

U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE - REGION ONE
 LEWIS AND CLARK NATIONAL FOREST BELT CREEK DISTRICT
**CONSTRUCTION PLANS FOR
 CARPENTER-SNOW CREEK NPL SITE
 DITCH LINER REPAIRS**

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LEWIS AND CLARK NATIONAL FOREST SUPERVISOR
 BELT CREEK DISTRICT MANAGER
 DATE 7/15/14
 DATE 7/15/14
 DATE 7/15/14
 DATE 7/14/14
 DATE 7/14/14
 DATE 7/14/14
 PROJECT ENGINEER

U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 LEWIS & CLARK NATIONAL FOREST
 GREAT FALLS, MONTANA

CARPENTER-SNOW CREEK
 DITCH LINER REPAIRS

TITLE SHEET
 AND INDEX

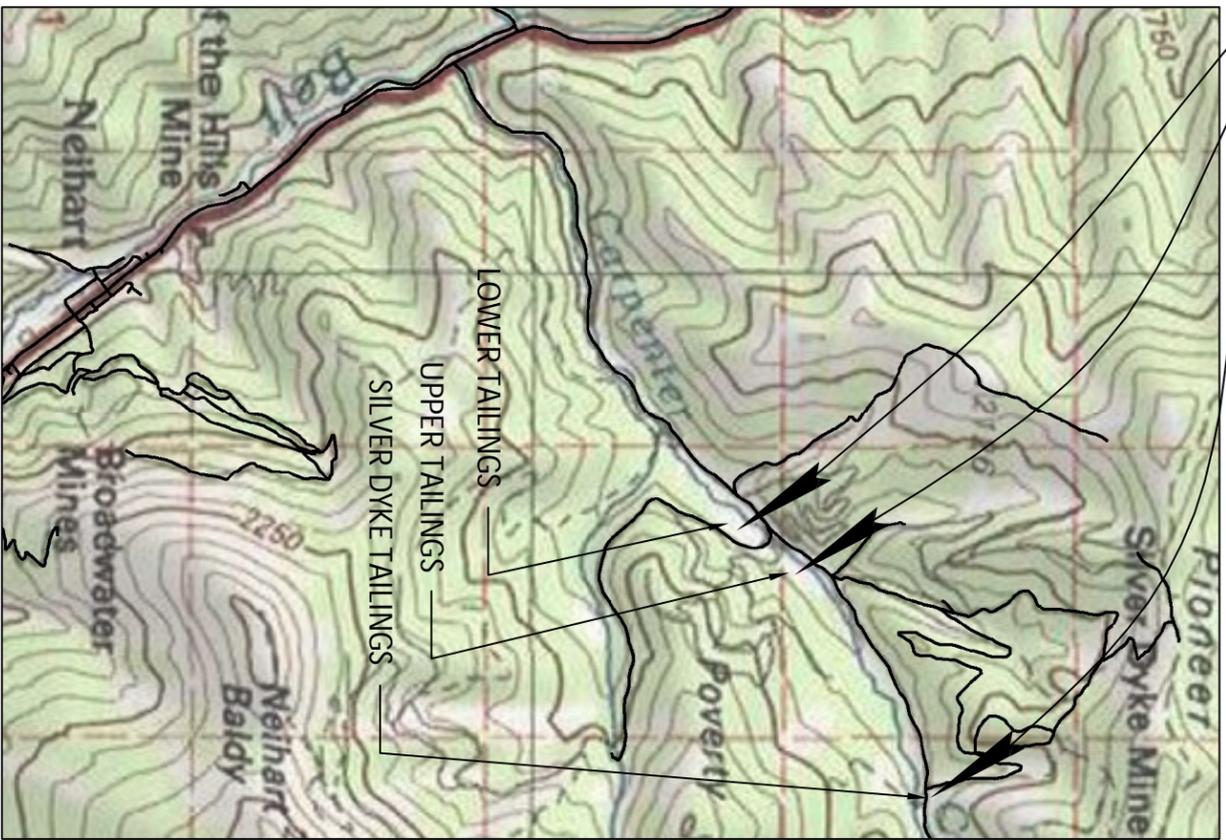
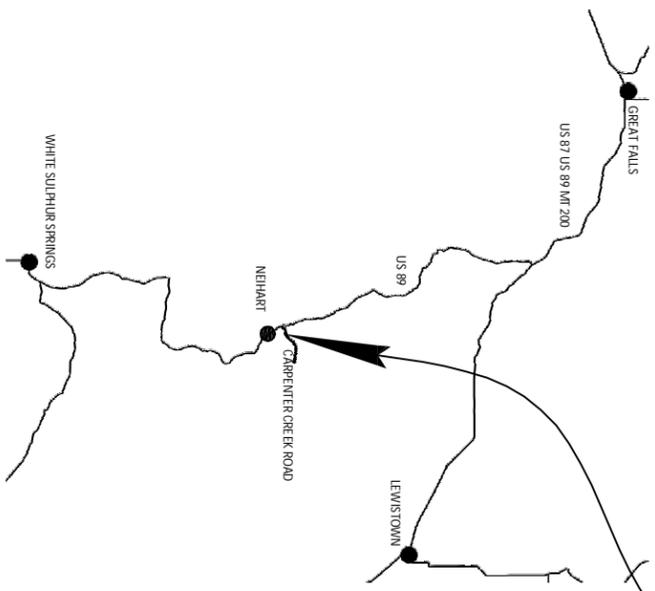
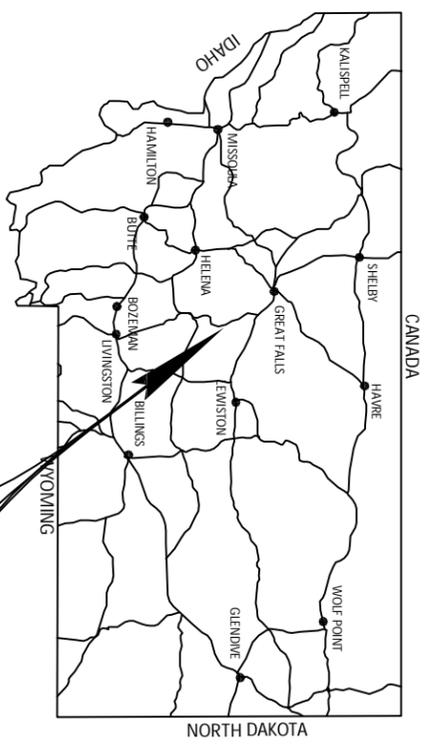
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 DRAWN: RESTORVAL DATE: 6/14
 CHECKED: DATE: _____

DATE: _____ REVISION: _____
 BY: _____

DRAWING NAME: _____
 COVER SHEET/DWG
 SHEET 1

U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE - REGION ONE
 LEWIS AND CLARK NATIONAL FOREST BELT CREEK DISTRICT

CONSTRUCTION PLANS FOR
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LEWIS AND CLARK NATIONAL FOREST SUPERVISOR _____ DATE _____
 BELT CREEK DISTRICT RANGER _____ DATE _____
 LEWIS AND CLARK NATIONAL FOREST ENGINEER _____ DATE _____
 NORTHERN REGION ON-SCENE COORDINATOR _____ DATE _____
 PROJECT ENGINEER _____ DATE _____



CARPENTER-SNOW CREEK
 DITCH LINER REPAIRS

TITLE SHEET
 AND INDEX

DESIGNED: ASTWALL DATE: 6/14
 DRAWN: ASTWALL DATE: 6/14
 CHECKED: _____ DATE: _____

DATE	REVISION	BY

DRAWING NAME
 COVER SHEET.DWG
 SHEET 1



U.S. DEPARTMENT OF AGRICULTURE
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GREAT FALLS, MONTANA

**CARPENTER—SNOW CREEK
DITCH LINER REPAIR**

ESTIMATED QUANTITIES

DESIGNED: RSTOVALL DATE: 6/14
DRAWN: RSTOVALL DATE: 6/14
CHECKED: DATE:

DATE	REVISION	BY

DRAWING NAME
QUANTITY ESTIMATES.DWG
SHEET 2

Upper Tailings Site-Base Items-Schedule 1

ITEM	DESCRIPTION	METHOD		QTY
		OF MEASURE	PAY UNIT	
15101	Mobilization	LSQ	Lump Sum	1
15707	Bales, Straw	AQ	Each	25
15708	Check dams	AQ	Each	3
15761	Soil Erosion Control	LSQ	Lump Sum	1
25101	Placed riprap, class 3	CQ	Cubic Yard	65
60803B	Paved waterway, type HDPE Ditch Liner T Intersection	AQ	Each	1
60803C	Paved waterway, type HDPE Ditch Liner Flared End Section	AQ	Each	1
60804	Geomembrane, type HDPE mat, 30 mil	CQ	*Square Yard	140
62507	seeding	LSQ	Lump Sum	1
62908	Turf reinforcement mat type 5.D	CQ	*square Yard	180

*SQUARE YARD - CALCULATED QUANTITIES ARE FOR TOTAL SURFACE AREA COVERAGE. THESE QUANTITIES DO NOT ACCOUNT FOR MATERIAL OVERLAP, SEAMS, OR WASTE. CONTRACTOR IS RESPONSIBLE TO FACTOR IN ADDITIONAL QUANTITIES FOR SEAMS, OVERLAPS, AND WASTE.

FOR INFORMATIONAL PURPOSES ONLY
SEE SECTION B FOR SCHEDULE OF ITEMS

- GOVERNMENT FURNISHED MATERIALS:
- TWO SECTIONS OF HDPE DITCH LINERS WILL BE PROVIDED BY THE GOVERNMENT FOR USE AT THE REPAIR 1 SITE.

- SPECIFICATION NOTES:
- 158: APPLY WATER AS NEEDED TO CONTROL DUST. THIS WORK IS INCIDENTAL TO THE CONTRACT.
 - 201: PLACE EXCESS GRUBBING MATERIAL IN LOCATIONS AS DIRECTED BY THE CO.
 - 608: EXCAVATION TO INSTALL THE HDPE DITCH LINER IS INCIDENTAL TO THE PAY ITEMS FOR THE HDPE DITCH LINER.
 - 625: APPLY MULCH IN AREAS DESIGNATED BY THE CO.

- GENERAL NOTES:
- MATERIALS AND CONSTRUCTION FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH 2003 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAYS (FP-03).
 - THE CONTRACTOR IS RESPONSIBLE FOR MINIMIZING SEDIMENT AND DEBRIS CAUSED BY CONSTRUCTION ACTIVITIES FROM ENTERING THE STREAMBED. NO WHEELED OR TRACKED EQUIPMENT SHALL BE USED IN STREAMBEDS WITHOUT PRIOR APPROVAL OF CO.
 - ESTIMATE OF QUANTITIES ARE FOR CONTRACTOR CONVENIENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL QUANTITIES, VOLUMES AND LENGTHS.
 - THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ANY BURIED UTILITIES PRIOR TO BEGINNING WORK.



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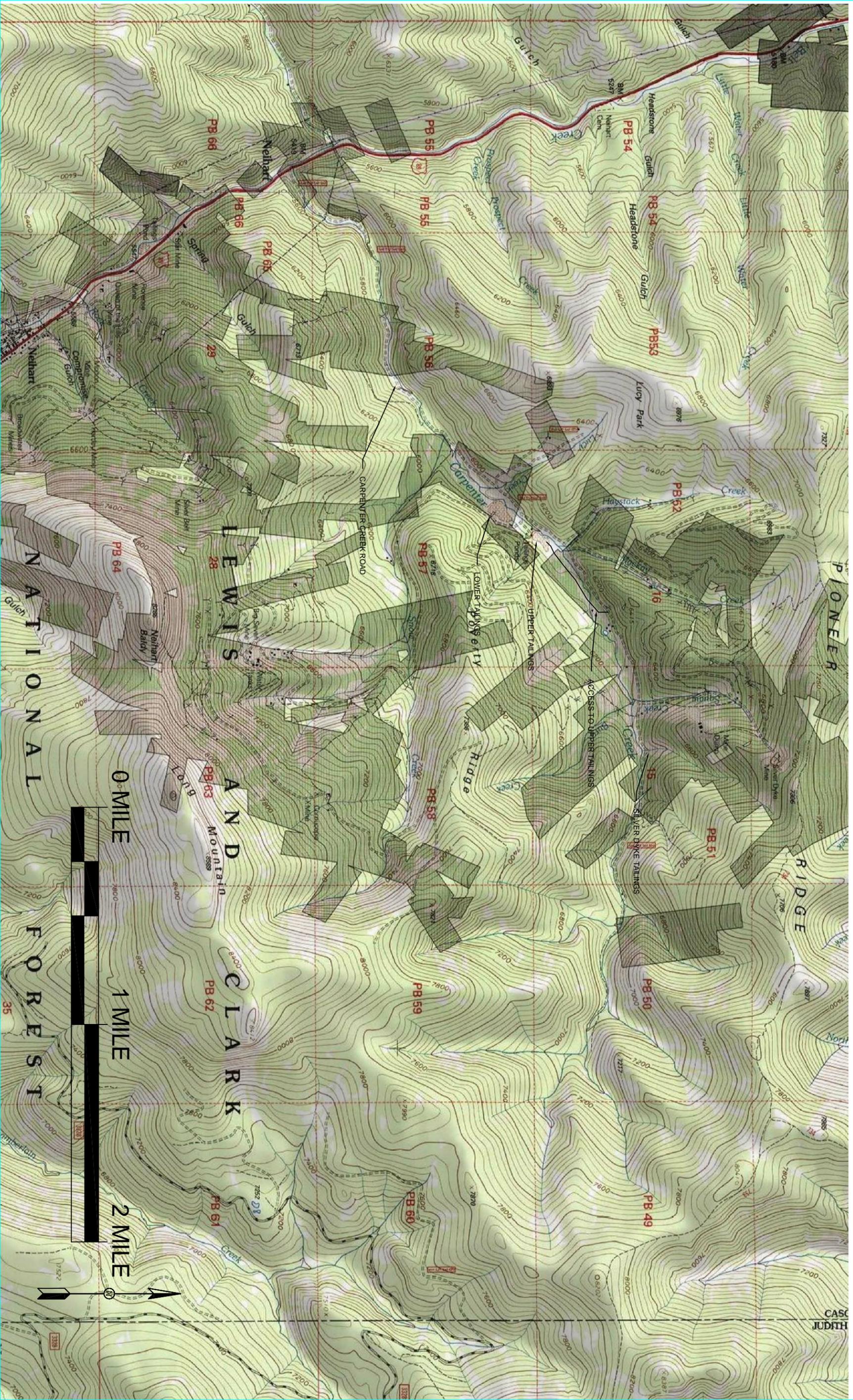
CARPENTER-SNOW CREEK
 DITCH LINER REPAIR

VICINITY MAP

DESIGNED: JNOLAND
 DRAWN: JNOLAND
 CHECKED: RSTOVALL

DATE: 4/13
 DATE: 4/13
 DATE: 4/13

DATE REVISION BY
 DRAWING NAME: VICINITY MAP-DWG
 SHEET: 3





LEGEND

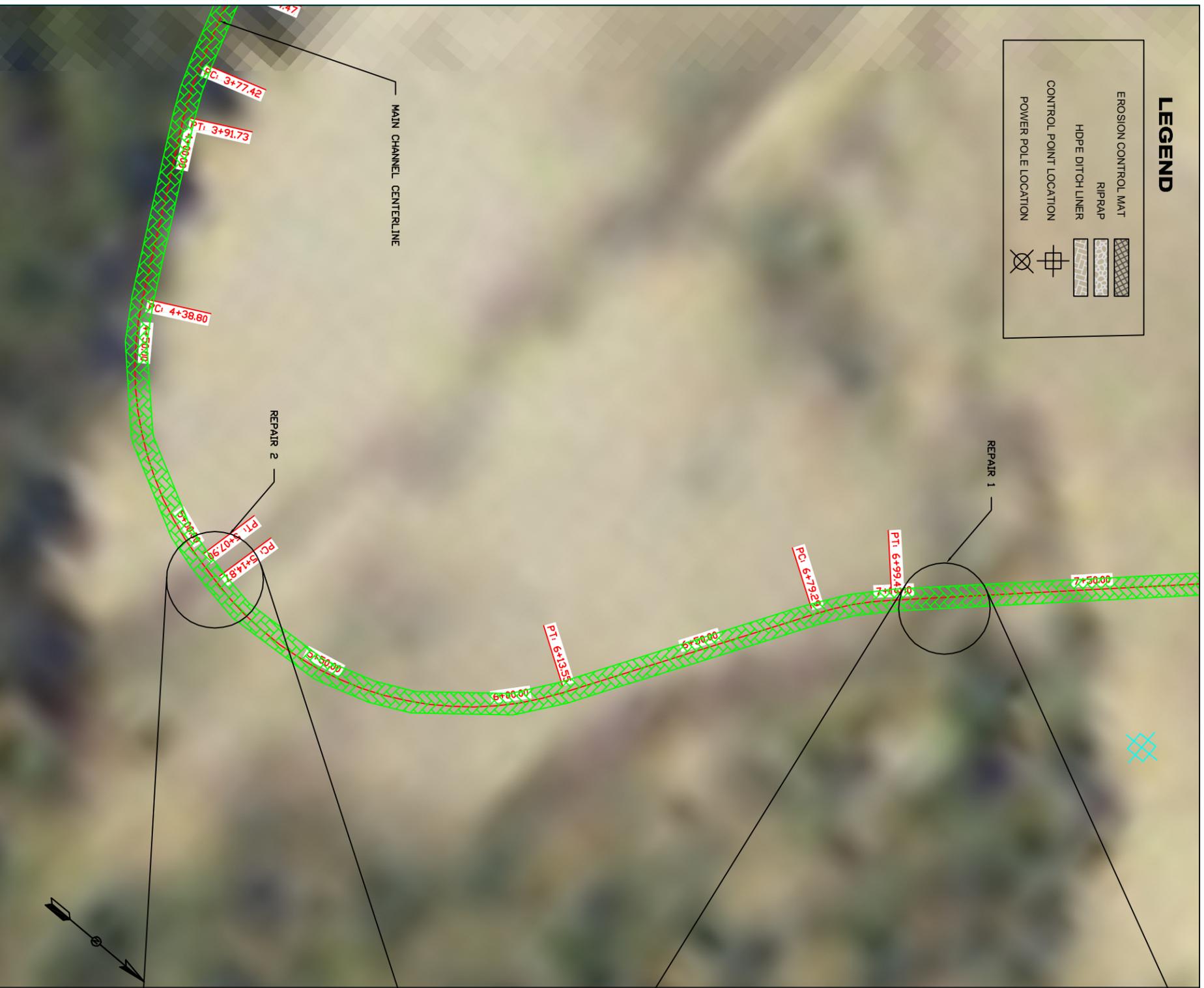
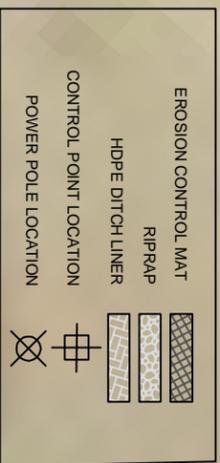
	WARNING SIGN LOCATION
	JACKLEG FENCE LOCATION
	CONTROL POINT LOCATION
	POWER POLE LOCATION
	CHECK DAM LOCATION

CONTROL POINT COORDINATE TABLE*

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP 1	706.51	1154.18	71.61	IRON STAKE
CP 2	867.20	1216.48	63.88	IRON STAKE
CP 3	1287.94	1365.76	64.33	IRON STAKE
CP 4	1308.08	1151.98	87.11	IRON STAKE
CP 5	1081.43	932.11	66.87	IRON STAKE

*LOCAL COORDINATE SYSTEM USED
*UNITS IN FEET

LEGEND



REPAIR 1 WORK ITEMS:

1. WHERE NATURAL CHANNEL INTERCEPTS DITCH LINER, REMOVE SECTION OF SMART DITCH LINER AND REPLACE WITH THE INTERSECTION.
2. INSTALL TWO SECTIONS OF SMART DITCH LINERS (PROVIDED BY GOVERNMENT) PERPENDICULAR TO EXISTING CHANNEL.
3. INSTALL FLARED END SECTION OF SMART DITCH LINER AND CONSTRUCT A RIP RAP LINED PROTECTION SYSTEM PER THE FLARED END SECTION DRAWING DETAIL. UPSTREAM RIP RAPPED WING WALL ALIGNMENTS WILL NEED TO BE ADJUSTED TO FIT THE SPECIFIC SITE.
4. INSTALL STRAW BALES IN COMPLIANCE WITH BMP'S

REPAIR 2 WORK ITEMS:

1. WHERE NATURAL CHANNEL INTERCEPTS DITCH LINER, CONSTRUCT A NEW HDPE LINED RIP RAPPED CHANNEL PER THE FLARED END SECTION/REPAIR 2 DRAWING DETAILS.
2. HDPE LINER IS TO WRAP OVER THE EXISTING SMART DITCH LINER A MINIMUM OF 8 INCHES AND MECHANICALLY FASTENED
3. CHANNEL CONSTRUCTION WILL BE A MINIMUM OF 50 LINEAR FEET AND PARALLEL EXISTING CONTOURS.
4. INSTALL THREE CHECK DAMS IN THE NEWLY CONSTRUCTED CHANNEL PER THE CHECK DAM TYPICAL DRAWING DETAILS.
5. INSTALL STRAW BALES IN COMPLIANCE WITH BMP'S





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GREAT FALLS, MONTANA

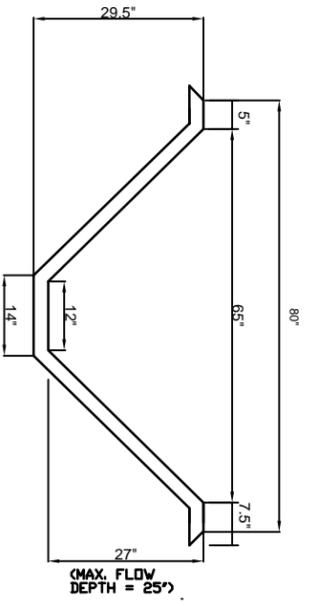
**CARPENTER-SNOW CREEK
DITCH LINER REPAIR**

**HDPE DITCH LINER
TYPICAL DETAILS**

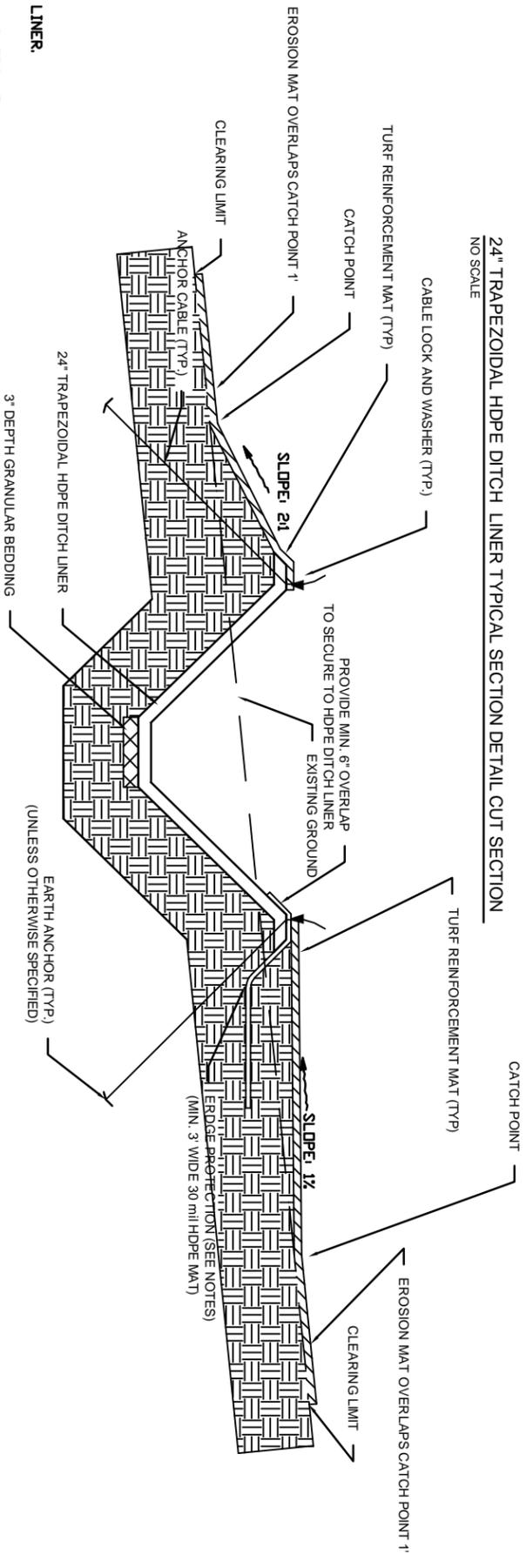
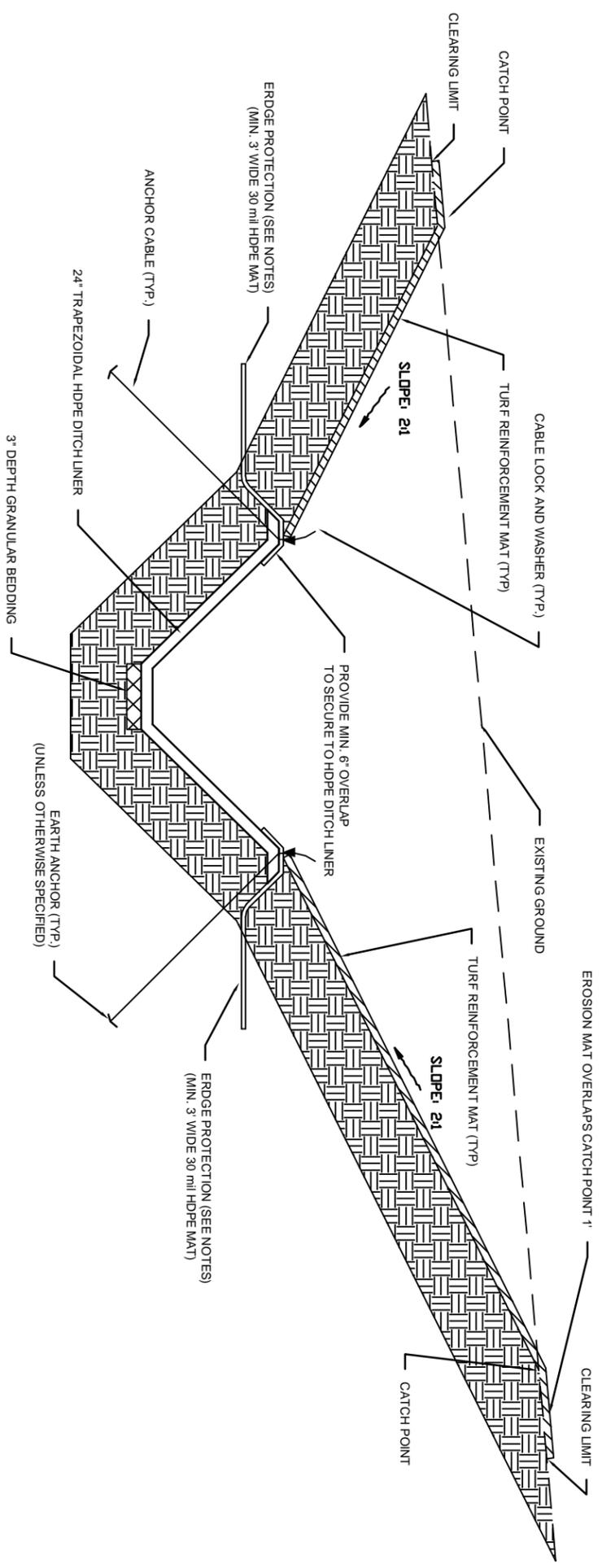
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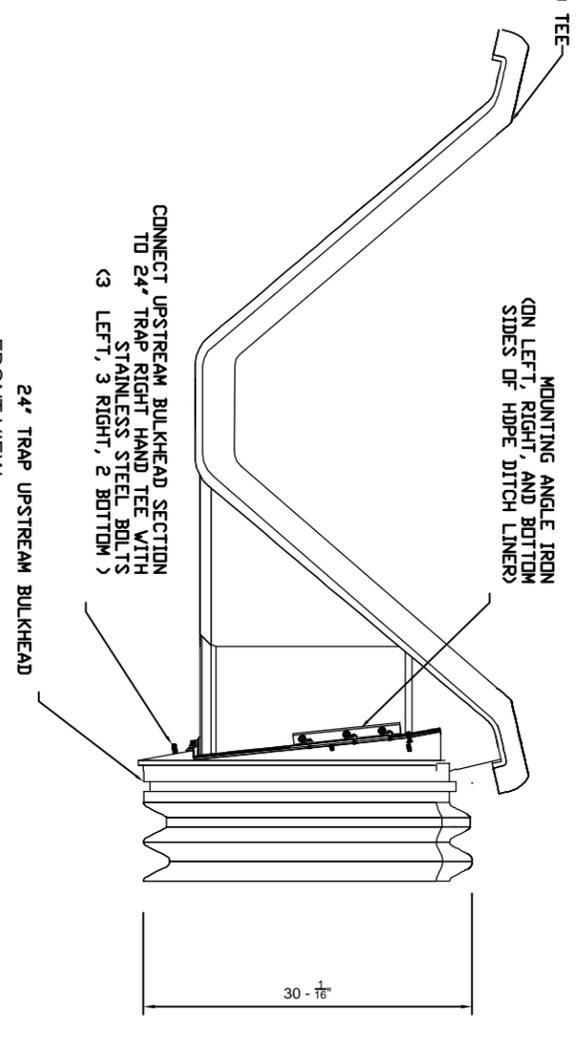
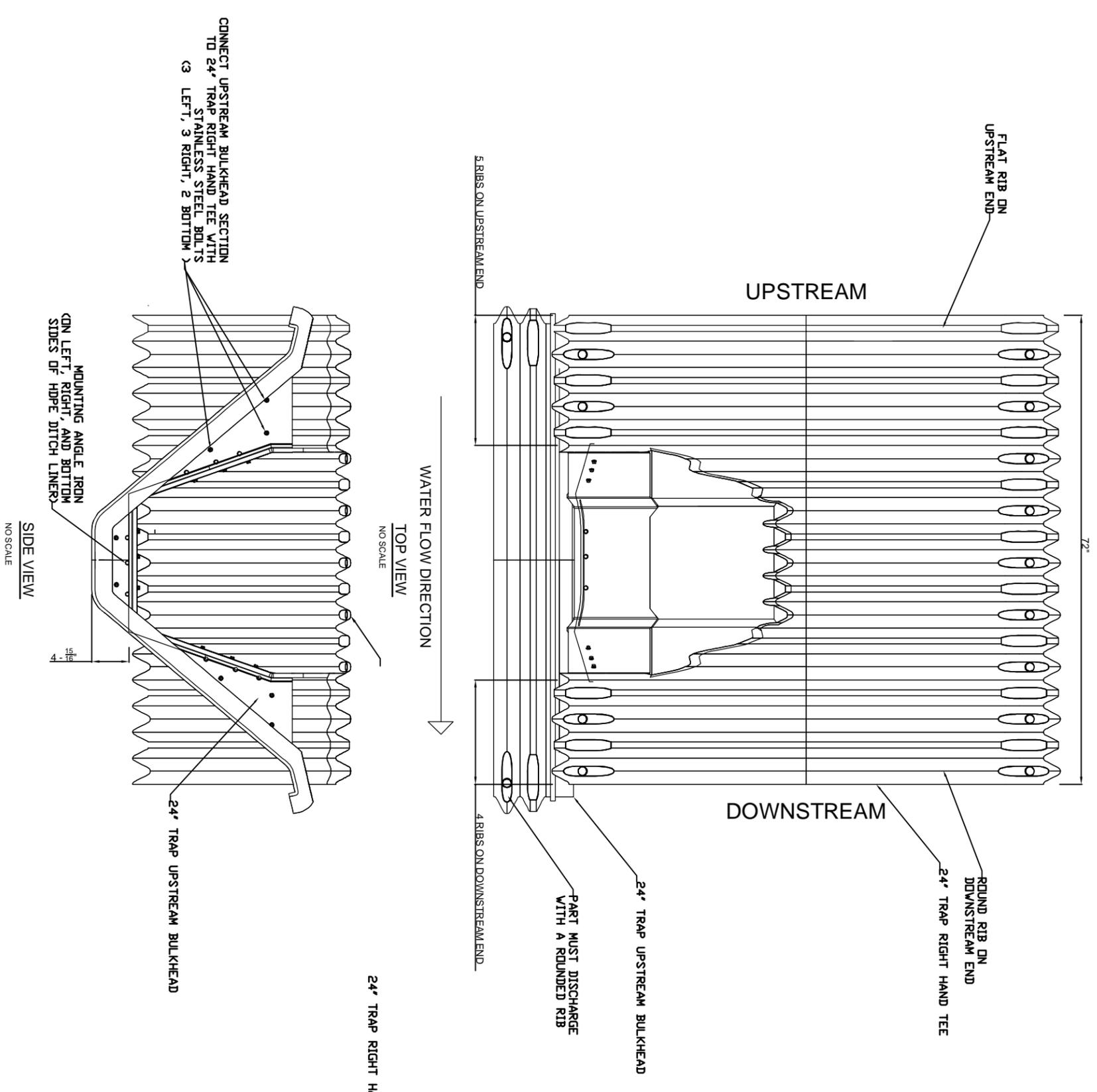
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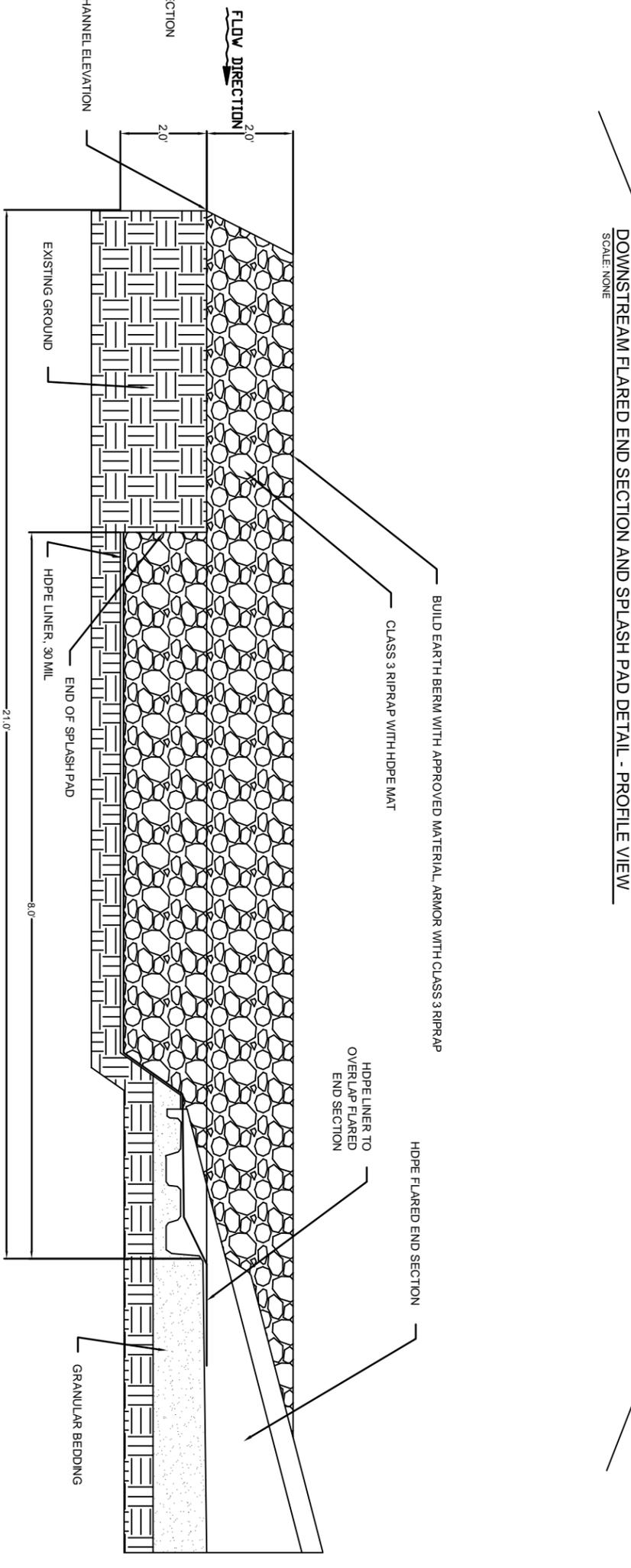
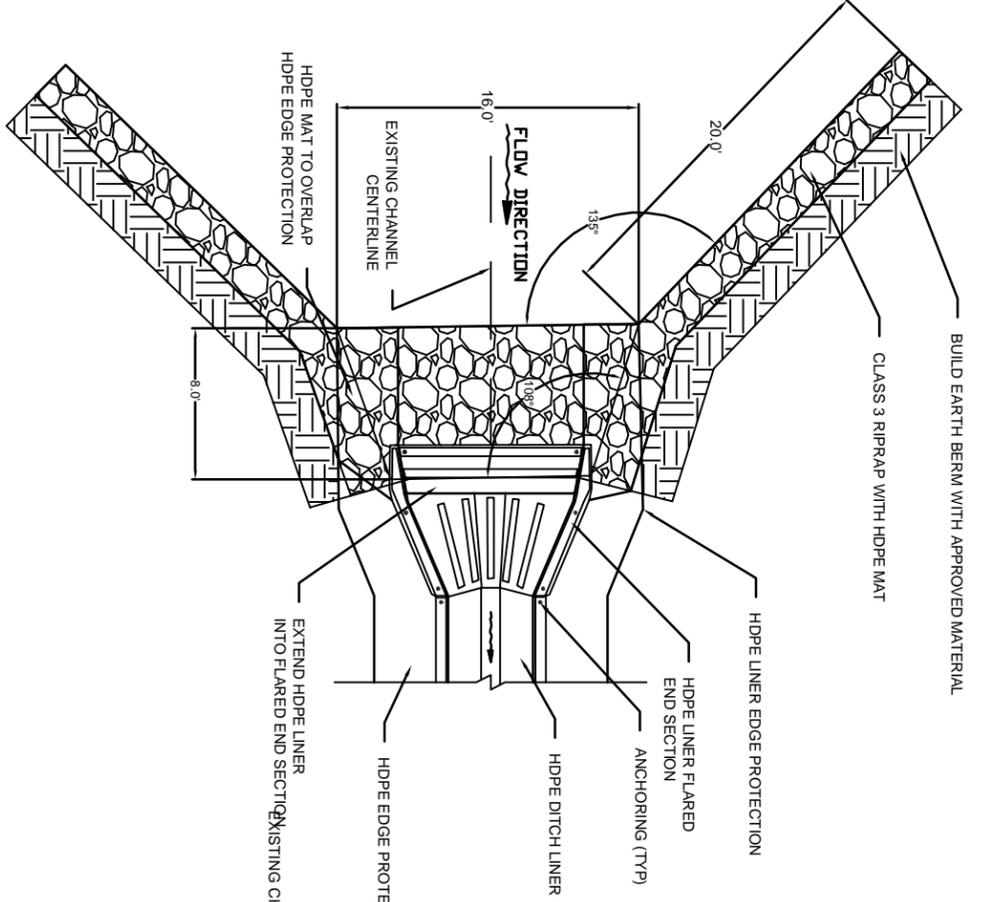
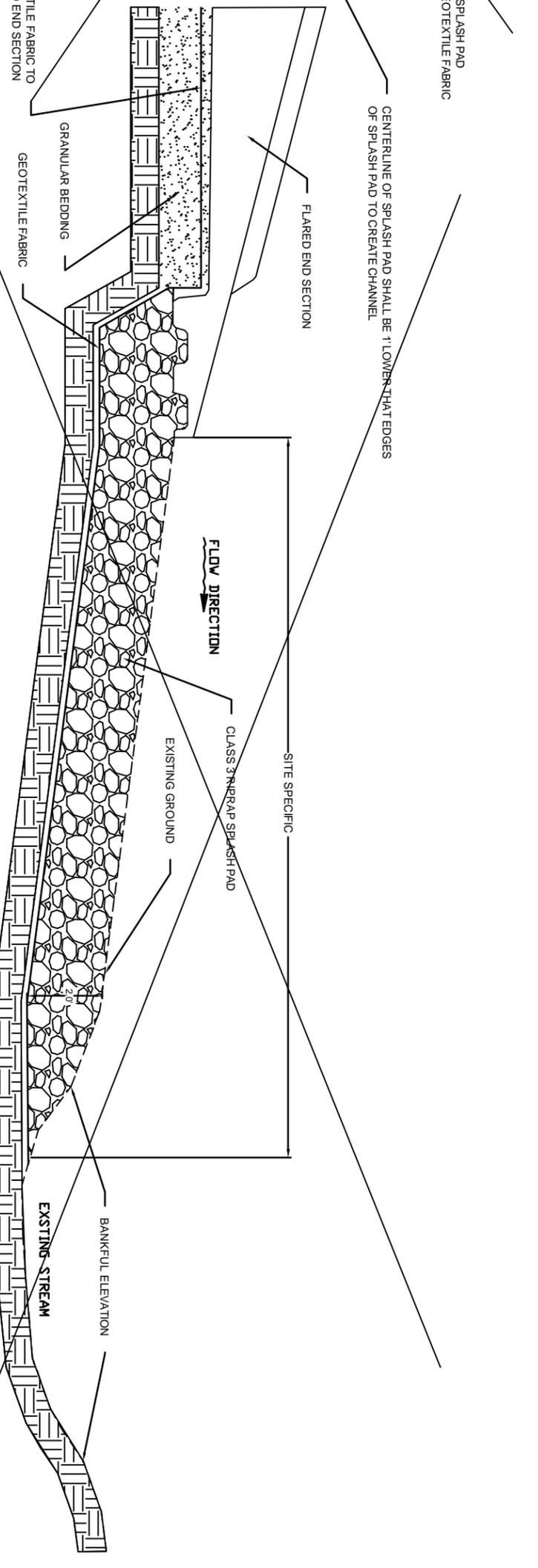
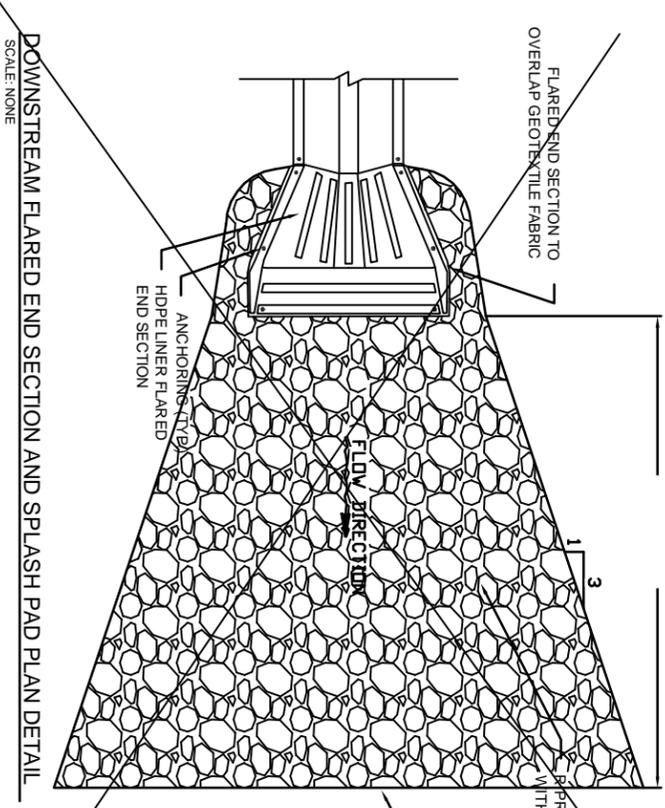
DRAWING NAME
24 INCH TYPICAL.DWG
SHEET **6**



- NOTES:
1. EDGE PROTECTION IS RECOMMENDED WHERE HDPE DITCH LINER RECEIVES LATERAL FLOWS.
 2. USE SELF-TAPPING SCREWS W/ WASHER OR HDPE WELDING TO ATTACH THE HDPE EDGE PROTECTION DIRECTLY TO THE HDPE DITCH LINER. ATTACH EDGE PROTECTION TO EVERY OTHER RB.
 3. TYPICAL INSTALLATION CONSISTS OF 6 ANCHORS PER SECTION (2 ANCHORS AT THE OVERLAP JOINT) WITH A MINIMUM ANCHOR DEPTH OF 30 INCHES.
 5. GRANULAR BEDDING IS REQUIRED A SMOOTH UNIFORM BASE FOR PLACEMENT OF THE HDPE DITCH LINER.
 6. DITCH SHALL BE SHAPED TO THE DIMENSIONS OF THE HDPE DITCH LINER PRIOR TO PLACEMENT.
 7. REFER TO THE HDPE DITCH LINER TECHNICAL MANUAL FOR GENERAL INSTALLATION PRACTICES.







UPSTREAM FLARED END SECTION AND SPLASH PAD DETAIL - PROFILE VIEW - TRIBUTARY 2
NO SCALE

UPSTREAM RIP RAP LINED FLARED END SECTION - PLAN VIEW - TRIBUTARY 2
NO SCALE



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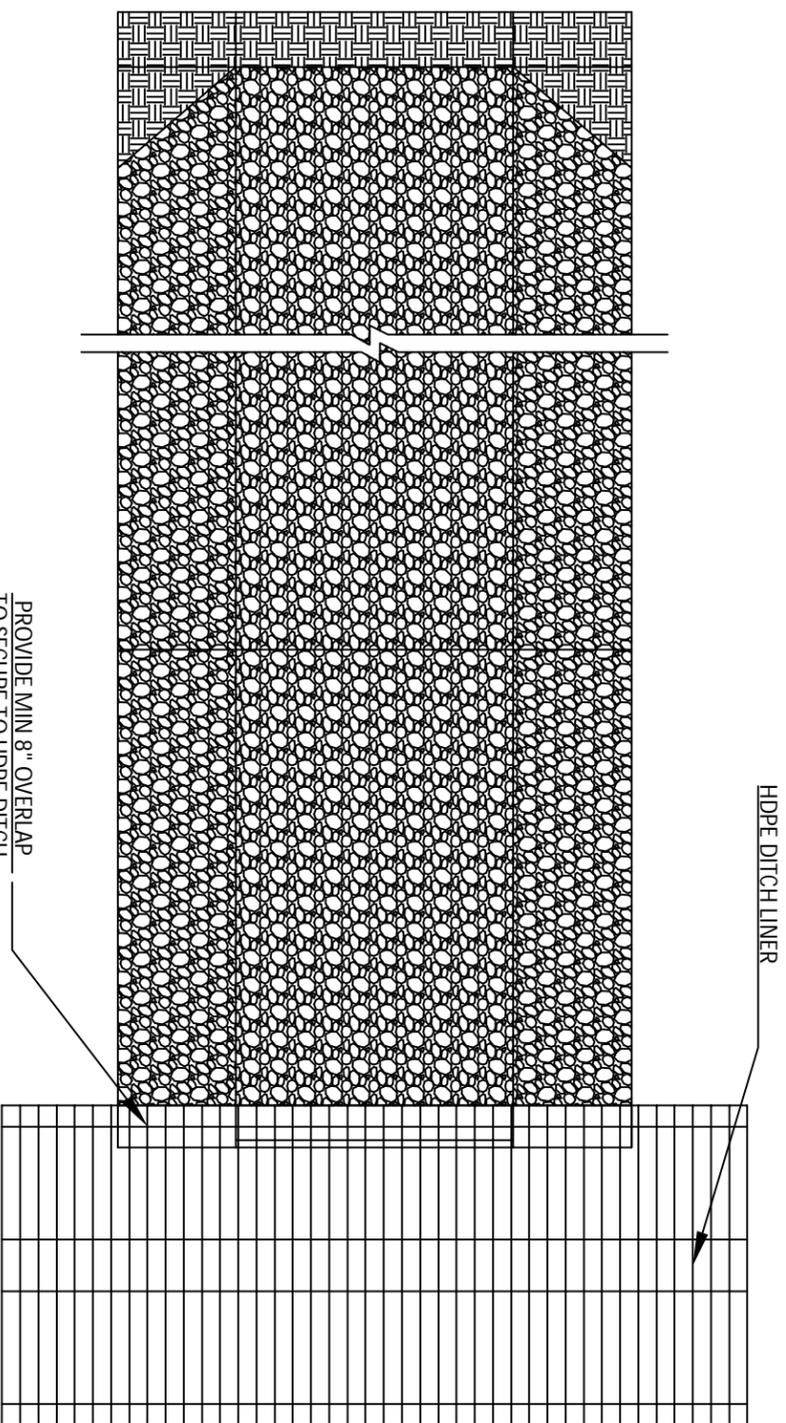
**CARPENTER-SNOW CREEK
DITCH LINER REPAIR**

**HDPE DITCH LINER
FLARED END SECTION/REPAIR 1**

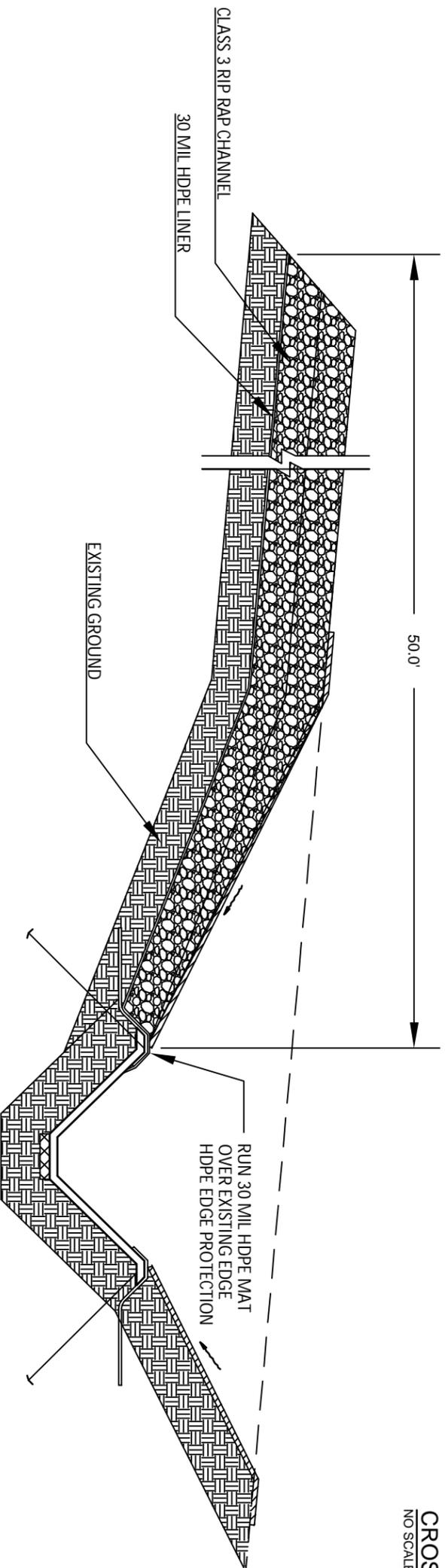
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DRAWN: JNOLAND	DATE: 4/13	DATE: 4/13	
CHECKED: RSTOVALL	DATE: 4/13		

DATE	REVISION	BY
6/14	RSTOVALL	

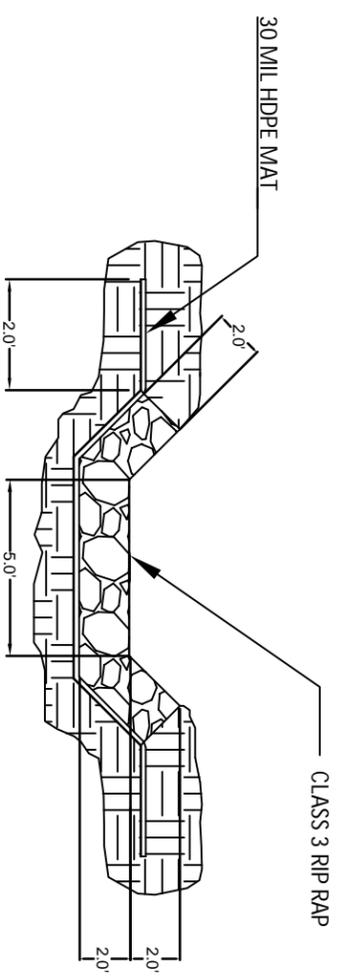
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SHEET: 8



REPAIR 2 PLAN VIEW
NO SCALE

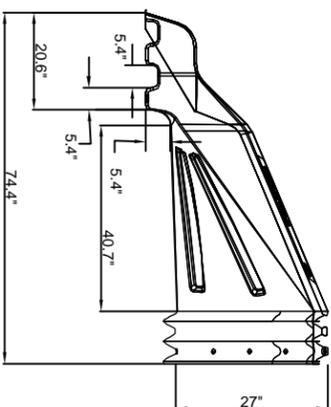


REPAIR 2 RPROFILE VIEW
NO SCALE

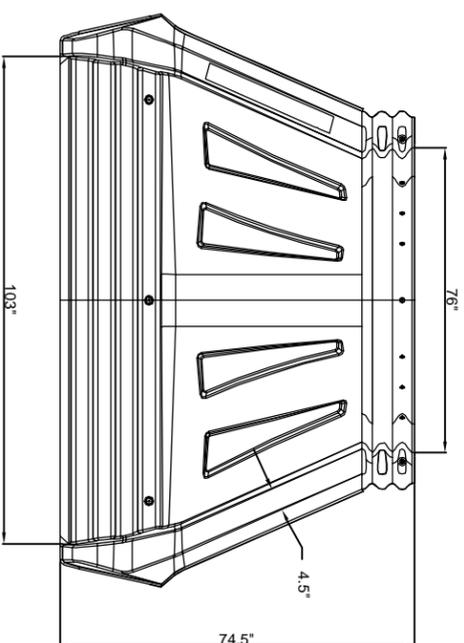


CROSS CHANNEL SECTION VIEW
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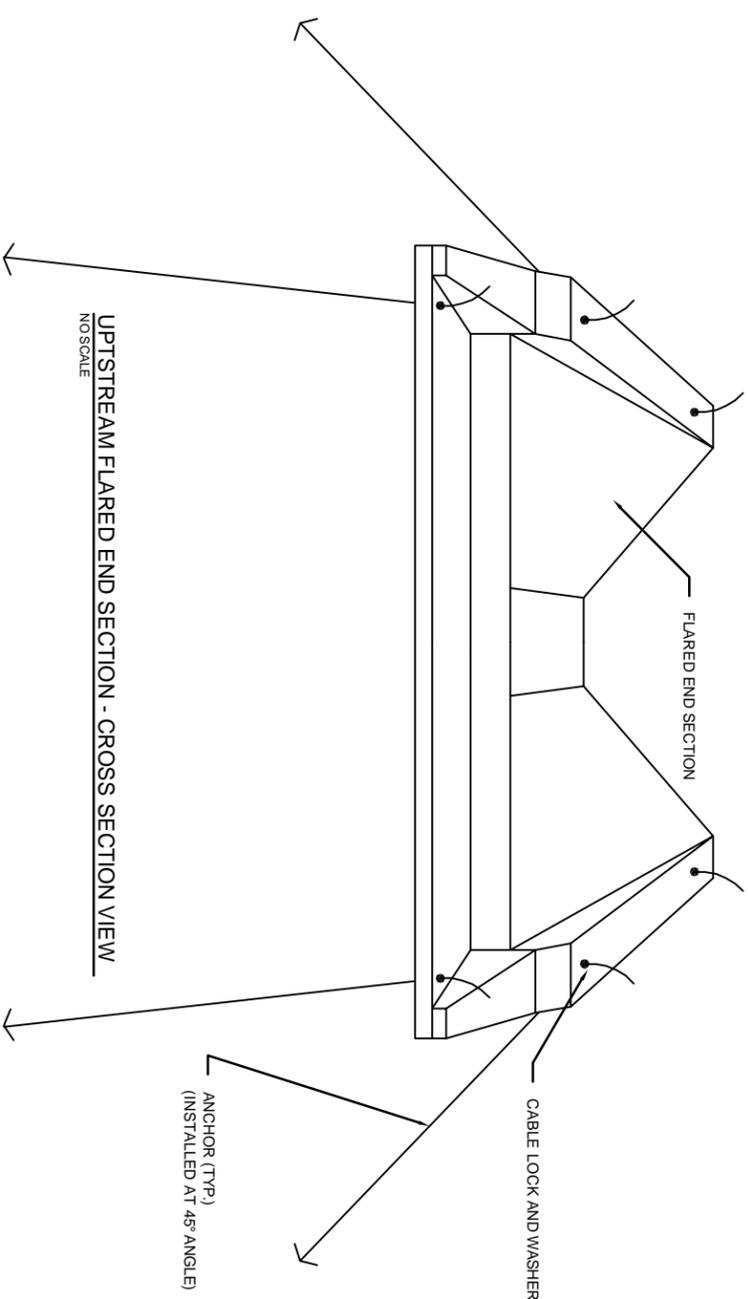
- NOTES:
1. REMOVE UNDERMINED TURF REINFORCEMENT MAT. ASSUME A TOTAL OF 40 LINEAR FEET ALONG DITCH LINER EDGE TO BE REPLACED.
 2. FILL VOIDS AND REESTABLISH COMPACTION BEHIND DITCH LINER USING LOCAL MATERIALS.
 3. RESTORE AFFECTED HDPE EDGE PROTECTION ALONG DITCH LINER
 4. CONSTRUCT NEW 30 MIL HDPE LINED CLASS 3 RIP RAP CHANNEL AND TIE INTO DITCH LINER PER DRAWINGS BELOW
 5. REPLACE TURF REINFORCEMENT MAT BORDERING DITCH LINER WHERE DAMAGED FROM CONSTRUCTION (SEE HDPE DITCH LINER TYPICAL DETAIL DRAWINGS).



24" TRAPEZOIDAL FLARED END SECTION - PROFILE VIEW
NO SCALE

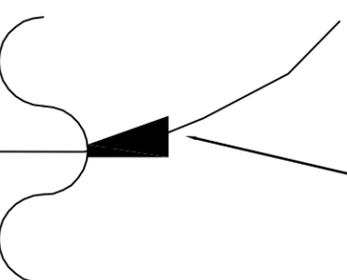


24" TRAPEZOIDAL FLARED END SECTION - PLAN VIEW
NO SCALE

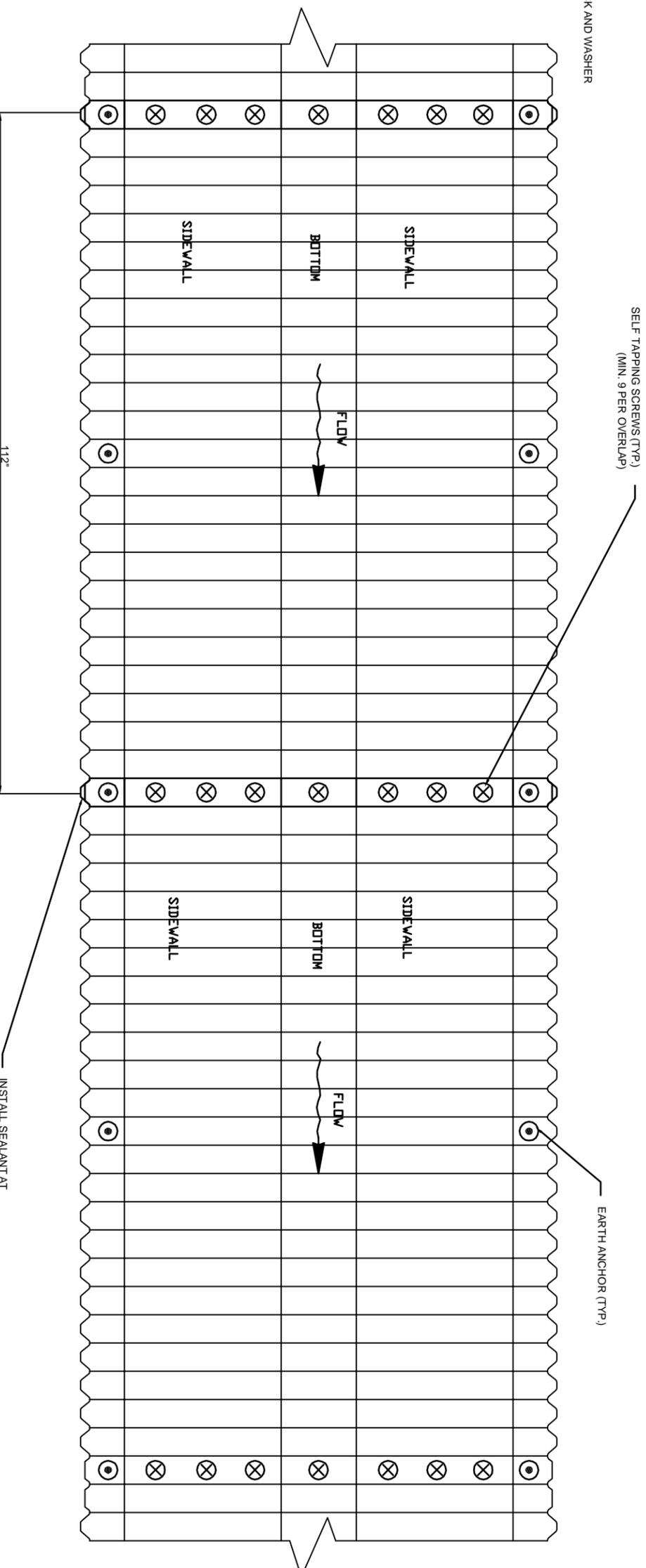


UPSTREAM FLARED END SECTION - CROSS SECTION VIEW
NO SCALE

ANCHOR WITH CABLE LOCK AND WASHER
(ON TOP OF RIBS)



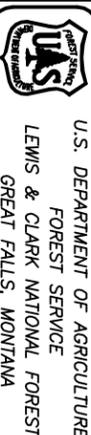
ANCHORING DETAIL
NO SCALE



STANDARD ANCHORING DETAIL
NO SCALE

INSTALL SEALANT AT EACH JOINT (TYP.)

112'



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CARPENTER-SNOW CREEK
DITCH LINER REPAIR

HDPE DITCH LINER
FLARED END/PLAN VIEW TYPICAL

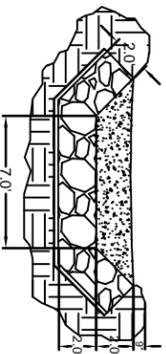
DESIGNED: JNOLAND
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CHECKED: RSTOWALL
DATE: 4/13
DATE: 4/13
DATE: 4/13

DATE	REVISION	BY

DRAWING NAME
24 INCH TYPICAL.DWG
SHEET 10

DESIGN CRITERIA

- KEEP A MAXIMUM HEIGHT OF 2 FEET AT THE CENTER OF THE DAM.
- KEEP THE CENTER OF THE CHECK DAM AT LEAST 9 INCHES LOWER THAN THE OUTER EDGES AT NATURAL GROUND ELEVATION
- KEEP THE SIDE SLOPES OF THE DAM AT 1:1 OR FLATTER
- ENSURE THAT THE MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
- STABILIZE OUTFLOW AREAS ALONG THE CHANNEL TO RESIST EROSION
- KEY THE STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 2 FEET TO AVOID WASHOUT FROM OVERFLOW AROUND THE DAM.



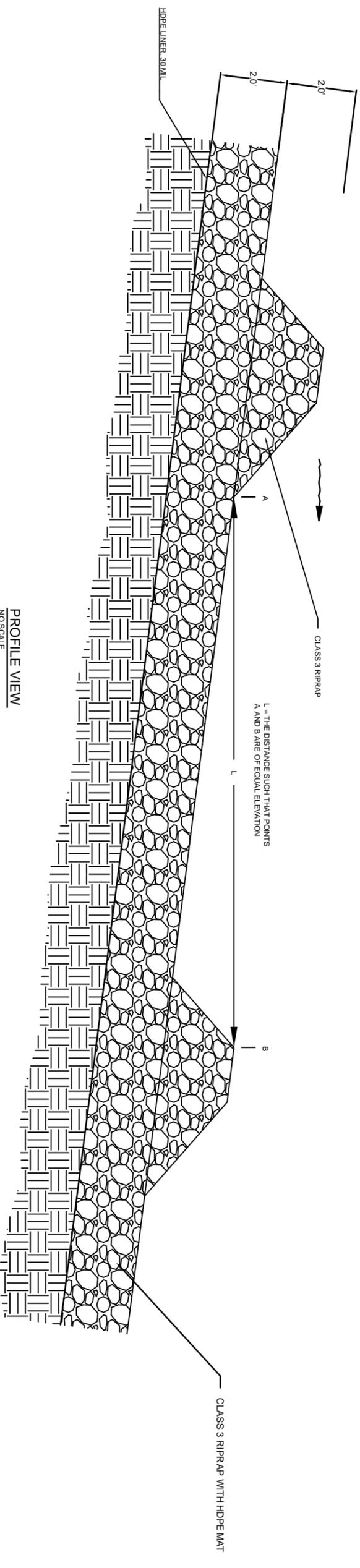
CROSS CHANNEL SECTION VIEW
NO SCALE

PROJECT SPECIFIC NOTES:

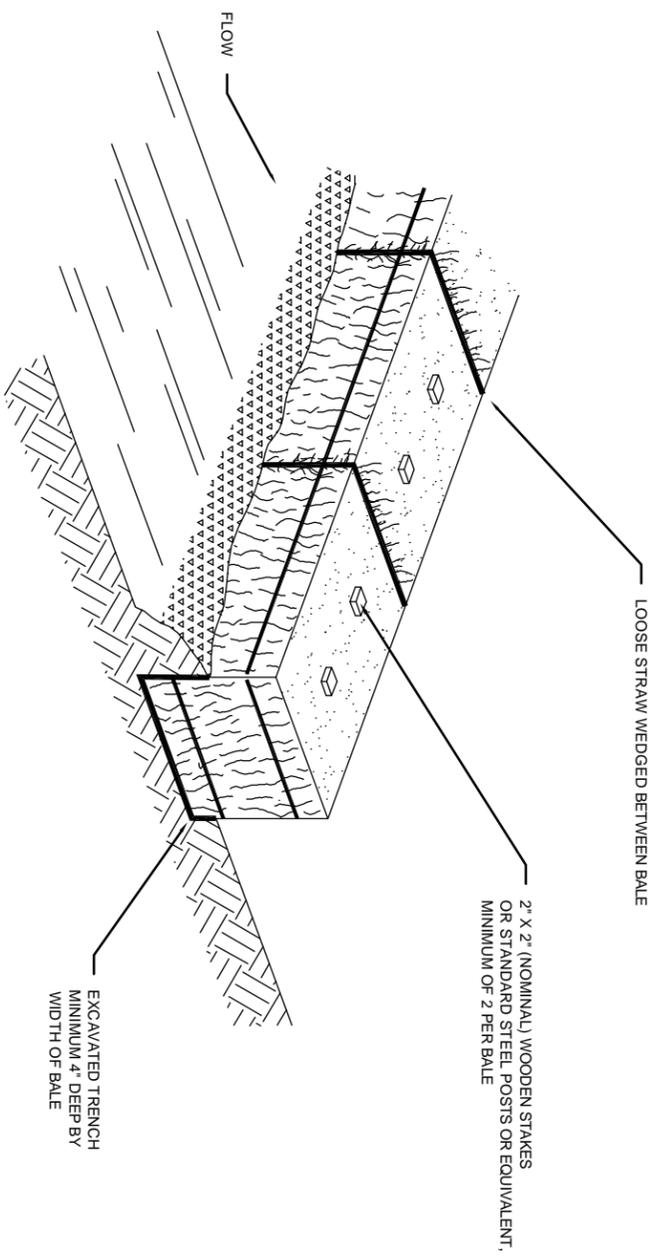
1. KEEP THE CENTER STONE SECTION AT LEAST 9 INCHES BELOW NATURAL GROUND LEVEL WHERE THE DAM ABUTS THE CHANNEL BANKS
2. INSTALL 3 CHECK DAMS TOTAL. USE DETAIL BELOW TO CONTROL PLACEMENT. MAKE SURE THAT THE CANNEL REACH ABOVE THE MOST UPSTREAM IS STABLE
3. ENSURE THAT OTHER AREAS OF THE CHANNEL, SUCH AS CULVERT ENTRANCES BELOW THE CHECK DAMS, ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONES



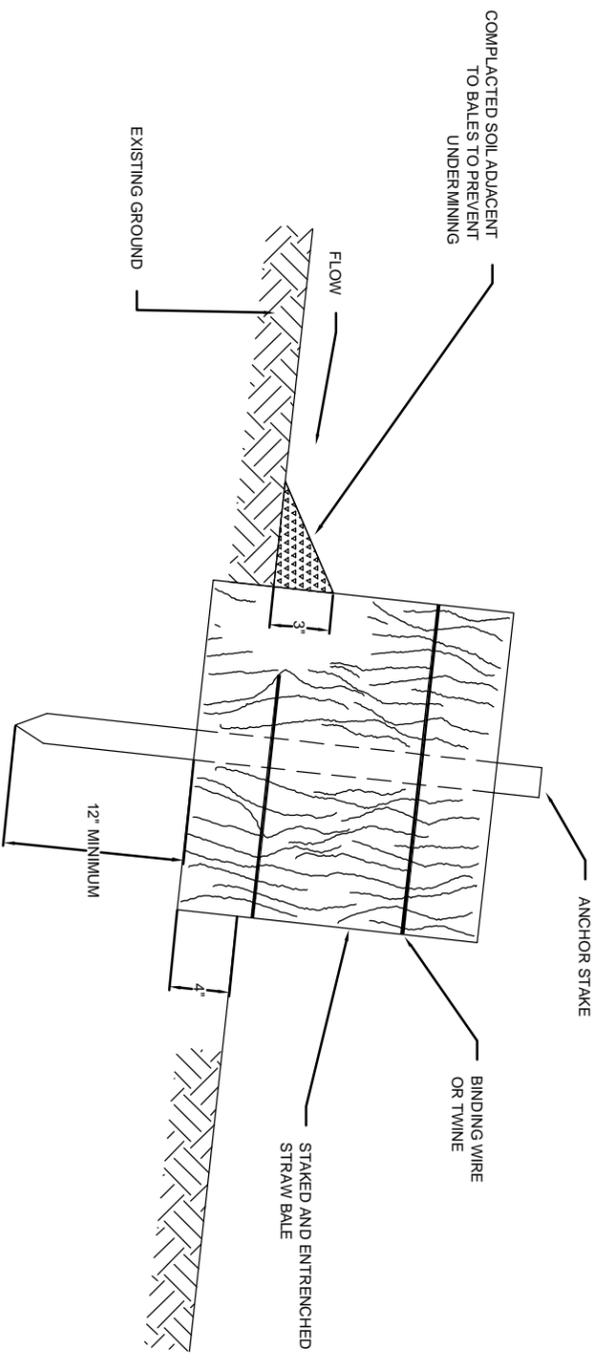
PROFILE CROSS SECTION VIEW
NO SCALE



PROFILE VIEW
NO SCALE

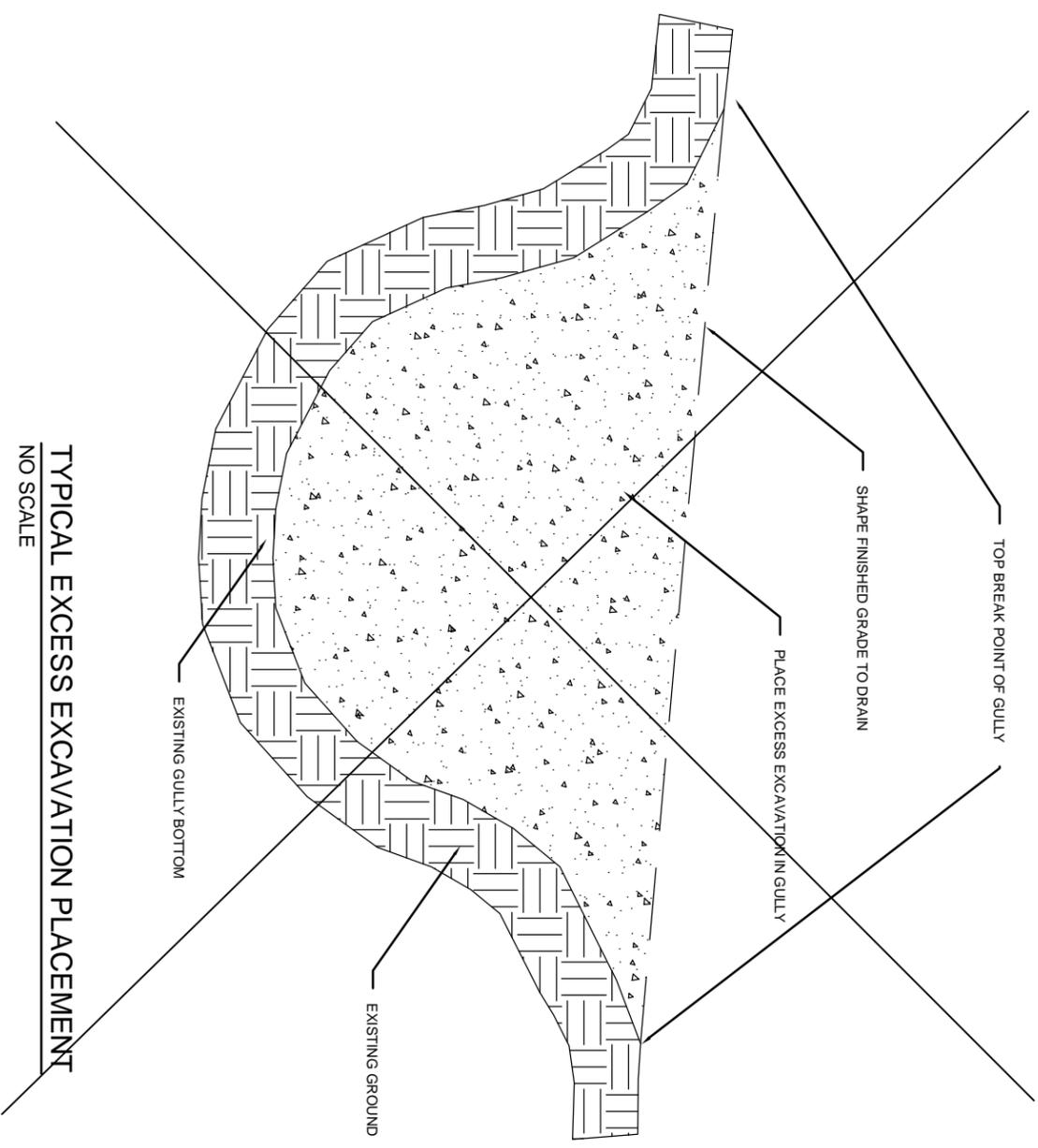


ISOMETRIC VIEW
NO SCALE



TYPICAL SECTION
NO SCALE

- NOTES:
1. THE STRAW BALES SHALL BE BUTTED TOGETHER AS TIGHTLY AS POSSIBLE.
 2. THE FIRST ANCHOR STAKE SHALL BE DRIVEN TOWARD THE PREVIOUSLY ANCHORED BALE TO HELP CREATE A TIGHT FIT.



TYPICAL EXCESS EXCAVATION PLACEMENT
NO SCALE

DESIGNED:	JNOLAND	DATE:	4/13
DRAWN:	JNOLAND	DATE:	4/13
CHECKED:	RSTOWALL	DATE:	4/13

DATE	REVISION	BY