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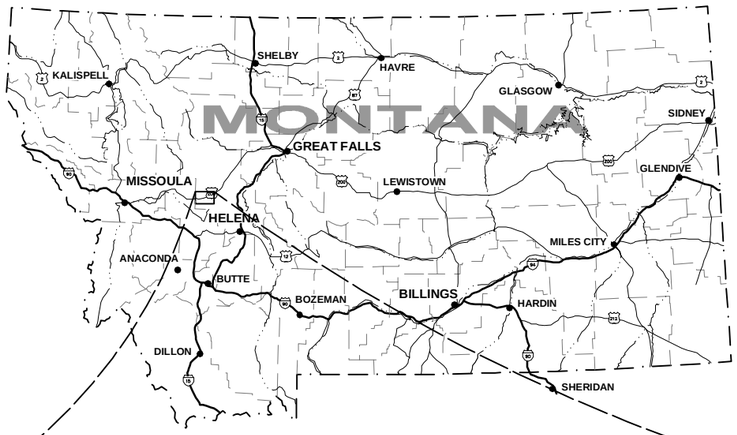
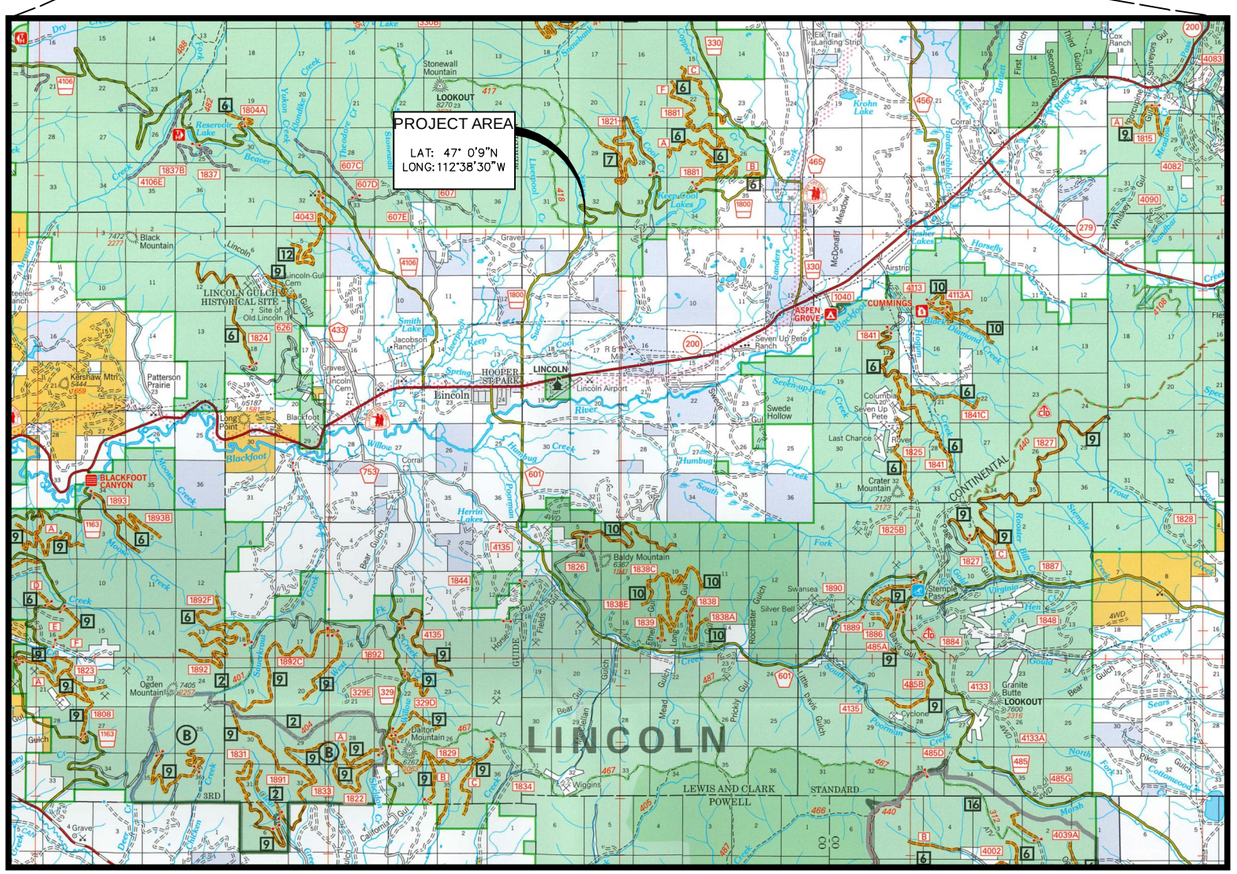


SUCKER CREEK AQUATIC ORGANISM PASSAGE

CULVERT REPLACEMENT

LINCOLN, MONTANA



NOT TO SCALE

PREPARED FOR:

BIG BLACKFOOT CHAPTER
OF TROUT UNLIMITED
P.O. BOX 1
OVANDO, MONTANA

Big Blackfoot Chapter of Montana Trout Unlimited
BIG BLACKFOOT

PREPARED BY:

DOWL
WWW.DOWL.COM

1300 Cedar Street
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406-442-0370

RECOMMENDED:

DISTRICT RANGER
LINCOLN RANGER DISTRICT — *Date*

REVIEWED:

FOREST ENGINEER
HELENA NATIONAL FOREST — *Date*

APPROVED:

FOREST SUPERVISOR
HELENA NATIONAL FOREST — *Date*

APPROVED:

MONTANA
JEFFREY KARL OLSSON
No. 18996PE
LICENSED PROFESSIONAL ENGINEER

Jeffrey K. Olsson, P.E. 18996
PROJECT MANAGER
DOWL — *Date*

SHEET INDEX

SHEET NO.	TITLE
G1	COVER SHEET
G2	QUANTITY SUMMARY, GENERAL NOTES, AND CONTROL POINTS
PP1	ROAD PLAN AND PROFILE
PP2	STREAM PLAN AND PROFILE
D1	STREAM SIMULATION DETAILS
D2	CONCEPTUAL STREAM DIVERSION DETAILS
XS1	ROAD CROSS SECTIONS

PROJECT 4626.11478.01
DATE SEPTEMBER 2015

SHEET
G1

ESTIMATED QUANTITY SUMMARY

Item No.	Item Description	Measurement		Total
		Method	Unit	
15101	Mobilization	LSQ	LS	1.0
15201	Construction Survey and Staking	LSQ	LS	1.0
20301	Removal of Existing Culvert, Method A	AQ	EA	1.0
20906	Structure Excavation	LSQ	LS	1.0
25101(A)	Placed Riprap, Class 4 (Commercial Source)	CQ	CY	42.0
25117(A)	Rock Weir Grade Control Structure	AQ	EA	3.0
25117(B)	Wood Weir Grade Control Structure	AQ	EA	2.0
60202	142" Span, 91" Rise, Corrugated Steel Pipe Arch, 0.138" Thickness	CQ	LF	47.0
62503	Seeding Dry Method	LSQ	LS	1.0
62601	Clump Planted Vegetation	AQ	EA	10.0

ALL QUANTITIES PROVIDED IN THE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE OR VERIFY QUANTITIES USED AS THE BASIS FOR BIDDING.
CQ = CONTRACT QUANTITY; AQ = ACTUAL QUANTITY; LSQ = LUMP SUM QUANTITY

GENERAL NOTES:

1. SPECIFICATIONS: CONSTRUCTION SHALL COMPLY WITH FEDERAL HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROAD AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03) AND APPLICABLE FOREST SERVICE SUPPLEMENTAL SPECIFICATIONS.
2. HYDROLOGY AND HYDRAULICS: THIS STRUCTURE IS DESIGNED TO PASS THE 100-YEAR FLOOD WHILE MAINTAINING STREAM DEPTH AND VELOCITY WITHIN OR NEAR THE RANGES THAT WOULD NATURALLY OCCUR IN THE VICINITY OF THE PROJECT. THE PEAK DISCHARGE FOR FLOODS OF 2-YEAR AND 100-YEAR RECURRENCE INTERVALS ARE ESTIMATED TO BE 20 CFS AND 341 CFS, RESPECTIVELY.
3. CLEARING AND GRUBBING: CLEARING AND GRUBBING IS CONSIDERED INCIDENTAL.
4. CORRUGATED PIPE-ARCH: THE CORRUGATED STEEL PIPE-ARCH SHALL BE 142" SPAN, 91" RISE, 3" X 1" CORRUGATIONS WITH GALVANIZED STEEL OF 0.138" THICKNESS.
5. FOUNDATION INVESTIGATION: A FOUNDATION INVESTIGATION HAS NOT BEEN CONDUCTED AT THIS SITE. IF BEDROCK OR VERY SOFT CLAY SOILS ARE ENCOUNTERED WITHIN THE LIMITS OF THE EXCAVATION SHOWN ON THE DRAWINGS, NOTIFY THE CO IMMEDIATELY. IN NO CASE SHOULD THE PIPE-ARCH BE PLACED DIRECTLY ON LARGE BOULDERS, RANDOM OUTCROPPINGS OF BEDROCK, OR SOFT SOILS WITHOUT PRIOR APPROVAL.
6. SURVEY: HORIZONTAL DATUM: NAD83 (NA2011) (EPOCH 2010.0000). MONTANA STATE PLANE COORDINATE SYSTEM INTERNATIONAL FEET. ALL DISTANCES, BEARINGS AND COORDINATES ARE GRID VALUES. VERTICAL DATUM: NAVD88 US SURVEY FEET
7. NATIVE STREAMBED MATERIAL: IT IS ANTICIPATED THAT NATIVE STREAMBED MATERIAL WILL BE FOUND UNDER THE EXISTING PIPE AND PROPOSED CHANNEL EXCAVATIONS. CONTRACTOR SHALL PRESERVE AND PROTECT THE MATERIAL AND USE IT FOR INFILL FOR THE PIPE. MATERIAL SHOULD BE CONSISTENT WITH TYPE AND GRADATION OF THE NATIVE STEAM MATERIAL AND WELL-GRADED TO PRODUCE A DENSE, WELL INTERLOCKED BED WITH LOW PERMEABILITY AND APPROVED BY THE CO PRIOR TO PLACEMENT. CONTRACTOR IS RESPONSIBLE FOR INSURING STREAM FLOW DOES NOT GO SUBSURFACE THROUGH THE CULVERT DURING A 48 PERIOD AFTER RE-WATERING.
8. UTILITIES: EXISTING UTILITIES ARE NOT SHOWN; THERE IS A KNOWN ELECTRICAL LINE WITHIN THE PROJECT AREA. EXACT LOCATION IS UNKNOWN. OTHER UTILITIES MAY ALSO BE PRESENT. LOCATION AND PROTECTION OF UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

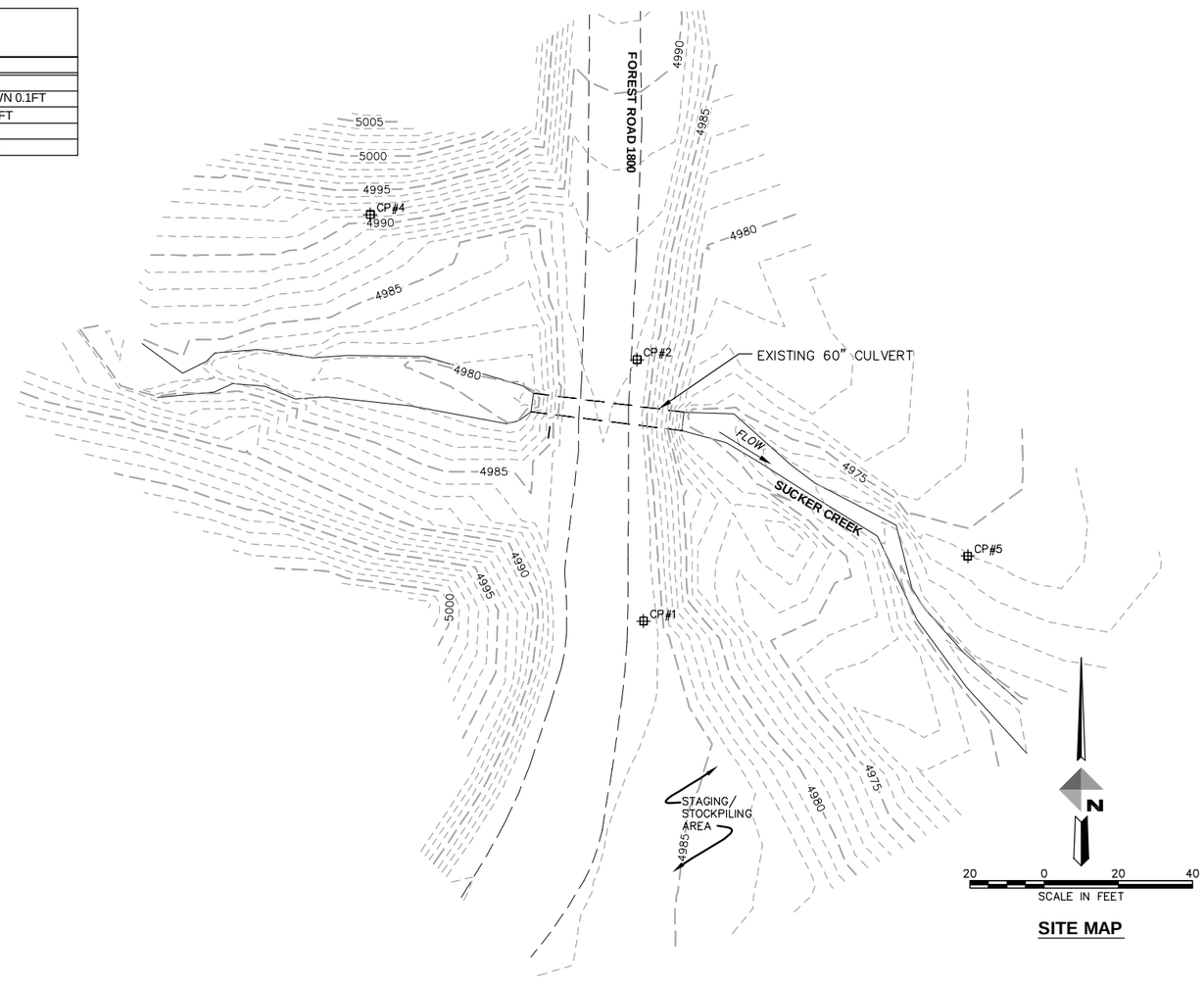
CONTROL POINT TABLE

POINT #	NORTHING	EASTING	ELEV. (FT)	DESCRIPTION
1	1019251.700	1185292.787	4986.33	SURV PPC
2	1019322.124	1185291.027	4986.87	SURV REB SET ½IN DIA DWN 0.1FT
3	1019042.854	1185203.680	4983.94	SURV SPIKE DWN 0.2FT
4	1019361.158	1185194.738	4992.62	SURV HUB W/MAG
5	1019269.225	1185380.136	4974.01	SURV HUB W/ MAG

BASIS OF CONTROL

HORIZONTAL DATUM: NAD83 (NA2011) (EPOCH 2010.0000).
MONTANA STATE PLANE COORDINATE SYSTEM INTERNATIONAL FEET
ALL DISTANCES, BEARINGS AND COORDINATES ARE GRID VALUES

VERTICAL DATUM: NAVD88 US SURVEY FEET



SITE MAP

REVISIONS

REV	DATE	DESCRIPTION	BY

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SUCKER CREEK AQUATIC ORGANISM PASSAGE
LINCOLN, MONTANA
QUANTITY SUMMARY, GENERAL NOTES, AND CONTROL POINTS

PROJECT 4626.11478.01
DATE SEPTEMBER 2015

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SHEET
G2

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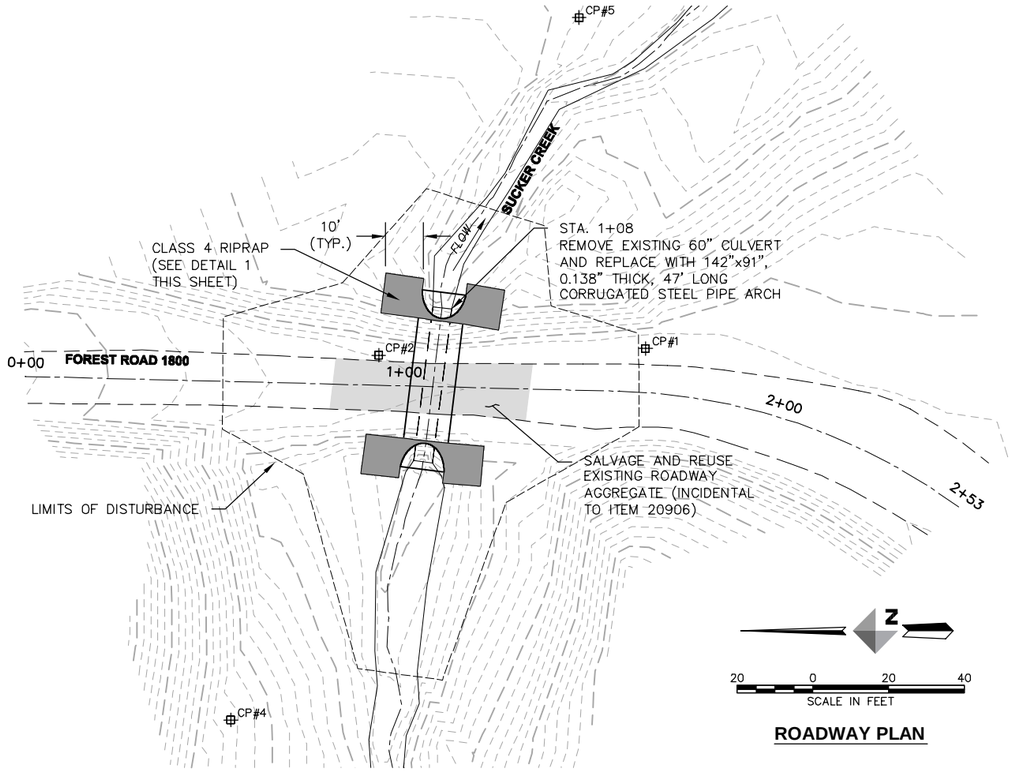
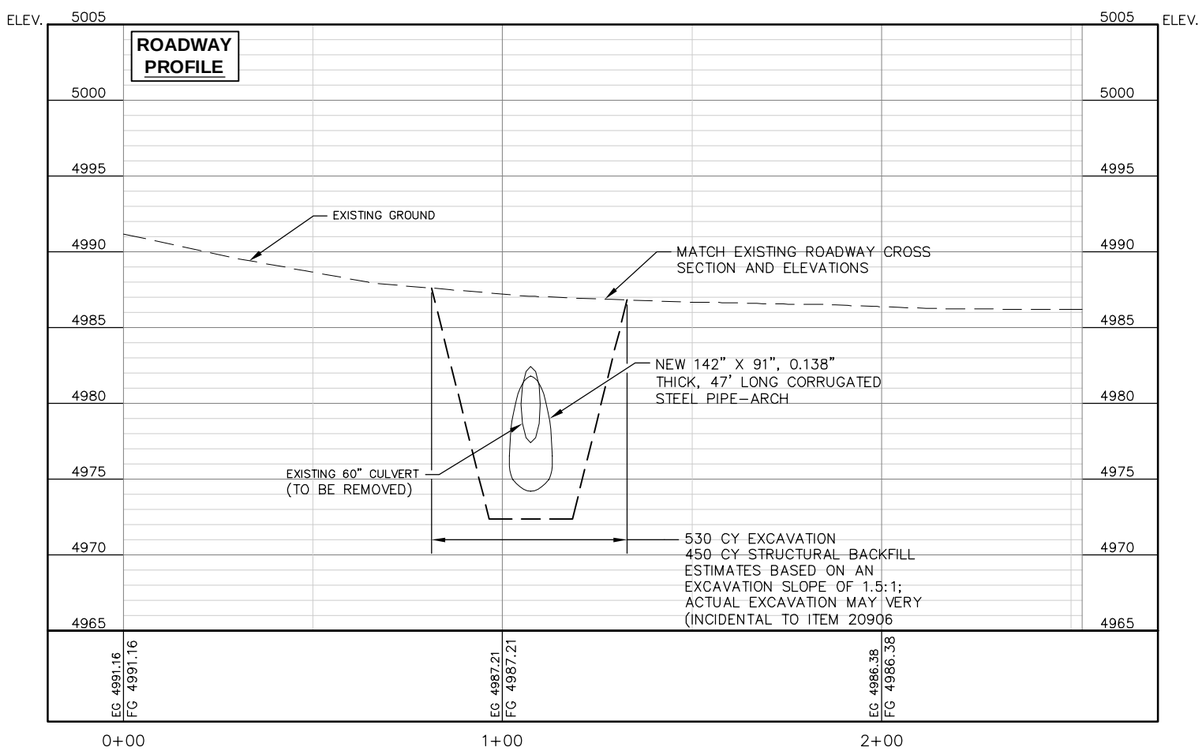
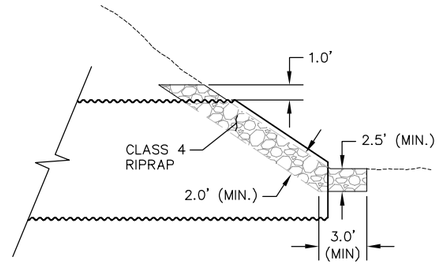


ROADWAY PLAN





1 PP1 **DETAIL**
END PROTECTION
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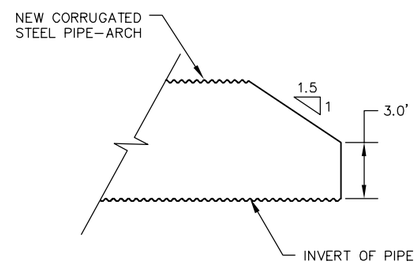

2 PP1 **DETAIL**
END TREATMENT
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SUCKER CREEK AQUATIC ORGANISM PASSAGE
LINCOLN, MONTANA

ROAD PLAN AND PROFILE

PROJECT 4626.11478.01
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SHEET
PP1

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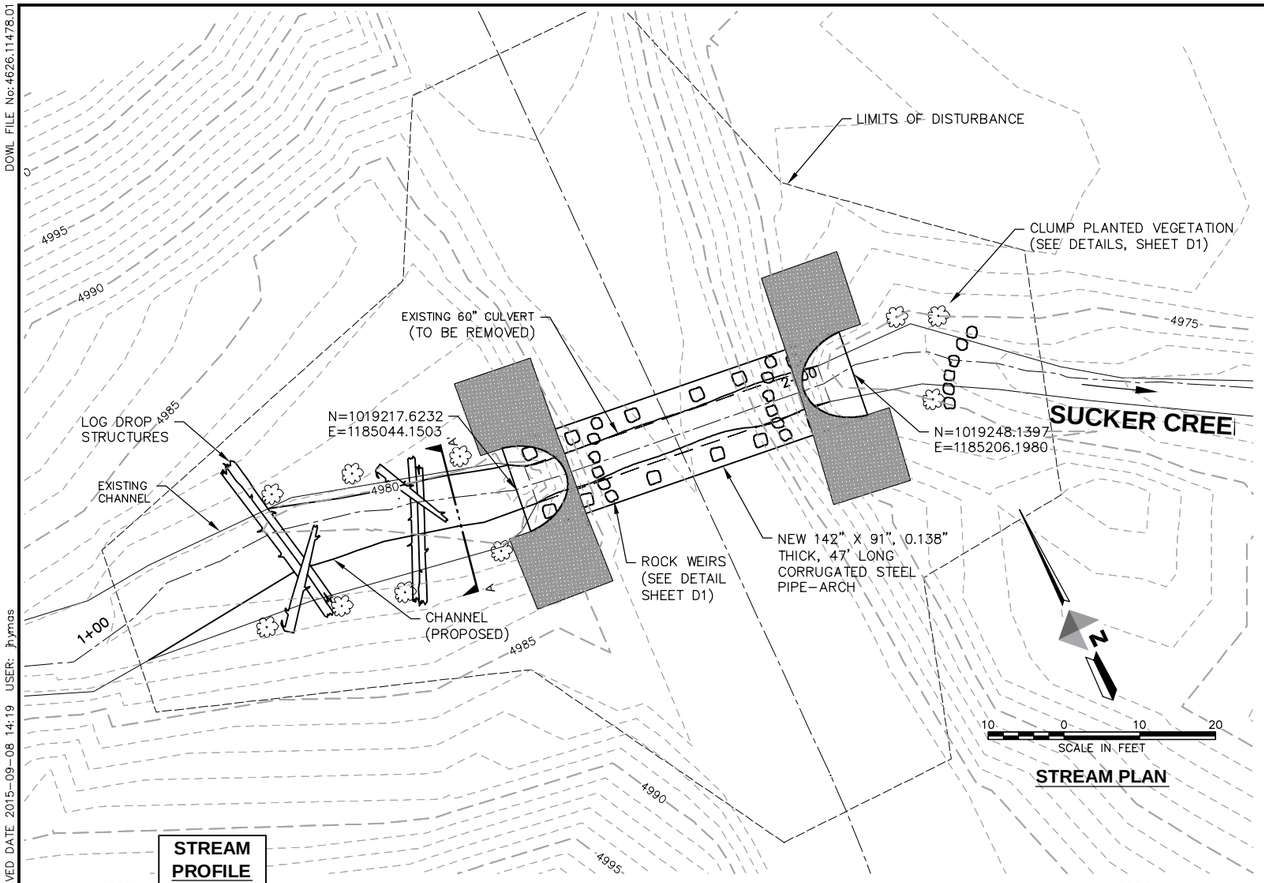
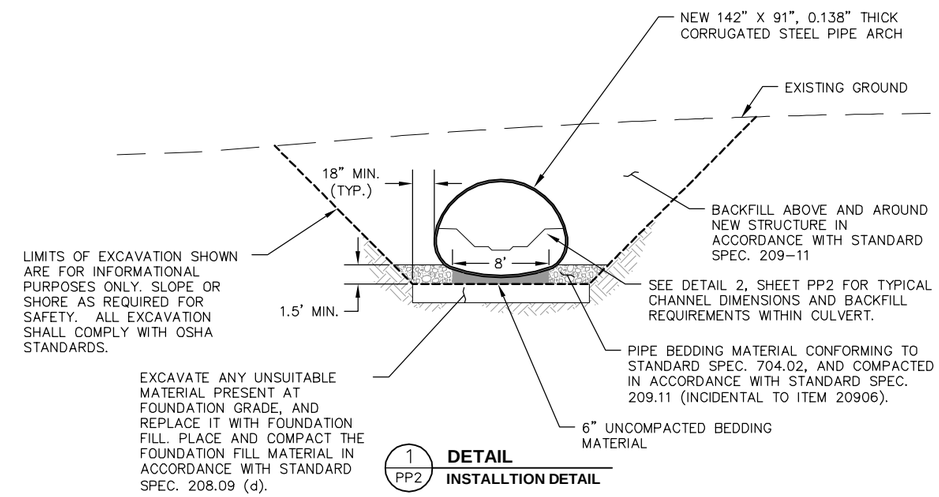


STREAM PLAN



1 / PP2 **DETAIL**
INSTALLTION DETAIL
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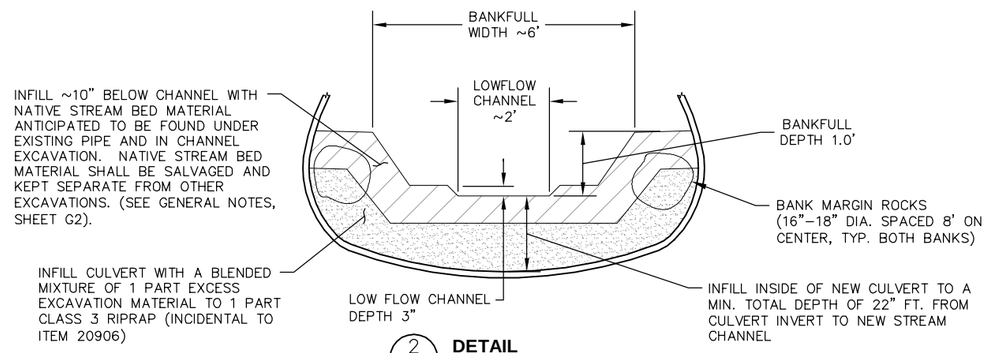

2 / PP2 **DETAIL**
TYPICAL CHANNEL CROSSING
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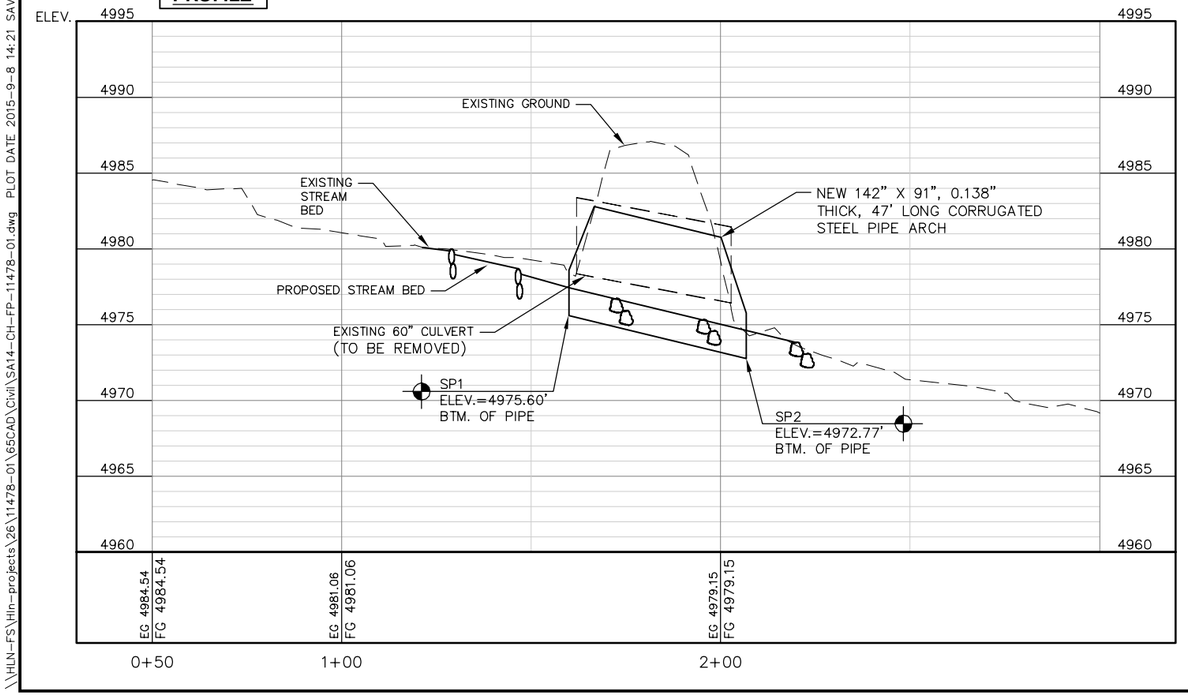
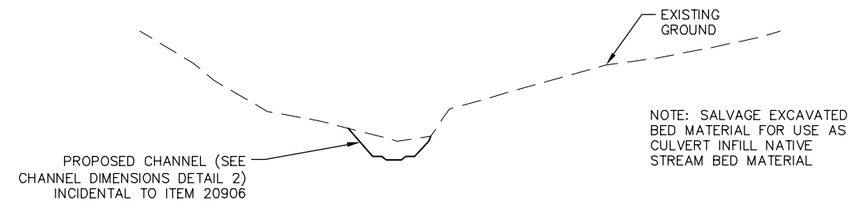
STREAM PROFILE





A / PP2 **SECTION A-A'**
UPSTREAM CHANNEL MODIFICATION
NOT TO SCALE

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SUCKER CREEK AQUATIC ORGANISM PASSAGE
LINCOLN, MONTANA

STREAM PLAN AND PROFILE

PROJECT 4626.11478.01
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PP2

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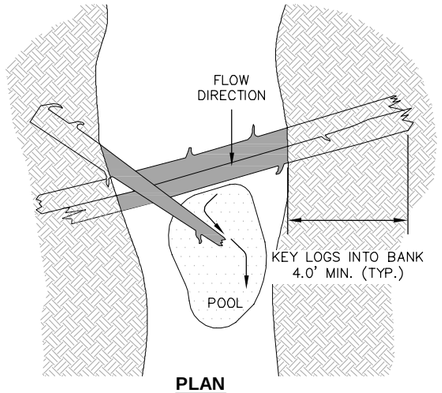
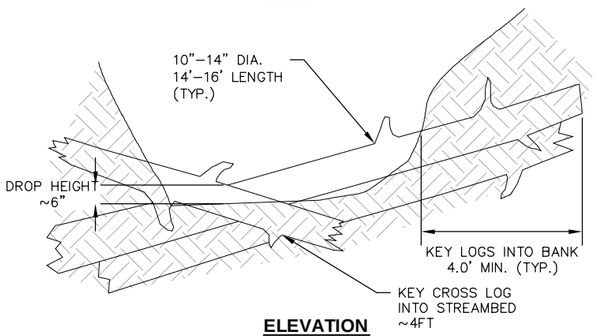


PLAN



ELEVATION

1 / D1 **DETAIL**
TYPICAL LOG STEP POOL
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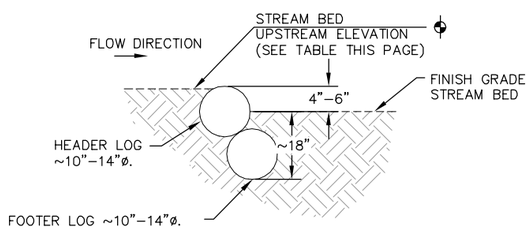

2 / D1 **DETAIL**
TYPICAL LOG STEP POOL
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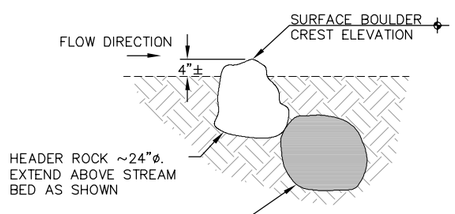
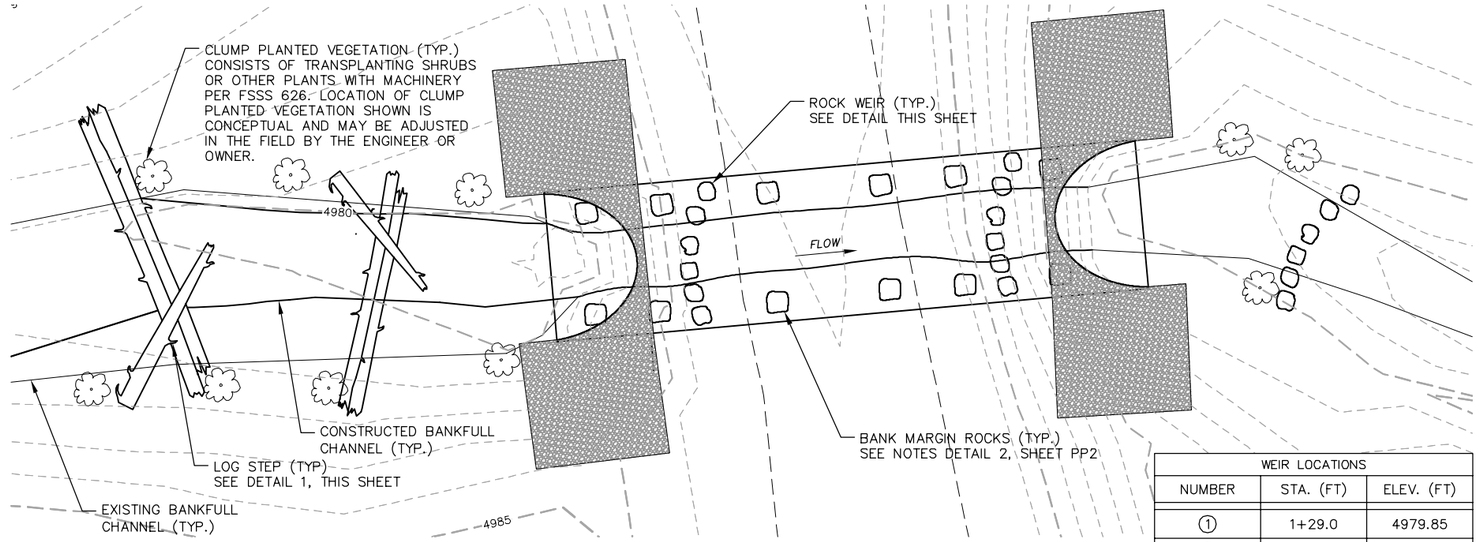


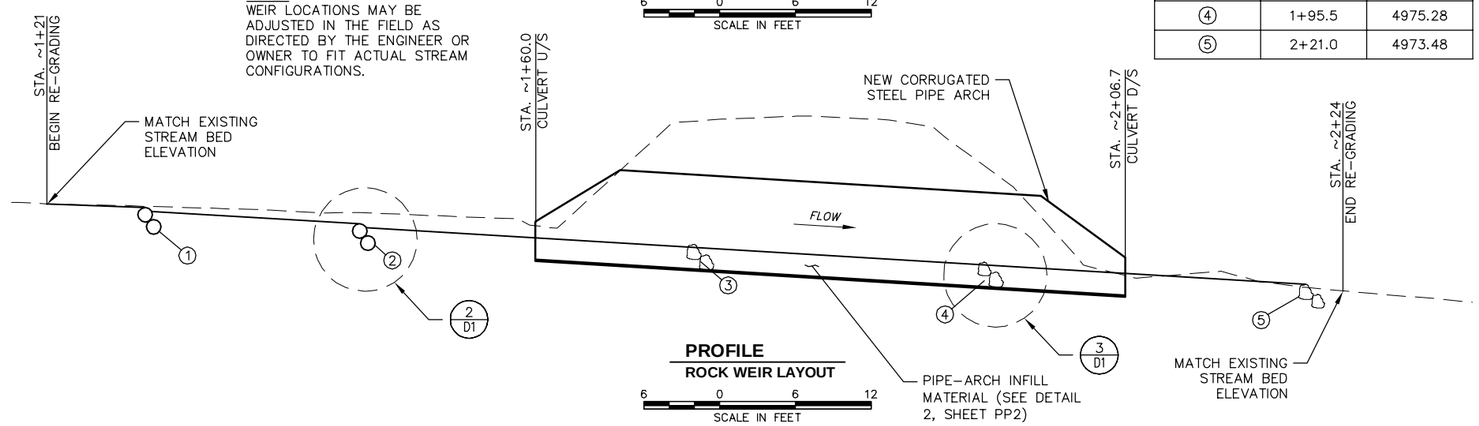
3 / D1 **DETAIL**
ROCK WEIR
NOT TO SCALE



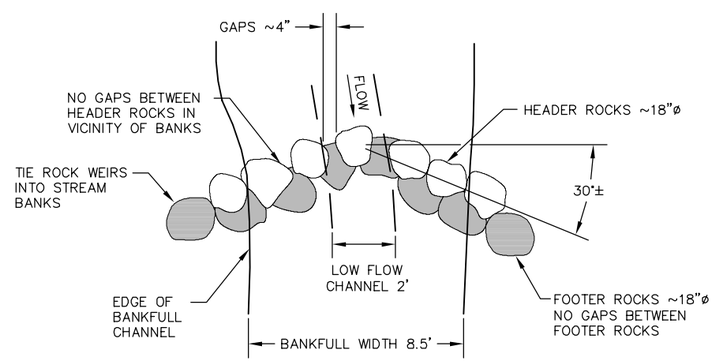
PLAN
ROCK WEIR LAYOUT
6 0 6 12
SCALE IN FEET

WEIR LOCATIONS		
NUMBER	STA. (FT)	ELEV. (FT)
1	1+29.0	4979.85
2	1+46.1	4978.55
3	1+72.5	4976.67
4	1+95.5	4975.28
5	2+21.0	4973.48

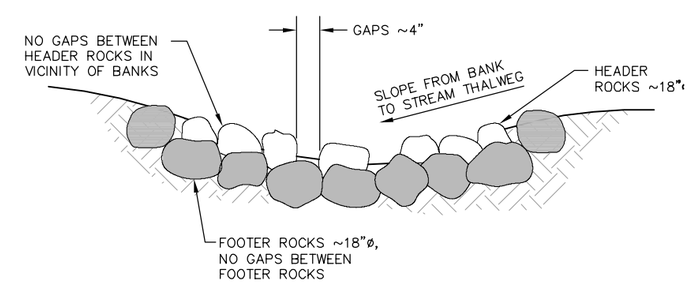
NOTE:
WEIR LOCATIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER OR OWNER TO FIT ACTUAL STREAM CONFIGURATIONS.



PROFILE
ROCK WEIR LAYOUT
6 0 6 12
SCALE IN FEET



PLAN



ELEVATION

4 / D1 **DETAIL**
ROCK WEIR
NOT TO SCALE

REVISIONS

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MONTANA JEFFREY KARL OLSSON No. 19969PE LICENSED PROFESSIONAL ENGINEER

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SUCKER CREEK AQUATIC ORGANISM PASSAGE
LINCOLN, MONTANA
STREAM SIMULATION
DETAILS

PROJECT 4626.11478.01
DATE SEPTEMBER 2015

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SHEET
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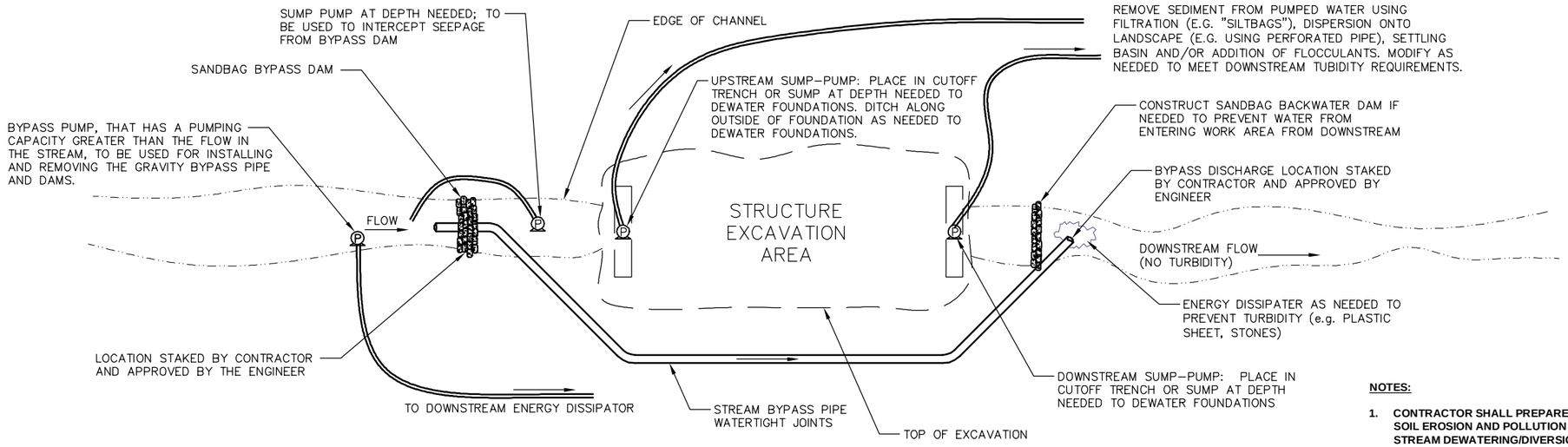
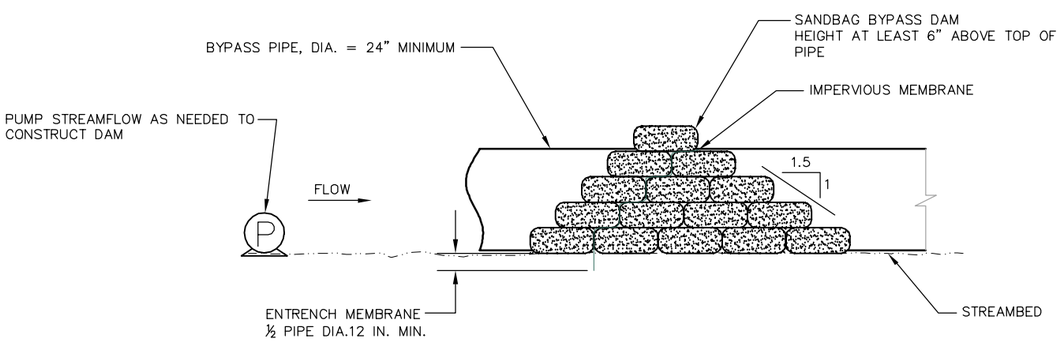


1 / D1 **DETAIL**
CONCEPTUAL DEWATERING & SEDIMENT CONTROL PLAN
NOT TO SCALE

NOTES:

1. **CONTRACTOR SHALL PREPARE FOR REVIEW AND APPROVAL A SOIL EROSION AND POLLUTION CONTROL PLAN TO INCLUDE STREAM DEWATERING/DIVERSION METHODS IN ACCORDANCE WITH SPECIFICATIONS AND THESE PLANS. DETAILS SHOWN ON THIS SHEET ARE CONCEPTUAL AND PROVIDE GUIDANCE OF METHODS AND MEANS THAT WOULD BE ACCEPTABLE.**
2. **WHEN CONSTRUCTING STREAM DIVERSION CONTRACTOR SHALL CAREFULLY REMOVE SOD AND TOPSOIL THAT LIES ALONG THE DIVERSION PATH AND STOCKPILE IN A LOCATION APPROVED BY THE ENGINEER. AFTER REMOVING THE DIVERSION STRUCTURE AND BACKFILLING THE TRENCH, CONTRACTOR SHALL CAREFULLY REPLACE THIS STOCKPILED MATERIAL. PRIORITY AREAS FOR REPLACEMENT OF VEGETATION ARE STREAMBANKS AND FLOODPLAINS.**
3. **CONSTRUCT TEMPORARY SEDIMENT EROSION CONTROLS AROUND TEMPORARY STOCKPILES AND STAGING AREAS. TEMPORARY CONTROLS MAY INCLUDE SILT FENCES, STRAW WADDLES OR BALES, EROSION CONTROL MATTING OR MULCH.**



2 / D2 **DETAIL**
SANDBAG BYPASS DAM
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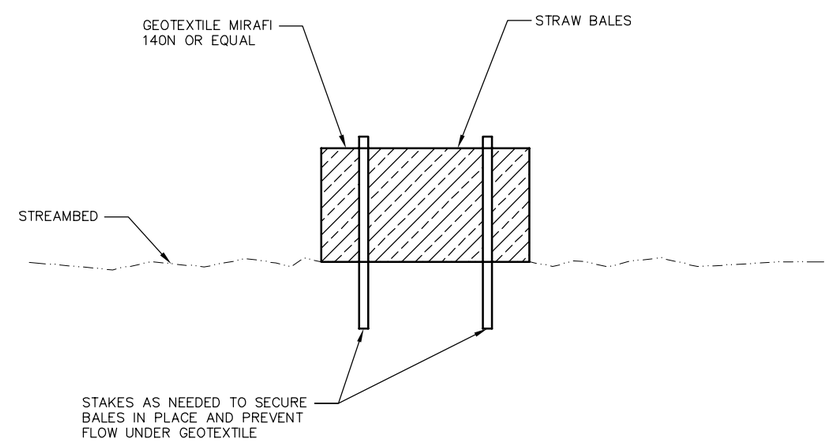

3 / D2 **DETAIL**
GEOTEXTILE-WRAPPED STRAW BALE DAM
NOT TO SCALE

REVISIONS

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SUCKER CREEK AQUATIC ORGANISM PASSAGE
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CONCEPTUAL STREAM DIVERSION DETAILS

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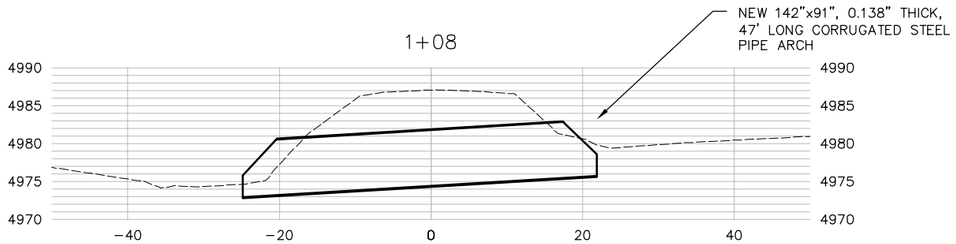

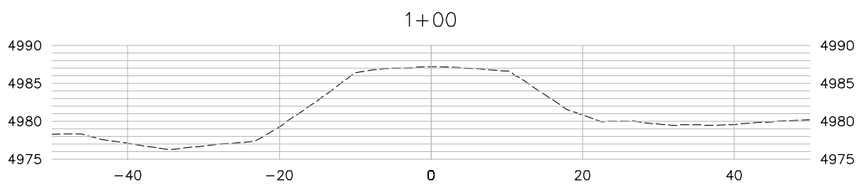

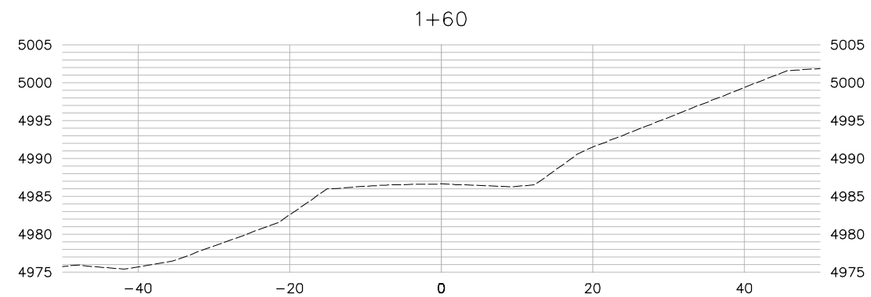

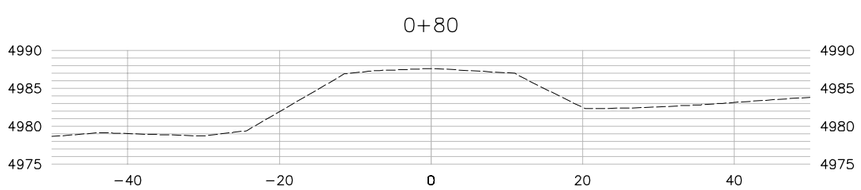

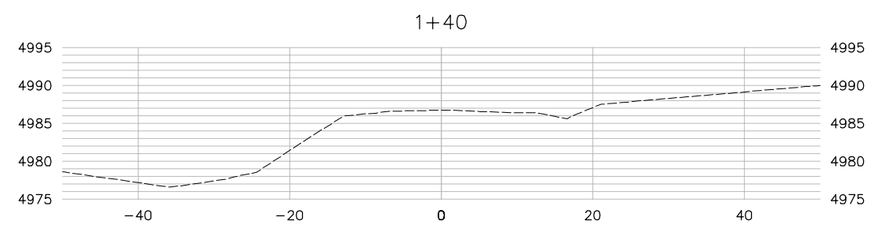

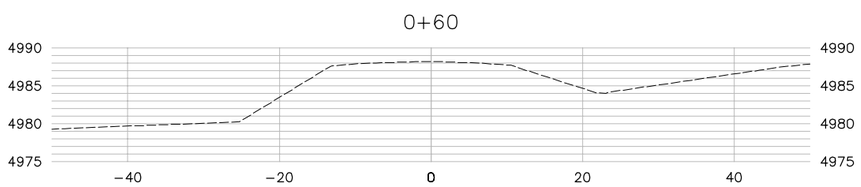

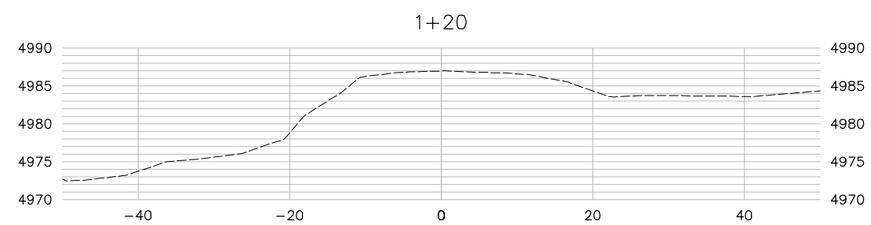

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SUCKER CREEK AQUATIC ORGANISM PASSAGE
LINCOLN, MONTANA

ROAD CROSS SECTIONS

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