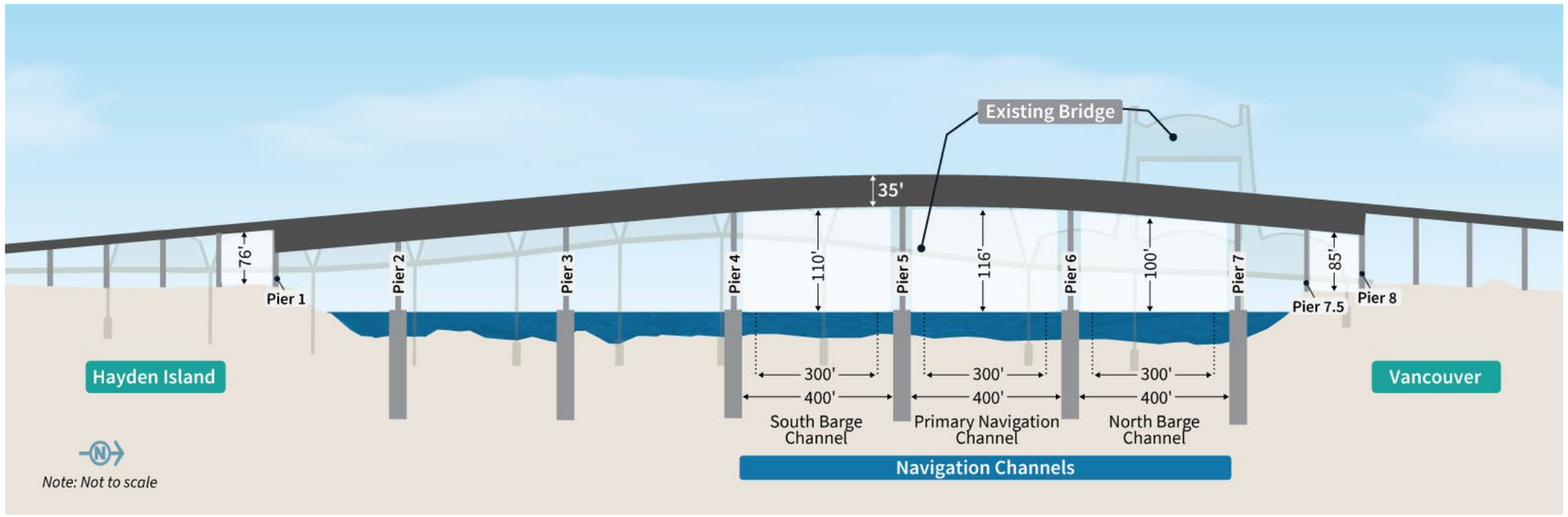


Figure 1-13. Navigation Clearances and Proposed Profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration



Note: The location and widths of the proposed navigation channels would be same for all bridge configuration and bridge type options. The three navigation channels would each be 400 feet wide (this width includes a 300-foot USACE-authorized channel (shown in dotted lines) plus a 50-foot channel maintenance buffer on each side of the authorized channel). The vertical navigation clearance would vary, as described in the following sections.

Double-Deck Fixed-Span Configuration

The double-deck fixed-span configuration would be two side-by-side, double-deck, fixed-span steel truss bridges. Figure 1-14 shows an example of this configuration (this image is subject to change and is shown as a representative concept; it does not depict the final design). The double-deck fixed-span configuration would provide 116 feet of vertical navigation clearance for river traffic using the primary navigation channel and 400 feet of horizontal navigation clearance at the primary navigation channel, as well as barge channels.

The eastern bridge would accommodate northbound highway traffic on the upper level and the shared-use path and utilities on the lower level. The western bridge would carry southbound traffic on the upper level and one set of light-rail tracks (one northbound track and one southbound track) on the lower level. Each bridge deck would typically be 79 feet wide, with a total out-to-out width of approximately 173 feet.[9]

Figure 1-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration

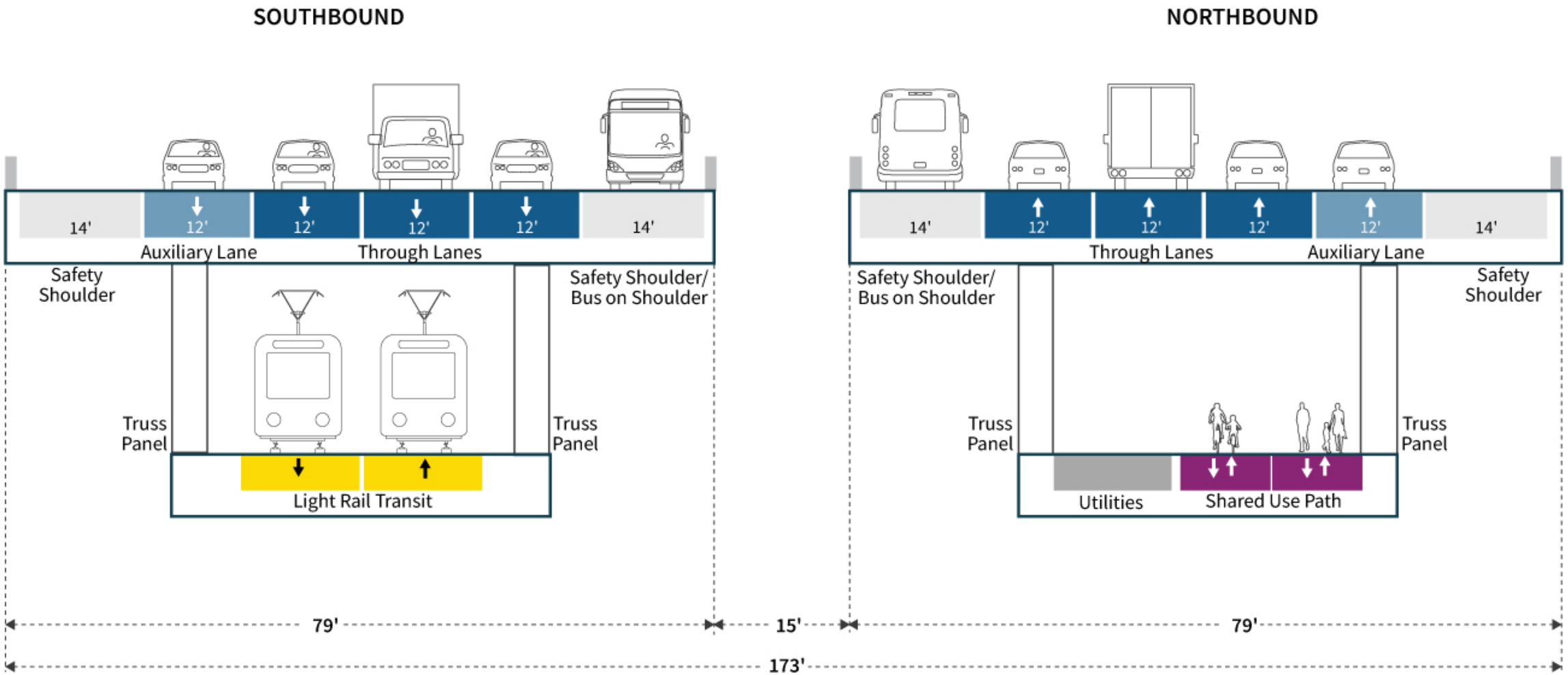


Note: Visualization is looking southeast from Vancouver.

Figure 1-15 shows a typical cross section of the two parallel double-deck bridges. Like all bridge configuration design options under consideration, the double-deck fixed-span configuration would have six in-water pier sets. Each pier set would require 12 in-water drilled shafts, for a total of 72 in-water drilled shafts. Each individual shaft cap would be approximately 50 feet by 85 feet. This bridge configuration would have up to a 4% maximum grade on both the Oregon and Washington sides. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

[9] "Out-to-out width" is the measurement between the outside edges of the bridge across its width at the widest point.

Figure 1-15. Typical Cross Section of the Double-Deck Fixed-Span Configuration



Note: Design is not final and subject to change. Widths may vary with final design. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Single-Level Fixed-Span Configuration – Recommended Design Option

The single-level fixed-span configuration would have two side-by-side, single-level, fixed-span steel or concrete bridges. This report considers two single-level fixed-span bridge type options: a girder (steel or concrete segmental) bridge and an extradosed bridge.[10] The description in this section applies to both bridge types (unless otherwise indicated). Conceptual examples of both options are shown on Figure 1-16. These images are subject to change and do not represent final design.

This configuration would provide 116 feet of vertical navigation clearance for river traffic using the primary navigation channel and 400 feet of horizontal navigation clearance at the primary navigation channel, as well as barge channels, which is consistent with the January 2026 PNCD issued by the USCG.

The eastern bridge would accommodate northbound highway traffic and the shared-use path; the bridge deck would be approximately 104 feet wide. The western bridge would carry southbound traffic and light-rail tracks; the bridge deck would be approximately 113 feet wide. The I-5 highway, light-rail tracks, and the shared-use path would be on the same level across the two bridges, instead of being divided between two levels as with the double-deck configuration. The total out-to-out width of the single-level fixed-span configuration (extradosed option) would be approximately 272 feet at its widest point, approximately 99 feet wider than the double-deck configuration. The total out-to-out width of the single-level fixed-span configuration (girder option) would be approximately 232 feet at its widest point. Figure 1-17 shows a typical cross section of the single-level configuration with an extradosed bridge as shown

The IBR Program recommends advancing the single-level fixed-span bridge configuration. All bridge configurations would provide important benefits to highway operations and safety and have similar impacts to many resources. The main differences between either of the fixed-span configurations and the movable-span configuration is that the latter would provide more vertical clearance to accommodate larger vessels and a lower grade for all land-based transportation modes (which would benefit freight and active transportation users in particular), but this configuration would also periodically disrupt all other land-based transportation modes (personal vehicles, freight, transit, and active transportation) with bridge openings. The main differences between the double-deck and single-level fixed-span configurations are that the slightly higher grade of the former would impact freight traffic and active transportation users, and the latter would have faster emergency response times (although there would also be more exposure to vehicles) and give users of the shared-use path a greater sense of security due to “eyes on the path.” The fixed-span configurations received generally positive comments from the public, while there was mixed feedback on the movable-span because of the tradeoffs given above.

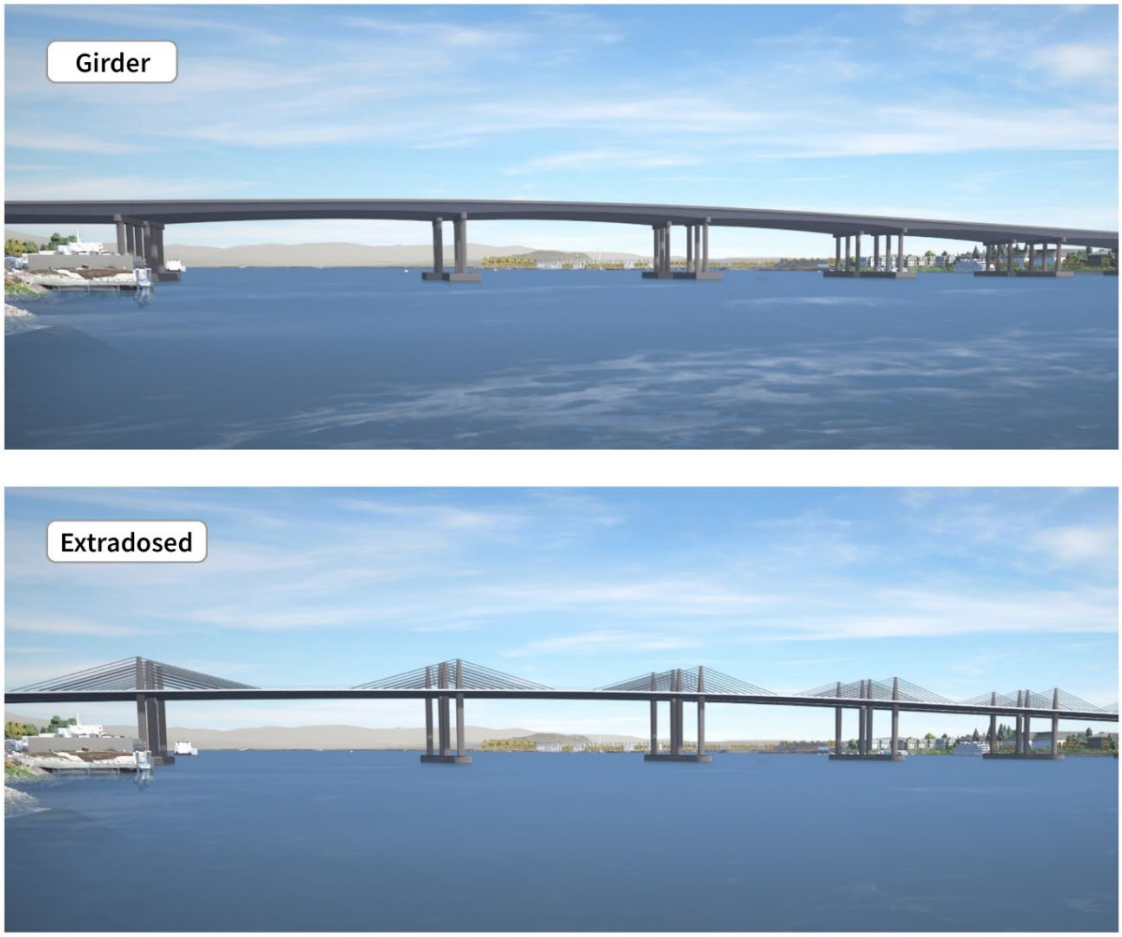
[10] The Draft SEIS also included a finback as a single-level fixed-span bridge type. As the design of the various bridge types progressed, it was determined that the finback would have higher risks associated with increased cost and construction schedule because this bridge type is less common and applying this bridge type to the scale of the new Columbia River bridges would introduce more design and construction challenges than the other bridge type options. Other bridge types, such as concrete or steel girder or extradosed, would have fewer risks and would be a more suitable for this location. As a result, the finback bridge type was dropped from further consideration.

by the 10-foot-wide bridge columns. Figure 1-18 shows a typical cross section with a girder bridge, which would not have the 10-foot-wide bridge columns shown on Figure 1-17.

There would be six in-water pier sets with 16 in-water drilled shafts on each combined shaft cap, for a total of 96 in-water drilled shafts. The combined shaft caps for each pier set would be approximately 50 feet by 230 feet.

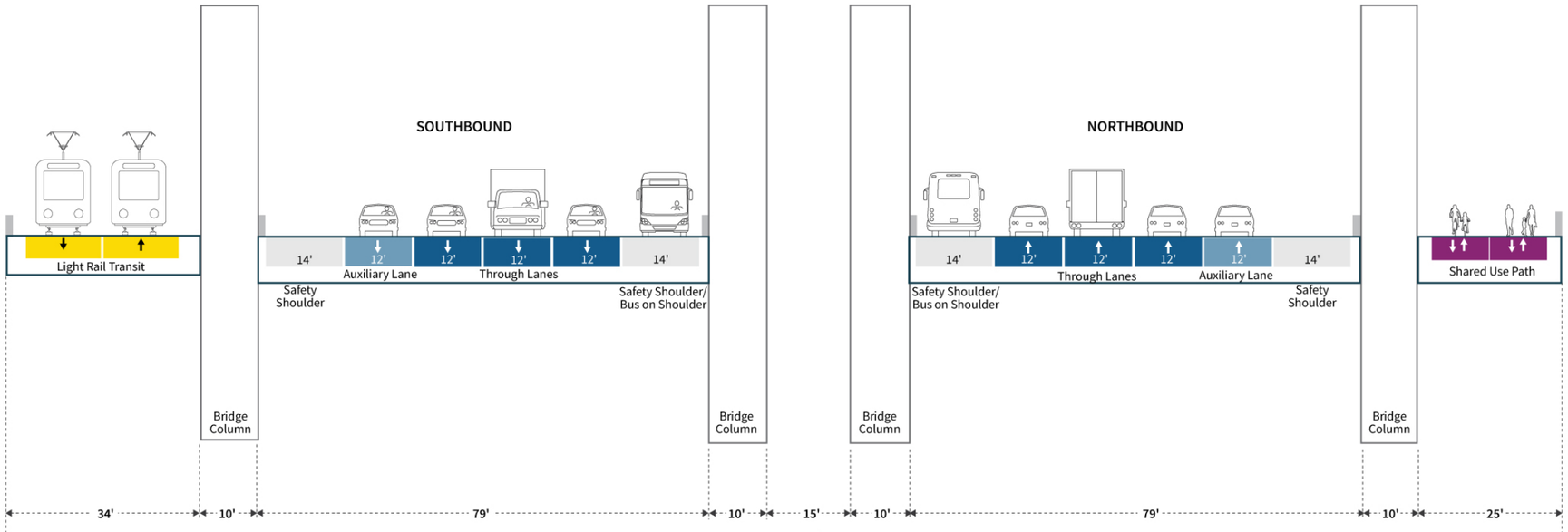
This bridge configuration would be expected to have an approximate grade of 3% on both the Oregon and Washington sides of the bridge. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

Figure 1-16. Conceptual Drawings of Single-Level Fixed-Span Bridge Types



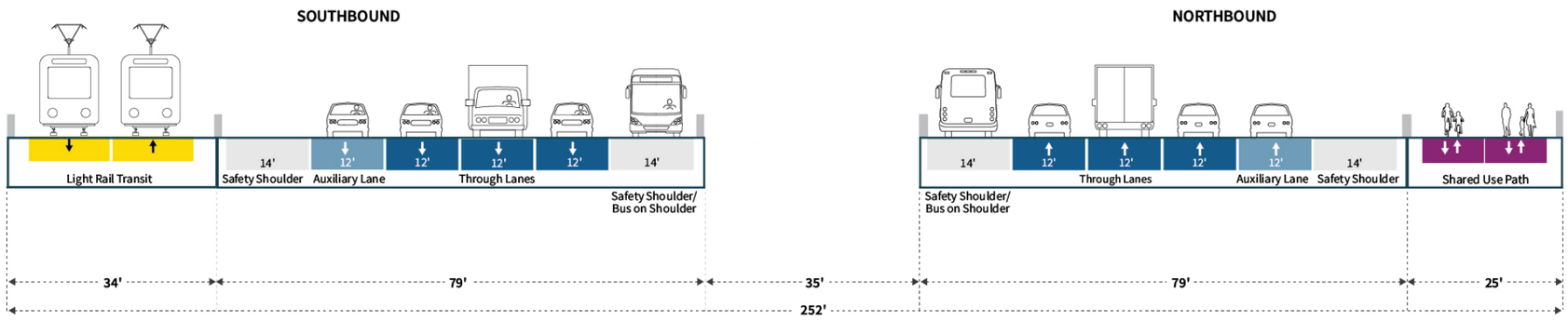
Note: Visualizations are for illustrative purposes only. They do not reflect property impacts or represent final design. Visualization is looking southeast from Vancouver.

Figure 1-17. Typical Cross Section of the Single-Level Fixed-Span Configuration (Extradosed Type)



Note: Design is not final and subject to change. Widths may vary with final design. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Figure 1-18. Typical Cross Section of the Single-Level Fixed-Span Configuration (Girder Type)



Note: Design is not final and subject to change. Widths may vary with final design. The cross section for a girder bridge type would be the same as an extradosed bridge type except that it would not have the four 10-foot bridge columns. The distance between the two bridges could be reduced to 10 feet. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Single-Level Movable-Span Configuration

The single-level movable-span configuration would have two side-by-side, single-level steel girder bridges with movable spans between Piers 5 and 6. For the purpose of this report, the IBR Program assessed a vertical lift movable-span configuration with counterweights based on the analysis in the *River Crossing Bridge Clearance Assessment Report – Movable-Span Options,* included as part of Attachment C in Appendix D, Design Options Development, Screening, and Evaluation Technical Report to the Final SEIS. A conceptual example of a vertical lift-span bridge is shown in Figure 1-19. These images are subject to change and do not represent final design.

A movable span must be located on a straight and flat bridge section (i.e., without horizontal curvature and with minimal grade). To comply with these requirements, and for the bridge to maintain the highway, transit, and active transportation connections on Hayden Island and in Vancouver while minimizing property acquisitions and displacements, the movable span is proposed to be located approximately 500 feet south of the existing lift span, between Piers 5 and 6.

The single-level movable-span configuration would provide approximately 90 feet of vertical navigation clearance over the proposed relocated primary navigation channel when the movable spans are in the closed position, with 99 feet of vertical navigation clearance available over the north barge channel. It satisfies the requirement of a minimum of 72 feet of vertical navigation clearance (the existing Interstate Bridge's maximum clearance over the alternate [southernmost] over the barge channel when the existing lift span is in the closed position).

In the open position, the movable span would provide 178 feet of vertical navigation clearance over the proposed relocated primary navigation channel. Similar to the fixed-span configurations, the movable span would provide 400 feet of horizontal navigation clearance for the primary navigation channel and for each of the two barge channels. The vertical lift-span towers would be approximately 243 feet high, which would be slightly shorter than the existing lift-span towers, which are 247 feet high.

Similar to the single-level fixed-span configuration, the eastern bridge would accommodate northbound highway traffic and the shared-use path, and the western bridge would carry southbound traffic and light-rail tracks. The I-5 highway, light-rail tracks, and shared-use path would be on the same level across the bridges instead of on two levels as with the double-deck configuration. Typical cross sections of the single-level movable-span configuration are shown in Figure 1-20; the top section depicts the vertical lift spans (Piers 5 and 6), and the bottom section depicts the fixed spans (Piers 2, 3, 4, and 7). The movable and fixed cross sections are slightly different because the movable span requires lift towers, which are not required for the fixed spans of the bridges.

There would be six in-water pier sets and two piers on land per bridge. The vertical lift span would have 22 in-water drilled shafts each for Piers 5 and 6; the shaft caps for these piers would be approximately 50 feet by 312 feet to accommodate the vertical lift spans. Piers 2, 3, 4, and 7 would have 16 in-water drilled shafts each; the shaft caps for these piers would be the same as for the fixed-span options (approximately 50 feet by 230 feet). The single-level movable-span configuration (with a vertical lift span) would have a total of 108 in-water drilled shafts.

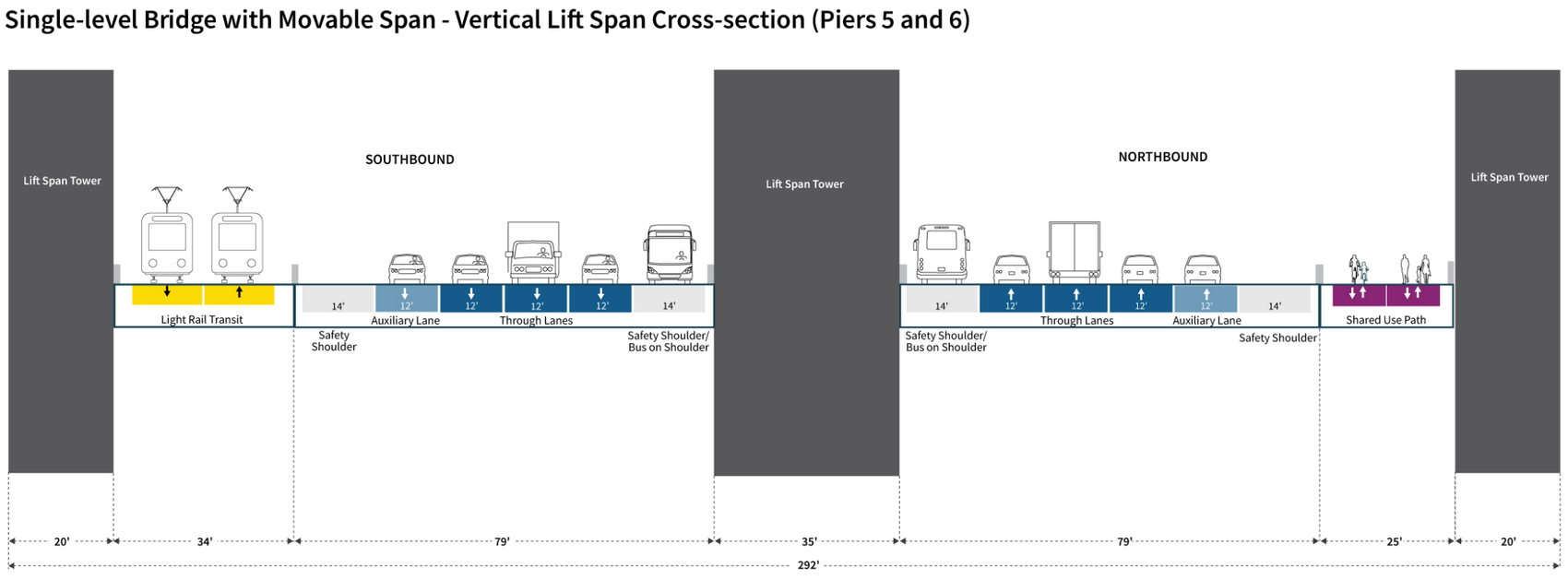
This single-level movable-span configuration would be expected to have an approximate grade of 3% on the Oregon side of the bridge and an approximate grade of 1.5% on the Washington side. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

Figure 1-19. Conceptual Drawings of Single-Level Movable-Span Configurations in the Closed and Open Positions



Note: Visualization is looking southeast (upstream) from Vancouver.

Figure 1-20. Typical Cross Section of the Single-Level Movable-Span Bridge Type



Note: Design is not final and subject to change. Widths may vary with final design. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Bridge Configuration Comparison

This section summarizes and compares each of the bridge configurations. Table 1-2 lists the key considerations for each bridge configuration. Figure 1-21 compares each of the three bridge configurations' footprints with the one auxiliary lane design option (refer to Figure 1-5 for a comparison of the one and two auxiliary lane design options footprints). The footprints of each configuration would differ in only three locations: over the Columbia River and at the bridge landings on Hayden Island and Vancouver. The rest of the I-5 corridor would have the same footprint. Over the Columbia River, the footprint of the double-deck fixed-span configuration would be approximately 173 feet wide. Comparatively, the extradosed bridge type of the single-level fixed-span configuration would be approximately 272 feet wide (approximately 99 feet wider), and the single-level fixed-span configuration with a girder bridge type would be approximately 232 feet wide (approximately 59 feet wider). The single-level movable-span configuration would be approximately 252 feet wide (approximately 79 feet wider than the double-deck fixed-span configuration), except at Piers 5 and 6, where larger bridge foundations would require an additional width of approximately 40 feet to support the movable span. The single-level configurations would have a wider footprint at the bridge landings on Hayden Island and Vancouver because transit and active transportation would be located adjacent to the highway, rather than below the highway in the double-deck option.

Figure 1-22 compares the basic profile and elevation of each configuration. The single-level fixed-span configuration and the lower deck of the double-deck fixed-span would have similar elevations, but the upper deck of the double-deck bridge would be approximately 35 feet higher. The single-level movable-span configuration would have a lower profile than the fixed-span configurations when the span is in the closed position.

Figure 1-21. Bridge Configuration Footprint Comparison

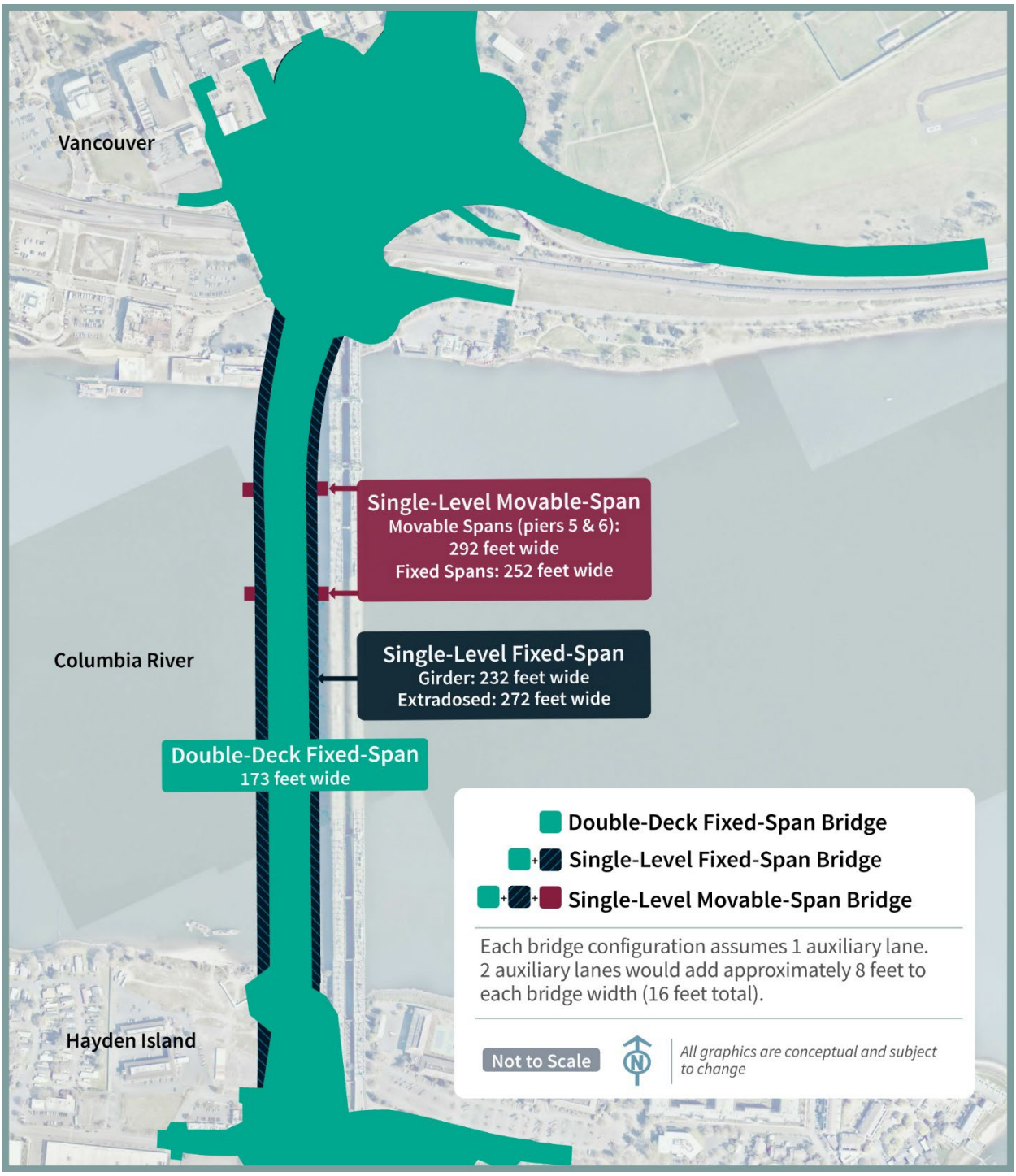
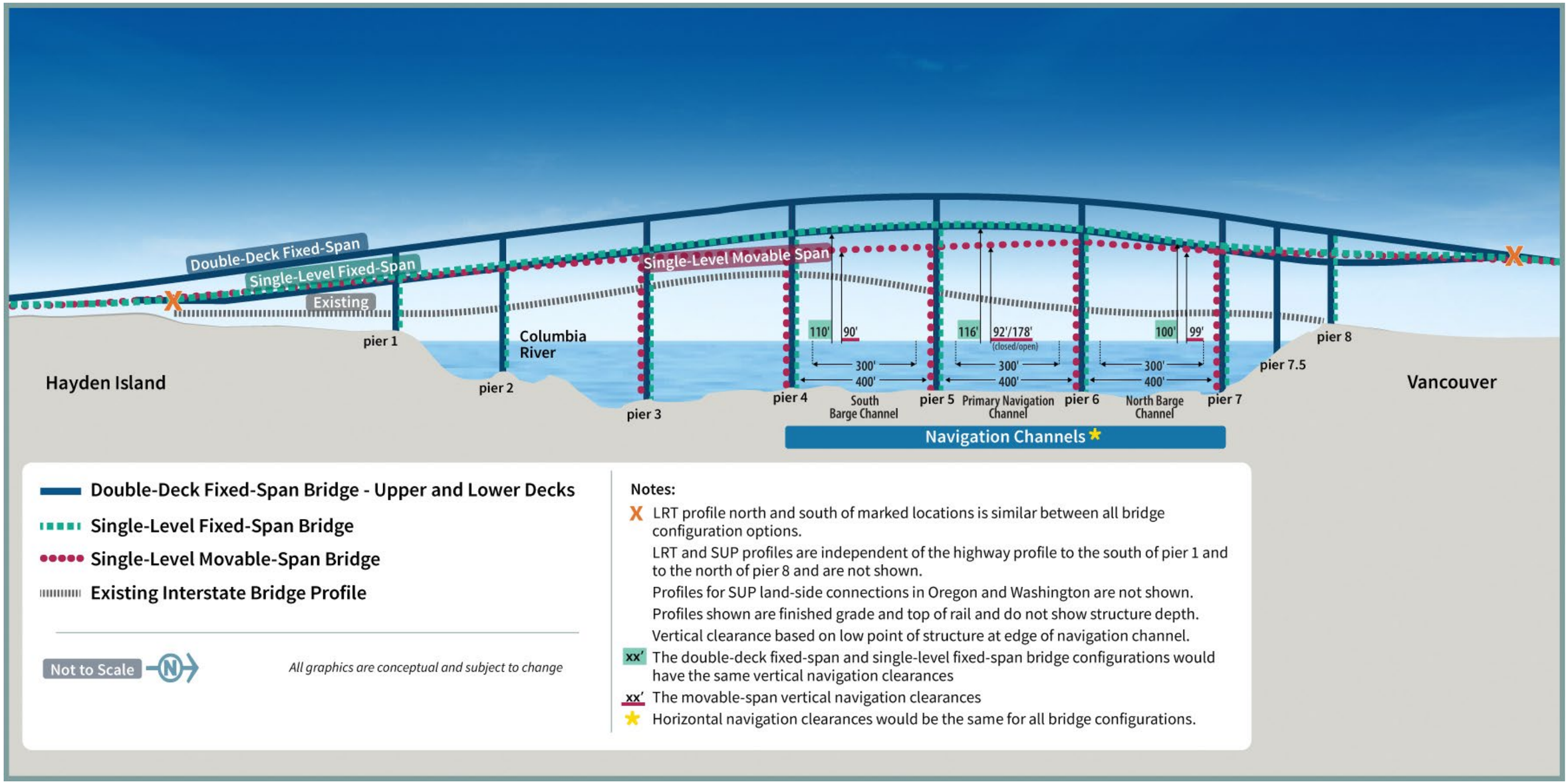


Figure 1-22. Bridge Configuration Profile Comparison



LRT = light-rail transit; SUP = shared-use path

Table 1-2. Summary of Bridge Configurations

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Bridge type	Steel through-truss spans	Double-deck steel truss	Single-level, concrete or steel girders, or extradosed	Single-level, steel girders with vertical lift span
Number of bridges	Two	Two	Two	Two
Movable-span type	Vertical lift span with counterweights.	N/A	N/A	Vertical lift span with counterweights
Movable-span location	Adjacent to Vancouver shoreline.	N/A	N/A	Between Piers 5 and 6 (approximately 500 feet south of the existing lift span)
Lift opening restrictions for vessels	Weekday peak AM and PM highway travel periods. [b] Typical bridge opening/gate closure durations are approximately 9 to 27 minutes depending on the purpose of the bridge lift (i.e., maintenance or vessel traffic) and lift elevation (i.e., partial lift or full lift). From 2007 to 2024, there was an average of 152 lifts per year (IBR 2025).	N/A	N/A	• Considering 2007–2024 trends in vessels transiting under the Interstate Bridge, there would be fewer bridge lifts compared to the No-Build Alternative due to increased vertical navigation clearance in the closed position (99 feet compared to 72 feet). • Additional restrictions to daytime bridge openings would be requested to consolidate fewer bridge openings outside of morning, midday, and evening peak hours when vehicle and transit demand is high in order to

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
				improve LRT on-time performance and system reliability and reduce highway congestion. Changes to bridge opening restrictions would require future federal rulemaking process and authorization by USCG (beyond the assumed No-Build Alternative bridge restrictions for peak AM and PM highway travel periods). [b] • Typical opening durations are assumed to be 9 to 18 minutes [c] for the purposes of impact analysis but would ultimately depend on various operational considerations related to vessel traffic and river and weather conditions. Additional time would also be required to stop traffic prior to opening and restart traffic after the bridge closes.
Out-to-out width [d]	138 feet total width	~173 feet total width	Girder: ~232 feet total width Extradosed: 272 feet total width	• ~292 feet at the movable span • ~252 feet at the fixed spans

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Deck widths	52 feet (SB) 52 feet (NB)	~79 feet (SB) ~79 feet (NB)	Girder: • ~113 feet (SB) • ~104 feet (NB) Extradosed: • ~133 feet (SB) • ~124 feet (NB)	~113 feet (SB) ~104 feet (NB)
Vertical navigation clearance	Primary navigation channel: • 39 feet when closed • 178 feet when open Barge channel: • 46 feet to 70 feet Alternate barge channel: • 72 feet	Primary navigation channel: • 116 feet maximum North barge channel: • 100 feet maximum South barge channel: • 110 feet maximum	Primary navigation channel: • 116 feet maximum. North barge channel: • 100 feet maximum South barge channel: • 110 feet maximum	Primary navigation channel: • Closed position: ~90 feet. • Open position: 178 feet North barge channel: • ~99 feet maximum South barge channel: • ~90 feet maximum
Horizontal navigation clearance	• 263 feet for primary navigation channel • 511 feet for barge channel • 260 feet for alternate barge channel	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Maximum height of bridge component (elevation relative to NAVD 88) [e]	247 feet at top of lift tower	~166 feet	Girder: ~137 feet. Extradosed: ~179 feet at top of pylons	~243 feet at top of lift tower
Movable span length (from center of pier to center of pier)	278 feet	N/A	N/A	450 feet
Number of in-water pier sets	Nine	Six	Six	Six
Number of in-water drilled shafts	N/A	72	96	108
Shaft cap sizes	N/A	50 feet by 85 feet	50 feet by 230 feet	• Piers 2, 3, 4, and 7: 50 feet by 230 feet • Piers 5 and 6: 50 feet by 312 feet (one combined footing at each location to house tower/equipment for the lift span)
Conceptual vertical grade [f]	4.8%	~4% on the Washington side ~4% on the Oregon side	~3% on the Washington side ~3% on the Oregon side	~1.5% on the Washington side. ~3% on the Oregon side
LRT location	N/A	Below highway on SB bridge	West of highway on SB bridge	West of highway on SB bridge

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Express bus	Shared roadway lanes	Inside shoulder of NB and SB (upper) bridges	Inside shoulder of NB and SB bridges	Inside shoulder of NB and SB bridges
Shared-use path location	Sidewalk adjacent to roadway in both directions	Below highway on NB bridge	East of highway on NB bridge	East of highway on NB bridge

All dimensions and quantities are approximate.

a When different bridge types are not mentioned, data apply to both bridge types under the single-level fixed-span bridge configuration.

b The No-Build Alternative assume existing conditions that restrict bridge openings during weekday peak periods (Monday through Friday 6:30 a.m. to 9 a.m.; 2:30 p.m. to 6 p.m., excluding federal holidays). For the Modified LPA with a single-level movable-span bridge configuration design option, additional timing restrictions, which would increase restrictions on the timing for and duration of bridge openings, except for emergencies, would be requested and coordinated with the USCG. Bridge openings would be required for vessels and/or cargo with heights greater than 72 feet under the No-Build Alternative; whereas, bridge openings for vessels and/or cargo requiring more than 99 feet of clearance would be required for the Modified LPA with the movable-span bridge configuration design option.

c For the purposes of the transportation analysis in the Final SEIS (Section 3.1, Transportation of the Final SEIS), the movable-span opening time is assumed to be an average of 13.2 minutes.

d "Out-to-out width" is the measurement between the outside edges of both northbound and southbound bridge across its width at the widest point and includes the space between the two bridges. The deck width is the measurement of the outer edges of either the northbound bridge or the southbound bridge.

e NAVD 88 (North American Vertical Datum of 1988) is a vertical control datum (reference point) used by federal agencies for surveying.

f The maximum allowable vertical grade according to ODOT and WSDOT standards on the I-5 mainline is 4%.

I-5 = Interstate 5; LPA = Locally Preferred Alternative; LRT = light-rail transit; N/A = not applicable; NAVD 88 = North American Vertical Datum of 1988; NB = northbound; ODOT = Oregon Department of Transportation; SB = southbound; SEIS = Supplemental Environmental Impact Statement; USACE = U.S. Army Corps of Engineers; USCG = U.S. Coast Guard; WSDOT = Washington State Department of Transportation

1.1.4 Downtown Vancouver (Subarea C)

This section discusses the geographic Subarea C (Figure 1-3 shows an overview of the geographic subareas). Figure 1-23 shows all highway and interchange improvements in Subarea C.

1.1.4.1 Highways, Interchanges, and Local Roadways

North of the Columbia River bridges in downtown Vancouver, improvements are proposed to the SR 14 interchange (Figure 1-23).

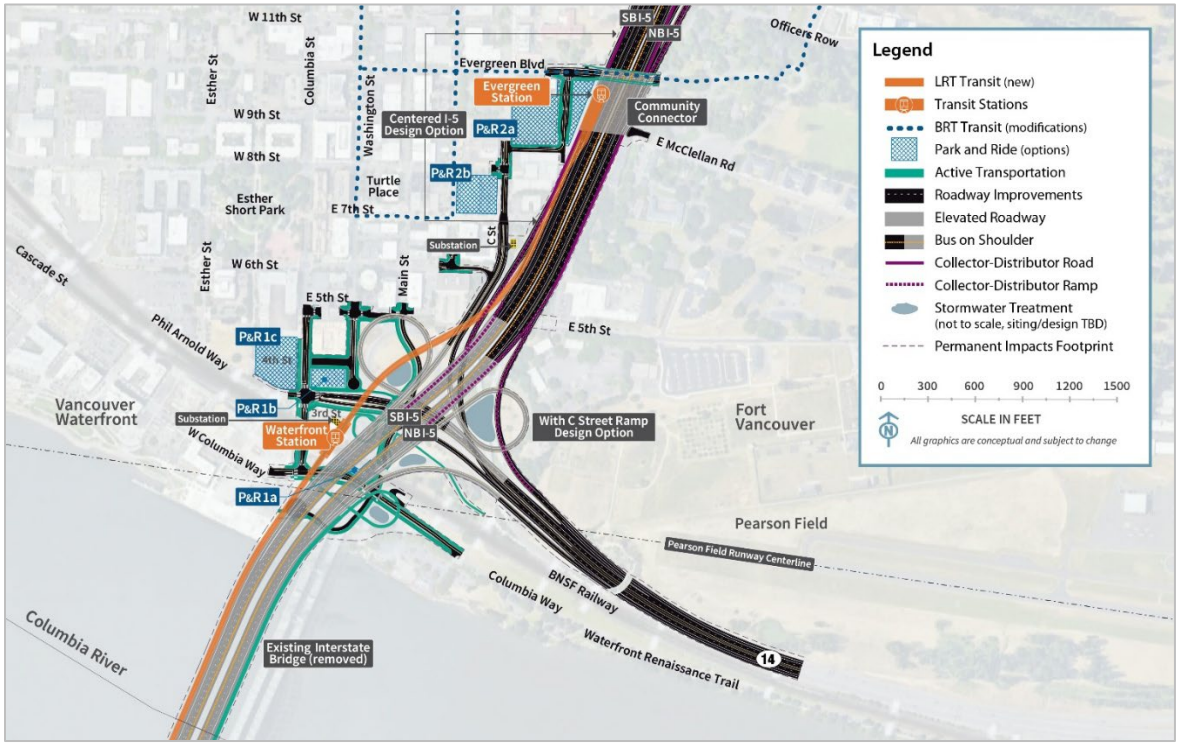
SR 14 INTERCHANGE/DOWNTOWN VANCOUVER

The new Columbia River bridges would touch down just north of the SR 14 interchange (Figure 1-23). The function of the SR 14 interchange configuration would remain essentially the same as it is now, but the interchange would be elevated to meet the new Columbia River bridges that cross over the BNSF Railway tracks. Direct connections between I-5 and SR 14 would be rebuilt. Access to and from downtown Vancouver would be provided as it is today, but the connection points would be relocated. Access from downtown Vancouver to eastbound SR 14 would be relocated from the Washington Street and W 5th Street intersection to a new intersection at Columbia Street and W 3rd Street. Access from westbound SR 14 would also be shifted from C Street to the new Columbia Street and W 3rd Street intersection. Access from downtown Vancouver to southbound I-5 would be relocated from the Washington Street and W 5th Street intersection to C Street. Access from northbound I-5 to downtown Vancouver would remain at C Street. Connections to downtown Vancouver would vary under the two design options under consideration for this area (with C Street ramps and without C Street ramps), as detailed below.

Main Street would be extended between 5th Street and Columbia Way. Vehicles traveling from downtown Vancouver to access SR 14 eastbound would use the new extension of Main Street to the intersection underneath I-5. If coming from the west or south (waterfront) in downtown Vancouver, vehicles would use the Phil Arnold Way/3rd Street extension to the intersection, then continue to SR 14 eastbound. The existing Columbia Way roadway under I-5 would be realigned to the north of its existing location and would intersect both the new Main Street extension and Columbia Street with T intersections.

In addition, the existing overcrossing of I-5 at Evergreen Boulevard would be reconstructed.

Figure 1-23. Downtown Vancouver (Subarea C)



BRT = bus rapid transit; LRT = light-rail transit; NB = northbound; P&R = park and ride; SB = southbound

C Street Ramp Design Options

With C Street Ramps – Recommended Design Option

The design option with C Street ramps would provide access to and from downtown Vancouver similar to existing conditions but with some of the connection points relocated. Access from northbound I-5 to downtown Vancouver would be rebuilt in the same location as the current connection. Downtown Vancouver I-5 access to and from the south would be consolidated at C Street with SR 14 connections to and from downtown at Columbia Street/W 3rd Street (Figure 1-24).

Without C Street Ramps

Under this design option, downtown Vancouver I-5 access to and from the south would be through the Mill Plain interchange rather than C Street. There would be no eastside loop ramp from northbound I-5 to C Street and no directional ramp on the west side of I-5 from C Street to southbound I-5. The existing eastside loop ramp would be removed. This option would reduce the footprint of the Modified LPA in this area.

The IBR Program recommends advancing the with C Street ramps design option. Both C Street ramp design options would provide important benefits to highway operations and safety and have similar impacts to many other resources, particularly the natural environment. While there would be some short-term construction cost savings and reduced visual impacts without C Street ramps, there would be greater impacts to local traffic as traffic that would have used the C Street ramps would be routed to the Mill Plain interchange, thereby increasing traffic volumes on the local street network and requiring additional mitigation. Both design options received a mix of positive and negative feedback from the public; however, there were more comments in support of the with C Street ramps design option. The with C Street ramps design option also has more support from the local partner agencies.

I-5 Alignment Design Options

Centered I-5 – Recommended Design Option

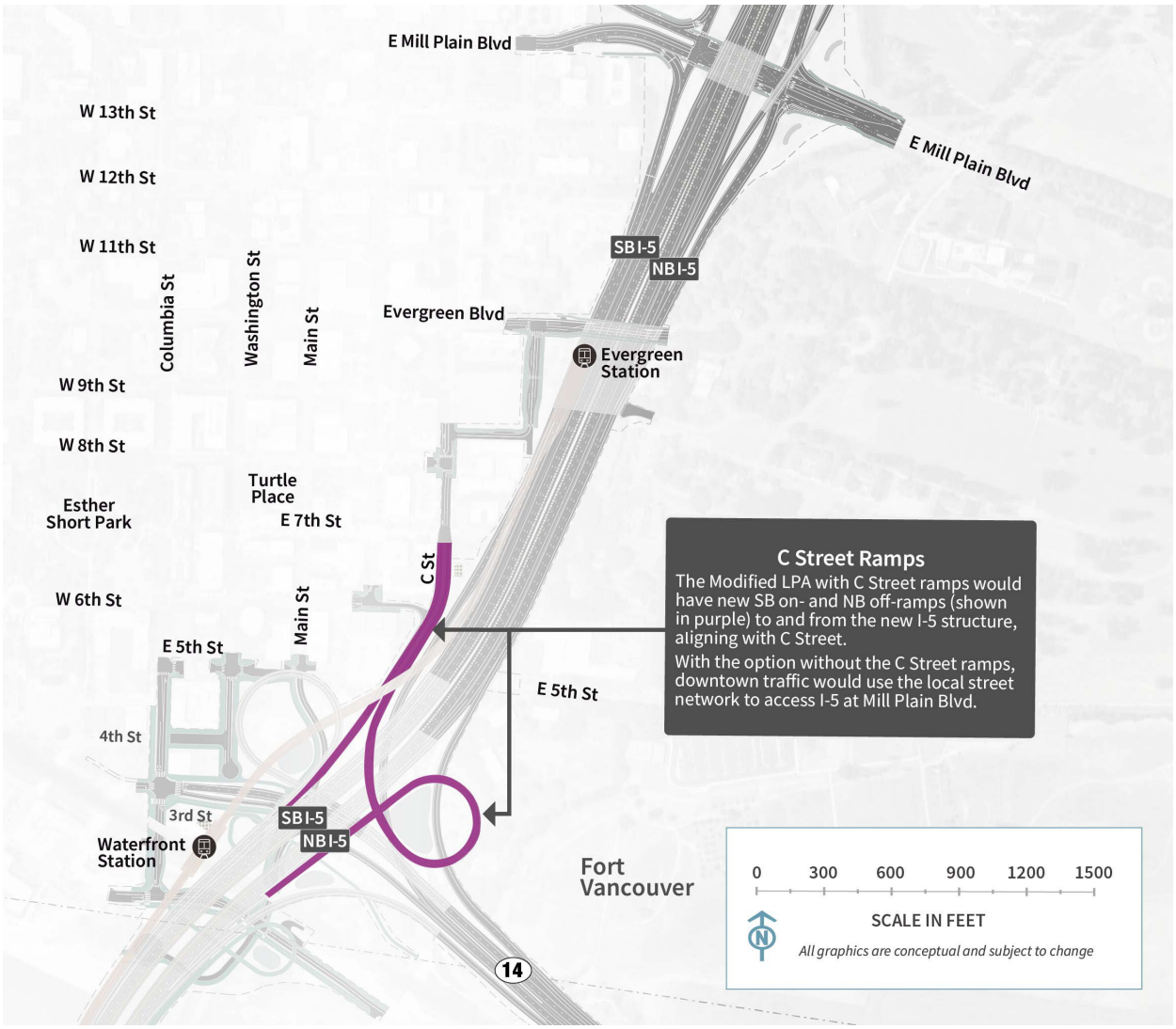
This design option would maintain the location of the existing I-5 mainline alignment through downtown Vancouver between the SR 14 interchange and the Mill Plain Boulevard interchange.

I-5 Shifted West

This design option would shift the I-5 mainline and ramps approximately 40 feet to the west between SR 14 and Mill Plain Boulevard.

The IBR Program recommends advancing the centered I-5 alignment design option. Both I-5 mainline alignments would provide important benefits to highway operations and safety and have similar impacts to many other resources, particularly the natural environment. The westward shift design option would notably increase acquisitions resulting in the displacement of an additional three businesses (with approximately 140 employees) and 33 residential units, and the physical removal of the historic Normandy Apartments. However, the westward shift would reduce the area of acquisition and other impacts to the Vancouver National Historic Reserve (VNHR) Historic District (which includes the Fort Vancouver National Historic Site). While some public comments noted the reduced impacts to the VNHR Historic District from the westward shift design option, others raised concerns about its effects on safety, congestion, and increased residential and business displacements.

Figure 1-24. Modified LPA With C Street Ramps



COLLECTOR-DISTRIBUTOR ROADWAYS

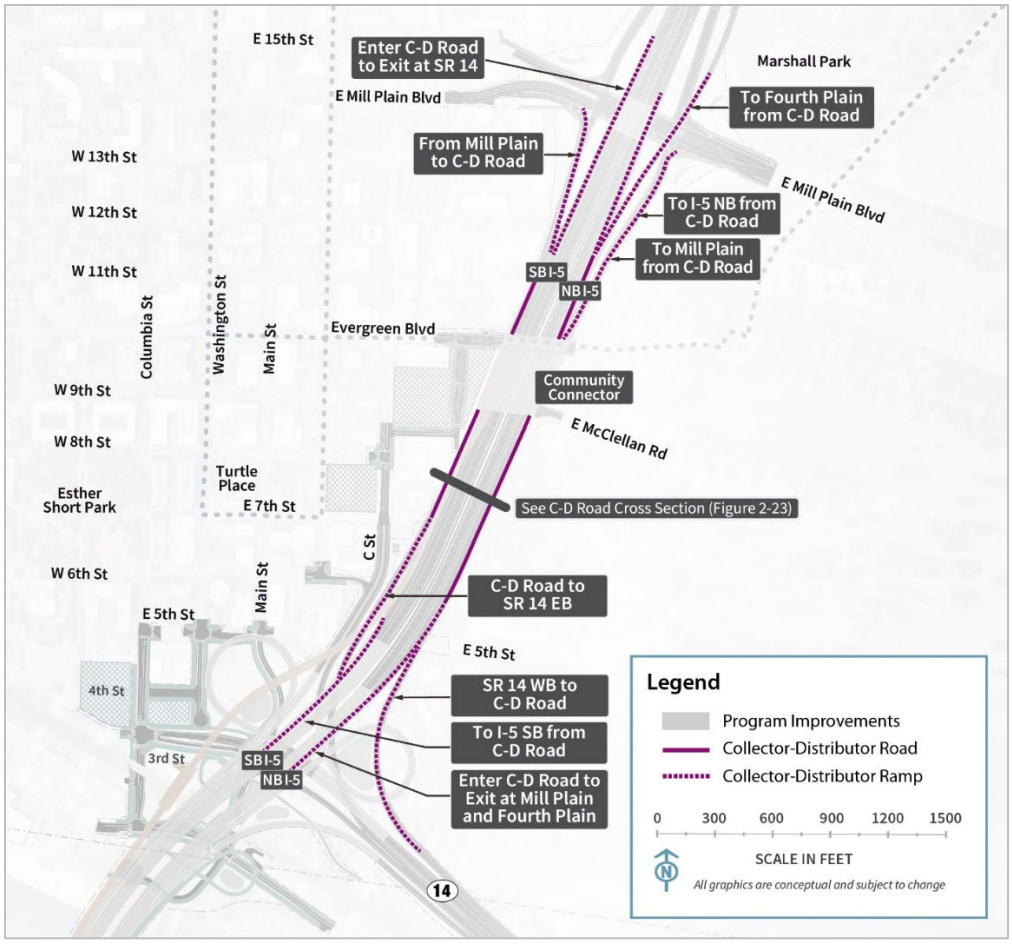
Figure 1-25 shows the location of the collector-distributor (C-D)[11] roadways in downtown Vancouver, and Figure 1-26 shows a typical cross section of the C-D roadways.

The on-ramp from SR 14 westbound would join the I-5 northbound off-ramp to Mill Plain/Fourth Plain Boulevard, forming the northbound C-D roadway between SR 14 and Fourth Plain Boulevard. The C-D roadway would provide access from northbound I-5 to the off-ramps at Mill Plain Boulevard and Fourth Plain Boulevard. The C-D roadway would also provide access from westbound SR 14 to the off-ramps at Mill Plain Boulevard and Fourth Plain Boulevard, and to the on-ramp to northbound I-5.

[11] A collector-distributor roadway parallels and connects the main travel lanes of a highway and frontage roads or entrance ramps.

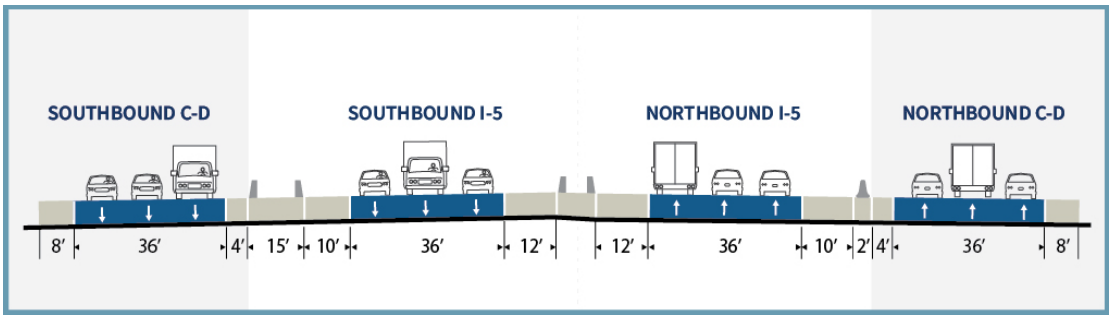
On southbound I-5, the off-ramp to SR 14 would join the southbound I-5 on-ramp from Mill Plain Boulevard to form a C-D roadway. The C-D roadway would provide access from southbound I-5 to the off-ramp to eastbound SR 14 and from Mill Plain Boulevard to the off-ramp to eastbound SR 14 and the on-ramp to southbound I-5.

Figure 1-25. Collector-Distributor Roadways



C-D = collector-distributor; EB = eastbound; NB = northbound; SB = southbound; WB = westbound

Figure 1-26. Typical Cross Section of the Collector-Distributor Roadways



The location of this cross section is shown on Figure 1-25.

1.1.4.2 Transit

LIGHT-RAIL ALIGNMENT AND STATIONS

Under the Modified LPA, the light-rail tracks would exit the highway bridge and be on their own bridge along the west side of the I-5 mainline after crossing the Columbia River (see Figure 1-23). The light-rail bridge would cross over the BNSF Railway tracks. An elevated light-rail station near the Vancouver waterfront (Waterfront Station) would be situated near the overcrossing of the BNSF tracks between Columbia Way and 3rd Street. Access to the elevated station would be primarily by elevator because the station would be situated approximately 90 feet above existing ground level. A stairwell(s) would be provided for emergency egress. The number of elevators and stairwells provided would be based on the ultimate platform configuration, station location relative to the BNSF trackway, projected ridership, and fire and life safety requirements. Passenger drop-off facilities would be located at ground level and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Waterfront Station. A new TPSS would be constructed north of the transit platform. The elevated light-rail tracks would continue north, cross over the westbound SR 14 on-ramp and the C Street/6th Street on-ramp to southbound I-5, and- then straddle the southbound I-5 C-D roadway. Transit components in the downtown Vancouver area would be similar between the C Street ramp and I-5 westward shift design options discussed above.

North of the Waterfront Station, the light-rail tracks would continue to the Evergreen Station, which would be the terminus of the light-rail extension (Figure 1-23). The light-rail tracks from downtown Vancouver to the terminus would be entirely on an elevated structure supported by single columns, where feasible, or by straddle bents[12] on either side of the roadway where needed. The Evergreen Station would be located at the same elevation as Evergreen Boulevard and the proposed Community Connector, and it would provide connections to the existing C-TRAN BRT system. Passenger drop-off facilities would be near the station and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Evergreen

[12] A straddle bent is a type of bridge support structure that “straddles” vehicle lanes and supports a flyover ramp.

Station. A new TPSS would be located on the south side of 7th Street, approximately 750 feet south of Evergreen Station.

PARK AND RIDES

The Modified LPA would provide parking capacity to accommodate 1,270 vehicles at designated park and rides in Vancouver along the LRT alignment (Figure 1-23) located near the Waterfront and Evergreen LRT stations. Parking capacity would be provided for 570 vehicles near the Waterfront Station and for 700 vehicles near the Evergreen Station.

> Park and rides can expand the catchment area of public transit systems (the geographic area from which a station draws ridership), making transit more accessible to people who live farther away from fixed-route transit service, and attracting new riders who might not have considered using public transit otherwise.

The park and rides would be designed to accomplish the following:

- Support transit ridership.
- Promote station access by walking, biking, rolling, and transit.
- Support City of Vancouver objectives to increase mobility and access for a vibrant downtown.
- Include existing parking facilities in downtown Vancouver to help meet the projected demand for park and rides in areas where City of Vancouver studies show surplus parking supply.

Additional information regarding the park and rides can be found in the Transportation Technical Report.

As presented in the Draft SEIS, the Modified LPA would provide parking capacity for LRT riders by locating a single park and ride near the Waterfront Station with approximately 570 parking spaces; three sites were considered for this facility. Similarly, a single park and ride near the Evergreen Station would provide approximately 700 parking spaces; two sites were considered. Based on further design analysis, public comment received on the Draft SEIS, and coordination with local agencies, the approach to providing parking capacity for LRT riders was adjusted to focus on dispersed parking across more facilities, including using all three sites previously identified near the Waterfront Station and both sites previously identified near the Evergreen Station. The approach to disperse parking capacity across more sites would correlate to smaller sites in terms of structure size above or below ground.

The sites under consideration are described below, and the evaluation of impacts and benefits to developing a single, large park and ride at each of the two LRT station or five smaller park and rides are evaluated in this report.

Waterfront Station Park and Rides

Studies included in Appendix D to the Final SEIS have shown the need for park-and-ride capacity to accommodate 570 vehicles in the vicinity of the Waterfront Station. Three possible sites are analyzed (Figure 1-23):

- 1a. Columbia Way (below I-5). This 0.75-acre site could be developed as a new aboveground one-level parking structure. Access would be via Columbia Way. It could support approximately 70 parking spaces.
- 1b. Columbia Street/SR 14. This 0.50-acre site could be developed as a new aboveground six-level structure along the east side of Columbia Street and north of the SR 14 westbound off-ramp. Access would be via Washington Street. It could accommodate approximately 250 parking spaces. To provide all 570 parking spaces at this site, the structure would need to be 10 to 12 levels.
- 1c. Columbia Street/Phil Arnold Way (Waterfront Gateway Site). This 1.5-acre site could be developed as a new surface lot along the west side of Columbia Street, north of Phil Arnold Way. Access would be via Phil Arnold Way. A surface lot would provide approximately 250 parking spaces. To provide all 570 parking spaces at this site, a new four-level structure would be needed.

The IBR Program recommends advancing 1,270 park-and-ride spaces dispersed across five sites in Vancouver along the light-rail alignment, including three sites near the Waterfront Station and two sites near the Evergreen Station. All of the park and rides would provide similar benefits to the community by increasing the transit stations' catchment areas and making transit more accessible. There could be minor localized differences in traffic patterns and transit ridership depending on the location of spaces. Dispersing the 1,270 parking spaces across five park and rides rather than concentrating the spaces at a single location each near the Waterfront Station and Evergreen Station would promote compatibility with local planning goals and plans for multiuse development, multimodal access, and attractive public spaces. As the FTA's Capital Investment Grant process progresses, the IBR Program team will refine the Program's transit components, which will contribute to further information on parking needs to support transit ridership.

Studies (Appendix D to the Final SEIS) leading to the Modified LPA in 2022 evaluated a mix of light-rail station sites and park and rides and found that 1,270 spaces serving the Waterfront and Evergreen Stations, combined with bus and active transportation improvements, would attract the most riders.

Evergreen Station Park and Rides

Studies included in Appendix D to the Final SEIS have shown the need for park and rides to accommodate 700 vehicles in the vicinity of the Evergreen Station. Two possible sites are analyzed in this technical report (see Figure 1-23):

- 2a. Library Square. This 3.2-acre site could be developed as a new underground three- to four-level structure east of C Street and south of Evergreen Boulevard. It could accommodate approximately 400 parking spaces. To provide all 700 parking spaces at this site, the structure

would require seven or more levels below ground.[13] This site could be combined with Site 2b to provide a total of 700 spaces.

- 2b. Columbia Credit Union. This approximately 1-acre site is an existing parking structure/commercial building and provides an estimated 400 parking spaces to current users on four levels above ground. The parking capacity would not be exclusively available for transit users; however, up to 300 spaces could be used for transit riders. This site could be combined with Site 2a to provide a total of 700 spaces.

1.1.4.3 Active Transportation

Within the downtown Vancouver area, the shared-use path on the northbound (or eastern) bridge would exit the bridge at the SR 14 interchange, loop down on the east side of I-5 via a vertical helix path, cross back below I-5 to the west side of I-5, run beneath the elevated light-rail crossing over BNSF, and then loop down to connect to the Main Street extension at the intersection underneath I-5 with connections to the Waterfront Station from the active transportation facilities. Connections to the Waterfront Renaissance Trail would be made by facilities along Main Street and Columbia Way (Figure 1-23). Access would be provided across state right of way beneath the new bridges to provide a connection between the recreational areas along the city's Columbia River waterfront east of the bridges and existing and future waterfront uses west of the bridges.

Active transportation components in the downtown Vancouver area would be similar for all design options.

As part of the Modified LPA, a Community Connector is proposed to be built over I-5 just south of Evergreen Boulevard and east of the Evergreen Station (Figure 1-23). The structure is proposed to include off-street pathways for active transportation modes including pedestrians, bicyclists, and other micro-mobility modes, and public space and amenities to support the active transportation facilities with connections to the Evergreen Station from the active transportation facilities. The primary intent of the Community Connector is to improve connections between downtown Vancouver on the west side of I-5 and the Vancouver National Historic Reserve on the east side.

1.1.5 Upper Vancouver (Subarea D)

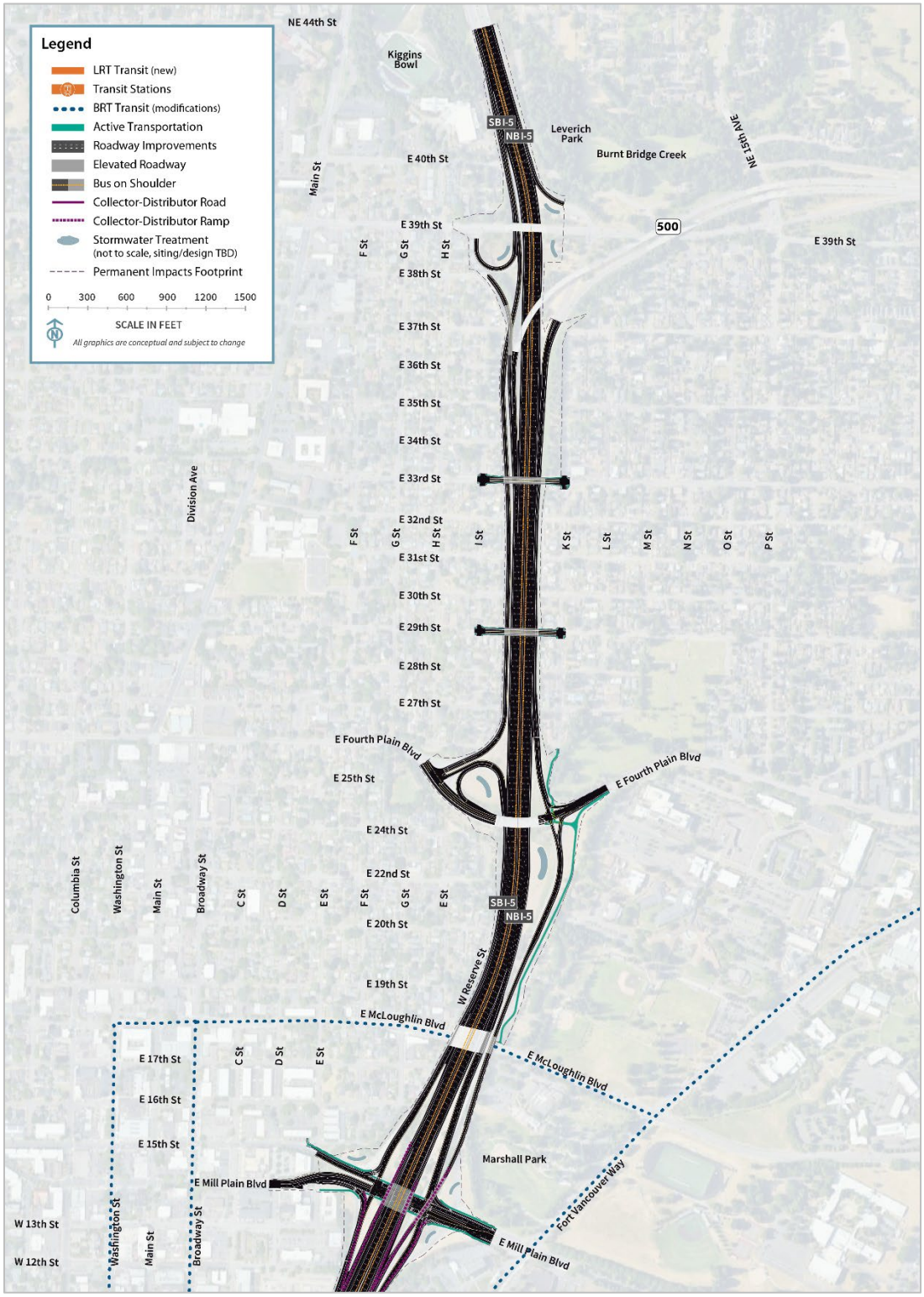
This section discusses the geographic Subarea D (Figure 1-3 shows an overview of the geographic subareas). Figure 1-27 shows all highway and interchange improvements in Subarea D.

1.1.5.1 Highways, Interchanges, and Local Roadways

Within the upper Vancouver area, the IBR Program proposes improvements to three interchanges—Mill Plain, Fourth Plain, and SR 500—as described below.

[13] The maximum depth of an underground parking structure at Library Square is provided for comparative purposes only. An underground parking structure would likely not exceed 3 or 4 levels because of engineering and environmental constraints.

Figure 1-27. Upper Vancouver (Subarea D)



BRT = bus rapid transit; LRT = light-rail transit; TBD = to be determined

MILL PLAIN BOULEVARD INTERCHANGE

The Mill Plain Boulevard interchange is north of the SR 14 interchange (Figure 1-27). This interchange would be reconstructed as a tight-diamond configuration but would otherwise remain similar in function and footprint to the existing interchange. The ramp terminal intersections would be sized to accommodate high, wide, heavy freight vehicles that travel between the Port of Vancouver and I-5. The off-ramp from I-5 northbound to Mill Plain Boulevard would diverge from the C-D road that would continue north, crossing over Mill Plain Boulevard, to provide access to Fourth Plain Boulevard via a C-D roadway. The off-ramp to Fourth Plain Boulevard would be reconstructed and would cross over Mill Plain Boulevard east of I-5, similar to the way it functions today.

FOURTH PLAIN BOULEVARD INTERCHANGE

At the Fourth Plain Boulevard interchange (Figure 1-27), improvements would include reconstruction of the I-5 ramp terminal intersections. The existing bridge for Fourth Plain Boulevard over I-5 would be retained. Northbound I-5 traffic exiting to Fourth Plain Boulevard would first exit to the northbound C-D roadway, which provides off-ramp access to Fourth Plain Boulevard and Mill Plain Boulevard. The westbound SR 14 to northbound I-5 on-ramp also joins the northbound C-D roadway before continuing north past the Fourth Plain Boulevard and Mill Plain Boulevard off-ramps as an auxiliary lane. The southbound I-5 off-ramp to Fourth Plain Boulevard would be braided below the 39th Street on-ramp to southbound I-5. This change would eliminate the existing nonstandard weave between the SR 500 interchange and the off-ramp to Fourth Plain Boulevard. It would also eliminate the existing westbound SR 500 to Fourth Plain Boulevard off-ramp connection. The existing overcrossing of I-5 at 29th Street would be reconstructed to accommodate a widened I-5, provide adequate vertical clearance over I-5, and provide pedestrian and bicycle facilities.

SR 500/39TH STREET INTERCHANGE AREA

The northern terminus of the I-5 improvements would be in the SR 500 interchange area (Figure 1-27). The improvements would primarily be to connect the Modified LPA to existing ramps. The off-ramp from I-5 southbound to 39th Street would be reconstructed to establish the beginning of the braided ramp to Fourth Plain Boulevard and restore the loop ramp to 39th Street. Ramps from existing I-5 northbound to SR 500 eastbound and from 39th Street to I-5 northbound would be partially reconstructed. The existing bridges for 39th Street over I-5 and SR 500 westbound to I-5 southbound would be retained. The 39th Street to I-5 southbound on-ramp would be reconstructed and braided over (i.e., grade separated or pass over) the new I-5 southbound off-ramp to Fourth Plain Boulevard.

The existing overcrossing of I-5 at 33rd Street would also be reconstructed to accommodate a widened I-5, provide adequate vertical clearance over I-5, and provide pedestrian and bicycle facilities.

1.1.5.2 Transit

There would be no LRT facilities in upper Vancouver. Proposed operational changes to bus service, including I-5 bus-on-shoulder service, are described in Section 1.1.7, Transit Operating Characteristics.

1.1.5.3 Active Transportation

Several active transportation improvements would be made in Subarea D consistent with City of Vancouver plans and policies. On the east side of I-5, a new shared-use path would connect E McLoughlin Boulevard to Fourth Plain Boulevard. At the Fourth Plain Boulevard interchange, there would be improvements to provide better bicycle and pedestrian mobility and accessibility; these include bicycle lanes, neighborhood connections, and a connection to the City of Vancouver's planned two-way cycle track on Fourth Plain Boulevard. The reconstructed overcrossings of I-5 at 29th Street and 33rd Street would provide pedestrian and bicycle facilities on those cross streets. No new active transportation facilities are proposed in the SR 500 interchange area. Active transportation improvements at the Mill Plain Boulevard interchange include buffered bicycle lanes and sidewalks, pavement markings, lighting, and signing.

1.1.6 Transit Support Facilities

1.1.6.1 Ruby Junction Light-Rail OMF Expansion

The TriMet Ruby Junction Light-Rail OMF in Gresham, Oregon, would be expanded to accommodate the additional LRVs associated with the Modified LPA's LRT service (the Ruby Junction location relative to the study area is shown in Figure 1-28). Improvements would include additional storage tracks for LRVs and maintenance materials and supplies; expanded LRV maintenance bays; expanded parking and employee support areas for additional personnel; an additional maintenance building for daily cleaning and periodic weather-dependent treatments for LRV maintenance, demolition, and relocation of a maintenance building (Ruby West); tenant improvements and new structures for affected operations; and a third lead track at the northern entrance to the Ruby Junction Light-Rail OMF. Adjacent parcels would be acquired to accommodate maintenance and storage needs required for or impacted by the Modified LPA. Figure 1-28 shows the proposed footprint of the expansion.

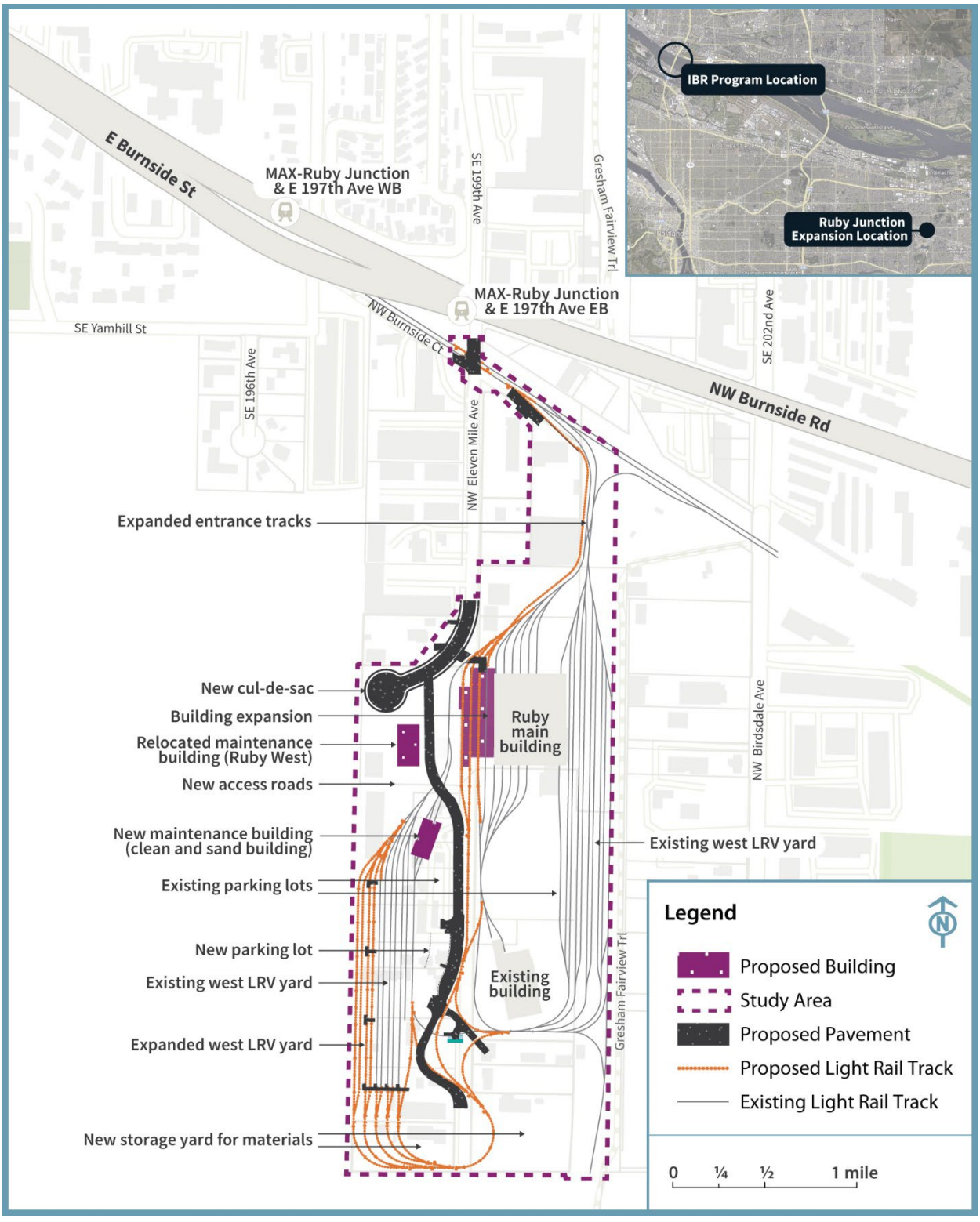
The existing main building would be expanded west to provide additional maintenance bays. Today, Eleven Mile Avenue extends from NW Burnside Road and dead ends at the southern limits of the existing OMF. To make space for the building expansion, the existing Eleven Mile Avenue public right of way would be vacated and would terminate in a new cul-de-sac west of the main building. A new cul-de-sac would be required to meet City of Gresham code requirements for fire access and turnaround. New internal/nonpublic access roads would be constructed to maintain access to TriMet buildings south of the cul-de-sac; these would impact an existing maintenance building (Ruby West), which would be demolished and rebuilt within Ruby Junction Light-Rail OMF.

The existing western LRV storage yard, west of Eleven Mile Avenue, would be expanded to the west to accommodate additional storage tracks and a runaround track (a track constructed to bypass congestion in the maintenance yard). This expansion would require partial demolition of an existing TriMet building (just north of the LRV storage) and would require relocating the material storage yard to the southeastern corner of the campus. Immediately east of the storage yard, a double track LRV maintenance building would be constructed impacting existing parking. Various other surface parking areas in the west yard would also be relocated north of the cul-de-sac.

All tracks in the west LRV storage yard would also be extended southward to connect to the proposed runaround track. The runaround track would connect to existing and proposed tracks adjacent to the existing Ruby Junction building located to the south. The connections to the runaround track would require partial demolition of an existing TriMet building and, full demolition of one existing building and partial demolition of another building on the adjacent private property to the south. These affected functions would be housed in a new replacement building on site.

A third track would be needed at the north entrance to the Ruby Junction Light-Rail OMF to accommodate increased train volumes without decreasing service. The additional track would also reduce operational impacts during construction and maintenance outages for the yard. Constructing the third track would require reconstruction of Burnside Court east of Eleven Mile Avenue. An additional crossover would also be needed on the mainline track where it crosses Eleven Mile Avenue; it would require reconstruction of the existing track crossings for vehicles, bicycles, and pedestrians.

Figure 1-28. Ruby Junction Light-Rail Operations and Maintenance Facility Study Area



EB = eastbound; LRV = light-rail vehicle; WB = westbound

1.1.6.2 Expo Center Overnight LRV Facility

An overnight facility for LRVs would be constructed on the southwest corner of the Expo Center property (as shown on Figure 1-29). The inclusion of the Expo Overnight Facility allows TriMet the ability to maintain current service and maintenance operations on their Blue Line system and reduce deadheading between Ruby Junction and the northern terminus of the MAX Yellow Line extension. Deadheading occurs when LRVs travel without paying passengers to move the vehicles to and from service. Currently, Blue Line is maintained through a limited nighttime work window. With the inclusion of the Expo Overnight Facility, trains originating service at Evergreen have substantially less deadhead time, reducing Yellow Line operating costs, and Blue Line maintenance windows are retained.

The facility would provide a yard access track, storage tracks for approximately 13 LRVs, one building for light LRV maintenance and operator facilities, a TPSS, a sand silo, a parking lot for operators and facility staff, space for security personnel, and other associated facilities. This facility and the lead tracks connecting to it would necessitate relocation and reconstruction of the internal circulation road from the Expo Road entrance to approximately 100 feet west of Building E of the Expo Center (including southern areas of the parking lot, including gates and booths). However, it would not affect existing Expo Center buildings.

The overnight facility lead track would connect to the mainline tracks by crossing Expo Road just south of the existing Expo Center MAX Station. The connection tracks would require relocation of one or two existing LRT facilities, including a TPSS building and potentially the existing signals/communication building, which are both just south of the Expo Center MAX Station. Existing artwork at the station may require relocation.

1.1.6.3 Additional Bus Bays at the C-TRAN Operations and Maintenance Facility

Three bus bays would be added to the existing C-TRAN OMF located at 2425 NE 65th Avenue in Vancouver. These additional bus bays, which would not require the acquisition of any new property, would provide maintenance capacity for the additional express bus service on I-5 (Section 1.1.7, Transit Operating Characteristics). Modifications to the facility would accommodate new vehicles as well as maintenance equipment.

Figure 1-29. Expo Center Overnight LRV Facility



1.1.7 Transit Operating Characteristics

1.1.7.1 LRT Operations

Nineteen new LRVs would be purchased to operate the extension of the MAX Yellow Line. These vehicles would be similar to those currently used for the TriMet MAX system. With the Modified LPA including all design options, LRT service in the new and existing portions of the Yellow Line in 2045

would operate with 6.7-minute average headways[14] during the 2-hour morning peak period. Midday and evening headways would be 15 minutes, and late-night headways would be 30 minutes. LRT service would operate between the hours of approximately 5 a.m. (first southbound train leaving Evergreen Station) and 1 a.m. (last northbound train arriving at the station), which is consistent with current service on the Yellow Line. LRVs would be deadheaded at Evergreen Station before beginning service each day. A third track at this northern terminus would accommodate layovers.

1.1.7.2 Express Bus Service and Bus on Shoulder

C-TRAN provides bus service that connects to LRT and augments travel between Washington and Oregon with express bus service to key employment centers in Oregon. Beginning in 2022, the main express route providing service in the I-5 corridor, Route 105, had two service variations. One pattern provides service between Salmon Creek and downtown Portland with a single intermediate stop at the 99th Street Transit Center, and one provides service between Salmon Creek and downtown Portland with two intermediate stops: the 99th Street Transit Center and downtown Vancouver. This route currently provides weekday service with 20-minute peak and 60-minute off-peak headways.

In 2045, for both the No-Build Alternative and Modified LPA, C-TRAN Route 105 would be revised to only provide direct service from the Salmon Creek Park and Ride and 99th Street Transit Center to downtown Portland with no intermediate stops in downtown Vancouver. Under the Modified LPA with all design options, this route would operate at 5-minute peak headways with no service in the off-peak, compared to 10-minute peak headways under the No-Build Alternative. Under both the No-Build Alternative and the Modified LPA, C-TRAN Route 105 intermediate stop service through downtown Vancouver would be replaced with C-TRAN Route 101, which would provide direct service from downtown Vancouver to downtown Portland and would operate at 15-minute peak and 30-minute off-peak headways and 10-minute peak and 30-minute off-peak headways, respectively.

Two other existing C-TRAN express bus service routes would remain unchanged after completion of the Modified LPA. C-TRAN Route 190 would continue to provide service from the Andresen Park and Ride in Vancouver to Marquam Hill in Portland. This route would continue to operate on SR 500 and I-5 within the study area. Route headways would be 10 minutes in the peak periods with no off-peak service. C-TRAN Route 164 would continue to provide service from the Fisher's Landing Transit Center to downtown Portland. This route would continue to operate within the study area only in the northbound direction during PM service to use the I-5 northbound high-occupancy vehicle lane in Oregon before exiting to eastbound SR 14 in Washington. Route headways would be 10 minutes during the peak and 30 minutes during the off-peak. These two routes provide the same routing and frequencies in both the No-Build Alternative and the proposed Modified LPA.

C-TRAN express bus Routes 105 and 190 are currently permitted to use the existing southbound inside shoulder of I-5 from 99th Street to the Interstate Bridge in Vancouver. However, the existing shoulders are too narrow for bus-on-shoulder use in the rest of the I-5 corridor in the study area. The Modified LPA would include inside shoulders on I-5 that would be wide enough (approximately 14 feet on the Columbia River bridges and 11.5 to 12 feet elsewhere on I-5) to allow northbound and southbound buses to operate on the shoulder, except where I-5 would have to taper to match existing inside

[14] Headways are defined as gaps between arriving transit vehicles.

shoulder widths at the north and south ends of the corridor. Figure 1-6, Figure 1-10, Figure 1-23, and Figure 1-27 show the potential bus-on-shoulder use over the Columbia River bridges. Bus on shoulder could operate on any of the Modified LPA bridge configurations and bridge types. Additional approvals (including a continuing control agreement), in coordination with ODOT, may be needed for buses to operate on the shoulder on the Oregon portion of I-5.

After completion of the Modified LPA, two C-TRAN express bus routes operating on I-5 through the study area would be able to use bus-on-shoulder operations to bypass congestion in the general-purpose lanes. C-TRAN Route 105 would operate on the shoulder for the full length of the study area. C-TRAN Route 190 would operate on the shoulder for the full length of the corridor except for the distance required to merge into and out of the shoulder as the route exits from and to SR 500. These two express bus routes (105 and 190) would have a combined frequency of every 3 minutes during the 2045 AM and PM peak periods. To support the increased frequency of express bus service, eight double-decker or articulated buses would be purchased.

With the C Street ramps design option, C-TRAN Route 101 would use bus on shoulder south of the SR 14 interchange but would not use the full extent of bus-on-shoulder lanes that would be included in the Modified LPA because the route would need to begin merging over early to use the C Street off-ramp to access downtown Vancouver. Without the C Street ramps design option, C-TRAN Route 101 would be rerouted to use the Mill Plain interchange to access downtown Vancouver. Under this design option, the Route 101 would also not use the full extent of bus-on-shoulder lanes that would be included in the Modified LPA but would use the bus on shoulder south of Mill Plain Boulevard and begin merging over early to use the Mill Plain off-ramp.

C-TRAN Route 164 would not be anticipated to use bus-on-shoulder operations because of the need to exit to SR 14 from northbound I-5.

1.1.7.3 Local Bus Route Changes

Two TriMet bus routes would be adjusted to accommodate the transit improvements associated with the Modified LPA. TriMet Line 6 bus route would be changed to terminate at the Expo Center MAX Station instead of Hayden Island, where it terminates currently and in the No-Build Alternative. The new Line 6 route would require passengers to transfer to the new LRT connection to access Hayden Island. TriMet Line 6 is anticipated to travel from Delta Park MAX Station north along Expo Road to the Expo Center MAX Station. Table 1-3 shows the existing service and anticipated future changes to TriMet Line 6. In addition to Line 6, TriMet Route 11 could require slight modifications to maintain transfers to the Expo Center MAX Station, depending on the final design of the station and surrounding area.

As part of the Modified LPA, several local C-TRAN bus routes would be changed to better complement the new light-rail extension. Most of these changes would reroute existing bus lines to provide a transfer opportunity at the proposed new Evergreen Station. Table 1-3 shows existing service and anticipated future changes to C-TRAN bus routes. In addition to the changes noted in Table 1-3, other local bus route modifications may move service from Broadway to C Street.

For both TriMet and C-TRAN detailed service planning analysis, including obtaining public feedback for service changes associated with the Modified LPA, would be conducted prior to the start of revenue service.

Table 1-3. Proposed TriMet and C-TRAN Bus Route Changes

Bus Route	Existing Route	Changes with Modified LPA
TriMet Line 6	Connects Goose Hollow, Portland City Center, N/NE Portland, Jantzen Beach, and Hayden Island. Within the study area, service currently runs between Delta Park MAX Station and Hayden Island via I-5.	Route would be revised to terminate at the Expo Center MAX Station. Route is anticipated to travel from the Delta Park MAX Station, north along Expo Road to connect via facilities on the west side of I-5 with the Expo Center MAX Station.
TriMet Line 11	Connects East Columbia, Expo Center, Smith/Bybee lakes, Rivergate and St. Johns via Marine Drive, Lombard, Columbia, Fessenden, and Ivanhoe.	Stops along Marine Drive would be relocated or the line would be rerouted slightly to connect via facilities on the west side of I-5 with the Expo Center MAX Station.
C-TRAN Fourth Plain and Mill Plain bus rapid transit (The Vine)	Runs between downtown Vancouver and the Vancouver Mall Transit Center via Fourth Plain Boulevard, with a second line along Mill Plain Boulevard. In the study area, service currently runs along Washington and Broadway Streets through downtown Vancouver.	Route would be revised to begin/end near the Evergreen Station in downtown Vancouver and provide service along Evergreen Boulevard to Fort Vancouver Way, where it would travel to or from Mill Plain Boulevard or Fourth Plain Boulevard depending on clockwise/counterclockwise operations. The Fourth Plain Boulevard route would continue to serve existing Vine stations beyond Evergreen Boulevard.
C-TRAN #2 Lincoln	Connects the 99th Street Transit Center to downtown Vancouver via Lincoln and Kaufman Avenues. Within the study area, service currently runs along Washington and Broadway Streets between 7th and 15th Streets in downtown Vancouver.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #25 St. Johns	Connects the 99th Street Transit Center to downtown Vancouver via St. Johns Boulevard and Fort Vancouver Way. Within the study area, service currently runs along Evergreen Boulevard, Jefferson Street/Kaufman Avenue, 15th Street, and Franklin Street in downtown Vancouver.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.

Bus Route	Existing Route	Changes with Modified LPA
C-TRAN #30 Burton	Connects the Fisher's Landing Transit Center with downtown Vancouver via 164th/162nd Avenues and 18th, 25th, 28th, and 39th Streets. Within the study area, service currently runs along McLoughlin Boulevard and on Washington and Broadway Streets between 8th and 15th Streets.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #60 Delta Park Regional	Connects the Delta Park MAX Station in Portland with downtown Vancouver via I-5. Within the study area, service currently runs along I-5, Mill Plain Boulevard, and Broadway Street.	Route would be discontinued.

1.1.8 Tolling

Consistent with the CRC LPA, tolling cars and trucks that would use the new Columbia River bridges is proposed as a method to help fund the bridge construction and future maintenance, as well as to provide different mode, time, and destination choices for trips across the Columbia River. The sections below describe the tolling authority and tolling operations.

1.1.8.1 Tolling Authority

Federal and state laws provide authority to toll the I-5 crossing. The IBR Program plans to toll the new Columbia River bridges under the federal tolling authorization program codified in 23 U.S.C. § 129 (Section 129). Section 129 allows public agencies to impose new tolls on federal-aid interstate highways for the reconstruction or replacement of toll-free bridges or tunnels. In 2023, the Washington State Legislature authorized tolling on the Interstate Bridge, with toll rates and policies to be set by the Washington State Transportation Commission (WSTC). In Oregon, the legislature authorized tolling on the Interstate Bridge in 2013 and gave the Oregon Transportation Commission (OTC) the authority to set toll rates and policies. Subsequently, in January 2025, the OTC reviewed and approved the I-5 tollway project application that designated the IBR Program as a "tollway project" and the facility (the I-5 bridge) as a

Tolling Equipment

Below are the key types of equipment used to collect data for billing purposes.

Transponders: Small tags affixed to vehicles that communicate with tolling equipment as the vehicle passes.

Antenna/Readers: As a vehicle with a transponder enters a toll zone, an antenna transmits a signal between the transponder and the reader. The reader then transmits pertinent information to the toll zone controller.

Automatic Vehicle Classification: Various roadway devices installed overhead and/or in pavement to detect and identify the vehicle type (e.g., truck, bus, personal vehicle, etc.).

License Plate Image Capture Cameras: Cameras and software that capture images of license plates as vehicles pass.

Digital Video Audit System: Various types of cameras monitor traffic flow and equipment locations.

tollway for construction as defined in Oregon Revised Statutes (ORS) 383.003(8) and pursuant to ORS 383.015.

At the beginning of 2024, the OTC and the WSTC entered into a bi-state tolling agreement to establish a cooperative process for setting toll rates and policies. This included the formation of the I-5 Bi-State Tolling Subcommittee, which consists of two commissioners each from the OTC and WSTC, and tasked the subcommittee with developing toll rate and policy recommendations for joint consideration and adoption by each state's commission. At the direction of the commissions, all toll scenarios being analyzed in the next round of tolling analysis (referred to as a level 3 toll traffic and revenue study) for the IBR Program assume a low-income discount. Formal action is still needed by the commissions to implement rates and policies, including discounts and exemptions.

In December 2024, a memorandum of understanding was executed by both states that outlined their shared understanding of tolling operations, including cooperation between the state Departments of Transportation and roles and responsibilities for the IBR Program. Toll collection would be managed by WSDOT, including drivers' option to use *Good To Go!* accounts for paying tolls. In addition to the memorandum, the two states plan to enter into a separate agreement guiding the sharing and uses of toll revenues, including the order of uses (flow of funds) for bridge construction, debt service, and other required expenditures. WSDOT and ODOT also plan to enter into one or more agreements addressing implementation logistics, toll collection, and operations and maintenance for tolling the bi-state facility.

1.1.8.2 Tolling Operations

The Modified LPA includes a proposal to apply variable tolls on vehicles using the Columbia River bridges with the toll collected electronically in both directions. Tolls would vary by time of day with higher rates during peak travel periods and lower rates during off-peak periods. The IBR Program evaluated multiple toll scenarios with two different variable toll schedules by time of day. For purposes of this NEPA analysis, the lowest toll schedule was analyzed, with tolls assumed to range between $1.50 and $3.15 (state fiscal year 2026 dollars) for passenger vehicles and light trucks (i.e., vehicles with two axels) with a *Good To Go!* account. The assumed toll range and other assumptions are documented in the IBR Program Level 2 Toll Traffic and Revenue Study (IBR 2023). Medium and heavy trucks (i.e., vehicles with more than two axels) would be charged a higher toll than passenger vehicles and light trucks. Passenger vehicles and light trucks without a *Good To Go!* account would pay an additional $2.00 per trip to cover the cost of identifying the vehicle owner from the license plate and invoicing the toll by mail.

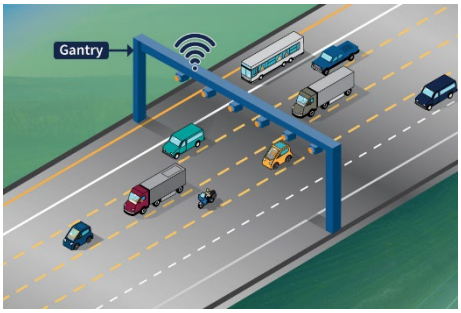
It is assumed that tolling would begin on the existing Interstate Bridge, referred to as "pre-completion tolling," in 2027, allowing time after receiving a Record of Decision to hire a contractor, install tolling equipment, and conduct the rate-setting process. The purpose of pre-completion tolling would be to generate initial capital construction funding on a pay-as-you-go basis. Later, toll revenue would be used to secure a portion of Program financing to pay back bonds or loans. Pre-completion tolling would also help pay current interest on the debt to minimize interest costs. Once the new Columbia River bridges are completed, the traffic and tolling operations would shift from the existing Interstate Bridge over to the new bridges, and 24-hour tolls would be implemented; this is referred to as "post-completion tolling."

The start dates for pre-completion tolling would be determined based on the IBR Program environmental and construction timelines; placeholders for tolling start dates were used in this NEPA analysis. This NEPA analysis assumed that pre-completion tolling on the existing Interstate Bridge would be toll-free overnight between 11 p.m. and 5 a.m. (IBR 2023). The OTC and WSTC are also considering this as an option during the level 3 toll traffic and revenue study; however, a decision has not been made on whether these toll-free hours would be implemented. This toll-free period could help avoid situations where users would be charged during lane or partial bridge closures when construction delays may occur.

Tolls would be collected using an all-electronic toll collection system using transponder pass readers and license plate cameras mounted to structures over the roadway. Each traffic lane and shoulder would have a pass reader and license plate camera to ensure accurate detection of vehicles. Toll collection booths would not be required. Instead, motorists could obtain a pass and set up a *Good To Go!* account that would automatically bill the account holder associated with the pass each time the vehicle crossed the bridge. Customers without passes would be tolled by a license plate recognition system that would bill the address of the owner registered to that vehicle's license plate.

There would be two separate "toll zones," which are the area in which the tolling system would detect and classify passing vehicles and then transmit pertinent information to the toll zone controller (Figure 1-30). There would be one zone for northbound traffic and one zone for southbound traffic. During pre-completion tolling, the toll zones would be located on I-5 in Vancouver, between the Interstate Bridge and the BNSF Railway. The location of the post-completion toll zones would be determined at a later date, but it is anticipated that both toll zones would remain in Vancouver.

Figure 1-30. Toll Zone



One gantry (i.e., overheard structure) would be located in each toll zone (Figure 1-30). Generators and equipment cabinets would be located nearby, which would house various equipment needed to support toll operations. Additional equipment cabinets would be placed throughout the Program area to support tolling operations, such as near the toll rate signage (see below).

As previously noted, a key element of tolling would be variable-rate pricing, where toll rates would differ based on the time of day a vehicle uses the bridge. To accomplish this, toll rate signs would be installed at route decision points on local roads, I-5 on-ramps, and on I-5, including locations north and south of the bridges where drivers make informed route decisions (e.g., I-5/Interstate 205 junction and I-5/Interstate 84 junction). The intent of the toll rate signs is to provide both static and variable pricing information. The static sign would contain details such as direction, wayfinding, or other information. These signs would also include a variable message sign panel that would show toll rate(s) in effect at that time.

1.1.9 Transportation System- and Demand-Management Measures

Many well-coordinated transportation demand-management and system-management programs are already in place in the Portland-Vancouver metropolitan region. In most cases, the impetus for the programs comes from state regulations: Oregon's Employee Commute Options rule and Washington's Commute Trip Reduction law (described in the sidebar).

State Laws to Reduce Commute Trips

Oregon and Washington have both adopted regulations intended to reduce the number of people commuting in single-occupancy vehicles (SOVs). Oregon's Employee Commute Options Program, created under Oregon Administrative Rule 340-242-0010, requires employers with over 100 employees in the greater Portland area to provide commute options that encourage employees to reduce auto trips to the work site. Washington's 1991 Commute Trip Reduction (CTR) Law, updated as the 2006 CTR Efficiency Act (Revised Code of Washington §70.94.521) addresses traffic congestion, air pollution, and petroleum fuel consumption. The law requires counties and cities with the greatest traffic congestion and air pollution to implement plans to reduce SOV demand. An additional provision mandates "major employers" and "employers at major worksites" to implement programs to reduce SOV use.

The physical and operational elements of the Modified LPA provide the greatest transportation demand-management opportunities by promoting other modes to fulfill more of the travel needs in the corridor. These include:

- Major new light-rail line in exclusive right of way, as well as express bus routes and bus routes that connect to new light-rail stations.
- I-5 inside shoulders that accommodate express buses.
- Modern bicycle and pedestrian facilities that accommodate more bicyclists and pedestrians and improve connectivity, safety, and travel time.
- Park and rides.
- A variable-rate toll on the new Columbia River bridges.

In addition to these fundamental elements of the Modified LPA, facilities and equipment would be implemented that could help existing or expanded transportation system–management measures maximize the capacity and efficiency of the system. These include:

- Replacement or expanded variable message signs in the primary study area. These signs alert drivers to incidents and events, allowing them to seek alternate routes or plan to limit travel during periods of congestion.
- Replacement or expanded traveler information systems with additional traffic monitoring equipment and cameras.
- Expanded incident response capabilities, which help traffic congestion to clear more quickly following accidents, spills, or other incidents.

- Queue jumps or bypass lanes for transit vehicles where multilane approaches are provided at ramp signals for on-ramps. Locations for these features will be determined during the detailed design phase.
- Active traffic management strategies including ramp metering and dynamic speed limits. These strategies are intended to manage congestion by controlling traffic flow.

1.1.10 Off-site Mitigation Sites

The IBR Program will provide off-site mitigation for unavoidable impacts to natural resources, including fish and wildlife species and their habitats, wetlands, surface waters, floodplains, and other regulated habitat features (refer to the Final SEIS, Sections 3.14, Water Quality and Hydrology; 3.15, Wetlands; and 3.16, Ecosystems).[15] Applicable federal, state, and local regulatory frameworks require mitigation sequencing that includes avoidance and minimization of impacts, and compensatory mitigation to achieve "no net loss" of the resource or its functions. Mitigation must fully offset the impacts of the Modified LPA and achieve this "no net loss" standard. The Modified LPA would result in unavoidable impacts to natural resources, which would require mitigation under one or more regulatory frameworks. Mitigation plans and mitigation bank use plans will be prepared to provide compensation for any such unavoidable impacts to regulated resources (wetlands, waters, floodplain, sensitive habitats) and to demonstrate that the IBR Program will achieve "no net loss" of function of these resources. The IBR Program is preparing functional assessments and coordinating with regulatory agencies to quantify the amount and type of compensatory mitigation required to offset Program impacts and achieve "no net loss."

It is anticipated that compensatory mitigation for unavoidable impacts to aquatic and terrestrial habitats and species in Washington will be provided through the purchase of credits from the proposed Wapato Valley Mitigation and Conservation Bank (Figure 1-31). The bank is approximately 876 acres and is located in the Columbia River floodplain at the mouth of the Lewis River, approximately 19 river miles downstream of the Interstate Bridge. Approval of the bank is expected in 2026.

It is anticipated that compensatory mitigation for unavoidable impacts to wetlands, and aquatic and terrestrial habitats and species in Oregon will be provided partially through the purchase of advance mitigation credits at ODOT's proposed Columbia Bottomlands Advance Mitigation/Conservation Site, and partially through the purchase and protection under conservation easement of a site on West Hayden Island (shown on Figure 1-31). The Columbia Bottomlands Advanced Mitigation/Conservation site is located in Scappoose Bay, a slough of Multnomah Channel, in Columbia County, Oregon. The site is located approximately 1 mile upstream of where the Multnomah Channel meets the Columbia River and approximately 20 river miles downstream of the Interstate Bridge. The site has been designed to provide advance mitigation credits for impacts to wetlands and aquatic and terrestrial habitats and species for future ODOT projects. All impacted wetlands and other water features would be mitigated in accordance with current USACE mitigation policies, and the conditions of the Section 404 Permit. All compensatory mitigation plans would be developed in coordination with the USACE

[15] On-site mitigation is identified and analyzed in relevant subsections of Chapter 3, Existing Conditions and Environmental Consequences of the Final SEIS.

and other appropriate agencies as part of the Section 404 permitting process. The USACE and other appropriate agencies would determine the appropriate level of mitigation based upon the functions lost or adversely affected as a result of impacts to aquatic resources.

The proposed site on West Hayden Island is approximately 65 acres in size and is located approximately 2.5 river miles downstream of the Interstate Bridge, on the south side of the island adjacent to North Portland Harbor. The site is currently owned by the Oregon Department of State Lands, but ODOT has proposed to purchase this site and place it under a conservation easement. One or more compensatory mitigation projects may also be conducted on the site. The specific activities to be conducted at this site would be developed in coordination with the applicable regulatory agencies for each of the various permit applications.

In addition to the compensatory wetland and habitat mitigation described above, the IBR Program may need to excavate material from within the 100-year floodplain to address the compensatory excavation requirements of the City of Portland's recently updated floodplain ordinance. If such activity is required, it is anticipated that this material would be removed from upland portions of the 65-acre parcel on West Hayden Island described above or from aquatic areas adjacent to this parcel. If such excavation activities are conducted, excavated materials will be disposed of at a location approved to receive that type of material.

Figure 1-31. Potential Compensatory Mitigation Sites



1.2 Modified LPA Construction

Construction of the IBR Program would be sequenced in accordance with many factors, such as the scale of improvements, different types of infrastructure and associated construction specialties required, timing of funding received, maintenance of traffic on I-5, navigation on the Columbia River, seasonal and weather constraints, permit conditions, and other considerations. Multiple construction packages are anticipated to be developed and delivered by different agencies—WSDOT, ODOT, TriMet, and C-TRAN—that will use various delivery methods (e.g., design-bid-build, design-build, progressive design-build, construction manager/general contractor).

The first construction packages are anticipated to be the new Columbia River bridges and approaches. Subsequent construction packages would be sequenced throughout the Program area. Early construction activities may occur in the Program area to prepare for the bridge replacement work. Demolition of the existing Interstate Bridge would take place after the new Columbia River bridges were opened to traffic. Construction of other components of the Modified LPA would be sequenced during and after the construction of the new Columbia River bridges begins.

Electronic tolling infrastructure for the existing Interstate Bridge would be constructed and operational near the start of construction on the new Columbia River bridges and would be constructed and operational for the new Columbia River bridges in time for their opening. The toll rates and policies for tolling (including pre-completion tolling) would be determined by the OTC and WSTC (refer to Section 1.1.8, Tolling).

1.2.1 Construction Components, Packaging Plan, and Duration

Table 1-4 lists the main construction components of the Modified LPA along with the estimated construction durations and descriptions of the associated work. Construction packages are also listed in Table 1-4 and illustrated in Figure 1-32. These main construction components would be defined by some functional improvement to the Program corridor; for example, construction of the new bridges would be coordinated with the construction of the connections to the existing I-5, enabling use of the new bridges while other components of the Program are constructed. Each listed component would require multiple construction packages—small and large, general and specialty. As construction progresses, interim connections may be in place while subsequent components are built and final connections and finishes are completed. This preliminary construction plan may change as the Program advances toward construction. Construction packages may further be combined or separated throughout delivery of the Program. Construction of all components identified in the Program could last more than 10 years.

The estimated durations are shown as ranges to reflect the potential for Program funding to be sequenced over time. In addition to funding, contractor schedules, regulatory restrictions on in-water work, river navigation considerations, permits and approvals, weather, materials, and equipment could all influence construction duration and overlap of construction of certain components. Certain work below the ordinary high-water mark of the Columbia River and North Portland Harbor would be restricted to minimize impacts to species listed under the Endangered Species Act and their designated critical habitat.

Throughout most periods of construction, three travel lanes in each direction on I-5 (accommodating personal vehicles, freight, and buses) would remain open during peak hours. Off-peak and weekend restrictions and closures could be required during construction. Active transportation connections would be maintained throughout construction. Advanced coordination and public notice would be given for restrictions, intermittent or longer-term closures, and detours for highway, local roadway, transit, and active transportation users via accessible facilities and wayfinding (refer to the Final SEIS, Section 3.1, Transportation, for additional information, including for local street and ramp or interstate access closures). At least one Columbia River navigation channel would remain open to shipping throughout construction. Advanced coordination and notice would be given for restrictions or intermittent closures to navigation channels as required (refer to the Final SEIS Section 3.2, Navigation, for additional information).

Table 1-4. Preliminary Construction Packaging Plan

Component and General Location	Estimated Duration	Description	Construction Packages
Columbia River bridges, approaches, and demolition of Interstate Bridge *Hayden Island to Evergreen Boulevard*	6 to 8 years	• General sequence for new bridges would include initial preparation and installation of foundation piles, shaft caps, pier columns, superstructure, and deck elements, followed by systems and finish work. • SR 14 interchange would be constructed in a separate construction package and must be completed before all traffic could be transferred to the new Columbia River bridges. • Demolition of the existing Interstate Bridge could begin only after traffic is transferred to the new Columbia River bridges.	• Columbia River Bridges [a] • Approaches [a] • Pre-completion Tolling Signage and Equipment Installation • SR 14 A • Evergreen Bridge • Interstate Bridge Demolition
Light-rail and bus-on-shoulder transit *Expo Station to Evergreen Station; Ruby Junction*	4 to 7 years	• The light-rail alignment would be partially supported by the southbound Columbia River bridge and approach structure guideways. • Light-rail construction would include all infrastructure associated with light-rail elements of the Transit Packages construction package (e.g., overhead catenary system, tracks, stations, and park and rides). • Bus on shoulder would include corresponding bus elements of the Transit Packages construction package.	• North Portland Harbor Transit Bridge • Marine Drive A (supports transit improvements) • Hayden Island A (supports transit improvements) • Light-rail Overnight Facility • Transit Packages • Ruby Junction

Component and General Location	Estimated Duration	Description	Construction Packages
Marine Drive and Hayden Island interchanges and North Portland Harbor bridges *Marine Drive to Hayden Island*	4 to 10 years	• Hayden Island interchange construction duration would not necessarily entail continuous active construction. • The North Portland Harbor bridges could include sequenced construction of southbound bridges, northbound bridges, and demolition of the existing North Portland Harbor bridge to maintain traffic mobility during construction. • Hayden Island and Marine Drive interchanges could be broken into several contracts, which could spread work over a longer duration.	• Hayden Island Surface Streets • Hayden Island Interchange • North Portland Harbor Bridges • Oregon I-5 Southbound • Oregon I-5 Northbound • North Portland Harbor Bridge Removal • Marine Drive Interchange • North Expo Road
Mill Plain Boulevard, Fourth Plain Boulevard, and SR 500/39th Street interchanges *Mill Plain Boulevard to SR 500*	3 to 4 years	• Construction of these interchanges could be independent from each other.	• Mill Plain Boulevard Interchange • Washington North

a The Columbia River Bridges and Approaches construction packages include light-rail guideway from the Hayden Island Bridge Approach, the Columbia River bridges, north to Evergreen Boulevard.

Figure 1-32. Preliminary Construction Packages



1.2.2 Potential Staging Sites and Casting Yards

Equipment and materials would be staged in the primary study area throughout construction generally within existing or newly purchased right of way, on land vacated by existing transportation facilities (e.g., I-5 on Hayden Island), or on nearby parcels. However, at least one large site could be required for construction offices, equipment maintenance and storage, maintenance of traffic equipment, employee parking, and construction material storage and other needs. Criteria for suitable sites include large, open areas for heavy machinery and material storage, waterfront access for barges (either a slip or a dock capable of handling heavy equipment and material) to convey material to the construction zone, and roadway or rail access for landside transportation of materials by truck or train.

Two potential major staging sites have been identified (see Figure 1-6). Both sites are located on Hayden Island on the west side of I-5. A large portion of both parcels would be required for new right of way for the Modified LPA. Other staging sites may be identified during the design process or by the contractor. Following construction of the Modified LPA, the staging sites could be converted to other uses.

In addition to on-land sites, some staging activities for construction of the new Columbia River and North Portland Harbor bridges would take place on the river itself. Temporary work structures, barges, barge-mounted cranes, derricks, and other construction vessels and equipment would be present on the river during most or all of the bridges' construction period. The IBR Program is working with USACE, USCG, and the Federal Aviation Administration to obtain necessary clearances for these activities.

A casting or staging yard could also be required for construction of the overwater bridges if a precast concrete segmental bridge design is used. A casting yard would require access to the river for barges, a slip or a dock capable of handling heavy equipment and material, a large area suitable for a concrete batch plant and associated heavy machinery and equipment, and access to a highway or railway for delivery of materials. Such a site would likely be between approximately 50 and 100 acres. As with the staging sites, casting yards would be identified during the design process or by the contractor and would be subject to the same contract and permit requirements to implement the best management practices (BMPs) described in Appendix M to the Final SEIS unless more stringent permitting requirements and conditions are required at the time of identification.

All material staging, equipment staging areas, equipment fueling areas, and casting yards would be contained and located outside of environmentally and culturally sensitive areas. To the extent practicable, these sites would be located in upland locations, on areas that are already or have been previously disturbed. These activities would be conducted consistent with the impact minimization BMPs described in Appendix M to the Final SEIS. Construction of the Modified LPA would also include revegetating temporarily disturbed areas consistent with federal, state, and local regulations, and the net result would be no net loss of habitat function in the long term. As with the staging sites, casting or staging yard sites may be identified as the design progresses or by the contractor and would be evaluated via a NEPA re-evaluation or supplemental NEPA document for potential environmental impacts at that time.

1.3 No-Build Alternative

The No-Build Alternative illustrates how transportation and environmental conditions would likely change by the year 2045 if the Modified LPA is not built. This alternative makes the same assumptions as the Modified LPA regarding population and employment growth through 2045, and it assumes that the same transportation and land use projects in the region would occur as planned.

Regional transportation projects included in the No-Build Alternative are those in the financially constrained 2018 *Regional Transportation Plan* (RTP) adopted in December 2018 by the Metro Council (Metro 2018) and in March 2019 (RTC 2019) by the Southwest Washington Regional Transportation Council (RTC) Board of Directors (referred to collectively as the 2018 RTP in this report).[16] The 2018 RTP has a planning horizon year of 2040 and includes projects from state and local plans necessary to meet transportation needs over this time period; financially constrained means these projects have identified funding sources. The Transportation Technical Report lists the projects included in the financially constrained 2018 RTP.

The implementation of regional and local land use plans is also assumed as part of the No-Build Alternative. For the IBR Program analysis, population and employment assumptions used in the 2018 RTP were updated to 2045 in a manner consistent with regional comprehensive and land use planning. In addition to accounting for added growth, adjustments were made within Portland to reallocate the households and employment based on the most current update to Portland's comprehensive plan, which was not complete in time for inclusion in the 2018 RTP.

Other projects assumed as part of the No-Build Alternative include major development and infrastructure projects that are in the planning stage, permitting stage, or partway through phased development. They include the Waterfront Vancouver project, Terminal 1 development, the Renaissance Boardwalk, the Waterfront Gateway project, improvements to the levee system, several restoration and habitat projects, and the Portland Expo Center.

In addition to population and employment growth and the implementation of local and regional plans and projects, the No-Build Alternative assumes that the existing Interstate Bridge would continue to operate as it does today. As the bridge ages, needs for repair and maintenance would potentially increase, and the bridge would continue to be at risk of mechanical failure or damage from a seismic event.

[16] The 2018 RTP was the adopted regional transportation plan available when the IBR Program initiated the SEIS. In 2023, Oregon Metro and RTC updated their respective RTPs as part of their five-year update cycle, as required under 23 CFR § 450.324. The 2023 RTP was adopted by Oregon Metro in 2023 and RTC in 2024, several years after the IBR Program Draft SEIS analysis was initiated in early 2021. To use the regional travel demand model supporting the 2023 RTP, additional refinement and coordination would be necessary for it to be ready for use in a facility-specific study, such as the IBR Program. This refinement and coordination process is lengthy and can take up to a year and a half for a complex project with numerous partner agencies, like the IBR Program. Therefore, the NEPA lead agencies exercised their discretion and determined, based on their technical expertise, that the 2018 RTP and Travel Demand Model continued to be the most appropriate base tool for the purposes of comparing the No-Build Alternative to the Modified LPA and design options in the Final SEIS.

2. METHODS

This section describes the methods used to prepare this Water Quality and Hydrology Technical Report to:

- Identify the study area and relevant laws and regulations.
- Collect data, assess both the beneficial and adverse impacts, and evaluate possible mitigation measures.

The methods and analysis comply with the National Environmental Policy Act (NEPA) and relevant federal, state, and local laws, and builds on those developed for the CRC project. The methods used for this analysis have been updated for the IBR Program as follows:

- Changes to federal or state regulation dates/citations.
- Changes in permitting processes, most notably for the Clean Water Act (CWA) Section 401 Water Quality Certification and Section 402 National Pollutant Discharge Elimination System (NPDES).
- Updates to 303(d)-listed impaired waters.
- Changes to predictions and modeling tools.
- Changes to constituents of emerging concern (CECs), including 6PPD - the additive component to rubber tires that forms the pollutant 6PPD-quinone now known to be toxic to fish and other aquatic life.
- Addition, removal, and updating of data sources as appropriate.

2.1 Study Area

The study area for the Modified LPA includes a 5-mile segment of I-5, approximately between the SR 500 interchange in Washington and the I-5/Columbia Boulevard interchange in Oregon and the area around the Tri-County Metropolitan Transportation District's (TriMet's) existing Ruby Junction Light-Rail OMF in Gresham, Oregon. Physical changes associated with the Modified LPA would occur in this area. The study area includes temporary construction easements that would be established directly adjacent to the proposed construction areas and the potential locations of larger staging areas and casting yards.

This evaluation additionally considers the watersheds (or portions of watersheds) and impervious areas that have hydrologic connectivity with the study area. Figure 2-1 shows the study area and watersheds. Figure 2-2 shows the full extent of the study watersheds.

Figure 2-1. Water Quality and Hydrology Study Area and Study-Specific Watersheds

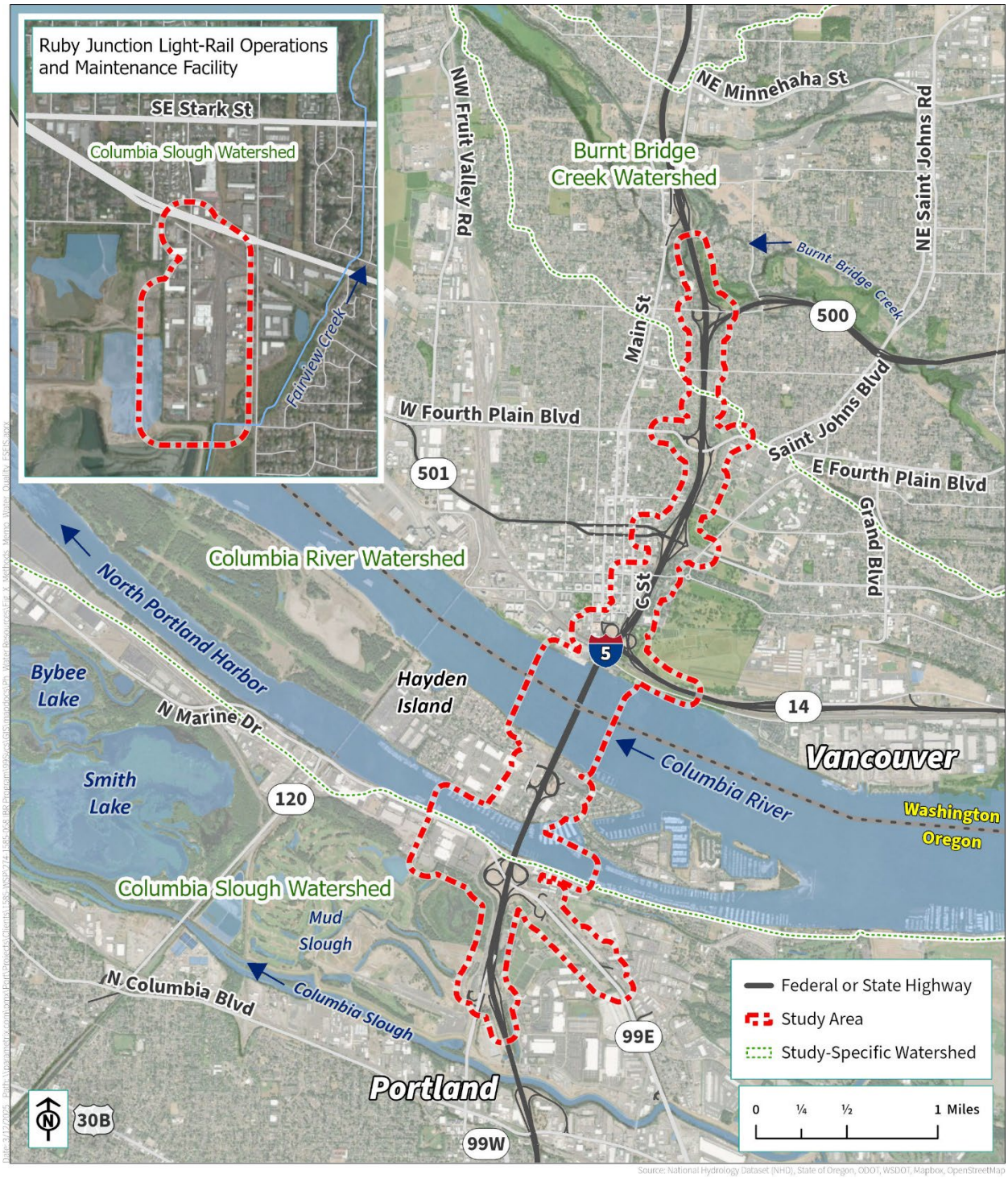
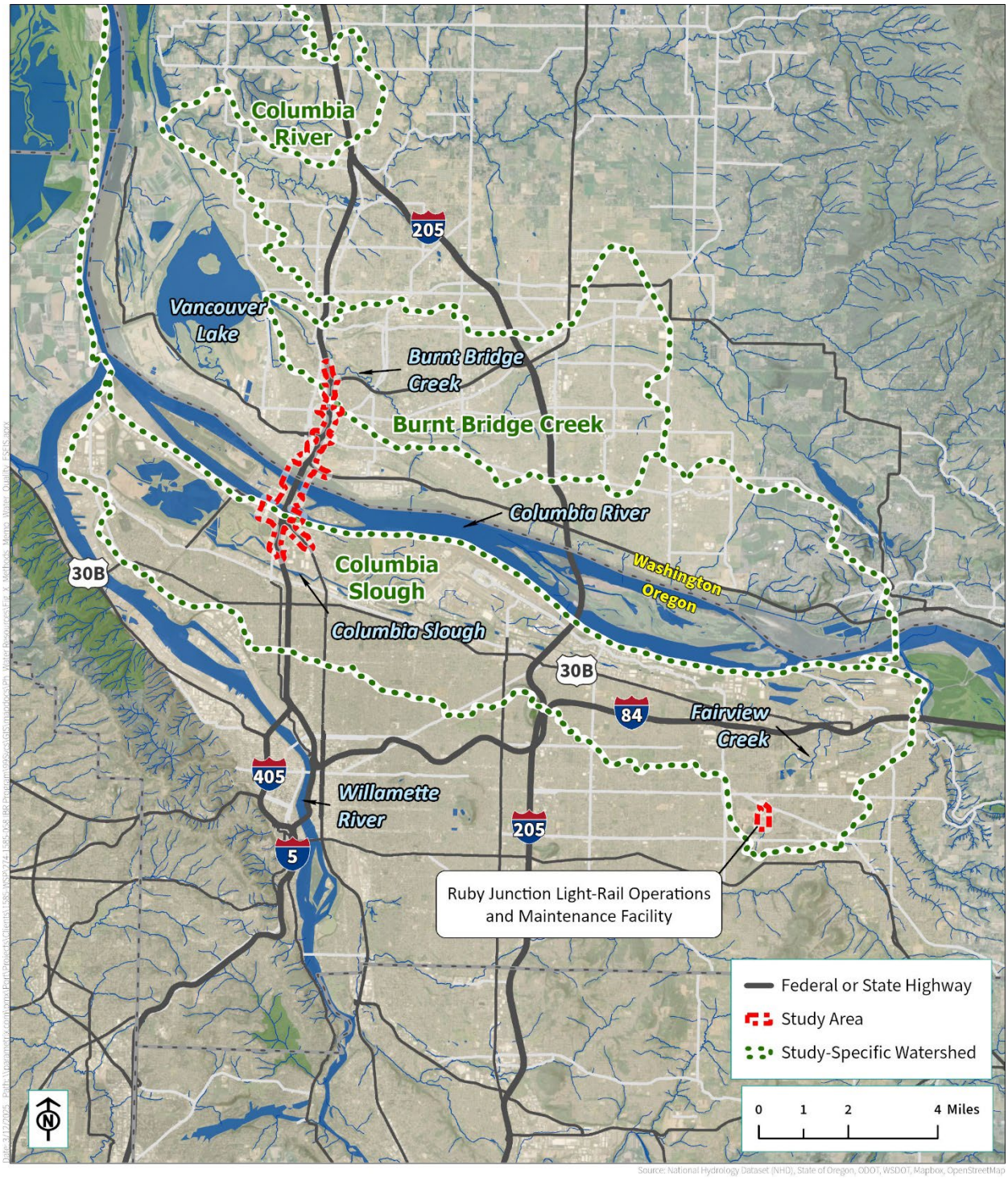


Figure 2-2. Full Extent of Study-Specific Watersheds



2.1.1 Contributing Watersheds

Study-specific watersheds (or portions of watersheds) are used as the fundamental geographic area for the evaluation of the Modified LPA (see Figure 2-1and Figure 2-2). Waterbodies and their associated watersheds in the study area have different levels of water quality, designated uses, and management scenarios.

Waterbodies and their contributing watersheds were delineated using geographic information system (GIS) data, Google Earth Pro, information from local governments, field surveys, the Washington State Department of Ecology (Ecology) Watershed Planning Program, local drainage districts, and the Columbia Slough Watershed Council.

The watersheds that would be directly affected by construction of, and stormwater runoff generated by, the Modified LPA in the study area are the Columbia Slough, the Columbia River, Burnt Bridge Creek, and Fairview Creek. Within the study area, the Columbia River includes North Portland Harbor, Hayden Island, and the north portion of the river corridor that lies within Vancouver and drains directly to the Columbia River.

2.1.2 Contributing Impervious Area

For the Modified LPA, impervious areas that would require stormwater management in both Oregon and Washington would comply with the requirements established in the programmatic Endangered Species Act (ESA) Section 7 and Magnuson Stevens Act consultations with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) for the State of Oregon Federal Aid Highway Program (FAHP). Based on these consultations, stormwater treatment would be required for all contributing impervious area (CIA). The CIA is defined as all impervious areas created by the Modified LPA (including new and rebuilt or replaced impervious surfaces) and contiguous existing impervious areas that contribute stormwater runoff to the Program's CIA. The CIA does not include impervious areas outside of the Modified LPA's construction footprint that would flow through to outfalls that would not be modified.

2.2 Relevant Laws and Regulations

The following sections list and briefly describe applicable federal, state, and local laws and regulations protecting the condition of waterbodies and floodplains, as well as permitting activities related to water quality and stormwater conveyance.

2.2.1 Federal

2.2.1.1 Clean Water Act, 1977 as Amended, 33 U.S.C. §1251–1376

The CWA requires states to set water quality standards for all contaminants in surface waters based on the "beneficial" or "designated" uses for the waterbody and makes it unlawful for a person to discharge a pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. The permitting processes within the purview of the CWA are summarized below.

SECTION 401 WATER QUALITY CERTIFICATION

Section 401 requires an applicant for a federal license, or a Section 404 permit applicant planning to conduct an activity that may result in a discharge to Waters of the U.S., to obtain a certification that the activity complies with state water quality requirements and standards. Section 404 applications are submitted to the USACE prior to submitting Section 401 applications to the certifying state agency. Applicants must submit a pre-filing meeting request to the certifying state agency at least 30 days prior to submitting the Section 401 application to the certifying state agency. The Section 404 request can be submitted prior to or concurrent with the Section 401 application process. The state agency then certifies whether the project meets state water quality standards, and if it will affect the quality of its waters, and forwards the application to the U.S. Environmental Protection Agency (EPA) for review. Upon completion of EPA's review, these certifications are issued by Ecology in Washington and Oregon Department of Environmental Quality (DEQ) in Oregon.

SECTION 402 NPDES PERMITS

The EPA requires NPDES permits for industrial sites, construction activities, and certain municipalities that have the potential to discharge to surface waters or to a conveyance system that leads to surface waters. These permits are administered through Ecology in Washington and through the DEQ in Oregon. Since these permits are administered by state regulatory agencies, their applicability is discussed individually under state regulations in Section 2.2.2.

SECTION 303(D) IMPAIRED WATERS AND TOTAL MAXIMUM DAILY LOADS (TMDLS)

Section 303(d) requires states and territories to issue water quality status reports every two years. These reports identify water quality trends, prioritize polluted waters, and target waters for TMDL development. TMDLs identify the pollutant load reductions that are necessary from point and nonpoint sources and guide implementation work by federal, state, tribal, territorial, and local water quality protection programs. In Washington and Oregon, Ecology and DEQ develop 303(d) lists for approval by the EPA, respectively.

SECTION 404 FOR PERMITTING DISCHARGES OF DREDGE OR FILL MATERIAL

Section 404 requires a permit to be issued by the USACE for activities involving the discharge of dredge or fill material into waters of the U.S. This permit would be required for work associated with the Modified LPA that would occur within jurisdictional wetlands or below the ordinary high-water mark (OHWM) of waterbodies within the study area. The IBR Program Wetlands and Other Waters Technical Report discusses the wetland and OHWM determination process in more detail.

2.2.1.2 Endangered Species Act of 1973 and Amendments; 16 U.S.C. §1531 et. seq.

The ESA provides a framework to conserve and protect endangered and threatened species and their habitats from effects such as those related to stormwater (e.g., water quality and hydromodification).

2.2.1.3 Fish and Wildlife Coordination Act of 1934 and Amendments, 16 U.S.C. §661 et. seq.

The Fish and Wildlife Coordination Act protects fish and wildlife when federal actions result in the control or modification of a natural stream or body of water.

2.2.1.4 Safe Drinking Water Act. 1974, as amended, 42 U.S.C. §300f

The Safe Drinking Water Act (SDWA) requires many actions to protect drinking water and its sources, including rivers, lakes, reservoirs, springs, and groundwater wells. The SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants. State drinking water programs provide direct oversight of water systems. Both Washington and Oregon implement the SDWA within their jurisdictions. For the Modified LPA, this law would only apply if infiltration basins or underground injection control measures were incorporated into the Program design.

2.2.1.5 U.S. Code of Federal Regulations (C.F.R.), Title 33, Section 208.10

This section of Title 33 of the C.F.R. details how the USACE and non-federal public sponsors of flood control systems (in this case, the Urban Flood Safety and Water Quality District [UFSWQD] and Peninsula Drainage Districts #1 and #2) must maintain levees, floodwalls, and other flood control structures. The mandate includes regular inspections to look for encroachments on the levee or its right of way, such as fences, patios, and pools; the growth of shrubs and trees whose root systems could damage the system's integrity; signs of seepage or sand boils; subsidence; animal burrows; and the accumulation of trash or debris.

The regulations state that no improvement shall be passed over, under, or through the walls, levees, improved channels, or floodways, nor shall any excavation or construction be permitted within the limits of the project right of way. In addition, no changes shall be made in any feature of the works without prior determination by the District Engineer of the Department of the Army or their authorized representative. This is so that any improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations that may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice.

Further, the USACE Flood Control Operations and Maintenance Policies, Regulation 1130-2-530 states: "Projects that protect urban areas or ones where failure would be catastrophic and result in loss of life should be inspected annually." It also instructs USACE personnel to report non-federal sponsors who are not complying with the regulations.

2.2.2 State

The following state water quality regulations apply to the IBR Program.

2.2.2.1 Washington

WASHINGTON ADMINISTRATIVE CODE (WAC). 2019. "WATER QUALITY STANDARDS FOR SURFACE WATERS OF THE STATE OF WASHINGTON." WAC 173-201A

This code establishes water quality standards for surface waters of the state of Washington consistent with public health and the propagation and protection of fish, shellfish, and wildlife. All surface waters are protected by narrative criteria, designated uses, and an antidegradation policy.

WAC. 2002. "NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT PROGRAM (DEPARTMENT OF ECOLOGY)." WAC 173-220

This state law establishes a state individual permit program, as part of the NPDES program created under Section 402 of the Clean Water Act, applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state. This program operates under state laws as part of the NPDES program created by the CWA. Ecology issues or authorizes and enforces NPDES permits in the state of Washington. The Ecology Stormwater Management Manual for Western Washington (SWMMWW) provides guidance on the measures necessary to control the quantity and quality of stormwater runoff for compliance with NPDES permits in western Washington (Ecology 2024).

Construction Stormwater General Permit

WSDOT will apply for coverage under the Washington NPDES and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity to cover construction activities disturbing more than 1 acre. Under the conditions of this permit, WSDOT must submit to Ecology a Notice of Intent to discharge stormwater associated with construction activities and to meet stormwater pollution prevention requirements. Approved methods of erosion and sediment control are provided in the SWMMWW and WSDOT Temporary Erosion and Sediment Control Manual (WSDOT 2019).

WSDOT Municipal Stormwater Permit

WSDOT maintains an NPDES and State Waste Discharge Municipal Stormwater General Permit to cover stormwater discharges from state highways and related facilities contributing to discharges from separate storm sewers Municipal Separate Storm Sewer System (MS4s) owned or operated by WSDOT. Under conditions of this permit, WSDOT must review its Stormwater Management Program and submit to Ecology a report outlining BMPs being implemented and their effectiveness to prevent or reduce pollutants from exceeding Water Quality Standards, monitoring or assessment standards for BMPs, and a schedule for implementation of additional BMPs as appropriate.

Western Washington Phase II Municipal Stormwater Permit

This permit covers owners and operators of regulated small MS4s located in western Washington, including the City of Vancouver. Under this permit, owners and operators are waived from obtaining coverage for small MS4s operated by WSDOT.

WAC. 2002. "WASTE DISCHARGE GENERAL PERMIT PROGRAM (DEPARTMENT OF ECOLOGY)." WAC 173-226

This code establishes a state general permit program applicable to the discharge of pollutants, wastes, and other materials to waters of the state. Permits issued are designed to satisfy the requirements for discharge permits under the CWA.

WAC. 2022. "HYDRAULIC CODE RULES." WAC 220-660

The Washington Department of Fish and Wildlife (WDFW) requires a hydraulic project approval for "construction or performance of work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state." The permit application allows WDFW to review proposed work and ensure it is performed in a way that protects fish and their aquatic environments, including water quality.

2.2.2.2 Oregon

OREGON REVISED STATUTES (ORS). 2019. "WATER QUALITY." ORS 468B

This statute sets effluent limitations, describes the implementation of the CWA, and sets permit requirements. It prohibits any person from causing pollution of any waters of the state or placing or causing to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means. The statute also prohibits the discharge of any wastes into waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.

OREGON ADMINISTRATIVE RULES (OAR). 2017. "DEPARTMENT OF ENVIRONMENTAL QUALITY: REGULATIONS PERTAINING TO NPDES AND WATER POLLUTION CONTROL FACILITIES (WPCF) PERMITS." OAR 340-045-0005 TO 340-045-0080

In Oregon, the DEQ issues or authorizes, and it enforces, NPDES and WPCF permits. For the Modified LPA, a permit would be required for: (1) the construction, installation, or operation of any activity that would increase the discharge of wastes into the waters of the state or would otherwise unlawfully alter the physical, chemical, or biological properties of any waters of the state; (2) an increase in volume or strength of any wastes in excess of the discharges authorized under an existing permit; and (3) the construction or use of any new outlet for the discharge of any wastes into the waters of the state.

1200-CA Construction Stormwater Permit

ODOT will use the programmatic 1200-CA under the Oregon DEQ NPDES Construction Stormwater Discharge Permit for activities that will disturb one or more acres of land and may discharge stormwater to surface waters causing an exceedance of a water quality standard. This permit requires an Erosion and Sediment Control Plan (ESCP). Terms and conditions along with approved methods of erosion and sediment control are given in the 1200-CA Construction Stormwater Permit and ODOT Erosion and Sediment Control Manual.

Municipal Separate Storm Sewer System (MS4) Individual Permit. 2020. ODOT

ODOT is an MS4 individual permit holder (2021). This permit prescribes all stormwater and allowable non-stormwater dischargers from the MS4 associated with ODOT-owned and/or -operated roads, water quality facilities, maintenance yards, rest areas, and other facilities located within highway right of way.

NPDES Municipal Separate Storm Sewer Systems (MS4) Phase I Individual Permit (No. 101314)

This permit prescribes all stormwater and allowable non-stormwater discharges from the MS4 within the city of Portland urban services boundary to surface waters of the state.

NPDES Municipal Separate Storm Sewer Systems (MS4) Phase I Individual Permit (No. 101315)

This permit prescribes all stormwater and allowable non-stormwater discharges from the MS4 within the cities of Gresham and Fairview to surface waters of the state.

STATE ISSUANCE, MONITORING, AND ENFORCEMENT OF SECTION 401 WATER QUALITY CERTIFICATION

In Oregon, for the Modified LPA a pre-filing meeting request to the DEQ would be required at least 30 days prior to the submittal of a Joint Permit Application (JPA). State guidance requires submitting a pre-filing request 30 days prior to sending the official request for a Section 401 Certification. The Section 404 application to the USACE must be submitted prior to or concurrently requesting a 401 certification. The 404 application can also be submitted in advance of the pre-filing meeting request. The JPA is then submitted to the Oregon Department of State Lands (DSL), the USACE (Portland District Office), and DEQ. DEQ reviews the project for 401 water quality certification and forwards the JPA to the EPA for review. Frequently, applicants are required to incorporate protective measures into their construction and operational plans, such as bank stabilization, treatment of stormwater runoff, spill protection, and fish and wildlife protection. The DEQ water quality certification process requires a Land Use Compatibility Statement signed by the local government land use authority to ensure that permits affecting land use are compatible with local government comprehensive plans.

WATER QUALITY MITIGATION. PD-05. 2006. ODOT. PROJECT DELIVERY LEADERSHIP TEAM

ODOT has developed its own guidance in its PD-05 Operational Notice that determines the need for stormwater treatment and detention on its projects and the appropriate level of mitigation. The operational notice was revised September 1, 2023 and it directs project teams to the resources required to identify and comply with post-construction stormwater management design requirements.

OREGON'S STATEWIDE PLANNING GOALS AND GUIDELINES. 2016. OAR 660-015-0000

In Oregon, Goal 6 instructs local governments to consider protection of air, water, and land resources from pollution and pollutants when developing comprehensive plans. The relevant pollutants considered include (but are not limited to) solid waste, water waste, and thermal pollution. The goal asks cities and counties to designate areas suitable for use in controlling pollution. It calls on them to use a variety of market, zoning, and management tools in creating these outcomes.

2.2.3 Regional and Local

2.2.3.1 Clark County, Washington

CLARK COUNTY CODE (CCC). 2015. "STORMWATER AND EROSION CONTROL." CCC 40.386

Clark County uses the WSDOT (2019) Highway Runoff Manual for publicly funded linear transportation projects guidance on minimum design requirements and BMPs, except for the use of the infeasibility criteria used for low impact development selection (WSDOT 2019). Clark County, through WSDOT's manual, requires stormwater mitigation for any development that results in an increase in impervious area of 5,000 square feet or more in a rural area or 2,000 square feet or more in an urban area.

CLARK COUNTY CODE. 2022, "FLOOD HAZARD AREAS." CCC 40.420

Clark County Flood Hazard Area code provides construction standards and outlines flood hazard permit requirements for construction or development within special flood hazard areas. Special flood hazard areas, as defined in the chapter, include land area subject to a 1% or greater chance of flooding in any given year.

2.2.3.2 City of Vancouver

VANCOUVER MUNICIPAL CODE (VMC). 2012. "STORMWATER MANAGEMENT." VMC 14.09

The City of Vancouver implements its own NPDES permit, as issued by Ecology. Vancouver defers to Ecology's Stormwater Management Manual for Western Washington (Ecology 2019) for guidance but requires stormwater mitigation for any development that increases the impervious area by more than 2,000 square feet.

VMC. 2009. "EROSION CONTROL." VMC 14.24

This code establishes regulations to minimize erosion from land development and land-disturbing activities.

VMC. 2016. "STORMWATER CONTROL." VMC 14.25

This code establishes standards for stormwater runoff.

VMC. 2016. "WATER RESOURCES PROTECTION." VMC 14.26

This code establishes allowable and prohibited discharges and BMPs for protecting stormwater, surface water, and groundwater quality.

VMC. 2005. "CRITICAL AREAS PROTECTION." VMC 20.740.120 (2020) AND 130 (2007)

This code regulates construction in floodways, floodplains, and severe erosion hazard areas. A critical areas report and permit are required.

2.2.3.3 Multnomah County, Oregon

MULTNOMAH COUNTY TRANSPORTATION SYSTEM PLAN (2016), POLICY 20: ENVIRONMENT

This policy avoids and minimizes impacts to the natural environment and fish and wildlife habitat when applying roadway design standards.

2.2.3.4 City of Portland

CITY OF PORTLAND PUBLIC IMPROVEMENTS CODE TITLE 17 PUBLIC IMPROVEMENTS, CHAPTER 17.38 DRAINAGE AND WATER QUALITY

This code provides for the effective management of stormwater, groundwater, and drainage and the protection and improvement water quality in Portland.

CITY OF PORTLAND ENVIRONMENTAL SERVICES EROSION CONTROL

In its 2021 Erosion Control Manual, the City of Portland provides guidance for temporary and permanent erosion prevention, sediment control, and control of other development activities.

CITY OF PORTLAND ADMINISTRATIVE RULE ENB-4.01, STORMWATER MANAGEMENT MANUAL (2020)

The City of Portland developed a stormwater management manual to implement its municipal NPDES permit. Portland requires stormwater mitigation for any development that develops or redevelops 500 square feet or more of impervious surface. Projects that meet this threshold are required to comply with stormwater management requirements for the new or redeveloped impervious area, unless specifically exempt.

PORTLAND CITY CODE (PCC). 2004. “STORMWATER MANAGEMENT.” PCC 33.653

The PCC provides for placement of stormwater facilities, standards, and criteria for on-site facilities. The code lists approval criteria to ensure the development of a feasible stormwater system with adequate capacity.

PCC “EROSION AND SEDIMENT CONTROL REGULATIONS.” PCC 10. 2019 UPDATE

This title provides requirements for development and construction-related activities to control the creation of sediment and to prevent the occurrence of erosion at the source during construction and development. Specific to water quality, these regulations seek to reduce the sediment and pollutants contained in erosion caused by construction and development and to reduce the amount of sediment and pollutants entering storm drainage systems and surface waters from all ground-disturbing activity.

PCC. “FLOOD HAZARD AREAS.” PCC 24.50 (AMENDED 2008)

This title outlines restrictions or prohibitions of activities that cause increased flood heights or velocities within Portland. Permitting requirements to ensure development or building sites will be reasonably safe from flooding are provided.

PCC. "PORTLAND ENVIRONMENTAL ZONES." PCC 33.430 (MARCH 2021)

This title establishes environmental zones to protect resources and functional values that have been identified by Portland as providing benefits to the public. The environmental regulations encourage flexibility and innovation in site planning and provide for development that is carefully designed to be sensitive to the site's protected resources.

2.3 Effects Guidelines

The following describes how impacts to water quality and hydrology were evaluated. The IBR Program team will coordinate with federal, state, and local resource agencies to determine impacts to water quality and hydrology. Generally, impacts are identified if the Modified LPA:

1. Would violate a NPDES permit for stormwater discharges.
2. Is likely to contaminate surface or ground waters that would result in an exceedance of federal, state, or local water quality standards.
3. Is noncompliant with an approved Water Quality Management Plan or TMDL.
4. Would become flooded or induce flooding as a result of stormwater increases or floodplain constriction.

2.4 Data Collection Methods

The following methods and data sources were used to identify existing conditions and provide the required information for analysis of the Modified LPA.

1. Reviewed the following studies and plans from local, state, and federal agencies:
    - Burnt Bridge Creek Ambient Water Quality Data Trend Analysis (Herrera 2017).
    - Streamflow Summary for Burnt Bridge Creek, Clark County, 2008 (Ecology 2010).
    - Burnt Bridge Creek Regional Wetland Bank and Greenway Trails Project Biological Evaluation (PBS 2003).
    - Burnt Bridge Creek Watershed Fecal Coliform Bacteria, Temperature, Dissolved Oxygen, and pH Source Assessment Report (Ecology 2020).
    - Surface Water/Groundwater Interactions and Near-Stream Groundwater Quality along Burnt Bridge Creek, Clark County (Ecology 2012).
    - Integrated Scientific Assessment Report, Vancouver Watershed Health Assessment (Herrera and PGG 2019).
    - Burnt Bridge Creek Ambient Water Quality Monitoring Program, 2017 Trend Analysis Report (Herrera 2018).
    - Burnt Bridge Creek Ambient Water Quality Monitoring – Quality Assurance Plan (Herrera 2011).
    - Comprehensive Conservation and Management Plan for the Lower Columbia River (LCEP 2011).
    - Columbia Slough Fish Advisory (OHA 2019).

- The Columbia Slough (Wells 1997).
- Multnomah County 2014 TMDL Implementation Plan for the Tualatin, Lower Willamette, and Sandy River Basins (Multnomah County 2014).
- Columbia Slough TMDL (DEQ 1998).
- 2020–2021 Columbia Slough Sediment Program Annual Report (BES and DEQ 2022).
- Columbia Slough Sediment Study (DEQ 2012).
- Lower Columbia Slough Refugia Project (BES 2015).
- Portland Plan: Watershed Health (BES 2011).
- Columbia Slough Report Card (BES 2019).
- Environmental Contaminants and their Effects on Fish in the Columbia River Basin (Hinck et al. 2004).
- Columbia River Basin National Stream Quality Accounting Network Program (Kelly and Hooper 2004).
- 2022 Stormwater Management Plan, City of Vancouver (2022).
- Lower Columbia River and Estuary Ecosystem Monitoring: Water Quality and Salmon Sampling Report (LCEP 2007).
- Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan (LCFRB 2010).
- Columbia River Cold Water Refuges Plan (EPA 2021a).
- Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (EPA 2021b).
- TMDL for Mercury in the Willamette Basin, Oregon (EPA 2021c).
- Water Quality of the Lower Columbia River Basin: Analysis of Current and Historical Water-Quality Data through 1994 (Fuhrer et al. 1996).
- Total Dissolved Gas TMDL for the Lower Columbia River (DEQ and Ecology 2002).
- Modification of State's Total Dissolved Gas Water Quality Standard (DEQ 2020).
- TMDL for 2,3,7,8-TCDD (Dioxin) in the Columbia River Basin (EPA 1991).
- Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead (ODFW 2010).
- City of Portland Watershed Management Plan (BES 2005).
- Portland Water Bureau Water Management and Conservation Plan (PWB 2020).
- Lower Columbia River Bi-State Water Quality Program, The Health of the River 1990–1996 Integrated Technical Report (Tetra Tech 1996).
- Water Quality Data, Columbia River Estuary, 2004–2005 (Morace 2006).
- Willamette Basin Rivers and Streams Assessment (DEQ 2009).
- Washington State's Water Quality Assessment and 303(d) list (Ecology 2022).
- Oregon's 2022 Integrated Report, 303(d) and Impaired Waters List (DEQ 2022).

2. Reviewed the following maps and GIS data, including those showing topography, soils, and floodplains:
    - *Infrastructure:* This information was used to develop impervious area estimates and evaluate runoff potential from the Modified LPA.
    - *Topography:* Topographic maps were used to delineate drainages in areas where as-built and infrastructure records providing drainage information were not available.
    - *Flood Insurance Rate Maps, Floodway Maps, and Flood Insurance Study Reports:* This information was used to identify 100-year floodplains and floodways located in the Program's study area.
    - *Land use maps:* The Program team coordinated with land use map reviews conducted as part of the land use technical report to obtain necessary information regarding land use in each of the study area watersheds.
3. Reviewed available water quality characterization studies, Section 303(d) listings, TMDLs, municipal water quality management plans and regulations, and other water quality, water quantity, and floodplains data to determine if streams located in the study area would be affected directly or indirectly by the Modified LPA. Specific data reviewed include the following:
    - Existing and proposed drainage patterns within the construction footprint.
    - Designated beneficial uses of study area streams.
    - Water quality status in study area receiving waters, including existing and anticipated 303(d) listings, TMDLs, and Water Quality Management Plans.
    - Project-specific sediment sampling data.
4. Reviewed the conceptual stormwater design, which proposes how stormwater may be conveyed, treated, and discharged.
5. Consulted with local, state, and federal water quality and stormwater agency representatives and interested parties.
6. Conducted field visits to study area waterways, road alignments, and stormwater outfall locations. During site reconnaissance surveys, collected data on existing conditions of study area waterways, existing stormwater facilities, and proposed locations for such facilities.
7. Calculated new and existing impervious surfaces using computer-aided design (CAD) and GIS mapping.
8. Calculated total disturbed area related to both in-water and out-of-water construction to assess temporary impacts.

Annual pollutant load estimates were conducted using Method 1: WSDOT Data-Federal Highway Administration (FHWA) Method as outlined in the WSDOT (2009) guide titled "Quantitative Procedures for Surface Water Impact Assessment." This method was selected because it provides estimates of pollutant loading for a wide range of average daily traffic volume highways (1,700 to 93,000) using data derived from observations made on highways in western Washington since 2001. It is directly applicable to the Program's location and is based on recently collected WSDOT data.

2.5 Analysis Methods

2.5.1 Long-Term Impacts

Long-term impacts are those that will remain after construction of the Modified LPA is complete. Beneficial and adverse potential long-term operational impacts of the Modified LPA on drainage systems and surface and ground water resources were determined by analyzing and reviewing the following:

- *Floodplain Impacts*. Floodplain impacts from the Modified LPA were compared by estimating its approximate footprint (e.g., loss of storage) and the extent of potential conveyance constrictions created by bridge crossings.
- *Groundwater Infiltration Impacts*. Increased impervious area can result in reduced groundwater recharge that, in some cases, can impact groundwater. For the Modified LPA, these were assessed by accounting for the total area of impervious surface over land resulting from new construction. Bridge segments directly over North Portland Harbor and the Columbia River were not included in the impervious surface tally for this particular impact analysis. Impervious surface area was further distinguished by study-specific watersheds.
- *Surface Water Quality Impacts*. Long-term surface water quality impacts were assessed based on comparisons of impervious surface areas requiring stormwater collection and by proximity to surface waters. Roadway located underneath another roadway, such as an overpass, was included in the impact analysis. Where new construction replaces existing impervious surface, the effectiveness of treating the existing road runoff was considered. Existing runoff characteristics were determined from topographic maps and field observations. The study-specific watersheds for the impervious discharge of additional runoff were determined to assess the extent of interbasin transfers of stormwater runoff. A pollutant load analysis was performed for key constituents found in road runoff using Method 1: WSDOT Data-FHWA Method. Potential erosion impacts were assessed through examination of topographic maps, proximity of ground disturbance to drainage channels/streams, and vegetation loss.
- *Groundwater Quality Impacts*. Long-term groundwater impacts were assessed generally in all areas affected by construction and, more specifically, in areas lying in proximity of federal, state, and locally designated groundwater/wellhead protection zones.
- *Existing Drainage System Constraints*. Local jurisdictions were contacted for information about existing drainage system constraints.
- *Beneficial Impacts*. Since stormwater treatment would be provided in areas not currently receiving treatment, beneficial impacts were discussed.
- *Impacts Requiring Mitigation*. Impacts requiring mitigation are considered permanent, or long-term, impacts to the affected resource. Mitigation off sets the impact but does not avoid it being permanent.

2.5.2 Temporary Construction Impacts

Construction activities can impact surface water quality by allowing increased erosion, disturbing the beds and banks of waterbodies, discharging construction materials and chemicals incidentally, and removing shading vegetation. Temporary construction impacts are those resulting from construction activities, and these impacts would either revert to pre-construction conditions or be restored to pre-construction conditions at the end of construction activities. Construction activities include, but are not limited to mobilization, ground disturbance, a required alteration of the natural environment to implement the project as described in the drawings, specifications, and permits. Impacts that occur during construction that cannot be avoided and require mitigation, are considered permanent impacts, offset by mitigation.

Groundwater quality could be affected by direct infiltration of contaminants during below-grade construction and by infiltration of contaminated surface water.

Potential temporary construction impacts associated with the Modified LPA were determined by evaluating the total area of demolition and construction activities, the total area of below-grade construction, and implementation of impact minimization measures. The temporary construction impact analysis focused on the following:

- Area of total disturbance.
- Impacts from fine sediment and contaminants (e.g., hydraulic oil, fuel, etc.).
- Erosion/soil characteristics.
- Depth to groundwater.
- Streambank/slope steepness.
- Amount of in-water work.

2.5.3 Indirect Impacts

Indirect impacts include those that are not a direct result of the Modified LPA but would occur later in time or farther in distance as a result of the Modified LPA. Potential indirect impacts were determined by evaluating how the Modified LPA would comply with state and local land use plans intended to avoid or minimize impacts in light of the population growth and development anticipated to occur in the region.

3. AFFECTED ENVIRONMENT

3.1 Introduction

This section presents the existing water quality and hydrologic conditions within the study area and study-specific watersheds. For purposes of this technical report, the study area is differentiated by the study-specific watersheds (Figure 2-1), which are primarily referenced as "receiving waters" where runoff from the Modified LPA could potentially be discharged. The following discussion describes the baseline conditions of those receiving waters in terms of hydrology, water quality, and stormwater.

3.2 Regional Conditions

3.2.1 Surface Water Hydrology

The Columbia River mainstem and North Portland Harbor (a branch of the Columbia River south of Hayden Island) both cross under I-5 within the study area, while the Columbia Slough and Burnt Bridge Creek cross I-5 south and north of the study area, respectively. Thus, the Columbia River and North Portland Harbor dominate the topography of the study area. North Portland Harbor is part of the same body of water as the Columbia River but is named differently in this report to distinguish the part of the waterbody south of Hayden Island (North Portland Harbor) from the part of the waterbody north of the island (Columbia River). The study area lies within the Columbia River main valley, except for a small area north of the SR 500 interchange that is located in the Burnt Bridge Creek watershed (Figure 2-1). Burnt Bridge Creek flows into Vancouver Lake before discharging to the Columbia River. In addition, runoff from the Delta Park area between North Portland Harbor and the lower Columbia Slough, which used to be part of the Columbia River floodplain, is now discharged to the lower Columbia Slough via pump stations. The Columbia Slough, which parallels the Columbia River floodplain, discharges near the confluence of the lower Willamette River and Columbia River.

The study area around the Ruby Junction Light-Rail OMF in Gresham, Oregon, lies within the 100-year floodplain of Fairview Creek (Figure 2-1). Fairview Creek discharges into the upper Columbia Slough downstream of the maintenance facility.

Study area elevations vary from approximately 10 feet in the Columbia River floodplain south of North Portland Harbor to about 220 feet at the drainage divide between the Columbia River and Burnt Bridge Creek valleys. South of the Columbia River, the study area is located entirely in a relatively flat and low-lying floodplain. Drainage within the floodplain is not well-defined and the Columbia Slough, which parallels the Columbia River floodplain, discharges into the Willamette River. North of the Columbia River, the study area is located within the gently sloped river valley.

Table 3-1 shows the average monthly discharges for each of these watercourses based on data available from U.S. Geological Survey (USGS) gauging stations. The information provides an indication of the relative size of each waterbody and permits a comparison of estimated project runoff with discharges in waterbodies receiving that runoff.

Table 3-1. Average Monthly Discharge (cubic feet per second) of Receiving Waters

Month	Columbia Slough at Portland (USGS 14211820)[a]	Columbia River at Vancouver (USGS 14144700)[b]	Burnt Bridge Creek near Mouth (USGS 14211902)[c]	Fairview Creek near Gresham (USGS 14211814)[d]
January	160	164,000	44	10
February	155	181,000	41	8.5
March	127	179,000	44	8.6
April	103	223,000	31	6.9
May	49[e]	308,000	23	5.2
June	88[f]	363,000	16	4.2
July	97	242,000	11	2.5
August	82	150,000	8.4	2.0
September	72	107,000	7.5	2.3
October	91	110,000	14	3.9
November	104	127,000	33	6.8
December	131	144,000	39	9.6

a USGS (2023a) from October 1989–September 2020.

b USGS (2023b) from October 1963–May 1970, April 2016–September 2021.

c USGS (2023c) from October 1998–September 2000, October 2010–October 2012.

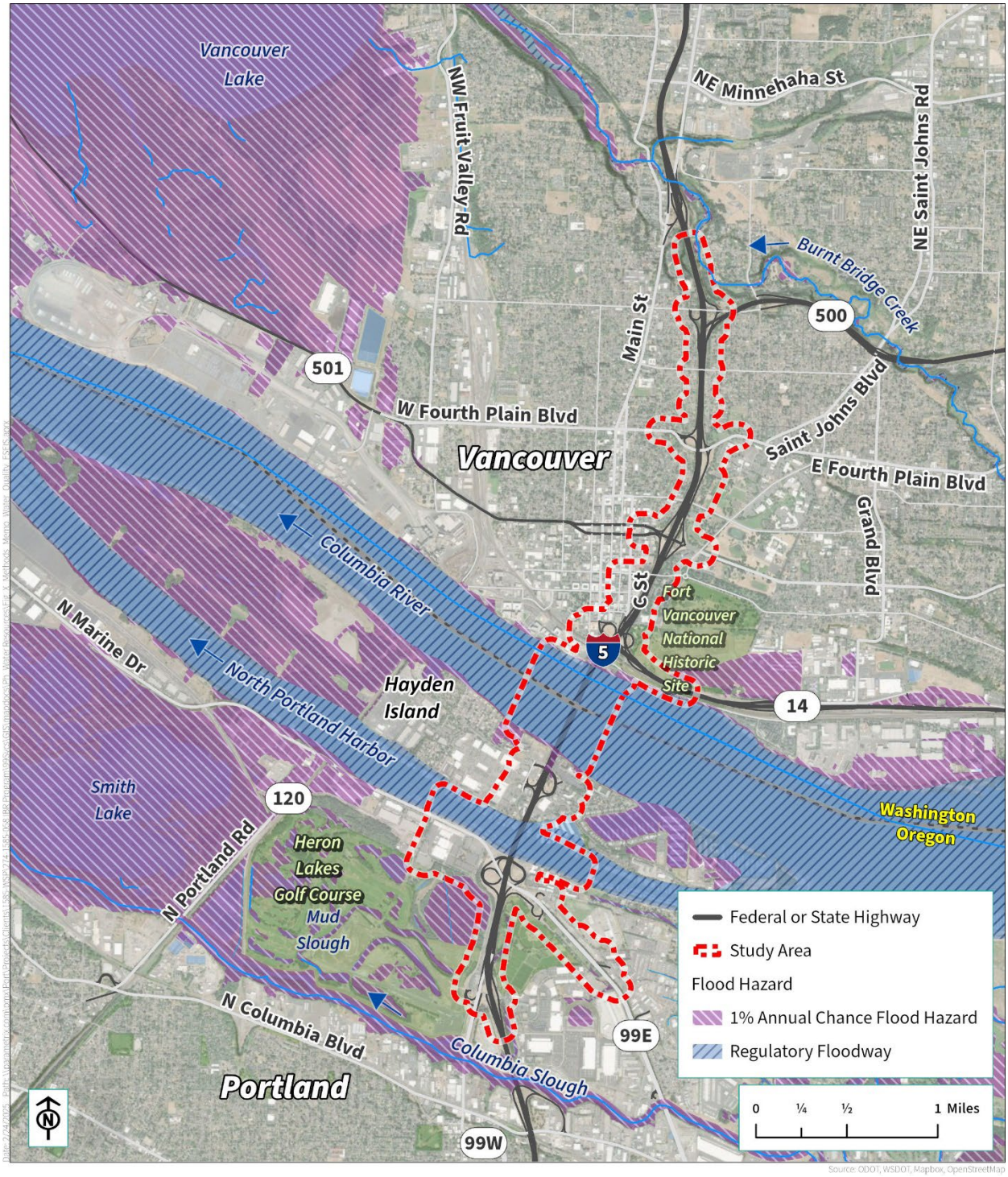
d USGS (2023d) from October 1992–March 2020.

e Average monthly reverse flow from the Willamette River was recorded in 1997, 2006, 2008, 2011, and 2018.

f Average monthly reverse flow from the Willamette River was recorded in 1990.

In the study area, floodplains designated by the Federal Emergency Management Agency (FEMA) that include those adjacent to the Columbia Slough, the Columbia River, and Burnt Bridge Creek (Figure 3-1). These floodplains are confined to the immediate vicinity of streams by levees or, in the case of Burnt Bridge Creek, by steep slopes. For reference, the FEMA-modeled water surface elevation of the 100-year floodplain at the Interstate Bridge crossing of the Columbia River is approximately 32 feet referenced to the North American Vertical Datum of 1988 (NAVD88).

Figure 3-1. Federal Emergency Management Agency Floodplain Boundaries in the Study Area



3.2.2 Local Climate

The study area is characterized by short, dry, warm summers, with typically cool and wet spring, fall, and winter. The Coast Range to the west of the study area offers limited shielding from Pacific Ocean storms, while the Cascade Mountains to the east provide an orographic lift of moisture-laden westerly winds, resulting in moderate rainfall. As measured by NOAA monitors at the Portland International Airport (PDX), nearly 90% of the average annual rainfall of approximately 36 inches occurs from October through May (NOAA 2022). The maximum daily rainfall recorded was 2.69 inches in November 1996. Average annual snowfall accumulations are approximately 2 inches, and usually melt within a couple of days. The two-year, 24-hour rainfall event in the study area vicinity is 2.4 inches, at PDX (BES 2020; ODOT 2008).

Average monthly temperatures taken at PDX by NOAA (2022) vary from approximately 41 degrees Fahrenheit (°F) in January to 70°F in August. The maximum recorded temperature was 116°F in June 2021, and the minimum recorded temperature was -3°F in February 1950. Surface winds seldom exceed sustained wind speeds of 50 miles per hour, and gusts have rarely exceeded 75 miles per hour (NOAA 2022).

3.2.3 Groundwater

Within the Portland Basin Aquifer System on the Oregon side, the study area is located on the unconsolidated sedimentary aquifer of the upper sedimentary subsystem (McFarland and Morgan 1996). This aquifer consists primarily of late Pleistocene catastrophic flood deposits and Columbia River alluvium. Recharge of the aquifer is from infiltration of precipitation, via injection wells, and also from septic systems. Median hydraulic conductivity (the rate at which groundwater flows through soil and bedrock) of the aquifer is high, approximately 200 feet per day. However, surface and upper surface level infiltration in urban areas, such as within the study area, has been shown to have lower hydraulic conductivity due to experiencing decades of urban-development compaction of those surficial soil layers (Gregory et al. 2006).

South of the Columbia River, several wells have been identified within the study area and are likely screened within the unconsolidated sedimentary aquifer. These wells are used for a variety of industrial, irrigation, and municipal purposes. For further details on these wells, refer to the IBR Geology and Soils Technical Report.

North of the Columbia River, the I-5 corridor and other infrastructure facilities are underlain by the unconsolidated sedimentary aquifer and the Troutdale Aquifer. The Troutdale Aquifer is a water supply for Vancouver and has been designated by the EPA as a Sole Source Aquifer (SSA). An SSA is an aquifer that supplies at least 50% of the drinking water for its service area, and for which there are no reasonably available alternative drinking water sources should the aquifer become contaminated. Under this designation, proposed federal financially assisted projects that have the potential to contaminate the aquifer are subject to EPA notification and review.

Consistent with the SSA designation and with critical areas management dictated by Washington state law, Special Wellhead Protection Areas have been designated within the Washington portion of the study area. As shown in Figure 3-2, “contribution” zones are delineated based on the amount of

time that groundwater contamination would take to spread into each zone. There is one Special Wellhead Protection Area that overlaps the study area.

The City of Vancouver has designated the entire area within the city boundary as a Critical Aquifer Recharge Area. VMC 14.26.120 lists actions that are prohibited within a Critical Aquifer Recharge Area, such as hazardous material municipal waste disposal. Figure 3-2 identifies two Special Wellhead Protection Areas designated by the City of Vancouver, surrounded by 1,000- and 1,900-foot buffers and subject to the prohibitions of the Critical Aquifer Recharge Area. In addition, the Special Wellhead Protection Areas are subject to further provisions.

3.2.4 Relevant Land Uses

North of the Columbia River, zoning west of I-5 is designated city center and includes a concentrated combination of retail, office, civic, and housing development. East of I-5 is designated as central park mixed-use and includes Pearson Air Field, Clark College, the Portland VA Medical Center-Vancouver, and the Vancouver National Historic Reserve, as well as some residential development.

Zoning on Hayden Island is designated as mixed-use neighborhood with a combination of retail, office space, and floating homes. South of the Columbia River, zoning designations are primarily general industrial and open space with some mixed-use neighborhood zoning east of I-5.

Land uses at the Ruby Junction Light-Rail OMF are zoned heavy industrial and are abutted by a mix of residential and commercial developments.

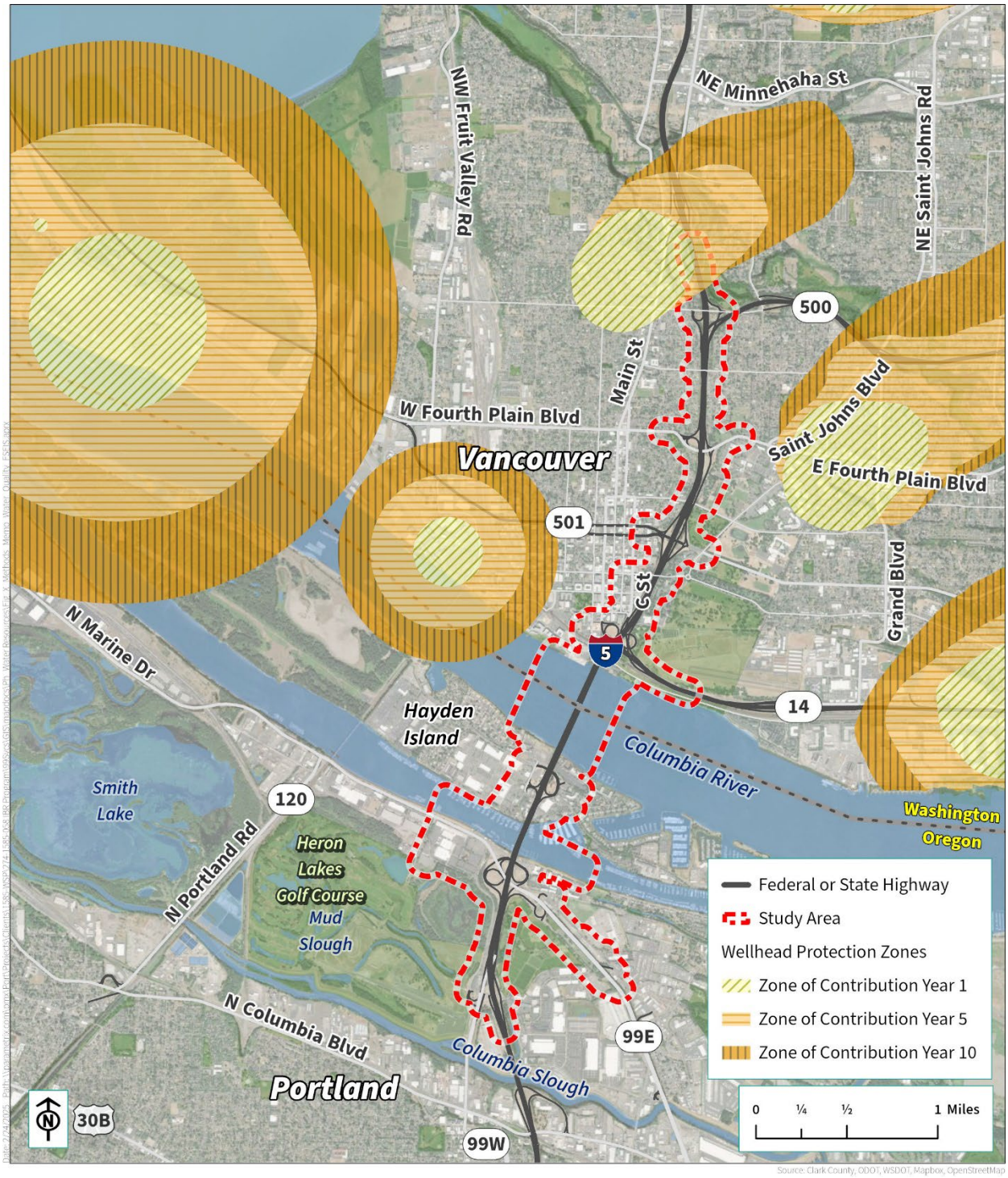
Additional references to land uses relevant to the Modified LPA in the study-specific watersheds are provided in the following sections.

3.2.5 Storm Drainage

In general, continuous curbs and concrete barriers confine surface runoff within I-5 and closed (pipe) drainage systems convey flows to surface water outfalls. Runoff from the bridges across North Portland Harbor and the Columbia River drains through scuppers to the water surface below.

The purpose of stormwater management strategies is to reduce stormwater runoff peak flows and the pollutants discharged into receiving waters from project-related changes in impervious surface area. BMP facilities have been shown to effectively reduce sediment, metals (including dissolved metals), and other pollutants from runoff. BMP effectiveness in removing polycyclic aromatic hydrocarbons (PAHs), microplastics, and CECs, including 6PPD (the additive component to rubber tires that forms the pollutant 6PPD-quinone now known to be toxic to fish and other aquatic life), are less well known because the fate and transport of these pollutants remain unclear. However, emerging BMP technologies continue to evolve to address pollutants other than sediment and metals (WSDOT 2022).

Figure 3-2. Wellhead Protection Zones



Existing stormwater treatment within the study area occurs in only a few areas. The only engineered water quality facility within the study area is a treatment and infiltration pond in the Burnt Bridge Creek watershed. The facility reduces sediment, metals, and other pollutants from runoff and is considered to be adequate treatment. In addition, a 3-acre area within the Columbia Slough watershed is infiltrated in adjacent pervious area and does not discharge to existing outfalls. Table 3-2 shows the existing conditions of the stormwater treatment along the study area by receiving waterbody.

Table 3-2. Existing Stormwater Drainage (acres)

Receiving Waterbody	Location along the Study Area	Total Contributing Impervious Area	Infiltrated Impervious Area	Treated Impervious Area Draining to Outfall(s)	Untreated Impervious Area Draining to Outfall(s)
Columbia Slough	Victory Boulevard interchange to the Southwest Marine Drive interchange	38.5	3.0	0.0	35.5
Columbia River – Oregon State	Marine Drive west of I-5 to the Columbia River bridges	45.8	0.0	0.0	45.8
Columbia River – Washington State	Columbia River bridges to downtown Vancouver	76.4	3.0	0.0	73.4
Burnt Bridge Creek	I-5 near SR 500	9.6	7.9	0.0	1.7
Fairview Creek	Ruby Junction Light-Rail OMF located approximately 12 miles east of I-5	7.3	7.3	0.0	0.0
	Totals	**177.6**	**21.2**	**0.0**	**156.4**

I-5 = Interstate 5; SR = State Route

3.3 Receiving Waters

3.3.1 Columbia Slough

3.3.1.1 Waterbody Description

The Columbia Slough is a slow-moving, low-gradient drainage channel running nearly 19 miles from Fairview Lake in the east to the Willamette River in the west. The slough is a remnant of the historic system of lakes, wetlands, and channels that once dominated the south floodplain of the Columbia River. The Columbia Slough and surrounding area were historically used by Native Americans for fishing, hunting, and gathering food (DEQ 2012).

The Columbia Slough watershed drains approximately 32,700 acres of land in portions of Troutdale, Fairview, Gresham, Maywood Park, Wood Village, and unincorporated Multnomah County. The Columbia Slough Watershed Council and the City of Portland Bureau of Environmental Services (BES) Community Watershed Stewardship Program partnered with the Confederated Tribes of Grand Ronde in 2019 to investigate the health of the Columbia Slough for continued cultural practice (Columbia Slough Watershed Council 2020). Research on the health of Wapato from four separate sites in Columbia Slough—Wapato Slough, Ramsey Slough, Blind Slough, and Frog Spring—is ongoing.

The Columbia Slough and areas to its north are currently intensively managed to provide drainage and flood control with pumps, weirs, and levees; it is divided into upper, middle, and lower reaches. The upper and middle reaches receive water from Fairview Lake, Fairview Creek, Wilkes Creek, groundwater, natural springs, and overland flow and stormwater outfalls from PDX and other industrial, commercial, and residential neighborhoods in the surrounding area. Flows and water levels in the upper and middle reaches are managed to mitigate low dissolved oxygen issues, while allowing for withdrawals, flood control, and recreation (BES 2021). Over half of the system is considered highly altered by these facilities (BES 2019). The lower reach is tidally influenced, while flows in the middle and upper reaches are controlled by pumping and gravity gates (BES 2011).

In July 2005, a ROD was issued for the Columbia Slough Sediment Program, a cleanup program developed by the DEQ and the City of Portland (DEQ 2005). The Columbia Slough Sediment Program aims to remediate widespread sediment contamination through source control contamination reduction, contaminant removal by dredging “hot spots,” and long-term monitoring to ensure the Program’s effectiveness (BES and DEQ 2011). The Program seeks to control sources of pollution, treat stormwater runoff, and clean up contaminated sediments in the lower Columbia Slough, Whitaker Slough, and Buffalo Slough. DEQ has signed separate agreements with the Oregon Department of Fish and Wildlife (ODFW) and the UFSWQD in regard to cleanup activities in the Columbia Slough (BES and DEQ 2022).

The study area crosses the lower reach of the Columbia Slough near river mile (RM) 6.5. The lower reach extends from the Peninsula Drainage Canal to the Willamette River, less than 1 mile south of its confluence with the Columbia River. It undergoes 1 to 2 feet of tidal fluctuation in its water surface elevation. Water levels are generally unmanaged but are affected by the management of the dams on the Columbia and Willamette Rivers (DEQ 2012). The channel bottom in the lower reach ranges from elevation 2.0 to 4.5 feet National Geodetic Vertical Datum of 1929 (NGVD29), and the water surface

elevation has been known to be as low as 2.4 feet NGVD29 and as high as 28.8 feet NGVD29 (USGS 2023a). The channel is generally between 100 and 200 feet wide. The lower reach receives water inputs from combined sewer overflows, stormwater, Smith and Bybee Wetlands, leachate from the St. John's Landfill, and the upper Columbia Slough (DEQ 2012). The majority (99%) of combined sewer overflows to the Columbia Slough have been controlled. However, 13 combined sewer overflow outfall pipes remain and may overflow into the Columbia Slough once every 10 years in summer and once every 5 years in winter on average (BES 2021).

The Columbia Slough watershed contains three drainage districts: Peninsula Drainage District No.1 (PEN 1), Peninsula Drainage District No. 2 (PEN 2), and the UFSWQD. Only PEN 1 and PEN 2 are located within the construction footprint of the Modified LPA, and they include areas north of the Columbia Slough. I-5 is the boundary between the two districts, with PEN 1 located to the west and PEN 2 to the east. Day-to-day operations of both districts are managed by the UFSWQD. Both PEN 1 and PEN 2 are protected by the Columbia River levees and rely on pump stations to move water through and out of the district areas.

The I-5 crossing of the Columbia Slough is in a highly urbanized area. Riparian habitat along the slough has been largely replaced by buildings and paved surfaces, although grasses, trees, and shrubs are present, especially along the south bank. However, riparian areas along the slough are generally not adequate to provide shade, bank stabilization, sediment control, pollution control, or streamflow moderation. The predominant land use around the Columbia Slough in the study area is light industrial, with some residential. The Columbia Slough connects to the Willamette River approximately 6.5 miles west of the study area, within a mile of the confluence of the Columbia and Willamette Rivers (BES and DEQ 2022).

Historically, the Columbia Slough consisted of multiple channels in a braided floodplain of wetlands, lakes, and waterways. However, much of the slough's wetland habitat has been filled, dredged, channelized, or degraded by current and past land uses. Prior to the construction of a main sewage treatment plant in 1951, raw sewage and industrial waste were dumped directly into the Columbia Slough and other Portland watersheds. Combined sewer outflow discharges to the Columbia Slough have nearly been eliminated in recent years (BES 2011). Remnant wetlands and restored wetlands in the slough watershed provide some thermoregulation and nutrient removal. The IBR Wetlands and Other Waters Technical Report discusses these wetlands in more detail. The DEQ has listed the beneficial uses of the Columbia Slough as irrigation, domestic and industrial water supply, livestock watering, anadromous fish passage, salmonid fish rearing, salmonid fish spawning, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, and hydropower (BES 2011).

3.3.1.2 Hydrology

The Columbia Slough area is highly urbanized with a complex system of roadways (including I-5, state highways, local access roads, and residential streets), parking lots, and other impervious surfaces. Approximately 36% of the watershed area contains impervious surfaces (BES 2011). The Columbia Slough has undergone profound hydrologic alteration. Originally, the Columbia Slough was a side channel of the Columbia River. Today, the Columbia Slough's original inlet is blocked at the upstream end, and it no longer receives flows from the Columbia River. The lower reach, downstream of

pumping facilities and gravity gates, remains tidally influenced by the Columbia and Willamette Rivers. Numerous dikes, pumps, and weirs regulate flows to, from, or within the slough.

The USGS monitors flows of the Columbia Slough within the lower reach at RM 0.6. Average monthly discharge recorded by USGS between 1989 and 2020 was 105 cubic feet per second (cfs). Maximum daily mean discharge occurred December 5, 1995, and was 2,400 cfs (USGS 2023a). Minimum daily mean discharge occurred February 7, 1996, and was 6,700 cfs. Flows of the lower reach are tidally influenced, and the tides can cause flow direction to be reversed (USGS 2023a). Average monthly discharges are shown in Table 3-1. The levee (at RM 8.5) between the Lower Slough and Middle Slough prevents reverse flows from entering the Middle Slough (BES 2009). Above the Lower Slough, flows are regulated by piped water, levees, and pumps (BES 2021).

3.3.1.3 Water Quality

BES has undertaken intensive water quality monitoring on the Columbia Slough since 1994. BES collects continuous, 15-minute-interval water quality measurements at three stations, one from each of the three reaches in the Columbia Slough; the parameters include water temperature, pH, dissolved oxygen, and conductivity (BES 2022). Additionally, BES collects water quality grab samples from a different set of 25 sites in the Columbia Slough for a comprehensive suite of laboratory analyses, which includes metals, nutrients, solids, and bacteria (BES 2022).

DEQ placed the slough on the state's 303(d) list in 1994/1996. The Columbia Slough is 303(d) listed for biocriteria, temperature, iron, and aquatic weeds (DEQ 2022). The DEQ defines biocriteria as the measure by which "Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities" (OAR 340-041-0011). TMDLs have been established for pH, dissolved oxygen, phosphorus, chlorophyll *a*, bacteria, lead, polychlorinated biphenyls (PCBs), dichlorodiphenyldichloroethylene (DDE)/dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin, and temperature (DEQ 1998, 2006).

TEMPERATURE

The Willamette Basin TMDL: Lower Willamette Subbasin established TMDLs for tributary streams, including the Columbia Slough. The TMDL follows the state water quality standard of 18 degrees Celsius (°C) (64°F) criteria for salmon and trout rearing and migration in the slough (DEQ 2006). Water temperature in the lower reach does not meet this standard during the summer. The main cause of elevated water temperatures is likely the installation of levees that alter the slough's physical features. Elevated water temperatures are also likely due to the lack of shade sources, long water residence time in a shallow channel, and the altered hydrological cycle with reduced aquifer recharge and groundwater inflow during summer months (BES 2021).

SEDIMENT/TURBIDITY

As a stormwater-receiving waterbody, the Columbia Slough has DEQ-established statewide benchmarks for total suspended solids (TSS). The DEQ has set a benchmark of 30 milligrams per liter (mg/L) of TSS for stormwater discharges to the slough (DEQ 2022). Downstream of the study area, in the Portland International Raceway area, less than 50% of BES sampling met the target. Generally, however, TSS improves as one moves upstream of the confluence with the Willamette River.

Upstream of the study area, near the Vancouver Avenue crossing of the slough, more than 90% of sampling met the target.

The slough contains fine, silty sediment with a relatively high organic matter content. It gradually accumulates sediment, a process known as aggrading. Major sources of TSS in the slough include stormwater from streets, parking lots, driveways, agricultural runoff (in the upper and middle reaches), construction activities, sediment resuspension, and bank erosion.

Water quality is somewhat compromised by this excessive sediment and turbidity. The Columbia Slough near the study area is considered not properly functioning for suspended sediment and turbidity. Appropriate erosion and sediment control BMPs are required to minimize and avoid sediment discharges and elevated turbidity (BES 2021).

CHEMICAL CONTAMINATION/NUTRIENTS

The Columbia Slough is 303(d) listed for biocriteria, iron, and aquatic weeds. TMDLs have been established for pH, dissolved oxygen, phosphorus, chlorophyll *a*, bacteria, lead, PCBs, DDE/DDT, dieldrin, dioxin, and temperature (DEQ 1998, 2006).

Low levels of sediment contamination are found throughout the slough, with the main risks being PCBs and pesticides in fish tissues. Disposal of PCBs was not regulated prior to 1979, and their presence in the Columbia Slough watershed is likely from past practices. PCBs bioaccumulate and are environmentally persistent (DEQ 1998).

The lower reach consistently exceeds the upper pH limit of the water quality standard in the spring and summer and the chlorophyll *a* standards in the spring, summer, and fall (BES 2021).

Transportation, land uses, stormwater runoff, industrial discharges, contaminated sites, auto wrecking yards, sediments, and air emissions are the main contributors to lead in the Columbia Slough. Other sources of chemical pollutants and nutrients include illegal dumping and hazardous spills. Lead samples taken in the lower reach met the dissolved lead standard, and 70% to 90% of the samples taken in the study area also met the total lead standard (BES 2021).

In addition to the contaminants listed above, dissolved copper—a neurotoxicant that damages the olfactory abilities of fish—is also known to occur in the Columbia Slough. Dissolved copper associated with highway runoff is a result of brake pad wear and vehicle exhaust; concentrations typically found in road runoff are within the range shown to affect predator avoidance and other behaviors (Hecht et al. 2007). Concentrations found in runoff are influenced by a number of factors, including traffic volume, congestion, adjacent land uses, air quality, and the frequency and duration of storms.

3.3.1.4 Stormwater Drainage

Conditions in the Columbia Slough, such as slow-moving water and existing water quality problems, make this waterbody more sensitive to TSS and other contaminants than other waterbodies within the study area.

Based on data available from the Natural Resources Conservation Service (NRCS), surficial soils in this area are mainly composed of the Sauvie-Rafton-Urban land complex. These soils belong to Hydrologic

Group D and have a low infiltration rate and high runoff potential. A soil survey conducted for Multnomah County indicates that water tables in this area are at a depth of less than 1 foot. Borehole logs available for the study area confirm the depths for the Sauvie-Rafton-Urban complex and also indicate that the soils can be highly variable. Land west and east of I-5 and south of North Portland Harbor generally has an industrial and open space zoning designation.

In this stormwater drainage area, much of I-5, Marine Drive, and NE Martin Luther King Jr. Boulevard are elevated on embankments or structures. The stormwater conveyance systems that serve these elevated roads do not convey runoff generated outside the right of way. These embankments are also part of the levee system. Surface runoff from I-5 and the roads within the study area is mostly confined to the roadway surface by continuous concrete barriers or curbs. It is collected almost entirely by closed gravity drainage systems consisting of inlets and stormwater pipes. One notable exception is NE Martin Luther King Jr. Boulevard east of I-5 where runoff is shed off the south shoulder and is conveyed in a system of sloughs before being discharged to the Columbia Slough via one of the PEN 1 or PEN 2 pump stations. Each pump station has two pumps with a design goal that each pump is capable of meeting at least two-thirds of the total pump station capacity. The measured capacities for the pump stations appear to be less than their rated capacities, which is likely due to the age of the pumps and other equipment and the condition of the discharge pipelines.

Within the study area, the existing impervious area in the Columbia Slough watershed is approximately 38.5 acres. Runoff from approximately 3 acres (NE Martin Luther King Jr. Boulevard and Union Court) is dispersed into adjacent impervious areas that are not connected to downstream conveyance (pipes or sloughs). Runoff from these areas generally ponds until it either infiltrates or evaporates. There are no flow control measures for runoff within the study area beyond the regulation of discharges provided by pump station operation. There are no engineered water quality facilities within the Columbia Slough study-specific watershed.

3.3.2 Columbia River and North Portland Harbor

3.3.2.1 Waterbody Description

The Interstate Bridge is located at RM 106 of the Columbia River. Shallow and near-shore habitat is present in the study area on both the Oregon and Washington shores and is influenced by flow and sediment input from tributaries and the mainstem river, which eventually settles to form shoals and shallow flats (USACE 2003).

Within the study area, the Columbia River and North Portland Harbor are a constrained and highly managed waterway primarily influenced by upstream dams; landform and bridge footings are the dominant and subdominant floodplain constrictions, respectively. Ten bridge footings are currently located below the OHWM. The IBR Wetlands and Other Waters Technical Report discusses the OHWM in more detail. A flood control levee runs along the south bank of North Portland Harbor and forms a boundary between the adjacent neighborhoods and the harbor. Sandy beaches created by dredge disposal are also present along the lower Columbia River. Shoreline erosion rates are likely slower than they were historically due to flow regulation and riverbank protection. The river channel is deeper and narrower than historical conditions and is routinely dredged as part of the Columbia and Lower Willamette Federal Navigation Channel Project, a joint effort by the USACE and the ports of

Kalama, Longview, Portland, Vancouver, and Woodland to maintain shipping navigation (USACE 2017a). The USACE and five lower Columbia River ports are developing an environmental impact statement for a long-term plan to maintain the river's 43-foot depth for another 20 years (USACE 2017b).

North Portland Harbor is a large side channel of the Columbia River located along the southern bank of Hayden Island. The channel branches off the Columbia River approximately 2 river miles upstream (east) of the existing bridge site and flows approximately 4.5 river miles downstream (west) before rejoining the mainstem Columbia River.

For the stormwater analysis, the Columbia River Watershed has been divided into the south and north sides of the river. The Columbia River South Watershed includes the portion of the study area that discharges to North Portland Harbor (a side channel of the Columbia River) and to the Columbia River south of the Oregon-Washington state line, including the Hayden Island area. The Columbia River North watershed includes the study area from the Oregon-Washington state line north to the SR 500 interchange.

3.3.2.2 Hydrology

Development of the hydropower system on the Columbia River has significantly influenced peak seasonal discharges and the velocity and timing of flows. The Columbia River estuary historically received annual spring freshet flows, which have been reduced on average by 50% to 55%. Flows between October and March have increased by 35% compared to historic rates (ISAB 2000). Average monthly discharges recorded by USGS on the Columbia River between 1963 and 2020 varied between 110,000 and 363,000 cfs. Maximum daily mean discharge occurred on June 19, 1964, and was 675,000 cfs (USGS 2023b). Minimum daily mean discharge occurred on September 23, 2018, and was 67,900 cfs. Average monthly discharges are shown in Table 3-1.

The Columbia River is also tidally influenced in its lower reaches below Bonneville Dam, which includes the study area. Flows and water surface elevations in this area are influenced by tidal fluctuations, resulting in minimal streamflow at times and daily elevation changes. On rare occasions, reverse flow may occur (ISAB 2000).

The study area in the vicinity of the Columbia River is highly urbanized and contains a complex system of roadways, including I-5, state highways, local access roads, and residential streets), parking lots, and other impervious surfaces. Over the past 150 years, historic off-channel areas have been filled, rechanneled, diverted, and otherwise developed for agricultural and urban use. The channelization of the watershed in addition to the development of the hydropower system have dramatically altered the historical hydrologic regime.

3.3.2.3 Water Quality

TEMPERATURE

A TMDL for temperature in the Columbia and lower Snake Rivers was established in May 2020. The TMDL applies a 20°C (68°F) summer maximum criterion for salmon and steelhead migration to the lower 397 miles of the Columbia, which includes the study area (EPA 2021b). Water temperatures in

the vicinity of the study area exceed the 20°C standard for salmon and steelhead migration an average of 7 days per year. Since the 1960s, summer water temperatures in the Columbia River have increased by approximately 1.5°C (EPA 2021a).

Upstream river flows are highly controlled by dams and diversions on the mainstem Columbia River and its tributaries. Dams on the Columbia River elevate water temperatures during summers, contributing to elevated water temperatures in the study area (EPA 2021b). Riparian vegetation that could play a role in regulating water temperatures is lacking in the vicinity of the study area. However, due to the size of the Columbia River, riparian vegetation would play a minor, if any, role in temperature regulation.

SEDIMENT/TURBIDITY

Suspended sediment (e.g., sand, silt, and clay particles) is a naturally occurring component of the riverine habitat in the study area, and has historically been influenced by flow and currents, rain events, and geologic events (e.g., earthquakes and volcanic activity). The movement and deposition of suspended sediments in the water column and through the river system are an important component of habitat-forming processes that contribute to the creation and maintenance of shallow water habitats capable of sustaining emergent and riparian vegetation.

Turbidity in the study area is very low. From October 2002 to November 2010, Ecology conducted water quality sampling approximately 3 miles upstream of the Interstate Bridge (Ecology 2021a). Of 43 samples, all were 12 nephelometric turbidity units (NTUs) or under, and 34 were 5 NTUs or under, which is extremely low turbidity.

CHEMICAL CONTAMINATION/NUTRIENTS

The Columbia River and North Portland Harbor do not meet the DEQ standards and are 303(d) listed for the following parameters: PCBs, PAHs, and DDT metabolites (DDE 4,4') (DEQ 2022). The Columbia River is on Ecology's 303(d) list for vinyl chloride (Ecology 20222). In addition to the 303(d) listings, the EPA has issued TMDLs for the Columbia River for dioxin (EPA 1991), temperature (EPA 2021b), and total dissolved gas (DEQ and Ecology 2002).

In addition to the contaminants listed above, dissolved copper—a neurotoxicant that damages the olfactory abilities of fish—is known to be present in the Columbia River above naturally occurring levels (Fuhrer et al. 1996). Dissolved copper associated with highway runoff is a result of brake pad wear and vehicle exhaust; concentrations typically found in road runoff are within the range shown to affect salmonid predator avoidance and other behaviors (Hecht et al. 2007). Concentrations found in runoff are influenced by a number of factors, including traffic volume, congestion, adjacent land uses, air quality, and the frequency and duration of storms.

Two sites near the study area in North Portland Harbor have been identified that indicate elevated levels of contamination: Diversified Marine and Schooner Creek Boat Works. At Diversified Marine, heavy metals, benzene, toluene, ethylbenzene, and xylene (BTEX); PAHs; chlorinated volatile organic compounds; and PCBs are potentially contaminating soil, groundwater, river sediments, and surface water. The EPA completed a preliminary assessment of the Diversified Marine site and sampled river sediments at a distance of 200 to 250 feet from shore. The samplings showed that elevated metal

levels were below levels of significant concern 200 feet downstream from the site. The DEQ is concerned about shoreline releases of metals, petroleum hydrocarbons, PCBs, and semivolatile organic compounds from this site.

At Schooner Creek Boat Works (Pier 99), the EPA completed a site investigation in August 2009. The data collected indicate that site soils are contaminated with heavy metals, PAHs, PCBs, DDT, phthalates, and tributyltin at concentrations that pose a potential risk to on-site workers, adjoining residents, on-site plants and wildlife, and nearby aquatic life. Sediments at the boat dock area are contaminated with metals, PAHs, and DDT that represents potential toxic and bioaccumulative threats to aquatic life.

3.3.2.4 Columbia River South Stormwater Watershed (Oregon)

Surficial soils on Hayden Island consist of the Pilchuck-Urban land complex based on available NRCS data. They are Hydrologic Group A soils that have a high infiltration rate and consist mainly of deep, well-drained to excessively-drained sands or gravelly sands. Available borehole information confirms this description. Limited piezometer data indicate that the water table is about 15 feet below ground and is expected to respond to changes in river level given the highly permeable nature of the soils. The land on each side of I-5 on Hayden Island is highly developed and comprises service-related businesses such as retail stores and restaurants, and their parking lots.

As with the Columbia Slough drainage, I-5 is elevated on an embankment across Hayden Island, but the adjacent roads and the ramp connections to I-5 are not elevated. However, runoff generated on I-5 and the local roads within the study area is mainly confined to the roadway corridors by continuous concrete barriers or curbs. Except for the North Portland Harbor bridge and the Interstate Bridge, runoff is collected entirely by closed gravity drainage systems with inlets and stormwater pipes that discharge directly to North Portland Harbor or Columbia River. Runoff from the bridges is discharged through scuppers directly to the water surface below. In this stormwater drainage area, the existing impervious surface area within the footprint of the Modified LPA is approximately 45.8 acres; there are no flow control measures or engineered water quality facilities within the Columbia River South study-specific watershed.

As in the Columbia Slough study-specific watershed, the footprint of the Modified LPA within this watershed was once part of the Columbia River floodplain. The portion south of North Portland Harbor is protected from flooding by the levee system, while material dredged from the Columbia River has been used to raise the overall ground surface on Hayden Island east of the BNSF Railway railroad tracks above the elevation of the Columbia River 100-year flood event.

3.3.2.5 Columbia River North Stormwater Watershed (Washington)

The Columbia River North study-specific watershed area includes the current I-5 corridor, as well as Vancouver city streets in the study area. In the Columbia River North watershed, there are approximately 76.4 acres of existing impervious surfaces and no flow control measures or engineered water quality facilities. Approximately 3 acres of SR 14 is dispersed to adjacent pervious surface area where it infiltrates and/or evaporates.

Within the study area, soils consist of the gently sloping Wind River and Lauren surficial soils that belong to Hydrologic Group B and have a moderate infiltration rate. While depths to the water table are not provided, borehole logs available for the area indicate groundwater levels are close to water levels in the Columbia River. In addition, piezometer readings taken by WSDOT in the SR 14 interchange area demonstrate that the water table, at least at that particular location, responds to changes in the river level.

Surface runoff from I-5 and local streets is generally confined to the roadway by continuous curbs and concrete barriers and is collected almost entirely by closed drainage systems. The only exceptions are the Interstate Bridge and a few ditches adjacent to I-5. These closed systems discharge runoff directly to the Columbia River via outfalls in the vicinity of the existing Interstate Bridge while runoff from the bridge itself drains through scuppers to the river below. A pump station located southeast of the SR 14 interchange discharges runoff from lower-lying portions of the interchange to the Columbia River during high river levels.

The vertical grade of I-5 is generally below the surrounding areas. As a result, the I-5 drainage system also conveys runoff from built-up areas outside the I-5 right of way. These areas, which are extensive, are estimated to make up over 50% of the total drainage area served by this system, and their contribution to flows was an important consideration when developing the approach to stormwater management in this watershed.

3.3.3 Burnt Bridge Creek

3.3.3.1 Waterbody Description

Burnt Bridge Creek is a small tributary to the lower Columbia River. It originates near the northeast boundary of Vancouver and flows 12.6 miles west (roughly paralleling SR 500 for approximately 5 miles) to its outlet at Vancouver Lake. Vancouver Lake then drains into the Columbia River via Lake River.

The I-5 corridor is located in the vicinity of RM 2 of Burnt Bridge Creek. Within the study area, the stream passes through a valley surrounded primarily by residential development. Stream slope is between 0% and 2%, but approximately 80% of the stream has a gradient of less than 0.1% (PBS 2003).

Burnt Bridge Creek enters the study area east of 15th Avenue near Leverich Park, northeast of the SR 500/I-5 interchange. In the area of Leverich Park, some areas of the creek have substantial overhead cover from large-diameter trees and shrubs, and sparse cover in areas maintained by park staff by widely spaced large-diameter trees. In the more open areas of Leverich Park, the banks are highly eroded by regular visitor usage and mowing of herbaceous vegetation in the vicinity of the channel. Substrate on the channel bed just downstream of the I-5 crossing has been observed by the USGS at their former stream gauge to consist of silts, sands, gravels, and cobbles (USGS 2023c).

From Leverich Park, the Burnt Bridge Creek channel passes under Leverich Park Way through a concrete culvert and onto City of Vancouver property adjacent to I-5. The channel is armored for approximately 100 feet, after which it continues north, parallel to I-5 and Leverich Park Way, through a silt-dominated channel. The vegetation surrounding this portion of the channel is dominated by reed

canarygrass (*Phalaris arundinacea*) with some overhanging blackberry (*Rubus* spp.) and red-osier dogwood (*Cornus sericea*). Site observations indicate that the channel banks are undercut due to the growth habit of reed canarygrass and eroded due to the presence of nutria (*Myocastor coypus*).

Approximately 500 feet north of the culvert, Leverich Park Way bends to the west and the Burnt Bridge Creek channel again passes under the roadway through a large, corrugated metal pipe culvert. The channel continues north through a densely vegetated, private property for approximately 200 feet. The channel continues north with a WSDOT wetland mitigation site bounding the channel to the west and Bonneville Power Administration property and private land to the east. In this section of the study area, the channel is dominated by fine sediments (PBS 2003) and has moderate to dense overhanging vegetation consisting of deciduous and coniferous tree and shrub species.

In 2004, the City of Vancouver initiated the Burnt Bridge Creek Greenway Improvement Project to enhance water quality, riparian habitat, and recreation (through trail connections). Stormwater treatment facilities were also added and include infiltration basins, bioswales, vortex manholes, water quality ponds, and wetlands in the central greenway corridor of the watershed.

3.3.3.2 Hydrology

Average monthly discharge at Burnt Bridge Creek between 1998 and 2012 was 26 cfs (USGS 2023c). Burnt Bridge Creek experiences seasonal fluctuation in flow, with seasonal lows occurring between July and October and highs occurring between December and March. During low flow periods, streamflow is primarily fed by groundwater discharge.

Within the study area, development in the vicinity of Burnt Bridge Creek is similar to the vicinity of the Columbia River. Historically, Burnt Bridge Creek has been prone to flooding (USFWS 1996). Development of the study area has increased peak flows, reduced base flows, and altered the timing of flows compared to historical conditions. Throughout the system, several actions have been taken to reduce or relieve flooding, including channel modification, installation or upsizing of culverts, installation of storm lines, and construction of drainage systems (Clark County Department of Public Works 1998). Additional flow control elements, along with stormwater treatment facilities and habitat enhancements, were added as part of the Burnt Bridge Creek Greenway Improvement Project.

3.3.3.3 Water Quality

TEMPERATURE

Desirable water temperatures for young salmonids during downstream migration range from 6.7°C to 13.3°C (44°F to 56°F). In freshwater, temperatures higher than 23°C (73.4°F) are lethal for juvenile salmonids, and temperatures higher than 21°C (70°F) are lethal for adult salmonids (EPA 2003). Several listed salmonids are present in Burnt Bridge Creek in the vicinity of the study area, which the IBR Ecosystems Technical Report, discusses in more detail. A temperature gauge at Leverich Park (gauge BBC 2.6), within the study area, indicated that from June 25 to October 15, 2018, the seven-day average daily maximum temperature exceeded 17.5°C (63.5°F) an estimated 70 times (Herrera 2018). Therefore, water temperatures in the vicinity of the study area likely exceed the NOAA Fisheries standard of 18°C (64°F) for salmonid migration and rearing in late summer.

SEDIMENT/TURBIDITY

Suspended sediment inclusive of sand, silt, and clay particles is a naturally occurring component of the riverine habitat in the study area, and has historically been influenced by flow and currents, rain events, and geologic events (e.g., earthquakes and volcanic activity). Ecology conducted water quality sampling in the study area vicinity approximately 0.25 mile east of I-5 on Burnt Bridge Creek between October 2003 and September 2009. Of 48 samples taken during this period, 40 were 10 NTUs or lower (Ecology 2021b). Turbidity within the watershed is generally lowest between July and October, which coincides with the period when the majority of flow within the stream is contributed via groundwater. In general, turbidity is not considered to be a parameter of concern in Burnt Bridge Creek (Herrera and PGG 2019). Water quality is consequently not compromised by excessive sediment and turbidity; however, habitat-forming processes requiring recruitment of suspended sediments are limited.

CHEMICAL CONTAMINATION/NUTRIENTS

Burnt Bridge Creek is not listed as having water quality issues related to chemical contaminants. However, the upper reaches of the stream pass through farmland where the use of chemical fertilizers and pesticides is likely. Furthermore, stormwater runoff is routed to the creek in several locations through pipes and ditches (Herrera and PGG 2019).

Water quality in Burnt Bridge Creek has been monitored extensively since the early 1970s and shows impairments typical of urban streams (Ecology 2020). Segments of Burnt Bridge Creek within the study area are considered impaired by fecal coliform bacteria, dissolved oxygen, pH, and temperature by the 303(d) list (Ecology 2022). Naturally occurring concentrations of phosphorus in the groundwater, coupled with nutrient inputs from urban and agricultural runoff, have supported nuisance growths of algae and further degraded the aquatic habitat (Herrera 2011).

Between October 2003 and September 2009, Ecology conducted water quality sampling of Burnt Bridge Creek in the study area vicinity, approximately 0.25 mile east of I-5. Of 49 fecal coliform bacteria samples taken during this time, 28 exceeded the criterion of 200 colony-forming units/100 milliliters. Out of 48 samples taken for dissolved oxygen, all exceeded the minimum criterion of 8.0 mg/L for salmonid spawning, rearing, and migration. Of the 48 samples taken for pH, values ranged between 6.85 and 8.06, within the approved range of 6.5 to 8.5 to protect designated aquatic life uses of salmonid spawning, rearing, and migration (McCarthy 2020; Ecology 2021b).

Ecology has not yet approved any TMDLs for Burnt Bridge Creek. The Burnt Bridge Creek TMDL Advisory Committee is currently conducting monitoring that would result in the determination of the required pollution reductions and the development of a detailed cleanup plan (Ecology 2021d).

3.3.3.4 Stormwater Drainage

The study area within this watershed includes approximately 9.6 acres of existing impervious surface area, including the SR 500 interchange and portions of I-5 to the north and SR 500 to the east. Surficial soils in this area typically consist of Wind River loams. These soils belong to Hydrologic Group B and are considered to have a moderate infiltration rate. Residential developments are located south of the SR 500 interchange; a school is located to the northwest of the SR 500 interchange; and a park is

located to the northeast. While depths to the water table are not provided, borehole logs available for the area indicate groundwater levels are close to water levels in the Columbia River.

Typical of an urban environment, surface runoff from highways and local streets is generally confined to the roadway by continuous curbs and concrete barriers and is conveyed almost entirely by closed drainage systems. In contrast to the other watersheds, runoff from the entire CIA within this portion of the study area currently contains some form of treatment. Runoff from 7.9 acres within the study area is conveyed to a treatment pond at the Main Street interchange.

The treatment and infiltration ponds are currently considered to provide adequate stormwater treatment in terms of water quality (dissolved metals reduction) and flow reduction.

3.3.4 Fairview Creek

3.3.4.1 Waterbody Description

Fairview Creek is a 5-mile-long urban stream that originates in a wetland near Grant Butte in Gresham, Oregon, and drains to Fairview Lake, and is a tributary to the eastern portion of the Columbia Slough. The Fairview Creek outlet at Fairview Lake is approximately 11 miles east of the study area. Historically, Fairview Creek had been a tributary of the Columbia River, but water from the wetlands was diverted into an artificial channel that drains into the Columbia Slough, which is a tributary of the Willamette River. In 1960, water managers built a dam along Fairview Creek to create Fairview Lake for water storage and recreation. Fairview Creek has two named tributaries: No Name Creek and Clear Creek (BES 2005).

The existing Ruby Junction Light-Rail OMF is located on NW Eleven Mile Avenue in Gresham, Oregon. The existing facility would be expanded by approximately 10.4 acres (from 22.8 to 33.2 acres). Portions of parcels in the study area for the maintenance facility are located within the 100-year floodplain of Fairview Creek. These three parcels presently contain several buildings and some paved surfaces.

3.3.4.2 Hydrology

The Fairview Creek study-specific watershed is 6.5 square miles and receives stormwater runoff from Gresham, Wood Village, and Fairview. Fairview Creek is impounded by a dam that forms Fairview Lake. During summer months, starting in May, the lake's water levels are maintained at 10 feet NGVD29. In winter months, starting in October, water elevation is lowered to 8.5 feet NGVD29. This accounts for an exaggerated hydrologic regime.

Average monthly discharge between 1992 and 2020 in Fairview Creek at the USGS gauging station near Glisan Street, approximately 1.4 miles downstream of the Ruby Junction Light-Rail OMF, was 6 cfs. Minimum daily discharge during this period was 0.03 cfs, and maximum daily discharge was 137 cfs (USGS 2023d). The 100-year floodplain for Fairview Creek is approximately 1,288 feet wide at its widest point and covers portions of the study area (Metro 2022).

3.3.4.3 Water Quality

The DEQ has placed Fairview Creek on its 303(d) list for biocriteria; it has approved TMDLs for bacteria and spring/summer temperature (DEQ 2009). In addition, Fairview Creek is included in the TMDLs for the Columbia Slough since it is a tributary. No additional water quality data were available for this creek.

Excessive fine sediments have been shown to settle in the streambeds of Fairview Creek. This has been caused by the erosion of upland areas and deposit of sediments by stormwater that is discharged into the creek. These sediments degrade native fish spawning areas and limit suitable habitat for benthic organisms (BES 2005).

3.3.4.4 Stormwater Drainage

The Ruby Junction Light-Rail OMF is approximately 22.8 acres, all within the Fairview Creek watershed. Of the 22.8 acres, 7.3 are existing CIA. Stormwater from the existing impervious surface area (5.3 acres) is infiltrated through the use of dry wells, ultimately recharging the groundwater aquifer and contributing to flows in waterbodies within the Columbia Slough watershed.

4. LONG-TERM EFFECTS

For each study area waterway, this section describes the long-term effects on hydrology, water quality, and stormwater that may occur from operation of the Modified LPA. “Long-term effects” refers to direct, permanent effects that would occur as a result of the Modified LPA. Long-term effects may impact resources beyond the study area.

4.1 No-Build Alternative

Under the No-Build Alternative, most of the existing impervious surface area along roadways in the study area would remain untreated, which would allow for the continued release of stormwater with degraded quality into the study area’s receiving waters. However, with no way to quantify future emissions or other pollutants, such as 6PPD-quinone and for the purposes of the present analysis, it is assumed that the No-Build Alternative would maintain existing water quality conditions and would not result in long-term changes (either increased or decreased impacts).

4.2 Modified LPA Long-Term Effects

4.2.1 Hydrology

This section describes potential hydrologic effects from the Modified LPA, which includes potential to increase flooding, alter peak flows, increase runoff volumes to local receiving waters, and decrease water infiltration and groundwater recharge.

The Modified LPA includes a stormwater conveyance and treatment system that would comply with all federal, state, and local water quantity and quality standards in place at the time of construction, including requirements that may be updated to reflect climate-induced heavier rainfall events. The proposed design for the Modified LPA includes inlets, catch basins, and gravity pipe drainage systems that would collect and convey runoff from the new bridges, transit guideway, and road improvements to stormwater treatment facilities. The treatment facilities would reduce total suspended solids, particulates, and dissolved metals to the maximum extent practicable before runoff reaches surface waters or is infiltrated.

The Modified LPA would also cross the Portland Metro Levee System (PMLS) with the extension of light-rail north from Expo Center, with modifications to the I-5 mainline north of N Victory Boulevard, with the North Portland Harbor bridges, and with local road revisions of North Marine Drive and North Expo Road. Such modifications may include activities to restore temporarily disturbed portions of the levees, or permanent modifications where proposed infrastructure would intersect with the existing levees or where access to the levees would change as a result of reconfiguration of the roadways. Modifications may also include improvements to existing levee function, if such improvements are requested or required. Modifications or improvements would be coordinated for consistency with the planned future condition of the levees under the CCFS projects. The design of these improvements would be closely coordinated with the US Army Corps of Engineers through the Section 408 authorization approval process and the UFSWQD. The assessment presented below of long-term

effects to water quality and hydrology associated with the Modified LPA includes effects associated with potential modifications to the federal levee system.

The Modified LPA would manage flow control and runoff in the Burnt Bridge Creek watershed and at the Ruby Junction Light-Rail OMF via detention and infiltration. In the North Portland Harbor area, runoff from some existing impervious surfaces and a few sections of new or modified roadway with the Modified LPA would be conveyed, treated, and discharged to the Columbia Slough. All other runoff generated by the Modified LPA would be conveyed, treated, and discharged within the watershed in which it is generated.

Floodways designated by FEMA that are located within the study area include the Columbia Slough, the Columbia River, and Burnt Bridge Creek. These floodways are confined to the immediate vicinity of streams in the study area due to levees or, in the case of Burnt Bridge Creek, steeper slopes. For the FEMA-designated floodways in the study area, and in compliance with Executive Order 11988 for Floodplain Management. HEC-RAS was used to calculate the water surface elevations in the main channel of the Columbia River and North Portland Harbor in the Program area. The calculated water surface elevations of the existing conditions were compared to the calculated water surface elevations of the proposed conditions that include all proposed bridges of the IBR Program, labeled the ultimate condition. Based on the current Columbia River Bridge design details and the assumptions for the future designs of bridges in North Portland Harbor, there are no calculated increases in water surface elevation that meet or exceed this threshold.

Table 4-1 summarizes changes in water surface elevation for the ultimate condition 100-year atmospheric river event. No rise in base flood elevation is anticipated for the ultimate construction package.

Table 4-1. Changes in Base Flood Elevation – Ultimate Condition

Cross Section Location	HEC-RAS Cross Section	100-year Atmospheric River WSE (ft.) [a] Existing	100-year Atmospheric River WSE (ft.) [a] Ultimate	100-year Atmospheric River WSE (ft.) [a] Difference
Columbia River upstream of Government Island	117.98	34.40	34.38	-0.01
Columbia River upstream of Hayden Island	108.93	32.98	32.97	-0.01
Columbia River upstream of the existing Interstate Bridge	106.78	32.66	32.64	-0.02
North Portland Harbor upstream of the existing North Portland Harbor bridge	4.46	32.58	32.57	-0.01
Columbia River upstream of the existing BNSF Railway Bridge	105.90	32.44	32.44	0.00

Cross Section Location	HEC-RAS Cross Section	100-year Atmospheric River WSE (ft.) [a] Existing	100-year Atmospheric River WSE (ft.) [a] Ultimate	100-year Atmospheric River WSE (ft.) [a] Difference
North Portland Harbor upstream of the existing BNSF Railway Bridge	3.32	32.47	32.46	0.01
Columbia River downstream of Hayden Island	102.46	32.21	32.21	0.00

a North American Vertical Datum of 1988

WSE = water surface elevation

During the final design phase, this preliminary assessment would be confirmed with the hydraulic analysis once design concepts progress to a sufficient level of detail. If the hydraulic analysis showed a rise in base flood elevation, mitigation would be explored. Mitigation measures could include alternative pier cap shapes to improve hydraulic efficiency and cutting of soils to compensate for reduced flood storage capacity. Currently, the potential areas to cut are anticipated to be entirely within the footprint of the Modified LPA. The results of hydraulic analysis and coordination with the City of Portland will determine whether the needed cut volume would require the acquisition of additional property. If mitigation measures cannot reduce base flood elevation change from the IBR Program to zero net rise, the change would be documented in a Floodplain Evaluation Report and a public notice, which would include the reasons for this finding and alternatives considered. A NEPA reevaluation would be prepared if necessary. As design progresses, the IBR Program would evaluate whether the needed cut volume would require the acquisition of additional property. If mitigation measures cannot reduce base flood elevation impacts from the Program to zero net-rise, the impacts would be documented in a Floodplain Evaluation Report and public notice, which would include the reasons for this finding and alternatives considered.

Prior to construction, a floodplain permit from the City of Portland would be required. If the Modified LPA results in a net rise of base flood elevations, a Conditional Letter of Map Revision would be required from FEMA prior to issuance of the floodplain permit. In 2024, the City of Portland updated its building code and zoning code for development within floodplains. The updates are intended, in part, to comply with the recommendations of the 2016 Federal Emergency Management (FEMA) National Flood Insurance Program Biological Opinion (BO) that was issued by NOAA Fisheries in 2016. Mitigation approaches that could address fill in floodplains are described in the Ecosystems Technical Report.

No new or expanded roads or facilities are proposed for the Burnt Bridge Creek floodway. A small area within the study area at the Ruby Junction Light-Rail OMF is mapped within the 100-year floodplain of Fairview Creek; however, the Modified LPA would not place new or expanded roads or facilities where they would encroach upon the Special Flood Hazard Area for Fairview Creek. Therefore, no increase in 100-year flood elevations is expected as a result of the Modified LPA.

The Columbia River and North Portland Harbor would be the only waterways crossed by the Modified LPA and subject to in-water work. However, long-term hydrologic effects may occur in the Columbia Slough, Burnt Bridge Creek, and Fairview Creek due to an increase in impervious surfaces in each watershed.

An increase in impervious surface area typically increases flow volume fluctuations within receiving waters and is associated with greater peak flows and increased total runoff volume. Since the study area drains to major waterbodies that have relatively high flows, the Modified LPA is anticipated to result in a relatively small flow volume fluctuation and change to greater peak flows and increased runoff. Flow controls for runoff generated by the Modified LPA would be required for flows discharged to Fairview Creek and Burnt Bridge Creek, but not for the Columbia River or Columbia Slough, in accordance with the FAHP requirements. These are considered large waterbodies that are exempt from flow control requirements for direct discharges unless the conveyance systems indicate capacity limitations.

Runoff from some existing impervious surfaces and a few sections of new or modified roadway with the Modified LPA that currently drain to North Portland Harbor would instead be conveyed, treated, and discharged to the Columbia Slough. All other runoff generated by the Modified LPA would be conveyed, treated, and discharged within the watershed in which it is generated. Table 4-2 provides information on total watershed areas of receiving waters and proposed increases to impervious surface areas within the watersheds.

Table 4-2. Changes in Impervious Surface Area from the Modified LPA

Watershed	Total Watershed Area Square Miles	Total Watershed Area Acres	Modified LPA Total Increase to Impervious Surface Square Miles	Modified LPA Total Increase to Impervious Surface Acres	% Increase to Impervious Surface within Watershed Area
Columbia Slough	51	32,640	0.003	2.2	0.007%
Lower Columbia River	18,000	11,519,954	0.042	26.8	0.0002%
Burnt Bridge Creek	28	17,920	0.002	1.1	0.006%
Fairview Creek	7	4,480	-0.001	-0.5	-0.011%
Total	**18,086**	**11,574,994**	**0.046**	**29.6**	**0.0003%**

Technical literature suggests that stream quality can begin to degrade when there is more than 10% of effective impervious surface area in a watershed (Klein 1979). An increase of impervious surface area within a watershed close to or above that threshold could be vulnerable to some level of degradation (with respect to habitat). Each of the watersheds within the study area is composed of 10% or more impervious surface area. However, even though the increase in impervious surface area for each watershed would represent a very small fraction of the total watershed (Table 4-2), literature suggests that any incremental increase could adversely affect stream quality.

Impervious surfaces do not allow water to percolate into the ground, thereby increasing the amount of runoff. Decreased water infiltration also decreases groundwater recharge and the beneficial dilution effects from water entering the water table. Groundwater contributes significantly to the base flow in watercourses. In many instances, it is the base flow that maintains the minimum discharge in creeks, especially during the dry summer months.

The addition of impervious surface area from the Modified LPA is unlikely to measurably affect base flows of waterways within the study area. The study area is not within the headwaters of the intersecting waterways, and the watershed areas for these waterways are relatively large, which lessens the effect of decreased infiltration on base flows. This is reflected in regulations that only require flow control for runoff to Fairview and Burnt Bridge Creeks. Furthermore, the proposed stormwater facilities for the Modified LPA would provide infiltration to treat stormwater runoff from both existing and new impervious surfaces within the project footprint. The area of existing, untreated impervious surface that would be treated under the Modified LPA is more than double the proposed new impervious surface area.

4.2.1.1 Columbia Slough

To a minor extent, the Modified LPA would alter the current hydrologic regime of the Columbia Slough through the addition of impervious surface and stormwater treatment. The addition of approximately 2.2 acres of impervious surface area, representing 0.007% of the watershed area, would potentially increase stormwater volumes. However, the Modified LPA would also include the addition of stormwater treatment facilities and management design that would avoid or minimize potential increases in stormwater volumes. The discharge rates of stormwater runoff volumes generated by the Modified LPA that would flow into the Columbia Slough would be regulated by downstream pumps. The Columbia Slough may be exempt from flow control requirements when the storm sewer system has available capacity (BES 2020).

4.2.1.2 Columbia River and North Portland Harbor

Six new in-water pier complexes would be built for the Modified LPA, and the original pier complexes would be removed. New piers for the North Portland Harbor bridges would be added. Given the size of the Columbia River and North Portland Harbor relative to the size of the piers, and given that this section of the river is tidally influenced, it is extremely unlikely that backwater effects would be measurable. Regardless, the Modified LPA would likely require a floodplain permit from the local jurisdictions. Floodplain permits would require modeling studies, which would be conducted prior to applying for the permit and based on the progressed design information available at that time. However, preliminary hydraulic calculations show that the Modified LPA would not result in floodplain impacts. If results of the final modeling show a backwater effect that exceeds local standards, balanced earthmoving (i.e., cut and fill) remedies within the floodplain would likely be prescribed.

In the study area of the Columbia River watershed, the Modified LPA includes 26.8 acres of additional impervious surface area. The Modified LPA would provide an increased level of infiltration for stormwater runoff. This may have a net (albeit not measurable) benefit to the hydrology of the Columbia River.

4.2.1.3 Burnt Bridge Creek

The Modified LPA may slightly alter the stormwater conveyance network that drains to Burnt Bridge Creek by providing additional stormwater treatment and rerouting some roadside ditches. This may improve Burnt Bridge Creek's hydrologic regime by providing infiltration opportunities for runoff from impervious surface areas. Ecology requires that runoff volumes be reduced to pre-development conditions for peak discharges between 50% of the two-year event and the 50-year event.

Flow controls would be required for runoff generated by the Modified LPA that is discharged to Burnt Bridge Creek. The Modified LPA would provide infiltration water quality BMPs in the vicinity of the SR 500 interchange, which would avoid or minimize increased runoff in Burnt Bridge Creek.

4.2.1.4 Fairview Creek

For the City of Gresham, flow control is required to the extent that stormwater discharges do not increase flows in Fairview Creek over pre-development conditions for a 25-year or greater storm event. The term "pre-developed" conditions is not explicitly defined but has been interpreted as the condition of the land at the time when a construction permit application is submitted. However, the City of Gresham is in the process of revising the Public Works Standards to define "pre-developed condition" as the condition of the land prior to any development occurring.

Since the Modified LPA would adhere to these flow control requirements, the hydrologic regime of Fairview Creek is not anticipated to be altered in the long-term.

4.2.2 Water Quality

Increased sedimentation in streams may occur after road construction if slopes are not stabilized as designed or if stormwater facilities do not function effectively in removal of sediment from runoff. Sedimentation due to erosion can be increased by two potential pathways: directly from erosion of the finished roadside embankments or from increased streambank erosion as a result of increased peak flows.

The Modified LPA corridor on the Oregon side of the Columbia River is relatively flat, and the portion on the Washington side of the Columbia River has more topographical features, including the area around Burnt Bridge Creek. If flooding were to occur, the area around Burnt Bridge Creek would be susceptible to erosion hazards. However, peak flows would be managed by stormwater facilities in the Burnt Bridge Creek watershed area. Stormwater facilities would be designed to effectively remove sediments from runoff before discharging stormwater to receiving waters.

Because metals and other pollutants bind to fine particles, accumulations of road-derived sediments may have elevated levels of contaminants. Runoff from transportation facilities is typically associated with a suite of pollutants, including suspended sediments, nutrients, PAHs, oils and grease, antifreeze from leaks, cadmium and zinc from mechanical and tire wear, 6PPD-quinone from tire wear and road dust, and copper from wear and tear of brake pads, bearings, metal plating, and engine parts. Fecal coliform, while not a product of roadway surfaces or activities, is known to be conveyed in road runoff. The concentration and load of these pollutants are affected by a number of factors, including traffic volumes, adjacent land uses, air quality, and the frequency, intensity, and duration of storms.

Stormwater management measures would be incorporated into the design of the Modified LPA to minimize the potential adverse impacts that road runoff can have on water quality.

Jurisdictionally prescribed water quality treatment design storms are believed to determine runoff flow rates that result in treatment of between 85% to 91% of all runoff volumes from all storm events, depending on the jurisdiction. Peak flows that exceed the water quality design storm often bypass a treatment facility leading to discharge of untreated runoff. However, the initial and generally low storm event runoff rates are considered to be the most pollutant-loaded and contain the initial flush of pollutants from a road surface. As a result, runoff volumes that bypass treatment can contain contaminants, but levels are believed to be lower than volumes that undergo treatment. It is understood that some pollutants (e.g., dissolved metals, PAHs, CECs, 6PPD-quinone) are toxic at very low levels and could be present in bypassed, untreated runoff.

The NPDES permit program, as authorized by the CWA, controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. and compliance with designated TMDLs. Several of the waterways in the study area have TMDLs listed for certain pollutants. Study area waterways and their associated 303(d) listings and designated TMDLs are shown in Table 4-3.

Table 4-3. Study Area Waterways with 303(d) Listings and Total Maximum Daily Loads

Waterway	303(d) Listing Factors	Established TMDLs
Columbia Slough	• Biocriteria[a] • Toxics (iron) • Aquatic weeds	• Toxics (lead, PCBs, DDE/DDT, dieldrin, and dioxin) • Eutrophication (pH, phosphorus, dissolved oxygen, and chlorophyll *a*) • Bacteria • Temperature
Columbia River (includes North Portland Harbor)	**In Oregon:** • Toxics (PCBs, PAHs, DDE 4,4') **In Washington:** • Vinyl chloride	• Dioxin • Total dissolved gas • Temperature
Burnt Bridge Creek	• Eutrophication (pH, dissolved oxygen) • Fecal coliform bacteria • Temperature	• None

Waterway	303(d) Listing Factors	Established TMDLs
Fairview Creek	• Biocriteria	• Bacteria • Temperature

a Biological criteria (biocriteria) are a way of describing the qualities that must be present to support a desired condition in a waterbody. Biocriteria are based on the numbers and kinds of organisms present and are regulatory-based biological measurements. Oregon Department of Environmental Quality defines biocriteria as the measure by which "Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities" (Oregon Administrative Rule 340-041-0011).

DDE = dichlorodiphenyldichloroethylene; DDT = dichlorodiphenyltrichloroethane; PAH = polycyclic aromatic hydrocarbons; PCB = polychlorinated biphenyl; TMDL = total maximum daily load

Section 303(d) of the CWA requires states to list (i.e., the 303(d) list) impaired waterbodies that do not meet applicable water quality standards based on the severity of the pollution and designated uses of the waterbodies. A TMDL is the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards. TMDLs are implemented in Oregon and Washington through the issuance or reissuance of NPDES permits by the DEQ and Ecology. Therefore, to ensure compliance with NPDES permits, the Modified LPA would be required to demonstrate that water pollution would be minimized to the greatest extent possible.

Traffic models run for the Modified LPA predict that traffic congestion within the study area would decrease compared to the No-Build Alternative (see the IBR Transportation Technical Report). The anticipated decrease in congestion may potentially reduce the proportionate amount of copper—a known byproduct of brake pad wear that is correlated with traffic congestion—carried by stormwater runoff compared to what would be proportionately carried by the No-Build Alternative. In addition, the Modified LPA includes the extension of light-rail transit into downtown Vancouver and other transportation system management and transportation demand management measures, which could reduce the number of vehicles, and therefore tires (the source of 6PPD-quinone), on study area roads.

Annual pollutant load estimates conducted using Method 1: WSDOT Data-FHWA Method, as outlined in WSDOT's (2009) guide, *Quantitative Procedures for Surface Water Impact Assessment*, are shown in Table 4-4. Table 4-4 also shows the mean estimated annual pollutant loads with the Modified LPA, which are constants provided by the WSDOT method.

Table 4-4. Estimated Annual Pollutant Loads from Untreated and Treated Highway Runoff (pounds/year • acre)

Pollutant	Mean Load from Untreated Runoff	Mean Load from Treated Runoff
Total Suspended Solids	769.00	88.00
Total Copper	0.16	0.04
Dissolved Copper	0.04	0.03
Total Zinc	0.98	0.21
Dissolved Zinc	0.31	0.14

Note: Values were derived using Western Washington WSDOT source data from the January 7, 2009, HI-RUN Model Documentation.

WSDOT = Washington State Department of Transportation

WSDOT has not yet vetted the data set through a formal quality assurance/control process. During development of annual loading estimates, apparent discrepancies were noted in the data. If discrepancies are valid, source data and loading rate estimates would be re-evaluated.

Table 4-5 shows the annual pollutant load estimates for the entire study area for the Modified LPA and the No-Build Alternative. Areas that are infiltrated are not factored into the pollutant load calculations since they are assumed to be naturally filtered through ground percolation before entering receiving waters through groundwater.

Table 4-5. Annual Pollutant Load Estimates for Entire Project Contributing Impervious Areas

Environmental Metric	No-Build Alternative	Modified LPA	Change
Treated CIA (acres)	0.0	189.7	189.7
Infiltrated CIA (acres)	21.2	17.5	-3.7
Untreated CIA (acres)	156.4	0.0	-156.4
Total CIA (acres)	178	207	29
TSS (lbs/year)	120,733	16,720	-86.1%
Total Cu (lbs/year)	25.0	7.6	-69.7%
Dissolved Cu (lbs/year)	6.3	5.7	-9.0%
Total Zn (lbs/year)	153.3	39.8	-74.0%
Dissolved Zn (lbs/year)	48.5	26.6	-45.2%

CIA = contributing impervious area; Cu = copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

Table 4-5 shows that the Modified LPA would provide stormwater treatment across the study area and decrease roadway-derived pollutants. Therefore, the Modified LPA would have a beneficial long-term effect on the water quality of receiving waters compared to the No-Build Alternative. Tables for each study-specific watershed are included in the following sections and include the pollutant-loading analysis for the Modified LPA and the No-Build Alternative.

Another potential water quality consideration is that the Modified LPA would involve additional roadway area and, consequently, additional winter maintenance activities. Highway sanding can result in large quantities of gravels and particulates making their way into adjacent waterbodies, with adverse effects to spawning beds and, occasionally, channel morphology. Chemical anti-icing and de-icing agents are a potential concern but are relatively benign. ODOT uses magnesium chloride with a corrosion inhibitor and solid salt, both as an anti-icer before a storm to help prevent ice and snow from bonding to the road, and as a deicer after a storm to help break the bond between the ice and the road. WSDOT uses liquid calcium chloride, sodium chloride, or magnesium chloride for anti-icing and solid salt for de-icing. These salt-based materials are known to reduce oxygen in water, but the applications to roads in Portland and Vancouver are infrequent and usually with low quantities.

Studies evaluating the effect of these kinds of anti-icing and de-icing agents on a small stream found no detectable change in water chemistry (Tanner and Wood 2000). Therefore, impacts from the potential use of anti-icing and de-icing agents within the study area would be expected to be negligible, particularly since the frequency of use of such chemicals is relatively low. Within the study area, there are only approximately 30 days a year, on average, with minimum temperatures below freezing (NOAA 2022). In many cases, the duration of freezing temperatures or ambient conditions are such that these agents are not applied. The water quality benefits of increased highway safety, which would reduce accidents and the risk of hazardous materials spills, could outweigh the potential adverse impacts from winter maintenance activities.

4.2.2.1 Columbia Slough

The Columbia Slough is 303(d) listed for biocriteria, toxics (iron), and aquatic weeds. The pollutants associated with highways that have been regulated through TMDLs on this system are fecal coliform, lead, and temperature. Stormwater is listed in the TMDLs as a comparatively minor source of these pollutants. While highway runoff is “stormwater,” highway runoff is not explicitly called out in the TMDLs.

The effect of the pollutants found in runoff depends to a large extent on the character of the receiving waters. Given the nature of the Columbia Slough, with its slow-moving water and identified water quality problems, TSS and other contaminants found in highway runoff are more of a concern within this stream than in other waterbodies within the study area. This is because slower flow, such as at the Columbia Slough, allows water to be exposed to stormwater pollutants for a longer period of time and increases the probability that contaminated sediments would accumulate. In addition to the accumulation of contaminated sediments, slower flows also provide a stable habitat for excessive growth of algae and macrophytes during the summer, which can lead to lower dissolved oxygen levels (BES 2019). These issues compound the water quality deficiencies of the lower reach of the Columbia Slough, making it more sensitive to added pollutants.

The Modified LPA with the double-deck fixed-span bridge configuration design option would increase the total CIA in this watershed by approximately 2.2 acres. This increase could largely be due to capturing runoff from the bridges across North Portland Harbor. The runoff from the existing bridge structures currently drains directly to the water surface below. Table 4-6 shows the CIA acreages for the No-Build Alternative and the Modified LPA, as well as a pollutant-loading estimate for each.

Table 4-6. Pollutant-Loading Estimate for the Columbia Slough Study-Specific Watershed

Environmental Metric	No-Build Alternative	Modified LPA[a]	Change
Treated CIA (acres)	0.0	40.7	40.7
Infiltrated CIA (acres)	3.0	0.0	-3.0
Untreated CIA (acres)	35.5	0.0	-35.5
Total CIA (acres)	38.5	40.7	2.2
TSS (lbs/year)	27,299.5	3,581.6	-86.9%
Total Cu (lbs/year)	5.7	1.6	-71.3%
Dissolved Cu (lbs/year)	1.4	1.2	-14.0%
Total Zn (lbs/year)	34.8	8.5	-75.4%
Dissolved Zn (lbs/year)	11.0	5.7	-48.2%

a Percentage change may not be precise due to rounding of values for annual loads.

CIA = contributing impervious area; Cu = copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

As shown in Table 4-6, the construction of the Modified LPA with the double-deck fixed-span bridge configuration design option would increase the total CIA and would decrease pollutant loading for all pollutants. It should also be noted that the analysis used to produce these pollutant-loading estimates are not based on enhanced stormwater treatment alone. Instead, it is based on the average of data collected from 13 different treatment facilities. Because the majority of treatment that would be provided by the Modified LPA is enhanced treatment compared to No-Build Alternative conditions (e.g., phosphorus-free compost-amended vegetated filtration strips or ecology embankments), the results shown in Table 4-5 are likely an overestimation of TSS, total copper, and dissolved copper pollutant loads that would enter the Columbia Slough.

Runoff concentrations of total zinc and dissolved zinc have not been shown to differ whether treated in different facility types. This analysis also does not include estimates for fecal coliform and lead, for which there are TMDLs, and it is not clear whether the Modified LPA would reduce these pollutants. However, with the addition of stormwater treatment and evidence that shows reduction of several pollutants, it is anticipated that the Modified LPA would result in a decrease of these pollutants.

4.2.2.2 Columbia River and North Portland Harbor

The Columbia River and North Portland Harbor within the study area are 303(d) listed for toxics (PCBs, PAHs, and DDE 4,4') in Oregon and vinyl chloride in Washington. The only pollutant associated with highway runoff that has been regulated through TMDLs on this system is temperature.

The Modified LPA would remove a few hundred feet of vegetation along the north and south shorelines of the Columbia River in the vicinity of the new bridge structures and along the north and south shorelines of Hayden Island. However, this would not be expected to change the Columbia River water temperatures due to its large size and the very minor role riparian vegetation currently plays on cooling water temperatures. Furthermore, increased highway runoff is not anticipated to increase water temperatures since it generally rains during cooler months when Columbia River water temperatures are not as much of a concern.

For the Columbia River pollutant-loading analysis, as in the stormwater analysis, the Oregon and Washington sides of the river were split into separate drainages to simplify the analysis of compliance with local stormwater regulations. The loading rates for nearly all pollutants considered in the analysis, presented in Table 4-7 and Table 4-8, would decrease substantially with the Modified LPA compared to the No-Build Alternative. The overall decrease in loading rates is expected because the Modified LPA would reduce untreated stormwater drainage and increase stormwater treatment within the Columbia River study-specific watershed on both the Oregon and Washington sides.

Table 4-7. Pollutant-Loading Estimate for the Columbia River South (Oregon) Study-Specific Watershed

Environmental Metric	No-Build Alternative	Modified LPA	Change
Treated CIA (acres)	0.0	51.6	51.6
Infiltrated CIA (acres)	0.0	0.0	0.0
Untreated CIA (acres)	45.8	0.0	-45.8
Total CIA (acres)	45.8	51.6	5.8
TSS (lbs/year)	35,220.2	4,540.8	-87.1%
Total Cu (lbs/year)	7.3	2.1	-71.8%
Dissolved Cu (lbs/year)	1.8	1.5	-15.5%
Total Zn (lbs/year)	44.9	10.8	-75.9%
Dissolved Zn (lbs/year)	14.2	7.2	-49.1%

CIA = contributing impervious area; Cu = copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

Table 4-8. Pollutant-Loading Estimate for the Columbia River North (Washington) Study-Specific Watershed

Environmental Metric	No-Build Alternative	Modified LPA	Change
Treated CIA (acres)	0.0	97.4	97.4
Infiltrated CIA (acres)	3.0	0.0	-3.0
Untreated CIA (acres)	73.4	0.0	-73.4
Total CIA (acres)	76.4	97.4	21.0
TSS (lbs/year)	56,444.6	8,571.2	-84.8%
Total Cu (lbs/year)	11.7	3.9	-66.8%
Dissolved Cu (lbs/year)	2.9	2.9	-0.5%
Total Zn (lbs/year)	71.9	20.5	-71.6%
Dissolved Zn (lbs/year)	22.8	13.6	-40.1%

CIA = contributing impervious area; Cu =copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

The Modified LPA is anticipated to have an overall beneficial long-term effect on the Columbia River and North Portland Harbor's water quality from proposed stormwater treatment.

4.2.2.3 Burnt Bridge Creek

Burnt Bridge Creek is on the 303(d) list for pH, dissolved oxygen, temperature, and fecal coliform bacteria. Highway runoff is not identified in the listing as a source for these pollutants.

An existing infiltration pond at the Main Street interchange would not be modified by the Modified LPA; however, the Modified LPA would reduce the total impervious surface draining to this facility by approximately 7.9 acres. Currently, during extreme runoff events, overflows from this infiltration pond are discharged to Burnt Bridge Creek without receiving adequate treatment. The reduction of stormwater flows to this facility and the addition of infiltration water quality treatment BMPs would reduce pollutant loading. As presented in Table 4-9, compared to the No-Build Alternative, the Modified LPA would eliminate the loading rates for all pollutants considered in the analysis since infiltration is assumed to remove pollutants entirely.

Table 4-9. Pollutant-Loading Estimate for the Burnt Bridge Creek Study-Specific Watershed

Environmental Metric	No-Build Alternative	Modified LPA	Change
Treated CIA (acres)	0.0	0.0	0.0
Infiltrated CIA (acres)	7.9	10.7	2.8
Untreated CIA (acres)	1.7	0.0	-1.7

Environmental Metric	No-Build Alternative	Modified LPA	Change
Total CIA (acres)	9.6	10.7	1.1
TSS (lbs/year)	1,307.3	0.0	-100%
Total Cu (lbs/year)	0.3	0.0	-100%
Dissolved Cu (lbs/year)	0.1	0.0	-100%
Total Zn (lbs/year)	1.7	0.0	-100%
Dissolved Zn (lbs/year)	0.5	0.0	-100%

CIA = contributing impervious area; Cu =copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

4.2.2.4 Fairview Creek

DEQ has placed Fairview Creek on its 303(d) list for biocriteria; it also has approved TMDLs for bacteria (E. coli) and spring/summer temperature (DEQ 2006, 2022; EPA 2021b). The source of E. coli bacteria is not thought to be specifically from roadway runoff (DEQ 2006). Fairview Creek is also included in the TMDLs for the Columbia Slough since it is a tributary. These TMDLs include lead and fecal coliform bacteria that are associated with highway runoff.

Portions of three of the 14 parcels in the study area around the Ruby Junction Light Rail OMF are located within the 100-year floodplain of Fairview Creek. These three parcels presently contain several buildings and some paved surfaces. No new structures are planned to be constructed in the floodplain, but some impervious surface would be added and some would be replaced or converted to pervious outside the floodplain. Overall, there would be a net reduction of 0.5 acre of CIA.

Since the majority of the existing impervious area and the entire impervious area of the proposed expansion of the Ruby Junction Light-Rail OMF would be infiltrated, a pollutant-loading estimates would remain zero (Table 4-10). The Modified LPA would not have a long-term adverse effect on Fairview Creek's water quality since runoff from the Ruby Junction Light-Rail OMF expansion area would be infiltrated and not discharged to Fairview Creek.

Table 4-10. Pollutant-Loading Estimate for the Fairview Creek Study-Specific Watershed

Environmental Metric	No-Build Alternative	Modified LPA	Change
Treated CIA (acres)	0.0	0.0	0.0
Infiltrated CIA (acres)	7.3	6.8	-0.5
Untreated CIA (acres)	0.0	0.0	0.0
Total CIA (acres)	7.3	6.8	-0.5
TSS (lbs/year)	0.0	0.0	0%
Total Cu (lbs/year)	0.0	0.0	0%

Environmental Metric	No-Build Alternative	Modified LPA	Change
Dissolved Cu (lbs/year)	0.0	0.0	0%
Total Zn (lbs/year)	0.0	0.0	0%
Dissolved Zn (lbs/year)	0.0	0.0	0%

CIA = contributing impervious area; Cu =copper; lbs = pounds; LPA = Locally Preferred Alternative; TSS = total suspended solids; Zn = zinc

4.2.3 Stormwater

The effects on stormwater and water quality are not mutually exclusive, yet they may be evaluated separately to highlight where notable differences in their effects potentially exist. This section, therefore, builds on the effects analysis of water quality presented above to focus on long-term effects from changes in CIA and the Modified LPA stormwater BMP facilities.

Stormwater runoff from highways has elevated levels of contaminants. The Modified LPA would replace and create new impervious surface. However, improvements to stormwater treatment on new and improved impervious surfaces (including the Columbia River and North Portland Harbor bridges) are anticipated to reduce stormwater pollutant loads discharged to the Columbia Slough, Columbia River, North Portland Harbor, and Burnt Bridge Creek from the study area. Discharges to Fairview Creek would likely remain the same.

Other than the infiltration pond near Burnt Bridge Creek, the Modified LPA would replace the existing water quality facilities with enhanced stormwater treatment that would meet stormwater management requirements in place at the time of construction, including requirements that may be updated to reflect climate-induced heavier rainfall events.

Much of the current stormwater runoff generated by the existing highway corridor is not treated in accordance with current stormwater treatment standards for new construction. The Modified LPA would treat all new impervious surfaces, as well as existing impervious surfaces that would be replaced, in accordance with current stormwater treatment standards before being discharged to receiving waters.

Table 4-5 presents an overall summary of the anticipated long-term effect of the Modified LPA on CIA from which runoff would be treated or infiltrated. The stormwater drainage areas used in these calculations do not include temporary construction staging areas that would be outside the construction footprint of the Modified LPA (i.e., casting yards that might be required for fabricating bridge elements). Nor does it include the area associated with the expansion of the Ruby Junction Light-Rail OMF.

Exclusive light-rail guideway is considered non-pollutant-generating because the light-rail vehicles are electric and other potential sources of pollution, such as bearings and gears, are sealed to prevent the loss of lubricants. Braking for light-rail vehicles is almost exclusively accomplished via regenerative (power) braking, which avoids friction or wear on the vehicle brake pads and, therefore, generates very few pollutants. Sand, however, may be applied to the tracks to aid traction on steeper grades and this is considered when assessing water quality facility requirements. While bus shelter

roofs might be pollutant-generating (e.g., constructed from galvanized metal), such areas would be very small in relation to the overall area and were not included in the areas of CIA. In addition, facilities such as transit stations are not highly defined at this early stage of project development.

Results from the traffic models showed that the Modified LPA would improve traffic congestion within the study area (see the IBR Transportation Technical Report). Decreasing traffic congestion on the Columbia River and North Portland Harbor bridges and associated roadways would decrease idling and brake pad wear, which may reduce the amount of copper and other traffic-related pollutants currently carried by corridor runoff.

The Modified LPA would increase impervious surface areas by approximately 29.6 acres, which may reduce natural infiltration rates and increase stormwater pollutant loads of suspended sediments, nutrients, PAHs, oils and grease, antifreeze from leaks, cadmium and zinc from tire wear, and copper from wear and tear of brake pads, bearings, metal plating, and engine parts. However, the Modified LPA would reduce the untreated impervious surface area by approximately 156 acres.

Therefore, in comparison to the No-Build Alternative, the Modified LPA would have an overall beneficial long-term effect on stormwater generation and treatment due to increased stormwater treatment and decreased traffic congestion.

4.2.3.1 Columbia Slough

Conditions in the Columbia Slough, such as slow-moving water and existing water quality problems, make this waterbody more sensitive to TSS and other contaminants related to stormwater than other waterbodies within the study area. This is due to the fact that stream sediments are exposed longer to dissolved pollutants due to the slow water velocity.

With the Modified LPA, the impervious surface area in the Columbia Slough watershed would increase by approximately 2.2 acres, as shown in Table 4-6. However, untreated impervious surface would be reduced by approximately 35.5 acres. Most of the increase in total impervious surface can be attributed to the Modified LPA capturing runoff from the bridges across North Portland Harbor. Stormwater runoff from the existing bridge currently drains directly to the water surface below. The Modified LPA would create and treat approximately 40.7 acres of new and rebuilt CIA in the Columbia Slough watershed. While I-5 would generally follow its current alignment and grade, the Modified LPA would completely rebuild the Marine Drive interchange in a different configuration from its existing layout.

4.2.3.2 Columbia River and North Portland Harbor

On the Oregon side, the Modified LPA would rebuild the Hayden Island interchange, retrofit the existing North Portland Harbor bridge with a stormwater collection and conveyance system, and demolish the existing Interstate Bridge. The last two components would result in eliminating runoff from approximately 8 acres of bridge deck that currently discharges directly to the water surface below. In this watershed, the Modified LPA would increase the CIA by approximately 5.8 acres (Table 4-7). Currently, there are no water quality facilities for runoff from the study area in this watershed. Table 4-7 summarizes the changes from the Modified LPA on the impervious surface area

from which runoff would be treated. Table 4-7 demonstrates that the Modified LPA proposes to treat runoff from the entire CIA.

This watershed includes existing surface parking in the vicinity of the Hayden Island interchange that may or may not remain after the Modified LPA has been completed. For the purpose of this analysis, it has been assumed that the land on the west side of the proposed interchange and transit guideway would be used for staging during construction and, independent of the Modified LPA, would be converted into transit-oriented development following construction. This land encompasses about 10 acres west of the Modified LPA's footprint and is bounded by the transit guideway, Center Avenue, Hayden Island Drive, and Jantzen Drive. Redevelopment of these areas would need to comply with the stormwater development and discharge requirements of either ODOT or the City of Portland and, in the numbers presented in Table 4-6, it is assumed that the impervious surface area would receive stormwater treatment.

Instead of biofiltration ponds, the Modified LPA would include bioretention ponds and roadside planters with underdrain pipe systems for the main water quality facilities on Hayden Island even though the soils belong to the Pilchuck-Urban land complex and are classified as Hydrologic Group A. At locations where such facilities are being considered, the depth to groundwater is only about 15 feet, and may be less depending on the influence of the Columbia River levels on the water table. Considering the likely depth of each facility, there would likely not be adequate separation between the facility bottom and water table for treating runoff. The EPA recommends a separation distance of at least 2 feet between the bottom of an infiltration basin and the seasonal high-water table (EPA 2005). No flow control facilities are required or proposed.

On the Washington side, the Modified LPA would increase the CIA in this study-specific watershed by approximately 21 acres, most of which may be attributed to the reconfigured interchanges and increased number and length of merge lanes for I-5. The Modified LPA would create and treat approximately 97.4 acres of new and rebuilt CIA. Table 4-8 summarizes the changes from Modified LPA on the impervious surface area from which runoff would be treated.

Flow control is not required for this watershed, and none is proposed under the Modified LPA. In addition, no new outfalls are currently proposed, but outfall capacities and conditions might result in upgrades or modifications resulting from increased discharges. Table 4-8 demonstrates that the Modified LPA proposes to treat runoff from the entire CIA.

From about Sixth Street in Vancouver, I-5 would generally continue to follow its existing alignment and grade. The SR 14 and Mill Plain interchanges would be reconfigured, which would alter the current interchange footprint. In contrast, the Fourth Plain interchange would be rebuilt, and the interchange footprint would be similar to what currently exists. New streets would be constructed at the SR 14 interchange to improve local connections. The light-rail guideway would be constructed primarily along the existing I-5 right of way.

4.2.3.3 Burnt Bridge Creek

The Modified LPA would improve connectivity between I-5 and SR 500 through the reconstruction of existing ramps and the construction of a new bridge from 39th Street to I-5 southbound over a new I-5 southbound to Fourth Plain ramp. This would increase the total impervious area in the watershed by approximately 1.1 acres and would create approximately 10.7 acres of new and rebuilt CIA, as shown in Table 4-9. Unlike the other watersheds, runoff to Burnt Bridge Creek must be reduced to pre-development (forested) conditions for peak discharges between 50% of the two-year event and the 50-year event.

Soils in this area belong to Hydrologic Group B, which are considered suitable for infiltration. A soil assessment was previously obtained that matches the findings of available soil data. The IBR Program's design team has preliminarily integrated bioretention ponds as the primary BMP for this watershed. The Modified LPA currently includes bioretention ponds to treat CIA associated with the Modified LPA.

An existing infiltration pond at the Main Street interchange would not be modified. Rather, the Modified LPA would reduce the total impervious surface area draining to this facility through the replacement of other existing water quality facilities with enhanced stormwater treatment. The infiltration pond was constructed as part of the I-5: Burnt Bridge Creek to NE 78th Street Project, which was completed in 2003. Overflows from this pond during extreme runoff events are discharged to Burnt Bridge Creek via a spillway and open channel.

4.2.3.4 Fairview Creek

The expansion of the Ruby Junction Light-Rail OMF would result in a slight net decrease of impervious surface area (0.5 acres), as shown in Table 4-10. Because the City of Gresham's requirements for stormwater treatment and flow control must be met for this portion of the Modified LPA, runoff from all new impervious surface would be infiltrated to reduce pollutants of concern. The infiltration techniques would comply with the City of Gresham's stormwater management requirements and would protect and/or improve the quality and quantity of existing groundwater flows. Therefore, the water quality of Fairview Creek would not be adversely impacted by the Modified LPA.

4.2.4 Design Options – Hydrology, Water Quality, and Stormwater

4.2.4.1 Two Auxiliary Lanes

The long-term effects of the Modified LPA with the two auxiliary lanes design option would be similar as with one auxiliary lane, except for an approximately 3.9-acre increase (+1.9%) in CIA with the wider I-5 roadway. Because all generated stormwater runoff would be treated, the overall effect to water quality and hydrology would be similar. However, as stormwater treatment does not remove all pollutant loads, the additional impervious surface from two auxiliary lanes would result in slightly increased pollutant loads compared to one auxiliary lane.

4.2.4.2 Single-Level Fixed-Span Configuration

The long-term effects of the Modified LPA with the single-level fixed-span configuration would be similar to the Modified LPA with the double-deck fixed-span configuration except for an approximately 3.3-acre increase (+1.6%) in CIA resulting from the slightly different configuration and dimensions of the bridges and interchanges (Table 4-11). However, given the similarity of construction activities and BMPs, all long-term effects would be similar.

Table 4-11. Changes in Impervious Surface Area from the Modified LPA with Single-Level Fixed-Span bridge configuration option

Watershed	Total Watershed Area Square Miles	Total Watershed Area Acres	Modified LPA Total Increase to Impervious Surface Square Miles	Modified LPA Total Increase to Impervious Surface Acres	% Increase to Impervious Surface within Watershed Area
Columbia Slough	51	32,640	0.003	2.2	0.007%
Lower Columbia River	18,000	11,519,954	0.047	30.1	0.0003%
Burnt Bridge Creek	28	17,920	0.002	1.1	0.006%
Fairview Creek	7	4,480	-0.001	-0.5	-0.011%
Total	**18,086**	**11,574,994**	**0.046**	**32.9**	**0.0003%**

4.2.4.3 Single-Level Movable-Span Configuration

Long-term effects of the Modified LPA with the single-level movable-span bridge configuration would be similar to the Modified LPA with the single-level fixed-span configuration and the double-deck fixed-span configuration, except that there would be the potential for additional pollutants. There would also be minor long-term water quality impacts associated with the logistical difficulty in stormwater collection off of the movable portion of the bridge structure when lifting, lifted, and lowering as well as accidental spills directly into the waterbody during over-water maintenance of the movable span. In addition, the Modified LPA with a movable-span bridge configuration would continue to have occurrences where traffic on I-5 would be stopped during a bridge lift, which would result in additional vehicle idling and brake pad wear compared to the Modified LPA with a fixed-span bridge configuration.

4.2.4.4 Interstate 5 Mainline Westward Shift

The I-5 mainline westward shift design option would have a similar footprint and long-term operation of the Modified LPA with the centered I-5 mainline; therefore, the long-term effects would be similar.

4.2.4.5 State Route 14 Interchange without C Street Ramps

The design option without the C Street ramps at the SR 14 interchange would have a slightly smaller footprint than the Modified LPA with the C Street ramps, which would reduce the amount of existing and new CIA. However, because all generated stormwater runoff would be treated, the long-term effects of this option would be similar.

4.2.4.6 Park and Rides

None of the park and rides would be located within the FEMA-designated floodplain. The park and rides located in areas that currently have unpaved surfaces would result in small increases in the amount of new impervious surfaces. However, because stormwater from all Modified LPA-related CIA would be treated, including from park and rides, the options would each have similar long-term effects on water quality and hydrology resources.

5. TEMPORARY EFFECTS

For purposes of this discussion, temporary direct effects are only those likely to occur during construction, including removal of the existing Interstate Bridge, and would cease once construction is completed. In some cases, such as the construction of a bridge crossing, temporary effects may last several years.

For the Modified LPA, the temporary effects discussed in this chapter are likely to be avoided or minimized with the proper implementation of measures, as discussed in Chapter 7 of this technical report. The temporary effects would result from construction activities such as soil mixing, pile driving, demolishing the existing bridge structure, installing cofferdams, and other temporary construction activities.

Temporary effects on hydrology include placing obstructions in the water column and altering groundwater flows by pumping during depressed roadway construction. Temporary water quality impacts include increased turbidity due to sediment disturbance associated with in-water work, pollutants from disturbance of sediments with existing contamination during in-water work, and pollutants due to potential equipment leaks or spills in the vicinity of waterways. See the IBR Hazardous Materials Technical Report for a discussion of the need to sample and analyze potentially hazardous sediments. Temporary effects to stormwater include turbid overland flows due to soil disturbance and release of pollutants from leaking equipment.

5.1 Modified LPA

5.1.1 Hydrology

Temporary effects on hydrology due to construction of the Modified LPA pertain to the placement of obstructions in the water column at the Columbia River during superstructure construction and groundwater impact during depressed roadway construction across the study area.

Groundwater may be temporarily impacted by construction below grade and close to or beneath the water table. A detailed analysis of the depth to the water table within the study area has not yet been conducted. However, a regional groundwater study indicates that the elevation of the water table is relatively constant over time and follows topographical features (McFarland and Morgan 1996). For instance, the water table within the SR 500 area would be farther from the surface than would the water table on Hayden Island. Without a detailed analysis, below-grade construction is conservatively assumed to potentially require groundwater pumping. This pumping may affect the contribution of the surficial aquifer to waterway flows as well as the groundwater quality of the surficial aquifer and stormwater quantity. Temporary effects on stormwater are discussed in Section 5.1.3. Since pumping would likely occur when the water table is high (e.g., during winter flows), this is not likely to affect the hydrologic regimes of waterways significantly.

5.1.1.1 Columbia Slough

Temporary effects to the hydrology of the Columbia Slough due to construction of the Modified LPA are not anticipated beyond the potential for groundwater pumping during depressed roadway construction along the I-5 corridor.

5.1.1.2 Columbia River and North Portland Harbor

During construction of the Modified LPA there is potential for groundwater pumping during depressed roadway construction within the Columbia River and North Portland Harbor study-specific watershed. This would be temporary and is not anticipated to have a noticeable effect on the hydrologic regime since this waterway is such a high-flow system.

Another temporary hydrologic effect on the Columbia River and North Portland Harbor is the placement of large temporary structures in the water column, which may be in place for several years. The Modified LPA would use cofferdams at some pier complexes to isolate the work area from active flow in the Columbia River. The purpose of the cofferdams would be to avoid contaminating the Columbia River with work or waste material, contain resuspended sediments, and minimize disturbance of fish. The type and number of cofferdams needed for the Modified LPA have not yet been determined but would be prior to construction. In addition to cofferdams, hundreds of temporary steel piles would be installed and removed during the multi-year construction of the mainstem Columbia River and North Portland Harbor bridge structures. Due to the heavy equipment and stresses placed on the support structures, many of these temporary piles would need to be load-bearing. The need for piles would be staged over the scheduled construction period so that only a few hundred piles would likely be in the water at a given time. Temporary piles would also be installed to assist in the demolition of the existing bridge structure across the Columbia River.

Given the width, volume, and flow rates of the Columbia River, and the regulation of river flows by upstream dams, the hydraulic effect of placing these temporary structures in the Columbia River and North Portland Harbor water column is expected to be minor. In addition to the large size of the watershed, there are 12 major dams located in the Columbia Basin that regulate the flow in the study area that would minimize the probability of temporary hydrologic effects. While the Columbia River is a highly managed waterbody that no longer resembles its original free-flowing state, it still experiences seasonal variation in flows, including large winter storm-induced flooding. The flow and stage of the Columbia River are also tidally influenced by the Pacific Ocean up to the Bonneville Dam, which includes the study area. Construction of the Modified LPA would require a floodplain permit from local jurisdictions, and further hydraulic analysis to ensure there are no temporary adverse effects on the Columbia River's hydrologic regime.

5.1.1.3 Burnt Bridge Creek

Temporary effects to the hydrology of Burnt Bridge Creek due to construction of the Modified LPA are not anticipated beyond the potential for groundwater pumping during depressed roadway construction.

5.1.1.4 Fairview Creek

No temporary effects to the hydrologic regime of Fairview Creek are anticipated for the expansion of the Ruby Junction Light-Rail OMF since the required stormwater treatment facilities, which include infiltration for the entire expansion area, would be constructed ahead of and in preparation for construction of the expanded facilities.

5.1.2 Water Quality

All reasonable precautions would be taken to avoid and minimize water quality impacts during staging and construction, including construction of the new bridges, removal of the Interstate Bridge, and modifications to levees. These measures are outlined in Section 7.2. Temporary effects on the water quality of receiving waters within the study area may still be possible and may include the following:

- Increased turbidity due to ground disturbance around waterways associated with construction or staging.
- Discharge of pollutants to surface waters due to equipment leaks or spills in the vicinity of waterways.
- Groundwater contamination due to upland ground improvement activities, including deep soil mixing with cementitious material or aggregate.
- Sediment and contaminant migration into groundwater or surface water from equipment pressure or steam-cleaning operations following construction periods.
- Discharge of pollutants to surface waters due to use of fertilizers, pesticides, or herbicides during restoration or revegetation activities.
- Contamination of groundwater due to direct infiltration of toxic contaminants during groundwater pumping from locations of known existing groundwater contamination.
- Infiltration of polluted surface water into groundwater.
- Increased turbidity due to riverbed disturbance during in-water work.
- Release of existing contaminated sediments due to disturbance of riverbed sediments containing hazardous materials during in-water work. Sampling and analyzing potentially hazardous sediments prior to construction is addressed in the IBR Hazardous Materials Technical Report.
- Construction material or other objects falling into the Columbia River and North Portland Harbor during construction of the new bridges and demolition of the Interstate Bridge.

Following construction, the use of fertilizers, pesticides, or herbicides for restoration and revegetation activities could affect the water quality of waterways. While most of these substances are expected to be infiltrated into the pervious ground at restoration and revegetation sites, the potential for runoff during heavy precipitation events cannot be ruled out. Temporary effects that are a result of in-water work are applicable only to the Columbia River and North Portland Harbor for the Modified LPA since in-water work would not be performed at other waterways in the study area.

Throughout the study area, bridge, highway, transit, and other related construction improvements would disturb the ground, which may expose soil to erosion from wind, rain, and runoff. Waterbodies in the study area could receive sediment-laden runoff by way of stormwater inlets, ditches, or other forms of conveyance, which could result in increased turbidity and excessive sediment deposits.

The NPDES stormwater permitting program is administered by the DEQ in Oregon and Ecology in Washington. Generally, for projects disturbing 1 or more acres, 1200-C or 1200-CA permits apply to construction activities, including clearing, grubbing, grading, excavation, and stockpiling activities. The major provisions of these NPDES permits include: no discharge of significant amounts of sediment to surface waters; implementation of an ESCP/stormwater pollution prevention plan (SWPPP); maintenance of BMPs; proper material and waste handling; compliance with water quality standards and any TMDLs for drainage basins; and visual inspection of BMPs.

Upland construction could cause turbidity in the study area waterways, though this would be prevented if the upland sites are managed appropriately. During construction, the Modified LPA would adhere to an ESCP/SWPPP that specifies type and placement of BMPs, mandates frequent inspection, and outlines contingency plans in the event of failure. Additionally, there would likely be numerous other barriers between the source and the waterway. Therefore, to the greatest extent practicable, turbid discharges due to land-based BMP failure would be avoided.

Construction equipment operating on land could release pollutants (e.g., petroleum-based fuel or other fluids) or materials that could enter waterbodies by way of stormwater inlets, ditches, or other forms of conveyance. In addition, pressure or steam cleaning of construction equipment prior to or following construction periods could release sediment and pollutants into ground or surface waters. These activities could affect the waterbodies in the study area (i.e., Columbia River, North Portland Harbor, Columbia Slough, Burnt Bridge Creek, and Fairview Creek).

Although there are numerous sources of chemical pollutants, there is a low risk that chemicals would actually enter the receiving waters. The Modified LPA would employ numerous containment methods that would greatly minimize the potential release of pollutants and would ensure that accidental releases are confined to a limited area and cleaned up quickly. In addition to an ESCP/SWPPP, a spill prevention, control, and countermeasures plan (SPCCP) would be developed and implemented to minimize the probability of pollutants entering waterways.

The pumping of groundwater to facilitate construction may create a cone of depression and the potential for the movement of contaminated groundwater to from nearby hazardous materials sites. A review of high-ranking potential hazardous materials sites indicates that there are potential sources of existing contamination near proposed depressed road sections, except north of SR 500. See the IBR Hazardous Materials Technical Report for more details.

The major site for construction staging and bridge assembly/casting areas considered by the Modified LPA is the 5.6-acre Thunderbird Hotel site on Hayden Island, which is adjacent to the Columbia River. The staging and casting/assembly site activities may increase stormwater runoff over existing conditions and may increase pollutant loading. For this site, or others identified by the contractor, the staging and casting sites would meet all applicable stormwater requirements during and following its use. When the construction staging sites have been confirmed, a site-specific environmental analysis would be conducted to ensure that water quality impacts during construction are minimized. As with

all construction activities, impacts to water quality would be minimized through the use of BMPs specified in the ESCP/SWPPPs and SPCCPs developed for all necessary NPDES permits. All necessary permits would be secured prior to site development and operations.

Following construction, the use of fertilizers, pesticides, or herbicides during restoration and revegetation activities may affect the water quality of receiving waters. Their use, however, would be minimized, especially near receiving waters. The Modified LPA would adhere to requirements described in ODOT Standard Specifications 01040.00 to 01040.90 and/or WSDOT Standard Specification 8-02 "Roadside Restoration."

5.1.2.1 Columbia Slough

Temporary effects on the water quality of the Columbia Slough includes increased turbidity due to ground disturbance associated with construction or staging; release of pollutants due to equipment leaks, spills, or cleaning activities in the vicinity of the waterway; release of pollutants of groundwater due to groundwater pumping during depressed roadway construction and infiltration of contaminated surface water; and release of pollutants associated with chemicals used during revegetation activities. All temporary effects are described above. For the Modified LPA, these effects would be minimized through the implementation of an ESCP/SWPPP and an SPCCP.

5.1.2.2 Columbia River and North Portland Harbor

Temporary effects on the water quality of the Columbia River and North Portland Harbor include:

- Increased turbidity due to ground disturbance associated with construction or staging.
- Release of pollutants due to equipment leaks, spills, or cleaning activities in the vicinity of the river.
- Release of pollutants associated with chemicals used during revegetation activities, construction material, and other objects falling into the Columbia River and North Portland Harbor during the construction of the new bridge and demolition of the old bridge.
- Contamination of groundwater due to groundwater pumping during depressed roadway construction and infiltration of contaminated surface water.
- Increased turbidity due to riverbed disturbance during in-water work.
- Release of existing contaminated sediments due to disturbance of riverbed sediments containing hazardous materials during in-water work. Sampling and analyzing potentially hazardous sediments prior to construction is addressed in the IBR Hazardous Materials Technical Report.

Temporary effects of upland construction activities are described above in Section 5.1.2.

Numerous potential sources of chemical pollutants are associated with in-water work in the Columbia River and North Portland Harbor, including:

- Equipment located in or over water (such as barges or equipment operating on barges, temporary work platforms, the existing structure, or the new structure) are potential sources of pollutants, including petroleum fuel and other fluids.

- Concrete would be placed in numerous locations both in and over water for the construction of the pier footings and columns for the new bridge.
- Construction of the superstructure would involve the use of numerous other potential contaminants, such as various petroleum products, adhesives, metal solder, concrete and metal dust, and asphalt.
- Bridge demolition would occur both in and over water and may release contaminants such as concrete debris, concrete dust created by saw cutting, and lead paint.

Dropped construction materials or demolition debris may alter water quality by stirring up sediments. Portions of the existing Interstate Bridge contain lead-based paints. Significant modification of the existing bridge without proper implementation of BMPs may contaminate surface waters. Accidental chemical spills from construction machinery may be directly toxic to aquatic life.

The construction of bridge piers requires pouring concrete pier cap elements. Concrete may be poured on land or overwater during the course of construction. This fresh concrete may accidentally come into contact with the Columbia River and North Portland Harbor either by dropping into the water while it is being poured or by mixing with stormwater runoff during on land construction and being discharged into a waterbody. Fresh concrete is known to raise pH when it comes into contact with water.

The Modified LPA is likely to generate turbidity during the course of in-water work in the Columbia River and North Portland Harbor. The riverbed would be disturbed during in-water construction and cause sand and fine sediments to be resuspended in the water column. The following activities are likely to generate turbidity:

- Installation and removal of temporary piles.
- Installation and removal of cofferdams.
- Drilling shafts.
- Removal of old piers and riprap in the channel where new piers would be placed.
- Operating and anchoring the barge in shallow water.
- Demolishing the various elements of the existing bridge.

Sediment plumes, as a result of these activities, are expected to be localized and brief because of the implementation of containment measures. Containment measures are outlined in more detail in Chapter 7. In addition, the riverbed within the study area consists mostly of sand, which is anticipated to settle quickly once disturbed. A turbidity monitoring plan would be implemented during in-water work to ensure compliance with water quality permits.

The Modified LPA would employ numerous BMPs to minimize turbidity during the course of in-water work. Nevertheless, due to the large size and strong currents of the Columbia River and North Portland Harbor, there is no equipment that would completely contain turbidity. In addition, it is possible that BMPs may fail as a result of an accident or poor management and cause turbidity above ambient levels in these waterbodies.

Potential adverse effects from in-water work within the deeper waters of the Columbia River are assumed to be minimal. This is due to the likelihood that contaminated sediments within the deeper water environment are not present due to the high-energy fluvial environment and the presence of coarse-grained sediments that tend to not retain contaminants. Therefore, there is very little risk that in-water work in the Columbia River would resuspend contaminated sediments. In North Portland Harbor, contaminated sediments have been identified, but they are thought to be outside of the Modified LPA's construction footprint. If there is potential that in-water work could disturb these sediments, they would be analyzed in accordance with regulatory criteria and removed and disposed of properly (see the IBR Hazardous Materials Technical Report). Removed sediments may be disposed of in a permitted upland disposal site if required.

5.1.2.3 Burnt Bridge Creek

Temporary effects to the water quality of Burnt Bridge Creek would include turbidity due to ground disturbance associated with construction or staging; potential release of pollutants from equipment leaks, spills, or cleaning activities in the vicinity of waterways; and potential pollutants associated with chemicals used during revegetation activities. These effects would be minimized through the implementation of an ESCP/SWPPP and SPCCP for the study area.

5.1.2.4 Fairview Creek

No temporary effects on the water quality of Fairview Creek are anticipated since runoff is almost completely infiltrated and runoff from the entire facility would be infiltrated as a result of the Modified LPA. If runoff were conveyed off site, although this is not anticipated, temporary effects may include increased turbidity due to ground disturbance around waterways associated with construction or staging; potential release of pollutants from equipment leaks, spills, or cleaning activities in the vicinity of waterways as described above; and potential pollutants associated with chemicals used during revegetation activities. These effects would be minimized during construction of the Modified LPA through the implementation of an ESCP/SWPPP and SPCCP regardless of whether construction runoff is treated on site through infiltration or conveyed off site.

5.1.3 Stormwater

Temporary effects to stormwater throughout the study area and watersheds are directly related to effects discussed in regard to hydrology and water quality, and in many cases the effects overlap. Temporary effects to stormwater include increased turbid runoff across the study area related to ground disturbance activities, potential release of pollutants to stormwater due to equipment or construction components, the potential for increased stormwater volumes due to groundwater pumping during depressed roadway construction, and at the Columbia River and North Portland Harbor, an increased exposure of stormwater to pollutants due to surface staging areas, barges, temporary work bridges, and other structures related to overwater construction.

Ground-disturbing activities would occur along the study area and in the vicinity of receiving waters. Turbid runoff is anticipated to occur during rain events around ground-disturbing activities such as clearing, grubbing, excavation, grading, stockpiling fill materials, and ground improvement activities. An ESCP/SWPPP would be designed and implemented for the Modified LPA that would prevent turbid

runoff from entering receiving waters. The site would be monitored by an environmental compliance monitor during construction to ensure turbid runoff is contained on site. In the event of an accidental turbid discharge into surface waters, the ESCP/SWPPP would provide a framework for reporting and corrective actions per permit requirements.

At active construction sites, as well as staging and equipment storage areas, pollutants from equipment or construction components may be released into stormwater. Potential pollutant sources include equipment fuel/oil leaks or spills, “green” concrete (concrete that has not fully cured), and buried waste unearthed during excavation. An SPCCP would be designed and implemented for the Modified LPA to provide a framework for containment, prevention, monitoring, reporting, and disposal of pollutants during construction.

During depressed roadway construction groundwater may be pumped to lower water table elevations below construction activities. At this level of design, the location where the groundwater would be discharged or treated before being discharged or returned to groundwater flows has not been identified. If the groundwater that is pumped is discharged overland, stormwater volumes would increase. In this case, stormwater treatment provided by the ESCP/SWPPP would need to be sized to account for these volumes.

5.1.3.1 Columbia Slough

Temporary effects to stormwater in the vicinity of the Columbia Slough include increased sedimentation in stormwater facilities due to turbid discharges related to ground disturbance activities, potential release of pollutants to stormwater due to equipment or construction components, and the potential for increased stormwater volumes due to groundwater pumping during depressed roadway construction. These effects and minimization measures are described above in Section 5.1.2.1.

5.1.3.2 Columbia River and North Portland Harbor

In addition to the temporary effects discussed above that pertain to the whole of the Modified LPA, the Columbia River and North Portland Harbor would experience an increase in stormwater volumes due to the impervious surfaces of staging areas, barges, temporary work bridges, and other structures related to overwater construction. The ESCP/SWPPP and SPCCP that would be prepared for construction of the Modified LPA would address these temporary overwater construction components and prescribe methods for stormwater conveyance, treatment, monitoring, reporting, and emergency response.

5.1.3.3 Burnt Bridge Creek

Temporary effects on stormwater in the vicinity of the Burnt Bridge Creek include increased sedimentation in stormwater facilities due to turbid discharges related to ground disturbance activities, potential release of pollutants to stormwater due to equipment or construction components, and the potential for increased stormwater volumes due to groundwater pumping during depressed roadway construction. These effects and minimization measures are described in Section 5.1.2.3.

5.1.3.4 Fairview Creek

Temporary effects to stormwater in the vicinity of Fairview Creek at the Ruby Junction Light-Rail OMF include increased sedimentation in stormwater facilities due to turbid discharges related to ground disturbance activities and potential release of pollutants to stormwater due to equipment or construction components. Both of these temporary construction effects are not anticipated to affect Fairview Creek because stormwater is currently treated or infiltrated on site and would continue to be during construction and after the completion of construction activities. Stormwater conveyed off site would require prescribed treatment to ensure that runoff was not turbid or contaminated. Stormwater conveyance, treatment, monitoring, and emergency response from the Modified LPA's expansion of the Ruby Junction Light-Rail OMF would be included in the ESCP/SWPPP and SPCCP.

5.1.4 Design Options

All design options would have similar temporary effects as the Modified LPA because of the similarity in footprint, potential levee modifications, construction activities, and BMPs. While the SR 14 interchange without C Street Ramps design option would have a slightly smaller footprint than the Modified LPA, it would still have similar construction activities and therefore, the temporary effects would be similar.

6. INDIRECT EFFECTS

This chapter addresses water quality and hydrology of surface waters only. For groundwater effects, see Section 4.2.2.

Population growth and land use development are anticipated to occur under both the Modified LPA and the No-Build Alternative. With both alternatives, potential impacts to receiving waters and floodplains could result from land use development changes, with potential positive and adverse impacts to water quality and water quantity in study area waterbodies and the floodplain. However, in compliance with local land use plans, the Modified LPA could encourage higher-density development, such as transit-oriented development around light-rail stations, in already urbanized areas relative to the No-Build Alternative. Concentrating growth in the urban area can help protect natural resources from the potentially adverse effects of development on the urban periphery, resulting in localized increases in stormwater runoff quantities and pollutant loads but a net regional reduction. Conversely, the No-Build Alternative, because it would not provide new high-capacity transit, would be less likely to result in dense growth and hence would be less protective of natural resources.

Under the Modified LPA, adjacent development or redevelopment would require compliance with applicable City of Portland and City of Vancouver land use codes, including existing stormwater treatment and floodplain regulations. Any development and redevelopment resulting from the Modified LPA would have to comply with the relevant laws, regulations, policies, and codes in force at the time. Regulatory approvals range from tree and street tree removal to stormwater treatment and floodplain regulations to environmental zone and critical areas protections to more complicated processes for larger developments.

Local and state land use requirements would limit negative impacts from development and redevelopment. These regulations require avoidance or minimization of impacts on environmentally sensitive resources, including water quality and hydrology and floodplains. In light of these protections, indirect effects from the Modified LPA and potential future development are expected to be negligible. Local regulations require the avoidance or minimization of impacts to protected resources. These resources include shorelines, floodplains, wetlands, streambanks, and their buffers. With implementation of regulations, such as environmental zones, the Shoreline Management Act, and Critical Areas Ordinance, impacts to existing resources would be negligible.

Relevant stormwater regulations that would apply to other development out of the scope of the Modified LPA are listed in Table 6-1.

Table 6-1. Jurisdictional Stormwater Treatment Requirements

Jurisdiction	Water Quality Design Criteria	Flow Design Criteria
ODOT	Treat 85% of the cumulative runoff.	Not applicable. Flow control not required for receiving waterbodies in this portion of the study area.
WSDOT	Treat 91% of the runoff volume over the period of simulation.	• Columbia River – not applicable (flow control not required for this waterbody). • Burnt Bridge Creek discharge must be reduced to pre-development (forested) flow rates from 50% of the 2-year to the 50-year peak flow.
City of Portland	70% removal of total suspended solids from 90% of the average annual runoff.	Flow control not required for receiving waterbodies in this portion of the study area. Not applicable.
City of Vancouver	Same as WSDOT.	Same as WSDOT.

ODOT = Oregon Department of Transportation; WSDOT = Washington State Department of Transportation

7. AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION MEASURES

The proposed design of the Modified LPA avoids and minimizes water quality and hydrology impacts. In addition, the Modified LPA would not begin construction until compliance with regulatory requirements (identified below) are sufficiently demonstrated. The following identifies regulatory requirements and program-specific mitigation measures to address long-term and temporary effects of the Modified LPA to water quality and hydrology. Table 7-1 lists temporary and long-term avoidance and minimization measures. No temporary or long-term mitigation measures within control of the IBR Program were identified.

Table 7-1. Avoidance and Minimization Measures

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Temporary	Disruption to groundwater hydrology during construction	ODOT and WSDOT will coordinate with the contractor to minimize groundwater pumping in instances where construction activities must be conducted in the dry to allow proper installation of materials and visual inspections of completed work to avoid dewatering areas when practicable and minimize changes to groundwater hydrology.
Temporary	Water contamination from construction equipment used during construction	ODOT and WSDOT will coordinate with the contractor to stage construction equipment used for in-water work activities above the OHWM and will require construction equipment to use non-petroleum-based fluids, as feasible.
Temporary	Water contamination from erosion and ground disturbance, and from pollutants in stormwater runoff during construction	ODOT and WSDOT will require the contractor to prepare and implement an erosion and sediment control plan (ESCP) and stormwater pollution prevention plan (SWPPP) to minimize impacts associated with clearing, vegetation removal, grading, filling, compaction, or excavation. The BMPs identified in the ESCP and SWPPP will be used to control sediments in areas impacted by vegetation removal or ground-disturbing activities. Additional temporary control measures may be required beyond those described in the ESCP/SWPPP if it appears pollution or erosion may result from weather, nature of the materials or progress on construction. For additional details, consult ODOT Standard Specifications 00280.00 to 00280.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02.
Temporary	Water contamination from erosion and exposed soils during construction grading and vegetation removal	ODOT and WSDOT will require the contractor to stabilize all exposed soils as directed in measures prescribed in the ESCP and SWPPP. The contractor will hydro-seed all bare soil areas following grading activities and revegetate all temporarily disturbed areas with native vegetation. For additional details, consult ODOT Standard Specifications 01030.00 to 01030.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02.

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Temporary	Release of hazardous materials from a spill during construction	ODOT and WSDOT will require the contractor to prepare an SPCC plan prior to beginning construction, implement the SPCC plan, and have the SPCC plan available at the project site at all times. These plans will be provided to Ecology in Washington and DEQ in Oregon for review and approval. The SPCC plan will identify the appropriate spill containment materials, as well as the means and methods of implementation, response, and reporting in the event of a spill. Any modifications to the SPCC plan during construction will be provided to ODOT, WSDOT, Ecology, and DEQ for review and approval. For additional details, consult ODOT Standard Specification 00290.00 to 00290.90 and WSDOT Standard Specification 1-07.15.
Temporary	Water contamination from soils exposed during construction grading and vegetation removal	Include native plants and pollinator-friendly species, to the extent feasible and consistent with regulatory requirements and specifications, in the design of vegetative landscaping for restoration of areas that are temporarily disturbed.
		ODOT and WSDOT will require the contractor to revegetate temporarily disturbed areas as soon as practicable in compliance with applicable regulatory requirements. For additional detail, consult ODOT Standard Specifications 01040.00 to 01040.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02.
Temporary	Potential for locating flood storage areas in habitat areas	ODOT and WSDOT will continue to work with the City of Portland to confirm flood storage compensation does not jeopardize threatened and endangered species and designated critical habitats or unduly affect any other species or habitats of interest (revised Floodplain Development Code Chapter 24.50 Flood Hazard Areas).
Temporary	Risk of flooding from increased flood heights or velocities due to project construction	ODOT and WSDOT will coordinate with Cities of Portland and Vancouver to comply with special flood hazard area regulations.
Temporary	Contaminated stormwater runoff entering waterbodies during construction	ODOT and WSDOT will require the contractor to comply with all relevant water quality permit conditions for the treatment of stormwater runoff prior to discharge into receiving waters during construction.
Temporary	Spills and releases of hazardous materials and pollutants in stormwater runoff during construction	ODOT and WSDOT will require the contractor to select, design, and implement water quality BMPs to comply with all federal, state, and local construction and requirements issued through CWA Section 402, to reduce suspended solids, particulates, and dissolved metals; and to treat newly identified pollutants like 6PPD-quinone.
Temporary	In-water work activities affect water quality during construction	ODOT and WSDOT will coordinate with the contractor to conduct specified in-water work during approved periods for the Columbia River, as approved by WDFW, ODFW, NOAA Fisheries, and U.S. Fish and Wildlife Service.

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Temporary	Water turbidity during construction	In compliance with requirements of the 401 permits issued by Department of Environmental Quality and Department of Ecology, ODOT, WSDOT, and the contractor will monitor turbidity and provide a "rest" period to allow turbidity, if any, to dissipate between in-water work activities.
Temporary	Material spills during in-water excavation during construction	If in-water excavation is required outside of a cofferdam, ODOT and WSDOT will coordinate with the contractor to use a clamshell bucket, minimizing material spillage, within the established in-water work windows. Excavation, handling, and disposal of excavated materials will be conducted consistent with the requirements and conditions of the regulatory permits issued for the Modified LPA.
Temporary	Contaminated soil or groundwater during construction	ODOT and WSDOT will coordinate with the contractor to study, test, and remediate sites with existing soil or groundwater contamination adjacent to construction areas, as needed.
Long-term	Water contamination from erosion of exposed soils	ODOT and WSDOT will maintain and monitor planted vegetation consistent with applicable regulatory and permit requirements. For additional detail, consult ODOT Standard Specifications 01040.00 to 01040.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02.
Long-Term	Rise in base flood elevation from changes within floodplains	As design progresses, ODOT and WSDOT will conduct a detailed hydraulic analysis of the affected floodplains. If a rise in the base flood elevation is predicted, assess mitigation through floodplain excavation (cut/fill balance) activities within the footprint of the Modified LPA and determine whether additional land may be required to accomplish the required mitigation. Complete a Location Hydraulic Study to document the impacts, mitigation measures, evaluation of alternatives, and findings in accordance with the provisions of 23 C.F.R. §650A.
Long-Term	Contaminated stormwater runoff entering waterbodies during operations	ODOT and WSDOT will comply with their stormwater management requirements, and the Cities of Portland and Vancouver regulations for the portions of the Modified LPA along City-managed roads, for the long-term treatment of stormwater runoff prior to discharge into receiving waters.
Long-Term	Spills and releases of hazardous materials and pollutants in stormwater runoff during operations	ODOT and WSDOT will comply with all federal, state, and local regulatory requirements and municipal stormwater permit requirements issued through CWA Section 402, to reduce suspended solids, particulates, and dissolved metals; and to treat newly identified pollutants like 6PPD-quinone.
Long-Term	Increased rate of stormwater runoff to waterbodies	ODOT and WSDOT will construct flow control facilities to infiltrate or reduce the flow rates of all primary study area runoff, pursuant to local regulatory requirements. Mitigation for increased runoff to the Columbia Slough or the Columbia River will not be required because these water bodies are exempt from stormwater quantity management.

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Long-Term	Potential increase in pollutants in stormwater and surface water	ODOT and WSDOT will design advanced and effective water quality treatment facilities in accordance with each jurisdiction's specifications, such as Ecology's Technology Assessment Protocol program (Washington), the 2025 Stormwater Management Manual (Portland), and Vancouver's Surface Water Management Program.
Long-Term	Base flood elevation increase	ODOT and WSDOT will offset potential rise in the base flood elevation through compensatory floodplain excavation (cut/fill balance) activities or through other approved mitigation strategies as determined through a Location Hydraulic Study.
Long-Term	Contaminated stormwater and changes in stormwater flow to the wellhead protection zone in the Burnt Bridge Creek watershed	For the wellhead protection zone in the Burnt Bridge Creek watershed, ODOT and WSDOT will provide stormwater treatment facilities for treatment of all Program-related runoff, such as providing underground injection control requirements, to the extent practicable, and stormwater facilities to manage stormwater volumes.
Long-Term	Contaminated stormwater runoff during operations	ODOT and WSDOT will prepare stormwater monitoring plan(s) to evaluate the long-term performance and effectiveness of the updated stormwater conveyance and treatment systems.
		ODOT and WSDOT will treat stormwater runoff through approved bioretention BMPs, such as ponds/planters, biofiltration swales, bioslopes, and/or media filter drains that provide water quality treatment via infiltration through a phosphorus-free, compost-amended soil medium and/or vegetation.
Long-Term	Displacement of USGS stream gage 14144700	Through discussions with USGS Oregon Water Science Center, ODOT and WSDOT will relocate the USGS stream gage 14144700 Columbia River at Vancouver, Washington.

8. PERMITS AND APPROVALS

This chapter summarizes potential permits and approvals that would be needed for the Modified LPA related to water quality and hydrology resources. Permits and approvals may overlap across federal, state, and local requirements.

8.1 Federal Permits

8.1.1 National Pollutant Discharge Elimination System

A Section 402 NPDES permit may be needed if a new outfall is developed on Hayden Island that discharges to North Portland Harbor.

Existing NPDES permits addressing stormwater outfalls may need to be amended to address additional stormwater flows generated by the Modified LPA.

Existing construction NPDES permits held by ODOT and WSDOT may also require modification to address construction of the Modified LPA.

In Oregon, NPDES permits are administered through DEQ. In Washington these permits are administered through Ecology. Specific state requirements are discussed below.

8.1.2 Clean Water Act Section 404

A CWA permit would be required for in-water work within the Columbia River and North Portland Harbor. A Section 404 permit would also be required for removal or placement of material within a jurisdictional wetland.

8.1.3 Flood Control Facilities Disturbance

Per 33 C.F.R. § 208.10:

> *No improvement shall be passed over, under, or through the walls, levees, improved channels, or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the Department of the Army or his authorized representative that such improvement, excavation, construction, or alteration would not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice.*

Further, the USACE Flood Control Operations and Maintenance Policies, Regulation 1130-2-530, states that projects that protect urban areas or ones where failure would be catastrophic and result in loss of life should be inspected annually. It also instructs USACE personnel to report non-federal sponsors that are not complying with the regulations.

Actions impacting federal levees may require USACE Section 408 permission.

8.2 State Permits

8.2.1 Water Quality Certification

Section 401 states water quality certification approval would be required in association with the Section 404 permit application process. Section 401 requires an applicant for a federal license or Section 404 permit who plans to conduct an activity that may result in a discharge to waters of the state or U.S. to obtain certification that the activity complies with state water quality requirements and standards. State agencies certify whether the project meets state water quality standards and does not endanger waters of the state/U.S. or wetlands. These certifications are issued by DEQ in Oregon and by Ecology in Washington. The DEQ and Ecology would also review and approve the stormwater management plan, as well as overall effects on water quality.

8.2.2 Safe Drinking Water Act Permits

Both Washington and Oregon implement the federal SDWA within their jurisdictions. This law would apply if infiltration basins or underground injection control measures were incorporated into the preferred stormwater management design.

8.2.3 Wetland/Waters Removal-Fill Permits

In Oregon, removal or fill in jurisdictional wetlands or other waters of the state (including some ditches) requires a Removal-Fill permit from the DSL. DSL requires a wetland delineation and compensatory mitigation plan as part of the permit application. A JPA is submitted to the DSL, the USACE (Portland Regional Office), and DEQ.

8.2.4 Waste Discharge General Permit

In Washington, a state general permit program is administered through Ecology and is applicable to the discharge of pollutants, wastes, and other materials to state or federal waters. Permits issued are designed to satisfy the requirements for discharge permits under the CWA.

8.2.5 National Pollutant Discharge Elimination System

WSDOT uses a NPDES Construction Stormwater General Permit to cover all WSDOT construction activities disturbing more than 1 acre. Under the conditions of this permit, WSDOT must submit to Ecology a Notice of Intent to discharge stormwater associated with construction activities and to meet stormwater pollution prevention requirements.

In Oregon, the DEQ issues and enforces NPDES and WPCF permits. However, a WPCF permit is not generally required for stormwater treatment facilities and therefore not anticipated to be necessary for this project.

Compliance with the 1200-CA and MS4 permit would be required for: (1) the construction, installation, or operation of any activity that would cause an increase in the discharge of wastes into the waters of the state or would otherwise unlawfully alter the physical, chemical, or biological properties of any waters of the state; (2) an increase in volume or strength of any wastes in excess of the discharges authorized under an existing permit; and (3) the construction or use of any new outlet for the discharge of any wastes into the waters of the state. ODOT has a NPDES General Construction 1200-CA Stormwater Permit to cover ODOT construction activities on sites covering more than 1 acre. This permit requires an ESCP/SWPPP.

8.3 Local Permits

Both the City of Vancouver and the City of Portland have written into their municipal codes and administrative rules specific requirements for projects to manage stormwater, minimize erosion, and protect water quality. These requirements will be assessed during each city's respective development and building permit review processes. The following is a list of codes specific to stormwater and erosion control that would pertain to the Modified LPA.

8.3.1 Clark County Code 40.420 "Flood Hazard Areas"

Clark County requires a flood hazard permit for construction or development within land area subject to a 1% or greater chance of flooding in any given year.

8.3.2 Vancouver Municipal Code 14.09. "Stormwater Management"

The City of Vancouver implements its own NPDES permit, as issued by Ecology. Vancouver defers to Ecology's Stormwater Management Manual for Western Washington (Ecology 2019) for guidance but requires stormwater mitigation for development that increases the impervious area by more than 2,500 square feet.

8.3.3 Vancouver Municipal Code 14.24 "Erosion Control"

This code establishes regulations to minimize erosion from land development and land-disturbing activities.

8.3.4 Vancouver Municipal Code 14.25 "Stormwater Control"

This code establishes regulations for new development and redevelopment activity compliance with NPDES permitting, City General Requirements, and BMPs for stormwater management.

8.3.5 Vancouver Municipal Code 14.26 "Water Resources Protection"

This code establishes allowable and prohibited discharges and BMPs for protecting stormwater, surface water, and groundwater quality.

8.3.6 City of Portland Administrative Rule ENB-4.01, Stormwater Management Manual

The City of Portland requires stormwater mitigation for development or redevelopment that creates or replaces 500 square feet or more of impervious area.

8.3.7 Portland City Code 33.653 “Stormwater Management”

The PCC establishes criteria and standards for placement and capacity of stormwater facilities.

8.3.8 Portland City Code 17.38 “Drainage and Water Quality”

This portion of the PCC provides guidelines for the effective management of stormwater, groundwater, and drainage to protect and improve water quality in the watercourses and waterbodies within City of Portland limits.

8.3.9 Portland City Code 24.50 “Flood Hazard Areas”

Section 24.50.060 outlines the specific requirements for development within flood hazard areas.

9. REFERENCES

BES (City of Portland Bureau of Environmental Services). 2005. 2005 Portland Watershed Management Plan. Available at <https://www.portlandoregon.gov/bes/article/107808>. Accessed October 12, 2022.

BES. 2009. A Paddler's Access Guide – Columbia Slough. Available at <https://www.portlandoregon.gov/bes/article/42677>. Accessed October 25, 2021.

BES. 2011. Portland Plan Watershed Health Background Report. Available at <https://www.portlandonline.com/portlandplan/index.cfm?c=51427&a=395050>. Accessed October 12, 2022.

BES. 2015. Lower Columbia Slough Refugia Project, Final Grant Report for Oregon Department of Environmental Quality's Columbia Slough Natural Resources Damages Fund. Prepared for Oregon Department of Environmental Quality. Available at <https://www.oregon.gov/deq/FilterDocs/LowerRefugiaF.pdf>. Accessed October 12, 2022.

BES. 2019. Columbia Slough Report Card, website. Available at <https://www.portlandoregon.gov/bes/index.cfm?&a=743315>. Accessed October 12, 2022.

BES. 2020. City of Portland Stormwater Management Manual. Available at <https://efiles.portlandoregon.gov/record/14136164/file/document>. Accessed October 12, 2022.

BES. 2021. About the Watershed – Columbia Slough Watershed. Available at <https://www.portlandoregon.gov/bes/article/147238#about>. Accessed October 25, 2021.

BES. 2022. Municipal Separate Storm Sewer System Monitoring Plan. Available at <https://www.portland.gov/sites/default/files/2022/portland_ms4_monitoring_plan_final_nov2022.pdf>. Accessed December 13, 2022.

BES and DEQ (City of Portland Bureau of Environmental Services and State of Oregon Department of Environmental Quality). 2011. Columbia Slough Sediment Program Watershed Action Plan. Prepared by City of Portland, Bureau of Environmental Services and Oregon Department of Environmental Quality.

BES and DEQ. 2022. 2020–2021 Annual Report Columbia Slough Sediment Program. Available at <https://www.portland.gov/sites/default/files/2022/2021_columbia_slough_sediment_program_annual_deq-bes_report.pdf>. Accessed October 12, 2022.

City of Vancouver. 2022. 2022 Stormwater Management Plan, City of Vancouver. Surface Water Management, Department of Public Works. Available at <https://www.cityofvancouver.us/sites/default/files/fileattachments/public_works/page/1125/2022_swmp_final.pdf>. Accessed October 12, 2022.

Clark County Department of Public Works. 1998. Burnt Bridge Creek Historic Summary. Available at <http://www.vancouverlakepartnership.org/MapsMaterials/BBC_Historic_Summary1998.pdf>. Accessed December 13, 2021.

DEQ (State of Oregon Department of Environmental Quality). 1998. Columbia Slough Total Maximum Daily Loads (TMDLs) for: Chlorophyll a, Dissolved Oxygen, pH, Phosphorus, Bacteria, DDE/DDT, PCBs, Pb, Dieldrin and 2,3,7,8 TCDD. Available at <https://www.oregon.gov/deq/FilterDocs/columbiasloughtmdl.pdf>. Accessed October 12, 2022.

DEQ. 2005. Record of Decision, Remedial Action Approach for Columbia Slough Sediment, Portland, Oregon. Available at <https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=17b16a0b-ef61-4256-bae1-e6fb1993eaebpdf&s=CSloughROD2005scan.pdf>. Accessed October 12, 2022.

DEQ. 2006. Willamette Basin TMDL. Available at <https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=17b16a0b-ef61-4256-bae1-e6fb1993eaebpdf&s=CSloughROD2005scan.pdf>. Accessed October 12, 2022.

DEQ. 2009. Willamette Basin Rivers and Streams Assessment. Available at <https://digital.osl.state.or.us/islandora/object/osl%3A486396/datastream/OBJ/view>. Accessed October 12, 2022.

DEQ. 2012. Columbia Slough Sediment Study, Lower Slough between River Mile 5.9 and 8.7. Available at <https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=8abdfe60-9020-4aca-876e-304601791f77.pdf&s=Whitaker%20Slough%20sampling%20Rpt%20Final%20bg%20with%20Appendices.pdf>. Accessed October 12, 2022.

DEQ. 2020. Order Approving a Modification to the Oregon's Water Quality Standard for Total Dissolved Gas in the Columbia River Mainstem. Available at <https://www.oregon.gov/deq/wq/Documents/columbiaUSACEtmdlorder.pdf>. Accessed August 31, 2023.DEQ. 2022. 2022 Integrated Report, website. Available at <https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx>. Accessed October 12, 2022.

DEQ and Ecology (State of Oregon Department of Environmental Quality and Washington State Department of Ecology). 2002. Total Maximum Daily Load (TMDL) for Lower Columbia River Total Dissolved Gas. Available at <https://apps.ecology.wa.gov/publications/documents/0203004.pdf>. Accessed October 12, 2022.

Ecology (Washington State Department of Ecology). 2010. Streamflow Summary for Burnt Bridge Creek, Clark County, 2008. Publication No. 10-03-072. Available at <https://apps.ecology.wa.gov/publications/documents/1003072.pdf>. Accessed October 12, 2022.

Ecology. 2012. Surface Water/Groundwater Interactions and Near-Stream Groundwater Quality along Burnt Bridge Creek, Clark County. Publication No. 12-03-003. Available at <https://apps.ecology.wa.gov/publications/documents/1203003.pdf>. Accessed October 12, 2022.

Ecology. 2019. 2019 Stormwater Management Manual for Western Washington. Available at <https://apps.ecology.wa.gov/publications/SummaryPages/1910021.html>. Accessed October 12, 2022.

Ecology. 2020. Burnt Bridge Creek Watershed Fecal Coliform Bacteria, Temperature, Dissolved Oxygen, and pH, Source Assessment Report. Publication 20-03-016. Available at <https://apps.ecology.wa.gov/publications/documents/2003016.pdf>. Accessed October 12, 2022.

Ecology. 2021a. Freshwater Information Network Search. Available at <https://apps.ecology.wa.gov/eim/search/SMP/RiverStreamSearch.aspx?StudyMonitoringProgramUserId=RiverStream&StudyMonitoringProgramUserIdSearchType=Equals&MPLocationStatus=Active>. Accessed October 26, 2021.

Ecology. 2021b. Freshwater Information Network Search. Available at <https://apps.ecology.wa.gov/eim/search/SMP/RiverStreamSearch.aspx?StudyMonitoringProgramUserId=RiverStream&StudyMonitoringProgramUserIdSearchType=Equals&MPLocationStatus=Active>. Accessed October 27, 2021.

Ecology 2021d. Clark County Water Quality Improvement Projects. Available at <https://fortress.wa.gov/ecy/ezshare/wq/WaterQualityImprovement/TMDL/ClarkCounty.htm>. Accessed October 27, 2021.

Ecology. 2022. Washington State Water Quality Assessment 303(d)/305(b) List, Current Water Quality Assessment, website. Available at <https://apps.ecology.wa.gov/ApprovedWQA/ApprovedPages/ApprovedSearch.aspx>. Accessed October 12, 2022.

Ecology. 2024. Stormwater Management Manual for Western Washington. Available at < https://fortress.wa.gov/ecy/ezshare/wq/SWMMs/2024SWMMWW/Content/Resources/DocsForDownload/2024SWMMWW_6-14-24.pdf>. Accessed February 19, 2025.

EPA (U.S. Environmental Protection Agency). 1991. Total Maximum Daily Loading (TMDL) to Limit Discharges of 2,3,7,8–TCDD (Dioxin) to the Columbia River Basin. 1991. Available at https://apps.ecology.wa.gov/publications/documents/0910058.pdf. Accessed October 12, 2022.

EPA. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA-910-B-03-002. Available at <https://nepis.epa.gov/Exe/ZyPDF.cgi/P1004IUI.PDF?Dockey=P1004IUI.PDF>. Accessed November 10, 2022.

EPA. 2005. National Management Measures to Control Nonpoint Source Pollution from Urban Areas. EPA-841-B-05-004. Available at <https://www.epa.gov/sites/default/files/2015-09/documents/urban_guidance_0.pdf>. Accessed October 12, 2022.

EPA. 2021a. Columbia River Cold Water Refuges Plan. EPA-910-R-21-001. Available at <https://www.epa.gov/sites/default/files/2021-01/documents/columbia-river-cwr-plan-final-2021.pdf>. Accessed October 12, 2022.

EPA. 2021b. Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load. Available at <https://www.epa.gov/system/files/documents/2022-06/tmdl-columbia-snake-temperature-errata-update-05102022.pdf>. Accessed October 12, 2022.

EPA. 2021c. Total Maximum Daily Load (TMDL) for Mercury in the Willamette Basin, Oregon. Available at <https://www.epa.gov/sites/default/files/2021-02/documents/tmdl-willamette-mercury-final-02-04-2021.pdf>. Accessed October 12, 2022.

Fuhrer, G.J., D.Q. Tanner, J.L. Morace, S.W. McKenzie, and K.A. Skach. 1996. Water Quality of the Lower Columbia River Basin: Analysis of Current and Historical Water-Quality Data through 1994. U.S. Geological Survey Water-Resources Investigations Report 95-4294. Available at <https://pubs.usgs.gov/wri/1995/4294/report.pdf>. Accessed October 12, 2022.

Gregory, J.H., M.D. Dukes, P.H. Jones, and G.L. Miller. 2006. Effect of urban soil compaction on infiltration rate. Journal of Soil and Water Conservation 61: 117–124. Available at <https://abe.ufl.edu/faculty/mdukes/pdf/stormwater/Gregor-et-%20al-JSWC-compaction-article.pdf>. Accessed October 6, 2022.

Hecht, S.A., D.H. Baldwin, C.A. Mebane, T. Hawkes, S.J. Gross, and N.L. Scholz. 2007. An Overview of Sensory Effects on Juvenile Salmonids Exposed to Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-83, 39 pp.

Herrera (Herrera Environmental Consultants, Inc.). 2011. Quality Assurance Project Plan, Burnt Bridge Creek Ambient Water Quality Monitoring Project. Prepared for City of Vancouver Surface Water Management. Available at <http://www.cityofvancouver.us/sites/default/files/fileattachments/public_works/page/1125/2011-qualityassuranceprojectplan-bbc-20110818.pdf>. Accessed October 12, 2022.

Herrera. 2017. Burnt Bridge Creek Ambient Water Quality Monitoring Program. Prepared for City of Vancouver, Surface Water Management. Available at <https://www.herrerainc.com/wp-content/uploads/2020/03/14-05818-003_2017_TrendAnlysRpt_BBC_AmbntWQMonPrgrm_MainText_20180320.pdf>. Accessed October 12, 2022.

Herrera. 2018. 2017 Trend Analysis Report, Burnt Bridge Creek Ambient Water Quality Monitoring Program. Prepared for City of Vancouver Surface Water Management. Available at <https://www.cityofvancouver.us/sites/default/files/fileattachments/public_works/page/1125/56_2018_bbc_monitoring_report.pdf>. Accessed October 12, 2022.

Herrera and PGG (Herrera Environmental Consultants, Inc., and Pacific Groundwater Group). 2019. Integrated Scientific Assessment Report, Vancouver Watershed Health Assessment. Prepared for City of Vancouver Surface Water Management. Available at <https://www.cityofvancouver.us/sites/default/files/fileattachments/public_works/page/1125/watershed_health_assessment_final report_appendixb.pdf>. Accessed October 12, 2022.

Hinck, J.E., C.J. Schmitt, T.M. Bartish, N.D. Denslow, V.S. Blazer, P.J. Anderson, J.J. Coyle, G.M. Dethloff, and D.E. Tillitt. 2004. Biomonitoring of Environmental Status and Trends (BEST) Program: Environmental Contaminants and their Effects on Fish in the Columbia River Basin. U.S. Geological Survey, Columbia Environmental Research Center, Columbia, Missouri, Scientific Investigations Report 2004–5154. Available at <https://www.cerc.usgs.gov/pubs/center/pdfdocs/best-columbia_river.pdf>. Accessed October 12, 2022.

IBR (Interstate Bridge Replacement Program). 2023. Level 2 Toll Traffic and Revenue Study. Available at <https://www.interstatebridge.org/media/sh2lube2/ibr_level-2_tr_report_final_remediated.pdf>. Accessed December 22, 2025.

IBR. 2025. "Detailed Bridge Lift Data 2007 – 2025."

ISAB (Independent Scientific Advisory Board). 2000. The Columbia River Estuary and the Columbia River Basin Fish and Wildlife Program. A Review of the Impacts of the Columbia River's Hydroelectric System on Estuarine Conditions. Conducted for the Northwest Power Planning Council in conjunction with studies by NOAA Fisheries.

Kelly, V.J. and R.P. Hooper. 2004. Monitoring the Water Quality of the Nation's Large Rivers: Columbia River Basin NASQAN Program. U.S. Geological Survey Fact Sheet 004-98. Available at <https://pubs.usgs.gov/fs/1998/0004/report.pdf>. Accessed October 12, 2022.

Klein, R.D. 1979. Urbanization and stream quality impairment. Water Resources Bulletin, American Water Resources Association 15: 948–963. Available at <https://www.edwardsaquifer.org/wp-content/uploads/2019/02/1979_Klein_UrbanizationStreamQuality.pdf>. Accessed October 12, 2022.

LCEP (Lower Columbia Estuary Partnership). 2007. Lower Columbia River and Estuary Ecosystem Monitoring: Water Quality and Salmon Sampling Report. Available at <https://www.estuarypartnership.org/sites/default/files/resource_files/WaterSalmonReport.pdf>. Accessed October 12, 2022.

LCEP. 2011. Lower Columbia River Estuary Plan, Comprehensive Conservation and Management Plan, 2011 Update. Available at <https://www.estuarypartnership.org/sites/default/files/CCMP%20Action%20Update%20Final%200212.pdf>. Accessed October 12, 2022.

LCFRB (Lower Columbia Fish Recovery Board). 2010. Washington Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan. Available at <https://www.lcfrb.gen.wa.us/librarysalmonrecovery>. Accessed October 12, 2022.

McFarland, W.D. and D.S. Morgan. 1996. Description of the Groundwater Flow System in the Portland Basin, Oregon and Washington. USGS, Water Supply, Paper 2470-A.

Metro. 2018. 2018 Regional Transportation Plan. Available at <https://www.oregonmetro.gov/regional-transportation-plan>. Accessed April 5, 2023.

Metro. 2022. Metromap web application. Available at <https://gis.oregonmetro.gov/metromap/>. Accessed October 12, 2022.

Morace, J.L. 2006. Water-Quality Data, Columbia River Estuary, 2004–05. U.S. Geological Survey Data Series 213. Prepared in cooperation with the Lower Columbia River Estuary Partnership and the Bonneville Power Administration. Available at <https://pubs.usgs.gov/ds/2006/213/pdf/lcrep_data.pdf>. Accessed October 12, 2022.

Multnomah County. 2014. Multnomah County 2014 TMDL Implementation Plan for the Tualatin, Lower Willamette and Sandy River Basins. Available at <https://multco-web7-psh-files-usw2.s3-us-west-2.amazonaws.com/s3fs-public/Multnomah%20County%20TMDL%202014%20Binder.pdf>. Accessed October 12, 2022.

NOAA (National Oceanic and Atmospheric Administration). 2022. National Centers for Environmental Information, Daily Summaries Station Details for Portland International Airport Station GHCND:USW00024229. Available at <https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USW00024229/detail>. Accessed October 12, 2022.

ODFW (Oregon Department of Fish and Wildlife). 2010. Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon & Steelhead. Available at <https://www.dfw.state.or.us/fish/crp/lower_columbia_plan.asp>. Accessed October 12, 2022.

ODOT (Oregon Department of Transportation). 2008. Regional Precipitation-Frequency Analysis and Spatial Mapping of 24-Hour Precipitation for Oregon. Available at <https://www.oregon.gov/ODOT/Programs/ResearchDocuments/SPR656_Rainfall_Analysis_Final_Report_web.pdf>. Accessed October 19, 2021.

ODOT. 2021. 2020 MSR Compliance Report. Prepared for ODOT National Pollutant Discharge Elimination System Phase I Municipal Separated Storm Sewer System Permit. DEQ File No. 101822. Available at <https://www.oregon.gov/odot/Maintenance/Documents/ANNUAL_COMPLIANCE_REPORT_2020.pdf>. Accessed April 4, 2023.

OHA (Oregon Health Authority). 2019. Columbia Slough Fish Advisory, Technical Report. Available at <https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/RECREATION/FISHCONSUMPTION/Documents/FINAL%20PUBS%20Columbia%20Slough%20Tech%20Report%20Document.pdf>. Accessed October 12, 2022.

PBS (PBS Engineering and Environmental). 2003. Evaluation of Natural Resources, Burnt Bridge Creek Regional Wetland Bank and Greenway Trails Project. Prepared for J. D. Walsh and Associates, City of Vancouver Surface Water Management, and Vancouver Parks and Recreation Department.

PWB (City of Portland Water Bureau). 2020. Water Management and Conservation Plan. Available at <https://www.portland.gov/sites/default/files/2020/wmcp-layout_2020-09-15_web_0.pdf>. Accessed October 12, 2022.

RTC (Southwest Washington Regional Transportation Commission). 2019. Regional Transportation Plan for Clark County. Available at <https://www.rtc.wa.gov/programs/rtp/clark/>. Accessed June 6, 2023.

Tanner, D.Q. and T.M. Wood. 2000. Effects of Calcium Magnesium Acetate (CMA) Deicing Material on the Water Quality of Bear Creek. Clackamas County, Oregon, 1999. U.S. Geological Survey Water Resources Investigations Report 00-4092. Available at <https://pubs.usgs.gov/wri/2000/4092/report.pdf>. Accessed October 12, 2022.

Tetra Tech. 1996. Lower Columbia River Bi-State Program, the Health of the River 1990–1996, Integrated Technical Report. Prepared for the Lower Columbia River Bi-State Water Quality Program. Available at <https://www.estuarypartnership.org/sites/default/files/resource_files/Additions_D_1996_health_of_the_river_integrated_report.pdf>. Accessed October 12, 2022.

USACE (U.S. Army Corps of Engineers). 2003. Columbia River Channel Improvement Project Final Supplemental Integrated Feasibility Report and Environmental Impact Statement. Portland District, Portland, Oregon.

USACE. 2017a. Columbia & Lower Willamette Rivers Project: Dredged Material Management Preliminary Assessment, Columbia River Federal Navigation Channel, River Mile 3 to 105.5. Portland District, Portland, Oregon. Available at <https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/7599/rec/1>. Accessed November 10, 2022.

USACE. 2017b. Review Plan: Lower Columbia River Federal Navigation Channel Maintenance Integrated Dredged Material Management Plan and Environmental Impact Statement. Portland District, Portland, Oregon. Available at https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/4778. Accessed November 10, 2022.

USCG (U.S. Coast Guard). 2022. Preliminary Navigation Clearance Determination for the Interstate Bridge Replacement Program. Letter to Thomas D. Goldstein, PE, IBR Program Oversight Manager, FHWA, from B. J. Harris, Chief, Waterways Management Branch, Coast Guard District 13. June 17. Available at <https://www.interstatebridge.org/media/fi2b3xei/ibr_next_steps_bridge_permitting_june2022_remediated.pdf>. Accessed September 25, 2023.

USGS. 2026. Preliminary Navigation Clearance Determination for the Interstate Bridge Replacement Program. Letter to Carley Francis, Interim IBR Program Administrator, IBR Program, from Brian L Dunn, Chief, Office of Bridge Programs. January 16, 2026. Available at <https://www.interstatebridge.org/media/2ildjsdp/ibrp_pncd_2026.pdf> . Accessed January 16, 2026.

USFWS (U.S. Fish and Wildlife Service), Shelley Matthews. 1996. Burnt Bridge Creek. Available at <https://www.fws.gov/oregonfwo/toolsforlandowners/urbanconservation/greenspaces/Documents/Projects/1994%20Finals/94BurntBridgeCreek.pdf>. Accessed December 13, 2021.

USGS (U.S. Geological Survey). 2023a. USGS Surface-Water Monthly Statistics for the Nation: USGS 14211820 Columbia Slough at Portland, OR. Available at <https://waterdata.usgs.gov/nwis/uv/?site_no=14211820&agency_cd=USGS&amp>. Accessed January 17, 2023.

USGS. 2023b. USGS Surface-Water Monthly Statistics for the Nation: USGS 14144700 Columbia River at Vancouver, WA. Available at

<https://waterdata.usgs.gov/nwis/uv/?site_no=14144700&agency_cd=USGS&amp>. Accessed January 17, 2023.

USGS. 2023c. USGS Surface-Water Monthly Statistics for the Nation: USGS 14211902 Burnt Bridge Creek near Mouth at Vancouver, WA. Available at <https://waterdata.usgs.gov/nwis/uv/?site_no=14211902&agency_cd=USGS&amp>. Accessed January 17, 2023.

USGS. 2023d. USGS Surface-Water Monthly Statistics for the Nation: USGS 14211814 Fairview Creek at Glisan St near Gresham, OR. Available at <https://waterdata.usgs.gov/nwis/uv/?site_no=14211814&agency_cd=USGS&amp>. Accessed January 17, 2023.

Wells, S.A. 1997. The Columbia Slough. Prepared for City of Portland, Bureau of Environmental Services. Technical Report EWR-2-7-97. Available at <https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1132&context=cengin_fac>. Accessed October 12, 2022.

WSDOT (Washington State Department of Transportation). 2009. Quantitative Procedures for Surface Water Impact Assessment. Available at <https://wsdot.wa.gov/sites/default/files/2021-10/Env-StormW-SurfaceWaterProcedure.pdf>. Accessed October 12, 2022.

WSDOT. 2019. Temporary Erosion and Sediment Control Manual. Available at <WSDOT Temporary Erosion and Sediment Control Manual M 3109.02>. Accessed February 19, 2025.

WSDOT. 2022. Biological Assessment Preparation Manual, Chapter 17.0 Stormwater Impacts Assessment. Available at <https://wsdot.wa.gov/sites/default/files/2022-06/BA-Manual-Chapter-17.pdf>. Accessed November 10, 2022.

Appendix A

PRELIMINARY LOCATION HYDRAULIC STUDY



Interstate Bridge Replacement Program NEPA Floodplain Evaluation

Preliminary Location Hydraulic Study

July 2025

OREGON

For Americans with Disabilities Act (ADA) or Civil Rights Title VI accommodations, translation/interpretation services, or more information, call (503) 731-4128, TTY 800-735-2900 or Oregon Relay Service 7-1-1.

WASHINGTON

Accommodation requests for people with disabilities in Washington can be made by contacting the Washington State Department of Transportation (WSDOT) ADA Affairs team at wsdotada@wsdot.wa.gov or by calling toll-free, (855) 362-4ADA (4232). Persons who are deaf or hard of hearing may make a request by calling the Washington State Relay at 711.

Preliminary Location Hydraulic Study

Prepared for:

Oregon Department of Transportation

Washington State Department of Transportation

TABLE OF CONTENTS

1. INTRODUCTION 1-1
1.1 Project Description 1-1
1.2 Purpose of Study 1-2
1.3 FEMA Floodplains 1-2
1.4 Public Review and Notice 1-5
1.5 Alternatives to Development in the Floodplain 1-5

2. HYDRAULIC MODEL 2-1
2.1 Data Sources 2-1
2.2 Hydrology 2-1
2.3 Existing Condition 2-2
2.4 Ultimate Condition 2-4
2.4.1 Columbia River Proposed Bridges 2-4
2.4.2 North Portland Harbor Proposed Bridges 2-7
2.4.3 Bridge Modeling Approach 2-7
2.4.4 Water Surface Elevation and Velocity 2-7
2.4.5 Bridge Freeboard 2-8

3. CHARACTERIZATION OF IMPACTS 3-1
3.1 Change in Base Flood Elevation 3-1
3.2 Change in Velocity 3-2
3.3 Impacts on Natural and Beneficial Floodplain Values 3-2
3.4 Support of Probable Incompatible Floodplain Development 3-3
3.5 Risk Associated with Implementation of the Action 3-3

4. ALTERNATIVES 4-1
4.1 Practicability of Alternatives 4-1
4.1.1 No Action 4-1
4.1.2 Alternative Sites 4-1
4.1.3 Alternative Actions 4-1
4.2 Alternatives to Longitudinal Encroachment 4-2

5. MITIGATIONS 5-1
5.1 Measures to Minimize Floodplain Impacts 5-1
5.1.1 Public Notice 5-1

5.1.2 Coordination with Local Officials 5-1
5.1.3 Ongoing Compliance Process 5-1
5.2 Measures to Restore and Preserve Natural and Beneficial Floodplain Values 5-2
6. EXECUTIVE ORDER 11988 COMPLIANCE SUMMARY 6-1
7. REFERENCES 7-2

FIGURES

Figure 1-1. IBR Program Area Map 1-1
Figure 1-2. Flood Insurance Rate Map – Columbia River Vancouver, Washington Side 1-3
Figure 1-3. Flood Insurance Rate Map – Columbia River Portland, Oregon Side 1-4
Figure 1-4. Flood Insurance Rate Map – North Portland Harbor, Portland Oregon 1-5
Figure 2-2. Columbia River Bridges and Approaches Construction Package Project Area 2-6

TABLES

Table 2-1. Existing Condition Water Surface Elevations – 100-Year Event 2-2
Table 2-2. Existing Condition Velocities – 100-Year Event 2-3
Table 2-3. Existing Condition Water Surface Elevation at Effective Cross Sections – 100-Year Event 2-3
Table 2-4. Ultimate Condition Water Surface Elevations – 100-Year Event 2-7
Table 2-5. Ultimate Condition Velocities – 100-Year Event 2-8
Table 2-6. Bridge Freeboard 2-8
Table 3-1. Changes in Base Flood Elevation – Ultimate Condition 3-1
Table 3-3. Changes in Velocity – Ultimate Condition 3-2

APPENDICES

Appendix A – FEMA Floodplain Maps

Appendix B – Cross-Section Map

Appendix C – Bridge Plans

Appendix D – HEC-RAS Model Results

Appendix E – Water Surface Elevation Profiles

ACRONYMS AND ABBREVIATIONS

1D	one-dimensional
2D	two-dimensional
ADA	Americans with Disabilities Act
BFE	base flood elevation
CLOMR	Condition Letter of Map Revision
CRBA	Columbia River Bridges and Approaches
CRT	Columbia River Treaty
DTM	digital terrain model
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FIS	Flood Insurance Study
FTA	Federal Transity Administration
HEC-RAS	Hydrologic Engineering Center's River Analysis System
I-5	Interstate 5
IBR	Interstate Bridge Replacement
NEPA	National Environmental Policy Act
OECR	Office of Equity and Civil Rights
PMLS	Portland Metro Levee System
SEIS	Supplemental Environmental Impact Statement
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
WSE	water surface elevation

1. INTRODUCTION

1.1 Project Description

The Interstate Bridge Replacement (IBR) Program includes bridge, transit, active transportation, and highway improvements in the Interstate 5 (I-5) corridor between Portland, Oregon, and Vancouver, Washington (Figure 1-1). I-5 is the main, and only continuous, north–south interstate highway on the West Coast. It links the United States, Canada, and Mexico and in the project area connects the cities of Vancouver, Washington and Portland, Oregon. The IBR Program intends to (1) address growing travel demand and congestion; (2) increase safe and efficient movement of freight; (3) improve public transportation service reliability and travel times; (4) address safety and vulnerability to incidents; (5) improve bicycle and pedestrian facilities; and (6) improve seismic resiliency.

Figure 1-1. IBR Program Area Map



The Oregon Department of Transportation and Washington State Department of Transportation are sponsoring the IBR Program and developing and delivering the improvements, with existing or anticipated funding and oversight by the Washington and Oregon state legislatures, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA). Funding will be sourced from federal sources, tolling, and Oregon and Washington state funds. FHWA and FTA are the federal lead agencies. Additional federal partners include the U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), and Federal Emergency Management Agency (FEMA).

1.2 Purpose of Study

The purpose of this study is to evaluate the potential for floodplain impacts from implementation of the IBR Program, in compliance with Executive Order 11988. This executive order requires federal agencies to avoid adverse impacts to floodplains, both short and long term, by evaluating alternatives to avoid development in floodplains. Adverse impacts include an increase in base flood elevation (BFE) or a significant impact to natural or beneficial floodplain values.

Executive Order 11988 requires certain steps to be completed for construction activities in floodplains to evaluate the alternatives and select a practicable alternative that minimizes adverse impacts. The eight steps prescribed in the executive order are:

1. Determine if the proposed project is in the floodplain.
2. Conduct public review and notice.
3. Evaluate alternatives to development in the floodplain.
4. Identify impacts from the proposed action.
5. Determine if impacts can be mitigated.
6. Reevaluate alternatives.
7. Present findings.
8. Implement the project.

FHWA implements Executive Order 11988 according to 23 Code of Federal Regulations (CFR) 650, Subpart A – Location Hydraulic Studies. USACE has also published implementation guidance in ER 1165-2-26. This Preliminary Location Hydraulic Study has been performed in accordance with Executive Order 11988 and following FHWA and USACE implementation guides. The IBR Program would involve construction activities in two floodplains: the mainstem Columbia River and the North Portland Harbor (Oregon Slough) channel on the Oregon side of Hayden Island. This report summarizes the study findings and outlines actions to avoid or mitigate adverse impacts to the floodplains. The report structure and format adhere to the specific requirements of a Location Hydraulic Study, per the executive order.

1.3 FEMA Floodplains

The proposed bridge structures would cross the regulatory floodplain and floodway of the Columbia River and North Portland Harbor as shown on FEMA Flood Insurance Rate Map (FIRM) panels 53011C0481D (effective September 5, 2012) and 4101830085F (effective October 19, 2004), Figure 1-2 through Figure 1-4. Full FIRM panels can be found in Appendix A.

Figure 1-2. Flood Insurance Rate Map – Columbia River Vancouver, Washington Side

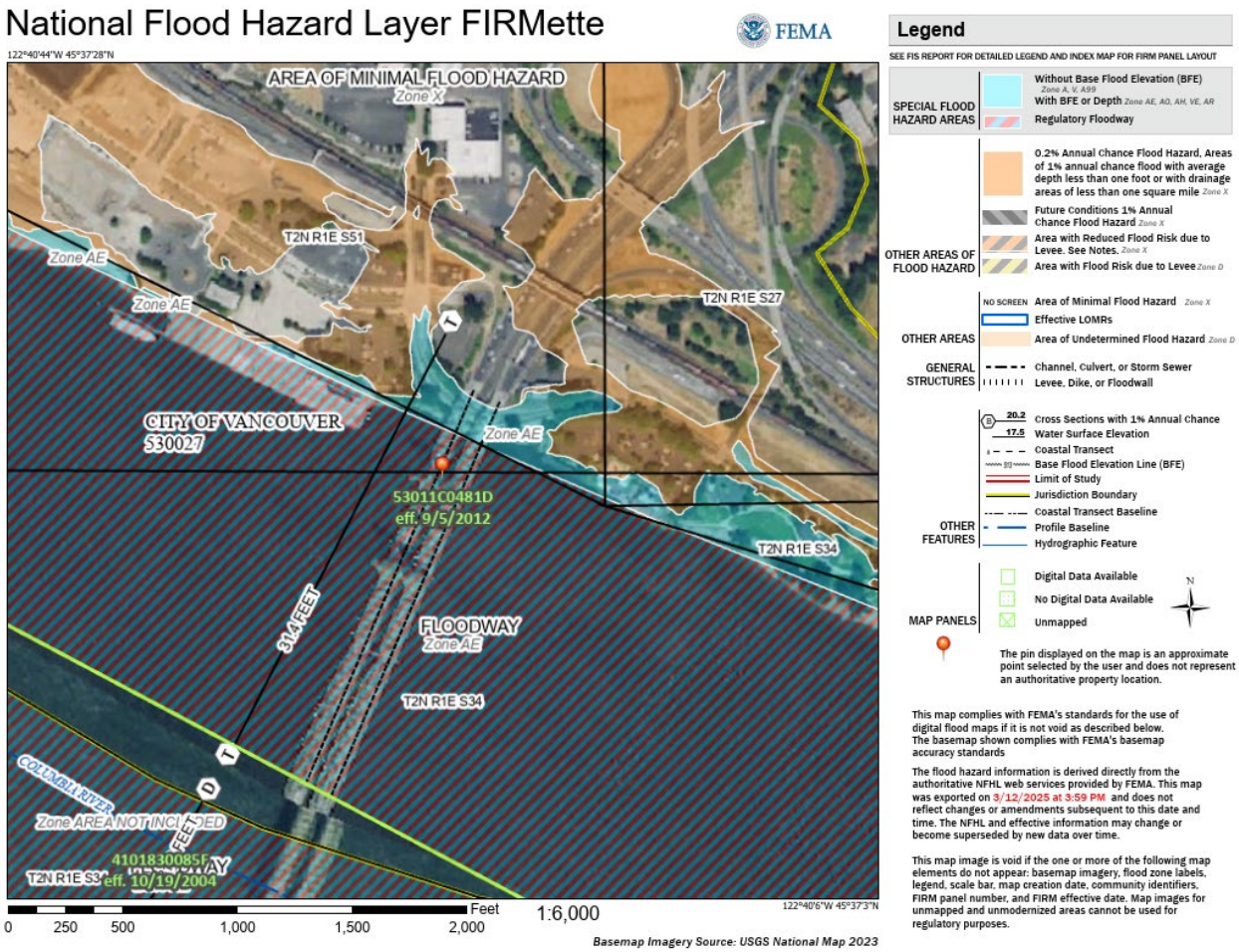


Figure 1-3. Flood Insurance Rate Map – Columbia River Portland, Oregon Side

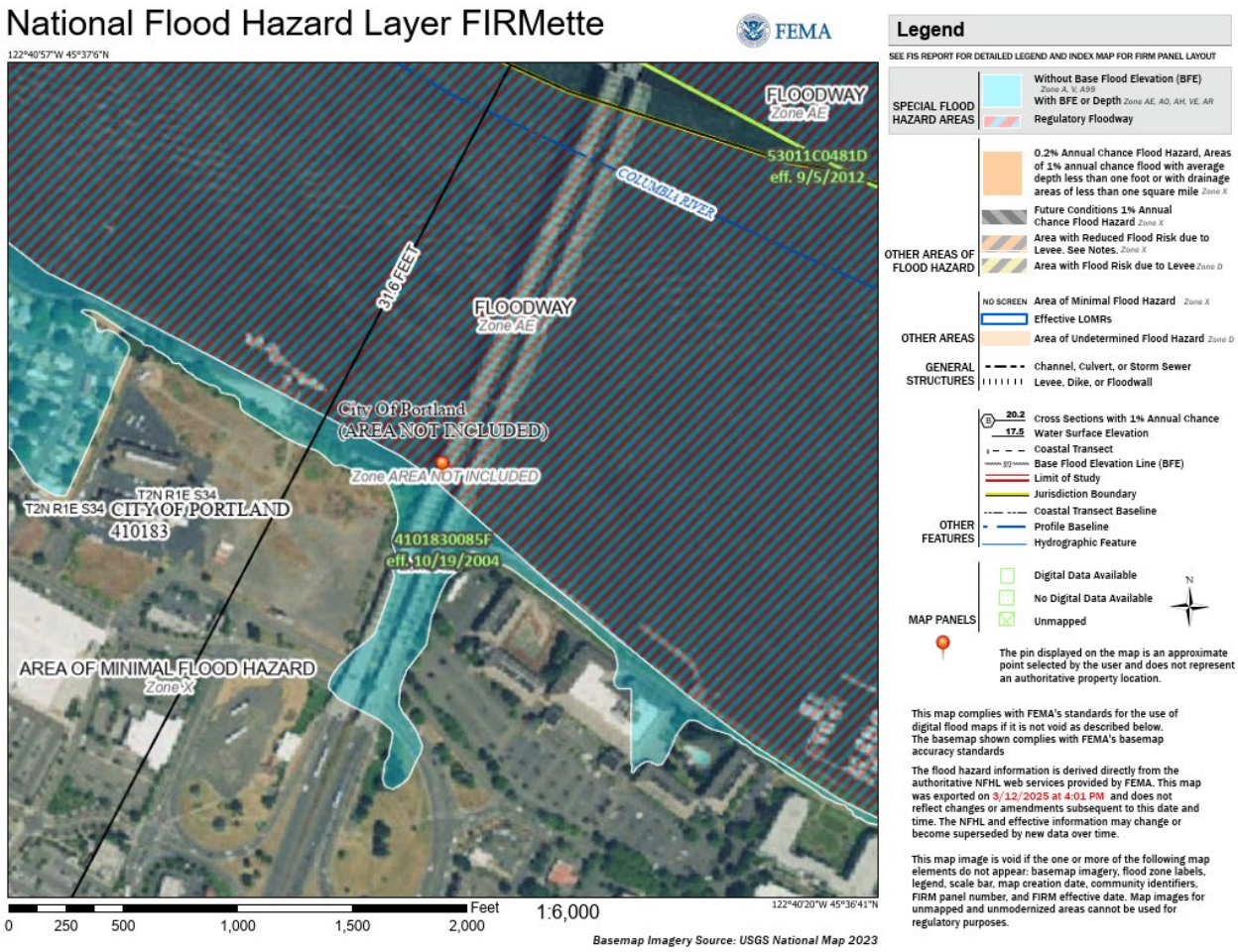
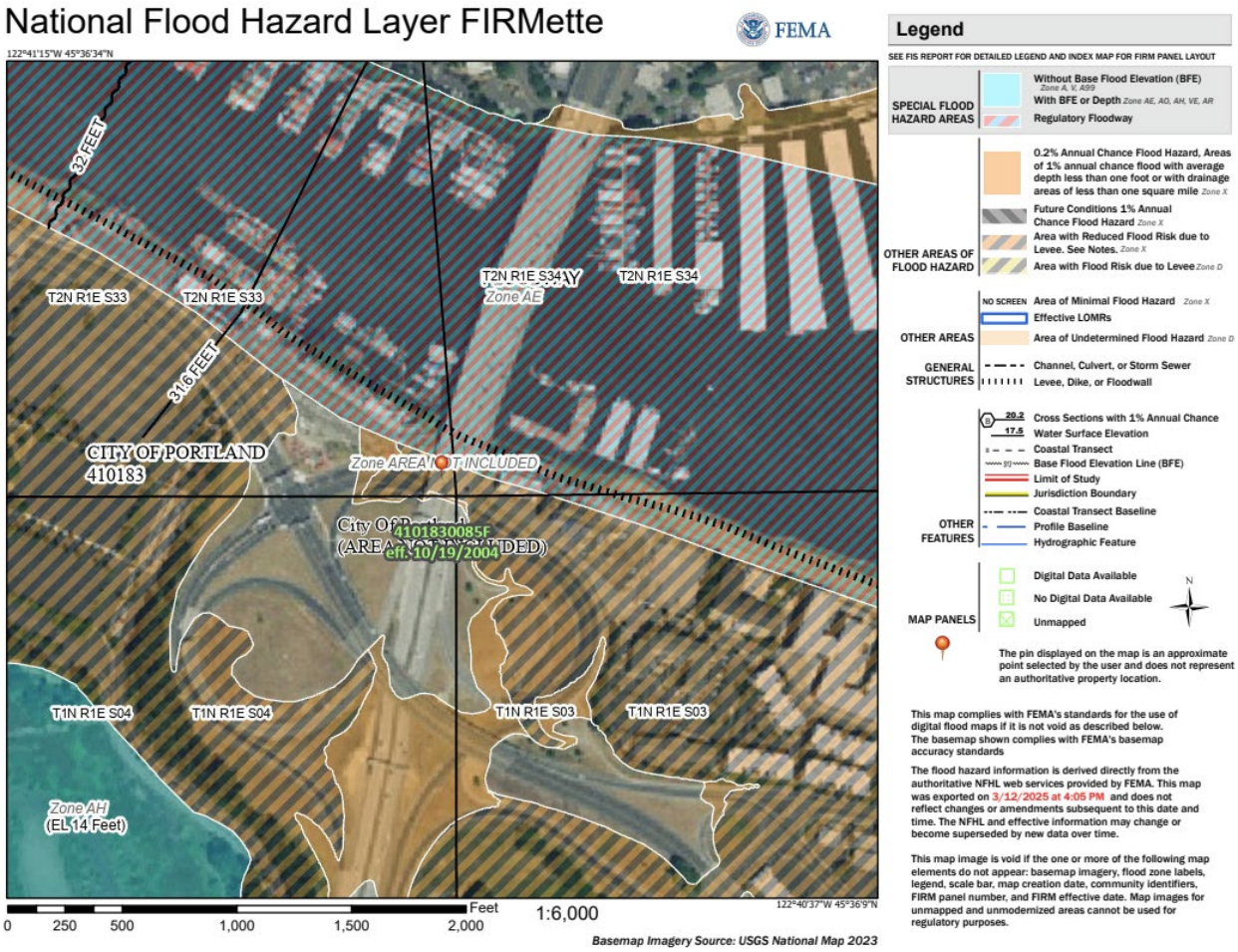


Figure 1-4. Flood Insurance Rate Map – North Portland Harbor, Portland Oregon



1.4 Public Review and Notice

The IBR Program has deployed a public coordination and review process in accordance with federal and local agency requirements. The Program has conducted public notification as part of the National Environmental Policy Act (NEPA) process. The Program's Section 408 submittals to the USACE document the public review and notice process. In addition, coordination has begun with the local floodplain administrators of the City of Portland and the City of Vancouver in accordance with the executive order requirements.

1.5 Alternatives to Development in the Floodplain

The IBR Program has undergone a detailed evaluation of different alternatives for crossing the waterways. Section 4 summarizes the IBR Program's evaluation of alternatives to development in the floodplain, including no action, Alternative Sites, and Alternative Actions. The evaluation found that

there is no practicable alternative that would avoid placing bridge components in the floodplain and floodway. Therefore, the recommended placement is justified.

2. HYDRAULIC MODEL

The IBR Program developed a one-dimensional (1D) hydraulic model using the USACE's Hydrologic Engineering Center's River Analysis System (HEC-RAS) Version 6.6 modeling system. The developed 1D model is based on USACE's Columbia River Treaty (CRT) Portland Metro Levee System (PMLS) model, such as using the CRT hydraulic output data for the model boundary conditions and as a basis for peak water surface calibration of the model. Please refer to the July 2025 Columbia River Bridges and Approaches (CRBA) *One-Dimensional Hydraulic Modeling Report* for a detailed discussion of how the 1D model is based on the CRT model. The developed HEC-RAS 1D model cross sections were placed as consistently as possible with both the USACE CRT Model and FEMA cross sections, while focusing on capturing important Program design features. The modeling approach is consistent with both the CRT modeling approach and the FEMA regulatory modeling approach for the Columbia River.

Please refer to the July 2025 CRBA *One-Dimensional Hydraulic Modeling Report* for a detailed discussion of selection of the project area, including the following:

1. Model extents
2. River reaches
3. Tributaries

Appendix B includes a cross-section map of the entire model extents. HEC-RAS cross sections correlate to the river mile stationing in the USACE CRT PMLS model.

2.1 Data Sources

Please refer to the July 2025 CRBA *One-Dimensional Hydraulic Modeling Report* for a detailed discussion of data sources, including:

1. FEMA Flood Insurance Studies (FIS) (FEMA 2010, 2012)
2. Historical project models
3. USACE CRT model geometry
4. Datums
5. Digital Terrain Model (DTM)
6. Existing bridge plan sets
7. Levee data

2.2 Hydrology

Please refer to the July 2025 CRBA memorandum, *Navigation Section 408: Columbia River Summary Hydrology Study for the Interstate Bridge Replacement (IBR) Program* and the July 2025 CRBA *One-*

Dimensional Hydraulic Modeling Report for a detailed discussion of flowrates and boundary conditions for the ID model, including:

1. Atmospheric river flowrates for 2, 5, 10, 20, 25, 50, 100 and 500-year events.
2. Spring freshet flowrates for 2, 5, 10, 20, 25, 50, 100 and 500-year events.
3. FEMA effective 100-year flowrate.

The same flowrates are used for existing condition and ultimate condition analyses.

2.3 Existing Condition

Please refer to the July 2025 CRBA *One-Dimensional Hydraulic Modeling Report* for a detailed discussion of the existing condition analysis, including:

1. Review of the CRT model
2. Modifications of the DTM around the project area
3. Existing condition bridge geometry
4. Existing condition cross sections
5. Manning's n roughness values
6. Bridge modeling approach
7. Flow split methodology
8. Boundary conditions
9. Model run controls
10. Model calibrations

The existing condition 1D model serves as the baseline for comparison and is intended to serve as the corrected effective model for future floodplain no-rise analyses.

Table 2-1 summarizes the existing 100-year water surface elevation (WSE) as determined by the CRBA 1D Existing Condition Model, and Table 2-2 summarizes the existing velocity at each bridge crossing, comparing the atmospheric river and spring freshet events, as well as the FEMA effective flow. Hydraulic model results across the full range of flow conditions can be found in Appendices D and E. The cross-section selected for comparison is the first cross-section immediately upstream of each bridge.

Table 2-1. Existing Condition Water Surface Elevations – 100-Year Event

Bridge	HEC-RAS Cross Section	WSE (feet NAVD 88)		
		Atmospheric River	Spring Freshet	FEMA Effective Flow
Columbia River	106.78	32.66	27.75	31.56

Bridge	HEC-RAS Cross Section	WSE (feet NAVD 88)		
		Atmospheric River	Spring Freshet	FEMA Effective Flow
North Portland Harbor	4.46	32.58	27.56	31.47

FEMA = Federal Emergency Management Agency; HEC-RAS = Hydrologic Engineering Center's River Analysis System; NAVD 88 = North American Vertical Datum of 1988; WSE = water surface elevation

Table 2-2. Existing Condition Velocities – 100-Year Event

Bridge	HEC-RAS Cross Section	Velocity (feet per second)		
		Atmospheric River	Spring Freshet	FEMA Effective Flow
Columbia River	106.78	3.40	4.79	3.49
North Portland Harbor	4.46	2.38	3.27	2.41

FEMA = Federal Emergency Management Agency; HEC-RAS = Hydrologic Engineering Center's River Analysis System

Table 2-3 shows the difference in WSE between the existing condition model and the FEMA effective BFE published in the FIS and FIRMs. Calculated WSE based on the IBR 1D hydraulic model are higher than the FIS for several reasons, including:

1. Updated DTM with current bathymetry
2. Inclusion of bridges at I-5 and the BNSF Railway
3. Inclusion of flow split around Hayden Island
4.

Table 2-3. Existing Condition Water Surface Elevation at Effective Cross Sections – 100-Year Event

FIS Cross Section	HEC-RAS Cross Section	100-Year Event WSE (feet NAVD 88)			
		Atmospheric River	Spring Freshet	FEMA Effective Flow	FEMA FIS BFE
AF	123.86	35.39	33.52	34.52	35.3
AE	123.07	35.25	33.23	34.36	35.1
AD	121.81	34.98	32.69	34.06	34.9
AC	120.10	34.55	31.90	33.61	34.6

FIS Cross Section	HEC-RAS Cross Section	100-Year Event WSE (feet NAVD 88)			
		Atmospheric River	Spring Freshet	FEMA Effective Flow	FEMA FIS BFE
AB	118.35	34.43	31.62	33.47	34.2
AA	116.36	34.06	30.86	33.08	33.7
Z	115.36	33.92	30.55	32.93	33.4
Y	113.25	33.69	30.01	32.67	32.8
X	111.41	33.33	29.25	32.28	32.5
W	110.56	33.21	28.99	32.15	32.2
V	109.79	33.12	28.79	32.06	32.1
U	107.70	32.79	28.03	31.70	31.7
T	106.67	32.61	27.65	31.51	31.4
S	105.91	32.44	27.27	31.32	31.2
R	104.78	32.33	27.04	31.21	30.8
Q	102.65	32.23	26.82	31.10	30.2

BFE = base flood elevation; FEMA = Federal Emergency Management Agency; FIS = Flood Insurance Study; HEC-RAS = Hydrologic Engineering Center's River Analysis; NAVD 88 = North American Vertical Datum of 1988; WSE = water surface elevation

2.4 Ultimate Condition

The ultimate condition analysis includes all IBR Program structures and removal of all existing bridge structures. The ultimate condition analysis uses the same base DTM, Manning's n values, flow split methodology, boundary conditions and model run controls as the existing condition analysis. Hydraulic model results across the full range of flow conditions can be found in Appendix D and E.

2.4.1 Columbia River Proposed Bridges

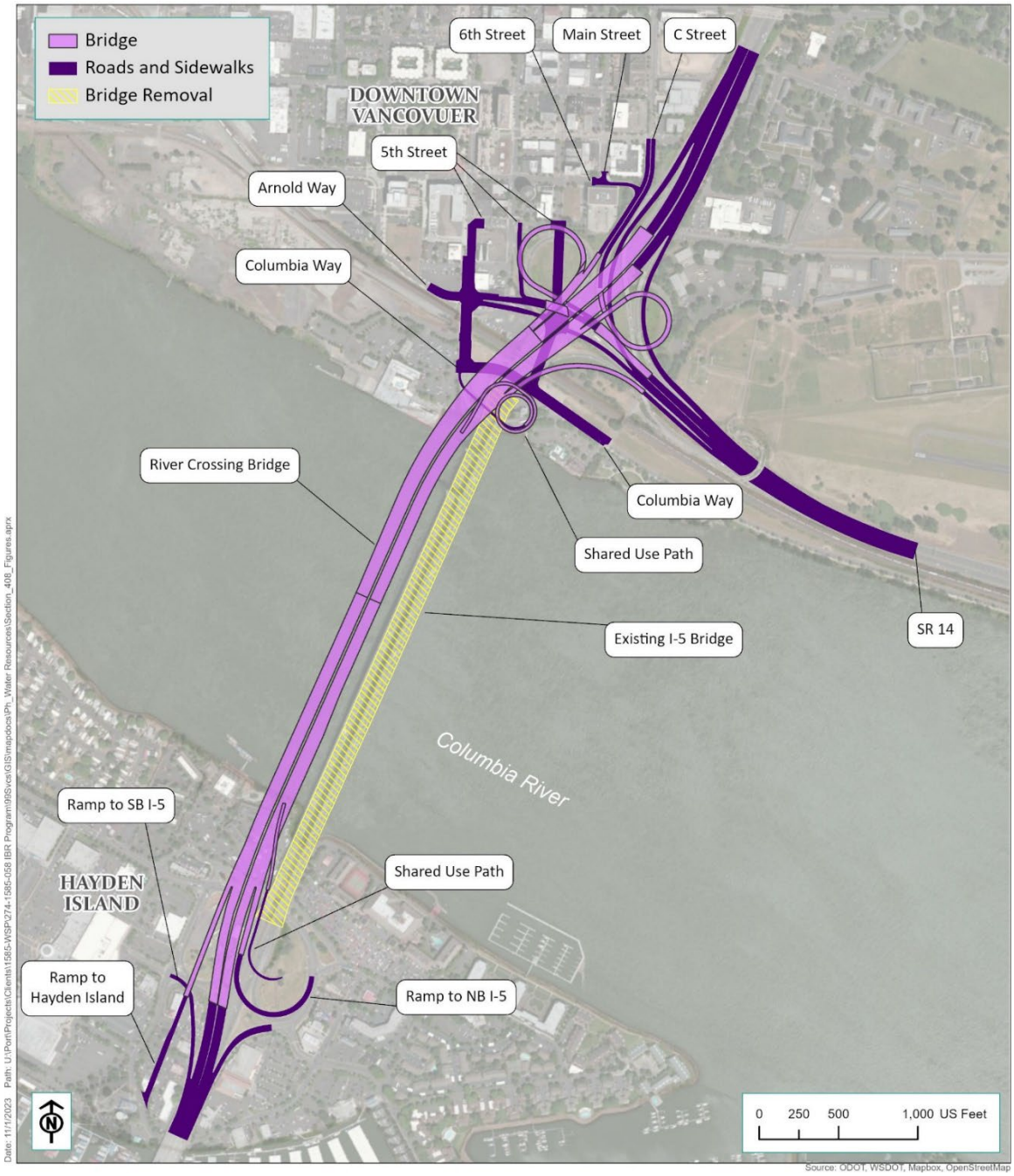
The first IBR construction package anticipated is the CRBA construction package, which includes all proposed structures crossing the Columbia River. Figure 2-2 shows the CRBA project area, including the alignment of the proposed bridges crossing the Columbia River and the existing bridge to be removed. As part of the environmental compliance process, many design alternatives were evaluated for the Columbia River bridge crossing. For the IBR Program Final Supplemental Environmental

Impact Statement (SEIS) two primary alternative bridge configurations are under consideration for the CRBA construction package:

1. Alternative 107: Single-level bridges with fixed spans
2. Alternative 108: Single-level bridges with movable spans over the primary navigation channel

Conceptual-level design drawings have been prepared for both alternatives, which can be found in Appendix C. The IBR Program has studied the hydraulics of both design alternatives in detail. The pier configurations for Alternatives 107 and 108 are nearly identical, so both alternatives have consistent hydraulic impacts. Similarities between the two alternatives include size and spacing of drilled shafts, drilled shaft cap details, and pier centerline locations. The two alternatives have slightly different column shapes above the shaft cap, but the hydraulic results are essentially the same.

Figure 2-1. Columbia River Bridges and Approaches Construction Package Project Area



Please refer to the July 2025 CRBA *One-Dimensional Hydraulic Modeling Report* for details on the following:

1. Bridge modeling approach
2. Hydraulic parameters selected

3. Assumptions made

2.4.2 North Portland Harbor Proposed Bridges

The hydraulic analysis of the replacement North Portland Harbor bridge is based on best available data at the time of this report. As of July 2025, only schematic-level design is available, provided in Appendix C. The bridge deck configuration for the proposed North Portland Harbor bridges is unknown at this time. However, because of their proximity and combined foundation, they are modeled as one bridge.

Each pier of the proposed North Portland Harbor bridge structures consists of an 8-foot diameter pier column on top of a 10-foot diameter drilled shaft.

2.4.3 Bridge Modeling Approach

The Yarnell equation is an appropriate bridge modeling approach in cases where the primary energy loss is due to the piers rather than abutments or other bridge characteristics, as is the case with the proposed Columbia River and North Portland Harbor bridges. A conservative Yarnell pier coefficient of 2.0 for square nosed piers was used for the proposed North Portland Harbor bridges. The conceptual design indicates that their piers will have cylindrical drilled shafts with square nose shaft caps and pier faces. During future design refinements, the piers could be optimized with cylindrical or round shaft caps and pier faces, which could result in a lower impact to hydraulics.

2.4.4 Water Surface Elevation and Velocity

Table 2-4 summarizes the ultimate condition 100-year WSE, and Table 2-5 summarizes the ultimate condition velocity at each bridge crossing, comparing the atmospheric river and spring freshet events, as well as the FEMA effective flow. Alternatives 107 and 108 have similar pier configurations below flood elevations. Hydraulic model results reported in Table 2-4 and Table 2-5, below, illustrate that the hydraulic performance of the two alternatives is nearly identical. Hydraulic model results across the full range of flow conditions can be found in Appendix D and E.

Table 2-4. Ultimate Condition Water Surface Elevations – 100-Year Event

Bridge	HEC-RAS Cross Section	WSE (feet NAVD 88)					
		Atmospheric River		Spring Freshet		FEMA Effective Flow	
		Alt 107	Alt 108	Alt 107	Alt 108	Alt 107	Alt 108
Columbia River	106.73	32.62	32.62	27.67	27.67	31.52	31.52
North Portland Harbor	4.52	32.60	32.60	27.60	27.60	31.49	31.49

Alt = Alternative; FEMA = Federal Emergency Management Agency; HEC-RAS = Hydrologic Engineering Center's River Analysis; NAVD 88 = North American Vertical Datum of 1988; WSE = water surface elevation

Table 2-5. Ultimate Condition Velocities – 100-Year Event

Bridge	HEC-RAS Cross Section	Velocity (feet per second)					
		Atmospheric River		Spring Freshet		FEMA Effective Flow	
		Alt 107	Alt 108	Alt 107	Alt 108	Alt 107	Alt 108
Columbia River	106.73	3.55	3.55	4.99	4.99	3.62	3.62
North Portland Harbor	4.52	2.13	2.13	2.97	2.97	2.18	2.18

Alt = Alternative; FEMA = Federal Emergency Management Agency; HEC-RAS = Hydrologic Engineering Center's River Analysis

2.4.5 Bridge Freeboard

Due to the need to accommodate ship passage, both the Columbia River and the North Portland Harbor bridges are proposed to be elevated above the normal river WSE and all storm event WSE. ODOT requires a minimum freeboard of 1 foot, while WSDOT requires a minimum freeboard of 3 feet above the 100-year WSE. The bridges would have freeboard that exceeds design requirements. Table 2-6 summarizes the freeboard between the atmospheric river 100-year WSE and the low chord of each bridge. See the HEC-RAS model results in Appendices D and E.

Table 2-6. Bridge Freeboard

Bridge	HEC-RAS Cross Section	(feet NAVD 88)		(feet)	
		100-year WSE	Lowest Low Chord Elevation	Minimum Freeboard	Minimum Freeboard Requirement
Columbia River	106.73	32.62	97.76	65.1	3.0
Nort Portland Harbor	4.52	32.60	36.66	4.1	1.0

HEC-RAS = Hydrologic Engineering Center's River Analysis; NAVD 88 = North American Vertical Datum of 1988; WSE = water surface elevation

3. CHARACTERIZATION OF IMPACTS

The following outcomes from construction of a federally funded project are considered adverse impacts:

- Increase in BFE
- Increase in erosive velocity
- Significant impact to natural or beneficial floodplain values

In general, on the Columbia River, spring freshet events produce higher flowrates and higher velocities. Meanwhile, winter atmospheric river events tend to produce higher WSE. The higher winter atmospheric river levels occur because the downstream boundary condition are driven by surcharge from the Willamette River. As such, the atmospheric river 100-year storm event is used to characterize impacts to BFE in the floodplain, while the spring freshet 100-year storm event is used to characterize changes in velocity.

3.1 Change in Base Flood Elevation

Table 3-1 summarizes changes in WSE for the ultimate condition 100-year atmospheric river event. No rise in BFE is anticipated for the ultimate construction package.

Table 3-1. Changes in Base Flood Elevation – Ultimate Condition

Cross Section Location	HEC-RAS Cross Section	100-year Atmospheric River WSE (feet NAVD 88)		
		Existing	Ultimate	Difference
Columbia River upstream of Government Island	117.98	34.40	34.38	-0.02
Columbia River upstream of Hayden Island	108.93	32.98	32.97	-0.01
Columbia River upstream of the existing Interstate Bridge	106.78	32.66	32.64	-0.02
North Portland Harbor upstream of the existing North Portland Harbor bridge	4.46	32.58	32.57	-0.01
Columbia River upstream of the existing BNSF Railway Bridge	105.90	32.44	32.44	0.00

Cross Section Location	HEC-RAS Cross Section	100-year Atmospheric River WSE (feet NAVD 88)		
		Existing	Ultimate	Difference
North Portland Harbor upstream of the existing BNSF Railway Bridge	3.32	32.47	32.46	-0.01
Columbia River downstream of Hayden Island	102.46	32.21	32.21	0.00

HEC-RAS = Hydrologic Engineering Center's River Analysis; NAVD 88 = North American Vertical Datum of 1988; WSE = water surface elevation

3.2 Change in Velocity

Velocities provide an indication of change in scour potential in the existing and ultimate conditions. Bridge scour potential was analyzed in detail in the IBR two-dimensional (2D) model, and a discussion of the results can be found in the July 2025 CRBA *Two-Dimensional Hydraulic Model Report.* Table 3-3 summarizes the changes in velocity expected at each bridge in the 100-year spring freshet event, according to the 1D model. The velocity results differ slightly between 1D and 2D modeling because 1D velocities are cross-sectionally averaged, while 2D models have a spatial distribution of velocities that are depth averaged.

Table 3-2. Changes in Velocity – Ultimate Condition

Bridge	HEC-RAS Cross Section	100-year Spring Freshet Velocity (feet per second)		
		Existing	Ultimate	Difference
Columbia River	106.78	4.79	4.82	0.03
Nort Portland Harbor	4.52	3.02	2.97	-0.05

HEC-RAS = Hydrologic Engineering Center's River Analysis

3.3 Impacts on Natural and Beneficial Floodplain Values

The IBR Program is expected to place fill within the floodplain for work related to the bridge piers, as well as some earthwork to accommodate changes to local roads. Fill within a floodplain can impact natural and beneficial floodplain values by reducing flood storage capacity and impacting aquatic and riparian habitats.

The City of Portland requires excavation to compensate for fill placed within the floodplain. Anticipating this required mitigation, the IBR Program has quantified the volume of fill expected to be

placed within the floodplain on the Portland side of the CRBA construction package project area, which is approximately 19,000 cubic yards. The City of Portland will require approximately 39,000 cubic yards of excavation to compensate for this. A detailed summary of the flood storage compensation can be found in the December 2024 IBR Program memorandum, *Flood Storage Compensatory Mitigation Alternatives Selection*. At this time, the Program team is in the process of obtaining a variance from the City of Portland that will account for floodplain mitigation identified in the IBR Program's *Biological Opinion*, which is currently under development. As a result, the proposed condition model does not include any compensatory floodplain excavations. The IBR Program is also working with the City of Vancouver to complete a similar assessment of compensatory storage requirements on the Vancouver side of the Columbia River.

A significant loss of flood storage capacity is not expected, given the relatively small amount of fill compared to the capacity of the Columbia River system. As design progresses, an unsteady flow model could be used to demonstrate that net fill does not cause an increase in backwater flood stage.

3.4 Support of Probable Incompatible Floodplain Development

The IBR Program does not support or induce other development that would likely increase impacts to the floodplain.

3.5 Risk Associated with Implementation of the Action

Long-term risks associated with implementation of the IBR Program are minimal. No rise in BFE is anticipated.

The temporary works needed to complete construction will add additional fill within the floodplain. The risks associated with temporary works are expected to be minimal. The exact configuration of construction works needed will be determined by the contractor. It should be anticipated that the temporary construction condition may produce a higher impact to BFE than the ultimate condition. As design progresses, a temporary condition hydraulic analysis should be completed for each construction package to determine the maximum potential floodplain impacts. Temporary condition should include both the existing bridge and proposed bridge, as well as temporary structures needed to complete construction.

4. ALTERNATIVES

4.1 Practicability of Alternatives

This section addresses the practicability of alternatives to significant encroachments or support of incompatible floodplain development.

4.1.1 No Action

Under the no action alternative, the IBR Program would not be built. Under this alternative, there would be no impacts to the floodplain from construction of the bridge replacement project. The no action alternative would result in negative effects on the community in the following ways:

1. Increased travel times and congestion with growing travel demand
2. Decreased safety and efficiency of freight
3. Decreased public transportation service reliability
4. Increased risk to safety due to the vulnerability of the existing bridge
5. Limitations in bicycle and pedestrian mobility
6. Vulnerability to catastrophic failure due to seismic event

4.1.2 Alternative Sites

The I-5 corridor is highly developed in both Portland and Vancouver. Alternative alignments would cause a significant impact on the surrounding community.

4.1.3 Alternative Actions

The IBR Program evaluated a tunnel alternative that would avoid construction within the floodplain. This alternative was determined to be impractical and eliminated for the following reasons:

- Would cut off important access to Hayden Island, downtown Vancouver and State Route 14
- Would have significantly more operational, environmental, and historical resource impacts than bridge replacement
- Would cost more than bridge replacement

Through the NEPA process, the IBR Program has evaluated numerous bridge alternatives, including various designs options for the following configurations:

- Single-level fixed-span
- Double-deck fixed-span
- Single-level movable-span

The Final SEIS studied the potential comprehensive Program impacts for each alternative and presented findings to the public for comment. Through this process, the Program has identified the Modified Locally Preferred Alternative. The two bridge alternatives evaluated for this Location Hydraulic Study are the two options in the Modified Locally Preferred Alternative that constitute the largest hydraulic impacts to the floodplain.

4.2 Alternatives to Longitudinal Encroachment

The IBR Program does not include any longitudinal encroachments.

5. MITIGATIONS

5.1 Measures to Minimize Floodplain Impacts

The following measures can be used to minimize floodplain impacts associated with the IBR Program.

5.1.1 Public Notice

Owners of properties impacted by increases in BFE should be notified. This includes properties expected to be impacted during the temporary construction activities. This Location Hydraulic Study represents the first step in identifying and notifying potentially affected property owners. Currently no impacts to property owners are anticipated and no property owners need to be notified. If final design or temporary construction results in a rise, affected property owners would need to be notified.

5.1.2 Coordination with Local Officials

The IBR Program has begun coordination with the local floodplain administrators of both affected communities, the City of Portland and the City of Vancouver. The floodplain administrators will ultimately issue the floodplain development permit required to begin construction within the floodplain.

5.1.3 Ongoing Compliance Process

The IBR Program will mitigate impacts to the floodplain through ongoing compliance with federal, state, and local processes, as described below:

1. Follow the federal NEPA process by characterizing potential impacts, evaluating alternatives, and identifying mitigation measures, and publishing the findings for public review and comment. This Location Hydraulic Study satisfies Executive Order 11988.
2. Follow the local floodplain permitting process for each construction package. Local floodplain permitting will require no rise in BFE for actions within the FEMA floodway.
3. Follow the FEMA map revision process if a rise is determined for a given construction package. Map revisions require public notice. A Conditional Letter of Map Revision (CLOMR) must be received by the local floodplain administrator before issuance of a permit for construction that will cause a rise. A final Letter of Map Revision is required at the end of construction, verifying that the constructed project adheres to the commitments of the CLOMR.
4. If temporary construction is found to cause significant impacts to BFE, the Program could consider purchasing flood insurance for affected properties.

5.2 Measures to Restore and Preserve Natural and Beneficial Floodplain Values

Compliance with City of Portland permitting requirements will provide mitigations for impacts to natural and beneficial floodplain values. The City of Portland requires compensatory storage to mitigate the loss of floodplain storage and habitat due to fill placed within the floodplain. The City of Portland's permitting requirements adhere to the terms of the National Oceanic and Atmospheric Administration *Biological Opinion*, intended to ensure that the National Flood Insurance Program avoids harming Endangered Species Act listed species and their habitats (NOAA 2016). The IBR Program is working with the City of Vancouver to determine equivalent compensatory storage requirements. The Final SEIS further discusses mitigation measures for Program's impacts to wetlands, aquatic and riparian habitats, and recreational uses.

6. EXECUTIVE ORDER 11988 COMPLIANCE SUMMARY

This section evaluates and describes the six items that are required for a Location Hydraulic Study in accordance with 23 Code of Federal Regulations 650A, Section 111, as follows:

a) National Flood Insurance Program Maps

The proposed bridge structures would be located within the base floodplain and floodway of the Columbia River and North Portland Harbor, as shown on FEMA FIRM panels 53011C0481D (effective September 5, 2012) and 4101830085F (effective October 19, 2004). Maps are provided in Appendix A.

b) Practicability of Alternatives to any Longitudinal Encroachments

A longitudinal encroachment is an action within the limits of the base floodplain that is parallel to the direction of the flow. The alignment of the proposed bridges is not longitudinal to the direction of the flow. Thus, alternatives to longitudinal encroachment were not considered for the Program.

c) Risk Analysis and Environmental Impact

1) Risks Associated with Implementation of the Action

The risk associated with implementation of the Program is expected to be less than significant as the construction of all bridges across both the Columbia River and North Portland Harbor would not result in a significant rise in BFE that increases risk to the community. The IBR Program is planned to provide significant benefits to the community, including improved transportation for emergency vehicles, evacuation, school buses, mail delivery vehicles, and commerce.

2) Impacts on Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values include, but are not limited to, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge. Construction of the IBR Program could temporarily impact native vegetation habitat at the construction site, but the impact is expected to be less than significant.

3) Support of Probable Incompatible Floodplain Development

The IBR Program improvements would be located along a transportation corridor that is already developed. The Program, therefore, would not support incompatible floodplain development within the 100-year floodplain. In addition, it is anticipated that FEMA floodplain regulations, and the City of Portland and City of Vancouver floodplain management ordinances, would prevent incompatible floodplain development.

4) Measures to Minimize Floodplain Impacts Associated with the Action

To minimize impacts, the size, shape, and orientation of the bridge piers are designed to minimize obstruction to the flow.

5) Measures to Restore and Preserve Natural and Beneficial Floodplain Values

Temporary impacts to vegetation resulting from construction activities would require mitigation through the restoration or pre-existing vegetation and contours. Construction permit requirements will outline all impacts and associated mitigation necessary for construction. Compliance with local permitting processes will help mitigate impacts to natural and beneficial floodplain values.

d) Practicability of Alternatives to Significant Encroachments or Support of Incompatible Floodplain Development

No alternatives are required as the IBR Program would not result in any significant encroachment or support incompatible floodplain development.

e) Summarizing Section 650.111 (c) and (d) in Environmental Review Documents

This Location Hydraulic Study, including subsections (c) and (d) described above, will be made available for the preparation of environmental review documents.

f) Consult Local, State, and Federal Water Resources and Floodplain Management

Consultation with local, state, and federal water resources and floodplain management agencies has been initiated and will continue through the preparation of the environmental review documents. A no-rise analysis will be conducted prior to obtaining local permits. If a rise in BFE is unavoidable, a CLOMR will be obtained from FEMA prior to construction of each construction package.

7. REFERENCES

FEMA (Federal Emergency Management Agency). 2010. Flood Insurance Study, City of Portland. FIS number 410183V000B. November 26, 2010.

FEMA (Federal Emergency Management Agency). 2012. Flood Insurance Study, Clark County, Washington and Incorporated Areas. FIS number 53011CV001A. September 5, 2012.

NOAA (National Oceanic and Atmospheric Administration). 2016. Biological Opinion on the Implementation of the National Flood Insurance Program in the State of Oregon. Endangered Species Act Section 7(a)(2) Biological Opinion - NMFS Consultation Number: NWR-2011-3197. April 14, 2016. Available at: <https://www.fisheries.noaa.gov/resource/document/biological-opinion-implementation-national-flood-insurance-program-state-oregon> Accessed June 23, 2025.

ODOT (Oregon Department of Transportation). 2014. Hydraulics Design Manual, Engineering and Asset Management Unit Geo-Environmental Section. April 2014.

WSDOT (Washington State Department of Transportation). 2023. Hydraulics Manual, Engineering and Regional Operations Hydraulics Office. May 2023.

APPENDIX A: FEMA FLOODPLAIN MAPS

National Flood Hazard Layer FIRMette

FEMA

122°40'44"W 45°37'28"N



122°40'6"W 45°37'3"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/12/2025 at 3:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

122°40'57"W 45°37'6"N



122°40'20"W 45°36'41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/12/2025 at 4:01 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

122°41'15"W 45°36'34"N



122°40'37"W 45°36'9"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

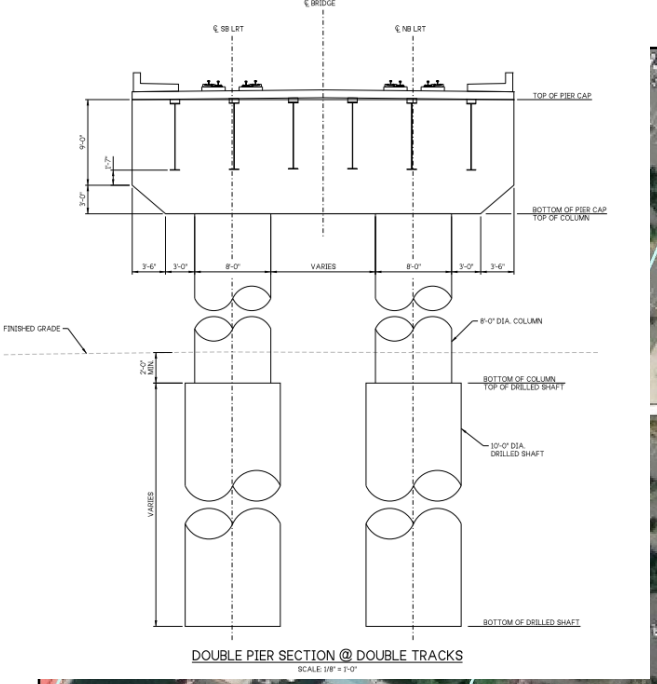
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/12/2025 at 4:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX B: CROSS-SECTION MAP



Average distance between outer edges of columns, including gaps = 295 ft

Average deck width, assuming deck extends 6.5 ft from face of column 295+6.5+6.5 = 308 ft.

Average distance between outer edges of columns, including gaps = 53 ft

Average deck width, assuming deck extends 6.5 ft from face of column 53+6.5+6.5 = 66 ft.

211.7 ft

260.1 ft

273.2 ft

320.5 ft

365.6 ft

385.2 ft

52.9 ft

Maxar, Microsoft

IBR Program Full Build Column Locations in North Portland Harbor (NPH)

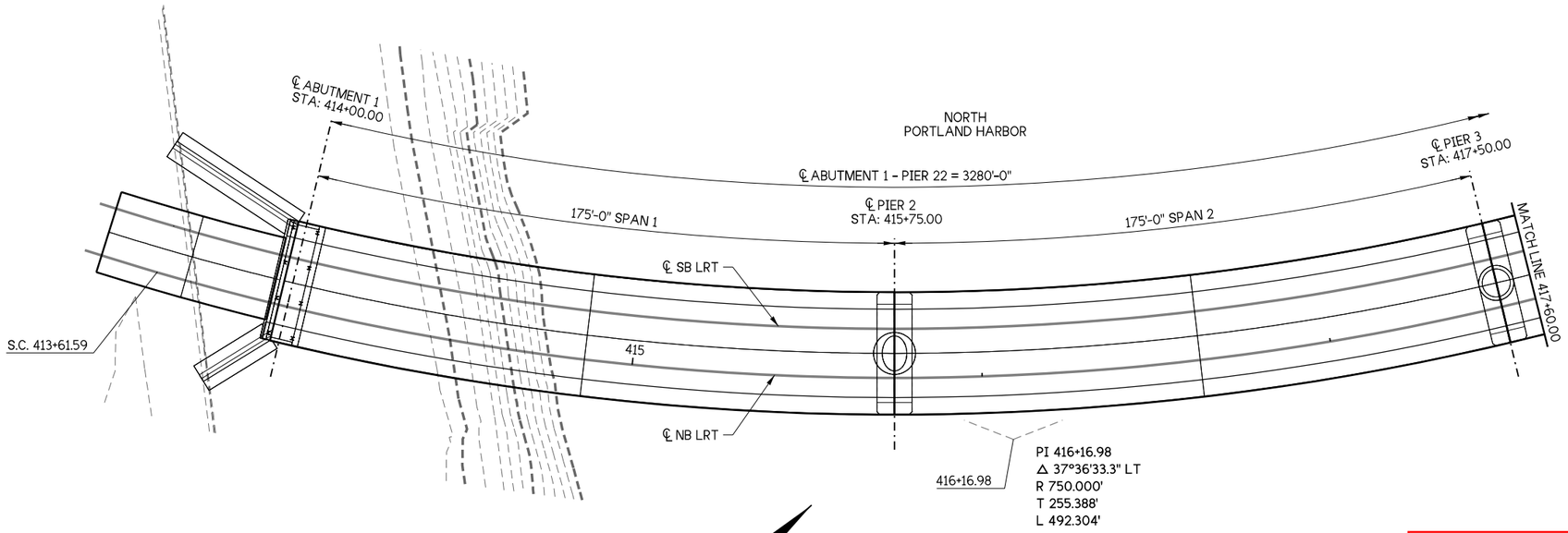
0 200 400 Feet

N

Legend

- NPH_Transit_Columns_and_Footings_20250207
- NPH_NonTransit_DrilledShafts_20240219
- Exist_CrossSections

DRAFT 30% TRANSIT BRIDGE PLANS



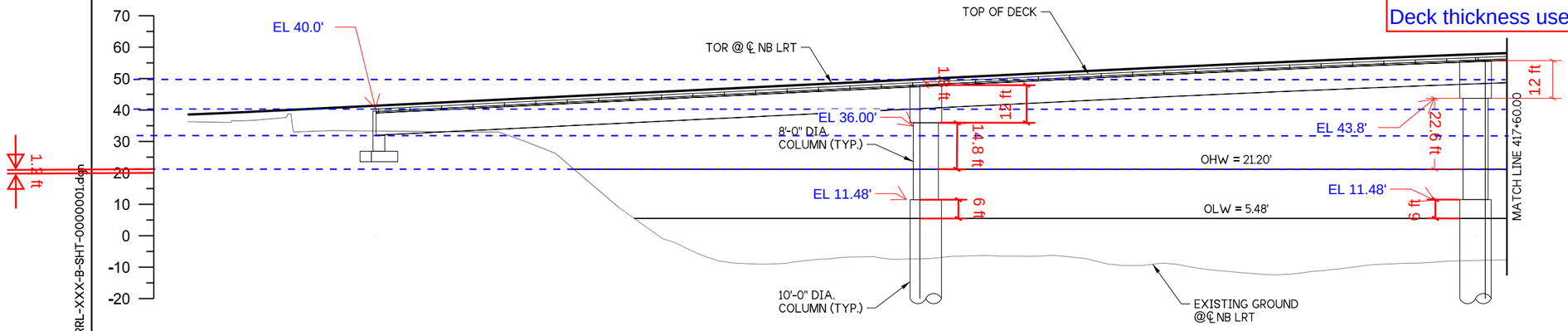
SPANS 1 & 2 PLAN

0 40 80
SCALE IN FEET

Top of deck EL = bottom of cap EL + 12 ft high pier cap + 0.83 ft deck thickness + 2 ft curb

Add 14.83' to bottom elevation of pier cap to get top of deck (for all piers).

Deck thickness used = 0.83+2=2.83'



SPANS 1 & 2 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn
TIME	10:58:19 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	DESIGNED BY
ENTERED BY	ENTERED BY
CHECKED BY	CHECKED BY
PROJ. ENGR.	PROJECT ENG
REGIONAL ADM.	REG ADMIN

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION | DATE | BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	FED AID NUMBER 1
JOB NUMBER		FED AID NUMBER 2
JOB NUMBER		FED AID NUMBER 3
CONTRACT NO.		LOCATION NO.
CONTRACT NUMBER		LOCATION NUMBER

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

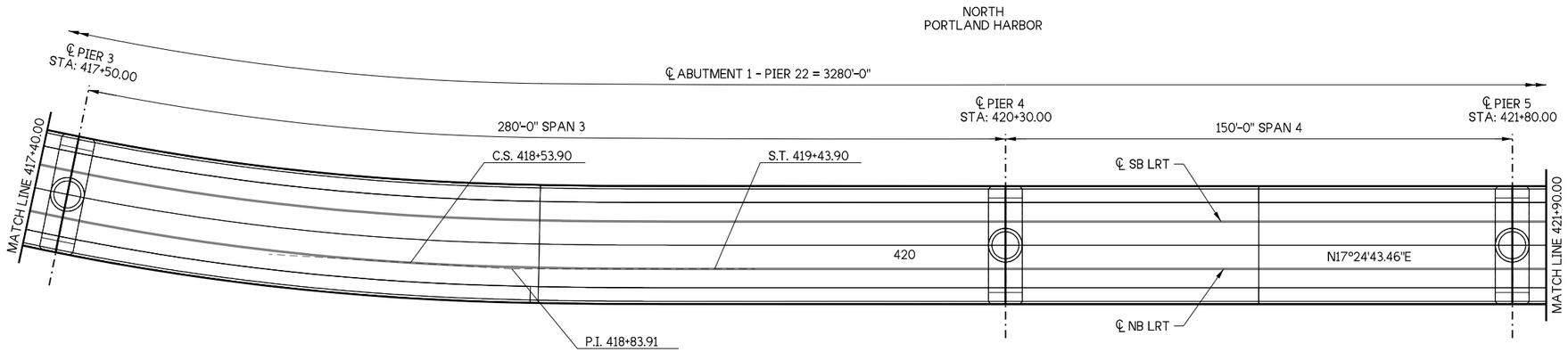
P.E. STAMP BOX DATE

PROJECT TITLE 1
PROJECT TITLE 2
PROJECT TITLE 3

SHEET TITLE 2
SHEET TITLE 1

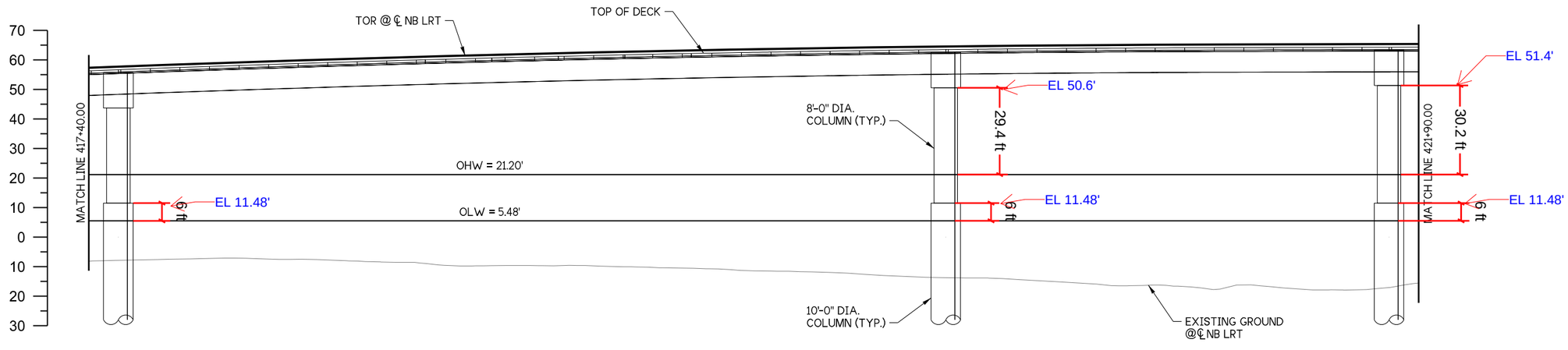
PLAN REF NO
PLAN REFERENCE

SHEET
SHEET NUMBER 'OF'
OF
SHEETS TOTAL
SHEETS



SPANS 3 & 4 PLAN

0 40 80
SCALE IN FEET



SPANS 3 & 4 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn
TIME	10:59:11 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

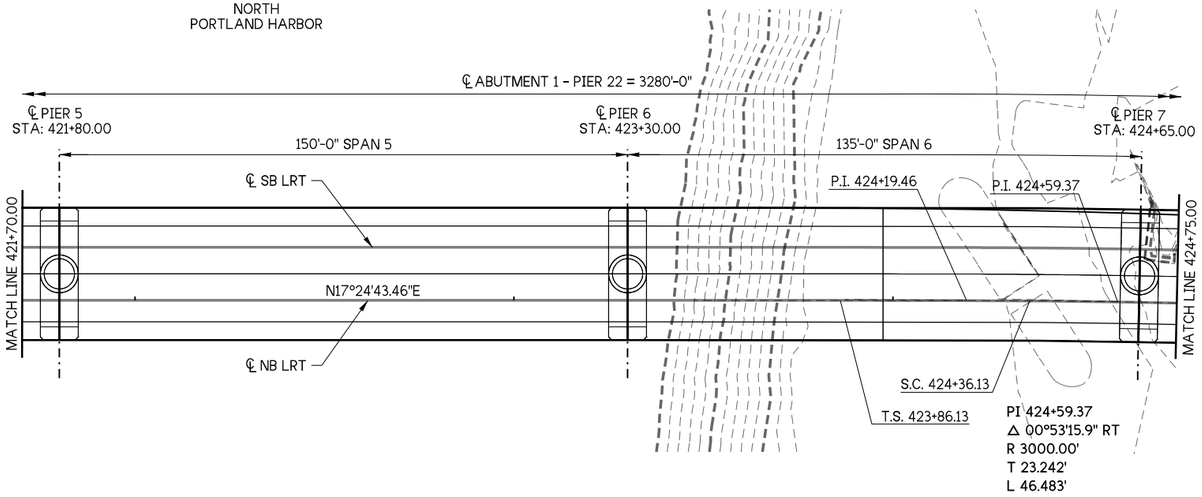
Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

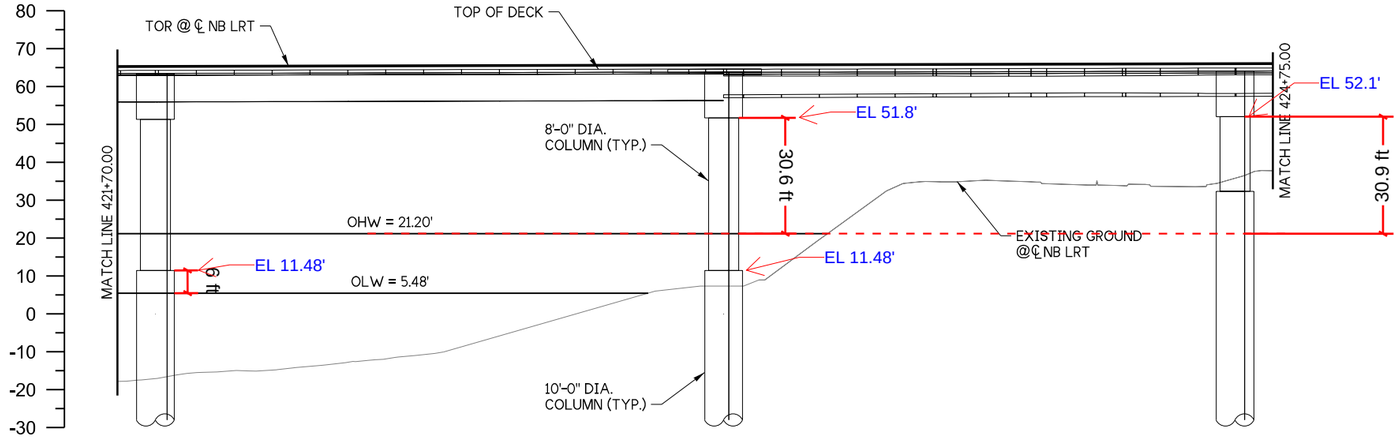
PLAN REF NO

SHEET OF SHEETS



SPANS 5 & 6 PLAN

0 40 80
SCALE IN FEET



SPANS 5 & 6 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn
TIME	10:59:53 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.	LOCATION NO.	

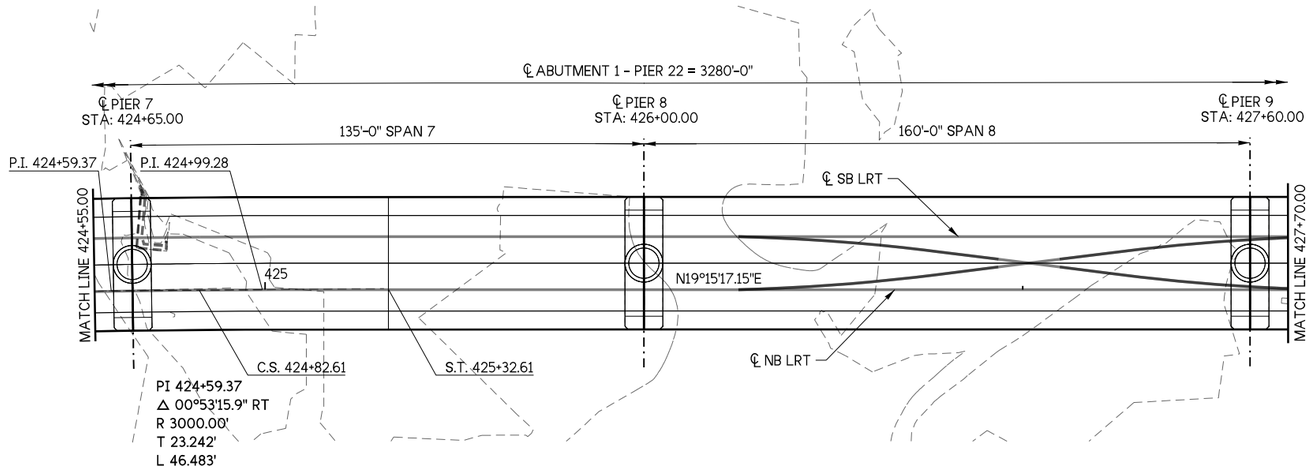
Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

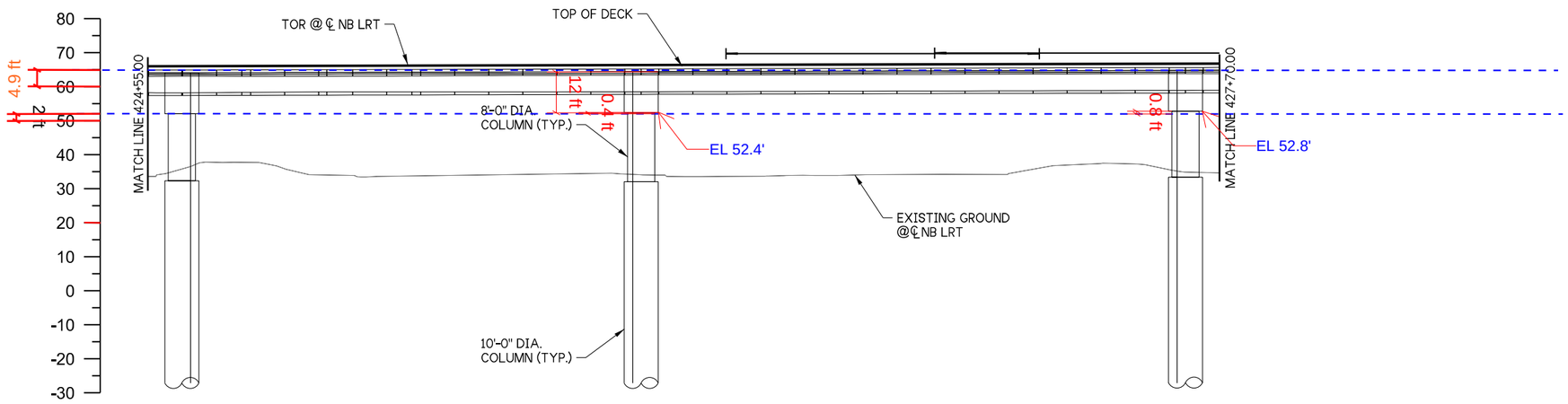
PLAN REF NO

SHEET OF SHEETS



SPANS 7 & 8 PLAN

0 40 80
SCALE IN FEET



SPANS 7 & 8 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn
TIME	11:00:28 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION | DATE | BY

REGION NO. 10 | STATE WASH
JOB NUMBER
CONTRACT NO.

FED. AID PROJ. NO.
LOCATION NO.

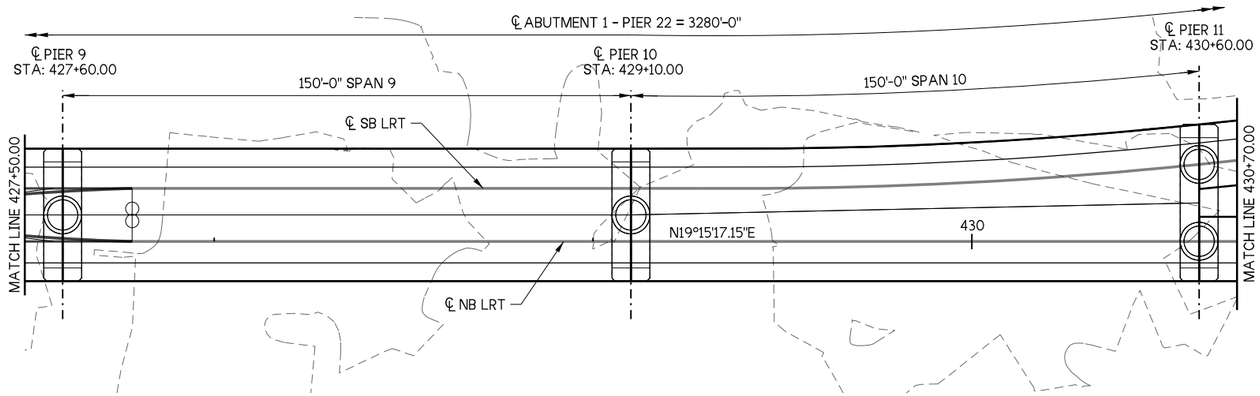
Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

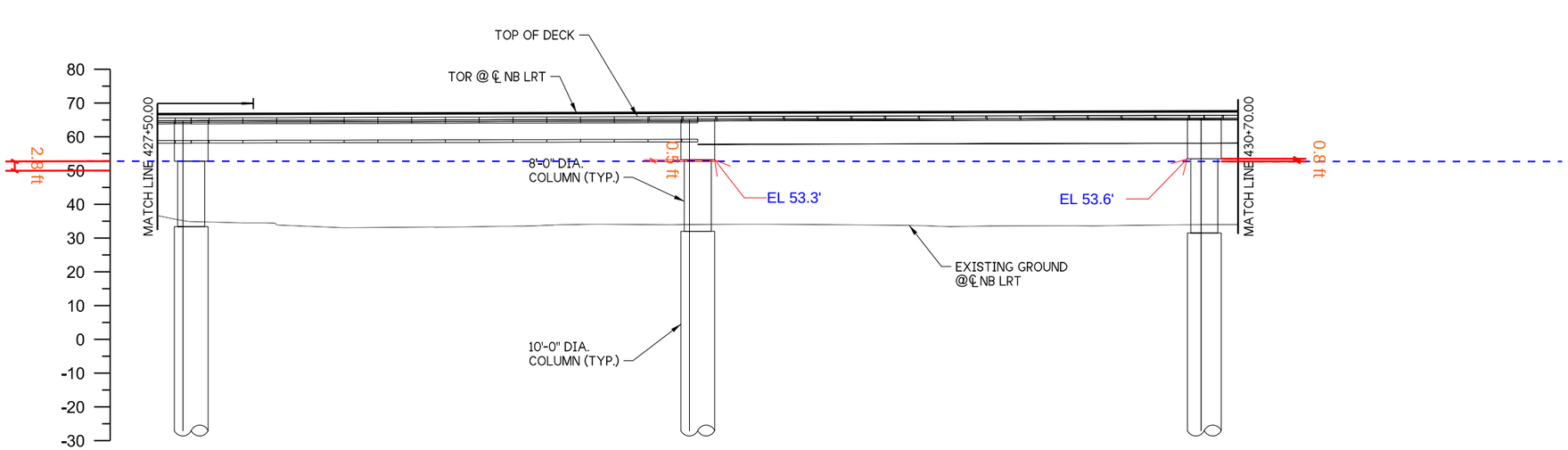
PLAN REF NO

SHEET
OF
SHEETS



SPANS 9 & 10 PLAN

0 40 80
SCALE IN FEET



SPANS 9 & 10 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.
TIME	11:01:12 AM				JOB NUMBER		
DATE	1/2/2025	PRELIMINARY					
PLOTTED BY	McDonSte	NOT FOR CONSTRUCTION			CONTRACT NO.	LOCATION NO.	
DESIGNED BY							
ENTERED BY							
CHECKED BY							
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE	BY			

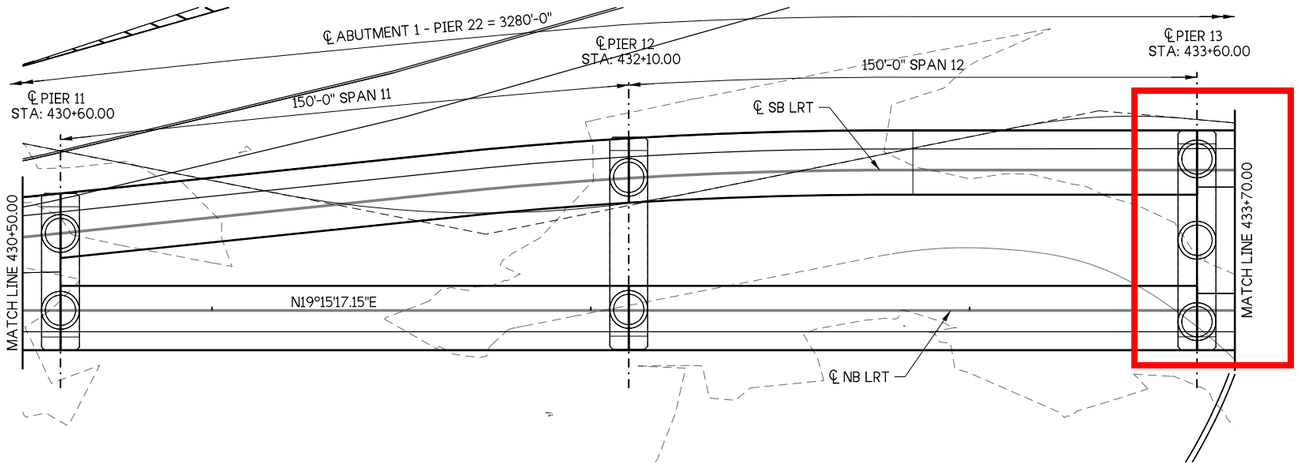
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

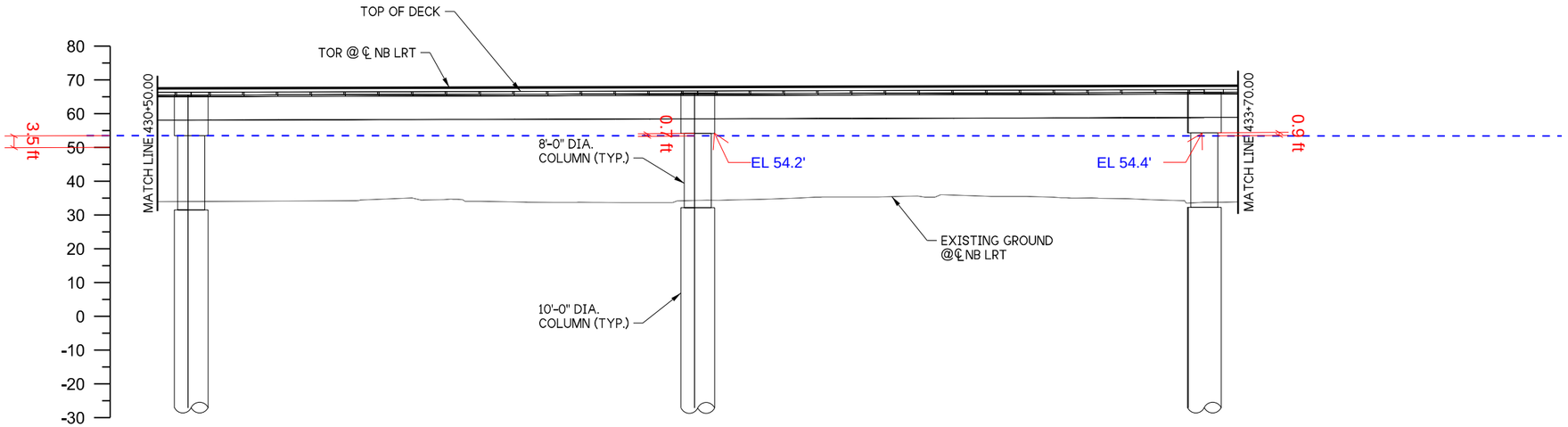
PLAN REF NO

SHEET OF SHEETS



SPANS 11 & 12 PLAN

0 40 80
SCALE IN FEET



SPANS 11 & 12 ELEVATION

0 40 80
SCALE IN FEET

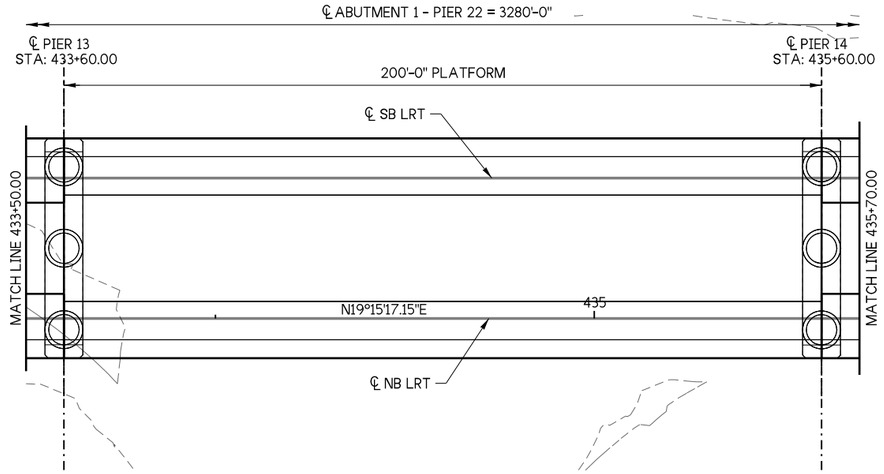
c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn			REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	PLAN REF NO
TIME	11:02:00 AM			JOB NUMBER			
DATE	1/2/2025						
PLOTTED BY	McDonSte	PRELIMINARY					
DESIGNED BY		NOT FOR CONSTRUCTION					
ENTERED BY							
CHECKED BY				CONTRACT NO.	LOCATION NO.		
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE BY				SHEET OF SHEETS

Interstate BRIDGE Replacement Program

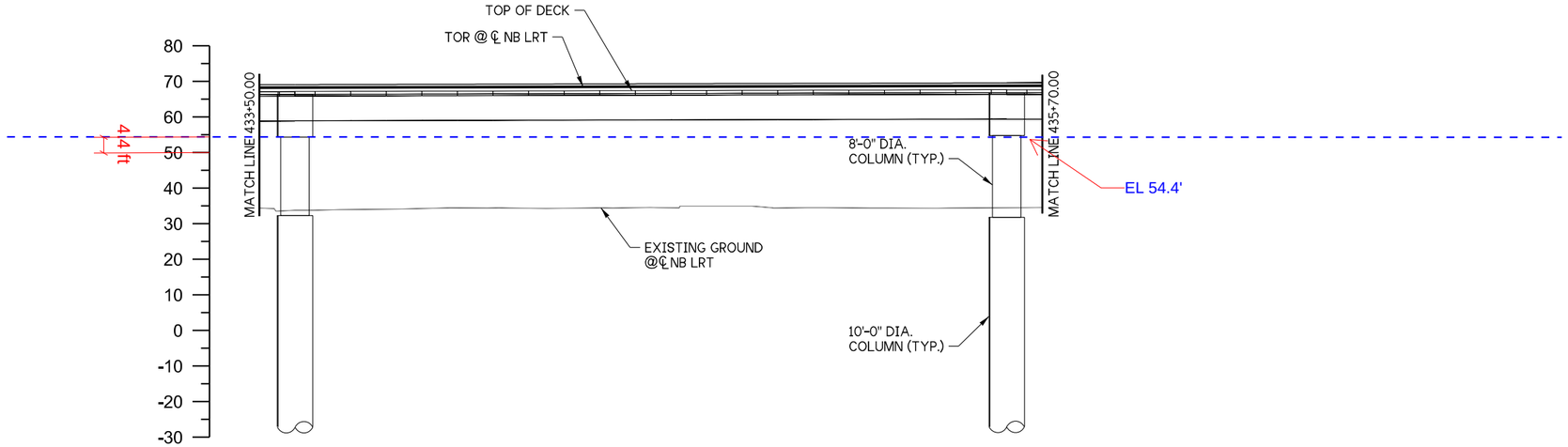
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE



SPANS 13 PLATFORM PLAN

0 40 80
SCALE IN FEET



SPANS 13 PLATFORM ELEVATION

0 40 80
SCALE IN FEET

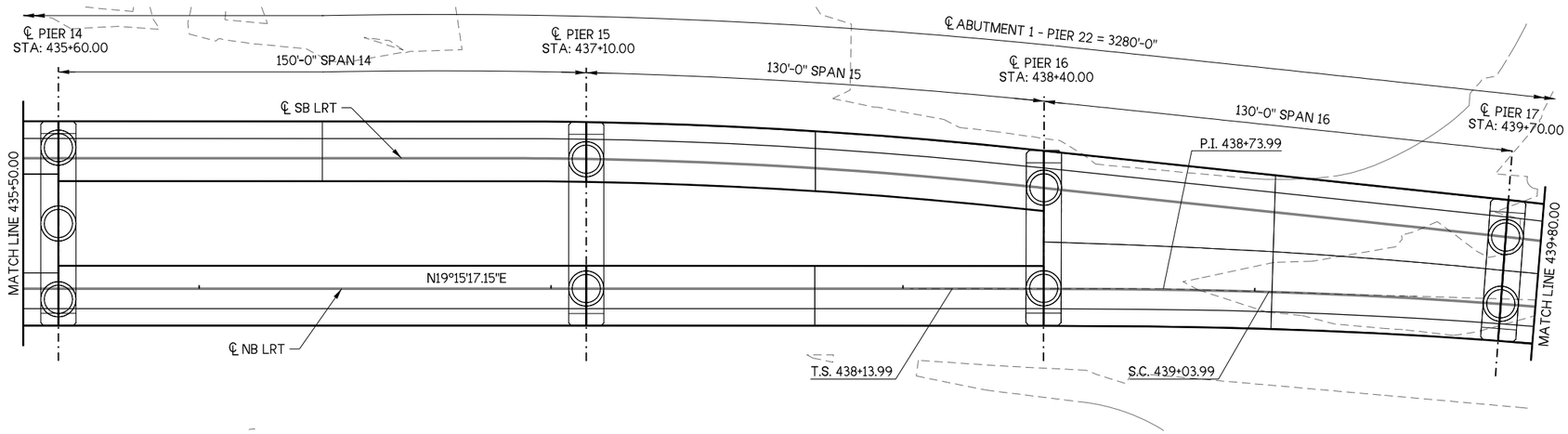
FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	PLAN REF NO
TIME	11:02:54 AM				JOB NUMBER			
DATE	1/2/2025							
PLOTTED BY	McDonSte							
DESIGNED BY		PRELIMINARY						SHEET
ENTERED BY								OF
CHECKED BY		NOT FOR CONSTRUCTION			CONTRACT NO.		LOCATION NO.	SHEETS
PROJ. ENGR.								
REGIONAL ADM.		REVISION	DATE	BY				

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

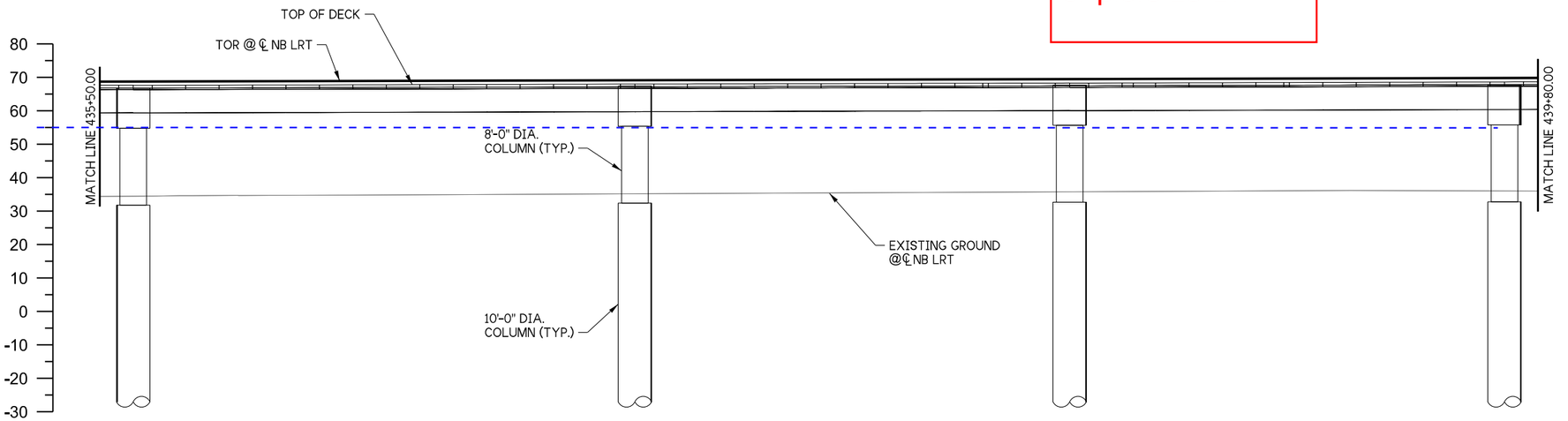
c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn



SPANS 14 THRU 16 PLAN

0 40 80
SCALE IN FEET

Use top of column elevation of 55.0 ft for piers 15-17



SPANS 14 THRU 16 ELEVATION

0 40 80
SCALE IN FEET

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn			REGION NO. 10	STATE WASH	FED. AID PROJ. NO.
TIME	11:03:35 AM			JOB NUMBER		
DATE	1/2/2025					
PLOTTED BY	McDonSte					
DESIGNED BY		PRELIMINARY		CONTRACT NO.	LOCATION NO.	
ENTERED BY						
CHECKED BY		NOT FOR CONSTRUCTION				
PROJ. ENGR.						
REGIONAL ADM.		REVISION	DATE BY			

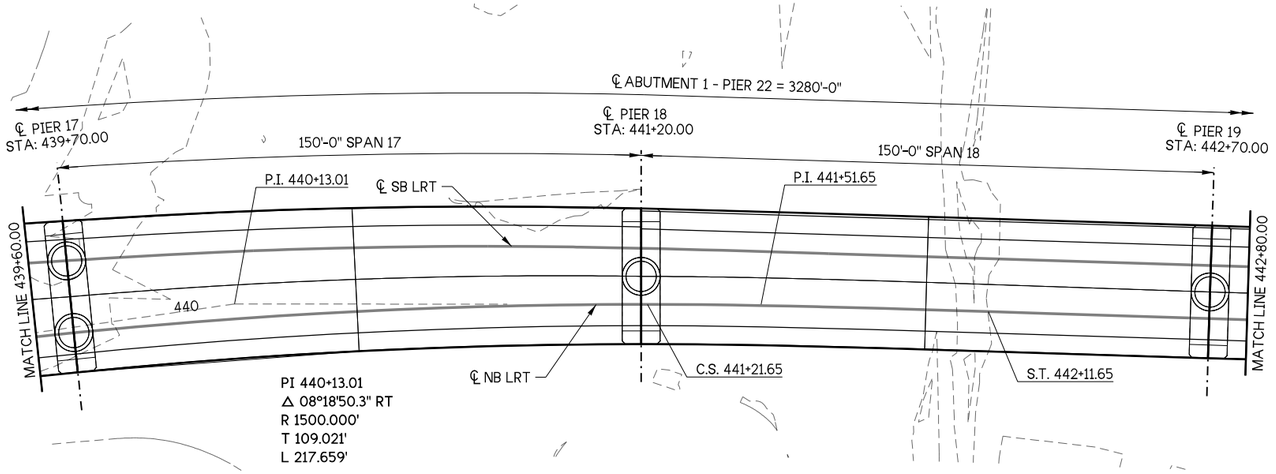
Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

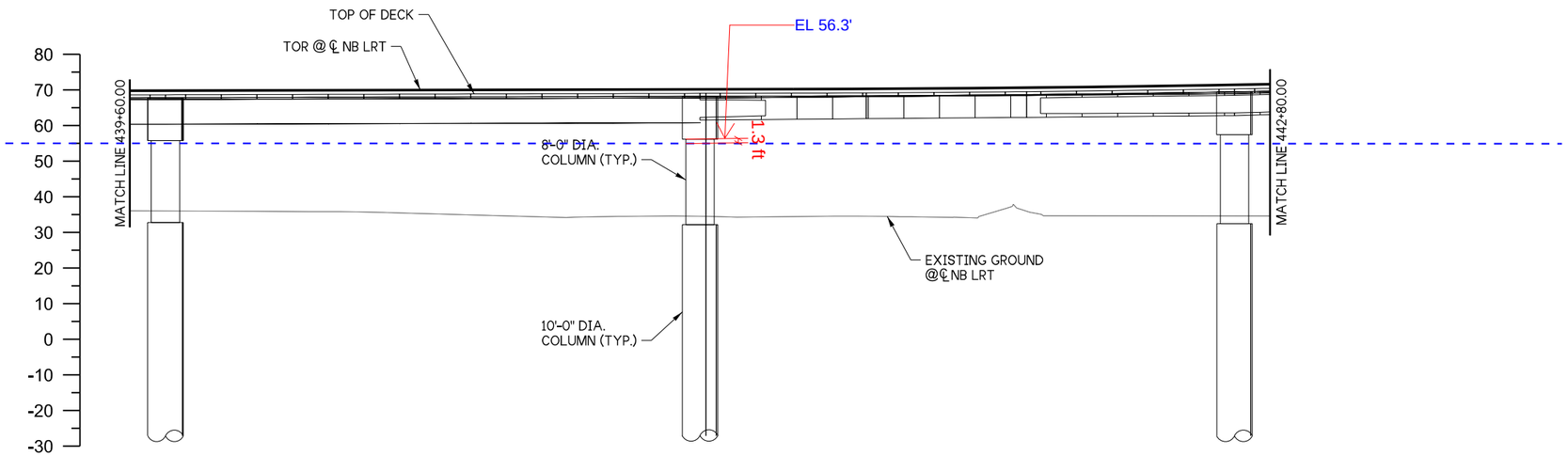
PLAN REF NO

SHEET OF SHEETS



SPANS 17 AND 18 PLAN

0 40 80
SCALE IN FEET



SPANS 17 AND 18 ELEVATION

0 40 80
SCALE IN FEET

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.
TIME	11:04:14 AM						
DATE	1/2/2025				JOB NUMBER		
PLOTTED BY	McDonSte	PRELIMINARY					
DESIGNED BY		NOT FOR CONSTRUCTION			CONTRACT NO.		LOCATION NO.
ENTERED BY							
CHECKED BY							
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE	BY			

Interstate BRIDGE Replacement Program

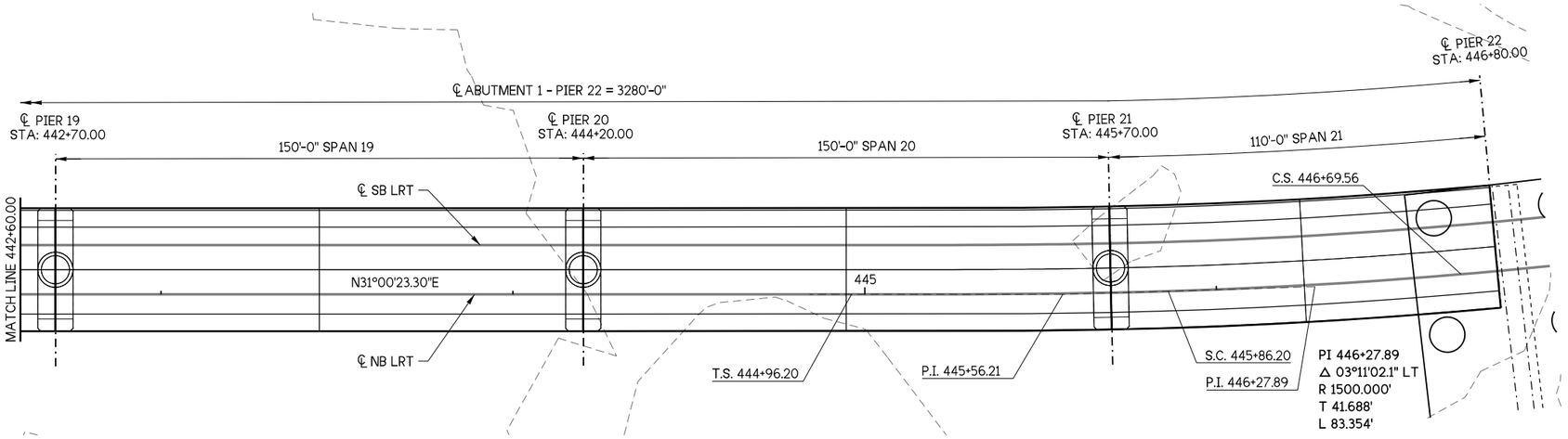
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

PLAN REF NO

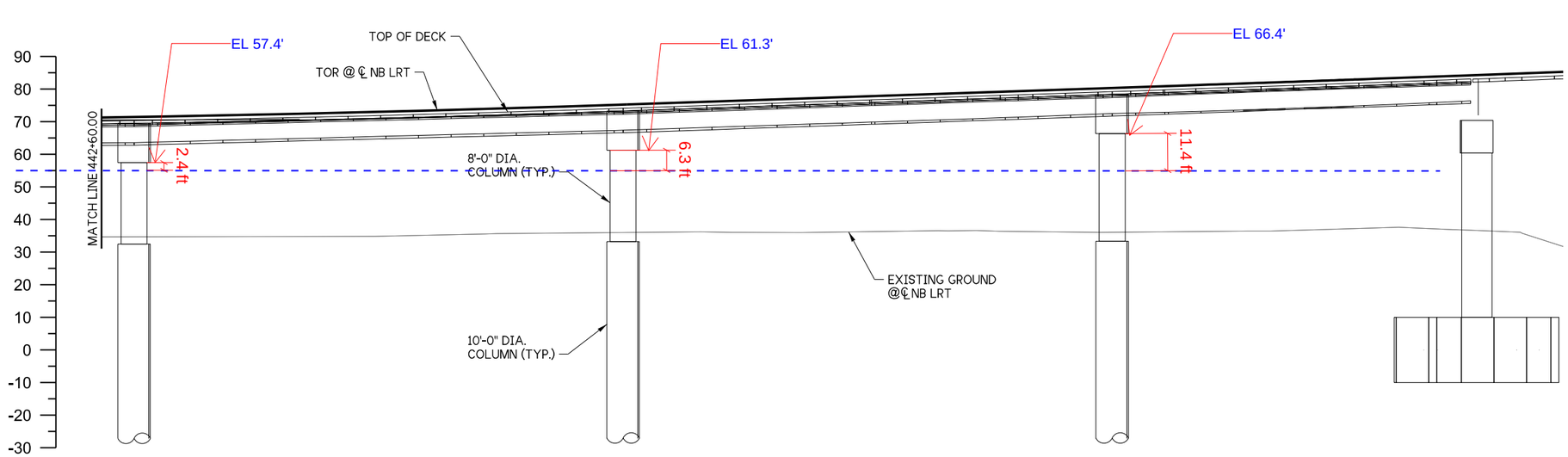
SHEET OF SHEETS

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn



SPANS 19 THRU 21 PLAN

0 40 80
SCALE IN FEET



SPANS 19 AND 21 ELEVATION

0 40 80
SCALE IN FEET

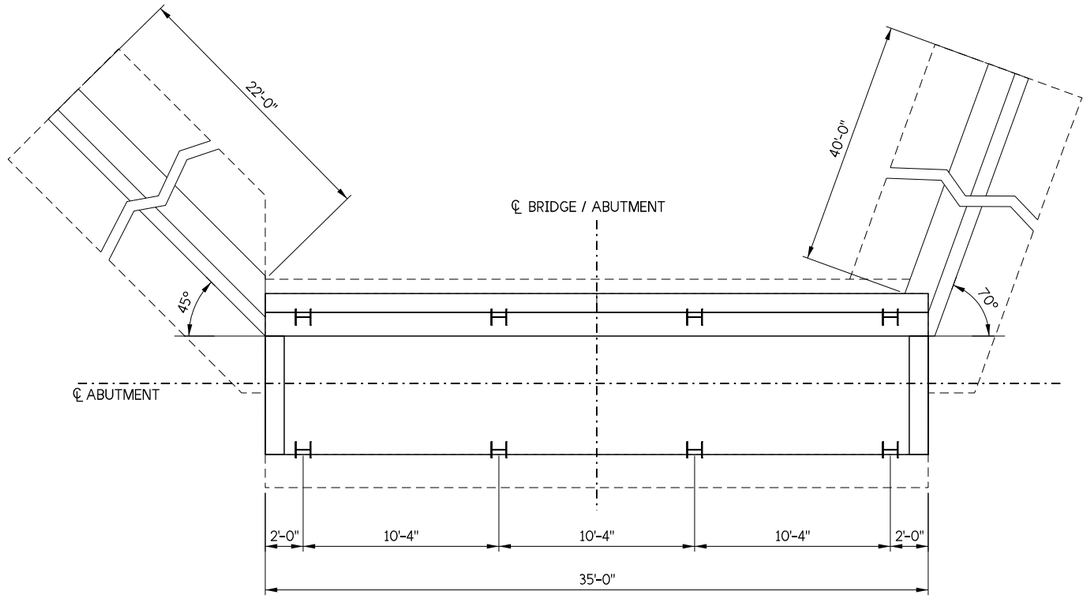
FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn				REGION NO.	STATE	FED. AID PROJ. NO.	PLAN REF NO
TIME	11:04:58 AM				10	WASH		
DATE	1/2/2025				JOB NUMBER			
PLOTTED BY	McDonSte							
DESIGNED BY		PRELIMINARY			CONTRACT NO.		LOCATION NO.	SHEET
ENTERED BY		NOT FOR CONSTRUCTION						OF
CHECKED BY								SHEETS
PROJ. ENGR.								
REGIONAL ADM.		REVISION	DATE	BY				

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

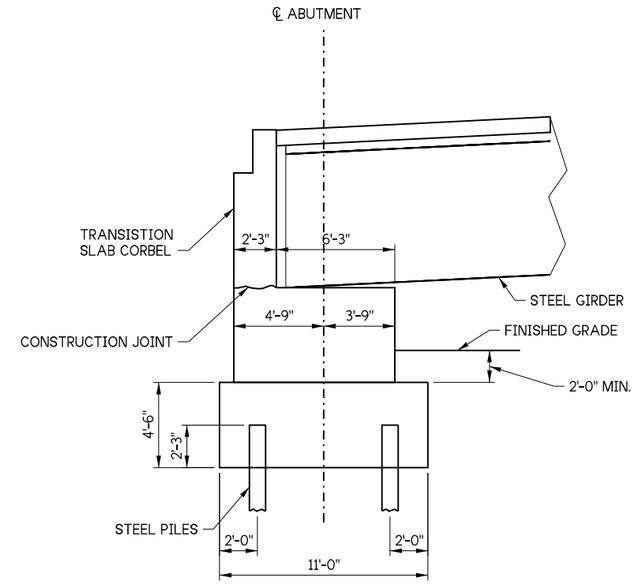
P.E. STAMP BOX DATE

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000001.dgn



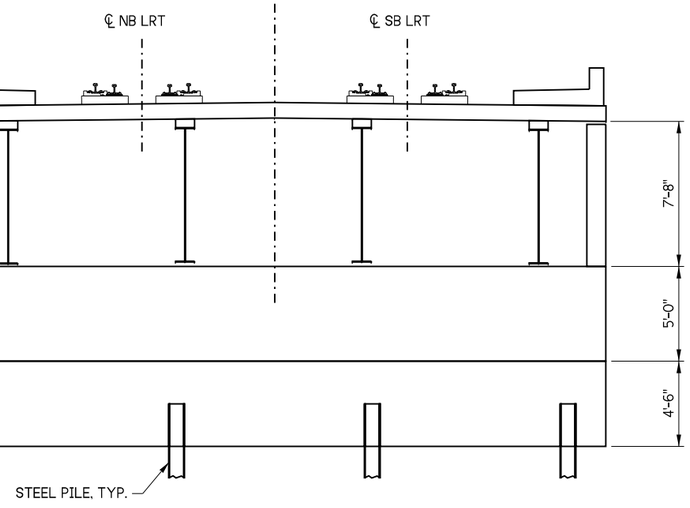
ABUTMENT PLAN VIEW

SCALE: 1/8" = 1'-0"



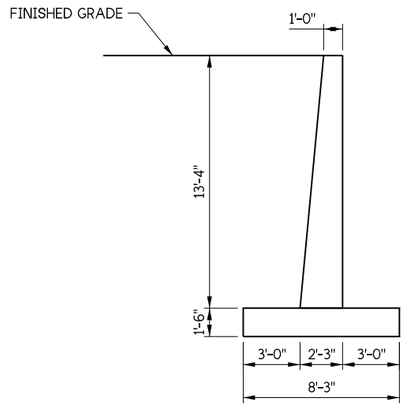
ABUTMENT SECTION

SCALE: 1/8" = 1'-0"



ABUTMENT ELEVATION

SCALE: 1/8" = 1'-0"



WINGWALL SECTION

SCALE: 1/8" = 1'-0"

c:\bms\wsp-us-pw-09\dms718021\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:06:43 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

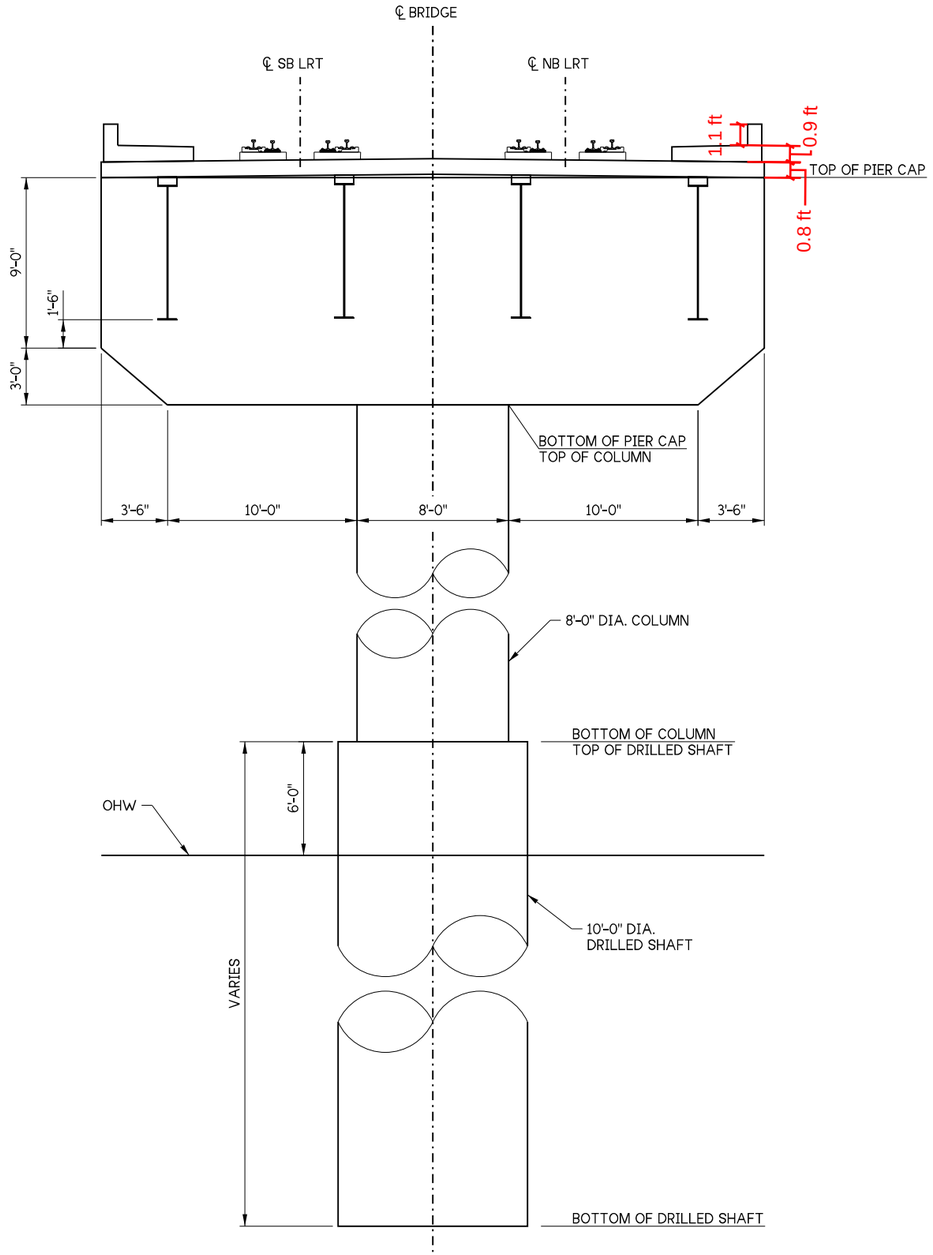
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

PLAN REF NO

SHEET OF SHEETS



TYPICAL PIER SECTION @ NORTH PORTLAND HARBOR DOUBLE TRACKS

SCALE: 1/8" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.
TIME	11:09:36 AM				JOB NUMBER		
DATE	1/2/2025	PRELIMINARY					
PLOTTED BY	McDonSte	NOT FOR CONSTRUCTION					
DESIGNED BY					CONTRACT NO.	LOCATION NO.	
ENTERED BY							
CHECKED BY							
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE	BY			

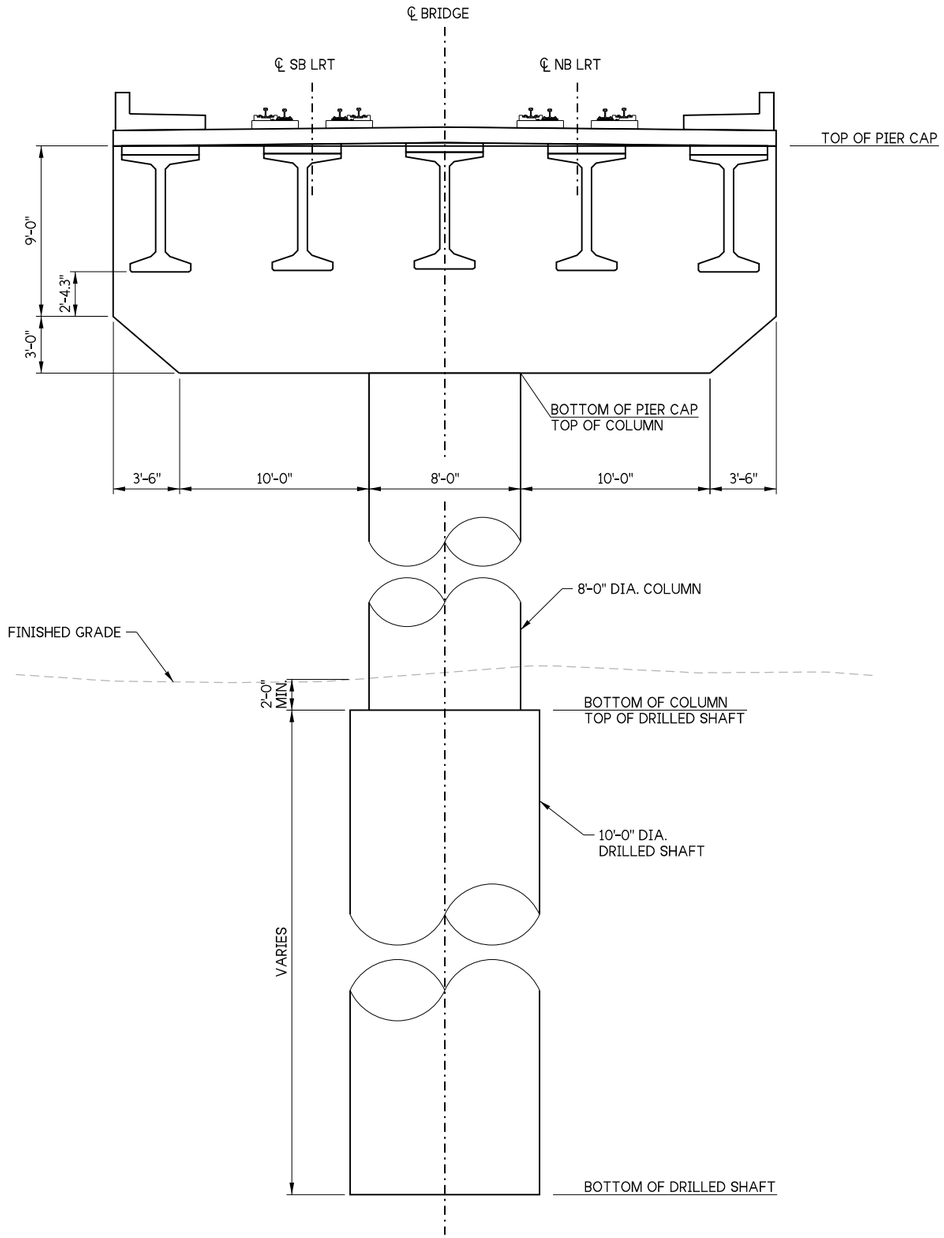
Interstate BRIDGE Replacement Program

DATE
P.E. STAMP BOX

DATE
P.E. STAMP BOX

PLAN REF NO

SHEET
OF
SHEETS



TYPICAL PIER SECTION @ DOUBLE TRACK

SCALE: 1/8" = 1'-0"

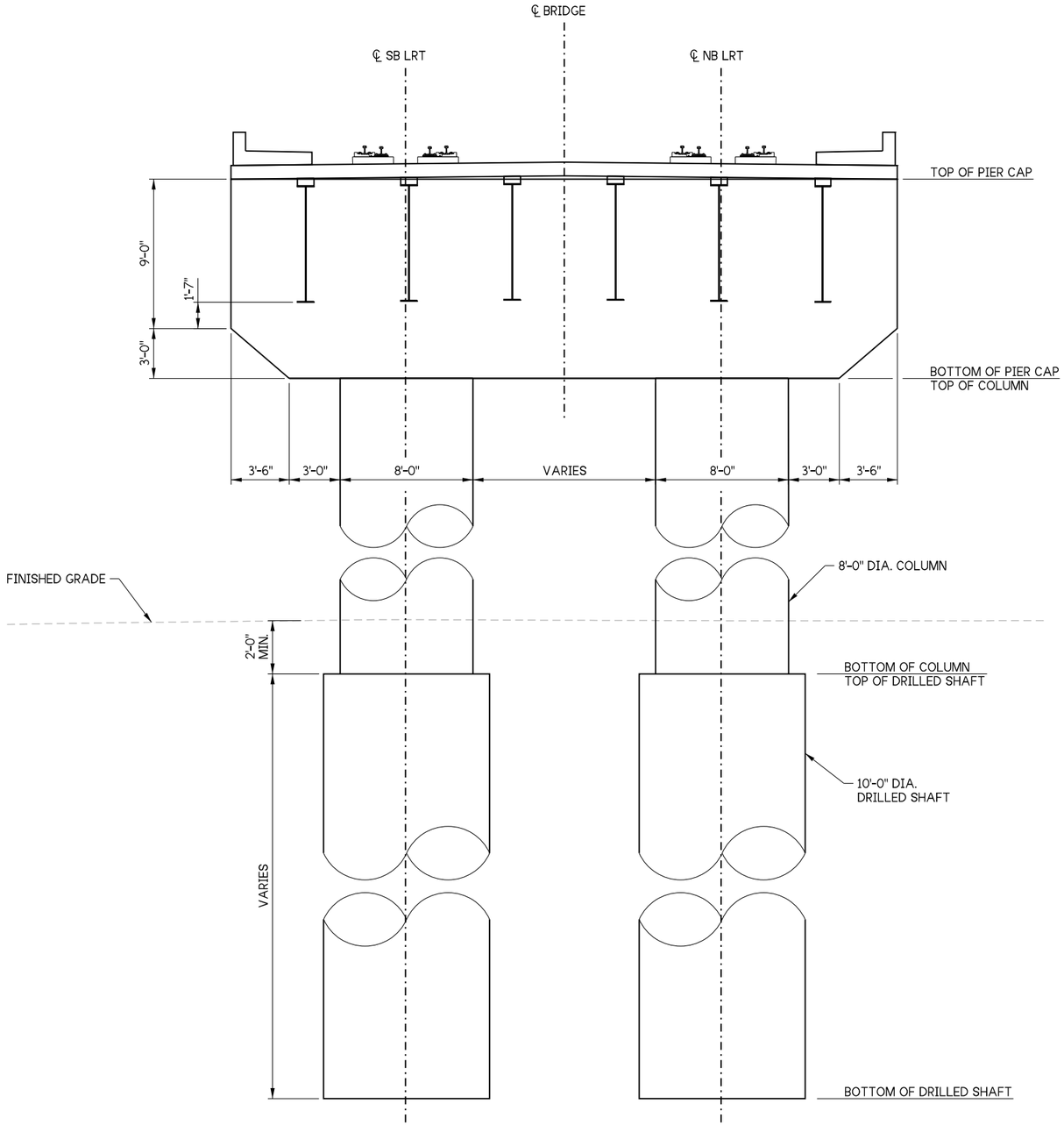
c:\bms\wsp-us-pw-09\dms/71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn			REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	PLAN REF NO
TIME	11:08:16 AM			JOB NUMBER			
DATE	1/2/2025						
PLOTTED BY	McDonSte	PRELIMINARY					
DESIGNED BY		NOT FOR CONSTRUCTION					
ENTERED BY							
CHECKED BY				CONTRACT NO.	LOCATION NO.		SHEET OF SHEETS
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE BY				

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE



DOUBLE PIER SECTION @ DOUBLE TRACKS

SCALE: 1/8" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:08:52 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO. 10 | STATE WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

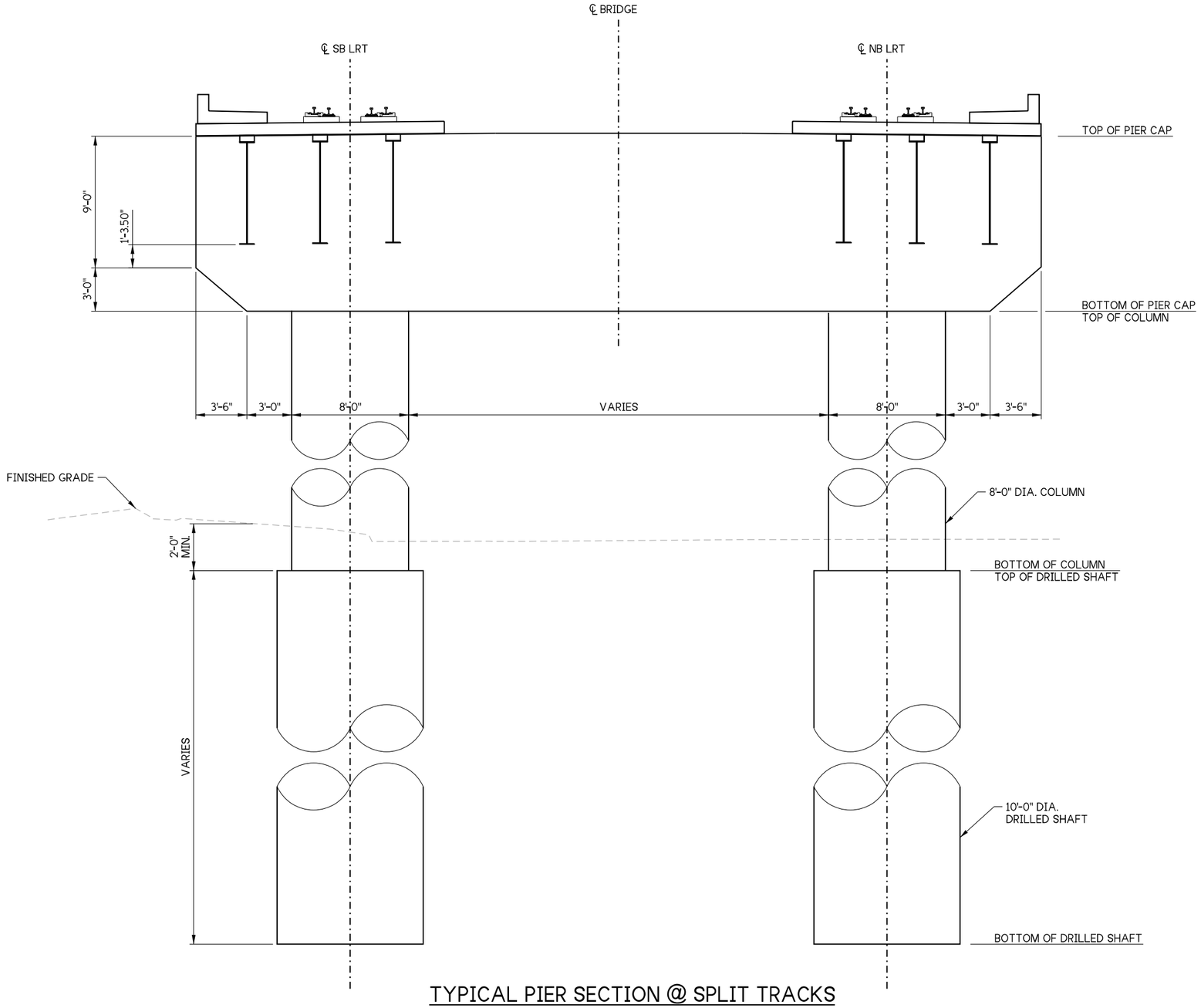
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

PLAN REF NO

SHEET OF SHEETS



TYPICAL PIER SECTION @ SPLIT TRACKS

SCALE: 1/8" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:11:19 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

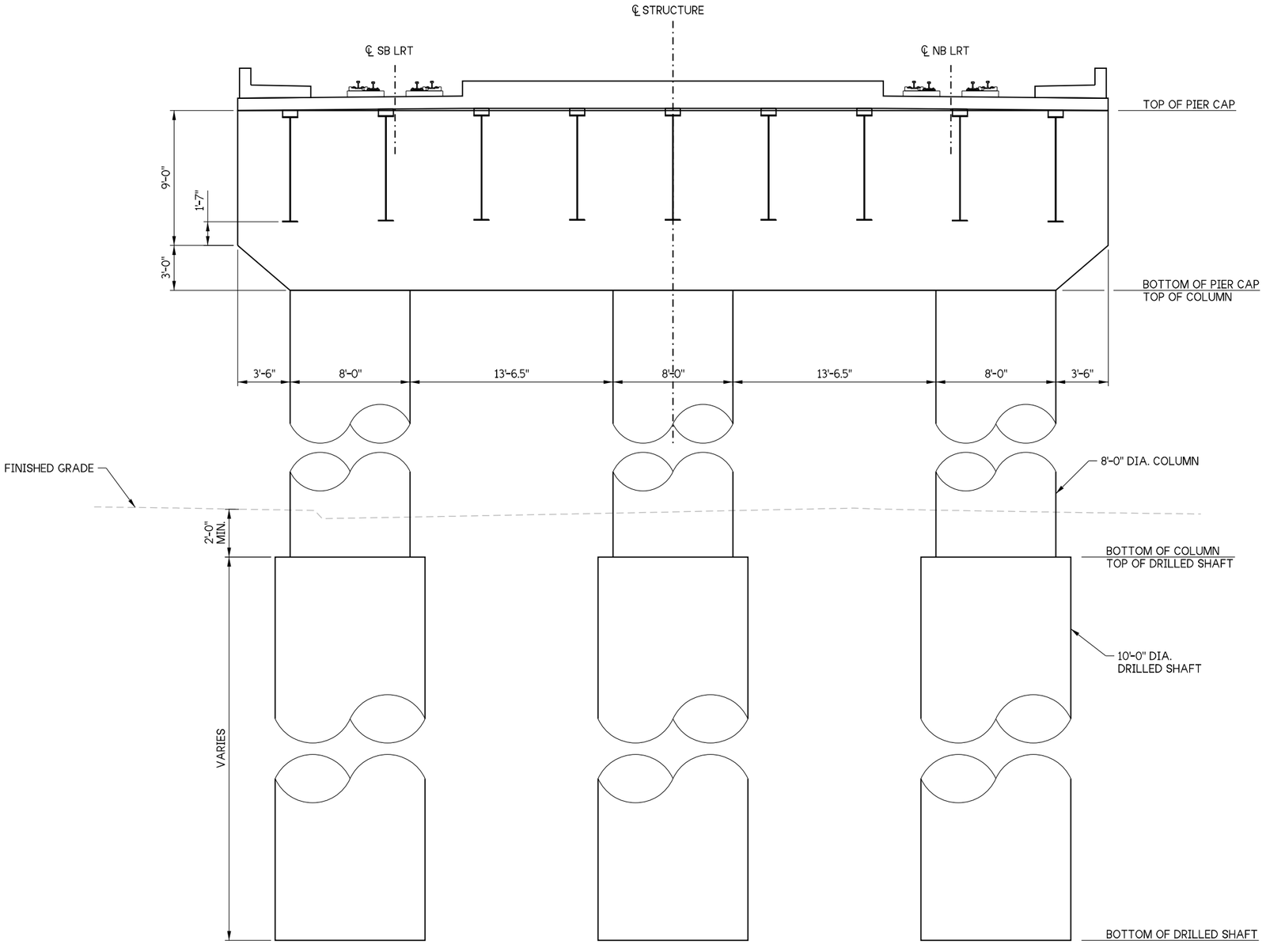
Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

PLAN REF NO

SHEET OF SHEETS



TYPICAL PIER SECTION @ INTERIOR PLATFORM

SCALE: 1/8" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:10:14 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

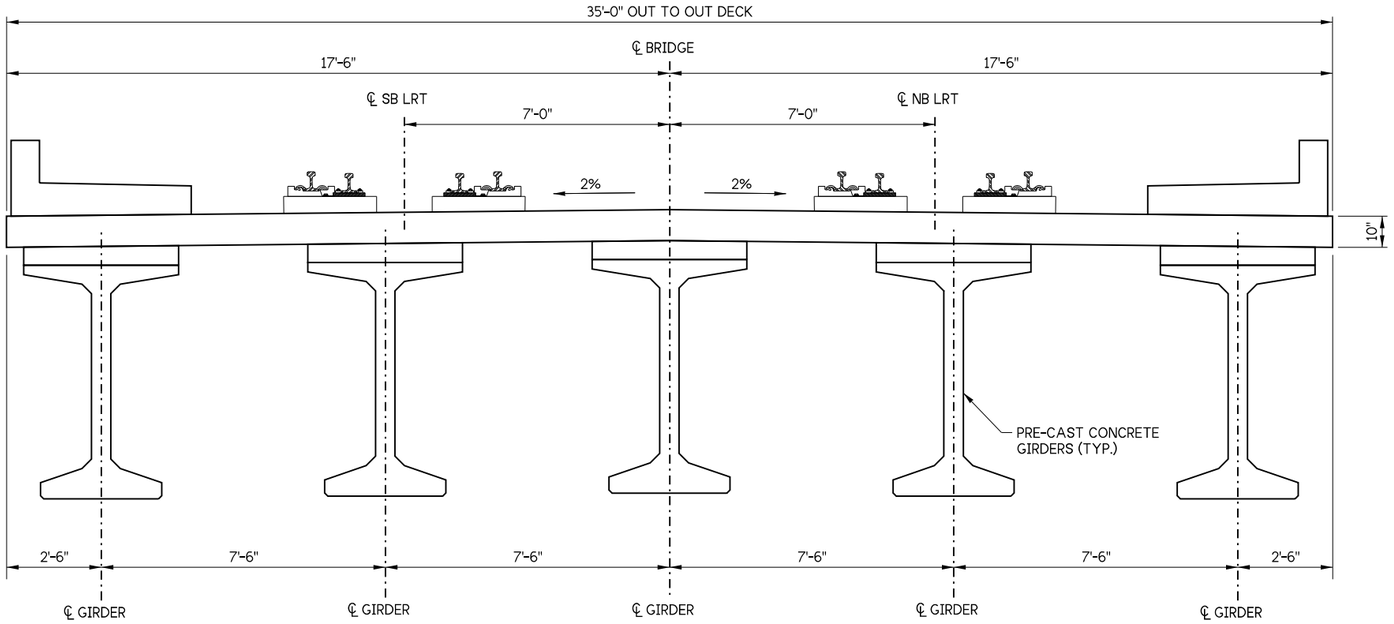
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

PLAN REF NO

SHEET OF SHEETS



TYPICAL PRE-CAST GIRDER SECTION @ DOUBLE TRACK

SCALE: 1/4" = 1'-0"

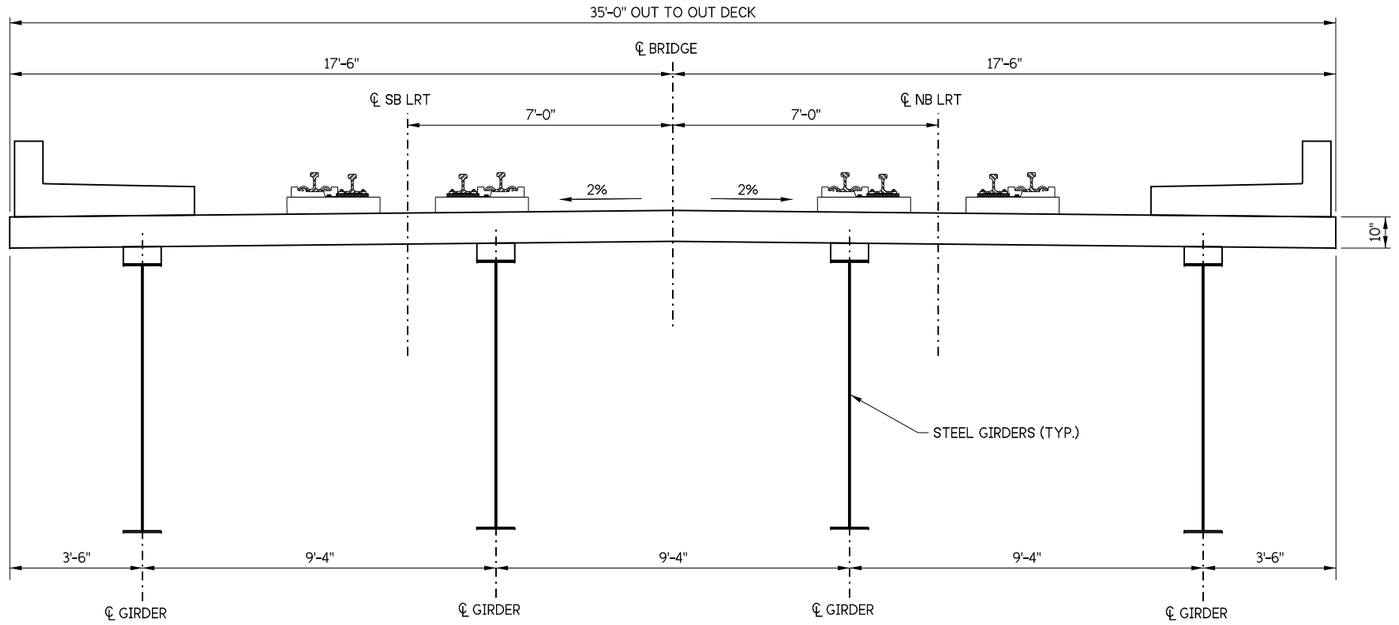
c:\bms\wsp-us-pw-09\dms\71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn				REGION NO.	STATE	FED. AID PROJ. NO.		PLAN REF NO
TIME	11:11:59 AM				10	WASH			
DATE	1/2/2025				JOB NUMBER				
PLOTTED BY	McDonSte								SHEET
DESIGNED BY									OF
ENTERED BY					CONTRACT NO.		LOCATION NO.		SHEETS
CHECKED BY									
PROJ. ENGR.									
REGIONAL ADM.		REVISION	DATE	BY					

Interstate BRIDGE Replacement Program

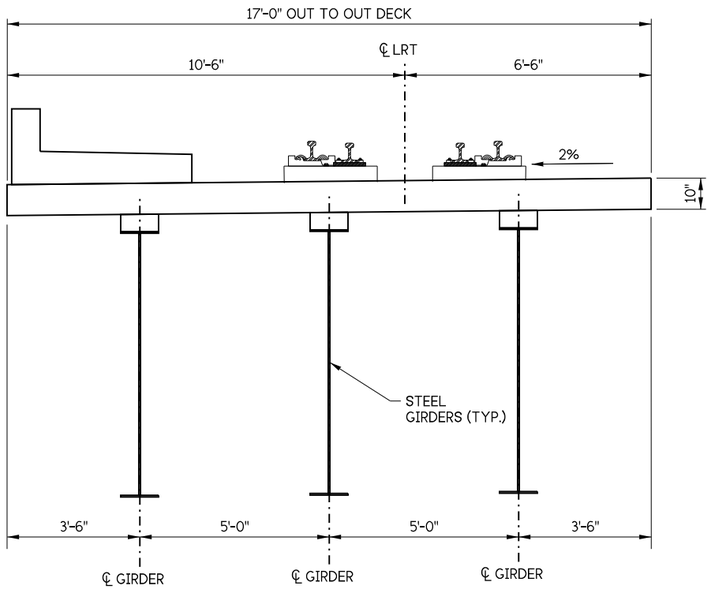
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE



TYPICAL STEEL GIRDER SECTION @ DOUBLE TRACK

SCALE: 1/4" = 1'-0"



TYPICAL STEEL GIRDER SECTION @ SINGLE TRACK

SCALE: 1/4" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:13:06 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

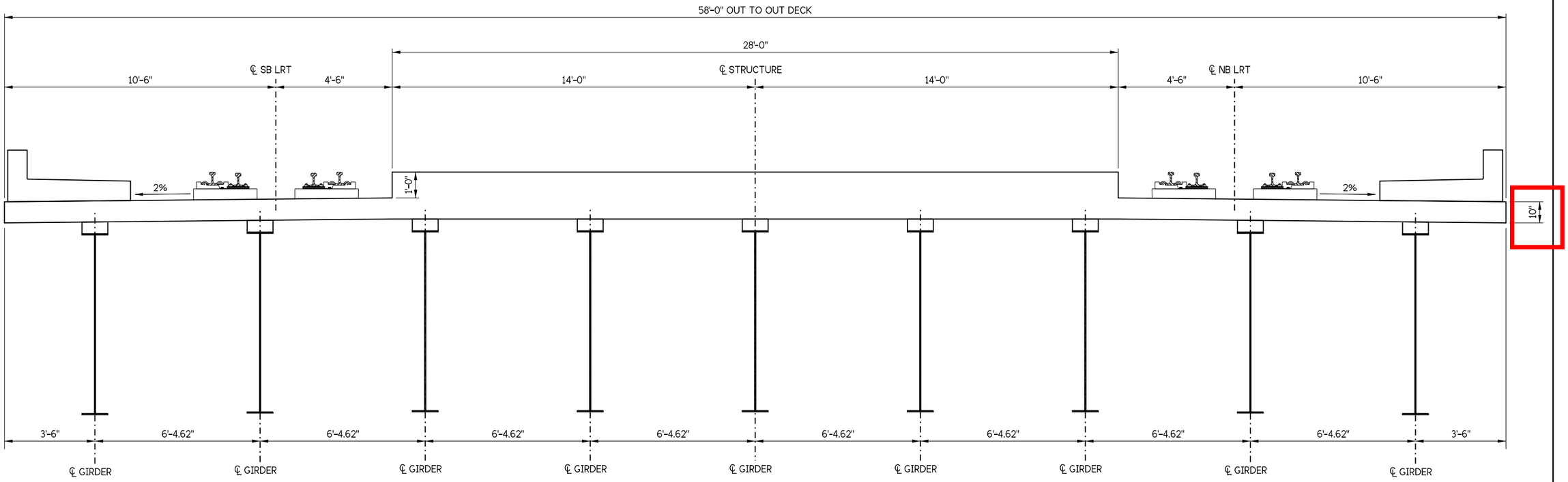
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

PLAN REF NO

SHEET OF SHEETS



TYPICAL STEEL GIRDER SECTION @ PLATFORM

SCALE: 1/4" = 1'-0"

c:\bms\wsp-us-pw-09\dms71802\IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn

FILE NAME	IBR040-IBR-OR-BR-TRRL-XXX-B-SHT-0000002.dgn
TIME	11:12:34 AM
DATE	1/2/2025
PLOTTED BY	McDonSte
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

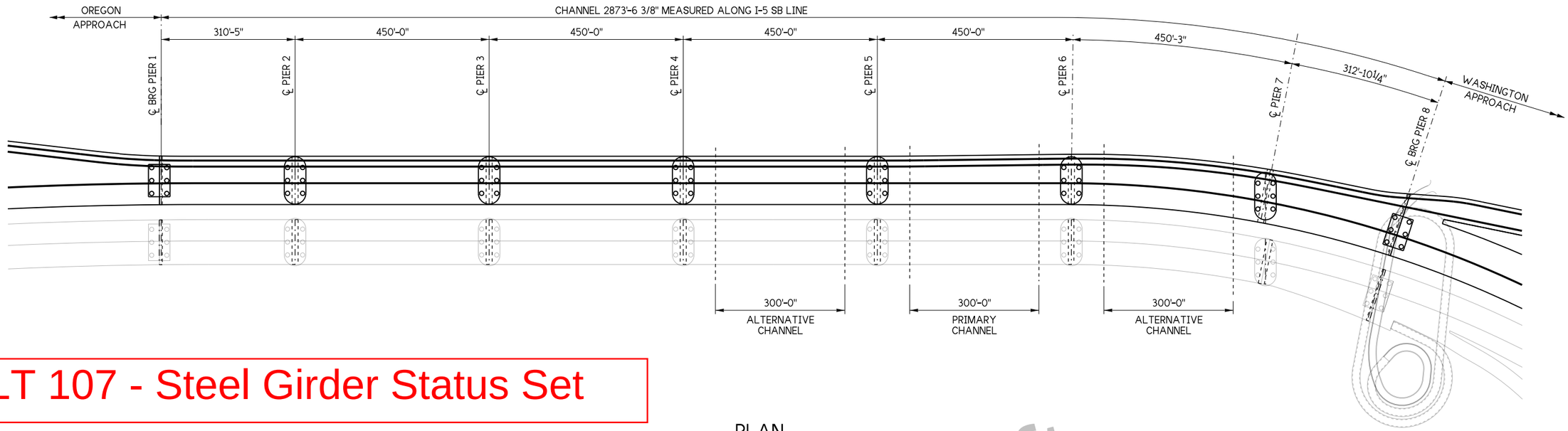
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

PLAN REF NO

SHEET OF SHEETS

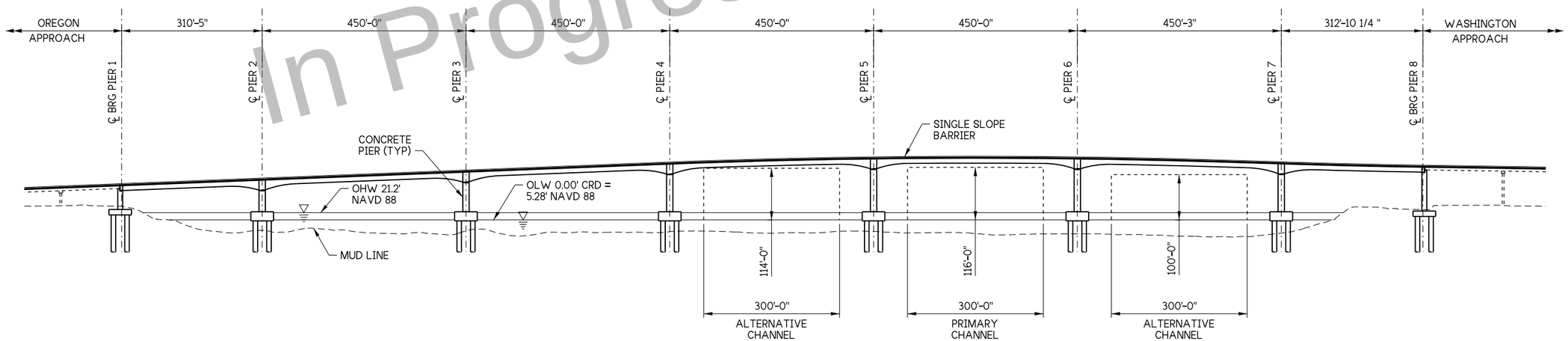
CRBA BRIDGE PLANS



ALT 107 - Steel Girder Status Set

PLAN

In Progress Draft



ELEVATION
I-5 SB

0 50 100
SCALE IN FEET

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000201.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000201.dgn			
TIME	4:32:28 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics05$	PRELIMINARY		
DESIGNED BY		NOT FOR CONSTRUCTION		
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

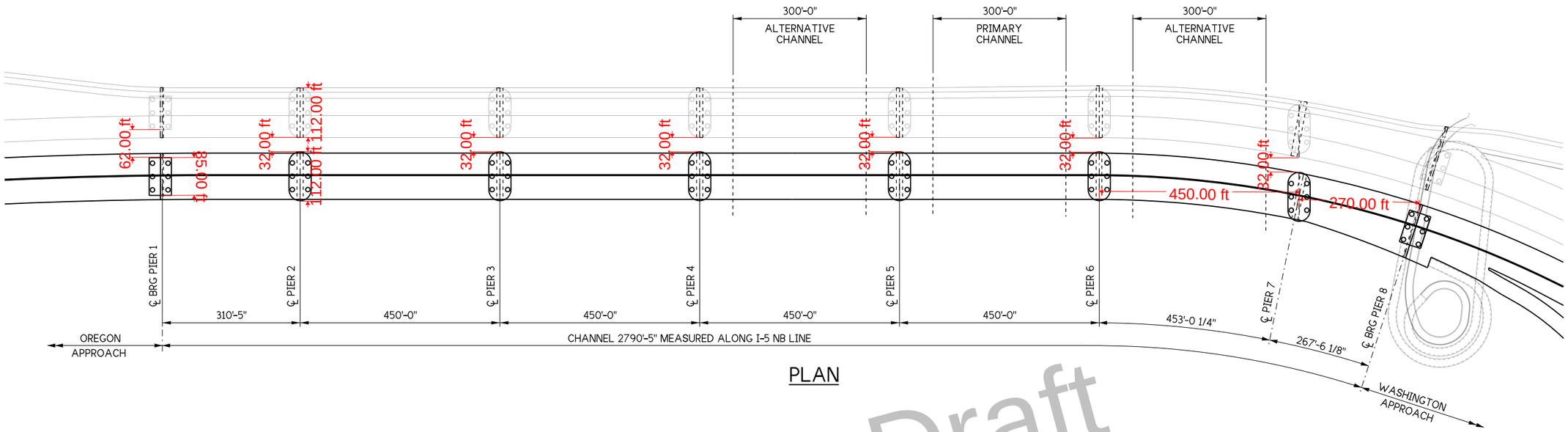
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

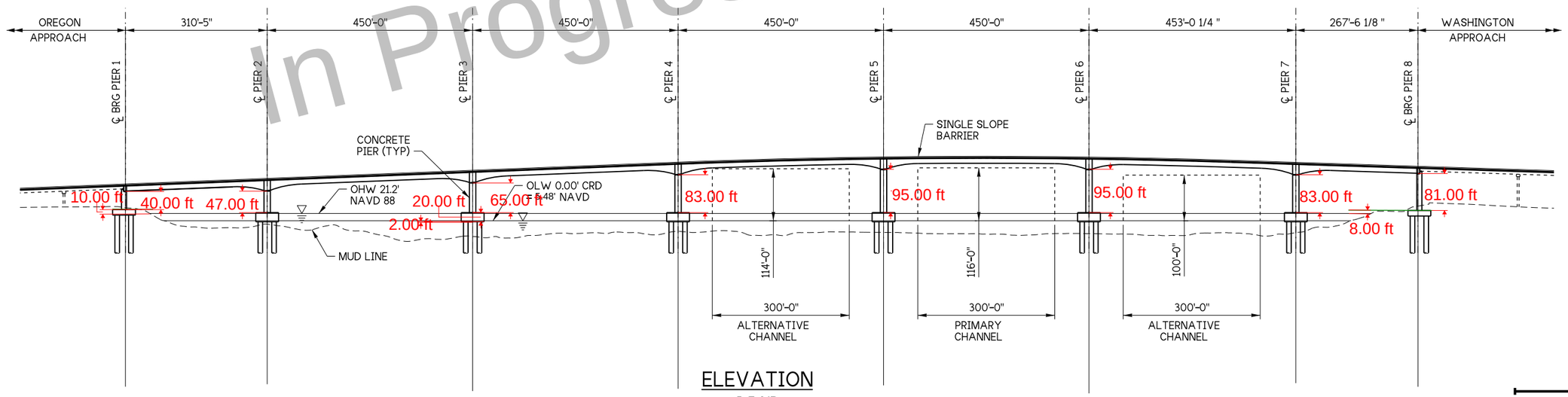
PLAN AND ELEVATION 1 OF 2

PLAN REF NO
BR-001

SHEET
OF
SHEETS



PLAN



ELEVATION

I-5 NB

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000202.dgn
TIME	4:32:40 AM
DATE	9/25/2024
PLOTTED BY	wsppw14ics01$
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY

NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO. 10 | STATE WASH | JOB NUMBER | CONTRACT NO.

FED. AID PROJ. NO. | LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

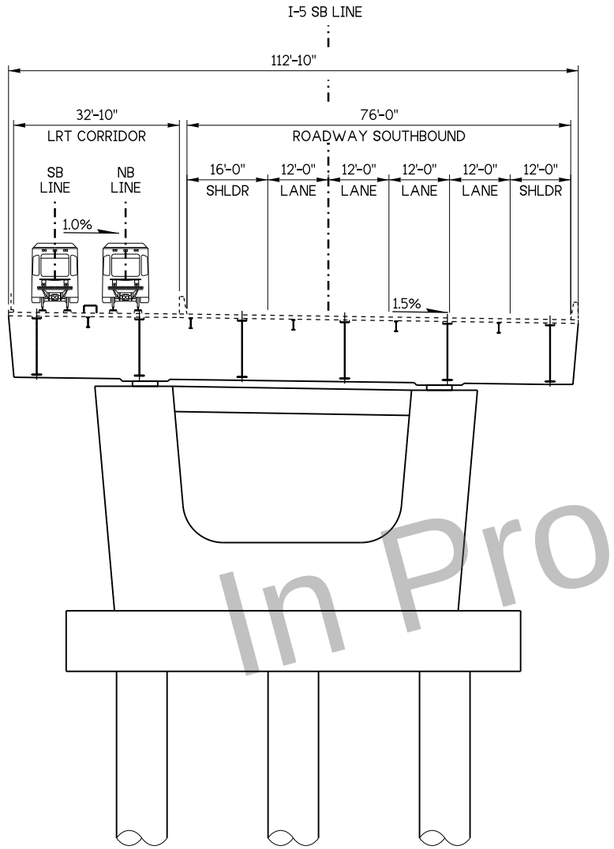
P.E. STAMP BOX DATE

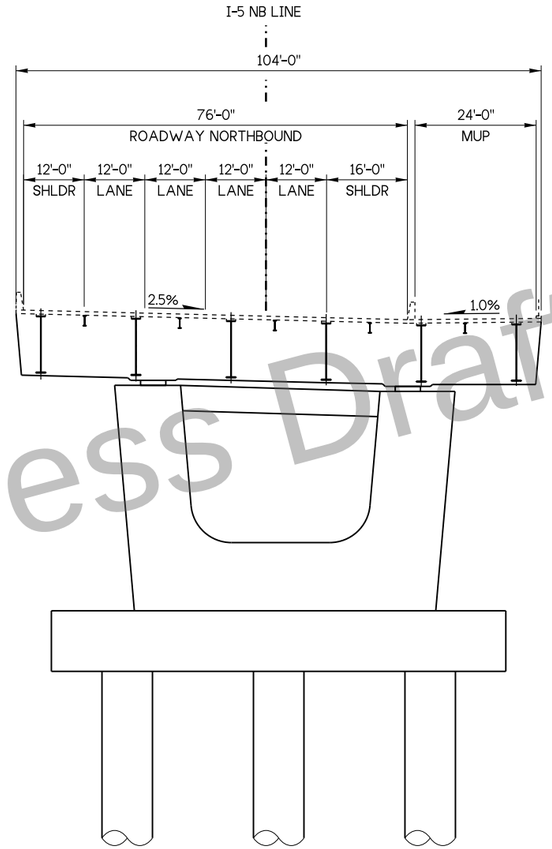
PLAN AND ELEVATION 2 OF 2

PLAN REF NO BR-001

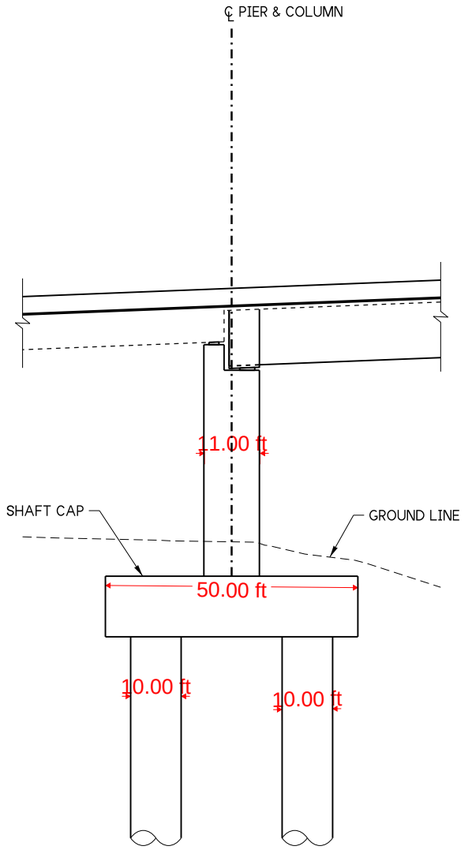
SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000202.dgn





CROSS-SECTION



ELEVATION

NB SHOWN, SB SIMILAR

PIER 1

0 50 100

SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000301.dgn			
TIME	6:29:32 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics01$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

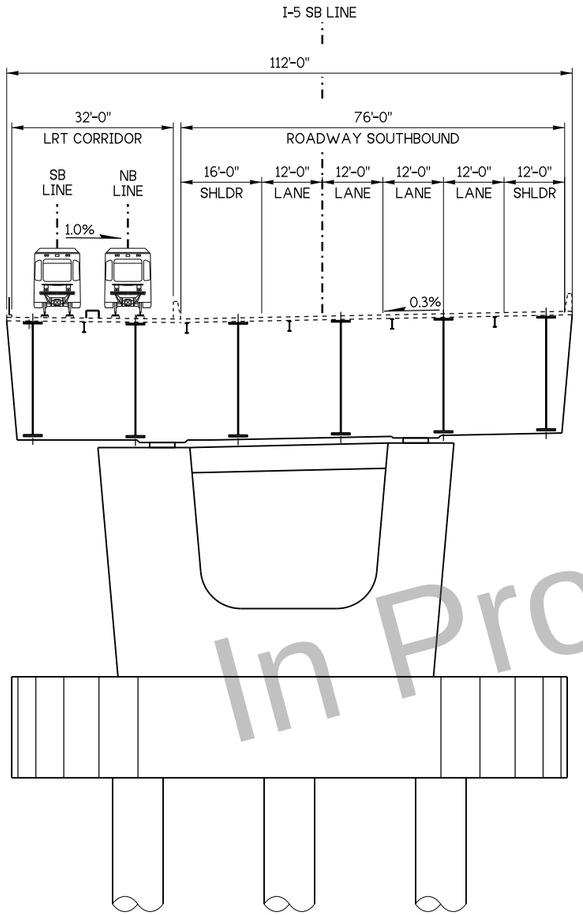
TYPICAL SECTION 1 OF 6

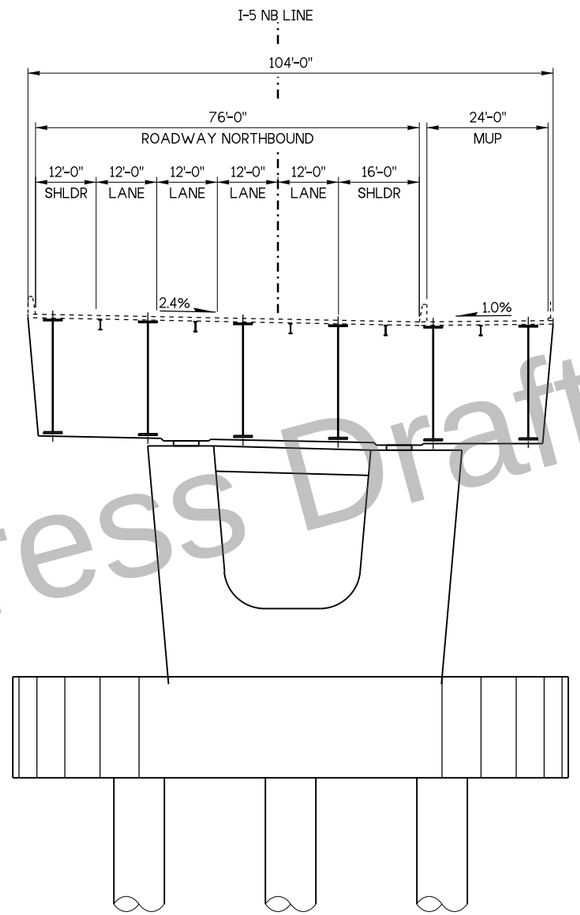
PLAN REF NO

BR-002

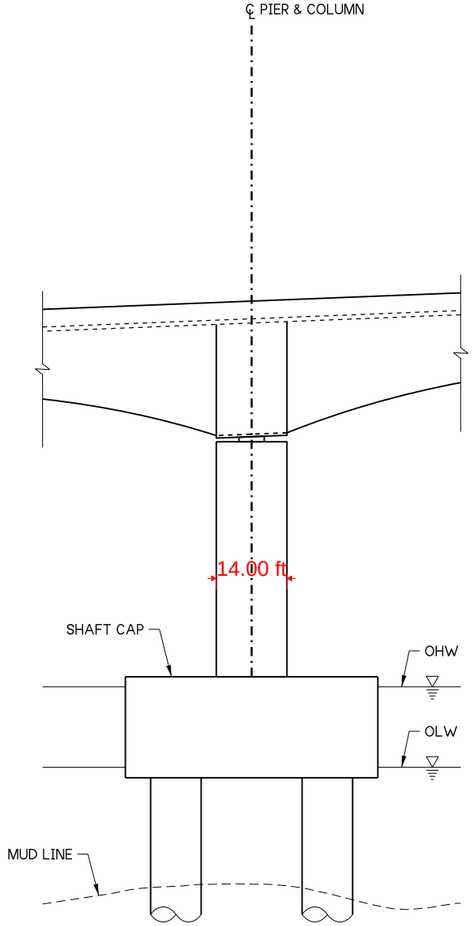
SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000301.dgn





CROSS-SECTION



ELEVATION

NB SHOWN, SB SIMILAR

PIER 2

0 50 100

SCALE IN FEET

In Progress Draft

FILE NAME			
TIME			
DATE			
PLOTTED BY			
DESIGNED BY			
ENTERED BY			
CHECKED BY			
PROJ. ENGR.			
REGIONAL ADM.	REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

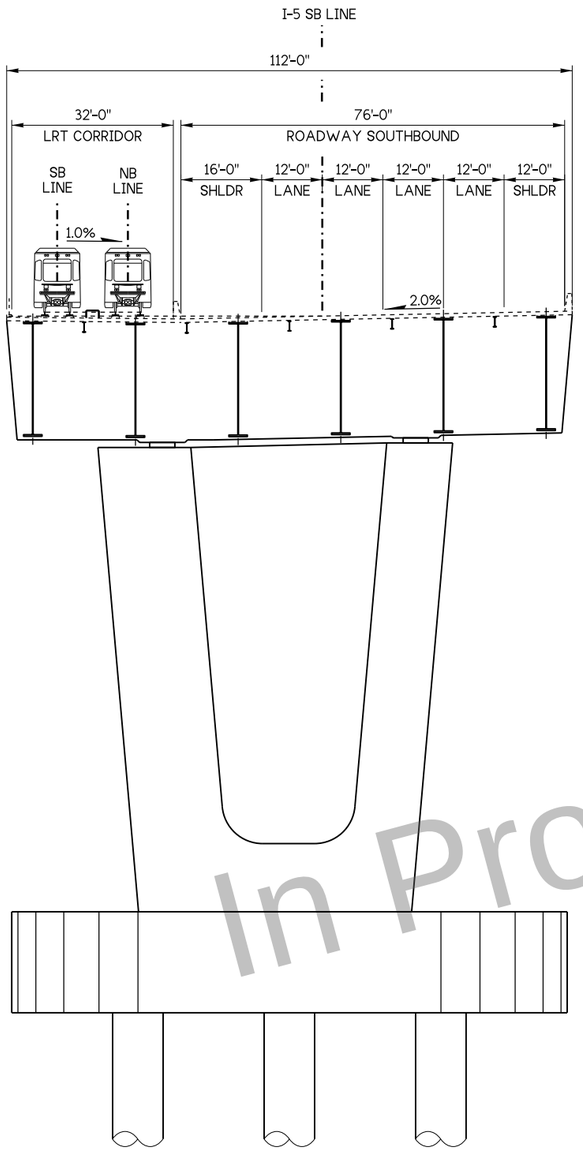
P.E. STAMP BOX DATE

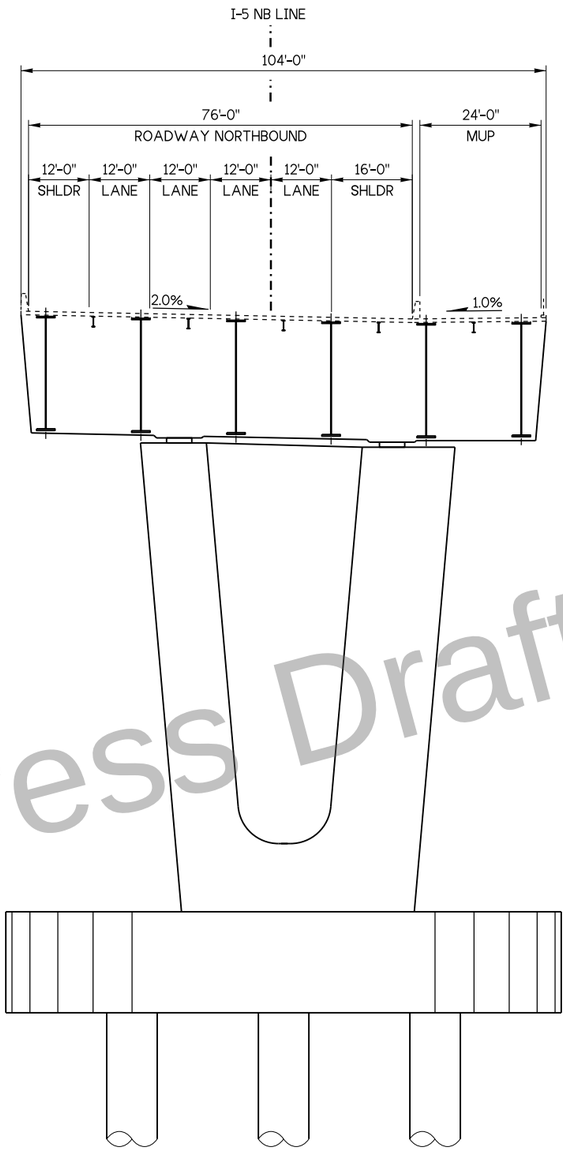
TYPICAL SECTION 2 OF 6

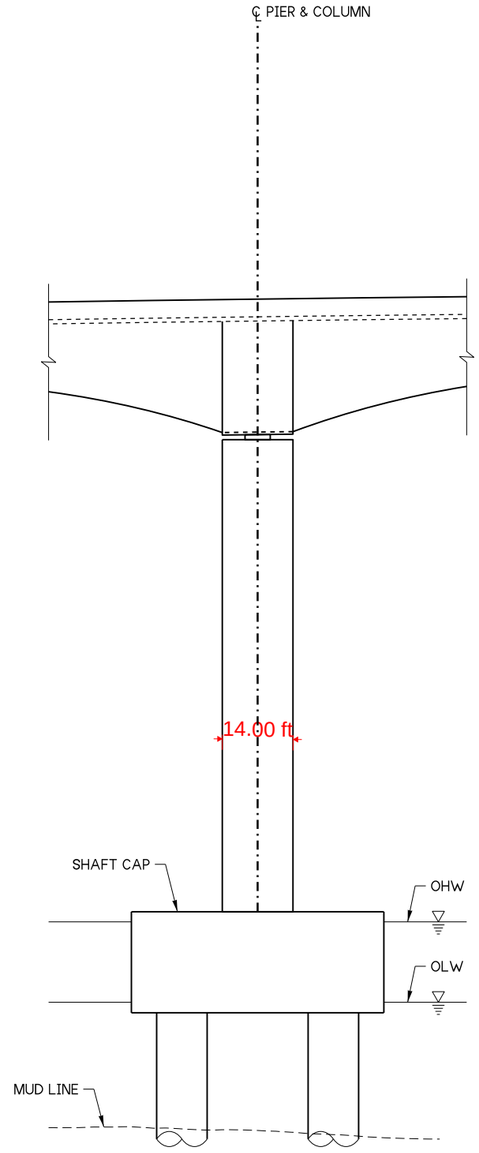
PLAN REF NO

BR-002

SHEET OF SHEETS







In Progress Draft

CROSS-SECTION

ELEVATION

NB SHOWN, SB SIMILAR

PIERS 3 THRU 5

PIER 5 SHOWN. PIERS 3 & 4 SIMLAR

0 50 100
SCALE IN FEET

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000303.dgn			
TIME	4:32:40 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics02$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

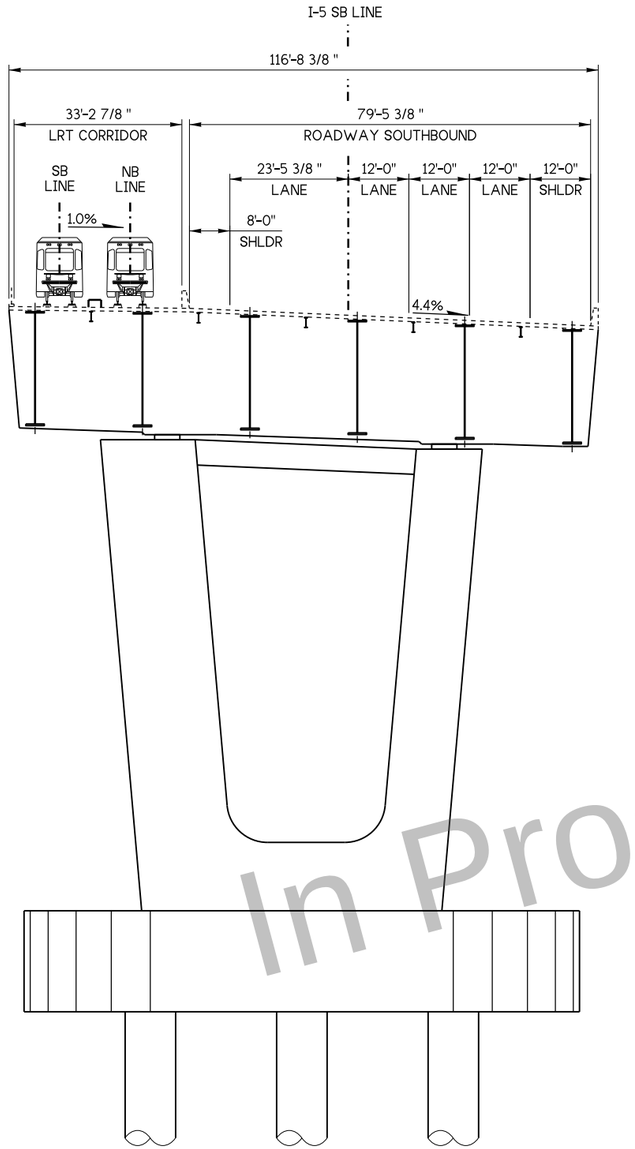
P.E. STAMP BOX DATE

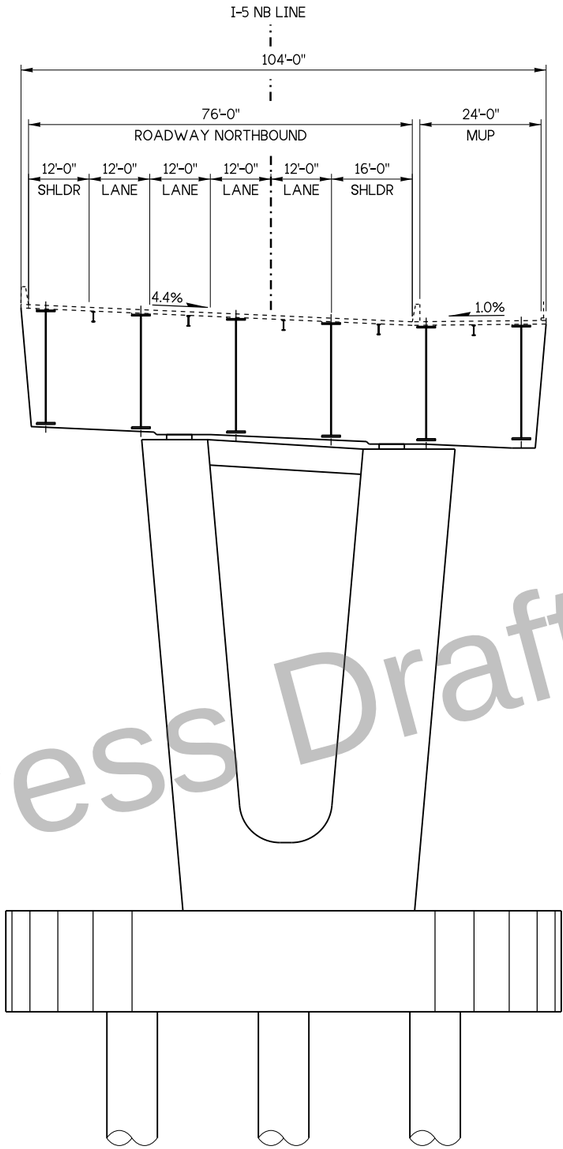
TYPICAL SECTION 3 OF 6

PLAN REF NO
BR-002

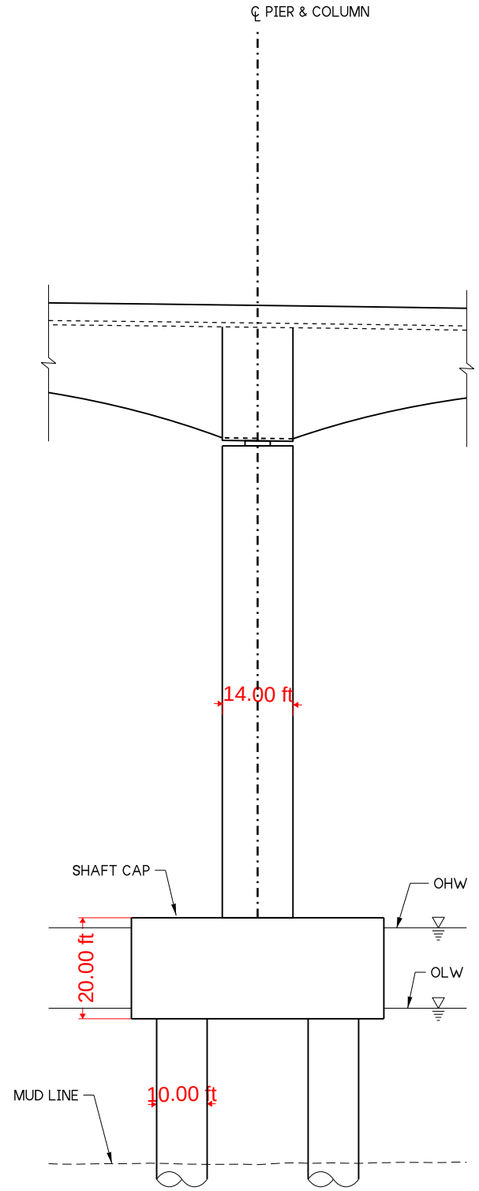
SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000303.dgn





CROSS-SECTION



ELEVATION

NB SHOWN, SB SIMILAR

PIER 6

0 50 100

SCALE IN FEET

In Progress Draft

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000304.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000304.dgn			
TIME	4:33:28 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics05$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO. 10 | STATE WASH | JOB NUMBER | CONTRACT NO.

FED. AID PROJ. NO. | LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

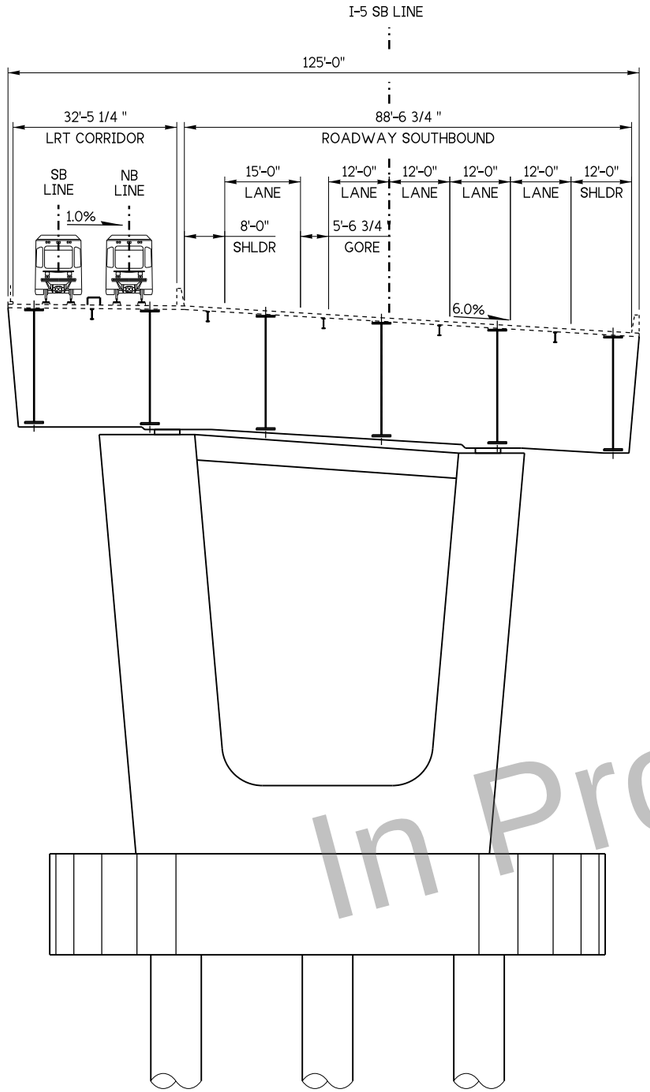
P.E. STAMP BOX DATE

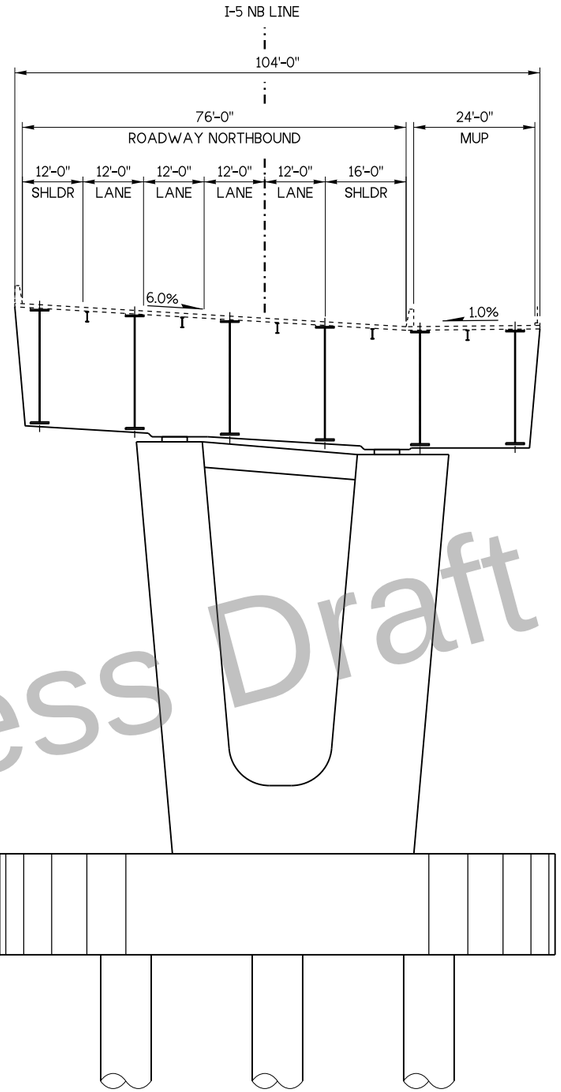
TYPICAL SECTION 4 OF 6

PLAN REF NO BR-002

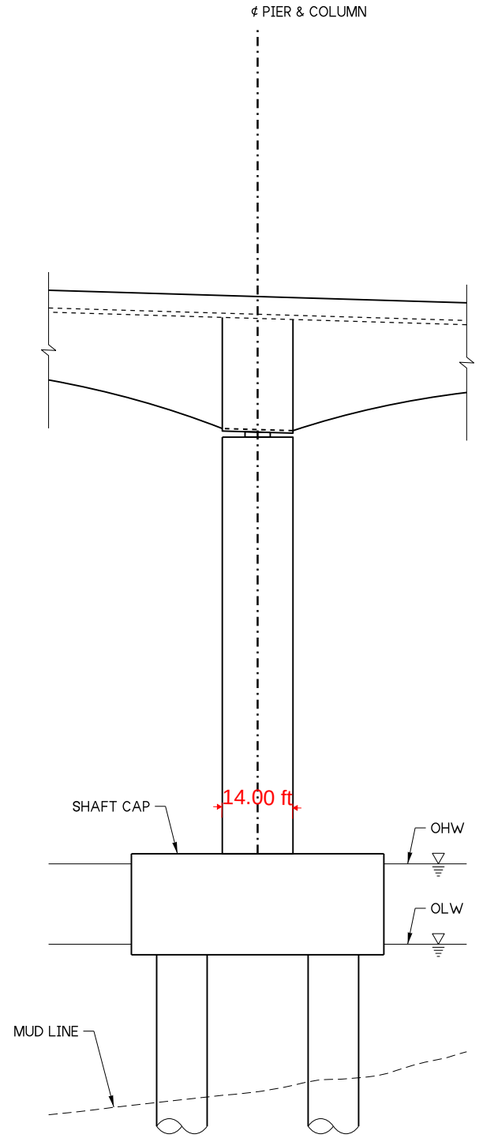
SHEET OF SHEETS

T.XX.R.XX. W.M. SEC. XX





CROSS-SECTION



ELEVATION

NB SHOWN, SB SIMILAR

PIER 7

0 50 100

SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000305.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	PLAN REF NO BR-002
TIME	4:32:36 AM				JOB NUMBER			
DATE	9/25/2024							
PLOTTED BY	wsppw14ics01$	PRELIMINARY NOT FOR CONSTRUCTION						
DESIGNED BY								
ENTERED BY								
CHECKED BY					CONTRACT NO.		LOCATION NO.	
PROJ. ENGR.								
REGIONAL ADM.		REVISION	DATE	BY				

Interstate BRIDGE Replacement Program

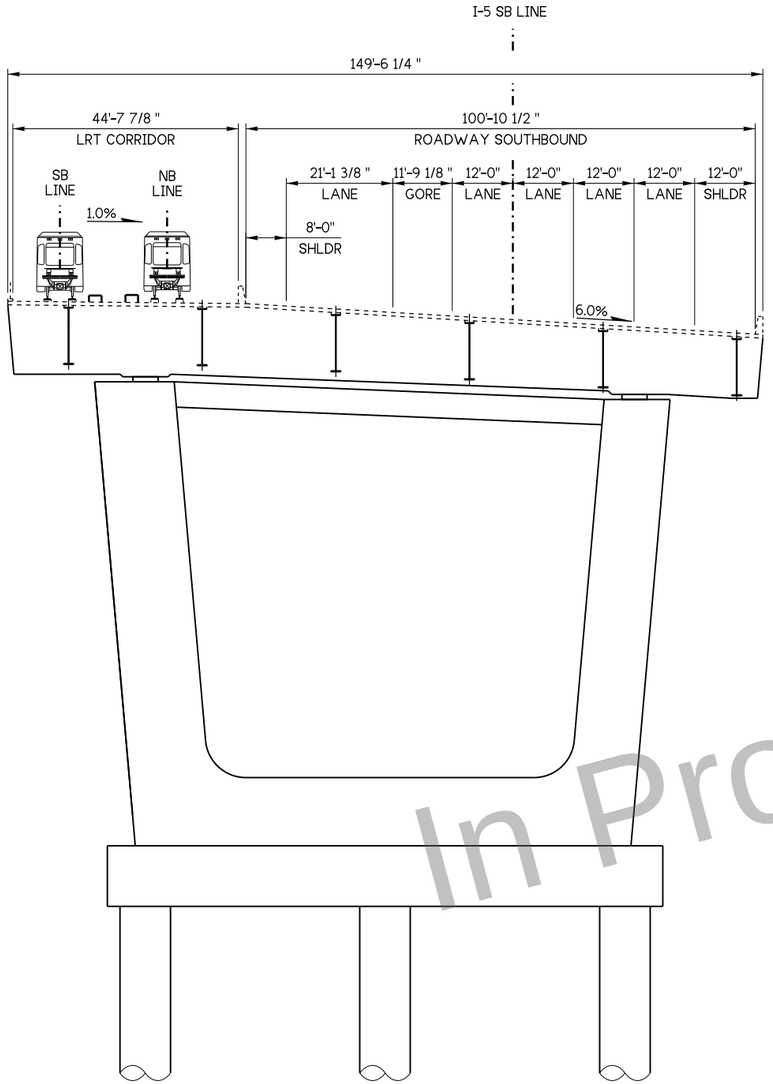
P.E. STAMP BOX DATE

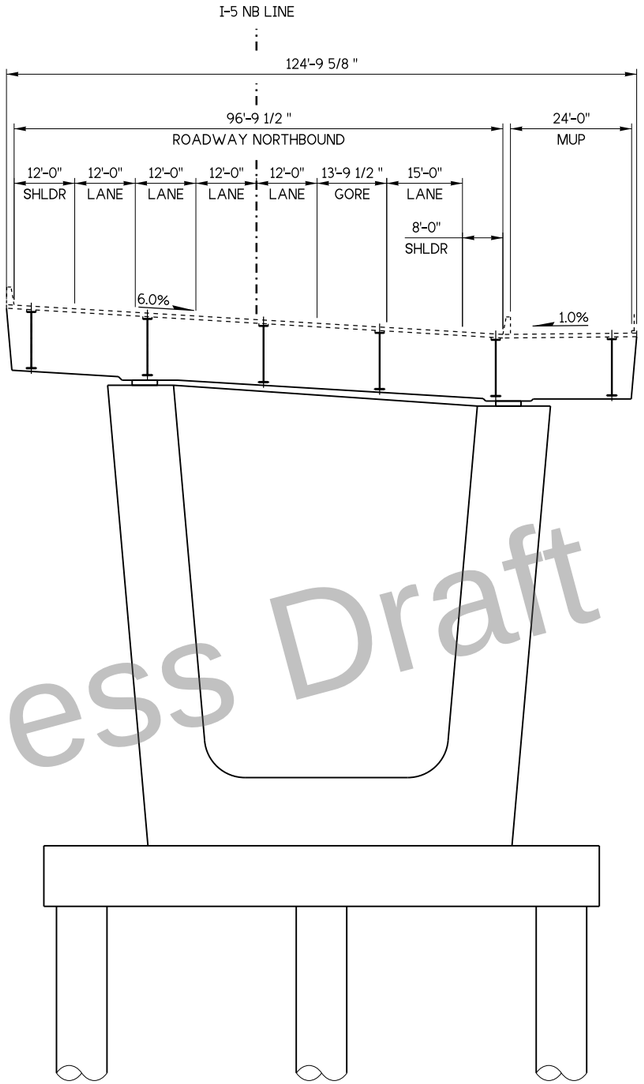
P.E. STAMP BOX DATE

TYPICAL SECTION 5 OF 6

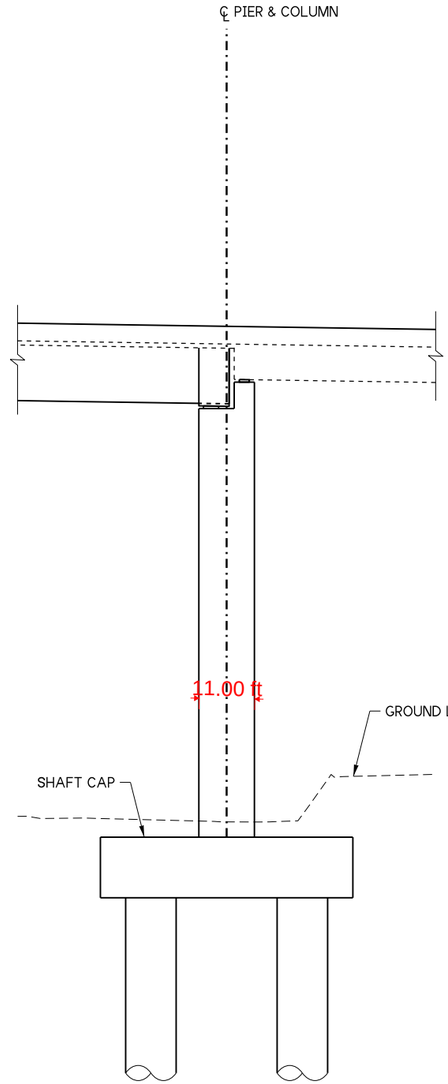
SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000305.dgn





CROSS-SECTION



ELEVATION

NB SHOWN, SB SIMILAR

PIER 8

0 50 100

SCALE IN FEET

In Progress Draft

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000306.dgn

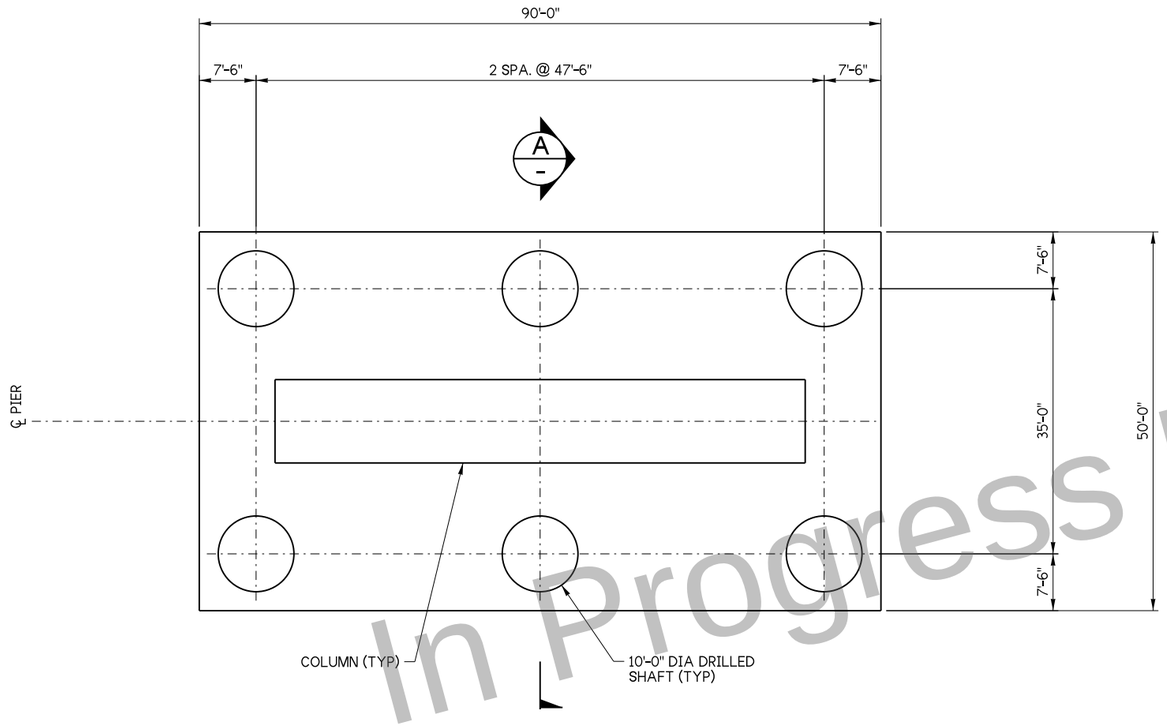
FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000306.dgn				REGION NO.	STATE	FED. AID PROJ. NO.			PLAN REF NO
TIME	4:32:45 AM				10	WASH				BR-002
DATE	9/25/2024				JOB NUMBER					
PLOTTED BY	wsppw14ics05$	PRELIMINARY								SHEET
DESIGNED BY		NOT FOR CONSTRUCTION								OF
ENTERED BY					CONTRACT NO.		LOCATION NO.			SHEETS
CHECKED BY										
PROJ. ENGR.										
REGIONAL ADM.		REVISION	DATE	BY						

Interstate BRIDGE Replacement Program

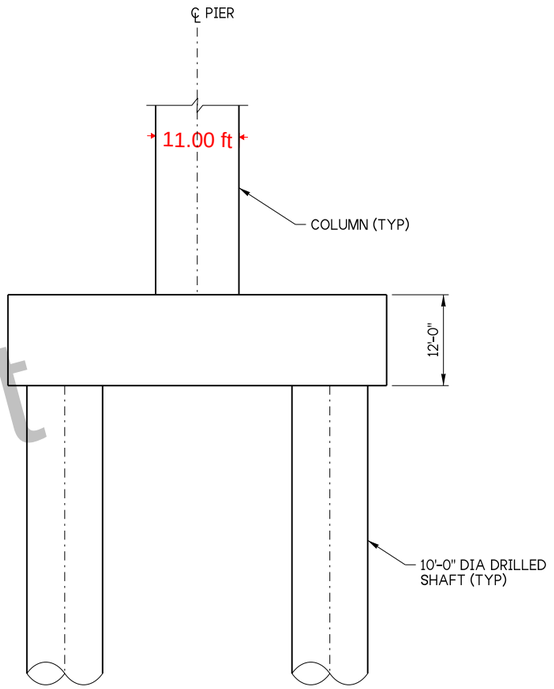
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

TYPICAL SECTION 6 OF 6



PLAN



SECTION A -

PIER 1

NOTES:

1. FOR DRILLED SHAFT DETAILS, SEE SHEET XX

0 50 100

SCALE IN FEET

In Progress Draft

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000501.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000501.dgn			
TIME	4:32:20 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics02$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO. 10 | STATE WASH | JOB NUMBER | CONTRACT NO.

FED. AID PROJ. NO. | LOCATION NO.

Interstate BRIDGE Replacement Program

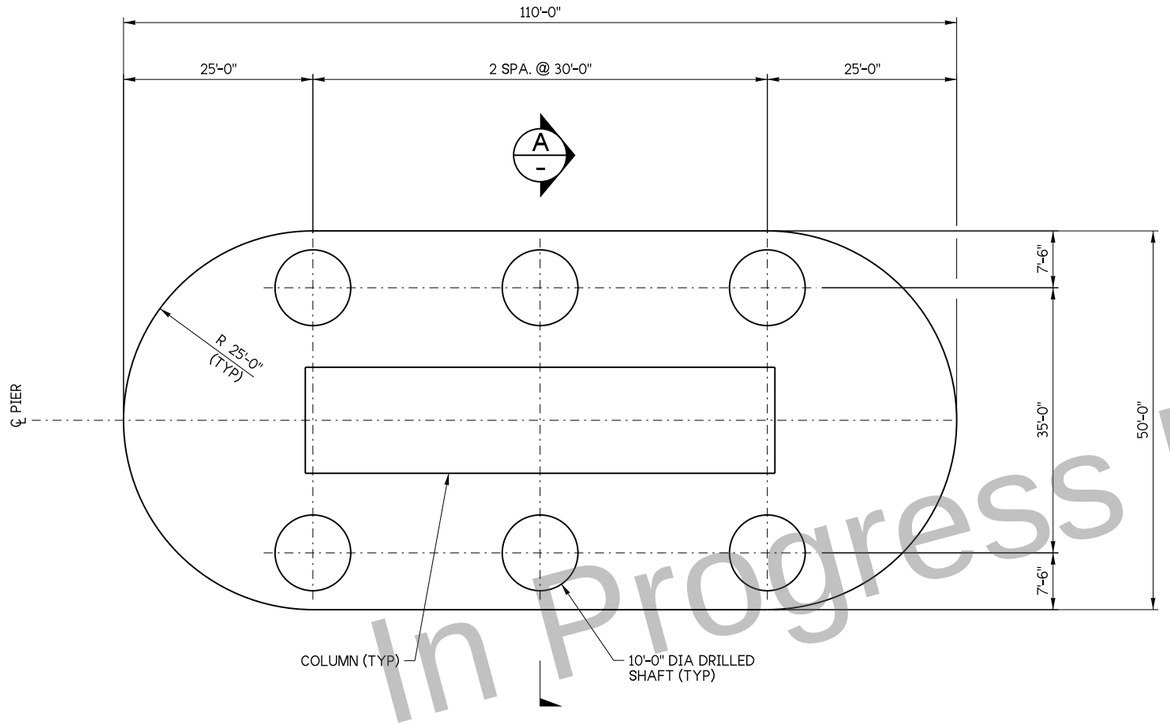
P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

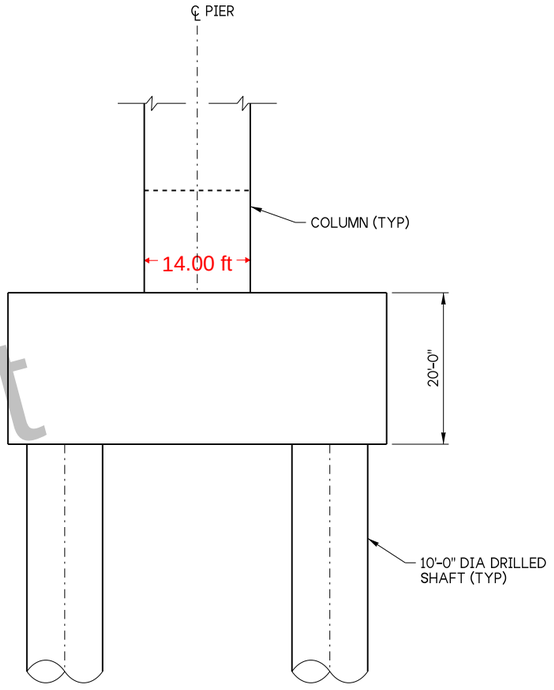
PLAN REF NO BR-002

SHEET OF SHEETS

TYPICAL SHAFT CAP DETAILS 1 OF 3



PLAN



SECTION A -

In Progress Draft

PIERS 2 THRU 7

PIER 2 SHOWN. PIERS 3 THRU 7 SIMLAR.

NOTES:

1. FOR DRILLED SHAFT DETAILS, SEE SHEET XX

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000502.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000502.dgn			
TIME	4:33:22 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics05$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.	LOCATION NO.	

Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

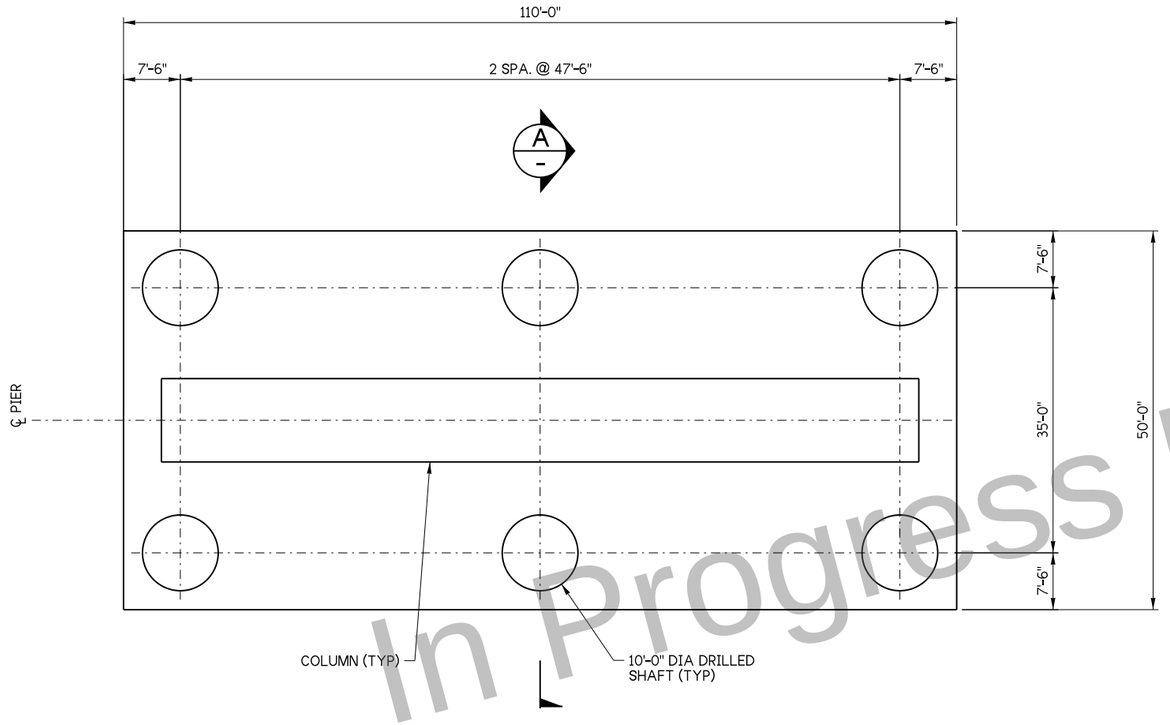
P.E. STAMP BOX — DATE

PLAN REF NO: BR-002

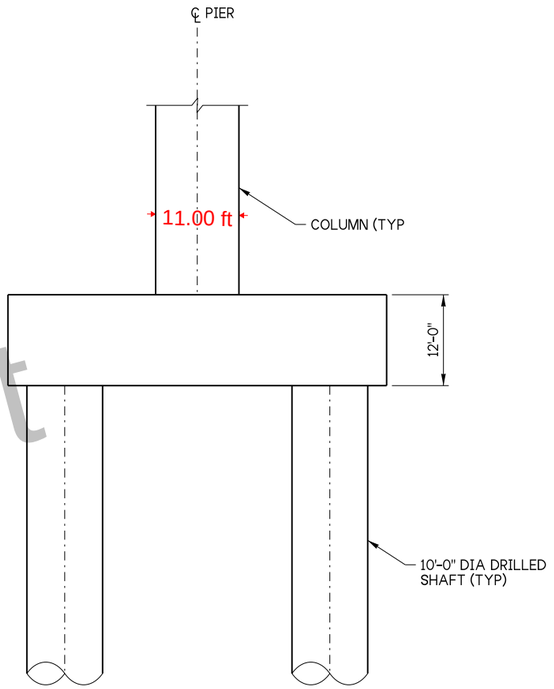
TYPICAL SHAFT CAP DETAILS 2 OF 3

SHEET OF SHEETS

T.XX.R.XX. W.M. SEC. XX



PLAN



SECTION A -

PIER 8

NOTES:

1. FOR DRILLED SHAFT DETAILS, SEE SHEET XX

0 50 100

SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000503.dgn			
TIME	4:33:03 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics01$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.	LOCATION NO.	

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

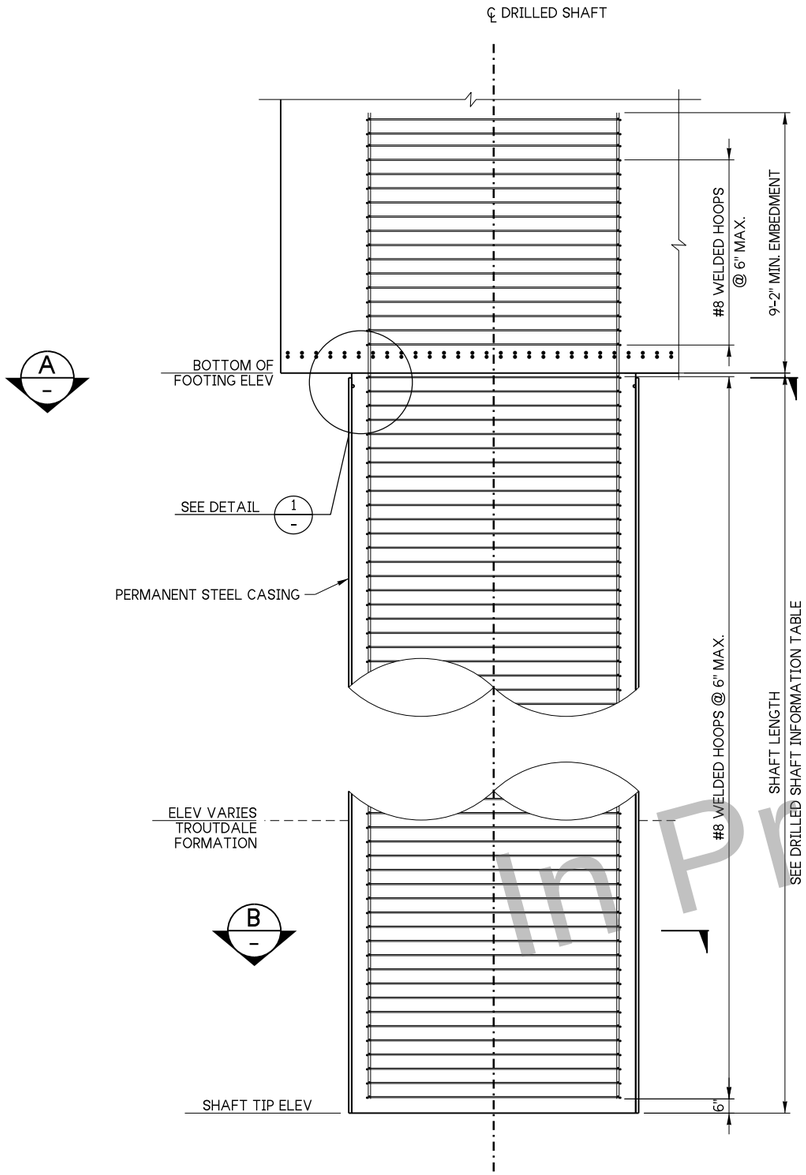
PLAN REF NO BR-002

SHEET OF SHEETS

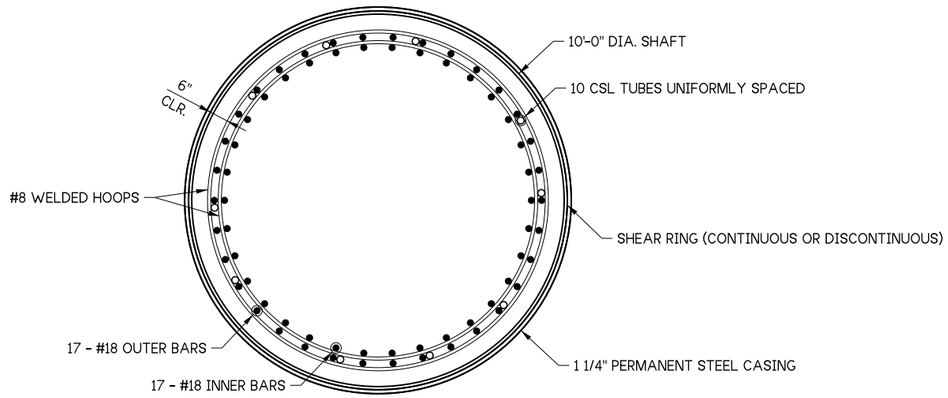
TYPICAL SHAFT CAP DETAILS 3 OF 3

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000503.dgn

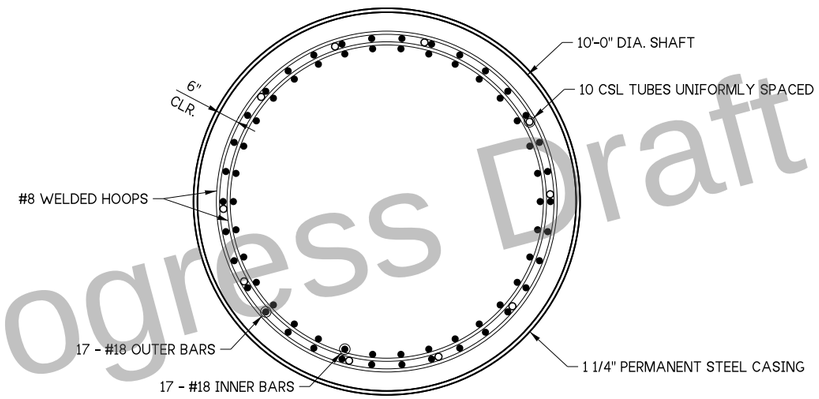
T.XX.R.XX. W.M. SEC. XX



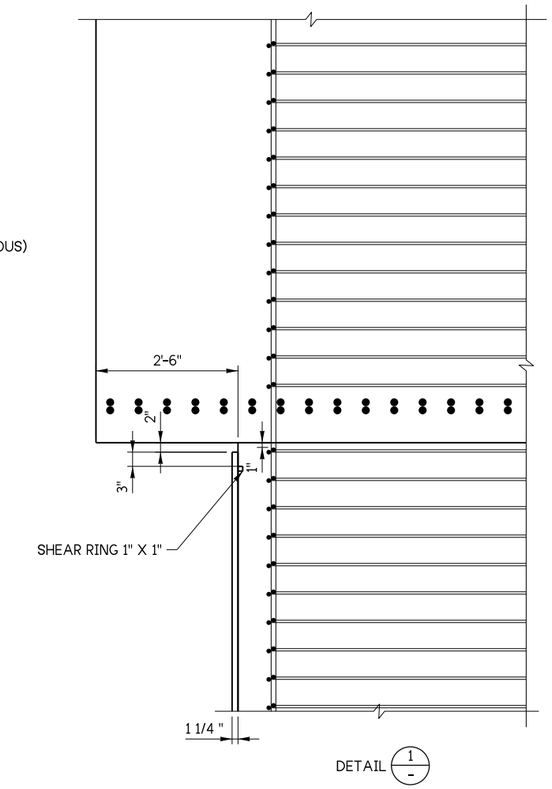
DRILLED SHAFT ELEVATION



SECTION A



SECTION B



DETAIL 1

DRILLED SHAFT INFORMATION						
PIER NUMBER	FOOTING QTY	SHAFTS PER FOOTING	SHAFT DIA (FT)	BOTTOM OF FOOTING ELEV	SHAFT TIP ELEV	SHAFT LENGTH (FT)
PIER 1	2	6	10	3.20	-227	230.2
PIER 2	2	6	10	3.20	-240	243.2
PIER 3	2	6	10	3.20	-246	249.2
PIER 4	2	6	10	3.20	-240	243.2
PIER 5	2	6	10	3.20	-222	225.2
PIER 6	2	6	10	3.20	-143	146.2
PIER 7	2	6	10	3.20	-144	147.2
PIER 8	2	6	10	3.20	-125	128.2

0 50 100
SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000601.dgn			
TIME	4:33:43 AM			
DATE	9/25/2024			
PLOTTED BY	wsppw14ics01$	PRELIMINARY		
DESIGNED BY		NOT FOR CONSTRUCTION		
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO. 10 | STATE WASH | JOB NUMBER | CONTRACT NO.

FED. AID PROJ. NO. | LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

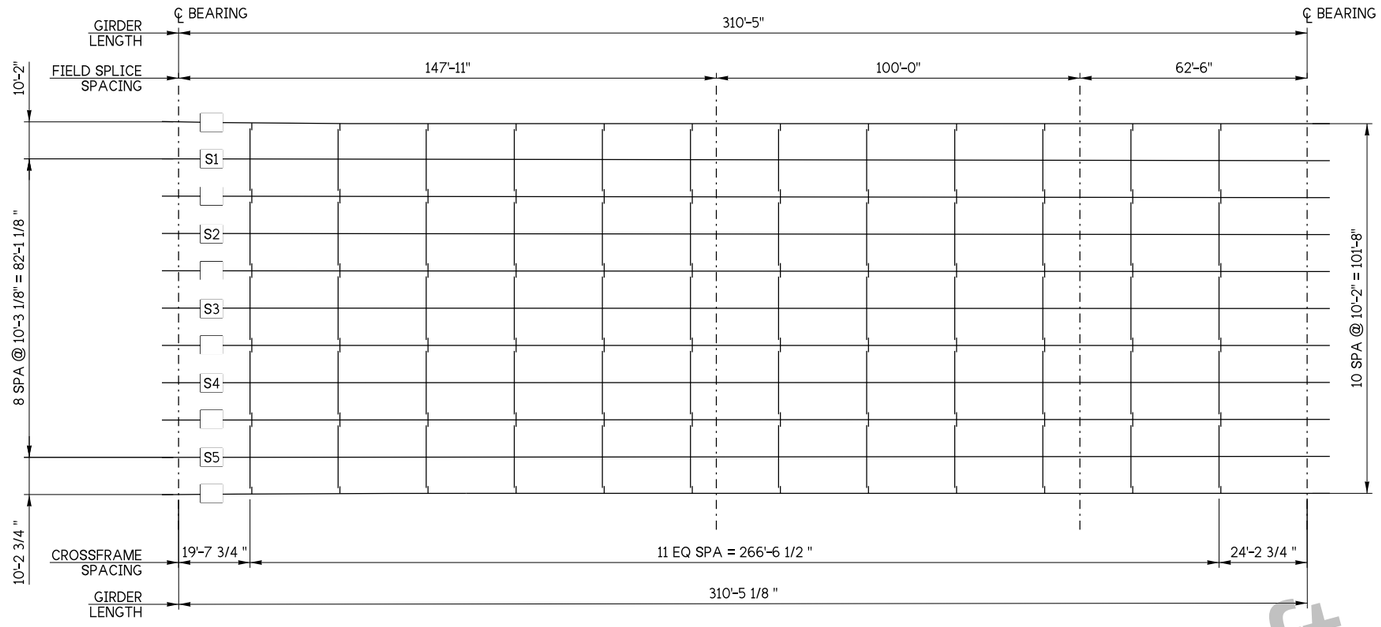
P.E. STAMP BOX DATE

SECTIONS

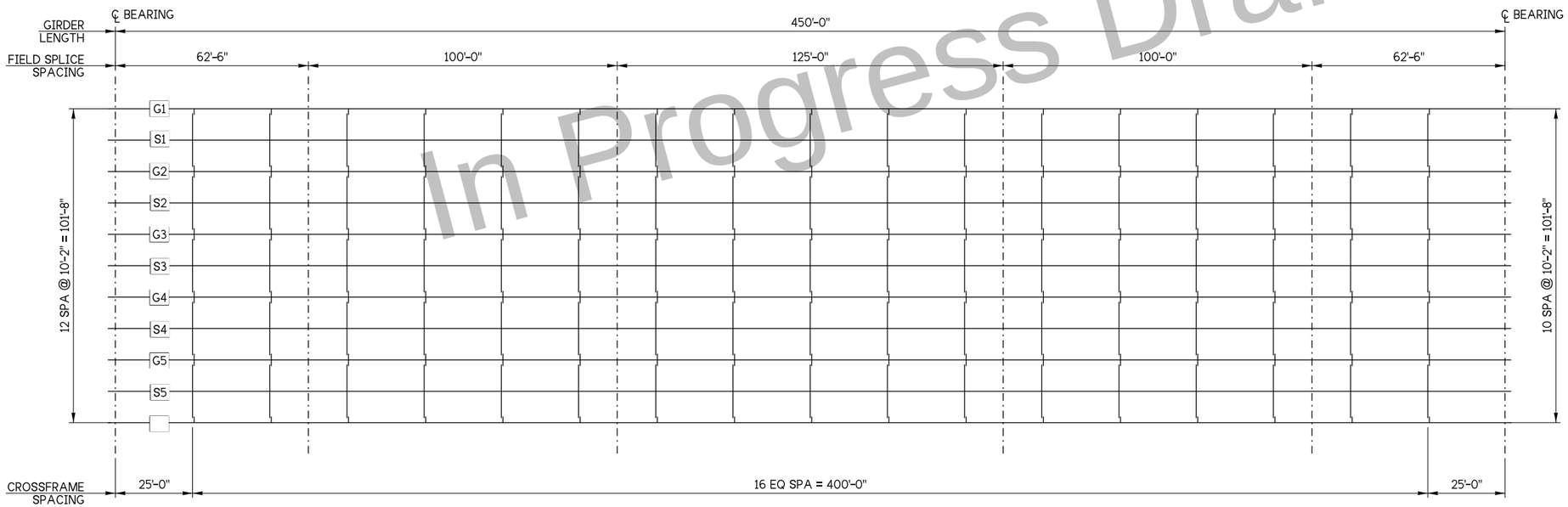
PLAN REF NO BR-002

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000601.dgn



SOUTHBOUND SPAN 1



SOUTHBOUND SPANS 2-4

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000701.dgn			
TIME	8:32:12 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics02$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

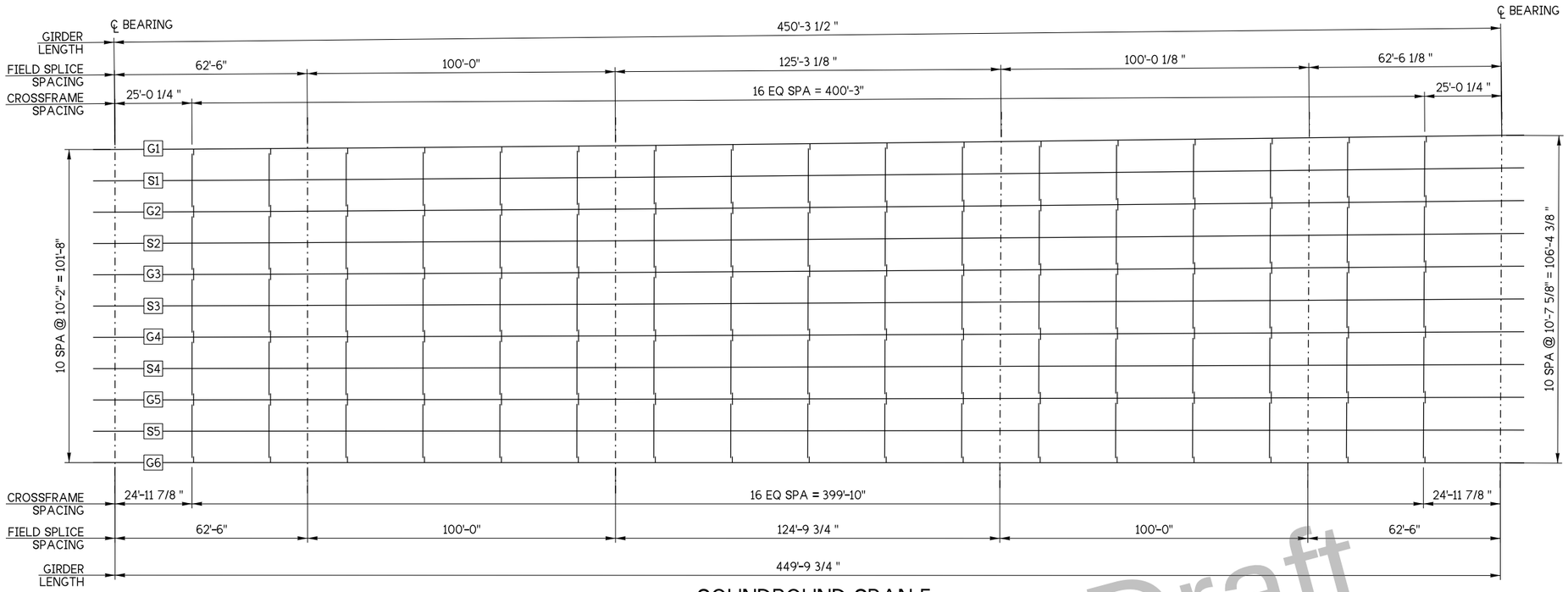
DATE
P.E. STAMP BOX

DATE
P.E. STAMP BOX

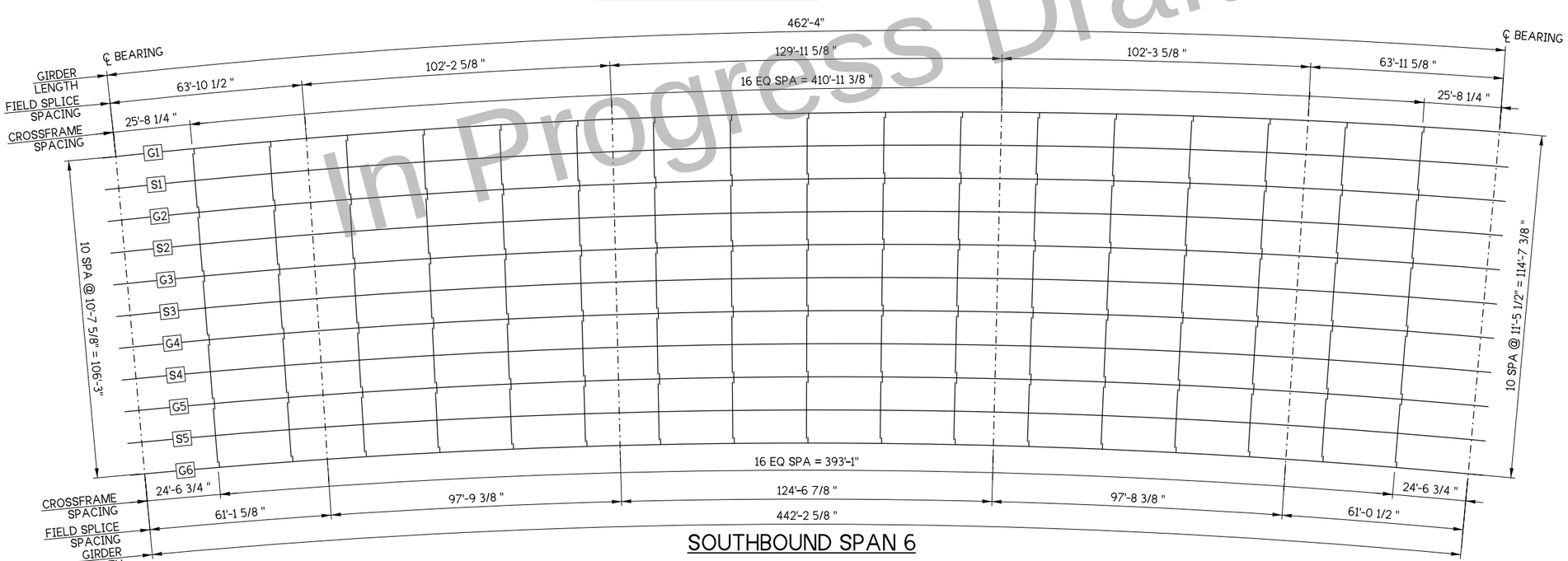
PLAN REF NO
BR-002

SHEET
OF
SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000701.dgn



SOUTHBOUND SPAN 5



SOUTHBOUND SPAN 6

In Progress Draft

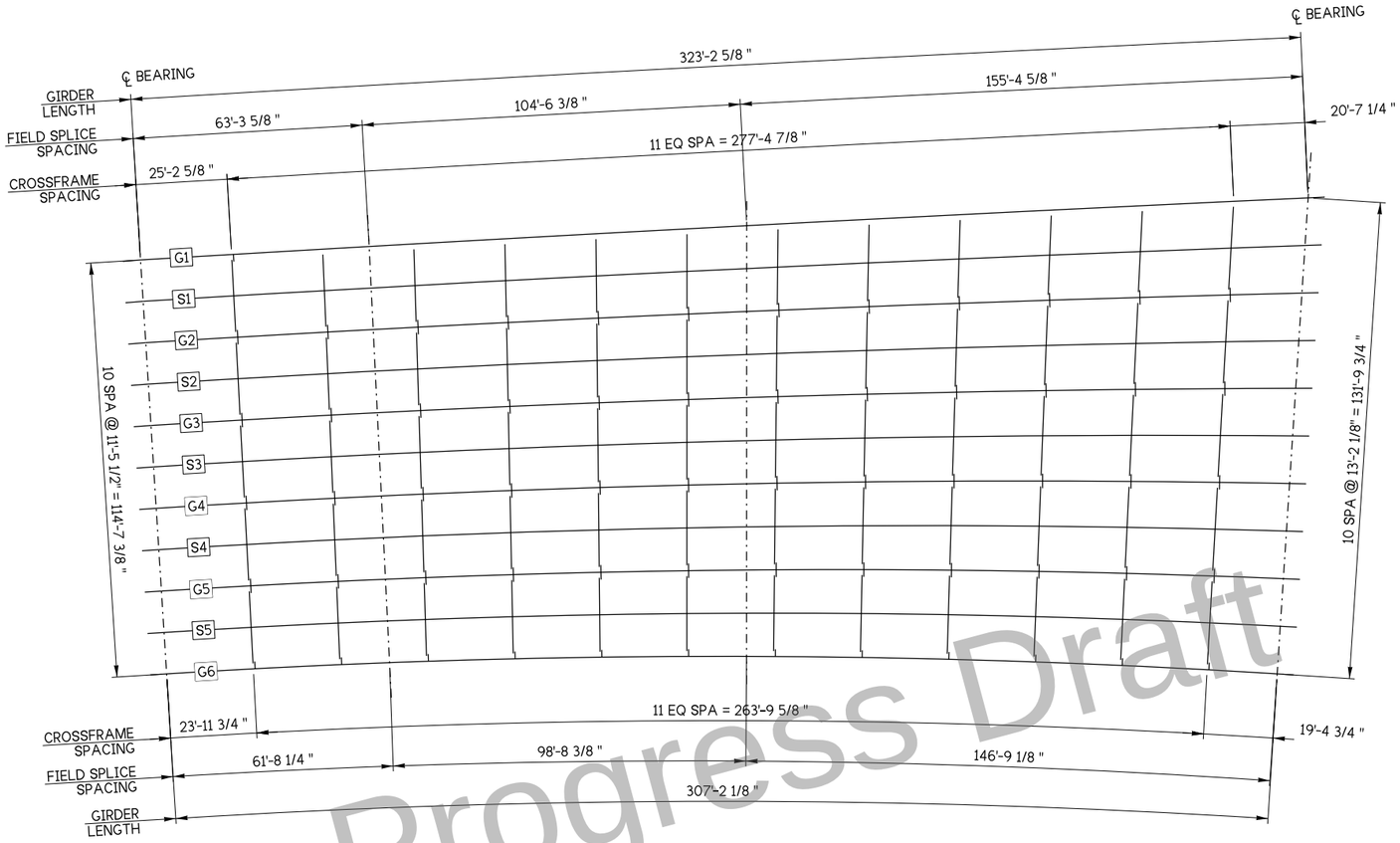
FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000702.dgn			REGION NO. 10	STATE WASH	FED. AID PROJ. NO.	PLAN REF NO BR-002
TIME	8:31:47 PM						
DATE	9/26/2024						
PLOTTED BY	wsppw14ics01$	PRELIMINARY NOT FOR CONSTRUCTION		JOB NUMBER			SHEET OF SHEETS
DESIGNED BY							
ENTERED BY							
CHECKED BY				CONTRACT NO.		LOCATION NO.	
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE BY				

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000702.dgn



SOUTHBOUND SPAN 7

In Progress Draft

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000703.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000703.dgn			
TIME	8:32:27 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics02$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

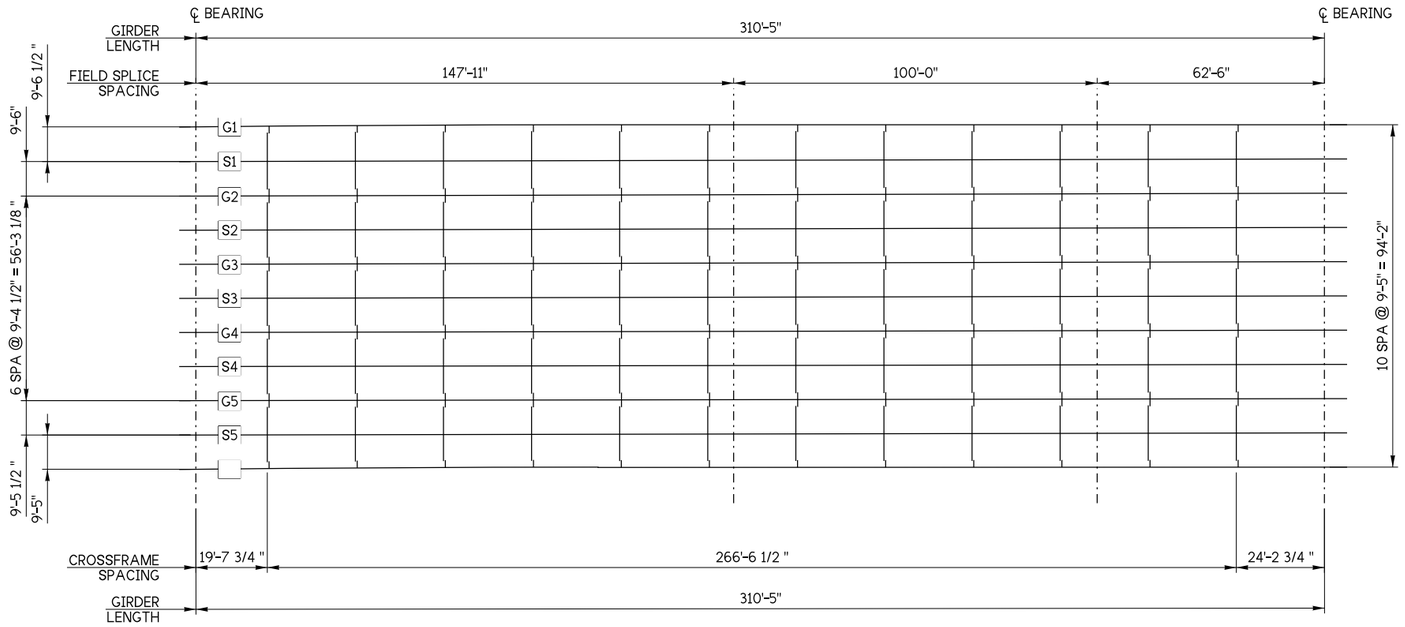
PLAN REF NO

BR-002

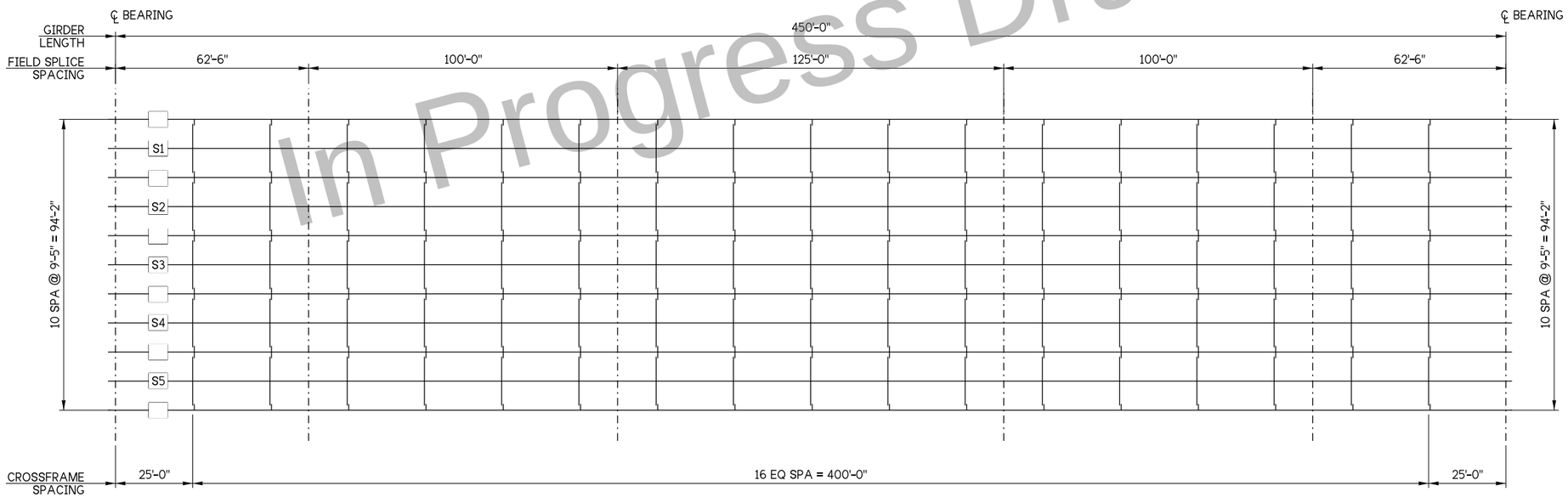
SHEET

OF

SHEETS



NORTHBOUND SPAN 1



NORTHBOUND SPANS 2-4

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000704.dgn			
TIME	8:32:11 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics05$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

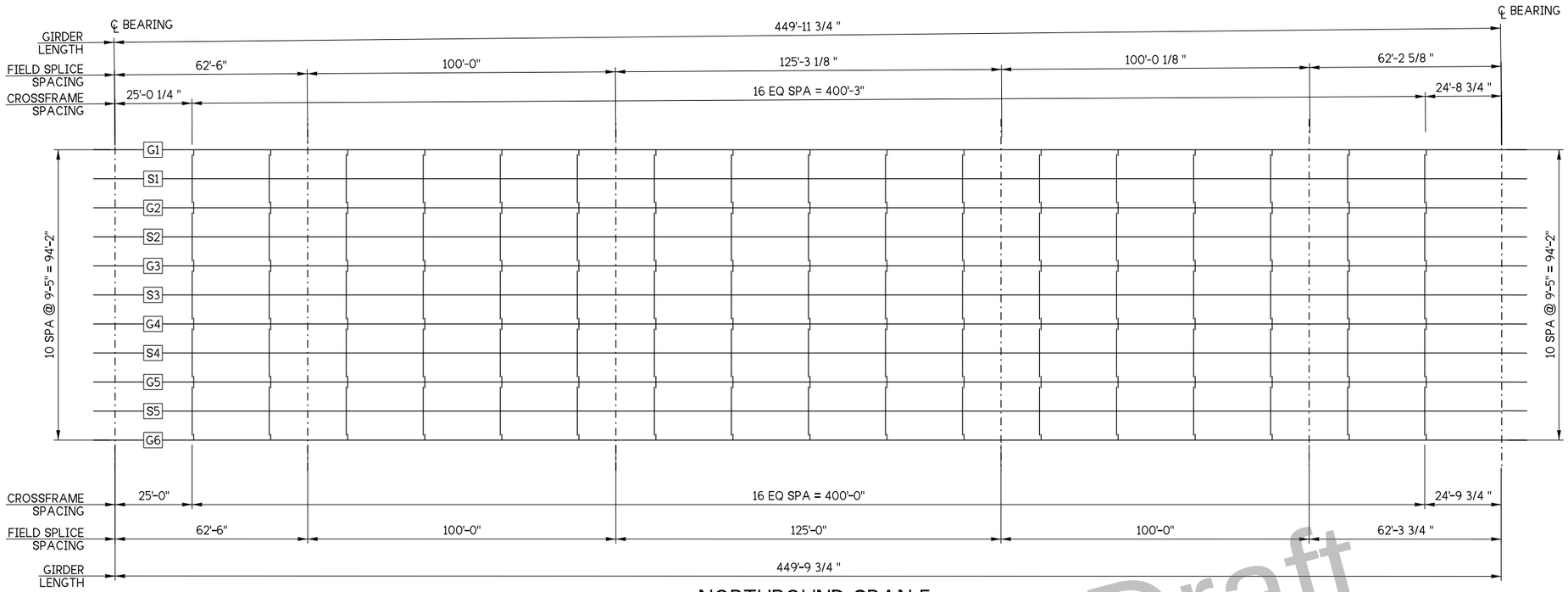
P.E. STAMP BOX DATE

PLAN REF NO

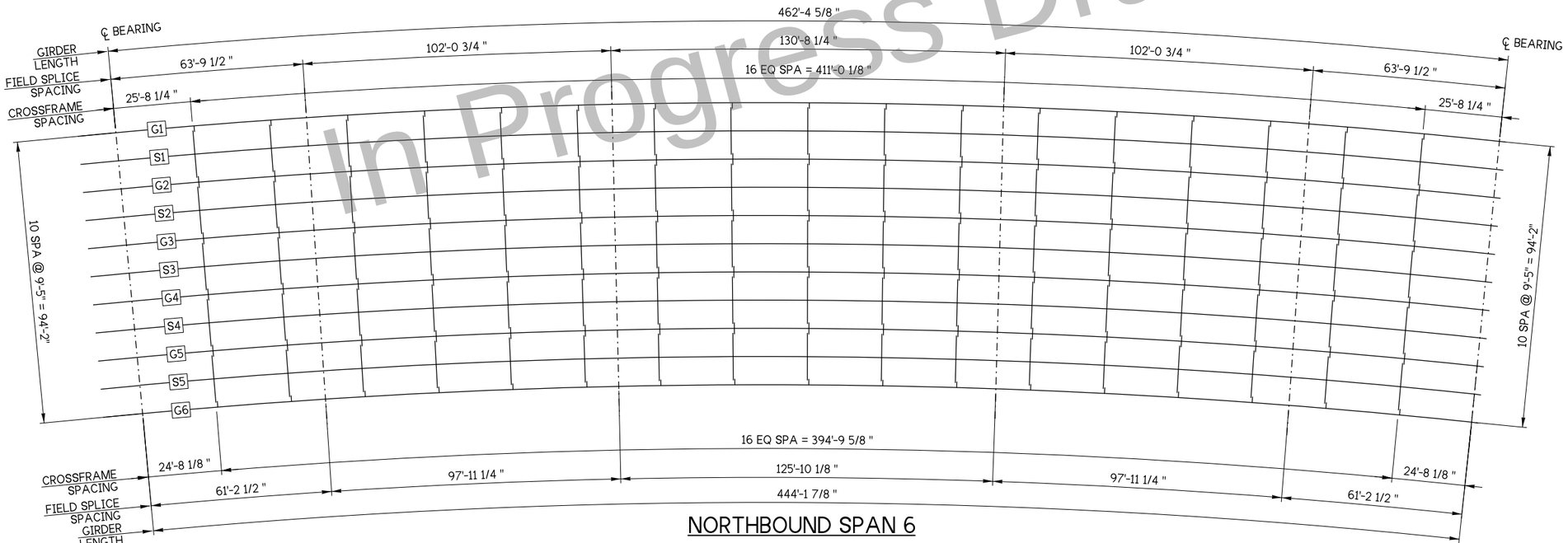
BR-002

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000704.dgn



NORTHBOUND SPAN 5



NORTHBOUND SPAN 6

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000705.dgn			
TIME	8:32:08 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics05$	PRELIMINARY		
DESIGNED BY		NOT FOR CONSTRUCTION		
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

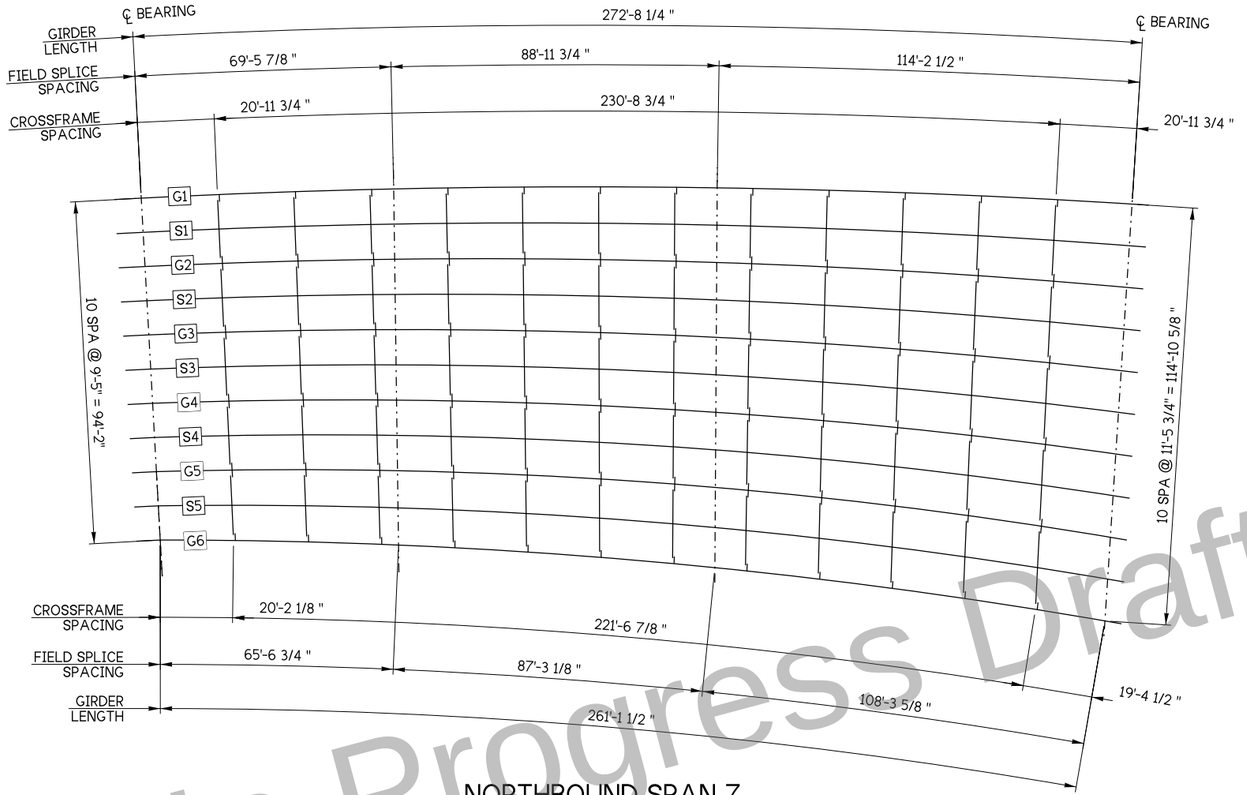
Interstate BRIDGE Replacement Program

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

PLAN REF NO
BR-002
SHEET
OF
SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000705.dgn



NORTHBOUND SPAN 7

In Progress Draft

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000706.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000706.dgn			
TIME	8:32:13 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics02$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

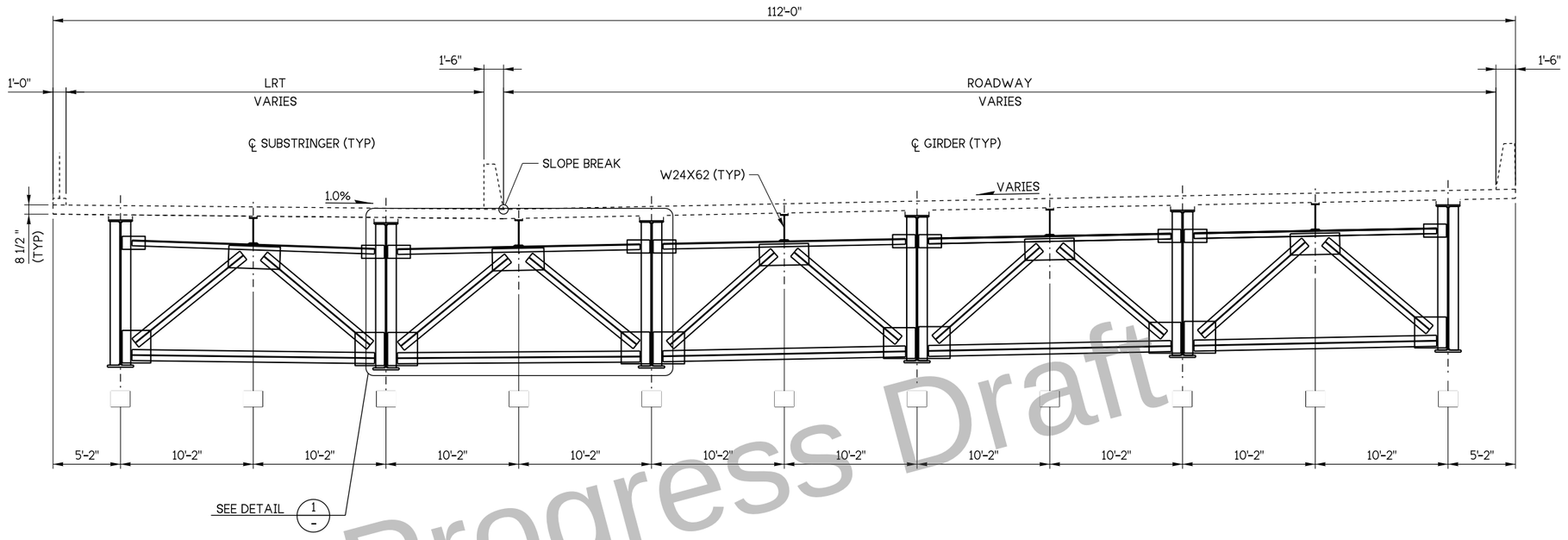
REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

PLAN REF NO
BR-002
SHEET
OF
SHEETS



SOUTHBOUND SUPERSTRUCTURE SECTION

STA XXX+XX.XX TO STA XXX+XX.XX

In Progress Draft

0 50 100
SCALE IN FEET

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000801.dgn
TIME	8:32:05 PM
DATE	9/26/2024
PLOTTED BY	wsppw14ics05$
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION	DATE	BY

REGION NO. 10 | STATE WASH
JOB NUMBER
CONTRACT NO.
FED. AID PROJ. NO.
LOCATION NO.

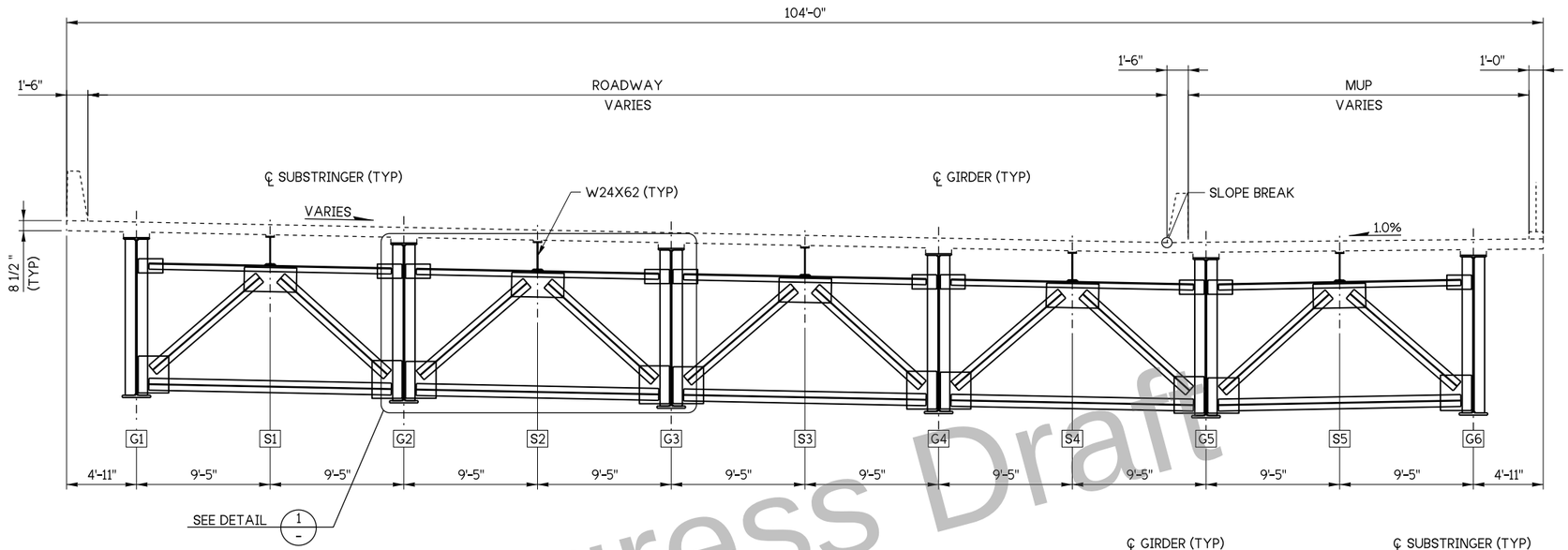
Interstate BRIDGE Replacement Program

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

SUPERSTRUCTURE SECTION 1 OF 2

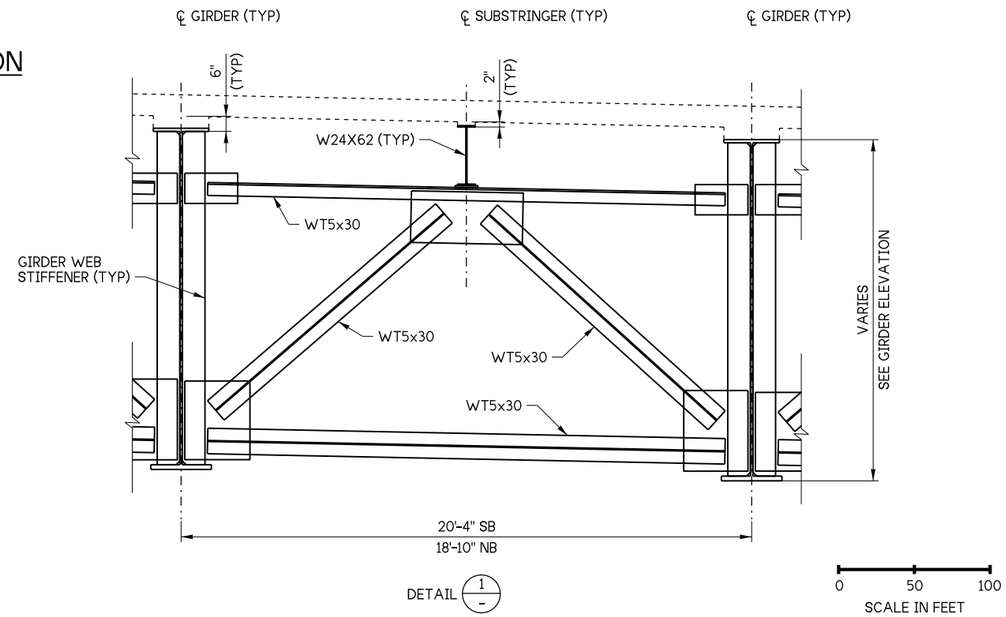
PLAN REF NO BR-002
SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000801.dgn



NORTHBOUND SUPERSTRUCTURE SECTION

STA XXX+XX.XX TO STA XXX+XX.XX



0 50 100
SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000802.dgn			
TIME	8:32:25 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics05$	PRELIMINARY		
DESIGNED BY		NOT FOR CONSTRUCTION		
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE
10	WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

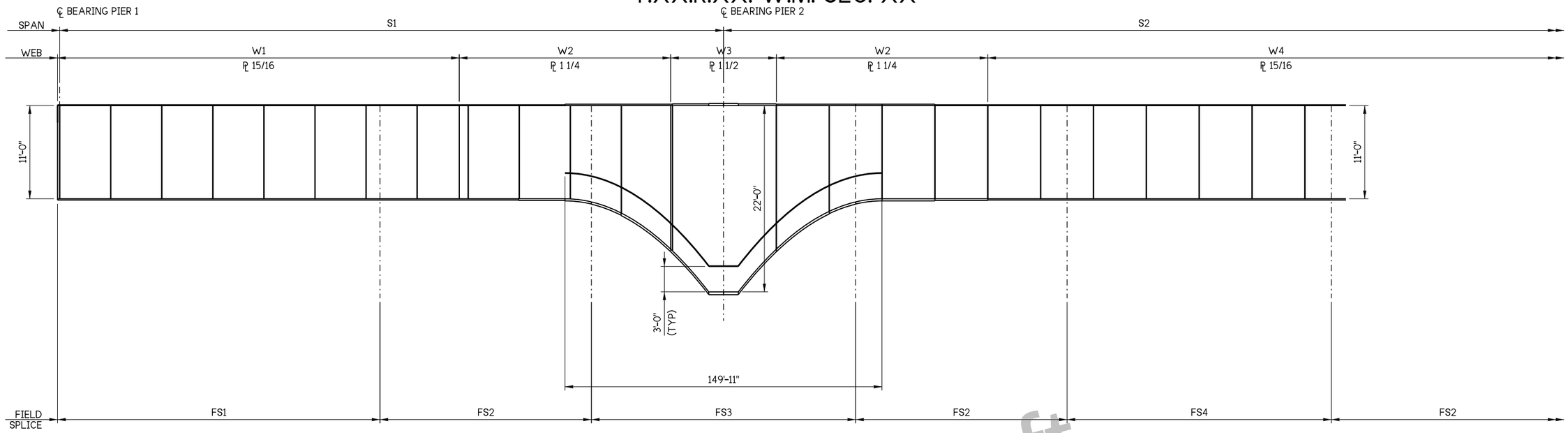
PLAN REF NO
BR-002

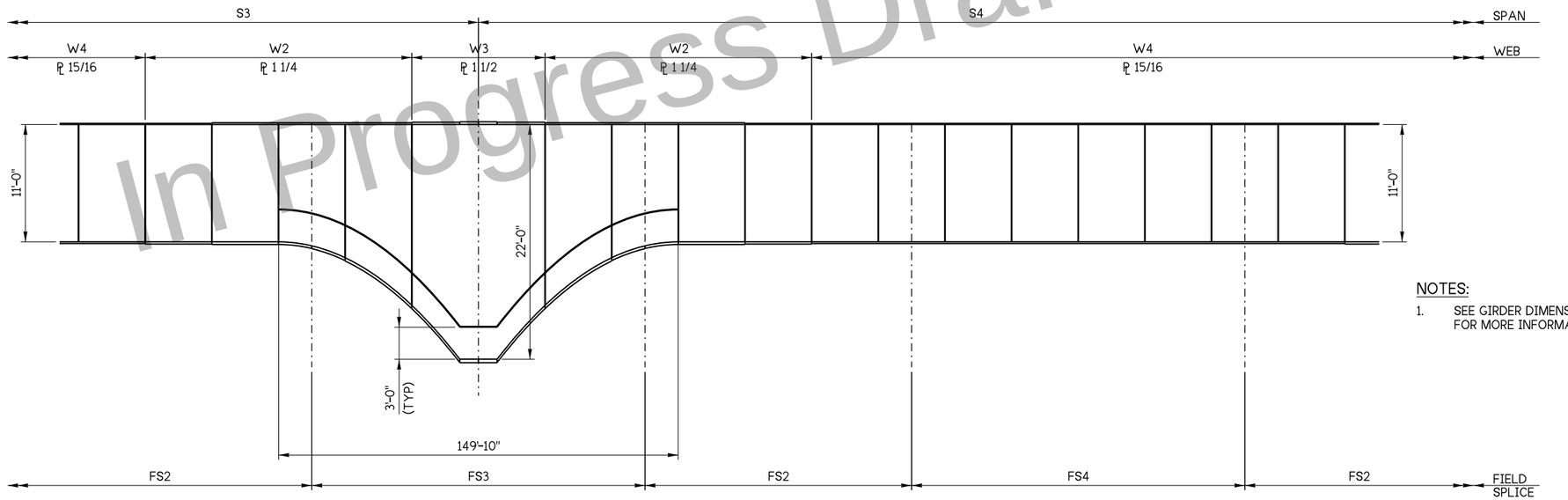
SUPERSTRUCTURE SECTION 2 OF 2

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000802.dgn

T.XX.R.XX. W.M. SEC. XX





NOTES:

1. SEE GIRDER DIMENSION TABLE FOR MORE INFORMATION

GIRDER ELEVATION

STA XXX+XX.XX TO STA XXX+XX.XX

0 50 100

SCALE IN FEET

In Progress Draft

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000901.dgn			
TIME	8:58:17 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics01$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.	REVISION	DATE	BY	

REGION NO. 10 | STATE WASH | JOB NUMBER | CONTRACT NO.

FED. AID PROJ. NO. | LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

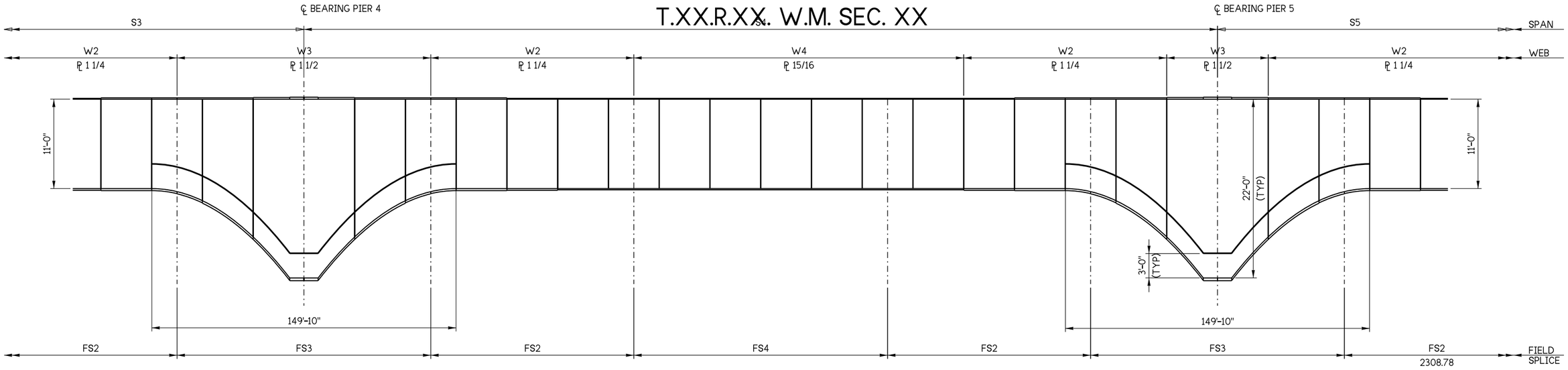
PLAN REF NO BR-002

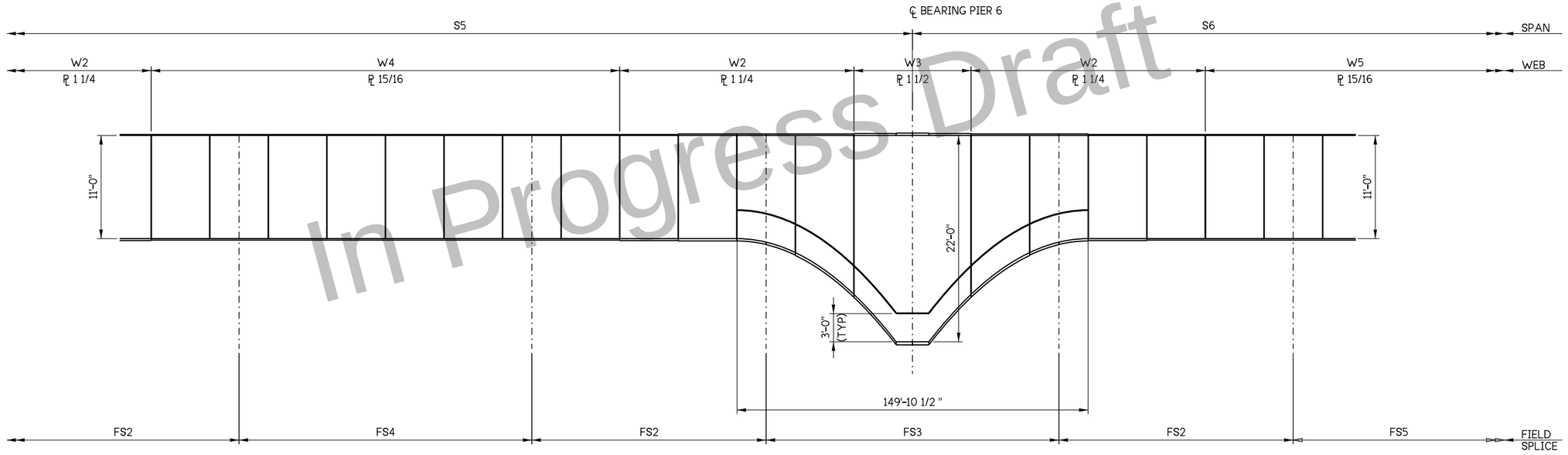
SUPERSTRUCTURE SECTION 1 OF 2

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000901.dgn

T.XX.R.XX. W.M. SEC. XX





In Progress Draft

GIRDER ELEVATION

STA XXX+XX.XX TO STA XXX+XX.XX

NOTES:

1. SEE GIRDER DIMENSION TABLE FOR MORE INFORMATION

0 50 100

SCALE IN FEET

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000902.dgn
TIME	8:58:49 PM
DATE	9/26/2024
PLOTTED BY	wsppw14ics01$
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

REVISION | DATE | BY

REGION NO. 10 | STATE WASH

JOB NUMBER

CONTRACT NO.

FED. AID PROJ. NO.

LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

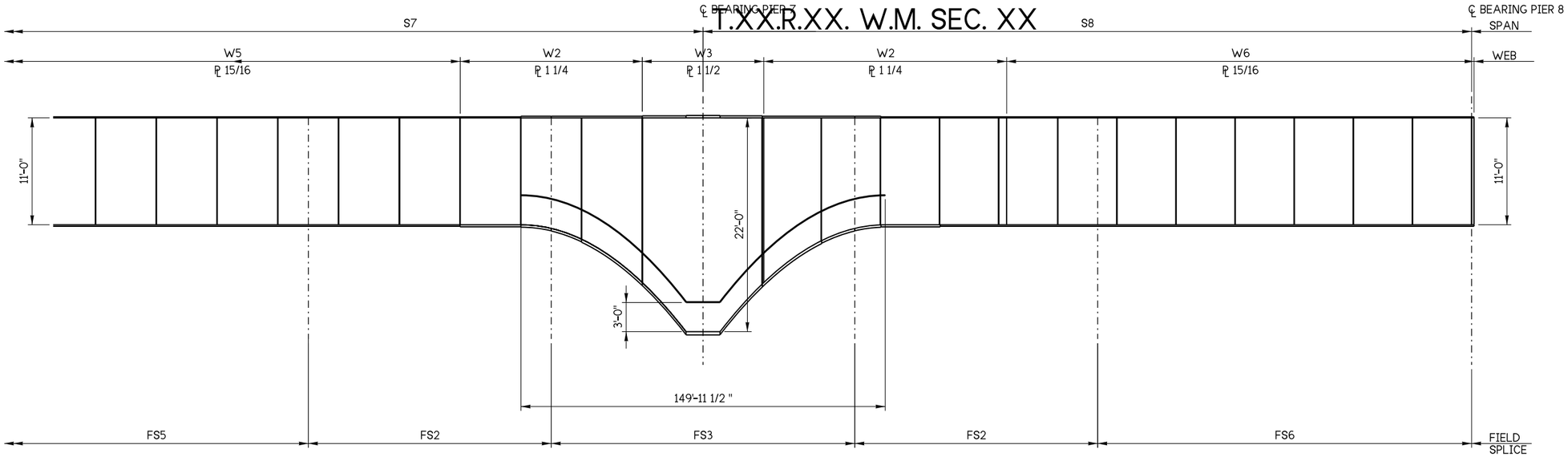
PLAN REF NO BR-002

SUPERSTRUCTURE SECTION 1 OF 2

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000902.dgn

T.XX.R.XX. W.M. SEC. XX



GIRDER ELEVATION

STA XXX+XX.XX TO STA XXX+XX.XX

In Progress Draft

NOTES:

1. SEE GIRDER DIMENSION TABLE FOR MORE INFORMATION

0 50 100

SCALE IN FEET

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000903.dgn

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000903.dgn			
TIME	8:58:19 PM			
DATE	9/26/2024			
PLOTTED BY	wsppw14ics01$			
DESIGNED BY				
ENTERED BY				
CHECKED BY				
PROJ. ENGR.				
REGIONAL ADM.		REVISION	DATE	BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

SUPERSTRUCTURE SECTION 1 OF 2

PLAN REF NO BR-002

SHEET OF SHEETS

T.XX.R.XX. W.M. SEC. XX

GIRDER DIMENSIONS - NORTHBOUND						
	G1	G2	G3	G4	G5	G6
S1	310'-5"	310'-5"	310'-5"	310'-5"	310'-5"	310'-5"
S2	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S3	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S4	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S5	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S6	462'-4 9/16"	458'-8 13/16"	455'-1 1/16"	451'-5 5/16"	447'-9 5/8"	444'-1 7/8"
S7	272'-8 3/16"	270'-3 3/16"	267'-10 15/16"	265'-7 5/8"	263'-5 1/8"	261'-1 7/16"
FS1	147'-11"	147'-11"	147'-11"	147'-11"	147'-11"	147'-11"
FS2	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"
FS3	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"
FS4	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"
FS5	137'-4 9/16"	133'-3 11/16"	130'-1 1/16"	126'-5 5/16"	122'-9 5/8"	119'-1 7/8"
FS6	110'-2 3/16"	157'-5 1/16"	105'-4 15/16"	103'-1 5/8"	100'-11 1/8"	98'-7 7/16"
W1	185'-5"	185'-5"	185'-5"	185'-5"	185'-5"	185'-5"
W2	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"
W3	50'-0"	50'-0"	50'-0"	50'-0"	50'-0"	50'-0"
W4	200'-0"	200'-0"	200'-0"	200'-0"	200'-0"	200'-0"
W5	212'-4 9/16"	208'-8 13/16"	205'-1 1/16"	201'-5 5/16"	197'-9 5/8"	194'-1 7/8"
W6	147'-8 3/16"	145'-3 3/16"	142'-10 15/16"	140'-7 5/8"	138'-5 1/8"	136'-1 7/16"

GIRDER DIMENSIONS - SOUTHBOUND						
	G1	G2	G3	G4	G5	G6
S1	310'-5"	310'-5"	310'-5"	310'-5"	310'-5"	310'-5"
S2	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S3	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S4	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S5	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"	450'-0"
S6	462'-3 15/16"	458'-3 11/16"	454'-3 3/8"	450'-3 1/8"	455'-7 3/16"	441'-7"
S7	323'-2 5/8"	319'-11 1/16"	316'-7 15/16"	313'-5 7/16"	310'-3 1/2"	307'-2 1/8"
FS1	147'-11"	147'-11"	147'-11"	147'-11"	147'-11"	147'-11"
FS2	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"
FS3	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"
FS4	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"	125'-0"
FS5	137'-3 15/16"	133'-3 11/16"	129'-3 3/8"	125'-3 1/8"	130'-7 3/16"	116'-7"
FS6	160'-8 5/8"	157'-5 1/16"	154'-1 15/16"	150'-11 7/16"	147'-9 1/2"	144'-8 1/8"
W1	185'-5"	185'-5"	185'-5"	185'-5"	185'-5"	185'-5"
W2	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"	100'-0"
W3	50'-0"	50'-0"	50'-0"	50'-0"	50'-0"	50'-0"
W4	200'-0"	200'-0"	200'-0"	200'-0"	200'-0"	200'-0"
W5	212'-3 15/16"	208'-3 11/16"	204'-3 3/8"	200'-3 1/8"	205'-7 3/16"	191'-7"
W6	198'-2 5/8"	194'-11 1/16"	191'-7 15/16"	188'-5 7/16"	185'-3 1/2"	182'-2 1/8"

In Progress Draft

0 50 100
SCALE IN FEET

FILE NAME	IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000904.dgn				REGION NO. 10	STATE WASH	FED. AID PROJ. NO.
TIME	8:59:00 PM				JOB NUMBER		
DATE	9/26/2024						
PLOTTED BY	wsppw14ics01$	PRELIMINARY					
DESIGNED BY		NOT FOR CONSTRUCTION					
ENTERED BY							
CHECKED BY					CONTRACT NO.		LOCATION NO.
PROJ. ENGR.							
REGIONAL ADM.		REVISION	DATE	BY			

Interstate BRIDGE Replacement Program

P.E. STAMP BOX DATE

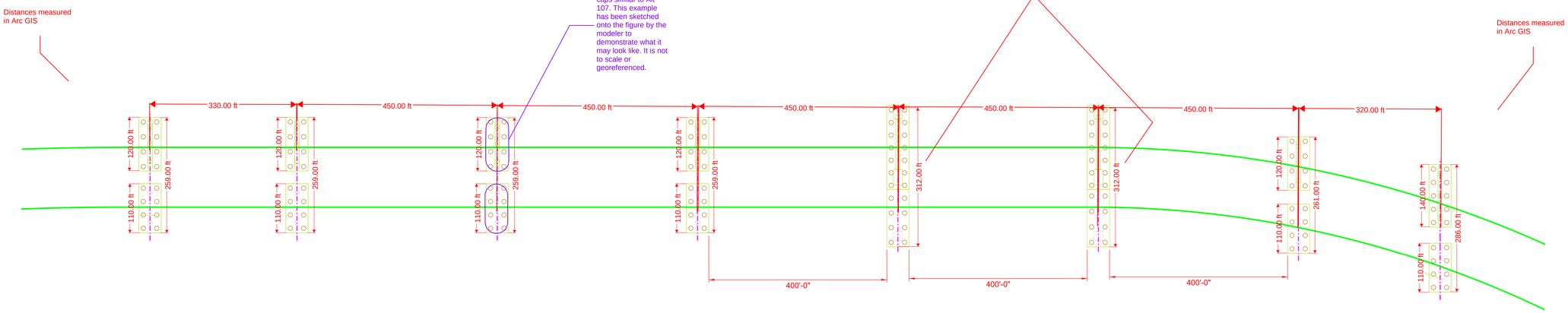
P.E. STAMP BOX DATE

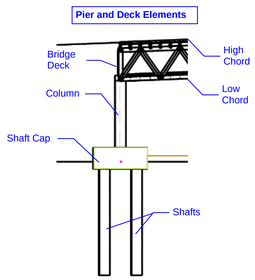
SUPERSTRUCTURE SECTION 1 OF 2

PLAN REF NO BR-002

SHEET OF SHEETS

...\IBR040-IBR-CR-BR-BRDG-LWK-B-DG-5000904.dgn





Conceptual
(Not for Construction)

PLAN

Direction of Flow
in the Columbia River Reach

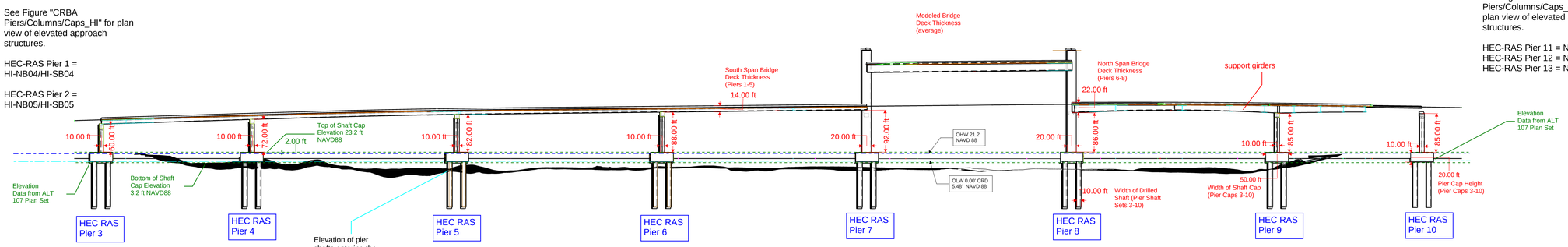
See Figure "CRBA Piers/Columns/Caps_HI" for plan view of elevated approach structures.

HEC-RAS Pier 1 = HI-NB04/HI-SB04

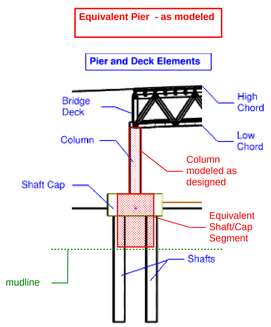
HEC-RAS Pier 2 = HI-NB05/HI-SB05

See Figure "CRBA Piers/Columns/Caps_WA" for plan view of elevated approach structures.

HEC-RAS Pier 11 = NB01/SB01
HEC-RAS Pier 12 = NB02/SB02
HEC-RAS Pier 13 = NB03/SB03



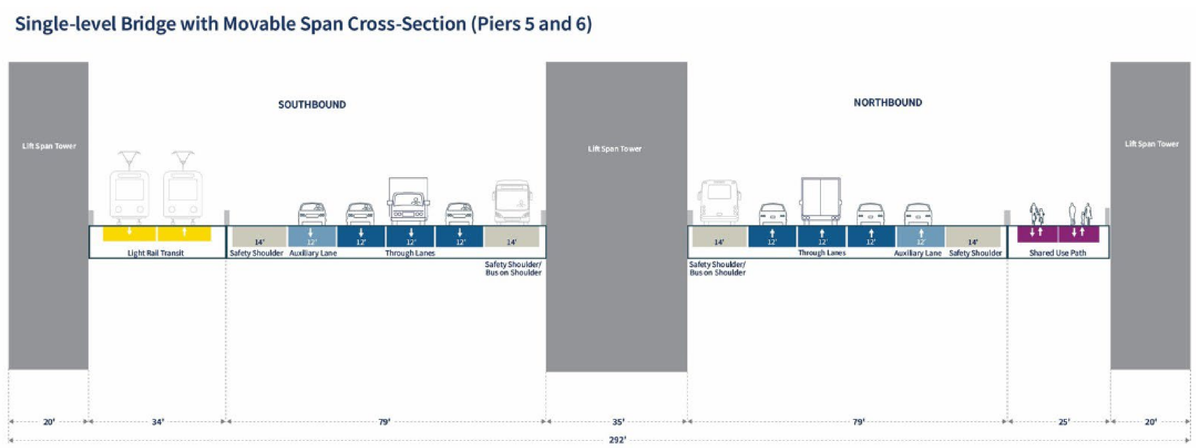
ELEVATION

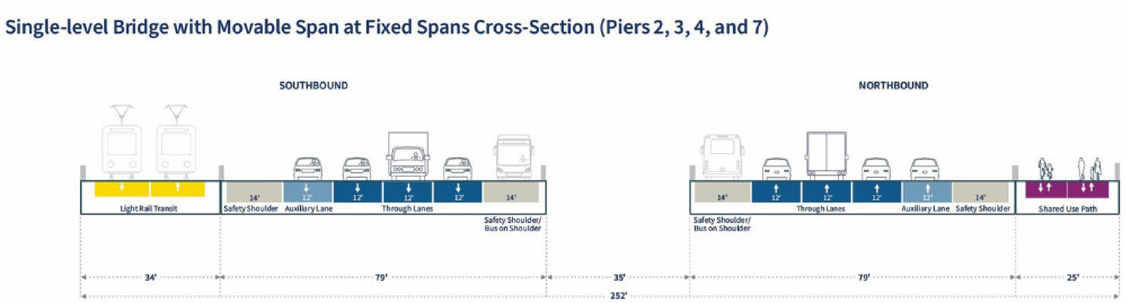


ALT 108 - MOVABLE BRIDGE

provided by project design on 09/01/2023

Figure 1-3. Columbia River Bridges Deck Cross Section – Single-Level Bridge with Movable-Span Option





Source:

Final Supplemental Environmental Impact Statement
Chapter 2 - Description of Alternatives.
Admin. DRAFT 1. May 2025
(Final Draft FSEIS projected publish date Nov. 2025)

Section

Alt 108 Movable Span Cap/Shafts

Alt 107 Fixed Span (Steel Girder) Cap/Shafts

HEC-RAS Modeled bridge deck (not to scale)

135.00 ft

120.00 ft

135.00 ft

135.00 ft

200.00 ft

HI-SB05

HI-NB05

HI-SB04

HI-NB04

HI-SB03

HI-NB03

HI-SB02

HI-NB02

HI-SB01

HI-NB01

ALTs 107/108 CR Bridge

Pier 1 =
HI-SB04/HI-NB04

Pier 2 =
HI-SB05/HI-NB05

Col-Hayden XS 4.38

HI-SB02-SB03 and HI-NB02-NB03 modeled as blocked obstructions.

HI-SB01-HI-NB01 represented as abutment (included in roadway surface).

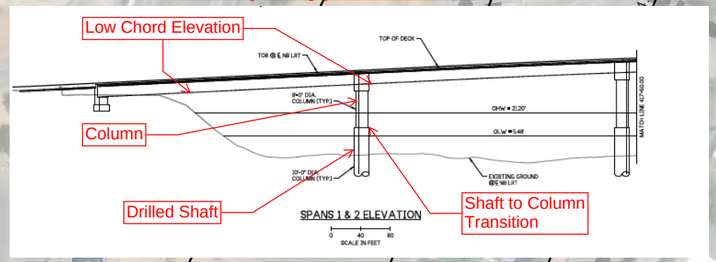
106.38 106.51 106.57 106.62 106.67 106.73 106.78 106.81 106.85 106.89 106.94

4.08 4.18 4.27 4.33 4.38 4.46 4.52

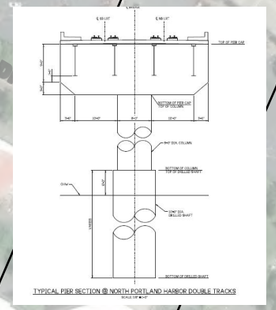
N Cutsforth Ave N Pavilion Ave N Hayden Island Dr N Tomahawk Island Dr N Center Ave

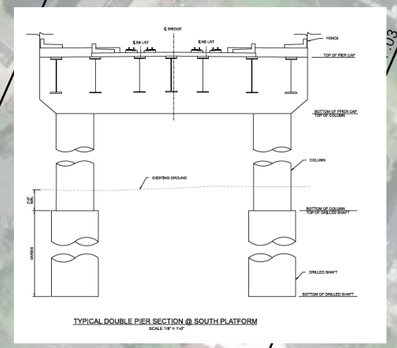
Jantzen Beach Center

Example Typical Elevation



Example Typical Sections





Hayden Island CRBA Columns, Piers, Caps

0 100 200 400 Feet

Hayden Island CRBA
Columns, Piers, Caps

0 100 200 400 Feet

Pier 9
CL station
2855

Pier 10

S06 and S07

S04
and
S05

LRT01
LRT02
S09
S10
S08
SB01
SB02
SB03
SB04
NB01
NB02
NB03
NB04
S07
S06
S05
S04
S03
S02
S01
R01
R02
R03
R04
R05

149.50 ft
149.50 ft
149.50 ft
149.50 ft
68.50 ft
755.00 ft
629.00 ft
527.00 ft
437.00 ft
375.00 ft
534.00 ft
508.00 ft
353.00 ft
389.00 ft
652.00 ft
106.57
106.62
106.67
106.72
106.78
106.81

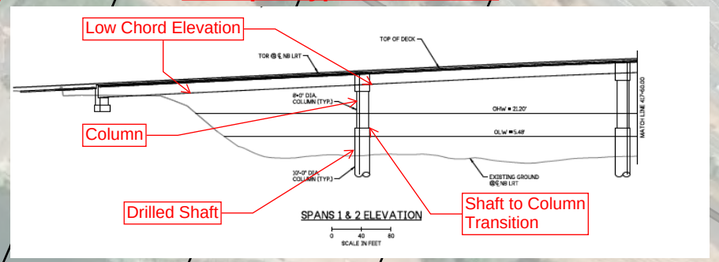
CR Bridges

Pier 11 - NB 01/SB01
Pier 12 - NB 02/SB02
Pier 13 - NB 03/SB03

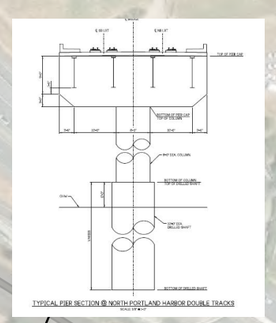
S P and S Railroad

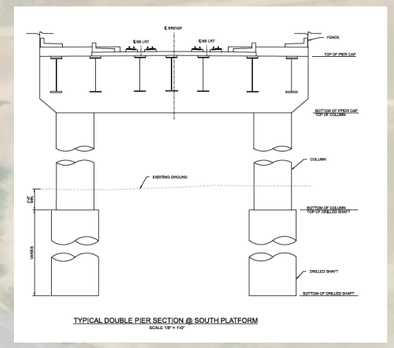
W 6th St
W 5th St
W 4th St
E 6th St
E 5th St
Vancouver City Hall
Hilton
Loowit Brewing Company
Couve Cycle
Smith Tower Apartments
The Evergreen Inn
Columbia Bank
Park 'n Go
Federal Highway Administration
Fort Vancouver Motor Repair
Alvord Rd
Adera
Webber Building
Pacific Energy Concepts
The Miller
Pearl Arnold Way
Cascade St
Columbia St
Washington St
W Columbia Way
AC Hotel Vancouver Waterfront
Clark Public Utilities
Village House 1
Village House 2

Example Typical Elevation



Example Typical Sections

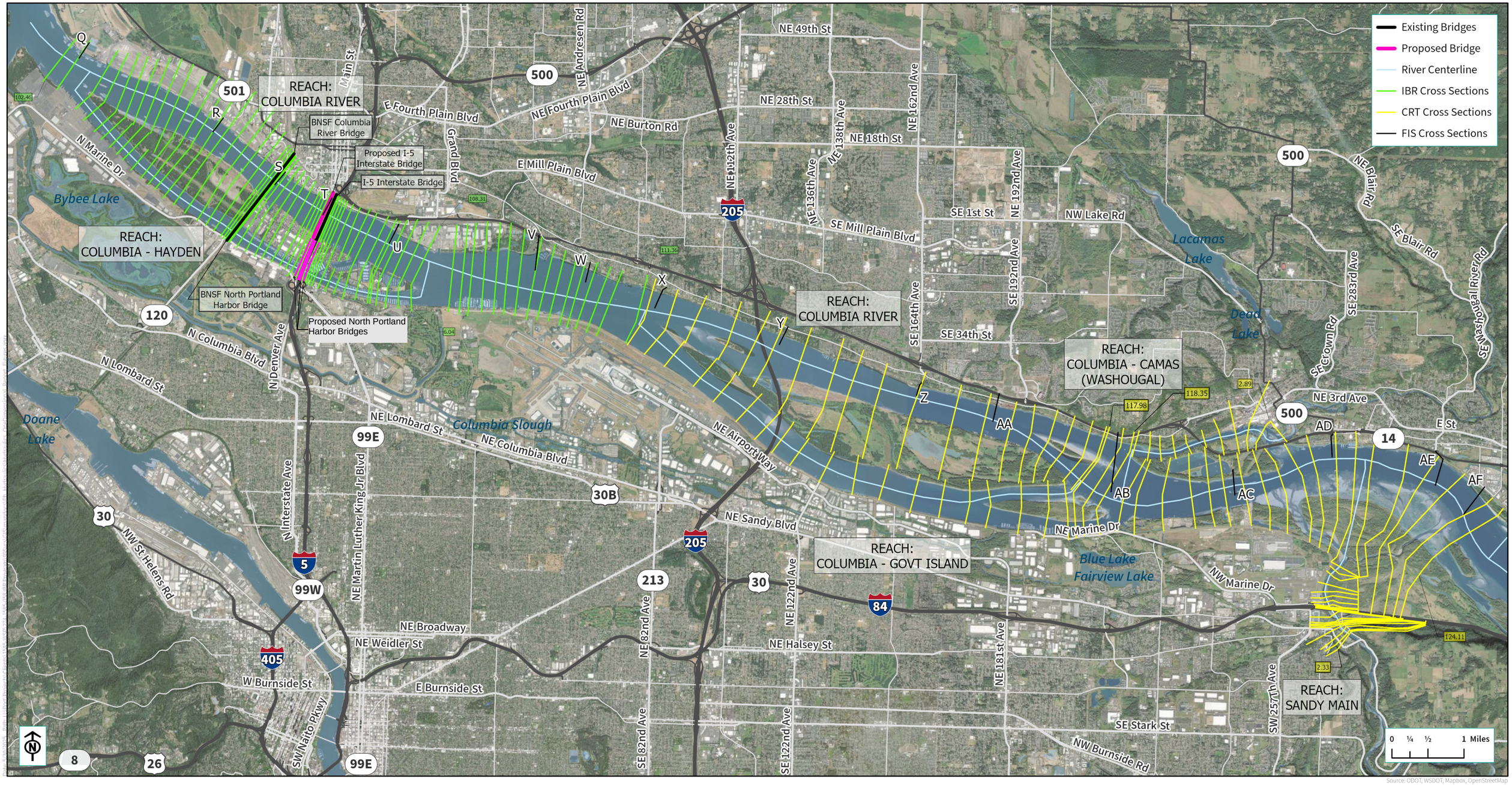




APPENDIX C: BRIDGE PLANS

Interstate BRIDGE Replacement Program

HEC-RAS Cross Sections and Model Features



Source: ODOT, WSDOT, Mapbox, OpenStreetMap

APPENDIX D: 1D HEC-RAS MODEL RESULTS

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Columbia	RM 102.5-108	106.81	FEMA 100-year	Existing_FEMA	31.75	31.561		0	0	2938.6	358.54	470947.8	603.12	3.51
Columbia	RM 102.5-108	106.81	2-year	Existing_WAR	18.21	18.118		0	0	2785.53	6.2	238321.6	39.27	2.46
Columbia	RM 102.5-108	106.81	2-year	Existing_SF	17.92	17.723		0.01	0	2783.88	7.01	340278.1	48.43	3.55
Columbia	RM 102.5-108	106.81	100-yr	Existing_WAR	32.84	32.662		0	0	3103.73	398.17	470470.3	340.14	3.43
Columbia	RM 102.5-108	106.81	100-yr	Existing_SF	28.11	27.752		0.01	0	2815.06	286.34	596033.4	558.36	4.82
Columbia	RM 102.5-108	106.78	FEMA 100-year	Existing_FEMA	31.75	31.56	-9.2	0	0	3100.22	608.08	469938.8	1362.53	3.49
Columbia	RM 102.5-108	106.78	2-year	Existing_WAR	18.21	18.116	-13.42	0	0	2794.63	61.65	238246.2	59.18	2.44
Columbia	RM 102.5-108	106.78	2-year	Existing_SF	17.91	17.72	-11.45	0	0	2793.9	79.13	340178.2	76.29	3.52
Columbia	RM 102.5-108	106.78	100-yr	Existing_WAR	32.84	32.661	-9.21	0	0	3113.49	648.6	468972.4	1587.62	3.4
Columbia	RM 102.5-108	106.78	100-yr	Existing_SF	28.1	27.749	-7.28	0.01	0	3040.38	584.15	595458.6	835.37	4.79
Columbia	RM 102.5-108	106.76 BR U	FEMA 100-year	Existing_FEMA	31.74	31.537	-8.72	0.01	0	2846.16	760.11	469579.7	1569.75	3.64
Columbia	RM 102.5-108	106.76 BR U	2-year	Existing_WAR	18.21	18.104	-13.01	0	0	2684.43	73.59	238222.8	70.65	2.55
Columbia	RM 102.5-108	106.76 BR U	2-year	Existing_SF	17.91	17.694	-11.03	0.01	0	2683.53	94.04	340148.9	90.59	3.69
Columbia	RM 102.5-108	106.76 BR U	100-yr	Existing_WAR	32.84	32.641	-8.73	0.01	0	2853.87	813.76	468592.3	1802.61	3.55
Columbia	RM 102.5-108	106.76 BR U	100-yr	Existing_SF	28.09	27.706	-6.77	0.01	0	2812.19	719.67	595097.1	1061.34	5.01
Columbia	RM 102.5-108	106.76 BR D	FEMA 100-year	Existing_FEMA	31.74	31.514	-9.6	0	0.01	2844.42	1999.39	469023.7	886.43	3.79
Columbia	RM 102.5-108	106.76 BR D	2-year	Existing_WAR	18.2	18.092	-14.11	0	0	2614.9	101	238225.3	40.69	2.65
Columbia	RM 102.5-108	106.76 BR D	2-year	Existing_SF	17.9	17.668	-12.01	0	0.01	2604.66	124.16	340158.7	50.71	3.83
Columbia	RM 102.5-108	106.76 BR D	100-yr	Existing_WAR	32.83	32.618	-9.61	0	0.01	2936.12	2129.42	468090.3	988.94	3.7
Columbia	RM 102.5-108	106.76 BR D	100-yr	Existing_SF	28.08	27.66	-7.54	0.01	0.01	2816.52	1684.35	594504.6	689.18	5.21
Columbia	RM 102.5-108	106.73	FEMA 100-year	Existing_FEMA	31.73	31.525		0.01	0	2952.25	1578.52	469610.6	720.37	3.61
Columbia	RM 102.5-108	106.73	2-year	Existing_WAR	18.2	18.097		0.01	0	2725.2	83.39	238250	33.59	2.52
Columbia	RM 102.5-108	106.73	2-year	Existing_SF	17.88	17.678		0.02	0	2715.23	102.88	340188.7	42.01	3.64
Columbia	RM 102.5-108	106.73	100-yr	Existing_WAR	32.82	32.628		0.01	0	3051.26	1675.05	468727.7	805.9	3.53
Columbia	RM 102.5-108	106.73	100-yr	Existing_SF	28.06	27.68		0.03	0	2928.46	1348.15	594975.8	554.25	4.97
Columbia	RM 102.5-108	106.67	FEMA 100-year	Existing_FEMA	31.71	31.507		0.01	0	2627.17	207.43	471668	34.01	3.64
Columbia	RM 102.5-108	106.67	2-year	Existing_WAR	18.18	18.088		0.01	0	2573.12	5.88	238360.1	1	2.5
Columbia	RM 102.5-108	106.67	2-year	Existing_SF	17.86	17.659		0.02	0	2571.77	6.48	340325.9	1.19	3.61
Columbia	RM 102.5-108	106.67	100-yr	Existing_WAR	32.81	32.611		0.01	0	2672.81	235.21	470935.6	37.86	3.55
Columbia	RM 102.5-108	106.67	100-yr	Existing_SF	28.03	27.647		0.02	0	2609.38	166.74	596685.9	25.55	4.98
Columbia	RM 102.5-108	105.91	FEMA 100-year	Existing_FEMA	31.55	31.322		0	0	2750.34	995.2	470514	400.23	3.82
Columbia	RM 102.5-108	105.91	2-year	Existing_WAR	18.08	17.975		0	0	2325.01	68.21	238268.3	30.52	2.56
Columbia	RM 102.5-108	105.91	2-year	Existing_SF	17.63	17.419		0	0	2320.99	79.2	340217.8	36.55	3.7
Columbia	RM 102.5-108	105.91	100-yr	Existing_WAR	32.65	32.438		0	0	2926.77	1073.95	469725.2	409.47	3.73
Columbia	RM 102.5-108	105.91	100-yr	Existing_SF	27.69	27.271		0	0	2549.53	887.71	595616.8	373.7	5.22
Columbia	RM 102.5-108	105.9	FEMA 100-year	Existing_FEMA	31.54	31.321	-15.36			2722.47	1434.89	470197.9	276.69	3.8
Columbia	RM 102.5-108	105.9	2-year	Existing_WAR	18.07	17.975	-20.7			2286.98	118.47	238227	21.52	2.54

Columbia	RM 102.5-108	105.9	2-year	Existing_SF	17.63	17.419	-18.11			2283.73	142.16	340165.3	26.09	3.67
Columbia	RM 102.5-108	105.9	100-yr	Existing_WAR	32.65	32.437	-15.38			2956.11	1542.25	469393	273.4	3.72
Columbia	RM 102.5-108	105.9	100-yr	Existing_SF	27.69	27.27	-13.01			2590.92	1306.95	595329.8	241.43	5.19
Columbia	RM 102.5-108	105.88 BR U	FEMA 100-year	Existing_FEMA	31.57	31.313	-14.52			2549.95	1091.58	470436.4	381.43	4.07
Columbia	RM 102.5-108	105.88 BR U	2-year	Existing_WAR	18.09	17.972	-20.17			2147.58	124.07	238215.1	27.88	2.72
Columbia	RM 102.5-108	105.88 BR U	2-year	Existing_SF	17.65	17.411	-17.43			2143.9	155.07	340144.8	33.68	3.94
Columbia	RM 102.5-108	105.88 BR U	100-yr	Existing_WAR	32.67	32.429	-14.53			2564.84	1160.83	469631.3	416.53	3.98
Columbia	RM 102.5-108	105.88 BR U	100-yr	Existing_SF	27.73	27.254	-12.15			2445.47	1038.9	595515.6	323.6	5.56
Columbia	RM 102.5-108	105.88 BR D	FEMA 100-year	Existing_FEMA	31.54	31.313	-19.74			2474.46	514.93	471381.1	13.48	3.81
Columbia	RM 102.5-108	105.88 BR D	2-year	Existing_WAR	18.07	17.972	-25.7			2155.87	22.3	238343.7	1.01	2.5
Columbia	RM 102.5-108	105.88 BR D	2-year	Existing_SF	17.62	17.411	-22.94			2155.52	22.4	340310	1.17	3.62
Columbia	RM 102.5-108	105.88 BR D	100-yr	Existing_WAR	32.65	32.429	-19.76			2559.62	561.91	470632.3	14.48	3.73
Columbia	RM 102.5-108	105.88 BR D	100-yr	Existing_SF	27.67	27.254	-17.19			2339.14	442.45	596423.3	12.34	5.19
Columbia	RM 102.5-108	105.85	FEMA 100-year	Existing_FEMA	31.51	31.313		0	0	3940.2	629.85	471203.7	75.92	3.56
Columbia	RM 102.5-108	105.85	2-year	Existing_WAR	18.06	17.972		0	0	2296.03	16.67	238348.5	1.82	2.33
Columbia	RM 102.5-108	105.85	2-year	Existing_SF	17.59	17.411		0	0	2292.19	15.56	340316.1	1.91	3.37
Columbia	RM 102.5-108	105.85	100-yr	Existing_WAR	32.62	32.429		0	0	4202.77	695.12	470430.1	83.41	3.48
Columbia	RM 102.5-108	105.85	100-yr	Existing_SF	27.62	27.254		0	0	2801.74	511.72	596306.4	60.03	4.84
Columbia	RM 102.5-108	105.84	FEMA 100-year	Existing_FEMA	31.51	31.311		0	0	3867.84	809.53	470306.3	793.66	3.57
Columbia	RM 102.5-108	105.84	2-year	Existing_WAR	18.06	17.97		0	0	2295.87	44.62	238228	94.45	2.34
Columbia	RM 102.5-108	105.84	2-year	Existing_SF	17.59	17.409		0.01	0	2291.64	50.7	340158.3	124.55	3.38
Columbia	RM 102.5-108	105.84	100-yr	Existing_WAR	32.62	32.427		0	0	3951.09	878.26	469478.1	852.3	3.5
Columbia	RM 102.5-108	105.84	100-yr	Existing_SF	27.61	27.249		0.01	0	3156.19	709.28	595441.9	726.92	4.85
Col-Hayden	RM 106 Left	4.52	FEMA 100-year	Existing_FEMA	31.56	31.488	-0.8	0.01	0	1261.59	201.21	92846.65	42.68	2.2
Col-Hayden	RM 106 Left	4.52	2-year	Existing_WAR	18.1	18.067	-5.2	0	0	1127.19	5.62	39626.76	0.62	1.46
Col-Hayden	RM 106 Left	4.52	2-year	Existing_SF	17.69	17.621	-3.77	0.01	0	1126.24	6.51	56659.27	0.64	2.13
Col-Hayden	RM 106 Left	4.52	100-yr	Existing_WAR	32.67	32.6	-0.72	0.01	0	1292.4	249.58	94493.39	48.42	2.18
Col-Hayden	RM 106 Left	4.52	100-yr	Existing_SF	27.74	27.602	0.12	0.01	0	1158.69	149.03	113939.3	33.57	3.02
Col-Hayden	RM 106 Left	4.46	FEMA 100-year	Existing_FEMA	31.56	31.466	-2.71	0	0	1232.37	115.58	92851.99	122.97	2.41
Col-Hayden	RM 106 Left	4.46	2-year	Existing_WAR	18.1	18.058	-5.79	0	0	985.22	1.2	39628.68	3.12	1.55
Col-Hayden	RM 106 Left	4.46	2-year	Existing_SF	17.68	17.602	-4.69	0	0	983.17	1.22	56661.52	3.67	2.25
Col-Hayden	RM 106 Left	4.46	100-yr	Existing_WAR	32.67	32.579	-2.63	0	0	1425.96	133.06	94512.62	145.69	2.38
Col-Hayden	RM 106 Left	4.46	100-yr	Existing_SF	27.73	27.561	-1.69	0	0	1041.13	81.66	113951.7	88.63	3.27
Col-Hayden	RM 106 Left	4.43 I-5 at NPH BR U	FEMA 100-year	Existing_FEMA	31.55	31.455	-2.46	0.01	0	1191.68	229.39	92691.03	170.12	2.52
Col-Hayden	RM 106 Left	4.43 I-5 at NPH BR U	2-year	Existing_WAR	18.09	18.053	-5.63	0	0	945.19	7.03	39621.63	4.35	1.62
Col-Hayden	RM 106 Left	4.43 I-5 at NPH BR U	2-year	Existing_SF	17.68	17.59	-4.49	0.01	0	943.12	8.4	56652.83	5.19	2.36
Col-Hayden	RM 106 Left	4.43 I-5 at NPH BR U	100-yr	Existing_WAR	32.66	32.568	-2.37	0.01	0	1384.61	260.45	94328.28	202.65	2.49
Col-Hayden	RM 106 Left	4.43 I-5 at NPH BR U	100-yr	Existing_SF	27.72	27.539	-1.42	0.01	0	1000.96	175.3	113826.5	120.12	3.43

Col-Hayden	RM 106 Left	4.43	I-5 at NPH	BR D	FEMA 100-year	Existing_FEMA	31.54	31.424	-2	0.01	0	917.89	217.54	92596.87	276.13	2.8
Col-Hayden	RM 106 Left	4.43	I-5 at NPH	BR D	2-year	Existing_WAR	18.09	18.039	-5.74	0	0	853.57	5.62	39613.5	13.89	1.8
Col-Hayden	RM 106 Left	4.43	I-5 at NPH	BR D	2-year	Existing_SF	17.67	17.561	-4.38	0.01	0	851.58	6.22	56643.08	17.12	2.62
Col-Hayden	RM 106 Left	4.43	I-5 at NPH	BR D	100-yr	Existing_WAR	32.66	32.537	-1.9	0.01	0	925.22	246.9	94235.88	308.6	2.77
Col-Hayden	RM 106 Left	4.43	I-5 at NPH	BR D	100-yr	Existing_SF	27.71	27.48	-0.81	0.01	0.01	899.75	158.02	113742	221.91	3.81
Col-Hayden	RM 106 Left	4.38			FEMA 100-year	Existing_FEMA	31.53	31.427	-3.06	0	0	949.91	153.67	92576.29	360.57	2.63
Col-Hayden	RM 106 Left	4.38			2-year	Existing_WAR	18.08	18.04	-6.45	0	0	885.58	4.22	39618.17	10.61	1.67
Col-Hayden	RM 106 Left	4.38			2-year	Existing_SF	17.65	17.562	-5.25	0.01	0	883.58	4.69	56649.44	12.29	2.43
Col-Hayden	RM 106 Left	4.38			100-yr	Existing_WAR	32.65	32.541	-2.97	0	0	957.27	173.48	94211.11	406.8	2.61
Col-Hayden	RM 106 Left	4.38			100-yr	Existing_SF	27.68	27.487	-1.94	0.01	0	931.79	113.69	113734.2	274.07	3.58
Col-Hayden	RM 106 Left	4.33			FEMA 100-year	Existing_FEMA	31.53	31.423	-4.25	0.01	0	919.25	86.97	92875.09	128.48	2.63
Col-Hayden	RM 106 Left	4.33			2-year	Existing_WAR	18.08	18.038	-7.94	0	0	861.74	1.08	39628.04	3.89	1.65
Col-Hayden	RM 106 Left	4.33			2-year	Existing_SF	17.65	17.558	-6.57	0.01	0	859.7	0.93	56661.14	4.35	2.4
Col-Hayden	RM 106 Left	4.33			100-yr	Existing_WAR	32.64	32.537	-4.15	0.01	0	933.94	96.42	94552.75	142.22	2.61
Col-Hayden	RM 106 Left	4.33			100-yr	Existing_SF	27.68	27.479	-3.08	0.02	0	895.61	65.46	113955	101.54	3.57
Col-Hayden	RM 106 Left	3.34			FEMA 100-year	Existing_FEMA	31.4	31.349	-3.69	0	0	2150.47	114.91	92879.34	96.3	1.89
Col-Hayden	RM 106 Left	3.34			2-year	Existing_WAR	18	17.978	-7.7	0	0	1340.65	8.26	39624.04	0.7	1.26
Col-Hayden	RM 106 Left	3.34			2-year	Existing_SF	17.48	17.427	-6.27	0	0	1339.27	10.11	56655.69	0.63	1.84
Col-Hayden	RM 106 Left	3.34			100-yr	Existing_WAR	32.52	32.467	-3.59	0	0	3048.19	121.37	94554.66	115.36	1.87
Col-Hayden	RM 106 Left	3.34			100-yr	Existing_SF	27.42	27.312	-2.14	0	0	1366.28	106.7	113967.9	47.37	2.6
Col-Hayden	RM 106 Left	3.32			FEMA 100-year	Existing_FEMA	31.4	31.348	-3.62			1425.21	93.36	92812.32	184.85	1.88
Col-Hayden	RM 106 Left	3.32			2-year	Existing_WAR	18	17.977	-7.49			1355.59	3.81	39623.8	5.39	1.26
Col-Hayden	RM 106 Left	3.32			2-year	Existing_SF	17.48	17.426	-6.11			1353.66	4.41	56656.32	5.69	1.84
Col-Hayden	RM 106 Left	3.32			100-yr	Existing_WAR	32.52	32.467	-3.51			2151.46	101.45	94625.23	64.7	1.86
Col-Hayden	RM 106 Left	3.32			100-yr	Existing_SF	27.41	27.31	-2.11			1385	77.99	113896.4	147.61	2.59
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	FEMA 100-year	Existing_FEMA	31.41	31.346	-2.74			1289.22	82.94	92739.55	268.06	2.09
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Existing_WAR	18.01	17.976	-6.94			1232.55	5.13	39620.61	7.26	1.41
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Existing_SF	17.49	17.423	-5.43			1230.48	5.91	56652.87	7.63	2.06
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Existing_WAR	32.53	32.464	-2.61			2008.03	90.87	94606.51	93.99	2.06
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Existing_SF	27.43	27.305	-0.67			1252.29	77.34	113835.3	209.34	2.88
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	FEMA 100-year	Existing_FEMA	31.41	31.346	-6.36			2021.01	117.53	92544.8	428.21	1.97
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Existing_WAR	18	17.976	-11.11			1277.5	2.26	39627.14	3.61	1.3
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Existing_SF	17.48	17.423	-9.5			1262.91	2.35	56660.84	3.22	1.9
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Existing_WAR	32.52	32.464	-6.24			2056.95	128.14	93995.95	667.3	1.94
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Existing_SF	27.42	27.305	-4.98			1742.37	87.38	113753.3	281.3	2.71
Col-Hayden	RM 106 Left	3.28			FEMA 100-year	Existing_FEMA	31.39	31.346		0	0	2190.56	89.99	92544.92	455.62	1.78
Col-Hayden	RM 106 Left	3.28			2-year	Existing_WAR	18	17.976		0	0	1400.53	2.57	39617.14	13.29	1.16
Col-Hayden	RM 106 Left	3.28			2-year	Existing_SF	17.47	17.423		0	0	1386.08	2.83	56647.24	16.35	1.7
Col-Hayden	RM 106 Left	3.28			100-yr	Existing_WAR	32.51	32.464		0	0	2256.62	97.05	94011.84	682.49	1.76

Col-Hayden	RM 106 Left	3.28	100-yr	Existing_SF	27.4	27.305		0	0	1862.97	70.4	113689.5	362.05	2.44
Col-Hayden	RM 106 Left	3.27	FEMA 100-year	Existing_FEMA	31.39	31.346		0	0	2066.81	519.41	90818.63	1752.49	1.78
Col-Hayden	RM 106 Left	3.27	2-year	Existing_WAR	18	17.974		0	0	1508.91	66.86	39534.09	32.05	1.2
Col-Hayden	RM 106 Left	3.27	2-year	Existing_SF	17.47	17.419		0	0	1444.12	86.05	56542.96	37.41	1.75
Col-Hayden	RM 106 Left	3.27	100-yr	Existing_WAR	32.51	32.464		0	0	2083.68	555.12	92190.26	2046	1.76
Col-Hayden	RM 106 Left	3.27	100-yr	Existing_SF	27.4	27.302		0.01	0	1899.08	514.42	112573.4	1034.15	2.47

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sandy	Main	2.33	FEMA 100-year	Existing_FEMA	7059	11.55	34.374		34.39	0.000017	1.151	7370.38	568.47	0.05
Sandy	Main	2.33	2-year	Existing_WAR	11000	11.55	23.4		23.72	0.000594	4.529	2517.02	294.62	0.26
Sandy	Main	2.33	2-year	Existing_SF	7500	11.55	23.377		23.52	0.000278	3.096	2510.13	294.39	0.18
Sandy	Main	2.33	100-yr	Existing_WAR	12000	11.55	35.29		35.34	0.000041	1.842	7895.38	577.19	0.08
Sandy	Main	2.33	100-yr	Existing_SF	7500	11.55	33.235		33.26	0.000025	1.325	6728.67	558.46	0.06
Sandy	Main	2.3	FEMA 100-year	Existing_FEMA	7059	11.38	34.373		34.39	0.000012	1.019	7155.81	607.52	0.04
Sandy	Main	2.3	2-year	Existing_WAR	11000	11.38	23.391		23.61	0.000431	3.721	2956.3	388.04	0.22
Sandy	Main	2.3	2-year	Existing_SF	7500	11.38	23.373		23.47	0.000202	2.542	2949.98	387.7	0.15
Sandy	Main	2.3	100-yr	Existing_WAR	12000	11.38	35.289		35.33	0.000028	1.65	7563.03	642.59	0.07
Sandy	Main	2.3	100-yr	Existing_SF	7500	11.38	33.235		33.26	0.000016	1.155	6659.73	569.12	0.05
Sandy	Main	2.24	FEMA 100-year	Existing_FEMA	7059	13.93	34.371		34.38	0.000012	0.966	7895.23	737.12	0.04
Sandy	Main	2.24	2-year	Existing_WAR	11000	13.93	23.087		23.39	0.0009	4.448	2472.8	430.88	0.31
Sandy	Main	2.24	2-year	Existing_SF	7500	13.93	23.241		23.38	0.000389	2.963	2531	434.33	0.2
Sandy	Main	2.24	100-yr	Existing_WAR	12000	13.93	35.284		35.32	0.000029	1.554	8433.57	760.83	0.06
Sandy	Main	2.24	100-yr	Existing_SF	7500	13.93	33.231		33.25	0.000017	1.105	7250.79	694.99	0.05
Sandy	Main	2.17	FEMA 100-year	Existing_FEMA	7059	12.02	34.372		34.38	0.000007	0.757	11215.98	884.62	0.03
Sandy	Main	2.17	2-year	Existing_WAR	11000	12.02	22.797		23.05	0.000944	4.065	2733.01	574.12	0.3
Sandy	Main	2.17	2-year	Existing_SF	7500	12.02	23.13		23.24	0.000361	2.612	2908.5	586.79	0.19
Sandy	Main	2.17	100-yr	Existing_WAR	12000	12.02	35.287		35.31	0.000018	1.211	12029.46	899.29	0.05
Sandy	Main	2.17	100-yr	Existing_SF	7500	12.02	33.231		33.24	0.000011	0.873	10211.17	877.91	0.04
Sandy	Main	2.14	FEMA 100-year	Existing_FEMA	7059	11.67	34.368		34.38	0.000008	0.812	8897.17	1242.56	0.03
Sandy	Main	2.14	2-year	Existing_WAR	11000	11.67	22.72		22.92	0.000619	3.637	3076.68	602.63	0.25
Sandy	Main	2.14	2-year	Existing_SF	7500	11.67	23.101		23.19	0.000243	2.337	3265.79	613.39	0.16
Sandy	Main	2.14	100-yr	Existing_WAR	12000	11.67	35.278		35.3	0.000019	1.313	9351.6	1629.57	0.05
Sandy	Main	2.14	100-yr	Existing_SF	7500	11.67	33.227		33.24	0.000011	0.921	8326.9	740.05	0.04
Sandy	Main	2.12	FEMA 100-year	Existing_FEMA	7059	8.05	34.365		34.38	0.00001	0.895	8146.47	524.32	0.04
Sandy	Main	2.12	2-year	Existing_WAR	11000	8.05	22.594		22.85	0.000726	4.084	2693.43	396.63	0.28
Sandy	Main	2.12	2-year	Existing_SF	7500	8.05	23.053		23.16	0.000276	2.607	2876.58	402.03	0.17
Sandy	Main	2.12	100-yr	Existing_WAR	12000	8.05	35.269		35.3	0.000024	1.444	8621.88	527.26	0.06
Sandy	Main	2.12	100-yr	Existing_SF	7500	8.05	33.223		33.24	0.000014	1.019	7549.75	520.54	0.04
Sandy	Main	2.1	FEMA 100-year	Existing_FEMA	7059	8.84	34.361		34.38	0.000012	0.987	7615.36	1496.07	0.04
Sandy	Main	2.1	2-year	Existing_WAR	11000	8.84	22.384		22.74	0.00112	4.758	2314.44	379.78	0.34
Sandy	Main	2.1	2-year	Existing_SF	7500	8.84	22.981		23.12	0.000387	2.956	2542.58	385.67	0.2
Sandy	Main	2.1	100-yr	Existing_WAR	12000	8.84	35.259		35.3	0.000029	1.589	8228.7	1964	0.07
Sandy	Main	2.1	100-yr	Existing_SF	7500	8.84	33.218		33.24	0.000017	1.121	7003.4	1062.39	0.05
Sandy	Main	2.07	FEMA 100-year	Existing_FEMA	7059	9.3	34.361	17.5	34.37	0.00001	0.931	8135.04	1411.98	0.04
Sandy	Main	2.07	2-year	Existing_WAR	11000	9.3	22.276	18.51	22.57	0.000877	4.334	2538.01	394.23	0.3
Sandy	Main	2.07	2-year	Existing_SF	7500	9.3	22.947	17.61	23.06	0.000296	2.675	2804.03	399.36	0.18

Sandy	Main	2.07	100-yr	Existing_WAR	12000	9.3	35.258	18.7	35.29	0.000024	1.504	8660.26	1749.31	0.06
Sandy	Main	2.07	100-yr	Existing_SF	7500	9.3	33.217	17.61	33.23	0.000014	1.06	7505.76	1184.49	0.04
Sandy	Main	1.97	FEMA 100-year	Existing_FEMA	7059	7.12	34.362	14.62	34.37	0.000005	0.653	12466.29	791.03	0.03
Sandy	Main	1.97	2-year	Existing_WAR	11000	7.12	22.133	15.78	22.26	0.000316	2.873	3974.01	625.16	0.18
Sandy	Main	1.97	2-year	Existing_SF	7500	7.12	22.905	14.77	22.95	0.000105	1.766	4459.66	632.97	0.11
Sandy	Main	1.97	100-yr	Existing_WAR	12000	7.12	35.262	16.04	35.28	0.000011	1.056	13182.22	799.13	0.04
Sandy	Main	1.97	100-yr	Existing_SF	7500	7.12	33.218	14.77	33.23	0.000006	0.742	11568.05	779.23	0.03
Sandy	Main	1.9	FEMA 100-year	Existing_FEMA	7059	10.89	34.362	15.56	34.37	0.000003	0.512	13872.83	764.51	0.02
Sandy	Main	1.9	2-year	Existing_WAR	11000	10.89	22.086	16.21	22.16	0.000175	2.147	5122.86	681.86	0.14
Sandy	Main	1.9	2-year	Existing_SF	7500	10.89	22.891	15.63	22.92	0.000058	1.322	5673.1	685.94	0.08
Sandy	Main	1.9	100-yr	Existing_WAR	12000	10.89	35.263	16.37	35.27	0.000007	0.83	14564.61	771.57	0.03
Sandy	Main	1.9	100-yr	Existing_SF	7500	10.89	33.218	15.63	33.22	0.000004	0.579	13003.6	755.41	0.02
Sandy	Main	1.88	FEMA 100-year	Existing_FEMA	7059	7.33	34.361	15.15	34.37	0.000003	0.549	13118.81	760.44	0.02
Sandy	Main	1.88	2-year	Existing_WAR	11000	7.33	22.04	16.31	22.13	0.000256	2.447	4495.51	652.28	0.16
Sandy	Main	1.88	2-year	Existing_SF	7500	7.33	22.875	15.34	22.91	0.000082	1.487	5043.07	658.2	0.09
Sandy	Main	1.88	100-yr	Existing_WAR	12000	7.33	35.26	16.51	35.27	0.000008	0.89	13806.32	769.1	0.04
Sandy	Main	1.88	100-yr	Existing_SF	7500	7.33	33.217	15.34	33.22	0.000005	0.622	12254.73	750.24	0.03
Sandy	Main	1.86	FEMA 100-year	Existing_FEMA	7059	3.1	34.362	12.95	34.37	0.000003	0.515	18504.78	1914.59	0.02
Sandy	Main	1.86	2-year	Existing_WAR	11000	3.1	22.012	14.62	22.11	0.000267	2.487	4423.23	645.06	0.17
Sandy	Main	1.86	2-year	Existing_SF	7500	3.1	22.866	13.13	22.9	0.000084	1.507	4977.65	651.73	0.1
Sandy	Main	1.86	100-yr	Existing_WAR	12000	3.1	35.262	15.12	35.27	0.000007	0.819	20246.19	1951.59	0.03
Sandy	Main	1.86	100-yr	Existing_SF	7500	3.1	33.217	13.13	33.22	0.000004	0.597	16336.65	1871.35	0.02
Sandy	Main	1.83	FEMA 100-year	Existing_FEMA	7059	7.33	34.359	13.47	34.36	0.000005	0.703	15968.24	1512.42	0.03
Sandy	Main	1.83	2-year	Existing_WAR	11000	7.33	21.876	14.65	22.05	0.00033	3.372	3335.59	463.96	0.2
Sandy	Main	1.83	2-year	Existing_SF	7500	7.33	22.817	13.61	22.88	0.00011	2.073	3834.03	592.87	0.11
Sandy	Main	1.83	100-yr	Existing_WAR	12000	7.33	35.254	14.91	35.27	0.000011	1.119	17361.83	1599.74	0.04
Sandy	Main	1.83	100-yr	Existing_SF	7500	7.33	33.213	13.61	33.22	0.000007	0.814	14320.56	1400.64	0.03
Sandy	Main	1.77	FEMA 100-year	Existing_FEMA	7059	9.81	34.359	14.28	34.36	0.000003	0.589	25787.57	2437.2	0.02
Sandy	Main	1.77	2-year	Existing_WAR	11000	9.81	21.685	15.34	21.93	0.000444	4.017	3268.55	730.6	0.23
Sandy	Main	1.77	2-year	Existing_SF	7500	9.81	22.761	14.41	22.84	0.000136	2.382	4175.68	952.69	0.13
Sandy	Main	1.77	100-yr	Existing_WAR	12000	9.81	35.257	15.59	35.26	0.000007	0.921	27977.15	2441.71	0.03
Sandy	Main	1.77	100-yr	Existing_SF	7500	9.81	33.214	14.41	33.22	0.000005	0.692	23044.01	2350.24	0.03
Sandy	Main	1.71	FEMA 100-year	Existing_FEMA	7059	9.37	34.359	14.02	34.36	0.000003	0.524	27934	2530.9	0.02
Sandy	Main	1.71	2-year	Existing_WAR	11000	9.37	21.551	15.1	21.77	0.000431	3.839	3423.85	736.04	0.22
Sandy	Main	1.71	2-year	Existing_SF	7500	9.37	22.724	14.14	22.8	0.000126	2.237	4420.94	945.9	0.12
Sandy	Main	1.71	100-yr	Existing_WAR	12000	9.37	35.255	15.36	35.26	0.000006	0.821	30205.44	2535.68	0.03
Sandy	Main	1.71	100-yr	Existing_SF	7500	9.37	33.213	14.14	33.22	0.000004	0.624	25040.11	2521.37	0.02
Sandy	Main	1.63	FEMA 100-year	Existing_FEMA	7059	9.81	34.358	14.31	34.36	0.000003	0.5	28058.82	2614.59	0.02
Sandy	Main	1.63	2-year	Existing_WAR	11000	9.81	21.38	15.37	21.59	0.000447	3.675	3115.31	577.93	0.22

Sandy	Main	1.63	2-year	Existing_SF	7500	9.81	22.675	14.44	22.74	0.000124	2.128	3974.92	775.65	0.12
Sandy	Main	1.63	100-yr	Existing_WAR	12000	9.81	35.253	15.62	35.26	0.000006	0.782	30402.81	2620.71	0.03
Sandy	Main	1.63	100-yr	Existing_SF	7500	9.81	33.212	14.44	33.22	0.000004	0.596	25066.64	2605.63	0.02
Sandy	Main	1.52	FEMA 100-year	Existing_FEMA	7059	8.78	34.356	13.98	34.36	0.000003	0.562	26138.29	2401.78	0.02
Sandy	Main	1.52	2-year	Existing_WAR	11000	8.78	21.021	15.1	21.3	0.000548	4.242	2687.41	443.14	0.25
Sandy	Main	1.52	2-year	Existing_SF	7500	8.78	22.577	14.12	22.67	0.000149	2.409	3495.93	602.94	0.13
Sandy	Main	1.52	100-yr	Existing_WAR	12000	8.78	35.249	15.36	35.26	0.000007	0.882	28299.59	2440.44	0.03
Sandy	Main	1.52	100-yr	Existing_SF	7500	8.78	33.209	14.12	33.21	0.000004	0.667	23391.14	2389.58	0.03
Sandy	Main	1.37	FEMA 100-year	Existing_FEMA	7059	9.02	34.355	12.87	34.36	0.000002	0.452	29640.89	2294.63	0.02
Sandy	Main	1.37	2-year	Existing_WAR	11000	9.02	20.789	13.85	20.95	0.000307	3.197	3602.6	575.85	0.19
Sandy	Main	1.37	2-year	Existing_SF	7500	9.02	22.526	12.99	22.57	0.000074	1.769	5318.52	1409.62	0.1
Sandy	Main	1.37	100-yr	Existing_WAR	12000	9.02	35.247	14.08	35.25	0.000004	0.717	31689.88	2301.52	0.03
Sandy	Main	1.37	100-yr	Existing_SF	7500	9.02	33.208	12.99	33.21	0.000003	0.526	27014.01	2282.59	0.02
Sandy	Main	1.29	FEMA 100-year	Existing_FEMA	7059	8.97	34.354	13.39	34.36	0.000002	0.471	27215.41	1920.19	0.02
Sandy	Main	1.29	2-year	Existing_WAR	11000	8.97	20.629	14.39	20.8	0.000344	3.433	4015.27	996.61	0.2
Sandy	Main	1.29	2-year	Existing_SF	7500	8.97	22.496	13.52	22.54	0.000074	1.786	6192.62	1335.72	0.1
Sandy	Main	1.29	100-yr	Existing_WAR	12000	8.97	35.244	14.62	35.25	0.000005	0.755	28949.4	1985.2	0.03
Sandy	Main	1.29	100-yr	Existing_SF	7500	8.97	33.206	13.52	33.21	0.000003	0.545	25018.15	1909.46	0.02
Sandy	Main	1.21	FEMA 100-year	Existing_FEMA	7059	6.75	34.351	12.03	34.36	0.000003	0.556	21283.54	2102.24	0.02
Sandy	Main	1.21	2-year	Existing_WAR	11000	6.75	20.538	13.12	20.67	0.000237	2.901	3830.97	459.21	0.17
Sandy	Main	1.21	2-year	Existing_SF	7500	6.75	22.47	12.17	22.51	0.000059	1.629	4784.47	520.63	0.09
Sandy	Main	1.21	100-yr	Existing_WAR	12000	6.75	35.238	13.37	35.25	0.000007	0.882	23186.76	2182.21	0.03
Sandy	Main	1.21	100-yr	Existing_SF	7500	6.75	33.203	12.17	33.21	0.000004	0.64	18941.8	1971.61	0.02
Columbia	RM 122-124	124.11	FEMA 100-year	Existing_FEMA	555000	-28.18	34.548		34.67	0.000024	2.952	223423.5	10935.77	0.08
Columbia	RM 122-124	124.11	2-year	Existing_WAR	261000	-28.18	21.033		21.1	0.000021	2.156	132481.4	5453.08	0.07
Columbia	RM 122-124	124.11	2-year	Existing_SF	385500	-28.18	23.071		23.2	0.000037	2.953	143728.5	5666.24	0.09
Columbia	RM 122-124	124.11	100-yr	Existing_WAR	549000	-28.18	35.413		35.53	0.000022	2.848	230447.4	10960.01	0.08
Columbia	RM 122-124	124.11	100-yr	Existing_SF	699500	-28.18	33.569		33.78	0.000043	3.829	215530.8	10846.93	0.11
Columbia	RM 122-124	123.86	FEMA 100-year	Existing_FEMA	555000	-29.5	34.521		34.64	0.000028	2.77	212292.5	11656.37	0.08
Columbia	RM 122-124	123.86	2-year	Existing_WAR	261000	-29.5	20.994		21.07	0.000033	2.177	119880.6	5688.29	0.08
Columbia	RM 122-124	123.86	2-year	Existing_SF	385500	-29.5	23.009		23.14	0.000054	2.935	131466.2	5863.77	0.11
Columbia	RM 122-124	123.86	100-yr	Existing_WAR	549000	-29.5	35.389		35.5	0.000025	2.667	219402.7	11762.55	0.08
Columbia	RM 122-124	123.86	100-yr	Existing_SF	699500	-29.5	33.52		33.72	0.000049	3.605	204243.3	11390.69	0.11
Columbia	RM 122-124	123.44	FEMA 100-year	Existing_FEMA	555000	-27.88	34.461		34.57	0.00003	2.732	231307.2	12570.03	0.09
Columbia	RM 122-124	123.44	2-year	Existing_WAR	261000	-27.88	20.902		20.98	0.000043	2.295	117537.8	7167.65	0.09
Columbia	RM 122-124	123.44	2-year	Existing_SF	385500	-27.88	22.865		23.01	0.000068	3.057	131764.3	7358.51	0.12
Columbia	RM 122-124	123.44	100-yr	Existing_WAR	549000	-27.88	35.337		35.44	0.000027	2.622	239605.8	12709.78	0.08
Columbia	RM 122-124	123.44	100-yr	Existing_SF	699500	-27.88	33.413		33.6	0.000054	3.57	221397.3	11500.44	0.11
Columbia	RM 122-124	123.07	FEMA 100-year	Existing_FEMA	555000	-22.96	34.36		34.51	0.000042	3.102	203086.9	11824.69	0.1

Columbia	RM 122-124	123.07	2-year	Existing_WAR	261000	-22.96	20.764		20.88	0.00007	2.717	97604.34	6042.28	0.12
Columbia	RM 122-124	123.07	2-year	Existing_SF	385500	-22.96	22.645		22.85	0.000107	3.603	109164	6390.55	0.15
Columbia	RM 122-124	123.07	100-yr	Existing_WAR	549000	-22.96	35.246		35.38	0.000037	2.97	211873	11936.27	0.09
Columbia	RM 122-124	123.07	100-yr	Existing_SF	699500	-22.96	33.228		33.48	0.000077	4.083	191985.2	11706.19	0.13
Columbia	RM 122-124	122.78	FEMA 100-year	Existing_FEMA	555000	-25.57	34.286		34.44	0.000042	3.214	194933.7	9543.94	0.1
Columbia	RM 122-124	122.78	2-year	Existing_WAR	261000	-25.57	20.667		20.78	0.000059	2.707	97483.25	5463.64	0.11
Columbia	RM 122-124	122.78	2-year	Existing_SF	385500	-25.57	22.486		22.69	0.000095	3.644	107656.5	5711.08	0.14
Columbia	RM 122-124	122.78	100-yr	Existing_WAR	549000	-25.57	35.18		35.32	0.000037	3.086	203679.6	10030.49	0.1
Columbia	RM 122-124	122.78	100-yr	Existing_SF	699500	-25.57	33.095		33.37	0.000077	4.228	183962.4	8840.56	0.14
Columbia	RM 122-124	122.31	FEMA 100-year	Existing_FEMA	555000	-34.51	34.182		34.34	0.000036	3.279	192606.2	9591.19	0.1
Columbia	RM 122-124	122.31	2-year	Existing_WAR	261000	-34.51	20.568		20.66	0.000037	2.502	105763.8	4910.57	0.09
Columbia	RM 122-124	122.31	2-year	Existing_SF	385500	-34.51	22.315		22.5	0.000064	3.436	114566.2	5113.2	0.12
Columbia	RM 122-124	122.31	100-yr	Existing_WAR	549000	-34.51	35.088		35.24	0.000032	3.149	201354.4	9712.12	0.09
Columbia	RM 122-124	122.31	100-yr	Existing_SF	699500	-34.51	32.908		33.19	0.000065	4.305	180722.8	9018.69	0.13
Columbia	RM 118.5-122	122.08	FEMA 100-year	Existing_FEMA	562059	-32.69	34.115	-6.52	34.3	0.000043	3.484	184139.3	8763.12	0.1
Columbia	RM 118.5-122	122.08	2-year	Existing_WAR	272000	-32.69	20.489	-14.29	20.61	0.000052	2.819	98585.48	5024.08	0.11
Columbia	RM 118.5-122	122.08	2-year	Existing_SF	393000	-32.69	22.19	-10.74	22.41	0.000085	3.772	107354.6	5246.64	0.14
Columbia	RM 118.5-122	122.08	100-yr	Existing_WAR	561000	-32.69	35.024	-6.54	35.19	0.000039	3.372	192140	8828.95	0.1
Columbia	RM 118.5-122	122.08	100-yr	Existing_SF	707000	-32.69	32.791	-3.51	33.1	0.000077	4.565	172765.5	8339.86	0.14
Columbia	RM 118.5-122	121.81	FEMA 100-year	Existing_FEMA	562059	-36.66	34.063	-5.71	34.24	0.000044	3.448	187723.6	7854.8	0.1
Columbia	RM 118.5-122	121.81	2-year	Existing_WAR	272000	-36.66	20.411	-16.47	20.54	0.000054	2.884	99416.35	5328.19	0.11
Columbia	RM 118.5-122	121.81	2-year	Existing_SF	393000	-36.66	22.06	-11.23	22.28	0.000093	3.845	108501.6	5596.38	0.14
Columbia	RM 118.5-122	121.81	100-yr	Existing_WAR	561000	-36.66	34.976	-5.73	35.14	0.00004	3.343	194998.4	8079.33	0.1
Columbia	RM 118.5-122	121.81	100-yr	Existing_SF	707000	-36.66	32.69	-2.48	32.99	0.00008	4.549	177160.3	7580.34	0.14
Columbia	RM 118.5-122	121.46	FEMA 100-year	Existing_FEMA	562059	-40.24	33.966	-2.52	34.16	0.00005	3.612	177813.5	7552.41	0.11
Columbia	RM 118.5-122	121.46	2-year	Existing_WAR	272000	-40.24	20.305	-10.82	20.44	0.000059	3.01	93927.6	4968.62	0.11
Columbia	RM 118.5-122	121.46	2-year	Existing_SF	393000	-40.24	21.874	-7.05	22.12	0.000099	4.043	101813.9	5111.87	0.15
Columbia	RM 118.5-122	121.46	100-yr	Existing_WAR	561000	-40.24	34.89	-2.54	35.07	0.000045	3.488	184844	7670.34	0.11
Columbia	RM 118.5-122	121.46	100-yr	Existing_SF	707000	-40.24	32.518	0.42	32.85	0.00009	4.755	167028.8	7318.93	0.15
Columbia	RM 118.5-122	121.23	FEMA 100-year	Existing_FEMA	562059	-24.85	33.931	-2.33	34.1	0.000041	3.422	187758.3	7303.85	0.1
Columbia	RM 118.5-122	121.23	2-year	Existing_WAR	272000	-24.85	20.255	-9.34	20.38	0.000052	2.802	102071.4	5418.88	0.11
Columbia	RM 118.5-122	121.23	2-year	Existing_SF	393000	-24.85	21.794	-6.16	22.01	0.000085	3.766	110497.7	5528.24	0.14
Columbia	RM 118.5-122	121.23	100-yr	Existing_WAR	561000	-24.85	34.856	-2.35	35.02	0.000037	3.319	194592.5	7451.47	0.1
Columbia	RM 118.5-122	121.23	100-yr	Existing_SF	707000	-24.85	32.45	0.57	32.75	0.000076	4.516	177105	7110.33	0.14
Columbia	RM 118.5-122	120.92	FEMA 100-year	Existing_FEMA	562059	-42.6	33.679	-7.41	34.02	0.000076	4.716	122395.5	5638.27	0.14
Columbia	RM 118.5-122	120.92	2-year	Existing_WAR	272000	-42.6	20.077	-16.01	20.28	0.000081	3.634	74846.87	3942.4	0.13
Columbia	RM 118.5-122	120.92	2-year	Existing_SF	393000	-42.6	21.472	-12.08	21.85	0.00014	4.955	79312.08	3982.8	0.18
Columbia	RM 118.5-122	120.92	100-yr	Existing_WAR	561000	-42.6	34.62	-7.44	34.95	0.000069	4.583	126363.8	5896.3	0.13
Columbia	RM 118.5-122	120.92	100-yr	Existing_SF	707000	-42.6	32.003	-3.83	32.6	0.00014	6.227	115456.5	5372.14	0.19

Columbia	RM 118.5-122	120.64	FEMA 100-year	Existing_FEMA	562059	-50.24	33.681	-21	33.95	0.000039	4.184	135451.2	5419.15	0.1
Columbia	RM 118.5-122	120.64	2-year	Existing_WAR	272000	-50.24	20.11	-29.08	20.23	0.000024	2.757	98659.84	2911.51	0.08
Columbia	RM 118.5-122	120.64	2-year	Existing_SF	393000	-50.24	21.526	-25.23	21.75	0.000045	3.842	102299.7	2945.86	0.11
Columbia	RM 118.5-122	120.64	100-yr	Existing_WAR	561000	-50.24	34.619	-21.03	34.88	0.000036	4.1	138313.8	5681.89	0.1
Columbia	RM 118.5-122	120.64	100-yr	Existing_SF	707000	-50.24	32.017	-17.49	32.48	0.000068	5.444	130541.3	4812.16	0.14
Columbia	RM 118.5-122	120.37	FEMA 100-year	Existing_FEMA	562059	-57.92	33.544	-17.66	33.89	0.000048	4.734	119246.8	3265.03	0.12
Columbia	RM 118.5-122	120.37	2-year	Existing_WAR	272000	-57.92	20.044	-27.16	20.19	0.000028	3.073	88506.88	2198.49	0.09
Columbia	RM 118.5-122	120.37	2-year	Existing_SF	393000	-57.92	21.399	-22.57	21.69	0.000053	4.296	91490.17	2206.78	0.12
Columbia	RM 118.5-122	120.37	100-yr	Existing_WAR	561000	-57.92	34.488	-17.7	34.82	0.000045	4.641	121679.7	3478.86	0.11
Columbia	RM 118.5-122	120.37	100-yr	Existing_SF	707000	-57.92	31.779	-14.22	32.37	0.000084	6.164	114890.7	2820.24	0.15
Columbia	RM 118.5-122	120.1	FEMA 100-year	Existing_FEMA	562059	-59.95	33.612	-26.38	33.84	0.000027	3.847	146187.6	4123.76	0.09
Columbia	RM 118.5-122	120.1	2-year	Existing_WAR	272000	-59.95	20.076	-34.24	20.16	0.000013	2.396	113541.2	2292.71	0.06
Columbia	RM 118.5-122	120.1	2-year	Existing_SF	393000	-59.95	21.459	-30.64	21.64	0.000025	3.367	116719.1	2312.31	0.08
Columbia	RM 118.5-122	120.1	100-yr	Existing_WAR	561000	-59.95	34.553	-26.4	34.78	0.000026	3.779	148780	4330.25	0.09
Columbia	RM 118.5-122	120.1	100-yr	Existing_SF	707000	-59.95	31.896	-23.21	32.28	0.000047	4.985	141826.2	3862.12	0.12
Columbia	RM 118.5-122	119.89	FEMA 100-year	Existing_FEMA	562059	-58.48	33.548	-24.34	33.81	0.000035	4.094	137657.1	5390.25	0.1
Columbia	RM 118.5-122	119.89	2-year	Existing_WAR	272000	-58.48	20.039	-33.88	20.15	0.000019	2.646	102793.4	2589.92	0.07
Columbia	RM 118.5-122	119.89	2-year	Existing_SF	393000	-58.48	21.389	-29.46	21.6	0.000037	3.706	106036.9	2655.46	0.1
Columbia	RM 118.5-122	119.89	100-yr	Existing_WAR	561000	-58.48	34.493	-24.36	34.74	0.000033	4.013	140320.7	5496.62	0.1
Columbia	RM 118.5-122	119.89	100-yr	Existing_SF	707000	-58.48	31.782	-20.43	32.22	0.000062	5.329	132841	4511.77	0.13
Columbia	RM 118.5-122	119.63	FEMA 100-year	Existing_FEMA	562059	-34.06	33.507	-11.34	33.76	0.000037	4.031	140899.7	5158.03	0.1
Columbia	RM 118.5-122	119.63	2-year	Existing_WAR	272000	-34.06	20.007	-17.49	20.12	0.000024	2.679	101544.4	2789.21	0.08
Columbia	RM 118.5-122	119.63	2-year	Existing_SF	393000	-34.06	21.33	-14.7	21.55	0.000044	3.736	105190.9	2998.4	0.11
Columbia	RM 118.5-122	119.63	100-yr	Existing_WAR	561000	-34.06	34.455	-11.36	34.7	0.000035	3.944	144558.2	5182.57	0.1
Columbia	RM 118.5-122	119.63	100-yr	Existing_SF	707000	-34.06	31.705	-8.88	32.14	0.000066	5.266	135207.5	4058.84	0.13
Columbia	RM 118.5-122	119.22	FEMA 100-year	Existing_FEMA	562059	-24.63	33.479	-6.95	33.68	0.000032	3.639	157102.8	5089.36	0.09
Columbia	RM 118.5-122	119.22	2-year	Existing_WAR	272000	-24.63	19.975	-11.27	20.07	0.000022	2.459	110612.5	3802.84	0.07
Columbia	RM 118.5-122	119.22	2-year	Existing_SF	393000	-24.63	21.272	-9.34	21.45	0.00004	3.425	114745.3	3816.87	0.1
Columbia	RM 118.5-122	119.22	100-yr	Existing_WAR	561000	-24.63	34.431	-6.97	34.63	0.00003	3.559	160656.9	5180.83	0.09
Columbia	RM 118.5-122	119.22	100-yr	Existing_SF	707000	-24.63	31.649	-5.1	32	0.000057	4.764	150326.8	4633.86	0.12
Columbia	RM 118.5-122	118.81	FEMA 100-year	Existing_FEMA	562059	-29.22	33.432	-1.17	33.62	0.000036	3.466	168189.1	5614.93	0.1
Columbia	RM 118.5-122	118.81	2-year	Existing_WAR	272000	-29.22	19.917	-7.92	20.02	0.000032	2.538	107195.6	4428.08	0.09
Columbia	RM 118.5-122	118.81	2-year	Existing_SF	393000	-29.22	21.169	-3.61	21.36	0.000058	3.504	112187.5	4506.93	0.12
Columbia	RM 118.5-122	118.81	100-yr	Existing_WAR	561000	-29.22	34.39	-1.19	34.57	0.000033	3.375	173021.8	5630.93	0.09
Columbia	RM 118.5-122	118.81	100-yr	Existing_SF	707000	-29.22	31.556	0.65	31.88	0.000067	4.581	158805.2	5507.96	0.13
Columbia	RM 118.5-122	118.62	FEMA 100-year	Existing_FEMA	562059	-25.56	33.464	-0.98	33.59	0.000024	2.838	201136.7	5609.91	0.08
Columbia	RM 118.5-122	118.62	2-year	Existing_WAR	272000	-25.56	19.923	-7.99	19.99	0.000022	2.082	130618.3	5010.15	0.07
Columbia	RM 118.5-122	118.62	2-year	Existing_SF	393000	-25.56	21.183	-5.28	21.31	0.00004	2.873	136819.2	5093.69	0.1
Columbia	RM 118.5-122	118.62	100-yr	Existing_WAR	561000	-25.56	34.42	-0.99	34.54	0.000022	2.766	206334.8	5646.68	0.08
Columbia	RM 118.5-122	118.62	100-yr	Existing_SF	707000	-25.56	31.608	0.81	31.83	0.000045	3.747	191104.7	5585.76	0.11

Columbia	RM 118-118.5	118.35	FEMA 100-year	Existing_FEMA	565000	-29.99	33.472	-0.21	33.56	0.00002	2.335	242844.7	7289.18	0.07
Columbia	RM 118-118.5	118.35	2-year	Existing_WAR	278000	-29.99	19.899	-8.05	19.96	0.000026	1.911	145444.6	7038.55	0.07
Columbia	RM 118-118.5	118.35	2-year	Existing_SF	397000	-29.99	21.148	-4.15	21.25	0.000045	2.573	154286.1	7083.39	0.1
Columbia	RM 118-118.5	118.35	100-yr	Existing_WAR	566000	-29.99	34.429	-0.2	34.51	0.000019	2.274	249823.6	7291.76	0.07
Columbia	RM 118-118.5	118.35	100-yr	Existing_SF	711000	-29.99	31.616	1.99	31.77	0.000039	3.109	229334.8	7264.26	0.1
Columbia	RM 118-118.5	118.19	FEMA 100-year	Existing_FEMA	565000	-53.38	33.458	-1	33.54	0.00002	2.279	247873.1	7607.67	0.07
Columbia	RM 118-118.5	118.19	2-year	Existing_WAR	278000	-53.38	19.874	-11.15	19.93	0.00003	1.92	144765.1	7572.39	0.08
Columbia	RM 118-118.5	118.19	2-year	Existing_SF	397000	-53.38	21.107	-5.88	21.21	0.000049	2.576	154108.5	7576.5	0.1
Columbia	RM 118-118.5	118.19	100-yr	Existing_WAR	566000	-53.38	34.417	-0.98	34.49	0.000019	2.218	255174.5	7622.28	0.07
Columbia	RM 118-118.5	118.19	100-yr	Existing_SF	711000	-53.38	31.588	1.07	31.73	0.000039	3.043	233654.4	7601.3	0.1
Columbia	RM 118-118.5	117.98	FEMA 100-year	Existing_FEMA	565000	-33.26	33.435	0.59	33.52	0.000022	2.277	248387.2	8125.31	0.07
Columbia	RM 118-118.5	117.98	2-year	Existing_WAR	278000	-33.26	19.834	-6.64	19.9	0.000035	1.989	139733.8	7909.28	0.08
Columbia	RM 118-118.5	117.98	2-year	Existing_SF	397000	-33.26	21.042	-3.32	21.15	0.000058	2.659	149291.1	7912.68	0.11
Columbia	RM 118-118.5	117.98	100-yr	Existing_WAR	566000	-33.26	34.396	0.62	34.47	0.00002	2.212	256201.9	8135.83	0.07
Columbia	RM 118-118.5	117.98	100-yr	Existing_SF	711000	-33.26	31.542	2.92	31.69	0.000043	3.054	233020.7	8108.41	0.1
Columbia	RM 111-118	117.93	FEMA 100-year	Existing_FEMA	383707.7	-35.82	33.421		33.51	0.00002	2.399	163347.5	4768.78	0.07
Columbia	RM 111-118	117.93	2-year	Existing_WAR	203384.9	-35.82	19.822		19.89	0.000028	2.065	100092.3	4612.37	0.08
Columbia	RM 111-118	117.93	2-year	Existing_SF	287822.6	-35.82	21.02		21.14	0.000047	2.77	105620.6	4614.01	0.1
Columbia	RM 111-118	117.93	100-yr	Existing_WAR	384317.2	-35.82	34.382		34.47	0.000019	2.339	167935.9	4776.09	0.07
Columbia	RM 111-118	117.93	100-yr	Existing_SF	487957.6	-35.82	31.515		31.68	0.000039	3.225	154278.6	4748.54	0.1
Columbia	RM 111-118	117.77	FEMA 100-year	Existing_FEMA	383707.7	-32.68	33.371		33.49	0.000026	2.734	140334.1	3967.71	0.08
Columbia	RM 111-118	117.77	2-year	Existing_WAR	203384.9	-32.68	19.777		19.86	0.000033	2.311	88002.01	3776.53	0.08
Columbia	RM 111-118	117.77	2-year	Existing_SF	287822.6	-32.68	20.941		21.09	0.000056	3.115	92401.62	3783.88	0.11
Columbia	RM 111-118	117.77	100-yr	Existing_WAR	384317.2	-32.68	34.336		34.45	0.000024	2.666	144169.2	3985.57	0.08
Columbia	RM 111-118	117.77	100-yr	Existing_SF	487957.6	-32.68	31.422		31.63	0.000051	3.679	132619.3	3950.99	0.11
Columbia	RM 111-118	117.51	FEMA 100-year	Existing_FEMA	383707.7	-37.45	33.296		33.45	0.000031	3.123	125071.8	4026.3	0.09
Columbia	RM 111-118	117.51	2-year	Existing_WAR	203384.9	-37.45	19.719		19.82	0.000031	2.502	81293.57	2934.82	0.08
Columbia	RM 111-118	117.51	2-year	Existing_SF	287822.6	-37.45	20.835		21.01	0.000055	3.402	84607.06	2987.13	0.11
Columbia	RM 111-118	117.51	100-yr	Existing_WAR	384317.2	-37.45	34.265		34.41	0.000029	3.05	129105.8	4281.91	0.09
Columbia	RM 111-118	117.51	100-yr	Existing_SF	487957.6	-37.45	31.284		31.56	0.000058	4.19	117587	3512.69	0.12
Columbia	RM 111-118	117.28	FEMA 100-year	Existing_FEMA	383707.7	-34.85	33.258		33.41	0.000029	3.149	125902.9	4435.86	0.09
Columbia	RM 111-118	117.28	2-year	Existing_WAR	203384.9	-34.85	19.685		19.78	0.000028	2.483	82314.47	2936.99	0.08
Columbia	RM 111-118	117.28	2-year	Existing_SF	287822.6	-34.85	20.773		20.95	0.000051	3.385	85523.37	2956.98	0.11
Columbia	RM 111-118	117.28	100-yr	Existing_WAR	384317.2	-34.85	34.229		34.38	0.000027	3.078	130335.1	4723.91	0.08
Columbia	RM 111-118	117.28	100-yr	Existing_SF	487957.6	-34.85	31.212		31.49	0.000056	4.22	117789.6	3607.4	0.12
Columbia	RM 111-118	117.03	FEMA 100-year	Existing_FEMA	383707.7	-33.86	33.218		33.37	0.000028	3.168	129153.2	4887.08	0.09
Columbia	RM 111-118	117.03	2-year	Existing_WAR	203384.9	-33.86	19.647		19.74	0.000028	2.485	81830.12	2788.47	0.08
Columbia	RM 111-118	117.03	2-year	Existing_SF	287822.6	-33.86	20.704		20.88	0.00005	3.395	84785.59	2798.86	0.11
Columbia	RM 111-118	117.03	100-yr	Existing_WAR	384317.2	-33.86	34.193		34.34	0.000026	3.094	133973.1	4991.32	0.08

Columbia	RM 111-118	117.03	100-yr	Existing_SF	487957.6	-33.86	31.134		31.41	0.000054	4.252	119340.2	4463.42	0.12
Columbia	RM 111-118	116.73	FEMA 100-year	Existing_FEMA	383707.7	-25.52	33.138		33.33	0.000032	3.494	119218.3	4755.41	0.09
Columbia	RM 111-118	116.73	2-year	Existing_WAR	203384.9	-25.52	19.584		19.7	0.00003	2.693	75518.14	2420.3	0.09
Columbia	RM 111-118	116.73	2-year	Existing_SF	287822.6	-25.52	20.589		20.8	0.000055	3.692	77954.01	2441.69	0.11
Columbia	RM 111-118	116.73	100-yr	Existing_WAR	384317.2	-25.52	34.117		34.3	0.00003	3.413	124063.1	5093.16	0.09
Columbia	RM 111-118	116.73	100-yr	Existing_SF	487957.6	-25.52	30.984		31.32	0.000062	4.686	109832.9	4013.45	0.13
Columbia	RM 111-118	116.36	FEMA 100-year	Existing_FEMA	383707.7	-23.62	33.077		33.26	0.000034	3.516	131357.2	5422.29	0.09
Columbia	RM 111-118	116.36	2-year	Existing_WAR	203384.9	-23.62	19.507		19.63	0.000036	2.842	73213.52	3268.03	0.09
Columbia	RM 111-118	116.36	2-year	Existing_SF	287822.6	-23.62	20.45		20.68	0.000064	3.893	76334.33	3337.19	0.12
Columbia	RM 111-118	116.36	100-yr	Existing_WAR	384317.2	-23.62	34.063		34.24	0.000031	3.422	136734.4	5478.06	0.09
Columbia	RM 111-118	116.36	100-yr	Existing_SF	487957.6	-23.62	30.858		31.2	0.000067	4.755	119579.7	5139.26	0.13
Columbia	RM 111-118	115.92	FEMA 100-year	Existing_FEMA	383707.7	-31.24	33.041		33.19	0.000028	3.254	156136.3	6267.09	0.09
Columbia	RM 111-118	115.92	2-year	Existing_WAR	203384.9	-31.24	19.445		19.56	0.00003	2.704	80855.61	4758.91	0.08
Columbia	RM 111-118	115.92	2-year	Existing_SF	287822.6	-31.24	20.34		20.55	0.000054	3.706	85144.31	4825.94	0.11
Columbia	RM 111-118	115.92	100-yr	Existing_WAR	384317.2	-31.24	34.03		34.17	0.000025	3.171	162382	6349.4	0.08
Columbia	RM 111-118	115.92	100-yr	Existing_SF	487957.6	-31.24	30.776		31.06	0.000055	4.438	142095.9	6133.8	0.12
Columbia	RM 111-118	115.36	FEMA 100-year	Existing_FEMA	383707.7	-32.43	32.926		33.1	0.000031	3.486	139656	6072.39	0.09
Columbia	RM 111-118	115.36	2-year	Existing_WAR	203384.9	-32.43	19.348		19.47	0.000031	2.794	74290.75	3433.95	0.09
Columbia	RM 111-118	115.36	2-year	Existing_SF	287822.6	-32.43	20.157		20.39	0.000056	3.853	77169.3	3633.82	0.12
Columbia	RM 111-118	115.36	100-yr	Existing_WAR	384317.2	-32.43	33.925		34.09	0.000029	3.39	145742.1	6138.82	0.09
Columbia	RM 111-118	115.36	100-yr	Existing_SF	487957.6	-32.43	30.552		30.89	0.000061	4.749	125384.1	5889.79	0.13
Columbia	RM 111-118	114.84	FEMA 100-year	Existing_FEMA	383707.7	-17.7	32.854		33.02	0.000031	3.341	136673.1	6203.27	0.09
Columbia	RM 111-118	114.84	2-year	Existing_WAR	203384.9	-17.7	19.264		19.38	0.000033	2.742	75552.89	3378.42	0.09
Columbia	RM 111-118	114.84	2-year	Existing_SF	287822.6	-17.7	20.003		20.22	0.000062	3.781	78073.19	3436.6	0.12
Columbia	RM 111-118	114.84	100-yr	Existing_WAR	384317.2	-17.7	33.858		34.01	0.000029	3.247	142999.4	6397	0.09
Columbia	RM 111-118	114.84	100-yr	Existing_SF	487957.6	-17.7	30.404		30.71	0.000063	4.564	122645	5338.42	0.13
Columbia	RM 111-118	114.45	FEMA 100-year	Existing_FEMA	383707.7	-22.18	32.802		32.95	0.000031	3.183	142741	6842.46	0.09
Columbia	RM 111-118	114.45	2-year	Existing_WAR	203384.9	-22.18	19.202		19.31	0.000034	2.65	77493.8	3144.49	0.09
Columbia	RM 111-118	114.45	2-year	Existing_SF	287822.6	-22.18	19.888		20.1	0.000063	3.658	79681.98	3226.24	0.12
Columbia	RM 111-118	114.45	100-yr	Existing_WAR	384317.2	-22.18	33.813		33.95	0.000028	3.085	149719.7	6984.79	0.09
Columbia	RM 111-118	114.45	100-yr	Existing_SF	487957.6	-22.18	30.294		30.58	0.000063	4.38	126152.3	6215.67	0.13
Columbia	RM 111-118	114.16	FEMA 100-year	Existing_FEMA	383707.7	-22.78	32.744		32.91	0.000031	3.271	130585.9	6243.96	0.09
Columbia	RM 111-118	114.16	2-year	Existing_WAR	203384.9	-22.78	19.16		19.26	0.000028	2.594	79089.49	2910.31	0.08
Columbia	RM 111-118	114.16	2-year	Existing_SF	287822.6	-22.78	19.808		20.01	0.000052	3.596	80805.17	2939.7	0.11
Columbia	RM 111-118	114.16	100-yr	Existing_WAR	384317.2	-22.78	33.759		33.91	0.000028	3.178	135928.3	6315.26	0.09
Columbia	RM 111-118	114.16	100-yr	Existing_SF	487957.6	-22.78	30.18		30.49	0.000062	4.488	117572.1	5830	0.13
Columbia	RM 111-118	113.67	FEMA 100-year	Existing_FEMA	383707.7	-15.25	32.693		32.83	0.000027	3.041	139185.2	5168.44	0.08
Columbia	RM 111-118	113.67	2-year	Existing_WAR	203384.9	-15.25	19.1		19.19	0.000028	2.457	85367.71	3314.29	0.08
Columbia	RM 111-118	113.67	2-year	Existing_SF	287822.6	-15.25	19.695		19.87	0.000052	3.403	87351.38	3349.41	0.11

Columbia	RM 111-118	113.67	100-yr	Existing_WAR	384317.2	-15.25	33.71		33.84	0.000025	2.961	143726.8	5186.23	0.08
Columbia	RM 111-118	113.67	100-yr	Existing_SF	487957.6	-15.25	30.073		30.34	0.000055	4.172	127502.7	5017.81	0.12
Columbia	RM 111-118	113.25	FEMA 100-year	Existing_FEMA	383707.7	-19.95	32.665		32.78	0.000024	2.663	145824.7	4311.73	0.08
Columbia	RM 111-118	113.25	2-year	Existing_WAR	203384.9	-19.95	19.047		19.13	0.000032	2.266	89794.23	3954.94	0.08
Columbia	RM 111-118	113.25	2-year	Existing_SF	287822.6	-19.95	19.598		19.75	0.00006	3.13	91977.77	3963.84	0.11
Columbia	RM 111-118	113.25	100-yr	Existing_WAR	384317.2	-19.95	33.686		33.79	0.000022	2.593	150225.7	4313.53	0.08
Columbia	RM 111-118	113.25	100-yr	Existing_SF	487957.6	-19.95	30.012		30.22	0.000051	3.66	134394.7	4288.63	0.11
Columbia	RM 111-118	112.99	FEMA 100-year	Existing_FEMA	383707.7	-33.39	32.619		32.74	0.000026	2.792	137932.6	3909.87	0.08
Columbia	RM 111-118	112.99	2-year	Existing_WAR	203384.9	-33.39	18.999		19.08	0.000031	2.326	87441.68	3548.07	0.08
Columbia	RM 111-118	112.99	2-year	Existing_SF	287822.6	-33.39	19.507		19.67	0.000058	3.225	89247.09	3551.3	0.11
Columbia	RM 111-118	112.99	100-yr	Existing_WAR	384317.2	-33.39	33.643		33.76	0.000024	2.72	141964.5	3949.95	0.08
Columbia	RM 111-118	112.99	100-yr	Existing_SF	487957.6	-33.39	29.919		30.15	0.000055	3.835	127415.7	3867.61	0.12
Columbia	RM 111-118	112.62	FEMA 100-year	Existing_FEMA	383707.7	-31.99	32.531		32.68	0.000033	3.142	122491.7	3320.63	0.09
Columbia	RM 111-118	112.62	2-year	Existing_WAR	203384.9	-31.99	18.926		19.02	0.00003	2.512	81078.2	2919.71	0.08
Columbia	RM 111-118	112.62	2-year	Existing_SF	287822.6	-31.99	19.368		19.56	0.000058	3.499	82368.8	2922.01	0.12
Columbia	RM 111-118	112.62	100-yr	Existing_WAR	384317.2	-31.99	33.561		33.71	0.00003	3.061	125914.4	3324.33	0.09
Columbia	RM 111-118	112.62	100-yr	Existing_SF	487957.6	-31.99	29.745		30.03	0.000064	4.316	113367.5	3142.84	0.13
Columbia	RM 111-118	112.1	FEMA 100-year	Existing_FEMA	383707.7	-18.55	32.425		32.59	0.000033	3.283	116885	2987.17	0.09
Columbia	RM 111-118	112.1	2-year	Existing_WAR	203384.9	-18.55	18.822		18.93	0.000037	2.654	76619.9	2934.49	0.09
Columbia	RM 111-118	112.1	2-year	Existing_SF	287822.6	-18.55	19.168		19.38	0.000071	3.707	77634.49	2936.15	0.13
Columbia	RM 111-118	112.1	100-yr	Existing_WAR	384317.2	-18.55	33.463		33.62	0.000031	3.203	119989	2996.13	0.09
Columbia	RM 111-118	112.1	100-yr	Existing_SF	487957.6	-18.55	29.535		29.85	0.000069	4.507	108273.3	2973.11	0.13
Columbia	RM 111-118	111.74	FEMA 100-year	Existing_FEMA	383707.7	-20.51	32.324		32.53	0.000036	3.608	106416.5	2507.69	0.1
Columbia	RM 111-118	111.74	2-year	Existing_WAR	203384.9	-20.51	18.742		18.86	0.000035	2.794	72794.86	2449.63	0.09
Columbia	RM 111-118	111.74	2-year	Existing_SF	287822.6	-20.51	19.01		19.25	0.000067	3.918	73452.93	2450.65	0.13
Columbia	RM 111-118	111.74	100-yr	Existing_WAR	384317.2	-20.51	33.368		33.56	0.000033	3.528	109050.4	2538.47	0.09
Columbia	RM 111-118	111.74	100-yr	Existing_SF	487957.6	-20.51	29.337		29.71	0.000073	4.933	98955.42	2490.49	0.14
Columbia	RM 111-118	111.41	FEMA 100-year	Existing_FEMA	383707.7	-22.27	32.282		32.47	0.000031	3.474	110443.3	2407.15	0.09
Columbia	RM 111-118	111.41	2-year	Existing_WAR	203384.9	-22.27	18.707		18.81	0.000025	2.592	78459.72	2321.55	0.08
Columbia	RM 111-118	111.41	2-year	Existing_SF	287822.6	-22.27	18.942		19.15	0.00005	3.643	79005.82	2322.83	0.11
Columbia	RM 111-118	111.41	100-yr	Existing_WAR	384317.2	-22.27	33.328		33.51	0.000029	3.402	112966.4	2414.67	0.09
Columbia	RM 111-118	111.41	100-yr	Existing_SF	487957.6	-22.27	29.251		29.6	0.000061	4.729	103194.1	2377.28	0.13
Columbia	RM 108-111	111.36	FEMA 100-year	Existing_FEMA	565000	-25.09	32.292	-4.93	32.46	0.000028	3.265	173029.6	4385.2	0.09
Columbia	RM 108-111	111.36	2-year	Existing_WAR	278000	-25.09	18.711	-10.18	18.8	0.000027	2.436	114119.2	4294.36	0.08
Columbia	RM 108-111	111.36	2-year	Existing_SF	397000	-25.09	18.949	-7.92	19.13	0.000053	3.448	115139.3	4296.04	0.12
Columbia	RM 108-111	111.36	100-yr	Existing_WAR	566000	-25.09	33.339	-4.91	33.5	0.000026	3.186	177630	4406.51	0.09
Columbia	RM 108-111	111.36	100-yr	Existing_SF	711000.1	-25.09	29.27	-2.62	29.58	0.000058	4.449	159817.6	4358.87	0.13
Columbia	RM 108-111	110.9	FEMA 100-year	Existing_FEMA	565000	-28.34	32.192	-6.29	32.39	0.00003	3.612	158691.2	4066.72	0.1
Columbia	RM 108-111	110.9	2-year	Existing_WAR	278000	-28.34	18.644	-11.45	18.75	0.000024	2.571	108607.5	3607.41	0.08

Columbia	RM 108-111	110.9	2-year	Existing_SF	397000	-28.34	18.813	-8.95	19.02	0.000049	3.652	109218	3607.7	0.12
Columbia	RM 108-111	110.9	100-yr	Existing_WAR	566000	-28.34	33.244	-6.27	33.44	0.000027	3.532	162902.4	4086.28	0.09
Columbia	RM 108-111	110.9	100-yr	Existing_SF	711000.1	-28.34	29.075	-4.16	29.45	0.00006	4.896	146369.8	3940.4	0.13
Columbia	RM 108-111	110.74	FEMA 100-year	Existing_FEMA	565000	-26.28	32.166	-5.01	32.37	0.00003	3.602	158224.7	3714	0.1
Columbia	RM 108-111	110.74	2-year	Existing_WAR	278000	-26.28	18.623	-10.92	18.72	0.000024	2.566	108601.4	3613.84	0.08
Columbia	RM 108-111	110.74	2-year	Existing_SF	397000	-26.28	18.77	-7.6	18.98	0.000049	3.646	109134.9	3614.81	0.12
Columbia	RM 108-111	110.74	100-yr	Existing_WAR	566000	-26.28	33.22	-4.99	33.41	0.000027	3.523	162145	3722.58	0.09
Columbia	RM 108-111	110.74	100-yr	Existing_SF	711000.1	-26.28	29.023	-2.95	29.39	0.00006	4.884	146582.9	3689.4	0.13
Columbia	RM 108-111	110.56	FEMA 100-year	Existing_FEMA	565000	-33.18	32.15	-7.54	32.34	0.000028	3.462	164775.4	3903.66	0.09
Columbia	RM 108-111	110.56	2-year	Existing_WAR	278000	-33.18	18.605	-14.6	18.7	0.000023	2.474	112691.1	3776.88	0.08
Columbia	RM 108-111	110.56	2-year	Existing_SF	397000	-33.18	18.735	-11.29	18.93	0.000046	3.517	113181.8	3777.83	0.11
Columbia	RM 108-111	110.56	100-yr	Existing_WAR	566000	-33.18	33.206	-7.54	33.38	0.000025	3.386	168900.6	3908.75	0.09
Columbia	RM 108-111	110.56	100-yr	Existing_SF	711000.1	-33.18	28.987	-4.8	29.33	0.000056	4.7	152461.1	3879.84	0.13
Columbia	RM 108-111	110.41	FEMA 100-year	Existing_FEMA	565000	-30.49	32.132	-6.26	32.31	0.000028	3.42	167005.3	4024.81	0.09
Columbia	RM 108-111	110.41	2-year	Existing_WAR	278000	-30.49	18.588	-12.62	18.68	0.000024	2.47	113049	3949.36	0.08
Columbia	RM 108-111	110.41	2-year	Existing_SF	397000	-30.49	18.699	-9.65	18.89	0.000048	3.514	113490.8	3949.84	0.11
Columbia	RM 108-111	110.41	100-yr	Existing_WAR	566000	-30.49	33.189	-6.24	33.36	0.000026	3.343	171263.9	4028.31	0.09
Columbia	RM 108-111	110.41	100-yr	Existing_SF	711000.1	-30.49	28.949	-3.76	29.28	0.000057	4.654	154213.8	4009.8	0.13
Columbia	RM 108-111	110.29	FEMA 100-year	Existing_FEMA	565000	-25.9	32.108	-4.2	32.29	0.000029	3.467	164991.2	4148.88	0.09
Columbia	RM 108-111	110.29	2-year	Existing_WAR	278000	-25.9	18.565	-10.62	18.67	0.000027	2.541	109795.1	3983.44	0.08
Columbia	RM 108-111	110.29	2-year	Existing_SF	397000	-25.9	18.654	-7.63	18.86	0.000054	3.618	110148.5	3984.45	0.12
Columbia	RM 108-111	110.29	100-yr	Existing_WAR	566000	-25.9	33.168	-4.18	33.34	0.000027	3.385	169390.7	4154.63	0.09
Columbia	RM 108-111	110.29	100-yr	Existing_SF	711000.1	-25.9	28.898	-1.94	29.24	0.000061	4.736	151700.8	4127.89	0.13
Columbia	RM 108-111	110.12	FEMA 100-year	Existing_FEMA	565000	-25.4	32.086	-3.73	32.27	0.000029	3.419	168014.1	4413.49	0.09
Columbia	RM 108-111	110.12	2-year	Existing_WAR	278000	-25.4	18.542	-9.41	18.64	0.000027	2.531	110267.3	4134.95	0.09
Columbia	RM 108-111	110.12	2-year	Existing_SF	397000	-25.4	18.606	-7.04	18.81	0.000056	3.606	110534.6	4136.67	0.12
Columbia	RM 108-111	110.12	100-yr	Existing_WAR	566000	-25.4	33.148	-3.69	33.32	0.000027	3.336	172708.4	4429.98	0.09
Columbia	RM 108-111	110.12	100-yr	Existing_SF	711000.1	-25.4	28.85	-1.18	29.19	0.000061	4.679	153853.6	4292.92	0.13
Columbia	RM 108-111	109.96	FEMA 100-year	Existing_FEMA	565000	-44.08	32.082	-6.28	32.24	0.000024	3.146	181728	4603.85	0.09
Columbia	RM 108-111	109.96	2-year	Existing_WAR	278000	-44.08	18.533	-13.55	18.62	0.000022	2.304	121061.6	4402.52	0.08
Columbia	RM 108-111	109.96	2-year	Existing_SF	397000	-44.08	18.588	-9.9	18.76	0.000045	3.284	121305.9	4402.98	0.11
Columbia	RM 108-111	109.96	100-yr	Existing_WAR	566000	-44.08	33.145	-6.27	33.29	0.000022	3.072	186636.4	4651.71	0.08
Columbia	RM 108-111	109.96	100-yr	Existing_SF	711000.1	-44.08	28.839	-4.07	29.12	0.000051	4.298	166948.8	4527.03	0.12
Columbia	RM 108-111	109.79	FEMA 100-year	Existing_FEMA	565000	-26.5	32.057	-2.85	32.21	0.000025	3.173	180708.4	4895.86	0.09
Columbia	RM 108-111	109.79	2-year	Existing_WAR	278000	-26.5	18.513	-9.49	18.6	0.000022	2.311	120529.9	4331.05	0.08
Columbia	RM 108-111	109.79	2-year	Existing_SF	397000	-26.5	18.547	-6.85	18.72	0.000045	3.297	120679.5	4331.49	0.11
Columbia	RM 108-111	109.79	100-yr	Existing_WAR	566000	-26.5	33.122	-2.77	33.27	0.000023	3.098	185917.3	4964.94	0.08
Columbia	RM 108-111	109.79	100-yr	Existing_SF	711000.1	-26.5	28.788	-0.99	29.08	0.000051	4.332	165665.3	4489.71	0.12
Columbia	RM 108-111	109.6	FEMA 100-year	Existing_FEMA	565000	-24.71	32.023	-4.6	32.19	0.000026	3.274	182710.2	5901.57	0.09

Columbia	RM 108-111	109.6	2-year	Existing_WAR	278000	-24.71	18.481	-9.72	18.57	0.000024	2.419	115525.7	4892.33	0.08
Columbia	RM 108-111	109.6	2-year	Existing_SF	397000	-24.71	18.481	-7.4	18.67	0.000049	3.454	115528.9	4892.37	0.11
Columbia	RM 108-111	109.6	100-yr	Existing_WAR	566000	-24.71	33.09	-4.58	33.25	0.000024	3.191	189032.5	5934.56	0.09
Columbia	RM 108-111	109.6	100-yr	Existing_SF	711000.1	-24.71	28.715	-2.43	29.02	0.000055	4.486	165724	5565.11	0.13
Columbia	RM 108-111	109.43	FEMA 100-year	Existing_FEMA	565000	-42.31	32.01	-4.37	32.16	0.000024	3.127	189929.2	5174.53	0.09
Columbia	RM 108-111	109.43	2-year	Existing_WAR	278000	-42.31	18.465	-10.6	18.55	0.000023	2.325	121925.8	4880.28	0.08
Columbia	RM 108-111	109.43	2-year	Existing_SF	397000	-42.31	18.448	-8.2	18.62	0.000047	3.322	121849.1	4879.19	0.11
Columbia	RM 108-111	109.43	100-yr	Existing_WAR	566000	-42.31	33.079	-4.36	33.22	0.000022	3.049	195462.1	5204.71	0.08
Columbia	RM 108-111	109.43	100-yr	Existing_SF	711000.1	-42.31	28.685	-2.63	28.97	0.000051	4.295	172967.8	5091.38	0.12
Columbia	RM 108-111	109.28	FEMA 100-year	Existing_FEMA	565000	-21.93	31.98	-3.74	32.14	0.000026	3.229	182964.1	5087.87	0.09
Columbia	RM 108-111	109.28	2-year	Existing_WAR	278000	-21.93	18.439	-8.65	18.53	0.000025	2.412	115929.3	4785.58	0.08
Columbia	RM 108-111	109.28	2-year	Existing_SF	397000	-21.93	18.396	-6.06	18.58	0.000051	3.45	115742.2	4779.31	0.12
Columbia	RM 108-111	109.28	100-yr	Existing_WAR	566000	-21.93	33.051	-3.72	33.2	0.000024	3.147	188439.6	5137.4	0.09
Columbia	RM 108-111	109.28	100-yr	Existing_SF	711000.1	-21.93	28.623	-1.89	28.92	0.000055	4.443	166099.5	5001.18	0.13
Columbia	RM 108-111	109.11	FEMA 100-year	Existing_FEMA	565000	-21.44	31.945	-4.62	32.1	0.000079	3.152	180931	5797.72	0.09
Columbia	RM 108-111	109.11	2-year	Existing_WAR	278000	-21.44	18.406	-8.96	18.49	0.000074	2.328	119593.7	4388.5	0.08
Columbia	RM 108-111	109.11	2-year	Existing_SF	397000	-21.44	18.329	-7.07	18.5	0.000151	3.333	119252.6	4387.53	0.11
Columbia	RM 108-111	109.11	100-yr	Existing_WAR	566000	-21.44	33.019	-4.61	33.16	0.000073	3.072	186032.6	6192.08	0.08
Columbia	RM 108-111	109.11	100-yr	Existing_SF	711000.1	-21.44	28.547	-2.67	28.84	0.000169	4.34	164904.9	4683.44	0.12
Columbia	RM 108-111	108.93	FEMA 100-year	Existing_FEMA	565000	-25.31	31.908	-5.92	32.06	0.000024	3.141	181927.3	5468.58	0.09
Columbia	RM 108-111	108.93	2-year	Existing_WAR	278000	-25.31	18.375	-10.08	18.46	0.000021	2.28	122045.9	4290.62	0.07
Columbia	RM 108-111	108.93	2-year	Existing_SF	397000	-25.31	18.263	-8.22	18.43	0.000043	3.269	121567.4	4289.01	0.11
Columbia	RM 108-111	108.93	100-yr	Existing_WAR	566000	-25.31	32.984	-5.91	33.13	0.000022	3.067	187096.1	5931.62	0.08
Columbia	RM 108-111	108.93	100-yr	Existing_SF	711000.1	-25.31	28.47	-4.16	28.76	0.00005	4.306	166307.6	4431.15	0.12
Columbia	RM 108-111	108.8	FEMA 100-year	Existing_FEMA	565000	-20.36	31.875	-3.78	32.04	0.000027	3.292	174322.4	5309	0.09
Columbia	RM 108-111	108.8	2-year	Existing_WAR	278000	-20.36	18.348	-7.8	18.44	0.000025	2.425	114992.3	4239.48	0.08
Columbia	RM 108-111	108.8	2-year	Existing_SF	397000	-20.36	18.208	-5.98	18.4	0.000051	3.481	114397.7	4237.75	0.12
Columbia	RM 108-111	108.8	100-yr	Existing_WAR	566000	-20.36	32.954	-3.77	33.11	0.000025	3.211	179774.8	5665.97	0.09
Columbia	RM 108-111	108.8	100-yr	Existing_SF	711000.1	-20.36	28.401	-2.08	28.72	0.000057	4.536	158324.7	4412.3	0.13
Columbia	RM 108-111	108.65	FEMA 100-year	Existing_FEMA	565000	-20.65	31.844	-2.21	32.02	0.000028	3.371	169469.6	5058.57	0.09
Columbia	RM 108-111	108.65	2-year	Existing_WAR	278000	-20.65	18.324	-6.02	18.42	0.000026	2.478	112589.1	4134.9	0.08
Columbia	RM 108-111	108.65	2-year	Existing_SF	397000	-20.65	18.156	-4.2	18.35	0.000054	3.561	111897.6	4133.03	0.12
Columbia	RM 108-111	108.65	100-yr	Existing_WAR	566000	-20.65	32.925	-2.2	33.09	0.000026	3.288	175057.9	5329.83	0.09
Columbia	RM 108-111	108.65	100-yr	Existing_SF	711000.1	-20.65	28.337	-0.65	28.67	0.00006	4.642	154319.2	4274.8	0.13
Columbia	RM 102.5-108	108.31	FEMA 100-year	Existing_FEMA	471909.5	-34.94	31.745		31.95	0.00003	3.649	129841.8	3281.93	0.1
Columbia	RM 102.5-108	108.31	2-year	Existing_WAR	238367	-34.94	18.252		18.36	0.000025	2.646	90190.98	3019.24	0.08
Columbia	RM 102.5-108	108.31	2-year	Existing_SF	340333.6	-34.94	18.006		18.23	0.000053	3.808	89474.4	3016.85	0.12
Columbia	RM 102.5-108	108.31	100-yr	Existing_WAR	471208.6	-34.94	32.834		33.03	0.000028	3.556	133347.7	3780.32	0.09
Columbia	RM 102.5-108	108.31	100-yr	Existing_SF	596878.1	-34.94	28.136		28.53	0.000064	5.023	119090.5	3041.55	0.14

Columbia	RM 102.5-108	108.07	FEMA 100-year	Existing_FEMA	471909.5	-33.64	31.723		31.93	0.000028	3.621	130657.8	3576.57	0.09
Columbia	RM 102.5-108	108.07	2-year	Existing_WAR	238367	-33.64	18.235		18.34	0.000023	2.585	92329	3473.74	0.08
Columbia	RM 102.5-108	108.07	2-year	Existing_SF	340333.6	-33.64	17.971		18.19	0.000047	3.72	91581.19	3472.82	0.11
Columbia	RM 102.5-108	108.07	100-yr	Existing_WAR	471208.6	-33.64	32.813		33.01	0.000026	3.532	133847.1	3746.1	0.09
Columbia	RM 102.5-108	108.07	100-yr	Existing_SF	596878.1	-33.64	28.09		28.47	0.000059	4.973	120299.4	3525.34	0.13
Columbia	RM 102.5-108	107.92	FEMA 100-year	Existing_FEMA	471909.5	-30.28	31.694		31.9	0.000029	3.684	129223.9	4051.14	0.1
Columbia	RM 102.5-108	107.92	2-year	Existing_WAR	238367	-30.28	18.213		18.32	0.000024	2.636	90719.73	3629.75	0.08
Columbia	RM 102.5-108	107.92	2-year	Existing_SF	340333.6	-30.28	17.924		18.15	0.000049	3.798	89904.57	3627.59	0.12
Columbia	RM 102.5-108	107.92	100-yr	Existing_WAR	471208.6	-30.28	32.786		32.99	0.000027	3.592	132430.5	4169.38	0.09
Columbia	RM 102.5-108	107.92	100-yr	Existing_SF	596878.1	-30.28	28.029		28.43	0.000061	5.067	118611.3	3815.4	0.14
Columbia	RM 102.5-108	107.79	FEMA 100-year	Existing_FEMA	471909.5	-32.76	31.691		31.88	0.000023	3.477	136431.3	3934.16	0.09
Columbia	RM 102.5-108	107.79	2-year	Existing_WAR	238367	-32.76	18.211		18.3	0.000017	2.411	99097.04	3625.36	0.07
Columbia	RM 102.5-108	107.79	2-year	Existing_SF	340333.6	-32.76	17.92		18.11	0.000036	3.471	98295.86	3624.12	0.1
Columbia	RM 102.5-108	107.79	100-yr	Existing_WAR	471208.6	-32.76	32.784		32.96	0.000022	3.397	139499.7	4143.46	0.08
Columbia	RM 102.5-108	107.79	100-yr	Existing_SF	596878.1	-32.76	28.024		28.37	0.000048	4.748	126222.5	3830.5	0.12
Columbia	RM 102.5-108	107.7	FEMA 100-year	Existing_FEMA	471909.5	-31.36	31.698		31.86	0.000021	3.251	147156.5	3880.25	0.08
Columbia	RM 102.5-108	107.7	2-year	Existing_WAR	238367	-31.36	18.211		18.29	0.000015	2.276	105591.6	3630.38	0.07
Columbia	RM 102.5-108	107.7	2-year	Existing_SF	340333.6	-31.36	17.919		18.09	0.000032	3.277	104702.2	3626.4	0.1
Columbia	RM 102.5-108	107.7	100-yr	Existing_WAR	471208.6	-31.36	32.791		32.95	0.000019	3.174	150556.9	3886.76	0.08
Columbia	RM 102.5-108	107.7	100-yr	Existing_SF	596878.1	-31.36	28.034		28.34	0.000043	4.45	135782.7	3859.54	0.12
Columbia	RM 102.5-108	107.65	FEMA 100-year	Existing_FEMA	471909.5	-28.56	31.694		31.85	0.000021	3.23	147909.1	3604.96	0.08
Columbia	RM 102.5-108	107.65	2-year	Existing_WAR	238367	-28.56	18.206		18.29	0.000016	2.274	105476.8	3401.04	0.07
Columbia	RM 102.5-108	107.65	2-year	Existing_SF	340333.6	-28.56	17.91		18.08	0.000034	3.275	104554.4	3397.72	0.1
Columbia	RM 102.5-108	107.65	100-yr	Existing_WAR	471208.6	-28.56	32.787		32.94	0.000019	3.152	151377.3	3617.6	0.08
Columbia	RM 102.5-108	107.65	100-yr	Existing_SF	596878.1	-28.56	28.023		28.33	0.000044	4.427	136284.5	3559.74	0.12
Columbia	RM 102.5-108	107.52	FEMA 100-year	Existing_FEMA	471909.5	-29.25	31.682		31.84	0.00002	3.197	148853.9	4081.69	0.08
Columbia	RM 102.5-108	107.52	2-year	Existing_WAR	238367	-29.25	18.198		18.28	0.000015	2.231	107097.1	3767.58	0.07
Columbia	RM 102.5-108	107.52	2-year	Existing_SF	340333.6	-29.25	17.893		18.05	0.000032	3.212	106165.1	3749.2	0.1
Columbia	RM 102.5-108	107.52	100-yr	Existing_WAR	471208.6	-29.25	32.776		32.93	0.000019	3.121	152281.4	4123.5	0.08
Columbia	RM 102.5-108	107.52	100-yr	Existing_SF	596878.1	-29.25	28		28.3	0.000042	4.375	137326.2	3946.77	0.11
Columbia	RM 102.5-108	107.37	FEMA 100-year	Existing_FEMA	471909.5	-26.07	31.679		31.82	0.000018	3.001	157817.7	4352.67	0.08
Columbia	RM 102.5-108	107.37	2-year	Existing_WAR	238367	-26.07	18.191		18.26	0.000014	2.115	112850.4	4187.44	0.06
Columbia	RM 102.5-108	107.37	2-year	Existing_SF	340333.6	-26.07	17.878		18.02	0.00003	3.047	111810.5	4185.22	0.09
Columbia	RM 102.5-108	107.37	100-yr	Existing_WAR	471208.6	-26.07	32.774		32.91	0.000017	2.929	161544.2	4437.43	0.07
Columbia	RM 102.5-108	107.37	100-yr	Existing_SF	596878.1	-26.07	27.99		28.25	0.000039	4.114	145478.5	4228.26	0.11
Columbia	RM 102.5-108	107.25	FEMA 100-year	Existing_FEMA	471909.5	-26.66	31.662		31.81	0.000019	3.059	155187.8	3596.38	0.08
Columbia	RM 102.5-108	107.25	2-year	Existing_WAR	238367	-26.66	18.181		18.25	0.000014	2.147	111325.5	3227.56	0.06
Columbia	RM 102.5-108	107.25	2-year	Existing_SF	340333.6	-26.66	17.856		18	0.00003	3.094	110276.8	3226.6	0.09
Columbia	RM 102.5-108	107.25	100-yr	Existing_WAR	471208.6	-26.66	32.758		32.9	0.000017	2.986	158834.8	3643.25	0.07
Columbia	RM 102.5-108	107.25	100-yr	Existing_SF	596878.1	-26.66	27.956		28.23	0.000039	4.193	143023.2	3449.24	0.11

Columbia	RM 102.5-108	107.14	FEMA 100-year	Existing_FEMA	471909.5	-26.24	31.641		31.79	0.00002	3.145	150731.8	3240.24	0.08
Columbia	RM 102.5-108	107.14	2-year	Existing_WAR	238367	-26.24	18.167		18.24	0.000015	2.209	108011	3144.76	0.07
Columbia	RM 102.5-108	107.14	2-year	Existing_SF	340333.6	-26.24	17.827		17.98	0.000032	3.185	106941.3	3143.25	0.1
Columbia	RM 102.5-108	107.14	100-yr	Existing_WAR	471208.6	-26.24	32.738		32.88	0.000019	3.07	154264.1	3305.13	0.08
Columbia	RM 102.5-108	107.14	100-yr	Existing_SF	596878.1	-26.24	27.913		28.2	0.000042	4.314	138846.5	3180.89	0.11
Columbia	RM 102.5-108	107.03	FEMA 100-year	Existing_FEMA	471909.5	-26.41	31.614		31.78	0.000022	3.278	144317.5	3073.73	0.08
Columbia	RM 102.5-108	107.03	2-year	Existing_WAR	238367	-26.41	18.15		18.23	0.000017	2.303	103515.6	3007.34	0.07
Columbia	RM 102.5-108	107.03	2-year	Existing_SF	340333.6	-26.41	17.792		17.96	0.000035	3.323	102437.1	3005.9	0.1
Columbia	RM 102.5-108	107.03	100-yr	Existing_WAR	471208.6	-26.41	32.713		32.87	0.00002	3.2	147711.6	3212.98	0.08
Columbia	RM 102.5-108	107.03	100-yr	Existing_SF	596878.1	-26.41	27.859		28.17	0.000046	4.5	132876.1	3039.39	0.12
Columbia	RM 102.5-108	106.94	FEMA 100-year	Existing_FEMA	471909.5	-25.02	31.596		31.77	0.000023	3.344	141978.2	3141.81	0.08
Columbia	RM 102.5-108	106.94	2-year	Existing_WAR	238367	-25.02	18.139		18.22	0.000017	2.344	101874.3	2938.36	0.07
Columbia	RM 102.5-108	106.94	2-year	Existing_SF	340333.6	-25.02	17.768		17.95	0.000036	3.382	100784.1	2937.79	0.1
Columbia	RM 102.5-108	106.94	100-yr	Existing_WAR	471208.6	-25.02	32.696		32.86	0.000021	3.265	145531.6	3372.27	0.08
Columbia	RM 102.5-108	106.94	100-yr	Existing_SF	596878.1	-25.02	27.823		28.15	0.000047	4.59	130463.5	2971.93	0.12
Columbia	RM 102.5-108	106.89	FEMA 100-year	Existing_FEMA	471909.5	-24.51	31.585		31.76	0.000023	3.402	139478.5	3082.52	0.09
Columbia	RM 102.5-108	106.89	2-year	Existing_WAR	238367	-24.51	18.132		18.22	0.000017	2.38	100409.3	2880.79	0.07
Columbia	RM 102.5-108	106.89	2-year	Existing_SF	340333.6	-24.51	17.754		17.94	0.000037	3.435	99318.42	2880.08	0.1
Columbia	RM 102.5-108	106.89	100-yr	Existing_WAR	471208.6	-24.51	32.685		32.86	0.000021	3.32	142953.6	3304.54	0.08
Columbia	RM 102.5-108	106.89	100-yr	Existing_SF	596878.1	-24.51	27.8		28.14	0.000049	4.67	128359.4	2912.46	0.12
Columbia	RM 102.5-108	106.85	FEMA 100-year	Existing_FEMA	471909.5	-23.83	31.567		31.76	0.000025	3.503	135308.6	2899.33	0.09
Columbia	RM 102.5-108	106.85	2-year	Existing_WAR	238367	-23.83	18.122		18.22	0.000019	2.449	97520.12	2797.45	0.07
Columbia	RM 102.5-108	106.85	2-year	Existing_SF	340333.6	-23.83	17.733		17.93	0.000039	3.536	96430.07	2796.7	0.11
Columbia	RM 102.5-108	106.85	100-yr	Existing_WAR	471208.6	-23.83	32.668		32.85	0.000023	3.422	138507.8	3157.79	0.09
Columbia	RM 102.5-108	106.85	100-yr	Existing_SF	596878.1	-23.83	27.766		28.12	0.000052	4.809	124583	2816.27	0.13
Columbia	RM 102.5-108	106.81	FEMA 100-year	Existing_FEMA	471909.5	-24.75	31.561		31.75	0.000025	3.512	134890.4	2938.6	0.09
Columbia	RM 102.5-108	106.81	2-year	Existing_WAR	238367	-24.75	18.118		18.21	0.000019	2.455	97156.8	2785.53	0.07
Columbia	RM 102.5-108	106.81	2-year	Existing_SF	340333.6	-24.75	17.723		17.92	0.00004	3.545	96057.53	2783.88	0.11
Columbia	RM 102.5-108	106.81	100-yr	Existing_WAR	471208.6	-24.75	32.662		32.84	0.000023	3.43	138144.1	3103.73	0.09
Columbia	RM 102.5-108	106.81	100-yr	Existing_SF	596878.1	-24.75	27.752		28.11	0.000052	4.822	124150.2	2815.06	0.13
Columbia	RM 102.5-108	106.78	FEMA 100-year	Existing_FEMA	471909.5	-26.88	31.56	-9.2	31.75	0.000024	3.487	136560.2	3100.22	0.09
Columbia	RM 102.5-108	106.78	2-year	Existing_WAR	238367	-26.88	18.116	-13.42	18.21	0.000018	2.438	97903.9	2794.63	0.07
Columbia	RM 102.5-108	106.78	2-year	Existing_SF	340333.6	-26.88	17.72	-11.45	17.91	0.000039	3.521	96795.94	2793.9	0.1
Columbia	RM 102.5-108	106.78	100-yr	Existing_WAR	471208.6	-26.88	32.661	-9.21	32.84	0.000022	3.403	139818.6	3113.49	0.08
Columbia	RM 102.5-108	106.78	100-yr	Existing_SF	596878.1	-26.88	27.749	-7.28	28.1	0.000051	4.792	125333.8	3040.38	0.13
Columbia	RM 102.5-108	106.76			Bridge									
Columbia	RM 102.5-108	106.73	FEMA 100-year	Existing_FEMA	471909.5	-39.39	31.525		31.73	0.000026	3.613	133006.9	2952.25	0.09
Columbia	RM 102.5-108	106.73	2-year	Existing_WAR	238367	-39.39	18.097		18.2	0.000019	2.521	94716.16	2725.2	0.07

Columbia	RM 102.5-108	106.73	2-year	Existing_SF	340333.6	-39.39	17.678		17.88	0.000041	3.643	93577.99	2715.23	0.11
Columbia	RM 102.5-108	106.73	100-yr	Existing_WAR	471208.6	-39.39	32.628		32.82	0.000024	3.527	136272.6	3051.26	0.09
Columbia	RM 102.5-108	106.73	100-yr	Existing_SF	596878.1	-39.39	27.68		28.06	0.000055	4.966	121693	2928.46	0.13
Columbia	RM 102.5-108	106.67	FEMA 100-year	Existing_FEMA	471909.5	-31.62	31.507		31.71	0.000059	3.637	130350.5	2627.17	0.09
Columbia	RM 102.5-108	106.67	2-year	Existing_WAR	238367	-31.62	18.088		18.18	0.000042	2.498	95481.2	2573.12	0.07
Columbia	RM 102.5-108	106.67	2-year	Existing_SF	340333.6	-31.62	17.659		17.86	0.000088	3.608	94379.27	2571.77	0.1
Columbia	RM 102.5-108	106.67	100-yr	Existing_WAR	471208.6	-31.62	32.611		32.81	0.000054	3.554	133254.9	2672.81	0.09
Columbia	RM 102.5-108	106.67	100-yr	Existing_SF	596878.1	-31.62	27.647		28.03	0.000122	4.979	120245.5	2609.38	0.13
Columbia	RM 102.5-108	106.62	FEMA 100-year	Existing_FEMA	471909.5	-29.68	31.484		31.7	0.000035	3.734	128639.4	2723.81	0.09
Columbia	RM 102.5-108	106.62	2-year	Existing_WAR	238367	-29.68	18.075		18.18	0.000025	2.56	93730.14	2571.75	0.07
Columbia	RM 102.5-108	106.62	2-year	Existing_SF	340333.6	-29.68	17.632		17.84	0.000053	3.699	92591.45	2569.66	0.11
Columbia	RM 102.5-108	106.62	100-yr	Existing_WAR	471208.6	-29.68	32.59		32.8	0.000033	3.649	131551.3	2740.98	0.09
Columbia	RM 102.5-108	106.62	100-yr	Existing_SF	596878.1	-29.68	27.602		28.01	0.000073	5.113	118454.8	2676.29	0.13
Columbia	RM 102.5-108	106.57	FEMA 100-year	Existing_FEMA	471909.5	-34.54	31.476		31.68	0.000083	3.67	129249.6	2740.92	0.09
Columbia	RM 102.5-108	106.57	2-year	Existing_WAR	238367	-34.54	18.068		18.17	0.000059	2.514	94935.2	2527.74	0.07
Columbia	RM 102.5-108	106.57	2-year	Existing_SF	340333.6	-34.54	17.617		17.82	0.000124	3.633	93795.78	2525.48	0.1
Columbia	RM 102.5-108	106.57	100-yr	Existing_WAR	471208.6	-34.54	32.582		32.78	0.000077	3.586	132118.2	2775.84	0.09
Columbia	RM 102.5-108	106.57	100-yr	Existing_SF	596878.1	-34.54	27.583		27.98	0.000174	5.026	119193.3	2575.79	0.13
Columbia	RM 102.5-108	106.51	FEMA 100-year	Existing_FEMA	471909.5	-37.18	31.452		31.67	0.000028	3.749	126903.4	3291.23	0.09
Columbia	RM 102.5-108	106.51	2-year	Existing_WAR	238367	-37.18	18.051		18.16	0.00002	2.6	91961.86	2588.49	0.08
Columbia	RM 102.5-108	106.51	2-year	Existing_SF	340333.6	-37.18	17.58		17.8	0.000043	3.762	90744.77	2587.18	0.11
Columbia	RM 102.5-108	106.51	100-yr	Existing_WAR	471208.6	-37.18	32.561		32.77	0.000026	3.662	129820.2	3466.94	0.09
Columbia	RM 102.5-108	106.51	100-yr	Existing_SF	596878.1	-37.18	27.534		27.95	0.000058	5.152	116633.8	2618.7	0.13
Columbia	RM 102.5-108	106.38	FEMA 100-year	Existing_FEMA	471909.5	-30.62	31.409		31.65	0.000028	3.942	120619.9	2433.67	0.1
Columbia	RM 102.5-108	106.38	2-year	Existing_WAR	238367	-30.62	18.03		18.14	0.000019	2.682	89206.29	2329.75	0.08
Columbia	RM 102.5-108	106.38	2-year	Existing_SF	340333.6	-30.62	17.537		17.77	0.000041	3.878	88058.17	2328.34	0.11
Columbia	RM 102.5-108	106.38	100-yr	Existing_WAR	471208.6	-30.62	32.519		32.75	0.000026	3.854	123298.3	3054.7	0.09
Columbia	RM 102.5-108	106.38	100-yr	Existing_SF	596878.1	-30.62	27.451		27.9	0.000059	5.398	111269.4	2355.24	0.14
Columbia	RM 102.5-108	106.26	FEMA 100-year	Existing_FEMA	471909.5	-24.14	31.343		31.63	0.000035	4.267	111567.9	2313.13	0.11
Columbia	RM 102.5-108	106.26	2-year	Existing_WAR	238367	-24.14	17.992		18.13	0.000025	2.934	81490.91	2228.7	0.08
Columbia	RM 102.5-108	106.26	2-year	Existing_SF	340333.6	-24.14	17.455		17.74	0.000053	4.251	80295.27	2227.18	0.12
Columbia	RM 102.5-108	106.26	100-yr	Existing_WAR	471208.6	-24.14	32.457		32.73	0.000032	4.169	114258.1	2719.26	0.1
Columbia	RM 102.5-108	106.26	100-yr	Existing_SF	596878.1	-24.14	27.318		27.85	0.000073	5.867	102431.3	2261.22	0.15
Columbia	RM 102.5-108	106.16	FEMA 100-year	Existing_FEMA	471909.5	-24.93	31.315		31.61	0.000034	4.325	109704.2	2152.16	0.11
Columbia	RM 102.5-108	106.16	2-year	Existing_WAR	238367	-24.93	17.979		18.11	0.000023	2.932	81416.7	2102.26	0.08
Columbia	RM 102.5-108	106.16	2-year	Existing_SF	340333.6	-24.93	17.427		17.71	0.000049	4.246	80257.84	2100.85	0.12
Columbia	RM 102.5-108	106.16	100-yr	Existing_WAR	471208.6	-24.93	32.43		32.71	0.000032	4.229	112108.5	2172.95	0.1
Columbia	RM 102.5-108	106.16	100-yr	Existing_SF	596878.1	-24.93	27.265		27.81	0.000071	5.931	101048.6	2126.41	0.15
Columbia	RM 102.5-108	106.05	FEMA 100-year	Existing_FEMA	471909.5	-30.31	31.313		31.58	0.000031	4.162	114984.6	3141.7	0.1

Columbia	RM 102.5-108	106.05	2-year	Existing_WAR	238367	-30.31	17.974		18.1	0.000021	2.811	85118.38	2706.74	0.08
Columbia	RM 102.5-108	106.05	2-year	Existing_SF	340333.6	-30.31	17.418		17.68	0.000044	4.071	83899.61	2703.17	0.11
Columbia	RM 102.5-108	106.05	100-yr	Existing_WAR	471208.6	-30.31	32.429		32.69	0.000029	4.068	118331.6	3178.77	0.1
Columbia	RM 102.5-108	106.05	100-yr	Existing_SF	596878.1	-30.31	27.257		27.76	0.000065	5.701	105570.7	2765.33	0.14
Columbia	RM 102.5-108	105.96	FEMA 100-year	Existing_FEMA	471909.5	-33.26	31.323		31.56	0.000027	3.888	123299	2579.09	0.09
Columbia	RM 102.5-108	105.96	2-year	Existing_WAR	238367	-33.26	17.976		18.08	0.000018	2.628	90989.29	2338.06	0.07
Columbia	RM 102.5-108	105.96	2-year	Existing_SF	340333.6	-33.26	17.42		17.65	0.000039	3.805	89691.5	2335.82	0.11
Columbia	RM 102.5-108	105.96	100-yr	Existing_WAR	471208.6	-33.26	32.438		32.66	0.000025	3.802	126134.5	2766.76	0.09
Columbia	RM 102.5-108	105.96	100-yr	Existing_SF	596878.1	-33.26	27.273		27.71	0.000056	5.328	113221.5	2457.98	0.13
Columbia	RM 102.5-108	105.91	FEMA 100-year	Existing_FEMA	471909.5	-34.34	31.322		31.55	0.000025	3.816	124720.8	2750.34	0.09
Columbia	RM 102.5-108	105.91	2-year	Existing_WAR	238367	-34.34	17.975		18.08	0.000016	2.559	93351.72	2325.01	0.07
Columbia	RM 102.5-108	105.91	2-year	Existing_SF	340333.6	-34.34	17.419		17.63	0.000035	3.704	92059.58	2320.99	0.1
Columbia	RM 102.5-108	105.91	100-yr	Existing_WAR	471208.6	-34.34	32.438		32.65	0.000023	3.734	127366.9	2926.77	0.09
Columbia	RM 102.5-108	105.91	100-yr	Existing_SF	596878.1	-34.34	27.271		27.69	0.000052	5.219	115151.6	2549.53	0.13
Columbia	RM 102.5-108	105.9	FEMA 100-year	Existing_FEMA	471909.5	-34.17	31.321	-15.36	31.54	0.000024	3.8	125177.1	2722.47	0.09
Columbia	RM 102.5-108	105.9	2-year	Existing_WAR	238367	-34.17	17.975	-20.7	18.07	0.000016	2.535	94208.38	2286.98	0.07
Columbia	RM 102.5-108	105.9	2-year	Existing_SF	340333.6	-34.17	17.419	-18.11	17.63	0.000033	3.669	92937.2	2283.73	0.1
Columbia	RM 102.5-108	105.9	100-yr	Existing_WAR	471208.6	-34.17	32.437	-15.38	32.65	0.000023	3.719	127830.1	2956.11	0.09
Columbia	RM 102.5-108	105.9	100-yr	Existing_SF	596878.1	-34.17	27.27	-13.01	27.69	0.00005	5.191	115698.6	2590.92	0.13
Columbia	RM 102.5-108	105.88			Bridge									
Columbia	RM 102.5-108	105.85	FEMA 100-year	Existing_FEMA	471909.5	-44.88	31.313		31.51	0.00002	3.557	133456.6	3940.2	0.08
Columbia	RM 102.5-108	105.85	2-year	Existing_WAR	238367	-44.88	17.972		18.06	0.000012	2.33	102377.8	2296.03	0.06
Columbia	RM 102.5-108	105.85	2-year	Existing_SF	340333.6	-44.88	17.411		17.59	0.000026	3.368	101092.3	2292.19	0.09
Columbia	RM 102.5-108	105.85	100-yr	Existing_WAR	471208.6	-44.88	32.429		32.62	0.000019	3.484	136119.4	4202.77	0.08
Columbia	RM 102.5-108	105.85	100-yr	Existing_SF	596878.1	-44.88	27.254		27.62	0.000041	4.836	123903.8	2801.74	0.12
Columbia	RM 102.5-108	105.84	FEMA 100-year	Existing_FEMA	471909.5	-41.24	31.311		31.51	0.00002	3.569	133243.7	3867.84	0.08
Columbia	RM 102.5-108	105.84	2-year	Existing_WAR	238367	-41.24	17.97		18.06	0.000012	2.338	102179.2	2295.87	0.06
Columbia	RM 102.5-108	105.84	2-year	Existing_SF	340333.6	-41.24	17.409		17.59	0.000026	3.379	100890.7	2291.64	0.09
Columbia	RM 102.5-108	105.84	100-yr	Existing_WAR	471208.6	-41.24	32.427		32.62	0.000019	3.496	135882.8	3951.09	0.08
Columbia	RM 102.5-108	105.84	100-yr	Existing_SF	596878.1	-41.24	27.249		27.61	0.00004	4.853	123708.5	3156.19	0.12
Columbia	RM 102.5-108	105.79	FEMA 100-year	Existing_FEMA	471909.5	-42.48	31.3		31.5	0.000021	3.61	131469.4	3828.32	0.08
Columbia	RM 102.5-108	105.79	2-year	Existing_WAR	238367	-42.48	17.964		18.05	0.000013	2.374	100468.9	2419.71	0.06
Columbia	RM 102.5-108	105.79	2-year	Existing_SF	340333.6	-42.48	17.396		17.58	0.000027	3.433	99167.7	2412.38	0.09
Columbia	RM 102.5-108	105.79	100-yr	Existing_WAR	471208.6	-42.48	32.418		32.61	0.00002	3.536	134102.2	3898.59	0.08
Columbia	RM 102.5-108	105.79	100-yr	Existing_SF	596878.1	-42.48	27.228		27.6	0.000043	4.915	121913.1	3523.36	0.12
Columbia	RM 102.5-108	105.74	FEMA 100-year	Existing_FEMA	471909.5	-45.49	31.315		31.49	0.000017	3.357	142951.3	2942.9	0.08
Columbia	RM 102.5-108	105.74	2-year	Existing_WAR	238367	-45.49	17.971		18.05	0.00001	2.178	109532.7	2365.33	0.06
Columbia	RM 102.5-108	105.74	2-year	Existing_SF	340333.6	-45.49	17.41		17.56	0.000021	3.147	108207.2	2360.28	0.08
Columbia	RM 102.5-108	105.74	100-yr	Existing_WAR	471208.6	-45.49	32.431		32.6	0.000016	3.29	146238.1	2944.56	0.07

Columbia	RM 102.5-108	105.74	100-yr	Existing_SF	596878.1	-45.49	27.255		27.58	0.000034	4.555	131805.7	2483.05	0.11
Columbia	RM 102.5-108	105.6	FEMA 100-year	Existing_FEMA	471909.5	-43.52	31.271		31.47	0.000019	3.62	134269.9	2679.05	0.08
Columbia	RM 102.5-108	105.6	2-year	Existing_WAR	238367	-43.52	17.951		18.04	0.000011	2.338	102601.7	2302.08	0.06
Columbia	RM 102.5-108	105.6	2-year	Existing_SF	340333.6	-43.52	17.368		17.54	0.000023	3.378	101267	2259.98	0.09
Columbia	RM 102.5-108	105.6	100-yr	Existing_WAR	471208.6	-43.52	32.39		32.58	0.000018	3.548	137015.2	2694.32	0.08
Columbia	RM 102.5-108	105.6	100-yr	Existing_SF	596878.1	-43.52	27.172		27.54	0.000038	4.91	124318.4	2499.24	0.11
Columbia	RM 102.5-108	105.44	FEMA 100-year	Existing_FEMA	471909.5	-45.02	31.257		31.46	0.000018	3.609	132686.3	2470.47	0.08
Columbia	RM 102.5-108	105.44	2-year	Existing_WAR	238367	-45.02	17.945		18.03	0.00001	2.295	104016.4	2044.51	0.06
Columbia	RM 102.5-108	105.44	2-year	Existing_SF	340333.6	-45.02	17.355		17.53	0.00002	3.313	102813.5	2029.3	0.08
Columbia	RM 102.5-108	105.44	100-yr	Existing_WAR	471208.6	-45.02	32.376		32.57	0.000017	3.541	135154.8	2744.99	0.08
Columbia	RM 102.5-108	105.44	100-yr	Existing_SF	596878.1	-45.02	27.145		27.51	0.000035	4.878	123650.9	2300.9	0.11
Columbia	RM 102.5-108	105.29	FEMA 100-year	Existing_FEMA	471909.5	-42.78	31.235		31.44	0.000021	3.657	130828.2	2493.78	0.08
Columbia	RM 102.5-108	105.29	2-year	Existing_WAR	238367	-42.78	17.933		18.02	0.000012	2.339	102055	2105.88	0.06
Columbia	RM 102.5-108	105.29	2-year	Existing_SF	340333.6	-42.78	17.329		17.51	0.000025	3.379	100815.1	2043.19	0.08
Columbia	RM 102.5-108	105.29	100-yr	Existing_WAR	471208.6	-42.78	32.355		32.55	0.00002	3.587	133312.7	2795.35	0.08
Columbia	RM 102.5-108	105.29	100-yr	Existing_SF	596878.1	-42.78	27.101		27.48	0.000043	4.953	121725.2	2252.2	0.11
Columbia	RM 102.5-108	105.11	FEMA 100-year	Existing_FEMA	471909.5	-42.78	31.217		31.42	0.000023	3.615	132405	3681.16	0.08
Columbia	RM 102.5-108	105.11	2-year	Existing_WAR	238367	-42.78	17.922		18.01	0.000013	2.315	103185.2	2182.63	0.06
Columbia	RM 102.5-108	105.11	2-year	Existing_SF	340333.6	-42.78	17.307		17.48	0.000027	3.347	101862.9	2157.05	0.08
Columbia	RM 102.5-108	105.11	100-yr	Existing_WAR	471208.6	-42.78	32.339		32.53	0.000022	3.546	134907.8	3878.64	0.08
Columbia	RM 102.5-108	105.11	100-yr	Existing_SF	596878.1	-42.78	27.065		27.44	0.000046	4.898	123191.7	2526.58	0.11
Columbia	RM 102.5-108	104.94	FEMA 100-year	Existing_FEMA	471909.5	-42.75	31.213		31.4	0.000017	3.434	138649.3	3478.99	0.08
Columbia	RM 102.5-108	104.94	2-year	Existing_WAR	238367	-42.75	17.917		17.99	0.00001	2.209	108128.2	2255.84	0.06
Columbia	RM 102.5-108	104.94	2-year	Existing_SF	340333.6	-42.75	17.295		17.45	0.000021	3.194	106727.2	2251.45	0.08
Columbia	RM 102.5-108	104.94	100-yr	Existing_WAR	471208.6	-42.75	32.335		32.51	0.000016	3.368	141243.2	3655.3	0.07
Columbia	RM 102.5-108	104.94	100-yr	Existing_SF	596878.1	-42.75	27.053		27.39	0.000035	4.657	129039.5	2775.27	0.11
Columbia	RM 102.5-108	104.78	FEMA 100-year	Existing_FEMA	471909.5	-44.9	31.205		31.38	0.000016	3.354	141727.1	3170.88	0.07
Columbia	RM 102.5-108	104.78	2-year	Existing_WAR	238367	-44.9	17.912		17.98	0.000009	2.156	110789.4	2303.87	0.05
Columbia	RM 102.5-108	104.78	2-year	Existing_SF	340333.6	-44.9	17.285		17.44	0.00002	3.119	109344.8	2300.51	0.08
Columbia	RM 102.5-108	104.78	100-yr	Existing_WAR	471208.6	-44.9	32.328		32.5	0.000015	3.289	144362.2	3332.36	0.07
Columbia	RM 102.5-108	104.78	100-yr	Existing_SF	596878.1	-44.9	27.037		27.36	0.000033	4.549	131973.7	2982.07	0.1
Columbia	RM 102.5-108	104.63	FEMA 100-year	Existing_FEMA	471909.5	-44.53	31.193		31.36	0.000017	3.329	143878.4	2752.04	0.07
Columbia	RM 102.5-108	104.63	2-year	Existing_WAR	238367	-44.53	17.906		17.98	0.00001	2.125	112618.2	2287.75	0.05
Columbia	RM 102.5-108	104.63	2-year	Existing_SF	340333.6	-44.53	17.271		17.42	0.00002	3.073	111168.8	2278.73	0.08
Columbia	RM 102.5-108	104.63	100-yr	Existing_WAR	471208.6	-44.53	32.316		32.48	0.000016	3.266	146567.4	3156.36	0.07
Columbia	RM 102.5-108	104.63	100-yr	Existing_SF	596878.1	-44.53	27.013		27.33	0.000035	4.508	133926.7	2370.9	0.1
Columbia	RM 102.5-108	104.47	FEMA 100-year	Existing_FEMA	471909.5	-42.91	31.188		31.35	0.000015	3.225	149545.9	3458.87	0.07
Columbia	RM 102.5-108	104.47	2-year	Existing_WAR	238367	-42.91	17.9		17.97	0.000009	2.085	114753.6	2462.41	0.05
Columbia	RM 102.5-108	104.47	2-year	Existing_SF	340333.6	-42.91	17.259		17.4	0.000019	3.018	113176.9	2455.71	0.08

Columbia	RM 102.5-108	104.47	100-yr	Existing_WAR	471208.6	-42.91	32.312		32.47	0.000014	3.16	152921.6	4085.42	0.07
Columbia	RM 102.5-108	104.47	100-yr	Existing_SF	596878.1	-42.91	26.999		27.3	0.000031	4.384	137825.3	2888.4	0.1
Columbia	RM 102.5-108	104.31	FEMA 100-year	Existing_FEMA	471909.5	-43.78	31.172		31.33	0.000017	3.248	148260.9	3553.47	0.08
Columbia	RM 102.5-108	104.31	2-year	Existing_WAR	238367	-43.78	17.888		17.96	0.00001	2.142	111456.8	2573.97	0.06
Columbia	RM 102.5-108	104.31	2-year	Existing_SF	340333.6	-43.78	17.232		17.38	0.000022	3.104	109773	2563.5	0.08
Columbia	RM 102.5-108	104.31	100-yr	Existing_WAR	471208.6	-43.78	32.297		32.45	0.000016	3.179	151510.2	3994.2	0.07
Columbia	RM 102.5-108	104.31	100-yr	Existing_SF	596878.1	-43.78	26.962		27.27	0.000035	4.442	136142.2	2875.47	0.11
Columbia	RM 102.5-108	104.15	FEMA 100-year	Existing_FEMA	471909.5	-42.11	31.177		31.31	0.000014	2.979	173584.1	5222.46	0.07
Columbia	RM 102.5-108	104.15	2-year	Existing_WAR	238367	-42.11	17.888		17.95	0.000008	1.967	123501.5	3172.68	0.05
Columbia	RM 102.5-108	104.15	2-year	Existing_SF	340333.6	-42.11	17.232		17.36	0.000018	2.851	121448.1	3149.88	0.07
Columbia	RM 102.5-108	104.15	100-yr	Existing_WAR	471208.6	-42.11	32.303		32.43	0.000013	2.912	178793	5688.4	0.07
Columbia	RM 102.5-108	104.15	100-yr	Existing_SF	596878.1	-42.11	26.97		27.23	0.000028	4.077	155261.6	4513.46	0.1
Columbia	RM 102.5-108	103.99	FEMA 100-year	Existing_FEMA	471909.5	-46.09	31.176		31.3	0.000012	2.816	172875.6	3870.55	0.06
Columbia	RM 102.5-108	103.99	2-year	Existing_WAR	238367	-46.09	17.886		17.94	0.000007	1.844	129601.2	2950.4	0.05
Columbia	RM 102.5-108	103.99	2-year	Existing_SF	340333.6	-46.09	17.228		17.34	0.000016	2.671	127682.8	2894.38	0.07
Columbia	RM 102.5-108	103.99	100-yr	Existing_WAR	471208.6	-46.09	32.301		32.42	0.000011	2.758	177087.9	4431.67	0.06
Columbia	RM 102.5-108	103.99	100-yr	Existing_SF	596878.1	-46.09	26.965		27.19	0.000025	3.844	158487.3	3355.55	0.09
Columbia	RM 102.5-108	103.84	FEMA 100-year	Existing_FEMA	471909.5	-43.49	31.169		31.29	0.000012	2.765	173291.3	4182.02	0.06
Columbia	RM 102.5-108	103.84	2-year	Existing_WAR	238367	-43.49	17.882		17.93	0.000007	1.81	131919.8	2997.39	0.05
Columbia	RM 102.5-108	103.84	2-year	Existing_SF	340333.6	-43.49	17.219		17.33	0.000015	2.623	129952	2958.38	0.07
Columbia	RM 102.5-108	103.84	100-yr	Existing_WAR	471208.6	-43.49	32.296		32.41	0.000011	2.708	176904.3	4348.33	0.06
Columbia	RM 102.5-108	103.84	100-yr	Existing_SF	596878.1	-43.49	26.952		27.17	0.000025	3.772	159892.2	3387.33	0.09
Columbia	RM 102.5-108	103.7	FEMA 100-year	Existing_FEMA	471909.5	-43.38	31.161		31.28	0.000011	2.767	174435.7	3601.35	0.06
Columbia	RM 102.5-108	103.7	2-year	Existing_WAR	238367	-43.38	17.878		17.93	0.000006	1.78	134166.8	2790.47	0.04
Columbia	RM 102.5-108	103.7	2-year	Existing_SF	340333.6	-43.38	17.21		17.31	0.000013	2.577	132307.7	2781.29	0.07
Columbia	RM 102.5-108	103.7	100-yr	Existing_WAR	471208.6	-43.38	32.287		32.4	0.00001	2.712	178160.2	3686.85	0.06
Columbia	RM 102.5-108	103.7	100-yr	Existing_SF	596878.1	-43.38	26.935		27.15	0.000022	3.761	160502.1	3256.64	0.09
Columbia	RM 102.5-108	103.56	FEMA 100-year	Existing_FEMA	471909.5	-44.88	31.154		31.27	0.00001	2.749	174162.8	3185.42	0.06
Columbia	RM 102.5-108	103.56	2-year	Existing_WAR	238367	-44.88	17.874		17.92	0.000006	1.75	136457.7	2690.36	0.04
Columbia	RM 102.5-108	103.56	2-year	Existing_SF	340333.6	-44.88	17.203		17.3	0.000012	2.531	134654.7	2683.65	0.06
Columbia	RM 102.5-108	103.56	100-yr	Existing_WAR	471208.6	-44.88	32.28		32.39	0.00001	2.697	177695.8	3632.81	0.06
Columbia	RM 102.5-108	103.56	100-yr	Existing_SF	596878.1	-44.88	26.922		27.14	0.000021	3.725	161341	2886.74	0.08
Columbia	RM 102.5-108	103.41	FEMA 100-year	Existing_FEMA	471909.5	-48.32	31.138		31.26	0.000011	2.834	168902.8	3050.77	0.06
Columbia	RM 102.5-108	103.41	2-year	Existing_WAR	238367	-48.32	17.867		17.92	0.000006	1.807	132158.9	2636.43	0.04
Columbia	RM 102.5-108	103.41	2-year	Existing_SF	340333.6	-48.32	17.187		17.29	0.000013	2.614	130370	2626.96	0.06
Columbia	RM 102.5-108	103.41	100-yr	Existing_WAR	471208.6	-48.32	32.265		32.38	0.00001	2.78	172199.7	3486.14	0.06
Columbia	RM 102.5-108	103.41	100-yr	Existing_SF	596878.1	-48.32	26.891		27.12	0.000022	3.842	156707.6	2816.16	0.09
Columbia	RM 102.5-108	103.24	FEMA 100-year	Existing_FEMA	471909.5	-45.98	31.125		31.25	0.000011	2.864	167238.4	2809.52	0.06
Columbia	RM 102.5-108	103.24	2-year	Existing_WAR	238367	-45.98	17.861		17.91	0.000006	1.809	132445.8	2571.38	0.04

Columbia	RM 102.5-108	103.24	2-year	Existing_SF	340333.6	-45.98	17.175		17.28	0.000012	2.617	130683.5	2565.76	0.06
Columbia	RM 102.5-108	103.24	100-yr	Existing_WAR	471208.6	-45.98	32.253		32.38	0.00001	2.812	170241	2936.87	0.06
Columbia	RM 102.5-108	103.24	100-yr	Existing_SF	596878.1	-45.98	26.867		27.1	0.000021	3.874	155942	2645.71	0.09
Columbia	RM 102.5-108	103.06	FEMA 100-year	Existing_FEMA	471909.5	-47.44	31.094		31.24	0.000012	3.06	155795.3	2528.06	0.07
Columbia	RM 102.5-108	103.06	2-year	Existing_WAR	238367	-47.44	17.848		17.91	0.000006	1.928	123874.4	2364.01	0.05
Columbia	RM 102.5-108	103.06	2-year	Existing_SF	340333.6	-47.44	17.147		17.27	0.000014	2.789	122223.1	2349.46	0.07
Columbia	RM 102.5-108	103.06	100-yr	Existing_WAR	471208.6	-47.44	32.224		32.36	0.000011	3.004	158550.8	2619.28	0.06
Columbia	RM 102.5-108	103.06	100-yr	Existing_SF	596878.1	-47.44	26.809		27.07	0.000024	4.137	145397.1	2416.72	0.09
Columbia	RM 101.5-102.5	102.65	FEMA 100-year	Existing_FEMA	565000	-55.72	31.102		31.21	0.000008	2.574	221044.3	4040.43	0.05
Columbia	RM 101.5-102.5	102.65	2-year	Existing_WAR	278000	-55.72	17.851		17.89	0.000004	1.556	178805.7	3115.23	0.04
Columbia	RM 101.5-102.5	102.65	2-year	Existing_SF	397000	-55.72	17.154		17.23	0.000008	2.249	176634.4	3111.29	0.05
Columbia	RM 101.5-102.5	102.65	100-yr	Existing_WAR	566000.1	-55.72	32.231		32.33	0.000008	2.538	224939.5	4209.25	0.05
Columbia	RM 101.5-102.5	102.65	100-yr	Existing_SF	711000.1	-55.72	26.824		27.01	0.000015	3.447	207157.5	3857.81	0.07
Columbia	RM 101.5-102.5	102.46	FEMA 100-year	Existing_FEMA	565000	-52.55	31.08	-33.88	31.19	0.00001	2.722	209851.7	3329.92	0.06
Columbia	RM 101.5-102.5	102.46	2-year	Existing_WAR	278000	-52.55	17.84	-38.83	17.88	0.000005	1.677	166167.5	3252.1	0.04
Columbia	RM 101.5-102.5	102.46	2-year	Existing_SF	397000	-52.55	17.13	-36.62	17.22	0.00001	2.428	163862.8	3240.43	0.06
Columbia	RM 101.5-102.5	102.46	100-yr	Existing_WAR	566000.1	-52.55	32.21	-33.87	32.32	0.000009	2.68	213609	3429.18	0.06
Columbia	RM 101.5-102.5	102.46	100-yr	Existing_SF	711000.1	-52.55	26.78	-31.72	26.99	0.000019	3.666	195594.4	3310.36	0.08
Col-Hayden	RM 106 Left	6.04	FEMA 100-year	Existing_FEMA	93090.54	-13.69	31.843	1.85	31.94	0.000031	2.494	39729.81	1584.72	0.08
Col-Hayden	RM 106 Left	6.04	2-year	Existing_WAR	39633	-13.69	18.308	-3.34	18.36	0.000032	1.792	22550.54	1187.12	0.07
Col-Hayden	RM 106 Left	6.04	2-year	Existing_SF	56666.42	-13.69	18.136	-1.13	18.24	0.000068	2.585	22346.8	1186.36	0.1
Col-Hayden	RM 106 Left	6.04	100-yr	Existing_WAR	94791.38	-13.69	32.938	1.97	33.03	0.000029	2.453	41477.67	1613.66	0.07
Col-Hayden	RM 106 Left	6.04	100-yr	Existing_SF	114122	-13.69	28.333	3.24	28.51	0.000068	3.41	34675	1426.09	0.11
Col-Hayden	RM 106 Left	5.83	FEMA 100-year	Existing_FEMA	93090.54	-10.56	31.763	5.64	31.9	0.000043	2.987	32385.63	1419.31	0.09
Col-Hayden	RM 106 Left	5.83	2-year	Existing_WAR	39633	-10.56	18.241	0.85	18.32	0.00005	2.222	17875.14	983.57	0.09
Col-Hayden	RM 106 Left	5.83	2-year	Existing_SF	56666.42	-10.56	17.994	2.75	18.16	0.000106	3.22	17632.29	982.53	0.13
Col-Hayden	RM 106 Left	5.83	100-yr	Existing_WAR	94791.38	-10.56	32.863	5.73	33	0.00004	2.934	33947.59	1421.16	0.09
Col-Hayden	RM 106 Left	5.83	100-yr	Existing_SF	114122	-10.56	28.162	6.84	28.43	0.000097	4.144	27844.31	1097.09	0.14
Col-Hayden	RM 106 Left	5.66	FEMA 100-year	Existing_FEMA	93090.54	-13.3	31.7	3.39	31.86	0.000044	3.22	29917.32	1252.52	0.1
Col-Hayden	RM 106 Left	5.66	2-year	Existing_WAR	39633	-13.3	18.196	-1.75	18.28	0.000043	2.284	17485.65	877.97	0.09
Col-Hayden	RM 106 Left	5.66	2-year	Existing_SF	56666.42	-13.3	17.898	0.03	18.07	0.000093	3.314	17223.64	877.12	0.13
Col-Hayden	RM 106 Left	5.66	100-yr	Existing_WAR	94791.38	-13.3	32.803	3.52	32.96	0.000041	3.17	31299.79	1256.35	0.09
Col-Hayden	RM 106 Left	5.66	100-yr	Existing_SF	114122	-13.3	28.037	4.93	28.34	0.000097	4.426	26294.2	915.34	0.14
Col-Hayden	RM 106 Left	5.53	FEMA 100-year	Existing_FEMA	93090.54	-18.96	31.625	-2.6	31.82	0.000045	3.59	26165.82	899.3	0.1
Col-Hayden	RM 106 Left	5.53	2-year	Existing_WAR	39633	-18.96	18.166	-8.44	18.25	0.000033	2.331	17013.71	660.58	0.08
Col-Hayden	RM 106 Left	5.53	2-year	Existing_SF	56666.42	-18.96	17.833	-6.34	18.01	0.000071	3.376	16794.33	659.03	0.12
Col-Hayden	RM 106 Left	5.53	100-yr	Existing_WAR	94791.38	-18.96	32.729	-2.44	32.92	0.000043	3.554	26941.63	1012.85	0.1
Col-Hayden	RM 106 Left	5.53	100-yr	Existing_SF	114122	-18.96	27.897	-0.76	28.27	0.000095	4.87	23573.53	721.09	0.14
Col-Hayden	RM 106 Left	5.44	FEMA 100-year	Existing_FEMA	93090.54	-24.84	31.623	-8.27	31.8	0.000035	3.375	27821.96	1380.02	0.09

Col-Hayden	RM 106 Left	5.44	2-year	Existing_WAR	39633	-24.84	18.166	-14.32	18.23	0.000021	2.073	19128.04	630.29	0.07
Col-Hayden	RM 106 Left	5.44	2-year	Existing_SF	56666.42	-24.84	17.834	-12.12	17.97	0.000044	2.997	18919.04	629.57	0.1
Col-Hayden	RM 106 Left	5.44	100-yr	Existing_WAR	94791.38	-24.84	32.727	-8.11	32.9	0.000033	3.351	28554.82	1472.76	0.09
Col-Hayden	RM 106 Left	5.44	100-yr	Existing_SF	114122	-24.84	27.896	-6.34	28.21	0.00007	4.523	25369.06	1203.08	0.13
Col-Hayden	RM 106 Left	5.41	FEMA 100-year	Existing_FEMA	93090.54	-25.73	31.613	-8.82	31.79	0.00004	3.412	27945.29	984.2	0.09
Col-Hayden	RM 106 Left	5.41	2-year	Existing_WAR	39633	-25.73	18.161	-15.14	18.23	0.000024	2.094	18954.29	629.84	0.07
Col-Hayden	RM 106 Left	5.41	2-year	Existing_SF	56666.42	-25.73	17.823	-12.82	17.97	0.000051	3.027	18741.65	628.38	0.1
Col-Hayden	RM 106 Left	5.41	100-yr	Existing_WAR	94791.38	-25.73	32.717	-8.63	32.89	0.000038	3.387	28779.98	1032.01	0.09
Col-Hayden	RM 106 Left	5.41	100-yr	Existing_SF	114122	-25.73	27.875	-6.83	28.2	0.00008	4.573	25343.03	756.65	0.13
Col-Hayden	RM 106 Left	5.24	FEMA 100-year	Existing_FEMA	93090.54	-31.75	31.574	-14.51	31.72	0.000163	3.075	30526.15	675.54	0.08
Col-Hayden	RM 106 Left	5.24	2-year	Existing_WAR	39633	-31.75	18.135	-20.78	18.19	0.000089	1.832	21659.33	640.63	0.06
Col-Hayden	RM 106 Left	5.24	2-year	Existing_SF	56666.42	-31.75	17.768	-18.54	17.88	0.000188	2.648	21424.56	638.82	0.08
Col-Hayden	RM 106 Left	5.24	100-yr	Existing_WAR	94791.38	-31.75	32.68	-14.33	32.82	0.000156	3.058	31275.33	680.2	0.08
Col-Hayden	RM 106 Left	5.24	100-yr	Existing_SF	114122	-31.75	27.794	-12.51	28.05	0.000324	4.102	27990.6	666.77	0.11
Col-Hayden	RM 106 Left	5.07	FEMA 100-year	Existing_FEMA	93090.54	-22.67	31.488	-7.67	31.66	0.000034	3.353	28184.72	942.47	0.09
Col-Hayden	RM 106 Left	5.07	2-year	Existing_WAR	39633	-22.67	18.087	-13.22	18.15	0.000021	2.062	19272.11	644.04	0.07
Col-Hayden	RM 106 Left	5.07	2-year	Existing_SF	56666.42	-22.67	17.665	-11.24	17.8	0.000044	2.99	19000.59	642.66	0.1
Col-Hayden	RM 106 Left	5.07	100-yr	Existing_WAR	94791.38	-22.67	32.598	-7.52	32.77	0.000032	3.328	28949.31	1021.36	0.09
Col-Hayden	RM 106 Left	5.07	100-yr	Existing_SF	114122	-22.67	27.62	-5.91	27.94	0.000069	4.517	25555.15	673.93	0.13
Col-Hayden	RM 106 Left	4.94	FEMA 100-year	Existing_FEMA	93090.54	-24.34	31.504	-5.39	31.63	0.000027	2.81	33590.09	927.48	0.08
Col-Hayden	RM 106 Left	4.94	2-year	Existing_WAR	39633	-24.34	18.084	-10.43	18.14	0.000019	1.805	22012.77	837.52	0.06
Col-Hayden	RM 106 Left	4.94	2-year	Existing_SF	56666.42	-24.34	17.659	-8.67	17.77	0.000041	2.623	21656.88	835.76	0.09
Col-Hayden	RM 106 Left	4.94	100-yr	Existing_WAR	94791.38	-24.34	32.615	-5.26	32.73	0.000025	2.782	34585.26	1036.44	0.08
Col-Hayden	RM 106 Left	4.94	100-yr	Existing_SF	114122	-24.34	27.642	-3.8	27.87	0.000057	3.82	30179.26	871.39	0.11
Col-Hayden	RM 106 Left	4.82	FEMA 100-year	Existing_FEMA	93090.54	-27.83	31.524	-11.74	31.6	0.000014	2.233	42396.94	1048.63	0.06
Col-Hayden	RM 106 Left	4.82	2-year	Existing_WAR	39633	-27.83	18.093	-16.93	18.12	0.000008	1.337	29706.24	915.17	0.04
Col-Hayden	RM 106 Left	4.82	2-year	Existing_SF	56666.42	-27.83	17.678	-14.88	17.74	0.000017	1.937	29326.13	913.86	0.06
Col-Hayden	RM 106 Left	4.82	100-yr	Existing_WAR	94791.38	-27.83	32.634	-11.62	32.71	0.000014	2.221	43582.67	1166.64	0.06
Col-Hayden	RM 106 Left	4.82	100-yr	Existing_SF	114122	-27.83	27.678	-10.33	27.82	0.000028	2.986	38635.82	951.32	0.08
Col-Hayden	RM 106 Left	4.72	FEMA 100-year	Existing_FEMA	93090.54	-19.94	31.53	-5.5	31.59	0.000014	1.907	49884.47	1455.21	0.05
Col-Hayden	RM 106 Left	4.72	2-year	Existing_WAR	39633	-19.94	18.091	-10.29	18.11	0.000011	1.248	31801.51	1272.4	0.04
Col-Hayden	RM 106 Left	4.72	2-year	Existing_SF	56666.42	-19.94	17.672	-8.55	17.72	0.000023	1.815	31268.64	1270.77	0.06
Col-Hayden	RM 106 Left	4.72	100-yr	Existing_WAR	94791.38	-19.94	32.641	-5.37	32.7	0.000014	1.886	51506.94	1465.65	0.05
Col-Hayden	RM 106 Left	4.72	100-yr	Existing_SF	114122	-19.94	27.685	-3.95	27.79	0.000031	2.602	44387.31	1406.27	0.08
Col-Hayden	RM 106 Left	4.62	FEMA 100-year	Existing_FEMA	93090.54	-16.23	31.537	-1.1	31.57	0.000011	1.555	60255.46	1688.34	0.05
Col-Hayden	RM 106 Left	4.62	2-year	Existing_WAR	39633	-16.23	18.091	-6.46	18.11	0.000009	1.047	37880.15	1642.3	0.04
Col-Hayden	RM 106 Left	4.62	2-year	Existing_SF	56666.42	-16.23	17.672	-4.71	17.71	0.00002	1.525	37192.01	1641.03	0.06
Col-Hayden	RM 106 Left	4.62	100-yr	Existing_WAR	94791.38	-16.23	32.648	-1.03	32.68	0.00001	1.536	62133.41	1711.36	0.04
Col-Hayden	RM 106 Left	4.62	100-yr	Existing_SF	114122	-16.23	27.696	-0.3	27.77	0.000024	2.131	53796.5	1675.43	0.07

Col-Hayden	RM 106 Left	4.58	FEMA 100-year	Existing_FEMA	93090.54	-13.1	31.52	-0.89	31.57	0.000012	1.815	52276.1	1516.24	0.05
Col-Hayden	RM 106 Left	4.58	2-year	Existing_WAR	39633	-13.1	18.082	-5.24	18.11	0.00001	1.214	32754.52	1393.17	0.04
Col-Hayden	RM 106 Left	4.58	2-year	Existing_SF	56666.42	-13.1	17.654	-3.56	17.7	0.000022	1.768	32157.59	1391.36	0.06
Col-Hayden	RM 106 Left	4.58	100-yr	Existing_WAR	94791.38	-13.1	32.631	-0.82	32.68	0.000012	1.793	53967.34	1526.61	0.05
Col-Hayden	RM 106 Left	4.58	100-yr	Existing_SF	114122	-13.1	27.663	-0.08	27.76	0.000027	2.487	46519.45	1479.15	0.08
Col-Hayden	RM 106 Left	4.55	FEMA 100-year	Existing_FEMA	93090.54	-14.31	31.504	-1.57	31.57	0.000015	2.017	46690.45	1287.69	0.06
Col-Hayden	RM 106 Left	4.55	2-year	Existing_WAR	39633	-14.31	18.075	-6.45	18.1	0.000011	1.331	29885.04	1226.39	0.05
Col-Hayden	RM 106 Left	4.55	2-year	Existing_SF	56666.42	-14.31	17.638	-4.98	17.7	0.000025	1.937	29349.66	1225.08	0.07
Col-Hayden	RM 106 Left	4.55	100-yr	Existing_WAR	94791.38	-14.31	32.616	-1.5	32.68	0.000014	1.995	48129.21	1298.83	0.06
Col-Hayden	RM 106 Left	4.55	100-yr	Existing_SF	114122	-14.31	27.633	-0.67	27.75	0.000032	2.756	41775.8	1261.93	0.08
Col-Hayden	RM 106 Left	4.52	FEMA 100-year	Existing_FEMA	93090.54	-12.54	31.488	-0.8	31.56	0.000018	2.205	42600.63	1261.59	0.06
Col-Hayden	RM 106 Left	4.52	2-year	Existing_WAR	39633	-12.54	18.067	-5.2	18.1	0.000015	1.46	27161.34	1127.19	0.05
Col-Hayden	RM 106 Left	4.52	2-year	Existing_SF	56666.42	-12.54	17.621	-3.77	17.69	0.000032	2.127	26658.56	1126.24	0.08
Col-Hayden	RM 106 Left	4.52	100-yr	Existing_WAR	94791.38	-12.54	32.6	-0.72	32.67	0.000017	2.179	43931.07	1292.4	0.06
Col-Hayden	RM 106 Left	4.52	100-yr	Existing_SF	114122	-12.54	27.602	0.12	27.74	0.00004	3.016	38042.86	1158.69	0.09
Col-Hayden	RM 106 Left	4.46	FEMA 100-year	Existing_FEMA	93090.54	-14.4	31.466	-2.71	31.56	0.00002	2.406	39372.87	1232.37	0.07
Col-Hayden	RM 106 Left	4.46	2-year	Existing_WAR	39633	-14.4	18.058	-5.79	18.1	0.000014	1.548	25634.42	985.22	0.05
Col-Hayden	RM 106 Left	4.46	2-year	Existing_SF	56666.42	-14.4	17.602	-4.69	17.68	0.000031	2.253	25185.39	983.17	0.08
Col-Hayden	RM 106 Left	4.46	100-yr	Existing_WAR	94791.38	-14.4	32.579	-2.63	32.67	0.000019	2.383	40578.43	1425.96	0.07
Col-Hayden	RM 106 Left	4.46	100-yr	Existing_SF	114122	-14.4	27.561	-1.69	27.73	0.000043	3.274	35243.45	1041.13	0.1
Col-Hayden	RM 106 Left	4.43	I-5 at NPH		Bridge										
Col-Hayden	RM 106 Left	4.38	FEMA 100-year	Existing_FEMA	93090.54	-16.65	31.427	-3.06	31.53	0.000023	2.63	36017.55	949.91	0.07
Col-Hayden	RM 106 Left	4.38	2-year	Existing_WAR	39633	-16.65	18.04	-6.45	18.08	0.000016	1.673	23742.95	885.58	0.06
Col-Hayden	RM 106 Left	4.38	2-year	Existing_SF	56666.42	-16.65	17.562	-5.25	17.65	0.000034	2.435	23320.71	883.58	0.08
Col-Hayden	RM 106 Left	4.38	100-yr	Existing_WAR	94791.38	-16.65	32.541	-2.97	32.65	0.000022	2.605	37079.07	957.27	0.07
Col-Hayden	RM 106 Left	4.38	100-yr	Existing_SF	114122	-16.65	27.487	-1.94	27.68	0.000049	3.575	32310.63	931.79	0.1
Col-Hayden	RM 106 Left	4.33	FEMA 100-year	Existing_FEMA	93090.54	-17.78	31.423	-4.25	31.53	0.000023	2.632	35923.09	919.25	0.07
Col-Hayden	RM 106 Left	4.33	2-year	Existing_WAR	39633	-17.78	18.038	-7.94	18.08	0.000015	1.65	24066.42	861.74	0.05
Col-Hayden	RM 106 Left	4.33	2-year	Existing_SF	56666.42	-17.78	17.558	-6.57	17.65	0.000032	2.399	23653.73	859.7	0.08
Col-Hayden	RM 106 Left	4.33	100-yr	Existing_WAR	94791.38	-17.78	32.537	-4.15	32.64	0.000021	2.611	36954.78	933.94	0.07
Col-Hayden	RM 106 Left	4.33	100-yr	Existing_SF	114122	-17.78	27.479	-3.08	27.68	0.000047	3.565	32350.03	895.61	0.1
Col-Hayden	RM 106 Left	4.27	FEMA 100-year	Existing_FEMA	93090.54	-19.1	31.389	-5.29	31.52	0.000027	2.92	32830.34	849	0.08
Col-Hayden	RM 106 Left	4.27	2-year	Existing_WAR	39633	-19.1	18.022	-9.43	18.07	0.000018	1.828	21864.32	795.97	0.06
Col-Hayden	RM 106 Left	4.27	2-year	Existing_SF	56666.42	-19.1	17.525	-7.99	17.64	0.000039	2.66	21469.37	793.61	0.09
Col-Hayden	RM 106 Left	4.27	100-yr	Existing_WAR	94791.38	-19.1	32.503	-5.17	32.63	0.000026	2.895	33779.27	894.79	0.08
Col-Hayden	RM 106 Left	4.27	100-yr	Existing_SF	114122	-19.1	27.414	-3.92	27.66	0.000058	3.958	29492.74	828.34	0.11
Col-Hayden	RM 106 Left	4.18	FEMA 100-year	Existing_FEMA	93090.54	-22.24	31.379	-6.53	31.51	0.000025	2.889	32551.78	771.11	0.08
Col-Hayden	RM 106 Left	4.18	2-year	Existing_WAR	39633	-22.24	18.017	-10.54	18.07	0.000015	1.772	22429.97	743.71	0.06
Col-Hayden	RM 106 Left	4.18	2-year	Existing_SF	56666.42	-22.24	17.514	-9.08	17.62	0.000033	2.576	22056.06	742.69	0.08

Col-Hayden	RM 106 Left	4.18	100-yr	Existing_WAR	94791.38	-22.24	32.494	-6.42	32.62	0.000024	2.868	33412.76	825.62	0.08
Col-Hayden	RM 106 Left	4.18	100-yr	Existing_SF	114122	-22.24	27.394	-5.22	27.63	0.000052	3.899	29496.25	762.42	0.11
Col-Hayden	RM 106 Left	4.08	FEMA 100-year	Existing_FEMA	93090.54	-19.26	31.378	-6.6	31.49	0.000022	2.71	34877.69	846.49	0.07
Col-Hayden	RM 106 Left	4.08	2-year	Existing_WAR	39633	-19.26	18.014	-10.56	18.06	0.000013	1.663	23919.35	795.14	0.05
Col-Hayden	RM 106 Left	4.08	2-year	Existing_SF	56666.42	-19.26	17.507	-9.14	17.6	0.000029	2.417	23516.8	793.6	0.08
Col-Hayden	RM 106 Left	4.08	100-yr	Existing_WAR	94791.38	-19.26	32.493	-6.49	32.61	0.000021	2.69	35824.69	866.44	0.07
Col-Hayden	RM 106 Left	4.08	100-yr	Existing_SF	114122	-19.26	27.39	-5.33	27.6	0.000046	3.659	31529.72	831.33	0.1
Col-Hayden	RM 106 Left	3.96	FEMA 100-year	Existing_FEMA	93090.54	-17.46	31.373	-6	31.47	0.000021	2.551	36992.29	1032.85	0.07
Col-Hayden	RM 106 Left	3.96	2-year	Existing_WAR	39633	-17.46	18.008	-9.75	18.05	0.000014	1.589	24975.81	872.16	0.05
Col-Hayden	RM 106 Left	3.96	2-year	Existing_SF	56666.42	-17.46	17.493	-8.35	17.58	0.00003	2.313	24527.69	870.01	0.08
Col-Hayden	RM 106 Left	3.96	100-yr	Existing_WAR	94791.38	-17.46	32.488	-5.91	32.59	0.00002	2.532	38097.8	1282.5	0.07
Col-Hayden	RM 106 Left	3.96	100-yr	Existing_SF	114122	-17.46	27.375	-4.78	27.56	0.000045	3.457	33325.44	969.16	0.1
Col-Hayden	RM 106 Left	3.82	FEMA 100-year	Existing_FEMA	93090.54	-16.62	31.369	-2.15	31.45	0.00002	2.346	40256.13	1316.06	0.07
Col-Hayden	RM 106 Left	3.82	2-year	Existing_WAR	39633	-16.62	17.999	-6.39	18.04	0.000015	1.532	25935.84	1042.24	0.05
Col-Hayden	RM 106 Left	3.82	2-year	Existing_SF	56666.42	-16.62	17.474	-4.71	17.55	0.000032	2.237	25389.24	1040.24	0.08
Col-Hayden	RM 106 Left	3.82	100-yr	Existing_WAR	94791.38	-16.62	32.485	-2.04	32.57	0.000018	2.321	41749.57	2182.27	0.06
Col-Hayden	RM 106 Left	3.82	100-yr	Existing_SF	114122	-16.62	27.361	-0.88	27.52	0.000043	3.213	35857.25	1080.53	0.1
Col-Hayden	RM 106 Left	3.71	FEMA 100-year	Existing_FEMA	93090.54	-16.82	31.367	-2.76	31.44	0.000017	2.172	43520.44	1374.98	0.06
Col-Hayden	RM 106 Left	3.71	2-year	Existing_WAR	39633	-16.82	17.995	-7.09	18.03	0.000012	1.413	28156.19	1117.55	0.05
Col-Hayden	RM 106 Left	3.71	2-year	Existing_SF	56666.42	-16.82	17.465	-5.31	17.53	0.000027	2.064	27564.65	1115.4	0.07
Col-Hayden	RM 106 Left	3.71	100-yr	Existing_WAR	94791.38	-16.82	32.484	-2.68	32.56	0.000016	2.148	45006.74	1949.57	0.06
Col-Hayden	RM 106 Left	3.71	100-yr	Existing_SF	114122	-16.82	27.354	-1.78	27.49	0.000036	2.974	38792.79	1164.32	0.09
Col-Hayden	RM 106 Left	3.57	FEMA 100-year	Existing_FEMA	93090.54	-21.18	31.359	-4.33	31.43	0.000016	2.086	45233.75	1475.04	0.06
Col-Hayden	RM 106 Left	3.57	2-year	Existing_WAR	39633	-21.18	17.988	-8.84	18.02	0.000012	1.373	28951.16	1184.11	0.05
Col-Hayden	RM 106 Left	3.57	2-year	Existing_SF	56666.42	-21.18	17.449	-7.21	17.51	0.000027	2.006	28313.29	1182.26	0.07
Col-Hayden	RM 106 Left	3.57	100-yr	Existing_WAR	94791.38	-21.18	32.477	-4.22	32.54	0.000015	2.062	46821.31	1885.59	0.06
Col-Hayden	RM 106 Left	3.57	100-yr	Existing_SF	114122	-21.18	27.336	-2.86	27.46	0.000034	2.863	40168.16	1216.2	0.09
Col-Hayden	RM 106 Left	3.45	FEMA 100-year	Existing_FEMA	93090.54	-17.43	31.367	-7.47	31.41	0.000009	1.701	55329.8	1742.14	0.05
Col-Hayden	RM 106 Left	3.45	2-year	Existing_WAR	39633	-17.43	17.99	-10.48	18.01	0.000006	1.065	37281.6	1321.56	0.04
Col-Hayden	RM 106 Left	3.45	2-year	Existing_SF	56666.42	-17.43	17.454	-9.32	17.49	0.000013	1.552	36573.39	1319.85	0.05
Col-Hayden	RM 106 Left	3.45	100-yr	Existing_WAR	94791.38	-17.43	32.484	-7.4	32.53	0.000009	1.687	56900.79	1956.69	0.05
Col-Hayden	RM 106 Left	3.45	100-yr	Existing_SF	114122	-17.43	27.35	-6.54	27.43	0.000019	2.308	49819.28	1361.7	0.07
Col-Hayden	RM 106 Left	3.34	FEMA 100-year	Existing_FEMA	93090.54	-16.28	31.349	-3.69	31.4	0.000013	1.89	49731.62	2150.47	0.05
Col-Hayden	RM 106 Left	3.34	2-year	Existing_WAR	39633	-16.28	17.978	-7.7	18	0.000011	1.26	31517.47	1340.65	0.05
Col-Hayden	RM 106 Left	3.34	2-year	Existing_SF	56666.42	-16.28	17.427	-6.27	17.48	0.000024	1.844	30779.48	1339.27	0.07
Col-Hayden	RM 106 Left	3.34	100-yr	Existing_WAR	94791.38	-16.28	32.467	-3.59	32.52	0.000013	1.868	51432.83	3048.19	0.05
Col-Hayden	RM 106 Left	3.34	100-yr	Existing_SF	114122	-16.28	27.312	-2.14	27.42	0.00003	2.602	44143.57	1366.28	0.08
Col-Hayden	RM 106 Left	3.32	FEMA 100-year	Existing_FEMA	93090.54	-16.5	31.348	-3.62	31.4	0.000013	1.879	49972.43	1425.21	0.05
Col-Hayden	RM 106 Left	3.32	2-year	Existing_WAR	39633	-16.5	17.977	-7.49	18	0.000011	1.258	31547.92	1355.59	0.05

Col-Hayden	RM 106 Left	3.32	2-year	Existing_SF	56666.42	-16.5	17.426	-6.11	17.48	0.000024	1.842	30800.69	1353.66	0.07
Col-Hayden	RM 106 Left	3.32	100-yr	Existing_WAR	94791.38	-16.5	32.467	-3.51	32.52	0.000013	1.859	51695.11	2151.46	0.05
Col-Hayden	RM 106 Left	3.32	100-yr	Existing_SF	114122	-16.5	27.31	-2.11	27.41	0.00003	2.589	44344.85	1385	0.08
Col-Hayden	RM 106 Left	3.3	BNSF at NPH		Bridge									
Col-Hayden	RM 106 Left	3.28	FEMA 100-year	Existing_FEMA	93090.54	-21.87	31.346		31.39	0.000011	1.778	54730.41	2190.56	0.05
Col-Hayden	RM 106 Left	3.28	2-year	Existing_WAR	39633	-21.87	17.976		18	0.000009	1.163	34185.08	1400.53	0.04
Col-Hayden	RM 106 Left	3.28	2-year	Existing_SF	56666.42	-21.87	17.423		17.47	0.000019	1.701	33412.1	1386.08	0.06
Col-Hayden	RM 106 Left	3.28	100-yr	Existing_WAR	94791.38	-21.87	32.464		32.51	0.000011	1.756	57020.48	2256.62	0.05
Col-Hayden	RM 106 Left	3.28	100-yr	Existing_SF	114122	-21.87	27.305		27.4	0.000025	2.439	47659.6	1862.97	0.07
Col-Hayden	RM 106 Left	3.27	FEMA 100-year	Existing_FEMA	93090.54	-19.86	31.346		31.39	0.000012	1.78	56103.46	2066.81	0.05
Col-Hayden	RM 106 Left	3.27	2-year	Existing_WAR	39633	-19.86	17.974		18	0.000009	1.195	33310.92	1508.91	0.04
Col-Hayden	RM 106 Left	3.27	2-year	Existing_SF	56666.42	-19.86	17.419		17.47	0.000021	1.749	32537.96	1444.12	0.06
Col-Hayden	RM 106 Left	3.27	100-yr	Existing_WAR	94791.38	-19.86	32.464		32.51	0.000011	1.756	58245.13	2083.68	0.05
Col-Hayden	RM 106 Left	3.27	100-yr	Existing_SF	114122	-19.86	27.302		27.4	0.000026	2.47	48399.29	1899.08	0.07
Col-Hayden	RM 106 Left	3.23	FEMA 100-year	Existing_FEMA	93090.54	-14.8	31.34		31.39	0.000013	1.84	54653.97	2136.02	0.05
Col-Hayden	RM 106 Left	3.23	2-year	Existing_WAR	39633	-14.8	17.97		17.99	0.000011	1.26	31737.42	1582.15	0.05
Col-Hayden	RM 106 Left	3.23	2-year	Existing_SF	56666.42	-14.8	17.409		17.46	0.000025	1.846	30934.29	1563.16	0.07
Col-Hayden	RM 106 Left	3.23	100-yr	Existing_WAR	94791.38	-14.8	32.459		32.51	0.000012	1.814	56858.09	2172.61	0.05
Col-Hayden	RM 106 Left	3.23	100-yr	Existing_SF	114122	-14.8	27.288		27.39	0.00003	2.565	46785.7	1906.21	0.08
Col-Hayden	RM 106 Left	3.19	FEMA 100-year	Existing_FEMA	93090.54	-15.44	31.342		31.39	0.00001	1.697	61288.06	3461.53	0.05
Col-Hayden	RM 106 Left	3.19	2-year	Existing_WAR	39633	-15.44	17.972		17.99	0.000007	1.108	35923.79	1408.54	0.04
Col-Hayden	RM 106 Left	3.19	2-year	Existing_SF	56666.42	-15.44	17.413		17.45	0.000016	1.618	35137.39	1406.9	0.06
Col-Hayden	RM 106 Left	3.19	100-yr	Existing_WAR	94791.38	-15.44	32.462		32.5	0.000009	1.669	65165.12	3597.6	0.05
Col-Hayden	RM 106 Left	3.19	100-yr	Existing_SF	114122	-15.44	27.294		27.38	0.000022	2.345	49259.61	3095.69	0.07
Col-Hayden	RM 106 Left	3.06	FEMA 100-year	Existing_FEMA	93090.54	-16.48	31.318		31.38	0.000015	1.952	48421.1	2942.11	0.06
Col-Hayden	RM 106 Left	3.06	2-year	Existing_WAR	39633	-16.48	17.957		17.98	0.000012	1.317	30287.57	1340.21	0.05
Col-Hayden	RM 106 Left	3.06	2-year	Existing_SF	56666.42	-16.48	17.381		17.44	0.000027	1.931	29523.21	1325.38	0.07
Col-Hayden	RM 106 Left	3.06	100-yr	Existing_WAR	94791.38	-16.48	32.438		32.49	0.000014	1.928	50093.64	3080.72	0.06
Col-Hayden	RM 106 Left	3.06	100-yr	Existing_SF	114122	-16.48	27.246		27.36	0.000032	2.698	42788.42	2345.96	0.08
Col-Hayden	RM 106 Left	2.92	FEMA 100-year	Existing_FEMA	93090.54	-17.62	31.313		31.36	0.000013	1.88	59428.44	2880.17	0.05
Col-Hayden	RM 106 Left	2.92	2-year	Existing_WAR	39633	-17.62	17.948		17.97	0.000011	1.311	30496.44	1296.31	0.05
Col-Hayden	RM 106 Left	2.92	2-year	Existing_SF	56666.42	-17.62	17.362		17.42	0.000025	1.922	29736.82	1293.26	0.07
Col-Hayden	RM 106 Left	2.92	100-yr	Existing_WAR	94791.38	-17.62	32.434		32.48	0.000012	1.843	62574.25	2900.25	0.05
Col-Hayden	RM 106 Left	2.92	100-yr	Existing_SF	114122	-17.62	27.228		27.33	0.00003	2.65	48354.96	2728.83	0.08
Col-Hayden	RM 106 Left	2.78	FEMA 100-year	Existing_FEMA	93090.54	-34.67	31.297		31.36	0.000011	1.94	49505.97	3513.13	0.05
Col-Hayden	RM 106 Left	2.78	2-year	Existing_WAR	39633	-34.67	17.946		17.97	0.000006	1.179	33701.24	1084.92	0.04
Col-Hayden	RM 106 Left	2.78	2-year	Existing_SF	56666.42	-34.67	17.356		17.4	0.000014	1.718	33063.14	1080.35	0.05
Col-Hayden	RM 106 Left	2.78	100-yr	Existing_WAR	94791.38	-34.67	32.417		32.47	0.00001	1.925	51030.07	3654.62	0.05
Col-Hayden	RM 106 Left	2.78	100-yr	Existing_SF	114122	-34.67	27.207		27.31	0.000023	2.628	44133.26	2681.41	0.07

Col-Hayden	RM 106 Left	2.59	FEMA 100-year	Existing_FEMA	93090.54	-32.91	31.29		31.34	0.00001	1.865	59547.46	4065.73	0.05
Col-Hayden	RM 106 Left	2.59	2-year	Existing_WAR	39633	-32.91	17.94		17.96	0.000006	1.164	34223.66	1681.53	0.04
Col-Hayden	RM 106 Left	2.59	2-year	Existing_SF	56666.42	-32.91	17.343		17.39	0.000014	1.696	33542.98	1544.89	0.05
Col-Hayden	RM 106 Left	2.59	100-yr	Existing_WAR	94791.38	-32.91	32.411		32.46	0.00001	1.836	63323.53	4132.03	0.05
Col-Hayden	RM 106 Left	2.59	100-yr	Existing_SF	114122	-32.91	27.187		27.29	0.000022	2.578	46021.41	3912.7	0.07
Col-Hayden	RM 106 Left	2.4	FEMA 100-year	Existing_FEMA	93090.54	-29.76	31.28		31.33	0.00001	1.853	53384.72	4008.13	0.05
Col-Hayden	RM 106 Left	2.4	2-year	Existing_WAR	39633	-29.76	17.934		17.95	0.000006	1.141	34847.05	1354.89	0.04
Col-Hayden	RM 106 Left	2.4	2-year	Existing_SF	56666.42	-29.76	17.33		17.37	0.000013	1.664	34161.78	1309.69	0.05
Col-Hayden	RM 106 Left	2.4	100-yr	Existing_WAR	94791.38	-29.76	32.401		32.45	0.000009	1.83	55659.23	4167.27	0.05
Col-Hayden	RM 106 Left	2.4	100-yr	Existing_SF	114122	-29.76	27.168		27.27	0.000021	2.527	46187.55	3137.11	0.07
Col-Hayden	RM 106 Left	2.23	FEMA 100-year	Existing_FEMA	93090.54	-30.2	31.262		31.32	0.000012	2.004	57272	4231.69	0.05
Col-Hayden	RM 106 Left	2.23	2-year	Existing_WAR	39633	-30.2	17.923		17.95	0.000008	1.265	31541.62	1791.41	0.04
Col-Hayden	RM 106 Left	2.23	2-year	Existing_SF	56666.42	-30.2	17.306		17.36	0.000017	1.847	30877.13	1705.56	0.06
Col-Hayden	RM 106 Left	2.23	100-yr	Existing_WAR	94791.38	-30.2	32.385		32.44	0.000011	1.969	61883.85	4320.19	0.05
Col-Hayden	RM 106 Left	2.23	100-yr	Existing_SF	114122	-30.2	27.126		27.24	0.000026	2.777	43020.91	3815.07	0.08
Col-Hayden	RM 106 Left	2.07	FEMA 100-year	Existing_FEMA	93090.54	-37.88	31.261		31.31	0.000009	1.811	64483.09	3912.47	0.05
Col-Hayden	RM 106 Left	2.07	2-year	Existing_WAR	39633	-37.88	17.921		17.94	0.000005	1.117	35874.29	1564.14	0.03
Col-Hayden	RM 106 Left	2.07	2-year	Existing_SF	56666.42	-37.88	17.303		17.34	0.000012	1.627	35065.61	1530.73	0.05
Col-Hayden	RM 106 Left	2.07	100-yr	Existing_WAR	94791.38	-37.88	32.384		32.43	0.000008	1.78	68882.14	3952.83	0.05
Col-Hayden	RM 106 Left	2.07	100-yr	Existing_SF	114122	-37.88	27.122		27.22	0.000019	2.504	49146.92	3673.91	0.07
Col-Hayden	RM 106 Left	1.95	FEMA 100-year	Existing_FEMA	93090.54	-39.54	31.254		31.3	0.000009	1.821	60919.46	3698.94	0.05
Col-Hayden	RM 106 Left	1.95	2-year	Existing_WAR	39633	-39.54	17.918		17.94	0.000005	1.113	35756.14	1319.84	0.03
Col-Hayden	RM 106 Left	1.95	2-year	Existing_SF	56666.42	-39.54	17.296		17.34	0.000012	1.621	35072.15	1294.62	0.05
Col-Hayden	RM 106 Left	1.95	100-yr	Existing_WAR	94791.38	-39.54	32.378		32.43	0.000009	1.793	65078.13	3702.95	0.05
Col-Hayden	RM 106 Left	1.95	100-yr	Existing_SF	114122	-39.54	27.11		27.21	0.000019	2.501	47570.34	3567.2	0.07
Col-Hayden	RM 106 Left	1.82	FEMA 100-year	Existing_FEMA	93090.54	-43.74	31.25		31.3	0.000009	1.76	64066.76	3761.45	0.05
Col-Hayden	RM 106 Left	1.82	2-year	Existing_WAR	39633	-43.74	17.915		17.93	0.000005	1.08	36850.75	1613.92	0.03
Col-Hayden	RM 106 Left	1.82	2-year	Existing_SF	56666.42	-43.74	17.289		17.33	0.000011	1.574	36121.3	1576.85	0.05
Col-Hayden	RM 106 Left	1.82	100-yr	Existing_WAR	94791.38	-43.74	32.374		32.42	0.000008	1.733	68324.38	3825.41	0.04
Col-Hayden	RM 106 Left	1.82	100-yr	Existing_SF	114122	-43.74	27.1		27.19	0.000019	2.425	49766.53	3561.85	0.07
Col-Hayden	RM 106 Left	1.65	FEMA 100-year	Existing_FEMA	93090.54	-34.12	31.238		31.29	0.000009	1.818	55320.05	1789.42	0.05
Col-Hayden	RM 106 Left	1.65	2-year	Existing_WAR	39633	-34.12	17.91		17.93	0.000005	1.092	36660.15	1133.02	0.03
Col-Hayden	RM 106 Left	1.65	2-year	Existing_SF	56666.42	-34.12	17.279		17.32	0.000011	1.591	35945.08	1131.33	0.05
Col-Hayden	RM 106 Left	1.65	100-yr	Existing_WAR	94791.38	-34.12	32.361		32.41	0.000009	1.805	57401.14	1959.3	0.05
Col-Hayden	RM 106 Left	1.65	100-yr	Existing_SF	114122	-34.12	27.08		27.17	0.000019	2.464	48073.39	1634.36	0.07
Col-Hayden	RM 106 Left	1.48	FEMA 100-year	Existing_FEMA	93090.54	-36.43	31.228		31.28	0.000009	1.849	57469.46	2619.9	0.05
Col-Hayden	RM 106 Left	1.48	2-year	Existing_WAR	39633	-36.43	17.905		17.92	0.000005	1.103	36061.63	1238.17	0.03
Col-Hayden	RM 106 Left	1.48	2-year	Existing_SF	56666.42	-36.43	17.268		17.31	0.000011	1.607	35394.89	1211.59	0.05
Col-Hayden	RM 106 Left	1.48	100-yr	Existing_WAR	94791.38	-36.43	32.353		32.4	0.000008	1.828	60421.38	2766.06	0.05

Col-Hayden	RM 106 Left	1.48	100-yr	Existing_SF	114122	-36.43	27.058		27.16	0.000019	2.52	47129.17	2386.78	0.07
Col-Hayden	RM 106 Left	1.36	FEMA 100-year	Existing_FEMA	93090.54	-38.12	31.224		31.27	0.000009	1.818	60040.93	2742.37	0.05
Col-Hayden	RM 106 Left	1.36	2-year	Existing_WAR	39633	-38.12	17.902		17.92	0.000005	1.108	35992.81	1376.09	0.03
Col-Hayden	RM 106 Left	1.36	2-year	Existing_SF	56666.42	-38.12	17.261		17.3	0.000011	1.615	35279.25	1336.33	0.05
Col-Hayden	RM 106 Left	1.36	100-yr	Existing_WAR	94791.38	-38.12	32.349		32.4	0.000009	1.796	63143.41	2914.1	0.05
Col-Hayden	RM 106 Left	1.36	100-yr	Existing_SF	114122	-38.12	27.048		27.14	0.000019	2.497	48700.15	2649.27	0.07
Col-Hayden	RM 106 Left	1.22	FEMA 100-year	Existing_FEMA	93090.54	-40.02	31.221		31.27	0.000007	1.724	57197.79	1936.81	0.04
Col-Hayden	RM 106 Left	1.22	2-year	Existing_WAR	39633	-40.02	17.902		17.92	0.000003	0.994	40117.95	1080.24	0.03
Col-Hayden	RM 106 Left	1.22	2-year	Existing_SF	56666.42	-40.02	17.26		17.29	0.000007	1.444	39425.91	1077.03	0.04
Col-Hayden	RM 106 Left	1.22	100-yr	Existing_WAR	94791.38	-40.02	32.346		32.39	0.000007	1.715	59069.88	2072.5	0.04
Col-Hayden	RM 106 Left	1.22	100-yr	Existing_SF	114122	-40.02	27.046		27.13	0.000014	2.309	50930.44	1441.01	0.06
Col-Hayden	RM 106 Left	1.07	FEMA 100-year	Existing_FEMA	93090.54	-43	31.219		31.26	0.000006	1.647	60896.46	1848.26	0.04
Col-Hayden	RM 106 Left	1.07	2-year	Existing_WAR	39633	-43	17.9		17.91	0.000003	0.935	42537.08	1289.57	0.03
Col-Hayden	RM 106 Left	1.07	2-year	Existing_SF	56666.42	-43	17.258		17.29	0.000006	1.358	41866.95	1247.04	0.04
Col-Hayden	RM 106 Left	1.07	100-yr	Existing_WAR	94791.38	-43	32.343		32.38	0.000006	1.64	62883.02	2091.47	0.04
Col-Hayden	RM 106 Left	1.07	100-yr	Existing_SF	114122	-43	27.041		27.12	0.000012	2.199	54155.3	1559.95	0.05
Col-Hayden	RM 106 Left	0.93	FEMA 100-year	Existing_FEMA	93090.54	-39.88	31.217		31.26	0.000006	1.569	61479.9	1724.02	0.04
Col-Hayden	RM 106 Left	0.93	2-year	Existing_WAR	39633	-39.88	17.899		17.91	0.000003	0.894	44502.89	1160.05	0.02
Col-Hayden	RM 106 Left	0.93	2-year	Existing_SF	56666.42	-39.88	17.255		17.28	0.000006	1.3	43755.92	1158.09	0.04
Col-Hayden	RM 106 Left	0.93	100-yr	Existing_WAR	94791.38	-39.88	32.341		32.38	0.000006	1.564	63269.09	1964.29	0.04
Col-Hayden	RM 106 Left	0.93	100-yr	Existing_SF	114122	-39.88	27.037		27.1	0.000011	2.093	55595.73	1351.74	0.05
Col-Hayden	RM 106 Left	0.72	FEMA 100-year	Existing_FEMA	93090.54	-39	31.21		31.25	0.000006	1.576	60590.27	1463.83	0.04
Col-Hayden	RM 106 Left	0.72	2-year	Existing_WAR	39633	-39	17.897		17.91	0.000003	0.873	45548.61	1059.03	0.02
Col-Hayden	RM 106 Left	0.72	2-year	Existing_SF	56666.42	-39	17.249		17.27	0.000006	1.266	44864.78	1053.67	0.03
Col-Hayden	RM 106 Left	0.72	100-yr	Existing_WAR	94791.38	-39	32.334		32.37	0.000006	1.574	62143.79	1692.7	0.04
Col-Hayden	RM 106 Left	0.72	100-yr	Existing_SF	114122	-39	27.024		27.09	0.000012	2.085	55445.73	1187.12	0.05
Col-Hayden	RM 106 Left	0.52	FEMA 100-year	Existing_FEMA	93090.54	-41.86	31.205		31.24	0.000005	1.558	62146.82	1587.76	0.04
Col-Hayden	RM 106 Left	0.52	2-year	Existing_WAR	39633	-41.86	17.894		17.91	0.000002	0.87	45711.78	1134.95	0.02
Col-Hayden	RM 106 Left	0.52	2-year	Existing_SF	56666.42	-41.86	17.244		17.27	0.000005	1.262	45025.55	1119.96	0.03
Col-Hayden	RM 106 Left	0.52	100-yr	Existing_WAR	94791.38	-41.86	32.329		32.37	0.000005	1.553	63968.34	1628.8	0.04
Col-Hayden	RM 106 Left	0.52	100-yr	Existing_SF	114122	-41.86	27.013		27.08	0.000011	2.071	56292.77	1286.97	0.05
Col-Govt Isl	RM 115 Left	6.93	FEMA 100-year	Existing_FEMA	181292.4	-18.31	33.478	4.38	33.53	0.000022	1.79	101903.3	4025.88	0.06
Col-Govt Isl	RM 115 Left	6.93	2-year	Existing_WAR	74615.16	-18.31	19.842	-3.63	19.88	0.000028	1.551	48105.87	3731.63	0.08
Col-Govt Isl	RM 115 Left	6.93	2-year	Existing_SF	109177.4	-18.31	21.089	-0.74	21.16	0.000048	2.066	52839.73	3870.08	0.1
Col-Govt Isl	RM 115 Left	6.93	100-yr	Existing_WAR	181682.8	-18.31	34.421	4.39	34.47	0.00002	1.731	105709.3	4049.29	0.06
Col-Govt Isl	RM 115 Left	6.93	100-yr	Existing_SF	223042.5	-18.31	31.588	7.55	31.68	0.000042	2.377	94326.63	4000.62	0.09
Col-Govt Isl	RM 115 Left	6.67	FEMA 100-year	Existing_FEMA	181292.4	-17.26	33.444	-0.49	33.5	0.000019	1.923	94320.33	3286.74	0.06
Col-Govt Isl	RM 115 Left	6.67	2-year	Existing_WAR	74615.16	-17.26	19.819	-5.35	19.85	0.000018	1.431	52140.76	2848.42	0.06
Col-Govt Isl	RM 115 Left	6.67	2-year	Existing_SF	109177.4	-17.26	21.047	-3.56	21.11	0.000032	1.961	55682.73	2926.99	0.08

Col-Govt Isl	RM 115 Left	6.67	100-yr	Existing_WAR	181682.8	-17.26	34.389	-0.47	34.44	0.000018	1.866	97455.05	3348.77	0.06
Col-Govt Isl	RM 115 Left	6.67	100-yr	Existing_SF	223042.5	-17.26	31.527	1.1	31.63	0.000035	2.531	88131.08	3198.34	0.08
Col-Govt Isl	RM 115 Left	6.29	FEMA 100-year	Existing_FEMA	181292.4	-12.69	33.388	2.53	33.46	0.000023	2.158	83993.15	3078.08	0.07
Col-Govt Isl	RM 115 Left	6.29	2-year	Existing_WAR	74615.16	-12.69	19.777	-2.14	19.81	0.00002	1.547	48228.68	2348.35	0.06
Col-Govt Isl	RM 115 Left	6.29	2-year	Existing_SF	109177.4	-12.69	20.969	-0.18	21.04	0.000036	2.139	51045.33	2374.3	0.08
Col-Govt Isl	RM 115 Left	6.29	100-yr	Existing_WAR	181682.8	-12.69	34.338	2.55	34.41	0.000021	2.089	86978.1	3187.29	0.07
Col-Govt Isl	RM 115 Left	6.29	100-yr	Existing_SF	223042.5	-12.69	31.424	3.75	31.55	0.000042	2.857	78072.7	2906.27	0.1
Col-Govt Isl	RM 115 Left	5.85	FEMA 100-year	Existing_FEMA	181292.4	-6.37	33.332	5.28	33.41	0.000024	2.177	86075.58	3375.9	0.07
Col-Govt Isl	RM 115 Left	5.85	2-year	Existing_WAR	74615.16	-6.37	19.724	2.49	19.76	0.000024	1.582	47166	2499.03	0.06
Col-Govt Isl	RM 115 Left	5.85	2-year	Existing_SF	109177.4	-6.37	20.874	3.5	20.95	0.000043	2.182	50046.82	2506.98	0.09
Col-Govt Isl	RM 115 Left	5.85	100-yr	Existing_WAR	181682.8	-6.37	34.287	5.29	34.36	0.000022	2.113	89308.27	3390.33	0.07
Col-Govt Isl	RM 115 Left	5.85	100-yr	Existing_SF	223042.5	-6.37	31.321	6.19	31.45	0.000045	2.873	79446.2	3197.56	0.09
Col-Govt Isl	RM 115 Left	5.56	FEMA 100-year	Existing_FEMA	181292.4	-7.66	33.279	6.09	33.37	0.000028	2.385	79930.98	3074.27	0.07
Col-Govt Isl	RM 115 Left	5.56	2-year	Existing_WAR	74615.16	-7.66	19.678	3.39	19.72	0.000028	1.705	43755	2306.05	0.07
Col-Govt Isl	RM 115 Left	5.56	2-year	Existing_SF	109177.4	-7.66	20.792	4.36	20.88	0.00005	2.357	46326.57	2309.13	0.09
Col-Govt Isl	RM 115 Left	5.56	100-yr	Existing_WAR	181682.8	-7.66	34.238	6.09	34.32	0.000025	2.318	82882.51	3081.74	0.07
Col-Govt Isl	RM 115 Left	5.56	100-yr	Existing_SF	223042.5	-7.66	31.224	6.98	31.38	0.000052	3.143	73716.74	2932.17	0.1
Col-Govt Isl	RM 115 Left	5.17	FEMA 100-year	Existing_FEMA	181292.4	-4.55	33.217	6.5	33.31	0.000029	2.422	75535.4	2553.54	0.08
Col-Govt Isl	RM 115 Left	5.17	2-year	Existing_WAR	74615.16	-4.55	19.615	3.63	19.66	0.000031	1.742	42820.8	2322.41	0.07
Col-Govt Isl	RM 115 Left	5.17	2-year	Existing_SF	109177.4	-4.55	20.68	4.65	20.77	0.000055	2.41	45296.32	2326.18	0.1
Col-Govt Isl	RM 115 Left	5.17	100-yr	Existing_WAR	181682.8	-4.55	34.182	6.5	34.27	0.000027	2.355	78008.98	2577.9	0.07
Col-Govt Isl	RM 115 Left	5.17	100-yr	Existing_SF	223042.5	-4.55	31.107	7.42	31.27	0.000056	3.196	70196.03	2505.81	0.1
Col-Govt Isl	RM 115 Left	4.79	FEMA 100-year	Existing_FEMA	181292.4	-6.64	33.158	5.99	33.25	0.000029	2.411	76650.07	2663.7	0.08
Col-Govt Isl	RM 115 Left	4.79	2-year	Existing_WAR	74615.16	-6.64	19.552	2.48	19.6	0.000031	1.742	42835.68	2309.93	0.07
Col-Govt Isl	RM 115 Left	4.79	2-year	Existing_SF	109177.4	-6.64	20.567	3.83	20.66	0.000055	2.416	45183.76	2317.43	0.1
Col-Govt Isl	RM 115 Left	4.79	100-yr	Existing_WAR	181682.8	-6.64	34.128	5.99	34.21	0.000026	2.342	79255.99	2709.62	0.07
Col-Govt Isl	RM 115 Left	4.79	100-yr	Existing_SF	223042.5	-6.64	30.993	6.96	31.15	0.000056	3.19	70950.09	2617.56	0.1
Col-Govt Isl	RM 115 Left	4.33	FEMA 100-year	Existing_FEMA	181292.4	-4.22	33.086	5.51	33.18	0.000029	2.435	74594.57	2462.5	0.08
Col-Govt Isl	RM 115 Left	4.33	2-year	Existing_WAR	74615.16	-4.22	19.482	2.65	19.53	0.000028	1.72	43368.52	2258.62	0.07
Col-Govt Isl	RM 115 Left	4.33	2-year	Existing_SF	109177.4	-4.22	20.439	3.68	20.53	0.000052	2.398	45532.73	2262.57	0.09
Col-Govt Isl	RM 115 Left	4.33	100-yr	Existing_WAR	181682.8	-4.22	34.063	5.52	34.15	0.000026	2.367	77051.52	2567.15	0.07
Col-Govt Isl	RM 115 Left	4.33	100-yr	Existing_SF	223042.5	-4.22	30.856	6.45	31.02	0.000055	3.219	69288.84	2304.06	0.1
Col-Govt Isl	RM 115 Left	3.93	FEMA 100-year	Existing_FEMA	181292.4	-6.77	33.012	6.7	33.11	0.000033	2.547	72519.85	2727	0.08
Col-Govt Isl	RM 115 Left	3.93	2-year	Existing_WAR	74615.16	-6.77	19.407	3.39	19.46	0.000035	1.846	40425.47	2228.19	0.08
Col-Govt Isl	RM 115 Left	3.93	2-year	Existing_SF	109177.4	-6.77	20.302	4.76	20.41	0.000065	2.574	42420.94	2231.29	0.1
Col-Govt Isl	RM 115 Left	3.93	100-yr	Existing_WAR	181682.8	-6.77	33.995	6.71	34.09	0.00003	2.473	75259.75	2831.46	0.08
Col-Govt Isl	RM 115 Left	3.93	100-yr	Existing_SF	223042.5	-6.77	30.713	7.68	30.89	0.000064	3.386	66546.5	2471.8	0.11
Col-Govt Isl	RM 115 Left	3.5	FEMA 100-year	Existing_FEMA	181292.4	-6	32.951	3.97	33.05	0.000027	2.473	74111.92	2404.21	0.07
Col-Govt Isl	RM 115 Left	3.5	2-year	Existing_WAR	74615.16	-6	19.351	1.02	19.4	0.000024	1.688	44215.08	2110.26	0.06

Col-Govt Isl	RM 115 Left	3.5	2-year	Existing_SF	109177.4	-6	20.197	2.08	20.28	0.000046	2.373	46001.3	2113.06	0.09
Col-Govt Isl	RM 115 Left	3.5	100-yr	Existing_WAR	181682.8	-6	33.939	3.98	34.03	0.000025	2.407	76488.89	2406.87	0.07
Col-Govt Isl	RM 115 Left	3.5	100-yr	Existing_SF	223042.5	-6	30.595	4.94	30.76	0.000053	3.271	68517.25	2311.18	0.1
Col-Govt Isl	RM 115 Left	3.07	FEMA 100-year	Existing_FEMA	181292.4	-0.03	32.842	9.4	32.97	0.000045	2.832	64830.51	2397.28	0.09
Col-Govt Isl	RM 115 Left	3.07	2-year	Existing_WAR	74615.16	-0.03	19.237	6.59	19.31	0.000061	2.194	34014.14	2167.86	0.1
Col-Govt Isl	RM 115 Left	3.07	2-year	Existing_SF	109177.4	-0.03	19.983	7.61	20.13	0.000111	3.064	35632.05	2170.35	0.13
Col-Govt Isl	RM 115 Left	3.07	100-yr	Existing_WAR	181682.8	-0.03	33.84	9.41	33.96	0.000041	2.742	67226.85	2402.34	0.09
Col-Govt Isl	RM 115 Left	3.07	100-yr	Existing_SF	223042.5	-0.03	30.379	10.31	30.6	0.000092	3.815	58945.61	2375.76	0.13
Col-Govt Isl	RM 115 Left	2.77	FEMA 100-year	Existing_FEMA	181292.4	-5.24	32.814	6.35	32.91	0.00003	2.456	75665.71	2694.68	0.08
Col-Govt Isl	RM 115 Left	2.77	2-year	Existing_WAR	74615.16	-5.24	19.193	3.56	19.24	0.000033	1.779	41939.15	2295.37	0.07
Col-Govt Isl	RM 115 Left	2.77	2-year	Existing_SF	109177.4	-5.24	19.901	4.6	20	0.000061	2.506	43566.05	2297.71	0.1
Col-Govt Isl	RM 115 Left	2.77	100-yr	Existing_WAR	181682.8	-5.24	33.816	6.35	33.9	0.000027	2.383	78367.21	2698.14	0.07
Col-Govt Isl	RM 115 Left	2.77	100-yr	Existing_SF	223042.5	-5.24	30.319	7.24	30.49	0.00006	3.288	68952.28	2661.52	0.11
Col-Govt Isl	RM 115 Left	2.49	FEMA 100-year	Existing_FEMA	181292.4	-3.63	32.774	6.29	32.86	0.00003	2.408	75364.71	2500.08	0.08
Col-Govt Isl	RM 115 Left	2.49	2-year	Existing_WAR	74615.16	-3.63	19.149	3.01	19.2	0.000031	1.74	42874.86	2350.51	0.07
Col-Govt Isl	RM 115 Left	2.49	2-year	Existing_SF	109177.4	-3.63	19.818	4.21	19.91	0.000059	2.456	44448.18	2352.92	0.1
Col-Govt Isl	RM 115 Left	2.49	100-yr	Existing_WAR	181682.8	-3.63	33.78	6.29	33.86	0.000027	2.337	77895.48	2529.91	0.07
Col-Govt Isl	RM 115 Left	2.49	100-yr	Existing_SF	223042.5	-3.63	30.24	7.17	30.4	0.000058	3.225	69160.78	2392.22	0.11
Col-Govt Isl	RM 115 Left	2.13	FEMA 100-year	Existing_FEMA	181292.4	-10.06	32.723	4.5	32.81	0.000028	2.369	77809.48	2718.18	0.07
Col-Govt Isl	RM 115 Left	2.13	2-year	Existing_WAR	74615.16	-10.06	19.094	0.71	19.14	0.000029	1.704	43795.91	2344.98	0.07
Col-Govt Isl	RM 115 Left	2.13	2-year	Existing_SF	109177.4	-10.06	19.712	2.21	19.8	0.000056	2.413	45246.88	2349.46	0.1
Col-Govt Isl	RM 115 Left	2.13	100-yr	Existing_WAR	181682.8	-10.06	33.734	4.51	33.82	0.000025	2.298	80558.35	2720.53	0.07
Col-Govt Isl	RM 115 Left	2.13	100-yr	Existing_SF	223042.5	-10.06	30.136	5.62	30.29	0.000056	3.179	70802.38	2699.11	0.1
Col-Govt Isl	RM 115 Left	1.7	FEMA 100-year	Existing_FEMA	181292.4	-10.17	32.618	4.23	32.73	0.000039	2.825	69783.05	2721.18	0.09
Col-Govt Isl	RM 115 Left	1.7	2-year	Existing_WAR	74615.16	-10.17	18.992	-0.5	19.06	0.00004	2.121	35868.29	2113.54	0.08
Col-Govt Isl	RM 115 Left	1.7	2-year	Existing_SF	109177.4	-10.17	19.511	1.18	19.65	0.00008	3.022	36975.48	2150.42	0.12
Col-Govt Isl	RM 115 Left	1.7	100-yr	Existing_WAR	181682.8	-10.17	33.639	4.24	33.75	0.000035	2.73	72563.66	2723.85	0.08
Col-Govt Isl	RM 115 Left	1.7	100-yr	Existing_SF	223042.5	-10.17	29.921	5.67	30.14	0.000081	3.847	62454.96	2713.35	0.12
Col-Govt Isl	RM 115 Left	1.35	FEMA 100-year	Existing_FEMA	181292.4	-10.52	32.547	1.33	32.67	0.000035	2.9	71017.73	2611.63	0.08
Col-Govt Isl	RM 115 Left	1.35	2-year	Existing_WAR	74615.16	-10.52	18.938	-3.09	19	0.00003	2.008	39107.72	1906.78	0.07
Col-Govt Isl	RM 115 Left	1.35	2-year	Existing_SF	109177.4	-10.52	19.401	-1.47	19.53	0.000059	2.877	39998.25	1932.87	0.1
Col-Govt Isl	RM 115 Left	1.35	100-yr	Existing_WAR	181682.8	-10.52	33.574	1.34	33.69	0.000032	2.815	73708.09	2625.44	0.08
Col-Govt Isl	RM 115 Left	1.35	100-yr	Existing_SF	223042.5	-10.52	29.782	2.69	30	0.00007	3.904	63975.03	2508.28	0.12
Col-Govt Isl	RM 115 Left	0.86	FEMA 100-year	Existing_FEMA	181292.4	-9.23	32.466	2.51	32.58	0.000033	2.695	67584.59	2145.43	0.08
Col-Govt Isl	RM 115 Left	0.86	2-year	Existing_WAR	74615.16	-9.23	18.874	-0.86	18.93	0.000026	1.816	41080.53	1861.35	0.07
Col-Govt Isl	RM 115 Left	0.86	2-year	Existing_SF	109177.4	-9.23	19.273	0.41	19.38	0.000053	2.61	41823.45	1863.81	0.1
Col-Govt Isl	RM 115 Left	0.86	100-yr	Existing_WAR	181682.8	-9.23	33.5	2.52	33.61	0.00003	2.62	69828.51	2186.56	0.08
Col-Govt Isl	RM 115 Left	0.86	100-yr	Existing_SF	223042.5	-9.23	29.622	3.59	29.83	0.000066	3.621	61676.27	1990.72	0.11
Col-Govt Isl	RM 115 Left	0.55	FEMA 100-year	Existing_FEMA	181292.4	-3	32.431	5.91	32.53	0.000031	2.475	73246.37	2313.84	0.08

Col-Govt Isl	RM 115 Left	0.55	2-year	Existing_WAR	74615.16	-3	18.829	3.16	18.88	0.000032	1.776	42012.89	2276.77	0.07
Col-Govt Isl	RM 115 Left	0.55	2-year	Existing_SF	109177.4	-3	19.182	4.15	19.28	0.000064	2.55	42816.7	2278.1	0.1
Col-Govt Isl	RM 115 Left	0.55	100-yr	Existing_WAR	181682.8	-3	33.469	5.92	33.56	0.000028	2.402	75650.67	2318.04	0.07
Col-Govt Isl	RM 115 Left	0.55	100-yr	Existing_SF	223042.5	-3	29.545	6.8	29.72	0.000063	3.35	66580.14	2305.59	0.11
Col-Govt Isl	RM 115 Left	0.24	FEMA 100-year	Existing_FEMA	181292.4	-2.26	32.336	8.35	32.47	0.000046	2.894	62645.66	2096.05	0.09
Col-Govt Isl	RM 115 Left	0.24	2-year	Existing_WAR	74615.16	-2.26	18.737	5.53	18.81	0.000057	2.178	34251.85	2077.05	0.09
Col-Govt Isl	RM 115 Left	0.24	2-year	Existing_SF	109177.4	-2.26	18.994	6.54	19.15	0.000115	3.139	34785.71	2077.54	0.14
Col-Govt Isl	RM 115 Left	0.24	100-yr	Existing_WAR	181682.8	-2.26	33.383	8.36	33.51	0.000041	2.802	64840.27	2097.35	0.09
Col-Govt Isl	RM 115 Left	0.24	100-yr	Existing_SF	223042.5	-2.26	29.351	9.28	29.59	0.000098	3.955	56393.56	2092.74	0.13
Col-Camas	RM 120 Right	2.89	FEMA 100-year	Existing_FEMA	2941	-4.36	33.566		33.57	0.000001	0.415	7094.89	260.78	0.01
Col-Camas	RM 120 Right	2.89	2-year	Existing_WAR	6000	-4.36	19.975		20.01	0.000027	1.549	3873.8	214.29	0.06
Col-Camas	RM 120 Right	2.89	2-year	Existing_SF	4000	-4.36	21.274		21.29	0.00001	0.963	4154.72	218.29	0.04
Col-Camas	RM 120 Right	2.89	100-yr	Existing_WAR	5000	-4.36	34.517		34.52	0.000003	0.681	7344.42	264.01	0.02
Col-Camas	RM 120 Right	2.89	100-yr	Existing_SF	4000	-4.36	31.784		31.79	0.000003	0.603	6635.54	254.74	0.02
Col-Camas	RM 120 Right	2.6	FEMA 100-year	Existing_FEMA	2941	0.04	33.567		33.57	0	0.115	25643.78	1554.13	0
Col-Camas	RM 120 Right	2.6	2-year	Existing_WAR	6000	0.04	19.984		19.99	0.000005	0.516	11636.82	989.11	0.03
Col-Camas	RM 120 Right	2.6	2-year	Existing_SF	4000	0.04	21.278		21.28	0.000002	0.31	12921.32	995.76	0.02
Col-Camas	RM 120 Right	2.6	100-yr	Existing_WAR	5000	0.04	34.521		34.52	0	0.188	26654.12	1617.66	0.01
Col-Camas	RM 120 Right	2.6	100-yr	Existing_SF	4000	0.04	31.787		31.79	0	0.168	23765.13	1289.08	0.01
Col-Camas	RM 120 Right	2.4	FEMA 100-year	Existing_FEMA	2941	-3.85	33.567		33.57	0	0.141	20895.34	1117.65	0
Col-Camas	RM 120 Right	2.4	2-year	Existing_WAR	6000	-3.85	19.978		19.98	0.000004	0.552	10865.2	703.94	0.02
Col-Camas	RM 120 Right	2.4	2-year	Existing_SF	4000	-3.85	21.276		21.28	0.000001	0.34	11781.92	708.91	0.01
Col-Camas	RM 120 Right	2.4	100-yr	Existing_WAR	5000	-3.85	34.52		34.52	0	0.231	21724.78	1316.67	0.01
Col-Camas	RM 120 Right	2.4	100-yr	Existing_SF	4000	-3.85	31.786		31.79	0	0.205	19499.34	934.55	0.01
Col-Camas	RM 120 Right	2.22	FEMA 100-year	Existing_FEMA	2941	-11.36	33.567		33.57	0	0.151	19692.18	969.48	0
Col-Camas	RM 120 Right	2.22	2-year	Existing_WAR	6000	-11.36	19.976		19.98	0.000002	0.513	11688.55	492.7	0.02
Col-Camas	RM 120 Right	2.22	2-year	Existing_SF	4000	-11.36	21.275		21.28	0.000001	0.324	12333.2	499.83	0.01
Col-Camas	RM 120 Right	2.22	100-yr	Existing_WAR	5000	-11.36	34.519		34.52	0	0.248	20500.17	1004.59	0.01
Col-Camas	RM 120 Right	2.22	100-yr	Existing_SF	4000	-11.36	31.786		31.79	0	0.218	18319.83	722.09	0.01
Col-Camas	RM 120 Right	2	FEMA 100-year	Existing_FEMA	2941	-13.6	33.567		33.57	0	0.165	18198.58	1513.12	0.01
Col-Camas	RM 120 Right	2	2-year	Existing_WAR	6000	-13.6	19.973		19.98	0.000002	0.55	10914.7	489.1	0.02
Col-Camas	RM 120 Right	2	2-year	Existing_SF	4000	-13.6	21.274		21.28	0.000001	0.346	11553.51	636.97	0.01
Col-Camas	RM 120 Right	2	100-yr	Existing_WAR	5000	-13.6	34.519		34.52	0	0.272	18832.09	1577.73	0.01
Col-Camas	RM 120 Right	2	100-yr	Existing_SF	4000	-13.6	31.785		31.79	0	0.237	17078.47	1488.8	0.01
Col-Camas	RM 120 Right	1.78	FEMA 100-year	Existing_FEMA	2941	-17.27	33.566		33.57	0	0.153	19200.4	570.42	0
Col-Camas	RM 120 Right	1.78	2-year	Existing_WAR	6000	-17.27	19.972		19.98	0.000002	0.499	12029.89	503.77	0.02
Col-Camas	RM 120 Right	1.78	2-year	Existing_SF	4000	-17.27	21.274		21.28	0.000001	0.315	12687.75	506.75	0.01
Col-Camas	RM 120 Right	1.78	100-yr	Existing_WAR	5000	-17.27	34.519		34.52	0	0.253	19745.83	575.2	0.01
Col-Camas	RM 120 Right	1.78	100-yr	Existing_SF	4000	-17.27	31.785		31.79	0	0.22	18192.55	561.18	0.01

Col-Camas	RM 120 Right	1.53	FEMA 100-year	Existing_FEMA	2941	-17.28	33.566		33.57	0	0.143	21803.99	1038.48	0
Col-Camas	RM 120 Right	1.53	2-year	Existing_WAR	6000	-17.28	19.97		19.97	0.000001	0.462	12992.01	523.67	0.02
Col-Camas	RM 120 Right	1.53	2-year	Existing_SF	4000	-17.28	21.273		21.27	0.000001	0.292	13675.93	526.18	0.01
Col-Camas	RM 120 Right	1.53	100-yr	Existing_WAR	5000	-17.28	34.518		34.52	0	0.236	22666.02	1059.06	0.01
Col-Camas	RM 120 Right	1.53	100-yr	Existing_SF	4000	-17.28	31.785		31.79	0	0.205	20245.91	977.93	0.01
Col-Camas	RM 120 Right	1.33	FEMA 100-year	Existing_FEMA	2941	-19.74	33.566		33.57	0	0.141	24308.31	1290.8	0
Col-Camas	RM 120 Right	1.33	2-year	Existing_WAR	6000	-19.74	19.969		19.97	0.000001	0.456	13144.28	491.09	0.02
Col-Camas	RM 120 Right	1.33	2-year	Existing_SF	4000	-19.74	21.273		21.27	0.000001	0.29	13786.75	494.45	0.01
Col-Camas	RM 120 Right	1.33	100-yr	Existing_WAR	5000	-19.74	34.518		34.52	0	0.232	25376.42	1302.3	0.01
Col-Camas	RM 120 Right	1.33	100-yr	Existing_SF	4000	-19.74	31.785		31.79	0	0.203	22352.88	1224.53	0.01
Col-Camas	RM 120 Right	1.13	FEMA 100-year	Existing_FEMA	2941	-16.93	33.566		33.57	0	0.119	25928.15	967.52	0
Col-Camas	RM 120 Right	1.13	2-year	Existing_WAR	6000	-16.93	19.968		19.97	0.000001	0.398	15081.27	650.44	0.01
Col-Camas	RM 120 Right	1.13	2-year	Existing_SF	4000	-16.93	21.272		21.27	0	0.251	15932.96	655.38	0.01
Col-Camas	RM 120 Right	1.13	100-yr	Existing_WAR	5000	-16.93	34.518		34.52	0	0.196	26856.05	988.67	0.01
Col-Camas	RM 120 Right	1.13	100-yr	Existing_SF	4000	-16.93	31.785		31.79	0	0.171	24253.96	922.23	0.01
Col-Camas	RM 120 Right	0.97	FEMA 100-year	Existing_FEMA	2941	-16.15	33.566		33.57	0	0.105	28995.06	1305.75	0
Col-Camas	RM 120 Right	0.97	2-year	Existing_WAR	6000	-16.15	19.967		19.97	0.000002	0.389	15404.88	882.01	0.02
Col-Camas	RM 120 Right	0.97	2-year	Existing_SF	4000	-16.15	21.272		21.27	0.000001	0.242	16558.11	885.42	0.01
Col-Camas	RM 120 Right	0.97	100-yr	Existing_WAR	5000	-16.15	34.518		34.52	0	0.173	30217.79	1407.97	0.01
Col-Camas	RM 120 Right	0.97	100-yr	Existing_SF	4000	-16.15	31.785		31.79	0	0.153	26873.85	1201.87	0.01
Col-Camas	RM 120 Right	0.76	FEMA 100-year	Existing_FEMA	2941	-21.87	33.566		33.57	0	0.095	32462.15	1117.63	0
Col-Camas	RM 120 Right	0.76	2-year	Existing_WAR	6000	-21.87	19.967		19.97	0.000001	0.311	19327.82	831.7	0.01
Col-Camas	RM 120 Right	0.76	2-year	Existing_SF	4000	-21.87	21.272		21.27	0	0.197	20425.62	849.85	0.01
Col-Camas	RM 120 Right	0.76	100-yr	Existing_WAR	5000	-21.87	34.518		34.52	0	0.158	33542.39	1158.15	0
Col-Camas	RM 120 Right	0.76	100-yr	Existing_SF	4000	-21.87	31.785		31.78	0	0.137	30483.46	1103.49	0

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Columbia	RM 102.5-108	106.78	FEMA 100-year	Ultimate_ALT107_FEMA	31.73	31.538		0.01	0	3139.61	579.41	470780.1	1257.3	3.5
Columbia	RM 102.5-108	106.78	FEMA 100-year	Ultimate_ALT108_FEMA	31.73	31.538		0.01	0	3139.61	579.41	470780.8	1257.29	3.5
Columbia	RM 102.5-108	106.78	2-year	Ultimate_ALT107_WAR	18.2	18.105		0.01	0	2785.98	68.76	238664.8	78.83	2.45
Columbia	RM 102.5-108	106.78	2-year	Ultimate_ALT108_WAR	18.2	18.105		0.01	0	2785.98	68.76	238664.8	78.83	2.45
Columbia	RM 102.5-108	106.78	2-year	Ultimate_ALT107_SF	17.89	17.698		0.01	0	2784.2	90.1	341364.6	102.28	3.54
Columbia	RM 102.5-108	106.78	2-year	Ultimate_ALT108_SF	17.89	17.698		0.01	0	2784.2	90.1	341364.6	102.28	3.54
Columbia	RM 102.5-108	106.78	100-yr	Ultimate_ALT107_WAR	32.82	32.643		0.01	0	3160.28	624.21	471169.2	1503.97	3.43
Columbia	RM 102.5-108	106.78	100-yr	Ultimate_ALT108_WAR	32.82	32.642		0.01	0	3160.28	624.21	471169.8	1503.96	3.43
Columbia	RM 102.5-108	106.78	100-yr	Ultimate_ALT107_SF	28.07	27.712		0.02	0	3023.01	557.33	597340.3	699.46	4.82
Columbia	RM 102.5-108	106.78	100-yr	Ultimate_ALT108_SF	28.07	27.711		0.02	0	3023.01	557.33	597340.6	699.45	4.82
Columbia	RM 102.5-108	106.73	FEMA 100-year	Ultimate_ALT107_FEMA	31.72	31.515	-10.34			2980.13	1581.62	470946.8	88.32	3.62
Columbia	RM 102.5-108	106.73	FEMA 100-year	Ultimate_ALT108_FEMA	31.72	31.515	-10.34			2980.12	1581.62	470947.5	88.32	3.62
Columbia	RM 102.5-108	106.73	2-year	Ultimate_ALT107_WAR	18.19	18.092	-14.68			2712.2	83.42	238726.9	2.02	2.53
Columbia	RM 102.5-108	106.73	2-year	Ultimate_ALT108_WAR	18.19	18.092	-14.68			2712.2	83.42	238726.9	2.02	2.53
Columbia	RM 102.5-108	106.73	2-year	Ultimate_ALT107_SF	17.88	17.67	-12.67			2702.56	102.95	341451.6	2.5	3.66
Columbia	RM 102.5-108	106.73	2-year	Ultimate_ALT108_SF	17.88	17.67	-12.67			2702.56	102.95	341451.6	2.5	3.66
Columbia	RM 102.5-108	106.73	100-yr	Ultimate_ALT107_WAR	32.82	32.62	-10.33			3136.09	1683.85	471468.5	145.05	3.55
Columbia	RM 102.5-108	106.73	100-yr	Ultimate_ALT108_WAR	32.82	32.62	-10.33			3136.09	1683.84	471469	145.04	3.55
Columbia	RM 102.5-108	106.73	100-yr	Ultimate_ALT107_SF	28.05	27.666	-8.3			2828.89	1350.99	597211.9	34.11	4.99
Columbia	RM 102.5-108	106.73	100-yr	Ultimate_ALT108_SF	28.05	27.666	-8.3			2828.89	1350.98	597212.3	34.11	4.99
Columbia	RM 102.5-108	106.70 BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.73	31.508	-10.04			2876.83	901.41	471607.9	107.54	3.83
Columbia	RM 102.5-108	106.70 BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.73	31.508	-10.04			2881.83	908.83	471601.1	107.58	3.83
Columbia	RM 102.5-108	106.70 BR U	2-year	Ultimate_ALT107_WAR	18.2	18.088	-14.5			2510.87	12.96	238797.1	2.35	2.67
Columbia	RM 102.5-108	106.70 BR U	2-year	Ultimate_ALT108_WAR	18.2	18.088	-14.5			2510.87	12.96	238797.1	2.35	2.67
Columbia	RM 102.5-108	106.70 BR U	2-year	Ultimate_ALT107_SF	17.9	17.662	-12.41			2501.13	16.73	341537.4	2.89	3.87
Columbia	RM 102.5-108	106.70 BR U	2-year	Ultimate_ALT108_SF	17.9	17.662	-12.41			2501.13	16.73	341537.4	2.89	3.87
Columbia	RM 102.5-108	106.70 BR U	100-yr	Ultimate_ALT107_WAR	32.83	32.614	-10.03			3022.56	1014.37	472106	177.06	3.75
Columbia	RM 102.5-108	106.70 BR U	100-yr	Ultimate_ALT108_WAR	32.83	32.614	-10.03			3027.56	1023	472097.8	177.12	3.74
Columbia	RM 102.5-108	106.70 BR U	100-yr	Ultimate_ALT107_SF	28.08	27.651	-7.98			2725.8	629.91	597925.9	41.29	5.27
Columbia	RM 102.5-108	106.70 BR U	100-yr	Ultimate_ALT108_SF	28.08	27.651	-7.98			2730.8	634.03	597922	41.31	5.27
Columbia	RM 102.5-108	106.70 BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.74	31.508	-9.52			2543.17	248	472328.2	40.67	3.88
Columbia	RM 102.5-108	106.70 BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.74	31.508	-9.52			2547.17	248.02	472328.8	40.67	3.88
Columbia	RM 102.5-108	106.70 BR D	2-year	Ultimate_ALT107_WAR	18.2	18.088	-13.65			2410.87	6.9	238804.3	1.18	2.68
Columbia	RM 102.5-108	106.70 BR D	2-year	Ultimate_ALT108_WAR	18.2	18.088	-13.65			2410.87	6.9	238804.3	1.18	2.68
Columbia	RM 102.5-108	106.70 BR D	2-year	Ultimate_ALT107_SF	17.9	17.662	-11.72			2409.53	7.62	341548	1.4	3.88
Columbia	RM 102.5-108	106.70 BR D	2-year	Ultimate_ALT108_SF	17.9	17.662	-11.72			2409.53	7.62	341548	1.4	3.88
Columbia	RM 102.5-108	106.70 BR D	100-yr	Ultimate_ALT107_WAR	32.84	32.614	-9.51			2621.19	282.26	472969.7	45.43	3.8
Columbia	RM 102.5-108	106.70 BR D	100-yr	Ultimate_ALT108_WAR	32.84	32.614	-9.51			2627.69	282.26	472970.3	45.43	3.8
Columbia	RM 102.5-108	106.70 BR D	100-yr	Ultimate_ALT107_SF	28.09	27.651	-7.6			2525.4	199.39	598367.1	30.55	5.33
Columbia	RM 102.5-108	106.70 BR D	100-yr	Ultimate_ALT108_SF	28.09	27.651	-7.59			2529.4	199.44	598367.4	30.56	5.33
Columbia	RM 102.5-108	106.67	FEMA 100-year	Ultimate_ALT107_FEMA	31.71	31.508		0.01	0	2627.17	207.77	472375	34.07	3.64

Columbia	RM 102.5-108	106.67	FEMA 100-year	Ultimate_ALT108_FEMA	31.71	31.508		0.01	0	2627.17	207.77	472375.7	34.07	3.64
Columbia	RM 102.5-108	106.67	2-year	Ultimate_ALT107_WAR	18.19	18.088		0.01	0	2573.12	5.89	238805.5	1.01	2.5
Columbia	RM 102.5-108	106.67	2-year	Ultimate_ALT108_WAR	18.19	18.088		0.01	0	2573.12	5.89	238805.5	1.01	2.5
Columbia	RM 102.5-108	106.67	2-year	Ultimate_ALT107_SF	17.87	17.662		0.02	0	2571.78	6.51	341549.3	1.2	3.62
Columbia	RM 102.5-108	106.67	2-year	Ultimate_ALT108_SF	17.87	17.662		0.02	0	2571.78	6.51	341549.3	1.2	3.62
Columbia	RM 102.5-108	106.67	100-yr	Ultimate_ALT107_WAR	32.81	32.614		0.01	0	2715.19	236.33	473023	38.04	3.57
Columbia	RM 102.5-108	106.67	100-yr	Ultimate_ALT108_WAR	32.81	32.614		0.01	0	2715.19	236.33	473023.5	38.04	3.57
Columbia	RM 102.5-108	106.67	100-yr	Ultimate_ALT107_SF	28.04	27.651		0.02	0	2609.4	167.31	598404.1	25.64	4.99
Columbia	RM 102.5-108	106.67	100-yr	Ultimate_ALT108_SF	28.04	27.651		0.02	0	2609.4	167.31	598404.4	25.64	4.99
Columbia	RM 102.5-108	106.62	FEMA 100-year	Ultimate_ALT107_FEMA	31.7	31.485		0.01	0	2723.82	1041.99	471309	265.89	3.74
Columbia	RM 102.5-108	106.62	FEMA 100-year	Ultimate_ALT108_FEMA	31.7	31.485		0.01	0	2723.82	1041.99	471309.7	265.89	3.74
Columbia	RM 102.5-108	106.62	2-year	Ultimate_ALT107_WAR	18.18	18.075		0.01	0	2571.75	108.55	238669.1	34.71	2.56
Columbia	RM 102.5-108	106.62	2-year	Ultimate_ALT108_WAR	18.18	18.075		0.01	0	2571.75	108.55	238669.1	34.71	2.56
Columbia	RM 102.5-108	106.62	2-year	Ultimate_ALT107_SF	17.85	17.635		0.02	0	2569.67	139.21	341372.4	45.36	3.71
Columbia	RM 102.5-108	106.62	2-year	Ultimate_ALT108_SF	17.85	17.635		0.02	0	2569.67	139.21	341372.4	45.36	3.71
Columbia	RM 102.5-108	106.62	100-yr	Ultimate_ALT107_WAR	32.8	32.592		0.01	0	2741.03	1117.47	471903.2	276.69	3.66
Columbia	RM 102.5-108	106.62	100-yr	Ultimate_ALT108_WAR	32.8	32.592		0.01	0	2741.03	1117.47	471903.8	276.69	3.66
Columbia	RM 102.5-108	106.62	100-yr	Ultimate_ALT107_SF	28.01	27.606		0.03	0	2676.35	997.25	597338.5	261.3	5.13
Columbia	RM 102.5-108	106.62	100-yr	Ultimate_ALT108_SF	28.01	27.606		0.03	0	2676.35	997.25	597338.8	261.3	5.13
Columbia	RM 102.5-108	105.91	FEMA 100-year	Ultimate_ALT107_FEMA	31.55	31.322		0	0	2750.39	996.73	471219.3	400.83	3.82
Columbia	RM 102.5-108	105.91	FEMA 100-year	Ultimate_ALT108_FEMA	31.55	31.322		0	0	2750.39	996.73	471219.9	400.83	3.82
Columbia	RM 102.5-108	105.91	2-year	Ultimate_ALT107_WAR	18.08	17.975		0	0	2325.01	68.34	238713.4	30.58	2.56
Columbia	RM 102.5-108	105.91	2-year	Ultimate_ALT108_WAR	18.08	17.975		0	0	2325.01	68.34	238713.4	30.58	2.56
Columbia	RM 102.5-108	105.91	2-year	Ultimate_ALT107_SF	17.63	17.42		0	0	2321	79.54	341440.8	36.7	3.72
Columbia	RM 102.5-108	105.91	2-year	Ultimate_ALT108_SF	17.63	17.42		0	0	2321	79.54	341440.8	36.7	3.72
Columbia	RM 102.5-108	105.91	100-yr	Ultimate_ALT107_WAR	32.66	32.439		0	0	2926.9	1078.79	471807.3	411.3	3.75
Columbia	RM 102.5-108	105.91	100-yr	Ultimate_ALT108_WAR	32.66	32.439		0	0	2926.9	1078.79	471807.8	411.3	3.75
Columbia	RM 102.5-108	105.91	100-yr	Ultimate_ALT107_SF	27.7	27.273		0	0	2549.56	890.42	597331.8	374.83	5.23
Columbia	RM 102.5-108	105.91	100-yr	Ultimate_ALT108_SF	27.7	27.273		0	0	2549.56	890.42	597332.1	374.83	5.23
Columbia	RM 102.5-108	105.9	FEMA 100-year	Ultimate_ALT107_FEMA	31.55	31.321	-15.35			2722.49	1437.08	470902.6	277.11	3.81
Columbia	RM 102.5-108	105.9	FEMA 100-year	Ultimate_ALT108_FEMA	31.55	31.321	-15.35			2722.49	1437.08	470903.3	277.11	3.81
Columbia	RM 102.5-108	105.9	2-year	Ultimate_ALT107_WAR	18.08	17.975	-20.69			2286.98	118.7	238672.1	21.57	2.54
Columbia	RM 102.5-108	105.9	2-year	Ultimate_ALT108_WAR	18.08	17.975	-20.69			2286.98	118.7	238672.1	21.57	2.54
Columbia	RM 102.5-108	105.9	2-year	Ultimate_ALT107_SF	17.63	17.42	-18.08			2283.74	142.74	341388.1	26.19	3.68
Columbia	RM 102.5-108	105.9	2-year	Ultimate_ALT108_SF	17.63	17.42	-18.08			2283.74	142.74	341388.1	26.19	3.68
Columbia	RM 102.5-108	105.9	100-yr	Ultimate_ALT107_WAR	32.65	32.438	-15.33			2956.7	1549.2	471473.6	274.64	3.74
Columbia	RM 102.5-108	105.9	100-yr	Ultimate_ALT108_WAR	32.65	32.438	-15.33			2956.7	1549.2	471474.1	274.64	3.74
Columbia	RM 102.5-108	105.9	100-yr	Ultimate_ALT107_SF	27.69	27.271	-12.98			2590.94	1310.93	597043.9	242.17	5.21
Columbia	RM 102.5-108	105.9	100-yr	Ultimate_ALT108_SF	27.69	27.271	-12.98			2590.94	1310.93	597044.3	242.17	5.21
Columbia	RM 102.5-108	105.88 BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.57	31.314	-14.5			2549.99	1093.24	471141.6	382.02	4.07
Columbia	RM 102.5-108	105.88 BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.57	31.314	-14.5			2549.99	1093.24	471142.3	382.02	4.07
Columbia	RM 102.5-108	105.88 BR U	2-year	Ultimate_ALT107_WAR	18.09	17.972	-20.15			2147.59	124.31	238660.1	27.94	2.73

Columbia	RM 102.5-108	105.88 BR U	2-year	Ultimate_ALT108_WAR	18.09	17.972	-20.15			2147.59	124.31	238660.1	27.94	2.73
Columbia	RM 102.5-108	105.88 BR U	2-year	Ultimate_ALT107_SF	17.66	17.413	-17.4			2143.91	155.68	341367.5	33.81	3.95
Columbia	RM 102.5-108	105.88 BR U	2-year	Ultimate_ALT108_SF	17.66	17.413	-17.4			2143.91	155.68	341367.5	33.81	3.95
Columbia	RM 102.5-108	105.88 BR U	100-yr	Ultimate_ALT107_WAR	32.68	32.431	-14.49			2564.85	1166.05	471712.9	418.41	4
Columbia	RM 102.5-108	105.88 BR U	100-yr	Ultimate_ALT108_WAR	32.68	32.43	-14.49			2564.85	1166.05	471713.5	418.41	4
Columbia	RM 102.5-108	105.88 BR U	100-yr	Ultimate_ALT107_SF	27.74	27.255	-12.12			2445.49	1042.05	597230.4	324.59	5.58
Columbia	RM 102.5-108	105.88 BR U	100-yr	Ultimate_ALT108_SF	27.74	27.255	-12.12			2445.49	1042.05	597230.7	324.59	5.58
Columbia	RM 102.5-108	105.88 BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.54	31.314	-19.73			2474.46	515.72	472087.6	13.5	3.82
Columbia	RM 102.5-108	105.88 BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.54	31.314	-19.73			2474.46	515.72	472088.3	13.5	3.82
Columbia	RM 102.5-108	105.88 BR D	2-year	Ultimate_ALT107_WAR	18.07	17.972	-25.69			2155.87	22.35	238789	1.01	2.51
Columbia	RM 102.5-108	105.88 BR D	2-year	Ultimate_ALT108_WAR	18.07	17.972	-25.69			2155.87	22.35	238789	1.01	2.51
Columbia	RM 102.5-108	105.88 BR D	2-year	Ultimate_ALT107_SF	17.62	17.413	-22.91			2155.52	22.5	341533.3	1.18	3.63
Columbia	RM 102.5-108	105.88 BR D	2-year	Ultimate_ALT108_SF	17.62	17.413	-22.91			2155.52	22.5	341533.3	1.18	3.63
Columbia	RM 102.5-108	105.88 BR D	100-yr	Ultimate_ALT107_WAR	32.65	32.431	-19.71			2559.63	564.45	472718.4	14.54	3.75
Columbia	RM 102.5-108	105.88 BR D	100-yr	Ultimate_ALT108_WAR	32.65	32.43	-19.71			2559.63	564.45	472718.9	14.54	3.75
Columbia	RM 102.5-108	105.88 BR D	100-yr	Ultimate_ALT107_SF	27.68	27.255	-17.16			2339.26	443.8	598140.8	12.37	5.2
Columbia	RM 102.5-108	105.88 BR D	100-yr	Ultimate_ALT108_SF	27.68	27.255	-17.16			2339.26	443.8	598141.1	12.37	5.2
Columbia	RM 102.5-108	105.85	FEMA 100-year	Ultimate_ALT107_FEMA	31.51	31.314		0	0	3940.23	630.82	471910	76.03	3.56
Columbia	RM 102.5-108	105.85	FEMA 100-year	Ultimate_ALT108_FEMA	31.51	31.314		0	0	3940.23	630.82	471910.7	76.03	3.56
Columbia	RM 102.5-108	105.85	2-year	Ultimate_ALT107_WAR	18.06	17.972		0	0	2296.03	16.7	238793.8	1.82	2.33
Columbia	RM 102.5-108	105.85	2-year	Ultimate_ALT108_WAR	18.06	17.972		0	0	2296.03	16.7	238793.8	1.82	2.33
Columbia	RM 102.5-108	105.85	2-year	Ultimate_ALT107_SF	17.59	17.413		0	0	2292.2	15.64	341539.5	1.92	3.38
Columbia	RM 102.5-108	105.85	2-year	Ultimate_ALT108_SF	17.59	17.413		0	0	2292.2	15.64	341539.5	1.92	3.38
Columbia	RM 102.5-108	105.85	100-yr	Ultimate_ALT107_WAR	32.62	32.431		0	0	4202.93	698.27	472515.3	83.79	3.5
Columbia	RM 102.5-108	105.85	100-yr	Ultimate_ALT108_WAR	32.62	32.43		0	0	4202.92	698.27	472515.9	83.79	3.5
Columbia	RM 102.5-108	105.85	100-yr	Ultimate_ALT107_SF	27.62	27.255		0	0	2802.55	513.29	598023.5	60.22	4.85
Columbia	RM 102.5-108	105.85	100-yr	Ultimate_ALT108_SF	27.62	27.255		0	0	2802.55	513.29	598023.8	60.22	4.85
Columbia	RM 102.5-108	105.84	FEMA 100-year	Ultimate_ALT107_FEMA	31.51	31.311		0.01	0	3867.85	810.77	471011.2	794.87	3.57
Columbia	RM 102.5-108	105.84	FEMA 100-year	Ultimate_ALT108_FEMA	31.51	31.311		0.01	0	3867.85	810.77	471011.8	794.88	3.57
Columbia	RM 102.5-108	105.84	2-year	Ultimate_ALT107_WAR	18.06	17.971		0	0	2295.87	44.71	238673	94.63	2.34
Columbia	RM 102.5-108	105.84	2-year	Ultimate_ALT108_WAR	18.06	17.971		0	0	2295.87	44.71	238673	94.63	2.34
Columbia	RM 102.5-108	105.84	2-year	Ultimate_ALT107_SF	17.59	17.41		0.01	0	2291.65	50.91	341381.1	125.03	3.39
Columbia	RM 102.5-108	105.84	2-year	Ultimate_ALT108_SF	17.59	17.41		0.01	0	2291.65	50.91	341381.1	125.03	3.39
Columbia	RM 102.5-108	105.84	100-yr	Ultimate_ALT107_WAR	32.62	32.428		0	0	3951.35	882.22	471559	856.14	3.51
Columbia	RM 102.5-108	105.84	100-yr	Ultimate_ALT108_WAR	32.62	32.428		0	0	3951.35	882.22	471559.5	856.14	3.51
Columbia	RM 102.5-108	105.84	100-yr	Ultimate_ALT107_SF	27.62	27.251		0.01	0	3157.02	711.45	597156.5	729.12	4.87
Columbia	RM 102.5-108	105.84	100-yr	Ultimate_ALT108_SF	27.62	27.251		0.01	0	3157.02	711.45	597156.8	729.12	4.87
Col-Hayden	RM 106 Left	4.55	FEMA 100-year	Ultimate_ALT107_FEMA	31.57	31.508	-1.61	0	0	1290.42	234.69	91735.27	413.28	2.01
Col-Hayden	RM 106 Left	4.55	FEMA 100-year	Ultimate_ALT108_FEMA	31.57	31.508	-1.61	0	0	1290.42	234.69	91734.61	413.28	2.01
Col-Hayden	RM 106 Left	4.55	2-year	Ultimate_ALT107_WAR	18.1	18.075	-6.49	0	0	1220.59	3.24	39160.15	24.28	1.32
Col-Hayden	RM 106 Left	4.55	2-year	Ultimate_ALT108_WAR	18.1	18.075	-6.49	0	0	1220.59	3.24	39160.15	24.28	1.32
Col-Hayden	RM 106 Left	4.55	2-year	Ultimate_ALT107_SF	17.69	17.63	-5.08	0	0	1218.4	3.34	55409.61	30.07	1.9

Col-Hayden	RM 106 Left	4.55	2-year	Ultimate_ALT108_SF	17.69	17.63	-5.08	0	0	1218.4	3.34	55409.61	30.07	1.9
Col-Hayden	RM 106 Left	4.55	100-yr	Ultimate_ALT107_WAR	32.67	32.612	-1.59	0	0	1312.01	260.36	91994.92	447.38	1.95
Col-Hayden	RM 106 Left	4.55	100-yr	Ultimate_ALT108_WAR	32.67	32.612	-1.59	0	0	1312.01	260.36	91994.38	447.37	1.95
Col-Hayden	RM 106 Left	4.55	100-yr	Ultimate_ALT107_SF	27.75	27.632	-0.73	0.01	0	1265.23	165.43	111874	363.55	2.72
Col-Hayden	RM 106 Left	4.55	100-yr	Ultimate_ALT108_SF	27.75	27.632	-0.73	0.01	0	1265.23	165.43	111873.8	363.55	2.72
Col-Hayden	RM 106 Left	4.52	FEMA 100-year	Ultimate_ALT107_FEMA	31.57	31.493	-0.83	0	0	1330.59	246.63	92031.66	104.94	2.18
Col-Hayden	RM 106 Left	4.52	FEMA 100-year	Ultimate_ALT108_FEMA	31.57	31.493	-0.83	0	0	1330.59	246.63	92031.01	104.94	2.18
Col-Hayden	RM 106 Left	4.52	2-year	Ultimate_ALT107_WAR	18.1	18.067	-5.24	0	0	1126.64	1.82	39184.88	0.97	1.44
Col-Hayden	RM 106 Left	4.52	2-year	Ultimate_ALT108_WAR	18.1	18.067	-5.24	0	0	1126.64	1.82	39184.88	0.97	1.44
Col-Hayden	RM 106 Left	4.52	2-year	Ultimate_ALT107_SF	17.68	17.614	-3.87	0.01	0	1124.75	2.07	55439.96	0.99	2.08
Col-Hayden	RM 106 Left	4.52	2-year	Ultimate_ALT108_SF	17.68	17.614	-3.87	0.01	0	1124.75	2.07	55439.96	0.99	2.08
Col-Hayden	RM 106 Left	4.52	100-yr	Ultimate_ALT107_WAR	32.67	32.598	-0.82	0	0	1486.13	286.1	92289.28	127.3	2.13
Col-Hayden	RM 106 Left	4.52	100-yr	Ultimate_ALT108_WAR	32.67	32.598	-0.82	0	0	1486.12	286.1	92288.73	127.29	2.13
Col-Hayden	RM 106 Left	4.52	100-yr	Ultimate_ALT107_SF	27.74	27.602	0.05	0.01	0	1189.05	159.32	112176.4	67.29	2.97
Col-Hayden	RM 106 Left	4.52	100-yr	Ultimate_ALT108_SF	27.74	27.602	0.05	0.01	0	1189.05	159.32	112176.1	67.29	2.97
Col-Hayden	RM 106 Left	4.47 BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.56	31.483	-0.64	0	0	1296.45	301.34	91953.75	128.14	2.26
Col-Hayden	RM 106 Left	4.47 BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.56	31.483	-0.64	0	0	1296.45	301.33	91953.1	128.14	2.26
Col-Hayden	RM 106 Left	4.47 BR U	2-year	Ultimate_ALT107_WAR	18.1	18.061	-5.1	0	0	1094.61	2.12	39184.42	1.13	1.5
Col-Hayden	RM 106 Left	4.47 BR U	2-year	Ultimate_ALT108_WAR	18.1	18.061	-5.1	0	0	1094.61	2.12	39184.42	1.13	1.5
Col-Hayden	RM 106 Left	4.47 BR U	2-year	Ultimate_ALT107_SF	17.67	17.601	-3.68	0	0	1092.73	2.39	55439.48	1.14	2.16
Col-Hayden	RM 106 Left	4.47 BR U	2-year	Ultimate_ALT108_SF	17.67	17.601	-3.68	0	0	1092.73	2.39	55439.48	1.14	2.16
Col-Hayden	RM 106 Left	4.47 BR U	100-yr	Ultimate_ALT107_WAR	32.66	32.589	-0.63	0	0	1453.18	350.89	92195.69	156.09	2.2
Col-Hayden	RM 106 Left	4.47 BR U	100-yr	Ultimate_ALT108_WAR	32.66	32.589	-0.62	0	0	1453.18	350.89	92195.14	156.08	2.2
Col-Hayden	RM 106 Left	4.47 BR U	100-yr	Ultimate_ALT107_SF	27.73	27.583	0.27	0	0	1156.9	191.54	112130.5	80.94	3.07
Col-Hayden	RM 106 Left	4.47 BR U	100-yr	Ultimate_ALT108_SF	27.73	27.583	0.27	0	0	1156.9	191.54	112130.3	80.94	3.07
Col-Hayden	RM 106 Left	4.47 BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.56	31.463	-2.56	0	0	1351.05	145.23	92058.48	179.53	2.48
Col-Hayden	RM 106 Left	4.47 BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.56	31.463	-2.56	0	0	1351.05	145.23	92057.83	179.52	2.48
Col-Hayden	RM 106 Left	4.47 BR D	2-year	Ultimate_ALT107_WAR	18.09	18.055	-5.73	0	0	953.2	1.42	39182.36	3.89	1.59
Col-Hayden	RM 106 Left	4.47 BR D	2-year	Ultimate_ALT108_WAR	18.09	18.055	-5.73	0	0	953.2	1.42	39182.36	3.89	1.59
Col-Hayden	RM 106 Left	4.47 BR D	2-year	Ultimate_ALT107_SF	17.67	17.588	-4.65	0	0	951.12	1.42	55437.03	4.57	2.3
Col-Hayden	RM 106 Left	4.47 BR D	2-year	Ultimate_ALT108_SF	17.67	17.588	-4.65	0	0	951.12	1.42	55437.03	4.57	2.3
Col-Hayden	RM 106 Left	4.47 BR D	100-yr	Ultimate_ALT107_WAR	32.66	32.57	-2.55	0	0	1510.37	165.34	92310.5	226.83	2.42
Col-Hayden	RM 106 Left	4.47 BR D	100-yr	Ultimate_ALT108_WAR	32.66	32.57	-2.55	0	0	1510.37	165.34	92309.95	226.83	2.42
Col-Hayden	RM 106 Left	4.47 BR D	100-yr	Ultimate_ALT107_SF	27.72	27.548	-1.56	0	0	1066.46	100.12	112194.4	108.43	3.35
Col-Hayden	RM 106 Left	4.47 BR D	100-yr	Ultimate_ALT108_SF	27.72	27.548	-1.56	0	0	1066.46	100.12	112194.2	108.43	3.35
Col-Hayden	RM 106 Left	4.46	FEMA 100-year	Ultimate_ALT107_FEMA	31.56	31.467	-2.75	0	0	1383.27	114.68	92126.73	141.82	2.39
Col-Hayden	RM 106 Left	4.46	FEMA 100-year	Ultimate_ALT108_FEMA	31.56	31.467	-2.75	0	0	1383.27	114.68	92126.09	141.82	2.39
Col-Hayden	RM 106 Left	4.46	2-year	Ultimate_ALT107_WAR	18.09	18.056	-5.81	0	0	985.21	1.19	39183.25	3.24	1.53
Col-Hayden	RM 106 Left	4.46	2-year	Ultimate_ALT108_WAR	18.09	18.056	-5.81	0	0	985.21	1.19	39183.25	3.24	1.53
Col-Hayden	RM 106 Left	4.46	2-year	Ultimate_ALT107_SF	17.67	17.591	-4.77	0	0	983.13	1.19	55438.02	3.82	2.2
Col-Hayden	RM 106 Left	4.46	2-year	Ultimate_ALT108_SF	17.67	17.591	-4.77	0	0	983.13	1.19	55438.02	3.82	2.2
Col-Hayden	RM 106 Left	4.46	100-yr	Ultimate_ALT107_WAR	32.66	32.573	-2.73	0	0	1542.83	130.01	92394.23	178.42	2.33
Col-Hayden	RM 106 Left	4.46	100-yr	Ultimate_ALT108_WAR	32.66	32.573	-2.73	0	0	1542.83	130.01	92393.69	178.42	2.33

Col-Hayden	RM 106 Left	4.46	100-yr	Ultimate_ALT107_SF	27.72	27.555	-1.77	0	0	1098.73	80.34	112235.6	87	3.23
Col-Hayden	RM 106 Left	4.46	100-yr	Ultimate_ALT108_SF	27.72	27.555	-1.77	0	0	1098.73	80.34	112235.4	87	3.23
Col-Hayden	RM 106 Left	4.42 BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.55	31.458	-2.56	0.01	0	1350.72	145.14	92058.76	179.33	2.48
Col-Hayden	RM 106 Left	4.42 BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.55	31.458	-2.56	0.01	0	1350.72	145.14	92058.1	179.33	2.48
Col-Hayden	RM 106 Left	4.42 BR U	2-year	Ultimate_ALT107_WAR	18.09	18.052	-5.73	0.01	0	953.19	1.42	39182.37	3.88	1.6
Col-Hayden	RM 106 Left	4.42 BR U	2-year	Ultimate_ALT108_WAR	18.09	18.052	-5.73	0.01	0	953.19	1.42	39182.37	3.88	1.6
Col-Hayden	RM 106 Left	4.42 BR U	2-year	Ultimate_ALT107_SF	17.66	17.582	-4.64	0.01	0	951.09	1.41	55437.05	4.56	2.3
Col-Hayden	RM 106 Left	4.42 BR U	2-year	Ultimate_ALT108_SF	17.66	17.582	-4.64	0.01	0	951.09	1.41	55437.05	4.56	2.3
Col-Hayden	RM 106 Left	4.42 BR U	100-yr	Ultimate_ALT107_WAR	32.66	32.565	-2.55	0.01	0	1509.68	165.27	92310.8	226.6	2.42
Col-Hayden	RM 106 Left	4.42 BR U	100-yr	Ultimate_ALT108_WAR	32.66	32.565	-2.55	0.01	0	1509.68	165.26	92310.24	226.6	2.42
Col-Hayden	RM 106 Left	4.42 BR U	100-yr	Ultimate_ALT107_SF	27.71	27.538	-1.56	0.02	0	1066.01	99.95	112194.8	108.26	3.35
Col-Hayden	RM 106 Left	4.42 BR U	100-yr	Ultimate_ALT108_SF	27.71	27.538	-1.56	0.02	0	1066.01	99.95	112194.5	108.26	3.35
Col-Hayden	RM 106 Left	4.42 BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.54	31.428	-2.92	0	0	917.93	188.58	92122.78	71.87	2.7
Col-Hayden	RM 106 Left	4.42 BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.54	31.428	-2.92	0	0	917.93	188.58	92122.13	71.87	2.7
Col-Hayden	RM 106 Left	4.42 BR D	2-year	Ultimate_ALT107_WAR	18.08	18.039	-6.39	0	0	853.57	4.9	39180.73	2.03	1.71
Col-Hayden	RM 106 Left	4.42 BR D	2-year	Ultimate_ALT108_WAR	18.08	18.039	-6.39	0	0	853.57	4.9	39180.73	2.03	1.71
Col-Hayden	RM 106 Left	4.42 BR D	2-year	Ultimate_ALT107_SF	17.65	17.555	-5.21	0	0	852.4	5.35	55435.07	2.59	2.47
Col-Hayden	RM 106 Left	4.42 BR D	2-year	Ultimate_ALT108_SF	17.65	17.555	-5.21	0	0	852.4	5.35	55435.07	2.59	2.47
Col-Hayden	RM 106 Left	4.42 BR D	100-yr	Ultimate_ALT107_WAR	32.64	32.536	-2.9	0	0	925.31	210.41	92409.7	82.56	2.64
Col-Hayden	RM 106 Left	4.42 BR D	100-yr	Ultimate_ALT108_WAR	32.64	32.536	-2.9	0	0	925.31	210.41	92409.15	82.56	2.64
Col-Hayden	RM 106 Left	4.42 BR D	100-yr	Ultimate_ALT107_SF	27.69	27.482	-1.82	0	0	899.76	136.38	112219.4	47.13	3.65
Col-Hayden	RM 106 Left	4.42 BR D	100-yr	Ultimate_ALT108_SF	27.69	27.482	-1.82	0	0	899.76	136.38	112219.2	47.13	3.65
Col-Hayden	RM 106 Left	4.38	FEMA 100-year	Ultimate_ALT107_FEMA	31.54	31.432	-3.11	0	0	949.95	153.24	92086.48	143.52	2.62
Col-Hayden	RM 106 Left	4.38	FEMA 100-year	Ultimate_ALT108_FEMA	31.54	31.432	-3.11	0	0	949.95	153.24	92085.82	143.51	2.62
Col-Hayden	RM 106 Left	4.38	2-year	Ultimate_ALT107_WAR	18.08	18.04	-6.49	0	0	885.58	4.18	39179.29	4.2	1.65
Col-Hayden	RM 106 Left	4.38	2-year	Ultimate_ALT108_WAR	18.08	18.04	-6.49	0	0	885.58	4.18	39179.29	4.2	1.65
Col-Hayden	RM 106 Left	4.38	2-year	Ultimate_ALT107_SF	17.65	17.557	-5.34	0	0	883.56	4.57	55433.64	4.8	2.38
Col-Hayden	RM 106 Left	4.38	2-year	Ultimate_ALT108_SF	17.65	17.557	-5.34	0	0	883.56	4.57	55433.64	4.8	2.38
Col-Hayden	RM 106 Left	4.38	100-yr	Ultimate_ALT107_WAR	32.64	32.54	-3.09	0	0	957.36	170.26	92372.87	159.54	2.55
Col-Hayden	RM 106 Left	4.38	100-yr	Ultimate_ALT108_WAR	32.64	32.54	-3.09	0	0	957.36	170.26	92372.31	159.54	2.55
Col-Hayden	RM 106 Left	4.38	100-yr	Ultimate_ALT107_SF	27.68	27.489	-2.03	0	0	931.8	112.42	112182.4	108.18	3.53
Col-Hayden	RM 106 Left	4.38	100-yr	Ultimate_ALT108_SF	27.68	27.489	-2.03	0	0	931.8	112.41	112182.1	108.18	3.53
Col-Hayden	RM 106 Left	4.35 BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.54	31.417	-2.73	0.01	0	909.87	213.92	91968.96	200.35	2.76
Col-Hayden	RM 106 Left	4.35 BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.54	31.417	-2.73	0.01	0	909.87	213.91	91968.3	200.35	2.76
Col-Hayden	RM 106 Left	4.35 BR U	2-year	Ultimate_ALT107_WAR	18.08	18.034	-6.27	0	0	845.55	5.44	39176.75	5.48	1.76
Col-Hayden	RM 106 Left	4.35 BR U	2-year	Ultimate_ALT108_WAR	18.08	18.034	-6.27	0	0	845.55	5.44	39176.75	5.48	1.76
Col-Hayden	RM 106 Left	4.35 BR U	2-year	Ultimate_ALT107_SF	17.64	17.543	-5.07	0.01	0	843.5	5.92	55430.88	6.22	2.53
Col-Hayden	RM 106 Left	4.35 BR U	2-year	Ultimate_ALT108_SF	17.64	17.543	-5.07	0.01	0	843.5	5.92	55430.88	6.22	2.53
Col-Hayden	RM 106 Left	4.35 BR U	100-yr	Ultimate_ALT107_WAR	32.64	32.526	-2.72	0	0	917.15	239.3	92239.41	223.96	2.7
Col-Hayden	RM 106 Left	4.35 BR U	100-yr	Ultimate_ALT108_WAR	32.64	32.526	-2.72	0	0	917.15	239.3	92238.87	223.95	2.7
Col-Hayden	RM 106 Left	4.35 BR U	100-yr	Ultimate_ALT107_SF	27.68	27.461	-1.61	0.01	0	891.62	153.65	112101.6	147.74	3.73
Col-Hayden	RM 106 Left	4.35 BR U	100-yr	Ultimate_ALT108_SF	27.68	27.461	-1.61	0.01	0	891.62	153.65	112101.3	147.74	3.73

Col-Hayden	RM 106 Left	4.35 BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.53	31.414	-3.98	0	0	872.4	120.92	92086.35	175.96	2.73
Col-Hayden	RM 106 Left	4.35 BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.53	31.414	-3.98	0	0	872.4	120.92	92085.7	175.96	2.73
Col-Hayden	RM 106 Left	4.35 BR D	2-year	Ultimate_ALT107_WAR	18.08	18.032	-7.8	0	0	829.68	1.33	39181.54	4.8	1.71
Col-Hayden	RM 106 Left	4.35 BR D	2-year	Ultimate_ALT108_WAR	18.08	18.032	-7.8	0	0	829.68	1.33	39181.54	4.8	1.71
Col-Hayden	RM 106 Left	4.35 BR D	2-year	Ultimate_ALT107_SF	17.64	17.541	-6.43	0	0	827.57	1.1	55436.65	5.26	2.47
Col-Hayden	RM 106 Left	4.35 BR D	2-year	Ultimate_ALT108_SF	17.64	17.541	-6.43	0	0	827.57	1.1	55436.65	5.26	2.47
Col-Hayden	RM 106 Left	4.35 BR D	100-yr	Ultimate_ALT107_WAR	32.63	32.523	-3.96	0	0	930.48	135.39	92368.63	198.66	2.67
Col-Hayden	RM 106 Left	4.35 BR D	100-yr	Ultimate_ALT108_WAR	32.63	32.523	-3.96	0	0	930.48	135.39	92368.07	198.66	2.67
Col-Hayden	RM 106 Left	4.35 BR D	100-yr	Ultimate_ALT107_SF	27.67	27.455	-2.83	0	0.01	863.35	85.59	112187	130.37	3.68
Col-Hayden	RM 106 Left	4.35 BR D	100-yr	Ultimate_ALT108_SF	27.67	27.455	-2.83	0	0.01	863.35	85.59	112186.8	130.37	3.68
Col-Hayden	RM 106 Left	4.33	FEMA 100-year	Ultimate_ALT107_FEMA	31.53	31.42	-4.29	0.01	0	919.21	87.28	92168.49	127.47	2.61
Col-Hayden	RM 106 Left	4.33	FEMA 100-year	Ultimate_ALT108_FEMA	31.53	31.42	-4.29	0.01	0	919.21	87.28	92167.84	127.47	2.61
Col-Hayden	RM 106 Left	4.33	2-year	Ultimate_ALT107_WAR	18.08	18.035	-7.98	0	0	861.69	1.06	39182.79	3.82	1.63
Col-Hayden	RM 106 Left	4.33	2-year	Ultimate_ALT108_WAR	18.08	18.035	-7.98	0	0	861.69	1.06	39182.79	3.82	1.63
Col-Hayden	RM 106 Left	4.33	2-year	Ultimate_ALT107_SF	17.63	17.546	-6.66	0.01	0	859.6	0.89	55437.93	4.21	2.35
Col-Hayden	RM 106 Left	4.33	2-year	Ultimate_ALT108_SF	17.63	17.546	-6.66	0.01	0	859.6	0.89	55437.93	4.21	2.35
Col-Hayden	RM 106 Left	4.33	100-yr	Ultimate_ALT107_WAR	32.63	32.529	-4.27	0.01	0	981.13	94.97	92468.69	139.01	2.55
Col-Hayden	RM 106 Left	4.33	100-yr	Ultimate_ALT108_WAR	32.63	32.529	-4.27	0.01	0	981.13	94.97	92468.14	139.01	2.55
Col-Hayden	RM 106 Left	4.33	100-yr	Ultimate_ALT107_SF	27.66	27.467	-3.17	0.02	0	895.58	65.35	112237.9	99.76	3.51
Col-Hayden	RM 106 Left	4.33	100-yr	Ultimate_ALT108_SF	27.66	27.467	-3.17	0.02	0	895.58	65.35	112237.6	99.76	3.51
Col-Hayden	RM 106 Left	4.27	FEMA 100-year	Ultimate_ALT107_FEMA	31.52	31.387	-5.34	0.01	0	848.99	350.68	91856.96	175.59	2.9
Col-Hayden	RM 106 Left	4.27	FEMA 100-year	Ultimate_ALT108_FEMA	31.52	31.387	-5.34	0.01	0	848.99	350.67	91856.31	175.59	2.9
Col-Hayden	RM 106 Left	4.27	2-year	Ultimate_ALT107_WAR	18.07	18.02	-9.47	0.01	0	795.95	38.63	39142.46	6.57	1.81
Col-Hayden	RM 106 Left	4.27	2-year	Ultimate_ALT108_WAR	18.07	18.02	-9.47	0.01	0	795.95	38.63	39142.46	6.57	1.81
Col-Hayden	RM 106 Left	4.27	2-year	Ultimate_ALT107_SF	17.62	17.514	-8.08	0.02	0	793.55	49.2	55386.11	7.7	2.6
Col-Hayden	RM 106 Left	4.27	2-year	Ultimate_ALT108_SF	17.62	17.514	-8.08	0.02	0	793.55	49.2	55386.11	7.7	2.6
Col-Hayden	RM 106 Left	4.27	100-yr	Ultimate_ALT107_WAR	32.62	32.497	-5.32	0.01	0	892.5	377.88	92132.25	192.54	2.83
Col-Hayden	RM 106 Left	4.27	100-yr	Ultimate_ALT108_WAR	32.62	32.497	-5.32	0.01	0	892.5	377.88	92131.7	192.54	2.83
Col-Hayden	RM 106 Left	4.27	100-yr	Ultimate_ALT107_SF	27.64	27.404	-4.03	0.02	0	828.26	338.07	111923.5	141.4	3.9
Col-Hayden	RM 106 Left	4.27	100-yr	Ultimate_ALT108_SF	27.64	27.404	-4.03	0.02	0	828.26	338.07	111923.3	141.4	3.9
Col-Hayden	RM 106 Left	3.34	FEMA 100-year	Ultimate_ALT107_FEMA	31.4	31.347	-3.73	0	0	2149.61	114.03	92173.67	95.54	1.88
Col-Hayden	RM 106 Left	3.34	FEMA 100-year	Ultimate_ALT108_FEMA	31.4	31.347	-3.73	0	0	2149.61	114.03	92173.02	95.54	1.88
Col-Hayden	RM 106 Left	3.34	2-year	Ultimate_ALT107_WAR	18	17.976	-7.73	0	0	1340.65	8.17	39178.81	0.69	1.25
Col-Hayden	RM 106 Left	3.34	2-year	Ultimate_ALT108_WAR	18	17.976	-7.73	0	0	1340.65	8.17	39178.81	0.69	1.25
Col-Hayden	RM 106 Left	3.34	2-year	Ultimate_ALT107_SF	17.47	17.421	-6.37	0	0	1339.25	9.87	55432.54	0.61	1.8
Col-Hayden	RM 106 Left	3.34	2-year	Ultimate_ALT108_SF	17.47	17.421	-6.37	0	0	1339.25	9.87	55432.54	0.61	1.8
Col-Hayden	RM 106 Left	3.34	100-yr	Ultimate_ALT107_WAR	32.51	32.463	-3.71	0	0	3046.23	118.71	92471.36	112.6	1.83
Col-Hayden	RM 106 Left	3.34	100-yr	Ultimate_ALT108_WAR	32.51	32.463	-3.71	0	0	3046.23	118.71	92470.81	112.6	1.83
Col-Hayden	RM 106 Left	3.34	100-yr	Ultimate_ALT107_SF	27.41	27.305	-2.27	0	0	1366.24	105.04	112251.3	46.59	2.56
Col-Hayden	RM 106 Left	3.34	100-yr	Ultimate_ALT108_SF	27.41	27.305	-2.27	0	0	1366.24	105.04	112251.1	46.59	2.56
Col-Hayden	RM 106 Left	3.32	FEMA 100-year	Ultimate_ALT107_FEMA	31.4	31.347	-3.66			1425.13	92.64	92107.17	183.42	1.86
Col-Hayden	RM 106 Left	3.32	FEMA 100-year	Ultimate_ALT108_FEMA	31.4	31.347	-3.66			1425.13	92.64	92106.52	183.42	1.86

Col-Hayden	RM 106 Left	3.32			2-year	Ultimate_ALT107_WAR	18	17.976	-7.53			1355.58	3.77	39178.57	5.33	1.24
Col-Hayden	RM 106 Left	3.32			2-year	Ultimate_ALT108_WAR	18	17.976	-7.53			1355.58	3.77	39178.57	5.33	1.24
Col-Hayden	RM 106 Left	3.32			2-year	Ultimate_ALT107_SF	17.47	17.419	-6.2			1353.64	4.3	55433.17	5.55	1.8
Col-Hayden	RM 106 Left	3.32			2-year	Ultimate_ALT108_SF	17.47	17.419	-6.2			1353.64	4.3	55433.17	5.55	1.8
Col-Hayden	RM 106 Left	3.32			100-yr	Ultimate_ALT107_WAR	32.51	32.462	-3.64			2147.18	99.24	92540.7	62.73	1.82
Col-Hayden	RM 106 Left	3.32			100-yr	Ultimate_ALT108_WAR	32.51	32.462	-3.64			2147.19	99.24	92540.15	62.73	1.82
Col-Hayden	RM 106 Left	3.32			100-yr	Ultimate_ALT107_SF	27.4	27.303	-2.25			1384.98	76.76	112180.9	145.26	2.55
Col-Hayden	RM 106 Left	3.32			100-yr	Ultimate_ALT108_SF	27.4	27.303	-2.25			1384.98	76.76	112180.7	145.26	2.55
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	FEMA 100-year	Ultimate_ALT107_FEMA	31.41	31.344	-2.79			1289.15	82.3	92034.95	265.98	2.07
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	FEMA 100-year	Ultimate_ALT108_FEMA	31.41	31.344	-2.79			1289.15	82.3	92034.3	265.98	2.07
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Ultimate_ALT107_WAR	18	17.975	-6.98			1232.55	5.07	39175.43	7.17	1.39
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Ultimate_ALT108_WAR	18	17.975	-6.98			1232.55	5.07	39175.43	7.17	1.39
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Ultimate_ALT107_SF	17.48	17.416	-5.54			1230.46	5.77	55429.81	7.44	2.01
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	2-year	Ultimate_ALT108_SF	17.48	17.416	-5.54			1230.46	5.77	55429.81	7.44	2.01
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Ultimate_ALT107_WAR	32.52	32.46	-2.77			2003.88	88.85	92522.68	91.14	2.02
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Ultimate_ALT108_WAR	32.52	32.46	-2.77			2003.88	88.85	92522.13	91.14	2.02
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Ultimate_ALT107_SF	27.42	27.298	-0.77			1252.26	76.14	112120.8	206.01	2.84
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR U	100-yr	Ultimate_ALT108_SF	27.42	27.298	-0.77			1252.26	76.14	112120.6	206.01	2.84
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	FEMA 100-year	Ultimate_ALT107_FEMA	31.4	31.344	-6.41			2020.95	116.62	91841.95	424.66	1.95
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	FEMA 100-year	Ultimate_ALT108_FEMA	31.4	31.344	-6.41			2020.95	116.62	91841.29	424.66	1.95
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Ultimate_ALT107_WAR	18	17.975	-11.15			1277.49	2.23	39181.88	3.56	1.29
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Ultimate_ALT108_WAR	18	17.975	-11.15			1277.49	2.23	39181.88	3.56	1.29
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Ultimate_ALT107_SF	17.47	17.416	-9.61			1262.81	2.29	55437.59	3.14	1.86
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	2-year	Ultimate_ALT108_SF	17.47	17.416	-9.61			1262.81	2.29	55437.59	3.14	1.86
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Ultimate_ALT107_WAR	32.52	32.46	-6.39			2056.84	125.3	91925.7	651.68	1.9
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Ultimate_ALT108_WAR	32.52	32.46	-6.39			2056.84	125.3	91925.14	651.67	1.9
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Ultimate_ALT107_SF	27.41	27.298	-5.09			1741.36	85.98	112040.3	276.71	2.67
Col-Hayden	RM 106 Left	3.3	BNSF at NPH	BR D	100-yr	Ultimate_ALT108_SF	27.41	27.298	-5.09			1741.36	85.98	112040	276.71	2.67
Col-Hayden	RM 106 Left	3.28			FEMA 100-year	Ultimate_ALT107_FEMA	31.39	31.344		0	0	2190.51	89.3	91842.06	451.87	1.76
Col-Hayden	RM 106 Left	3.28			FEMA 100-year	Ultimate_ALT108_FEMA	31.39	31.344		0	0	2190.51	89.29	91841.42	451.87	1.76
Col-Hayden	RM 106 Left	3.28			2-year	Ultimate_ALT107_WAR	18	17.975		0	0	1400.52	2.54	39172	13.13	1.15
Col-Hayden	RM 106 Left	3.28			2-year	Ultimate_ALT108_WAR	18	17.975		0	0	1400.52	2.54	39172	13.13	1.15
Col-Hayden	RM 106 Left	3.28			2-year	Ultimate_ALT107_SF	17.46	17.416		0	0	1385.98	2.76	55424.29	15.97	1.66
Col-Hayden	RM 106 Left	3.28			2-year	Ultimate_ALT108_SF	17.46	17.416		0	0	1385.98	2.76	55424.29	15.97	1.66
Col-Hayden	RM 106 Left	3.28			100-yr	Ultimate_ALT107_WAR	32.51	32.46		0	0	2256.24	94.91	91941.19	666.58	1.72
Col-Hayden	RM 106 Left	3.28			100-yr	Ultimate_ALT108_WAR	32.51	32.46		0	0	2256.24	94.91	91940.64	666.58	1.72
Col-Hayden	RM 106 Left	3.28			100-yr	Ultimate_ALT107_SF	27.39	27.298		0	0	1861.97	69.28	111977.5	356.23	2.4
Col-Hayden	RM 106 Left	3.28			100-yr	Ultimate_ALT108_SF	27.39	27.298		0	0	1861.97	69.28	111977.2	356.23	2.4
Col-Hayden	RM 106 Left	3.27			FEMA 100-year	Ultimate_ALT107_FEMA	31.39	31.344		0	0	2066.76	515.43	90128.98	1738.82	1.77
Col-Hayden	RM 106 Left	3.27			FEMA 100-year	Ultimate_ALT108_FEMA	31.39	31.344		0	0	2066.76	515.43	90128.35	1738.8	1.77
Col-Hayden	RM 106 Left	3.27			2-year	Ultimate_ALT107_WAR	17.99	17.973		0	0	1508.81	66.09	39089.91	31.67	1.18
Col-Hayden	RM 106 Left	3.27			2-year	Ultimate_ALT108_WAR	17.99	17.973		0	0	1508.81	66.09	39089.91	31.67	1.18
Col-Hayden	RM 106 Left	3.27			2-year	Ultimate_ALT107_SF	17.46	17.413		0	0	1443.59	84.08	55322.43	36.5	1.71

Col-Hayden	RM 106 Left	3.27	2-year	Ultimate_ALT108_SF	17.46	17.413		0	0	1443.59	84.08	55322.43	36.5	1.71
Col-Hayden	RM 106 Left	3.27	100-yr	Ultimate_ALT107_WAR	32.5	32.46		0	0	2083.63	542.8	90159.94	1999.94	1.72
Col-Hayden	RM 106 Left	3.27	100-yr	Ultimate_ALT108_WAR	32.5	32.46		0	0	2083.63	542.79	90159.4	1999.93	1.72
Col-Hayden	RM 106 Left	3.27	100-yr	Ultimate_ALT107_SF	27.39	27.295		0.01	0	1899.06	506.46	110879.6	1016.88	2.43
Col-Hayden	RM 106 Left	3.27	100-yr	Ultimate_ALT108_SF	27.39	27.295		0.01	0	1899.06	506.46	110879.4	1016.88	2.43

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sandy	Main	2.33	FEMA 100-year	Ultimate_ALT107_FEMA	7059	11.55	34.358		34.38	0.000017	1.153	7361.5	568.33	0.05
Sandy	Main	2.33	FEMA 100-year	Ultimate_ALT108_FEMA	7059	11.55	34.358		34.38	0.000017	1.153	7361.47	568.33	0.05
Sandy	Main	2.33	2-year	Ultimate_ALT107_WAR	11000	11.55	23.397		23.71	0.000594	4.53	2516.19	294.59	0.26
Sandy	Main	2.33	2-year	Ultimate_ALT108_WAR	11000	11.55	23.397		23.71	0.000594	4.53	2516.19	294.59	0.26
Sandy	Main	2.33	2-year	Ultimate_ALT107_SF	7500	11.55	23.37		23.52	0.000279	3.098	2508.22	294.33	0.18
Sandy	Main	2.33	2-year	Ultimate_ALT108_SF	7500	11.55	23.37		23.52	0.000279	3.098	2508.22	294.33	0.18
Sandy	Main	2.33	100-yr	Ultimate_ALT107_WAR	12000	11.55	35.279		35.33	0.000041	1.844	7888.69	577.08	0.08
Sandy	Main	2.33	100-yr	Ultimate_ALT108_WAR	12000	11.55	35.279		35.33	0.000041	1.844	7888.67	577.08	0.08
Sandy	Main	2.33	100-yr	Ultimate_ALT107_SF	7500	11.55	33.216		33.24	0.000025	1.327	6718.09	558.3	0.06
Sandy	Main	2.33	100-yr	Ultimate_ALT108_SF	7500	11.55	33.216		33.24	0.000025	1.327	6718.08	558.3	0.06
Sandy	Main	2.3	FEMA 100-year	Ultimate_ALT107_FEMA	7059	11.38	34.358		34.37	0.000012	1.02	7148.94	607.22	0.04
Sandy	Main	2.3	FEMA 100-year	Ultimate_ALT108_FEMA	7059	11.38	34.358		34.37	0.000012	1.02	7148.91	607.22	0.04
Sandy	Main	2.3	2-year	Ultimate_ALT107_WAR	11000	11.38	23.389		23.6	0.000431	3.722	2955.34	387.98	0.22
Sandy	Main	2.3	2-year	Ultimate_ALT108_WAR	11000	11.38	23.389		23.6	0.000431	3.722	2955.34	387.98	0.22
Sandy	Main	2.3	2-year	Ultimate_ALT107_SF	7500	11.38	23.366		23.47	0.000202	2.544	2947.78	387.59	0.15
Sandy	Main	2.3	2-year	Ultimate_ALT108_SF	7500	11.38	23.366		23.47	0.000202	2.544	2947.78	387.59	0.15
Sandy	Main	2.3	100-yr	Ultimate_ALT107_WAR	12000	11.38	35.278		35.32	0.000028	1.651	7557.81	641.79	0.07
Sandy	Main	2.3	100-yr	Ultimate_ALT108_WAR	12000	11.38	35.278		35.32	0.000028	1.651	7557.8	641.79	0.07
Sandy	Main	2.3	100-yr	Ultimate_ALT107_SF	7500	11.38	33.216		33.24	0.000016	1.156	6651.57	568.81	0.05
Sandy	Main	2.3	100-yr	Ultimate_ALT108_SF	7500	11.38	33.216		33.24	0.000016	1.156	6651.55	568.81	0.05
Sandy	Main	2.24	FEMA 100-year	Ultimate_ALT107_FEMA	7059	13.93	34.355		34.37	0.000012	0.967	7886.15	736.77	0.04
Sandy	Main	2.24	FEMA 100-year	Ultimate_ALT108_FEMA	7059	13.93	34.355		34.37	0.000012	0.967	7886.12	736.77	0.04
Sandy	Main	2.24	2-year	Ultimate_ALT107_WAR	11000	13.93	23.084		23.39	0.000902	4.451	2471.57	430.83	0.31
Sandy	Main	2.24	2-year	Ultimate_ALT108_WAR	11000	13.93	23.084		23.39	0.000902	4.451	2471.57	430.83	0.31
Sandy	Main	2.24	2-year	Ultimate_ALT107_SF	7500	13.93	23.235		23.37	0.00039	2.966	2528.38	434.1	0.2
Sandy	Main	2.24	2-year	Ultimate_ALT108_SF	7500	13.93	23.235		23.37	0.00039	2.966	2528.38	434.1	0.2
Sandy	Main	2.24	100-yr	Ultimate_ALT107_WAR	12000	13.93	35.272		35.31	0.000029	1.555	8426.6	760.47	0.06
Sandy	Main	2.24	100-yr	Ultimate_ALT108_WAR	12000	13.93	35.272		35.31	0.000029	1.555	8426.59	760.47	0.06
Sandy	Main	2.24	100-yr	Ultimate_ALT107_SF	7500	13.93	33.212		33.23	0.000017	1.107	7240.51	694.1	0.05
Sandy	Main	2.24	100-yr	Ultimate_ALT108_SF	7500	13.93	33.212		33.23	0.000017	1.107	7240.49	694.1	0.05
Sandy	Main	2.17	FEMA 100-year	Ultimate_ALT107_FEMA	7059	12.02	34.356		34.36	0.000007	0.757	11202.16	884.47	0.03
Sandy	Main	2.17	FEMA 100-year	Ultimate_ALT108_FEMA	7059	12.02	34.356		34.36	0.000007	0.757	11202.11	884.47	0.03
Sandy	Main	2.17	2-year	Ultimate_ALT107_WAR	11000	12.02	22.793		23.05	0.000946	4.068	2730.93	573.92	0.31
Sandy	Main	2.17	2-year	Ultimate_ALT108_WAR	11000	12.02	22.793		23.05	0.000946	4.068	2730.93	573.92	0.31
Sandy	Main	2.17	2-year	Ultimate_ALT107_SF	7500	12.02	23.123		23.23	0.000363	2.615	2904.58	586.58	0.19
Sandy	Main	2.17	2-year	Ultimate_ALT108_SF	7500	12.02	23.123		23.23	0.000363	2.615	2904.58	586.58	0.19
Sandy	Main	2.17	100-yr	Ultimate_ALT107_WAR	12000	12.02	35.275		35.3	0.000018	1.211	12019.04	897.74	0.05
Sandy	Main	2.17	100-yr	Ultimate_ALT108_WAR	12000	12.02	35.275		35.3	0.000018	1.211	12019.01	897.73	0.05
Sandy	Main	2.17	100-yr	Ultimate_ALT107_SF	7500	12.02	33.212		33.22	0.000011	0.874	10194.54	877.8	0.04
Sandy	Main	2.17	100-yr	Ultimate_ALT108_SF	7500	12.02	33.212		33.22	0.000011	0.874	10194.5	877.8	0.04
Sandy	Main	2.14	FEMA 100-year	Ultimate_ALT107_FEMA	7059	11.67	34.353		34.36	0.000008	0.812	8889.36	1237.32	0.03

Sandy	Main	2.14	FEMA 100-year	Ultimate_ALT108_FEMA	7059	11.67	34.353		34.36	0.000008	0.812	8889.34	1237.31	0.03
Sandy	Main	2.14	2-year	Ultimate_ALT107_WAR	11000	11.67	22.716		22.92	0.00062	3.639	3074.64	602.56	0.25
Sandy	Main	2.14	2-year	Ultimate_ALT108_WAR	11000	11.67	22.716		22.92	0.00062	3.639	3074.64	602.56	0.25
Sandy	Main	2.14	2-year	Ultimate_ALT107_SF	7500	11.67	23.094		23.18	0.000243	2.34	3262.02	613.35	0.16
Sandy	Main	2.14	2-year	Ultimate_ALT108_SF	7500	11.67	23.094		23.18	0.000243	2.34	3262.02	613.35	0.16
Sandy	Main	2.14	100-yr	Ultimate_ALT107_WAR	12000	11.67	35.266		35.29	0.000019	1.313	9345.79	1622.03	0.05
Sandy	Main	2.14	100-yr	Ultimate_ALT108_WAR	12000	11.67	35.266		35.29	0.000019	1.313	9345.77	1622.02	0.05
Sandy	Main	2.14	100-yr	Ultimate_ALT107_SF	7500	11.67	33.209		33.22	0.000011	0.922	8317.43	739.27	0.04
Sandy	Main	2.14	100-yr	Ultimate_ALT108_SF	7500	11.67	33.208		33.22	0.000011	0.922	8317.41	739.27	0.04
Sandy	Main	2.12	FEMA 100-year	Ultimate_ALT107_FEMA	7059	8.05	34.349		34.36	0.00001	0.896	8138.28	524.27	0.04
Sandy	Main	2.12	FEMA 100-year	Ultimate_ALT108_FEMA	7059	8.05	34.349		34.36	0.00001	0.896	8138.25	524.27	0.04
Sandy	Main	2.12	2-year	Ultimate_ALT107_WAR	11000	8.05	22.59		22.85	0.000727	4.087	2691.7	396.58	0.28
Sandy	Main	2.12	2-year	Ultimate_ALT108_WAR	11000	8.05	22.59		22.85	0.000727	4.087	2691.7	396.58	0.28
Sandy	Main	2.12	2-year	Ultimate_ALT107_SF	7500	8.05	23.045		23.15	0.000277	2.61	2873.5	401.94	0.17
Sandy	Main	2.12	2-year	Ultimate_ALT108_SF	7500	8.05	23.045		23.15	0.000277	2.61	2873.5	401.94	0.17
Sandy	Main	2.12	100-yr	Ultimate_ALT107_WAR	12000	8.05	35.258		35.29	0.000024	1.445	8615.74	527.22	0.06
Sandy	Main	2.12	100-yr	Ultimate_ALT108_WAR	12000	8.05	35.258		35.29	0.000024	1.445	8615.73	527.22	0.06
Sandy	Main	2.12	100-yr	Ultimate_ALT107_SF	7500	8.05	33.204		33.22	0.000014	1.021	7539.88	520.48	0.04
Sandy	Main	2.12	100-yr	Ultimate_ALT108_SF	7500	8.05	33.204		33.22	0.000014	1.021	7539.85	520.48	0.04
Sandy	Main	2.1	FEMA 100-year	Ultimate_ALT107_FEMA	7059	8.84	34.345		34.36	0.000012	0.988	7606.25	1488	0.04
Sandy	Main	2.1	FEMA 100-year	Ultimate_ALT108_FEMA	7059	8.84	34.345		34.36	0.000012	0.988	7606.22	1487.97	0.04
Sandy	Main	2.1	2-year	Ultimate_ALT107_WAR	11000	8.84	22.38		22.73	0.001123	4.762	2312.61	379.73	0.34
Sandy	Main	2.1	2-year	Ultimate_ALT108_WAR	11000	8.84	22.38		22.73	0.001123	4.762	2312.61	379.73	0.34
Sandy	Main	2.1	2-year	Ultimate_ALT107_SF	7500	8.84	22.973		23.11	0.000388	2.96	2539.54	385.59	0.2
Sandy	Main	2.1	2-year	Ultimate_ALT108_SF	7500	8.84	22.973		23.11	0.000388	2.96	2539.54	385.59	0.2
Sandy	Main	2.1	100-yr	Ultimate_ALT107_WAR	12000	8.84	35.247		35.29	0.000029	1.59	8219.75	1959.75	0.07
Sandy	Main	2.1	100-yr	Ultimate_ALT108_WAR	12000	8.84	35.247		35.29	0.000029	1.59	8219.73	1959.74	0.07
Sandy	Main	2.1	100-yr	Ultimate_ALT107_SF	7500	8.84	33.199		33.22	0.000017	1.122	6994.23	1058.63	0.05
Sandy	Main	2.1	100-yr	Ultimate_ALT108_SF	7500	8.84	33.199		33.22	0.000017	1.122	6994.21	1058.63	0.05
Sandy	Main	2.07	FEMA 100-year	Ultimate_ALT107_FEMA	7059	9.3	34.345	17.5	34.36	0.00001	0.932	8125.98	1400.95	0.04
Sandy	Main	2.07	FEMA 100-year	Ultimate_ALT108_FEMA	7059	9.3	34.345	17.5	34.36	0.00001	0.932	8125.95	1400.91	0.04
Sandy	Main	2.07	2-year	Ultimate_ALT107_WAR	11000	9.3	22.271	18.51	22.56	0.000879	4.338	2535.98	394.19	0.3
Sandy	Main	2.07	2-year	Ultimate_ALT108_WAR	11000	9.3	22.271	18.51	22.56	0.000879	4.338	2535.98	394.19	0.3
Sandy	Main	2.07	2-year	Ultimate_ALT107_SF	7500	9.3	22.939	17.61	23.05	0.000297	2.678	2800.82	399.3	0.18
Sandy	Main	2.07	2-year	Ultimate_ALT108_SF	7500	9.3	22.939	17.61	23.05	0.000297	2.678	2800.82	399.3	0.18
Sandy	Main	2.07	100-yr	Ultimate_ALT107_WAR	12000	9.3	35.246	18.7	35.28	0.000025	1.505	8653.36	1742.07	0.06
Sandy	Main	2.07	100-yr	Ultimate_ALT108_WAR	12000	9.3	35.246	18.7	35.28	0.000025	1.505	8653.35	1742.06	0.06
Sandy	Main	2.07	100-yr	Ultimate_ALT107_SF	7500	9.3	33.198	17.61	33.21	0.000014	1.061	7496	1178.91	0.05
Sandy	Main	2.07	100-yr	Ultimate_ALT108_SF	7500	9.3	33.198	17.61	33.21	0.000014	1.061	7495.98	1178.89	0.05
Sandy	Main	1.97	FEMA 100-year	Ultimate_ALT107_FEMA	7059	7.12	34.346	14.62	34.35	0.000005	0.654	12453.92	790.88	0.03
Sandy	Main	1.97	FEMA 100-year	Ultimate_ALT108_FEMA	7059	7.12	34.346	14.62	34.35	0.000005	0.654	12453.88	790.88	0.03
Sandy	Main	1.97	2-year	Ultimate_ALT107_WAR	11000	7.12	22.127	15.78	22.25	0.000316	2.875	3970.49	625.1	0.18
Sandy	Main	1.97	2-year	Ultimate_ALT108_WAR	11000	7.12	22.127	15.78	22.25	0.000316	2.875	3970.49	625.1	0.18

Sandy	Main	1.97	2-year	Ultimate_ALT107_SF	7500	7.12	22.897	14.77	22.94	0.000105	1.768	4454.45	632.91	0.11
Sandy	Main	1.97	2-year	Ultimate_ALT108_SF	7500	7.12	22.897	14.77	22.94	0.000105	1.768	4454.45	632.91	0.11
Sandy	Main	1.97	100-yr	Ultimate_ALT107_WAR	12000	7.12	35.251	16.04	35.27	0.000011	1.057	13172.89	799.03	0.04
Sandy	Main	1.97	100-yr	Ultimate_ALT108_WAR	12000	7.12	35.251	16.04	35.27	0.000011	1.057	13172.88	799.03	0.04
Sandy	Main	1.97	100-yr	Ultimate_ALT107_SF	7500	7.12	33.199	14.77	33.21	0.000006	0.743	11553.26	779.01	0.03
Sandy	Main	1.97	100-yr	Ultimate_ALT108_SF	7500	7.12	33.199	14.77	33.21	0.000006	0.743	11553.23	779.01	0.03
Sandy	Main	1.9	FEMA 100-year	Ultimate_ALT107_FEMA	7059	10.89	34.347	15.56	34.35	0.000003	0.512	13860.87	764.39	0.02
Sandy	Main	1.9	FEMA 100-year	Ultimate_ALT108_FEMA	7059	10.89	34.347	15.56	34.35	0.000003	0.512	13860.82	764.39	0.02
Sandy	Main	1.9	2-year	Ultimate_ALT107_WAR	11000	10.89	22.081	16.21	22.15	0.000175	2.149	5118.92	681.83	0.14
Sandy	Main	1.9	2-year	Ultimate_ALT108_WAR	11000	10.89	22.081	16.21	22.15	0.000175	2.149	5118.92	681.83	0.14
Sandy	Main	1.9	2-year	Ultimate_ALT107_SF	7500	10.89	22.883	15.63	22.91	0.000058	1.323	5667.4	685.9	0.08
Sandy	Main	1.9	2-year	Ultimate_ALT108_SF	7500	10.89	22.883	15.63	22.91	0.000058	1.323	5667.4	685.9	0.08
Sandy	Main	1.9	100-yr	Ultimate_ALT107_WAR	12000	10.89	35.251	16.37	35.26	0.000007	0.831	14555.61	771.48	0.03
Sandy	Main	1.9	100-yr	Ultimate_ALT108_WAR	12000	10.89	35.251	16.37	35.26	0.000007	0.831	14555.59	771.48	0.03
Sandy	Main	1.9	100-yr	Ultimate_ALT107_SF	7500	10.89	33.199	15.63	33.2	0.000004	0.579	12989.24	755.25	0.02
Sandy	Main	1.9	100-yr	Ultimate_ALT108_SF	7500	10.89	33.199	15.63	33.2	0.000004	0.579	12989.21	755.25	0.02
Sandy	Main	1.88	FEMA 100-year	Ultimate_ALT107_FEMA	7059	7.33	34.346	15.15	34.35	0.000003	0.55	13106.92	760.3	0.02
Sandy	Main	1.88	FEMA 100-year	Ultimate_ALT108_FEMA	7059	7.33	34.346	15.15	34.35	0.000003	0.55	13106.87	760.3	0.02
Sandy	Main	1.88	2-year	Ultimate_ALT107_WAR	11000	7.33	22.034	16.31	22.13	0.000256	2.449	4491.66	652.24	0.16
Sandy	Main	1.88	2-year	Ultimate_ALT108_WAR	11000	7.33	22.034	16.31	22.13	0.000256	2.449	4491.66	652.24	0.16
Sandy	Main	1.88	2-year	Ultimate_ALT107_SF	7500	7.33	22.867	15.34	22.9	0.000082	1.489	5037.57	658.13	0.09
Sandy	Main	1.88	2-year	Ultimate_ALT108_SF	7500	7.33	22.867	15.34	22.9	0.000082	1.489	5037.57	658.13	0.09
Sandy	Main	1.88	100-yr	Ultimate_ALT107_WAR	12000	7.33	35.249	16.51	35.26	0.000008	0.891	13797.35	768.99	0.04
Sandy	Main	1.88	100-yr	Ultimate_ALT108_WAR	12000	7.33	35.249	16.51	35.26	0.000008	0.891	13797.34	768.98	0.04
Sandy	Main	1.88	100-yr	Ultimate_ALT107_SF	7500	7.33	33.198	15.34	33.2	0.000005	0.623	12240.48	750.08	0.03
Sandy	Main	1.88	100-yr	Ultimate_ALT108_SF	7500	7.33	33.198	15.34	33.2	0.000005	0.623	12240.45	750.08	0.03
Sandy	Main	1.86	FEMA 100-year	Ultimate_ALT107_FEMA	7059	3.1	34.346	12.95	34.35	0.000003	0.515	18474.82	1914.13	0.02
Sandy	Main	1.86	FEMA 100-year	Ultimate_ALT108_FEMA	7059	3.1	34.346	12.95	34.35	0.000003	0.515	18474.71	1914.13	0.02
Sandy	Main	1.86	2-year	Ultimate_ALT107_WAR	11000	3.1	22.006	14.62	22.1	0.000267	2.489	4419.37	644.99	0.17
Sandy	Main	1.86	2-year	Ultimate_ALT108_WAR	11000	3.1	22.006	14.62	22.1	0.000267	2.489	4419.37	644.99	0.17
Sandy	Main	1.86	2-year	Ultimate_ALT107_SF	7500	3.1	22.858	13.13	22.89	0.000084	1.509	4972.19	651.67	0.1
Sandy	Main	1.86	2-year	Ultimate_ALT108_SF	7500	3.1	22.858	13.13	22.89	0.000084	1.509	4972.19	651.67	0.1
Sandy	Main	1.86	100-yr	Ultimate_ALT107_WAR	12000	3.1	35.25	15.12	35.26	0.000007	0.819	20223.41	1951.18	0.03
Sandy	Main	1.86	100-yr	Ultimate_ALT108_WAR	12000	3.1	35.25	15.12	35.26	0.000007	0.819	20223.37	1951.18	0.03
Sandy	Main	1.86	100-yr	Ultimate_ALT107_SF	7500	3.1	33.198	13.13	33.2	0.000004	0.597	16301.11	1870.46	0.02
Sandy	Main	1.86	100-yr	Ultimate_ALT108_SF	7500	3.1	33.198	13.13	33.2	0.000004	0.597	16301.03	1870.45	0.02
Sandy	Main	1.83	FEMA 100-year	Ultimate_ALT107_FEMA	7059	7.33	34.343	13.47	34.35	0.000005	0.704	15944.57	1510.66	0.03
Sandy	Main	1.83	FEMA 100-year	Ultimate_ALT108_FEMA	7059	7.33	34.343	13.47	34.35	0.000005	0.704	15944.48	1510.65	0.03
Sandy	Main	1.83	2-year	Ultimate_ALT107_WAR	11000	7.33	21.87	14.65	22.05	0.000331	3.374	3332.73	462.89	0.2
Sandy	Main	1.83	2-year	Ultimate_ALT108_WAR	11000	7.33	21.87	14.65	22.05	0.000331	3.374	3332.73	462.89	0.2
Sandy	Main	1.83	2-year	Ultimate_ALT107_SF	7500	7.33	22.809	13.61	22.88	0.00011	2.075	3829	591.54	0.11
Sandy	Main	1.83	2-year	Ultimate_ALT108_SF	7500	7.33	22.809	13.61	22.88	0.00011	2.075	3829	591.54	0.11
Sandy	Main	1.83	100-yr	Ultimate_ALT107_WAR	12000	7.33	35.243	14.91	35.26	0.000011	1.12	17343.14	1598.6	0.04

Sandy	Main	1.83	100-yr	Ultimate_ALT108_WAR	12000	7.33	35.243	14.91	35.26	0.000011	1.12	17343.11	1598.59	0.04
Sandy	Main	1.83	100-yr	Ultimate_ALT107_SF	7500	7.33	33.194	13.61	33.2	0.000007	0.815	14293.93	1400.17	0.03
Sandy	Main	1.83	100-yr	Ultimate_ALT108_SF	7500	7.33	33.194	13.61	33.2	0.000007	0.815	14293.87	1400.17	0.03
Sandy	Main	1.77	FEMA 100-year	Ultimate_ALT107_FEMA	7059	9.81	34.344	14.28	34.35	0.000003	0.583	25749.58	2436.7	0.02
Sandy	Main	1.77	FEMA 100-year	Ultimate_ALT108_FEMA	7059	9.81	34.344	14.28	34.35	0.000003	0.583	25749.45	2436.69	0.02
Sandy	Main	1.77	2-year	Ultimate_ALT107_WAR	11000	9.81	21.678	15.34	21.92	0.000445	4.02	3263.63	729.34	0.23
Sandy	Main	1.77	2-year	Ultimate_ALT108_WAR	11000	9.81	21.678	15.34	21.92	0.000445	4.02	3263.63	729.34	0.23
Sandy	Main	1.77	2-year	Ultimate_ALT107_SF	7500	9.81	22.753	14.41	22.84	0.000136	2.385	4167.37	952.02	0.13
Sandy	Main	1.77	2-year	Ultimate_ALT108_SF	7500	9.81	22.753	14.41	22.84	0.000136	2.385	4167.37	952.02	0.13
Sandy	Main	1.77	100-yr	Ultimate_ALT107_WAR	12000	9.81	35.245	15.59	35.25	0.000007	0.922	27948.59	2441.66	0.03
Sandy	Main	1.77	100-yr	Ultimate_ALT108_WAR	12000	9.81	35.245	15.59	35.25	0.000007	0.922	27948.54	2441.66	0.03
Sandy	Main	1.77	100-yr	Ultimate_ALT107_SF	7500	9.81	33.195	14.41	33.2	0.000005	0.693	22999.32	2349.68	0.03
Sandy	Main	1.77	100-yr	Ultimate_ALT108_SF	7500	9.81	33.195	14.41	33.2	0.000005	0.693	22999.22	2349.67	0.03
Sandy	Main	1.71	FEMA 100-year	Ultimate_ALT107_FEMA	7059	9.37	34.343	14.02	34.35	0.000003	0.525	27894.44	2530.76	0.02
Sandy	Main	1.71	FEMA 100-year	Ultimate_ALT108_FEMA	7059	9.37	34.343	14.02	34.35	0.000003	0.525	27894.3	2530.76	0.02
Sandy	Main	1.71	2-year	Ultimate_ALT107_WAR	11000	9.37	21.544	15.1	21.76	0.000432	3.843	3418.59	734.62	0.22
Sandy	Main	1.71	2-year	Ultimate_ALT108_WAR	11000	9.37	21.544	15.1	21.76	0.000432	3.843	3418.59	734.62	0.22
Sandy	Main	1.71	2-year	Ultimate_ALT107_SF	7500	9.37	22.715	14.14	22.79	0.000126	2.24	4412.56	944.31	0.12
Sandy	Main	1.71	2-year	Ultimate_ALT108_SF	7500	9.37	22.715	14.14	22.79	0.000126	2.24	4412.56	944.31	0.12
Sandy	Main	1.71	100-yr	Ultimate_ALT107_WAR	12000	9.37	35.244	15.36	35.25	0.000006	0.822	30175.8	2535.62	0.03
Sandy	Main	1.71	100-yr	Ultimate_ALT108_WAR	12000	9.37	35.244	15.36	35.25	0.000006	0.822	30175.74	2535.62	0.03
Sandy	Main	1.71	100-yr	Ultimate_ALT107_SF	7500	9.37	33.194	14.14	33.2	0.000004	0.625	24992.14	2521.25	0.02
Sandy	Main	1.71	100-yr	Ultimate_ALT108_SF	7500	9.37	33.194	14.14	33.2	0.000004	0.625	24992.04	2521.25	0.02
Sandy	Main	1.63	FEMA 100-year	Ultimate_ALT107_FEMA	7059	9.81	34.342	14.31	34.34	0.000003	0.501	28017.95	2614.48	0.02
Sandy	Main	1.63	FEMA 100-year	Ultimate_ALT108_FEMA	7059	9.81	34.342	14.31	34.34	0.000003	0.501	28017.8	2614.48	0.02
Sandy	Main	1.63	2-year	Ultimate_ALT107_WAR	11000	9.81	21.373	15.37	21.58	0.000449	3.679	3110.87	577.47	0.22
Sandy	Main	1.63	2-year	Ultimate_ALT108_WAR	11000	9.81	21.373	15.37	21.58	0.000449	3.679	3110.87	577.47	0.22
Sandy	Main	1.63	2-year	Ultimate_ALT107_SF	7500	9.81	22.666	14.44	22.74	0.000125	2.13	3967.95	771.44	0.12
Sandy	Main	1.63	2-year	Ultimate_ALT108_SF	7500	9.81	22.666	14.44	22.74	0.000125	2.13	3967.95	771.44	0.12
Sandy	Main	1.63	100-yr	Ultimate_ALT107_WAR	12000	9.81	35.242	15.62	35.25	0.000006	0.783	30372.16	2620.64	0.03
Sandy	Main	1.63	100-yr	Ultimate_ALT108_WAR	12000	9.81	35.242	15.62	35.25	0.000006	0.783	30372.1	2620.64	0.03
Sandy	Main	1.63	100-yr	Ultimate_ALT107_SF	7500	9.81	33.193	14.44	33.2	0.000004	0.597	25017.05	2605.36	0.02
Sandy	Main	1.63	100-yr	Ultimate_ALT108_SF	7500	9.81	33.193	14.44	33.2	0.000004	0.597	25016.96	2605.36	0.02
Sandy	Main	1.52	FEMA 100-year	Ultimate_ALT107_FEMA	7059	8.78	34.341	13.98	34.34	0.000003	0.563	26100.72	2401.57	0.02
Sandy	Main	1.52	FEMA 100-year	Ultimate_ALT108_FEMA	7059	8.78	34.34	13.98	34.34	0.000003	0.563	26100.6	2401.57	0.02
Sandy	Main	1.52	2-year	Ultimate_ALT107_WAR	11000	8.78	21.012	15.1	21.29	0.00055	4.246	2683.54	437.97	0.25
Sandy	Main	1.52	2-year	Ultimate_ALT108_WAR	11000	8.78	21.012	15.1	21.29	0.00055	4.246	2683.54	437.97	0.25
Sandy	Main	1.52	2-year	Ultimate_ALT107_SF	7500	8.78	22.568	14.12	22.66	0.000149	2.411	3490.31	601.6	0.13
Sandy	Main	1.52	2-year	Ultimate_ALT108_SF	7500	8.78	22.568	14.12	22.66	0.000149	2.411	3490.31	601.6	0.13
Sandy	Main	1.52	100-yr	Ultimate_ALT107_WAR	12000	8.78	35.238	15.36	35.24	0.000007	0.883	28271	2440.16	0.03
Sandy	Main	1.52	100-yr	Ultimate_ALT108_WAR	12000	8.78	35.238	15.36	35.24	0.000007	0.883	28270.95	2440.16	0.03
Sandy	Main	1.52	100-yr	Ultimate_ALT107_SF	7500	8.78	33.19	14.12	33.19	0.000004	0.669	23345.62	2389.43	0.03
Sandy	Main	1.52	100-yr	Ultimate_ALT108_SF	7500	8.78	33.19	14.12	33.19	0.000004	0.669	23345.54	2389.43	0.03

Sandy	Main	1.37	FEMA 100-year	Ultimate_ALT107_FEMA	7059	9.02	34.339	12.87	34.34	0.000002	0.452	29604.99	2294.51	0.02
Sandy	Main	1.37	FEMA 100-year	Ultimate_ALT108_FEMA	7059	9.02	34.339	12.87	34.34	0.000002	0.452	29604.87	2294.51	0.02
Sandy	Main	1.37	2-year	Ultimate_ALT107_WAR	11000	9.02	20.779	13.85	20.94	0.000308	3.201	3597	574.23	0.19
Sandy	Main	1.37	2-year	Ultimate_ALT108_WAR	11000	9.02	20.779	13.85	20.94	0.000308	3.201	3597	574.23	0.19
Sandy	Main	1.37	2-year	Ultimate_ALT107_SF	7500	9.02	22.516	12.99	22.56	0.000074	1.771	5305.04	1408.16	0.1
Sandy	Main	1.37	2-year	Ultimate_ALT108_SF	7500	9.02	22.516	12.99	22.56	0.000074	1.771	5305.04	1408.16	0.1
Sandy	Main	1.37	100-yr	Ultimate_ALT107_WAR	12000	9.02	35.235	14.08	35.24	0.000004	0.718	31662.9	2301.44	0.03
Sandy	Main	1.37	100-yr	Ultimate_ALT108_WAR	12000	9.02	35.235	14.08	35.24	0.000004	0.718	31662.85	2301.44	0.03
Sandy	Main	1.37	100-yr	Ultimate_ALT107_SF	7500	9.02	33.189	12.99	33.19	0.000003	0.527	26970.5	2282.32	0.02
Sandy	Main	1.37	100-yr	Ultimate_ALT108_SF	7500	9.02	33.189	12.99	33.19	0.000003	0.527	26970.43	2282.32	0.02
Sandy	Main	1.29	FEMA 100-year	Ultimate_ALT107_FEMA	7059	8.97	34.339	13.39	34.34	0.000002	0.471	27185.35	1919.93	0.02
Sandy	Main	1.29	FEMA 100-year	Ultimate_ALT108_FEMA	7059	8.97	34.339	13.39	34.34	0.000002	0.471	27185.24	1919.92	0.02
Sandy	Main	1.29	2-year	Ultimate_ALT107_WAR	11000	8.97	20.618	14.39	20.79	0.000346	3.438	4004.71	994.95	0.2
Sandy	Main	1.29	2-year	Ultimate_ALT108_WAR	11000	8.97	20.618	14.39	20.79	0.000346	3.438	4004.71	994.95	0.2
Sandy	Main	1.29	2-year	Ultimate_ALT107_SF	7500	8.97	22.486	13.52	22.53	0.000074	1.789	6179.67	1335.33	0.1
Sandy	Main	1.29	2-year	Ultimate_ALT108_SF	7500	8.97	22.486	13.52	22.53	0.000074	1.789	6179.67	1335.33	0.1
Sandy	Main	1.29	100-yr	Ultimate_ALT107_WAR	12000	8.97	35.233	14.62	35.24	0.000005	0.756	28926.18	1980.4	0.03
Sandy	Main	1.29	100-yr	Ultimate_ALT108_WAR	12000	8.97	35.233	14.62	35.24	0.000005	0.756	28926.14	1980.39	0.03
Sandy	Main	1.29	100-yr	Ultimate_ALT107_SF	7500	8.97	33.187	13.52	33.19	0.000003	0.545	24981.77	1909.28	0.02
Sandy	Main	1.29	100-yr	Ultimate_ALT108_SF	7500	8.97	33.187	13.52	33.19	0.000003	0.545	24981.69	1909.28	0.02
Sandy	Main	1.21	FEMA 100-year	Ultimate_ALT107_FEMA	7059	6.75	34.336	12.03	34.34	0.000003	0.556	21250.63	2101.06	0.02
Sandy	Main	1.21	FEMA 100-year	Ultimate_ALT108_FEMA	7059	6.75	34.336	12.03	34.34	0.000003	0.556	21250.52	2101.06	0.02
Sandy	Main	1.21	2-year	Ultimate_ALT107_WAR	11000	6.75	20.527	13.12	20.66	0.000238	2.905	3825.97	458.39	0.17
Sandy	Main	1.21	2-year	Ultimate_ALT108_WAR	11000	6.75	20.527	13.12	20.66	0.000238	2.905	3825.97	458.39	0.17
Sandy	Main	1.21	2-year	Ultimate_ALT107_SF	7500	6.75	22.46	12.17	22.5	0.000059	1.63	4779.4	520.42	0.09
Sandy	Main	1.21	2-year	Ultimate_ALT108_SF	7500	6.75	22.46	12.17	22.5	0.000059	1.63	4779.4	520.42	0.09
Sandy	Main	1.21	100-yr	Ultimate_ALT107_WAR	12000	6.75	35.226	13.37	35.24	0.000007	0.883	23161.16	2182.08	0.03
Sandy	Main	1.21	100-yr	Ultimate_ALT108_WAR	12000	6.75	35.226	13.37	35.24	0.000007	0.883	23161.11	2182.08	0.03
Sandy	Main	1.21	100-yr	Ultimate_ALT107_SF	7500	6.75	33.183	12.17	33.19	0.000004	0.641	18904.23	1968.5	0.02
Sandy	Main	1.21	100-yr	Ultimate_ALT108_SF	7500	6.75	33.183	12.17	33.19	0.000004	0.641	18904.15	1968.49	0.02
Columbia	RM 122-12	124.11	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-28.18	34.533		34.66	0.000025	2.953	223300	10935.2	0.08
Columbia	RM 122-12	124.11	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-28.18	34.533		34.66	0.000025	2.953	223299.7	10935.2	0.08
Columbia	RM 122-12	124.11	2-year	Ultimate_ALT107_WAR	261000	-28.18	21.023		21.09	0.000021	2.157	132427.2	5452.85	0.07
Columbia	RM 122-12	124.11	2-year	Ultimate_ALT108_WAR	261000	-28.18	21.023		21.09	0.000021	2.157	132427.2	5452.85	0.07
Columbia	RM 122-12	124.11	2-year	Ultimate_ALT107_SF	385500	-28.18	23.063		23.19	0.000037	2.954	143679.7	5665.5	0.09
Columbia	RM 122-12	124.11	2-year	Ultimate_ALT108_SF	385500	-28.18	23.063		23.19	0.000037	2.954	143679.7	5665.5	0.09
Columbia	RM 122-12	124.11	100-yr	Ultimate_ALT107_WAR	549000	-28.18	35.402		35.52	0.000022	2.849	230354.5	10959.76	0.08
Columbia	RM 122-12	124.11	100-yr	Ultimate_ALT108_WAR	549000	-28.18	35.402		35.52	0.000022	2.849	230354.3	10959.76	0.08
Columbia	RM 122-12	124.11	100-yr	Ultimate_ALT107_SF	699500	-28.18	33.551		33.76	0.000043	3.831	215385.8	10845.55	0.11
Columbia	RM 122-12	124.11	100-yr	Ultimate_ALT108_SF	699500	-28.18	33.551		33.76	0.000043	3.831	215385.5	10845.55	0.11
Columbia	RM 122-12	123.86	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-29.5	34.505		34.62	0.000028	2.772	212168.4	11651.66	0.08
Columbia	RM 122-12	123.86	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-29.5	34.505		34.62	0.000028	2.772	212168	11651.65	0.08

Columbia	RM 122-12	123.86	2-year	Ultimate_ALT107_WAR	261000	-29.5	20.984		21.06	0.000033	2.178	119823.7	5688.18	0.08
Columbia	RM 122-12	123.86	2-year	Ultimate_ALT108_WAR	261000	-29.5	20.984		21.06	0.000033	2.178	119823.7	5688.18	0.08
Columbia	RM 122-12	123.86	2-year	Ultimate_ALT107_SF	385500	-29.5	23		23.13	0.000054	2.936	131414.5	5862.09	0.11
Columbia	RM 122-12	123.86	2-year	Ultimate_ALT108_SF	385500	-29.5	23		23.13	0.000054	2.936	131414.5	5862.09	0.11
Columbia	RM 122-12	123.86	100-yr	Ultimate_ALT107_WAR	549000	-29.5	35.377		35.49	0.000025	2.667	219308.4	11761.64	0.08
Columbia	RM 122-12	123.86	100-yr	Ultimate_ALT108_WAR	549000	-29.5	35.377		35.49	0.000025	2.667	219308.3	11761.64	0.08
Columbia	RM 122-12	123.86	100-yr	Ultimate_ALT107_SF	699500	-29.5	33.501		33.7	0.000049	3.608	204098.6	11384.9	0.11
Columbia	RM 122-12	123.86	100-yr	Ultimate_ALT108_SF	699500	-29.5	33.501		33.7	0.000049	3.608	204098.3	11384.88	0.11
Columbia	RM 122-12	123.44	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-27.88	34.446		34.56	0.00003	2.734	231161.3	12565.54	0.09
Columbia	RM 122-12	123.44	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-27.88	34.446		34.56	0.00003	2.734	231160.9	12565.52	0.09
Columbia	RM 122-12	123.44	2-year	Ultimate_ALT107_WAR	261000	-27.88	20.892		20.97	0.000044	2.297	117464.9	7166.81	0.09
Columbia	RM 122-12	123.44	2-year	Ultimate_ALT108_WAR	261000	-27.88	20.892		20.97	0.000044	2.297	117464.9	7166.81	0.09
Columbia	RM 122-12	123.44	2-year	Ultimate_ALT107_SF	385500	-27.88	22.856		23	0.000068	3.058	131697.7	7356.32	0.12
Columbia	RM 122-12	123.44	2-year	Ultimate_ALT108_SF	385500	-27.88	22.856		23	0.000068	3.058	131697.7	7356.32	0.12
Columbia	RM 122-12	123.44	100-yr	Ultimate_ALT107_WAR	549000	-27.88	35.325		35.43	0.000027	2.623	239496.3	12708.75	0.08
Columbia	RM 122-12	123.44	100-yr	Ultimate_ALT108_WAR	549000	-27.88	35.325		35.43	0.000027	2.623	239496.1	12708.75	0.08
Columbia	RM 122-12	123.44	100-yr	Ultimate_ALT107_SF	699500	-27.88	33.394		33.59	0.000054	3.573	221224	11482.5	0.11
Columbia	RM 122-12	123.44	100-yr	Ultimate_ALT108_SF	699500	-27.88	33.394		33.59	0.000054	3.573	221223.7	11482.45	0.11
Columbia	RM 122-12	123.07	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-22.96	34.344		34.49	0.000042	3.104	202933.6	11823.42	0.1
Columbia	RM 122-12	123.07	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-22.96	34.344		34.49	0.000042	3.104	202933.1	11823.41	0.1
Columbia	RM 122-12	123.07	2-year	Ultimate_ALT107_WAR	261000	-22.96	20.753		20.87	0.00007	2.718	97541.33	6041.77	0.12
Columbia	RM 122-12	123.07	2-year	Ultimate_ALT108_WAR	261000	-22.96	20.753		20.87	0.00007	2.718	97541.33	6041.77	0.12
Columbia	RM 122-12	123.07	2-year	Ultimate_ALT107_SF	385500	-22.96	22.635		22.84	0.000107	3.605	109104.1	6388.07	0.15
Columbia	RM 122-12	123.07	2-year	Ultimate_ALT108_SF	385500	-22.96	22.635		22.84	0.000107	3.605	109104.1	6388.07	0.15
Columbia	RM 122-12	123.07	100-yr	Ultimate_ALT107_WAR	549000	-22.96	35.235		35.37	0.000037	2.972	211757	11936.01	0.09
Columbia	RM 122-12	123.07	100-yr	Ultimate_ALT108_WAR	549000	-22.96	35.235		35.37	0.000037	2.972	211756.8	11936.01	0.09
Columbia	RM 122-12	123.07	100-yr	Ultimate_ALT107_SF	699500	-22.96	33.209		33.46	0.000077	4.086	191801.6	11704.5	0.13
Columbia	RM 122-12	123.07	100-yr	Ultimate_ALT108_SF	699500	-22.96	33.209		33.46	0.000077	4.086	191801.3	11704.49	0.13
Columbia	RM 122-12	122.78	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-25.57	34.27		34.43	0.000042	3.215	194784	9537.68	0.1
Columbia	RM 122-12	122.78	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-25.57	34.27		34.43	0.000042	3.215	194783.5	9537.66	0.1
Columbia	RM 122-12	122.78	2-year	Ultimate_ALT107_WAR	261000	-25.57	20.656		20.77	0.000059	2.708	97425.35	5462.23	0.11
Columbia	RM 122-12	122.78	2-year	Ultimate_ALT108_WAR	261000	-25.57	20.656		20.77	0.000059	2.708	97425.35	5462.23	0.11
Columbia	RM 122-12	122.78	2-year	Ultimate_ALT107_SF	385500	-25.57	22.476		22.68	0.000096	3.645	107601.7	5709.91	0.14
Columbia	RM 122-12	122.78	2-year	Ultimate_ALT108_SF	385500	-25.57	22.476		22.68	0.000096	3.645	107601.7	5709.91	0.14
Columbia	RM 122-12	122.78	100-yr	Ultimate_ALT107_WAR	549000	-25.57	35.168		35.31	0.000038	3.087	203561.8	10024.98	0.1
Columbia	RM 122-12	122.78	100-yr	Ultimate_ALT108_WAR	549000	-25.57	35.168		35.31	0.000038	3.087	203561.5	10024.97	0.1
Columbia	RM 122-12	122.78	100-yr	Ultimate_ALT107_SF	699500	-25.57	33.076		33.35	0.000077	4.231	183793.5	8829.63	0.14
Columbia	RM 122-12	122.78	100-yr	Ultimate_ALT108_SF	699500	-25.57	33.076		33.35	0.000077	4.231	183793.2	8829.61	0.14
Columbia	RM 122-12	122.31	FEMA 100-year	Ultimate_ALT107_FEMA	555000	-34.51	34.166		34.33	0.000036	3.281	192454.1	9587.37	0.1
Columbia	RM 122-12	122.31	FEMA 100-year	Ultimate_ALT108_FEMA	555000	-34.51	34.166		34.33	0.000036	3.281	192453.7	9587.36	0.1
Columbia	RM 122-12	122.31	2-year	Ultimate_ALT107_WAR	261000	-34.51	20.557		20.65	0.000037	2.503	105711	4908.43	0.09
Columbia	RM 122-12	122.31	2-year	Ultimate_ALT108_WAR	261000	-34.51	20.557		20.65	0.000037	2.503	105711	4908.43	0.09
Columbia	RM 122-12	122.31	2-year	Ultimate_ALT107_SF	385500	-34.51	22.305		22.49	0.000064	3.437	114515.9	5112.88	0.12

Columbia	RM 122-12	122.31	2-year	Ultimate_ALT108_SF	385500	-34.51	22.305		22.49	0.000064	3.437	114515.9	5112.88	0.12
Columbia	RM 122-12	122.31	100-yr	Ultimate_ALT107_WAR	549000	-34.51	35.076		35.22	0.000032	3.15	201239.2	9711.72	0.09
Columbia	RM 122-12	122.31	100-yr	Ultimate_ALT108_WAR	549000	-34.51	35.076		35.22	0.000032	3.15	201238.9	9711.72	0.09
Columbia	RM 122-12	122.31	100-yr	Ultimate_ALT107_SF	699500	-34.51	32.889		33.17	0.000065	4.308	180547.1	9012.44	0.13
Columbia	RM 122-12	122.31	100-yr	Ultimate_ALT108_SF	699500	-34.51	32.889		33.17	0.000065	4.308	180546.8	9012.42	0.13
Columbia	RM 118.5-	122.08	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-32.69	34.099	-6.52	34.28	0.000043	3.486	183999.5	8761.12	0.1
Columbia	RM 118.5-	122.08	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-32.69	34.099	-6.52	34.28	0.000043	3.486	183998.9	8761.12	0.1
Columbia	RM 118.5-	122.08	2-year	Ultimate_ALT107_WAR	272000	-32.69	20.479	-14.29	20.6	0.000052	2.821	98530.93	5022.58	0.11
Columbia	RM 118.5-	122.08	2-year	Ultimate_ALT108_WAR	272000	-32.69	20.479	-14.29	20.6	0.000052	2.821	98530.93	5022.58	0.11
Columbia	RM 118.5-	122.08	2-year	Ultimate_ALT107_SF	393000	-32.69	22.18	-10.74	22.4	0.000085	3.774	107302.2	5245.83	0.14
Columbia	RM 118.5-	122.08	2-year	Ultimate_ALT108_SF	393000	-32.69	22.18	-10.74	22.4	0.000085	3.774	107302.2	5245.83	0.14
Columbia	RM 118.5-	122.08	100-yr	Ultimate_ALT107_WAR	561000	-32.69	35.012	-6.54	35.18	0.000039	3.374	192034.7	8828.47	0.1
Columbia	RM 118.5-	122.08	100-yr	Ultimate_ALT108_WAR	561000	-32.69	35.012	-6.54	35.18	0.000039	3.374	192034.5	8828.47	0.1
Columbia	RM 118.5-	122.08	100-yr	Ultimate_ALT107_SF	707000	-32.69	32.772	-3.51	33.09	0.000078	4.568	172602.1	8330.09	0.14
Columbia	RM 118.5-	122.08	100-yr	Ultimate_ALT108_SF	707000	-32.69	32.772	-3.51	33.09	0.000078	4.568	172601.8	8330.07	0.14
Columbia	RM 118.5-	121.81	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-36.66	34.047	-5.71	34.22	0.000044	3.45	187597.5	7851.4	0.1
Columbia	RM 118.5-	121.81	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-36.66	34.047	-5.71	34.22	0.000044	3.45	187597.2	7851.39	0.1
Columbia	RM 118.5-	121.81	2-year	Ultimate_ALT107_WAR	272000	-36.66	20.4	-16.47	20.53	0.000054	2.885	99357.9	5326.13	0.11
Columbia	RM 118.5-	121.81	2-year	Ultimate_ALT108_WAR	272000	-36.66	20.4	-16.47	20.53	0.000054	2.885	99357.9	5326.13	0.11
Columbia	RM 118.5-	121.81	2-year	Ultimate_ALT107_SF	393000	-36.66	22.05	-11.23	22.27	0.000093	3.847	108444.5	5596.11	0.14
Columbia	RM 118.5-	121.81	2-year	Ultimate_ALT108_SF	393000	-36.66	22.05	-11.23	22.27	0.000093	3.847	108444.5	5596.11	0.14
Columbia	RM 118.5-	121.81	100-yr	Ultimate_ALT107_WAR	561000	-36.66	34.964	-5.73	35.13	0.00004	3.344	194901.6	8076.5	0.1
Columbia	RM 118.5-	121.81	100-yr	Ultimate_ALT108_WAR	561000	-36.66	34.964	-5.73	35.13	0.00004	3.344	194901.4	8076.49	0.1
Columbia	RM 118.5-	121.81	100-yr	Ultimate_ALT107_SF	707000	-36.66	32.67	-2.48	32.98	0.00008	4.552	177009.2	7578.81	0.14
Columbia	RM 118.5-	121.81	100-yr	Ultimate_ALT108_SF	707000	-36.66	32.67	-2.48	32.98	0.00008	4.552	177008.9	7578.81	0.14
Columbia	RM 118.5-	121.46	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-40.24	33.95	-2.52	34.14	0.00005	3.614	177690.9	7550.63	0.11
Columbia	RM 118.5-	121.46	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-40.24	33.95	-2.52	34.14	0.00005	3.614	177690.5	7550.62	0.11
Columbia	RM 118.5-	121.46	2-year	Ultimate_ALT107_WAR	272000	-40.24	20.294	-10.82	20.43	0.000059	3.011	93872.37	4968.15	0.11
Columbia	RM 118.5-	121.46	2-year	Ultimate_ALT108_WAR	272000	-40.24	20.294	-10.82	20.43	0.000059	3.011	93872.37	4968.15	0.11
Columbia	RM 118.5-	121.46	2-year	Ultimate_ALT107_SF	393000	-40.24	21.863	-7.05	22.11	0.000099	4.045	101760.5	5110.5	0.15
Columbia	RM 118.5-	121.46	2-year	Ultimate_ALT108_SF	393000	-40.24	21.863	-7.05	22.11	0.000099	4.045	101760.5	5110.5	0.15
Columbia	RM 118.5-	121.46	100-yr	Ultimate_ALT107_WAR	561000	-40.24	34.878	-2.54	35.06	0.000045	3.489	184751.3	7668.86	0.11
Columbia	RM 118.5-	121.46	100-yr	Ultimate_ALT108_WAR	561000	-40.24	34.878	-2.54	35.06	0.000045	3.489	184751.1	7668.86	0.11
Columbia	RM 118.5-	121.46	100-yr	Ultimate_ALT107_SF	707000	-40.24	32.498	0.42	32.83	0.000091	4.759	166880.8	7312.2	0.15
Columbia	RM 118.5-	121.46	100-yr	Ultimate_ALT108_SF	707000	-40.24	32.498	0.42	32.83	0.000091	4.759	166880.6	7312.18	0.15
Columbia	RM 118.5-	121.23	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-24.85	33.915	-2.33	34.09	0.000041	3.424	187640.4	7300.04	0.1
Columbia	RM 118.5-	121.23	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-24.85	33.915	-2.33	34.09	0.000041	3.424	187640	7300.03	0.1
Columbia	RM 118.5-	121.23	2-year	Ultimate_ALT107_WAR	272000	-24.85	20.244	-9.34	20.36	0.000052	2.803	102010.6	5418.35	0.11
Columbia	RM 118.5-	121.23	2-year	Ultimate_ALT108_WAR	272000	-24.85	20.244	-9.34	20.36	0.000052	2.803	102010.6	5418.35	0.11
Columbia	RM 118.5-	121.23	2-year	Ultimate_ALT107_SF	393000	-24.85	21.783	-6.16	22	0.000086	3.768	110439.2	5527.01	0.14
Columbia	RM 118.5-	121.23	2-year	Ultimate_ALT108_SF	393000	-24.85	21.783	-6.16	22	0.000086	3.768	110439.2	5527.01	0.14
Columbia	RM 118.5-	121.23	100-yr	Ultimate_ALT107_WAR	561000	-24.85	34.844	-2.35	35.01	0.000037	3.32	194502.2	7450.2	0.1
Columbia	RM 118.5-	121.23	100-yr	Ultimate_ALT108_WAR	561000	-24.85	34.844	-2.35	35.01	0.000037	3.32	194502	7450.2	0.1

Columbia	RM 118.5-	121.23	100-yr	Ultimate_ALT107_SF	707000	-24.85	32.429	0.57	32.73	0.000076	4.519	176959.7	7108.83	0.14
Columbia	RM 118.5-	121.23	100-yr	Ultimate_ALT108_SF	707000	-24.85	32.429	0.57	32.73	0.000076	4.519	176959.5	7108.83	0.14
Columbia	RM 118.5-	120.92	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-42.6	33.663	-7.41	34.01	0.000076	4.718	122327.2	5636.56	0.14
Columbia	RM 118.5-	120.92	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-42.6	33.663	-7.41	34.01	0.000076	4.718	122327	5636.55	0.14
Columbia	RM 118.5-	120.92	2-year	Ultimate_ALT107_WAR	272000	-42.6	20.066	-16.01	20.27	0.000081	3.636	74810.3	3942.1	0.13
Columbia	RM 118.5-	120.92	2-year	Ultimate_ALT108_WAR	272000	-42.6	20.066	-16.01	20.27	0.000081	3.636	74810.3	3942.1	0.13
Columbia	RM 118.5-	120.92	2-year	Ultimate_ALT107_SF	393000	-42.6	21.461	-12.08	21.84	0.00014	4.957	79277.01	3982.6	0.18
Columbia	RM 118.5-	120.92	2-year	Ultimate_ALT108_SF	393000	-42.6	21.461	-12.08	21.84	0.00014	4.957	79277.01	3982.6	0.18
Columbia	RM 118.5-	120.92	100-yr	Ultimate_ALT107_WAR	561000	-42.6	34.608	-7.44	34.93	0.000069	4.585	126310.8	5891.45	0.13
Columbia	RM 118.5-	120.92	100-yr	Ultimate_ALT108_WAR	561000	-42.6	34.608	-7.44	34.93	0.000069	4.585	126310.7	5891.44	0.13
Columbia	RM 118.5-	120.92	100-yr	Ultimate_ALT107_SF	707000	-42.6	31.982	-3.83	32.58	0.00014	6.231	115370.8	5366.41	0.19
Columbia	RM 118.5-	120.92	100-yr	Ultimate_ALT108_SF	707000	-42.6	31.982	-3.83	32.58	0.00014	6.231	115370.6	5366.4	0.19
Columbia	RM 118.5-	120.64	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-50.24	33.665	-21	33.94	0.000039	4.186	135402.2	5414.84	0.1
Columbia	RM 118.5-	120.64	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-50.24	33.665	-21	33.94	0.000039	4.186	135402	5414.83	0.1
Columbia	RM 118.5-	120.64	2-year	Ultimate_ALT107_WAR	272000	-50.24	20.099	-29.08	20.22	0.000024	2.758	98630.68	2911.31	0.08
Columbia	RM 118.5-	120.64	2-year	Ultimate_ALT108_WAR	272000	-50.24	20.099	-29.08	20.22	0.000024	2.758	98630.68	2911.31	0.08
Columbia	RM 118.5-	120.64	2-year	Ultimate_ALT107_SF	393000	-50.24	21.515	-25.23	21.74	0.000045	3.843	102271.7	2945.56	0.11
Columbia	RM 118.5-	120.64	2-year	Ultimate_ALT108_SF	393000	-50.24	21.515	-25.23	21.74	0.000045	3.843	102271.7	2945.56	0.11
Columbia	RM 118.5-	120.64	100-yr	Ultimate_ALT107_WAR	561000	-50.24	34.606	-21.03	34.87	0.000036	4.101	138275.7	5677.2	0.1
Columbia	RM 118.5-	120.64	100-yr	Ultimate_ALT108_WAR	561000	-50.24	34.606	-21.03	34.87	0.000036	4.101	138275.7	5677.19	0.1
Columbia	RM 118.5-	120.64	100-yr	Ultimate_ALT107_SF	707000	-50.24	31.996	-17.49	32.46	0.000068	5.446	130481.5	4810.21	0.14
Columbia	RM 118.5-	120.64	100-yr	Ultimate_ALT108_SF	707000	-50.24	31.996	-17.49	32.46	0.000068	5.446	130481.4	4810.21	0.14
Columbia	RM 118.5-	120.37	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-57.92	33.527	-17.66	33.88	0.000048	4.736	119204.9	3262.81	0.12
Columbia	RM 118.5-	120.37	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-57.92	33.527	-17.66	33.88	0.000048	4.736	119204.7	3262.8	0.12
Columbia	RM 118.5-	120.37	2-year	Ultimate_ALT107_WAR	272000	-57.92	20.033	-27.16	20.18	0.000028	3.074	88481.83	2198.42	0.09
Columbia	RM 118.5-	120.37	2-year	Ultimate_ALT108_WAR	272000	-57.92	20.033	-27.16	20.18	0.000028	3.074	88481.83	2198.42	0.09
Columbia	RM 118.5-	120.37	2-year	Ultimate_ALT107_SF	393000	-57.92	21.388	-22.57	21.67	0.000053	4.297	91466.07	2206.72	0.12
Columbia	RM 118.5-	120.37	2-year	Ultimate_ALT108_SF	393000	-57.92	21.388	-22.57	21.67	0.000053	4.297	91466.07	2206.72	0.12
Columbia	RM 118.5-	120.37	100-yr	Ultimate_ALT107_WAR	561000	-57.92	34.476	-17.7	34.81	0.000045	4.642	121647.5	3469.31	0.11
Columbia	RM 118.5-	120.37	100-yr	Ultimate_ALT108_WAR	561000	-57.92	34.476	-17.7	34.81	0.000045	4.642	121647.5	3469.29	0.11
Columbia	RM 118.5-	120.37	100-yr	Ultimate_ALT107_SF	707000	-57.92	31.758	-14.22	32.35	0.000084	6.167	114840.1	2814.75	0.15
Columbia	RM 118.5-	120.37	100-yr	Ultimate_ALT108_SF	707000	-57.92	31.758	-14.22	32.35	0.000084	6.167	114840	2814.74	0.15
Columbia	RM 118.5-	120.1	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-59.95	33.596	-26.38	33.83	0.000027	3.848	146143.5	4121.57	0.09
Columbia	RM 118.5-	120.1	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-59.95	33.596	-26.38	33.83	0.000027	3.848	146143.3	4121.56	0.09
Columbia	RM 118.5-	120.1	2-year	Ultimate_ALT107_WAR	272000	-59.95	20.064	-34.24	20.15	0.000013	2.396	113515.1	2292.65	0.06
Columbia	RM 118.5-	120.1	2-year	Ultimate_ALT108_WAR	272000	-59.95	20.064	-34.24	20.15	0.000013	2.396	113515.1	2292.65	0.06
Columbia	RM 118.5-	120.1	2-year	Ultimate_ALT107_SF	393000	-59.95	21.448	-30.64	21.62	0.000025	3.368	116694	2311.41	0.08
Columbia	RM 118.5-	120.1	2-year	Ultimate_ALT108_SF	393000	-59.95	21.448	-30.64	21.62	0.000025	3.368	116694	2311.41	0.08
Columbia	RM 118.5-	120.1	100-yr	Ultimate_ALT107_WAR	561000	-59.95	34.541	-26.4	34.76	0.000026	3.78	148745.2	4326.84	0.09
Columbia	RM 118.5-	120.1	100-yr	Ultimate_ALT108_WAR	561000	-59.95	34.541	-26.4	34.76	0.000026	3.78	148745.1	4326.83	0.09
Columbia	RM 118.5-	120.1	100-yr	Ultimate_ALT107_SF	707000	-59.95	31.875	-23.21	32.26	0.000047	4.987	141774	3861.26	0.12
Columbia	RM 118.5-	120.1	100-yr	Ultimate_ALT108_SF	707000	-59.95	31.875	-23.21	32.26	0.000047	4.987	141773.9	3861.26	0.12

Columbia	RM 118.5-	119.89	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-58.48	33.531	-24.34	33.79	0.000035	4.095	137611	5388.84	0.1
Columbia	RM 118.5-	119.89	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-58.48	33.531	-24.34	33.79	0.000035	4.095	137610.9	5388.83	0.1
Columbia	RM 118.5-	119.89	2-year	Ultimate_ALT107_WAR	272000	-58.48	20.027	-33.88	20.14	0.000019	2.647	102766.1	2589.73	0.07
Columbia	RM 118.5-	119.89	2-year	Ultimate_ALT108_WAR	272000	-58.48	20.027	-33.88	20.14	0.000019	2.647	102766.1	2589.73	0.07
Columbia	RM 118.5-	119.89	2-year	Ultimate_ALT107_SF	393000	-58.48	21.378	-29.46	21.59	0.000037	3.707	106010.1	2654.2	0.1
Columbia	RM 118.5-	119.89	2-year	Ultimate_ALT108_SF	393000	-58.48	21.378	-29.46	21.59	0.000037	3.707	106010.1	2654.2	0.1
Columbia	RM 118.5-	119.89	100-yr	Ultimate_ALT107_WAR	561000	-58.48	34.481	-24.36	34.73	0.000033	4.014	140285.6	5495.36	0.1
Columbia	RM 118.5-	119.89	100-yr	Ultimate_ALT108_WAR	561000	-58.48	34.48	-24.36	34.73	0.000033	4.014	140285.5	5495.36	0.1
Columbia	RM 118.5-	119.89	100-yr	Ultimate_ALT107_SF	707000	-58.48	31.761	-20.43	32.2	0.000062	5.331	132784	4510.52	0.13
Columbia	RM 118.5-	119.89	100-yr	Ultimate_ALT108_SF	707000	-58.48	31.761	-20.43	32.2	0.000062	5.331	132783.9	4510.52	0.13
Columbia	RM 118.5-	119.63	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-34.06	33.49	-11.34	33.74	0.000037	4.032	140836	5157.54	0.1
Columbia	RM 118.5-	119.63	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-34.06	33.49	-11.34	33.74	0.000037	4.032	140835.8	5157.54	0.1
Columbia	RM 118.5-	119.63	2-year	Ultimate_ALT107_WAR	272000	-34.06	19.995	-17.49	20.11	0.000024	2.679	101512.8	2788.32	0.08
Columbia	RM 118.5-	119.63	2-year	Ultimate_ALT108_WAR	272000	-34.06	19.995	-17.49	20.11	0.000024	2.679	101512.8	2788.32	0.08
Columbia	RM 118.5-	119.63	2-year	Ultimate_ALT107_SF	393000	-34.06	21.319	-14.7	21.54	0.000045	3.737	105160.6	2995.38	0.11
Columbia	RM 118.5-	119.63	2-year	Ultimate_ALT108_SF	393000	-34.06	21.319	-14.7	21.54	0.000045	3.737	105160.6	2995.38	0.11
Columbia	RM 118.5-	119.63	100-yr	Ultimate_ALT107_WAR	561000	-34.06	34.443	-11.36	34.68	0.000035	3.945	144510.3	5182.25	0.1
Columbia	RM 118.5-	119.63	100-yr	Ultimate_ALT108_WAR	561000	-34.06	34.443	-11.36	34.68	0.000035	3.945	144510.2	5182.25	0.1
Columbia	RM 118.5-	119.63	100-yr	Ultimate_ALT107_SF	707000	-34.06	31.684	-8.88	32.11	0.000066	5.268	135141.5	4057.8	0.13
Columbia	RM 118.5-	119.63	100-yr	Ultimate_ALT108_SF	707000	-34.06	31.684	-8.88	32.11	0.000066	5.268	135141.4	4057.8	0.13
Columbia	RM 118.5-	119.22	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-24.63	33.462	-6.95	33.67	0.000032	3.64	157041	5086.3	0.09
Columbia	RM 118.5-	119.22	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-24.63	33.462	-6.95	33.67	0.000032	3.64	157040.9	5086.29	0.09
Columbia	RM 118.5-	119.22	2-year	Ultimate_ALT107_WAR	272000	-24.63	19.963	-11.27	20.06	0.000022	2.46	110575.9	3802.69	0.07
Columbia	RM 118.5-	119.22	2-year	Ultimate_ALT108_WAR	272000	-24.63	19.963	-11.27	20.06	0.000022	2.46	110575.9	3802.69	0.07
Columbia	RM 118.5-	119.22	2-year	Ultimate_ALT107_SF	393000	-24.63	21.261	-9.34	21.44	0.00004	3.426	114709.9	3816.77	0.1
Columbia	RM 118.5-	119.22	2-year	Ultimate_ALT108_SF	393000	-24.63	21.261	-9.34	21.44	0.00004	3.426	114709.9	3816.77	0.1
Columbia	RM 118.5-	119.22	100-yr	Ultimate_ALT107_WAR	561000	-24.63	34.418	-6.97	34.61	0.00003	3.56	160610.2	5179.86	0.09
Columbia	RM 118.5-	119.22	100-yr	Ultimate_ALT108_WAR	561000	-24.63	34.418	-6.97	34.61	0.00003	3.56	160610.1	5179.86	0.09
Columbia	RM 118.5-	119.22	100-yr	Ultimate_ALT107_SF	707000	-24.63	31.628	-5.1	31.98	0.000057	4.767	150247.7	4632.89	0.12
Columbia	RM 118.5-	119.22	100-yr	Ultimate_ALT108_SF	707000	-24.63	31.628	-5.1	31.98	0.000057	4.767	150247.5	4632.89	0.12
Columbia	RM 118.5-	118.81	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-29.22	33.415	-1.17	33.6	0.000036	3.467	168105	5614.71	0.1
Columbia	RM 118.5-	118.81	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-29.22	33.415	-1.17	33.6	0.000036	3.467	168104.7	5614.71	0.1
Columbia	RM 118.5-	118.81	2-year	Ultimate_ALT107_WAR	272000	-29.22	19.905	-7.92	20.01	0.000032	2.539	107149.5	4427.44	0.09
Columbia	RM 118.5-	118.81	2-year	Ultimate_ALT108_WAR	272000	-29.22	19.905	-7.92	20.01	0.000032	2.539	107149.5	4427.44	0.09
Columbia	RM 118.5-	118.81	2-year	Ultimate_ALT107_SF	393000	-29.22	21.158	-3.61	21.35	0.000058	3.505	112142.6	4506.65	0.12
Columbia	RM 118.5-	118.81	2-year	Ultimate_ALT108_SF	393000	-29.22	21.158	-3.61	21.35	0.000058	3.505	112142.6	4506.65	0.12
Columbia	RM 118.5-	118.81	100-yr	Ultimate_ALT107_WAR	561000	-29.22	34.377	-1.19	34.55	0.000033	3.376	172958.7	5630.71	0.09
Columbia	RM 118.5-	118.81	100-yr	Ultimate_ALT108_WAR	561000	-29.22	34.377	-1.19	34.55	0.000033	3.376	172958.6	5630.71	0.09
Columbia	RM 118.5-	118.81	100-yr	Ultimate_ALT107_SF	707000	-29.22	31.534	0.65	31.86	0.000067	4.584	158698	5507.37	0.13
Columbia	RM 118.5-	118.81	100-yr	Ultimate_ALT108_SF	707000	-29.22	31.534	0.65	31.86	0.000067	4.584	158697.8	5507.37	0.13
Columbia	RM 118.5-	118.62	FEMA 100-year	Ultimate_ALT107_FEMA	562059	-25.56	33.447	-0.98	33.57	0.000024	2.84	201046.2	5609.63	0.08
Columbia	RM 118.5-	118.62	FEMA 100-year	Ultimate_ALT108_FEMA	562059	-25.56	33.447	-0.98	33.57	0.000024	2.84	201045.8	5609.63	0.08
Columbia	RM 118.5-	118.62	2-year	Ultimate_ALT107_WAR	272000	-25.56	19.911	-7.99	19.98	0.000022	2.083	130561.7	5010.03	0.07

Columbia	RM 118.5-	118.62	2-year	Ultimate_ALT108_WAR	272000	-25.56	19.911	-7.99	19.98	0.000022	2.083	130561.7	5010.03	0.07
Columbia	RM 118.5-	118.62	2-year	Ultimate_ALT107_SF	393000	-25.56	21.172	-5.28	21.3	0.00004	2.874	136763.7	5093.27	0.1
Columbia	RM 118.5-	118.62	2-year	Ultimate_ALT108_SF	393000	-25.56	21.172	-5.28	21.3	0.00004	2.874	136763.7	5093.27	0.1
Columbia	RM 118.5-	118.62	100-yr	Ultimate_ALT107_WAR	561000	-25.56	34.408	-0.99	34.53	0.000022	2.767	206266.5	5645.4	0.08
Columbia	RM 118.5-	118.62	100-yr	Ultimate_ALT108_WAR	561000	-25.56	34.408	-0.99	34.53	0.000022	2.767	206266.4	5645.4	0.08
Columbia	RM 118.5-	118.62	100-yr	Ultimate_ALT107_SF	707000	-25.56	31.587	0.81	31.8	0.000045	3.749	190987.5	5585.56	0.11
Columbia	RM 118.5-	118.62	100-yr	Ultimate_ALT108_SF	707000	-25.56	31.587	0.81	31.8	0.000045	3.749	190987.3	5585.56	0.11
Columbia	RM 118-11	118.35	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-29.99	33.455	-0.21	33.54	0.00002	2.336	242722.7	7289.13	0.07
Columbia	RM 118-11	118.35	FEMA 100-year	Ultimate_ALT108_FEMA	565000	-29.99	33.455	-0.21	33.54	0.00002	2.336	242722.4	7289.13	0.07
Columbia	RM 118-11	118.35	2-year	Ultimate_ALT107_WAR	278000	-29.99	19.887	-8.05	19.94	0.000026	1.912	145362.5	7037.26	0.07
Columbia	RM 118-11	118.35	2-year	Ultimate_ALT108_WAR	278000	-29.99	19.887	-8.05	19.94	0.000026	1.912	145362.5	7037.26	0.07
Columbia	RM 118-11	118.35	2-year	Ultimate_ALT107_SF	397000	-29.99	21.137	-4.15	21.24	0.000045	2.574	154205.9	7083.36	0.1
Columbia	RM 118-11	118.35	2-year	Ultimate_ALT108_SF	397000	-29.99	21.137	-4.15	21.24	0.000045	2.574	154205.9	7083.36	0.1
Columbia	RM 118-11	118.35	100-yr	Ultimate_ALT107_WAR	566000	-29.99	34.417	-0.2	34.5	0.000019	2.275	249732.3	7291.73	0.07
Columbia	RM 118-11	118.35	100-yr	Ultimate_ALT108_WAR	566000	-29.99	34.417	-0.2	34.5	0.000019	2.275	249732.1	7291.73	0.07
Columbia	RM 118-11	118.35	100-yr	Ultimate_ALT107_SF	711000	-29.99	31.594	1.99	31.74	0.000039	3.111	229176.5	7263.94	0.1
Columbia	RM 118-11	118.35	100-yr	Ultimate_ALT108_SF	711000	-29.99	31.594	1.99	31.74	0.000039	3.111	229176.1	7263.94	0.1
Columbia	RM 118-11	118.19	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-53.38	33.441	-1	33.52	0.000021	2.281	247745.7	7607.6	0.07
Columbia	RM 118-11	118.19	FEMA 100-year	Ultimate_ALT108_FEMA	565000	-53.38	33.441	-1	33.52	0.000021	2.281	247745.3	7607.6	0.07
Columbia	RM 118-11	118.19	2-year	Ultimate_ALT107_WAR	278000	-53.38	19.862	-11.15	19.92	0.00003	1.922	144676.3	7572.35	0.08
Columbia	RM 118-11	118.19	2-year	Ultimate_ALT108_WAR	278000	-53.38	19.862	-11.15	19.92	0.00003	1.922	144676.3	7572.35	0.08
Columbia	RM 118-11	118.19	2-year	Ultimate_ALT107_SF	397000	-53.38	21.096	-5.88	21.2	0.000049	2.578	154022.2	7576.46	0.1
Columbia	RM 118-11	118.19	2-year	Ultimate_ALT108_SF	397000	-53.38	21.096	-5.88	21.2	0.000049	2.578	154022.2	7576.46	0.1
Columbia	RM 118-11	118.19	100-yr	Ultimate_ALT107_WAR	566000	-53.38	34.404	-0.98	34.48	0.000019	2.219	255079.1	7622.17	0.07
Columbia	RM 118-11	118.19	100-yr	Ultimate_ALT108_WAR	566000	-53.38	34.404	-0.98	34.48	0.000019	2.219	255079	7622.17	0.07
Columbia	RM 118-11	118.19	100-yr	Ultimate_ALT107_SF	711000	-53.38	31.566	1.07	31.71	0.00004	3.045	233488.3	7601.24	0.1
Columbia	RM 118-11	118.19	100-yr	Ultimate_ALT108_SF	711000	-53.38	31.566	1.07	31.71	0.00004	3.045	233487.9	7601.24	0.1
Columbia	RM 118-11	117.98	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-33.26	33.418	0.59	33.5	0.000022	2.279	248250.8	8125.18	0.07
Columbia	RM 118-11	117.98	FEMA 100-year	Ultimate_ALT108_FEMA	565000	-33.26	33.418	0.59	33.5	0.000022	2.279	248250.3	8125.18	0.07
Columbia	RM 118-11	117.98	2-year	Ultimate_ALT107_WAR	278000	-33.26	19.822	-6.64	19.88	0.000035	1.991	139640.4	7909.24	0.08
Columbia	RM 118-11	117.98	2-year	Ultimate_ALT108_WAR	278000	-33.26	19.822	-6.64	19.88	0.000035	1.991	139640.4	7909.24	0.08
Columbia	RM 118-11	117.98	2-year	Ultimate_ALT107_SF	397000	-33.26	21.031	-3.32	21.14	0.000058	2.661	149199.7	7912.65	0.11
Columbia	RM 118-11	117.98	2-year	Ultimate_ALT108_SF	397000	-33.26	21.031	-3.32	21.14	0.000058	2.661	149199.7	7912.65	0.11
Columbia	RM 118-11	117.98	100-yr	Ultimate_ALT107_WAR	566000	-33.26	34.383	0.62	34.46	0.00002	2.213	256099.6	8135.68	0.07
Columbia	RM 118-11	117.98	100-yr	Ultimate_ALT108_WAR	566000	-33.26	34.383	0.62	34.46	0.00002	2.213	256099.3	8135.68	0.07
Columbia	RM 118-11	117.98	100-yr	Ultimate_ALT107_SF	711000	-33.26	31.52	2.92	31.66	0.000043	3.057	232842.6	8108.15	0.1
Columbia	RM 118-11	117.98	100-yr	Ultimate_ALT108_SF	711000	-33.26	31.52	2.92	31.66	0.000043	3.057	232842.1	8108.15	0.1
Columbia	RM 111-11	117.93	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-35.82	33.404		33.49	0.00002	2.401	163267.3	4768.65	0.07
Columbia	RM 111-11	117.93	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-35.82	33.404		33.49	0.00002	2.401	163267	4768.65	0.07
Columbia	RM 111-11	117.93	2-year	Ultimate_ALT107_WAR	203055.4	-35.82	19.81		19.88	0.000028	2.062	100038.9	4612.36	0.08
Columbia	RM 111-11	117.93	2-year	Ultimate_ALT108_WAR	203055.4	-35.82	19.81		19.88	0.000028	2.062	100038.9	4612.36	0.08
Columbia	RM 111-11	117.93	2-year	Ultimate_ALT107_SF	287847	-35.82	21.009		21.13	0.000048	2.772	105567.4	4613.99	0.1
Columbia	RM 111-11	117.93	2-year	Ultimate_ALT108_SF	287847	-35.82	21.009		21.13	0.000048	2.772	105567.4	4613.99	0.1

Columbia	RM 111-11	117.93	100-yr	Ultimate_ALT107_WAR	384318.1	-35.82	34.37		34.45	0.000019	2.34	167876	4775.99	0.07
Columbia	RM 111-11	117.93	100-yr	Ultimate_ALT108_WAR	384318.1	-35.82	34.37		34.45	0.000019	2.34	167875.8	4775.99	0.07
Columbia	RM 111-11	117.93	100-yr	Ultimate_ALT107_SF	487999.6	-35.82	31.493		31.65	0.000039	3.228	154174	4748.4	0.1
Columbia	RM 111-11	117.93	100-yr	Ultimate_ALT108_SF	487999.8	-35.82	31.493		31.65	0.000039	3.228	154173.8	4748.4	0.1
Columbia	RM 111-11	117.77	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-32.68	33.354		33.47	0.000027	2.736	140267.2	3967.45	0.08
Columbia	RM 111-11	117.77	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-32.68	33.354		33.47	0.000027	2.736	140267	3967.45	0.08
Columbia	RM 111-11	117.77	2-year	Ultimate_ALT107_WAR	203055.4	-32.68	19.765		19.85	0.000033	2.309	87958.66	3776.46	0.08
Columbia	RM 111-11	117.77	2-year	Ultimate_ALT108_WAR	203055.4	-32.68	19.765		19.85	0.000033	2.309	87958.66	3776.46	0.08
Columbia	RM 111-11	117.77	2-year	Ultimate_ALT107_SF	287847	-32.68	20.929		21.08	0.000056	3.117	92357.42	3783.81	0.11
Columbia	RM 111-11	117.77	2-year	Ultimate_ALT108_SF	287847	-32.68	20.929		21.08	0.000056	3.117	92357.42	3783.81	0.11
Columbia	RM 111-11	117.77	100-yr	Ultimate_ALT107_WAR	384318.1	-32.68	34.323		34.43	0.000024	2.667	144118.9	3985.32	0.08
Columbia	RM 111-11	117.77	100-yr	Ultimate_ALT108_WAR	384318.1	-32.68	34.323		34.43	0.000024	2.667	144118.8	3985.32	0.08
Columbia	RM 111-11	117.77	100-yr	Ultimate_ALT107_SF	487999.6	-32.68	31.4		31.61	0.000052	3.682	132531.5	3950.88	0.11
Columbia	RM 111-11	117.77	100-yr	Ultimate_ALT108_SF	487999.8	-32.68	31.4		31.61	0.000052	3.682	132531.4	3950.88	0.11
Columbia	RM 111-11	117.51	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-37.45	33.279		33.43	0.000031	3.125	125003.6	4022.21	0.09
Columbia	RM 111-11	117.51	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-37.45	33.279		33.43	0.000031	3.125	125003.4	4022.19	0.09
Columbia	RM 111-11	117.51	2-year	Ultimate_ALT107_WAR	203055.4	-37.45	19.707		19.8	0.000031	2.499	81260.28	2934.32	0.08
Columbia	RM 111-11	117.51	2-year	Ultimate_ALT108_WAR	203055.4	-37.45	19.707		19.8	0.000031	2.499	81260.28	2934.32	0.08
Columbia	RM 111-11	117.51	2-year	Ultimate_ALT107_SF	287847	-37.45	20.823		21	0.000055	3.404	84571.78	2986.67	0.11
Columbia	RM 111-11	117.51	2-year	Ultimate_ALT108_SF	287847	-37.45	20.823		21	0.000055	3.404	84571.78	2986.67	0.11
Columbia	RM 111-11	117.51	100-yr	Ultimate_ALT107_WAR	384318.1	-37.45	34.253		34.4	0.000029	3.051	129051.6	4279.41	0.09
Columbia	RM 111-11	117.51	100-yr	Ultimate_ALT108_WAR	384318.1	-37.45	34.253		34.4	0.000029	3.051	129051.5	4279.4	0.09
Columbia	RM 111-11	117.51	100-yr	Ultimate_ALT107_SF	487999.6	-37.45	31.262		31.53	0.000058	4.193	117508.2	3509.27	0.12
Columbia	RM 111-11	117.51	100-yr	Ultimate_ALT108_SF	487999.8	-37.45	31.261		31.53	0.000058	4.193	117508	3509.26	0.12
Columbia	RM 111-11	117.28	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-34.85	33.241		33.39	0.000029	3.151	125827.5	4430.35	0.09
Columbia	RM 111-11	117.28	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-34.85	33.241		33.39	0.000029	3.151	125827.3	4430.34	0.09
Columbia	RM 111-11	117.28	2-year	Ultimate_ALT107_WAR	203055.4	-34.85	19.674		19.77	0.000028	2.479	82281.41	2936.76	0.08
Columbia	RM 111-11	117.28	2-year	Ultimate_ALT108_WAR	203055.4	-34.85	19.674		19.77	0.000028	2.479	82281.41	2936.76	0.08
Columbia	RM 111-11	117.28	2-year	Ultimate_ALT107_SF	287847	-34.85	20.762		20.94	0.000051	3.387	85488.21	2956.79	0.11
Columbia	RM 111-11	117.28	2-year	Ultimate_ALT108_SF	287847	-34.85	20.762		20.94	0.000051	3.387	85488.21	2956.79	0.11
Columbia	RM 111-11	117.28	100-yr	Ultimate_ALT107_WAR	384318.1	-34.85	34.217		34.36	0.000027	3.079	130275.1	4721.72	0.08
Columbia	RM 111-11	117.28	100-yr	Ultimate_ALT108_WAR	384318.1	-34.85	34.217		34.36	0.000027	3.079	130275	4721.72	0.08
Columbia	RM 111-11	117.28	100-yr	Ultimate_ALT107_SF	487999.6	-34.85	31.19		31.47	0.000056	4.223	117708.2	3603.07	0.12
Columbia	RM 111-11	117.28	100-yr	Ultimate_ALT108_SF	487999.8	-34.85	31.189		31.47	0.000056	4.223	117708	3603.06	0.12
Columbia	RM 111-11	117.03	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-33.86	33.201		33.36	0.000028	3.169	129069.8	4883.64	0.09
Columbia	RM 111-11	117.03	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-33.86	33.201		33.36	0.000028	3.169	129069.5	4883.63	0.09
Columbia	RM 111-11	117.03	2-year	Ultimate_ALT107_WAR	203055.4	-33.86	19.635		19.73	0.000028	2.482	81798.92	2788.36	0.08
Columbia	RM 111-11	117.03	2-year	Ultimate_ALT108_WAR	203055.4	-33.86	19.635		19.73	0.000028	2.482	81798.92	2788.36	0.08
Columbia	RM 111-11	117.03	2-year	Ultimate_ALT107_SF	287847	-33.86	20.693		20.87	0.00005	3.396	84752.05	2798.74	0.11
Columbia	RM 111-11	117.03	2-year	Ultimate_ALT108_SF	287847	-33.86	20.693		20.87	0.00005	3.396	84752.05	2798.74	0.11
Columbia	RM 111-11	117.03	100-yr	Ultimate_ALT107_WAR	384318.1	-33.86	34.18		34.33	0.000026	3.095	133909.5	4990.53	0.08
Columbia	RM 111-11	117.03	100-yr	Ultimate_ALT108_WAR	384318.1	-33.86	34.18		34.33	0.000026	3.095	133909.4	4990.53	0.08
Columbia	RM 111-11	117.03	100-yr	Ultimate_ALT107_SF	487999.6	-33.86	31.111		31.39	0.000054	4.255	119238.7	4456.1	0.12

Columbia	RM 111-11	117.03	100-yr	Ultimate_ALT108_SF	487999.8	-33.86	31.111		31.39	0.000054	4.255	119238.5	4456.09	0.12
Columbia	RM 111-11	116.73	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-25.52	33.12		33.31	0.000032	3.496	119136.7	4751.18	0.09
Columbia	RM 111-11	116.73	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-25.52	33.12		33.31	0.000032	3.496	119136.5	4751.16	0.09
Columbia	RM 111-11	116.73	2-year	Ultimate_ALT107_WAR	203055.4	-25.52	19.573		19.69	0.00003	2.69	75491.42	2420.26	0.08
Columbia	RM 111-11	116.73	2-year	Ultimate_ALT108_WAR	203055.4	-25.52	19.573		19.69	0.00003	2.69	75491.42	2420.26	0.08
Columbia	RM 111-11	116.73	2-year	Ultimate_ALT107_SF	287847	-25.52	20.577		20.79	0.000055	3.694	77924.44	2440.12	0.11
Columbia	RM 111-11	116.73	2-year	Ultimate_ALT108_SF	287847	-25.52	20.577		20.79	0.000055	3.694	77924.44	2440.12	0.11
Columbia	RM 111-11	116.73	100-yr	Ultimate_ALT107_WAR	384318.1	-25.52	34.104		34.28	0.00003	3.414	123997.9	5091.94	0.09
Columbia	RM 111-11	116.73	100-yr	Ultimate_ALT108_WAR	384318.1	-25.52	34.104		34.28	0.00003	3.414	123997.8	5091.93	0.09
Columbia	RM 111-11	116.73	100-yr	Ultimate_ALT107_SF	487999.6	-25.52	30.961		31.3	0.000062	4.69	109740.6	4008.54	0.13
Columbia	RM 111-11	116.73	100-yr	Ultimate_ALT108_SF	487999.8	-25.52	30.961		31.3	0.000062	4.69	109740.4	4008.53	0.13
Columbia	RM 111-11	116.36	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-23.62	33.059		33.24	0.000034	3.517	131263.5	5421.2	0.09
Columbia	RM 111-11	116.36	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-23.62	33.059		33.24	0.000034	3.517	131263.2	5421.2	0.09
Columbia	RM 111-11	116.36	2-year	Ultimate_ALT107_WAR	203055.4	-23.62	19.496		19.62	0.000035	2.839	73177.95	3265.82	0.09
Columbia	RM 111-11	116.36	2-year	Ultimate_ALT108_WAR	203055.4	-23.62	19.496		19.62	0.000035	2.839	73177.95	3265.82	0.09
Columbia	RM 111-11	116.36	2-year	Ultimate_ALT107_SF	287847	-23.62	20.438		20.67	0.000064	3.895	76293.15	3336.74	0.12
Columbia	RM 111-11	116.36	2-year	Ultimate_ALT108_SF	287847	-23.62	20.438		20.67	0.000064	3.895	76293.15	3336.74	0.12
Columbia	RM 111-11	116.36	100-yr	Ultimate_ALT107_WAR	384318.1	-23.62	34.05		34.22	0.000031	3.424	136663.8	5477.76	0.09
Columbia	RM 111-11	116.36	100-yr	Ultimate_ALT108_WAR	384318.1	-23.62	34.05		34.22	0.000031	3.424	136663.6	5477.76	0.09
Columbia	RM 111-11	116.36	100-yr	Ultimate_ALT107_SF	487999.6	-23.62	30.835		31.17	0.000067	4.759	119459.6	5136.9	0.13
Columbia	RM 111-11	116.36	100-yr	Ultimate_ALT108_SF	487999.8	-23.62	30.835		31.17	0.000067	4.759	119459.3	5136.89	0.13
Columbia	RM 111-11	115.92	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-31.24	33.023		33.17	0.000028	3.256	156027.4	6265.98	0.09
Columbia	RM 111-11	115.92	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-31.24	33.023		33.17	0.000028	3.256	156027.1	6265.98	0.09
Columbia	RM 111-11	115.92	2-year	Ultimate_ALT107_WAR	203055.4	-31.24	19.435		19.55	0.00003	2.701	80804.35	4758.22	0.08
Columbia	RM 111-11	115.92	2-year	Ultimate_ALT108_WAR	203055.4	-31.24	19.435		19.55	0.00003	2.701	80804.35	4758.22	0.08
Columbia	RM 111-11	115.92	2-year	Ultimate_ALT107_SF	287847	-31.24	20.327		20.54	0.000054	3.708	85083.77	4825.58	0.11
Columbia	RM 111-11	115.92	2-year	Ultimate_ALT108_SF	287847	-31.24	20.327		20.54	0.000054	3.708	85083.77	4825.58	0.11
Columbia	RM 111-11	115.92	100-yr	Ultimate_ALT107_WAR	384318.1	-31.24	34.017		34.16	0.000025	3.172	162299.8	6348.74	0.08
Columbia	RM 111-11	115.92	100-yr	Ultimate_ALT108_WAR	384318.1	-31.24	34.017		34.16	0.000025	3.172	162299.6	6348.74	0.08
Columbia	RM 111-11	115.92	100-yr	Ultimate_ALT107_SF	487999.6	-31.24	30.752		31.04	0.000055	4.442	141950.7	6132.34	0.12
Columbia	RM 111-11	115.92	100-yr	Ultimate_ALT108_SF	487999.8	-31.24	30.752		31.04	0.000055	4.442	141950.4	6132.34	0.12
Columbia	RM 111-11	115.36	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-32.43	32.909		33.09	0.000031	3.488	139549.5	6071.73	0.09
Columbia	RM 111-11	115.36	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-32.43	32.909		33.09	0.000031	3.488	139549.2	6071.73	0.09
Columbia	RM 111-11	115.36	2-year	Ultimate_ALT107_WAR	203055.4	-32.43	19.337		19.46	0.00003	2.79	74254.66	3412.73	0.09
Columbia	RM 111-11	115.36	2-year	Ultimate_ALT108_WAR	203055.4	-32.43	19.337		19.46	0.00003	2.79	74254.66	3412.73	0.09
Columbia	RM 111-11	115.36	2-year	Ultimate_ALT107_SF	287847	-32.43	20.144		20.37	0.000056	3.855	77122.85	3632.21	0.12
Columbia	RM 111-11	115.36	2-year	Ultimate_ALT108_SF	287847	-32.43	20.144		20.37	0.000056	3.855	77122.85	3632.21	0.12
Columbia	RM 111-11	115.36	100-yr	Ultimate_ALT107_WAR	384318.1	-32.43	33.912		34.08	0.000029	3.391	145662	6136.85	0.09
Columbia	RM 111-11	115.36	100-yr	Ultimate_ALT108_WAR	384318.1	-32.43	33.912		34.08	0.000029	3.391	145661.9	6136.84	0.09
Columbia	RM 111-11	115.36	100-yr	Ultimate_ALT107_SF	487999.6	-32.43	30.528		30.86	0.000062	4.753	125241.9	5887.18	0.13
Columbia	RM 111-11	115.36	100-yr	Ultimate_ALT108_SF	487999.8	-32.43	30.528		30.86	0.000062	4.753	125241.6	5887.17	0.13
Columbia	RM 111-11	114.84	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-17.7	32.836		33	0.000031	3.343	136563.7	6197.38	0.09

Columbia	RM 111-11	114.84	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-17.7	32.836		33	0.000031	3.343	136563.4	6197.36	0.09
Columbia	RM 111-11	114.84	2-year	Ultimate_ALT107_WAR	203055.4	-17.7	19.254		19.37	0.000033	2.739	75517.81	3377.39	0.09
Columbia	RM 111-11	114.84	2-year	Ultimate_ALT108_WAR	203055.4	-17.7	19.254		19.37	0.000033	2.739	75517.81	3377.39	0.09
Columbia	RM 111-11	114.84	2-year	Ultimate_ALT107_SF	287847	-17.7	19.99		20.21	0.000062	3.783	78028.38	3435.77	0.12
Columbia	RM 111-11	114.84	2-year	Ultimate_ALT108_SF	287847	-17.7	19.99		20.21	0.000062	3.783	78028.38	3435.77	0.12
Columbia	RM 111-11	114.84	100-yr	Ultimate_ALT107_WAR	384318.1	-17.7	33.845		34	0.000029	3.246	142917.2	6392.54	0.09
Columbia	RM 111-11	114.84	100-yr	Ultimate_ALT108_WAR	384318.1	-17.7	33.845		34	0.000029	3.246	142917	6392.51	0.09
Columbia	RM 111-11	114.84	100-yr	Ultimate_ALT107_SF	487999.6	-17.7	30.38		30.69	0.000063	4.568	122514.1	5331.58	0.13
Columbia	RM 111-11	114.84	100-yr	Ultimate_ALT108_SF	487999.8	-17.7	30.38		30.69	0.000063	4.568	122513.8	5331.57	0.13
Columbia	RM 111-11	114.45	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-22.18	32.784		32.94	0.000031	3.185	142619.5	6841.73	0.09
Columbia	RM 111-11	114.45	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-22.18	32.784		32.94	0.000031	3.185	142619.2	6841.73	0.09
Columbia	RM 111-11	114.45	2-year	Ultimate_ALT107_WAR	203055.4	-22.18	19.192		19.3	0.000034	2.647	77461.57	3142.7	0.09
Columbia	RM 111-11	114.45	2-year	Ultimate_ALT108_WAR	203055.4	-22.18	19.192		19.3	0.000034	2.647	77461.57	3142.7	0.09
Columbia	RM 111-11	114.45	2-year	Ultimate_ALT107_SF	287847	-22.18	19.875		20.08	0.000063	3.66	79639.34	3224.58	0.12
Columbia	RM 111-11	114.45	2-year	Ultimate_ALT108_SF	287847	-22.18	19.875		20.08	0.000063	3.66	79639.34	3224.58	0.12
Columbia	RM 111-11	114.45	100-yr	Ultimate_ALT107_WAR	384318.1	-22.18	33.799		33.94	0.000028	3.086	149628	6982.55	0.09
Columbia	RM 111-11	114.45	100-yr	Ultimate_ALT108_WAR	384318.1	-22.18	33.799		33.94	0.000028	3.086	149627.8	6982.55	0.09
Columbia	RM 111-11	114.45	100-yr	Ultimate_ALT107_SF	487999.6	-22.18	30.269		30.56	0.000064	4.384	125998	6209.59	0.13
Columbia	RM 111-11	114.45	100-yr	Ultimate_ALT108_SF	487999.8	-22.18	30.269		30.56	0.000064	4.384	125997.7	6209.58	0.13
Columbia	RM 111-11	114.16	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-22.78	32.726		32.89	0.000031	3.273	130492.4	6242.73	0.09
Columbia	RM 111-11	114.16	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-22.78	32.726		32.89	0.000031	3.273	130492.2	6242.73	0.09
Columbia	RM 111-11	114.16	2-year	Ultimate_ALT107_WAR	203055.4	-22.78	19.15		19.25	0.000028	2.591	79062.66	2909.87	0.08
Columbia	RM 111-11	114.16	2-year	Ultimate_ALT108_WAR	203055.4	-22.78	19.15		19.25	0.000028	2.591	79062.66	2909.87	0.08
Columbia	RM 111-11	114.16	2-year	Ultimate_ALT107_SF	287847	-22.78	19.795		20	0.000052	3.598	80769.84	2939.13	0.11
Columbia	RM 111-11	114.16	2-year	Ultimate_ALT108_SF	287847	-22.78	19.795		20	0.000052	3.598	80769.84	2939.13	0.11
Columbia	RM 111-11	114.16	100-yr	Ultimate_ALT107_WAR	384318.1	-22.78	33.745		33.9	0.000028	3.179	135858.4	6313.94	0.09
Columbia	RM 111-11	114.16	100-yr	Ultimate_ALT108_WAR	384318.1	-22.78	33.745		33.9	0.000028	3.179	135858.2	6313.94	0.09
Columbia	RM 111-11	114.16	100-yr	Ultimate_ALT107_SF	487999.6	-22.78	30.155		30.46	0.000062	4.492	117449.9	5824.52	0.13
Columbia	RM 111-11	114.16	100-yr	Ultimate_ALT108_SF	487999.8	-22.78	30.155		30.46	0.000062	4.492	117449.7	5824.51	0.13
Columbia	RM 111-11	113.67	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-15.25	32.675		32.81	0.000027	3.043	139105.3	5168.11	0.08
Columbia	RM 111-11	113.67	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-15.25	32.675		32.81	0.000027	3.043	139105.1	5168.11	0.08
Columbia	RM 111-11	113.67	2-year	Ultimate_ALT107_WAR	203055.4	-15.25	19.09		19.18	0.000028	2.453	85334.44	3313.9	0.08
Columbia	RM 111-11	113.67	2-year	Ultimate_ALT108_WAR	203055.4	-15.25	19.09		19.18	0.000028	2.453	85334.44	3313.9	0.08
Columbia	RM 111-11	113.67	2-year	Ultimate_ALT107_SF	287847	-15.25	19.682		19.86	0.000052	3.405	87306.11	3348.48	0.11
Columbia	RM 111-11	113.67	2-year	Ultimate_ALT108_SF	287847	-15.25	19.682		19.86	0.000052	3.405	87306.11	3348.48	0.11
Columbia	RM 111-11	113.67	100-yr	Ultimate_ALT107_WAR	384318.1	-15.25	33.697		33.83	0.000025	2.962	143667.8	5186.01	0.08
Columbia	RM 111-11	113.67	100-yr	Ultimate_ALT108_WAR	384318.1	-15.25	33.697		33.83	0.000025	2.962	143667.7	5186.01	0.08
Columbia	RM 111-11	113.67	100-yr	Ultimate_ALT107_SF	487999.6	-15.25	30.048		30.31	0.000055	4.176	127390	5014.44	0.12
Columbia	RM 111-11	113.67	100-yr	Ultimate_ALT108_SF	487999.8	-15.25	30.048		30.31	0.000055	4.176	127389.8	5014.43	0.12
Columbia	RM 111-11	113.25	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-19.95	32.647		32.76	0.000024	2.665	145747.3	4311.7	0.08
Columbia	RM 111-11	113.25	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-19.95	32.647		32.76	0.000024	2.665	145747.1	4311.7	0.08
Columbia	RM 111-11	113.25	2-year	Ultimate_ALT107_WAR	203055.4	-19.95	19.037		19.12	0.000032	2.263	89754.84	3954.77	0.08
Columbia	RM 111-11	113.25	2-year	Ultimate_ALT108_WAR	203055.4	-19.95	19.037		19.12	0.000032	2.263	89754.84	3954.77	0.08

Columbia	RM 111-11	113.25	2-year	Ultimate_ALT107_SF	287847	-19.95	19.584		19.74	0.00006	3.133	91923.2	3963.62	0.11
Columbia	RM 111-11	113.25	2-year	Ultimate_ALT108_SF	287847	-19.95	19.584		19.74	0.00006	3.133	91923.2	3963.62	0.11
Columbia	RM 111-11	113.25	100-yr	Ultimate_ALT107_WAR	384318.1	-19.95	33.673		33.78	0.000022	2.594	150168.5	4313.51	0.08
Columbia	RM 111-11	113.25	100-yr	Ultimate_ALT108_WAR	384318.1	-19.95	33.672		33.78	0.000022	2.594	150168.4	4313.51	0.08
Columbia	RM 111-11	113.25	100-yr	Ultimate_ALT107_SF	487999.6	-19.95	29.987		30.2	0.000051	3.663	134285.3	4287.5	0.11
Columbia	RM 111-11	113.25	100-yr	Ultimate_ALT108_SF	487999.8	-19.95	29.987		30.2	0.000051	3.663	134285.1	4287.5	0.11
Columbia	RM 111-11	112.99	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-33.39	32.601		32.72	0.000026	2.793	137862.2	3909.61	0.08
Columbia	RM 111-11	112.99	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-33.39	32.601		32.72	0.000026	2.793	137862	3909.61	0.08
Columbia	RM 111-11	112.99	2-year	Ultimate_ALT107_WAR	203055.4	-33.39	18.989		19.07	0.000031	2.323	87406.7	3548.01	0.08
Columbia	RM 111-11	112.99	2-year	Ultimate_ALT108_WAR	203055.4	-33.39	18.989		19.07	0.000031	2.323	87406.7	3548.01	0.08
Columbia	RM 111-11	112.99	2-year	Ultimate_ALT107_SF	287847	-33.39	19.493		19.66	0.000058	3.227	89197.64	3551.21	0.11
Columbia	RM 111-11	112.99	2-year	Ultimate_ALT108_SF	287847	-33.39	19.493		19.66	0.000058	3.227	89197.64	3551.21	0.11
Columbia	RM 111-11	112.99	100-yr	Ultimate_ALT107_WAR	384318.1	-33.39	33.63		33.74	0.000024	2.721	141911.9	3949.82	0.08
Columbia	RM 111-11	112.99	100-yr	Ultimate_ALT108_WAR	384318.1	-33.39	33.63		33.74	0.000024	2.721	141911.8	3949.82	0.08
Columbia	RM 111-11	112.99	100-yr	Ultimate_ALT107_SF	487999.6	-33.39	29.893		30.12	0.000055	3.838	127316.2	3866.64	0.12
Columbia	RM 111-11	112.99	100-yr	Ultimate_ALT108_SF	487999.8	-33.39	29.893		30.12	0.000055	3.838	127316.1	3866.64	0.12
Columbia	RM 111-11	112.62	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-31.99	32.513		32.67	0.000033	3.143	122431.4	3320.57	0.09
Columbia	RM 111-11	112.62	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-31.99	32.513		32.67	0.000033	3.143	122431.3	3320.57	0.09
Columbia	RM 111-11	112.62	2-year	Ultimate_ALT107_WAR	203055.4	-31.99	18.916		19.01	0.00003	2.508	81049.89	2919.66	0.08
Columbia	RM 111-11	112.62	2-year	Ultimate_ALT108_WAR	203055.4	-31.99	18.916		19.01	0.00003	2.508	81049.89	2919.66	0.08
Columbia	RM 111-11	112.62	2-year	Ultimate_ALT107_SF	287847	-31.99	19.354		19.54	0.000058	3.501	82327.47	2921.93	0.12
Columbia	RM 111-11	112.62	2-year	Ultimate_ALT108_SF	287847	-31.99	19.354		19.54	0.000058	3.501	82327.47	2921.93	0.12
Columbia	RM 111-11	112.62	100-yr	Ultimate_ALT107_WAR	384318.1	-31.99	33.548		33.69	0.00003	3.062	125869.9	3324.27	0.09
Columbia	RM 111-11	112.62	100-yr	Ultimate_ALT108_WAR	384318.1	-31.99	33.548		33.69	0.00003	3.062	125869.8	3324.27	0.09
Columbia	RM 111-11	112.62	100-yr	Ultimate_ALT107_SF	487999.6	-31.99	29.719		30.01	0.000064	4.319	113285.8	3139.28	0.13
Columbia	RM 111-11	112.62	100-yr	Ultimate_ALT108_SF	487999.8	-31.99	29.719		30.01	0.000064	4.319	113285.6	3139.28	0.13
Columbia	RM 111-11	112.1	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-18.55	32.407		32.57	0.000033	3.284	116830.3	2987.07	0.09
Columbia	RM 111-11	112.1	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-18.55	32.407		32.57	0.000033	3.284	116830.2	2987.07	0.09
Columbia	RM 111-11	112.1	2-year	Ultimate_ALT107_WAR	203055.4	-18.55	18.812		18.92	0.000037	2.651	76592.11	2934.43	0.09
Columbia	RM 111-11	112.1	2-year	Ultimate_ALT108_WAR	203055.4	-18.55	18.812		18.92	0.000037	2.651	76592.11	2934.43	0.09
Columbia	RM 111-11	112.1	2-year	Ultimate_ALT107_SF	287847	-18.55	19.153		19.37	0.000071	3.71	77591.81	2936.08	0.13
Columbia	RM 111-11	112.1	2-year	Ultimate_ALT108_SF	287847	-18.55	19.153		19.37	0.000071	3.71	77591.81	2936.08	0.13
Columbia	RM 111-11	112.1	100-yr	Ultimate_ALT107_WAR	384318.1	-18.55	33.45		33.61	0.000031	3.204	119948.7	2995.86	0.09
Columbia	RM 111-11	112.1	100-yr	Ultimate_ALT108_WAR	384318.1	-18.55	33.449		33.61	0.000031	3.204	119948.6	2995.86	0.09
Columbia	RM 111-11	112.1	100-yr	Ultimate_ALT107_SF	487999.6	-18.55	29.509		29.82	0.000069	4.51	108194.9	2973.01	0.13
Columbia	RM 111-11	112.1	100-yr	Ultimate_ALT108_SF	487999.8	-18.55	29.509		29.82	0.000069	4.51	108194.8	2973.01	0.13
Columbia	RM 111-11	111.74	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-20.51	32.306		32.51	0.000036	3.61	106370.3	2507.34	0.1
Columbia	RM 111-11	111.74	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-20.51	32.306		32.51	0.000036	3.61	106370.2	2507.34	0.1
Columbia	RM 111-11	111.74	2-year	Ultimate_ALT107_WAR	203055.4	-20.51	18.732		18.85	0.000035	2.79	72772.15	2449.59	0.09
Columbia	RM 111-11	111.74	2-year	Ultimate_ALT108_WAR	203055.4	-20.51	18.732		18.85	0.000035	2.79	72772.15	2449.59	0.09
Columbia	RM 111-11	111.74	2-year	Ultimate_ALT107_SF	287847	-20.51	18.995		19.23	0.000068	3.921	73416.71	2450.6	0.13
Columbia	RM 111-11	111.74	2-year	Ultimate_ALT108_SF	287847	-20.51	18.995		19.23	0.000068	3.921	73416.71	2450.6	0.13
Columbia	RM 111-11	111.74	100-yr	Ultimate_ALT107_WAR	384318.1	-20.51	33.355		33.55	0.000033	3.529	109016	2538.17	0.09

Columbia	RM 111-11	111.74	100-yr	Ultimate_ALT108_WAR	384318.1	-20.51	33.354		33.55	0.000033	3.529	109015.9	2538.17	0.09
Columbia	RM 111-11	111.74	100-yr	Ultimate_ALT107_SF	487999.6	-20.51	29.31		29.69	0.000073	4.937	98888.7	2490.38	0.14
Columbia	RM 111-11	111.74	100-yr	Ultimate_ALT108_SF	487999.8	-20.51	29.31		29.69	0.000073	4.937	98888.57	2490.38	0.14
Columbia	RM 111-11	111.41	FEMA 100-year	Ultimate_ALT107_FEMA	383709	-22.27	32.263		32.45	0.000031	3.476	110398.8	2406.99	0.09
Columbia	RM 111-11	111.41	FEMA 100-year	Ultimate_ALT108_FEMA	383709.1	-22.27	32.263		32.45	0.000031	3.476	110398.7	2406.99	0.09
Columbia	RM 111-11	111.41	2-year	Ultimate_ALT107_WAR	203055.4	-22.27	18.698		18.8	0.000025	2.589	78438.34	2321.5	0.08
Columbia	RM 111-11	111.41	2-year	Ultimate_ALT108_WAR	203055.4	-22.27	18.698		18.8	0.000025	2.589	78438.34	2321.5	0.08
Columbia	RM 111-11	111.41	2-year	Ultimate_ALT107_SF	287847	-22.27	18.927		19.13	0.00005	3.645	78971.21	2322.75	0.11
Columbia	RM 111-11	111.41	2-year	Ultimate_ALT108_SF	287847	-22.27	18.927		19.13	0.00005	3.645	78971.21	2322.75	0.11
Columbia	RM 111-11	111.41	100-yr	Ultimate_ALT107_WAR	384318.1	-22.27	33.314		33.49	0.000029	3.403	112933.6	2414.6	0.09
Columbia	RM 111-11	111.41	100-yr	Ultimate_ALT108_WAR	384318.1	-22.27	33.314		33.49	0.000029	3.403	112933.5	2414.6	0.09
Columbia	RM 111-11	111.41	100-yr	Ultimate_ALT107_SF	487999.6	-22.27	29.224		29.57	0.000061	4.732	103130	2376.99	0.13
Columbia	RM 111-11	111.41	100-yr	Ultimate_ALT108_SF	487999.8	-22.27	29.224		29.57	0.000061	4.732	103129.9	2376.99	0.13
Columbia	RM 108-11	111.36	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-25.09	32.274	-4.93	32.44	0.000028	3.267	172948.4	4384.97	0.09
Columbia	RM 108-11	111.36	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-25.09	32.274	-4.93	32.44	0.000028	3.267	172948.3	4384.97	0.09
Columbia	RM 108-11	111.36	2-year	Ultimate_ALT107_WAR	278000	-25.09	18.702	-10.18	18.79	0.000027	2.437	114078.6	4294.31	0.08
Columbia	RM 108-11	111.36	2-year	Ultimate_ALT108_WAR	278000	-25.09	18.702	-10.18	18.79	0.000027	2.437	114078.6	4294.31	0.08
Columbia	RM 108-11	111.36	2-year	Ultimate_ALT107_SF	397000	-25.09	18.934	-7.92	19.12	0.000053	3.45	115075.3	4295.93	0.12
Columbia	RM 108-11	111.36	2-year	Ultimate_ALT108_SF	397000	-25.09	18.934	-7.92	19.12	0.000053	3.45	115075.3	4295.93	0.12
Columbia	RM 108-11	111.36	100-yr	Ultimate_ALT107_WAR	566000.1	-25.09	33.325	-4.9	33.48	0.000026	3.187	177570.1	4406.41	0.09
Columbia	RM 108-11	111.36	100-yr	Ultimate_ALT108_WAR	566000	-25.09	33.325	-4.91	33.48	0.000026	3.187	177569.9	4406.41	0.09
Columbia	RM 108-11	111.36	100-yr	Ultimate_ALT107_SF	711000.1	-25.09	29.243	-2.62	29.55	0.000058	4.452	159700	4358.64	0.13
Columbia	RM 108-11	111.36	100-yr	Ultimate_ALT108_SF	711000.1	-25.09	29.243	-2.62	29.55	0.000058	4.452	159699.9	4358.64	0.13
Columbia	RM 108-11	110.9	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-28.34	32.173	-6.29	32.37	0.00003	3.614	158616.9	4066.37	0.1
Columbia	RM 108-11	110.9	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-28.34	32.173	-6.29	32.37	0.00003	3.614	158616.7	4066.37	0.1
Columbia	RM 108-11	110.9	2-year	Ultimate_ALT107_WAR	278000	-28.34	18.634	-11.45	18.74	0.000024	2.572	108573.2	3607.4	0.08
Columbia	RM 108-11	110.9	2-year	Ultimate_ALT108_WAR	278000	-28.34	18.634	-11.45	18.74	0.000024	2.572	108573.2	3607.4	0.08
Columbia	RM 108-11	110.9	2-year	Ultimate_ALT107_SF	397000	-28.34	18.798	-8.96	19.01	0.000049	3.654	109163.5	3607.68	0.12
Columbia	RM 108-11	110.9	2-year	Ultimate_ALT108_SF	397000	-28.34	18.798	-8.96	19.01	0.000049	3.654	109163.5	3607.68	0.12
Columbia	RM 108-11	110.9	100-yr	Ultimate_ALT107_WAR	566000.1	-28.34	33.231	-6.26	33.42	0.000027	3.533	162847.7	4086.1	0.09
Columbia	RM 108-11	110.9	100-yr	Ultimate_ALT108_WAR	566000	-28.34	33.231	-6.27	33.42	0.000027	3.533	162847.5	4086.1	0.09
Columbia	RM 108-11	110.9	100-yr	Ultimate_ALT107_SF	711000.1	-28.34	29.047	-4.16	29.42	0.00006	4.899	146270.1	3937.9	0.13
Columbia	RM 108-11	110.9	100-yr	Ultimate_ALT108_SF	711000.1	-28.34	29.047	-4.16	29.42	0.00006	4.899	146269.9	3937.89	0.13
Columbia	RM 108-11	110.74	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-26.28	32.147	-5.01	32.35	0.00003	3.604	158155.4	3713.89	0.1
Columbia	RM 108-11	110.74	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-26.28	32.147	-5.01	32.35	0.00003	3.604	158155.3	3713.89	0.1
Columbia	RM 108-11	110.74	2-year	Ultimate_ALT107_WAR	278000	-26.28	18.613	-10.92	18.72	0.000025	2.567	108567	3613.78	0.08
Columbia	RM 108-11	110.74	2-year	Ultimate_ALT108_WAR	278000	-26.28	18.613	-10.92	18.72	0.000025	2.567	108567	3613.78	0.08
Columbia	RM 108-11	110.74	2-year	Ultimate_ALT107_SF	397000	-26.28	18.755	-7.6	18.96	0.000049	3.648	109080	3614.71	0.12
Columbia	RM 108-11	110.74	2-year	Ultimate_ALT108_SF	397000	-26.28	18.755	-7.6	18.96	0.000049	3.648	109080	3614.71	0.12
Columbia	RM 108-11	110.74	100-yr	Ultimate_ALT107_WAR	566000.1	-26.28	33.207	-4.99	33.4	0.000027	3.524	162094.1	3722.44	0.09
Columbia	RM 108-11	110.74	100-yr	Ultimate_ALT108_WAR	566000	-26.28	33.207	-4.99	33.4	0.000027	3.524	162093.9	3722.44	0.09
Columbia	RM 108-11	110.74	100-yr	Ultimate_ALT107_SF	711000.1	-26.28	28.995	-2.95	29.37	0.00006	4.888	146481.7	3689.17	0.13
Columbia	RM 108-11	110.74	100-yr	Ultimate_ALT108_SF	711000.1	-26.28	28.995	-2.95	29.37	0.00006	4.888	146481.5	3689.17	0.13

Columbia	RM 108-11	110.56	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-33.18	32.131	-7.54	32.32	0.000028	3.464	164702.6	3903.55	0.09
Columbia	RM 108-11	110.56	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-33.18	32.131	-7.55	32.32	0.000028	3.464	164702.5	3903.55	0.09
Columbia	RM 108-11	110.56	2-year	Ultimate_ALT107_WAR	278000	-33.18	18.596	-14.6	18.69	0.000023	2.474	112655	3776.81	0.08
Columbia	RM 108-11	110.56	2-year	Ultimate_ALT108_WAR	278000	-33.18	18.596	-14.6	18.69	0.000023	2.474	112655	3776.81	0.08
Columbia	RM 108-11	110.56	2-year	Ultimate_ALT107_SF	397000	-33.18	18.72	-11.29	18.91	0.000046	3.519	113124.3	3777.72	0.11
Columbia	RM 108-11	110.56	2-year	Ultimate_ALT108_SF	397000	-33.18	18.72	-11.29	18.91	0.000046	3.519	113124.3	3777.72	0.11
Columbia	RM 108-11	110.56	100-yr	Ultimate_ALT107_WAR	566000.1	-33.18	33.192	-7.53	33.37	0.000026	3.387	168847	3908.69	0.09
Columbia	RM 108-11	110.56	100-yr	Ultimate_ALT108_WAR	566000	-33.18	33.192	-7.54	33.37	0.000026	3.387	168846.9	3908.69	0.09
Columbia	RM 108-11	110.56	100-yr	Ultimate_ALT107_SF	711000.1	-33.18	28.959	-4.8	29.3	0.000056	4.703	152354.2	3879.53	0.13
Columbia	RM 108-11	110.56	100-yr	Ultimate_ALT108_SF	711000.1	-33.18	28.959	-4.8	29.3	0.000056	4.703	152354	3879.53	0.13
Columbia	RM 108-11	110.41	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-30.49	32.113	-6.26	32.29	0.000028	3.422	166930	4024.74	0.09
Columbia	RM 108-11	110.41	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-30.49	32.113	-6.26	32.29	0.000028	3.422	166930	4024.74	0.09
Columbia	RM 108-11	110.41	2-year	Ultimate_ALT107_WAR	278000	-30.49	18.578	-12.62	18.67	0.000024	2.471	113011.2	3949.32	0.08
Columbia	RM 108-11	110.41	2-year	Ultimate_ALT108_WAR	278000	-30.49	18.578	-12.62	18.67	0.000024	2.471	113011.2	3949.32	0.08
Columbia	RM 108-11	110.41	2-year	Ultimate_ALT107_SF	397000	-30.49	18.684	-9.65	18.88	0.000048	3.516	113430.4	3949.77	0.11
Columbia	RM 108-11	110.41	2-year	Ultimate_ALT108_SF	397000	-30.49	18.684	-9.65	18.88	0.000048	3.516	113430.4	3949.77	0.11
Columbia	RM 108-11	110.41	100-yr	Ultimate_ALT107_WAR	566000.1	-30.49	33.176	-6.25	33.35	0.000026	3.344	171208.5	4028.28	0.09
Columbia	RM 108-11	110.41	100-yr	Ultimate_ALT108_WAR	566000	-30.49	33.176	-6.24	33.35	0.000026	3.344	171208.4	4028.28	0.09
Columbia	RM 108-11	110.41	100-yr	Ultimate_ALT107_SF	711000.1	-30.49	28.921	-3.76	29.26	0.000057	4.657	154103	4009.61	0.13
Columbia	RM 108-11	110.41	100-yr	Ultimate_ALT108_SF	711000.1	-30.49	28.921	-3.76	29.26	0.000057	4.657	154102.8	4009.61	0.13
Columbia	RM 108-11	110.29	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-25.9	32.09	-4.2	32.28	0.000029	3.469	164913.4	4148.78	0.09
Columbia	RM 108-11	110.29	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-25.9	32.09	-4.2	32.28	0.000029	3.469	164913.3	4148.78	0.09
Columbia	RM 108-11	110.29	2-year	Ultimate_ALT107_WAR	278000	-25.9	18.555	-10.62	18.66	0.000027	2.542	109756.8	3983.33	0.08
Columbia	RM 108-11	110.29	2-year	Ultimate_ALT108_WAR	278000	-25.9	18.555	-10.62	18.66	0.000027	2.542	109756.8	3983.33	0.08
Columbia	RM 108-11	110.29	2-year	Ultimate_ALT107_SF	397000	-25.9	18.638	-7.62	18.84	0.000054	3.62	110087.2	3984.27	0.12
Columbia	RM 108-11	110.29	2-year	Ultimate_ALT108_SF	397000	-25.9	18.638	-7.62	18.84	0.000054	3.62	110087.2	3984.27	0.12
Columbia	RM 108-11	110.29	100-yr	Ultimate_ALT107_WAR	566000.1	-25.9	33.154	-4.18	33.33	0.000027	3.386	169333.5	4154.57	0.09
Columbia	RM 108-11	110.29	100-yr	Ultimate_ALT108_WAR	566000	-25.9	33.154	-4.18	33.33	0.000027	3.386	169333.3	4154.57	0.09
Columbia	RM 108-11	110.29	100-yr	Ultimate_ALT107_SF	711000.1	-25.9	28.87	-1.94	29.22	0.000061	4.739	151586.1	4127.57	0.13
Columbia	RM 108-11	110.29	100-yr	Ultimate_ALT108_SF	711000.1	-25.9	28.87	-1.94	29.22	0.000061	4.739	151585.9	4127.57	0.13
Columbia	RM 108-11	110.12	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-25.4	32.067	-3.73	32.25	0.000029	3.42	167931.1	4413.29	0.09
Columbia	RM 108-11	110.12	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-25.4	32.067	-3.73	32.25	0.000029	3.42	167931	4413.29	0.09
Columbia	RM 108-11	110.12	2-year	Ultimate_ALT107_WAR	278000	-25.4	18.532	-9.41	18.63	0.000028	2.532	110227.5	4134.69	0.09
Columbia	RM 108-11	110.12	2-year	Ultimate_ALT108_WAR	278000	-25.4	18.532	-9.41	18.63	0.000028	2.532	110227.5	4134.69	0.09
Columbia	RM 108-11	110.12	2-year	Ultimate_ALT107_SF	397000	-25.4	18.591	-7.03	18.79	0.000056	3.608	110470.6	4136.26	0.12
Columbia	RM 108-11	110.12	2-year	Ultimate_ALT108_SF	397000	-25.4	18.591	-7.03	18.79	0.000056	3.608	110470.6	4136.26	0.12
Columbia	RM 108-11	110.12	100-yr	Ultimate_ALT107_WAR	566000.1	-25.4	33.134	-3.7	33.31	0.000027	3.337	172647.2	4429.58	0.09
Columbia	RM 108-11	110.12	100-yr	Ultimate_ALT108_WAR	566000	-25.4	33.134	-3.69	33.31	0.000027	3.337	172647.1	4429.57	0.09
Columbia	RM 108-11	110.12	100-yr	Ultimate_ALT107_SF	711000.1	-25.4	28.822	-1.18	29.16	0.000062	4.682	153733.9	4289.45	0.13
Columbia	RM 108-11	110.12	100-yr	Ultimate_ALT108_SF	711000.1	-25.4	28.822	-1.18	29.16	0.000062	4.682	153733.7	4289.44	0.13
Columbia	RM 108-11	109.96	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-44.08	32.063	-6.28	32.22	0.000024	3.147	181641.5	4603.45	0.09
Columbia	RM 108-11	109.96	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-44.08	32.063	-6.28	32.22	0.000024	3.147	181641.3	4603.45	0.09

Columbia	RM 108-11	109.96	2-year	Ultimate_ALT107_WAR	278000	-44.08	18.523	-13.55	18.61	0.000022	2.305	121019.2	4402.45	0.08
Columbia	RM 108-11	109.96	2-year	Ultimate_ALT108_WAR	278000	-44.08	18.523	-13.55	18.61	0.000022	2.305	121019.2	4402.45	0.08
Columbia	RM 108-11	109.96	2-year	Ultimate_ALT107_SF	397000	-44.08	18.573	-9.9	18.74	0.000045	3.285	121237.5	4402.85	0.11
Columbia	RM 108-11	109.96	2-year	Ultimate_ALT108_SF	397000	-44.08	18.573	-9.9	18.74	0.000045	3.285	121237.5	4402.85	0.11
Columbia	RM 108-11	109.96	100-yr	Ultimate_ALT107_WAR	566000.1	-44.08	33.131	-6.27	33.28	0.000022	3.073	186572.4	4649.9	0.08
Columbia	RM 108-11	109.96	100-yr	Ultimate_ALT108_WAR	566000	-44.08	33.131	-6.27	33.28	0.000022	3.073	186572.2	4649.9	0.08
Columbia	RM 108-11	109.96	100-yr	Ultimate_ALT107_SF	711000.1	-44.08	28.811	-4.07	29.1	0.000051	4.302	166822.3	4526.68	0.12
Columbia	RM 108-11	109.96	100-yr	Ultimate_ALT108_SF	711000.1	-44.08	28.811	-4.07	29.1	0.000051	4.302	166822.1	4526.68	0.12
Columbia	RM 108-11	109.79	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-26.5	32.038	-2.85	32.19	0.000025	3.174	180616.6	4894.75	0.09
Columbia	RM 108-11	109.79	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-26.5	32.038	-2.84	32.19	0.000025	3.174	180616.4	4894.75	0.09
Columbia	RM 108-11	109.79	2-year	Ultimate_ALT107_WAR	278000	-26.5	18.503	-9.49	18.59	0.000022	2.312	120488.1	4330.93	0.08
Columbia	RM 108-11	109.79	2-year	Ultimate_ALT108_WAR	278000	-26.5	18.503	-9.49	18.59	0.000022	2.312	120488.1	4330.93	0.08
Columbia	RM 108-11	109.79	2-year	Ultimate_ALT107_SF	397000	-26.5	18.532	-6.85	18.7	0.000045	3.298	120612.1	4331.29	0.11
Columbia	RM 108-11	109.79	2-year	Ultimate_ALT108_SF	397000	-26.5	18.532	-6.85	18.7	0.000045	3.298	120612.1	4331.29	0.11
Columbia	RM 108-11	109.79	100-yr	Ultimate_ALT107_WAR	566000.1	-26.5	33.108	-2.78	33.26	0.000023	3.099	185849.2	4963.37	0.08
Columbia	RM 108-11	109.79	100-yr	Ultimate_ALT108_WAR	566000	-26.5	33.108	-2.77	33.26	0.000023	3.099	185849	4963.37	0.08
Columbia	RM 108-11	109.79	100-yr	Ultimate_ALT107_SF	711000.1	-26.5	28.76	-0.99	29.05	0.000051	4.335	165539.3	4488.49	0.12
Columbia	RM 108-11	109.79	100-yr	Ultimate_ALT108_SF	711000.1	-26.5	28.76	-0.99	29.05	0.000051	4.335	165539.1	4488.49	0.12
Columbia	RM 108-11	109.6	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-24.71	32.004	-4.6	32.17	0.000026	3.275	182598.8	5900.73	0.09
Columbia	RM 108-11	109.6	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-24.71	32.004	-4.6	32.17	0.000026	3.275	182598.5	5900.73	0.09
Columbia	RM 108-11	109.6	2-year	Ultimate_ALT107_WAR	278000	-24.71	18.471	-9.72	18.56	0.000024	2.42	115485	4891.86	0.08
Columbia	RM 108-11	109.6	2-year	Ultimate_ALT108_WAR	278000	-24.71	18.471	-9.72	18.56	0.000024	2.42	115485	4891.86	0.08
Columbia	RM 108-11	109.6	2-year	Ultimate_ALT107_SF	397000	-24.71	18.466	-7.4	18.65	0.000049	3.456	115462.9	4891.61	0.11
Columbia	RM 108-11	109.6	2-year	Ultimate_ALT108_SF	397000	-24.71	18.466	-7.4	18.65	0.000049	3.456	115462.9	4891.61	0.11
Columbia	RM 108-11	109.6	100-yr	Ultimate_ALT107_WAR	566000.1	-24.71	33.077	-4.59	33.23	0.000024	3.192	188950	5934.33	0.09
Columbia	RM 108-11	109.6	100-yr	Ultimate_ALT108_WAR	566000	-24.71	33.077	-4.58	33.23	0.000024	3.192	188949.9	5934.33	0.09
Columbia	RM 108-11	109.6	100-yr	Ultimate_ALT107_SF	711000.1	-24.71	28.687	-2.43	29	0.000055	4.489	165583.9	5564.67	0.13
Columbia	RM 108-11	109.6	100-yr	Ultimate_ALT108_SF	711000.1	-24.71	28.687	-2.43	29	0.000055	4.489	165583.7	5564.67	0.13
Columbia	RM 108-11	109.43	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-42.31	31.991	-4.37	32.14	0.000024	3.129	189831.4	5174.45	0.09
Columbia	RM 108-11	109.43	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-42.31	31.991	-4.37	32.14	0.000024	3.129	189831.2	5174.45	0.09
Columbia	RM 108-11	109.43	2-year	Ultimate_ALT107_WAR	278000	-42.31	18.455	-10.6	18.54	0.000023	2.326	121879.3	4879.62	0.08
Columbia	RM 108-11	109.43	2-year	Ultimate_ALT108_WAR	278000	-42.31	18.455	-10.6	18.54	0.000023	2.326	121879.3	4879.62	0.08
Columbia	RM 108-11	109.43	2-year	Ultimate_ALT107_SF	397000	-42.31	18.433	-8.2	18.6	0.000047	3.324	121773.6	4878.12	0.11
Columbia	RM 108-11	109.43	2-year	Ultimate_ALT108_SF	397000	-42.31	18.433	-8.2	18.6	0.000047	3.324	121773.6	4878.12	0.11
Columbia	RM 108-11	109.43	100-yr	Ultimate_ALT107_WAR	566000.1	-42.31	33.065	-4.37	33.21	0.000022	3.051	195390.1	5203.43	0.08
Columbia	RM 108-11	109.43	100-yr	Ultimate_ALT108_WAR	566000	-42.31	33.065	-4.36	33.21	0.000022	3.051	195390	5203.43	0.08
Columbia	RM 108-11	109.43	100-yr	Ultimate_ALT107_SF	711000.1	-42.31	28.657	-2.63	28.94	0.000051	4.298	172823.3	5091.26	0.12
Columbia	RM 108-11	109.43	100-yr	Ultimate_ALT108_SF	711000.1	-42.31	28.657	-2.63	28.94	0.000051	4.298	172823	5091.26	0.12
Columbia	RM 108-11	109.28	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-21.93	31.961	-3.74	32.12	0.000026	3.231	182867.6	5086.51	0.09
Columbia	RM 108-11	109.28	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-21.93	31.961	-3.75	32.12	0.000026	3.231	182867.4	5086.5	0.09
Columbia	RM 108-11	109.28	2-year	Ultimate_ALT107_WAR	278000	-21.93	18.429	-8.65	18.52	0.000025	2.413	115886.9	4784.41	0.08
Columbia	RM 108-11	109.28	2-year	Ultimate_ALT108_WAR	278000	-21.93	18.429	-8.65	18.52	0.000025	2.413	115886.9	4784.41	0.08
Columbia	RM 108-11	109.28	2-year	Ultimate_ALT107_SF	397000	-21.93	18.38	-6.06	18.56	0.000051	3.452	115673.3	4776.66	0.12

Columbia	RM 108-11	109.28	2-year	Ultimate_ALT108_SF	397000	-21.93	18.38	-6.06	18.56	0.000051	3.452	115673.3	4776.66	0.12
Columbia	RM 108-11	109.28	100-yr	Ultimate_ALT107_WAR	566000.1	-21.93	33.037	-3.73	33.19	0.000024	3.148	188368.1	5136.16	0.09
Columbia	RM 108-11	109.28	100-yr	Ultimate_ALT108_WAR	566000	-21.93	33.037	-3.72	33.19	0.000024	3.148	188367.9	5136.16	0.09
Columbia	RM 108-11	109.28	100-yr	Ultimate_ALT107_SF	711000.1	-21.93	28.594	-1.89	28.9	0.000055	4.447	165956.9	5001.09	0.13
Columbia	RM 108-11	109.28	100-yr	Ultimate_ALT108_SF	711000.1	-21.93	28.594	-1.89	28.9	0.000055	4.447	165956.6	5001.09	0.13
Columbia	RM 108-11	109.11	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-21.44	31.926	-4.62	32.08	0.000079	3.153	180840.8	5788.99	0.09
Columbia	RM 108-11	109.11	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-21.44	31.926	-4.62	32.08	0.000079	3.153	180840.5	5788.97	0.09
Columbia	RM 108-11	109.11	2-year	Ultimate_ALT107_WAR	278000	-21.44	18.397	-8.96	18.48	0.000074	2.328	119550.8	4388.38	0.08
Columbia	RM 108-11	109.11	2-year	Ultimate_ALT108_WAR	278000	-21.44	18.397	-8.96	18.48	0.000074	2.328	119550.8	4388.38	0.08
Columbia	RM 108-11	109.11	2-year	Ultimate_ALT107_SF	397000	-21.44	18.313	-7.07	18.49	0.000152	3.335	119182.4	4387.33	0.11
Columbia	RM 108-11	109.11	2-year	Ultimate_ALT108_SF	397000	-21.44	18.313	-7.07	18.49	0.000152	3.335	119182.4	4387.33	0.11
Columbia	RM 108-11	109.11	100-yr	Ultimate_ALT107_WAR	566000.1	-21.44	33.005	-4.61	33.15	0.000073	3.073	185966.3	6188.69	0.08
Columbia	RM 108-11	109.11	100-yr	Ultimate_ALT108_WAR	566000	-21.44	33.005	-4.61	33.15	0.000073	3.073	185966	6188.68	0.08
Columbia	RM 108-11	109.11	100-yr	Ultimate_ALT107_SF	711000.1	-21.44	28.518	-2.67	28.81	0.000169	4.343	164770.4	4683.02	0.12
Columbia	RM 108-11	109.11	100-yr	Ultimate_ALT108_SF	711000.1	-21.44	28.518	-2.67	28.81	0.000169	4.343	164770.1	4683.02	0.12
Columbia	RM 108-11	108.93	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-25.31	31.889	-5.92	32.04	0.000024	3.142	181838.8	5434.92	0.09
Columbia	RM 108-11	108.93	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-25.31	31.889	-5.92	32.04	0.000024	3.142	181838.5	5434.84	0.09
Columbia	RM 108-11	108.93	2-year	Ultimate_ALT107_WAR	278000	-25.31	18.365	-10.08	18.45	0.000021	2.281	122003.8	4290.48	0.07
Columbia	RM 108-11	108.93	2-year	Ultimate_ALT108_WAR	278000	-25.31	18.365	-10.08	18.45	0.000021	2.281	122003.8	4290.48	0.07
Columbia	RM 108-11	108.93	2-year	Ultimate_ALT107_SF	397000	-25.31	18.247	-8.22	18.41	0.000043	3.271	121498.1	4288.78	0.11
Columbia	RM 108-11	108.93	2-year	Ultimate_ALT108_SF	397000	-25.31	18.247	-8.22	18.41	0.000043	3.271	121498.1	4288.78	0.11
Columbia	RM 108-11	108.93	100-yr	Ultimate_ALT107_WAR	566000.1	-25.31	32.97	-5.91	33.12	0.000022	3.068	187028	5927.99	0.08
Columbia	RM 108-11	108.93	100-yr	Ultimate_ALT108_WAR	566000	-25.31	32.97	-5.91	33.12	0.000022	3.068	187027.8	5927.98	0.08
Columbia	RM 108-11	108.93	100-yr	Ultimate_ALT107_SF	711000.1	-25.31	28.441	-4.16	28.73	0.00005	4.309	166179.5	4430.94	0.12
Columbia	RM 108-11	108.93	100-yr	Ultimate_ALT108_SF	711000.1	-25.31	28.441	-4.16	28.73	0.00005	4.309	166179.2	4430.94	0.12
Columbia	RM 108-11	108.8	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-20.36	31.856	-3.78	32.02	0.000027	3.294	174227.3	5299.8	0.09
Columbia	RM 108-11	108.8	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-20.36	31.856	-3.79	32.02	0.000027	3.294	174227.1	5299.76	0.09
Columbia	RM 108-11	108.8	2-year	Ultimate_ALT107_WAR	278000	-20.36	18.339	-7.8	18.43	0.000025	2.426	114950.5	4239.36	0.08
Columbia	RM 108-11	108.8	2-year	Ultimate_ALT108_WAR	278000	-20.36	18.339	-7.8	18.43	0.000025	2.426	114950.5	4239.36	0.08
Columbia	RM 108-11	108.8	2-year	Ultimate_ALT107_SF	397000	-20.36	18.192	-5.98	18.38	0.000051	3.483	114328.8	4237.55	0.12
Columbia	RM 108-11	108.8	2-year	Ultimate_ALT108_SF	397000	-20.36	18.192	-5.98	18.38	0.000051	3.483	114328.8	4237.55	0.12
Columbia	RM 108-11	108.8	100-yr	Ultimate_ALT107_WAR	566000.1	-20.36	32.94	-3.77	33.1	0.000025	3.212	179700.2	5664.23	0.09
Columbia	RM 108-11	108.8	100-yr	Ultimate_ALT108_WAR	566000	-20.36	32.94	-3.77	33.1	0.000025	3.212	179700	5664.22	0.09
Columbia	RM 108-11	108.8	100-yr	Ultimate_ALT107_SF	711000.1	-20.36	28.372	-2.08	28.69	0.000058	4.54	158196.2	4411.49	0.13
Columbia	RM 108-11	108.8	100-yr	Ultimate_ALT108_SF	711000.1	-20.36	28.372	-2.08	28.69	0.000058	4.54	158196	4411.49	0.13
Columbia	RM 108-11	108.65	FEMA 100-year	Ultimate_ALT107_FEMA	565000	-20.65	31.825	-2.21	32	0.000028	3.373	169379.7	5049.9	0.09
Columbia	RM 108-11	108.65	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-20.65	31.825	-2.22	32	0.000028	3.373	169379.5	5049.88	0.09
Columbia	RM 108-11	108.65	2-year	Ultimate_ALT107_WAR	278000	-20.65	18.314	-6.02	18.41	0.000026	2.479	112548.3	4134.79	0.08
Columbia	RM 108-11	108.65	2-year	Ultimate_ALT108_WAR	278000	-20.65	18.314	-6.02	18.41	0.000026	2.479	112548.3	4134.79	0.08
Columbia	RM 108-11	108.65	2-year	Ultimate_ALT107_SF	397000	-20.65	18.14	-4.19	18.34	0.000054	3.563	111830	4132.84	0.12
Columbia	RM 108-11	108.65	2-year	Ultimate_ALT108_SF	397000	-20.65	18.14	-4.19	18.34	0.000054	3.563	111830	4132.84	0.12
Columbia	RM 108-11	108.65	100-yr	Ultimate_ALT107_WAR	566000.1	-20.65	32.911	-2.21	33.08	0.000026	3.29	174983.1	5326.74	0.09
Columbia	RM 108-11	108.65	100-yr	Ultimate_ALT108_WAR	566000	-20.65	32.911	-2.2	33.08	0.000026	3.29	174982.9	5326.73	0.09

Columbia	RM 108-11	108.65	100-yr	Ultimate_ALT107_SF	711000.1	-20.65	28.308	-0.65	28.64	0.00006	4.646	154196.9	4272.5	0.13
Columbia	RM 108-11	108.65	100-yr	Ultimate_ALT108_SF	711000.1	-20.65	28.308	-0.65	28.64	0.00006	4.646	154196.7	4272.49	0.13
Columbia	RM 102.5-1	108.31	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-34.94	31.725		31.93	0.00003	3.656	129778.9	3275.74	0.1
Columbia	RM 102.5-1	108.31	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-34.94	31.725		31.93	0.00003	3.656	129778.8	3275.73	0.1
Columbia	RM 102.5-1	108.31	2-year	Ultimate_ALT107_WAR	238812.4	-34.94	18.241		18.35	0.000026	2.652	90160.39	3019.08	0.08
Columbia	RM 102.5-1	108.31	2-year	Ultimate_ALT108_WAR	238812.4	-34.94	18.241		18.35	0.000026	2.652	90160.39	3019.08	0.08
Columbia	RM 102.5-1	108.31	2-year	Ultimate_ALT107_SF	341557	-34.94	17.987		18.21	0.000054	3.824	89419.59	3016.7	0.12
Columbia	RM 102.5-1	108.31	2-year	Ultimate_ALT108_SF	341557	-34.94	17.987		18.21	0.000054	3.824	89419.59	3016.7	0.12
Columbia	RM 102.5-1	108.31	100-yr	Ultimate_ALT107_WAR	473297.4	-34.94	32.817		33.02	0.000028	3.573	133293.6	3753.14	0.09
Columbia	RM 102.5-1	108.31	100-yr	Ultimate_ALT108_WAR	473297.9	-34.94	32.817		33.02	0.000028	3.573	133293.4	3753.08	0.09
Columbia	RM 102.5-1	108.31	100-yr	Ultimate_ALT107_SF	598597.1	-34.94	28.104		28.5	0.000064	5.042	118995.2	3041.51	0.14
Columbia	RM 102.5-1	108.31	100-yr	Ultimate_ALT108_SF	598597.4	-34.94	28.103		28.5	0.000064	5.042	118995	3041.51	0.14
Columbia	RM 102.5-1	108.07	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-33.64	31.703		31.91	0.000028	3.628	130599.5	3575.07	0.09
Columbia	RM 102.5-1	108.07	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-33.64	31.703		31.91	0.000028	3.628	130599.4	3575.07	0.09
Columbia	RM 102.5-1	108.07	2-year	Ultimate_ALT107_WAR	238812.4	-33.64	18.225		18.33	0.000023	2.59	92299.06	3473.7	0.08
Columbia	RM 102.5-1	108.07	2-year	Ultimate_ALT108_WAR	238812.4	-33.64	18.225		18.33	0.000023	2.59	92299.06	3473.7	0.08
Columbia	RM 102.5-1	108.07	2-year	Ultimate_ALT107_SF	341557	-33.64	17.952		18.17	0.000048	3.736	91527.06	3472.76	0.12
Columbia	RM 102.5-1	108.07	2-year	Ultimate_ALT108_SF	341557	-33.64	17.952		18.17	0.000048	3.736	91527.06	3472.76	0.12
Columbia	RM 102.5-1	108.07	100-yr	Ultimate_ALT107_WAR	473297.4	-33.64	32.797		32.99	0.000026	3.549	133798.1	3744.06	0.09
Columbia	RM 102.5-1	108.07	100-yr	Ultimate_ALT108_WAR	473297.9	-33.64	32.797		32.99	0.000026	3.549	133798	3744.05	0.09
Columbia	RM 102.5-1	108.07	100-yr	Ultimate_ALT107_SF	598597.1	-33.64	28.057		28.44	0.00006	4.991	120205.8	3525.3	0.13
Columbia	RM 102.5-1	108.07	100-yr	Ultimate_ALT108_SF	598597.4	-33.64	28.057		28.44	0.00006	4.991	120205.6	3525.3	0.13
Columbia	RM 102.5-1	107.92	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-30.28	31.674		31.88	0.000029	3.692	129164.5	4049.82	0.1
Columbia	RM 102.5-1	107.92	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-30.28	31.674		31.88	0.000029	3.692	129164.4	4049.82	0.1
Columbia	RM 102.5-1	107.92	2-year	Ultimate_ALT107_WAR	238812.4	-30.28	18.202		18.31	0.000024	2.642	90689.63	3629.66	0.08
Columbia	RM 102.5-1	107.92	2-year	Ultimate_ALT108_WAR	238812.4	-30.28	18.202		18.31	0.000024	2.642	90689.63	3629.66	0.08
Columbia	RM 102.5-1	107.92	2-year	Ultimate_ALT107_SF	341557	-30.28	17.905		18.13	0.00005	3.814	89849.37	3627.45	0.12
Columbia	RM 102.5-1	107.92	2-year	Ultimate_ALT108_SF	341557	-30.28	17.905		18.13	0.00005	3.814	89849.37	3627.45	0.12
Columbia	RM 102.5-1	107.92	100-yr	Ultimate_ALT107_WAR	473297.4	-30.28	32.77		32.97	0.000027	3.609	132380.8	4167.58	0.09
Columbia	RM 102.5-1	107.92	100-yr	Ultimate_ALT108_WAR	473297.9	-30.28	32.77		32.97	0.000027	3.609	132380.7	4167.58	0.09
Columbia	RM 102.5-1	107.92	100-yr	Ultimate_ALT107_SF	598597.1	-30.28	27.995		28.4	0.000062	5.086	118515.6	3814.06	0.14
Columbia	RM 102.5-1	107.92	100-yr	Ultimate_ALT108_SF	598597.4	-30.28	27.995		28.4	0.000062	5.086	118515.4	3814.06	0.14
Columbia	RM 102.5-1	107.79	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-32.76	31.671		31.86	0.000024	3.484	136374.4	3933	0.09
Columbia	RM 102.5-1	107.79	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-32.76	31.671		31.86	0.000024	3.484	136374.3	3933	0.09
Columbia	RM 102.5-1	107.79	2-year	Ultimate_ALT107_WAR	238812.4	-32.76	18.201		18.29	0.000017	2.417	99067.63	3625.32	0.07
Columbia	RM 102.5-1	107.79	2-year	Ultimate_ALT108_WAR	238812.4	-32.76	18.201		18.29	0.000017	2.417	99067.63	3625.32	0.07
Columbia	RM 102.5-1	107.79	2-year	Ultimate_ALT107_SF	341557	-32.76	17.901		18.09	0.000036	3.485	98241.86	3624.03	0.1
Columbia	RM 102.5-1	107.79	2-year	Ultimate_ALT108_SF	341557	-32.76	17.901		18.09	0.000036	3.485	98241.86	3624.03	0.1
Columbia	RM 102.5-1	107.79	100-yr	Ultimate_ALT107_WAR	473297.4	-32.76	32.767		32.95	0.000022	3.413	139452.5	4142.77	0.08
Columbia	RM 102.5-1	107.79	100-yr	Ultimate_ALT108_WAR	473297.9	-32.76	32.767		32.95	0.000022	3.413	139452.4	4142.77	0.08
Columbia	RM 102.5-1	107.79	100-yr	Ultimate_ALT107_SF	598597.1	-32.76	27.99		28.34	0.000049	4.765	126129.6	3830.36	0.12
Columbia	RM 102.5-1	107.79	100-yr	Ultimate_ALT108_SF	598597.4	-32.76	27.99		28.34	0.000049	4.765	126129.5	3830.35	0.12

Columbia	RM 102.5-1	107.7	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-31.36	31.678		31.84	0.000021	3.257	147093.6	3880.13	0.08
Columbia	RM 102.5-1	107.7	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-31.36	31.678		31.84	0.000021	3.257	147093.4	3880.13	0.08
Columbia	RM 102.5-1	107.7	2-year	Ultimate_ALT107_WAR	238812.4	-31.36	18.2		18.28	0.000016	2.281	105558.9	3630.23	0.07
Columbia	RM 102.5-1	107.7	2-year	Ultimate_ALT108_WAR	238812.4	-31.36	18.2		18.28	0.000016	2.281	105558.9	3630.23	0.07
Columbia	RM 102.5-1	107.7	2-year	Ultimate_ALT107_SF	341557	-31.36	17.899		18.07	0.000033	3.29	104642.4	3626.13	0.1
Columbia	RM 102.5-1	107.7	2-year	Ultimate_ALT108_SF	341557	-31.36	17.899		18.07	0.000033	3.29	104642.4	3626.13	0.1
Columbia	RM 102.5-1	107.7	100-yr	Ultimate_ALT107_WAR	473297.4	-31.36	32.774		32.93	0.000019	3.189	150504.7	3886.66	0.08
Columbia	RM 102.5-1	107.7	100-yr	Ultimate_ALT108_WAR	473297.9	-31.36	32.774		32.93	0.000019	3.189	150504.5	3886.66	0.08
Columbia	RM 102.5-1	107.7	100-yr	Ultimate_ALT107_SF	598597.1	-31.36	28		28.31	0.000043	4.467	135679.1	3859.35	0.12
Columbia	RM 102.5-1	107.7	100-yr	Ultimate_ALT108_SF	598597.4	-31.36	28		28.31	0.000043	4.467	135678.9	3859.35	0.12
Columbia	RM 102.5-1	107.65	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-28.56	31.674		31.83	0.000021	3.236	147844.7	3604.76	0.08
Columbia	RM 102.5-1	107.65	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-28.56	31.674		31.83	0.000021	3.236	147844.5	3604.76	0.08
Columbia	RM 102.5-1	107.65	2-year	Ultimate_ALT107_WAR	238812.4	-28.56	18.196		18.28	0.000016	2.279	105443.4	3400.92	0.07
Columbia	RM 102.5-1	107.65	2-year	Ultimate_ALT108_WAR	238812.4	-28.56	18.196		18.28	0.000016	2.279	105443.4	3400.92	0.07
Columbia	RM 102.5-1	107.65	2-year	Ultimate_ALT107_SF	341557	-28.56	17.89		18.06	0.000034	3.288	104493.1	3397.5	0.1
Columbia	RM 102.5-1	107.65	2-year	Ultimate_ALT108_SF	341557	-28.56	17.89		18.06	0.000034	3.288	104493.1	3397.5	0.1
Columbia	RM 102.5-1	107.65	100-yr	Ultimate_ALT107_WAR	473297.4	-28.56	32.77		32.92	0.00002	3.167	151324	3617.41	0.08
Columbia	RM 102.5-1	107.65	100-yr	Ultimate_ALT108_WAR	473297.9	-28.56	32.77		32.92	0.00002	3.167	151323.8	3617.41	0.08
Columbia	RM 102.5-1	107.65	100-yr	Ultimate_ALT107_SF	598597.1	-28.56	27.99		28.29	0.000044	4.443	136178.4	3559.04	0.12
Columbia	RM 102.5-1	107.65	100-yr	Ultimate_ALT108_SF	598597.4	-28.56	27.99		28.29	0.000044	4.443	136178.3	3559.04	0.12
Columbia	RM 102.5-1	107.52	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-29.25	31.662		31.82	0.00002	3.203	148790.2	4081.2	0.08
Columbia	RM 102.5-1	107.52	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-29.25	31.662		31.82	0.00002	3.203	148790.1	4081.2	0.08
Columbia	RM 102.5-1	107.52	2-year	Ultimate_ALT107_WAR	238812.4	-29.25	18.188		18.27	0.000015	2.235	107064.4	3766.85	0.07
Columbia	RM 102.5-1	107.52	2-year	Ultimate_ALT108_WAR	238812.4	-29.25	18.188		18.27	0.000015	2.235	107064.4	3766.85	0.07
Columbia	RM 102.5-1	107.52	2-year	Ultimate_ALT107_SF	341557	-29.25	17.873		18.03	0.000032	3.226	106104.6	3748.99	0.1
Columbia	RM 102.5-1	107.52	2-year	Ultimate_ALT108_SF	341557	-29.25	17.873		18.03	0.000032	3.226	106104.6	3748.99	0.1
Columbia	RM 102.5-1	107.52	100-yr	Ultimate_ALT107_WAR	473297.4	-29.25	32.759		32.91	0.000019	3.136	152228.4	4122.87	0.08
Columbia	RM 102.5-1	107.52	100-yr	Ultimate_ALT108_WAR	473297.9	-29.25	32.759		32.91	0.000019	3.136	152228.3	4122.87	0.08
Columbia	RM 102.5-1	107.52	100-yr	Ultimate_ALT107_SF	598597.1	-29.25	27.966		28.26	0.000042	4.391	137220.7	3946.03	0.11
Columbia	RM 102.5-1	107.52	100-yr	Ultimate_ALT108_SF	598597.4	-29.25	27.966		28.26	0.000042	4.391	137220.5	3946.03	0.11
Columbia	RM 102.5-1	107.37	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-26.07	31.659		31.8	0.000019	3.006	157748.9	4350.46	0.08
Columbia	RM 102.5-1	107.37	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-26.07	31.659		31.8	0.000019	3.006	157748.8	4350.45	0.08
Columbia	RM 102.5-1	107.37	2-year	Ultimate_ALT107_WAR	238812.4	-26.07	18.181		18.25	0.000014	2.119	112814.6	4187.36	0.06
Columbia	RM 102.5-1	107.37	2-year	Ultimate_ALT108_WAR	238812.4	-26.07	18.181		18.25	0.000014	2.119	112814.6	4187.36	0.06
Columbia	RM 102.5-1	107.37	2-year	Ultimate_ALT107_SF	341557	-26.07	17.858		18	0.00003	3.06	111744.1	4185.08	0.09
Columbia	RM 102.5-1	107.37	2-year	Ultimate_ALT108_SF	341557	-26.07	17.858		18	0.00003	3.06	111744.1	4185.08	0.09
Columbia	RM 102.5-1	107.37	100-yr	Ultimate_ALT107_WAR	473297.4	-26.07	32.757		32.89	0.000017	2.943	161486.4	4436.49	0.07
Columbia	RM 102.5-1	107.37	100-yr	Ultimate_ALT108_WAR	473297.9	-26.07	32.757		32.89	0.000017	2.943	161486.3	4436.49	0.07
Columbia	RM 102.5-1	107.37	100-yr	Ultimate_ALT107_SF	598597.1	-26.07	27.956		28.22	0.000039	4.129	145365.6	4228.12	0.11
Columbia	RM 102.5-1	107.37	100-yr	Ultimate_ALT108_SF	598597.4	-26.07	27.956		28.22	0.000039	4.129	145365.4	4228.12	0.11
Columbia	RM 102.5-1	107.25	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-26.66	31.642		31.79	0.000019	3.065	155120	3595.55	0.08
Columbia	RM 102.5-1	107.25	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-26.66	31.642		31.79	0.000019	3.065	155119.8	3595.55	0.08
Columbia	RM 102.5-1	107.25	2-year	Ultimate_ALT107_WAR	238812.4	-26.66	18.17		18.24	0.000014	2.151	111290.5	3227.53	0.06

Columbia	RM 102.5-1	107.25	2-year	Ultimate_ALT108_WAR	238812.4	-26.66	18.17		18.24	0.000014	2.151	111290.5	3227.53	0.06
Columbia	RM 102.5-1	107.25	2-year	Ultimate_ALT107_SF	341557	-26.66	17.836		17.99	0.00003	3.107	110211.6	3226.54	0.09
Columbia	RM 102.5-1	107.25	2-year	Ultimate_ALT108_SF	341557	-26.66	17.836		17.99	0.00003	3.107	110211.6	3226.54	0.09
Columbia	RM 102.5-1	107.25	100-yr	Ultimate_ALT107_WAR	473297.4	-26.66	32.741		32.88	0.000018	3	158777.8	3642.67	0.08
Columbia	RM 102.5-1	107.25	100-yr	Ultimate_ALT108_WAR	473297.9	-26.66	32.741		32.88	0.000018	3	158777.7	3642.67	0.08
Columbia	RM 102.5-1	107.25	100-yr	Ultimate_ALT107_SF	598597.1	-26.66	27.922		28.2	0.00004	4.208	142912	3444.9	0.11
Columbia	RM 102.5-1	107.25	100-yr	Ultimate_ALT108_SF	598597.4	-26.66	27.922		28.2	0.00004	4.208	142911.8	3444.89	0.11
Columbia	RM 102.5-1	107.14	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-26.24	31.62		31.77	0.00002	3.151	150666.1	3237.8	0.08
Columbia	RM 102.5-1	107.14	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-26.24	31.62		31.77	0.00002	3.151	150666	3237.8	0.08
Columbia	RM 102.5-1	107.14	2-year	Ultimate_ALT107_WAR	238812.4	-26.24	18.156		18.23	0.000015	2.214	107976.7	3144.71	0.07
Columbia	RM 102.5-1	107.14	2-year	Ultimate_ALT108_WAR	238812.4	-26.24	18.156		18.23	0.000015	2.214	107976.7	3144.71	0.07
Columbia	RM 102.5-1	107.14	2-year	Ultimate_ALT107_SF	341557	-26.24	17.806		17.97	0.000033	3.199	106876.9	3143.16	0.1
Columbia	RM 102.5-1	107.14	2-year	Ultimate_ALT108_SF	341557	-26.24	17.806		17.97	0.000033	3.199	106876.9	3143.16	0.1
Columbia	RM 102.5-1	107.14	100-yr	Ultimate_ALT107_WAR	473297.4	-26.24	32.721		32.87	0.000019	3.085	154207	3304.42	0.08
Columbia	RM 102.5-1	107.14	100-yr	Ultimate_ALT108_WAR	473297.9	-26.24	32.721		32.87	0.000019	3.085	154206.8	3304.42	0.08
Columbia	RM 102.5-1	107.14	100-yr	Ultimate_ALT107_SF	598597.1	-26.24	27.878		28.17	0.000042	4.33	138736.9	3180.79	0.11
Columbia	RM 102.5-1	107.14	100-yr	Ultimate_ALT108_SF	598597.4	-26.24	27.878		28.17	0.000042	4.33	138736.8	3180.79	0.11
Columbia	RM 102.5-1	107.03	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-26.41	31.593		31.76	0.000022	3.285	144254.5	3069.92	0.08
Columbia	RM 102.5-1	107.03	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-26.41	31.593		31.76	0.000022	3.285	144254.3	3069.92	0.08
Columbia	RM 102.5-1	107.03	2-year	Ultimate_ALT107_WAR	238812.4	-26.41	18.139		18.22	0.000017	2.308	103482.6	3007.29	0.07
Columbia	RM 102.5-1	107.03	2-year	Ultimate_ALT108_WAR	238812.4	-26.41	18.139		18.22	0.000017	2.308	103482.6	3007.29	0.07
Columbia	RM 102.5-1	107.03	2-year	Ultimate_ALT107_SF	341557	-26.41	17.771		17.94	0.000036	3.337	102374.7	3005.82	0.1
Columbia	RM 102.5-1	107.03	2-year	Ultimate_ALT108_SF	341557	-26.41	17.771		17.94	0.000036	3.337	102374.7	3005.82	0.1
Columbia	RM 102.5-1	107.03	100-yr	Ultimate_ALT107_WAR	473297.4	-26.41	32.695		32.86	0.00002	3.215	147656.7	3212.64	0.08
Columbia	RM 102.5-1	107.03	100-yr	Ultimate_ALT108_WAR	473297.9	-26.41	32.695		32.86	0.00002	3.215	147656.5	3212.64	0.08
Columbia	RM 102.5-1	107.03	100-yr	Ultimate_ALT107_SF	598597.1	-26.41	27.824		28.14	0.000046	4.517	132770.2	3039.28	0.12
Columbia	RM 102.5-1	107.03	100-yr	Ultimate_ALT108_SF	598597.4	-26.41	27.824		28.14	0.000046	4.517	132770	3039.28	0.12
Columbia	RM 102.5-1	106.94	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-25.02	31.576		31.75	0.000023	3.351	141913.4	3140.4	0.08
Columbia	RM 102.5-1	106.94	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-25.02	31.576		31.75	0.000023	3.351	141913.3	3140.4	0.08
Columbia	RM 102.5-1	106.94	2-year	Ultimate_ALT107_WAR	238812.4	-25.02	18.128		18.21	0.000017	2.349	101842	2938.34	0.07
Columbia	RM 102.5-1	106.94	2-year	Ultimate_ALT108_WAR	238812.4	-25.02	18.128		18.21	0.000017	2.349	101842	2938.34	0.07
Columbia	RM 102.5-1	106.94	2-year	Ultimate_ALT107_SF	341557	-25.02	17.747		17.93	0.000036	3.396	100722.4	2937.76	0.1
Columbia	RM 102.5-1	106.94	2-year	Ultimate_ALT108_SF	341557	-25.02	17.747		17.93	0.000036	3.396	100722.4	2937.76	0.1
Columbia	RM 102.5-1	106.94	100-yr	Ultimate_ALT107_WAR	473297.4	-25.02	32.678		32.85	0.000021	3.28	145472	3371.31	0.08
Columbia	RM 102.5-1	106.94	100-yr	Ultimate_ALT108_WAR	473297.9	-25.02	32.678		32.85	0.000021	3.28	145471.8	3371.29	0.08
Columbia	RM 102.5-1	106.94	100-yr	Ultimate_ALT107_SF	598597.1	-25.02	27.788		28.12	0.000048	4.607	130359	2971.37	0.12
Columbia	RM 102.5-1	106.94	100-yr	Ultimate_ALT108_SF	598597.4	-25.02	27.788		28.12	0.000048	4.607	130358.8	2971.37	0.12
Columbia	RM 102.5-1	106.89	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-24.51	31.564		31.74	0.000023	3.408	139416.5	3080.85	0.09
Columbia	RM 102.5-1	106.89	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-24.51	31.564		31.74	0.000023	3.408	139416.4	3080.85	0.09
Columbia	RM 102.5-1	106.89	2-year	Ultimate_ALT107_WAR	238812.4	-24.51	18.121		18.21	0.000018	2.385	100377.4	2880.77	0.07
Columbia	RM 102.5-1	106.89	2-year	Ultimate_ALT108_WAR	238812.4	-24.51	18.121		18.21	0.000018	2.385	100377.4	2880.77	0.07
Columbia	RM 102.5-1	106.89	2-year	Ultimate_ALT107_SF	341557	-24.51	17.732		17.92	0.000037	3.449	99257.5	2880.04	0.1
Columbia	RM 102.5-1	106.89	2-year	Ultimate_ALT108_SF	341557	-24.51	17.732		17.92	0.000037	3.449	99257.5	2880.04	0.1

Columbia	RM 102.5-	106.89	100-yr	Ultimate_ALT107_WAR	473297.4	-24.51	32.667		32.84	0.000022	3.336	142895.3	3303.44	0.08
Columbia	RM 102.5-	106.89	100-yr	Ultimate_ALT108_WAR	473297.9	-24.51	32.667		32.84	0.000022	3.336	142895.2	3303.43	0.08
Columbia	RM 102.5-	106.89	100-yr	Ultimate_ALT107_SF	598597.1	-24.51	27.764		28.11	0.000049	4.687	128256.4	2912.12	0.12
Columbia	RM 102.5-	106.89	100-yr	Ultimate_ALT108_SF	598597.4	-24.51	27.764		28.1	0.000049	4.687	128256.2	2912.12	0.12
Columbia	RM 102.5-	106.85	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-23.83	31.546		31.74	0.000025	3.509	135236	2943.19	0.09
Columbia	RM 102.5-	106.85	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-23.83	31.546		31.74	0.000025	3.509	135235.9	2943.19	0.09
Columbia	RM 102.5-	106.85	2-year	Ultimate_ALT107_WAR	238812.4	-23.83	18.111		18.2	0.000019	2.456	97393.12	2792.42	0.07
Columbia	RM 102.5-	106.85	2-year	Ultimate_ALT108_WAR	238812.4	-23.83	18.111		18.2	0.000019	2.456	97393.12	2792.42	0.07
Columbia	RM 102.5-	106.85	2-year	Ultimate_ALT107_SF	341557	-23.83	17.711		17.91	0.00004	3.553	96276.35	2790.75	0.11
Columbia	RM 102.5-	106.85	2-year	Ultimate_ALT108_SF	341557	-23.83	17.711		17.91	0.00004	3.553	96276.35	2790.75	0.11
Columbia	RM 102.5-	106.85	100-yr	Ultimate_ALT107_WAR	473297.4	-23.83	32.65		32.83	0.000023	3.438	138465.3	3019.5	0.09
Columbia	RM 102.5-	106.85	100-yr	Ultimate_ALT108_WAR	473297.9	-23.83	32.65		32.83	0.000023	3.438	138465.2	3019.5	0.09
Columbia	RM 102.5-	106.85	100-yr	Ultimate_ALT107_SF	598597.1	-23.83	27.73		28.09	0.000052	4.827	124438.3	2840.18	0.13
Columbia	RM 102.5-	106.85	100-yr	Ultimate_ALT108_SF	598597.4	-23.83	27.73		28.09	0.000052	4.827	124438.1	2840.18	0.13
Columbia	RM 102.5-	106.81	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-24.75	31.54		31.73	0.000025	3.518	134847.9	2946.88	0.09
Columbia	RM 102.5-	106.81	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-24.75	31.54		31.73	0.000025	3.518	134847.8	2946.88	0.09
Columbia	RM 102.5-	106.81	2-year	Ultimate_ALT107_WAR	238812.4	-24.75	18.107		18.2	0.000019	2.461	97104.49	2783.73	0.07
Columbia	RM 102.5-	106.81	2-year	Ultimate_ALT108_WAR	238812.4	-24.75	18.107		18.2	0.000019	2.461	97104.49	2783.73	0.07
Columbia	RM 102.5-	106.81	2-year	Ultimate_ALT107_SF	341557	-24.75	17.702		17.9	0.00004	3.561	95977.32	2781.86	0.11
Columbia	RM 102.5-	106.81	2-year	Ultimate_ALT108_SF	341557	-24.75	17.702		17.9	0.00004	3.561	95977.32	2781.86	0.11
Columbia	RM 102.5-	106.81	100-yr	Ultimate_ALT107_WAR	473297.4	-24.75	32.644		32.83	0.000023	3.447	138091.9	3077.16	0.09
Columbia	RM 102.5-	106.81	100-yr	Ultimate_ALT108_WAR	473297.9	-24.75	32.644		32.83	0.000023	3.447	138091.8	3077.16	0.09
Columbia	RM 102.5-	106.81	100-yr	Ultimate_ALT107_SF	598597.1	-24.75	27.717		28.08	0.000053	4.84	124034.1	2821.4	0.13
Columbia	RM 102.5-	106.81	100-yr	Ultimate_ALT108_SF	598597.4	-24.75	27.716		28.08	0.000053	4.84	124034	2821.4	0.13
Columbia	RM 102.5-	106.78	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-26.88	31.538		31.73	0.000024	3.504	136174.2	3139.61	0.09
Columbia	RM 102.5-	106.78	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-26.88	31.538		31.73	0.000024	3.504	136174.1	3139.61	0.09
Columbia	RM 102.5-	106.78	2-year	Ultimate_ALT107_WAR	238812.4	-26.88	18.105		18.2	0.000018	2.447	97766.39	2785.98	0.07
Columbia	RM 102.5-	106.78	2-year	Ultimate_ALT108_WAR	238812.4	-26.88	18.105		18.2	0.000018	2.447	97766.39	2785.98	0.07
Columbia	RM 102.5-	106.78	2-year	Ultimate_ALT107_SF	341557	-26.88	17.698		17.89	0.000039	3.541	96632.83	2784.2	0.11
Columbia	RM 102.5-	106.78	2-year	Ultimate_ALT108_SF	341557	-26.88	17.698		17.89	0.000039	3.541	96632.83	2784.2	0.11
Columbia	RM 102.5-	106.78	100-yr	Ultimate_ALT107_WAR	473297.4	-26.88	32.643		32.82	0.000023	3.43	139457.7	3160.28	0.09
Columbia	RM 102.5-	106.78	100-yr	Ultimate_ALT108_WAR	473297.9	-26.88	32.642		32.82	0.000023	3.43	139457.6	3160.28	0.09
Columbia	RM 102.5-	106.78	100-yr	Ultimate_ALT107_SF	598597.1	-26.88	27.712		28.07	0.000052	4.823	124902.3	3023.01	0.13
Columbia	RM 102.5-	106.78	100-yr	Ultimate_ALT108_SF	598597.4	-26.88	27.711		28.07	0.000052	4.823	124902.1	3023.01	0.13
Columbia	RM 102.5-	106.73	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-39.39	31.515	-10.34	31.72	0.000026	3.624	132391.9	2980.13	0.09
Columbia	RM 102.5-	106.73	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-39.39	31.515	-10.34	31.72	0.000026	3.624	132391.7	2980.12	0.09
Columbia	RM 102.5-	106.73	2-year	Ultimate_ALT107_WAR	238812.4	-39.39	18.092	-14.68	18.19	0.000019	2.527	94649.82	2712.2	0.07
Columbia	RM 102.5-	106.73	2-year	Ultimate_ALT108_WAR	238812.4	-39.39	18.092	-14.68	18.19	0.000019	2.527	94649.82	2712.2	0.07
Columbia	RM 102.5-	106.73	2-year	Ultimate_ALT107_SF	341557	-39.39	17.67	-12.67	17.88	0.000041	3.657	93507.57	2702.56	0.11
Columbia	RM 102.5-	106.73	2-year	Ultimate_ALT108_SF	341557	-39.39	17.67	-12.67	17.88	0.000041	3.657	93507.57	2702.56	0.11
Columbia	RM 102.5-	106.73	100-yr	Ultimate_ALT107_WAR	473297.4	-39.39	32.62	-10.33	32.82	0.000024	3.548	135697.6	3136.09	0.09
Columbia	RM 102.5-	106.73	100-yr	Ultimate_ALT108_WAR	473297.9	-39.39	32.62	-10.33	32.82	0.000024	3.548	135697.5	3136.09	0.09
Columbia	RM 102.5-	106.73	100-yr	Ultimate_ALT107_SF	598597.1	-39.39	27.666	-8.3	28.05	0.000055	4.986	121243.8	2828.89	0.13

Columbia	RM 102.5-1	106.73	100-yr	Ultimate_ALT108_SF	598597.4	-39.39	27.666	-8.3	28.05	0.000055	4.986	121243.7	2828.89	0.13
Columbia	RM 102.5-1	106.7			Bridge									
Columbia	RM 102.5-1	106.67	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-31.62	31.508		31.71	0.000059	3.642	130353	2627.17	0.09
Columbia	RM 102.5-1	106.67	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-31.62	31.508		31.71	0.000059	3.642	130353	2627.17	0.09
Columbia	RM 102.5-1	106.67	2-year	Ultimate_ALT107_WAR	238812.4	-31.62	18.088		18.19	0.000042	2.502	95483.17	2573.12	0.07
Columbia	RM 102.5-1	106.67	2-year	Ultimate_ALT108_WAR	238812.4	-31.62	18.088		18.19	0.000042	2.502	95483.17	2573.12	0.07
Columbia	RM 102.5-1	106.67	2-year	Ultimate_ALT107_SF	341557	-31.62	17.662		17.87	0.000089	3.62	94387.34	2571.78	0.1
Columbia	RM 102.5-1	106.67	2-year	Ultimate_ALT108_SF	341557	-31.62	17.662		17.87	0.000089	3.62	94387.34	2571.78	0.1
Columbia	RM 102.5-1	106.67	100-yr	Ultimate_ALT107_WAR	473297.4	-31.62	32.614		32.81	0.000055	3.57	133261.9	2715.19	0.09
Columbia	RM 102.5-1	106.67	100-yr	Ultimate_ALT108_WAR	473297.9	-31.62	32.614		32.81	0.000055	3.57	133261.8	2715.19	0.09
Columbia	RM 102.5-1	106.67	100-yr	Ultimate_ALT107_SF	598597.1	-31.62	27.651		28.04	0.000123	4.993	120255.6	2609.4	0.13
Columbia	RM 102.5-1	106.67	100-yr	Ultimate_ALT108_SF	598597.4	-31.62	27.651		28.04	0.000123	4.993	120255.5	2609.4	0.13
Columbia	RM 102.5-1	106.62	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-29.68	31.485		31.7	0.000035	3.739	128641.8	2723.82	0.09
Columbia	RM 102.5-1	106.62	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-29.68	31.485		31.7	0.000035	3.739	128641.8	2723.82	0.09
Columbia	RM 102.5-1	106.62	2-year	Ultimate_ALT107_WAR	238812.4	-29.68	18.075		18.18	0.000025	2.565	93731.96	2571.75	0.07
Columbia	RM 102.5-1	106.62	2-year	Ultimate_ALT108_WAR	238812.4	-29.68	18.075		18.18	0.000025	2.565	93731.96	2571.75	0.07
Columbia	RM 102.5-1	106.62	2-year	Ultimate_ALT107_SF	341557	-29.68	17.635		17.85	0.000053	3.712	92599.06	2569.67	0.11
Columbia	RM 102.5-1	106.62	2-year	Ultimate_ALT108_SF	341557	-29.68	17.635		17.85	0.000053	3.712	92599.06	2569.67	0.11
Columbia	RM 102.5-1	106.62	100-yr	Ultimate_ALT107_WAR	473297.4	-29.68	32.592		32.8	0.000033	3.665	131557.9	2741.03	0.09
Columbia	RM 102.5-1	106.62	100-yr	Ultimate_ALT108_WAR	473297.9	-29.68	32.592		32.8	0.000033	3.665	131557.8	2741.03	0.09
Columbia	RM 102.5-1	106.62	100-yr	Ultimate_ALT107_SF	598597.1	-29.68	27.606		28.01	0.000074	5.127	118464.3	2676.35	0.13
Columbia	RM 102.5-1	106.62	100-yr	Ultimate_ALT108_SF	598597.4	-29.68	27.606		28.01	0.000074	5.127	118464.3	2676.35	0.13
Columbia	RM 102.5-1	106.57	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-34.54	31.477		31.69	0.000084	3.675	129251.9	2740.95	0.09
Columbia	RM 102.5-1	106.57	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-34.54	31.477		31.69	0.000084	3.675	129251.9	2740.95	0.09
Columbia	RM 102.5-1	106.57	2-year	Ultimate_ALT107_WAR	238812.4	-34.54	18.068		18.17	0.000059	2.519	94936.95	2527.74	0.07
Columbia	RM 102.5-1	106.57	2-year	Ultimate_ALT108_WAR	238812.4	-34.54	18.068		18.17	0.000059	2.519	94936.95	2527.74	0.07
Columbia	RM 102.5-1	106.57	2-year	Ultimate_ALT107_SF	341557	-34.54	17.619		17.83	0.000125	3.646	93802.98	2525.5	0.1
Columbia	RM 102.5-1	106.57	2-year	Ultimate_ALT108_SF	341557	-34.54	17.619		17.83	0.000125	3.646	93802.98	2525.5	0.1
Columbia	RM 102.5-1	106.57	100-yr	Ultimate_ALT107_WAR	473297.4	-34.54	32.585		32.79	0.000078	3.602	132124.4	2775.87	0.09
Columbia	RM 102.5-1	106.57	100-yr	Ultimate_ALT108_WAR	473297.9	-34.54	32.585		32.79	0.000078	3.602	132124.4	2775.87	0.09
Columbia	RM 102.5-1	106.57	100-yr	Ultimate_ALT107_SF	598597.1	-34.54	27.587		27.98	0.000175	5.04	119202.4	2575.81	0.13
Columbia	RM 102.5-1	106.57	100-yr	Ultimate_ALT108_SF	598597.4	-34.54	27.587		27.98	0.000175	5.04	119202.4	2575.81	0.13
Columbia	RM 102.5-1	106.51	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-37.18	31.453		31.67	0.000028	3.755	126905.4	3291.84	0.09
Columbia	RM 102.5-1	106.51	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-37.18	31.453		31.67	0.000028	3.755	126905.5	3291.84	0.09
Columbia	RM 102.5-1	106.51	2-year	Ultimate_ALT107_WAR	238812.4	-37.18	18.051		18.16	0.00002	2.605	91963.52	2588.49	0.08
Columbia	RM 102.5-1	106.51	2-year	Ultimate_ALT108_WAR	238812.4	-37.18	18.051		18.16	0.00002	2.605	91963.52	2588.49	0.08
Columbia	RM 102.5-1	106.51	2-year	Ultimate_ALT107_SF	341557	-37.18	17.583		17.8	0.000043	3.775	90751.45	2587.18	0.11
Columbia	RM 102.5-1	106.51	2-year	Ultimate_ALT108_SF	341557	-37.18	17.583		17.8	0.000043	3.775	90751.45	2587.18	0.11
Columbia	RM 102.5-1	106.51	100-yr	Ultimate_ALT107_WAR	473297.4	-37.18	32.563		32.77	0.000026	3.678	129826.1	3467.03	0.09
Columbia	RM 102.5-1	106.51	100-yr	Ultimate_ALT108_WAR	473297.9	-37.18	32.563		32.77	0.000026	3.678	129826.1	3467.03	0.09
Columbia	RM 102.5-1	106.51	100-yr	Ultimate_ALT107_SF	598597.1	-37.18	27.537		27.95	0.000059	5.167	116642.3	2618.81	0.13
Columbia	RM 102.5-1	106.51	100-yr	Ultimate_ALT108_SF	598597.4	-37.18	27.537		27.95	0.000059	5.167	116642.3	2618.81	0.13

Columbia	RM 102.5-1	106.38	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-30.62	31.41		31.65	0.000028	3.948	120621.6	2433.7	0.1
Columbia	RM 102.5-1	106.38	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-30.62	31.41		31.65	0.000028	3.948	120621.6	2433.7	0.1
Columbia	RM 102.5-1	106.38	2-year	Ultimate_ALT107_WAR	238812.4	-30.62	18.031		18.14	0.000019	2.687	89207.52	2329.75	0.08
Columbia	RM 102.5-1	106.38	2-year	Ultimate_ALT108_WAR	238812.4	-30.62	18.031		18.14	0.000019	2.687	89207.52	2329.75	0.08
Columbia	RM 102.5-1	106.38	2-year	Ultimate_ALT107_SF	341557	-30.62	17.54		17.77	0.000041	3.892	88063.46	2328.34	0.11
Columbia	RM 102.5-1	106.38	2-year	Ultimate_ALT108_SF	341557	-30.62	17.54		17.77	0.000041	3.892	88063.46	2328.34	0.11
Columbia	RM 102.5-1	106.38	100-yr	Ultimate_ALT107_WAR	473297.4	-30.62	32.521		32.75	0.000026	3.871	123302.8	3056.25	0.09
Columbia	RM 102.5-1	106.38	100-yr	Ultimate_ALT108_WAR	473297.9	-30.62	32.521		32.75	0.000026	3.871	123302.8	3056.24	0.09
Columbia	RM 102.5-1	106.38	100-yr	Ultimate_ALT107_SF	598597.1	-30.62	27.454		27.91	0.000059	5.413	111276	2355.25	0.14
Columbia	RM 102.5-1	106.38	100-yr	Ultimate_ALT108_SF	598597.4	-30.62	27.454		27.91	0.000059	5.413	111276	2355.25	0.14
Columbia	RM 102.5-1	106.26	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-24.14	31.344		31.63	0.000035	4.274	111569	2313.25	0.11
Columbia	RM 102.5-1	106.26	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-24.14	31.344		31.63	0.000035	4.274	111569	2313.25	0.11
Columbia	RM 102.5-1	106.26	2-year	Ultimate_ALT107_WAR	238812.4	-24.14	17.992		18.13	0.000025	2.94	81491.84	2228.7	0.08
Columbia	RM 102.5-1	106.26	2-year	Ultimate_ALT108_WAR	238812.4	-24.14	17.992		18.13	0.000025	2.94	81491.84	2228.7	0.08
Columbia	RM 102.5-1	106.26	2-year	Ultimate_ALT107_SF	341557	-24.14	17.457		17.74	0.000053	4.266	80299.05	2227.18	0.12
Columbia	RM 102.5-1	106.26	2-year	Ultimate_ALT108_SF	341557	-24.14	17.457		17.74	0.000053	4.266	80299.05	2227.18	0.12
Columbia	RM 102.5-1	106.26	100-yr	Ultimate_ALT107_WAR	473297.4	-24.14	32.458		32.73	0.000032	4.187	114261.3	2719.62	0.1
Columbia	RM 102.5-1	106.26	100-yr	Ultimate_ALT108_WAR	473297.9	-24.14	32.458		32.73	0.000032	4.187	114261.3	2719.62	0.1
Columbia	RM 102.5-1	106.26	100-yr	Ultimate_ALT107_SF	598597.1	-24.14	27.32		27.86	0.000074	5.884	102435.9	2261.23	0.15
Columbia	RM 102.5-1	106.26	100-yr	Ultimate_ALT108_SF	598597.4	-24.14	27.32		27.86	0.000074	5.884	102435.9	2261.23	0.15
Columbia	RM 102.5-1	106.16	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-24.93	31.315		31.61	0.000034	4.332	109705	2152.16	0.11
Columbia	RM 102.5-1	106.16	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-24.93	31.315		31.61	0.000034	4.332	109705	2152.16	0.11
Columbia	RM 102.5-1	106.16	2-year	Ultimate_ALT107_WAR	238812.4	-24.93	17.979		18.11	0.000023	2.938	81417.45	2102.26	0.08
Columbia	RM 102.5-1	106.16	2-year	Ultimate_ALT108_WAR	238812.4	-24.93	17.979		18.11	0.000023	2.938	81417.45	2102.26	0.08
Columbia	RM 102.5-1	106.16	2-year	Ultimate_ALT107_SF	341557	-24.93	17.429		17.71	0.00005	4.261	80260.99	2100.86	0.12
Columbia	RM 102.5-1	106.16	2-year	Ultimate_ALT108_SF	341557	-24.93	17.429		17.71	0.00005	4.261	80260.99	2100.86	0.12
Columbia	RM 102.5-1	106.16	100-yr	Ultimate_ALT107_WAR	473297.4	-24.93	32.431		32.71	0.000032	4.247	112110.8	2173.07	0.1
Columbia	RM 102.5-1	106.16	100-yr	Ultimate_ALT108_WAR	473297.9	-24.93	32.431		32.71	0.000032	4.247	112110.8	2173.07	0.1
Columbia	RM 102.5-1	106.16	100-yr	Ultimate_ALT107_SF	598597.1	-24.93	27.266		27.82	0.000072	5.948	101052.2	2126.41	0.15
Columbia	RM 102.5-1	106.16	100-yr	Ultimate_ALT108_SF	598597.4	-24.93	27.266		27.82	0.000072	5.948	101052.2	2126.41	0.15
Columbia	RM 102.5-1	106.05	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-30.31	31.313		31.58	0.000031	4.168	114985.5	3141.76	0.1
Columbia	RM 102.5-1	106.05	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-30.31	31.313		31.58	0.000031	4.168	114985.5	3141.76	0.1
Columbia	RM 102.5-1	106.05	2-year	Ultimate_ALT107_WAR	238812.4	-30.31	17.975		18.1	0.000021	2.816	85119.19	2706.74	0.08
Columbia	RM 102.5-1	106.05	2-year	Ultimate_ALT108_WAR	238812.4	-30.31	17.975		18.1	0.000021	2.816	85119.19	2706.74	0.08
Columbia	RM 102.5-1	106.05	2-year	Ultimate_ALT107_SF	341557	-30.31	17.419		17.68	0.000045	4.085	83902.75	2703.18	0.11
Columbia	RM 102.5-1	106.05	2-year	Ultimate_ALT108_SF	341557	-30.31	17.419		17.68	0.000045	4.085	83902.75	2703.18	0.11
Columbia	RM 102.5-1	106.05	100-yr	Ultimate_ALT107_WAR	473297.4	-30.31	32.43		32.69	0.000029	4.086	118334.9	3178.83	0.1
Columbia	RM 102.5-1	106.05	100-yr	Ultimate_ALT108_WAR	473297.9	-30.31	32.43		32.69	0.000029	4.086	118334.9	3178.83	0.1
Columbia	RM 102.5-1	106.05	100-yr	Ultimate_ALT107_SF	598597.1	-30.31	27.259		27.77	0.000065	5.717	105574.3	2765.44	0.14
Columbia	RM 102.5-1	106.05	100-yr	Ultimate_ALT108_SF	598597.4	-30.31	27.259		27.77	0.000065	5.717	105574.3	2765.44	0.14
Columbia	RM 102.5-1	105.96	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-33.26	31.323		31.56	0.000027	3.894	123300	2579.16	0.09
Columbia	RM 102.5-1	105.96	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-33.26	31.323		31.56	0.000027	3.894	123300	2579.16	0.09

Columbia	RM 102.5-1	105.96	2-year	Ultimate_ALT107_WAR	238812.4	-33.26	17.976		18.08	0.000018	2.632	90990.1	2338.06	0.07
Columbia	RM 102.5-1	105.96	2-year	Ultimate_ALT108_WAR	238812.4	-33.26	17.976		18.08	0.000018	2.632	90990.1	2338.06	0.07
Columbia	RM 102.5-1	105.96	2-year	Ultimate_ALT107_SF	341557	-33.26	17.422		17.65	0.000039	3.818	89694.88	2335.83	0.11
Columbia	RM 102.5-1	105.96	2-year	Ultimate_ALT108_SF	341557	-33.26	17.422		17.65	0.000039	3.818	89694.88	2335.83	0.11
Columbia	RM 102.5-1	105.96	100-yr	Ultimate_ALT107_WAR	473297.4	-33.26	32.44		32.67	0.000025	3.819	126137.5	2767.02	0.09
Columbia	RM 102.5-1	105.96	100-yr	Ultimate_ALT108_WAR	473297.9	-33.26	32.44		32.67	0.000025	3.819	126137.5	2767.02	0.09
Columbia	RM 102.5-1	105.96	100-yr	Ultimate_ALT107_SF	598597.1	-33.26	27.274		27.72	0.000057	5.343	113225.7	2458	0.13
Columbia	RM 102.5-1	105.96	100-yr	Ultimate_ALT108_SF	598597.4	-33.26	27.274		27.72	0.000057	5.343	113225.7	2458	0.13
Columbia	RM 102.5-1	105.91	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-34.34	31.322		31.55	0.000025	3.822	124721.7	2750.39	0.09
Columbia	RM 102.5-1	105.91	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-34.34	31.322		31.55	0.000025	3.822	124721.7	2750.39	0.09
Columbia	RM 102.5-1	105.91	2-year	Ultimate_ALT107_WAR	238812.4	-34.34	17.975		18.08	0.000017	2.563	93352.53	2325.01	0.07
Columbia	RM 102.5-1	105.91	2-year	Ultimate_ALT108_WAR	238812.4	-34.34	17.975		18.08	0.000017	2.563	93352.53	2325.01	0.07
Columbia	RM 102.5-1	105.91	2-year	Ultimate_ALT107_SF	341557	-34.34	17.42		17.63	0.000035	3.717	92062.9	2321	0.1
Columbia	RM 102.5-1	105.91	2-year	Ultimate_ALT108_SF	341557	-34.34	17.42		17.63	0.000035	3.717	92062.9	2321	0.1
Columbia	RM 102.5-1	105.91	100-yr	Ultimate_ALT107_WAR	473297.4	-34.34	32.439		32.66	0.000024	3.75	127369.6	2926.9	0.09
Columbia	RM 102.5-1	105.91	100-yr	Ultimate_ALT108_WAR	473297.9	-34.34	32.439		32.66	0.000024	3.75	127369.6	2926.9	0.09
Columbia	RM 102.5-1	105.91	100-yr	Ultimate_ALT107_SF	598597.1	-34.34	27.273		27.7	0.000052	5.233	115155.6	2549.56	0.13
Columbia	RM 102.5-1	105.91	100-yr	Ultimate_ALT108_SF	598597.4	-34.34	27.273		27.7	0.000052	5.233	115155.6	2549.56	0.13
Columbia	RM 102.5-1	105.9	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-34.17	31.321	-15.35	31.55	0.000024	3.806	125178	2722.49	0.09
Columbia	RM 102.5-1	105.9	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-34.17	31.321	-15.35	31.55	0.000024	3.806	125178	2722.49	0.09
Columbia	RM 102.5-1	105.9	2-year	Ultimate_ALT107_WAR	238812.4	-34.17	17.975	-20.69	18.08	0.000016	2.54	94209.2	2286.98	0.07
Columbia	RM 102.5-1	105.9	2-year	Ultimate_ALT108_WAR	238812.4	-34.17	17.975	-20.69	18.08	0.000016	2.54	94209.2	2286.98	0.07
Columbia	RM 102.5-1	105.9	2-year	Ultimate_ALT107_SF	341557	-34.17	17.42	-18.08	17.63	0.000034	3.682	92940.49	2283.74	0.1
Columbia	RM 102.5-1	105.9	2-year	Ultimate_ALT108_SF	341557	-34.17	17.42	-18.08	17.63	0.000034	3.682	92940.49	2283.74	0.1
Columbia	RM 102.5-1	105.9	100-yr	Ultimate_ALT107_WAR	473297.4	-34.17	32.438	-15.33	32.65	0.000023	3.736	127832.9	2956.7	0.09
Columbia	RM 102.5-1	105.9	100-yr	Ultimate_ALT108_WAR	473297.9	-34.17	32.438	-15.33	32.65	0.000023	3.736	127832.8	2956.7	0.09
Columbia	RM 102.5-1	105.9	100-yr	Ultimate_ALT107_SF	598597.1	-34.17	27.271	-12.98	27.69	0.000051	5.206	115702.7	2590.94	0.13
Columbia	RM 102.5-1	105.9	100-yr	Ultimate_ALT108_SF	598597.4	-34.17	27.271	-12.98	27.69	0.000051	5.206	115702.7	2590.94	0.13
Columbia	RM 102.5-1	105.88			Bridge									
Columbia	RM 102.5-1	105.85	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-44.88	31.314		31.51	0.00002	3.562	133457.5	3940.23	0.08
Columbia	RM 102.5-1	105.85	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-44.88	31.314		31.51	0.00002	3.562	133457.5	3940.23	0.08
Columbia	RM 102.5-1	105.85	2-year	Ultimate_ALT107_WAR	238812.4	-44.88	17.972		18.06	0.000012	2.334	102378.5	2296.03	0.06
Columbia	RM 102.5-1	105.85	2-year	Ultimate_ALT108_WAR	238812.4	-44.88	17.972		18.06	0.000012	2.334	102378.5	2296.03	0.06
Columbia	RM 102.5-1	105.85	2-year	Ultimate_ALT107_SF	341557	-44.88	17.413		17.59	0.000026	3.38	101095.4	2292.2	0.09
Columbia	RM 102.5-1	105.85	2-year	Ultimate_ALT108_SF	341557	-44.88	17.413		17.59	0.000026	3.38	101095.4	2292.2	0.09
Columbia	RM 102.5-1	105.85	100-yr	Ultimate_ALT107_WAR	473297.4	-44.88	32.431		32.62	0.000019	3.5	136121.8	4202.93	0.08
Columbia	RM 102.5-1	105.85	100-yr	Ultimate_ALT108_WAR	473297.9	-44.88	32.43		32.62	0.000019	3.5	136121.8	4202.92	0.08
Columbia	RM 102.5-1	105.85	100-yr	Ultimate_ALT107_SF	598597.1	-44.88	27.255		27.62	0.000041	4.85	123907.6	2802.55	0.12
Columbia	RM 102.5-1	105.85	100-yr	Ultimate_ALT108_SF	598597.4	-44.88	27.255		27.62	0.000041	4.85	123907.6	2802.55	0.12
Columbia	RM 102.5-1	105.84	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-41.24	31.311		31.51	0.00002	3.574	133244.6	3867.85	0.08
Columbia	RM 102.5-1	105.84	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-41.24	31.311		31.51	0.00002	3.574	133244.6	3867.85	0.08
Columbia	RM 102.5-1	105.84	2-year	Ultimate_ALT107_WAR	238812.4	-41.24	17.971		18.06	0.000012	2.342	102179.9	2295.87	0.06

Columbia	RM 102.5-	105.84	2-year	Ultimate_ALT108_WAR	238812.4	-41.24	17.971		18.06	0.000012	2.342	102179.9	2295.87	0.06
Columbia	RM 102.5-	105.84	2-year	Ultimate_ALT107_SF	341557	-41.24	17.41		17.59	0.000026	3.391	100893.8	2291.65	0.09
Columbia	RM 102.5-	105.84	2-year	Ultimate_ALT108_SF	341557	-41.24	17.41		17.59	0.000026	3.391	100893.8	2291.65	0.09
Columbia	RM 102.5-	105.84	100-yr	Ultimate_ALT107_WAR	473297.4	-41.24	32.428		32.62	0.000019	3.512	135885.2	3951.35	0.08
Columbia	RM 102.5-	105.84	100-yr	Ultimate_ALT108_WAR	473297.9	-41.24	32.428		32.62	0.000019	3.512	135885.2	3951.35	0.08
Columbia	RM 102.5-	105.84	100-yr	Ultimate_ALT107_SF	598597.1	-41.24	27.251		27.62	0.000041	4.867	123712.2	3157.02	0.12
Columbia	RM 102.5-	105.84	100-yr	Ultimate_ALT108_SF	598597.4	-41.24	27.251		27.62	0.000041	4.867	123712.2	3157.02	0.12
Columbia	RM 102.5-	105.79	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.48	31.301		31.5	0.000021	3.616	131470.2	3828.39	0.08
Columbia	RM 102.5-	105.79	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.48	31.301		31.5	0.000021	3.616	131470.2	3828.39	0.08
Columbia	RM 102.5-	105.79	2-year	Ultimate_ALT107_WAR	238812.4	-42.48	17.965		18.05	0.000013	2.378	100469.6	2419.72	0.06
Columbia	RM 102.5-	105.79	2-year	Ultimate_ALT108_WAR	238812.4	-42.48	17.965		18.05	0.000013	2.378	100469.6	2419.72	0.06
Columbia	RM 102.5-	105.79	2-year	Ultimate_ALT107_SF	341557	-42.48	17.397		17.58	0.000028	3.446	99170.58	2412.4	0.09
Columbia	RM 102.5-	105.79	2-year	Ultimate_ALT108_SF	341557	-42.48	17.397		17.58	0.000028	3.446	99170.58	2412.4	0.09
Columbia	RM 102.5-	105.79	100-yr	Ultimate_ALT107_WAR	473297.4	-42.48	32.418		32.61	0.00002	3.552	134104.4	3898.97	0.08
Columbia	RM 102.5-	105.79	100-yr	Ultimate_ALT108_WAR	473297.9	-42.48	32.418		32.61	0.00002	3.552	134104.4	3898.97	0.08
Columbia	RM 102.5-	105.79	100-yr	Ultimate_ALT107_SF	598597.1	-42.48	27.229		27.61	0.000043	4.929	121916.6	3523.39	0.12
Columbia	RM 102.5-	105.79	100-yr	Ultimate_ALT108_SF	598597.4	-42.48	27.229		27.61	0.000043	4.929	121916.6	3523.39	0.12
Columbia	RM 102.5-	105.74	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-45.49	31.315		31.49	0.000017	3.362	142952.5	2942.9	0.08
Columbia	RM 102.5-	105.74	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-45.49	31.315		31.49	0.000017	3.362	142952.5	2942.9	0.08
Columbia	RM 102.5-	105.74	2-year	Ultimate_ALT107_WAR	238812.4	-45.49	17.972		18.05	0.00001	2.182	109533.5	2365.34	0.06
Columbia	RM 102.5-	105.74	2-year	Ultimate_ALT108_WAR	238812.4	-45.49	17.972		18.05	0.00001	2.182	109533.5	2365.34	0.06
Columbia	RM 102.5-	105.74	2-year	Ultimate_ALT107_SF	341557	-45.49	17.412		17.57	0.000021	3.159	108210.4	2360.29	0.08
Columbia	RM 102.5-	105.74	2-year	Ultimate_ALT108_SF	341557	-45.49	17.412		17.57	0.000021	3.159	108210.4	2360.29	0.08
Columbia	RM 102.5-	105.74	100-yr	Ultimate_ALT107_WAR	473297.4	-45.49	32.432		32.6	0.000016	3.304	146241.2	2944.56	0.07
Columbia	RM 102.5-	105.74	100-yr	Ultimate_ALT108_WAR	473297.9	-45.49	32.432		32.6	0.000016	3.304	146241.2	2944.56	0.07
Columbia	RM 102.5-	105.74	100-yr	Ultimate_ALT107_SF	598597.1	-45.49	27.257		27.58	0.000035	4.568	131809.7	2483.09	0.11
Columbia	RM 102.5-	105.74	100-yr	Ultimate_ALT108_SF	598597.4	-45.49	27.257		27.58	0.000035	4.568	131809.7	2483.09	0.11
Columbia	RM 102.5-	105.6	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-43.52	31.272		31.47	0.000019	3.625	134270.5	2679.06	0.08
Columbia	RM 102.5-	105.6	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-43.52	31.272		31.47	0.000019	3.625	134270.5	2679.06	0.08
Columbia	RM 102.5-	105.6	2-year	Ultimate_ALT107_WAR	238812.4	-43.52	17.951		18.04	0.000011	2.342	102602.3	2302.08	0.06
Columbia	RM 102.5-	105.6	2-year	Ultimate_ALT108_WAR	238812.4	-43.52	17.951		18.04	0.000011	2.342	102602.3	2302.08	0.06
Columbia	RM 102.5-	105.6	2-year	Ultimate_ALT107_SF	341557	-43.52	17.369		17.55	0.000023	3.39	101269.4	2260.03	0.09
Columbia	RM 102.5-	105.6	2-year	Ultimate_ALT108_SF	341557	-43.52	17.369		17.55	0.000023	3.39	101269.4	2260.03	0.09
Columbia	RM 102.5-	105.6	100-yr	Ultimate_ALT107_WAR	473297.4	-43.52	32.391		32.59	0.000018	3.564	137016.8	2694.33	0.08
Columbia	RM 102.5-	105.6	100-yr	Ultimate_ALT108_WAR	473297.9	-43.52	32.391		32.59	0.000018	3.564	137016.8	2694.33	0.08
Columbia	RM 102.5-	105.6	100-yr	Ultimate_ALT107_SF	598597.1	-43.52	27.173		27.55	0.000038	4.925	124321.1	2499.27	0.11
Columbia	RM 102.5-	105.6	100-yr	Ultimate_ALT108_SF	598597.4	-43.52	27.173		27.55	0.000038	4.925	124321.1	2499.27	0.11
Columbia	RM 102.5-	105.44	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-45.02	31.257		31.46	0.000018	3.614	132686.8	2470.48	0.08
Columbia	RM 102.5-	105.44	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-45.02	31.257		31.46	0.000018	3.614	132686.8	2470.48	0.08
Columbia	RM 102.5-	105.44	2-year	Ultimate_ALT107_WAR	238812.4	-45.02	17.945		18.03	0.00001	2.299	104016.8	2044.51	0.06
Columbia	RM 102.5-	105.44	2-year	Ultimate_ALT108_WAR	238812.4	-45.02	17.945		18.03	0.00001	2.299	104016.8	2044.51	0.06
Columbia	RM 102.5-	105.44	2-year	Ultimate_ALT107_SF	341557	-45.02	17.356		17.53	0.00002	3.325	102815.5	2029.32	0.08
Columbia	RM 102.5-	105.44	2-year	Ultimate_ALT108_SF	341557	-45.02	17.356		17.53	0.00002	3.325	102815.5	2029.32	0.08

Columbia	RM 102.5-1	105.44	100-yr	Ultimate_ALT107_WAR	473297.4	-45.02	32.376		32.57	0.000017	3.557	135156	2745.15	0.08
Columbia	RM 102.5-1	105.44	100-yr	Ultimate_ALT108_WAR	473297.9	-45.02	32.376		32.57	0.000017	3.557	135156	2745.15	0.08
Columbia	RM 102.5-1	105.44	100-yr	Ultimate_ALT107_SF	598597.1	-45.02	27.146		27.52	0.000035	4.892	123653.1	2300.93	0.11
Columbia	RM 102.5-1	105.44	100-yr	Ultimate_ALT108_SF	598597.4	-45.02	27.146		27.52	0.000035	4.892	123653.1	2300.93	0.11
Columbia	RM 102.5-1	105.29	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.78	31.235		31.44	0.000022	3.663	130828.5	2493.82	0.08
Columbia	RM 102.5-1	105.29	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.78	31.235		31.44	0.000022	3.663	130828.5	2493.82	0.08
Columbia	RM 102.5-1	105.29	2-year	Ultimate_ALT107_WAR	238812.4	-42.78	17.933		18.02	0.000012	2.343	102055.4	2105.88	0.06
Columbia	RM 102.5-1	105.29	2-year	Ultimate_ALT108_WAR	238812.4	-42.78	17.933		18.02	0.000012	2.343	102055.4	2105.88	0.06
Columbia	RM 102.5-1	105.29	2-year	Ultimate_ALT107_SF	341557	-42.78	17.329		17.51	0.000025	3.391	100816.7	2043.21	0.08
Columbia	RM 102.5-1	105.29	2-year	Ultimate_ALT108_SF	341557	-42.78	17.329		17.51	0.000025	3.391	100816.7	2043.21	0.08
Columbia	RM 102.5-1	105.29	100-yr	Ultimate_ALT107_WAR	473297.4	-42.78	32.356		32.56	0.00002	3.603	133313.6	2795.54	0.08
Columbia	RM 102.5-1	105.29	100-yr	Ultimate_ALT108_WAR	473297.9	-42.78	32.356		32.56	0.00002	3.603	133313.5	2795.54	0.08
Columbia	RM 102.5-1	105.29	100-yr	Ultimate_ALT107_SF	598597.1	-42.78	27.101		27.48	0.000043	4.967	121726.8	2252.21	0.11
Columbia	RM 102.5-1	105.29	100-yr	Ultimate_ALT108_SF	598597.4	-42.78	27.101		27.48	0.000043	4.967	121726.8	2252.21	0.11
Columbia	RM 102.5-1	105.11	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.78	31.218		31.42	0.000023	3.621	132405.3	3681.17	0.08
Columbia	RM 102.5-1	105.11	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.78	31.218		31.42	0.000023	3.621	132405.2	3681.17	0.08
Columbia	RM 102.5-1	105.11	2-year	Ultimate_ALT107_WAR	238812.4	-42.78	17.922		18.01	0.000013	2.32	103185.5	2182.63	0.06
Columbia	RM 102.5-1	105.11	2-year	Ultimate_ALT108_WAR	238812.4	-42.78	17.922		18.01	0.000013	2.32	103185.5	2182.63	0.06
Columbia	RM 102.5-1	105.11	2-year	Ultimate_ALT107_SF	341557	-42.78	17.307		17.48	0.000028	3.359	101864.2	2157.09	0.08
Columbia	RM 102.5-1	105.11	2-year	Ultimate_ALT108_SF	341557	-42.78	17.307		17.48	0.000028	3.359	101864.2	2157.09	0.08
Columbia	RM 102.5-1	105.11	100-yr	Ultimate_ALT107_WAR	473297.4	-42.78	32.339		32.54	0.000022	3.562	134908.3	3878.71	0.08
Columbia	RM 102.5-1	105.11	100-yr	Ultimate_ALT108_WAR	473297.9	-42.78	32.339		32.54	0.000022	3.562	134908.3	3878.71	0.08
Columbia	RM 102.5-1	105.11	100-yr	Ultimate_ALT107_SF	598597.1	-42.78	27.065		27.44	0.000047	4.913	123192.9	2526.63	0.11
Columbia	RM 102.5-1	105.11	100-yr	Ultimate_ALT108_SF	598597.4	-42.78	27.065		27.44	0.000047	4.913	123192.9	2526.63	0.11
Columbia	RM 102.5-1	104.94	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.75	31.213		31.4	0.000017	3.439	138649.5	3478.99	0.08
Columbia	RM 102.5-1	104.94	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.75	31.213		31.4	0.000017	3.439	138649.5	3478.99	0.08
Columbia	RM 102.5-1	104.94	2-year	Ultimate_ALT107_WAR	238812.4	-42.75	17.917		17.99	0.00001	2.213	108128.5	2255.84	0.06
Columbia	RM 102.5-1	104.94	2-year	Ultimate_ALT108_WAR	238812.4	-42.75	17.917		17.99	0.00001	2.213	108128.5	2255.84	0.06
Columbia	RM 102.5-1	104.94	2-year	Ultimate_ALT107_SF	341557	-42.75	17.296		17.46	0.000021	3.206	106728.4	2251.45	0.08
Columbia	RM 102.5-1	104.94	2-year	Ultimate_ALT108_SF	341557	-42.75	17.296		17.46	0.000021	3.206	106728.4	2251.45	0.08
Columbia	RM 102.5-1	104.94	100-yr	Ultimate_ALT107_WAR	473297.4	-42.75	32.335		32.51	0.000016	3.383	141243.7	3655.38	0.07
Columbia	RM 102.5-1	104.94	100-yr	Ultimate_ALT108_WAR	473297.9	-42.75	32.335		32.51	0.000016	3.383	141243.7	3655.38	0.07
Columbia	RM 102.5-1	104.94	100-yr	Ultimate_ALT107_SF	598597.1	-42.75	27.053		27.39	0.000035	4.671	129040.6	2775.35	0.11
Columbia	RM 102.5-1	104.94	100-yr	Ultimate_ALT108_SF	598597.4	-42.75	27.053		27.39	0.000035	4.671	129040.5	2775.35	0.11
Columbia	RM 102.5-1	104.78	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-44.9	31.205		31.38	0.000016	3.359	141727.2	3170.88	0.07
Columbia	RM 102.5-1	104.78	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-44.9	31.205		31.38	0.000016	3.359	141727.2	3170.88	0.07
Columbia	RM 102.5-1	104.78	2-year	Ultimate_ALT107_WAR	238812.4	-44.9	17.912		17.98	0.000009	2.16	110789.7	2303.87	0.05
Columbia	RM 102.5-1	104.78	2-year	Ultimate_ALT108_WAR	238812.4	-44.9	17.912		17.98	0.000009	2.16	110789.7	2303.87	0.05
Columbia	RM 102.5-1	104.78	2-year	Ultimate_ALT107_SF	341557	-44.9	17.285		17.44	0.00002	3.13	109345.9	2300.51	0.08
Columbia	RM 102.5-1	104.78	2-year	Ultimate_ALT108_SF	341557	-44.9	17.285		17.44	0.00002	3.13	109345.9	2300.51	0.08
Columbia	RM 102.5-1	104.78	100-yr	Ultimate_ALT107_WAR	473297.4	-44.9	32.328		32.5	0.000015	3.304	144362.5	3332.39	0.07
Columbia	RM 102.5-1	104.78	100-yr	Ultimate_ALT108_WAR	473297.9	-44.9	32.328		32.5	0.000015	3.304	144362.5	3332.38	0.07
Columbia	RM 102.5-1	104.78	100-yr	Ultimate_ALT107_SF	598597.1	-44.9	27.037		27.36	0.000033	4.562	131974.6	2982.07	0.11

Columbia	RM 102.5-1	104.78	100-yr	Ultimate_ALT108_SF	598597.4	-44.9	27.037		27.36	0.000033	4.562	131974.6	2982.07	0.11
Columbia	RM 102.5-1	104.63	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-44.53	31.193		31.37	0.000017	3.334	143878.5	2752.04	0.07
Columbia	RM 102.5-1	104.63	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-44.53	31.193		31.37	0.000017	3.334	143878.5	2752.04	0.07
Columbia	RM 102.5-1	104.63	2-year	Ultimate_ALT107_WAR	238812.4	-44.53	17.906		17.98	0.00001	2.129	112618.4	2287.75	0.05
Columbia	RM 102.5-1	104.63	2-year	Ultimate_ALT108_WAR	238812.4	-44.53	17.906		17.98	0.00001	2.129	112618.4	2287.75	0.05
Columbia	RM 102.5-1	104.63	2-year	Ultimate_ALT107_SF	341557	-44.53	17.271		17.42	0.00002	3.084	111169.6	2278.74	0.08
Columbia	RM 102.5-1	104.63	2-year	Ultimate_ALT108_SF	341557	-44.53	17.271		17.42	0.00002	3.084	111169.6	2278.74	0.08
Columbia	RM 102.5-1	104.63	100-yr	Ultimate_ALT107_WAR	473297.4	-44.53	32.317		32.48	0.000016	3.28	146567.5	3156.38	0.07
Columbia	RM 102.5-1	104.63	100-yr	Ultimate_ALT108_WAR	473297.9	-44.53	32.317		32.48	0.000016	3.28	146567.5	3156.37	0.07
Columbia	RM 102.5-1	104.63	100-yr	Ultimate_ALT107_SF	598597.1	-44.53	27.013		27.33	0.000035	4.521	133927.3	2370.9	0.1
Columbia	RM 102.5-1	104.63	100-yr	Ultimate_ALT108_SF	598597.4	-44.53	27.013		27.33	0.000035	4.521	133927.3	2370.9	0.1
Columbia	RM 102.5-1	104.47	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.91	31.188		31.35	0.000015	3.23	149545.9	3458.87	0.07
Columbia	RM 102.5-1	104.47	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.91	31.188		31.35	0.000015	3.23	149545.9	3458.87	0.07
Columbia	RM 102.5-1	104.47	2-year	Ultimate_ALT107_WAR	238812.4	-42.91	17.9		17.97	0.000009	2.089	114753.8	2462.41	0.05
Columbia	RM 102.5-1	104.47	2-year	Ultimate_ALT108_WAR	238812.4	-42.91	17.9		17.97	0.000009	2.089	114753.8	2462.41	0.05
Columbia	RM 102.5-1	104.47	2-year	Ultimate_ALT107_SF	341557	-42.91	17.259		17.4	0.000019	3.028	113177.6	2455.71	0.08
Columbia	RM 102.5-1	104.47	2-year	Ultimate_ALT108_SF	341557	-42.91	17.259		17.4	0.000019	3.028	113177.6	2455.71	0.08
Columbia	RM 102.5-1	104.47	100-yr	Ultimate_ALT107_WAR	473297.4	-42.91	32.312		32.47	0.000014	3.174	152921.6	4085.41	0.07
Columbia	RM 102.5-1	104.47	100-yr	Ultimate_ALT108_WAR	473297.9	-42.91	32.312		32.47	0.000014	3.174	152921.6	4085.41	0.07
Columbia	RM 102.5-1	104.47	100-yr	Ultimate_ALT107_SF	598597.1	-42.91	26.999		27.3	0.000031	4.396	137825.7	2888.43	0.1
Columbia	RM 102.5-1	104.47	100-yr	Ultimate_ALT108_SF	598597.4	-42.91	26.999		27.3	0.000031	4.396	137825.7	2888.43	0.1
Columbia	RM 102.5-1	104.31	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-43.78	31.172		31.34	0.000017	3.253	148260.8	3553.44	0.08
Columbia	RM 102.5-1	104.31	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-43.78	31.172		31.34	0.000017	3.253	148260.8	3553.44	0.08
Columbia	RM 102.5-1	104.31	2-year	Ultimate_ALT107_WAR	238812.4	-43.78	17.888		17.96	0.00001	2.146	111456.9	2573.97	0.06
Columbia	RM 102.5-1	104.31	2-year	Ultimate_ALT108_WAR	238812.4	-43.78	17.888		17.96	0.00001	2.146	111456.9	2573.97	0.06
Columbia	RM 102.5-1	104.31	2-year	Ultimate_ALT107_SF	341557	-43.78	17.232		17.38	0.000022	3.115	109773.2	2563.51	0.08
Columbia	RM 102.5-1	104.31	2-year	Ultimate_ALT108_SF	341557	-43.78	17.232		17.38	0.000022	3.115	109773.2	2563.51	0.08
Columbia	RM 102.5-1	104.31	100-yr	Ultimate_ALT107_WAR	473297.4	-43.78	32.297		32.45	0.000016	3.193	151509.7	3994.14	0.07
Columbia	RM 102.5-1	104.31	100-yr	Ultimate_ALT108_WAR	473297.9	-43.78	32.297		32.45	0.000016	3.193	151509.7	3994.13	0.07
Columbia	RM 102.5-1	104.31	100-yr	Ultimate_ALT107_SF	598597.1	-43.78	26.962		27.27	0.000035	4.455	136141.9	2875.47	0.11
Columbia	RM 102.5-1	104.31	100-yr	Ultimate_ALT108_SF	598597.4	-43.78	26.962		27.27	0.000035	4.455	136141.9	2875.47	0.11
Columbia	RM 102.5-1	104.15	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-42.11	31.177		31.31	0.000014	2.984	173584	5222.46	0.07
Columbia	RM 102.5-1	104.15	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-42.11	31.177		31.31	0.000014	2.984	173584	5222.46	0.07
Columbia	RM 102.5-1	104.15	2-year	Ultimate_ALT107_WAR	238812.4	-42.11	17.888		17.95	0.000008	1.971	123501.5	3172.68	0.05
Columbia	RM 102.5-1	104.15	2-year	Ultimate_ALT108_WAR	238812.4	-42.11	17.888		17.95	0.000008	1.971	123501.5	3172.68	0.05
Columbia	RM 102.5-1	104.15	2-year	Ultimate_ALT107_SF	341557	-42.11	17.232		17.36	0.000018	2.861	121448.4	3149.88	0.08
Columbia	RM 102.5-1	104.15	2-year	Ultimate_ALT108_SF	341557	-42.11	17.232		17.36	0.000018	2.861	121448.4	3149.88	0.08
Columbia	RM 102.5-1	104.15	100-yr	Ultimate_ALT107_WAR	473297.4	-42.11	32.303		32.43	0.000013	2.925	178792.6	5688.37	0.07
Columbia	RM 102.5-1	104.15	100-yr	Ultimate_ALT108_WAR	473297.9	-42.11	32.303		32.43	0.000013	2.925	178792.6	5688.37	0.07
Columbia	RM 102.5-1	104.15	100-yr	Ultimate_ALT107_SF	598597.1	-42.11	26.97		27.23	0.000029	4.089	155261.5	4513.46	0.1
Columbia	RM 102.5-1	104.15	100-yr	Ultimate_ALT108_SF	598597.4	-42.11	26.97		27.23	0.000029	4.089	155261.5	4513.46	0.1
Columbia	RM 102.5-1	103.99	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-46.09	31.176		31.3	0.000012	2.82	172875.6	3870.55	0.06

Columbia	RM 102.5-1	103.99	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-46.09	31.176		31.3	0.000012	2.821	172875.5	3870.55	0.06
Columbia	RM 102.5-1	103.99	2-year	Ultimate_ALT107_WAR	238812.4	-46.09	17.886		17.94	0.000007	1.847	129601.3	2950.4	0.05
Columbia	RM 102.5-1	103.99	2-year	Ultimate_ALT108_WAR	238812.4	-46.09	17.886		17.94	0.000007	1.847	129601.3	2950.4	0.05
Columbia	RM 102.5-1	103.99	2-year	Ultimate_ALT107_SF	341557	-46.09	17.228		17.34	0.000016	2.68	127683	2894.38	0.07
Columbia	RM 102.5-1	103.99	2-year	Ultimate_ALT108_SF	341557	-46.09	17.228		17.34	0.000016	2.68	127683	2894.38	0.07
Columbia	RM 102.5-1	103.99	100-yr	Ultimate_ALT107_WAR	473297.4	-46.09	32.301		32.42	0.000012	2.77	177087.5	4431.65	0.06
Columbia	RM 102.5-1	103.99	100-yr	Ultimate_ALT108_WAR	473297.9	-46.09	32.301		32.42	0.000012	2.77	177087.5	4431.65	0.06
Columbia	RM 102.5-1	103.99	100-yr	Ultimate_ALT107_SF	598597.1	-46.09	26.965		27.2	0.000025	3.855	158487.1	3355.55	0.09
Columbia	RM 102.5-1	103.99	100-yr	Ultimate_ALT108_SF	598597.4	-46.09	26.965		27.2	0.000025	3.855	158487.1	3355.55	0.09
Columbia	RM 102.5-1	103.84	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-43.49	31.169		31.29	0.000012	2.769	173291.2	4182.01	0.06
Columbia	RM 102.5-1	103.84	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-43.49	31.169		31.29	0.000012	2.769	173291.1	4182.01	0.06
Columbia	RM 102.5-1	103.84	2-year	Ultimate_ALT107_WAR	238812.4	-43.49	17.882		17.93	0.000007	1.814	131919.8	2997.39	0.05
Columbia	RM 102.5-1	103.84	2-year	Ultimate_ALT108_WAR	238812.4	-43.49	17.882		17.93	0.000007	1.814	131919.8	2997.39	0.05
Columbia	RM 102.5-1	103.84	2-year	Ultimate_ALT107_SF	341557	-43.49	17.219		17.33	0.000016	2.632	129951.9	2958.38	0.07
Columbia	RM 102.5-1	103.84	2-year	Ultimate_ALT108_SF	341557	-43.49	17.219		17.33	0.000016	2.632	129951.9	2958.38	0.07
Columbia	RM 102.5-1	103.84	100-yr	Ultimate_ALT107_WAR	473297.4	-43.49	32.296		32.41	0.000011	2.72	176903.7	4348.27	0.06
Columbia	RM 102.5-1	103.84	100-yr	Ultimate_ALT108_WAR	473297.9	-43.49	32.296		32.41	0.000011	2.72	176903.7	4348.27	0.06
Columbia	RM 102.5-1	103.84	100-yr	Ultimate_ALT107_SF	598597.1	-43.49	26.952		27.17	0.000025	3.783	159891.8	3387.32	0.09
Columbia	RM 102.5-1	103.84	100-yr	Ultimate_ALT108_SF	598597.4	-43.49	26.952		27.17	0.000025	3.783	159891.8	3387.32	0.09
Columbia	RM 102.5-1	103.7	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-43.38	31.161		31.28	0.000011	2.771	174435.5	3601.34	0.06
Columbia	RM 102.5-1	103.7	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-43.38	31.161		31.28	0.000011	2.771	174435.5	3601.34	0.06
Columbia	RM 102.5-1	103.7	2-year	Ultimate_ALT107_WAR	238812.4	-43.38	17.878		17.93	0.000006	1.784	134166.8	2790.47	0.04
Columbia	RM 102.5-1	103.7	2-year	Ultimate_ALT108_WAR	238812.4	-43.38	17.878		17.93	0.000006	1.784	134166.8	2790.47	0.04
Columbia	RM 102.5-1	103.7	2-year	Ultimate_ALT107_SF	341557	-43.38	17.21		17.31	0.000013	2.586	132307.5	2781.29	0.07
Columbia	RM 102.5-1	103.7	2-year	Ultimate_ALT108_SF	341557	-43.38	17.21		17.31	0.000013	2.586	132307.5	2781.29	0.07
Columbia	RM 102.5-1	103.7	100-yr	Ultimate_ALT107_WAR	473297.4	-43.38	32.287		32.4	0.00001	2.724	178159.5	3686.83	0.06
Columbia	RM 102.5-1	103.7	100-yr	Ultimate_ALT108_WAR	473297.9	-43.38	32.287		32.4	0.00001	2.724	178159.5	3686.83	0.06
Columbia	RM 102.5-1	103.7	100-yr	Ultimate_ALT107_SF	598597.1	-43.38	26.935		27.16	0.000022	3.772	160501.5	3256.62	0.09
Columbia	RM 102.5-1	103.7	100-yr	Ultimate_ALT108_SF	598597.4	-43.38	26.935		27.16	0.000022	3.772	160501.5	3256.62	0.09
Columbia	RM 102.5-1	103.56	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-44.88	31.153		31.27	0.00001	2.753	174162.5	3185.36	0.06
Columbia	RM 102.5-1	103.56	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-44.88	31.153		31.27	0.00001	2.753	174162.5	3185.36	0.06
Columbia	RM 102.5-1	103.56	2-year	Ultimate_ALT107_WAR	238812.4	-44.88	17.874		17.92	0.000006	1.753	136457.6	2690.36	0.04
Columbia	RM 102.5-1	103.56	2-year	Ultimate_ALT108_WAR	238812.4	-44.88	17.874		17.92	0.000006	1.753	136457.6	2690.36	0.04
Columbia	RM 102.5-1	103.56	2-year	Ultimate_ALT107_SF	341557	-44.88	17.203		17.3	0.000012	2.54	134654.3	2683.64	0.06
Columbia	RM 102.5-1	103.56	2-year	Ultimate_ALT108_SF	341557	-44.88	17.203		17.3	0.000012	2.54	134654.3	2683.64	0.06
Columbia	RM 102.5-1	103.56	100-yr	Ultimate_ALT107_WAR	473297.4	-44.88	32.28		32.39	0.00001	2.709	177695	3632.79	0.06
Columbia	RM 102.5-1	103.56	100-yr	Ultimate_ALT108_WAR	473297.9	-44.88	32.28		32.39	0.00001	2.709	177695	3632.79	0.06
Columbia	RM 102.5-1	103.56	100-yr	Ultimate_ALT107_SF	598597.1	-44.88	26.922		27.14	0.000021	3.736	161340.1	2886.67	0.08
Columbia	RM 102.5-1	103.56	100-yr	Ultimate_ALT108_SF	598597.4	-44.88	26.922		27.14	0.000021	3.736	161340.1	2886.67	0.08
Columbia	RM 102.5-1	103.41	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-48.32	31.137		31.26	0.000011	2.839	168902.3	3050.72	0.06
Columbia	RM 102.5-1	103.41	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-48.32	31.137		31.26	0.000011	2.839	168902.3	3050.71	0.06
Columbia	RM 102.5-1	103.41	2-year	Ultimate_ALT107_WAR	238812.4	-48.32	17.867		17.92	0.000006	1.81	132158.8	2636.43	0.04
Columbia	RM 102.5-1	103.41	2-year	Ultimate_ALT108_WAR	238812.4	-48.32	17.867		17.92	0.000006	1.81	132158.8	2636.43	0.04

Columbia	RM 102.5-1	103.41	2-year	Ultimate_ALT107_SF	341557	-48.32	17.186		17.29	0.000013	2.624	130369.4	2626.96	0.06
Columbia	RM 102.5-1	103.41	2-year	Ultimate_ALT108_SF	341557	-48.32	17.186		17.29	0.000013	2.624	130369.4	2626.96	0.06
Columbia	RM 102.5-1	103.41	100-yr	Ultimate_ALT107_WAR	473297.4	-48.32	32.265		32.39	0.00001	2.792	172198.5	3486.06	0.06
Columbia	RM 102.5-1	103.41	100-yr	Ultimate_ALT108_WAR	473297.9	-48.32	32.265		32.39	0.00001	2.792	172198.5	3486.06	0.06
Columbia	RM 102.5-1	103.41	100-yr	Ultimate_ALT107_SF	598597.1	-48.32	26.89		27.12	0.000022	3.853	156706.2	2816.14	0.09
Columbia	RM 102.5-1	103.41	100-yr	Ultimate_ALT108_SF	598597.4	-48.32	26.89		27.12	0.000022	3.853	156706.2	2816.14	0.09
Columbia	RM 102.5-1	103.24	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-45.98	31.124		31.25	0.000011	2.869	167237.9	2809.5	0.06
Columbia	RM 102.5-1	103.24	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-45.98	31.124		31.25	0.000011	2.869	167237.9	2809.5	0.06
Columbia	RM 102.5-1	103.24	2-year	Ultimate_ALT107_WAR	238812.4	-45.98	17.861		17.91	0.000006	1.813	132445.5	2571.38	0.04
Columbia	RM 102.5-1	103.24	2-year	Ultimate_ALT108_WAR	238812.4	-45.98	17.861		17.91	0.000006	1.813	132445.5	2571.38	0.04
Columbia	RM 102.5-1	103.24	2-year	Ultimate_ALT107_SF	341557	-45.98	17.175		17.28	0.000012	2.626	130682.6	2565.75	0.06
Columbia	RM 102.5-1	103.24	2-year	Ultimate_ALT108_SF	341557	-45.98	17.175		17.28	0.000012	2.626	130682.6	2565.75	0.06
Columbia	RM 102.5-1	103.24	100-yr	Ultimate_ALT107_WAR	473297.4	-45.98	32.252		32.38	0.00001	2.824	170239.7	2936.86	0.06
Columbia	RM 102.5-1	103.24	100-yr	Ultimate_ALT108_WAR	473297.9	-45.98	32.252		32.38	0.00001	2.824	170239.7	2936.86	0.06
Columbia	RM 102.5-1	103.24	100-yr	Ultimate_ALT107_SF	598597.1	-45.98	26.866		27.1	0.000022	3.885	155940.3	2645.7	0.09
Columbia	RM 102.5-1	103.24	100-yr	Ultimate_ALT108_SF	598597.4	-45.98	26.866		27.1	0.000022	3.885	155940.3	2645.7	0.09
Columbia	RM 102.5-1	103.06	FEMA 100-year	Ultimate_ALT107_FEMA	472616.8	-47.44	31.094		31.24	0.000012	3.064	155794.5	2528.05	0.07
Columbia	RM 102.5-1	103.06	FEMA 100-year	Ultimate_ALT108_FEMA	472617.5	-47.44	31.094		31.24	0.000012	3.064	155794.5	2528.05	0.07
Columbia	RM 102.5-1	103.06	2-year	Ultimate_ALT107_WAR	238812.4	-47.44	17.848		17.91	0.000006	1.932	123874.2	2364	0.05
Columbia	RM 102.5-1	103.06	2-year	Ultimate_ALT108_WAR	238812.4	-47.44	17.848		17.91	0.000006	1.932	123874.2	2364	0.05
Columbia	RM 102.5-1	103.06	2-year	Ultimate_ALT107_SF	341557	-47.44	17.146		17.27	0.000014	2.799	122221.9	2349.45	0.07
Columbia	RM 102.5-1	103.06	2-year	Ultimate_ALT108_SF	341557	-47.44	17.146		17.27	0.000014	2.799	122221.9	2349.45	0.07
Columbia	RM 102.5-1	103.06	100-yr	Ultimate_ALT107_WAR	473297.4	-47.44	32.223		32.36	0.000012	3.017	158548.9	2619.24	0.06
Columbia	RM 102.5-1	103.06	100-yr	Ultimate_ALT108_WAR	473297.9	-47.44	32.223		32.36	0.000012	3.017	158548.9	2619.24	0.06
Columbia	RM 102.5-1	103.06	100-yr	Ultimate_ALT107_SF	598597.1	-47.44	26.808		27.08	0.000024	4.149	145394.7	2416.71	0.09
Columbia	RM 102.5-1	103.06	100-yr	Ultimate_ALT108_SF	598597.4	-47.44	26.808		27.08	0.000024	4.149	145394.7	2416.71	0.09
Columbia	RM 101.5-1	102.65	FEMA 100-year	Ultimate_ALT107_FEMA	565000.1	-55.72	31.102		31.21	0.000008	2.574	221044.3	4040.43	0.05
Columbia	RM 101.5-1	102.65	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-55.72	31.102		31.21	0.000008	2.574	221044.3	4040.43	0.05
Columbia	RM 101.5-1	102.65	2-year	Ultimate_ALT107_WAR	278000	-55.72	17.851		17.89	0.000004	1.556	178805.7	3115.23	0.04
Columbia	RM 101.5-1	102.65	2-year	Ultimate_ALT108_WAR	278000	-55.72	17.851		17.89	0.000004	1.556	178805.7	3115.23	0.04
Columbia	RM 101.5-1	102.65	2-year	Ultimate_ALT107_SF	397000	-55.72	17.154		17.23	0.000008	2.249	176634.4	3111.29	0.05
Columbia	RM 101.5-1	102.65	2-year	Ultimate_ALT108_SF	397000	-55.72	17.154		17.23	0.000008	2.249	176634.4	3111.29	0.05
Columbia	RM 101.5-1	102.65	100-yr	Ultimate_ALT107_WAR	566000.1	-55.72	32.231		32.33	0.000008	2.538	224939.5	4209.25	0.05
Columbia	RM 101.5-1	102.65	100-yr	Ultimate_ALT108_WAR	566000.1	-55.72	32.231		32.33	0.000008	2.538	224939.5	4209.25	0.05
Columbia	RM 101.5-1	102.65	100-yr	Ultimate_ALT107_SF	711000.1	-55.72	26.824		27.01	0.000015	3.447	207157.5	3857.81	0.07
Columbia	RM 101.5-1	102.65	100-yr	Ultimate_ALT108_SF	711000.1	-55.72	26.824		27.01	0.000015	3.447	207157.5	3857.81	0.07
Columbia	RM 101.5-1	102.46	FEMA 100-year	Ultimate_ALT107_FEMA	565000.1	-52.55	31.08	-33.88	31.19	0.00001	2.722	209851.7	3329.92	0.06
Columbia	RM 101.5-1	102.46	FEMA 100-year	Ultimate_ALT108_FEMA	565000.1	-52.55	31.08	-33.88	31.19	0.00001	2.722	209851.7	3329.92	0.06
Columbia	RM 101.5-1	102.46	2-year	Ultimate_ALT107_WAR	278000	-52.55	17.84	-38.83	17.88	0.000005	1.677	166167.5	3252.1	0.04
Columbia	RM 101.5-1	102.46	2-year	Ultimate_ALT108_WAR	278000	-52.55	17.84	-38.83	17.88	0.000005	1.677	166167.5	3252.1	0.04
Columbia	RM 101.5-1	102.46	2-year	Ultimate_ALT107_SF	397000	-52.55	17.13	-36.62	17.22	0.00001	2.428	163862.8	3240.43	0.06
Columbia	RM 101.5-1	102.46	2-year	Ultimate_ALT108_SF	397000	-52.55	17.13	-36.62	17.22	0.00001	2.428	163862.8	3240.43	0.06
Columbia	RM 101.5-1	102.46	100-yr	Ultimate_ALT107_WAR	566000.1	-52.55	32.21	-33.87	32.32	0.000009	2.68	213609	3429.18	0.06

Columbia	RM 101.5-1	102.46	100-yr	Ultimate_ALT108_WAR	566000.1	-52.55	32.21	-33.87	32.32	0.000009	2.68	213609	3429.18	0.06
Columbia	RM 101.5-1	102.46	100-yr	Ultimate_ALT107_SF	711000.1	-52.55	26.78	-31.72	26.99	0.000019	3.666	195594.4	3310.36	0.08
Columbia	RM 101.5-1	102.46	100-yr	Ultimate_ALT108_SF	711000.1	-52.55	26.78	-31.72	26.99	0.000019	3.666	195594.4	3310.36	0.08
Col-Hayde	RM 106 Le	6.04	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-13.69	31.842	1.79	31.94	0.000031	2.475	39728.4	1584.71	0.08
Col-Hayde	RM 106 Le	6.04	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-13.69	31.842	1.79	31.94	0.000031	2.475	39728.34	1584.71	0.08
Col-Hayde	RM 106 Le	6.04	2-year	Ultimate_ALT107_WAR	39187.67	-13.69	18.303	-3.4	18.35	0.000032	1.772	22544.47	1187.1	0.07
Col-Hayde	RM 106 Le	6.04	2-year	Ultimate_ALT108_WAR	39187.67	-13.69	18.303	-3.4	18.35	0.000032	1.772	22544.47	1187.1	0.07
Col-Hayde	RM 106 Le	6.04	2-year	Ultimate_ALT107_SF	55443.02	-13.69	18.108	-1.24	18.21	0.000065	2.533	22313.5	1186.22	0.1
Col-Hayde	RM 106 Le	6.04	2-year	Ultimate_ALT108_SF	55443.02	-13.69	18.108	-1.24	18.21	0.000065	2.533	22313.5	1186.22	0.1
Col-Hayde	RM 106 Le	6.04	100-yr	Ultimate_ALT107_WAR	92702.67	-13.69	32.921	1.82	33.01	0.000028	2.401	41450.1	1612.98	0.07
Col-Hayde	RM 106 Le	6.04	100-yr	Ultimate_ALT108_WAR	92702.12	-13.69	32.921	1.82	33.01	0.000028	2.4	41450.1	1612.98	0.07
Col-Hayde	RM 106 Le	6.04	100-yr	Ultimate_ALT107_SF	112403	-13.69	28.312	3.14	28.49	0.000066	3.362	34648.28	1425.26	0.11
Col-Hayde	RM 106 Le	6.04	100-yr	Ultimate_ALT108_SF	112402.7	-13.69	28.312	3.14	28.49	0.000066	3.362	34648.27	1425.26	0.11
Col-Hayde	RM 106 Le	5.83	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-10.56	31.763	5.55	31.9	0.000043	2.964	32386.09	1419.31	0.09
Col-Hayde	RM 106 Le	5.83	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-10.56	31.763	5.55	31.9	0.000043	2.964	32386.06	1419.31	0.09
Col-Hayde	RM 106 Le	5.83	2-year	Ultimate_ALT107_WAR	39187.67	-10.56	18.237	0.79	18.31	0.000049	2.198	17871.53	983.55	0.09
Col-Hayde	RM 106 Le	5.83	2-year	Ultimate_ALT108_WAR	39187.67	-10.56	18.237	0.79	18.31	0.000049	2.198	17871.53	983.55	0.09
Col-Hayde	RM 106 Le	5.83	2-year	Ultimate_ALT107_SF	55443.02	-10.56	17.972	2.62	18.13	0.000102	3.155	17610.25	982.44	0.13
Col-Hayde	RM 106 Le	5.83	2-year	Ultimate_ALT108_SF	55443.02	-10.56	17.972	2.62	18.13	0.000102	3.155	17610.25	982.44	0.13
Col-Hayde	RM 106 Le	5.83	100-yr	Ultimate_ALT107_WAR	92702.67	-10.56	32.849	5.58	32.98	0.000038	2.87	33927.88	1421.13	0.09
Col-Hayde	RM 106 Le	5.83	100-yr	Ultimate_ALT108_WAR	92702.12	-10.56	32.849	5.58	32.98	0.000038	2.87	33927.88	1421.13	0.09
Col-Hayde	RM 106 Le	5.83	100-yr	Ultimate_ALT107_SF	112403	-10.56	28.145	6.74	28.4	0.000095	4.084	27826.72	1096.18	0.14
Col-Hayde	RM 106 Le	5.83	100-yr	Ultimate_ALT108_SF	112402.7	-10.56	28.145	6.74	28.4	0.000095	4.084	27826.71	1096.18	0.14
Col-Hayde	RM 106 Le	5.66	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-13.3	31.701	3.34	31.86	0.000043	3.195	29918.9	1252.56	0.1
Col-Hayde	RM 106 Le	5.66	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-13.3	31.701	3.33	31.86	0.000043	3.195	29918.88	1252.56	0.1
Col-Hayde	RM 106 Le	5.66	2-year	Ultimate_ALT107_WAR	39187.67	-13.3	18.194	-1.85	18.27	0.000042	2.258	17483.31	877.96	0.09
Col-Hayde	RM 106 Le	5.66	2-year	Ultimate_ALT108_WAR	39187.67	-13.3	18.194	-1.85	18.27	0.000042	2.258	17483.31	877.96	0.09
Col-Hayde	RM 106 Le	5.66	2-year	Ultimate_ALT107_SF	55443.02	-13.3	17.879	-0.09	18.04	0.000089	3.245	17207.39	877.06	0.13
Col-Hayde	RM 106 Le	5.66	2-year	Ultimate_ALT108_SF	55443.02	-13.3	17.879	-0.09	18.04	0.000089	3.245	17207.39	877.06	0.13
Col-Hayde	RM 106 Le	5.66	100-yr	Ultimate_ALT107_WAR	92702.67	-13.3	32.792	3.36	32.94	0.000039	3.102	31285.62	1256.33	0.09
Col-Hayde	RM 106 Le	5.66	100-yr	Ultimate_ALT108_WAR	92702.12	-13.3	32.792	3.36	32.94	0.000039	3.102	31285.61	1256.33	0.09
Col-Hayde	RM 106 Le	5.66	100-yr	Ultimate_ALT107_SF	112403	-13.3	28.024	4.82	28.32	0.000094	4.361	26282.71	915.29	0.14
Col-Hayde	RM 106 Le	5.66	100-yr	Ultimate_ALT108_SF	112402.7	-13.3	28.024	4.82	28.32	0.000094	4.361	26282.7	915.29	0.14
Col-Hayde	RM 106 Le	5.53	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-18.96	31.628	-2.67	31.82	0.000044	3.563	26167.54	899.46	0.1
Col-Hayde	RM 106 Le	5.53	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-18.96	31.628	-2.67	31.82	0.000044	3.563	26167.53	899.46	0.1
Col-Hayde	RM 106 Le	5.53	2-year	Ultimate_ALT107_WAR	39187.67	-18.96	18.164	-8.5	18.25	0.000032	2.305	17012.39	660.57	0.08
Col-Hayde	RM 106 Le	5.53	2-year	Ultimate_ALT108_WAR	39187.67	-18.96	18.164	-8.5	18.25	0.000032	2.305	17012.39	660.57	0.08
Col-Hayde	RM 106 Le	5.53	2-year	Ultimate_ALT107_SF	55443.02	-18.96	17.817	-6.47	17.99	0.000068	3.306	16783.92	658.96	0.11
Col-Hayde	RM 106 Le	5.53	2-year	Ultimate_ALT108_SF	55443.02	-18.96	17.817	-6.47	17.99	0.000068	3.306	16783.92	658.96	0.11
Col-Hayde	RM 106 Le	5.53	100-yr	Ultimate_ALT107_WAR	92702.67	-18.96	32.721	-2.63	32.91	0.000041	3.477	26935.96	1012.25	0.1
Col-Hayde	RM 106 Le	5.53	100-yr	Ultimate_ALT108_WAR	92702.12	-18.96	32.721	-2.63	32.91	0.000041	3.477	26935.96	1012.25	0.1
Col-Hayde	RM 106 Le	5.53	100-yr	Ultimate_ALT107_SF	112403	-18.96	27.889	-0.9	28.25	0.000092	4.798	23567.75	720.93	0.14
Col-Hayde	RM 106 Le	5.53	100-yr	Ultimate_ALT108_SF	112402.7	-18.96	27.889	-0.9	28.25	0.000092	4.798	23567.74	720.93	0.14

Col-Hayde	RM 106 Le	5.44	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-24.84	31.626	-8.33	31.8	0.000034	3.349	27823.59	1380.1	0.09
Col-Hayde	RM 106 Le	5.44	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-24.84	31.626	-8.34	31.8	0.000034	3.349	27823.57	1380.1	0.09
Col-Hayde	RM 106 Le	5.44	2-year	Ultimate_ALT107_WAR	39187.67	-24.84	18.164	-14.38	18.23	0.00002	2.05	19126.78	630.28	0.07
Col-Hayde	RM 106 Le	5.44	2-year	Ultimate_ALT108_WAR	39187.67	-24.84	18.164	-14.38	18.23	0.00002	2.05	19126.78	630.28	0.07
Col-Hayde	RM 106 Le	5.44	2-year	Ultimate_ALT107_SF	55443.02	-24.84	17.819	-12.27	17.95	0.000042	2.934	18909.05	629.53	0.09
Col-Hayde	RM 106 Le	5.44	2-year	Ultimate_ALT108_SF	55443.02	-24.84	17.819	-12.27	17.95	0.000042	2.934	18909.05	629.53	0.09
Col-Hayde	RM 106 Le	5.44	100-yr	Ultimate_ALT107_WAR	92702.67	-24.84	32.719	-8.31	32.89	0.000032	3.278	28549.53	1472.43	0.09
Col-Hayde	RM 106 Le	5.44	100-yr	Ultimate_ALT108_WAR	92702.12	-24.84	32.719	-8.3	32.89	0.000032	3.278	28549.53	1472.43	0.09
Col-Hayde	RM 106 Le	5.44	100-yr	Ultimate_ALT107_SF	112403	-24.84	27.888	-6.48	28.2	0.000068	4.456	25363.6	1202.86	0.12
Col-Hayde	RM 106 Le	5.44	100-yr	Ultimate_ALT108_SF	112402.7	-24.84	27.888	-6.48	28.2	0.000068	4.456	25363.6	1202.86	0.12
Col-Hayde	RM 106 Le	5.41	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-25.73	31.615	-8.89	31.79	0.000039	3.386	27947.28	984.36	0.09
Col-Hayde	RM 106 Le	5.41	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-25.73	31.615	-8.89	31.79	0.000039	3.386	27947.27	984.36	0.09
Col-Hayde	RM 106 Le	5.41	2-year	Ultimate_ALT107_WAR	39187.67	-25.73	18.159	-15.21	18.23	0.000024	2.071	18953.11	629.83	0.07
Col-Hayde	RM 106 Le	5.41	2-year	Ultimate_ALT108_WAR	39187.67	-25.73	18.159	-15.21	18.23	0.000024	2.071	18953.11	629.83	0.07
Col-Hayde	RM 106 Le	5.41	2-year	Ultimate_ALT107_SF	55443.02	-25.73	17.807	-12.98	17.94	0.000049	2.963	18732	628.32	0.09
Col-Hayde	RM 106 Le	5.41	2-year	Ultimate_ALT108_SF	55443.02	-25.73	17.807	-12.98	17.94	0.000049	2.963	18732	628.32	0.09
Col-Hayde	RM 106 Le	5.41	100-yr	Ultimate_ALT107_WAR	92702.67	-25.73	32.709	-8.85	32.88	0.000036	3.313	28774.28	1031.72	0.09
Col-Hayde	RM 106 Le	5.41	100-yr	Ultimate_ALT108_WAR	92702.12	-25.73	32.709	-8.85	32.88	0.000036	3.313	28774.27	1031.72	0.09
Col-Hayde	RM 106 Le	5.41	100-yr	Ultimate_ALT107_SF	112403	-25.73	27.867	-6.98	28.18	0.000078	4.505	25337.77	755.97	0.12
Col-Hayde	RM 106 Le	5.41	100-yr	Ultimate_ALT108_SF	112402.7	-25.73	27.867	-6.98	28.18	0.000078	4.505	25337.77	755.97	0.12
Col-Hayde	RM 106 Le	5.24	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-31.75	31.577	-14.57	31.72	0.00016	3.051	30528.33	675.55	0.08
Col-Hayde	RM 106 Le	5.24	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-31.75	31.577	-14.57	31.72	0.00016	3.051	30528.32	675.55	0.08
Col-Hayde	RM 106 Le	5.24	2-year	Ultimate_ALT107_WAR	39187.67	-31.75	18.134	-20.84	18.18	0.000087	1.812	21658.49	640.62	0.05
Col-Hayde	RM 106 Le	5.24	2-year	Ultimate_ALT108_WAR	39187.67	-31.75	18.134	-20.84	18.18	0.000087	1.812	21658.49	640.62	0.05
Col-Hayde	RM 106 Le	5.24	2-year	Ultimate_ALT107_SF	55443.02	-31.75	17.755	-18.69	17.86	0.000181	2.592	21416.2	638.76	0.08
Col-Hayde	RM 106 Le	5.24	2-year	Ultimate_ALT108_SF	55443.02	-31.75	17.755	-18.69	17.86	0.000181	2.592	21416.2	638.76	0.08
Col-Hayde	RM 106 Le	5.24	100-yr	Ultimate_ALT107_WAR	92702.67	-31.75	32.674	-14.54	32.81	0.000149	2.991	31271.3	680.15	0.08
Col-Hayde	RM 106 Le	5.24	100-yr	Ultimate_ALT108_WAR	92702.12	-31.75	32.674	-14.54	32.81	0.000149	2.991	31271.29	680.15	0.08
Col-Hayde	RM 106 Le	5.24	100-yr	Ultimate_ALT107_SF	112403	-31.75	27.788	-12.67	28.04	0.000314	4.041	27987.07	666.76	0.11
Col-Hayde	RM 106 Le	5.24	100-yr	Ultimate_ALT108_SF	112402.7	-31.75	27.788	-12.67	28.04	0.000314	4.041	27987.07	666.76	0.11
Col-Hayde	RM 106 Le	5.07	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-22.67	31.492	-7.73	31.66	0.000033	3.327	28187.86	942.54	0.09
Col-Hayde	RM 106 Le	5.07	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-22.67	31.492	-7.73	31.66	0.000033	3.327	28187.85	942.54	0.09
Col-Hayde	RM 106 Le	5.07	2-year	Ultimate_ALT107_WAR	39187.67	-22.67	18.086	-13.28	18.15	0.00002	2.039	19271.96	644.04	0.06
Col-Hayde	RM 106 Le	5.07	2-year	Ultimate_ALT108_WAR	39187.67	-22.67	18.086	-13.28	18.15	0.00002	2.039	19271.96	644.04	0.06
Col-Hayde	RM 106 Le	5.07	2-year	Ultimate_ALT107_SF	55443.02	-22.67	17.656	-11.38	17.79	0.000042	2.926	18994.97	642.63	0.09
Col-Hayde	RM 106 Le	5.07	2-year	Ultimate_ALT108_SF	55443.02	-22.67	17.656	-11.38	17.79	0.000042	2.926	18994.97	642.63	0.09
Col-Hayde	RM 106 Le	5.07	100-yr	Ultimate_ALT107_WAR	92702.67	-22.67	32.595	-7.7	32.76	0.000031	3.255	28947.69	1020.24	0.09
Col-Hayde	RM 106 Le	5.07	100-yr	Ultimate_ALT108_WAR	92702.12	-22.67	32.595	-7.7	32.76	0.000031	3.255	28947.69	1020.23	0.09
Col-Hayde	RM 106 Le	5.07	100-yr	Ultimate_ALT107_SF	112403	-22.67	27.62	-6.05	27.93	0.000067	4.449	25555.12	673.93	0.12
Col-Hayde	RM 106 Le	5.07	100-yr	Ultimate_ALT108_SF	112402.7	-22.67	27.62	-6.04	27.93	0.000067	4.449	25555.11	673.93	0.12
Col-Hayde	RM 106 Le	4.94	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-24.34	31.509	-5.46	31.63	0.000026	2.788	33593.94	928.44	0.08
Col-Hayde	RM 106 Le	4.94	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-24.34	31.509	-5.46	31.63	0.000026	2.788	33593.94	928.44	0.08

Col-Hayde	RM 106 Le	4.94	2-year	Ultimate_ALT107_WAR	39187.67	-24.34	18.084	-10.48	18.13	0.000019	1.785	22012.63	837.51	0.06
Col-Hayde	RM 106 Le	4.94	2-year	Ultimate_ALT108_WAR	39187.67	-24.34	18.084	-10.48	18.13	0.000019	1.785	22012.63	837.51	0.06
Col-Hayde	RM 106 Le	4.94	2-year	Ultimate_ALT107_SF	55443.02	-24.34	17.651	-8.79	17.75	0.000039	2.567	21649.76	835.72	0.09
Col-Hayde	RM 106 Le	4.94	2-year	Ultimate_ALT108_SF	55443.02	-24.34	17.651	-8.79	17.75	0.000039	2.567	21649.76	835.72	0.09
Col-Hayde	RM 106 Le	4.94	100-yr	Ultimate_ALT107_WAR	92702.67	-24.34	32.612	-5.42	32.73	0.000024	2.721	34582.5	1036.32	0.07
Col-Hayde	RM 106 Le	4.94	100-yr	Ultimate_ALT108_WAR	92702.12	-24.34	32.612	-5.43	32.73	0.000024	2.721	34582.48	1036.32	0.07
Col-Hayde	RM 106 Le	4.94	100-yr	Ultimate_ALT107_SF	112403	-24.34	27.641	-3.93	27.86	0.000055	3.762	30178.64	871.39	0.11
Col-Hayde	RM 106 Le	4.94	100-yr	Ultimate_ALT108_SF	112402.7	-24.34	27.641	-3.93	27.86	0.000055	3.762	30178.63	871.39	0.11
Col-Hayde	RM 106 Le	4.82	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-27.83	31.528	-11.79	31.6	0.000014	2.216	42401.1	1048.8	0.06
Col-Hayde	RM 106 Le	4.82	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-27.83	31.528	-11.8	31.6	0.000014	2.216	42401.08	1048.8	0.06
Col-Hayde	RM 106 Le	4.82	2-year	Ultimate_ALT107_WAR	39187.67	-27.83	18.093	-17	18.12	0.000008	1.322	29705.91	915.17	0.04
Col-Hayde	RM 106 Le	4.82	2-year	Ultimate_ALT108_WAR	39187.67	-27.83	18.093	-17	18.12	0.000008	1.322	29705.91	915.17	0.04
Col-Hayde	RM 106 Le	4.82	2-year	Ultimate_ALT107_SF	55443.02	-27.83	17.668	-15.01	17.72	0.000016	1.895	29317.62	913.83	0.06
Col-Hayde	RM 106 Le	4.82	2-year	Ultimate_ALT108_SF	55443.02	-27.83	17.668	-15.01	17.72	0.000016	1.895	29317.62	913.83	0.06
Col-Hayde	RM 106 Le	4.82	100-yr	Ultimate_ALT107_WAR	92702.67	-27.83	32.63	-11.77	32.7	0.000013	2.172	43578.37	1166.44	0.06
Col-Hayde	RM 106 Le	4.82	100-yr	Ultimate_ALT108_WAR	92702.12	-27.83	32.63	-11.77	32.7	0.000013	2.172	43578.35	1166.44	0.06
Col-Hayde	RM 106 Le	4.82	100-yr	Ultimate_ALT107_SF	112403	-27.83	27.677	-10.43	27.81	0.000027	2.941	38634.1	951.31	0.08
Col-Hayde	RM 106 Le	4.82	100-yr	Ultimate_ALT108_SF	112402.7	-27.83	27.677	-10.44	27.81	0.000027	2.941	38634.09	951.31	0.08
Col-Hayde	RM 106 Le	4.72	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-19.94	31.534	-5.55	31.59	0.000014	1.893	49890.18	1455.25	0.05
Col-Hayde	RM 106 Le	4.72	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-19.94	31.534	-5.55	31.59	0.000014	1.893	49890.16	1455.25	0.05
Col-Hayde	RM 106 Le	4.72	2-year	Ultimate_ALT107_WAR	39187.67	-19.94	18.09	-10.33	18.11	0.00001	1.234	31801.12	1272.4	0.04
Col-Hayde	RM 106 Le	4.72	2-year	Ultimate_ALT108_WAR	39187.67	-19.94	18.09	-10.33	18.11	0.00001	1.234	31801.12	1272.4	0.04
Col-Hayde	RM 106 Le	4.72	2-year	Ultimate_ALT107_SF	55443.02	-19.94	17.662	-8.66	17.71	0.000022	1.776	31257.12	1270.73	0.06
Col-Hayde	RM 106 Le	4.72	2-year	Ultimate_ALT108_SF	55443.02	-19.94	17.662	-8.66	17.71	0.000022	1.776	31257.12	1270.73	0.06
Col-Hayde	RM 106 Le	4.72	100-yr	Ultimate_ALT107_WAR	92702.67	-19.94	32.637	-5.53	32.69	0.000013	1.845	51500.73	1465.6	0.05
Col-Hayde	RM 106 Le	4.72	100-yr	Ultimate_ALT108_WAR	92702.12	-19.94	32.637	-5.53	32.69	0.000013	1.845	51500.71	1465.6	0.05
Col-Hayde	RM 106 Le	4.72	100-yr	Ultimate_ALT107_SF	112403	-19.94	27.683	-4.07	27.78	0.00003	2.562	44384.47	1406.25	0.08
Col-Hayde	RM 106 Le	4.72	100-yr	Ultimate_ALT108_SF	112402.7	-19.94	27.683	-4.08	27.78	0.00003	2.562	44384.46	1406.25	0.08
Col-Hayde	RM 106 Le	4.62	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.23	31.541	-1.12	31.58	0.000011	1.544	60135.2	1686.09	0.04
Col-Hayde	RM 106 Le	4.62	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.23	31.541	-1.12	31.58	0.000011	1.544	60135.18	1686.09	0.04
Col-Hayde	RM 106 Le	4.62	2-year	Ultimate_ALT107_WAR	39187.67	-16.23	18.09	-6.5	18.11	0.000009	1.035	37862.27	1634.72	0.04
Col-Hayde	RM 106 Le	4.62	2-year	Ultimate_ALT108_WAR	39187.67	-16.23	18.09	-6.5	18.11	0.000009	1.035	37862.27	1634.72	0.04
Col-Hayde	RM 106 Le	4.62	2-year	Ultimate_ALT107_SF	55443.02	-16.23	17.663	-4.85	17.7	0.000019	1.492	37162.97	1633.58	0.06
Col-Hayde	RM 106 Le	4.62	2-year	Ultimate_ALT108_SF	55443.02	-16.23	17.663	-4.85	17.7	0.000019	1.492	37162.97	1633.58	0.06
Col-Hayde	RM 106 Le	4.62	100-yr	Ultimate_ALT107_WAR	92702.67	-16.23	32.643	-1.11	32.68	0.00001	1.503	61998.14	1707.08	0.04
Col-Hayde	RM 106 Le	4.62	100-yr	Ultimate_ALT108_WAR	92702.12	-16.23	32.643	-1.11	32.68	0.00001	1.503	61998.12	1707.08	0.04
Col-Hayde	RM 106 Le	4.62	100-yr	Ultimate_ALT107_SF	112403	-16.23	27.694	-0.36	27.76	0.000023	2.1	53694.75	1663.83	0.06
Col-Hayde	RM 106 Le	4.62	100-yr	Ultimate_ALT108_SF	112402.7	-16.23	27.694	-0.35	27.76	0.000023	2.1	53694.75	1663.83	0.06
Col-Hayde	RM 106 Le	4.58	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-13.1	31.524	-0.92	31.57	0.000012	1.804	51827.2	1466.24	0.05
Col-Hayde	RM 106 Le	4.58	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-13.1	31.524	-0.92	31.57	0.000012	1.804	51827.17	1466.24	0.05
Col-Hayde	RM 106 Le	4.58	2-year	Ultimate_ALT107_WAR	39187.67	-13.1	18.082	-5.28	18.1	0.00001	1.202	32699.19	1386.76	0.04
Col-Hayde	RM 106 Le	4.58	2-year	Ultimate_ALT108_WAR	39187.67	-13.1	18.082	-5.28	18.1	0.00001	1.202	32699.19	1386.76	0.04
Col-Hayde	RM 106 Le	4.58	2-year	Ultimate_ALT107_SF	55443.02	-13.1	17.645	-3.67	17.69	0.000021	1.732	32093.71	1384.31	0.06

Col-Hayde	RM 106 Le	4.58	2-year	Ultimate_ALT108_SF	55443.02	-13.1	17.645	-3.67	17.69	0.000021	1.732	32093.71	1384.31	0.06
Col-Hayde	RM 106 Le	4.58	100-yr	Ultimate_ALT107_WAR	92702.67	-13.1	32.627	-0.9	32.67	0.000011	1.758	53450.14	1476.22	0.05
Col-Hayde	RM 106 Le	4.58	100-yr	Ultimate_ALT108_WAR	92702.12	-13.1	32.627	-0.9	32.67	0.000011	1.758	53450.11	1476.22	0.05
Col-Hayde	RM 106 Le	4.58	100-yr	Ultimate_ALT107_SF	112403	-13.1	27.661	-0.15	27.75	0.000026	2.454	46232.88	1435.35	0.07
Col-Hayde	RM 106 Le	4.58	100-yr	Ultimate_ALT108_SF	112402.7	-13.1	27.661	-0.15	27.75	0.000026	2.454	46232.88	1435.35	0.07
Col-Hayde	RM 106 Le	4.55	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-14.31	31.508	-1.61	31.57	0.000015	2.005	46601.44	1290.42	0.06
Col-Hayde	RM 106 Le	4.55	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-14.31	31.508	-1.61	31.57	0.000015	2.005	46601.42	1290.42	0.06
Col-Hayde	RM 106 Le	4.55	2-year	Ultimate_ALT107_WAR	39187.67	-14.31	18.075	-6.49	18.1	0.000011	1.318	29805.7	1220.59	0.05
Col-Hayde	RM 106 Le	4.55	2-year	Ultimate_ALT108_WAR	39187.67	-14.31	18.075	-6.49	18.1	0.000011	1.318	29805.7	1220.59	0.05
Col-Hayde	RM 106 Le	4.55	2-year	Ultimate_ALT107_SF	55443.02	-14.31	17.63	-5.08	17.69	0.000024	1.898	29263.48	1218.4	0.07
Col-Hayde	RM 106 Le	4.55	2-year	Ultimate_ALT108_SF	55443.02	-14.31	17.63	-5.08	17.69	0.000024	1.898	29263.48	1218.4	0.07
Col-Hayde	RM 106 Le	4.55	100-yr	Ultimate_ALT107_WAR	92702.67	-14.31	32.612	-1.59	32.67	0.000013	1.955	48032.83	1312.01	0.05
Col-Hayde	RM 106 Le	4.55	100-yr	Ultimate_ALT108_WAR	92702.12	-14.31	32.612	-1.59	32.67	0.000013	1.955	48032.81	1312.01	0.05
Col-Hayde	RM 106 Le	4.55	100-yr	Ultimate_ALT107_SF	112403	-14.31	27.632	-0.73	27.75	0.000031	2.72	41656.86	1265.23	0.08
Col-Hayde	RM 106 Le	4.55	100-yr	Ultimate_ALT108_SF	112402.7	-14.31	27.632	-0.73	27.75	0.000031	2.72	41656.86	1265.23	0.08
Col-Hayde	RM 106 Le	4.52	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-12.54	31.493	-0.83	31.57	0.000018	2.185	42846.63	1330.59	0.06
Col-Hayde	RM 106 Le	4.52	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-12.54	31.493	-0.83	31.57	0.000018	2.185	42846.62	1330.59	0.06
Col-Hayde	RM 106 Le	4.52	2-year	Ultimate_ALT107_WAR	39187.67	-12.54	18.067	-5.24	18.1	0.000014	1.444	27154.8	1126.64	0.05
Col-Hayde	RM 106 Le	4.52	2-year	Ultimate_ALT108_WAR	39187.67	-12.54	18.067	-5.24	18.1	0.000014	1.444	27154.8	1126.64	0.05
Col-Hayde	RM 106 Le	4.52	2-year	Ultimate_ALT107_SF	55443.02	-12.54	17.614	-3.87	17.68	0.00003	2.082	26644.42	1124.75	0.08
Col-Hayde	RM 106 Le	4.52	2-year	Ultimate_ALT108_SF	55443.02	-12.54	17.614	-3.87	17.68	0.00003	2.082	26644.42	1124.75	0.08
Col-Hayde	RM 106 Le	4.52	100-yr	Ultimate_ALT107_WAR	92702.67	-12.54	32.598	-0.82	32.67	0.000017	2.129	44195.43	1486.13	0.06
Col-Hayde	RM 106 Le	4.52	100-yr	Ultimate_ALT108_WAR	92702.12	-12.54	32.598	-0.82	32.67	0.000017	2.129	44195.43	1486.12	0.06
Col-Hayde	RM 106 Le	4.52	100-yr	Ultimate_ALT107_SF	112403	-12.54	27.602	0.05	27.74	0.000039	2.969	38168.6	1189.05	0.09
Col-Hayde	RM 106 Le	4.52	100-yr	Ultimate_ALT108_SF	112402.7	-12.54	27.602	0.05	27.74	0.000039	2.969	38168.59	1189.05	0.09
Col-Hayde	RM 106 Le	4.47			Bridge									
Col-Hayde	RM 106 Le	4.46	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-14.4	31.467	-2.75	31.56	0.00002	2.388	39529.12	1383.27	0.07
Col-Hayde	RM 106 Le	4.46	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-14.4	31.467	-2.75	31.56	0.00002	2.388	39529.11	1383.27	0.07
Col-Hayde	RM 106 Le	4.46	2-year	Ultimate_ALT107_WAR	39187.67	-14.4	18.056	-5.81	18.09	0.000014	1.531	25634.42	985.21	0.05
Col-Hayde	RM 106 Le	4.46	2-year	Ultimate_ALT108_WAR	39187.67	-14.4	18.056	-5.81	18.09	0.000014	1.531	25634.42	985.21	0.05
Col-Hayde	RM 106 Le	4.46	2-year	Ultimate_ALT107_SF	55443.02	-14.4	17.591	-4.77	17.67	0.00003	2.205	25176.55	983.13	0.08
Col-Hayde	RM 106 Le	4.46	2-year	Ultimate_ALT108_SF	55443.02	-14.4	17.591	-4.77	17.67	0.00003	2.205	25176.55	983.13	0.08
Col-Hayde	RM 106 Le	4.46	100-yr	Ultimate_ALT107_WAR	92702.67	-14.4	32.573	-2.73	32.66	0.000018	2.33	40822.81	1542.83	0.06
Col-Hayde	RM 106 Le	4.46	100-yr	Ultimate_ALT108_WAR	92702.12	-14.4	32.573	-2.73	32.66	0.000018	2.33	40822.8	1542.83	0.06
Col-Hayde	RM 106 Le	4.46	100-yr	Ultimate_ALT107_SF	112403	-14.4	27.555	-1.77	27.72	0.000041	3.226	35238.26	1098.73	0.09
Col-Hayde	RM 106 Le	4.46	100-yr	Ultimate_ALT108_SF	112402.7	-14.4	27.555	-1.77	27.72	0.000041	3.226	35238.26	1098.73	0.09
Col-Hayde	RM 106 Le	4.42			Bridge									
Col-Hayde	RM 106 Le	4.38	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.65	31.432	-3.11	31.54	0.000023	2.616	36021.33	949.95	0.07
Col-Hayde	RM 106 Le	4.38	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.65	31.432	-3.11	31.54	0.000023	2.616	36021.33	949.95	0.07
Col-Hayde	RM 106 Le	4.38	2-year	Ultimate_ALT107_WAR	39187.67	-16.65	18.04	-6.49	18.08	0.000016	1.655	23743.26	885.58	0.06
Col-Hayde	RM 106 Le	4.38	2-year	Ultimate_ALT108_WAR	39187.67	-16.65	18.04	-6.49	18.08	0.000016	1.655	23743.26	885.58	0.06

Col-Hayde	RM 106 Le	4.38	2-year	Ultimate_ALT107_SF	55443.02	-16.65	17.557	-5.34	17.65	0.000033	2.383	23316.09	883.56	0.08
Col-Hayde	RM 106 Le	4.38	2-year	Ultimate_ALT108_SF	55443.02	-16.65	17.557	-5.34	17.65	0.000033	2.383	23316.09	883.56	0.08
Col-Hayde	RM 106 Le	4.38	100-yr	Ultimate_ALT107_WAR	92702.67	-16.65	32.54	-3.09	32.64	0.000021	2.555	37077.77	957.36	0.07
Col-Hayde	RM 106 Le	4.38	100-yr	Ultimate_ALT108_WAR	92702.12	-16.65	32.54	-3.09	32.64	0.000021	2.554	37077.76	957.36	0.07
Col-Hayde	RM 106 Le	4.38	100-yr	Ultimate_ALT107_SF	112403	-16.65	27.489	-2.03	27.68	0.000048	3.526	32312.22	931.8	0.1
Col-Hayde	RM 106 Le	4.38	100-yr	Ultimate_ALT108_SF	112402.7	-16.65	27.489	-2.03	27.68	0.000048	3.526	32312.22	931.8	0.1
Col-Hayde	RM 106 Le	4.35			Bridge									
Col-Hayde	RM 106 Le	4.33	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-17.78	31.42	-4.29	31.53	0.000022	2.613	35918.6	919.21	0.07
Col-Hayde	RM 106 Le	4.33	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-17.78	31.42	-4.29	31.53	0.000022	2.613	35918.59	919.21	0.07
Col-Hayde	RM 106 Le	4.33	2-year	Ultimate_ALT107_WAR	39187.67	-17.78	18.035	-7.98	18.08	0.000015	1.631	24061.62	861.69	0.05
Col-Hayde	RM 106 Le	4.33	2-year	Ultimate_ALT108_WAR	39187.67	-17.78	18.035	-7.98	18.08	0.000015	1.631	24061.62	861.69	0.05
Col-Hayde	RM 106 Le	4.33	2-year	Ultimate_ALT107_SF	55443.02	-17.78	17.546	-6.66	17.63	0.000031	2.348	23640.91	859.6	0.08
Col-Hayde	RM 106 Le	4.33	2-year	Ultimate_ALT108_SF	55443.02	-17.78	17.546	-6.66	17.63	0.000031	2.348	23640.91	859.6	0.08
Col-Hayde	RM 106 Le	4.33	100-yr	Ultimate_ALT107_WAR	92702.67	-17.78	32.529	-4.27	32.63	0.000021	2.554	36945.77	981.13	0.07
Col-Hayde	RM 106 Le	4.33	100-yr	Ultimate_ALT108_WAR	92702.12	-17.78	32.529	-4.27	32.63	0.000021	2.554	36945.76	981.13	0.07
Col-Hayde	RM 106 Le	4.33	100-yr	Ultimate_ALT107_SF	112403	-17.78	27.467	-3.17	27.66	0.000046	3.513	32337.19	895.58	0.1
Col-Hayde	RM 106 Le	4.33	100-yr	Ultimate_ALT108_SF	112402.7	-17.78	27.467	-3.17	27.66	0.000046	3.513	32337.19	895.58	0.1
Col-Hayde	RM 106 Le	4.27	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-19.1	31.387	-5.34	31.52	0.000027	2.898	32828.13	848.99	0.08
Col-Hayde	RM 106 Le	4.27	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-19.1	31.387	-5.34	31.52	0.000027	2.898	32828.12	848.99	0.08
Col-Hayde	RM 106 Le	4.27	2-year	Ultimate_ALT107_WAR	39187.67	-19.1	18.02	-9.47	18.07	0.000017	1.808	21862.04	795.95	0.06
Col-Hayde	RM 106 Le	4.27	2-year	Ultimate_ALT108_WAR	39187.67	-19.1	18.02	-9.47	18.07	0.000017	1.808	21862.04	795.95	0.06
Col-Hayde	RM 106 Le	4.27	2-year	Ultimate_ALT107_SF	55443.02	-19.1	17.514	-8.08	17.62	0.000037	2.604	21460.49	793.55	0.09
Col-Hayde	RM 106 Le	4.27	2-year	Ultimate_ALT108_SF	55443.02	-19.1	17.514	-8.08	17.62	0.000037	2.604	21460.49	793.55	0.09
Col-Hayde	RM 106 Le	4.27	100-yr	Ultimate_ALT107_WAR	92702.67	-19.1	32.497	-5.32	32.62	0.000025	2.832	33773.83	892.5	0.08
Col-Hayde	RM 106 Le	4.27	100-yr	Ultimate_ALT108_WAR	92702.12	-19.1	32.497	-5.32	32.62	0.000025	2.832	33773.82	892.5	0.08
Col-Hayde	RM 106 Le	4.27	100-yr	Ultimate_ALT107_SF	112403	-19.1	27.404	-4.03	27.64	0.000056	3.899	29484.13	828.26	0.11
Col-Hayde	RM 106 Le	4.27	100-yr	Ultimate_ALT108_SF	112402.7	-19.1	27.404	-4.03	27.64	0.000056	3.899	29484.13	828.26	0.11
Col-Hayde	RM 106 Le	4.18	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-22.24	31.377	-6.58	31.5	0.000025	2.858	32720.76	821.26	0.08
Col-Hayde	RM 106 Le	4.18	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-22.24	31.377	-6.58	31.5	0.000025	2.858	32720.75	821.26	0.08
Col-Hayde	RM 106 Le	4.18	2-year	Ultimate_ALT107_WAR	39187.67	-22.24	18.015	-10.58	18.06	0.000015	1.749	22505.14	754.46	0.06
Col-Hayde	RM 106 Le	4.18	2-year	Ultimate_ALT108_WAR	39187.67	-22.24	18.015	-10.58	18.06	0.000015	1.749	22505.14	754.46	0.06
Col-Hayde	RM 106 Le	4.18	2-year	Ultimate_ALT107_SF	55443.02	-22.24	17.504	-9.18	17.6	0.000032	2.517	22121.94	753.02	0.08
Col-Hayde	RM 106 Le	4.18	2-year	Ultimate_ALT108_SF	55443.02	-22.24	17.504	-9.18	17.6	0.000032	2.517	22121.94	753.02	0.08
Col-Hayde	RM 106 Le	4.18	100-yr	Ultimate_ALT107_WAR	92702.67	-22.24	32.489	-6.56	32.61	0.000023	2.796	33588.44	877.42	0.07
Col-Hayde	RM 106 Le	4.18	100-yr	Ultimate_ALT108_WAR	92702.12	-22.24	32.489	-6.56	32.61	0.000023	2.796	33588.44	877.42	0.07
Col-Hayde	RM 106 Le	4.18	100-yr	Ultimate_ALT107_SF	112403	-22.24	27.385	-5.33	27.61	0.00005	3.832	29621.58	797.98	0.11
Col-Hayde	RM 106 Le	4.18	100-yr	Ultimate_ALT108_SF	112402.7	-22.24	27.385	-5.33	27.61	0.00005	3.832	29621.58	797.98	0.11
Col-Hayde	RM 106 Le	4.08	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-19.26	31.376	-6.64	31.49	0.000022	2.69	34910.33	859.24	0.07
Col-Hayde	RM 106 Le	4.08	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-19.26	31.376	-6.63	31.49	0.000022	2.69	34910.32	859.24	0.07
Col-Hayde	RM 106 Le	4.08	2-year	Ultimate_ALT107_WAR	39187.67	-19.26	18.012	-10.61	18.05	0.000013	1.645	23893.97	797.16	0.05
Col-Hayde	RM 106 Le	4.08	2-year	Ultimate_ALT108_WAR	39187.67	-19.26	18.012	-10.61	18.05	0.000013	1.645	23893.97	797.16	0.05
Col-Hayde	RM 106 Le	4.08	2-year	Ultimate_ALT107_SF	55443.02	-19.26	17.497	-9.24	17.58	0.000028	2.367	23484.48	794.71	0.08

Col-Hayde	RM 106 Le	4.08	2-year	Ultimate_ALT108_SF	55443.02	-19.26	17.497	-9.24	17.58	0.000028	2.367	23484.48	794.71	0.08
Col-Hayde	RM 106 Le	4.08	100-yr	Ultimate_ALT107_WAR	92702.67	-19.26	32.488	-6.62	32.59	0.00002	2.631	35869.6	885.16	0.07
Col-Hayde	RM 106 Le	4.08	100-yr	Ultimate_ALT108_WAR	92702.12	-19.26	32.488	-6.62	32.59	0.00002	2.631	35869.6	885.16	0.07
Col-Hayde	RM 106 Le	4.08	100-yr	Ultimate_ALT107_SF	112403	-19.26	27.381	-5.43	27.58	0.000044	3.606	31527.61	832.27	0.1
Col-Hayde	RM 106 Le	4.08	100-yr	Ultimate_ALT108_SF	112402.7	-19.26	27.381	-5.43	27.58	0.000044	3.606	31527.61	832.27	0.1
Col-Hayde	RM 106 Le	3.96	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-17.46	31.371	-6.04	31.47	0.000021	2.532	36990.46	1032.79	0.07
Col-Hayde	RM 106 Le	3.96	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-17.46	31.371	-6.04	31.47	0.000021	2.532	36990.46	1032.79	0.07
Col-Hayde	RM 106 Le	3.96	2-year	Ultimate_ALT107_WAR	39187.67	-17.46	18.005	-9.8	18.04	0.000013	1.572	24973.82	872.15	0.05
Col-Hayde	RM 106 Le	3.96	2-year	Ultimate_ALT108_WAR	39187.67	-17.46	18.005	-9.8	18.04	0.000013	1.572	24973.82	872.15	0.05
Col-Hayde	RM 106 Le	3.96	2-year	Ultimate_ALT107_SF	55443.02	-17.46	17.484	-8.43	17.56	0.000028	2.264	24519.37	869.97	0.07
Col-Hayde	RM 106 Le	3.96	2-year	Ultimate_ALT108_SF	55443.02	-17.46	17.484	-8.43	17.56	0.000028	2.264	24519.37	869.97	0.07
Col-Hayde	RM 106 Le	3.96	100-yr	Ultimate_ALT107_WAR	92702.67	-17.46	32.483	-6.02	32.58	0.000019	2.477	38092.09	1281.99	0.07
Col-Hayde	RM 106 Le	3.96	100-yr	Ultimate_ALT108_WAR	92702.12	-17.46	32.483	-6.02	32.58	0.000019	2.476	38092.09	1281.99	0.07
Col-Hayde	RM 106 Le	3.96	100-yr	Ultimate_ALT107_SF	112403	-17.46	27.366	-4.88	27.55	0.000043	3.406	33317.42	969.09	0.1
Col-Hayde	RM 106 Le	3.96	100-yr	Ultimate_ALT108_SF	112402.7	-17.46	27.366	-4.88	27.55	0.000043	3.406	33317.42	969.09	0.1
Col-Hayde	RM 106 Le	3.82	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.62	31.367	-2.19	31.45	0.000019	2.328	40253.99	1314.32	0.07
Col-Hayde	RM 106 Le	3.82	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.62	31.367	-2.19	31.45	0.000019	2.328	40253.98	1314.32	0.07
Col-Hayde	RM 106 Le	3.82	2-year	Ultimate_ALT107_WAR	39187.67	-16.62	17.997	-6.43	18.03	0.000014	1.515	25933.66	1042.23	0.05
Col-Hayde	RM 106 Le	3.82	2-year	Ultimate_ALT108_WAR	39187.67	-16.62	17.997	-6.43	18.03	0.000014	1.515	25933.66	1042.23	0.05
Col-Hayde	RM 106 Le	3.82	2-year	Ultimate_ALT107_SF	55443.02	-16.62	17.465	-4.81	17.54	0.000031	2.189	25380.11	1040.2	0.08
Col-Hayde	RM 106 Le	3.82	2-year	Ultimate_ALT108_SF	55443.02	-16.62	17.465	-4.81	17.54	0.000031	2.189	25380.11	1040.2	0.08
Col-Hayde	RM 106 Le	3.82	100-yr	Ultimate_ALT107_WAR	92702.67	-16.62	32.48	-2.17	32.56	0.000018	2.271	41740.93	2180.99	0.06
Col-Hayde	RM 106 Le	3.82	100-yr	Ultimate_ALT108_WAR	92702.12	-16.62	32.48	-2.16	32.56	0.000018	2.271	41740.93	2180.99	0.06
Col-Hayde	RM 106 Le	3.82	100-yr	Ultimate_ALT107_SF	112403	-16.62	27.352	-0.96	27.51	0.000041	3.165	35848.17	1080.46	0.09
Col-Hayde	RM 106 Le	3.82	100-yr	Ultimate_ALT108_SF	112402.7	-16.62	27.352	-0.96	27.51	0.000041	3.165	35848.17	1080.46	0.09
Col-Hayde	RM 106 Le	3.71	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.82	31.365	-2.8	31.44	0.000016	2.155	43518.16	1374.25	0.06
Col-Hayde	RM 106 Le	3.71	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.82	31.365	-2.8	31.44	0.000016	2.155	43518.15	1374.24	0.06
Col-Hayde	RM 106 Le	3.71	2-year	Ultimate_ALT107_WAR	39187.67	-16.82	17.993	-7.14	18.02	0.000012	1.398	28153.94	1117.55	0.05
Col-Hayde	RM 106 Le	3.71	2-year	Ultimate_ALT108_WAR	39187.67	-16.82	17.993	-7.14	18.02	0.000012	1.398	28153.94	1117.55	0.05
Col-Hayde	RM 106 Le	3.71	2-year	Ultimate_ALT107_SF	55443.02	-16.82	17.457	-5.42	17.52	0.000026	2.02	27555.28	1115.37	0.07
Col-Hayde	RM 106 Le	3.71	2-year	Ultimate_ALT108_SF	55443.02	-16.82	17.457	-5.42	17.52	0.000026	2.02	27555.28	1115.37	0.07
Col-Hayde	RM 106 Le	3.71	100-yr	Ultimate_ALT107_WAR	92702.67	-16.82	32.479	-2.78	32.55	0.000015	2.101	44999.46	1947.49	0.06
Col-Hayde	RM 106 Le	3.71	100-yr	Ultimate_ALT108_WAR	92702.12	-16.82	32.479	-2.78	32.55	0.000015	2.101	44999.46	1947.49	0.06
Col-Hayde	RM 106 Le	3.71	100-yr	Ultimate_ALT107_SF	112403	-16.82	27.346	-1.85	27.48	0.000035	2.93	38783.21	1164.27	0.09
Col-Hayde	RM 106 Le	3.71	100-yr	Ultimate_ALT108_SF	112402.7	-16.82	27.346	-1.86	27.48	0.000035	2.93	38783.21	1164.27	0.09
Col-Hayde	RM 106 Le	3.57	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-21.18	31.357	-4.39	31.42	0.000016	2.07	45231.27	1474.87	0.06
Col-Hayde	RM 106 Le	3.57	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-21.18	31.357	-4.39	31.42	0.000016	2.07	45231.27	1474.87	0.06
Col-Hayde	RM 106 Le	3.57	2-year	Ultimate_ALT107_WAR	39187.67	-21.18	17.986	-8.89	18.01	0.000012	1.357	28948.98	1184.1	0.05
Col-Hayde	RM 106 Le	3.57	2-year	Ultimate_ALT108_WAR	39187.67	-21.18	17.986	-8.89	18.01	0.000012	1.357	28948.98	1184.1	0.05
Col-Hayde	RM 106 Le	3.57	2-year	Ultimate_ALT107_SF	55443.02	-21.18	17.441	-7.32	17.5	0.000026	1.963	28304.18	1182.23	0.07
Col-Hayde	RM 106 Le	3.57	2-year	Ultimate_ALT108_SF	55443.02	-21.18	17.441	-7.32	17.5	0.000026	1.963	28304.18	1182.23	0.07
Col-Hayde	RM 106 Le	3.57	100-yr	Ultimate_ALT107_WAR	92702.67	-21.18	32.472	-4.37	32.53	0.000014	2.017	46814.31	1883.25	0.06
Col-Hayde	RM 106 Le	3.57	100-yr	Ultimate_ALT108_WAR	92702.12	-21.18	32.472	-4.36	32.53	0.000014	2.017	46814.31	1883.25	0.06

Col-Hayde	RM 106 Le	3.57	100-yr	Ultimate_ALT107_SF	112403	-21.18	27.328	-2.99	27.45	0.000033	2.821	40158.82	1216.17	0.08
Col-Hayde	RM 106 Le	3.57	100-yr	Ultimate_ALT108_SF	112402.7	-21.18	27.328	-2.99	27.45	0.000033	2.821	40158.82	1216.17	0.08
Col-Hayde	RM 106 Le	3.45	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-17.43	31.365	-7.51	31.41	0.000009	1.688	55327.17	1741.98	0.05
Col-Hayde	RM 106 Le	3.45	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-17.43	31.365	-7.51	31.41	0.000009	1.688	55327.17	1741.98	0.05
Col-Hayde	RM 106 Le	3.45	2-year	Ultimate_ALT107_WAR	39187.67	-17.43	17.988	-10.52	18.01	0.000006	1.053	37279.08	1321.55	0.03
Col-Hayde	RM 106 Le	3.45	2-year	Ultimate_ALT108_WAR	39187.67	-17.43	17.988	-10.52	18.01	0.000006	1.053	37279.08	1321.55	0.03
Col-Hayde	RM 106 Le	3.45	2-year	Ultimate_ALT107_SF	55443.02	-17.43	17.446	-9.39	17.48	0.000013	1.519	36562.91	1319.82	0.05
Col-Hayde	RM 106 Le	3.45	2-year	Ultimate_ALT108_SF	55443.02	-17.43	17.446	-9.39	17.48	0.000013	1.519	36562.91	1319.82	0.05
Col-Hayde	RM 106 Le	3.45	100-yr	Ultimate_ALT107_WAR	92702.67	-17.43	32.479	-7.49	32.52	0.000008	1.65	56893.45	1956.15	0.04
Col-Hayde	RM 106 Le	3.45	100-yr	Ultimate_ALT108_WAR	92702.12	-17.43	32.479	-7.49	32.52	0.000008	1.65	56893.45	1956.15	0.04
Col-Hayde	RM 106 Le	3.45	100-yr	Ultimate_ALT107_SF	112403	-17.43	27.342	-6.61	27.42	0.000019	2.274	49808.24	1361.66	0.06
Col-Hayde	RM 106 Le	3.45	100-yr	Ultimate_ALT108_SF	112402.7	-17.43	27.342	-6.61	27.42	0.000019	2.274	49808.24	1361.66	0.06
Col-Hayde	RM 106 Le	3.34	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.28	31.347	-3.73	31.4	0.000013	1.876	49729.36	2149.61	0.05
Col-Hayde	RM 106 Le	3.34	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.28	31.347	-3.73	31.4	0.000013	1.876	49729.36	2149.61	0.05
Col-Hayde	RM 106 Le	3.34	2-year	Ultimate_ALT107_WAR	39187.67	-16.28	17.976	-7.73	18	0.000011	1.246	31515.29	1340.65	0.05
Col-Hayde	RM 106 Le	3.34	2-year	Ultimate_ALT108_WAR	39187.67	-16.28	17.976	-7.73	18	0.000011	1.246	31515.29	1340.65	0.05
Col-Hayde	RM 106 Le	3.34	2-year	Ultimate_ALT107_SF	55443.02	-16.28	17.421	-6.37	17.47	0.000023	1.805	30770.37	1339.25	0.07
Col-Hayde	RM 106 Le	3.34	2-year	Ultimate_ALT108_SF	55443.02	-16.28	17.421	-6.37	17.47	0.000023	1.805	30770.37	1339.25	0.07
Col-Hayde	RM 106 Le	3.34	100-yr	Ultimate_ALT107_WAR	92702.67	-16.28	32.463	-3.71	32.51	0.000012	1.827	51422.92	3046.23	0.05
Col-Hayde	RM 106 Le	3.34	100-yr	Ultimate_ALT108_WAR	92702.12	-16.28	32.463	-3.71	32.51	0.000012	1.827	51422.93	3046.23	0.05
Col-Hayde	RM 106 Le	3.34	100-yr	Ultimate_ALT107_SF	112403	-16.28	27.305	-2.27	27.41	0.000029	2.563	44134.07	1366.24	0.08
Col-Hayde	RM 106 Le	3.34	100-yr	Ultimate_ALT108_SF	112402.7	-16.28	27.305	-2.27	27.41	0.000029	2.563	44134.08	1366.24	0.08
Col-Hayde	RM 106 Le	3.32	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.5	31.347	-3.66	31.4	0.000013	1.865	49970.16	1425.13	0.05
Col-Hayde	RM 106 Le	3.32	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.5	31.347	-3.66	31.4	0.000013	1.865	49970.16	1425.13	0.05
Col-Hayde	RM 106 Le	3.32	2-year	Ultimate_ALT107_WAR	39187.67	-16.5	17.976	-7.53	18	0.000011	1.244	31545.74	1355.58	0.05
Col-Hayde	RM 106 Le	3.32	2-year	Ultimate_ALT108_WAR	39187.67	-16.5	17.976	-7.53	18	0.000011	1.244	31545.74	1355.58	0.05
Col-Hayde	RM 106 Le	3.32	2-year	Ultimate_ALT107_SF	55443.02	-16.5	17.419	-6.2	17.47	0.000023	1.802	30791.55	1353.64	0.07
Col-Hayde	RM 106 Le	3.32	2-year	Ultimate_ALT108_SF	55443.02	-16.5	17.419	-6.2	17.47	0.000023	1.802	30791.55	1353.64	0.07
Col-Hayde	RM 106 Le	3.32	100-yr	Ultimate_ALT107_WAR	92702.67	-16.5	32.462	-3.64	32.51	0.000012	1.819	51686.39	2147.18	0.05
Col-Hayde	RM 106 Le	3.32	100-yr	Ultimate_ALT108_WAR	92702.12	-16.5	32.462	-3.64	32.51	0.000012	1.819	51686.39	2147.19	0.05
Col-Hayde	RM 106 Le	3.32	100-yr	Ultimate_ALT107_SF	112403	-16.5	27.303	-2.25	27.4	0.000029	2.551	44335.23	1384.98	0.08
Col-Hayde	RM 106 Le	3.32	100-yr	Ultimate_ALT108_SF	112402.7	-16.5	27.303	-2.25	27.4	0.000029	2.551	44335.24	1384.98	0.08
Col-Hayde	RM 106 Le	3.3	BNSF at NPH		Bridge									
Col-Hayde	RM 106 Le	3.28	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-21.87	31.344		31.39	0.000011	1.765	54727.22	2190.51	0.05
Col-Hayde	RM 106 Le	3.28	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-21.87	31.344		31.39	0.000011	1.765	54727.22	2190.51	0.05
Col-Hayde	RM 106 Le	3.28	2-year	Ultimate_ALT107_WAR	39187.67	-21.87	17.975		18	0.000008	1.15	34182.87	1400.52	0.04
Col-Hayde	RM 106 Le	3.28	2-year	Ultimate_ALT108_WAR	39187.67	-21.87	17.975		18	0.000008	1.15	34182.87	1400.52	0.04
Col-Hayde	RM 106 Le	3.28	2-year	Ultimate_ALT107_SF	55443.02	-21.87	17.416		17.46	0.000018	1.664	33402.94	1385.98	0.06
Col-Hayde	RM 106 Le	3.28	2-year	Ultimate_ALT108_SF	55443.02	-21.87	17.416		17.46	0.000018	1.664	33402.94	1385.98	0.06
Col-Hayde	RM 106 Le	3.28	100-yr	Ultimate_ALT107_WAR	92702.67	-21.87	32.46		32.51	0.00001	1.717	57011.62	2256.24	0.05
Col-Hayde	RM 106 Le	3.28	100-yr	Ultimate_ALT108_WAR	92702.12	-21.87	32.46		32.51	0.00001	1.717	57011.63	2256.24	0.05
Col-Hayde	RM 106 Le	3.28	100-yr	Ultimate_ALT107_SF	112403	-21.87	27.298		27.39	0.000024	2.403	47649.45	1861.97	0.07

Col-Hayde	RM 106 Le	3.28	100-yr	Ultimate_ALT108_SF	112402.7	-21.87	27.298		27.39	0.000024	2.403	47649.45	1861.97	0.07
Col-Hayde	RM 106 Le	3.27	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-19.86	31.344		31.39	0.000011	1.767	56100.44	2066.76	0.05
Col-Hayde	RM 106 Le	3.27	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-19.86	31.344		31.39	0.000011	1.767	56100.44	2066.76	0.05
Col-Hayde	RM 106 Le	3.27	2-year	Ultimate_ALT107_WAR	39187.67	-19.86	17.973		17.99	0.000009	1.182	33308.77	1508.81	0.04
Col-Hayde	RM 106 Le	3.27	2-year	Ultimate_ALT108_WAR	39187.67	-19.86	17.973		17.99	0.000009	1.182	33308.77	1508.81	0.04
Col-Hayde	RM 106 Le	3.27	2-year	Ultimate_ALT107_SF	55443.02	-19.86	17.413		17.46	0.00002	1.712	32528.97	1443.59	0.06
Col-Hayde	RM 106 Le	3.27	2-year	Ultimate_ALT108_SF	55443.02	-19.86	17.413		17.46	0.00002	1.712	32528.97	1443.59	0.06
Col-Hayde	RM 106 Le	3.27	100-yr	Ultimate_ALT107_WAR	92702.67	-19.86	32.46		32.5	0.00001	1.717	58236.9	2083.63	0.05
Col-Hayde	RM 106 Le	3.27	100-yr	Ultimate_ALT108_WAR	92702.12	-19.86	32.46		32.5	0.00001	1.717	58236.91	2083.63	0.05
Col-Hayde	RM 106 Le	3.27	100-yr	Ultimate_ALT107_SF	112403	-19.86	27.295		27.39	0.000025	2.433	48386.6	1899.06	0.07
Col-Hayde	RM 106 Le	3.27	100-yr	Ultimate_ALT108_SF	112402.7	-19.86	27.295		27.39	0.000025	2.433	48386.6	1899.06	0.07
Col-Hayde	RM 106 Le	3.23	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-14.8	31.338		31.39	0.000013	1.826	54651.09	2135.98	0.05
Col-Hayde	RM 106 Le	3.23	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-14.8	31.338		31.39	0.000013	1.826	54651.09	2135.98	0.05
Col-Hayde	RM 106 Le	3.23	2-year	Ultimate_ALT107_WAR	39187.67	-14.8	17.968		17.99	0.000011	1.246	31735.36	1582.08	0.05
Col-Hayde	RM 106 Le	3.23	2-year	Ultimate_ALT108_WAR	39187.67	-14.8	17.968		17.99	0.000011	1.246	31735.36	1582.08	0.05
Col-Hayde	RM 106 Le	3.23	2-year	Ultimate_ALT107_SF	55443.02	-14.8	17.403		17.45	0.000024	1.807	30925.66	1562.96	0.07
Col-Hayde	RM 106 Le	3.23	2-year	Ultimate_ALT108_SF	55443.02	-14.8	17.403		17.45	0.000024	1.807	30925.66	1562.96	0.07
Col-Hayde	RM 106 Le	3.23	100-yr	Ultimate_ALT107_WAR	92702.67	-14.8	32.455		32.5	0.000012	1.774	56849.42	2172.54	0.05
Col-Hayde	RM 106 Le	3.23	100-yr	Ultimate_ALT108_WAR	92702.12	-14.8	32.455		32.5	0.000012	1.774	56849.43	2172.54	0.05
Col-Hayde	RM 106 Le	3.23	100-yr	Ultimate_ALT107_SF	112403	-14.8	27.282		27.38	0.000029	2.527	46773.71	1905.97	0.08
Col-Hayde	RM 106 Le	3.23	100-yr	Ultimate_ALT108_SF	112402.7	-14.8	27.282		27.38	0.000029	2.527	46773.71	1905.97	0.08
Col-Hayde	RM 106 Le	3.19	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-15.44	31.341		31.38	0.00001	1.684	61282.81	3461.5	0.05
Col-Hayde	RM 106 Le	3.19	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-15.44	31.341		31.38	0.00001	1.684	61282.8	3461.5	0.05
Col-Hayde	RM 106 Le	3.19	2-year	Ultimate_ALT107_WAR	39187.67	-15.44	17.97		17.99	0.000007	1.095	35921.71	1408.53	0.04
Col-Hayde	RM 106 Le	3.19	2-year	Ultimate_ALT108_WAR	39187.67	-15.44	17.97		17.99	0.000007	1.095	35921.71	1408.53	0.04
Col-Hayde	RM 106 Le	3.19	2-year	Ultimate_ALT107_SF	55443.02	-15.44	17.407		17.45	0.000015	1.584	35128.64	1406.88	0.06
Col-Hayde	RM 106 Le	3.19	2-year	Ultimate_ALT108_SF	55443.02	-15.44	17.407		17.45	0.000015	1.584	35128.64	1406.88	0.06
Col-Hayde	RM 106 Le	3.19	100-yr	Ultimate_ALT107_WAR	92702.67	-15.44	32.457		32.5	0.000009	1.633	65150.1	3597.6	0.05
Col-Hayde	RM 106 Le	3.19	100-yr	Ultimate_ALT108_WAR	92702.12	-15.44	32.457		32.5	0.000009	1.633	65150.13	3597.6	0.05
Col-Hayde	RM 106 Le	3.19	100-yr	Ultimate_ALT107_SF	112403	-15.44	27.287		27.37	0.000021	2.31	49250.16	3094.63	0.07
Col-Hayde	RM 106 Le	3.19	100-yr	Ultimate_ALT108_SF	112402.7	-15.44	27.287		27.37	0.000021	2.31	49250.16	3094.63	0.07
Col-Hayde	RM 106 Le	3.06	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-16.48	31.317		31.37	0.000014	1.938	48419.38	2942	0.06
Col-Hayde	RM 106 Le	3.06	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-16.48	31.317		31.37	0.000014	1.938	48419.37	2942	0.06
Col-Hayde	RM 106 Le	3.06	2-year	Ultimate_ALT107_WAR	39187.67	-16.48	17.956		17.98	0.000012	1.302	30286.04	1340.19	0.05
Col-Hayde	RM 106 Le	3.06	2-year	Ultimate_ALT108_WAR	39187.67	-16.48	17.956		17.98	0.000012	1.302	30286.04	1340.19	0.05
Col-Hayde	RM 106 Le	3.06	2-year	Ultimate_ALT107_SF	55443.02	-16.48	17.376		17.43	0.000026	1.89	29516.81	1325.37	0.07
Col-Hayde	RM 106 Le	3.06	2-year	Ultimate_ALT108_SF	55443.02	-16.48	17.376		17.43	0.000026	1.89	29516.81	1325.37	0.07
Col-Hayde	RM 106 Le	3.06	100-yr	Ultimate_ALT107_WAR	92702.67	-16.48	32.435		32.49	0.000013	1.885	50088.93	3080.37	0.05
Col-Hayde	RM 106 Le	3.06	100-yr	Ultimate_ALT108_WAR	92702.12	-16.48	32.435		32.49	0.000013	1.885	50088.93	3080.37	0.05
Col-Hayde	RM 106 Le	3.06	100-yr	Ultimate_ALT107_SF	112403	-16.48	27.241		27.35	0.000031	2.658	42781.55	2345.25	0.08
Col-Hayde	RM 106 Le	3.06	100-yr	Ultimate_ALT108_SF	112402.7	-16.48	27.241		27.35	0.000031	2.658	42781.55	2345.25	0.08
Col-Hayde	RM 106 Le	2.92	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-17.62	31.312		31.36	0.000013	1.866	59425.39	2880.16	0.05

Col-Hayde	RM 106 Le	2.92	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-17.62	31.312		31.36	0.000013	1.866	59425.39	2880.16	0.05
Col-Hayde	RM 106 Le	2.92	2-year	Ultimate_ALT107_WAR	39187.67	-17.62	17.947		17.97	0.000011	1.297	30495.19	1296.31	0.05
Col-Hayde	RM 106 Le	2.92	2-year	Ultimate_ALT108_WAR	39187.67	-17.62	17.947		17.97	0.000011	1.297	30495.19	1296.31	0.05
Col-Hayde	RM 106 Le	2.92	2-year	Ultimate_ALT107_SF	55443.02	-17.62	17.358		17.41	0.000024	1.88	29731.59	1293.24	0.07
Col-Hayde	RM 106 Le	2.92	2-year	Ultimate_ALT108_SF	55443.02	-17.62	17.358		17.41	0.000024	1.88	29731.59	1293.24	0.07
Col-Hayde	RM 106 Le	2.92	100-yr	Ultimate_ALT107_WAR	92702.67	-17.62	32.431		32.48	0.000011	1.802	62565.9	2900.21	0.05
Col-Hayde	RM 106 Le	2.92	100-yr	Ultimate_ALT108_WAR	92702.12	-17.62	32.431		32.48	0.000011	1.802	62565.94	2900.21	0.05
Col-Hayde	RM 106 Le	2.92	100-yr	Ultimate_ALT107_SF	112403	-17.62	27.223		27.33	0.000029	2.611	48344.91	2728.34	0.08
Col-Hayde	RM 106 Le	2.92	100-yr	Ultimate_ALT108_SF	112402.7	-17.62	27.223		27.33	0.000029	2.611	48344.91	2728.34	0.08
Col-Hayde	RM 106 Le	2.78	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-34.67	31.296		31.35	0.000011	1.926	49504.82	3513.02	0.05
Col-Hayde	RM 106 Le	2.78	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-34.67	31.296		31.35	0.000011	1.926	49504.82	3513.02	0.05
Col-Hayde	RM 106 Le	2.78	2-year	Ultimate_ALT107_WAR	39187.67	-34.67	17.945		17.97	0.000006	1.166	33700.25	1084.92	0.04
Col-Hayde	RM 106 Le	2.78	2-year	Ultimate_ALT108_WAR	39187.67	-34.67	17.945		17.97	0.000006	1.166	33700.25	1084.92	0.04
Col-Hayde	RM 106 Le	2.78	2-year	Ultimate_ALT107_SF	55443.02	-34.67	17.353		17.4	0.000013	1.681	33059.01	1080.32	0.05
Col-Hayde	RM 106 Le	2.78	2-year	Ultimate_ALT108_SF	55443.02	-34.67	17.353		17.4	0.000013	1.681	33059.01	1080.32	0.05
Col-Hayde	RM 106 Le	2.78	100-yr	Ultimate_ALT107_WAR	92702.67	-34.67	32.415		32.47	0.00001	1.883	51026.99	3654.43	0.05
Col-Hayde	RM 106 Le	2.78	100-yr	Ultimate_ALT108_WAR	92702.12	-34.67	32.415		32.47	0.00001	1.883	51027	3654.43	0.05
Col-Hayde	RM 106 Le	2.78	100-yr	Ultimate_ALT107_SF	112403	-34.67	27.204		27.31	0.000022	2.589	44128.32	2680.3	0.07
Col-Hayde	RM 106 Le	2.78	100-yr	Ultimate_ALT108_SF	112402.7	-34.67	27.204		27.31	0.000022	2.589	44128.32	2680.3	0.07
Col-Hayde	RM 106 Le	2.59	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-32.91	31.289		31.34	0.00001	1.851	59544.99	4065.71	0.05
Col-Hayde	RM 106 Le	2.59	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-32.91	31.289		31.34	0.00001	1.851	59544.99	4065.71	0.05
Col-Hayde	RM 106 Le	2.59	2-year	Ultimate_ALT107_WAR	39187.67	-32.91	17.939		17.96	0.000006	1.151	34222.8	1681.42	0.04
Col-Hayde	RM 106 Le	2.59	2-year	Ultimate_ALT108_WAR	39187.67	-32.91	17.939		17.96	0.000006	1.151	34222.8	1681.42	0.04
Col-Hayde	RM 106 Le	2.59	2-year	Ultimate_ALT107_SF	55443.02	-32.91	17.34		17.38	0.000014	1.66	33539.3	1544.46	0.05
Col-Hayde	RM 106 Le	2.59	2-year	Ultimate_ALT108_SF	55443.02	-32.91	17.34		17.38	0.000014	1.66	33539.3	1544.46	0.05
Col-Hayde	RM 106 Le	2.59	100-yr	Ultimate_ALT107_WAR	92702.67	-32.91	32.409		32.46	0.000009	1.795	63316.77	4131.98	0.05
Col-Hayde	RM 106 Le	2.59	100-yr	Ultimate_ALT108_WAR	92702.12	-32.91	32.409		32.46	0.000009	1.795	63316.81	4131.98	0.05
Col-Hayde	RM 106 Le	2.59	100-yr	Ultimate_ALT107_SF	112403	-32.91	27.184		27.28	0.000022	2.539	46013.48	3912.62	0.07
Col-Hayde	RM 106 Le	2.59	100-yr	Ultimate_ALT108_SF	112402.7	-32.91	27.184		27.28	0.000022	2.539	46013.48	3912.62	0.07
Col-Hayde	RM 106 Le	2.4	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-29.76	31.279		31.33	0.00001	1.839	53383.55	4008.02	0.05
Col-Hayde	RM 106 Le	2.4	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-29.76	31.279		31.33	0.00001	1.839	53383.55	4008.02	0.05
Col-Hayde	RM 106 Le	2.4	2-year	Ultimate_ALT107_WAR	39187.67	-29.76	17.933		17.95	0.000006	1.128	34846.32	1354.86	0.04
Col-Hayde	RM 106 Le	2.4	2-year	Ultimate_ALT108_WAR	39187.67	-29.76	17.933		17.95	0.000006	1.128	34846.32	1354.86	0.04
Col-Hayde	RM 106 Le	2.4	2-year	Ultimate_ALT107_SF	55443.02	-29.76	17.328		17.37	0.000013	1.628	34158.73	1309.51	0.05
Col-Hayde	RM 106 Le	2.4	2-year	Ultimate_ALT108_SF	55443.02	-29.76	17.328		17.37	0.000013	1.628	34158.73	1309.51	0.05
Col-Hayde	RM 106 Le	2.4	100-yr	Ultimate_ALT107_WAR	92702.67	-29.76	32.4		32.45	0.000009	1.79	55656.04	4167.12	0.05
Col-Hayde	RM 106 Le	2.4	100-yr	Ultimate_ALT108_WAR	92702.12	-29.76	32.4		32.45	0.000009	1.79	55656.05	4167.12	0.05
Col-Hayde	RM 106 Le	2.4	100-yr	Ultimate_ALT107_SF	112403	-29.76	27.165		27.26	0.000021	2.489	46183.82	3136.42	0.07
Col-Hayde	RM 106 Le	2.4	100-yr	Ultimate_ALT108_SF	112402.7	-29.76	27.165		27.26	0.000021	2.489	46183.82	3136.42	0.07
Col-Hayde	RM 106 Le	2.23	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-30.2	31.262		31.32	0.000012	1.989	57270.75	4231.68	0.05
Col-Hayde	RM 106 Le	2.23	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-30.2	31.262		31.32	0.000012	1.989	57270.73	4231.68	0.05
Col-Hayde	RM 106 Le	2.23	2-year	Ultimate_ALT107_WAR	39187.67	-30.2	17.923		17.95	0.000008	1.251	31541.19	1791.33	0.04
Col-Hayde	RM 106 Le	2.23	2-year	Ultimate_ALT108_WAR	39187.67	-30.2	17.923		17.95	0.000008	1.251	31541.19	1791.33	0.04

Col-Hayde	RM 106 Le	2.23	2-year	Ultimate_ALT107_SF	55443.02	-30.2	17.305		17.36	0.000016	1.807	30875.31	1705.34	0.06
Col-Hayde	RM 106 Le	2.23	2-year	Ultimate_ALT108_SF	55443.02	-30.2	17.305		17.36	0.000016	1.807	30875.31	1705.34	0.06
Col-Hayde	RM 106 Le	2.23	100-yr	Ultimate_ALT107_WAR	92702.67	-30.2	32.384		32.44	0.000011	1.925	61880.29	4320.16	0.05
Col-Hayde	RM 106 Le	2.23	100-yr	Ultimate_ALT108_WAR	92702.12	-30.2	32.384		32.44	0.000011	1.925	61880.31	4320.16	0.05
Col-Hayde	RM 106 Le	2.23	100-yr	Ultimate_ALT107_SF	112403	-30.2	27.124		27.24	0.000026	2.735	43018.75	3814.8	0.08
Col-Hayde	RM 106 Le	2.23	100-yr	Ultimate_ALT108_SF	112402.7	-30.2	27.124		27.24	0.000026	2.735	43018.76	3814.8	0.08
Col-Hayde	RM 106 Le	2.07	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-37.88	31.261		31.31	0.000009	1.798	64481.95	3912.47	0.05
Col-Hayde	RM 106 Le	2.07	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-37.88	31.261		31.31	0.000009	1.798	64481.95	3912.47	0.05
Col-Hayde	RM 106 Le	2.07	2-year	Ultimate_ALT107_WAR	39187.67	-37.88	17.921		17.94	0.000005	1.104	35873.81	1564.13	0.03
Col-Hayde	RM 106 Le	2.07	2-year	Ultimate_ALT108_WAR	39187.67	-37.88	17.921		17.94	0.000005	1.104	35873.81	1564.13	0.03
Col-Hayde	RM 106 Le	2.07	2-year	Ultimate_ALT107_SF	55443.02	-37.88	17.301		17.34	0.000011	1.592	35063.63	1530.59	0.05
Col-Hayde	RM 106 Le	2.07	2-year	Ultimate_ALT108_SF	55443.02	-37.88	17.301		17.34	0.000011	1.592	35063.63	1530.59	0.05
Col-Hayde	RM 106 Le	2.07	100-yr	Ultimate_ALT107_WAR	92702.67	-37.88	32.384		32.43	0.000008	1.741	68878.9	3952.81	0.04
Col-Hayde	RM 106 Le	2.07	100-yr	Ultimate_ALT108_WAR	92702.12	-37.88	32.384		32.43	0.000008	1.741	68878.93	3952.81	0.04
Col-Hayde	RM 106 Le	2.07	100-yr	Ultimate_ALT107_SF	112403	-37.88	27.121		27.21	0.000019	2.466	49144.09	3673.82	0.07
Col-Hayde	RM 106 Le	2.07	100-yr	Ultimate_ALT108_SF	112402.7	-37.88	27.121		27.21	0.000019	2.466	49144.09	3673.82	0.07
Col-Hayde	RM 106 Le	1.95	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-39.54	31.254		31.3	0.000009	1.807	60918.74	3698.94	0.05
Col-Hayde	RM 106 Le	1.95	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-39.54	31.254		31.3	0.000009	1.807	60918.74	3698.94	0.05
Col-Hayde	RM 106 Le	1.95	2-year	Ultimate_ALT107_WAR	39187.67	-39.54	17.918		17.94	0.000005	1.1	35755.82	1319.8	0.03
Col-Hayde	RM 106 Le	1.95	2-year	Ultimate_ALT108_WAR	39187.67	-39.54	17.918		17.94	0.000005	1.1	35755.82	1319.8	0.03
Col-Hayde	RM 106 Le	1.95	2-year	Ultimate_ALT107_SF	55443.02	-39.54	17.294		17.33	0.000011	1.586	35070.79	1294.58	0.05
Col-Hayde	RM 106 Le	1.95	2-year	Ultimate_ALT108_SF	55443.02	-39.54	17.294		17.33	0.000011	1.586	35070.79	1294.58	0.05
Col-Hayde	RM 106 Le	1.95	100-yr	Ultimate_ALT107_WAR	92702.67	-39.54	32.377		32.42	0.000008	1.754	65076.17	3702.95	0.04
Col-Hayde	RM 106 Le	1.95	100-yr	Ultimate_ALT108_WAR	92702.12	-39.54	32.377		32.42	0.000008	1.754	65076.21	3702.95	0.04
Col-Hayde	RM 106 Le	1.95	100-yr	Ultimate_ALT107_SF	112403	-39.54	27.109		27.2	0.000019	2.464	47568.33	3567.15	0.07
Col-Hayde	RM 106 Le	1.95	100-yr	Ultimate_ALT108_SF	112402.7	-39.54	27.109		27.2	0.000019	2.464	47568.33	3567.15	0.07
Col-Hayde	RM 106 Le	1.82	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-43.74	31.25		31.3	0.000009	1.747	64066.26	3761.45	0.05
Col-Hayde	RM 106 Le	1.82	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-43.74	31.25		31.3	0.000009	1.747	64066.26	3761.45	0.05
Col-Hayde	RM 106 Le	1.82	2-year	Ultimate_ALT107_WAR	39187.67	-43.74	17.915		17.93	0.000005	1.068	36850.49	1613.91	0.03
Col-Hayde	RM 106 Le	1.82	2-year	Ultimate_ALT108_WAR	39187.67	-43.74	17.915		17.93	0.000005	1.068	36850.49	1613.91	0.03
Col-Hayde	RM 106 Le	1.82	2-year	Ultimate_ALT107_SF	55443.02	-43.74	17.288		17.33	0.000011	1.541	36120.2	1576.79	0.05
Col-Hayde	RM 106 Le	1.82	2-year	Ultimate_ALT108_SF	55443.02	-43.74	17.288		17.33	0.000011	1.541	36120.2	1576.79	0.05
Col-Hayde	RM 106 Le	1.82	100-yr	Ultimate_ALT107_WAR	92702.67	-43.74	32.374		32.42	0.000008	1.695	68322.98	3825.37	0.04
Col-Hayde	RM 106 Le	1.82	100-yr	Ultimate_ALT108_WAR	92702.12	-43.74	32.374		32.42	0.000008	1.695	68323.01	3825.37	0.04
Col-Hayde	RM 106 Le	1.82	100-yr	Ultimate_ALT107_SF	112403	-43.74	27.099		27.19	0.000018	2.388	49764.86	3561.78	0.06
Col-Hayde	RM 106 Le	1.82	100-yr	Ultimate_ALT108_SF	112402.7	-43.74	27.099		27.19	0.000018	2.388	49764.86	3561.78	0.06
Col-Hayde	RM 106 Le	1.65	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-34.12	31.238		31.29	0.000009	1.804	55320.14	1789.42	0.05
Col-Hayde	RM 106 Le	1.65	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-34.12	31.238		31.29	0.000009	1.804	55320.14	1789.42	0.05
Col-Hayde	RM 106 Le	1.65	2-year	Ultimate_ALT107_WAR	39187.67	-34.12	17.91		17.93	0.000005	1.08	36660.03	1133.02	0.03
Col-Hayde	RM 106 Le	1.65	2-year	Ultimate_ALT108_WAR	39187.67	-34.12	17.91		17.93	0.000005	1.08	36660.03	1133.02	0.03
Col-Hayde	RM 106 Le	1.65	2-year	Ultimate_ALT107_SF	55443.02	-34.12	17.278		17.32	0.00001	1.557	35944.51	1131.32	0.05
Col-Hayde	RM 106 Le	1.65	2-year	Ultimate_ALT108_SF	55443.02	-34.12	17.278		17.32	0.00001	1.557	35944.51	1131.32	0.05
Col-Hayde	RM 106 Le	1.65	100-yr	Ultimate_ALT107_WAR	92702.67	-34.12	32.362		32.41	0.000008	1.765	57401.54	1959.31	0.04

Col-Hayde	RM 106 Le	1.65	100-yr	Ultimate_ALT108_WAR	92702.12	-34.12	32.362		32.41	0.000008	1.765	57401.54	1959.31	0.04
Col-Hayde	RM 106 Le	1.65	100-yr	Ultimate_ALT107_SF	112403	-34.12	27.08		27.17	0.000018	2.427	48073.3	1634.36	0.06
Col-Hayde	RM 106 Le	1.65	100-yr	Ultimate_ALT108_SF	112402.7	-34.12	27.08		27.17	0.000018	2.427	48073.3	1634.36	0.06
Col-Hayde	RM 106 Le	1.48	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-36.43	31.228		31.28	0.000009	1.835	57469.99	2619.9	0.05
Col-Hayde	RM 106 Le	1.48	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-36.43	31.228		31.28	0.000009	1.835	57469.98	2619.9	0.05
Col-Hayde	RM 106 Le	1.48	2-year	Ultimate_ALT107_WAR	39187.67	-36.43	17.905		17.92	0.000005	1.091	36061.63	1238.17	0.03
Col-Hayde	RM 106 Le	1.48	2-year	Ultimate_ALT108_WAR	39187.67	-36.43	17.905		17.92	0.000005	1.091	36061.63	1238.17	0.03
Col-Hayde	RM 106 Le	1.48	2-year	Ultimate_ALT107_SF	55443.02	-36.43	17.268		17.31	0.00001	1.572	35394.83	1211.59	0.05
Col-Hayde	RM 106 Le	1.48	2-year	Ultimate_ALT108_SF	55443.02	-36.43	17.268		17.31	0.00001	1.572	35394.83	1211.59	0.05
Col-Hayde	RM 106 Le	1.48	100-yr	Ultimate_ALT107_WAR	92702.67	-36.43	32.353		32.4	0.000008	1.788	60422.9	2766.12	0.04
Col-Hayde	RM 106 Le	1.48	100-yr	Ultimate_ALT108_WAR	92702.12	-36.43	32.353		32.4	0.000008	1.788	60422.92	2766.12	0.04
Col-Hayde	RM 106 Le	1.48	100-yr	Ultimate_ALT107_SF	112403	-36.43	27.059		27.15	0.000018	2.482	47130.57	2386.79	0.07
Col-Hayde	RM 106 Le	1.48	100-yr	Ultimate_ALT108_SF	112402.7	-36.43	27.059		27.15	0.000018	2.482	47130.57	2386.79	0.07
Col-Hayde	RM 106 Le	1.36	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-38.12	31.224		31.27	0.000009	1.804	60041.63	2742.38	0.05
Col-Hayde	RM 106 Le	1.36	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-38.12	31.224		31.27	0.000009	1.804	60041.63	2742.38	0.05
Col-Hayde	RM 106 Le	1.36	2-year	Ultimate_ALT107_WAR	39187.67	-38.12	17.902		17.92	0.000005	1.096	35992.9	1376.1	0.03
Col-Hayde	RM 106 Le	1.36	2-year	Ultimate_ALT108_WAR	39187.67	-38.12	17.902		17.92	0.000005	1.096	35992.9	1376.1	0.03
Col-Hayde	RM 106 Le	1.36	2-year	Ultimate_ALT107_SF	55443.02	-38.12	17.261		17.3	0.000011	1.58	35279.55	1336.35	0.05
Col-Hayde	RM 106 Le	1.36	2-year	Ultimate_ALT108_SF	55443.02	-38.12	17.261		17.3	0.000011	1.58	35279.55	1336.35	0.05
Col-Hayde	RM 106 Le	1.36	100-yr	Ultimate_ALT107_WAR	92702.67	-38.12	32.349		32.4	0.000008	1.757	63145.58	2914.1	0.04
Col-Hayde	RM 106 Le	1.36	100-yr	Ultimate_ALT108_WAR	92702.12	-38.12	32.349		32.4	0.000008	1.757	63145.59	2914.1	0.04
Col-Hayde	RM 106 Le	1.36	100-yr	Ultimate_ALT107_SF	112403	-38.12	27.049		27.14	0.000019	2.46	48702.53	2649.3	0.07
Col-Hayde	RM 106 Le	1.36	100-yr	Ultimate_ALT108_SF	112402.7	-38.12	27.049		27.14	0.000019	2.46	48702.53	2649.3	0.07
Col-Hayde	RM 106 Le	1.22	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-40.02	31.222		31.27	0.000007	1.711	57198.28	1936.83	0.04
Col-Hayde	RM 106 Le	1.22	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-40.02	31.222		31.27	0.000007	1.711	57198.28	1936.83	0.04
Col-Hayde	RM 106 Le	1.22	2-year	Ultimate_ALT107_WAR	39187.67	-40.02	17.902		17.92	0.000003	0.982	40118.04	1080.24	0.03
Col-Hayde	RM 106 Le	1.22	2-year	Ultimate_ALT108_WAR	39187.67	-40.02	17.902		17.92	0.000003	0.982	40118.04	1080.24	0.03
Col-Hayde	RM 106 Le	1.22	2-year	Ultimate_ALT107_SF	55443.02	-40.02	17.26		17.29	0.000007	1.413	39426.23	1077.03	0.04
Col-Hayde	RM 106 Le	1.22	2-year	Ultimate_ALT108_SF	55443.02	-40.02	17.26		17.29	0.000007	1.413	39426.23	1077.03	0.04
Col-Hayde	RM 106 Le	1.22	100-yr	Ultimate_ALT107_WAR	92702.67	-40.02	32.346		32.39	0.000007	1.677	59071.36	2072.61	0.04
Col-Hayde	RM 106 Le	1.22	100-yr	Ultimate_ALT108_WAR	92702.12	-40.02	32.346		32.39	0.000007	1.677	59071.37	2072.61	0.04
Col-Hayde	RM 106 Le	1.22	100-yr	Ultimate_ALT107_SF	112403	-40.02	27.047		27.13	0.000014	2.274	50931.8	1441.4	0.06
Col-Hayde	RM 106 Le	1.22	100-yr	Ultimate_ALT108_SF	112402.7	-40.02	27.047		27.13	0.000014	2.274	50931.8	1441.4	0.06
Col-Hayde	RM 106 Le	1.07	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-43	31.219		31.26	0.000006	1.634	60897.04	1848.28	0.04
Col-Hayde	RM 106 Le	1.07	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-43	31.219		31.26	0.000006	1.634	60897.04	1848.28	0.04
Col-Hayde	RM 106 Le	1.07	2-year	Ultimate_ALT107_WAR	39187.67	-43	17.901		17.91	0.000003	0.925	42537.2	1289.57	0.03
Col-Hayde	RM 106 Le	1.07	2-year	Ultimate_ALT108_WAR	39187.67	-43	17.901		17.91	0.000003	0.925	42537.2	1289.57	0.03
Col-Hayde	RM 106 Le	1.07	2-year	Ultimate_ALT107_SF	55443.02	-43	17.258		17.29	0.000006	1.329	41867.38	1247.07	0.04
Col-Hayde	RM 106 Le	1.07	2-year	Ultimate_ALT108_SF	55443.02	-43	17.258		17.29	0.000006	1.329	41867.38	1247.07	0.04
Col-Hayde	RM 106 Le	1.07	100-yr	Ultimate_ALT107_WAR	92702.67	-43	32.344		32.38	0.000006	1.604	62884.88	2091.54	0.04
Col-Hayde	RM 106 Le	1.07	100-yr	Ultimate_ALT108_WAR	92702.12	-43	32.344		32.38	0.000006	1.604	62884.89	2091.54	0.04
Col-Hayde	RM 106 Le	1.07	100-yr	Ultimate_ALT107_SF	112403	-43	27.042		27.11	0.000011	2.166	54156.97	1560	0.05
Col-Hayde	RM 106 Le	1.07	100-yr	Ultimate_ALT108_SF	112402.7	-43	27.042		27.11	0.000011	2.166	54156.97	1560	0.05

Col-Hayde	RM 106 Le	0.93	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-39.88	31.217		31.25	0.000006	1.557	61480.48	1724.09	0.04
Col-Hayde	RM 106 Le	0.93	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-39.88	31.217		31.25	0.000006	1.557	61480.48	1724.09	0.04
Col-Hayde	RM 106 Le	0.93	2-year	Ultimate_ALT107_WAR	39187.67	-39.88	17.899		17.91	0.000003	0.884	44503.07	1160.05	0.02
Col-Hayde	RM 106 Le	0.93	2-year	Ultimate_ALT108_WAR	39187.67	-39.88	17.899		17.91	0.000003	0.884	44503.07	1160.05	0.02
Col-Hayde	RM 106 Le	0.93	2-year	Ultimate_ALT107_SF	55443.02	-39.88	17.255		17.28	0.000005	1.271	43756.54	1158.09	0.04
Col-Hayde	RM 106 Le	0.93	2-year	Ultimate_ALT108_SF	55443.02	-39.88	17.255		17.28	0.000005	1.271	43756.54	1158.09	0.04
Col-Hayde	RM 106 Le	0.93	100-yr	Ultimate_ALT107_WAR	92702.67	-39.88	32.342		32.38	0.000005	1.53	63271.21	1964.47	0.04
Col-Hayde	RM 106 Le	0.93	100-yr	Ultimate_ALT108_WAR	92702.12	-39.88	32.342		32.38	0.000005	1.53	63271.21	1964.47	0.04
Col-Hayde	RM 106 Le	0.93	100-yr	Ultimate_ALT107_SF	112403	-39.88	27.038		27.1	0.000011	2.061	55597.41	1351.75	0.05
Col-Hayde	RM 106 Le	0.93	100-yr	Ultimate_ALT108_SF	112402.7	-39.88	27.038		27.1	0.000011	2.061	55597.41	1351.75	0.05
Col-Hayde	RM 106 Le	0.72	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-39	31.21		31.25	0.000006	1.564	60590.9	1463.88	0.04
Col-Hayde	RM 106 Le	0.72	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-39	31.21		31.25	0.000006	1.564	60590.9	1463.88	0.04
Col-Hayde	RM 106 Le	0.72	2-year	Ultimate_ALT107_WAR	39187.67	-39	17.897		17.91	0.000003	0.863	45548.81	1059.03	0.02
Col-Hayde	RM 106 Le	0.72	2-year	Ultimate_ALT108_WAR	39187.67	-39	17.897		17.91	0.000003	0.863	45548.81	1059.03	0.02
Col-Hayde	RM 106 Le	0.72	2-year	Ultimate_ALT107_SF	55443.02	-39	17.25		17.27	0.000005	1.239	44865.59	1053.68	0.03
Col-Hayde	RM 106 Le	0.72	2-year	Ultimate_ALT108_SF	55443.02	-39	17.25		17.27	0.000005	1.239	44865.59	1053.68	0.03
Col-Hayde	RM 106 Le	0.72	100-yr	Ultimate_ALT107_WAR	92702.67	-39	32.336		32.37	0.000006	1.54	62146	1692.79	0.04
Col-Hayde	RM 106 Le	0.72	100-yr	Ultimate_ALT108_WAR	92702.12	-39	32.336		32.37	0.000006	1.539	62146	1692.79	0.04
Col-Hayde	RM 106 Le	0.72	100-yr	Ultimate_ALT107_SF	112403	-39	27.026		27.09	0.000012	2.054	55447.59	1187.16	0.05
Col-Hayde	RM 106 Le	0.72	100-yr	Ultimate_ALT108_SF	112402.7	-39	27.026		27.09	0.000012	2.054	55447.59	1187.16	0.05
Col-Hayde	RM 106 Le	0.52	FEMA 100-year	Ultimate_ALT107_FEMA	92383.23	-41.86	31.205		31.24	0.000005	1.546	62147.74	1587.77	0.04
Col-Hayde	RM 106 Le	0.52	FEMA 100-year	Ultimate_ALT108_FEMA	92382.58	-41.86	31.205		31.24	0.000005	1.546	62147.74	1587.77	0.04
Col-Hayde	RM 106 Le	0.52	2-year	Ultimate_ALT107_WAR	39187.67	-41.86	17.894		17.91	0.000002	0.86	45712.06	1134.96	0.02
Col-Hayde	RM 106 Le	0.52	2-year	Ultimate_ALT108_WAR	39187.67	-41.86	17.894		17.91	0.000002	0.86	45712.06	1134.96	0.02
Col-Hayde	RM 106 Le	0.52	2-year	Ultimate_ALT107_SF	55443.02	-41.86	17.245		17.27	0.000005	1.235	45026.6	1120.01	0.03
Col-Hayde	RM 106 Le	0.52	2-year	Ultimate_ALT108_SF	55443.02	-41.86	17.245		17.27	0.000005	1.235	45026.6	1120.01	0.03
Col-Hayde	RM 106 Le	0.52	100-yr	Ultimate_ALT107_WAR	92702.67	-41.86	32.331		32.37	0.000005	1.519	63970.94	1628.8	0.03
Col-Hayde	RM 106 Le	0.52	100-yr	Ultimate_ALT108_WAR	92702.12	-41.86	32.331		32.37	0.000005	1.519	63970.95	1628.8	0.03
Col-Hayde	RM 106 Le	0.52	100-yr	Ultimate_ALT107_SF	112403	-41.86	27.015		27.08	0.00001	2.039	56295.27	1286.97	0.05
Col-Hayde	RM 106 Le	0.52	100-yr	Ultimate_ALT108_SF	112402.7	-41.86	27.015		27.08	0.00001	2.039	56295.27	1286.97	0.05
Col-Govt Is	RM 115 Le	6.93	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-18.31	33.462	4.37	33.51	0.000022	1.792	101836.9	4025.49	0.06
Col-Govt Is	RM 115 Le	6.93	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-18.31	33.462	4.37	33.51	0.000022	1.792	101836.8	4025.49	0.06
Col-Govt Is	RM 115 Le	6.93	2-year	Ultimate_ALT107_WAR	74944.61	-18.31	19.842	-3.6	19.88	0.000028	1.558	48107.9	3731.66	0.08
Col-Govt Is	RM 115 Le	6.93	2-year	Ultimate_ALT108_WAR	74944.61	-18.31	19.842	-3.6	19.88	0.000028	1.558	48107.9	3731.66	0.08
Col-Govt Is	RM 115 Le	6.93	2-year	Ultimate_ALT107_SF	109153	-18.31	21.078	-0.74	21.14	0.000048	2.067	52795.79	3868.35	0.1
Col-Govt Is	RM 115 Le	6.93	2-year	Ultimate_ALT108_SF	109153	-18.31	21.078	-0.74	21.14	0.000048	2.067	52795.79	3868.35	0.1
Col-Govt Is	RM 115 Le	6.93	100-yr	Ultimate_ALT107_WAR	181682	-18.31	34.409	4.39	34.46	0.00002	1.732	105659.6	4048.65	0.06
Col-Govt Is	RM 115 Le	6.93	100-yr	Ultimate_ALT108_WAR	181682	-18.31	34.409	4.39	34.46	0.00002	1.732	105659.5	4048.65	0.06
Col-Govt Is	RM 115 Le	6.93	100-yr	Ultimate_ALT107_SF	223000.4	-18.31	31.566	7.54	31.65	0.000042	2.379	94239.44	4000.54	0.09
Col-Govt Is	RM 115 Le	6.93	100-yr	Ultimate_ALT108_SF	223000.3	-18.31	31.566	7.54	31.65	0.000042	2.379	94239.28	4000.54	0.09
Col-Govt Is	RM 115 Le	6.67	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-17.26	33.428	-0.49	33.49	0.000019	1.924	94265.98	3286.03	0.06
Col-Govt Is	RM 115 Le	6.67	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-17.26	33.428	-0.49	33.49	0.000019	1.924	94265.91	3286.03	0.06

Col-Govt Is	RM 115 Le	6.67	2-year	Ultimate_ALT107_WAR	74944.61	-17.26	19.82	-5.33	19.85	0.000018	1.437	52141.75	2848.44	0.06
Col-Govt Is	RM 115 Le	6.67	2-year	Ultimate_ALT108_WAR	74944.61	-17.26	19.82	-5.33	19.85	0.000018	1.437	52141.75	2848.44	0.06
Col-Govt Is	RM 115 Le	6.67	2-year	Ultimate_ALT107_SF	109153	-17.26	21.035	-3.56	21.1	0.000032	1.961	55649.43	2926.5	0.08
Col-Govt Is	RM 115 Le	6.67	2-year	Ultimate_ALT108_SF	109153	-17.26	21.035	-3.56	21.1	0.000032	1.961	55649.43	2926.5	0.08
Col-Govt Is	RM 115 Le	6.67	100-yr	Ultimate_ALT107_WAR	181682	-17.26	34.377	-0.47	34.43	0.000018	1.866	97413.82	3348.31	0.06
Col-Govt Is	RM 115 Le	6.67	100-yr	Ultimate_ALT108_WAR	181682	-17.26	34.377	-0.47	34.43	0.000018	1.866	97413.73	3348.31	0.06
Col-Govt Is	RM 115 Le	6.67	100-yr	Ultimate_ALT107_SF	223000.4	-17.26	31.505	1.09	31.61	0.000035	2.532	88061.07	3198.01	0.09
Col-Govt Is	RM 115 Le	6.67	100-yr	Ultimate_ALT108_SF	223000.3	-17.26	31.505	1.09	31.61	0.000035	2.532	88060.92	3198.01	0.09
Col-Govt Is	RM 115 Le	6.29	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-12.69	33.371	2.53	33.44	0.000023	2.16	83941.99	3077.4	0.07
Col-Govt Is	RM 115 Le	6.29	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-12.69	33.371	2.53	33.44	0.000023	2.16	83941.91	3077.4	0.07
Col-Govt Is	RM 115 Le	6.29	2-year	Ultimate_ALT107_WAR	74944.61	-12.69	19.777	-2.12	19.81	0.00002	1.554	48228.62	2348.35	0.06
Col-Govt Is	RM 115 Le	6.29	2-year	Ultimate_ALT108_WAR	74944.61	-12.69	19.777	-2.12	19.81	0.00002	1.554	48228.62	2348.35	0.06
Col-Govt Is	RM 115 Le	6.29	2-year	Ultimate_ALT107_SF	109153	-12.69	20.958	-0.18	21.03	0.000036	2.139	51018.1	2374.1	0.08
Col-Govt Is	RM 115 Le	6.29	2-year	Ultimate_ALT108_SF	109153	-12.69	20.958	-0.18	21.03	0.000036	2.139	51018.1	2374.1	0.08
Col-Govt Is	RM 115 Le	6.29	100-yr	Ultimate_ALT107_WAR	181682	-12.69	34.325	2.55	34.39	0.000021	2.09	86938.66	3186.43	0.07
Col-Govt Is	RM 115 Le	6.29	100-yr	Ultimate_ALT108_WAR	181682	-12.69	34.325	2.55	34.39	0.000021	2.09	86938.56	3186.43	0.07
Col-Govt Is	RM 115 Le	6.29	100-yr	Ultimate_ALT107_SF	223000.4	-12.69	31.402	3.76	31.53	0.000042	2.859	78008.56	2903.74	0.1
Col-Govt Is	RM 115 Le	6.29	100-yr	Ultimate_ALT108_SF	223000.3	-12.69	31.402	3.76	31.53	0.000042	2.859	78008.45	2903.73	0.1
Col-Govt Is	RM 115 Le	5.85	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-6.37	33.315	5.28	33.39	0.000024	2.178	86019.2	3375.38	0.07
Col-Govt Is	RM 115 Le	5.85	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-6.37	33.315	5.28	33.39	0.000024	2.178	86019.1	3375.38	0.07
Col-Govt Is	RM 115 Le	5.85	2-year	Ultimate_ALT107_WAR	74944.61	-6.37	19.723	2.51	19.76	0.000025	1.589	47164.73	2499.03	0.06
Col-Govt Is	RM 115 Le	5.85	2-year	Ultimate_ALT108_WAR	74944.61	-6.37	19.723	2.51	19.76	0.000025	1.589	47164.73	2499.03	0.06
Col-Govt Is	RM 115 Le	5.85	2-year	Ultimate_ALT107_SF	109153	-6.37	20.863	3.5	20.94	0.000043	2.182	50017.76	2506.9	0.09
Col-Govt Is	RM 115 Le	5.85	2-year	Ultimate_ALT108_SF	109153	-6.37	20.863	3.5	20.94	0.000043	2.182	50017.76	2506.9	0.09
Col-Govt Is	RM 115 Le	5.85	100-yr	Ultimate_ALT107_WAR	181682	-6.37	34.274	5.29	34.34	0.000022	2.114	89266.11	3390.29	0.07
Col-Govt Is	RM 115 Le	5.85	100-yr	Ultimate_ALT108_WAR	181682	-6.37	34.274	5.29	34.34	0.000022	2.114	89266.02	3390.29	0.07
Col-Govt Is	RM 115 Le	5.85	100-yr	Ultimate_ALT107_SF	223000.4	-6.37	31.299	6.2	31.43	0.000045	2.874	79375.01	3196.17	0.09
Col-Govt Is	RM 115 Le	5.85	100-yr	Ultimate_ALT108_SF	223000.3	-6.37	31.299	6.2	31.43	0.000045	2.874	79374.88	3196.17	0.09
Col-Govt Is	RM 115 Le	5.56	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-7.66	33.262	6.08	33.35	0.000028	2.387	79879.38	3074.13	0.07
Col-Govt Is	RM 115 Le	5.56	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-7.66	33.262	6.09	33.35	0.000028	2.387	79879.28	3074.13	0.07
Col-Govt Is	RM 115 Le	5.56	2-year	Ultimate_ALT107_WAR	74944.61	-7.66	19.677	3.4	19.72	0.000029	1.713	43752.86	2306.05	0.07
Col-Govt Is	RM 115 Le	5.56	2-year	Ultimate_ALT108_WAR	74944.61	-7.66	19.677	3.4	19.72	0.000029	1.713	43752.86	2306.05	0.07
Col-Govt Is	RM 115 Le	5.56	2-year	Ultimate_ALT107_SF	109153	-7.66	20.78	4.36	20.87	0.000051	2.358	46299.52	2309.1	0.09
Col-Govt Is	RM 115 Le	5.56	2-year	Ultimate_ALT108_SF	109153	-7.66	20.78	4.36	20.87	0.000051	2.358	46299.52	2309.1	0.09
Col-Govt Is	RM 115 Le	5.56	100-yr	Ultimate_ALT107_WAR	181682	-7.66	34.226	6.09	34.31	0.000025	2.318	82844.08	3081.64	0.07
Col-Govt Is	RM 115 Le	5.56	100-yr	Ultimate_ALT108_WAR	181682	-7.66	34.226	6.09	34.31	0.000025	2.318	82843.97	3081.64	0.07
Col-Govt Is	RM 115 Le	5.56	100-yr	Ultimate_ALT107_SF	223000.4	-7.66	31.201	6.97	31.35	0.000052	3.145	73650.98	2929.16	0.1
Col-Govt Is	RM 115 Le	5.56	100-yr	Ultimate_ALT108_SF	223000.3	-7.66	31.201	6.97	31.35	0.000052	3.145	73650.84	2929.15	0.1
Col-Govt Is	RM 115 Le	5.17	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-4.55	33.2	6.49	33.29	0.000029	2.424	75492.24	2553.16	0.08
Col-Govt Is	RM 115 Le	5.17	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-4.55	33.2	6.49	33.29	0.000029	2.424	75492.17	2553.16	0.08
Col-Govt Is	RM 115 Le	5.17	2-year	Ultimate_ALT107_WAR	74944.61	-4.55	19.613	3.64	19.66	0.000031	1.75	42817.33	2322.4	0.07
Col-Govt Is	RM 115 Le	5.17	2-year	Ultimate_ALT108_WAR	74944.61	-4.55	19.613	3.64	19.66	0.000031	1.75	42817.33	2322.4	0.07
Col-Govt Is	RM 115 Le	5.17	2-year	Ultimate_ALT107_SF	109153	-4.55	20.668	4.65	20.76	0.000055	2.411	45268.69	2326.14	0.1

Col-Govt Is	RM 115 Le	5.17	2-year	Ultimate_ALT108_SF	109153	-4.55	20.668	4.65	20.76	0.000055	2.411	45268.69	2326.14	0.1
Col-Govt Is	RM 115 Le	5.17	100-yr	Ultimate_ALT107_WAR	181682	-4.55	34.169	6.5	34.26	0.000027	2.356	77976.6	2577.57	0.07
Col-Govt Is	RM 115 Le	5.17	100-yr	Ultimate_ALT108_WAR	181682	-4.55	34.169	6.5	34.26	0.000027	2.356	77976.52	2577.57	0.07
Col-Govt Is	RM 115 Le	5.17	100-yr	Ultimate_ALT107_SF	223000.4	-4.55	31.084	7.42	31.24	0.000056	3.198	70139.18	2505.22	0.1
Col-Govt Is	RM 115 Le	5.17	100-yr	Ultimate_ALT108_SF	223000.3	-4.55	31.084	7.42	31.24	0.000056	3.198	70139.05	2505.22	0.1
Col-Govt Is	RM 115 Le	4.79	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-6.64	33.141	5.99	33.23	0.000029	2.412	76604.77	2663.15	0.08
Col-Govt Is	RM 115 Le	4.79	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-6.64	33.141	5.99	33.23	0.000029	2.412	76604.72	2663.15	0.08
Col-Govt Is	RM 115 Le	4.79	2-year	Ultimate_ALT107_WAR	74944.61	-6.64	19.55	2.49	19.6	0.000031	1.75	42830.91	2309.92	0.07
Col-Govt Is	RM 115 Le	4.79	2-year	Ultimate_ALT108_WAR	74944.61	-6.64	19.55	2.49	19.6	0.000031	1.75	42830.91	2309.92	0.07
Col-Govt Is	RM 115 Le	4.79	2-year	Ultimate_ALT107_SF	109153	-6.64	20.555	3.83	20.65	0.000055	2.417	45155.81	2317.35	0.1
Col-Govt Is	RM 115 Le	4.79	2-year	Ultimate_ALT108_SF	109153	-6.64	20.555	3.83	20.65	0.000055	2.417	45155.81	2317.35	0.1
Col-Govt Is	RM 115 Le	4.79	100-yr	Ultimate_ALT107_WAR	181682	-6.64	34.116	5.99	34.2	0.000026	2.343	79221.73	2708.93	0.07
Col-Govt Is	RM 115 Le	4.79	100-yr	Ultimate_ALT108_WAR	181682	-6.64	34.116	5.99	34.2	0.000026	2.343	79221.66	2708.93	0.07
Col-Govt Is	RM 115 Le	4.79	100-yr	Ultimate_ALT107_SF	223000.4	-6.64	30.97	6.96	31.13	0.000056	3.192	70890.09	2617.43	0.1
Col-Govt Is	RM 115 Le	4.79	100-yr	Ultimate_ALT108_SF	223000.3	-6.64	30.97	6.96	31.13	0.000056	3.192	70889.95	2617.43	0.1
Col-Govt Is	RM 115 Le	4.33	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-4.22	33.069	5.52	33.16	0.000029	2.436	74552.44	2461.24	0.08
Col-Govt Is	RM 115 Le	4.33	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-4.22	33.069	5.51	33.16	0.000029	2.436	74552.38	2461.24	0.08
Col-Govt Is	RM 115 Le	4.33	2-year	Ultimate_ALT107_WAR	74944.61	-4.22	19.479	2.67	19.53	0.000029	1.728	43362.37	2258.61	0.07
Col-Govt Is	RM 115 Le	4.33	2-year	Ultimate_ALT108_WAR	74944.61	-4.22	19.479	2.67	19.53	0.000029	1.728	43362.37	2258.61	0.07
Col-Govt Is	RM 115 Le	4.33	2-year	Ultimate_ALT107_SF	109153	-4.22	20.427	3.67	20.52	0.000052	2.399	45505.02	2262.53	0.09
Col-Govt Is	RM 115 Le	4.33	2-year	Ultimate_ALT108_SF	109153	-4.22	20.427	3.67	20.52	0.000052	2.399	45505.02	2262.53	0.09
Col-Govt Is	RM 115 Le	4.33	100-yr	Ultimate_ALT107_WAR	181682	-4.22	34.05	5.52	34.14	0.000026	2.368	77018.93	2565.94	0.07
Col-Govt Is	RM 115 Le	4.33	100-yr	Ultimate_ALT108_WAR	181682	-4.22	34.05	5.52	34.14	0.000026	2.368	77018.87	2565.94	0.07
Col-Govt Is	RM 115 Le	4.33	100-yr	Ultimate_ALT107_SF	223000.4	-4.22	30.833	6.45	30.99	0.000055	3.221	69235.32	2303.89	0.1
Col-Govt Is	RM 115 Le	4.33	100-yr	Ultimate_ALT108_SF	223000.3	-4.22	30.833	6.45	30.99	0.000055	3.221	69235.19	2303.89	0.1
Col-Govt Is	RM 115 Le	3.93	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-6.77	32.995	6.7	33.1	0.000033	2.549	72472.8	2726.27	0.08
Col-Govt Is	RM 115 Le	3.93	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-6.77	32.995	6.7	33.1	0.000033	2.549	72472.73	2726.26	0.08
Col-Govt Is	RM 115 Le	3.93	2-year	Ultimate_ALT107_WAR	74944.61	-6.77	19.404	3.41	19.46	0.000036	1.854	40417.84	2228.18	0.08
Col-Govt Is	RM 115 Le	3.93	2-year	Ultimate_ALT108_WAR	74944.61	-6.77	19.404	3.41	19.46	0.000036	1.854	40417.84	2228.18	0.08
Col-Govt Is	RM 115 Le	3.93	2-year	Ultimate_ALT107_SF	109153	-6.77	20.29	4.75	20.39	0.000065	2.575	42393.08	2231.25	0.1
Col-Govt Is	RM 115 Le	3.93	2-year	Ultimate_ALT108_SF	109153	-6.77	20.29	4.75	20.39	0.000065	2.575	42393.08	2231.25	0.1
Col-Govt Is	RM 115 Le	3.93	100-yr	Ultimate_ALT107_WAR	181682	-6.77	33.982	6.71	34.08	0.00003	2.474	75223.49	2831.27	0.08
Col-Govt Is	RM 115 Le	3.93	100-yr	Ultimate_ALT108_WAR	181682	-6.77	33.982	6.71	34.08	0.00003	2.474	75223.41	2831.27	0.08
Col-Govt Is	RM 115 Le	3.93	100-yr	Ultimate_ALT107_SF	223000.4	-6.77	30.689	7.67	30.87	0.000064	3.388	66488.34	2471	0.11
Col-Govt Is	RM 115 Le	3.93	100-yr	Ultimate_ALT108_SF	223000.3	-6.77	30.689	7.67	30.87	0.000064	3.388	66488.24	2471	0.11
Col-Govt Is	RM 115 Le	3.5	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-6	32.933	3.97	33.03	0.000028	2.474	74070.21	2404.17	0.07
Col-Govt Is	RM 115 Le	3.5	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-6	32.933	3.97	33.03	0.000028	2.474	74070.16	2404.17	0.07
Col-Govt Is	RM 115 Le	3.5	2-year	Ultimate_ALT107_WAR	74944.61	-6	19.347	1.04	19.39	0.000025	1.695	44206.75	2110.25	0.07
Col-Govt Is	RM 115 Le	3.5	2-year	Ultimate_ALT108_WAR	74944.61	-6	19.347	1.04	19.39	0.000025	1.695	44206.75	2110.25	0.07
Col-Govt Is	RM 115 Le	3.5	2-year	Ultimate_ALT107_SF	109153	-6	20.184	2.08	20.27	0.000046	2.374	45974.58	2113.02	0.09
Col-Govt Is	RM 115 Le	3.5	2-year	Ultimate_ALT108_SF	109153	-6	20.184	2.08	20.27	0.000046	2.374	45974.58	2113.02	0.09
Col-Govt Is	RM 115 Le	3.5	100-yr	Ultimate_ALT107_WAR	181682	-6	33.926	3.99	34.02	0.000025	2.408	76457.92	2406.84	0.07
Col-Govt Is	RM 115 Le	3.5	100-yr	Ultimate_ALT108_WAR	181682	-6	33.926	3.99	34.02	0.000025	2.408	76457.84	2406.84	0.07

Col-Govt Is	RM 115 Le	3.5	100-yr	Ultimate_ALT107_SF	223000.4	-6	30.571	4.93	30.74	0.000053	3.273	68462.34	2308.87	0.1
Col-Govt Is	RM 115 Le	3.5	100-yr	Ultimate_ALT108_SF	223000.3	-6	30.571	4.93	30.74	0.000053	3.273	68462.24	2308.87	0.1
Col-Govt Is	RM 115 Le	3.07	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-0.03	32.824	9.41	32.95	0.000046	2.834	64788.41	2397.14	0.09
Col-Govt Is	RM 115 Le	3.07	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-0.03	32.824	9.4	32.95	0.000046	2.834	64788.35	2397.14	0.09
Col-Govt Is	RM 115 Le	3.07	2-year	Ultimate_ALT107_WAR	74944.61	-0.03	19.232	6.6	19.31	0.000061	2.204	34003.14	2167.85	0.1
Col-Govt Is	RM 115 Le	3.07	2-year	Ultimate_ALT108_WAR	74944.61	-0.03	19.232	6.6	19.31	0.000061	2.204	34003.14	2167.85	0.1
Col-Govt Is	RM 115 Le	3.07	2-year	Ultimate_ALT107_SF	109153	-0.03	19.97	7.61	20.12	0.000112	3.066	35603.8	2170.3	0.13
Col-Govt Is	RM 115 Le	3.07	2-year	Ultimate_ALT108_SF	109153	-0.03	19.97	7.61	20.12	0.000112	3.066	35603.8	2170.3	0.13
Col-Govt Is	RM 115 Le	3.07	100-yr	Ultimate_ALT107_WAR	181682	-0.03	33.827	9.41	33.94	0.000041	2.743	67195.64	2402.28	0.09
Col-Govt Is	RM 115 Le	3.07	100-yr	Ultimate_ALT108_WAR	181682	-0.03	33.827	9.41	33.94	0.000041	2.743	67195.58	2402.28	0.09
Col-Govt Is	RM 115 Le	3.07	100-yr	Ultimate_ALT107_SF	223000.4	-0.03	30.354	10.31	30.58	0.000092	3.818	58887.9	2374.23	0.13
Col-Govt Is	RM 115 Le	3.07	100-yr	Ultimate_ALT108_SF	223000.3	-0.03	30.354	10.31	30.58	0.000092	3.818	58887.8	2374.22	0.13
Col-Govt Is	RM 115 Le	2.77	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-5.24	32.796	6.34	32.89	0.00003	2.457	75618.27	2694.64	0.08
Col-Govt Is	RM 115 Le	2.77	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-5.24	32.796	6.34	32.89	0.00003	2.457	75618.17	2694.64	0.08
Col-Govt Is	RM 115 Le	2.77	2-year	Ultimate_ALT107_WAR	74944.61	-5.24	19.188	3.57	19.24	0.000033	1.788	41926.52	2295.35	0.07
Col-Govt Is	RM 115 Le	2.77	2-year	Ultimate_ALT108_WAR	74944.61	-5.24	19.188	3.57	19.24	0.000033	1.788	41926.52	2295.35	0.07
Col-Govt Is	RM 115 Le	2.77	2-year	Ultimate_ALT107_SF	109153	-5.24	19.888	4.6	19.99	0.000062	2.507	43535.73	2297.67	0.1
Col-Govt Is	RM 115 Le	2.77	2-year	Ultimate_ALT108_SF	109153	-5.24	19.888	4.6	19.99	0.000062	2.507	43535.73	2297.67	0.1
Col-Govt Is	RM 115 Le	2.77	100-yr	Ultimate_ALT107_WAR	181682	-5.24	33.803	6.35	33.89	0.000027	2.384	78332.05	2698.06	0.07
Col-Govt Is	RM 115 Le	2.77	100-yr	Ultimate_ALT108_WAR	181682	-5.24	33.803	6.35	33.89	0.000027	2.384	78331.96	2698.06	0.07
Col-Govt Is	RM 115 Le	2.77	100-yr	Ultimate_ALT107_SF	223000.4	-5.24	30.295	7.24	30.46	0.00006	3.29	68887.24	2654.11	0.11
Col-Govt Is	RM 115 Le	2.77	100-yr	Ultimate_ALT108_SF	223000.3	-5.24	30.295	7.24	30.46	0.00006	3.29	68887.1	2654.1	0.11
Col-Govt Is	RM 115 Le	2.49	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-3.63	32.756	6.29	32.85	0.00003	2.409	75320.47	2499.48	0.08
Col-Govt Is	RM 115 Le	2.49	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-3.63	32.756	6.29	32.85	0.00003	2.409	75320.36	2499.48	0.08
Col-Govt Is	RM 115 Le	2.49	2-year	Ultimate_ALT107_WAR	74944.61	-3.63	19.143	3.02	19.19	0.000032	1.749	42860.88	2350.49	0.07
Col-Govt Is	RM 115 Le	2.49	2-year	Ultimate_ALT108_WAR	74944.61	-3.63	19.143	3.02	19.19	0.000032	1.749	42860.88	2350.49	0.07
Col-Govt Is	RM 115 Le	2.49	2-year	Ultimate_ALT107_SF	109153	-3.63	19.805	4.22	19.9	0.000059	2.457	44416.73	2352.87	0.1
Col-Govt Is	RM 115 Le	2.49	2-year	Ultimate_ALT108_SF	109153	-3.63	19.805	4.22	19.9	0.000059	2.457	44416.73	2352.87	0.1
Col-Govt Is	RM 115 Le	2.49	100-yr	Ultimate_ALT107_WAR	181682	-3.63	33.767	6.29	33.85	0.000027	2.337	77862.37	2529.55	0.07
Col-Govt Is	RM 115 Le	2.49	100-yr	Ultimate_ALT108_WAR	181682	-3.63	33.767	6.29	33.85	0.000027	2.337	77862.28	2529.55	0.07
Col-Govt Is	RM 115 Le	2.49	100-yr	Ultimate_ALT107_SF	223000.4	-3.63	30.215	7.17	30.38	0.000058	3.227	69101.77	2392.07	0.11
Col-Govt Is	RM 115 Le	2.49	100-yr	Ultimate_ALT108_SF	223000.3	-3.63	30.215	7.17	30.38	0.000058	3.227	69101.67	2392.07	0.11
Col-Govt Is	RM 115 Le	2.13	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-10.06	32.705	4.5	32.79	0.000028	2.37	77761.04	2718.13	0.07
Col-Govt Is	RM 115 Le	2.13	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-10.06	32.705	4.5	32.79	0.000028	2.37	77760.95	2718.13	0.07
Col-Govt Is	RM 115 Le	2.13	2-year	Ultimate_ALT107_WAR	74944.61	-10.06	19.088	0.73	19.13	0.000029	1.712	43780.66	2344.93	0.07
Col-Govt Is	RM 115 Le	2.13	2-year	Ultimate_ALT108_WAR	74944.61	-10.06	19.088	0.73	19.13	0.000029	1.712	43780.66	2344.93	0.07
Col-Govt Is	RM 115 Le	2.13	2-year	Ultimate_ALT107_SF	109153	-10.06	19.699	2.21	19.79	0.000056	2.414	45214.99	2349.38	0.1
Col-Govt Is	RM 115 Le	2.13	2-year	Ultimate_ALT108_SF	109153	-10.06	19.699	2.21	19.79	0.000056	2.414	45214.99	2349.38	0.1
Col-Govt Is	RM 115 Le	2.13	100-yr	Ultimate_ALT107_WAR	181682	-10.06	33.72	4.51	33.8	0.000025	2.299	80522.71	2720.51	0.07
Col-Govt Is	RM 115 Le	2.13	100-yr	Ultimate_ALT108_WAR	181682	-10.06	33.72	4.51	33.8	0.000025	2.299	80522.62	2720.51	0.07
Col-Govt Is	RM 115 Le	2.13	100-yr	Ultimate_ALT107_SF	223000.4	-10.06	30.111	5.62	30.27	0.000056	3.181	70735.02	2699.04	0.1
Col-Govt Is	RM 115 Le	2.13	100-yr	Ultimate_ALT108_SF	223000.3	-10.06	30.111	5.62	30.27	0.000056	3.181	70734.9	2699.04	0.1

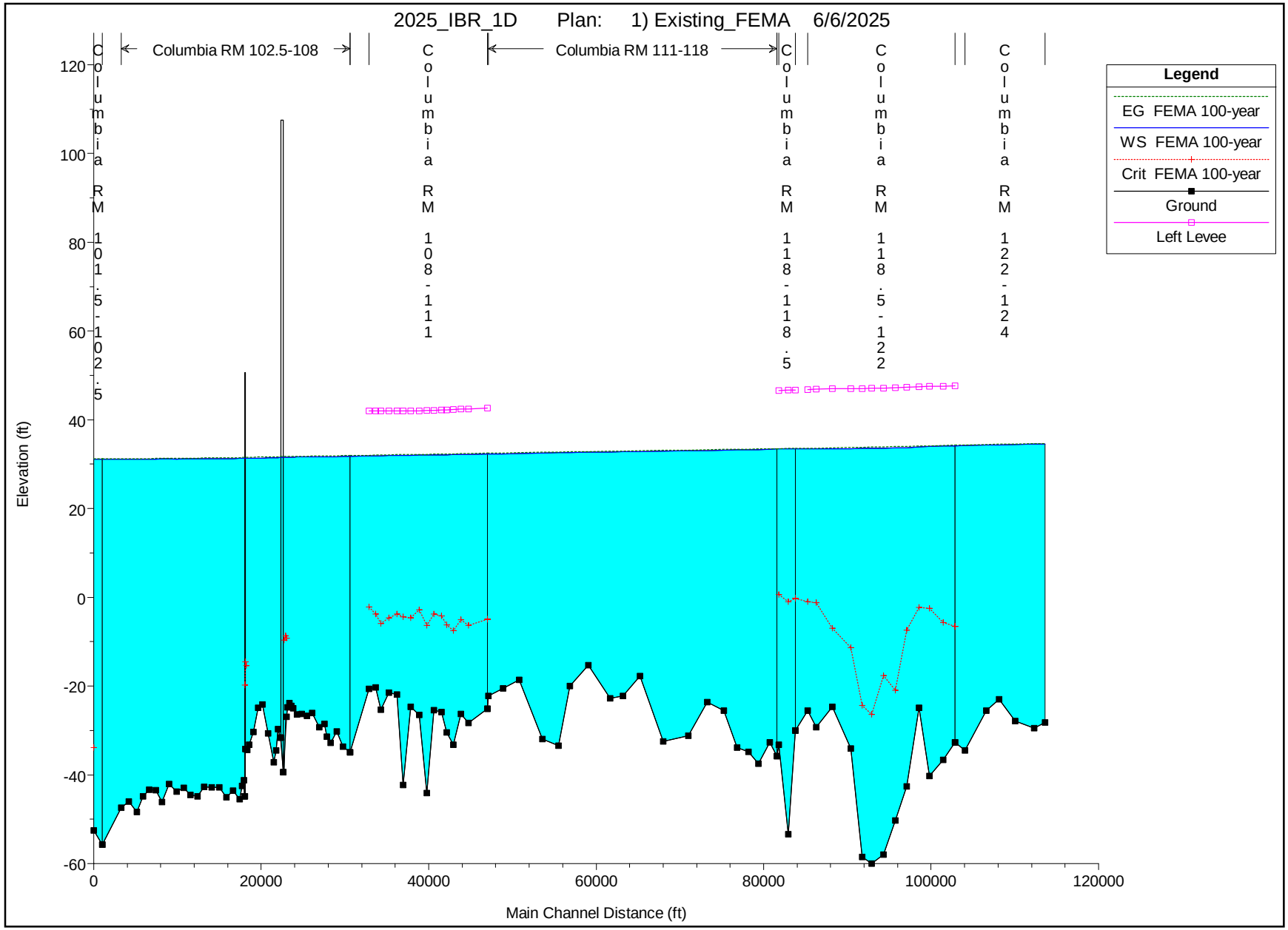
Col-Govt Is	RM 115 Le	1.7	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-10.17	32.6	4.23	32.72	0.000039	2.827	69734.09	2721.13	0.09
Col-Govt Is	RM 115 Le	1.7	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-10.17	32.6	4.24	32.72	0.000039	2.827	69734.02	2721.13	0.09
Col-Govt Is	RM 115 Le	1.7	2-year	Ultimate_ALT107_WAR	74944.61	-10.17	18.985	-0.49	19.05	0.000041	2.132	35852.4	2112.98	0.08
Col-Govt Is	RM 115 Le	1.7	2-year	Ultimate_ALT108_WAR	74944.61	-10.17	18.985	-0.49	19.05	0.000041	2.132	35852.4	2112.98	0.08
Col-Govt Is	RM 115 Le	1.7	2-year	Ultimate_ALT107_SF	109153	-10.17	19.497	1.18	19.64	0.00008	3.023	36945.63	2149.78	0.12
Col-Govt Is	RM 115 Le	1.7	2-year	Ultimate_ALT108_SF	109153	-10.17	19.497	1.18	19.64	0.00008	3.023	36945.63	2149.78	0.12
Col-Govt Is	RM 115 Le	1.7	100-yr	Ultimate_ALT107_WAR	181682	-10.17	33.626	4.24	33.73	0.000035	2.731	72527.47	2723.82	0.08
Col-Govt Is	RM 115 Le	1.7	100-yr	Ultimate_ALT108_WAR	181682	-10.17	33.626	4.24	33.73	0.000035	2.731	72527.39	2723.82	0.08
Col-Govt Is	RM 115 Le	1.7	100-yr	Ultimate_ALT107_SF	223000.4	-10.17	29.895	5.67	30.12	0.000081	3.85	62385.75	2713.28	0.13
Col-Govt Is	RM 115 Le	1.7	100-yr	Ultimate_ALT108_SF	223000.3	-10.17	29.895	5.67	30.12	0.000081	3.85	62385.63	2713.28	0.13
Col-Govt Is	RM 115 Le	1.35	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-10.52	32.528	1.33	32.65	0.000035	2.902	70970.5	2611.16	0.09
Col-Govt Is	RM 115 Le	1.35	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-10.52	32.528	1.33	32.65	0.000035	2.902	70970.39	2611.16	0.09
Col-Govt Is	RM 115 Le	1.35	2-year	Ultimate_ALT107_WAR	74944.61	-10.52	18.93	-3.08	18.99	0.00003	2.018	39092.34	1905.59	0.07
Col-Govt Is	RM 115 Le	1.35	2-year	Ultimate_ALT108_WAR	74944.61	-10.52	18.93	-3.08	18.99	0.00003	2.018	39092.34	1905.59	0.07
Col-Govt Is	RM 115 Le	1.35	2-year	Ultimate_ALT107_SF	109153	-10.52	19.387	-1.47	19.51	0.00006	2.878	39971.05	1932.3	0.1
Col-Govt Is	RM 115 Le	1.35	2-year	Ultimate_ALT108_SF	109153	-10.52	19.387	-1.47	19.51	0.00006	2.878	39971.05	1932.3	0.1
Col-Govt Is	RM 115 Le	1.35	100-yr	Ultimate_ALT107_WAR	181682	-10.52	33.56	1.34	33.67	0.000032	2.816	73673.03	2625.28	0.08
Col-Govt Is	RM 115 Le	1.35	100-yr	Ultimate_ALT108_WAR	181682	-10.52	33.56	1.34	33.67	0.000032	2.816	73672.97	2625.28	0.08
Col-Govt Is	RM 115 Le	1.35	100-yr	Ultimate_ALT107_SF	223000.4	-10.52	29.756	2.68	29.98	0.00007	3.907	63910.34	2507.96	0.12
Col-Govt Is	RM 115 Le	1.35	100-yr	Ultimate_ALT108_SF	223000.3	-10.52	29.756	2.68	29.98	0.00007	3.907	63910.21	2507.96	0.12
Col-Govt Is	RM 115 Le	0.86	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-9.23	32.447	2.51	32.56	0.000033	2.697	67545.48	2144.6	0.08
Col-Govt Is	RM 115 Le	0.86	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-9.23	32.447	2.51	32.56	0.000033	2.697	67545.44	2144.6	0.08
Col-Govt Is	RM 115 Le	0.86	2-year	Ultimate_ALT107_WAR	74944.61	-9.23	18.865	-0.85	18.92	0.000027	1.825	41064.3	1861.29	0.07
Col-Govt Is	RM 115 Le	0.86	2-year	Ultimate_ALT108_WAR	74944.61	-9.23	18.865	-0.85	18.92	0.000027	1.825	41064.3	1861.29	0.07
Col-Govt Is	RM 115 Le	0.86	2-year	Ultimate_ALT107_SF	109153	-9.23	19.259	0.4	19.36	0.000053	2.612	41796.83	1863.72	0.1
Col-Govt Is	RM 115 Le	0.86	2-year	Ultimate_ALT108_SF	109153	-9.23	19.259	0.4	19.36	0.000053	2.612	41796.83	1863.72	0.1
Col-Govt Is	RM 115 Le	0.86	100-yr	Ultimate_ALT107_WAR	181682	-9.23	33.486	2.52	33.59	0.00003	2.621	69799.12	2186.2	0.08
Col-Govt Is	RM 115 Le	0.86	100-yr	Ultimate_ALT108_WAR	181682	-9.23	33.486	2.52	33.59	0.00003	2.621	69799.03	2186.2	0.08
Col-Govt Is	RM 115 Le	0.86	100-yr	Ultimate_ALT107_SF	223000.4	-9.23	29.595	3.59	29.8	0.000066	3.623	61624.23	1990.26	0.11
Col-Govt Is	RM 115 Le	0.86	100-yr	Ultimate_ALT108_SF	223000.3	-9.23	29.595	3.59	29.8	0.000066	3.623	61624.13	1990.26	0.11
Col-Govt Is	RM 115 Le	0.55	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-3	32.413	5.91	32.51	0.000031	2.477	73204.03	2313.79	0.08
Col-Govt Is	RM 115 Le	0.55	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-3	32.413	5.91	32.51	0.000031	2.477	73203.93	2313.79	0.08
Col-Govt Is	RM 115 Le	0.55	2-year	Ultimate_ALT107_WAR	74944.61	-3	18.819	3.17	18.87	0.000032	1.785	41991.95	2276.73	0.07
Col-Govt Is	RM 115 Le	0.55	2-year	Ultimate_ALT108_WAR	74944.61	-3	18.819	3.17	18.87	0.000032	1.785	41991.95	2276.73	0.07
Col-Govt Is	RM 115 Le	0.55	2-year	Ultimate_ALT107_SF	109153	-3	19.167	4.14	19.27	0.000065	2.551	42783.71	2278.04	0.1
Col-Govt Is	RM 115 Le	0.55	2-year	Ultimate_ALT108_SF	109153	-3	19.167	4.14	19.27	0.000065	2.551	42783.71	2278.04	0.1
Col-Govt Is	RM 115 Le	0.55	100-yr	Ultimate_ALT107_WAR	181682	-3	33.456	5.92	33.55	0.000028	2.403	75619.41	2317.95	0.07
Col-Govt Is	RM 115 Le	0.55	100-yr	Ultimate_ALT108_WAR	181682	-3	33.456	5.92	33.55	0.000028	2.403	75619.32	2317.95	0.07
Col-Govt Is	RM 115 Le	0.55	100-yr	Ultimate_ALT107_SF	223000.4	-3	29.518	6.8	29.69	0.000063	3.352	66519.32	2305.51	0.11
Col-Govt Is	RM 115 Le	0.55	100-yr	Ultimate_ALT108_SF	223000.3	-3	29.518	6.8	29.69	0.000063	3.352	66519.22	2305.51	0.11
Col-Govt Is	RM 115 Le	0.24	FEMA 100-year	Ultimate_ALT107_FEMA	181291	-2.26	32.318	8.35	32.45	0.000046	2.896	62606.92	2096.03	0.09
Col-Govt Is	RM 115 Le	0.24	FEMA 100-year	Ultimate_ALT108_FEMA	181291	-2.26	32.318	8.35	32.45	0.000046	2.896	62606.83	2096.03	0.09
Col-Govt Is	RM 115 Le	0.24	2-year	Ultimate_ALT107_WAR	74944.61	-2.26	18.726	5.54	18.8	0.000057	2.189	34230.72	2077.03	0.1

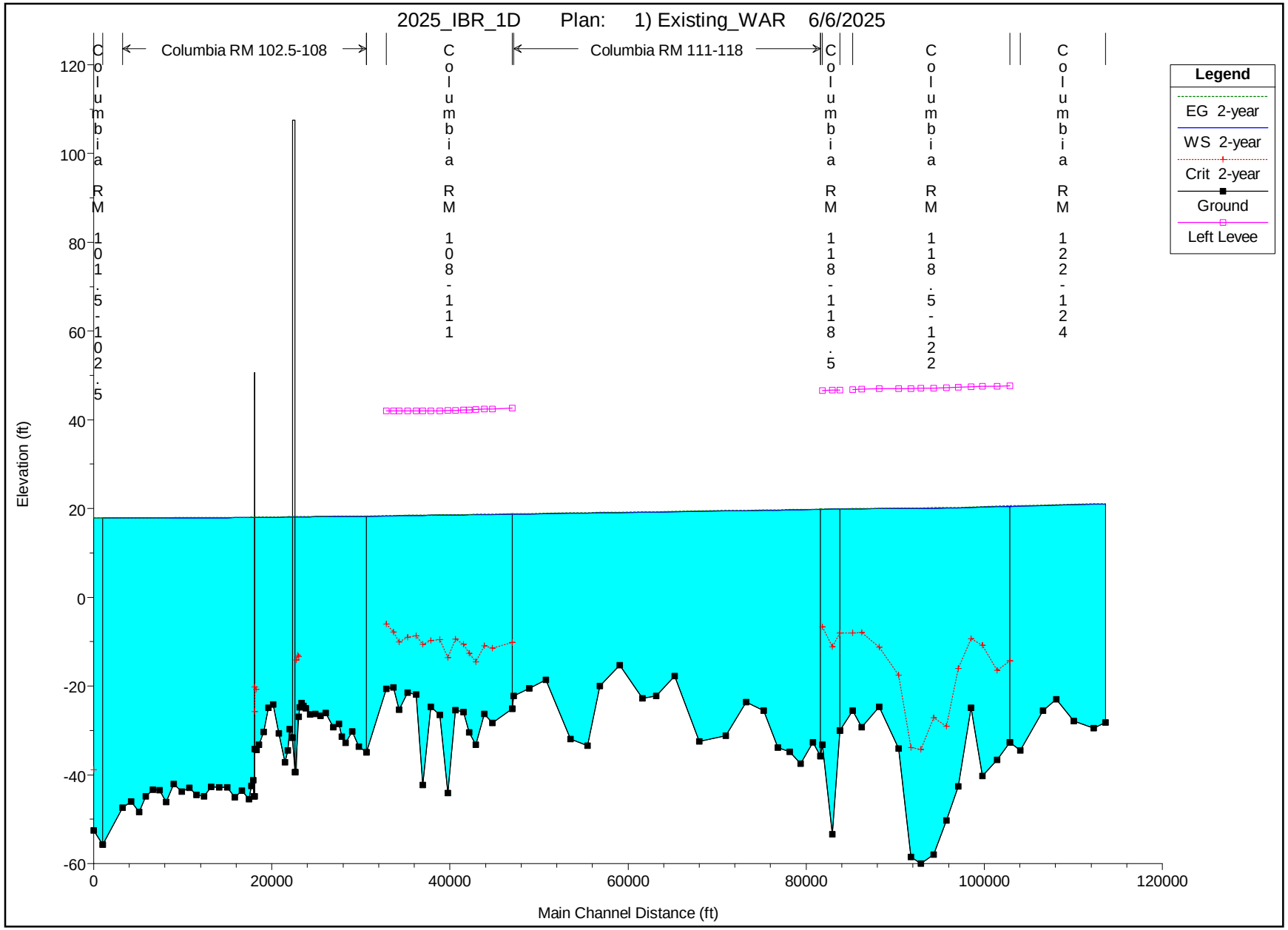
Col-Govt Is	RM 115 Le	0.24	2-year	Ultimate_ALT108_WAR	74944.61	-2.26	18.726	5.54	18.8	0.000057	2.189	34230.72	2077.03	0.1
Col-Govt Is	RM 115 Le	0.24	2-year	Ultimate_ALT107_SF	109153	-2.26	18.979	6.54	19.13	0.000115	3.141	34754.8	2077.51	0.14
Col-Govt Is	RM 115 Le	0.24	2-year	Ultimate_ALT108_SF	109153	-2.26	18.979	6.54	19.13	0.000115	3.141	34754.8	2077.51	0.14
Col-Govt Is	RM 115 Le	0.24	100-yr	Ultimate_ALT107_WAR	181682	-2.26	33.37	8.36	33.49	0.000041	2.803	64811.75	2097.34	0.09
Col-Govt Is	RM 115 Le	0.24	100-yr	Ultimate_ALT108_WAR	181682	-2.26	33.37	8.36	33.49	0.000041	2.803	64811.66	2097.34	0.09
Col-Govt Is	RM 115 Le	0.24	100-yr	Ultimate_ALT107_SF	223000.4	-2.26	29.324	9.28	29.57	0.000098	3.958	56337.36	2092.71	0.13
Col-Govt Is	RM 115 Le	0.24	100-yr	Ultimate_ALT108_SF	223000.3	-2.26	29.324	9.28	29.57	0.000098	3.958	56337.25	2092.71	0.13
Col-Camas	RM 120 Rig	2.89	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-4.36	33.549		33.55	0.000001	0.415	7090.56	260.73	0.01
Col-Camas	RM 120 Rig	2.89	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-4.36	33.549		33.55	0.000001	0.415	7090.54	260.73	0.01
Col-Camas	RM 120 Rig	2.89	2-year	Ultimate_ALT107_WAR	6000	-4.36	19.963		20	0.000027	1.55	3871.33	214.25	0.06
Col-Camas	RM 120 Rig	2.89	2-year	Ultimate_ALT108_WAR	6000	-4.36	19.963		20	0.000027	1.55	3871.33	214.25	0.06
Col-Camas	RM 120 Rig	2.89	2-year	Ultimate_ALT107_SF	4000	-4.36	21.263		21.28	0.00001	0.963	4152.29	218.25	0.04
Col-Camas	RM 120 Rig	2.89	2-year	Ultimate_ALT108_SF	4000	-4.36	21.263		21.28	0.00001	0.963	4152.29	218.25	0.04
Col-Camas	RM 120 Rig	2.89	100-yr	Ultimate_ALT107_WAR	5000	-4.36	34.504		34.51	0.000003	0.681	7341.13	263.96	0.02
Col-Camas	RM 120 Rig	2.89	100-yr	Ultimate_ALT108_WAR	5000	-4.36	34.504		34.51	0.000003	0.681	7341.13	263.96	0.02
Col-Camas	RM 120 Rig	2.89	100-yr	Ultimate_ALT107_SF	4000	-4.36	31.762		31.77	0.000003	0.603	6630.05	254.67	0.02
Col-Camas	RM 120 Rig	2.89	100-yr	Ultimate_ALT108_SF	4000	-4.36	31.762		31.77	0.000003	0.603	6630.04	254.67	0.02
Col-Camas	RM 120 Rig	2.6	FEMA 100-year	Ultimate_ALT107_FEMA	2941	0.04	33.551		33.55	0	0.115	25626.2	1553.27	0
Col-Camas	RM 120 Rig	2.6	FEMA 100-year	Ultimate_ALT108_FEMA	2941	0.04	33.551		33.55	0	0.115	25626.14	1553.27	0
Col-Camas	RM 120 Rig	2.6	2-year	Ultimate_ALT107_WAR	6000	0.04	19.972		19.98	0.000005	0.516	11625.4	989.05	0.03
Col-Camas	RM 120 Rig	2.6	2-year	Ultimate_ALT108_WAR	6000	0.04	19.972		19.98	0.000005	0.516	11625.4	989.05	0.03
Col-Camas	RM 120 Rig	2.6	2-year	Ultimate_ALT107_SF	4000	0.04	21.267		21.27	0.000002	0.31	12910.21	995.68	0.02
Col-Camas	RM 120 Rig	2.6	2-year	Ultimate_ALT108_SF	4000	0.04	21.267		21.27	0.000002	0.31	12910.21	995.68	0.02
Col-Camas	RM 120 Rig	2.6	100-yr	Ultimate_ALT107_WAR	5000	0.04	34.508		34.51	0	0.188	26640.9	1617.37	0.01
Col-Camas	RM 120 Rig	2.6	100-yr	Ultimate_ALT108_WAR	5000	0.04	34.508		34.51	0	0.188	26640.88	1617.37	0.01
Col-Camas	RM 120 Rig	2.6	100-yr	Ultimate_ALT107_SF	4000	0.04	31.765		31.77	0	0.168	23742.47	1286.81	0.01
Col-Camas	RM 120 Rig	2.6	100-yr	Ultimate_ALT108_SF	4000	0.04	31.765		31.77	0	0.168	23742.41	1286.81	0.01
Col-Camas	RM 120 Rig	2.4	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-3.85	33.55		33.55	0	0.141	20881.62	1115.16	0
Col-Camas	RM 120 Rig	2.4	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-3.85	33.55		33.55	0	0.141	20881.57	1115.15	0
Col-Camas	RM 120 Rig	2.4	2-year	Ultimate_ALT107_WAR	6000	-3.85	19.967		19.97	0.000004	0.553	10857.06	703.9	0.02
Col-Camas	RM 120 Rig	2.4	2-year	Ultimate_ALT108_WAR	6000	-3.85	19.967		19.97	0.000004	0.553	10857.06	703.9	0.02
Col-Camas	RM 120 Rig	2.4	2-year	Ultimate_ALT107_SF	4000	-3.85	21.265		21.27	0.000001	0.34	11774	708.86	0.01
Col-Camas	RM 120 Rig	2.4	2-year	Ultimate_ALT108_SF	4000	-3.85	21.265		21.27	0.000001	0.34	11774	708.86	0.01
Col-Camas	RM 120 Rig	2.4	100-yr	Ultimate_ALT107_WAR	5000	-3.85	34.508		34.51	0	0.231	21713.63	1310.77	0.01
Col-Camas	RM 120 Rig	2.4	100-yr	Ultimate_ALT108_WAR	5000	-3.85	34.507		34.51	0	0.231	21713.61	1310.76	0.01
Col-Camas	RM 120 Rig	2.4	100-yr	Ultimate_ALT107_SF	4000	-3.85	31.765		31.77	0	0.205	19482.71	933.77	0.01
Col-Camas	RM 120 Rig	2.4	100-yr	Ultimate_ALT108_SF	4000	-3.85	31.765		31.77	0	0.205	19482.67	933.77	0.01
Col-Camas	RM 120 Rig	2.22	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-11.36	33.55		33.55	0	0.151	19678.32	968.74	0
Col-Camas	RM 120 Rig	2.22	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-11.36	33.55		33.55	0	0.151	19678.28	968.74	0
Col-Camas	RM 120 Rig	2.22	2-year	Ultimate_ALT107_WAR	6000	-11.36	19.965		19.97	0.000002	0.514	11682.85	492.64	0.02
Col-Camas	RM 120 Rig	2.22	2-year	Ultimate_ALT108_WAR	6000	-11.36	19.965		19.97	0.000002	0.514	11682.85	492.64	0.02
Col-Camas	RM 120 Rig	2.22	2-year	Ultimate_ALT107_SF	4000	-11.36	21.264		21.27	0.000001	0.324	12327.62	499.77	0.01
Col-Camas	RM 120 Rig	2.22	2-year	Ultimate_ALT108_SF	4000	-11.36	21.264		21.27	0.000001	0.324	12327.62	499.77	0.01

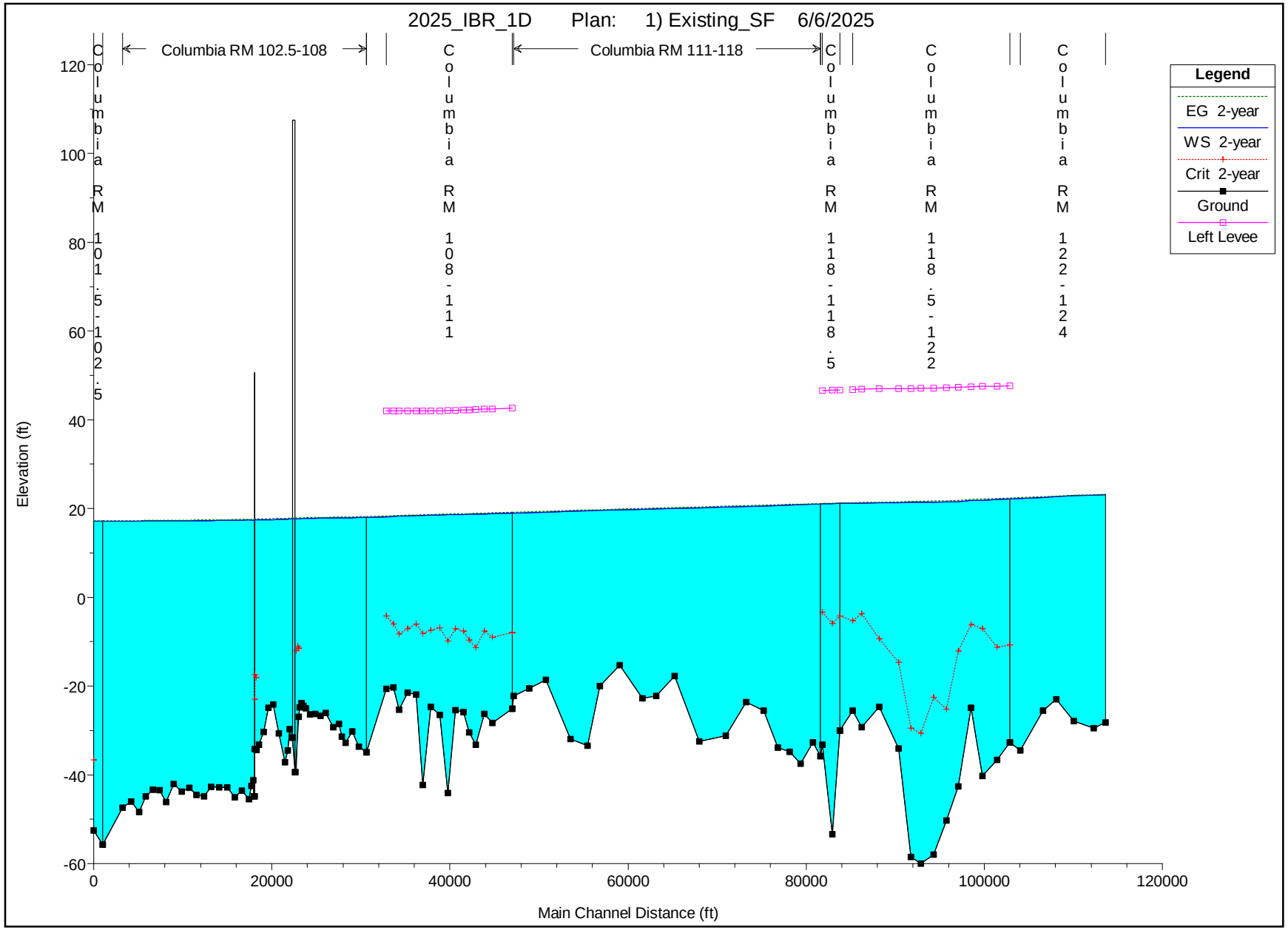
Col-Camas	RM 120 Rig	2.22	100-yr	Ultimate_ALT107_WAR	5000	-11.36	34.507		34.51	0	0.248	20489.46	1004.17	0.01
Col-Camas	RM 120 Rig	2.22	100-yr	Ultimate_ALT108_WAR	5000	-11.36	34.507		34.51	0	0.248	20489.44	1004.17	0.01
Col-Camas	RM 120 Rig	2.22	100-yr	Ultimate_ALT107_SF	4000	-11.36	31.764		31.76	0	0.219	18305.3	720.83	0.01
Col-Camas	RM 120 Rig	2.22	100-yr	Ultimate_ALT108_SF	4000	-11.36	31.764		31.76	0	0.219	18305.27	720.82	0.01
Col-Camas	RM 120 Rig	2	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-13.6	33.55		33.55	0	0.165	18187.94	1512.71	0.01
Col-Camas	RM 120 Rig	2	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-13.6	33.55		33.55	0	0.165	18187.9	1512.71	0.01
Col-Camas	RM 120 Rig	2	2-year	Ultimate_ALT107_WAR	6000	-13.6	19.962		19.97	0.000002	0.55	10909.05	489.06	0.02
Col-Camas	RM 120 Rig	2	2-year	Ultimate_ALT108_WAR	6000	-13.6	19.962		19.97	0.000002	0.55	10909.05	489.06	0.02
Col-Camas	RM 120 Rig	2	2-year	Ultimate_ALT107_SF	4000	-13.6	21.263		21.26	0.000001	0.346	11548.01	635.28	0.01
Col-Camas	RM 120 Rig	2	2-year	Ultimate_ALT108_SF	4000	-13.6	21.263		21.26	0.000001	0.346	11548.01	635.28	0.01
Col-Camas	RM 120 Rig	2	100-yr	Ultimate_ALT107_WAR	5000	-13.6	34.506		34.51	0	0.272	18823.33	1577.39	0.01
Col-Camas	RM 120 Rig	2	100-yr	Ultimate_ALT108_WAR	5000	-13.6	34.506		34.51	0	0.272	18823.32	1577.39	0.01
Col-Camas	RM 120 Rig	2	100-yr	Ultimate_ALT107_SF	4000	-13.6	31.764		31.76	0	0.237	17065.15	1488.54	0.01
Col-Camas	RM 120 Rig	2	100-yr	Ultimate_ALT108_SF	4000	-13.6	31.764		31.76	0	0.237	17065.13	1488.54	0.01
Col-Camas	RM 120 Rig	1.78	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-17.27	33.55		33.55	0	0.153	19190.92	570.33	0
Col-Camas	RM 120 Rig	1.78	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-17.27	33.55		33.55	0	0.153	19190.89	570.33	0
Col-Camas	RM 120 Rig	1.78	2-year	Ultimate_ALT107_WAR	6000	-17.27	19.96		19.96	0.000002	0.499	12024.06	503.74	0.02
Col-Camas	RM 120 Rig	1.78	2-year	Ultimate_ALT108_WAR	6000	-17.27	19.96		19.96	0.000002	0.499	12024.06	503.74	0.02
Col-Camas	RM 120 Rig	1.78	2-year	Ultimate_ALT107_SF	4000	-17.27	21.262		21.26	0.000001	0.315	12682.08	506.72	0.01
Col-Camas	RM 120 Rig	1.78	2-year	Ultimate_ALT108_SF	4000	-17.27	21.262		21.26	0.000001	0.315	12682.08	506.72	0.01
Col-Camas	RM 120 Rig	1.78	100-yr	Ultimate_ALT107_WAR	5000	-17.27	34.506		34.51	0	0.253	19738.67	575.13	0.01
Col-Camas	RM 120 Rig	1.78	100-yr	Ultimate_ALT108_WAR	5000	-17.27	34.506		34.51	0	0.253	19738.65	575.13	0.01
Col-Camas	RM 120 Rig	1.78	100-yr	Ultimate_ALT107_SF	4000	-17.27	31.764		31.76	0	0.22	18180.47	561.08	0.01
Col-Camas	RM 120 Rig	1.78	100-yr	Ultimate_ALT108_SF	4000	-17.27	31.763		31.76	0	0.22	18180.44	561.08	0.01
Col-Camas	RM 120 Rig	1.53	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-17.28	33.55		33.55	0	0.143	21789.11	1038.19	0
Col-Camas	RM 120 Rig	1.53	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-17.28	33.55		33.55	0	0.143	21789.07	1038.19	0
Col-Camas	RM 120 Rig	1.53	2-year	Ultimate_ALT107_WAR	6000	-17.28	19.959		19.96	0.000001	0.462	12985.95	523.65	0.02
Col-Camas	RM 120 Rig	1.53	2-year	Ultimate_ALT108_WAR	6000	-17.28	19.959		19.96	0.000001	0.462	12985.95	523.65	0.02
Col-Camas	RM 120 Rig	1.53	2-year	Ultimate_ALT107_SF	4000	-17.28	21.262		21.26	0.000001	0.293	13670.04	526.16	0.01
Col-Camas	RM 120 Rig	1.53	2-year	Ultimate_ALT108_SF	4000	-17.28	21.262		21.26	0.000001	0.293	13670.04	526.16	0.01
Col-Camas	RM 120 Rig	1.53	100-yr	Ultimate_ALT107_WAR	5000	-17.28	34.506		34.51	0	0.236	22654.61	1059.02	0.01
Col-Camas	RM 120 Rig	1.53	100-yr	Ultimate_ALT108_WAR	5000	-17.28	34.506		34.51	0	0.236	22654.59	1059.02	0.01
Col-Camas	RM 120 Rig	1.53	100-yr	Ultimate_ALT107_SF	4000	-17.28	31.763		31.76	0	0.206	20227.95	975.3	0.01
Col-Camas	RM 120 Rig	1.53	100-yr	Ultimate_ALT108_SF	4000	-17.28	31.763		31.76	0	0.206	20227.91	975.3	0.01
Col-Camas	RM 120 Rig	1.33	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-19.74	33.55		33.55	0	0.141	24289.74	1290.63	0
Col-Camas	RM 120 Rig	1.33	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-19.74	33.55		33.55	0	0.141	24289.68	1290.63	0
Col-Camas	RM 120 Rig	1.33	2-year	Ultimate_ALT107_WAR	6000	-19.74	19.957		19.96	0.000001	0.457	13138.59	491.07	0.02
Col-Camas	RM 120 Rig	1.33	2-year	Ultimate_ALT108_WAR	6000	-19.74	19.957		19.96	0.000001	0.457	13138.59	491.07	0.02
Col-Camas	RM 120 Rig	1.33	2-year	Ultimate_ALT107_SF	4000	-19.74	21.261		21.26	0.000001	0.29	13781.22	494.42	0.01
Col-Camas	RM 120 Rig	1.33	2-year	Ultimate_ALT108_SF	4000	-19.74	21.261		21.26	0.000001	0.29	13781.22	494.42	0.01
Col-Camas	RM 120 Rig	1.33	100-yr	Ultimate_ALT107_WAR	5000	-19.74	34.506		34.51	0	0.232	25362.38	1302.09	0.01
Col-Camas	RM 120 Rig	1.33	100-yr	Ultimate_ALT108_WAR	5000	-19.74	34.506		34.51	0	0.232	25362.36	1302.09	0.01
Col-Camas	RM 120 Rig	1.33	100-yr	Ultimate_ALT107_SF	4000	-19.74	31.763		31.76	0	0.203	22329.8	1223.85	0.01

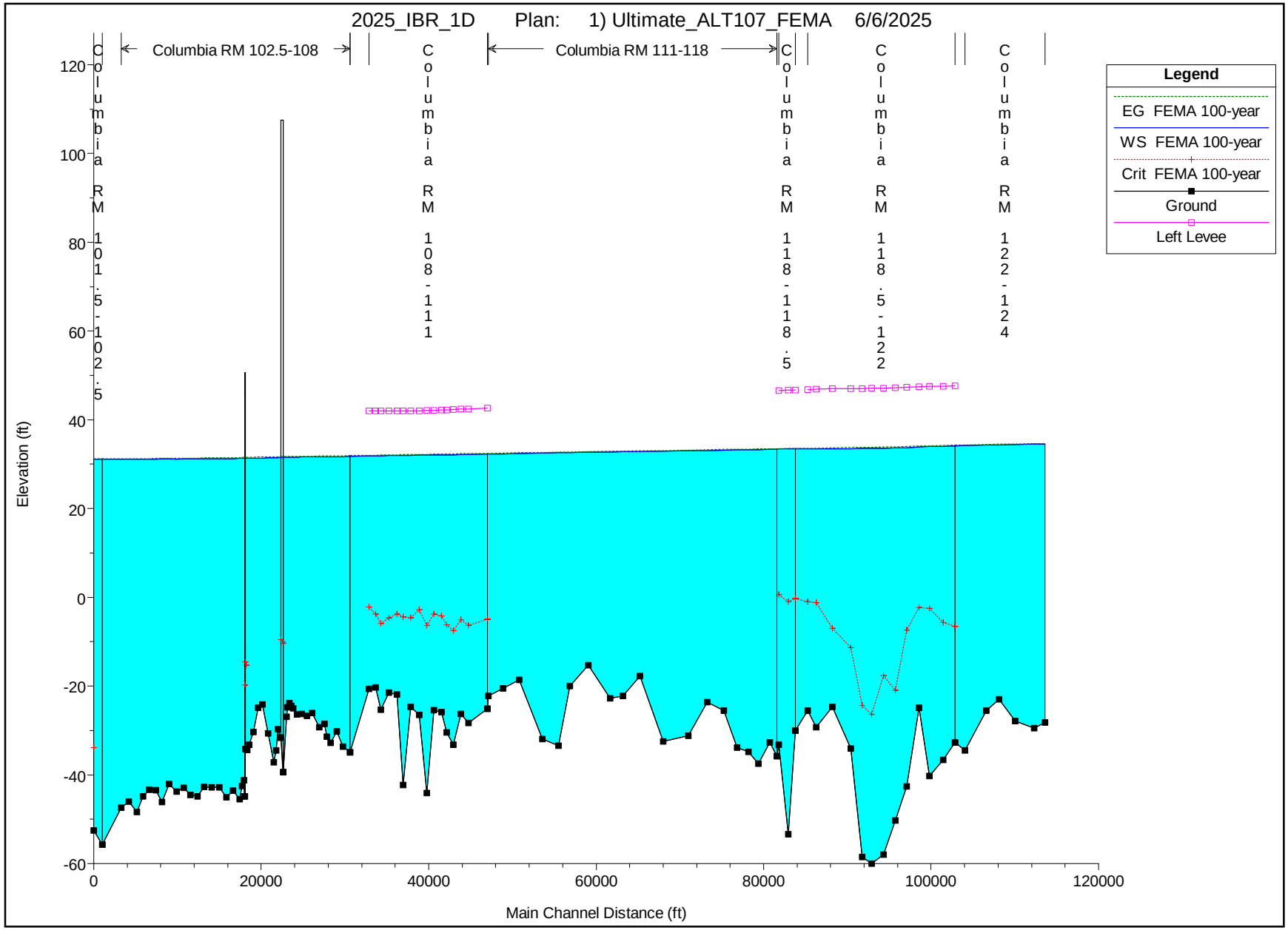
Col-Camas	RM 120 Rig	1.33	100-yr	Ultimate_ALT108_SF	4000	-19.74	31.763		31.76	0	0.203	22329.75	1223.85	0.01
Col-Camas	RM 120 Rig	1.13	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-16.93	33.55		33.55	0	0.119	25912.07	967.37	0
Col-Camas	RM 120 Rig	1.13	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-16.93	33.55		33.55	0	0.119	25912.02	967.37	0
Col-Camas	RM 120 Rig	1.13	2-year	Ultimate_ALT107_WAR	6000	-16.93	19.957		19.96	0.000001	0.398	15073.74	650.39	0.01
Col-Camas	RM 120 Rig	1.13	2-year	Ultimate_ALT108_WAR	6000	-16.93	19.957		19.96	0.000001	0.398	15073.74	650.39	0.01
Col-Camas	RM 120 Rig	1.13	2-year	Ultimate_ALT107_SF	4000	-16.93	21.261		21.26	0	0.251	15925.64	655.34	0.01
Col-Camas	RM 120 Rig	1.13	2-year	Ultimate_ALT108_SF	4000	-16.93	21.261		21.26	0	0.251	15925.64	655.34	0.01
Col-Camas	RM 120 Rig	1.13	100-yr	Ultimate_ALT107_WAR	5000	-16.93	34.506		34.51	0	0.196	26843.74	987.8	0.01
Col-Camas	RM 120 Rig	1.13	100-yr	Ultimate_ALT108_WAR	5000	-16.93	34.506		34.51	0	0.196	26843.73	987.8	0.01
Col-Camas	RM 120 Rig	1.13	100-yr	Ultimate_ALT107_SF	4000	-16.93	31.763		31.76	0	0.171	24234.09	921.91	0.01
Col-Camas	RM 120 Rig	1.13	100-yr	Ultimate_ALT108_SF	4000	-16.93	31.763		31.76	0	0.171	24234.06	921.91	0.01
Col-Camas	RM 120 Rig	0.97	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-16.15	33.55		33.55	0	0.105	28974.6	1304.61	0
Col-Camas	RM 120 Rig	0.97	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-16.15	33.55		33.55	0	0.105	28974.53	1304.61	0
Col-Camas	RM 120 Rig	0.97	2-year	Ultimate_ALT107_WAR	6000	-16.15	19.955		19.96	0.000002	0.39	15394.67	881.98	0.02
Col-Camas	RM 120 Rig	0.97	2-year	Ultimate_ALT108_WAR	6000	-16.15	19.955		19.96	0.000002	0.39	15394.67	881.98	0.02
Col-Camas	RM 120 Rig	0.97	2-year	Ultimate_ALT107_SF	4000	-16.15	21.261		21.26	0.000001	0.242	16548.21	885.39	0.01
Col-Camas	RM 120 Rig	0.97	2-year	Ultimate_ALT108_SF	4000	-16.15	21.261		21.26	0.000001	0.242	16548.21	885.39	0.01
Col-Camas	RM 120 Rig	0.97	100-yr	Ultimate_ALT107_WAR	5000	-16.15	34.506		34.51	0	0.173	30201.27	1406.54	0.01
Col-Camas	RM 120 Rig	0.97	100-yr	Ultimate_ALT108_WAR	5000	-16.15	34.506		34.51	0	0.173	30201.25	1406.53	0.01
Col-Camas	RM 120 Rig	0.97	100-yr	Ultimate_ALT107_SF	4000	-16.15	31.763		31.76	0	0.153	26849.06	1201.15	0.01
Col-Camas	RM 120 Rig	0.97	100-yr	Ultimate_ALT108_SF	4000	-16.15	31.763		31.76	0	0.153	26849	1201.15	0.01
Col-Camas	RM 120 Rig	0.76	FEMA 100-year	Ultimate_ALT107_FEMA	2941	-21.87	33.55		33.55	0	0.095	32443.58	1117.49	0
Col-Camas	RM 120 Rig	0.76	FEMA 100-year	Ultimate_ALT108_FEMA	2941	-21.87	33.55		33.55	0	0.095	32443.52	1117.49	0
Col-Camas	RM 120 Rig	0.76	2-year	Ultimate_ALT107_WAR	6000	-21.87	19.955		19.96	0.000001	0.311	19318.19	831.56	0.01
Col-Camas	RM 120 Rig	0.76	2-year	Ultimate_ALT108_WAR	6000	-21.87	19.955		19.96	0.000001	0.311	19318.19	831.56	0.01
Col-Camas	RM 120 Rig	0.76	2-year	Ultimate_ALT107_SF	4000	-21.87	21.261		21.26	0	0.197	20416.13	849.74	0.01
Col-Camas	RM 120 Rig	0.76	2-year	Ultimate_ALT108_SF	4000	-21.87	21.261		21.26	0	0.197	20416.13	849.74	0.01
Col-Camas	RM 120 Rig	0.76	100-yr	Ultimate_ALT107_WAR	5000	-21.87	34.506		34.51	0	0.158	33527.98	1156.91	0
Col-Camas	RM 120 Rig	0.76	100-yr	Ultimate_ALT108_WAR	5000	-21.87	34.506		34.51	0	0.158	33527.96	1156.9	0
Col-Camas	RM 120 Rig	0.76	100-yr	Ultimate_ALT107_SF	4000	-21.87	31.763		31.76	0	0.137	30459.7	1103.31	0
Col-Camas	RM 120 Rig	0.76	100-yr	Ultimate_ALT108_SF	4000	-21.87	31.763		31.76	0	0.137	30459.64	1103.31	0

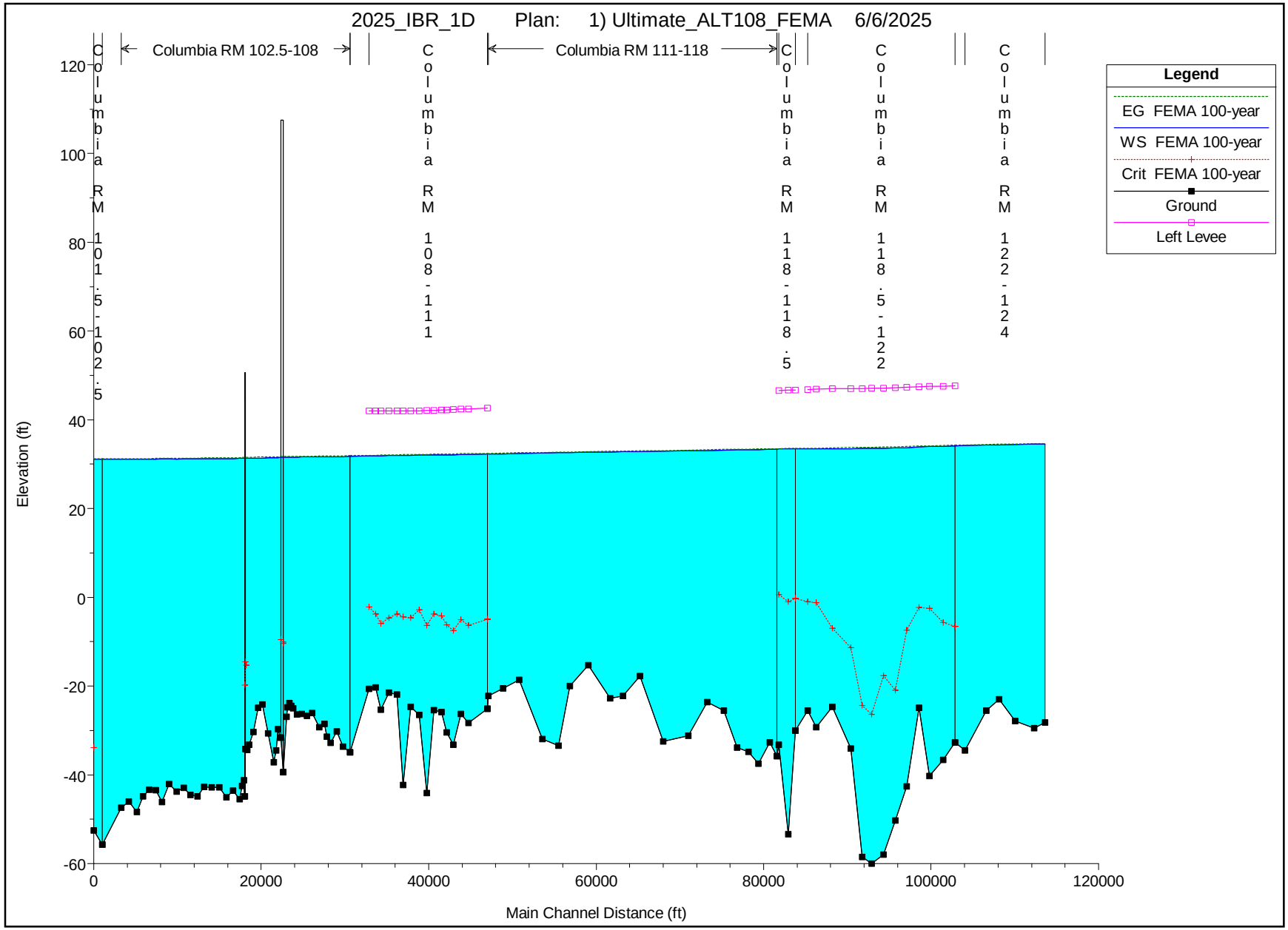
APPENDIX E: WATER SURFACE ELEVATION PROFILES

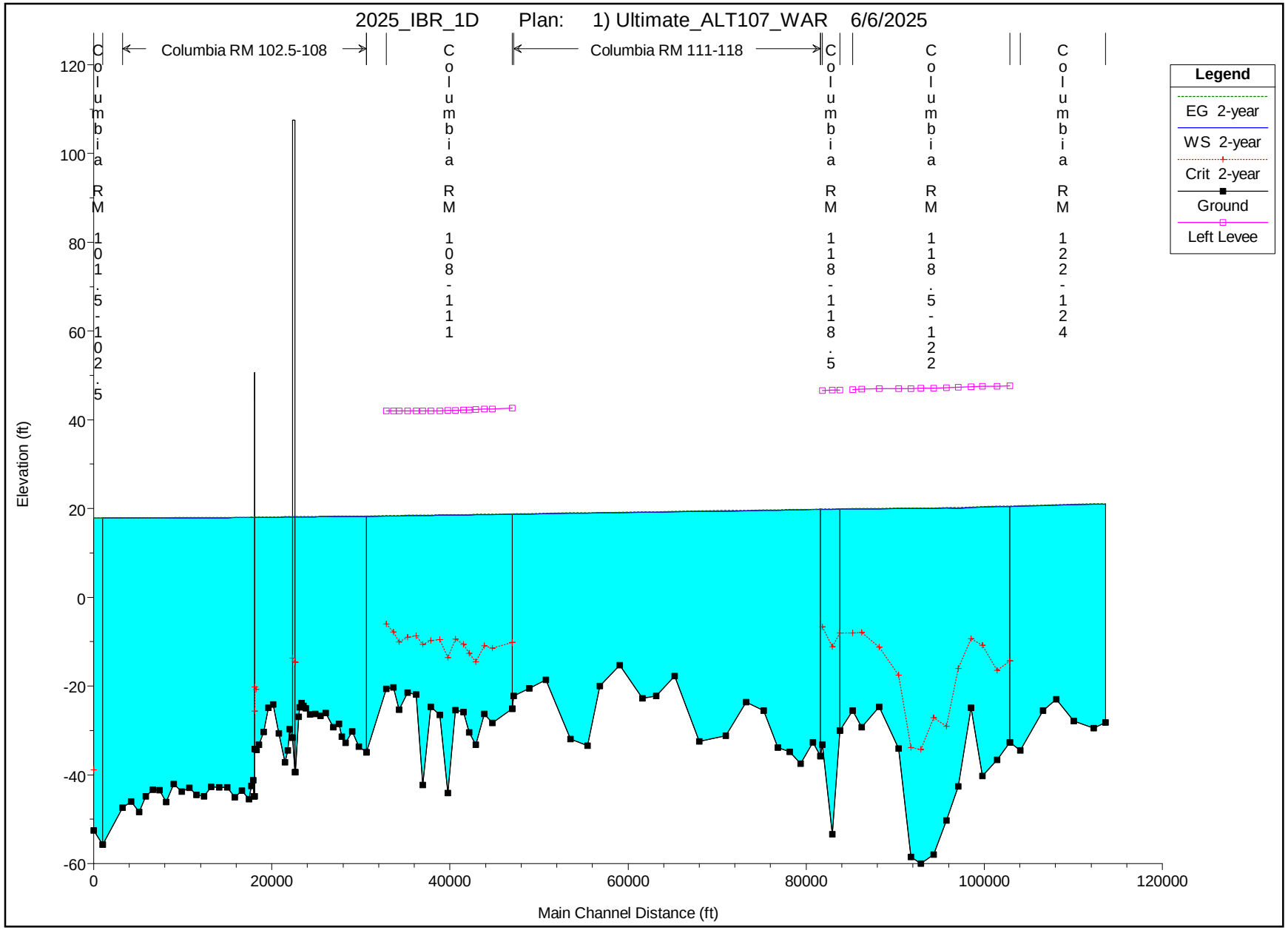

2025_IBR_1D Plan: 1) Existing_FEMA 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG FEMA 100-year
WS FEMA 100-year
Crit FEMA 100-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000

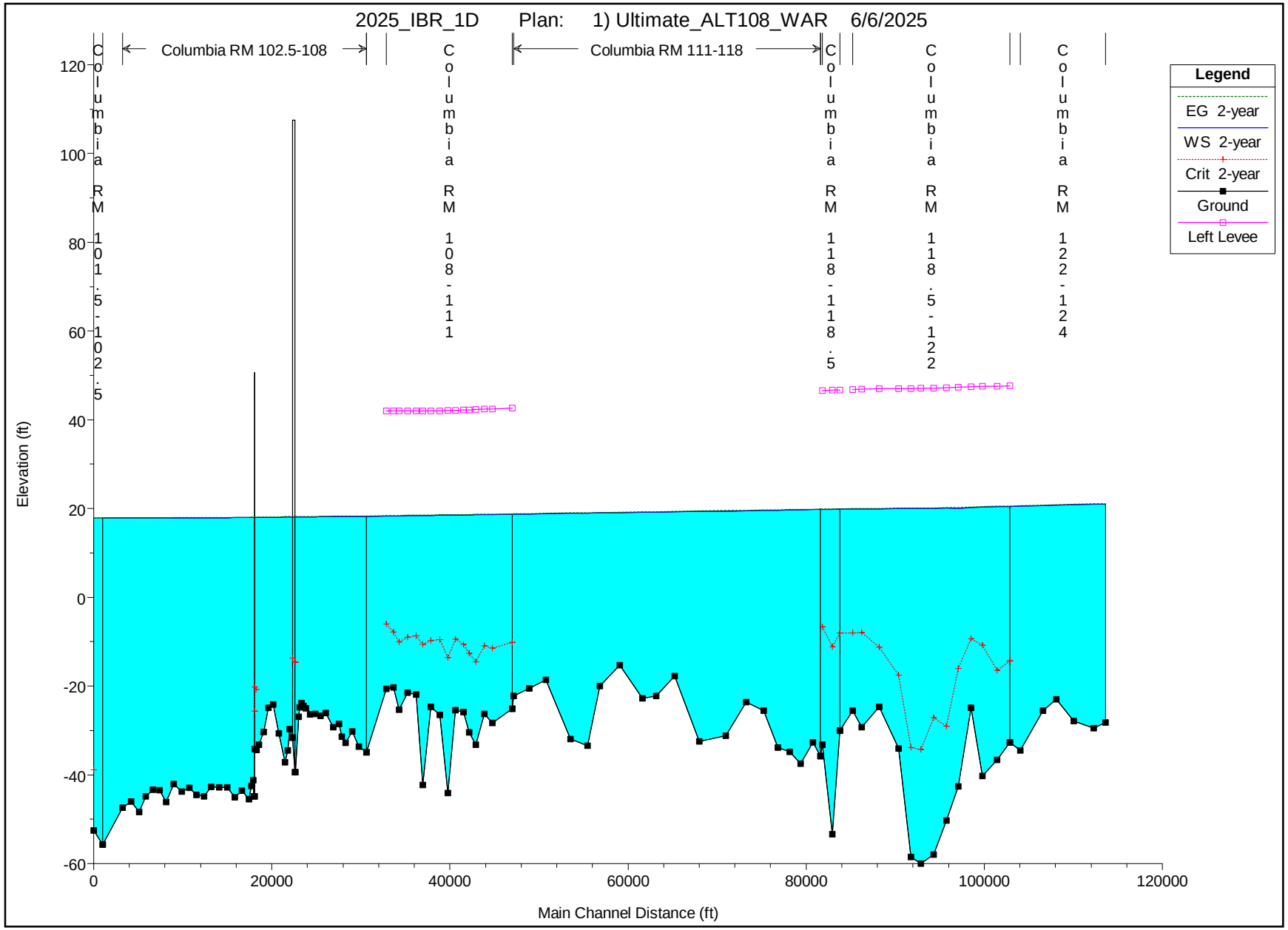

2025_IBR_1D Plan: 1) Existing_WAR 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000

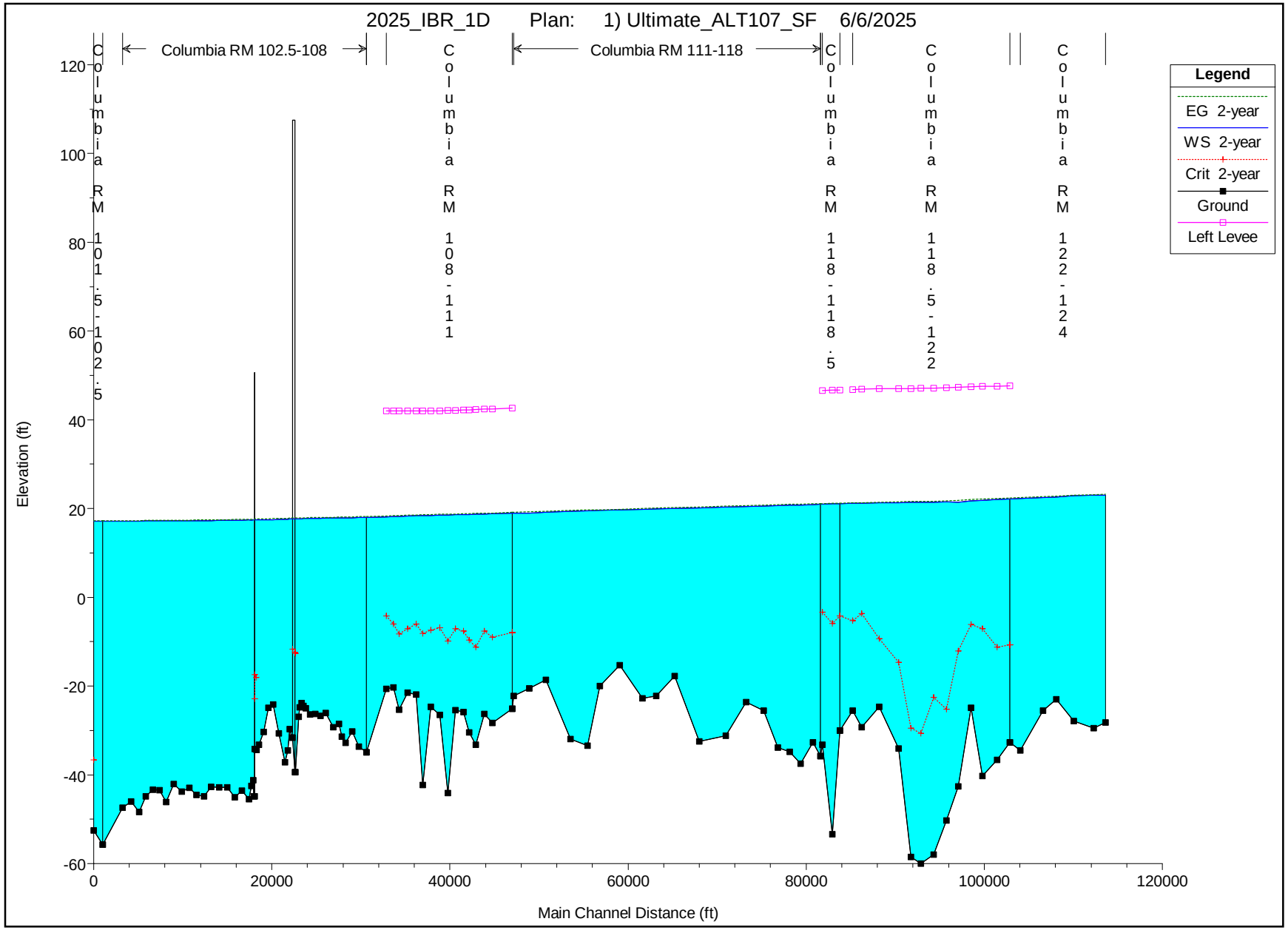

2025_IBR_1D Plan: 1) Existing_SF 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000

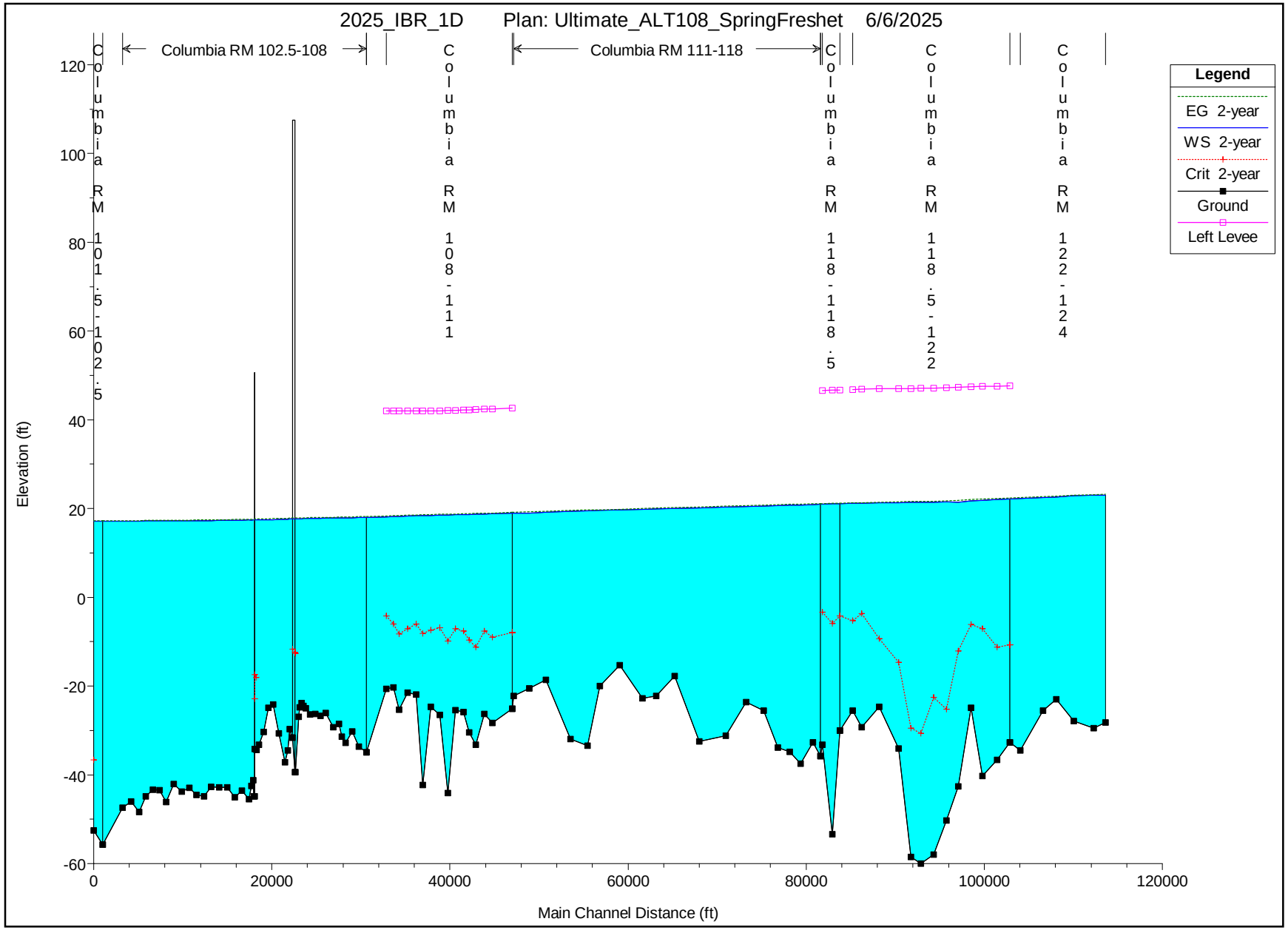

2025_IBR_1D Plan: 1) Ultimate_ALT107_FEMA 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG FEMA 100-year
WS FEMA 100-year
Crit FEMA 100-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000


2025_IBR_1D Plan: 1) Ultimate_ALT108_FEMA 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG FEMA 100-year
WS FEMA 100-year
Crit FEMA 100-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000


2025_IBR_1D Plan: 1) Ultimate_ALT107_WAR 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000


2025_IBR_1D Plan: 1) Ultimate_ALT108_WAR 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000


2025_IBR_1D Plan: 1) Ultimate_ALT107_SF 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000


2025_IBR_1D Plan: Ultimate_ALT108_SpringFreshet 6/6/2025
Columbia RM 102.5-108
Columbia RM 111-118
Columbia RM 101.5-102.5
Columbia RM 108-111
Columbia RM 118-118.5
Columbia RM 118.5-122
Columbia RM 122-124
Legend
EG 2-year
WS 2-year
Crit 2-year
Ground
Left Levee
Elevation (ft)
Main Channel Distance (ft)
120
100
80
60
40
20
0
-20
-40
-60
0
20000
40000
60000
80000
100000
120000