Trout Unlimited and Union Soil and Water Conservation District

Elmer Dam Fish Passage and Flow Improvements Project

Temporary Fish Passage Plan

River Structures CONSULTING

June 2022

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Appendices

1.0 Introduction

1.1 Purpose

Trout Unlimited (TU) and the Union Soil and Water Conservation District (USWCD) contracted River Structures Consulting (River Structures) to provide engineering and design services for the Elmer Dam Fish Passage and Flow Improvements Project (Project). The purpose of this report is to present the Temporary Fish Passage Plan (Plan) to be implemented during the construction of the Project. The objective of the Plan is to outline the approach to mitigate temporary disruption to the migration of native fish species during construction of the Project. The key objectives of the Plan are to:

1. Provide relevant background information to serve as the basis of the Plan including:
    a. Project Description
    b. Hydrology, Irrigation, and Fish Migration
    c. OAR and NMFS rules and criteria
2. Outline the Temporary Fish Passage Plan Including:
    a. Proposed Construction Timeline
    b. Mitigation methods and temporary facilities
    c. Roles and Responsibilities

The following sections present the relevant background information used as the basis of the Plan.

1.2 Project Description

Elmer Dam is located on Catherine Creek in Union County approximately 14 miles east of La Grande, Oregon. Catherine Creek is a tributary to the Grande Ronde River and is a migratory corridor for Chinook Salmon as well as Steelhead, Bull Trout, Lamprey, and Mountain Whitefish. Elmer Dam is located approximately 30 miles downstream of the Catherine Creek adult trapping facility which serves as a satellite facility to the Lookingglass Fish Hatchery (Hatchery). The satellite facilities are operated by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under the Grande Ronde Satellite Facilities Project.

Elmer Dam is a concrete run-of-river dam that provides irrigation storage from April to November. The dam is equipped with a pool and weir type fish ladder and a 20-foot-wide stop log spillway. The reservoir system consists of three oxbow (off-channel) storage reservoirs located off the left bank of Catherine Creek, and the on-channel storage reservoir. Each of the three oxbow reservoirs have individual intake structures that divert water from Catherine Creek (reservoir 4). The existing fish ladder at Elmer Dam does not meet Oregon Department of Fish and Wildlife (ODFW) or National Marine Fisheries Service (NMFS) design criteria for fish passage facilities. Likewise, the intake structures are not equipped with NMFS/ODFW compliant screening systems to prevent fish entrainment into the off-channel reservoirs.

TU and the USWCD, in cooperation with private landowners, seek to address fish passage and flow issues on Catherine Creek associated with Elmer Dam and the reservoir systems for the benefit of native migratory fish species. The primary objectives of the Project are to:

1. Construct a vertical slot fishway to improve fish passage past Elmer Dam. The new fishway will meet current ODFW and NMFS fishway design criteria.

2. Install a 5-foot-wide tilting weir gate on Elmer Dam to provide additional hydraulic capacity and improve regulation of instream flows. It will also eliminate the need to adjust stop logs in the primary spillway throughout the irrigation season.
3. Relocate three existing intake structures to off-channel wet wells with ODFW/NMFS compliant fish screens. The off-channel oxbow reservoirs 1, 2 and 3 will be hydraulically connected to the lower wet wells, adjacent to Elmer Dam and the existing intake structures between each oxbow reservoir and Catherine Creek (reservoir 4) will be decommissioned. These efforts will reduce entrainment of ESA listed steelhead and juvenile Chinook, as well as other resident species, into the oxbow (off-channel) reservoirs while maximizing the storage capacity of the existing reservoir system.

2.0 Temporary Passage Plan

2.1 Approach Justification

Per ODFW, the in-water work window for Catherine Creek is July 1 – October 15. Figure 1 displays fish return numbers to the CTUIR trap approximately 30 miles upstream. As shown in Figure 1, this period overlaps with the tail end of the in-migration period for Catherine Creek spring Chinook. The in-water work window also overlaps with the irrigation season (typically April 1 – October 31) which requires full storage capacity in Reservoir 4 (Catherine Creek).

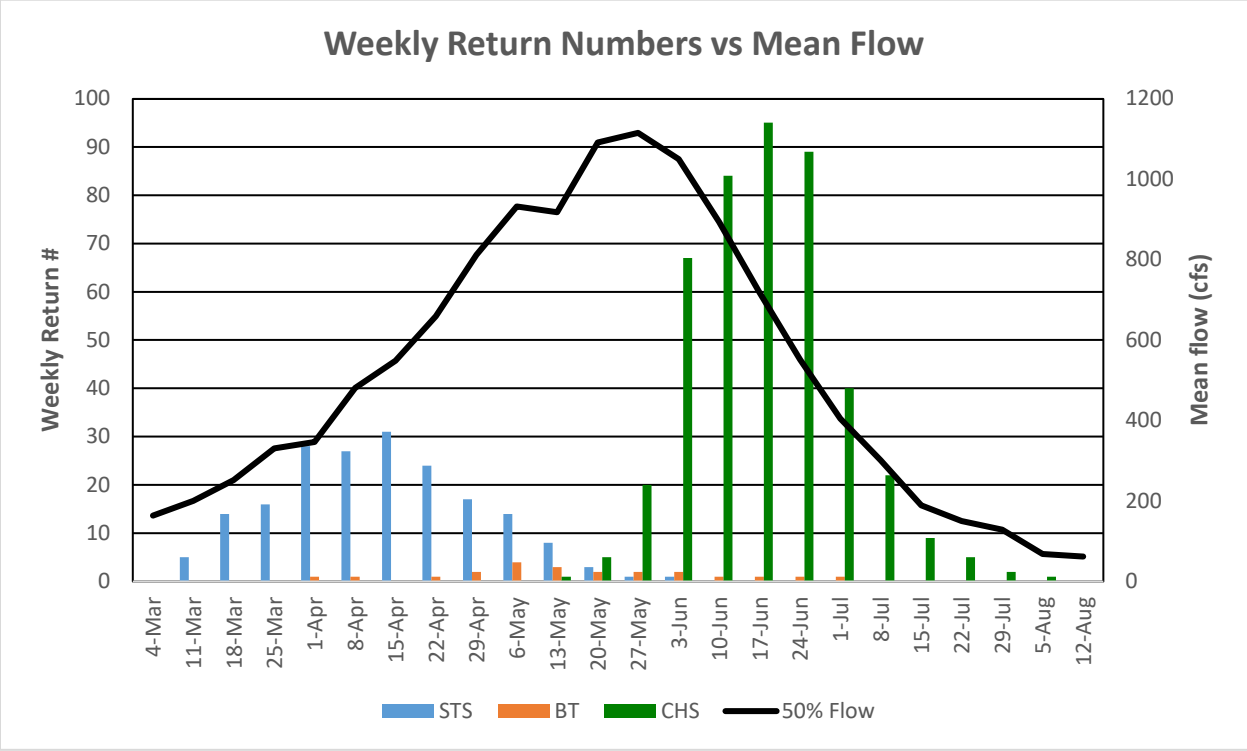


Figure 1. Fish Migration Timing

Efforts were made to incorporate a volitional upstream passage facility in the Plan. However, it was determined that construction of the temporary facility would require a significant portion of the in-water work window and leave inadequate time for construction of the permanent fishway. Therefore, the Plan

proposes a monitored trap and haul approach during construction of the Elmer Dam modifications and vertical slot fishway. Downstream fish passage will be provided continuously during the construction of the Project. The full Plan is presented in the following sections.

2.2 Construction Timeline

Construction will be completed in two phases over a two-year period starting in the late fall/winter. The construction phases are summarized in Table 1.

Table 1. Construction Phases

Construction Phase	Phase I	Phase II
Performance Period	November 1 – March 31 (Request in-water work window exemption for the installation of the reservoir intakes)	July 1 – November 30 (Request in-water work window extension)
Design Elements	• Decommission existing non-compliant intakes at Reservoirs No. 1, No. 2, and No. 3. • Install screened off-channel wet wells at Elmer Dam (to Reservoir 1) and Booth Lane. • Install screened oxbow intake structure at Reservoir No. 2 • Install underground piping from Elmer Dam wet well to Reservoir No. 1. • Install underground piping and between Reservoirs No. 1 to No. 2 and No. 2 to No. 3. • Connect new intakes to the existing distribution system outside of the irrigation season.	• Install temporary trap in the existing fishway. • Install temporary cofferdam and downstream fish bypass. • Demolish existing fishway and left abutment after spring Chinook run is complete. • Install vertical slot fishway at Elmer Dam • Install 5-ft tilting weir gate at Elmer Dam • Install overhead irrigation supply piping across Elmer Dam.

2.3 Phase I Temporary Fish Passage Plan

Phase I consists of installing the new screened intake structures, wet wells, and reservoir connections required for operation of the reservoir system. As noted in Table 1, an in-water work exemption will be requested for the installation of the pump stations and oxbow intakes outside of the irrigation season. This will allow the work to be completed when the reservoir is empty.

In-water work will require installation of temporary cofferdams around each of the proposed intake structures while the existing intakes remain operational. The contractor will coordinate with TU, USWCD, ODFW, and possibly CTUIR fish biologists for the immediate removal of fish from the work area upon installation of the cofferdams. Dewatering and/or construction activities shall not occur within the in-water work area until the fish have been removed. Fish removed from within the cofferdam will be immediately returned to Catherine Creek. Figures presented in Appendix A present the proposed cofferdam and fish exclusion barriers to be installed for Phase I construction. Note that the cofferdams presented in Appendix A are conceptual. Final alignment and design of the coffer dams will be the

responsibility of the contractor and may vary. The proposed winter in-water work will not block or impede upstream or downstream migration in Catherine Creek and no fish passage mitigation measures are proposed for winter work.

Prior to the start of the irrigation season (approximately April 1) the new intakes will be connected to the existing distribution systems. Construction of the Phase I design elements during the non-irrigation season will avoid interruption of irrigation operations.

2.4 Phase II Temporary Fish Passage Plan

Phase II construction consists of installing the new fishway and 5-foot-wide overshot gate at Elmer Dam. The construction period for Phase II is anticipated to extend from July 1st - November 15th and therefore will require an in-water work window extension. Additional time will be needed due to the extensive dewatering efforts, construction of the temporary fish passage facilities, and complex formwork required for the vertical slot fishway.

From Figure 1, approximately 9% of the Chinook return to the CTUIR Catherine Creek adult trapping facility located approximately 30 miles upstream of Elmer Dam after July 1. Similarly, very few bull trout and no steelhead adults are seen at the upstream CTUIR trapping facility in July. Because the trap data is from an upstream location, it is anticipated that the number of Chinook passing Elmer Dam during this period will occur sooner than exhibited in Figure 1. If a temporary volitional fishway was constructed, it is anticipated that any remaining Chinook will have passed Elmer Dam before it is complete. Therefore, the Phase II fish passage plan proposes an adaptive trap and haul program be employed during the early portion of the in-water work window.

Phase II construction efforts will begin with the installation of a sheet pile coffer dam upstream of Elmer Dam. During the construction of the cofferdam the dam boards and existing fishway will remain in service for both upstream and downstream passage. When it is time to close the cofferdam and dewater the existing dam and ladder (likely the second or third week of July), the flow will be diverted through a downstream bypass structure and the existing fish ladder. Appendix A, Figure 9 and Figure 10 present a plan view of the Phase II temporary bypass plan. Appendix B presents plan, section, and detail drawings of the temporary bypass structures. Note that Appendix A and Appendix B figures and drawings were developed to present the overall construction approach and key design and operational criteria of the temporary bypass facilities. The contractor is responsible for final design, construction, and operation of the temporary bypass facilities (with exception to the temporary fish trap which will be designed, installed, and operated by the CTUIR) and therefore may develop an alternative approach to construction of the temporary bypass facilities, so long as they meet the intent and criteria outlined herein.

Initially a portion of the bypass flow will be routed through the existing fish ladder to attract any remaining upstream migrants. CTUIR will install and operate a temporary fish trap within the existing ladder consisting of a finger weir and picket barrier. Stoplogs will be installed to manage pool depths and drop heights within the ladder during trapping operations. Up to 10 cfs will be diverted to the existing fish ladder for trapping operations. Water will be conveyed from the coffer dam through an 18-inch-diameter pipe to the existing ladder entrance. Flow through the pipe will be controlled with a sluice gate installed on the upstream face of the coffer dam. The contractor will fabricate a water-tight barrier to be installed at the fish ladder exit to prevent backwatering of the work area. The 18-inch pipe will penetrate the barrier and discharge into the first bay of the ladder. The pipe outlet will be submerged within the ladder pool to reduce turbulence within the fish trap and reduce potential for fish to jump at the pipe outlet. The picket

weir, provided by CTUIR, will be located downstream of the pipe outlet and will prevent upstream migrants from exhausting themselves by attempting to swim through the pipe.

When CTUIR is performing fish removal and transfer operations, the sluice gate can be closed and the trap partially drained to crowd fish, if necessary. CTUIR will haul and release fish above the Catherine Creek Acclimation Facility. CTUIR may utilize some of the trapped fish for spawning. Final operational requirements for the trap (i.e., frequency in which the trap is checked by CTUIR, handling and transfer methods, duration of trap operations, etc.) will be negotiated between CTUIR and ODFW and finalized prior to the start of any Phase II dewatering activities. Once trapping operations have completed, all the flow will be diverted to the downstream bypass channel. The cofferdam will be extended downstream of the dam and dewatering of the left bank will commence in preparation for demolition of the existing fishway and installation of the new vertical slot fishway and tilting weir gate. All bypass discharge will be routed through the bypass channel and released into the tail race.

The downstream bypass structure consists of an adjustable weir, a plunge pool, and a cofferdam extending downstream through the existing spillway apron. The adjustable stoplog weir is designed to pass between 3 and 100 cfs. The stoplog weir will be adjusted by the Contractor to maintain a minimum depth of 1 foot over the weir for downstream migrants. The weir discharges into a 12-foot-long by 8-foot-wide by 4-foot-deep (minimum dimensions) plunge pool. The plunge pool is designed to provide adequate depth and energy dissipation for downstream migrating fish. The plunge pool will also be equipped with an adjustable weir at the downstream end of the pool to allow the contractor to maintain pool depth and a minimum 1 foot of depth over the plunge pool weir. Finally, the supersack cofferdam will extend downstream to the spillway apron to contain water to the north side of the channel and spillway. The Contractor may choose an alternative method to construct the temporary downstream bypass structure so long as it meets the criteria outlined above and summarized in Table 2. Supersack construction was presented because it can be used in tandem with visqueen to contain water. In addition, supersacks can be moved relatively easily with an excavator to adjust to changing flow conditions.

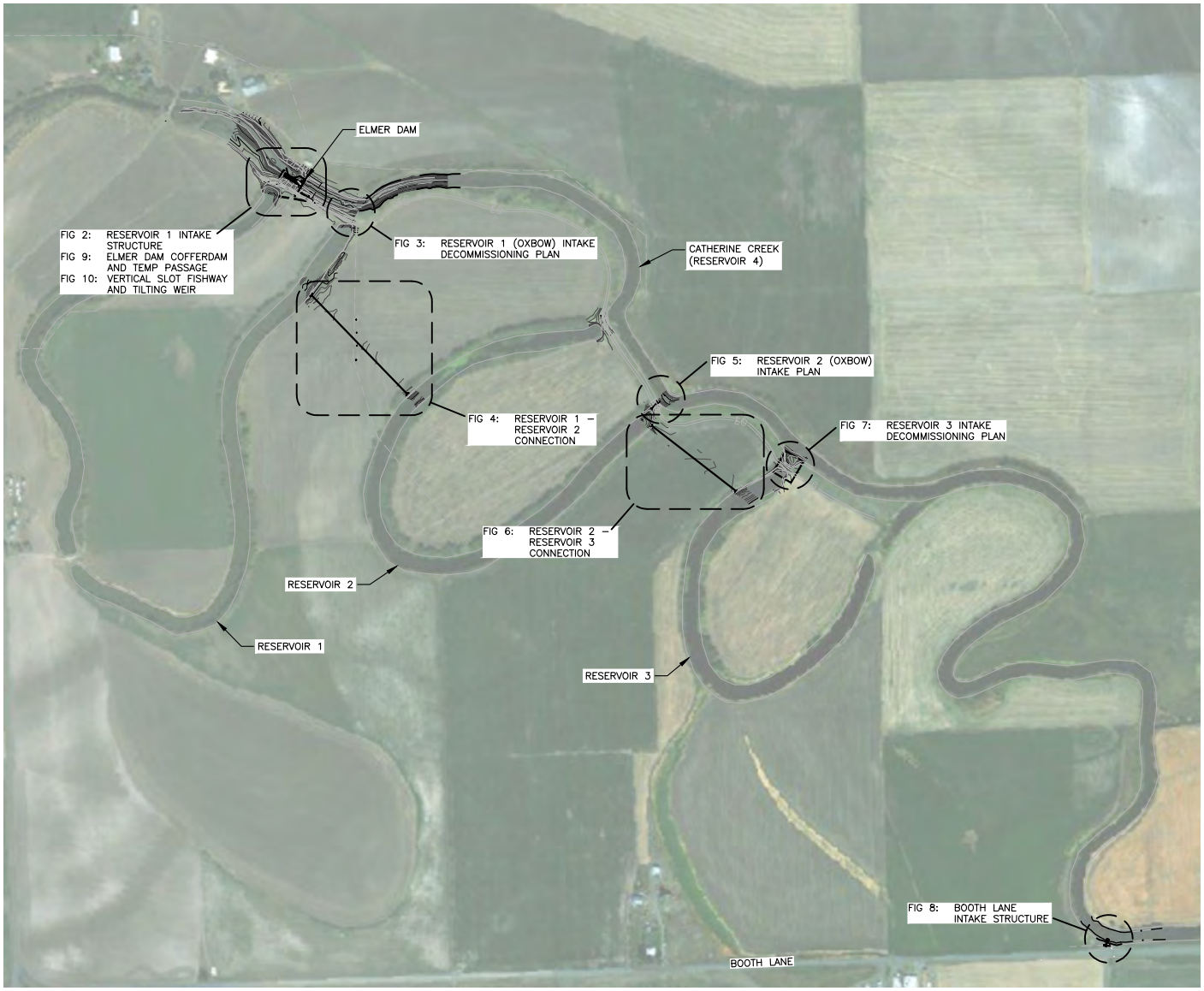
Based on discussions with the local ODFW fisheries biologists, downstream migrants are not anticipated in this reach during the upstream trapping period (early July).

After the construction of the dam and fishway improvements are completed, the cofferdam will be removed, and the dam restored to its winter operating regime with the primary spillway open to allow upstream and downstream passage until the following irrigation season.

Table 2. Temporary Downstream Bypass and Trap Criteria

Criteria	Value	Responsible Party	Comments
Temporary Trapping Facility			
Water Supply	10 cfs (max)	Contractor	Water supply shall be adjustable with gate or valve adjustment.
Trapping Period	Early July	CTUIR	Trapping period to begin with installation of the coffer dam. End of operations to be negotiated between CTUIR and ODFW based on fish return timing.
Fish Handling/ Transfer method	TBD	CTUIR	Fish handling to be negotiated between CTUIR and ODFW.
Trap Check Frequency	TBD	CTUIR	Frequency of trap check to be negotiated between CTUIR and ODFW.
Downstream Bypass Channel			
Discharge Capacity	3 – 100 cfs	Contractor	Contractor shall coordinate with the landowners/irrigators on management of the forebay water surface elevation and discharge through the weir.
Weir Operational Range	2683.00 ft – 2676.50 ft	Contractor	Stoplog weir shall be able to regulate flows over 6.5' range of forebay elevations.
Min. Weir Depth	1 ft	Contractor	Minimum depth of flow over downstream bypass weirs and dam apron shall be 1 foot.
Min. Plunge Pool Depth	4 ft	Contractor	Adjust plunge pool sandbag weir to maintain minimum plunge pool depth.
Min. Plunge Pool Dimensions	12ft long x 8 ft wide	Contractor	Dimensions are based on maintaining an energy dissipation factor of less than 60 ft-lbs/s/ft^3 for full range of design flows.

APPENDIX A
TEMPORARY FISH PASSAGE PLAN FIGURES



OVERALL SITE KEY PLAN

SCALE: 1"= 1000'

0" 1000' 2000'

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TITLE:

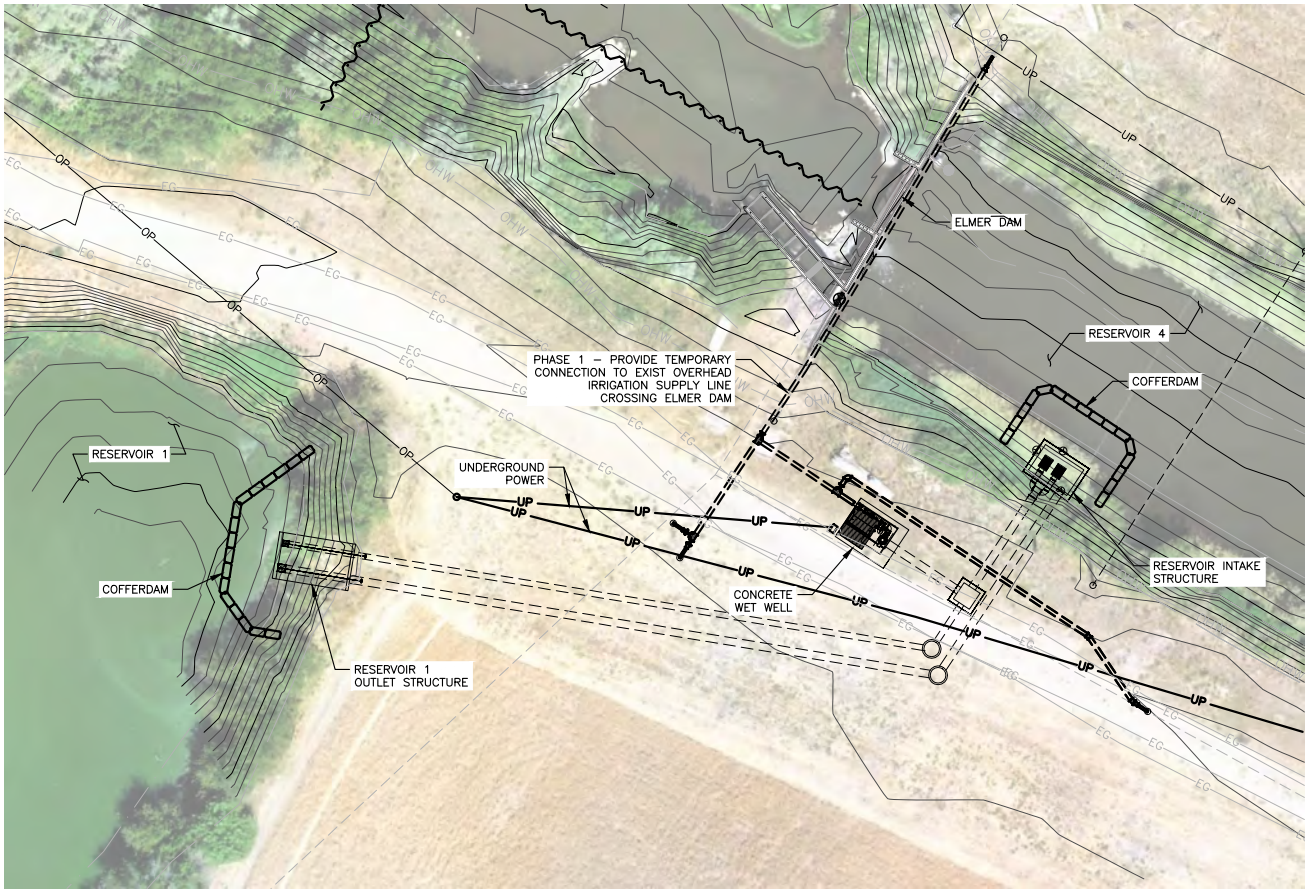
TROUT UNLIMITED
ELMER DAM
TEMPORARY FISH PASSAGE PLAN

River Structures CONSULTING

DRAWN:	CHECKED:	DATE:
J. LAHMON	J. WOODBURY	11/05/21

FIGURE: 1

Path: C:\Users\User\River Structures Consulting\Chris Boyd - c_Projects\Trout Unlimited\Elmer Dam\Temp Passage Report\Plan Figures\Figures.dwg Plot date: Jun 29, 2022 10:56am, CAD User: User



RESERVOIR 1 INTAKE STRUCTURE PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - INSTALL RESERVOIR INTAKE STRUCTURE.
  - INSTALL RESERVOIR 1 OUTLET STRUCTURE.
  - INSTALL CONCRETE WET WELL WITH PUMPS, VFD, AND CONTROLS.
  - INSTALL UNDERGROUND IRRIGATION SUPPLY PIPING.
  - CONNECT NEW UNDERGROUND IRRIGATION SUPPLY PIPING TO EXIST ABOVE GROUND IRRIGATION LINE ACROSS ELMER DAM.
  - INSTALL UNDERGROUND POWER TO RESERVOIR 1 AND RESERVOIR 2 WET WELLS.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN–WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TITLE:

TROUT UNLIMITED
ELMER DAM
TEMPORARY FISH PASSAGE PLAN

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FIGURE:

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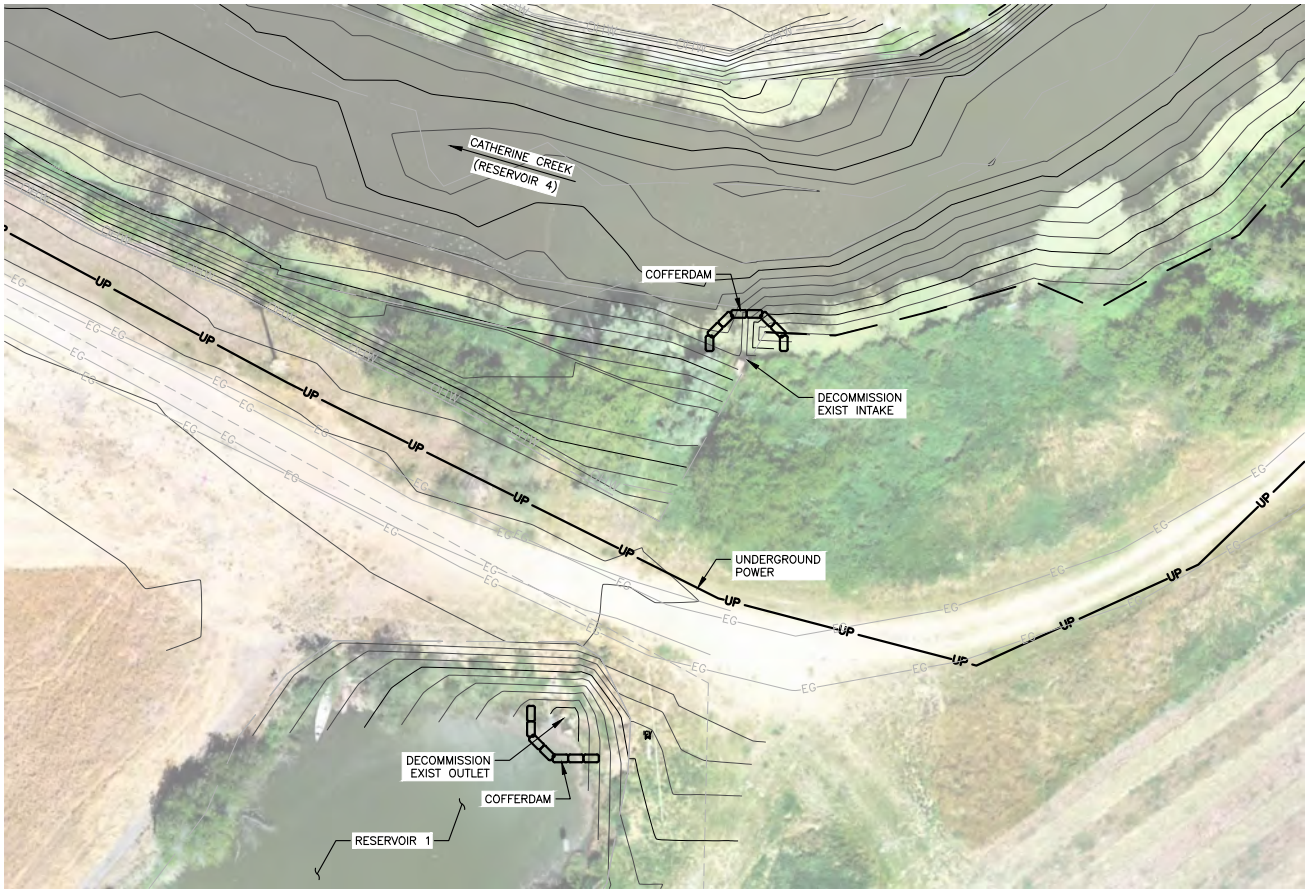

RESERVOIR 1 INTAKE DECOMMISSIONING PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - DECOMMISSION EXISTING INTAKE AND OUTLET STRUCTURE TO RESERVOIR 1.
  - INSTALL UNDERGROUND POWER TO RESERVOIR 2 INTAKE WET WELL.
  - REGRADE AND RE-VEGETATE DISTURBED AREAS.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TITLE:

TROUT UNLIMITED
ELMER DAM
TEMPORARY FISH PASSAGE PLAN

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J. LAHMON	J. WOODBURY	11/05/21

FIGURE:

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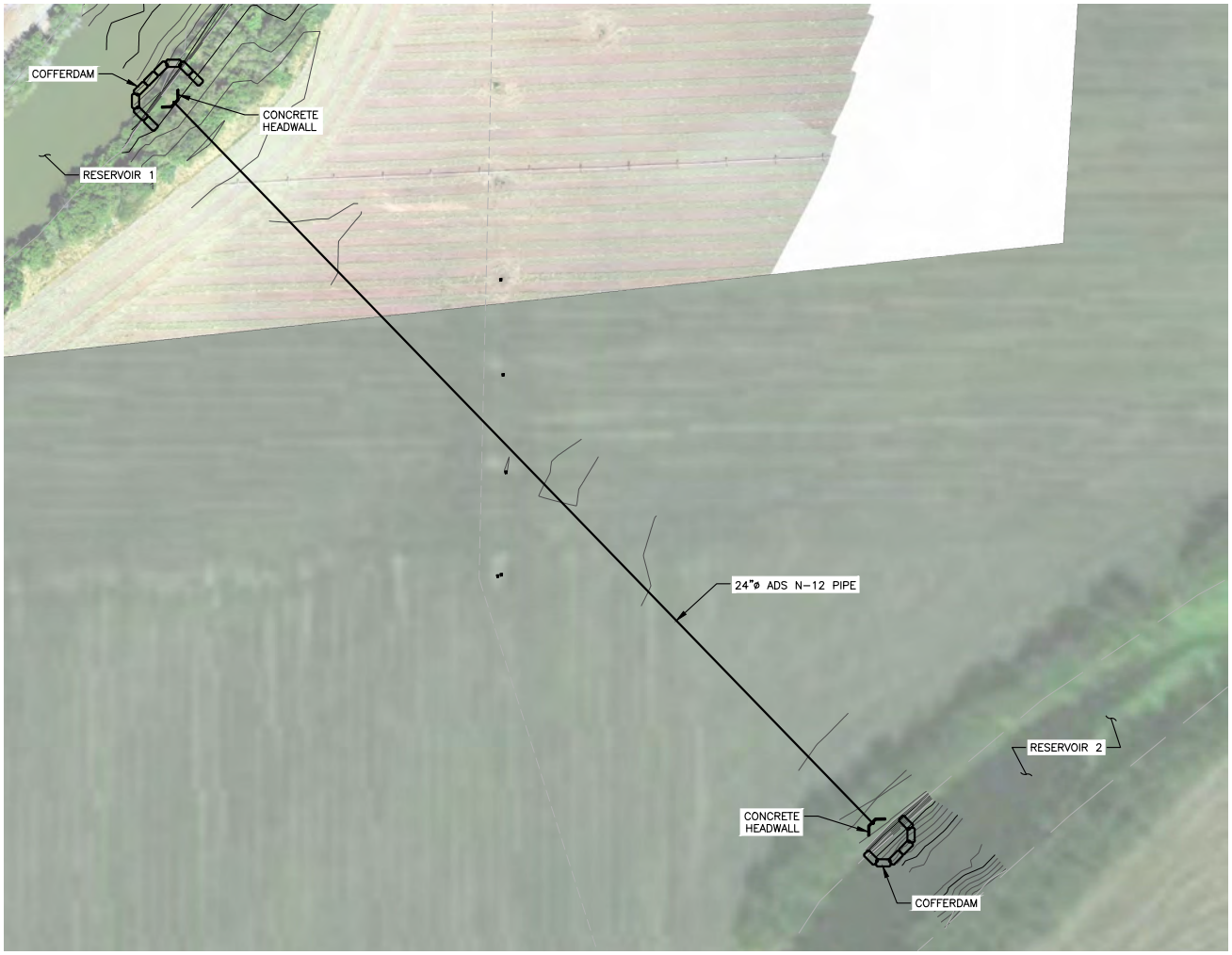

RESERVOIR 1 – RESERVOIR 2 CONNECTION PLAN

SCALE: 1"= 50'

0' 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - INSTALL CONCRETE HEADWALLS AND 24"ø ADS N-12 PIPE TO CREATE HYDRAULIC CONNECTION BETWEEN RESERVOIR 1 AND RESERVOIR 2.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TITLE:

TROUT UNLIMITED
ELMER DAM
TEMPORARY FISH PASSAGE PLAN

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FIGURE:

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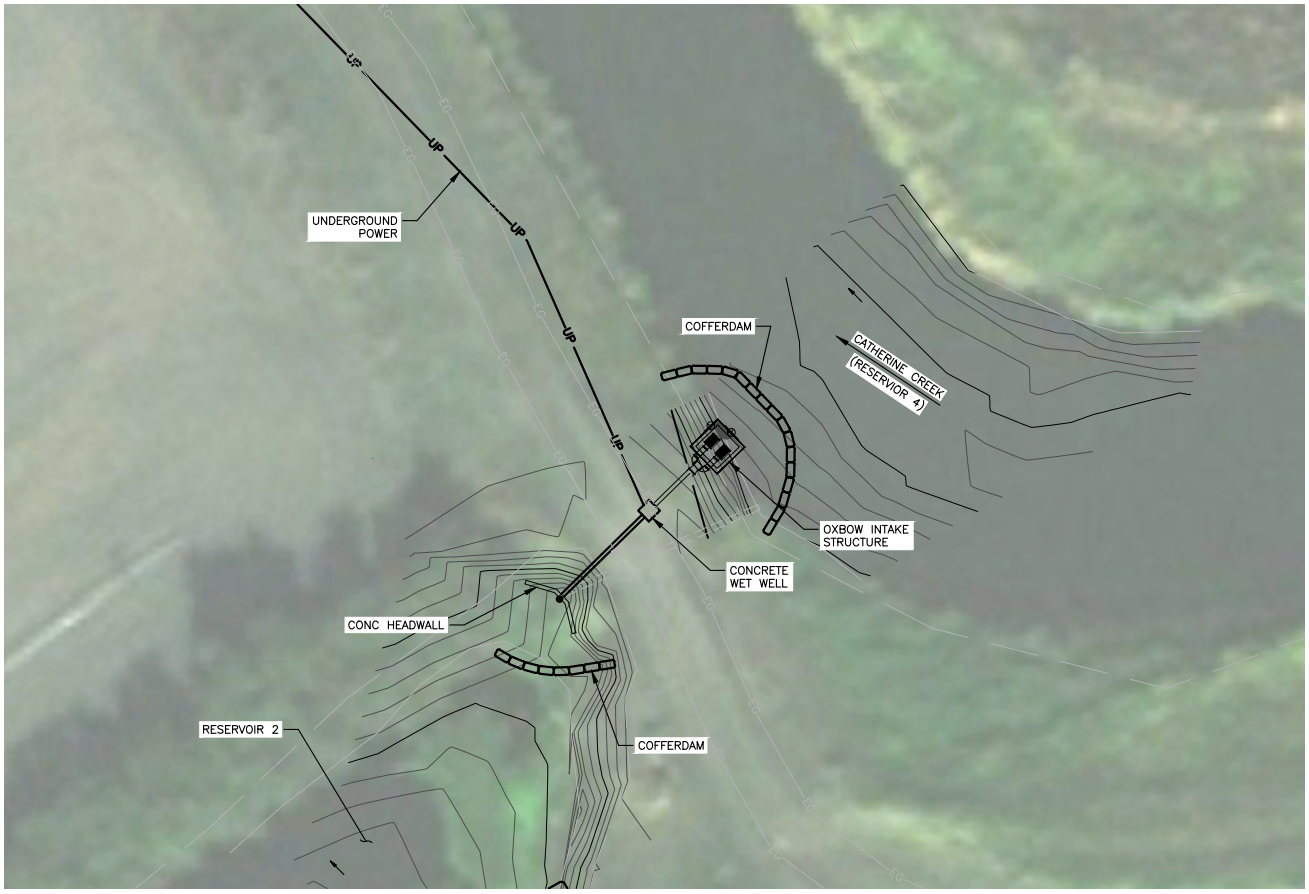

RESERVOIR 2 (OXBOW) INTAKE PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - INSTALL OXBOW INTAKE STRUCTURE.
  - INSTALL CONCRETE WET WELL.
  - INSTALL CONCRETE HEADWALL.
  - INSTALL UNDERGROUND POWER TO WET WELL.
  - REGRADE AND RE-VEGETATE DISTURBED AREAS.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TITLE:

TROUT UNLIMITED
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TEMPORARY FISH PASSAGE PLAN

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FIGURE:

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RESERVOIR 2 – RESERVOIR 3 CONNECTION PLAN

SCALE: 1"= 50'

0' 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - INSTALL CONCRETE HEADWALLS AND 24"ø ADS N-12 PIPE TO CREATE HYDRAULIC CONNECTION BETWEEN RESERVOIR 2 AND RESERVOIR 3.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

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FIGURE:

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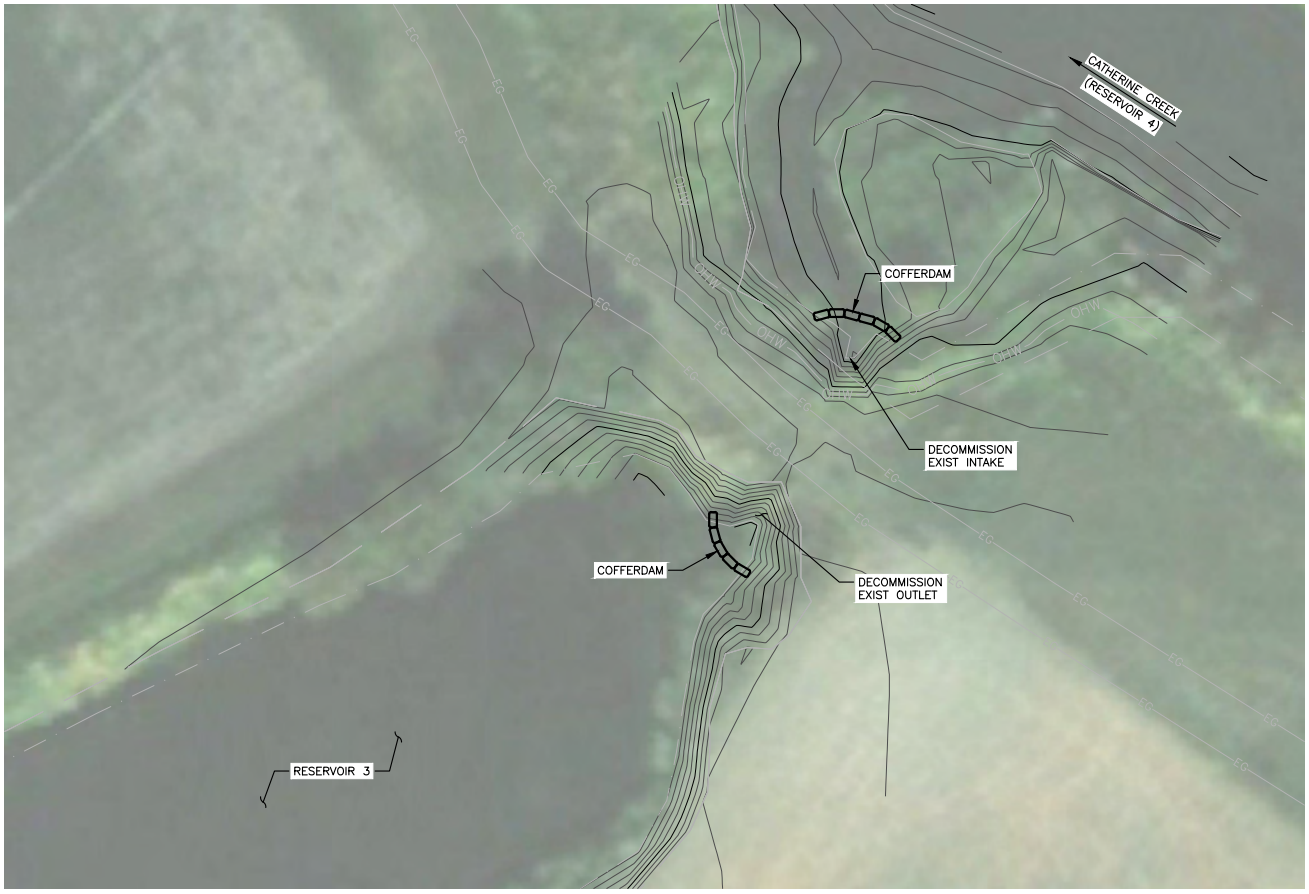

RESERVOIR 3 INTAKE DECOMMISSIONING PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - DECOMMISSION EXISTING INTAKE AND OUTLET STRUCTURE TO RESERVOIR 3.
  - REGRADE AND RE-VEGETATE DISTURBED AREAS.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - COFFERDAM DESIGN AND DEWATERING MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

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TEMPORARY FISH PASSAGE PLAN

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FIGURE:

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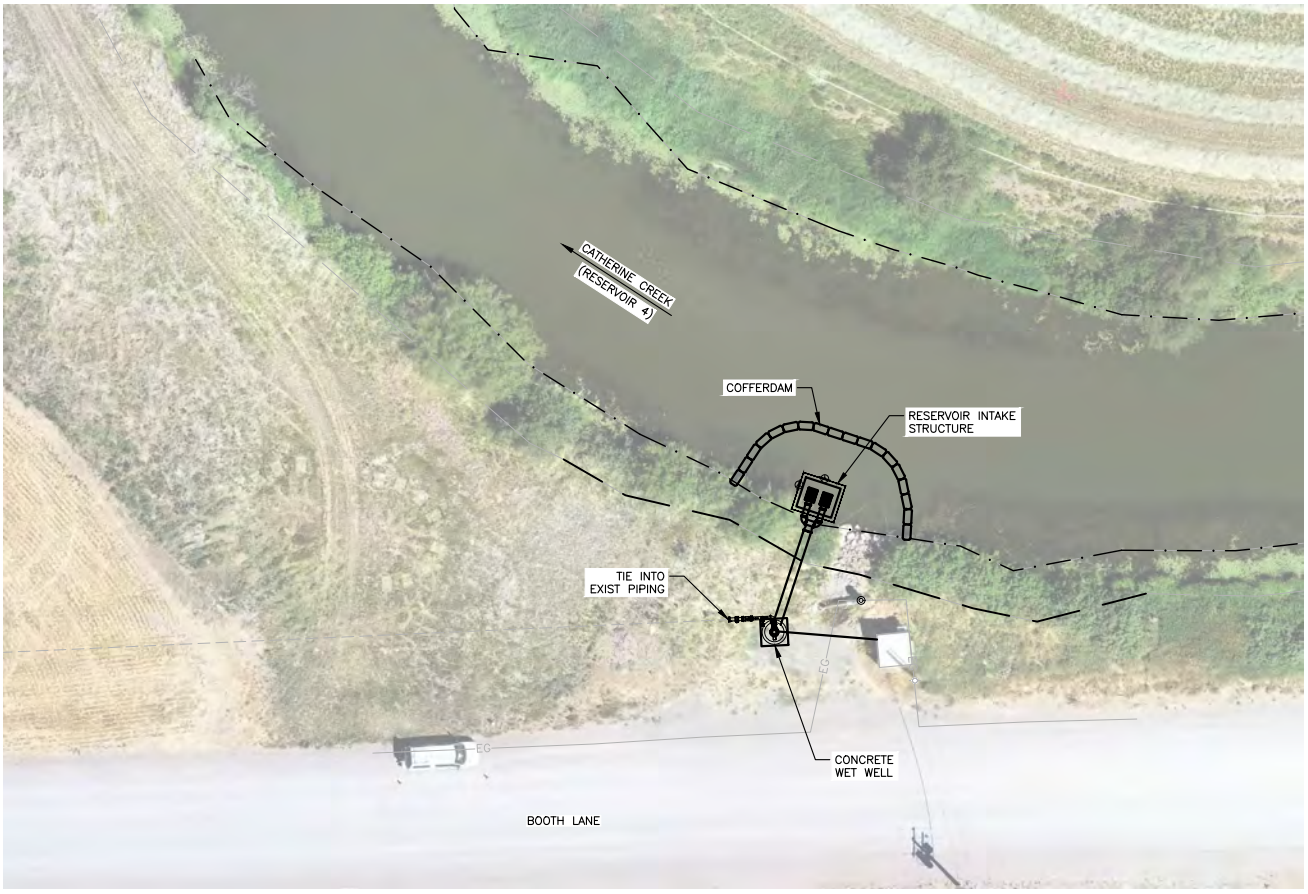

BOOTH LANE INTAKE STRUCTURE PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 1
- WORK PERIOD: NOVEMBER 1 – DECEMBER 15
- WORK ITEMS:
  - INSTALL RESERVOIR INTAKE STRUCTURE AT BOOTH LANE.
  - INSTALL CONCRETE WET WELL.
  - CONNECT TO EXISTING PIPING AND POWER.
  - REGRADE AND RE–VEGETATE DISTURBED AREAS.
- FISH PASSAGE MEASURES
  - FISH REMOVAL SHALL OCCUR AFTER INSTALLATION OF TEMPORARY COFFERDAMS.
  - CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN–WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
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FIGURE:

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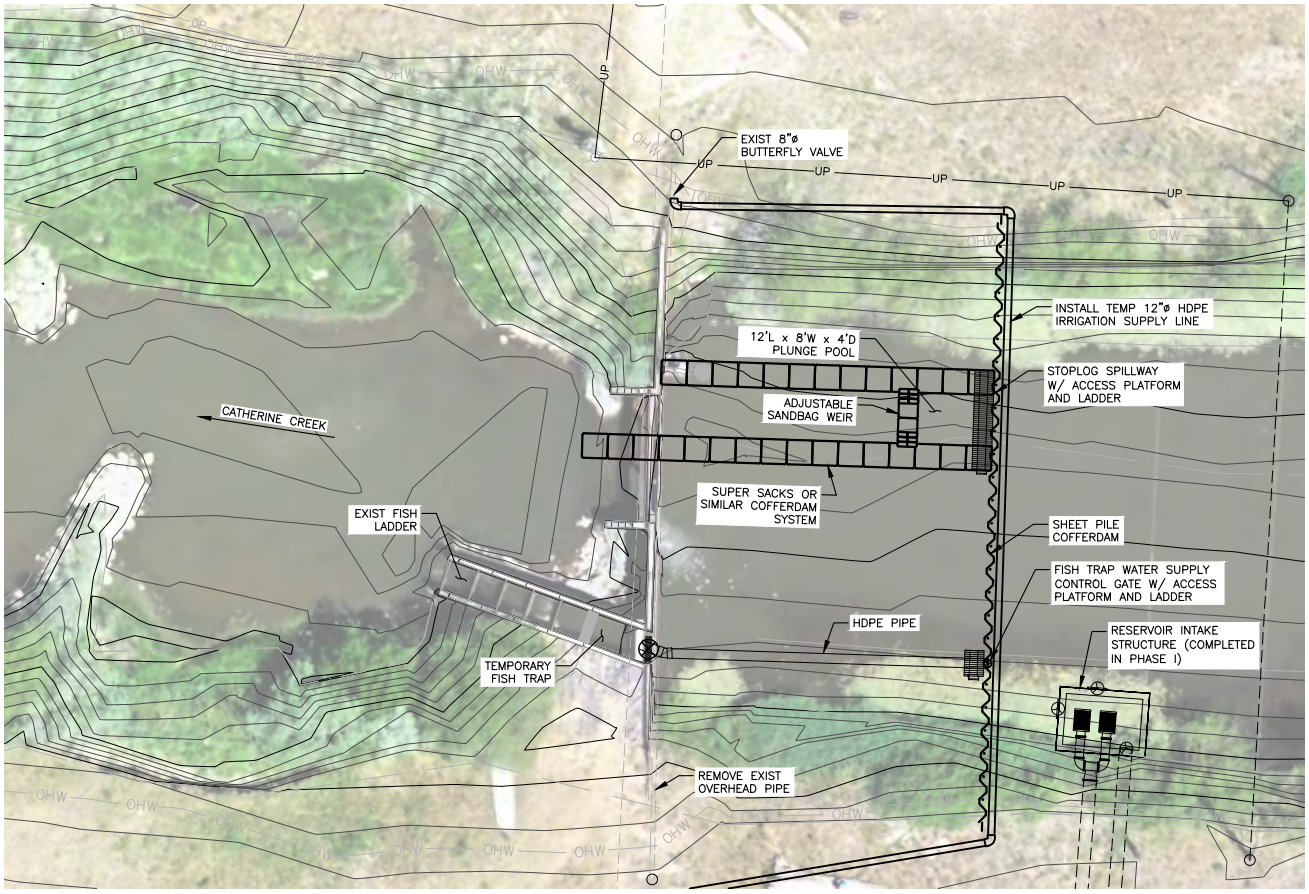

ELMER DAM COFFER DAM AND TEMPORARY PASSAGE PLAN

SCALE: 1"= 30'

0' 15' 30'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 2A
- WORK PERIOD: JULY 1 – NOVEMBER 30
- WORK ITEMS:
  - INSTALL SHEET PILE COFFERDAM.
  - INSTALL ADJUSTABLE STOPLOG WEIRS, PLUNGE POOL, AND BYPASS CHANNEL.
  - INSTALL HDPE WATER SUPPLY PIPE TO EXIST FISH LADDER.
  - INSTALL FISH TRAP IN EXIST FISH LADDER (BY CTUIR).
  - BEGIN EXCAVATION OF LEFT BANK.
  - INSTALL TEMPORARY 12"ø HDPE IRRIGATION SUPPLY PIPE
  - REMOVE EXIST 8"ø OVERHEAD IRRIGATION SUPPLY PIPE.
- FISH PASSAGE MEASURES
  - CONTRACTOR SHALL COORDINATE WITH TU, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - THE ADJUSTABLE STOPLOG WEIRS, PLUNGE POOL, AND BYPASS CHANNEL WILL PROVIDE DOWNSTREAM PASSAGE FOR THE DURATION OF THE PHASE 2 WORK PERIOD.
  - CTUIR WILL OPERATE AND INSPECT THE TRAP AS WELL AS HANDLE, TRANSPORT, AND RELEASE UPSTREAM CHINOOK MIGRANTS UPSTREAM OF THE DAM.
  - FISH TRAP AND HAUL OPERATIONS SHALL CONTINUE THROUGH THE MONTH OF JULY OR UNTIL THE TRAP HAS BEEN CLEAR OF FISH FOR A PERIOD OF TIME TO BE AGREED UPON BETWEEN ODFW AND CTUIR PRIOR TO START OF CONSTRUCTION.

TITLE:

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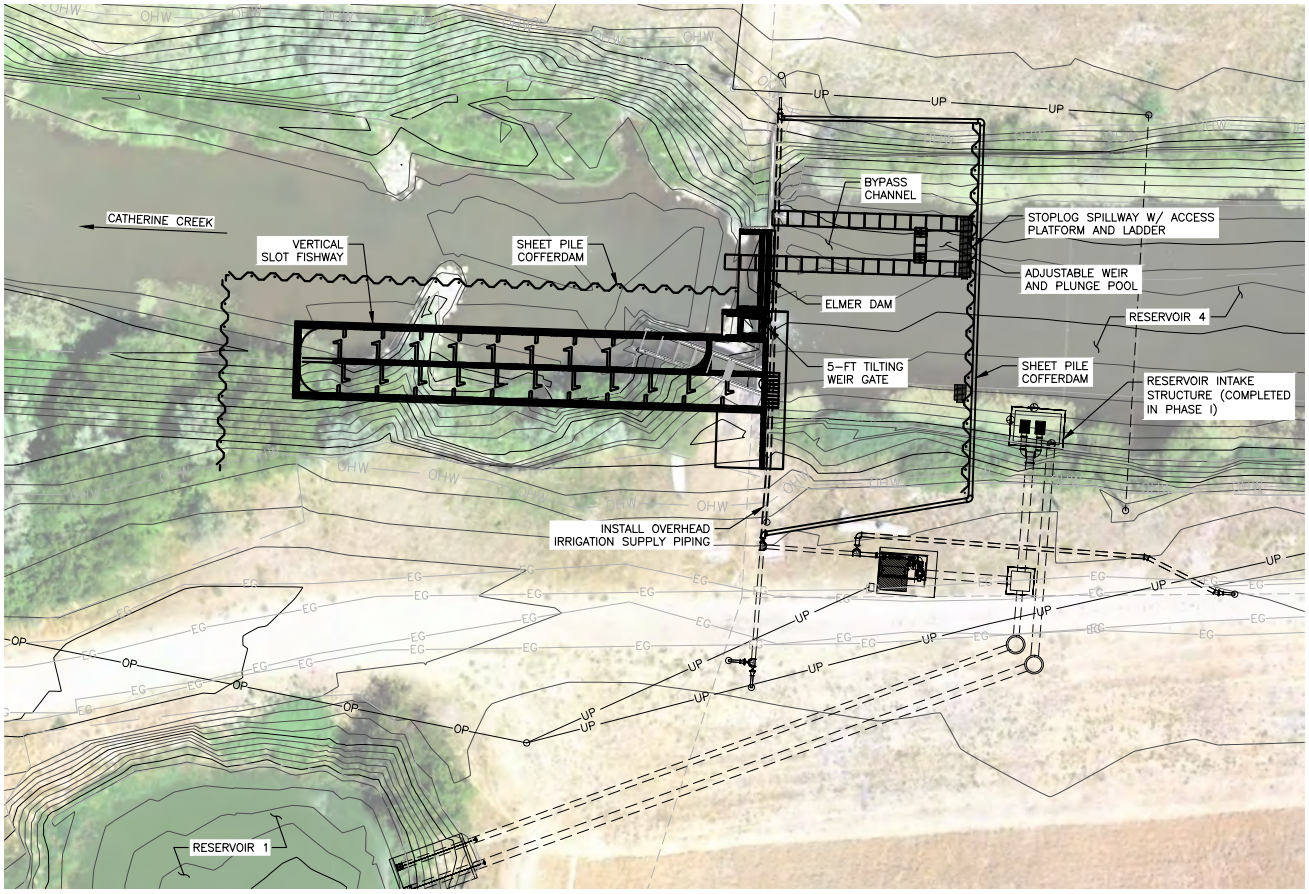
FIGURE:

9



VERTICAL SLOT FISHWAY AND TILTING WEIR PLAN

SCALE: 1"= 50'

0" 25' 50'

N

TEMPORARY PASSAGE PLAN NOTES:

- PHASE 2B
- WORK PERIOD: JULY 1 – NOVEMBER 30
- WORK ITEMS:
  - INSTALL SHEET PILE COFFERDAM DOWNSTREAM OF ELMER DAM.
  - DEMOLISH EXIST FISH LADDER AND CONCRETE WINGWALL.
  - INSTALL 5-FT TILTING WEIR GATE AT ELMER DAM.
  - INSTALL VERTICAL SLOT FISHWAY AT ELMER DAM.
  - INSTALL NEW OVERHEAD IRRIGATION PIPING ACROSS ELMER DAM.
  - REGRADE AND RE-VEGETATE DISTURBED AREAS.
- FISH PASSAGE MEASURES
  - DOWNSTREAM FISH MIGRATION AND BYPASS FLOWS SHALL BE PROVIDED FOR DURATION OF THE WORK PERIOD THROUGH THE ADJUSTABLE STOPLOG WEIRS, PLUNGE POOL AND BYPASS CHANNEL.
  - CONTRACTOR SHALL COORDINATE WITH TU, USWCD, ODFW AND CTUIR FOR IMMEDIATE REMOVAL OF FISH FROM WORK AREA.
  - CONSTRUCTION ACTIVITIES WITHIN IN-WATER WORK AREA SHALL NOT BEGIN UNTIL FISH REMOVAL HAS OCCURRED.
  - UPON COMPLETION OF THE WORK, ALL TEMPORARY FISH PASSAGE AND COFFERDAM WORKS SHALL BE REMOVED.

TITLE:

TROUT UNLIMITED
ELMER DAM
TEMPORARY FISH PASSAGE PLAN

River Structures CONSULTING

DRAWN:	CHECKED:	DATE:
J. LAHMON	J. WOODBURY	11/05/21

FIGURE:

10

APPENDIX B
TEMPORARY FISH PASSAGE PLAN DRAWINGS

NOTES:

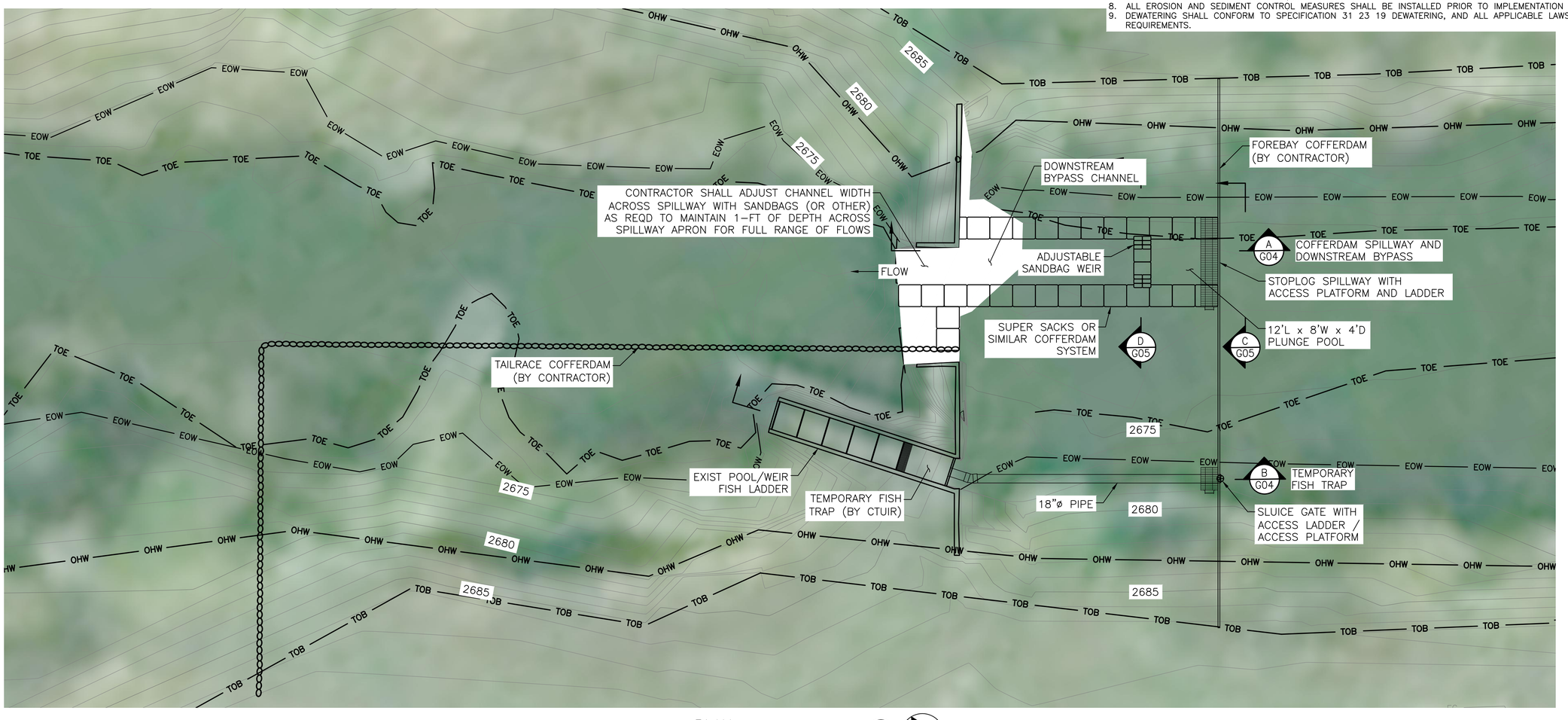
1. THE DAM AND FISHWAY CONCEPTUAL COFFERDAM PLAN PRESENTED ON SHEETS G03, G04, AND G05 ARE FOR REGULATORY APPROVAL AND THE CONTRACTOR'S UNDERSTANDING OF THE DEWATERING AND TEMPORARY FISH PASSAGE AND TRAPPING MEASURES REQUIRED FOR CONSTRUCTION OF ELMER DAM MODIFICATIONS.
2. THE TEMPORARY FACILITIES SHOWN IN THE PLAN SET ARE INFORMATIONAL ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, IMPLEMENTATION, OPERATION AND MAINTENANCE AND REMOVAL OF ALL TEMPORARY DEWATERING, DOWNSTREAM FISH PASSAGE AND FISH TRAP WATER SUPPLY MEASURES. THE CONTRACTOR SHALL DESIGN AND IMPLEMENT THE TEMPORARY FACILITIES IN ACCORDANCE WITH THE CRITERIA PRESENTED IN THE DRAWINGS AND THE TEMPORARY FISH PASSAGE PLAN.
3. THE CONTRACTOR'S COFFERDAM STRUCTURAL DESIGN AND INSTALLATION PLANS SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OREGON.
4. THE CONTRACTOR SHALL SUBMIT THE DESIGN OF THE ABOVE MEASURES AS PART OF THE CONTRACTOR'S DEWATERING PLAN. THE DEWATERING PLAN SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

FISH TRAPPING NOTES:

1. THE CONSTRUCTION WINDOW OVERLAPS WITH THE IN-MIGRATION WINDOW FOR CATHERINE CREEK SPRING CHINOOK.
2. THE CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION (CTUIR) SHALL BE RESPONSIBLE FOR IMPLEMENTATION AND OPERATION OF A TEMPORARY FISH TRAP WITHIN THE EXISTING FISHWAY, IN ACCORDANCE WITH THE TEMPORARY FISH PASSAGE PLAN, TO MITIGATE FOR DISRUPTION OF SPRING CHINOOK MIGRATION DUE TO CONSTRUCTION OF ELMER DAM MODIFICATIONS.
3. THE CONTRACTOR SHALL DESIGN AND IMPLEMENT A WATER SUPPLY SYSTEM BETWEEN THE FOREBAY COFFERDAM AND THE FISH TRAP. THE WATER SUPPLY SYSTEM SHALL BE EQUIPPED WITH FLOW CONTROLS (SLUICE GATE) AND BE ABLE TO DELIVER UP TO 10 CFS TO THE FISH TRAP.
4. ONLY QUALIFIED CTUIR STAFF SHALL BE INVOLVED WITH FISH TRAPPING OPERATIONS.
5. CTUIR SHALL BE RESPONSIBLE FOR FIELD ADJUSTING THE FISH TRAP WATER SUPPLY RATES AND STOPLOG HEIGHTS BASED ON THE NEEDS OF TRAPPING OPERATIONS AS WELL AS TAILWATER LEVELS IN CATHERINE CREEK. THE WATER SUPPLY SHALL BE THROTTLED AS NEEDED TO MINIMIZE TURBULENCE WITHIN THE TRAP TO PREVENT FISH EXHAUSTION.

DEWATERING NOTES:

1. CONSTRUCTION OF THE ELMER DAM MODIFICATIONS REQUIRES DEWATERING OF THE FOREBAY AND LEFT BANK OF THE TAILRACE. THE PRIMARY FOREBAY DEWATERING MEASURES SHALL INCLUDE THE FOREBAY COFFERDAM, DOWNSTREAM BYPASS, FISH TRAP WATER SUPPLY AND DEWATERING PUMPS.
2. THE FOREBAY COFFERDAM SHALL HAVE A MINIMUM TOP OF WALL ELEVATION OF 2884' AND PROVIDE A MAXIMUM FOREBAY ELEVATION OF 2883'. THE FOREBAY COFFERDAM SHALL BE EQUIPPED WITH AN ADJUSTABLE STOPLOG SPILLWAY AND WATER SUPPLY INTAKE GATE FOR THE FISH TRAP. THE STOPLOG SPILLWAY SHALL HAVE A MAX DISCHARGE CAPACITY OF 100 CFS. THE TEMPORARY TRAP WATER SUPPLY SHALL PROVIDE A MAX DISCHARGE OF 10 CFS. SEE SHEETS G04 AND G05 FOR ADDITIONAL CRITERIA AND DETAILS.
3. A DOWNSTREAM BYPASS CHANNEL SHALL BE CONSTRUCTED TO TRANSPORT RIVER FLOWS AND DOWNSTREAM MIGRATING FISH BETWEEN COFFERDAM SPILLWAY AND ELMER DAM. THE DOWNSTREAM BYPASS CHANNEL SHALL MAINTAIN A MINIMUM DEPTH OF 4' IN THE PLUNGE POOL AND 1' ACROSS THE SPILLWAY WEIR, PLUNGE POOL WEIR AND ELMER DAM SPILLWAY. THE CONTRACTOR SHALL PROVIDE DOWNSTREAM FISH PASSAGE IN ACCORDANCE WITH ODFW AND NMFS FISH PASSAGE CRITERIA FOR THE DURATION OF THE WORK.
4. INSTALLATION OF THE TAILRACE COFFERDAM SHALL PROCEED UPON COMPLETION OF THE TEMPORARY FISH TRAPPING OPERATIONS. THE CONTRACTOR MUST RECEIVE WRITTEN APPROVAL FROM ODFW IN ACCORDANCE WITH THE TEMPORARY FISH PASSAGE PLAN TO PROCEED WITH THE TAILRACE COFFERDAM INSTALLATION.
5. THE TAILRACE COFFERDAM HEIGHT AND STYLE SHALL BE DETERMINED BY THE CONTRACTOR. BOTH FOREBAY AND TAILRACE COFFERDAM STRUCTURAL DESIGN CALCULATIONS AND PLANS SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OREGON AND SUBMITTED FOR APPROVAL BY THE ENGINEER.
6. THE CONTRACTOR SHALL COORDINATE WITH TROUT UNLIMITED, UNION SOIL AND WATER CONSERVATION DISTRICT (USWCD) AND ODFW ON FISH REMOVAL PRIOR TO DEWATERING THE FOREBAY OR TAILRACE.
7. THE CONTRACTOR'S DEWATERING PLAN SHALL ADDRESS TURBIDITY TREATMENT AND EROSION CONTROL MEASURES FOR SEEPAGE WATER REMOVAL FROM THE DEWATERED AREAS. ALL DISCHARGE FROM THE WORK AREA SHALL MEET LOCAL, STATE AND FEDERAL DISCHARGE REQUIREMENTS.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO IMPLEMENTATION OF DEWATERING WORK.
9. DEWATERING SHALL CONFORM TO SPECIFICATION 31 23 19 DEWATERING, AND ALL APPLICABLE LAWS, REGULATIONS AND REQUIREMENTS.



PLAN
SCALE: 1"=10'-0"

REV	DATE	BY	DESCRIPTION
0	06/17/22	CCB	ISSUED FOR CONSTRUCTION

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

Quadrant Consulting, Inc.

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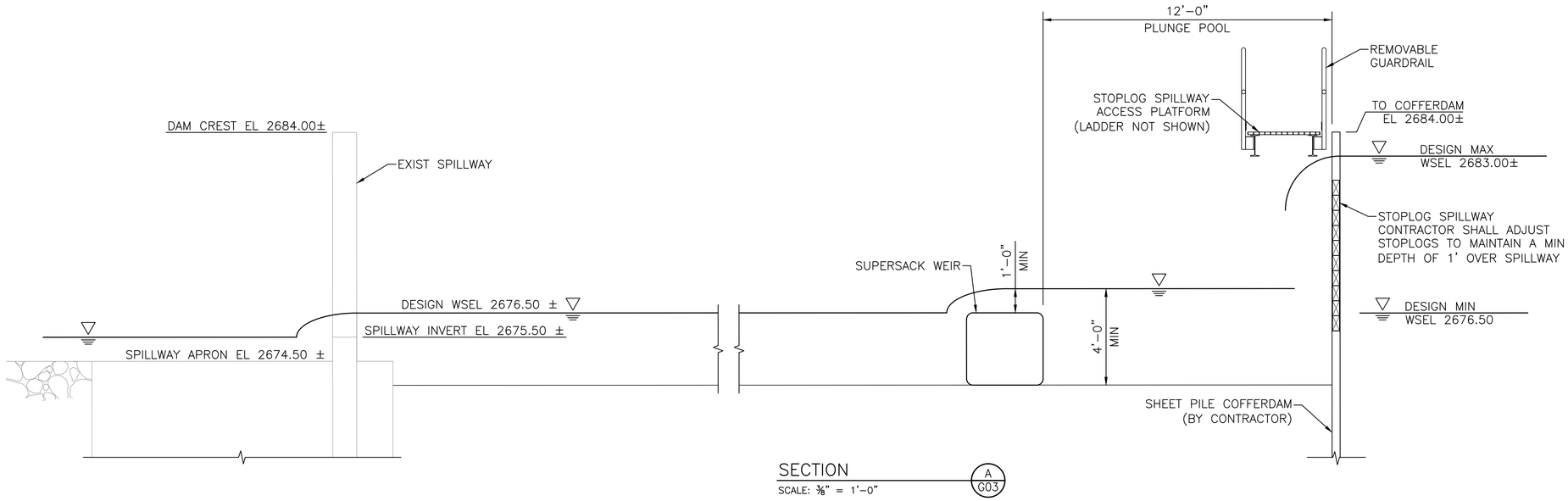
PO BOX 1643 | BOISE, ID 83701 | RIVERSTRUCTURES.COM

TU/USWCD
ELMER DAM MODIFICATIONS
DAM & FISHWAY
CONCEPTUAL COFFERDAM PLAN

DESIGNED J. WOODBURY
DRAWN J. LAHMON
CHECKED C. BOYD
ISSUED DATE 06/17/22

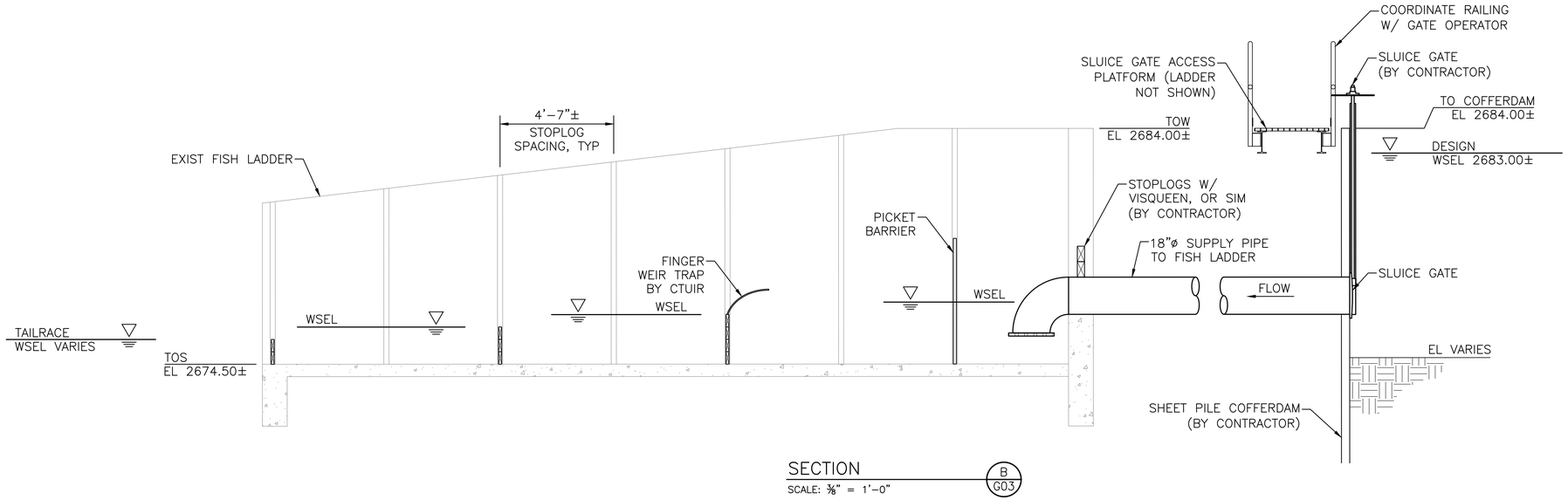
DRAWING
G03
SCALE: AS NOTED



SECTION
SCALE: ⅜" = 1'–0"
A
G03

NOTES:

1. INSTREAM FLOWS SHALL BE PROVIDED THROUGH A COMBINATION OF PIPED FLOW THROUGH THE EXIST FISH LADDER AND BYPASS SPILLWAY FLOW.
2. THE CONTRACTOR SHALL COORDINATE WITH LAND OWNERS/IRRIGATORS ON FOREBAY WATER LEVEL MANAGEMENT.
3. THE CONTRACTOR SHALL ADJUST STOPLOG HEIGHTS TO MAINTAIN 1 FT OF DEPTH OVER THE WEIR FOR RANGE OF BYPASS FLOWS, TYP 20–30 CFS (TOTAL).
4. THE BYPASS SPILLWAY SHALL BE CAPABLE OF PASSING FLOWS UP TO 100 CFS.
5. CONTRACTOR SHALL ADJUST SANDBAG PLACEMENT AT THE PLUNGE POOL WEIR AND EXIST SPILLWAY APRON TO MAINTAIN A MINIMUM OF 1 FT OF DEPTH.



SECTION
SCALE: ⅜" = 1'–0"
B
G03

TRAP NOTES:

1. CONTRACTOR SHALL PROVIDE AND INSTALL ALL COMPONENTS (SLUICE GATE, PIPE, WATER TIGHT CONNECTION TO LADDER, ETC) FOR UP TO 10 CFS WATER SUPPLY TO FISH LADDER.
2. CONTRACTOR SHALL INSTALL A PICKET BARRIER W/ 1" MAX OPENING OR SIM TO PREVENT FISH MIGRATION UPSTREAM THROUGH PIPE.
3. CTUIR SHALL INSTALL AND OPERATE FISH TRAP TO FIT IN EXIST FISH LADDER IN ACCORDANCE WITH THE TEMPORARY FISH PASSAGE PLAN.
4. CTUIR STAFF SHALL REGULATE THE FLOW TO THE FISH TRAP BY ADJUSTING THE SLUICE GATE. FLOWS SHALL BE REGULATED SUCH THAT VELOCITIES AND TURBULENCE WITHIN THE TRAP ARE SUITABLE FOR SUSTAINED SWIM SPEEDS TO PREVENT FISH EXHAUSTION.
5. CTUIR SHALL ADJUST STOPLOG HEIGHTS WITHIN THE FISH LADDER TO ACHIEVE OPTIMAL FLOW DEPTHS AND DROP HEIGHTS ACROSS THE LADDER AS TAILWATER ELEVATION VARIES.
6. THE SLUICE GATE MAY BE PARTIALLY OR FULLY CLOSED TO ASSIST WITH CROWDING AND NETTING OF FISH.
7. CTUIR STAFF SHALL BE RESPONSIBLE FOR ALL HANDLING AND TRANSPORT OF FISH. FISH SHALL BE RELEASED ABOVE CTUIR'S CATHERINE CREEK ADULT TRAPPING FACILITY AT RIVER MILE 42.5.

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TU/USWCD

ELMER DAM MODIFICATIONS

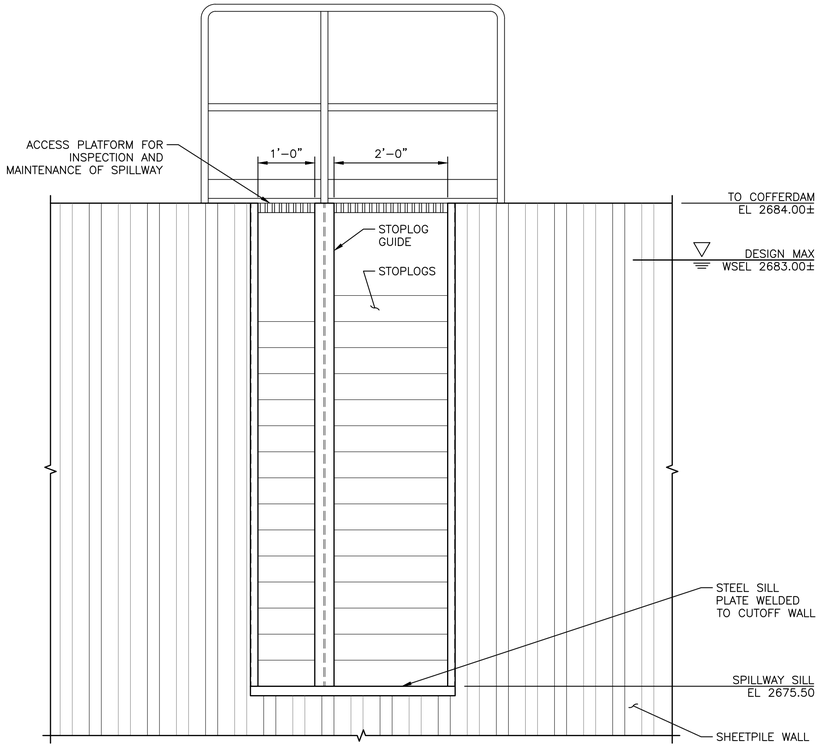
DAM & FISHWAY
CONCEPTUAL COFFERDAM SECTIONS 1

DESIGNED J. WOODBURY
DRAWN J. LAHMON
CHECKED C. BOYD
ISSUED DATE 06/17/22

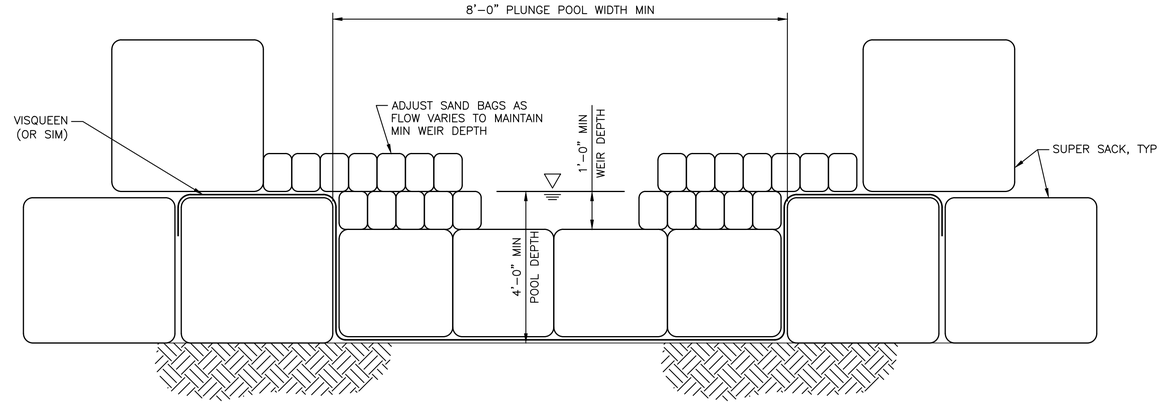
DRAWING
G04
SCALE: AS NOTED

NOTES:

1. COFFERDAM SPILLWAY SHALL BE DESIGNED, INSTALLED AND MAINTAINED BY CONTRACTOR.
2. SPILLWAY SHALL PASS FLOWS UP TO 100 CFS.
3. CONTRACTOR SHALL ADJUST SPILLWAY AS REQD TO MAINTAIN A MIN DEPTH OF 1' OVER SPILLWAY WEIR FOR DOWNSTREAM MIGRANTS.
4. PLUNGE POOL SHALL BE CENTERED BELOW THE COFFERDAM WEIR TO PREVENT FISH FROM IMPACTING PLUNGE POOL WALLS.
5. WEIR AND STOPLOGS SHALL BE FREE OF ANY SHARP PROTRUSIONS OR JAGGED CORNERS WHICH MAY HARM FISH.



SPILLWAY SECTION (C / G03)
SCALE: ¾" = 1'–0"



SAND BAG WEIR SECTION (D / G03)
SCALE: ½" = 1'–0"

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TU/USWCD

ELMER DAM MODIFICATIONS

DAM & FISHWAY
CONCEPTUAL COFFERDAM SECTIONS 2

DESIGNED J. WOODBURY
DRAWN J. LAHMON
CHECKED C. BOYD
ISSUED DATE 06/17/22

DRAWING
G05
SCALE: AS NOTED