

SRFB Grant Regional Application Materials

Submission Date	2018-03-30 13:19:08
	Mill Creek Fish Passage Project
Sponsor Organization	Chelan County Natural Resource Department
Sponsor Contact Person	Mike Kane
Sponsor Address	411 Washington St
City	Wenatchee
State	WA
Zip Code	98801
Phone Number	509-885-2126
E-Mail Address	kanenaturalresources@gmail.com
PRISM #	181824
Habitat Work Schedule #	181824
Anticipated Request- SRFB	131476
Anticipated Request- Tributary Committee	0
Total Anticipated Request (SRFB and Trib)	131476
Anticipated Other Funding	494599
Anticipated TOTAL Budget	626075
% of budget request from SRFB	21
In one or two sentences, what do you propose to do?	The proposal will be for final design, permitting and construction of a fish passage barrier replacement on Mill Creek, a tributary to Peshasting Creek.
What subbasin is the project in?	Wenatchee
What project category is your project?	Restoration
Has this project previously been submitted for funding through SRFB?	Yes

If Yes, is this project the same or different from the previous submission? Please explain (e.g. different phase, different scope).	Previous project was funded, but original design was not able to meet requirements of Chelan County Public Works (CCPW) standards (WSDOT and ASHTO). Current proposal with revised design effort is less expensive and meets CCPW standards.
Does this project or any of its phases (e.g. design) exist in Habitat Work Schedule?	Yes
Briefly describe the location of the project	The location of the project is on the Mountain Home Ranch Road crossing of Mill Creek, 260' upstream of the confluence with Peshastin Creek.
Latitude	473038.53
Longitude	1203759.38
What assessment unit(s) is the project in?	Wenatchee- Peshastin
What rank restoration priority is/are the AU(s) listed above?	Wenatchee- Peshastin- 4
What rank protection priority is/are the AU(s) listed above?	Wenatchee- Peshastin- 4
What is the primary species the project will target?	Steelhead
What are the secondary species (if any) that the project will benefit?	Spring Chinook Bull Trout
What are the expected project outcomes in terms of PCSRF core metrics?	1 complete barrier removed, 2 miles of habitat made accessible
What is the primary ecological concern that the project addresses (not required for protection projects)?	Habitat Quantity (Natural Barriers)
What are the secondary ecological concern(s) that the project addresses (not required for protection projects)?	Peripheral and Transitional Habitats (Side Channel and Wetland Conditions)
What rank of the ecological concern(s) listed above?	primary: rank 5 , secondary: rank 4

Briefly describe how your proposed restoration or protection project would improve or protect freshwater survival or capacity for target species at the project scale.

This project will remove a complete barrier on RM 0.1 on Mill Creek and open 2.2 miles of high quality rearing and spawning tributary habitat to ESA-listed steelhead. This will increase capacity in the lower Peshastin reach. Due to the Rat Creek Fire and watershed topography there is the potential for an extreme debris flow event. This was the main driver in selecting the replacement structure therefore the project has the benefit of added protection against climate change.

Briefly describe how long will it take for the benefits of the project to be realized and how long are they estimated to persist?

Immediately following barrier removal and replacement the additional habitat will be available for juvenile rearing and refuge, and steelhead spawning. In the event of a debris flow, the crossing improvement will also be immediately realized so that natural process can occur from the headwaters to confluence with Peshastin Creek.

Who has the responsibility to manage and maintain the project? What is the responsibility of current or future landowners?

The project is primarily on Chelan County Right of Way, with a small portion of the temporary impacts being on the adjacent Smith property. Chelan County Public Works and the Smith Family are supportive of the project and are actively engaged in the design process. Maintenance for the structure would be the responsibility of CCPW. The sponsor will maintain and monitor the riparian plantings and restored stream channel to insure that fish passage is maintained and plantings achieve 80% survival.

Have you successfully implemented projects in the past?

Yes

Are the benefits associated with the project in perpetuity?

Immediately following barrier removal and replacement the additional habitat will be available for juvenile rearing and refuge, and steelhead spawning. In the event of a debris flow, the crossing improvement will also be immediately realized so that natural process can occur from the headwaters to confluence with Peshastin Creek.

Is there a high risk of failure associated with this project?

No. 30 percent design is in place, and both CCPW and the Smith Family (landowner whose property will experience small temporary impacts due to the project) are supportive. Restoring stream habitat connectivity by removing anthropogenic barriers has been shown to result in the rapid re-colonization of endemic species (Hillman T., P. Roni, and J. O'Neal. 2016).

How much habitat is being protected or gained?

2.2 miles of ESA-listed steelhead and bull trout spawning and rearing habitat.

Are threats imminent?

The location of the project is on the Mountain Home Ranch Road crossing of Mill Creek, 260' upstream of the confluence with Peshastin Creek.

Has there been public outreach about this project to assess the level of community support? Is there any community outreach planned during and/or after implementation?

Both landowners, primary being CCPW and secondary John Smith family (owns a small portion of land that will be temporarily affected during construction) are supportive. The local community has expressed interest in seeing habitat improvement projects on Peshastin Creek and are supportive of these efforts.

Does the project build community support for salmon recovery efforts?	The Chelan County Natural Resources department holds community meetings every year for each sub-watershed of the Wenatchee River, including the Peshastin River. Simple projects such as barrier replacements build quick support because the results are immediate and easy to understand. The addition of the major tributary in lower Peshastin as newly opened habitat will be a success story to share at these meetings and build support.
Has the project sponsor secured landowner participation or acceptance?	Yes
Will there be public access?	Yes
Will the project create benefits or raise concerns for particular groups or the community at large?	No
What is the breadth and strength of the partnership supporting the project (technical support, financial, and in-kind contributions, labor)?	Chelan County Public Works, Bureau of Reclamation and Cascadia Conservation District are all partnering with CCNRD to open up fish passage to Mill Creek.
Does the project represent an opportunity for economic benefit? Explain why.	Recovery of salmon and steelhead represents a benefit overall to the economy. Additionally, the project implementation provides some regional employment thru design and construction.
Will this project help the region move closer to delisting or reduce regulatory intervention? Explain how.	The project seeks to replace a fish passage barrier and open up 2 miles of steelhead habitat. This not only moves us closer to delisting, but addresses an issue voluntarily, prior to regulatory intervention.
How much benefit does the project create for the dollars invested?	2 miles of cold natural stream habitat is made accessible to steelhead and other salmonids in an area of warm summer water temperatures and severely altered habitat characteristics.

Mill Creek Fish Passage Project



*Chelan County Natural Resources Department
411 Washington Street Suite 401
Mike Kane
PRISM # 18-1824*

Anticipated Request - SRFB:	\$ 131,476
Anticipated Request - TribCom:	\$ 0
Anticipated Request for Proposal:	\$ 131,476
Anticipated Request - FBRB:	\$494,599
 Anticipated <u>TOTAL</u> Project Budget:	 \$ 626,075

Comments

SRFB Panel 9/26/18

Date: 9/26/18

Project

Status: NMI

Full Panel Review

1. If the project is a POC, identify the SRFB criteria used to determine the status of the project:
2. If the project is a POC, identify the changes that would make this a technically sound project:
3. If the project is Conditioned, the following language will be added to the project agreement:
4. General comments:

The current proposal is confusing based on the change in budget from the April application and your replies to our comments. Specifically, you have 30% design drawings, but no basis of design report, and you're willing to evaluate other design options during preliminary design, if funded by SRFB and BAFBRB.

What other alternatives were evaluated prior to selecting a corrugated arch pipe?

Response

As outlined in the Correction Analysis Form submitted with the final proposal, two options were previously considered in 2012, a Precast bridge (36' span, shallow abutments) that did not meet Chelan County Public Works requirements and a Girder bridge (45' span, deep abutments and footings) which was too expensive to move beyond the initial design stages.

In re-starting the design effort with Public Works and Natural Systems Design in 2018, a pre-cast concrete reinforced split box culvert was initially considered. This was selected based on past experience with similar projects, current engineering trends, and Chelan County Public Works' preference for concrete structures. Consultation with the geotechnical engineer that completed the original site investigation led to increased footing depth. The desire to provide a design with a higher resiliency to climate change and debris flow passage led to increased span and rise. Combined, these factors increased the procurement cost of a pre-cast concrete reinforced split box culvert to the point where it was cost prohibitive. A high radius arch structural plate culvert proved to be less expensive (\$95,500 savings) than the pre-cast concrete box and provides the same level of scour protection, geotechnical stability, and similar abilities to pass debris flows. See Supplemental Correction Analysis Form.

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Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Comment

Do you have a preferred alternative for this project? If not, then the proposal may need to be changed to an alternatives analysis, with selection of preferred alternative taken to preliminary design.

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Response

Yes. The preferred alternative is the high radius arch structural plate culvert. This meets the approval of Chelan County Public Works standards, meets or exceeds applicable design standards, provides resiliency to climate change, and lowers construction cost compared to previously considered design options.

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Staff Comments: While you have elected to make both your SRFB and BAFBRB grant requests under the preliminary design requirement thresholds (\$250,000 and \$500,000, respectively), this is leading to the lack of certainty of your proposal.

Response

The proposal is to fund final design, permitting and construction of a corrugated arch pipe culvert to provide for fish passage and meet the requirements of Chelan County Public Works. The project initially scored higher with BAFBRB than with SRFB, so that lead to a larger match request from BAFBRB than from SRFB in the final application phases.

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Incorporating Climate Change into the Design of Water Crossing Structures (WDFW 2016), recommends incorporating projected changes to bankfull width into culvert design as a standard practice. This document was utilized as a guide for channel design and structure sizing in the preferred alternative, however language left over from the draft BAFBRB/SRFB proposals might have added to the confusion and uncertainty:

"WDFW's Stream Simulation design approach was utilized for channel design and initial structure sizing. WDFW's report Incorporating Climate Change into the Design of Water Crossing Structures will be used to provide guidance on appropriately addressing the risk and uncertainty associated with predicting climate change impacts. Findings from this examination will also play a role in refining selection of an appropriate structure; the risk and uncertainty associated with both debris flow and climate change impacts will ultimately determine the final structure span with the most extreme condition controlling selection."

The design included in the final SRFB application did in fact take into account projected changes in bankfull width as well as local information from Chelan County PW experience after the 2013 flood event in Colockum Creek. WDFW's guidance provided in Incorporating Climate Change into the Design of Water Crossing Structures is general and does not provide specific design criteria or proposed design modifications; as such, general findings from the document were considered and integrated into the design. The uncertainties and difficulties associated with predicting climate change make it difficult to ascribe a universal set of design standards and as such, the responsibility of identifying a fiscally responsible design which addresses these uncertainties and risks

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

falls to the engineer and design team. We feel our current design achieves this balance.

Final Geotech analysis, permit agency comments and changes in materials and construction costs could contribute to some changes in the final design of this crossing.

Supplemental Correction Analysis Form:

Correction Analysis Form

Site Information (measurements in feet)

Project Name: **Mill Creek Fish Passage Project** PRISM Project #: _____ Date: **10/10/18**
Bankfull Width (outside influence of culvert): **10.5 ft** Utilities Crossing: ☒ Yes ☐ No ☐ Unknown
Road Fill at Culvert Invert: **5.3 ft** Road Width: **20 ft**
Road Description/Condition (mainline, spur road, driveway/access): **Local access road, narrow compared to current design standards, very little shoulder present, no guardrail currently, pavement is in fair condition (some patches present)**

Evaluator Information

Evaluator Name: **Nic Truscott, PE** Affiliation: **Natural Systems Design**
Mailing Address: **305 Flora St.** City: **Bellingham** State: **WA** Zip: **98225**
Telephone: **360-966-8104** FAX: _____ Cell: **360-296-0019** E-mail: **nic@naturaldes.com**

Upstream Habitat/Channel Description

Channel Slope (outside of culvert influence): **5.8%** Re-grade Potential (streambed US – streambed DS in feet): **6.5 ft**
Dominant Substrate: ☐ Sand (<1/5") ☒ Gravel (1/5"–3") ☐ Cobble (3"–12") ☐ Boulder (>12") ☐ Bedrock
Additional Upstream Information, Habitat Description, Other Site Conditions or Concerns, Including Potential Re-Grade Impacts Relative to Channel Stability And Habitat: **Streambed is dominated by gravel substrate; pools and diversity in local bed topography are almost always associated with the presence of boulders and/or wood. Riparian vegetation is largely healthy. Channel is entrenched with banks that are only inundated at infrequent events (25-year or greater). Bed slope is fairly steep, but proposed channel slope aligns well with natural slope of channel in vicinity of crossing and therefore potential channel re-grade following construction in minimized. Construction of bed and in particular incorporation of stable particles to simulate natural banks and channel bed roughness will be critical in terms of providing a stable stream simulation channel.**

Downstream Habitat/Channel Description

Channel Slope: **6.8%** (outside of culvert influence)
Additional Downstream Information, Habitat Description, Other Site Conditions or Concerns: **Similar to upstream conditions, downstream habitat is largely riffle with local pools and holding areas associated with boulders and/or logs. Riparian vegetation is healthy, channel is slightly less entrenched downstream of the culvert with a high floodplain bench on the left bank downstream of the culvert. Substrate is mostly gravel with occasional large boulders and some cobble present.**

Correction Options and Preferred Alternative

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Options to Consider – Provide up to Three Site-Appropriate Correction Alternatives.

Option 1: Precast Reinforced Concrete Split Box Culvert (18' span, 11' rise)

Option 2: High Radius Arch Structural Plate Culvert (20'-8" span, deep footings)

Preferred Alternative – Provide a 1- or 2-paragraph Recommendation for this Site. Include any Site-Specific Concerns that Will Need to be Addressed During Design and Construction:

The existing culvert at this site is clearly undersized and should be replaced due to the fact that it is both undersized and inappropriately placed (slope is much shallower than natural stream slope). Replacement with a structure which accommodates an appropriate stream simulation design channel is a suitable and affordable option to pursue. Previous design efforts resulted in design iterations which failed to advance for separate reasons: the first design effort did not meet Chelan County Public Works (CCPW) requirements while the second design effort met CCPW requirements the design and construction costs were clearly prohibitive. When reexamining the design effort with a different engineer, the first crossing structure proposed was Option 1, a precast reinforced concrete split box culvert (PRCSBC). This type of structure was selected based on success with this structure type on similar projects, recent trends in fish passage engineering, and CCPW's preference for concrete structures. Through the preliminary design and analysis process, several factors led to the need to increase the rise and span of the structure; namely, geotechnical considerations, the desire to provide a design resilient to climate change, and the potential for debris slides in the drainage. Balancing the uncertainty, risk, and fiscal consequences of these factors led to reconsideration of the structure type as increasing the span and rise of the PRCSBC to account for reasonable levels of risk and uncertainty associated with climate change and debris flow potential proved to be cost prohibitive (note that the cost for Option 1 below does not include an increased span to address the potential for increased flows associated with climate change or debris flow conveyance; this option was abandoned once it was clear that further increasing structure size would only add to construction costs). A High Radius Structural Plate Culvert was selected because it provides increased conveyance, equal protection from scour and settling, and lowers construction cost considerably. CCPW has reviewed the current plans featuring the High Radius Structural Plate Culvert and has approved moving to the next phase of design. Given that CCPW is amenable to a structural plate crossing structure, we believe the current design (Option 2) strikes a balance of achieving current design standards, addressing uncertainty and risk of debris flow and climate change, and capitol costs of construction.

Cost Estimates

Rough Cost Estimate* - Attach Detailed Cost Breakdown Using the Appropriate Cost Estimate Template, Provided Separately.

Option 1: \$ 604,136

Option 2: \$ 508,599

*This is a rough approximation of project costs; actual costs may vary depending on specifications identified during final project design.

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

COST ESTIMATE

Project: Mill Creek Fish Passage Project
Project No.:

Analyst: N. Truscott

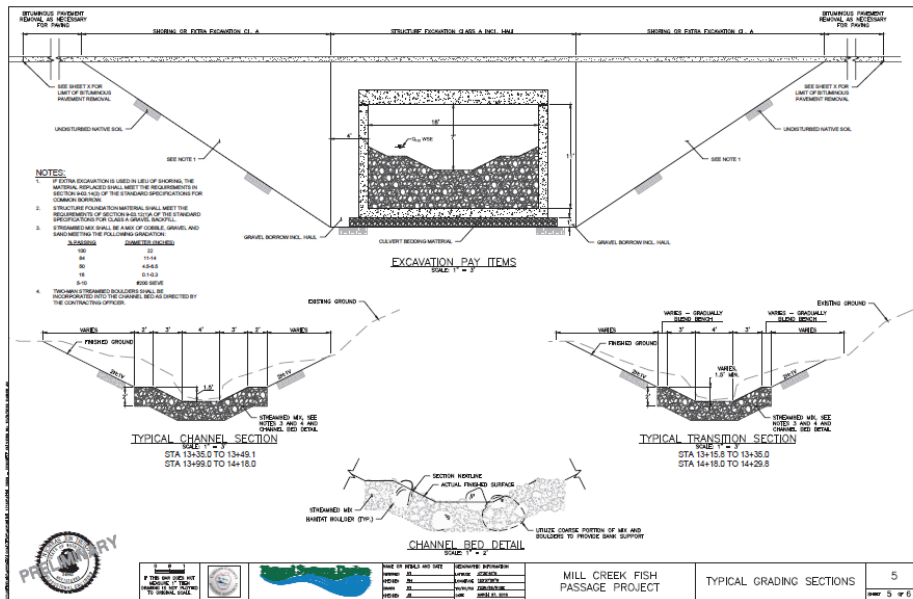
Checked: -

Latest Revision: 3/28/2018

Allowance for Indeterminates Included in Bid Items: 10%
Inflation to 2019 \$ Included in Bid Items: 2%

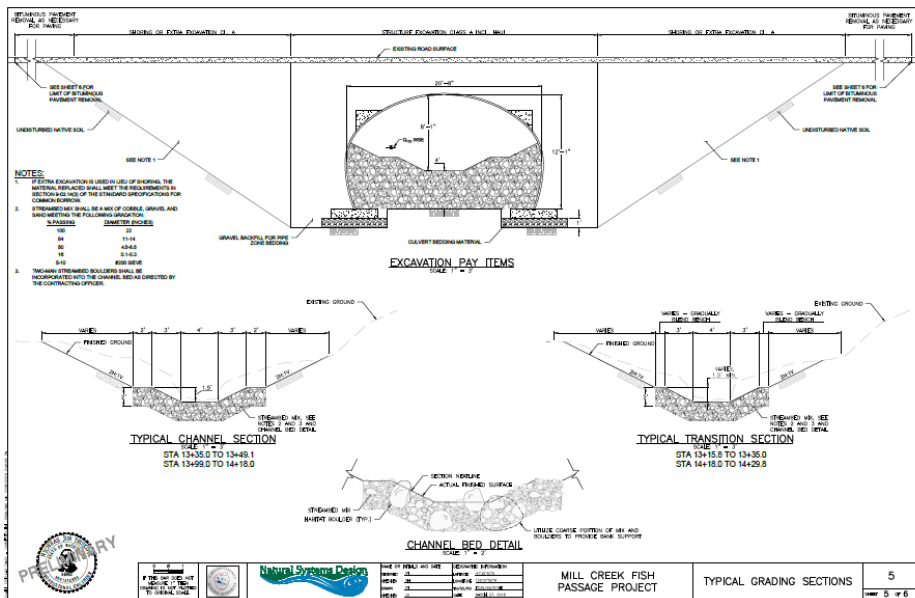
Construction

Item #	Item Description	WSDOT Ref	Quantity	Unit	Unit Price (\$)	Amount (\$)
1	MOBILIZATION		1	LS	\$45,830	\$45,830
2	CLEARING		0.22	LS	\$22,400	\$11,088
3	HIGH VISIBILITY FENCE		325	LF	\$4	\$4,144
4	TEMPORARY STREAM DIVERSION		1	LS	\$12,303	\$12,303
5	TEMPORARY DETOUR		1	LS	\$11,308	\$11,308
6	TEMPORARY BRIDGE		1	LS	\$48,483	\$48,483
7	STRUCTURE EXCAVATION CLASS A INCL HAUL		865	CY	\$28	\$24,220
8	SHORING OR EXTRA EXCAVATION CL. A		1	LS	\$23,408	\$23,408
9	CULVERT BEDDING MATERIAL		45.00	CY	\$84	\$3,780
10	PRE-CAST REINFORCED SPLIT BOX CULVERT		1	LS	\$201,376	\$201,376
11	GRAVEL BORROW INCL HAUL		400	CY	\$62	\$17,320
12	CHANNEL GRADING		1	LS	\$7,728	\$7,728
13	STREAMBED SEDIMENT		260	CY	\$84	\$21,840
14	STREAMBED BOULDER TWO MAN		100	EA	\$140	\$14,000
15	CRUSHED SURFACING BASE COURSE		35	CY	\$84	\$7,380
16	HMA CL 1/2 IN. PG 64-22		80	TN	\$336	\$26,880
17	BEAM GUARDRAIL TYPE 31		76	LF	\$50	\$3,830
18	BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL		4	EA	\$4,256	\$17,024
19	BEAM GUARDRAIL PLACEMENT - 25' SPAN		2	EA	\$836	\$1,792
20	PAINT LINE		685	LF	\$6	\$3,836
21	SURVEYING		1	LS	\$3,320	\$3,320
22	PROJECT TEMPORARY TRAFFIC CONTROL		1	LS	\$18,480	\$18,480
23	SITE RESTORATION		1	LS	\$6,552	\$6,552
24	UTILITY RECONNECTION		1	LS	\$14,000	\$14,000
25	MINOR CHANGE		1	LS	\$5,600	\$5,600
Subtotal						\$557,321
Taxes (as % of Construction Sub-Total)						8.4% \$46,815
Total (Construction)						\$604,136



Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

COST ESTIMATE						
				Natural Systems Design		
Project: Mill Creek Fish Passage Project				Analyst: N. Truscott		
Project No: --				Checked: -		
				Latest Revision: 6/26/2018		
				Allowance for Indeterminates Included in Bid Items: 10%		
				Inflation to 2019 \$ Included in Bid Items: 2%		
Construction						
Item #	Item Description	VSDOT Ref	Quantity	Unit	Unit Price (\$)	Amount (\$)
1	MOBILIZATION		1	LS	\$38,582.23	\$38,582
2	CLEARING		0.22	LS	\$50,400.00	\$11,088
3	HIGH VISIBILITY FENCE		325	LF	\$4.00	\$4,144
4	TEMPORARY STREAM DIVERSION		1	LS	\$12,303.20	\$12,303
5	TEMPORARY DETOUR		1	LS	\$11,307.52	\$11,308
6	TEMPORARY BRIDGE		1	LS	\$48,482.56	\$48,483
7	STRUCTURE EXCAVATION CLASS A INCL HAUL		1,065	CY	\$33.60	\$35,784
8	SHORING OR EXTRA EXCAVATION CL. A		1	LS	\$23,408.00	\$23,408
9	CULVERT BEDDING MATERIAL		45.00	CY	\$84.00	\$3,780
10	HIGH RADIUS ARCH STRUCTURAL PLATE CULVERT		1	LS	\$36,185.60	\$36,186
11	GRAVEL BACKFILL FOR PIPE ZONE BEDDING		560	CY	\$61.60	\$34,436
12	CHANNEL GRADING		1	LS	\$7,728.00	\$7,728
13	STREAMBED SEDIMENT		260	CY	\$84.00	\$21,840
14	STREAMBED BOULDER TWO MAN		100	EA	\$140.00	\$14,000
15	CRUSHED SURFACING BASE COURSE		95	CY	\$84.00	\$7,980
16	HMA CL. 1/2 IN. PG 64-22		80	TN	\$336.00	\$26,880
17	BEAM GUARDRAIL TYPE 31		76	LF	\$50.40	\$3,830
18	BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL		4	EA	\$4,256.00	\$17,024
19	BEAM GUARDRAIL PLACEMENT - 25' SPAN		2	EA	\$896.00	\$1,792
20	SURVEYING		1	LS	\$3,920.00	\$3,920
21	PROJECT TEMPORARY TRAFFIC CONTROL		1	LS	\$18,480.00	\$18,480
22	SITE RESTORATION		1	LS	\$6,552.00	\$6,552
23	UTILITY RECONNECTION		1	LS	\$14,000.00	\$14,000
24	MINOR CHANGE		1	LS	\$5,600.00	\$5,600
Subtotal						\$469,188
Taxes (as % of Construction Sub-Total)			8.4%			39,412
Total (Construction)						\$508,599



SRFB Panel 5/9/18

1. Recommended improvements to make this a technically sound project according to the SRFB's criteria:

The proposal references "current 30% design"; please load this to PRISM. Preliminary designs and a basis of design (BOD) report that meet the criteria identified in Manual 18 Appendix D will need to be posted on PRISM before final application. The BOD report should include a discussion of the alternatives considered and the rationale for the preferred selection. If this will not be feasible, the grant should be for design and permits, without construction. The cost estimate shows nice detail on construction costs but should also include match and show the total project cost.

The proposal highlights the potential for debris flows to occur in the basin and the increased span and footing depth for the proposed drainage structure to accommodate sediment deposition and minimize scour impacts. While a nearly 21-foot wide corrugated arch pipe with about 12 feet of clearance may accommodate smaller debris flows, most debris flows contain a fair amount of woody debris that typically will plug even the largest of culverts. Increasing the size and clearance of the arch pipe may in this case just be adding costs to the project without providing meaningful protection from debris flows. The project design should focus on maintaining the stability of the crossing and allowing for maintenance access to clean out the structure in the event of a debris flow. The culvert inlet should also be mitered to increase its capacity and lessen the impact of woody debris piling up.

Response to Comments:

The design team has included total project cost and anticipated match from FBRB for this project, but does not have a completed a basis of design report at this time and does not have current funding to complete prior to the final PRISM submittal. The sponsor has reduced the ask from SRFB to \$131,476 (21%).

The design team is willing to consider various design options including a bridge while completing preliminary designs, but accommodating the concerns of Chelan County Public Works and the adjacent landowner will remain a high priority in that process. The design team is definitely focused on maintaining the stability of the crossing and access for maintenance will be possible post-construction. The sponsor would be willing to work with the SRFB Panel to address debris flow concerns while maintaining a cost effective project.

Tributary Committee Comments

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

1. Although the project should have biological benefit, it is currently not cost effective. After discussing fish passage projects similar to this one with a contractor, the Committees believe the project can be completed for less than \$300,000. Please find ways to reduce the total budget to \$300,000 or less.
2. The Committees question whether a temporary bridge is necessary. It may be less expensive to place a firetruck on site and provide hotel rooms for residents for a couple of days.

Response

The Sponsor has invited the contractor that the Tributary Committee refers to in the statement above to bid on more than one occasion, but he has declined. In this case, he has indicated he would bid on the project, so potentially a lot of money could be saved if he has a responsive bid. Additionally, the sponsor is no longer requesting funding from the Tributary Committee.

Public Works and the Natural Resource Department have explored the option of closing the road entirely, but there are too many landowners who use this road for access and we are not in the position to assume the liability if an emergency happens and access is not open.

Summary of Changes in Application from Draft to Final

The following changes were made in the application:

- The sponsor is asking for 79% of the Match to come from the Brian Abbott Fish Barrier Removal Board Coordinated Pathway and 21% to come from SRFB.
- Costs for construction were increased based on recent bids/awards and consult with Public Works.
- Budget was arranged in a different format to comply with PRISM format with separate AA&E and Construction sheets.
- A partial barrier was discovered in one of the weirs upstream of the culvert as part of FBRB WDFW field check. This barrier is not likely to be a barrier to upstream migration of steelhead, but CCNRD and Cascadia Conservation District have committed to fixing by 2021. Form attached.

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Project Number	18-1824
Project Name	Mill Creek Fish Passage Project
Sponsor	Chelan County Natural Resource Department

List all related projects previously funded or reviewed by RCO:

Project # or Name	Status	Status of Prior Phase Deliverables and Relationship to Current Proposal?
11-1444	Completed Completed	Inadequate funding to complete construction
	Choose a status Choose a status	
	Choose a status Choose a status	

If previous project was not funded, describe how the current proposal differs from the original.

Previous project was funded, but original design was not able to meet requirements of Chelan County Public Works (CCPW) standards (WSDOT and ASHTO), subsequent design effort resulted in more expensive project than budget. Current proposal with revised design effort is less expensive and meets CCPW standards.

1. Project brief.

This project will complete design, permitting and replace a fish passage barrier culvert on Mill Creek (RM 5.2 on Peshastin Creek) to open 2.2 miles of perennial stream providing access to spawning and rearing habitat for steelhead.

2. Project location.

The culvert replacement project is located at RM 0.1 on Mill Creek at the Mountain Home Ranch Road crossing. Mill Creek is a tributary to Peshastin Creek at RM 5.2 which flows into the Wenatchee River. This project will affect 2.2 miles of perennial stream providing excellent small stream habitat. The project is primarily on Chelan County Right of Way.

3. Problem statement.

The project would reconnect 2.2 miles of perennial small stream habitat with an average gradient of 6-8%.

Currently, a 4'x5' box culvert with a 1.5% slope and 2' outfall drop is located on Mill Creek at the Mountain Home Road crossing at RM 0.1. This culvert structure was

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

identified in the 2004 Chelan County Fish Barrier Inventory as a passage barrier due to outfall drop cutting off access to 2.2 miles of high quality tributary habitat.

In the the lower Peshatin Reach (RM 0 – 9.4 at Ingalls Creek), Mill Creek has the best tributary habitat opportunity available for spawning and rearing for steelhead. Anthropogenic impacts in the lower Peshastin (State Highway 97, irrigation, agricultural and residential encroachment) have resulted in low late summer flows, high instream temperatures, straightening and floodplain disconnection (Andonaegui 2001). As a result there are limited rearing opportunities in the lower mainstem and egg to parr survival is low (Cram 2016).

In contrast to the mainstem Peshastin, Mill Creek has only one residence above the barrier and is otherwise in a natural condition. Mill Creek has perennial flow, drains a north and east facing basin, and has a relatively shallow stream gradient compared to nearby Allen, Hansel and Camas Creeks. The Rat Creek Fire burned through the Mill Creek watershed in November 1994 but based on intrinsic potential maps is 95 percent forested with a gradient of 5 – 8 percent. Mill Creek has moderate amounts of woody debris in the first 1.5 miles, numerous plunge pools of 1-2' with some 3-4' drops and fish including O. mykiss were observed throughout the reach (October 2010 survey, ~1cfs). Data from a CCNRD discharge monitoring site just upstream of the barrier showed flows in 2013 between 4 and 18 cfs during the steelhead spawning window (March – May) and above 1 cfs during low flow (Figure X). 2014 data shows a seven day average maximum (7DAM) stream temprautre of 21.9°C in Peshastin Creek (Ecology gage at the mouth) and a 7DAM of 16.9°C in Mill Creek, suggesting the potential for thermal refuge. The completion of this project will address Tier 4 habitat restoration as recommended in the Biological Strategy (Provide improved fish passage culvert replacement in Mill, Ruby and Scotty Creek (more info needed for Mill Creek to determine the extent of potential rearing habitat and flow regime) (UCRTT 2014) and Recovery Plan (UCSRB 2007) for Peshastin Creek.

The effects of climate change are difficult to quantify, yet the consensus is that in the future, both the frequency and magnitude of extreme events will increase and correspondingly both bankfull width and 100-year event magnitude would be likely to increase. Due to the Rat Creek Fire and watershed topography there is the potential for an extreme debris flow event. This was the main driver in selecting the replacement structure and as a result, the project has the benefit of added protection against climate change.

4. List the fish resources present at the site and targeted by this project.

Species	Life History Present (egg, juvenile, adult)	Current Population Trend (decline, stable, rising)	Endangered Species Act Coverage (Y/N)
Chinook Salmon		Decline	Y

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Steelhead	Juvenile, adult, egg	Stable	Y
Bull Trout		Stable	Y

Peshastin Creek supports spring Chinook, steelhead, and bull trout as well as redband and cutthroat trout. Peshastin Creek is a minor spawning area for spring Chinook and a major spawning area for steelhead (UCRTT 2013 p. 40). Recent data indicates that Peshastin Creek had the highest percentage of wild steelhead spawners and lowest proportion of hatchery spawners for any single tributary in the Wenatchee basin (WDFW 2017). The project allow access to spawning and rearing habitat for adult steelhead, resident trout, and bull trout. Some use by Spring Chinook and Coho salmon is anticipated as well but gradients of 5%+ may restrict that use. Mill Creek stream temperature data show temperatures stay below 12°C by late September, suggesting potential for Bull trout spawning.

5. Describe the limiting factors, and limiting life stages (by fish species) that your project expects to address.

This project would address the #5 ranked Ecological Concern, habitat quantity (Anthropogenic Barriers) for steelhead and bull trout by restoring fish passage on Mill Creek, and is specifically identified in the Biological Strategy (UCRTT 2017). Recent research by WDFW shows low egg to parr steelhead survival in Peshastin Creek (Cram 2016) potentially due to scour. Opening up Mill Creek to steelhead spawning and rearing is the primary goal of the is project.

6. Project goals and objectives.

A. What are the project's goals?

The goal of this project is to remove a fish barrier and restore access to 2.2 miles of quality tributary habitat.

B. What are the project's objectives?

- Complete final design and permitting based on current 30% design
- Remove a 4'x5' box culvert that creates a barrier to fish passage
- Install a maximum 20'8" span arch culvert with a 12'1" rise to accomodate the potential for a debris flow event.
- Provide access to 2.2 miles of spawning and rearing habitat to ESA-listed steelhead and bull trout.

C. What are the assumptions and constraints that could impact whether you achieve your objectives?

Topo survey, initial cultural resource surveys and Geotech surveys have been completed at this site. Previous design alternatives have been proposed for this site, but the current

design effort is proposed as the most cost effective alternative available that can meet the design requirements and landowner constraints, while achieving the goals of fish passage thru this site. The site is located on a sole access to residences in an area of typically high fire danger during the “fish window”. This necessitates providing a temporary access around the construction site during construction to facilitate public and property safety. The site is also located on an alluvial fan at the base of a drainage basin that is prone to wildfire/storm events and the potential for debris flows must be considered in the design process. See the response to Question 7D for more detail on this constraint. The project is primarily on Chelan County Right of Way, with a small portion of the temporary impacts being on the adjacent Smith property. Chelan County Public Works and the Smith Family are supportive of the project and are actively engaged in the design process.

7. Project details.

A. Provide a narrative description of the proposed project.

To date, preliminary plans have been drafted illustrating design concepts and project elements typical of 30% design. This revision of previous design efforts has been completed with input from CCPW. Comments from CCPW will be incorporated at subsequent design steps.

Project schedule will depend on when a contract award can be made. If January 2019 is the award date, then the most realistic scenario would be to complete the design and permitting phases during the remainder of 2019. It is possible that these steps could be completed to facilitate a 2020 construction window, if a spring advertising for bid is sufficient. If spring 2020 is not realistic, than advertising to bid in the fall of 2020 would be another scenario and likely result in the best prices. This would result in construction during July/August 2021, planting in October 2021 and final inspection/final reports by December 2021.

During the 2020 work window, a temporary road bypass would be constructed and the existing culvert would be removed and replaced. During construction the creek will be diverted around the work area. The stream section opened by removal of the existing box culvert will be replaced with a maximum 20’8” span arch culvert with a 12’1” rise (see 7D for more info on factors influencing final design). In addition to the correction of barriers, riparian vegetation will be planted to restore and enhance habitat.

B. Provide a scope of work and detailed list of project deliverables.

The sponsor will manage the design effort with the assistance of a licensed engineer to provide designs support. The sponsor will also be responsible for preparing and submitting permits along with coordination with stakeholders and landowners.

The attached budgets include design and construction costs.

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Admin and Engineering cost: \$73,790

Construction, management and permitting cost: \$552,284

Total project cost: \$626,074

Task 1: Field Assessment	Kickoff meeting, compilation of existing data, and 2 field days for data collection and evaluation of potential treatments	April 2019	consultant	
Task 2: Survey	Additional Geotechnical and Topographic survey	May 2019	consultant	
Task 3: Preliminary Design	60% preliminary designs, cost estimate, and draft Basis of Design report	August 2019	consultant	
Task 4: 90% Design	Design and draft specifications	November 2019	consultant	
Task 5: Final Design	100% Final Designs, specifications and bid documents	March 2020	consultant	
Task 6: Permitting Support	Meetings and field visits. JARPA assistance.	September 2019	consultant	
Task 7: Meetings	Design review and field meetings with stakeholders	Ongoing	consultant	
Task 8: Landowner Outreach, Project Management,	Project coordination and grant	Ongoing	CCNRD	

Permitting	administration, landowner and stakeholder involvement, Permit preparation.			
Task 9: Construction Management	On-site construction supervision		consultant	

Construction				Amount	Amount	Match in PRISM
Category (choose one)	Task Description	Qty	Rate			
Mobilization	Contractor Mobilization	1.00	\$ 38,582.00	\$ 38,582	\$ 30,480	\$ 8,102
Construction	Clearing	0.22	\$ 50,400.00	\$ 11,088	\$ 8,760	\$ 2,328
Construction	High Visibility Fence	925.00	\$ 4.48	\$ 4,144	\$ 3,274	\$ 870
Construction	Temporary Stream Diversion	1.00	\$ 12,303.20	\$ 12,303	\$ 9,719	\$ 2,584
Construction	Temporary Detour	1.00	\$ 11,307.52	\$ 11,308	\$ 8,933	\$ 2,375
Construction	Temporary Bridge	1.00	\$ 48,482.56	\$ 48,483	\$ 38,302	\$ 10,181
Construction	Structure Excavation Class A Incl Haul	1,065.00	\$ 33.60	\$ 35,784	\$ 28,269	\$ 7,515
Construction	Shooting or Extra Excavation Cl A	1.00	\$ 23,408.00	\$ 23,408	\$ 18,492	\$ 4,916
Construction	Culvert Bedding Material	45.00	\$ 84.00	\$ 3,780	\$ 2,986	\$ 794
Construction	High Radius Arch Structural Plate Culvert	1.00	\$ 96,185.60	\$ 96,186	\$ 75,987	\$ 20,199
Construction	Gravel Backfill for Pipe Zone Bedding	560.00	\$ 61.60	\$ 34,496	\$ 27,252	\$ 7,244
Construction	Channel Grading	1.00	\$ 7,728.00	\$ 7,728	\$ 6,105	\$ 1,623
Construction	Streambed Sediment	260.00	\$ 84.00	\$ 21,840	\$ 17,254	\$ 4,586
Construction	Streambed Boulder Two Man	100.00	\$ 140.00	\$ 14,000	\$ 11,060	\$ 2,940
Construction	Crushed Surfacing Base Course	95.00	\$ 84.00	\$ 7,980	\$ 6,304	\$ 1,676
Construction	HMA CL 1/2" In PG 64-22	80.00	\$ 336.00	\$ 26,880	\$ 21,235	\$ 5,645
Construction	Beam Guardrail Type 31	76.00	\$ 50.40	\$ 3,830	\$ 3,026	\$ 804
Construction	Beam Guardrail Type 31/Non-Flared	4.00	\$ 4,256.00	\$ 17,024	\$ 13,449	\$ 3,575
Construction	Beam Guardrail Placement - 25' Span	2.00	\$ 896.00	\$ 1,792	\$ 1,416	\$ 376
Surveys	Surveying	1.00	\$ 3,920.00	\$ 3,920	\$ 3,097	\$ 823
				\$ -		
Construction	Project Temporary Traffic Control	1.00	\$ 18,480.00	\$ 18,480	\$ 14,599	\$ 3,881
Construction	Site Restoration	1.00	\$ 6,552.00	\$ 6,552	\$ 5,176	\$ 1,376
Construction	Utility Reconnection	1.00	\$ 14,000.00	\$ 14,000	\$ 11,060	\$ 2,940
Construction	Minor Change	1.00	\$ 5,600.00	\$ 5,600	\$ 4,424	\$ 1,176
Permits	Sponsor and Consultant Permitting	1.00	\$ 11,920.00	\$ 11,920	\$ 9,417.00	\$ 2,503
Construction supervision	Engineering Support	1.00	\$ 20,000.00	\$ 20,000	\$ 15,800.00	\$ 4,200
Construction supervision	Sponsor Construction Management	1.00	\$ 6,000.00	\$ 6,000	\$ 4,740	\$ 1,260
Surveys	Geotech	1.00	\$ 5,765.00	\$ 5,765	\$ 4,554	\$ 1,211
Other	Sales Tax for Chelan County (R 4% of total)	1.00	\$ 39,411.73	\$ 39,412	\$ 31,135	\$ 8,277
					\$ -	\$ -
			\$Total	\$ 552,284	\$ 436,305	\$ 115,989

Administrative, Architectural & Engineering							
Category	Task Description	Qty	Rate				
Administrative	<i>Design meetings w/ stakeholders</i>	1.00	\$ 7,360.00	\$ 7,360.00	\$ 5,814	\$ 1,546	
Assessments (geologic, hydrologic)	<i>Site assessment and data collection</i>	1.00	\$ 5,420.00	\$ 5,420.00	\$ 4,282	\$ 1,138	
Preliminary design	<i>Design engineering, cost est. report</i>	1.00	\$ 21,060.00	\$ 21,060.00	\$ 16,637	\$ 4,423	
Final design	<i>30% Design and specs.</i>	1.00	\$ 16,125.00	\$ 16,125.00	\$ 12,739	\$ 3,386	
Final design	<i>Final Design, specs, bid support</i>	1.00	\$ 9,825.00	\$ 9,825.00	\$ 7,762	\$ 2,063	
Administrative	<i>Sponsor Admin and management</i>	1.00	\$ 14,000.00	\$ 14,000.00	\$ 11,060	\$ 2,940	
			\$ -	\$ -	\$ -	\$ -	
			\$ -	\$ -	\$ -	\$ -	
			\$ -	\$ -	\$ -	\$ -	
			\$ -	\$ -	\$ -	\$ -	
			\$ Total	\$ 73,790	\$ 58,294	\$ 15,496	

C. Explain how the sponsor determined cost estimates.

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Cost estimates for design were determined with consultant input based on previous and current design efforts in the Wenatchee Watershed. Cost estimates for construction were based on 30% plans completed by a PE with Natural Systems Design and reflect the latest cost information. Construction costs were increased between the draft proposal and final proposal, based on recent project bids and awards as well as input from Chelan County Public Works. The format for the spreadsheet was also changed to allow for costs allowable under construction, like permitting, survey and construction management.

D. Describe the design or acquisition alternatives considered to achieve the project's objectives.

WDFW's Stream Simulation design approach was utilized for channel design and initial structure sizing. WDFW's report [Incorporating Climate Change into the Design of Water Crossing Structures](#) will be used to provide guidance on appropriately addressing the risk and uncertainty associated with predicting climate change impacts. Findings from this examination will also play a role in refining selection of an appropriate structure; the risk and uncertainty associated with both debris flow and climate change impacts will ultimately determine the final structure span with the most extreme condition controlling selection.

To accommodate potential debris flows the current design features a structure with a maximum span of 20'-8" nearly twice the measured bankfull width (10.5') and over 33% larger than the minimum width required (14.6'). The rise of the structure is 12'-1" which allows over 5.5' of freeboard above the 100-year event with a bed thickness of 4' at the thalweg. The area above the 100-year water surface elevation available to convey extreme events (81 sq ft) is over three times the area required to convey the 100-year flood (26.5 sq ft). This configuration provides protection from extreme events while reducing construction cost significantly compared to a bridge. In support of future design iterations, the potential for debris flows will be analyzed in more detail to estimate debris flow rate that may occur under post-fire or heavily logged conditions. The results of this analysis will be used to refine selection of a replacement structure capable of safely conveying such an event.

E. How have lessons learned from completed projects or monitoring studies informed this project?

As part of the preliminary design process, available site-specific data were reviewed including a geotechnical investigation at the site; this review brought to light the potential for extreme events at the project location and the need to consider said events in the design. Specifically, the potential for a debris flow event became evident. Debris flow events are known to occur in the region; a single 2011-event in a nearby basin resulted in the failure of three bridges on Colockum Creek and a debris flow event occurred recently in a small nearby basin just 1.3 miles from the project site. Loss of

vegetation through logging and/or fire coupled with heavy seasonal rains appear to be correlated with debris flow events.

The potential for debris flows to scour structure foundations or plug the replacement structure led to the decision to increase structure span (for conveyance) and footing depth (for scour protection) beyond the minimum required for stream simulation design.

Describe the long-term stewardship and maintenance obligations for the project or acquired land.

Maintenance for the structure would be the responsibility of CCPW. The sponsor will maintain and monitor the riparian plantings and restored stream channel to insure that fish passage is maintained and plantings achieve 80% survival.

8. Explain why it is important to do this project now instead of later.

This project was previously started but had to be shelved due to design and cost issues. The initial design effort did not meet the standards and when a second design effort was started, estimated construction costs exceeded \$1.2 million. This effort has produced a much more affordable construction cost, however steel and concrete prices are high and don't appear to be going down anytime soon. Delaying this project will likely result in higher prices.

9. If the project is a part of a larger overall project or strategy, describe the goal of the overall strategy, explain individual sequencing steps, and which of these steps is included in this application for funding.

The Larsen Creek tributary one mile downstream from the Mill Creek confluence with Peshastin Creek is to be replaced in 2018. Additional wood treatments in Larsen Creek are planned for 2019 to treat incision, improve habitat and provide natural water storage on two miles of that stream. A floodplain reconnection/sidechannel project is also being submitted for design funding in this SRFB round. These projects are adjacent to some of the best connected stream habitat in the lower 9 miles of Peshastin Creek (RM 4.5-5.0).

10. Describe the sponsors experience managing this type of project.

The Chelan County Natural Resource Department has successfully replaced over 30 fish passage barrier culverts with bridges or culverts since 2006. To do this, CCNRD has partnered with private landowners, Chelan County Public Works, Washington State Department of Transportation and the U.S. Forest Service. CCNRD staff have many years of experience managing design and implementation of salmon restoration projects and managing a variety of funds to do so.

11. List all landowner names.

Chelan County Public Works

John Smith family

12. List project partners and their role and contribution to the project.

Chelan County Public Works will have a role on the design team and will facilitate in construction management.

13. Stakeholder Outreach

There are no identified barriers to this project. The local community has expressed interest in seeing habitat improvement projects on Peshasting Creek and are supportive of these efforts.

Supplemental Questions

Restoration Project Supplemental Questions

Answer the following supplemental questions:

A. Will the sponsor complete, or already completed, a preliminary design, final design, and design report (per Appendix D) before construction?

YesYes

- i. If no, please describe the design process and list all pre-construction deliverables submitted to RCO for review. Including riparian planting plans.*

B. Will a licensed professional engineer design the project?

YesYes

- i. If not, please describe the qualifications of the design team.*

C. If this project includes measures to stabilize an eroding stream bank, explain why bank stabilization there is necessary to accomplish habitat recovery.

N/A

D. Describe the steps the sponsor will take to minimize the introduction and spread of invasive species during construction and restoration. Specifically consider how the sponsor will use un-infested materials and clean equipment entering and leaving the project area.

Acquisition Project Supplemental Questions

Applies to both acquisition-only and combination projects. Answer the following supplemental questions (these are not included in the ten-page limit):

- A. Provide a detailed description of the property.** *Describe the habitat types, size, and quality on site (forested riparian/floodplain, wetlands, tributary, main stem, off-channel, bluff-backed beach, barrier beach, open coastal inlet, estuarine delta, pocket estuary, uplands, etc.), critical areas on site, and any other features that make the site unique. Describe existing land use.*
- B. List type (fee title or conservation easement) and acreage of acquisitions proposed.**
- C. Does the sponsor hold an option or purchase and sale agreement for the property?**
- D. Describe adjacent land uses.** *Describe the property's proximity to publically owned or protected properties in the vicinity. Attach a map in PRISM that illustrates this relationship.*
- E. If uplands are included on the property, state their size and explain why they are essential for protecting salmonid habitat.**
- F. What percentage of the total project area is intact and fully functioning habitat?**
- G. Is the site in need of restoration that is not part of this grant application?** *If yes, describe the restoration need and planned timeframe for implementation.*
- H. List structures (home, barn, outbuildings, fence, levees, bank armoring, or other infrastructure) on the property and any proposed modifications.** *If possible, please attach a map showing these structures. Note: In general, remove structures on SRFB-assisted acquisitions. Refer to "Manual 18, Salmon Recovery Grants," Section 2 for information about ineligible project elements.*
- I. Describe the long-term stewardship and maintenance obligations for the acquired property.** *Identify any planned use of the property, including upland areas. If answered above, please skip.*
- J. Describe the following:**
 - i. Zoning/land use**
 - ii. Shoreline Master Plan designation**

iii. Portion of site within 100-year floodplain

iv. Portion of site within designated floodway

K. Explain why federal, state, and local regulations are insufficient to protect the property from degradation.

Fish Passage Project Supplemental Questions

Answer the supplemental questions below.

NOTE: For fish passage design and evaluation guidance, applicants should refer to the Washington Department of Fish and Wildlife's [Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual](#) and the [Water Crossing Design Guidelines](#) (2013). For engineering design questions or technical assistance, contact [Don Ponder](#), Department of Fish and Wildlife, (360) 902-2547. To schedule fish passage and diversion inventory and assessment training, contact [Justin Zweifel](#), Department of Fish and Wildlife, (360) 902-2608.

A. Describe the passage problem (outfall, velocity, slope, etc.)

The passage problem is a 2' outfall drop.

B. Describe the current barrier (age, material, shape, and condition).

The existing concrete box culvert was built by Chelan County Public Works in 1955 with cast in place concrete. The structure measures 4-ft by 5-ft, 49-ft long with a 1.5% grade. The structure currently presents a total passage barrier at all flows due to a 2-ft outfall drop.

C. Is the current barrier a complete or partial barrier?

The current barrier is a complete barrier.

D. If a culvert or arch is proposed, does it employ a stream simulation, no slope, hydraulic, or other design?

Stream simulation

E. Describe the amount and quality of habitat made accessible if the barrier is corrected. Has the project received a Priority Index (PI) number?

2 miles of habitat will be made available by replacement of this culvert.

PI numbers are not completed for this barrier at this time.

F. Identify if there are additional fish passage barriers downstream or upstream of this project.

Barriers downstream have been corrected to allow for fish passage. An upstream weir was identified by WDFW to have a 0.52 meter drop during review of the application for funding thru the Brian Abbot FBRB Coordinated Pathway. This weir is located 0.07 miles upstream of the culvert and was labeled as a partial barrier, though it is unlikely that it would be a barrier to adult steelhead migration. Chelan County Natural Resource Department, Cascadia Conservation District and the Bureau of Reclamation have committed to correcting the partial barrier by 2021 as part of the FBRB funding submittal. See attached Expanded Fish Barrier Evaluation Form.

G. Engineering licensing requirement. Will a licensed professional engineer design the project? Yes~~Yes~~

i. If not, please describe the qualifications of the design team.

Diversions and Screening Project Supplemental Questions

Answer the supplemental questions below.

NOTE: For questions or technical assistance, contact [Pat Schille](#), Department of Fish and Wildlife, (509) 575-2735. Refer to the Washington Department of Fish and Wildlife's [Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual](#) for further guidance. To schedule fish passage and diversion inventory and assessment training, contact [Justin Zweifel](#), Department of Fish and Wildlife, (360) 902-2608.

- A. Problem statement information to include in Item 3 of main questions above:** *If the diversion is equipped with a fish screen, provide details of why it is not functioning properly from a fish protection perspective (entrainment or impingement).*
- B. Has the project received a Screening Priority Index (SPI) number?** *If yes, provide the SPI and indicate if the Washington Department of Fish and Wildlife developed the SPI.*
- C. Is this a pump or gravity diversion?**
- D. What is the flow of the diversion in gallons per minute (gpm)?** *How was the flow determined (water right, meter – system meter, calculated from irrigation system components or direct measurement during peak spring/summer diversion using a flow meter)?*
- E. If it is not possible to determine the flow, then provide the bank-full, cross-sectional area of the ditch, measured 100-300 feet downstream of the point of diversion.** *Refer to Section 8.3 of the Washington Department of Fish and Wildlife's [Fish Passage Barrier and Surface Water Screening Assessment and Prioritization Manual](#) for instructions on how to collect this information.*
- F. For projects that have a goal of saving water:**
 - i. Describe the mechanism that the sponsor intends to use to conserve water (trust, etc.) and explain why this is the preferred approach.**
 - ii. Which steps in the water conservation process will this project proposal complete?**
 - iii. How much water, if any, will be saved because of this project?** *By what methods are you calculating the amount of water conserved?*

G. Will a licensed professional engineer design the project? Choose an answerChoose an answer

i. If not, please describe the qualifications of the design team.

Knotweed Removal Project Supplemental Questions

Answer the following supplemental questions:

- A. Describe the level of infestation in the watershed.**
- B. What has been accomplished to date related to knotweed control in the watershed?** *Who has done the work? What is the success of these actions?*
- C. What is the planned prioritization strategy for knotweed control within the sub-watershed or watershed?** *Include efforts before and beyond the duration of the requested grant funding.*
- D. What is the anticipated time to control?** *Time to control is defined as treatment from upper extent to lowest, until the need is only a minor maintenance control effort to prevent re-sprouting or new stems from becoming established.*
- E. List the major tasks necessary to reach a maintenance control level and their anticipated time schedule.** *Include efforts before and beyond the duration of the requested grant funding.*
- F. Describe the staffing level needed to meet annual treatment goals and the plan to achieve that staffing level.**
- G. What are the completed and/or planned landowner outreach efforts?**
- H. What is the estimated total cost to reach a maintenance control level within the sub-watershed/watershed proposed for treatment?**
- I. What is the 10-year strategy (including funding) for the following:**
 - i. Getting to maintenance control levels for the sub-watershed/watershed?**
 - ii. Long-term maintenance/control?**
- J. How will the SRFB funds leverage other programs in the same sub-watershed/watershed?**
- K. What are the proposed re-vegetation plans for treated sites?**

Road Maintenance and Abandonment Plan (RMAP) Projects in Large Forest Supplemental Questions

Answer the following supplemental questions:

- A. Explain how the RMAP project is not solely mitigation (i.e., not exclusively compensation for unavoidable impacts of specific forestry projects or actions).**
- B. Provide documentation that the landowner has received an extension from the Department of Natural Resources for the proposed project.** *Identify how this RMAP project fits within the landowner's great RMAP requirements. Attach documentation in PRISM.*
- C. Provide a prioritized list of stream crossing barriers based on fish and habitat data.** *This prioritized list may be different from the landowner's RMAP prioritization list. The prioritization should be based on information including the following: Fish species documented in the stream, miles of stream habitat above barrier, quality of upstream habitat, relationship to other barriers on the stream, and other factors. This list should include an introduction that identifies the factors and data sources used in the prioritization. Include the proposed project on the prioritized list. Attach this documentation in PRISM.*

Comments

Use this section to respond to the comments received after the initial site visits, and then again after submitting the final application.

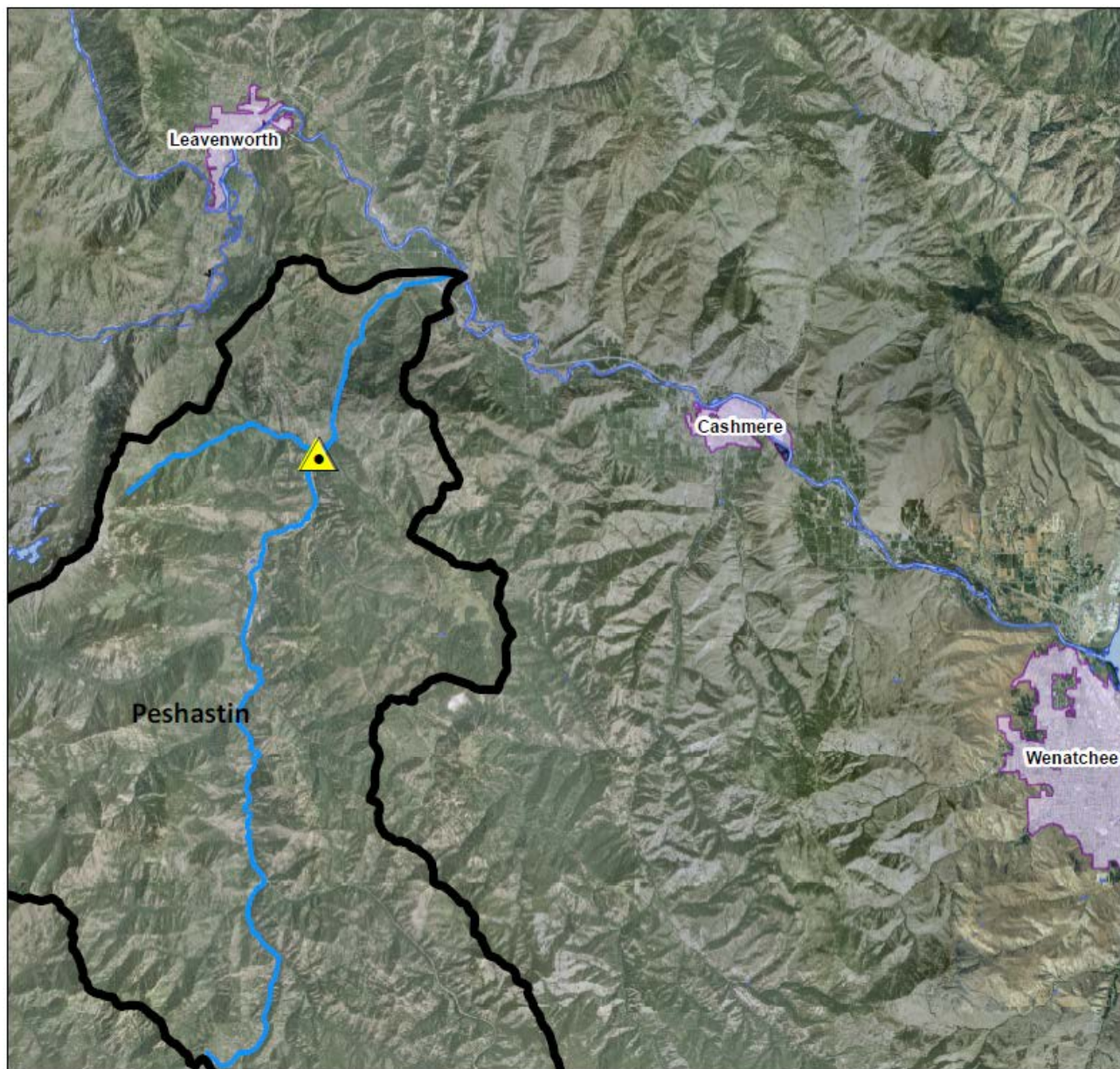
Response to Site Visit Comments

Please describe how the sponsor responded to the review panel's initial site visit comments. *RCO recommends that the sponsor list each review panel comment and question and identify the response. The sponsor may use this space to respond directly to the comments.*

Response to Post-Application Comments

Please describe how the sponsor responded to the review panel's post-application comments. *RCO recommends that the sponsor list each of the review panel's comments and questions and identify the response. The sponsor may use this space to respond directly to the comments.*

Figure 1. Location Overview Map.



Legend



Barrier Location



Peshastin



Stream



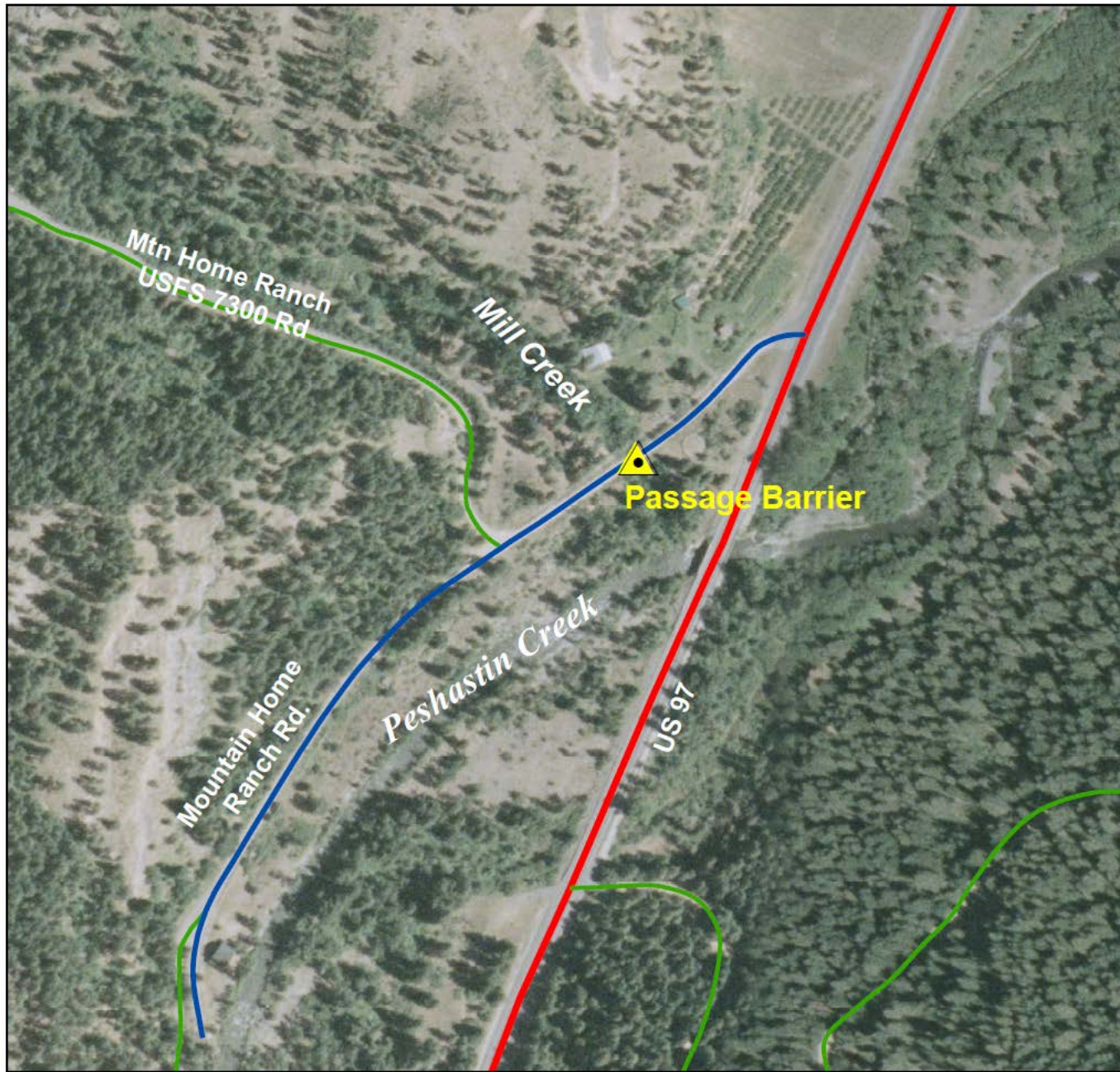
City Limits







Map Scale: 1 inch = 14,900 feet



Figure 2. Site Location Detail



Legend

-  Barrier Location
-  County
-  Highway
-  USFS



Map Scale: 1 inch = 300 feet



Figure 2. Barrier crossing on Mountain Home Ranch rd (above) and Box culvert at RM 0.1 on Mill Creek (below).



Figure 3. Mill Creek photos from informal habitat survey, CCNRD
September/October 2010



Young riparian community
and LWD on Mill Creek
(about RM 1.2) in area
where Rat Creek Fire
and/or past logging
reduced mature
conifer/deciduous cover.



Pool habitat at about RM
1.0 on Mill Creek



Small Gravels in Mill Creek
near RM 1.0

Figure 4. Stream temperature (top) and discharge data

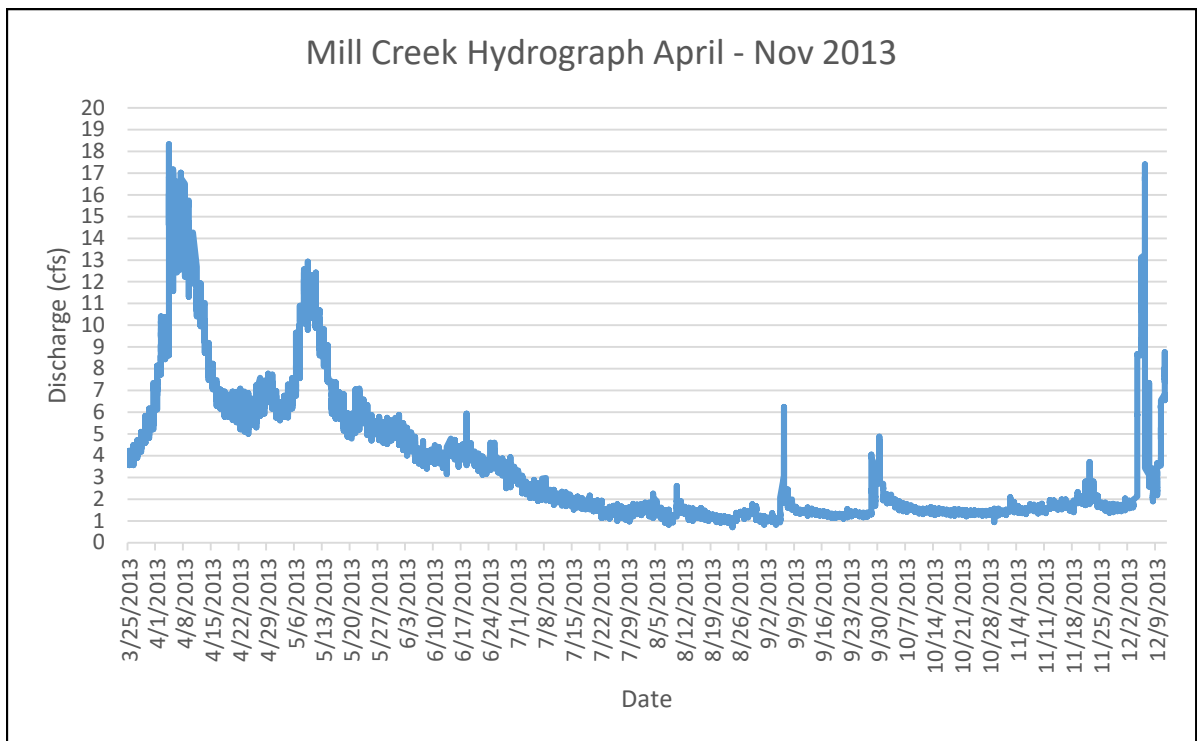
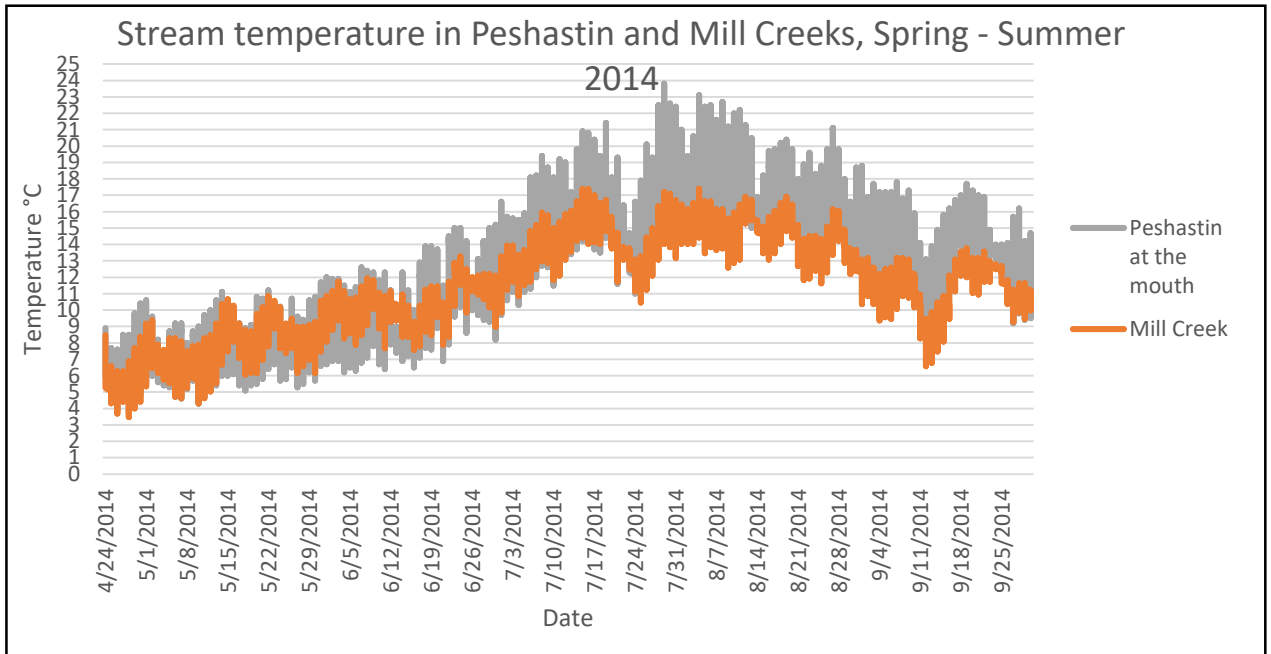
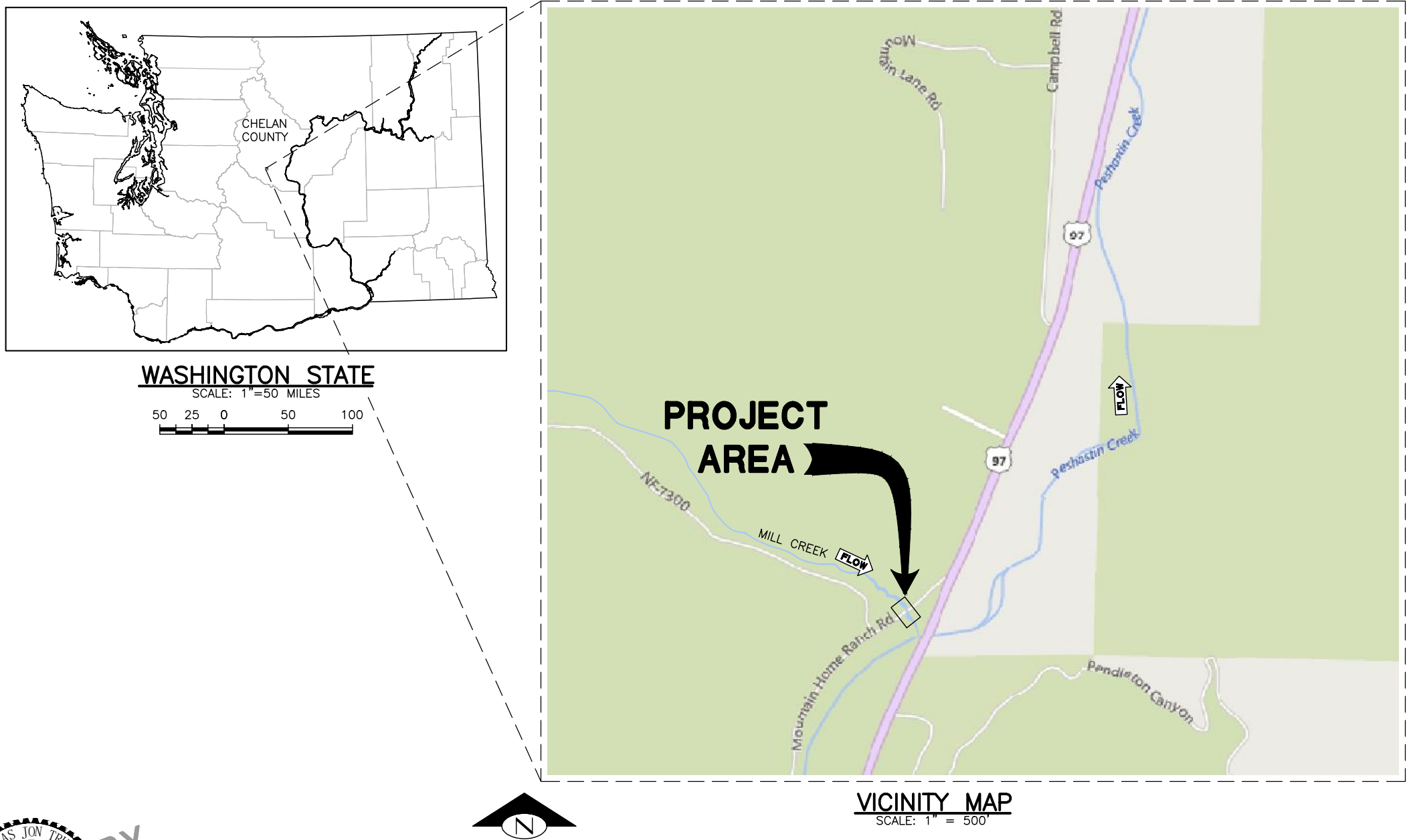


Figure 5. 30 % plans

MILL CREEK

FISH PASSAGE PROJECT

CHELAN COUNTY NATURAL RESOURCES



DRAWING LIST	
SHEET NO.	SHEET TITLE
1	COVER SHEET
2	NOTES & SUMMARY OF QUANTITIES
3	SITE PREPARATION AND DEWATERING PLAN
4	GRADING PLAN & PROFILE
5	TYPICAL GRADING SECTIONS
6	ROADWAY PAVING, STRIPING, AND GUARDRAIL PLAN

CONTACT INFORMATION
NATURAL SYSTEMS DESIGN, INC
305 FLORA STREET
BELLINGHAM, WA 98225
(360) 656-5207
CHELAN COUNTY NATURAL RESOURCES
411 WASHINGTON STREET, SUITE 201
WENATCHEE, WA 98801
(509) 667-6533



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DRAWING IS NOT PLOTTED
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	NT	LATITUDE	47°30'49"N
CHECKED	RH	LONGITUDE	120°37'55"W
DRAWN	NT	TN/SC/RG	T23N/S6/R18E
CHECKED	JS	DATE	MARCH 27, 2018

MILL CREEK FISH
PASSAGE PROJECT

COVER SHEET

1
SHEET 1 OF 6

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GENERAL NOTES

1. THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF CHELAN COUNTY NATURAL RESOURCES, HEREAFTER REFERRED TO AS "CONTRACTING AGENCY" AND THEIR AUTHORIZED AGENTS "CONTRACTOR".
2. NATURAL SYSTEMS DESIGN HEREAFTER REFERRED TO AS "ENGINEER" IS RESPONSIBLE FOR THE PREPARATION OF THESE ORIGINAL PLANS AND ASSOCIATED SPECIFICATIONS; AND WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGE, OR USE, OF THESE PLANS WHICH INCLUDES ALTERATION, DELETION, OR EDITING OF THIS DOCUMENT WITHOUT EXPLICIT WRITTEN PERMISSION FROM THE ENGINEER. ANY OTHER UNAUTHORIZED USE OF THIS DOCUMENT IS PROHIBITED.
3. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND FURTHER AGREES THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS IN ACCORDANCE WITH THE PROVISIONS OUTLINED BY THE PROJECT CONTRACT AND SPECIFICATIONS.
4. ALL IMPROVEMENTS SHALL BE ACCOMPLISHED UNDER THE APPROVAL, INSPECTION, AND TO THE SATISFACTION OF THE CONTRACTING AGENCY. IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THESE PLANS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS FOR CONSTRUCTION OF ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION UNLESS NOTED OTHERWISE. ALL REFERENCES TO THE "STANDARD SPECIFICATIONS" SHALL MEAN THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION. CONSTRUCTION NOT SPECIFIED ON THESE PLANS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS OBLIGATED TO BE FAMILIAR WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS NOT DISCUSSED IN THE GENERAL NOTES. THE CONTRACT SPECIAL PROVISIONS SHALL SUPERSEDE THOSE OF THE STANDARD SPECIFICATIONS WHERE DISCREPANCIES OCCUR.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTOR(S) TO EXAMINE THE PROJECT SITE PRIOR TO THE OPENING OF BID PROPOSALS. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, SUCH AS THE NATURE AND LOCATION OF THE WORK; AND THE GENERAL AND LOCAL CONDITIONS, PARTICULARLY THOSE AFFECTING THE AVAILABILITY OF TRANSPORTATION, THE DISPOSAL, HANDLING, AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRICITY, ROADS, THE UNCERTAINTIES OF WEATHER, THE CONDITIONS OF THE GROUND, SURFACE AND SUBSURFACE MATERIALS, GROUNDWATER, THE EQUIPMENT AND FACILITIES NEEDED FOR AND DURING THE PERFORMANCE OF THE WORK, AND THE COSTS THEREOF. ANY FAILURE BY THE CONTRACTOR AND SUBCONTRACTOR(S) TO ACQUAINT THEMSELVES WITH ALL THE AVAILABLE INFORMATION WILL NOT RELIEVE THE CONTRACTOR AND SUBCONTRACTOR(S) FROM RESPONSIBILITY FOR PROPERLY ESTIMATING THE DIFFICULTY AND COST OF SUCCESSFULLY PERFORMING THE WORK.
6. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE CONTRACT DOCUMENTS AND FOR ALL SUBMITTALS REQUIRED TO THE CONTRACTING AGENCY FOR REVIEW AND ACCEPTANCE.

PERMIT NOTES

1. EVERY REASONABLE EFFORT SHALL BE MADE TO CONDUCT THE ACTIVITIES SHOWN IN THESE PLANS, IN A MANNER THAT MINIMIZES THE ADVERSE IMPACT ON WATER QUALITY, FISH AND WILDLIFE, AND THE NATURAL ENVIRONMENT.
2. ALL WORK WILL BE IN COMPLIANCE WITH PERMIT CONDITIONS ISSUED BY PERTINENT REGULATORY AGENCIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE COPIES OF ALL PERMITS ON THE JOB SITE, UNDERSTAND AND COMPLY WITH ALL PERMIT CONDITIONS.
3. ALL WORK THAT DISTURBS THE SUBSTRATE, BANK, OR SHORE OF A WATERS OF THE STATE THAT CONTAINS FISH LIFE SHALL BE CONDUCTED ONLY DURING THE WORK PERIOD FOR THAT WATERBODY AS ALLOWED BY RELEVANT HYDRAULIC WORK PERMITS. THOSE PORTIONS OF THE PROJECT WORK THAT OCCUR OUTSIDE OR ABOVE THE ORDINARY HIGH WATER MARK (ABOVE THE USACE JURISDICTIONAL LINE) ARE NOT SUBJECT TO THE WORK PERIODS DESCRIBED ABOVE UNLESS SPECIFIED IN THE RELEVANT PERMITS.
4. ALL ACTIVITIES THAT INVOLVE WORK ADJACENT TO, OR WITHIN THE WETTED CHANNEL SHALL, AT ALL TIMES, REMAIN CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS; EFFLUENT LIMITATION; AND STANDARDS OF PERFORMANCE, PROHIBITIONS, PRETREATMENT STANDARDS, AND MANAGEMENT PRACTICES ESTABLISHED PURSUANT TO THE CLEAN WATER ACT OR PURSUANT TO APPLICABLE STATE AND LOCAL LAW.
5. IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE CONTRACTING AGENCY SHALL BE NOTIFIED IMMEDIATELY.
6. IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND THE CONTRACTING AGENCY SHALL BE NOTIFIED IMMEDIATELY.

SURVEY NOTES

1. UNLESS NOTED OTHERWISE ON THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION.
- 2.
3. ALL ALIGNMENTS SHOWN IN THESE DRAWINGS WILL BE MADE AVAILABLE TO THE CONTRACTOR IN ELECTRONIC FORMAT (.DWG, SHAPE FILE, LANDXML, ETC.) FOR THE CONTRACTOR TO USE IN SURVEYING AND STAKING OUT PROJECT ELEMENTS.
4. THE CONTRACTOR SHALL MAINTAIN A SET OF PLANS ON THE JOB SHOWING "AS-CONSTRUCTED" CHANGES MADE TO DATE. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUPPLY TO CONTRACTING AGENCY A SET OF PLANS, MARKED UP TO THE SATISFACTION OF THE CONTRACTING AGENCY, REFLECTING THE AS-CONSTRUCTED MODIFICATIONS.
5. ELEVATIONS SHOWN ON THE PLANS FOR PIPE INVERTS, TOPS OF BANKS, THALWEG, GRADE CONTROLS, ETC., ARE BASED UPON THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY ALL NECESSARY SURFACE ELEVATIONS IN THE FIELD AND NOTIFY THE CONTRACTING AGENCY OF ANY DISCREPANCIES, WHICH MIGHT AFFECT PROPER OPERATION OF THE NEW FACILITIES BEFORE BREAKING GROUND AND PRIOR TO FACILITY INSTALLATION. THE CONTRACTING AGENCY SHALL BE CONTACTED IN THE EVENT ELEVATIONS ARE INCORRECT SO THAT THE PROPER ADJUSTMENTS CAN BE MADE BY ENGINEER PRIOR TO THE INSTALLATION OF THE FACILITIES, AS SET FORTH IN THE SPECIAL PROVISIONS.
6. LIDAR FOR THIS PROJECT WAS COLLECTED IN 2015 AND IS REPRESENTATIVE OF CONDITIONS AT THE TIME OF COLLECTION. LIDAR DATA HAVE BEEN SUPPLEMENTED WITH LOCAL GROUND SURVEY TO BETTER DEFINE THE CHANNEL; GROUND SURVEY OCCURRED IN 2008. THE HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE NORTH (FT). THE VERTICAL DATUM IS NAVD88 (FT).

EROSION, SEDIMENT CONTROL AND WATER MANAGEMENT NOTES

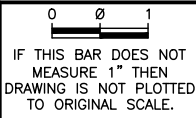
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION CONTROL MEASURES. THE EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PERFORMANCE OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
2. A SEDIMENT AND EROSION CONTROL PLAN WILL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL BY CONTRACTING AGENCY AND/OR THE ENGINEER BEFORE ANY CONSTRUCTION MAY BEGIN. THE SEDIMENT AND EROSION CONTROL PLAN WILL IDENTIFY BEST MANAGEMENT PRACTICES TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
3. ACTIVITIES SHALL BE DESIGNED AND CONSTRUCTED TO AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES TO THE MAXIMUM EXTENT PRACTICAL THROUGH THE USE OF PRACTICAL ALTERNATIVES. ALTERNATIVES THAT SHALL BE CONSIDERED INCLUDE THOSE THAT MINIMIZE THE NUMBER AND EXTENT OF IN-WATER WORK AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
4. AT NO TIME SHALL SEDIMENT-LADEN WATER BE DISCHARGED OR PUMPED DIRECTLY INTO THE SUBJECT RIVER, STREAM, OR WETLAND. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE PROJECT PERMITS AND / OR SPECIFICATIONS.
5. IF HIGH WATER LEVEL CONDITIONS THAT CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE WATER LEVEL SUBSIDES.
6. PERMIT CONDITIONS CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF EROSION AND TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON-SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED CONCENTRATIONS AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON-SITE.
7. CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT TO CONSTRUCTION AREAS DEFINED ON SITE PLAN OR IDENTIFIED AS ACCEPTABLE BY THE ENGINEER OR CONTRACTING AGENCY.
8. ALL EXTERNAL GREASE AND OIL SHALL BE PRESSURE-WASHED OFF THE EQUIPMENT PRIOR TO TRANSPORT TO THE SITE.
9. ALL EQUIPMENT OPERATING BELOW OHWM SHALL UTILIZE READILY BIODEGRADABLE VEGETABLE-BASED HYDRAULIC FLUIDS.
10. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE SUBJECT RIVER, STREAM, OR WETLAND.
11. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ONSITE AT ALL TIMES.
12. NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTED TO BE REMOVED ON THE PLANS OR AS DIRECTLY SPECIFIED ON-SITE BY THE PROJECT MANAGEMENT STAFF. ALL TREES CONFLICTING WITH GRADING SHALL BE REMOVED. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED.

13. FOLLOWING CONSTRUCTION, SITE RESTORATION WILL INCLUDE ESTABLISHING LONG-TERM EROSION PROTECTION MEASURES. THESE MEASURES WILL INCLUDE PLANTINGS, EROSION CONTROL FABRIC, SEED, AND MULCH. EQUIPMENT AND EXCESS SUPPLIES WILL BE REMOVED AND THE WORK AREA WILL BE CLEANED. MAINTENANCE ACTIVITIES FOR THE NEWLY CONSTRUCTED RESTORATION PROJECTS ARE ANTICIPATED TO OCCUR PERIODICALLY.

CONSTRUCTION NOTES

1. CONTRACT DOCUMENTS REFER TO THESE PLANS.
2. CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE ALL WORK AS INDICATED IN THE CONTRACT DOCUMENTS.
3. CONSTRUCTION HOURS SHALL BE WEEKDAYS BETWEEN 7:00 A.M. AND 6:30 P.M. UNLESS PRIOR APPROVAL IS RECEIVED FROM THE CONTRACTING AGENCY.
4. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE CONTRACTING AGENCY OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
5. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
6. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
7. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, PRIVATE BRIDGE, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
8. THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY.
9. NOTES AND DETAILS ON THE PLANS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREIN.
10. DIMENSIONS CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE PLANS.
11. THE PLANS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF ALL CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKS, AND THE PUBLIC DURING CONSTRUCTION.
12. MATERIAL SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREAS. THE CONTRACTOR SHALL USE ONLY DESIGNATED SPECIFIC SITES FOR STORAGE OF EQUIPMENT AND MATERIALS AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF ALL EQUIPMENT AND MATERIALS.

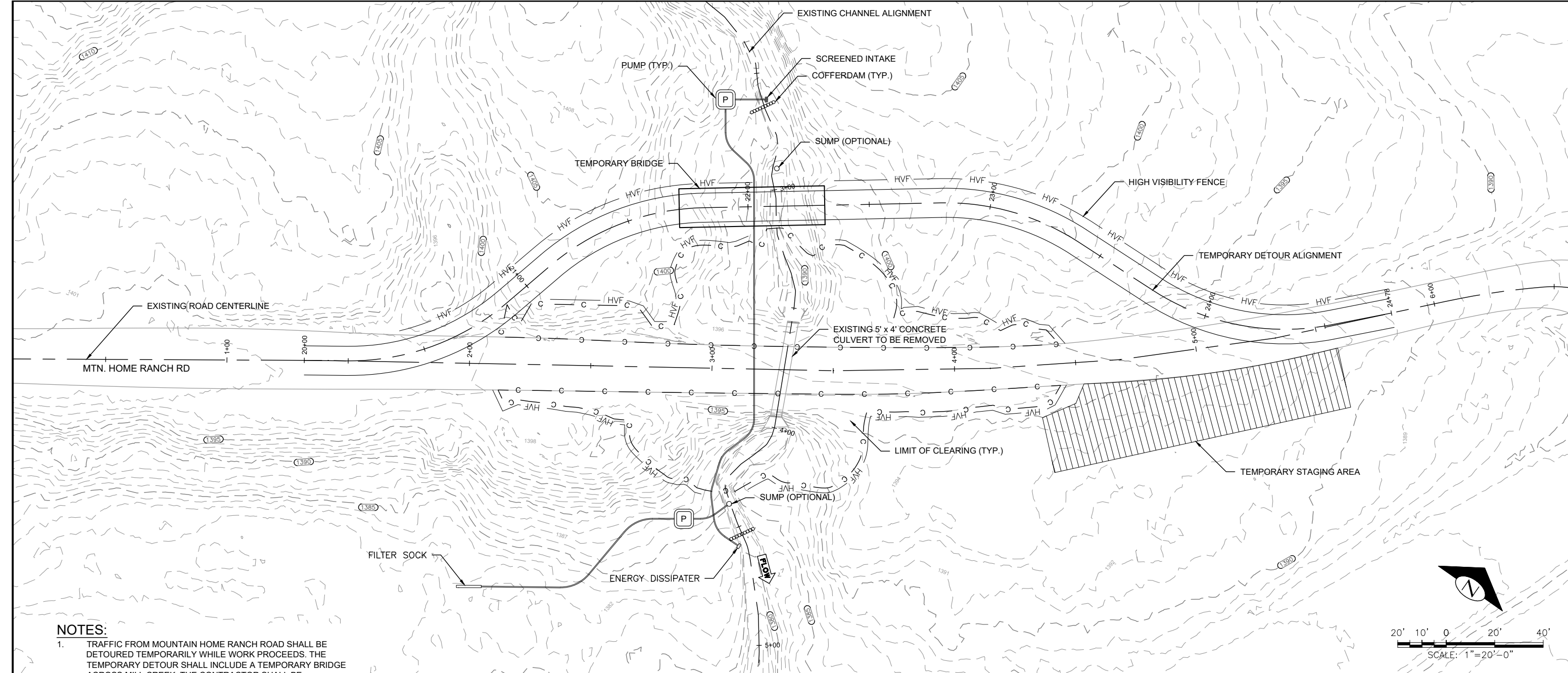
ITEM NO.	QUANTITY	UNITS	DESCRIPTION
1	LUMP SUM	L.S.	MOBILIZATION
2	0.22	ACRE	CLEARING
3	925	L.F.	HIGH VISIBILITY FENCE
4	LUMP SUM	L.S.	TEMPORARY STREAM DIVERSION
5	LUMP SUM	L.S.	TEMPORARY DETOUR
6	LUMP SUM	L.S.	TEMPORARY BRIDGE
7	1065	C.Y.	STRUCTURE EXCAVATION CLASS A INCL. HAUL
8	LUMP SUM	L.S.	SHORING OR EXTRA EXCAVATION CL. A
9	45	C.Y.	CULVERT BEDDING MATERIAL
10	LUMP SUM	L.S.	HIGH RADIUS ARCH STRUCTURAL PLATE CULVERT
11	560	C.Y.	GRAVEL BACKFILL FOR PIPE ZONE BEDDING
12	LUMP SUM	L.S.	CHANNEL GRADING
13	260	C.Y.	STREAMBED SEDIMENT
14	100	EACH	STREAMBED BOULDER TWO MAN
15	95	C.Y.	CRUSHED SURFACING BASE COURSE
16	80	TON	HMA CL. 1/2 IN. PG 64-22
17	76	L.F.	BEAM GUARDRAIL TYPE 31
18	4	EACH	BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL
19	2	EACH	BEAM GUARDRAIL PLACEMENT - 25' SPAN
20	685	L.F.	PAINT LINE
21	LUMP SUM	L.S.	SURVEYING
22	LUMP SUM	L.S.	PROJECT TEMPORARY TRAFFIC CONTROL
23	LUMP SUM	L.S.	SITE RESTORATION
24	LUMP SUM	L.S.	UTILITY RECONNECTION
25	5,000	CALC	MINOR CHANGE



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CHECKED	RH	LONGITUDE	120°37'55"W
DRAWN	NT	TN/SC/RG	T23N/S6/R18E
CHECKED	JS	DATE	MARCH 27, 2018

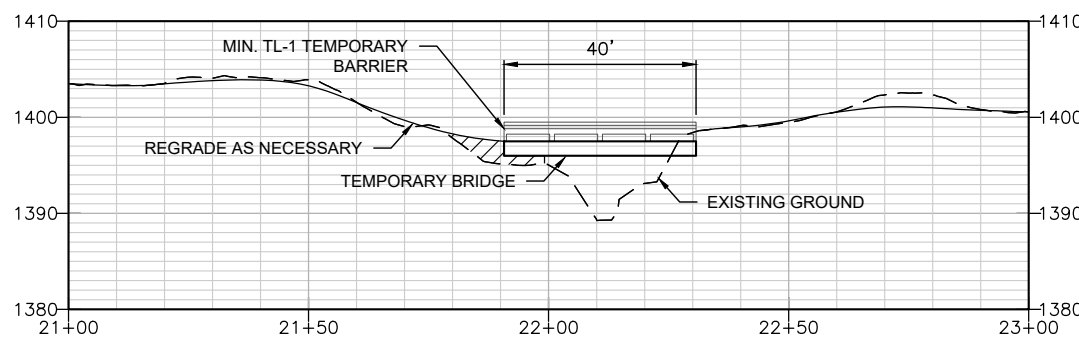
MILL CREEK FISH
PASSAGE PROJECT

NOTES & SUMMARY
OF QUANTITIES

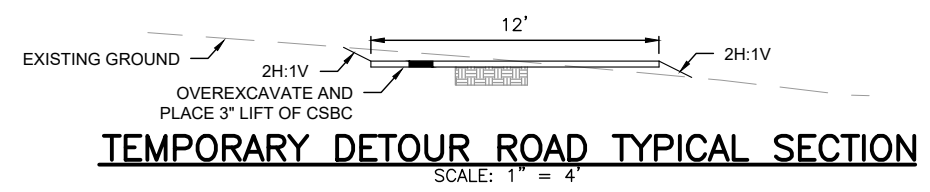


- NOTES:**
1. TRAFFIC FROM MOUNTAIN HOME RANCH ROAD SHALL BE DETOURED TEMPORARILY WHILE WORK PROCEEDS. THE TEMPORARY DETOUR SHALL INCLUDE A TEMPORARY BRIDGE ACROSS MILL CREEK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING A TEMPORARY BRIDGE IN ACCORDANCE WITH THESE DRAWINGS AND THE SPECIAL PROVISIONS.
 2. CONTRACTOR SHALL DEVELOP AND SUBMIT A TEMPORARY TRAFFIC CONTROL PLAN AS REQUIRED IN THE STANDARD SPECIFICATIONS. CONTRACTOR SHALL IMPLEMENT ALL TRAFFIC CONTROL ELEMENTS REQUIRED TO SAFELY CONTROL TRAFFIC FOR THE FULL DURATION OF THE PROJECT.
 3. TEMPORARY BRIDGE DECK SHALL INCLUDE TEMPORARY LONGITUDINAL TRAFFIC BARRIER WHICH SATISFIES THE REQUIREMENTS FOR NCHRP TL-1.
 4. TEMPORARY BRIDGE DECK WIDTH SHALL BE NO LESS THAN 16 FEET TO ACCOMMODATE A 12 FT TRAVEL LANE WITH 2 FEET OF SHY DISTANCE ON EACH SIDE.
 5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND SUPPORTING CALCULATIONS DOCUMENTING LOAD RATING CALCULATIONS IN CONFORMANCE WITH THE REQUIREMENTS STATED ON THIS SHEET. TEMPORARY BRIDGE SHALL BE INSTALLED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.

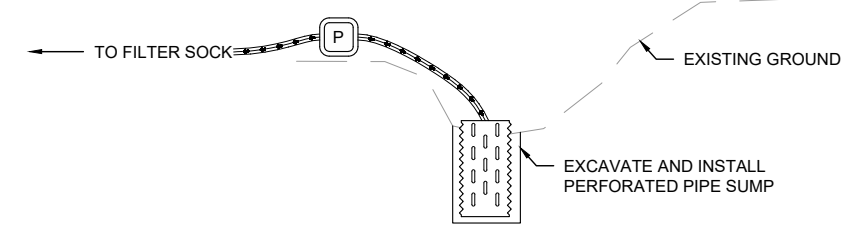
SITE PREPARATION PLAN



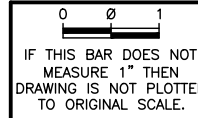
TEMPORARY BRIDGE PROFILE



TEMPORARY DETOUR ROAD TYPICAL SECTION



SUMP DETAIL
NTS



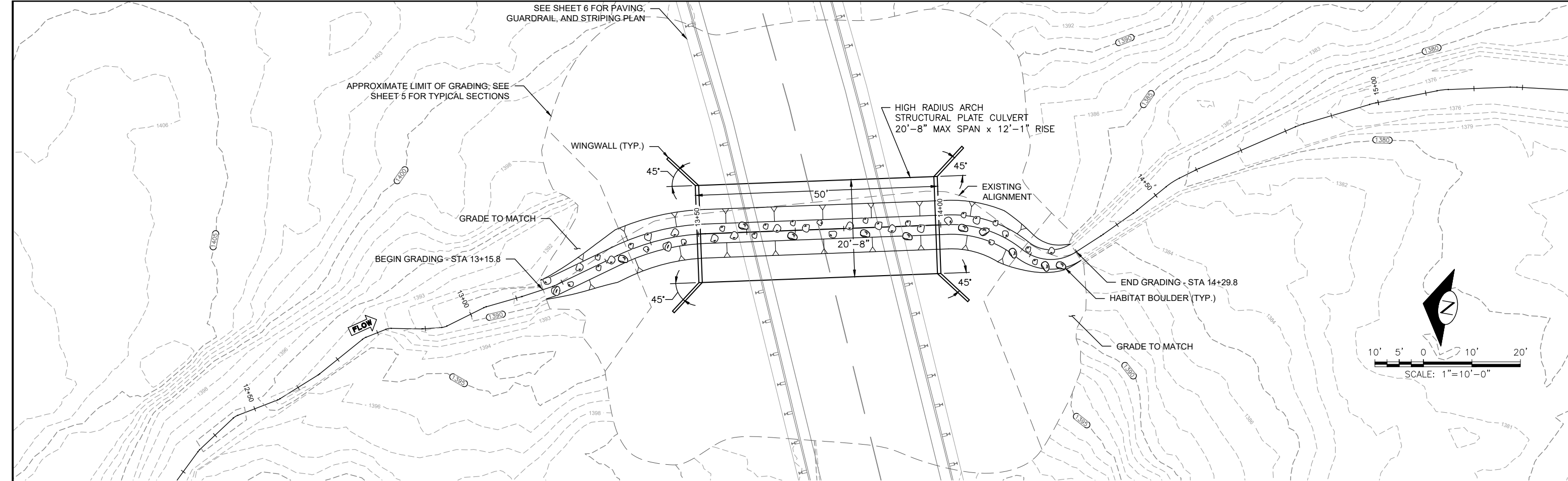
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**MILL CREEK FISH
PASSAGE PROJECT**

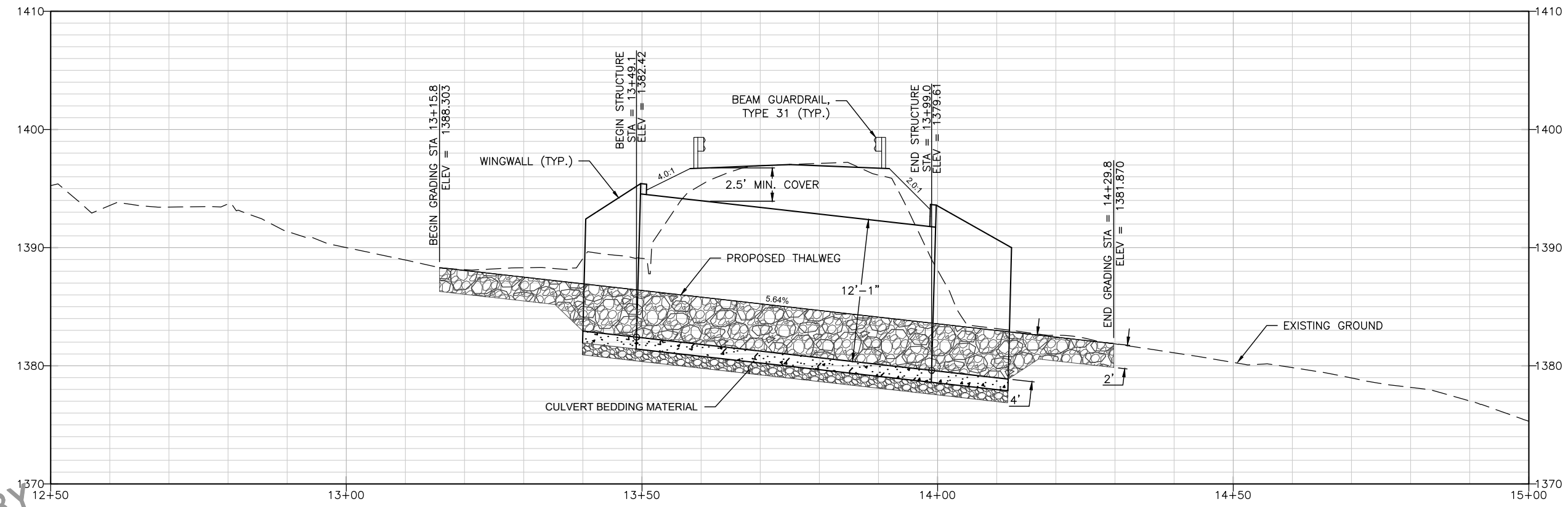
**SITE PREPARATION AND
DEWATERING PLAN**

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GRADING PLAN



GRADING PROFILE

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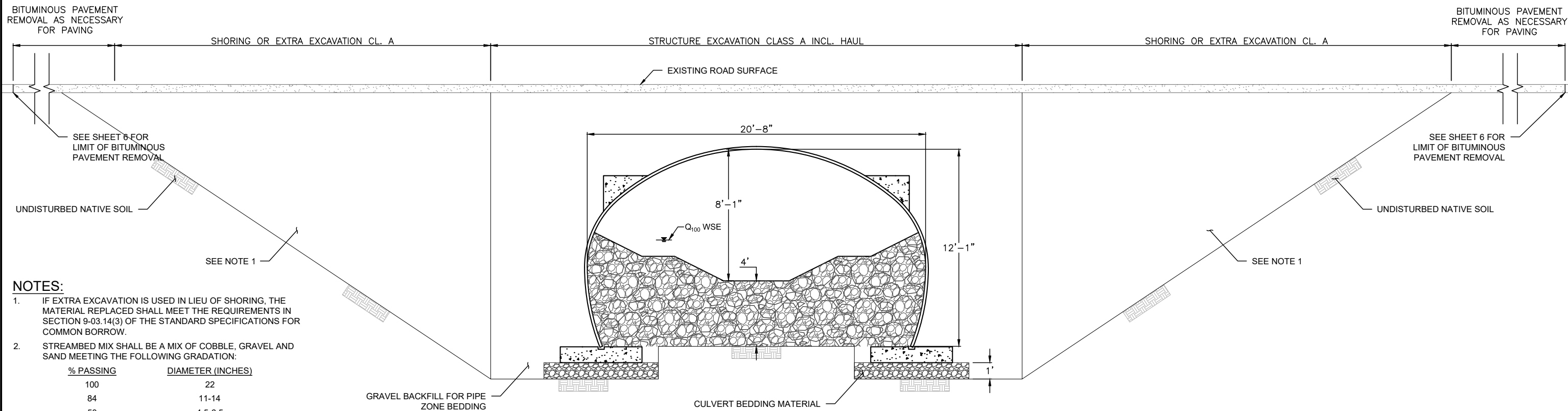
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MILL CREEK FISH
PASSAGE PROJECT

GRADING PLAN & PROFILE

4
SHEET 4 OF 6

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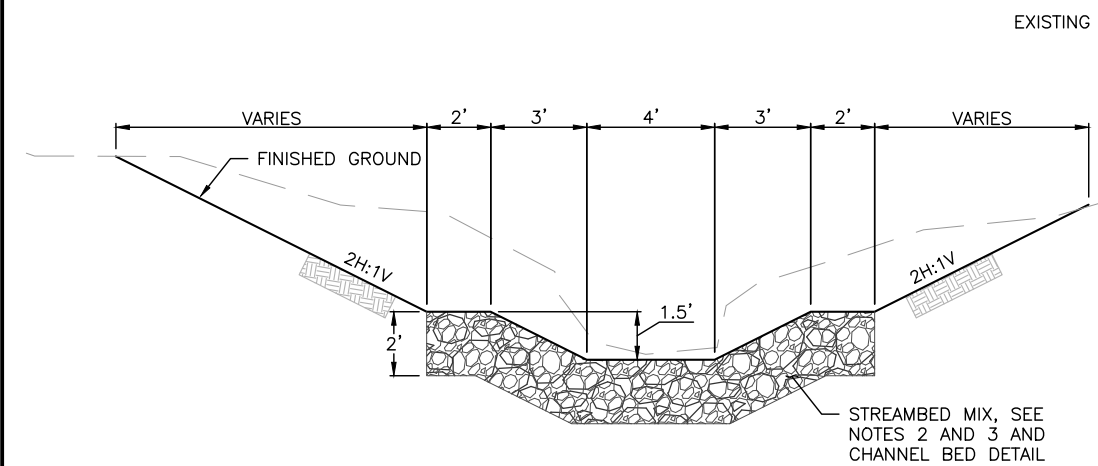


- NOTES:**
1. IF EXTRA EXCAVATION IS USED IN LIEU OF SHORING, THE MATERIAL REPLACED SHALL MEET THE REQUIREMENTS IN SECTION 9-03.14(3) OF THE STANDARD SPECIFICATIONS FOR COMMON BORROW.
 2. STREAMBED MIX SHALL BE A MIX OF COBBLE, GRAVEL AND SAND MEETING THE FOLLOWING GRADATION:

% PASSING	DIAMETER (INCHES)
100	22
84	11-14
50	4.5-6.5
16	0.1-0.3
5-10	#200 SIEVE
 3. TWO-MAN STREAMBED BOULDERS SHALL BE INCORPORATED INTO THE CHANNEL BED AS DIRECTED BY THE CONTRACTING OFFICER.

EXCAVATION PAY ITEMS

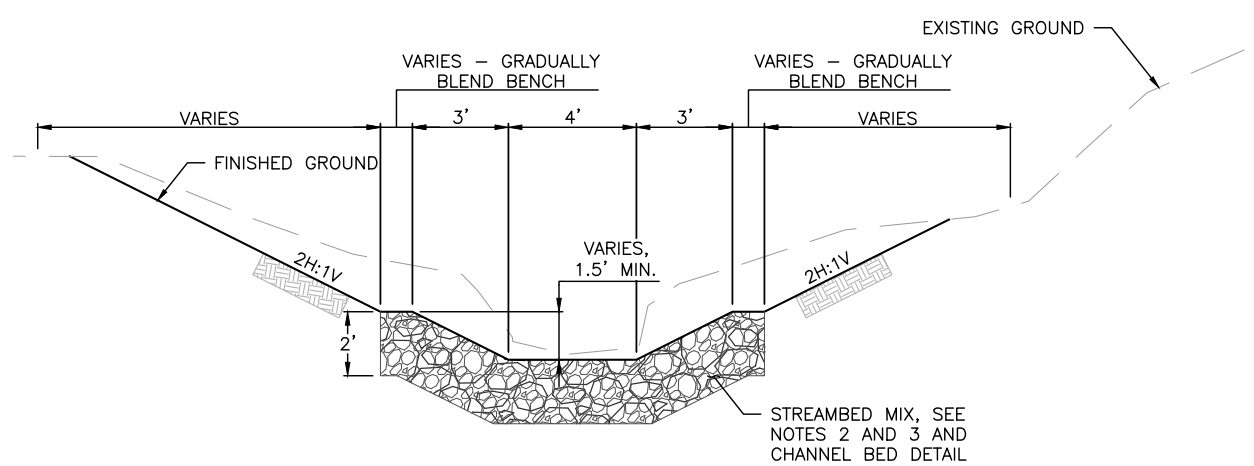
SCALE: 1" = 3'



TYPICAL CHANNEL SECTION

SCALE: 1" = 3'

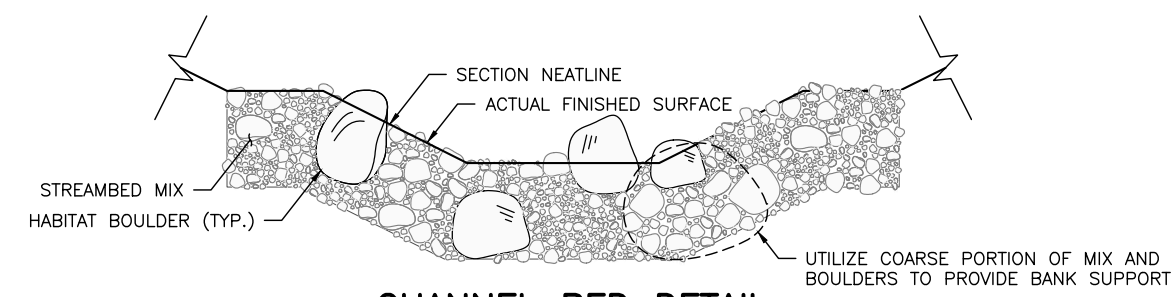
STA 13+35.0 TO 13+49.1
STA 13+99.0 TO 14+18.0



TYPICAL TRANSITION SECTION

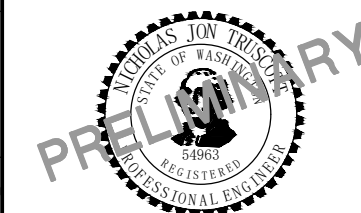
SCALE: 1" = 3'

STA 13+15.8 TO 13+35.0
STA 14+18.0 TO 14+29.8



CHANNEL BED DETAIL

SCALE: 1" = 2'



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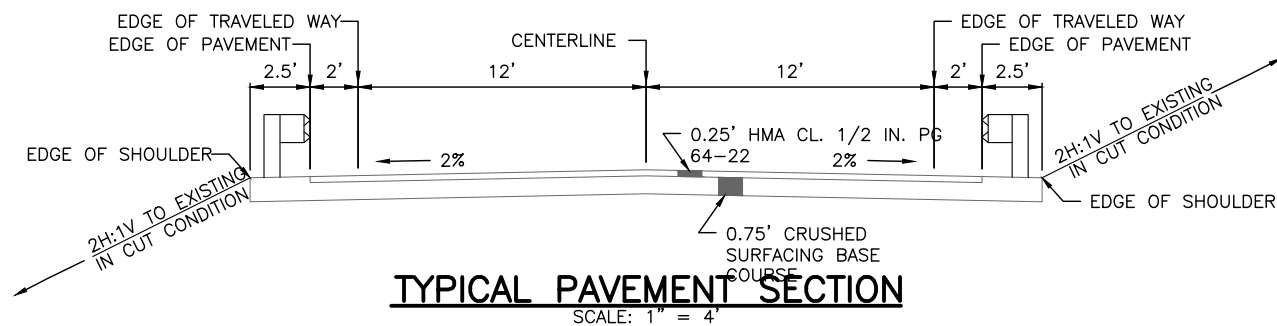
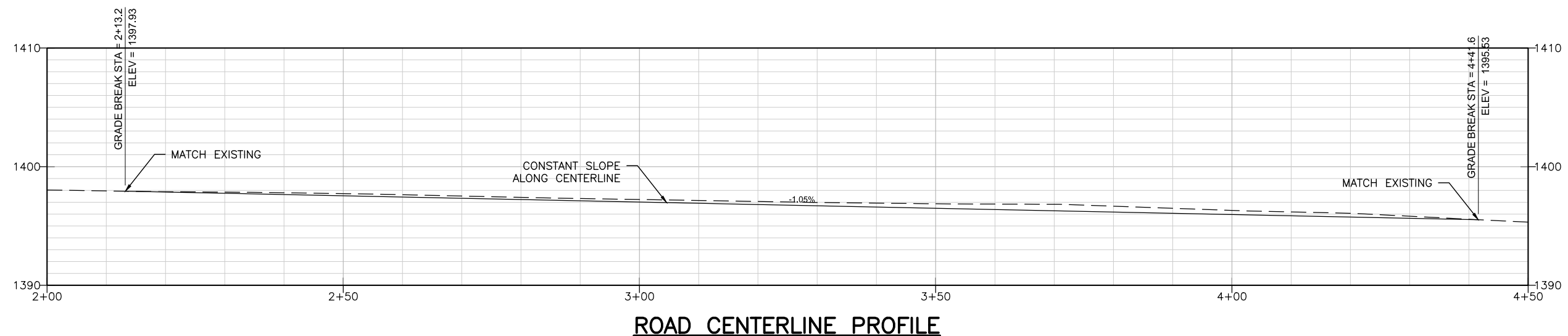
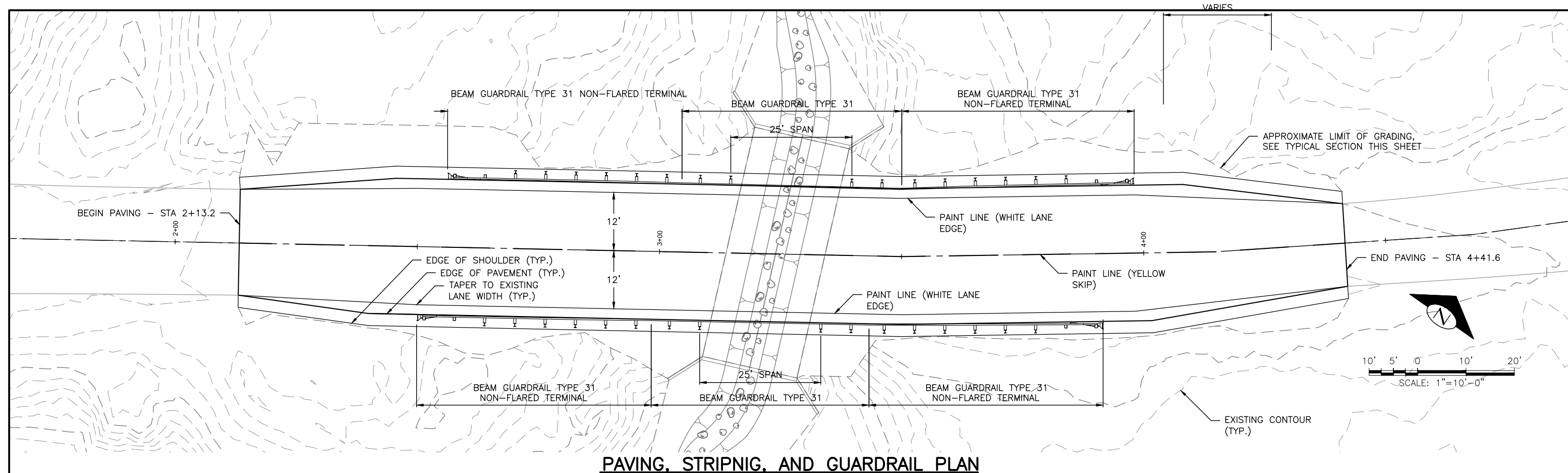
MILL CREEK FISH
PASSAGE PROJECT

TYPICAL GRADING SECTIONS

5
SHEET 5 OF 6

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DRAWN	<u>NT</u>	DN/SC/RG	<u>T23N/S6/R18E</u>
CHECKED	<u>JS</u>	DATE	<u>MARCH 27, 2018</u>

MILL CREEK FISH PASSAGE PROJECT

ROADWAY PAVING, STRIPING, AND GUARDRAIL PLAN

Correction Analysis Form

Site Information (measurements in feet)

Project Name: *Mill Creek Fish Passage Project*

PRISM Project #:

Date: 6/27/18

Bankfull Width (outside influence of culvert): 10.5 ft

Utilities Crossing: ☒ Yes ☐ No ☐ Unknown

Road Fill at Culvert Invert: 5.3 ft

Road Width: 20 ft

Road Description/Condition (mainline, spur road, driveway/access): Local access road, narrow compared to current design standards, very little shoulder present, no guardrail currently, pavement is in fair condition (some patches present)

Evaluator Information

Evaluator Name: **Nic Truscott, PE**

Affiliation: **Natural Systems Design**

Mailing Address: **305 Flora St.**

City: **Bellingham**

State: **WA**

Zip: 98225

Telephone: 360-656-5207 FAX:

Cell: 360-296-0019

E-mail: nic@naturaldes.com

Upstream Habitat/Channel Description

Channel Slope (outside of culvert influence): 5.8%

Re-grade Potential (streambed US – streambed DS in feet): 6.5 ft

Dominant Substrate: ☐ Sand (<1/5") ☒ Gravel (1/5"–3") ☐ Cobble (3"–12") ☐ Boulder (>12") ☐ Bedrock

Additional Upstream Information, Habitat Description, Other Site Conditions or Concerns, Including Potential Re-Grade Impacts Relative to Channel Stability And Habitat: Streambed is dominated by gravel substrate; pools and diversity in local bed topography are almost always associated with the presence of boulders and/or wood. Riparian vegetation is largely healthy. Channel is entrenched with banks that are only inundated at infrequent events (25-year or greater). Bed slope is fairly steep, but proposed channel slope aligns well with natural slope of channel in vicinity of crossing and therefore potential channel re-grade following construction is minimized. Construction of bed and in particular incorporation of stable particles to simulate natural banks and channel bed roughness will be critical in terms of providing a stable stream simulation channel.

Downstream Habitat/Channel Description

Channel Slope: 6.8% (outside of culvert influence)

Additional Downstream Information, Habitat Description, Other Site Conditions or Concerns: Similar to upstream conditions, downstream habitat is largely riffle with local pools and holding areas associated with boulders and/or logs. Riparian vegetation is healthy, channel is slightly less entrenched downstream of the culvert with a high floodplain bench on the left bank downstream of the culvert. Substrate is mostly gravel with occasional large boulders and some cobble present.

Correction Options and Preferred Alternative

Options to Consider – Provide up to Three Site-Appropriate Correction Alternatives.

Option 1: Precast bridge (36' span, shallow abutments)

Option 2: Girder bridge (45' span, deep abutments and footings)

Option 3: High Radius Arch Structure Plate Culvert (20'-8" span, deep footings)

Preferred Alternative - Provide a 1- or 2-paragraph Recommendation for this Site. Include any Site-Specific Concerns that Will Need to be Addressed During Design and Construction:

The existing culvert at this site is clearly undersized and should be replaced due to the fact that it is both undersized and inappropriately placed (slope is much shallower than natural stream slope). Replacement with a structure which accommodates an appropriate stream simulation design channel is a suitable and affordable option to pursue.

Option 1 did not meet the requirements of Chelan County Public Works and so this option had to be abandoned.

Option 2 initial cost estimates were clearly way more than we had initially proposed so this option also had to be abandoned.

Option 3 was developed with a different engineer who meets the requirements of Public Works and has the ability to accommodate cost issues with standards. Project stakeholders have expressed concerns regarding the potential for debris flow events to occur at this site. Addressing these concerns in a cost-effective manner, while at the same time providing a design which accounts for the uncertainty associated with climate change then becomes the biggest challenge at this site. A traditional bridge would address these concerns, but is not cost-effective. The current design (Option 3) attempts to address these concerns in a cost-effective manner through using a much more cost-effective structure which maximizes opening size, provides adequate footing depth (scour protection), and is resilient to climate change and/or channel evolution following construction.

Cost Estimates

Rough Cost Estimate* - Attach Detailed Cost Breakdown Using the Appropriate Cost Estimate Template, Provided Separately.

Option 1: \$ 203,051

Option 2: \$1,441,295

Option 3: \$ 552,284

*This is a rough approximation of project costs; actual costs may vary depending on specifications identified during final project design.

Correction Analysis Form Instructions

Site Information

Project Name – This is the landowner's last name followed by the creek name. If more than one site per landowner is evaluated on the same creek, designate each site with a letter, e.g. Franklin – Boulder Creek A.

PRISM Project Number – This will be provided by PRISM database.

Bankfull Width – The stream width measured perpendicular to flow at the stage at which water begins to overflow into the active flood plain. Bankfull width requires a floodplain or a bench not present in many channels. In those cases, use ordinary high water. Ordinary high water is where the regular stream flow makes a line on the bank marking soil or vegetation with a character distinct from that of the abutting upland. Also defined as the lowest point at which perennial vegetation grows on the stream bank. Enter the average of several bankfull width measurements taken up and/or downstream of the culvert, outside the influence of the culvert.

Utilities Crossing – Include any water, gas, phone or electrical utilities at the crossing to be affected by project construction.

Road Fill at Downstream End – Measure height of material from top of culvert to top of fill at downstream end.

Road Width – Measurement should include shoulders.

Road Description/Condition – Provide a brief description of the road surface, use, condition, etc.

Evaluator Information

Provide contact information for the people completing the Correction Analysis Form.

Upstream Habitat and Channel Description

Channel Slope – This is measured outside of the culvert influence.

Re-grade Potential – Subtract the downstream streambed elevation from the upstream streambed elevation at the site.

Dominant Substrate – Identify the size category most prominent in the substrate.

Additional Information – Provide any additional upstream information that may be important to the project.

Downstream Habitat and Channel Description

Channel Slope – This is measured outside of the culvert influence.

Additional Information – Provide any additional upstream information that may be important to the project.

Correction Options and Preferred Alternative

Options to Consider – The purpose of this section is to provide the sponsor some guidance on the intended fix. Most small forest landowner projects should be relatively straightforward; however each site is different.

Preferred Alternative – Describe the recommended correction and site-specific concerns to be addressed during design and construction.

Cost Estimates

Rough cost estimate – Provide estimated costs for correction options listed above. Costs should be based on cost estimate templates, provided separately, for culverts, bottomless arch culverts, and bridges. Attach the corresponding completed template for each estimate. These represent approximate costs; actual costs may vary depending on specifications identified during final project design.



Fish Passage and Diversion Screening Inventory Database Report Cover Sheet

The Washington Department of Fish and Wildlife (WDFW) makes every attempt to keep these reports in sync with the fish passage data presented on the web map; however, the dynamic nature of the data and workflows associated with maintaining the Fish Passage database may result in short-term differences.

Users are encouraged to contact WDFW to discuss appropriate use of the data and how we can assist with fish passage barrier removal or inventory. Please visit the Fish Passage web site for contact information at: http://dfw.wa.gov/conservation/habitat/fish_passage/.

Disclaimer:

- WDFW makes no guarantee concerning the data's content, accuracy, completeness, or the results obtained from use of the data.
- These data are not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife.
- WDFW makes no warranty of fitness for a particular purpose, no representation as to the quality of any data, and assumes no liability for the data represented here.
- The fish and wildlife data may not represent exhaustive inventories, but are compilations of observations from field biologists that are updated periodically as knowledge improves.
- It is important to note that fish passage features, habitats, or species may occur on the ground in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted.
- All data presented here represent a snapshot observation of conditions in a dynamic environment that are subject to change.
- Unauthorized attempts to alter or modify the contents of these reports are strictly prohibited.

Other Notes Regarding Fish Passage Data:

- The Fish Passage and Diversion Screening Inventory (FPDSI) database often uses default values such as '-99.99' or -999 to represent null values.
- EXIF data presented with Image Reports may be erroneous due to camera battery failures and resetting of camera clock functions.
- When conducting projects or planning for fish and wildlife, please consider using additional information gathered from field investigations and consultations with WDFW or other professional biologists.
- Erroneous data may be reported directly to Fish Passage staff through the use of the Washington State Fish Passage web application at: <http://apps.wdfw.wa.gov/fishpassage/>.

WDFW Fish Passage and Diversion Screening Inventory Database

Site Description Report

Site ID

Project

Geographic Coordinates

Latitude (WGS 84):	<input type="text" value="47.51181"/>
Longitude (WGS 84):	<input type="text" value="-120.63328"/>
East (HARN 83):	<input type="text" value="1,607,476.0"/>
North (HARN 83):	<input type="text" value="794,492.5"/>

General Location

Road Name:	<input type="text" value="Nfd 7300"/>
Mile Post:	<input type="text" value="-999.99"/>
County:	<input type="text" value="Chelan"/>
WDFW Region:	<input type="text" value="2"/>

Waterbody

Stream:	<input type="text" value="Mill Cr"/>
Tributary To:	<input type="text" value="Peshastin Cr"/>
WRIA:	<input type="text" value="45"/>
River Mile:	<input type="text" value="-999.99"/>
Fish Use Potential:	<input type="text" value="Yes"/>
FUP Criteria:	<input type="text" value="Physical"/>

Owner

Type:	<input type="text" value="Private"/>
Name:	<input type="text"/>

PI Species

<input type="checkbox"/> Sockeye	<input type="checkbox"/> Chinook	<input type="checkbox"/> Sea Run Cutthroat
<input type="checkbox"/> Pink	<input type="checkbox"/> Coho	<input type="checkbox"/> Resident Trout
<input type="checkbox"/> Chum	<input type="checkbox"/> Steelhead	<input type="checkbox"/> Bull Trout

Associated Features

<input type="checkbox"/> Culvert	<input type="checkbox"/> Dam	<input type="checkbox"/> Natural Barrier	<input type="checkbox"/> Diversion
<input type="checkbox"/> Non-Culvert Xing	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Fishway	

Location/Directions

Site Comments

Print Date: 5/14/2018

These data represent a snapshot of the Washington Department of Fish and Wildlife's current records. Due to the ongoing nature of assessment and inventory of these features, these data may not accurately represent conditions on the ground, and are subject to change.

WDFW Fish Passage and Diversion Screening Inventory Database

Other Feature Assessment Report

Site ID:	602260		
Latitude:	47.51181	Stream:	Mill Cr
Longitude:	-120.63328	Trib To:	Peshastin Cr
		WRIA:	45
		Fish Use Potential:	Yes

Data Source

Organization	WDFW		
Field Crew:	Layman;Phinney	Review Date:	5/1/2018

Details

Structure Category:	Streambed Control	Fishway Present:	No
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Description:

6 steambed controls D/S of site #950183.

Results

Barrier:	Yes
Reason:	WS Drop
Passability (%):	33
Recheck:	



Comment

Largest WSD is 0.54m.

Potential Habitat Gain

Survey Type:		Spawning (sq m):		Length (m):	
Significant Reach:	Unknown	Rearing (sq m):		PI Total:	

WDFW Fish Passage and Diversion Screening Inventory Database

Image Report - Active

Site ID: 602260

Latitude: 47.51181

Longitude: -120.63328

Stream: Mill Cr

Tributary To: Peshastin Cr

WRIA: 45

Fish Use Potential: Yes

Associated Features

☐ Culvert

☐ Dam

☐ Natural Barrier

☐ Diversion

☐ Non-Culvert Xing

☒ Other

☐ Fishway



Image Name: 602260_1.JPG, Date/Time: 05/01/2018 16:40



Image Name: 602260_2.JPG, Date/Time: 05/01/2018 16:41

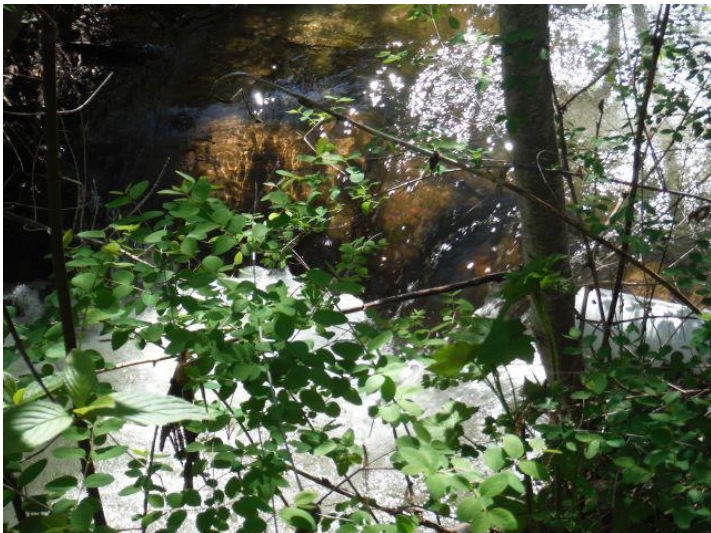


Image Name: 602260_3.JPG, Date/Time: 05/01/2018 16:41

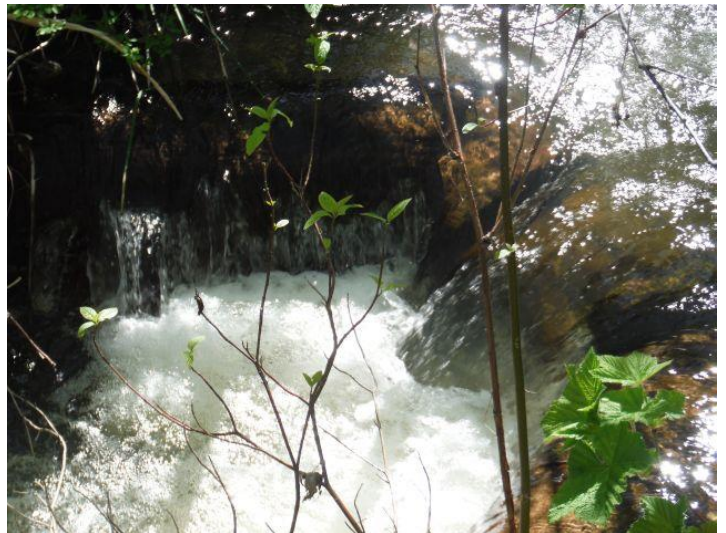


Image Name: 602260_4.JPG, Date/Time: 05/01/2018 16:42

Print Date: 5/14/2018

These data represent a snapshot of the Washington Department of Fish and Wildlife's current records. Due to the ongoing nature of assessment and inventory of these features, these data may not accurately represent conditions on the ground, and are subject to change.

WDFW Fish Passage and Diversion Screening Inventory Database

Image Report - Active

Site ID: **602260**

Latitude: **47.51181**

Longitude: **-120.63328**

Stream: **Mill Cr**

Tributary To: **Peshastin Cr**

WRIA: **45**

Fish Use Potential: **Yes**

Associated Features

☐ Culvert

☐ Dam

☐ Natural Barrier

☐ Diversion

☐ Non-Culvert Xing

☒ Other

☐ Fishway



Image Name: 602260_5.JPG, Date/Time: 05/01/2018 16:42



Image Name: 602260_6.JPG, Date/Time: 05/01/2018 16:44

Print Date: 5/14/2018

These data represent a snapshot of the Washington Department of Fish and Wildlife's current records. Due to the ongoing nature of assessment and inventory of these features, these data may not accurately represent conditions on the ground, and are subject to change.