



# 2018 Annual Bridge Report

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Prepared by the Whatcom County Public  
Works Bridge and Hydraulic Group  
Submitted September 2019

# Whatcom County

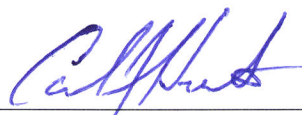
## 2018 Bridge Report

Submitted: September 2019

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

*"Each county engineer shall furnish the county legislative authority with a written report of the findings of the bridge inspection effort. This report shall be made available to said authority and shall be consulted during the preparation of the proposed six-year transportation program revision. The report 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. It is highly recommended that deficient short span bridges, drainage structures, and large culverts be included in said report."*

Prepared by:



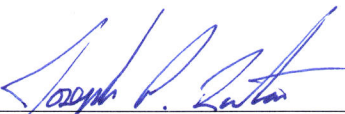
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### Cover Photo:

Hannegan Road Bridge No. 236 spanning Ten Mile Creek. This 64-foot precast, pre-stressed, single span bridge was constructed in 2018 replacing the existing 31-foot span bridge.

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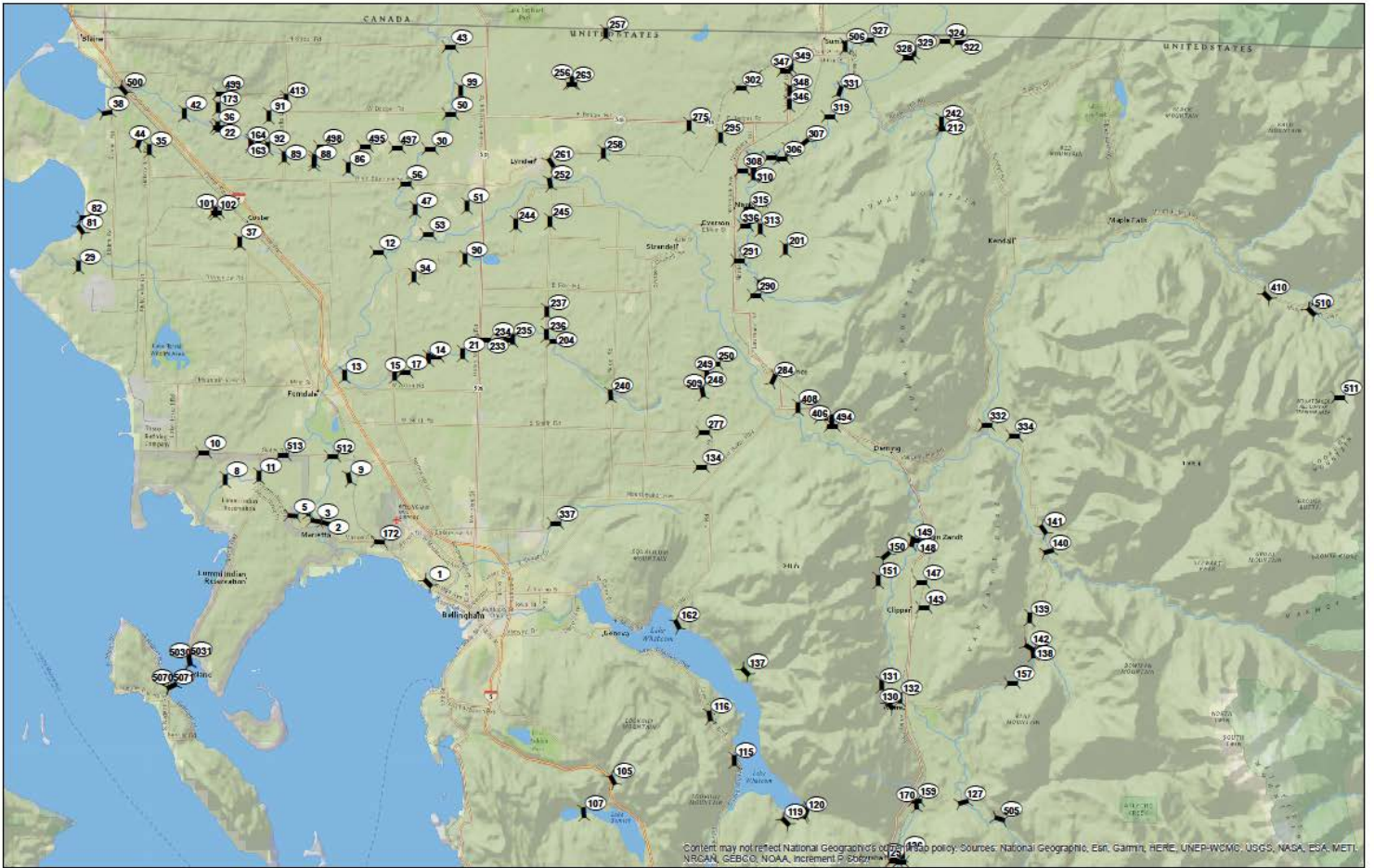
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# Acronyms

The following is a list of common acronyms widely used in the bridge inspection field:

ADT	Average Daily Traffic
BRAC	Bridge Replacement Advisory Committee
FHWA	Federal Highway Administration
FO	Functionally Obsolete
HBRRP	Highway Bridge Replacement and Rehabilitation Program
NBIS	National Bridge Inspection Standards
SD	Structurally Deficient
SID	Structure Identification Number
SR	Sufficiency Rating
UBIT	Under Bridge Inspection Truck
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

# Whatcom County Bridge Location Map



# Executive Summary

This report has been completed in compliance with WAC 136-20-060, which requires that each County 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 incorporated into a comprehensive program strategy to preserve the county's roadways. This report summarizes the status of the Whatcom County Bridge Program for calendar year 2018.

Whatcom County's bridge inventory is vital in connecting the nearly 974 miles of County roads and providing for the safe and efficient movement of people and freight. Specifically, bridges on key transportation and freight corridors are monitored closely to prevent bridges on these routes from becoming restricted.

One of the key overall Bridge Program goals is to replace or rehabilitate bridges that are considered structurally deficient (SD) per the National Bridge Inspection Standards (NBIS). At the end of 2018 Whatcom County had a total of 162 bridges in the overall inventory and 11 of these bridges were designated as SD. Of those 11 bridges, 4 were actively worked on in 2018 for future replacement or rehabilitation. For a comprehensive list of the SD bridges please see Exhibit C.

As recommended in WAC 136-20-060 Whatcom County also inspects large culverts, defined as culverts with a diameter of 5' or larger. Bridge Program staff inspected 152 of these structures in 2016 and 2017 which are listed in Appendix B.

## 2018 Bridge Program Highlights

- Whatcom County bridge inventory consists of 162 structures.
- A total of 81 Whatcom County bridge condition inspections were completed in 2018.
- Whatcom County provided bridge inspection services for 7 structures owned by outside local agencies.
- A total of 37 bridge repair and maintenance work orders were completed by the Maintenance & Operations Bridge Crew.
- A new bridge was constructed on Hannegan Road over Ten Mile Creek, replacing an existing 31-foot span concrete bridge on timber caps and piles.
- Maintenance & Operations crews replaced a failing timber cap with a new a new galvanized steel cap on the Mosquito Lake Road/North Fork Nooksack River Bridge No. 332.
- A structural steel repair project was completed at both the Gooseberry Point and Lummi Island ferry terminals.
- M & O completed a timber cap repair on West Badger Road/Bertrand Creek Bridge No. 50.

# Bridge Inventory Summary

Of the 162 structures in the Whatcom County inventory 5 are all timber construction, 101 are of primarily concrete construction, 7 are predominately steel (all of which are fracture critical) and the remainder are a combination of these materials. See Appendix A for a complete list of Whatcom County Bridges.



**W. Badger Road/Bertrand Creek Bridge No. 50 is typical of our channel beam girders supported by timber piles and caps**

## **Lummi Island Ferry Terminals**

The Gooseberry Point and Lummi Island Ferry Terminal structures are considered bridge structures and are inspected and maintained just like the other bridges in the inventory. These consist of a steel transfer span and a timber approach span at the Gooseberry Point terminal and a steel transfer span and a reinforced concreted girder approach span at the Lummi Island terminal.



**Gooseberry Point Terminal**

### **Short Span Bridges**

The National Bridge Inspection Standards do not require short span bridges (span length of 20 feet or less) be reported to FHWA. Out of the 162 bridges in the Whatcom County inventory, 24 of these bridges are classified as short span bridges. Even though the inspection reports and bridge information for short span bridges are not reported to WSDOT or FHWA, Whatcom County inspects and operates these bridges the same as the larger, federally reported bridges in our inventory.

### **Outside Local Agency Bridges**

The Whatcom County Bridge and Hydraulics program provides inspection services to local agencies upon request. The county works with cities under inter-local agreements (ILA), with conditions set forth in the Revised Code of Washington (RCW) Chapter 39.34. The county's services are provided primarily to local agencies that lack expertise and resources to inspect and maintain their bridge inventory. In addition, the Whatcom County Public Works Road Maintenance Division contracts with local agencies for the maintenance of other local agency bridges. In 2018 the county provided inspection services on 7 structures for outside local agencies.

<b>Local Agency</b>	<b>Number of bridges inspected in 2018</b>
City of Everson	1
City of Sumas	1
San Juan County	4
Port of Bellingham	1 (ferry terminal)

**Summary of outside local agency bridges inspected in 2018**



## Oversize/Overweight Load Permits

There were 181 oversize/overweight permits issued in 2018 and of those 41 involved routes over county owned bridges. Bridge program staff reviews these applications to ensure that these oversize/overweight loads can cross these bridges without causing any harm to the structure.



Height restriction sign posted on the Slater Road/Nooksack River Bridge No. 512

## Bridge Inspections and Findings

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. For these bridges an Under-Bridge Inspection Truck (UBIT) is required. Steel bridges with fracture critical members may also require special inspections with special inspection equipment. A third category of special inspections are the Under Water Inspections which are required every five years for bridges with piers that extend below ordinary low-water levels.

During bridge inspections, the current condition of each bridge element is noted. The deficiencies are coded to NBIS standards and show the degree of deterioration in various elements, the three primary elements being:

- Deck,
- Superstructure, and
- 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 our inspection program are forwarded to the Washington State Department of Transportation (WSDOT) for review. Once the report has been accepted by WSDOT it is made available to the Federal Highway Administration (FHWA).

The NBIS utilizes information from the latest bridge inspection to determine the Sufficiency Rating (SR) which is a calculated rating based on information from the most recent bridge inspection. 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 factor 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.

Whatcom County owns 2 bridges located on designated truck freight routes with a T-2 classification (there are no T-1 routes currently designated in Whatcom County). T-2 freight routes are defined as carrying 4 million to 10 million annual gross tonnage and serve as vital transportation corridors in Whatcom County. Hannegan Road from State Route 542 (Mt. Baker Highway) north to State Route 544 (Pole Road) is classified as a T-2 freight route and includes two county owned bridges; Hannegan Road/Ten Mile Creek Bridge No. 236 and Hannegan Road/Four Mile Creek Bridge No. 237. Both of the bridges are open unrestricted to full legal loads allowing for the efficient and safe movement of freight and goods.

See Exhibit A for our master list of special inspections and details on inspection frequencies and schedules for all of our UBIT and underwater bridge inspections.



**Photo of a typical UBIT**

## Exhibit “A” - Master List of Special Inspection and Equipment Needs

Bridge #	Bridge Name	Most Recent Fracture Critical Inspection Date	Most Recent Underwater Inspection Date	UBIT Frequency
3	MARIETTA	-	September 2017	-
107	NORTH LAKE SAMISH	-	July 2015	
140	MIDDLE FORK	August 2018	-	24 Months
252	NOOKSACK RIVER	March 2018	September 2015	-
332	NORTH FORK	April 2017	-	-
421	ROCKY CREEK	April 2017	-	-
500	DAKOTA CREEK	-	-	-
503	GOOSEBERRY FERRY SLIP	October 2018	March 2016	-
507	LUMMI ISLAND FERRY SLIP	October 2018	March 2016	-
512	NOOKSACK RIVER	April 2017	-	24 Months

## Load, Height and Width 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. Bridges which have load rating factors less than 1 are required to have the applicable weight restriction posted. At the end of the 2018 Whatcom County had 23 bridges posted for weight restrictions.

In 2017 WSDOT introduced new load posting requirements issued by FHWA regarding the load rating and posting of Single Unit Vehicles (SUV) and Emergency Vehicles for bridges which fall under the NBIS. SUV's are single unit trucks with tightly spaced axles such as garbage trucks and construction equipment introduced during the last decade. SUV truck configurations range from 4 to 7-axes.

FHWA is requiring that all Group 1 bridges, defined as a bridge with an AASHTO 1, 2 or 3 rating factor of less than 1.3, have a new load rating completed by June 2020. Whatcom County has approximately 58 bridges which fall in this Group 1 category, and we are on track to have all of these completed by August of 2019, well ahead of schedule. Depending on the condition of the bridge and the load rating calculations a bridge may need to be posted for the three existing AASHTO legal trucks and/or the SUV configurations.

Bridges that have height restrictions of 15'-3" or less are required to be posted with the allowable height. Whatcom County has two roads passing through posted height restricted bridge structures, both of which are steel truss structures. They are Slater Road/Nooksack River Bridge No. 512 and Mosquito Lake Road/Middle Fork Nooksack River Bridge No. 140. The list of current load, height and weight restricted bridges is shown in Exhibit 'B'.

### Exhibit "B" – Load, Height and Width Restricted Bridges

Bridge No.	Road Name	Features Crossed	Restricted Width (FT)	Restricted Vertical Clearance (FT)	Bridge Posted for Load Restriction
1	MARINE DRIVE	ACCESS RD OLD RR			Yes
44	BRIDGE WAY	CALIFORNIA CREEK	16		Yes
51	FLYNN ROAD	FISHTRAP CREEK	16		
81	JACKSON ROAD.	TERRELL CREEK			Yes
82	ALDERSON ROAD	TERRELL CREEK			
91	STEIN ROAD	DAKOTA CR. TRIB.			Yes
105	MANLEY ROAD	SILVER CREEK	11.3		
107	N. LAKE SAMMISH DRIVE	LAKE SAMMISH	12		Yes
130	TURKINGTON ROAD	JONES CREEK			Yes
147	NELSON ROAD	BLACK SLOUGH			Yes
132	HUDSON ROAD	JONES CREEK	15		
140	MOSQUITO LK ROAD	MIDDLE FORK	13.2	18	
151	HILLSIDE ROAD	SIGITOWITZ CREEK			Yes
163	CUSTER SCHOOL ROAD	DAKOTA CR TRIB			Yes
164	CUSTER SCHOOL ROAD	DAKOTA CREEK			Yes
206	GARRISON ROAD	SUMAS RIVER			Yes
249	ROBERTS ROAD	ANDERSON CREEK			Yes
250	MARTIN ROAD	ANDERSON CREEK			Yes
256	ASSINK ROAD	FISHTRAP CREEK			Yes
284	LIND ROAD	SMITH CREEK			Yes
291	MASSEY ROAD	SUMAS RIVER			Yes
308	ALM ROAD	SUMAS RIVER			Yes
313	OAT COLES ROAD	SWIFT CREEK	15		
332	MOSQUITO LK RD	NORTH FORK			Yes
413	DELTA LINE ROAD	DAKOTA CREEK			Yes
503	FERRY-LUMMI TRANSFER SPAN	HALE PASSAGE	12		Yes
503A	FERRY-LUMMI APPROACH	HALE PASSAGE			Yes
506	HERON LANE	JOHNSON CREEK	12		
507	FERRY-GP TRANSFER SPAN	HALE PASSAGE	14		Yes
507A	FERRY-GP APPROACH	HALE PASSAGE	14		Yes
510	COAL CREEK ROAD	GALLOP CREEK	14		
512	SLATER ROAD	NOOKSACK RIVER		15	



Posted weight restrictions for Jackson Road/Terrell Creek Bridge No. 81

## Bridge Replacement and Rehabilitation Plans for Deficient Bridges

One area of emphasis within the Bridge Program is to replace or rehabilitate bridges that are classified as structurally deficient (SD) per NBIS. The 5 SD bridges listed below were actively worked on in 2018:

1. West Badger Road/Bertrand Creek Bridge No. 50 Replacement (construction underway in 2019, BRAC funded)
2. Roberts Road/Anderson Creek Bridge No. 249 Replacement (construction underway in 2019, BRAC funded)
3. North Lake Samish Bridge No. 107 (TS&L completed in 2017, design, permitting and real estate work underway in 2018. BRAC application submitted in May 2019 for construction phase funding)
4. Massey Road/Sumas River Bridge No. 291 Deck Replacement Project (construction underway in 2019)

5. Mosquito Lake Road/NF Nooksack River Bridge No. 332 Cap Replacement Project (construction completed in May 2018)

Construction was completed in 2018 on the Hannegan Road/Ten-Mile Creek Bridge No. 236 Replacement Project. While this bridge was not designated as SD, it is the last remaining reinforced concrete channel girder bridge on timber caps and piles remaining on the Hannegan Road, which is a designated T-2 freight route and an important transportation corridor in Whatcom County. This old bridge design utilized an older style reinforced concrete channel girder that has historically not held up well to the type of truck traffic that Hannegan Road carries. This replacement project removed this bridge from Hannegan Road before problems developed and the bridge necessitated a load restriction. Since 2000, 20 SD bridges have been replaced or re-built in Whatcom County. The list of current SD bridges is shown in Exhibit 'C.'

## 2018 Replacement and Rehabilitation Construction Projects

### Hannegan Road/Ten Mile Creek Bridge No. 236 Replacement

This project included replacement of an existing 31-foot span channel girder superstructure on timber caps and piles. The new bridge consists of a 64-foot span precast, pre-stressed voided slab superstructure on a steel pile supported foundation. The new structure was opened to traffic in the fall of 2018.



Setting girders during construction of the new Hannegan Road/Ten Mile Creek Bridge No. 236

### **Ferry Terminal Structural Steel Repair Project**

This project included work at both the Gooseberry Point and Lummi Island ferry terminals. Major elements of work at Gooseberry Point included replacement of both live load hangars and the lifting beam. Additional work completed at both terminals included replacement of gusset plates, diagonal bracing, high-strength bolts and apron anchorage arm brackets. This work was completed primarily in September of 2018 during the annual Whatcom Chief dry dock period.



**Gooseberry Point terminal structural steel repair work**



**New live load hangars installed at the Gooseberry Point terminal**

### **Mosquito Lake Road/North Fork Nooksack River Bridge No. 332 Cap Repair**

This project, completed by the Maintenance & Operations Bridge Crew, included replacing a failing timber cap at the southern abutment and replacing it with a new galvanized steel I-beam cap. Work also included installing steel collars around the existing timber piles and installation of new concrete panel back wall at the abutment. This work was completed in May of 2018 and removed the SD designation on this bridge.



**Photo of the new steel I-beam cap and steel pile collars**



**Photo of wood cribbing and jacks used for temporary shoring during construction**



### Exhibit “C” – Structurally Deficient Bridges

Bridge No.	Bridge Name	Deficiency's	Sufficiency Rating	Status
1	LITTLE SQUALICUM	Delamination of Deck, Cap Beam Capacity	41.97	Monitoring
50	BERTRAND CR	Timber Cap Section Loss	22.51	Construction of replacement bridge scheduled for 2019
81	JACKSON RD.	Timber Cap and Pile Deterioration	28.42	Monitoring
107	North Lake Samish	Timber Girder Section Loss	14.02	TS&L Study Complete – Design for replacement bridge underway. BRAC funding application for replacement project submitted in May of 2019.
172	BNSF RR	Deck Deterioration	75.45	Monitoring
248	ANDERSON CR	Timber Cap and Pile Deterioration	37.26	Monitoring. BRAC funding application for replacement project submitted in May of 2019.
249	ANDERSON CR	Timber Cap Section Loss	39.86	Construction of replacement bridge scheduled for 2019
250	ANDERSON CR	Timber Cap and Pile Deterioration	53.54	Monitoring
291	SUMAS RIVER	Concrete Channel Beam Deterioration	42.72	Rehabilitation Project Scheduled 2019
497	BERTRAND CR TRIB	Scour Exposing Concrete Footings	45.5	Monitoring
509	SALAKANUM WAY	Timber Cap Deterioration	58.24	Monitoring

## 2018 Large Culvert Inventory

In 2016 and 2017 Whatcom County Bridge Program staff inspected all culverts with a diameter of 5' or greater located on the County road system. All culvert inspections were completed using FHWA publication No. FHWA-CFL/TD-10-005 titled "*Culvert Assessment and Decision Making Procedures Manual*" dated September 2010. All told 152 structures were inspected as part of this effort. As part of the inspection effort each culvert was given an overall condition rating and any needed repairs or maintenance work was forwarded to Maintenance & Operations. These large diameter culverts will continue to be inspected moving forward on a regular basis. For a detailed list of the large diameter culverts please Appendix "B".

## Maintenance and Repair Activities

The majority of bridge repair and maintenance work is done by Whatcom County Maintenance & Operation crews, with support from various vendors. During 2018 Maintenance & Operation crews washed all of the bridges in the County inventory. In addition, the majority of the bridges were brushed to support ongoing maintenance, repair and inspection activities. The Maintenance & Operations crews also provide support for routine bridge inspections by utilizing the county owned hydra platform for access to certain bridges.

Thirty seven (37) maintenance work orders were completed in 2018. (See Exhibit D below).

### Exhibit "D" – Maintenance Work Orders Completed in 2018

Bridge No.	Bridge Name	Work Completed	Date Repaired
50	WEST BADGER ROAD	CAP REPAIR	JANUARY 2018
173	WEST VALLEY VIEW ROAD	APPROACH REPAIR	JANUARY 2018
126	INNIS CREEK ROAD	DEBRIS REMOVAL	JANUARY 2018
313	OAT COLES ROAD	APPROACH REPAIR	JANUARY 2018
134	KELLY ROAD	BRIDGE RAIL REPAIR	JANUARY 2018
50	WEST BADGER ROAD	RE-TORQUE BOLTS	FEBRUARY 2018
315	BRECKINRIDGE ROAD	DEBRIS REMOVAL	MARCH 2018
126	INNIS CREEK ROAD	DEBRIS REMOVAL	MARCH 2018
99	JACKMAN ROAD	PATCH POT HOLES	MARCH 2018
43	H. STREET	PATCH POT HOLES	MARCH 2018
201	GOODWIN ROAD	PATCH POT HOLES	MARCH 2018
313	OAT COLES ROAD	PATCH POT HOLES	MARCH 2018
249	ROBERTS ROAD	PATCH POT HOLES	MARCH 2018
250	MARTIN ROAD	PATCH POT HOLES	MARCH 2018
313	OAT COLES ROAD	REGRADE GRAVEL APPROACHES	APRIL 2018

Bridge No.	Bridge Name	Work Completed	Date Repaired
201	GOODWIN ROAD	DEBRIS REMOVAL	APRIL 2018
332	MOSQUITO LAKE ROAD	REPLACE TIMBER CAP WITH NEW STEEL CAP	MAY 2018
277	SMITH ROAD	BEAVER DAM REMOVAL	JUNE 2018
277	SMITH ROAD	BEAVER DAM REMOVAL	JULY 2018
503	GOOSEBERRY TERMINAL	PAINT APRON ARMS	JULY 2018
507	LUMMI ISLAND TERMINAL	PAINT APRON ARMS	JULY 2018
277	SMITH ROAD	BEAVER DAM REMOVAL	JULY 2018
313	OAT COLES ROAD	PATCH POT HOLES	JULY 2018
507	LUMMI ISLAND TERMINAL	INSTALL PIN TUBE BRACKET	JULY 2018
507	LUMMI ISLAND TERMINAL	PAINT LIFTING BEAM	JULY 2018
50	WEST BADGER ROAD	RE-TORQUE BOLTS	AUGUST 2018
503	GOOSEBERRY TERMINAL	APPLY RUST INHIBITING PAINT	AUGUST 2018
512	SLATER ROAD	GUARDRAIL REPAIR	AUGUST 2018
503	GOOSEBERRY TERMINAL	REPAIR NON-SKID SURFACE ON APRON	AUGUST 2018
507	LUMMI ISLAND TERMINAL	REPAIR NON-SKID SURFACE ON APRON	AUGUST 2018
507	LUMMI ISLAND TERMINAL	SCRAPE BARNACLES FROM PILING	AUGUST 2018
126	INNIS CREEK ROAD	CLEAN OUT SEDIMENT TRAP	SEPTEMBER 2018
11	HAXTON WAY	PATCH POT HOLES	SEPTEMBER 2018
201	GOODWIN ROAD	SEDIMENT REMOVAL	SEPTEMBER 2018
201	GOODWIN ROAD	ACCESS ROAD REPAIR	NOVEMBER 2018
313	OAT COLES ROAD	POT HOLE REPAIR	NOVEMBER 2018
50	WEST BADGER ROAD	RE-TORQUE BOLTS	NOVEMBER 2018



Maintenance & Operations crews deploying the hydra platform on Bridge No. 332

# Glossary of Bridge Terms

**Abutment** – a substructure supporting the end of a single span, or the extreme end of a multi-span super-structure and, in general, retaining or supporting the bridge approach fill.

**Approach span** – the span or spans connecting the abutment with the main span or spans.

**Back wall** – the top-most portion of an abutment functioning primarily as a retaining wall to contain approach roadway fill.

**Beam** – a linear structural member designed to span from one support to another.

**Bent** – a supporting unit of the beams of a span made up of one or more column or column-like members connected at their top-most ends by a cap, strut, or other horizontal member.

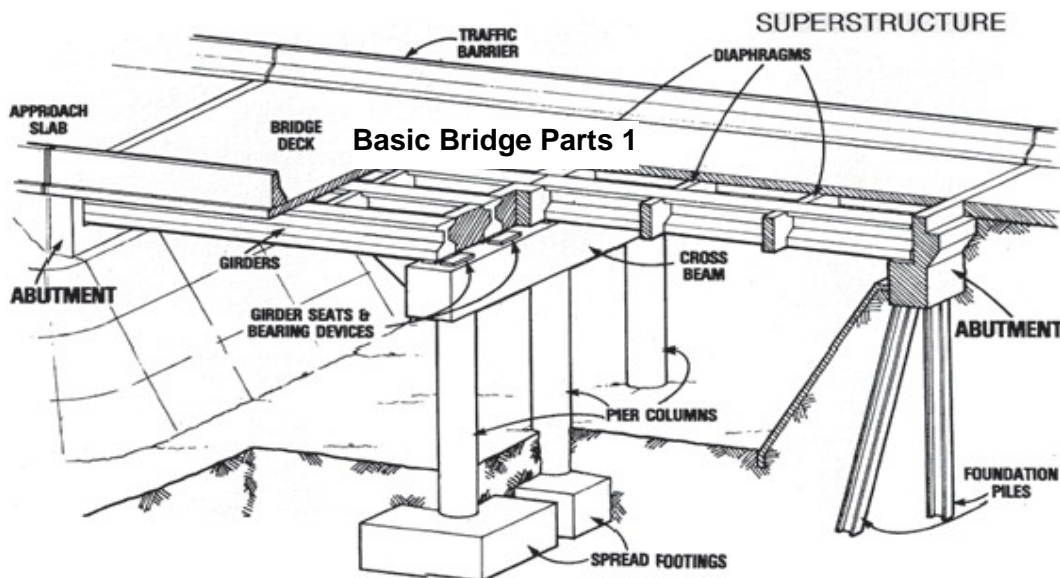
**Box Girder** – a support beam that is a hollow box; its cross-section is a rectangle or square.

**Bracing** – a system of tension or compression members, or a combination of these, connected to the parts to be supported or strengthened by a truss or frame. It transfers wind, dynamic, impact, and vibratory stresses to the substructure and gives rigidity throughout the complete assemblage. Can also refer to diagonal members that tie two or more columns of a bent together.

**Cap** – the horizontally-oriented, top-most piece or member of a bent serving to distribute the beam loads upon the columns and to hold the beams in their proper relative positions.

**Cast-in-Place** – concrete poured within form work on site to create a structural element in its final position.

**Catwalks** – temporary foot bridges, used by bridge inspection personnel.



**Chord** – in a truss, the upper-most and the lower-most longitudinal members, extending the full length of the truss.

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

**Column crosses brace** – transverse brace between two main longitudinal members.

**Compression** – a type of stress involving a pressing or squeezing together; tends to shorten a member; opposite of tension.

**Culvert** – a pipe or small structure used for drainage under a road, railroad or other embankment. A culvert with a span length greater than 20 feet is included in the National Bridge Inventory and receives a rating using the NBI scale.

**Dead load** – a static load due to the weight of the structure itself.

**Deck** – the roadway portion of a bridge that provides direct support for vehicular and pedestrian traffic.

**Deck bridge** – a bridge in which the supporting members are all beneath the roadway.

**Deck truss** – a bridge whose roadway is supported from beneath by a truss.

**Diagonal** – a sloping structural member of a truss or bracing system.

**Elastomeric pads** – rectangular pads made of neoprene, found between the sub-structure and superstructure that bears the entire weight of the superstructure. Elastomeric pads can deform to allow for thermal movements of the superstructure.

**End wall** – the wall located directly under each end of a bridge that holds back approach roadway fills. The end wall is part of the abutment.

**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 sub-structure 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.

**Fracture critical member** – a member in tension or with a tension element whose failure would probably cause a portion of or the entire bridge to collapse.

**Girder** – a main support member for the structure that usually receives loads from floor beams and stringers; also, any large beam, especially if built up.

**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** – vehicular traffic, wind, water; and/or earthquakes.

**Lower chord** – the bottom horizontal member of a truss.

**Main beam** – a beam supporting the spans and bearing directly onto a column or wall.

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

**Oscillation** – a periodic movement back and forth between two extreme limits. An example is the string of a guitar that has been plucked. Its vibration back and forth is one oscillation. A vibration is described by its size (amplitude), its oscillation rate (frequency), and its timing (phase). In a suspension bridge, oscillation results from energy collected and stored by the bridge. If a part of the bridge has to store more energy than it is capable of storing, that part will probably fail.

**Pier** – a structure comprised of stone, concrete, brick, steel, or wood that supports the ends of the spans of a multispan superstructure at an intermediate location between abutments. A pier is usually a solid structure as opposed to a bent, which is usually made up of columns.

**Pile** – a linear (vertical) member of timber, steel, concrete, or composite materials driven into the earth to carry structure loads into the soil.

**Pile bent** – A row of driven or placed piles with a pile cap to hold them in their correct positions; see "Bent."

**Plate girder** – a large, solid web plate with flange plates attached to the web plate by flange angles or fillet welds. Typically fabricated from steel.

**Post or column** – a member resisting compressive stresses, in a vertical or near vertical position.

**Pre-cast girder** – fabricated off site of Portland Cement Concrete, reinforcing steel and post-tensioning cables. These girders are shipped to the construction site by truck and hoisted into place by cranes.

**Reinforced concrete** – concrete with steel reinforcing bars bonded within it to supply increased tensile strength and durability.

**Scour** – erosive action of removing streambed material around bridge substructure due to water flow. Scour is of particular concern during high-water events.

**Short span bridge** – these bridges have a single NBIS span length of 20 feet or less. They are typically supported by timber piles or shallow concrete footings.

**Soffit** – the underside of the bridge deck or sidewalk.

**Spall** – a concrete deficiency wherein a portion of the concrete surface is popped off from the main structure due to the expansive forces of corroding steel rebar underneath. This is especially common on older concrete bridges.

**Span** – The distance between piers, towers, or abutments.

**Steel** – A very hard and strong alloy of iron and carbon.

**Stringer** – a longitudinal beam (less than 30 feet long) supporting the bridge deck, and in large bridges, framed into or upon the floor beams.

**Sufficiency rating** – the sufficiency rating is a numeric value from 100 (a bridge in new condition) to 0 (a bridge incapable of carrying traffic). The sufficiency rating is the summation of four calculated values: Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reductions.

**Substructure** – the abutment, piers, grillage, or other structure built to support the span or spans of a bridge superstructure, and distributes all bridge loads to the ground surface. Includes abutments, piers, bents, and bearings.

**Superstructure** – the entire portion of a bridge structure which primarily receives and supports traffic loads and in turn transfers the reactions to the bridge substructure; usually consists of the deck and beams or, in the case of a truss bridge, the entire truss.

**Tension** – type of stress involving an action which pulls apart.

**Tie** – a member carrying tension.

**Torsion** – a twisting force or action.

**Truss bridge** – a bridge having a pair of trusses for the superstructure.

**Upper chord** – the top longitudinal member of a truss.

**Web** – the portion of a beam located between and connected to the flanges.

**Welded joint** – a joint in which the assembled elements and members are united through fusion of metal.

**Wheel rail** – a timber curb fastened directly to the deck, most commonly found on all-timber bridges.

**Wing wall** – walls that slant outward from the corners of the overall bridge that support roadway fill of the approach.

**Appendix "A" – 2018 Whatcom County Bridge Inventory  
Total of 162 Bridges Including 24 Short Spans**

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
1	LITTLE SQUALICUM	1933	270	35	3796	2
2	MARIETTA SLOUGH	1978	105	32	3746	7
3	MARIETTA	1936	420	32.9	3746	7
5	PORTAGE SLOUGH	1997	90	42	3700	6
7	SLOUGH BRIDGE	1979	90	32.1	1099	6
8	Red River	1997	82	31	284	3
9	SILVER CREEK	1953	31	25.5	70	0
10	Jordan Creek	2017	142	41	15000	4
11	RED RIVER	1920	126	25.5	5592	5
12	SCHNEIDER DITCH	1950	19	21.3	230	99
13	BARRETT CREEK	1969	57	25.5	1316	3
14	TEN MILE CR	1924	38	25.8	1192	2
15	TEN MILE CR	1935	83	43.2	4900	3
16	TEN MILE CR	1986	80	31	441	3
17	TEN MILE CR	1933	61	25.5	1185	2
21	TEN MILE CR	1933	31	25.5	887	3
22	DAKOTA CR.	1930	31	25.7	167	4
29	TERRELL CREEK	2003	31	34	833	4
30	BERTRAND CR.	1938	126	33.1	1839	4
35	CALIFORNIA CR	1956	169	32.6	951	4
36	DAKOTA CR.	1934	75	25.5	820	4
37	CALIFORNIA CR	1923	40	32	558	3



Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
38	DRAYTON HARBOR	1933	104	25.5	5082	3
42	DAKOTA CR.	1995	131	31.1	275	4
43	BERTRAND CR.	1995	118	37.4	924	5
44	Bridge Way	1922	85	16	10	99
47	BERTRAND CREEK	1950	82	36	1251	6
50	BERTRAND CR	1934	69	32	2988	4
51	FISHTRAP CR	1988	36	17	120	2
53	RIVER ROAD	2004	50	23.8	125	99
56	BERTRAND CREEK	1949	83	27	9097	6
81	JACKSON RD.	1975	62	25.5	977	4
82	TERRELL CREEK	1987	50	46.9	2766	3
86	DAKOTA CREEK	1956	18	36	1245	3
87	DAKOTA CREEK	2005	53	37	729	4
88	S. FORK DAKOTA CREEK	2005	53	37	729	4
89	DAKOTA CR.	1950	31	25.5	644	3
90	COUGAR CR	1947	19	25.5	433	2
91	DAKOTA CR TRIB	1906	50	25.5	150	4
92	DAKOTA CREEK	2000	55	32	720	4
94	COUGAR CR	1931	18	25.5	135	2
99	DRAINAGE DITCH	1932	19	25.5	190	5
101	CALIFORNIA CR	1949	31	25.9	365	3
102	CALIFORNIA CREEK	2004	31	25.5	190	4
105	MANLEY	2011	19	12.8	10	6

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
106	FRIDAY CR	1934	76	27	851	7
107	LAKE SAMISH	1953	251	29.9	955	7
115	HIGH BRIDGE	2006	228	37.5	2123	19
116	AUSTIN CREEK	2004	82	42.8	2481	7
119	BRANNIAN CREEK	2008	40	32.2	542	0
120	FIR CREEK	1944	20	25.5	545	0
121	DIVERSION CHANNEL	1944	20	25.5	545	0
124	NP RR	1955	126	31.4	120	5
125	Samish River	1998	69	32.3	114	3
126	INNIS CREEK	2007	40	24	103	3
127	SOUTH FORK	1998	276	31	250	99
130	JONES CR.	1951	31	25.9	338	0
131	MCCARTY CR	1975	70	23.8	338	99
132	HUDSON	1950	15	15	5	0
134	ANDERSON CR	1939	31	25.5	402	3
137	SMITH CREEK	1989	99	30.6	1010	99
138	HUTCHINSON CREEK	1945	31	25.5	337	21
139	MOSQUITO LK	1951	19	25	160	21
140	MIDDLE FORK	1915	423	16	117	21

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
141	PORTER CREEK	1936	31	25.5	135	21
142	JOHNSON CREEK	2004	24	0	337	21
143	BLACK SLOUGH	1934	19	25.6	170	99
147	BLACK SLOUGH	1934	31	21.3	66	4
148	SOUTH FORK	2015	360	30	700	99
149	SLOUGH	1934	76	25.5	636	99
150	LOW WATER CROSSING	1969	24	26	194	99
151	SIGITOWITZ CREEK	1950	31	25.5	250	0
157	HUTCHINSON CREEK	2005	72	32.2	818	21
159	DOREN RD	1958	19	29.5	224	3
162	OLSON CR	1940	19	25.5	1171	99
163	DAKOTA CR TRIB	1954	31	25.5	843	5
164	DAKOTA CR	1950	31	25.5	844	5
170	N. INNIS CREEK	1999	31	25.5	180	4
172	GN RR OVERPASS	1940	196	32.3	4200	1
173	HAYNIE CR	1956	38	25.5	820	4
174	SILVER CR	1958	19	21.3	194	99
201	SWIFT CR	1934	38	27	1425	6
204	TEN MILE CR	1934	38	25.5	372	5
206	SUMAS RIVER	1935	69	25.5	252	3
212	SAAR CREEK	2016	53	32.5	867	3
233	TEN MILE CR TRIB	1900	31	25.5	841	4
234	TEN MILE CR	1947	31	25.5	841	4
235	TEN MILE CR	1946	38	25.5	68	99

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
236	TEN MILE CR	1944	31	36	11198	5
237	FOUR MILE CREEK	1954	37	44	9411	6
240	TEN MILE CREEK	2012	40	32.2	645	3
242	SAAR CREEK	2004	104	29.7	118	3
244	SCOTT DITCH	1951	31	25.5	72	5
245	Scott Ditch	2009	77	42.7	9000	4
248	ANDERSON CR	1973	62	25.5	1114	4
249	ANDERSON CR	1958	69	30	150	4
250	ANDERSON CR	1958	31	30	80	0
252	NOOKSACK RIVER	1934	320	30	9332	12
256	ASSINK RD	1949	31	25.5	185	4
257	FISH TRAP CR	1950	31	27	300	5
258	KAMM SLOUGH	1956	19	25.5	838	5
261	Kamm Slough	2010	145	50	2400	4
263	FISH TRAP CR	1954	38	30.1	700	4
275	SQUAW CREEK	1963	19	25.5	866	4
277	ANDERSON CREEK	2005	53	40	4147	4
284	LIND	1955	31	25.5	50	99
288	SUMAS RIVER	1959	19	25.5	131	3
290	SUMAS RIVER	1932	31	25.5	106	3
291	SUMAS RIVER	1950	31	30	326	4
295	JOHNSON	1950	31	25.5	1031	2
302	JOHNSON CREEK	2010	53	32	240	5
303	SUMAS RIVER	1956	76	25.5	267	4
304	SUMAS RIVER	1993	60	32	263	3

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
306	SUMAS RIVER	1997	75	31	267	4
307	SUMAS RIVER	1953	60	25.5	1032	4
308	SUMAS RIVER	1947	69	25.5	261	2
309	SUMAS RIVER	1932	76	25.5	269	2
310	SUMAS RIVER	1947	57	25.5	209	2
313	SWIFT CR	2017	31	17.2	223	4
315	SUMAS RIVER	1954	82	25.4	1274	4
319	SUMAS RIVER	1949	31	25.5	250	3
322	SLEASMAN SLOUGH	1935	31	21.3	131	99
324	SLEASMAN SLOUGH	1935	19	25.5	120	5
325	SAAR CR	1946	31	27	113	6
327	SUMAS RIVER	1917	152	27	206	4
328	SAAR CR	1966	31	29.7	524	6
329	LENHART RD BR	1953	31	21.5	30	99
331	SUMAS RIVER	1943	82	25.5	922	3
332	NORTH FORK	1930	210	28	800	22
334	CANYON CR	1937	80	27	1050	23
336	SWIFT CR	1935	82	27	2340	3
337	SQUALICUM CR	1934	19	21.5	58	99
346	BONE CREEK	1946	10	0	270	4
347	JOHNSON CR	1955	31	21.3	40	99
348	DRAINAGE RELIEF	2002	12	23.5	172	40
349	JOHNSON CR	1945	47	29.3	567	2
406	SMITH CR	1974	19	22	149	99
408	SMITH CR	1958	31	21.5	56	99
410	HENDRICKS CREEK	1967	60	23.4	62	1

Bridge No.	Bridge Name	Year Built	Structure Length	Structure Width	Traffic (adt)	Detour Length
411	SMITH CR	1945	20	29	280	2
413	DAKOTA CR	1965	31	25.5	1485	4
421	ROCKY CREEK	1956	180	33.2	911	2
422	SULPHUR CREEK	2010	112	33	916	99
423	SANDY CREEK	1957	127	31.3	916	99
494	SMITH CREEK OVERFLOW	1946	84	27.5	1112	2
495	SOUTH FORK DAKOTA CREEK	1950	30	44.4	1500	4
497	BERTRAND CR TRIB	1950	21	30	1156	3
498	DAKOTA CREEK	2006	40	32	604	3
499	DAKOTA CREEK TRIB	1950	16	28	1434	4
500	DAKOTA CR	1928	335	31.5	1221	2
503	GOOSEBERRY FERRY SLIP	1950	70	13	1100	99
505	SKOOKUM CR	1980	101	26	100	99
506	JOHNSON CR	1944	72	14	25	99
507	LUMMI ISLAND FERRY SLIP	1978	96	17.5	1100	99
508	JOHNSON CREEK	1996	53	20	30	99
509	ANDERSON CREEK	1954	31	22.7	50	99
510	GALLOP CREEK	1952	65	16.6	16	99
511	DEEP CREEK	2000	31	21.3	15	99
512	NOOKSACK RIVER	1957	246	32.6	11192	7
513	RED RIVER	1900	104	36	11365	7
503A	FERRY SLIP APPR	1950	158	23.8	1250	99
507A	FERRY SLIP APPR	1978	60	17.5	1250	99

**Appendix "B" – 2018 Whatcom County Large Culvert Inventory  
Total of 152 Structures**

<b>Culvert ID No.</b>	<b>Road Name</b>	<b>Location</b>	<b>Stream Name</b>	<b>Shape</b>	<b>Material</b>	<b>Diameter</b>
LC202	CORNELL CREEK RD	0.37 MI FROM SR 542 (EAST END)	HENDRICK CREEK	RND	CMP	8
LC207	COAL CREEK RD	1.2 MILES FROM SR 542		RND	CMP	10
LC206	COAL CREEK RD	.74 MI SOUTH OF VAUGHN	GLACIER CREEK	RND	CMP	5
LC643	LAKWAY DR	35' EAST OF EUCLID	GENEVA CREEK	RND	CON	5
LC623	LAKE LOUISE RD	120' EAST OF WESTERN LANE	BEAVER CREEK	RND	CMP	6
LC622	LAKE LOUISE RD	300' WEST OF POLO PARK DR	BEAVER CREEK	BOX	CON	6X4
LC621	LAKE LOUISE RD	525' WEST OF LAKE LOUISE DR		BOX	CON	8X8
LC211	NOON RD	0.48 MI NORTH OF E SMITH RD		RND	CMP	8
LC616	NOON RD	0.30 MI SOUTH OF E SMITH RD		RND	CMP	6
LC615	NOON RD	0.20 MI SOUTH OF HUNTLEY RD		BOX	CON	3X6
LC614	NOON RD	0.39 MI NORTH OF SR 542		RND	CMP	5
LC633	VAN WYCK RD	0.68 MILES WEST OF NOON RD		RND	CMP	5
LC635 & LC636	DEWEY RD	0.18 MI SOUTH OF VAN WYCK RD	SQUALICUM CREEK	RND	CMP	6
LC203	NORTHFORK RD	0.95 MI NORTH OF MOSQUITO LAKE RD		RND	CMP	5
LC607	MOSQUITO LAKE RD	SOUTH OF SR 542		RND	CMP	11
LC610	MOSQUITO LAKE RD	SOUTH OF SR 9		RND	CON	5
LC406	SUNSET AVE	WEST OF NORTHWEST RD		SQSH	CMP	8X7
LC404	GRAVELINE RD	0.17 MI NORTH OF SUNSET AVE	SILVER CREEK	SQSH	CMP	8X7
LC403	NORTHWEST RD	200' SOUTH OF SUNSET AVE	SILVER CREEK	RND	CON	5
LC410	SLATER RD	225' WEST OF NORTHWEST RD.	BEAR CREEK	RND	CON	6
LC634	HORTON RD	0.35 MI EAST OF SR 539	SPRING CREEK	RND	CON	5
LC411	SEACREST DR	0.14 MILES SOUTH OF SUNRISE RD (LUMMI ISLAND)		BOX	CON	5X6

Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC205	CHASTEEN RD	AT TEN MILE RD		RND	CON	5
LC209	E LAURAL RD	0.42 MI EAST OF SR 539	CRYSTAL SPRINGS CREEK	RND	CMP	6
LC1	ALDRICH RD	0.17 MI SOUTH OF WEST AXTON RD	DEER CREEK	RND	CMP	10
LC11	NORTHWEST RD	0.17 MI SOUTH OF WEST AXTON RD	DEER CREEK	RND	CMP	7
LC41	CLARKSON RD	0.37 MI WEST OF NORTHWEST RD		RND	CON	5
LC40	CLARKSON RD	0.16 MI WEST OF NORTHWEST RD		RND	CON	5
m,	AXTON RD	JUST EAST OF FERNDALE CITY LIMITS		RND	CON	6
LC418	KWINA RD	0.27 MI WEST OF HAXTON RD		BOX	CON	5X7
LC417	HAXTON WAY	0.5 MI SOUTH OF RED RIVER		RND	CON	5
LC413	IMHOF RD	100' NORTH OF SLATER RD		RND	CMP	8
LC408 & LC409	SLATER RD	0.33 MI EAST OF BRIDGE 512)	TENNANT CREEK	RND	CMP	10
LC16	HAM RD	0.12 MI SOUTH OF ARNIE RD	CAMPBELL CREEK	SQSH	CMP	6
LC31	ARNIE RD	250' WEST OF HAM RD		RND	CMP	6
LC33	BIRCH BAY LYNDEN RD	JUST EAST OF HAM RD	CALIFORNIA CREEK	SQSH	CMP	12
LC18	HAM RD	0.62 MI SOUTH OF BIRCH BAY LYNDEN RD		RND	CMP	5
LC17	HAM RD	0.71 MI SOUTH OF BIRCH BAY LYNDEN RD	TARTE CREEK	RND	CMP	7
LC12	NORTHWEST RD	0.52 MI SOUTH OF WEST WISER LAKE RD	COUGAR CREEK	RND	CMP	7
LC39	WEST BADGER RD	AT GLENDALE RD		RND	CON	5
LC24	LOOMIS TRAIL RD	0.23 MI WEST OF WEIDCAMP RD		RND	CON	6
LC22	BIRCH BAY LYNDEN RD	0.12 MI EAST OF BOB HALL RD		RND	CON	6
LC10	STEIN RD	0.62 MI NORTH OF BIRCH BAY LYNDEN RD		RND	CMP	5
LC3	CUSTER SCHOOL RD	0.93 MI NORTH OF BIRCH BAY LYNDEN RD		RND	CMP	9
LC20	LOOMIS TRAIL RD	0.32 MI WEST OF PORTAL WAY		RND	CON	6
LC27	PORTAL WAY	0.17 MI NORTH OF ARNIE		BOX	CON	12X6



Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC26	PORTAL WAY	0.11 MI NORTH OF MAIN		BOX	CON	5X5
LC30	FOX RD	0.28 MI EAST OF VISTA		RND	CMP	6
LC13	VISTA DR	0.40 MI NORTH OF GRANDVIEW		RND	CMP	7
LC43	ENTERPRISE RD	0.17 MI SOUTH OF WILLEY'S LAKE RD	SCHNEIDER CREEK	RND	CMP	5
LC402	NORTHWEST RD	SOUTH OF SLATER RD	BEAR CREEK	SQSH	CMP	16
LC613	HENDERSON RD	0.10 MI EAST OF Y RD	SOUTH FORK ANDERSON CREEK	RND	CMP	11
LC602	KELLY RD	AT SAND RD		RND	CMP	6
LC246	VAN DYKE RD	360' WEST OF THEIL RD	ELDER DITCH	RND	CON	6
LC250	THEIL RD	280' SOUTH OF VAN DYKE RD	SCOTT DITCH	RND	CON	6
LC245	THEIL RD	0.35 MI NORTH OF VAN DYKE RD	SCOTT DITCH	BOX	CON	6X5
LC213	NOON RD	0.57 MI NORTH OF VAN DYKE RD	SCOTT DITCH	BOX	CON	6X5
LC248	NOLTE RD	0.35 MI NORTH OF VAN DYKE RD	SCOTT DITCH	RND	CMP	12
LC212	NOON RD	0.48 MI NORTH OF POLE RD		RND	CMP	6
LC214	STARRY RD	0.61 MILES NORTH OF E SMITH RD	STARRY CREEK	RND	CMP	11
LC214B	STARRY RD	NORTH OF E SMITH RD		SQSH	CMP	12
LC210	EAST RD	0.14 MI SOUTH OF E AXTON RD	DEER CREEK	RND	CMP	5
LC48	OLSON RD	0.18 MI SOUTH OF DOUGLAS RD		RND	CON	5
LC49	CHURCH RD	0.33 MI SOUTH OF DOUGLAS RD	SCHELL CREEK	RND	CON	5
LC236	PANGBORN RD	0.99 MI EAST OF HAMMER RD	SQUAW CREEK	SQSH	CMP	9
LC225	CLEARBROOK RD	0.22 MI EAST OF VAN BUREN RD	JOHNSON CREEK	RND	CMP	15
LC226	CLEARBROOK RD	0.23 MI WEST OF HILL RD.	SUMAS RIVER	RND	CON	6
LC232	HILL RD	0.30 MI NORTH OF CLEARBROOK RD	SUMAS RIVER	RND	CMP	7
LC234	JONES RD	0.51 MI EAST OF CONCHMAN RD		RND	CMP	5
LC233	JONES RD	1 MI EAST OF NIMS RD	SAAR CREEK	RND	CMP	6
LC235	NIMS RD	375' NORTH OF ROCK RD	SAAR CREEK	RND	CMP	8

Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC242	ROCK RD	285' WEST OF NIMS RD	SAAR CREEK	RND	CMP	8
LC241	ROCK RD	350' EAST OF HILLVIEW RD	ARNOLD SLOUGH	SQSH	CMP	5
LC201	SILVER LAKE RD	1.02 MI SOUTH OF BLACK MOUNTIAN RD	MAPLE CREEK	RND	CON	5
LC624	LINDQUIST RD	0.1 MI NORTHEAST OF Y RD	CARPENTER CREEK	RND	CON	5
LC625	NORTHSHORE RD	0.14 MI SOUTH OF Y RD	CARPENTER CREEK	RND	CON	5
LC617	Y ROAD	0.10 MI SOUTHEAST OF NORTHSHORE RD	CARPENTER CREEK	RND	CON	5
LC642	MANLEY RD	1 MI NORTH OF PACIFIC RD	BARNES CREEK	RND	CON	5
LC38	VALLEY VIEW RD	0.29 MI SOUTH OF MCGEE		RND	CMP	7
LC8	HAYNIE RD	0.15 MI WEST OF 34TH AVE		RND	CON	5
LC4	GILES RD	0.10 MI SOUTH OF HAYNIE RD		RND	CMP	5
LC21	ROGER RD	SOUTH OF HOIER RD		RND	CON	6
LC9	HOIER RD	0.15 MI EAST OF HARVEY RD		RND	CON	6
LC7	HARVEY RD	0.15 MI NORTH OF SWEET RD	SPOONER CREEK	RND	CMP	5
LC37	SWEET RD	0.2 MI WEST OF HARVEY RD		RND	CMP	6
LC28	KICKERVILLE RD	0.5 MI SOUTH OF BAY RD	TERRELL CREEK	BOX	CON	8X8
LC45	BROWN RD	0.39 MI EAST OF KICKERVILLE RD	TERRELL CREEK	RND	CON	6
LC44	BROWN RD	234' WEST OF JACKSON RD.		BOX	CON	5X5
LC47	NORTH STAR RD	0.33 MI SOUTH OF ALDERGROVE RD		RND	CMP	13
LC35	SUNRISE RD	0.46 MI SOUTH OF H STREET RD	NORTH FORK DAKOTA CREEK	RND	CON	6
LC36	SUNRISE RD	0.13 MI SOUTH OF H STREET RD		RND	CMP	6
LC5	H STREET RD	0.22 MI WEST OF SUNRISE RD		RND	CMP	6.5
LC6	H STREET RD	0.38 MI WEST OF SUNRISE RD		RND	CMP	11
LC2	BURK RD	0.15 MI EAST OF DELTA LINE RD	NORTH FORK DAKOTA CREEK	RND	CMP	14
LC29	ZELL RD	AT WILLEY'S LAKE RD		RND	CMP	6

Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC34	LOOMIS TRAIL RD	JUST WEST OF I-5		RND	CMP	6
LC32	ARNIE RD	0.3 MI EAST OF VALLEY VIEW RD		BOX	CON	8X5
LC25	PORTAL WAY	280' SOUTH OF FARIS (THE SOUGH LEG OF FARIS)		BOX	CON	6X5
LC50	UNICH RD	0.17 MI EAST OF BARR RD	JORDAN CREEK	BOX	CON	6X4
LC414	LAMPMAN RD	0.20 MI EAST OF HAXTON WAY		RND	CON	5
LC412	ELDER RD	0.2 MI NORTH OF SLATER RD	JORDAN CREEK	RND	CMP	12
LC416	NORTH RED RIVER RD	0.66 MI WEST OF HILLAIRE RD	JORDAN CREEK	RND	CMP	9
LC415	NORTH RED RIVER RD	0.74 MI WEST OF HILLAIRE RD		RND	CMP	5
LC637	E SMITH RD	0.77 MI EAST OF SR 542		RND	CON	5
LC204	HILLARD RD	175' SOUTH OF DEMING RD		RND	CMP	5
LC612	LINNELL RD	0.25 MI NORTH OF POTTER RD		RND	CMP	6
LC603	NELSON RD	0.50 MI SOUTH OF POTTER RD		RND	CMP	8
LC608	CLIPPER RD	0.54 MI SOUTH OF STRAND RD		BOX	CON	6X4
LC609	CLIPPER RD	0.14 MI SOUTH OF STRAND RD	TINGLING CREEK	BOX	CON	6X4
LC604	STRAND RD	0.52 MI EAST OF SR 9	TINGLING CREEK	BOX	CON	6X4
LC605	TRUCK RD	0.14 MI EASTERLY OF DEAL RD		RND	CON	5
LC638	PARK RD	1.18 MI EAST OF BLUE CANYON RD		RND	CMP	6
LC644	PARK RD	0.38 MI EAST OF BLUE CANYON RD		BOX	CON	8X4
LC620	BLUE CANYON RD	1 MILE FROM PARK RD		RND	CMP	5
LC619	BLUE CANYON RD	0.62 MI FROM PARK RD	BLUE CONYON CREEK	RND	CMP	5
LC618	RAINBOW DR	BETWEEN BROOK AND CEDAR	SILVER CREEK	RND	CMP	6
LC601	GLENHAVEN	BETWEEN RAINBOW RD AND LAKESIDE DR	SILVER CREEK	BOX	CON	8X3
LC631	SAMISH WAY	0.64 MI NORTHWEST OF MANLEY RD	CHUCKANUT CREEK	BOX	CON	8X8

Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC630	SAMISH WAY	0.46 MI NORTHWEST OF MANLEY RD	BEAR CREEK	RND	CON	5
LC632	SAMISH WAY	500' EAST OF YEW STREET RD		RND	CON	5
LC405	LANGE RD	0.22 MI EAST OF WASHKE RD	ANDREASEN DITCH	RND	CON	9
LC407	WASHKE RD	350' NORTH OF LANGE RD	ANDREASEN DITCH	RND	CMP	5
LC639	EAST LAKE SAMISH DR	0.24 MI NORTH OF CEDAR ACRES	BARNES CREEK	BOX	CON	6X8
LC640	NORH LAKE SAMISH	0.11 MI WEST OF EAST LAKE SAMISH	FINNEY CREEK	RND	CON	6
LC641	ROY RD	0.53 MI WEST OF AXELSON		BOX	CON	4X6
LC626 & LC627	OLD SAMISH RD	0.55 MI WEST OF LAKE SAMISH DR		RND	CON	5
LC628 & LC629	OLD SAMISH RD	0.73 MI WEST OF FALLS DR	CHUCKANUT CREEK	RND	CMP	6
LC228	GOODWIN RD	0.32 MI NORTH OF SOUTH PASS RD	GOLD CREEK	BOX	CON	7X3
LC227	GOODWIN RD	0.07 MI SOUTH OF SORENSON RD	BRECKENRIDGE CREEK	RND	CMP	10
LC222	LINDSAY RD	67' WEST OF TELEGRAPH RD	KINNEY CREEK	RND	CMP	8
LC223	TELEGRAPH RD	0.10 MI SOUTH OF LINDSAY RD	KINNEY CREEK	RND	CMP	8
LC24	SORRENSON RD	0.20 MI EAST OF TELEGRAPH RD	KINNEY CREEK	RND	CMP	8
LC237	SOUTH PASS RD	0.32 MI NORTH OF SEALUND RD	BRECKENRIDGE CREEK	BOX	CON	8X10
LC238	MACK RD	100' FROM SR 9		BOX	CON	3X6
LC240	OAT COLES RD	0.13 MI NORTH OF MACK RD		RND	CMP	5
LC239	MASSEY RD	0.37 MI EAST OF OAT COLES RD	GOODWIN CREEK	RND	CMP	6
LC229	GOODWIN RD	AT MASSEY RD		RND	CON	5
LC230	GOODWIN RD	AT GILMORE RD	POWER CREEK	RND	CMP	10
LC231	GOODWIN RD	0.38 MI NORTH OF HOPEWELL RD	DALE CREEK	RND	CMP	6
LC221	LINDSAY RD	60' WEST OF VAN BUREN RD	JOHNSON CREEK	RND	CMP	5
LC220	LINDSAY RD	0.22 MI WEST OF VAN BUREN RD	SUMAS RIVER	RND	CMP	5
LC243	VAN BUREN	0.12 MI NORTH OF HAMPTON RD	SUMAS RIVER	RND	CMP	5

Culvert ID No.	Road Name	Location	Stream Name	Shape	Material	Diameter
LC247	HAMPTON RD	45' WEST OF VAN BUREN	JOHNSON CREEK	RND	CON	7
LC244	STICKNEY ISLAND RD	0.12 MI SOUTH OF TIMON RD	MORMON DITCH	RND	CMP	9
LC249	NORTHWOOD RD	0.25 MI NORTH OF HAMPTON RD	KAMM SLOUGH	RND	CON	5
LC215	ASSINK RD	1 MI NORTH OF PANGBORN RD	FISHTRAP CREEK	RND	CMP	7.5
LC219	PANGBORN RD	20' EAST OF BENDER RD	FISHTRAP CREEK TRIB	BOX	CON	6X3
LC218	PANGBORN RD	AT BENSON RD	FISHTRAP CREEK	BOX	CON	6X3
LC216	PRARIE RD	WEST OF DOUBLE DITCH RD	DOUBLE DITCH	BOX	CON	6X4
LC217	PRARIE RD	EAST OF DOUBLE DITCH RD	DOUBLE DITCH	BOX	CON	6X4
LC23	H STREET RD	AT JACKMAN RD	JACKMAN DITCH	RND	CMP	6
LC604B	STRAND RD	0.46 MI EAST OF SR 9		RND	CMP	5