2022 Annual Bridge Report

Prepared by Kitsap County Public Works
Engineering Division

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Cover Photos

Top Left:
Golf Club Hill Road Bridge 07, built in 2019, is located in central Kitsap County over Chico Creek.

Top Right:
Woodbridge Culvert 42, built in 2017, is located in northern Kitsap County over a wetlands area.

Bottom:
West Kingston Bridge 43, built in 2017, is located in northern Kitsap County connecting Carpenter Creek to the Carpenter Creek Estuary that flows to Apple Tree Cove.

Credits

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2022 Annual Bridge Report

This bridge report is prepared by the Kitsap County Public Works Engineering Division each year to fulfill the requirements of the Washington Administrative Code (WAC) 136-20-060. This WAC requires the County Engineer's report of the bridge inspections as follows:

"Each county engineer shall furnish the county legislative authority with a written resume of the findings of the bridge inspection effort. This resume shall be made available to said authority and shall be consulted during the preparation of the proposed six-year transportation program revision. The resume shall include the county engineer's recommendations as to replacement, repair or load restriction for each deficient bridge. The resolution of adoption of the six-year transportation program shall include assurances to the effect that the county engineer's report with respect to deficient bridges was available to said authority during the preparation of the program."

Prepared by: _____
Julie Hamon
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Table of Contents

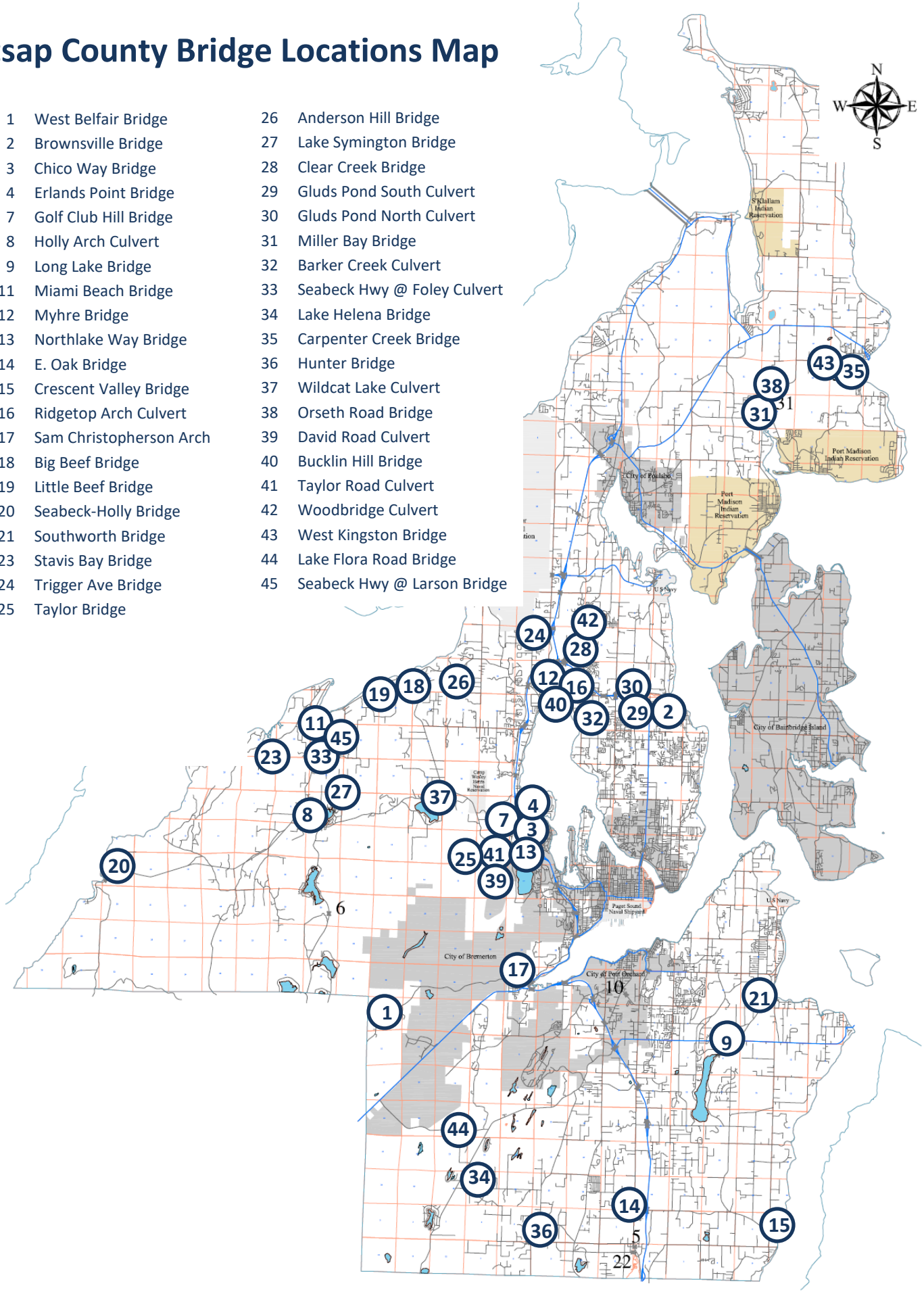
Acronyms

The following table is commonly used acronyms within the bridge condition inspection field:

ACP	**Asphalt Concrete Pavement**
ADT	**Average Daily Traffic**
AASHTO	**American Association of State Highway and Transportation Officials**
EV	**Emergency Vehicle** *(Load Rating)*
FHWA	**Federal Highway Administration**
FO	**Functionally Obsolete** *(Sufficiency Status)*
NBI	**National Bridge Inventory**
NBIS	**National Bridge Inspection Standards**
POA	**Plan of Action** *(Scour related)*
SD	**Structurally Deficient** *(Sufficiency Status)*
SR	**Sufficiency Rating** *Scale of 1[structurally deficient]-100[structurally sufficient]*
SHV	**Specialized Hauling Vehicles** *(Load Rating)*
UBIT	**Under bridge Inspection Truck**
WAC	**Washington Administrative Code**
WSDOT	**Washington Department of Transportation**

Kitsap County Bridge Locations Map

1 West Belfair Bridge
2 Brownsville Bridge
3 Chico Way Bridge
4 Erlands Point Bridge
7 Golf Club Hill Bridge
8 Holly Arch Culvert
9 Long Lake Bridge
11 Miami Beach Bridge
12 Myhre Bridge
13 Northlake Way Bridge
14 E. Oak Bridge
15 Crescent Valley Bridge
16 Ridgetop Arch Culvert
17 Sam Christopherson Arch
18 Big Beef Bridge
19 Little Beef Bridge
20 Seabeck-Holly Bridge
21 Southworth Bridge
23 Stavis Bay Bridge
24 Trigger Ave Bridge
25 Taylor Bridge
26 Anderson Hill Bridge
27 Lake Symington Bridge
28 Clear Creek Bridge
29 Gluds Pond South Culvert
30 Gluds Pond North Culvert
31 Miller Bay Bridge
32 Barker Creek Culvert
33 Seabeck Hwy @ Foley Culvert
34 Lake Helena Bridge
35 Carpenter Creek Bridge
36 Hunter Bridge
37 Wildcat Lake Culvert
38 Orseth Road Bridge
39 David Road Culvert
40 Bucklin Hill Bridge
41 Taylor Road Culvert
42 Woodbridge Culvert
43 West Kingston Bridge
44 Lake Flora Road Bridge
45 Seabeck Hwy @ Larson Bridge



Executive Summary

This report has been completed in compliance with WAC 136-02-060, which requires that each County Road Engineer furnish a written resume of the county's bridge inspection efforts to the county legislative authority. It is also the intention of this report that information presented here be considered during development of the comprehensive Six Year Transportation Improvement Program (TIP).

Highlights and changes in 2022

- No new reportable bridges constructed this year.

Bridge Inventory

In Kitsap County, the bridge inventory is predominately made up of concrete structures with no fracture critical, underwater, or UBIT inspections required.

0	TIMBER
1	STEEL
4	STEEL ARCH
28	CONCRETE
1	CONCRETE ARCH
7	CONC. BOX CULVERT
41	**TOTAL BRIDGES**

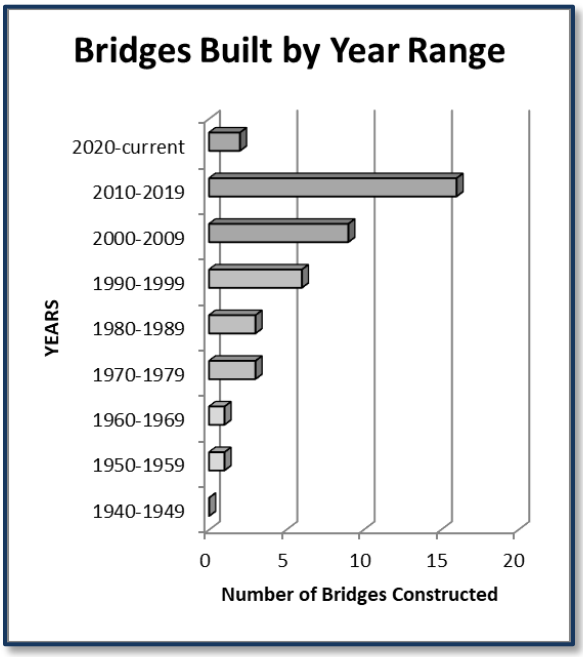


Figure 1

Summary of Bridge Inventory

As of 2022, the unincorporated Kitsap County road system contains 41 NBI reportable bridges and culverts which provide continuity between 915 centerline miles of Kitsap County maintained roads.

Load & Height Restricted Bridges

Each bridge is required to have a "Load Rating" calculation. The Load Rating establishes how much weight the bridge can carry for several standard configurations of vehicle axle loads.

In November 2016, FHWA released a memo requiring additional load postings when the Operating rating factor of the legal loads is less than 1 based on the Load Factor or Allowable Stress Methods. The legal loads in the State consist of the three AASHTO legal trucks, Type 3 (Single Unit), Type 3S2 (Truck-Semi Trailer) and Type 303 (Truck Trailer), the SHV's (SU4, SU5, SU6 and SU7). Emergency Vehicles EV2 and EV3 are also considered legal loads on the Interstate and within one road mile from the interstate.

In order to determine the need of additional postings, Kitsap County completed a thorough assessment of the bridge inventory followed by revised load ratings for all required structures to comply with the new mandate.

Taylor Road Bridge posted with weight restriction.

#	Bridge Name	Posted	Operating Tons	Inventory Tons
25	Taylor Road Bridge	Recommend Remove Current Weight Posting.	39.24	23.51
27	Lake Symington Bridge	Recommend Remove Current Weight Posting.	47.16	28.25

Figure 2

Bridges that have traffic portals (vertical under clearance) of 15 feet or less are required to be posted with allowable height load. Kitsap County currently has one bridge (Trigger Ave #24) that carries traffic under the bridge and it is not required to be posted for height restrictions.

Bridge Condition Inspection

Background

Bridge inspections are performed in accordance with the National Bridge Inspection Standards (NBIS) in conformance with 23 CFR 650.3. The standards mandate that all public agencies with a bridge inventory inspect and report the findings at a minimum of once every two years (routine inspection). Special inspections are required for bridges that cannot be given close or adequate inspection from the ground such as UBIT, Underwater, or Fracture Critical Inspections. Kitsap County does not currently have any bridges within the inventory that require any of these special inspections. All Kitsap County bridges are inspected by certified in-house staff.

The inspector uses these standards to document the current condition of each bridge element listed. The deficiencies are coded to NBIS standards and show the degree of deterioration in various elements— the three primary elements being:

- deck
- superstructure
- substructure

As deterioration accelerates, the coding values drop and work orders for repairs are issued. In the case where the coding factors are extremely low, recommendations are made for repair, replacement or rehabilitation. Bridges with identified deficiencies may be inspected or monitored at more frequent intervals.

The results of the County's inspection program are forwarded to the Washington State Department of Transportation (WSDOT) for review. Once the report has been accepted by WSDOT, it is available to the Federal Highway Administration (FHWA). A copy of all final inspection reports are kept on file with Kitsap County Public Works.

Sufficiency Ratings

The Sufficiency Rating (SR) of a structure is an important number used to place a determine need for rehabilitation or replacement. The NBIS has several factors which contribute to the calculation of this overall rating of a bridge. The SR is a number from 0 to 100, with 100 being an entirely sufficient bridge, and 0 being an entirely insufficient or deficient bridge. Items that go into the determination of the SR include: load bearing capacity, average daily traffic, availability and length of detour, the geometry of the bridge and the risk of scour on bridge foundations at waterway crossings.

In addition to the sufficiency rating, bridges can also be given a deficiency status of Functionally Obsolete (FO) or Structurally Deficient (SD). A bridge is considered FO if the design of the bridge is not suitable for its current use. A bridge is considered Structurally Deficient when condition of the bridge due to deterioration and/or damage is significantly defective and may need to be posted for restrictions or closure.

Kitsap County currently has no bridges classified as Structurally Deficient in the inventory.

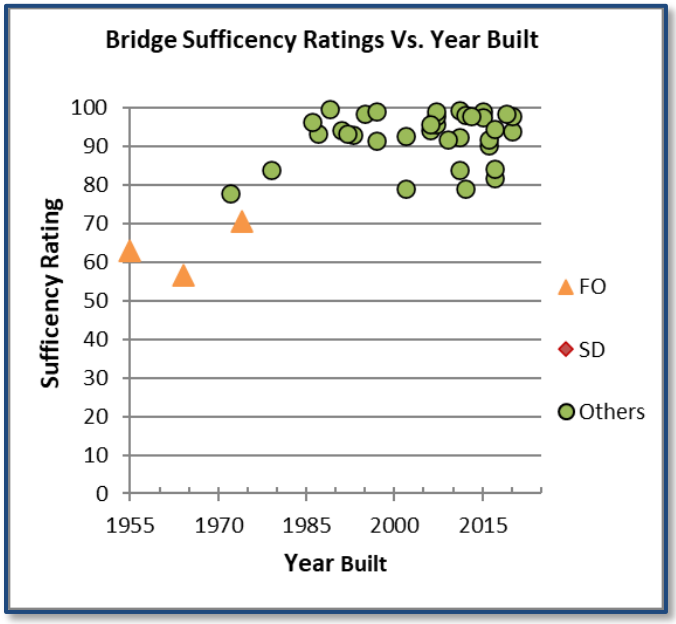


Figure 3

Scour Evaluation

Background

The collapse of New York's Schoharie Creek Bridge in 1987 brought the concept of scour evaluations and scour concerns front and center within the bridge condition inspection community. In addition, scour is the most common cause of bridge failure in the U.S. Scour records are required for all bridges over water per FHWA. Of Kitsap County's 41 reportable bridges, 40 are located over water ways. Because of this high percentage, scour is a constant and relevant concern for Kitsap County bridges.

Evaluations & POAs

Scour evaluations are performed to identify the susceptibility to erosion of streambed material and the degree of foundation element stability. Older bridges were designed with spread footings only (no pile foundations) which automatically enter them into the scour critical category. When a bridge is determined to be scour critical, a Scour Plan of Action (POA) is developed to identify appropriate measures necessary to make the bridge less vulnerable to damage or failure due to scour. The POAs for all scour critical bridges in Kitsap County are available in the bridge file and through the BridgeWorks database.

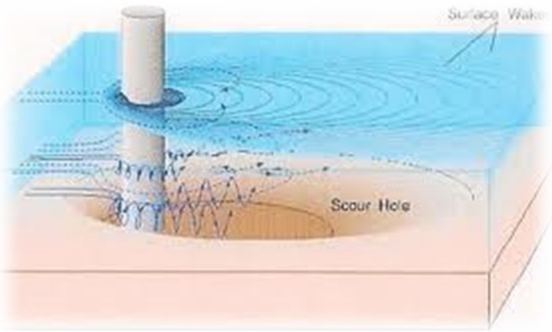


Diagram of localized scour.

Replacement & Rehabilitation Plans for Deficient Bridges

Kitsap County's current focus is to replace any bridges that are SD per NBIS as well as repair bridges with critical scour damage.

In 2018, they County hired a contractor to install scour counter measures on the Southworth Bridge (#21). The scour countermeasures included reconstructing the abutment protection on both piers by installing a shotcrete wall on and below the face of the pile caps to prevent the scour from behind the rockery armament.

Future Projects

Taylor Road Bridge #25

Kitsap County is eligible for a maintenance grant to repaint the steel box cars on the Taylor Road Bridge. This project is currently in design with estimated construction during summer 2023.

Repair & Maintenance Recommendations

Repair and maintenance work is primarily done by county forces. This work typically consists of cleaning debris off deck, re-sealing failing joints, removing clogging debris from under bridges, etc.

In the summer of 2013, the county hired a contractor to perform scour countermeasures on 2 scour critical bridges (Little Beef #19 & Sam Christopherson #17).

Little Beef Bridge BEFORE 2013

Little Beef Bridge AFTER 2013

In February of 2016, county forces performed temporary scour countermeasure repairs on Stavis Bay Bridge #23. This was followed by permanent scour countermeasures installed in August of 2018.

Stavis Bay Bridge BEFORE 2016

Temp. Scour Repair 2016

Stavis Bay Bridge AFTER 2018

Emergency Repairs & Inspections

Emergency Inspection Protocol

Kitsap County is working on revising and implementing an emergency inspection protocol for in-service bridges. There are several categories of emergencies depending on the severity and type of event, each has its own procedures. In addition to the Bridge Condition Inspection Team Leader, there are 3 staff members trained in bridge condition inspections, each with a designated group of bridges they are responsible for in emergency situations.

Emergency Results/Repairs

Storm washout of culvert on Lake Helena Dec. 2010

Bulging of vinyl sheeting at abutment from material migration Jan. 2010

Lake Helena Bridge completed Apr. 2011

Big Beef Bridge repair completed Feb. 2010

Glossary of Bridge Terms

ABUTMENT – A substructure element supporting each end of a single span or the extreme ends of a multi-span superstructure and, in general, retaining or supporting the approach embankment.

APPROACH SPAN – The span or spans connecting the abutment with the main span or spans.

BEAM – A linear structural member designed to span from one support to another.

BOX GIRDER – A support beam that is a hollow box; its cross-section is a rectangle or square.

CAST-IN-PLACE – Concrete poured within form work on site to create a structural element in its final position.

COLUMN – A vertical structural member that transfers dead and live load from the bridge deck and girders to the footings or shafts.

CULVERT – A drainage structure beneath the embankment (e.g., corrugated metal pipe, concrete box culvert)

DEAD LOAD – A static load due to the weight of the structure itself. Can be increased over the life of the bridge by additional sidewalks or overlays to pavement.

DECK – The roadway portion of a bridge that directly supports vehicular and pedestrian traffic.

ELASTOMERIC PADS – A synthetic rubber pad used in bearings that compresses under loads and accommodates horizontal movement by deforming.

EXPANSION JOINT – A joint designed to provide means for expansion and contraction movements produced by temperature changes, load, or other forces.

FATIGUE – Cause of structural deficiencies, usually due to repetitive loading over time.

FOOTING – The enlarged, lower portion of a substructure that distributes the structure load either to the earth or to supporting piles; the most common footing is the concrete slab; “footer” is a colloquial term for footing.

GIRDER – A main support member for the structure that usually receives loads from deck and transfers load down to the piers.

HANGER – A tension member serving to suspend an attached member.

HINGE – A point in a structure at which a member is free to rotate.

LIVE LOAD – Temporary or transient forces that act on the structure; i.e. vehicular traffic, wind, water, and/or earthquakes.

MEMBER – An individual angle, beam, plate, or built piece intended to become an integral part of an assembled frame or structure.

PIER – A vertical support or substructure unit that supports the spans of a multi-span superstructure at an intermediate location between its abutments; A substructure unit supporting each end of a bridge span; made up of two or more columns or column-like members connected at their top most ends by a cap, strut, or other member holding them in their correct positions.

PILE – A vertical shaft driven or drilled into the ground that carries loads through weak layers of soil to those capable of supporting such loads.

PRE-CAST – Fabricated off site of Portland Cement Concrete, reinforcing steel, and possibly post-tensioning cables. These girders are shipped to the

construction site by truck and hoisted into place by cranes.

PRESTRESSING – Applying forces to a structure to deform it in such a way that it will withstand its working loads more effectively. This can be done via Post-tensioning (tendons are stressed after the concrete has been cast and hardened) or Pretensioning (applying stands that are stressed before concrete is placed and then the stands are cut/release inducing internal compression into concrete.)

REINFORCED CONCRETE – Concrete with steel reinforcing bars bonded within it to supply increased tensile strength and durability.

RIGID FRAME BRIDGE – A bridge with moment-resistant connections between the superstructure and the substructure to produce an integral, elastic structure.

SCOUR – Removal of stremabed or bank area by stream flow; erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges.

SCOUR CRITCIAL – bridge with foundation elements that have been determined to be unstable for the observed and/or calculated stream instability and/or scour condtions.

SOFFIT – Under side of a bridge deck.

SHORT SPAN BRIDGE – Structures that having an opening of 20 feet or less and do not qualify for federal replacement funding, nor are they reported to NBI. (The opening measurement is taken along center of roadway between undercopings of abutments, spring lines of arches, or extreme ends of openings for multiple boxes.)

SPALL – Depression in concrete cased by a separation of a portion of the surface concrete, revealing a fracture parallel with or slightly inclined to the surface.

SPAN – The distance between piers, towers, or abutments.

SPREAD FOOTING – Foundation, usually reinforced concrete slab, which distributes load to the earth or rock below the structure.

SUBSTRUCTURE – The parts of a bridge that are below the bottom of the girders. Bearings, pilings, shafts, spread footings, and column may be part of the substructure.

SUFFICIENCY RATING – A calculated numeric value used to indicate sufficiency of a bridge to remain in service. Value ranges from 100 (a bridge in new condition) to 0 (a bridge incapable of carrying traffic.) Combines four calculated vales: Structural Adequacy & Safety, Servicability & Functional Obsolescence, Essentiality for Public Use, Special Reductions.

SUPERSTRUCTURE – The parts of a bridge that are above the bearings. Girders, bridge deck, and bridge railing are parts of the superstructure.

TENSION – A force that pulls or stretches.

THALWEG – Lowest elevation of the streambed.

WINGWALL – The retaining wall extension of an abutment intended to restrain and hold in place the side slope material of an approach roadway embankment.

Additional definitions available at:
hhttp://www.wsdot.wa.gov/TNBhistory/glossary.htm
and FHWA's BIRM (Bridge Inspector's Reference Manual)

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Appendix A

Bridge Listings

On the following pages is an overview of the bridges in Kitsap County's inventory that are NBI Reportable.

Additional information regarding short span structures can be obtained from Kitsap County's Stormwater Division within the Department of Public Works

Structures 5, 6, & 22 are considered short spans and no longer part of the NBI inventory. Structure 10 was annexed to the City of Port Orchard and no longer part of the County's inventory.

Bridge Listings

The following is a list of all bridges that are under Kitsap County jurisdiction and need to be inspected by Public Works every twenty-four months, as per FHWA requirements.

Bridge #	Bridge Name	Length *(LF)* [NBIS]	Width (LF)	Lanes	Detour (miles)	Year Built	Sufficiency Rating
1	West Belfair Bridge	47	44	2	21	1992	94.20
2	Brownsville-Gilberton Bridge	104	41.3	2	6	1986	95.75
3	Chico Way Bridge	93	52.8	2	3	2009	97.88
4	Erlands Point Bridge	76	43.5	2	6	1997	98.96
7	Golf Club Hill Bridge	142	30.7	2	NONE	2019	92.47
8	Holly Road Arch Culvert	24	CULVERT	2	5	1995	99.35
9	Long Lake Road Bridge	53	40	2	8	1993	98.03
11	Miami Beach Bridge	57	36.8	2	NONE	2013	79.00
12	Myhre Road Bridge	70	66	2	1	2006	99.17
13	Northlake Way Bridge	76	43.5	2	4	1997	97.57
14	East Oak Street Bridge	30	30.4	2	NONE	1991	90.14
15	Crescent Valley Bridge	139	36.6	2	4	1972	91.78
16	Ridgetop Boulevard Arch	31	CULVERT	3	3	1989	81.90
17	Sam Christopherson Arch	24	CULVERT	3	2	1987	84.23
18	Big Beef Bridge	102	41.5	2	18	1974	**70.43 – FO**
19	Little Beef Bridge	110	30	2	3	1955	**63.11 – FO**
20	Seabeck-Holly Bridge (at Anderson Creek)	50	28.6	2	15	2017	93.95
21	Southworth Bridge	127	47.3	2	3	2011	98.02
23	Stavis Bay Road Bridge	69	29.1	2	NONE	2011	84.04
24	Trigger Avenue Bridge	141	41.5	2	3	1979	92.66
25	Taylor Road Bridge	82	27.3	2	55	2002	79.21
26	Anderson Hill Bridge	127	39	2	NONE	2002	94.55
27	Lake Symington Bridge	31	27	2	1	1964	**56.71 – FO**
28	Clear Creek Bridge	58	56	2	5	2006	83.85
29	Gluds Pond South Culvert	24	CULVERT	2	5	2007	98.39
30	Gluds Pond North Culvert	24	CULVERT	2	3	2007	98.39

Bridge #	Bridge Name	Length (LF)	Width (LF)	Lanes	Detour	Year Built	Sufficiency Rating
31	Miller Bay Road	51	62	3	3	2007	93.08
32	Barker Creek Culvert	36	CULVERT	2	10	2008	97.96
33	Seabeck Hwy @ Foley Lane Culvert	22	CULVERT	2	10	2010	95.88
34	Lake Helena Bridge	52	36.1	2	10	2011	99.06
35	Carpenter Creek Bridge	97	39.8	2	10	2011	94.24
36	Hunter Road Bridge	45	32.1	2	NONE	2012	77.82
37	Wildcat Lake Culvert	23	CULVERT	2	2	2012	99.83
38	Orseth Road Bridge	23	24.4	2	NONE	2015	93.46
39	David Road Culvert	25	CULVERT	2	NONE	2015	93.36
40	Bucklin Hill Bridge	240	71.0	4	1	2016	96.37
41	Taylor Road Culvert	25	CULVERT	2	NONE	2016	91.79
42	Woodbridge Culvert	20	CULVERT	2	NONE	2017	91.39
43	West Kingston Bridge	150	41.8	2	2	2017	97.21
44	Lake Flora Road Bridge	81	42	2	11	2020	96.16
45	Seabeck Hwy @ Larson Lane Bridge	60	47	2	15	2020	95.88

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Appendix B

Bridge Condition Inspection Results

On the following pages are the detailed reports of all NBI reportable bridges with Kitsap County's Inventory.

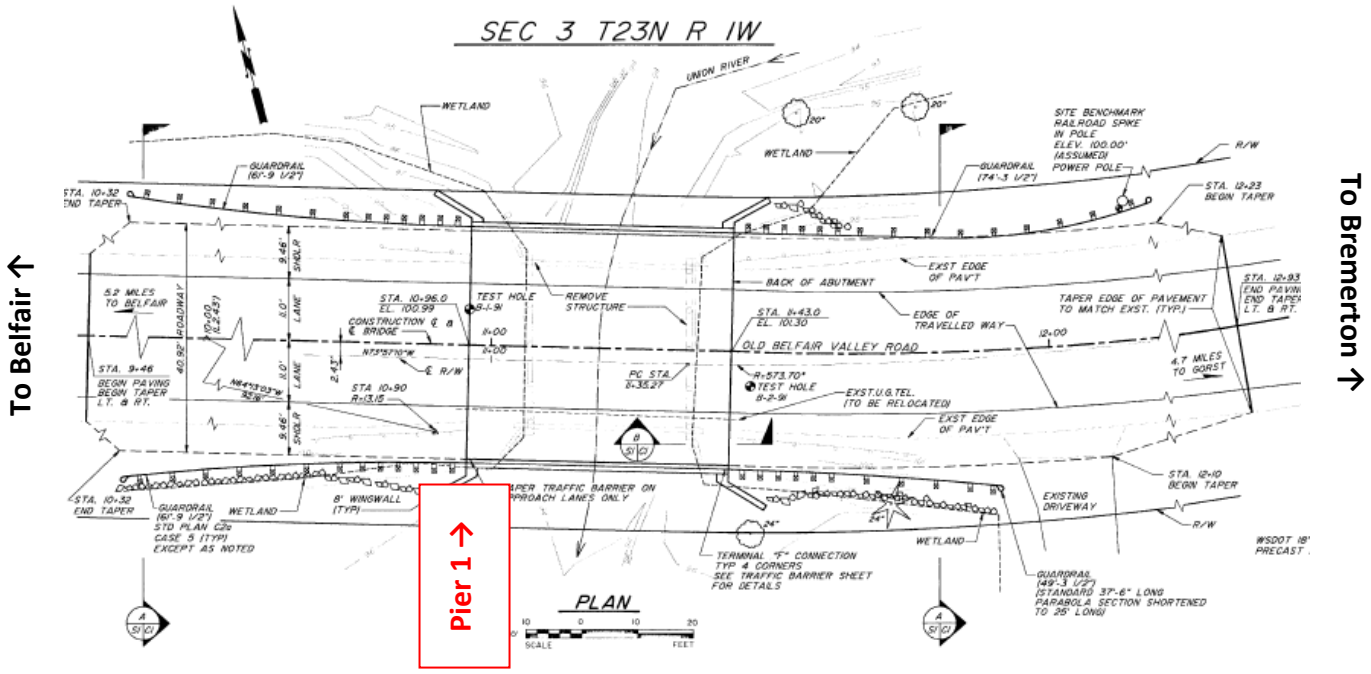
This information includes basic structure design, noted defects or damage, bridge layout and orientation, and recommended maintenance.

Bridge 01 – West Belfair Bridge				
West Belfair Valley Road	**Union River**	**1992**	**94.20**	**Jun. 15, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed, precast voided concrete slabs (4'ω x 1'-6" h) in good condition. Small spall on exterior flange at south side 8.5' from west abutment – 5"ι x 3"ω x ¾"d. 3 spalls visible between panels F & G center span 4"ι X 4"ω X ¼"d. Minor moisture evident between throughout underside of panels.
	Deck	3" ACP Overlay with waterproof membrane. ACP in travel way has been replaced since last inspection (2019). Small settlement noted in the roadway at the NE corner.
	Other	Concrete Bridge Railing showing no signs of impact. Transitions do not meet current standards.
Substructure	***Foundation***	Driven 12" steel pipe piles filled with rebar & concrete with no visible defects noted.
	Abutments	Cast-in-place concrete pile cap/abutment. Slab seat is 25" with elastomeric bearing pads. Moisture present at NW and SW corners with evidence of water and sediment seeping through cracked joint over face of abutment. NW corner at connection from deck to wing wall has minor cracking evident, appears to be the deck pushing against the wing wall.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour evaluation and analysis as well as hydraulic analysis was performed by Alpha Engineering in 1992. Scour hole developing at NW corner (P1 inlet). Approximately 4-6 feet below average water surface. Large woody debris trapped in the bottom. Roads is working on designing temporary repair. Silt deposit anabranch at NE corner forcing water to the West. This bridge is **not** scour critical. (No history of scour)	
Photo		

Bridge 01 – West Belfair Bridge

Maintenance Report



Recommendations	Monitor streambed movement at inlet end. Gravel aggregation underneath the bridge and at outlet. Monitor scour hole at NW corner especially during high flows. Temporary repairs warranted.

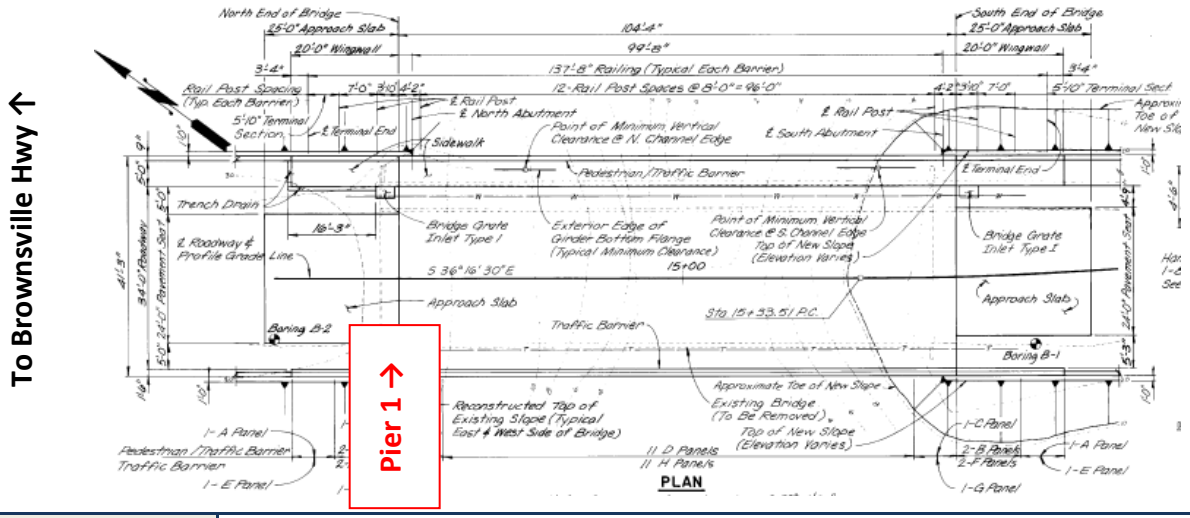
Vegetation undermining at SE corner	***Scour hole at NW Corner***
	

Bridge 02 – Brownsville-Gilberton Bridge				
Illahee Road	**Steele Creek**	**1986**	**95.75**	**Jul. 14, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed, precast bulb-tee girders (6'-10½"'ω x 4'-6" h) in good condition. Spall 6"ι x 6"ω x1/2"d evident at end diaphragm between girders A & B at north end. Spall 3"ι x 3"ω x ½"d between girders A & B near southerly cross-brace. Minor moisture present between all girders and top flanges. All steel intermediate diaphragm braces are missing ¾" bolts & nuts.
	Deck	ACP Overlay in fair condition with longitudinal cracks beginning to show in the wheel tracks. Water seeping between girders at all seams except center seam. ACP needs repair along with repairs at joints.
	Other	Concrete Bridge Railing is cracking around where each pedestrian rail post is attached. Cracking and spalling accelerating with signs of efflorescence showing.
Substructure	***Foundation***	Driven 14" steel pipe piles filled with lean concrete.
	Abutments	Cast-in-place concrete pile cap/abutment. Girder seat are 30" with elastomeric bearing pads. Signs of some crushing of the bearing pads at Pier 2. Both abutments have hairline vertical cracks running from girder seat to bottom of abutment. Girder seat C at south abutment has small delamination spall evident 3"x 3" at bearing pad. Vinyl sheet wall at NW corner top cap separated 1'-4.75" at connection with broken support whaler on face of wall.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour evaluation and analysis phase 2 was performed by Entranco Engineering in 1997. Scour countermeasure work for north abutment was performed in June 1999. **This bridge is scour critica**l.
Photo		

Bridge 02 – Brownsville-Gilberton Bridge

Maintenance Report



Recommendations	Repair ACP at both bridge joints. Consider repaving ACP on bridge deck. Monitor cracks where pedestrian rail is attached to concrete bridge rail. Monitor bulging and for scour at sheet pile wall at NW corner of abutment. Monitor separated timber cap at sheet pile wall at NW corner, presently 1'-4.75" wide on face and 1'-6" on fill side. Sidewalk panels setting up to ½" on the East side of the bridge.

Cracks in Pedestrian Rail

Bridge Joints

Pier 2

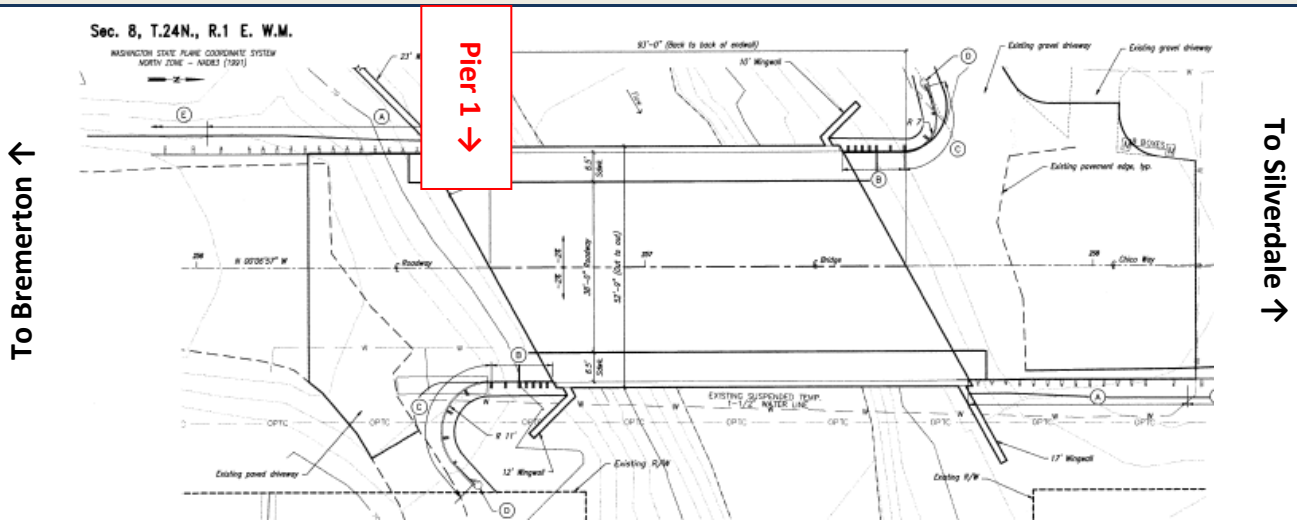
Pier 1

Bridge 03 – Chico Bridge				
Chico Way	**Chico Creek**	**2009**	**97.88**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed, precast bulb-tee girders (WF50G) in good condition.
	Deck	Cast-in-place concrete deck with cast-in-place sidewalks. Hairline cracks beginning to appear in deck at SW quadrant as well as the sidewalk and barrier along East& West sides of bridge.
	Other	Concrete Bridge and Metal Pedestrian Railing is in like-new condition.
Substructure	***Foundation***	Driven steel H12x63 piles.
	Abutments	Cast-in-place concrete abutment. Girder seats are 36” with elastomeric bearing pads. In Summer of 2020, maintenance crews repaired sloughing bank armor. Appears to be holding up.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour analysis has not yet been performed for this structure. Minor repair work performed to stabilize log boles in December of 2010 upstream. Minor bank armor repair in summer 2020.	
Photo		

Bridge 03 – Chico Bridge

Maintenance Report



Recommendations	Monitor bank repair under the bridge. Monitor hole in log weir 35’ & 75’ upstream from bridge at NW quadrant. Broken locate wire for water line at splice point in the NE corner.

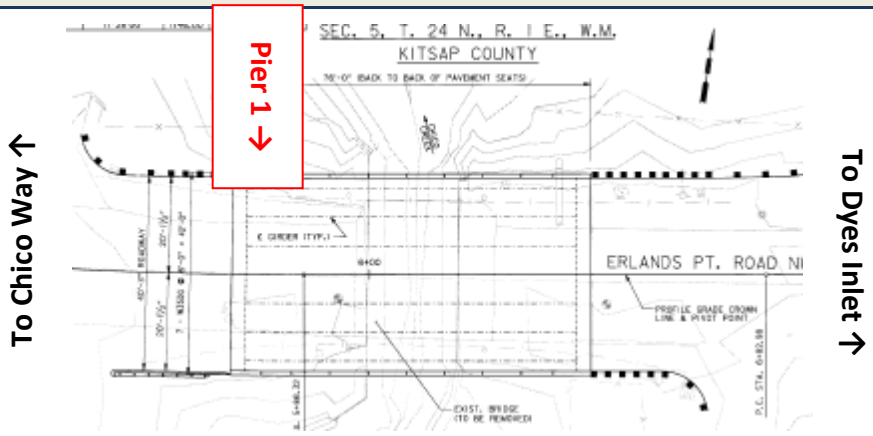
Hole in log weir 75’ upstream from bridge in NW quadrant.	***Bank Armor repair in 2020***
	

Bridge 04 – Erlands Point Bridge				
Erlands Point Road	**Chico Creek**	**1997**	**98.71**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

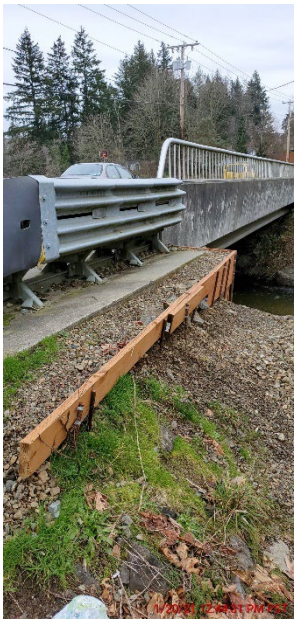
Superstructure	***Girder***	Prestressed, precast bulb-tee girders (W35G) in good condition.
	Deck	2” ACP Overlay with waterproof membrane.
	Other	Concrete bridge railing beginning to show hairline cracks at attachments to metal pedestrian railing. Traffic attenuator pad at SW corner has been repaired with rebar stakes and timber lagging in 2020.
Substructure	***Foundation***	Driven steel 18” pipe piles filled with concrete.
	Abutments	Cast-in-place concrete abutment. Girder seats are 46” with elastomeric bearing pads. Slope armor is working well at this time. No defects found.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour evaluation and analysis was performed by Entranco Engineering in 1998. Upstream beaver dam is no longer intact and there is significant sediment and debris build-up at upstream end of bridge. This bridge is **not** scour critical.	
Photo		

Bridge 04 – Erlands Point Bridge

Maintenance Report



Recommendations	Monitor slope armor at SE corner of bridge. The coating on the ductile iron pipe on the south side of the structure is beginning to rust. The ACP overlay is beginning to show perpendicular cracking at bridge joints due to continued settlement.

Repair of undermining of attenuator slab	***Upstream sediment and debris from broken beaver dam***
	

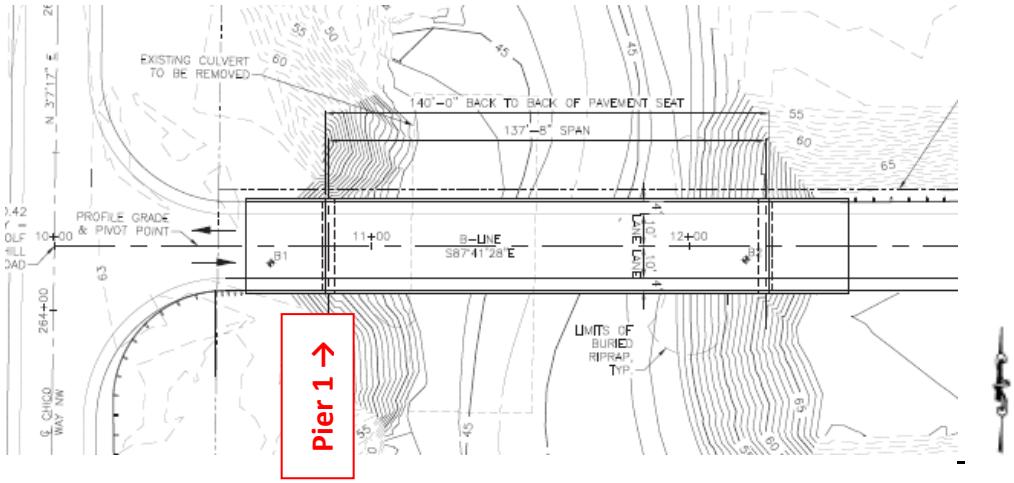
Bridge 07 – Golf Club Hill Bridge				
Golf Club Hill Road	**Chico Creek**	**2019**	**92.47**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	WF58G Precast prestressed bulb-tee girders in good condition. 4 girders at approximately 136’ in length.
	Deck	Cast-in-place 7.5” concrete deck with epoxy coated rebar in good condition.
	Other	Cast-in-place concrete bridge railing in good condition. Railing has pigmented sealer. Uniform vertical cracking along barrier with effloresce leaching.
Substructure	***Foundation***	Driven 18” steel piles filled with rebar and concrete. 5 piles per pier. Tip elevation on Pier 1 varies from 5.8 to 9.0 and at Pier 2 varies from 5.2 to 5.9.
	Abutments	Cast-in-place concrete abutment with attached wing walls in good condition. Girder seats are 12”.
Scour and Load Rating		Bridge was load rated as per FHWA requirements by Shearer Design in 2019. This bridge is **not** scour critical.
Photo		

Bridge 07 – Golf Club Hill Bridge

Maintenance Report

← Chico Way



To Kitsap Golf & Country Club →

Recommendations	Monitor flows during high water events.

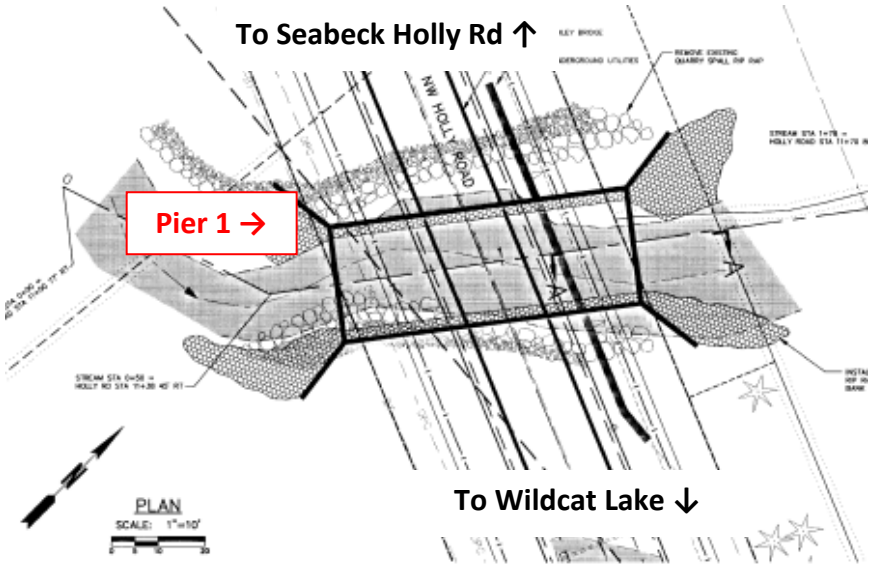
Pier 1 Abutment	*Pier 2 Abutment*
	

Bridge 08 – Holly Arch Culvert				
NW Holly Road	**Big Beef Creek**	**1995**	**99.35**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	Galvanized steel arch culvert in fair condition. 6” to 8” of rusting is evident at connection point between steel panels and concrete footing. In mid-span in ceiling of arch 3 dented areas found within an 18”x18” area affected. Roadway ACP overlayed cy CRP 5036 in 2022. Roadway guardrail replaced by CRP 5035 in 2020.
Substructure	***Foundation***	Cast-in-place concrete spread footings. Scour repair performed in late summer of 2012. Footings are now protected by streambed gravel.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour evaluation and analysis phase 2 was performed by Tetra Tech / KCM in 2004. County roads performed scour repair in late summer of 2012. **This bridge is scour critica**l.	
Photo		

Bridge 08 – Holly Arch Culvert

Maintenance Report



Recommendations	Monitor scour repair area for continued material loss at SW quadrant. Monitor wood debris upstream and bank sloughing at SW corner.

Nails found in wing wall attachments, for nets?	***Downstream at outlet***
	

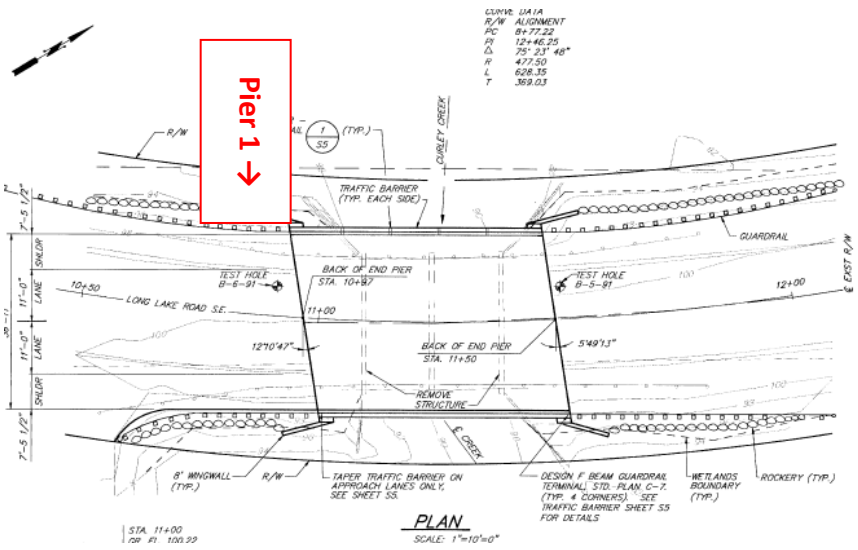
Bridge 09 – Long Lake Bridge				
Long Lake Road	**Curley Creek**	**1993**	**98.03**	**Jun. 15, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed, precast voided concrete slabs (4'ω x 2'-2" h) in good condition.
	Deck	3" ACP overlay with waterproof membrane is in fair condition. Cracking throughout needs sealing. ACP at bridge joints need repairs.
	Other	Concrete bridge railing transitions & terminals do not meet current standards.
Substructure	***Foundation***	Driven steel 12" pipe piles filled with concrete.
	Abutments	Cast-in-place concrete abutment in fair condition with undermining happening. Girder seats are 24". NE corner, scour is under the pile cap - 2" void height x 10' long x 2' distance under the cap. SE corner, scour is under the pile cap – 2" void height x 13' long. Pier 2 abutment has soil on top from between slabs and/or voids at pavement seat.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. SE & NE corners of pile cap are showing signs of back water scour due to large beaver dam at mid span that was removed Summer 2013. Heavily overgrown outlet end contributing to backwater scour. Beaver dam rebuilt at centerline of bridge between old wooden pilings. This is contributing to back water causing scour at abutments. This bridge is **not** scour critical.	
Photo		

Bridge 09 – Long Lake Bridge

Maintenance Report

To Mullenix Rd ↑



To Sedgwick Rd ↑

Recommendations	Repair ACP at both bridge joints and seal cracking in ACP Roadway. Monitor settlement and cracked ACP at the NE & SE corners at bridge ends in the embankment areas. Monitor void areas under both abutment walls. Monitor sloughed rockwall at NE embankment 15'to 20' of wall has toppled and recommend repair. Remove beaver dam under bridge adding to back water scour.

Sloughing rockery at NE quadrant

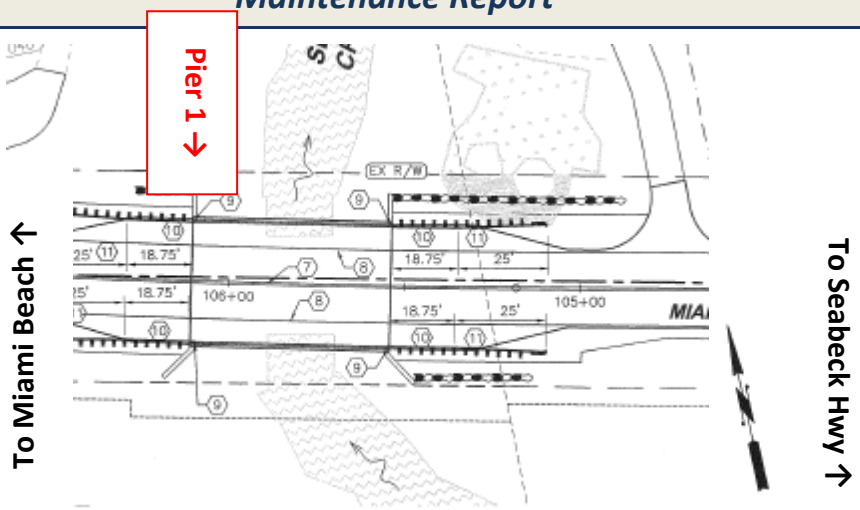
Cracking in ACP and at bridge joints

Bridge 11 – Miami Beach Bridge				
Miami Beach Road	**Seabeck Creek**	**2013**	**79.00**	**Jun. 13, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed, precast voided concrete slabs (4'ω x 2'-2" h) in good condition.
	Deck	Cast-in-place 8" concrete deck with epoxy rebar mat. In good condition beginning to show signs of minor pitting throughout the deck.
	Other	Concrete bridge railing sealed with pigmented sealer in good condition. Metal pedestrian railing in good condition. Small section replaced on the South side after tree fell down in late winter 2016.
Substructure	***Foundation***	Driven steel 2' pipe piles filled with concrete and rebar to depths of 50-52' in length.
	Abutments	Cast-in-place concrete abutment in good condition. Elastomeric bearing pads and large rip rap protection. Elastomeric bearing pads show minor bulging throughout Pier 1.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Enginering in 2019. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 11 – Miami Beach Bridge

Maintenance Report



Recommendations	Bridge is in good condition. Monitor material moving from abutment embankments to stream bed during high flows. Monitor stream bank beginning to cut at the East side just downstream from the structure.

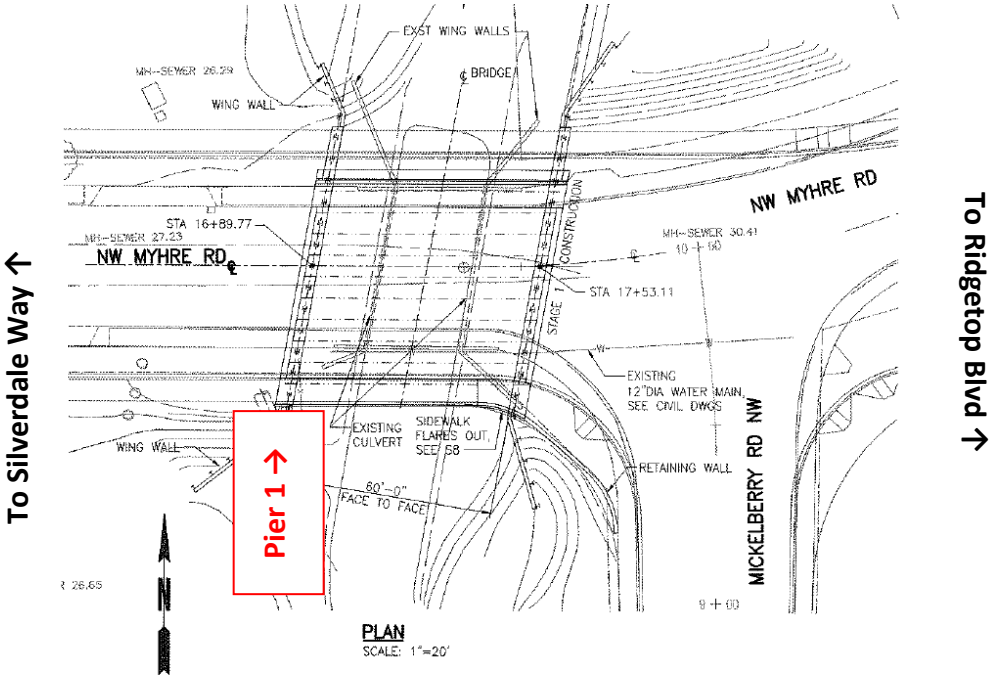
Debris getting caught on anabranch at downstream end of bridge	***Looking downstream under bridge gravel buildup***
	

Bridge 12 – Myhre Bridge				
Myhre Road	**Clear Creek**	**2006**	**99.17**	**Aug. 24, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed (35” DBT with 72” Flange) bulb-tee girders in good condition. Minor moisture present at both exterior girders.
	Deck	2” ACP overlay with waterproof membrane is in good condition. Cracking appearing at both bridge joints in need of sealing.
	Other	Concrete bridge & metal pedestrian railing in good condition. Hairline vertical cracking beginning to appear in concrete railing at connection to metal pedestrian rail.
Substructure	***Foundation***	Driven steel 14” HP14x117 pile foundation under abutment and HP12x63 piles under wing walls.
	Abutments	Cast-in-place concrete abutment in good condition. Girder seats are 25”. Both abutment walls now have minor hairline vertical cracks at the bearing seats. SE wing wall top – small crack where wall meets outside flange of girder 45-degree angle x 6” long. Small voids now present between wing walls and abutments due to deterioration of fiber expansion material.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 12 – Myhre Bridge

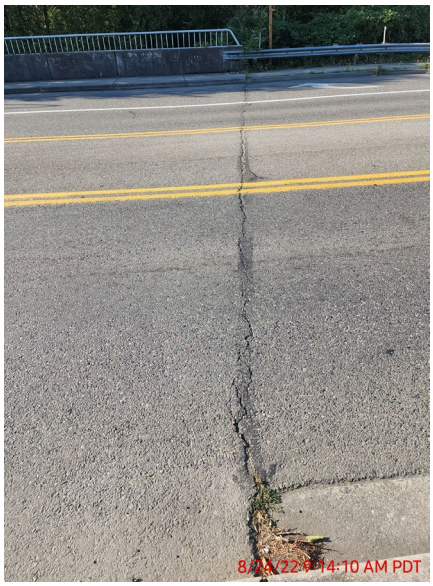
Maintenance Report



Recommendations	Heavy vegetation growing and siltation deposits at inlet & outlet ends and should be removed. Seal cracking in ACP at both bridge joints. NE & SW sidewalk panels settling up to ½". Monitor settlement along Pier 2 joint.

Inlet End siltation and vegetation

Seal Cracking in ACP at Bridge Joints

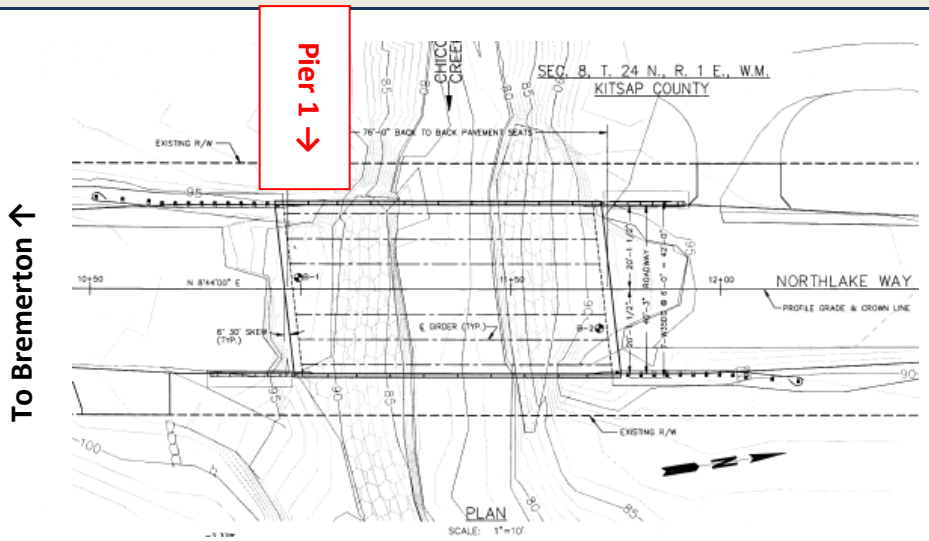


Bridge 13 – Northlake Bridge				
Northlake Way NW	**Chico Creek**	**1997**	**97.57**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed (W35DG) bulb-tee girders in good condition.
	Deck	2.5” ACP overlay with waterproof membrane is in repaired condition (milled and repaved in summer 2020 in travel lanes). Repair of ACP overlay has resolved previous problem of significant moisture between girders at deck underside.
	Other	Concrete bridge & metal pedestrian railing in good condition.
Substructure	***Foundation***	Driven steel 18” pipe piles filled with concrete. Additional rip rap was added at both side of inlet end in spring of 2009 by county forces and is working well.
	Abutments	Cast-in-place concrete abutment in good condition. Girder seats are 46”.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2018. Scour evaluation and analysis was performed by West Consultants in 1997. Additional rock armor placed at inlet end is working well. This bridge is **not** scour critical.	
Photo		

Bridge 13 – Northlake Bridge

Maintenance Report



Recommendations	Monitor bank armor at SW & NW corners.

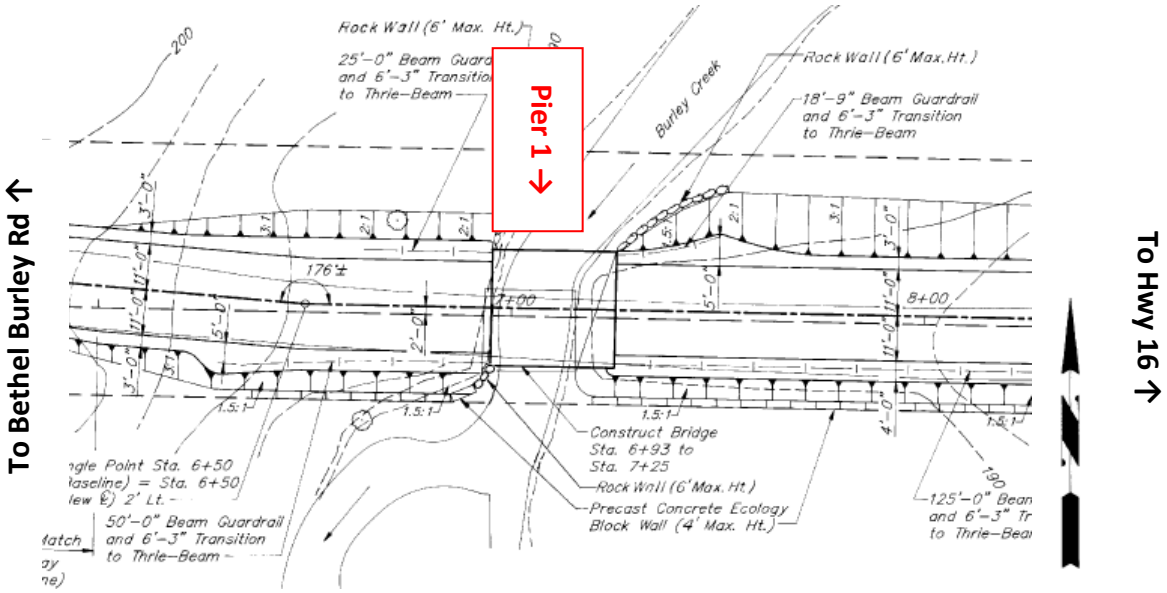
Travel lanes repaved in Summer 2020	***CB with some debris***
	

Bridge 14 – Oak Street Bridge				
Oak Street	**Burley Creek**	**1991**	**90.14**	**Jul. 8, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3 span concrete box culvert in good condition. Minor moisture is present at seams only. Leachate and Stalactite formation noted in between all slabs, and abutment walls. Efflorescence is accelerating. Backer rod is exposed at 2nd seam in from South on East side at ground elevation.
	Other	Bridge rail transitions do not meet current standards. Roadway settlement is apparent at East pier with cracking across roadway and about 1" crack in ACP at North end. Settlement at West joint also noted with only cracking appearing at roadway shoulders at this time.
Substructure	***Foundation***	Cast-in-place concrete footings. Scour holes that have formed under the footing have begun to fill back in with the stream channel returning to the center of the structure. No girder seat – spread footings.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by Entranco Engineering in 1996. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.
Photo		

Bridge 14 – Oak Street Bridge

Maintenance Report



Recommendations	3 areas of failing ACP curb should be repaired: NE, NW,and SE corners. Monitor rip rap at NE & SW corners with evidence of bank loss at this time.

Failing ACP Curb

Cracking in ACP due to roadway settlement

Bridge 15 – Crescent Valley Bridge				
Crescent Valley Rd.	**Olalla Creek**	**1972**	**91.78**	**Jul. 8, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

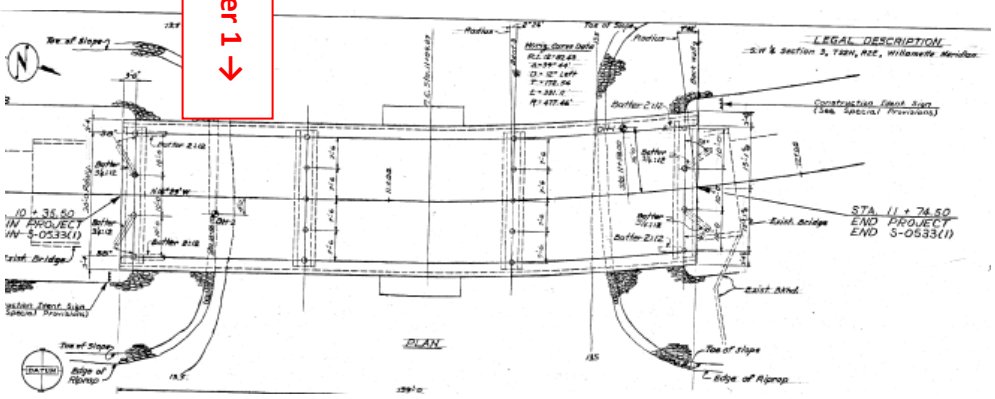
Superstructure	***Girder***	Cast-in-place post-tensioned slab in satisfactory condition.
	Deck	Cast-in-place post-tensioned slab with deck showing signs of accelerated scaling. Iron pipe showing through the deck along the sidewalk entire length, both sides – 1' from curb.
	Other	All 4 corners under the sidewalk panels, material is starting to slough away again. Sidewalk repair on the west side observation area [midspan] is starting to spall 3'x 6'x 1/4" deep. 4 sidewalk panels at bridge joints have settled and are in need of repair. Metal bridge rail and transitions do not meet current standards.
Substructure	***Foundation***	Driven 16" precast concrete piles. Rust staining evident at Bent #3 pile cap at easterly pile connection to the deck. Barnacle build-up to 4' from ground elevation of all piles in the water.
	Abutments	Cast-in-place concrete abutments are protected by vinyl sheet piling walls. Vertical hairline cracking in the Pier 4 carrying up to the deck underside. A 4"x 4" hole in vinyl sheet pile wall below header wall on NW corner. Slab seat is 45".
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour evaluation and analysis phase 1 was performed by Entranco Engineering in 1996, followed by phase 2 in 1997. Scour countermeasure plan was implemented in 6/99. No further scour problems at this time. **This bridge is scour critica**l.	
Photo		

Bridge 15 – Crescent Valley Bridge

Maintenance Report

To Pierce County ←

Pier 1 →



Olalla Valley Rd →

Recommendations	Current bridge rail and transitions do not meet current standards. Monitor settlement at bridge ends and approach roadways. Monitor scaling in wheel tracks of the concrete deck as well as ¾" pipes appearing in deck 1-1.5' from curb in both lanes. Repair sidewalk spalls west side at observation area. Clean and reseal North (P2) bridge joint. Repair ACP at South (P1) Bridge Joint. Repair sidewalk panels at all four corners caused by settlement.

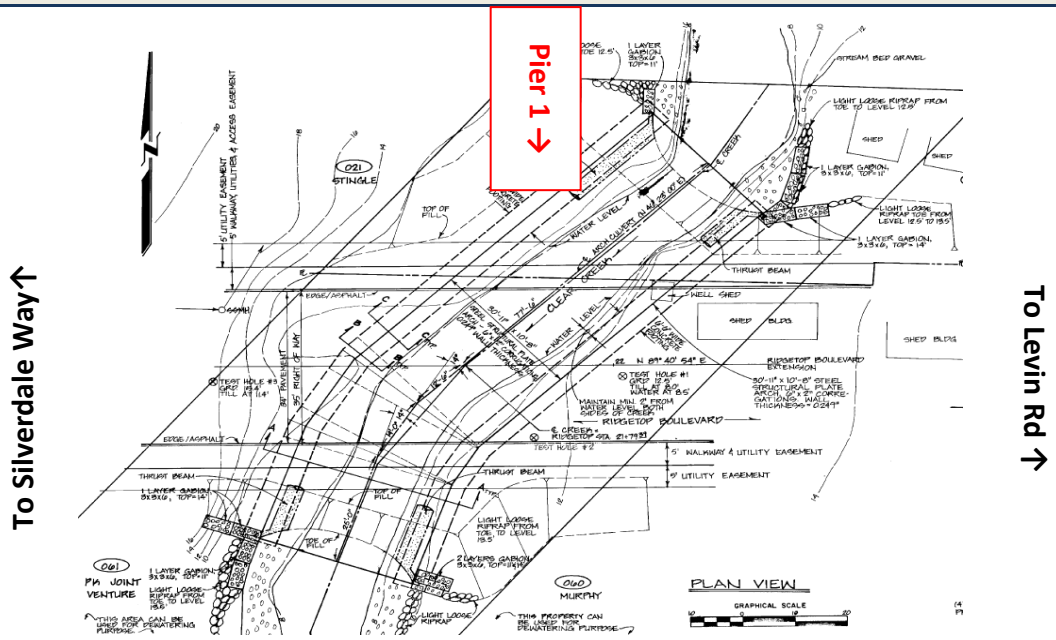
Sidewalk Spall	***Repair ACP at South joint***
	

Bridge 16 – Ridgetop Arch Culvert				
Ridgetop Boulevard	**Clear Creek**	**1986**	**81.90**	**Aug. 24, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

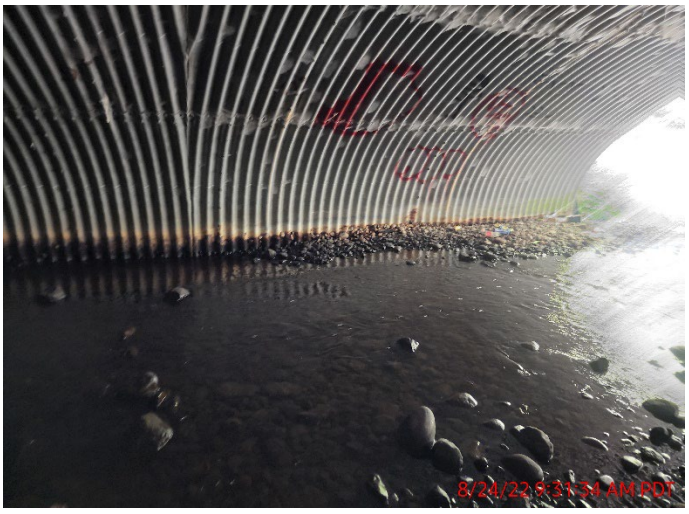
Superstructure	***Culvert***	Low profile steel multi-plate arch culvert in fair condition. No defects evident in the structure or the roadway surfacing and drainage above. There are some nuts missing from the plate seam bolts at the north end. Vertical seams along pier 1 (West side) leaching water at bolt locations.
Substructure	***Foundation***	Cast-in-place concrete spread footings (3' high x 6.5' wide). 4" of rust staining evident at connection of multi-plate to the footing throughout the structure. Scour at SE corner approximately 35 feet from inlet varies from top only exposure in summer to 0.5' exposure in winter.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour evaluation and analysis phase 1 was performed by Entranco Engineering in 1996, followed by Phase 2 analysis was performed by Tetra Tech / KCM in 2005. Central Road Shop performed scour countermeasure work in the spring of 2007. **This bridge is scour critica**l.
Photo		

Bridge 16 – Ridgetop Arch Culvert

Maintenance Report



Recommendations	Monitor scour of east footing (Pier 2) during high flow events especially the exposed footing at inlet. East half of rock weir has been removed by flows.

SE Footing exposed 5" in winter inspection	***SE Footing only top exposure in summer inspection***
	

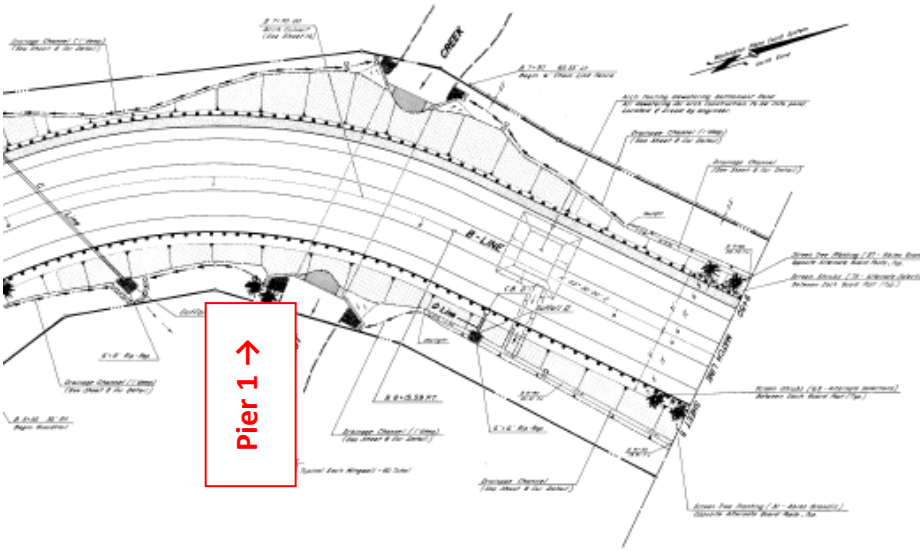
Bridge 17 – Sam Christopherson Arch Culvert				
Sam Christopherson Boulevard	**Gorst Creek**	**1987**	**84.23**	**Jun. 15, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	Low profile steel multi-plate arch culvert in fair condition. Leachate noted on panel bolts, east and west ends, first seam in. SE corner of arch has 3' x 3' patch of electrolysis staining; also mid span north side 2’ X 2’ area.
Substructure	***Foundation***	Cast-in-place concrete spread footings (3’ high x 6’ wide). 4” to 6” of rust staining evident at connection of multi-plate to the footing throughout the structure. Scour countermeasures installed in Summer 2013.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. Scour counter measures installed in Summer 2013. Pier 1(South) footing scour has been top surface has been covered with sand and larger cobbles since winter inspection. Pier 2(North) footing has 10” of vertical exposure at the inlet that tapers to zero for approximately 20 feet in from inlet. **This bridge is scour critica**l.
Photo		

Bridge 17 – Sam Christopherson Arch Culvert

Maintenance Report

To SR 3 →



To West Belfair Valley Rd →

Recommendations	Monitor scour along the N & S footing areas at inlet ends. Top surface of Pier 1 (South) footing exposed in winter inspection. Top surface of Pier 2(North) footing exposed from inlet (East) back approx. 20 LF with 10" vertical at inlet. Monitor upstream debris. Monitor repair patching and cracking in ACP above culvert. South Pier (P1) wing wall at inlet end cracking at seam, approximately ¼".

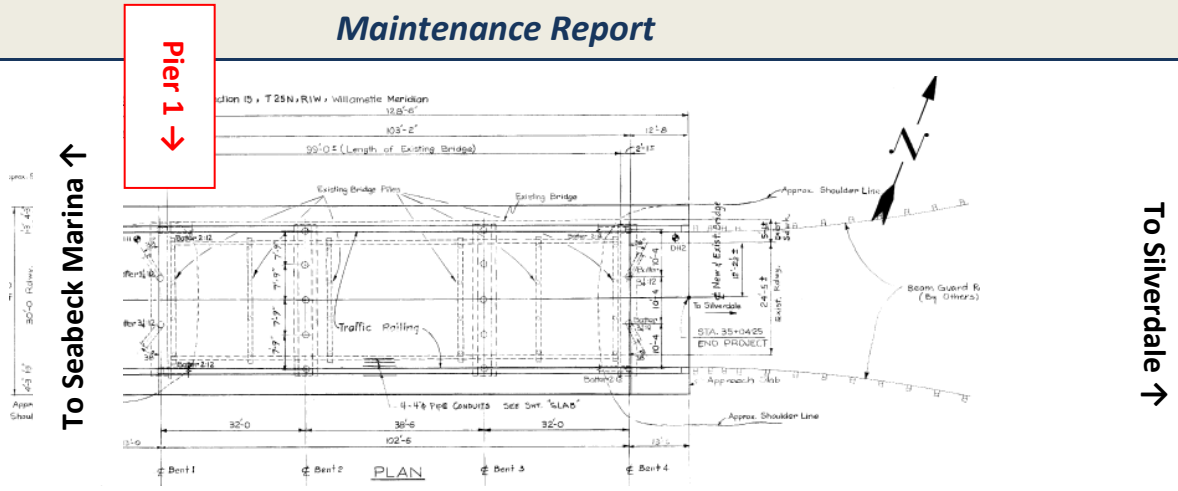
Footing Exposed	***Pier 1 Inlet Wing Wall cracking***
	

Bridge 18 – Big Beef Bridge				
Seabeck Highway	**Big Beef Creek**	**1974**	**70.43 FO**	**Aug. 24, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Cast-in-place post-tensioned slab in fair condition. 6”x 6”x 1” spall on East side midspan Exterior edge of slab.
	Deck	Cast-in-place post-tensioned slab with deck showing signs of moderate scaling with exposed aggregate in the wheel tracks. Replacement approach slab was constructed on the west side during the 2010 Scour Repair. Southwest bridge joint in need of resealing.
	Other	Bridge rail transitions do not meet current standards. Wooden pedestrian rail on both sides in poor condition showing signs of weathering and rot. Small hairline cracks showing at NE & NW sidewalk slabs. Hairline cracks evident at every connection of pedestrian rail to the deck.
Substructure	***Foundation***	Driven 16” precast concrete piles. Barnacle build-up on bottom 4’ of all ten piles in water.
	Abutments	Cast-in-place concrete abutments. Slab seat is 24“. Emergency Repair work was done in January 2010 to repair scour at the west abutment and approach slab. Steel sheet piling was driven and attached to a tieback anchor system and beach armor rock was re-established which is continuing to rust. Northern abutment corner at Pier 4 has lost rock armor and needs to be monitored. Currently 4’ deep of material loss. There are existing patched spalls at deck underside behind Pier 1. One previously repaired spall has delaminated and beginning to detach due to moisture leaking through joint above.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour evaluation and analysis phase 1 was performed by Entranco Engineering in 1997, followed by Phase 2 analysis performed by KCM / Tetra Tech in 2003. Tetra Tech consulted the 2010 repair work and Quigg Bros performed the work. **This bridge is scour critica**l.
Photo		

Bridge 18 – Big Beef Bridge

Maintenance Report



Recommendations	Monitor steel sheet pile wall at west abutment and any movement of the beach armor rock. Existing piles at west abutment are now exposed 5' below pile cap and should be monitored closely during high water events and tides. Monitor settlement of native material under sidewalk panels at all four corners. Recommend packing in quarry spalls at NE corner abutment due to undermining from tidal action. Timber pedestrian rail is rotting and should be replaced. Cathodic protection is recommended for steel sheet pile abutment. Reseal Southwest joint.

Abutment at Pier 4 with material loss at NW corner

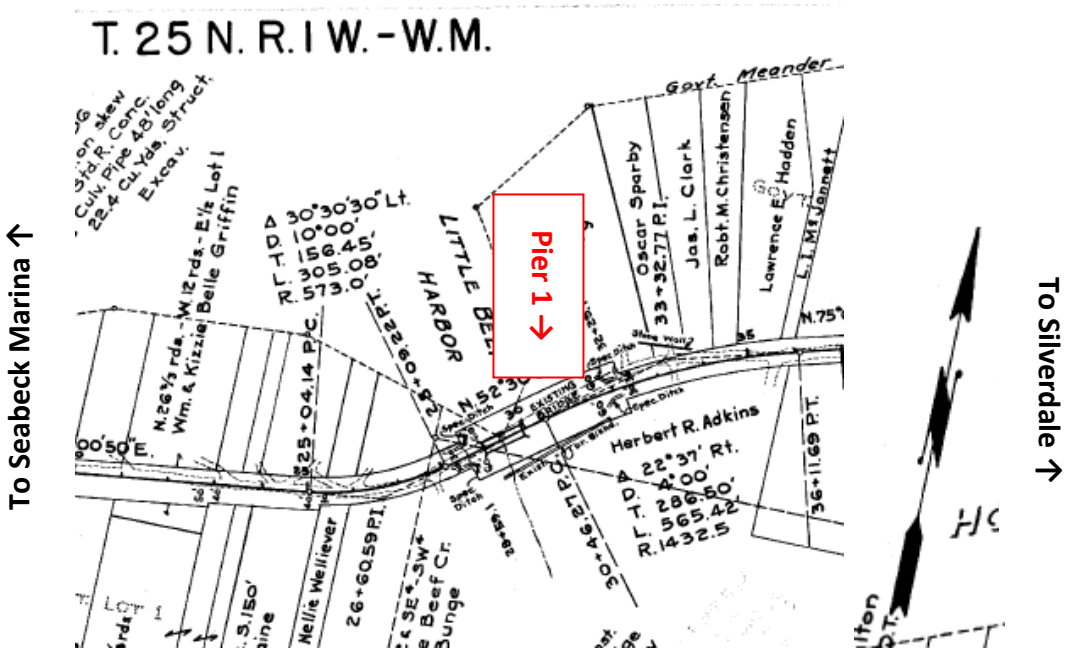
Timber Ped Rail in need of replacement

Bridge 19 – Little Beef Bridge				
Seabeck Highway	**Little Beef Creek**	**1955**	**63.11 FO**	**Aug. 24, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Cast-in-place beam structure with cantilevered spans in fair condition. Minor transverse cracking throughout underside of deck. Rust staining between stringers C & D at Pier #2. Vertical hairline crack on diaphragm between B & C at Pier #2.
	Deck	Cast-in-place concrete deck with flexure cracks evident in deck underside at intermediate diaphragms with efflorescence showing. ACP overlay on deck area has been repaired in the northbound lane wheel tracks. Northeast bridge joint needs repair and southwest joint needs resealing.
	Other	Bridge rail transitions do not meet current standards. Damaged bridge rail on north side – 3 sections in from the west still functional.
Substructure	***Foundation***	Driven 13” precast concrete piles.
	Abutments	Cast-in-place concrete cantilevered abutments. Some hairline cracks in cantilever backwalls. Scour countermeasures were implemented in Summer 2013 on east end cantilever span footing.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Recommended posting for SU5, SU6, & SU7 trucks. Scour evaluation and analysis phase 1 was performed by Entranco Engineering in 1997, followed by Phase 2 analysis in 1997. Scour countermeasures installed Summer 2013. **This bridge is scour critica**l.	
Photo		

Bridge 19 – Little Beef Bridge

Maintenance Report



Recommendations	Repair Northeast bridge joint and reseal the Southwest bridge joint. Monitor material loss and settlement at cantilevered spans. Repair ACP curb at NW corner to prevent surface runoff and slope surface erosion.

North bridge joint in need of repair	*Broken ACP curb at NW corner of bridge*
	

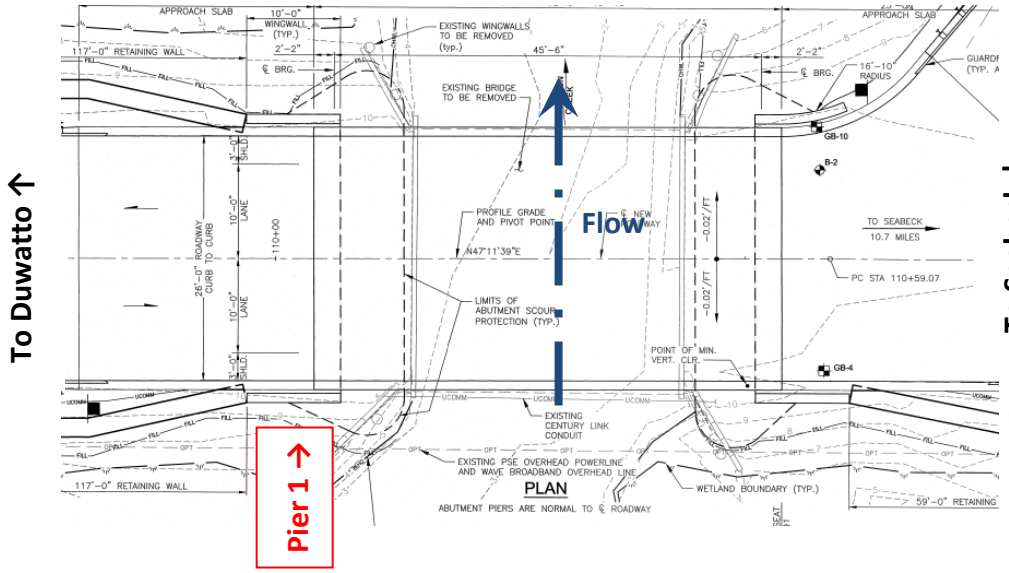
Bridge 20 – Seabeck-Holly Bridge				
Seabeck-Holly Road	**Anderson Creek**	**2017**	**93.95**	**Jun. 13, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Inspection frequency increased due to the condition of the substructure components.

Superstructure	***Girder***	Precast prestressed Concrete 18" slab girders, approx. 47.5 feet in length. Minor exterior edge spalling on girder A. soffit between A & B as well as between B & C has approx. 1" step.
	Deck	6" cast-in-place deck with steel reinforcing. Aggregate and minor roughness caused by tining on the left side throughout. No visible cracks. Southbound lane on deck seeing accelerated scaling between bridge joints. Likely from concrete mix or placement at time of construction.
	Other	Cast-in-place concrete bridge railing and metal pedestrian railing. Concrete bridge railing has a few hairline cracks throughout and a 2' scrap on the right side near Abutment 1 and a 4' scrap on the right side near abutment 2 from construction. Elastomeric bearing pads under each end of each girder.
Substructure	***Foundation***	16" drive steel pile casing filled with concrete and steel reinforcement. 6 piles per pier. Pier 1 has a tip elevation of 40 feet and pier 2 has a tip elevation of 30 feet.
	Abutments	Cast-in-place concrete abutments. Pile cap width of 4 feet and stem wall width/beam seat of 16".
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Exceltech in 2018. Scour evaluation was performed by TranTech Engineering in 2018. Scour analysis was performed by MP Stormwater Hydraulic Engineering Services in 2016 as part of the new bridge design process. This bridge is **not** scour critical.	
Photo		

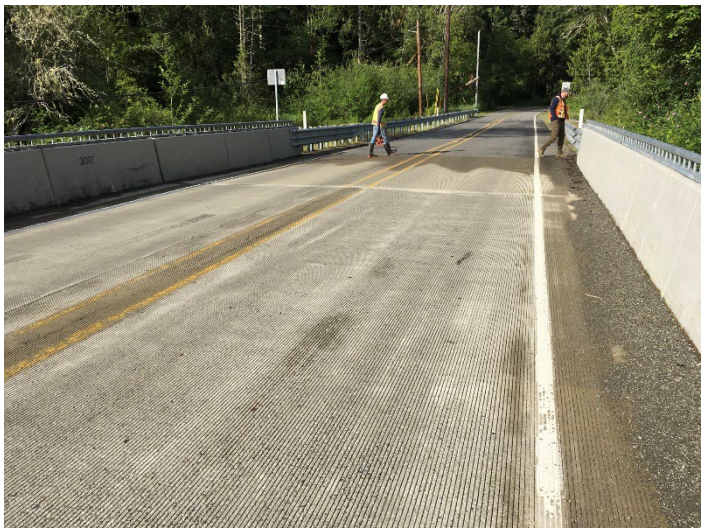
Bridge 20 – Seabeck-Holly Bridge

Maintenance Report

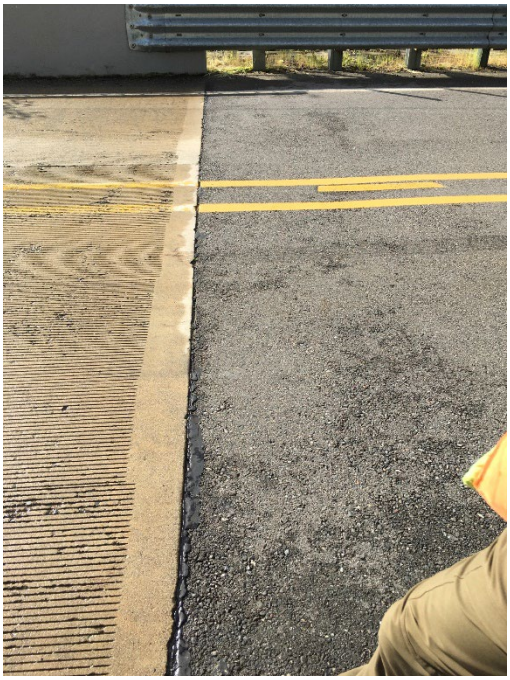


Recommendations	Monitor scaling of Southbound bridge deck. May warrant surface treatment if continues to deteriorate. Monitor settlement at approach slabs approximately ¼". Deck shoulders have sand buildup from wintertime maintenance. Reseal asphalt joint at approach slabs.

Sand buildup at shoulder



Reseal asphalt joint at approach slabs

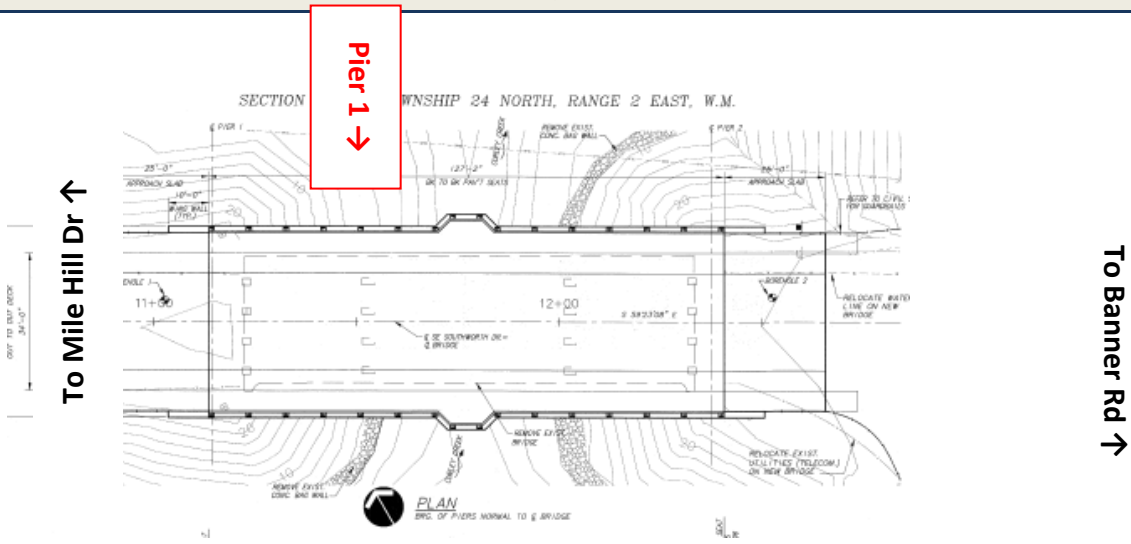


Bridge 21 – Southworth Bridge				
Southworth Drive	**Curley Creek**	**2011**	**98.02**	**6/15/21**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete (WF66G) bulb-tee girders, approx. length of 127' in good/new condition.
	Deck	10" cast-in-place deck and epoxy coated reinforcement. Hairline cracks starting to show in gutter pan and sidewalks. Expansion joints at both ends are full of sand. East end of bridge has uniform diagonal shear cracking of deck at 3' and 10' from East bridge end. Hairline perpendicular cracking beginning to show along sidewalk on South side of bridge.
	Other	Galvanized metal pedestrian railing in good condition. Accelerated map cracking at all 4 quadrants on the concrete barrier sections.
Substructure	***Foundation***	Drilled shaft foundation 5' in diameter with rebar encased in concrete. 4 shafts per pier to approx. length of 40' in depth.
	Abutments	Cast-in-place concrete abutment with pigmented sealer. Rock armor at abutments was rebuilt along with shotcrete wall installed as part of scour countermeasure repair performed in summer 2018. NW wing wall corner has surface spall 4' x 2' x 8" and SW exterior abutment wall has superficial surface spalls located at construction joint locations between pier cap and wing wall. The conduits at the SE corner steadily leaking at thermal couplers. Beam Seat – 36".
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Otak Engineering in 2012 and updated in 2019 by TranTech Engineering to include Emergency Vehicles (EV) and Single Unit Vehicles (SU). Scour analysis has not yet been performed for this structure. Scour countermeasure repair performed in summer 2018 to install shotcrete walls to protect pile caps at abutments and rebuild rock armor.	
Photo		

Bridge 21 – Southworth Bridge

Maintenance Report



Recommendations	Monitor rock armor, large rock armor in place but some of the smaller material on P1 has been removed by tidal action. Monitor shear cracking at NE & SE corners of deck. Monitor all four corners of roadway embankment for erosion. Clean expansion joints. Tack seal both roadway approach joints. Clean CBs at West end of bridge, both sides.

Summer 2018 Abutment Scour Repair

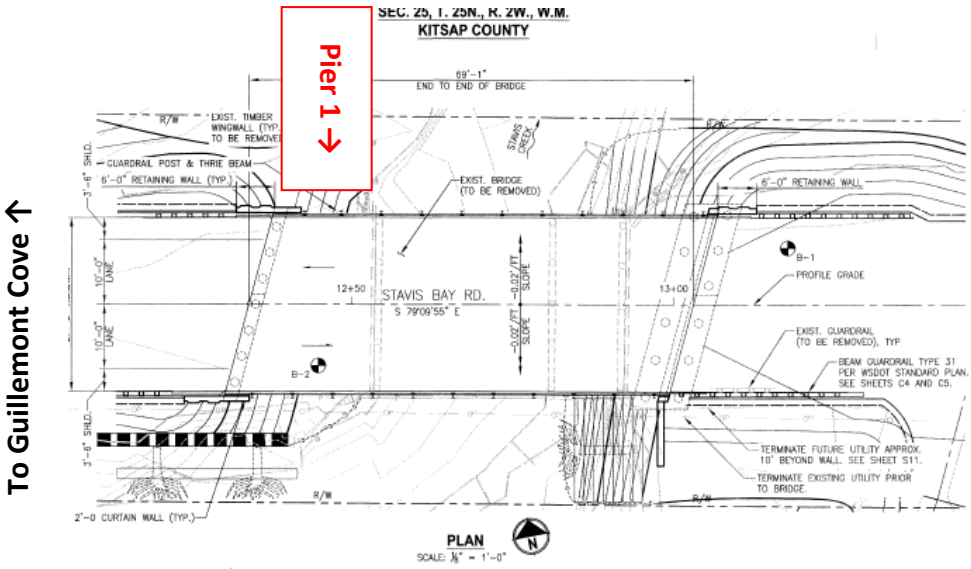
NW Corner Surface Spall

Bridge 23 – Stavis Bay Bridge				
Stavis Bay Road	**Stavis Creek**	**2011**	**84.04**	**Jun. 13, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed 26” concrete voided slabs in good condition. Small spall on exterior slab at north side, likely from scour repair activities.
	Deck	3” ACP overlay with waterproof membrane in good condition.
	Other	Metal bridge railing and elastomeric bearing pads in good condition.
Substructure	***Foundation***	Driven 16” steel pipe piles with filled with concrete and rebar to depth of approx. 40’.
	Abutments	Cast-in-place concrete abutments. Beam seat – 24”. County road department installed permanent scour countermeasures at the SE & SW quadrants in summer 2018.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. Pier 2 rock armament from Scour repair has been toppling into the creek with 6.25’ exposed abutment at center of pier leaving 3.75’ buried.	
Photo		

Bridge 23 – Stavis Bay Bridge

Maintenance Report



Recommendations	Monitor scour countermeasures and abutments for scour during high tides and high-water events. Pier 2 abutment has some erosion of the armament mainly in the center of the abutment and large riprap has begun topple into the creek.

Pier 2 scour repair summer 2018

Pier 2 Armament Sloughing

Bridge 24 – Trigger Ave Bridge				
Clear Creek Road	**Trigger Ave**	**1979**	**92.66**	**Jul. 12, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete girders in good condition. Rusting rebar on bottom flange of girder F north end has been previously covered with galvanized spray and needs reapplication.
	Deck	Cast-in-place concrete deck with 2.5" ACP overlay in poor condition and is deteriorating. Some longitudinal cracks starting to show throughout in the ACP deck. North bridge joint has previously filled potholes that warrant full length joint repair.
	Other	Concrete bridge railing in fair condition. NE corner of jersey barrier has surface spall 10"x4" on roadside face.
Substructure	***Foundation***	Cast-in-place spread footings. Concrete slope protection at north side has 1" gap to abutment at east end. Void up to 15" in depth, likely from surface runoff around abutment. Recommend filling with grout to prevent further erosion.
	Abutments	Cast-in-place concrete abutments. North abutment between stringers A & B where 2-6" conduits enter the diaphragm, small spall evident at bottom of the knockout. Minor moisture is evident at bearing pads both sides. SE corner at deck underside 1st bay from the east, embankment material is piping through 2-4" conduit knockouts at abutment wall. Stringer seats – 24".
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2017. This bridge is **not** scour critical. (Bridge not over water, therefore, not scour critical.)	
Photo		

Bridge 24 – Trigger Ave Bridge

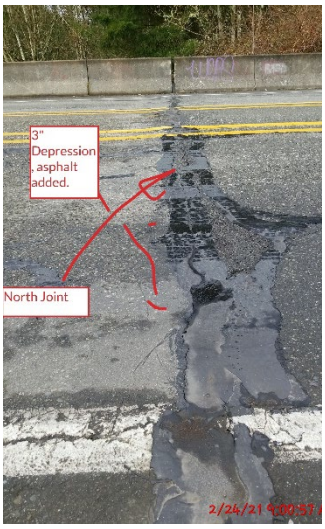
Maintenance Report

To Bangor Base ← (Old Frontier Rd)

To SR 3 →

Recommendations	Grout conduit void at North abutment between girders A & B. Deteriorating joint allowing soils to migrate to the abutments underneath bridge, recommend repairing north ACP bridge joint. Recommend recoating exposed rebar on girder undersides with galvanizing spray. Recommend placing grout in gap between concrete slope protection and abutment at east end on north pier.

Bridge Joints



North joint

South Joint

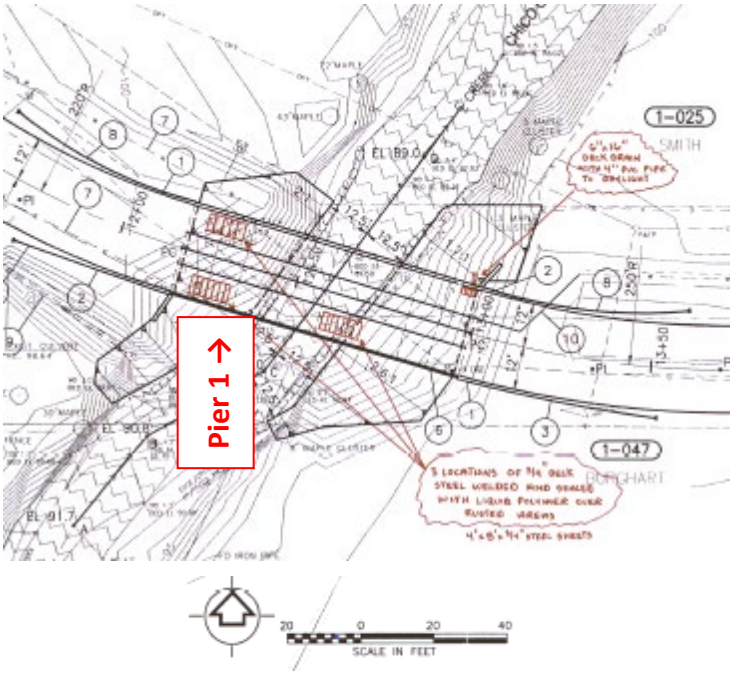
Gap in concrete slope protection with void at NE corner

Bridge 25 – Taylor Bridge				
NW Taylor Road	**Chico Creek**	**2002**	**79.21**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Steel box cars (railroad flats), 3 sections, 82’ span in fair condition. Surface rust [minor] is accelerating at deck underside with some surface flaking starting to appear throughout with more accelerated flaking at both abutment ends. This structure has grant allotted for a maintenance contract to paint the steel girders which is currently under design.
	Deck	2” ACP overlay.
	Other	Metal bridge railing and elastomeric bearing pads in good condition.
Substructure	***Foundation***	Driven HP12x53 steel piles to approximately 30’ in depth.
	Abutments	Cast-in-place concrete abutment in good condition. Hairline cracks evident at grout pads at Pier 2 (east side joint). East side rock armor is undermining 20’west of the bridge and is settling into the creek. Bearing seats – 26”.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements TranTech Engineering in 2017. Bridge requires posting for the SU7 vehicle. Scour analysis has not yet been performed for this structure. New bridge constructed in 2/2002 replacing a washed-out culvert. In December-2007 the west abutment was repaired, and upstream channel was realigned and armored with woody materials following the flood event. **This bridge is scour critica**l.
Photo		

Bridge 25 – Taylor Bridge

Maintenance Report



Recommendations	Monitor sloughing rock slope armor at east abutment. Clean drain at NE corner of the bridge. Guardrail Terminal at the NW corner was missing hardware to secure to the wooden post. This has already been fixed by Roads Maintenance.

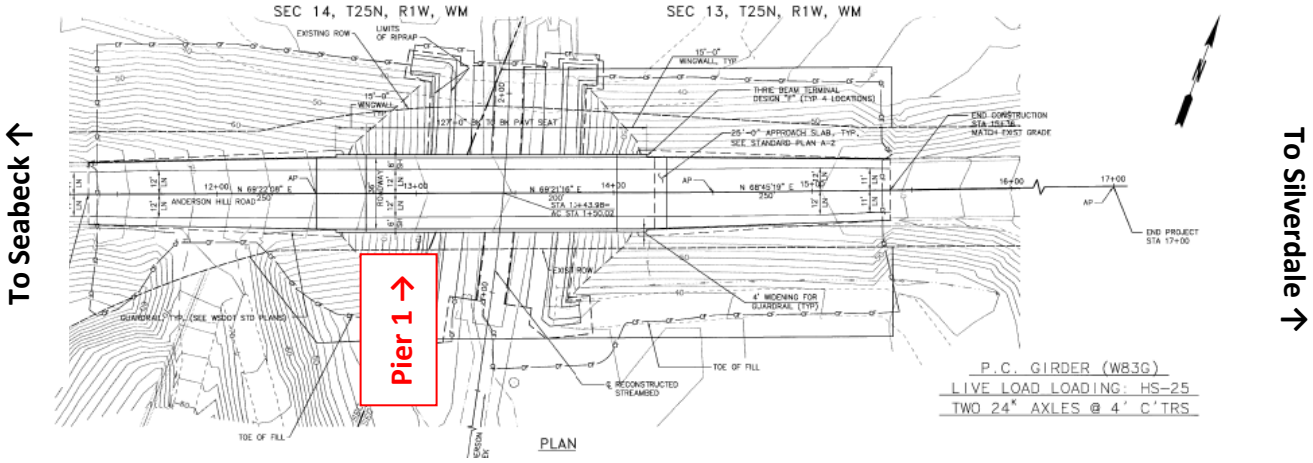
Sloughing of Rock Armor on East Abutment	***NE Corner Drain to clean***
	

Bridge 26 – Anderson Hill Bridge				
NW Anderson Hill	**Anderson Creek**	**2002**	**94.55**	**Jul. 12, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete (W83G) bulb-tee girders, approx. length of 127'. 6" spall with exposed rebar on exterior flange at the SE corner between wing wall & barrier. Plates between girders and elastomeric pads beginning to rust, more predominantly at Pier 1.
	Deck	9" cast-in-place concrete deck and epoxy coated reinforcement. Numerous transverse cracks across deck full width across deck area – 6' to 8' spacing. Crack lengths and widths appear to be increasing. Silica sealer applied to entire deck area in Summer 2014. The majority of the sealed is worn off in the travel lanes. Minor flexure cracks evident between all girders with efflorescence showing in deck underside. Deck surface is starting to scale in the wheel tracks. 2 small deck spalls at expansion joints SE & NW corners in the driving lane. West expansion joint starting to crack and separate.
	Other	Cast-in-place concrete bridge railing. Minor scraps along the north barrier as well as the nw corner spalled off from a vehicular accident. Barrier joint filler between sections is worn/missing allowing moisture/sediment to travel from the roadway to abutment. Guardrail transitions and terminals were replace in 2020 under CRP 5032.
Substructure	***Foundation***	Driven 16" steel piling casing with steel reinforcement and filled with concrete.
	Abutments	Cast-in-place concrete abutments, wing walls, and concrete pile caps. Heavy sediment build-up and wood debris under the bridge. Girder seats – 26".
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech in 2019. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical. (High flood plain elevation of footings.)
Photo		

Bridge 26 – Anderson Hill Bridge

Maintenance Report



Recommendations	Reseal both bridge joints at approach slabs. Monitor transverse cracking and scaling in deck. Monitor stream flow path and large sediment deposits and heavy vegetation growth under the bridge. Beaver intrusion/activity spotted at location recently.

Beaver dam at north side of structure. Heavy sediment build-up under bridge.	***Girder plates beginning to rust. More predominantly at West Pier 1***
	

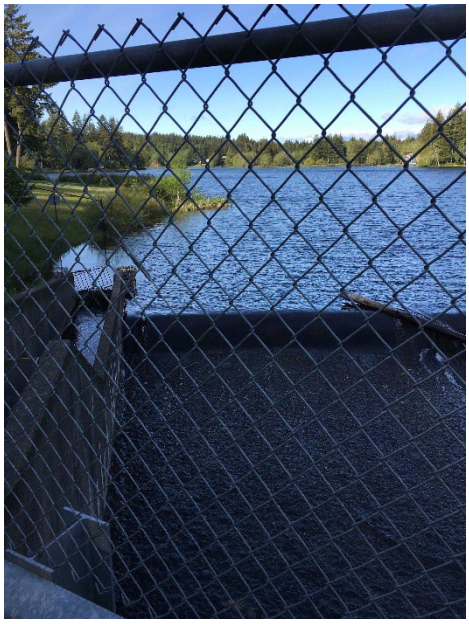
Bridge 27 – Lake Symington Bridge				
Big Beef Crossing NW	**Lake Symington Spillway**	**1964**	**56.71 FO**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Cast-in-place voided reinforced slab in fair condition. Spall on underside of slab – 2" wide x 4" long x ¾" deep rusty leaching spall at west edge and center span near the west drain including a 3' transverse crack from drain past spall. 3' long partially open diagonal crack at NW corner of slab at the abutment wall.
	Deck	ACP Overlay in fair condition. South side approach has newer ACP overlay. Numerous rock pockets in deck underside.
	Other	Spillway includes adjacent fish ladder to south of structure. Grate at lake side of fish ladder has debris buildup. Buildup has also spilled onto corner of spillway. Water is weeping out of construction cold joints adjacent to fish ladder at the SE quadrant. Metal bridge railing in fair condition and showing signs of weathering.
Substructure	***Foundation***	Cast-in-place floor slab under spillway.
	Abutments	Cast-in-place reinforced 8" walls in fair condition. Hairline cracking in pier walls and spillway floor appears to have been filled. Joint filler falling out between wing wall and abutment at SW corner. South approach smooth due to ACP overlay and North approach has ¼" settlement which does not appear to been caused by defects in the abutments or retaining walls. Slab seat – 8".
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2017. Scour analysis has not yet been performed for this structure. Recommended posting is at 14 tons. This bridge is **not** scour critical. (Structure footings are protected by concrete spillway.)	
Photo		

Bridge 27 – Lake Symington Bridge

Maintenance Report

Recommendations	Monitor cracking in pier walls and deck underside. Monitor roadway settlement at both ends. Clean debris from fish ladder gate at lake side. Remove logs hung up on inlet end of spillway. Reseal bridge ACP at bridge joints.

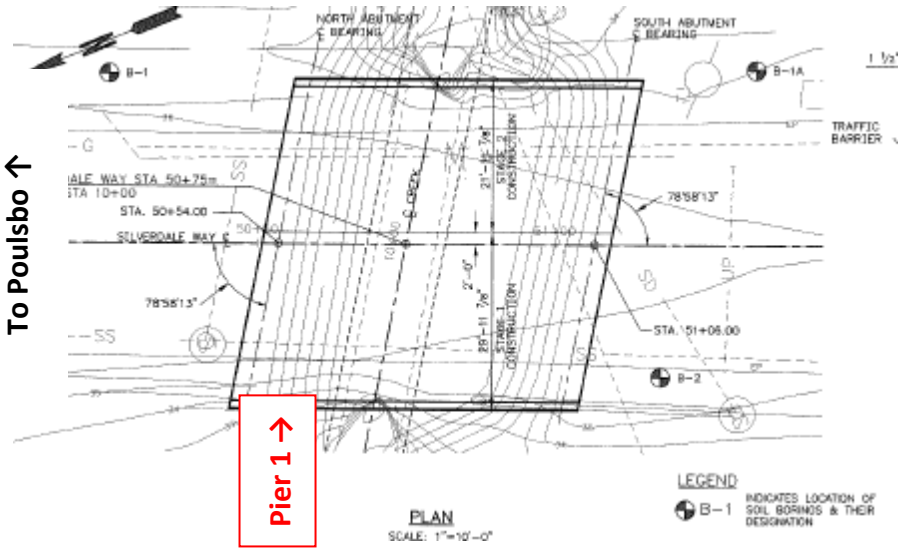
Reseal Bridge Joints	*Clean debris from fish ladder grate & logs at inlet*
	

Bridge 28 – Clear Creek Bridge				
Silverdale Way	**Clear Creek**	**2006**	**83.85**	**Jul. 12, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete Channel Beams 48”x28”x52’ in length. No defects found in good condition. Minor moisture present between girders throughout.
	Deck	3” ACP Overlay.
	Other	Cast-in-place concrete bridge barrier in good condition. Hairline vertical cracking evenly spaced approximately 4’. NW corner approach has newly installed bioretention ditch for water quality.
Substructure	***Foundation***	Driven HP12x53 steel pile foundation with vertical and battered pile configuration.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads. Beam seat –24”. SW corner small area of moisture present at bearing pad.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech in 2019. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 28 – Clear Creek Bridge

Maintenance Report



Recommendations	All components are in good condition. Large vegetation mass should be removed from inlet end as well as silt deposited at outlet end. Upstream beaver dam has been rebuilt (since removal in 2016) with approximately 5-6' height/elevation. Monitor large woody debris lodged in SW quad at inlet.

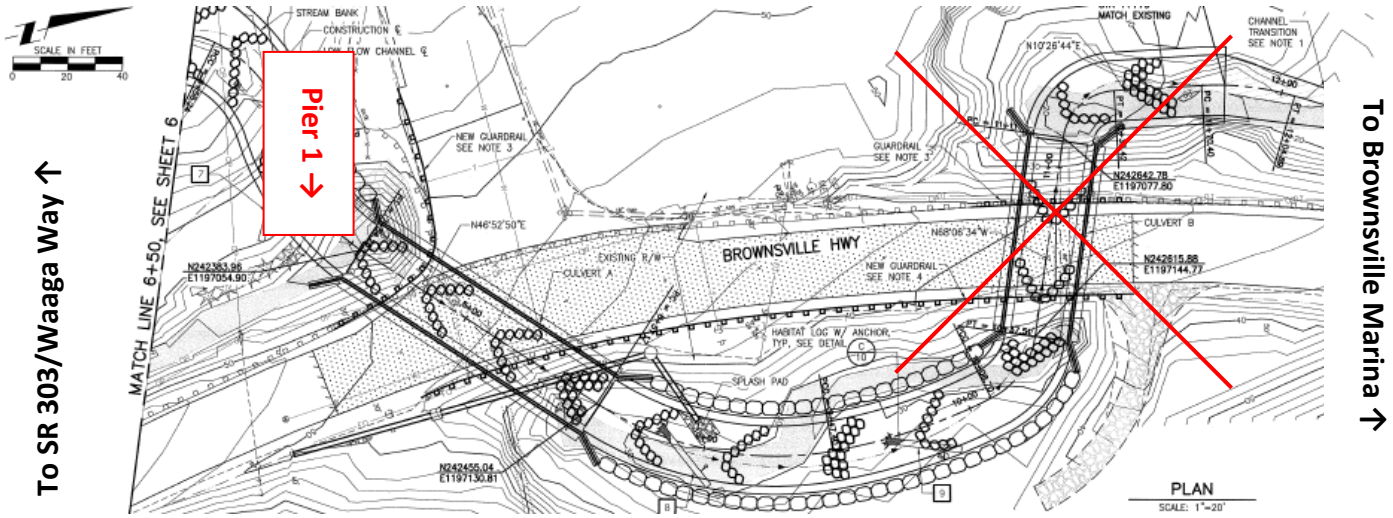
Upstream beaver dam	***Debris buildup in SW quadrant at inlet end.***
	

Bridge 29 – Gluds Pond South Culvert				
Brownsville Highway	**Steele Creek**	**2007**	**98.39**	**Jul. 14, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-sided Precast Concrete Culvert unit in good condition. Minor moisture and efflorescence present in all seams.
Substructure	***Foundation***	Precast Concrete Spread Footings. No signs of settlement or movement. Flow meter was installed at outlet end at the NW corner. Inlet flows are concentrated at Pier 1 corner with no exposure of the footing at this time. Flow is redirected to center of span through structure to outlet.
Scour and Load Rating		In 2018 it was determined by TranTech Engineering that this structure has sufficient fill, in excess of 8' and does not require a load rating. Scour analysis has not yet been performed for this structure. Upstream rock weirs have come apart and are lying in the channel. This bridge is **not** scour critical.
Photo		

Bridge 29 – Gluds Pond South Culvert

Maintenance Report



Recommendations	Monitor streambed movement at the SE corner at inlet end. Heavy growth and sediment deposits at inlet end should be monitored or removed.

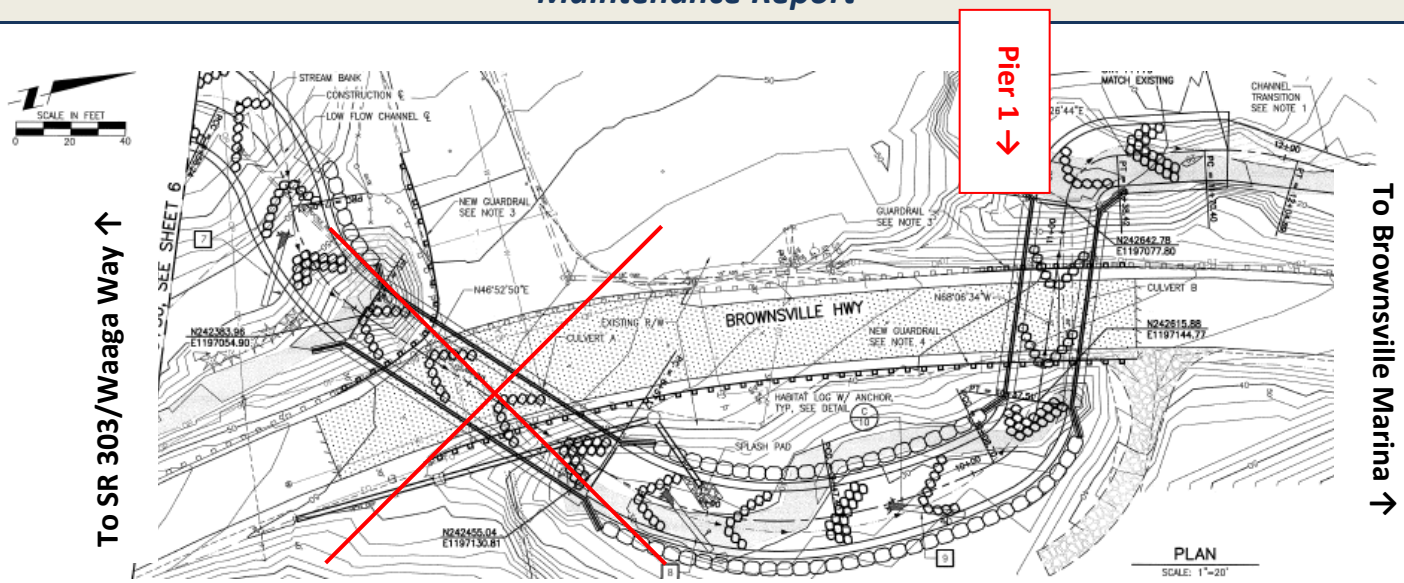
Heavy growth and sedimentation at Inlet end looking east.	***Looking Upstream at Outlet***
	

Bridge 30 – Gluds Pond North Culvert				
Brownsville Highway	**Steele Creek**	**2007**	**98.39**	**Jul. 14, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-sided Precast Concrete Culvert unit in good condition. Moisture and efflorescence present in all seams. From inlet end the first 5 ceiling joints have a 1" vertical difference between the panels. From outfall end the 4th, 5th, 6th, 8th panel joints all have center span delamination in ceiling area that measure uniformly 1.5' long x 10" wide x ½' deep. 9th panel delamination has fallen and now there is a spall. Possible seismic or differential settlement occurred.
Substructure	***Foundation***	Precast Concrete Spread Footings. SE wing wall connection has broken grout seam 3' up from channel elevation.
Scour and Load Rating	In 2018 it was determined by TranTech Engineering that this structure has sufficient fill, in excess of 8' and does not require a load rating. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 30 – Gluds Pond North Culvert

Maintenance Report



Recommendations	Monitor spalling in ceiling areas. Heavy growth and sediment deposits at inlet and outlet ends should be monitored or removed. There is also sediment and streambed gravel aggregation underneath the length of the structure on Pier 2 side. Monitor flows at NW corner as material continues to be removed by flows.

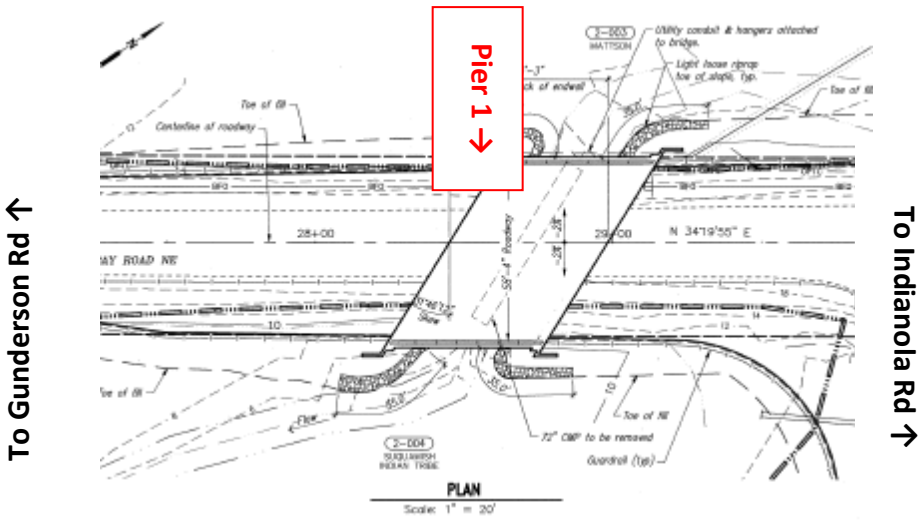
Inlet end vegetation/sediment build-up	***Looking downstream from inlet***
	

Bridge 31 – Miller Bay Bridge				
Miller Bay Road	**Grover Creek**	**2007**	**93.08**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete Channel Beams 48”x28”x50.7’ in length. No defects found in good condition.
	Deck	3” ACP overlay with waterproof membrane in fair condition. ACP at bridge joints previously repaired and no longer have the settlement issues at this time. Some rutting beginning to appear in the northbound lane predominately in the left when track.
	Other	Cast-in-place concrete bridge barrier in good condition.
Substructure	***Foundation***	Driven 18” steel pile foundation with reinforcing steel and cast-in-place concrete.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads. Channel beam seat –24”. Small spall at North abutment top face at 3rd beam in from east 2” x 2”. Bearing pads are beginning to show bulching and pinching mostly on Pier 1, East side of each girder. Some pinching of the bearing pads at the west end of Pier 2. Some vertical hairline cracking notated on Pier 2.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 31 – Miller Bay Bridge

Maintenance Report



Recommendations	Replace missing nut at guardrail transition section connection to concrete barrier at SE quadrant. Replace missing screw on utility conduit cover/access. Reseal ACP at Bridge Joints

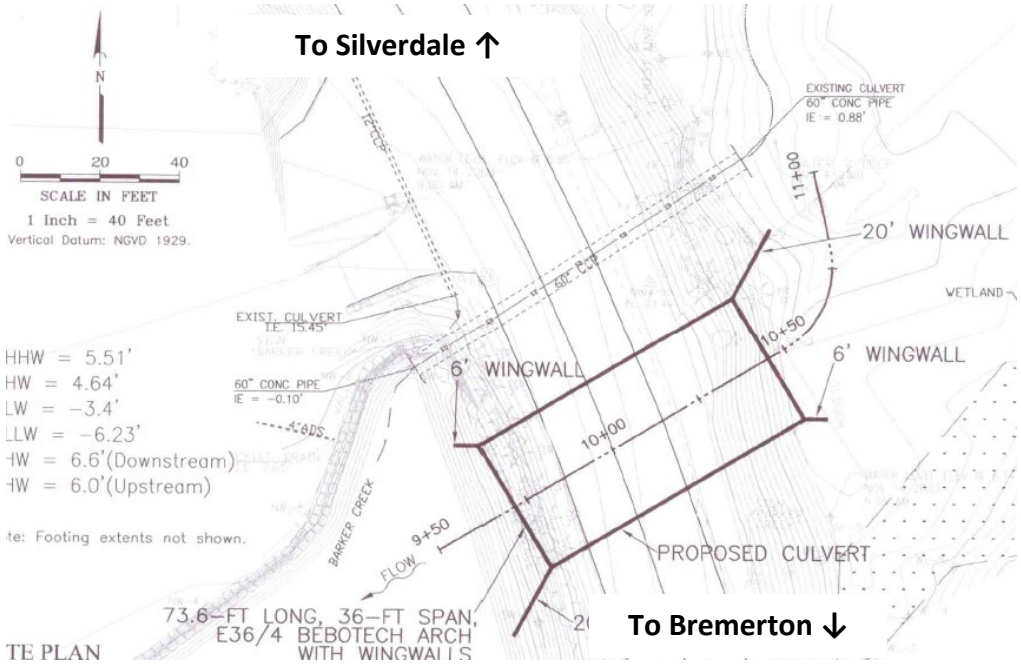
Replace missing nut at SE transition	*Reseal ACP at Bridge Joints*
	

Bridge 32 – Barker Culvert				
Tracyton Boulevard	**Barker Creek**	**2008**	**97.96**	**Mar. 3, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

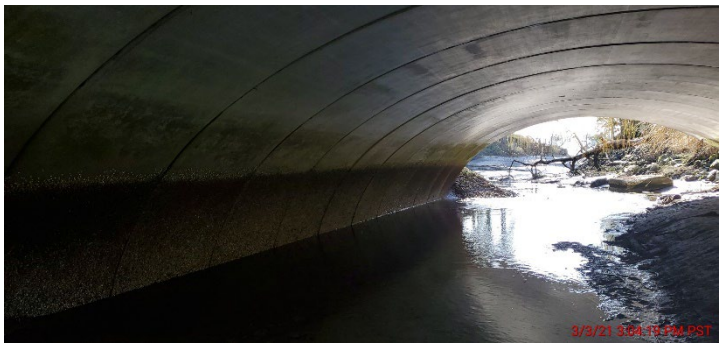
Superstructure	***Culvert***	Precast concrete arch culvert with precast MSE wing walls in good condition. Several joints between wing wall and headwall showing signs of rotational movement or settlement: Previous measurements at NE corner is 1 ¼" gap; previous measurements at SE corner has 2" horizontal and vertical movement; current measurement at SW corner has 2" movement horizontal with the headwall tipped.
Substructure	***Foundation***	Cast-in-place footings with rebar reinforcement. Arch seat is 1.5' wide.
Scour and Load Rating	In 2018 it was determined by TranTech Engineering that this structure has sufficient fill, in excess of 8' and does not require a load rating. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 32 – Barker Culvert

Maintenance Report



Recommendations	Monitor rotational movement and or settlement at wing wall connections. Monitor flows through structure concentrated in the south side, no exposure of the footing at this time.

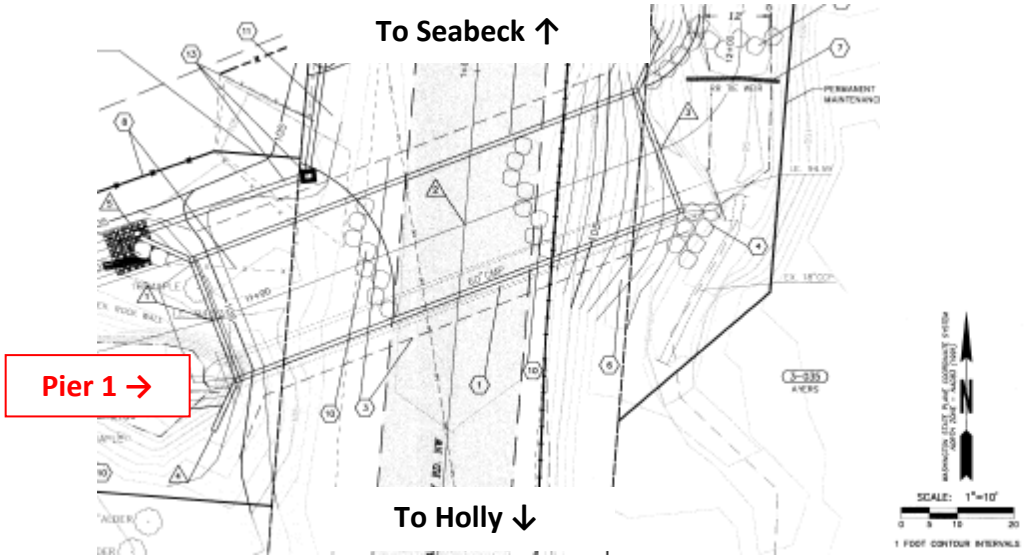
Upstream concrete storm pipe, last section disconnected	***Flows along southern pier and sediment buildup along north pier***
	

Bridge 33 – Foley Lane Culvert				
Seabeck Highway	**Seabeck Creek**	**2010**	**95.88**	**Jun. 13, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-side precast concrete culvert 22’ Span x 10’ Rise. Moisture present in at some seams with leaks in the joints. 6th panel in from the west on south side, 2”x4” spall at panel joint near ground elevation. 3rd panel seam from the West has a small spall in the ceiling. 2nd Joint from the West on the North side has a spall at ground level 2”x4”x0.5” deep. Grout at NE wing wall connection is cracking.
Substructure	***Foundation***	Precast footings and wing walls with rebar reinforcement.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 33 – Foley Lane Culvert

Maintenance Report



Recommendations	Monitor off site flows near wing wall at SE corner. Seasonal flows only.

Embankment sloughing at SE Corner

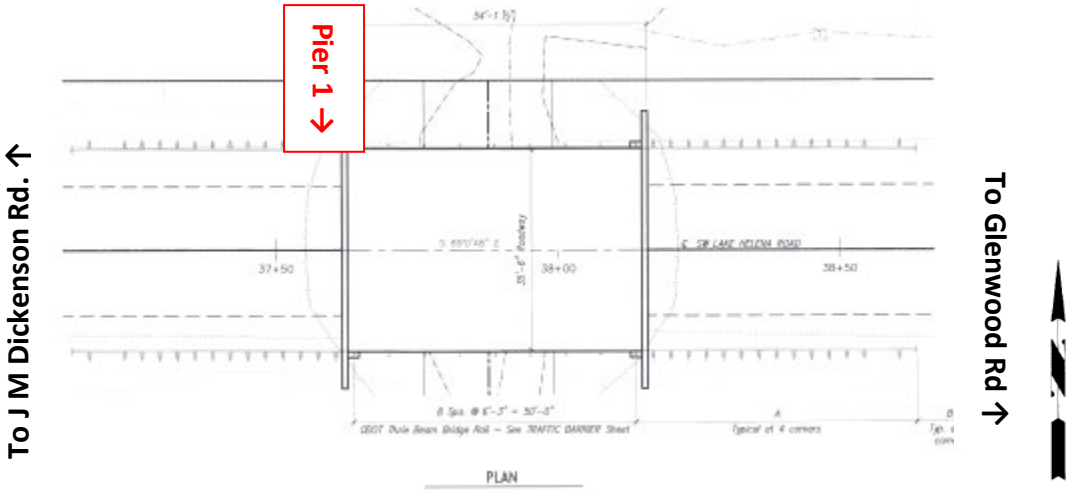
Cobble and gravel streambed through culvert

Bridge 34 – Lake Helena Bridge				
Lake Helena Road	**Muck Fork Creek**	**2011**	**99.06**	**Jul. 8, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete voided slab 21”x48”x52’ in length. Section of backer rod hanging from underside of girders at 2nd seam from South side on East abutment.
	Deck	3” ACP overlay with waterproof membrane. Longitudinal cracking in wheel tracks is accelerating some areas have 2” deep crack/void longitudinally in wheel track.
	Other	Metal nested Thrie Beam bridge railing attached to exterior slabs.
Substructure	***Foundation***	Driven W12x74 steel H-pile foundation approx. 50’ in length.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads and rip rap protection. Beam seat –24”. Small beaver dam at inlet end across channel 3’ wide x 1’ high. Rock armor is being moved by foot traffic. Settlement visually noticeable on both piers as seen in guardrail dip at bridge joint.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Sargent Engineering in 2011. Load Rating updated by TranTech Engineering in 2019 for SU and EV ratings. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 34 – Lake Helena Bridge

Maintenance Report



Recommendations	Seal longitudinal cracking in wheel tracks of ACP which has been accelerating. Remove rock & wood dam being built at inlet end. Monitor the ponding water at the North side of the bridge and at NW corner due to settlement.

Rock & Wood Dam at inlet end.	***ACP wearing down in wheel tracks. Alligatoring in some spots.***
	

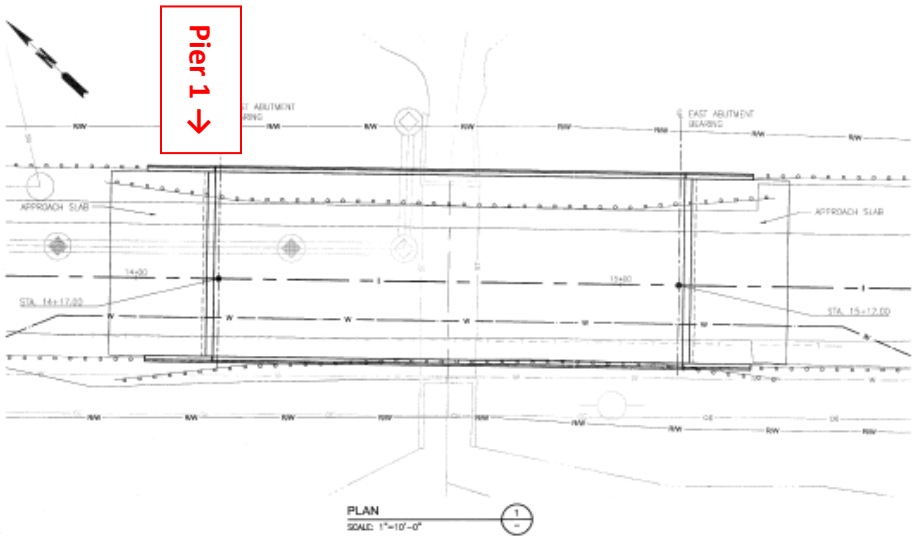
Bridge 35 – Carpenter Creek Bridge				
South Kingston Road	**Carpenter Creek**	**2011**	**94.24**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete W41DG bulb-tee girders.
	Deck	3” ACP overlay with waterproof membrane.
	Other	Cast-in-place concrete bridge barrier in good condition. SE Sidewalk panel 4”x5” surface spall. Sidewalk has superficial crack on 3rd panel from North.
Substructure	***Foundation***	Driven HP14x89 steel H-pile foundation approximately 55’ in length.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads. Beam seat –54”. Material loss and sloughing at all 4 corners of the abutments. Bottom of the pile cap/abutment is beginning to be exposed at the center of Pier 1 approximately 12 feet with a sliver void underneath with a depth of 30” back from face of abutment. Both corners of Pier 2 have loss of abutment armament and beginning to see small void under corner only a few inches deep by ¼” in height. Evidence of moisture at utility conduits and pavement seat at exterior of abutment.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 35 – Carpenter Creek Bridge

Maintenance Report

To West Kingston Rd →



To Indianola →

Recommendations	Monitor abutment slopes during higher tides. Monitor material loss at all four corners. Monitor material loss at center of Pier 1 abutment which is approximately 12 LF across the bottom face of the abutment and as much as 2.45' in depth back from face. Between the continuous tidal action and mobile streambed material, this bridge may need future shotcrete protection of abutment and piles similar to Southworth Bridge (#21). Reseal ACP at Pier 2 joint.

Pier 1 scour under abutment

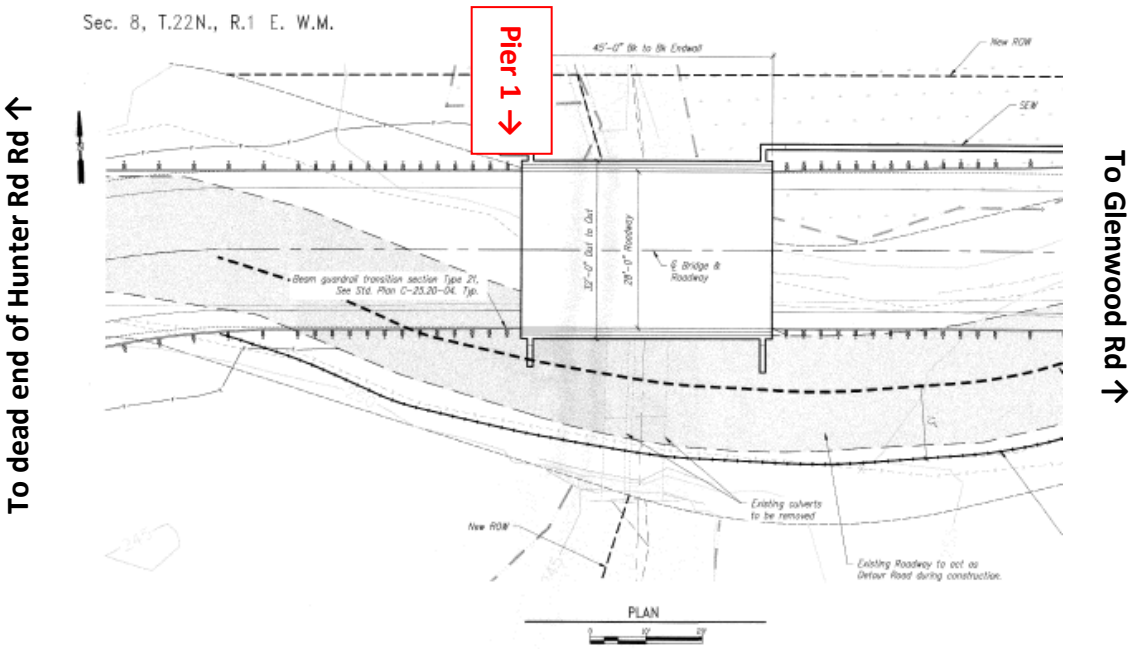
Material sloughing & loss at NE corner

Bridge 36 – Hunter Bridge				
Hunter Road	**Huge Creek**	**2012**	**77.82**	**Jul. 8, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete voided slabs 24”x48”x45’ in length.
	Deck	5” cast-in-place concrete deck with epoxy reinforcing steel. Moisture on deck underside present.
	Other	Cast-in-place concrete bridge barrier in good condition.
Substructure	***Foundation***	Driven 12¾” steel pile foundation approximately 28’-35’ in length with reinforcing steel and concrete.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads and large rip rap protection. Minor loss of rock armor at SE, SW, and NW corners. Beam seat –36”.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 36 – Hunter Bridge

Maintenance Report



Recommendations	Monitor CB at SW corner for plugging. Monitor erosion area at SE quadrant over embankment slope. Clean and place hot poured joint to seal water out at both bridge joints. Clean debris build-up at CB at SW corner.

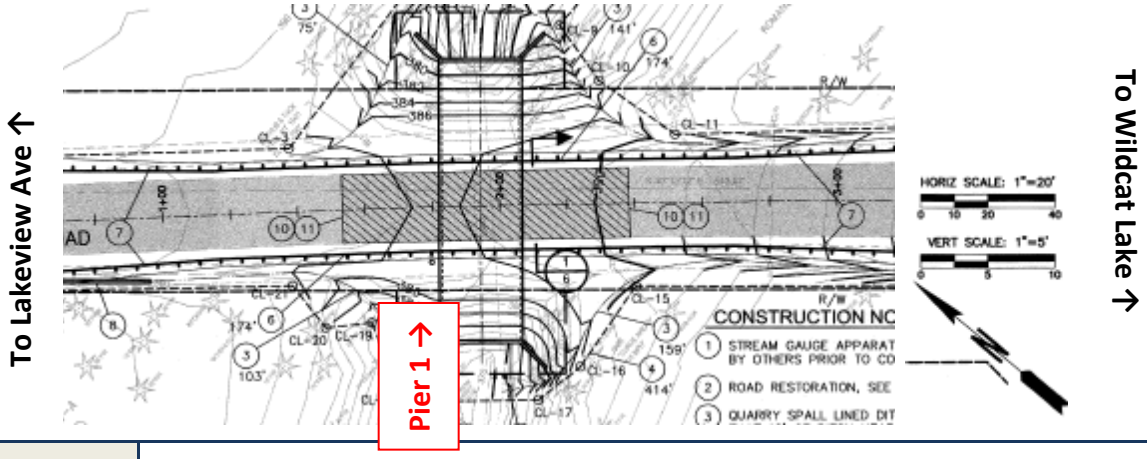
Clean debris build-up at CB	*Clean and seal bridge joints*
	

Bridge 37 – Wildcat Lake Culvert				
Wildcat Lake Road	**Wildcat Creek**	**2012**	**99.83**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-side precast concrete culvert 85’ length with a 23’ span x 9’-10” rise. Components are all in new condition. There is evidence of repair ceiling spall from construction at the first seem from the inlet, center span. Moisture between seams starting to increase and weep in areas show with efflorescent mineral deposits present, predominately on P2 side, 3rd and 4th seams from inlet.
Substructure	***Foundation***	Precast footings and wing walls with rebar reinforcement.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Tetra Tech Engineering in 2012. In 2018 the structure was determined by TranTech Engineering to have sufficient fill in excess of 10’ therefore not needing to be load rated for EV or SU4-SU7. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 37 – Wildcat Lake Culvert

Maintenance Report



Recommendations	Monitor footing areas during high flow events.

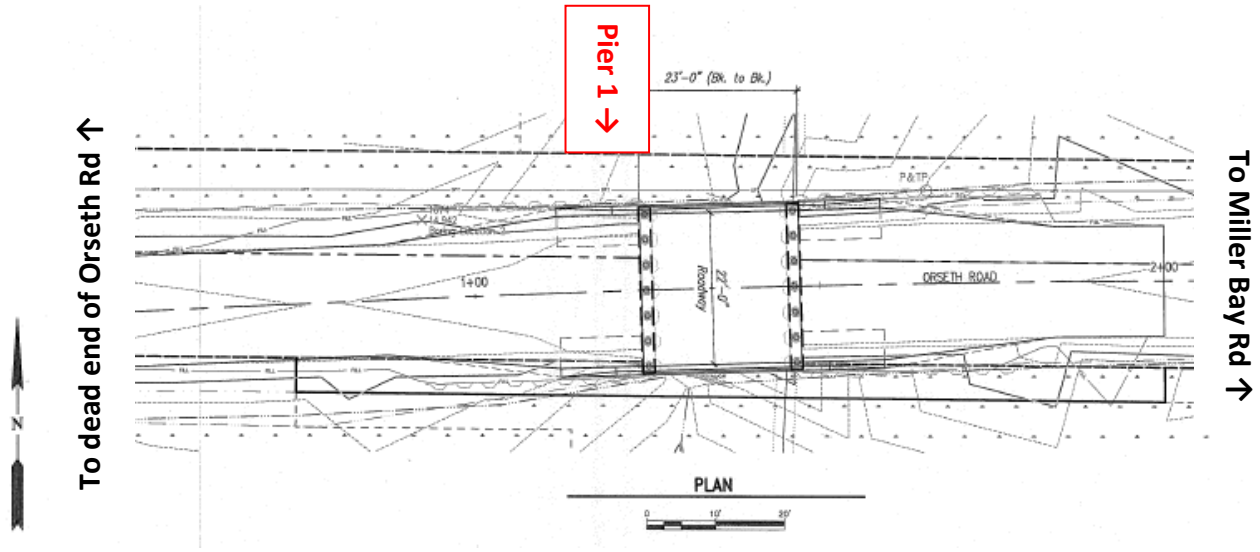
Downstream debris	***Looking downstream at channel under structure***
	

Bridge 38 – Orseth Road Bridge				
Orseth Road	**Grovers Creek**	**2015**	**93.46**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

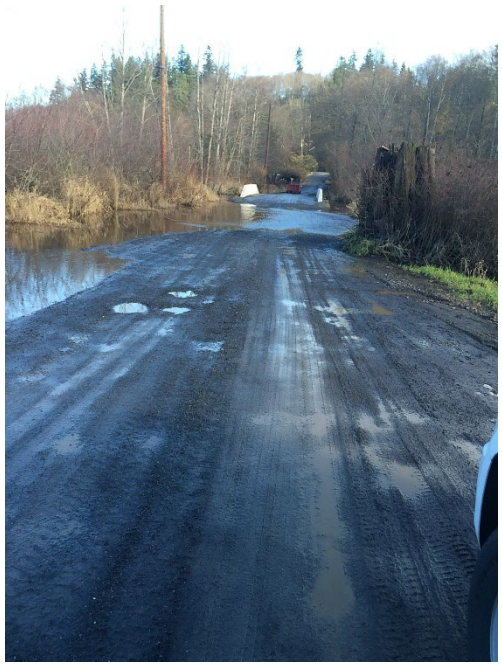
Superstructure	***Girder***	Precast concrete slabs 14”x 48”x 23’ in length.
	Deck	3” HMA over Waterproof Membrane.
	Other	Cast-in-place concrete bridge barrier has cracking at all 4 corner terminal connections to bridge barrier due to settlement on both ends behind abutment. On the south barrier, the reflective tape has been damaged and needs replacing.
Substructure	***Foundation***	Driven 9½” steel pile foundation approximately 35’-40’ in length.
	Abutments	Cast-in-place concrete abutment with elastomeric bearing pads and sheet pile protection. Beam seat 21”.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Sargent Engineering in 2015. Load Rating updated by TranTech Engineering in 2019 for SU and EV ratings. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 38 – Orseth Road Bridge

Maintenance Report



Recommendations	Monitor roadway settlement on both sides of deck. Monitor settlement and separation of barrier terminals at all 4 corners. Monitor water over roadway in high flows. Replace broken/missing reflective tape on South barrier. Seal cracking in ACP at bridge joints resulting from settlement.

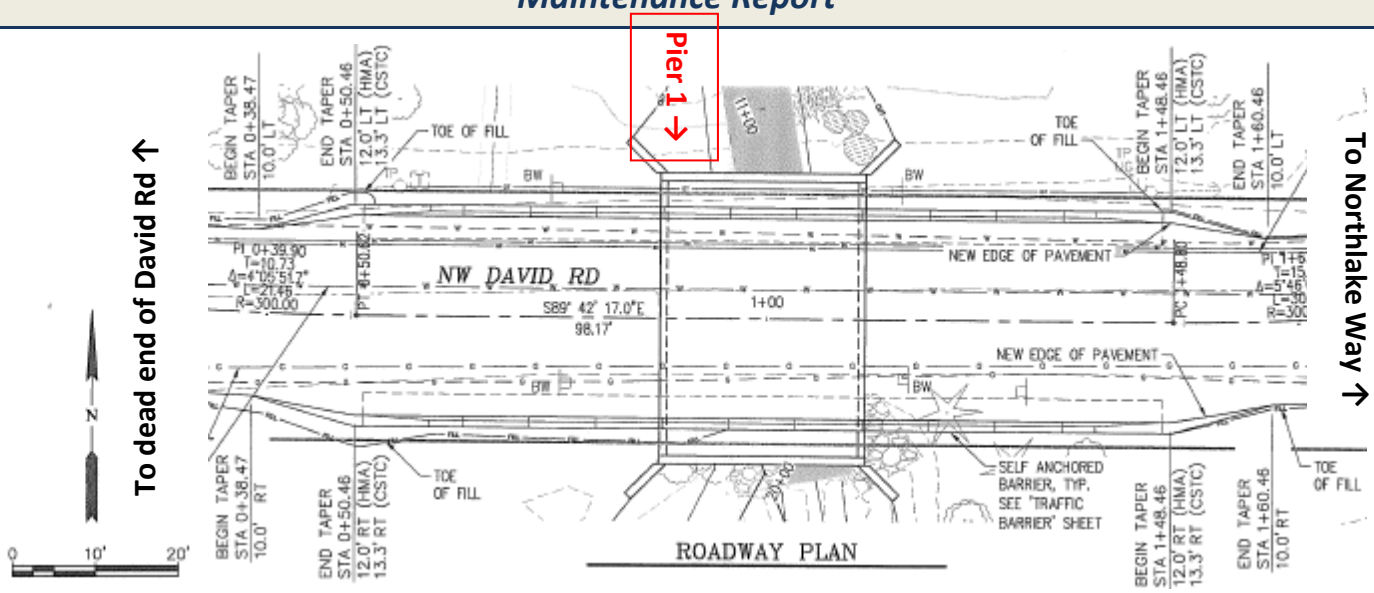
Water over approach roadway on West end.	***Cracking & separation of Barrier terminals***
	 

Bridge 39 – David Road Culvert				
David Road	**Dickerson Creek**	**2015**	**93.36**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-side precast concrete culvert 35’ length with a 23’ span x 9’-10” rise. Components are all in good condition. Minor moisture present at joints including leaking in spots with efflorescence.
Substructure	***Foundation***	Precast footings and wing walls with rebar reinforcement.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 39 – David Road Culvert

Maintenance Report



Recommendations	Monitor moisture at joints. Monitor bank at SW corner wing wall. No notable changes since last inspections. Beaver sticks present but no beaver dam at this time.

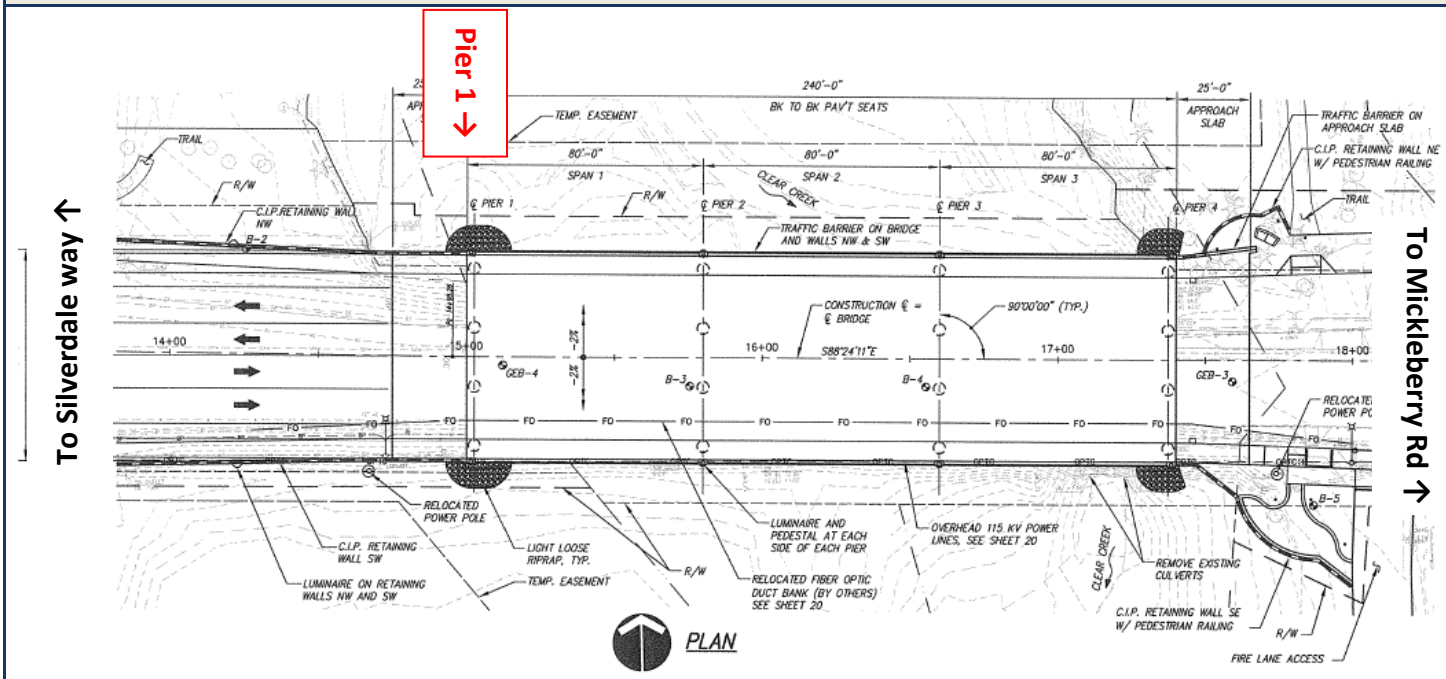
Inlet Pier 1 SW corner	***Wall & ceiling seams with moisture & efflorescence***
	

Bridge 40 – Bucklin Hill Bridge				
Bucklin Hill Road	**Clear Creek**	**2016**	**96.37**	**Aug. 24, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Precast prestressed concrete (W35DG) bulb-tee girders, approx. length of 77' for spans 1 & 3 and 76' for span 2 in good/new condition.
	Deck	5" cast-in-place concrete deck with epoxy coated reinforcement.
	Other	Concrete bridge railing in good condition with vertical hairline cracking at regular intervals. Powder coated metal pedestrian railing in good condition.
Substructure	***Foundation***	Drilled shaft foundation 4' in diameter with rebar encased in concrete. 4 shafts per pier to approx. length of 50-70 feet in depth. Top of columns on piers 2&3 have some rust appearing, may be from the coating or mineral deposits from runoff.
	Abutments	Cast-in-place concrete abutment with pigmented sealer. Cast-in-place concrete retaining wall at all four corners in good condition with some areas of hairline cracks with leaching. Pier 4 has cast-in-place concrete stormwater diffuser tank at the base of the abutment which is need of cleaning. Cast-in-place pile caps at piers 2 & 3 in new condition.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Exeltech in 2016. Load Rating updated by TranTech Engineering in 2019 for SU and EV ratings. Scour analysis has not yet been performed for this structure.	
Photo		

Bridge 40 – Bucklin Hill Bridge

Maintenance Report



Recommendations	Clean vegetation from south side sidewalk. Address flow issues at stormwater diffuser causing erosion on southern half. Need to backfill overflow pipe from diffuser with cobbles as now is completely exposed to the elements.

Stormwater diffuser grating needs maintenance	***Pier 2 & 3 columns with rusting appearing at top of column***
	

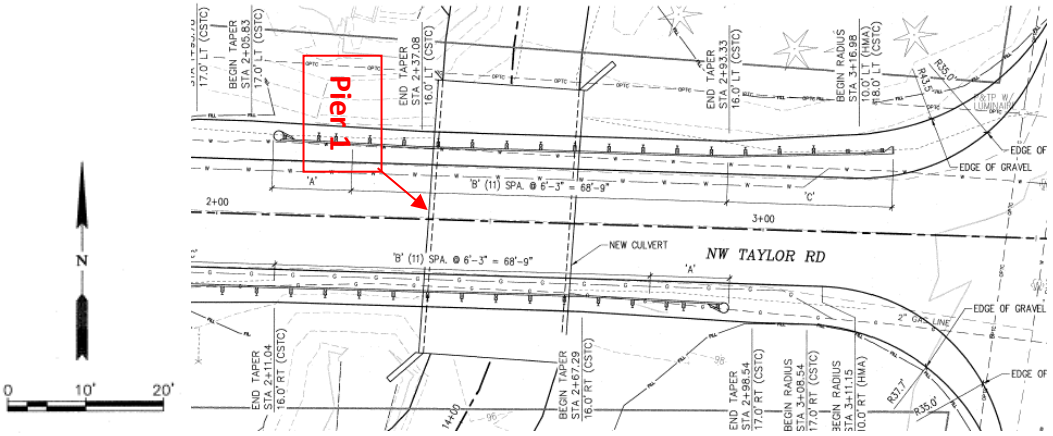
Bridge 41 – Taylor Road Culvert				
Taylor Road	**Dickerson Creek**	**2016**	**91.79**	**Aug. 13, 2021**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	3-side precast concrete culvert 50’ length with a 25’ span x 9’-10” rise. Components are all in new condition. Some moisture dripping between sections 4 & 5 on Pier 2 side.
Substructure	***Foundation***	Precast footings and wing walls with rebar reinforcement.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by TranTech Engineering in 2019. Scour analysis has not yet been performed for this structure. Heavy beaver activity at inlet of this structure with dam full span across inlet. Water is flowing slight trickle on East end of structure. Only 3-4 feet of freeboard in culvert underside.
Photo		

Bridge 41 – Taylor Road Culvert

Maintenance Report

To dead end of Taylor Rd ↑



To Northlake Way ↑

Recommendations	Monitor moisture in joint on Pier 2. Monitor beaver activity seen at upsteam side of structure.

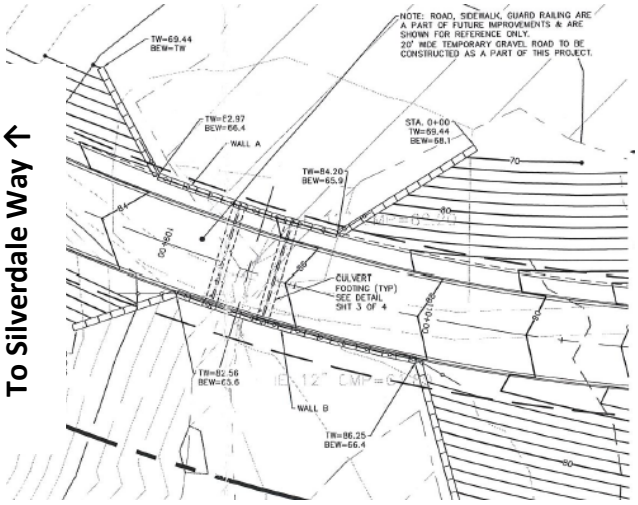
Flows concentrated at Pier 2	***Beaver dam at inlet end***
	

Bridge 42 – Woodbridge Culvert				
Woodbridge St. NW	**Wetlands**	**2017**	**91.39**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Culvert***	Low profile steel multi-plate arch culvert in new condition. Slight deflection at the top of the culvert.
Substructure	***Foundation***	Concrete footing is 4.5’ in depth and 2’ in height with 4”x8” keyway filled with grout.
Other		Concrete sidewalk is built on fill over the culvert structure. ACP installed on fill over the culvert with concrete bridge railing and metal pedestrian railing in new condition. Ultrablock retaining walls on both faces of the culvert.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by Pacific Affiliates Inc., in 2017. Scour evaluation was performed by TranTech Engineering in 2018. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.
Photo		

Bridge 42 – Woodbridge Culvert

Maintenance Report



Recommendations	No recommendations at this time. Monitor footing at Pier 1 for exposure. Currently approximately 6 feet of top of footing is now exposed.

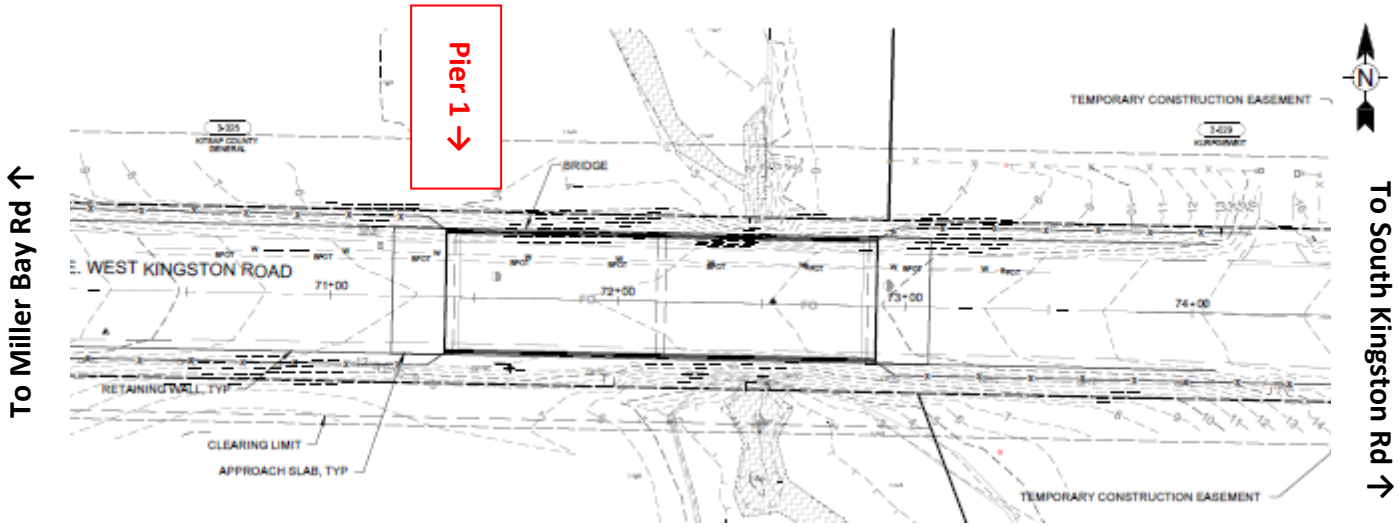
Low flow due to wetland drainage

Bridge 43 – West Kingston Bridge				
West Kingston Road	**Carpenter Creek**	**2017**	**97.21**	**May. 16, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed precast (WF36G) concrete wide flange girders in good condition. Spots of exposed steel visible on the bottom flanges of the girder likely from casting aids.
	Deck	Cast-in-place 7.5” concrete deck with epoxy coated rebar in good condition.
	Other	Concrete bridge railing with hairline cracking throughout. Metal pedestrian railing in new condition. Elastomeric bearing pads at each end of the 5 girders. Compression Seal between bridge and approach slabs. Concrete sidewalks on both sides of the bridge in good condition. Guardrail on all 4 quadrants in new condition.
Substructure	***Foundation***	Abutments 1 & 2 have 3 – 4’ diameter drilled shaft and the intermediate pier has 3 – 5’ diameter drilled shafts have rebar and concrete encased in steel casing; length 40-50 feet.
	Abutments	Each cast-in-place concrete abutment is 5’ wide. The intermediate pier consists of a 3’ diameter column on top of the drilled shaft foundation with a 5’ wide pile cap.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Tetra Tech, Inc. in 2018. Scour evaluation was performed by TranTech Engineering in 2018. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 43 – West Kingston Bridge

Maintenance Report



Recommendations	Clean sidewalks from sand buildup. Monitor settlement at asphalt joint with approach slabs.

Sand Buildup

Looking West at Piers 1 & 2

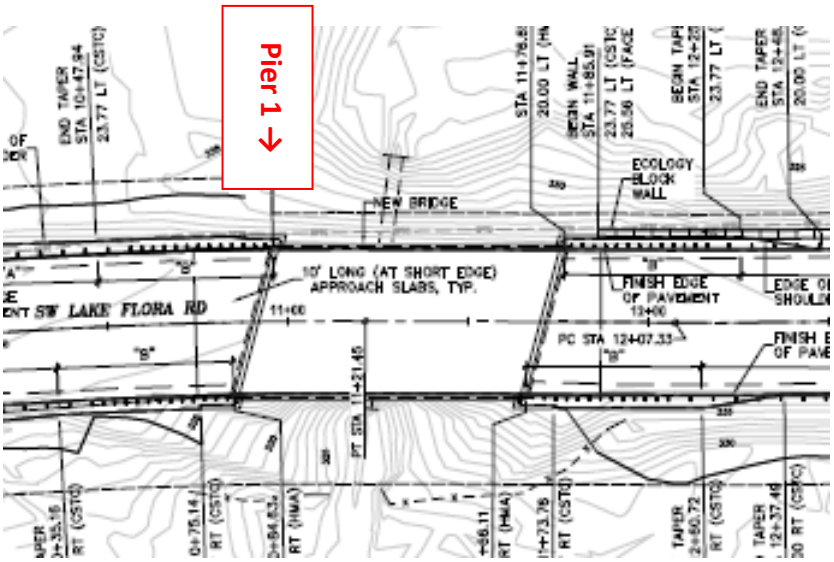
Bridge 44 – Lake Flora Road Bridge				
SW Lake Flora Road	**Coulter Creek**	**2020**	**96.16**	**Oct. 17, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed precast (WF36G) concrete wide flange girders in new condition. Spots of exposed steel visible on the bottom flanges of the girder likely from casting aids.
	Deck	Cast-in-place 7.5” concrete deck with epoxy coated rebar in good condition.
	Other	Concrete bridge railing in new condition. Metal pedestrian railing in new condition. Elastomeric bearing pads at each end of the 7 girders. Compression Seal between bridge and approach slabs. Guardrail on all 4 quadrants in new condition.
Substructure	***Foundation***	Each concrete abutment is supported with 10 Steel H14x73 piles approximately 60-65 feet in length driven to elevations ranging from 293-297.
	Abutments	Each cast-in-place concrete abutment is 3’ wide.
Scour and Load Rating	Bridge has been load rated as per FHWA requirements by Sargent Engineers in 2020. Scour evaluation was performed by Sargent Engineers in 2020. Scour analysis has not yet been performed for this structure. This bridge is **not** scour critical.	
Photo		

Bridge 44 – Lake Flora Road Bridge

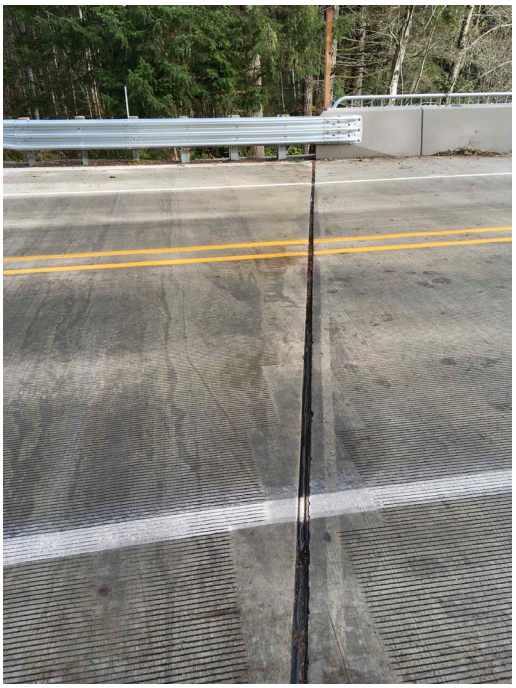
Maintenance Report

To SR 3 →



To Sunnyslope Rd →

Recommendations	Clean sand from compression joint seal between bridge and approach slabs. Apply hot poured joint sealer between ACP and Concrete approach slabs.

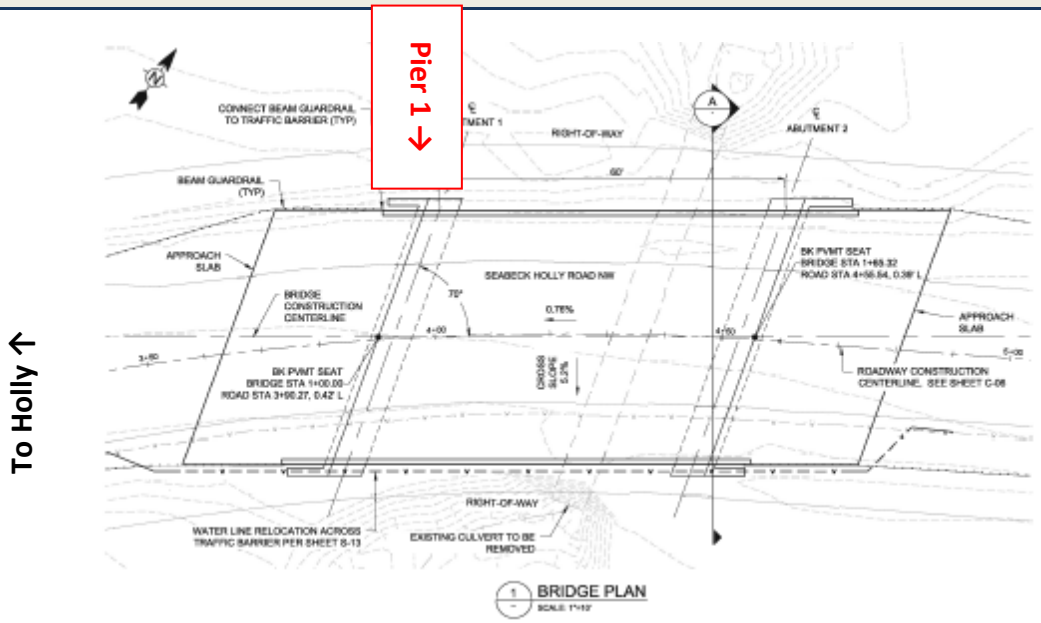
Compression Joint between deck and approach slab	***Apply hot poured joint sealant at ACP joint to concrete approach slabs***
	

Bridge 45 – Seabeck Hwy @ Larson Lane Bridge				
Seabeck Holly Road NW	**Seabeck Creek**	**2021**	**95.88**	**Jun. 13, 2022**
Route Name	*Feature Intersected*	*Year Built*	*Sufficiency rating*	*Last Inspection*

Superstructure	***Girder***	Prestressed concrete voided slab girder 2’ x 4’ x 62.5’ in new condition.
	Deck	Cast-in-place concrete deck with epoxy coated reinforcing steel., Deck thickness varies from 8.5” at high (north) side to 4.5” at the lower (south) side.
	Other	Cast-in-place single slope concrete bridge railing (42” tall) in good condition. Metal pedestrian railing (12” tall) Type S-BP-12 in new condition. Cast-in-place concrete approach slabs on both ends of bridge (25’ in length x 1’-1” in thickness) in good condition. 2.5” Elastomeric compression seal placed in 1.5” width joint between concrete deck and concrete approach slabs. 2’ x 6” x 1” Elastomeric Bearing pads with 14-gauge shims under each end slab girders in new condition.
Substructure	***Foundation***	Driven steel pile casings filled with concrete foundation. 2 rows of 8 piles per abutment for 32 total piles. Average pile tip elevation on Abutment 1 is 40.65’ and average for Abutment 2 is 41.7’.
	Abutments	Cast-in-place concrete abutment in new condition.
Scour and Load Rating		Bridge has been load rated as per FHWA requirements by Tetra Tech in 2021. Scour evaluation and analysis was performed by Tetra Tech in 2021. Bank stabilization repair completed in 2021 by Hood Canal Salmon Enhancement Group. This bridge is **not** scour critical.
Photo		

Bridge 45 – Seabeck Hwy @ Larson Lane Bridge

Maintenance Report



Recommendations	Monitor high flows for bank erosion. Some loss of lower rock armament on P2 side with potential for more in high flows.

Rock Armament @ P2

Upstream Bank Repairs