Appendix B: Project Drawings

Gold Ray Dam DECONSTRUCTION, FISH PASSAGE, AND SHORT-TERM RESTORATION PLANS FOR JACKSON COUNTY ROADS & PARKS

PROJECT PARTNERS









AMERICAN RECOVERY
AND REINVESTMENT ACT

PROJECT DESCRIPTION

GOLD RAY DAM IS A 38 FOOT HIGH CONCRETE DAM THAT SPANS 360 FEET ACROSS THE ROGUE RIVER AT RIVER MILE 125.8. THE DESIGN-BUILD TEAM OF SLAYDEN CONSTRUCTION GROUP (SCG), RIVER DESIGN GROUP (RDG) AND HDR WAS RETAINED BY JACKSON COUNTY ROADS AND PARKS TO DEVELOP ENVIRONMENTAL STUDIES, PROCURE NECESSARY PERMITS, REMOVE GOLD RAY DAM, AND RESTORE UNHINDERED FISH PASSAGE AT THE PROJECT SITE. THESE DRAWINGS REPRESENT THE DECONSTRUCTION PLANS NECESSARY TO REMOVE THE DAM. THEY INCLUDE DECONSTRUCTION PHASING, FISH PASSAGE CONCEPTS, WORK ARE ISOLATION TECHNIQUES, EROSION CONTROL, AND DETAILS NECESSARY TO REMOVE THE GOLD RAY DAM. IN ADDITION, SHORT-TERM RESTORATION PLANS ARE PROVIDED TO STABILIZE KELLY SLOUGH, TOLO SLOUGH, AND THE BEAR CREEK CONFLUENCE.

BENCHMARK

SURVEY CONTROL USED FOR THE PROJECT IS PROVIDED ON DRAWING 2.0. THE HORIZONTAL DATUM IS NAD 83, STATE PLANE COORDINATES, OREGON ZONE SOUTH, AND THE VERTICAL DATUM IS NAVD 88. THE BENCHMARK COORDINATES CORRESPOND TO THE TOP CENTER OF CONTROL MARKERS LISTED ON DRAWING.

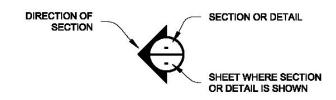
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GOLD RAY DAM VICINITY MAP



T36S-R2W SECTION 18
USGS QUADRANGLE: SAMS VALLEY, OREGON
GOLD RAY DAM @ RIVER MILE 126



CROSS-SECTION SHEET REFERENCE



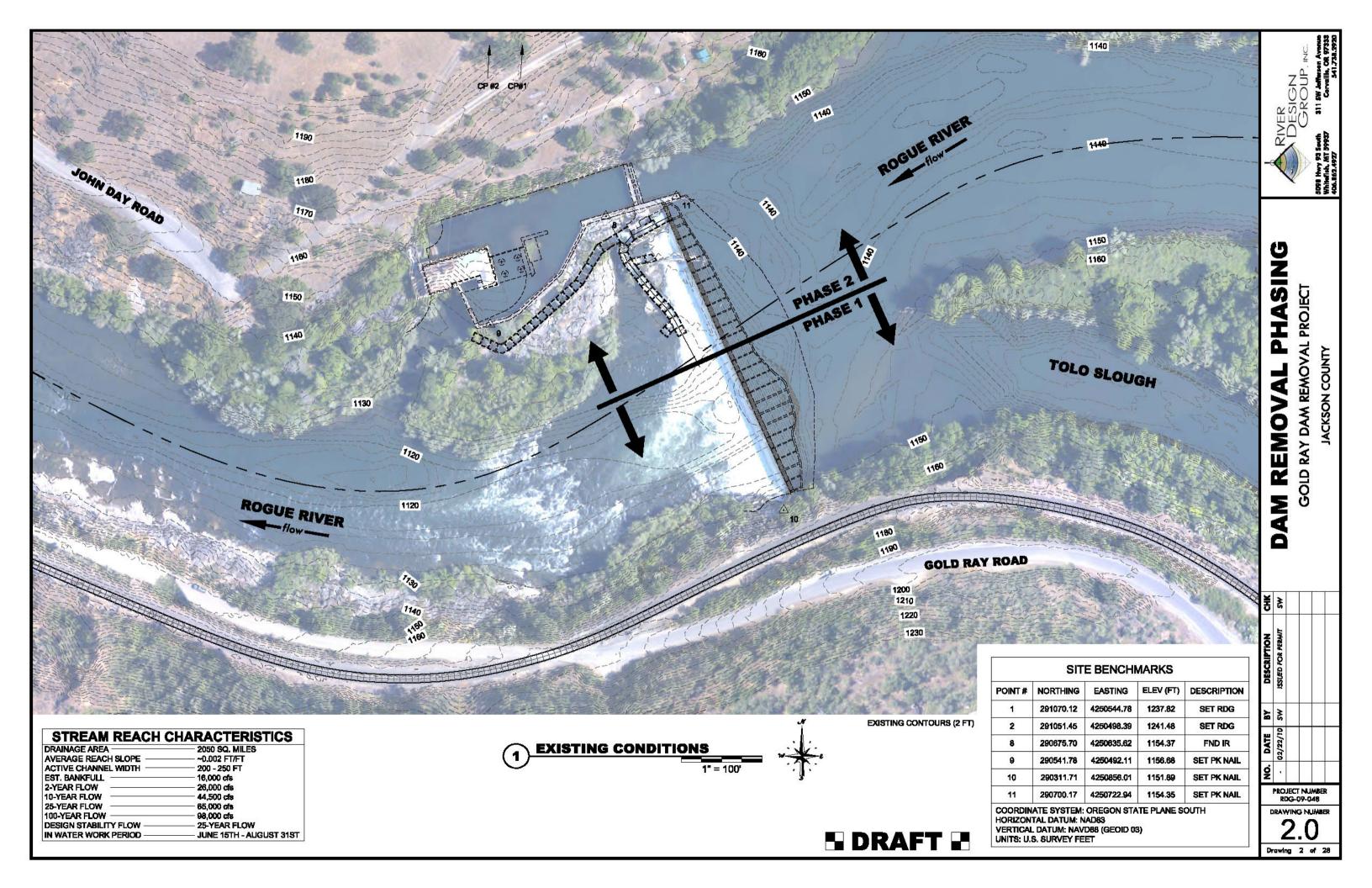
RIVER DESIGN GROUP. II

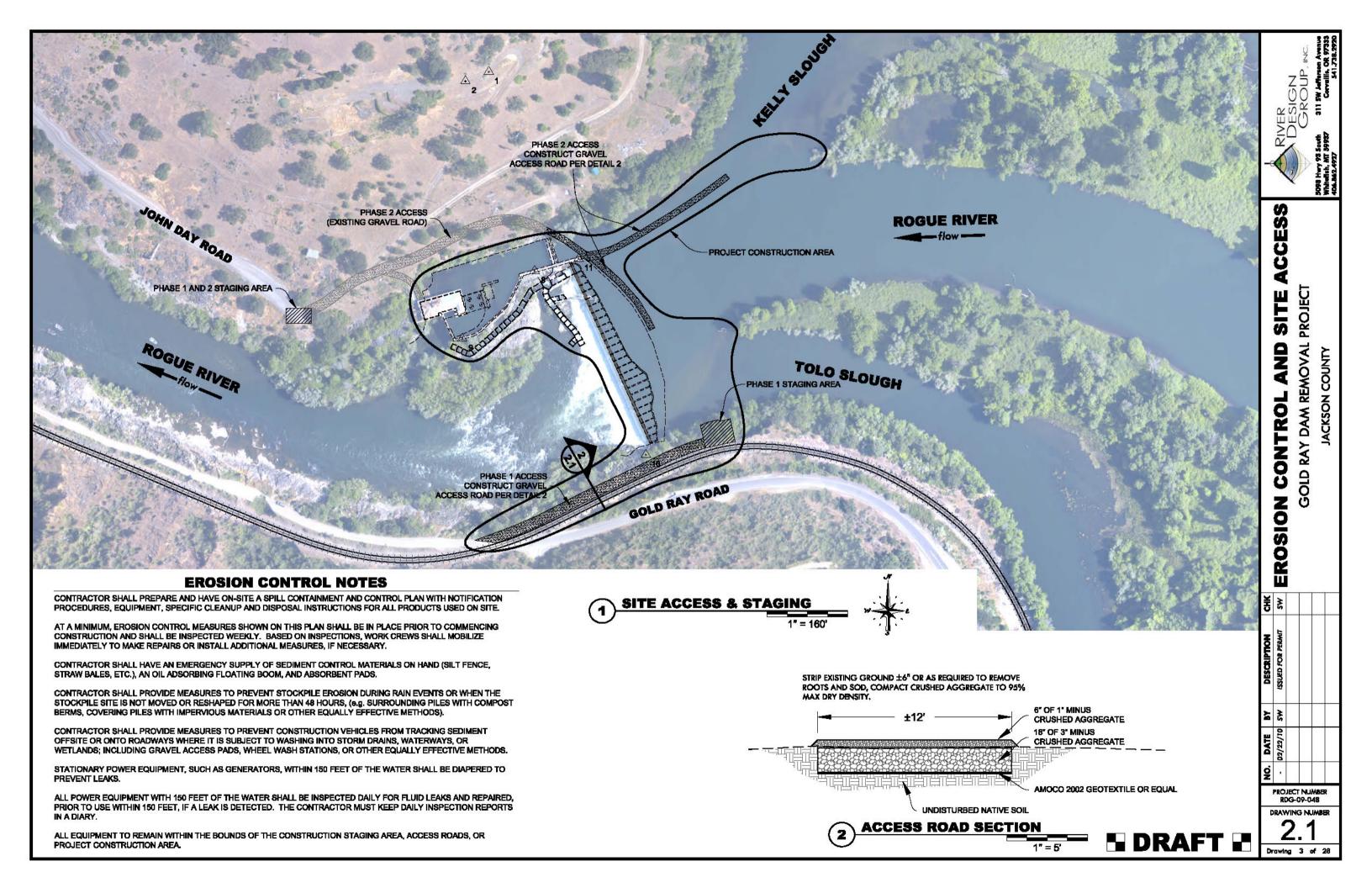
COVER PAGE AND NOTES
GOLD RAY DAM REMOVAL PROJECT

PROJECT NUMBER RDG-09-048

1.0

Drawing 1 of 28





2. THE ESCP MUST BE KEPT ONSITE AND ALL EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN MUST BE INSTALLED IN SUCH A MANNER TO ENSURE THAT SEDIMENT OR SEDIMENT LADEN WATER THAT ENTERS OR IS LIKELY TO ENTER SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATER, ROADWAY, OR OTHER PROPERTIES DOES NOT OCCUR.

3. THE IMPLEMENTATION OF THE ESCP AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THE EROSION AND SEDIMENT CONTROL MEASURES IS THE RESPONSIBILITY OF THE PERMIT REGISTRANT UNTIL ALL CONSTRUCTION IS COMPLETED AND VEGETATION/LANDSCAPING

4. THE PERMIT REGISTRANT MUST BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, OR FEDERAL REGULATIONS.

5. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE REFORE VEGETATION IS DISTURBED. AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS.

6. BEGIN LAND CLEARING, EXCAVATION, TRENCHING, CUTTING OR GRADING AND EARTHWORK-SURFACE ROUGHING AFTER INSTALLING APPLICABLE. SEDIMENT, EROSION PREVENTION AND RUNOFF CONTROL MEASURES NOT IN THE DIRECT PATH OF WORK.

7. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.

8. WET WEATHER BMPS: CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND ON SLOPES GREATER THAN FIVE (5) PERCENT FROM OCTOBER 1 THROUGH MAY 31 EACH YEAR.

9. WET WEATHER BMPS: TEMPORARY STABILIZATION OF THE SITE MUST BE INSTALLED AT THE END OF THE SHIFT BEFORE A HOLIDAY OR WEEKEND OR AT THE END OF EACH WORKDAY IF RAINFALL IS FORECAST IN THE NEXT 24 HOURS AND EACH WEEKEND AND HOLIDAY.

10. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. PRESERVE EXISTING VEGETATION AND RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION.

PROVIDE PERMANENT EROSION PREVENTION MEASURES ON ALL EXPOSED AREAS TO PREVENT FROM BECOMING A SOURCE OF EROSION AND REMOVE ALL TEMPORARY CONTROL MEASURES, UNLESS LOCAL ORDINANCES REQUIRE OTHERWISE, AS AREAS ARE STABILIZED.

12. ALL TEMPORARY SEDIMENT CONTROLS MUST REMAIN IN PLACE UNTIL PERMANENT VEGETATION OR OTHER PERMANENT COVERING OF EXPOSED SOIL IS ESTABLISHED. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED.

13. SEDIMENT CONTROLS MUST BE INSTALLED AND MAINTAINED ALONG THE SITE PERIMETER ON ALL DOWN GRADIENT SIDES OF THE CONSTRUCTION SITE AND AT ALL ACTIVE AND OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION.

14. PRIOR TO ANY LAND DISTURBING ACTIVITIES EACH SITE MUST HAVE GRAVELED, PAVED, OR CONSTRUCTED ENTRANCES, EXITS AND PARKING AREAS WITH EXIT TIRE WASH TO REDUCE THE TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS.

15. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER WATERTIGHT TRUCKS MUST BE USED OR LOADS MUST BE DRAINED ON-SITE UNTIL DRIPPING HAS BEEN REDUCED TO MINIMIZE SPILLAGE ON ROADS.

16. TEMPORARY STABILIZATION OR COVERING OF SOIL STOCKPILES AND PROTECTION OF STOCKPILE LOCATED AWAY FROM CONSTRUCTION ACTIVITY MUST OCCUR AT THE END OF EACH WORKDAY OR OTHER BMPS, SUCH AS DIVERSION OF UNCONTAMINATED FLOWS AND INSTALLATION OF SEDIMENT FENCES AROUND STOCKPILES, MUST BE IMPLEMENTED TO PREVENT TURBID DISCHARGES TO SURFACE WATERS.

17. BMPS THAT WILL BE USED TO PREVENT OR MINIMIZE STORMWATER FROM BEING EXPOSED TO POLLUTANTS FROM SPILLS, NO DISCHARGE OF CONCRETE TRUCK WASH WATER, VEHICLE AND EQUIPMENT CLEANING, VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE, OTHER CLEANING AND MAINTENANCE ACTIVITIES, AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS.

18. ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS MUST INCLUDE PROPER STORAGE, APPLICATION, AND DISPOSAL.

19. SOLID WASTE AND HAZARDOUS MATERIALS MANAGEMENT. FOLLOW PROJECT WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES. EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES: REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY; AND MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, MATERIAL USE, COVERED STORAGE AREAS FOR WASTE AND

20. THE PERMITTEE MUST PROPERLY MANAGE HAZARDOUS WASTES, USED OILS, CONTAMINATED SOILS, CONCRETE WASTE, SANITARY WASTE, LIQUID WASTE, OR OTHER TOXIC SUBSTANCES DISCOVERED OR GENERATED DURING CONSTRUCTION AND MEET ALL STATE AND FEDERAL REGULATIONS AND APPROVALS

21. THE ESCP MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS, DURING THE CONSTRUCTION PERIOD, THESE MEASURES MUST BE UPGRADED AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS. CHANGES TO THE ESCP MUST ALSO BE SUBMITTED IN THE FORM OF AN ACTION PLAN TO DEQ OR ITS AGENT FOR APPROVAL.

ON-SITE SOIL TYPES

TALLOWBOX GRAVELLY SANDY LOAM (188G) IS A MODERATELY DEEP, SOMEWHAT EXCESSIVELY DRAINED SOIL WITH A HIGH EROSION POTENTIAL.

CAMAS-NEWBERG-EVANS COMPLEX (23A) IS A VERY DEEP AND EXCESSIVELY TO WELL DRAINED SOIL WITH A LOW EROSION POTENTIAL.

EROSION CONTROL SEEDING

ALL DISTURBED AREAS SHALL BE BROADCAST SEEDED WITH AN "EROSION CONTROL" SEED MIX. THE MIX SHALL CONSIST OF THE FOLLOWING SEED BY WEIGHT: 1 PART CRIMSON CLOVER, 1 PART WHITE SWEET CLOVER, AND 2 PARTS CEREAL RYE (SECALE CEREALE) OR APPROVED EQUAL BASED ON SEED AVAILABILITY. MINIMUM APPLICATION RATE SHALL BE 30 POUNDS PER ACRE. AFTER BROADCAST SEEDING, ONE PASS OF THE AREA SHALL BE COMPLETED WITH A 5,000 POUND (OR LESS) TRACKED VEHICLE AND COVER THE AREA WITH STERILE STRAW OR EROSION CONTROL BLANKET.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S 1200-C PERMIT APPLICATION AND ESCP GUIDANCE DOCUMENT HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE LISTED BMPS WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS, TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESCP, AN ACTION PLAN WILL BE SUBMITTED.

22. SIGNIFICANT AMOUNTS OF SEDIMENT, WHICH LEAVES THE SITE, MUST BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE AND STABILIZED OR PROPERLY DISPOSED. THE CAUSE OF THE SEDIMENT RELEASE MUST BE FOUND AND PREVENTED FROM CAUSING A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIME FRAME.

23. VACUUMING OR DRY SWEEPING MUST BE USED TO CLEAN-UP RELEASED SEDIMENT AND MUST NOT BE INTENTIONALLY WASHED INTO STORM SEWERS, DRAINAGE WAYS, OR WATER BODIES.

24. THE APPLICATION RATE OF FERTILIZERS USED TO RE-ESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. TIME-RELEASE FERTILIZERS SHOULD BE USED WITH CARE WITHIN ANY WATERWAY RIPARIAN

25. SEDIMENT MUST BE REMOVED FROM BEHIND A SEDIMENT FENCE WHEN IT HAS REACHED A HEIGHT OF 1/3 THE HEIGHT OF THE FENCE ABOVEGROUND AND BEFORE FENCE REMOVAL.

26. SEDIMENT MUST BE REMOVED FROM BEHIND BIO BAGS AND OTHER BARRIERS IT HAS REACHED A HEIGHT OF TWO (2) INCHES AND BEFORE BMP REMOVAL.

27. REMOVAL OF TRAPPED SEDIMENT IN A SEDIMENT BASIN OR SEDIMENT TRAP OR CATCH BASINS MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY (50%) AND AT COMPLETION OF PROJECT.

28. DEQ MUST APPROVE OF ANY TREATMENT SYSTEM AND OPERATIONAL PLAN THAT MAY BE NECESSARY TO TREAT CONTAMINATED CONSTRUCTION DEWATERING OR SEDIMENT AND TURBIDITY IN STORMWATER RUNOFF.

29. SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR THIRTY DAYS OR MORE, THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD.

30. SHOULD CONSTRUCTION ACTIVITIES CEASE FOR FIFTEEN (15) DAYS OR MORE ON ANY SIGNIFICANT PORTION OF A CONSTRUCTION SITE TEMPORARY STABILIZATION IS REQUIRED FOR THAT PORTION OF THE SITE WITH STRAW, COMPOST, OR OTHER TACKIFIED COVERING THAT PREVENT SOIL OR WIND EROSION UNTIL WORK RESUMES ON THAT PORTION OF THE SITE.

31. DAILY INSPECTIONS WHEN RAINFALL AND RUNOFF OCCURS OF THE BMPS AND DISCHARGE OUTFALLS MUST BE THE PROJECT ESCP INSPECTOR. THESE INSPECTIONS AND OBSERVATIONS MUST BE RECORDED IN A LOG THAT IS AVAILABLE ON SITE.

32. BMPS MUST BE INSPECTED BEFORE, DURING, AND AFTER SIGNIFICANT STORM EVENTS.

33. ALL ESCP CONTROLS AND PRACTICES MUST BE INSPECTED VISUALLY ONCE TO ENSURE THAT BMPS ARE IN WORKING ORDER PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY AND MUST BE INSPECTED VISUALLY ONCE EVERY TWO (2) WEEKS DURING INACTIVE PERIODS GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS

34. IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION DURING PERIODS WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.

BMP MATRIX SCHEDULE 2010 SCHEDULE

| | | | | 2010 SCHEDULI | | | | |
|--|-----|-------|--|---------------|---|-----|--------|---|
| BMPs | YES | NO | RATIONALE IF "NO" | J II | | A | 5 F | (|
| RUNOFF CONTROLS | | | | N | L | G | P | |
| Stabilize stream banks | Х | j | SEE RESTORATION PLANS | | | К | Х | 3 |
| Pipe slope drains | | Х | NOT APPLICABLE | | | | J. | |
| Energy dissipaters | | Х | NOT APPLICABLE | | | | 0 | |
| Run-on diversion | | | NOT APPLICABLE | 1 | | | Ų. | |
| Grass-lined channel | | | NOT APPLICABLE | | | | | |
| Trench drains | | | NOT APPLICABLE | | | | | Ť |
| Drop inlets | | | NOT APPLICABLE | | | | | t |
| Check dams | | | NOT APPLICABLE | | | | | İ |
| CLEARING & GRADING | | | | | | | | |
| Top-soiling | X | | SEE RESTORATION PLANS | | Ì | | | T |
| Temporary seeding & planting | Х | | SEE RESTORATION PLANS | X | X | Х | Х | Ť |
| Permanent seeding & planting | | Ú | SEE RESTORATION PLANS | | | Х | × | Ť |
| Mycorrhizae / biofertilizers | | X | | | | | Ú | Ť |
| Mulches | Х | 9 653 | | Х | X | К | Х | Ť |
| Compost blankets | | Х | MULCH IS BEING USED INSTEAD | | | | | t |
| Erosion control blankets | | 3 750 | SEE RESTORATION PLANS | | | Х | X | 1 |
| Soil binders | | Х | NOT NECESSARY DUE TO SOIL AND SLOPES | | | | 1 | 1 |
| Soil tackifiers | | | NOT NECESSARY DUE TO SOIL AND SLOPES | | | | 4 | 1 |
| Sodding veg, buffer strips | | x | NOT NECESSARY DUE TO SOIL AND SLOPES | | | | - 1 | t |
| Tree preservation fences | | - | TOT TEODOGRAFT BOE TO GO EATED SEGIED | | | | * | t |
| Live staking | | | SEE RESTORATION PLANS SEE RESTORATION PLANS | | | | X | 1 |
| | | | | | - | | | 4 |
| <u>live fascines / brush wattles</u> Stabilization mats | ^ | X | NOT APPLICABLE | 13 | | | ^ | + |
| | | | INOT AFFEIGABLE | 100 | | | | _ |
| EROSION CONTROL PRACTICES Sediment fencing | | | | | 1 | 1.0 | | _ |
| Sand bag barrier | Х | · · | NOT ADDI GADI E | Х | X | K | X | 4 |
| Gravel bag berm | | X | NOT APPLICABLE | 1 | 1 | - | 1 | 1 |
| Earth dikes | | X | NOT APPLICABLE | | | - | 3 | + |
| Drainage swales | | X | NOT NECESSARY DUE TO SOIL AND SLOPES | 13 | | | 2 | 1 |
| Subsurface drains that daylight | | X | NOT APPLICABLE | 14 | 1 | | - 1 | 1 |
| Rock outlet protection | | X | NOT APPLICABLE | 13 | | | 3 | 4 |
| Sediment trap | | X | NOT APPLICABLE | 9.9 | - | - | 0 | 4 |
| | | X | NOT APPLICABLE | 2 | - | _ | 0 | 1 |
| Compost berm / sock | | X | NOT APPLICABLE | 9.9 | - | | 0 | 4 |
| Fiber rolls / straw wattles | | X | NOT NECESSARY DUE TO SOIL AND SLOPES | 9-9 | | _ | 0 | 4 |
| Storm drain inlet protection | | X | NOT APPLICABLE | | - | | 4 | 4 |
| Temp or perm sedimentation basin | | X | NOT APPLICABLE | | - | | 3 | + |
| Unpayed access road stabilized | X | | NOT ADDITION DE | X | X | Х | X | 4 |
| Ponded water management | | X | NOT APPLICABLE | | _ | | ¥ | 1 |
| Paving operations control | | X | NOT APPLICABLE | | _ | _ | 4 | 1 |
| Temporary equipment bridge | | | NOT APPLICABLE | | - | _ | | 4 |
| BMPs to prevent illicit connections | | | NOT APPLICABLE | | _ | _ | 1 | 1 |
| BMPs to prevent illegal discharge | | X | NOT APPLICABLE | | 1 | _ | | 1 |
| leuse and recycle construction waste | X | | The second secon | X | X | X | X | I |

RIVER DESIGN GROUP R

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REMOVAL

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RDG-09-048

CONSTRUCTION CALLOUTS

- ACCESS RIVER FROM THE SOUTH ALONG THE RAILROAD TRACKS AND CREATE A STAGING AREA ON THE NORTH SIDE OF THE RAILROAD TRACKS AND UPSTREAM OF THE DAM APPROXIMATELY 100 FEET.
- 2 IMPORT ROUND RIVER ROCK, ANGULAR MATERIAL AND RIVER SAND VIA TRAIN CARS FROM LOCAL COMMERCIAL SOURCES AND SAVAGE RAPIDS DAM LEFTOVER MATERIAL. AGGREGATE WILL RANGE IN SIZE FROM 1 INCH TO 12 INCHES AND BE UTILIZED TO BUILD AN ACCESS ROAD/COFFERDAM ACROSS TOLO SLOUGH TO THE EXISTING LAND USING APPROXIMATELY 1,500 CUBIC YARDS OF MATERIAL.
- FISH SALVAGE PLAN SHALL BE ACTIVATED FOR TOLO SLOUGH AND THE ENTIRE 3 FISH SALVAGE PLAN SHALL BE ACTIVATED FOR TOLU SLOUGH AND THE ENTIRE SLOUGH AREA SHALL BE DEFISHED BY LOWERING THE WATER ELEVATION WITH PUMPS. ENTIRE SALVAGE SHALL TAKE LESS THAN 24 HOURS.
- IMPORT ROUND RIVER ROCK, ANGULAR MATERIAL AND RIVER SAND VIA TRAIN AND BUILD COFFERDAM TO CENTER OF EXISTING CONCRETE DAM. APPROXIMATE QUANTITY OF TEMPORARY AGGREGATE FILL IS 4,000 CUBIC YARDS.
- IMPORT ROUND RIVER ROCK, ANGULAR MATERIAL AND RIVER SAND VIA TRAIN AND 5 BUILD COFFERDAM TO ISOLATE DOWNSTREAM AREA OF EXISTING CONCRETE DAM FROM MOVING WATER. APPROXIMATE QUANTITY OF TEMPORARY FILL MATERIAL IS 1,000 CUBIC YARDS.
- 6 FISH SALVAGE PLAN SHALL BE ACTIVATED FOR ISOLATED AREA BY FIRST LOWERING THE WATER LEVEL WITH PUMPS THEN DEFISHING WITH SEINE NETS AND ELECTROSHOCKING IF NECESSARY.
- REMOVE ISOLATED SECTION OF CONCRETE AND TIMBER CRIB DAM DOWN TO EXISTING REMOVE ISOLATED SECTION OF CONCRETE AND TIMELINGS CONCRETE TO FILL IN BEDROCK AND DISPOSE OF OFF-SITE OR STOCKPILE AND STAGE CONCRETE TO FILL IN POWERHOUSE FOREBAY ON NORTH SIDE OF DAM (SEE PHASE 2 DRAWINGS).
- REMOVE APPROXIMATELY 100 FEET OF TEMPORARY COFFERDAM BY INCREMENTALLY 8 LOWERING IT AND ALLOWING THE RESERVOIR AREA TO DEWATER IN A CONTROLLED MANNER. INVOKE FISH SALVAGE PLAN FOR KELLY SLOUGH AREA AND MAINSTEM ROGUE RIVER FRINGE AREA.
- PERFORM FISH SALVAGE AND DEFISHING OF AREA BETWEEN EXISTING CONCRETE DAM 9 AND LOG CRIB DAM ON NORTH SIDE OF EXISTING DAM.



PROJECT NUMBER RDG-09-048

PHASE 1 - COFFERDAM LONG PROFILE

HORZ 1" = 20' VERT 1" = 20'

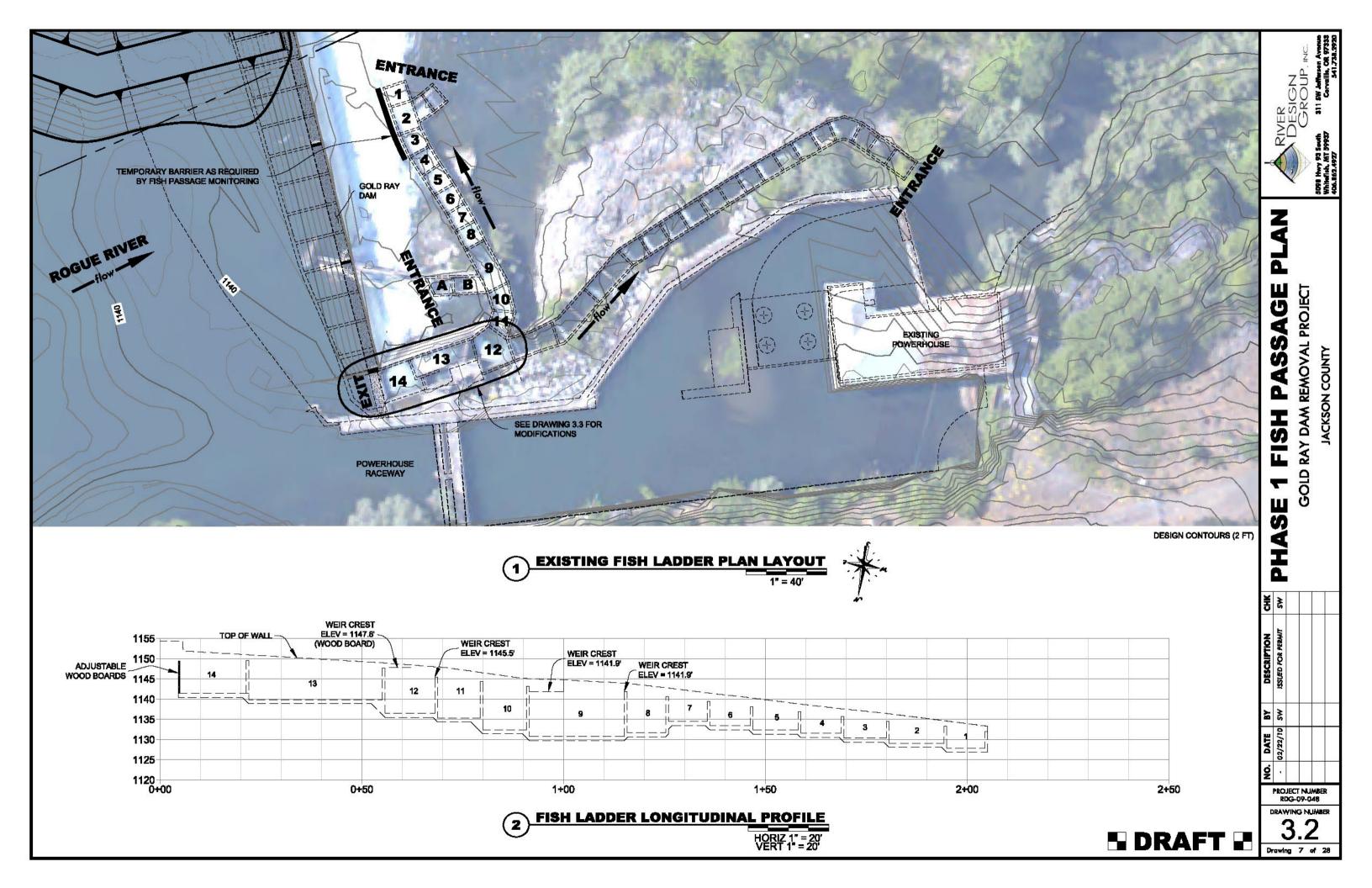
SECTIONS

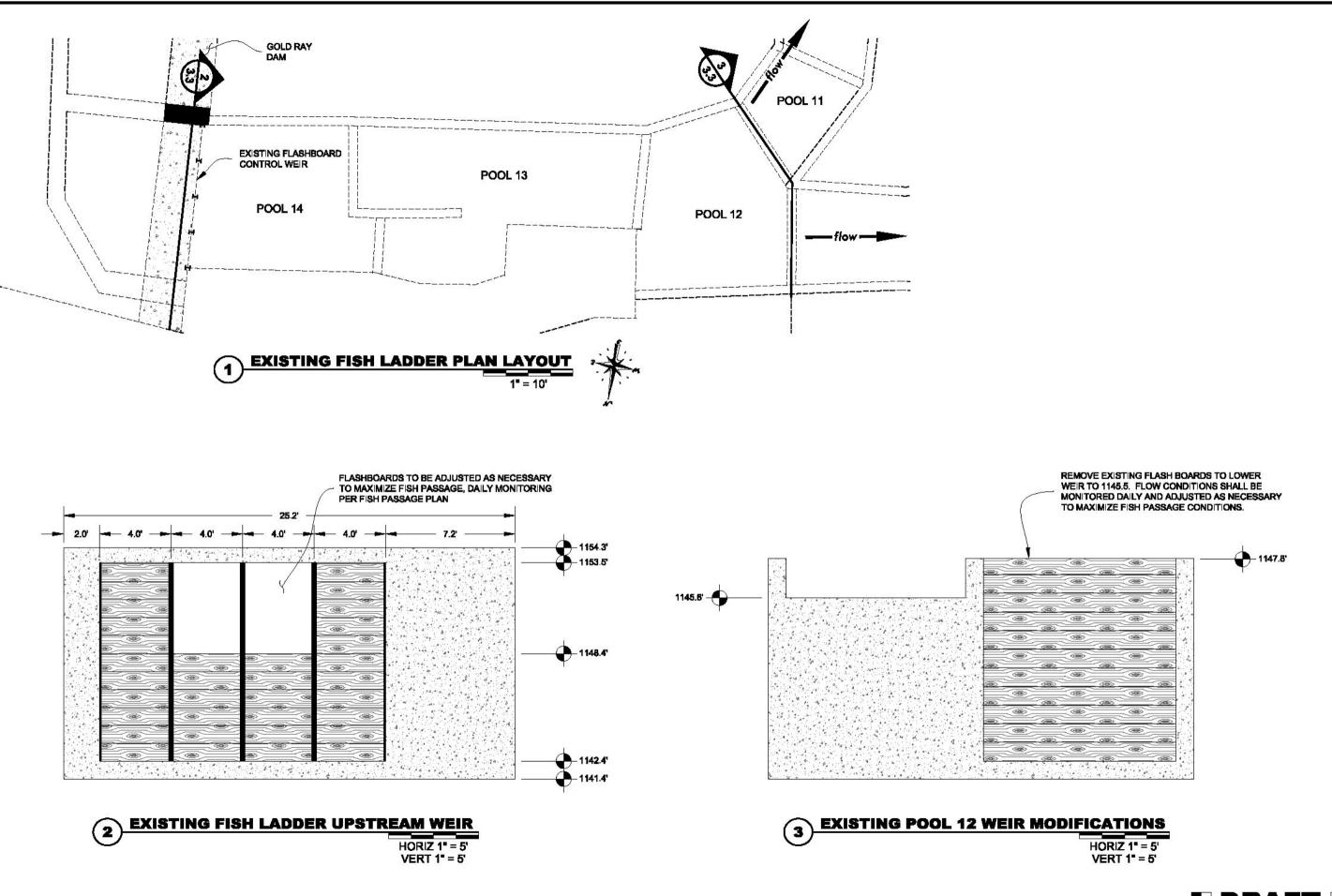
GOLD RAY DAM REMOVAL PROJECT PHASE

PROJECT NUMBER RDG-09-048

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RIVER DESIGN GROUP GROUP

1 FISH PASSAGE DETAILS GOLD RAY DAM REMOVAL PROJECT

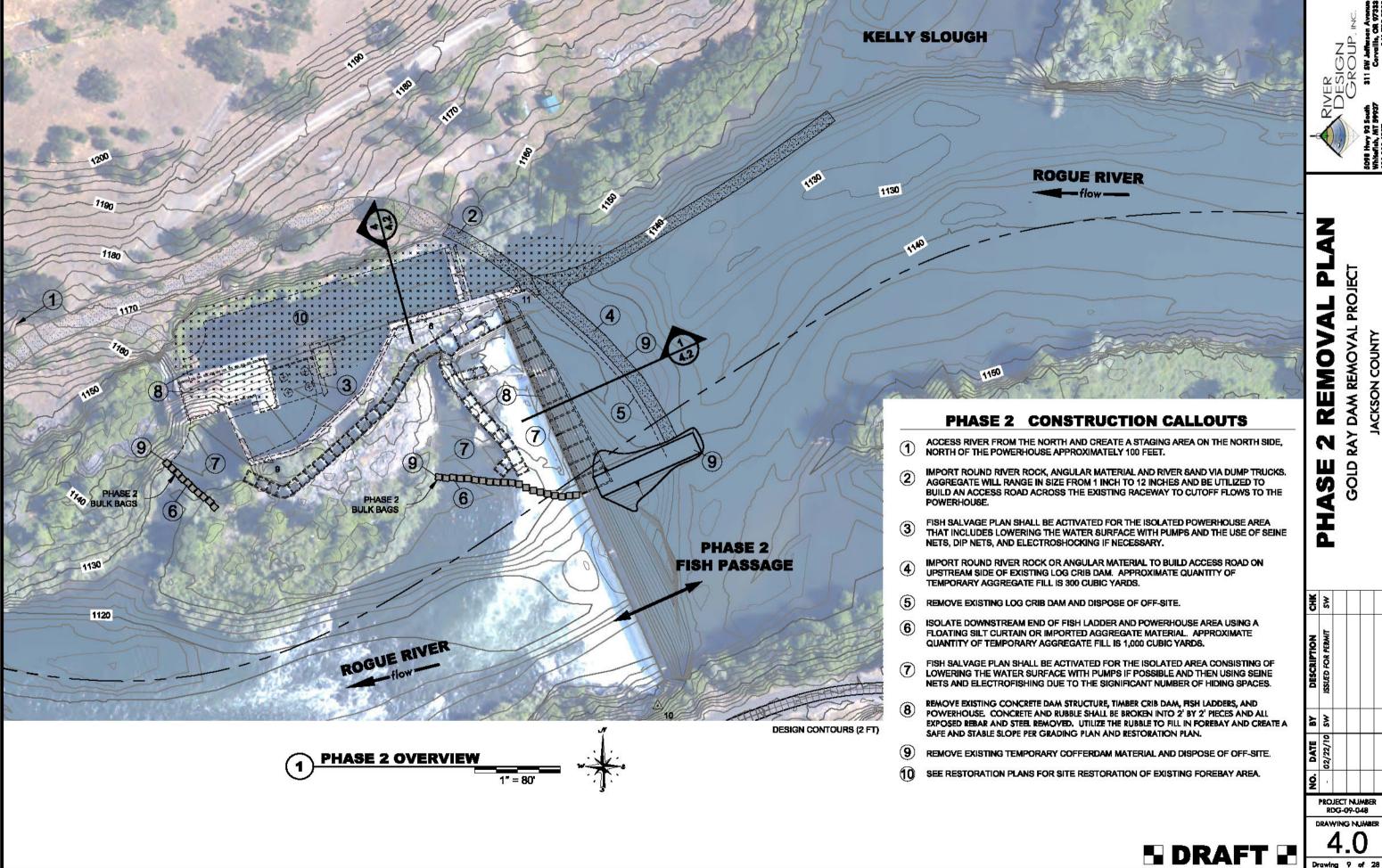
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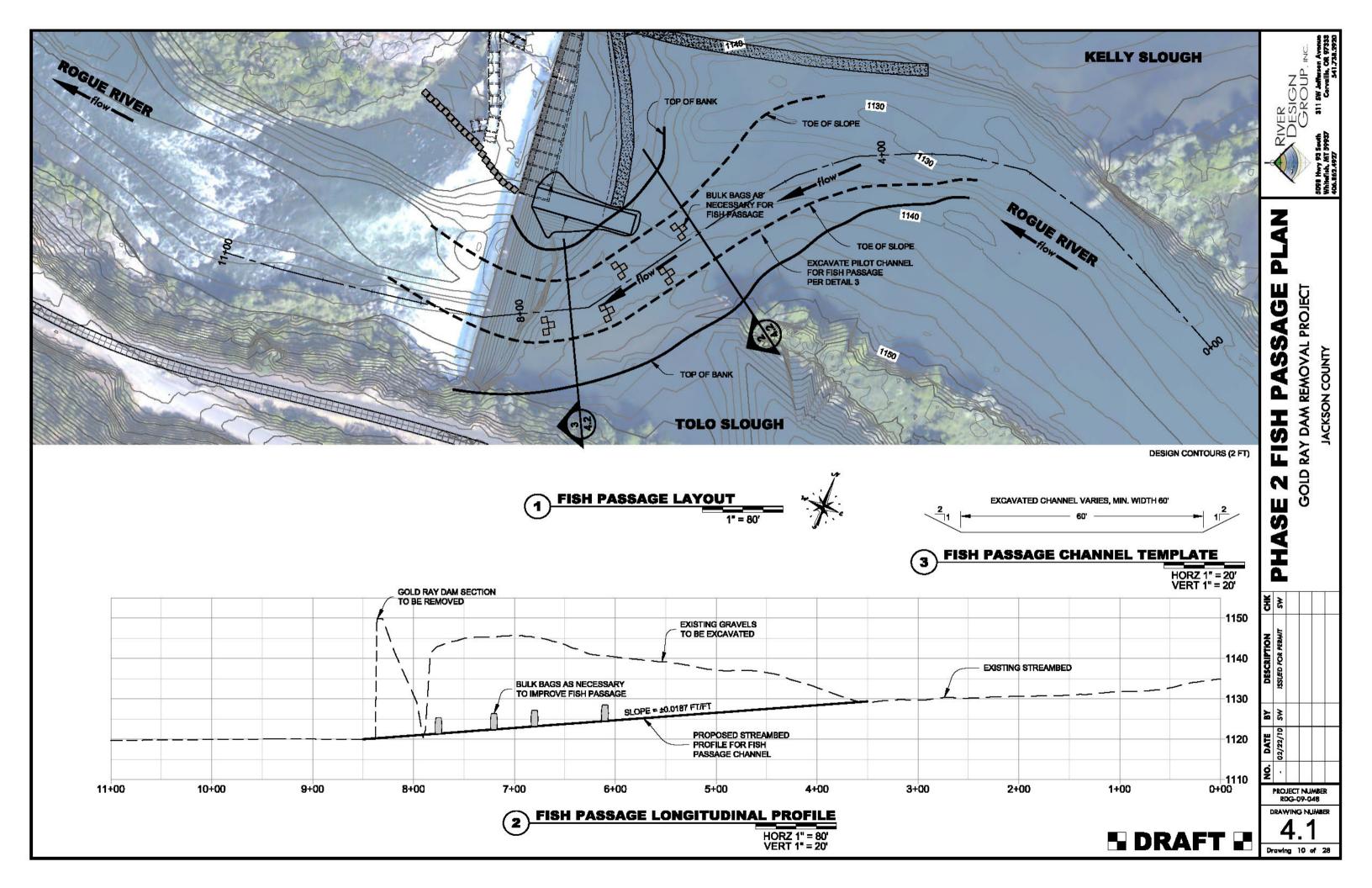
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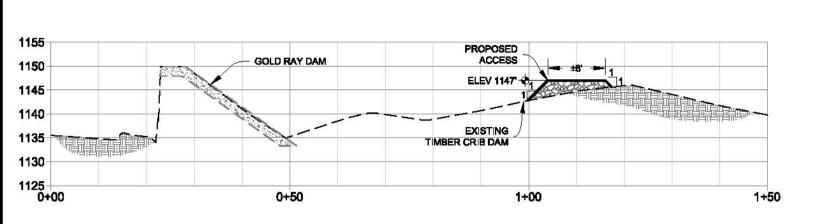
Drawing 8 of 2

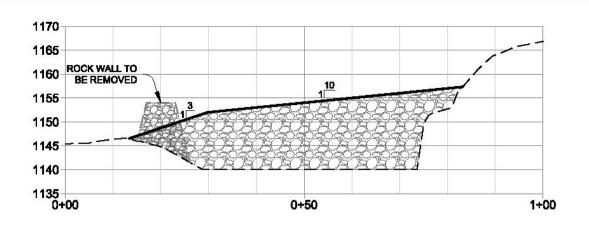


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Drawing 9 of 28





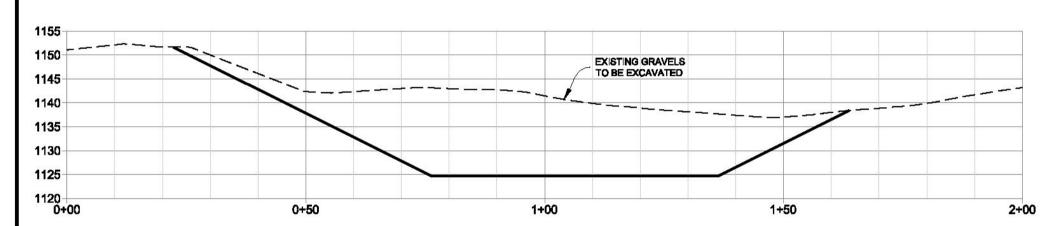


1 PHASE 2 - ACCESS

HORZ 1" = 20'
VERT 1" = 20'

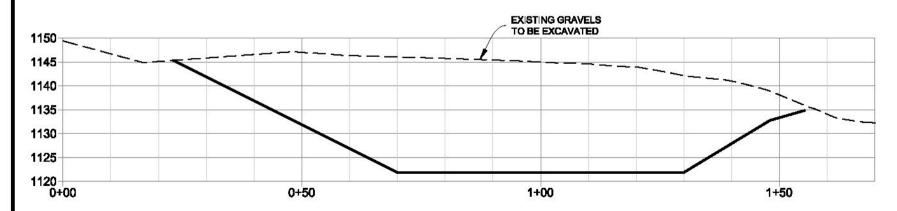
FORBAY SECTION

HORZ 1" = 20'
VERT 1" = 20'



FISH PASSAGE CHANNEL - STA 6+00

HORZ 1" = 20'
VERT 1" = 20'



FISH PASSAGE CHANNEL - STA 7+50

HORZ 1" = 20'
VERT 1" = 20'



PHASE 2 SECTIONS
GOLD RAY DAM REMOVAL PROJECT

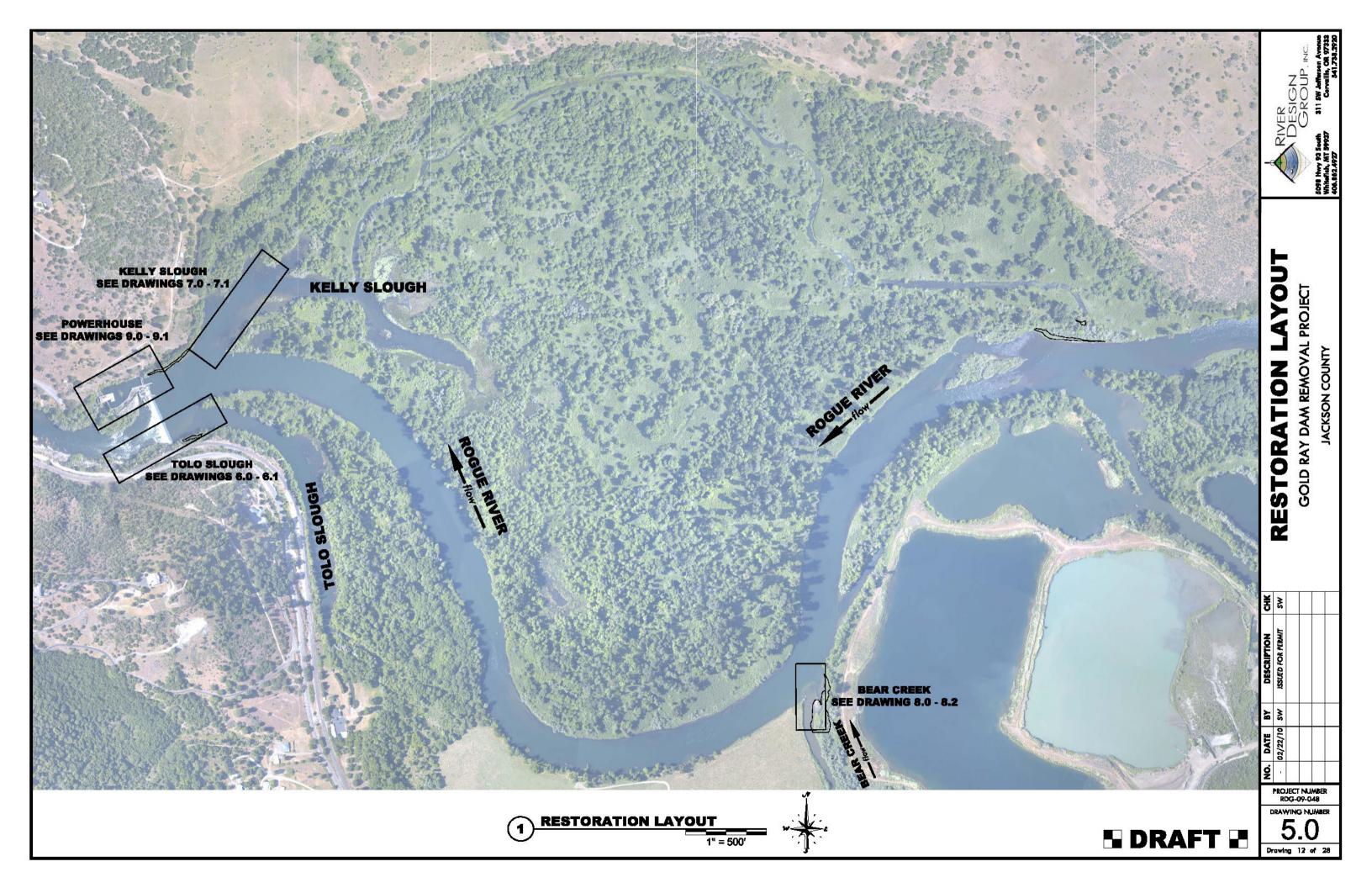
JACKSON COUNTY

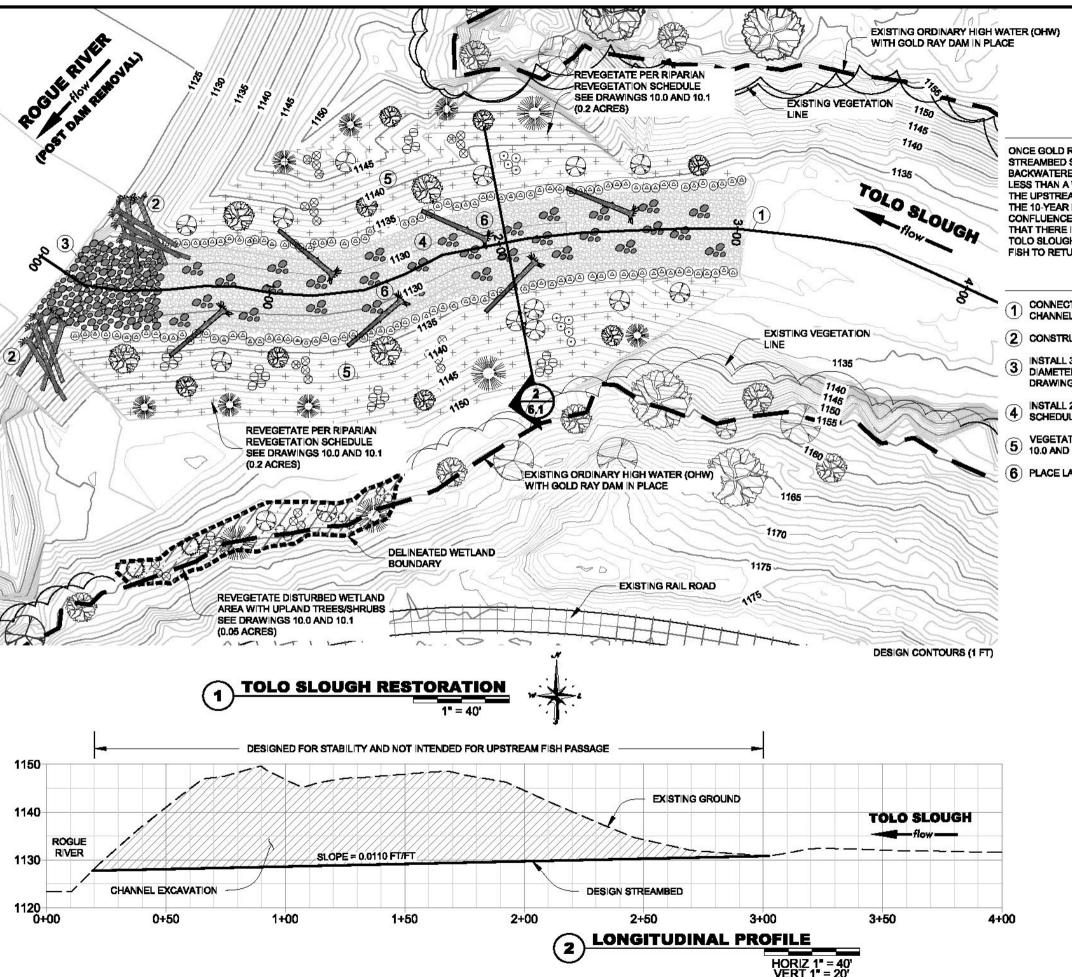
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DESIGN INTENT

ONCE GOLD RAY DAM IS REMOVED AND THE ROGUE RIVER REACHES A STABLE STREAMBED SLOPE, TOLO SLOUGH WILL ACT AS A BACKWATER AREA THAT IS BACKWATERED ONLY DURING YEARLY HIGH FLOWS FOR SHORT DURATIONS TYPICALLY LESS THAN A WEEK. SURFACE WATER FROM THE ROGUE RIVER WILL CONVEY ACROSS THE UPSTREAM FLOODPLAIN AND INTO TOLO SLOUGH AT PEAK FLOWS GREATER THAN THE 10-YEAR EVENT. THEREFORE, THIS PLAN PROVIDES CONNECTIVITY AT THE CONFLUENCE OF TOLO SLOUGH WITH THE ROGUE RIVER TO ENSURE STABILITY AND THAT THERE IS NO FISH STRANDING IN THE SLOUGH. UPSTREAM FISH PASSAGE INTO TOLO SLOUGH WILL ONLY BE DURING HIGH FLOW EVENTS WITH PROVISIONS FOR THE FISH TO RETURN TO THE MAINSTEM ROGUE RIVER.

CONSTRUCTION NOTES

- CONNECT TOLO SLOUGH TO THE MAINSTEM ROGUE RIVER BY EXCAVATING A CHANNEL PER DETAIL 1 (DRAWING 6.1).
- (2) CONSTRUCT ENGINEERED LARGE WOOD STRUCTURE PER DRAWING 11.3.
- 3 INSTALL 3' THICK LAYER OF ROUND ROCK BOULDERS WITH AN AVERAGE DIAMETER OF 2.5'-3.0' IN ACCORDANCE WITH "LARGE ROCK SCHEDULE" ON THIS DRAWING. (~180 CUBIC YARDS)
- (4) INSTALL 2' THICK LAYER OF GRAVEL IN ACCORDANCE WITH "GRAVEL MATRIX SCHEDULE" ON THIS DRAWING. (~820 CUBIC YARDS)
- 5 VEGETATE EXPOSED AREA WITH "RIPARIAN" PLANTING SCHEME ON DRAWINGS 10.0 AND 10.1. (-0.4 ACRES TOTAL)
- (6) PLACE LARGE WOOD WITH ROOTWAD, BURY AT LEAST 50% INTO GROUND.

LARGE ROCK SCHEDULE

BOULDERS 2.5' - 3.5' DIAMETER

GRAVEL MATRIX SCHEDULE

| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) |
|--------------------|-------------------------|-------------------------|
| 100 | 15 | 20 |
| 85 | 13 | 18 |
| 50 | 10 | 15 |
| 30 | 6 | 9 |
| 15 | 3 | 5 |

MATRIX THICKNESS (T) = 24 INCHES

B DRAFT ■

SACOUP, INC.
South 311 SW Jefferson Aven
59937 Corveills, 08.973

5098 Hwy 93

SLOUGH CONFLUENCE

0

<u>0</u>

ACKSON COUNTY

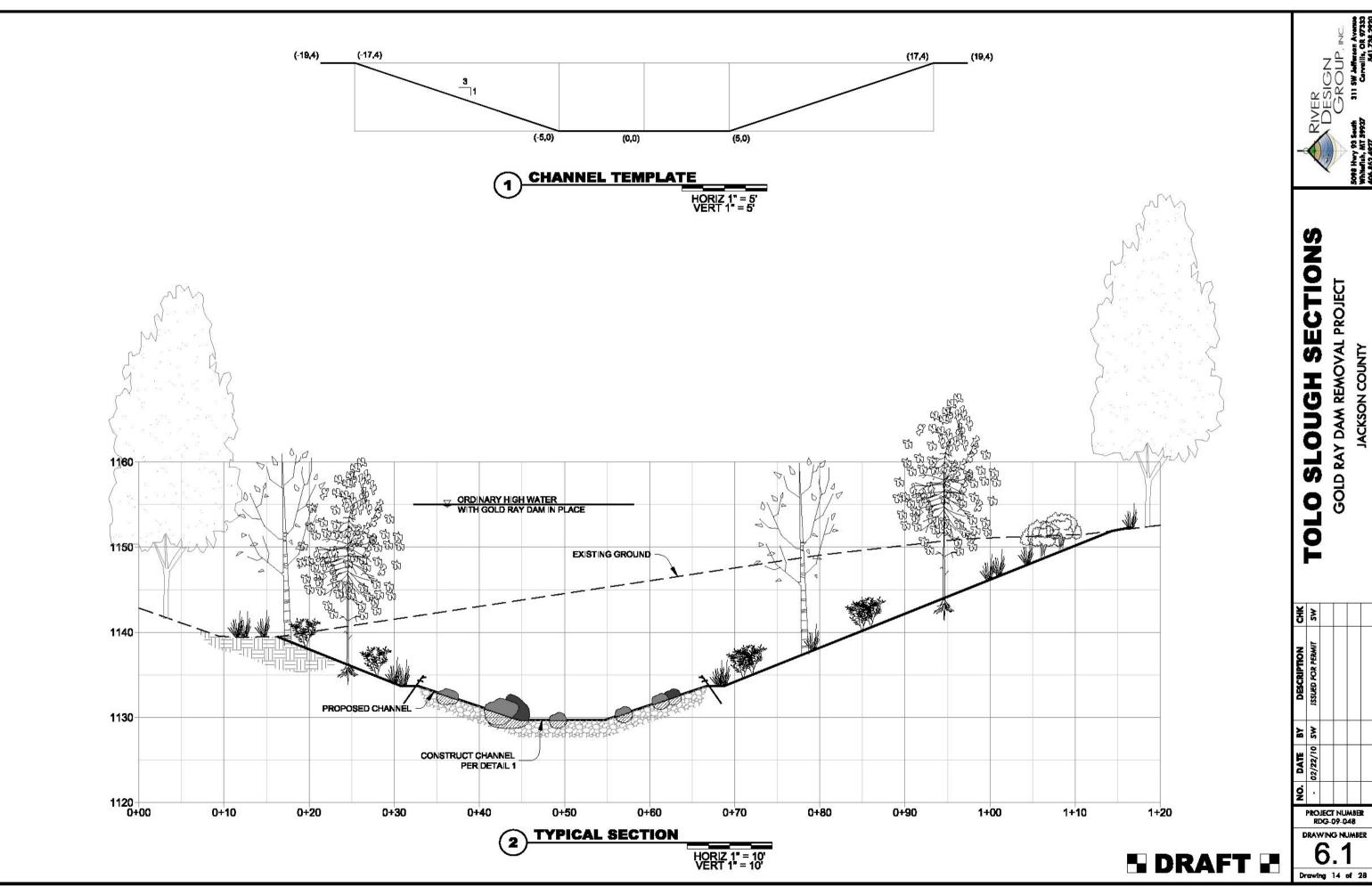
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PROJECT NUMBER RDG-09-048

DRAWING NUMBER

6.0 Drawing 13 of 28



PROJECT NUMBER RDG-09-048

DRAWING NUMBER 6.1

Drawing 14 of 28

LOWER KELLY SLOUGH 1150 **EXISTING GROUND** 1140 DESIGN STREAMBANK **EXCAVATION** 1120 0+00 0+50 1+00 1+50 2+00 2+50 3+00

LONGITUDINAL PROFILE

HORIZ 1" = 50' VERT 1" = 20'

DESIGN INTENT

IN ORDER TO EFFECTIVELY DEAL WITH OVERLAND FLOODPLAIN FLOWS INTO KELLY SLOUGH FROM THE MAINSTEM ROQUE RIVER, A STABILIZATION PLAN HAS BEEN DEVELOPED FOR THE CONFLUENCE AREA. THE PLAN UTILIZES A BANK STABILIZATION STRATEGY THAT USES LARGE ROCK, WOOD, AND VEGETATION TO STABILIZE THE AREA AS WATER RE-ENTERS THE ROQUE RIVER. THIS APPROACH WILL ENSURE SHORT-TERM STABILITY AND PRESERVE OPTIONS FOR FUTURE RESTORATION OF KELLY SLOUGH AT A LATER DATE.

CONSTRUCTION NOTES

- ONNECT KELLY SLOUGH TO THE MAINSTEM ROQUE RIVER BY RESHAPING STREAM BANK PER DETAIL 1 (DRAWING 7.1).
- (2) CONSTRUCT ENGINEERED LARGE WOOD STRUCTURE PER DRAWING 11.3.
- 3 INSTALL 3' THICK LAYER OF ROUND ROCK BOULDERS WITH AN AVERAGE DIAMETER OF 2.5'-3.0' IN ACCORDANCE WITH "LARGE ROCK SCHEDULE" ON THIS DRAWING. (~520 CUBIC YARDS)
- (4) INSTALL 2' THICK LAYER OF GRAVEL IN ACCORDANCE WITH "GRAVEL MATRIX SCHEDULE" ON THIS DRAWING. (~900 CUBIC YARDS)
- 5 VEGETATE EXPOSED AREA WITH "RIPARIAN" PLANTING SCHEME ON DRAWINGS 10.0 AND 10.1. (~0.4 ACRES TOTAL)
- 6 PLACE LARGE WOOD WITH ROOTWAD, BURY AT LEAST 50% INTO GROUND.

LARGE ROCK SCHEDULE

BOULDERS 2.5' - 3.5' DIAMETER

GRAVEL MATRIX SCHEDULE

| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) |
|--------------------|-------------------------|-------------------------|
| 100 | 15 | 20 |
| 85 | 13 | 18 |
| 50 | 10 | 15 |
| 30 | 6 | 9 |
| 15 | 3 | 5 |

MATRIX THICKNESS (T) = 24 INCHES

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- 02/22/10 SW ISSUED FOR PERMIT S

PROJECT NUMBER RDG-09-048

7.0

Drawing 15 of 28

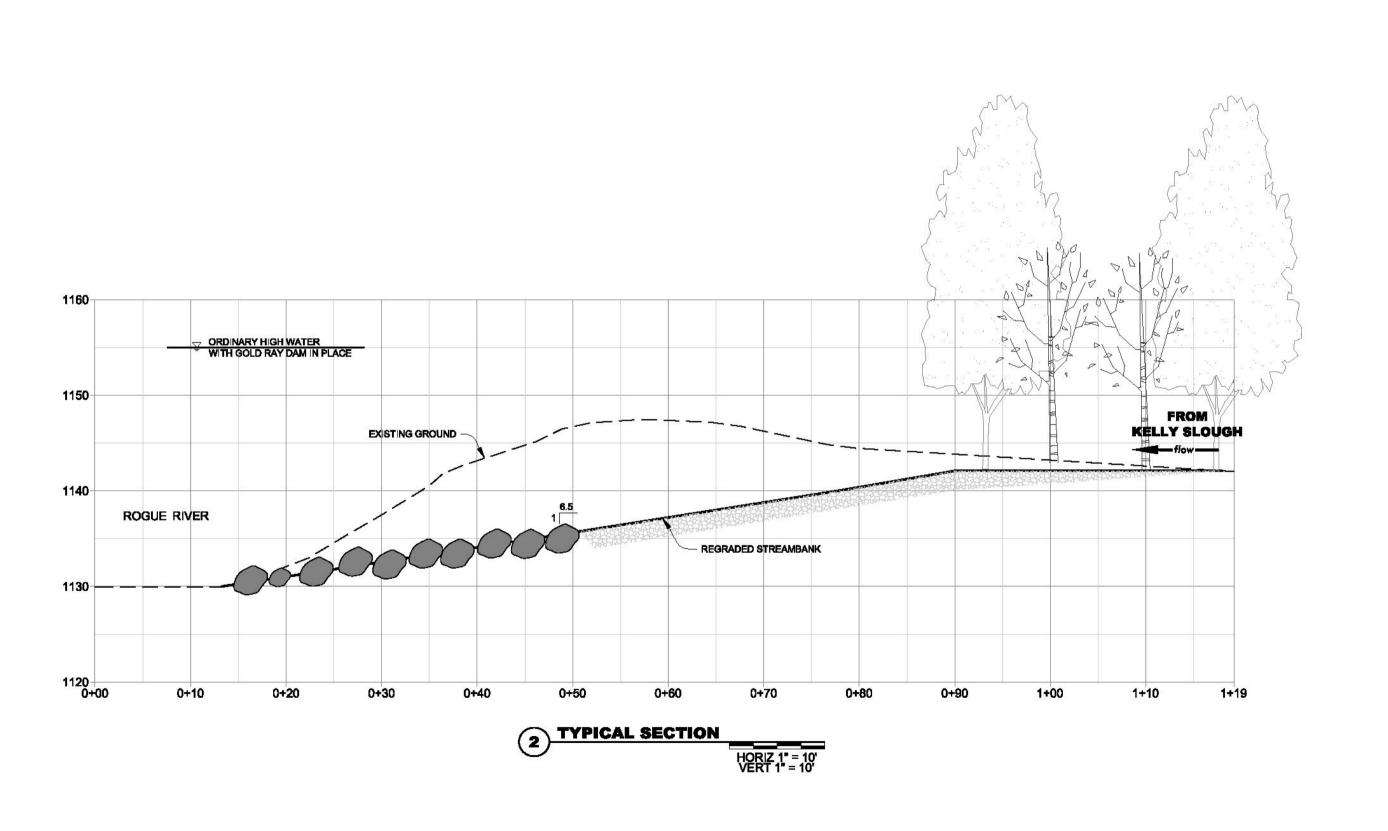
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RIVER

SLOUGH CONFLUENCE OLD RAY DAM REMOVAL PROJECT

KELL

ACKSON COUNTY





KELLY SLOUGH SECTIONS
GOLD RAY DAM REMOVAL PROJECT

JACKSON COUNTY

DATE BY DESCRIPTION CHK
02/22/10 SW ISSUED FOR PERMIT SW

PROJECT NUMBER RDG-09-048

DRAWING NUMBER

DRAFT 2

Drawing 16 of 28

BEAR CREEK RESTORATION
PHASE 1 - 2010



DESIGN INTENT

DUE TO THE TIMING OF THE DAM REMOVAL AND ANTICIPATED CHANGES TO THE ROGUE RIVER AFTER THE FIRST WINTER, A TWO PHASED APPROACH IS NECESSARY TO ENSURE YEAR-ROUND FISH PASSAGE AT THE CONFLUENCE AREA. PHASE 1 WILL BE IMPLEMENTED IMMEDIATELY AFTER REMOVAL OF THE GOLD RAY DAM AND CONSISTS OF CREATING A CLEAR AND DEFINED CONNECTION TO THE EXISTING STREAMBED ELEVATION OF THE MAINSTEM ROGUE RIVER. THIS CONNECTION WILL BE CREATED BY SHAPING THE EXISTING GRAVELS AND INSTALLING BOULDER GRADE CONTROL STRUCTURES AND LARGE WOOD IN A STABLE PATTERN THAT ENSURES FISH PASSAGE. THESE MATERIALS WILL BE DESIGNED TO WITHSTAND 25-YR PEAK FLOW EVENTS. PHASE 2 WILL TAKE PLACE THE FOLLOWING YEAR AFTER WINTER FLOWS HAVE SCOURED THE ROGUE RIVER AT THE CONFLUENCE AREA. THE ANTICIPATED BED LOWERING IS ON THE ORDER OF 2-4 FT. THE CONFLUENCE AREA WILL BE RECONSTRUCTED TO PROVIDE A CLEAR CONNECTION DOWN TO THE LOWER MAINSTEM ELEVATION. THIS RESTORATION EFFORT WILL BE CONSTRUCTED USING A COMBINATION OF BOULDER GRADE CONTROL STRUCTURES AND LARGE WOOD TO PROVIDE ADEQUATE COMPLEXITY AND STABILITY IN THE CONFLUENCE AREA. ON-GOING MONITORING OF THE DAM REMOVAL SITE WILL ENSURE CONTINUED OBSERVATIONS OF FISH PASSAGE AND NOTIFICATION IF FISH PASSAGE IS NOT BEING PROVIDED.

CONSTRUCTION NOTES

- ONNECT BEAR CREEK TO THE MAINSTEM ROGUE RIVER BY RESHAPING STREAM BANK PER DETAIL 1 (DRAWING 8.2).
- (2) CONSTRUCT ENGINEERED LARGE WOOD STRUCTURE PER DRAWING 11.3.
- 3 INSTALL 3" THICK LAYER OF ROUND ROCK BOULDERS WITH AN AVERAGE DIAMETER OF 2.5"-3.0" IN ACCORDANCE WITH "LARGE ROCK SCHEDULE" ON THIS DRAWING. (~580 CUBIC YARDS)
- (4) INSTALL 2' THICK LAYER OF GRAVEL IN ACCORDANCE WITH "GRAVEL MATRIX SCHEDULE" ON THIS DRAWING. (~2,950 CUBIC YARDS)
- 5 VEGETATE EXPOSED AREA WITH "RIPARIAN" PLANTING SCHEME ON DRAWINGS 10.0 AND 10.1. (~0.7 ACRES TOTAL)
- 6 PLACE LARGE WOOD WITH ROOTWAD, BURY AT LEAST 50% INTO GROUND.
- (7) CONSTRUCT ENGINEERED RIFFLE PER DRAWING 11.4.

LARGE ROCK SCHEDULE

BOULDERS 2.5' - 3.5' DIAMETER

GRAVEL MATRIX SCHEDULE

| ORATE MAIRIX GOILEDGEE | | | | | |
|------------------------|-------------------------|-------------------------|--|--|--|
| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) | | | |
| 100 | 15 | 20 | | | |
| 85 | 13 | 18 | | | |
| 50 | 10 | 15 | | | |
| 30 | 6 | 9 | | | |
| 15 | 3 | 5 | | | |

MATRIX THICKNESS (T) = 24 INCHES

1160 EXISTING GROUND AT CENTERLINE 1150 AVERAGE SLOPE = 0.0190 FT/FT ROGUE RIVER **EXISTING CHANNEL DESIGN STREAMBED** CHANNEL **EXCAVATION** 1130 0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

LONGITUDINAL PROFILE

PRIZ 1" = 100'

DRAFT 2

SOSE Hwy 93 Sauth Whiteflah, MT 3993 Ava acq acq 2007

CREEK PHASE
RAY DAM REMOVAL PROJECT
JACKSON COUNTY

EAR

8

GOLD

02/22/10 SW ISSUED FOR PERMIT SW

PROJECT NUMBER RDG-09-048

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PROJECT NUMBER

DRAWING NUMBER

DESIGN INTENT

DUE TO THE TIMING OF THE DAM REMOVAL AND ANTICIPATED CHANGES TO THE ROGUE RIVER AFTER THE FIRST WINTER, A TWO PHASED APPROACH IS NECESSARY TO ENSURE YEAR-ROUND FISH PASSAGE AT THE CONFLUENCE AREA. PHASE 2 WILL TAKE PLACE IN 2011 AFTER WINTER FLOWS HAVE SCOURED THE ROGUE RIVER AT THE CONFLUENCE AREA. THE ANTICIPATED BED LOWERING IS ON THE ORDER OF 2-4 FT. THE CONFLUENCE AREA WILL BE RECONSTRUCTED TO PROVIDE A CLEAR CONNECTION DOWN TO THE LOWER MAINSTEM ELEVATION. THIS RESTORATION EFFORT WILL BE CONSTRUCTED USING A COMBINATION OF BOULDER GRADE CONTROL STRUCTURES AND LARGE WOOD TO PROVIDE ADEQUATE COMPLEXITY AND STABILITY IN THE CONFLUENCE AREA. ON-GOING MONITORING OF THE DAM REMOVAL SITE WILL ENSURE CONTINUED OBSERVATIONS OF FISH PASSAGE AND NOTIFICATION IF FISH PASSAGE IS NOT BEING PROVIDED.

CONSTRUCTION NOTES

- CONNECT BEAR CREEK TO THE MAINSTEM ROGUE RIVER BY RESHAPING STREAM BANK PER DETAIL 1 (DRAWING 8.2).
- (2) CONSTRUCT ENGINEERED LARGE WOOD STRUCTURE PER DRAWING 11.3.
- INSTALL 3' THICK LAYER OF ROUND ROCK BOULDERS WITH AN AVERAGE DIAMETER OF 2.5'-3.0' IN ACCORDANCE WITH "LARGE ROCK SCHEDULE" ON THIS
- (4) INSTALL 2' THICK LAYER OF GRAVEL IN ACCORDANCE WITH "GRAVEL MATRIX SCHEDULE" ON THIS DRAWING.
- 5 VEGETATE EXPOSED AREA WITH "RIPARIAN" PLANTING SCHEME ON DRAWINGS 10.0 AND 10.1. (~0.7 ACRES TOTAL)
- (6) PLACE LARGE WOOD WITH ROOTWAD, BURY AT LEAST 50% INTO GROUND.
- (7) CONSTRUCT ENGINEERED RIFFLE PER DRAWING 11.4.

LARGE ROCK SCHEDULE

BOULDERS 2.5' - 3.5' DIAMETER

GRAVEL MATRIX SCHEDULE

| OIGHT II IIM I KIM GOILLEGEL | | | | | |
|------------------------------|-------------------------|-------------------------|--|--|--|
| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) | | | |
| 100 | 15 | 20 | | | |
| 85 | 13 | 18 | | | |
| 50 | 10 | 15 | | | |
| 30 | 6 | 9 | | | |
| 15 | 3 | 5 | | | |

MATRIX THICKNESS (T) = 24 INCHES

EXISTING VEGETATION

REVEGETATE PER RIPARIAN REVEGETATION SCHEDULE **SEE DRAWINGS 10.0 AND 10.1**

(0.4 ACRES)

EXISTING VEGETATION

DELINEATED WETLAND

DESIGN CONTOURS (1 FT)

9+00

LONGITUDINAL PROFILE

ORDINARY HIGH WATER (OHW) WITH GOLD RAY DAM IN PLACE

REVEGETATE PER RIPARIAN

REVEGETATION SCHEDULE SEE DRAWINGS 10.0 AND 10.1

ORDINARY HIGH WATER (OHW) WITH GOLD RAY DAM IN PLACÉ

BEAR CREEK RESTORATION

PHASE 2 - 2011

1140 **ELEVATION AFTER SCOUR** 1130 0+00 3+00 1+00 2+00 4+00 5+00

EXCAVATION

ROGUE RIVER

EXISTING CHANNEL

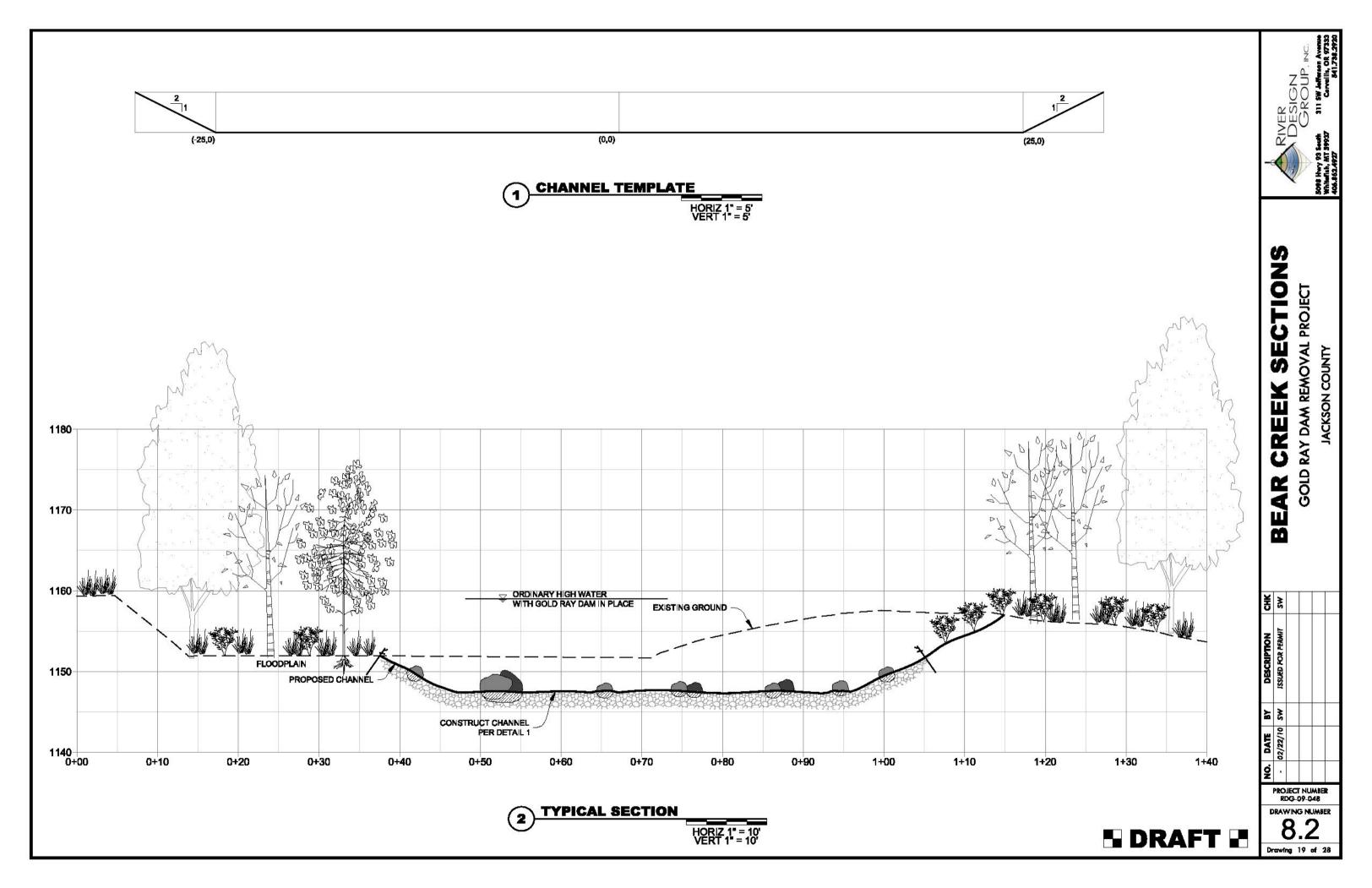
1160 EXISTING AVERAGE SLOPE = 0.0190 FT/FT 1150 CHANNEL

6+00

7+00

8+00

- DRAFT



DESIGN INTENT

THE EXISTING FOREBAY AREA WAS BLASTED INTO THE GRANITE ROCK AND HAS VERTICAL SLOPES. THESE VERTICAL WALLS WILL CREATE A POTENTIAL HAZARD FOR PEDESTRIANS AND MUST BE ADDRESSED FOR SAFETY. THE EXISTING FOREBAY AREA WILL BE FILLED WITH A COMBINATION OF CONCRETE REMOVED FROM THE DAM AND RIVER ALLUVIUM EXCAVATED AS PART OF THE FISH PASSAGE CHANNEL SHAPING. CONCRETE RUBBLE SHALL BE 37X3' PIECES OR SMALLER. IF EXPOSED REBAR IS VISIBLE, IT SHALL BE CUT OFF FLUSH TO CREATE A SMOOTH SURFACE AND DISPOSED OF OFF SITE.

FILL MATERIAL WILL BE PLACED IN THE FOREBAY AREA OUTSIDE ORDINARY HIGH WATER AND WILL BE COMPACTED TO PROVIDE A SMOOTH TRANSITION SLOPE FROM THE EXISTING ACCESS DRIVE DOWN TO THE RIVER AREA. FINE SEDIMENT AND SILT WILL BE UTILIZED TO COVER THE FILL MATERIAL AND WILL PROVIDE A GROWING MEDIUM FOR RIPARIAN PLANTS AND NATIVE VEGETATION. AREA SHALL BE PLANTED WITH DESIGNATED VEGETATION.

CONSTRUCTION NOTES

 \bigodot VEGETATE EXPOSED AREA WITH "UPLAND" PLANTING SCHEME ON DRAWINGS 10.0 AND 10.1. (~1.3 ACRES TOTAL)

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RESTORATION

POWERHOUSE

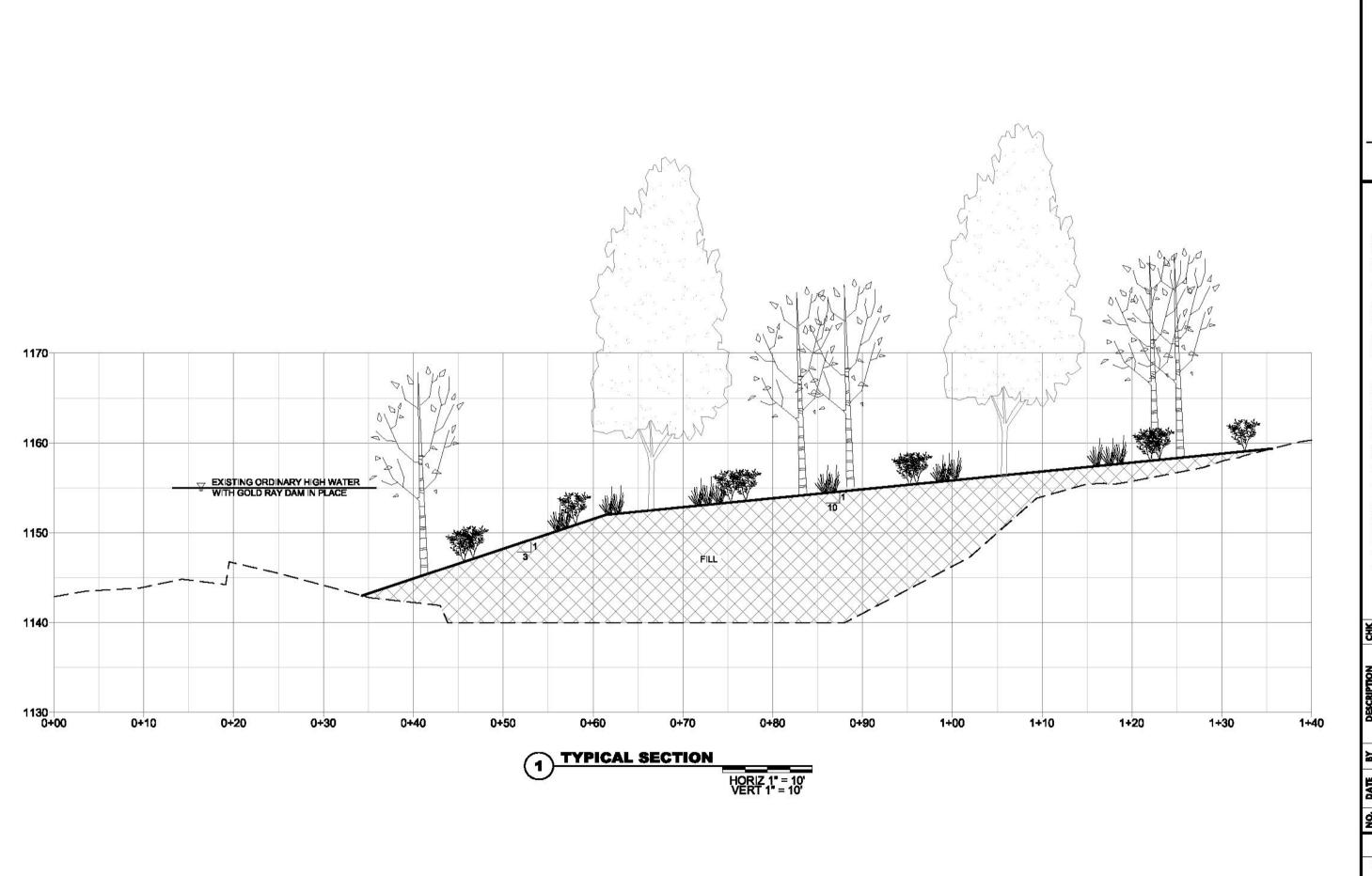
GOLD RAY DAM REMOVAL PROJECT

PROJECT NUMBER RDG-09-048

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Drawing 20 of 28

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POWERHOUSE SECTION
GOLD RAY DAM REMOVAL PROJECT

JACKSON COUNTY

2/10 SW ISSUED FOR FEMIT SW

PROJECT NUMBER RDG-09-048

DRAWING NUMBER
9.1

Drawing 21 of 28

REVEGETATION NOTES

GENERAL NOTES

- 1. ALL PLANT MATERIAL MUST BE CLASSIFIED AS NATIVE FROM THIS REGION AND NON-CLONAL IN ORIGIN. ALL NATIVE PLANT MATERIAL TO BE USED IN PLANTING AREAS TO ORIGINATE FROM PARENT SOURCES WITHIN 50 MILES OF SITE. SEED SOURCE MUST BE AS LOCAL AS POSSIBLE.
- 2. INSTALL TREE AND SHRUB SPECIES IN RANDOM GROUPINGS, AVOIDING LINEAR ROWS OR AS DIRECTED IN FIELD, WITHIN CLOSE PROXIMITY OF EXISTING PLANTINGS OR NEWLY PLANTED MATERIAL. THE INTENT IS TO REPLICATE NATURAL PLANT COMMUNITIES BY PROVIDING A LAYERED UNDERSTORY CANOPY WITH A MIXTURE OF TREES.
- 3. THE PLANTING AND SEEDING AREA IS TO COVERED WITH TOPSOIL. IF THIS TOPSOIL IS DEEMED BY PROJECT ENGINEER TO BE INADEQUATE, IMPORTED MATERIAL SHALL BE USED TO POCKET PLANT THE PLANTS IN UPLAND, RIPARIAN, EMERGENT, AND WETLAND SITES.
- THOROUGHLY WATER ALL PLANTS IMMEDIATELY FOLLOWING INSTALLATION TO PROVIDE MAXIMUM SOIL CONTACT AND TO ELIMINATE AIR POCKETS. AFTER PLANTING EACH PLANT, PROVIDE A TWO (2) INCH LAYER OF MULCH AROUND DISTURBED AREA.

WILLOW STAKE PLANTING

- WILLOW STAKES SHALL HAVE MINIMUM DIAMETER OF 1.5" AND MINIMUM LENGTH 4". THE STAKES SHALL BE CUT FROM NEARBY PLANTS TO ENSURE COMPATIBILITY IF POSSIBLE, OR LOCAL 'ECOTYPES' STAKES SHALL HAVE SIDE BRANCHES CLEANLY REMOVED WITH BARK INTACT, BASAL ENDS CUT AT AN ANGLE AND TOPS CUT SQUARE.
- 2. STAKES SHALL BE CUT AND INSTALLED ON THE SAME DAY.

DROUGHT TOLERANT

INFREQUENTLY SATURATED SOILS

SEASONALLY SATURATED SOILS

PERMANENTLY SATURATED SOILS

NATIVE PLANTS

- 3. STAKES SHALL BE INSTALLED WHILE IN THE DORMANT STAGE, NOVEMBER 1 TO FEBRUARY 15 IN THE ROGUE VALLEY, UNLESS IRRIGATION IS PROVIDED. STAKES SHOULD BE DEEP ENOUGH TO CONTACT THE LOW SUMMER WATER LEVEL
- 4. STAKES SHALL BE INSTALLED ON 2' CENTERS WITH 80% OF THE STAKE LENGTH INSTALLED INTO THE GROUND WITH FIRM SOIL IN CONTACT WITH THE WILLOW STAKE. A PIECE OF REBAR SHOULD BE USED AS A PILOT HOLE FOR THE STAKE.
- 5. TAMP STAKES INTO GROUND WITH A DEAD BLOW HAMMER (HAMMER HEAD FILLED WITH SHOT OR
- WILLOW CLUMPS ARE PREFERRED TO LIVE STAKES ON THE LOWER HALF OF THE STREAMBANK. INSTALL PER NRCS PLANT MATERIALS TECHNICAL NOTE 42.

SEASONALLY LOW WATER

TABLE ELEVATION

7. ALTERNATE INSTALLATION PROCEDURES MAY BE USED UPON CONSULTATION WITH RIVER DESIGN GROUP PROJECT ENGINEER.

UPLAND

ZONE

RIPARIAN

ZONE

WILLOW CLUMP PLANTING

- WILLOW CLUMPS SHALL BE SALVAGED FROM THE EXCAVATED CHANNEL AREA. FILL IN ANY HOLES WHERE DONOR CLUMPS ARE EXTRACTED IF OUTSIDE THE CHANNEL EXCAVATION LIMITS.
- 2. WILLOW CLUMP PLANTINGS SHALL FOLLOW THE NATURAL RESOURCE CONSERVATION SERVICE (NRCS) PLANT MATERIALS TECHNICAL NOTE 42 (2003).
- LOCATE AND UTILIZE YOUNG AND VIGOROUS (8' 20' TALL) WILLOW CLUMPS IN CONSULTATION WITH THE PROJECT ENGINEER. DIG THE WILLOW CLUMP UTILIZING A TRACKHOE BUCKET AND OBTAIN AT LEAST 75% OF THE ROOT MASS. DO NOT ALLOW CLUMPS TO SIT MORE THEN 1 HOUR OR DRY OUT. TRANSPORT CLUMPS TO PLANTING SITE.
- DIG A HOLE UTILIZING THE TRACKHOE BUCKET TO THE SAME SIZE AND SHAPE OF THE CLUMP. HOLE SHALL BE TO A DEPTH JUST ABOVE THE STANDING WATER TABLE AND NOT INTO THE WATER TABLE. PACK THE SOIL FIRMLY IN THE EXCAVATED HOLE UPON INSTALLATION.
- AFTER INSTALLATION, CUT OFF APPROXIMATELY 33%-50% OF THE WILLOW TOPS STRAIGHT ACROSS. WILLOW CLUMPS SHALL BE PLACED APPROXIMATELY 15 FEET APART.

SOD & SOIL SALVAGE

FLOODPLAIN SOD AND SOIL SHALL BE SALVAGED TO THE MAXIMUM EXTENT PRACTICABLE IN AREAS THAT ARE TO BE DISTURBED. SOD AND SOIL SHALL BE TRANSPORTED AND STOCKPILED AT A CONVENIENT LOCATION DETERMINED BY THE PROJECT ENGINEER AND CLEARLY FLAGGED. STOCKPILE SHALL BE IRRIGATED ON A REGULAR BASIS AS NECESSARY TO MAINTAIN MOISTURE IN THE SOD AND SOIL. THE SOD AND SOIL SHALL BE USED TO COVER DISTURBED AREAS OR AS DIRECTED BY THE FIELD ENGINEER TO PREPARE AREAS FOR PLANTING. TRANSPLANTED SOD AND SOIL SHALL BE TRACKED OVER WITH AN EXCAVATOR AND GAPS BETWEEN SOD STRIPS SHALL BE FILLED WITH NATIVE SOILS AND SEEDED WITH A NATIVE SEED MIX.

EROSION CONTROL SEEDING

EMERGENT

AND WETLAND

ZONE

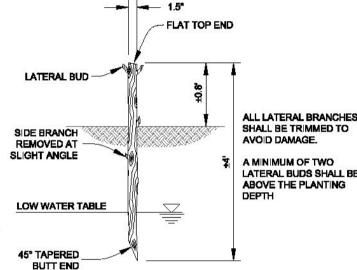
ALL DISTURBED AREAS SHALL BE BROADCAST SEEDED WITH AN "EROSION CONTROL" SEED MIX. THE MIX SHALL CONSIST OF THE FOLLOWING SEED BY WEIGHT: 1 PART CRIMSON CLOVER, 1 PART WHITE SWEET CLOVER, AND 2 PARTS CEREAL RYE (SECALE CEREALE) OR APPROVED EQUAL BASED ON SEED AVAILABILITY. MINIMUM APPLICATION RATE SHALL BE 30 POUNDS PER ACRE. AFTER BROADCAST SEEDING, ONE PASS OF THE AREA SHALL BE COMPLETED WITH A 5,000 POUND (OR LESS) TRACKED VEHICLE AND COVER THE AREA WITH STERILE STRAW OR EROSION CONTROL BLANKET.

APPROXIMATE LIMIT OF

LOW FLOW

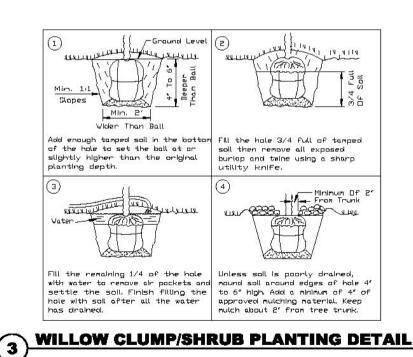
WILLOW STAKE

PERENNIAL VEGETATION



ALL LATERAL BRANCHES LATERAL BUDS SHALL BE

WILLOW STAKING DETAIL NOT TO SCALE



PLANTING ZONES PROVIDED ARE APPROXIMATE. APPROPRIATE PLANT SPECIES AND DISTRIBUTION VARY WITH EACH INDIVIDUAL SITE AND PLANT SPECIES CHARACTERISTICS.



NOTE PROJECT

REMOVAL ACKSON DAM RAY REVEGI GOLD

PROJECT NUMBER RDG-09-048

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Drawing 22 of 28

NOT TO SCALE

PENETRATE INTO PERMANENTLY

PLANTING GUIDELINES

SATURATED SOIL

NOI L ETA

| ∽ | Y | | | The second of th |
|-------|----------|----------------------------|--------------|--|
| COVER | | RED FESCUE BLUE WILDRYE | SEED SEED | 7 LBS/ACRE 15 LBS/ACRE |

1 GALLON

±60/ACRE

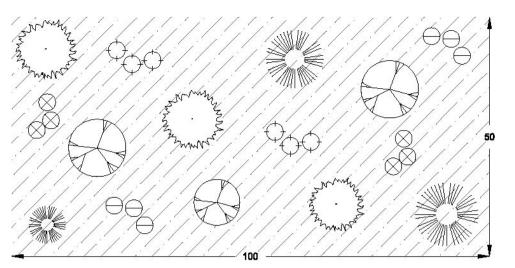
RIPARIAN AREAS REVEGETATION SCHEDULE

OREGON GRAPE

| SYMBOL | | COMMON NAME | SIZE | INSTALLATION |
|--------|-------------------------------|---|--|---|
| TREES | | PONDEROSA PINE BLACK COTTONWOOD OREGON ASH | 2 TO 5 GALLON 2 TO 5 GALLON 20 TO 5 GALLON | ±30/ACRE ±30/ACRE ±30/ACRE |
| SHRUBS | \ominus \otimes \ominus | RED-OSIER DOGWOOD SERVICE BERRY TWIN BERRY WILLOW STAKES | 2 TO 5 GALLON 2 TO 5 GALLON 1 GALLON 1.5"Ø x 4' STAKE | ±80/ACRE ±80/ACRE ±80/ACRE 1 FT O.C. |
| SEED | + + + + + + + + + + + + + + + | RED FESCUE BLUE WILDRYE | SEED SEED | 7 LBS/ACRE 15 LBS/ACRE |

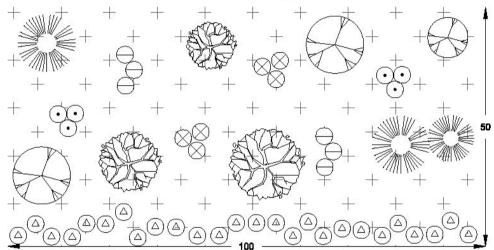
EMERGENT & WETLAND AREAS REVEGETATION SCHEDULE

| | SYMBOL | COMMON NAME | SIZE | INSTALLATION |
|--------|---|--|--|---|
| TREES | *** | WHITE ALDER OREGON ASH | 2 TO 5 GALLON 2 TO 5 GALLON | ±30/ACRE ±30/ACRE |
| SHRUBS | ⊕ ⊕ ⊕ | RED-OISER DOGWOOD WILLOW STAKES WESTERN SPIREA WILLOW CLUMP | 2 TO 5 GALLON 1.5Ø x 4' STAKE 1 TO 2 GALLON 8' - 20' TALL | ±60/ACRE 1 FT O.C. ±60/ACRE 10 FT O.C. |
| COVER | + + + + + + + + + + + + + + + | TUFTED HAIRGRASS AMERICAN SLOUGHGRASS | SEED SEED | 3 LBS/ACRE 8 LBS/ACRE |

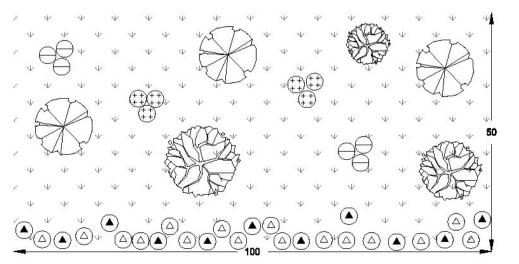


1 UPLAND TREE/SHRUB LAYOUT

1" = 20'



2 RIPARIAN TREE/SHRUB LAYOUT



3 EMERGENT & WETLAND TREE/SHRUB LAYOUT





REVEGETATION SCHEDULE GOLD RAY DAM PROJECT

NO. DATE BY DESCRIPTION CHI
- 02/22/10 SW ISSUED FOR PERMIT SW

PROJECT NUMBER RDG-09-048

GENERAL NOTES

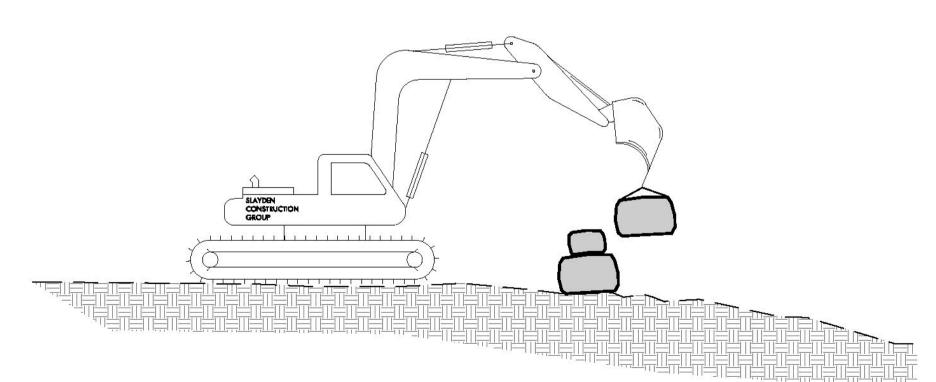
BULK BAGS ARE ALSO CALLED FLEXIBLE INTERMEDIATE BULK CONTAINERS (FIBC) THAT CAN BE CUSTOM MADE FROM VARIOUS FABRIC. THE FOLLOWING REQUIREMENTS ARE NECESSARY FOR THE RIVER ENVIRONMENT:

WIDE x 3' LONG x 2.5' HIGH.

BULK BAGS SHALL BE CAREFULLY PLACED TO ENSURE NO TEARING OR CUTTING OF THE BAGS OCCURS.

BULK BAGS SHALL BE PLACED USING A HYDRAULIC CRANE OR TRACKHOE USING LIFTING BARS AND STEEL CABLES TO EQUALIZE LOAD ON LIFTING LOOPS.

BULK BAG ISOLATION - TYP





EXAMPLE BULK BAGS FOR DEWATERING

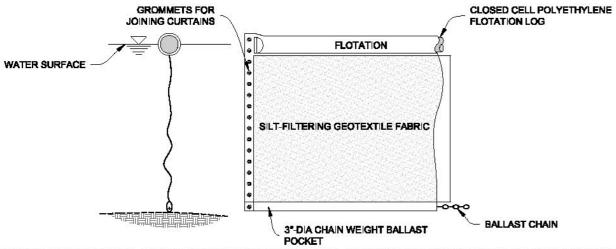
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5098 Hwy 93 South White/lish, MT 59937 406.862.4927

DETAIL GOLD RAY DAM REMOVAL PROJECT **BULK BAG**

PROJECT NUMBER RDG-09-048

WORK AREA ISOLATION - TYPICAL NOT TO SCALE GROMMETS FOR JOINING CURTAINS CLO FLO



FLOATING SILT CURTAIN SHALL BE A "LAYFIELD FSC 13" OR APPROVED EQUAL. THE BODY OF THE FLOATING SILT CURTAIN IS MADE FROM A STRONG, HIGH-FILTRATION FABRIC THAT RETAINS FINE SILTS AND SEDIMENTS ON-SITE. THE FLOAT AND BOTTOM SLEEVE ARE CONSTRUCTED FROM A UV-STABLE, HIGH-STRENGTH POLYETHYLENE (I.E. RIPSTOP-TYPE MATERIAL). THE FLOATING SILT CURTAIN IS INCREASED IN LENGTH BY JOINING ADDITIONAL SECTIONS OF CURTAIN, WHICH TYPICALLY COMES IN 50" LENGTHS.

B FLOATING SILT CURTAIN



EXAMPLE OF FLOATING SILT CURTAIN PLACEMENT



■ DRAFT

FLOATING SILT CURTAIN DETAIL GOLD RAY DAM REMOVAL PROJECT

NO. DATE BY DESCRIPTION CHI
- 02/22/10, SW ISSUED FOR PERMIT SW

PROJECT NUMBER RDG-09-048

DRAWING NUMBER

Drawing 25 of 28

Dekowe 700 Coir Mat

4M x 50M

NAG C125BN

2M x 30M

TAPERED 18" x 2" x 4"

OTHER BRAND MATERIALS MAY BE SUBSTITUTED FOR SPECIFIED BRAND MATERIALS AS LONG AS SPECIFICATIONS ARE SIMILAR.

BioD-Roll 30H 9 lbs/cu. ft density

Coir Log, 12" Ø

CONSTRUCTION NOTES

TOE OF SOIL LIFT 1 SHALL BE STABILIZED USING A MIXTURE OF THE LARGEST NATURAL GRAVELS AND COBBLES FOUND IN THE STREAM, OR COARSER MATERIAL SHOULD BE IMPORTED. TOE SHALL BE STABILIZED DOWN TO THE MAXIMUM ANTICIPATED SCOUR DEPTH. CONSTRUCTION MANAGER SHALL VIEW AND APPROVE FOUNDATION LAYER PRIOR TO CONSTRUCTING SOIL LIFTS.

UPSTREAM AND DOWNSTREAM "TIE-IN" POINTS SHALL BE STABLE AREAS AND THE FABRIC SHALL BE STAKED TIGHTLY INTO THE STABILE AREA USING WOOD STAKES AT 2-FOOT O.C. STABLE AREAS INCLUDE LARGE WOOD OR BOULDERS TO PROTECT FABRIC TIE IN POINTS.

SLOPE ENGINEERED SOIL LIFTS APPROXIMATELY 30-DEGREES AS ILLUSTRATED ON THE SECTION DETAIL, OR ALLOW FOR A MINIMUM SETBACK OF 12-INCHES BETWEEN THE TOE FACE AND FIRST LIFT, AND 12-18" BETWEEN SUBSEQUENT LIFTS.

EMBED LIVE CUTTINGS A MINIMUM OF 5-FEET INTO SOIL LIFT, AND AT LEAST 3 CUTTINGS PER LINEAL FOOT.

NOTIFY CONSTRUCTION MANAGER OF ANY PROPOSED CHANGES PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER RESERVES THE RIGHT TO MODIFY STRUCTURE DESIGN SPECIFICATIONS DURING CONSTRUCTION IF WARRANTED DUE TO UNFORESEEN CONDITIONS.

TOE LOGS SHALL BE PLACED PER DETAIL APPROXIMATELY EVERY 5'-10'. ENDS OF LOGS SHALL BE BROKEN AND NOT SAWED OFF.

INSTALL CONTAINERIZED WILLOWS AND AT LEAST 4 FOOT WILLOW CUTTINGS SELECTED FROM LOCAL SOURCES FOR OVERBANK AND RIPARIAN BUFFER. SALVAGE AND INSTALL SHRUB AND WILLOW TRANSPLANTS AS THEY ARE AVAILABLE IN CONSTRUCTED FLOODPLAIN SURFACE.

SOIL LIFT BACKFILL:

Height

12"

12"

Callout

SOIL LIFT 1

SOIL LIFT 2

- 1. SOIL LIFTS SHALL CONTAIN A MIXTURE OF NATIVE GRAVELS AND SOIL FROM ON-SITE SOURCES.
- 2. EACH LIFT SHALL CONTAIN SOILS FOR PLANTING AND THE LIFTS SHALL BE COMPACTED USING A VIBRATORY PLATE COMPACTOR OR EQUAL TO A MINIMUM OF 90% MAXIMUM RELATIVE DENSITY.
- 3. WILLOW STAKES SHALL BE PLACED IN A SHALLOW LAYER OF DIRT BETWEEN EACH SOIL LIFT.
- 4. APPLY NATIVE SEED MIX TO INSIDE OF FRONT 2-FEET OF SOIL LIFT.
- 5. SOIL LIFT FABRIC TO BE DRAWN TIGHT WITH NO FOLDS, ROLLS, OR GAPS.
- 6. INSERT STAKES AT 18" TO 24" FROM SOIL LIFT FACE SO THAT SUBSEQUENT LIFTS COVER STAKES.
- 7. VEGETATE TOP OF SOIL LIFTS PER PLANTING PLANS.





EXAMPLE OF VEGETATED SOIL LIFTS FOLLOWING CONSTRUCTION (LEFT) AND DURING THE SECOND GROWING SEASON (RIGHT)

RIVER DESIGN GROUP

VEGETATED SOIL LIF
GOLD RAY DAM REMOVAL PROJECT

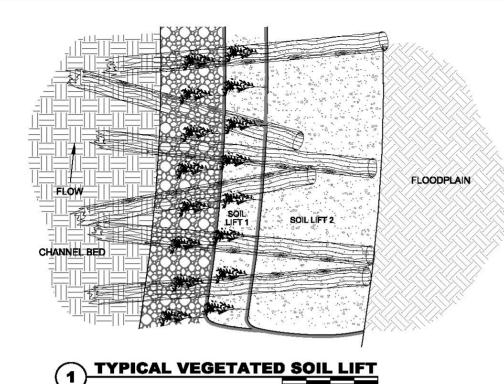
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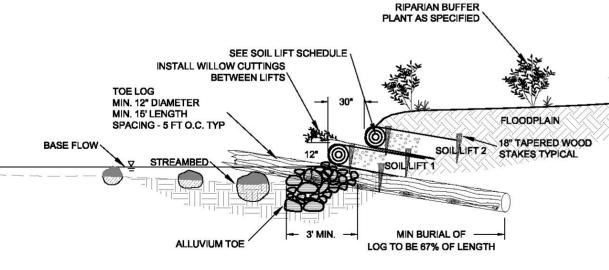
PROJECT NUMBER RDG-09-048

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Drawing 26 of 28



NUMBER OF SOIL LIFTS AND LENGTH OF TREATED BANK IS CALLED OUT ON SPECIFIC DRAWING SCHEDULE





0

PROJECT NUMBER

DRAWING NUMBER

DESIGN INTENT

THE INTENT OF THE ENGINEERED LARGE WOOD HABITAT STRUCTURE IS TO PROVIDE BANK STABILIZATION BY REDUCING NEAR-BANK STRESS AND PROMOTING SCOUR OF THE POOL. STRUCTURE PERFORMANCE IS DEPENDENT UPON PLACEMENT WITHIN A SEQUENCE OF OTHER BANK STABILIZATION STRUCTURES.

THE STRUCTURE IS DESIGNED TO BE NATURAL IN APPEARANCE AND INCORPORATE LARGE WOOD, ROCK, BIOENGINEERING, AND VEGETATION. THE STRUCTURE IS DESIGNED TO HAVE NO ABRUPT AFFECT ON THE WATER SURFACE PROFILE AT ALL FLOW LEVELS. THE STRUCTURE EXTENDS APPROXIMATELY 10-15% INTO THE CHANNEL, LEAVING 85-90% FEET OF THE CHANNEL WIDTH UNOBSTRUCTED FOR BEDLOAD AND DEBRIS TRANSPORT, AND RECREATIONAL PASSAGE. OVER TIME, THE STRUCTURE WILL DECOMPOSE AND/OR BECOME ABANDONED AND REPLACED BY RIPARIAN VEGETATION THAT WILL BE PLANTED IN AND AROUND THE STRUCTURE.

CONSTRUCTION NOTES

EXCAVATE TRENCH AND SET FOOTER LOGS AT SPECIFIED DEPTH. USE FOOTER LOGS WITH MINIMUM DIAMETER AND STEM LENGTH AS SPECIFIED. FOOTER LOGS SHALL NOT HAVE A ROOTFAN. IF POSSIBLE, BACKFILL UP TO TOP OF FOOTER LOGS WITH SPECIFIED ALLUVIAL BACKFILL. DOUSE BACKFILL PERIODICALLY WITH WATER TO IMPROVE COMPACTION AND MINIMIZE VOID SPACES.

SET ROOTWAD LOGS ON FOOTER LOGS. PLACE LOG STEMS SLOPING DOWNWARD, FROM BANK INTO WATER. USE ROOTWADS WITH MINIMUM ROOTFAN DIAMETER AND STEM LENGTH AS SPECIFIED. BACKFILL WITH NATIVE MATERIAL UP TO TOP OF ROOTWAD LOGS AND PLACE BALLAST ROCKS ON TOP OF ROOTWAD LOGS AT LOCATIONS WHERE ROOTWAD LOGS INTERSECT FOOTER LOGS. DOUSE BACKFILL PERIODICALLY WITH WATER TO IMPROVE COMPACTION AND MINIMIZE VOID SPACES.

ADD ADDITIONAL TIER OF FOOTER LOGS AND ROOTWAD LOGS AS DESCRIBED ABOVE. COVER BALLAST ROCKS AND TOP OF STRUCTURE WITH SOIL AND TRANSPLANTED WILLOW CLUMPS. PLACE ADDITIONAL LOGS AND WOODY DEBRIS INTO TRENCH TO ACT AS DEFLECTOR LOGS AND ADDITIONAL BALLASTING. NUMBER AND SIZE OF HABITAT LOGS MAY VARY FROM STRUCTURES SHOWN.

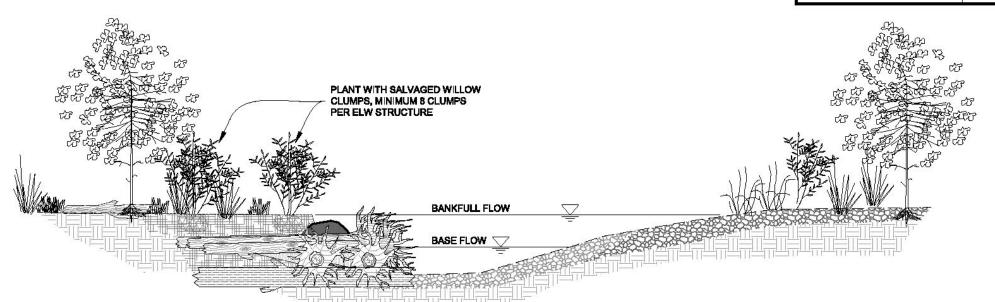
THE CONSTRUCTION MANAGER SHALL INSPECT AND APPROVE ALL FOOTER LOGS AND ROOTWAD LOGS PRIOR TO BACKFILLING. NOTIFY CONSTRUCTION MANAGER OF ANY PROPOSED CHANGES PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER RESERVES THE RIGHT TO MODIFY STRUCTURE DESIGN SPECIFICATIONS DURING CONSTRUCTION IF WARRANTED DUE TO UNFORESEEN CONDITIONS.

STRUCTURE DIMENSIONS

| OTROOTORE PRINCIPAL | | | | |
|---------------------|--|--|--|--|
| 2.5 ft | | | | |
| 8 ft | | | | |
| 24 in | | | | |
| 25 ft | | | | |
| 8 ft | | | | |
| 20 ft | | | | |
| 24 ft | | | | |
| 16 ft | | | | |
| | | | | |

MATERIAL SCHEDULE (PER STRUCTURE)

| Item | Quantity | Dia. (in) | Length (ft) | Rootwad (Y/N) |
|--------------------|----------|-----------|-------------|---------------------|
| Footer Log | 4 | 24 | 24 | No |
| Rootwad Log | 4 | 24 | 24 | Yes - 6 ft Dia. Min |
| Deflector Log | 4 | 20 | 20 | Optional - 3-4 ft |
| Misc. Wood | 4 | 20 | 20 | No |
| CY of Ballast Rock | 12 | 30 | 8 | CESS |



FLOW

FOOTER LOG

MIN. DIAMETER = FD.

ORDINARY HIGH WATER

EXISTING TOP OF BANK

BANK TREATMENTS

ROOTWAD STEMS = RL

EXCAVATION LIMITS

BALLEST ROCKS (BURIED)

MIN. DIAMETER = RD

BURY STEMS HALE



CONSTRUCTED ENGINEERED LARGE WOOD STRUCTURE

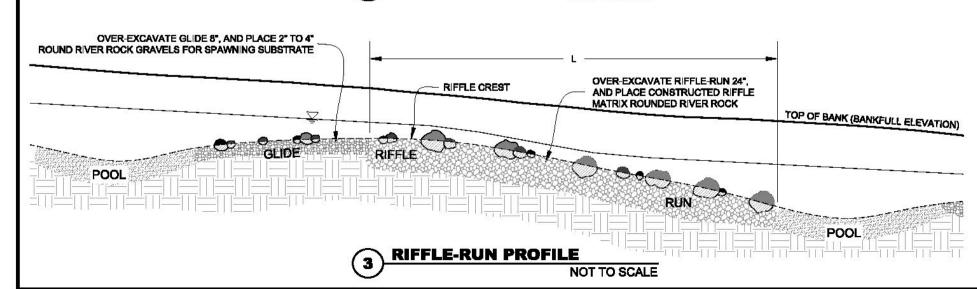
STRUCTURE CROSS SECTION

PLAN VIEW

NOT TO SCALE

ORDINARY HIGH WATER MINIMUM BOULDER EMBEDMENT - 1 DIAMETER

NOT TO SCALE



CONSTRUCTION NOTES

BOULDER PLACEMENT BEGINS NEAR THE DOWNSTREAM END OF THE GLIDE TO PROVIDE LARGE SCALE ROUGHNESS DURING HIGH FLOW AND HYDRAULIC VARIABILITY UNDER LOW FLOW CONDITIONS. HYDRAULIC EFFECT INCLUDES SPAWNING MATERIAL RETENTION AND DEPOSITION ALONG GLIDE FACE. BOULDERS PLACED ALONG THE RIFFLE AND RUN PROVIDE DISRUPTION OF AVERAGE VELOCITY GRADIENTS AND SERVE A GRADE CONTROL FUNCTION FOR THE OVERALL GEOMORPHIC UNIT. PARTICULAR CARE SHOULD BE EMPLOYED WITH ELEMENT PLACEMENT TO REINFORCE THE RUN POOL TRANSITIONAL SLIP FACE.

BOULDERS SHOULD BE PLACED IN RANDOM PATTERNS THAT REPLICATE NATURAL STREAM CONDITIONS AS DIRECTED BY THE PROJECT HYDRAULIC ENGINEER.

SEE GRADATION SCHEDULES ON THIS SHEET FOR CONSTRUCTED RIFFLE MATRIX GRADATION AND HABITAT BOULDER REQUIREMENTS. SUFFICIENT FINES (SAND FRACTION OR FINER) SHALL BE DEVELOPED FROM ON-SITE EXCAVATIONS AND PRESSURE WASHED INTO THE PLACED RIFFLE MATRIX

ENGINEERED RIFFLE TO BE CONSTRUCTED IN ONE HALF FOOT VERTICAL LIFTS WITH FINES ADDED AND WASHED. SUCCESSFUL WASHING WILL BE DETERMINED BY MINIMIZATION OF VOIDS WITHIN PLACED MATRIX SUCH THAT PONDING OCCURS ON TOP OF LIFT WITH LITTLE TO NO PERCOLATION LOSSES OCCURRING THROUGH THE ENGINEERED RIFFLE.

ENGINEERED RIFFLE SCHEDULE

| BOULDER ELEMENT SIZE (FT.) | ER L=100' |
|-------------------------------|--------------|
| 1.5' | 55 |
| 2.0 | 20 |
| 2.75' | 30 |
| 3.5' | 30 |

ENGINEERED RIFFLE MATRIX GRADATION

| PERCENT PASSING | LOWER LIMIT (INCHES) | UPPER LIMIT (INCHES) |
|--------------------|-------------------------|-------------------------|
| 100 | 17.0 | 22.5 |
| 85 | 14.5 | 20.0 |
| 50 | 11.0 | 17.0 |
| 30 | 6.5 | 10.5 |
| 15 | 3.5 | 5.5 |

MATRIX THICKNESS (T) = 24 INCHES

RIFFLE JACKSON COUNTY

GOLD RAY DAM REMOVAL PROJECT ENGINEERED

PROJECT NUMBER