



AGENDA

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1. Join us via Zoom (*please mute your device until called upon*).
Join the Webinar: <https://ketchumidaho-org.zoom.us/j/89430882103>
Webinar ID: 894 3088 2103
2. Address the Commission in person at City Hall.
3. Submit your comments in writing at participate@ketchumidaho.org (*by noon the day of the meeting*)

This agenda is subject to revisions. All revisions will be underlined.

CALL TO ORDER:

ROLL CALL: Pursuant to Idaho Code 74-204(4), all agenda items are action items, and a vote may be taken on these items.

COMMUNICATIONS FROM COMMISSIONERS:

CONSENT AGENDA:

ALL ACTION ITEMS - The Commission is asked to approve the following listed items by a single vote, except for any items that a commissioner asks to be removed from the Consent Agenda and considered separately.

1. ACTION ITEM: Approval of the January 14, 2025 minutes from the Planning and Zoning Commission

PUBLIC HEARING:

2. ACTION: Recommendation to approved Warm Springs Preserve Floodplain Development Permit 24-002, as conditioned, and direct staff to return with findings of fact.

NEW BUSINESS:

EXECUTIVE SESSION:

ADJOURNMENT:



**CITY OF KETCHUM
MEETING MINUTES OF THE
PLANNING & ZONING COMMISSION
Tuesday, January 14, 2025**

CALL TO ORDER: *(00:00:24 in video)*

Neil Morrow called the meeting of the Ketchum Planning and Zoning Commission to order at 4:30 p.m.

ROLL CALL:

Neil Morrow
Susan Passovoy
Brenda Moczygemba
Tim Carter
Matthew McGraw

ALSO PRESENT:

Morgan Landers – Director of Planning & Building
Abby Rivin – Senior Planner
Paige Nied – Associate Planner

COMMUNICATIONS FROM COMMISSIONERS: *(00:00:40 in video)*

- None

CONSENT AGENDA: *(00:00:40 in video)*

- None

NEW BUSINESS: *(00:00:45 in video)*

1. ACTION: Recommendation to remand the 121 Badger Lane Floodplain Development permit to the Planning and Building Department for further analysis. *(00:00:50 in video)*
 - Commissioner comments re 121 Badger Lane decision to remand: Brenda Moczygemba *(00:01:00 in video)*

Motion to Remand at 4:34 p.m. *(00:04:15 in video)*

MOVER: Matthew McGraw

SECONDER: Susan Passovoy

AYES: Susan Passovoy, Matthew McGraw, Tim Carter, & Neil Morrow

NAYS: Brenda Moczygemba

RESULT: ADOPTED

2. Update on the Cohesive Ketchum Comprehensive Plan and Code Update project *(00:04:45 in video)*

- Staff Presentation, update on status of draft Comprehensive Plan, Public Comments, upcoming Community Open House; Abby Rivin (00:04:50 in video)
- Staff Presentation on usability features, specifically the adjustable slider for the proposed Future Land Use Map; Abby Rivin. (00:07:25 in video)
- Commission questions for Staff and Staff responses regarding Public Comment, and extending the public comment period; Susan Passovoy, Morgan Landers, Matthew McGraw. (00:10:10 in video)
- Commission questions for Staff and Staff responses regarding housing density; Brenda Moczygemba, Morgan Landers. (00:17:30 in video)
- Commission questions for Staff and Staff responses regarding the next steps of the adoption draft, potential changes after the public comment period, and extending the public comment period; Brenda Moczygemba, Morgan Landers, Tim Carter, Neil Morrow, Susan Passovoy, Matthew McGraw. (00:19:10 in video)
- Commission questions for Staff and Staff responses regarding the Comprehensive Plan's overlaps/interactions with zoning ordinance & Ketchum Municipal Code; Susan Passovoy, Morgan Landers. (00:28:20 in video)
- Commission comments and Staff responses regarding public outreach for draft Comprehensive Plan; Morgan Landers, Matthew McGraw, Neil Morrow, (00:30:20 in video)

PUBLIC COMMENT: (00:37:00 in video)

3. Public comments

- Tori Canfield commented on public feedback, accuracy of the future land use map with zoning changes; Tori Canfield. (00:37:20 in video)
- Michelle Stannet commented on comparisons between current neighborhoods and potential future neighborhoods, Michelle Stannet. (00:41:10 in video)
- Perry Boyle commented, suggesting time for public comment at every Planning & Zoning Commission meeting, commenting on adding language addressing interplay of City Council with the Comp Plan, and commenting on having a 3D model of Ketchum constructed for public use showing how Ketchum would look if entirely built to code; Perry Boyle. (00:44:40 in video)
- Staff response to public comments; Morgan Landers. (00:46:50 in video)

NEW BUSINESS (CONT.): (00:49:30 in video)

4. Update of Ketchum Code Update

- Staff presentation on update of Ketchum Development Code, compilation of Titles 16 and 17 into one combined chapter, increased usability and comprehensibility; Morgan Landers. (00:49:50 in video)
- Commission questions and Staff responses regarding transfer of language from old Ketchum Code, and the replacement process; Tim Carter; Morgan Landers. (00:53:50 in video)
- Commission questions and Staff responses regarding codification of changed interpretations in the code over the last 3-4 years; Brenda Moczygemba, Morgan Landers. (00:58:40 in video)

5. Staff comment on hiring of Senior Planner, and continued staffing issues; Morgan Landers
(00:59:45 in video)

ADJOURNMENT:

Motion to adjourn at 5:30 p.m. (01:00:30 in video)

MOVER: Susan Passovoy

SECONDER: Brenda Moczygemba

AYES: Brenda Moczygemba, Susan Passovoy, Matthew McGraw, Tim Carter, & Neil Morrow

NAYS:

RESULT: UNANIMOUSLY ADOPTED

Neil Morrow – P & Z Commissioner

Morgan Landers – Director of Planning & Building



**City of Ketchum
Planning & Building**

**STAFF REPORT
KETCHUM PLANNING AND ZONING COMMISSION
JANUARY 28, 2025 MEETING**

PROJECT: Warm Springs Preserve

FILE NUMBER: P24-002

REPRESENTATIVE: Ben Whipple, City of Ketchum
Stacy Passmore, Superbloom, Landscape Architecture
Rob, Rio Applied Science and Engineering (ASE)

OWNER: City of Ketchum

REQUEST: Floodplain Development Permit for restoration activities related to the river and floodplain function, rehabilitation of riparian areas, and enhancement of fish habitat.

LOCATION: 201-311 Bald Mountain Rd (Warm Springs Ranch Resort)

ZONING: Tourist (T) and Recreation Use (RU)

OVERLAY: Floodplain Management Overlay and Avalanche Overlay

NOTICE: A public meeting notice for the project was mailed to all owners of property within 300 feet of the project site and all political subdivisions on January 8, 2025. The notice was published in the Idaho Mountain Express on January 8, 2025. A notice was posted on the project site and the city’s website on January 8, 2025.

REVIEWER: Morgan Landers, AICP – Director of Planning and Building
Jen Zung – Harmony Engineering

EXECUTIVE SUMMARY

The City of Ketchum acquired the 65-acre Warm Springs Preserve property in 2022 and spent the past few years developing the Warm Springs Preserve Master Plan (adopted in 2023) and a restoration plan to achieve the vision of the plan. The vision states “Warm Springs Preserve offers a unique opportunity for large-scale, community-supported creek restoration and passive recreation near the confluence of the Big Wood River and Warm Springs Creek.” The plan seeks to achieve the vision through six principles including:

- Create a Preserve that is connected and accessible to all
- Design for success over time
- Support all-season multi-functional use
- Demonstrate leadership through regeneration of healthy ecosystems for people, plants, and animals
- Restore the creek and floodplain
- Celebrate and educate about the past, present, and future of the preserve

The full master plan can be found by [clicking HERE](#).

The property generally consists of seven zones which are shown and illustrated in the master plan and in the application materials included as Attachment 3. The proposed project includes a significant amount of work within and outside the floodplain. As this is a floodplain development permit, the Commission is reviewing the proposed work within the established floodplain and riparian areas which consists of restoration efforts focused on restoring the river, floodplain and riparian zones with the majority of work taking place in the creek, the lower creek edge, and southern floodplain.

The work will include stream alterations in the form of pool and channel excavations, installation of large woody debris, and installation of a constructed riffle. These items are designed to improve the longevity and stability of the creek during flood events, minimizing degradation of the creek during high water periods. The work is also designed to increase the efficiency of the flood carrying capacity of the larger area during flood events to allow for safe and efficient movement of water through the reach with minimal damage. Finally, the restoration work that will occur, once the grading work has been completed, focuses on the stabilization of river/floodplain function and enhancement of fish habitats through an extensive and thoughtful planting plan by zone with specific plant lists for areas identified as wet and dry floodplain, near-stream riparian, in-stream aquatic, wet meadows, and wetlands. The goal of the planting plan is to create a bio-diverse ecosystem of plants to ensure the long term success and resilience of the area.

Due to the scope of the project, staff determined the complex stream alterations projects warrant review by the Planning & Zoning Commission. The project is subject to all floodplain development review criteria and standards specified in KMC §17.88.050 & 17.88.060.

Upon review of the proposed project, staff finds the project to not reduce floodwater carrying capacity, preserves the inherent natural characteristics of the floodplain, mitigates wetland impacts effectively with new wetlands, as well as meets all other applicable floodplain development criteria. A full review of all floodplain criteria can be found in Attachment 4.

BACKGROUND

The Warm Springs Preserve property has seen many transformations since the 1800s. As outlined on page 8 of the Warm Springs Preserve Master Plan, the area was a thriving ecosystem with an active floodplain with multiple meandering streams and areas able to convey flood waters. In the 1800s and into the mid 1900s, increased human activity resulted in channelization of the stream and much of the areas able to convey flood waters were filled. As development continued within the floodplain up and down the reach, Warm Springs Creek continued to become confined and is now at high risk of stream bank erosion, channel incision, and downstream flooding. As noted above, the City of Ketchum purchased the property in 2022 and adopted the Warm Springs Preserve Master Plan in 2023.

A floodplain development permit application was received on January 9, 2024, and routed to all staff departments and Harmony Engineering and Design for review. Two rounds of review and revisions were conducted prior to scheduling the application for review by the Planning and Zoning Commission. As of the date of this report, all comments have been addressed satisfactorily through revisions to the proposed plans or through conditions of approval.

CONFORMANCE WITH FLOODPLAIN DEVELOPMENT STANDARDS:

As the project occurs within the Floodplain Management Overlay District, the project is subject to criteria and standards listed in KMC 17.88.050. Please see attachment XX for a full detailed analysis of all applicable standards. Staff finds the project to be in conformance with all standards and have highlighted a few below that result in proposed conditions of approval.

Permits from Regulatory Agencies

Ketchum requires that all permits required by outside agencies must be obtained prior to submittal of a floodplain development permit. The Administrator has the ability to waive or amend this requirement. Due to the size and complexity of the project and the many agencies that require permits, staff recommends condition of approval #1 allowing submittal of the approved permits prior to start of construction. Below is a list of required permits:

- FEMA – Conditional Letter of Map Revision (CLOMR)
- Idaho Department of Water Resources – Stream Alteration Permit
- Idaho Department of Environmental Quality – general construction permit due to the size of project
- US Army Corps of Engineers (ACE) (authorized on February 26, 2024)

As of the date of this report, the USACE issued a letter of authorization for the project on February 26, 2024 (Attachment 1).

Comments from City Engineer

There is one access to the Warm Springs Preserve property and that is Lopey Lane. Lopey Lane is an existing road with a bridge that crosses Warm Springs Creek. Currently, the bridge is elevated as such that floodwaters pass under the bridge, not over. The bridge is not proposed to be altered as part of the project. The project does propose to improve the road once it crosses onto the Warm Springs Preserve property. As shown on Sheet C2.0 the road includes a set of two 36" culverts closer to the existing bridge and one additional bridge structure closer to the parking area. The existing driveway/road and proposed bridge/culverts are located outside of published FEMA 100-year floodplain extents and are designed to convey only a portion of Warm Springs Creek flood flows. Both facilities are designed to have a minimum of 1-foot of freeboard at the 100-year flow. The existing driveway/road does not become inundated at the 100-year flow under proposed conditions. Additionally, the bridge is designed to carry those flows with or without the culverts in place.

The city engineer did provide some minor comments related to the finished condition of the road included crowning, amount of gravel shoulder, details of drywells, and a few others that will be addressed with issuance of the final construction plans. These items will not impact the ability of the culverts or bridge to effectively convey flood waters. Condition of approval #2 addresses these items.

Bridge Stability

The existing condition of the property and stream create a high-risk environment during flood events, risking public safety and damage to properties. The channelization of Warm Springs Creek and adjacent development have made it difficult for water to move at reasonable velocities throughout the area. The proposed project includes re-grading to create additional side channels and removes historically placed fill to recreate a functioning river and floodplain that reduces the danger to the public and property. Additionally, the project proposes to address existing exposure issues related to water/sewer mains and bridges. Finally, the study conducted by the applicant and reviewed by third party engineers seeks to ensure the long-term stability of the construction. Condition of Approval 3 requires an additional scour analysis be conducted for the materials proposed within the stream near the bridge to ensure that the materials can withstand higher flows during more significant flood events.

STAFF RECOMMENDATION:

Staff recommends **approval** of the Floodplain Development Permit application (File No. P24-002) subject to the following conditions:

1. A Conditional Letter of Map Revision (CLOMR) approved by FEMA and other jurisdictional permits are required for the project. Work shall not commence until all required permits from third party agencies including USACE, IDWR, IDEQ, and FEMA have been issued and provided to the Planning and Building Department.

2. Prior to commencement of construction, no later than September 15, a revised civil plan set shall be submitted to the Planning and Building Department addressing all comments from the city engineer regarding reconstruction of Lopey Lane and adjacent parking areas. Civil plans shall be reviewed and approved by the City Engineer prior to construction of all items under the scope of work associated with Lopey Lane and the parking.
3. An additional scour analysis pertaining to materials placed in the stream near the existing Lopey Lane bridge shall be conducted to ensure the materials can withstand higher flows. The design of these materials should be designed for a 200-yr event and checked against a 500-yr event. The scour analysis shall be provided to the Planning and Building Department for review and approval prior to installation of materials.
4. A Construction Management Plan shall be submitted by the contractor prior to start of construction.
5. This approval is subject to the scope of work described in the documents shown in Attachments 1-3.
6. Any modification to approved plans as referenced in this approval shall be subject to a written amendment to this permit approval. If construction or improvements differ from the approved plans, such work may be subject to removal at the applicant's expense.
7. Following project completion, upon an annual inspection, if 80% or fewer of the plants indicated on Landscape Plan have not survived, the property owner shall re-install new plantings.
8. The Administrator shall conduct site inspections of work in progress. The Administrator shall make as many inspections of the work as may be necessary to ensure that the work is being done according to the terms of this permit, approved plans, and KMC 17.88. In exercising this power, the Administrator has a right, upon presentation of proper credentials, to enter the property at any reasonable hour for the purposes of inspection or other enforcement action.
9. Floodplain Development Permit approval shall be valid for a period of 1 year the date of signing Findings of Fact. If construction has not commenced within that time, the permit shall become null and void unless an extension is requested and granted pursuant to KMC 17.88.050.G.
10. No use of restricted use chemicals or soil sterilants will be allowed within one hundred feet (100') of the mean high-water mark on any property within the city limits at any time (KMC 17.88.040.C.3).
11. All applications of herbicides and/or pesticides within one hundred feet (100') of the mean high water mark, but not within twenty five feet (25') of the mean high water mark, must be done by a licensed applicator and applied at the minimum application rates (KMC 17.88.040.C.4).
12. Application times for herbicides and/or pesticides will be limited to two (2) times a year; once in the spring and once in the fall unless otherwise approved by the City Arborist (KMC 17.88.040.C.5).
13. It shall be unlawful to dump, deposit or otherwise cause any trash, landscape debris or other material to be placed in any stream, channel, ditch, pond or basin that regularly or periodically carries or stores water.

RECOMMENDED MOTION:

"I move to approve the Warm Springs Preserve Floodplain Development Permit application, as conditioned, and direct staff to return with the findings of fact."

ATTACHMENTS:

1. Application and Supplemental Documents
2. Warm Springs Preserve Basis of Design Report
3. Project Plans (landscape, irrigation, civil, stream alteration)
4. Floodplain Development Criteria Analysis



City of Ketchum

ATTACHMENT 1:

Application and Supporting Documents

OFFICIAL USE ONLY	
File Number:	P24-002
Date Received:	1/9/24
By:	HLN
Fee Paid:	
Approved Date:	
Denied Date:	
By:	

Floodplain Development Permit Application

Submit completed application and documentation to planningandzoning@ketchumidaho.org Or hand deliver to Ketchum City Hall, 191 5th St. W. Ketchum, ID If you have questions, please contact the Planning and Building Department at (208) 726-7801. To view the Development Standards, visit the City website at: www.ketchumidaho.org and click on Municipal Code. You will be contacted and invoiced once your application package is complete.

When is a Floodplain Development Permit Application required?

The Floodplain Management Overlay Zoning District boundaries are represented on the official zoning map of the City.

All land within the external boundary of the special flood hazard area (SFHA) and all parcels with any portion thereof affected by said SFHA shall be considered to be within the Floodplain Management Overlay Zoning district.

All land areas within the external boundary of the SFHA shall be considered to be within the floodplain subdistrict of the Floodplain Management Overlay Zoning District. The City may make necessary interpretations of the boundary based upon the recommendation of the City Engineer or other expert.

All land areas within the external boundary of the regulatory floodway shall be considered to be within the floodway subdistrict of the Floodplain Management Overlay Zoning District. The City may make necessary interpretations of the boundary based upon the recommendation of the City Engineer or other expert.

NOTE: This permit is required for all properties containing 100 year floodplain area and Riparian Setbacks

PROPERTY OWNER INFORMATION	
Property Owner Name(s):	City of Ketchum
Property Owner's Mailing Address:	P.O. Box 2315 - 191 5th St., West Ketchum, ID 83340
Phone:	(208)726.4228
Email:	Ben Whipple (Owner's Contact + PM) bwhipple@ketchumidaho.org
PROJECT INFORMATION	
Project Name:	Warm Springs Preserve
Project Representative's Name (main point of contact for project):	Stacy Passmore
Project Representative's Phone:	214-288-1517
Project Representative's Mailing Address:	750 Pennsylvania Ave, Denver, CO 80203
Project Representative's Email:	stacy@superbloom.net
Architect's name, phone number, e-mail:	Michael Doty Architects
Landscape Architect's name, phone number, e-mail:	see above project representative
Environmental consultant's name, phone number, e-mail:	Rio Applied Science & Engineering
Engineer's name, phone number, e-mail:	Joe Young joe@rioase.com
Project Address:	201-311 Bald Mountain Rd, Ketchum, ID 83340
Legal Description of parcel:	WARM SPRINGS RANCH RESORT PUD BLK 2 IN CODE AREA 003002
Lot Size:	23.46 acres
Zoning District:	T, RU
Overlay Zones – indicate all that apply:	<input checked="" type="checkbox"/> Floodplain <input checked="" type="checkbox"/> Floodway <input checked="" type="checkbox"/> Riparian Zone <input checked="" type="checkbox"/> Avalanche <input type="checkbox"/> Mountain
Brief description of project scope:	The proposed design seeks to restore the stated characteristics of the river, floodplain, and Riparian Zone. Numerous in-channel alterations are proposed to include pool and channel excavation, installation of large woody debris, and installation of constructed riffles to achieve the project goals and objectives. The restoration plan integrates elements of limiting disturbance to areas identified by the landowner (City of Ketchum), improving irrigation, restoring processes for improved river-floodplain function, and rehabilitation and enhancement of fish habitats. The project is part of the larger Warm Springs Preserve project, which is detailed in the Warm Springs Preserve Master Plan, approved by Ketchum City Council in 2023. A parallel application has been submitted for the proposed driveway alterations and new restroom and maintenance building, which is not in the floodplain zone.
Value of Project: \$	Floodplain improvements are estimated to be \$2,254,000. Total project cost is estimated to be \$5.5 M including non-floodplain improvements.
TYPE OF PROJECT – indicate all that apply:	

<input type="checkbox"/> New Building in Floodplain	<input type="checkbox"/> Building Addition in Floodplain	<input type="checkbox"/> Emergency Streambank Stabilization / Stream Alteration	<input checked="" type="checkbox"/> Other. Please describe: Floodplain restoration and open space trails
<input type="checkbox"/> Floodplain Development	<input checked="" type="checkbox"/> Streambank Stabilization / Stream Alteration		
PROPOSED SETBACKS – if project is a new building or an addition to an existing building			
Front:	Side:	Side:	Rear:
ADDITIONAL INFORMATION			
Will fill or excavation be required in floodplain, floodway or riparian zone? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
If Yes, Amount in Cubic Yards: Fill: 2,334CY Excavation: 10,064 CY			
Will Existing Trees or Vegetation be Removed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Will new trees or vegetation be planted? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

Applicant agrees in the event of a dispute concerning the interpretation or enforcement of the Floodplain Management Overlay Application, in which the City of Ketchum is the prevailing party, to pay reasonable attorney fees, including attorney fees on appeal, and expenses of the City of Ketchum. I, the undersigned, certify that all information submitted with and upon this application form is true and accurate to the best of my knowledge and belief.


Signature of Owner/Representative

1/2/24
Date



Warm Springs Preserve Project Floodplain Development Permit Application

Floodplain Management Overlay Evaluation Standards Narrative

1. *The proposal preserves or restores the inherent natural characteristics of the river, floodplain, and Riparian Zone, including riparian vegetation and wildlife habitat. Development does not alter river channel unless all stream alteration criteria for evaluation are also met.*

Yes, the proposed project seeks to restore the stated characteristics of the river, floodplain, and riparian zone. Numerous in-channel alterations are proposed to achieve the project goals and objectives. These include—pool and channel excavation, and installation of large woody debris and constructed riffles. The plan integrates elements of restoration—restoring processes for improved river-floodplain function, and rehabilitation and enhancement of fish habitats—while limiting disturbance to areas identified by the landowner (City of Ketchum), and improving irrigation. Applying this strategy is intended to improve habitat complexity, floodplain connectivity, and increased riparian tree- and shrub-dominated habitat to provide long-term structure and cover. The following restoration concepts are being proposed as specific actions for the project:

- i) Restore process and habitat by distributing flow and energy laterally through enabling channel migration to the extent practical, floodplain reconnection, and/or reconstructing appropriate primary and secondary channel planforms.
- ii) Restore process and reconnect habitat by increasing side channel abundance and diversity with proximal access to the primary channel.
- iii) Restore hydraulic processes, floodplain reconnection, and habitat by providing a greater diversity of channel forms. Channel geometry and planform restoration will focus on reducing channel confinement and increasing geomorphic complexity. Secondary channels will be incorporated where possible.
- iv) Protect existing areas of dense woody riparian vegetation where hydraulic complexity and habitat conditions are already favorable.
- v) Restore riparian processes by planting woody vegetation (especially cottonwood) with greater plant density along the outside of bends and in floodplain areas susceptible to channel migration and/or avulsion to ensure future channel evolution results in favorable conditions.
- vi) Restore process and habitat by increasing the abundance of instream structure (e.g., large woody debris and boulders), creating hydraulic diversity and habitat complexity while promoting more floodplain inundation and side channel development.
- vii) Restore localized hydraulic processes and habitat by modifying primary channels to result in diverse habitat units, including greater frequency of pools and greater overall range of channel geometry.

2. *No temporary construction activities, encroachment, or other disturbance into the twenty-five foot (25') Riparian Zone, including encroachment of below grade structures, shall be permitted, except for approved stream stabilization work and restoration work associated with a riparian zone that is degraded.*

Temporary construction activities (e.g., temporary construction access routes) and river/floodplain restoration-related disturbances as described in the response to question #1 above are being proposed within the riparian zone in numerous locations. The extent of the disturbances is specified in the Design Drawings that accompany the application. It should be noted that Rio Applied Science and Engineering (Rio ASE) considered all appropriate General Aquatic Conservation Measures when completing the design. These Conservation Measures specify how all work (within and outside of sensitive areas) shall be conducted. The Conservation Measures are included in the Design Drawings for ease of reference by the selected construction contractor and are considered requirements (not optional or mere suggestions).

3. *No permanent development shall occur within the twenty-five foot (25') Riparian Zone, except for approved stream stabilization work and restoration work associated with permit issued under this title, or exceptions as described below:*
 - a) *Access to a property where no other primary access is available.*
 - b) *Emergency access required by the Fire Department.*
 - c) *A single defined pathways or staircases for the purpose of providing access to the river channel and in order to mitigate multiple undefined social paths.*
 - d) *Development by the City of Ketchum.*

See above responses regarding proposed restoration grading and planting improvements within the 25' riparian zone. The design plans do not include building development in the 25' riparian zone. To provide ADA access to the restored floodplain area and to Warm Springs Creek, the design includes several small low-profile footbridges that cross the new pilot channels, rustic benches for seating and minimal directional signage. These are detailed in the drawings and were selected/selected to be durable to inundation and will minimally impact any hydrological flows.

4. *New or replacement planting and vegetation in the Riparian Zone shall include plantings that are low growing and have dense root systems for the purpose of stabilizing stream banks and repairing damage previously done to riparian vegetation. Examples of such plantings most commonly include red osier dogwood, common chokecherry, serviceberry, elderberry, river birch, skunk bush sumac, Beb's willow, Drummond's willow, little wild rose, gooseberry, and honeysuckle. However, in rare instances the distance from the top-of-bank to the mean highwater mark is significant and the native vegetation appropriate for the Riparian Zone are low growing, drought resistant grasses and shrubs. Replacement planting and vegetation shall be appropriate for the specific site conditions. Proposal does not include vegetation within the twenty-five foot (25') Riparian Zone that is degraded, not natural, or which does not promote bank stability.*

Per the attached landscape plans, the design proposes extensive revegetation of the floodplain and fill areas using site specific native species that are planted by hydrological zone. The restoration plantings include trees, shrubs and seeded grasses and perennials

that would have historically been found in this riparian floodplain area. These are defined in several zones and are based on slope and access to annual water flows.

5. *Landscaping and driveway plans to accommodate the function of the floodplain allow for sheet flooding. Surface drainage is controlled and shall not adversely impact adjacent properties including driveways drained away from paved roadways. Culvert(s) under driveways may be required. Landscaping berms shall be designed to not dam or otherwise obstruct floodwaters or divert same onto roads or other public pathways.*

A significant amount of re-grading of existing high terraces located adjacent to Warm Springs Creek is being proposed thereby converting these disconnected areas to active riverine floodplains capable of activating/inundating on a near annual basis. These areas are designed to look and function as natural floodplains and are designed to accommodate sheet flooding from Warm Springs Creek. Any/all storm drainage generated onsite and from off-site (run-on) locations will be retained onsite or drain back to Warm Springs Creek within the project extents and will have no change in impacts to adjacent properties. Landscaping berms in the form of spoil piles generated from project excavations are located outside of existing 100-year floodplain extents and drainage from these features will not impact existing or proposed roads or public pathways. Storm drainage within proposed parking areas is designed to be contained/infiltrated onsite. Two new bridge/culverts are proposed within the new floodplain intended to convey floodplain flows through the project site and back to Warm Springs Creek. These hydraulic structures are designed to convey only a portion of flood flows and will be designed to have a minimum of 1-foot of freeboard at the 100-year flow.

6. *Floodwater carrying capacity is not diminished by the proposal.*

Rio ASE is currently coordinating with City of Ketchum's floodplain administrator to complete a Conditional Letter of Map Revision (CLOMR). Preliminary hydraulic modeling/analyses indicate that base flood elevations (BFE's) will be reduced or stay the same (compared to FEMA published values) as a result of proposed project activities.

7. *Impacts of the development on aquatic life, recreation, or water quality upstream, downstream or across the stream are not negative.*

This project seeks to improve aquatic habitats as described in the responses to questions #1 and #18. Proposed new recreation access and opportunities are described in the responses to questions #8 and #17. Proposed water quality improvements are described in the responses to questions #8 and #18 (e.g., fine sediment storage on the floodplain, stabilization of banks through riparian planting and bank stability provided by wood habitat structures, and thermal buffering provided by shading and a more robust riparian corridor).

8. *Building setback in excess of the minimum required along waterways is encouraged. An additional ten-foot (10') building setback beyond the required twenty-five foot (25') Riparian Zone is encouraged to provide for yards, decks and patios outside the twenty five foot (25') Riparian Zone.*

The design plans do not include building development in the floodplain or within 35' of the riparian areas. The proposed restroom and maintenance building is over 35' from the closest edge of the new proposed floodplain area and is over 200' from the closest point on the Creek. There are several small low-profile footbridges and benches within the new

floodplain area to provide ADA access to the Creek.

- 9) *The top of the lowest floor of a building located in, or partially within, the SFHA shall be at or above the Flood Protection Elevation (FPE). A building is considered to be partially within the SFHA if any portion of the building or appendage of the building, such as footings, attached decks, posts for upper story decks, are located within the SFHA. See section 17.88.060, figures 1 and 2 of this chapter to reference construction details. See Chapter 17.08 of this title for definition of "lowest floor."*
 - a) *In the SFHA where Base Flood Elevations (BFEs) have been determined, the FPE shall be twenty-four inches (24") above the BFE for the subject property; twenty-four inches (24") or two (2) feet is the required freeboard in Ketchum city limits.*
 - b) *In the SFHA where no BFE has been established, the FPE shall be at least two (2) feet above the highest adjacent grade.*

The design plans do not include buildings or development in the floodplain or SFHA.

10. *The backfill used around the foundation in the SFHA floodplain shall provide a reasonable transition to existing grade but shall not be used to fill the parcel to any greater extent.*
 - a) *Compensatory storage shall be required for any fill placed within the floodplain.*
 - b) *A CLOMR-F shall be obtained prior to placement of any additional fill in the floodplain.*

There are no structures proposed within SFHA's.

11. *All new buildings located partially or wholly within the SFHA shall be constructed on foundations that are designed by a licensed professional engineer.*

There are no structures proposed within SFHA's..

12. *Driveways shall comply with City of Ketchum street standards; access for emergency vehicles has been adequately provided for by limiting flood depths in all roadways to one foot (1-ft) or less during the 1% annual chance event.*

The design plans do not include new driveways in the floodplain or SFHA. However, the design includes two new bridge/culverts under the existing driveway/road into the project site. The existing driveway/road originates from Bald Mountain Road, crosses Warm Springs Creek to the south via an existing bridge (which this project does not intend to modify/impact), and continues to a proposed parking area. The existing driveway/road and proposed bridge/culverts are located outside of published FEMA 100-year floodplain extents. These hydraulic structures are designed to convey only a portion of Warm Springs Creek flood flows and will be designed to have a minimum of 1-foot of freeboard at the 100-year flow. The existing driveway/road does not become inundated at the 100-year flow under proposed conditions.

13. *Landscaping or revegetation shall conceal cuts and fills required for driveways and other elements of the development.*

The entire restoration area will be extensively revegetated per the landscaping plans to restore the native planting regime adjacent to Warm Springs Creek. Grading and topography have been carefully designed to be as natural as possible and to minimize steep slopes.

14. *(Stream alteration.) The proposal is shown to be a permanent solution and creates a stable situation.*

All proposed stream alteration design elements are intended to be permanent solutions addressing existing limiting factors to in-stream habitat and river and floodplain processes. However, post-construction adaptive management may be needed (pending an evaluation from all stakeholders) to address unintended responses (if any) which is common in restoration projects of this scope. All wood structures are designed to withstand estimated hydraulic conditions at the 100-year flow. Engineered riffle materials for constructed riffles in the mainstem Warm Springs Creek and at bridge/culvert locations were sized based on the 100-year flow. Constructed riffles within the Baldy Side Channel are sized to withstand hydraulic conditions at the 1.5-year flow. Limiting factors, design criteria, methods, and approaches are discussed in more detail in the basis of design report.

15. *(Stream alteration.) No increase to the one percent (1%) annual chance flood elevation at any location in the community, based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice and has been certified and submitted with supporting calculations and a No Rise Certificate, by a registered Idaho engineer.*

Rio ASE is currently coordinating with City of Ketchum's floodplain administrator to complete a Conditional Letter of Map Revision (CLOMR).

16. *(Stream alteration.) The project has demonstrated No Adverse Impact or has demonstrated all impacts will be mitigated.*

Rio ASE is currently coordinating with City of Ketchum's floodplain administrator to complete a Conditional Letter of Map Revision (CLOMR). Preliminary hydraulic modeling/analyses indicate that base flood elevations (BFE's) will be reduced or stay the same (compared to FEMA published values) as a result of proposed project activities. A CLOMR is FEMA's comment on a proposed project that would result in a modification of the existing regulatory floodway or effective BFEs.

17. *(Stream alteration.) The recreational use of the stream including access along any and all public pedestrian/fisher's easements and the aesthetic beauty shall not be obstructed or interfered with by the proposed work.*

This project seeks to increase access to Warm Springs Creek and floodplain areas within the entire project reach by all recreational users and will not obstruct or restrict access at any location. Access to Warm Springs Creek will be enhanced by the addition of a pedestrian trail network with some portions of the trail being ADA compliant. Users of the proposed Warm Springs Preserve will be allowed to explore freely and are encouraged to utilize proposed access points with direct access to the Warm Springs Creek channel and other features including a new pond and new side channels.

18. *(Stream alteration.) Fish habitat shall be maintained or improved as a result of the work proposed.*

Within the project area, Warm Springs Creek flows through and over relic glacial outwash and alluvium. Over the past several thousand years, the modern Warm Springs Creek has slowly incised through this material, leaving behind sets of terraces. More recently,

the terraces within the project area have been mechanically altered to accommodate land use and development, including a golf course. Similarly, the stream channel has been artificially confined, concentrating flow and creating further incision and floodplain abandonment. There is virtually no floodplain connectivity within the northern half of the project reach, even at the 100-year recurrence interval flow. The southern half of the project has marginally better floodplain connectivity, activating at around the 5-year recurrence interval flow. Channel incision is expected to continue where flood flows lack the ability to spread out and dissipate energy on the floodplain, and instead are concentrated on the bed and banks. As a result of incision and concentrated stream flow, much of the fine sediment has been scoured from the streambed, leaving behind a relatively uniform layer of coarse cobble bed armor. This condition has created a channel morphology that is predominantly plane-bed with only occasional pools formed by large flow constrictions caused by boulders, logs, tree roots and/or human infrastructure such as bridge abutments. Fine sediment introduced to the system tends to fill interstitial spaces between the armor causing severe embedment, further reducing pool formation and spawning habitat quality. Most of the Warm Springs Creek banks within the project area are stable; many are also armored with riprap. Bank erosion is only prevalent where there is a lack of bank material stability including tree roots and riprap. Much of the abandoned floodplain vegetation has been cleared or converted to non-native species. The incised stream channel has likely lowered the groundwater table and has certainly reduced the frequency and magnitude of groundwater recharge via the floodplain. Past geotechnical explorations on the site reveal the late-summer groundwater table is over 10 feet below the floodplain surface in many areas. Few riparian species can survive on the abandoned floodplain. Cottonwood trees and willow shrubs persist only along the near-bank riparian area where water is accessible. At the downstream end of the reach, where Warm Springs Creek approaches the Big Wood River, less incision has occurred, the floodplain is more accessible, the groundwater table is presumably higher (relative to the floodplain elevation), and healthy, native riparian vegetation is much more prevalent. This project seeks to restore river and floodplain processes to improve the quantity, quality, and diversity of aquatic habitats. Fish habitat is expected to be improved as discussed in the response to question #1a.

19. *(Stream alteration.) The proposed work shall not be in conflict with the local public interest, including, but not limited to, property values, fish and wildlife habitat, aquatic life, recreation and access to public lands and waters, aesthetic beauty of the stream and water quality.*

This project does not seek to conflict with local public interest and much public outreach and coordination performed by the City of Ketchum and stakeholders has already occurred and will continue as the design progresses. This project does not seek to reduce the value of adjacent properties but does seek to improve aquatic and terrestrial habitats, recreation and access, water quality, and riparian and upland plant communities.

20. *(Stream alteration.) The work proposed is for the protection of the public health, safety and/or welfare such as public schools, sewage treatment plant, water and sewer distribution lines and bridges providing particularly limited or sole access to areas of habitation.*

Rio ASE analyzed perceived risk associated with large woody material using the Large Woody Materials–Risk Based Design Guidelines (Knutson and Fealko, 2014). Based on the analysis (Appendix B of the Basis of Design Report), the estimated risk to public safety and property damage are both high primarily due to the numerous residential

houses immediately adjacent to Warm Springs Creek and existing bridge used to access the site within the project reach. Based on the risk-based design guidelines, a design flow event equal to or greater than the 100-year peak flood is recommended. Rio ASE has selected the 100-year flow as the design flow for all wood structures, project wide. This project also does not seek to impact the existing bridge on Warm Springs Creek and includes wood habitat structures (for improved habitat and bank stability) and a new side channel (for added conveyance capacity) in the lower portion of the project reach to address existing bank instabilities in the near vicinity of an existing sewer line.

21. *(Wetlands) Where development is proposed that impacts any wetland the first priority shall be to move development from the wetland area. Mitigation strategies shall be proposed at time of application that replace the impacted wetland area with an equal amount and quality of new wetland area or riparian habitat improvement.*

A formal wetland delineation has not been performed within the Warm Springs Preserve project area. Ecological units (e.g., riverine, riparian, and aspen/cottonwood communities), which contain likely WOTUS/associated wetlands have been mapped within the project area. All proposed actions for the project have been overlaid by the mapped ecological units (see Warm Springs Preserve Stream and Enhancement Design Set—60% Design Drawings). Most of the proposed actions that intersect possible wetlands are within Warm Springs Creek’s active riverine channel. There is a limited extent of vegetated wetlands that occur within the riparian or aspen/cottonwood community ecological units. The proposed actions largely avoid areas where vegetated wetlands possibly occur. Where proposed actions to likely WOTUS/associated wetlands or riparian areas are unavoidable, a mitigation ratio of 1:1 or greater has been applied. The post implementation project condition is expected to result in a net gain in the quantity and quality of aquatic stream habitat, including off-channel wetland/riparian areas.

Supporting Information and Attachments

- Attachment A: Site Survey Drawings
- Attachment B1: 60% Design Drawings – Stream and Floodplain Enhancement
- Attachment B2: 60% Design Drawings – Landscape, Parking, and Irrigation
- Attachment C: Stream and Floodplain Enhancement 60% Basis of Design Report



Acknowledgement of Floodplain Affidavit

Pursuant to Ketchum Municipal Code §17.88.040 D1, prior to the issuance of any floodplain development permit for development within the Floodplain Management Overlay District and the Waterways Review District as defined under to Ketchum Municipal Code §17.08, the property owner shall submit to the Planning and Building Department a written affidavit on a form provided by the City, signed by the property owner under seal of a notary public, of the property owner's actual knowledge that the property is located within the Floodplain Management Overlay District or the Waterways Review District. The property owner will also acknowledge that he or she is aware of the flood hazard potential for the property and is aware of the regulations the Floodplain Management Overlay Zoning District and Waterways Review District no work shall occur in these areas without city permits and approvals

Instructions

1. Property owner shall complete the attached affidavit.
2. Property Owner shall sign before a notary public and have the affidavit notarized.
3. Property Owner shall return original notarized affidavit to the City of Ketchum Planning & Building Department.
4. The Planning & Building Department shall have the notarized affidavit recorded in the records of Blaine County for the property.
5. A copy of the recorded document will be delivered to the Property Owner and filed in the City records with the building permit documents.

RECORDING REQUESTED BY AND WHEN RECORDED RETURN TO:	
City Clerk, City of Ketchum PO Box 2315 Ketchum Idaho, 83340	

(Space Above Line For Recorder's Use)

Acknowledgement of Floodplain Management Overlay District and Waterways Design Review District Affidavit

Property Owner: City of Ketchum - Jade Riley (City Administrator)
Building Permit Number or Land Use Permit Number:
Property Address: 201-311 Bald Mountain Rd, Ketchum, ID 83340
Legal Description: WARM SPRINGS RANCH RESORT PUD BLK 2 IN CODE AREA 003002
Parcel Number: RPK
Scope of Work: Warm Springs Preserve Floodplain Restoration

Please initial and fill below:

I acknowledge that this development and the parcel of land, or portion thereof, on which the development will be situated are within the Floodplain Management Overlay District.

I acknowledge this property is within the Waterways Review District.

I have thoroughly read and fully understand Ketchum Municipal Code Title 17, Chapter 17.88 "Floodplain Management Overlay District", to include regulations for the Waterways Design Review District including regulations on activities within 100 feet of the mean high-water mark.

I fully understand and agree to comply with Ketchum Municipal Code Title 17, Chapter 17.88.040 C.

I, on behalf of myself, my personal representatives and my heirs, successors, and assignees, acknowledge by this written *affidavit* that said property is located within the one percent annual chance floodplain (SFHA) as defined herein, and/or said property is within the Waterways Design Review District and that a violation of the terms of Ketchum Municipal Code 17.88 shall cause the City to seek legal remedies.

I acknowledge that the City of Ketchum Planning & Building Department shall have the notarized affidavit recorded in the records of Blaine County for the property.



 Property Owner Signature

12/28/23

 Date



STATE OF IDAHO, County of BLAINE

On this 28 day of December, before me, the undersigned, a Notary Public in and for said State, personally appeared Jade Riley, known or identified to me to be the person whose name is subscribed to the within instrument.

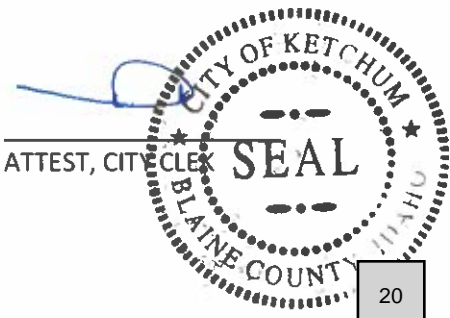
WITNESS my hand and seal the day and year in this certificate first above written.


 _____ Residing at: KETCHUM

Notary Public for IDAHO
 (State)

Commission Expires: 11/15/28

City of Ketchum accepts this Affidavit from (insert owner's name).





DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
IDAHO FALLS REGULATORY OFFICE
900 NORTH SKYLINE DRIVE, SUITE A
IDAHO FALLS, IDAHO 83402-1700

February 26, 2024

WALLA WALLA DISTRICT
REGULATORY DIVISION

SUBJECT: NWW-2024-00033, Warm Springs Preserve

Ben Whipple
City of Ketchum
191 Fifth St
Ketchum, ID 83340

Dear Mr. Whipple:

We have determined that your proposed project is authorized in accordance with Department of the Army (DA) **Nationwide Permit (NWP) No. 27: Aquatic Habitat Restoration, Establishment, and Enhancement Activities**. This project is located at Warm Springs Preserve, 201-311 Bald Mountain Rd, Ketchum, Blaine County, Idaho, within Sections 11, 12, and 13 of Township 03 North, Range 17 East, near Latitude 43.6895408 and Longitude -114.3848390. Please refer to File Number NWW-2024-00033 in all future correspondence with our office regarding this project.

Project activities include the discharge of approximately 1,953 cubic yards of dirt, rocks, and woody material below the Ordinary High-Water Mark (OHWM) along a 4,800-ft reach of Warm Springs Creek, for the purpose of improving fish habitat, restoring riparian and hydraulic processes, reconnecting floodplain, and increasing groundwater recharge. The work will entail the grading of creekbanks, excavation of adjacent land to restore flood plain, the creation of creek side channels, the installation of a headgate to control water level of side channels, the creation of riffle complexes and pools within the creek, the placement of boulders and logs as habitat features within the creek and along its banks, and the planting of native vegetation. Additional work includes temporary partial-dewatering of work areas via coffer dam. All work shall be done in accordance with the submitted drawings, titled: "Appendix_A_WSP_60pct_Design_Stream_Floodplain_Drawings_20240105"

DA permit authorization is necessary because your project may involve the discharge of fill material into waters of the U.S. This authorization is outlined in Section 404 of the Clean Water Act (33 U.S.C. 1344).

You must comply with all general and regional conditions for this verification letter to remain valid and to avoid possible enforcement actions. The general and regional permit conditions for *NWP No. 27: Aquatic Habitat Restoration, Establishment, and Enhancement Activities* are attached and also available online¹.

You must also comply with the conditions detailed in the attached Section 401 Water Quality Certification (WQC) issued by the Idaho Department of Environmental Quality (IDEQ) on December 4, 2020. If you have any questions regarding the conditions set forth in the WQC, please contact IDEQ directly at 208-736-2190, Twin Falls Regional Office.

Nationwide Permit General Condition 30 (Compliance Certification) requires that every permittee who has received NWP verification must submit a signed certification regarding the completed work and any required mitigation. This Compliance Certification form is enclosed for your convenience and must be completed and returned to us within 30 days of your project's completion.

This letter of authorization does not convey any property rights, or any exclusive privileges and does not authorize any injury to property or excuse you from compliance with other Federal, State, or local statutes, ordinances, regulations, or requirements which may affect this work.

This verification is valid until **March 14, 2026**, unless the NWP is modified, suspended, or revoked. If your project, as permitted under this NWP verification, is modified in any way you must contact our office prior to commencing any work activities. If you will not complete construction of your project by March 14, 2026, please contact us at least 60-days prior to this date. A new application and verification may be required.

We actively use feedback to improve our delivery and provide you with the best possible service. If you would like to provide feedback, please take our online survey². If you have questions or if you would like a paper copy of the survey, please contact the Walla Walla District Regulatory. For more information about the Walla Walla District Regulatory program, you can visit us online³.

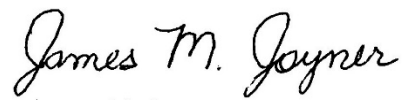
¹ <http://www.nww.usace.army.mil/Business-With-Us/Regulatory-Division/Nationwide-Permits/>

² <https://regulatory.ops.usace.army.mil/customer-service-survey/>

³ <http://www.nww.usace.army.mil/Business-With-Us/Regulatory-Division/>

If you have any questions or need additional information about this permit authorization, you can contact Cabel Patterson by phone at 208-541-2991, by mail at the address in the letterhead, or email at cabel.c.patterson@usace.army.mil. For informational purposes, a copy of this letter has been sent to: Bradley Dawson (IDFG), Sean Woodhead (IDEQ), and Mandy Pomeroy (Blaine County Administrator).

Sincerely,

A handwritten signature in black ink that reads "James M. Joyner". The signature is written in a cursive style with a large initial "J".

James Joyner
Chief, Upper Snake/Idaho Panhandle Branch,
Regulatory Division

Encls

Transfer of Nationwide Permit Form
Compliance Certification Form
Joint Application for Permit
NWP27 Permit Conditions
Section 401 Water Quality Certification (WQC)

TRANSFER OF NATIONWIDE PERMIT

When the structures or work authorized by this Nationwide Permit, NWW-2024-00033, Warm Springs Preserve, are still in existence at the time the property is transferred. The terms and conditions of this Nationwide Permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this Nationwide Permit, the associated liabilities and compliance with the terms and conditions the transferee must sign and date below.

Name of New Owner:

Street Address:

Mailing Address:

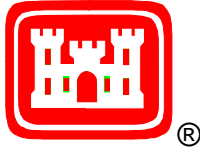
City, State, Zip:

Phone Number:

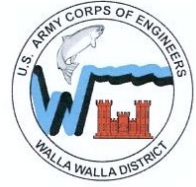
Signature of TRANSFEREE

DATE

COMPLIANCE CERTIFICATION



US Army Corps of Engineers
Walla Walla District



Permit Number: NWW- NWW-2024-00033

Name of Permittee: Ben Whipple, City of Ketchum

Date of Issuance: February 26, 2024

Upon completion of the activity authorized by this permit and any mitigation required by the permit, please sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Walla Walla District
Idaho Falls Regulatory Office
900 North Skyline Rd., Suite A
Idaho Falls, Idaho 83402-1718

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with all terms and conditions of this permit, the permit is subject to suspension, modification, or revocation and you are subject to an enforcement action by this office.

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of the said permit. The required mitigation was also completed in accordance with the permit conditions.

Signature of PERMITEE

DATE



City of Ketchum

ATTACHMENT 2:

Warm Springs Preserve Basis of Design Report



Warm Springs Preserve Basis of Design Report (90% Design)

For Wood River Land Trust
August 19, 2024



Prepared by Rio ASE | Joe@RioASE.com
RioASE.com | Boise, ID | Admin@RioASE.com

AUTHORS AND CONTRIBUTORS

Authors: Rob Richardson (Rio ASE), Mark Pacold (Rio ASE), Joe Young (Rio ASE), Zach Sudman (Rio ASE)

Contributors: Erin Murray (Rio ASE)

ACKNOWLEDGMENTS

The authors and contributors of this report gratefully acknowledge the citizens of the Wood River Valley for their cooperation and involvement throughout the project. Funding for this project was provided by the City of Ketchum and the Wood River Land Trust. Lastly, we thank the Friends of the Warm Springs Preserve for their support throughout the project.

CONTENTS

Authors and Contributors.....	i
Acknowledgments.....	ii
Contents.....	iii
List of Figures.....	v
List of Tables.....	vi
List of Acronyms.....	vii
1 Introduction.....	1
1.1 Project Responsible Parties.....	1
1.2 Site Location.....	1
2 Project Background.....	2
2.1 Environmental Setting.....	2
2.2 Project Goals and Objectives.....	2
3 Existing Conditions.....	4
3.1 Hydrology.....	4
3.2 Geomorphology.....	4
3.3 Fish Use and Habitat Availability.....	5
3.4 Riparian Conditions and Wetlands.....	7
3.5 Bridges.....	10
3.6 Irrigation Diversion.....	10
3.7 Utilities.....	10
4 Design Development.....	12
4.1 Proposed Project Elements.....	12
4.2 Channel Design.....	15
4.2.1 Side Channel Length and Salmonid Utilization.....	15
4.2.2 Flow Distribution and Channel Section.....	15
4.3 Bridge Design.....	15
4.4 Cost Estimates.....	16
4.5 Project Impacts.....	16
5 Hydraulic Modeling and Analysis.....	17
5.1 Existing Conditions Model Results.....	17
5.2 Proposed Conditions Model Results.....	17
6 Stability Analysis.....	20

6.1	Large Woody Material Risk Assessment and Design Factors of Safety	20
6.2	Large Wood Stability Analysis	20
6.3	Scour Analysis.....	21
6.4	Constructed Riffle Stability.....	21
7	Construction	23
7.1	General Aquatic and Construction Conservation Measures.....	23
8	Limitations	25
8.1	Design Purposes, Persons, and Projects	25
8.2	Design Factors.....	25
8.3	Conditions Can Change	25
8.4	Report Misinterpretation.....	26
8.5	Hazards of Instream Habitat Structures.....	26
8.6	Channel Response is Unpredictable.....	27
8.7	Monitoring and Maintenance	27
8.8	Construction Site Safety.....	27
9	References.....	28
Appendix A	90% Design Drawings	
Appendix B	Hydraulic Model Development Technical Memo	
Appendix C	Adaptive Management Plan	
Appendix D	Construction Quantities and Cost Estimate	
Appendix E	Large Wood Risk Matrix and Stability Calculations	
Appendix F	Design Review Comment Tracking	

LIST OF FIGURES

Figure 1-1. Project vicinity.....1

Figure 3-1. Life stages of trout and relevance to the project site.....6

Figure 3-2. Summary of health riparian conditions targeted for the project area.....8

Figure 3-3. Existing wetlands (National Wetlands Inventory database, accessed December 2023).9

Figure 3-4. Pipe exposed in the creek bed adjacent to the existing irrigation diversion..... 11

Figure 5-1. Proposed conditions inundation extent (depth) at low flow..... 18

Figure 6-1. Risk evaluations for public safety and property damage..... 20

LIST OF TABLES

Table 3-1. Selected Peak Discharges (cubic ft per second [cfs])	4
Table 3-2. Annual Daily Exceedance Discharges (cfs) for the USGS Gage Locations and Project Area.....	4
Table 4-1. Performance and Sustainability Criteria for Each Proposed Action.....	13
Table 4-2. Materials Discharged below OHWM or Wetlands	16
Table 4-3. Summary of Impacts to Waters of the U.S. or Wetlands	16
Table 5-1. Proposed Conditions Flow Split at Low Flow (95% exceedance flow)	18
Table 5-2. Modeled Flow Distributions and Percentages of Total Flow at Upstream End of Channels.....	18
Table 6-1. Large Woody Material Stability	21
Table 6-2. Constructed Riffle Material Gradations.....	22

LIST OF ACRONYMS

1D – one-dimensional

2D – two-dimensional

BMP – best management practice

cfs – cubic feet per second

CLOMR – Conditional Letter of Map Revision

Drawings – 90% Design Drawings

FEMA – Federal Emergency Management Agency

FHWA – Federal Highway Administration

ft – feet

FWSP – Friends of the Warm Springs Preserve

HEC-RAS – Hydraulic Engineering Center’s River Analysis System

IDWR – Idaho Department of Water Resources

NOAA – National Oceanic and Atmospheric Administration

NWI – National Wetlands Inventory

OHWM – ordinary high-water mark

OSC – Idaho Governor’s Office of Species Conservation

Report – 90 Percent Basis of Design Report

Rio ASE – Rio Applied Science & Engineering

STA – station

SWPPP – storm water pollution prevention plan

USACE – U.S. Army Corps of Engineers

USBR – U.S. Bureau of Reclamation

USFS – U.S. Forest Service

USFWS – U.S. Fish and Wildlife Service

USGS – U.S. Geological Survey

WRLT – Wood River Land Trust

1 INTRODUCTION

Rio Applied Science & Engineering (Rio ASE) has prepared this 90 Percent Basis of Design report (report) for the Wood River Land Trust (WRLT). This report provides a summary of our findings pertaining to the existing conditions of the Warm Springs Preserve project reach on Warm Springs Creek near Ketchum, Idaho, and an explanation of the design process, analyses, and outcomes for the proposed enhancement design.

Rio ASE organized the following sections of this report to describe the project scope and design approach. This report is submitted to satisfy a 90 Percent Design review by WRLT, City of Ketchum, and regulatory/permitting agencies. The conditions of the project reach are described in terms of processes that shaped the stream and associated ecosystem. This includes discussions on hydrology, hydraulics, habitat, and geomorphology. The evaluation and consideration of the site conditions provide the basis for the project stream and floodplain restoration design.

1.1 Project Responsible Parties

- The project sponsor is the Wood River Land Trust and the project manager is Cory McCaffrey, 208-788-3947.
- The design consultant for all proposed work within Warm Springs Creek and grading within the floodplain is Rio ASE and the engineer of record is Joe Young, 208-484-4700. Proposed site civil work (to include proposed parking lots, utilities, pump stations and pressurized irrigation systems, trails, and structures) is being designed by others (Superbloom and Benchmark Associates).

1.2 Site Location

The Warm Springs Preserve project reach is located on Warm Springs Creek just upstream of its confluence with the Big Wood River. The reach is about 4,800 feet (ft) long and is located about two miles west of downtown Ketchum, Idaho, on 65 acres of land owned by the City of Ketchum. Additional mapping is provided in the 90% Design Drawings (Drawings) in Appendix A.

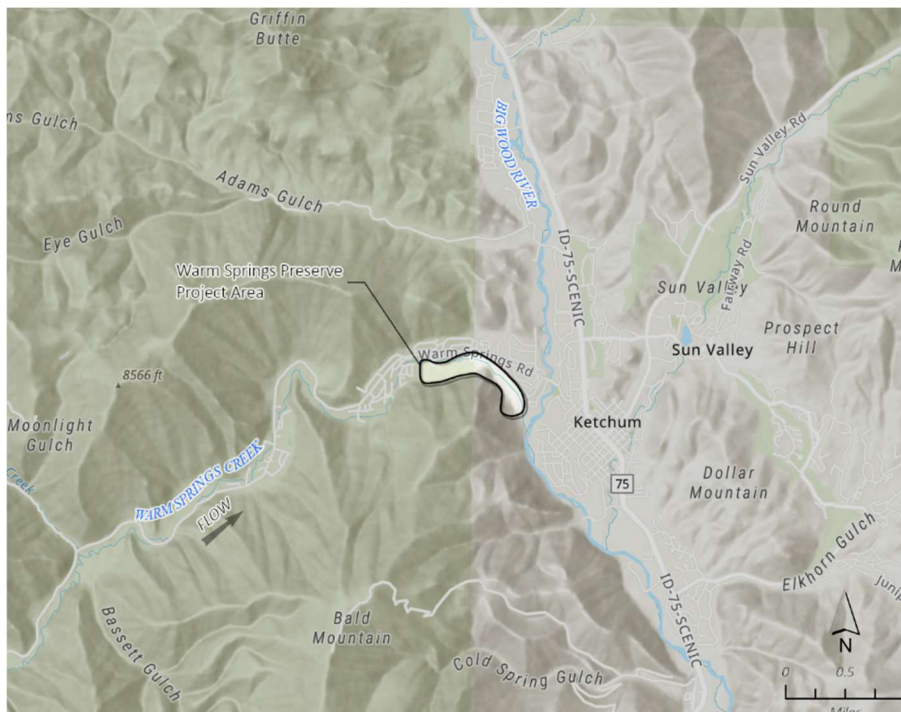


Figure 1-1. Project vicinity.

2 PROJECT BACKGROUND

In 2022, the City of Ketchum took possession of 65 acres of the Warm Springs Ranch property and established the Warm Springs Preserve for public use. The City of Ketchum has partnered with the WRLT and various stakeholders, including the Friends of the Warm Springs Preserve (FWSP) to create a renewed landscape to enhance the streamside park. The enhancement of the Warm Springs Preserve property includes a wide range of objectives related to recreation and restoration. The scope of this piece of the larger project is only concerning the restoration and enhancement of Warm Springs Creek and the adjacent floodplain and does not include park amenities. Some of the main components of this project include restoration of aquatic habitat within the existing creek, creation of side channels, enhancement of floodplain connectivity, flood conveyance improvements, and establishment of native plant communities.

2.1 Environmental Setting

The Warm Springs Preserve project site is located just upstream from its confluence with the Big Wood River, which joins the Malad River just before the Malad flows into the Snake River. The project reach runs along the base of Bald Mountain and the adjacent land includes a former golf course, riparian zone, and steep, densely forested areas. The nearby Warm Springs Creek canyon drains a mountainous and forested area to the west, but is densely developed with residential homes within the direct vicinity of the project area. Warm Springs Road is the major arterial providing access to residential areas and recreation, including Sun Valley Ski Resort on Bald Mountain. Elevations within the project reach range from 5,800 to 6,200 ft above sea level.

Warm Springs Creek has historically meandered through a narrow river valley, changing its course due to flooding and waterway developments, but has been stabilized into its current channel with riprap and fill to protect residential developments and historical land uses. In the southeast portion, the channel moves along the former golf course and through land previously used for ranching. This area contains topsoil and gravel that previous landowners removed from the stream channel. The historical golf course abuts the steep face of Bald Mountain, which is heavily forested with Douglas fir trees and riparian understory (Walsworth, 2009).

2.2 Project Goals and Objectives

The WRLT and City of Ketchum are committed to the following priorities for the Warm Springs Preserve. Items in bold represent aspects that are addressed in this piece of the design.

- A passive park for open space in perpetuity
- Off-leash dog access
- Nordic ski trails
- Public restrooms
- New irrigation system
- **Restoration of the riparian zone adjacent to Warm Springs Creek and its floodplain**

The primary stream and floodplain restoration goals include:

- Enhance and increase the natural channel function of Warm Springs Creek and geomorphic processes that improve habitat suitability for trout
- Create a pond that can be used for irrigation, fishing, and dogs
- Increase floodplain inundation and floodway conveyance
- Create side channels through the floodplain to provide more diverse aquatic and riparian habitat
- Create a wetland to help mitigate loading of pollutants

Stream and floodplain restoration objectives were developed to address the primary limiting factors:

- Increase the number of large wood pieces in Warm Springs Creek
- Increase the quantity and quality of habitat diversity (aquatic, riparian, and upland)
- Increase stem density (number per area) of native shrubs and trees
- Improve site-appropriate native vegetation
- Increase floodplain connectivity
- Increase number and depth of pools

3 EXISTING CONDITIONS

3.1 Hydrology

Flow frequency analyses were performed using data from four U.S. Geological Survey (USGS) gaging stations (#13137000 Warm Springs Creek, ID; #13135500 Big Wood River NR Ketchum ID; and #13139510 Big Wood River at Hailey, ID) to estimate peak flows for input into hydraulic models discussed in this section. A detailed description of the hydrologic analyses is described in Appendix B. As part of the hydrologic analyses, basin area regressions were developed to estimate discharge values at inflow locations within each of the hydraulic models. A summary of peak flows at inflow locations is shown in Table 3-1; Table 3-2 includes a low flow (95% exceedance flow) estimated to be representative of base flow conditions in the summertime, as discussed in Appendix B. The estimated drainage area of Warm Springs Creek at the upstream limit of the project site is 96 square miles (USGS, 2023).

Table 3-1. Selected Peak Discharges (cubic ft per second [cfs])

Exceedance Probability	Recurrence Interval	Warm Springs Creek	Big Wood River Upstream	Big Wood River Downstream
0.667	1.5-year	330	809	1,139
0.5	2-year	432	1,014	1,446
0.2	5-year	723	1,548	2,271
0.1	10-year	867*	2543*	3410*
0.04	25-year	1081*	3402*	4483*
0.02	50-year	1399*	3981*	5380*
0.01	100-year	1673*	4690*	6363*

**FEMA draft model discharges*

Table 3-2. Annual Daily Exceedance Discharges (cfs) for the USGS Gage Locations and Project Area

Annual Daily Exceedance	Warm Springs Creek, USGS Gage 13137000	Big Wood River Upstream	Big Wood River Downstream
95%	29	69	40

3.2 Geomorphology

Within the project area, Warm Springs Creek flows through and over relic glacial outwash and alluvium. As with many drainages in the region, Warm Springs Creek exhibited much greater discharge during the last ice age, generating large volumes of sediment (glacial outwash) that filled the valley (Pierce & Scott, 1982). Over the past several thousand years, Warm Springs Creek has slowly incised through this material, leaving behind sets of terraces. More recently, the terraces within the project area have been mechanically altered to accommodate land use and development, including a golf course. Similarly, the stream channel has been artificially confined, concentrating flow and creating further incision and floodplain abandonment. There is virtually no floodplain connectivity within the northern half of the project reach, even at the 100-year recurrence interval flow (see Hydraulic Modeling Maps in Appendix B). The southern half of the project has marginally better floodplain connectivity, activating at around the 5-year recurrence interval flow. Channel incision is expected to continue

where flood flows lack the ability to spread out and dissipate energy on the floodplain, and instead are concentrated on the bed and banks.

As a result of incision and concentrated stream flow, much of the fine sediment has been scoured from the streambed, leaving behind a relatively uniform layer of coarse cobble bed armor. This condition has created a channel morphology that is predominantly plane-bed with only occasional pools formed by large flow constrictions caused by boulders, logs, tree roots, and/or human infrastructure such as bridge abutments. Fine sediment introduced to the system tends to fill interstitial spaces between the armor, causing severe embedment and further reducing pool formation and spawning habitat quality. The project reach has an average bed slope of 0.83% with sub-reaches that vary from 0.4% to a constructed boulder riffle at 6.4%. Most of the Warm Springs Creek banks within the project area are stable; many are also armored with riprap. Bank erosion is only prevalent where there is a lack of bank material stability, including tree roots and riprap.

Much of the abandoned floodplain vegetation has been cleared or converted to non-native species. The incised stream channel has likely lowered the groundwater table and has certainly reduced the frequency and magnitude of groundwater recharge via the floodplain. Past geotechnical explorations on the site reveal the late-summer groundwater table is over 10 ft below the floodplain surface in many areas. Few riparian species can survive on the abandoned floodplain. Cottonwood trees and willow shrubs persist only along the near-bank riparian area where water is accessible. At the downstream end of the reach, where Warm Springs Creek approaches the Big Wood River, less incision has occurred, the floodplain is more accessible, the groundwater table is presumably higher (relative to the floodplain elevation), and healthy, native riparian vegetation is much more prevalent.

3.3 Fish Use and Habitat Availability

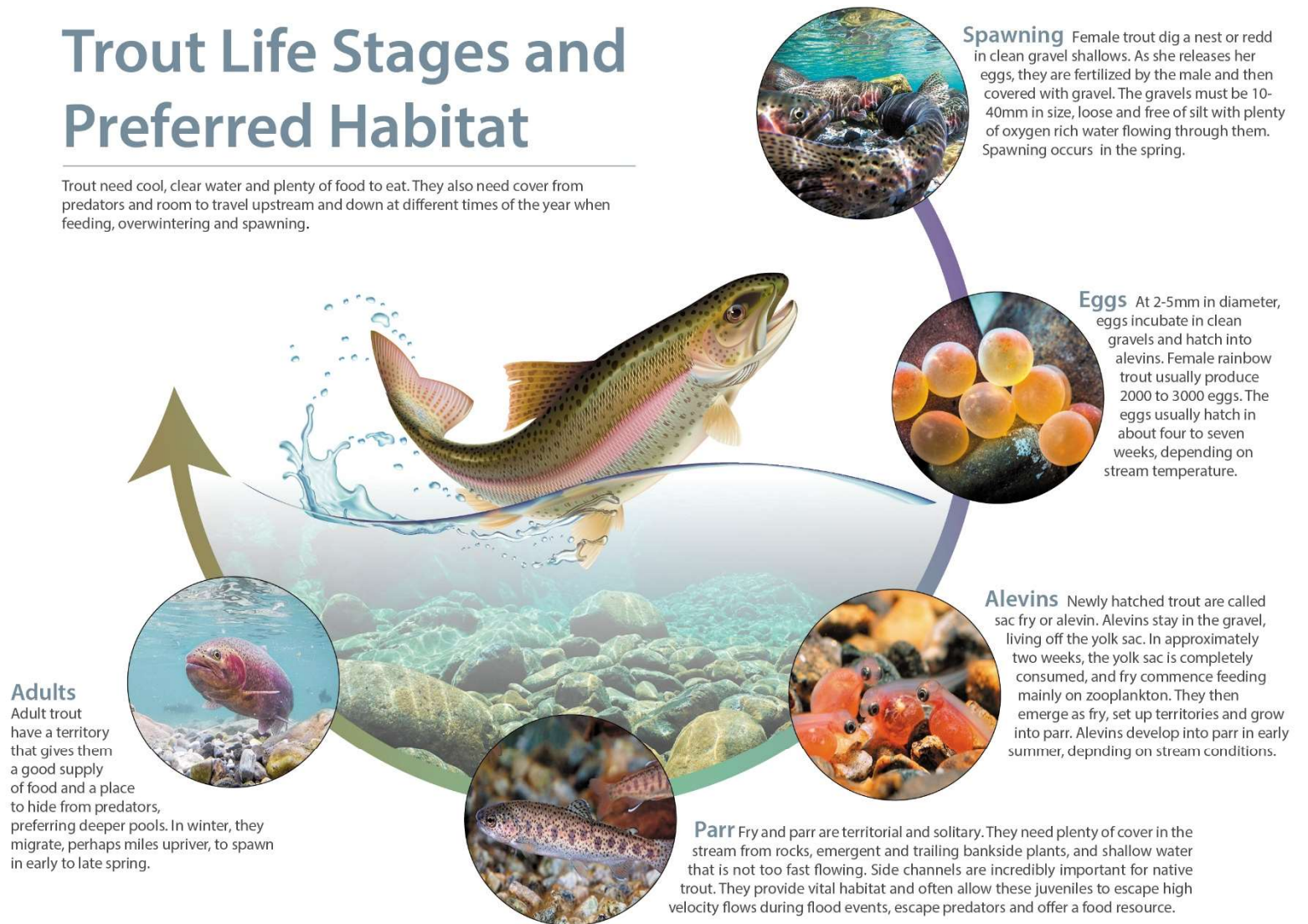
According to project stakeholders and reporting from the Wood River Atlas (Cardno and Ecosystem Sciences, 2020), trout abundance and size is less than desired. Current habitat limitations include:

- Lack of pool quantity and depth for overwintering and cover from predators
- Lack of instream wood for cover from predators
- Armored large bed material that results in lack of spawning gravel

Additional information regarding the life cycles of trout and the relevance to the project site is provided in Figure 3-1.

Trout Life Stages and Preferred Habitat

Trout need cool, clear water and plenty of food to eat. They also need cover from predators and room to travel upstream and down at different times of the year when feeding, overwintering and spawning.



Insects + Plants = Fish Food
Aquatic invertebrates like insects, are integral to the trout food web. Insects feed on aquatic plants, decaying matter and microscopic animals. In turn, they become food for fish.



Riparian Vegetation
Riparian vegetation helps stabilize banks while providing shade and cover for fish. Juvenile fish need slow water and cover generally near the bank and in side channels.



Deep Pools and Cover
Adult fish need deep pools and cover often associated with in-stream wood and boulders.

Figure 3-1. Life stages of trout and relevance to the project site.

3.4 Riparian Conditions and Wetlands

Due to the incised/entrenched nature of the existing Warm Springs Channel there is a narrow riparian fringe and few wetlands. The northern half of the project reach has a narrow riparian corridor that exists on the channel margins. Both right and left banks through this reach are steep (2:1 or greater), which means that vegetation must be within a few feet laterally of the channel to access the adjacent groundwater associated with the channel. This reach also is considered a losing reach, meaning that groundwater elevations drop moving away from the channel, making the transition from riparian to upland even more abrupt.

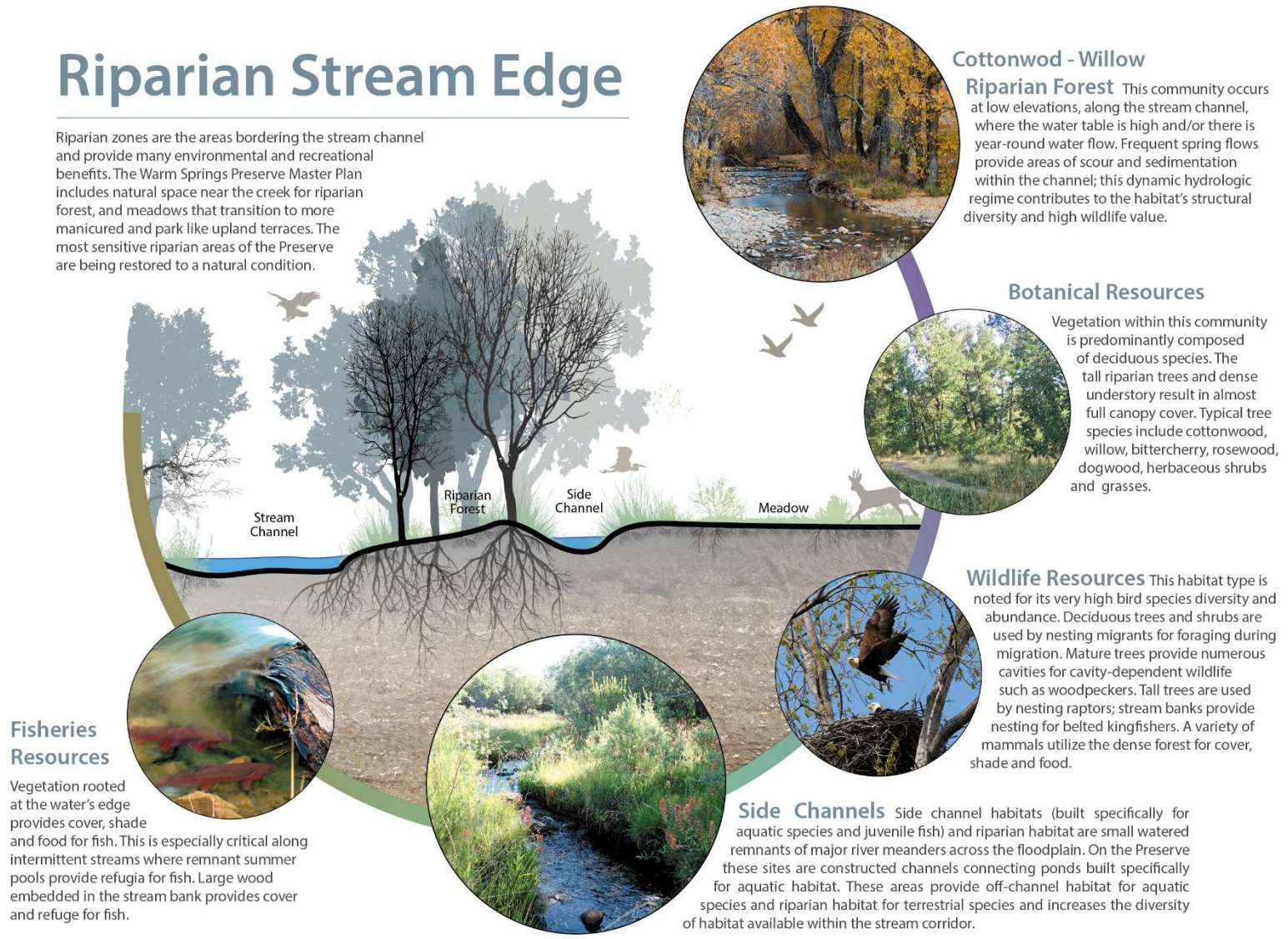
The left bank through this reach is on private property, resulting in a patchwork of riparian conditions. Some landowners have left mature trees and a small riparian buffer, while others have converted their bank to mowed lawns, poured concrete, or placed riprap to protect the bank. The river right bank is within the Warm Springs Preserve property and has a fairly consistent corridor of mature trees and brush, but all contained within a narrow margin due to the steep and tall nature of the bank. There are no wetlands within the north half of the project other than the immediate channel margins and an artificial pond used for pumping water to irrigate the upland lawn.

The southern half of the project has better floodplain connectivity on the river right side. The southern floodplain is mostly grasses with stands of quaking aspen and cottonwood, as well as some wetlands along the toe of the hillslope. The river right bank is lower and more gradual than upstream, which allows for a wider riparian corridor. The river left bank through this reach is all private property as well, with a similar assortment of riparian conditions as the northern reach. A summary of healthy riparian conditions targeted for the project site is provided in Figure 3-2.

According to the National Wetlands Inventory (NWI) database managed by the U.S. Fish and Wildlife Service (USFWS), the wetlands types consist of forested/shrub and emergent in the downstream portion of the project reach. NWI wetlands are shown in Figure 3-3. A formal wetland delineation has not been completed but may be at a later time, if needed.

Riparian Stream Edge

Riparian zones are the areas bordering the stream channel and provide many environmental and recreational benefits. The Warm Springs Preserve Master Plan includes natural space near the creek for riparian forest, and meadows that transition to more manicured and park like upland terraces. The most sensitive riparian areas of the Preserve are being restored to a natural condition.



Cottonwood - Willow

Riparian Forest This community occurs at low elevations, along the stream channel, where the water table is high and/or there is year-round water flow. Frequent spring flows provide areas of scour and sedimentation within the channel; this dynamic hydrologic regime contributes to the habitat's structural diversity and high wildlife value.

Botanical Resources

Vegetation within this community is predominantly composed of deciduous species. The tall riparian trees and dense understory result in almost full canopy cover. Typical tree species include cottonwood, willow, bittercherry, rosewood, dogwood, herbaceous shrubs and grasses.

Wildlife Resources This habitat type is noted for its very high bird species diversity and abundance. Deciduous trees and shrubs are used by nesting migrants for foraging during migration. Mature trees provide numerous cavities for cavity-dependent wildlife such as woodpeckers. Tall trees are used by nesting raptors; stream banks provide nesting for belted kingfishers. A variety of mammals utilize the dense forest for cover, shade and food.

Fisheries Resources

Vegetation rooted at the water's edge provides cover, shade and food for fish. This is especially critical along intermittent streams where remnant summer pools provide refugia for fish. Large wood embedded in the stream bank provides cover and refuge for fish.

Side Channels Side channel habitats (built specifically for aquatic species and juvenile fish) and riparian habitat are small watered remnants of major river meanders across the floodplain. On the Preserve these sites are constructed channels connecting ponds built specifically for aquatic habitat. These areas provide off-channel habitat for aquatic species and riparian habitat for terrestrial species and increases the diversity of habitat available within the stream corridor.



Dynamic + Continually Changing

Riparian forests grow within an alluvial environment that is continually changing due to the ebb and flow of the stream. Riparian vegetation is constantly being reset by flooding disturbance.

Mature cottonwood stands do not regenerate in place, but regenerate by "moving" up and down a river reach. Over time, a healthy riparian area supports all stages of cottonwood communities.

Periodic flooding events are needed for Cottonwood seedlings to germinate and become established on newly-deposited, moist sand and gravel bars. This cottonwood community can grow into a mature riparian forest.

Figure 3-2. Summary of health riparian conditions targeted for the project area.



Figure 3-3. Existing wetlands (National Wetlands Inventory database, accessed December 2023).

3.5 Bridges

Currently, one single span, two-lane bridge provides access to the Warm Springs Preserve and is located approximately at the midpoint of the project reach. Concrete abutments with piles provide a bearing surface. Based on the hydraulic model results (discussed in Section 5), the bridge structure appears to adequately convey the 100-year flow.

3.6 Irrigation Diversion

Within the project reach, the Warm Springs Preserve irrigation diversion serves the Warm Springs Preserve parcel. Three water rights are stacked and have a combined use limitation of 27.9 acres and a combined diversion rate of 1.12 cfs. The primary water right, 37-212A, has a priority date of June 23, 1888, and authorizes diversion of 1.12 cfs for irrigation of 27.9 acres between April 15 and October 31. The other two water rights, 37-2621 and 37-20381, are supplemental water rights for irrigation at the same place of use. Water right 37-2621 has a priority date of August 6, 1959, and a diversion rate of 0.48 cfs. Water right 37-20381 has a priority date of November 12, 1936, and a diversion rate of 0.50 cfs. These three water rights are stacked and have a combined use limitation of 27.9 acres and a combined diversion rate of 1.12 cfs.

3.7 Utilities

As shown in the Drawings (Appendix A; Drawing C2), two known pipe crossings exist on Warm Springs Creek, both exposed in the channel bed (Figure 3-4). The design team has been engaging with the City of Ketchum to determine the use of these pipes. The pipe at station (STA) 2+50 is an active water line. A valve for this water pipe is located on the south side of Warm Springs Creek and will be preserved and protected during construction. The pipe crossing is in an area of the channel that will not be disturbed during construction. The second pipe crossing located at approximately STA 9+00 is suspected of being a part of the existing irrigation system and will also be left undisturbed during construction. The proposed design does not seek to stabilize or provide protection for these pipe crossings. Additional utilities may exist at approximately STA 24+00, where relic bridge abutments are located, as well as in other unknown locations. Rio ASE was not provided all utility linework/mapping.



Figure 3-4. Pipe exposed in the creek bed adjacent to the existing irrigation diversion.

An existing sanitary sewer is located adjacent to Warm Springs Creek near STA 48+00. As part of restoration activities, the project will stabilize the existing riprapped bank by incorporating wood habitat structures at this location. Refer to the Drawings (Appendix A) for more details on the proposed treatment.

4 DESIGN DEVELOPMENT

The restoration plan for the project reach integrates elements of limiting disturbance to areas identified by the landowner, improving irrigation, restoring processes for improved river-floodplain function, and rehabilitation and enhancement of fish habitats. The project is intended to improve habitat complexity, floodplain connectivity, and riparian tree- and shrub-dominated habitat to provide long-term structure and cover. The following restoration concepts are specific actions developed for the project reach:

- Restore process and habitat by distributing flow and energy laterally through enabling channel migration to the extent practical, floodplain reconnection, and/or reconstructing appropriate primary and secondary channel planforms.
- Restore process and reconnect habitat by increasing side channel abundance and diversity with proximal access to the primary channel.
- Restore hydraulic processes, floodplain reconnection, and habitat by providing a greater diversity of channel forms. Channel geometry and planform restoration should focus on reducing channel confinement and increasing geomorphic complexity. Secondary channels should be incorporated where possible.
- Protect existing areas of dense woody riparian vegetation where hydraulic complexity and habitat conditions are already favorable.
- Restore riparian processes by planting woody vegetation (especially cottonwood and willow) with greater plant density along the outside of bends and in floodplain areas susceptible to channel migration and/or avulsion to ensure future channel evolution results in favorable conditions.
- Restore process and habitat by increasing the abundance of instream structure (e.g., large woody debris and boulders), creating hydraulic diversity and habitat complexity while promoting more floodplain inundation and side channel development.
- Restore localized hydraulic processes and habitat by modifying primary channels to result in diverse habitat units, including greater frequency of pools and greater overall range of channel geometry.

4.1 Proposed Project Elements

The design team collaborations and interpretations of the current environmental setting have helped identify specific restoration actions for the Project Reach. These actions are listed below and depicted in the 60% Design Drawings (Appendix A):

- Improvement of the Warm Springs Preserve diversion by creating a constructed riffle and removing the existing concrete headworks. The existing headworks will be replaced with a natural channel that is designed to divert perennial flow into the proposed side channel (“Baldy Channel”). The inlet of the Baldy Channel will mimic a natural side channel inlet composed of soil, rock, and logs to provide structure and to prevent excessive erosion.
- Instream earthwork (excavation and fill) within the existing mainstem channel to create pools, point bars, and constructed riffles to develop an overall more complex riverine network.
- Installation of large and small woody debris structures to promote in-channel complexity, force hydraulic response (scour, deposition, split flow, floodplain connection, sediment sorting, and overall hydraulic diversity), and provide concealment cover for juvenile trout.
- Floodplain earthwork (excavation) to lower the floodplain to allow for more frequent activation on a semi-annual basis (2-year recurrence interval flood or greater) and to create off-channel habitat, including multiple perennial side channels and a small irrigation pond. The static volume of the proposed irrigation pond is approximately 0.6 acre ft, which is less than 2.22 acre ft, which is the 24 hour volume of the irrigation water right of 1.12 cfs.

- Installation of one 30-ft span rolled steel girder bridge and two 36-inch corrugated metal relief culverts where the parking lot access road crosses the proposed Baldy Channel and proposed floodplain swale, respectively.
- Revegetation by means of planting native species within the riparian zone and transplanting local vegetation harvested near the project site, as available. Existing mature vegetation will be preserved to the extent possible and used as floodplain roughness and/or bank roughness, where available and appropriate. Existing, mature riparian vegetation is extremely limited within the project area.

The proposed channel alignments and geometry are designed to be highly functional from baseflow through bankfull flow. The performance and sustainability criteria vary based on each proposed action summarized in Table 4-1.

Table 4-1. Performance and Sustainability Criteria for Each Proposed Action

Work Element	Performance/Sustainability Criteria
Headcut and Grade Stabilization	<p>Performance: 1) Standard riffle to provide localized grade control for bankfull conditions within constructed side channels. 2) Structural control riffles to prevent headcuts and provide project-scale grade control under 100-year discharge conditions at the bridge, side-channel inlet (Baldy Channel), and the reconstructed riffle immediately upstream of the existing bridge. Develop appropriate riffle/streambed material gradation based on estimated hydraulics from the two-dimensional (2D) hydraulic model to be stable during design discharges.</p> <p>Sustainability: Utilize native material for riffle construction. The reduced channel slope will reduce shear stresses throughout the project area, lessening potential for incipient motion of materials. The long-term plan allows for some movement of the channel plan forms; attempting to utilize existing gravels as riffle matrix should allow riffle performance over time.</p> <p>Risk: The riffles become unstable and hydraulic forces lower riffle elevations, causing a reduction in floodplain activation. The risk is being countered by designing riffles to be stable up to the 100-year discharge.</p>
Improve Floodplain Connectivity	<p>Performance: Develop vertical profile to activate the floodplain at a more frequent (1.5- to 2-year discharge) interval primarily via floodplain excavation. Excavate, develop, and promote complex floodplain features (side channels, oxbow [irrigation] pond, high-flow swales, topographic variability) to diversify floodplain conditions at all active flows and increase floodplain connectivity. Removal of existing berms/levees will also increase floodplain connectivity.</p> <p>Sustainability: Initial vegetated floodplain roughness features need to survive and grow to prevent overbank erosion. Bank stability, large woody material structures, and constructed riffles will maintain channel geometry to ensure floodplain connectivity.</p> <p>Risk: Channel incision or channel erosion that increases channel capacity and reduces floodplain connectivity. This risk is being reduced by strategic placement of floodplain roughness, riffle stability, large woody material, and riparian revegetation to promote stability.</p>
Protect Streambanks Using Bioengineering Methods	<p>Performance: Provide short-term stability (5 years) at strategic locations by roughening banks using large woody debris or other natural materials</p>

Table 4-1. Performance and Sustainability Criteria for Each Proposed Action

Work Element	Performance/Sustainability Criteria
	<p>and planting with native riparian vegetation.</p> <p>Sustainability: The near-bank revegetation plan should provide rapid development of a riparian zone that will increase bank stability in the long term (+5 years).</p> <p>Risk: Increased erosion and channel widening reduce floodplain connectivity. This risk is being mitigated by redundancy in structures, revegetation treatments, and current activation levels of floodplain, which will all reduce energy at higher discharge events.</p>
Install Habitat-Forming Natural Material Instream Structures	<p>Performance: Large woody debris structures will be designed to withstand estimated hydraulic conditions associated with a minimum 100-year flow event. Structures will be strategically located to stabilize banks and/or to scour and/or maintain pools and provide fish cover habitat.</p> <p>Sustainability: The volume of wood structures installed will mitigate the short-term lack of natural large woody recruitment through the project reach. Revegetation strategy should provide future large wood recruitment once the system matures (+20 years).</p> <p>Risk: The loss of structures could reduce wood loading metrics below desired levels. This is mitigated through the volume of wood initially placed. The loss of structures poses risks to the Warm Springs Preserve bridge and residential dwellings by causing blockages and/or associated scour. This is mitigated by specifying a maximum log length and designing to the 100-year discharge.</p>
Riparian Vegetation Planting	<p>Performance: The planting plan utilizes local native species and a range of stock types, likely including live stakes, plugs, and containerized plants. A detailed planting plan will be developed in future design phases.</p> <p>Sustainability: There are cottonwood trees and willows in and around the project area, including seed sources further upstream. The proposed grading plan takes into consideration native recruitment and it is expected that native cottonwood, willow, and other plants will naturally recruit within the project area, further bolstering the plant cover. The riparian community should be naturally sustainable over time following project completion.</p> <p>Risk: Plants not surviving or performing poorly increases the potential for encroachment by weeds and reduced stability of graded surfaces over time due to reduced root mass and associated soil binding. This risk is being mitigated by requiring a specialized contractor to acquire and install plant materials, and by providing irrigation until plants are established. Revegetation will also be scheduled for spring to maximize the probability of success.</p>
Channel Construction	<p>Performance: Create side channels and add instream structure to diversify instream hydraulics, improve fish habitat, and increase floodplain connectivity. The floodplain will be activated at a more</p>

Table 4-1. Performance and Sustainability Criteria for Each Proposed Action

Work Element	Performance/Sustainability Criteria
	<p>frequent (1.5- to 2-year) interval. Channel profile and cross sections should have less than a 10% adjustment within the first five years to promote short-term stability as vegetation becomes established.</p> <p>Sustainability: Long-term goals for the project are to maintain restored floodplain connection, reduce the potential for future channel incision, and maintain restored habitat complexity.</p> <p>Risk: In early years, prior to establishment of a robust riparian corridor that will provide dominant hydraulic control, there is risk of increased deformation. This risk is being mitigated by placement of bank roughness, large woody material structures, and constructed riffles to maintain plan form and profile in the short term.</p>

4.2 Channel Design

4.2.1 Side Channel Length and Salmonid Utilization

Recent biological studies of salmonids in the Upper Salmon Basin (Idaho Governor’s Office of Species Conservation [OSC Team], 2019) suggest that juvenile fish utilize side channels heavily, but tend to occupy areas near inlets or outlets. Telemetry studies indicated the maximum daily movement of a juvenile salmonid is approximately 415 ft. Therefore, the proposed design incorporates multiple shorter-length side channels to maximize the number of flow convergences and divergences and connection opportunities to the primary Warm Springs Creek channel. The Baldy Channel is a long side channel bordering the upland terrace proposed to facilitate floodplain groundwater recharge and for upland irrigation needs. This long side channel has been divided into segments by including an inline oxbow (irrigation) pond and wetland. This diversity of habitat was selected to increase complexity and provide shorter stream lengths between various habitat types.

4.2.2 Flow Distribution and Channel Section

Design channel dimensions were selected based on target flow splits at the 1.5-year discharge and at low flow (selected as 29 cfs, which is the 95% exceedance flow during the summer season). Channel dimensions were initially estimated based on average reach slopes and calculations for normal depth at riffle locations. Obtaining low-flow perennial discharge was the primary factor in determining channel inverts at side channels leaving Warm Springs Creek. Channel width was largely driven by the desired flow during the 1.5-year discharge. The combination of these two controls required side channels to have a lower width-to-depth ratio than the main channel.

4.3 Bridge Design

The existing parking lot access road (Lopey Lane) will follow the existing road alignment; however, there are two proposed crossings. One crossing includes installation of two 36-inch corrugated metal flood relief culverts where Lopey Lane crosses a flood swale designed to convey floodplain flows that begin flowing at the 1.5-year discharge. This is referred to in the design drawings (Appendix A) as the Floodplain Swale. The other crossing is a 30-ft rolled steel girder bridge where Lopey Lane crosses the proposed perennial Baldy Channel.

The bridge span (width perpendicular to stream flow) was determined by multiplying the width of the channel at the 1.5-year discharge (bankfull width) by 1.5. This is the minimum width as specified by the National Oceanic and Atmospheric Administration (NOAA) to allow for fish passage and natural stream processes (NOAA, 2023). This calculation resulted in a 30-ft span for the Baldy Channel.

The crossings were incorporated into the 2D hydraulic models by grading the crossings into the Proposed Conditions terrain. Hydraulic analysis was conducted for the bridge with the assumption of no conveyance in the flood relief culverts to reflect the worst-case scenario. The bridge elevation was set such that the low chord of the bridge was 1.2-ft above the modeled 100-year discharge Proposed Conditions water surface elevation to satisfy the Idaho Department of Water Resources (IDWR) requirement of 1-ft of freeboard above the 100-year discharge. See the design drawings in Appendix A for profile views of the bridge and culverts, Section 5 for hydraulic model results, and Appendix B for discussion of model development.

4.4 Cost Estimates

Refer to Appendix D for estimated quantities and associated construction costs.

4.5 Project Impacts

Construction is planned for fall 2025; the in-water work window is July 15 to March 15. The spatial extent of disturbance is shown in the Drawings (Appendix A). Table 4-2 summarizes materials discharged below the ordinary high-water mark (OHWM) or wetlands. Although a formal wetland delineation has not been completed, ecological units for the project have been mapped. All impacts were calculated for the Active Riverine and Lacustrine zones. It is assumed that all wetlands within the project area are contained in this zone, based on the absence of observable wetlands outside of the margins of these zones (see further discussion in Section 3.4). Table 4-3 summarizes impacts to waters of the United States, including wetlands.

Table 4-2. Materials Discharged below OHWM or Wetlands

Type or Material	Quantity (cubic yard)
Class 1, 2, and 3 Riffle Material for Constructed Riffles (gravel, rock, or stone)	840
Boulders (gravel, rock, or stone)	84
General Fill for Filling Existing Pond (dirt or topsoil)	298
Woody Material for Habitat Structures	731
Total	1,953

Table 4-3. Summary of Impacts to Waters of the U.S. or Wetlands

Type	Area (acres)	Area (sq. ft)	Quantity (cubic yard)	Material
Channel Fill (filling)	0.41	18,010	1,222	Riffle Material
Channel and Pool Excavation (excavation)	0.65	28,417	978	Native alluvium
Wood Material (filling)	0.19	8,155	731	Woody Material (for habitat structures)
Total	1.25	54,582	2,931	

5 HYDRAULIC MODELING AND ANALYSIS

The purpose of the existing conditions hydraulic model is to determine the hydraulic conditions (depth, velocity, shear stress, and water surface elevation) for existing conditions in order to evaluate existing floodplain connectivity, in-channel and floodplain habitat conditions at high and low flows, and provide the basis for comparison with proposed conditions hydraulic modeling (to ensure project objectives are being met). The 2D hydraulic model was developed using the U.S. Army Corps of Engineers (USACE) Hydraulic Engineering Center's River Analysis System (HEC-RAS), version 6.3.1. Development of any HEC-RAS 2D hydraulic model requires delineation of the model domain, a terrain surface, designation of hydraulic roughness (Manning's n values), creation of the model mesh, and designation of boundary conditions specifying the inflow(s) hydrology and conditions for outflow(s). Each of these major components of the hydraulic model are discussed in greater detail in Appendix B.

5.1 Existing Conditions Model Results

Appendix B includes model results (depth, velocity, and shear stress) for the low flow and various recurrence interval flows for existing conditions. Interpretations of the results are summarized as follows:

- Inundation extent (and water surface elevations relative to existing bank heights) indicate the channel is disconnected from the floodplain throughout the upper project reach above the 100-year flow event and the lower project reach above the 5-year flow event.
- Lack of floodplain engagement limits riparian vegetation to a narrow vegetated riparian corridor along the left and right banks. Limited width provides little low-velocity refuge for aquatic species, such as fish, during high-flow events.
- Depth, velocity, and shear stress results indicate a substantial lack of hydraulic variability throughout the project reach.
- Difference maps illustrate the relative difference in water surface elevations, velocities, and shear stress comparing existing vs. proposed conditions.
 - These difference maps were generated from 2D hydraulic model results, which calculate hydraulic metrics longitudinally and laterally across a detailed 2D mesh (grid) rather than using depth-averaged results from individual cross sections in a one-dimensional (1D) model. A Conditional Letter of Map Revision (CLOMR) has also been submitted for this project, which uses the Federal Emergency Management Agency (FEMA) standard 1D modeling results developed from multiple cross sections. The two different modeling approaches (1D vs 2D) produce slightly different results; however, regulatory compliance will be based on the CLOMR 1D model, which does not show a rise in base flood elevations in the Warm Springs Ranch Subdivision.

The project reach is severely confined, resulting in a lack of floodplain connectivity. Combined with a homogenous channel, the project reach provides little quantity or quality aquatic habitat value.

5.2 Proposed Conditions Model Results

Appendix B includes 2D hydraulic model results (depth, velocity, and shear stress) for proposed conditions for various recurrence interval flows. Interpretations of the results are summarized as follows:

- Improved floodplain connectivity and inundation frequency throughout the upper project reach at and above the 1.5-year flow. Additionally, the lower river right floodplain is activated at 5-year flow.
- Shear and velocity remain unchanged on river left of Warm Spring Creek adjacent to existing infrastructure and residential dwellings. Additional floodplain connectivity on river right provides

increased flood conveyance and relief. These components working in concert indicate no harm or significant change in hydraulic conditions are expected to occur on river left.

- Flow splits provide perennial side channel activation; however, the design will be refined in a future phase to ensure adequate perennial water delivery to the relocated irrigation pump station. Table 5-1 summarizes proposed channel flow splits and Figure 5-1 illustrates inundation extents at low flow.
- Table 5-2 summarizes flow splits for each channel segment for various modeled proposed condition flows. The flows in the main channel and side channels past the first segments are mathematical subtractions and additions, which cause some inaccuracies at higher flows when overland flow is entering or exiting a channel.

Table 5-1. Proposed Conditions Flow Split at Low Flow (95% exceedance flow)

Channel	Flow (cfs)
Baldy Channel	5.3
Dollar Channel	1.9
Sunny Channel	0.3

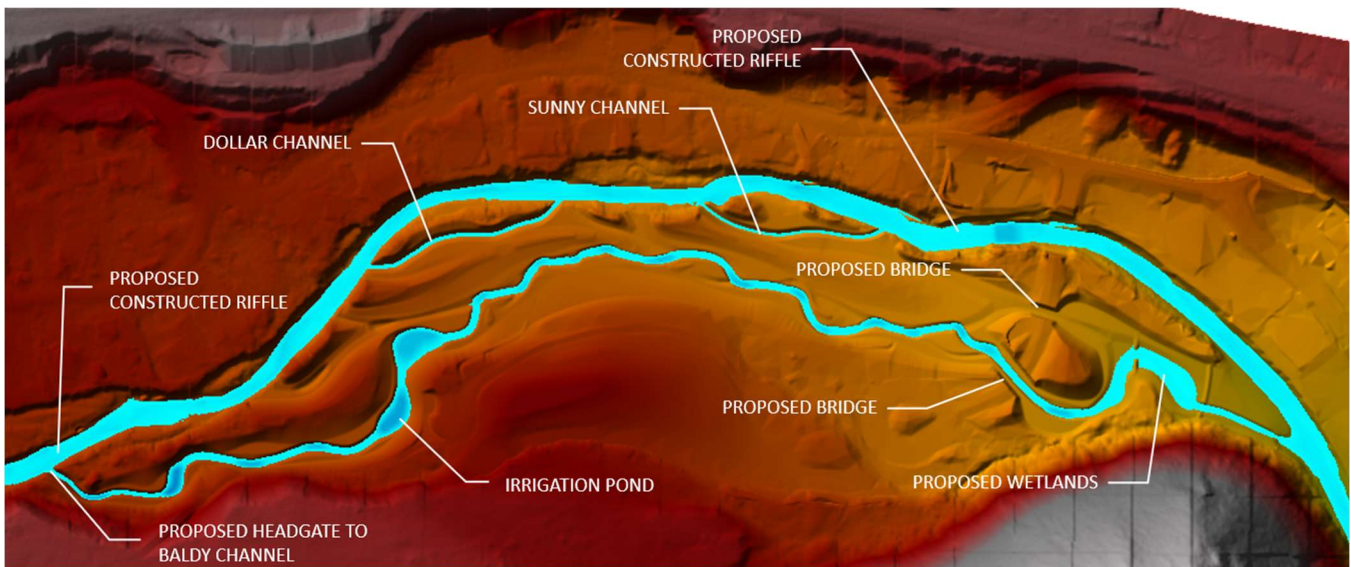


Figure 5-1. Proposed conditions inundation extent (depth) at low flow.

Table 5-2. Modeled Flow Distributions and Percentages of Total Flow at Upstream End of Channels

Channel Segment	Channel Discharge (cfs)		Percent of Total Discharge	
	Low Flow	1.5-yr	Low Flow	1.5-yr
Main Channel – Upstream of Baldy Channel	29	330	100%	100%
Main Channel – Downstream of Baldy Channel	23.8	272	82%	82%
Main Channel – Downstream of Dollar Channel	21.9	246	75%	74%
Main Channel – Downstream of Sunny Channel	23.4	262	81%	79%
Baldy Channel	5.3	58	18%	18%
Dollar Channel	1.9	28	7%	9%
Sunny Channel	0.3	14	1%	4%

The bridge span for Lopey Lane was designed to be 1.5 times the bankfull width of the channel. This design width and flood relief culverts help to mitigate high shears and velocities associated with contractions and expansions at the bridge. The highest velocities and shear stresses modeled at the bridge contraction were at the 100-year discharge, having a maximum velocity of 8.3 ft/s and a maximum shear stress of 1.9 lb/ft². These results were used to design the riffle material that will compose the channel bed material through the bridge crossings to mitigate the risks of erosion and incision. See Section 6.4 for further discussion.

6 STABILITY ANALYSIS

6.1 Large Woody Material Risk Assessment and Design Factors of Safety

Large woody material structures are proposed in the main channel and side channels to provide roughness and habitat throughout the project area. There are approximately 10 different types of proposed structures. These structures will consist of key log members that act as the frame of the structure and may include wood piles. Wood structures will also include numerous racking logs and slash material. These structures are intended to emulate natural log jams.

Rio ASE analyzed the perceived risk associated with large woody material using the Large Woody Materials–Risk Based Design Guidelines (Knutson & Fealko, 2014). Based on the analysis (Appendix E), the estimated risk to public safety and property damage are both high, due primarily to the numerous residential houses immediately adjacent to Warm Springs Creek and the fact that the public park will be used by recreationalists with varying degrees of knowledge and experience with rivers and their associated hazards. The risk matrix scorings in Figure 6-1 are intended to be representative of all structures proposed within the project reach.

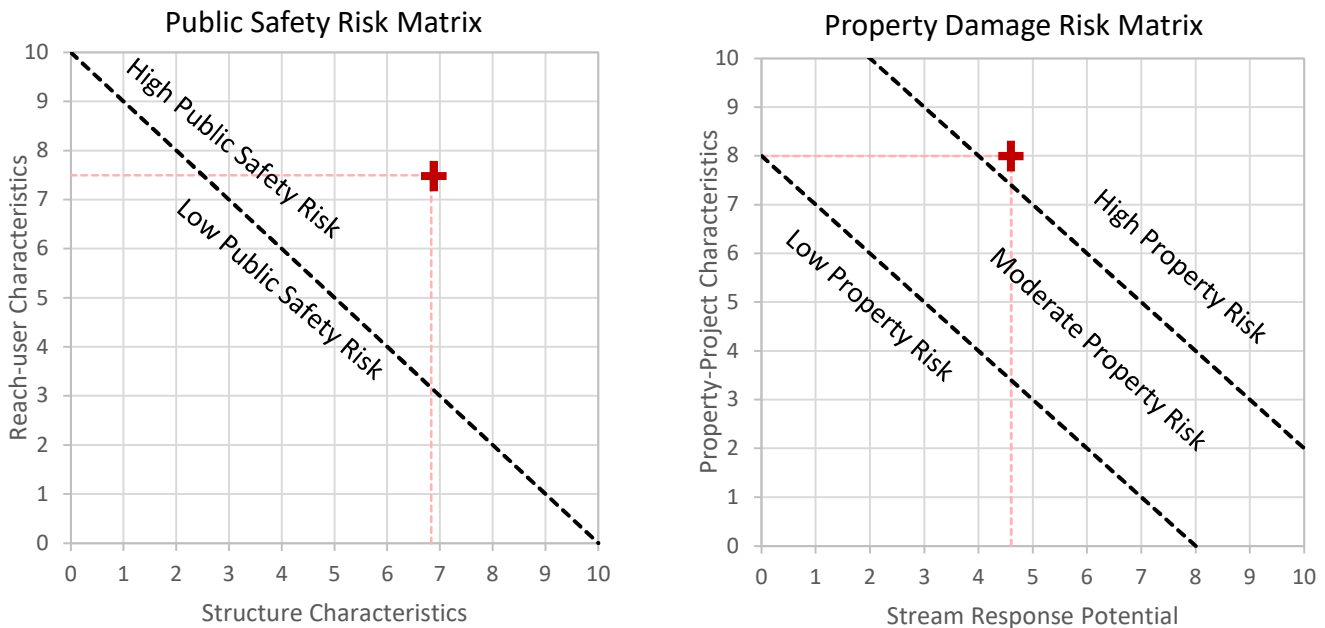


Figure 6-1. Risk evaluations for public safety and property damage.

These guidelines recommend a design flow event equal to or greater than the 100-year peak flood and factors of safety of 2.0 for buoyancy and 1.75 for sliding and rotation.

6.2 Large Wood Stability Analysis

Rio ASE evaluated all proposed wood structure types at the 100-year peak flood (Appendix E). A summary of the stability analyses for each structure type are shown below in Table 6-1. One structure location was analyzed for each structure type, representing critical hydraulic conditions experienced by that structure type. Factors of safety have been included in the stability analysis, which are achieved in part by incorporating existing riprap boulders where present into the design to supplement the support provided by the wood alone. For example, log structures are proposed adjacent to the City of Ketchum sewer line that is currently protected with rock riprap. During construction, the existing riprap is proposed to be removed, the wood structures installed, and the existing riprap replaced as backfill to provide ballast over the woody materials and scour countermeasures. Coarse alluvium will also be used as backfill to achieve the necessary quantity of backfill material. The top

elevation of the wood structure and backfill in this location will be near or at the 100-year base flood elevation. Wood material longevity when fully submerged below water is expected to persist for several decades (U.S. Forest Service [USFS] 1967; Bilby et al., 1999). At such time that the wood does decay, the additional rock will provide bank stability comparable to the existing condition. Also, additional wood is expected to be racked (accumulate) onto the proposed structure, which is desirable because it will provide improved habitat. The proposed wood structures will result in a modest amount of fill within the ordinary high-water extents, thereby reducing the conveyance capacity of the mainstem Warm Springs Creek channel. The proposed side channel on the opposite bank is expected to offset that lost conveyance capacity in order to retain (or lower) existing base flood elevations.

Table 6-1. Large Woody Material Stability

Structure	Factor of Safety	
	Buoyancy	Sliding
Minimum Requirement	2.0	1.75
HS-1: Six-Log Structure	2.2	2.1
HS-2: Nine-Log Structure	2.1	2.1
HS-3: Single-Log Structure	2.1	2.7
HS-4: Whole-Tree Structure	2.1	3.0
HS-5: Constriction Jam	2.3	1.9
HS-6: Small Apex Jam	2.4	2.6
HS-7: Bleeder Jam	2.1	3.0

6.3 Scour Analysis

Scour analyses for each wood structure were estimated using the standard HEC-18—single-pile equation, HEC-18—effective pier width method assuming debris loading, and Froehlich’s abutment scour equation. Results from the three methods were averaged to estimate scour depths at each structure.

Bridge scour was evaluated for the proposed bridge crossing on Lopey Lane. Details of this analysis are provided in Appendix B. The total potential scour of 7-ft below the design channel elevations was estimated for this structure by summing the results of contraction and abutment scour at the 500-year flow event. It is important to note that the analysis assumes native alluvium material composed of primarily sandy-gravelly material. The proposed engineered riffle material (specified in the Drawings [Appendix A] and discussed in Section 6.4 for the channel bed through the bridge opening) was sized to withstand the expected hydraulic conditions at the 100-year flow.

6.4 Constructed Riffle Stability

Based on hydraulic model results for the 100-, 5-, and 1.5-year discharges, it was determined that three riffle gradation classes would be necessary to satisfy the desired stability requirements for the proposed constructed riffles. The following standard methods were used to calculate design riffle gradations:

- HEC 11 Design of Riprap Revetment Method (Federal Highway Administration [FHWA], 1989)
- EM 1601 (USACE, 1994)
- Rock Ramp Design Guidelines (U.S. Bureau of Reclamation [USBR], 2007)

Class-1: Class-1 Riffle Material is designed for the two constructed riffles on Warm Springs Creek (see Appendix A). One of these riffles (Mainstem Riffle 1) is located at the inlet to the Baldy Channel. The intent of this riffle is to reduce the risk of incision on Warm Springs Creek, which would result in reduced flows within the Baldy Channel. The other Class-1 Riffle (Mainstem Riffle 2) is located immediately upstream of the existing bridge on Lopey Lane. The intent of this riffle is to create a more stable riffle than the current configuration of boulders

that is actively eroding at this site. The hydraulic model showed that both of these riffles had worst case hydraulic conditions at the 100-year discharge, and shear stresses and velocities were similar enough that the same gradation could be used for both riffles. The highest velocities and shears were located at Mainstem Riffle 1. The maximum shear stress was modeled at 4.5 lb/ft² and the maximum velocity was modeled at 11.0 ft/s with a depth at max velocity of 5 ft. The gradation shown in Table 6-2 was developed using these hydraulic model results with the listed analysis methods, and according to incipient motion calculations (Julien, 2010), the gradation material size of D30 and larger is calculated to be stable at the 100-year discharge.

Class-2: Class-2 Riffle Material is designed primarily for the constructed riffle that will pass below the proposed bridge on Lopey Lane, the riffles downstream of the bridge, and at the inlet to the Baldy Side Channel. The hydraulic conditions were different enough from the Class-1 Riffles that it was determined that a smaller gradation would achieve stability at the 100-year design flow. The intent of the riffles is to mitigate the risk of scour through the bridge crossing, which would risk compromising the bridge sills through the downstream riffles near the confluence with Warm Springs Creek, potentially resulting in the formation of a headcut that could compromise the bridge, and through the inlet of the Baldy Side Channel, which could compromise the ability of the inlet to convey the design irrigation flow. The hydraulic model showed that these areas had worst-case hydraulic conditions at the 100-year discharge. The hydraulic conditions at the downstream riffles and the upstream inlet locations were not as erosive as the bridge crossing; however, these were identified as hydraulic controls where incision would be undesirable. The maximum shear stress at the bridge crossing was modeled at 2.0 lb/ft² and the maximum velocity was modeled at 8.0 ft/s with a depth at maximum velocity of 1.9 ft. The gradation shown in Table 6-2 was developed using these hydraulic model results with the listed analysis methods. According to incipient motion calculations (Julien, 2010), the gradation material size of D50 and larger is calculated to be stable at the 100-year discharge.

Class-3: Class-3 Riffle Material is designed for grade control with the Baldy Channel at the 1.5-year discharge, which is assumed to be the channel-forming discharge. It is anticipated that some of the native in-situ glacial outwash and alluvium that will be excavated to create the proposed floodplain and Baldy Channel will meet this gradation criteria. The contracting officer or design engineer will be on-site and responsible for determining if the in-situ materials are suitable during construction. If the material is not suitable, the contractor shall over-excavate the native material and replace it with material that meets the gradation requirements. The 1.5-year discharge model results were analyzed to determine the worst-case hydraulic conditions along the Baldy Channel. The maximum shear stress was modeled at 1.2 lb/ft² and the maximum velocity was modeled at 5 ft/s with a depth at maximum velocity of 1.8 ft. Using these hydraulic model results with the listed analysis methods, the gradation shown in Table 6-2 was developed. According to incipient motion calculations (Julien, 2010), the gradation material of D50 and larger is calculated to be stable at the 1.5-year discharge.

Table 6-2. Constructed Riffle Material Gradations

Percent Passing	Class-1 Riffle Material (in.)	Class-2 Riffle Material (in.)	Class-3 Riffle Material (in.)
100% (D100)	32	18	8
84% (D84)	26	14	6
50% (D50)	16	9	4
30% (D30)	12	7	3
16% (D16)	8	4.5	2
10% (D10)	< 0.8	< 0.5	< 0.2

7 CONSTRUCTION

Construction is expected to begin in the summer and fall of 2025 and completed prior to 2026 spring high-flows.

Rio ASE considered General Aquatic Conservation Measures when completing the design. These Conservation Measures are included in the Drawings attached in Appendix A for ease of reference by the construction contractor. The following is a summary of the project's compliance with the general conservation measures.

7.1 General Aquatic and Construction Conservation Measures

- **Climate change:** Climate change was considered in the design. Primary features that address climate change scenarios (runoff timing, lower flows, increased temperature) include side channels, wetlands, and shallow groundwater storage. In addition to these, there will be increased floodplain connectivity and wetland habitat, which should also enhance shallow groundwater storage and subsequent surface water/groundwater connectivity in warmer months and low-flow conditions.
- **Timing of in-water work:** The approved in-water work window for the Warm Springs Creek is currently July 15th through March 15th of the following year.
- **Temporary Cofferdams:** Temporary cofferdam locations proposed for active channel work are in the design drawings (Appendix A). It is ultimately up to the contractor to determine the configuration of the cofferdams, but the contractor will be held to the requirement that any work in the active channel must be completely isolated using cofferdams and dewatered. This work is only to occur during the in-water work window.
- **Site layout and flagging:** The construction contractor will be required to stake all major project elements for approval by the contracting officer or engineer prior to construction and adhere to vertical and horizontal tolerances in accordance with the Specifications (to be developed in a future design phase).
- **Temporary access roads and paths:** Temporary access routes are shown in the Drawings (Appendix A). The construction contractor will not be allowed to deviate from the designated routes unless approved by the contracting officer or engineer.
- **Temporary stream crossings:** There are no temporary stream crossings planned. All construction access is planned to utilize temporary bridges.
- **Staging, storage, and stockpile areas:** Proposed staging and stockpile areas throughout the project area are shown in the Drawings (Appendix A). The construction contractor will not be allowed to deviate from these areas unless approved by the contracting officer or engineer.
- **Equipment:** Equipment necessary to complete the project likely will include dozers, excavators, loaders, and a variety of service vehicles. We included General Conservation and Implementation Measures as notes in the Drawings (Appendix A), and those notes indicate biodegradable lubricants are required for work below the ordinary high-water mark (OHWM).
- **Erosion control:** General Aquatic Conservation Measures in the Drawings (Appendix A) along with suggested placement of stormwater best management practices (BMP). Those include erosion control measures for temporary erosion controls, sediment barriers restricting loads to the stream, soil stabilization measures, and emergency erosion controls. Our scope does not include preparation of a project-specific storm water pollution prevention plan (SWPPP).
- **Dust abatement:** General Conservation and Implementation Measures are included in the Drawings (Appendix A). Those include recommendations regarding work scheduling, dust stabilization measures (water only), spill containment, and a restriction on petroleum-based stabilization products.
- **Spill prevention, control, and counter measures:** General Conservation and Implementation Measures are included in the Drawings (Appendix A). Those include directing the contractor to keep a list of

hazardous materials, written procedures for notification of environmental response, spill containment kits, worker training, and storage of waste liquids. Our scope does not include preparation of a SWPPP.

- **Invasive species control:** General Conservation and Implementation Measures are included in the Drawings (Appendix A). Those include directing the contractor to power wash all vehicles, inspecting in-water equipment, and a restriction on felt-soled wading boots. Our scope does not include preparation of a project-specific invasive species control plan.

8 LIMITATIONS

Some clients, design professionals, and contractors may not recognize that stream and river engineering analysis and design practices are less exact than other engineering and natural science disciplines. Such misunderstandings can create unrealistic expectations, sometimes leading to disappointments, claims, and disputes. Rio ASE includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with Rio ASE if you are unclear how these “Report Limitations and Guidelines” apply to your project or site.

8.1 Design Purposes, Persons, and Projects

This report has been prepared for the Client and their authorized agents and regulatory agencies for use on the Project(s) specifically designed in the report. The information contained herein is not applicable to other sites or projects.

Rio ASE structures its services to meet the specific needs of its clients. No party other than the Client may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project and its schedule and budget, our services have been executed in accordance with our Agreement and generally accepted practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

8.2 Design Factors

This report has been prepared solely for this Project and Client. Rio ASE considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless Rio ASE specifically indicates otherwise, it is important not to rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site, or
- Completed before project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed design and/or structure
- Elevation, configuration, location, or orientation of the proposed structures
- Composition of the design team, or
- Project ownership.

If changes occur after the date of this report, Rio ASE cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations in the context of such changes. Based on that review, we can provide written modifications or confirmation, as appropriate.

8.3 Conditions Can Change

This report is based on conditions that existed at the time the study/design was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability, stream flow fluctuations or stream channel fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of

the described events may have occurred, please contact Rio ASE before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Any designs associated with this report may need to be adjusted in the field during construction in order to meet the specific-site conditions and intended function. Rio ASE cannot assume responsibility for the recommendations in this report if unexpected conditions are encountered during construction. We recommend that you allow sufficient monitoring and consultation by Rio ASE during construction to confirm that the conditions encountered are consistent with those indicated in the report, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether construction activities are completed in accordance with our recommendations.

8.4 Report Misinterpretation

Misinterpretation of this report can result in costly problems. Rio ASE can help reduce the risks of misinterpretation by conferring with appropriate stakeholders after submitting the report, participating in pre-bid and preconstruction conferences, and providing construction observation.

To help reduce the risk of problems, we recommend giving contractors the complete report, including these “Report Limitations and Guidelines.” When providing the report, we recommend that you preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited, and
- Encourages contractors to confer with Rio ASE and/or to conduct additional study to obtain the specific types of information they need or prefer.

8.5 Hazards of Instream Habitat Structures

Instream habitat structures (“Structures”) create potential hazards, including, but not limited to:

- Persons falling from the Structures and associated injury or death,
- Collisions of recreational users and their watercraft with the Structures, and associated risk of injury, and damage of the watercraft,
- Mobilization of a portion or all of the Structures during high water flow conditions and related damage to downstream persons and property,
- Flooding,
- Erosion, and
- Channel avulsion.

In some cases, instream habitat structures are only intended to be temporary, providing temporary stabilization while riparian vegetation becomes established or while stream/river processes stabilize. This gradual deterioration with age and vulnerability to major flood events make the risks with temporary Structures inherently greater with their increasing age.

Rio ASE strongly recommends that the Client appropriately address safety concerns, including but not limited to warning construction workers of hazards associated with working in or near deep and fast-moving water and on steep, slippery, and unstable slopes. In addition, signs should be placed along the enhanced stream reaches in prominent locations to warn third parties, such as nearby residents and recreational users, of the potential hazards noted above.

8.6 Channel Response is Unpredictable

In general, rivers and streams are dynamic and unpredictable. Any predictions regarding future channel evolution and/or response either stated or implied in this report or associated design(s) shall be considered an estimate based on professional judgment given the data available and conditions that existed at the time the study/design was performed. Channel evolution and/or response may include but is not limited to erosion, deposition, channel migration, avulsion, flooding, and sediment and debris transport. Channel evolution and/or response is inevitable, and it should not be assumed that any condition whether natural or constructed will persist unchanged indefinitely in a riverine environment.

8.7 Monitoring and Maintenance

In some designs, Rio ASE may have excluded piles, anchors, chains, cables, reinforcing bars, bolts and similar fasteners from woody habitat structures with the intent of mimicking naturally occurring instream wood structures. In other designs Rio ASE may have included such fasteners in woody habitat structures, if considered appropriate. While Rio ASE designs structures to be relatively stable during flood events, some movement of these structures is expected. We recommend that the Client implement appropriate monitoring and maintenance procedures to minimize potential adverse impacts at or near areas of concern, and consider replacing, adjusting and/or removing damaged, malfunctioning, or deteriorated components of structures.

8.8 Construction Site Safety

Our recommendations are not intended to direct the construction contractor's procedures, means, methods, schedule, or management of the work site during construction of any project associated with this report. The construction contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

9 REFERENCES

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APPENDIX A 90% DESIGN DRAWINGS

Provided as a separate PDF file.

APPENDIX B HYDRAULIC MODEL DEVELOPMENT TECHNICAL MEMO

Provided as a separate PDF file.

APPENDIX C ADAPTIVE MANAGEMENT PLAN

Provided as a separate file.

APPENDIX D CONSTRUCTION QUANTITIES AND COST ESTIMATE

Provided as a separate PDF file.

APPENDIX E LARGE WOOD RISK MATRIX AND STABILITY CALCULATIONS

Provided as a separate PDF file.

APPENDIX F DESIGN REVIEW COMMENT TRACKING

Provided as a separate PDF file.



City of Ketchum

ATTACHMENT 3:

**Project Plans (landscape,
irrigation, civil, stream
alteration)**

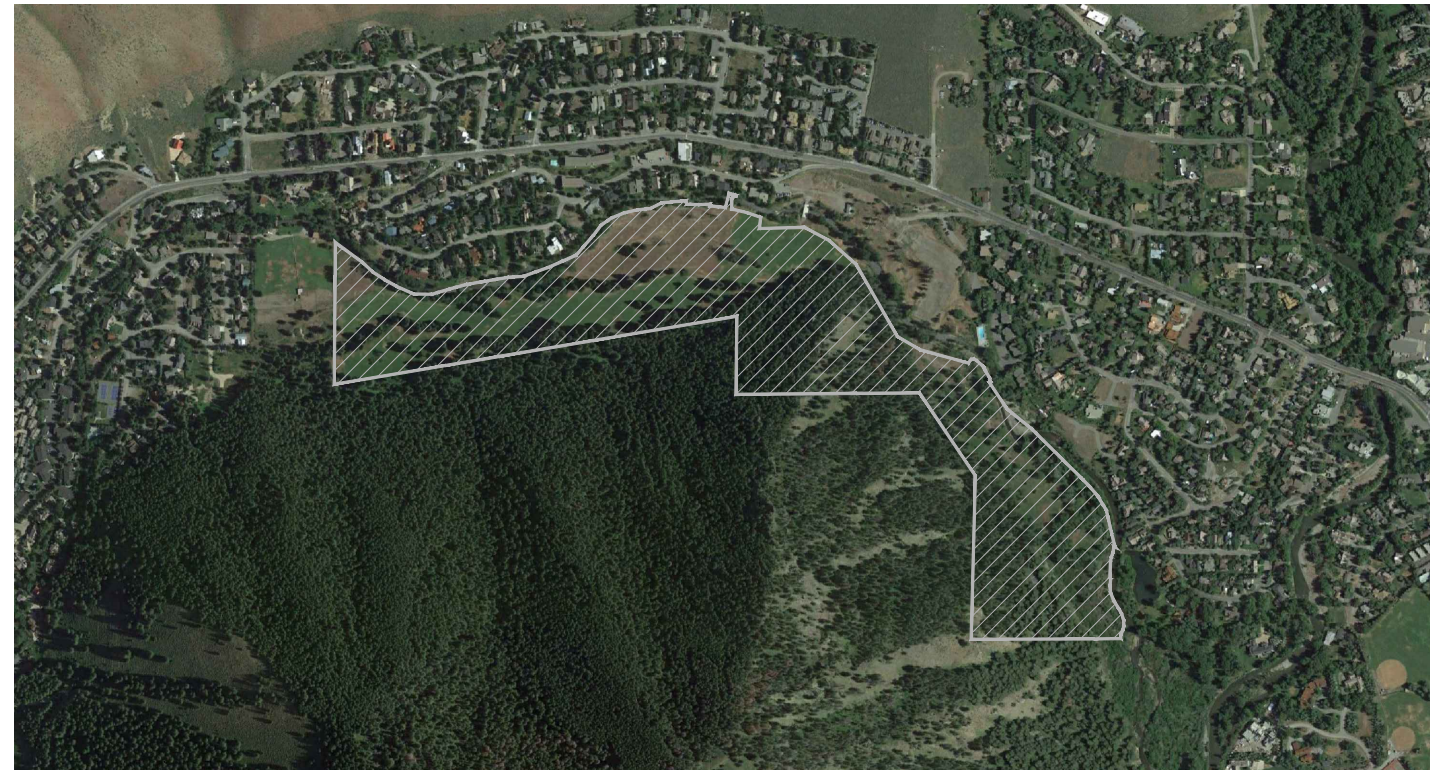
PROJECT NARRATIVE

A FORMER GOLF COURSE SAVED BY THE COMMUNITY, WARM SPRINGS PRESERVE IS AN EXTRAORDINARY OPPORTUNITY TO ENHANCE A WELL-LOVED LANDSCAPE AND IMPORTANT ECOSYSTEM IN THE KETCHUM COMMUNITY. IN 2022-2023 THE CITY OF KETCHUM CONDUCTED EXTENSIVE COMMUNITY OUTREACH TO DEVELOP A VISION PLAN FOR THE FUTURE OF THE PRESERVE, INCLUDING 10-ACRES OF CREEK AND FLOODPLAIN RESTORATION, UNIVERSALLY ACCESSIBLE (ADA) TRAIL IMPROVEMENTS, NEW IRRIGATION AND IMPROVED ACCESS AND PARKING. THESE ITEMS WERE OUTLINED AND REQUIRED THROUGH THE DEED OF TRANSFER WHEN THE CITY ACQUIRED THE PROPERTY, AND THE VISION PLAN WAS APPROVED BY KETCHUM CITY COUNCIL IN APRIL 2023. DUE TO THE SCALE OF THE PROJECT, THE IMPROVEMENTS INCLUDED IN THE VISION PLAN THE PROJECT MAY BE DEVELOPED IN PHASES.

AREA B: FLOODPLAIN AND MIDDLE TERRACE RESTORATION: THIS DESIGN PACKAGE INCLUDES RESTORATION DESIGN WITHIN THE FLOODPLAIN ZONE ADJACENT TO WARM SPRINGS CREEK. THE PROPOSED DESIGN SEEKS TO RESTORE THE STATED CHARACTERISTICS OF THE RIVER, FLOODPLAIN, AND RIPARIAN ZONE. NUMEROUS IN-CHANNEL ALTERATIONS ARE PROPOSED TO INCLUDE POOL AND CHANNEL EXCAVATION, INSTALLATION OF LARGE WOODY DEBRIS, AND INSTALLATION OF CONSTRUCTED RIFFLES TO ACHIEVE THE PROJECT GOALS AND OBJECTIVES. THE RESTORATION PLAN INTEGRATES ELEMENTS OF LIMITING DISTURBANCE TO AREAS IDENTIFIED BY THE LANDOWNER (CITY OF KETCHUM), IMPROVING IRRIGATION, RESTORING PROCESSES FOR IMPROVED RIVER-FLOODPLAIN FUNCTION, AND REHABILITATION AND ENHANCEMENT OF FISH HABITATS. THE PROJECT IS PART OF THE LARGER WARM SPRINGS PRESERVE PROJECT, WHICH IS DETAILED IN THE WARM SPRINGS PRESERVE MASTER PLAN, APPROVED BY KETCHUM CITY COUNCIL IN 2023. A PARALLEL APPLICATION HAS BEEN SUBMITTED FOR THE PROPOSED DRIVEWAY ALTERATIONS AND NEW RESTROOM AND MAINTENANCE BUILDING, WHICH IS NOT IN THE FLOODPLAIN ZONE.

LEGAL DESCRIPTION

WARM SPRINGS RANCH RESORT PUD BLK 2 IN CODE AREA 003002
ADDRESS: 201-311 BALD MOUNTAIN ROAD, KETCHUM, ID 83340



VICINITY MAP

NOT TO SCALE

PROJECT LOT COVERAGE

TOTAL SQUARE FOOTAGE – BLOCK 6 = 195,647 SF (LOT COVERAGE OF BUILDING AND PARKING = 7.8%)
TOTAL SQUARE FOOTAGE – ENTIRE WARM SPRINGS PRESERVE = 5,623,930 (LOT COVERAGE OF BUILDING AND PARKING 0.2 %)

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RESTORATION PLANTING
INTERMOUNTAIN AQUATICS

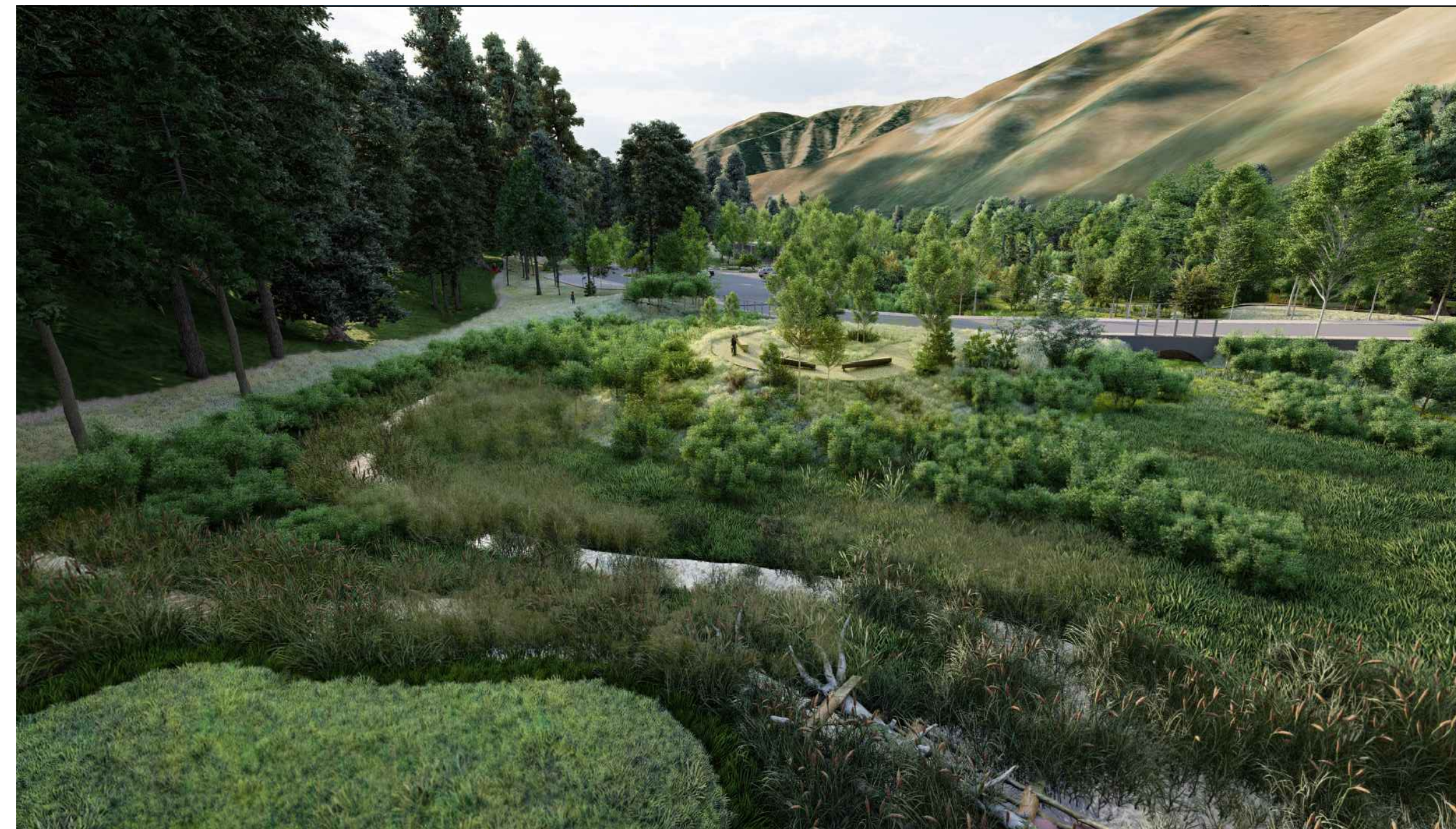
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WARM SPRINGS PRESERVE

FLOODPLAIN DEVELOPMENT PERMIT LANDSCAPE & REVEGETATION PLANS

Issued: 12/10/24



ILLUSTRATIVE RENDERING

LANDSCAPE GENERAL NOTES

- ALL EXISTING GRADING, CURB LAYOUT, EASEMENTS AND UTILITIES ARE BASED ON SURVEY INFORMATION PREPARED BY MARK PHILLIPS (2023) AND RIO APPLIED SCIENCE & ENGINEERING (2023) AND ARE SHOWN FOR INFORMATION ONLY.
- ALL PROPOSED UTILITIES, STREET LAYOUT, AND STREET & ROAD GRADING INFORMATION WAS PREPARED BY BENCHMARK ASSOCIATES ENGINEERING AND ARE SHOWN FOR INFORMATION ONLY. REFER TO CIVIL CONSTRUCTION DRAWING PACKAGE FOR FURTHER INFORMATION. NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.
- CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES ABOVE AND BELOW GRADE PRIOR TO CONSTRUCTION.
- FINAL LIGHTING LOCATIONS TO BE STAKED AND CONFIRMED WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. STREET LIGHTING WILL BE PROVIDED ON SITE PER CIVIL CONSTRUCTION DRAWINGS. CONTRACTOR TO VERIFY LOCATIONS IN FIELD PRIOR TO COMMENCING WORK. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND ENGINEER OF ANY DISCREPANCIES.
- ALL ARCHITECTURAL ELEMENTS ARE SHOWN ON LANDSCAPE PLANS FOR REFERENCE ONLY. DEMOLITION AND PROPOSED ARCHITECTURAL BUILDING DOCUMENTATION SHALL BE PROVIDED UNDER SEPARATE COVER BY ARCHITECT OR MICHAEL DOTY ARCHITECTS.
- THESE DRAWINGS USE A SYSTEM OF KEYNOTES FOR MATERIAL DESIGNATIONS AND SPECIFIC SITUATION NOTES. CONTRACTOR TO BE FAMILIAR WITH SYSTEM PRIOR TO COMMENCING WORK. CONTACT LANDSCAPE ARCHITECT IF CONFLICTS ARE FOUND OR SYSTEM IS NOT CLEAR.
- WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.
- ALL LAYOUT DIMENSIONS ARE FROM PLAN VIEW CALCULATIONS. FIELD DIMENSIONS MAY VARY FROM PLAN DUE TO ACTUAL LENGTHS ALONG SLOPED SURFACES.
- ALL LAYOUT DIMENSIONS ARE TO BACK OF CURB, FACE OF WALL, CENTERLINE OF ARCHITECTURAL COLUMN, AND/OR FACE OF BUILDING UNLESS OTHERWISE NOTED.
- DIMENSIONS MARKED "VERIFY" ARE TO BE FIELD MEASURED. ANY DISCREPANCIES FROM THE NOTED DIMENSIONS ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO CONTINUING WORK.
- COORDINATE PROPOSED WALKS AND RAMPS WITH EXISTING CONDITIONS. LAYOUT OF ARCS TO BE SMOOTH AND CONTINUOUS. STAKE PROPOSED WALKS AND REVIEW IN FIELD WITH ARCHITECT PRIOR TO FORMING.
- UNLESS OTHERWISE NOTED, FOR ALL ATTACHED AND DETACHED CITY SIDEWALKS, ACCESSIBLE RAMPS AND CURB & GUTTER WITHIN RIGHT-OF-WAY, REFER TO CIVIL DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL WALK WIDTHS, GRADES AND ADJACENT CONDITIONS PRIOR TO STARTING WORK AND SHALL NOTIFY LANDSCAPE ARCHITECT OF ANY AND ALL DISCREPANCIES.
- ALL UTILITY EASEMENTS AS NOTED HEREIN SHALL REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT ENTRY.
- LIMIT OF WORK LINE FOR CONSTRUCTION IS SHOWN DIAGRAMMATICALLY AND OCCURS AT BACK OF CURB, FACE OF BUILDING OR PROPERTY LINE UNLESS OTHERWISE NOTED.
- DRAWING AND PLAN NOTES REPRESENT FINISHED, BUILT CONDITIONS. ALL BRACING, TEMPORARY SUPPORTS AND SHORING NECESSARY FOR CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- ALL SYMBOLS ARE SHOWN DIAGRAMMATICALLY ILLUSTRATING APPROXIMATE LOCATION OF EXISTING AND PROPOSED MATERIALS. ANY DISCREPANCIES OR CONFLICTS BETWEEN EXISTING AND PROPOSED CONDITIONS SHALL BE REPORTED TO THE ARCHITECT PRIOR TO CONSTRUCTION.
- ALL FENCING SHALL BE IN ACCORDANCE WITH THE CITY OF AURORA FENCE, WALL, AND AWNING STANDARDS CHAPTER 146-4.7.9, EXCEPT WHERE OTHERWISE NOTED AND ACCEPTED BY THE CITY OF AURORA.
- REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION PERTAINING TO THE PROJECT MATERIALS, PROCEDURES AND INSTALLATION.

SHEET NUMBER

SHEET INDEX

SHEET NUMBER	SHEET TITLE
L0.00	COVER SHEET
L0.01	ILLUSTRATIVE RENDERINGS
C1.0	SITE GEOMETRY PLAN - PARKING
C2.0	ROAD PLAN AND PROFILE
C2.1	PARKING LOT GRADING
C3.0	UTILITY PLAN
L1.00	OVERALL PLAN
L1.01	LANDSCAPE PLAN
L1.02	LANDSCAPE PLAN
L1.03	LANDSCAPE PLAN
L1.04	LANDSCAPE PLAN
L2.00	LANDSCAPE DETAILS & PLANTING SCHEDULES
IR1.0	IRRIGATION - PLUMBING PLAN
IR1.1	IRRIGATION - ELECTRICAL PLAN
IR1.2	IRRIGATION - DETAILS
IR1.3	IRRIGATION - DETAILS
IR1.4	IRRIGATION PUMP STATION DETAILS
IR1.5	PUMP PAD & WET WELL LAYOUT

SUPERBLOOM

750 PENNSYLVANIA ST.
DENVER, CO 80203
720.440.2668

WARM SPRINGS PRESERVE STREAM &
FLOODPLAIN ENHANCEMENT DESIGN SET

FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 12/10/2024
DESIGNED: SP, DL, HC, ML
APPROVED: DL

DRAWING NAME

COVER SHEET

DRAWING NO.

L0.00



ILLUSTRATIVE IMAGE OF OVERALL MASTER PLAN



NEW POND | ILLUSTRATIVE RENDERING



FLOODPLAIN AND NEW PILOT CHANNEL | ILLUSTRATIVE RENDERING



FLOODPLAIN CROSSING | ILLUSTRATIVE RENDERING

NOTES:

1. RENDERINGS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY TO CONVEY GENERAL DESIGN AESTHETIC. THESE ARE NOT FOR CONSTRUCTION PURPOSES. PLEASE REFER TO HARDLINED DRAWINGS AND DETAILS FOR THIS INFORMATION.

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

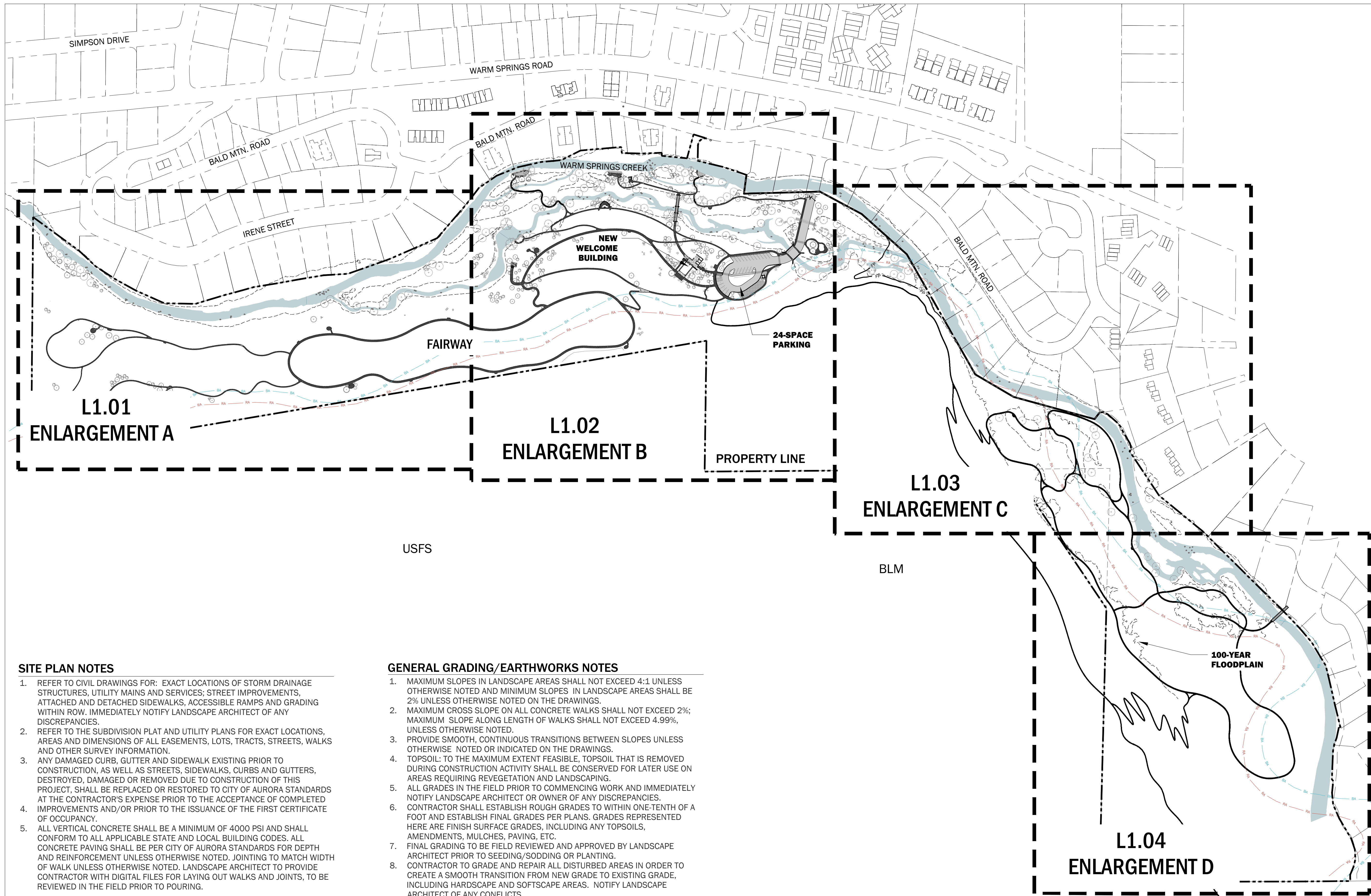
DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL

DRAWING NAME

ILLUSTRATIVE
RENDERINGS

DRAWING NO.

L0.01



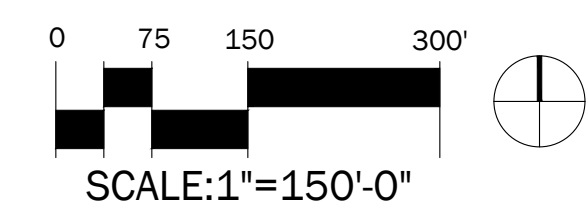
SITE PLAN NOTES

- REFER TO CIVIL DRAWINGS FOR: EXACT LOCATIONS OF STORM DRAINAGE STRUCTURES, UTILITY MAINS AND SERVICES; STREET IMPROVEMENTS, ATTACHED AND DETACHED SIDEWALKS, CURBS AND GUTTERS, WALKS AND OTHER SURVEY INFORMATION.
- REFER TO THE SUBDIVISION PLAT AND UTILITY PLANS FOR EXACT LOCATIONS, AREAS AND DIMENSIONS OF ALL EASEMENTS, LOTS, TRACTS, STREETS, WALKS AND OTHER SURVEY INFORMATION.
- ANY DAMAGED CURB, GUTTER AND SIDEWALK EXISTING PRIOR TO CONSTRUCTION, AS WELL AS STREETS, SIDEWALKS, CURBS AND GUTTERS, DESTROYED, DAMAGED OR REMOVED DUE TO CONSTRUCTION OF THIS PROJECT, SHALL BE REPLACED OR RESTORED TO CITY OF AURORA STANDARDS AT THE CONTRACTOR'S EXPENSE PRIOR TO THE ACCEPTANCE OF COMPLETED IMPROVEMENTS AND/OR PRIOR TO THE ISSUANCE OF THE FIRST CERTIFICATE OF OCCUPANCY.
- ALL VERTICAL CONCRETE SHALL BE A MINIMUM OF 4000 PSI AND SHALL CONFORM TO ALL APPLICABLE STATE AND LOCAL BUILDING CODES. ALL CONCRETE PAVING SHALL BE PER CITY OF AURORA STANDARDS FOR DEPTH AND REINFORCEMENT UNLESS OTHERWISE NOTED. JOINTING TO MATCH WIDTH OF WALK UNLESS OTHERWISE NOTED. LANDSCAPE ARCHITECT TO PROVIDE CONTRACTOR WITH DIGITAL FILES FOR LAYING OUT WALKS AND JOINTS, TO BE REVIEWED IN THE FIELD PRIOR TO POURING.

GENERAL GRADING/EARTHWORKS NOTES

- MAXIMUM SLOPES IN LANDSCAPE AREAS SHALL NOT EXCEED 4:1 UNLESS OTHERWISE NOTED AND MINIMUM SLOPES IN LANDSCAPE AREAS SHALL BE 2% UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- MAXIMUM CROSS SLOPE ON ALL CONCRETE WALKS SHALL NOT EXCEED 2%; MAXIMUM SLOPE ALONG LENGTH OF WALKS SHALL NOT EXCEED 4.99%, UNLESS OTHERWISE NOTED.
- PROVIDE SMOOTH, CONTINUOUS TRANSITIONS BETWEEN SLOPES UNLESS OTHERWISE NOTED OR INDICATED ON THE DRAWINGS.
- TOPSOIL: TO THE MAXIMUM EXTENT FEASIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE CONSERVED FOR LATER USE ON AREAS REQUIRING REVEGETATION AND LANDSCAPING.
- ALL GRADES IN THE FIELD PRIOR TO COMMENCING WORK AND IMMEDIATELY NOTIFY LANDSCAPE ARCHITECT OR OWNER OF ANY DISCREPANCIES.
- CONTRACTOR SHALL ESTABLISH ROUGH GRADES TO WITHIN ONE-TENTH OF A FOOT AND ESTABLISH FINAL GRADES PER PLANS. GRADES REPRESENTED HERE ARE FINISH SURFACE GRADES, INCLUDING ANY TOPSOILS, AMENDMENTS, MULCHES, PAVING, ETC.
- FINAL GRADING TO BE FIELD REVIEWED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO SEEDING/SODDING OR PLANTING.
- CONTRACTOR TO GRADE AND REPAIR ALL DISTURBED AREAS IN ORDER TO CREATE A SMOOTH TRANSITION FROM NEW GRADE TO EXISTING GRADE, INCLUDING HARDSCAPE AND SOFTSCAPE AREAS. NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS.

1 Overall Site Plan (For Reference Only)
Scale: 1"=150'-00"



SUPERBLOOM
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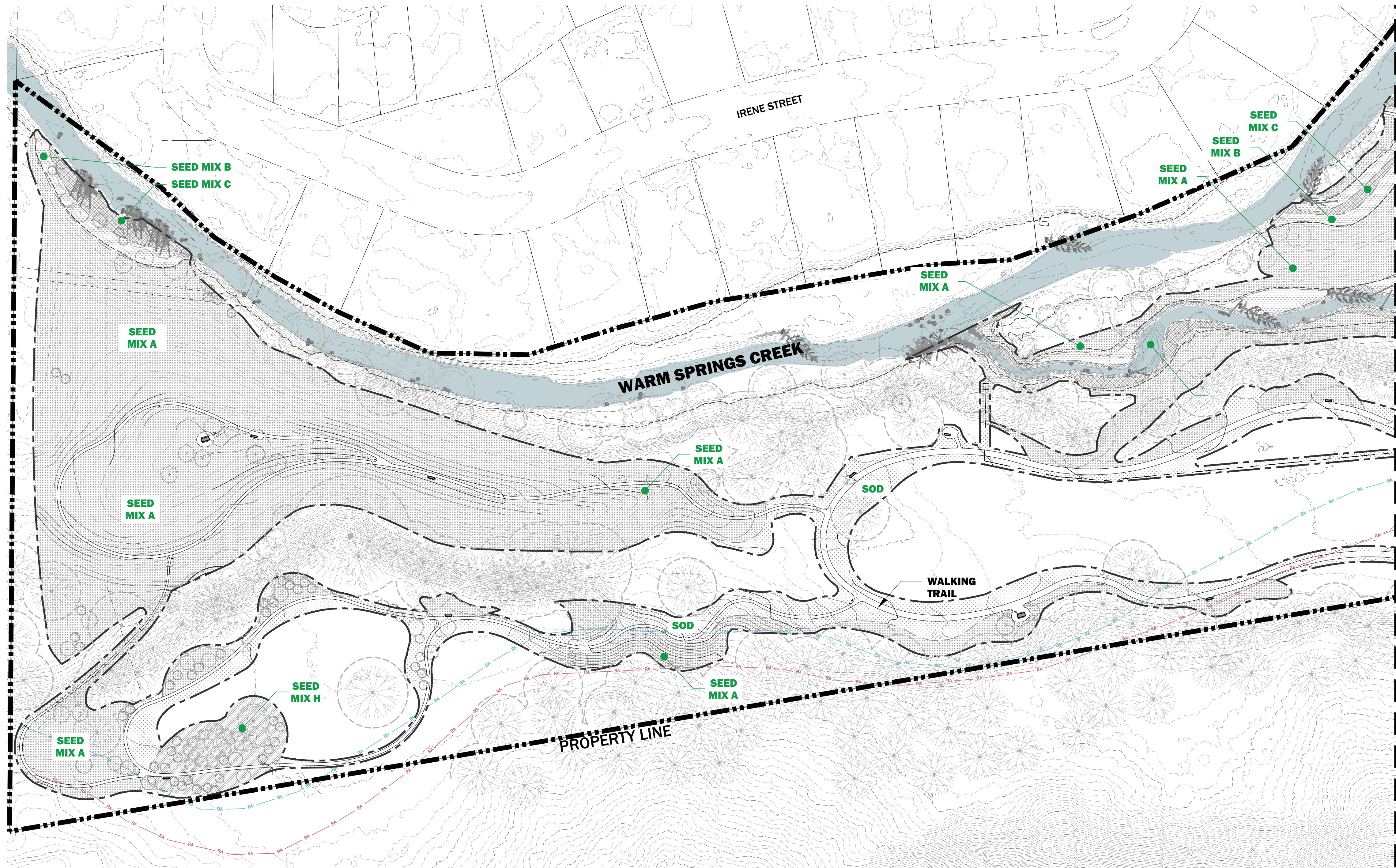
WARM SPRINGS PRESERVE STREAM &
FLOODPLAIN ENHANCEMENT DESIGN SET
FLOODPLAIN SUBMITTAL #2
WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL
DRAWING NAME

COVER SHEET

DRAWING NO.
L1.00



LINETYPE LEGEND

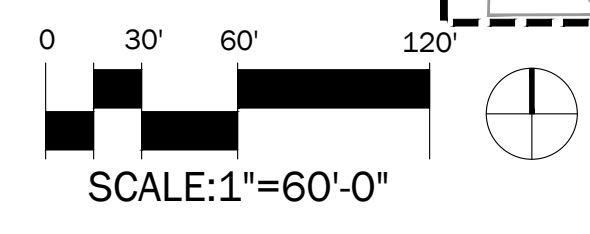
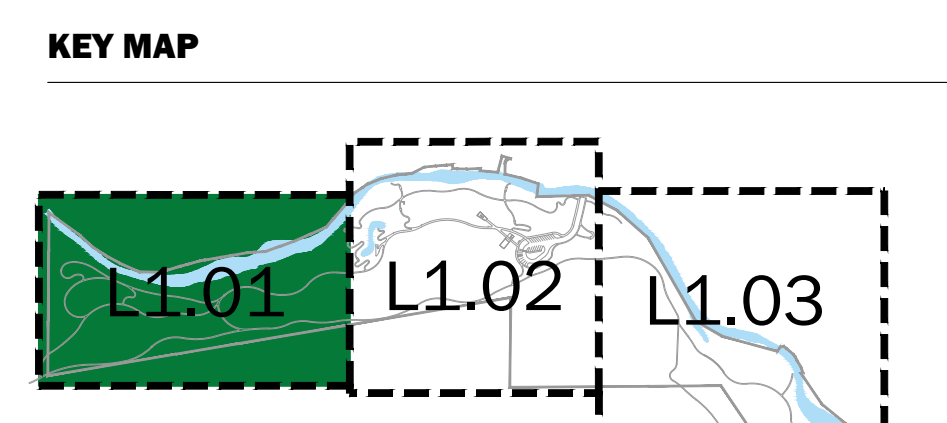
FP	100-YEAR FLOODPLAIN
BA	MODERATE RISK AVALANCHE ZONE
RA	HIGH RISK AVALANCHE ZONE
---	PROPERTY LINE
---	LIMIT OF WORK
---	TREE PROTECTION ZONE
---	BUILDING PERMIT LIMIT OF WORK
---	29 CFS "LOW FLOW" INUNDATION EXTENTS

SEED MIX LEGEND

SYMBOL	KEY	PLANT MIX TYPE
[Pattern]	MIX A	UPLAND MEADOW MIX
[Pattern]	MIX B	XERIC (DRY) FLOODPLAIN
[Pattern]	MIX C	MESIC (WET) FLOODPLAIN
[Pattern]	MIX D	NEAR STREAM RIPARIAN
[Pattern]	MIX E,F,G	IN STREAM AQUATIC, SHALLOW EMERGENT WETLAND, & DEEP EMERGENT WETLAND
[Pattern]	MIX H	ASPEN GROVE
[Pattern]	SOD	RESTORED LAWN

MATCHLINE, SEE SHEET L1.02

1 Enlargement A
Scale: 1"=60'



SUPERBLOOM

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WARM SPRINGS PRESERVE STREAM &
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FLOODPLAIN SUBMITTAL #2

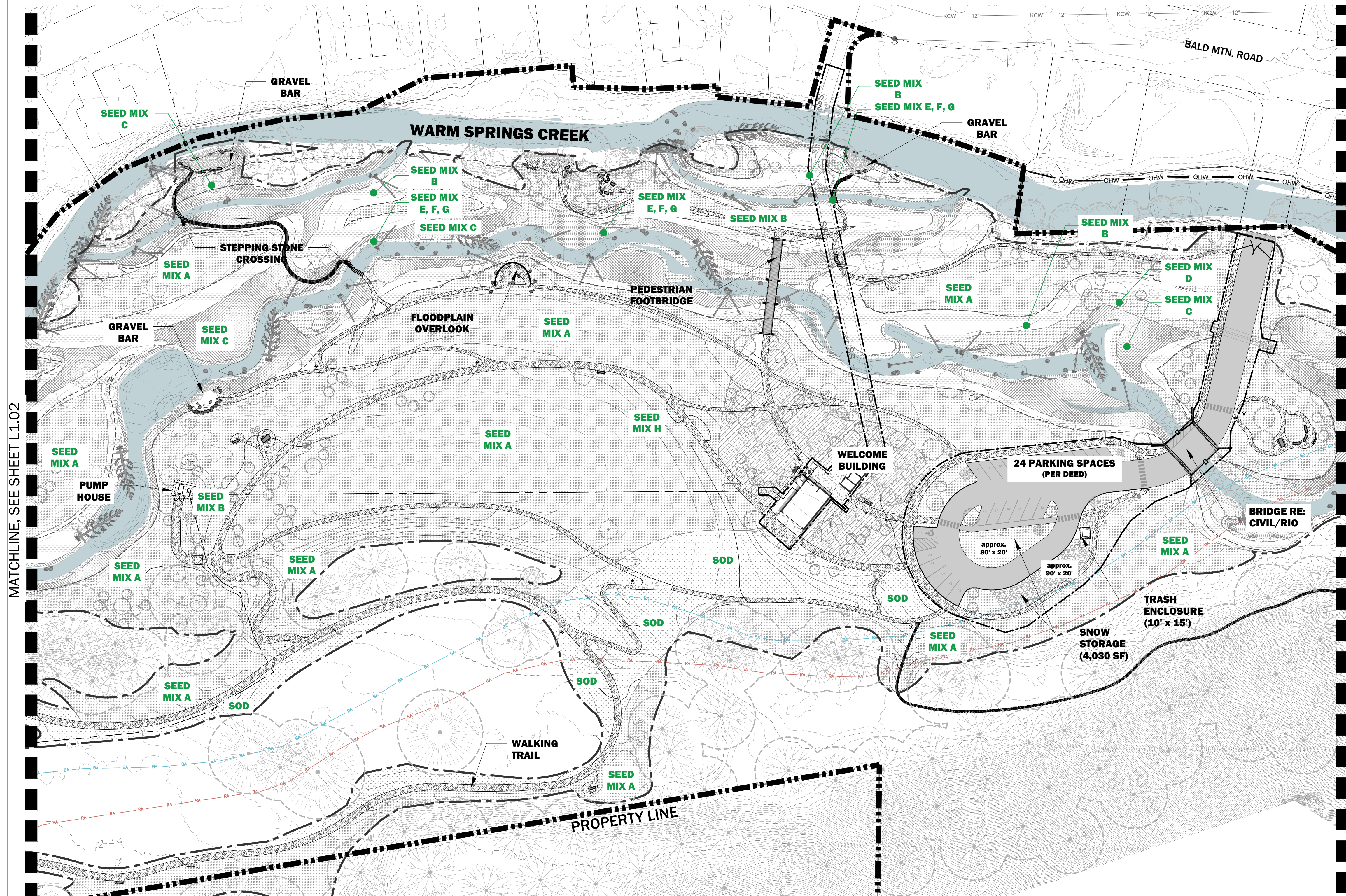
WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL

DRAWING NAME
LANDSCAPE PLANS

DRAWING NO.
L1.01



MATCHLINE, SEE SHEET L1.02

MATCHLINE, SEE SHEET L1.03

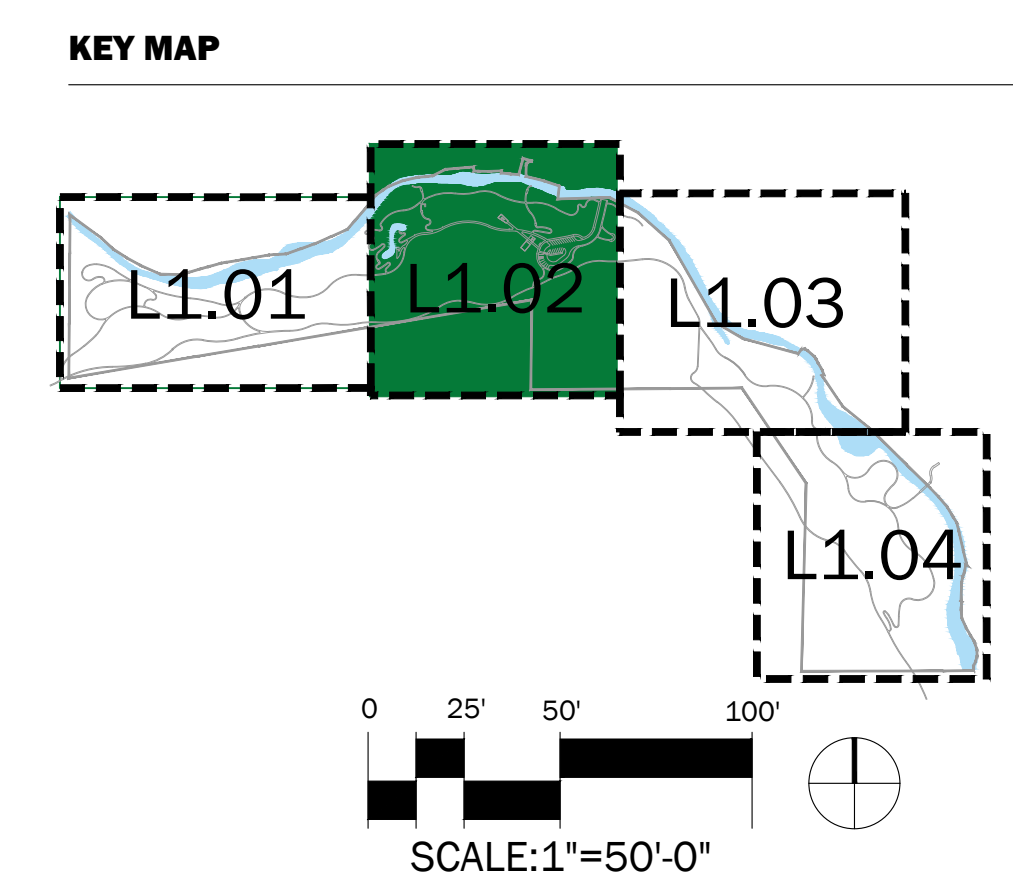
LINETYPE LEGEND

— (blue)	100-YEAR FLOODPLAIN
— (light blue)	MODERATE RISK AVALANCHE ZONE
— (red)	HIGH RISK AVALANCHE ZONE
— (dashed)	PROPERTY LINE
— (thick dashed)	LIMIT OF WORK
— (dotted)	TREE PROTECTION ZONE
— (dash-dot)	BUILDING PERMIT LIMIT OF WORK
— (light blue shaded)	29 CFS "LOW FLOW" INUNDATION EXTENTS

SEED MIX LEGEND

SYMBOL	KEY	PLANT MIX TYPE
[Pattern]	MIX A	UPLAND MEADOW MIX
[Pattern]	MIX B	XERIC (DRY) FLOODPLAIN
[Pattern]	MIX C	MESIC (WET) FLOODPLAIN
[Pattern]	MIX D	NEAR STREAM RIPARIAN
[Pattern]	MIX E,F,G	IN STREAM AQUATIC, SHALLOW EMERGENT WETLAND, & DEEP EMERGENT WETLAND
[Pattern]	MIX H	ASPEN GROVE
[Pattern]	SOD	RESTORED LAWN

1 Enlargement B
Scale: 1"=50'



SUPERBLOOM

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WARM SPRINGS PRESERVE STREAM &
FLOODPLAIN ENHANCEMENT DESIGN SET

FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

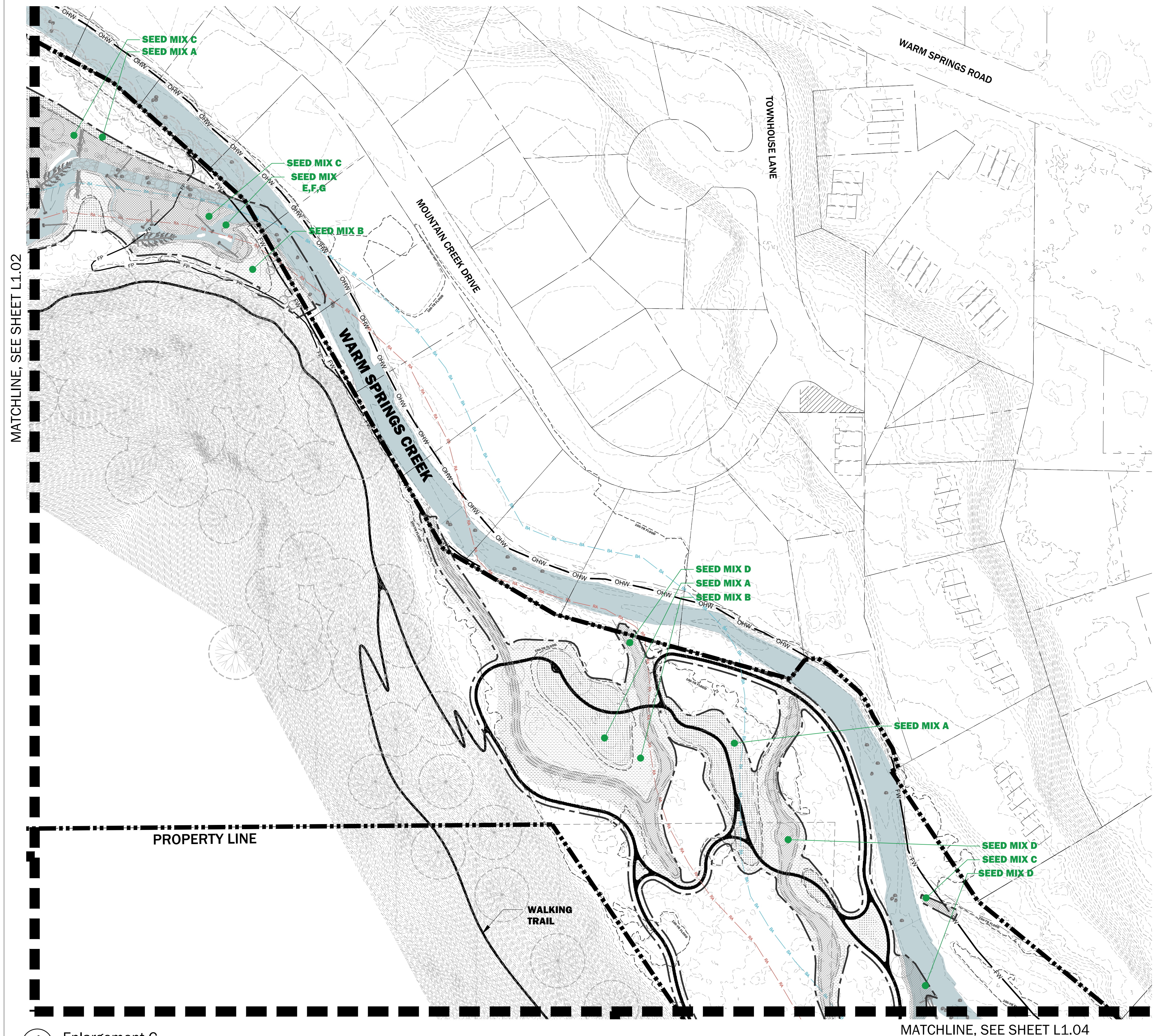
WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL

DRAWING NAME

LANDSCAPE PLAN

DRAWING NO. **L1.02**

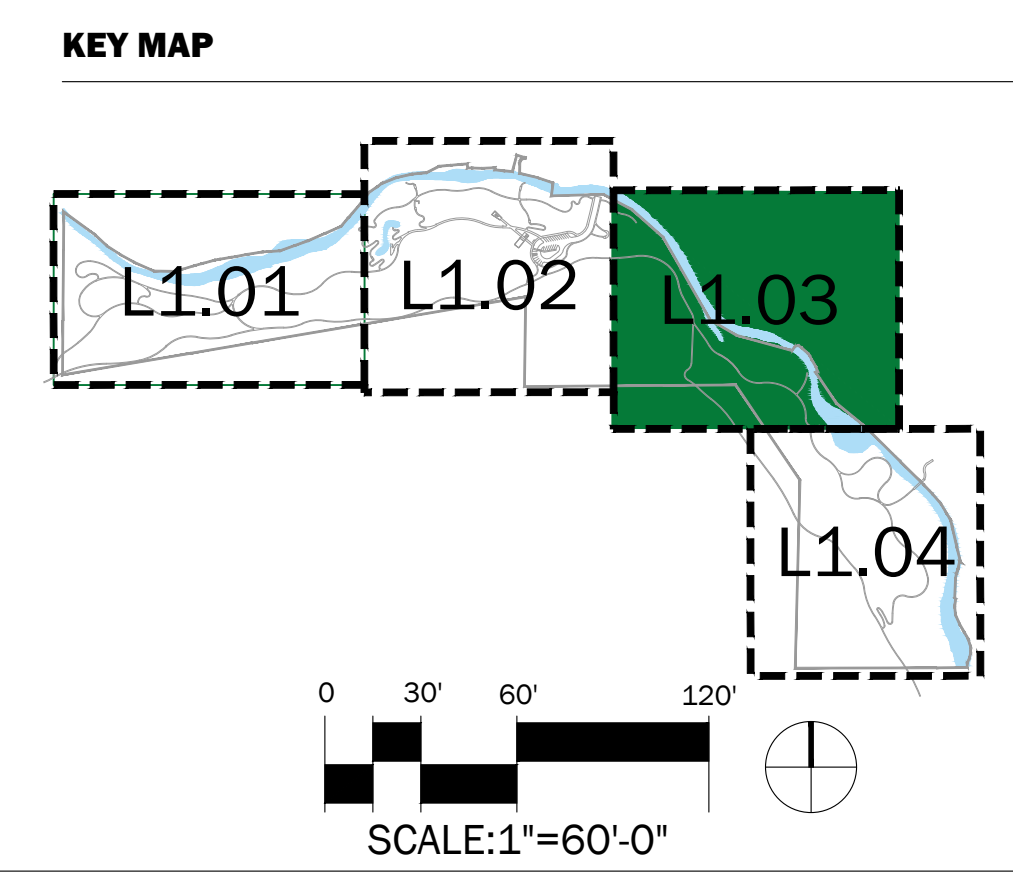


LINETYPE LEGEND

— FP — FP	100-YEAR FLOODPLAIN
— BA — BA	MODERATE RISK AVALANCHE ZONE
— RA — RA	HIGH RISK AVALANCHE ZONE
— —	PROPERTY LINE
— — — —	LIMIT OF WORK
— — — —	TREE PROTECTION ZONE
— — — —	BUILDING PERMIT LIMIT OF WORK
■	29 CFS "LOW FLOW" INUNDATION EXTENTS

SEED MIX LEGEND

SYMBOL	KEY	PLANT MIX TYPE
▨	MIX A	UPLAND MEADOW MIX
▩	MIX B	XERIC (DRY) FLOODPLAIN
▧	MIX C	MESIC (WET) FLOODPLAIN
▦	MIX D	NEAR STREAM RIPARIAN
▤	MIX E,F,G	IN STREAM AQUATIC, SHALLOW EMERGENT WETLAND, & DEEP EMERGENT WETLAND
▣	MIX H	ASPEN GROVE
◻	SOD	RESTORED LAWN



SUPERBLOOM

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WARM SPRINGS PRESERVE STREAM &
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FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
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BLAINE COUNTY, IDAHO

WORKING DRAFT
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APPROVED: DL
DRAWING NAME

LANDSCAPE
PLAN

DRAWING NO.
L1.03

MATCHLINE, SEE SHEET L1.02

PROPERTY LINE

WALKING TRAIL

SEED MIX A

SEED MIX D
SEED MIX C
SEED MIX D

SEED MIX D
SEED MIX A
SEED MIX B

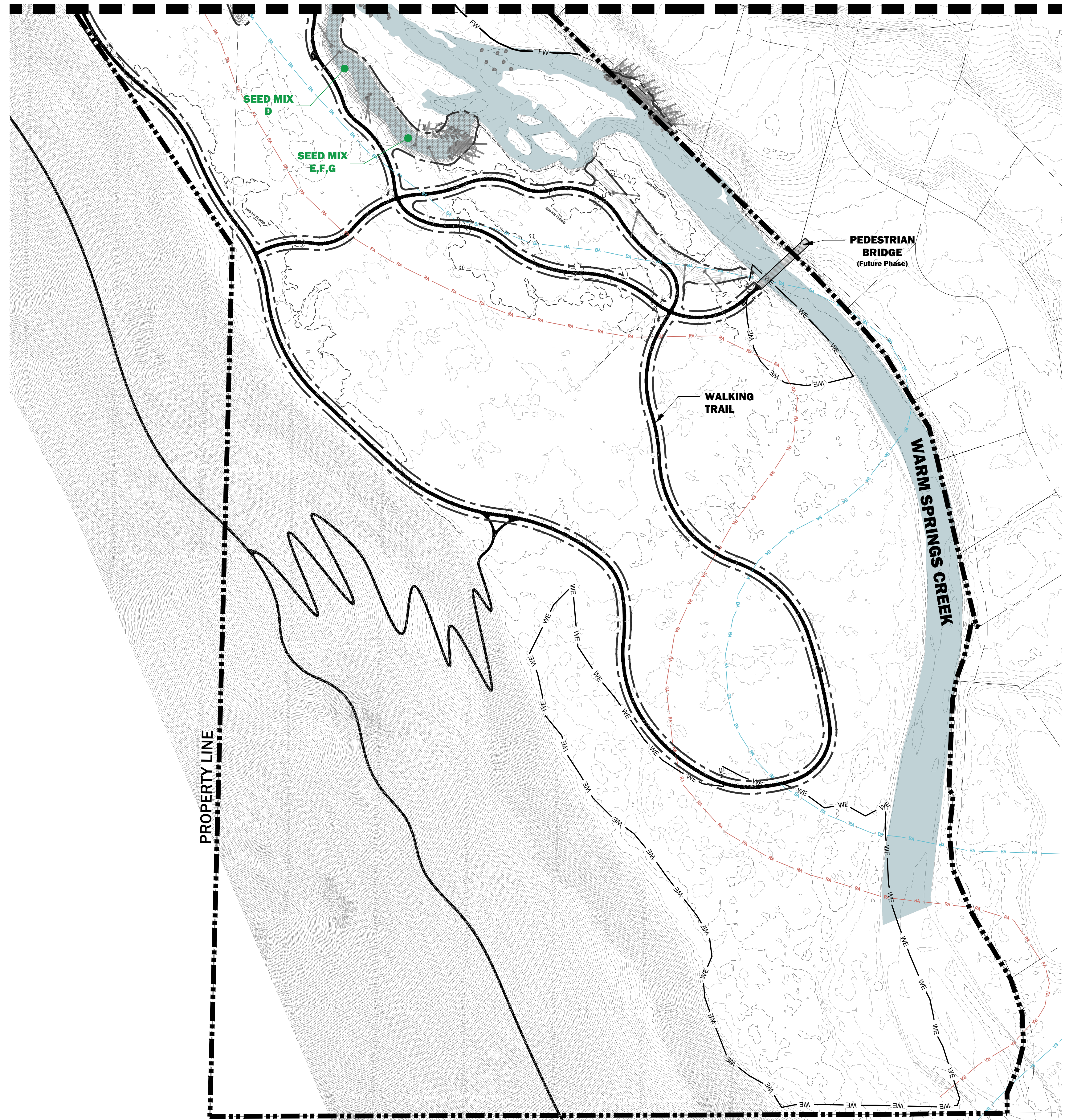
SEED MIX C
SEED MIX E,F,G

SEED MIX C
SEED MIX A

MATCHLINE, SEE SHEET L1.04

1 Enlargement C
Scale: 1"=60'

MATCHLINE, SEE SHEET L1.03



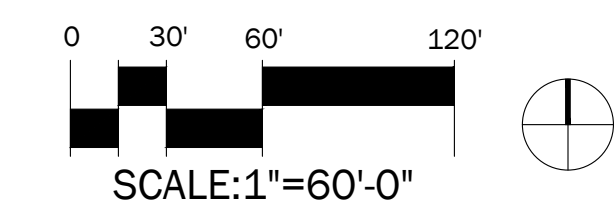
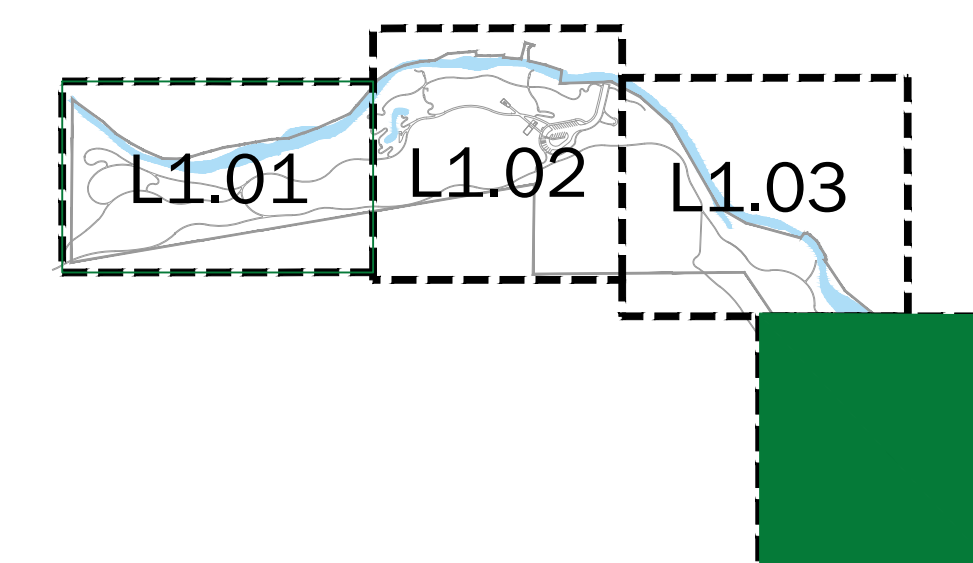
LINETYPE LEGEND

- 100-YEAR FLOODPLAIN
- MODERATE RISK AVALANCHE ZONE
- HIGH RISK AVALANCHE ZONE
- PROPERTY LINE
- LIMIT OF WORK
- TREE PROTECTION ZONE
- BUILDING PERMIT LIMIT OF WORK
- 29 CFS "LOW FLOW" INUNDATION EXTENTS

SEED MIX LEGEND

SYMBOL	KEY	PLANT MIX TYPE
	MIX A	UPLAND MEADOW MIX
	MIX B	XERIC (DRY) FLOODPLAIN
	MIX C	MESIC (WET) FLOODPLAIN
	MIX D	NEAR STREAM RIPARIAN
	MIX E,F,G	IN STREAM AQUATIC, SHALLOW EMERGENT WETLAND, & DEEP EMERGENT WETLAND
	MIX H	ASPEN GROVE
	SOD	RESTORED LAWN

KEY MAP



1 Enlargement D
Scale: 1"=60'

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WARM SPRINGS PRESERVE STREAM &
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FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL
DRAWING NAME

LANDSCAPE
PLAN

DRAWING NO.

L1.04



1 Local Boulder Bench + Stepping Stones
Scale: NTS



2 Artisan Bench
Scale: NTS



3 Pedestrian Footbridge
Scale: NTS



4 Floodplain ADA Overlook
Scale: NTS

WARM SPRINGS PRESERVE STREAM &
FLOODPLAIN ENHANCEMENT DESIGN SET

FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL

DRAWING NAME

LANDSCAPE
DETAILS

DRAWING NO.

L2.00

NOTE: The Following Live Plants in the Plant Mixes are being Contract Grown under a separate Contract and will be provided to the installing Contractor. The Installing Contractor is to coordinate with Owner's Representative and Landscape Architect for integration of Contract Grown species into plantings.

PLANT MIX A - UPLAND MEADOW (330,626 SF)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF HATCH AREA	% OF PATCH	O.C. SPACING	NOTES
Shrubs (Patches): 15% of Total Hatch Area (49,600 sf)										
-	3180	<i>Artemisia tridentata</i> var. <i>vaseyana</i>	Mountain Big Sagebrush	Shrub	10 ci	Tube Seedling	15%	50%	3'	Plant in patches in favorable microsites. Shrubs to be Field Located by Landscape Architect.
-	955	<i>Chrysothamnus viscidiflorus</i>	Douglas Rabbitbrush	Shrub	10 ci	Tube Seedling	15%	15%	3'	Shrubs to be Field Located by Landscape Architect.
-	955	<i>Ericameria nauseosa</i>	Rubber Rabbitbrush	Shrub	10 ci	Tube Seedling	15%	15%	3'	Shrubs to be Field Located by Landscape Architect.
-	1270	<i>Purshia tridentata</i>	Antelope Bitterbrush	Shrub	10 ci	Tube Seedling	15%	20%	3'	Plant in patches in favorable microsites. Shrubs to be Field Located by Landscape Architect.
Grasses (Seed to Cover 100% of Hatch Area)										
-	-	<i>Bromus ciliatus</i>	Fringed Brome	Grass	-	Seed	-	-	-	Grasses = 80% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Bromus ciliatus</i>	Fringed Brome	Grass	-	Seed	-	-	-	
-	-	<i>Bromus marginatus</i>	Mountain Brome	Grass	-	Seed	-	-	-	
-	-	<i>Bromus marginatus</i>	Mountain Brome	Grass	-	Seed	-	-	-	
-	-	<i>Elymus elymoides</i>	Squirreltail Grass	Grass	-	Seed	-	-	-	
-	-	<i>Elymus elymoides</i>	Squirreltail Grass	Grass	-	Seed	-	-	-	
-	-	<i>Elymus glaucus</i>	Blue Wildrye	Grass	-	Seed	-	-	-	
-	-	<i>Elymus glaucus</i>	Blue Wildrye	Grass	-	Seed	-	-	-	
-	-	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	Thickspike Wheatgrass	Grass	-	Seed	-	-	-	
-	-	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	Thickspike Wheatgrass	Grass	-	Seed	-	-	-	
-	-	<i>Elymus trachycaulus</i>	Slender Wheatgrass	Grass	-	Seed	-	-	-	
-	-	<i>Elymus trachycaulus</i>	Slender Wheatgrass	Grass	-	Seed	-	-	-	
-	-	<i>Festuca idahoensis</i>	Idaho Fescue	Grass	-	Seed	-	-	-	
-	-	<i>Festuca thurberi</i>	Thurber's Fescue	Grass	-	Seed	-	-	-	
-	-	<i>Hesperostipa comata</i>	Needle and Thread Bunchgrass	Grass	-	Seed	-	-	-	
-	-	<i>Koeleria macrantha</i>	Prairie Junegrass	Grass	-	Seed	-	-	-	
-	-	<i>Leymus cinereus</i>	Great Basin Wildrye	Grass	-	Seed	-	-	-	
-	-	<i>Poa secunda sandbergii</i>	Sandberg Bluegrass	Grass	-	Seed	-	-	-	
-	-	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	Grass	-	Seed	-	-	-	
Forbs (Seed to Cover 100% of Hatch Area)										
-	-	<i>Achillea millefolium occidentale</i>	Western Common Yarrow	Forb	-	Seed	-	-	-	Forbs = 20% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Eriogonum umbellatum</i>	Suffurflower Buckwheat	Forb	-	Seed	-	-	-	
-	-	<i>Linum lewisii</i>	Blue Flax	Forb	-	Seed	-	-	-	
-	-	<i>Lupinus sericeus</i>	Silky Lupine	Forb	-	Seed	-	-	-	
-	-	<i>Penstemon eatonii</i>	Firecracker Penstemon	Forb	-	Seed	-	-	-	
-	-	<i>Penstemon strictus</i>	Rocky Mountain Penstemon	Forb	-	Seed	-	-	-	
-	-	<i>Sphaeralcea</i> sp.	Globemallow	Forb	-	Seed	-	-	-	Species dependent on availability
PLANT MIX B - XERIC (DRY) FLOODPLAIN (125,000 SF)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF HATCH AREA	% OF PATCH	O.C. SPACING	NOTES
Shrubs (Patches): 20% of Total Hatch Area (25,000 sf)										
-	80	<i>Amelanchier alnifolia</i>	Western Serviceberry	Shrub	#5	Cont.	2.5%	2.5%	3'	Plant in microsites that retain more moisture. Shrubs to be Field Located by Landscape Architect.
-	1600	<i>Artemisia tridentata</i>	Big Sagebrush	Shrub	10 ci	Tube Seedling	50%	50%	3'	Consider Establishing in island patches. Shrubs to be Field Located by Landscape Architect.
-	480	<i>Chrysothamnus viscidiflorus</i>	Douglas Rabbitbrush	Shrub	10 ci	Tube Seedling	15%	15%	3'	Shrubs to be Field Located by Landscape Architect.
-	480	<i>Ericameria nauseosa</i>	Rubber Rabbitbrush	Shrub	10 ci	Tube Seedling	15%	15%	3'	Shrubs to be Field Located by Landscape Architect.
-	80	<i>Prunus virginiana</i>	Chokecherry	Shrub	#5	Cont.	2.5%	2.5%	3'	Plant in microsites that retain more moisture. Shrubs to be Field Located by Landscape Architect.
-	320	<i>Purshia tridentata</i>	Antelope Bitterbrush	Shrub	10 ci	Tube Seedling	10%	10%	3'	Plant in patches in favorable microsites. Shrubs to be Field Located by Landscape Architect.
-	160	<i>Rosa woodsii</i>	Wood's Rose	Shrub	#5	Cont.	5%	5%	3'	Shrubs to be Field Located by Landscape Architect.
Grasses (Seed to Cover 100% of Hatch Area)										
-	-	<i>Festuca idahoensis</i>	Idaho Fescue	Grass	-	Seed	-	-	-	Grasses = 75% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Leymus cinereus</i>	Great Basin Wildrye	Grass	-	Seed	-	-	-	
-	-	<i>Poa secunda sandbergii</i>	Sandberg Bluegrass	Grass	-	Seed	-	-	-	
-	-	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	Grass	-	Seed	-	-	-	
Forbs (Seed to Cover 100% of Hatch Area)										
-	-	<i>Achillea millefolium</i>	Common Yarrow	Forb	-	Seed	-	-	-	Forbs = 25% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Artemisia ludoviciana</i>	White Sagebrush	Forb	-	Seed	-	-	-	
-	-	<i>Eriogonum umbellatum</i>	Suffurflower Buckwheat	Forb	-	Seed	-	-	-	
-	-	<i>Linum lewisii</i>	Blue Flax	Forb	-	Seed	-	-	-	
-	-	<i>Lupinus argenteus</i>	Silvery Lupine	Forb	-	Seed	-	-	-	
-	-	<i>Penstemon</i> sp.	Penstemon species	Forb	-	Seed	-	-	-	Species dependent on availability
-	-	<i>Sphaeralcea</i> sp.	Globemallow	Forb	-	Seed	-	-	-	Species dependent on availability
PLANT MIX C - MESIC (WET) FLOODPLAIN (68,953 SF)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF HATCH AREA	% OF PATCH	O.C. SPACING	NOTES
Trees (Patches): 10% of Total Hatch Area (6,895 sf)										
-	55	<i>Populus angustifolia</i>	Narrow-leaf Cottonwood	Tree	#5	Cont.	-	45%	8'	Install Wildlife Exclusion Fence Around Trees
-	12	<i>Populus tremuloides</i>	Quaking Aspen	Tree	#5	Cont.	-	10%	8'	Install Wildlife Exclusion Fence Around Trees
-	55	<i>Populus trichocarpa</i>	Black Cottonwood	Tree	#5	Cont.	-	45%	8'	Install Wildlife Exclusion Fence Around Trees
Shrubs (Patches): 10% of Total Hatch Area (6,895 sf)										
-	25	<i>Alnus incana</i>	Thin-leaf Alder	Shrub	#5	Cont.	-	5%	6'	Plant in microsites that retain more moisture. Shrubs to be Field Located by Landscape Architect.
-	25	<i>Betula occidentalis</i>	Water Birch	Shrub	#5	Cont.	-	5%	6'	Shrubs to be Field Located by Landscape Architect.
-	150	<i>Ribes aureum</i>	Golden Currant	Shrub	#5	Cont.	-	35%	6'	Shrubs to be Field Located by Landscape Architect.
-	150	<i>Rosa woodsii</i>	Wood's Rose	Shrub	#5	Cont.	-	35%	6'	Shrubs to be Field Located by Landscape Architect.
-	90	<i>Symphoricarpos</i> sp.	Snowberry	Shrub	#5	Cont.	-	20%	6'	Shrubs to be Field Located by Landscape Architect.
Grasses (Seed to Cover 100% of Hatch Area)										
-	-	<i>Elymus glaucus</i>	Blue Wildrye	Grass	-	Seed	-	-	-	Grasses = 60% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Leymus cinereus</i>	Great Basin Wildrye	Grass	-	Seed	-	-	-	
-	-	<i>Pascopyrum smilii</i>	Western Wheatgrass	Grass	-	Seed	-	-	-	
-	-	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	Grass	-	Seed	-	-	-	
Forbs (Seed to Cover 100% of Hatch Area)										
-	-	<i>Achillea millefolium</i>	Common Yarrow	Forb	-	Seed	-	-	-	Forbs = 40% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase
-	-	<i>Linum lewisii</i>	Blue Flax	Forb	-	Seed	-	-	-	
-	-	<i>Lupinus</i> sp.	Lupine Species	Forb	-	Seed	-	-	-	Species dependent on availability
-	-	<i>Penstemon</i> sp.	Penstemon species	Forb	-	Seed	-	-	-	Species dependent on availability
-	-	<i>Symphotrichum laeve</i>	Smooth Blue Aster	Forb	-	Seed	-	-	-	
-	-	<i>Vicia americana</i>	American Vetch	Forb	-	Seed	-	-	-	

NOTES

- All species cross-referenced to Blaine County Riparian and Wetland List
- All species listed are generally available commercially; Wild collections may be needed to increase diversity or aesthetics
- Recommend wild collections of cottonwood, willow, dogwood species, sagebrush, rabbitbrush, and antelope bitterbrush
- No formal on-site plant investigations have been completed by IMA
- Species present taken from geoengineers investigation and other professional plant surveys of the Wood River Watershed
- Consider using pre-vegetated coir mats (wetland sod) for aesthetic impact and erosion protection in place of herbaceous wetland seedings

WARM SPRINGS PRESERVE STREAM &
 FLOODPLAIN ENHANCEMENT DESIGN SET
 FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

WORKING DRAFT
 NOT FOR
 CONSTRUCTION

DATE: 12/10/2024
 DESIGNED: SP, DL, HC, MP
 APPROVED: DL
 DRAWING NAME

**SEED MIX
SCHEDULE 1**

DRAWING NO.

L2.01

NOTE: The Following Live Plants in the Plant Mixes are being Contract Grown under a separate Contract and will be provided to the installing Contractor. The Installing Contractor is to coordinate with Owner's Representative and Landscape Architect for integration of Contract Grown species into plantings.

PLANT MIX D - NEAR STREAM RIPARIAN (26,985 SF)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF HATCH AREA	% OF PATCH	O.C. SPACING	NOTES
Trees (Patches): 10% of Total Hatch Area (6,746 sf)							25%			
-	50	<i>Populus angustifolia</i>	Narrow-leaf Cottonwood	Tree	#5	Cont.	-	40%	8'	Tree Forming, Install Wildlife Exclusion Fence Around Trees
-	50	<i>Populus trichocarpa</i>	Black Cottonwood	Tree	#5	Cont.	-	40%	8'	Install Wildlife Exclusion Fence Around Trees
-	15	<i>Salix amygdaloides</i>	Peachleaf Willow	Tree	#5	Cont.	-	10%	8'	Install Wildlife Exclusion Fence Around Trees
-	15	<i>Salix lasiandra var. caudata</i>	Whiplash Willow	Tree	#5	Cont.	-	10%	8'	Tree Forming, Install Wildlife Exclusion Fence Around Trees
Shrubs (Patches): 50% of Total Hatch Area (13,490 sf)							50%			
-	110	<i>Cornus sericea</i>	Redosier Dogwood	Shrub	#5	Cont.	-	25%	6'	Very Palatable to Moose, Shrubs to be Field Located by Landscape Architect.
-	110	<i>Salix boothii</i>	Booth's Willow	Shrub	#5	Cont.	-	25%	6'	Clump Forming, Shrubs to be Field Located by Landscape Architect.
-	110	<i>Salix exigua</i>	Golden Currant	Shrub	#5	Cont.	-	25%	6'	Mat Forming, Shrubs to be Field Located by Landscape Architect.
-	110	<i>Salix lutea</i>	Wood's Rose	Shrub	#5	Cont.	-	25%	6'	Clump Forming, Shrubs to be Field Located by Landscape Architect.
Grasses (Seed to Cover 100% of Hatch Area)										
-	-	<i>Calamagrostis canadensis</i>	Bluejoint Reedgrass	Grass	-	Seed	-	-	-	Grasses = 100% of Seed Mix. Individual Species Percentages to be Supplied to Contractor During Construction Phase. Saturated but not inundated soils
-	-	<i>Deschampsia cespitosa</i>	Tufted Hairgrass	Grass	-	Seed	-	-	-	Saturated but not inundated soils
-	-	<i>Elymus glaucus</i>	Blue Wildrye	Grass	-	Seed	-	-	-	Moist Soils
PLANT MIX E - IN STREAM AQUATIC (2,055 SF, 33.33% of Total Hatch Area Indicated in Plans as Mix E, F, G)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF PLANT MIX E	% OF PATCH	O.C. SPACING	NOTES
Herbaceous Live Plants: 25% of Mix E							25%			To be located along stream channels on inundated and saturated soils
-	265	<i>Carex aquatilis</i>	Water Sedge	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Carex utriculata</i>	Beaked Sedge	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Eleocharis palustris</i>	Great Spike Rush	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Juncus arcticus</i>	Arctic Rush	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
Seed Mix: Seed to Cover 100% of Plant Mix E (2,055 SF)							% OF PLANT MIX E			
-	-	<i>Beckmannia syzigachne</i>	American Slough Grass	Herbaceous	-	Seed	100%			Saturated but not inundated soils
-	-	<i>Calamagrostis canadensis</i>	Bluejoint Grass	Herbaceous	-	Seed				Saturated but not inundated soils
-	-	<i>Deschampsia cespitosa</i>	Tufted Hair Grass	Herbaceous	-	Seed				Saturated but not inundated soils
-	-	<i>Pascopyrum smithii</i>	Western Wheatgrass	Herbaceous	-	Seed				Saturated but not inundated soils
PLANT MIX F - SHALLOW EMERGENT WETLAND (2,055 SF, 33.33% of Total Hatch Area Indicated in Plans as Mix E, F, G)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF PLANT MIX F	% OF PATCH	O.C. SPACING	NOTES
Herbaceous Live Plants: 25% of Mix F							25%			To be located along pond edges with zones of permanent inundation and frequent soil saturation
-	265	<i>Carex nebrascensis</i>	Nebraska Sedge	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Carex pellita</i>	Woolly Sedge	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Carex utriculata</i>	Beaked Sedge	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
-	265	<i>Juncus arcticus</i>	Arctic Rush	Herbaceous	5.5 ci	Tube Seedling	25%		9"	Alternatively could be wetland sod mix of sedges and rushes at water's edge along pond shores and stream channel margins.
Seed Mix: Seed to Cover 100% of Plant Mix F (2,055 SF)							% OF PLANT MIX F			
-	-	<i>Beckmannia syzigachne</i>	American Slough Grass	Herbaceous	-	Seed	100%			Saturated but not inundated soils
-	-	<i>Calamagrostis canadensis</i>	Bluejoint Grass	Herbaceous	-	Seed				Saturated but not inundated soils
-	-	<i>Deschampsia cespitosa</i>	Tufted Hair Grass	Herbaceous	-	Seed				Saturated but not inundated soils
-	-	<i>Pascopyrum smithii</i>	Western Wheatgrass	Herbaceous	-	Seed				Saturated but not inundated soils
PLANT MIX G - DEEP EMERGENT WETLAND (2,055 SF, 33.33% of Total Hatch Area Indicated in Plans as Mix E, F, G)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF PLANT MIX G	% OF PATCH	O.C. SPACING	NOTES
Herbaceous Live Plants: 100% of Mix G							100%			To be located within pond on permanently inundated soils
-	1185	<i>Schoenoplectus acutus</i>	Hardstem Bulrush	Herbaceous	#1	Cont.	50%		12"	Alternatively could be wetland sod mix of these species
-	1185	<i>Scirpus microcarpus</i>	Small-Fruited Bulrush	Herbaceous	#1	Cont.	50%		12"	Alternatively could be wetland sod mix of these species
PLANT MIX H - ASPEN GROVE (24731 SF)										
KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANT TYPE	SIZE	ROOT	% OF HATCH AREA	% OF PATCH	O.C. SPACING	NOTES
Forbs: 40% of Total Hatch Area (9892.4 sf)							40%			
-	360	<i>Achillea millefolium</i>	Common Yarrow	Forb	4"	Pot	-	-	18"	
-	360	<i>Aquilegia coerulea</i>	Blue Columbine	Forb	#1	Cont.	-	-	18"	
-	360	<i>Delphinium occidentale</i>	Duncecap Larkspur	Forb	#1	Cont.	-	-	18"	
-	360	<i>Erigeron speciosus</i>	Showy Fleabane	Forb	4"	Pot	-	-	18"	
-	360	<i>Eriogonum umbellatum</i>	Sulfurflower Buckwheat	Forb	4"	Pot	-	-	18"	
-	360	<i>Gaillardia aristata</i>	Blanket Flower	Forb	4"	Pot	-	-	18"	
-	360	<i>Geranium viscosissimum</i>	Sticky Geranium	Forb	#1	Pot	-	-	18"	
-	360	<i>Hellomeris multiflora</i>	Showy Goldeneye	Forb	#1	Cont.	-	-	18"	
-	360	<i>Hymenoxys hoopesii</i>	Meadow Fire	Forb	#1	Cont.	-	-	18"	
-	360	<i>Linum lewisii</i>	Blue Flax	Forb	4"	Cont.	-	-	18"	
-	360	<i>Penstemon rydbergii</i>	Rydberg's Penstemon	Forb	4"	Cont.	-	-	18"	
-	360	<i>Penstemon strictus</i>	Rocky Mountain Penstemon	Forb	#1	Cont.	-	-	18"	
-	360	<i>Rudbeckia occidentalis</i>	Western Coneflower	Forb	#1	Cont.	-	-	18"	
-	360	<i>Solidago missouriensis</i>	Missouri Goldenrod	Forb	#1	Cont.	-	-	18"	
-	360	<i>Symphotrichum laeve</i>	Smooth Aster	Forb	#1	Cont.	-	-	18"	
Grasses: 60% of Hatch Area (14838 sf)										
-	1630	<i>Bouteloua curtipendula</i>	Side Oats Gram	Grass	5.5 ci	Tube Seedling			18"	
-	1630	<i>Bouteloua gracilis</i>	Blue Grama	Grass	5.5 ci	Tube Seedling			18"	
-	1630	<i>Festuca idahoensis</i>	Idaho Blue Fescue	Grass	5.5 ci	Tube Seedling			18"	
-	1630	<i>Hesperostipa comata</i>	Needle and Thread Grass	Grass	5.5 ci	Tube Seedling			18"	
-	1630	<i>Oryzopsis hymenoides</i>	Indian Ricegrass	Grass	5.5 ci	Tube Seedling			18"	
SOD (54,410 SF)										
KEY	QTY	BOTANICAL NAME	NOTES							
-	73862	<i>Rhizomatous Tall Fescue</i>	** Contractor to Reclaim Existing Sod on Site and Install in Areas of the Fairway as Shown in the Planting Plans, Where Possible After Regrading. Contactor to Submit Pricing for New Sod as part of their base bid for review.							

WARM SPRINGS PRESERVE STREAM &
 FLOODPLAIN ENHANCEMENT DESIGN SET
 FLOODPLAIN SUBMITTAL #2

WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

NOTES

- All species cross-referenced to Blaine County Riparian and Wetland List
- All species listed are generally available commercially; Wild collections may be needed to increase diversity or aesthetics
- Recommend wild collections of cottonwood, willow, dogwood species, sagebrush, rabbitbrush, and antelope bitterbrush
- No formal on-site plant investigations have been completed by IMA
- Species present taken from geoengineers investigation and other professional plant surveys of the Wood River Watershed
- Consider using pre-vegetated coir mats (wetland sod) for aesthetic impact and erosion protection in place of herbaceous wetland seedings

WORKING DRAFT
 NOT FOR
 CONSTRUCTION

DATE: 12/10/2024
 DESIGNED: SP, DL, HC, MP
 APPROVED: DL

DRAWING NAME

**SEED MIX
SCHEDULE 2**

DRAWING NO.

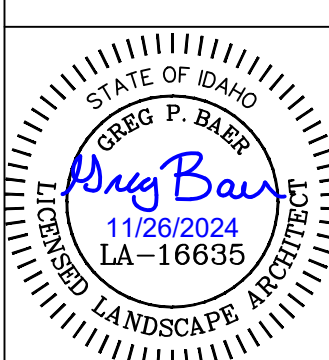
L2.02

SUBMITTALS	DATE
1. DESIGN REVIEW	11/17/23
2.	
3.	
4.	
5.	
6.	

NOTES:
 1. CONTRACTORS AND SUBCONTRACTORS SHALL VERIFY ALL FIGURED DIMENSIONS AND CONDITIONS AT THE JOBSITE, REVIEW AND COMPARE ALL CHAPTERS AND INTERDISCIPLINARY DRAWINGS, AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES PRIOR TO ANY FABRICATION OF ANY WORK OR FIELD WORK BEING DONE IN ACCORDANCE WITH AIA DOCUMENT A201. DO NOT SCALE THESE DRAWINGS.
 2. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PREPARED BY THE ARCHITECTS FOR THIS PROJECT ARE INSTRUMENTS OF THE ARCHITECTS' SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT AND UNLESS OTHERWISE PROVIDED THE ARCHITECT SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT. REPRODUCTION IS PROHIBITED. COPYRIGHT 2022 STUDIO SUPERBLOOM, LLC.

PROJECT
WARM SPRINGS PRESERVE
 ### BALD MOUNTAIN RD.
 KETCHUM, ID
 CITY OF KETCHUM AND WRLT

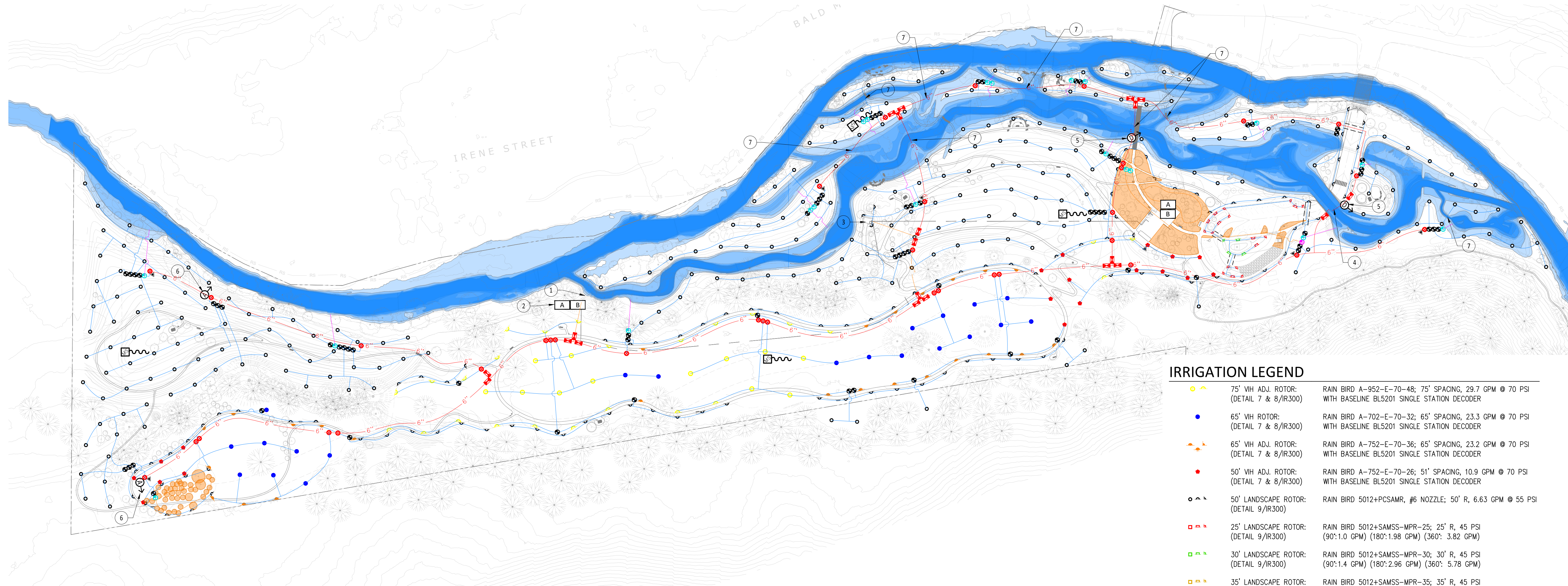
IRRIGATION - PLUMBING PLAN



SCALE: AS NOTED

IR100

DRAWN BY:
 CHECKED BY:



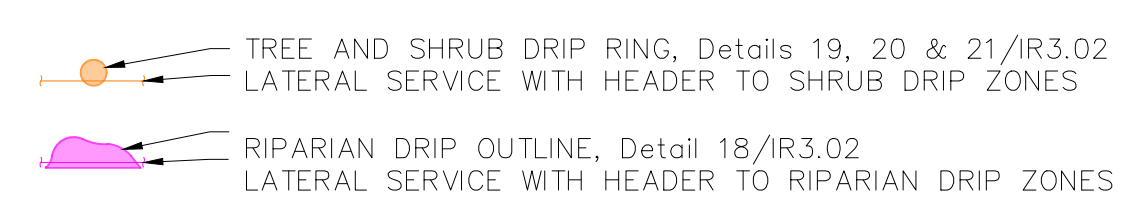
IRRIGATION LEGEND

	75' VIH ADJ. ROTOR: (DETAIL 7 & 8/IR300)	RAIN BIRD A-952-E-70-48; 75' SPACING, 29.7 GPM @ 70 PSI WITH BASELINE BL5201 SINGLE STATION DECODER
	65' VIH ROTOR: (DETAIL 7 & 8/IR300)	RAIN BIRD A-702-E-70-32; 65' SPACING, 23.3 GPM @ 70 PSI WITH BASELINE BL5201 SINGLE STATION DECODER
	65' VIH ADJ. ROTOR: (DETAIL 7 & 8/IR300)	RAIN BIRD A-752-E-70-36; 65' SPACING, 23.2 GPM @ 70 PSI WITH BASELINE BL5201 SINGLE STATION DECODER
	50' VIH ADJ. ROTOR: (DETAIL 7 & 8/IR300)	RAIN BIRD A-752-E-70-26; 51' SPACING, 10.9 GPM @ 70 PSI WITH BASELINE BL5201 SINGLE STATION DECODER
	50' LANDSCAPE ROTOR: (DETAIL 9/IR300)	RAIN BIRD 5012+PCSAMR, #6 NOZZLE; 50' R, 6.63 GPM @ 55 PSI
	25' LANDSCAPE ROTOR: (DETAIL 9/IR300)	RAIN BIRD 5012+SAMSS-MPR-25; 25' R, 45 PSI (90':1.0 GPM) (180':1.98 GPM) (360': 3.82 GPM)
	30' LANDSCAPE ROTOR: (DETAIL 9/IR300)	RAIN BIRD 5012+SAMSS-MPR-30; 30' R, 45 PSI (90':1.4 GPM) (180':2.96 GPM) (360': 5.78 GPM)
	35' LANDSCAPE ROTOR: (DETAIL 9/IR300)	RAIN BIRD 5012+SAMSS-MPR-35; 35' R, 45 PSI (90':1.92 GPM) (180':3.81 GPM) (360': 7.58 GPM)
	QUICK COUPLER VALVE: (DETAIL 5/IR300)	RAIN BIRD 5RC
	2" ELEC. CONTROL VALVE: (DETAIL 16/IR301)	RAIN BIRD 200-PESB-PRS-D WITH BASELINE BL5201 SINGLE STATION DECODER
	1.5" DRIP CONTROL VALVE: (DETAIL 17/IR301)	RAIN BIRD XCZ-150-LCS WITH BASELINE BL5201 SINGLE STATION DECODER
	1" DRIP CONTROL VALVE: (DETAIL 17/IR301)	RAIN BIRD XCZ-100-FLOW WITH BASELINE BL5201 SINGLE STATION DECODER
	LATERAL ISOLATION VALVE (DETAIL 2/IR300)	
	MAINLINE ISOLATION VALVE (DETAIL 1/IR300)	
	AIR RELIEF VALVE: (DETAIL 4/IR300)	CRISPIN PL10A
	DRAIN VALVE (DETAIL 3/IR300)	
	BASELINE BL5315 SOIL MOISTURE SENSOR	
	BASELINE 3200 BASELINE BL-3200PSS-CM W/BL-CLOUD-LTE-VZ-P & BL-CM-OMNI	
	2" HDPE 4710 DR13.5	
	6" HDPE 4710 DR13.5	
	8" HDPE 4710 DR13.5	
	HDPE DR13.5 SLEEVING - INCLUDE TWO (2) 2" CONDUITS AT ALL SLEEVING LOCATIONS FOR COMMUNICATION/ELECTRICAL @ 24" MIN. DEPTH	

DRIP IRRIGATION NOTES

- ALL PLANTER BEDS ARE TO BE IRRIGATED WITH A NETAFIM TLCV4-12## DRIP IRRIGATION LINE. THE CONTRACTOR IS RESPONSIBLE TO INSTALL THE DRIP SYSTEM AS PER MANUFACTURER'S RECOMMENDATIONS AND THE FOLLOWING REQUIREMENTS:
 - SHRUBS: DETAIL 19/IR302
 - TREES: DETAILS 20 & 21/IR302
 - RIPARIAN: DETAIL 18/IR302
 - ALL ZONES 15 G.P.M. AND UNDER SHALL BE INSTALLED WITH A RAIN BIRD XCZ-100-FLOW DRIP CONTROL ZONE KIT. ENSURE THAT KIT INCLUDES PRESSURE REGULATION AND DIAPHRAGM SCREEN CLEANING SYSTEM, FILTER SHALL BE 150 MESH STAINLESS STEEL SCREEN. INSTALL PER DETAIL 15/IR301.
 - ALL ZONES 16-50 G.P.M. SHALL BE INSTALLED WITH A RAIN BIRD XCZ-150-LCS DRIP CONTROL ZONE KIT. ENSURE THAT KIT INCLUDES PRESSURE REGULATION AND DIAPHRAGM SCREEN CLEANING SYSTEM, FILTER SHALL BE 120 MESH STAINLESS STEEL SCREEN. INSTALL PER DETAIL 15/IR301.
 - ALL ZONES SHALL HAVE A MANUAL DRAIN VALVE AT THE END OF EACH SUPPLY/EXHAUST LATERAL, AS NEEDED, TO ALLOW FOR ADEQUATE DRAINAGE FOR WINTERIZATION.
 - ALL ZONES SHALL INCLUDE AN AIR/VAC RELIEF VALVE AT ALL HIGH POINTS
 - ALL TUBING IS TO BE STAKED DOWN WITH T156 SIX INCH (6") SOIL STAPLES TO PREVENT EXPOSURE OF PIPE THROUGH MULCH.
 - CONTRACTOR SHALL INSTALL CHECK VALVES ON LATERAL HEADERS EVERY 8' IN ELEVATION CHANGE.
- THE CONTRACTOR IS RESPONSIBLE TO INSTALL THE DRIP SYSTEM SO THAT THE OPTIMUM AMOUNT OF WATER IS APPLIED TO INSURE THE HEALTH OF ALL PLANT MATERIAL.
- THE CONTRACTOR IS RESPONSIBLE TO SCHEDULE A MEETING WITH THE LANDSCAPE ARCHITECT, IRRIGATION CONSULTANT AND THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH ANY IRRIGATION INSTALLATION IN ORDER TO REVIEW WORK TO BE DONE. ALL LATERAL LINES FROM VALVES TO HEADERS ARE TO BE BURIED AT MINIMUM DEPTH OF TWELVE INCHES (12"). SIZE AS NECESSARY.
- ALL DRIP TUBING OUTSIDE OF THE 100 YR FLOOD LIMIT SHALL BE BURIED AT A DEPTH OF 3".
- ALL DRIP TUBING INSTALLED WITHIN THE 100 YR FLOOD ZONE SHALL BE BURIED AT A DEPTH OF 6".
- AFTER INSTALLATION OF THE IRRIGATION SYSTEM THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE OWNER WITH AS-BUILT DRAWINGS AND INSTRUCTIONS FOR MAINTENANCE OF THE DRIP SYSTEM.
- CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT AND IRRIGATION CONSULTANT AFTER INSTALLING DRIP IRRIGATION AND PRIOR TO PLACING MULCH/TOPSOIL FOR INSPECTION.

DRIP LAYOUT SCHEMATIC

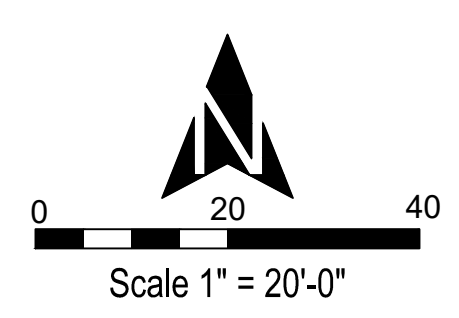


GENERAL NOTES

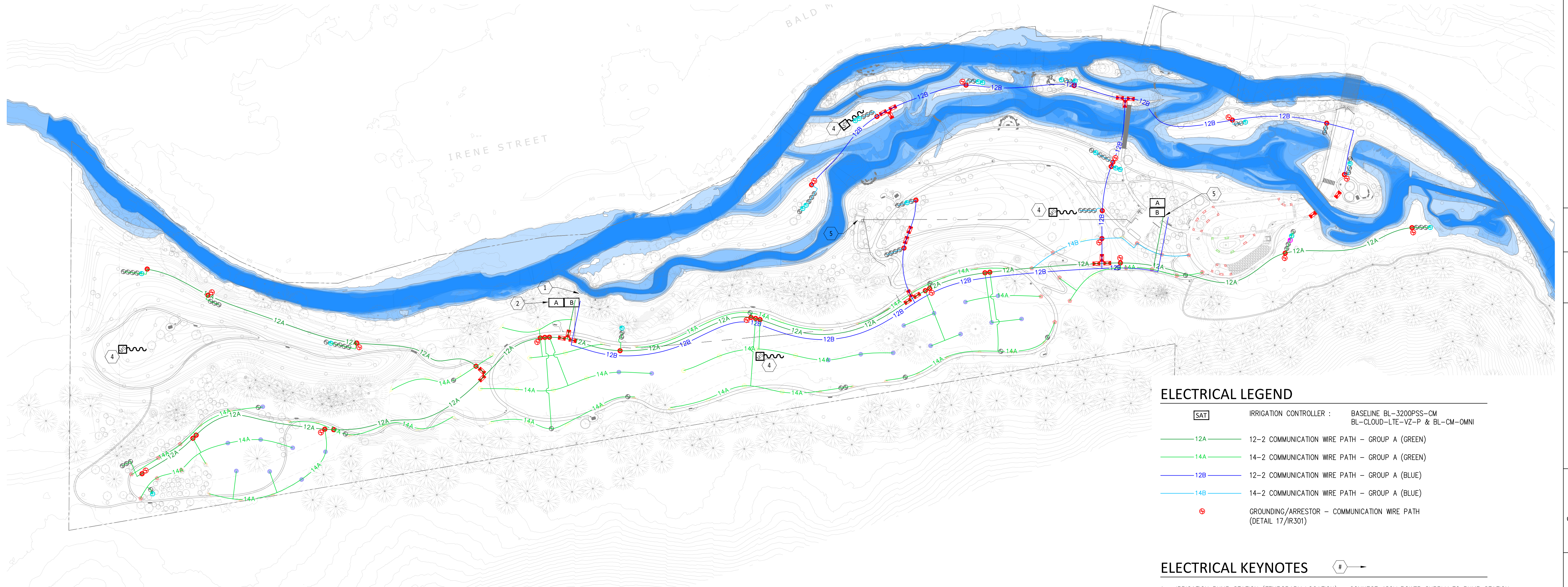
- EXISTING SITE PLAN WAS CREATED BY SUPERBLOOM.
- DESIGN IS BASED ON 500 GPM @ 105 PSI.
- ALL NEW IRRIGATION MATERIAL NOTED ON THIS PLAN IS TO BE CONTRACTOR PROVIDED, CONTRACTOR INSTALLED.
- ALL VIH ROTORS WILL BE GPS'D BY BAER DESIGN GROUP (BDG). BDG MAY ADJUST LOCATION OF MATERIALS IN THE FIELD AS NECESSARY TO FIT SITE CONDITIONS. CONTRACTOR SHALL SCHEDULE STAKING A MINIMUM OF 10 DAYS IN ADVANCE. MINIMUM OF THREE HOLES SHALL BE STAKED PER VISIT.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES (PRIVATE AND PUBLIC) PRIOR TO CONSTRUCTION. ANY DAMAGE TO MARKED UTILITIES SHALL BE REPAIRED AT NO COST TO THE OWNER.
- COORDINATE WITH ALL OTHER PLAN SHEETS PRIOR TO AND DURING CONSTRUCTION.
- CONTRACTOR WILL PAY FOR AND ACQUIRE ALL PERMITS REQUIRED AS PART OF THIS PROJECT.
- ALL ROCK OR DEBRIS LARGER THAN 2" BROUGHT TO THE SURFACE FROM TRENCHING SHALL BE REMOVED FROM THE BACKFILL.
- ALL SPLICES TO BE INSTALLED IN 10" ROUND VALVE BOX WITH BLACK FLUSH LID MARKED "ELEC".
- ALL COMMUNICATION WIRE SHALL BE 12-2 OR 14-2 MAXI CABLE PER ELECTRICAL PLAN.
- ALL ELECTRICAL WIRE ABOVE FINISH GRADE SHALL BE INSTALLED IN RIGID SCH 40 PVC CONDUIT.
- ALL MULTI-STRAND ELECTRICAL WIRES SHALL BE TAPPED TOGETHER IN TEN FOOT INTERVALS OR LESS.
- ALL INSTALLATION SHALL MEET OR EXCEED NATIONAL, STATE AND LOCAL CODES.
- CONTRACTOR SHALL MAINTAIN DAILY RECORDS AND MODIFICATIONS OF WORK NOTED ON AN IRRIGATION AS-BUILT.
- CONTRACTOR SHALL ACCOMPANY CURRENT IRRIGATION AS-BUILT WITH EACH PAYMENT APPLICATION MONTHLY.
- THE ENTIRE INSTALLED SYSTEM SHALL INCLUDE MINIMUM A ONE YEAR WARRANTY FROM THE DATE OF FINAL ACCEPTANCE. ALL DEFECTS IN MATERIAL OR LABOR SHALL BE REPAIRED BY THE CONTRACTOR IN A TIMELY MANNER AND AT NO COST TO THE OWNER. PLANT MATERIAL LOST DUE TO LACK OF URGENCY ON A WARRANTY ITEM SHALL BE REPLACED TO EQUAL OR GREATER VALUE AT NO COST TO THE OWNER.
- ALL MATERIALS SHALL BE THOSE SPECIFIED NEW IN BOX AND WITHOUT FLAWS OR DEFECTS OF ANY KIND.
- NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT WRITTEN APPROVAL PRIOR TO BID.
- THE IRRIGATION SYSTEM IS DESIGNED TO PROVIDE MAXIMUM EFFICIENCY AND DISTRIBUTION UNIFORMITY. IF THE CONTRACTOR IS REQUIRED TO MAKE FIELD ADJUSTMENTS, NOTIFY THE IRRIGATION CONSULTANT IMMEDIATELY FOR FURTHER EVALUATION.

IRRIGATION KEYNOTES

- INSTALL IRRIGATION PUMP STATION ADJACENT TO EXISTING POND. EXACT LOCATION TO BE DETERMINED ON SITE. COORDINATE WITH ELECTRICAL FOR POWER SERVICE.
- INSTALL TWO IRRIGATION CONTROLLERS ON PEDESTAL NEAR IRRIGATION PUMP STATION AND MAINLINE. CONNECT TO 120V GFCI POWER SUPPLY PROVIDED BY ELECTRICAL.
- EXTEND MAINLINE TO FUTURE POND AND IRRIGATION PUMP STATION LOCATION.
- BRIDGE CROSSING.
- INSTALL DRAIN VALVE AT LOW POINT. PLUMB DISCHARGE TO CREEK. PROVIDE RIP RAP TO PREVENT EROSION IF REQUIRED.
- INSTALL AIR RELIEF VALVE AT HIGH POINT. FIELD ADJUST EXACT LOCATION AS REQUIRED.
- CREEK CROSSING - SEE DETAIL 13/IR301.
- RIPARIAN DRIP ZONE - INSTALL ELECTRIC VALVE, HEADER/LATERAL PIPING AND DRIP TUBING TO PROVIDE UNIFORM IRRIGATION APPLICATION TO PLANTINGS WITHIN THE RIPARIAN ZONES.



BAER DESIGN GROUP, LLC
 greg@baerdg.com
 Ph. 208.859.1980



ELECTRICAL LEGEND

[SAT]	IRRIGATION CONTROLLER :	BASELINE BL-3200PSS-CM BL-CLOUD-LTE-VZ-P & BL-CM-OMNI
— 12A —	12-2 COMMUNICATION WIRE PATH - GROUP A (GREEN)	
— 14A —	14-2 COMMUNICATION WIRE PATH - GROUP A (GREEN)	
— 12B —	12-2 COMMUNICATION WIRE PATH - GROUP A (BLUE)	
— 14B —	14-2 COMMUNICATION WIRE PATH - GROUP A (BLUE)	
⊕	GROUNDING/ARRESTOR - COMMUNICATION WIRE PATH (DETAIL 17/IR301)	

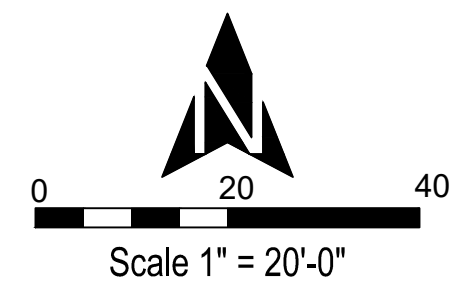
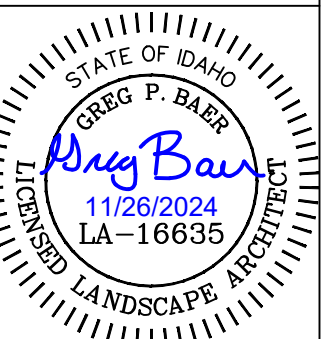
ELECTRICAL KEYNOTES # →

- IRRIGATION PUMP STATION (TEMPORARY LOCATION) - CONNECT 480V POWER SUPPLY TO PUMP STATION DISCONNECT. COORDINATE WITH ELECTRICAL FOR SERVICE. ALL WORK SHALL BE DONE BY A LICENSED ELECTRICIAN.
- COORDINATE AND PROVIDE FOR A 120V POWER, 20 AMP GFCI POWER SERVICE FOR TWO IRRIGATION CONTROLLERS NEAR PUMP STATION.
- IRRIGATION PUMP STATION (FINAL LOCATION) - CONNECT 480V POWER SUPPLY TO PUMP STATION DISCONNECT. COORDINATE WITH ELECTRICAL FOR SERVICE. ALL WORK SHALL BE DONE BY A LICENSED ELECTRICIAN.
- INSTALL MOISTURE SENSOR IN LOCATION THAT BEST REPRESENTS THE OVERALL MICRO CLIMATE OF EACH SPECIFIC PLANTING ZONE. EXACT LOCATION TO BE DETERMINED BY DESIGN TEAM AND CLIENT.
- EXTEND IRRIGATION COMMUNICATION WIRE TO PROPOSED BUILDING FOR FUTURE.

SUBMITTALS	DATE
1 DESIGN REVIEW	11/17/23
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3	
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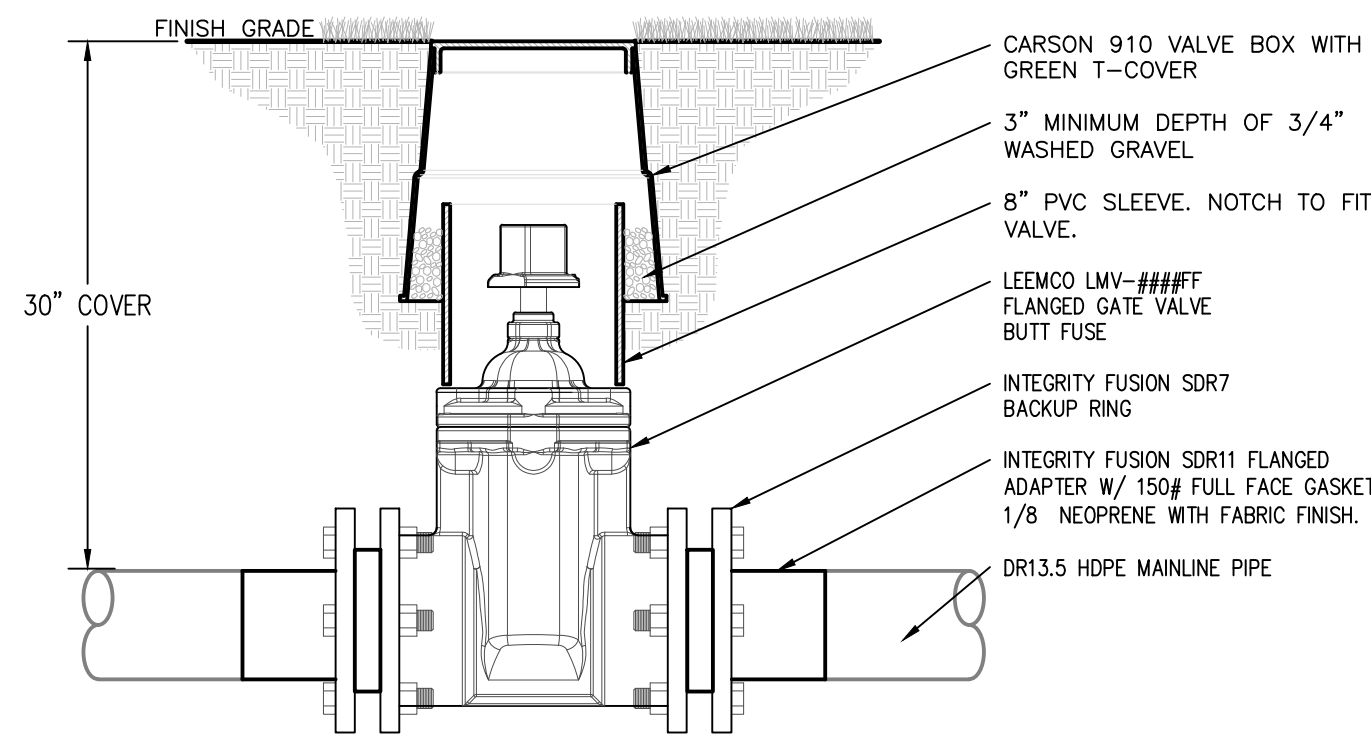


Scale 1" = 20'-0"

SCALE: AS NOTED

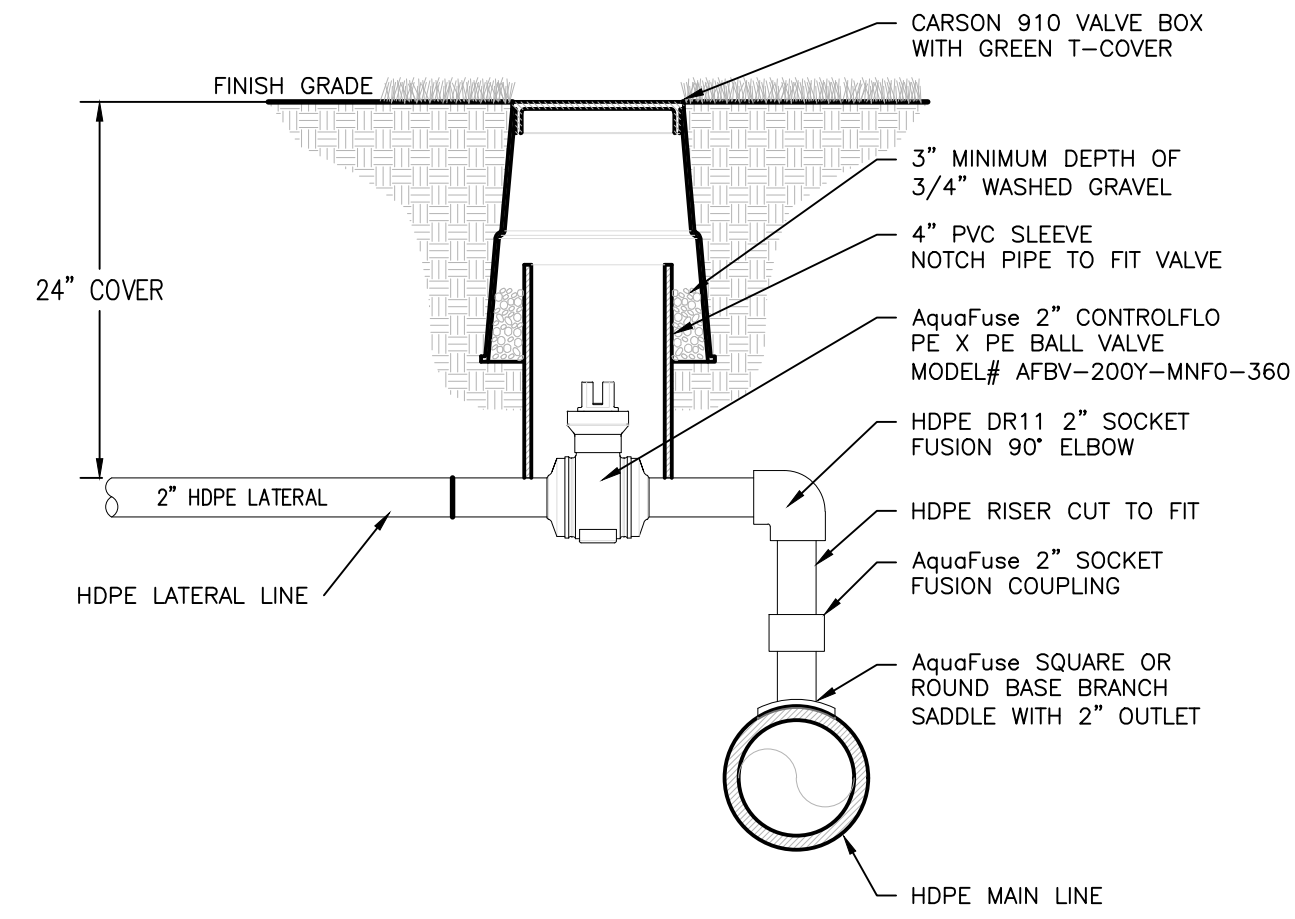
IR200

DRAWN BY:
CHECKED BY:



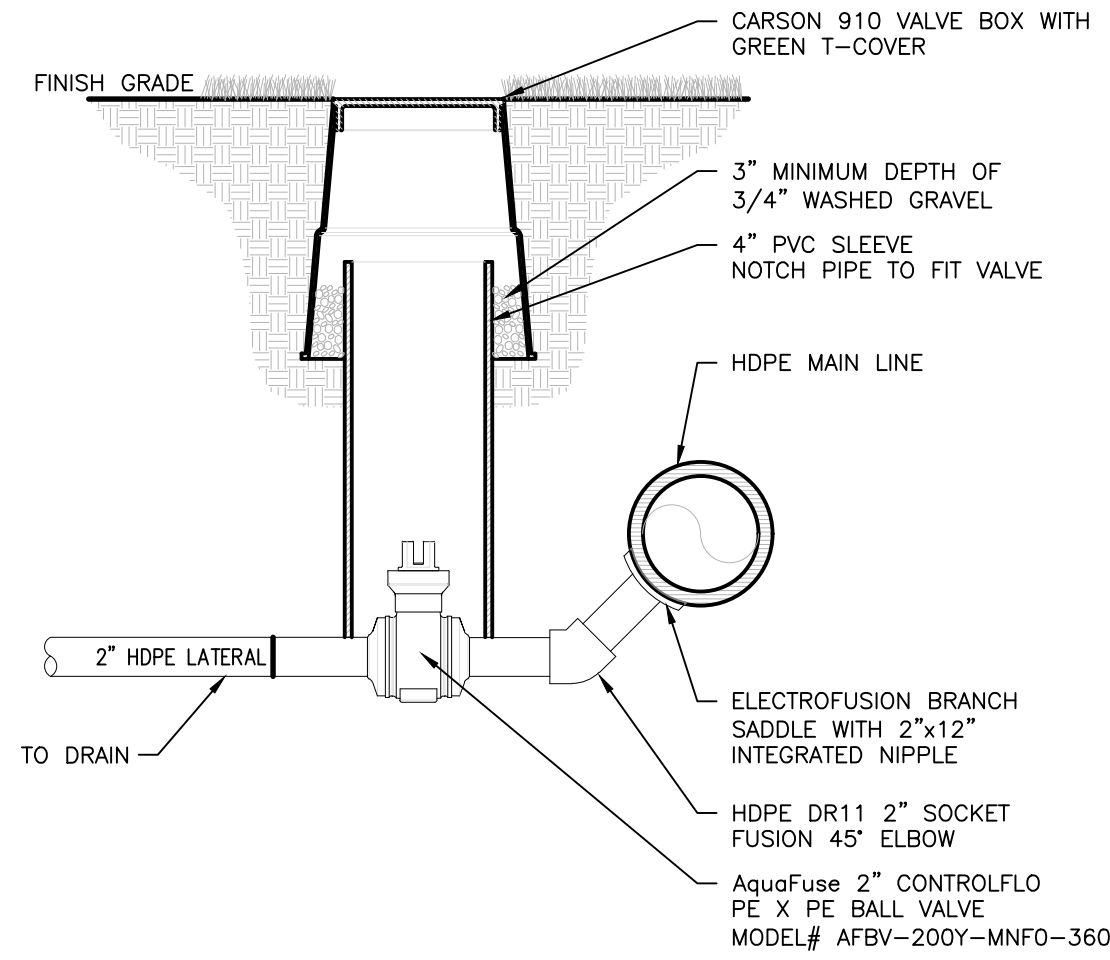
1 Mainline Gate Valve - HDPE

NTS



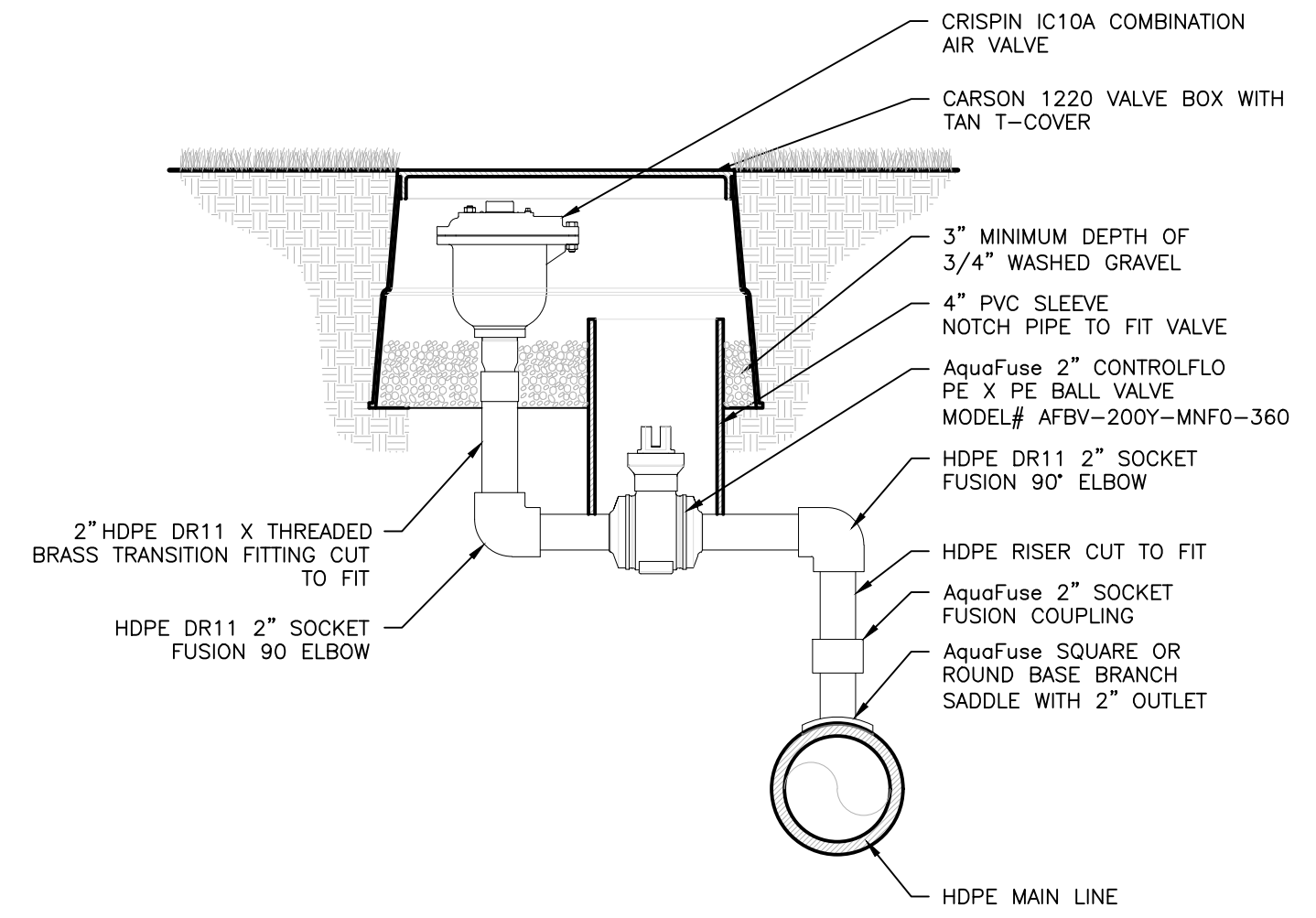
2 2" Lateral Isolation Valve Assembly

NTS



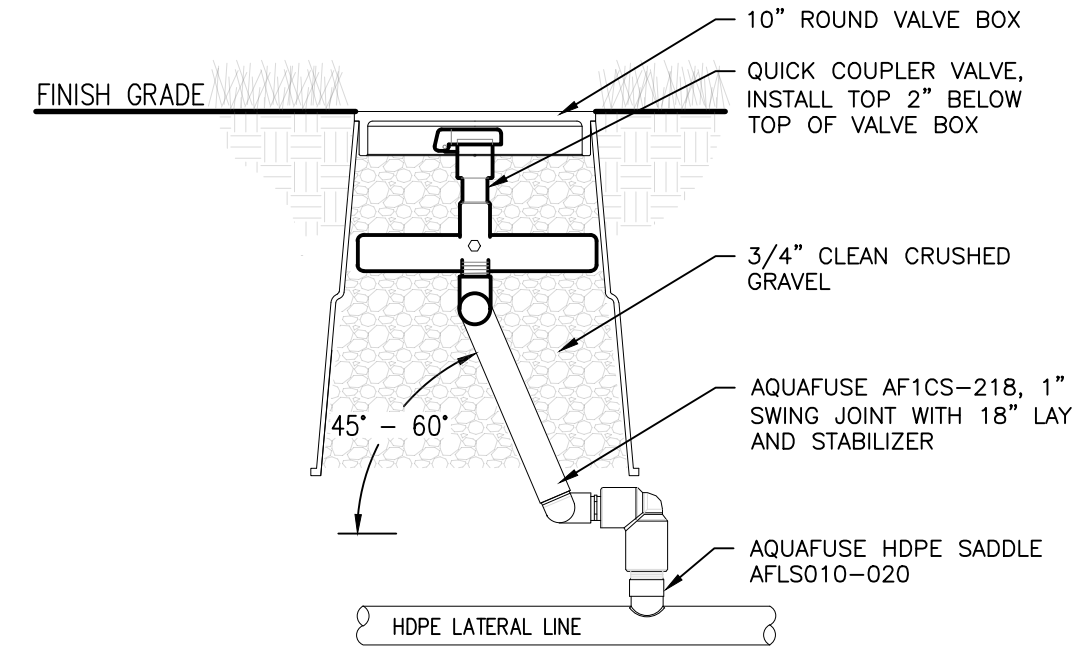
3 Manual Drain/Lake Fill

NTS



4 Air/Vac Valve Assembly

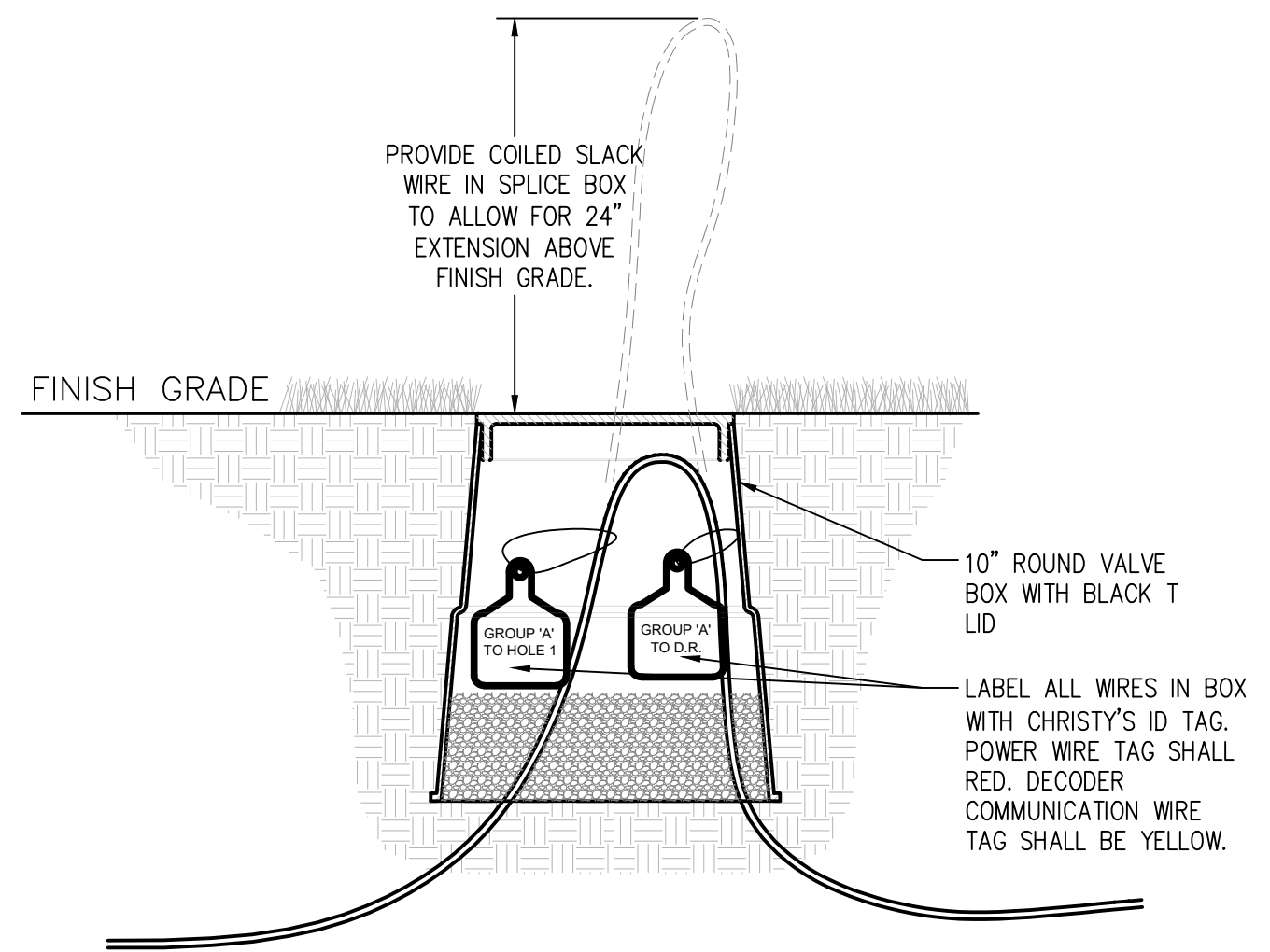
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NOTE:
1. ACME O-RING SEALED THREADS ARE TO BE FINGER TIGHTENED AND "BACKED OFF" ONE FULL ROTATION BEFORE INSTALLATION.

5 Quick Couple Valve Assembly

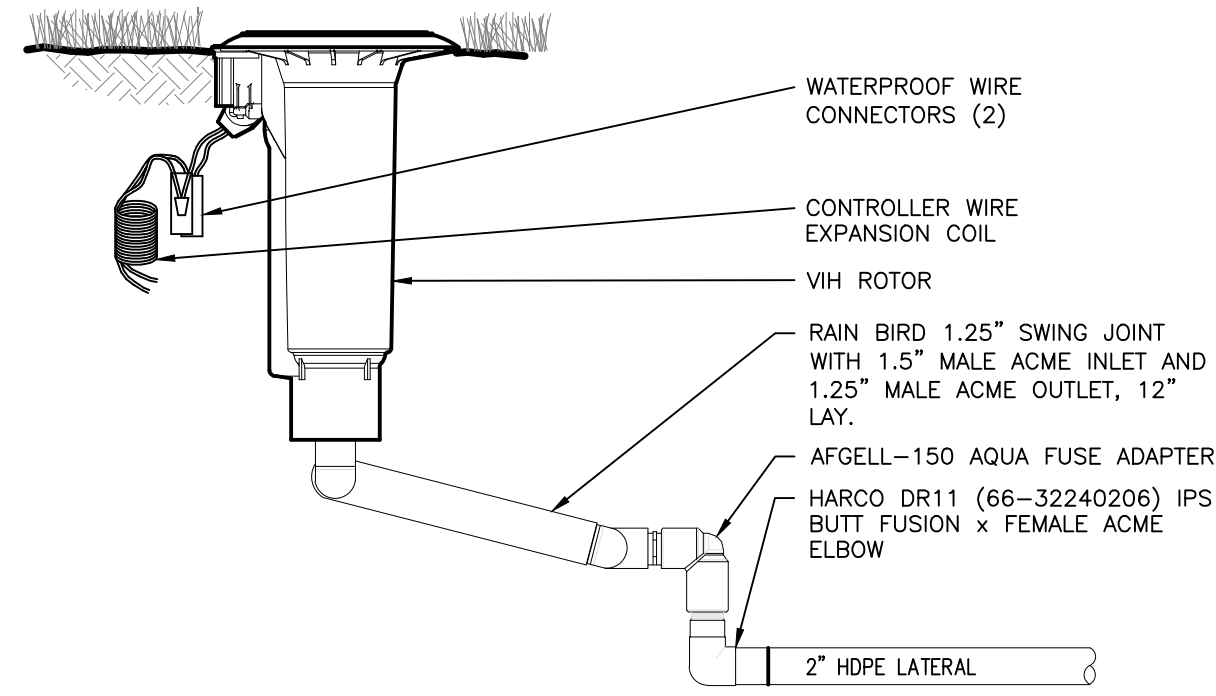
NTS



NOTES:
1. ALL TAG IDENTIFICATIONS SHALL BE TRANSFERRED TO IRRIGATION AS-BUILT.
2. ALL 24 VOLT WIRING SHALL BE SPLICED WITH 3M DBY/4 SPUCE KIT.
3. ALL 120/240 VOLT WIRING SHALL BE SPLICED WITH UL APPROVED 3M RESIN PACK.

6 Splice Box

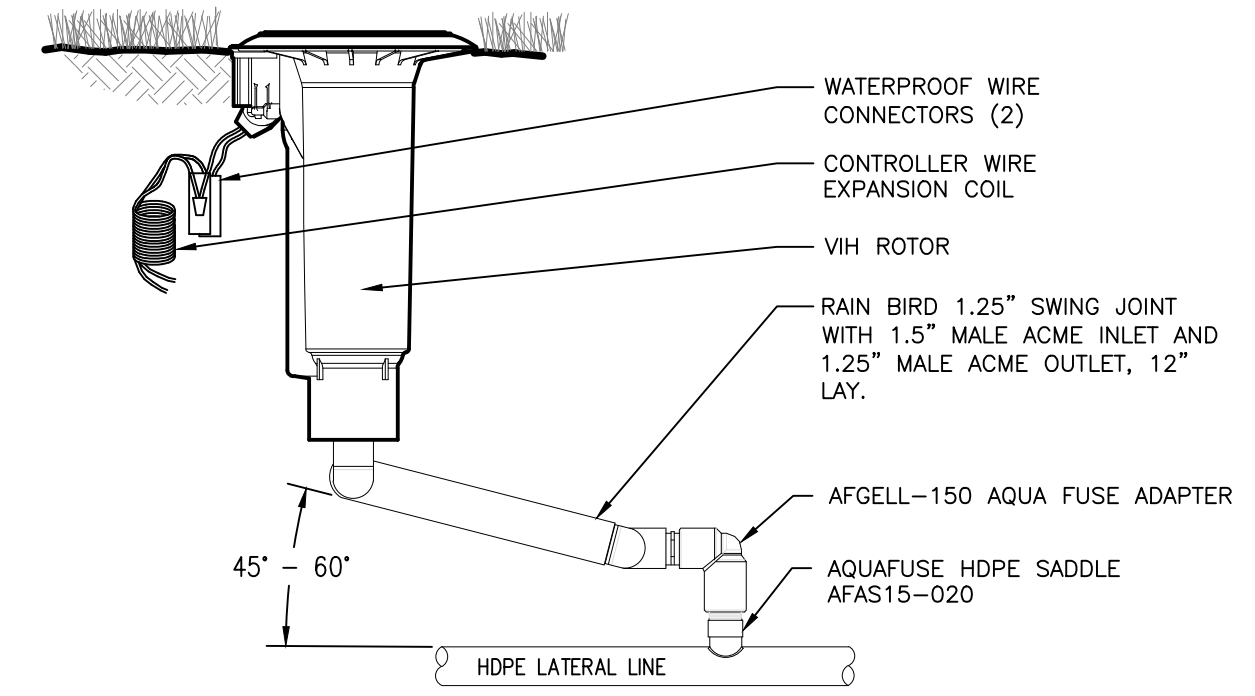
NTS



NOTE:
1. ACME O-RING SEALED THREADS ARE TO BE FINGER TIGHTENED AND "BACKED OFF" ONE FULL ROTATION BEFORE INSTALLATION.

7 VIH Rotor - End Lateral

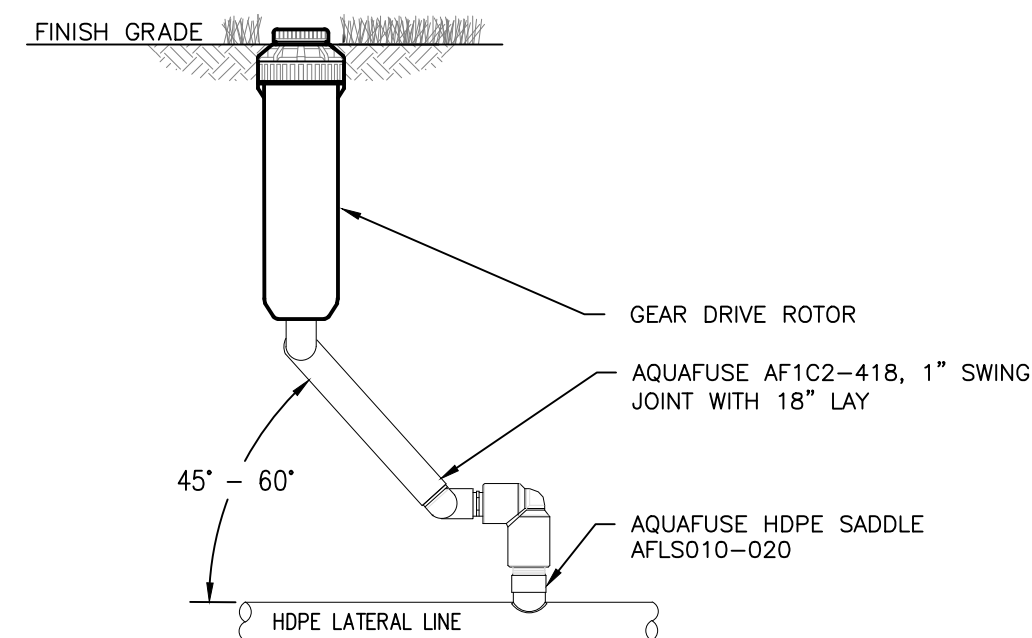
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NOTE:
1. ACME O-RING SEALED THREADS ARE TO BE FINGER TIGHTENED AND "BACKED OFF" ONE FULL ROTATION BEFORE INSTALLATION.

8 VIH Rotor - Mid Lateral

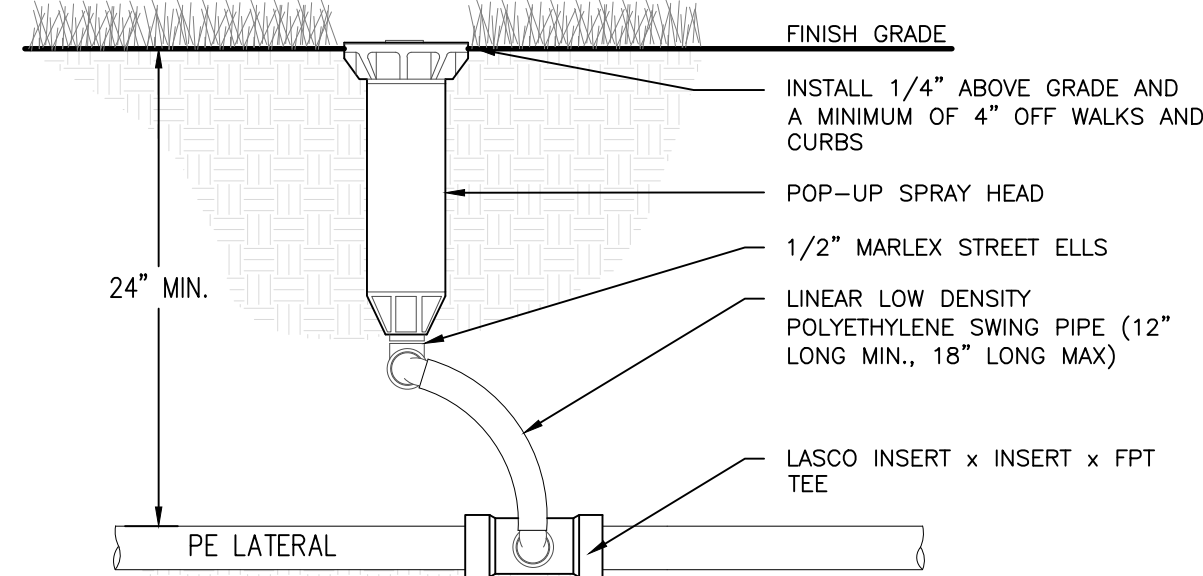
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NOTE:
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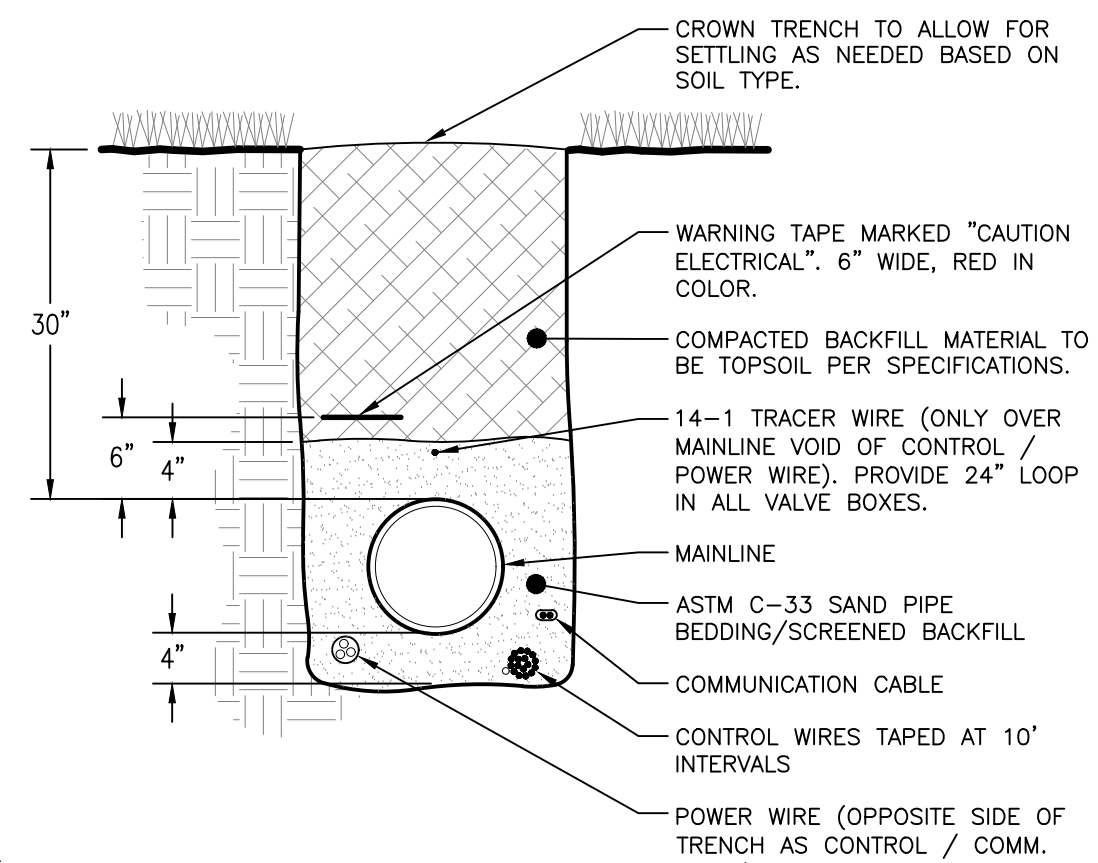
9 Gear Driven Rotor

NTS



10 MP Rotator/Spray Head

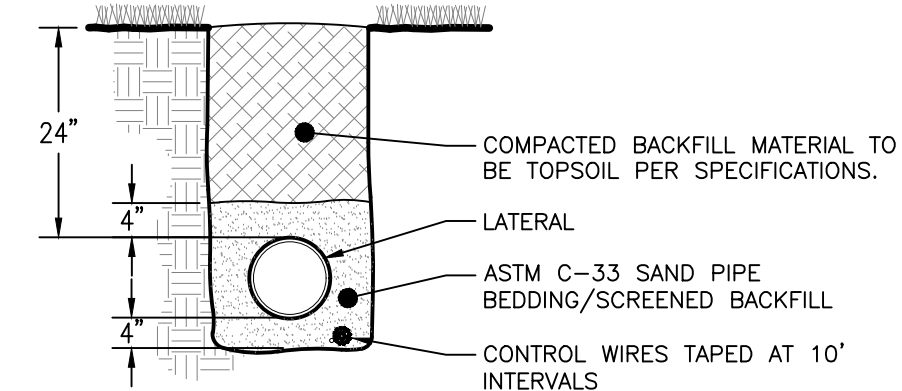
NTS



NOTE:
1. CUT SOD WITH 1" SOIL LAYER.
2. SOD CUT SHALL BE 18" WIDE.
3. CUT SOD SHALL BE ROLLED AND WATERED TO KEEP MOIST AND SHALL BE REPLACED WITHIN 48 HOURS OF CUT.
4. CROWN CENTER OF TRENCH 2" TO ALLOW FOR SETTLING.
5. TOP DRESS SOD SEAMS PULLING AWAY FROM EDGE WITH APPROVED TOP DRESSING MATERIAL.
6. PLACE AND COMPACT BACKFILL IN 6" LIFTS.
7. COMPACT BACKFILL WITH PNEUMATIC TAMPER WITH MAX 6"x6" FOOT.
8. COMPACTION TO MATCH UNDISTURBED ADJACENT SOILS.
9. TOP 6" SOIL PROFILE TO MATCH ADJACENT UNDISTURBED SOIL PROFILE.

11 Mainline Trench Section

NTS



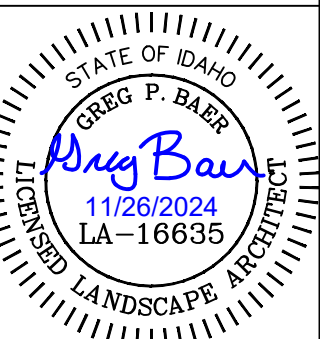
12 Lateral Trench Section

NTS

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1 DESIGN REVIEW	11/17/23
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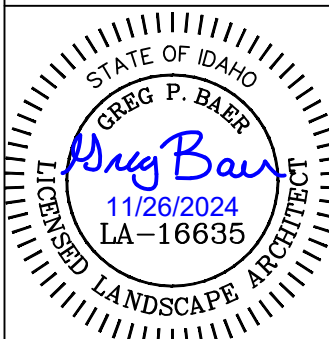


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IRRIGATION - DETAILS

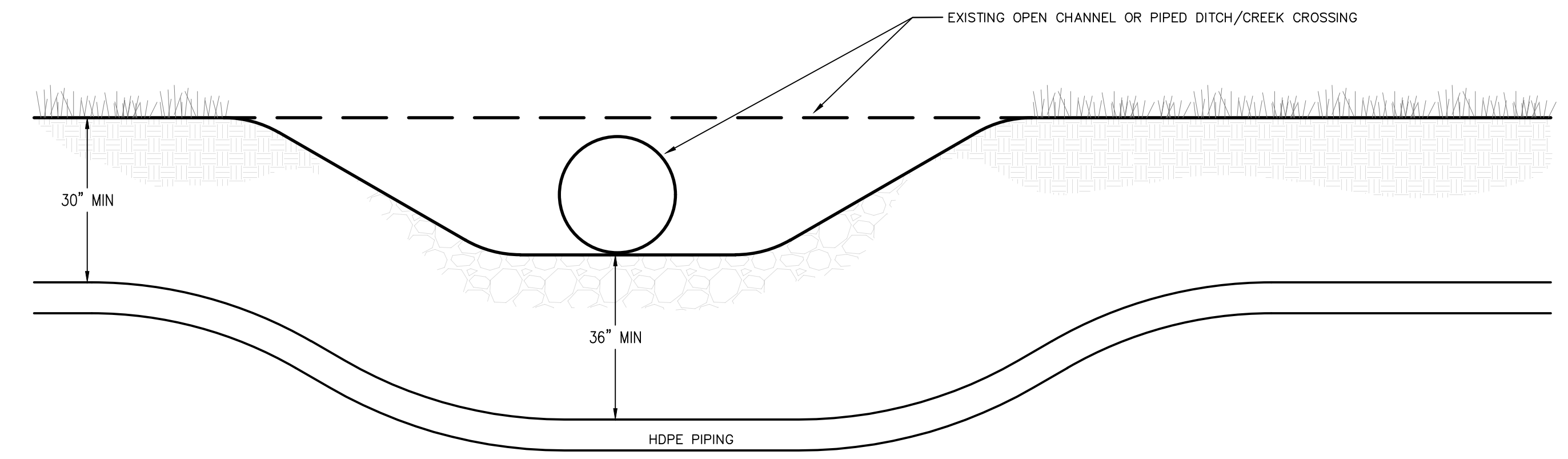


SCALE: AS NOTED

IR301

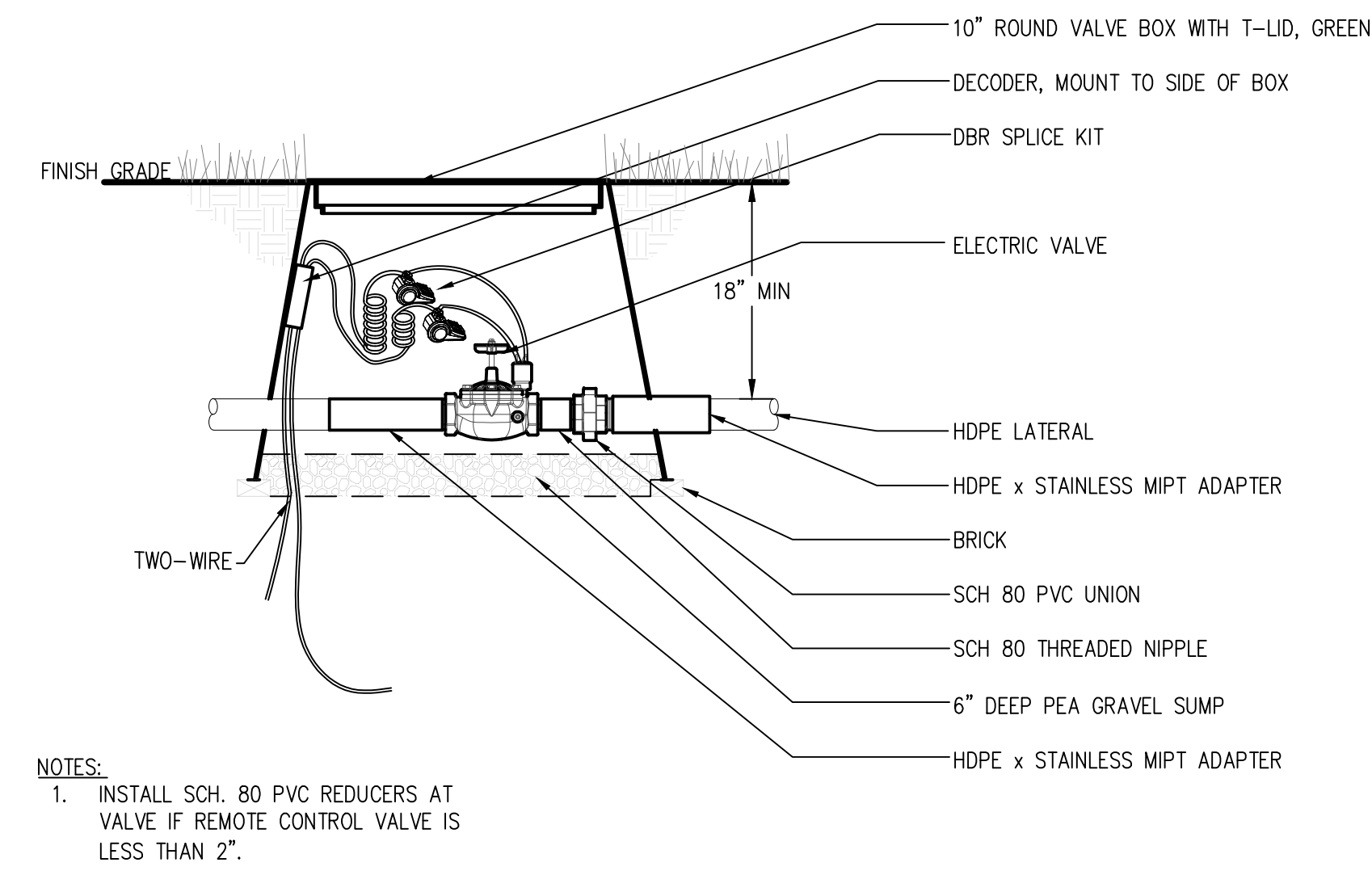
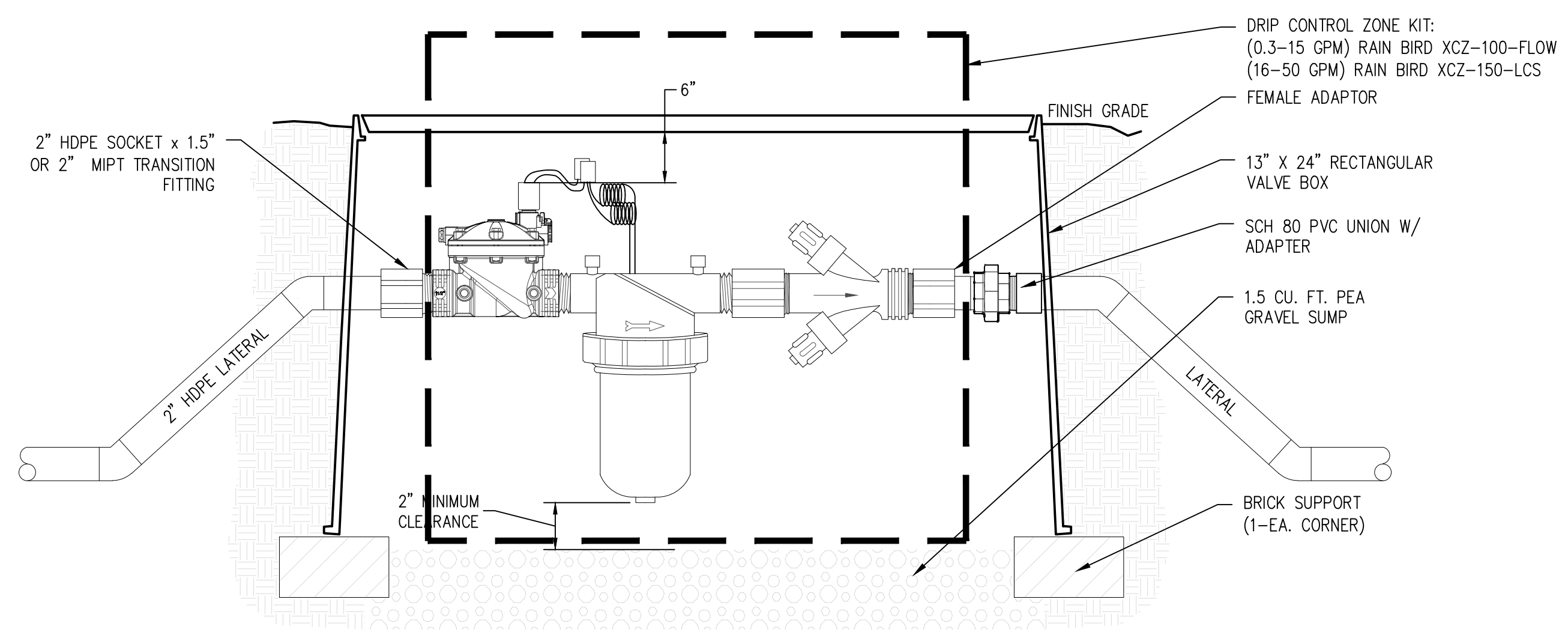
DRAWN BY: GBR
CHECKED BY:

MINIMUM ALLOWABLE RADIUS OF HDPE PIPE	
DR RATING	DEFLECTION RADIUS
DR 9 OR LOWER	20X THE O.D.
DR 13.5	25X THE O.D.
DR 21	27X THE O.D.
DR 21 OR GREATER	100X THE O.D.



13 Creek/Depression Crossing
NTS

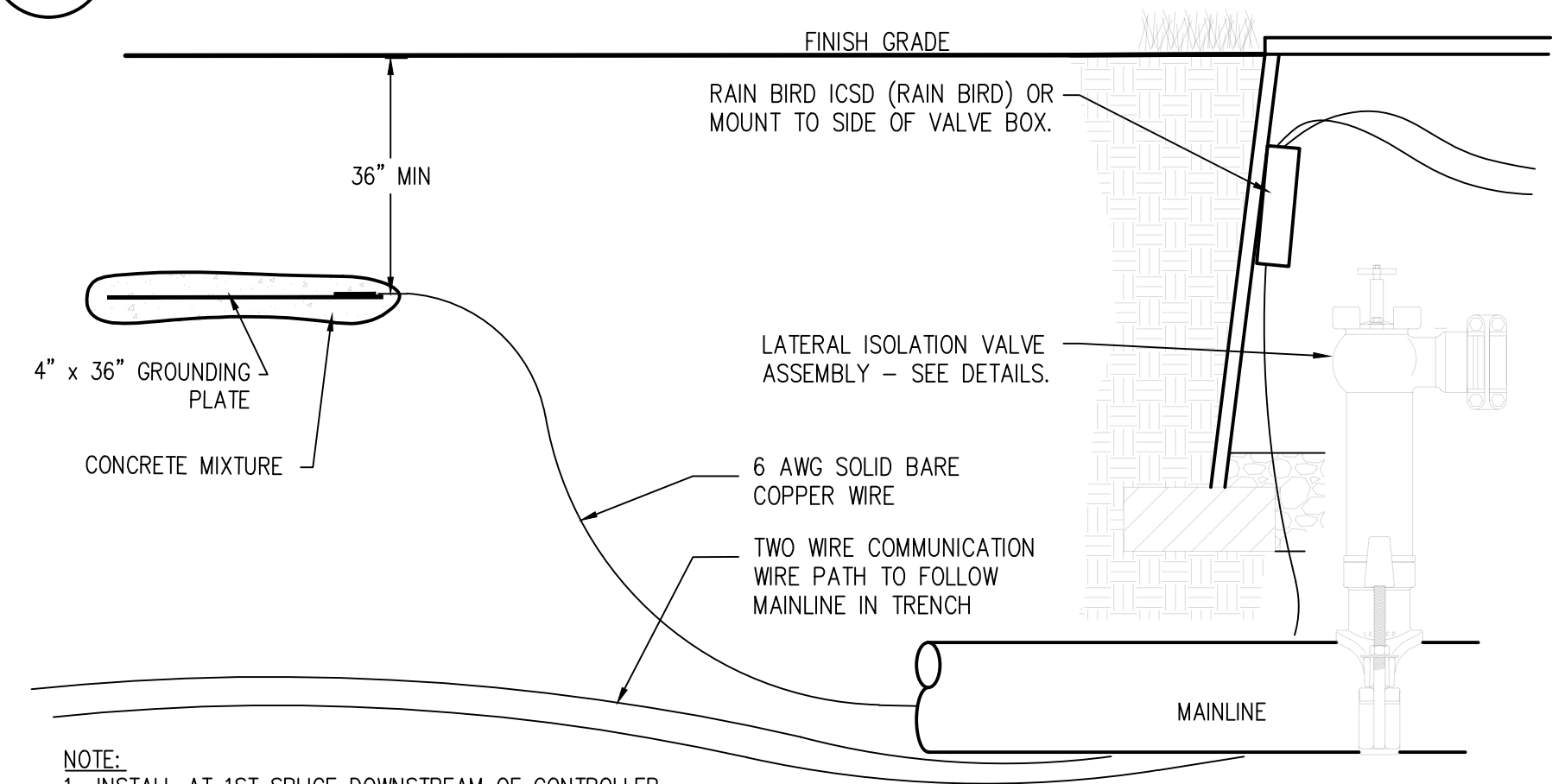
14 Pipe Deflection Chart
NTS



NOTES:
1. INSTALL SCH. 80 PVC REDUCERS AT VALVE IF REMOTE CONTROL VALVE IS LESS THAN 2".

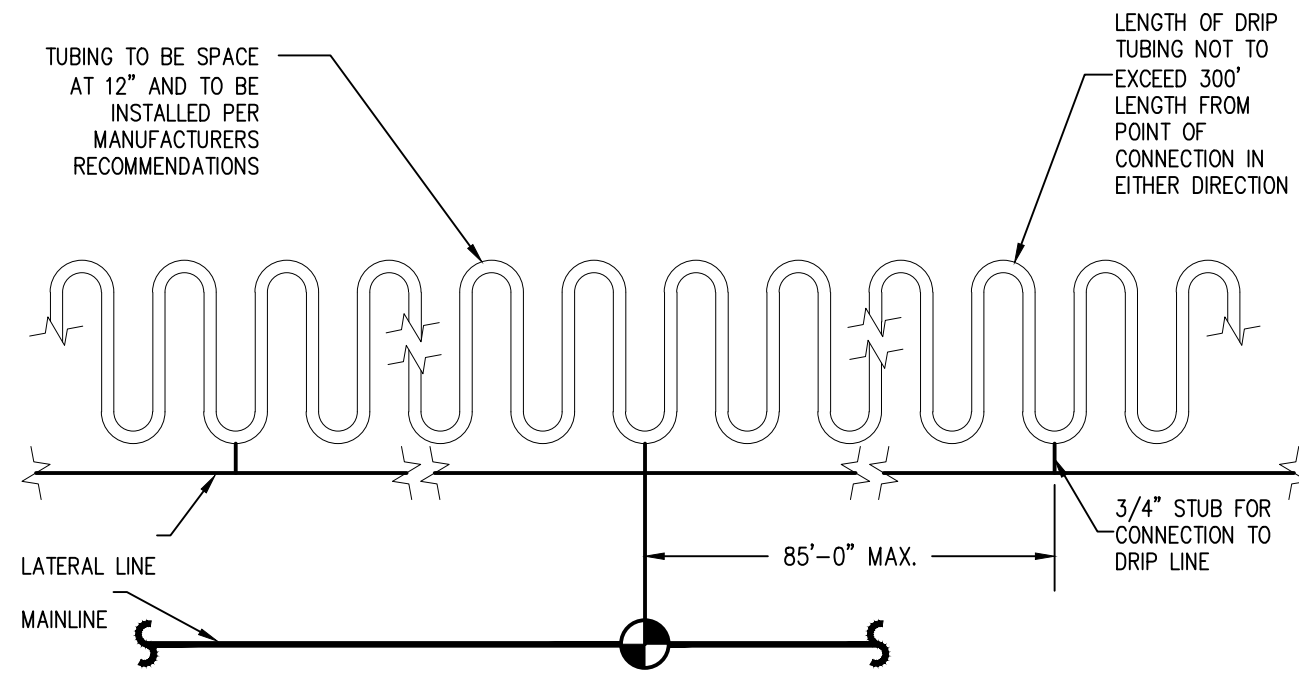
15 1" & 1.5" Drip Control Zone Valve Assembly
NTS

16 Pipe Deflection Chart
NTS

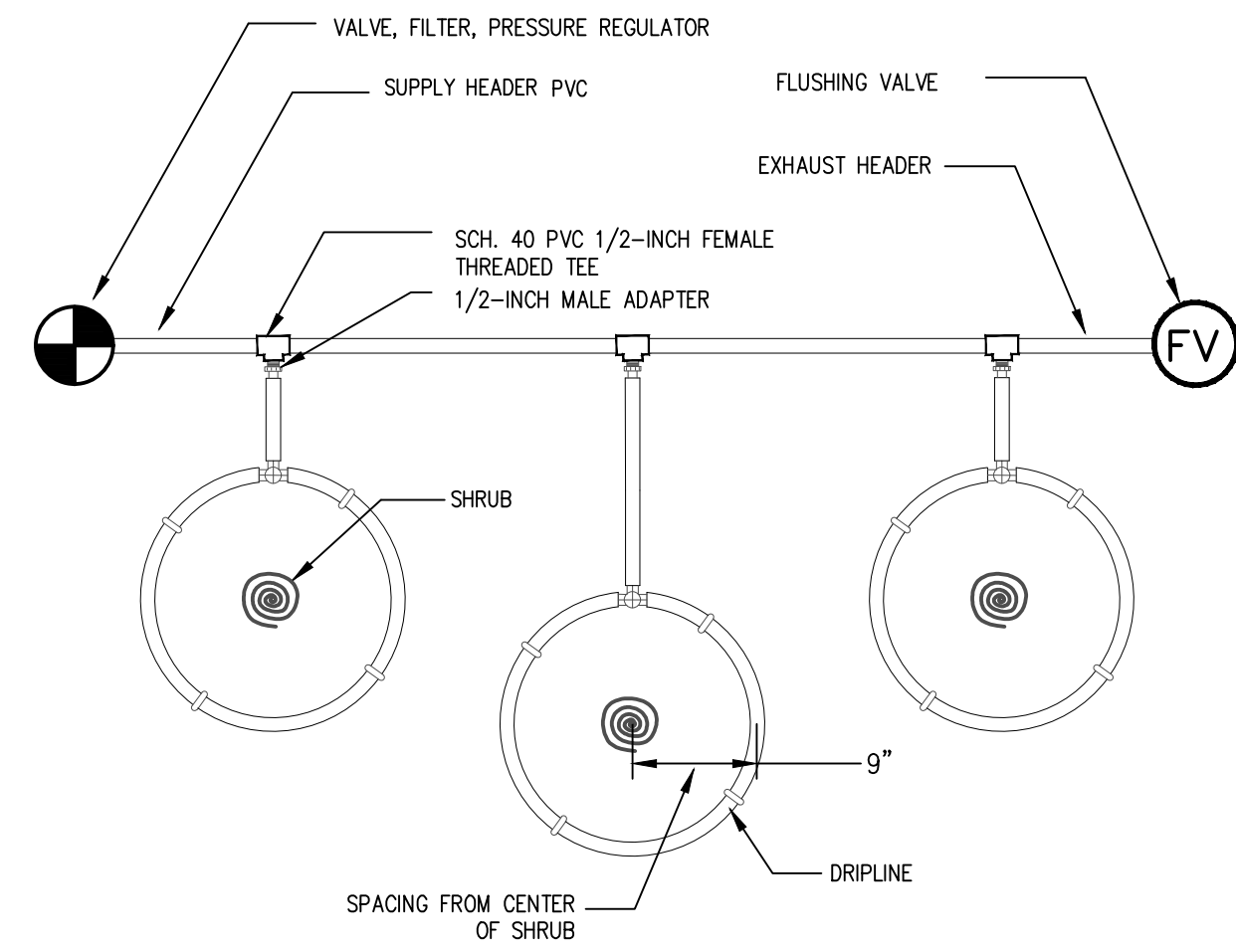


NOTE:
1. INSTALL AT 1ST SPLICE DOWNSTREAM OF CONTROLLER.
2. INSTALL ONE EVERY 450'.
3. INSTALL IN ROUGH OR OUT OF PLAY AREAS.
4. INSTALL ON EVERY SPUR IN EXCESS OF 50' OR GREATER.
5. INSTALL AT ALL DEAD-ENDS.
6. GROUNDING SHALL BE TESTED WITH A MEGGER BY CONTRACTOR AND CERTIFIED TO MEET ASIC MINIMUM CODE OF 10 OHMS TO GROUND, OR MANUFACTURERS MINIMUM REQUIREMENTS.
7. CONTRACTOR TO PROVIDE TEST RESULTS TO IRRIGATION CONSULTANT FOR SIGN OFF.

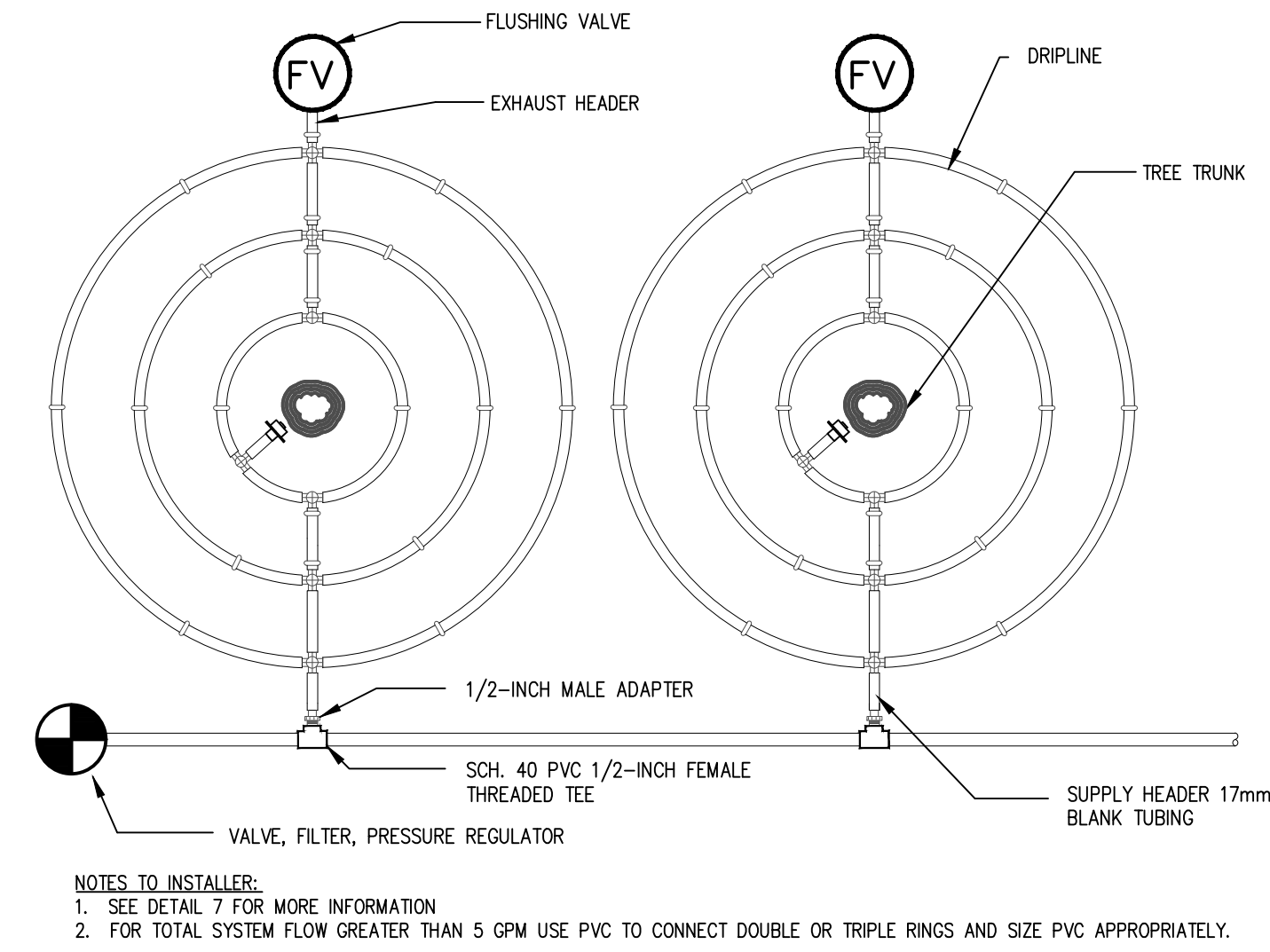
17 Two Wire Path Grounding Assembly
NTS



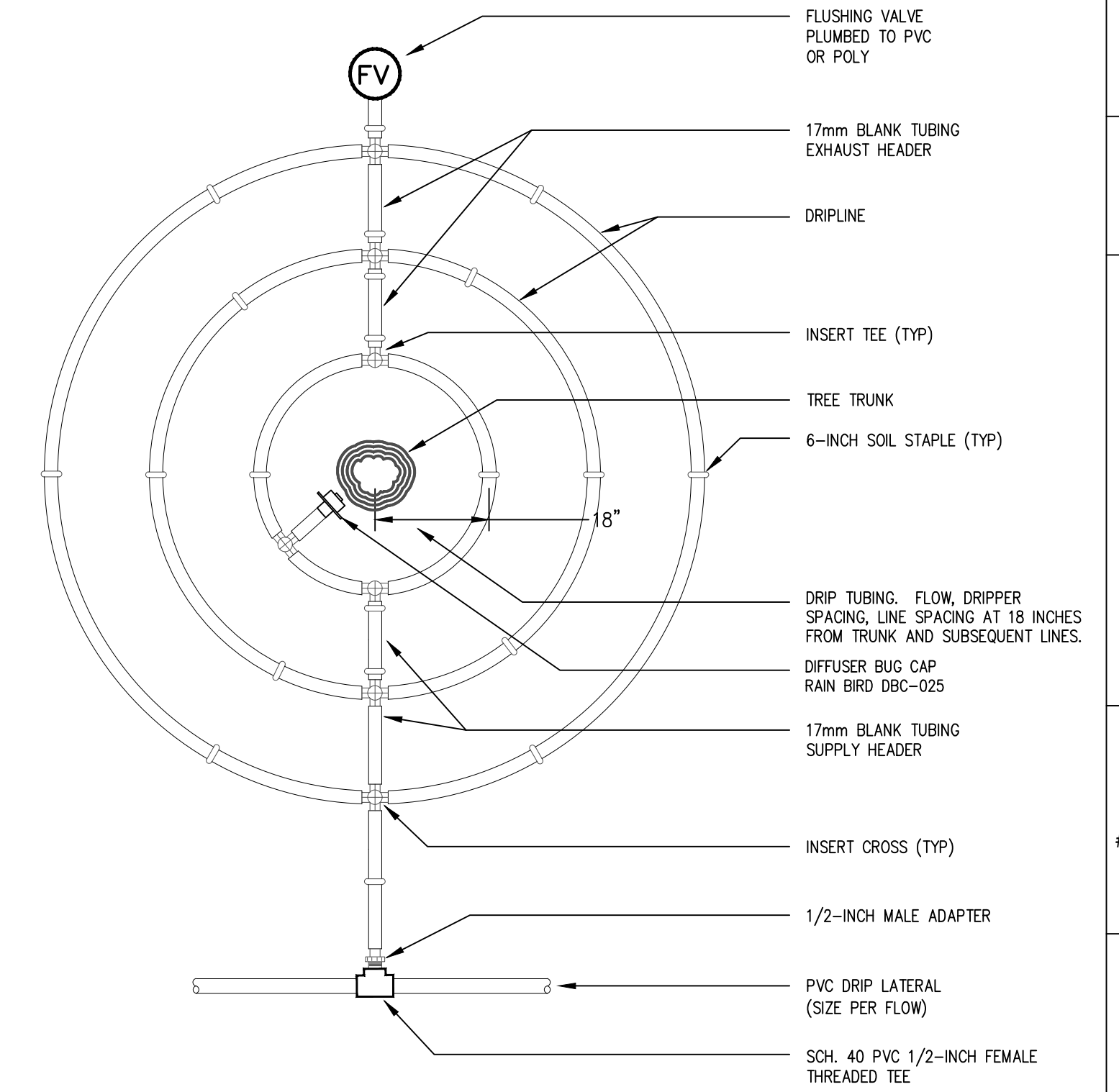
18 Drip Layout - Grasses/Perennials/Annuals
NTS



19 Drip Layout - Shrubs
NTS

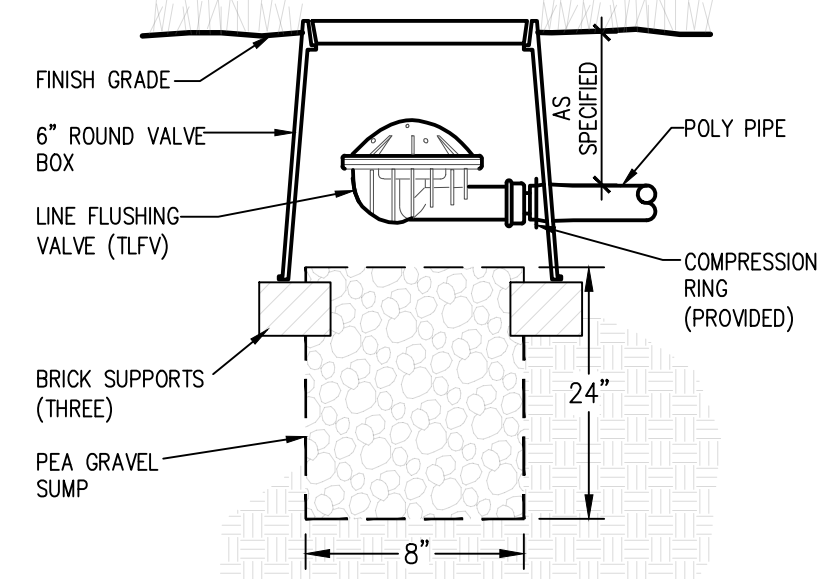


20 Drip Layout - Trees
NTS

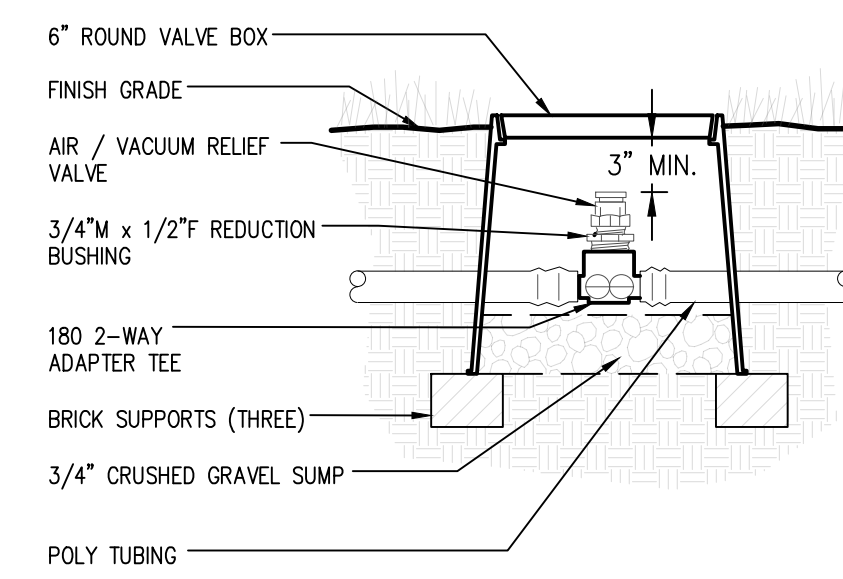


NOTES TO INSTALLER:
1. INSTALL FIRST DRIPLINE LOOP 18-INCHES FROM CENTER OF TREE TRUNK. INSTALL EACH ADDITIONAL LOOP AT 18-INCH SPACING
2. INSTALL DRIPLINE TUBING ON SURFACE TO A MAXIMUM OF 6-INCHES BELOW GRADE, STAPLE IN PLACE PER MANUFACTURER'S RECOMMENDATION, BACKFILL, AND SPREAD SURFACE TREATMENT AS DIRECTED BY OTHERS.

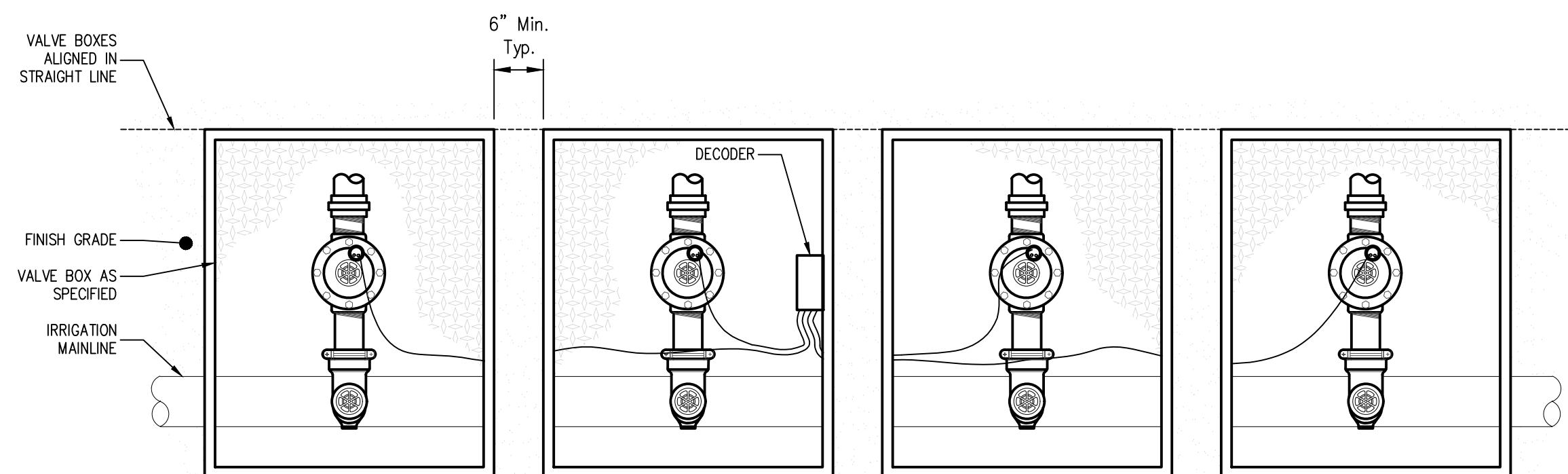
21 Tree Drip Plumbing Detail
NTS



22 Drip Line Flush Valve
NTS



23 Drip Line Air/Vac Release Valve
NTS

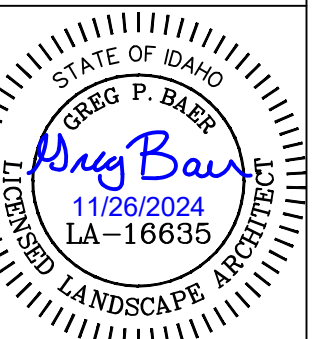


24 Rectangular Valve Box Spacing
NTS

SUBMITTALS	DATE
1. DESIGN REVIEW	11/17/23
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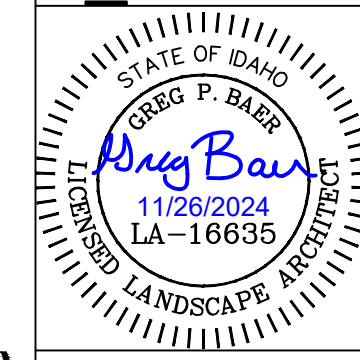
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IRRIGATION PUMP STATION DETAILS



SCALE: AS NOTED

IR400

DRAWN BY: GIB
CHECKED BY:



Main Disconnect. A service-entrance rated, non-fused disconnect shall be mounted in the pump control panel and shall isolate all power to the control panel. The disconnect shall include an operating handle mounted on the control panel enclosure door that is mechanically interlocked to prevent entry while the disconnect is in the ON position. To prevent damage from vandalism, a disconnect external to the pump station enclosure shall not be accepted.

Overcurrent Protection. The VFD bridge rectifiers shall be protected from over current by an appropriately sized circuit breaker. Fuses are not acceptable.

Lightning & Surge Protection. The Pump Control Panel shall be equipped with transient voltage and surge arrestors.

Variable Frequency Drive (VFD). The VFD shall be appropriately sized to meet the FLA (full load amps) required by the pump motor, as stated on the motor nameplate. The VFD shall be manufactured by ABB Industrial Systems, Mitsubishi, or approved equal. Initial start-up and calibration shall be performed by a factory certified technician, which shall extend the warranty on the control panel to a total of three (3) years.

Programmable Logic Controller (PLC). The PLC shall be fully programmed prior to pump panel installation. The technician installing and programming the PLC is to be factory trained and certified by the PLC manufacturer. The PLC programming shall be non-proprietary, and the complete station programming shall be made available to the owner via a USB drive included with the station control panel.

PLC Operator Interface. The PLC shall be equipped with a 5.7" LCD color touchscreen. The operator interface shall allow the user to make adjustments to the PLC program locally without requiring any additional equipment such as a laptop computer. A VFD control keypad is not an acceptable substitution for the digital operator interface. The PLC shall have an Ethernet port to enable remote access.

PLC Control Functions:

- User settable Local or Remote control.
- System Pressure Setpoint
- Pump Sleep Settings, with two threshold modes: Sleep by Flow or Sleep by Frequency
- System Protection Settings, including fault and warning parameters for low flow, high flow, low pressure, high pressure, restart trials and restart delay time.
- Load Factory Default Settings, User Saved Default Settings.
- Pre-Programmed Start-Up Routines to limit and/or delay starting and acceleration of the pump to eliminate excessive velocity and pressure. It shall also include initial start-up, mainline fill, power outage and automatic re-starts.

PLC Monitoring Functions

- Pump operating status, total pump run hours, motor frequency, motor amperage
- System pressure, flow rate
- Fault Log with time stamps and diagnostic utility.
- Trend Data, with graphic display of system pressure, flow, motor frequency and amperage. Data shall be exportable to MS Excel.
- Sleep port to upload, download of program, and data storage.

Instrumentation

Pressure Gauges shall have a 304 stainless steel case, with bezel construction. Gauges shall have a 2.5" diameter and be liquid filled. Pressure Transmitter(s) shall be constructed of stainless steel and rated for the pump station discharge pressure.

Flow Meter. The station shall include a magnetic flow meter. The flow meter shall have flange connections. The flow meter shall be capable of pulse and analog output. Current and totalized flow shall be read at the pump control panel HMI. Insertion flow meters and sensors shall not be accepted.

Submersible Pump Protection Shrouds

Each pump and motor shall be completely enclosed in a slotted PVC well casing. Both ends of the shall be thoroughly sealed to ensure that no water can enter at either end. Water shall only enter the casing through precision laser cut slots, which will not allow debris larger than can be passed entirely through the pump. All water entering the casing shall pass over, and cool the motor, prior to entering the pump.

SCOPE OF WORK

Packaged Pump Station supplier shall provide a variable speed vertical turbine pump station complete with pump, piping, valves, sensors, variable frequency drive (VFD), programmable logic controller (PLC), UL 508A listed control panel, and all appurtenances necessary for a complete and functioning pumping system. The station shall be mounted to press broke formed steel base and enclosed in a powder-coated marine grade aluminum enclosure. The pump station shall be manufactured by a UL QCCJ and ISO 9001 certified pump station manufacturer.

Technical Service and Support. The manufacturer shall provide access 24/7 phone support with a factory certified technician. The technician shall have access to all relevant data specific to the pump station, including specifications, submittal, shop drawings, programming, and detailed photos of the system.

Factory Testing. The pump station shall undergo and pass all of the following system performance tests: Hydrostatic testing that meets ANSI/Hi specifications and standards; Flow testing that meets ANSI/Hi 14.6 specifications and standards; and Vibration testing that meets ANSI/Hi 9.6.4 Vibration Measurement and Allowable Values specifications and standards. The pumping system shall be flow tested as a complete unit, which shall include function testing of pumps, motors, instrumentation, appurtenances, and control panel. The results of all tests shall be available to the owner.

PRODUCTS

Piping, Valves, Skid Base, & Station Enclosure.

Piping. The station piping shall be standard wall pipe with grooved connections. Flanged or welded connections shall not be acceptable. Threaded connections between the main piping sections other than at the pump volute shall not be acceptable.

Valves. Butterfly style isolation valves--with grooved connections--shall be included on station suction and discharge piping. Flanged or threaded connections shall not be accepted. A non-slam check valve shall be included on the discharge of each pump. An air release valve shall be included, located immediately after the pump check valve.

Skid. The pump skid shall be made of 1/4" press broke A36 steel. No welded bases or open rail systems shall be acceptable.

Corrosion Protection. The pump skid and appurtenances shall be cleaned to bare steel and coated with a baked on powder coating, all piping including elbows shall be coated inside and out. The pump station shall be pressure tested prior to coating. No welding shall be performed after the pump station is powder coated.

Station Enclosure. The pump station enclosure shall be constructed of marine grade aluminum modular panels to allow access to all pumps and components by simply removing any panel. The entire front of the enclosure shall consist of hinged doors. The enclosure shall be powder coated. The roof of the enclosure shall be easily displaced and replaced by one person for the purpose of servicing the pump station. The station enclosure shall include a ventilation fan (or fans) appropriately sized to adequately cool the enclosed equipment.

Automatic Filter. The pump station shall include an automatic screen filter. The filter shall use suction scanning devices to automatically remove debris from the filter element. The filter shall be VAF or approved equal. Control logic for filter flush shall be included as part of the main control panel PLC programming.

Pump Control System

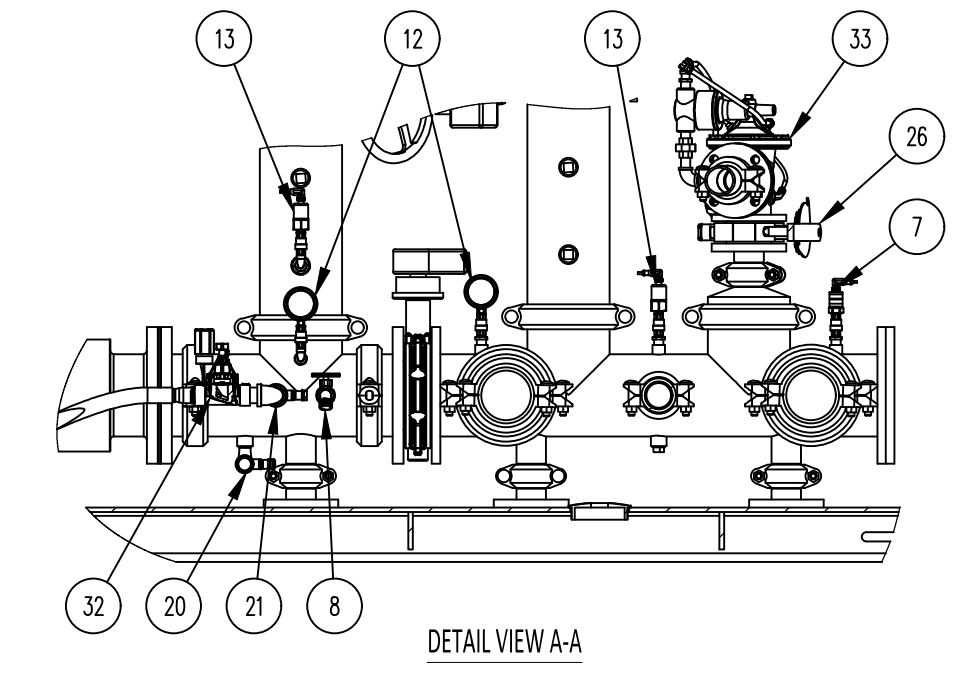
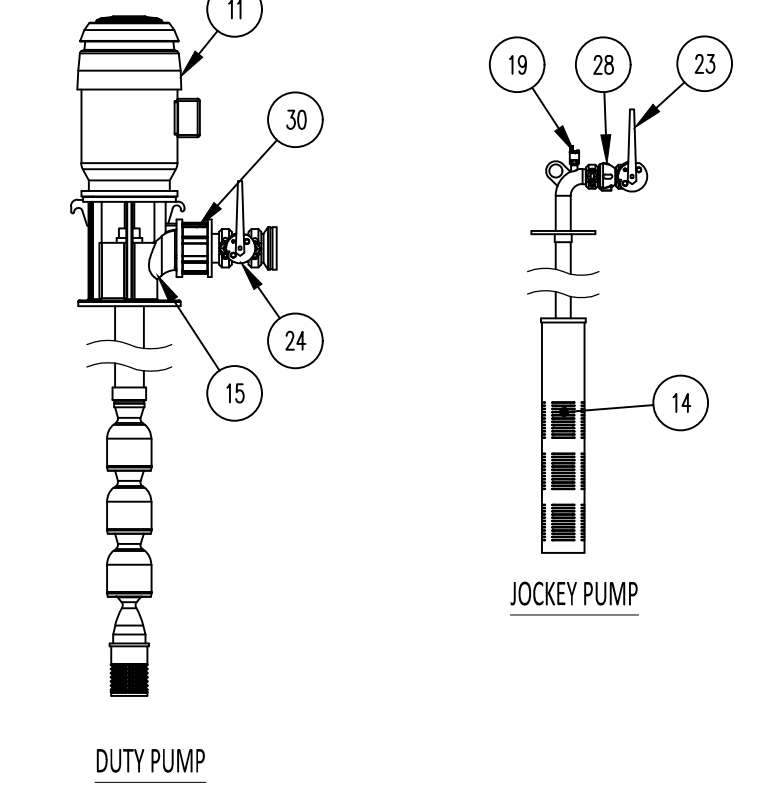
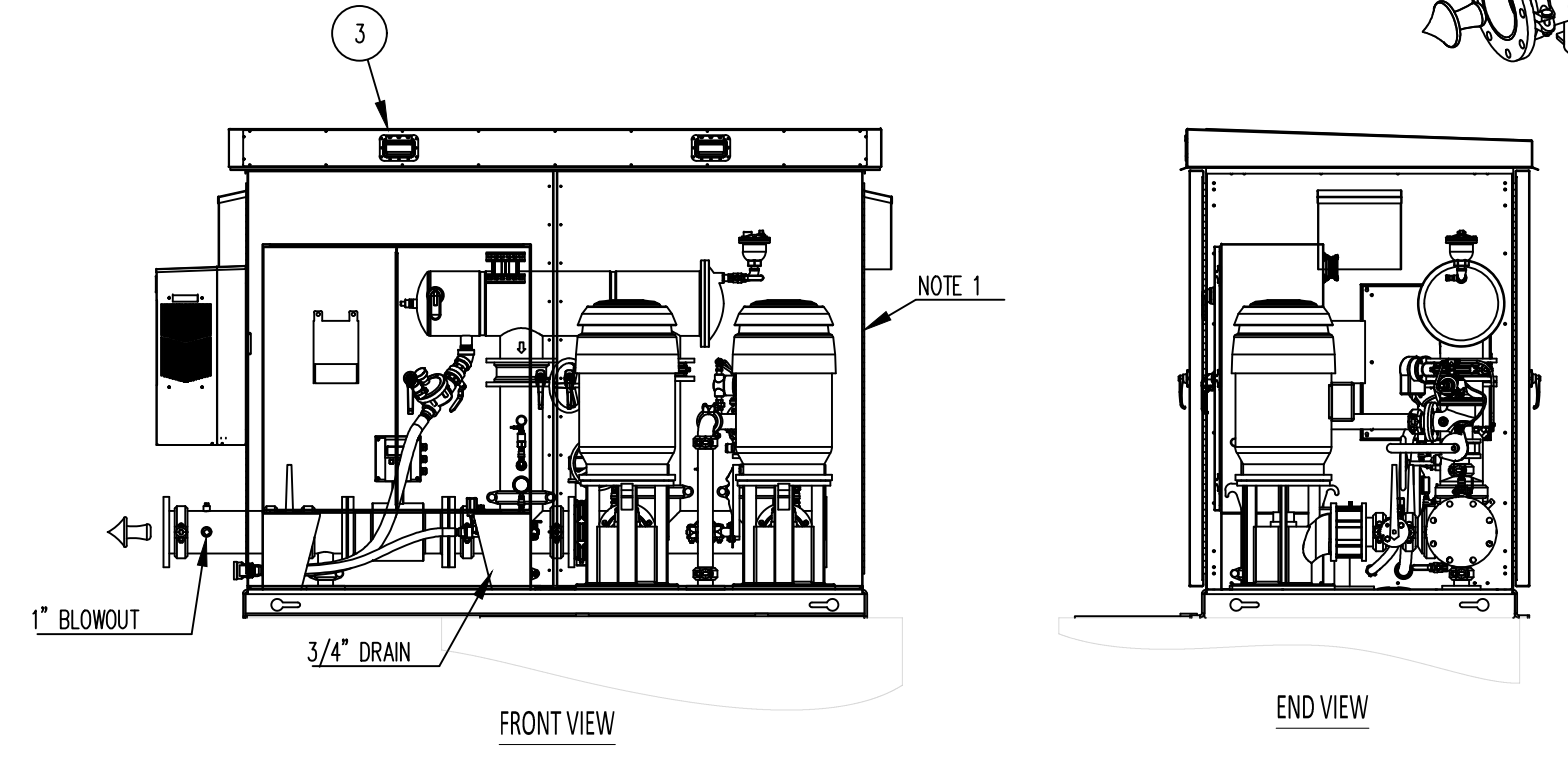
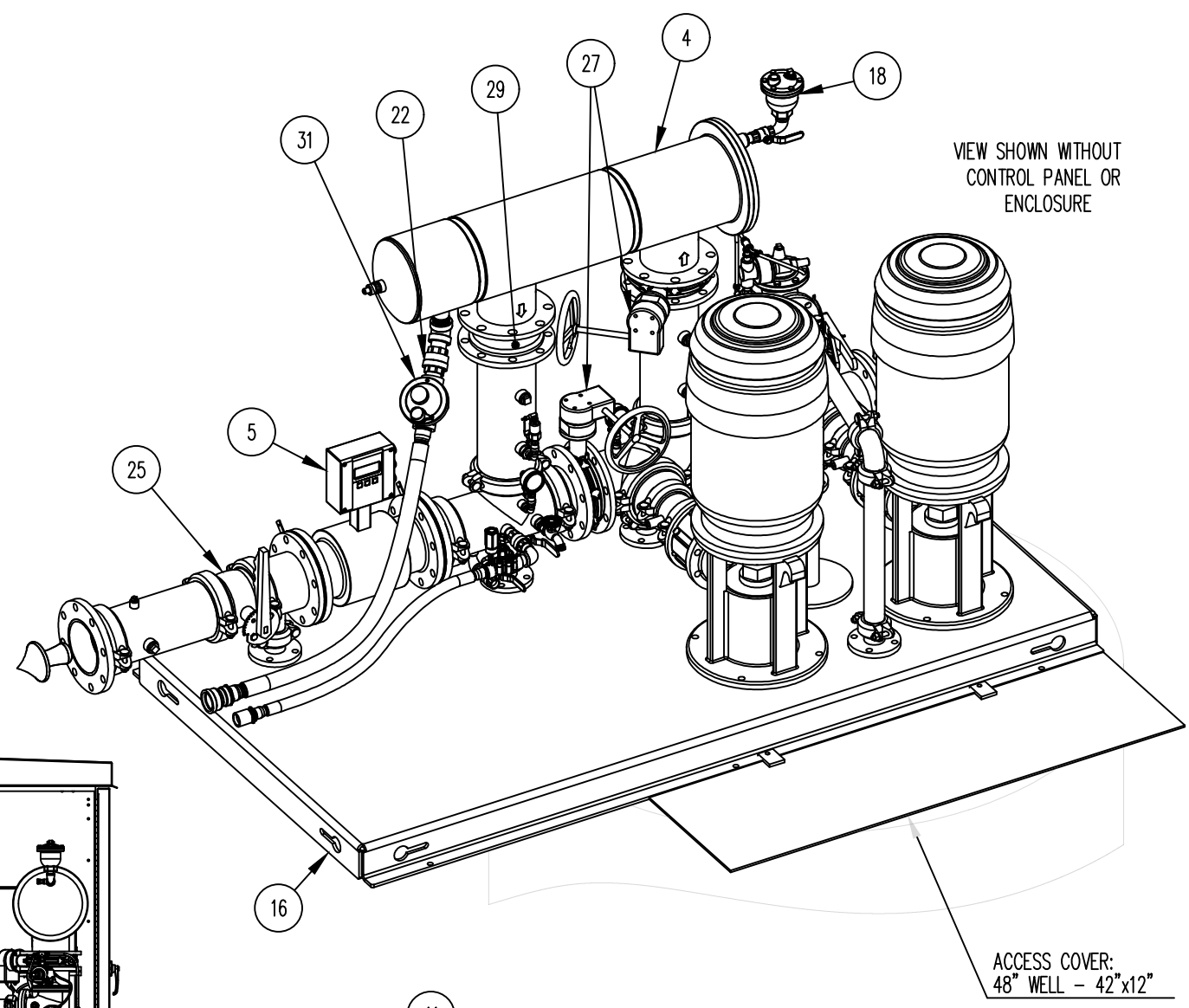
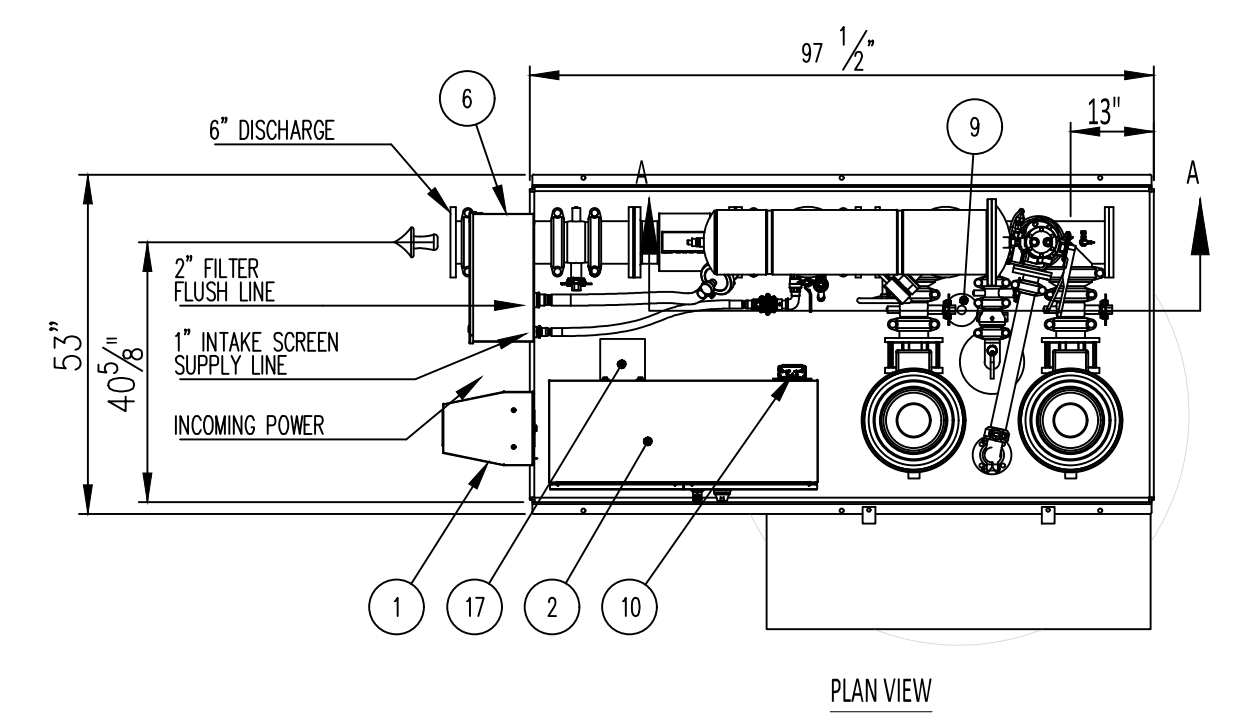
NEMA Rating. The VFD, PLC, and associated electrical equipment shall be mounted in a NEMA 12 enclosure rated for indoor installation. To avoid potential water or rodent damage, VFD's mounted outside the main control panel are not acceptable.

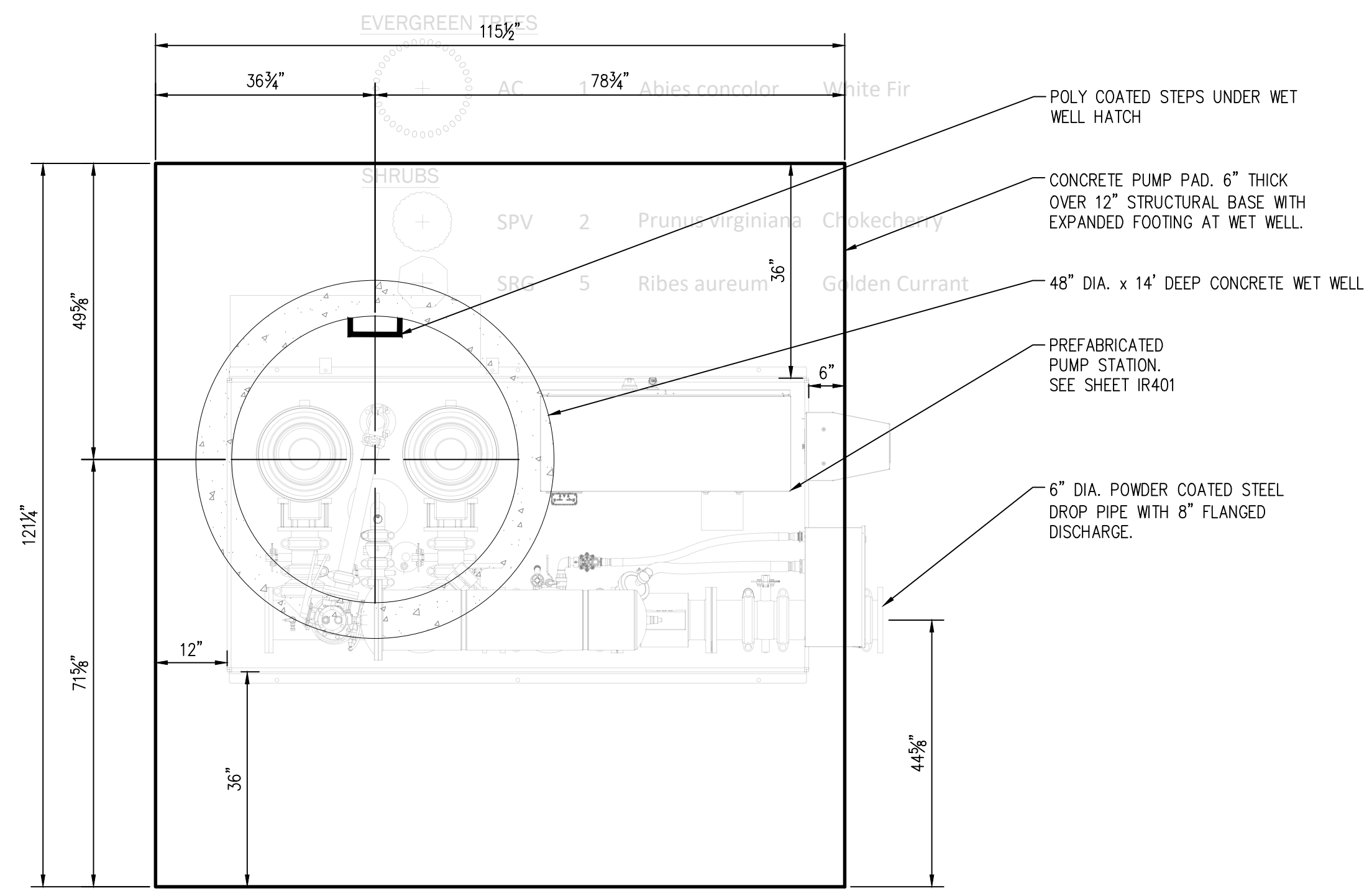
Control Panel Manufacturing & Testing. The pump control panel shall be manufactured and listed by a UL508A Panel Shop. The panel shall be UL labeled as an "Enclosed Industrial Control Panel". The pump control panel shall be completely manufactured, tested and programmed prior to delivery to the job site.

Documentation. A color wiring schematic and pump nameplate information shall be permanently affixed to the inside of the control enclosure. All field terminal connections shall be numbered and labeled.

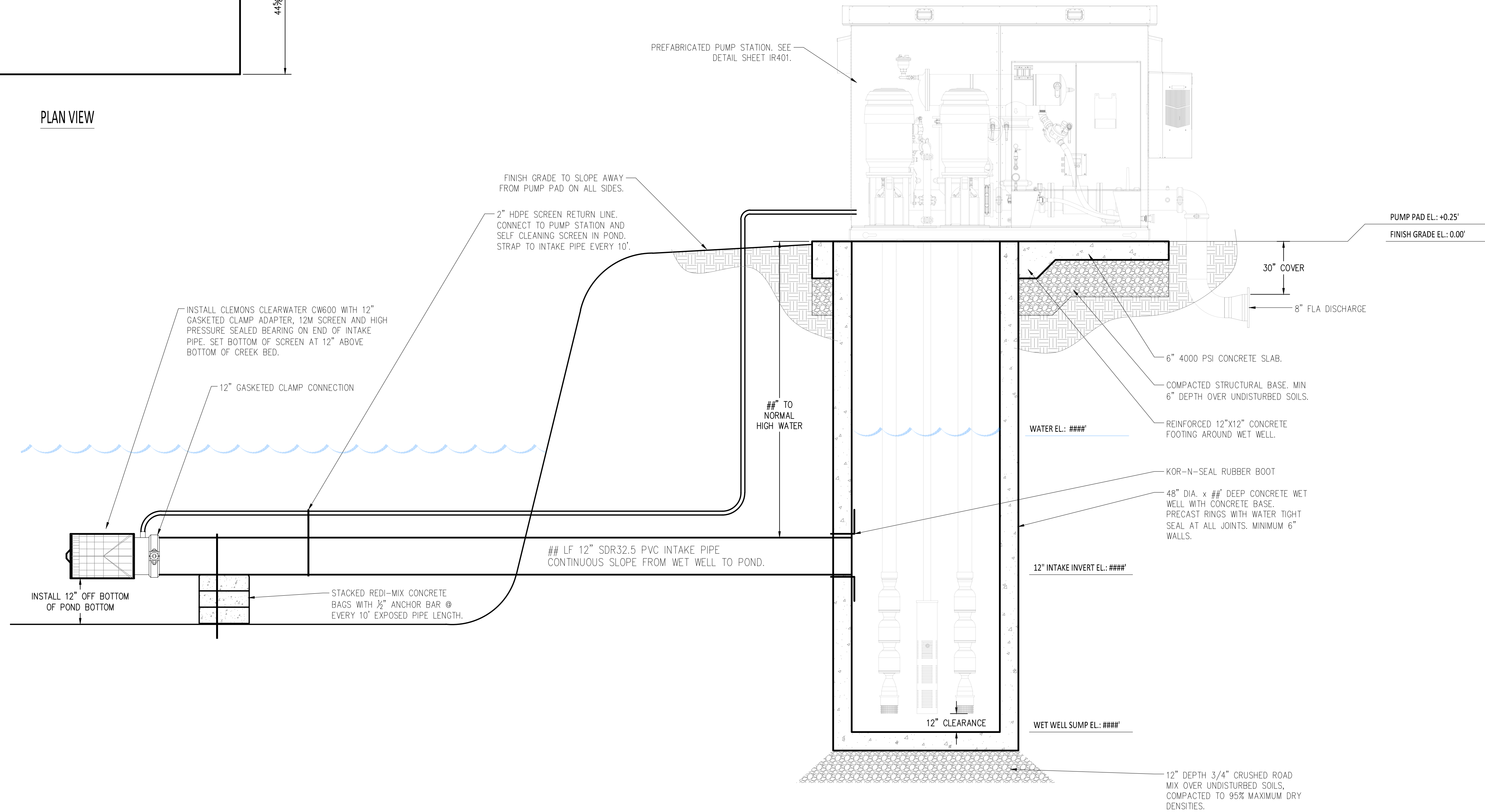
Cooling System. The control panel cooling system shall be appropriately sized for the ambient conditions. The cooling system shall not allow dust, insects or rodents inside the pump control panel. Two sets of spare filters shall be included with the pumping system.

DESIGN SPECIFICATIONS			
Design Flow Rate:	500 GPM @ 105 PSI		
Duty Pump Details:	25 HP/Pump	270 GPM @ 240 TDH	
Jockey Pump Details:	5 HP/Pump	55 GPM @ 240 TDH	
Minimum Power:	480 Volt / 3 Phase		
ITEM NO.	DESCRIPTION	Size	QTY.
1	AC UNIT, N28, HOFFMAN		1
2	CONTROL PANEL		1
3	ENCLOSURE, MARINE GRADE ALUMINUM, 4-DOOR	48x96x66	1
4	FILTER	6"	1
5	FLOW METER, BADGER	6"	1
6	HARMONICS PANEL	24"x20"x10"	1
7	HIGH PRESSURE SWITCH	1/4"	1
8	HOSE BIB	3/4"	1
9	LEVEL SENSOR/FLOAT SWITCH CAP		1
10	MODEM		1
11	MOTOR		2
12	PRESSURE GAUGE	2-1/2"	2
13	PRESSURE TRANSDUCER	1/4"	2
14	PUMP, SUBMERSIBLE		1
15	PUMP, TURBINE, DI HEAD	4"	2
16	SKID, BENT	48"x96"	1
17	TRANSFORMER	3kVA	1
18	VALVE, AIR RELIEF	3/4"	1
19	VALVE, AIR RELIEF, FV-4	1/2"	1
20	VALVE, BALL	3/4"	1
21	VALVE, BALL	1"	1
22	VALVE, BALL	1-1/2"	1
23	VALVE, BUTTERFLY, GROOVE, LEVER	2"	1
24	VALVE, BUTTERFLY, GROOVE, LEVER	4"	2
25	VALVE, BUTTERFLY, GROOVE, LEVER	6"	1
26	VALVE, BUTTERFLY, LUG, LEVER, 175 PSI	2"	1
27	VALVE, BUTTERFLY, WAFER, GEAR-OP, NBE	6"	2
28	VALVE, CHECK, GROOVED	2"	1
29	VALVE, CHECK, NBE	6"	1
30	VALVE, CHECK, SILENT	4"	2
31	VALVE, FILTER FLUSH	1-1/2"	1
32	VALVE, LAKE SCREEN SUPPLY	1"	1
33	VALVE, PRESSURE RELIEF, ANGLED	2"	1





PLAN VIEW



SECTION VIEW

PLANT SCHEDULE L6.15

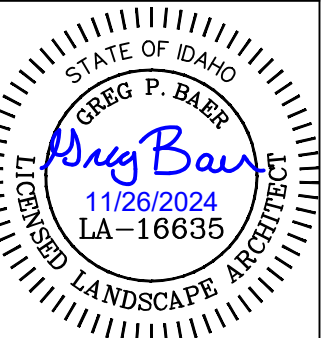
PLANT SCHEDULE L6.16

SUBMITTALS	DATE
1 DESIGN REVIEW	11/17/23
2	
3	
4	
5	
6	

NOTES:
1. CONTRACTORS AND SUBCONTRACTORS SHALL VERIFY ALL FIGURED DIMENSIONS AND CONDITIONS AT THE JOBSITE, REVIEW AND COMPARE ALL CHAPTERS AND INTERDISCIPLINARY DRAWINGS, AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES PRIOR TO ANY FABRICATION OF ANY WORK OR FIELD WORK BEING DONE, IN ACCORDANCE WITH AIA DOCUMENT A201. DO NOT SCALE THESE DRAWINGS.
2. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PREPARED BY THE ARCHITECTS FOR THIS PROJECT ARE INSTRUMENTS OF THE ARCHITECT'S SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT AND UNLESS OTHERWISE PROVIDED THE ARCHITECT SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT. REPRODUCTION IS PROHIBITED. COPYRIGHT 2022, STUDIO SUPERBLOOM, LLC.

PROJECT
WARM SPRINGS PRESERVE
BALD MOUNTAIN RD.
KETCHUM, ID
CITY OF KETCHUM AND WRLT

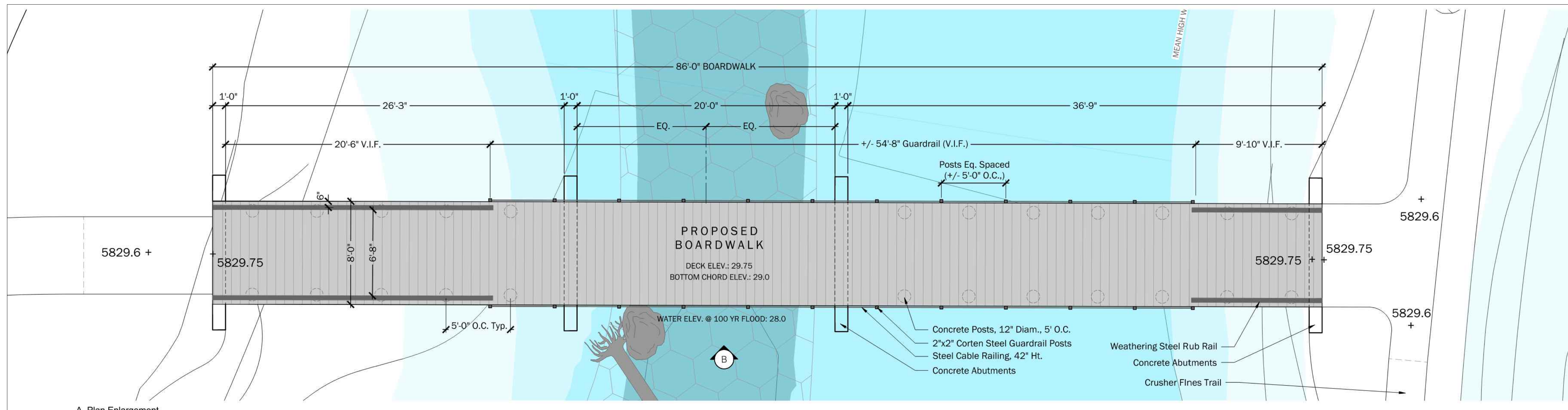
PUMP PAD & WET WELL LAYOUT



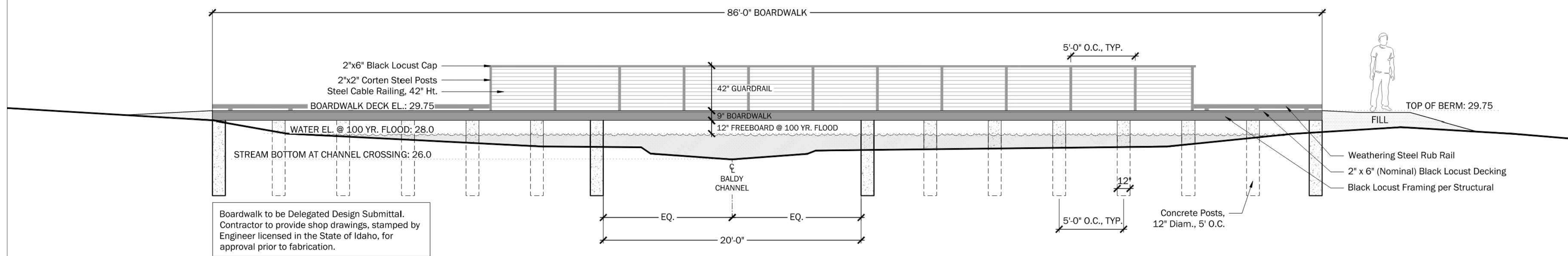
SCALE: AS NOTED

IR401

DRAWN BY:
CHECKED BY:



A. Plan Enlargement
SCALE: 1/4" = 1'-0"

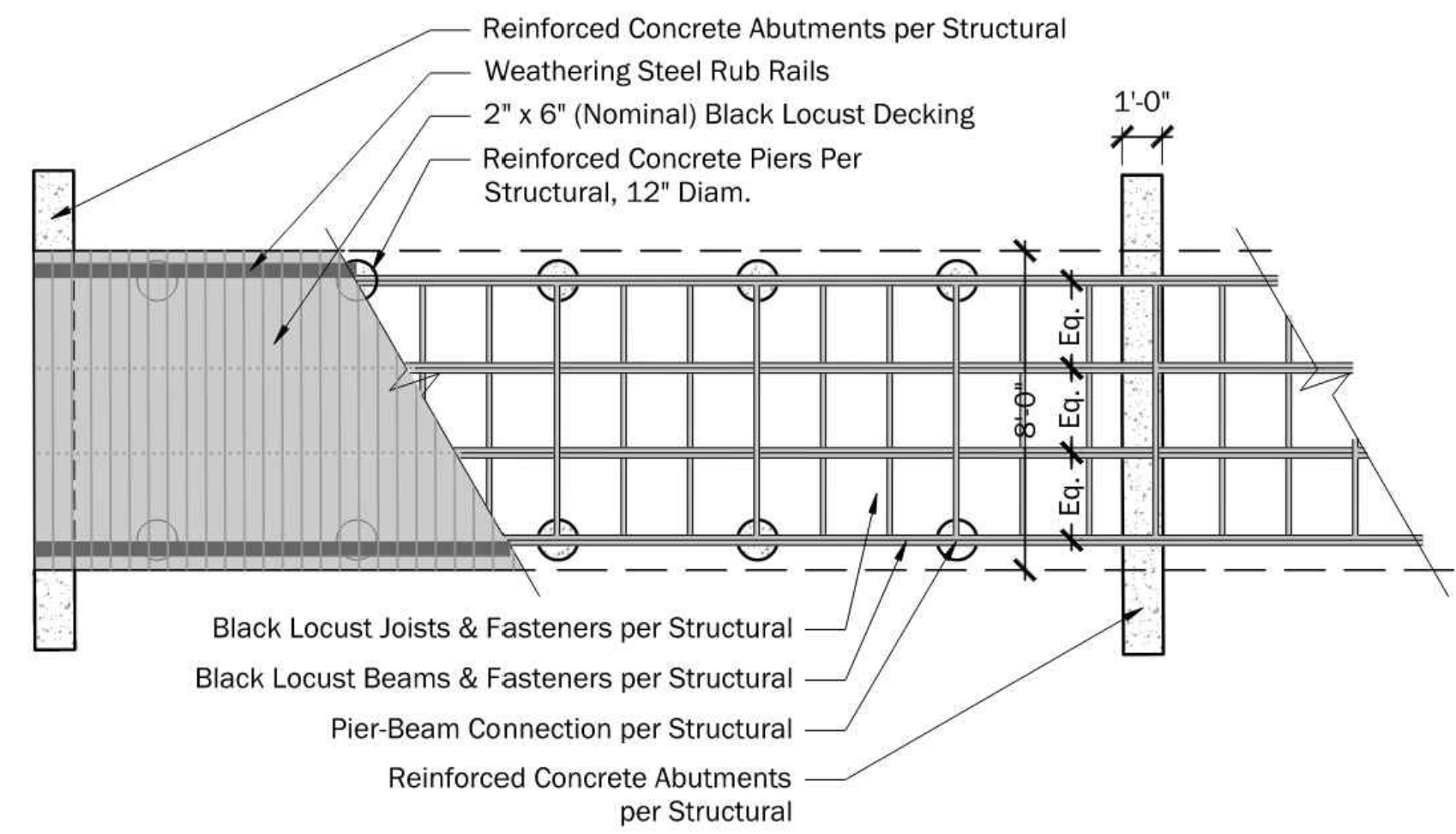


B. Elevation
SCALE: 1/4" = 1'-0"

Boardwalk to be Delegated Design Submittal. Contractor to provide shop drawings, stamped by Engineer licensed in the State of Idaho, for approval prior to fabrication.

Boardwalk to be Delegated Design Submittal. Contractor to provide shop drawings, stamped by Engineer licensed in the State of Idaho, for approval prior to fabrication.

Decking Notes:
1. Decking to Be Black Locust or Approved Equal Locally Harvested/Sourced Dense Hardwood, Re: Specs
2. Pre-Drill & Countersink Holes for Decking Fasteners
3. Seal Cut Ends with Penofin Penetrating Oil or Approved Equal.



C. Decking & Framing Plan
SCALE: 1/4" = 1'-0"

WORKING DRAFT
NOT FOR
CONSTRUCTION

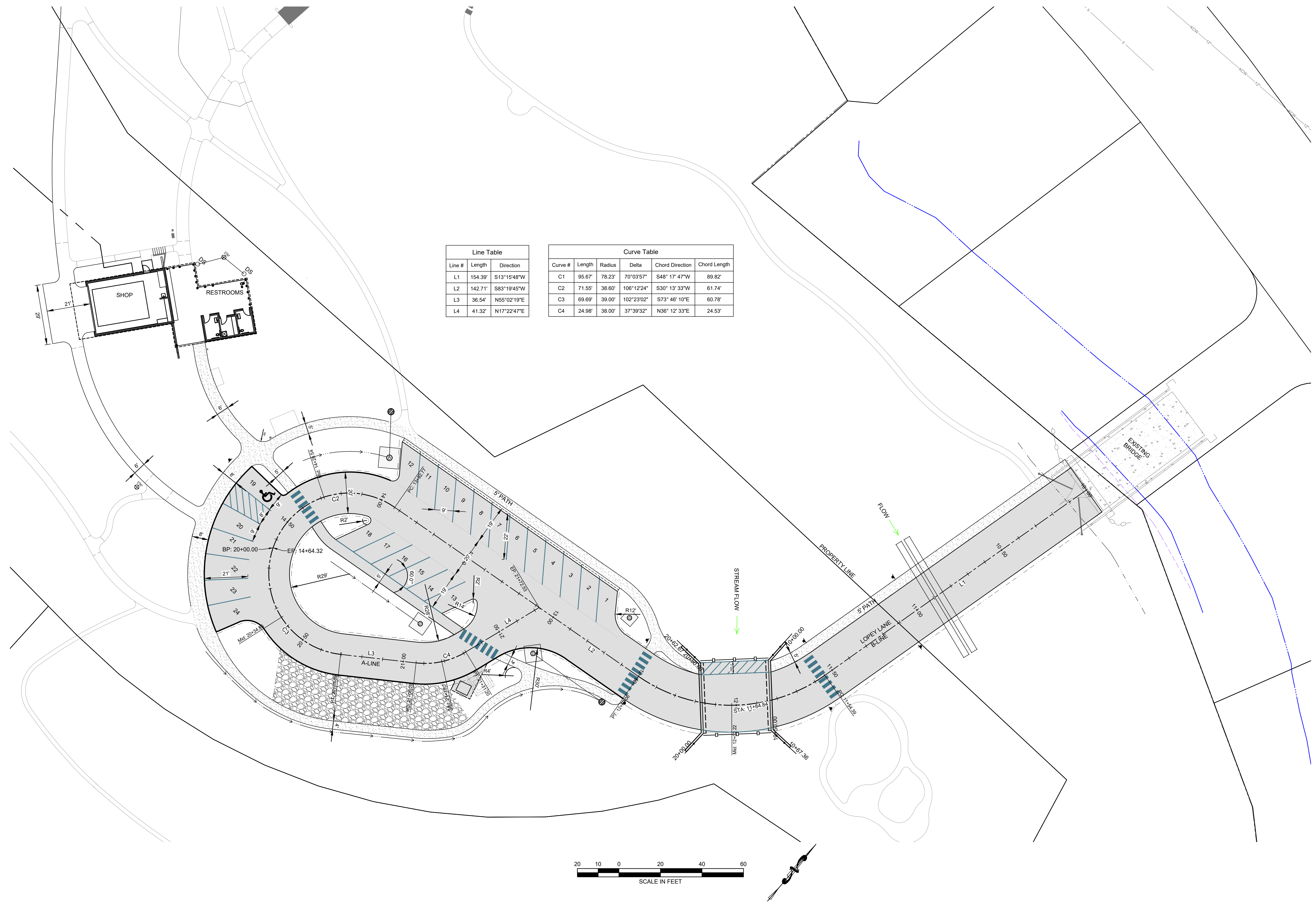
DATE: 12/10/2024
DESIGNED: SP, DL, HC, MP
APPROVED: DL

DRAWING NAME
PEDESTRIAN BOARDWALK DETAIL

DRAWING NO.
L2.03

Line Table		
Line #	Length	Direction
L1	154.39'	S13°15'48"W
L2	142.71'	S83°19'45"W
L3	36.54'	N55°02'19"E
L4	41.32'	N17°22'47"E

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	95.67'	78.23'	70°03'57"	S48°17'47"W	89.82'
C2	71.55'	38.60'	106°12'24"	S30°13'33"W	61.74'
C3	69.69'	39.00'	102°23'02"	S73°48'10"E	60.78'
C4	24.98'	38.00'	37°39'32"	N36°12'33"E	24.53'



**WARM SPRINGS PRESERVE
SITE GEOMETRY PLAN**

LOCATED WITHIN SECTION 1&12, T4 N, R17 E, B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR: CITY OF KETCHUM

PROJECT INFORMATION
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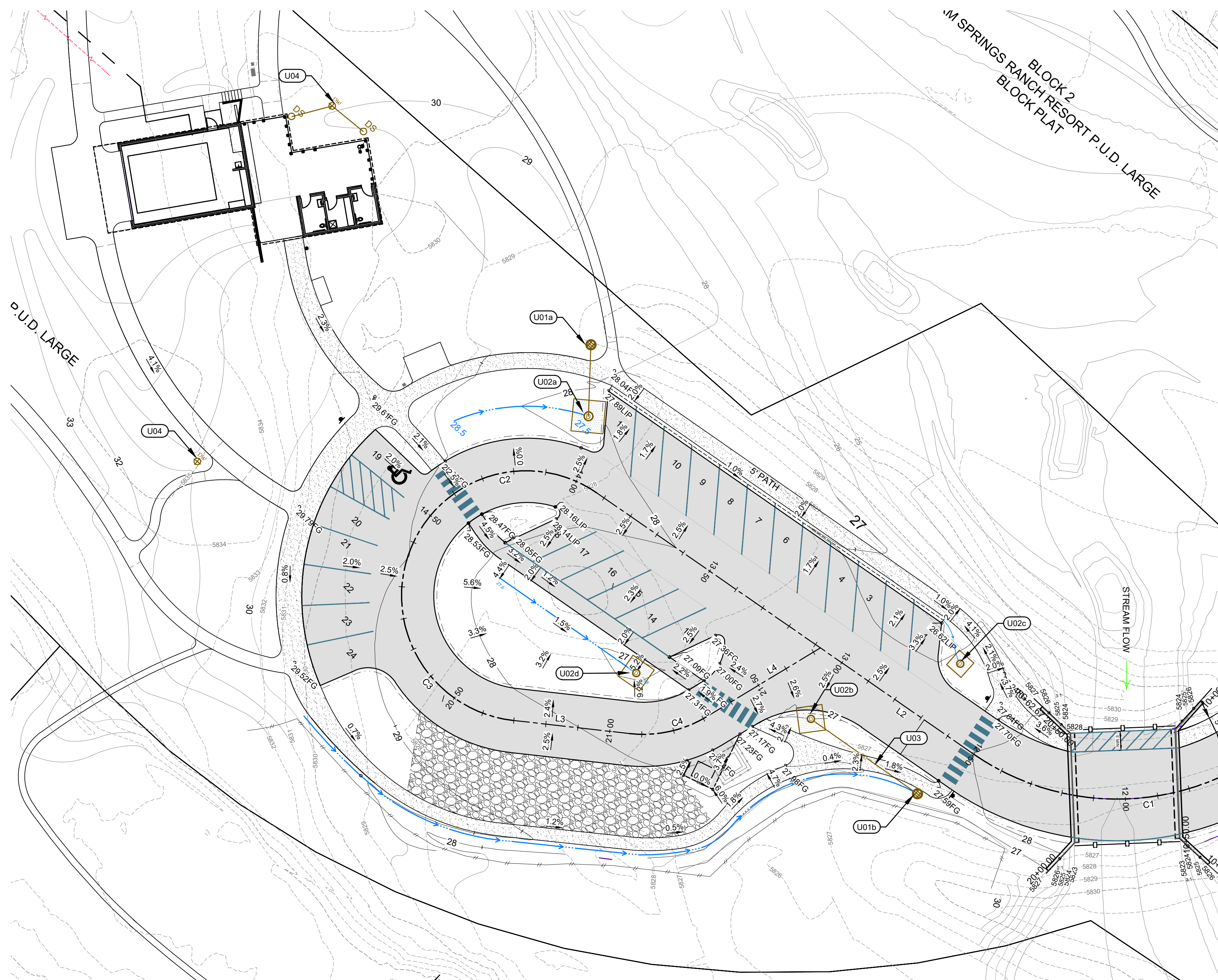
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CONSTRUCTION**

DESIGNED BY: PLJ
DRAWN BY: PLJ
CHECKED BY:
SURVEY DATE:

**GALENA - BENCHMARK
ENGINEERING**
Civil Engineers & Land Surveyors
100 Bell Drive
P.O. Box 133
Ketchum, ID 83340
(208) 726-9512
www.benchmark-associates.com

PURPOSE: ISSUE FOR REVIEW	
NO.	REVISIONS

REUSE OF DRAWINGS: These drawings, or any portion thereof, shall not be used on any project or extensions of this Project except by agreement in writing with Galeana-Benchmark Engineering.

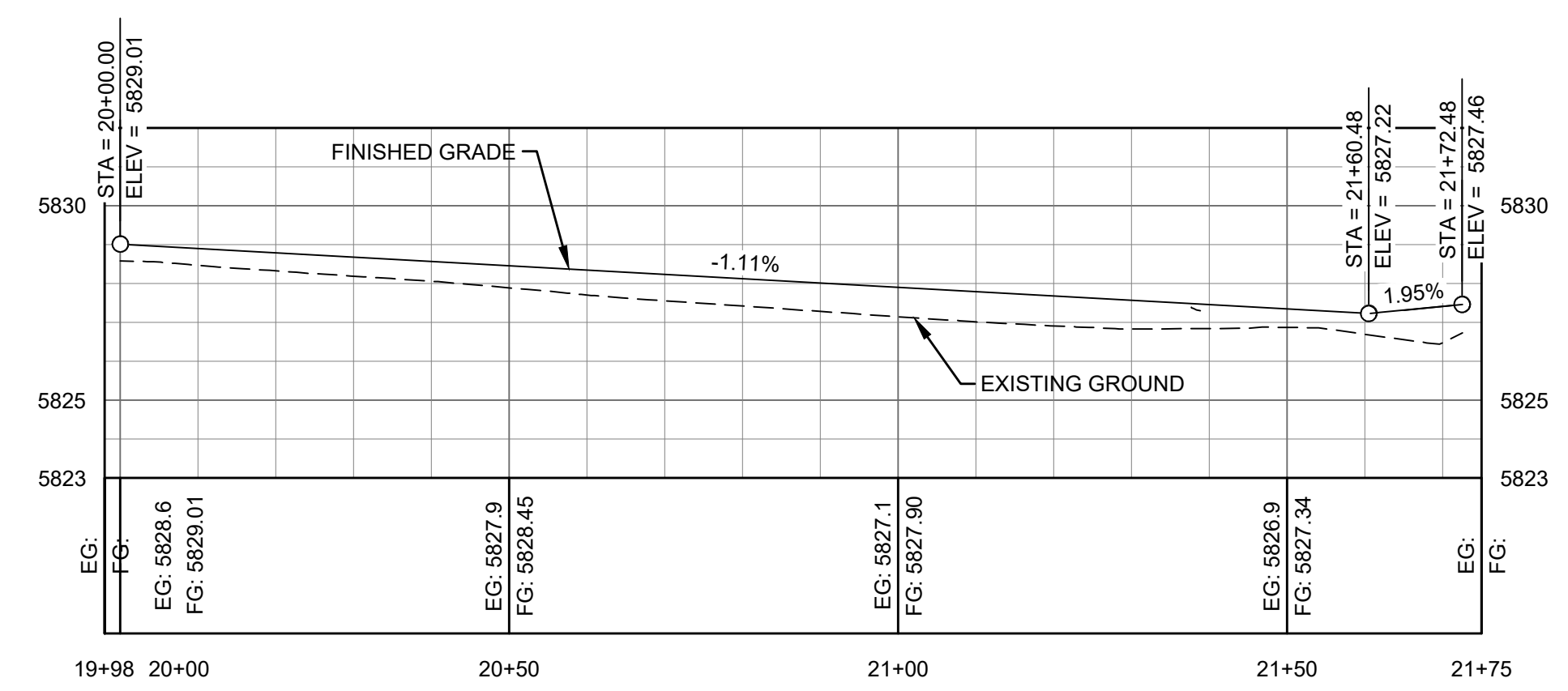
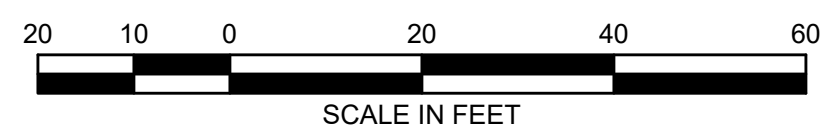


- ### DRAINAGE UTILITY KEY NOTES
- U01 INSTALL 30" CATCH BASINS. SEE DETAIL X1 / X2.
 - a. CB #1 RIM = 5827.75'
12" INV OUT = 5823.75'
 - b. CB #2 RIM = 5827.4'
12" INV OUT = 5823.4'
 - U02 INSTALL DRY WELL LENGTH, WIDTH AND DEPTH VARY. SEE DETAIL 1 / C2.2.
 - a. DW #1 6' L X 8' W X 6' DEPTH
RIM = 5827.5'
12" INV IN = 5823.3'
 - b. DW #2 8' L X 8' W X 8' DEPTH
RIM = 5826.75'
12" INV IN = 5822.8'
 - c. DW #3 6' L X 6' W X 6' DEPTH
RIM = 5826.2'
 - d. DW #4 8' L X 8' W X 8' DEPTH
RIM = 5826.8'
 - U03 INSTALL 12" STORM DRAIN LINE SLOPE AT 2%. SEE DETAIL X1 / X2.
 - U04 INSTALL LANDSCAPE DRYWELL FOR BUILDING DOWNSPOUTS. SEE DETAIL X1 / X2.

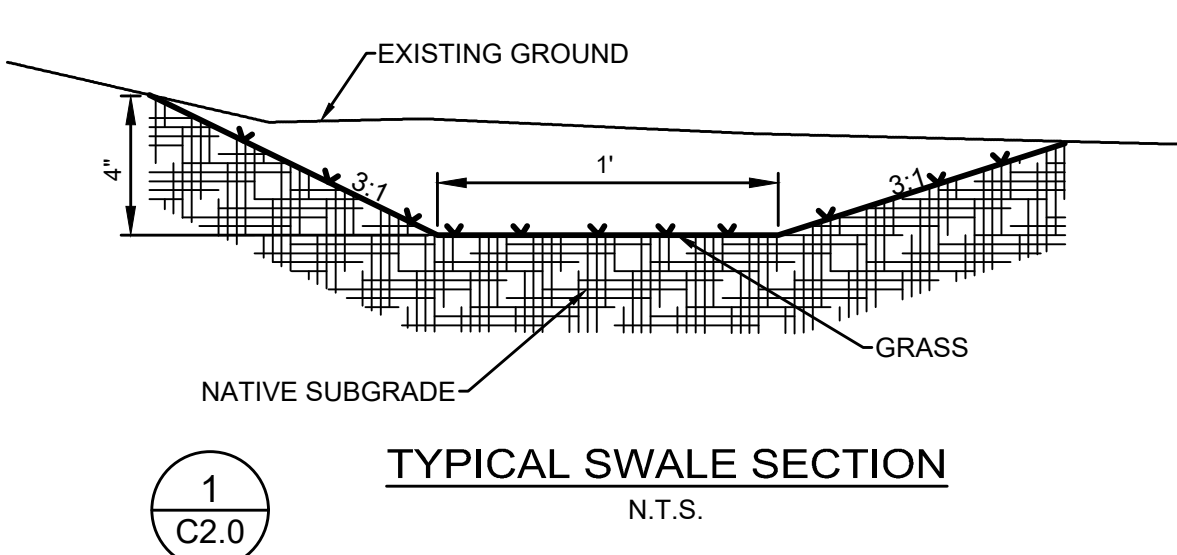
CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MOST CURRENT EDITION OF THE "IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION" (ISPCW) AND CITY OF KETCHUM STANDARDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND KEEPING A COPY OF THE ISPCW AND CITY OF KETCHUM STANDARDS ON SITE DURING CONSTRUCTION.
2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS IN AN APPROXIMATE WAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UTILITIES PRIOR TO COMMENCING AND DURING THE CONSTRUCTION. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH RESULT FROM HIS FAILURE TO ACCURATELY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CONTRACTOR SHALL CALL DIGLINE (1-800-342-1585) TO LOCATE ALL EXISTING UNDERGROUND UTILITIES A MINIMUM OF 48 HOURS IN ADVANCE OF EXCAVATION.
3. CONTRACTOR SHALL COORDINATE LOCATIONS OF DRY UTILITY FACILITIES (POWER, CABLE, PHONE, TV) WITH THE APPROPRIATE UTILITY FRANCHISE.
4. THE CONTRACTOR SHALL CLEAN UP THE SITE AFTER CONSTRUCTION SO THAT IT IS IN A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION (THIS MAY INCLUDE ENCROACHMENT PERMITS AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (CGP) PERMIT COVERAGE).
6. ALL CLEARING & GRUBBING SHALL CONFORM TO ISPCW SECTION 201.
7. ALL EXCAVATION & EMBANKMENT SHALL CONFORM TO ISPCW SECTION 202. SUBGRADE SHALL BE EXCAVATED AND SHAPED TO LINE, GRADE, AND CROSS-SECTION SHOWN ON THE PLANS. THE SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D-698. THE CONTRACTOR SHALL WATER OR AERATE SUBGRADE AS NECESSARY TO OBTAIN OPTIMUM MOISTURE CONTENT. IN-LIEU OF DENSITY MEASUREMENTS, THE SUBGRADE MAY BE PROOF-ROLLED TO THE APPROVAL OF THE ENGINEER.
 - PROOF-ROLLING: AFTER EXCAVATION TO THE SUBGRADE ELEVATION AND PRIOR TO PLACING COURSE GRAVEL, THE CONTRACTOR SHALL PROOF ROLL THE SUBGRADE WITH A 5-TON SMOOTH DRUM ROLLER, LOADED WATER TRUCK, OR LOADED DUMP TRUCK, AS ACCEPTED BY THE ENGINEER. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF UNSUITABLE SUBGRADE MATERIAL AREAS, AND/OR AREAS NOT CAPABLE OF COMPACTION ACCORDING TO THESE SPECIFICATIONS. UNSUITABLE OR DAMAGED SUBGRADE IS WHEN THE SOIL MOVES, PUMPS AND/OR DISPLACES UNDER ANY TYPE OF PRESSURE INCLUDING FOOT TRAFFIC LOADS.
 - IF, IN THE OPINION OF THE ENGINEER, THE CONTRACTOR'S OPERATIONS RESULT IN DAMAGE TO, OR PROTECTION OF, THE SUBGRADE, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, REPAIR THE DAMAGED SUBGRADE BY OVER-EXCAVATION OF UNSUITABLE MATERIAL TO FIRM SUBSOIL, LINE EXCAVATION WITH GEOTEXTILE FABRIC, AND BACKFILL WITH PIT RUN GRAVEL.
8. ALL 2" MINUS GRAVEL SHALL CONFORM TO ISPCW 802, TYPE II (ITD STANDARD 703.04, 2"), SHALL BE PLACED IN CONFORMANCE WITH ISPCW SECTION 801 AND COMPACTED PER SECTION 202. MINIMUM COMPACTION OF PLACED MATERIAL SHALL BE 90% OF MAXIMUM LABORATORY DENSITY AS DETERMINED BY AASHTO T-99.
9. ALL 3/4" MINUS CRUSHED GRAVEL SHALL CONFORM TO ISPCW 802, TYPE I (ITD STANDARD 703.04, 3/4" B), SHALL BE PLACED IN CONFORMANCE WITH ISPCW SECTION 802 AND COMPACTED PER SECTION 202. MINIMUM COMPACTION OF PLACED MATERIAL SHALL BE 95% OF MAXIMUM LABORATORY DENSITY AS DETERMINED BY AASHTO T-99 OR ITD T-91.
10. ALL ASPHALTIC CONCRETE PAVEMENT WORK SHALL CONFORM TO ISPCW SECTION(S) 805, 810, AND 811 FOR CLASS II PAVEMENT. ASPHALT AGGREGATE SHALL BE 1/2" (13MM) NOMINAL SIZE CONFORMING TO TABLE 803B IN ISPCW SECTION 803. ASPHALT BINDER SHALL BE PG 58-28 CONFORMING TO TABLE A-1 IN ISPCW SECTION 805.
11. ASPHALT SAWCUTS SHALL BE AS INDICATED ON THE DRAWINGS, OR 24" INCHES FROM EDGE OF EXISTING ASPHALT, IF NOT INDICATED OTHERWISE SO AS TO PROVIDE A CLEAN PAVEMENT EDGE FOR MATCHING. NO WHEEL CUTTING SHALL BE ALLOWED.
12. ALL CONCRETE WORK SHALL CONFORM TO ISPCW SECTIONS 701, 703, AND 705. ALL CONCRETE SHALL BE 3,000 PSI MINIMUM, 28 DAY, AS DEFINED IN ISPCW SECTION 703, TABLE 1. IMMEDIATELY AFTER PLACEMENT PROTECT CONCRETE BY APPLYING MEMBRANE-FORMING CURING COMPOUND, TYPE 2, CLASS A PER ASTM C 309-94. APPLY CURING COMPOUND PER MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS.
13. ALL TRENCHING SHALL CONFORM TO ISPCW STANDARD DRAWING SD-301. TRENCHES SHALL BE BACKFILLED AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99.
14. PER IDAHO CODE § 55-1613, THE CONTRACTOR SHALL RETAIN AND PROTECT ALL MONUMENTS, ACCESSORIES TO CORNERS, BENCHMARKS AND POINTS SET IN CONTROL SURVEYS; ALL MONUMENTS, ACCESSORIES TO CORNERS, BENCHMARKS AND POINTS SET IN CONTROL SURVEYS THAT ARE LOST OR DISTURBED BY CONSTRUCTION SHALL BE REESTABLISHED AND RE-MONUMENTED, AT THE EXPENSE OF THE AGENCY OR PERSON CAUSING THEIR LOSS OR DISTURBANCE AT THEIR ORIGINAL LOCATION OR BY SETTING OF A WITNESS CORNER OR REFERENCE POINT OR A REPLACEMENT BENCHMARK OR CONTROL POINT, BY OR UNDER THE DIRECTION OF A PROFESSIONAL LAND SURVEYOR.

PARKING LOT & BUILDING GRADING PLAN



PARKING LOOP PROFILE B-LINE
SCALE: 1"=20' H; 1"=4' V



**WARM SPRINGS PRESERVE
PARKING LOT GRADING**

LOCATED WITHIN SECTION 1&12, T4 N, R17 E, B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
 PREPARED FOR: CITY OF KETCHUM

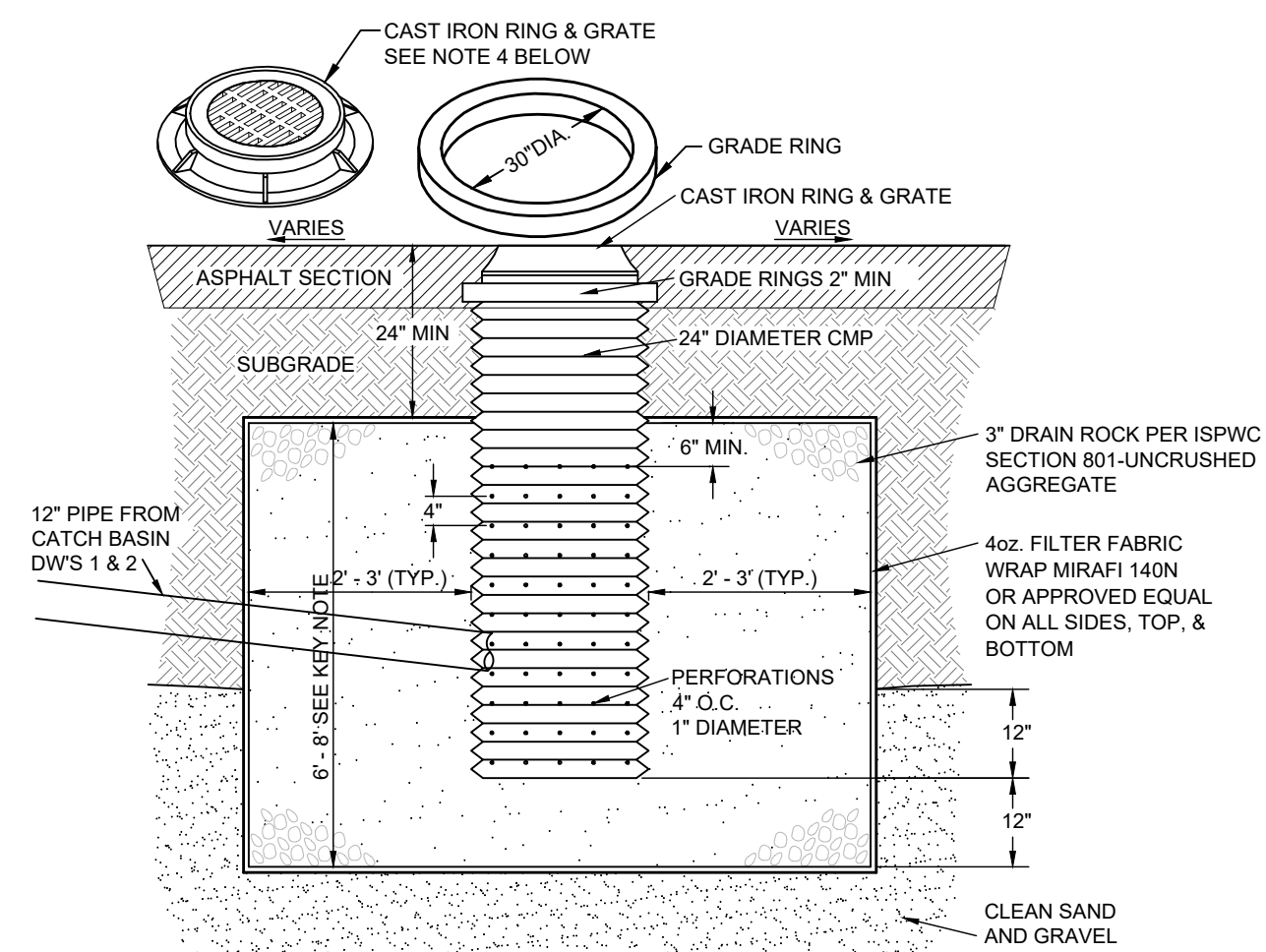
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DESIGNED BY: PLJ
 DRAWN BY: PLJ
 CHECKED BY:
 SURVEY DATE:
**GALENA-BENCHMARK
ENGINEERING**
 Civil Engineers & Land Surveyors
 100 Bell Drive
 Ketchum, Idaho 83340
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 www.benchmark-associates.com

NO.	DATE	BY	REVISIONS

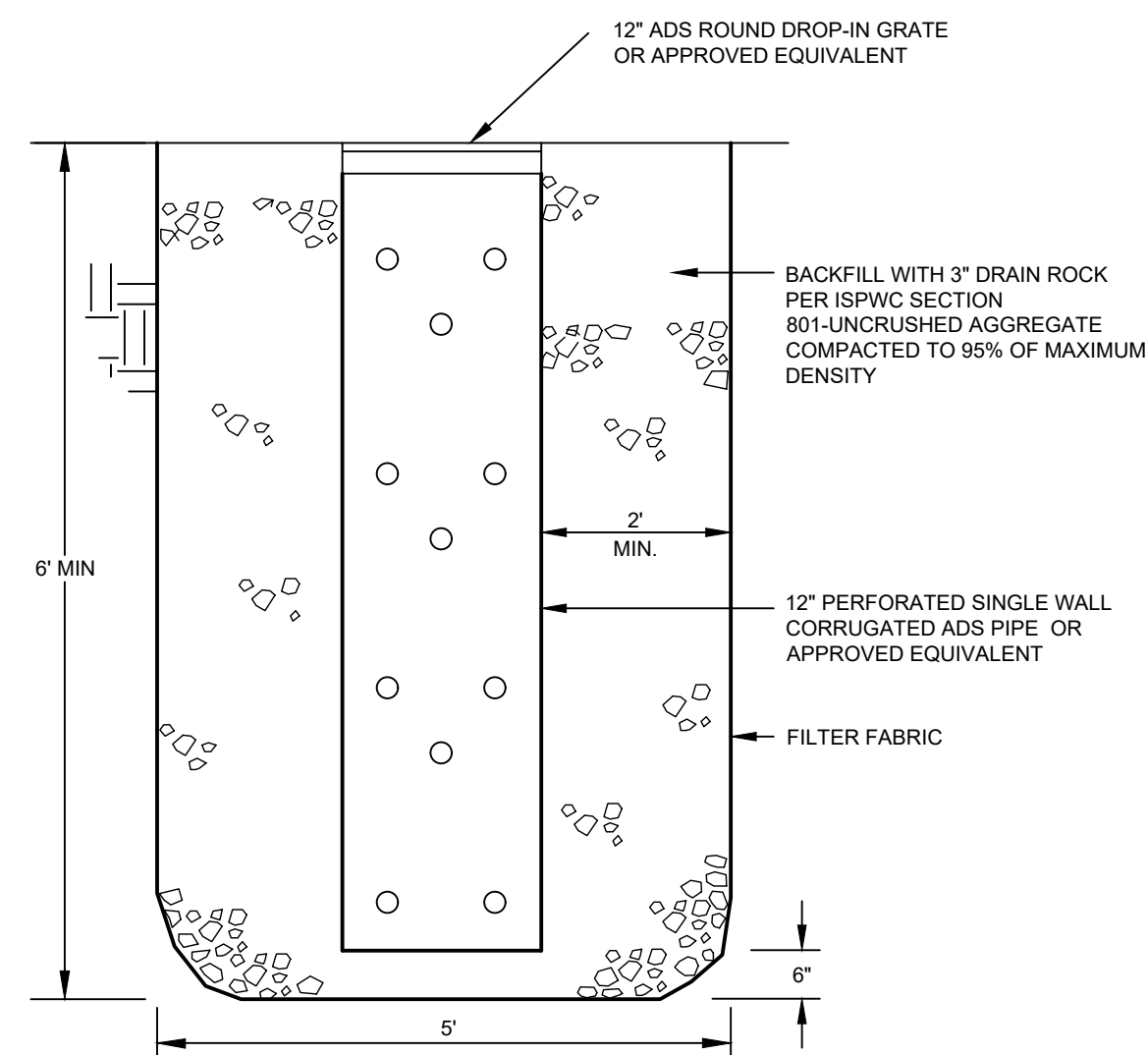
PURPOSE: ISSUE FOR REVIEW

C2.1

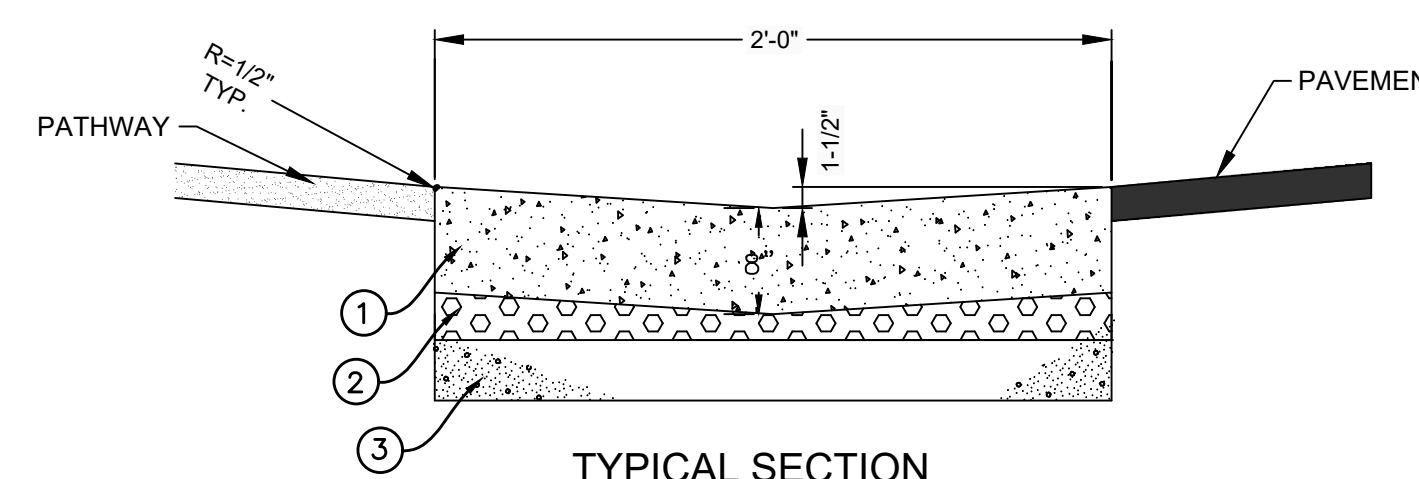


- NOTE:**
1. THE BED SHALL BE EXCAVATED A MINIMUM OF 24" INTO CLEAN SAND AND GRAVEL.
 2. MAXIMUM DEPTH SHALL NOT EXCEED 12 FEET.
 3. IF CLEAN SAND AND GRAVEL IS NOT ENCOUNTERED WITHIN 12 FEET, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER.
 4. GRATE OR SOLID LID AS APPROVED BY CITY OF KETCHUM.

1
C2.0 **DRYWELL DETAIL**
N.T.S.



2
C2.0 **LANDSCAPE DRYWELL**
N.T.S.



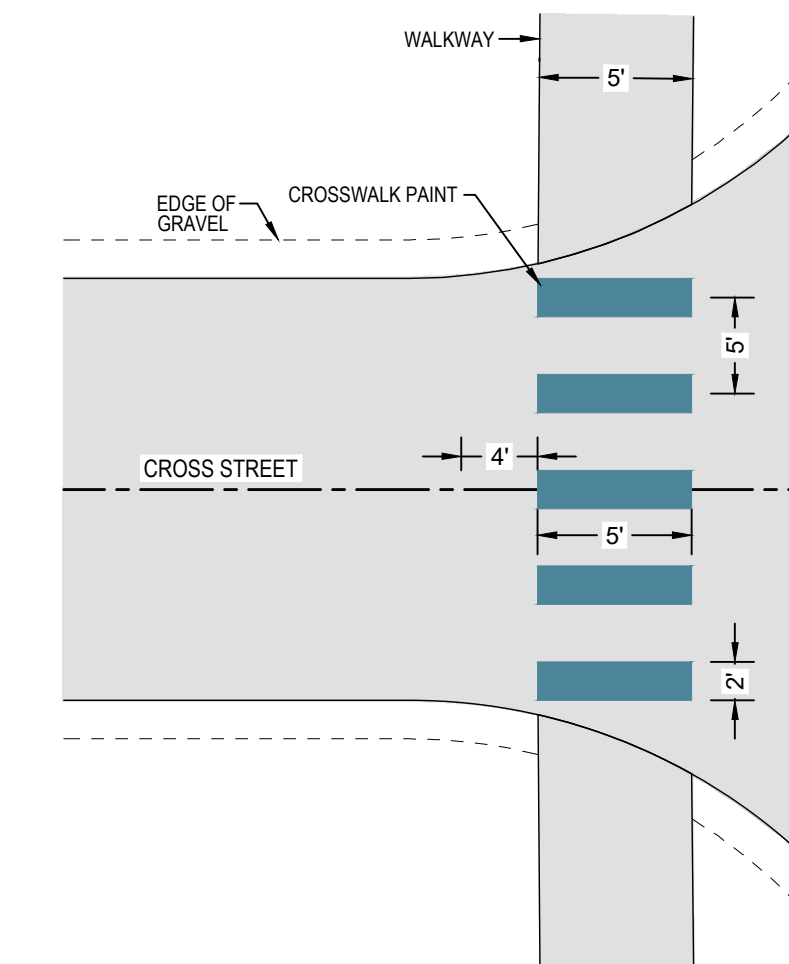
LEGEND

- ① 8-INCH THICK CONCRETE
- ② 2" MIN. OF 3/4" TYPE I AGGREGATE BASE
- ③ 6" OF 2" TYPE II SUBBASE

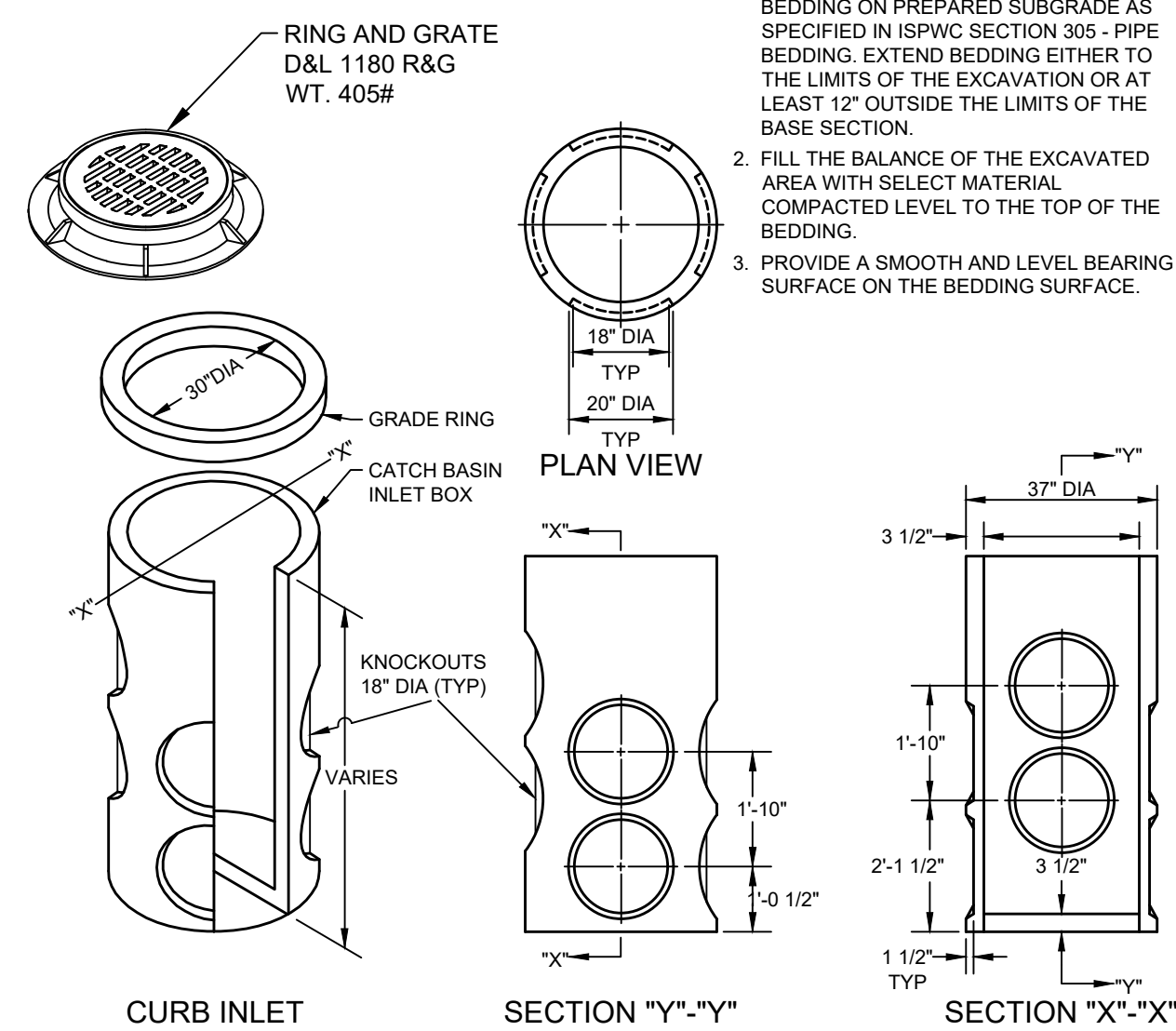
NOTES:

1. 1/2-INCH PREFORMED EXPANSION JOINT MATERIAL (AASHTO M 213) AT TERMINAL POINTS OF RADI.
2. CONTINUOUS PLACEMENT PREFERRED. SCORE INTERVALS TO MATCH SIDEWALK WITH 10-FOOT MAXIMUM SPACING.
3. MATERIALS SHALL CONFORM WITH CURRENT ISWPC STANDARDS, DIVISION 800 AGGREGATES AND ASPHALT.
4. CONCRETE SHALL BE TITAN MIX OR APPROVED EQUAL.

3
C2.0 **2" VALLEY GUTTER (TYP.)**
N.T.S.



4
C2.0 **CROSSWALK PAINTING DETAIL**
C2.0 N.T.S.

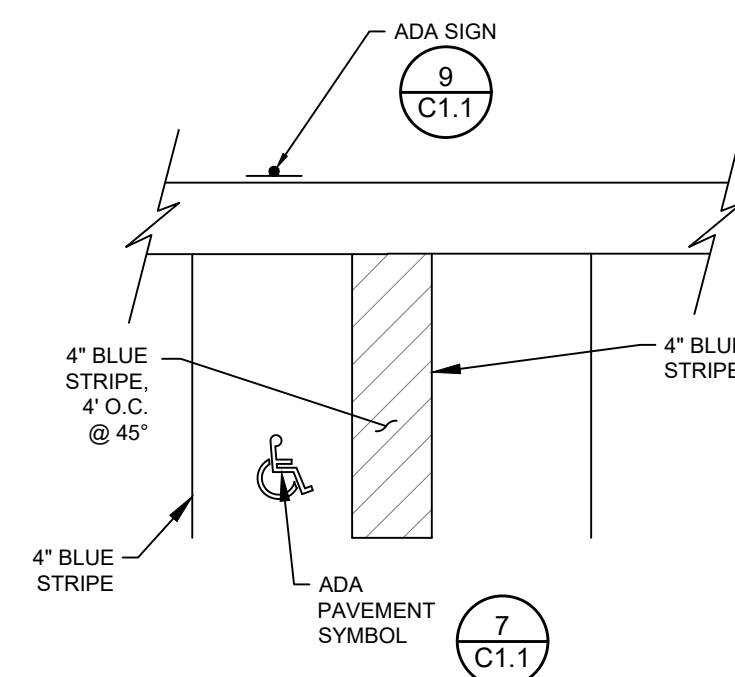


NOTES:

1. PLACE A MINIMUM OF 4" OF COMPACTED BEDDING ON PREPARED SUBGRADE AS SPECIFIED IN ISWPC SECTION 305 - PIPE BEDDING. EXTEND BEDDING EITHER TO THE LIMITS OF THE EXCAVATION OR AT LEAST 12" OUTSIDE THE LIMITS OF THE BASE SECTION.
2. FILL THE BALANCE OF THE EXCAVATED AREA WITH SELECT MATERIAL COMPACTED LEVEL TO THE TOP OF THE BEDDING.
3. PROVIDE A SMOOTH AND LEVEL BEARING SURFACE ON THE BEDDING SURFACE.

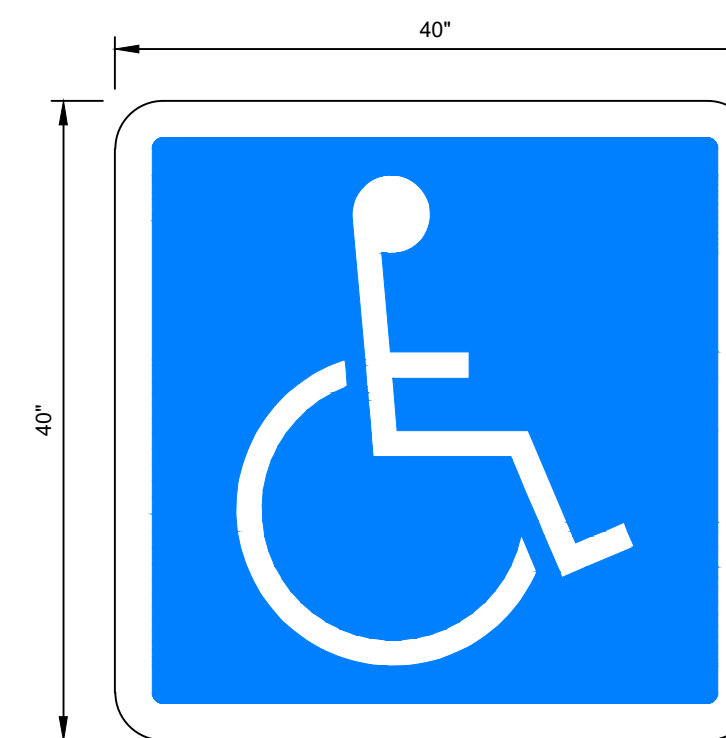
1. ISWPC INLET CATCH BASIN TYPE IV (SD-604A) IS THE PREFERRED CATCH BASIN TYPE.

5
C2.0 **30" CATCH BASIN (TYP.)**
N.T.S.



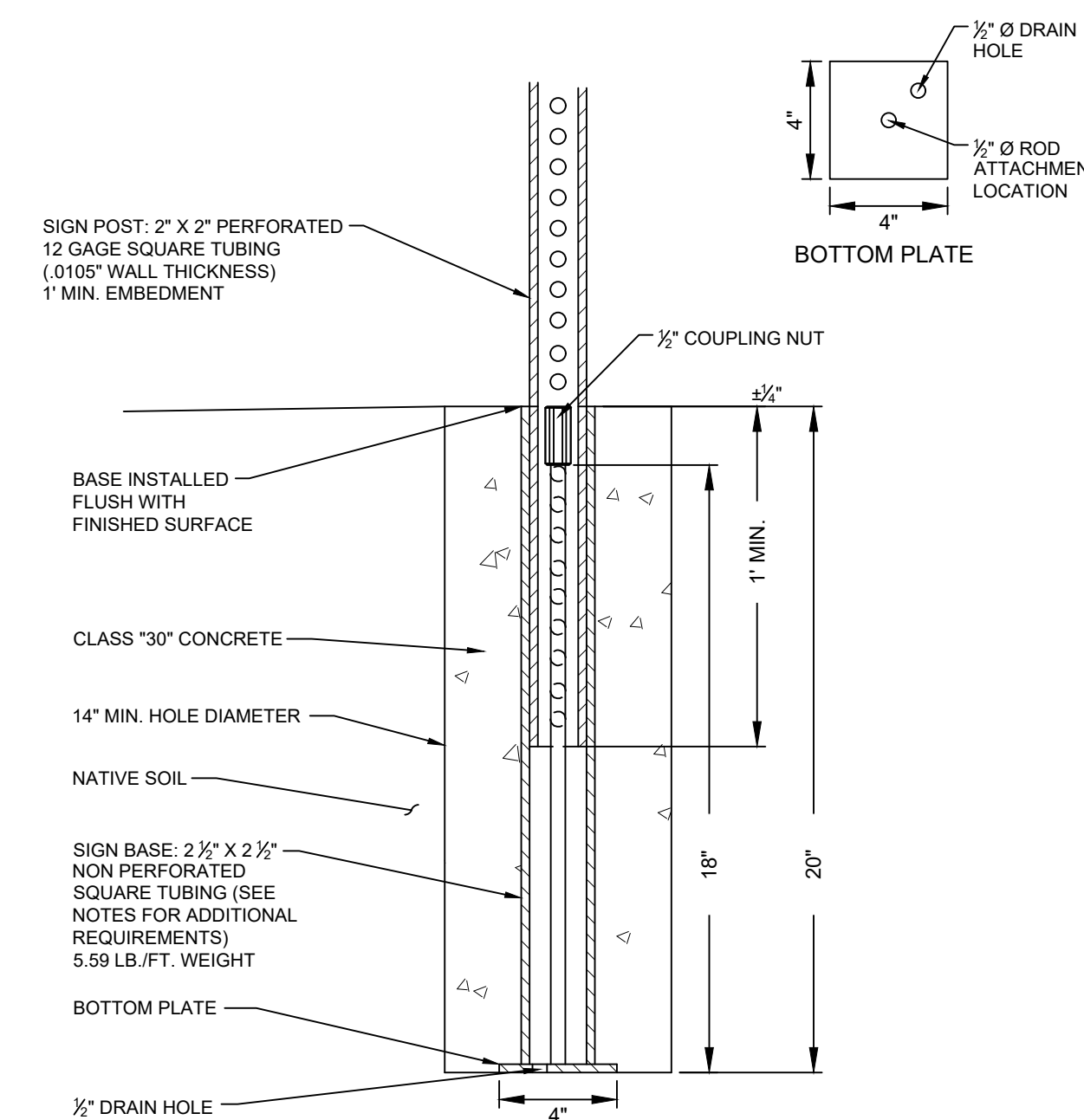
- NOTE:**
1. MAXIMUM GRADE IN ANY DIRECTION IS 2.0%.
 2. ALL ROAD STRIPING SHALL BE 125ml THERMOPLASTIC.

6
C2.0 **ADA PARKING DETAIL**
N.T.S.



NOTE: ADA SYMBOL SHALL BE WHITE ON BLUE WITH BORDER, PREMARK HANDICAP WITH VIZIGRIP, 90MIL THERMOPLASTIC OR APPROVED EQUAL.

7
C2.0 **ADA SYMBOL**
N.T.S.

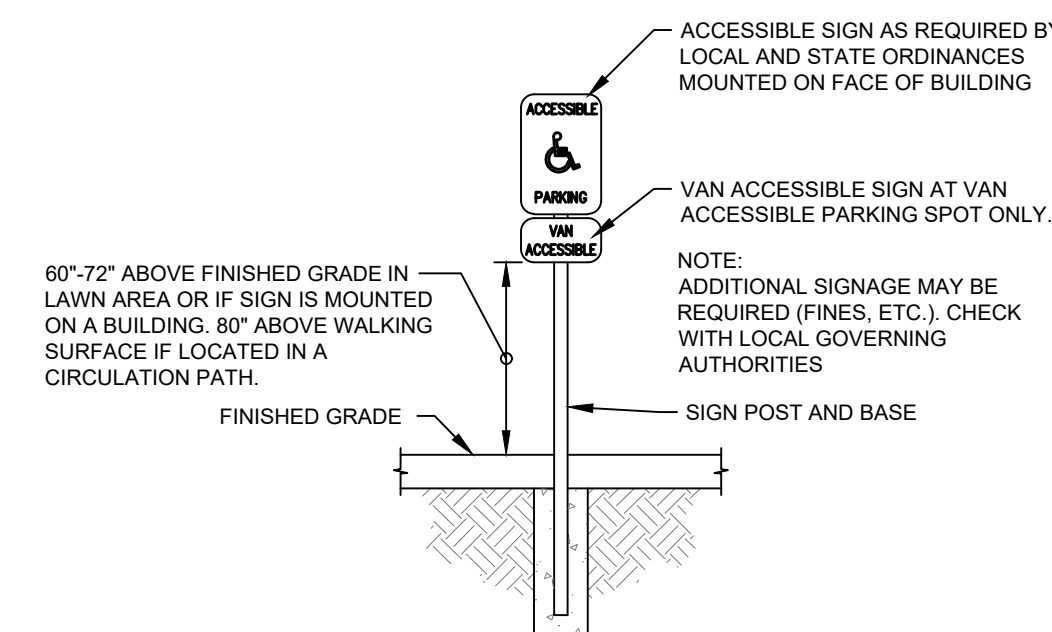


NOTES:

1. BASES SHALL BE INSTALLED TO BE FLUSH WITH SURFACE.
2. ALL INSTALLATIONS SHALL HAVE 14" Ø MINIMUM FOUNDATION OR GROUTED INTO SOLID ROCK.
3. ALL STREET SIGNS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE MUTCD.
4. SIGN PLACEMENT SHALL BE APPROVED BY THE CITY OF KETCHUM.
5. CITY TO PROVIDE BASES.

SIGN BASE MATERIAL & DIMENSION REQUIREMENTS	
2 1/2" OUTSIDE TUBE STEEL (20" LENGTH)	2 1/2" INSIDE TUBE STEEL
INTERNAL ROD MATERIAL & DIMENSION REQUIREMENTS	
3/8" THICK	1/2" COLD ROLLED ROD (18" LENGTH)
BOTTOM PLATE MATERIAL & DIMENSION REQUIREMENTS	
4" X 4" X 1/2" STEEL STRAP	

8
C2.0 **TYPICAL SIGN BASE**
N.T.S.



9
C2.0 **ADA SIGN**
N.T.S.

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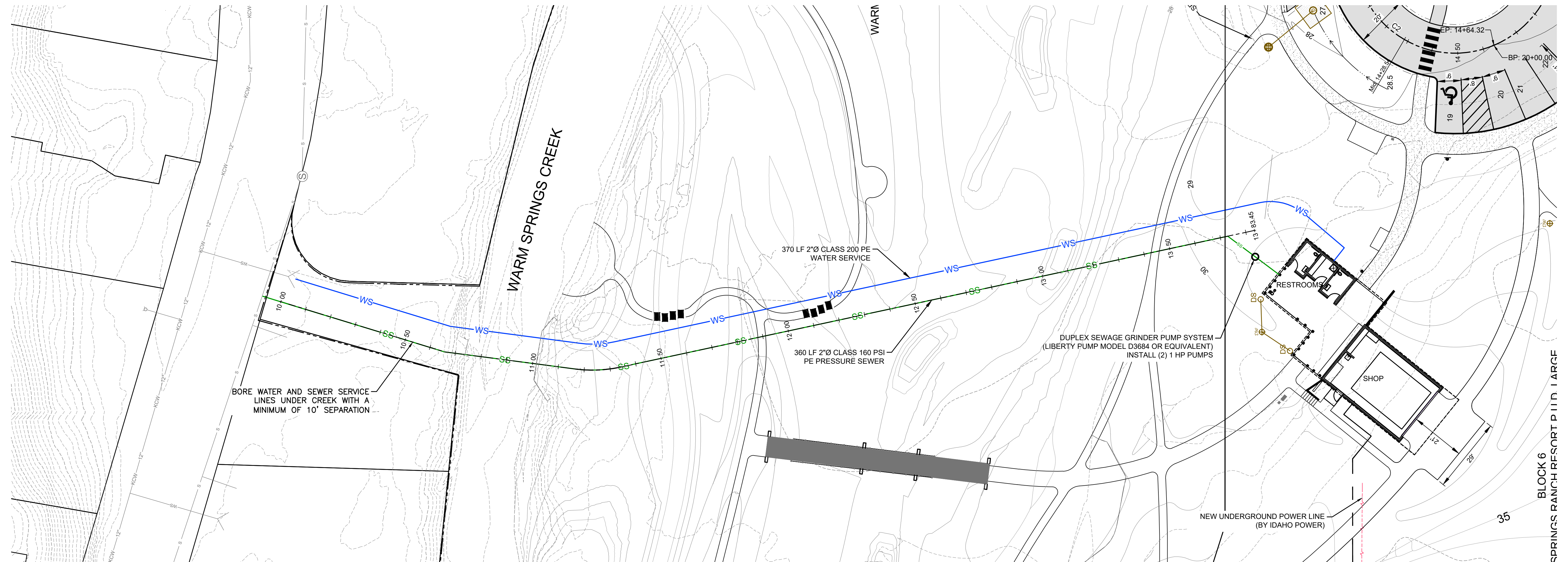
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DRAWN BY: PLJ
CHECKED BY:
SURVEY DATE:

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Civil Engineers & Land Surveyors
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(208) 726-9512
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GALENA-BENCHMARK
SURVEYING ENGINEERING PLANNING
ELEVATION ABOVE SEA LEVEL
920 FEET

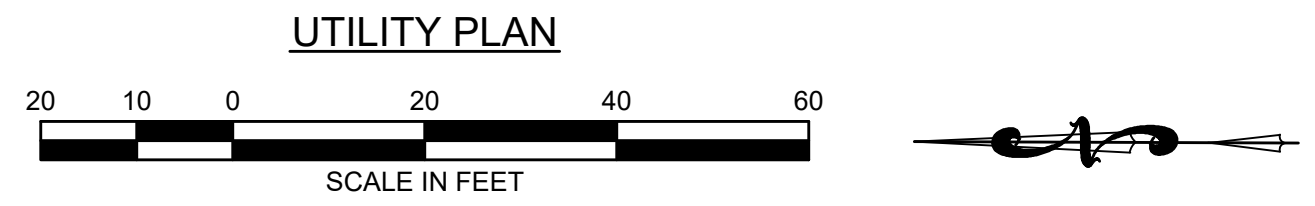
PURPOSE:	ISSUE FOR REVIEW	REVISIONS
NO.	DATE	BY

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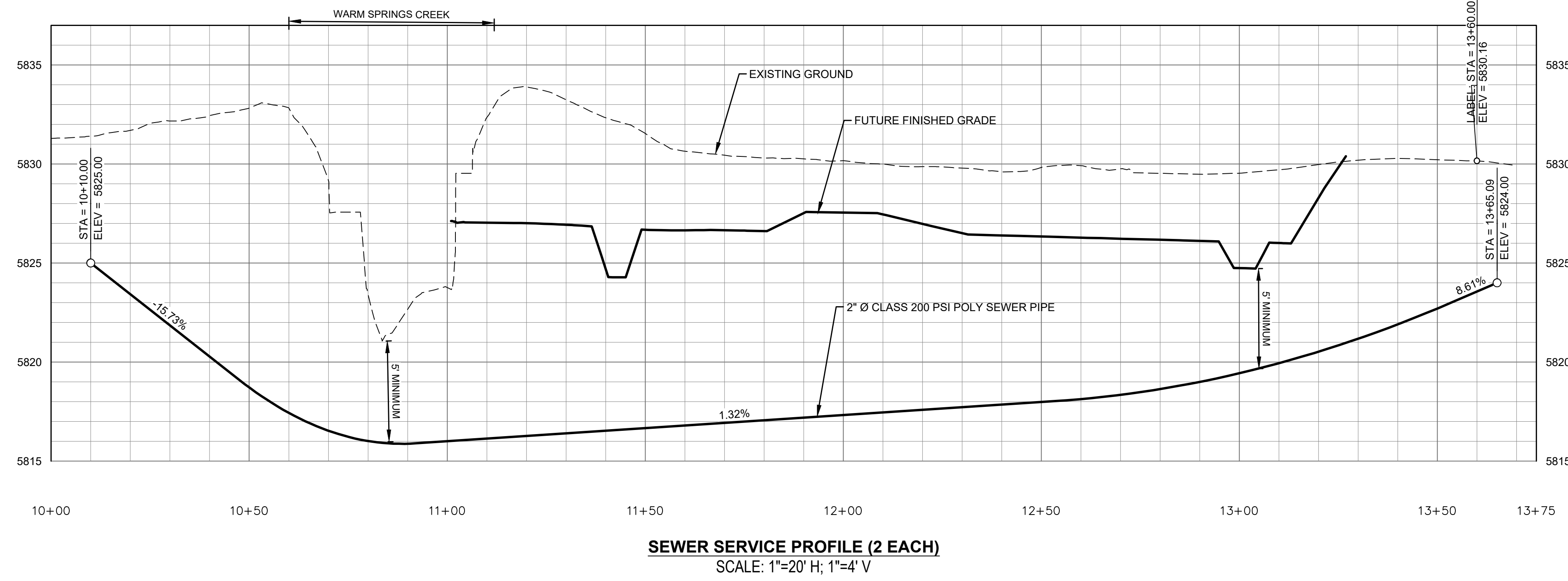


LEGEND

—S—	SANITARY SEWER MAIN LINE (NOT SURVEYED)
—SS—	SANITARY SEWER SERVICE (NOT SURVEYED)
—W—	WATER MAIN LINE (NOT SURVEYED)
—WS—	WATER SERVICE LINE (NOT SURVEYED)
—WS— (Blue)	WATER SERVICE PROPOSED
—SS— (Green)	SEWER SERVICE PROPOSED
—P— (Red dashed)	UNDERGROUND POWER LINE PROPOSED
⊙	SEWER MANHOLE (NOT SURVEYED)



- UTILITY GENERAL NOTES**
- UTILITIES SHALL BE CONSTRUCTED PER THE CITY OF KETCHUM'S STANDARDS; THE MOST CURRENT VERSION OF THE IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION (ISPMC); AND DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) STANDARDS.
 - WATER LINES SHALL HAVE A MINIMUM OF 10 FEET OF HORIZONTAL SEPARATION AND 18" VERTICAL SEPARATION FROM SEWER LINES AND STORM DRAIN PIPES, MEASURED FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE.
 - ELECTRICAL SERVICE LINE MAY BE IN THE SAME TRENCH AS THE WATER SERVICE LINE. ONCE THE WATER LINE IS INSTALLED, THE TRENCH SHALL BE BACK FILLED TO 42" IN DEPTH AND THE POWER INSTALLED WITH A MINIMUM OF 1-FOOT HORIZONTAL SEPARATION FROM THE WATER LINE.
 - UTILITY TRENCHES SHALL BE CONSTRUCTED PER DETAILS 1 & 2. TRENCHES SHALL BE BACKFILLED WITH IMPORTED STRUCTURAL BACKFILL.
 - CONTRACTOR SHALL CONTACT CITY OF KETCHUM WATER AND SEWER PRIOR TO ANY WATER AND SEWER SERVICE CONSTRUCTION.



**WARM SPRINGS PRESERVE
UTILITY PLAN**

LOCATED WITHIN SECTION 1&12, T4 N, R17 E, B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR: CITY OF KETCHUM

**PRELIMINARY
NOT FOR
CONSTRUCTION**

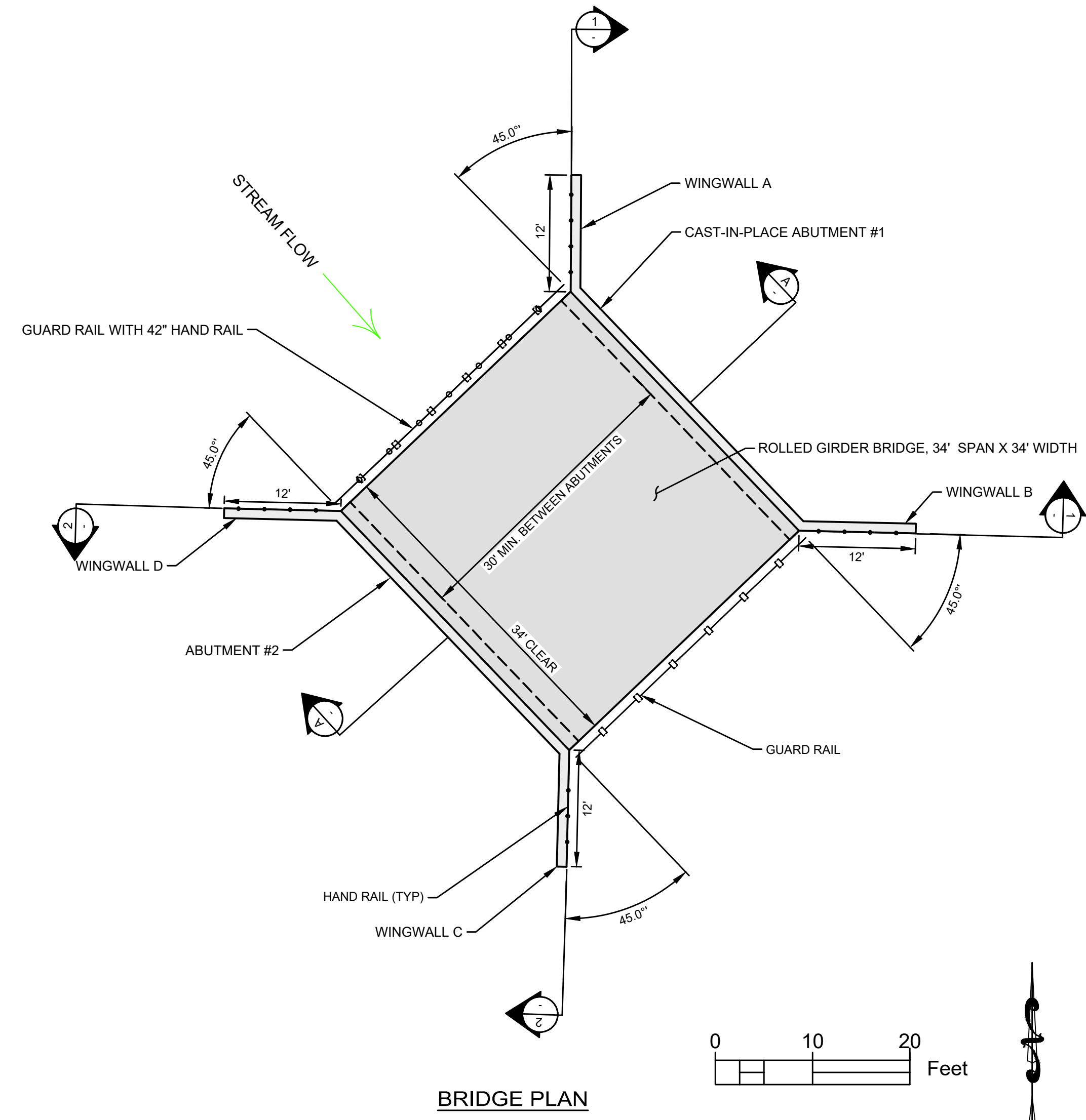
DESIGNED BY: PLJ
DRAWN BY: PLJ
CHECKED BY:
SURVEY DATE:

**GALENA-BENCHMARK
ENGINEERING**
Civil Engineers & Land Surveyors
100 Bell Drive
P.O. Box 733
Ketchum, ID 83340
(208) 726-9512
www.benchmark-associates.com

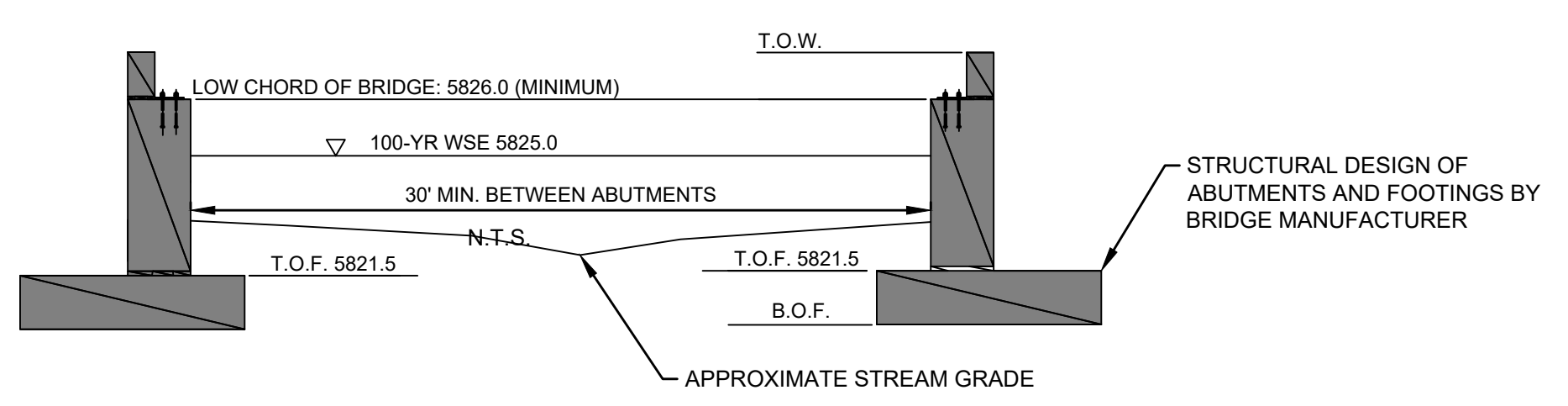
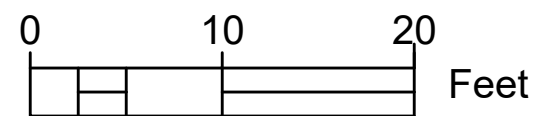
GALENA-BENCHMARK
SURVEYING ENGINEERING PLANS
ELEVATION ABOVE SEA LEVEL IN FEET

NO.	DATE	BY	REVISIONS

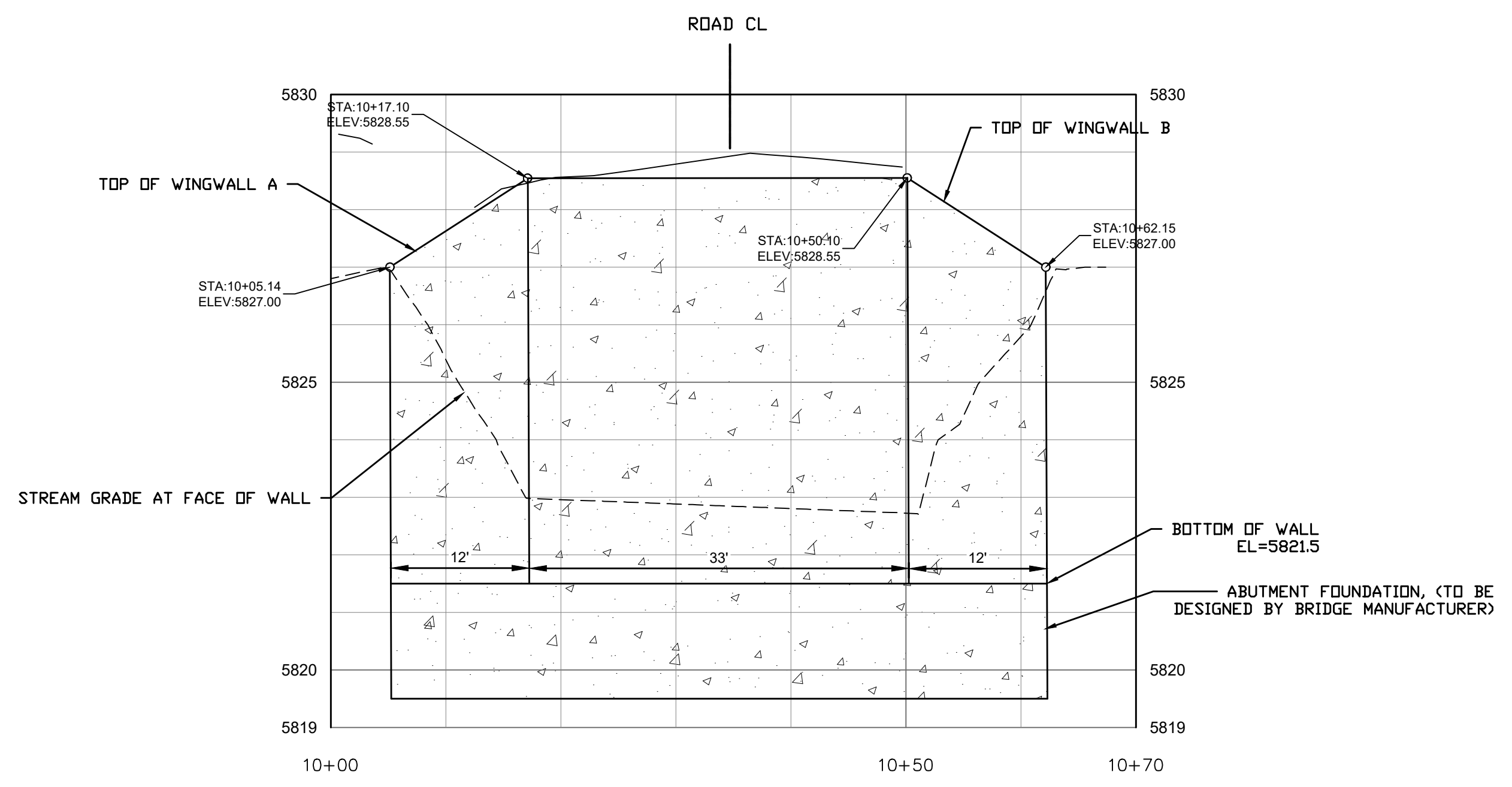
REUSE OF DRAWINGS: These drawings, or any portion thereof, shall not be used on any project or extension of this Project except by agreement in writing with Galena-Benchmark Engineering.



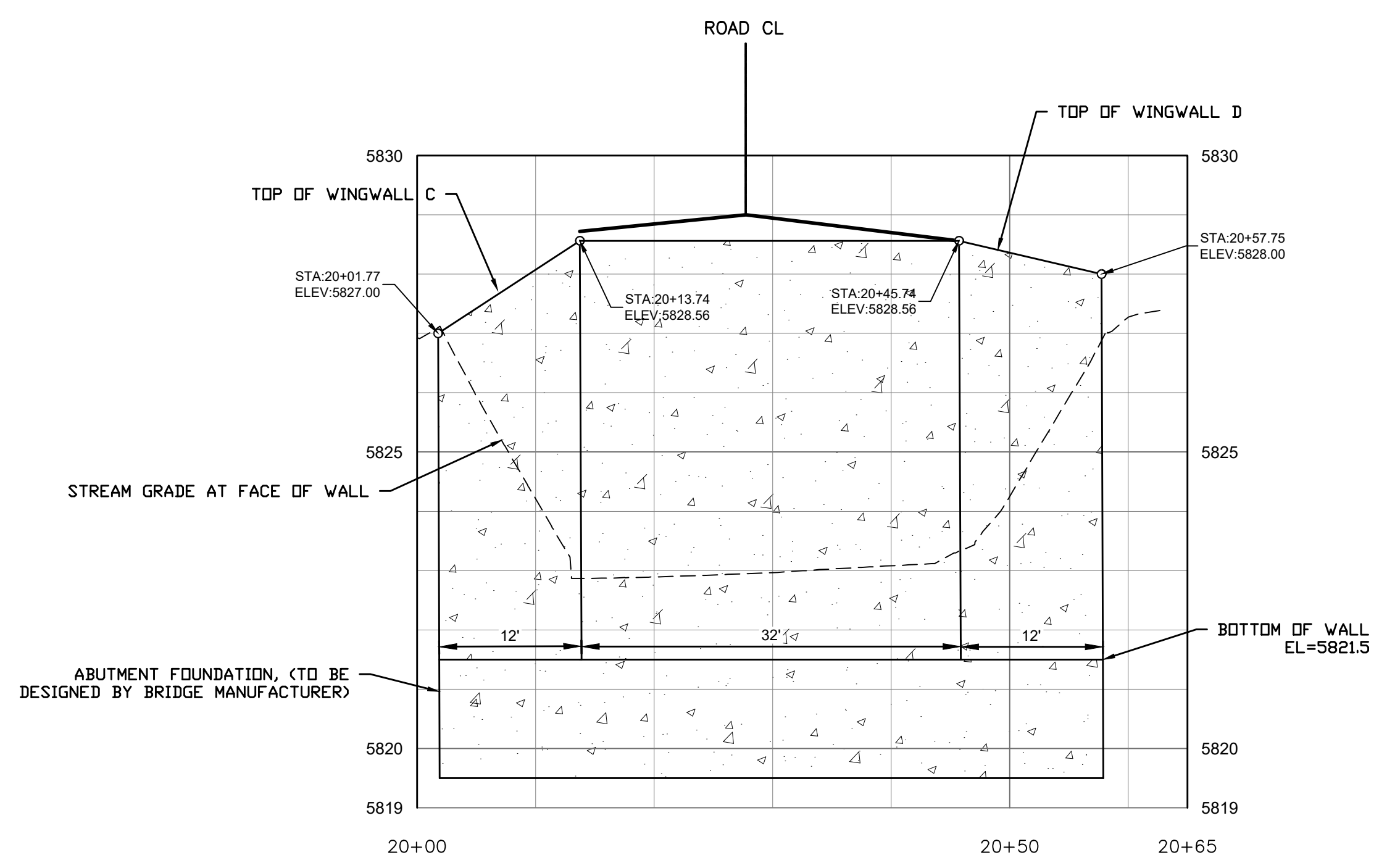
BRIDGE PLAN



SECTION A



BRIDGE ABUTMENT #1 PROFILE (2 EACH)
SCALE: 1"=20' H; 1"=4' V



BRIDGE ABUTMENT #2 PROFILE (2 EACH)
SCALE: 1"=20' H; 1"=4' V

WARM SPRINGS PRESERVE
VEHICULAR BRIDGE

LOCATED WITHIN SECTION 11&12, T4 N., R17 E. B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR: CITY OF KETCHUM

PROJECT INFORMATION
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**PRELIMINARY
NOT FOR
CONSTRUCTION**

DESIGNED BY: PLJ
DRAWN BY: PLJ
CHECKED BY:
SURVEY DATE:

GALENA-BENCHMARK ENGINEERING
Civil Engineers & Land Surveyors
100 Bell Drive
Ketchum, Idaho 83340
(208) 726-9512
www.benchmark-associates.com

NO.	DATE	BY	REVISIONS

PURPOSE: ISSUE FOR REVIEW

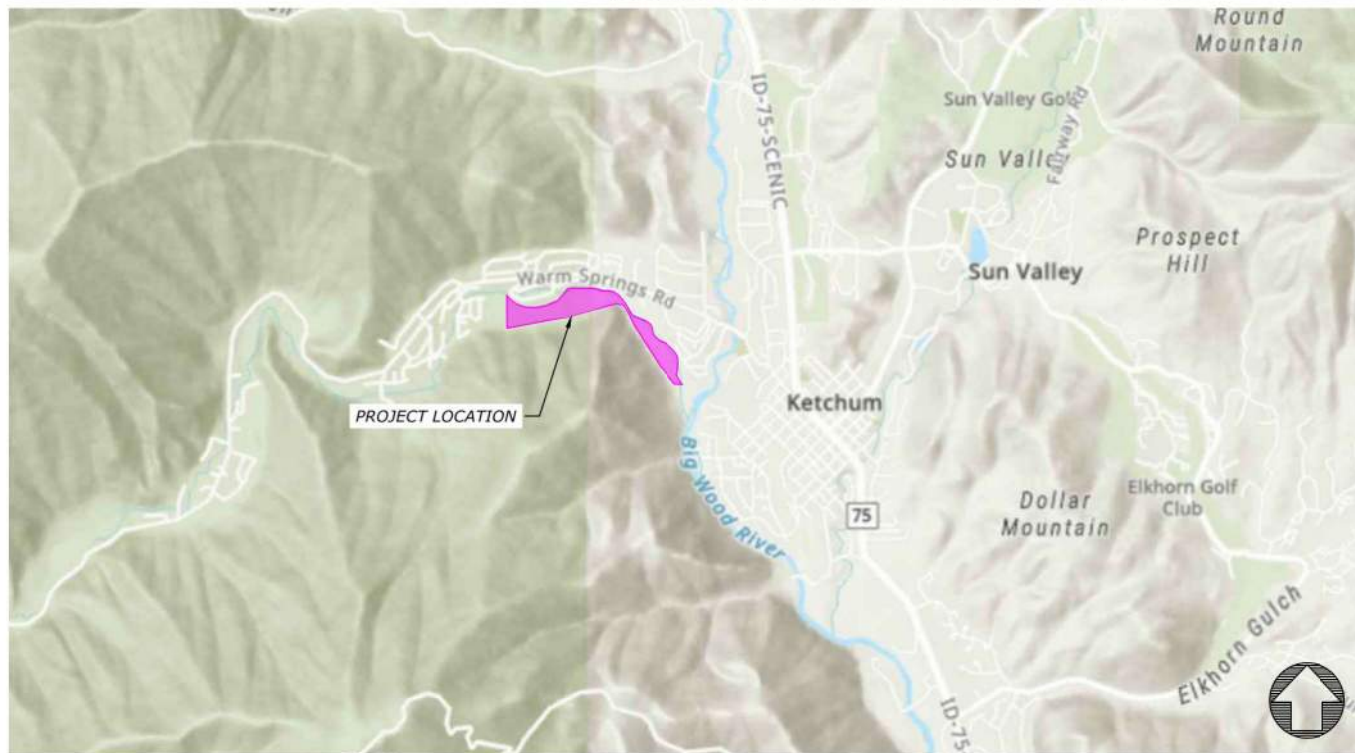
REUSE OF DRAWINGS: These drawings, or any portion thereof, shall not be used on any project or extension of this Project except by agreement in writing with Galena-Benchmark Engineering.

WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

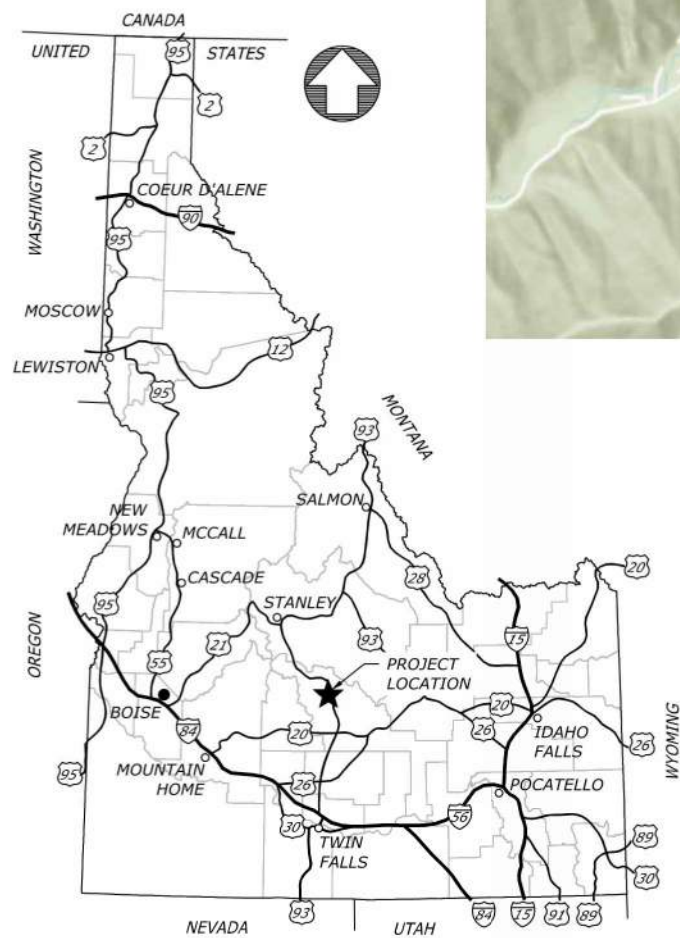
WARM SPRINGS CREEK, KETCHUM, ID 95% DESIGN DRAWINGS

PREPARED FOR:
WOOD RIVER LAND TRUST
CORY MCCAFFREY
119 E BULLION STREET
HAILEY, ID 83333
(208) 788-3947

PREPARED BY:
RIO APPLIED SCIENCE & ENGINEERING, LLC
ATTN: JOE YOUNG, PE
3380 WEST AMERICANA TERRACE, SUITE 390
BOISE, ID 83706
(208) 484-4700



VICINITY MAP
Not to scale

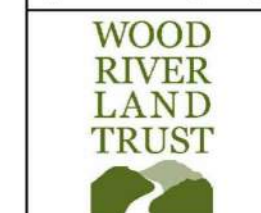


KEY MAP
Not to scale



LOCATION MAP

SHEET INDEX		
SHEET COUNT	DRAWING NUMBER	SHEET TITLE
1	G1	COVER SHEET
2	G2	GENERALS - 1
3	G3	GENERALS - 2
4	G4	CONSERVATION MEASURES - 1
5	G5	CONSERVATION MEASURES - 2
6	G6	QUANTITIES
7	C1	EXISTING CONDITIONS OVERVIEW
8	C2	EXISTING CONDITIONS PLAN 1
9	C3	EXISTING CONDITIONS PLAN 2
10	C4	EXISTING CONDITIONS PLAN 3
11	C5	EXISTING CONDITIONS PLAN 4
12	C6	PROPOSED CONDITIONS OVERVIEW
13	C7	PROPOSED CONDITIONS PLAN - 1
14	C8	PROPOSED CONDITIONS PLAN - 2
15	C9	PROPOSED CONDITIONS PLAN - 3
16	C10	PROPOSED CONDITIONS PLAN - 4
17	C11	PROPOSED CONDITIONS DEMO OVERVIEW
18	C12	PROPOSED CONDITIONS ACCESS, STAGING, & EROSION CONTROL
19	C13	PROPOSED CONDITIONS ACCESS, STAGING, & EROSION CONTROL
20	C14	MAINSTEM PLAN & PROFILE RIFFLE 1 - STA 10+39 TO 12+01
21	C15	MAINSTEM PLAN & PROFILE RIFFLE 2 - STA 26+17 TO 27+77
22	C16	BALDY CHANNEL PLAN & PROFILE STA 0+00 TO 6+00
23	C17	BALDY CHANNEL PLAN & PROFILE STA 6+00 TO 14+00
24	C18	BALDY CHANNEL PLAN & PROFILE STA 14+00 TO 20+92
25	C19	BALDY CHANNEL PLAN & PROFILE STA 20+92 TO 24+22
26	C20	DOLLAR CHANNEL PLAN & PROFILE STA 0+00 TO 3+47
27	C21	SUNNY CHANNEL PLAN & PROFILE STA 0+00 TO 3+38
28	C22	CHALLENGER CHANNEL PLAN & PROFILE STA 0+36 TO 3+32
29	C23	ROUNDHOUSE CHANNEL PLAN & PROFILE STA 0+03 TO 2+15
30	C24	VALLEY SECTION OVERVIEW
31	C25	VALLEY SECTIONS
32	D1	ACCESS AND ISOLATION DETAILS
33	D2	DETAIL CONSTRUCTED RIFFLE
34	D3	DETAIL CONSTRUCTED RIFFLE MATERIALS AND SCHEDULES
35	D4	DETAIL SHORT ROUGHENED EDGE
36	D5	DETAIL HABITAT STRUCTURE 1
37	D6	DETAIL HABITAT STRUCTURE 2
38	D7	DETAIL HABITAT STRUCTURE 3
39	D8	DETAIL HABITAT STRUCTURE 4
40	D9	DETAIL HABITAT STRUCTURE 5
41	D10	DETAIL HABITAT STRUCTURE 6
42	D11	DETAIL HABITAT STRUCTURE 7
43	D12	DETAIL HABITAT STRUCTURE 8
44	D13	DETAIL BALDY CHANNEL INLET



WARM SPRINGS PRESERVE STREAM &
 FLOODPLAIN ENHANCEMENT DESIGN SET
 95% DESIGN DRAWINGS
 WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

WORKING DRAFT
 NOT FOR
 CONSTRUCTION

DATE: 11/6/2024
 DESIGNED: ZS, MP, JY
 APPROVED: JY

DRAWING NAME
 GENERALS
 COVER SHEET

DRAWING NO. G1 95
 SHEET 1 OF 4

FILE: E:\PROJECTS\WOOD_RIVER\WARM_SPRINGS_PRESERVE\DESIGN\DRAWINGS\GENERAL.DWG, SAVED BY: ZACH SUDMAN, PLOT DATE: 11/06/2024, 12:58 PM

GENERAL NOTES

- A. PROJECT COORDINATE SYSTEM IS NAD83 IDAHO STATE PLANE, CENTRAL ZONE, US FOOT.
B. THE IDAHO STATE PUBLIC WORKS CONSTRUCTION (ISPMC) STANDARDS FOR CONSTRUCTION SHALL APPLY UNLESS OTHERWISE NOTED IN THE PLANS OR PROJECT SPECIAL PROVISIONS.
C. TOPOGRAPHIC MAPPING WITHIN THE PROJECT AREA IS BASED ON A COMBINATION OF 2017 LIDAR DATA SUPPLEMENTED WITH TOPOGRAPHIC AND BATHYMETRIC DATA COLLECTED BY RIO ASE IN SEPTEMBER 2022 AND 2023 AND PHILLIPS LAND SURVEYING IN OCTOBER 2023. TOPOGRAPHIC MAPPING IS ASSUMED TO BE ACCURATE AND REPRESENTATIVE OF EXISTING CONDITIONS.
D. EXISTING UNDERGROUND UTILITY LOCATIONS HAVE NOT BEEN IDENTIFIED AND ARE NOT SHOWN ON THESE PLANS. CONTRACTOR IS RESPONSIBLE TO LOCATE UTILITIES PRIOR TO CONSTRUCTION AND SHALL PROTECT EXISTING UTILITIES DURING CONSTRUCTION.

GENERAL REQUIREMENTS

1. DESCRIPTION OF WORK

- A. EXCAVATION OF FLOODPLAIN TO INCREASE SEASONAL FLOODPLAIN INUNDATION.
B. ADDITION OF WOOD STRUCTURES ON WARM SPRINGS CREEK TO ENHANCE HABITAT.
C. EXCAVATION OF POOLS WITHIN WARM SPRINGS CREEK TO ENHANCE HABITAT.
D. CREATION OF A SIDE CHANNEL TO CONVEY FLOW INTO AND OUT OF A POND TO BE USED FOR IRRIGATION AND RECREATION.
E. CREATION OF TWO SHORTER SIDE CHANNELS FOR HABITAT.
F. INCORPORATION OF RIFFLES, POOLS, AND GLIDE HABITAT UNITS AND BANK AND FLOODPLAIN ROUGHNESS TREATMENTS AND WOOD HABITAT STRUCTURES WITHIN SIDE CHANNELS.
G. REVEGETATION THROUGH PLANTING AND SEEDING OF NATIVE SPECIES WITHIN RIPARIAN, WETLAND, AND UPLAND ZONES.

2. PROJECT ROLES

- A. THE ABOVE WORK IS TO BE PERFORMED FOR THE CITY OF KETCHUM, HEREAFTER REFERRED TO AS THE "SPONSOR". THE SPONSOR WILL APPOINT A PROJECT STAFF MEMBER, HEREAFTER REFERRED TO AS "CONTRACTING OFFICER", WHO WILL HAVE THE RESPONSIBILITY TO ISSUE A CONTRACT TO CONSTRUCT THE ABOVE WORK AND WILL ADMINISTER THE CONTRACT AND FUNDS FOR THE PROJECT. ONLY THE SPONSOR MAY APPROVE CHANGES TO THE CONTRACT AMOUNT AND THE CONTRACT REQUIREMENTS.
B. RIO ASE, HEREAFTER REFERRED TO AS THE "ENGINEER," IS THE SPONSOR'S REPRESENTATIVE WHO HAS DESIGNED THE PROJECT. THE ENGINEER PROVIDES CLARIFICATION TO THE CONTRACTING OFFICER REGARDING THE INTENT OF THE DRAWINGS AND SPECIFICATIONS AND WHETHER ALL THE PROPOSED OR COMPLETED WORK IS IN COMPLIANCE WITH THE CONSTRUCTION SPECIFICATIONS. THE ENGINEER ALSO REVIEWS ALL PROPOSED CHANGES AND MAKES RECOMMENDATIONS TO THE CONTRACTING OFFICER PRIOR TO THE CONTRACTING OFFICER'S APPROVAL OF THE CHANGES.
C. THE OWNER OF THE PROPERTY WHERE CONSTRUCTION WILL OCCUR IS THE CITY OF KETCHUM, HEREIN REFERRED TO AS THE "PROPERTY OWNER."
D. CONSTRUCTION OBSERVATION WILL BE PROVIDED BY THE SPONSOR AND/OR THE ENGINEER. CONSTRUCTION OBSERVERS WILL NOT DIRECT THE CONTRACTOR IN ANY WAY BUT WILL ADVISE THE CONTRACTING OFFICER REGARDING THE TECHNICAL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND WHETHER THE ONGOING WORK IS IN COMPLIANCE OR IF THERE ARE DISCREPANCIES. THE CONSTRUCTION OBSERVERS ARE NOT RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES AND/OR SAFETY OF THE CONTRACTOR.

3. GENERAL CONSTRUCTION SEQUENCE

- A. CONSTRUCTION STAKING
B. SITE PREPARATION, INSTALL EROSION & SEDIMENT CONTROL MEASURES
C. EARTHWORK AND GRADING INCLUDING EXCAVATION OF NEW CHANNELS, ALCOVES, AND FLOODPLAIN FEATURES, INSTALLATION OF BOULDERS AND LARGE WOOD HABITAT STRUCTURES
D. CHECK GRADES, PREWASH CHANNELS, ACTIVATE CHANNELS
E. RECLAIM TEMPORARY CONSTRUCTION ACCESS AND STAGING AREAS TO PRE-EXISTING CONDITIONS
F. PLANTING AND SEEDING
G. FINAL INSPECTION, SITE CLEANUP, AND DEMOBILIZATION

4. WORK SCHEDULE

- A. THE APPROVED WORK WINDOW FOR THIS PROJECT IS JULY 8 TO MARCH 15 THE FOLLOWING YEAR. WORK REQUIRING EQUIPMENT TO OPERATE PARTLY, OR WHOLLY, BELOW THE ORDINARY HIGH WATER LINE SHALL BE COMPLETED DURING THE IN-WATER WORK WINDOW.
B. ALL OTHER WORK LOCATED OUTSIDE OF THE ORDINARY HIGH WATER LINE SHALL BE ACCOMPLISHED BY _____.
C. THE CONTRACTOR MAY NOT LEAVE THE WORK SITE OR SUSPEND ACTIVITY FOR MORE THAN FIVE (5) CONSECUTIVE DAYS AFTER MOBILIZING TO THE SITE AND PRIOR TO REACHING SUBSTANTIAL COMPLETION UNLESS OTHERWISE APPROVED BY THE CONTRACTING OFFICER.

5. LOCATION

- A. ALL WORK IS ON WARM SPRINGS CREEK, ITS FLOODPLAIN, AND THE PROPERTY BELONGING TO THE PROPERTY OWNER.
B. SITE IMPROVEMENTS WILL BE REQUIRED TO CREATE ACCESS POINTS SUITABLE FOR MOBILIZATION OF CONSTRUCTION EQUIPMENT AND DELIVERY OF PROJECT MATERIALS.

USE OF SITE

1. CONTRACTORS USE OF PREMISES

- A. PRIOR TO PERFORMING WORK, THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT SITE, PROJECT SITE CONDITIONS, AND ALL PORTIONS OF THE WORK.
B. CONTRACTOR MUST COORDINATE ALL WORK AND ACCESS TO THE SITE WITH THE CONTRACTING OFFICER. THE CONTRACTING OFFICER WILL BE RESPONSIBLE FOR COORDINATION WITH THE PROPERTY OWNER.
C. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING PUBLIC SAFETY IN AND AROUND THE PROJECT SITE, AND WILL PROVIDE ANY SAFETY PRECAUTIONS SUCH AS TEMPORARY FENCING OR OTHER METHODS AT THE CONTRACTOR'S DISCRETION WHERE DEEMED NECESSARY. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE OSHA AND NRS CHAPTER 618 STANDARDS, IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
D. THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF PROPERTY AT THE PROJECT SITE AND WILL PROVIDE REASONABLE PROTECTION TO PREVENT DAMAGE OR LOSS TO EQUIPMENT, MATERIALS, AND SUPPLIES INCORPORATED IN THE PROJECT AND TO THE PROPERTY OWNER.

- E. THE CONTRACTOR SHALL ONLY ACCESS THE PROJECT SITE AS SHOWN ON THE DRAWINGS. ALTERNATE GATE ACCESS POINTS SHALL NOT BE USED, UNLESS AUTHORIZED BY THE CONTRACTING OFFICER.
F. CONTRACTOR SHALL ONLY USE DESIGNATED ACCESS ROUTES AND STREAM CROSSING LOCATIONS AS INDICATED ON THE DRAWINGS.
G. THE CONTRACTOR SHALL CAUSE NOTICE TO BE GIVEN TO THE APPROPRIATE STATE UNDERGROUND UTILITIES LOCATION CENTER AND TO ANY UNDERGROUND UTILITY FACILITIES WHO ARE NOT MEMBERS OF THE REGISTERED PROTECTION SERVICE. THE CONTRACTOR MUST TAKE ALL REASONABLE MEASURES TO PROTECT EXISTING UTILITIES AND ALL NOTICES SHALL BE GIVEN AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. ALL WORK PERFORMED ADJACENT TO UTILITIES SHALL BE IN ACCORDANCE WITH PROCEDURES OUTLINED BY THE UTILITY COMPANY. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DAMAGE TO UTILITIES TO THE SPONSOR AND THE UTILITY COMPANY.
H. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO ANY UTILITY LINES AT NO COST OR OBLIGATION TO THE SPONSOR OR THE PROPERTY OWNER.
I. MOVEMENT OF CONSTRUCTION EQUIPMENT OVER PIPES, BRIDGES, UTILITIES OR INFRASTRUCTURE DURING CONSTRUCTION SHALL BE AT THE CONTRACTOR'S RISK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO INFRASTRUCTURE AT NO COST OR OBLIGATION TO THE SPONSOR OR THE PROPERTY OWNER.
J. CONTRACTOR IS EXPECTED TO KEEP A NEAT AND TIDY CONSTRUCTION SITE, FREE OF ACCUMULATED WASTE MATERIALS AND TRASH.
K. CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO MINIMIZE DAMAGE TO EXISTING VEGETATION DURING CONSTRUCTION ACTIVITIES.
L. THE CONTRACTOR SHALL ONLY REMOVE TREES AND SHRUBS THAT ARE ABSOLUTELY NECESSARY FOR THE EXECUTION OF THE WORK AND SHALL MAKE ALL EFFORTS TO MINIMIZE TREE AND SHRUB REMOVAL. IN THE EVENT THAT A TREE OR SHRUB OUTSIDE THE IMMEDIATE WORK AREAS MUST BE REMOVED OR DAMAGED, THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE CONTRACTING OFFICER. ANY TREE OR SHRUB UNNECESSARILY REMOVED FROM THE WORK SITE SHALL BE REPLACED BY A NEW TREE OR SHRUB OF EQUAL OR GREATER VALUE AT THE SOLE EXPENSE OF THE CONTRACTOR AS APPROVED BY THE CONTRACTING OFFICER.
M. THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EQUIPMENT AND FACILITIES UPON COMPLETION OF WORK UNDER THIS CONTRACT.

2. EQUIPMENT

- A. CONTRACTOR IS REQUIRED TO PRESSURE WASH AND REMOVE ALL DIRT, GREASE, OIL, FUEL, VEGETATION AND WEED SEEDS BEFORE BRINGING EQUIPMENT ON SITE TO LIMIT INTRODUCTION OF NOXIOUS WEEDS, AQUATIC INVASIVES AND POLLUTANTS TO THE SITE.
B. COMPLETE VEHICLE AND EQUIPMENT STAGING, CLEANING, MAINTENANCE, REFUELING, AND FUEL STORAGE IN THE DESIGNATED CONSTRUCTION STAGING AND MATERIAL STORAGE AREA 150' AWAY FROM ANY NATURAL WATER BODY.
C. INSPECT ALL VEHICLES AND EQUIPMENT OPERATED WITHIN 150 FEET OF SURFACE WATERS DAILY FOR FLUID LEAKS BEFORE LEAVING THE CONSTRUCTION STAGING AND MATERIAL STORAGE AREA. REPAIR ANY LEAKS DETECTED IN THE CONSTRUCTION STAGING AND MATERIAL STORAGE AREA BEFORE RESUMING OPERATION. DOCUMENT INSPECTIONS IN A RECORD THAT IS AVAILABLE FOR REVIEW ON REQUEST BY THE CONTRACTING OFFICER AND REGULATORY AGENCIES.
D. USE OF EQUIPMENT IN FLOWING WATER IS LIMITED BY APPLICABLE PERMITS. EQUIPMENT MUST BE THOROUGHLY CLEANED BEFORE ENTERING THE WATER. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE REGULATIONS FOR IN-WATER EQUIPMENT USE.
E. HYDRAULICS FLUIDS - ALL EQUIPMENT THAT ARE DOING WORK IN ACTIVE STREAM CHANNELS, OR PERMANENT WATER BODIES DURING PROJECT CONSTRUCTION MUST USE HYDRAULIC OIL THAT MEETS OR EXCEEDS ENVIRONMENTALLY ACCEPTABLE LUBRICANTS BY THE U.S. EPA (2011); E.G., MINERAL OIL, POLYGLYCOL, VEGETABLE OIL, SYNTHETIC ESTER; MOBIL® BIODEGRADABLE HYDRAULIC OILS, TOTAL® HYDRAULIC FLUID, TERRESOLVE TECHNOLOGIES LTD.® BIOBASED BIODEGRADABLE LUBRICANTS, COUGAR LUBRICATION® 2XT BIO ENGINE OIL, SERIES 4300 SYNTHETIC BIO-DEGRADABLE HYDRAULIC OIL, 8060-2 SYNTHETIC BIO-DEGRADABLE GREASE NO. 2, ETC. OR MEET STRINGENT ACUTE AQUATIC TOXICITY (L-50), WHICH IS INHERENTLY BIODEGRADABLE. THIS DOES NOT INCLUDE TRUCKS, DOZERS, FRONT END LOADERS, ETC., THAT ARE OPERATED ON THE FLOOD PLAIN OR INVOLVED IN THE CONSTRUCTION OF NEW CHANNELS PRIOR TO ADDING WATER FLOW OR FILLING ABANDONED CHANNELS AFTER DE-WATERING. ALL PRODUCTS SHALL BE API CERTIFIED AND THE VENDOR SHALL FURNISH DOCUMENTATION OF THE CERTIFICATION UPON REQUEST. PRODUCTS MUST MEET THE PERFORMANCE AND WARRANTY REQUIREMENTS OF THE MANUFACTURERS LISTED IN THE SPECIFICATIONS.
F. ABSORBENT PADS TO SOAK UP LEAKS AND A FUEL SPILL RESPONSE KIT (INCLUDING RAG PADS AND BOOMS) OF APPROPRIATE SIZE FOR THE EQUIPMENT USED SHALL BE ON SITE AT ALL TIMES AND READILY AVAILABLE THROUGHOUT THE CONSTRUCTION PERIOD.

3. HOURS OF WORK

- A. THE NORMAL WORK HOURS SHALL BE 7:00 AM TO 7:00 PM, MONDAY THROUGH FRIDAY. NO WORK SHALL BE PERFORMED OUTSIDE THE NORMAL WORK HOURS, OR ON SATURDAYS, SUNDAYS, OR HOLIDAYS UNLESS AUTHORIZED BY THE CONTRACTING OFFICER. THE CONTRACTOR SHALL REQUEST WORK HOUR VARIATIONS IN WRITING VIA EMAIL AND OBTAIN WRITTEN APPROVAL FROM THE CONTRACTING OFFICER PRIOR TO WORKING OUTSIDE NORMAL WORK HOURS.

SPECIAL PROCEDURES

1. IN-STREAM WORK

- A. IN-STREAM WORK IS ALLOWED AS SPECIFIED IN THE PERMIT DOCUMENTS.
B. TURBIDITY CRITERIA SHALL BE STRICTLY ADHERED TO WHILE COMPLETING ALL INSTREAM WORK. COFFERDAMS, FLOW DIVERSION STRUCTURES AND BYPASS CHANNELS SHALL BE INSTALLED AT ALL LOCATIONS INDICATED ON THE DRAWINGS OR AT LOCATIONS SHOWN ON AN APPROVED "COFFERDAM AND FLOW DIVERSION PLAN" (SEE SPECIFICATIONS). SOME ASPECTS OF THE PROJECT MAY NOT REQUIRE THE USE OF A COFFERDAM TO COMPLETE THE WORK.
C. DEWATERING WITHIN COFFERDAMS SHALL BE PERFORMED TO THE EXTENT NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THESE PLANS AS FOLLOWS: DEWATERING AT WOOD STRUCTURE LOCATIONS SHALL BE CONDUCTED SUCH THAT WATER IS NO DEEPER THAN THE DIAMETER OF THE LOG(S) ON THE LOWEST LAYER OF THE STRUCTURE, AND WITHIN CONSTRUCTION EXCAVATIONS SUCH THAT WATER IS SHALLOW ENOUGH TO ALLOW THE CONTRACTING OFFICER TO EASILY INSPECT FINISHED ELEVATIONS OF THE WORK. DISCHARGE FROM PUMPING SHALL BE ROUTED TO THE FLOODPLAIN AREAS SO AS TO ALLOW THE REMOVAL OF FINE SEDIMENTS PRIOR TO REENTERING SURFACE WATERS OR WETLANDS. ALL PUMPS USED BY THE CONTRACTOR FOR DEWATERING SHALL HAVE SCREENED INTAKES THAT MEET WASHINGTON DEPARTMENT OF FISH AND WILDLIFE SPECIFICATIONS AND NATIONAL MARINE FISHERIES SERVICE ANADROMOUS SALMONID PASSAGE FACILITY DESIGN CRITERIA (NMF5, 2011).
D. CONTRACTOR SHALL RETAIN EXISTING VEGETATION AND VARY CHANNEL WIDTH (±0.5 FEET) AND DEPTH (+0.2 TO -0.5 FEET) OF SIDE CHANNEL EXCAVATION AS DIRECTED BY THE CONTRACTING OFFICER.



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS,MP, JY
APPROVED: JY

DRAWING NAME
GENERALS
GENERALS - 1

DRAWING NO.
G2 96
SHEET 2 OF 4

FILE: B:\PROJECTS\WOOD_HUCTZ\WARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCTS\GENERALS.DWG SAVED BY: ZACH SUDMAN PLOT DATE: 11/06/2024 12:58 PM

SPECIAL PROCEDURES CONTINUED

2. TURBIDITY MONITORING

- A. TURBIDITY MONITORING IS REQUIRED AS PART OF THIS PROJECT AND SHALL BE COMPLETED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSERVATION MEASURES. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR TURBIDITY AS SET FORTH IN THE PERMIT DOCUMENTS AND FOLLOW THE PROTOCOLS OUTLINED BELOW.
1. TAKE A BACKGROUND TURBIDITY SAMPLE USING A RECENTLY-CALIBRATED TURBIDIMETER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, OR MEASURE TURBIDITY WITH A VISUAL TURBIDITY OBSERVATION. TURBIDITY SHOULD BE MEASURED EVERY 2 HOURS WHILE IN-WATER WORK IS BEING IMPLEMENTED OR MORE OFTEN IF SEDIMENT DISTURBANCE VARIES GREATLY. TURBIDITY DOES NOT NEED TO BE MONITORED WHEN WORKING IN THE DEWATERED SECTIONS UNLESS A VISIBLE PLUME IS EVIDENT. THE BACKGROUND SAMPLES SHOULD BE TAKEN AT A RELATIVELY UNDISTURBED LOCATION APPROXIMATELY 100 FEET UPSTREAM FROM THE PROJECT AREA. RECORD THE OBSERVATION, LOCATION (LATITUDE/LONGITUDE), AND TIME BEFORE MONITORING AT THE DOWNSTREAM POINT, KNOWN AS THE MEASUREMENT COMPLIANCE POINT.
2. TAKE A SECOND SAMPLE, IMMEDIATELY AFTER EACH UPSTREAM SAMPLE, AT THE MEASUREMENT COMPLIANCE POINT, APPROXIMATELY 100 FEET DOWNSTREAM FROM THE PROJECT AREA. RECORD THE DOWNSTREAM OBSERVATION, LOCATION, AND TIME.
3. COMPARE THE UPSTREAM AND DOWNSTREAM SAMPLES. IF OBSERVED OR MEASURED TURBIDITY DOWNSTREAM IS MORE THAN UPSTREAM OBSERVATION OR MEASUREMENT (> 10%), THE ACTIVITY MUST BE MODIFIED TO REDUCE TURBIDITY. IF VISUAL ESTIMATES ARE USED, AN OBVIOUS DIFFERENCE BETWEEN UPSTREAM AND DOWNSTREAM OBSERVATIONS SHALL BEAR THE ASSUMPTION OF A (> 10%) DIFFERENCE (FIGURE 1). MARK "YES" OR "NO" ON YOUR DATASHEET. CONTINUE TO MONITOR EVERY 2 HOURS AS LONG AS INSTREAM ACTIVITY CONTINUES.
4. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 4 HOURS), THE ACTIVITY MUST STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND, AND THE EC LEAD MUST BE NOTIFIED WITHIN 48 HOURS. THE EC LEAD SHALL DOCUMENT THE REASONS FOR THE EXCEEDANCE AND CORRECTIVE MEASURES TAKEN THEN NOTIFY THE LOCAL NMFS BRANCH CHIEF AND/OR USFWS FIELD SUPERVISOR AND SEEK RECOMMENDATIONS.
5. IF AT ANY TIME, MONITORING, INSPECTIONS, OR OBSERVATIONS SHOW THAT THE TURBIDITY CONTROLS ARE INEFFECTIVE, IMMEDIATELY MOBILIZE WORK CREWS TO REPAIR, REPLACE, OR REINFORCE CONTROLS AS NECESSARY.
6. ANY EXCEEDANCE OF THE TURBIDITY STANDARD MUST BE REPORTED TO THE DEQ REGIONAL OFFICE WITHIN 24 HOURS. COPIES OF TURBIDITY MONITORING RECORDS OR LOGS MUST BE AVAILABLE TO DEQ UPON REQUEST. THE LOG MUST INCLUDE BACKGROUND MEASUREMENTS (IN NTUS); DOWN-CURRENT MEASUREMENTS, COMPARISON OF BACKGROUND AND DOWN-CURRENT MONITORING AS A NUMERIC VALUE (IN NTUS), AND LATITUDE/LONGITUDE, TIME AND DATE FOR EACH SAMPLING EVENT. MONITORING RECORDS OR LOGS MUST DESCRIBE ALL EXCEEDANCES AND SUBSEQUENT ACTIONS TAKEN TO CORRECT THE VIOLATIONS, INCLUDING MONITORING AND THE EFFECTIVENESS OF THE ACTION(S) TAKEN.

WOOD STRUCTURES

1. WOOD STRUCTURES

- A. SEE SPECIFICATIONS FOR LOG, RACKING, AND SLASH MATERIAL REQUIREMENTS.
B. CONTRACTOR SHALL PROCURE ALL WOOD MATERIALS REQUIRED FOR THIS CONTRACT THROUGH LEGAL MEANS AND HAS SOLE RESPONSIBILITY TO SECURE ANY AND ALL NECESSARY PERMITS TO DO SUCH.

TEMPORARY UTILITIES

1. TEMPORARY ELECTRIC

- A. ELECTRIC POWER IS NOT AVAILABLE AT THE SITE.
B. IF TEMPORARY POWER IS NECESSARY TO OPERATE PUMPS, CONTRACTOR SHALL PROVIDE ALL GENERATORS, AND OTHER ELECTRICAL EQUIPMENT AND FACILITIES FOR OBTAINING AND DISTRIBUTING POWER ON THE SITE.
C. ALL GENERATORS SHALL BE PLACED OUTSIDE OF THE ORDINARY HIGH WATER LINE WITH APPROPRIATE SPILL PREVENTION AND CONTAINMENT MEASURES.

2. TEMPORARY WATER

- A. POTABLE WATER IS NOT AVAILABLE TO THE CONTRACTOR AT THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING POTABLE WATER FOR ALL EMPLOYEES AT THE SITE.

3. TEMPORARY SANITATION FACILITIES

- A. CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SANITATION FACILITIES (E.G., "PORT-A-POTTIES") FOR USE BY THE CONSTRUCTION AND OBSERVATION CREWS FOR THE DURATION OF THE CONSTRUCTION AND REVEGETATION ACTIVITIES.

4. TEMPORARY FIRST AID FACILITIES

- A. CONTRACTOR SHALL PROVIDE FIRST AID EQUIPMENT AND SUPPLIES ONSITE FOR EMPLOYEES.
B. CONTRACTOR SHALL HAVE AN EMERGENCY ACTION PLAN AND INSTRUCT EMPLOYEES WHAT TO DO IN CASE OF A WORKPLACE INJURY.
C. CONTRACTOR SHALL REVIEW THE PLAN WITH EACH EMPLOYEE AND HAVE THE PLAN AVAILABLE ONSITE AT ALL TIMES.

5. TEMPORARY FIRE PROTECTION

- A. THE CONTRACTOR SHALL CONDUCT OPERATIONS IN A MANNER THAT IS FIRE-SAFE FOR THE WORK AREA AND ADJACENT AREAS. PROPER FIRE EXTINGUISHERS SHALL BE INSTALLED ON ALL EQUIPMENT AND MAINTAINED BY THE CONTRACTOR. THE PREMISE SHALL BE MAINTAINED CLEAR OF RUBBISH, DEBRIS, OR OTHER MATERIAL CONSTITUTING A POTENTIAL FIRE HAZARD.
B. WHERE SIGNIFICANT OR CONTINUED NONCOMPLIANCE WITH FIRE SAFETY IS NOTED, THE CONTRACTING OFFICER RESERVES THE RIGHT TO STOP THE WORK AT NO EXTRA COST DUE TO EXTENSION OF TIME PENDING REMEDIAL ACTION. FURTHERMORE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR, AND REIMBURSE THE SPONSOR AS APPROPRIATE, ANY FINES OR PENALTIES LEVIED BY THE FIRE DEPARTMENT.

6. TEMPORARY FUEL STORAGE

- A. ALL STATIONARY TEMPORARY FUEL STORAGE SHALL BE LOCATED IN CONSTRUCTION STAGING AREAS OR OTHERWISE APPROVED LOCATIONS.
B. FUEL STORAGE VESSELS SHALL BE INSPECTED PRIOR TO SITE DELIVERY FOR LEAKS OR DAMAGE. LEAKY STORAGE TANKS WILL NOT BE PERMITTED ON SITE.
C. SECONDARY CONTAINMENT WILL BE REQUIRED FOR ALL ON SITE FUEL STORAGE VESSELS. SECONDARY CONTAINMENT STRUCTURES WILL PROVIDE STORAGE CAPACITY IN THE AMOUNT OF 110% OF THE VOLUME OF THE LARGEST PRIMARY CONTAINER STORED WITHIN.
D. AT THE CONCLUSION OF PROJECT CONSTRUCTION, ANY LEAKED FUEL OR CONTAMINATED RAINWATER WITHIN THE SECONDARY CONTAINMENT STRUCTURE WILL BE PROPERLY COLLECTED AND LEGALLY DISPOSED OF AT AN OFFSITE LOCATION.

TEMPORARY ENVIRONMENTAL CONTROLS

1. REGULATORY REQUIREMENTS

- A. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS AND SHALL BE EXPECTED TO MAINTAIN COPIES OF ALL REQUIRED PERMITS ON SITE FOR INSPECTION AND REVIEW.

- B. CONTRACTOR SHALL CONFORM TO MOST STRINGENT REQUIREMENT IN CASES OF CONFLICT BETWEEN SPECIFICATIONS AND REGULATORY REQUIREMENTS.
C. CONTRACTING OFFICER MAY STOP ANY CONSTRUCTION ACTIVITY IN VIOLATION OF FEDERAL, STATE, OR LOCAL LAWS AND ADDITIONAL EXPENSES RESULTING FROM WORK STOPPAGE WILL BE RESPONSIBILITY OF CONTRACTOR.
D. CONTRACTOR WILL BE RESPONSIBLE FOR PRODUCING IMPLEMENTING, ADHERING TO, AND MAINTAINING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) OR EQUIVALENT PLAN IN ACCORDANCE WITH THE REGULATIONS AND GUIDELINES SET FORTH AND SUBJECT TO APPROVAL BY THE STATE IN WHICH THE PROJECT IS LOCATED.

2. DUST CONTROL

- A. CONTRACTOR SHALL TRUCK WATER TO THE SITE TO USE FOR DUST ABATEMENT. WATER SHALL BE OBTAINED THROUGH LEGAL MEANS.
B. CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT, AND MATERIALS TO CONTROL DUST ON ALL ACCESS ROADS SEVERAL TIMES PER DAY TO PREVENT DUST NUISANCE OR DAMAGE TO PERSONS, PROPERTY, OR ACTIVITIES, INCLUDING, BUT NOT LIMITED TO CROPS, ORCHARDS, CULTIVATED FIELDS, WILDLIFE HABITATS, DWELLINGS AND RESIDENCES, AGRICULTURAL ACTIVITIES, RECREATIONAL ACTIVITIES, TRAFFIC, AND SIMILAR CONDITIONS.
C. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES RESULTING FROM DUST ORIGINATING FROM CONTRACTOR OPERATIONS.

3. AIR POLLUTION CONTROL

- A. UTILIZE REASONABLY AVAILABLE METHODS AND DEVICES TO PREVENT, CONTROL, AND OTHERWISE MINIMIZE ATMOSPHERIC EMISSIONS OR DISCHARGES OF AIR CONTAMINANTS.
B. DO NOT OPERATE EQUIPMENT AND VEHICLES THAT SHOW EXCESSIVE EXHAUST GAS EMISSIONS UNTIL CORRECTIVE REPAIRS OR ADJUSTMENTS REDUCE SUCH EMISSIONS TO ACCEPTABLE LEVELS.

4. NOISE CONTROL

- A. DO NOT EXCEED 80 DECIBELS (DAYTIME), AS MEASURED AT NOISE-SENSITIVE AREAS SUCH AS RESIDENCES AND SCHOOLS DURING THE HOURS OF 7:00 A.M. TO 7:00 P.M. DO NOT EXCEED NOISE LEVELS OF 65 DECIBELS (NIGHTTIME) DURING THE HOURS OF 7:00 P.M. TO 7:00 A.M.
B. PROVIDE SPECIALTY MUFFLERS FOR CONTINUOUSLY RUNNING GENERATORS, PUMPS, AND OTHER STATIONARY EQUIPMENT TO MEET THE DECIBEL REQUIREMENTS ABOVE.
C. COMPRESSION BRAKES ARE NOT ALLOWED.
D. PERFORM OPERATIONS PRODUCING HIGH-INTENSITY IMPACT NOISE ONLY WEEKDAYS DURING THE HOURS OF 7:00 A.M. TO 7:00 P.M.

5. WATER POLLUTION CONTROL

- A. PERFORM CONSTRUCTION ACTIVITIES BY METHODS THAT WILL PREVENT ENTRANCE, OR ACCIDENTAL SPILLAGE, OF SOLID MATTER, CONTAMINANTS, DEBRIS, OR OTHER POLLUTANTS OR WASTES INTO STREAMS, FLOWING OR DRY WATERCOURSES, LAKES, WETLANDS, RESERVOIRS, OR UNDERGROUND WATER SOURCES. SUCH POLLUTANTS AND WASTES INCLUDE, BUT ARE NOT RESTRICTED TO REFUSE, GARBAGE, CEMENT, SANITARY WASTE, INDUSTRIAL WASTE, HAZARDOUS MATERIALS, RADIOACTIVE SUBSTANCES, OIL AND OTHER PETROLEUM PRODUCTS, AGGREGATE PROCESSING TAILINGS, MINERAL SALTS, AND THERMAL POLLUTION.

6. SURVEYING

- A. THE CONTRACTOR SHALL PROVIDE ALL SURVEYING TASKS NECESSARY FOR CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO: LOCATE SURVEY CONTROL AND REFERENCE POINTS, ESTABLISH HORIZONTAL AND VERTICAL CONTROL, PLACE GRADING STAKES, IDENTIFY AND STAKE THE CHANNEL CENTERLINE, IDENTIFY ALL MAJOR AND MINOR WORK COMPONENTS, AND PERIODICALLY VERIFY LOCATIONS AND ELEVATIONS OF ALL CONSTRUCTION ITEMS. AUTOCAD FILES FOR THE DESIGN ARE AVAILABLE UPON REQUEST.
B. CONTRACTOR SHALL BE RESPONSIBLE FOR REPORTING ANY ELEVATION OR HORIZONTAL DISCREPANCIES TO THE CONTRACTING OFFICER FOR CLARIFICATION. MINOR ADJUSTMENTS TO SUIT FIELD CONDITIONS ARE ANTICIPATED, AND IT SHALL BE THE RESPONSIBILITY OF THE ENGINEER TO MAKE DECISIONS REGARDING THESE ADJUSTMENTS.
C. ELECTRONIC VERSIONS OF THE TOPOGRAPHIC MAPPING AND DESIGN SURFACES ARE AVAILABLE IN AUTOCAD FORMAT UPON REQUEST. TOPOGRAPHIC MAPPING DO NOT INCLUDE UTILITIES AND SURFACE FEATURES, STRUCTURES, AND OTHER ITEMS MAY BE ENCOUNTERED AT THE PROJECT SITE THAT ARE NOT REFLECTED IN THE MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK EXISTING CONDITIONS PRIOR TO BIDDING OR COMMENCING WORK.
D. CONTROL POINTS IDENTIFIED ON THE DRAWINGS SHALL BE USED FOR ALL TIES TO SPATIAL AND ELEVATION DATA LISTED IN THE DRAWINGS.
E. ALL DIMENSIONS ON THE DRAWINGS ARE IN UNITS OF FEET AND DECIMALS, UNLESS OTHERWISE SPECIFIED.

FINAL SITE REVIEW

1. GENERAL

- A. THROUGHOUT THE PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF CHANGES IN THE CONTRACT DOCUMENTS.
B. PRIOR TO COMMENCING DEMOBILIZATION, THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ELEMENTS WITH THE CONTRACTING OFFICER, WHO WILL GIVE APPROVAL OR PROVIDE A WRITTEN LIST FINAL ITEMS TO BE CORRECTED.
C. FINAL SITE REVIEW APPROVAL IS CONTINGENT ON THE SUCCESSFUL COMPLETION OF: CONSTRUCTION OF DESIGN ELEMENTS, CLEANING OF THE SITE, REMOVAL OF ALL CONSTRUCTION ACCESS ROADS, RUTS AND STAGING AREAS, RESTORATION OF AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, AND OTHER TASKS AS OUTLINED IN THESE SPECIFICATIONS AND ON THE DRAWINGS.

2. RECORD DOCUMENTS

- A. CONTRACTOR'S SET: SECURE FROM THE CONTRACTING AGENCY ONE COMPLETE SET OF CONTRACT DOCUMENTS FOR USE AS THE CONTRACTOR'S SET OF RECORD DOCUMENTS. LABEL IMMEDIATELY AS "RECORD DOCUMENTS-CONTRACTOR'S SET." USE THIS SET TO RECORD ALL CHANGES IN THE WORK AS THEY OCCUR ON A DAILY BASIS.
B. MAINTAIN THE CONTRACTOR'S SET OF RECORD DOCUMENTS PROTECTED FROM DETERIORATION AND FROM LOSS AND DAMAGE UNTIL COMPLETION OF THE WORK. IN THE EVENT OF LOSS OR DAMAGE USE WHATEVER MEANS NECESSARY TO AGAIN SECURE AND RECORD THE DATA.

3. FINAL CLEANUP

- A. COMPLETE THE FOLLOWING CLEANUP TASKS BEFORE REQUESTING INSPECTION FOR COMPLETION FOR THE ENTIRE PROJECT OR A PORTION OF THE PROJECT.
1. CLEAN THE PROJECT SITE AND GROUNDS IN AREAS DISTURBED BY CONSTRUCTION ACTIVITIES OF RUBBISH, WASTE MATERIALS, LITTER, AND FOREIGN SUBSTANCES. REMOVE ALL WASTE FROM THE PROPERTY, DO NOT BURN, BURY, OR OTHERWISE DISPOSE OF TRASH ON THE PROJECT SITE.
2. REMOVE CONSTRUCTION EQUIPMENT, TOOLS, MACHINERY, AND SURPLUS MATERIAL FROM THE SITE. WHERE EXTRA MATERIALS OF VALUE REMAIN AFTER COMPLETION, COORDINATE WITH THE CONTRACTING OFFICER ON WHERE TO LEAVE THEM ON THE PROJECT SITE.
3. PREPARE ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES THAT ARE ABOVE ORDINARY HIGH WATER FOR SEEDING SPECIFICATIONS OUTLINED IN THESE PLANS AND/OR THE SPECIFICATIONS.
4. LEFTOVER WOODY MATERIAL, WOOD AND OTHER NATIVE ORGANICS MAY BE BROKEN AND BROADCAST OVER THE RESTORED AREA AS APPROVED BY THE CONTRACTING OFFICER.
5. CONTRACTING OFFICER SHALL PROVIDE FINAL APPROVAL OF SITE CLEANUP PRIOR TO DEMOBILIZATION.



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS,MP,JY
APPROVED: JY

DRAWING NAME
GENERALS

GENERALS - 2

DRAWING NO.
G3 97
SHEET 3 OF 4

FILE: B:\PROJECTS\WOOD_HICZUWARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCT\DWGS_GENERAL\DWG-GENERAL.DWG-DATE: 11/06/2024 12:58 PM

GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THESE CONSERVATION MEASURES ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO FISH SPECIES. THE FOLLOWING GENERAL CONSERVATION MEASURES WILL BE APPLIED TO ALL ACTIONS OF THIS PROJECT.

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS

- A. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION.
B. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL ENVIRONMENTAL POLICY ACT, NATIONAL HISTORIC PRESERVATION ACT, THE APPROPRIATE STATE AGENCY REMOVAL AND FILL PERMIT, AND USACE CLEAN WATER ACT (CWA) 404 PERMITS, CWA SECTION 401 WATER QUALITY CERTIFICATIONS.

2. TIMING OF IN-WATER WORK

- A. APPROPRIATE STATE (IDAHO DEPARTMENT OF FISH AND GAME) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.
B. CHANGES TO ESTABLISHED WORK WINDOWS WILL BE APPROVED BY REGIONAL STATE BIOLOGISTS.

3. SITE LAYOUT AND FLAGGING

- A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.
B. AREAS TO BE FLAGGED WILL INCLUDE:
1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
2. EQUIPMENT ENTRY AND EXIT POINTS;
3. ROAD AND STREAM CROSSING ALIGNMENTS;
4. STAGING, STORAGE, AND STOCKPILE AREAS; AND
5. NO-SPRAY AREAS AND BUFFERS.

4. TEMPORARY ACCESS ROADS AND PATHS

- A. EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED.
B. VEHICLE USE AND HUMAN ACTIVITIES, INCLUDING WALKING, IN AREAS OCCUPIED BY TERRESTRIAL ESA-LISTED SPECIES WILL BE MINIMIZED.
C. TEMPORARY ACCESS ROADS AND PATHS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. IF SLOPES ARE STEEPER THAN 30%, THEN THE ROAD WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.
D. THE REMOVAL OF RIPARIAN VEGETATION DURING CONSTRUCTION OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED. WHEN TEMPORARY VEGETATION REMOVAL IS REQUIRED, VEGETATION WILL BE CUT AT GROUND LEVEL (NOT GRUBBED).
E. AT PROJECT COMPLETION, ALL TEMPORARY ACCESS ROADS AND PATHS WILL BE OBLITERATED, AND THE SOIL WILL BE STABILIZED AND REVEGETATED. ROAD AND PATH OBLITERATION REFERS TO THE MOST COMPREHENSIVE DEGREE OF DECOMMISSIONING AND INVOLVES DECOMPACTING THE SURFACE AND DITCH, PULLING THE FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPING TO MATCH THE ORIGINAL CONTOUR.

5. TEMPORARY STREAM CROSSINGS

- A. EXISTING STREAM CROSSINGS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.
B. TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR DIRECTLY OVER WATER.
C. FOR PROJECTS THAT REQUIRE EQUIPMENT AND VEHICLES TO CROSS IN THE WET:
5. THE LOCATION AND NUMBER OF ALL WET CROSSINGS SHALL BE APPROVED BY THE BPA EC LEAD AND DOCUMENTED IN THE CONSTRUCTION PLANS;
6. VEHICLES AND MACHINERY SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHENEVER POSSIBLE;
7. NO STREAM CROSSINGS WILL OCCUR 300 FEET UPSTREAM OR 100 FEET DOWNSTREAM OF AN EXISTING REDD OR SPAWNING FISH; AND
8. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND BANKS RESTORED.

6. STAGING, STORAGE, AND STOCKPILE AREAS

- A. STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. STAGING AREAS CLOSER THAN 150 FEET WILL BE APPROVED BY THE CONTRACTING OFFICER.
B. NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN 150 FEET IF CLEARLY INDICATED IN THE PLANS THAT AREA IS FOR NATURAL MATERIALS ONLY.
C. ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.
D. ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE DISPOSED OF OUTSIDE THE 100-YEAR FLOODPLAIN.

7. EQUIPMENT

- A. MECHANIZED EQUIPMENT AND VEHICLES WILL BE SELECTED, OPERATED, AND MAINTAINED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS ON THE ENVIRONMENT (E.G., MINIMALLY-SIZED, LOW PRESSURE TIRES; MINIMAL HARD-TURN PATHS FOR TRACKED VEHICLES; TEMPORARY MATS OR PLATES WITHIN WET AREAS OR ON SENSITIVE SOILS).
B. EQUIPMENT WILL BE STORED, FUELED, AND MAINTAINED IN AN CLEARLY IDENTIFIED STAGING AREA THAT MEETS STAGING AREA CONSERVATION MEASURES;
C. EQUIPMENT WILL BE REFUELED IN A VEHICLE STAGING AREA OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS);
D. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.
E. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND; AND
F. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

8. EROSION CONTROL

- A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:
1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;
2. IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION;
3. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE SEDGE MATS, FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC;
4. SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS, SOIL MICROORGANISMS, AND VEGETATION;
5. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL; AND
6. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.
B. EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:
1. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
2. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

9. DUST ABATEMENT

- A. THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES BY CONSIDERING SOIL TYPE, EQUIPMENT USAGE, PREVAILING WIND DIRECTION, AND THE EFFECTS CAUSED BY OTHER EROSION AND SEDIMENT CONTROL MEASURES.
B. WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.
C. DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR A STREAM CHANNEL AND WILL BE APPLIED SO AS TO MINIMIZE THE LIKELIHOOD THAT THEY WILL ENTER STREAMS. APPLICATIONS OF LIGNINSULFONATE WILL BE LIMITED TO A MAXIMUM RATE OF 0.5 GALLONS PER SQUARE YARD OF ROAD SURFACE, ASSUMING MIXED 50:50 WITH WATER.
D. APPLICATION OF DUST ABATEMENT CHEMICALS WILL BE AVOIDED DURING OR JUST BEFORE WET WEATHER, AND AT STREAM CROSSINGS OR OTHER AREAS THAT COULD RESULT IN UNFILTERED DELIVERY OF THE DUST ABATEMENT MATERIALS TO A WATERBODY (TYPICALLY THESE WOULD BE AREAS WITHIN 25 FEET OF A WATERBODY OR STREAM CHANNEL; DISTANCES MAY BE GREATER WHERE VEGETATION IS SPARSE OR SLOPES ARE STEEP).
E. SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.
F. PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

10. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES.

- A. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.
B. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.
C. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.
D. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.
E. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.
F. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.

11. INVASIVE SPECIES CONTROL.

- A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.
B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.
C. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES UNLESS DECONTAMINATION PROCEDURES HAVE BEEN APPROVED BY THE EC LEAD.

WORK AREA ISOLATION AND FISH SALVAGE.

1. WORK AREA ISOLATION.

- A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.
B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE IN-WATER WORK WINDOW.
C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).
D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.

2. FISH SALVAGE.

- A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE MAINTAINED BY THE CONTRACTING OFFICER.
B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.
C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODOLOGIES, AND CONSERVATION MEASURES SPECIFIED BELOW:
1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.
2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.
3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.
4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.
5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.
6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.
7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
8. SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.
9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.
11. CONTINUE TO SLOWLY DEWATER STREAM REACH.
12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.
13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.
14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.
15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.
16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.
17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS
WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
GENERALS
CONSERVATION MEASURES - 1

DRAWING NO.
G4 98
SHEET 4 OF 4

FILE: E:\PROJECTS\WOOD_HICKORY\WOOD_HICKORY\SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCTS\GENERALS.DWG - SAVED BY: ZACH SUDMAN PLOT DATE: 11/06/2024 12:58 PM

WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED)

3. ELECTROFISHING.

- A. INITIAL SITE SURVEY AND INITIAL SETTINGS.
1. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.
2. RECORD WATER TEMPERATURE. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18 DEGREES CELSIUS.
3. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.
4. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.
5. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.
B. ELECTROFISHING TECHNIQUE.
1. SAMPLING WILL BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.
2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.
3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.
4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ
5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.
6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.
7. SETTINGS WILL BE LOWERED IN SHALLOWER WATER SINCE VOLTAGE GRADIENTS LIKELY TO INCREASE.
8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).
9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.
C. SAMPLE PROCESSING.
1. FISH SHOULD BE SORTED BY SIZE TO AVOID PREDATION DURING SAMPLING.
2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.
3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES
4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.

4. DEWATERING.

- A. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.
B. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETITIVE DEWATERING AND REWATERING.
C. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA. NMFS ENGINEERING REVIEW AND APPROVAL WILL BE OBTAINED FOR PUMPS EXCEEDING 3 CUBIC FEET PER SECOND.
D. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.
E. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

4. FISH PASSAGE.

- A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.
B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE BPA EC LEAD UNDER ADVISEMENT BY THE NMFS HABITAT BIOLOGIST.

2. CONSTRUCTION AND DISCHARGE WATER.

- A. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
B. DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
C. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS, AND OTHER POLLUTANTS.

3. TIME AND EXTENT OF DISTURBANCE.

- A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.
B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

4. CESSATION OF WORK.

- A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES PERMITTED).
B. WATER QUALITY LEVELS EXCEEDED. SEE CWA SECTION 401 WATER QUALITY CERTIFICATION AND TURBIDITY MEASURES.

5. SITE RESTORATION.

- A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.
B. PROJECT-RELATED WASTE WILL BE REMOVED.
C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENED IF NEEDED FOR REVEGETATION OR WATER INFILTRATION.
D. THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE TO MONITOR AND MAINTAIN THE SITE OVER THE LIFE OF THE PROJECT.

6. REVEGETATION.

- A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.
B. A MIX OF NATIVE SPECIES (INVASIVE SPECIES NOT ALLOWED) APPROPRIATE TO THE SITE WILL BE USED TO REESTABLISH VEGETATION, PROVIDE SHADE, AND REDUCE EROSION. REESTABLISHED VEGETATION SHOULD BE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN THREE YEARS.
C. VEGETATION SUCH AS WILLOWS, SEDGES, OR RUSH MATS WILL BE SALVAGED FROM DISTURBED OR ABANDONED AREAS TO BE REPLANTED.
D. SHORT-TERM STABILIZATION MEASURE MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, OR OTHER SIMILAR TECHNIQUES.
E. SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM, WATE BODY, OR WETLAND.
F. FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.
G. INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY THREE YEARS POST-CONSTRUCTION).

7. SITE ACCESS AND IMPLEMENTATION MONITORING.

- A. THE PROJECT SPONSOR WILL PROVIDE CONSTRUCTION MONITORING DURING IMPLEMENTATION TO ENSURE ALL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED, EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED, AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.
B. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL SUBMIT THE PROJECT COMPLETION FORM (PCF) WITHIN 30 DAYS OF PROJECT COMPLETION.

8. CWA SECTION 401 WATER QUALITY CERTIFICATION.

- A. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS (SEE TURBIDITY MONITORING) TO ENSURE IN-WATER WORK IS NOT DEGRADING WATER QUALITY.
B. DURING CONSTRUCTION, WATER QUALITY PROVISIONS PROVIDED BY THE IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

9. STAGED REWATERING PLAN.

- A. WHEN REINTRODUCING WATER TO DEWATERED AREAS AND NEWLY CONSTRUCTED CHANNELS, A STAGED REWATERING PLAN WILL BE APPLIED.
B. THE FOLLOWING WILL BE APPLIED TO ALL REWATERING EFFORTS. COMPLEX REWATERING EFFORTS MAY REQUIRE ADDITIONAL NOTES OR A DEDICATED SHEET IN THE CONSTRUCTION DETAILS.
1. TURBIDITY MONITORING PROTOCOL WILL BE APPLIED TO REWATERING EFFORTS.
2. PRE-WASH THE AREA BEFORE REWATERING. TURBID WASH WATER WILL BE DETAINED AND PUMPED TO THE FLOODPLAIN OR SEDIMENT CAPTURE AREAS RATHER THAN DISCHARGING TO FISH-BEARING STREAMS.
3. INSTALL SEINE NETS AT UPSTREAM END TO PREVENT FISH FROM MOVING DOWNSTREAM UNTIL 2/3 OF TOTAL FLOW IS RESTORED TO THE CHANNEL.
4. STARTING IN EARLY MORNING INTRODUCE 1/3 OF NEW CHANNEL FLOW OVER PERIOD OF 1-2 HOURS.
5. INTRODUCE SECOND THIRD OF FLOW OVER NEXT 1 TO 2 HOURS AND BEGIN FISH SALVAGE OF BYPASS CHANNEL IF FISH ARE PRESENT.
6. REMOVE UPSTREAM SEINE NETS ONCE 2/3 FLOW IN REWATERED CHANNEL AND DOWNSTREAM TURBIDITY IS WITHIN ACCEPTABLE RANGE (LESS THAN 40 NTU OR LESS THAN 10% BACKGROUND).
7. INTRODUCE FINAL THIRD OF FLOW ONCE FISH SALVAGE EFFORTS ARE COMPLETE AND DOWNSTREAM TURBIDITY VERIFIED TO BE WITHIN ACCEPTABLE RANGE.
8. INSTALL PLUG TO BLOCK FLOW INTO OLD CHANNEL OR BYPASS. REMOVE ANY REMAINING SEINE NETS.
9. IN LAMPREY SYSTEMS, PERFORM LAMPREY SALVAGE AND DRY SHOCKING MAY BE NECESSARY.

10. TURBIDITY MONITORING.

- A. RECORD THE READING, LOCATION, AND TIME FOR THE BACKGROUND READING APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER OR VIA VISUAL OBSERVATION (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).
B. RECORD THE TURBIDITY READING, LOCATION, AND TIME AT THE MEASUREMENT COMPLIANCE LOCATION POINT.
1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.
2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.
3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.
4. 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.
C. TURBIDITY SHALL BE MEASURED (BACKGROUND LOCATION AND COMPLIANCE POINTS) EVERY 4 HOURS WHILE WORK IS BEING IMPLEMENTED.
D. IF THERE IS A VISIBLE DIFFERENCE BETWEEN A COMPLIANCE POINT AND THE BACKGROUND, THE EXCEEDANCE WILL BE NOTED IN THE PROJECT COMPLETION FORM (PCF). ADJUSTMENTS OR CORRECTIVE MEASURES WILL BE TAKEN IN ORDER TO REDUCE TURBIDITY.
E. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 8 HOURS), THE ACTIVITY WILL STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND. THE BPA EC LEAD WILL BE NOTIFIED OF ALL EXCEEDANCES AND CORRECTIVE ACTIONS AT PROJECT COMPLETION.
F. IF TURBIDITY CONTROLS (COFFER DAMS, WADDLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, CREWS WILL BE MOBILIZED TO MODIFY AS NECESSARY. OCCURRENCES WILL BE DOCUMENTED IN THE PROJECT COMPLETION FORM (PCF).
G. FINAL TURBIDITY READINGS, EXCEEDANCES, AND CONTROL FAILURES WILL BE SUBMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS
WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

WORKING DRAFT
NOT FOR CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
GENERALS
CONSERVATION MEASURES - 2

DRAWING NO.
G5 99
SHEET 5 OF 4

FILE: E:\PROJECTS\BIBAC\WOOD_HICZZUWARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCTION\DWG_GENERAL\5.DWG-SAVED.B17: ZACH SUOMAIN PLOT DATE: 11/06/2024 12:58 PM

QUANTITIES

ITEM DESCRIPTION	QUANTITY	UNIT
GENERAL		
MOBILIZATION AND DEMOBILIZATION	1	LS
COFFERDAMS, PUMPING, DEWATERING, & WATER MANAGEMENT	1	LS
STORMWATER, SITE ACCESS, PREPARATION, & HOUSEKEEPING	1	LS
SURVEYING/CONSTRUCTION STAKING/MACHINE CONTROL	1	LS
SITE WORK		
CHANNEL AND FLOODPLAIN EXCAVATION	36,359	CY
DEMOLITION	1	LS
CLASS 1 CONSTRUCTED RIFFLE MATERIAL	866	CY
CLASS 2 CONSTRUCTED RIFFLE MATERIAL	323	CY
CLASS 3 CONSTRUCTED RIFFLE MATERIAL	570	CY
HABITAT BOULDER	157	EA
WOOD MATERIAL ACQUISITION AND DELIVERY	1	LS
HS-1: SIX LOG STRUCTURE	7	EA
HS-3: SINGLE LOG STRUCTURE	55	EA
HS-4: WHOLE TREE STRUCTURE	18	EA
HS-5: CONSTRUCTION JAM	1	EA
HS-6: SMALL APEX JAM	1	EA
HS-7: FLOODPLAIN INUNDATION STRUCTURE	70	LF
HS-8: BLEEDER JAM	2	EA
SHORT ROUGHENED EDGE TREATMENT	550	LF
WILLOW BAFFLE	320	LF
ROLLED STEEL GIRDER BRIDGE	1	LS
2 - 36" DIA. 60-FT CORRUGATED METAL PIPE CULVERT	1	LS
BALDY CHANNEL INLET	1	LS

LARGE WOOD MATERIAL QUANTITIES

MATERIAL TYPE	SIZE (DBH) (IN)	MIN. LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	TOTAL (EA)
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	99
TYPE 2	13 - 22	30 - 40	NO	NA	NO	95
TYPE 3	13 - 22	40 - 60	YES	4	YES	20
TYPE 4	12 - 14	20 - 35	NO	NA	NO	1
TYPE 5	13 - 22	40 - 50	YES	4.5	NO	5
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	224
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	578
SLASH-1	1 - 4	5 - 15	NA	NA	YES	855
SLASH-2	1 - 4	5 - 15	NA	NA	YES	487
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	1453

NOTE:
ONE RACKING-1 OR RACKING-2 MEMBER PER STRUCTURE MAY BE COTTONWOOD (UP TO 144 COTTONWOOD RACKING MEMBERS).



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS
 WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
 DESIGNED: ZS, MP, JY
 APPROVED: JY

DRAWING NAME
 GENERALS
 QUANTITIES

DRAWING NO. G6
 SHEET 6 OF 100

FILE: R:\PROJECTS\BCE_WOOD_HICZZ\WARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CAD\PRODUCT\DWG_GENERAL\GENERAL.DWG-*SAVED BY: ZACH SUDDMAN PLOT DATE: 11/06/2024 1:27 PM*

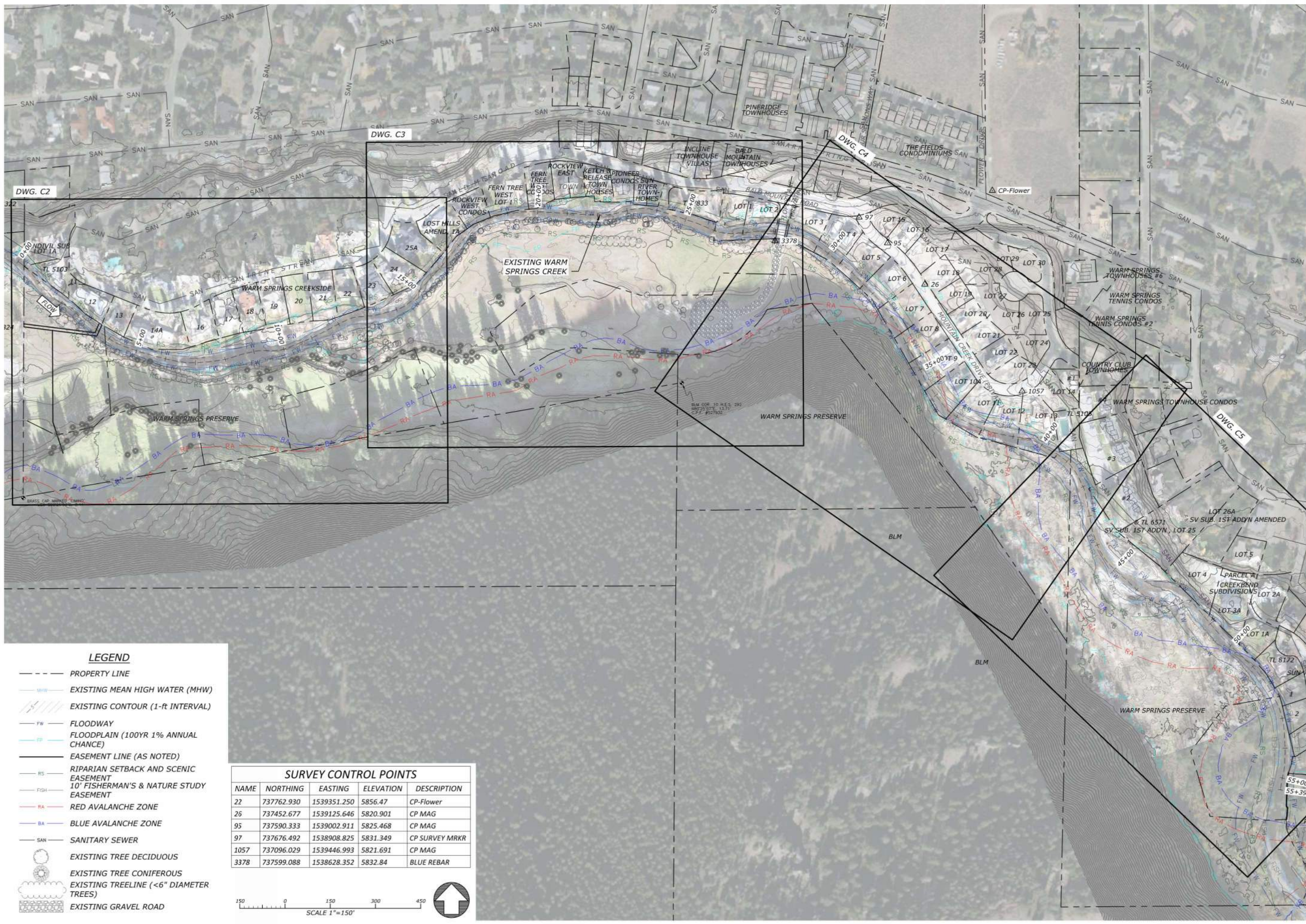
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NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
EXISTING CONDITIONS

OVERVIEW

DRAWING NO. C1 101
SHEET 7 OF

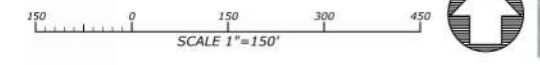


LEGEND

- PROPERTY LINE
- EXISTING MEAN HIGH WATER (MHW)
- EXISTING CONTOUR (1-ft INTERVAL)
- FW FLOODWAY
- FLOODPLAIN (100YR 1% ANNUAL CHANCE)
- EASEMENT LINE (AS NOTED)
- RS RIPARIAN SETBACK AND SCENIC EASEMENT
- FISH 10' FISHERMAN'S & NATURE STUDY EASEMENT
- RA RED AVALANCHE ZONE
- BA BLUE AVALANCHE ZONE
- SAN SANITARY SEWER
- EXISTING TREE DECIDUOUS
- EXISTING TREE CONIFEROUS
- EXISTING TREELINE (<6" DIAMETER TREES)
- EXISTING GRAVEL ROAD

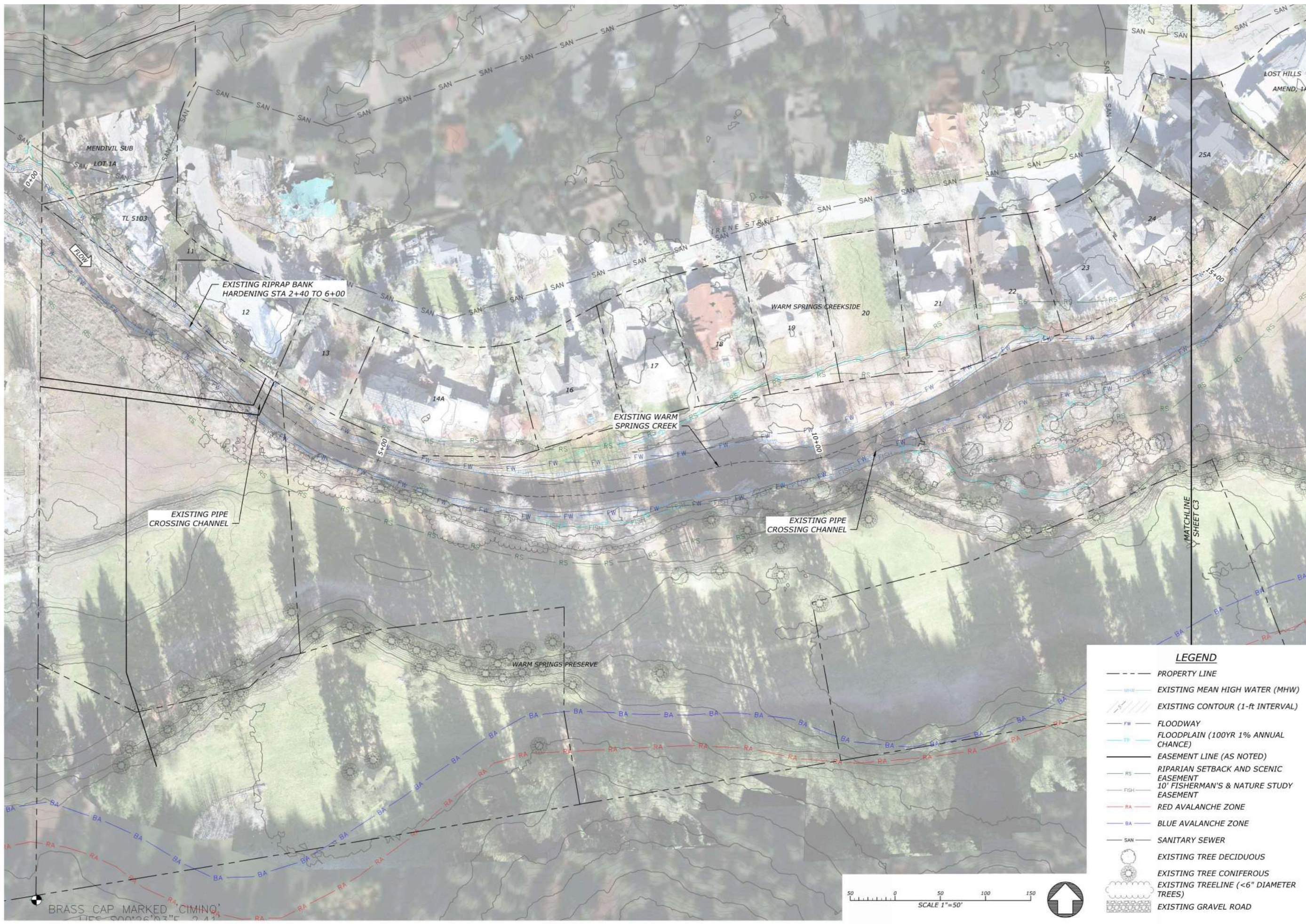
SURVEY CONTROL POINTS

NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
22	737762.930	1539351.250	5856.47	CP-Flower
26	737452.677	1539125.646	5820.901	CP MAG
95	737590.333	1539002.911	5825.468	CP MAG
97	737676.492	1538908.825	5831.349	CP SURVEY MRKR
1057	737096.029	1539446.993	5821.691	CP MAG
3378	737599.088	1538628.352	5832.84	BLUE REBAR



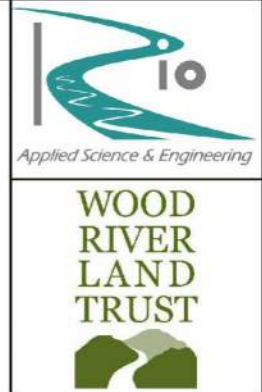
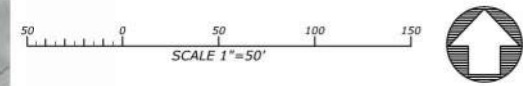
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LEGEND

- PROPERTY LINE
- MHW — EXISTING MEAN HIGH WATER (MHW)
- EXISTING CONTOUR (1-ft INTERVAL)
- FW — FLOODWAY
- FLOODPLAIN (100YR 1% ANNUAL CHANCE)
- EASEMENT LINE (AS NOTED)
- RS — RIPARIAN SETBACK AND SCENIC EASEMENT
- FISH — 10' FISHERMAN'S & NATURE STUDY EASEMENT
- RA — RED AVALANCHE ZONE
- BA — BLUE AVALANCHE ZONE
- SAN — SANITARY SEWER
- EXISTING TREE DECIDUOUS
- EXISTING TREE CONIFEROUS
- EXISTING TREELINE (<6" DIAMETER TREES)
- ▒ EXISTING GRAVEL ROAD



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

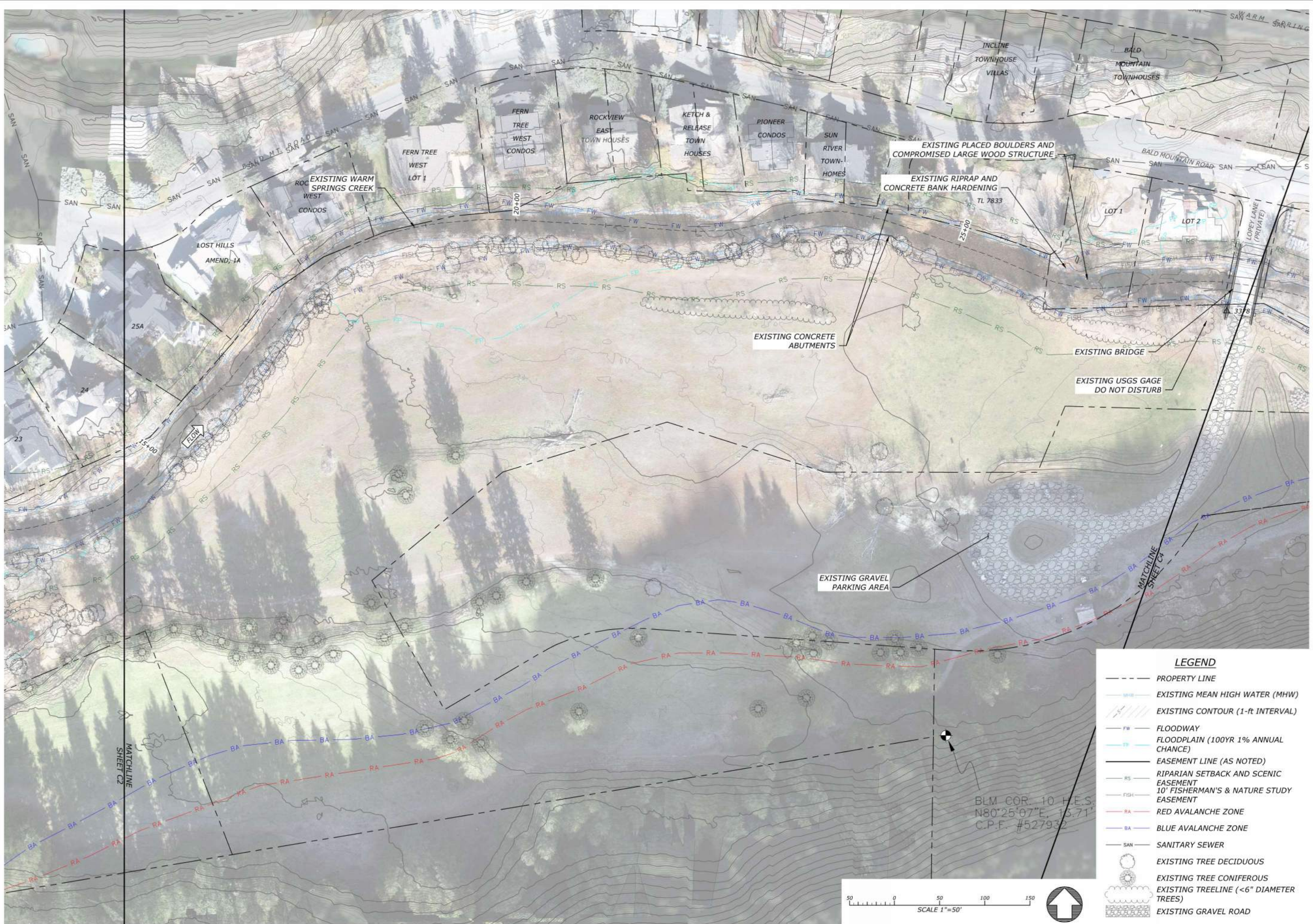
95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

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NOT FOR
CONSTRUCTION**

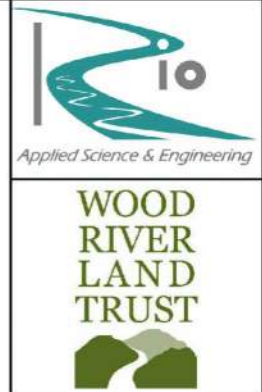
DATE:	11/6/2024
DESIGNED:	ZS, MP, JY
APPROVED:	JY
DRAWING NAME	EXISTING CONDITIONS
PLAN 1	
DRAWING NO.	C2 102
SHEET 8 OF	

FILE: R:\PROJECTS\BGC_WOOD_HICZZ\WARM_SPRINGS_PRESERVE_CREEK_SAVED_BY_ZACH_SUDMAN.BIT DATE: 11/06/2024 1:00 PM



LEGEND

	PROPERTY LINE
	EXISTING MEAN HIGH WATER (MHW)
	EXISTING CONTOUR (1-ft INTERVAL)
	FLOODWAY
	FLOODPLAIN (100YR 1% ANNUAL CHANCE)
	EASEMENT LINE (AS NOTED)
	RIPARIAN SETBACK AND SCENIC EASEMENT
	10' FISHERMAN'S & NATURE STUDY EASEMENT
	RED AVALANCHE ZONE
	BLUE AVALANCHE ZONE
	SANITARY SEWER
	EXISTING TREE DECIDUOUS
	EXISTING TREE CONIFEROUS
	EXISTING TREELINE (<6" DIAMETER TREES)
	EXISTING GRAVEL ROAD



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

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DATE: 11/6/2024
DESIGNED: ZS, MP, JY
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DRAWING NAME
EXISTING CONDITIONS

PLAN 2

DRAWING NO. C3 103
SHEET 9 OF

WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

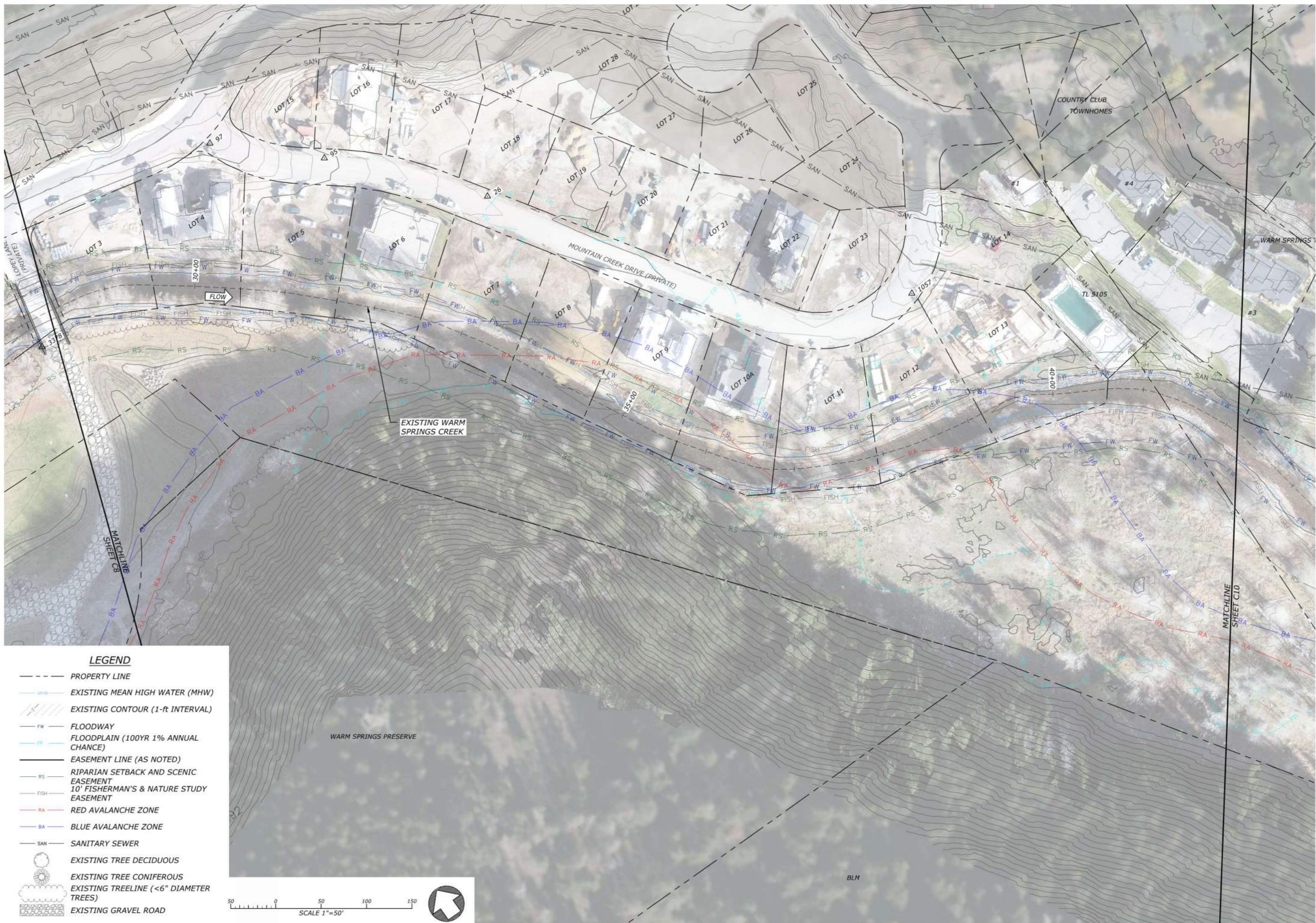
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DESIGNED: ZS.MP. JY
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DRAWING NAME
EXISTING CONDITIONS

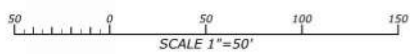
PLAN 3

DRAWING NO. C4 104
SHEET 10 OF 10



LEGEND

- PROPERTY LINE
- EXISTING MEAN HIGH WATER (MHW)
- EXISTING CONTOUR (1-ft INTERVAL)
- FW FLOODWAY
- FLOODPLAIN (100YR 1% ANNUAL CHANCE)
- EASEMENT LINE (AS NOTED)
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- FISH 10' FISHERMAN'S & NATURE STUDY EASEMENT
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- SAN SANITARY SEWER
- EXISTING TREE DECIDUOUS
- EXISTING TREE CONIFEROUS
- EXISTING TREELINE (<6" DIAMETER TREES)
- EXISTING GRAVEL ROAD



FILE: R:\PROJECTS\BCE_WOOD_HUC22\WARM_SPRINGS_PRESERVE_CIVIL\EXISTING_CONDITIONS.DWG, SAVED BY: ZACH STONMAN, PLOT DATE: 11/06/2024, 1:00 PM

WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

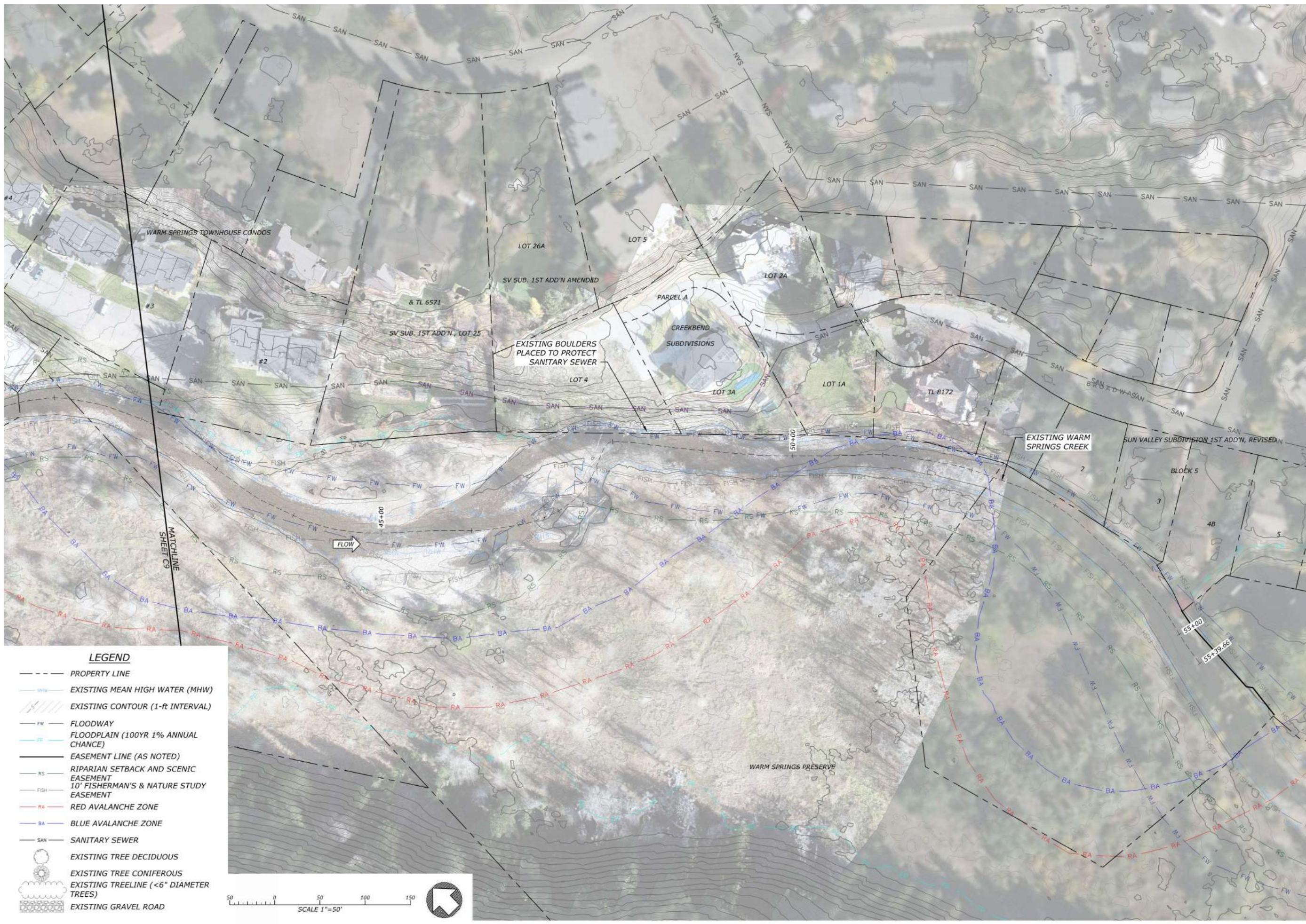
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
EXISTING CONDITIONS

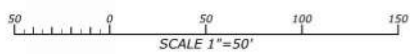
PLAN 4

DRAWING NO. C5 105
SHEET 11 OF



LEGEND

- PROPERTY LINE
- EXISTING MEAN HIGH WATER (MHW)
- EXISTING CONTOUR (1-ft INTERVAL)
- FW FLOODWAY
- FLOODPLAIN (100YR 1% ANNUAL CHANCE)
- EASEMENT LINE (AS NOTED)
- RS RIPARIAN SETBACK AND SCENIC EASEMENT
- FISH 10' FISHERMAN'S & NATURE STUDY EASEMENT
- RA RED AVALANCHE ZONE
- BA BLUE AVALANCHE ZONE
- SAN SANITARY SEWER
- EXISTING TREE DECIDUOUS
- EXISTING TREE CONIFEROUS
- EXISTING TREELINE (<6" DIAMETER TREES)
- EXISTING GRAVEL ROAD



FILE: R:\PROJECTS\BCE_WOOD_HICZZ\WARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCTS\DWG_EXISTING_CONDITIONS.DWG, SAVED BY: ZACH STONMAN, PLOT DATE: 11/06/2024, 1:00 PM

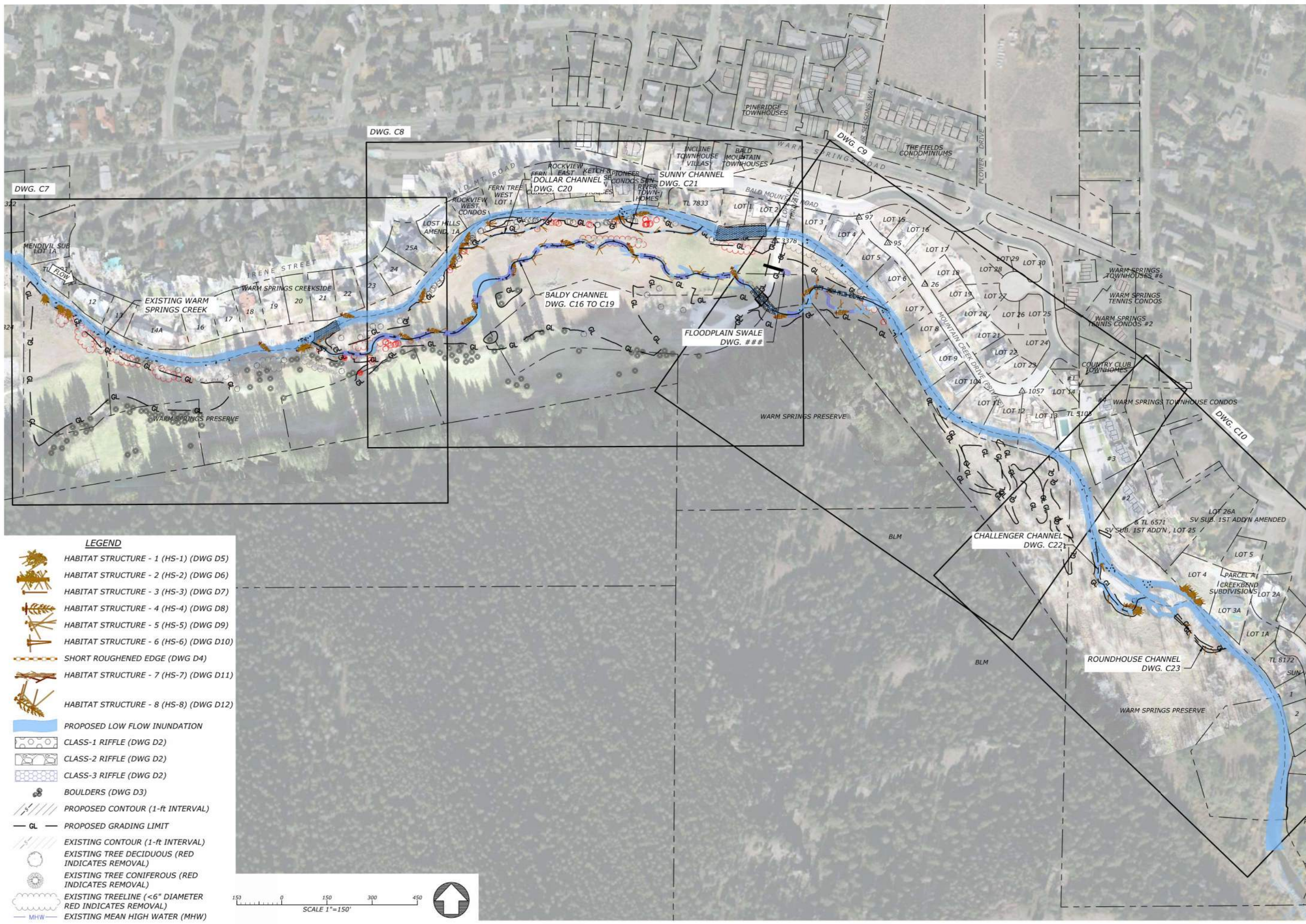
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

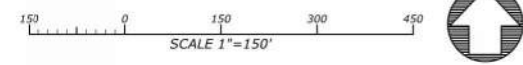
OVERVIEW

DRAWING NO. C6 106
SHEET 12 OF



LEGEND

- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
- HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
- HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
- HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
- HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
- HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
- HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
- HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
- PROPOSED LOW FLOW INUNDATION
- CLASS-1 RIFFLE (DWG D2)
- CLASS-2 RIFFLE (DWG D2)
- CLASS-3 RIFFLE (DWG D2)
- BOULDERS (DWG D3)
- PROPOSED CONTOUR (1-ft INTERVAL)
- PROPOSED GRADING LIMIT
- EXISTING CONTOUR (1-ft INTERVAL)
- EXISTING TREE DECIDUOUS (RED INDICATES REMOVAL)
- EXISTING TREE CONIFEROUS (RED INDICATES REMOVAL)
- EXISTING TREELINE (<6" DIAMETER RED INDICATES REMOVAL)
- EXISTING MEAN HIGH WATER (MHW)



FILE: R:\PROJECTS\BCE_WOOD_HUC22\WARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CAD\PRODUCT\DWG_PROD\PROPOSED_CONDITIONS.DWG SAVED BY: ZACH SUDMAN PLOT DATE: 11/6/2024 1:02 PM

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DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

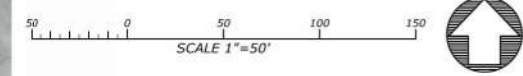
DRAWING NAME
PROPOSED CONDITIONS

PLAN - 1

DRAWING NO. C7 107
SHEET 13 OF



FILE: R:\PROJECTS\BCE_WOOD_HUC22\WARM_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CAD\PRODUCT\DWG_PROD\PROPOSED_CONDITIONS.DWG SAVED BY: ZACH SUDMAN PLOT DATE: 11/6/2024 1:02 PM



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

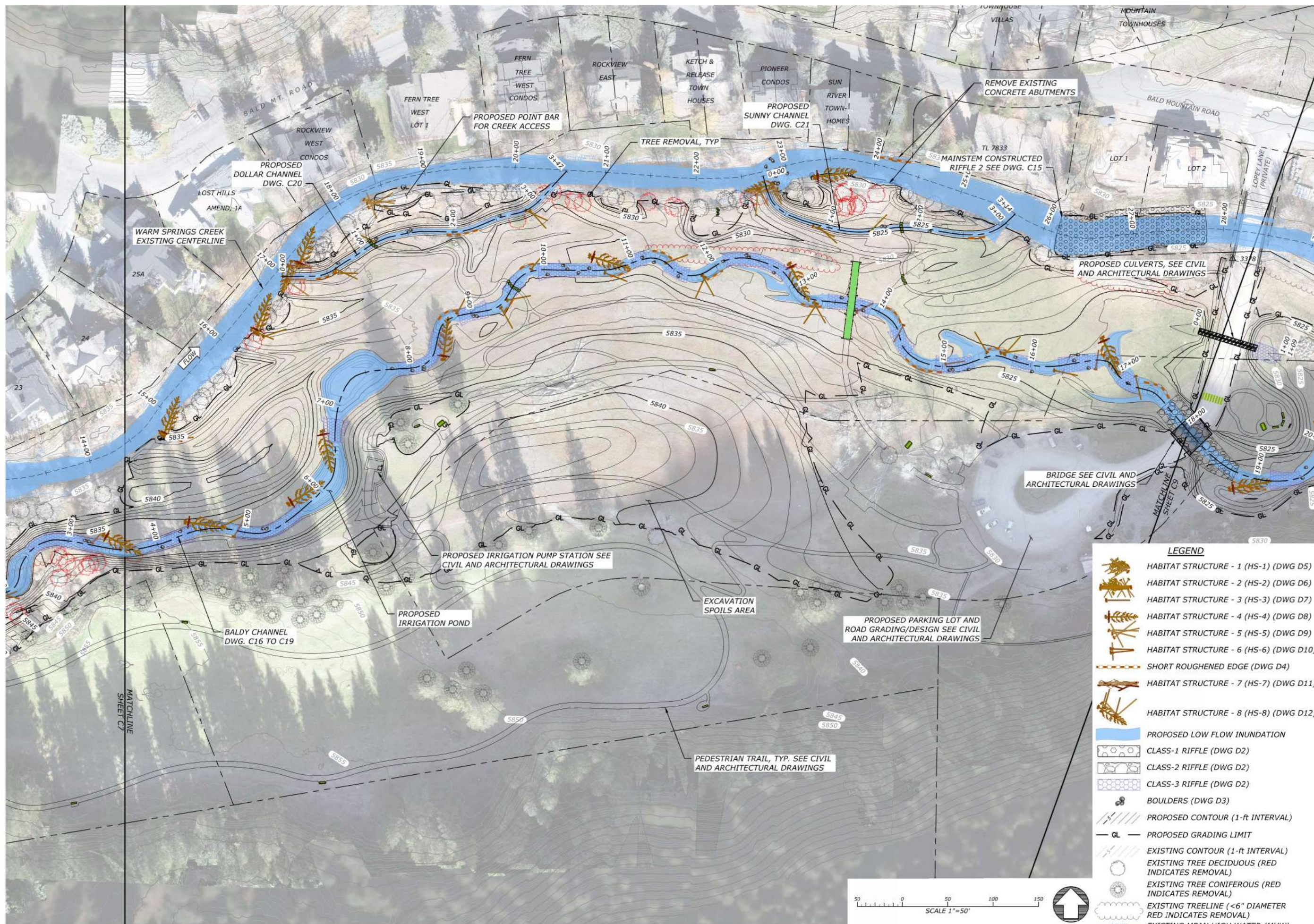
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

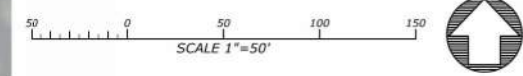
PLAN - 2

DRAWING NO. C8 108
SHEET 14 OF



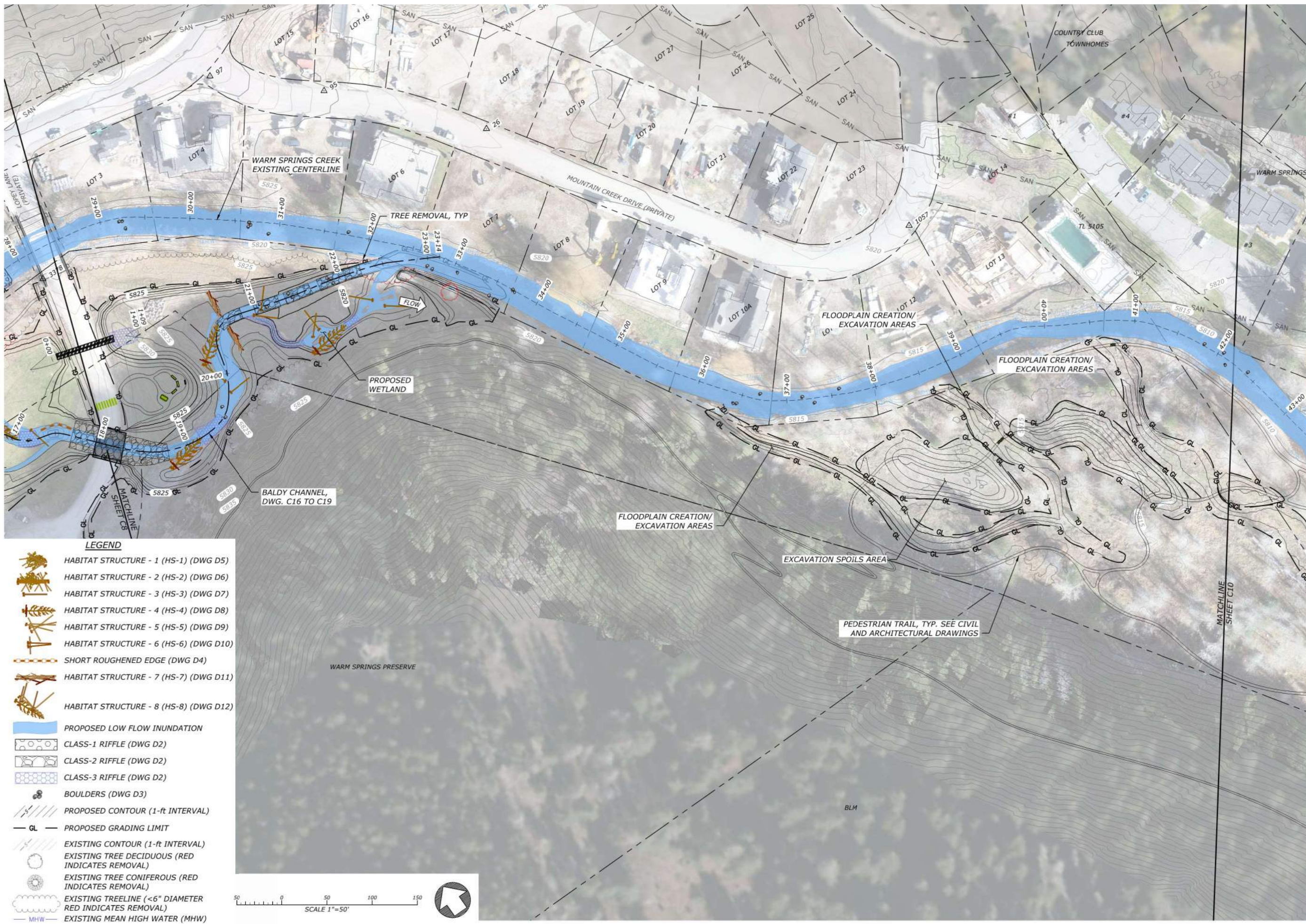
LEGEND

	HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
	HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
	HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
	HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
	HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
	HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
	HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
	HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
	PROPOSED LOW FLOW INUNDATION
	CLASS-1 RIFFLE (DWG D2)
	CLASS-2 RIFFLE (DWG D2)
	CLASS-3 RIFFLE (DWG D2)
	BOULDERS (DWG D3)
	PROPOSED CONTOUR (1-ft INTERVAL)
	PROPOSED GRADING LIMIT
	EXISTING CONTOUR (1-ft INTERVAL)
	EXISTING TREE DECIDUOUS (RED INDICATES REMOVAL)
	EXISTING TREE CONIFEROUS (RED INDICATES REMOVAL)
	EXISTING TREELINE (<6" DIAMETER RED INDICATES REMOVAL)
	EXISTING MEAN HIGH WATER (MHW)



FILE: R:\PROJECTS\WOOD_HUC\Z\WARM_SPRINGS_PRESERVE\DWG\PRODUCTION\95%_PROPOSED_CONDITIONS.DWG SAVED BY: ZACH SUDMAN PLOT DATE: 11/6/2024 1:02 PM

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WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

95% DESIGN DRAWINGS

WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

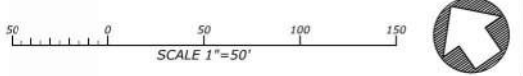
DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

PLAN - 3

DRAWING NO. C9 109
SHEET 15 OF

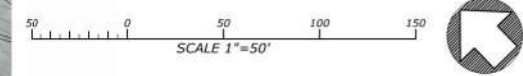
- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - EXISTING CONTOUR (1-ft INTERVAL)
 - EXISTING TREE DECIDUOUS (RED INDICATES REMOVAL)
 - EXISTING TREE CONIFEROUS (RED INDICATES REMOVAL)
 - EXISTING TREELINE (<6" DIAMETER RED INDICATES REMOVAL)
 - EXISTING MEAN HIGH WATER (MHW)





LEGEND

	HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
	HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
	HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
	HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
	HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
	HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
	HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
	HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
	PROPOSED LOW FLOW INUNDATION
	CLASS-1 RIFFLE (DWG D2)
	CLASS-2 RIFFLE (DWG D2)
	CLASS-3 RIFFLE (DWG D2)
	BOULDERS (DWG D3)
	PROPOSED CONTOUR (1-ft INTERVAL)
	PROPOSED GRADING LIMIT
	EXISTING CONTOUR (1-ft INTERVAL)
	EXISTING TREE DECIDUOUS (RED INDICATES REMOVAL)
	EXISTING TREE CONIFEROUS (RED INDICATES REMOVAL)
	EXISTING TREELINE (<6" DIAMETER RED INDICATES REMOVAL)
	EXISTING MEAN HIGH WATER (MHW)



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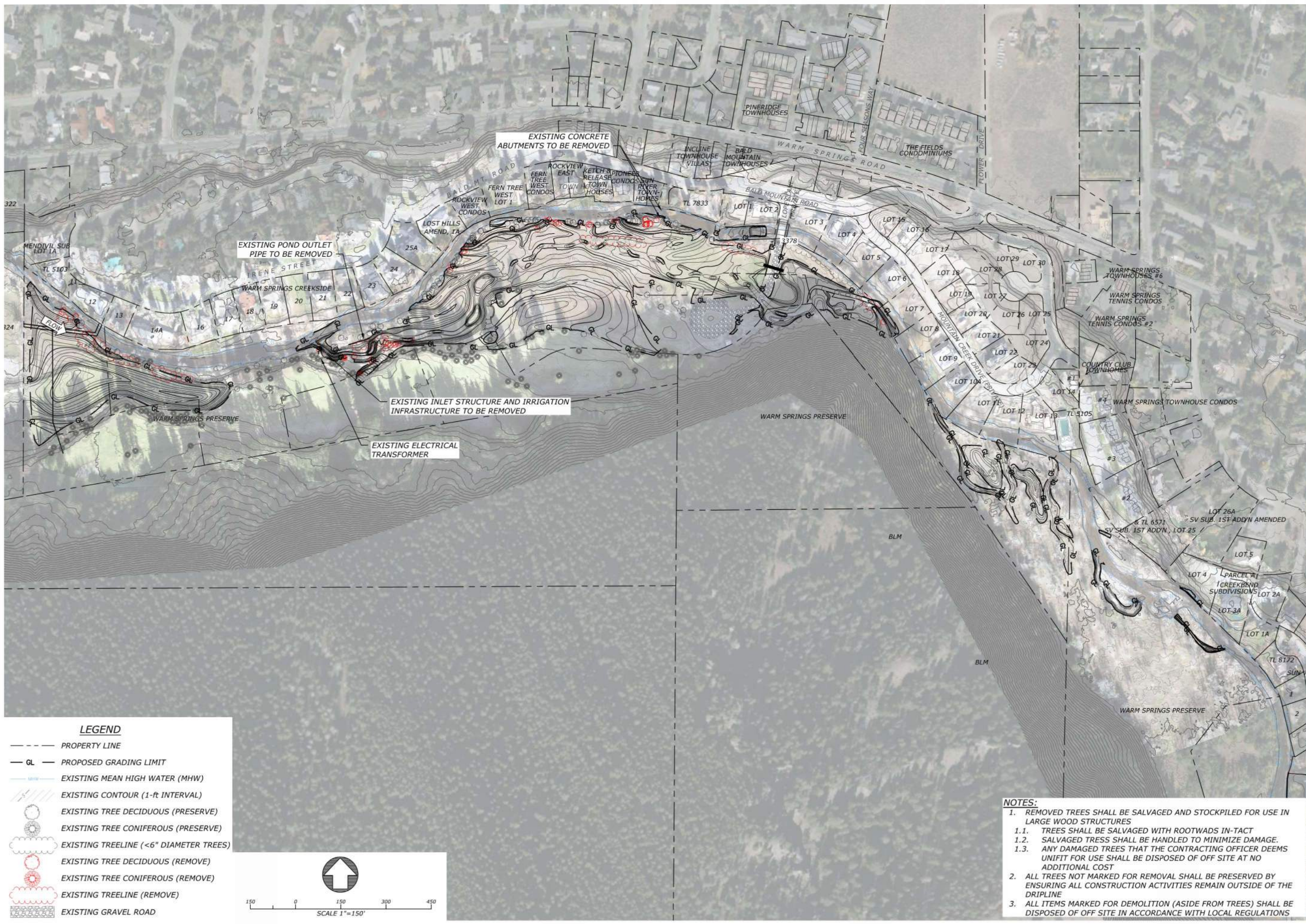
DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

PLAN - 4

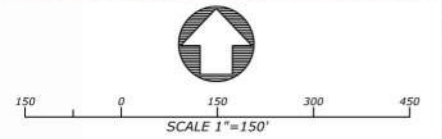
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SHEET 16 OF

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LEGEND

- PROPERTY LINE
- GL — PROPOSED GRADING LIMIT
- MHW — EXISTING MEAN HIGH WATER (MHW)
- EXISTING CONTOUR (1-ft INTERVAL)
- EXISTING TREE DECIDUOUS (PRESERVE)
- EXISTING TREE CONIFEROUS (PRESERVE)
- EXISTING TREELINE (<6" DIAMETER TREES)
- EXISTING TREE DECIDUOUS (REMOVE)
- EXISTING TREE CONIFEROUS (REMOVE)
- EXISTING TREELINE (REMOVE)
- EXISTING GRAVEL ROAD



NOTES:

1. REMOVED TREES SHALL BE SALVAGED AND STOCKPILED FOR USE IN LARGE WOOD STRUCTURES
 - 1.1. TREES SHALL BE SALVAGED WITH ROOTWADS IN-TACT
 - 1.2. SALVAGED TREES SHALL BE HANDLED TO MINIMIZE DAMAGE.
 - 1.3. ANY DAMAGED TREES THAT THE CONTRACTING OFFICER DEEMS UNFIT FOR USE SHALL BE DISPOSED OF OFF SITE AT NO ADDITIONAL COST
2. ALL TREES NOT MARKED FOR REMOVAL SHALL BE PRESERVED BY ENSURING ALL CONSTRUCTION ACTIVITIES REMAIN OUTSIDE OF THE DRIPLINE
3. ALL ITEMS MARKED FOR DEMOLITION (ASIDE FROM TREES) SHALL BE DISPOSED OF OFF SITE IN ACCORDANCE WITH LOCAL REGULATIONS

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

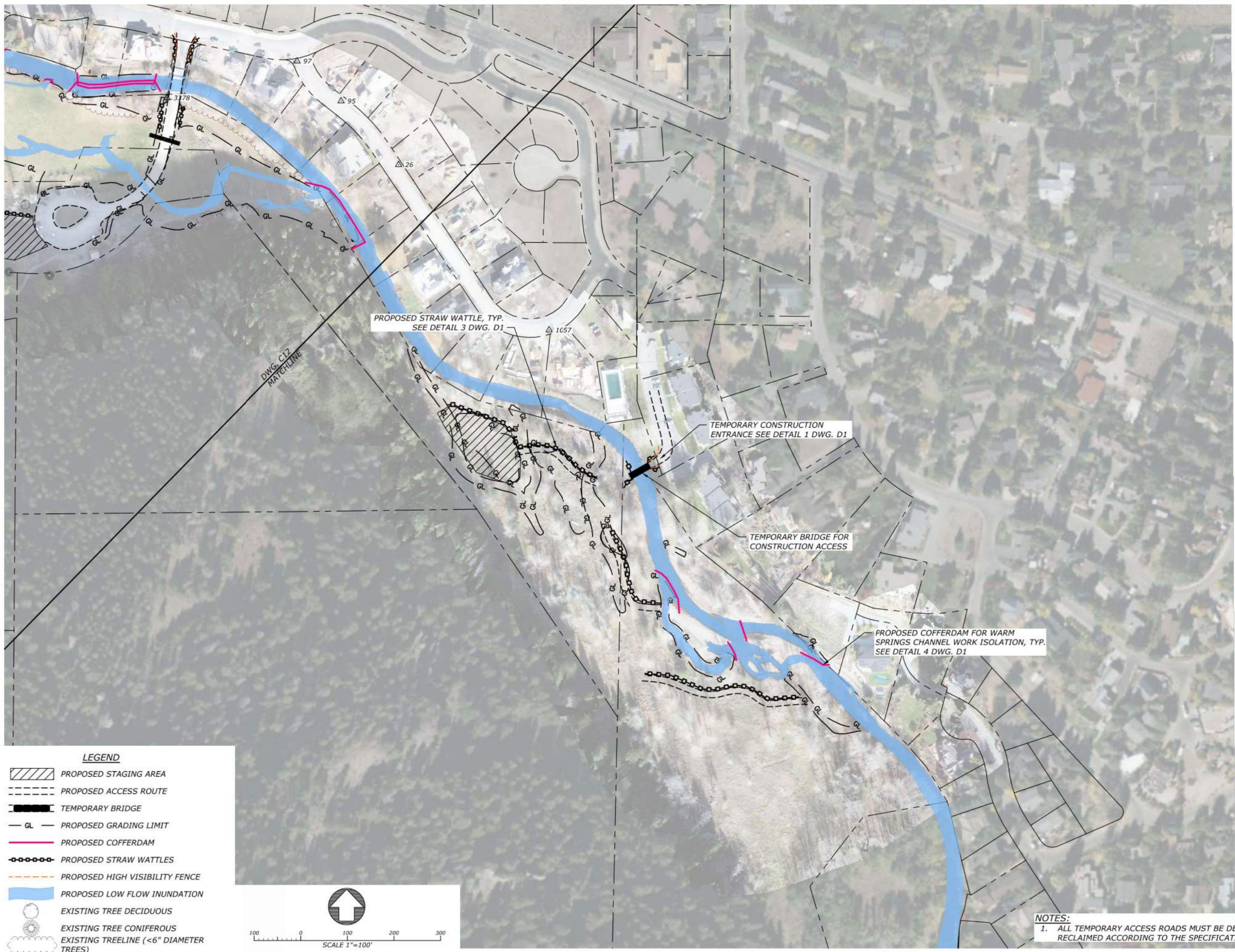
DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

DEMO OVERVIEW

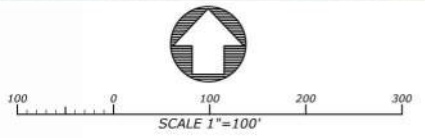
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SHEET 17 OF

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LEGEND

- PROPOSED STAGING AREA
- PROPOSED ACCESS ROUTE
- TEMPORARY BRIDGE
- PROPOSED GRADING LIMIT
- PROPOSED COFFERDAM
- PROPOSED STRAW WATTLES
- PROPOSED HIGH VISIBILITY FENCE
- PROPOSED LOW FLOW INUNDATION
- EXISTING TREE DECIDUOUS
- EXISTING TREE CONIFEROUS
- EXISTING TREELINE (<6" DIAMETER TREES)



NOTES:

1. ALL TEMPORARY ACCESS ROADS MUST BE DECOMPACTED AND RECLAIMED ACCORDING TO THE SPECIFICATIONS AND PLANTING PLAN

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CONSTRUCTION**

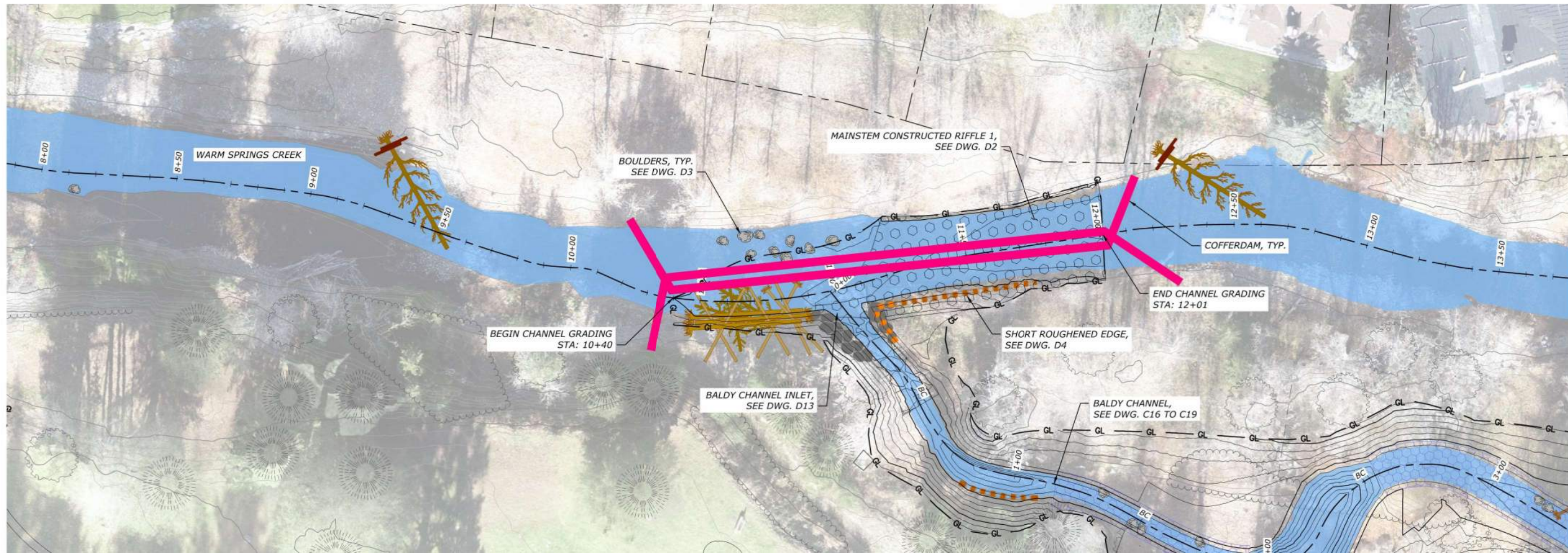
DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
PROPOSED CONDITIONS

ACCESS STAGING & EROSION CONTROL PLAN-2

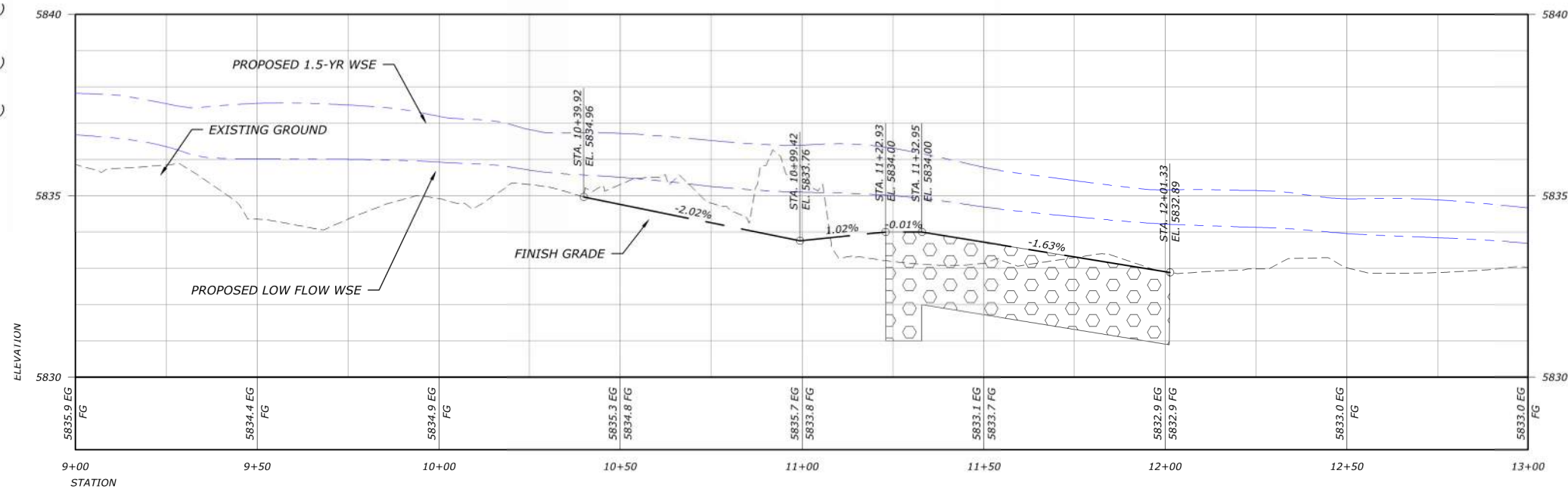
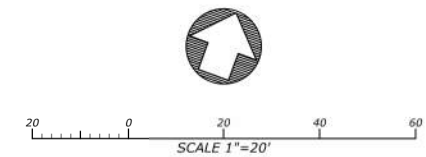
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SHEET 19 OF

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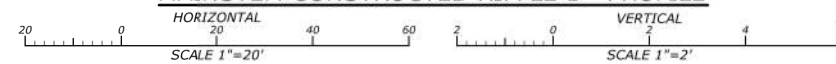


MAINSTEM CONSTRUCTED RIFFLE 1 - PLAN

- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



MAINSTEM CONSTRUCTED RIFFLE 1 - PROFILE



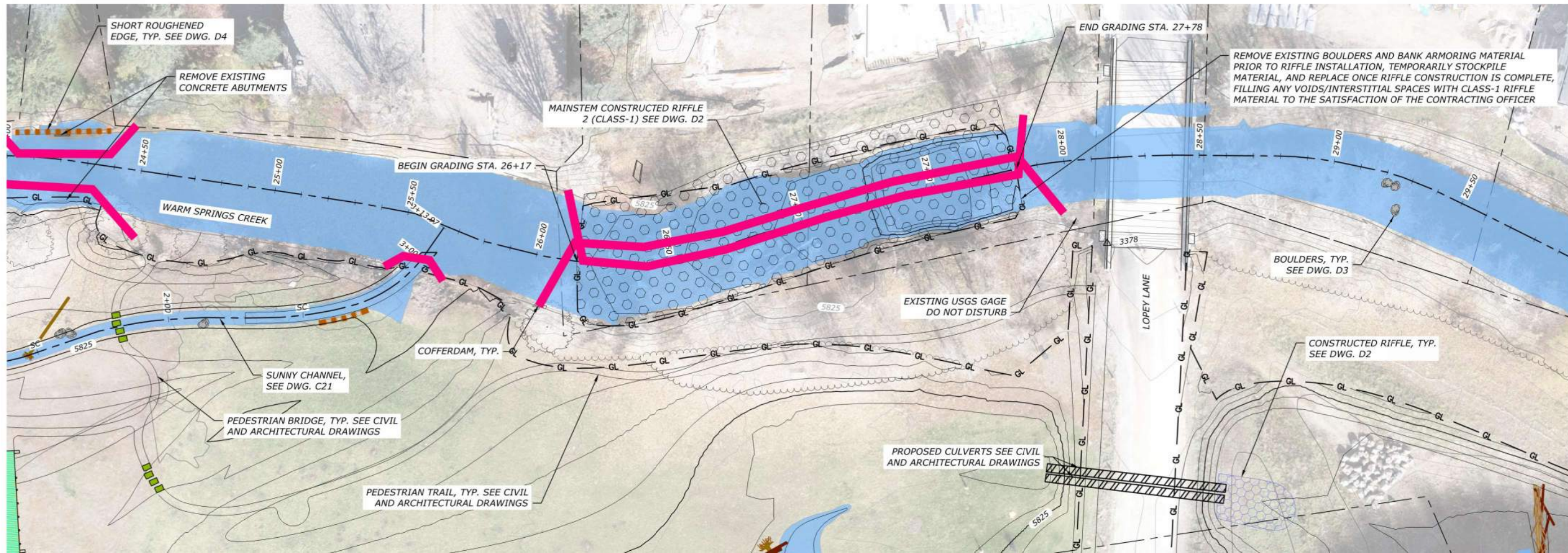
**WORKING DRAFT
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CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

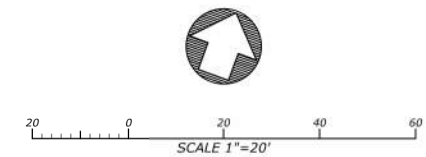
DRAWING NAME
MAINSTEM PLAN AND PROFILE

RIFFLE 1 - STA 10+39 TO 12+01

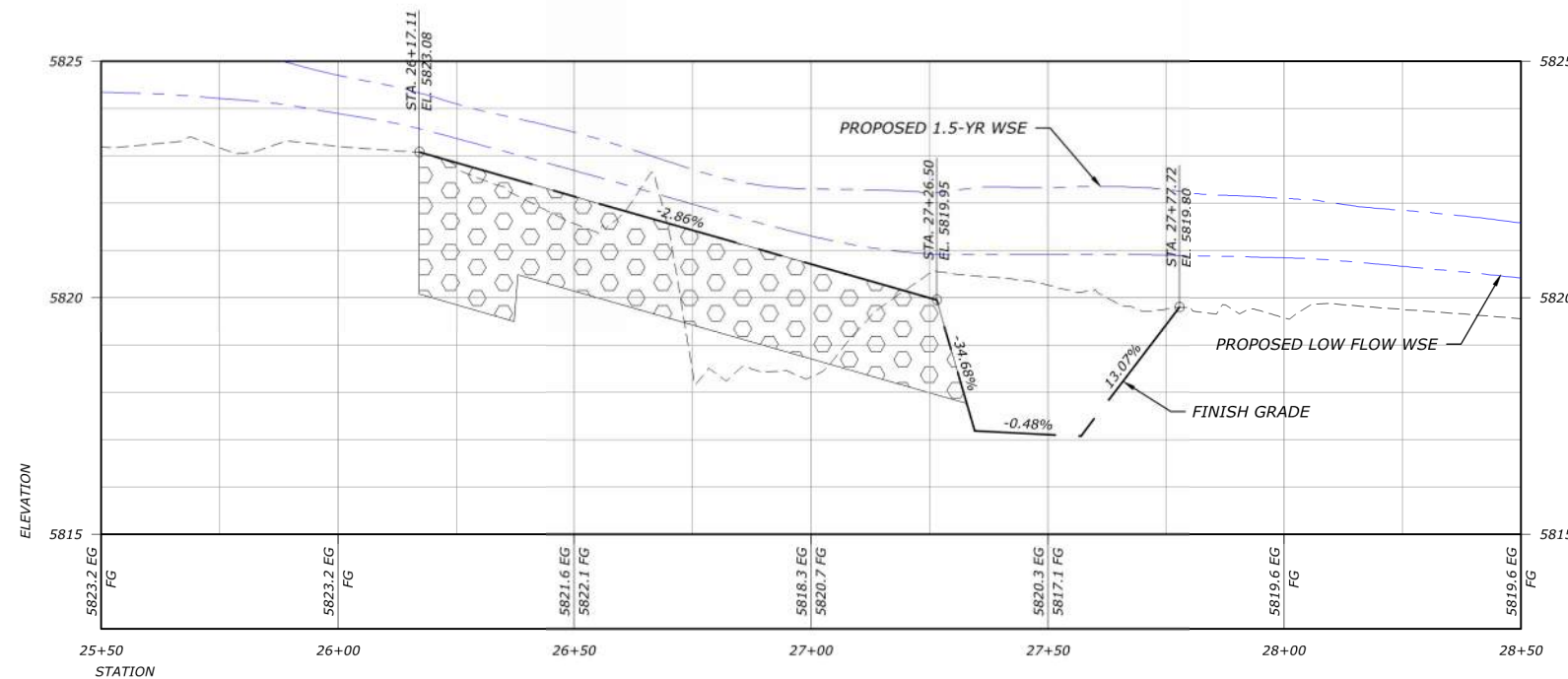
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C14 114
SHEET 20 OF



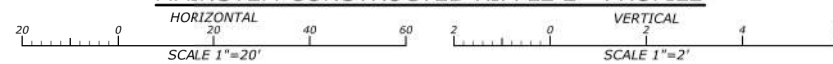
MAINSTEM CONSTRUCTED RIFFLE 2 - PLAN



- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - SHORT ROUGHENED EDGE (DWG D4)
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



MAINSTEM CONSTRUCTED RIFFLE 2 - PROFILE



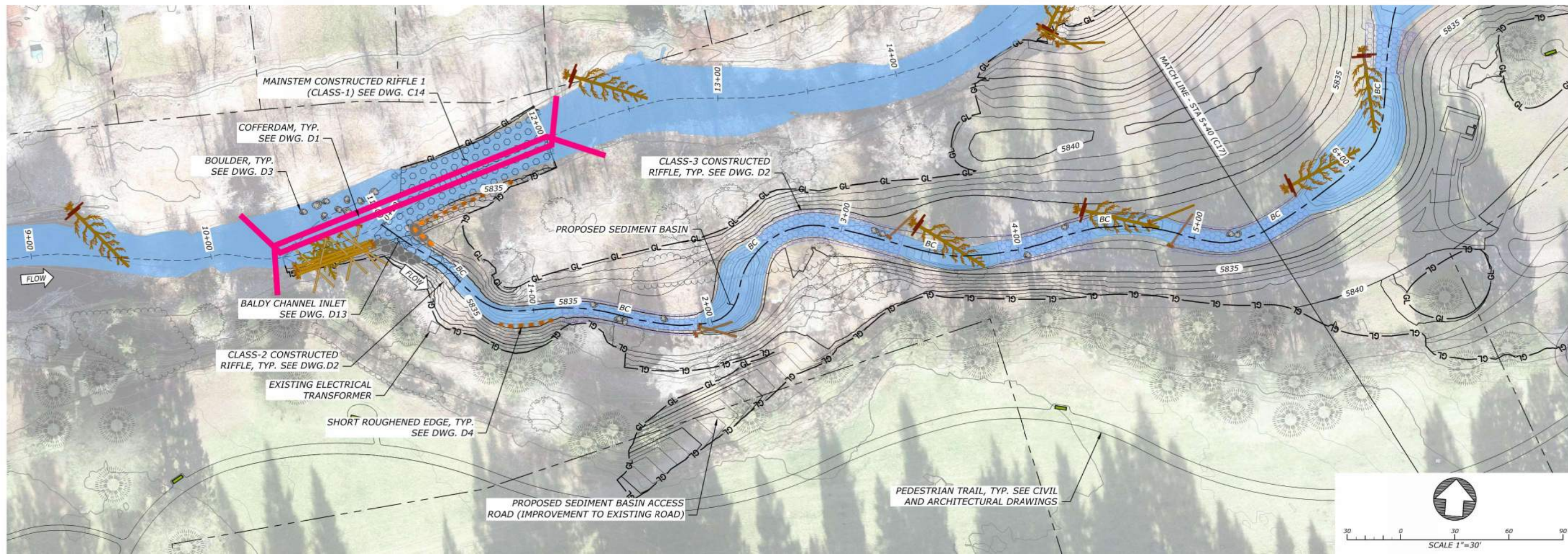
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CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

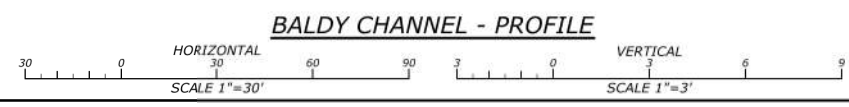
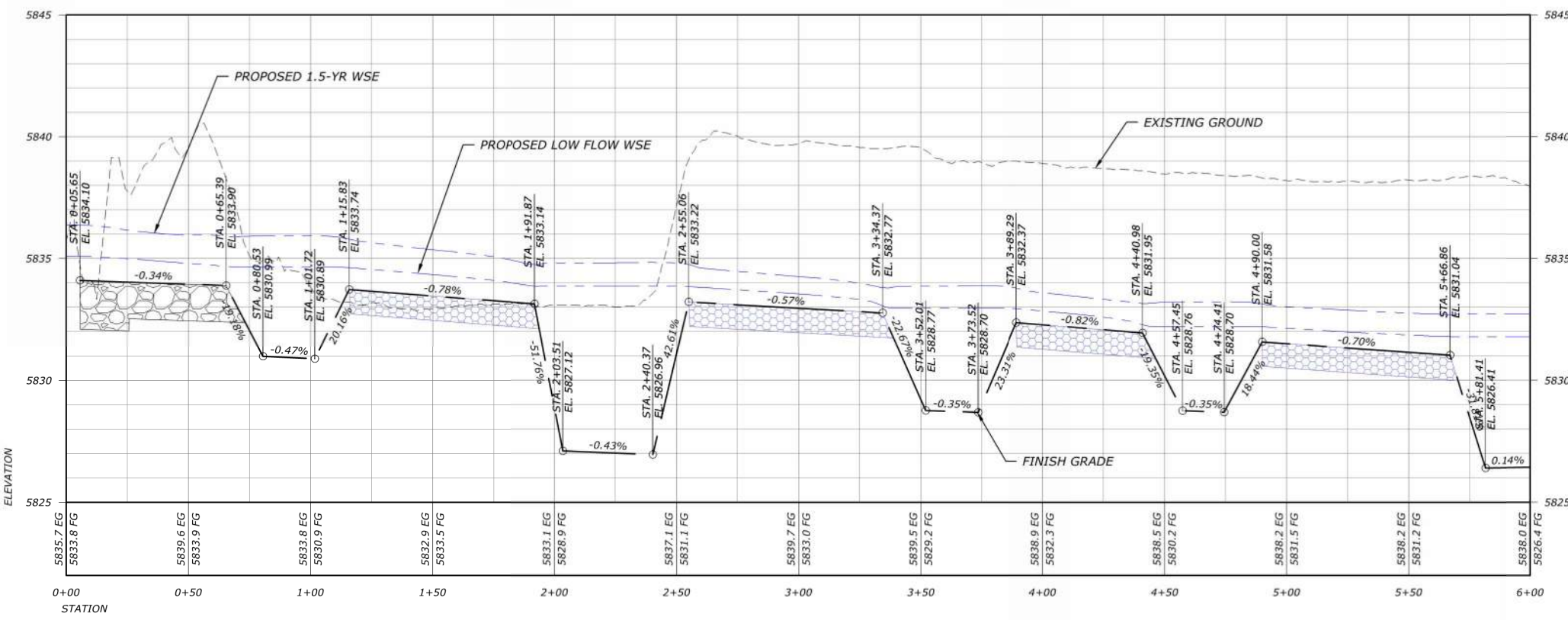
DRAWING NAME
MAINSTEM PLAN AND PROFILE

RIFFLE 2 - STA 26+17 TO 27+77

DRAWING NO.
C15 115
SHEET 21 OF



- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)
 - FESL BANK TREATMENT



FILE: E:\PROJECTS\WOOD_HUCKLEBERRY_SPRINGS_PRESERVE_CITY_OF_KETCHUM\CD\PRODUCTION\DWG_PLAN_PROFILE_BALDY_CHANNEL.DWG SAVED BY: ZACH SUDMAN, PLOT DATE: 11/6/2024 1:09 PM

**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
BALDY CHANNEL PLAN AND PROFILE

STA 0+00 TO 6+00

DRAWING NO.
C16 116
SHEET 22 OF

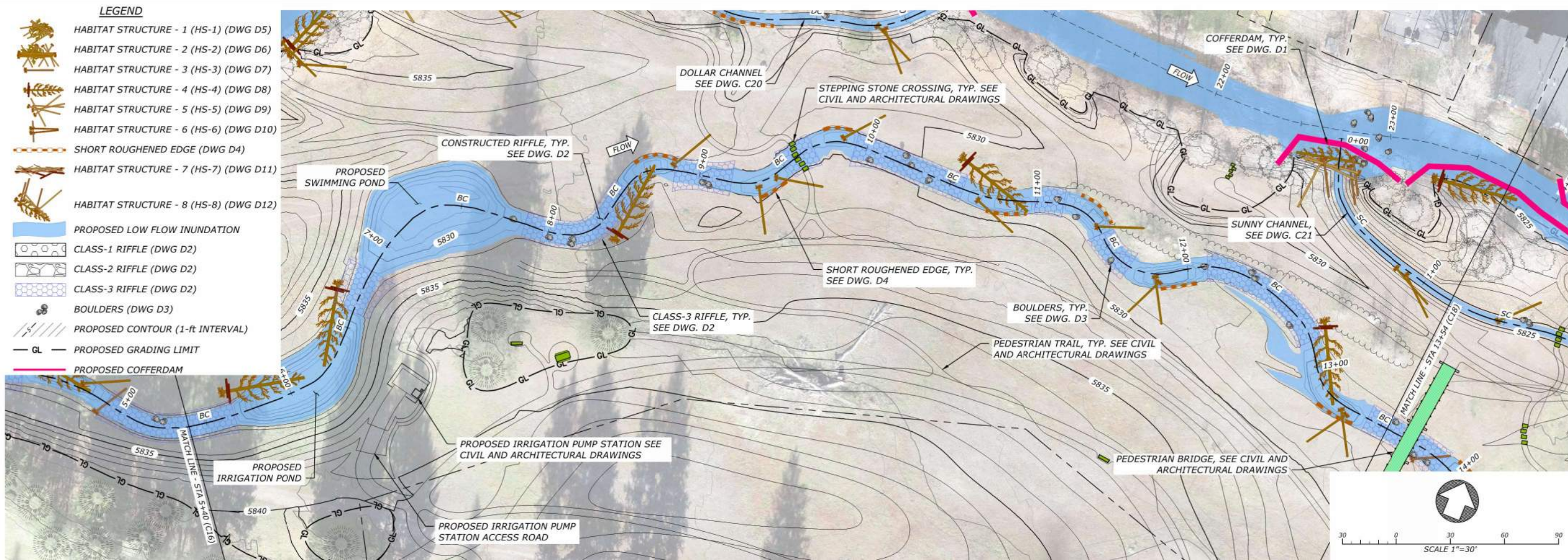
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CONSTRUCTION**

DATE: 11/6/2024
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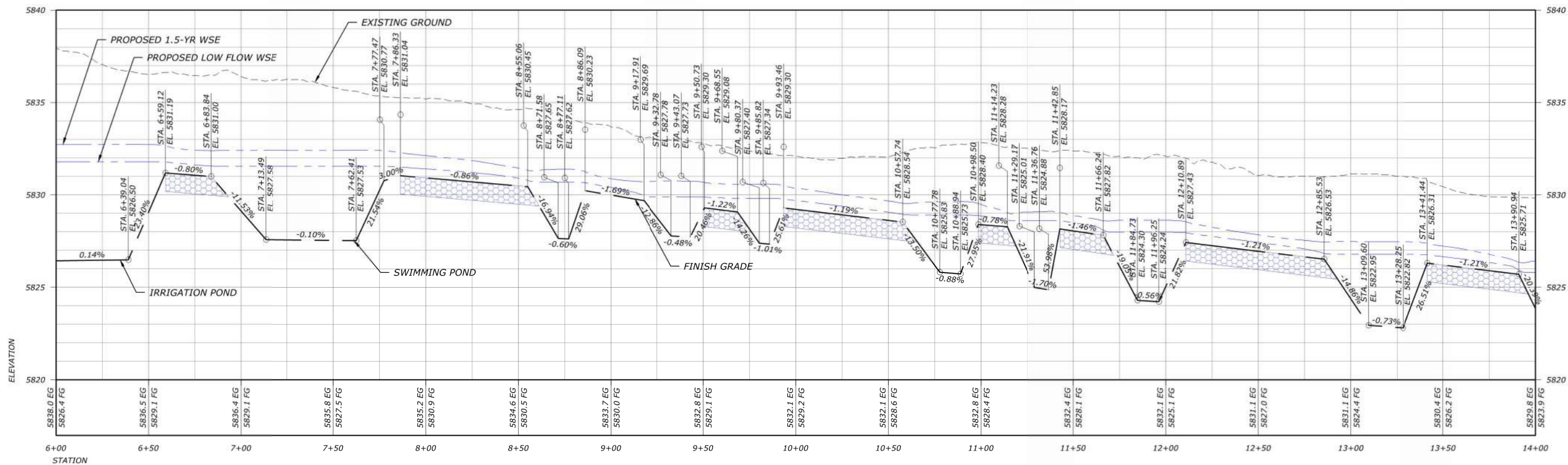
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BALDY CHANNEL PLAN AND PROFILE

STA 6+00 TO 14+00

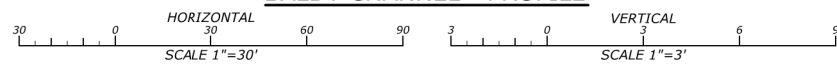
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C17 117
SHEET 23 OF



BALDY CHANNEL - PLAN

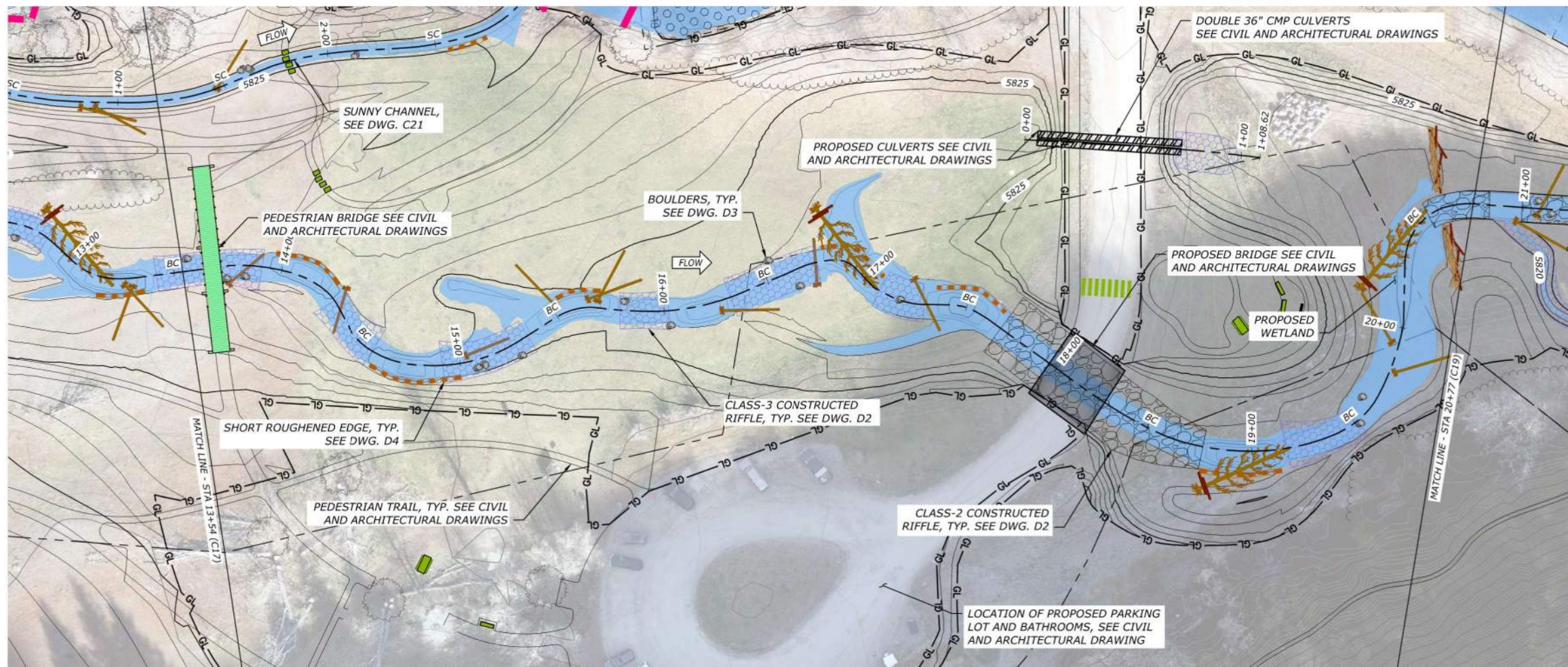


BALDY CHANNEL - PROFILE



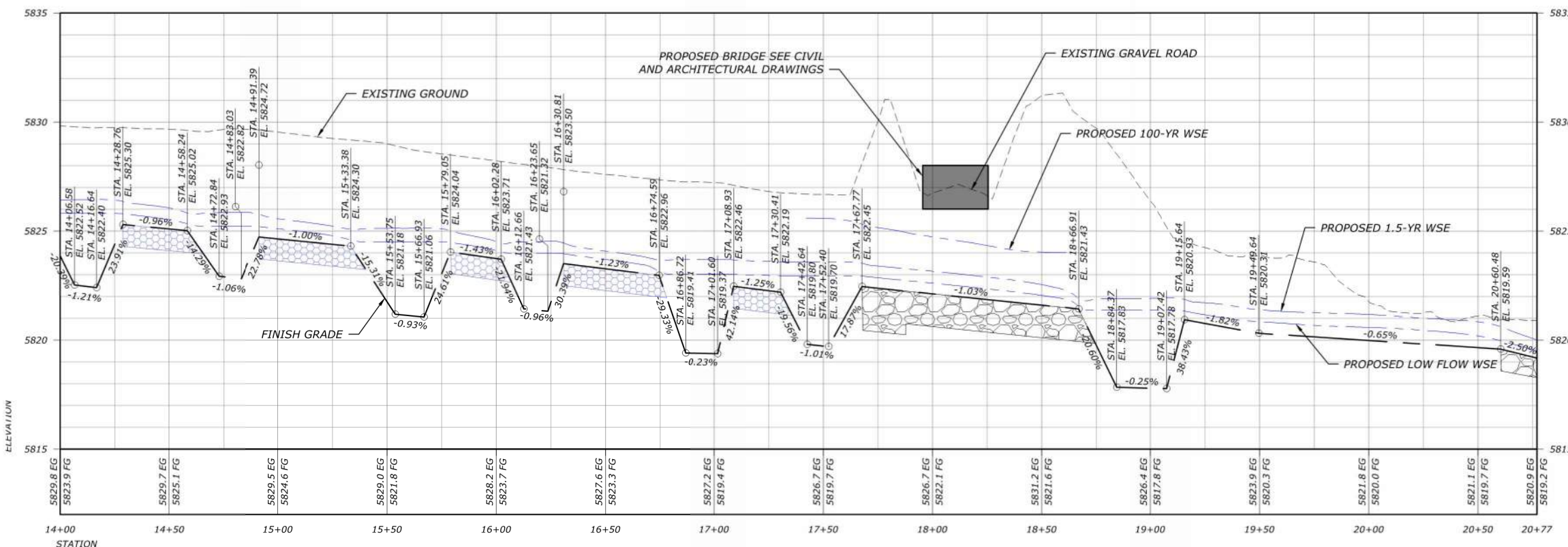
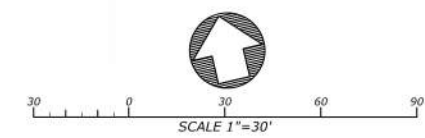
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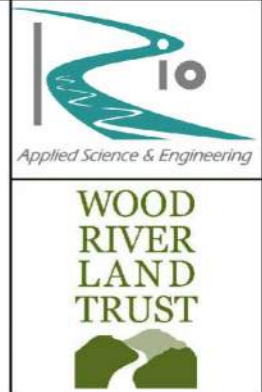
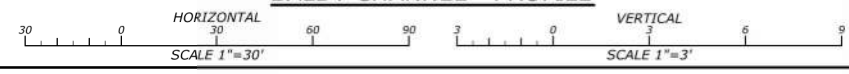


BALDY CHANNEL - PLAN

- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



BALDY CHANNEL - PROFILE



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS
 WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

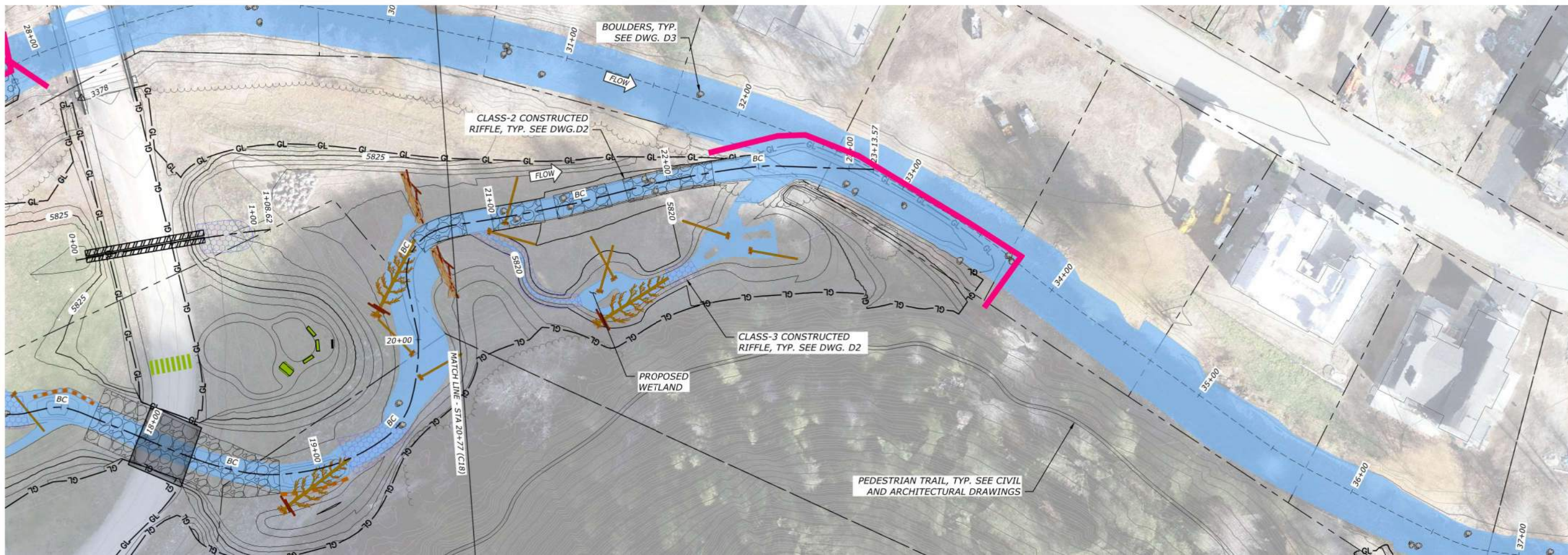
WORKING DRAFT
 NOT FOR
 CONSTRUCTION

DATE: 11/6/2024
 DESIGNED: ZS.MP, JY
 APPROVED: JY

DRAWING NAME
BALDY CHANNEL PLAN AND PROFILE

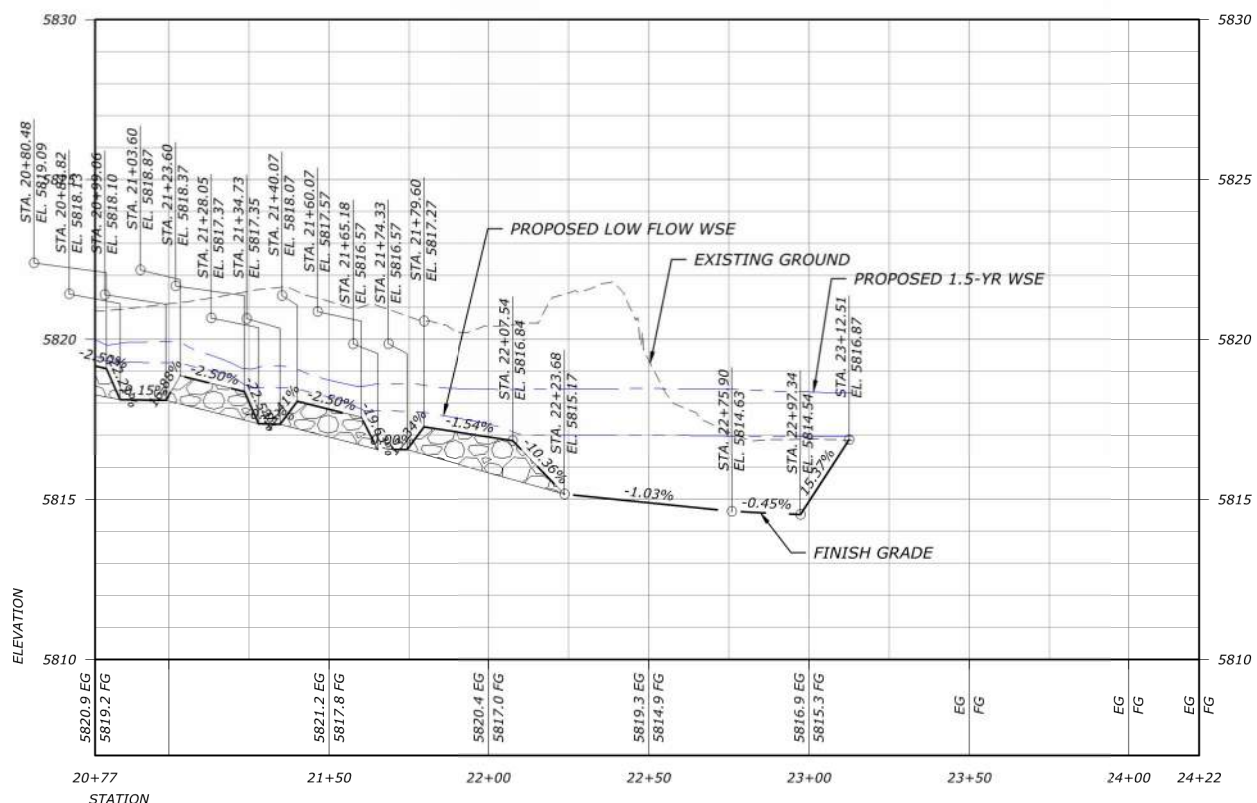
STA 14+00 TO 20+77

DRAWING NO.
C18 118
 SHEET 24 OF

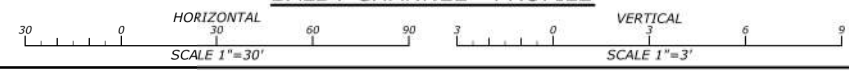
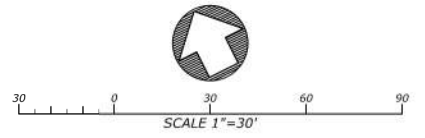


BALDY CHANNEL - PLAN

- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



BALDY CHANNEL - PROFILE



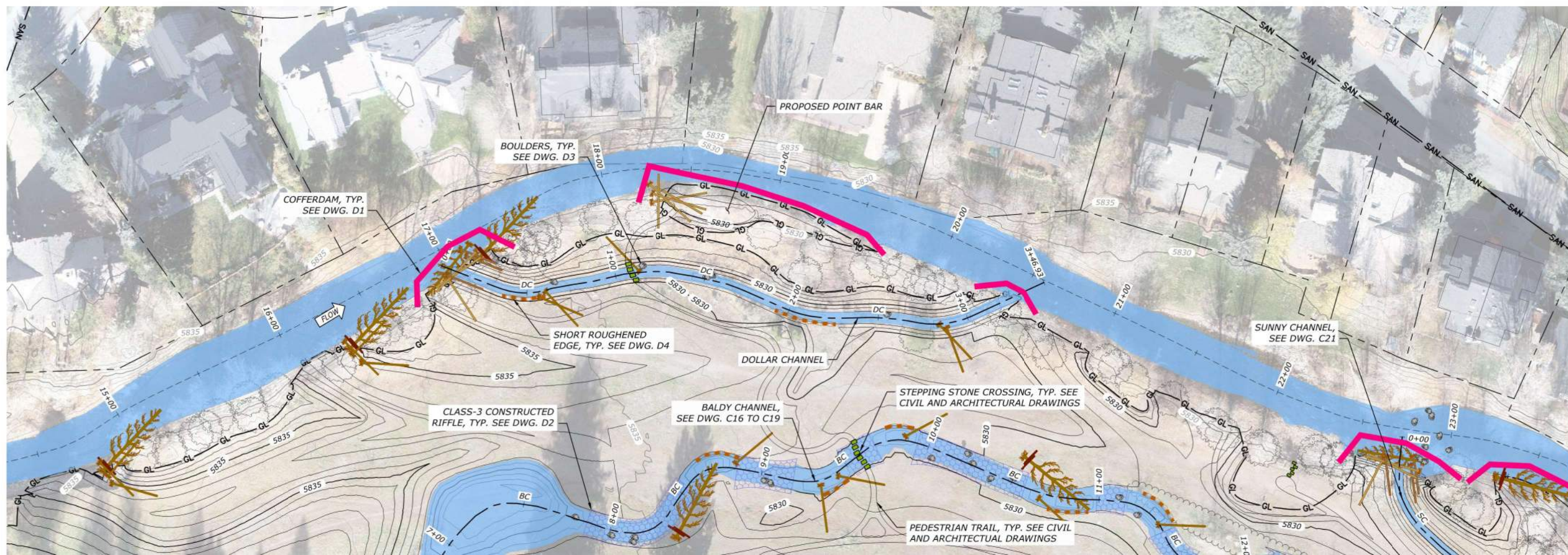
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
BALDY CHANNEL PLAN AND PROFILE

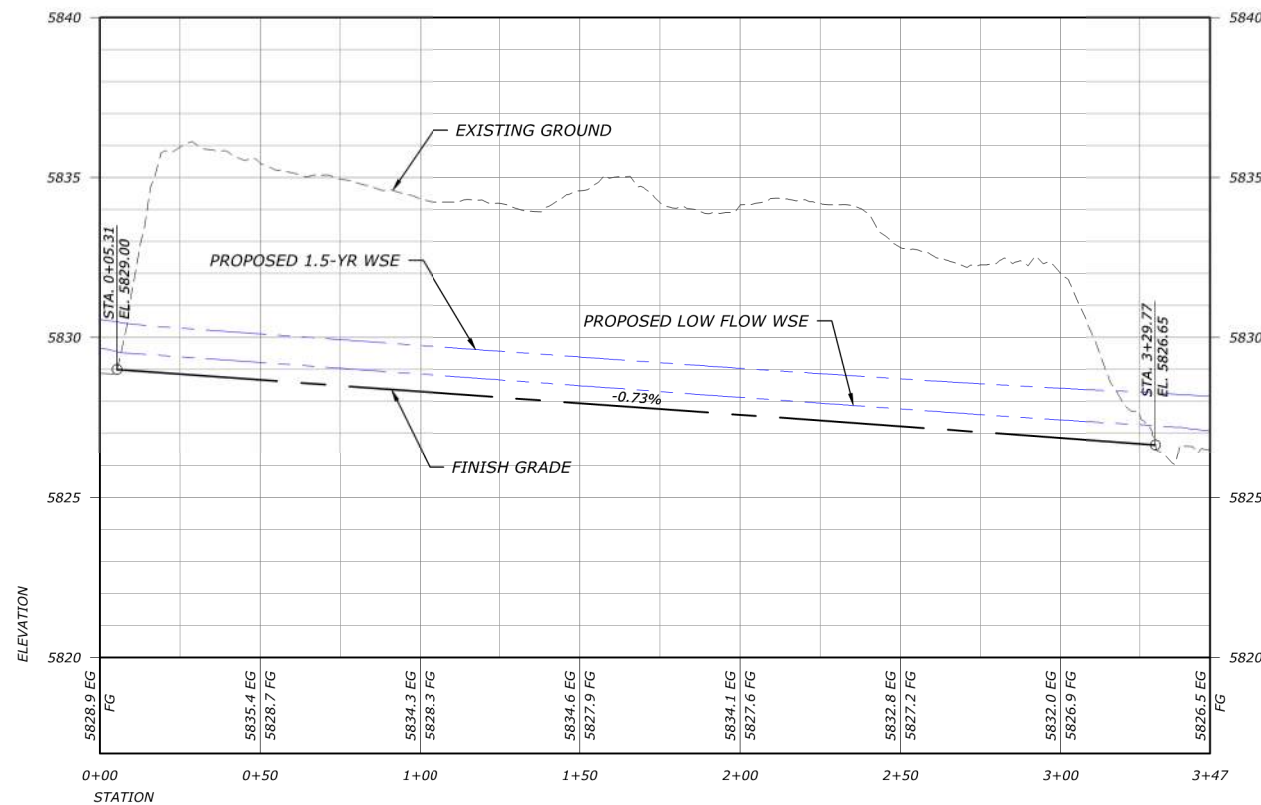
STA 20+77 TO 24+22

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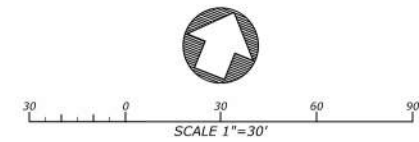
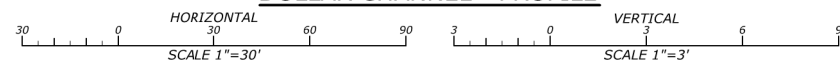


DOLLAR CHANNEL - PLAN

- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



DOLLAR CHANNEL - PROFILE



**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP, JY
APPROVED: JY

DRAWING NAME
DOLLAR CHANNEL PLAN
AND PROFILE

STA 0+00 TO 3+47

DRAWING NO.
C20 120
SHEET 26 OF 26

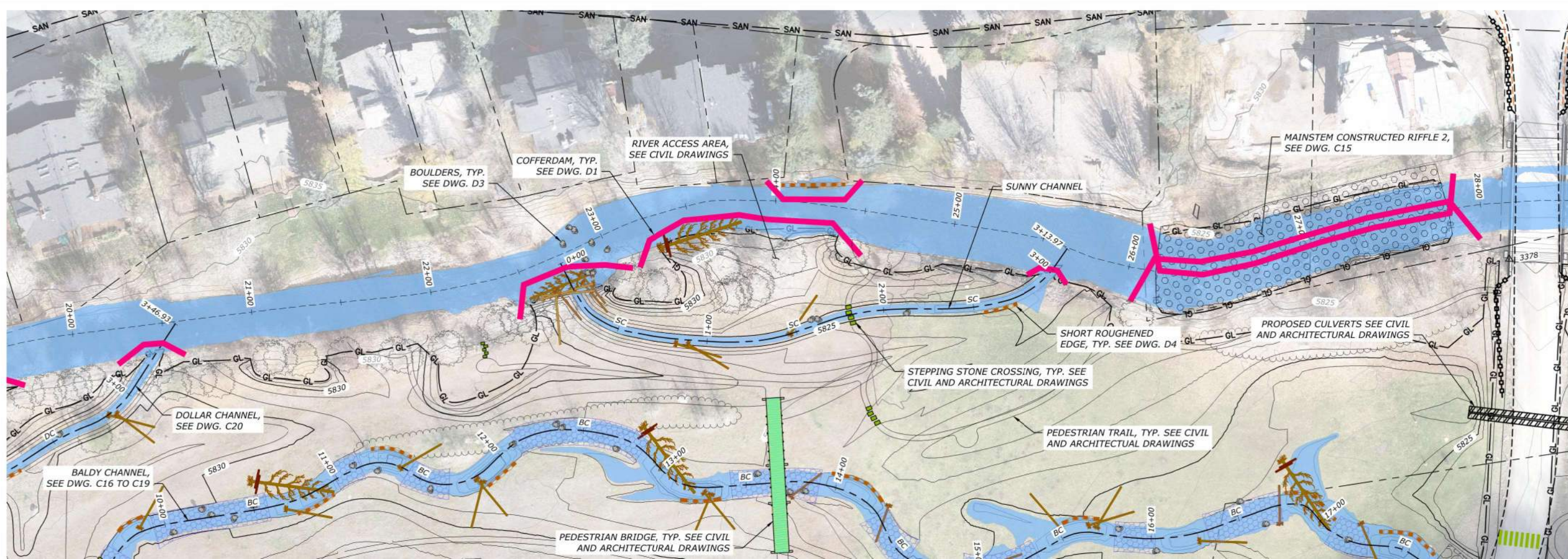
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
SUNNY CHANNEL PLAN AND PROFILE

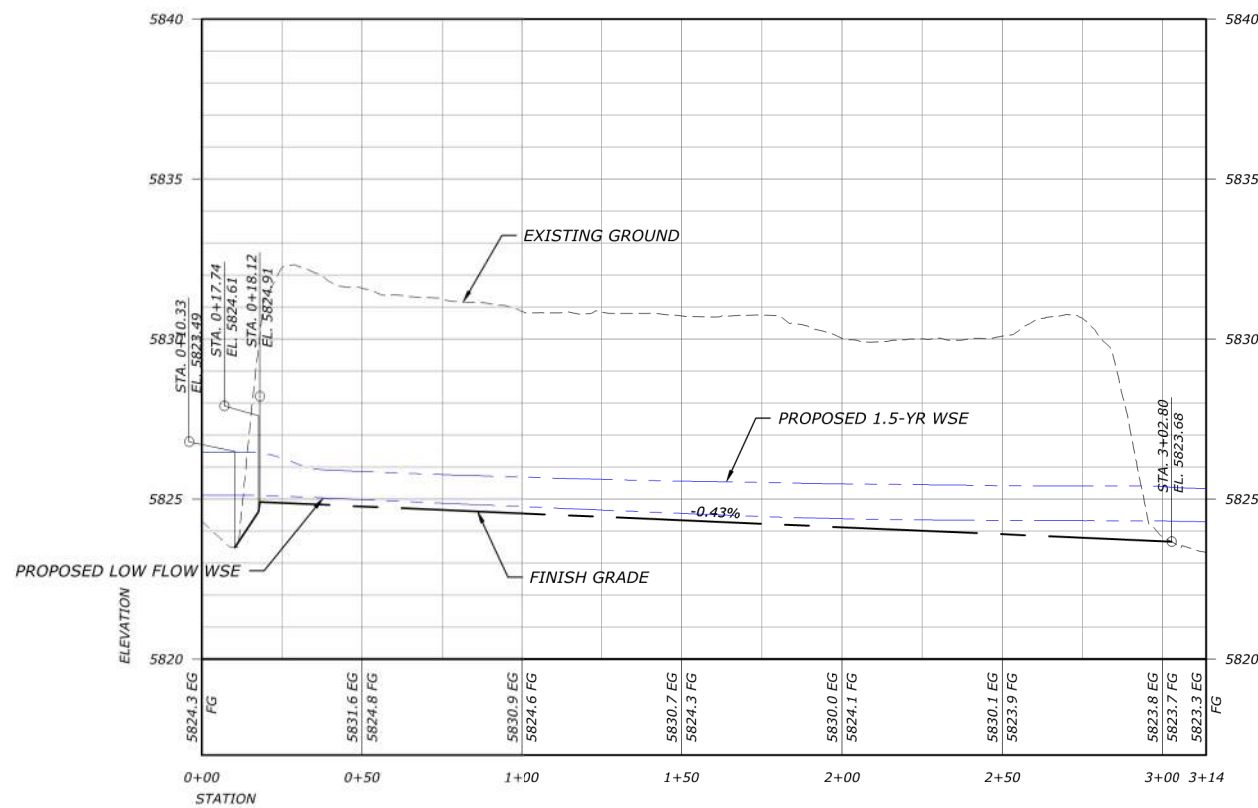
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DRAWING NO.
C21 121
SHEET 27 OF

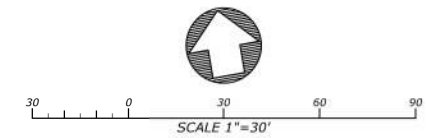
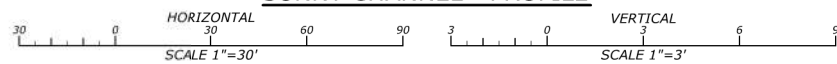


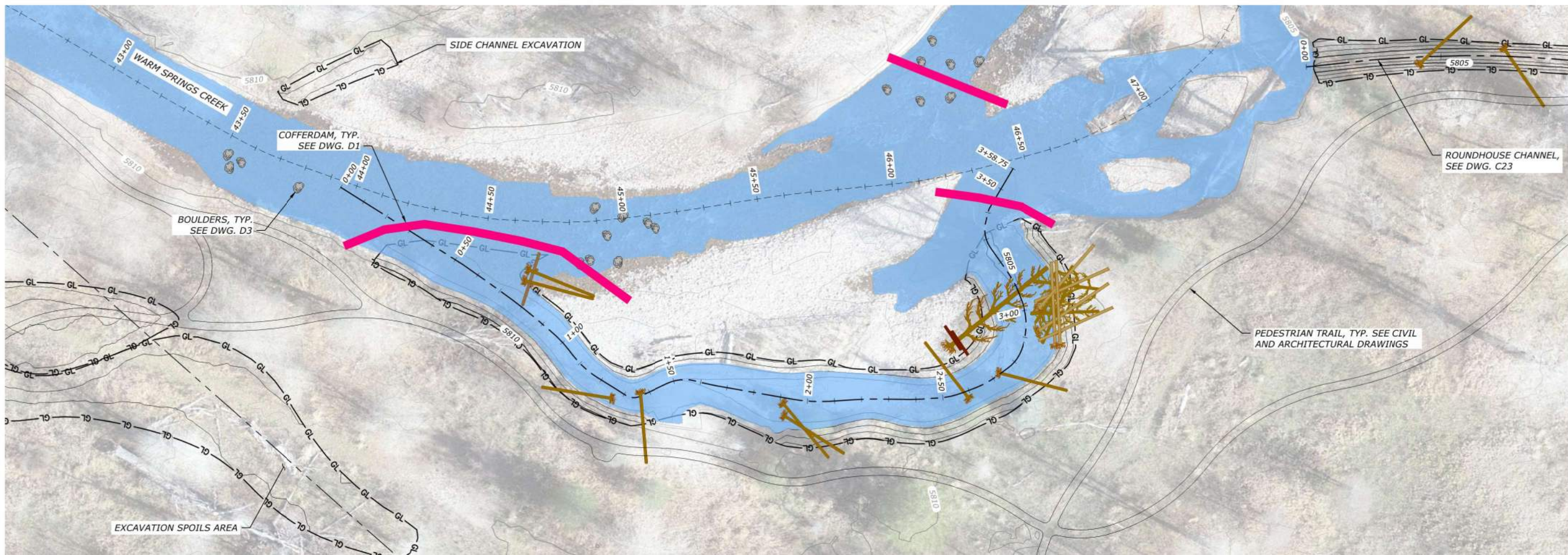
SUNNY CHANNEL - PLAN

- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)

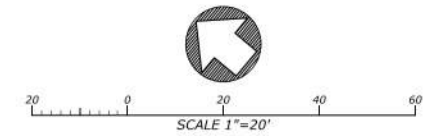


SUNNY CHANNEL - PROFILE

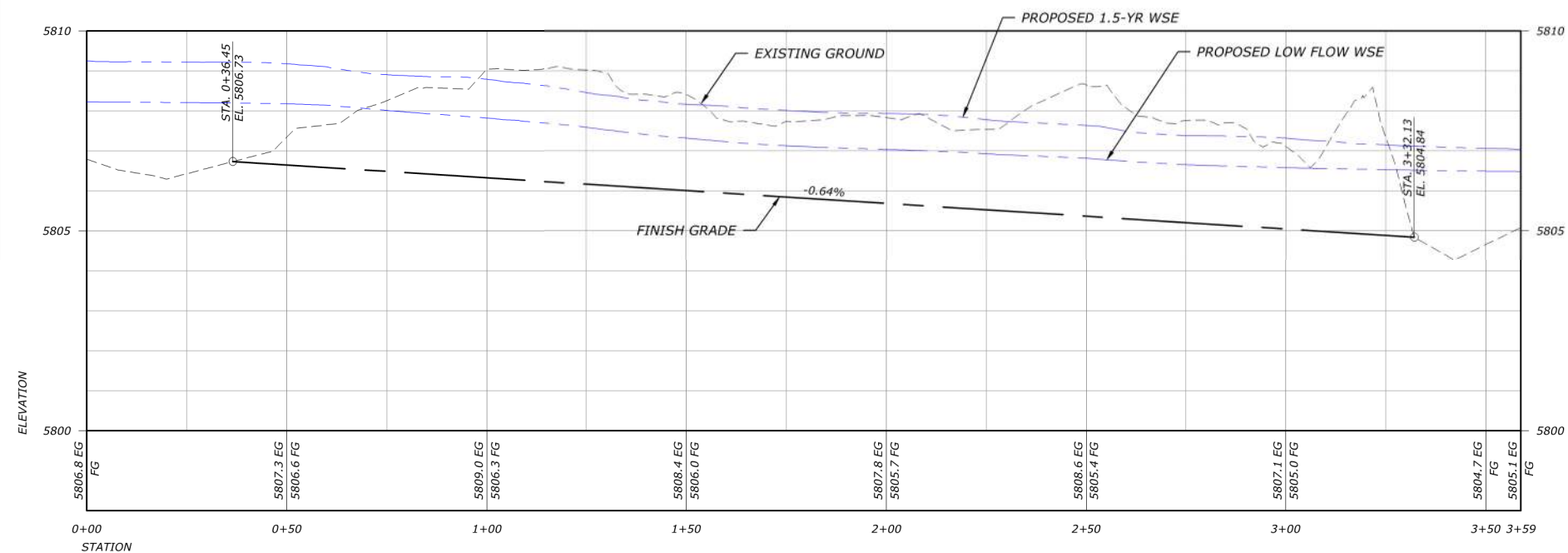




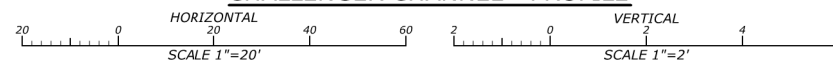
CHALLENGER CHANNEL - PLAN



- LEGEND**
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
 - HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
 - HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
 - HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
 - HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
 - HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
 - HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
 - HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
 - PROPOSED LOW FLOW INUNDATION
 - CLASS-1 RIFFLE (DWG D2)
 - CLASS-2 RIFFLE (DWG D2)
 - CLASS-3 RIFFLE (DWG D2)
 - BOULDERS (DWG D3)
 - PROPOSED CONTOUR (1-ft INTERVAL)
 - PROPOSED GRADING LIMIT
 - PROPOSED COFFERDAM
 - EXISTING CONTOUR (1-ft INTERVAL)



CHALLENGER CHANNEL - PROFILE



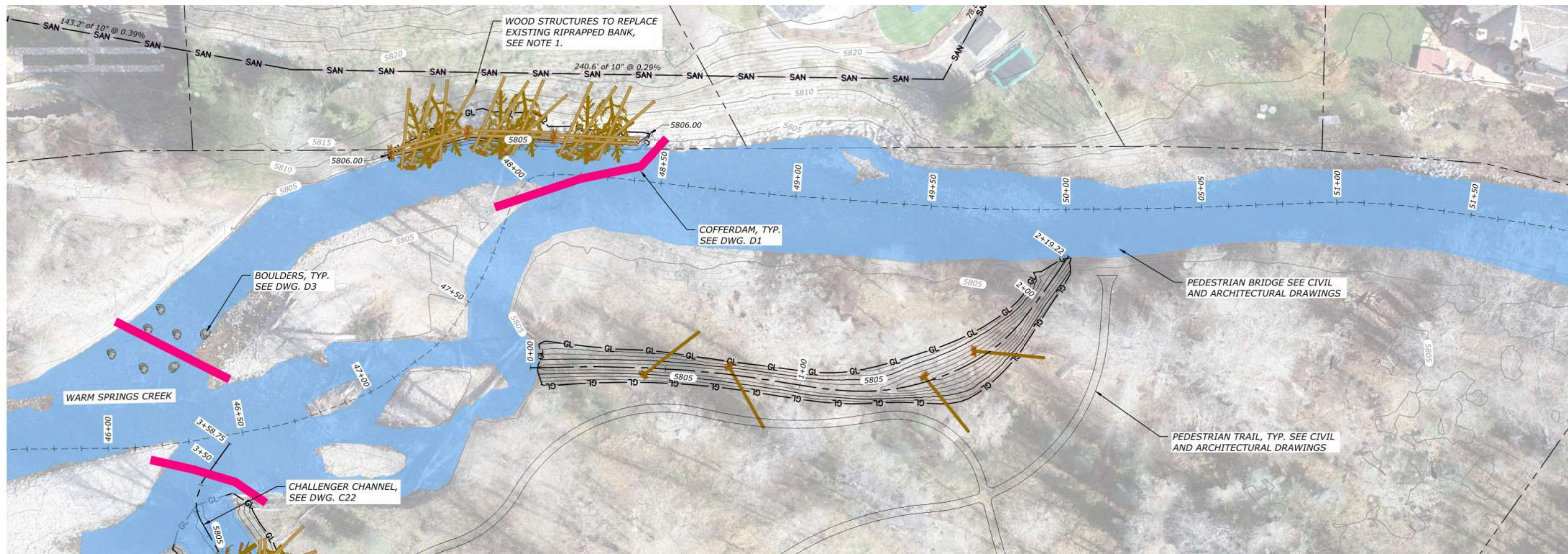
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

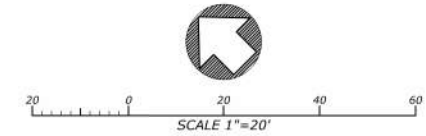
DRAWING NAME
CHALLENGER CHANNEL
PLAN AND PROFILE

STA 0+00 TO 3+59

DRAWING NO.
C22 122
SHEET 28 OF



ROUNDHOUSE CHANNEL - PLAN

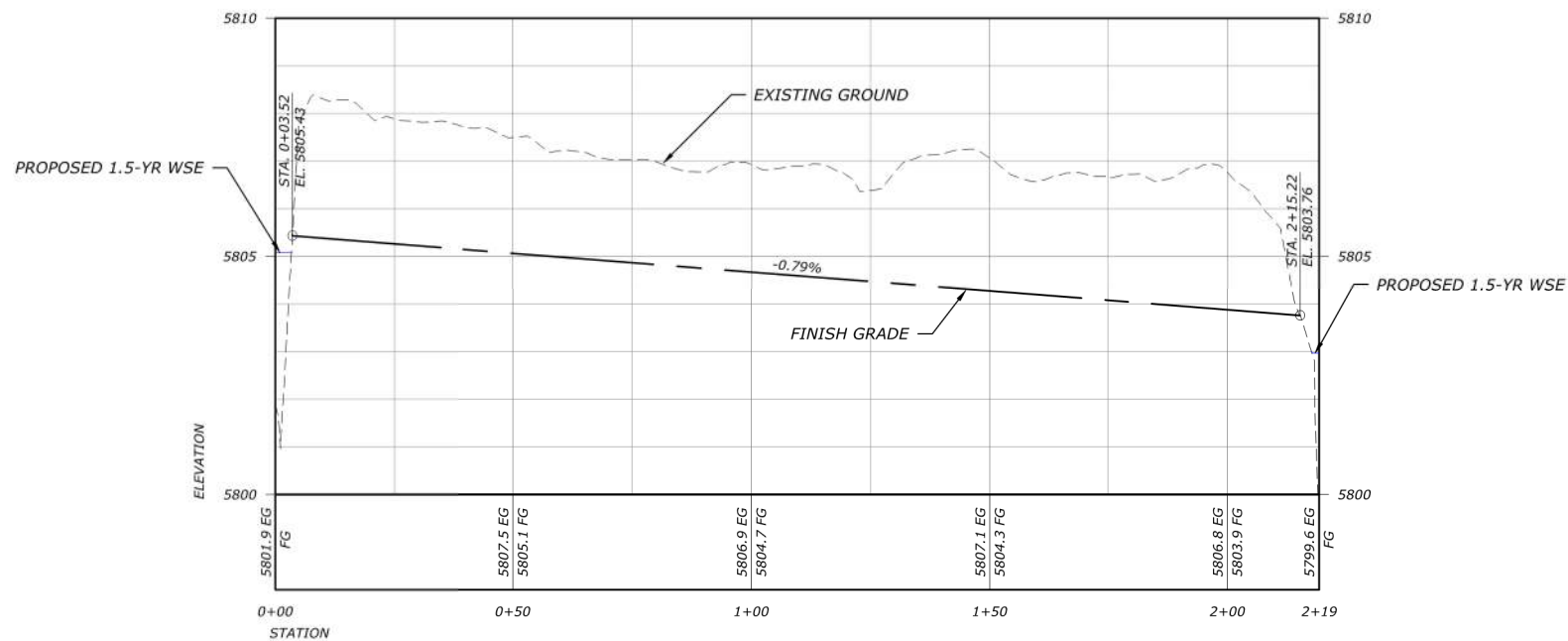


LEGEND

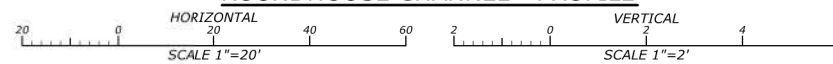
- HABITAT STRUCTURE - 1 (HS-1) (DWG D5)
- HABITAT STRUCTURE - 2 (HS-2) (DWG D6)
- HABITAT STRUCTURE - 3 (HS-3) (DWG D7)
- HABITAT STRUCTURE - 4 (HS-4) (DWG D8)
- HABITAT STRUCTURE - 5 (HS-5) (DWG D9)
- HABITAT STRUCTURE - 6 (HS-6) (DWG D10)
- HABITAT STRUCTURE - 7 (HS-7) (DWG D11)
- HABITAT STRUCTURE - 8 (HS-8) (DWG D12)
- PROPOSED LOW FLOW INUNDATION
- CLASS-1 RIFFLE (DWG D2)
- CLASS-2 RIFFLE (DWG D2)
- CLASS-3 RIFFLE (DWG D2)
- BOULDERS (DWG D3)
- PROPOSED CONTOUR (1-ft INTERVAL)
- PROPOSED GRADING LIMIT
- PROPOSED COFFERDAM
- EXISTING CONTOUR (1-ft INTERVAL)

NOTES:

1. REMOVE EXISTING RIPRAP AND INSTALL WOOD STRUCTURE IN ACCORDANCE WITH DWG. D5 TAKING CARE TO NOT DISTURB OR EXPOSE THE SEWER LINE. BACKFILL THE WOOD STRUCTURE WITH THE REMOVED RIPRAP AND CLASS 1 RIFFLE MATERIAL TO DESIGN GRADES.



ROUNDHOUSE CHANNEL - PROFILE



**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
ROUNDHOUSE CHANNEL
PLAN AND PROFILE

STA 0+00 TO 2+19

DRAWING NO.
C23 123
SHEET 29 OF

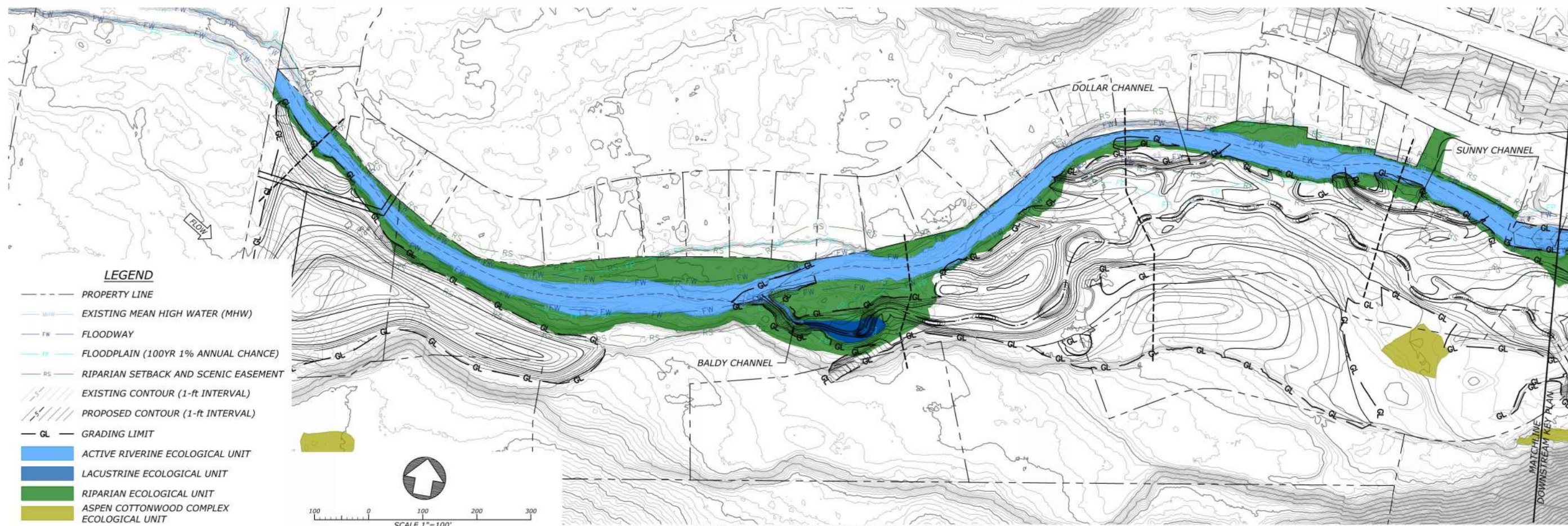
**WORKING DRAFT
NOT FOR
CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

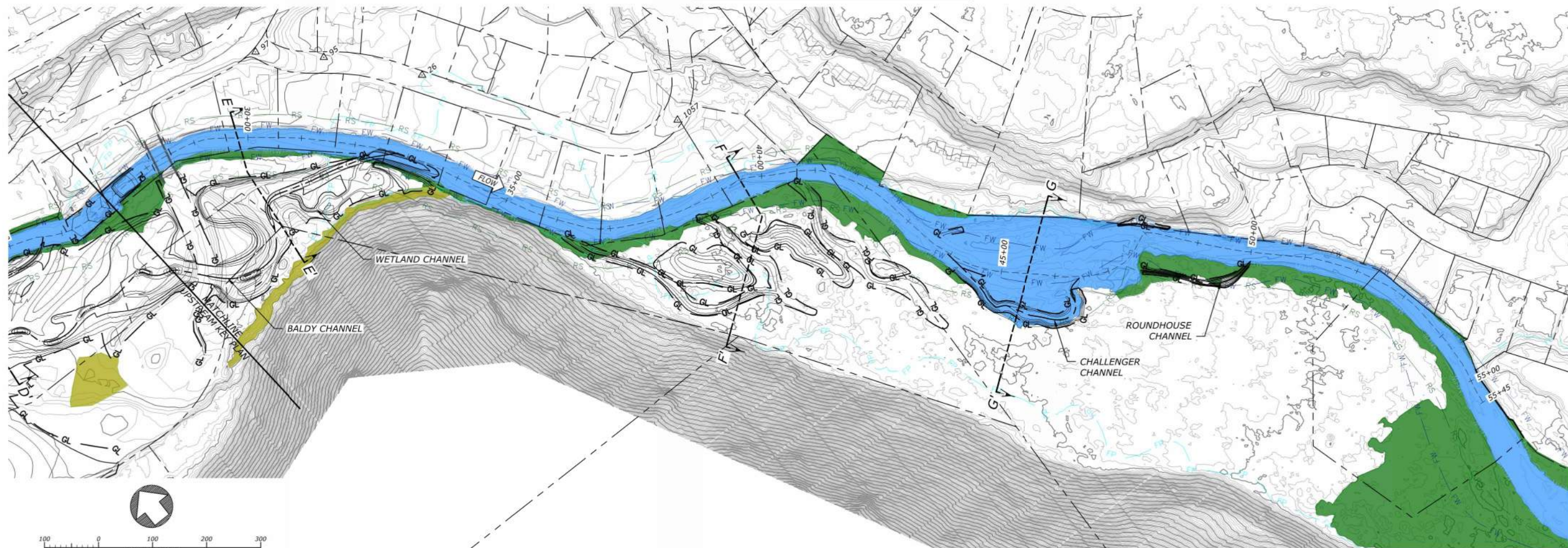
DRAWING NAME
VALLEY SECTIONS

VALLEY SECTION OVERVIEW

DRAWING NO. C24 124
SHEET 30 OF

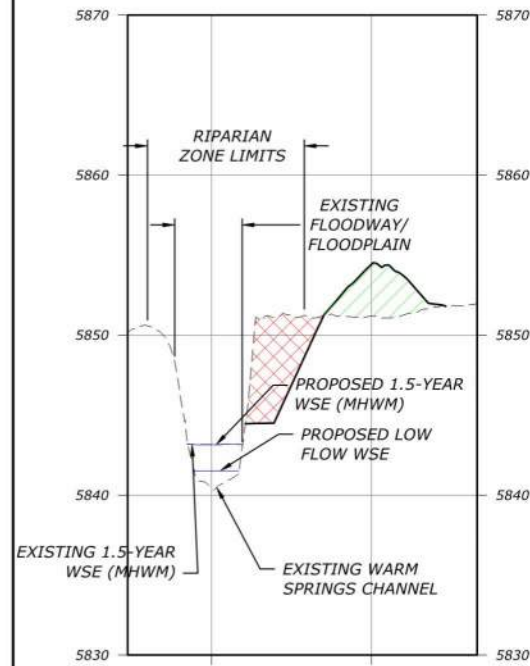


VALLEY SECTIONS - UPSTREAM KEY PLAN

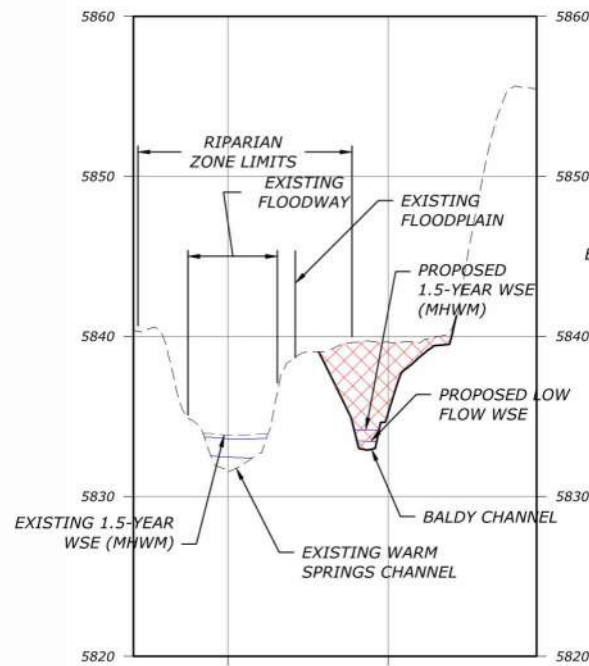


VALLEY SECTIONS - DOWNSTREAM KEY PLAN

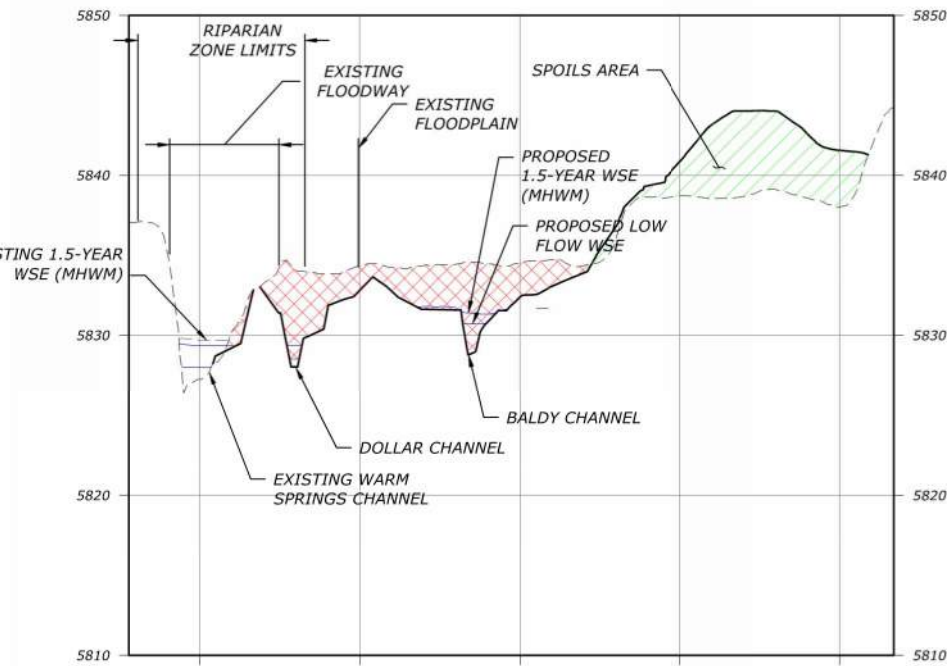
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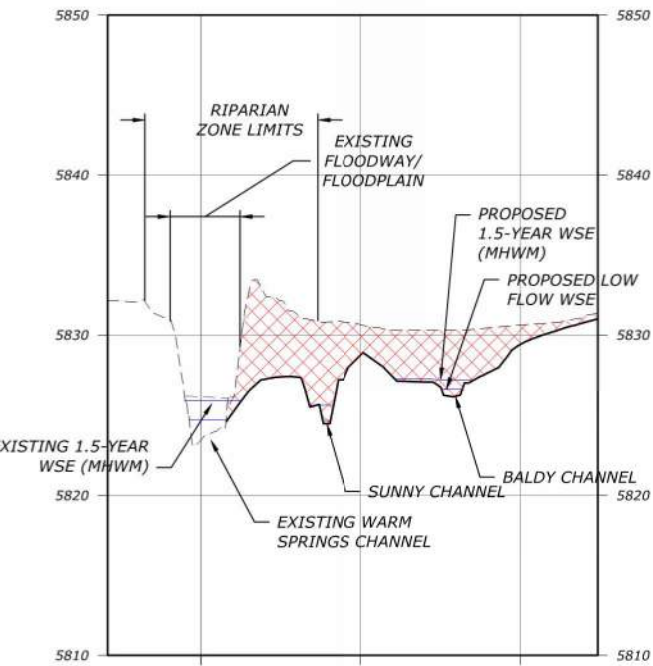
SECTION A-A'



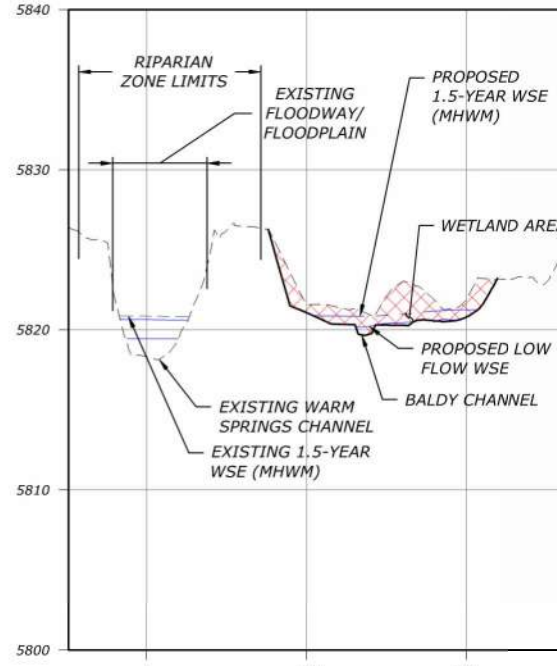
SECTION B-B'



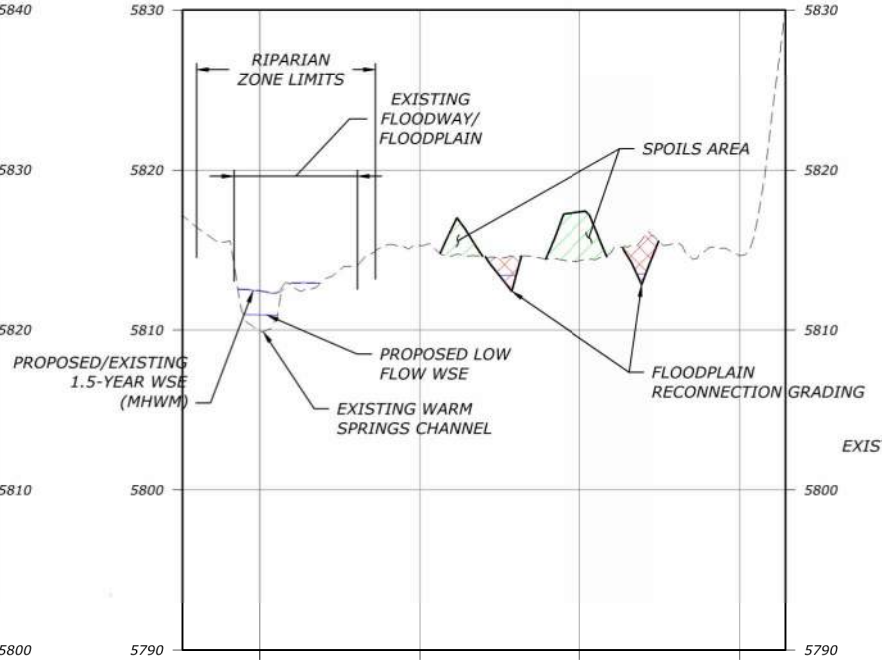
SECTION C-C'



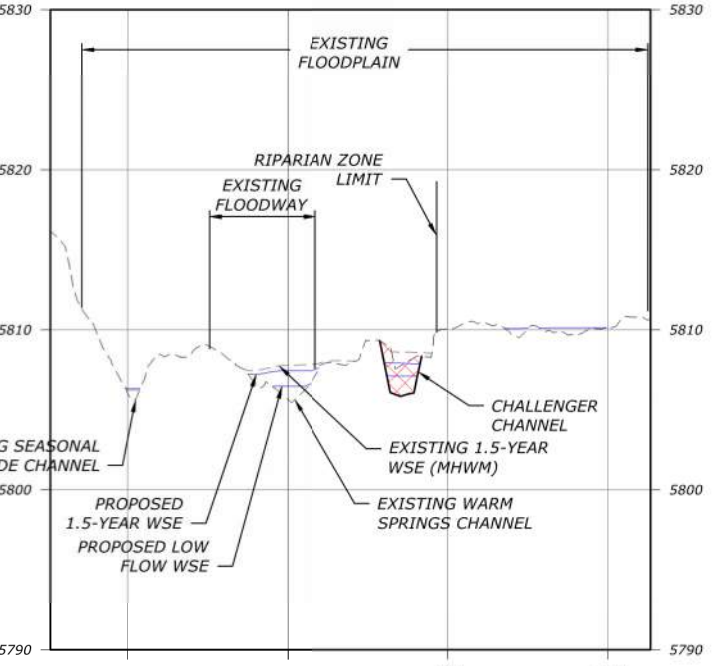
SECTION D-D'



SECTION E-E'



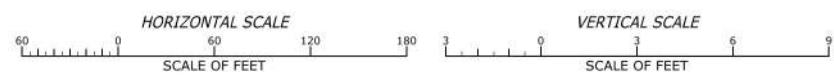
SECTION F-F'



SECTION G-G'

ESTIMATED FLOWS		
CHANNEL NAME	LOW FLOW (cfs)	1.5-YEAR FLOW (cfs)
WARM SPRINGS (UPSTREAM OF PROJECT)	29	330
BALDY	5	58
DOLLAR	2	28
SUNNY	1	14

- LEGEND**
- EXISTING GRADE
 - FINISH GRADE
 - PROPOSED WATER SURFACE ELEVATION (1.5-YR AND LOW FLOW)
 - EXISTING WATER SURFACE ELEVATION (1.5-YR FLOW)
 - CUT
 - FILL



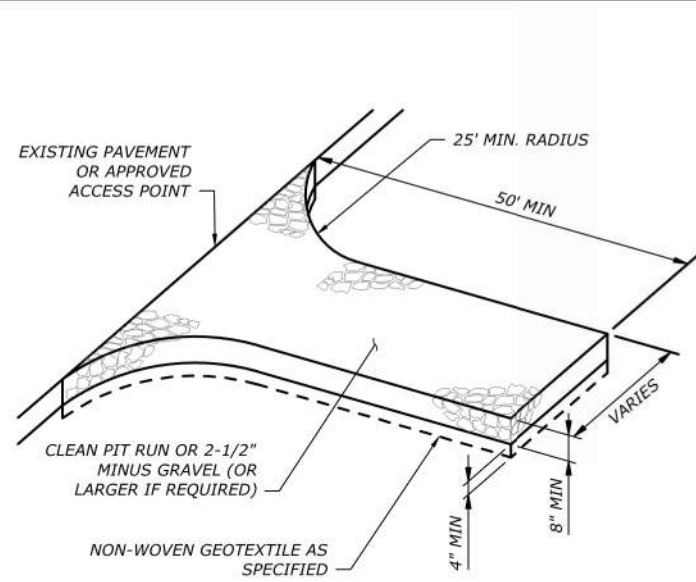
WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
VALLEY SECTIONS
VALLEY SECTIONS

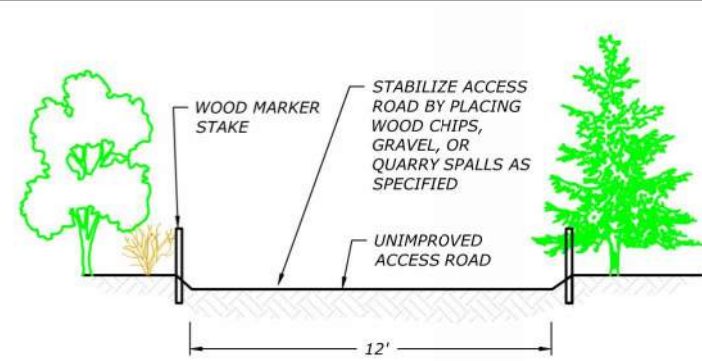
DRAWING NO.
C25 125
SHEET 31 OF

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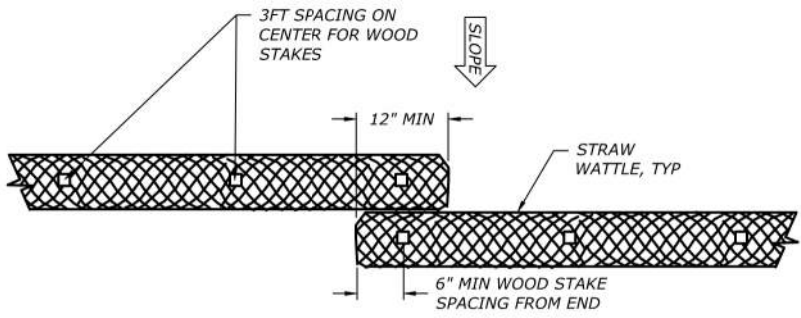
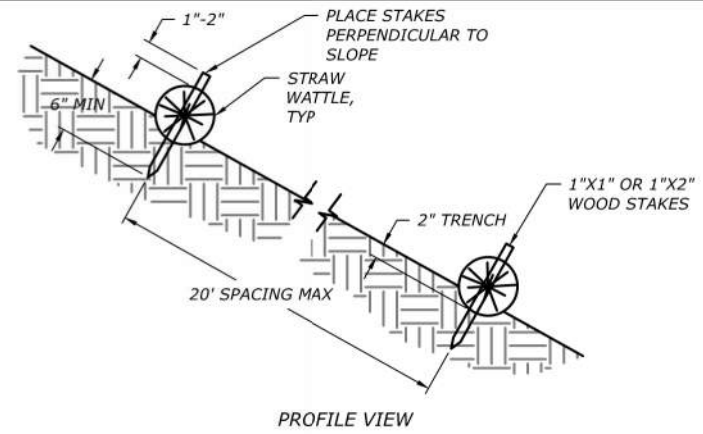
- NOTES:**
- ADDITIONAL GRAVEL SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
 - REMOVE GRAVEL ENTRANCE AND REPLACE WITH BASE COURSE PRIOR TO COMPLETION OF THE PROJECT.

1 TEMPORARY CONSTRUCTION ENTRANCE
NTS

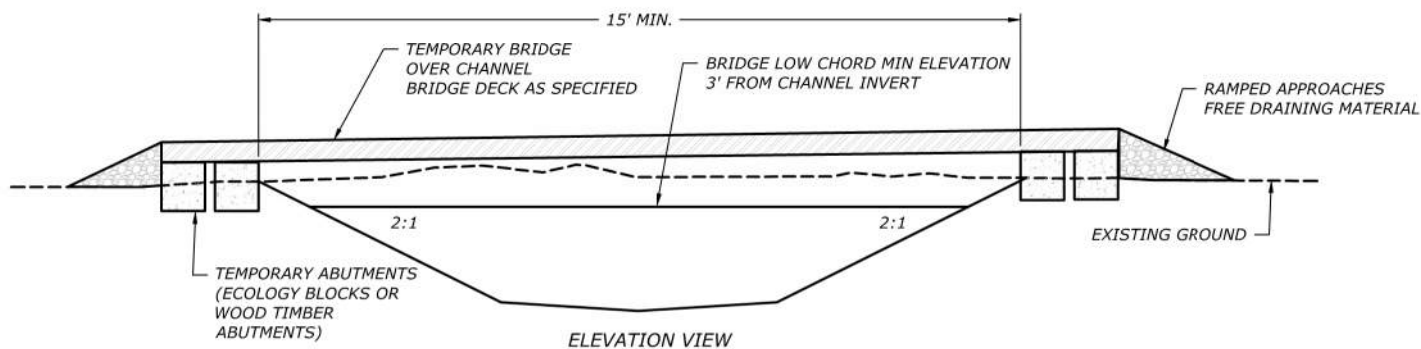


- NOTES:**
- CLEARED ACCESS TO BE ROUTED TO MINIMIZE VEGETATION DISTURBANCE AND FOREST CLEARING.
 - CONTRACTOR SHALL MARK CLEARING LIMITS. CLEARING LIMITS TO BE APPROVED BY ENGINEER PRIOR TO ANY CLEARING ACTIVITIES.
 - ANY TREES GREATER THAN 18" Ø SHALL BE REMOVED W/ ROOTWADS INTACT AND STOCKPILED FOR USE IN LOGJAM CONSTRUCTION.
 - TREES AND SHRUBS WITH 6"-18" Ø SHALL BE STOCKPILED FOR USE AS RACKING MATERIAL IN LOGJAM CONSTRUCTION.
 - VEGETATION AND ORGANIC SOIL SHALL BE STRIPPED, TEMPORARILY STOCKPILED, AND REPLACED ON ROAD ALIGNMENT AFTER WORK IS COMPLETE AND ACCEPTED.
 - ACCESS SHALL BE MAINTAINED BY MINOR GRADING AND PLACEMENT OF WOOD CHIPS, GRAVEL AND/OR QUARRY SPALLS. ALL GRAVEL OR QUARRY SPALLS (IF PLACED) SHALL BE UNDERLAIN WITH A GEOTEXTILE AND REMOVED.
 - RESTORE ACCESS ROADS AND SEED IN ACCORDANCE WITH SEEDING SPECIFICATIONS.

2 ACCESS ROAD
NTS



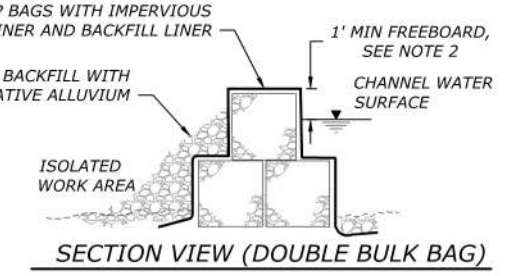
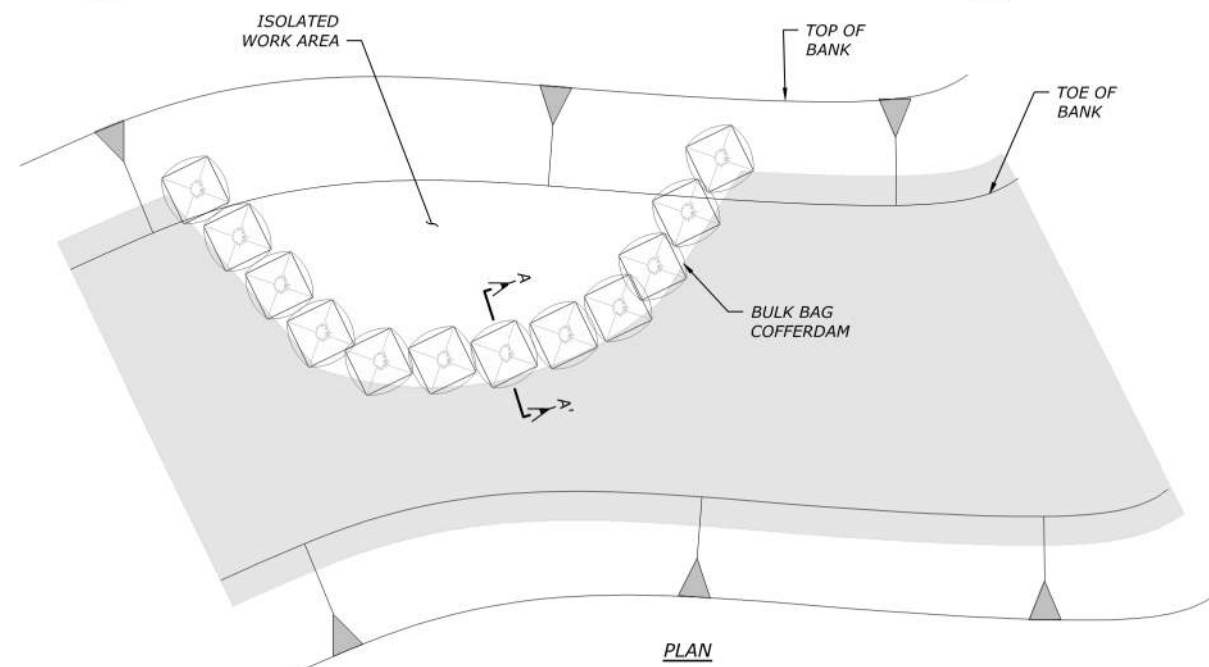
3 STRAW WATTLE
NTS



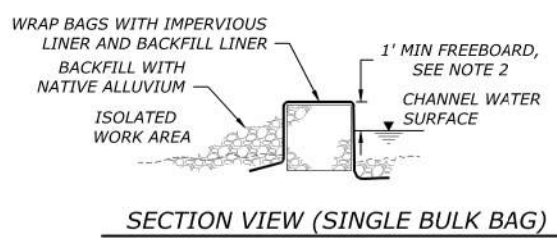
- TEMPORARY BRIDGE NOTES:**
- CONTRACTOR TO DESIGN TEMPORARY BRIDGE FOR CHANNEL CROSSINGS.
 - BRIDGE SHALL BE LOCATED SUCH THAT ONLY ONE SPAN IS USED AT CHANNEL CROSSINGS.
 - END OF BRIDGE SHALL BEAR ON HIGH BANKS WITH SUFFICIENT BEARING CAPACITY TO PREVENT SLOUGHING OR COLLAPSE OF CHANNEL BANKS.
 - CONCRETE ECOLOGY BLOCKS OR WOOD ABUTMENTS MAY BE USED TO SUPPORT ENDS OF TEMPORARY BRIDGE AS NEEDED.
 - BRIDGES MAY BE CONSTRUCTED FROM LOGS, RAIL CAR BEDS OR APPROVED EQUAL AND DECKED WITH STEEL SHEET, WOOD LAGGING OR APPROVED EQUAL.

5 TEMPORARY BRIDGE
NTS

- GENERAL EROSION AND SEDIMENT CONTROL AND WORK AREA ISOLATION NOTES:**
- THE DETAILS SHOWN ON THIS SHEET ARE EXAMPLES OF ACCEPTABLE METHODS TO USE DURING CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING A COFFERDAM, PUMPING, AND DEWATERING PLAN FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY OR ENGINEER. THE PLAN SHALL INCLUDE SUFFICIENT DETAIL OF MEANS AND METHODS SATISFYINGLY MEETING THE PROJECT SPECIFICATIONS AND PERMIT REQUIREMENTS. IF APPROVED, OTHER METHODS MAY BE USED SUCH AS UTILIZING INFLATABLE BLADDERS, PLATES, OR BARRIERS OF VARIOUS MATERIALS. COFFERDAMS SHALL INCLUDE PLASTIC LINER OR FINE MESH SILT FENCE TO REDUCE TURBIDITY AND FINES FROM ENTERING THE FREE FLOWING PORTION OF LIVE WATER.
 - COFFERDAMS SHALL BE CONSTRUCTED TO ACCOMMODATE ALL FLOW CONDITIONS AND WATER SURFACE ELEVATIONS EXPECTED DURING CONSTRUCTION PLUS A MINIMUM OF 1-FOOT OF FREEBOARD. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH WATER QUALITY STANDARDS, SAFETY AND CONSTRUCTION STANDARDS, DAMAGE OR LOSS TO EQUIPMENT, MATERIALS, AND DAMAGES TO PRIVATE PROPERTY.
 - THE CONTRACTING AGENCY IS RESPONSIBLE FOR MEASURING TURBIDITY HOWEVER THE CONTRACTOR SHALL ADHERE TO THE SPECIAL PROCEDURES REGARDING IN-STREAM WORK, TURBIDITY, AND DEWATERING (DRAWINGS XXXX). ADDITIONALLY, THIS PROJECT SHALL ADHERE TO HIP CONSERVATION MEASURES. CONSERVATION MEASURES ARE SUMMARIZED ON DRAWINGS XXXX AND SHALL BE STRICTLY ADHERED TO.
 - THE CONTRACTOR SHALL NOTIFY THE OWNER AND CONTRACTING OFFICER AT LEAST 5 DAYS BEFORE EACH COFFERDAM INSTALLATION DATE SO THAT FISH SALVAGE ACTIVITIES CAN BE SCHEDULED. ANTICIPATED COFFERDAM LOCATIONS ARE SHOWN IN THE PLANS.
 - FILL MATERIAL FOR BULK BAGS SHALL BE CLEAN, WASHED, AND ROUNDED MATERIAL MEETING STANDARD SPECIFICATIONS FOR DRAIN ROCK, STREAMBED AGGREGATES, STREAMBED SEDIMENTS, OR STREAMBED COBBLES. MATERIAL USED TO FILL BULK BAGS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE PERMITS.
 - DEWATERING PUMP DISCHARGE FROM WITHIN COFFERDAM WORK AREAS SHALL BE RELEASED ONTO FLOODPLAIN AREAS AWAY FROM WETLANDS AND CONSTRUCTION ACTIVITIES. DISCHARGE SHALL BE COMPLETELY INFILTRATED PRIOR TO REACHING WETLANDS OR SURFACE WATERS UNLESS APPROVED BY THE CONTRACTING OFFICER. ALL RETURN FLOWS MUST MEET PERMIT REQUIREMENTS FOR TURBIDITY.
 - EXCAVATIONS ASSOCIATED WITH CHANNEL, FLOODPLAIN, AND WOOD HABITAT STRUCTURES SHALL BE DEWATERED IN ACCORDANCE WITH THE SPECIFICATIONS.
 - ALL PUMP INTAKES SHALL BE SCREENED FOR FISH PROTECTION AS REQUIRED BY NOAA.
 - ALL EARTHWORK ACTIVITIES AND WOOD HABITAT STRUCTURE CONSTRUCTION WITHIN THE ORDINARY HIGH WATER CHANNEL SHALL CONFORM TO THE WATER QUALITY STANDARDS ESTABLISHED BY REGULATORY AGENCY PERMITS FOR THIS PROJECT.



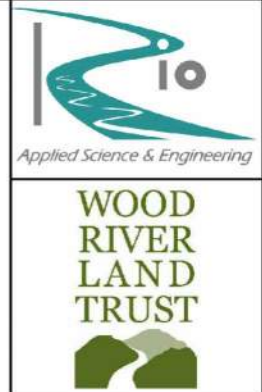
4 BULK BAG COFFERDAM
NTS



- NOTES:**
- WRAP BULK BAGS WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
 - BACKFILL THE DOWNSTREAM SIDE OF THE COFFERDAM WITH NATIVE ADJACENT ALLUVIUM.
 - USE BULK BAGS AS A BUTTRESS AS REQUIRED.
 - BULK BAG MATERIAL SHALL BE 8 OZ. (MIN) WOVEN FABRIC HAVING A 1200 HOUR UV RESISTANCE WITH LIFTING LOOPS.
 - PLACE BULK BAGS CAREFULLY TO PREVENT TEARING OR CUTTING OF BAGS.
 - BULK BAG FILL MATERIAL SHALL BE CLEAN, WASHED, ALLUVIUM.

STRAW WATTLE SPACING TABLE				
SLOPE	SPACING BASED ON WATTLE DIAMETER (FT)			
	6"	9"	12"	20"
1:1	5	10	15	20
2:1	10	20	30	40
3:1	15	30	45	60
4:1 OR FLATTER	20	40	60	80

- STRAW WATTLE NOTES:**
- INSTALL WATTLES ON THE UPPER SLOPE IN SEEDING ZONE 5 (DISTURBED HILLSLOPES OUTSIDE OF THE FLOODPLAIN LIMITS).
 - WATTLES SHALL BE INSTALLED ON CONTOUR.
 - TURN THE TERMINATING END OF EACH ROW UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE WATTLE.
 - EXTERIOR NETTING SHALL BE MADE OF BIODEGRADABLE FIBERS.
 - ANY DAMAGED WATTLE SHALL BE REPLACED AS DIRECTED BY THE CONTRACTING OFFICER AT THE CONTRACTOR'S EXPENSE.
 - STRAW WATTLE DIAMETER SHALL BE 9" UNLESS APPROVED BY CONTRACTING OFFICER.
 - INSTALL STRAW WATTLES PRIOR TO PLANTING AND SEEDING ACTIVITIES.



WOOD RIVER LAND TRUST
WARM SPRINGS CREEK, KETCHUM, ID
BLAINE COUNTY, IDAHO

95% DESIGN DRAWINGS

WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET

WORKING DRAFT
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CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

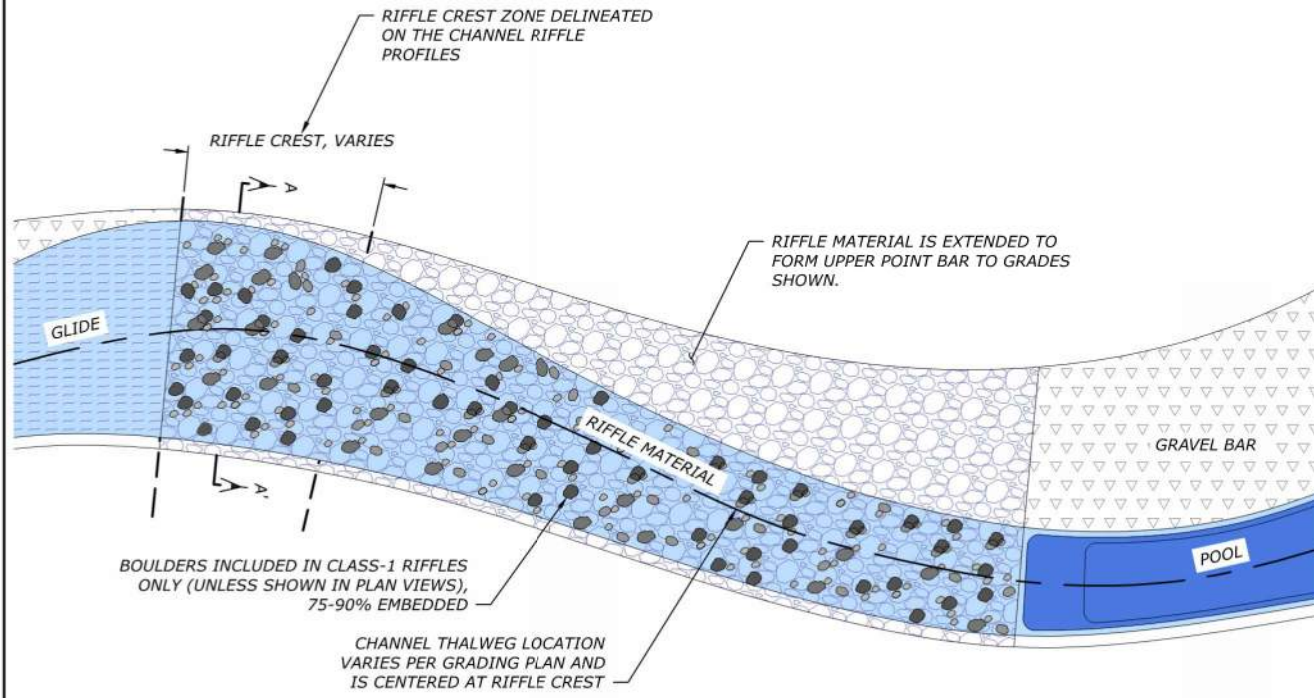
DRAWING NAME: DETAILS

ACCESS AND ISOLATION DETAILS

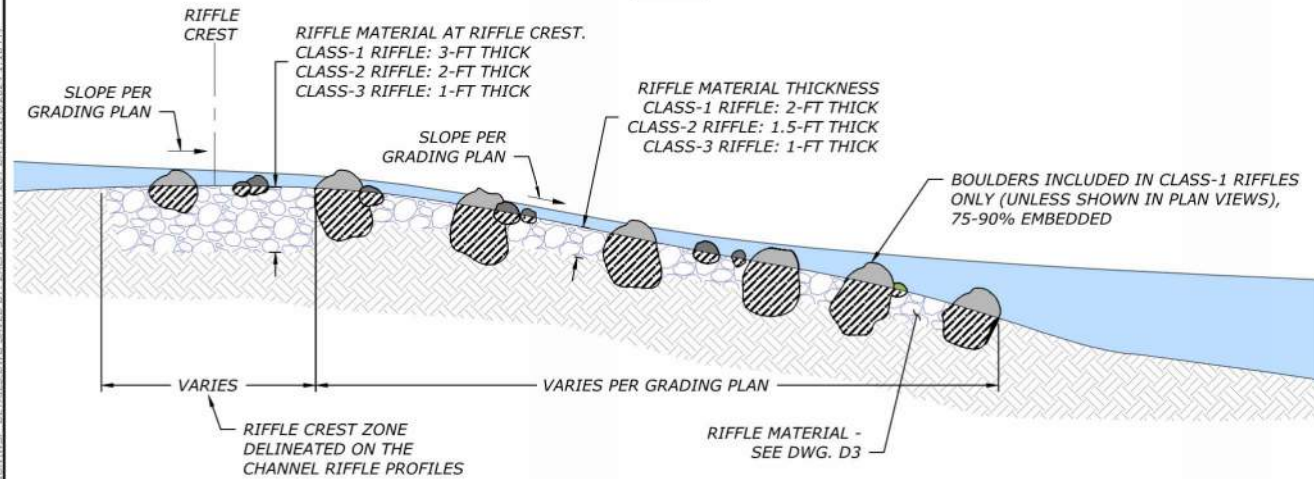
DRAWING NO. D1 126
SHEET 32 OF

RIFFLE OVERVIEW NOTES:

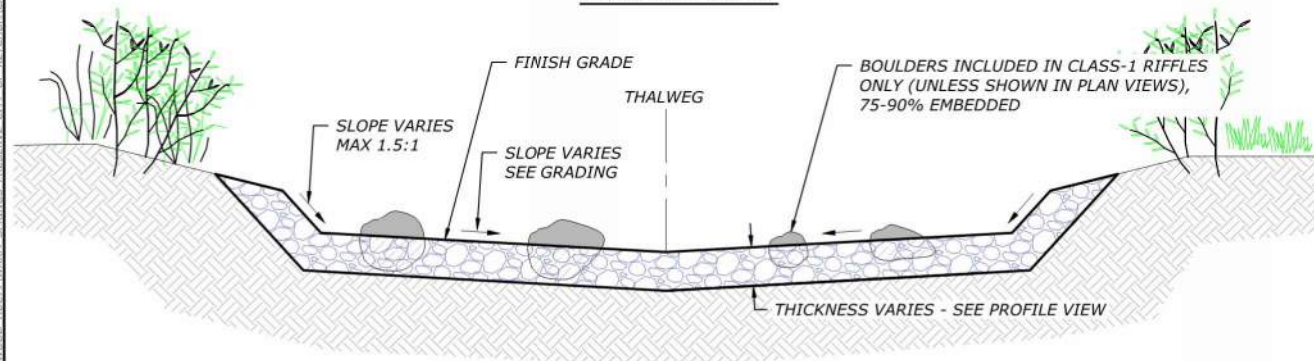
CONSTRUCTED RIFFLES ARE TO BE INSTALLED AT LOCATIONS SHOWN IN THE GRADING PLANS. CLASS 1 AND 2 RIFFLES SHALL BE OVER EXCAVATED AND CONSTRUCTED WITH SORTED NATIVE MATERIAL AND/OR IMPORTED MATERIAL THAT MEETS GRADATIONS SHOWN ON DRAWING D3. IF IN-SITU MATERIAL MEETS THE SPECIFICATION FOR CLASS 3 RIFFLE MATERIAL (CLASS 3 RIFFLE LOCATIONS ONLY) PER THE GRADATION ON DRAWING D3 THEN RIFFLE SHALL BE GRADED WITHOUT OVER-EXCAVATION AND PLACEMENT OF CLASS 3 CONSTRUCTED RIFFLE MATERIAL. IF IN-SITU MATERIAL DOES NOT MEET THE SPECIFICATION FOR CLASS 3 RIFFLE MATERIAL, RIFFLE SHALL BE OVER-EXCAVATED AND CLASS 3 CONSTRUCTED RIFFLE MATERIAL SHALL BE INSTALLED PER THE RIFFLE



PLAN



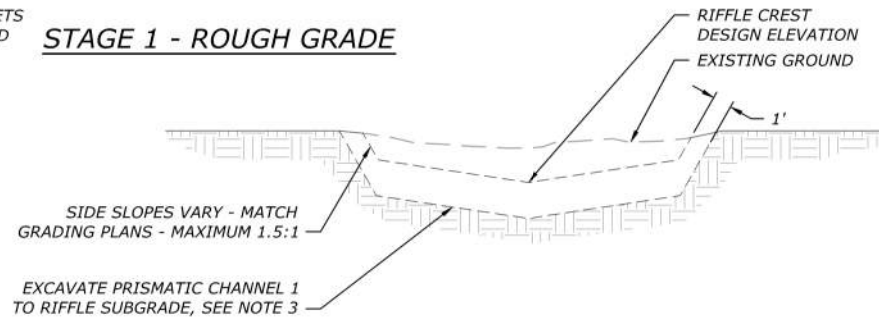
PROFILE VIEW



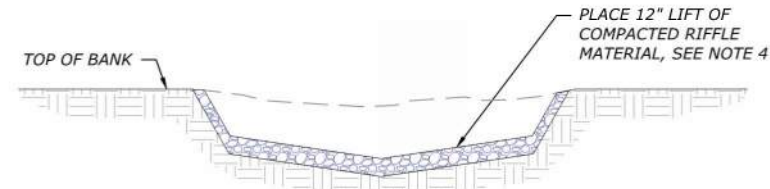
SECTION A-A'

CONSTRUCTION SEQUENCING

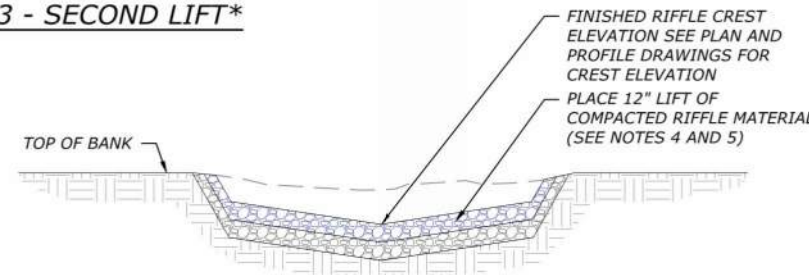
STAGE 1 - ROUGH GRADE



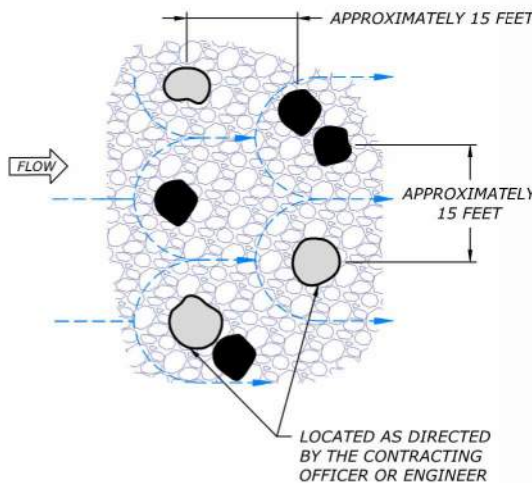
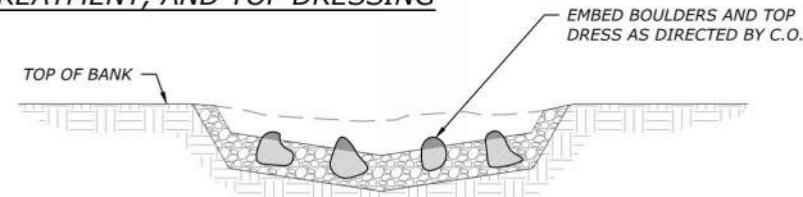
STAGE 2 - FIRST LIFT*



STAGE 3 - SECOND LIFT*



STAGE 4 - BOULDER PLACEMENT (CLASS-1 ONLY), BANK TREATMENT, AND TOP DRESSING



BOULDER PLACEMENT (CLASS-1 ONLY)

CONSTRUCTED RIFFLE NOTES:

1. SEE DWG. D3. FOR RIFFLE MATERIALS.
2. THREE PLACEMENTS ARE REQUIRED AS FOLLOWS:
 - 2.1. CONSTRUCTED RIFFLE MATERIAL
 - 2.2. BOULDERS FOR CLASS-1 ONLY (EMBEDDED)
 - 2.3. ROUGHNESS ROCK (TOP DRESSING)
3. REMOVE ORGANICS AND/OR CHANNEL MATERIAL TO FINISH GRADE OF RIFFLE IN ACCORDANCE WITH THE CHANNEL PROFILE AND DESIGN CONTOURS ON THE GRADING DRAWINGS. THEN, EXCAVATE TO RIFFLE MATERIAL SUBGRADE (TO THE SPECIFIED RIFFLE MATERIAL THICKNESS ON THE CHANNEL BED AND BANKS)
4. SCARIFY THE CHANNEL BED TO A DEPTH OF 4 INCHES (MINIMUM) FOR IMPROVED BONDING OF RIFFLE MATERIAL TO EXISTING GROUND.
5. IMPORT WELL-MIXED CLASS-1, CLASS-2, AND CLASS-3 RIFFLE MATERIAL AND/OR CREATE MATERIAL FROM SCREENING NATIVE ALLUVIUM FROM PROJECT EXCAVATIONS AND/OR IMPORTED MATERIAL MEETING THE SPECIFICATIONS FOR CONSTRUCTED RIFFLE MATERIAL.
6. PLACE RIFFLE MATERIAL IN LIFTS OF 12 INCHES (MAXIMUM) AND COMPACT BY TRACKING OVER THE MATERIAL (300 SERIES EXCAVATOR OR LARGER OR EQUIPMENT APPROVED BY THE CONTRACTING OFFICER) TO SUFFICIENTLY COMPACT THE MATERIAL.
7. REPEAT RIFFLE CONSTRUCTION BY PLACING ANOTHER 12-INCH LIFT WHERE REQUIRED TO MEET DESIGN FINISH GRADES AND CROSS SECTION SHAPE.
8. FOR CLASS-1 RIFFLES AND WHERE SHOWN IN PLAN VIEWS, INSTALL BOULDERS (SPECIFIED ON DRAWING D3) TO THE SURFACE OF THE RIFFLE IN ACCORDANCE WITH THE DETAILS ON THIS DRAWING.
9. TOP DRESS THE SURFACE OF THE RIFFLE BY INSTALLING A THIN LAYER OF LOOSE RIFFLE MATERIAL (NOT COMPACTED) AS DIRECTED BY THE ENGINEER OR CONTRACTING OFFICER TO ACHIEVE A NATURAL APPEARANCE. SEEK APPROVAL OF FINISH GRADES PRIOR TO INSTALLING TOP DRESSING.
10. IF HABITAT STRUCTURES OR BANK TREATMENTS ARE SPECIFIED WITHIN THE CONSTRUCTED RIFFLE EXTENTS, THE RIFFLE SHALL BE CONSTRUCTED BEFORE INSTALLATION OF THOSE FEATURES
11. COMPLETED RIFFLES OR CHANNELS (APPROVED BY THE ENGINEER OR CONTRACTING OFFICER) SHALL BE LEFT UNDISTURBED (NOT DRIVEN ON BY MACHINERY) UNLESS APPROVED BY THE CONTRACTING OFFICER



CONSTRUCTED RIFFLE ON THE LEMHI RIVER WITH BANK TREATMENTS - ONE YEAR AFTER CONSTRUCTION.



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
95% DESIGN DRAWINGS
 WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

WORKING DRAFT
 NOT FOR
 CONSTRUCTION

DATE: 11/6/2024
 DESIGNED: ZS, MP, JY
 APPROVED: JY

DRAWING NAME
 DETAILS

CONSTRUCTED RIFFLE

DRAWING NO. D2 127
 SHEET 33 OF 33

CLASS 1 RIFFLE MATERIAL NOTES:

1. THE LARGER COMPONENT (50% PASSING AND LARGER) OF THE CLASS 1 RIFFLE MATERIAL SHALL BE IMPORTED MATERIAL CONSISTING OF ANGULAR OR SUBANGULAR MATERIAL. THE SMALLER COMPONENT (50% PASSING AND SMALLER) CAN BE IMPORTED OR DEVELOPED ONSITE BY SCREENING AND MIXING OF NATIVE ALLUVIUM FROM PROJECT EXCAVATIONS. THE FINAL CLASS 1 RIFFLE MATERIAL SHALL BE A WELL GRADED AND UNIFORMLY MIXED SUBSTRATE BOULDERS SHALL BE INCLUDED IN CLASS-1 RIFFLE MATERIAL.

CLASS 2 RIFFLE MATERIAL NOTES:

1. CLASS 2 RIFFLE MATERIAL SHALL BE IMPORTED OR DEVELOPED BY CONTRACTOR ONSITE BY SCREENING AND MIXING OF NATIVE ALLUVIUM FROM PROJECT EXCAVATIONS TO FORM A WELL GRADED AND UNIFORMLY MIXED SUBSTRATE.

CLASS 3 RIFFLE MATERIAL NOTES:

1. THE C.O. OR ENGINEER SHALL INSPECT SUITABILITY OF IN-SITU MATERIAL (IN EXCAVATION AREAS) AND ACCEPT OR REJECT BASED UPON THE CLASS 3 RIFFLE MATERIAL GRADATION SHOWN ON THIS DRAWING.
2. IF IN-SITU MATERIAL DOES NOT MEET THE SPECIFIED CLASS 3 RIFFLE GRADATION AT CLASS 3 RIFFLE LOCATIONS, THE CONTRACTOR SHALL OVER-EXCAVATE UNSUITABLE MATERIAL AND INSTALL A CONSTRUCTED RIFFLE PER THE DETAIL ON DRAWING D2 USING ACCEPTABLE CLASS 3 MATERIAL.
3. WHERE PLACEMENT OF CLASS 3 RIFFLE MATERIAL IS REQUIRED TO MEET FINISH GRADE (FILL AREAS), THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF A CONSTRUCTED RIFFLE PER DRAWING D2. THE FULL THICKNESS OF FILL MATERIAL SHALL MEET CLASS 3 RIFFLE MATERIAL SPECIFICATIONS (IF THICKER THAN 1-FT REQUIRED THICKNESS).

BOULDERS	
DESCRIPTION	SIZE CLASS
BOULDERS	36 INCH - 48 INCH
EXTRA LARGE HABITAT BOULDERS	48 INCH MIN.

BOULDER NOTES:

1. SEE TYPICAL BOULDER PLACEMENT DETAIL, DWG. D2.
2. BOULDERS SHALL BE IMPORTED.
3. NOMINAL DIAMETER SHALL BE MEASURED AS THE INTERMEDIATE AXIS WHERE THE SMALL AND LARGE AXIS SHALL NOT BE MORE THAN 3 TIMES LESS THAN OR GREATER THAN THE NOMINAL DIAMETER. THIS PREVENTS LONG AND/OR THIN PLATE LIKE BOULDERS FROM BEING APPROVED.
4. BOULDERS SHALL BE ROUNDED TO SUB-ANGULAR.

GRADATION NOTES:

1. PERCENT PASSING SIZE CLASS IS BASED ON THE NOMINAL DIAMETER OF ROCK.
2. NOMINAL DIAMETER SHALL BE MEASURED AS THE INTERMEDIATE AXIS WHERE THE SMALL AND LARGE AXIS SHALL NOT BE MORE THAN 3 TIMES LESS THAN OR GREATER THAN THE NOMINAL DIAMETER.
3. SIZE CLASS IS UNIQUE TO THESE DRAWINGS AND IS NOT THE UNIFIED SOIL CLASSIFICATION.
4. ACCEPTABLE RIFFLE MATERIAL MAY BE CREATED FROM STOCKPILES OF VARIOUS SIZED SCREENED MATERIALS.

CLASS 1 RIFFLE MATERIAL	
PERCENT PASSING	SIZE CLASS
100%	32 INCHES
84%	26 INCHES
50%	16 INCHES
30%	12 INCHES
16%	8 INCH
10%	<0.8 INCH

CLASS 2 RIFFLE MATERIAL	
PERCENT PASSING	MIN. SIZE CLASS
100%	18 INCHES
84%	14 INCHES
50%	9 INCHES
30%	7 INCHES
16%	4.5 INCH
10%	<0.5 INCH

CLASS 3 RIFFLE MATERIAL	
PERCENT PASSING	MIN. SIZE CLASS
100%	8.0 INCHES
84%	6.0 INCHES
50%	4.0 INCHES
30%	3.0 INCHES
16%	2.0 INCH
10%	<0.2 INCH

RIFFLE SCHEDULE NOTES:

1. RIFFLE CREST IS DEFINED AS THE LONGITUDINAL (PARALLEL TO STREAM FLOW) LENGTH OF THE 0% SLOPE PORTION OF THE UPSTREAM END OF THE RIFFLE.

MAIN CHANNEL RIFFLE SCHEDULE						
START STA (FT)	END STA (FT)	CREST LENGTH (FT)	RIFFLE CLASS	AREA (SQ.FT.)	RIFFLE VOLUME (CY)	BOULDER S (EA)
11+01	12+01	10	CLASS-1	3311	274	6
26+17	27+34	0	CLASS-1	7516	592	10

BALDY CHANNEL RIFFLE SCHEDULE						
START STA (FT)	END STA (FT)	CREST LENGTH (FT)	RIFFLE CLASS	AREA (SQ.FT.)	RIFFLE VOLUME (CY)	BOULDER S (EA)
0+00	0+54	10	CLASS-2	499	30	0
1+16	1+91	0	CLASS-3	907	34	0
2+55	3+34	0	CLASS-3	1353	51	0
3+89	4+41	0	CLASS-3	889	33	0
4+90	5+66	0	CLASS-3	1272	48	0
6+59	6+84	0	CLASS-3	609	23	0
7+87	8+55	0	CLASS-3	1080	41	0
8+86	9+18	0	CLASS-3	548	21	0
9+51	9+69	0	CLASS-3	323	12	0
9+94	10+58	0	CLASS-3	1017	38	0
10+98	11+15	0	CLASS-3	253	10	0
11+43	11+67	0	CLASS-3	374	14	0
12+11	12+85	0	CLASS-3	1126	42	0
13+42	13+91	0	CLASS-3	797	30	0
14+29	14+58	0	CLASS-3	514	20	0
14+92	15+34	0	CLASS-3	701	26	0
15+80	16+02	0	CLASS-3	375	14	0
16+31	16+74	0	CLASS-3	745	28	0
17+09	17+30	0	CLASS-3	376	14	0
17+69	18+77	10	CLASS-2	3140	180	0
19+16	19+51	0	CLASS-3	629	24	0
20+55	20+84	10	CLASS-2	373	24	0
20+99	21+28	10	CLASS-2	377	24	0
21+35	21+65	10	CLASS-2	402	25	0
21+75	22+25	10	CLASS-2	674	40	0

WETLAND CHANNEL RIFFLE SCHEDULE						
START STA (FT)	END STA (FT)	CREST LENGTH (FT)	RIFFLE CLASS	AREA (SQ.FT.)	RIFFLE VOLUME (CY)	BOULDER S (EA)
0+00	0+76	0	CLASS-3	646	24	0
1+28	1+44	0	CLASS-3	160	6	0

CULVERT RIFFLE SCHEDULE						
START STA (FT)	END STA (FT)	CREST LENGTH (FT)	RIFFLE CLASS	AREA (SQ.FT.)	RIFFLE VOLUME (CY)	BOULDER S (EA)
N/A	N/A	0	CLASS-3	472	17	0



WARM SPRINGS PRESERVE STREAM & FLOODPLAIN ENHANCEMENT DESIGN SET
 95% DESIGN DRAWINGS
 WOOD RIVER LAND TRUST
 WARM SPRINGS CREEK, KETCHUM, ID
 BLAINE COUNTY, IDAHO

WORKING DRAFT
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 CONSTRUCTION

DATE: 11/6/2024
 DESIGNED: ZS.MP. JY
 APPROVED: JY

DRAWING NAME
DETAILS

CONSTRUCTED RIFFLE MATERIALS AND SCHEDULES

DRAWING NO. D3 128
SHEET 34 OF

WORKING DRAFT
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CONSTRUCTION

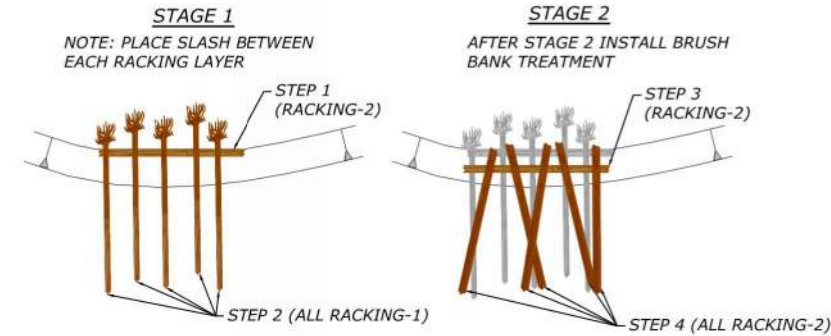
DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
DETAILS

SHORT ROUGHENED
EDGE

DRAWING NO. D4 129
SHEET 35 OF 35

SHORT ROUGHENED EDGE STRUCTURE SEQUENCING



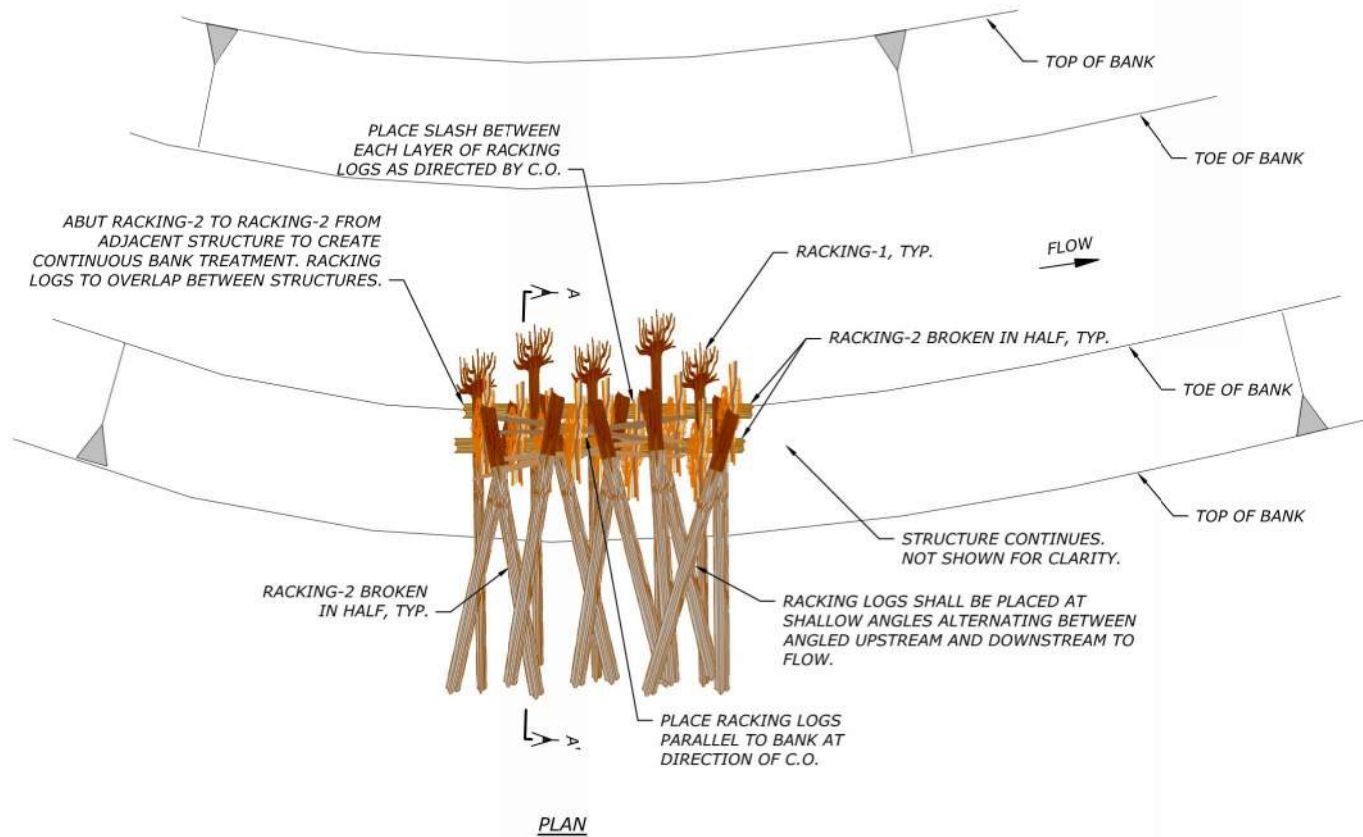
SEQUENCING NOTES:

- RACKING-2 (FOOTER) SHALL BE PLACED SO ITS UPSTREAM END RESTS ON THE STREAM BED (UP TO 1/2 DIAMETER BURIED TO ACCOMMODATE VARIED BANK HEIGHTS) ALONG THE TOE OF THE BANK. BACKFILL AND COMPACT AROUND FOOTER LOG WITH COMPACTED FILL.
- RACKING-1 LOGS (WITH ROOTWADS) SHALL BE INSTALLED ON TOP OF RACKING-2 LOGS. ROOTWADS SHALL BE PLACED OVER TOP OF FOOTER LOG WITH ROOTWAD AS CLOSE TO BANK AS POSSIBLE AND AS DIRECTED BY C.O.
- PLACE SLASH BETWEEN EACH LAYER OF RACKING.
- REPEAT STEPS 1 AND 2 AT THE DIRECTION OF C.O. TO BUILD TALL ROUGHENED EDGE.
- PLACE GENERAL FILL OVER PLACED MATERIALS TO FINISH GRADES AND COMPACT TO 85% RELATIVE DENSITY.

SHORT ROUGHENED EDGE BANK TREATMENT (PER 10-FT LENGTH) MATERIAL SCHEDULE

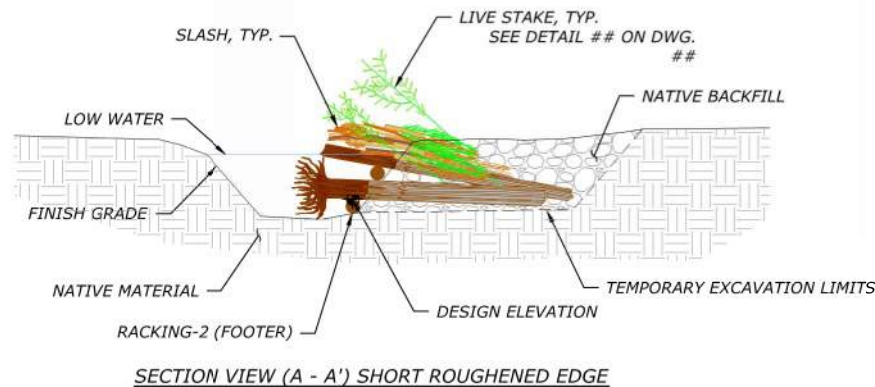
LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	3 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	4 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	7 CY
SLASH-2	1 - 4	5 - 15	NA	NA	YES	7 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	10 EA

- QUANTITIES SHOWN IN THE TABLES INCLUDE QUANTITIES ASSOCIATED WITH THE BRUSH BANK PORTION OF THESE TREATMENTS.
- C.O. MAY REQUEST PLACEMENT OF ADDITIONAL MATERIAL BASED ON BANK HEIGHT AND EXPOSURE OF UNSUITABLE MATERIAL.
- IF LIVE STAKES QUANTITY IS FOR DORMANT INSTALLATION, QUANTITY SHALL BE DOUBLED IF INSTALLED APRIL 21 TO OCTOBER 10.



NOTES:

- ROUGHENED EDGE BANK TREATMENT SHALL BE CONSTRUCTED AT LOCATIONS AS SHOWN ON THE PLANS. THE EXACT LOCATION OF EACH OCCURRENCE OF BANK ROUGHNESS SHALL BE LOCATED BY THE CONTRACTOR AND APPROVED BY THE C.O. PRIOR TO CONSTRUCTING.
- ALL EXPOSED ENDS OF KEY LOGS AND RACKING LOGS SHALL BE BROKEN. ALL EXPOSED CLEAN CUT ENDS OF LOGS WILL REQUIRE THE CONTRACTOR TO REPLACE WITH A BROKEN END AT NO ADDITIONAL EXPENSE.

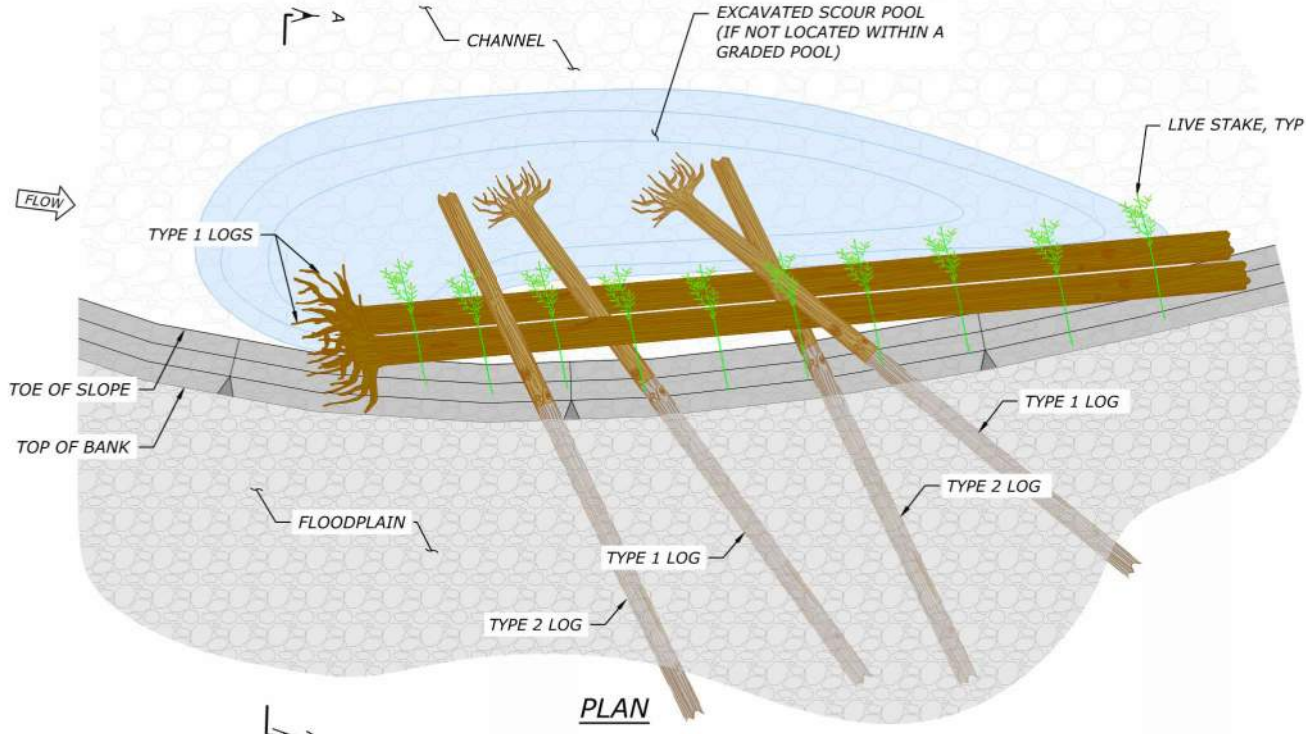


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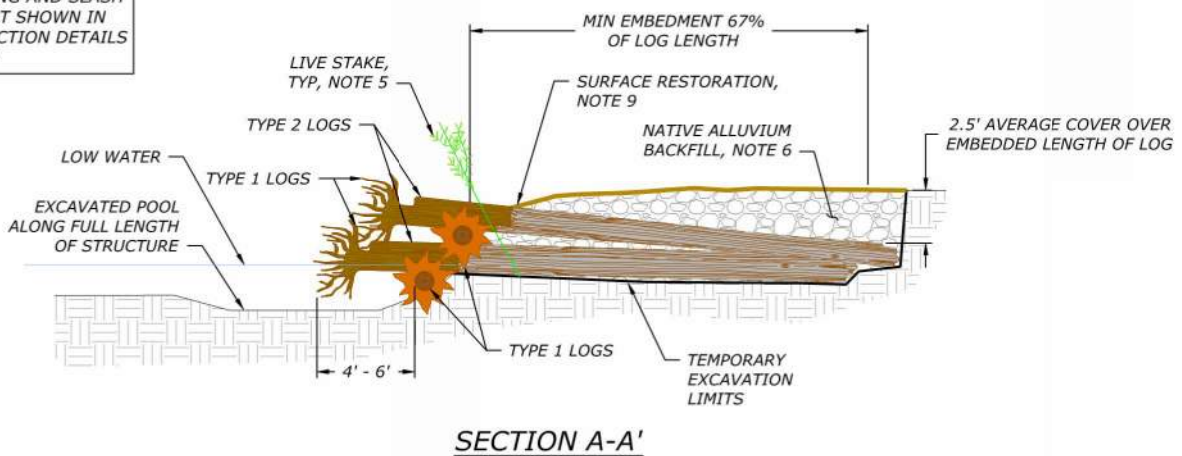
DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
DETAILS
HS-1

DRAWING NO. D5 130
SHEET 36 OF 36



NOTE: RACKING AND SLASH MATERIAL NOT SHOWN IN PLAN AND SECTION DETAILS FOR CLARITY.



- NOTES:**
1. INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE APPROVED BY THE CONTRACTING OFFICER PRIOR TO INSTALLATION.
 2. IF POOL EXCAVATION IS NOT SPECIFIED IN THE GRADING PLAN, THE CONTRACTING OFFICER WILL DETERMINE IF A SCOUR POOL IS DESIRED. THE SCOUR POOL SHALL BE EXCAVATED TO A DEPTH OF 2' ADJACENT TO THE STRUCTURE AND EXTEND BEYOND ROOTWADS EXTENDING INTO CHANNEL PER THE DIRECTION OF THE CONTRACTING OFFICER.
 3. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING CONSTRUCTION OF RIFFLES OR STREAMBED MATERIALS.
 4. RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE BY WEAVING THE MATERIAL IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER. RACKING CAN BE PLACED FIRST TO LIFT THE LOG OFF CHANNEL BED AS DIRECTED BY THE CONTRACTING OFFICER. SEE STRUCTURE SEQUENCING FOR RACKING AND SLASH PLACEMENT.
 5. LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
 6. BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE IS DEFINED AS ANYTHING CLASSIFIED AS A CLAY, SILT, OR SAND. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
 7. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARKED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
 8. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

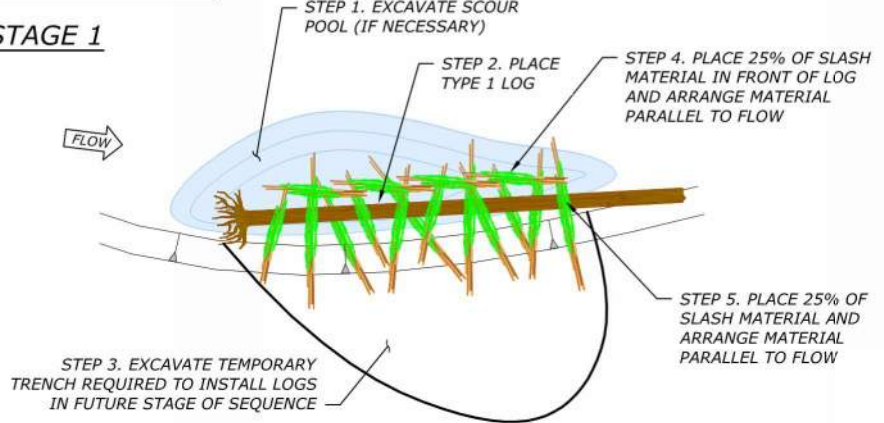
HS-1: SIX-LOG STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	4 EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	2 EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	6 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	6 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	20 EA
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	15 EA

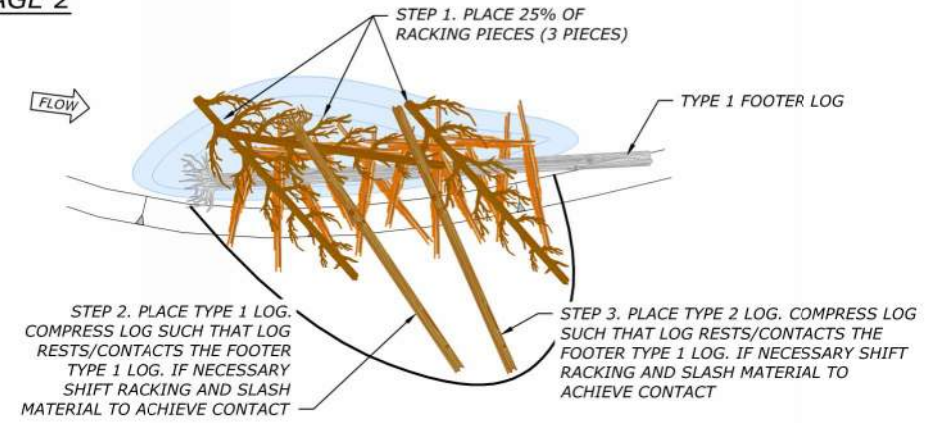
NOTE: REPEAT STAGES 1-3 FOR 2ND LIFT.

STRUCTURE SEQUENCING

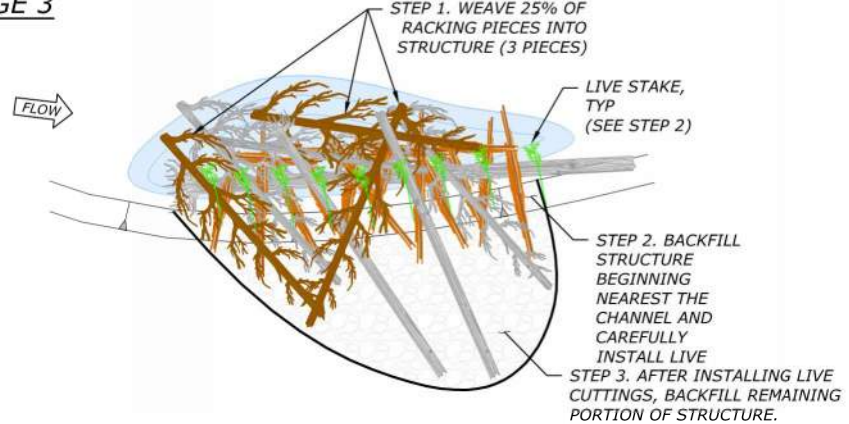
STAGE 1



STAGE 2



STAGE 3



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CONSTRUCTION**

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
DETAILS

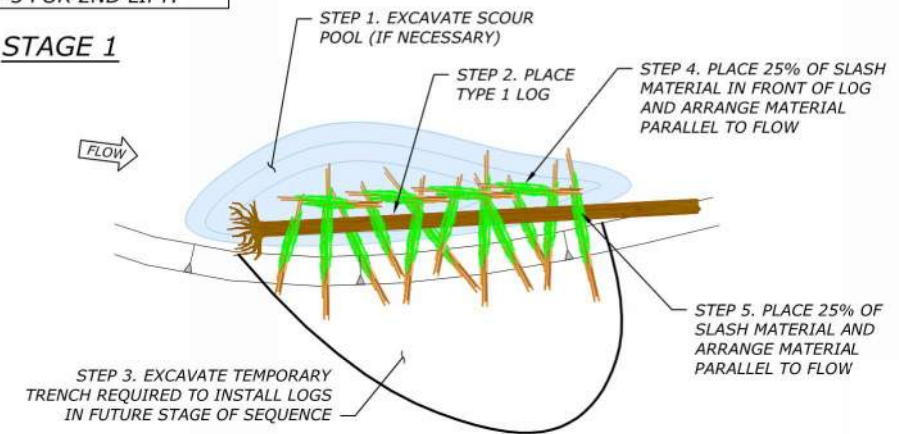
HS-2

DRAWING NO.
D6 131
SHEET 37 OF

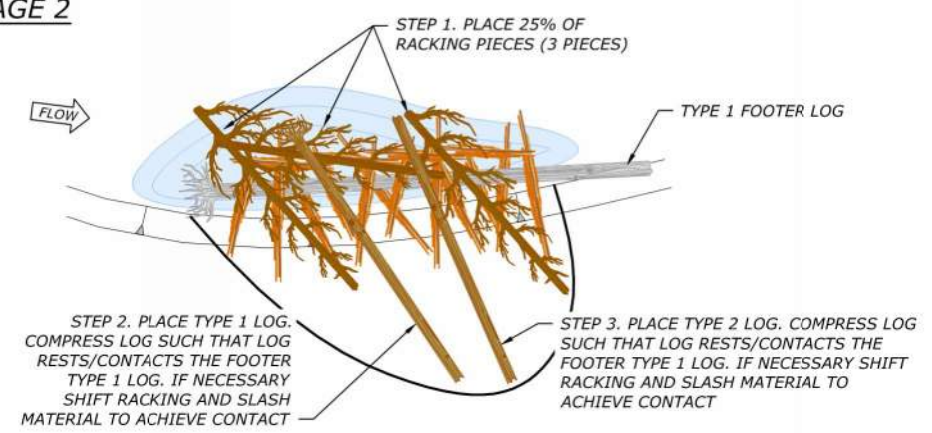
NOTE: REPEAT STAGES 1-3 FOR 2ND LIFT.

STRUCTURE SEQUENCING

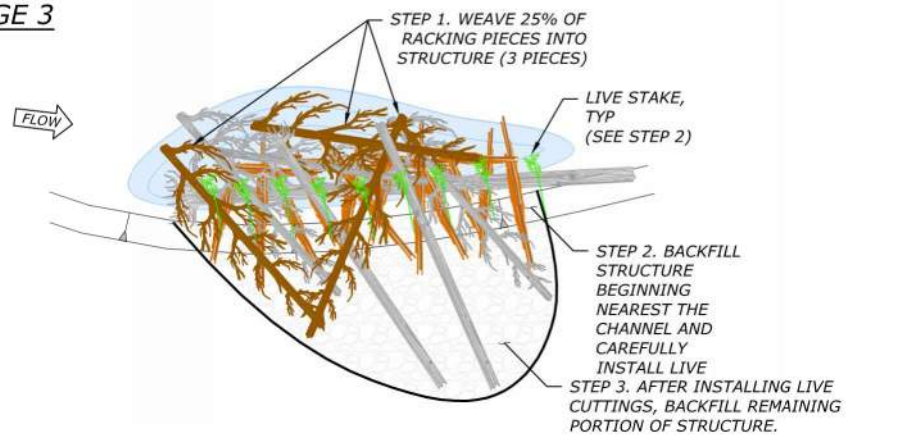
STAGE 1



STAGE 2

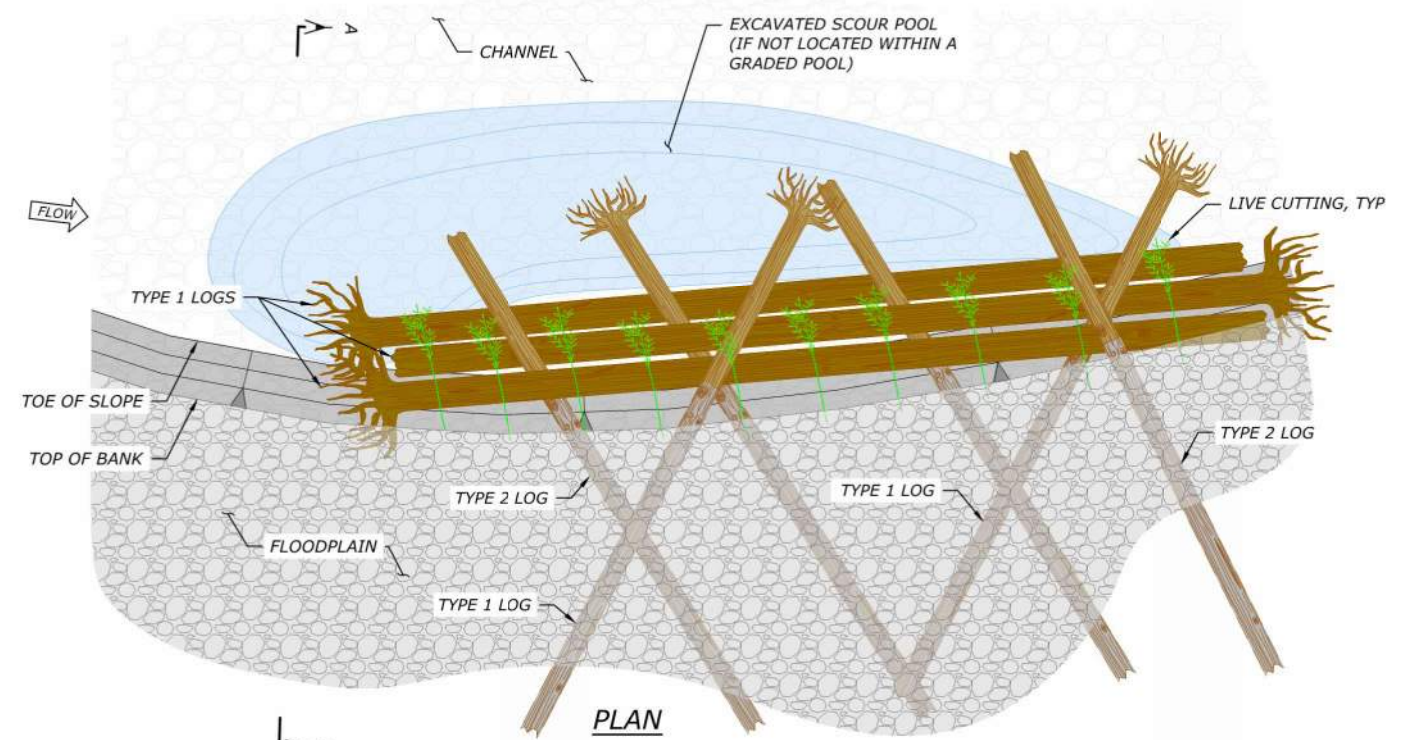


STAGE 3

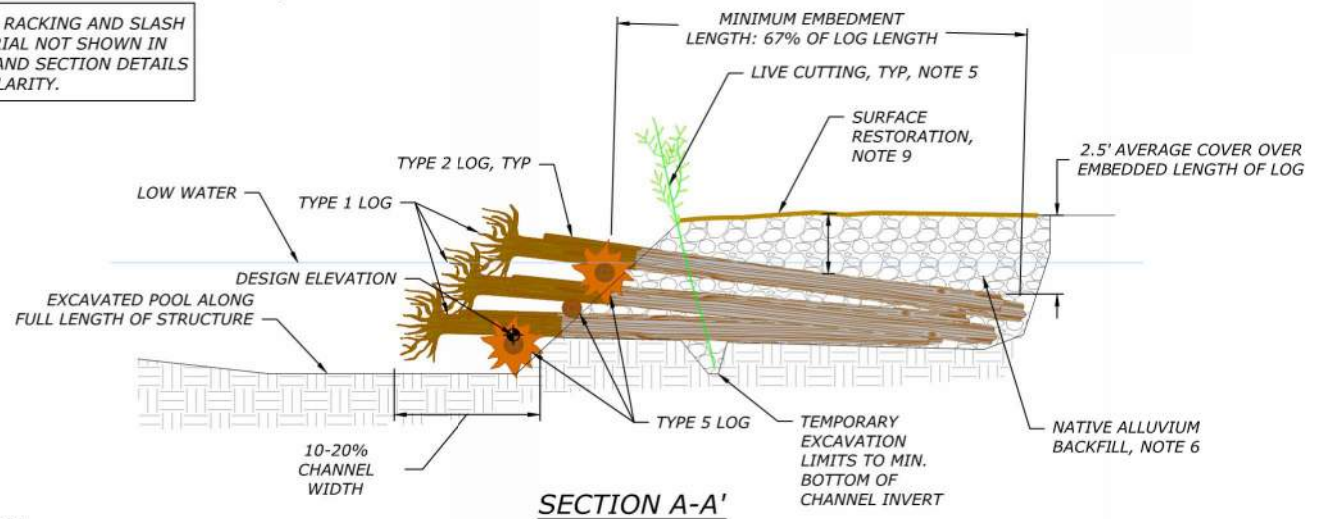


HS-2: NINE-LOG STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	3 EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	3 EA
TYPE 5	13 - 22	40 - 50	YES	4.5	NO	3 EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	9 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	15 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	45 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	20 EA



NOTE: RACKING AND SLASH MATERIAL NOT SHOWN IN PLAN AND SECTION DETAILS FOR CLARITY.



- NOTES:**
- INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE APPROVED BY THE CONTRACTING OFFICER PRIOR TO INSTALLATION.
 - IF POOL EXCAVATION IS NOT SPECIFIED IN THE GRADING PLAN, THE CONTRACTING OFFICER WILL DETERMINE IF A SCOUR POOL IS DESIRED. THE SCOUR POOL SHALL BE EXCAVATED TO A DEPTH OF 2' ADJACENT TO THE STRUCTURE AND EXTEND BEYOND ROOTWADS EXTENDING INTO CHANNEL PER THE DIRECTION OF THE CONTRACTING OFFICER.
 - ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING CONSTRUCTION OF RIFFLES OR STREAMBED MATERIALS.
 - RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE BY WEAVING THE MATERIAL IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER. RACKING CAN BE PLACED FIRST TO LIFT THE LOG OFF CHANNEL BED AS DIRECTED BY THE CONTRACTING OFFICER. SEE STRUCTURE SEQUENCING FOR RACKING AND SLASH PLACEMENT.
 - LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
 - BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE IS DEFINED AS ANYTHING CLASSIFIED AS A CLAY, SILT, OR SAND. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
 - ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
 - LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

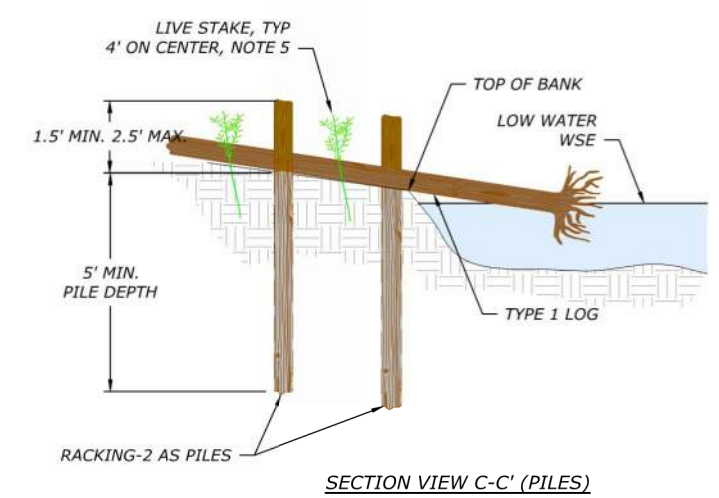
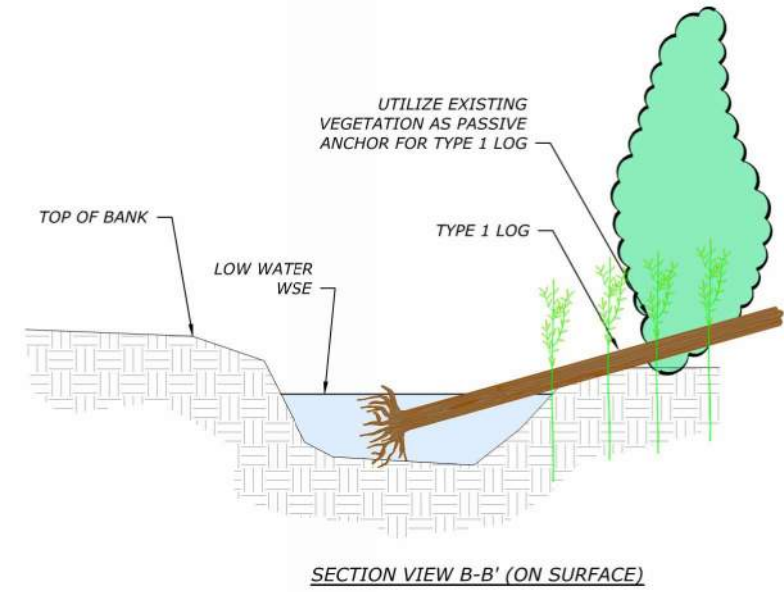
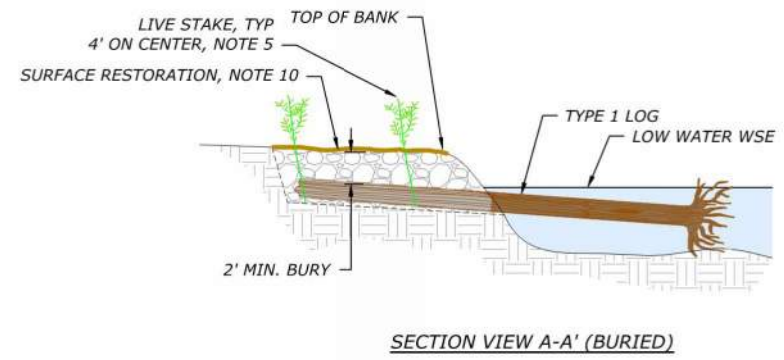
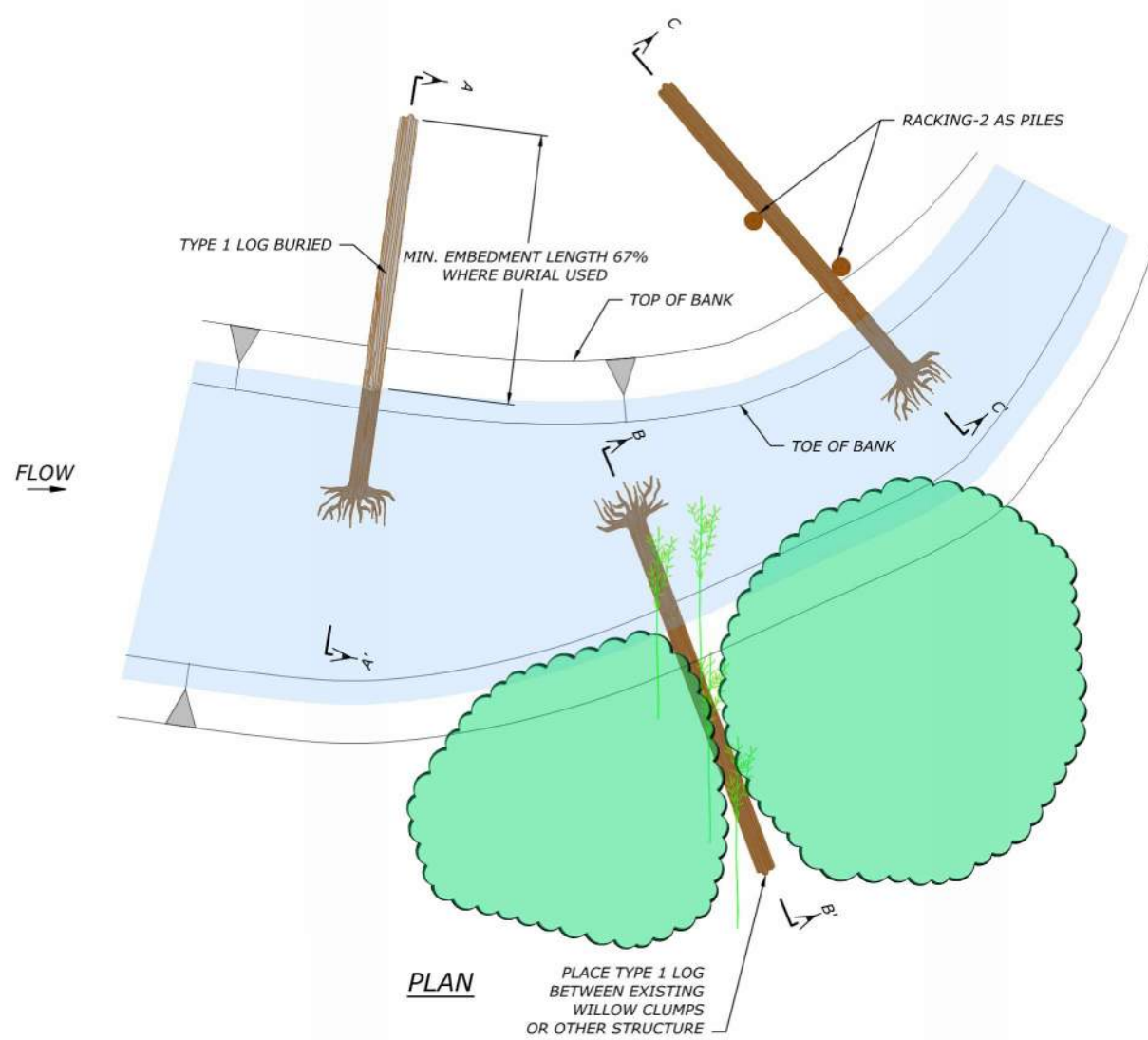
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NOT FOR
CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS.MP. JY
APPROVED: JY

DRAWING NAME
DETAILS

HS-3

DRAWING NO. D7 132
SHEET 38 OF 38



NOTES:

1. INSTALL STRUCTURES AT LOCATIONS IDENTIFIED ON PLAN AND PROFILE DRAWINGS.
2. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
3. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
4. SEE STRUCTURE SCHEDULE FOR NUMBER OF STRUCTURES, LOCATIONS, LOGS, AND ASSOCIATED MATERIAL QUANTITIES.
5. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
6. RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE WHILE PLACING LAYERS SUCH THAT IT IS WOVEN INTO STRUCTURE IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
7. WHEN EXCAVATED INTO GROUND, BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE FOR BACKFILL. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING.
8. WHEN UTILIZING EXISTING VEGETATION AS PASSIVE ANCHORS THERE SHALL BE AT A MINIMUM A WILLOW CLUMP ON THE DOWNSTREAM SIDE, BUT PREFERABLY ON THE UPSTREAM SIDE AS WELL. THE CONTRACTING OFFICER SHALL AGREE TO PLACEMENT AREAS OF STRUCTURES THAT ARE NOT BURIED.
9. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

HS-3: SINGLE-LOG STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	1 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	3 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	3 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	6 EA

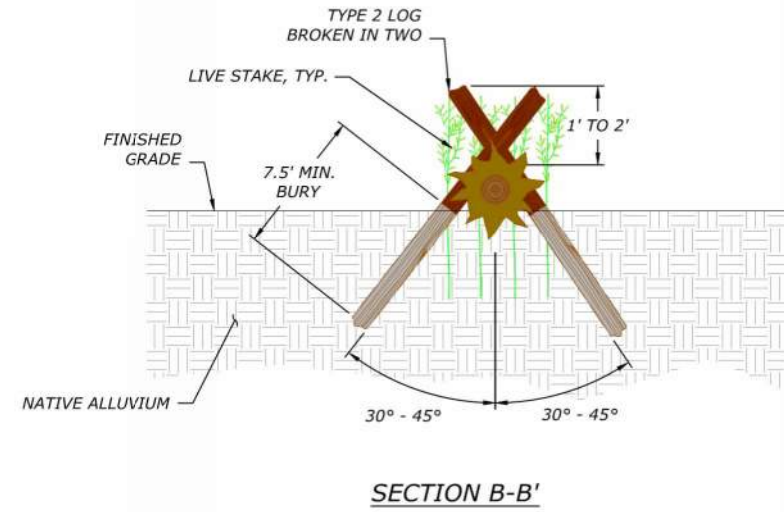
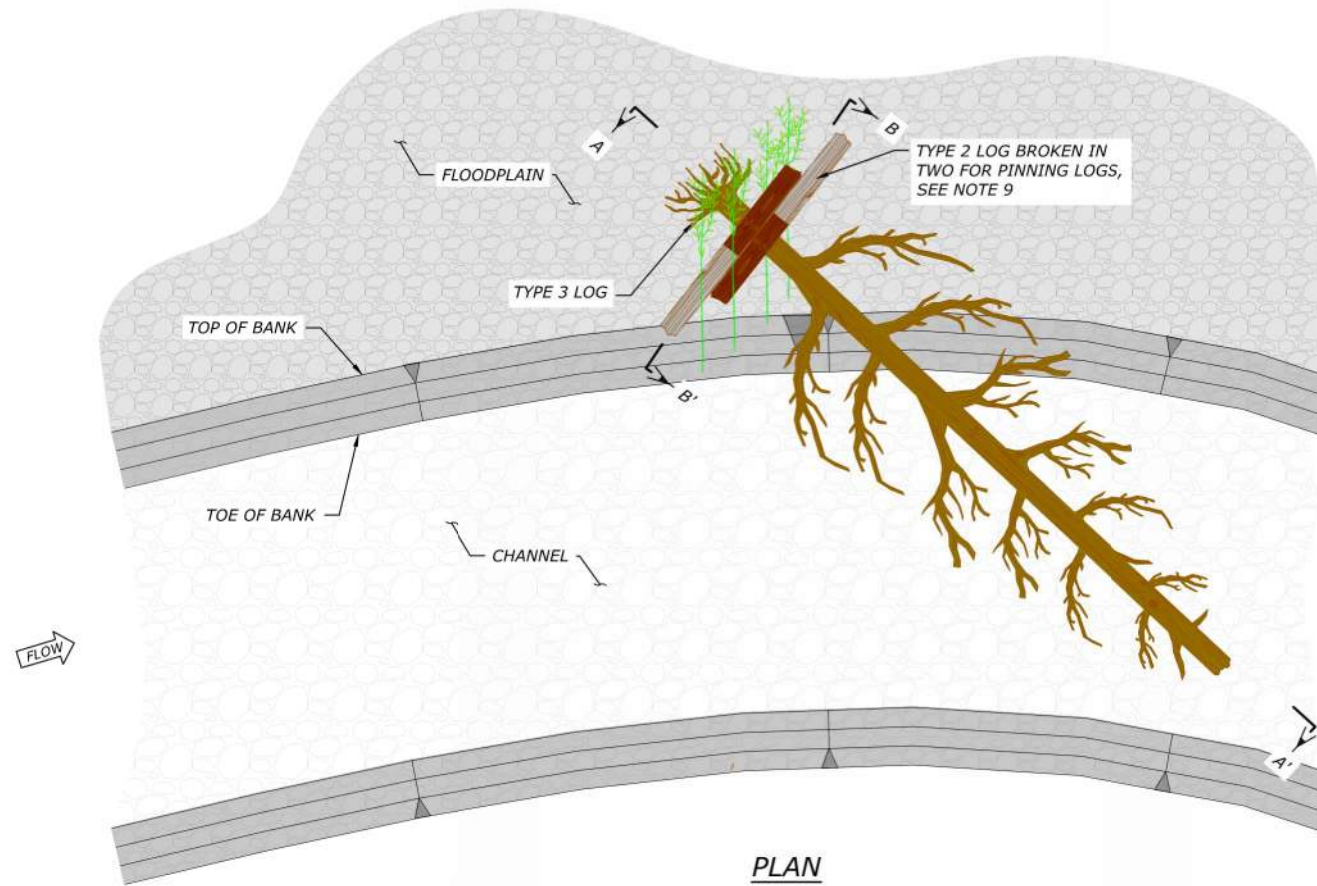
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CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

DRAWING NAME
DETAILS

HS-4

DRAWING NO.
D8 133
SHEET 39 OF 40

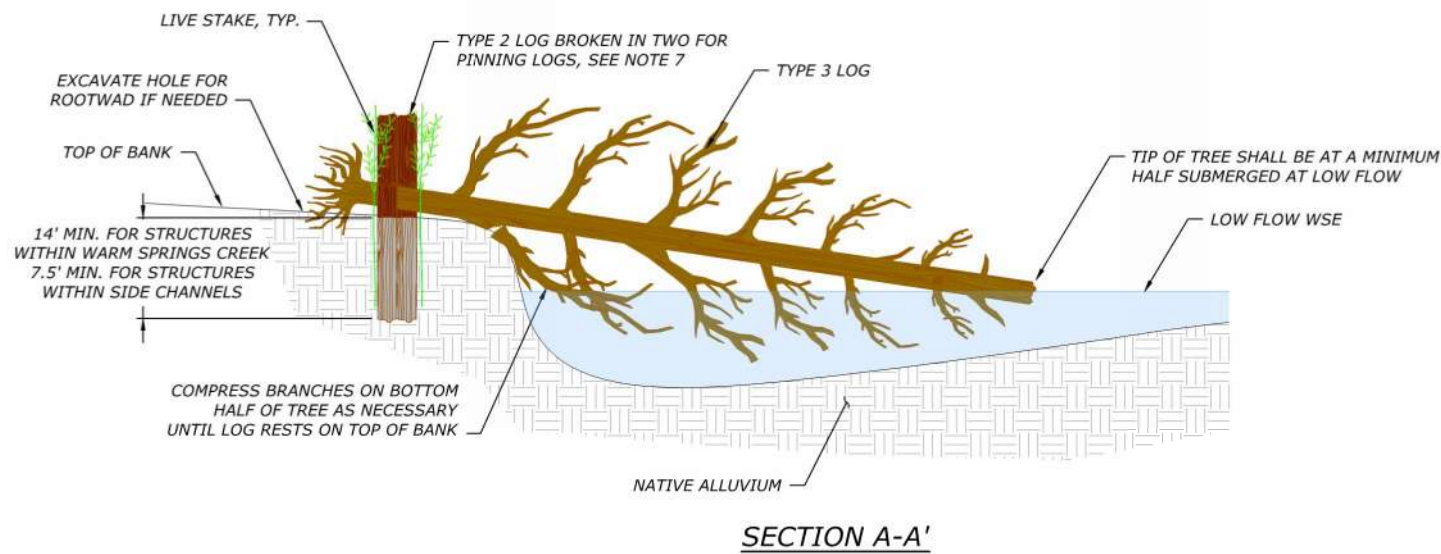


NOTES:

1. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.

NOTES:

1. INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
2. ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
3. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
4. TYPE 3 LOG SHALL BE HANDLED A MINIMUM NUMBER OF TIMES TO REDUCE LOSS OF LIMBS, FOLIAGE, ETC.. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE AT NO COST TO THE SPONSOR.
5. SLASH MATERIAL SHALL BE INCORPORATED INTO THE STRUCTURE BY PLACING IT UPSTREAM OR UNDER TYPE 3 LOG, AS DIRECTED BY THE CONTRACTING OFFICER.
6. LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.
7. PINNING LOGS TO BE DRIVEN.



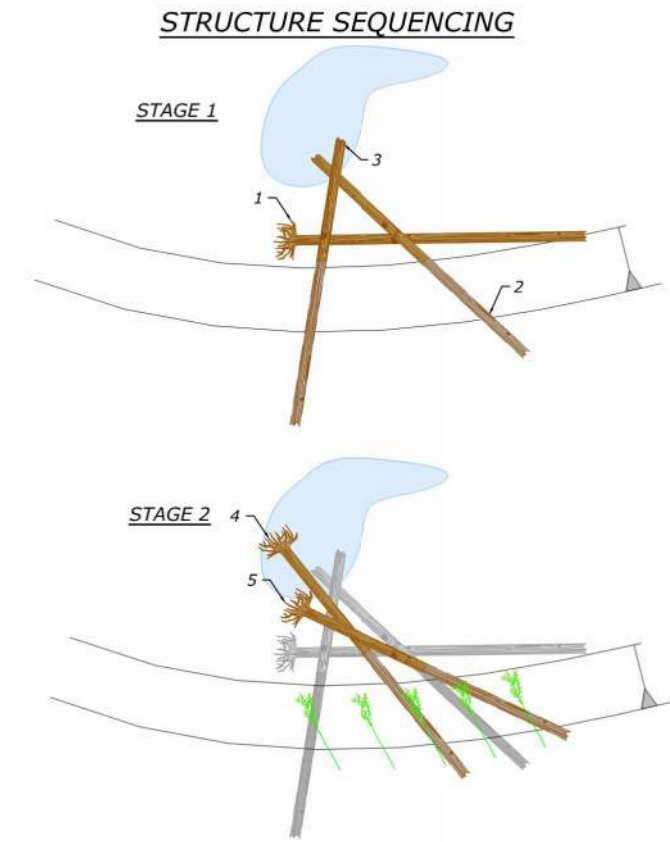
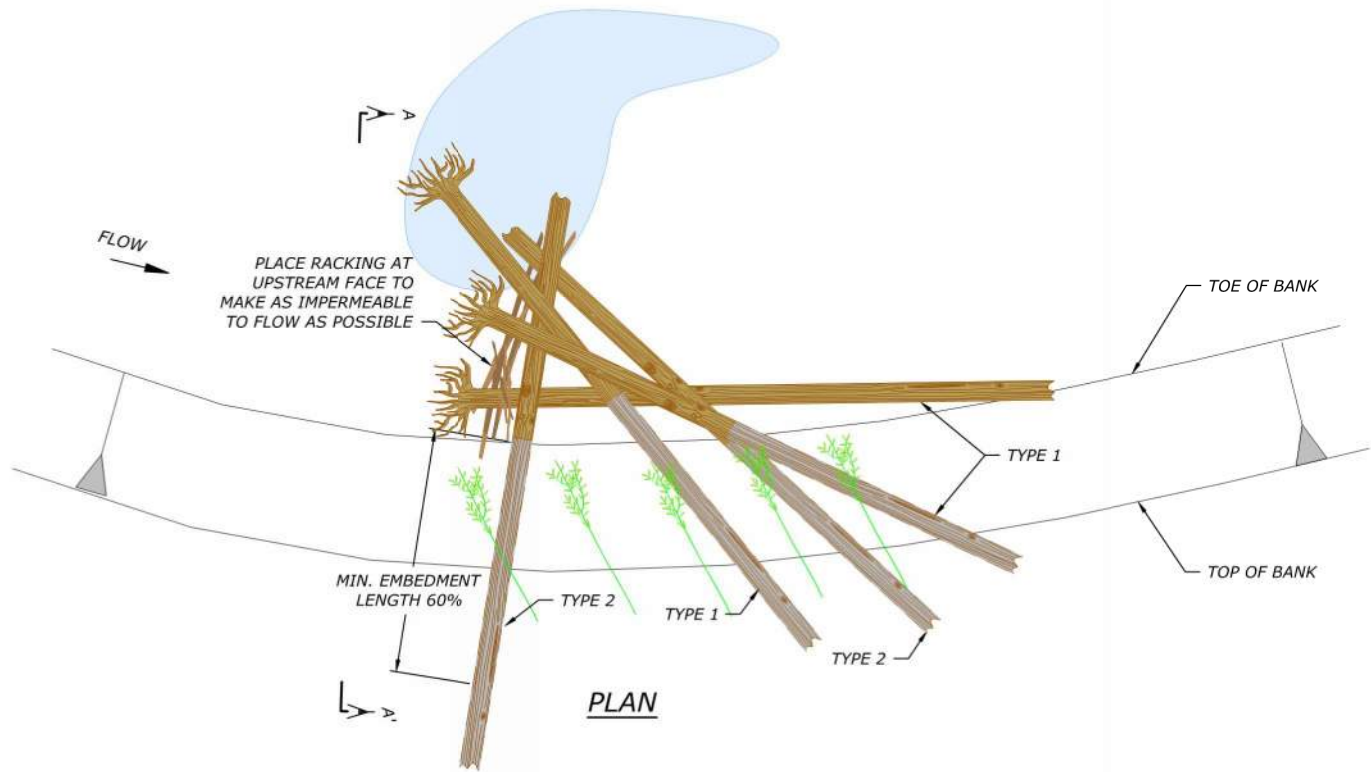
HS-4: WHOLE TREE STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 2	13 - 22	30 - 40	NO	NA	NO	1 EA
TYPE 3	13 - 22	40 - 60	YES	4	YES	1 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	2 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	5 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	6 EA

14

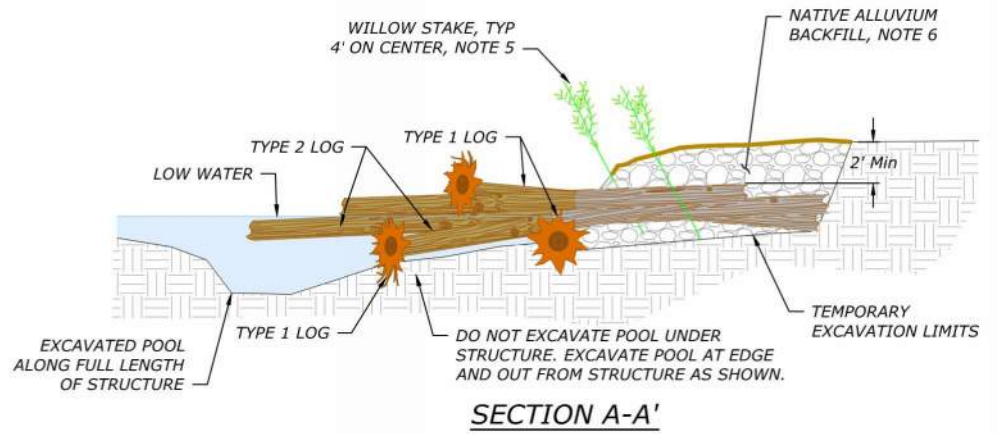
HABITAT STRUCTURE - 4 (HS-4) WHOLE TREE STRUCTURE

NTS



HS-5: CONSTRUCTION JAM STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	3 EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	2 EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	2 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	8 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	10 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	8 EA



- NOTES:**
- INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
 - WHERE POOL EXCAVATION IS NOT SPECIFIED IN THE GRADING PLAN, THE C.O. MAY DIRECT EXCAVATION OF A SCOUR POOL. IF A SCOUR POOL IS REQUIRED EXCAVATE A 2' DEEP POOL ADJACENT TO THE STRUCTURE AND EXTEND POOL OUT PAST ROOTWAD EXTENDING INTO CHANNEL.
 - ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
 - RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE WHILE PLACING LAYERS SUCH THAT IT IS WOVEN INTO STRUCTURE IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
 - LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
 - BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE MATERIAL CLASSIFIES AS A CLAY, SILT OR SAND. PLACE BACKFILL AS THE STRUCTURE IS CONSTRUCTED IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
 - ALL EXPOSED ENDS OF LOGS SHALL BE BROKEN/MARRED AND NOT SAW CUT TO APPEAR NATURAL.
 - LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

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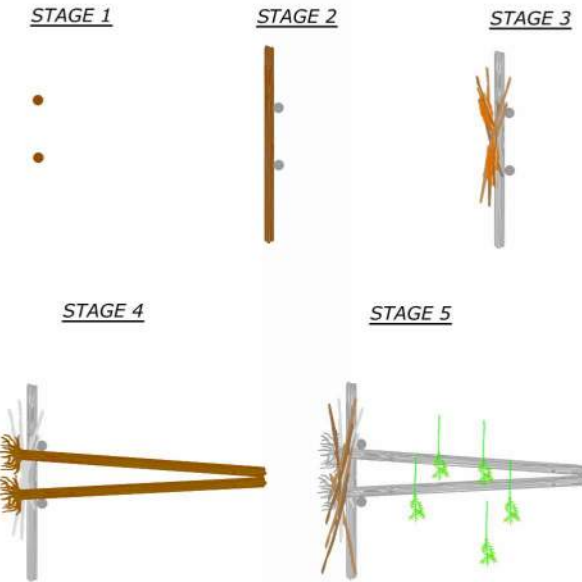
DATE: 11/6/2024
 DESIGNED: ZS, MP, JY
 APPROVED: JY

DRAWING NAME
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 HS-5

DRAWING NO. D9 134
 SHEET 40 OF 40

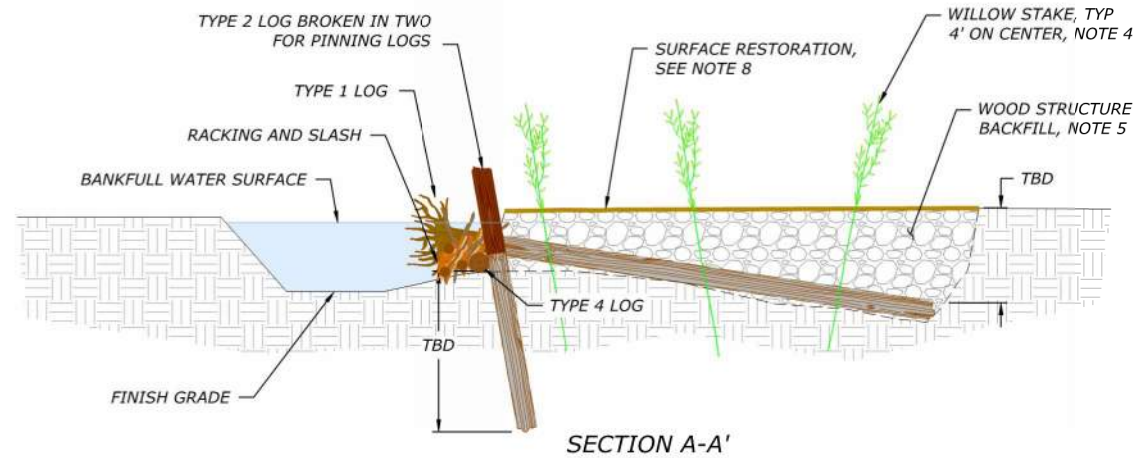
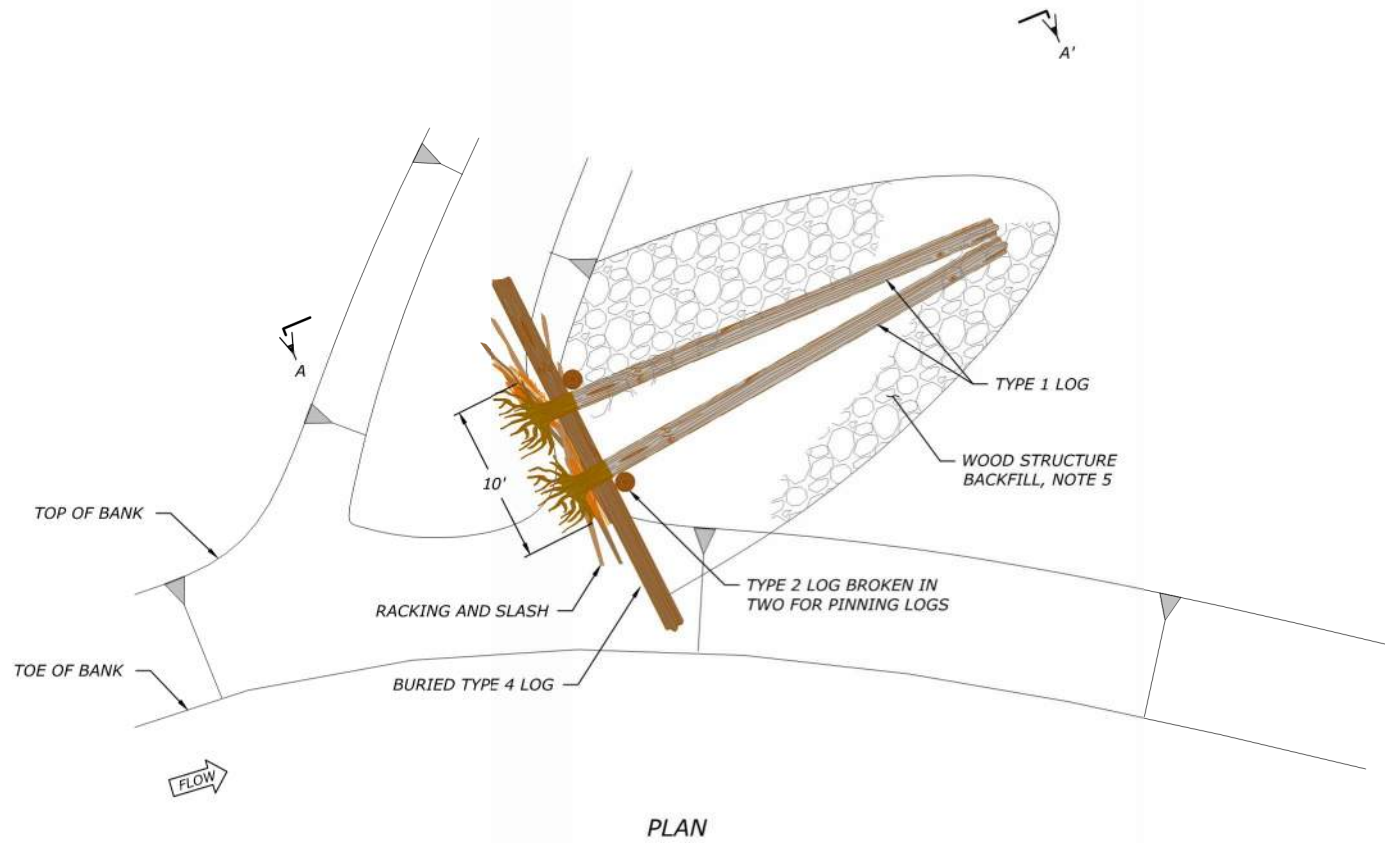
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STRUCTURE SEQUENCING



HS-6: SMALL APEX JAM STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	2 EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	1 EA
TYPE 4	12 - 14	20 - 35	NO	NA	NO	1 EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	2 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	8 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	10 CY
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	8 EA



NOTES:

- INSTALL STRUCTURES AT LOCATIONS IDENTIFIED IN THE PLANS. THE EXACT LOCATION OF EACH STRUCTURE SHALL BE STAKED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
- ROUGH GRADING OF PILOT CHANNEL SHALL BE COMPLETE PRIOR TO INSTALLATION OF LOGS.
- RACKING, SLASH, AND LIVE STAKES SHALL BE INCORPORATED INTO THE STRUCTURE BY WEAVING IT IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
- LIVE STAKES SHALL BE INSTALLED PRIOR TO AND/OR DURING BACKFILLING TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. LIVE STAKES SHALL HAVE CONTINUOUS CONTACT WITH SOIL ALONG THE LENGTH OF THE STAKE LEAVING NO VOIDS.
- BACKFILL USING SPECIFIED WOOD STRUCTURE BACKFILL MATERIAL. NATIVE EXCAVATED MATERIAL MAY BE USED AS WOOD STRUCTURE BACKFILL MATERIAL IF IT MEETS THE REQUIRED GRADATION. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE.
- ALL EXPOSED ENDS OF LOGS SHALL BE BROKEN AND NOT SAW CUT TO APPEAR NATURAL.
- LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.
- REPLACE ORGANIC LAYER AND/OR PREPARE SURFACE FOR SEEDING IN ACCORDANCE WITH THE PLANTING AND SEEDING PLAN AND/OR SPECIFICATIONS.

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CONSTRUCTION

DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

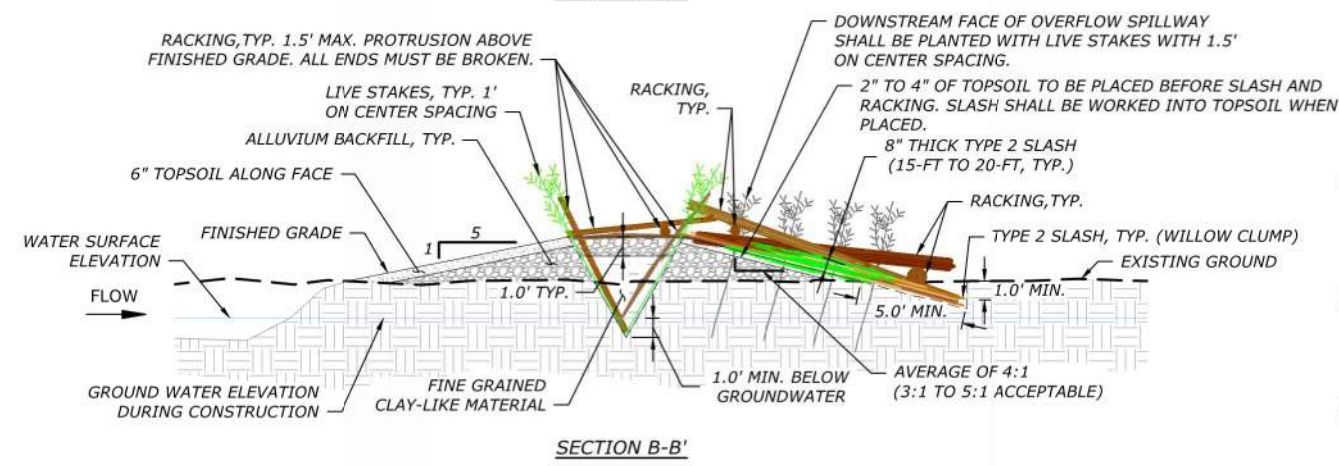
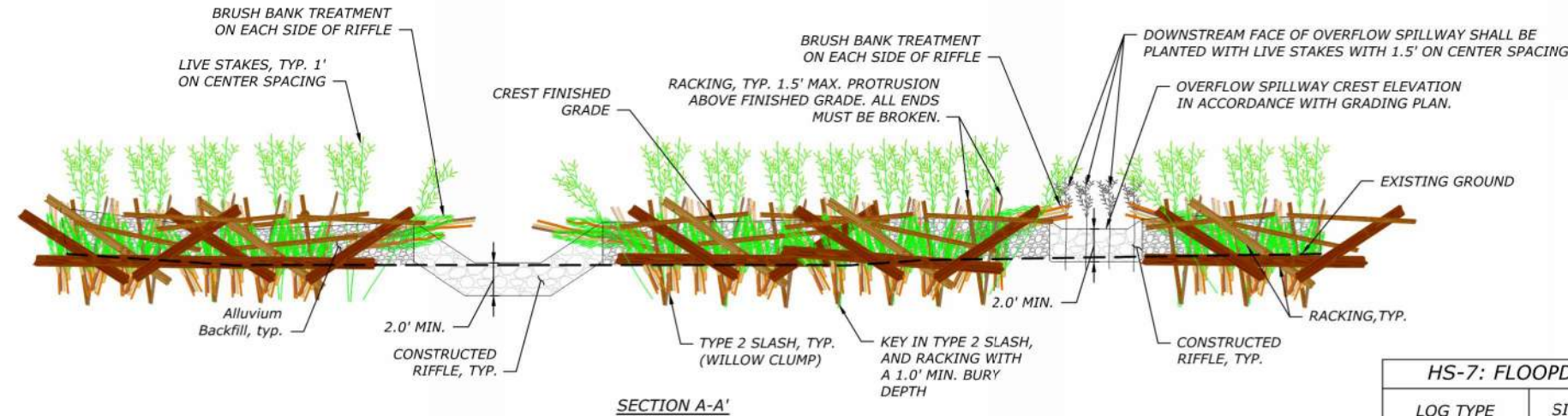
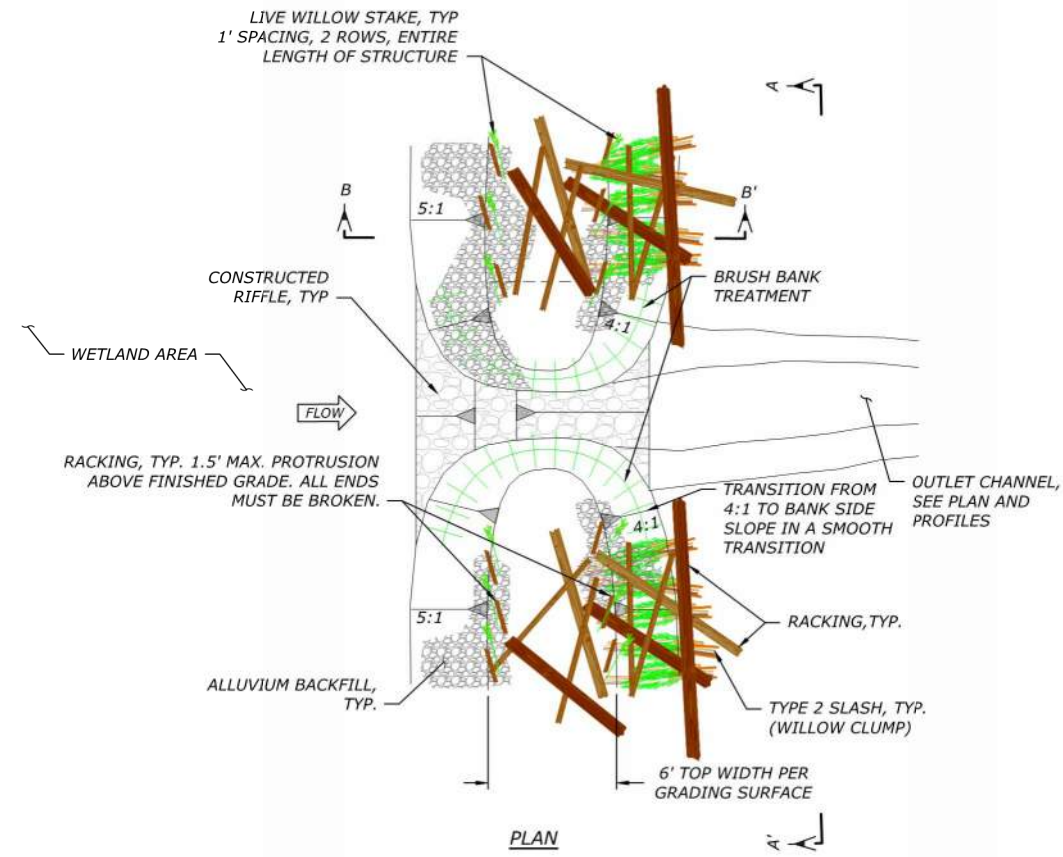
DRAWING NAME
DETAILS

HS-6

DRAWING NO.
D10 135
SHEET 41 OF



EXAMPLE PHOTO



HS-7: FLOODPLAIN INUNDATION STRUCTURE (PER LINEAR FOOT) MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	1 EA
SLASH-2	1 - 4	5 - 15	NA	NA	YES	1 EA
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	2 EA

- INSTALLATION:**
- THE ENGINEER SHALL SUPERVISE THE INSTALLATION OF THE FIRST FLOODPLAIN INUNDATION STRUCTURE TO INSURE PROPER INSTALLATION. THE CONTRACTOR MAY PROCEED WITH UNSUPERVISED INSTALLATION OF THE REST OF THE STRUCTURES, ONCE THE ENGINEER HAS SIGNED OFF THAT THEY ARE PROPERLY TRAINED.
 - ALL STRUCTURES SHALL BE PLACED AS SHOWN ON THE DRAWINGS.
- SLASH AND RACKING:**
- PLACE SLASH AND RACKING SUCH THAT PIECES ARE INTERLACED WITH PARTIALLY BURIED MEMBERS. NO RACKING AND SLASH SHALL BE PLACED LOOSELY ON THE GROUND SUCH THAT IT WOULD FLOAT AWAY IN THE EVENT OF HIGH WATER.
 - RACKING PIECES SHALL NOT EXTEND BEYOND 1.5' ABOVE FINISHED GRADE.
- BACKFILL MATERIAL:**
- CORE BACKFILL MATERIAL SHALL CONSIST OF FINE GRAINED CLAY-LIKE MATERIAL LARGELY FREE OF GRAVELS AND COBBLES TO REDUCE PERMEABILITY AND TO ALLOW INFILLING OF VOID SPACE BETWEEN RACKING AND SLASH MATERIAL.
 - GENERAL BACKFILL MATERIAL SHALL BE A MIX OF COBBLES, GRAVELS, AND FINES TO REDUCE PERMEABILITY. MATERIAL SHALL BE GENERATED FROM STOCKPILES OF EXCAVATED MATERIAL FROM PROJECT EXCAVATIONS.
 - BACKFILL MATERIALS SHALL BE APPROVED BY THE CONTRACTING OFFICER OR ENGINEER PRIOR TO

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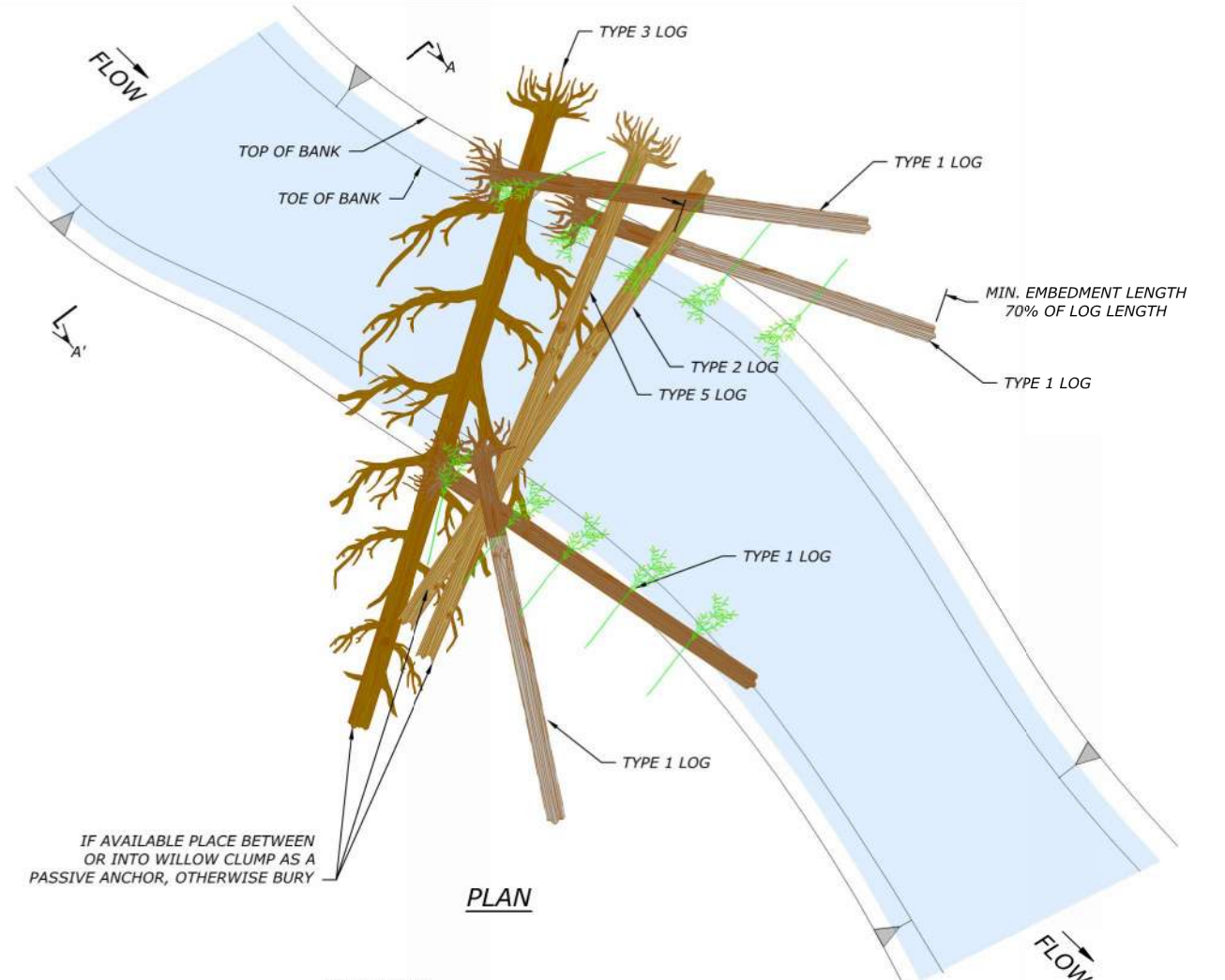
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DESIGNED: ZS, MP, JY
APPROVED: JY

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DETAILS

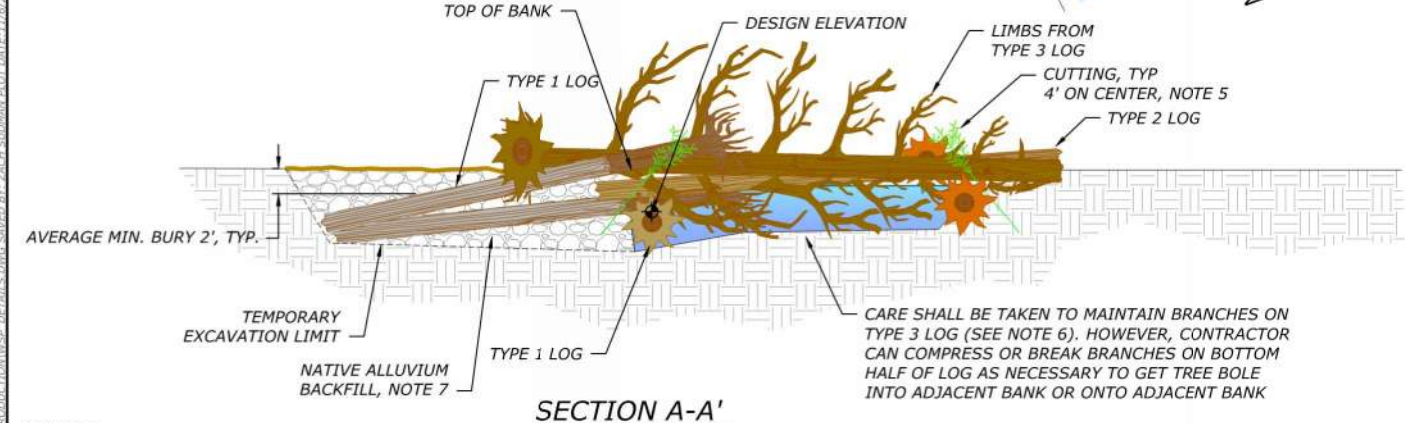
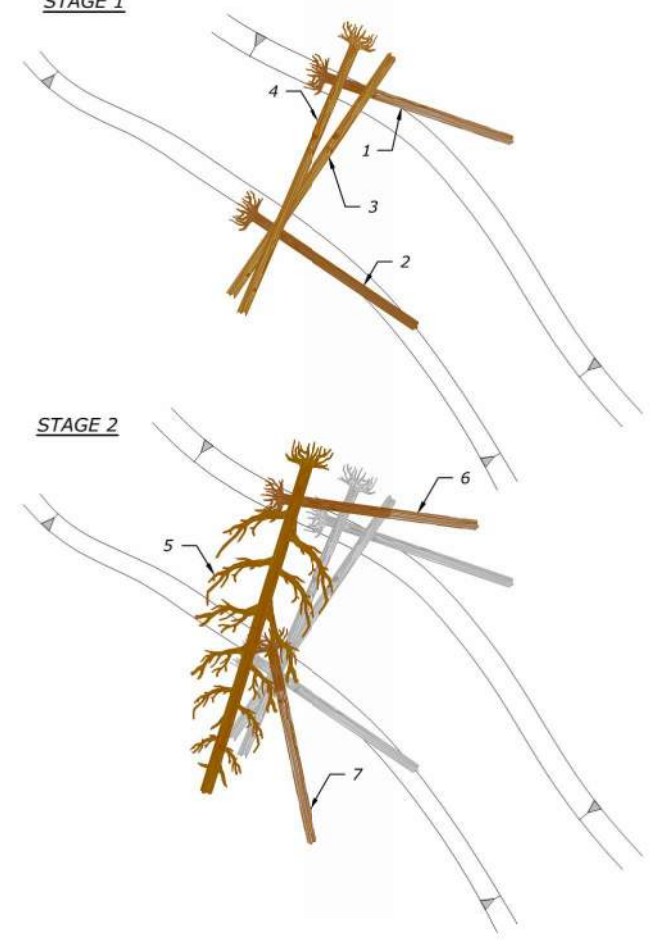
HS-7

DRAWING NO. D11 136
SHEET 42 OF 42

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STRUCTURE SEQUENCING



HS-8: BLEEDER JAM STRUCTURE MATERIAL SCHEDULE

LOG TYPE	SIZE (DBH)	LENGTH (FT)	ROOTWAD	MIN. ROOTWAD DIA. (FT)	BRANCHES	QUANTITY
TYPE 1	13 - 22	30 - 40	YES	4.5	NO	4 EA
TYPE 2	13 - 22	30 - 40	NO	NA	NO	1 EA
TYPE 3	13 - 22	40 - 60	YES	4	YES	1 EA
TYPE 5	13 - 22	40 - 50	YES	4.5	NO	1 EA
RACKING-1	4 - 12	15 - 25	YES	2.5	YES	2 EA
RACKING-2	4 - 12	15 - 25	OPTIONAL	NA	YES	7 EA
SLASH-1	1 - 4	5 - 15	NA	NA	YES	5 EA
LIVE STAKES	> 3/4	6 - 8	NA	NA	NA	12 EA

- NOTES:**
- INSTALL STRUCTURE AT LOCATION IDENTIFIED ON PLAN AND PROFILE DRAWINGS.
 - THE EXACT LOCATION OF STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLATION FOR APPROVAL BY THE CONTRACTING OFFICER.
 - ROUGH GRADING OF CHANNEL SHALL BE COMPLETE PRIOR TO CONSTRUCTION OF STRUCTURE INCLUDING RIFFLE CONSTRUCTION AND PLACEMENT OF BAR MATERIAL.
 - SEE STRUCTURE SCHEDULE FOR NUMBER OF STRUCTURES, LOCATIONS, LOGS, AND ASSOCIATED MATERIAL QUANTITIES.
 - ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO OR UPON COMPLETION OF INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
 - TYPE 3 LOG SHALL BE HANDLE DIRECTLY TO REDUCE LOSS OF LIMBS, FOLIAGE, ETC.. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE AT NOT COST TO THE CONTRACTING AGENCY.
 - RACKING AND SLASH MATERIAL SHALL BE INCORPORATED INTO THE STRUCTURE WHILE PLACING LAYERS SUCH THAT IT IS WOVEN INTO STRUCTURE IN BETWEEN PLACED LOGS, FILLING VOIDS, ETC. AT EACH STEP THROUGHOUT CONSTRUCTION AS DIRECTED BY THE CONTRACTING OFFICER.
 - BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE. UNSUITABLE MATERIAL CLASSIFIES AS A CLAY, SILT OR SAND. PLACE BACKFILL AS STRUCTURE IS CONSTRUCTED IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
 - WHEN UTILIZING EXISTING VEGETATION AS PASSIVE ANCHORS THERE SHALL BE AT A MINIMUM A WILLOW CLUMP ON THE DOWNSTREAM SIDE, BUT PREFERABLY ON THE UPSTREAM SIDE AS WELL.
 - LOG PLACEMENT MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER TO PROVIDE VARIABILITY FROM STRUCTURE TO STRUCTURE.

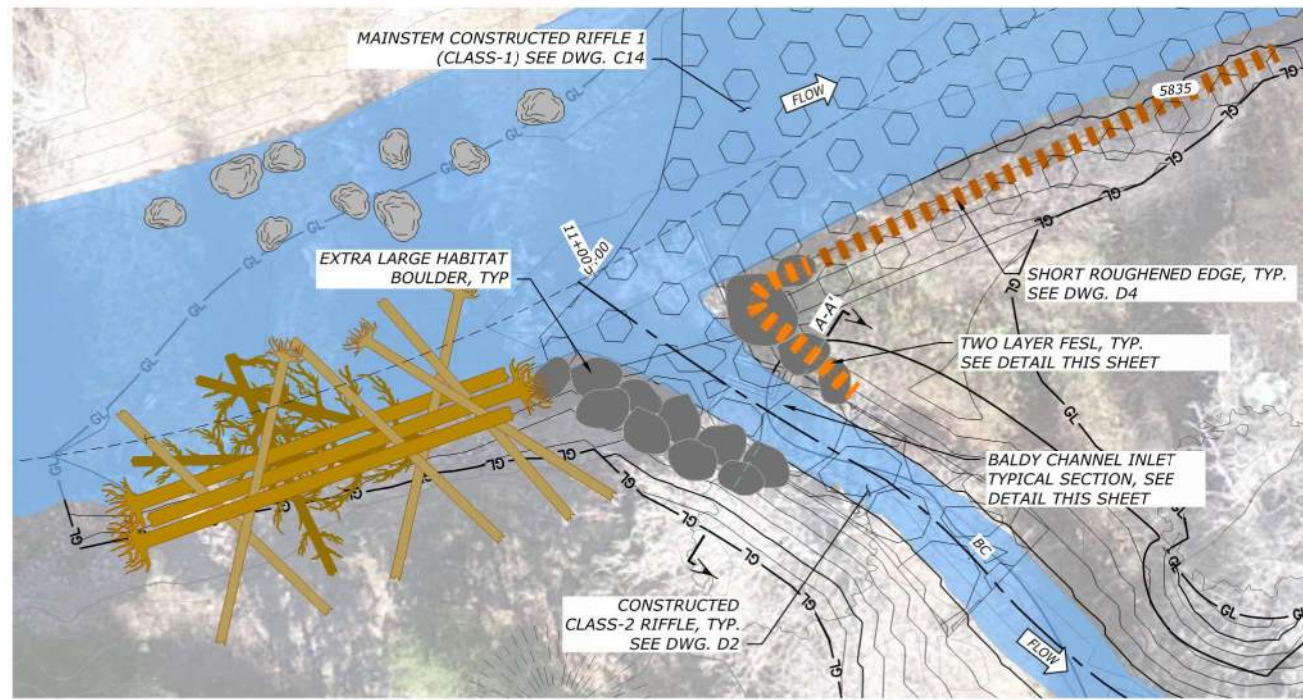
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DATE: 11/6/2024
DESIGNED: ZS, MP, JY
APPROVED: JY

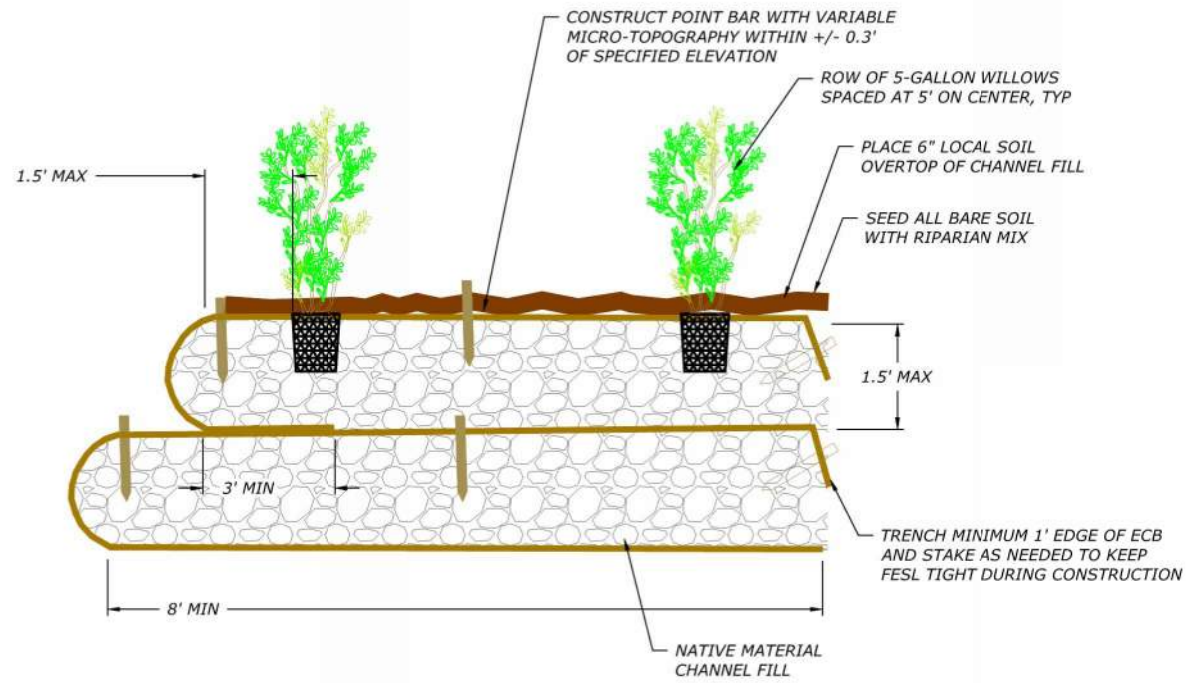
DRAWING NAME
DETAILS
HS-8

DRAWING NO. D12 137
SHEET 43 OF 43

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19 BALDY CHANNEL INLET - PLAN



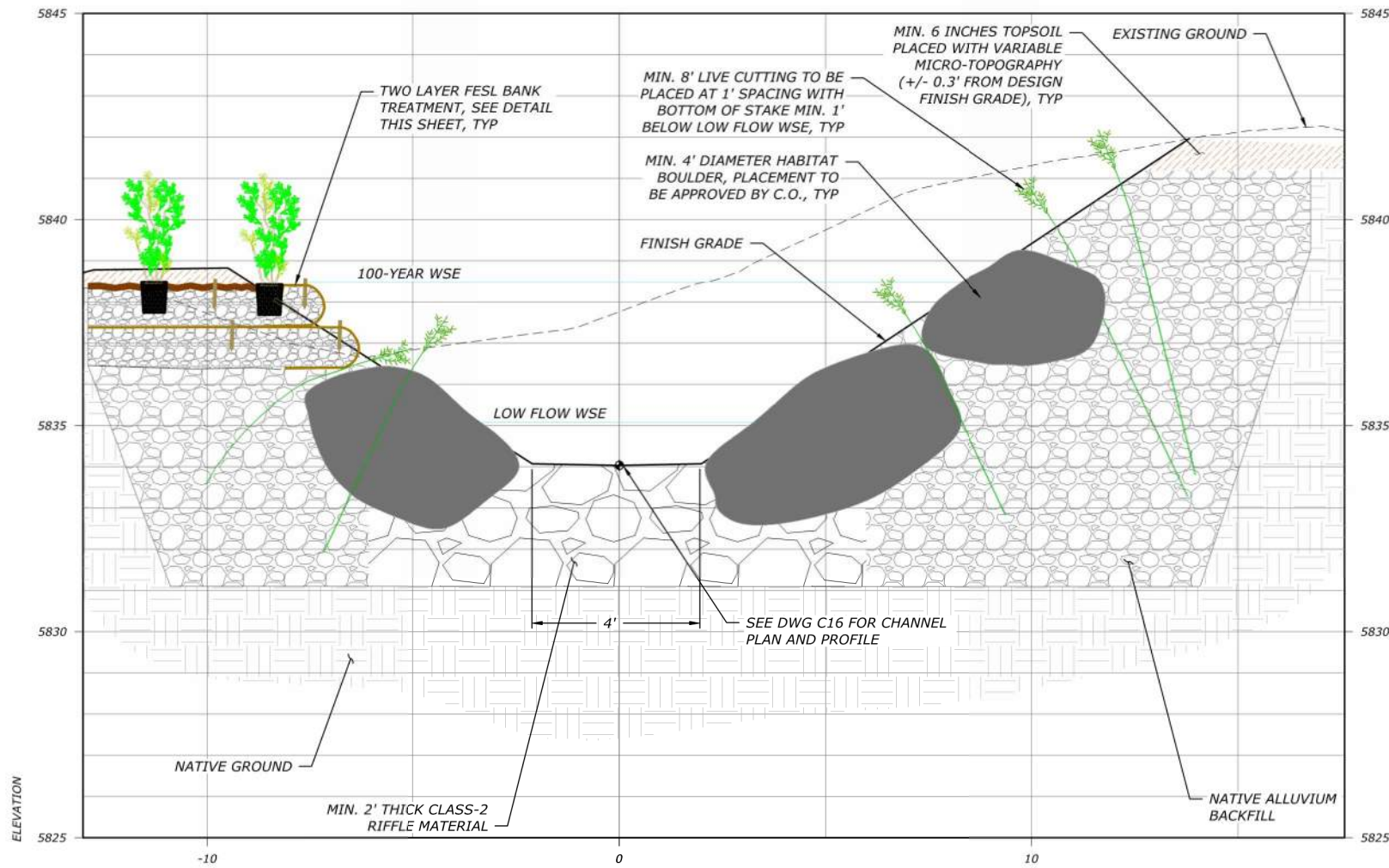
BANK TREATMENT - TWO LAYER FESL NOTES:

1. PLACE 2 LAYERS OF BIODEGRADABLE EROSION CONTROL BLANKET (ECB):
 - 1.1. FINE EROSION CONTROL BLANKET SHALL BE C125BN (INSIDE LAYER)
 - 1.2. COARSE EROSION CONTROL BLANKET SHALL BE GEOCOIR 700 (OUTSIDE LAYER)
2. PLACE BACKFILL MATERIAL ON TOP OF 2 LAYERS OF EROSION CONTROL BLANKET SO THAT A MINIMUM OF 3' IS BURIED. SOIL LIFTS SHALL NOT BE GREATER THAN 1.5' THICK.
3. SEED THE TOP OF THE BACKFILL MATERIAL AT THE LOCATION SHOWN IN THE DETAIL (TOP FRONT OF THE BANK TREATMENT).
4. FILL SHALL NOT BE PLACED DURING FIRST LIFT AT LOCATIONS WHERE BOLES OF LOGS SHALL BE PLACED. FABRIC SHALL BE FOLDED UNDER THE LOG.
5. PULL EXPOSED EROSION CONTROL BLANKET OVER BACKFILL MATERIAL AND PULL TIGHT. REMOVE WRINKLES/FOLDS (SEED WILL NOW BE UNDERNEATH EROSION CONTROL BLANKET).
6. KEY IN FABRIC A MINIMUM OF 1 FT. STAKE EDGE OF ECB TO KEEP EROSION CONTROL BLANKET TIGHT. STAKE SPACING SHALL BE A MAXIMUM OF 5'.
7. STAKE FESL WITH 1" X 2" X 18" WOODEN STAKES; 1 ROW, PLACED 3' APART, AT FRONT EDGE OF FESL AND 1 ROW PLACED 3' APART, 4' BEHIND FRONT EDGE OF FESL.
8. REPEAT STEPS 1 THROUGH 7 FOR SECOND (TOP) LIFT
9. BACK FILL TRENCH AND COMPLETE FINISH GRADING OF THE FILL AREA. TOP OF FILL AREA SHALL INCLUDE A 6" TOP LAYER OF ORGANIC SOIL.

21 TWO LAYER FESL BANK TREATMENT
NTS

BALDY CHANNEL INLET NOTES:

1. THE BALDY CHANNEL INLET SHALL BE CONSTRUCTED DURING THE FALL WHEN WILLOWS ARE DORMANT.
2. BANKS SHALL BE CONSTRUCTED OF LARGE HABITAT BOULDERS WITH PLACEMENT TO BE APPROVED BY THE C.O. OR ENGINEER.
3. WELL GRADED NATIVE ALLUVIUM SHALL BE PLACED TO FILL IN VOIDS IN LARGE BOULDERS AND BENEATH TWO LAYER FESL BANK TREATMENT.
4. POTTED WILLOWS, LIVE CUTTINGS, AND SEEDS SHALL BE IRRIGATED FOR A MINIMUM OF THREE YEARS FOLLOWING CONSTRUCTION.



20 BALDY CHANNEL INLET - TYPICAL SECTION

WORKING DRAFT
NOT FOR
CONSTRUCTION

DATE:	11/6/2024
DESIGNED:	ZS, MP, JY
APPROVED:	JY
DRAWING NAME	DETAILS
BALDY CHANNEL INLET DETAIL	
DRAWING NO.	D13 138
SHEET 44 OF 44	

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City of Ketchum

ATTACHMENT 4:

Floodplain Development Criteria Analysis

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1	<p>The proposal preserves or restores the inherent natural characteristics of the river, floodplain, and riparian zone, including riparian vegetation and wildlife habitat. Development does not alter river channel unless all stream alteration criteria for evaluation are also met.</p> <p><i>Staff Comments</i></p> <p><i>The property has seen consistent degradation over the past 100 years, resulting in stream bank erosion, channel incision, and an ecological profile that consists of a monoculture of plant species (including invasive). The project goes well beyond preserving the inherent natural characteristics of the river by restoring the river and floodplain back to the pre-human development period of its history.</i></p> <p><i>The project will include excavations in and around the stream to restore the original configuration of the reach by reestablishing a functioning side channel, excavating out previous fill areas, and creating small pools for aquatic habitat and riparian function.</i></p> <p><i>The extensive and ecologically sensitive planting plan will further support the excavation efforts by creating a bio-diverse ecology that is more resilient long term and provides stability of the soils during flood events.</i></p> <p><i>These improvements rehabilitate the entire river system through the reach and re-establishes a functioning floodplain to allow for historic flow of floodwaters through the site. Alterations to the river channel are proposed and as noted below, the project meets all stream alteration evaluation criteria.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)2	<p>No temporary construction activities, encroachment or other disturbance into the 25-foot riparian zone, including encroachment of below grade structures, shall be permitted, with the exception of approved stream stabilization work and restoration work associated with a riparian zone that is degraded.</p> <p><i>Staff Comments</i></p> <p><i>There will be extensive construction related activities within the stream and riparian area associated with the stream alteration work and restoration of the riparian area. As noted in condition 4, a comprehensive construction management plan will be required prior to start of construction to ensure that construction activities are well managed and do not result in any downstream impacts or impacts to adjacent properties.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)3	<p>No permanent development shall occur within the 25-foot riparian zone, with the exception of approved stream stabilization work and</p>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<p>restoration work associated with permit issued under this title, or exceptions as described below: a. Access to a property where no other primary access is available; b. Emergency access required by the fire department; c. A single defined pathways or staircases for the purpose of providing access to the river channel and in order to mitigate multiple undefined social paths; d. Development by the City of Ketchum.</p>
			<i>Staff Comments</i>	<p><i>There are proposed development activities within the 25-foot riparian area which include:</i></p> <ul style="list-style-type: none"> • <i>Irrigation (well house and service lines)</i> • <i>Defined pathways to avoid the creation of social paths</i> • <i>Existing municipal water and sewer lines proposed to remain</i> <p><i>There is an existing electrical transformer and service line within the riparian area that will be relocated outside the riparian area as part of the project.</i></p> <p><i>All development activities are permitted as they fall under subsection "d" of this criteria as development by the City of Ketchum.</i></p>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)4	<p>New or replacement planting and vegetation in the riparian zone shall include plantings that are low growing and have dense root systems for the purpose of stabilizing stream banks and repairing damage previously done to riparian vegetation. Examples of such plantings most commonly include: red osier dogwood, common chokecherry, serviceberry, elderberry, river birch, skunk bush sumac, Beb's willow, Drummond's willow, little wild rose, gooseberry, and honeysuckle. However, in rare instances the distance from the top-of-bank to the mean high water mark is significant and the native vegetation appropriate for the riparian zone are low growing, drought resistant grasses and shrubs. Replacement planting and vegetation shall be appropriate for the specific site conditions. Proposal does not include vegetation within the 25-foot riparian zone that is degraded, not natural, or which does not promote bank stability.</p>
			<i>Staff Comments</i>	<p><i>The existing riparian area along much of the bank is currently degraded, contains non-natural materials such as remnant concrete, and is very steep which does not promote the growth of bank stabilizing plant species. An extensive planting plan has been developed which identifies specific plant lists for each zone of restoration. Zones include Upland Meadow, Xeric (dry) floodplain, Mesic (wet) floodplain, near stream riparian, in-stream aquatic, aspen grove, and restored lawn. See sheets L2.01 and L2.02 for the detailed</i></p>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<p><i>planting mix for each zone. Specifically related to the riparian planting, Near Stream Riparian Zone is detailed with Seed Mix D and includes a wide variety of willows, cottonwoods, and grasses. Installation will include #5 containers for the trees and shrubs and a seen mix for grasses. The land scape plan notes that temporary protection from wildlife will be needed.</i></p> <p><i>The proposed plantings are appropriate for the specific site conditions as they have been tailored for the specific zones based on an ecological profile. Once installation is complete and plantings are stabilized, the riparian zone will be well established and not degrade over time, ensuring long term bank stability.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)5	<p>Landscaping and driveway plans to accommodate the function of the floodplain allow for sheet flooding. Surface drainage is controlled and shall not adversely impact adjacent properties including driveways drained away from paved roadways. Culvert(s) under driveways may be required. Landscaping berms shall be designed to not dam or otherwise obstruct floodwaters or divert same onto roads or other public pathways.</p> <p><i>There is one access to the Warm Springs Preserve property and that is Lopey Lane. Lopey Lane is an existing road with a bridge that crosses Warm Springs Creek. Currently, the bridge is elevated as such that floodwaters pass under the bridge, not over. The bridge is not proposed to be altered as part of the project. The project does propose to improve the road once it crosses onto the Warm Springs Preserve property. As shown on Sheet C2.0 the road includes a set of two 36" culverts closer to the existing bridge and one additional bridge structure closer to the parking area. The existing driveway/road and proposed bridge/culverts are located outside of published FEMA 100-year floodplain extents and are designed to convey only a portion of Warm Springs Creek flood flows. Both facilities are designed to have a minimum of 1-foot of freeboard at the 100-year flow. The existing driveway/road does not become inundated at the 100- year flow under proposed conditions. Additionally, the bridge is designed to carry those flows with or without the culverts in place.</i></p> <p><i>The city engineer did provide some minor comments related to the finished condition of the road included crowning, amount of gravel shoulder, details of drywells, and a few others that will be addressed with issuance of the final construction plans. These items will not</i></p>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<p><i>impact the ability of the culverts or bridge to effectively convey flood waters. Condition of approval #2 addresses these items.</i></p> <p><i>There is also a pedestrian bridge to be constructed within the southern floodplain area and that bridge is also designed to have a minimum of 1-foot of freeboard at the 100-year flow. Please see sheet L2.03 for details of the pedestrian bridge.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)6 <i>Staff Comments</i>	<p>Flood water carrying capacity is not diminished by the proposal.</p> <p><i>Extensive 2D and 1D hydraulic modeling was conducted to evaluate the project to ensure that the flood carrying capacity is maintained post construction. Post construction, the project modeling shows a no rise in the base flood elevations in the surrounding area. This demonstrates that the project will adequately convey floods of a 100-year event as well or better than the property has historically. The proposed development also has significantly more excavation (10,064 cubic yards) than fill (2,334 cubic yards) resulting in a net cut-fill balance of 7,730 cubic yards.</i></p> <p><i>Based on the submittal, there is no rise of the base flood elevations when comparing the proposed condition with the effective map for the area. However, there is a small rise documented within the project site, that has no impact to off-site or downstream properties. As such, a Conditional Letter of Map Revision (CLOMR) is required to document the changed condition on the property even though there is no rise documented outside the property. Condition of approval XX addresses the requirement of a CLOMR from FEMA prior to start of construction and the subsequent Letter of Map Revision required after project completion.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)7 <i>Staff Comments</i>	<p>Impacts of the development on aquatic life, recreation, or water quality upstream, downstream or across the stream are not adverse.</p> <p><i>As mentioned above, the current condition of the property is degraded with poor aquatic and plant health. The proposed project dramatically improves the conditions for aquatic life with site specific and purposeful grading and restoration work. All proposed recreation access paths are designed to deter the creation of social trail networks to preserve the restoration work. The development proposal itself is a restoration project with no buildings or other development proposed.</i></p>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)8	<p>Building setback in excess of the minimum required along waterways is encouraged. An additional ten-foot building setback beyond the required 25-foot riparian zone is encouraged to provide for yards, decks and patios outside the 25-foot riparian zone.</p>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
			<i>Staff Comments</i>	<i>There is no construction of buildings part of this application. A separate design review application was filed by the City for a bathroom/storage building near the parking area. That proposed facility is outside the floodplain and riparian areas more than 100 feet.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)9	<p>The top of the lowest floor of a building located in, or partially within, the SFHA shall be at or above the flood protection elevation (FPE). A building is considered to be partially within the SFHA if any portion of the building or appendage of the building, such as footings, attached decks, posts for upper story decks, are located within the SFHA. See <u>section 17.88.060</u>, figures 1 and 2 of this chapter to reference construction details. See <u>chapter 17.08</u> of this title for definition of "lowest floor."</p> <p>a. In the SFHA where base flood elevations (BFEs) have been determined, the FPE shall be 24 inches above the BFE for the subject property; 24 inches or two feet is the required freeboard in Ketchum City Limits.</p> <p>b. In the SFHA where no BFE has been established, the FPE shall be at least two feet above the highest adjacent grade.</p>
			<i>Staff Comments</i>	<i>There are no buildings proposed.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)10	<p>The backfill used around the foundation in the SFHA floodplain shall provide a reasonable transition to existing grade but shall not be used to fill the parcel to any greater extent.</p> <p>a. Compensatory storage shall be required for any fill placed within the floodplain.</p> <p>b. A CLOMR-F shall be obtained prior to placement of any additional fill in the floodplain.</p>
			<i>Staff Comments</i>	<i>There are no buildings proposed and therefore no foundations.</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.88.050(E)11	<p>All new buildings located partially or wholly within the SFHA shall be constructed on foundations that are designed by a licensed professional engineer.</p>
			<i>Staff Comments</i>	<i>There are no buildings proposed.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)12	<p>Driveways shall comply with City of Ketchum street standards; access for emergency vehicles has been adequately provided for by limiting flood depths in all roadways to one foot or less during the one percent annual chance event.</p>
			<i>Staff Comments</i>	<i>As noted above, the city engineer has provided some comments related to the design of the road (which is outside the SFHA) that will be addressed prior to grading permit application. Condition of</i>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<i>Approval 2 addresses this item. The existing driveway/road does not become inundated at the 100-year flow with the proposed changes to the property.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 3	Landscaping or revegetation shall conceal cuts and fills required for driveways and other elements of the development.
			<i>Staff Comments</i>	<i>Landscaping is proposed on all areas of the property including driveways/roads and other elements of the project. The landscaping will conceal any cuts and fills which are required. No areas will be left bare upon completion of the project.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 4	(Stream Alteration) The proposal is shown to be a permanent solution and creates a stable situation.
			<i>Staff Comments</i>	<i>The existing condition of the property is every changing and very unstable. The city has been monitoring the stream channel for undercutting, bank erosion, and debris jams during each flooding event and frequently must approve emergency stream stabilization permits to adjacent property owners. All proposed stream alteration work is intended to create a permanent and stable solution including the addition of woody debris, in-stream riffle, and riparian plantings. Post construction, the project area will be monitored to determine efficacy of the work and whether any post construction adjustments need to be made. If any permits are required for post construction adjustments, those applications will be filed to the appropriate entities for review and approval.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 5	(Stream Alteration) No increase to the one percent annual chance flood elevation at any location in the community, based on hydrologic and hydraulic analysis performed in accordance with standard engineering practice and has been certified and submitted with supporting calculations and a No Rise Certificate, by a registered Idaho engineer.
			<i>Staff Comments</i>	<i>As noted above, extensive 2D and 1D hydraulic modeling was conducted to evaluate the project to ensure that the flood carrying capacity is maintained post construction. Post construction, the project modeling shows a no rise in the base flood elevations in the surrounding area. This demonstrates that the project will adequately convey floods of a 100-year event as well or better than the property has historically. The proposed development also has significantly more excavation (10,064 cubic yards) than fill (2,334 cubic yards) resulting in a net cut-fill balance of 7,730 cubic yards.</i> <i>Based on the submittal, there is no rise of the base flood elevations when comparing the proposed condition with the effective map for the area. However, there is a small rise documented within the project</i>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<i>site, that has no impact on off-site or downstream properties. Because of this condition, a No Rise Certificate is not achievable for the project. As such, per Ketchum Municipal Code, if a no rise certificate cannot be provided, a Conditional Letter of Map Revision (CLOMR) is required to document the changed condition on the property even though there is no rise documented outside the property. Condition of approval 1 addresses the requirement of a CLOMR from FEMA prior to start of construction and the subsequent Letter of Map Revision required after project completion.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 6	(Stream Alteration) The project has demonstrated no adverse impact or has demonstrated all impacts will be mitigated.
			<i>Staff Comments</i>	<i>As noted above, the hydraulic modeling demonstrates there are no adverse impacts from the project to any of the surrounding areas or downstream.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 7	(Stream Alteration) The recreational use of the stream including access along any and all public pedestrian/fisher's easements and the aesthetic beauty shall not be obstructed or interfered with by the proposed work.
			<i>Staff Comments</i>	<i>One of the stated objects of the project is to "Create a Preserve that is connected and accessible to all". The project proposes a series of improvements to winter and summer recreation opportunities and increases the amount of access opportunities to the stream than exist today. The aesthetic beauty of the area will be enhanced by the proposed improvements and will ensure long term stability of the area as a result of the project.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 8	(Stream Alteration) Fish habitat is maintained or improved as a result of the work proposed.
			<i>Staff Comments</i>	<i>Currently, the fish habitat along the northern portions of the reach are poor as a result of steep banks, limited riparian vegetation, and lack of floodplain connectivity. The proposed restoration project will reconnect the floodplain and enhance riparian and floodplain vegetation which provides more areas for aquatic life to live and creates an environment where they can thrive. Fish habitats will be improved as a result of the restoration project.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)1 9	(Stream Alteration) The proposed work shall not be in conflict with the local public interest, including, but not limited to, property values, fish and wildlife habitat, aquatic life, recreation and access to public lands and waters, aesthetic beauty of the stream and water quality.
			<i>Staff Comments</i>	<i>The Warm Springs Preserve Master Plan was jointly created by the City of Ketchum and the community. The primary objectives of the plan are to:</i>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<ul style="list-style-type: none"> • Create a Preserve that is connected and accessible to all • Design for success over time • Support all-season multi-functional use • Demonstrate leadership through regeneration of healthy ecosystems for people, plants, and animals • Restore the creek and floodplain • Celebrate and educate about the past, present, and future of the preserve <p>As these are the primary objectives of the project, and the plan has been adopted by the Ketchum City Council, the project is clearly within the public interest. As noted in the analysis above, the project results in an improvement to fish and wildlife habitat, aquatic life, recreation opportunities and river access, and aesthetic beauty.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)20	<p>(Stream Alteration) The work proposed is for the protection of the public health, safety and/or welfare such as public schools, sewage treatment plant, water and sewer distribution lines and bridges providing particularly limited or sole access to areas of habitation.</p> <p><i>Staff Comments</i> The existing condition of the property and stream create a high-risk environment during flood events, risking public safety and damage to properties. The channelization of Warm Springs Creek and adjacent development have made it difficult for water to move at reasonable velocities throughout the area. The proposed project includes re-grading to create additional side channels and removes historically places fill to recreate a functioning river and floodplain that reduces the danger to the public and property. Additionally, the project proposes to address existing exposure issues related to water/sewer mains and bridges. Finally, the study conducted by the applicant and reviewed by third party engineers seeks to ensure the long-term stability of the construction. Condition of Approval 3 requires an additional scour analysis be conducted for the materials proposed within the stream near the bridge to ensure that the materials can withstand higher flows during more significant flood events.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.88.050(E)21	<p>(Wetlands) Where development is proposed that impacts any wetland the first priority shall be to move development from the wetland area. Mitigation strategies shall be proposed at time of application that replace the impacted wetland area with an equal amount and quality of new wetland area or riparian habitat improvement.</p> <p><i>Staff Comments</i> Due to the size and scope of this restoration project, impact to wetlands is unavoidable as most of the identified wetlands are within the Warm Springs Creek active river channel. There are some</p>

Floodplain Development Permit Requirements				
1. Evaluation Standards: 17.88.050€				
Compliant			Standards and Staff Comments	
Yes	No	N/A	Guideline	City Standards and <i>Staff Comments</i>
				<i>vegetative wetlands that were identified, however, the propose project largely avoids those areas. Where impacts were unavoidable, a minimum 1:1 mitigation ratio was applied. Upon completion of the project, the site will have a net gain in quality and quantity of wetland areas.</i>