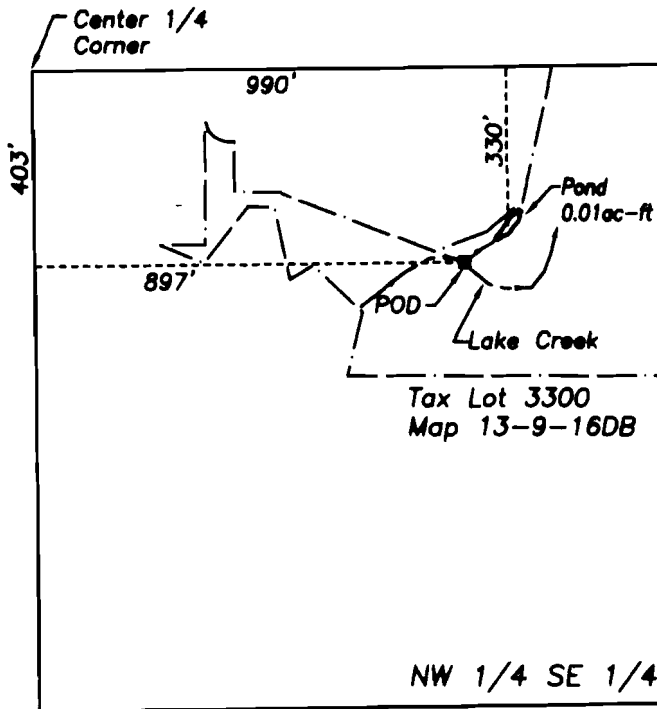
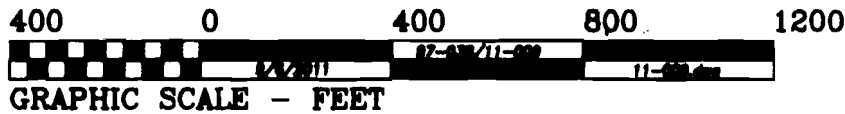


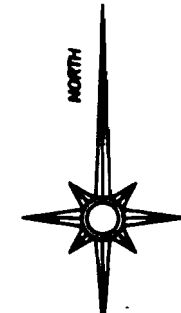
# Application to Store Water in a Reservoir



Section 16  
T13S, R9E, W.M.  
Jefferson Co., OR



Renewal date: 6/30/2012



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Source of water is Lake Creek

Point of Diversion (POD) is 403' south and 897' east of the Center 1/4 Corner of Section 16.

Approximate center of pond is 330' south and 990' east of Center 1/4 of Section 16

- Tax lot boundary
- Point of Diversion
- 1/16 Section lines

THIS MAP IS FOR THE PURPOSE OF IDENTIFYING THE LOCATION OF THE WATER RIGHT. IT IS NOT INTENDED TO PROVIDE LEGAL DIMENSIONS OR LOCATIONS OF PROPERTY OWNERSHIP LINES.

# LAKE CREEK - DIVERSION 13 & 14

## FISH SCREENS AND CONSTRUCTED RIFFLE



### PROJECT PARTNERS



UPPER DESCHUTES  
WATERSHED COUNCIL

### PROJECT DESCRIPTION

DIVERSION 13 AND DIVERSION 14 ON LAKE CREEK CURRENTLY DIVERT WATER WITHOUT HEADGATES OR STATE AND FEDERALLY-APPROVED FISH SCREENS. IN ADDITION, THE WATER RIGHT HOLDERS UTILIZE A 1-2 FOOT HIGH CHECK STRUCTURE IN THE CREEK IN ORDER TO DIVERT THEIR IRRIGATION WATER. THIS CHECK STRUCTURE IS A PASSAGE BARRIER TO ANADROMOUS AND RESIDENT FISH SPECIES PRESENT IN LAKE CREEK. THE PROPOSED PROJECT INCLUDES SCREENING BOTH IRRIGATION DITCHES AND REPLACING THE ROCK CHECK STRUCTURE WITH A CONSTRUCTED RIFFLE. THE CONSTRUCTED RIFFLE WILL BE BUILT TO PASS FLOWS AND SEDIMENT, PROVIDE VOLUNTARY FISH PASSAGE OVER ALL FLOWS, AND BE NATURAL IN APPEARANCE. THE RIFFLE WILL ALSO REQUIRE SUBSTANTIALLY LESS MAINTENANCE THAN DOES THE EXISTING CHECK STRUCTURE.

### BENCHMARK

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

### DRAWING INDEX

1.0	COVER PAGE AND NOTES
1.1	PROJECT SPECIFICATIONS
2.0	EXISTING SITE LAYOUT
3.0	PROJECT LAYOUT
4.0	CONSTRUCTED RIFFLE DETAIL
4.1	DIVERSION 13 INTAKE
4.2	DIVERSION 14 INTAKE
4.3	DIVERSION 13 BANK TREATMENT DETAIL
5.0	WORK AREA ISOLATION
5.1	SITE ACCESS AND STAGING

### LAKE CREEK VICINITY MAP



T138-R9E SECTION 16  
USGS QUADRANGLE: BLACK BUTTE, OR

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CROSS-SECTION SHEET REFERENCE

### COVER PAGE AND NOTES

LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

CHK	DATE	BY	DESCRIPTION	CHK	DATE	BY	DESCRIPTION
	0	11/18/10	CS				
	1	8/22/11	CS				

PROJECT NUMBER  
E05-15-019  
DRAWING NUMBER  
**1.0**  
Drawing 1 of 10

**GENERAL NOTES TO CONTRACTOR**

1. THE CONSTRUCTION SPECIFICATIONS AND MATERIAL SPECIFICATIONS DESCRIBE MINIMUM ACCEPTABLE QUALITY OF WORK AND MATERIALS FOR THE PROJECT. IF A CONFLICT ARISES BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE SPECIFICATION GOVERNS THE WORK AND/OR MATERIAL. THE DRAWINGS ARE A VISUAL REPRESENTATION TO COMPLEMENT CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE DRAWINGS INCLUDE LOCATION, PROFILES, SECTIONS, DETAILS AND NOTES NECESSARY TO DESCRIBE THE WORK. IF SITE CONDITIONS WARRANT CHANGES TO THE PLANS, THE PROJECT INSPECTOR RESERVES THE RIGHT TO DIRECT THE CONTRACTOR TO MAKE THESE MODIFICATIONS. NO CHANGES SHALL BE MADE TO THE DRAWINGS OR SPECIFICATIONS WITHOUT PRIOR WRITTEN APPROVAL OF THE PROJECT INSPECTOR.
2. IN THE EVENT THAT A PERMIT CONDITION CONFLICTS WITH THE DRAWINGS AND SPECIFICATIONS, THE ISSUE SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT INSPECTOR FOR CLARIFICATION PRIOR TO PROCEEDING WITH WORK.
3. THE PROJECT SHALL BE CONSTRUCTED ACCORDING TO THE PLAN SET. THE CONTRACTOR SHALL NOTIFY THE PROJECT INSPECTOR OF ANY CHANGES PRIOR TO IMPLEMENTATION. THE PROJECT INSPECTOR FOR THIS PROJECT SHALL BE RIVER DESIGN GROUP, INC.
4. RIVER DESIGN GROUP MAKES NO REPRESENTATION OF THE EXISTENCE OR NONEXISTENCE OF UTILITIES. CONTRACTOR IS RESPONSIBLE FOR CALLING THE OREGON UTILITY NOTIFICATION CENTER (800-333-2244) AT LEAST TWO BUSINESS DAYS PRIOR TO DIGGING.
5. COSTS INCURRED DUE TO PROJECT DELAYS RESULTING FROM FAILURE OF THE CONTRACTOR TO MEET THE REQUIREMENTS OF THE GENERAL NOTES TO CONTRACTOR, SAFETY, CONTRACTOR QUALIFICATIONS, MATERIAL SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, CONSTRUCTION SPECIFICATIONS, AND PLAN SET SHALL BE THE EXPENSE OF THE CONTRACTOR.

**SAFETY**

1. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL STATE AND LOCAL LAWS, ORDINANCES, CODES, AND/OR REGULATIONS APPLICABLE FOR THE PROJECT INSTALLATION. THE PROJECT INSPECTOR WILL DOCUMENT ANY SAFETY VIOLATIONS WITHIN 24 HOURS.

**CONTRACTOR QUALIFICATIONS**

1. THE CONTRACTOR SHALL HAVE AT LEAST TWO (2) YEARS OF RIVER RESTORATION CONSTRUCTION EXPERIENCE AND SHALL HAVE COMPLETED AT LEAST FIVE (5) RIVER RESTORATION PROJECTS. SIMILAR EXPERIENCE WILL BE EVALUATED ON A CASE BY CASE BASIS.
2. IF THE CONTRACTOR CHOOSES TO DESIGNATE AN EMPLOYEE WITHOUT QUALIFIED STREAM RESTORATION EXPERIENCE, THE CONTRACTOR SHALL BE ON-SITE AT ALL TIMES WHEN THE EMPLOYEE IS PERFORMING RIVER RESTORATION WORK. FAILURE TO ABIDE BY THIS CONDITION WITHOUT PREVIOUS AGREEMENT WITH THE PROJECT INSPECTOR WOULD BE GROUNDS FOR TERMINATION.
3. THE CONTRACTOR SHALL MAINTAIN AT LEAST \$2,000,000 IN LIABILITY INSURANCE AND HAVE PROOF OF LIABILITY INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
4. THE CONTRACTOR SHALL HAVE PROOF OF WORKERS COMPENSATION INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.
5. COPIES OF ALL PROJECT PERMITS SHALL BE POSTED ON-SITE IN A VISIBLE LOCATION. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE PERMITS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY KNOWN CHANGES OR ACTIVITIES THAT COULD VIOLATE PERMIT REQUIREMENTS PRIOR TO IMPLEMENTATION.

**MATERIALS SPECIFICATIONS**

1. THE CONTRACTOR SHALL FURNISH ALL MATERIALS NECESSARY TO CONSTRUCT THE PROJECT UNLESS OTHER PROVISIONS HAVE BEEN AGREED UPON PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DELIVER ALL MATERIALS TO THE DESIGNATED STOCKPILE LOCATIONS LABELED ON THE PLAN SET OR TO A LOCATION SPECIFIED BY THE PROJECT INSPECTOR. IF A MATERIAL SOURCE HAS BEEN PRE-DETERMINED, THE PROJECT INSPECTOR SHALL PROVIDE DIRECTIONS TO THE CONTRACTOR.
2. MATERIAL QUANTITIES, DIMENSIONS AND SIZES SHALL CONFORM TO THE NOTES AND SPECIFICATIONS PROVIDED ON THE PLAN SET OR ON THE MATERIALS LIST.
3. THE PROJECT INSPECTOR SHALL INSPECT AND APPROVE ALL MATERIALS PRIOR TO CONSTRUCTION. IF MATERIALS DO NOT MEET THE MINIMUM REQUIREMENTS SPECIFIED IN THE PLAN SET OR MATERIAL LIST, THE PROJECT INSPECTOR SHALL REJECT THE MATERIALS.

**EQUIPMENT SPECIFICATIONS**

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

**EXCAVATOR** - AT A MINIMUM, ONE EXCAVATOR(S) SHALL BE REQUIRED. THE EQUIPMENT SHALL BE A MINIMUM 30,000 LB (KAROTA 10-080 OR SIMILAR) SIZE CLASS WITH HYDRAULIC THUMB AND RUBBER TRACKS CAPABLE OF MOVING 2 FT DIAMETER BouldERS. MINIMUM BUCKET VOLUME SHALL BE 0.75 CUBIC YARDS. THE BUCKET SHALL BE EQUIPPED WITH A HYDRAULIC THUMB FOR GRASPING LOGS, ROCKS, AND OTHER MATERIALS. THE EQUIPMENT MUST BE CAPABLE OF CROSSING WATER AND WORKING ON OR ADJACENT TO STEEP SLOPES. A CHAIN SHALL BE AVAILABLE FOR ATTACHING CULVERTS, PUMPS AND OTHER EQUIPMENT OR MATERIALS TO THE BUCKET FOR TRANSPORT ON-SITE.

**DUMP TRUCK** - ONE (1) DUMP TRUCK(S) SHALL BE REQUIRED FOR THIS PROJECT. TRUCK(S) SHALL HAVE A MINIMUM BED VOLUME OF EIGHT (8) CUBIC YARDS. THE TRUCK(S) SHALL BE CAPABLE OF DRIVING ON NON-ASPHALT SURFACES AND OFF-ROAD SURFACES. TRUCKS WILL BE NECESSARY FOR DELIVERING MATERIALS TO PROJECT SITE.

**SKID STEER** - ONE (1) WID-STEEER) ALL-SURFACE LOADER SHALL BE REQUIRED. THE FRAGILE AREA SHALL BE EQUIPPED WITH SOOT TRACKS TO MINIMIZE DISTURBANCE TO FRAGILE AREAS.

**TRASH PUMP** - ONE (1) TRASH PUMP SHALL BE REQUIRED. DISCHARGE CAPACITY SHALL BE AT LEAST 400 GPM (1 CFS). TOTAL HEAD LIFT SHALL BE AT LEAST 80 FT. PUMPS SHALL BE EQUIPPED WITH AT LEAST 100 FEET OF 4" DIAMETER OUTLET HOSE. A PIPE WRENCH SHALL BE AVAILABLE FOR ATTACHING HOSE. FUEL AND OIL SHALL BE SUPPLIED FOR THE TRASH PUMP.

**CHAINSAW** - ONE (1) CHAINSAW SHALL BE REQUIRED. THE CHAINSAW MUST BE CAPABLE OF COMPLETELY SAWING LOGS OF THE DIAMETER SPECIFIED IN THE MATERIAL SPECIFICATIONS. ALSO, THE CHAINSAW MUST BE CAPABLE OF SAWING HDPE OR PVC CULVERTS OR PIPES AS NOTED IN THE MATERIAL SPECIFICATIONS.

3. ALL EQUIPMENT SHALL BE WASHED PRIOR TO MOBILIZATION TO THE SITE TO MINIMIZE THE INTRODUCTION OF FOREIGN MATERIALS AND FLUIDS TO THE PROJECT SITE. ALL EQUIPMENT SHALL BE FREE OF OIL, HYDRAULIC FLUID, AND DIESEL FUEL LEAKS. TO PREVENT INVASION OF NOXIOUS WEEDS, ALL EQUIPMENT SHALL BE POWER WASHED OR CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ADEQUATE MEASURES HAVE BEEN TAKEN.
4. EQUIPMENT SHALL BE IN A WELL-MAINTAINED CONDITION TO MINIMIZE THE LIKELIHOOD OF A FLUID LEAK. IF A FLUID LEAK DOES OCCUR, THE PROJECT INSPECTOR SHALL BE NOTIFIED IMMEDIATELY, AND ALL WORK CEASED UNTIL THE LEAK HAS BEEN RECTIFIED. AT ALL TIMES DURING THE CONSTRUCTION PHASE, FLUID SPILL CONTAINMENT EQUIPMENT SHALL BE PRESENT ON-SITE AND READY FOR DEPLOYMENT SHOULD AN ACCIDENTAL SPILL OCCUR. PROJECT INSPECTOR RESERVES THE RIGHT TO REFUSE EQUIPMENT THAT DOES NOT MEET THE PREVIOUS CRITERIA.
5. THE CONTRACTOR SHALL MAINTAIN A COMPLETE TOOL SET WITH COMMONLY REPLACED PARTS (E.G. O-RINGS) TO MINIMIZE DOWNTIME IN THE EVENT OF EQUIPMENT MALFUNCTION. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ON SITE DURING THE PROJECT.

**MOBILIZATION SPECIFICATIONS**

1. ALL MOBILIZATION AND DEMOBILIZATION WILL BE PERFORMED IN A SAFE AND ORDERLY MANNER WITH PARTICULAR CARE NOT TO DAMAGE EXISTING VEGETATION OR UNDUE DISTURBANCE TO THE INGRESS-EGRESS ROUTE.
2. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE INCURRED TO PROPERTY RESOURCES DURING MOBILIZATION AND DEMOBILIZATION. VEGETATION THAT MAY BE CAUSE FOR CONCERN DURING MOBILIZATION SHALL BE IDENTIFIED BY THE CONTRACTOR AND FLAGGED BY THE PROJECT INSPECTOR AT THE TIME OF THE PROJECT "WALK THROUGH".
3. INGRESS AND EGRESS ROUTES TO THE PROJECT SITE WILL BE IDENTIFIED DURING THE PROJECT "WALK THROUGH".
4. UPON COMPLETION OF CONSTRUCTION AND DEMOBILIZATION ACTIVITIES THE CONTRACTOR SHALL PERFORM SITE RESTORATION. ALL COMPACTED SURFACES ARE TO BE REPIRT TO A MINIMUM DEPTH OF 4 INCHES FOR BIASING PRESERVATION. ORGANIC CONSTRUCTION DEBRIS SHALL BE PLACED AT THE DIRECTION OF THE PROJECT INSPECTOR ON SURFACES EXPOSED DURING CONSTRUCTION. DISTURBED AREAS ARE TO BE SEEDED WITH AN APPROVED EROSION CONTROL SEED MIX AND COVERED WITH STERILE STRAW. SITE RESTORATION SHALL BE CERTIFIED COMPLETE IN WRITING BY THE PROJECT INSPECTOR UPON COMPLETION OF CONSTRUCTION ACTIVITIES.

**CONSTRUCTION SPECIFICATIONS**

1. CONSTRUCTION SHALL OCCUR IN ACCORDANCE WITH THE PLAN SET, CONSTRUCTION SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, MATERIAL SPECIFICATIONS, REVEGETATION SPECIFICATIONS AND GENERAL SPECIFICATIONS.
2. PRIOR TO CONSTRUCTION, CONSTRUCTION AREAS WILL BE STAKED OUT USING A SURVEY GRADE GLOBAL POSITIONING SYSTEM (GPS), TOTAL STATION, OR SURVEY LASER. THE PROJECT INSPECTOR SHALL STAKE THE LOCATIONS OF THE CONSTRUCTION ACCESS, STOCKPILE LOCATIONS, LIMITS OF DISTURBANCE, TEMPORARY DIVERSION CHANNELS, TEMPORARY CULVERTS, PROPOSED CHANNEL CENTERLINE, PROPOSED CHANNEL MARGINS, CHANNEL BED FEATURES, FLOODPLAIN EXTENTS, WETLANDS AND ALL STRUCTURES ACCORDING TO THE PLAN SET. AT A MINIMUM, STAKING OF FEATURES SHALL OCCUR EVERY 20 FEET ALONG THE ALIGNMENT. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE TO GRADE STAKES. IF EXCESSIVE DISTURBANCE TO GRADE STAKES BY THE CONTRACTOR OCCURS, IT SHALL BE THE CONTRACTOR'S EXPENSE TO RE-STAKE THE PROJECT.
3. CONSTRUCTION ACCESS SHALL BE DETERMINED BY THE PROJECT INSPECTOR. CONSTRUCTION EQUIPMENT SHALL NOT CROSS PRIVATE LAND UNLESS PERMISSION IS OBTAINED FROM THE LANDOWNER. THE CONTRACTOR SHALL LEAVE ALL GATES, WHETHER OPEN OR CLOSED, AS FOUND.
4. STREAM CROSSINGS SHALL BE MINIMIZED DURING CONSTRUCTION. IF MULTIPLE CROSSINGS (10 OR MORE) ARE EXPEDITED, THE CONTRACTOR SHALL PROVIDE AND INSTALL TEMPORARY CULVERTS SO THAT EQUIPMENT CAN CROSS THE STREAM WITHOUT GENERATING EXCESS TURBIDITY. TEMPORARY CULVERT SIZES SHALL ACCOMMODATE 100% OF EXPECTED BASE FLOW DURING CONSTRUCTION. THE PROJECT INSPECTOR SHALL SPECIFY THE SIZES AND LOCATIONS OF THE TEMPORARY CULVERTS.
5. PRIOR TO CONSTRUCTION, WORK AREA ISOLATION DEVICES SHALL BE CONSTRUCTED TO DIVERT WATER AWAY FROM THE CONSTRUCTION AREA. TEMPORARY DIVERSION CHANNELS SHALL BE LOCATED AND CONSTRUCTED ACCORDING TO THE DESIGN REPORT OR PLAN SET. TEMPORARY DIVERSION CHANNELS CONSTRUCTED IN FINE SOILS SUCH AS SAND, SILT, OR ORGANIC MATERIAL SHALL BE COMPLETELY LINED WITH FABRIC TO PREVENT EROSION. THE CONTRACTOR SHALL USE "EOD BLOCKS", BULK BAGS, OR AN APPROVED EQUAL, FOR CONSTRUCTING CONFERDAMS FOR TEMPORARY DIVERSION CHANNELS. THE CONTRACTOR SHALL DIVERT WATER INCREMENTALLY INTO THE TEMPORARY DIVERSION CHANNEL TO MINIMIZE TURBIDITY AND PERMIT FISH TO MOVE OUT OF THE DEMATERED CHANNEL SEGMENTS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO DEMATERING CHANNEL SEGMENTS. THE PROJECT INSPECTOR SHALL NOTIFY A QUALIFIED FISH BIOLOGIST OF POSSIBLE FISH RESCUE NEEDS.
6. STRAW BALES SHALL BE AVAILABLE AND INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE PROJECT INSPECTOR.
7. THE CONTRACTOR SHALL EXCAVATE THE CHANNEL TO APPROXIMATE DESIGN DIMENSIONS USING THE EXCAVATOR. EXCAVATION SHALL COMPLY WITH CONSTRUCTION STAKES AND THE PLAN SET. EXCAVATION SHALL ESTABLISH CHANNEL ELEVATIONS WITHIN ONE-HALF FOOT OF FINAL ELEVATIONS. THE PROJECT INSPECTOR SHALL INSPECT THE CHANNEL EXCAVATION FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL, UNTIL HAULLED OFF-SITE OR USED ON-SITE. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOIL SHALL BE MINIMIZED. EXCAVATED SOIL AND RIPARIAN SHRUB TRANSPLANTS SHALL BE CAREFULLY STOCKPILED AND REUSED FOR PLANTING FLOODPLAINS OR STREAM BANKS.
8. AFTER EXCAVATING THE CHANNEL, THE CONTRACTOR SHALL INSTALL THE CONSTRUCTED RIFFLE AND DIVERSION INTAKES USING THE EXCAVATOR. EACH STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LOCATIONS AND SPECIFICATIONS PROVIDED IN THE PLAN SET. THE PROJECT INSPECTOR SHALL INSPECT AND APPROVE ALL STRUCTURES PRIOR TO BACKFILLING.
9. UPON NOTIFICATION FROM THE PROJECT INSPECTOR, THE CONTRACTOR SHALL DIVERT WATER INCREMENTALLY INTO THE NEW CHANNEL. EFFORTS SHALL BE MADE TO MINIMIZE TURBIDITY AND PERMIT FISH TO MOVE OUT OF THE DEMATERED CHANNEL SEGMENTS.
10. THE CONTRACTOR SHALL REMOVE EXCESS MATERIALS, TEMPORARY CULVERTS AND EQUIPMENT FROM THE SITE. THE CONTRACTOR SHALL REGRADE DISTURBED AREAS AND CONSTRUCTION ACCESS ROADS TO THEIR ORIGINAL GRADES. THE CONTRACTOR SHALL TREAT COMPACTED SOIL AREAS INCLUDING ACCESS ROADS AND MATERIAL STOCKPILE AREAS. THE CONTRACTOR SHALL REMOVE SOIL FROM THE PROJECT SITE IF THE SOIL IS TAINTED WITH PETROLEUM-BASED FLUIDS.



**PROJECT SPECIFICATIONS**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DISCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

REV.	DATE	BY	DESCRIPTION
0	11/17/16	CE	DESIGN FOR PERMIT
1	5/27/17	CE	REVISION 1

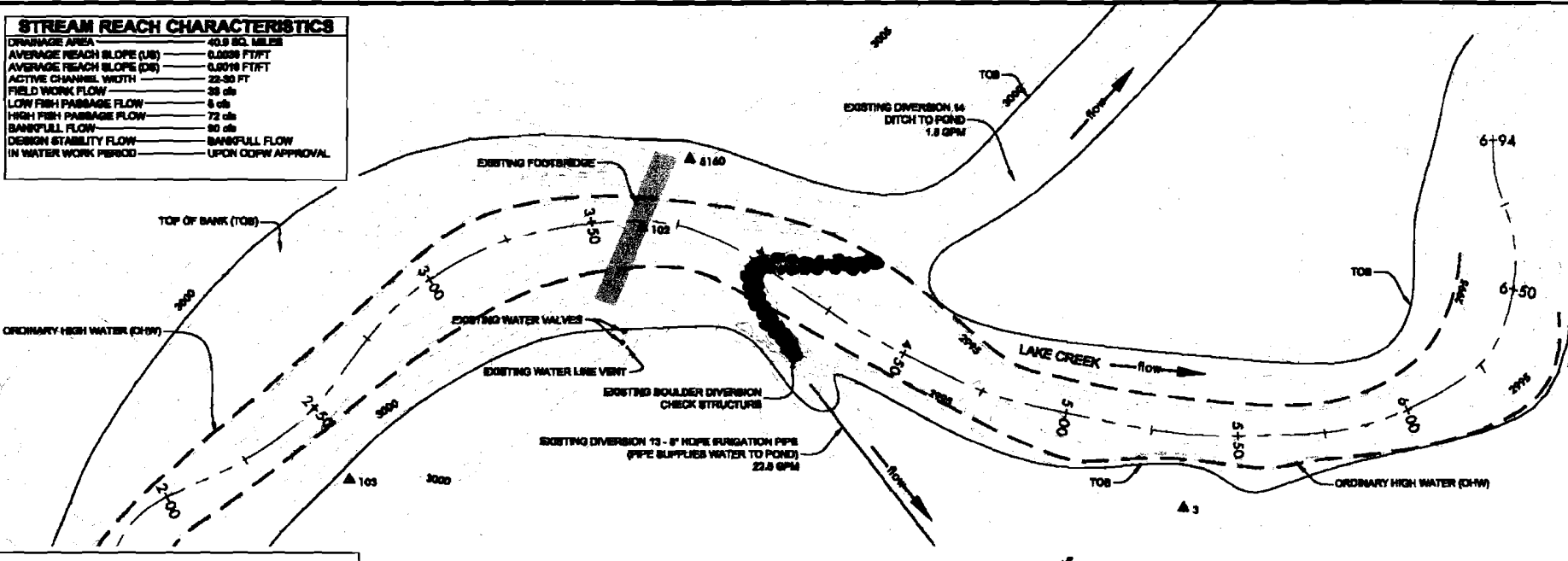
PROJECT NUMBER: 100-10-018  
DRAWING NUMBER: 1.1  
Drawing 2 of 10

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WATER RESOURCES DEPT  
SALEM, OREGON

**STREAM REACH CHARACTERISTICS**

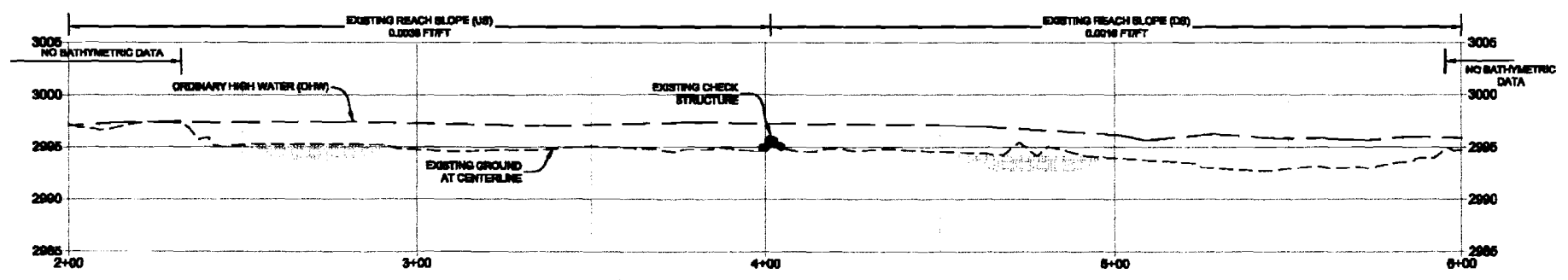
DRAINAGE AREA	40.9 SQ. MILES
AVERAGE REACH SLOPE (US)	0.0038 FT/FT
AVERAGE REACH SLOPE (DS)	0.0018 FT/FT
ACTIVE CHANNEL WIDTH	22-30 FT
FIELD WORK FLOW	38 cfs
LOW FISH PASSAGE FLOW	8 cfs
HIGH FISH PASSAGE FLOW	72 cfs
BANKFULL FLOW	80 cfs
DESIGN STABILITY FLOW	BANKFULL FLOW
IN WATER WORK PERIOD	UPON ODFW APPROVAL



**1 EXISTING CONDITIONS- PLAN VIEW**  
1" = 30'

**PROJECT CONTROL**

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
3	284726.22	788884.48	2898.57	SET 2 X 2 HUB
101	28891.53	788724.54	2898.59	SET PEGS HYDRG
102	284826.42	788726.30	3004.53	SET PK 089L
103	284734.12	788894.18	3001.38	SET PDG HYDRG
0190	284828.08	788743.04	3005.19	FWD YPG



**2 EXISTING CONDITIONS- PROFILE**  
HORIZ 1" = 30'  
VERT 1" = 10'



**EXISTING SITE LAYOUT**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DISCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

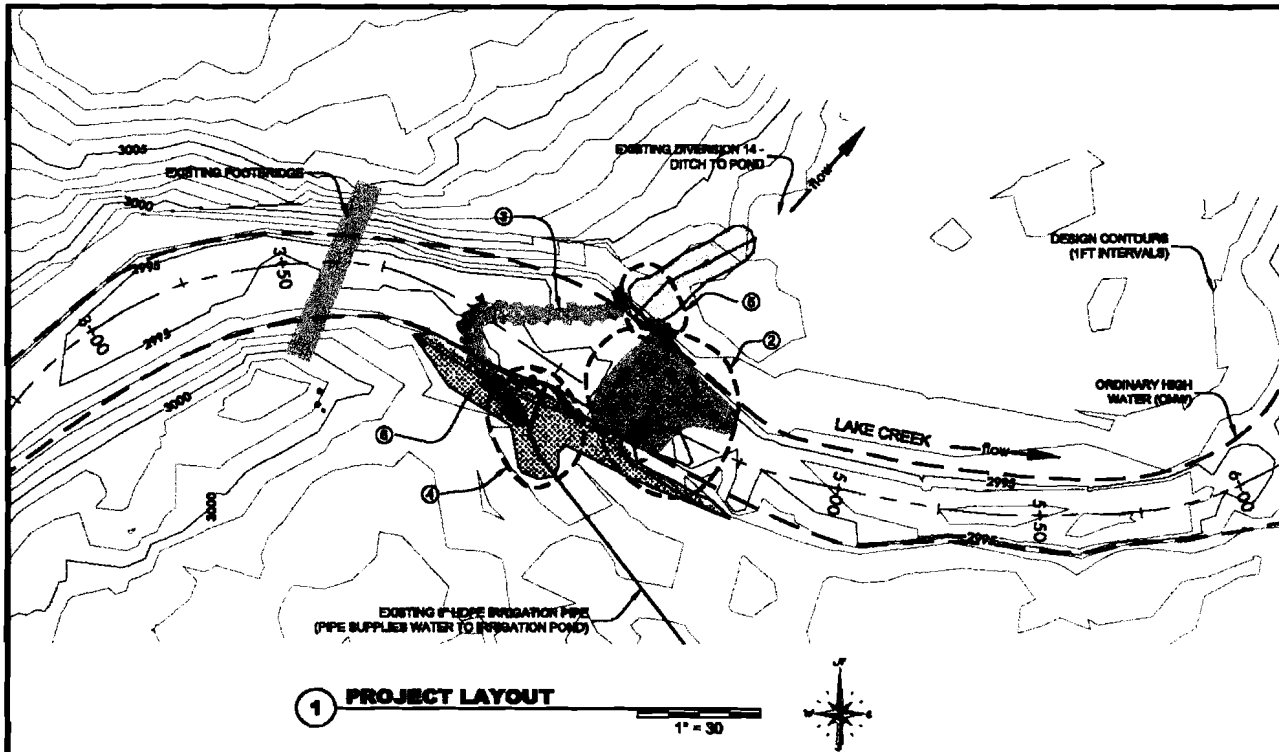
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0	11/17/10	CF	ISSUED FOR PERMIT DIVISION 1
1	8/22/11	CF	

PROJECT NUMBER: 103-10-018  
DRAWING NUMBER: **2.0**  
Drawing 3 of 10

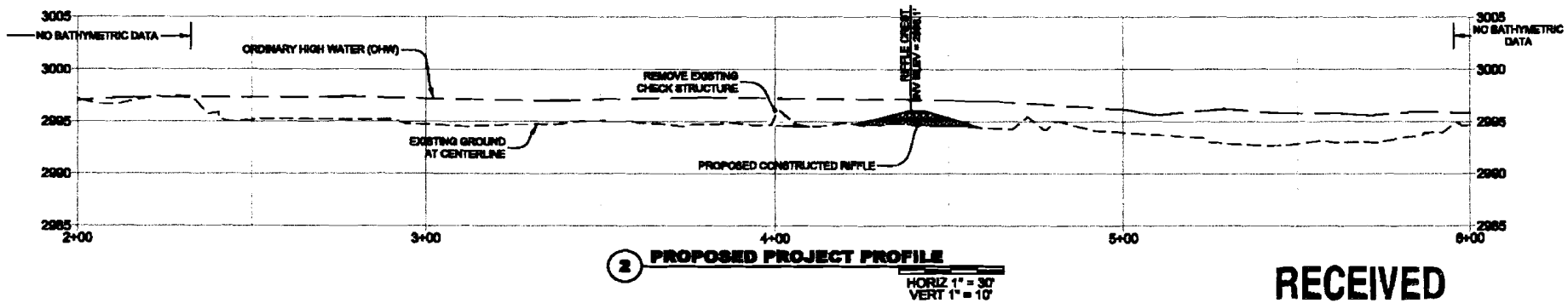
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**1 PROJECT LAYOUT**  
1" = 30'



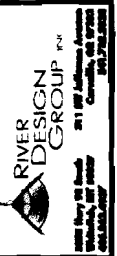
**2 PROPOSED PROJECT PROFILE**  
HORIZ 1" = 30'  
VERT 1" = 10'

**GENERAL NOTES**

THE PROJECT WILL INCLUDE MODIFYING DIVERSION 13 AND DIVERSION 14 ON LAKE CREEK. A WORK AREA ISOLATION PLAN WILL BE IMPLEMENTED TO DIVERT WATER AROUND THE WORK AREA. THE CONSTRUCTED RIFFLE WILL BE COMPLETED WITH LESS THAN 24 INCH DIAMETER ROUND ROCK. UPON COMPLETION OF THE CONSTRUCTED RIFFLE MATRIX, THE EXISTING BOULDER CHECK STRUCTURE WILL BE DISMANTLED. BOULDERS WILL BE REMOVED FROM THE CHECK STRUCTURE AND PLACED IN THE RIFFLE SURFACE. LEFT OVER MATERIAL WILL BE USED TO CREATE A NEW RIVER-RIGHT CHANNEL MARGIN TO NARROW THE CHANNEL WIDTH. SOIL MATS AND SNIPPL TRANSPLANTS WILL BE PLACED OVER THE FILL MATERIAL TO CREATE THE STREAMBANK LINE AND ADJACENT FLOODPLAIN SURFACE. THE WORK AREA ISOLATION DEVICES WILL BE REMOVED FROM THE STREAM FOLLOWING CHANNEL CONSTRUCTION. STAGING AREAS AND ACCESS POINTS WILL BE RECLAIMED AND CONSTRUCTION DEBRIS WILL BE OUT-HAULED TO AN APPROVED DISPOSAL SITE.

**CONSTRUCTION NOTES**

- 1 IMPLEMENT WORK AREA ISOLATION PLAN PER DRAWING 6.D
- 2 CONSTRUCT RIFFLE PER DRAWING 4.D
- 3 REMOVE EXISTING CHECK STRUCTURE, USE BOULDERS IN RIFFLE CONSTRUCTION
- 4 INSTALL DIVERSION 13 INTAKE PER DRAWING 4.I
- 5 INSTALL DIVERSION 14 INTAKE PER DRAWING 4.J
- 6 CONSTRUCT NEW BANK ALONG RIVER RIGHT PER DRAWING 4.K
- 7 REMOVE WORK AREA ISOLATION ELEMENTS
- 8 PROJECT SITE CLEANUP AND OUT-HAUL



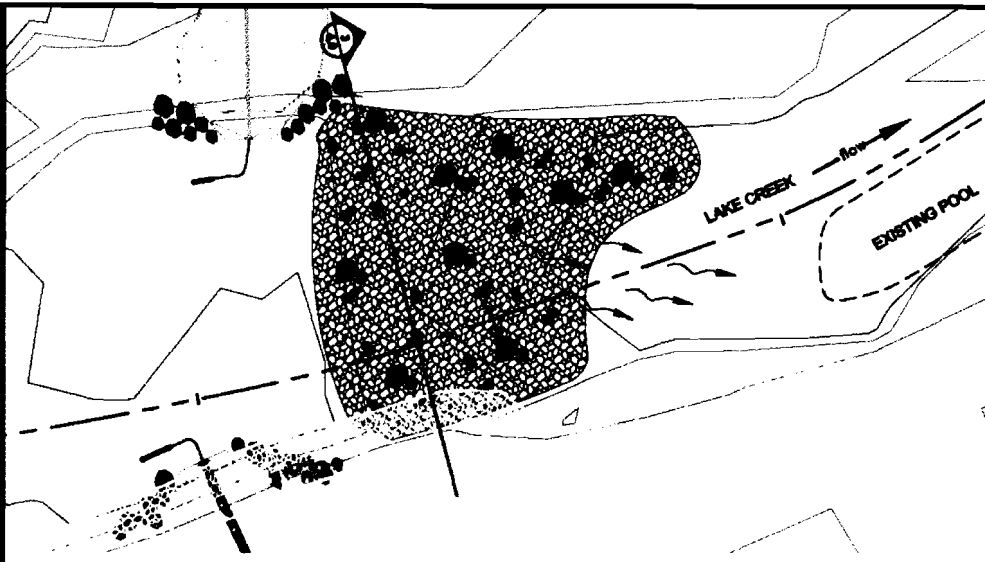
**PROJECT LAYOUT**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHEPHERD, OREGON

NO.	DATE	BY	DESCRIPTION
0	11/17/16	CS	ISSUED FOR PERMIT
1	5/22/17	CS	REVISION 1

PROJECT NUMBER: SDG-15-070  
DRAWING NUMBER: **3.0**  
Drawing: 4 of 10

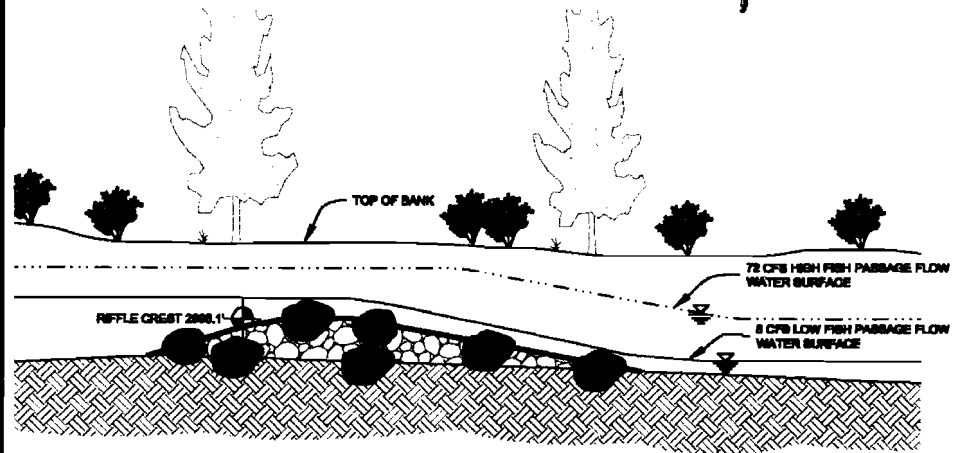
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1 RIFFLE PLAN

1" = 10'

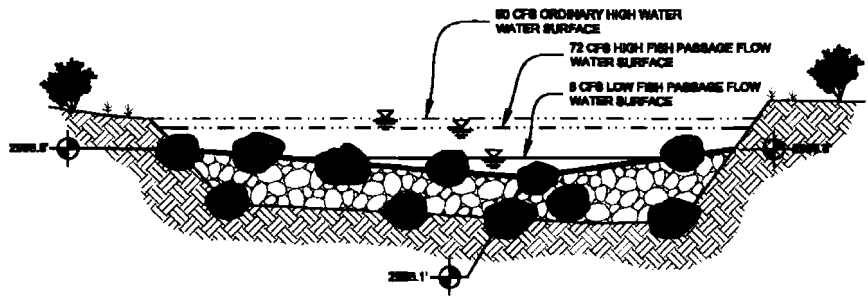


2 RIFFLE PROFILE

HORIZ 1" = 6'  
VERT 1" = 3'

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SEP 07 2011



3 RIFFLE SECTION

HORIZ 1" = 6'  
VERT 1" = 3'

**CONSTRUCTION NOTES**

THE EXISTING CHANNEL IS TO BE CLEARED OF ORGANIC DEBRIS AND MADE UNIFORM TO PROVIDE CONSISTENT SURFACE FOR BUILDING THE CONSTRUCTED RIFFLE. THE CONSTRUCTED RIFFLE IS TO BE BUILT IN 6 INCH LIFTS USING MATERIAL IN ACCORDANCE WITH THE RIFFLE MATRIX GRADATION. BOULDERS ARE TO BE PLACED IN THE COMPACTED RIFFLE MATRIX MATERIAL AS EACH LIFT IS COMPLETED. FISH ARE TO BE PRESSURE WASHED INTO THE SURFACE OF EACH LIFT UNTIL WATER POOLS ON THE COMPACTED LIFT SURFACE. BOULDERS ARE TO BE ARRANGED ON THE SURFACE OF THE TOP LIFT TO SUFFICIENTLY BACKWATER THE UPSTREAM POOL AND PROVIDE VOLITIONAL FISH PASSAGE THROUGH THE CONSTRUCTED RIFFLE. EXPOSED BOULDERS ARE TO BE EMBEDDED TO 65% OF THE BOULDER DIAMETER AND BOULDER TOP ELEVATIONS SHOULD VARY FOR HABITAT DIVERSITY.

**BOULDER SCHEDULE**

QUANTITY	DIAMETER (INCHES)
20	16
20	24

**RIFFLE MATRIX GRADATION**

PERCENT PASSING	DIAMETER (INCHES)
100	18
85	12
60	8
30	4
15	2

TOTAL VOLUME 22 CY

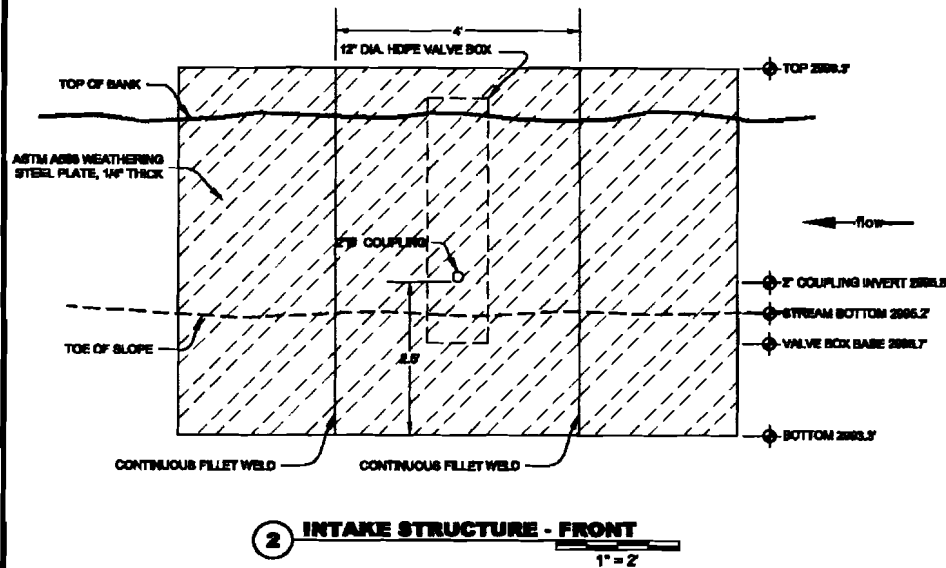
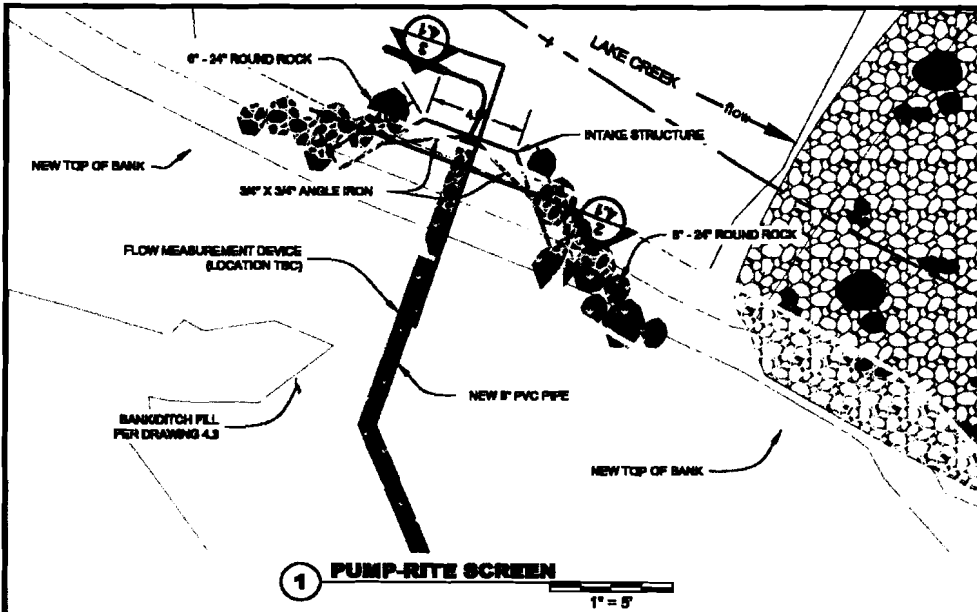


**CONSTRUCTED RIFFLE DETAIL**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DISCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

REV.	DATE	BY	DESCRIPTION	CHECKED
1	11/17/16	CS	DESIGN FOR PERMIT	CS
2	2/22/17	CS	REVISION 1	CS
3				
4				
5				

PROJECT NUMBER: 800-18-010  
DRAWING NUMBER: 4.0  
Drawing 4 of 10

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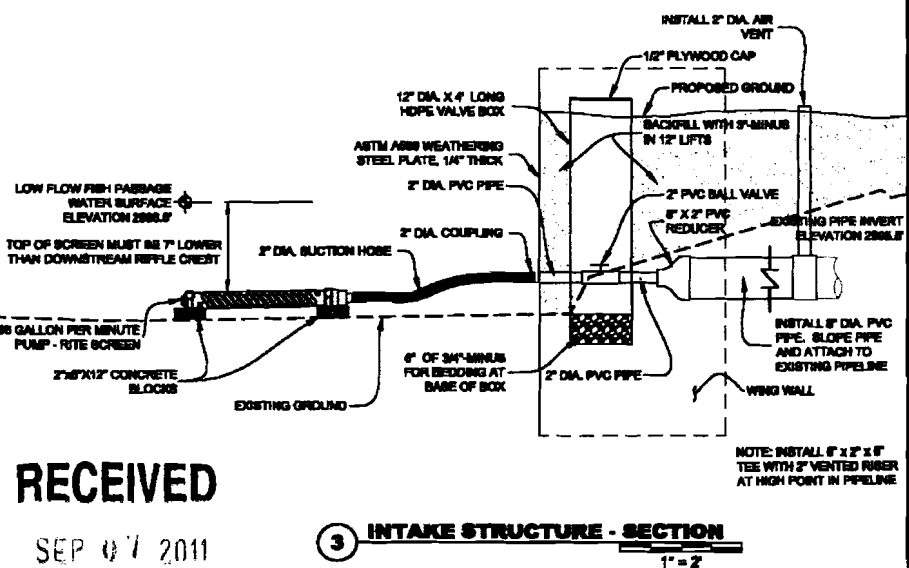
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**SCREEN SIZING NOTES**

LOW FISH PASSAGE FLOW	8 CFS
HIGH FISH PASSAGE FLOW	73 CFS
MAX DIVERSION RATE	22.6 GPM = 0.05 CFS
SCREEN OPENING SIZE	0.075 INCH PERFORATIONS
% OPEN AREA	50%
MINIMUM REQUIRED SCREEN AREA - PASSIVE SCREEN	0.25 SQ FT @ 0.2 FPS APPROACH VELOCITY
SCREEN AREA PROVIDED	3.00 SQ FT
SCREEN APPROACH VELOCITY	0.014 FPS
SWEEPING VELOCITY	0.02 FPS

**SCREEN - NOTES**

SCREEN SHALL BE "PUMP-RITE SCREENS" MODEL "14-LB", 8" DIAMETER X 30" LONG SCREEN, 60 GPM CAPACITY W/ 2" MFT ADAPTOR.

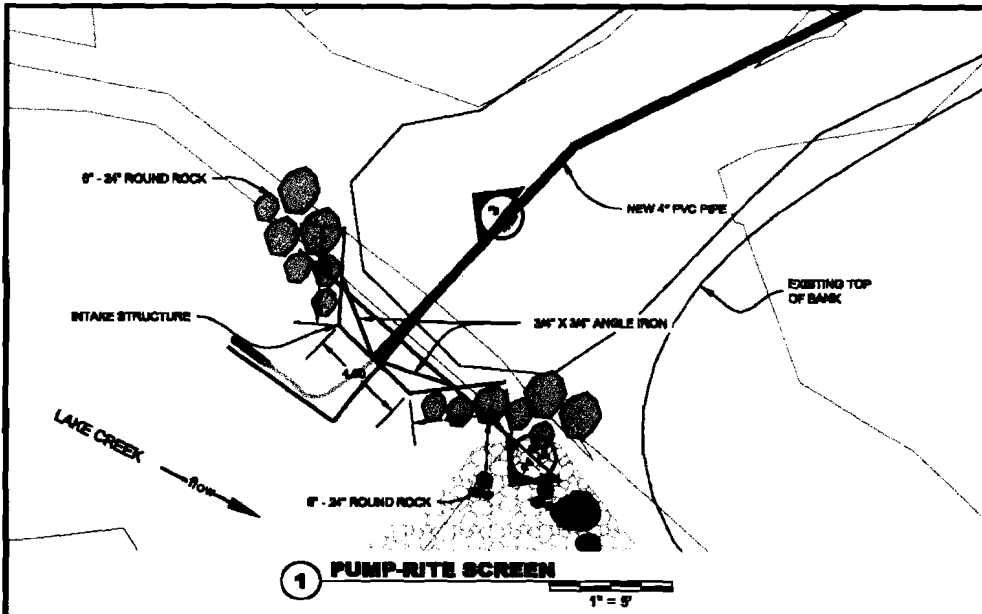


**RIVER DESIGN GROUP, INC.**  
381 NE Adams St. Salem, OR 97301  
503.585.4444

**DIVERSION 13 INTAKE**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

REV.	DATE	BY	DESCRIPTION
0	11/17/10	CS	ISSUED FOR PERMIT
1	5/22/11	CS	REVISION 1

PROJECT NUMBER: 200-10-010  
DRAWING NUMBER: **4.1**  
Drawing 6 of 10



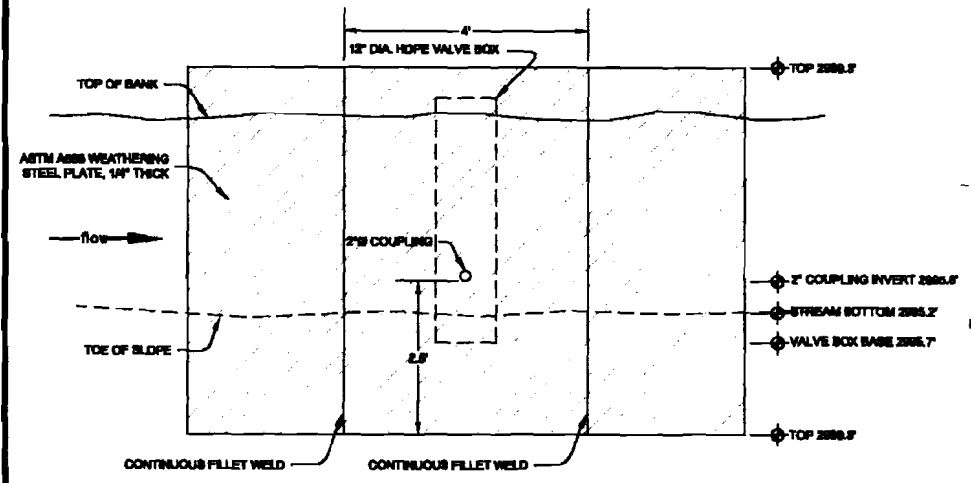
**1 PUMP-RITE SCREEN**  
1" = 5'

**SCREEN SIZING NOTES**

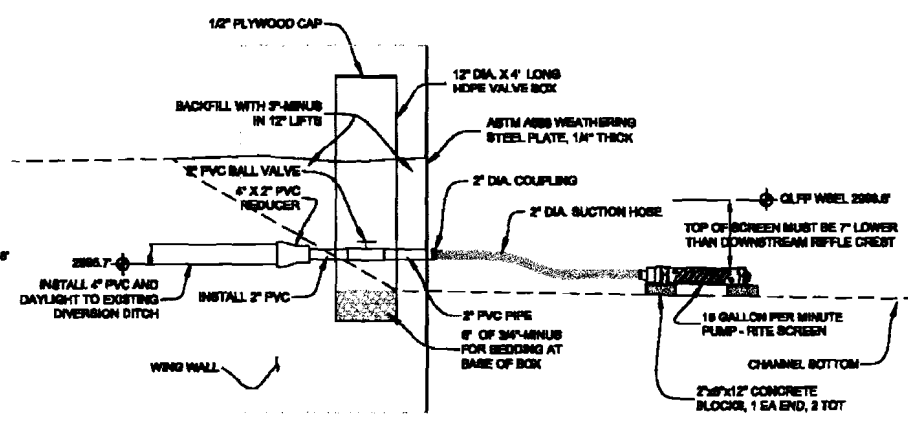
LOW FISH PASSAGE FLOW	8 CFS
HIGH FISH PASSAGE FLOW	73 CFS
MAX DIVERSION RATE	1.8 GPM = 0.004 CFS
SCREEN OPENING SIZE	0.075 INCH PERFORATIONS
% OPEN AREA	50%
MINIMUM REQUIRED SCREEN AREA - PASSIVE SCREEN	0.02 SQ FT @ 0.2 FPS APPROACH VELOCITY
SCREEN AREA PROVIDED	1.0 SQ FT
SCREEN APPROACH VELOCITY	0.004 FPS
SWEEPING VELOCITY	0.22 FPS

**SCREEN - NOTES**

SCREEN SHALL BE "PUMP-RITE SCREENS" MODEL "MM-L10", 2" DIAMETER X 10" LONG SCREEN, 18 GMP CAPACITY, W/ 2" MP7 ADAPTOR.



**2 INTAKE STRUCTURE - FRONT**  
1" = 2'



**3 INTAKE STRUCTURE - SECTION**  
1" = 2'



**DIVERSION 14 INTAKE**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
0	11/17/16	CS	DESIGN FOR PERMIT	TS
1	2/29/17	CS	REVISION 1	TS

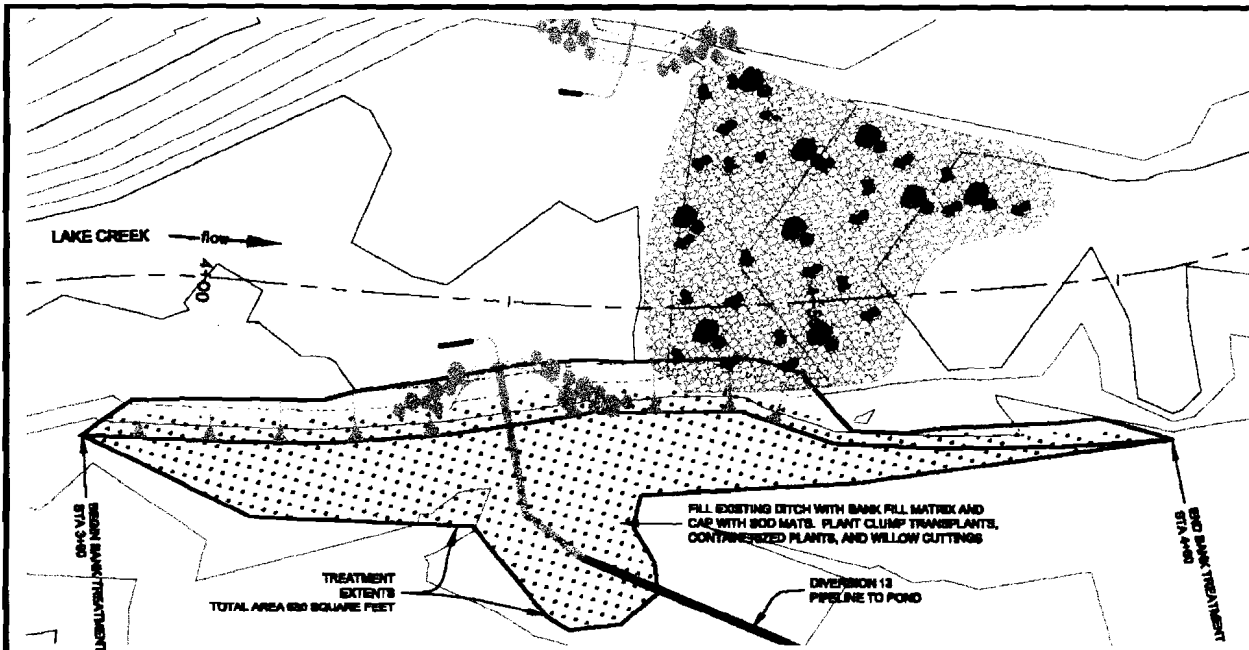
PROJECT NUMBER  
SDG-10-018  
DRAWING NUMBER  
**4.2**  
Drawing 7 of 10

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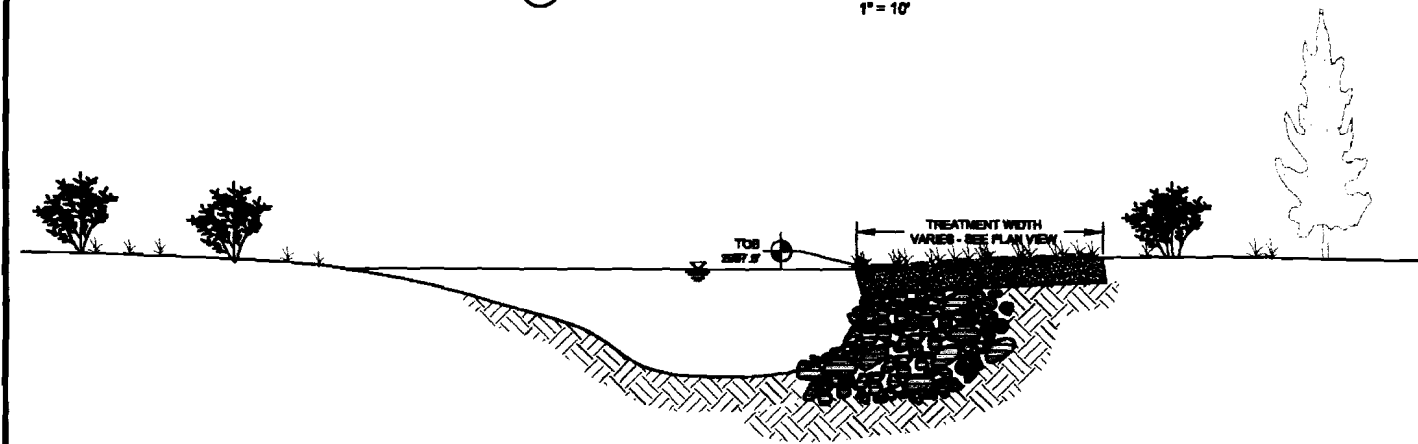
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1 COBBLE TOE / SOD MAT BANK TREATMENT  
1" = 10'



1 COBBLE TOE / SOD MAT BANK TREATMENT - TYPICAL  
NOT TO SCALE

**DESIGN INTENT**

LAKE CREEK IS OVERWIDENED THROUGH THE PROJECT AREA DUE TO THE EFFECTS OF THE EXISTING BOULDER CHECK STRUCTURE. THE PROPOSED BANK TREATMENT WILL NARROW THE CHANNEL WIDTH TO IMPROVE SEDIMENT TRANSPORT EFFICIENCY THROUGH THE POOL DURING HIGH FLOWS AND MAINTAIN A HIGHER WATER SURFACE ELEVATION DURING BASE FLOWS. PROMOTING POOL SCOUR WILL PROVIDE A DEEPER POOL FOR AQUATIC HABITAT. A HIGHER WATER SURFACE ELEVATION WILL BE BENEFICIAL FOR GENERATING HEAD FOR DIVERTING WATER VIA DIVERSION 13 AND DIVERSION 14.

**CONSTRUCTION NOTES**

THE BANK FILL MATRIX IS TO BE PLACED STARTING AT THE PROPOSED BANKLINE AND WORKING BACK TOWARDS THE EXISTING BANKLINE. THE BANK FILL MATRIX IS TO INCLUDE SUFFICIENT FINES FOR COMPACTING THE BANK FILL MATERIAL. RIPARIAN SOD MATS ARE TO BE PLACED STARTING AT THE NEW BANKLINE AND WORKING BACK TOWARDS THE EXISTING BANKLINE. SALVAGED RIPARIAN SHRUBS ARE TO BE TRANSPLANTED INTO THE BANK FILL, IF AVAILABLE SOD MAT AVAILABILITY IS LIMITED, SOD SHOULD BE PRIORITIZED FOR THE BANK EDGE. THE REMAINING FILL SURFACE IS TO BE SEEDED WITH AN APPROVED NATIVE SEED MIX AND PLANTED WITH SALVAGED VEGETATION AND CONTAINERIZED PLANTS.

**BANK FILL MATRIX GRADATION**

PERCENT PASSING	DIAMETER (INCHES)
100	12
85	7
60	4
30	2
15	1

TOTAL VOLUME 53 CY



**TYPICAL BANK TREATMENT**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHEPARD, OREGON

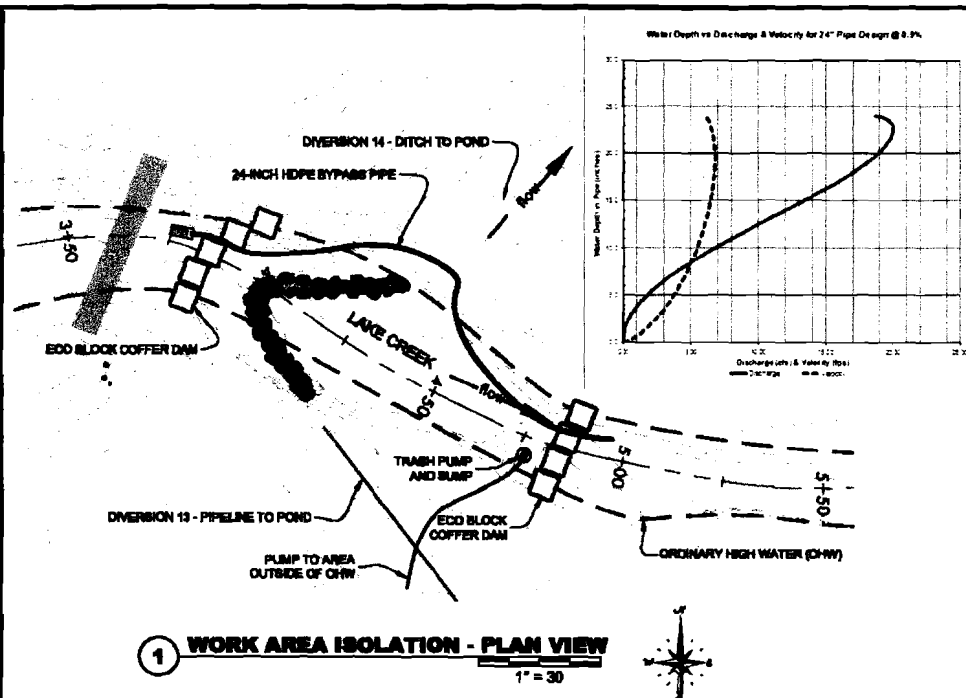
NO.	DATE	BY	DESCRIPTION	CHK
0	11/17/10	CS	ISSUED FOR PERMIT	TR
1	2/22/11	CS	REVISION 1	TR

PROJECT NUMBER: 820-10-018  
SHEET NUMBER: 4.3  
Drawing 8 of 10

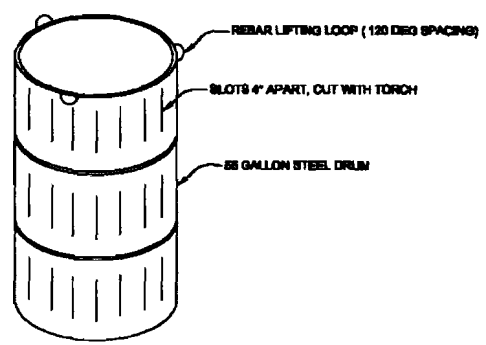
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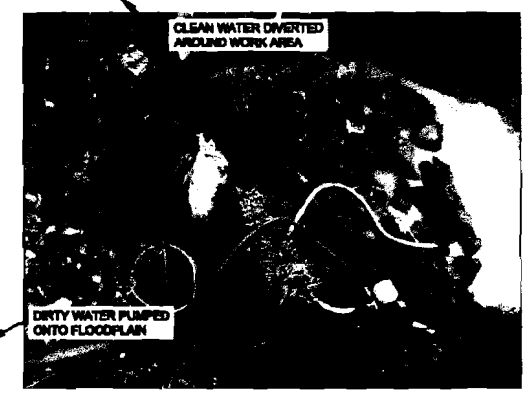
1 **WORK AREA ISOLATION - PLAN VIEW**  
1" = 30'



2 **SUMP - TYPICAL**

**TRASH PUMP NOTES**

THE WATER PUMP SHALL BE A 3\"/>



2 **TRASH PUMP PLACEMENT - TYPICAL**

**ECOBLOCK NOTES**

THE FOLLOWING REQUIREMENTS ARE NECESSARY FOR THE STREAM ENVIRONMENT:  
 ECO BLOCKS ARE 2' X 2' X 4' CONCRETE BLOCKS.  
 ECO BLOCKS SHALL BE PLACED ACROSS THE CHANNEL AND COVERED WITH A TARP OR APPROVED EQUAL.  
 ECO BLOCKS SHALL BE PLACED USING A TRACK-DOE USING LIFTING BARS AND STEEL CABLES TO EQUALIZE LOAD ON LIFTING LOOPS.

RIVER DESIGN GROUP, INC.  
 241 NE Ashland Avenue  
 Corvallis, OR 97330  
 541.325.2007

**WORK AREA ISOLATION**  
 LAKE CREEK - DIVERSION 13  
 UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

REV.	DATE	BY	DESCRIPTION
0	11/19/16	CS	ISSUED FOR PERMIT
1	2/22/21	CS	DIVERSION 13

PROJECT NUMBER: ECD-18-010  
 DRAWING NUMBER: 5.0  
 Drawing 9 of 10

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1 SITE ACCESS AND STAGING  
1" = 200'



RIVER DESIGN GROUP, INC.  
211 1st Avenue  
Salem, OR 97301  
503.596.8222

**SITE ACCESS AND STAGING**  
LAKE CREEK - DIVERSION 13 & 14  
UPPER DESCHUTES WATERSHED COUNCIL - CAMP SHERMAN, OREGON

NO.	DATE	BY	DESCRIPTION	CHK
0	11/17/10	CS	ISSUED FOR PERMIT	TS
1	5/29/11	CS	REVISION 1	TS

PROJECT NUMBER: 100-10-010  
DRAWING NUMBER: 5.1  
Drawing 10 of 10

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