Design Report

Trestle Creek Restoration Project

North Branch Trestle Creek – Existing Conditions

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Contents

1 Introduction

1.1 Background

Valiant Idaho II, LLC (Valiant), in consultation with the Idaho Club, retained River Design Group, Inc. (RDG) to develop a restoration plan for improving aquatic habitat and fish passage conditions on the North Branch Trestle Creek (NBTC) near Sandpoint, Idaho (Figure 1-1). NBTC supports tributary spawning habitat for *kokanee Oncorhynchus nerka* (kokanee). Similar to other streams in the Intermountain West, Trestle Creek has experienced a long period of land management that has disrupted channel processes and native fish populations. It is believed that the NBTC was artificially constructed as an irrigation canal in the 1900s. Presently, residential development, clearing of instream wood, and fish passage barriers associated with the outlet to Lake Pend Oreille, US Highway 200 and Montana Rail Link have degraded stream corridor habitat conditions and impeded the passage of kokanee and other fish species including bull trout, into NBTC from Lake Pend Oreille (Figure 1-2).

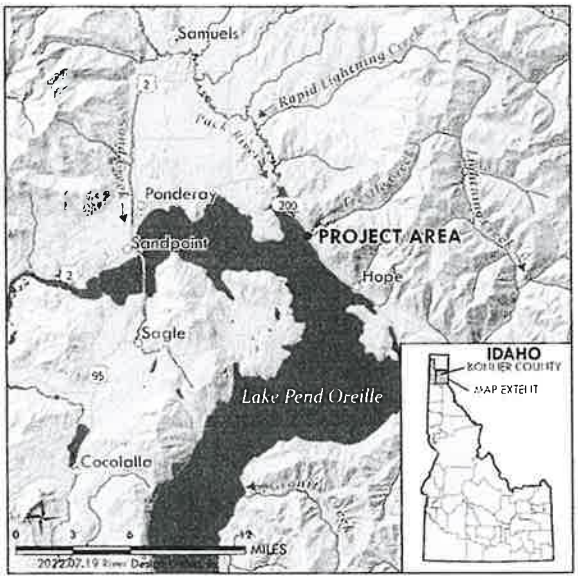

Figure 1-1. Project vicinity map.

The riparian vegetation community along NBTC within the project area is simplified due to the entrenched nature of the channel, lack of floodplain connectivity, and adjacent land uses. Channel conditions are also less complex due to these modifications. Human-caused changes and the channel's response to those alterations have resulted in decreased channel-floodplain connectivity, a shorter, steeper channel, and more homogenous riffle habitat. The proposed restoration design will reactivate the historical confluence of NBTC and Trestle Creek, re-establish fish passage connectivity during all flow stages, create a functioning, well vegetated floodplain, and enhance stream corridor habitat conditions.

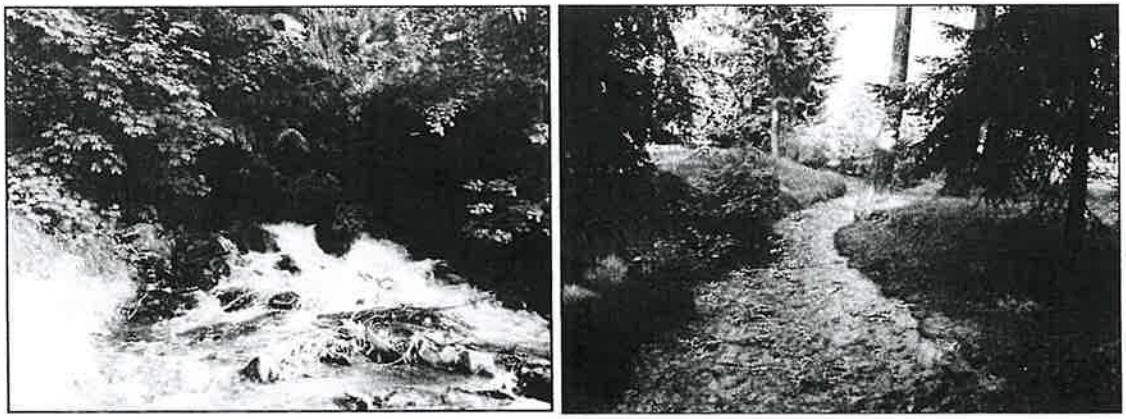

Figure 1-2. The existing outfall of NBTC into Lake Pend Oreille creates a temporary fish passage barrier during low flow periods (left photo). Contemporary land uses and the channelized nature of NBTC has resulted in altered riparian vegetation communities and simplified aquatic habitat.

1.2 Project Goals and Objectives

Restoration goals and objectives were based on active involvement of the landowners, state and federal agency personnel, and Valiant. Valiant conducted meetings with the project stakeholders and provided specific objectives to RDG as part of the assessment and design process. There was general agreement that the project should address existing channel-floodplain connectivity, floodplain and in-stream habitat conditions, and fish passage. Based on input from the various stakeholders, the following project goal and objectives were established:

- **Project Goal**: Improve fish passage and aquatic habitat conditions in NBTC for kokanee and other affected fish species.
- **Objective 1**: Reactivate the historical confluence of NBTC and Trestle Creek for the purpose of providing fish passage during all flow stages.
- **Objective 2**: Modify the existing channel profile to increase pool frequency, diversify aquatic habitat, and reduce stream energy.
- **Objective 3**: Excavate high banks adjacent to the channel to improve channel-floodplain connectivity and facilitate establishment of an emergent wetland community type.
- **Objective 4**: Incorporate existing mature trees and vegetation into the design to provide shade and stability to the restored NBTC channel.

2 Methods

The following section outlines RDG's methods for evaluating the existing river corridor conditions and preparing the design plan. A site vicinity map is included in Figure 1-2.

2.1 Field Survey

RDG completed a site review and data collection effort in June 2022 to characterize existing channel and fish habitat/passage conditions. Data collection included a channel survey completed with a Trimble RTK GPS. Channel data, including detailed longitudinal profiles and cross-sections, were collected following USFS procedures (Harrelson, et al. 1994). Discharge measurements were completed following standard U.S. Geological Survey protocols (Buchanan and Somers 1976). Pebble counts were collected to characterize the channel bed sediment (Wolman 1954).

2.2 Channel Hydraulics

HEC-RAS v.3.1.3 (USACE, 2006) was utilized to evaluate the existing and proposed channel hydraulic conditions in 2007. A one dimensional gradually varied steady-state hydraulic model of the channel was developed for the existing conditions and proposed design to validate the hydraulic performance.

3 Existing Conditions

The following sections provide background information on the NBTC project area. NBTC was constructed as an artificial channel/diversion canal in the early to middle 1900s (personal communication, Chris Downs, Idaho Department of Fish & Game, 2006). The NBTC channel diverges from mainstem Trestle Creek approximately 1.0 mile upstream of the project area (Figure 3-1). There is no control structure at the inlet. NBTC experiences fluctuating flow levels commensurate with the Trestle Creek hydrograph. The channel typically experiences peak discharge during the spring in response to rain-on-snow and rain-on-snowmelt dominated storms. NBTC within the project area typically dewaters during late summer and early fall resulting in the loss of habitat connectivity with Lake Pend Oreille. Loss of migratory habitat for kokanee and other fish species is a concern of fish managers in the Lake Pend Oreille watershed.

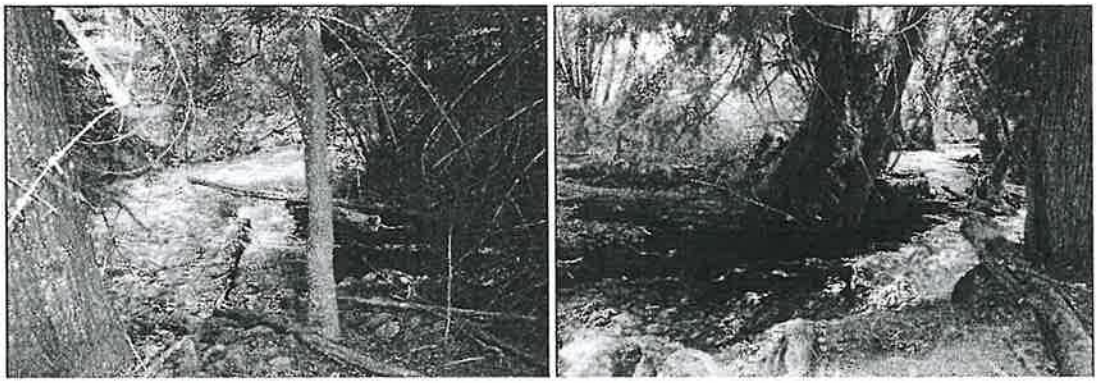

Figure 3-1. NBTC splits from the main stem Trestle Creek approximately 1.0 mile upstream of the project area. The channel is characterized as a riffle dominated, moderately entrenched B4 stream type.

3.1 Channel Morphology and Fish Habitat Conditions

Within the project area, NBTC transitions from an entrenched, confined system with small step pools downstream of the Montana Rail Link crossing to a moderately entrenched, riffle dominated channel in the downstream reach near the confluence with Lake Pend Oreille. As previously described, NBTC was artificially constructed in the early to middle 1900s and maintains a relatively straight pattern with homogenous habitat characteristics.

A Level 2 channel classification was performed to classify the existing channel morphology (Rosgen, 1996). Table 3-1 summarizes the existing channel dimensions. As noted, two dominant channel types were observed due to the variation in the width of the floodprone area.

Table 3-1. Summary of dominant channel types and metrics within the project area.

Dominant Channel Type	W/D Ratio	Entrenchment Ratio	Sinuosity	Slope (ft/ft)	D50 (mm)
F4	13.5	1.15	1.1	0.0177	64
B4	13.6	>1.4	1.1	0.0177	64

Figure 3-2 (at right) depicts the typical channel conditions of the upper reach of the project area. NBTC is characteristic of an entrenched channel type in the upper reach of the project area. The restoration plan does not address this reach as it contains valuable riparian trees, shrubs, and small energy-dissipating step pools throughout, indicative of a typical B channel.

3.2 Channel Hydraulics

Existing and proposed channel and floodplain hydraulics were evaluated in 2007 by modeling several riffle cross-sections in the project area. WinXSPRO v.3.0 and HEC-RAS v.3.1.3 were used to analyze stream cross-section data for geometric and hydraulic parameters. Modeled cross-sections were generally uniform in shape and located on riffle habitat units. Data is summarized in Table 3-2. Channel cross-section area ranged from 6.7 ft^2 to 8.1 ft^2 with an average value of 7.3ft^2. Average bankfull channel velocity ranged from 3.7 feet per second (fps) to 5.0 fps. Bankfull channel width averaged 9.2 feet. Hydraulic modeling indicates a bankfull discharge ranging from 25.4 cubic feet per second (cfs) to 34.5 cfs with an average value of 31.4. This value was used to develop the bankfull channel design dimensions presented in Section 4.0.

Table 3-2. Existing bankfull channel hydraulics characteristics and cross-section dimensions for select cross-sections in the project area.

Parameter	XS 1 Riffle	XS 2 Riffle	XS 3 Riffle	XS 5 Riffle	Average
Area	6.8	7.9	6.7	8.1	7.3
Wetted Perimeter	10.3	10.6	7.7	11.1	9.9
Bankfull Width	10.0	10.0	6.3	10.5	9.2
Hydraulic Radius	0.70	0.75	0.87	0.73	0.75
Mean Depth	0.68	0.79	1.06	0.77	0.83
Slope	0.02	0.02	0.02	0.02	0.02
Manning's Roughness	0.04	0.04	0.04	0.04	0.04
Average Velocity (ft/s)	3.74	4.07	5.02	4.29	4.28
Computed Discharge (cfs)	25.4	32.2	33.4	34.5	31.4

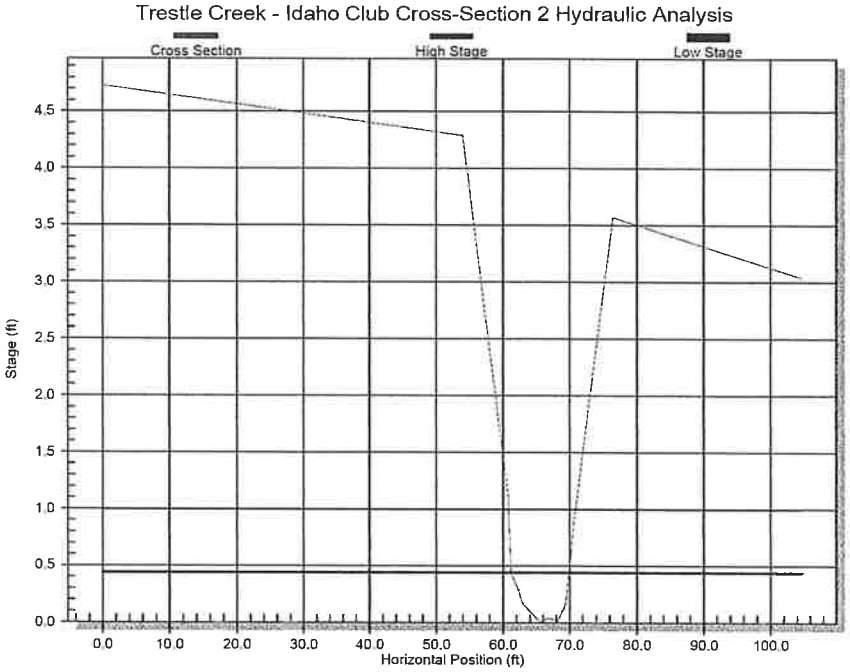

Figure 3-5. Cross-section 2 in the NBTC project area. The channel is confined on both sides by high terraces approximately 3.0 feet to 4.0 feet above the estimated bankfull stage of the creek.

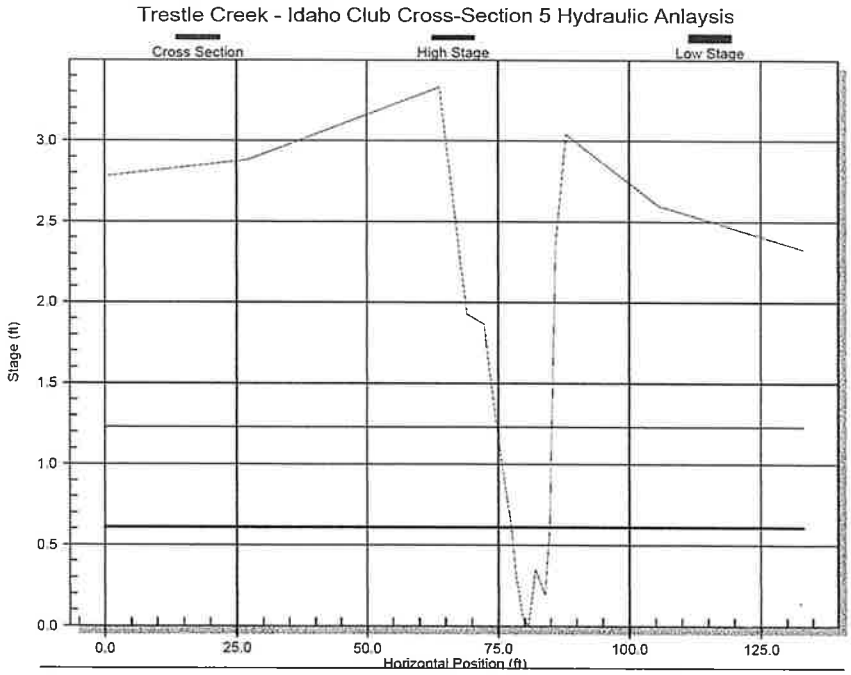

Figure 3-6. Cross-section 3 in the NBTC project area. The channel is dominated by riffle habitat and is disconnected from its floodplain due to the channelized nature of the cross-section.

3.3 Peak Discharge Analysis

HY8 (FHWA 2007) was used to evaluate hydraulics of the upstream MRL culvert system. The culverts were modeled assuming maximum headwater conditions as measured from the top of the MRL railroad grade to the invert elevation of the culverts. Due to the regulated nature of streamflow in NBTC, this method was determined to be the most conservative and appropriate for determining the maximum flow rate in the project area. Under maximum headwater conditions, the maximum predicted discharge of the culvert system was 204 cfs. This flow rate was used to evaluate hydraulic performance of the channel and floodplain for the proposed restoration condition.

Table 3-3. Summary table of modeled discharge assuming maximum headwater conditions at the inlet of the MRL culverts. A total discharge of 204 cfs was computed.

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Culvert 3 Discharge (cfs)	Iterations
999.16	30.00	1.41	14.12	14.48	4
999.67	48.00	5.14	21.24	21.62	4
1000.11	66.00	10.14	27.74	28.12	3
1000.55	84.00	15.98	33.84	34.19	3
1001.01	102.00	22.49	39.61	39.92	3
1001.49	120.00	29.48	45.12	45.40	4
1002.03	138.00	36.67	50.54	50.79	4
1002.63	156.00	43.84	55.97	56.19	4
1003.31	174.00	50.85	61.48	61.67	4
1004.09	192.00	57.70	67.07	67.24	3
1004.66	**204.00**	**62.13**	**70.78**	**70.95**	**19**

3.4 Fish Passage Barriers

Two fish passage barriers were identified in the project area. These include the existing outfall to Lake Pend Oreille and the existing MRL culverts located at the upstream end of the project area. Both features likely serve as temporary fish passage barriers during certain flow regimes. During full pool conditions on Lake Pend Oreille, fish are able to pass through the existing culvert outlet and into NBTC. However, as the lake approaches low pool, the armored and perched nature of the culvert prevents fish access into NBTC. Similarly, as flows recede in NBTC, the existing MRL culvert system likely serves as a migration barrier to fish utilizing NBTC to access upstream reaches of Trestle Creek (flow depth barrier).

The lower fish barrier is addressed in the restoration plan. The existing outfall to Lake Pend Oreille will be abandoned and a new stream channel will be constructed to provide for the unobstructed passage of fish from Trestle Creek into NBTC. The existing MRL culverts will not be modified.

4 Restoration Plan

Natural stream systems are formed and maintained by a number of natural and anthropogenic influences. They maintain typical shapes and patterns that correspond to their geomorphic setting and physical inputs. Natural channels balance their physical dimensions in response to changes in stream flow, sediment inputs, and other disturbances (Leopold et al. 1964). In general, as the valley becomes flatter, the stream becomes more sinuous. For any geomorphic setting, streams exist in a "most probable state" that defines general shape, pattern, and stability characteristics (Leopold et al. 1964). The most probable state includes ranges of values for most hydraulic geometry variables that are most likely to occur in natural settings.

For NBTC, the most probable channel form is a moderately entrenched, riffle-pool, single-threaded channel characterized by gravel and cobble substrate and developed within a relatively narrow, vegetated floodplain corridor. Attachment A contains the construction plan set prepared under the responsible charge of a civil engineer licensed to practice in the State of Idaho. The plan set contains all pertinent information related to the engineering and implementation of the project. The following sections describe the restoration plan components.

4.1 Meander Geometry, Alignment, and Pattern

The following section describes treatments specific to three sub-reaches of the project area. Sub-reaches were delineated based on the proposed restoration treatments. Channel stationing is based on the alignment provided in Attachment A, Sheet 4.0. STA 2+73 represents the upper limit of the project area. STA 5+25 denotes the downstream extent of the project area immediately upstream of the confluence of NBTC and Trestle Creek (see Attachment A, Sheet PP-1). All construction will occur above elevation 2062.5', which is the vertical restraint defined by the artificial high water mark. NBTC will function naturally for the remaining 25 feet of the existing ground prior to the confluence with the main stem of Trestle Creek.

4.1.1 Reach 1 - STA 2+73 to STA 3+39 (New Channel Construction)

New channel construction is proposed from STA 2+73 to STA 3+39 (see Sheet 4.0, Attachment A). In this section, a moderately entrenched, riffle system with small boulder clusters with pocket pools will be constructed, emulating improved upstream channel conditions of NBTC. Vegetated Wood Matrix bank structures will line each bank to define and stabilize the new bankline. Design channel dimensions are summarized in Table 4-2.

Table 4-2. Proposed bankfull riffle channel dimensions for NBTC from STA 2+73 to STA 3+39.

Bankfull Dimension	Average Value (Range)
Width	11 (11.4-12.4)
Mean Depth	1.0
Maximum Depth	1.4 (1.3-1.5)
Width to Depth Ratio	10 (11-12)
Ave Cross Section Area	11.8
Mean Channel Velocity	3.5

4.1.2 Reach 2 – STA 3+39 to STA 4+42 (New Channel Step Pool Construction)

From STA 3+39 to STA 4+42, the channel and floodplain will be slightly inset into the existing ground surface and a series of eight step-pools will be constructed to daylight the proposed channel bed to the lower existing channel bed elevation of NBTC upstream of the confluence of Trestle Creek (see Attachment A, Sheet 6.0). Each sequence will incorporate a two-stage rock weir that provides fish passage during base flow stage and peak discharge. Maximum head loss over each rock step will be no more than 0.7 feet during base flow. Weir rocks will not be gapped to maximize fish passage and sediment transport. Table 4-3 summarizes the step-pool system dimensions.

Table 4-3. Proposed step-pool structure dimensions.

Step-Pool Dimensions	Average Value
Pool Spacing	13.0
Step Height	0.7
Pool Width	13.5
High Flow Weir Width	10.0-12.0
Low Flow Weir Width	4.0

4.1.3 Reach 3 – Sta 4+42 to STA 5+00 (New Channel Construction)

New channel construction is proposed from STA 4+42 to STA 5+00 (see Sheet 4.0, Attachment A). Downstream of the step-pool system, the existing NBTC is over-widened relative to the channel design dimensions. In this sub-reach, a new moderately entrenched, riffle system with small boulder clusters with pocket pools will be constructed, emulating improved upstream channel conditions of NBTC. Channel bed and bank construction will terminate at elevation 2062.5' (~station 5+00), which is designated at the artificial high water mark. Vegetated Wood Matrix bank structures will line each bank to define and stabilize the new bankline. Design channel dimensions are summarized in Table 4-4.

Table 4-4. Proposed bankfull riffle channel dimensions for NBTC from STA 4+42 to STA 5+25.

Bankfull Dimension	Average Value (Range)
Width	11 (11.4-12.4)
Mean Depth	1.0
Maximum Depth	1.4 (1.3-1.5)
Width to Depth Ratio	10 (11-12)
Ave Cross Section Area	11.8
Mean Channel Velocity	3.5

Figure 4-2. The historical outlet of NBTC and the confluence with the main stem Trestle Creek (background of photo). The design channel alignment will blend to the existing streambanks. All existing vegetation will be maintained and preserved.

Excavated material will be used to fill the existing NBTC channel, as noted in Attachment A, Sheet 4.1. Approximately 300 cubic yards of fill material will be excavated and placed in the abandoned NBTC channel. The existing culvert outfall to Lake Pend Oreille will be decommissioned and removed. Fill material will be graded to design elevations and revegetated with a floodplain seed mix as noted on Attachment A, sheet 3.1. Vegetated wood matrix bank structures will be installed along the proposed riffle adjacent to the fill area. The fill will be compacted and the surface will be roughened. Any excess wood from construction is placed onto the new floodplain to add roughness and help disperse overland flow.

4.2 Channel and Fish Habitat Structures

A variety of native material structures have been incorporated in the project design to improve channel-floodplain connectivity, fish habitat diversity, and riparian vegetation recovery. Proposed structure types and construction specifications are denoted in Sheet 6.0 to Sheet 6.2, Attachment A. Table 4-5 lists the proposed structures and their specific objectives.

Table 4-5. Proposed channel and fish habitat structures.

Structure Type	Resource Objectives
Vegetated Wood Matrix	- Stream bank stability - Fish habitat and cover - Riparian habitat improvement
Constructed Channel Streambed	- Vertical grade control through riffles - Fish habitat and migration
Boulder Step Pool System	- Vertical grade control through slope transition - Fish habitat and migration
Fill Plug	- Stabilize the existing channel and divert flow into new channel at ~STA 2+90. - Provide floodplain for overbank flows
Revegetation - Shrub Salvage and Transplant - Broadcast seed	- Floodplain stability - Sediment filtration - Erosion control - Terrestrial Habitat

The following sections provide narrative descriptions of the proposed treatments.

4.2.1 Vegetated Wood Matrix

Vegetated wood matrices are a bioengineering technique that combines layers of dormant willow cuttings with small wood, brush, and alluvium to revegetate and stabilize stream banks and slopes. Vegetated wood matrix are proposed in Reach 1 and Reach 3 along all new channel construction. To construct a vegetated wood matrix, a coarse cobble toe is first established. A layer of small wood (2"- 4") is then placed in an angled pattern along the prepared bench projecting 2 feet into the streambed to establish an exposed wood toe. A small amount of alluvium is placed onto the wood toe to anchor it into place. Alternating layers of alluvium and brush are then placed onto the small wood at a slope of 1:1 until reaching the top of bank elevation as shown on Sheet 6.2, Attachment A. Leaving a back trench during the layering process will allow dormant willow cuttings to be placed along the backslope at a 1:1 slope projecting 3-4 feet over the stream channel. If available, a two to three-inch layer of topsoil can be placed between each lift to reduce air pockets and provide a rooting medium for the willow cuttings. The layered alluvium and brush hold the soil in place while vegetation becomes established in the relatively high-stress land/water interface. Vegetated wood matrices will provide near-bank protection until planted vegetation becomes established.

4.2.2 Constructed Channel Streambed

Constructed Channel Streambed structures will be used to stabilize the channel bed elevation and provide aquatic habitat. The channel streambed will be constructed to design elevation with the specified streambed fill gradation. Small boulders (10"–12") will be installed throughout the channel streambed with a maximum protrusion of 0.5 feet to provide energy dissipation and fish habitat. The boulders will be placed at the direction of the construction manager to create clusters and pocket pools. The majority of the small boulders will be placed within the low-flow channel to help define the shape and maintain low-flow passage and habitat.

4.2.3 Boulder Step Pool

Boulder Step Pool structures will be used to stabilize the channel bed elevation as it transitions from the upper surfaces down to the historical floodplain tie-in with Trestle Creek. Large boulders (24"- 30") will be placed as shown in attachment A, Sheet 6.0 to construct the step-pool weir and side flanks. A non-woven geotextile fabric will be placed against the upstream face of the step to collect fine material, seal the boulders and avoid piping of water below the throat elevation. The boulder frame and fabric will be backfilled with the specified streambed fill graduation. A bankfull bench will be constructed along the edge of the step-pool reach using sod mats and native transplants.

4.2.4 Fill Plug

A fill plug will be necessary for routing the stream flow into the reconstructed channel segment from STA 2+90 to STA 3+15. The fill plug will be constructed with native alluvium excavated from new channel construction. Excavated materials will be transported to the fill plug locations and compacted with heavy equipment. Topsoil stockpiled during the channel excavation will cap the alluvium. Vegetation transplants and floodplain seeding will be incorporated into the fill plug surface to accelerate site revegetation. A vegetated wood matrix will be constructed along the right bank of the new channel/plug fill interface to stabilize the material.

4.2.5 Revegetation

Revegetation practices include broadcast seeding disturbed areas and transplanting sod and shrubs. Transplanted materials will include willows, grass sod, and shrubs that are in the project area. Transplanted material will either be stockpiled for later planting or planted immediately. Planted areas will be irrigated to increase plant survival. Broadcast seeding will be completed at the culmination of the channel construction. Other plantings will be completed during the dormant season in either the fall after construction or the following spring.

5 Construction Implementation Plan

The project area was divided into three reaches for the implementation plan. Work will commence in Reach 1 at the upstream section of the project area (Station 2+73) and proceed downstream. The construction implementation plan is based on the entire restoration plan being implemented in one phase. Due to the intermittent nature of NBTC, it is plausible that all construction may occur during dry channel conditions. In the event of flowing water, the following dewatering and phasing plan will be implemented. All efforts will be made to minimize turbidity during construction.

5.1 Task 1: Channel Stakeout and Final Design Modifications

The design alignment will be reviewed with the contractor in the field. The design alignment may be slightly modified to field fit the alignment to beneficial features (e.g., vegetated areas, large trees). This task will be completed by RDG's construction manager prior to construction.

5.2 Task 2: Gather, Sort, and Distribute materials in Project Area

All project materials will be delivered to the project area and distributed to the appropriate sites based on anticipated material quantities outlined in Attachment A, Sheet 3.1. Stockpile locations will be located to minimize stream crossings and existing roads and travel ways will be used. Additional ingress and egress routes will be located away from live water. This task will be completed approximately one week prior to actual construction.

5.3 Task 3: Implement Treatments in Reach 1

If streamflow is present during construction, the flow with remain in the existing channel. The complete project will be constructed in the dry leaving a plug upstream (~Sta 2+73) and downstream (~Sta 5+00) to avoid flow entering the work area. If the contractor encounters groundwater during excavation, the flow will be pumped and discharged back to NBTC adjacent to Reach 1 (vicinity of the existing culvert). Following the dewatering, the design channel will be over-excavated down to subgrade and all excavated material will be staged along the edge of the existing channel to be filled after the activation of the new channel. Proposed channel and fish habitat structures will be constructed per the specifications and details presented in Attachment A.

Estimated Construction Time: 3 Days

5.4 Task 4: Implement Treatments in Reach 2

Reach 2 will be constructed in the dry as all streamflow will be maintained in the current channel and outfall to Lake Pend Oreille. The first task will be to remove the existing culvert and road prism crossing the proposed alignment at STA 4+75. Excavated fill material will be temporarily stockpiled adjacent to the existing NBTC channel and outfall to Lake Pend Oreille. Following the removal of the fill and culvert, the excavator will over-excavate the step-pool system to the appropriate channel dimensions. The Boulder step-pool structures will be constructed and set at the design elevations provided in Attachment A, Sheet 4.1. A geotextile fabric will be installed on the upstream face of each step to avoid gaps and other voids. The fabric will then be backfilled with native alluvium and coarse cobble. Sod will be placed to create the bankfull bench along each side of the step-pool system.

Estimated Construction Time: 5 Days

5.5 Task 5: Implement Treatments in Reach 3

The final task will be to shape and construct the new channel through Reach 3 of the project area. The design channel will be over-excavated down to subgrade and all excavated material will be hauled up to the fill area adjacent to the existing channel. Proposed channel and fish habitat structures will be constructed per the specifications and details presented in Attachment A.

Estimated Construction Time: 3 Days

5.6 Task 6: Activate Streamflow

Following the completion of all channel work, streamflow will be incrementally diverted into the new channel at STA 2+73. This will be accomplished incrementally to minimize turbidity. Following activation, the proposed plug and floodplain will be backfilled with the staged material. The complete proposed floodplain will be graded to design elevation within the work proposed area and then daylighted to match the existing elevations of the surrounding topography. Any excess fill material will be hauled and stockpiled outside of the project area.

5.7 Task 7: Implement Revegetation Plan

After all grading is complete any remaining transplants will be installed into the floodplain at the direction of the construction manager. All floodplain and disturbed areas will be reseeded with the prescribed seed mix shown in Attachment A, Sheet 3.1.

5.8 Recommended Construction Best Management Practices (BMPs)

All heavy equipment will be washed prior to mobilization to the site to minimize the introduction of noxious weeds to the project site. It will be the equipment contractors' responsibility to ensure that adequate measures have been taken. Equipment should be new or in a well-maintained condition to minimize the likelihood of a fluid leak. If a fluid leak does occur, the construction supervisor will be notified immediately, and all work ceased until the leak has been rectified. At all times during the construction phase, fluid spill containment equipment will be present on-site and ready for deployment should an accidental spill occur. It is understood that there will be short-term pulses of sediment produced during clear water diversion preparation and removal of clear water diversion materials. There may also

be periodic pulses during channel shaping and structure placement from sub-surface waters and or seepage through the work isolation structures. If necessary, any subsurface water that may collect in the excavation areas will be pumped away from live water. There will be short periods of time when minor pulses of turbid water may be discharged into the stream or waters that feed the stream.

Trash pumps and associated equipment (hoses, clamps, etc.) will be on-site and available for deployment as necessary to help reduce turbidity in the stream and/or nearby state waters. Pump deployment may be necessary to help dewater construction locations to aid in construction. It is understood that the water pumped will be turbid and all efforts will be made to discharge to upland sites.

6 Conclusion

The restoration plan focuses on improving the form and function of the NBTC downstream of the exiting footbridge to just upstream of the confluence with Trestle Creek. The river corridor continues to exhibit impairments related to historical land uses. The restoration plan includes increasing aquatic habitat diversity by restoring pools in the channel, re-establishing a vegetated floodplain surface, and re-establishing fish passage and fluvial connectivity.

For this project, channel stability represents a condition where several hydraulic variables are balanced to achieve a state of dynamic equilibrium that approximates stable conditions, satisfies traditional hydraulic design principles, and considers results from the best available regime equations. Vegetated wood matrixes and sod mats are prescribed to provide habitat as well as bank stabilization until the riparian vegetation matures. In addition to structural treatments, the design presents revegetation tactics that ensure post-project site conditions are suitable to support the establishment of a diverse, self-sustaining riparian vegetation community.

7 References

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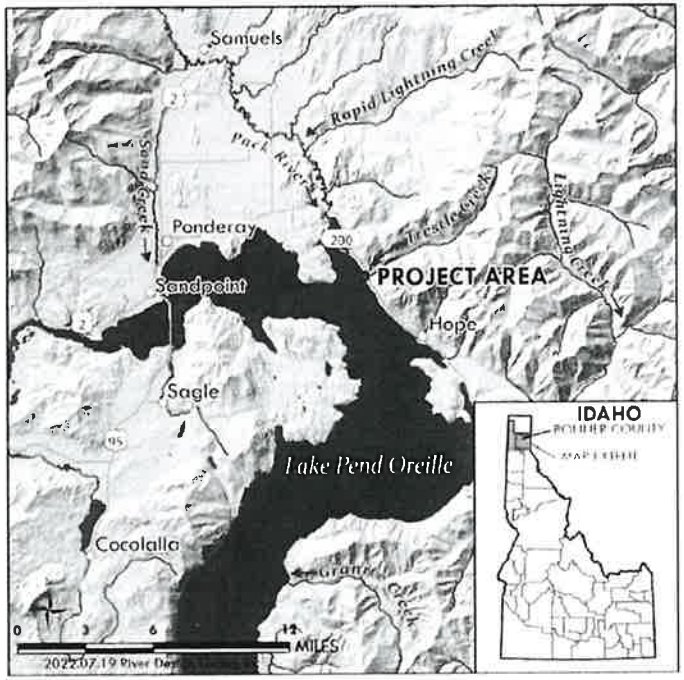
ATTACHMENT A

CONSTRUCTION PLAN SET

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
FINAL DESIGN PLAN SET

TRESTLE CREEK VICINITY MAP



DRAWING INDEX

PROJECT PARTNERS

THE IDAHO CLUB

Vallant Idaho II, LLC
The Idaho Club
151 Clubhouse Way
Sandpoint, ID 83864

PROJECT DESCRIPTION

THE NORTH BRANCH OF TRESTLE CREEK (NBTC) WAS ARTIFICIALLY CONSTRUCTED AS AN IRRIGATION CANAL IN THE EARLY 1900S. PRESENTLY, RESIDENTIAL DEVELOPMENT, CLEARING OF INSTREAM WOOD, AND FISH PASSAGE BARRIERS ASSOCIATED WITH THE OUTFALL TO LAKE PEND OREILLE, US HIGHWAY 200 AND THE MONTANA RAIL LINK TRACKS HAVE DEGRADED STREAM CORRIDOR HABITAT CONDITIONS AND IMPEDED THE PASSAGE OF *KOKANEE ONCORHYNCHUS NERKA* (KOKANEE), *SALVELINUS CONFLUENTUS* (BULL TROUT), AND OTHER FISH SPECIES INTO NBTC FROM LAKE PEND OREILLE.

IN EARLY 2022, THE LAKE PEND OREILLE IDAHO CLUB EXPRESSED INTEREST IN IMPROVING FISH PASSAGE AND RE-NATURALIZING A PORTION OF THE NORTH BRANCH TRESTLE CREEK (NBTC) FOR THE BENEFIT OF KOKANEE, BULL TROUT AND OTHER FISH SPECIES. RIVER DESIGN GROUP WAS RETAINED TO PRODUCE A FINAL DESIGN FOR THIS PROJECT AREA USING THE MOST RECENT DESIGN STANDARDS. THE PRIMARY GOAL OF THIS PROJECT IS TO ENHANCE THE AESTHETICS OF THE EXISTING NBTC CHANNEL BY CONSTRUCTING A NATURALLY FUNCTIONING CHANNEL AND FLOODPLAIN CONFIGURATION THROUGH THE PROPOSED IDAHO CLUB PROPERTY.

IDAHO DEPARTMENT OF LANDS
MAY 13 2024
PEND OREILLE LAKE AREA

STANDARD OF PRACTICE

RIVER DESIGN GROUP, INC. WORKS EXCLUSIVELY IN THE RIVER ENVIRONMENT AND UTILIZES THE MOST CURRENT AND ACCEPTED PRACTICES AVAILABLE FOR PLANNING AND DESIGN OF RIVER, FLOODPLAIN, AND AQUATIC HABITAT RESTORATION PROJECTS. CURRENT STANDARDS FOR THE DESIGN OF RESTORATION PROJECTS VARY DEPENDING ON PROJECT GOALS.

PROFESSIONAL ENGINEER
REGISTERED
18262
4/18/24
STATE OF IDAHO
NATHAN M. WYATT

REUSE OF DRAWINGS

RDG
RIVER DESIGN GROUP
311 SW Jefferson Avenue
Corvallis, OR 97333
541.758.2620
239 Vergennes Avenue
Middlebury, VT 05753
802.989.4927

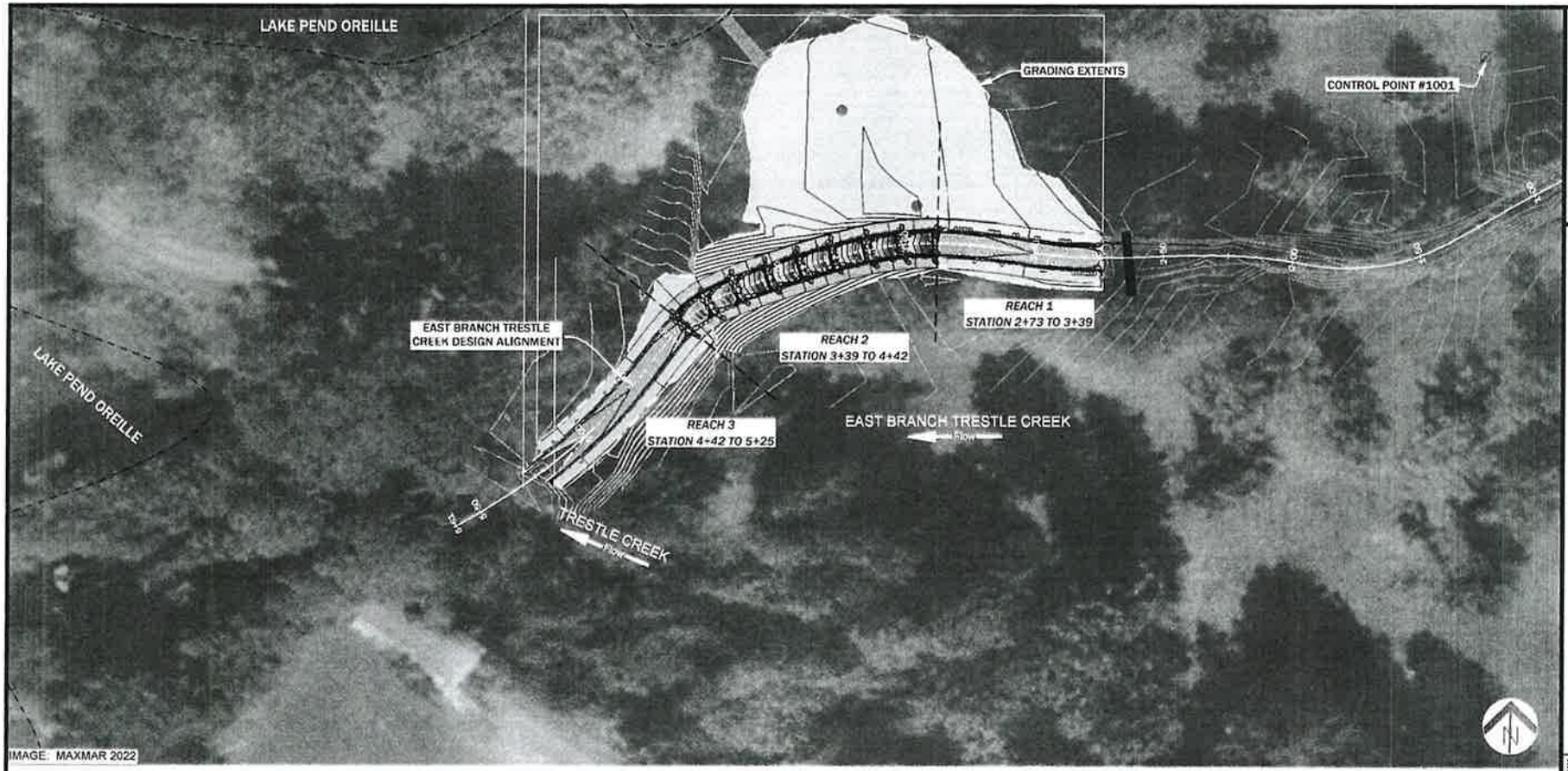
COVER PAGE AND NOTES

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW
2	08/01/23		ADD WETLAND SHEET	NW
3	10/12/23		ADD DEWATER SHEET	NW
4	02/29/24		DESIGN REVISION	
5	04/19/24		DESIGN REVISION	

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
1.0



1 **SITE PLAN**

1" = 40'

DETAIL LEGEND		
SYMBOL		DETAIL SHEET #
	RIPARIAN SEED AREA	
	SOD BANK TREATMENT	
	EXISTING TREE TO BE PRESERVED	
	BOULDER STEP POOL	6.0
	CONSTRUCTED CHANNEL STREAMBED	6.1
	VEGETATED WOOD MATRIX	6.2

IDAHO DEPARTMENT OF LANDS

MAY 13 2024

PEND OREILLE LAKE AREA

PROJECT DATUM

THE PROJECT COORDINATES ARE BASED ON THE FOLLOWING:

HORIZONTAL PROJECTION:	IDAHO STATE PLANE (WEST FOOT)
HORIZONTAL DATUM:	NAD83 (2011)
UNITS:	US SURVEY FEET
VERTICAL DATUM:	NAVD29 (GEOID 12B)

TOPOGRAPHY AND CROSS SECTION GROUND LINES ARE BASED ON SURVEY WORK PERFORMED BY RDG IN JULY 2022.

CONTROL POINTS

POINT NUMBER	EASTING	NORTHING	POINT ELEVATION	RAW DESCRIPTION
1001	2478328.5410'	2412772.5490'	2075.704'	5/8" REBAR WITH A 2" ALUMINUM CAP MARKED "RDG"

RDG

SITE PLAN

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT

NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER RDG-22-170

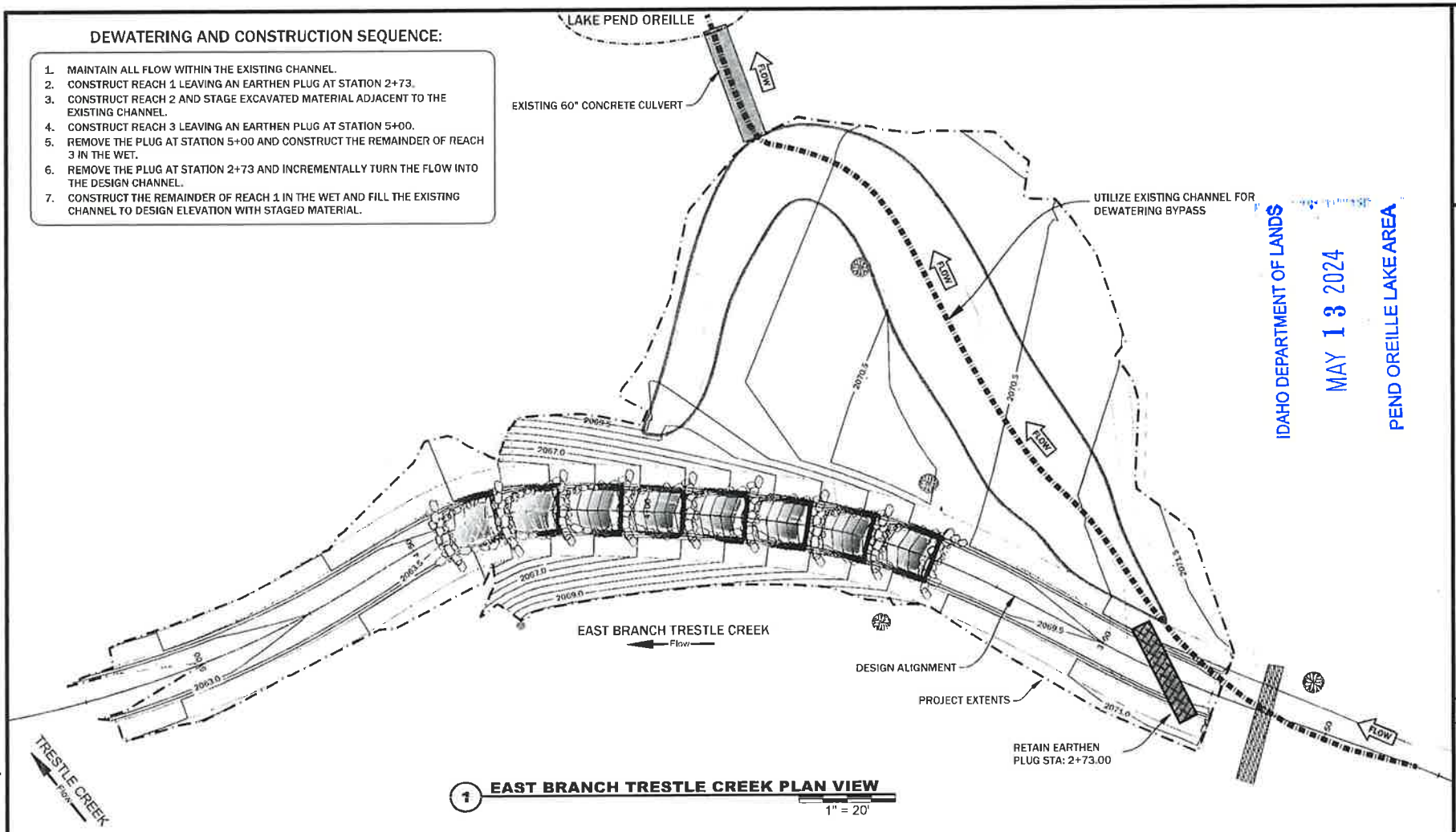
DRAWING NUMBER 2.0

Drawing 2 of 12

M:\Projects\22-RDG-22-170 Trestle Creek\DWG\Trestle Creek_Plan.dwg

DEWATERING AND CONSTRUCTION SEQUENCE:

1. MAINTAIN ALL FLOW WITHIN THE EXISTING CHANNEL.
2. CONSTRUCT REACH 1 LEAVING AN EARTHEN PLUG AT STATION 2+73.
3. CONSTRUCT REACH 2 AND STAGE EXCAVATED MATERIAL ADJACENT TO THE EXISTING CHANNEL.
4. CONSTRUCT REACH 3 LEAVING AN EARTHEN PLUG AT STATION 5+00.
5. REMOVE THE PLUG AT STATION 5+00 AND CONSTRUCT THE REMAINDER OF REACH 3 IN THE WET.
6. REMOVE THE PLUG AT STATION 2+73 AND INCREMENTALLY TURN THE FLOW INTO THE DESIGN CHANNEL.
7. CONSTRUCT THE REMAINDER OF REACH 1 IN THE WET AND FILL THE EXISTING CHANNEL TO DESIGN ELEVATION WITH STAGED MATERIAL.



1 EAST BRANCH TRESTLE CREEK PLAN VIEW
1" = 20'

LEGEND	
SYMBOL	
	BYPASS CHANNEL
	EARTHEN PLUG
FLOW	BYPASS FLOW DIRECTION

IDAHO DEPARTMENT OF LANDS
MAY 13 2024
PEND OREILLE LAKE AREA

RDG

DEWATERING PLAN

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/19/22	LS	FINAL DESIGN	NW
3	10/12/23	LS	DEWATER PLAN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
2.1

Drawing 1 of 12

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GENERAL NOTES

1. CONTOUR INTERVAL IS NOTED ON DRAWINGS.
2. SLOPES DESIGNATED AS 2:1, 1.5:1, ET CETERA, ARE THE RATIOS OF HORIZONTAL DISTANCE TO VERTICAL DISTANCE.
3. DIMENSIONS ARE GIVEN IN FEET AND TENTHS OF A FOOT.
4. TOPOGRAPHY AND CROSS SECTION GROUND LINES ARE BASED ON SURVEY WORK PERFORMED IN JUNE, 2022 BY RDG.
5. ALL EXISTING CONDITIONS ARE TO BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION AND ANY ADJUSTMENTS TO THE DRAWINGS SHALL BE MADE AS DIRECTED BY THE ENGINEER.
6. EXISTING PRIVATE IMPROVEMENTS, WHICH LIE WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE NOTED WILL BE REMOVED BY THE OWNER PRIOR TO CONSTRUCTION OR ABANDONED IN PLACE.
7. PROTECT ALL TREES AND LAND AREAS NOT LOCATED WITHIN THE PROJECT CONSTRUCTION, STAGING OR EARTHWORK LIMITS, EXERCISE CARE IN AREAS NOT SO MARKED TO AVOID UNNECESSARY DAMAGE TO NATURAL VEGETATION.
8. THE PROJECT SPONSOR IS RESPONSIBLE FOR COMPLYING WITH ALL PERMITS AND EASEMENTS INCLUDING ALL FEDERAL, STATE, COUNTY, AND LOCAL PERMIT CONDITIONS.
9. EXCAVATION, TRENCHING, SHORING, AND SHIELDING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE WORK. THESE DRAWINGS ARE NOT INTENDED TO PROVIDE MEANS OR METHODS OF CONSTRUCTION.
10. EXCAVATION SHALL MEET THE REQUIREMENTS OF OSHA 29 CFR PART 1926, SUBPART P, EXCAVATIONS. ACTUAL SLOPES SHALL NOT EXCEED THE SLOPES AS INDICATED ON DRAWINGS.
11. ENGINEER WILL PROVIDE SURVEY CONTROL AND GRADING SURFACES FOR EQUIPMENT WITH GPS MACHINE CONTROL CAPABILITY. ENGINEER SHALL PROVIDE SURVEY STAKING AND LAYOUT FOR CONSTRUCTION.
12. VERTICAL TOLERANCE FOR CONSTRUCTION COMPLIANCE WILL BE 0.3 FEET. HORIZONTAL TOLERANCE WILL BE 1.0 FEET.
13. CONTRACTOR SHALL CONFIRM QUANTITIES. REPORTED VOLUMES ARE NEATLINE AND DO NOT INCLUDE ADJUSTMENTS FOR COMPACTION OR OTHER FACTORS.

GENERAL SPECIFICATIONS

1. THE PROJECT SHALL BE CONSTRUCTED ACCORDING TO THE PLAN SET. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY CHANGES PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER FOR THIS PROJECT SHALL BE A DESIGNATED RIVER DESIGN GROUP REPRESENTATIVE.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. CALL U-DIG PRIOR TO CONSTRUCTION.
3. COSTS INCURRED DUE TO PROJECT DELAYS RESULTING FROM FAILURE OF THE CONTRACTOR TO MEET THE REQUIREMENTS OF THE GENERAL SPECIFICATIONS, CONTRACTOR QUALIFICATIONS, CONSTRUCTION SPECIFICATIONS, MATERIALS SPECIFICATIONS AND REVEGETATION SPECIFICATIONS SHALL BE THE EXPENSE OF THE CONTRACTOR.

TEMPORARY DIVERSION PROCEDURES

1. TEMPORARY DIVERSIONS SHALL BE ACTIVATED OR DEACTIVATED INCREMENTALLY IN TWO STAGES TO ALLOW RESIDENT AQUATIC LIFE TO EXIT THE DEWATERED AREA.
2. A PERIOD OF APPROXIMATELY ONE HOUR SHALL BE ALLOWED BETWEEN THE TWO STAGES.
3. EFFORTS SHALL BE MADE TO LIMIT TURBIDITY DURING DIVERSION ACTIVATION AND DEACTIVATION. MATERIAL USED TO DIVERT FLOW DURING STAGED DIVERSIONS SHALL BE CLEAN AND DEVOID OF FINES.
4. EFFORTS SHALL BE MADE TO LIMIT DISTURBANCE TO VEGETATION.
5. EFFORTS SHALL BE MADE TO AVOID FATALITIES OF AQUATIC LIFE.

CONTRACTOR QUALIFICATIONS

1. THE CONTRACTOR SHALL HAVE AT LEAST TWO (2) YEARS OF RIVER RESTORATION CONSTRUCTION EXPERIENCE AND SHALL HAVE COMPLETED AT LEAST FIVE (5) RIVER RESTORATION PROJECTS. OR, THE CONTRACTOR SHALL HAVE AT LEAST ONE (1) YEAR OF RIVER RESTORATION EXPERIENCE, SHALL HAVE COMPLETED AT LEAST THREE (3) RIVER RESTORATION PROJECTS, AND SHALL HAVE COMPLETED AN APPROVED RIVER RESTORATION TRAINING CLASS. APPROVED TRAINING CLASSES INCLUDE THOSE SPONSORED BY WILDLAND HYDROLOGY, INC., OR A SIMILARLY QUALIFIED PRACTITIONER OF NATURAL CHANNEL DESIGN STREAM RESTORATION PRINCIPLES.
2. IF THE CONTRACTOR CHOOSES TO DESIGNATE AN EMPLOYEE WITHOUT QUALIFIED STREAM RESTORATION EXPERIENCE, THE CONTRACTOR SHALL BE ON-SITE AT ALL TIMES WHEN THE EMPLOYEE IS PERFORMING RIVER RESTORATION WORK. FAILURE TO ABIDE BY THIS CONDITION WITHOUT PREVIOUS AGREEMENT WITH THE CONSTRUCTION MANAGER WOULD BE GROUNDS FOR TERMINATION.
3. THE CONTRACTOR SHALL MAINTAIN AT LEAST $2,000,000 IN LIABILITY INSURANCE AND HAVE PROOF OF LIABILITY INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
4. THE CONTRACTOR SHALL HAVE PROOF OF WORKER'S COMPENSATION INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
5. COPIES OF ALL PROJECT PERMITS SHALL BE POSTED ON-SITE IN A VISIBLE LOCATION. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE PERMITS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY KNOWN CHANGES OR ACTIVITIES THAT COULD VIOLATE PERMIT REQUIREMENTS PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER SHALL BE RESPONSIBLE FOR ALL CORRESPONDENCE WITH PERMIT AGENCIES.

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCTION SHALL OCCUR IN ACCORDANCE WITH THE PLAN SET, CONSTRUCTION SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, MATERIAL SPECIFICATIONS, REVEGETATION SPECIFICATIONS AND GENERAL SPECIFICATIONS.
2. CONSTRUCTION ACCESS SHALL BE DETERMINED BY THE CONSTRUCTION MANAGER. THE CONTRACTOR SHALL LEAVE ALL GATES, WHETHER OPEN OR CLOSED, AS FOUND.
3. STREAM CROSSINGS SHALL BE MINIMIZED DURING CONSTRUCTION. CONTRACTOR SHALL USE CULVERTS AT STREAM CROSSINGS SO THAT EQUIPMENT CAN CROSS THE STREAM WITHOUT GENERATING EXCESS TURBIDITY.
4. STRAW BALES AND SILT FENCING SHALL BE AVAILABLE AND INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE CONSTRUCTION MANAGER. CONSTRUCTION FENCING (LIMITS OF DISTURBANCE) SHALL BE INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE CONSTRUCTION MANAGER.
5. INITIALLY, THE CONTRACTOR SHALL EXCAVATE THE CHANNEL TO APPROXIMATE DESIGN DIMENSIONS. EXCAVATION SHALL COMPLY WITH CONSTRUCTION STAKES AND THE PLAN SET. EXCAVATION SHALL ESTABLISH CHANNEL ELEVATIONS WITHIN ONE-HALF FOOT OF FINAL ELEVATIONS. THE CONSTRUCTION MANAGER SHALL INSPECT THE CHANNEL EXCAVATION FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL UNTIL HAULED OFF-SITE OR USED ON-SITE. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED. EXCAVATED SOD AND RIPARIAN SHRUB TRANSPLANTS SHALL BE CAREFULLY STOCKPILED AND REUSED FOR PLANTING FLOODPLAINS OR STREAM BANKS.
6. AFTER EXCAVATING THE CHANNEL, THE CONTRACTOR SHALL INSTALL BANK STABILIZATION AND HABITAT STRUCTURES USING THE EXCAVATOR. EACH STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LOCATIONS AND SPECIFICATIONS PROVIDED IN THE PLAN SET. THE CONSTRUCTION MANAGER SHALL INSPECT AND APPROVE ALL STRUCTURES PRIOR TO BACKFILLING.
7. AFTER ALL STRUCTURES ARE INSTALLED, THE CHANNEL WILL BE SHAPED TO WITHIN 0.3 FEET OF THE FINAL ELEVATIONS SPECIFIED ON THE PLAN SET USING AN EXCAVATOR. THE CONSTRUCTION MANAGER SHALL CHECK THE FINAL ELEVATIONS FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL UNTIL HAULED TO AN ON-SITE REPOSITORY DESIGNATED BY THE CONSTRUCTION MANAGER. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED.
8. THE CONTRACTOR SHALL REMOVE EXCESS MATERIALS, TEMPORARY CULVERTS AND EQUIPMENT FROM THE SITE. THE CONTRACTOR SHALL REGRADE DISTURBED AREAS AND CONSTRUCTION ACCESS ROADS TO THEIR ORIGINAL GRADES. THE CONTRACTOR SHALL TREAT COMPACTED SOIL AREAS INCLUDING ACCESS ROADS AND MATERIAL STOCKPILE AREAS. THE CONTRACTOR SHALL REMOVE SOIL FROM THE PROJECT SITE IF THE SOIL IS TAINTED WITH PETROLEUM-BASED FLUIDS.

EQUIPMENT SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT NECESSARY TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL MOBILIZE ALL EQUIPMENT TO THE PROJECT AREA AS DIRECTED BY THE CONSTRUCTION MANAGER.
2. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING EQUIPMENT FOR THIS PROJECT:

   EXCAVATOR - ONE (1) EXCAVATOR SHALL BE REQUIRED. THE EQUIPMENT SHALL BE MINIMUM 200 CLASS. THE BUCKET VOLUME SHALL BE MINIMUM OF ONE (1) CUBIC YARD. THE BUCKET SHALL BE EQUIPPED WITH A HYDRAULIC THUMB FOR GRASPING LOGS, ROCKS, AND OTHER MATERIALS. THE EQUIPMENT MUST BE CAPABLE OF CROSSING WATER AND WORKING ON OR ADJACENT TO STEEP SLOPES. A CHAIN OR STRAP SHALL BE AVAILABLE FOR ATTACHING CULVERTS, PUMPS AND OTHER EQUIPMENT OR MATERIALS TO THE BUCKET FOR TRANSPORT ON-SITE.

   ALL SURFACE VEHICLE - ONE (1) ALL-SURFACE VEHICLE (ASV) SHALL BE REQUIRED. THE EQUIPMENT SHALL BE EQUIPPED WITH SOD TRACKS TO MINIMIZE DISTURBANCE TO FRAGILE AREAS.

   CHAINSAW - ONE (1) CHAINSAW SHALL BE REQUIRED. THE CHAINSAW MUST BE CAPABLE OF COMPLETELY SAWING LOGS OF THE DIAMETER SPECIFIED IN THE MATERIAL SPECIFICATIONS.
3. ALL EQUIPMENT SHALL BE WASHED PRIOR TO MOBILIZATION TO THE SITE TO MINIMIZE THE INTRODUCTION OF FOREIGN MATERIALS AND FLUIDS TO THE PROJECT SITE. ALL EQUIPMENT SHALL BE FREE OF OIL, HYDRAULIC FLUID, AND DIESEL FUEL LEAKS. TO PREVENT INVASION OF NOXIOUS WEEDS OR THE SPREAD OF WHIRLING DISEASE SPORES, ALL EQUIPMENT SHALL BE POWER WASHED OR CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ADEQUATE MEASURES HAVE BEEN TAKEN.
4. EQUIPMENT SHALL BE IN A WELL-MAINTAINED CONDITION TO MINIMIZE THE LIKELIHOOD OF A FLUID LEAK. IF A FLUID LEAK DOES OCCUR, THE CONSTRUCTION MANAGER SHALL BE NOTIFIED IMMEDIATELY, AND ALL WORK CEASED UNTIL THE LEAK HAS BEEN RECTIFIED. AT ALL TIMES DURING THE CONSTRUCTION PHASE, FLUID SPILL CONTAINMENT EQUIPMENT SHALL BE PRESENT ON-SITE AND READY FOR DEPLOYMENT SHOULD AN ACCIDENTAL SPILL OCCUR.
5. THE CONTRACTOR SHALL MAINTAIN A COMPLETE TOOL SET WITH COMMONLY REPLACED PARTS (E.G. O-RINGS) TO MINIMIZE DOWNTIME IN THE EVENT OF EQUIPMENT MALFUNCTION. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ON SITE DURING THE PROJECT.

IDAHO DEPARTMENT OF LANDS

MAY 13 2024

PEND OREILLE LAKE AREA

RDG

SPECIFICATIONS

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
3.0

TOTAL WOOD QUANTITIES

ITEM	QUANTITY	DIAMETER	LENGTH	ROOTWAD
CATEGORY 2 WOOD	23	2-4 IN	20 FT	OPTIONAL
CATEGORY 3 WOOD	232	< 2 IN	10-12 FT	OPTIONAL
WILLOW CUTTINGS	696	0.25-1.0 IN	8 FT	NO

NOTE:
WOOD LENGTHS SHOWN WILL PRODUCE THE PROPER AMOUNT MATERIAL FOR STRUCTURES WHEN SPLIT INTO APPROPRIATE SIZES DURING CONSTRUCTION. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.

TOTAL ROCK QUANTITIES

ITEM	QUANTITY (EA)	DIAMETER (IN)
CATEGORY 1 ROCK	280	24-30
CATEGORY 2 ROCK	74	10-12

ITEM	QUANTITY (CY)	GRADATION	
		SIZE (IN)	PERCENT PASSING
STREAMBED/STREAMBANK FILL	90	10	100
		6	90-100
		4	50-80
		3	30-50
		1	10-30
		0.08	10

TOTAL EARTHWORK QUANTITIES

ITEM	QUANTITY (CY)
CUT	300
BACKFILL	300
NET	0

NOTE:
VOLUMES ARE NEATLINE. CONTRACTOR TO APPLY EXPANSION FACTORS TO DETERMINE A MORE ACCURATE BACKFILL VOLUME.

TOTAL MISCELLANEOUS QUANTITIES

ITEM	QUANTITY
SOD MAT	288 (SF)
SHRUB SALVAGE AND TRANSPLANT	12 (AS AVAILABLE)
RECLAMATION SEED	5.5 (PLS LBS)
NONWOVEN GEOTEXTILE FABRIC	160 (LF)
20D RING SHANK NAILS W/WASHERS	160 (EA)

BOULDER STEP POOL STRUCTURE QUANTITIES

ITEM	QUANTITY
BOULDER STEP POOL STRUCTURES	8 (EA)
STREAMBED FILL (6" MINUS)	40 (CY)
SOD MAT	288 (SF)
CATEGORY 1 ROCK	280 (EA)
NONWOVEN GEOTEXTILE FABRIC	160 (LF)
20D RING SHANK NAILS W/WASHERS	160 (EA)

CONSTRUCTED CHANNEL STREAMBED QUANTITIES

ITEM	QUANTITY
CONSTRUCTED RIFFLE	92 (LF)
CATEGORY 2 ROCK	74 (EA)
STREAMBED FILL	28 (CY)

VEGETATED WOOD MATRIX QUANTITIES

ITEM	QUANTITY
VEGETATED WOOD MATRIX	232 (LF)
CATEGORY 2 WOOD	23 (EA)
CATEGORY 3 WOOD	232 (EA)
WILLOW CUTTINGS	696 (EA)
STREAMBED FILL	22 CY

RIPARIAN SEEDING SCHEDULE

LOCATION	SPECIES		PLS LBS/ACRE	TOTAL PLS LBS
FLOODPLAIN 0.234 ACRES	SLENDER WHEATGRASS	ELYMUS TRACHYCAULUS	10.59	2.48
	BLUEJOINT REEDGRASS	CALAMAGROSTIS CANADENSIS	4.71	1.10
	TUFTED HAIRGRASS	DESCHAMPSIA CAESPITOSA	1.18	0.28
	MEADOW BARLEY	HORDEUM BRACHYANTHERUM	7.35	1.72
			TOTAL	5.57

RDG

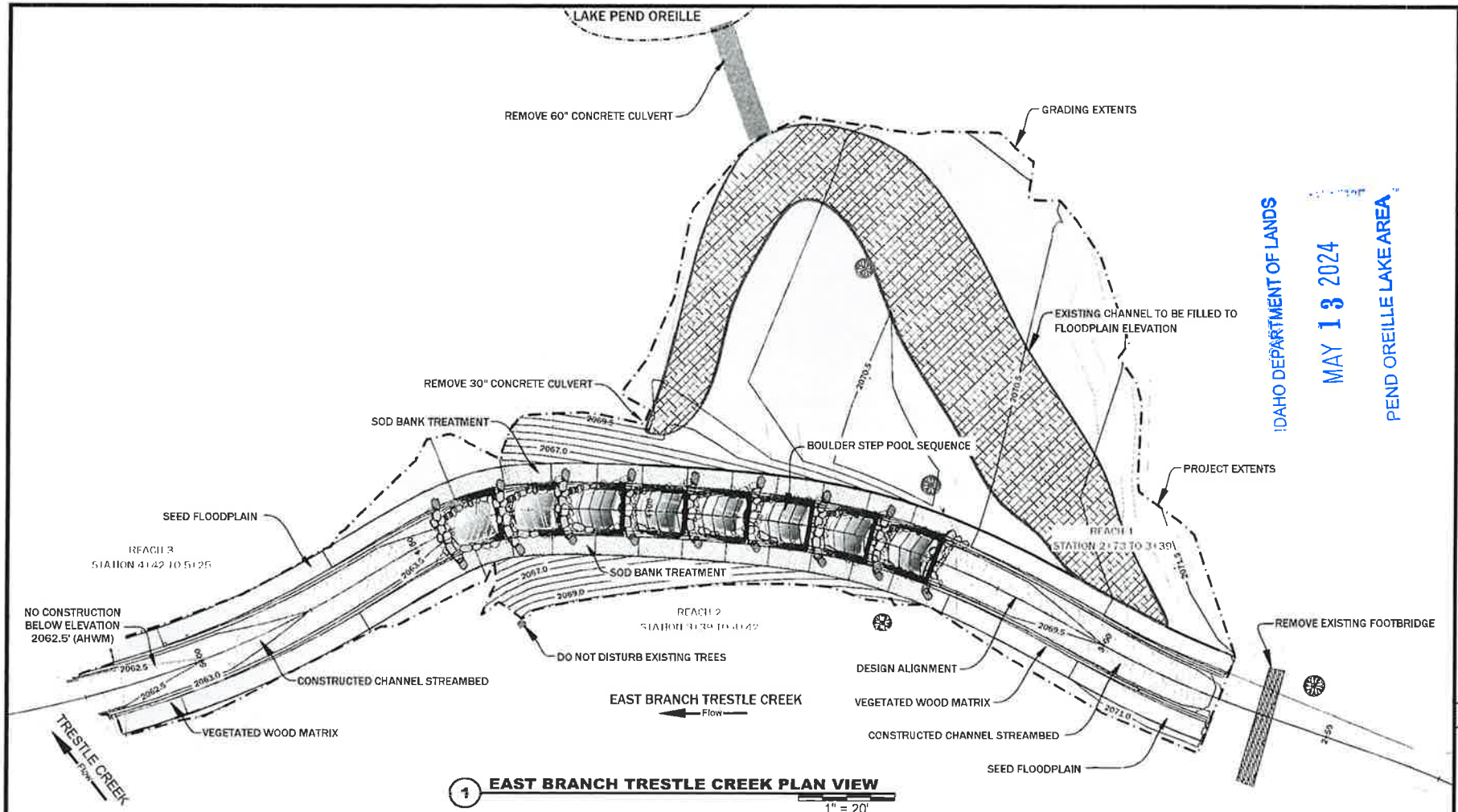
MATERIALS AND QUANTITIES

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
3.1



1 EAST BRANCH TRESTLE CREEK PLAN VIEW

1" = 20'

CHANNEL TOP OF BANK ELEVATIONS

STATION START	ELEVATIONS (FT)	STATION START	ELEVATIONS (FT)	STATION START	ELEVATIONS (FT)	STATION START	ELEVATIONS (FT)
0+30	2075.5	3+64	2079.1	3+92	2067.5	4+19	2066.1
2+72	2071.5	3+66	2068.9	3+93	2067.5	4+29	2065.5
3+39	2070.4	3+67	2068.9	4+03	2066.9	4+31	2065.4
3+40	2070.4	3+77	2068.3	4+05	2066.8	4+32	2065.4
3+51	2069.8	3+79	2068.2	4+06	2066.8	4+42	2064.8
3+53	2069.7	3+80	2068.2	4+16	2066.2	4+44	2064.8
3+54	2069.6	3+90	2067.6	4+18	2066.1	5+27	2063.7

STRUCTURE SCHEDULE

STATION START	STATION END	BANK	STRUCTURE	STATION START	STATION END	BANK	STRUCTURE
2+95	3+39	L	VWM	4+03	4+16	C	BSP
3+00	3+39	C	CCS	4+16	4+29	C	BSP
3+05	3+39	R	VWM	4+29	4+42	C	BSP
3+39	3+51	C	BSP	4+42	5+20	L	VWM
3+51	3+64	C	BSP	4+42	4+95	C	CCS
3+64	3+77	C	BSP	4+42	5+18	R	VWM
3+90	4+03	C	BSP				

DETAIL LEGEND

SYMBOL		DETAIL SHEET #
	FLOODPLAIN SEED AREA	
	SOD BANK TREATMENT	
	EXISTING TREE TO BE PRESERVED	
	BOULDER STEP POOL	6.0
	CONSTRUCTED CHANNEL STREAMBED	6.1
	VEGETATED WOOD MATRIX	6.2

RDG

PLAN VIEW AND DATA SHEET

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
4.0

N:\Projects\2022 RDG-22-170 Trestle Creek\DWG\Trestle Cree...Plan.dwg

EXISTING GROUND COMPARED TO RDG DESIGN SURFACE

FILL ^ 9.0' 8.0' 7.0' 6.0' 5.0' 4.0' 3.0' 2.5 2.0' 1.5' 1.0' 0.3' -0.3' -1.0' -1.5' -2.0' -2.5' -3.0' -4.0' -5.0' -6.0' -7.0' -8.0' -9.0' v CUT

EARTHWORK VOLUMES

STATION 2+73 TO 5+28

CUT (CY)	FILL (CY)	NET (CY)
300	300	0

NOTES:
REPORTED VOLUMES ARE NEATLINE CUT VOLUME INCLUDES STREAMBED SUBGRADE EARTHWORK.

NO CONSTRUCTION BELOW ELEVATION 2062.5' (AHWM)

TRESTLE CREEK Flow

DESIGN ALIGNMENT

EAST BRANCH TRESTLE CREEK Flow

GRADING EXTENTS

1 SITE PLAN
1" = 20'

2 EAST BRANCH TRESTLE CREEK PROFILE
1" = 30'

ELEVATION
2060' 2062' 2064' 2066' 2068' 2070' 2072' 2074'

5+50 5+25 5+00 4+75 4+50 4+25 4+00 3+75 3+50 3+25 3+00 2+75 2+50

ARTIFICIAL HIGH WATER MARK ELEV. = 2062.5'
EXISTING GROUND
TOP OF BANK PROFILE
-1.2%
-5.4%
-1.6%

PROFILE LEGEND
EXISTING GROUND ELEVATION
BANKFULL SURFACE
DESIGN SURFACE

IDAHO DEPARTMENT OF LANDS
MAY 13 2024
PEND OREILLE LAKE AREA

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

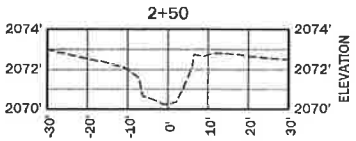
PROJECT NUMBER RDG-22-170
DRAWING NUMBER 4.1

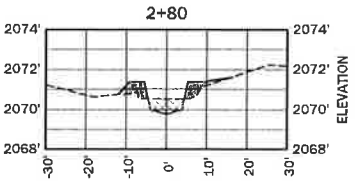
GRADING PLAN AND PROFILE

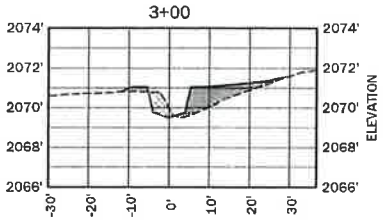
EAST BRANCH TRESTLE CREEK RESTORATION PROJECT

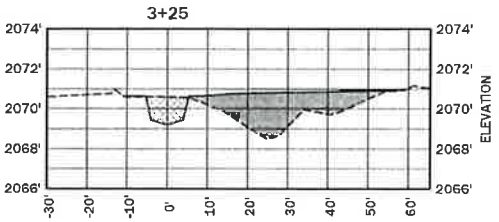
NEAR SANDPOINT, IDAHO

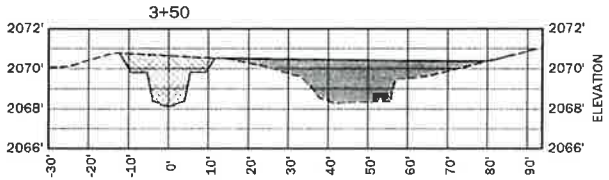
RDG

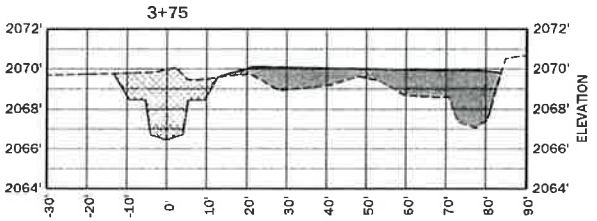


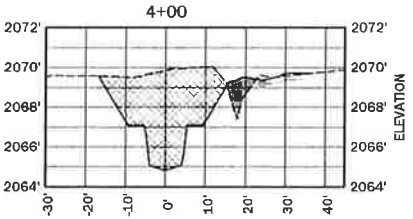


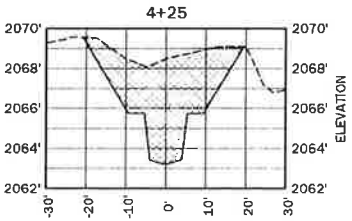


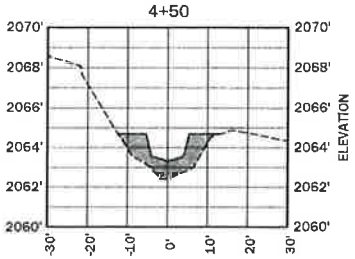


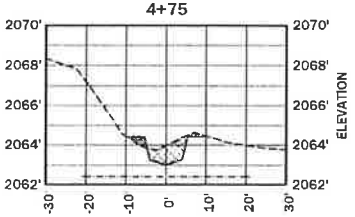


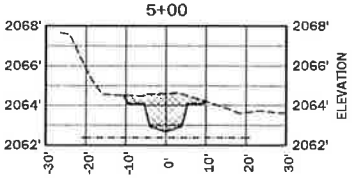


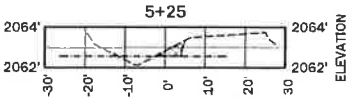












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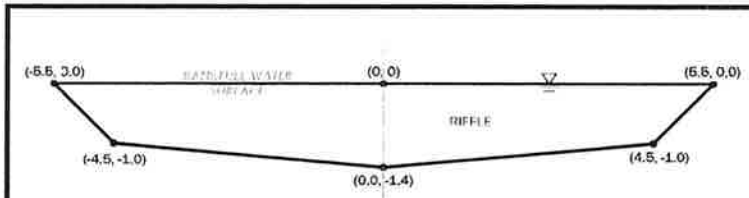

DESIGN CHANNEL CROSS SECTION TYPICAL

0' 1' 2'

SECTION LEGEND

EXISTING GROUND ELEVATION
FINISHED GRADE
ARTIFICIAL HIGH WATER MARK
CUT
FILL

1 CHANNEL CROSS SECTIONS

1" = 30'

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DESIGN CHANNEL CROSS SECTIONS

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT

NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
5.0

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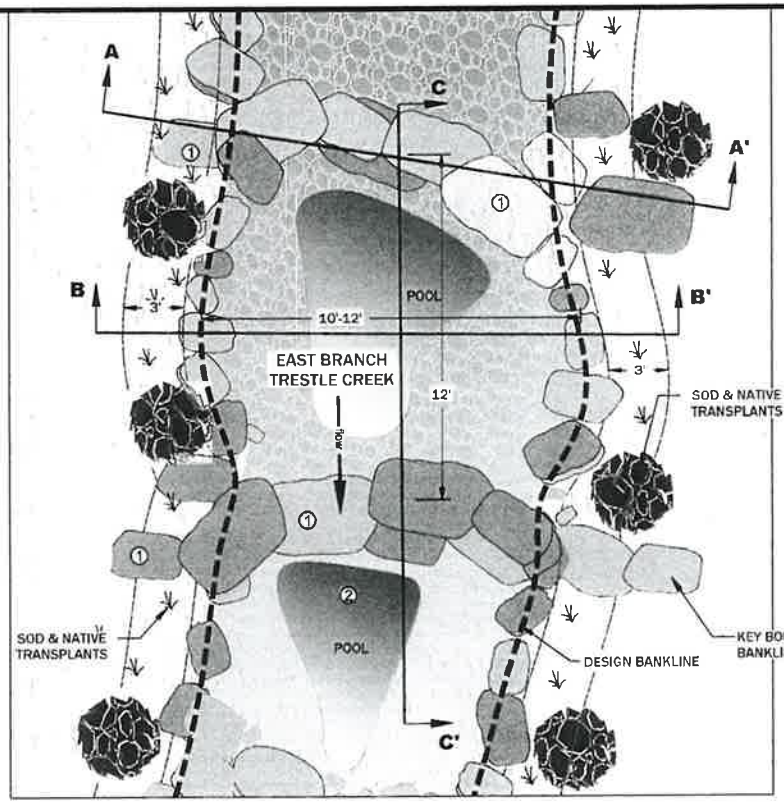


1 BOULDER STEP POOL PLAN VIEW 1" = 6'

GENERAL NOTES

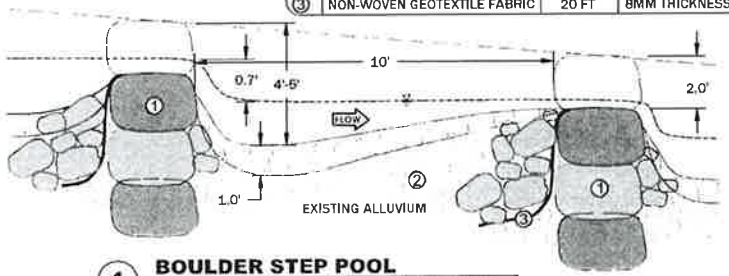
1. THE INTENT OF THE BOULDER STEP POOL STRUCTURE IS TO PROVIDE VERTICAL AND LATERAL STABILITY FOR ENTRENCHED STREAM TYPES EXHIBITING STEEP GRADIENTS. THE STRUCTURE CONSISTS OF ALTERNATING GRADE CONTROL STEPS AND PLUNGE POOLS. VELOCITY AND ENERGY DISSIPATION IS CONTROLLED BY STEP SPACING WHICH IS DETERMINED AS A FUNCTION OF GRADIENT RELATIVE TO CHANNEL WIDTH. STEP HEIGHT IS DESIGNED TO MAINTAIN UPSTREAM FISH PASSAGE AT ALL FLOW STAGES. PLUNGE POOLS PROVIDE RESTING AREAS FOR FISH TO STAGE.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY ENGINEER.
3. ENGINEER SHALL MARK THE GENERAL CONSTRUCTION LOCATIONS FOR EACH BOULDER STEP POOL STRUCTURE PRIOR TO CONSTRUCTION.

NOTES ON BOULDER STEP POOL STRUCTURE

1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN ON THE DRAWING. SALVAGE COBBLE FROM THE EXISTING CHANNEL AND STOCK PILE ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BASE OF THE EXCAVATION BY PLACING AND BUCKET COMPACTING STREAMBED FILL TO SUBGRADE ELEVATIONS SHOWN ON THE DRAWINGS.
3. STEP POOLS SHALL BE CONSTRUCTED FROM ROCKS WITH THE DIMENSIONS SHOWN IN THE MATERIAL SCHEDULE. PREFERRED ROCK IS RECTANGULAR IN SHAPE FROM SOURCE APPROVED BY ENGINEER AND SHALL BE SOUND, DENSE (SG=2.65 MIN.) AND FREE FROM CRACKS, SEAMS OR OTHER DEFECTS THAT CAN ACCELERATE WEATHERING.
4. PLACE CAT 1 ROCKS ACCORDING TO THE LAYOUT AND ELEVATIONS SHOWN ON SITE PLAN. FOOTER ROCKS SHALL BE PLACED UNDER ALL CAP ROCKS UNLESS CAP ROCKS EXTEND BELOW SCOUR DEPTH. ALL ROCKS SHALL BE PLACED ON SUITABLE SUBGRADE CONSISTING OF COARSE ALLUVIUM AS APPROVED BY ENGINEER. ROCK SHALL BE EQUIPMENT-PLACED SO THAT LARGER ROCKS ARE UNIFORMLY DISTRIBUTED WITH NO GAPS BETWEEN BOTH FOOTER ROCKS AND CAP ROCKS. STREAMBED FILL SHALL BE PLACED IN VOIDS AROUND RIPARIAN CUTTINGS AND BETWEEN FOOTER ROCKS AND CAP ROCKS.
5. PLACE NON-WOVEN GEOTEXTILE FABRIC ON THE UPSTREAM SIDE OF STEP POOLS TO MINIMIZE PIPING OF WATER THROUGH THE STEPS. FABRIC SHALL BE PLACED ACROSS THE ENTIRE WIDTH OF THE STEP THROAT AND SHALL EXTEND BELOW THE ESTIMATED SCOUR DEPTH AS SHOWN ON THE DRAWINGS AND AS DIRECTED BY ENGINEER. BACKFILL FABRIC WITH NATIVE STREAMBED FILL AND SMALL BOULDERS AS SHOWN ON THE DRAWINGS.
6. THE UPSTREAM TIE-IN WILL BE STAKED IN THE EXISTING STREAMBED BY ENGINEER. THE DOWNSTREAM TIE-IN SHALL TRANSITION SMOOTHLY INTO EXISTING TRESTLE CREEK. STRUCTURE TIE-IN LOCATIONS MAY BE STABILIZED WITH BOULDERS AND STREAMBED FILL AS DIRECTED BY ENGINEER.

MATERIAL SCHEDULE (PER STRUCTURE)

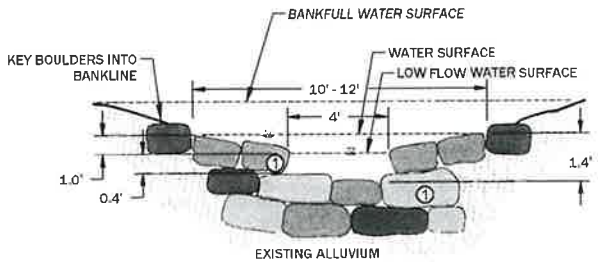
	ITEM	QUANTITY	DIAMETER (IN.)
①	CATEGORY 1 ROCK	25	24 - 30
②	CHANNEL STREAMBED FILL	5 CY	SEE GRADATION
③	NON-WOVEN GEOTEXTILE FABRIC	20 FT	8MM THICKNESS



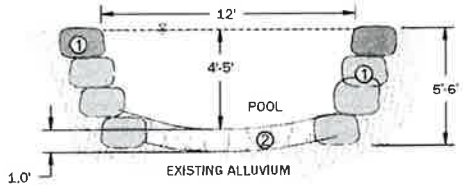
4 BOULDER STEP POOL PROFILE C - C' 1" = 5'

STREAMBED FILL GRADATION	
SIZE (IN)	PERCENT PASSING
10	100
6	90-100
4	50-80
3	30-50
1	10-30
0.08	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION



2 BOULDER STEP WEIR SECTION A - A' 1" = 5'



3 POOL SECTION B - B' 1" = 5'

EXAMPLE OF A CONSTRUCTED BOULDER STEP POOL SYSTEM

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BOULDER STEP POOL DETAIL

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/19/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
6.0

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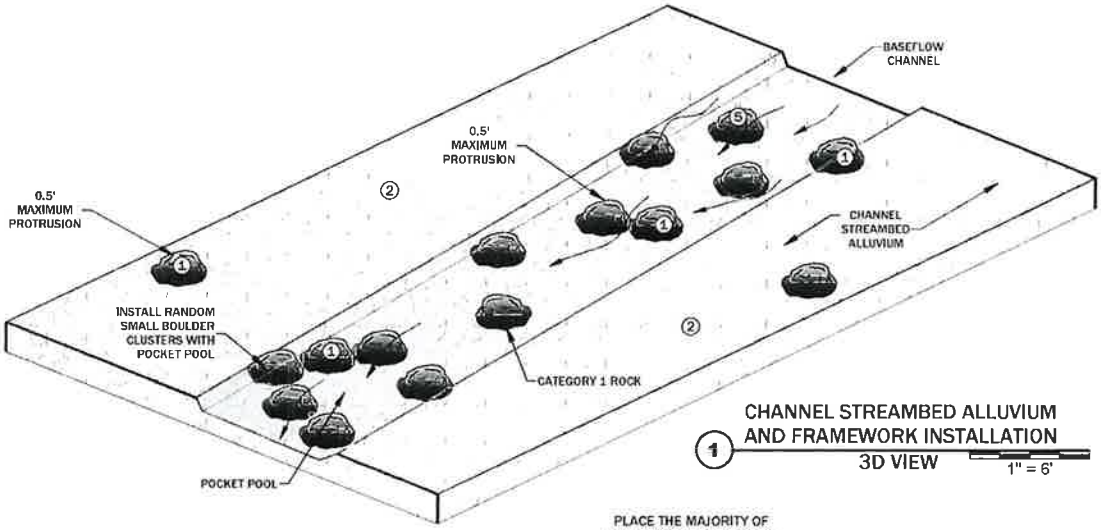
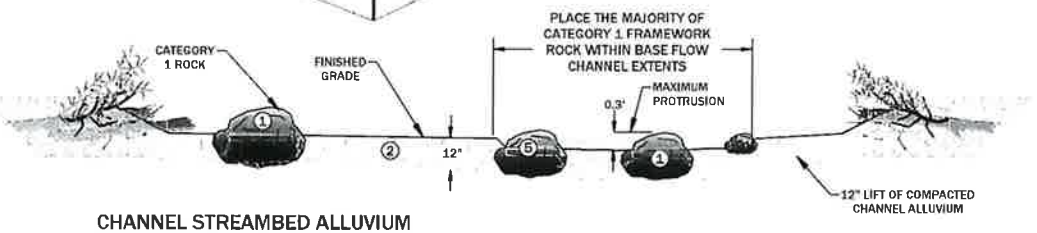


1 CHANNEL STREAMBED ALLUVIUM AND FRAMEWORK INSTALLATION
3D VIEW
1" = 6'



2 CHANNEL STREAMBED ALLUVIUM AND FRAMEWORK INSTALLATION
SECTION VIEW
1" = 5'

TYPICAL CONSTRUCTED STREAMBED THROUGH A RIFFLE FEATURE

GENERAL NOTES

1. CONSTRUCTION OF THE CHANNEL STREAMBED WILL OCCUR AFTER THE CHANNEL SUBGRADE IS PREPARED.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED THE CONSTRUCTION MANAGER.
3. CONTRACTOR SHALL MARK THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE LOCATIONS OF THE CONSTRUCTED CHANNEL STREAMBED STRUCTURES.
4. ALL SUBGRADE EXCAVATION SHALL TERMINATE AT ELEVATION 2062.5'. CONSTRUCTION MANAGER SHALL IDENTIFY LIMITS DURING CONSTRUCTION.

NOTES ON CONSTRUCTED CHANNEL STREAMBED INSTALLATION

1. PRIOR TO CONSTRUCTION OF THE CHANNEL STREAMBED, CONSTRUCTION MANAGER SHALL VERIFY CHANNEL SUBGRADE ELEVATIONS. CHANNEL SUBGRADE SERVES AS THE FOUNDATION FOR THE CONSTRUCTED CHANNEL STREAMBED.
2. CONTRACTOR SHALL STOCKPILE CHANNEL ALLUVIUM PER SPECIFICATIONS NOTED ON THE DRAWING.
3. PREPARE THE FRAMEWORK. CONTRACTOR SHALL PLACE 10-INCH TO 12-INCH BOULDERS (CATEGORY 1 ROCK) ON THE SURFACE OF THE CHANNEL SUBGRADE PRIMARILY WITHIN THE LOW FLOW CHANNEL AS INDICATED ON THE DRAWING. DUE TO THE INHERENT VARIABILITY IN MATERIALS, BOULDER ELEVATIONS SHALL BE ADJUSTED TO ASSURE BOULDER PROTRUSION ABOVE FINISH GRADE WILL BE NO GREATER THAN 0.5-FT.
4. CONTRACTOR MAY INSTALL 10-INCH TO 12-INCH BOULDERS (CATEGORY 1 ROCK) IN CLUSTERS, AS DIRECTED BY THE CONSTRUCTION MANAGER, TO CREATE A COMPLEX SERIES OF POCKET POOLS THAT EFFECTIVELY DISSIPATE ENERGY AND PROVIDE PATHWAYS FOR FISH MOVEMENT. BOULDER ELEVATIONS SHALL BE ADJUSTED TO ASSURE BOULDER PROTRUSION ABOVE FINISH GRADE IS NO GREATER THAN 0.3-FT.
5. PREPARE THE MATRIX. AFTER THE FRAMEWORK, BOULDER CLUSTERS, AND SMALL BOULDER RIBS ARE INSTALLED AND INSPECTED BY CONSTRUCTION MANAGER, PLACE APPROPRIATE CHANNEL STREAMBED ALLUVIUM GRADATION AND WASH FINES INTO STREAMBED. CHANNEL STREAMED ALLUVIUM SHALL BE PLACED TO THE FULL COURSE THICKNESS OF 12-INCHES TO FINISHED GRADE.

MATERIAL SCHEDULE
(PER LINEAR FOOT)

	ITEM	DIA.	QUANTITY
①	CATEGORY 1 ROCK	10" - 12"	0.8 EA
②	CHANNEL STREAMBED ALLUVIUM	6" MINUS	0.3 CY

STREAMBED FILL GRADATION	
SIZE (IN)	PERCENT PASSING
10	100
6	90-100
4	50-80
3	30-50
1	10-30
0.08	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION

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CONSTRUCTED CHANNEL STREAMBED DETAIL

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER
RDG-22-170

DRAWING NUMBER
6.1

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NOTES ON VEGETATED WOOD MATRIX INSTALLATION

1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BENCH OF THE STRUCTURE BY PLACING CHANNEL STREAMBED ALLUVIUM FROM THE BASE OF THE EXCAVATION DEPTH/BOTTOM OF EXCAVATION TO WITHIN 1.0-FT. OF FINISHED GRADE.
3. CATEGORY 2 AND CATEGORY 3 WOOD, AND CHANNEL STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LAYERS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN BELOW IN THE INSTALLATION SEQUENCE. PLACE SIX (6) FT TO EIGHT (8) FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 3 PER LINEAR FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANK EDGE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANK LINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
4. THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE. STRUCTURE ENDS MAY BE STABILIZED WITH ADDITIONAL CATEGORY 1 ROCK AS APPROVED BY ENGINEER.
5. AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT.

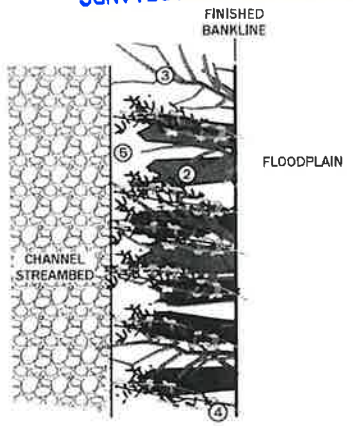
GENERAL NOTES

1. CONSTRUCTION OF THE VEGETATED WOOD MATRIX WILL OCCUR AFTER THE CHANNEL AND FLOODPLAIN BACKFILL IS PLACED AND THE CHANNEL STREAMBED IS CONSTRUCTED.
2. IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
3. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
4. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
5. CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.
6. ALL SUBGRADE EXCAVATION SHALL TERMINATE AT ELEVATION 2062.5'. CONSTRUCTION MANAGER SHALL IDENTIFY LIMITS DURING CONSTRUCTION.

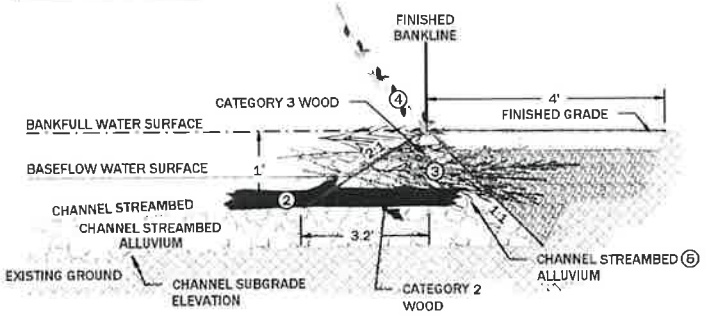
STREAMBANK FILL GRADATION	
SIZE (IN)	PERCENT PASSING
10	100
6	90-100
4	50-80
3	30-50
1	10-30
0.08	10
NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION	

MATERIAL SCHEDULE (PER LINEAR FOOT)

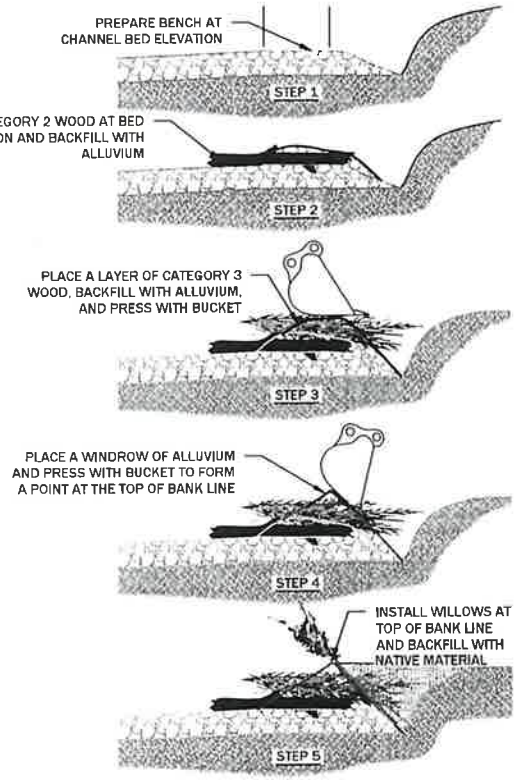
	ITEM	DIA.	QUANTITY
②	CATEGORY 2 WOOD	2" - 4"	0.25
③	CATEGORY 3 WOOD	< 2"	2
④	WILLOW CUTTINGS	0.25" - 1"	3
⑤	STREAMBANK ALLUVIUM	6" MINUS	0.1 CY



1 VEGETATED WOOD MATRIX PLAN VIEW NTS



2 VEGETATED WOOD MATRIX SECTION VIEW NTS



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE SECTION VIEW NTS

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VEGETATED WOOD MATRIX

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT
NEAR SANDPOINT, IDAHO

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER RDG-22-170

DRAWING NUMBER 6.2

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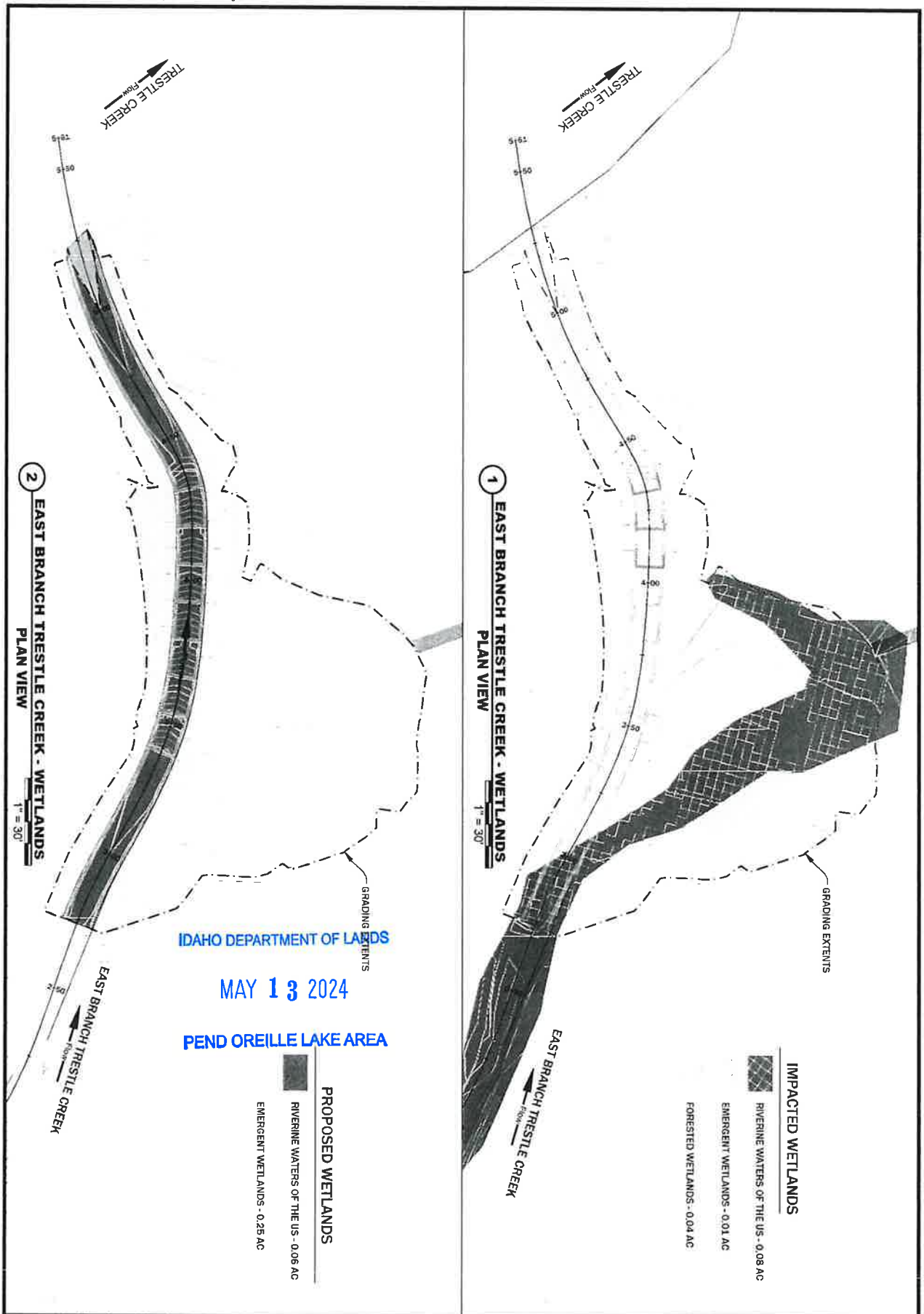

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MAY 13 2024

PEND OREILLE LAKE AREA

NO.	DATE	BY	DESCRIPTION	CHK
1	07/18/22	LS	FINAL DESIGN	NW

PROJECT NUMBER RDG-22-170

DRAWING NUMBER 7.0

WETLAND IMPACTS

EAST BRANCH TRESTLE CREEK RESTORATION PROJECT

NEAR SANDPOINT, IDAHO

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