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Priddis River Hazard Study:
SURVEY AND BASE DATA COLLECTION REPORT

FINAL

Prepared for:

Alberta Environment and Parks
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Prepared by:

Stantec Consulting Ltd.

March 20, 2019

Classification: Public

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Approved by:

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Matt Wood, P.Eng. - Project Manager / Lead Project Engineer

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Executive Summary

Alberta Environment and Parks (AEP) commissioned Stantec Consulting Ltd. (Stantec) in August 2017 to undertake the Priddis River Hazard Study. The primary purpose of the study is to identify and assess river and flood hazards along Fish and Priddis Creeks. The study area includes about 30 km of Fish Creek, between Range Road 40 (288 St W) and Tsuut'ina Nation; and about 20 km of Priddis Creek, between its confluence with Fish Creek and Tsuut'ina Nation.

This study is being conducted under the provincial Flood Hazard Identification Program (FHIP), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards. Project stakeholders include the Government of Alberta, local authorities and the public. Key municipal stakeholders include the Foothills County, including the Hamlets of Priddis and Priddis Greens.

The Priddis River Hazard Study includes multiple components and deliverables. This report documents the methodology and results of the survey and base data collection component of the study, which supports hydraulic modelling, flood mapping, flood risk assessment, and channel stability investigation. The tasks associated with this component include a cross section survey, hydraulic and flood control structure data collection, survey and digital terrain model (DTM) data comparison, and aerial imagery acquisition. Additional base data collected by Stantec includes administrative, cadastral, and transportation data, structural design drawings, and other relevant data.

All survey and base data meet FHIP standards and minimum accuracy requirements.

Preliminary aerial imagery for the study area was acquired in 2016 and provided by AEP to Stantec in fall 2017. Newer orthorectified aerial imagery will be provided to Stantec in fall 2018 and used in all subsequent work.

A digital terrain model (DTM) derived from Light Detection and Ranging (LiDAR) data collected in fall 2017 was also provided by AEP. Although the DTM provided by AEP underwent rigorous quality control and was deemed to meet FHIP standards, additional checks were done by Stantec and its accuracy was confirmed.

The locations and alignments of surveyed channel cross sections were selected based on the following principles:

- The locations and alignments were based on aerial imagery and available 1 m LiDAR-derived DTM, or a 15 m LiDAR-derived DEM where the 1 m DTM was not available.
- Main channels and about 20 m of overbank on both sides of the channel were surveyed at representative cross section locations throughout the study area, and where necessary to support hydraulic modelling. These include: where abrupt changes occur in slope, cross sectional area or channel roughness; at the upstream and downstream faces of bridges; and other channel restrictions.
- Where abrupt changes in the topography or roughness were noted, several sections were surveyed to adequately describe the changes.
- Intervals between sections were selected to adequately define river geometry for hydraulic modelling, and to ensure the assumption of uniform flow remains reasonably valid.

- The sections were aligned to be generally perpendicular to expected flow lines for flood events ranging from the 2-year to the 1000-year flood.

A total of 264 channel cross sections were surveyed along Fish Creek, and 181 channel cross sections were surveyed along Priddis Creek. Surveyed elevations were assigned a series of standard point codes to document channel conditions for hydraulic modelling. Geometry details were surveyed for 21 bridges and four culverts. No dedicated flood control structures were identified or surveyed. Three dams are located within the study area, but survey of the structures was not required because all are on tributaries to Fish or Priddis Creeks.

All survey data was collected using GNSS RTK receivers, including channel bathymetry, overbank topography, and hydraulic structure details. In areas of dense tree cover or next to steep slopes where accurate GNSS survey was not possible, a conventional total station instrument was used.

All coordinate information is provided in 3-degree Transverse Mercator (3TM) Central Meridian 114 based on the Canadian Spatial Reference System North American Datum of 1983 (CSRS NAD83). Vertical control is referenced to the Canadian Geodetic Vertical Datum of 1928 (CGDV28). GPS positions were realized based on NAD83(CSRS) (adopted epoch 2002) and Vertical Datum CGDV28(HTv2.0).

Acknowledgements

The Priddis River Hazard Study was managed on behalf of AEP by Muhammad Durrani, M.Eng., P.Eng., with support from Kurt Morrison, M.Eng., P.Eng., of the River Engineering and Technical Services Section, both of whom provided project direction and review of this document.

The following personnel from Stantec contributed to this component of the study:

- Matt Wood, P. Eng., CPESC – Project Manager, Lead Project Engineer and Hydraulic Modelling Specialist
- Tracey Franks, P.Tech (Eng) – Local Survey Lead
- Alex Amies, B.Sc., EIT – Survey Crew Lead
- James Bigelow, B.Sc., P.Eng. – Hydraulic Modeling and Project Engineer
- Catalina Tandara, CET – CAD Lead
- Tyrell Nielsen, B.Sc. GIS Technician – GIS Support
- Marcel Chichak, P.Eng. - Program Lead

The project team acknowledges assistance provided by personal of the following agencies and their consultants:

- Informatics Branch, AEP
- Hamlet of Priddis
- Hamlet of Priddis Greens
- Robert Miller, Foothills County
- Water Survey of Canada

1.0 INTRODUCTION

The Priddis River Hazard Study was conducted by Stantec Consulting Ltd. (Stantec) on behalf of the Government of Alberta, in accordance with the study-specific terms of reference and applicable provincial guidelines.

1.1 STUDY BACKGROUND

Alberta Environment and Parks (AEP) commissioned Stantec in August 2017 to undertake the Priddis River Hazard Study. The study is being conducted under the provincial Flood Hazard Identification Program (FHIP), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards (Alberta Environment, 2011). Project stakeholders include the Government of Alberta, local authorities and the public. The key municipal stakeholder is the Foothills County.

1.2 STUDY OBJECTIVES

The primary purpose of the Priddis River Hazard Study is to identify and assess river and flood hazards along Fish and Priddis Creeks. The study includes multiple components and deliverables. This report documents the methodology and results of the survey and base data collection component of the study. The primary tasks and services of the survey and base data collection component include:

- river cross section survey;
- hydraulic structure data collection (e.g. bridges and culverts);
- other features data collection (e.g. beaver dams and riprap);
- dedicated flood control structures (none are located within the study area);
- survey and DTM data comparison;
- aerial imagery acquisition; and
- additional base data collection (e.g. cadastral data, etc.)

The data and information described in this report and associated deliverables will support hydraulic modelling, flood mapping, flood hazard identification, flood risk assessment, and channel stability investigation.

1.3 STUDY AREA & REACH

The study area includes about 30 km of Fish Creek, between Range Road 40 (288 St W) and Tsuut'ina Nation; and about 20 km of Priddis Creek, between its confluence with Fish Creek and Tsuut'ina Nation (**Figure 1**). The study area is located solely within the Foothills County, and includes the Hamlets of Priddis and Priddis Greens.

The study area includes 21 bridges and four culverts, but no dedicated flood control structures. Three dams are located within the study area, but they are on tributaries to either Fish or Priddis Creeks.

Author: Marty Anderson

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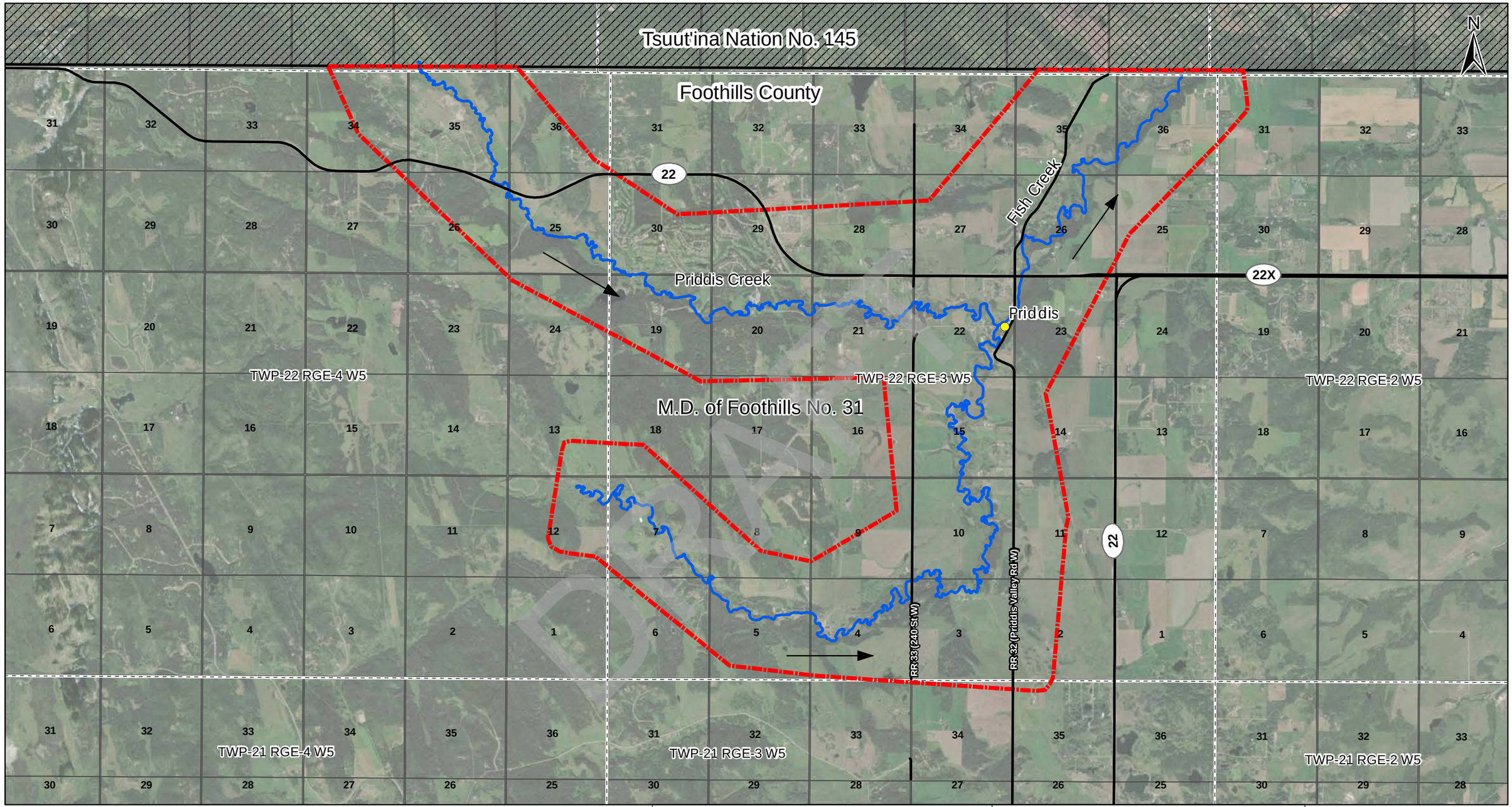


Legend

- Study Boundary
- Tsuut'ina Land
- Study Streams
- Highway
- Flow Direction

Projection: NAD 1983 CSRS 3TM 114
Source: Stantec Consulting Ltd., Contains information licensed under the Open Government license.
Spatial Data Warehouse Ltd.,
Imagery: 2017

Alberta Government

Priddis River Hazard Study

1,000 500 0 1,000
Meters
1:60,000

Priddis Study Area

Figure 1.0

DATE: October 2021

QA/QC:

fig1_priddis_study_area_103
10/21/2021

Stantec

Classification: Public

2.0 SURVEY PROGRAM & DATA

The field program to survey channel cross sections, hydraulic structures, and other features began in late September 2017 and carried on through to mid-November 2017. Geo-referenced photos were collected concurrently with the survey and are included as part of this report submission.

2.1 PROCEDURES & METHODOLOGY

Where practical, surveying of hydraulic structures and channel topography was completed using GNSS RTK receivers. In areas of dense tree cover or next to steep slopes where accurate GNSS survey was not possible, a conventional total station instrument was used. This was done by establishing temporary control points with GNSS in the open, and measuring into the difficult areas with the total station.

A Trimble S6 DR+ Robotic total station was utilized for all conventional surveying required on the project. Temperature and pressure adjustments were considered for each setup, and preliminary collimation and leveling checks were done to ensure the instrument was functioning correctly. Foresight and backsight checks were recorded at the beginning and end of each setup. This ensured that the instrument had not become disturbed while carrying out measurements. As part of the daily field QA/QC, total station measurements between the temporary control points were confirmed to be within the expected equipment tolerance and below the absolute positional accuracy of ±0.05 m, at 95% confidence threshold set in the study-specific terms of reference.

Daily field logs containing control checks, weather conditions, instrument measurements, and sketches were created as part of the survey. Survey data was electronically stored on Trimble TSC3 controllers and backed up remotely at the end of each working day.

All coordinate information has been provided in 3-degree Transverse Mercator (3TM) Central Meridian 114 based on the Canadian Spatial Reference System North American Datum of 1983 (CSRS NAD83). Vertical control is referenced to the Canadian Geodetic Vertical Datum of 1928 (CGDV28). GPS positions were realized based on NAD83(CSRS) (adopted epoch 2002) and Vertical Datum CGDV28(HTv2.0).

2.1.1 Survey Control

Only two low-order Alberta Survey Control Monuments (ASCMs) were available in the project area. We determined that establishing our own survey control throughout would be required to meet the accuracy requirements of the project. Natural Resources Canada's (NRCan) online Precise Point Positioning (PPP) tool in conjunction with long duration Static GNSS observations was used to establish control.

A total of six control points (¼" x 24" steel rebar) were used to establish horizontal and vertical control. They were placed approximately 3-4 km apart in areas unlikely to be disturbed, and under wide open sky. As the field work progressed, static GNSS data was recorded at each location and processed using NRCan's online PPP tool. For the static processing, data was recorded at two second intervals with mask set at 10 degrees. Despite PPP using only GPS and GLONASS in their processing, we were still able to get excellent results using the rapid satellite ephemeris. The six control points remained in the ground after the survey was complete.

Coordinates were output using horizontal datum NAD83 (Canadian Spatial Reference System, CSRS) (adopted epoch 2002) and orthometric height based on the vertical datum CGVD28 (HTv2.0). The processed output results for each control point can be found in the **Appendix A**. **Table 1** presents a summary of the static GNSS control survey data using PPP.

Table 1 - Summary of Static GNSS Control Survey Processed Using Precise Point Positioning

Control Point	σ_N 95%	σ_E 95%	σ_{EL} 95%	Static Duration
CP1	0.003	0.005	0.011	7h 20 m
CP2	0.003	0.005	0.011	6h 57 m
CP3	0.003	0.005	0.011	8h 2 m
CP4	0.002	0.005	0.010	7h 36 m
CP5	0.003	0.005	0.011	7h 11 m
CP6	0.003	0.007	0.012	5h 44 m

The two 3rd order ASCMs in the area were surveyed using RTK from the Stantec PPP control established on site. New coordinates were assigned based on these field observations for comparison to values obtained by other surveyors/contractors working on the project. **Table 2** presents a summary of the control coordinates that were used.

Table 2 - Summary of Control Coordinates 3TM CM114 NAD83(CSRS) CGVD28

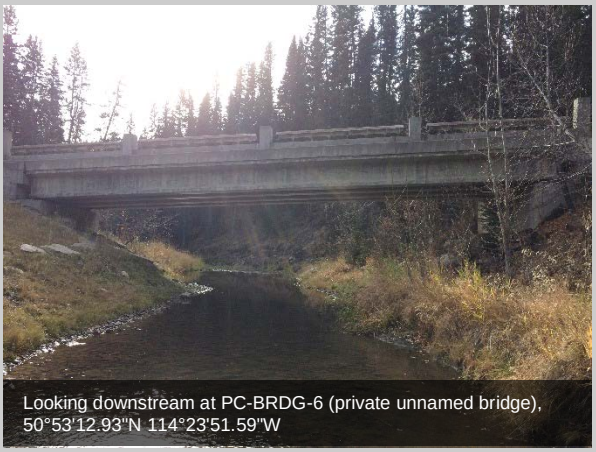
Point Name	Northing	Easting	Elevation	Description
CP1	5638483.080	-24476.700	1186.286	REBAR
CP2	5640788.344	-30483.870	1249.326	REBAR
CP3	5639556.272	-28960.538	1213.866	REBAR
CP4	5642356.914	-21776.084	1152.703	REBAR
CP5	5635009.625	-24585.354	1201.954	REBAR
CP6	5634879.693	-28214.211	1237.700	REBAR
285593_pub	5642121.828	-31934.292	1262.116	ASCM_published
285593_obs	5642121.787	-31934.531	1262.178	ASCM_field_obs
55855_pub	5642062.671	-23654.639	1217.056	ASCM_published
55855_obs	5642062.616	-23654.757	1217.032	ASCM_field_obs

2.1.2 Georeferenced Photos

The crews took georeferenced photos of the channel, overbank area, and hydraulic structures within the study area. The team photographed upstream and downstream views of each hydraulic structure, as well as the channel extending upstream and downstream of the structure. Other surveyed features were also captured in photos, such as beaver dams or substantial debris fields. Several hundred photos were collected throughout the study area.

Example photographs of one of the bridge structures are provided in the **Photo 1** below. All digital copies of geo-referenced photos are provided to AEP as part of this submission.

Photo 1 - Examples of Structure Photos Taken During Survey



Looking downstream at PC-BRDG-6 (private unnamed bridge), 50°53'12.93"N 114°23'51.59"W

Looking upstream at PC-BRDG-6 (private unnamed bridge), 50°53'12.93"N 114°23'51.59"W

Looking downstream at channel downstream of PC-BRDG-6 (private unnamed bridge), 50°53'12.93"N 114°23'51.59"W

Looking downstream at channel downstream of PC-BRDG-6 (private unnamed bridge), 50°53'12.93"N 114°23'51.59"W

2.2 CROSS SECTIONS

Prior to undertaking the survey, a cross section plan survey plan was developed to define the locations and alignments of proposed model cross sections. This plan was based primarily on available aerial imagery and digital elevation model (DEM) data, and was adjusted as required in the field.

The location and alignment of the cross sections were selected based on the following guiding principles:

- Cross sections were surveyed at representative locations throughout the study area, and where necessary to support hydraulic modelling. These include: where abrupt changes occur in slope, cross sectional area or channel roughness; at the upstream and downstream faces of bridges; and other channel restrictions.
- Where abrupt changes in the topography or roughness were noted, several sections were surveyed to adequately describe the changes.
- Intervals between sections were selected to adequately define river geometry for hydraulic modelling, and to ensure the assumption of uniform flow remains reasonably valid. Frequency of sections increased in select

areas including near bridges, culverts, confluences, and other areas where there were observed significant changes in morphology or channel characteristics.

- The sections were aligned to be generally perpendicular to expected flow lines for flood events ranging from the 2-year to the 1000-year flood. Where irregularities in the topography challenged the alignment at all flood levels, the alignments were selected to focus on the expected 100-year magnitude flood flow.
- As part of this study, cross section locations from the previous provincial Priddis Flood Risk Mapping Study (Alberta Environment, 2004) were resurveyed to support section comparisons.

The channel cross section locations (discussed previously in this document) are shown in **Appendix B**.

The channel cross section survey was completed by a two-person survey crew on foot, using waders to cross the creek where necessary. The few locations that were too deep to access safely were left until the watercourse was adequately frozen and safe to cross. Once frozen, holes were augured into the ice and measured with RTK. Cross section alignments were provided to the survey crews prior to mobilizing in the field. In some instances, slight deviations from line were required due to obstructions. Typical cross sections extended 20 m from either side of top of bank to provide adequate overlap with the LiDAR-derived DTM. All grade changes within the channel width were collected. Standard topological features codes were used to differentiate top of bank, bottom of bank, edge of water, gravel bars, watercourse bottom, thalweg, and edge of substantial vegetation, as provided in **Table 3**. Additional features between cross sections were also surveyed and photographed such as rip rap, dykes, beaver dams, culverts, substantial debris areas, or other features potentially influencing modelled creek hydraulics.

A maximum spacing of 10 m between measurements was used for collecting cross section topography. A minimum of ten measurements through the channel width were collected. The overall length and number of measurements per cross section varied greatly based on the channel characteristics. In some instances, it was not possible to safely collect the top of bank due to the presence of a cliff face. In cases such as this, as much of the channel was surveyed as possible and the bottom of the cliff face noted in the feature codes.

Point descriptions were given to all surveyed channel cross sections and topographical features. A breakdown of all surveyed features and their corresponding point descriptions are listed below in **Table 3**.

Table 3 - Surveyed Features Point Descriptions

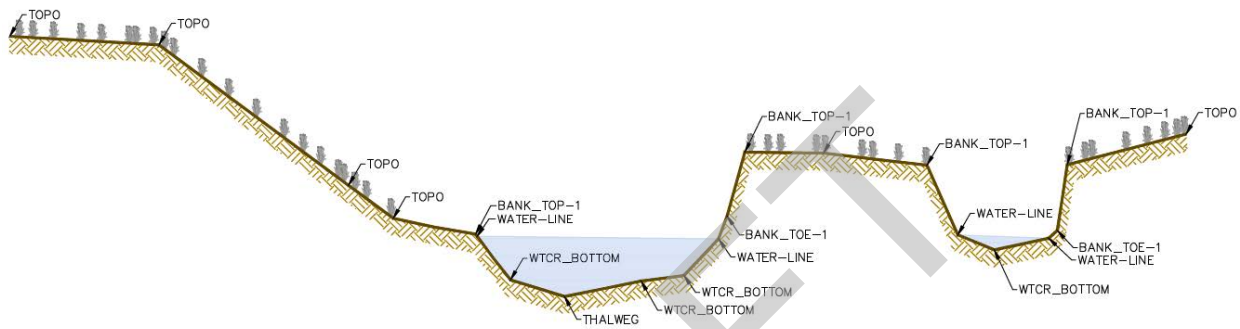
Feature	Point Descriptions
Water Level Marks	2 foot water level mark, flood marker @ 8 ft
Abutment	abutment, abutment cl, abutment@top, brdg_abutment, brdg_abutment @ ground, brdg_abutment@u/s girder, brdg_abutment@u/s girder steel w=0.3 m
Asphalt	Asphalt, edge_asphalt, edge_asphalt-1, edge_asphalt-2, edge_asphalt1 ,edge_asphalt2, edge_asphalt3, edge_asphalt4, edge_asphalt6, edge_asphalt7, edge_asphalt8, edge_asphalt9, edge_asphalt10, edge_asphalt11, edge_asphalt12, edge_asphalt13, edge_asphalt14, edge_asphalt15, edge_asphalt16, edge_asphalt100, edge_asphalt101, edge_asphalt120, edge_asphalt121, edge_asphalt133, edge_asphalt134, edge_asphalt135, edge_asphalt136, edge_asphalt137, edge_asphalt138, edge_asphalt139, edge_asphalt140, edge_asphalt141, topo asphalt
Bank Toe	bank_toe-1
Bank Top	bank_top-, bank_top-1, bank_top-1 edge_mgr_veg
Barricade	baricade

Barrier Edge	barrier_edge conc solid H=0.83 m
Beaverdam	Beaverdam, beaverdam1
Back of Curb	boc, boc W=0.45 m, curb_boc, curb_boc1
Bottom of Cliff	bottom cliff, bottom_cliff, cliff-base, cliff toe
Bridge Deck	brdg_deck, brdg_deck @top, brdg_deck underside, brdg_deck wood, deck raised cl w=0.60 m, raised_deck cl
Bridge Girder	brdg_girder @u/s conc 0.5m to u/s_deck, brdg_girder u/s, brdg_girder@u/s_conc 0.5m to u/s_deck, elev @ underside girder @beam w=0.30m, elev @ underside girder @beam w=0.30m h=0.30m to u/s deck, elev @ underside girder 0.30m to u/s deck, elevation@u/s_girder 0.5m to u/s_deck
Bridge Wingwall	brdg_wingwall, brdg_wingwall@ground, cl_wingwall@top wood, wingwall, wingwall cl, wingwall_cl@top, wood_guardrail h=0.60m, wood_guardrail h=0.60m-2
Centerline of Pile	cl pile, cl pile d=0.30m, cl pile ibeam 0.30m x 30m, cl_pile 0.3x0.3m, cl_pile d=0.20m
Road	cl_road, edge_road, road_cl, road_cl-1, road_cl1, road_cl2, road_cl3, road_cl100, road_cl120, road_cl133
Centerline of Steelbeam	cl_steelbeam @u/s deck, cl_steelbeam 0.3x0.3m @u/s deck
Concrete	conc_slab, conc_slab1, conc_slab2, conc_slab3, conc_span, conc_span_cl@u/s_girder H=0.85m, conc_span_cl@u/s_girder H=0.85m W=1.25m, concrete, edge_conc-1, edge_conc2, edge_conc3, edge_conc4, edge_conc5, edge_conc100, edge_conc101@top, edge_conc102, edge_conc103@top, edge_conc104, edge_conc105, edge_concrete-1, edge_concrete-2
Culvert	Culvert, culvert edge, culvert@edge, culvert_bot, culvert_end, culvert_end mitered, culvert_inv 2.40m, culvert_inv csp, culvert_invert, culvert_invert csp, culvert_top, culvert_top csp
Debris	Debris, debris area
Gravel	edge_gravel-1, edge_gravel-2, edge_gravel-3, edge_gravel-4, edge_gravel-5, edge_gravel-6, edge_gravel-7, edge_gravel-8, edge_gravel1, edge_gravel2, edge_gravel3, edge_gravel4, edge_gravel12, edge_gravel13, edge_gravel14, edge_gravel15, edge_gravel16, edge_gravel17, gravel
Edge of Major Vegetation	edge_mjr_veg
Face of Curb	foc
Guardrail	guardrail, guardrail h=0.8m, guardrail h=0.60m, guardrail H=0.7m, guardrail H=0.8m, guardrail H=0.55m, guardrail start, guardrail1 H=0.7m, guardrail1 H=0.55m, guardrail2 H=0.6m, guardrail2 start, guardrail3 H=0.6m, guardrail3 H=0.6m start, guardrail4 H=0.6m, guardrail4 H=0.6m start, guardrail5 H=0.6m, guardrail5 H=0.6m start
Handrail	handrail, handrail cl H=1.45, handrail h= 1.00m, handrail H=0.46, handrail H=1.17m, handrail wood h=1.1m
Centerline of Pier	pier cl top
Steel Retaining Wall	retwall steel
Stone Retaining Wall	retwall stone
Riprap	rip_rap, rip_rap-end, rip_rap-start, rip_rap_end, rip_rap_start, riprap
Rocks	rock, rock-dam
Steel Beam	steelbeam bot w=0.20m
Thalweg	thagwag. Thalwag, thalweg
Ground Topography	topo

Water Level	water-line, water-line & cliff-base, water-line & cliff_bottom, waterline
Bottom of Watercourse	wtcr_bottom

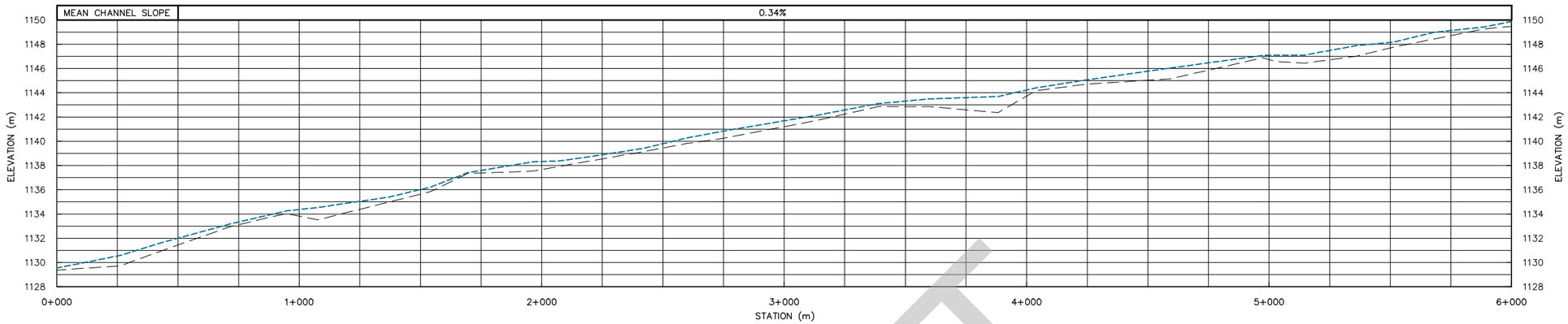
Surveyed channel cross sections used a series of standard point descriptions (with some variance in point description naming, see **Table 3**) to best represent conditions of the channel for hydraulic modelling and comparison of current and historical cross sections and thalweg, as shown in **Figure 2**.

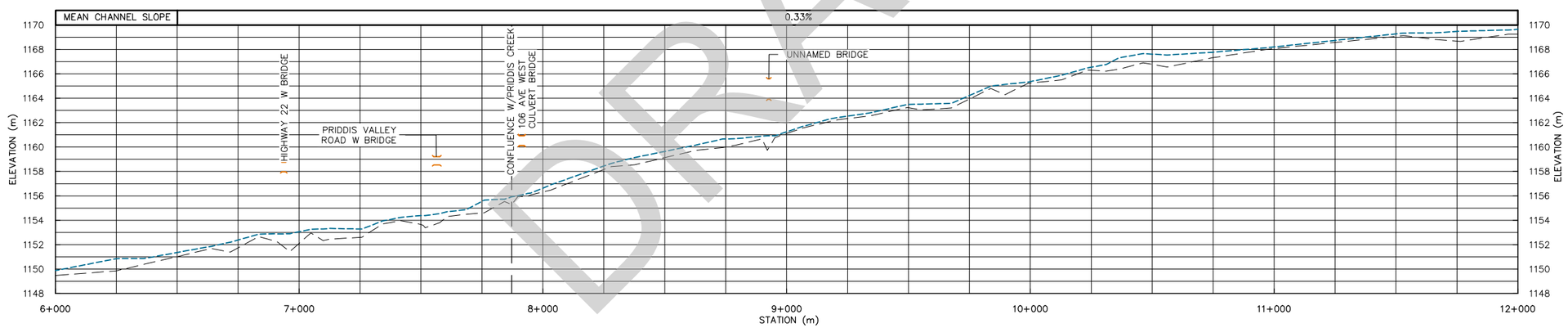
Figure 2 - Cross Section Schematic Showing Survey Point Codes



2.3 LONGITUDINAL PROFILES

Longitudinal profiles have been developed for each of the creeks based on the thalweg point at each surveyed cross section. **Figures 3.0** to **7.0** provide the surveyed thalweg and water level profiles. **Appendix C** provides the surveyed cross section properties for both watercourses including surveyed water elevations at the time of survey. The number of wetted edges surveyed are also provided in **Appendix C**. The sections where there is an odd number of wetted edges reflect minor side-channels that were not wide enough to require two edge points.





ORIGINAL SHEET - ANSI B 11"x17"

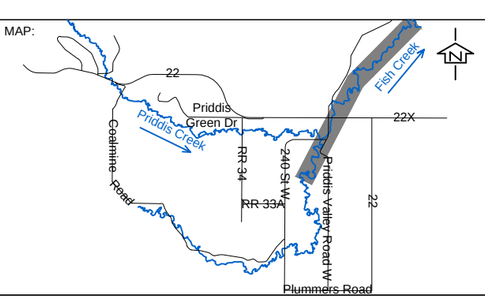
LEGEND:

- SURVEYED THALWEG
- BRIDGE TOP DECK (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- BRIDGE LOW CHORD (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- WATER LEVEL

Notes

1. SURVEY DONE IN NOVEMBER 2017.

LOCATION MAP:



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Priddis River Hazard Study

SURVEYED THALWEG AND WATER LEVEL PROFILE - FISH CREEK STA 0+000 TO 12+000

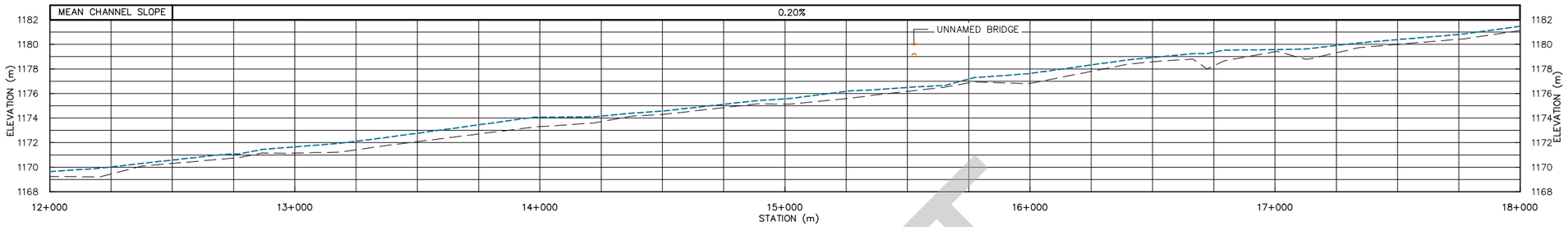
SCALE:
H 1:20 000 V 1:400
0 200 600 1000m
0 4 12 20m

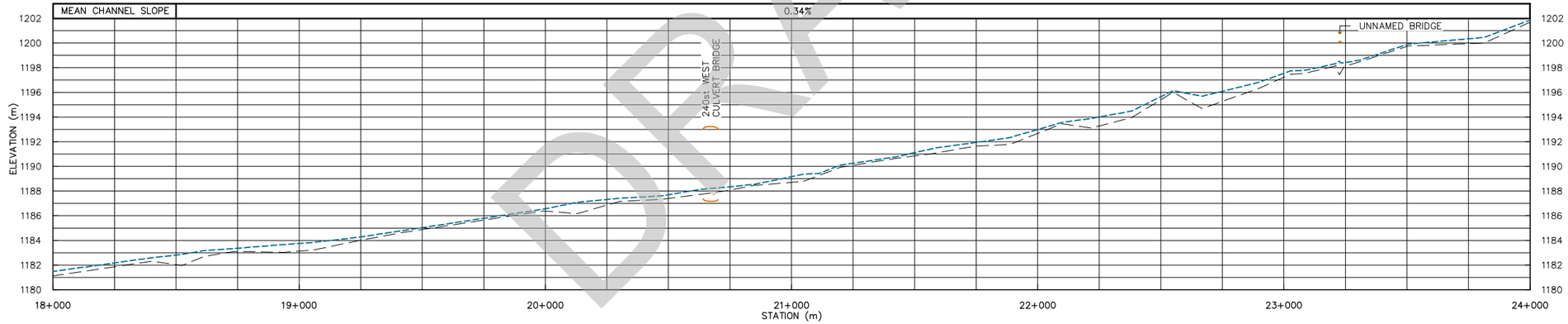
DATE: February 2018

QA/QC:

Stantec

FIGURE 3.0





ORIGINAL SHEET - ANSI B 11"x17"

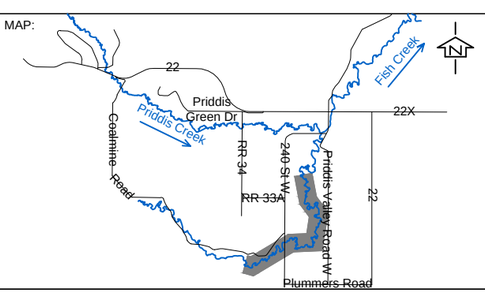
LEGEND:

- SURVEYED THALWEG
- BRIDGE TOP DECK (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- BRIDGE LOW CHORD (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- CULVERT OBVERT (DOES NOT REPRESENT THE DIAMETER OF THE STRUCTURE)
- CULVERT INVERT (DOES NOT REPRESENT THE DIAMETER OF THE STRUCTURE)
- WATER LEVEL

Notes

1. SURVEY DONE IN NOVEMBER 2017.

LOCATION MAP:



Alberta Government

Priddis River Hazard Study

SURVEYED THALWEG AND WATER LEVEL
PROFILE - FISH CREEK
STA 12+000 TO 24+000

SCALE:
H 1:20 000 V 1:400
0 200 600 1000
0 4 12 20

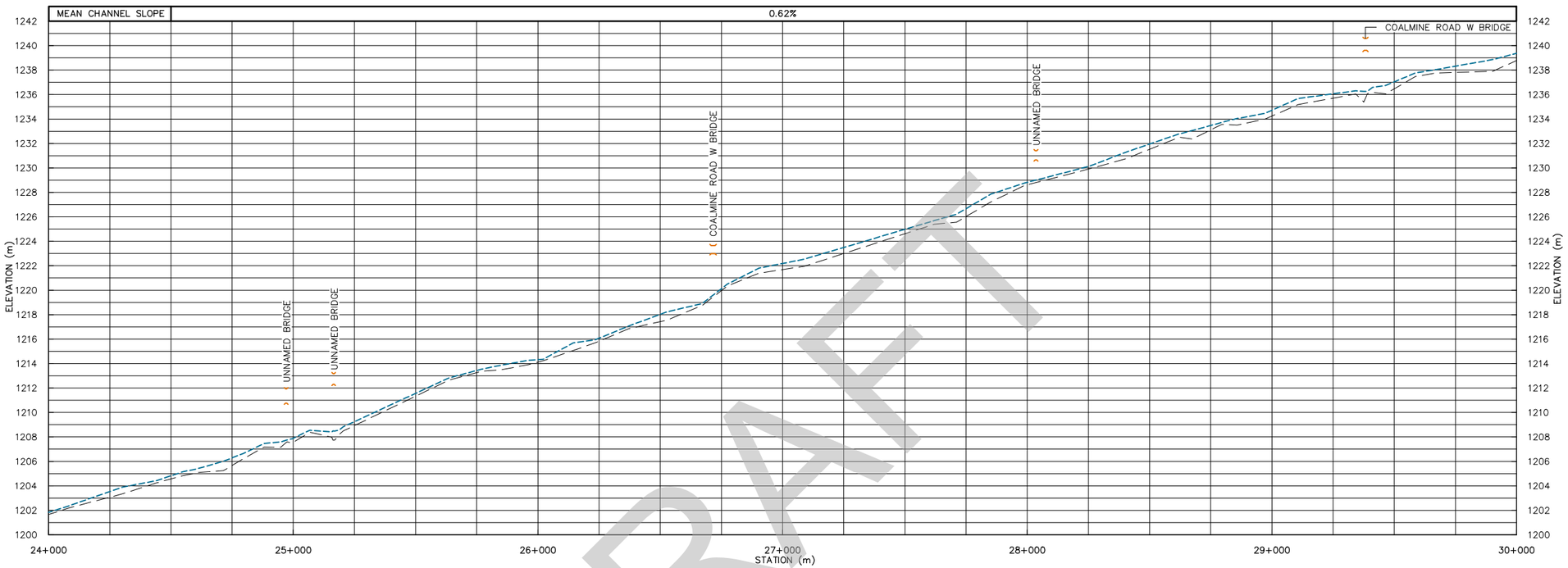
DATE: February 2018

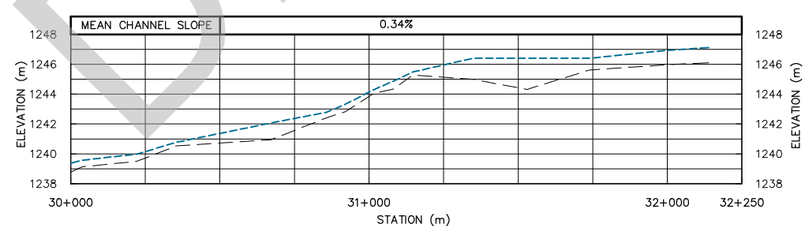
QA/QC:

Stantec

FIGURE 4.0

2019/03/15 8:11 AM By: Calle, Alba





U:\110773627\drawing\civil\thalweg_profile_fish_priddis.dwg

ORIGINAL SHEET - ANSI B 11"x17"

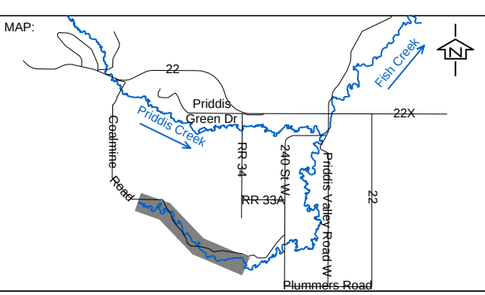
LEGEND:

- SURVEYED THALWEG
- BRIDGE TOP DECK (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- BRIDGE LOW CHORD (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- WATER LEVEL

Notes

1. SURVEY DONE IN NOVEMBER 2017.

LOCATION MAP:



Alberta Government

Priddis River Hazard Study

SURVEYED THALWEG AND WATER LEVEL PROFILE - FISH CREEK STA 24+00 TO 32+250

SCALE:
H 1:20 000 V 1:400
0 200 600 1000
0 4 12 20

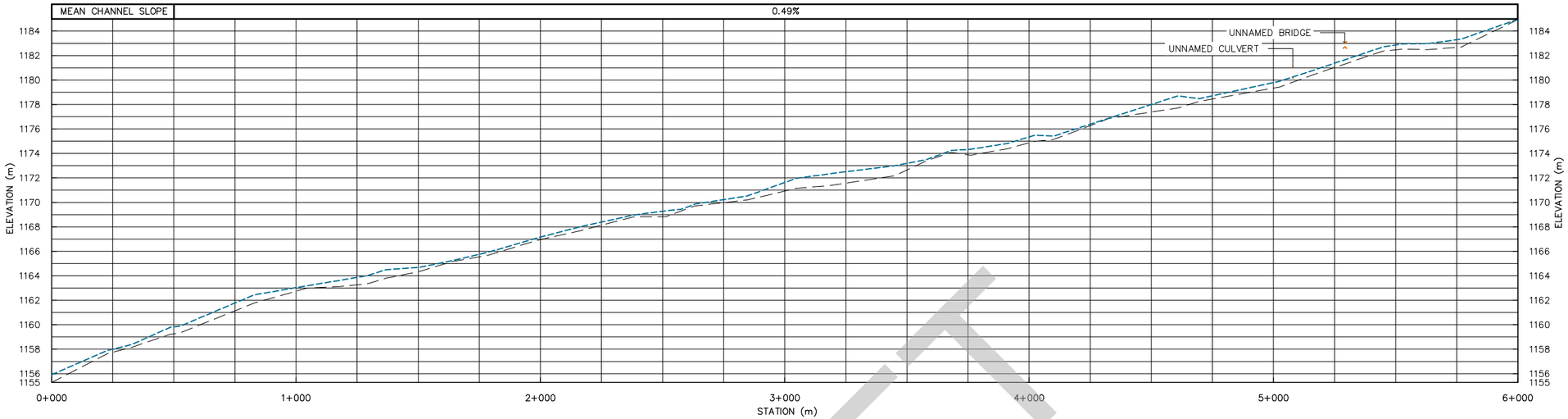
DATE: February 2018

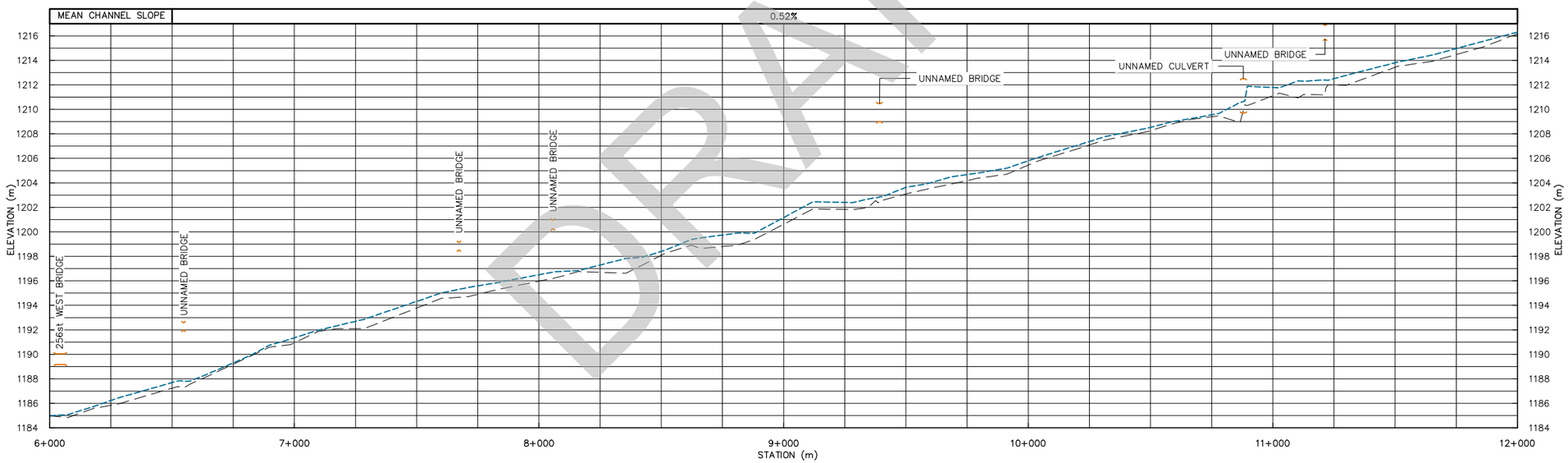
QA/QC:

Stantec

FIGURE 5.0

2019/03/15 8:14 AM By: Calle, Alba





U:\110773827\drawing\civil\thalweg_profile_fish_priddis.dwg

ORIGINAL SHEET - ANSI B 11"x17"

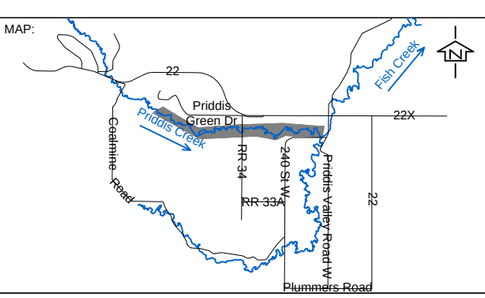
LEGEND:

- SURVEYED THALWEG
- BRIDGE TOP DECK (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- BRIDGE LOW CHORD (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- CULVERT OBVERT (DOES NOT REPRESENT THE DIAMETER OF THE STRUCTURE)
- CULVERT INVERT (DOES NOT REPRESENT THE DIAMETER OF THE STRUCTURE)
- WATER LEVEL

Notes

1. SURVEY DONE IN NOVEMBER 2017.

LOCATION MAP:



Alberta Government

Priddis River Hazard Study

SURVEYED THALWEG AND WATER LEVEL PROFILE - PRIDDIS CREEK STA 0+000 TO 12+000

SCALE:
H 1:20 000 V 1:400
0 200 600 1000
0 4 12 20

DATE: February 2018

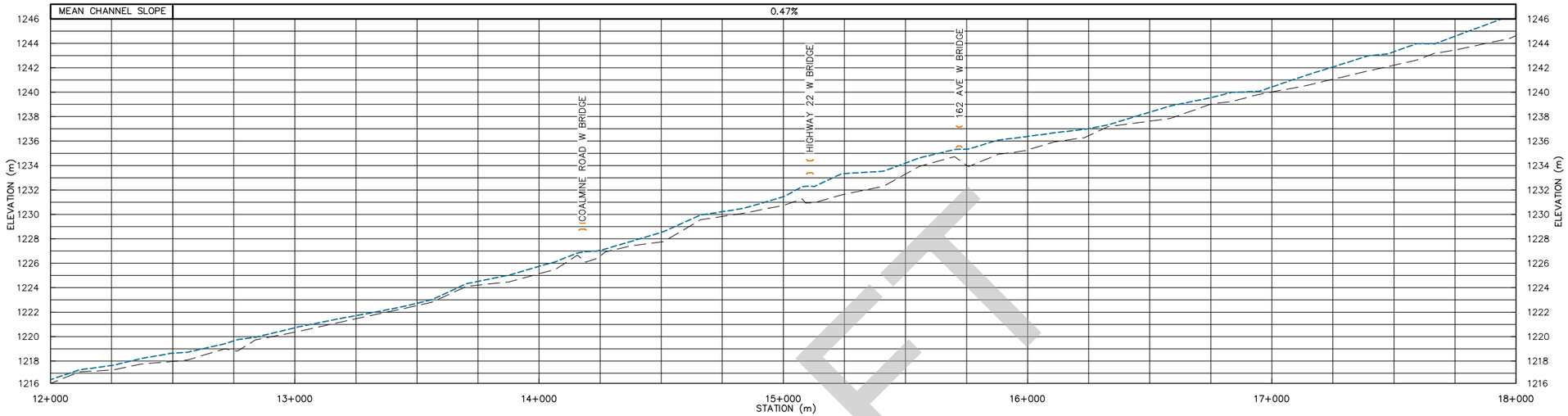
QA/QC:

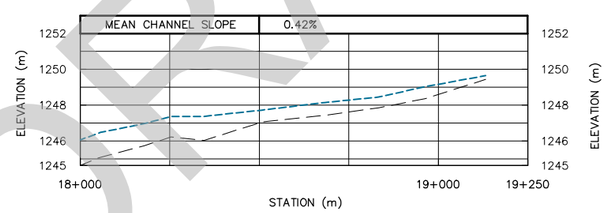
Stantec

FIGURE 6.0

2019/03/15 8:16 AM By: Calle, Alba

U:\110773627\drawing\civil\thalweg_profile_fish_priddis.dwg





ORIGINAL SHEET - ANSI B 11"x17"

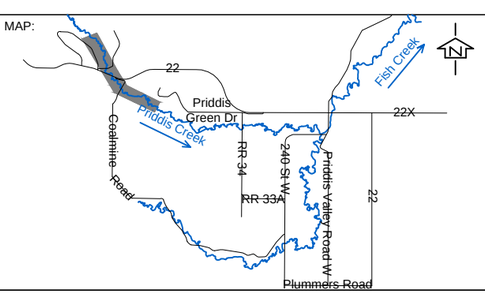
LEGEND:

- SURVEYED THALWEG
- BRIDGE TOP DECK (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- BRIDGE LOW CHORD (DOES NOT REPRESENT THE WIDTH OF THE STRUCTURE)
- WATER LEVEL

Notes

1. SURVEY DONE IN NOVEMBER 2017.

LOCATION MAP:



Alberta Government

Priddis River Hazard Study

SURVEYED THALWEG AND WATER LEVEL
PROFILE - PRIDDIS CREEK
STA 12+000 TO 19+250

SCALE:
H 1:20 000 V 1:400
0 200 600 1000
0 4 12 20

DATE: February 2018

QA/QC:

Stantec

FIGURE 7.0

2.4 HYDRAULIC STRUCTURES

21 bridges and four culverts along the creeks within the study area were surveyed. All hydraulic structures located on Fish Creek are listed in **Table 4** and all hydraulic structures located on Priddis Creek are listed in **Table 5.** Measurements were taken to adequately capture and model the structure geometry. This was accomplished with a combination of GNSS RTK survey, conventional surveying and tape measurements. Photographs and detailed profile sketches including field measurements were created for each hydraulic structure. Photocopies of all profile sketches are included as **Appendix D.**

The surveyed bridge details included length of span, width of bridge, top of curb/solid guard rail elevations, low chord elevations, number of piers along with width and location, type and shape of piers, roadway profiles, and bridge wingwalls. Water level gauges/indicators were also surveyed if present. Channel cross sections were surveyed 1-2 m from the upstream and downstream faces of the structure. Additional cross sections were surveyed a channel width upstream and downstream of the structure.

Surveyed culvert details included culvert type, culvert shape, entrance condition, dimensions and barrel length, upstream and downstream inverts, and top of roadway profile. Cross sections were surveyed 1-2 m from the upstream and downstream inverts, as well as additional cross sections one channel width upstream and downstream of the culvert. **Appendix E** provides a table showing the properties of all of the surveyed structures. **Tables 4** and **5** below provide a summary of the structures.

Table 4 - Fish Creek Hydraulic Structures

Stream	AT Bridge File No.	Description	River Station (m)		Model Hydraulic Structure ID No.
			Start	End	
Fish Creek	2047	Highway 22W Bridge	6+929	6+945	FC-BRDG-1
Fish Creek	1312	Priddis Valley Road W Bridge	7+552	7+577	FC-BRDG-2
Fish Creek	1322	186 Ave West Culvert Bridge	7+904	7+923	FC-CLVT-1
Fish Creek	N/A	Unnamed Private Bridge at 50°52'52.18"N, 114°19'53.07"W	8+923	8+931	FC-BRDG-3
Fish Creek	N/A	Unnamed Private Bridge at 50°51'36.01"N, 114°19'51.18"W	15+523	15+530	FC-BRDG-4
Fish Creek	1314	240 Street West Culvert Bridge (Range Road 33)	20+646	20+696	FC-CLVT-2
Fish Creek	N/A	Unnamed Private Bridge at 50°50'27.70"N, 114°21'44.01"W	23+226	23+229	FC-BRDG-5
Fish Creek	N/A	Unnamed Private Bridge at 50°50'36.36"N, 114°22'32.19"W	24+968	24+973	FC-BRDG-6
Fish Creek	N/A	Unnamed Private Bridge at 50°50'35.52"N, 114°22'41.80"W	25+163	25+167	FC-BRDG-7
Fish Creek	N/A	Unnamed Private Bridge at 50°50'38.11"N, 114°23'17.10"W	26+038	26+039	FC-BRDG-8
Fish Creek	N/A	Coalmine Road W Bridge	26+708	26+724	FC-BRDG-9
Fish Creek	N/A	Unnamed Private Bridge at 50°51'9.90"N, 114°24'9.38"W	28+033	28+039	FC-BRDG-10
Fish Creek	N/A	Coalmine Road W Bridge	29+377	29+388	FC-BRDG-11

Table 5 - Priddis Creek Hydraulic Structures

Stream		Description	River Station (m)	

	AT Bridge File No.		Start	End	Model Hydraulic Structure ID No.
Priddis Creek	N/A	Unnamed Private Culvert Bridge on subchannel at 50°53'19.77"N, 114°21'43.12"W	5+078	5+081	PC-CLVT-1
Priddis Creek	N/A	Unnamed Private Bridge on subchannel at 50°53'19.66"N, 114°21'49.77"W	5+290	5+294	PC-BRDG-1
Priddis Creek	N/A	256 Street West Bridge	6+023	6+043	PC-BRDG-2
Priddis Creek	N/A	Unnamed Private Bridge	6+545	6+549	PC-BRDG-3
Priddis Creek	N/A	Unnamed Private Bridge at 50°53'15.85"N, 114°23'2.75"W	7+671	7+675	PC-BRDG-4
Priddis Creek	N/A	Unnamed Private Bridge at 50°53'11.89"N, 114°23'8.26"W	8+055	8+059	PC-BRDG-5
Priddis Creek	N/A	Unnamed Private Bridge at 50°53'12.75"N, 114°23'51.65"W	9+385	9+398	PC-BRDG-6
Priddis Creek	N/A	Unnamed Private Culvert Bridge at 50°53'28.65"N, 114°24'33.14"W	10+872	10+886	PC-CLVT-2
Priddis Creek	N/A	Unnamed Private Bridge at 50°53'31.77"N, 114°24'43.56"W	11+212	11+215	PC-BRDG-7
Priddis Creek	428	Coalmine Road West Bridge (Township Road 222)	14+168	14+185	PC-BRDG-8
Priddis Creek	429	Highway 22W Bridge	15+100	15+118	PC-BRDG-9
Priddis Creek	N/A	162 Ave W Bridge (Township Road 225)	15+713	15+727	PC-BRDG-10

2.5 OTHER FEATURES

Throughout the survey, the field staff were directed to capture other features such as erosion protection structures (such as riprap bank revetments) and retaining walls. Depending on the feature and observations made during the field reconnaissance, these features may be incorporated into the hydraulic model. Each feature was documented by capturing the start and end points, elevations and photographs. **Tables 6** and **7** list each of these features that were captured as part of the survey. **Appendix B** provides figures that illustrate the location of each of these features.

Table 6 – Fish Creek Other Features

Stream	Description	River Station (m)		Stream	Description	River Station (m)	
		Start	End			Start	End
Fish Creek	Riprap	0+442	0+461	Fish Creek	Riprap	24+743	24+804
Fish Creek	Riprap	0+831	0+888	Fish Creek	Riprap	24+883	25+054
Fish Creek	Riprap	0+971	1+029	Fish Creek	Riprap	24+926	25+300
Fish Creek	Riprap	4+877	4+922	Fish Creek	Riprap	25+081	25+242
Fish Creek	Riprap	6+047	6+186	Fish Creek	Riprap	25+874	25+951
Fish Creek	Riprap	6+213	6+292	Fish Creek	Riprap	26+026	26+041
Fish Creek	Riprap	7+536	7+552	Fish Creek	Riprap	26+031	26+076
Fish Creek	Riprap	7+536	7+591	Fish Creek	Riprap	26+701	26+731
Fish Creek	Riprap	7+685	7+743	Fish Creek	Riprap	26+703	26+726
Fish Creek	Riprap	7+882	7+928	Fish Creek	Riprap	27+818	27+877
Fish Creek	Riprap	7+903	7+932	Fish Creek	Riprap	28+971	28+995
Fish Creek	Riprap	8+092	8+137	Fish Creek	Riprap	29+371	29+403
Fish Creek	Riprap	8+279	8+280	Fish Creek	Riprap	29+379	29+402
Fish Creek	Riprap	8+341	8+416	Fish Creek	Retaining Wall Stone	27+304	27+329
Fish Creek	Riprap	8+423	8+463	Fish Creek	Retaining Wall Steel	27+334	27+370
Fish Creek	Riprap	9+221	9+253				
Fish Creek	Riprap	10+285	10+322				
Fish Creek	Riprap	20+633	20+654				
Fish Creek	Riprap	20+634	20+654				
Fish Creek	Riprap	20+687	20+702				
Fish Creek	Riprap	20+688	20+706				
Fish Creek	Riprap	23+208	23+243				
Fish Creek	Riprap	23+212	23+246				
Fish Creek	Riprap	23+460	23+531				
Fish Creek	Riprap	24+218	24+251				
Fish Creek	Riprap	24+350	24+370				

Table 7 - Priddis Creek Other Features

Stream	Description	River Station (m)	
		Start	End
Priddis Creek	Riprap	0+743	0+765
Priddis Creek	Riprap	5+013	5+036
Priddis Creek	Riprap	7+643	7+679
Priddis Creek	Riprap	7+667	7+681
Priddis Creek	Riprap	8+053	8+058
Priddis Creek	Riprap	8+056	8+062
Priddis Creek	Riprap	9+379	9+402
Priddis Creek	Riprap	9+379	9+398
Priddis Creek	Riprap	10+867	10+875
Priddis Creek	Riprap	10+873	10+874
Priddis Creek	Riprap	10+883	10+887
Priddis Creek	Riprap	10+884	10+889
Priddis Creek	Riprap	11+204	11+224
Priddis Creek	Riprap	11+205	11+225
Priddis Creek	Riprap	14+167	14+184
Priddis Creek	Riprap	14+169	14+187
Priddis Creek	Riprap	14+370	14+403
Priddis Creek	Riprap on subchannel	5+080	5+081
Priddis Creek	Riprap on subchannel	5+083	5+097
Priddis Creek	Riprap on subchannel	5+212	5+316
Priddis Creek	Riprap on subchannel	5+288	5+296

2.6 ACCURACY

Trimble R10 multi constellation GNSS receivers were used for both base stations and rovers when surveying with RTK. To ensure that the accuracy requirements of ±0.05 m at 95% confidence were met, baseline distances were kept under 3 km and controllers were configured to only store measurements meeting study accuracy requirements.

The Trimble R10 receivers are capable of tracking GPS, GLONASS, Galileo, and BeiDou (COMPASS) constellations which were used for all RTK surveying. To check that the GNSS equipment was functioning correctly and to quantify any temporal errors, the same control point was measured at the beginning and end of each day. As part of daily field QA/QC, residual errors on known points were checked to be within expected tolerance of the equipment, and within study accuracy requirements.

The Trimble S6 DR+ Robotic total station was used for all conventional surveying required on the project. For each setup, temperature and pressure adjustments were considered, and preliminary collimation and leveling checks were done to ensure the instrument was functioning correctly. Foresight and backsight checks were recorded at the beginning and end of each setup. This ensured that the instrument had not become disturbed while carrying out measurements. As part of the daily field QA/QC, total station measurements between the temporary control points were confirmed to be within the expected equipment tolerance and within study accuracy requirements.

The manufacturer specified positioning performance under ideal conditions for both types of survey equipment used is provided in **Tables 8** and **9.**

Table 8 - Trimble R10 Manufacturer Specified Positioning Performance Under Ideal Conditions

STATIC AND FAST STATIC		
	Horizontal	3 mm + 0.5 ppm RMS
	Vertical	5 mm + 0.5 ppm RMS
REAL TIME KINEMATIC SURVEYING		
Single Baseline <30 km	Horizontal	8 mm + 1 ppm RMS
	Vertical	15 mm + 1 ppm RMS

Table 9 - Trimble S6 Robotic DR+ Manufacturer Specified Positioning Performance

ANGULAR MEASUREMENT Standard dev. based on DIN 18723	3 seconds (1.0 milligon)	
DISTANCE MEASUREMENT Accuracy (RMSE)	Standard	2 mm + 2 ppm
	Tracking	4 mm + 2 ppm

3.0 ADDITIONAL BASE DATA

Additional base data that was obtained is listed below:

Water Survey of Canada Data

- WSC benchmark data was obtained for the only hydrometric station located within the study reach: WSC Station No. 05BK001 (Fish Creek near Priddis). The provided benchmark locations and assumed datum information (dated February 15, 2010) are included in **Appendix F**. The elevation of the gauge (assumed datum) was noted as 26.377 m. The results of the benchmark survey are as follows:

Table 10 - Benchmark Data

Benchmark ID	Description	Assumed Datum Elevation (m)	Surveyed Datum Elevation (m)	Datum shift (assumed to surveyed) (m)
BM 98-1	Spike in power pole	32.580	1159.580	1127.000
BM 98-2	Brass cap on ground	31.554	1158.594	1127.040
TBM 91-1	Spike in power pole	32.544	1159.579	1127.035
TBM 09-1	Spike in tree	30.956	1157.994	1127.038

The shift between the assumed WSC datum and the survey datum was determined by surveying the primary bench mark BM 98-2. The difference between the assumed elevation of 31.554 m and the surveyed elevation 1158.594 m yields a shift of +1127.040 m. Elevation checks to the secondary benchmarks were found to agree within +/-0.003 m except for BM 98-1 (nail in power pole), which was found to be disturbed by approximately 0.04 m. This could have been a result of the nail being bent down or the pole leaning/sinking.

We recommend moving forward with the WSC data using a +1127.040 m datum shift resulting in a gauge elevation of 1153.417 m (26.377 m+1127.040 m shift).

Additional Data

Additional data provided by AEP included:

- *Priddis Flood Risk Mapping Study (Alberta Environment, 2004)* – including flood hazard mapping GIS data;
- ESRI shapefiles that define the study area, the anticipated LiDAR acquisition area, and the proposed aerial imagery acquisition area;
- LiDAR-derived DTM of the project area (collected in fall 2017); and
- Bridge file drawings were obtained from AT in digital PDF format. This information was used to further support the survey data taken at the hydraulic sections.
- WSC benchmark report was provided by Water Survey of Canada in digital PDF format.

- Cadastral data was obtained from AEP in GIS format and the provincial cadastral data was provided in a digital GIS shapefile.

Preliminary aerial imagery for the study area was acquired in 2016 and provided by AEP to Stantec in fall 2017. Newer orthorectified aerial imagery will be provided to Stantec in fall 2018 and used in all subsequent work.

4.0 CONCLUSIONS

This report documents the methodology and results of the survey and base data collection component of the Priddis River Hazard Study. In conclusion:

- Survey work was completed in fall 2018, and all collected data meets FHIP standards and minimum study-specific ± 0.05 m accuracy requirements.
- The stated accuracy of the LiDAR-derived DTM provided by AEP was confirmed by Stantec by comparison with survey data, and is acceptable for use in hydraulic modelling and flood mapping for this study.
- Preliminary aerial imagery for the study area was acquired in 2016 and provided by AEP to Stantec in fall 2017. Newer imagery will be provided to Stantec in fall 2018 and used in all subsequent work.

5.0 REFERENCES

Alberta Environment, 2011. Flood Hazard Identification Program Guidelines. Prepared by the Water Management Operations River Forecast Section. July 2011.

Alberta Environment, 2004. Priddis Flood Risk Mapping Study. Prepared by the Regional Services River Engineering Team. April 2004

APPENDIX A – CSRS-PPP PROCESSING REPORT

CSRS-PPP (V 1.05 11216)

cp1

Data Start	Data End	Duration of Observations
2017-10-18 14:23:42.000	2017-10-18 21:43:48.000	7h 20m 6.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.010m		2.0m / 1.206m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.938 m

(APC = antenna phase center; ARP = antenna reference point)

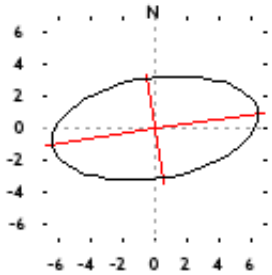
Estimated Position for 00762911.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 52’ 56.1959’’	-114º 20’ 52.2179’’	1171.099 m
Sigmas(95%)	0.003 m	0.005 m	0.011 m
Apriori	50º 52’ 56.218’’	-114º 20’ 52.338’’	1174.903 m
Estimated - Apriori	-0.695 m	2.355 m	-3.804 m

Orthometric Height CGVD28 (HTv2.0)

1186.286 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 6.550mm
semi-minor: 3.132mm
semi-major azimuth: 81º 27’ 3.78’’



UTM (North) Zone 11

5640084.781m (N) 686558.125m (E)

Scale Factors
1.00002739 (point)
0.99984360 (combined)

(Coordinates from RINEX file used as apriori position)

CSRS-PPP (V 1.05 11216)

cp2

Data Start	Data End	Duration of Observations
2017-10-11 14:21:52.000	2017-10-11 21:19:30.000	6h 57m 38.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.009m		2.0m / 1.220m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.905 m

(APC = antenna phase center; ARP = antenna reference point)

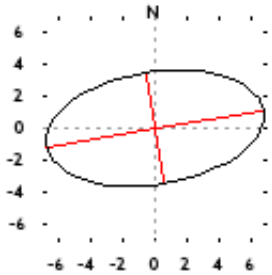
Estimated Position for 00762840.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 54’ 09.7730’’	-114º 26’ 00.2260’’	1234.422 m
Sigmas(95%)	0.003 m	0.005 m	0.011 m
Apriori	50º 54’ 09.793’’	-114º 26’ 00.307’’	1239.083 m
Estimated - Apriori	-0.624 m	1.576 m	-4.661 m

Orthometric Height CGVD28 (HTv2.0)

1249.326 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 6.932mm
semi-minor: 3.499mm
semi-major azimuth: 81º 0’ 34.46’’



UTM (North) Zone 11

5642144.297m (N) 680461.621m (E)

Scale Factors
0.99999991 (point)
0.99980619 (combined)

(Coordinates from RINEX file used as apriori position)

CSRS-PPP (V 1.05 11216)

cp3

Data Start	Data End	Duration of Observations
2017-10-16 14:42:36.000	2017-10-16 22:45:06.000	8h 2m 30.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.010m		2.0m / 1.434m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.820 m

(APC = antenna phase center; ARP = antenna reference point)

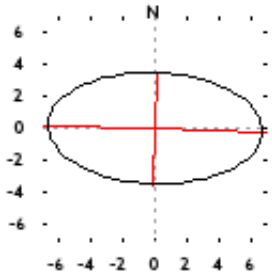
Estimated Position for 00762890.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 53’ 30.1816’’	-114º 24’ 41.9094’’	1198.907 m
Sigmas(95%)	0.003 m	0.005 m	0.011 m
Apriori	50º 53’ 30.181’’	-114º 24’ 41.927’’	1200.846 m
Estimated - Apriori	0.023 m	0.340 m	-1.939 m

Orthometric Height CGVD28 (HTv2.0)

1213.866 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 6.747mm
semi-minor: 3.491mm
semi-major azimuth: 92º 3’ 38.29’’



UTM (North) Zone 11

5640975.028m (N) 682033.900m (E)

Scale Factors
1.00000691 (point)
0.99981876 (combined)

(Coordinates from RINEX file used as apriori position)

CSRS-PPP (V 1.05 11216)

cp4

Data Start	Data End	Duration of Observations
2017-10-27 15:40:24.000	2017-10-27 23:16:58.000	7h 36m 34.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.010m		2.0m / 1.324m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.896 m

(APC = antenna phase center; ARP = antenna reference point)

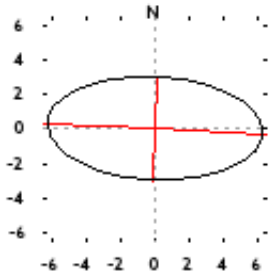
Estimated Position for 03903000.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 55’ 01.9552’’	-114º 18’ 34.8891’’	1137.285 m
Sigmas(95%)	0.002 m	0.005 m	0.010 m
Apriori	50º 55’ 01.945’’	-114º 18’ 34.957’’	1138.972 m
Estimated - Apriori	0.332 m	1.332 m	-1.688 m

Orthometric Height CGVD28 (HTv2.0)

1152.703 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 6.250mm
semi-minor: 2.985mm
semi-major azimuth: 92º 47’ 21.25’’



UTM (North) Zone 11

5644065.653m (N) 689099.427m (E)

Scale Factors
1.00003911 (point)
0.99986063 (combined)

(Coordinates from RINEX file used as apriori position)

CSRS-PPP (V 1.05 11216)

cp5

Data Start	Data End	Duration of Observations
2017-10-31 14:44:58.000	2017-10-31 21:56:36.000	7h 11m 38.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.010m		2.0m / 1.353m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.845 m

(APC = antenna phase center; ARP = antenna reference point)

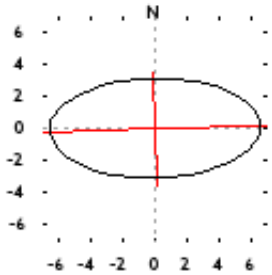
Estimated Position for 03903040.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 51’ 03.7664’’	-114º 20’ 56.9365’’	1186.858 m
Sigmas(95%)	0.003 m	0.005 m	0.011 m
Apriori	50º 51’ 03.825’’	-114º 20’ 56.966’’	1191.495 m
Estimated - Apriori	-1.817 m	0.583 m	-4.637 m

Orthometric Height CGVD28 (HTv2.0)

1201.954 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 6.621mm
semi-minor: 3.118mm
semi-major azimuth: 88º 28’ 6.68’’



UTM (North) Zone 11

5636609.362m (N) 686590.634m (E)

Scale Factors
1.00002754 (point)
0.99984128 (combined)

(Coordinates from RINEX file used as apriori position)

CSRS-PPP (V 1.05 11216)

cp6

Data Start	Data End	Duration of Observations
2017-11-06 15:59:54.000	2017-11-06 21:44:36.000	5h 44m 42.00s
Apri / Aposteriori Phase Std		**Apri / Aposteriori Code Std**
0.015m / 0.010m		2.0m / 1.475m
Observations	**Frequency**	**Mode**
Phase and Code	L1 and L2	Static
Elevation Cut-Off	**Rejected Epochs**	**Observation & Estimation Steps**
10.000 degrees	0.00 %	2.00 sec / 2.00 sec
Antenna Model	**APC to ARP**	**ARP to Marker**
TRMR10 NONE	L1= 0.128 m L2= 0.120 m	1.700 m

(APC = antenna phase center; ARP = antenna reference point)

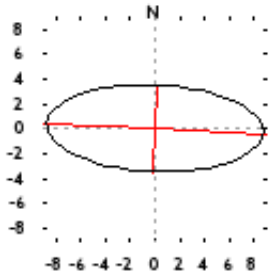
Estimated Position for 03903101.17o

	Latitude (+n)	Longitude (+e)	Ell. Height
NAD83(CSRS) (2002)	50º 50’ 58.9654’’	-114º 24’ 02.4228’’	1222.820 m
Sigmas(95%)	0.003 m	0.007 m	0.012 m
Apriori	50º 50’ 58.988’’	-114º 24’ 02.466’’	1226.941 m
Estimated - Apriori	-0.707 m	0.848 m	-4.122 m

Orthometric Height CGVD28 (HTv2.0)

1237.700 m
(click for height reference information)

95% Error Ellipse (mm)
semi-major: 8.747mm
semi-minor: 3.483mm
semi-major azimuth: 92º 13’ 57.84’’



UTM (North) Zone 11

5636332.161m (N) 682969.644m (E)

Scale Factors
1.00001111 (point)
0.99981921 (combined)

(Coordinates from RINEX file used as apriori position)

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If you have any questions, please feel free to contact:
EMail: nrcan.geodeticinformationservices.rncan@canada.ca
Phone:343-292-6617

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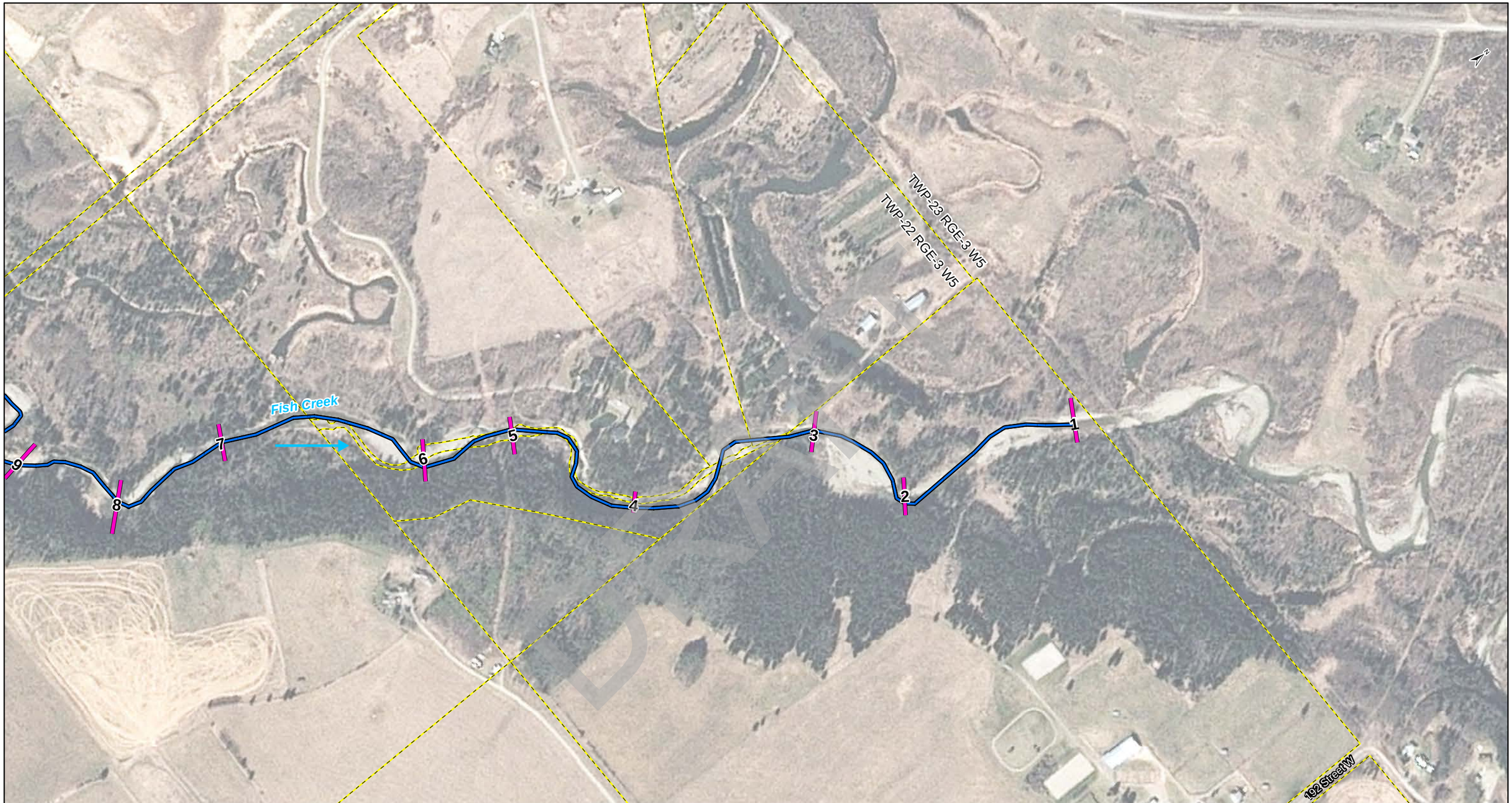
Canada

APPENDIX B – SURVEYED CROSS SECTIONS & RELATED DATA



Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

Projection: NAD 1983 3TM 114
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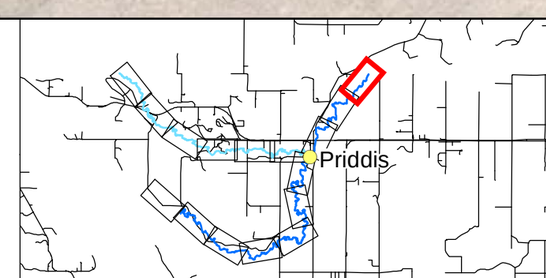
Imagery: 2017



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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

100 50 0 100
Meters
1:5,000

Sheet 1 of 16

DATE: January 2019
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Author: Marty Anderson

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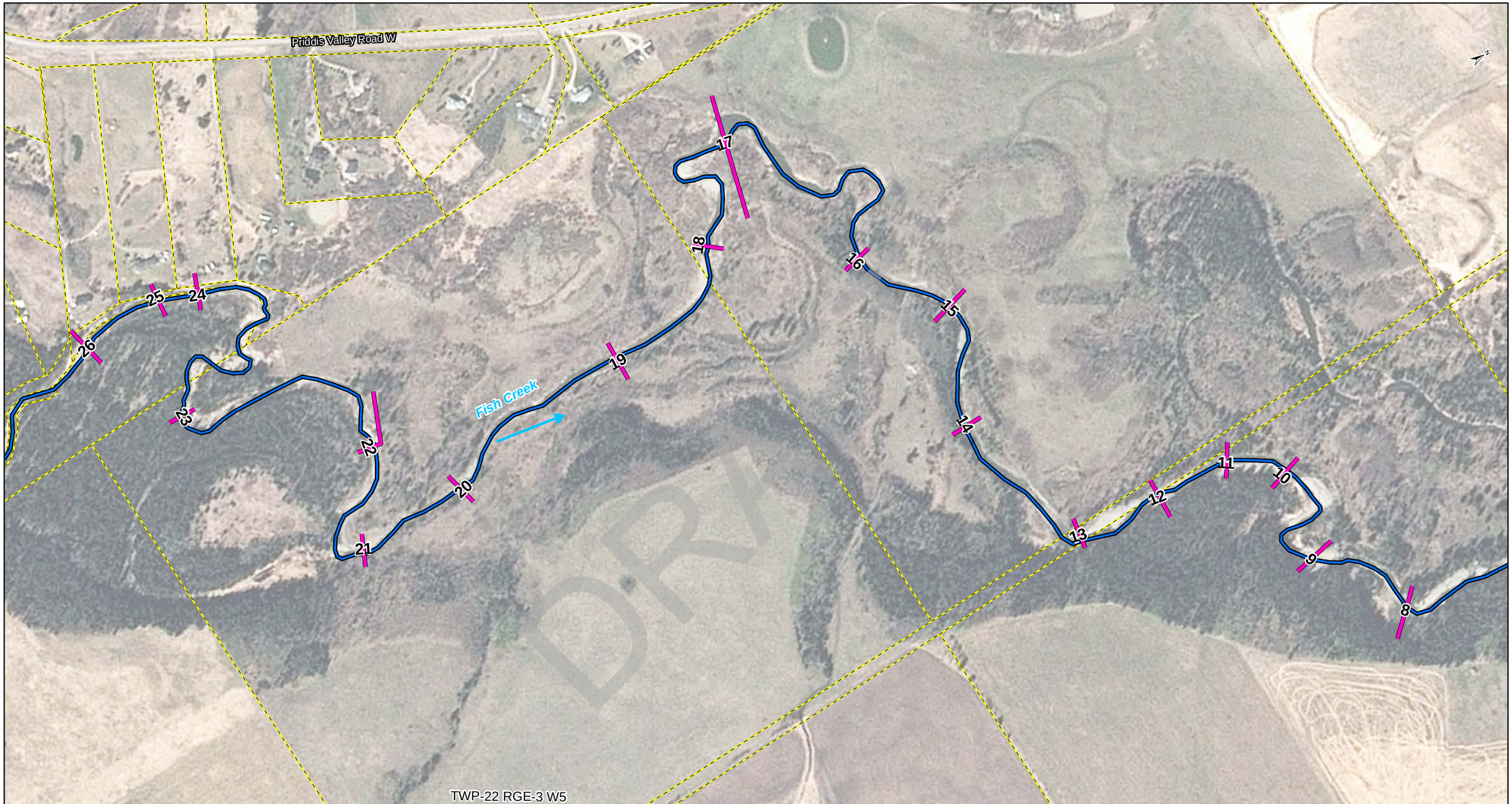
Classification: Public



Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

Projection: NAD 1983 3TM 114
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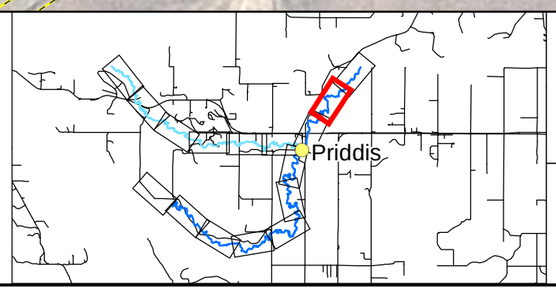

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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Meters
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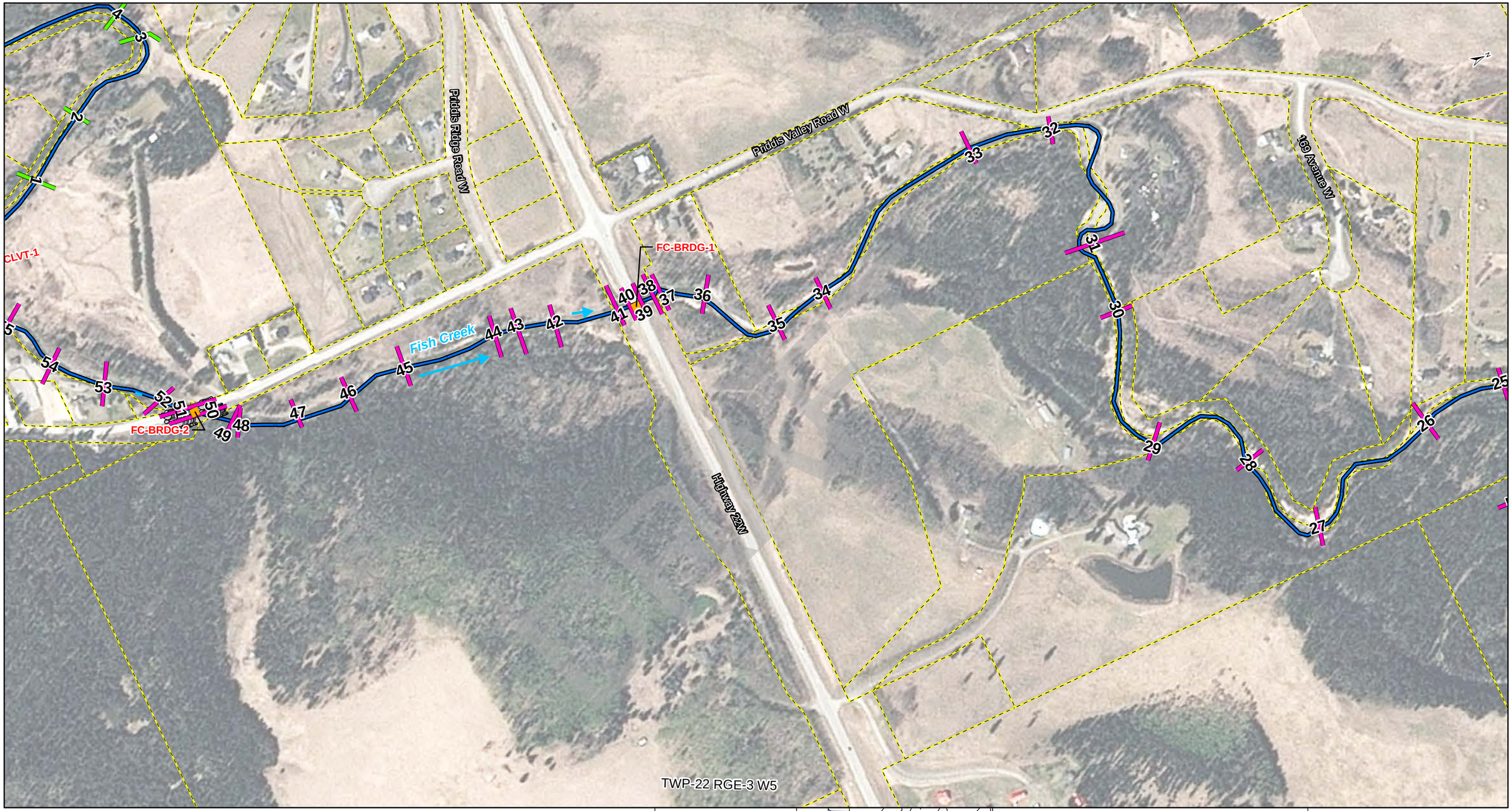

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

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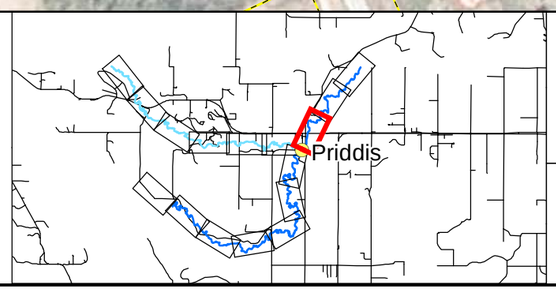

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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Meters
1:5,000

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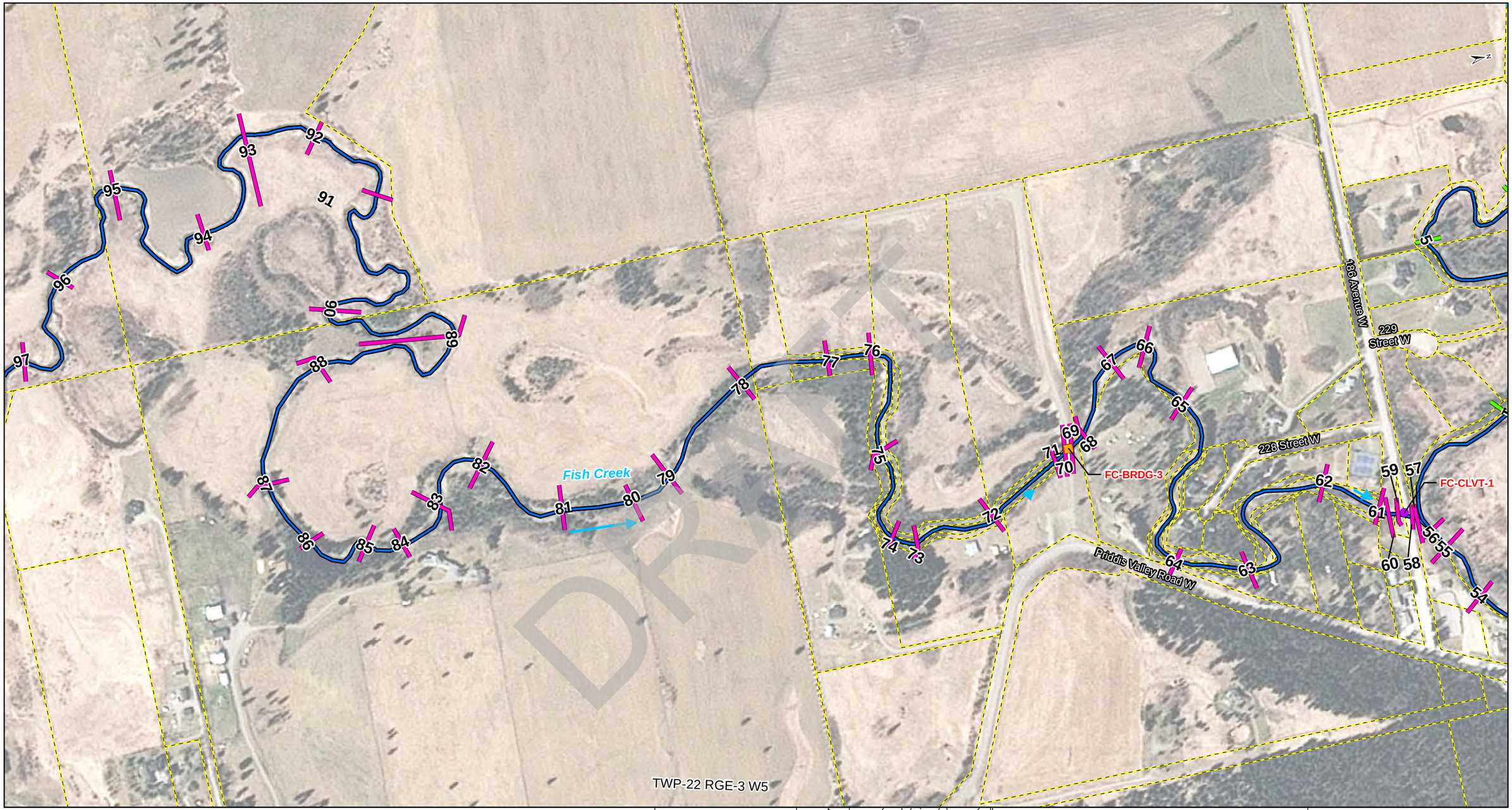
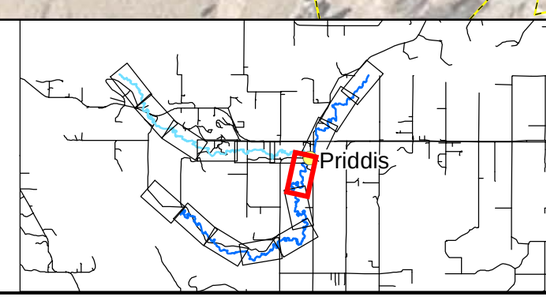


Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral



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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

100 50 0 100
Meters
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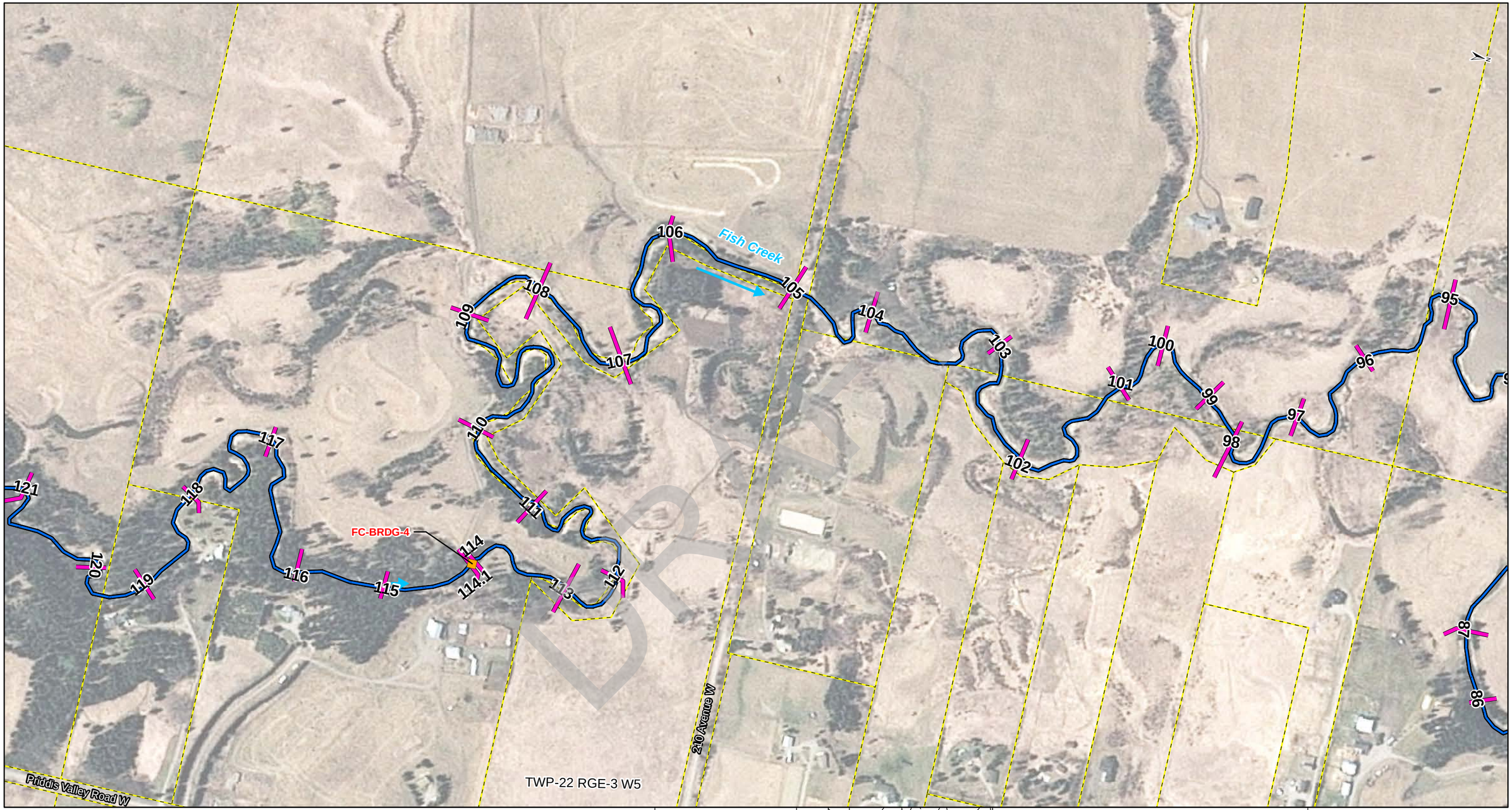
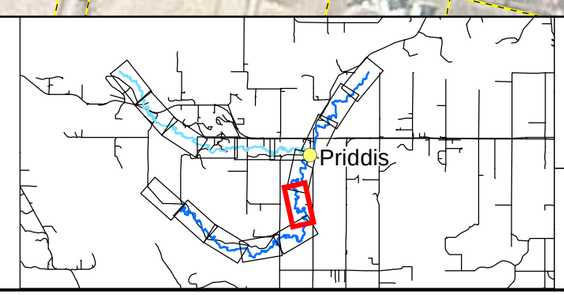


Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral



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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

100 50 0 100
Meters
1:5,000

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Author: Marty Anderson

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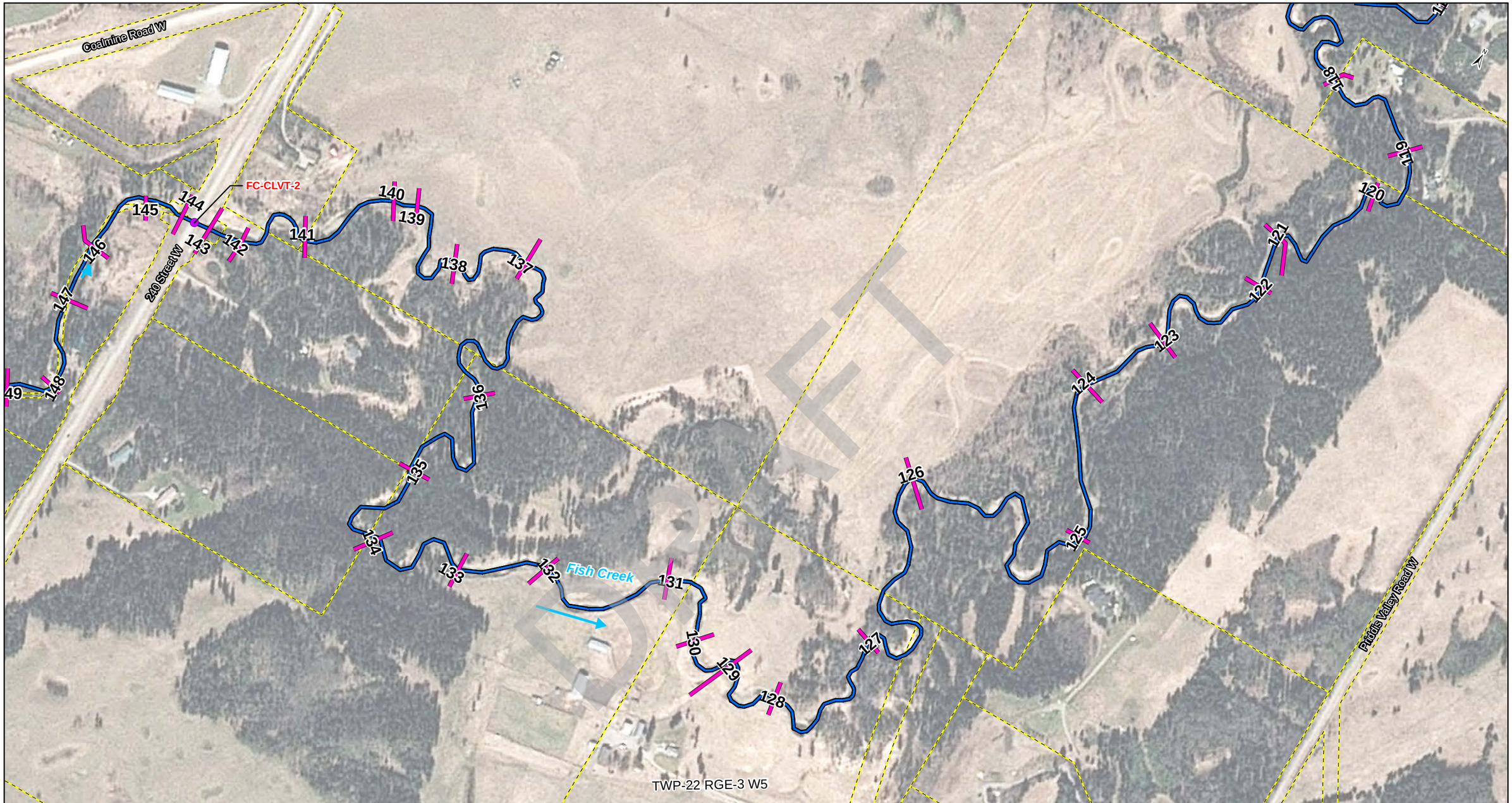

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

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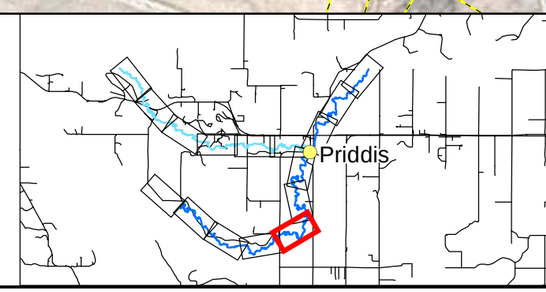

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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Meters
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Sheet 6 of 16

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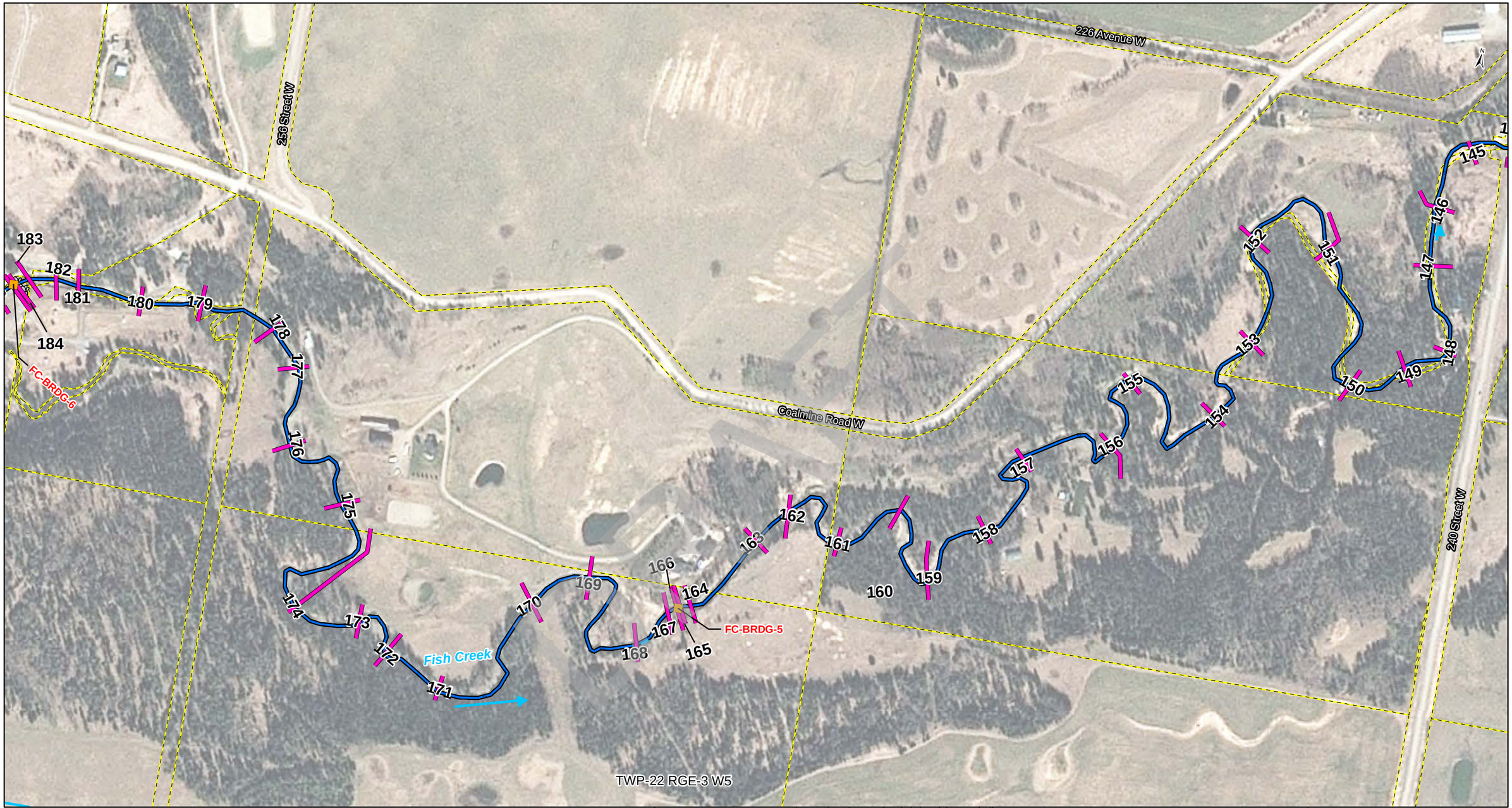
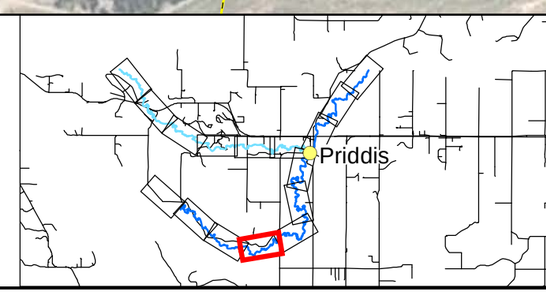


Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral



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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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Meters
1:5,000

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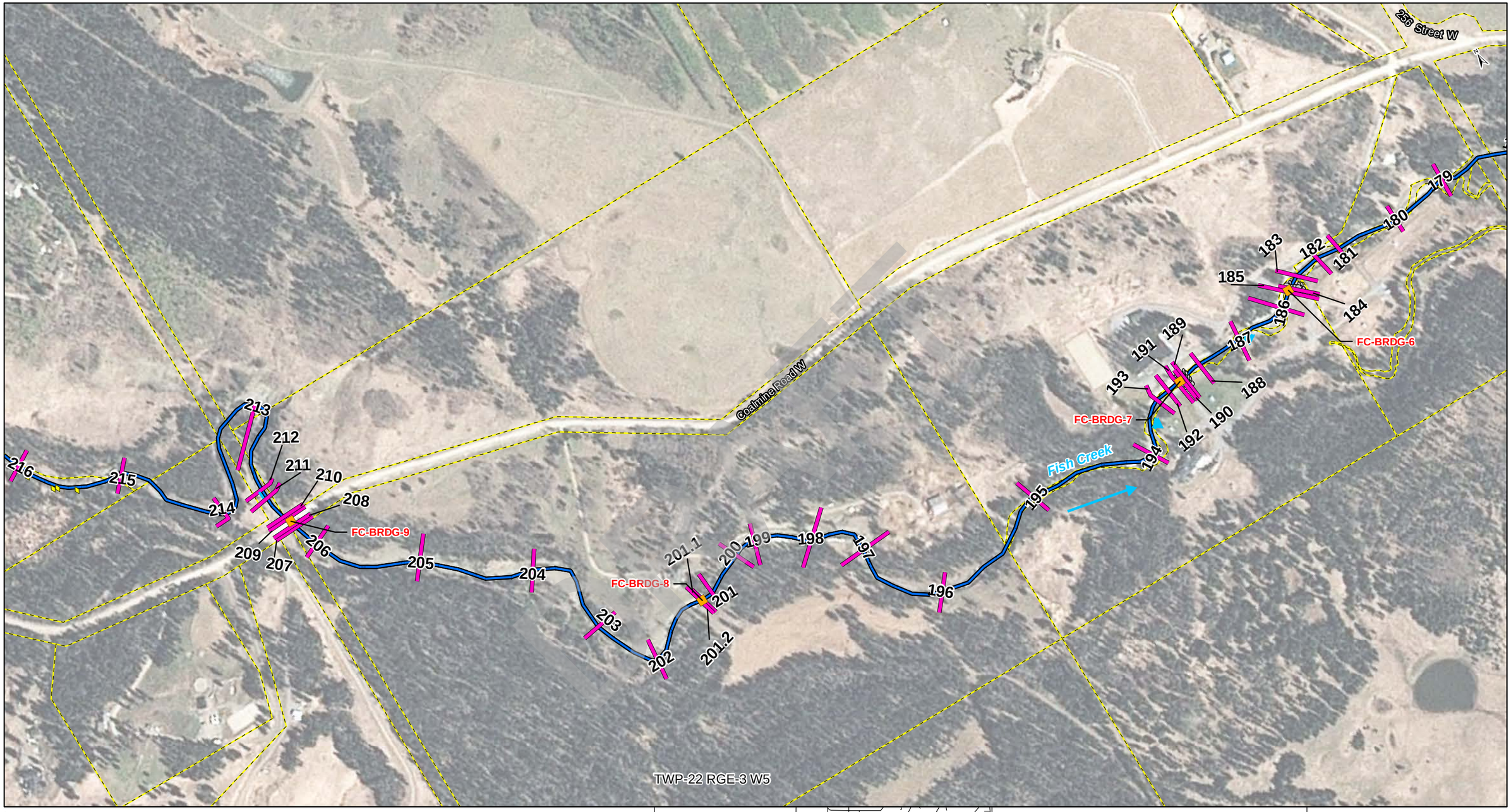

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

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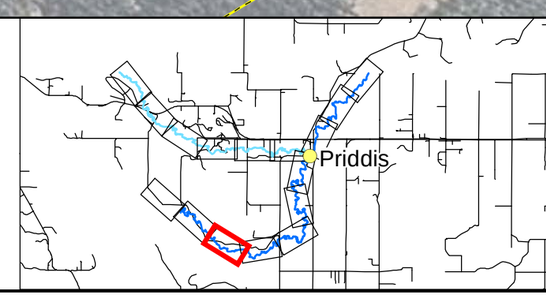

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

100 50 0 100
Meters
1:5,000

Sheet 8 of 16

DATE: January 2019
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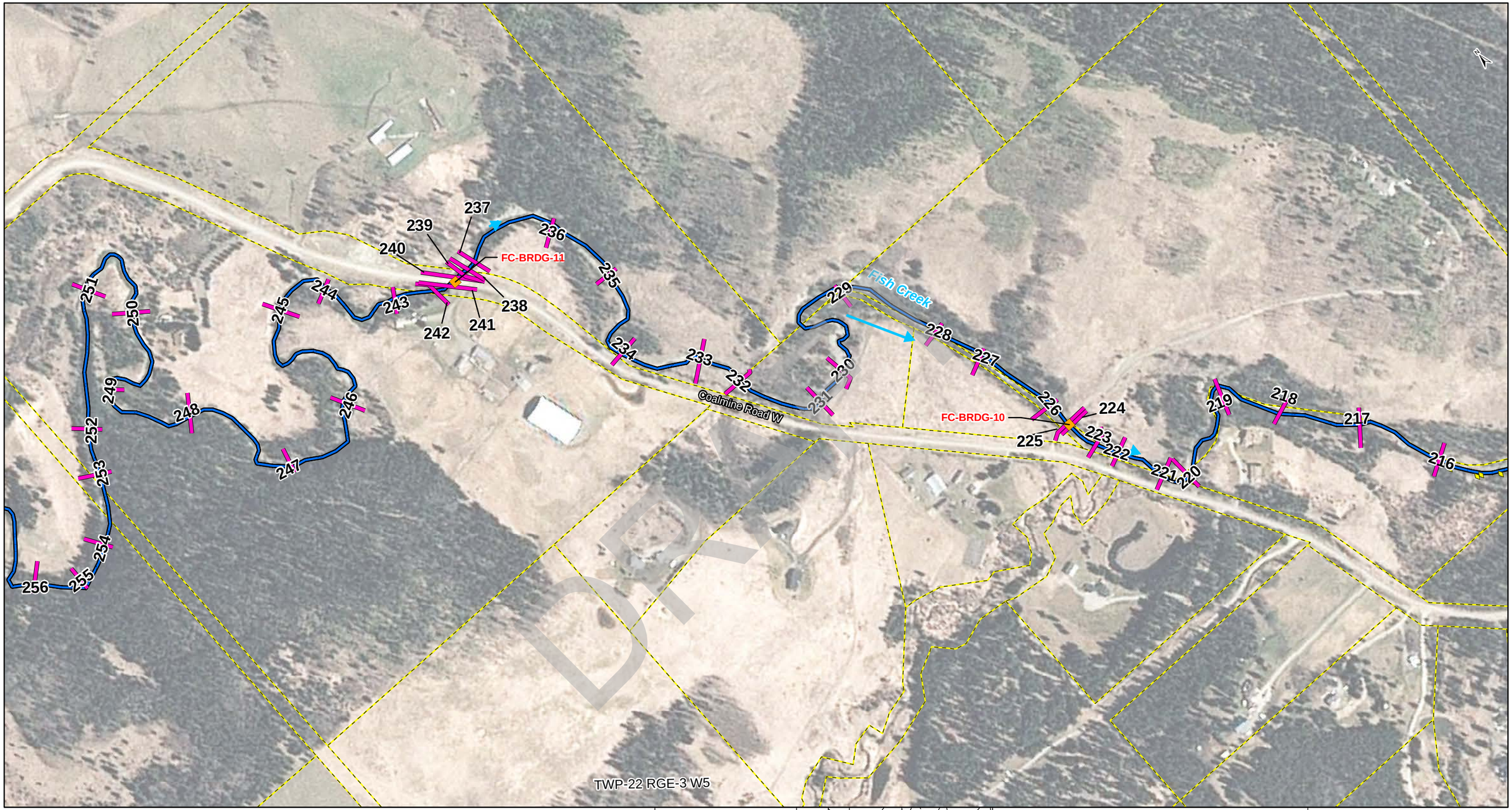
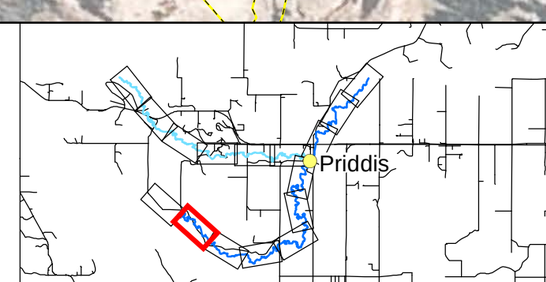


Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral



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Imagery: 2017

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Priddis River Hazard Study

100 50 0 100
Meters
1:5,000

Surveyed Cross Sections and Related Data

Sheet 9 of 16

DATE: January 2019
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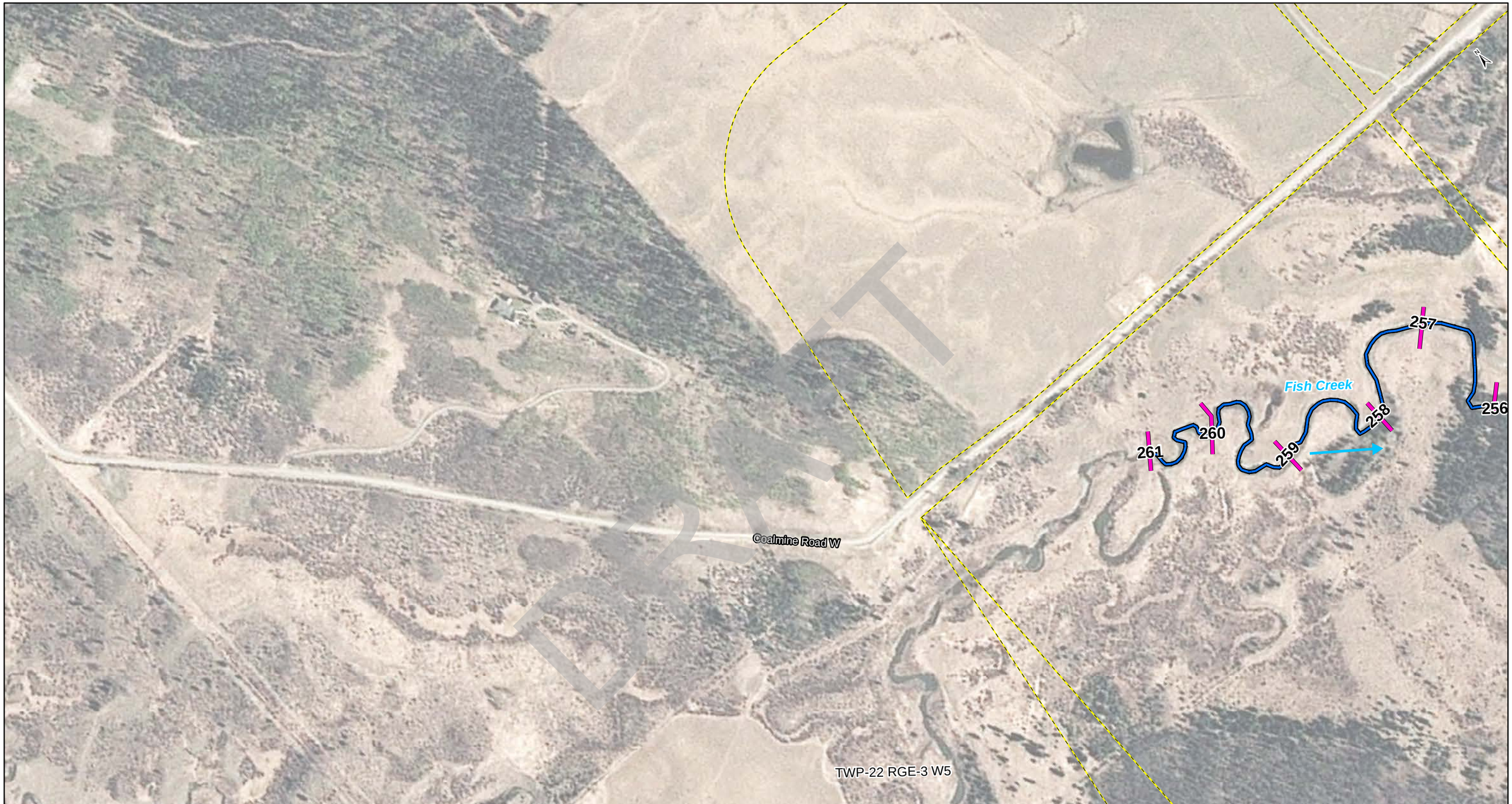

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

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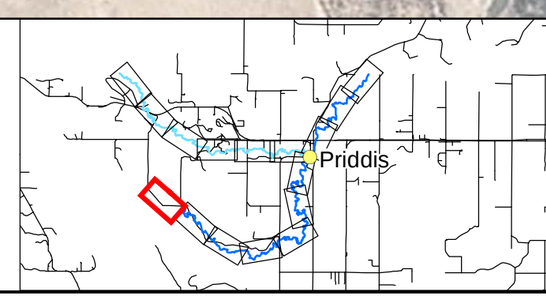

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

100 50 0 100
Meters
1:5,000

Sheet 10 of 16

DATE: January 2019
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Stantec

Author: Marty Anderson

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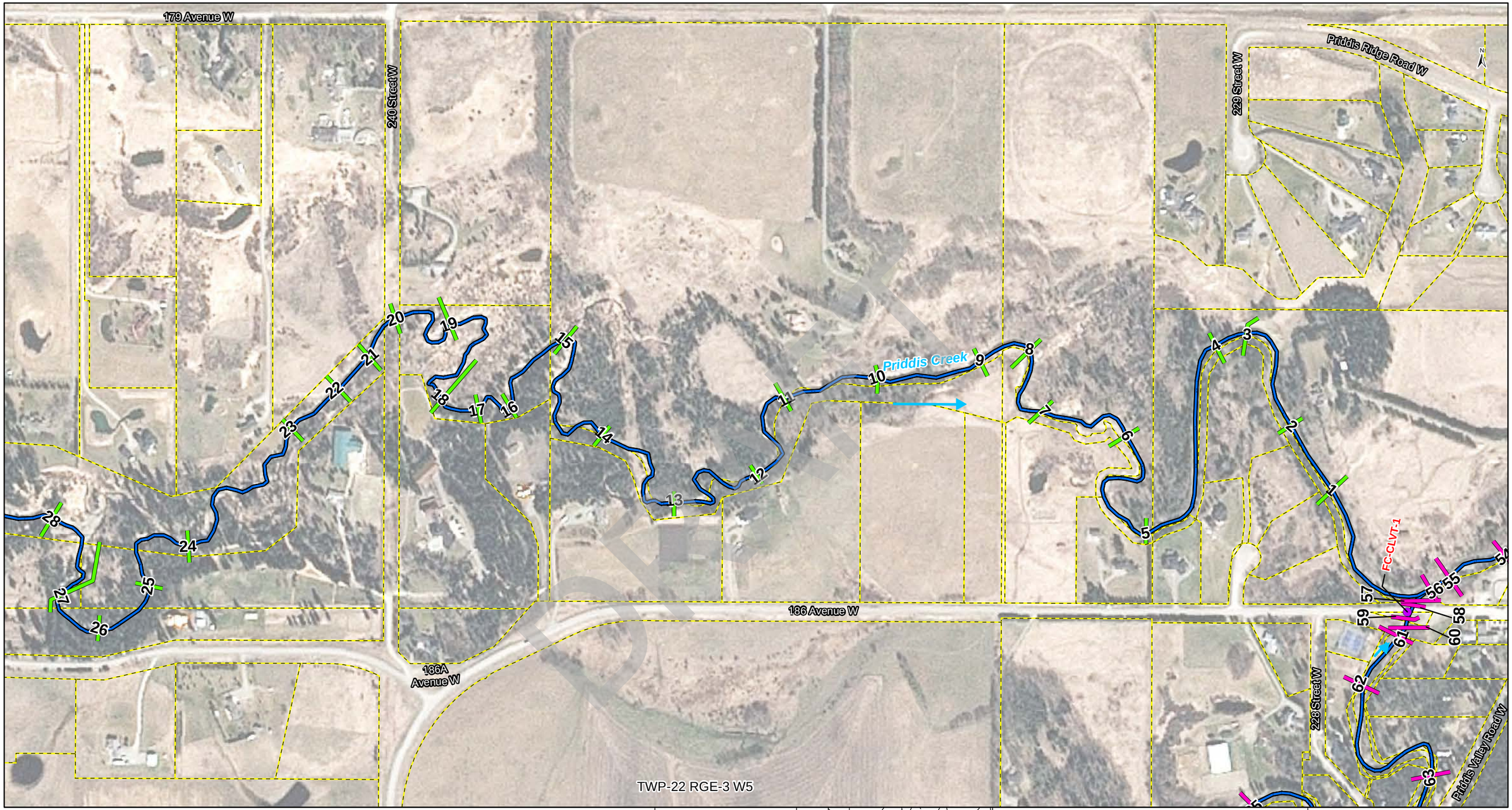
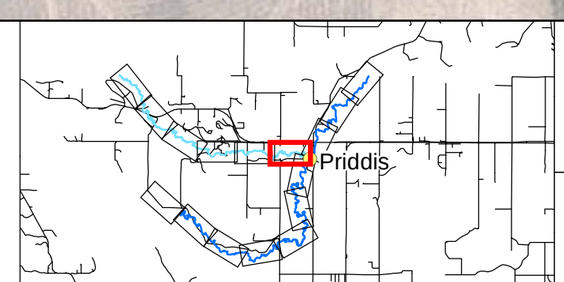


Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral



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Priddis River Hazard Study

100 50 0 100
Meters
1:5,000

Surveyed Cross Sections and Related Data

Sheet 11 of 16

DATE: January 2019

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3/18/2019

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Imagery: 2017

Author: Marty Anderson

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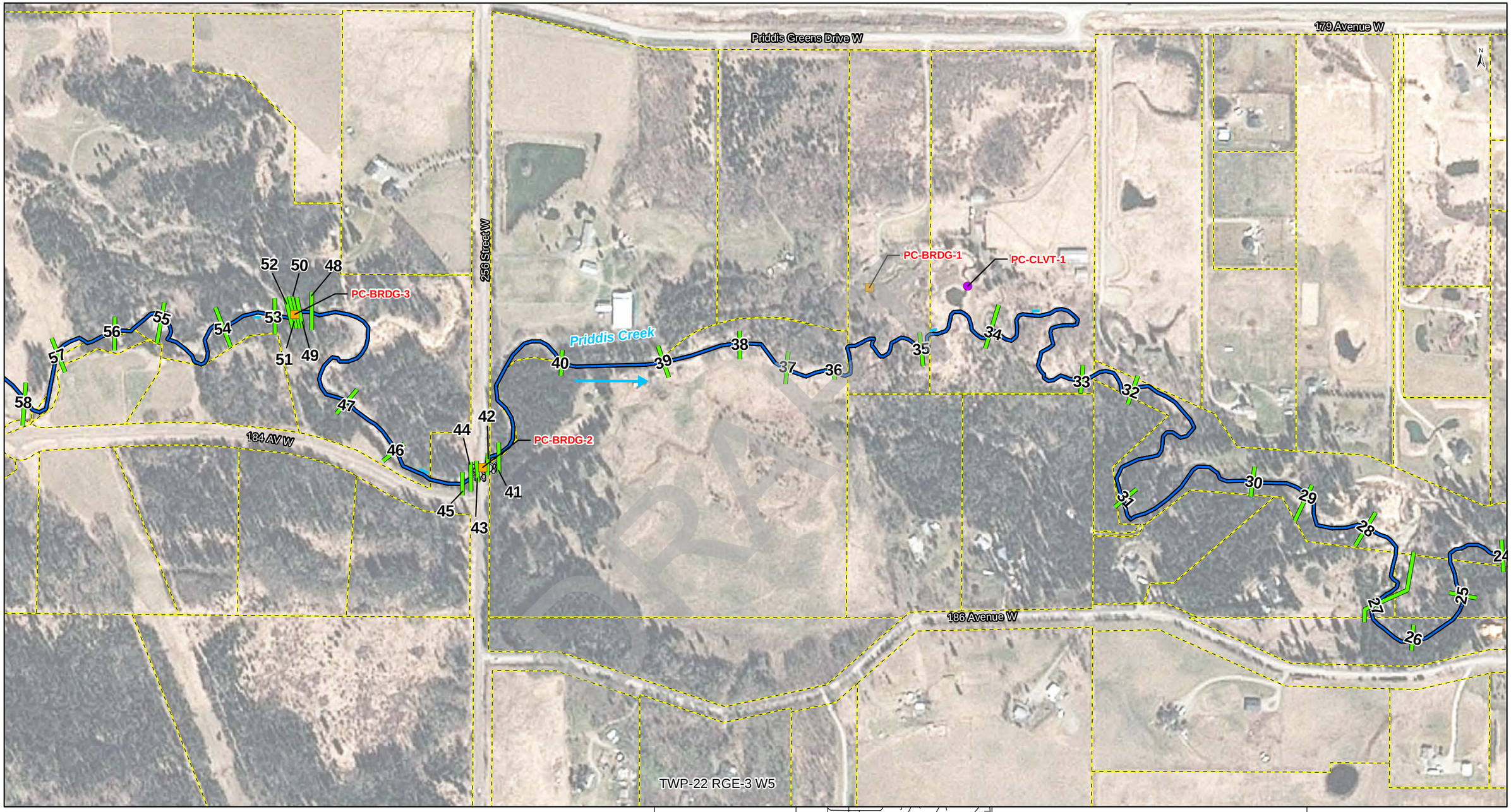

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

Projection: NAD 1983 3TM 114
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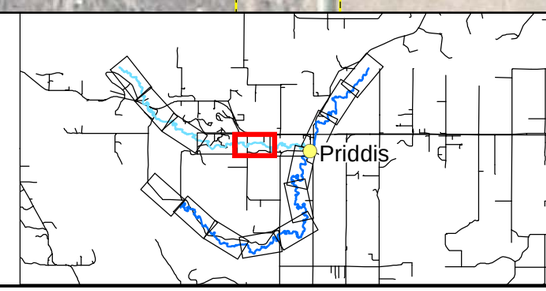
Imagery: 2017



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Priddis River Hazard Study

100 50 0 100
Meters
1:5,000

Surveyed Cross Sections and Related Data

Sheet 12 of 16

DATE: January 2019
QA/QC:

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Author: Marty Anderson

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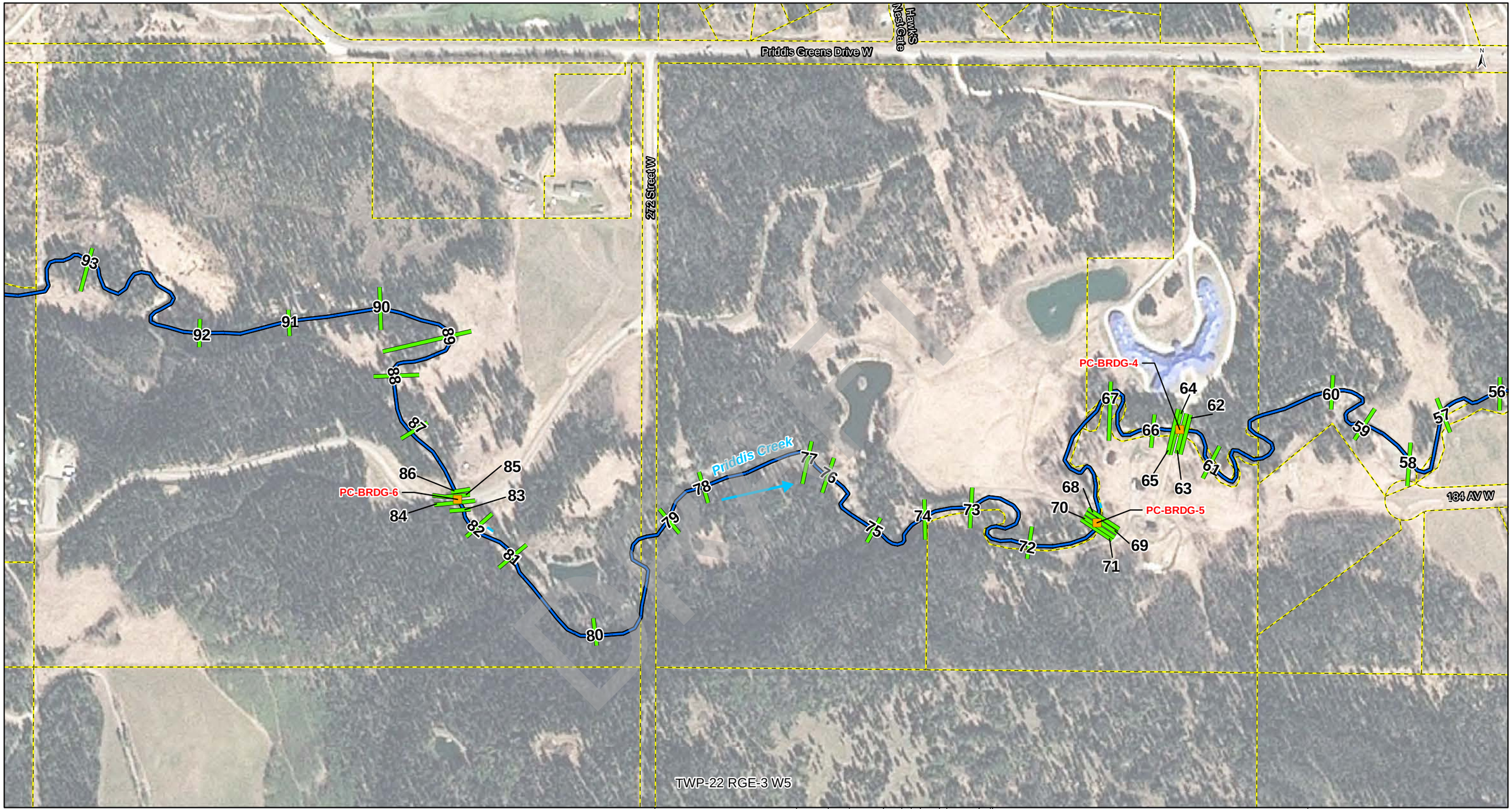
Classification: Public



Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall

- Priddis Creek Survey Cross Section
- Fish Creek Survey Cross Section
- Watercourse
- Flow Direction
- Cadastral

Projection: NAD 1983 3TM 114
Source: Stantec Consulting Ltd., Contains information licensed under the Open Government license.
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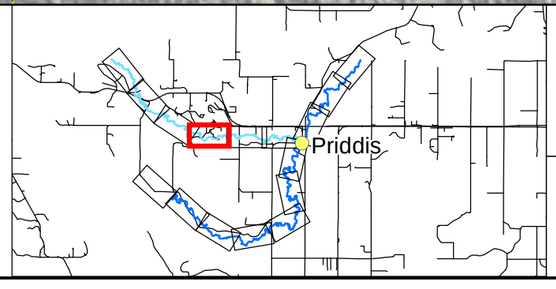
Imagery: 2017



Alberta Government

Priddis River Hazard Study

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Surveyed Cross Sections and Related Data

Sheet 13 of 16

DATE: January 2019
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Legend

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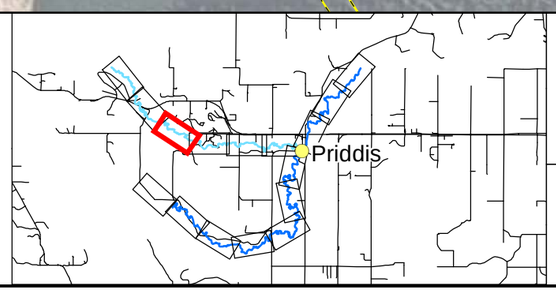

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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Meters
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Sheet 14 of 16

DATE: January 2019

QA/QC:

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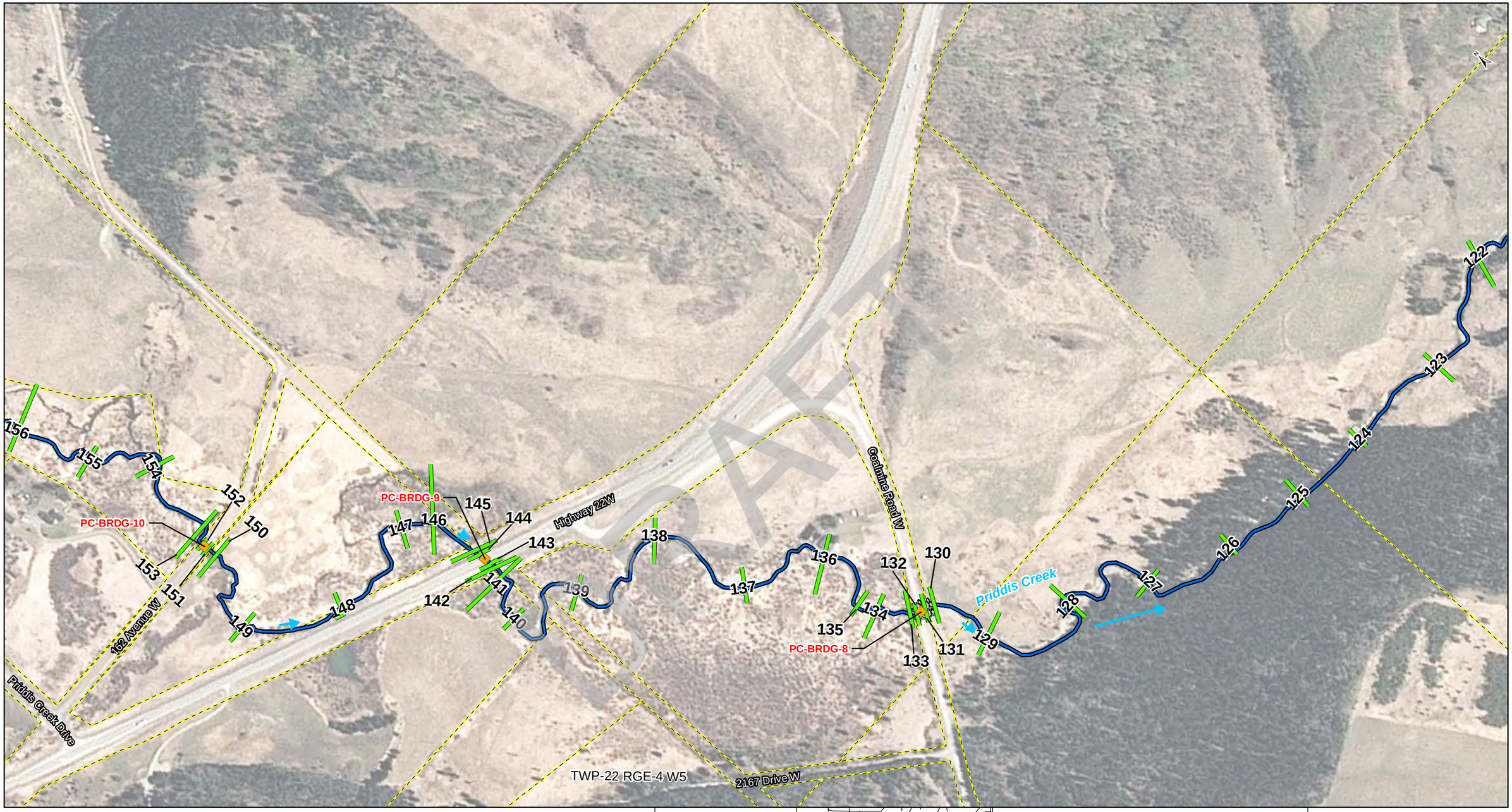

Legend

Hydraulic Structures
- Bridge
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- Riprap
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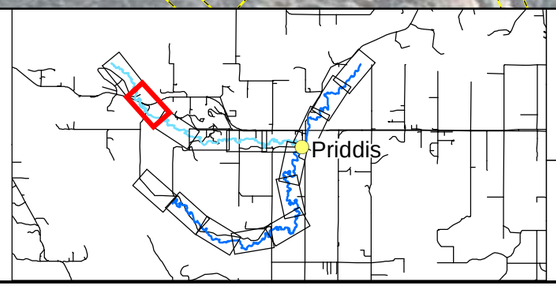

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Priddis River Hazard Study

Surveyed Cross Sections and Related Data

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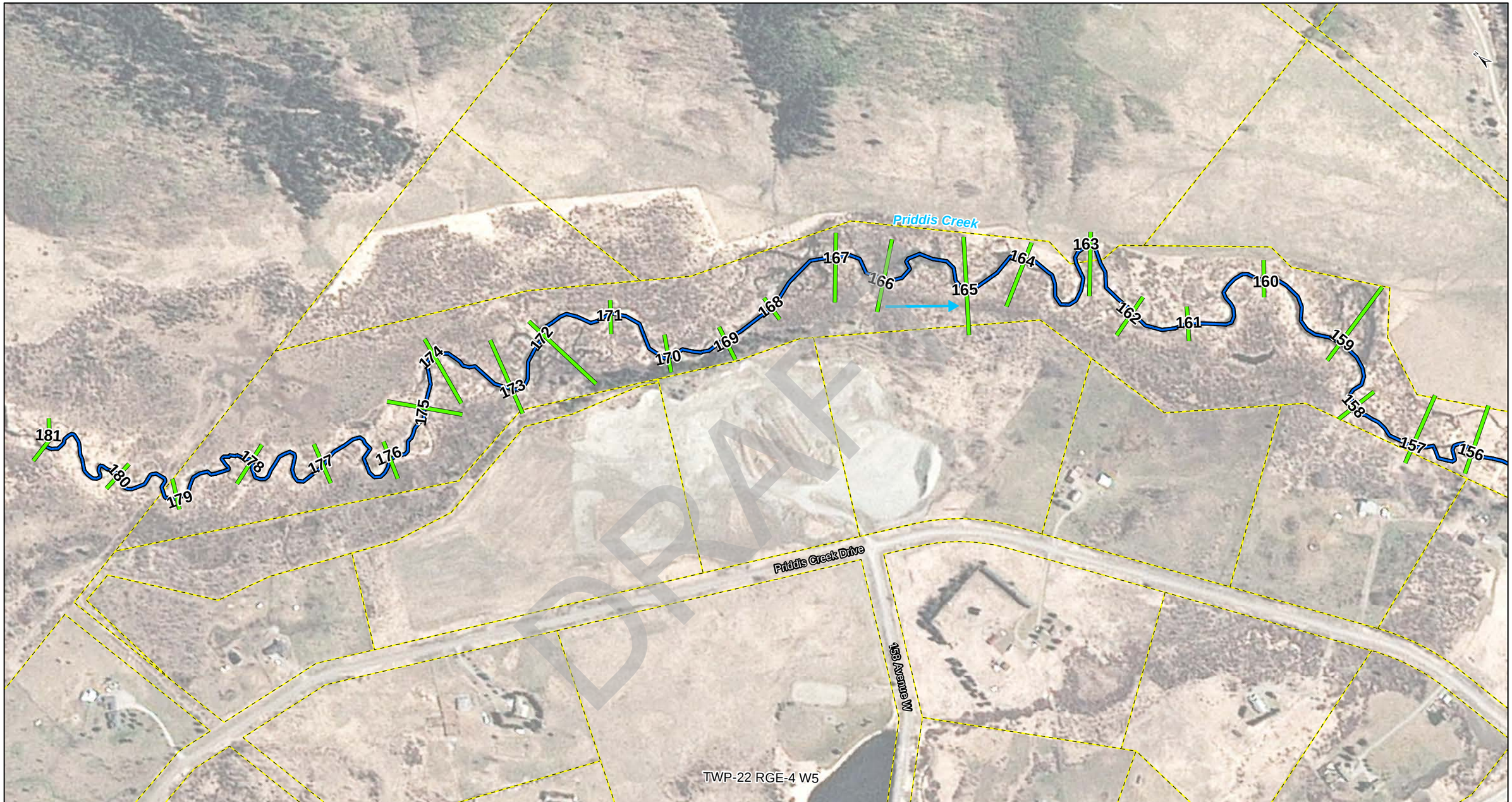

Legend

Hydraulic Structures
- Bridge
- Culvert

Other Features
- Riprap
- Retaining Wall
- Priddis Creek Survey Cross Section
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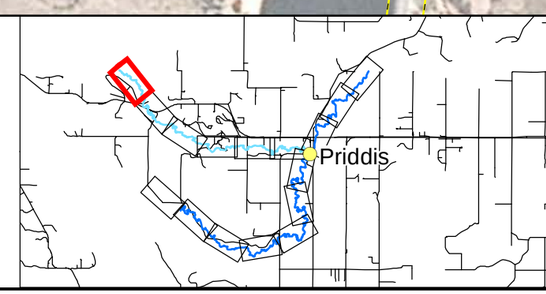

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Priddis River Hazard Study

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Meters
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Surveyed Cross Sections and Related Data

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Classification: Public

APPENDIX C – SURVEY DATA

Table C.1 - Fish Creek Cross Section Properties

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	0	1	1129.33	2	1129.55	1129.54	1129.55	0.01
Fish Creek	263	2	1129.74	2	1130.59	1130.58	1130.59	0.01
Fish Creek	430	3	1130.91	2	1131.63	1131.62	1131.63	0.01
Fish Creek	717	4	1132.98	2	1133.20	1133.14	1133.25	0.11
Fish Creek	947	5	1134.07	4	1134.26	1134.20	1134.31	0.11
Fish Creek	1076	6	1133.58	2	1134.54	1134.53	1134.54	0.01
Fish Creek	1372	7	1134.93	2	1135.40	1135.39	1135.41	0.02
Fish Creek	1541	8	1135.71	2	1136.21	1136.19	1136.23	0.04
Fish Creek	1695	9	1137.24	4	1137.41	1137.31	1137.50	0.19
Fish Creek	1884	10	1137.01	2	1138.28	1138.27	1138.30	0.03
Fish Creek	1967	11	1137.58	2	1138.31	1138.28	1138.34	0.06
Fish Creek	2070	12	1137.95	2	1138.37	1138.37	1138.37	0.00
Fish Creek	2193	13	1138.36	2	1138.72	1138.70	1138.73	0.03
Fish Creek	2422	14	1139.16	2	1139.43	1139.42	1139.43	0.01
Fish Creek	2597	15	1139.81	2	1140.27	1140.26	1140.27	0.01
Fish Creek	2736	16	1140.21	2	1140.79	1140.78	1140.80	0.02
Fish Creek	3143	17	1141.21	4	1142.17	1142.16	1142.18	0.02
Fish Creek	3388	18	1142.80	2	1143.11	1143.09	1143.12	0.03
Fish Creek	3601	19	1142.83	2	1143.50	1143.46	1143.53	0.07
Fish Creek	3882	20	1142.39	2	1143.69	1143.67	1143.70	0.03
Fish Creek	4038	21	1144.17	2	1144.40	1144.37	1144.43	0.06
Fish Creek	4245	22	1144.60	4	1145.06	1145.01	1145.10	0.09
Fish Creek	4590	23	1145.19	2	1146.03	1146.02	1146.04	0.02
Fish Creek	4975	24	1146.89	2	1147.08	1147.08	1147.08	0.00
Fish Creek	5028	25	1146.50	2	1147.11	1147.09	1147.12	0.03
Fish Creek	5146	26	1146.48	2	1147.11	1147.10	1147.11	0.01
Fish Creek	5361	27	1147.04	2	1147.89	1147.88	1147.90	0.02
Fish Creek	5510	28	1147.80	2	1148.17	1148.13	1148.21	0.08
Fish Creek	5682	29	1148.45	2	1148.99	1148.99	1148.99	0.00
Fish Creek	5884	30	1149.27	2	1149.43	1149.41	1149.44	0.03
Fish Creek	5986	31	1149.47	2	1149.82	1149.82	1149.82	0.00
Fish Creek	6249	32	1149.87	2	1150.86	1150.82	1150.89	0.07
Fish Creek	6361	33	1150.39	2	1150.87	1150.86	1150.87	0.01
Fish Creek	6642	34	1151.70	2	1151.87	1151.84	1151.90	0.06

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	6718	35	1151.39	2	1152.20	1152.18	1152.22	0.04
Fish Creek	6835	36	1152.62	2	1152.87	1152.85	1152.88	0.03
Fish Creek	6898	37	1152.32	2	1152.89	1152.88	1152.90	0.02
Fish Creek	6911	38	1152.23	2	1152.88	1152.85	1152.90	0.05
Fish Creek	6928	39	1151.22	2	1152.84	1152.83	1152.84	0.01
Fish Creek	6945	40	1149.63	2	1152.84	1152.82	1152.85	0.03
Fish Creek	6961	41	1151.40	2	1152.90	1152.89	1152.91	0.02
Fish Creek	7049	42	1152.96	2	1153.27	1153.26	1153.27	0.01
Fish Creek	7098	43	1152.36	2	1153.29	1153.26	1153.31	0.05
Fish Creek	7129	44	1152.47	2	1153.34	1153.29	1153.38	0.09
Fish Creek	7258	45	1152.62	2	1153.28	1153.28	1153.28	0.00
Fish Creek	7343	46	1153.70	4	1153.94	1153.85	1154.03	0.18
Fish Creek	7414	47	1153.97	2	1154.24	1154.21	1154.27	0.06
Fish Creek	7499	48	1153.70	3	1154.39	1154.39	1154.39	0.00
Fish Creek	7509	49	1153.51	2	1154.38	1154.36	1154.40	0.04
Fish Creek	7548	50	1153.96	2	1154.38	1154.37	1154.39	0.02
Fish Creek	7578	51	1153.82	2	1154.56	1154.55	1154.56	0.01
Fish Creek	7609	52	1154.33	2	1154.70	1154.70	1154.70	0.00
Fish Creek	7685	53	1154.50	2	1154.87	1154.85	1154.88	0.03
Fish Creek	7761	54	1154.64	2	1155.66	1155.63	1155.68	0.05
Fish Creek	7842	55	1155.52	2	1155.73	1155.66	1155.80	0.14
Fish Creek	7872	56	1155.29	2	1155.92	1155.92	1155.92	0.00
Fish Creek	7898	57	1155.94	2	1156.01	1156.01	1156.01	0.00
Fish Creek	7904	58	1155.78	2	1156.01	1156.01	1156.01	0.00
Fish Creek	7924	59	1155.92	2	1156.08	1156.08	1156.09	0.01
Fish Creek	7936	60	1155.95	2	1156.20	1156.19	1156.20	0.01
Fish Creek	7951	61	1156.09	2	1156.23	1156.19	1156.26	0.07
Fish Creek	8032	62	1156.50	2	1156.91	1156.89	1156.92	0.03
Fish Creek	8279	63	1158.25	2	1158.66	1158.65	1158.67	0.02
Fish Creek	8377	64	1158.50	2	1159.15	1159.14	1159.15	0.01
Fish Creek	8631	65	1159.70	2	1160.17	1160.16	1160.18	0.02
Fish Creek	8739	66	1159.84	2	1160.67	1160.62	1160.71	0.09
Fish Creek	8792	67	1160.14	2	1160.69	1160.68	1160.69	0.01
Fish Creek	8899	68	1160.47	2	1160.89	1160.86	1160.92	0.06
Fish Creek	8920	69	1159.62	2	1160.92	1160.90	1160.94	0.04
Fish Creek	8933	70	1159.52	2	1160.92	1160.90	1160.94	0.04

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	8948	71	1160.74	2	1160.92	1160.91	1160.93	0.02
Fish Creek	9063	72	1161.53	2	1161.66	1161.66	1161.66	0.00
Fish Creek	9176	73	1162.10	2	1162.30	1162.26	1162.34	0.08
Fish Creek	9211	74	1162.25	2	1162.42	1162.41	1162.43	0.02
Fish Creek	9342	75	1162.53	2	1162.80	1162.79	1162.80	0.01
Fish Creek	9496	76	1163.13	2	1163.50	1163.47	1163.52	0.05
Fish Creek	9553	77	1163.06	2	1163.52	1163.51	1163.52	0.01
Fish Creek	9676	78	1163.14	2	1163.59	1163.56	1163.61	0.05
Fish Creek	9837	79	1164.81	2	1164.99	1164.96	1165.02	0.06
Fish Creek	9896	80	1164.30	2	1165.14	1165.12	1165.15	0.03
Fish Creek	9991	81	1165.19	4	1165.33	1165.27	1165.38	0.11
Fish Creek	10129	82	1165.51	2	1165.89	1165.87	1165.90	0.03
Fish Creek	10234	83	1166.30	2	1166.49	1166.35	1166.62	0.27
Fish Creek	10311	84	1166.23	2	1166.77	1166.76	1166.77	0.01
Fish Creek	10364	85	1166.40	2	1167.31	1167.30	1167.32	0.02
Fish Creek	10466	86	1166.87	2	1167.66	1167.64	1167.68	0.04
Fish Creek	10561	87	1166.52	2	1167.54	1167.53	1167.55	0.02
Fish Creek	10746	88	1167.17	2	1167.77	1167.76	1167.77	0.01
Fish Creek	10982	89	1168.04	2	1168.16	1168.15	1168.17	0.02
Fish Creek	11194	90	1167.36	2	1168.57	1168.56	1168.58	0.02
Fish Creek	11531	91	1169.08	2	1169.34	1169.32	1169.36	0.04
Fish Creek	11664	92	1168.81	2	1169.36	1169.34	1169.38	0.04
Fish Creek	11765	93	1168.68	2	1169.49	1169.48	1169.50	0.02
Fish Creek	11989	94	1169.08	2	1169.60	1169.59	1169.60	0.01
Fish Creek	12205	95	1169.25	3	1169.92	1169.91	1169.92	0.01
Fish Creek	12378	96	1170.08	4	1170.32	1170.29	1170.34	0.05
Fish Creek	12555	97	1170.25	2	1170.87	1170.87	1170.88	0.01
Fish Creek	12708	98	1170.66	4	1171.04	1171.02	1171.06	0.04
Fish Creek	12771	99	1170.64	2	1171.08	1171.08	1171.08	0.00
Fish Creek	12868	100	1171.18	2	1171.45	1171.43	1171.47	0.04
Fish Creek	12956	101	1171.09	2	1171.59	1171.58	1171.59	0.01
Fish Creek	13186	102	1171.09	2	1171.95	1171.91	1171.98	0.07
Fish Creek	13375	103	1171.73	2	1172.43	1172.41	1172.44	0.03
Fish Creek	13616	104	1172.32	2	1173.60	1173.57	1173.62	0.05
Fish Creek	13792	105	1172.52	2	1173.97	1173.96	1173.98	0.02
Fish Creek	13975	106	1173.29	2	1174.07	1174.06	1174.07	0.01

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	14219	107	1173.61	2	1174.10	1174.08	1174.12	0.04
Fish Creek	14380	108	1174.18	2	1174.41	1174.41	1174.41	0.00
Fish Creek	14499	109	1174.24	2	1174.57	1174.54	1174.60	0.06
Fish Creek	14886	110	1175.18	2	1175.42	1175.40	1175.44	0.04
Fish Creek	15022	111	1175.16	2	1175.59	1175.58	1175.60	0.02
Fish Creek	15269	112	1175.66	2	1176.23	1176.22	1176.23	0.01
Fish Creek	15368	113	1175.89	2	1176.30	1176.28	1176.32	0.04
Fish Creek	15523	114	1176.25	2	1176.52	1176.50	1176.54	0.04
Fish Creek	15530	114.1	1176.32	2	1176.79	1176.77	1176.82	0.05
Fish Creek	15653	115	1176.52	2	1176.66	1176.63	1176.68	0.05
Fish Creek	15773	116	1176.97	2	1177.30	1177.29	1177.30	0.01
Fish Creek	15992	117	1176.83	2	1177.61	1177.61	1177.61	0.00
Fish Creek	16237	118	1177.73	2	1177.81	1177.79	1177.84	0.05
Fish Creek	16400	119	1178.39	2	1178.74	1178.74	1178.74	0.00
Fish Creek	16522	120	1178.62	5	1178.45	1178.04	1178.86	0.82
Fish Creek	16722	121	1178.03	6	1179.24	1179.17	1179.31	0.14
Fish Creek	16793	122	1178.70	2	1179.54	1179.50	1179.57	0.07
Fish Creek	17008	123	1179.42	2	1179.57	1179.55	1179.58	0.03
Fish Creek	17129	124	1178.77	2	1179.63	1179.63	1179.63	0.00
Fish Creek	17343	125	1179.74	2	1180.12	1180.10	1180.14	0.04
Fish Creek	17772	126	1180.41	2	1180.85	1180.82	1180.87	0.05
Fish Creek	18161	127	1181.53	2	1182.00	1181.96	1182.03	0.07
Fish Creek	18400	128	1182.35	4	1182.59	1182.51	1182.67	0.16
Fish Creek	18522	129	1182.04	2	1182.86	1182.85	1182.87	0.02
Fish Creek	18614	130	1182.72	2	1183.18	1183.17	1183.18	0.01
Fish Creek	18765	131	1183.11	2	1183.34	1183.30	1183.38	0.08
Fish Creek	18936	132	1183.07	2	1183.66	1183.64	1183.68	0.04
Fish Creek	19056	133	1183.23	2	1183.84	1183.82	1183.85	0.03
Fish Creek	19230	134	1183.93	4	1184.23	1184.10	1184.35	0.25
Fish Creek	19401	135	1184.60	2	1184.74	1184.73	1184.74	0.01
Fish Creek	19644	136	1184.63	2	1185.36	1185.33	1185.40	0.07
Fish Creek	19991	137	1186.40	2	1186.53	1186.52	1186.54	0.02
Fish Creek	20131	138	1186.22	2	1187.10	1187.07	1187.12	0.05
Fish Creek	20302	139	1187.18	2	1187.41	1187.39	1187.43	0.04
Fish Creek	20335	140	1185.97	2	1187.40	1187.37	1187.43	0.06
Fish Creek	20475	141	1187.21	2	1187.62	1187.62	1187.62	0.00

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	20603	142	1186.68	2	1188.13	1188.12	1188.14	0.02
Fish Creek	20633	142.1	1187.70	2	1188.14	1188.10	1188.18	0.08
Fish Creek	20651	143	1187.31	2	1188.16	1188.15	1188.17	0.02
Fish Creek	20691	144	1187.41	2	1188.13	1188.11	1188.14	0.03
Fish Creek	20709	144.1	1187.94	2	1188.14	1188.13	1188.15	0.02
Fish Creek	20743	145	1188.06	2	1188.33	1188.29	1188.36	0.07
Fish Creek	20847	146	1188.38	2	1188.55	1188.53	1188.56	0.03
Fish Creek	20926	147	1188.57	2	1188.86	1188.83	1188.88	0.05
Fish Creek	21051	148	1188.82	2	1189.38	1189.37	1189.38	0.01
Fish Creek	21114	149	1189.29	2	1189.43	1189.42	1189.44	0.02
Fish Creek	21198	150	1189.82	2	1190.11	1190.02	1190.20	0.18
Fish Creek	21418	151	1190.60	2	1190.75	1190.68	1190.81	0.13
Fish Creek	21584	152	1191.14	2	1191.50	1191.49	1191.51	0.02
Fish Creek	21744	153	1191.65	2	1191.93	1191.92	1191.93	0.01
Fish Creek	21888	154	1191.80	2	1192.34	1192.30	1192.38	0.08
Fish Creek	22099	155	1193.47	2	1193.56	1193.54	1193.58	0.04
Fish Creek	22219	156	1193.11	2	1193.89	1193.84	1193.94	0.10
Fish Creek	22382	157	1194.00	2	1194.49	1194.47	1194.50	0.03
Fish Creek	22550	158	1196.02	2	1196.14	1196.13	1196.15	0.02
Fish Creek	22668	159	1194.71	2	1195.69	1195.67	1195.70	0.03
Fish Creek	22796	160	1195.45	2	1196.51	1196.46	1196.56	0.10
Fish Creek	22896	161	1196.26	2	1196.80	1196.79	1196.81	0.02
Fish Creek	23027	162	1197.47	2	1197.74	1197.74	1197.74	0.00
Fish Creek	23085	163	1197.47	2	1197.78	1197.76	1197.80	0.04
Fish Creek	23210	164	1197.77	2	1198.34	1198.27	1198.40	0.13
Fish Creek	23225	165	1197.46	2	1198.53	1198.49	1198.56	0.07
Fish Creek	23230	166	1197.48	2	1198.39	1198.39	1198.39	0.00
Fish Creek	23305	167	1198.48	2	1198.40	1198.39	1198.41	0.02
Fish Creek	23343	168	1198.05	2	1198.60	1198.54	1198.65	0.11
Fish Creek	23506	169	1199.77	2	1199.92	1199.85	1199.99	0.14
Fish Creek	23594	170	1199.60	2	1200.29	1200.24	1200.35	0.11
Fish Creek	23814	171	1199.98	2	1200.46	1200.41	1200.50	0.09
Fish Creek	23903	172	1201.18	4	1201.40	1201.29	1201.52	0.23
Fish Creek	23985	173	1201.56	2	1201.74	1201.72	1201.76	0.04
Fish Creek	24079	174	1202.19	2	1202.34	1202.32	1202.35	0.03
Fish Creek	24303	175	1203.31	2	1203.90	1203.84	1203.95	0.11

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	24438	176	1204.23	2	1204.42	1204.40	1204.43	0.03
Fish Creek	24548	177	1204.83	2	1205.15	1205.13	1205.16	0.03
Fish Creek	24610	178	1205.11	2	1205.41	1205.38	1205.44	0.06
Fish Creek	24713	179	1204.90	2	1206.01	1205.91	1206.11	0.20
Fish Creek	24795	180	1206.18	2	1206.66	1206.54	1206.78	0.24
Fish Creek	24880	181	1207.18	2	1207.46	1207.42	1207.50	0.08
Fish Creek	24911	182	1207.38	2	1207.56	1207.53	1207.58	0.05
Fish Creek	24947	183	1207.18	2	1207.60	1207.56	1207.63	0.07
Fish Creek	24966	184	1207.42	2	1207.60	1207.56	1207.64	0.08
Fish Creek	24972	185	1207.60	2	1207.75	1207.75	1207.75	0.00
Fish Creek	24994	186	1207.52	2	1207.86	1207.85	1207.87	0.02
Fish Creek	25067	187	1208.35	2	1208.55	1208.54	1208.56	0.02
Fish Creek	25129	188	1208.31	1	1208.75	1208.75	1208.75	0.00
Fish Creek	25155	189	1207.98	2	1208.41	1208.35	1208.47	0.12
Fish Creek	25160	190	1207.75	2	1208.50	1208.48	1208.51	0.03
Fish Creek	25168	191	1207.79	2	1208.48	1208.48	1208.48	0.00
Fish Creek	25184	192	1208.15	2	1208.54	1208.53	1208.55	0.02
Fish Creek	25203	193	1208.51	2	1208.84	1208.83	1208.84	0.01
Fish Creek	25279	194	1209.66	2	1209.85	1209.83	1209.87	0.04
Fish Creek	25451	195	1211.00	2	1211.18	1211.15	1211.21	0.06
Fish Creek	25634	196	1212.66	2	1212.82	1212.78	1212.86	0.08
Fish Creek	25768	197	1213.34	4	1213.54	1213.47	1213.61	0.14
Fish Creek	25851	198	1213.51	5	1213.88	1213.86	1213.90	0.04
Fish Creek	25928	199	1213.77	2	1214.23	1214.21	1214.26	0.05
Fish Creek	25961	200	1213.91	2	1214.27	1214.26	1214.28	0.02
Fish Creek	26020	201	1214.19	2	1214.36	1214.34	1214.38	0.04
Fish Creek	26036	201.1	1214.07	2	1214.60	1214.57	1214.64	0.07
Fish Creek	26039	201.2	1214.01	2	1214.61	1214.61	1214.61	0.00
Fish Creek	26142	202	1215.01	2	1215.69	1215.68	1215.69	0.01
Fish Creek	26234	203	1215.67	2	1215.96	1215.95	1215.96	0.01
Fish Creek	26368	204	1216.85	2	1217.07	1217.04	1217.09	0.05
Fish Creek	26524	205	1217.52	2	1218.22	1218.21	1218.23	0.02
Fish Creek	26670	206	1218.65	2	1218.91	1218.89	1218.92	0.03
Fish Creek	26706	207	1218.57	2	1219.02	1219.01	1219.02	0.01
Fish Creek	26709	208	1218.27	2	1219.00	1218.99	1219.00	0.01
Fish Creek	26721	209	1218.23	2	1218.93	1218.92	1218.94	0.02

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	26727	210	1218.84	2	1219.03	1218.96	1219.09	0.13
Fish Creek	26759	211	1219.87	2	1220.10	1220.08	1220.11	0.03
Fish Creek	26773	212	1220.23	2	1220.50	1220.49	1220.50	0.01
Fish Creek	26902	213	1221.43	2	1221.81	1221.80	1221.81	0.01
Fish Creek	27087	214	1222.04	2	1222.54	1222.51	1222.56	0.05
Fish Creek	27241	215	1223.26	2	1223.51	1223.47	1223.54	0.07
Fish Creek	27389	216	1223.92	2	1224.20	1224.18	1224.22	0.04
Fish Creek	27509	217	1224.49	2	1224.82	1224.77	1224.86	0.09
Fish Creek	27618	218	1225.37	2	1225.69	1225.66	1225.72	0.06
Fish Creek	27709	219	1225.58	2	1226.21	1226.18	1226.24	0.06
Fish Creek	27850	220	1227.17	2	1227.86	1227.86	1227.86	0.00
Fish Creek	27889	221	1227.69	2	1227.87	1227.86	1227.87	0.01
Fish Creek	27959	222	1228.04	2	1228.26	1228.23	1228.28	0.05
Fish Creek	27989	223	1228.59	2	1228.78	1228.74	1228.81	0.07
Fish Creek	28032	224	1228.32	2	1229.02	1229.01	1229.02	0.01
Fish Creek	28038	225	1228.21	2	1229.05	1229.06	1229.04	0.02
Fish Creek	28070	226	1228.50	2	1228.97	1228.96	1228.98	0.02
Fish Creek	28185	227	1229.41	2	1229.73	1229.71	1229.75	0.04
Fish Creek	28252	228	1229.96	2	1230.14	1230.07	1230.20	0.13
Fish Creek	28402	229	1230.78	2	1231.29	1231.27	1231.31	0.04
Fish Creek	28621	230	1232.50	2	1232.80	1232.76	1232.83	0.07
Fish Creek	28672	231	1232.37	2	1233.06	1233.03	1233.09	0.06
Fish Creek	28792	232	1233.29	4	1233.72	1233.63	1233.81	0.18
Fish Creek	28854	233	1233.51	2	1234.04	1234.03	1234.04	0.01
Fish Creek	28969	234	1234.00	4	1234.46	1234.33	1234.59	0.26
Fish Creek	29104	235	1235.19	2	1235.68	1235.64	1235.71	0.07
Fish Creek	29206	236	1235.57	2	1235.87	1235.80	1235.94	0.14
Fish Creek	29340	237	1236.09	2	1236.31	1236.30	1236.32	0.02
Fish Creek	29354	238	1235.62	2	1236.38	1236.38	1236.39	0.01
Fish Creek	29364	239	1235.08	2	1236.36	1236.35	1236.37	0.02
Fish Creek	29372	240	1235.41	2	1236.26	1236.22	1236.29	0.07
Fish Creek	29388	241	1235.95	2	1236.28	1236.25	1236.30	0.05
Fish Creek	29407	242	1236.17	2	1236.59	1236.57	1236.61	0.04
Fish Creek	29463	243	1236.04	2	1236.75	1236.74	1236.76	0.02
Fish Creek	29584	244	1237.46	2	1237.77	1237.76	1237.77	0.01
Fish Creek	29668	245	1237.64	1	1238.04	1238.04	1238.04	0.00

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Fish Creek	29900	246	1237.92	2	1238.86	1238.85	1238.87	0.02
Fish Creek	30036	247	1239.15	3	1239.58	1239.56	1239.59	0.03
Fish Creek	30219	248	1239.37	2	1239.98	1239.96	1240.00	0.04
Fish Creek	30352	249	1240.54	2	1240.78	1240.74	1240.81	0.07
Fish Creek	30515	250	1240.05	2	1240.06	1240.06	1240.06	0.00
Fish Creek	30668	251	1240.99	2	1242.07	1242.06	1242.08	0.02
Fish Creek	30856	252	1242.44	4	1242.79	1242.73	1242.84	0.11
Fish Creek	30918	253	1242.77	2	1243.32	1243.32	1243.32	0.00
Fish Creek	31015	254	1244.08	2	1244.32	1244.31	1244.32	0.01
Fish Creek	31077	255	1244.29	3	1244.86	1244.84	1244.87	0.03
Fish Creek	31145	256	1245.25	4	1245.49	1245.46	1245.52	0.06
Fish Creek	31347	257	1244.90	2	1246.41	1246.40	1246.41	0.01
Fish Creek	31527	258	1244.43	2	1246.40	1246.39	1246.41	0.02
Fish Creek	31735	259	1245.61	2	1246.40	1246.40	1246.40	0.00
Fish Creek	31982	260	1245.96	2	1246.91	1246.90	1246.91	0.01
Fish Creek	32136	261	1246.14	2	1247.12	1247.10	1247.13	0.03

Table C.2 - Priddis Creek Cross Section Properties

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	226	1	1157.62	2	1157.89	1157.87	1157.90	0.03
Priddis Creek	329	2	1158.15	2	1158.39	1158.36	1158.42	0.06
Priddis Creek	485	3	1159.19	2	1159.79	1159.77	1159.81	0.04
Priddis Creek	528	4	1159.37	2	1159.90	1159.89	1159.90	0.01
Priddis Creek	827	5	1161.78	2	1162.44	1162.43	1162.44	0.01
Priddis Creek	1044	6	1162.99	2	1163.18	1163.15	1163.21	0.06
Priddis Creek	1180	7	1163.11	2	1163.63	1163.60	1163.65	0.05
Priddis Creek	1292	8	1163.36	2	1164.02	1163.99	1164.04	0.05
Priddis Creek	1366	9	1163.81	2	1164.50	1164.48	1164.51	0.03
Priddis Creek	1509	10	1164.37	2	1164.71	1164.69	1164.72	0.03
Priddis Creek	1640	11	1165.17	2	1165.24	1165.23	1165.25	0.02
Priddis Creek	1789	12	1165.65	2	1165.94	1165.91	1165.97	0.06
Priddis Creek	1986	13	1166.88	2	1167.10	1167.08	1167.11	0.03
Priddis Creek	2161	14	1167.68	2	1168.01	1168.00	1168.01	0.01
Priddis Creek	2381	15	1168.77	2	1168.97	1168.94	1168.99	0.05
Priddis Creek	2513	16	1168.85	2	1169.31	1169.30	1169.32	0.02
Priddis Creek	2577	17	1169.32	2	1169.44	1169.43	1169.44	0.01
Priddis Creek	2631	18	1169.66	2	1169.86	1169.85	1169.86	0.01
Priddis Creek	2845	19	1170.24	2	1170.52	1170.49	1170.54	0.05
Priddis Creek	2982	20	1170.59	2	1171.48	1171.48	1171.48	0.00
Priddis Creek	3045	21	1170.96	2	1171.95	1171.92	1171.98	0.06
Priddis Creek	3104	22	1170.81	2	1171.95	1171.92	1171.98	0.06
Priddis Creek	3187	23	1171.40	2	1172.35	1172.33	1172.37	0.04
Priddis Creek	3447	24	1172.18	2	1172.99	1172.96	1173.02	0.06
Priddis Creek	3582	25	1173.38	2	1173.51	1173.49	1173.53	0.04
Priddis Creek	3680	26	1173.98	2	1174.24	1174.20	1174.28	0.08
Priddis Creek	3760	27	1173.86	2	1174.34	1174.34	1174.34	0.00
Priddis Creek	3911	28	1174.42	4	1174.82	1174.79	1174.84	0.05
Priddis Creek	4023	29	1175.00	2	1175.49	1175.48	1175.49	0.01
Priddis Creek	4099	30	1175.14	2	1175.42	1175.41	1175.42	0.01
Priddis Creek	4325	31	1176.86	4	1176.74	1176.46	1177.01	0.55
Priddis Creek	4607	32	1177.72	3	1178.70	1178.10	1179.30	1.20
Priddis Creek	4696	33	1178.26	2	1178.48	1178.47	1178.49	0.02
Priddis Creek	5023	34	1179.51	4	1179.89	1179.85	1179.93	0.08

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	5181	35	1180.59	4	1180.92	1180.89	1180.95	0.06
Priddis Creek	5382	36	1182.23	2	1181.74	1181.71	1181.76	0.05
Priddis Creek	5449	37	1182.39	2	1182.71	1182.64	1182.78	0.14
Priddis Creek	5526	38	1182.35	2	1182.95	1182.91	1182.98	0.07
Priddis Creek	5631	39	1182.48	2	1182.98	1182.97	1182.98	0.01
Priddis Creek	5766	40	1182.49	4	1183.34	1183.31	1183.37	0.06
Priddis Creek	6004	41	1184.83	2	1184.99	1184.99	1185.00	0.01
Priddis Creek	6022	42	1184.72	4	1183.34	1183.31	1183.37	0.06
Priddis Creek	6042	43	1183.98	2	1185.00	1184.99	1185.00	0.01
Priddis Creek	6059	44	1184.85	2	1185.06	1185.04	1185.08	0.04
Priddis Creek	6073	45	1184.86	2	1185.08	1185.07	1185.08	0.01
Priddis Creek	6180	46	1185.61	2	1185.75	1185.73	1185.76	0.03
Priddis Creek	6272	47	1185.95	2	1186.40	1186.39	1186.41	0.02
Priddis Creek	6524	48	1187.40	2	1187.84	1187.82	1187.85	0.03
Priddis Creek	6539	49	1187.31	2	1187.85	1187.80	1187.90	0.10
Priddis Creek	6544	50	1187.39	2	1187.82	1187.81	1187.82	0.01
Priddis Creek	6551	51	1187.44	4	1187.79	1187.77	1187.80	0.03
Priddis Creek	6556	52	1187.37	4	1187.81	1187.77	1187.84	0.07
Priddis Creek	6575	53	1187.60	2	1187.83	1187.82	1187.84	0.02
Priddis Creek	6649	54	1187.97	4	1188.43	1188.41	1188.44	0.03
Priddis Creek	6824	55	1189.87	2	1189.94	1189.91	1189.97	0.06
Priddis Creek	6897	56	1190.61	4	1190.74	1190.65	1190.83	0.18
Priddis Creek	6985	57	1190.82	2	1191.25	1191.24	1191.25	0.01
Priddis Creek	7098	58	1191.76	4	1191.98	1191.90	1192.05	0.15
Priddis Creek	7175	59	1191.86	2	1192.34	1192.33	1192.34	0.01
Priddis Creek	7289	60	1192.11	2	1192.87	1192.83	1192.90	0.07
Priddis Creek	7600	61	1194.61	2	1195.01	1194.96	1195.05	0.09
Priddis Creek	7665	62	1193.92	2	1195.41	1195.41	1195.42	0.01
Priddis Creek	7669	63	1193.86	2	1195.43	1195.43	1195.43	0.00
Priddis Creek	7676	64	1193.97	2	1195.47	1195.45	1195.48	0.00
Priddis Creek	7682	65	1194.13	2	1195.46	1195.46	1195.46	0.00
Priddis Creek	7709	66	1194.72	2	1195.46	1195.44	1195.47	0.03
Priddis Creek	7818	67	1195.24	4	1195.86	1195.82	1195.90	0.08
Priddis Creek	8035	68	1195.89	2	1196.68	1196.68	1196.68	0.00
Priddis Creek	8042	69	1196.21	2	1196.75	1196.72	1196.78	0.06
Priddis Creek	8048	70	1195.57	2	1196.73	1196.73	1196.74	0.01

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	8054	71	1196.13	2	1196.76	1196.72	1196.80	0.06
Priddis Creek	8149	72	1196.70	2	1196.84	1196.82	1196.86	0.04
Priddis Creek	8344	73	1196.63	2	1197.84	1197.72	1197.95	0.23
Priddis Creek	8408	74	1197.30	4	1197.91	1197.90	1197.92	0.02
Priddis Creek	8503	75	1198.26	2	1198.49	1198.48	1198.50	0.02
Priddis Creek	8611	76	1198.88	2	1199.38	1199.38	1199.38	0.00
Priddis Creek	8650	77	1198.62	2	1199.51	1199.50	1199.51	0.01
Priddis Creek	8800	78	1198.83	2	1199.91	1199.90	1199.91	0.01
Priddis Creek	8869	79	1199.38	2	1199.88	1199.88	1199.88	0.00
Priddis Creek	9108	80	1201.79	2	1202.46	1202.42	1202.49	0.07
Priddis Creek	9270	81	1201.75	2	1202.39	1202.38	1202.40	0.02
Priddis Creek	9332	82	1202.00	2	1202.68	1202.68	1202.68	0.00
Priddis Creek	9363	83	1202.58	2	1202.79	1202.76	1202.82	0.06
Priddis Creek	9374	84	1202.19	2	1202.80	1202.78	1202.82	0.04
Priddis Creek	9383	85	1202.55	2	1202.87	1202.86	1202.88	0.02
Priddis Creek	9391	86	1202.58	2	1202.86	1202.85	1202.86	0.01
Priddis Creek	9489	87	1203.11	2	1203.64	1203.63	1203.65	0.02
Priddis Creek	9571	88	1203.48	2	1203.91	1203.90	1203.91	0.01
Priddis Creek	9674	89	1203.92	2	1204.50	1204.45	1204.55	0.10
Priddis Creek	9778	90	1204.38	2	1204.78	1204.78	1204.78	0.00
Priddis Creek	9900	91	1204.72	2	1205.20	1205.15	1205.24	0.09
Priddis Creek	10021	92	1205.79	2	1206.03	1206.02	1206.03	0.01
Priddis Creek	10303	93	1207.37	4	1207.78	1207.74	1207.82	0.08
Priddis Creek	10478	94	1208.10	2	1208.47	1208.45	1208.49	0.04
Priddis Creek	10569	95	1208.78	2	1208.96	1208.92	1209.00	0.08
Priddis Creek	10657	96	1209.20	2	1209.26	1209.24	1209.28	0.04
Priddis Creek	10769	97	1209.41	2	1209.67	1209.60	1209.73	0.13
Priddis Creek	10854	98	1208.94	2	1210.57	1210.53	1210.60	0.07
Priddis Creek	10860	99	1210.16	2	1210.59	1210.59	1210.59	0.00
Priddis Creek	10873	100	1210.42	2	1210.67	1210.67	1210.67	0.00
Priddis Creek	10884	101	1210.30	2	1211.88	1211.88	1211.88	0.00
Priddis Creek	11015	102	1211.19	4	1211.76	1211.72	1211.80	0.08
Priddis Creek	11090	103	1210.90	2	1212.32	1212.32	1212.32	0.00
Priddis Creek	11116	104	1211.18	4	1212.30	1212.25	1212.34	0.09
Priddis Creek	11187	105	1211.10	2	1212.39	1212.37	1212.41	0.04
Priddis Creek	11198	106	1211.18	2	1212.40	1212.39	1212.40	0.01

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	11205	107	1211.63	2	1212.39	1212.38	1212.39	0.01
Priddis Creek	11213	108	1212.05	2	1212.37	1212.31	1212.42	0.11
Priddis Creek	11288	109	1211.97	2	1212.79	1212.76	1212.81	0.05
Priddis Creek	11498	110	1213.47	2	1213.86	1213.83	1213.89	0.06
Priddis Creek	11639	111	1213.95	2	1214.43	1214.42	1214.44	0.02
Priddis Creek	11851	112	1215.12	2	1215.57	1215.54	1215.60	0.06
Priddis Creek	11988	113	1216.21	2	1216.47	1216.45	1216.49	0.04
Priddis Creek	12104	114	1217.11	2	1217.27	1217.25	1217.28	0.03
Priddis Creek	12249	115	1217.33	2	1217.68	1217.61	1217.74	0.13
Priddis Creek	12356	116	1217.76	2	1218.19	1218.17	1218.21	0.04
Priddis Creek	12478	117	1217.58	2	1218.62	1218.61	1218.62	0.01
Priddis Creek	12548	118	1218.10	2	1218.72	1218.71	1218.72	0.01
Priddis Creek	12701	119	1219.01	2	1219.41	1219.40	1219.42	0.02
Priddis Creek	12751	120	1218.82	2	1219.75	1219.69	1219.80	0.11
Priddis Creek	12826	121	1219.73	2	1219.95	1219.92	1219.97	0.05
Priddis Creek	13004	122	1220.46	2	1220.80	1220.80	1220.80	0.00
Priddis Creek	13175	123	1221.16	2	1221.49	1221.48	1221.49	0.01
Priddis Creek	13322	124	1221.81	2	1222.02	1221.99	1222.05	0.06
Priddis Creek	13432	125	1222.30	2	1222.46	1222.45	1222.47	0.02
Priddis Creek	13547	126	1222.81	2	1223.01	1223.00	1223.02	0.02
Priddis Creek	13690	127	1224.11	2	1224.32	1224.32	1224.32	0.00
Priddis Creek	13863	128	1224.46	2	1225.03	1225.01	1225.04	0.03
Priddis Creek	14055	129	1225.55	2	1226.13	1226.11	1226.15	0.04
Priddis Creek	14144	130	1226.67	2	1226.84	1226.82	1226.86	0.04
Priddis Creek	14159	131	1226.23	4	1226.95	1226.90	1226.99	0.09
Priddis Creek	14170	132	1225.86	2	1226.94	1226.94	1226.95	0.01
Priddis Creek	14179	133	1226.03	4	1226.96	1226.90	1226.99	0.09
Priddis Creek	14225	134	1226.44	6	1227.00	1226.97	1227.02	0.05
Priddis Creek	14259	135	1226.81	2	1227.17	1227.14	1227.19	0.05
Priddis Creek	14361	136	1227.42	2	1227.77	1227.76	1227.77	0.01
Priddis Creek	14498	137	1227.79	2	1228.59	1228.56	1228.62	0.06
Priddis Creek	14650	138	1229.57	4	1229.94	1229.92	1229.96	0.04
Priddis Creek	14823	139	1230.11	2	1230.48	1230.48	1230.48	0.00
Priddis Creek	14990	140	1230.76	2	1231.45	1231.42	1231.48	0.06
Priddis Creek	15064	141	1231.17	4	1232.27	1232.24	1232.29	0.05
Priddis Creek	15078	142	1230.94	2	1232.30	1232.29	1232.31	0.02

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	15086	143	1230.20	2	1232.26	1232.24	1232.27	0.03
Priddis Creek	15107	144	1230.08	2	1232.23	1232.21	1232.25	0.04
Priddis Creek	15116	145	1230.98	2	1232.29	1232.26	1232.32	0.06
Priddis Creek	15183	146	1231.94	2	1232.29	1232.26	1232.32	0.06
Priddis Creek	15226	147	1231.63	2	1233.33	1233.31	1233.34	0.03
Priddis Creek	15398	148	1232.35	2	1233.53	1233.52	1233.54	0.02
Priddis Creek	15544	149	1233.91	2	1234.62	1234.51	1234.72	0.21
Priddis Creek	15689	150	1234.67	2	1235.31	1235.30	1235.32	0.02
Priddis Creek	15703	151	1233.52	4	1235.35	1235.33	1235.36	0.03
Priddis Creek	15713	152	1233.11	2	1235.27	1235.27	1235.27	0.00
Priddis Creek	15746	153	1233.99	4	1235.34	1235.33	1235.36	0.03
Priddis Creek	15865	154	1234.90	3	1236.07	1236.06	1236.08	0.02
Priddis Creek	15978	155	1235.28	2	1236.35	1236.35	1236.35	0.00
Priddis Creek	16099	156	1235.87	4	1236.68	1236.46	1236.90	0.44
Priddis Creek	16221	157	1236.29	4	1236.96	1236.65	1237.27	0.62
Priddis Creek	16318	158	1237.09	2	1237.33	1237.26	1237.39	0.13
Priddis Creek	16424	159	1237.37	4	1238.85	1238.84	1238.87	0.03
Priddis Creek	16572	160	1237.88	2	1238.88	1238.83	1238.92	0.09
Priddis Creek	16740	161	1239.05	2	1239.56	1239.55	1239.57	0.02
Priddis Creek	16823	162	1239.24	3	1239.99	1239.79	1240.18	0.39
Priddis Creek	16935	163	1239.83	2	1240.08	1240.02	1240.13	0.11
Priddis Creek	17129	164	1240.33	4	1241.40	1241.34	1241.45	0.11
Priddis Creek	17225	165	1240.62	4	1242.07	1241.96	1242.13	0.16
Priddis Creek	17385	166	1241.67	2	1242.99	1242.89	1243.08	0.19
Priddis Creek	17464	167	1241.82	6	1243.14	1243.12	1243.15	0.03
Priddis Creek	17580	168	1244.11	2	1243.98	1243.94	1244.01	0.07
Priddis Creek	17654	169	1244.07	2	1243.96	1243.94	1243.97	0.03
Priddis Creek	17738	170	1244.47	4	1244.59	1244.54	1244.63	0.09
Priddis Creek	17844	171	1244.77	4	1244.71	1244.67	1244.80	0.13
Priddis Creek	17953	172	1246.25	2	1246.31	1246.29	1246.32	0.03
Priddis Creek	18046	173	1246.21	4	1246.48	1246.33	1246.62	0.29
Priddis Creek	18166	174	1246.81	6	1246.97	1246.91	1247.03	0.12
Priddis Creek	18241	175	1247.30	8	1247.37	1247.34	1247.39	0.05
Priddis Creek	18332	176	1247.38	2	1247.38	1247.37	1247.38	0.01
Priddis Creek	18496	177	1247.71	2	1247.73	1247.72	1247.73	0.01
Priddis Creek	18671	178	1248.12	4	1248.15	1248.00	1248.30	0.30

River or Creek	River Station	Section ID	Thalweg Elevation	Number of Wetted Edges Surveyed	Surveyed Water Surface Elevation (m)			
					Mean (m)	Minimum (m)	Maximum (m)	Range (m)
Priddis Creek	18820	179	1248.41	2	1248.45	1248.44	1248.46	0.02
Priddis Creek	18950	180	1248.92	2	1249.03	1249.02	1249.03	0.01
Priddis Creek	19120	181	1249.59	2	1249.65	1249.63	1249.66	0.03

APPENDIX D – HYDRAULIC STRUCTURE PROFILE SKETCHES

CULVERT INFORMATION SHEET

Project: PRIDDIS FLOOD STUDY Cross Section: ADDITIONAL (NEAR P37)
Location: PRIDDIS AB Surveyor: A. AMIES

Culvert Type

CSP	(Round)	✓	Concrete	(Round)	
CSP	(Arch)		Concrete	(Arch)	
Rectangular	(Box)		Other	(Specify)	

Barrel Length 7.2 m

Barrel Section

Diameter 0.90 m (Round)
Rise _____ m (Arch) Span _____ m
Height _____ m (Box) Width _____ m

Invert

Upstream 1180.171 m Downstream 1180.061 m

Entrance Condition

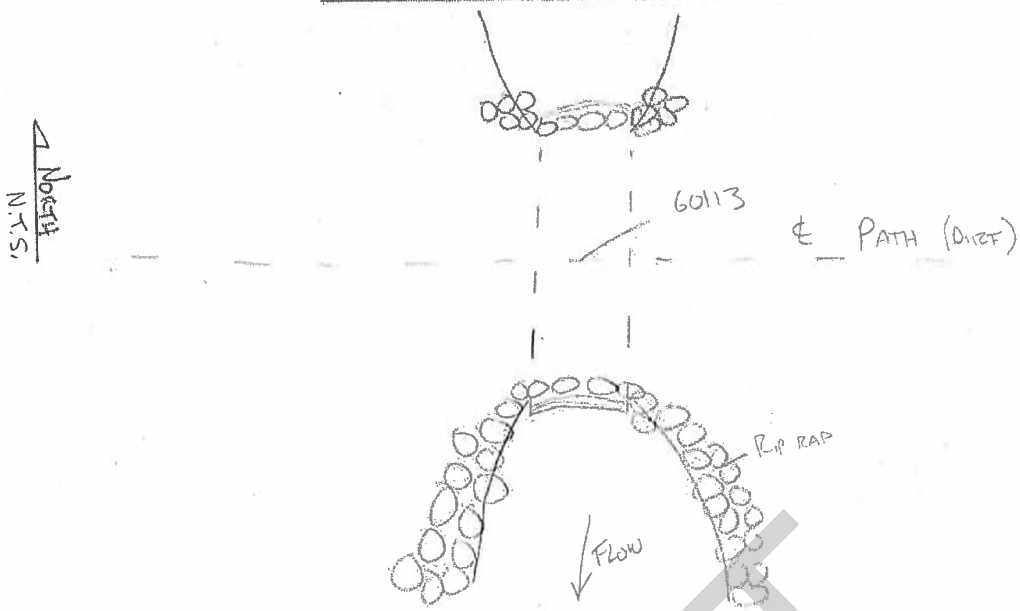
Projecting from fill ✓ Square headwall _____
Mitred to conform to slope _____ Bevelled headwall _____
Other (specify) _____

Note: All elevations to be referenced to geodetic datum.

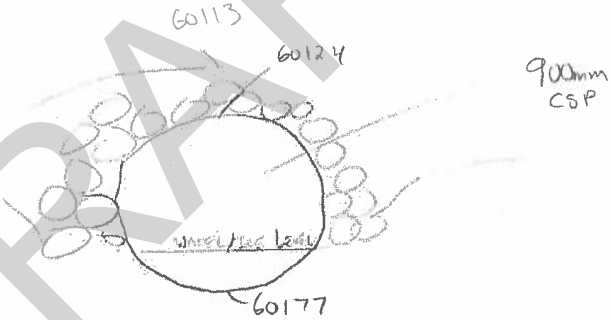
PC-CLVT-1

A. Amies Feb 8, 2018

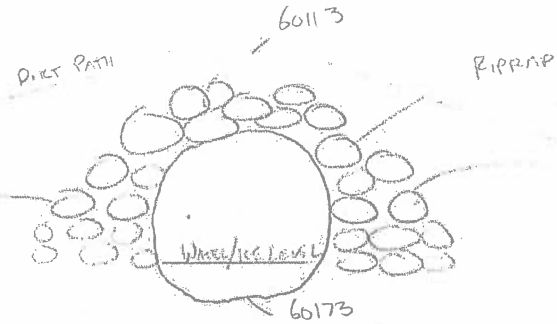
Profile Sketches



Culvert Profile (Top View)



Upstream Profile (Looking South)



Downstream Profile (Looking North)

CULVERT INFORMATION SHEET (CP3)

Project: Peaddis Flood Assessment Cross Section: P98-P101

Location: Peaddis NB Surveyor: A. Amies

Culvert Type

CSP	(Round)	✓	Concrete	(Round)	
CSP	(Arch)		Concrete	(Arch)	
Rectangular	(Box)		Other	(Specify)	

Barrel Length 13.6m m

Barrel Section

Diameter	2.4	m (Round)			
Rise		m (Arch)	Span		m
Height		m (Box)	Width		m

Invert

Upstream 1210.282 m Downstream 1210.299 m

Entrance Condition

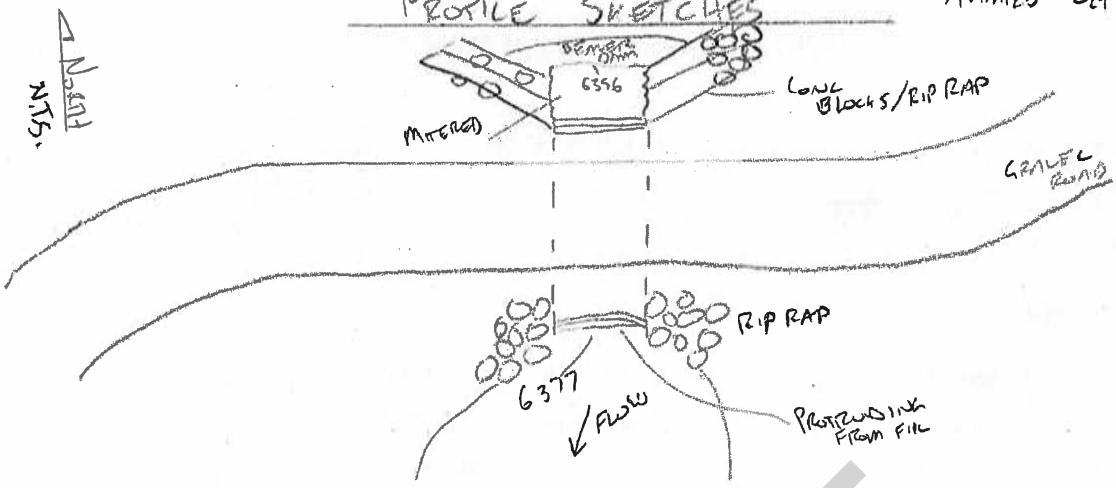
Projecting from fill		Square headwall	
Mitred to conform to slope	✓	Bevelled headwall	
Other (specify)			

Note: All elevations to be referenced to geodetic datum.

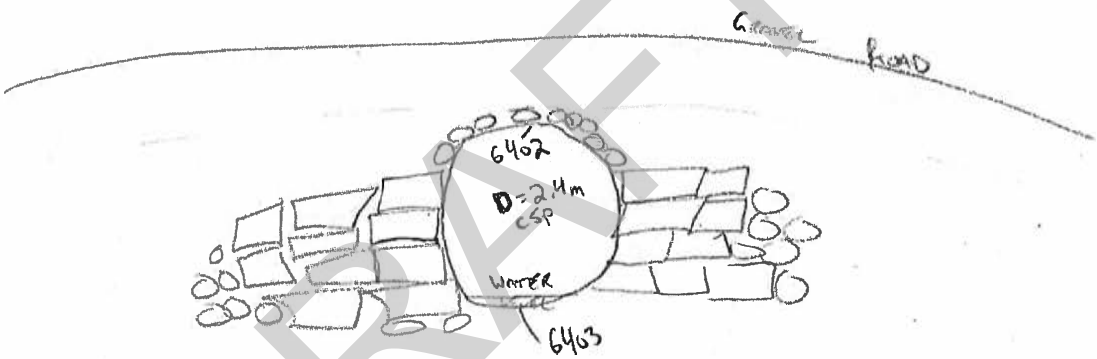
PROFILE SKETCHES

A AMIES OCT 17, 2017

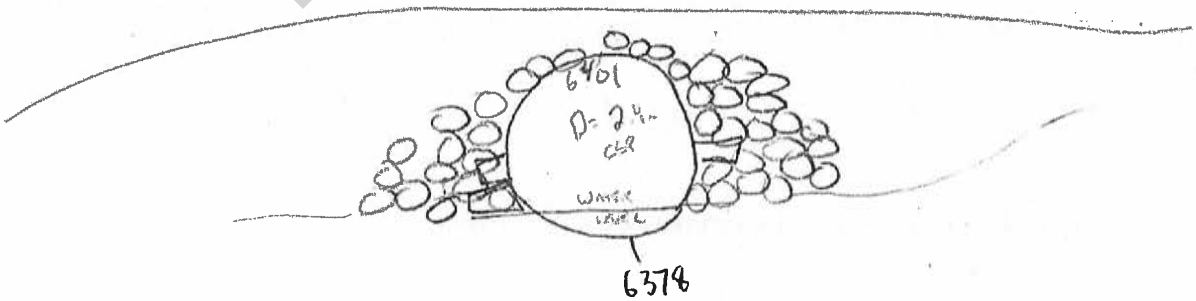
N.T.S.



CULVERT PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING SOUTH)



* POINT SERIES ADJUSTED PREFIX '1' ADDED.

DOWNSTREAM PROFILE (LOOKING NORTH)

(CPI)

BRIDGE INFORMATION SHEET

Project: PRIDDIS FLOOD STUDY Cross Section: ADDITIONAL (NEAR P35)

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 5.27 m

Outside to Outside Width 1.55 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1183.223 m	1182.963	m
Midspan		1183.146 m	1182.886	m
Right	Abutment	1183.077 m	1182.817	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 0 Width _____ m

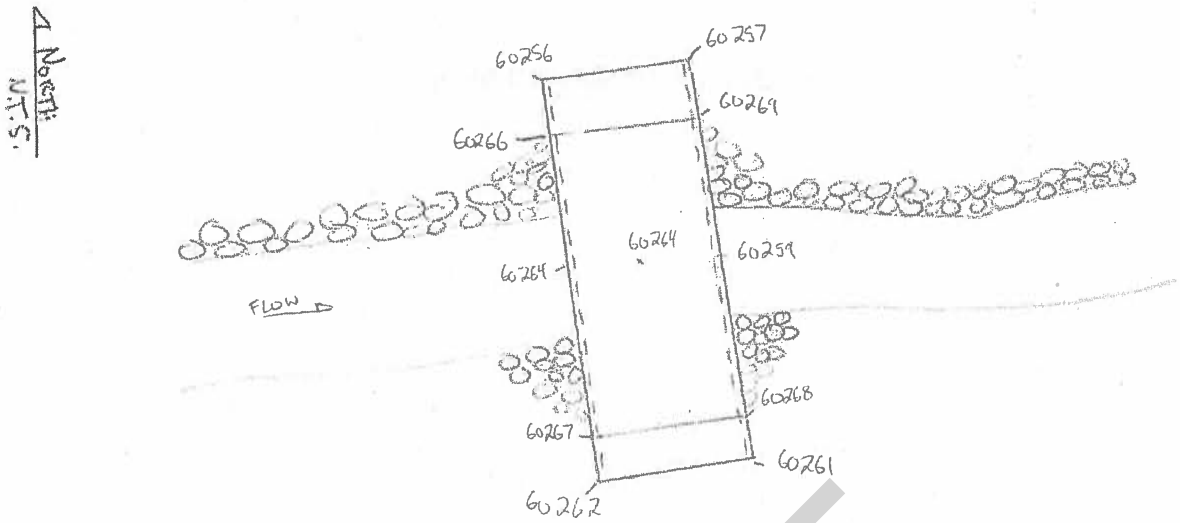
Type _____ (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape _____ (i.e. rectangular, circular, wedge)

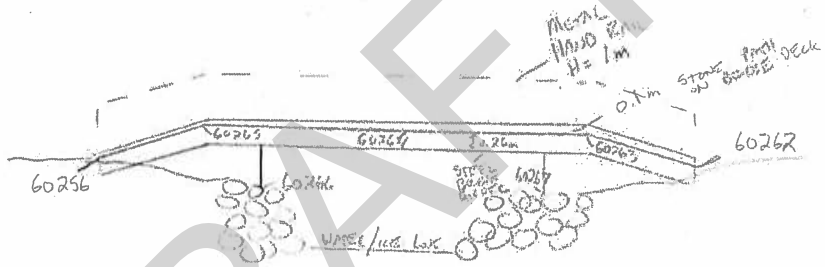
Note: All elevations to be referenced to geodetic datum.

PROFILE SKETCHES

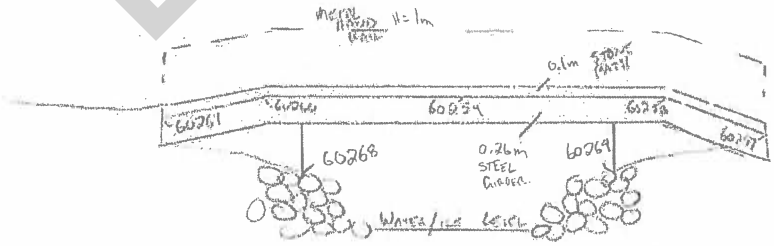
A. AMIES FEB 8, 2018



BRIDGE PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST)

BRIDGE INFORMATION SHEET (PRE)

Project: PRUDDIS FLOOD STUDY
Cross Section: P41-P45
Location: 256 ST W
Surveyor: A. AMIES / D VANDERKEEN

Overall Dimensions

Abutment to Abutment Span 9.30 m
Outside to Outside Width 11.9 m

Elevation Data

	Top of Solid	Curb or Guard Rail	Low Chord
Left Abutment	1188.061 m	1187.257	m
Midspan	1188.052 m	1187.232	m
Right Abutment	1188.019 m	1187.174	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2 x 9 Width 0.3 m

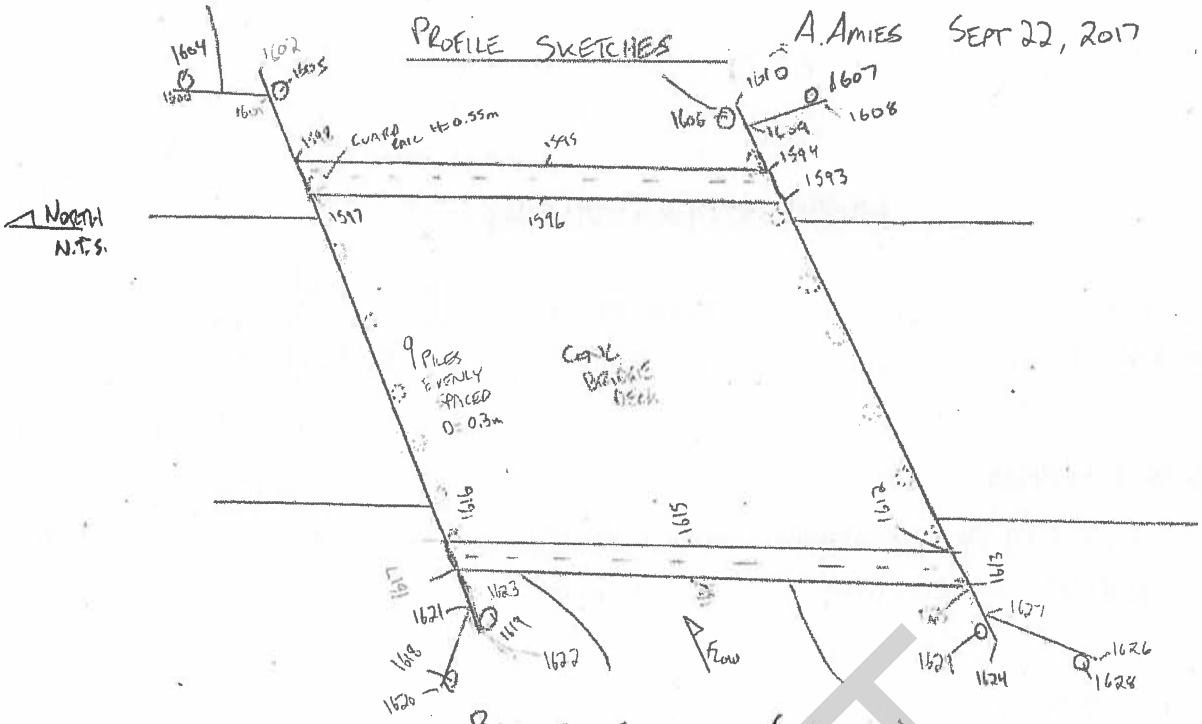
Type TIMBER PILE (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

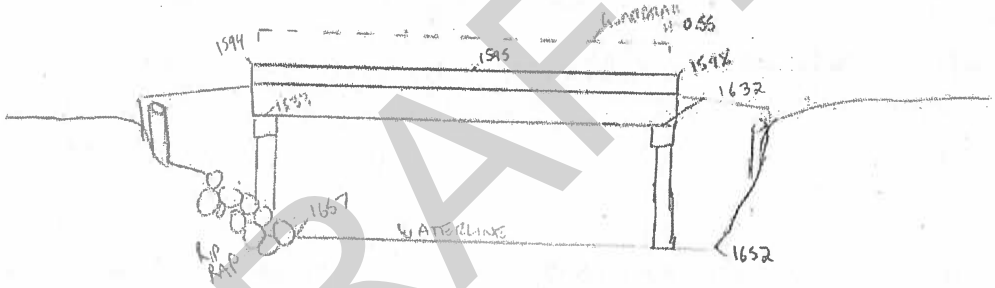
Note: All elevations to be referenced to geodetic datum.

PROFILE SKETCHES

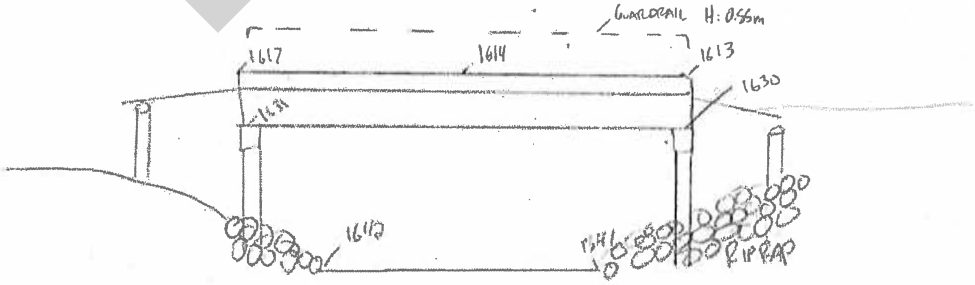
A. AMIES SEPT 22, 2017



BRIDGE SKETCH (TOP VIEW)



DOWNSTREAM PROFILE (LOOKING WEST)



UPSTREAM PROFILE (LOOKING EAST)

PC-BRDG-3

BRIDGE INFORMATION SHEET (CP1)

Project: Priddis Flood Risk Assessment Cross Section: P49-P52

Location: Priddis AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 13.03 m

Outside to Outside Width 3.45 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1190.580 m	1189.940	m
Midspan		1190.593 m	1189.953	m
Right	Abutment	1190.540 m	1189.900	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 0 Width _____ m

Type _____ (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape _____ (i.e. rectangular, circular, wedge)

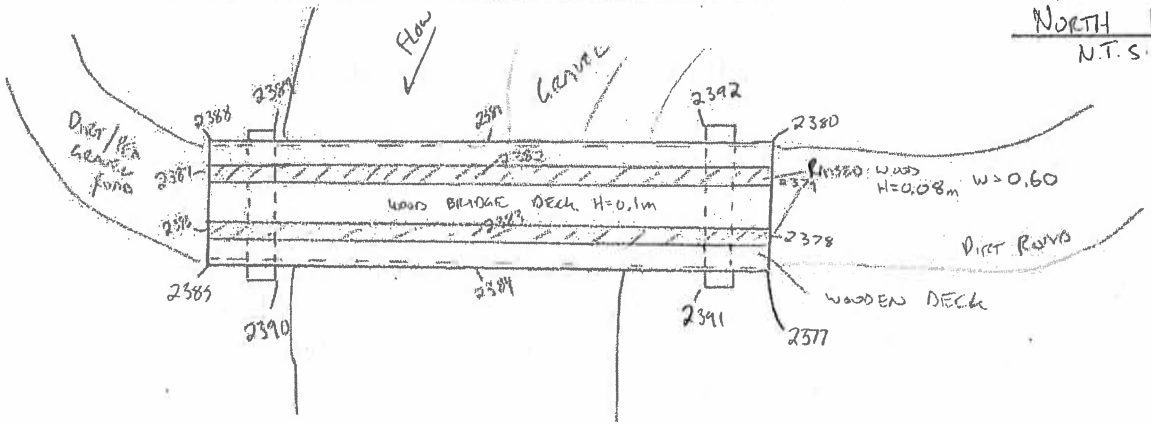
Note: All elevations to be referenced to geodetic datum.

PC-BRDG-3

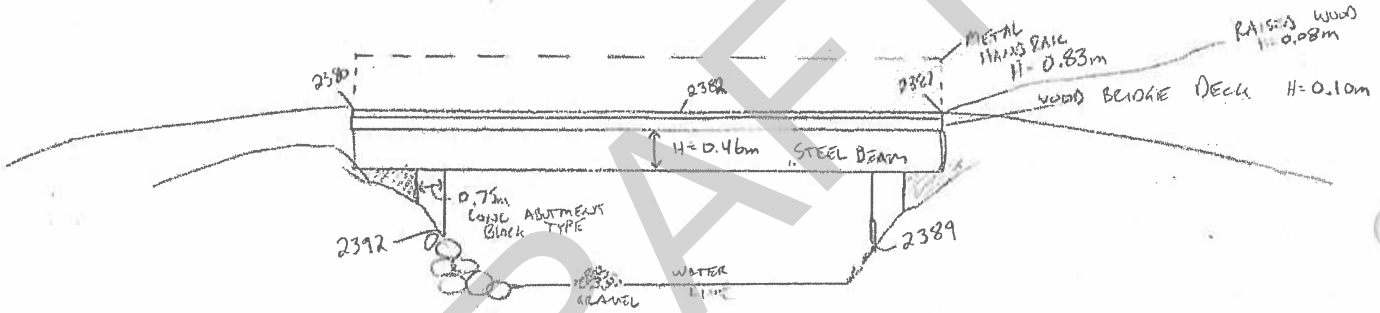
A. Amies Oct 23, 2017

BRIDGE PROFILE SKETCHES

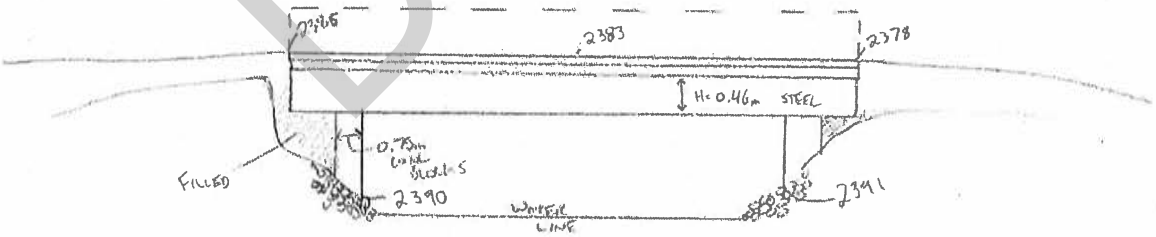
NORTH
N.T.S.



BRIDGE PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST)

* POINT SERIES ADJUSTED
PREFIX '1' ADDED

BRIDGE INFORMATION SHEET (CP1)

Project: PRIDDIS FLOOD ASSESSMENT Cross Section: P62 - P65

Location: PRIDDIS, AB Surveyor: A AMIES

Overall Dimensions

Abutment to Abutment Span 23.78 m

Outside to Outside Width 3.5 m

Elevation Data

		Top of Curb or Guard Rail	Low Chord
Left	Abutment	1197.067 m	1196.437 m
Midspan		1197.137 m	1195.507 m
Right	Abutment	1197.142 m	1196.512 m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

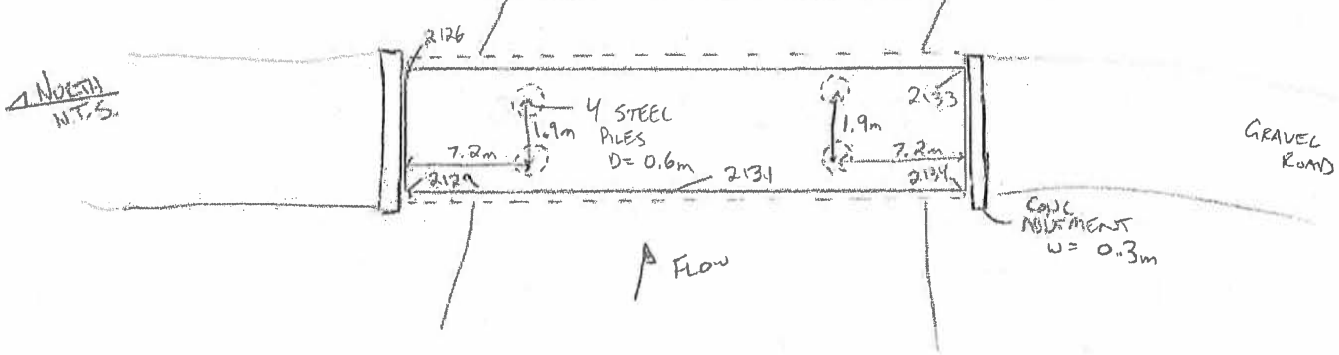
Number 2 x 2 Width 0.6 m

Type STEEL CYL. (i.e. pile bent, timber truss, concrete cylinder)

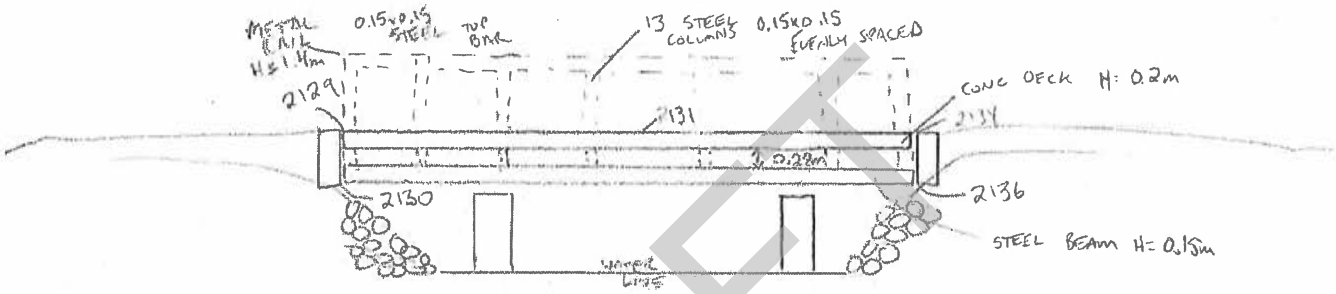
Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

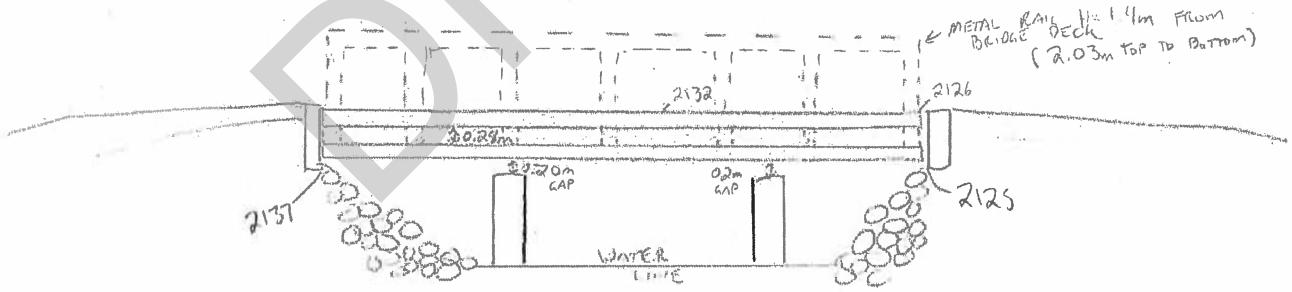
BRIDGE PROFILE SKETCH OCT 19, 2017 A. AMIES



BRIDGE PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST)

* POINT SERIES ADJUSTED PREFIX '1' ADDED

BRIDGE INFORMATION SHEET (CP1)

Project: Priddis Flood Assessment Cross Section: P68- P71

Location: Priddis, AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 24.55 m

Outside to Outside Width 3.6 m

Elevation Data

		Top of Solid		of Curb or Guard Rail		Low Chord	
Left	Abutment	1199.061	m	1198.321			m
Midspan		1198.971	m	1198.231			m
Right	Abutment	1199.135	m	1198.495			m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 1 Width 0.66 m

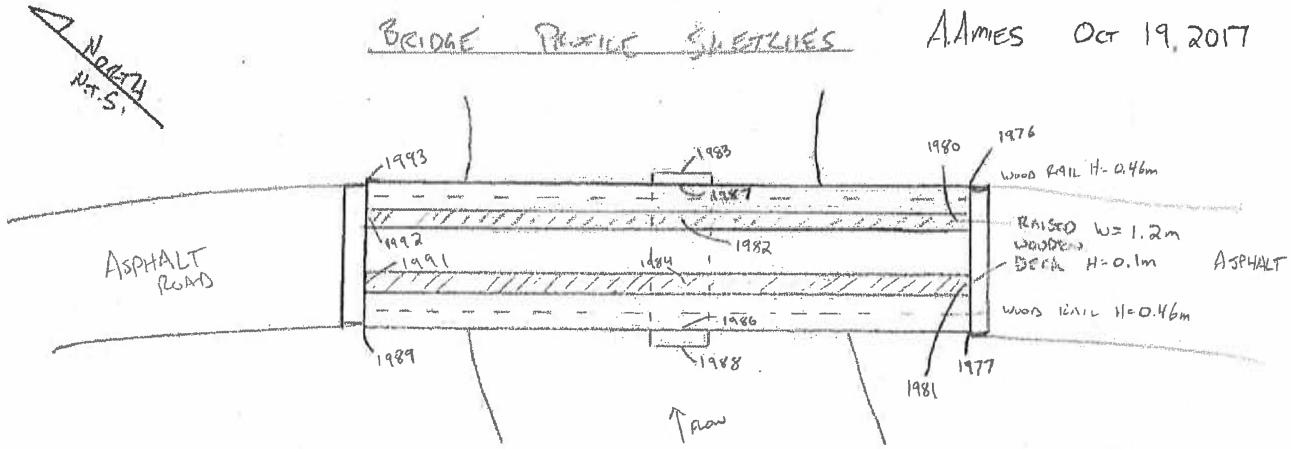
Type Conc. (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape Rectangular (i.e. rectangular, circular, wedge)

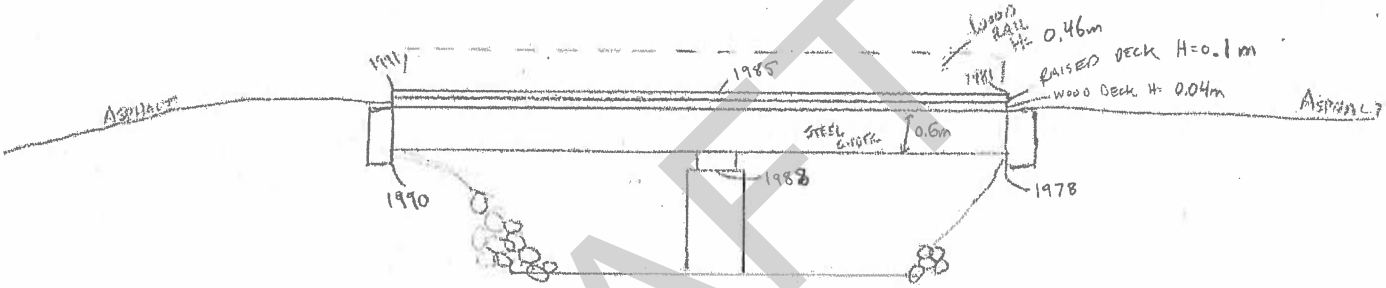
Note: All elevations to be referenced to geodetic datum.

BRIDGE PROFILE SKETCHES

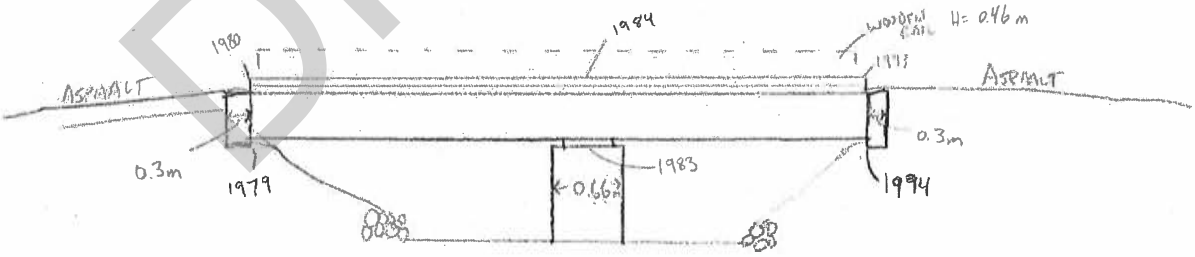
A. AMES OCT 19, 2017



BRIDGE PROFILE TOP VIEW



UPSTREAM PROFILE (LOOKING NORTH)



DOWNSTREAM PROFILE (LOOKING SOUTH)

* POINT SERIES ADJUSTED
PREFIX '1' ADDED

BRIDGE INFORMATION SHEET (CP3)

Project: Priddis Risk Assessment Cross Section: P83 – P86

Location: Priddis, AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 20.54 m

Outside to Outside Width 6.02 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1207.982 m	1206.090	m
Midspan		1208.731 m	1206.981	m
Right	Abutment	1209.207 m	1207.310	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 0 Width _____ m

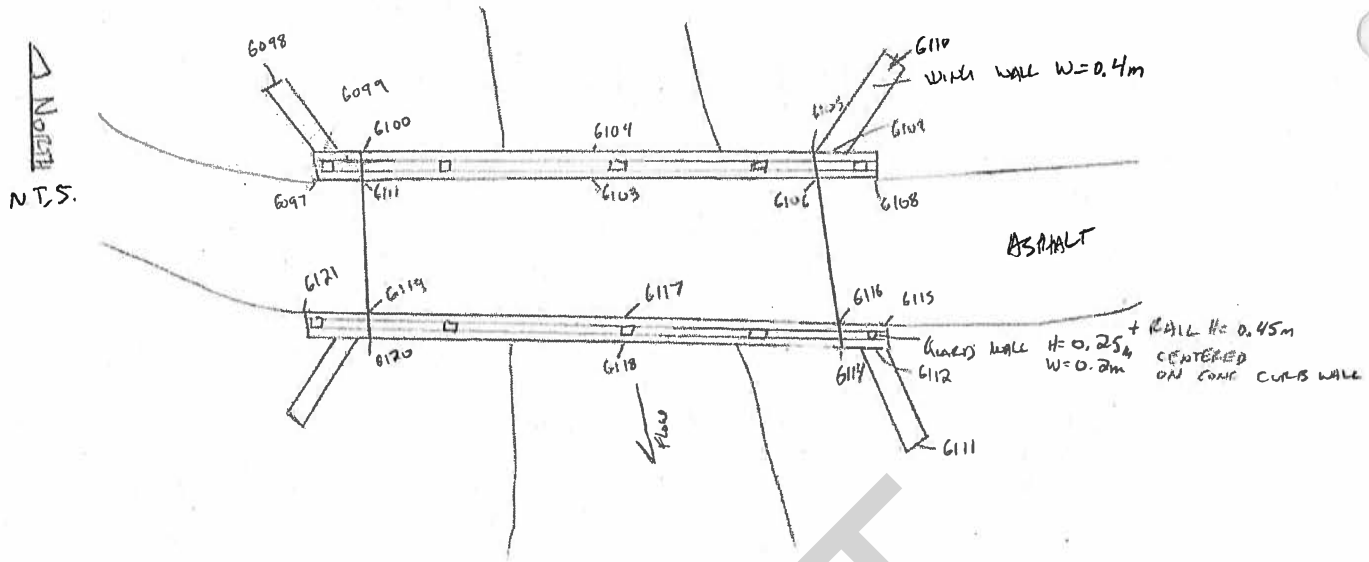
Type _____ (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape _____ (i.e. rectangular, circular, wedge)

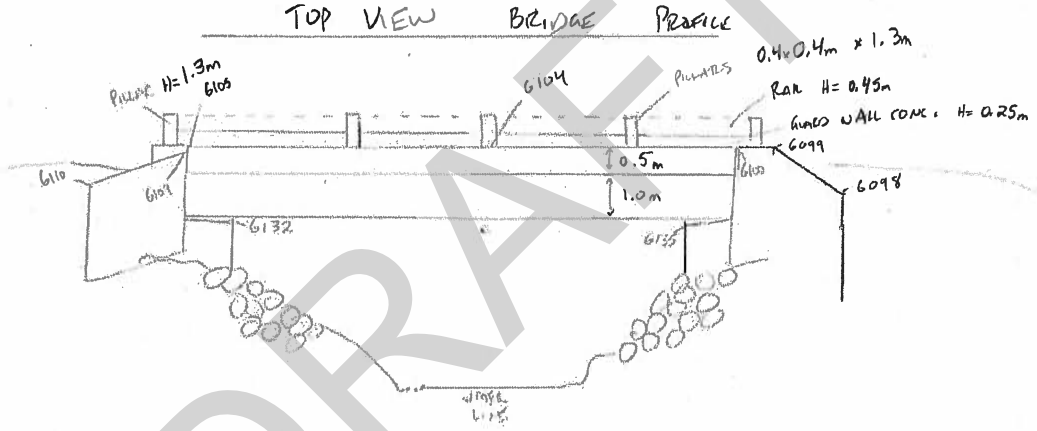
Note: All elevations to be referenced to geodetic datum.

PROFILE SKETCHES

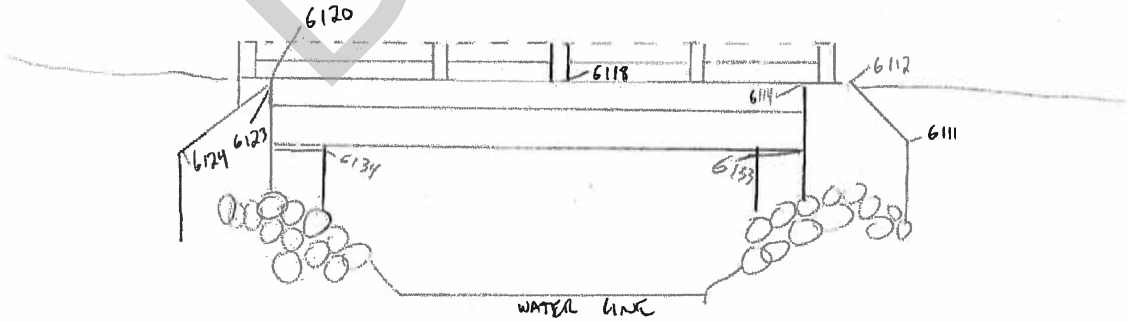
A. AMIES
OCT 16, 2017



TOP VIEW BRIDGE PROFILE



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST

* POINT SERIES ADJUSTED. PREFIX '1' ADDED

PC-BRDG-7

BRIDGE INFORMATION SHEET (CP2)

Project: Peloodis Flood Assessment Cross Section: P105-108

Location: Peloodis, AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 9.65 m

Outside to Outside Width 4.20 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1214.897 m	1213.777	m
Midspan		1214.940 m	1213.82	m
Right	Abutment	1214.960 m	1213.84	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 0 Width _____ m

Type _____ (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape _____ (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

PC-BRDG-7

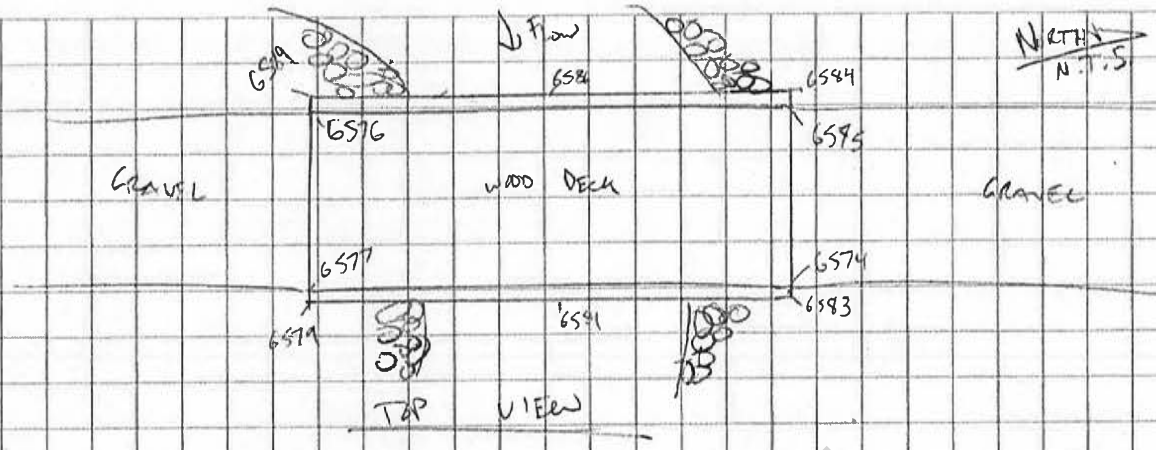
2/2

Stantec

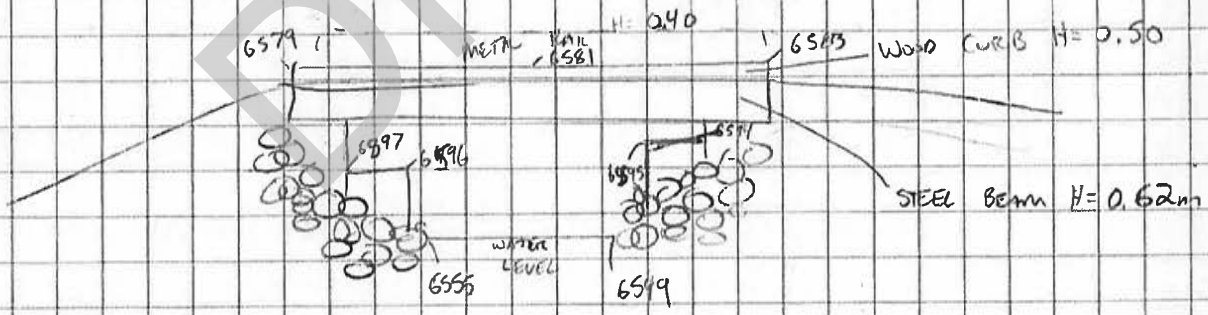
BRIDGE PROFILE SKETCH

A. Amies

Friday Oct 13, 2017



Upstream Cross Section (Looking East)



Downstream Cross Section (Looking West)

Designed by:

Checked by:

PC-BRDG-8

BRIDGE INFORMATION SHEET (PRE)

Project: PRIDDIS FLOOD HAZARD STUDY Cross Section: P130-P133

Location: COALMINE RD. W Surveyor: A AMIES / D. VANDERVEEN

Overall Dimensions

Abutment to Abutment Span 14.00 m

Outside to Outside Width 9.65 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1229.301 m	1228.810	m
Midspan		1229.273 m	1228.773	m
Right	Abutment	1229.108 m	1228.588	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2x8 Width 0.3 m

Type STEEL I BEAM (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape SQUARE (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

BRIDGE/CULVERT PHOTO SHEET

Project: _____ Location: _____ Cross Section: ____

Surveyor: _____ Photo Date: _____

UPSTREAM VIEW

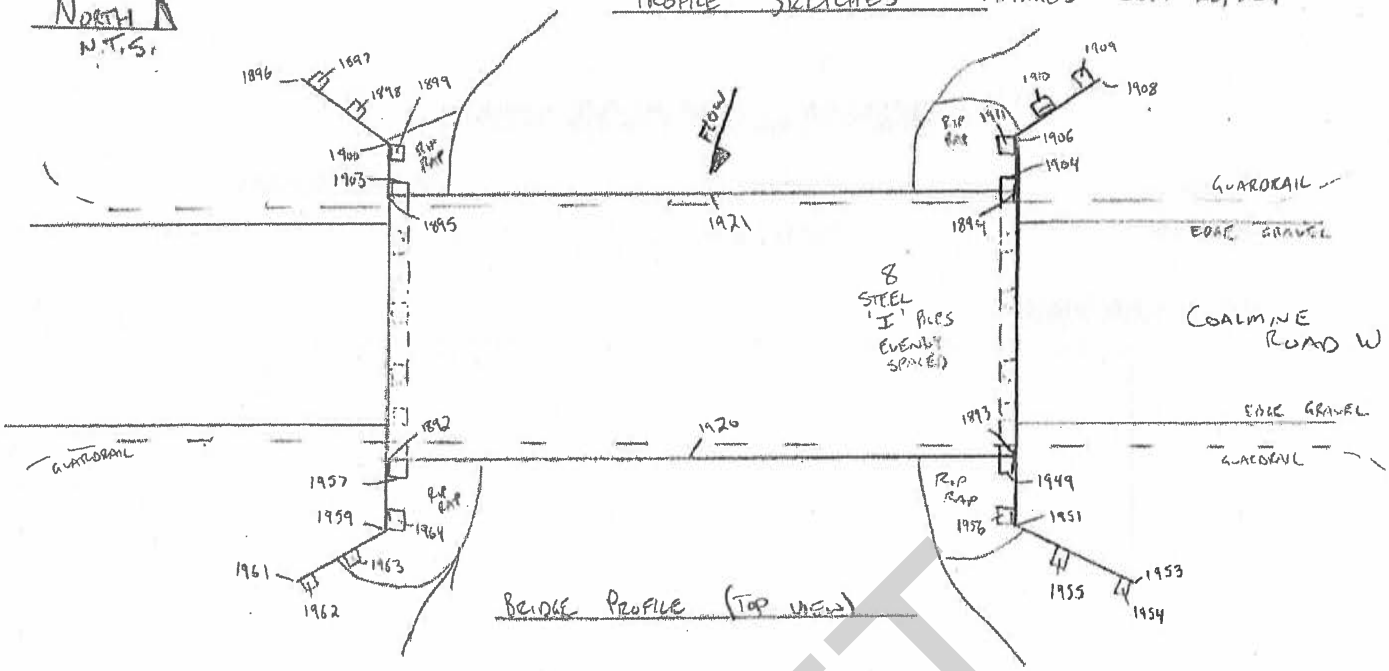
PHOTO

DOWNSTREAM VIEW

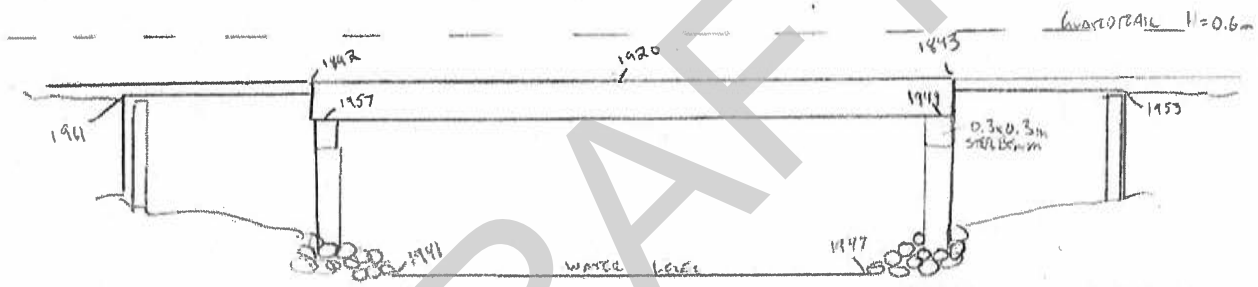
PHOTO

PROFILE SKETCHES AAmies SEPT 26, 2019

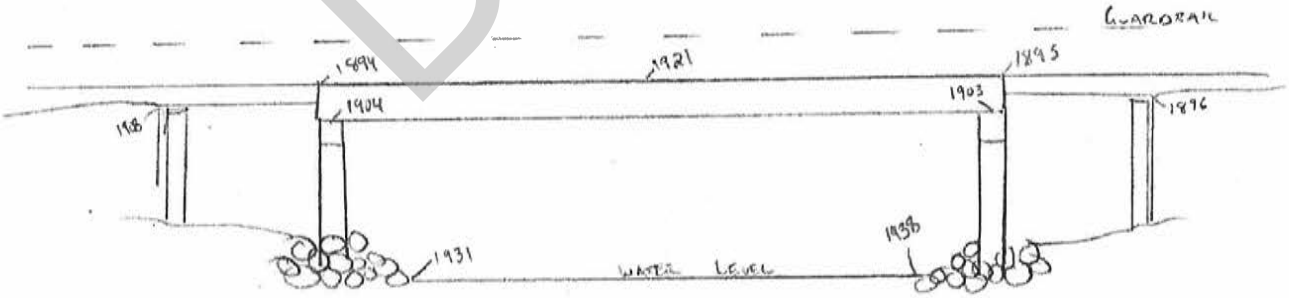
NORTH
N.T.S.



BRIDGE PROFILE (TOP VIEW)



DOWNSTREAM PROFILE (LOOKING WEST)



UPSTREAM PROFILE (LOOKING EAST)

BRIDGE INFORMATION SHEET (PRE)

Project: PRIODIS FLOOD HAZARD STUDY Cross Section: P144-P147

Location: HWY 22X Surveyor: A. AMIES / D. VANDERVEEN

Overall Dimensions

Abutment to Abutment Span 8.15m m

Outside to Outside Width 14.2 m

Elevation Data

	Top of Solid	Curb or Guard Rail	Low Chord
Left Abutment	1234.376 m	1232.258	m
Midspan	1234.391 m	1233.397	m
Right Abutment	1234.403 m	1232.244	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number NONE Width _____ m

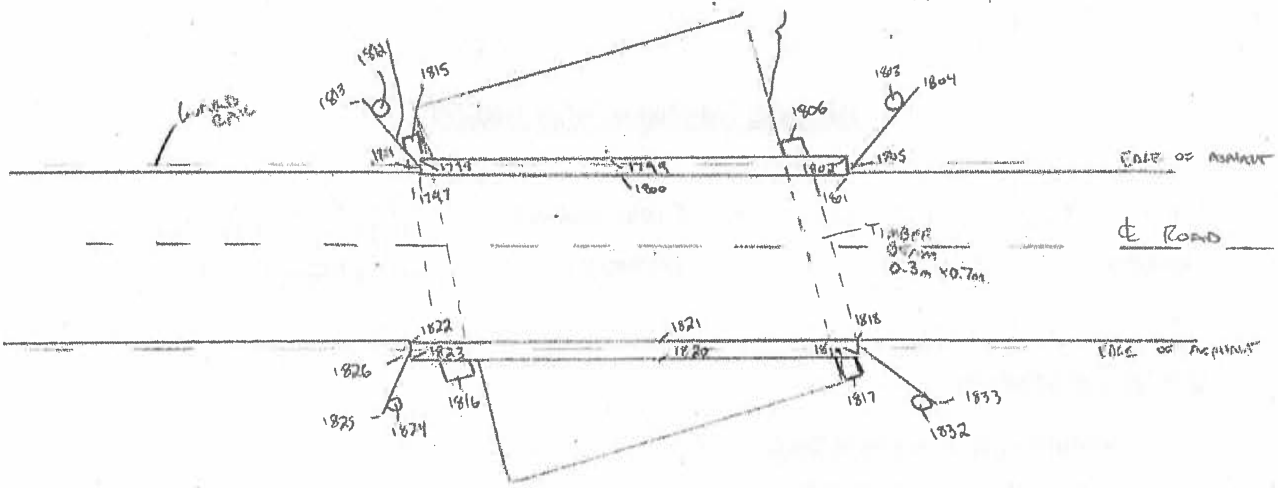
Type _____ (i.e. pile bent, timber truss, concrete cylinder)

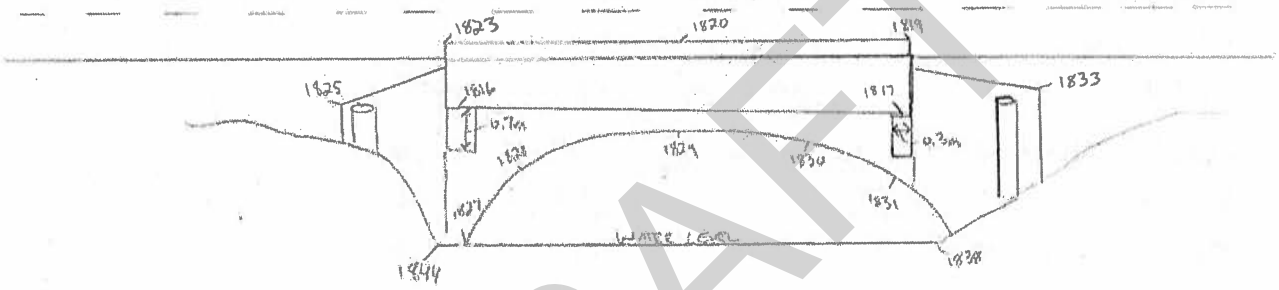
Nose Shape _____ (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

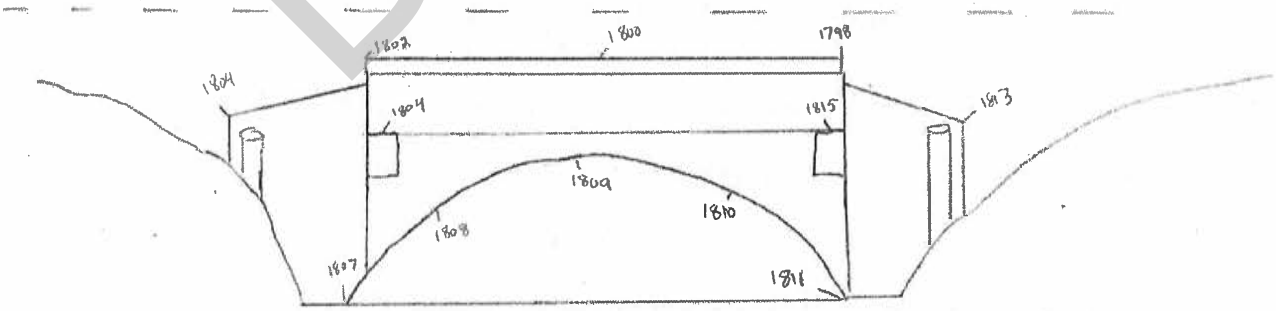
BRIDGE PROFILE SKETCHES

A. Amies
Sept 26, 2017





DOWNSTREAM PROFILE (LOOKING NORTH)



UPSTREAM PROFILE (LOOKING SOUTH)

BRIDGE INFORMATION SHEET (PRE)

Project: PRIDDIS FLOOD HAZARD STUDY
Cross Section: P150-P153
Location: TWNSHP RD. 225
Surveyor: A AMIES / P. VANDERVEEN

Overall Dimensions

Abutment to Abutment Span 6.1 m
Outside to Outside Width 8.4 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1237.143 m	1236.432	m
Midspan		1237.151 m	1236.44	m
Right	Abutment	1237.154 m	1236.437	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

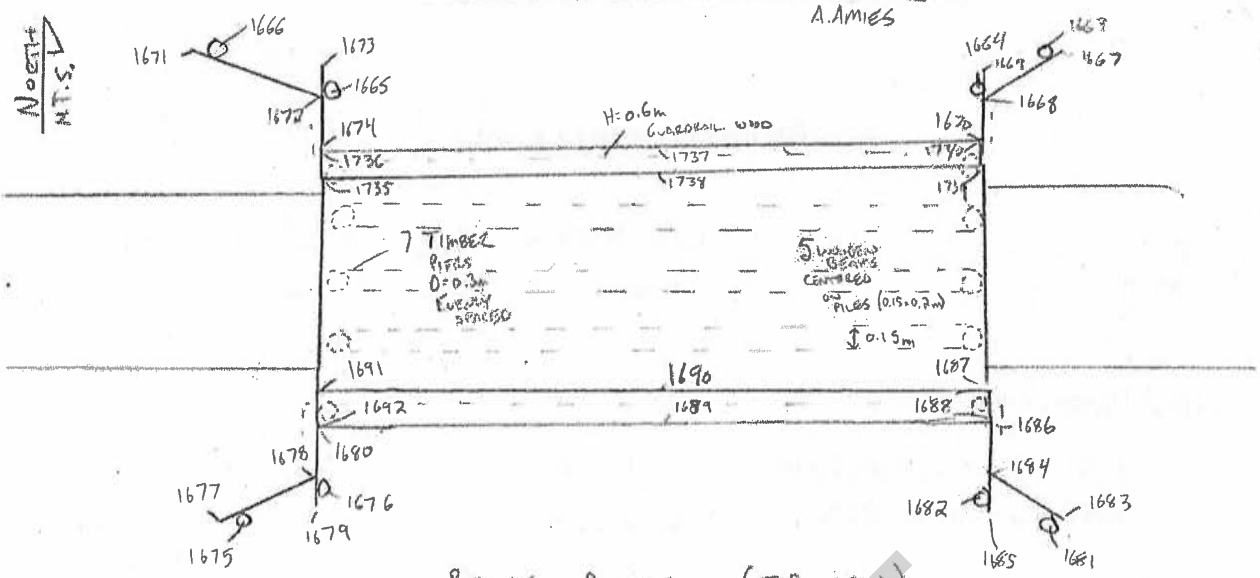
Number 2 × 7 Width 0.3 m

Type TIMBER (i.e. pile bent, timber truss, concrete cylinder)

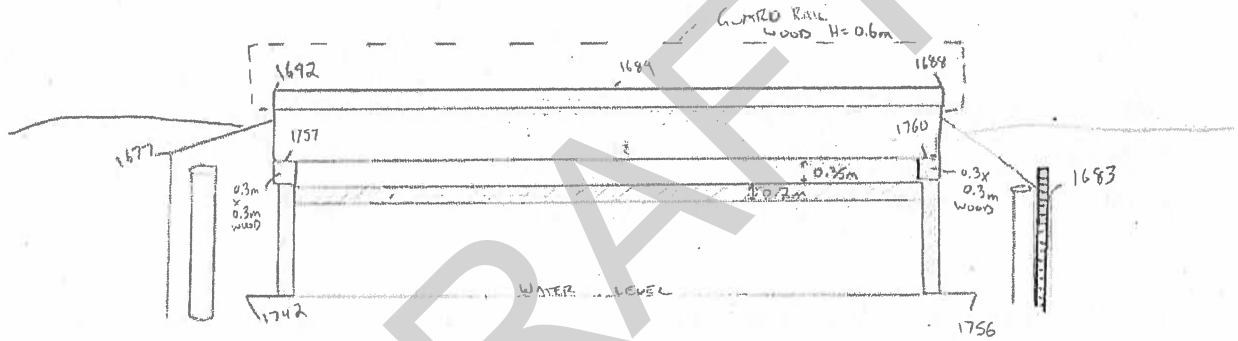
Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

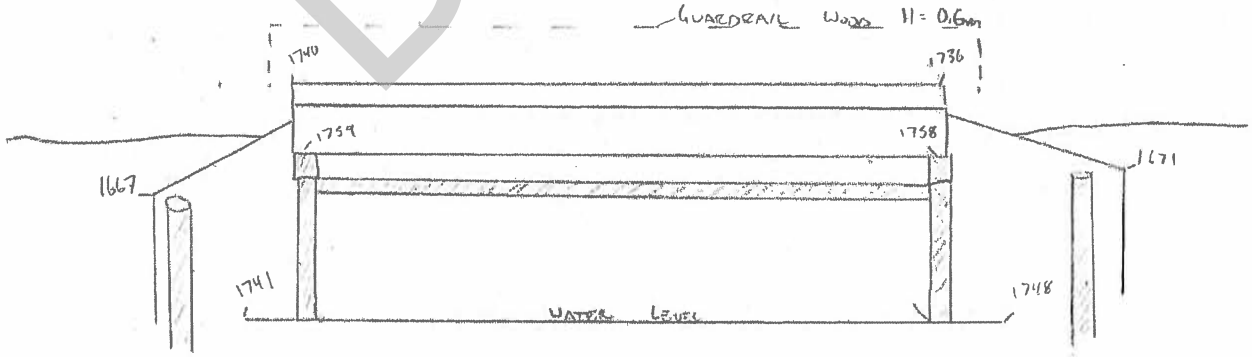
BRIDGE SKETCHES SEPT 26, 2017
A. AMIES



BRIDGE PROFILE (TOP VIEW)



DOWNSTREAM PROFILE (LOOKING NORTH)



UPSTREAM PROFILE (LOOKING SOUTH)

FC-CLVT-1

BRIDGE INFORMATION SHEET (PRE)

Project: PRIDDIS FLOOD STUDY Cross Section: 58-61

Location: 186 AVE W Surveyor: A. ARMES / D. VANDERVEEN

Overall Dimensions

Abutment to Abutment Span 11.62 m

Outside to Outside Width 14.3 m

Elevation Data

ATTACHED. SEE POINTS

	Top of Solid	Curb or Guard Rail	Low Chord
Left Abutment	1160.917 m	1158.685	m
Midspan	1160.914 m	1160.132	m
Right Abutment	1160.948 m	1158.917	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 0 Width N/A m

Type N/A (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape N/A (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

CULVERT INFORMATION SHEET

Project: _____ Cross Section: _____

Location: _____ Surveyor: _____

Culvert Type

CSP (Round) _____ Concrete (Round) _____

CSP (Arch) _____ Concrete (Arch) _____

Rectangular (Box) _____ Other (Specify) _____

Barrel Length _____ m

Barrel Section

Diameter _____ m (Round)

Rise _____ m (Arch) Span _____ m

Height _____ m (Box) Width _____ m

Invert

Upstream _____ m Downstream _____ m

Entrance Condition

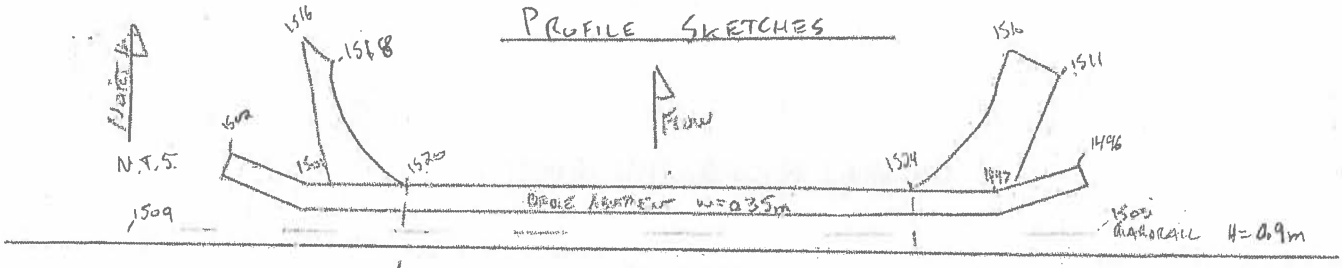
Projecting from fill _____ Square headwall _____

Mitred to conform to slope _____ Bevelled headwall _____

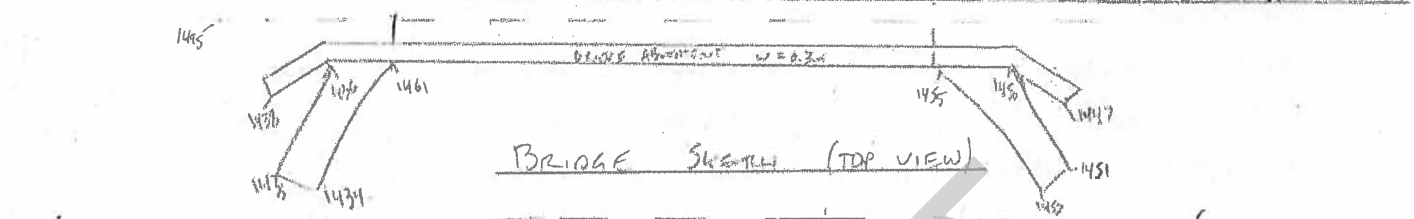
Other (specify) _____

Note: All elevations to be referenced to geodetic datum.

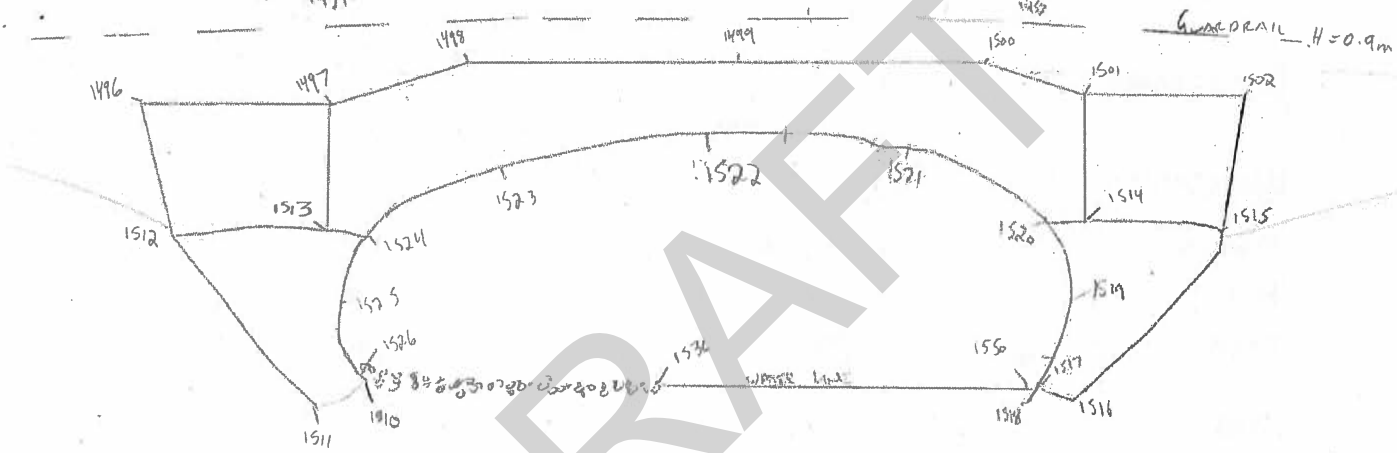
PROFILE SKETCHES



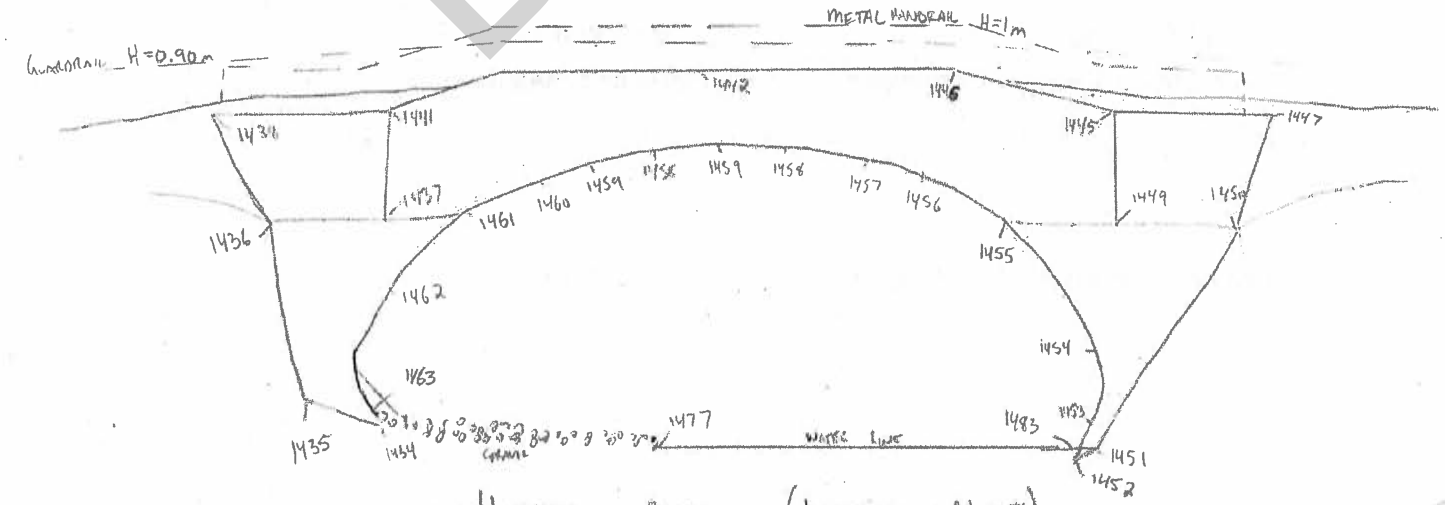
186 AVE W



BRIDGE SKETCH (TOP VIEW)



DOWNSTREAM PROFILE (LOOKING SOUTH)



UPSTREAM PROFILE (LOOKING NORTH)

CULVERT INFORMATION SHEET (CPS)

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 145-148
Location: PRIDDIS, AB 240 ST W Surveyor: A. AMIES

Culvert Type

CSP	(Round)		Concrete	(Round)	
CSP	(Arch)	✓	Concrete	(Arch)	
Rectangular	(Box)		Other	(Specify)	

Barrel Length 49.8 m

Barrel Section

Diameter		m (Round)			
Rise	5.5	m (Arch)	Span	7.5	m
Height		m (Box)	Width		m

Invert

Upstream 1187.439 m Downstream 1187.405 m

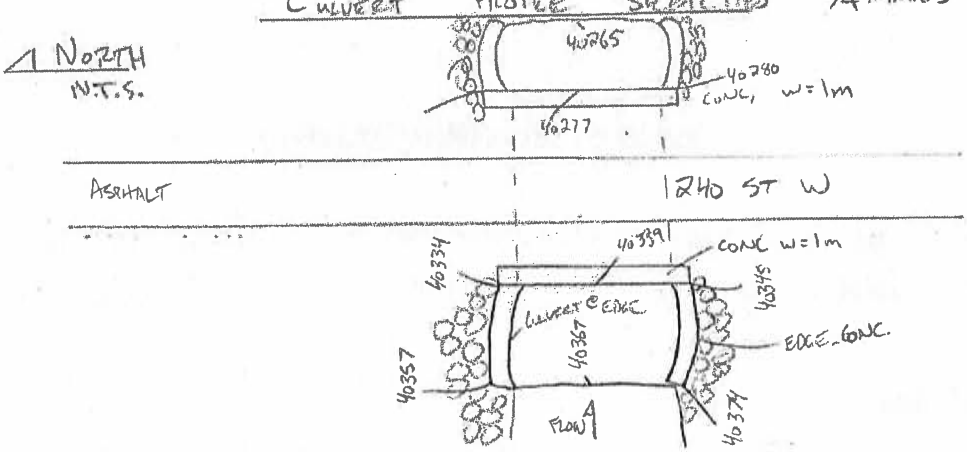
Entrance Condition

Projecting from fill		Square headwall	
Mitred to conform to slope	✓	Bevelled headwall	
Other (specify)			

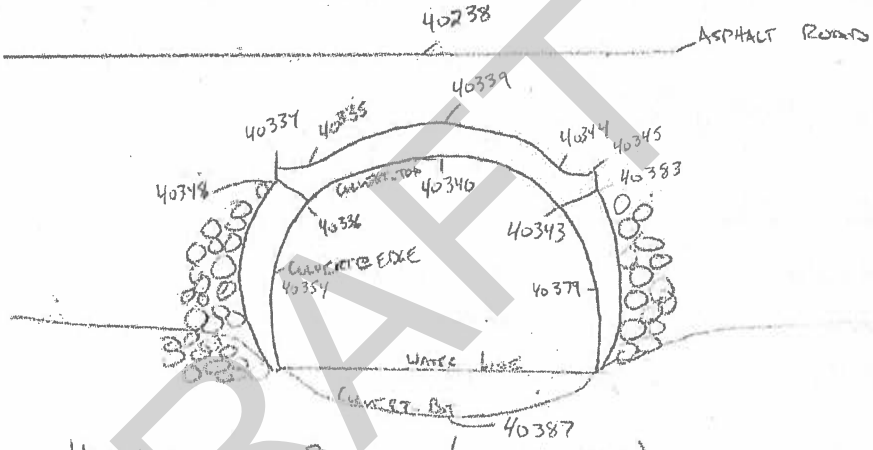
Note: All elevations to be referenced to geodetic datum.

FC-CLVT-2

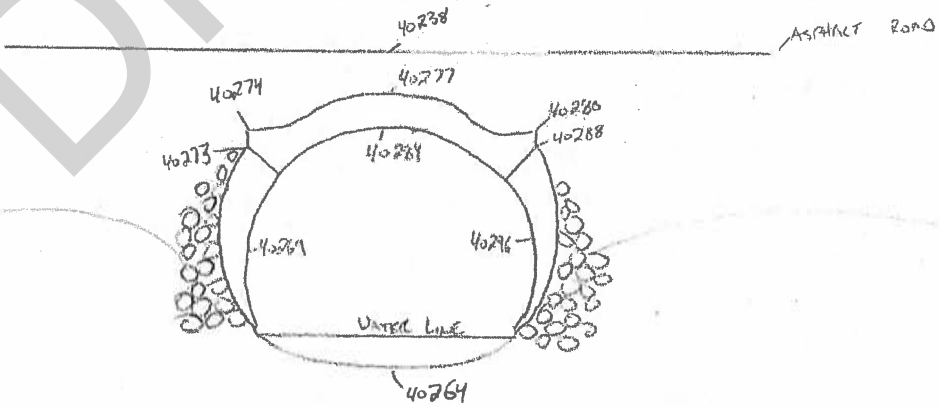
CULVERT PROFILE SKETCHES A. AMIES OCT 31, 2017



CULVERT PROFILE TOP VIEW



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST)

BRIDGE INFORMATION SHEET (PRE)

Project: PRIDDIS FLOOD STUDY Cross Section: 37-41

Location: PRIDDIS, HWY 22X Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 39.70 m

Outside to Outside Width 14.58 m

Elevation Data

		Top of Solid	of Curb or Guard Rail	Low Chord
Left	Abutment	1159.276 m	1158.279	m
Midspan		1158.703 m	1157.776	m
Right	Abutment	1158.139 m	1157.252	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2 x 7 Width 0.5 m

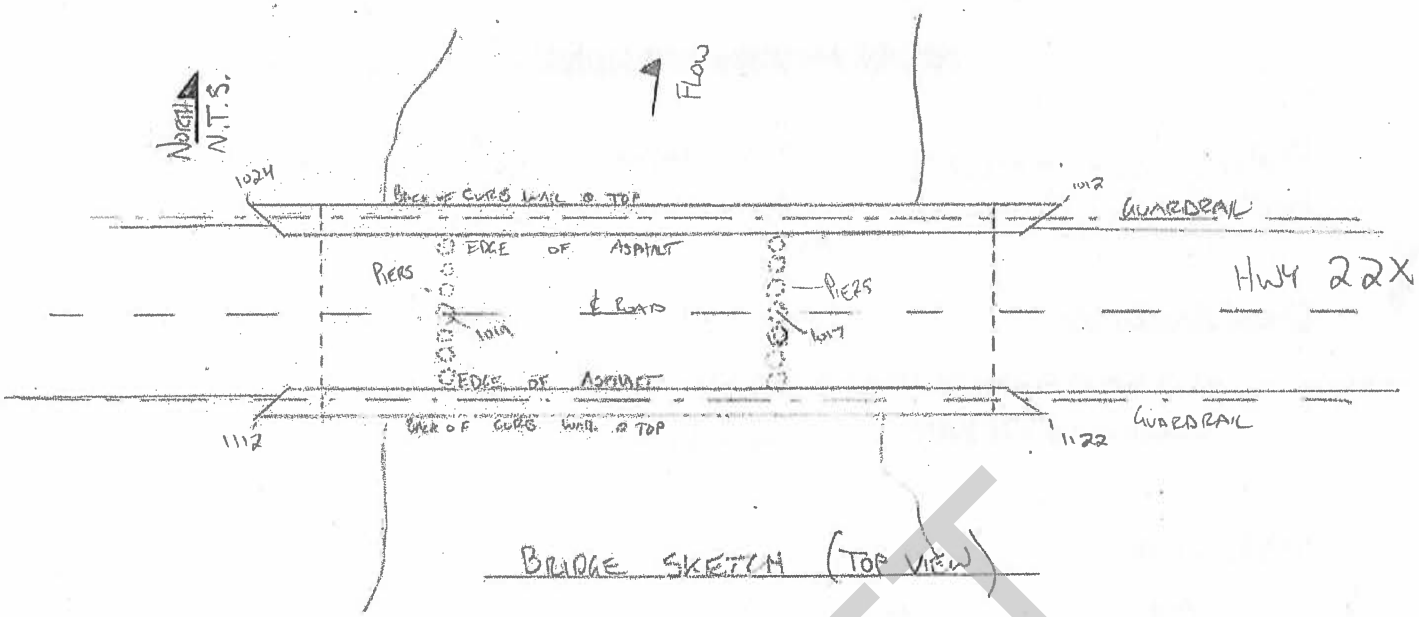
Type STEEL/ CONC. CYL. (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

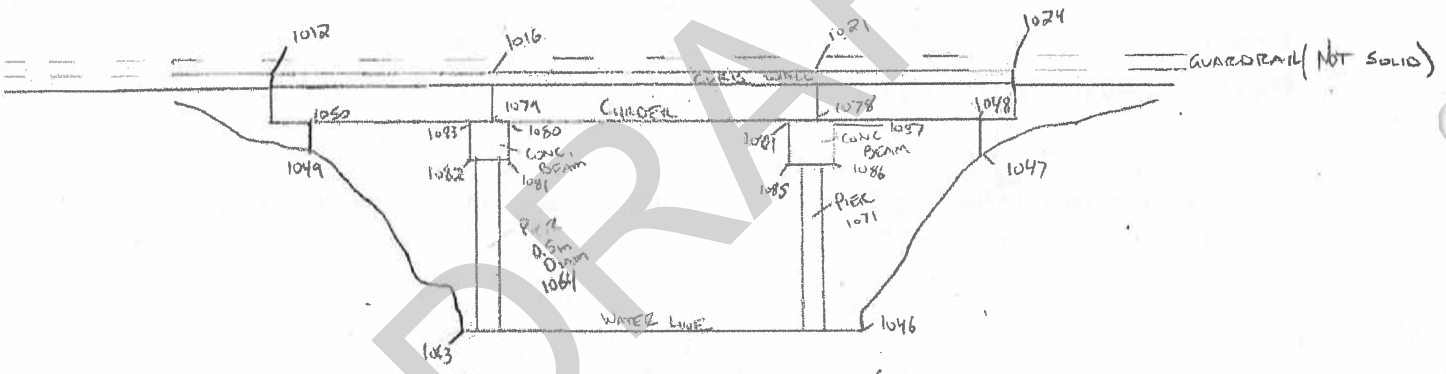
Note: All elevations to be referenced to geodetic datum.

PROFILE SKETCHES

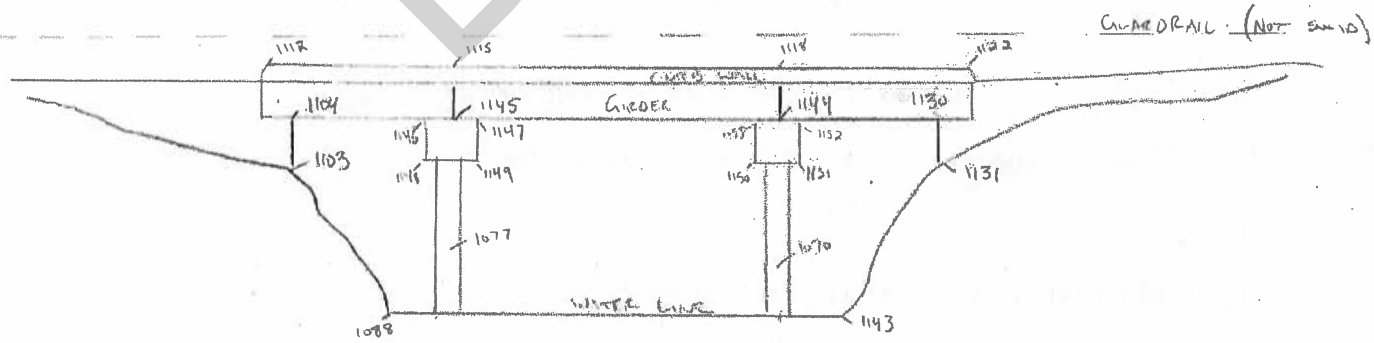
A. AMIES SEPT 19, 2017



BRIDGE SKETCH (TOP VIEW)



DOWNSTREAM CROSS SECTION (LOOKING SOUTH)



UPSTREAM CROSS SECTION (LOOKING NORTH)

BRIDGE INFORMATION SHEET (PRE)

Project: PRIDDIS FLOOD STUDY Cross Section: 49-52

Location: PRIDDIS VALLEY RD. Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 49.9 m

Outside to Outside Width 11.25 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1160.183 m	1158.636	m
Midspan		1160.040 m	1156.547	m
Right	Abutment	1159.903 m	1158.428	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

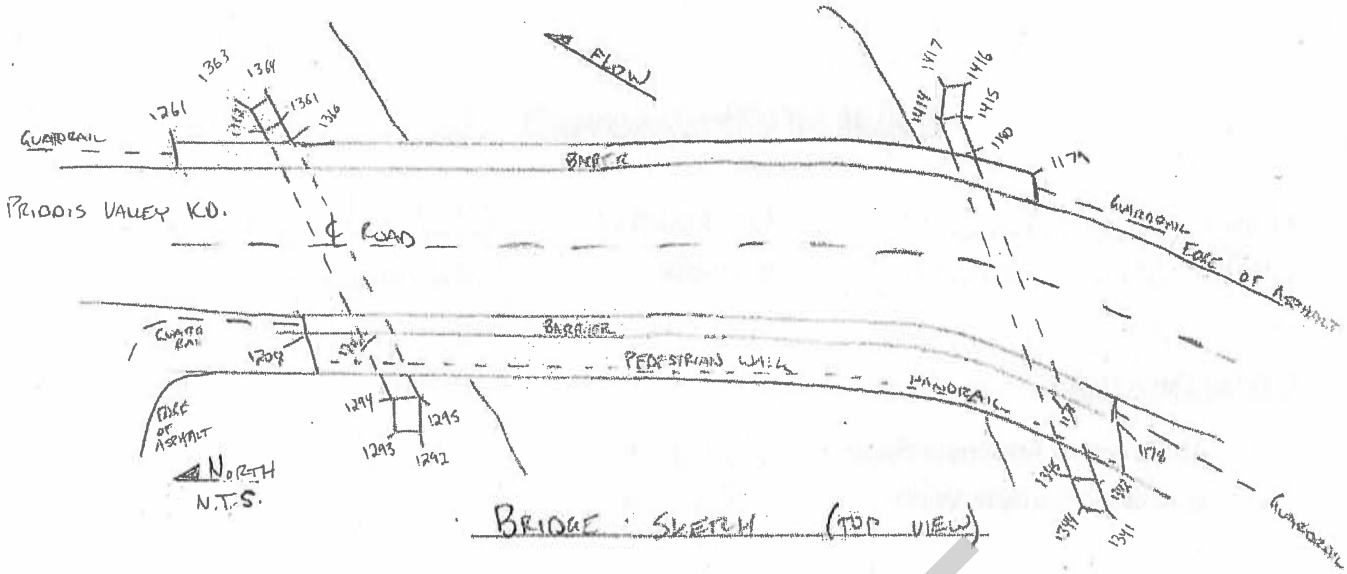
Number 4 × 5 Width 0.5 m

Type STEEL/ CONC. CYL (i.e. pile bent, timber truss, concrete cylinder)

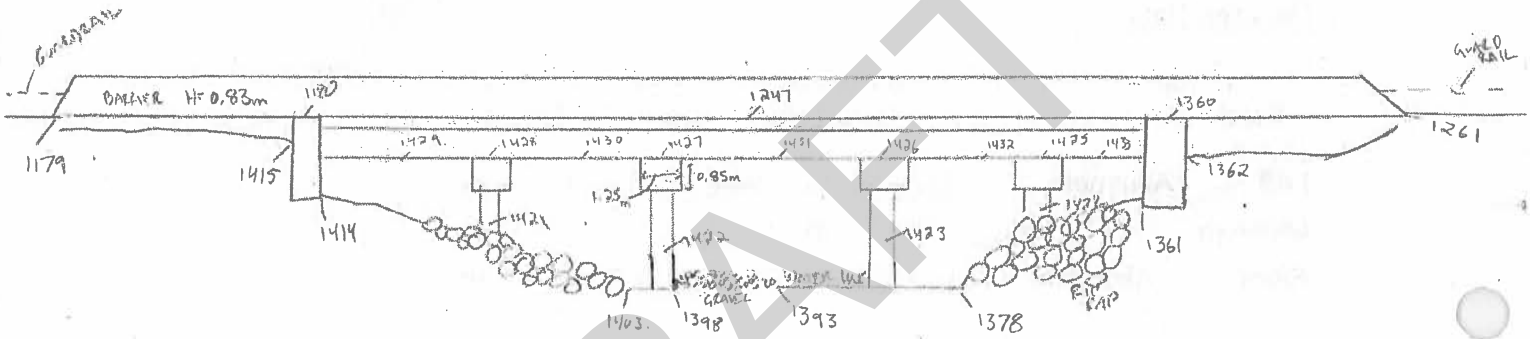
Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

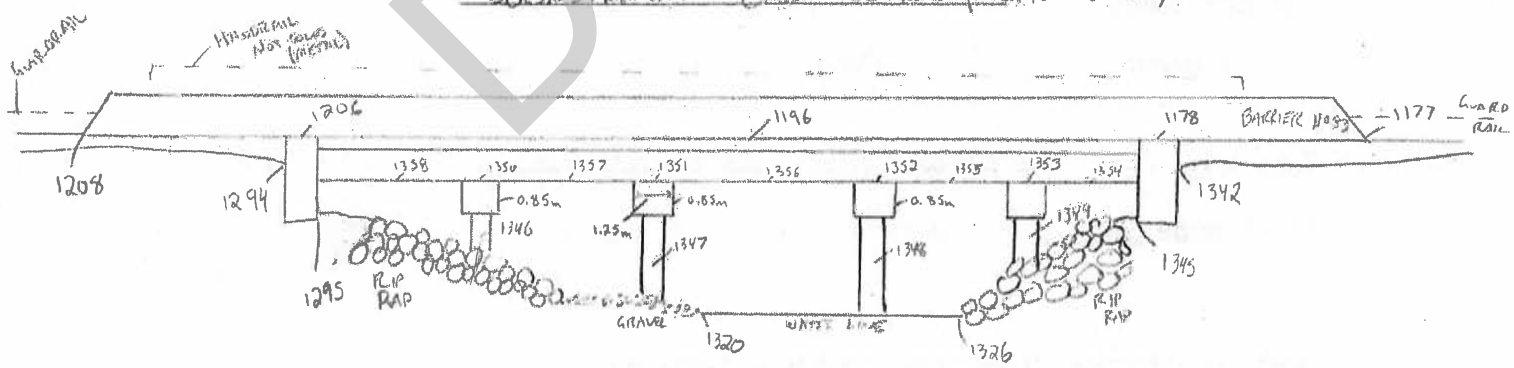
PROFILE SKETCHES A AMIES SEPT 20, 2017



BRIDGE SKETCH (TOP VIEW)



DOWNSTREAM CROSS SECTION (LOOKING WEST)



UPSTREAM CROSS SECTION (LOOKING EAST)

BRIDGE INFORMATION SHEET (CP1)

Project: Priddis Flood Assessment Cross Section: 69-72

Location: Priddis AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 26.5 m

Outside to Outside Width 6.3 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1165.559 m	1164.202	m
Midspan		1165.576 m	1164.240	m
Right	Abutment	1165.551 m	1164.260	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number (2x8)+(2x4) Width 0.3 m

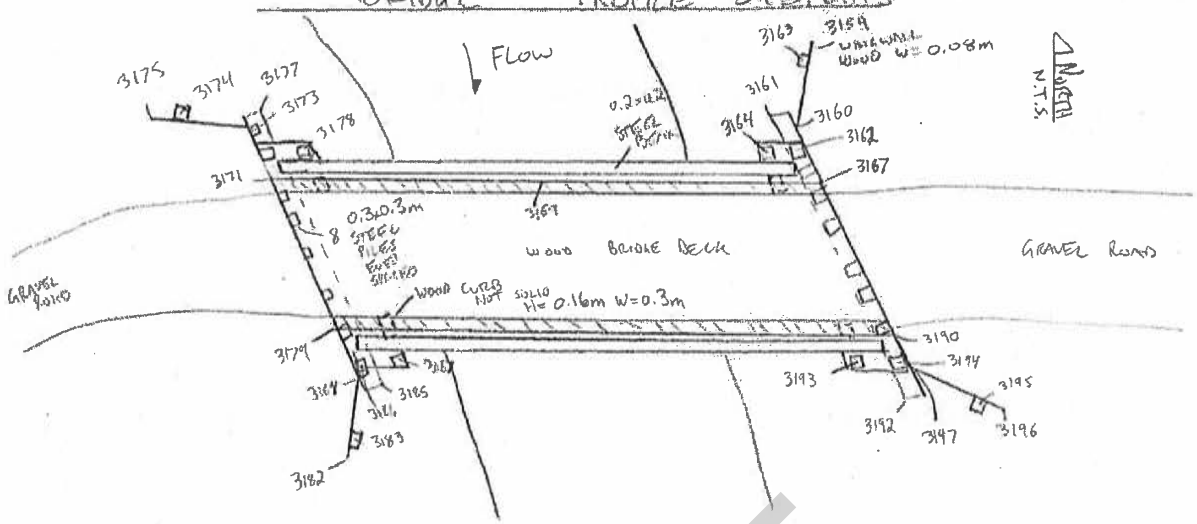
Type STEEL PILE (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape RECTANGULAR (i.e. rectangular, circular, wedge)

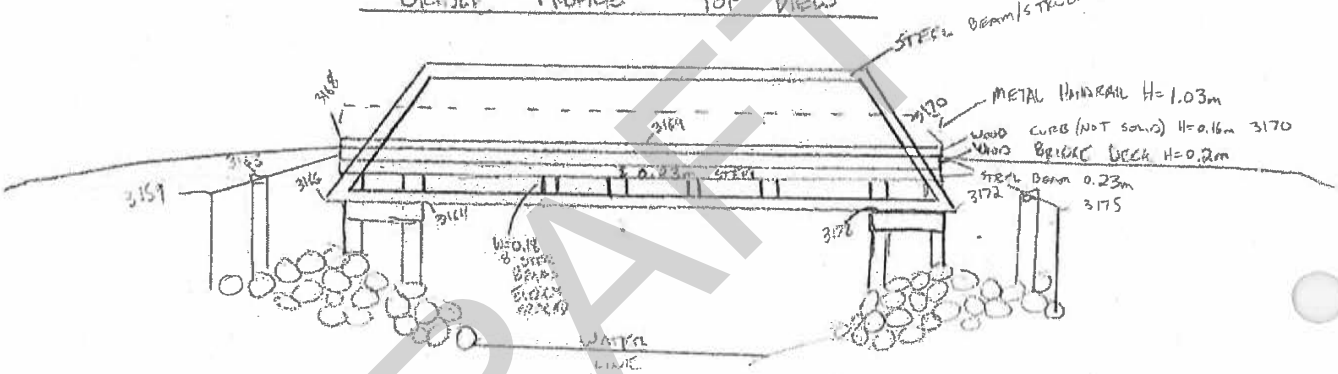
Note: All elevations to be referenced to geodetic datum.

A. Amies
Oct 26, 2017

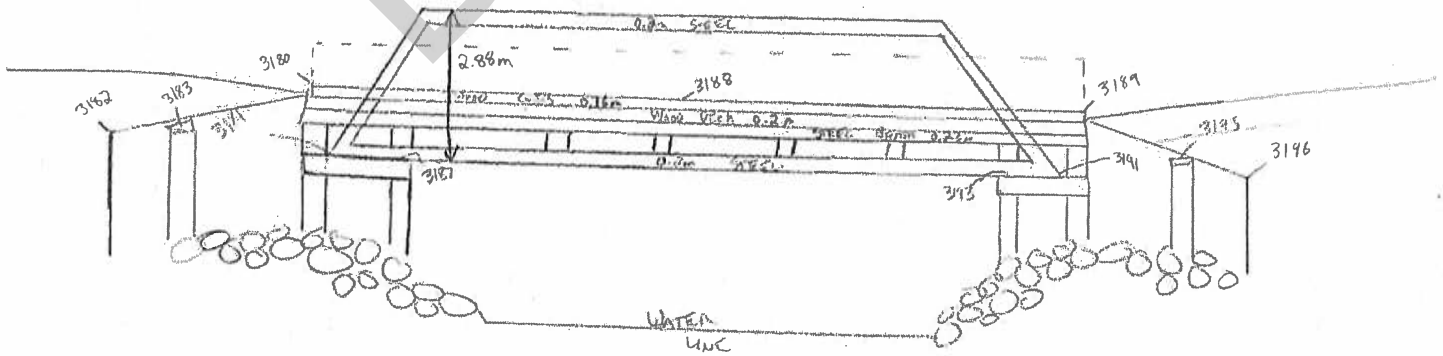
Bridge Profile Sketches



Bridge Profile Top View



Upstream Profile (Looking South)



Downstream Profile (Looking North)

*Point Series Adjusted. Prefix '1' Added

BRIDGE INFORMATION SHEET (CPS)

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 115

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 8.10 m

Outside to Outside Width 3.55 m

Elevation Data

		Top of Solid		Curb or Guard Rail		Low Chord	
Left	Abutment	1179.891	m	1179.141			m
Midspan		1179.989	m	1179.269			m
Right	Abutment	1179.993	m	1179.141			m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2x3 Width 0.35 m

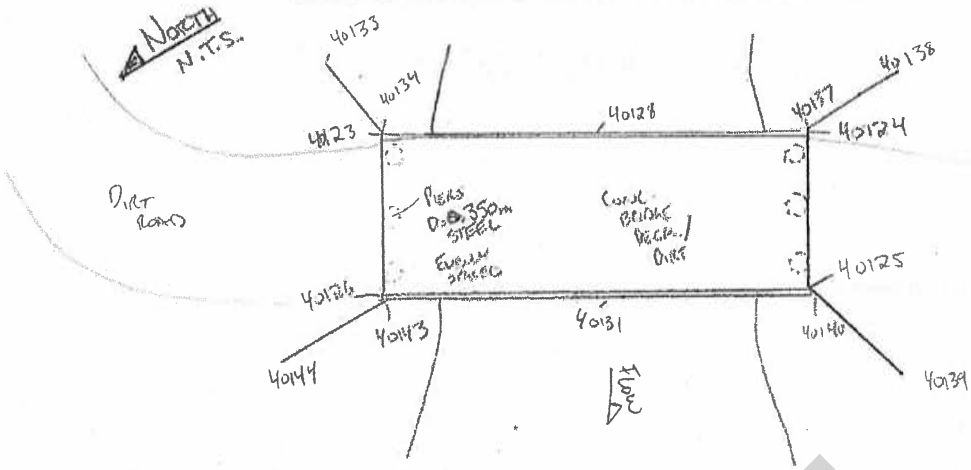
Type STEEL PILE (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

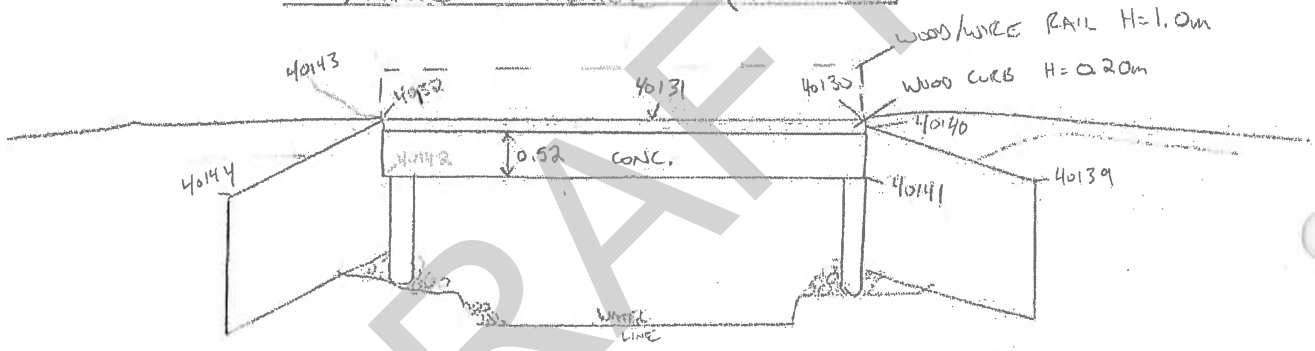
Note: All elevations to be referenced to geodetic datum.

A. Amies Oct 30, 2017

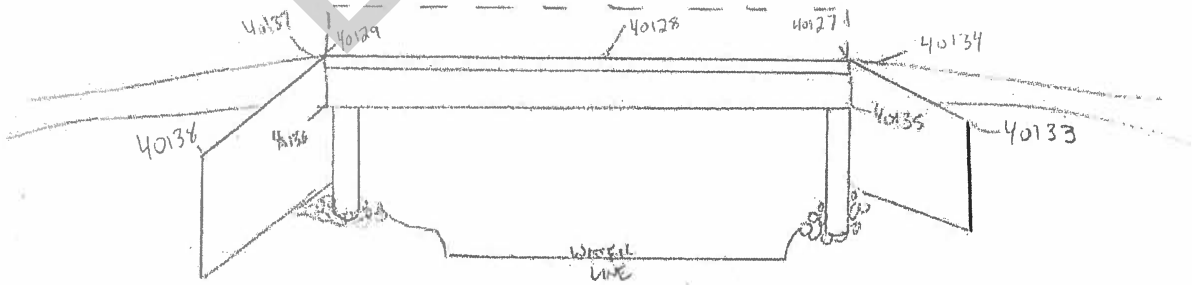
Bridge Profile Sketches



Bridge Profile (Top View)



Downstream Profile (Looking East)



Upstream Profile (Looking West)

BRIDGE INFORMATION SHEET (CPS)

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 168-171

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 14.4 m

Outside to Outside Width 2.35 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1200.806 m	1200.144	m
Midspan		1200.782 m	1200.132	m
Right	Abutment	1200.812 m	1200.152	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2 x 3 Width 0.35 m

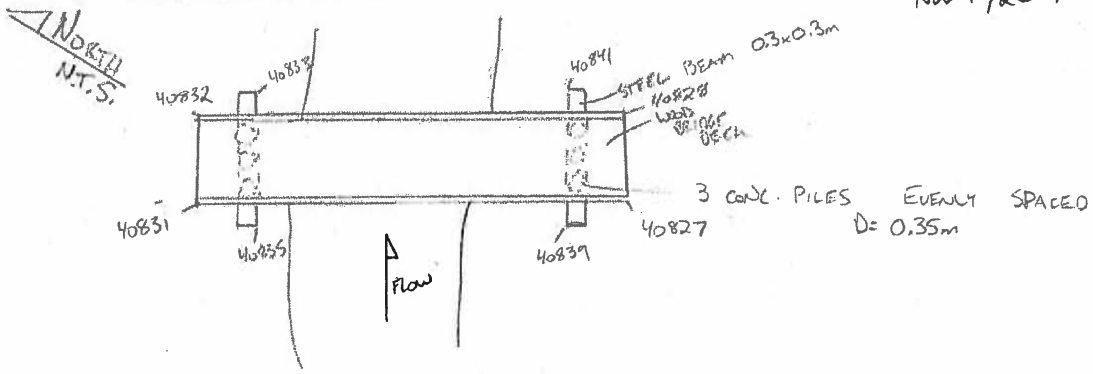
Type CONC. CYL. (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

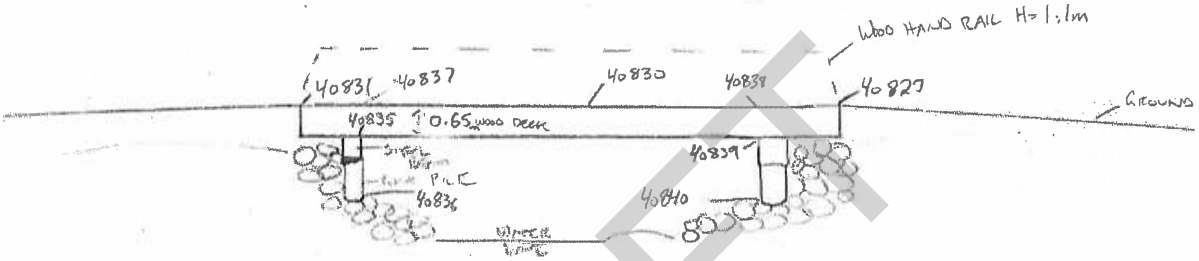
Note: All elevations to be referenced to geodetic datum.

A. Amies
Nov 1, 2017

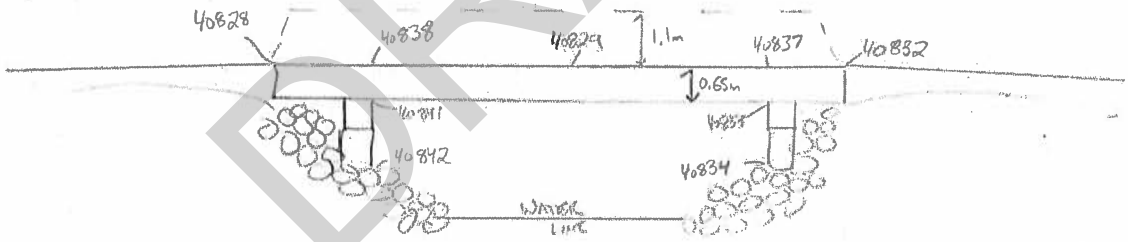
Bridge Profile Sketches



Bridge Profile (Top View)



Upstream Profile (Looking East)



Downstream Profile (Looking West)

BRIDGE INFORMATION SHEET (CP6)

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 187-190

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 23.95 m

Outside to Outside Width 4.4 m

Elevation Data

		Top of Solid		Curb or Guard Rail		Low Chord	
Left	Abutment	1211.995	m	1210.783			m
Midspan		1211.942	m	1210.762			m
Right	Abutment	1211.963	m	1210.798			m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2x4 Width 0.3 m

Type STEEL CYLINDER (i.e. pile bent, timber truss, concrete cylinder)

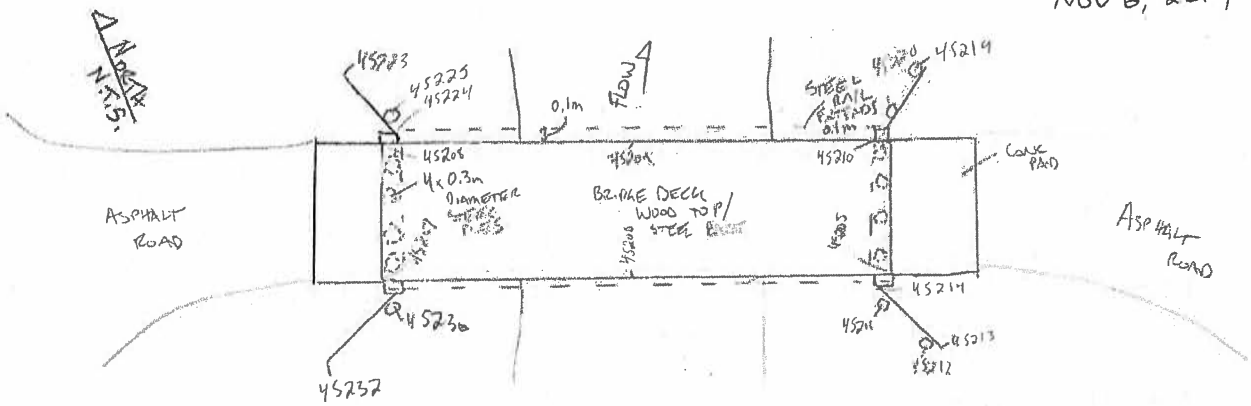
Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

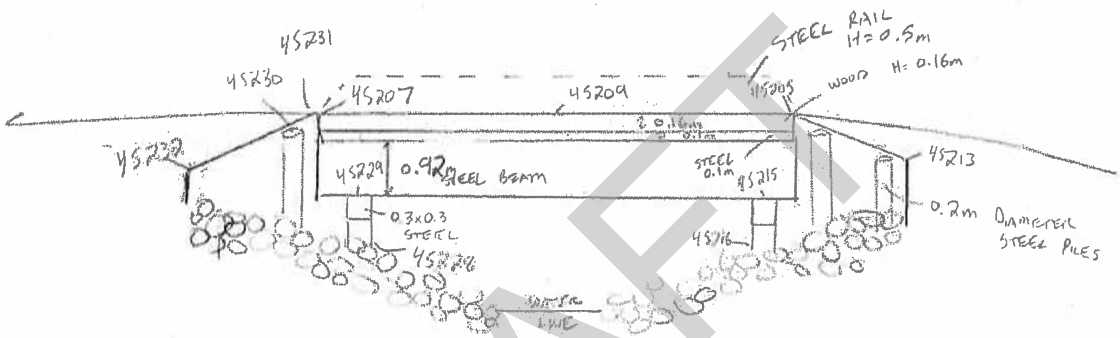
FC-BRDG-6

A. AMIES
Nov 6, 2017

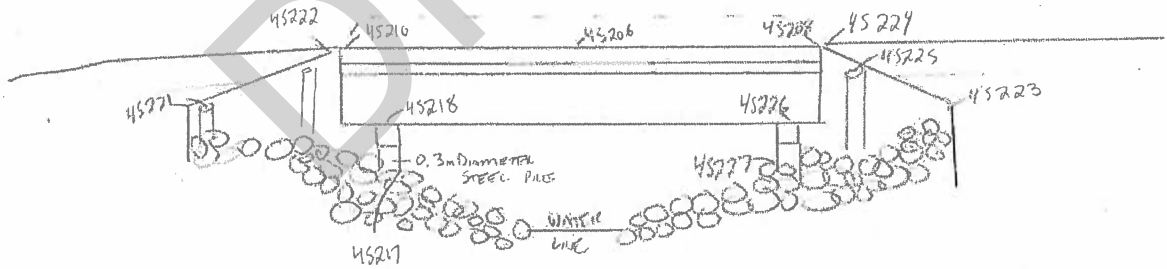
BRIDGE PROFILE SKETCHES



BRIDGE PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING EAST)



DOWNSTREAM PROFILE (LOOKING WEST)

FC-BRDG-7

BRIDGE INFORMATION SHEET (CP6)

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 192-195

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 17.8 m

Outside to Outside Width 4.25 m

Elevation Data

	Top of Solid	Curb or Guard Rail	Low Chord
Left Abutment	1213.181 m	1212.302	m
Midspan	1213.168 m	1212.288	m
Right Abutment	1213.175 m	1212.295	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2x4 Width 0.3 m

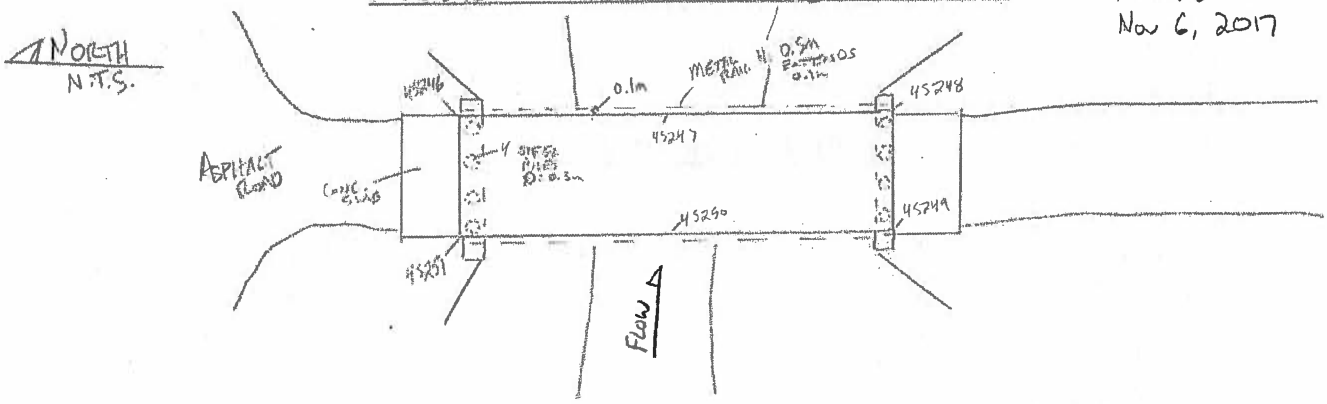
Type STEEL CYL. (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

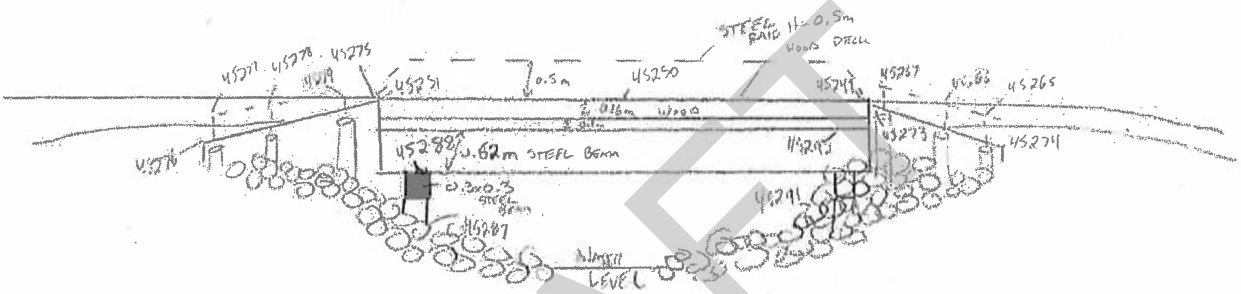
Note: All elevations to be referenced to geodetic datum.

A. Ames
Nov 6, 2017

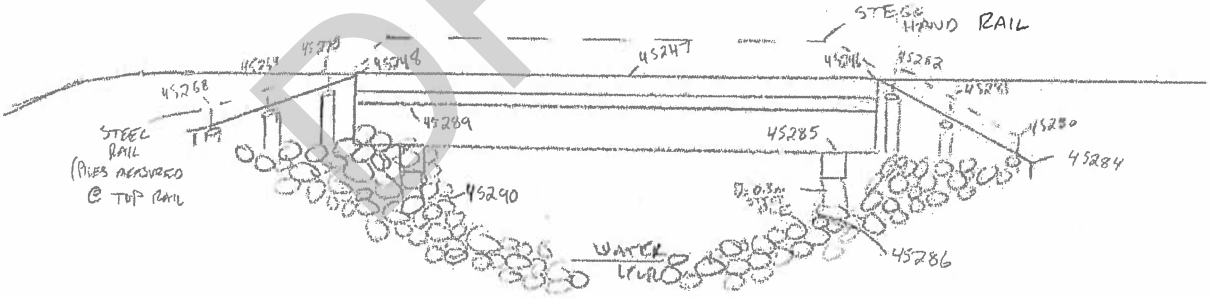
Bridge Profile Sketches



Bridge Profile (Top View)



Upstream Profile (Looking East)



Downstream Profile (Looking West)

FC-BRDG-8

(CPS)

BRIDGE INFORMATION SHEET

Project: PRIDDIS FLOOD RISK ASSESSMENT Cross Section: 201.1-201.2

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 14.3* m * NO ABUTMENTS, DISTANCE BETWEEN PIERS

Outside to Outside Width 1.2 m

Elevation Data

		Top of Solid		Curb or Guard Rail		Low Chord	
Left	Abutment	1216.928	m	1216.518			m
Midspan		1216.745	m	1216.335			m
Right	Abutment	1216.885	m	1216.475			m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2x4 Width 0.15 m

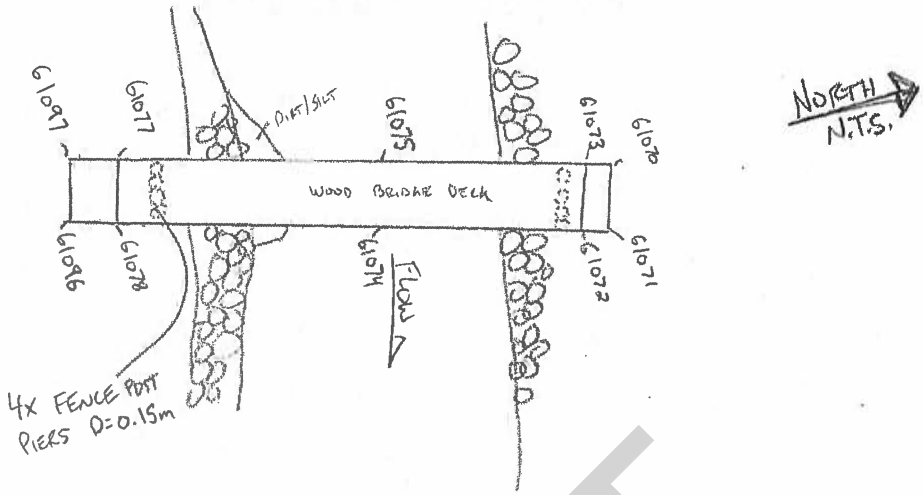
Type WOOD (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

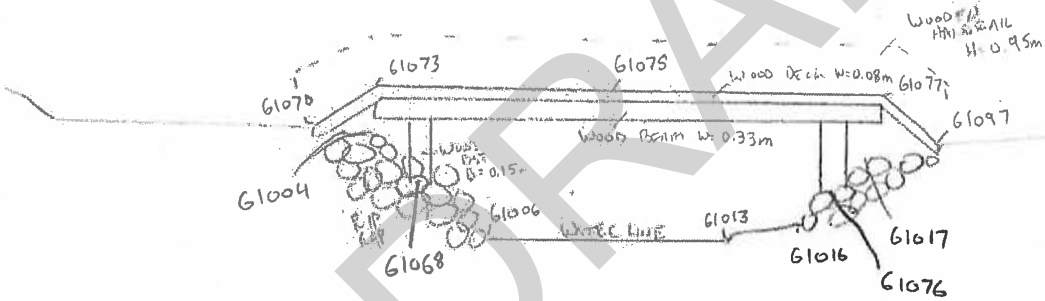
Note: All elevations to be referenced to geodetic datum.

A. Amies May 19, 2018

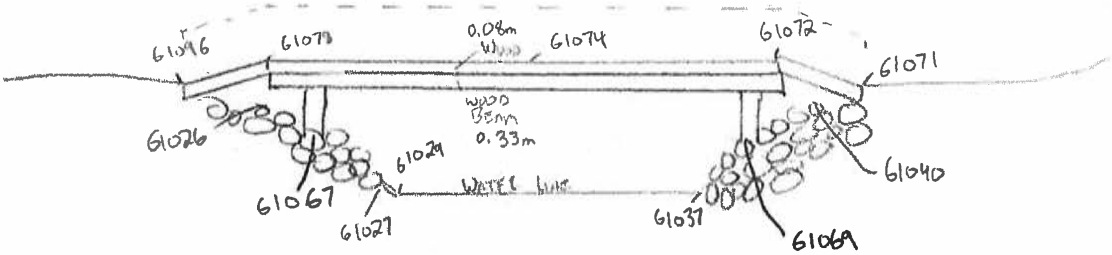
Bridge Profile Sketches



Bridge Profile (Top View)



Upstream Profile (Looking East)



Downstream Profile (Looking West)

FC-BRDG-9

BRIDGE INFORMATION SHEET (CP6)

Project: Priddis Flood Risk Assessment Cross Section: 211-214

Location: Priddis AB Surveyor: A. Amies

Overall Dimensions

Abutment to Abutment Span 24.0 m

Outside to Outside Width 9.9 m

Elevation Data

		Top of Solid	Curb or Guard Rail	Low Chord
Left	Abutment	1223.275 m	1222.745	m
Midspan		1223.646 m	1223.126	m
Right	Abutment	1224.001 m	1223.479	m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 4x6 Width 0.3 m

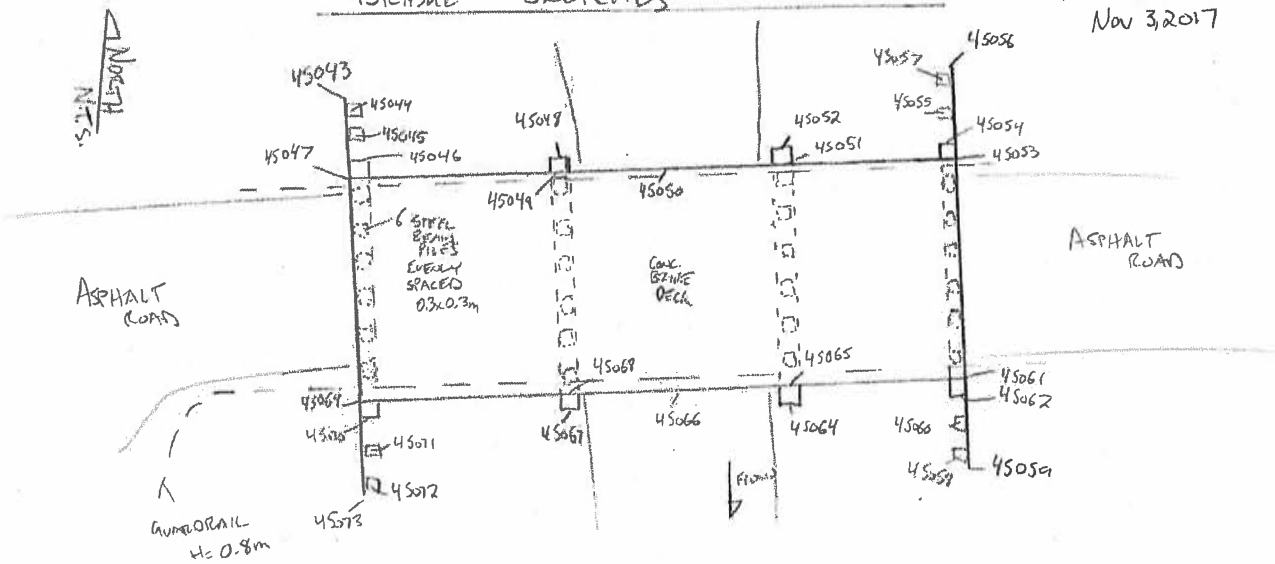
Type Steel beam (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape Rectangular (i.e. rectangular, circular, wedge)

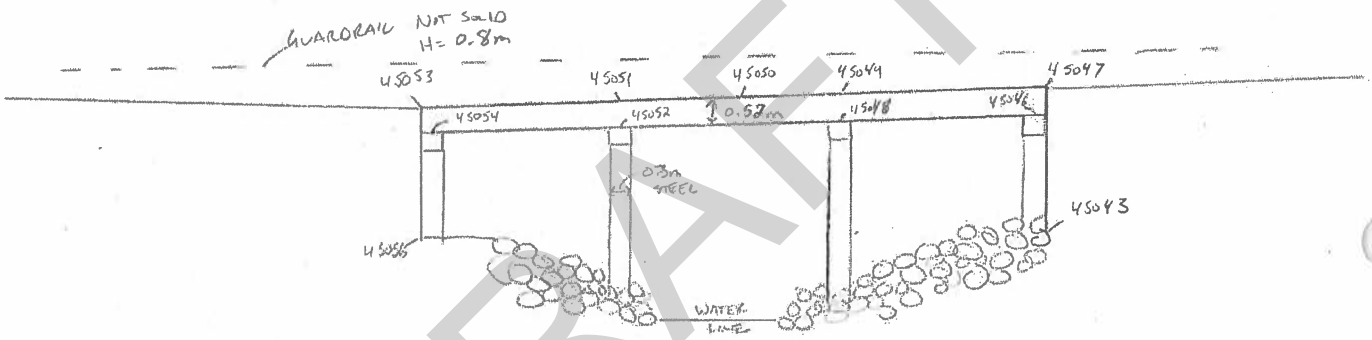
Note: All elevations to be referenced to geodetic datum.

BRIDGE SKETCHES

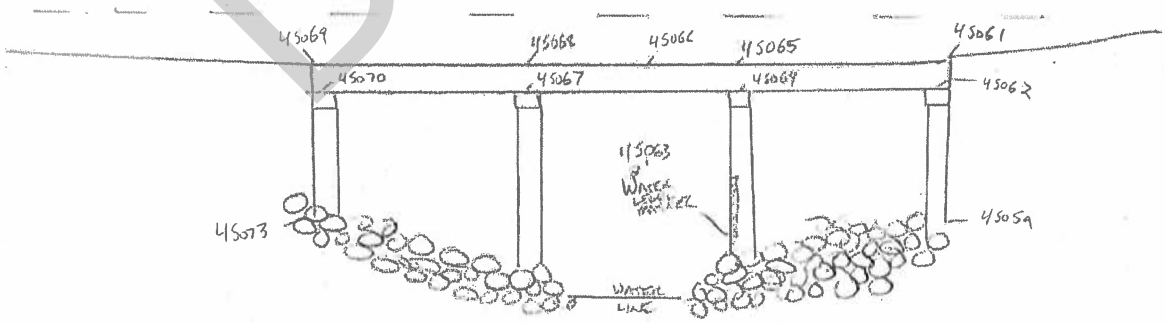
A. AMIES
Nov 3, 2017



BRIDGE PROFILE (TOP VIEW)



UPSTREAM PROFILE (LOOKING SOUTH)



DOWNSTREAM PROFILE (LOOKING NORTH)

FC-BRDG-10

BRIDGE INFORMATION SHEET (CPG)

Project: PRIDDIS FLOOD HAZARD ASSESSMENT Cross Section: 228-229

Location: PRIDDIS, AB Surveyor: A. AMIES

Overall Dimensions

Abutment to Abutment Span 12.3 m

Outside to Outside Width 4.3 m

Elevation Data

		Top of Curb or Guard Rail	Low Chord
Left	Abutment	1231.670 m	1230.910 m
Midspan		1231.582 m	1230.822 m
Right	Abutment	1231.586 m	1230.826 m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 2 x 3 Width 1.3 m

Type CONC. CYL. (i.e. pile bent, timber truss, concrete cylinder)

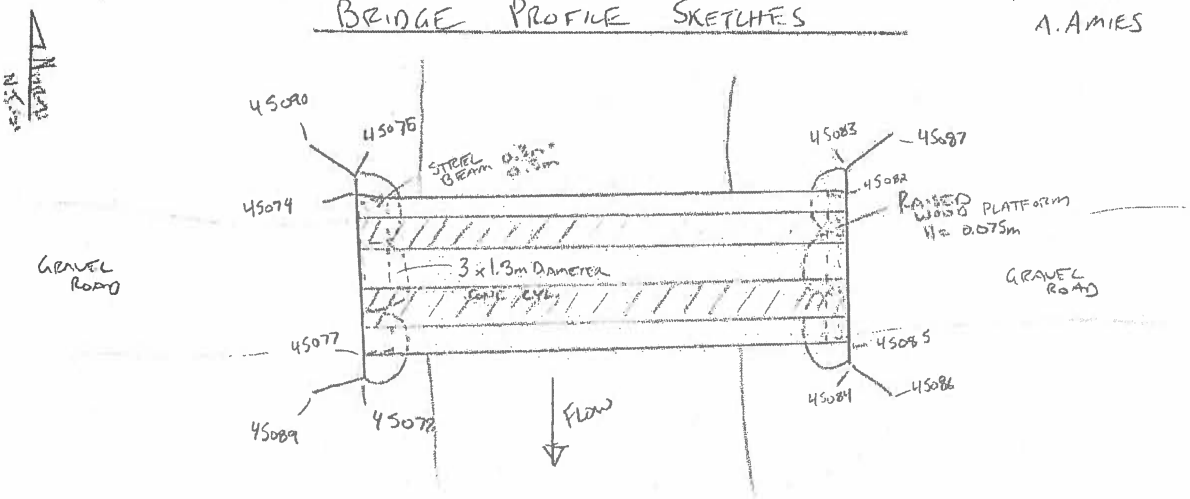
Nose Shape CIRCULAR (i.e. rectangular, circular, wedge)

Note: All elevations to be referenced to geodetic datum.

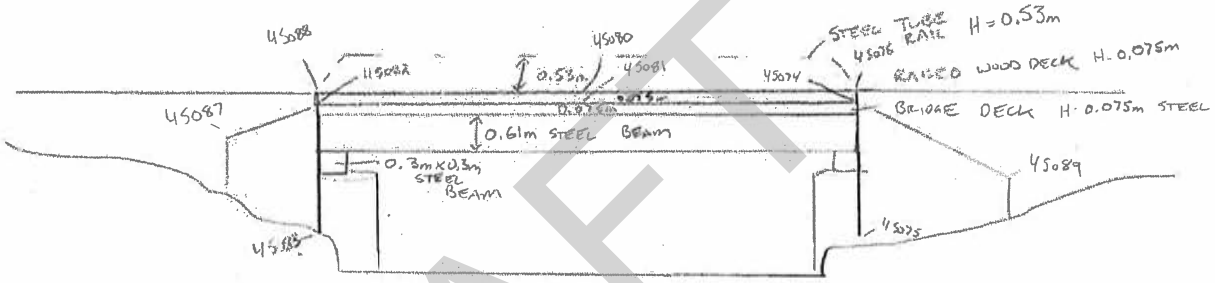
IMAGES 1876-1879

Nov 3, 2017
A. Amies

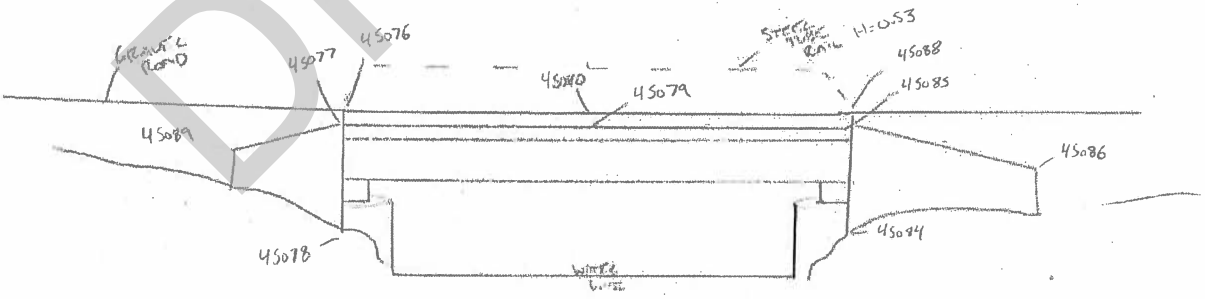
Bridge Profile Sketches



Bridge Profile (Top View)



Upstream Profile (Looking South)



Downstream Profile (Looking North)

BRIDGE INFORMATION SHEET (CPG)

Project: Priddis Flood Hazard Assessment Cross Section: 243-246

Location: Priddis AB Surveyor: A. Ames

Overall Dimensions

Abutment to Abutment Span 27.0 m

Outside to Outside Width 9.9 m

Elevation Data

		Top of Solid		Curb or Guard Rail		Low Chord	
Left	Abutment	1240.917	m	1240.079			m
Midspan		1240.586	m	1239.706			m
Right	Abutment	1240.252	m	1239.403			m

Note: For arch type bridges, additional shots should be taken between abutments and midspan. Provide a sketch.

Pier Description

Number 4 x 5 Width 0.3 m

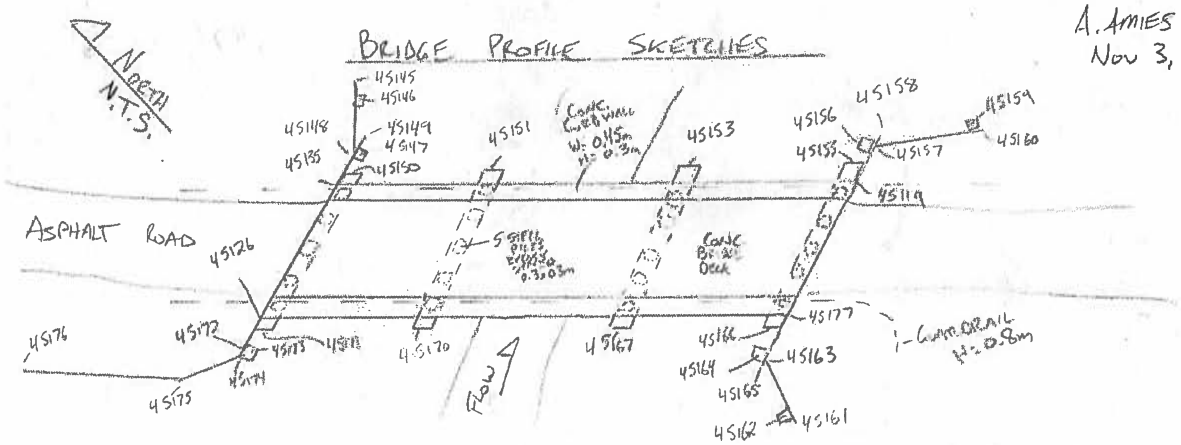
Type Steel Beam (i.e. pile bent, timber truss, concrete cylinder)

Nose Shape Rectangular (i.e. rectangular, circular, wedge)

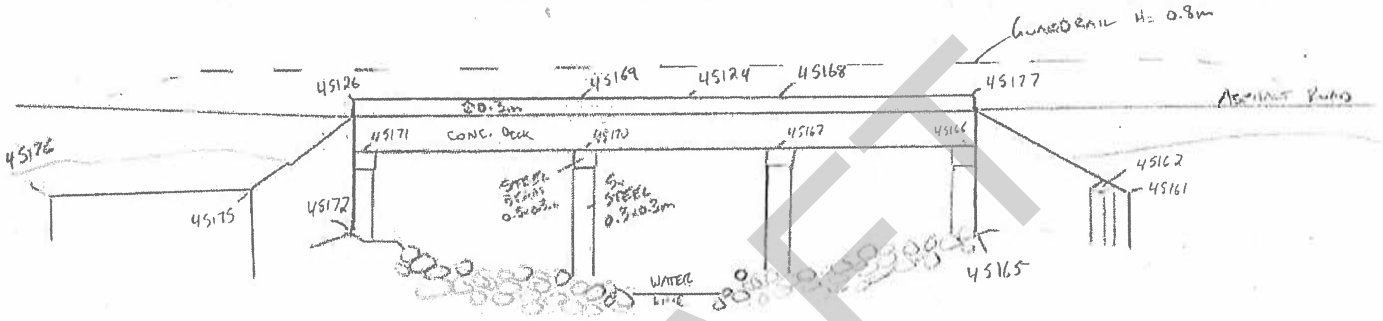
Note: All elevations to be referenced to geodetic datum.

A. Amies
Nov 3, 2017

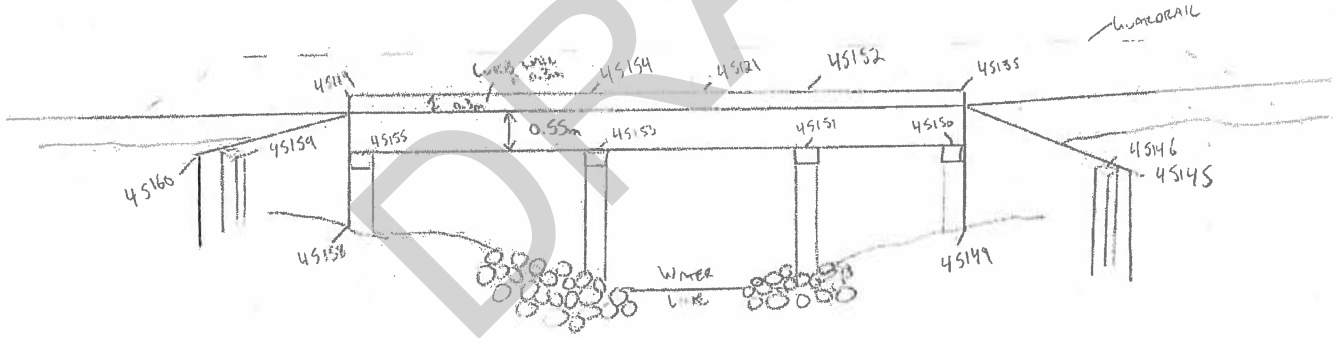
Bridge Profile Sketches



Bridge Profile (Top View)



Upstream Profile (Looking East)



Downstream Profile (Looking West)

APPENDIX E – DETAILED HYDRAULIC STRUCTURE TABLE

Table E.1

Model Structure ID	Stream Name	River Station (m)	Municipality	Road/Trail	Owner	Owner ID	Design/ Drawing Info	Type of Bridge	Descrip.	Span (m)	Width (m)	Number of Piers	Skew (°)	Elevation (m)			Survey Status	In Model?	Model Comment
														Top Chord	Deck	Low Chord			
FC-BRDG-11	Fish Creek	29383.0	MD of Foothills No. 31	Coalmine Rd W	Unknown	-	No	Highway Bridge	Concrete Bridge	27.0	9.9	4	11°	1241.39	1240.59	1239.71	Stantec Surveyed 2018	Yes	-
FC-BRDG-10		28037.1		Unnamed	Unknown	-	No	Road Bridge	Steel Beam Bridge	12.3	4.3	2	0°	1231.58	1231.58	1230.82		Yes	-
FC-BRDG-9		26720.1		Coalmine Rd W	Unknown	-	No	Highway Bridge	Steel Beam Bridge	24.0	9.9	4	0°	1224.45	1223.65	1223.13		Yes	-
FC-BRDG-8		26037.3		Unnamed	Unknown	-	No	Pedestrian Bridge	Wooden Clear Span Bridge	14.3	1.2	2	8°	1216.75	1216.75	1216.34		Yes	-
FC-BRDG-7		25181.9		Unnamed	Unknown	-	No	Wooden Deck Road Bridge	Clear Span Bridge	16.5	4.3	2	0°	1213.17	1213.17	1212.29		Yes	-
FC-BRDG-6		24971.2		Unnamed	Unknown	-	No	Wooden Deck Road Bridge	Clear Span Bridge	22.9	4.4	2	0°	1211.94	1211.94	1210.76		Yes	-
FC-BRDG-5		23228.9		Unnamed	Unknown	-	No	Pedestrian Bridge	Wooden Clear Span Bridge	14.4	2.4	2	0°	1201.88	1200.78	1200.13		Yes	-
FC-CULVT-2		20671.3		240 St West	AT[1]	1314	Yes	Highway Bridge	CSP Round Concrete Culvert	49.8	7.5	0	0°	1196.24	1196.24	1192.69		Yes	-
FC-BRDG-4		15526.2		Unnamed	Unknown	-	No	Gravel Road Bridge	Clear Span Bridge	8.1	3.6	2	0°	1179.99	1179.99	1179.27		Yes	-
FC-BRDG-3		8931.8		Unnamed	Unknown	-	No	Gravel Road Bridge	Truss Bridge	26.5	5.3	4	11°	1165.58	1165.58	1164.24		Yes	-
FC-CULVT-1		7913.6		186 Ave West	AT[1]	1322	Yes	Highway Culvert Bridge	Concrete Bridge	11.6	14.3	0	0°	1161.91	1160.91	1160.13		Yes	-
FC-BRDG-2		7510.8		Priddis Valley Rd W	AT[1]	1312	Yes	Highway Bridge	Concrete Bridge	72.0	11.3	4	14°	1160.04	1160.04	1156.55		Yes	-
FC-BRDG-1		6937.0		Highway 22W	AT[1]	2047	Yes	Highway Bridge	Concrete Bridge	43.0	14.6	2	7°	1158.71	1158.71	1157.68		Yes	-
PC-BRDG-10	Priddis Creek	15708.2		162 Ave W (Township Rd 225)	Unknown	-	No	Highway Bridge	Wooden Bridge	6.0	8.4	2	0°	1237.15	1237.15	1236.44		Yes	-
PC-BRDG-9		15096.5		Highway 22W	AT[1]	429	Yes	Highway Bridge	Culvert Bridge	8.2	14.2	0	0°	1234.99	1234.39	1233.40		Yes	-
PC-BRDG-8		14164.5		Coalmine Rd W	AT[1]	428	Yes	Clear-span road bridge	Steel Beam Bridge	13.7	9.7	2	9°	1229.87	1229.27	1228.77		Yes	-
PC-BRDG-7		11190.3		Unnamed	Unknown	-	No	Wooden Platform Road Bridge	Steel Beam Bridge	9.7	4.2	0	16°	1214.94	1214.94	1213.82		Yes	-
PC-CULVT-2		10866.9		Unnamed	Unknown	-	No	Gravel Road Bridge	CSP Round Culvert	13.6	2.4	0	0°	1213.41	1213.41	1212.74		Yes	-
PC-BRDG-6		9379.0		Unnamed	Unknown	-	No	Gravel Road Bridge	Concrete Bridge	20.5	6.0	0	7°	1208.73	1208.73	1206.98		Yes	-
PC-BRDG-5		8045.2		Unnamed	Unknown	-	No	Wooden Platform Road Bridge	Steel Beam Bridge	24.6	3.6	1	8°	1199.43	1198.97	1198.23		Yes	-
PC-BRDG-4		7672.8		Unnamed	Unknown	-	No	Concrete Paved Road Bridge	Steel Beam Bridge	23.8	3.5	2	9°	1197.14	1197.14	1195.51		Yes	-
PC-BRDG-3		6545.8		Unnamed	Unknown	-	No	Wooden Platform Road Bridge	Steel Beam Bridge	13.0	3.5	0	0°	1190.59	1190.59	1189.95		Yes	-
PC-BRDG-2		6032.6		256 St West	Unknown	-	No	Highway Bridge	Concrete Span Bridge	11.9	9.3	2	0°	1188.05	1188.05	1187.23		Yes	-
PC-BRDG-1		5292.5		Unnamed	Unknown	-	No	Pedestrian Bridge	Steel Beam Bridge	5.3	1.6	0	0°	1183.15	1183.15	1182.89		No	Located on private property on small side channel of Priddis Creek
PC-CULVT-1		5089.2		Unnamed	Unknown	-	No	Pedestrian Bridge	CSP Round Culvert	7.2	0.9	0	0°	1181.49	1181.49	1181.10		No	

[1] – Alberta Transportation

APPENDIX F – WSC GAUGE DATA

BENCH MARKS

GIVE ELEVATIONS OF BENCHMARKS TYPES AND NUMBERS OR MARKINGS.

GAUGE DATUM = 26.377 m (Assumed)

BM 98-1 - Head of spike in power pole 32m south of TBM 91-1 next to outdoor rink. Elevation: **32.580 m** Assumed (Ref. to TBM 91-1)

***BM 98-2** - Brass cap on ground rod 22.3 m East of shelter along chain link fence. Elevation: **31.554 m** Assumed (Ref. to TBM 91-1)

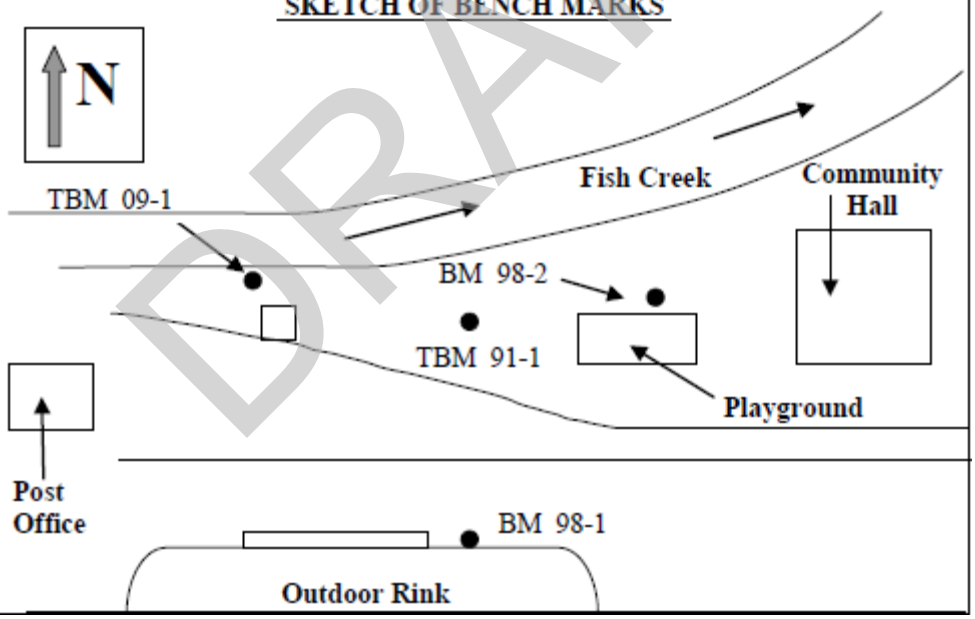
TBM 91-1 – Head of spike in power pole located 18m ESE of the gauge. Elevation: **32.544 m** Assumed (Ref. to TBM #3)

TBM 09-1 – Head of spike in tree approx. 5 m NW of gauge on RB edge. Elevation: **30.956 m** Assumed (Ref. to BM 98-2)

BENCH MARK CLASSIFICATION: 2 *** = PRIMARY B.M.**

REMARKS: Level check to gauges once a year during the frost-free period with all bench marks tied-in preferably at the same time.

SKETCH OF BENCH MARKS



Note: benchmark report repoduced from Water Survey of Canada.