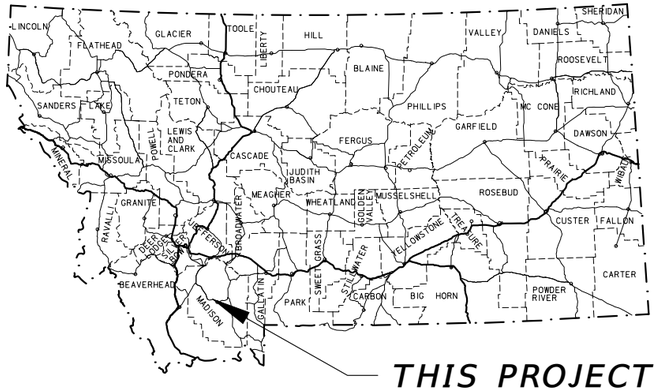
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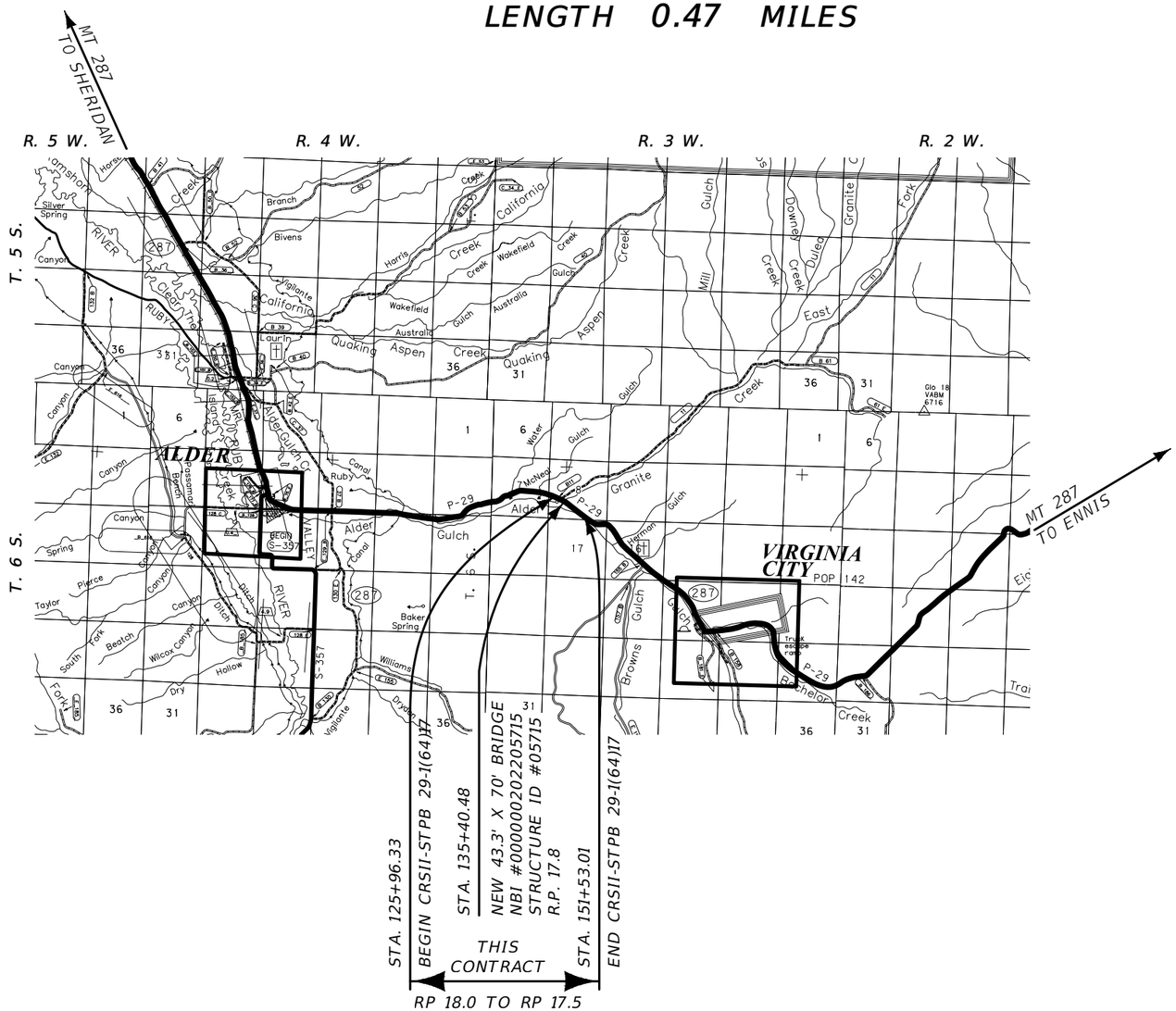
MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17
BRIDGE REPLACEMENT
GRANITE CR - 3M NW VIRGINIA CITY
MADISON COUNTY

PROJECT DESIGN DATA	
PRESENT 2020	A.D.T. = 1,310
LETTING 2022	A.D.T. = 1,350
DESIGN 2042	A.D.T. = 1,780
	D.H.V. = 220
	TRUCKS = 7.3%
	V. = 45 MPH
	18 KIP ESAL'S = 36
	GROWTH RATE = 1.4%

SURFACING SOURCES -
CONTRACTOR FURNISHED

LENGTH 0.47 MILES



PLANS PREPARED BY

GreatWest ENGINEERING
2501 BELT VIEW DRIVE
HELENA, MT 59601
(406)449-8627

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R / W & I.C.	STPB 29-1(71)17
P. E.	STPB 29-1(63)17

GREAT WEST ENGINEERING

DocuSigned by:
Jonathan Weaver
4831B87D2F5D482...
DATE 12/16/2022

JONATHAN ROBERT WEAVER 29128PE
MONTANA PROFESSIONAL ENGINEER LICENSED

MONTANA DEPARTMENT OF TRANSPORTATION

RECEIVED :
DocuSigned by:
Kelly Williams
6826FEC785E2478...
KELLY LAKE, DESIGN ENGINEER
12/16/2022
DATE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

DIVISION ADMINISTRATOR — DATE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdTTLz01.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022	
1		2:00 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	UPN 8932000

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BASIS OF PLAN QUANTITIES

(QUANTITIES FOR ESTIMATING PURPOSES ONLY)

COMP. AGGREGATE WEIGHT	= 3700 LBS. PER CUBIC YARD
COMP. WEIGHT OF PL. MIX BIT. SURF.	= 3855 LBS. PER CUBIC YARD
ASPHALT CEMENT - GRADE S - 3/4" AGG.	= 5.4% OF PL.MIX BIT.SURF.
BITUMINOUS MATERIAL	= 8.5 LBS. PER GAL.
EMULSIFIED ASPHALT - TACK (ALL OTHER SURFACES)	= 0.05 GAL. PER SQ.YARD (UNDILUTED)
EMULSIFIED ASPHALT - FOG SEAL (RUMBLE STRIPS)	= 0.10 GAL. PER SQ.YARD (UNDILUTED)
SEAL	= 0.42 GAL. PER SQ.YARD
COVER	= 25 LBS. PER SQ.YARD

CLEARING AND GRUBBING

CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR EMBANKMENT IN-PLACE.

PUBLIC LAND SURVEY MONUMENTS

ALL MONUMENTS TO BE REMOVED AND RELOCATED OR RESET BY STATE FORCES.

STATIONING - REFERENCE POSTS

STATIONING ON THIS PROJECT RUNS FROM WEST TO EAST. REFERENCE POSTS RUN FROM EAST TO WEST.

NOTES

SOILS INFORMATION

SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION. THE LOCATION OF GEOTECHNICAL BORINGS AND TEST PITS ARE SHOWN ON THE PLAN VIEW WITH THE FOLLOWING SYMBOLS:

BORING NUMBER (GEOTECHNICAL BORING)

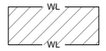
TEST PIT NUMBER (GEOTECHNICAL TEST PIT)

UTILITIES

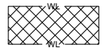
CALL THE UTILITIES UNDERGROUND LOCATION CENTER (811) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICE BEFORE EXCAVATING. ALL CLEARANCES OR DEPTHS PROVIDED FOR UTILITIES ARE FROM EXISTING GROUND LINE.

WETLANDS

WETLANDS MAY EXIST ADJACENT TO THE ROADWAY AND MAY EXIST BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMANENT WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS OUTSIDE OF THE PERMANENT IMPACT AREAS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR.

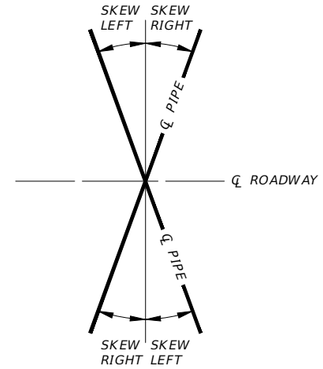


DELINEATED WETLAND AREAS



PERMANENT WETLAND IMPACTED AREAS

SKEW DIAGRAM



WETLAND DELINEATION TABLE

WETLAND DESIGNATION	STATION FROM	STATION TO	WETLAND AREA (acres) DELINEATED AREA	WETLAND AREA (acres) PERMANENT IMPACTED AREA	REMARKS
WL-3ct	120+01	127+87	3.441	0.000	#
WL-4	120+01	156+41	6.313	0.397	#
WL 3c	126+97	133+23	4.535	0.477	
WL-2b	131+93	133+13	0.042	0.002	
WL 2c	132+96	137+51	2.515	0.130	#
WL-3b	133+14	136+13	0.942	0.333	
WL-2a	133+59	145+81	3.289	0.001	#
WL-1b	133+99	136+73	1.508	0.000	#
WL-3a	135+95	144+96	2.132	0.977	
WL 1c	137+48	145+31	14.116	0.016	#
WL-1a	139+18	144+82	4.736	0.000	#
TOTAL			43.57	2.33	

AREA OF EXISTING WETLAND EXTENDS BEYOND PLAN LIMITS

APPROACHES (FOR INFORMATION ONLY)

STATION	TYPE	linear feet WIDTH	linear feet RADIUS # LEFT	linear feet RADIUS # RIGHT	linear feet LENGTH	EXISTING SURFACING	feet PMS THK.	feet CAC/CTS THK.	PROPOSED SURFACE	tons PLANT MIX BIT. SURF. COMM. PG 64-28	cu. yards CRUSHED AGG. COURSE	cu. yards CR. TOP SURF. (MODIFIED) ##	gal. EMULSIFIED ASPHALT TACK	sq. yards AGG. TREAT.	REMARKS
133+10.00	PUBLIC	24	SEE DETAIL		358.8	GRAVEL	SEE TYPICAL SECTIONS		GRAVEL	94	129	190	21	1,163	PUBLIC APPROACH LT
137+30.00	FARM FIELD	24	25	25	96.2	GRAVEL	0.2	0.6	GRAVEL	8	12	46	3	59	FARM FIELD APPROACH RT
144+84.80	FARM FIELD	24	25	25	115.4	GRAVEL	0.2	0.6	GRAVEL	7	12	56	3	58	FARM FIELD APPROACH LT
SUBTOTAL										109	153	292	27	1,280	

ALL RADII MEASURED TO FRONT OF GUTTER OR EDGE OF SHOULDER
SEE SPECIAL PROVISIONS

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LINEAR AND LEVEL DATA

LENGTH OF ROADWAY	2 LANE RURAL	2,556.68 ft
LENGTH OF BRIDGE	2 LANE RURAL	70.00 ft
TOTAL LENGTH OF	CRSII-STPB 29-1(64)17	2,486.68 ft

BEARING SOURCE

GRID - MONTANA COORDINATE SYSTEM NAD83-2011

LEVEL DATUM SOURCE

NAVD88 GEOID12A (GNSS DERIVED ELEVATIONS HOLDING THE NAVD88 ELEVATION AT POINT F8932 FROM CONTROL SET BY MDT PERSONNEL)

CENTERLINE ALIGNMENT COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
120+01.22	POT	402,574.897	1,323,968.632	BEGIN ALIGNMENT
125+03.33	PC	402,438.936	1,324,451.983	BEGIN CONNECTION
125+96.33	POC	402,412.955	1,324,541.278	BEGIN CRSII-STPB 29-1(64)17
135+04.90	POC	402,076.840	1,325,384.149	BRIDGE END
135+76.03	POC	402,044.392	1,325,447.452	BRIDGE END
150+97.73	PT	401,155.001	1,326,675.488	
151+53.01	POT	401,116.397	1,326,715.051	END CRSII-STPB 29-1(64)17
152+80.08	PC	401,027.651	1,326,806.003	END CONNECTION
156+41.00	POC	400,800.297	1,327,085.673	END ALIGNMENT

GRANITE CREEK ROAD ALIGNMENT COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
9+50.00	POT	402,115.807	1,325,187.688	BEGIN ALIGNMENT
10+16.16	POT	402,175.963	1,325,215.228	BEGIN APPROACH
10+36.45	PC	402,194.412	1,325,223.674	
11+78.41	PT	402,310.418	1,325,304.200	
13+26.40	PC	402,415.184	1,325,408.724	
13+75.00	POC	402,451.238	1,325,441.284	END APPROACH
14+31.13	PT	402,496.656	1,325,474.213	END ALIGNMENT

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CONTROL DIAGRAM

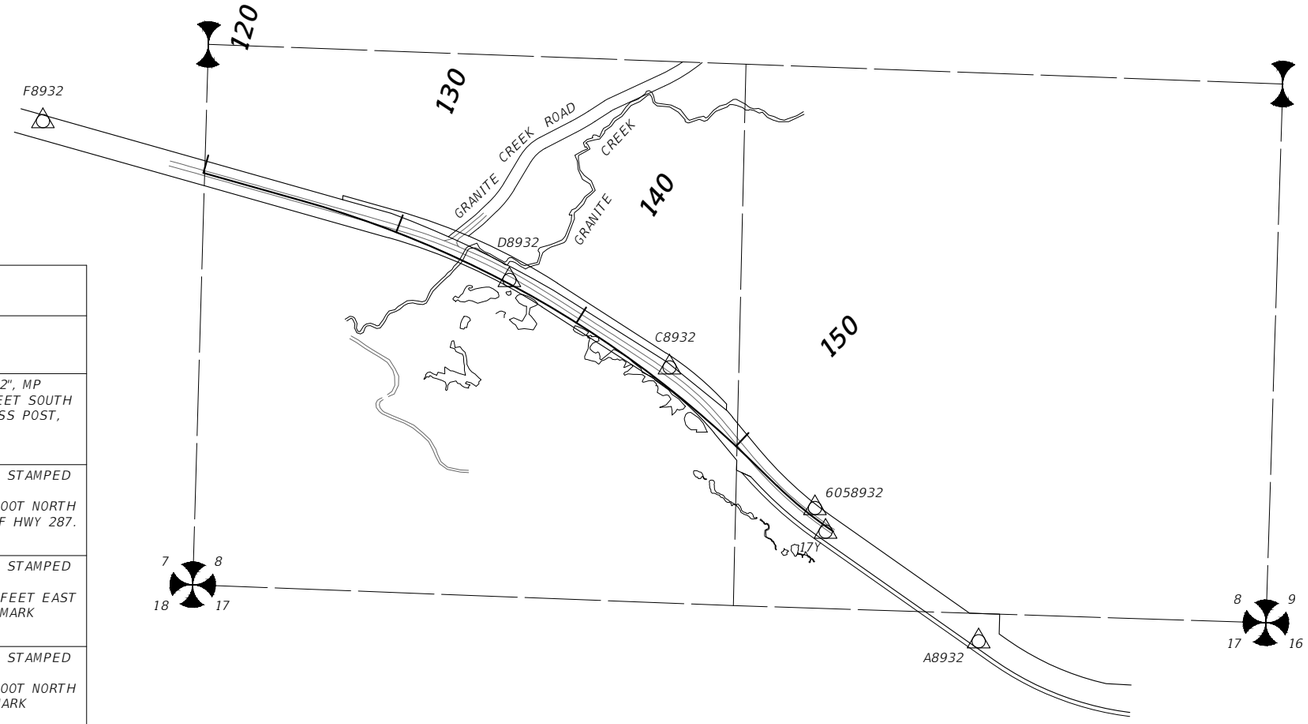
SCALE: 1" = 750'

NOTE: THIS PROJECT IS ON THE MONTANA COORDINATE SYSTEM NAD83-2011. NORTHING AND EASTING COORDINATES ARE EXPRESSED IN UNITS OF INTERNATIONAL FEET AND ELEVATIONS ARE IN UNITS OF U.S. SURVEY FEET.

DIMENSIONS SHOWN ON THE PLANS ARE GRID. ALL SURVEY AND STAKING REQUIRE THE USE OF A COMBINATION SCALE FACTOR (CSF) TO CONVERT GRID DIMENSIONS TO GROUND DIMENSIONS (GRID DISTANCE / CSF = GROUND DISTANCE). THE CSF FOR THIS PROJECT IS 0.99956394

T. 6 S. R. 3 W.

SEC. 8



CONTROL ABSTRACT

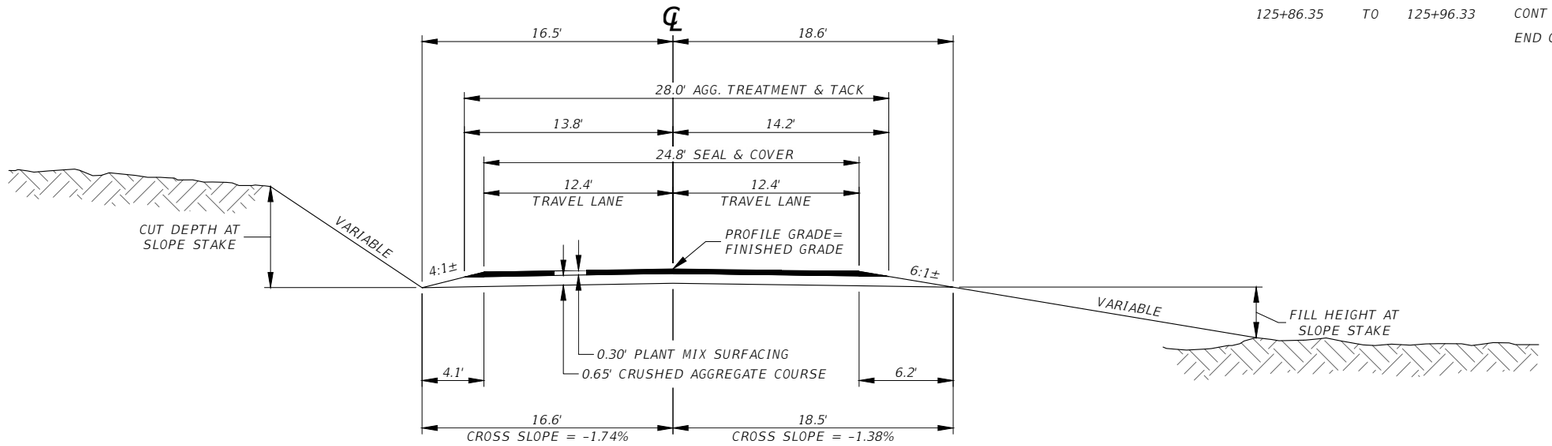
POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
17Y	400,799.406	1,327,048.376	5,450.94	FOUND 2" MDT ALUMINUM CONTROL CAP STAMPED "17Y 1992", MP 17.45 OF HWY 287, 22 FEET SOUTH OF CENTERLINE, 14 FEET SOUTH OF EDGE OF PAVEMENT, 1 FOOT NORTH OF AN MDT WITNESS POST, MARK LOCATED ON SOUTH SIDE OF HWY 287.
A8932	400,256.827	1,327,806.161	5,461.68	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "A8932 2018", MP 17.24 OF HWY 287, 32 FEET SOUTH OF CENTERLINE, 24 FEET SOUTH OF EDGE OF PAVEMENT, 1 FOOT NORTH OF WITNESS POST, MARK LOCATED ON THE SOUTH SIDE OF HWY 287.
C8932	401,612.346	1,326,275.636	5,428.10	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "C8932 2018", MP 17.66 OF HWY 287, 33 FEET NORTH OF CENTERLINE, 21 FEET NORTH OF EDGE OF PAVEMENT, 14 FEET EAST OF APPROACH, 1 FOOT SOUTH OF AN MDT WITNESS POST, MARK LOCATED ON NORTH SIDE OF HWY 287.
D8932	402,045.279	1,325,483.425	5,418.60	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "D8932 2018", MP 17.81 OF HWY 287, 30 FEET SOUTH OF CENTERLINE, 18 FEET SOUTH OF EDGE OF PAVEMENT, 1 FOOT NORTH OF AN MDT WITNESS POST, 5 FEET EAST OF APPROACH, MARK LOCATED ON SOUTH SIDE OF HWY 287.
F8932	402,831.404	1,323,174.275	5,419.07	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "F8932 2018", MP 18.23 OF HWY 287, 32 FEET NORTH OF CENTERLINE, 20 FEET NORTH OF EDGE OF PAVEMENT, 1 FOOT SOUTH OF AN MDT WITNESS POST, 9 FEET EAST OF GRAVEL ROAD MARK LOCATED ON NORTH SIDE OF HWY 287.
G8932	403,015.108	1,322,198.002	5,398.17	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "G8932 2018", MP 18.45 OF HWY 287, 28 FEET NORTH OF CENTERLINE, 16 FEET NORTH OF EDGE OF PAVEMENT, 1 FOOT SOUTH OF AN MDT WITNESS POST, MARK LOCATED ON NORTH SIDE OF HWY 287.
H8932	402,928.914	1,321,362.257	5,376.53	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "H8932 2018", MP 18.60 OF HWY 287, 27 FEET SOUTH OF CENTERLINE, 15 FEET SOUTH OF EDGE OF PAVEMENT, 6 FEET EAST OF APPROACH , 1 FOOT NORTH OF AN MDT WITNESS POST, MARK LOCATED ON SOUTH SIDE OF HWY 287.
6058932	400,915.975	1,326,996.002	5,449.67	FOUND 5/8"x30" REBAR W/ 2" MDT ALUMINUM CONTROL CAP STAMPED "6058932 2018", MP 17.45 OF HIGHWAY 287, 40.7 FEET NORTH OF CENTERLINE OF HIGHWAY 287, 31.5 FEET SOUTH OF HIGHWAY STATION MARKER 155, MARK LOCATED ON NORTH SIDE OF HIGHWAY 287.

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TYPICAL SECTION NO. 1

MAINLINE - CONN. TO PTW



125+03.33			BEGIN CONNECTION
125+03.33	TO	125+86.35	TRANS TYP NO 1 TO TYP NO 2
125+86.35			2% RT
125+86.35	TO	125+96.33	CONT TRANS TYP NO 1 TO TYP NO 2, 2% RT
			END CONNECTION

QUANTITIES

UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
	COVER	PLANT MIX	CR. AGG. COURSE			ASPHALT CEMENT	SEAL	AGG. TREATMENT	EMULSIFIED ASPHALT TACK**
AREA square feet		8.02	20.49		square yards PER STATION		275	319	319
cubic yards PER STATION		29.7	75.9		tons PER STATION	3.09	0.49		
tons PER STATION		57.2			gallons PER STATION				16
square yards PER STATION	275								

** BASED ON 1 APPLICATION

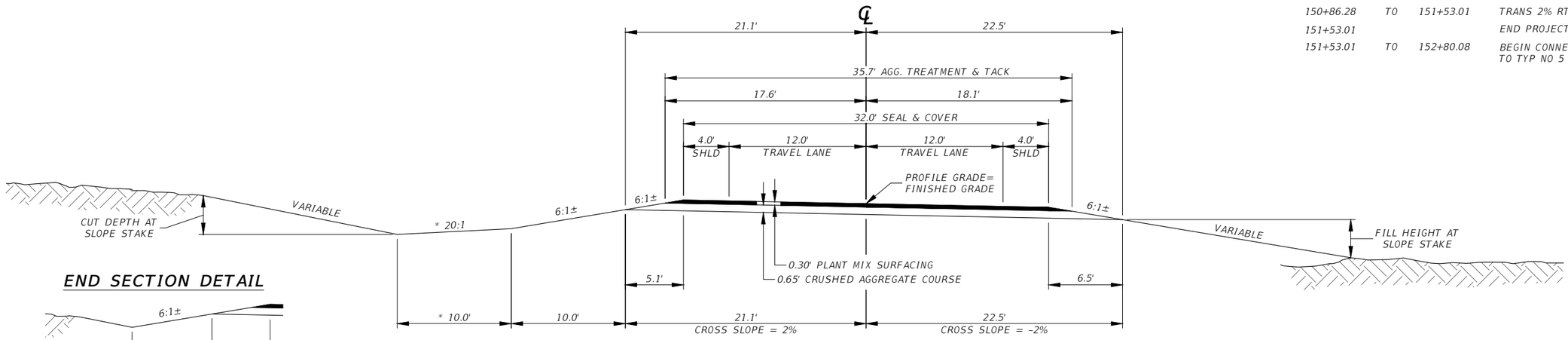
* FILL SLOPES	
0' - 10'	6:1
10' - 20'	4:1
20' - 30'	3:1
OVER 30'	2:1

* BACK SLOPES	
0' - 5'	5:1
5' - 10'	3:1
10' - 15'	2:1
OVER 15'	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 2

MAINLINE



END SECTION DETAIL

STA. 125+95.41 TO STA. 128+40
STA. 128+40 TO STA. 128+50 TRANSITION

125+96.33	TO	133+05.48	BEGIN PROJECT
			THEN TO TYP NO 3
137+75.48	TO	150+86.28	
150+86.28	TO	151+53.01	TRANS 2% RT TO 1.01% LT
151+53.01			END PROJECT
151+53.01	TO	152+80.08	BEGIN CONNECTION, TRANS TYP NO 2 (1.01% LT) TO TYP NO 5

QUANTITIES

UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
	COVER	PLANT MIX	CR. AGG. COURSE			ASPHALT CEMENT	SEAL	AGG. TREATMENT	EMULSIFIED ASPHALT TACK**
AREA square feet		10.15	25.75		square yards PER STATION		356	396	396
cubic yards PER STATION		37.6	95.4		tons PER STATION	3.92	0.64		
tons PER STATION		72.5			gallons PER STATION				20
square yards PER STATION	356								

** BASED ON 1 APPLICATION

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdTYPz01.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR - 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022		
1		2:01 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000 / 5

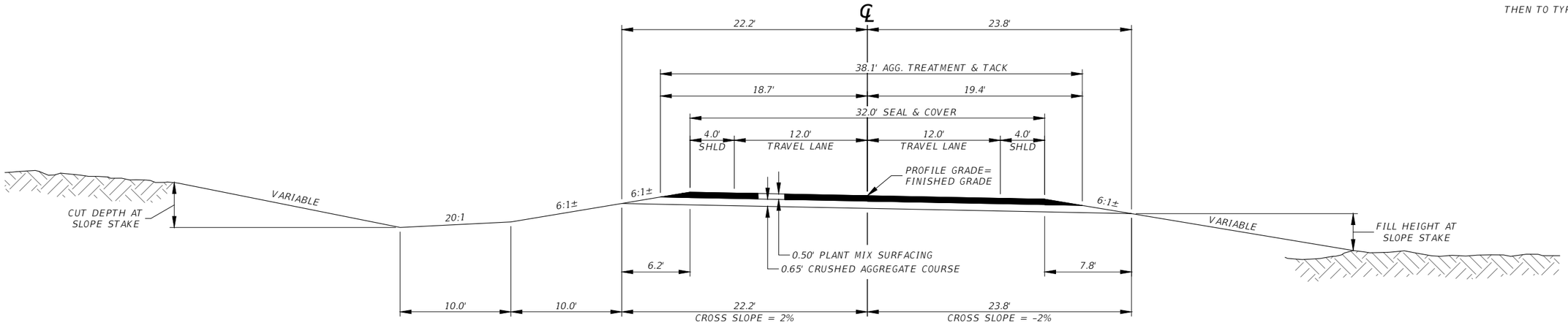
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TYPICAL SECTION NO. 3

MAINLINE

133+05.48			TYP NO 3 ONLY
133+05.48	TO	134+05.48	TRANS TYP NO 3 TO TYP NO 4
137+75.48			TYP NO 3 ONLY
			THEN TO TYP NO 2



QUANTITIES

UNIT	AGGREGATE COVER	AGGREGATE PLANT MIX	AGGREGATE CR. AGG. COURSE	AGGREGATE	UNIT	BITUMINOUS MATERIAL ASPHALT CEMENT	BITUMINOUS MATERIAL SEAL	BITUMINOUS MATERIAL AGG. TREATMENT	BITUMINOUS MATERIAL EMULSIFIED ASPHALT TACK**
AREA square feet		17.52	27.33		square yards PER STATION		356	396	792
cubic yards PER STATION		64.9	101.2		tons PER STATION	6.76	0.64		
tons PER STATION		125.1			gallons PER STATION				40
square yards PER STATION	356								

** BASED ON 2 APPLICATIONS

* FILL SLOPES	
0' - 10'	6:1
10' - 20'	4:1
20' - 30'	3:1
OVER 30'	2:1

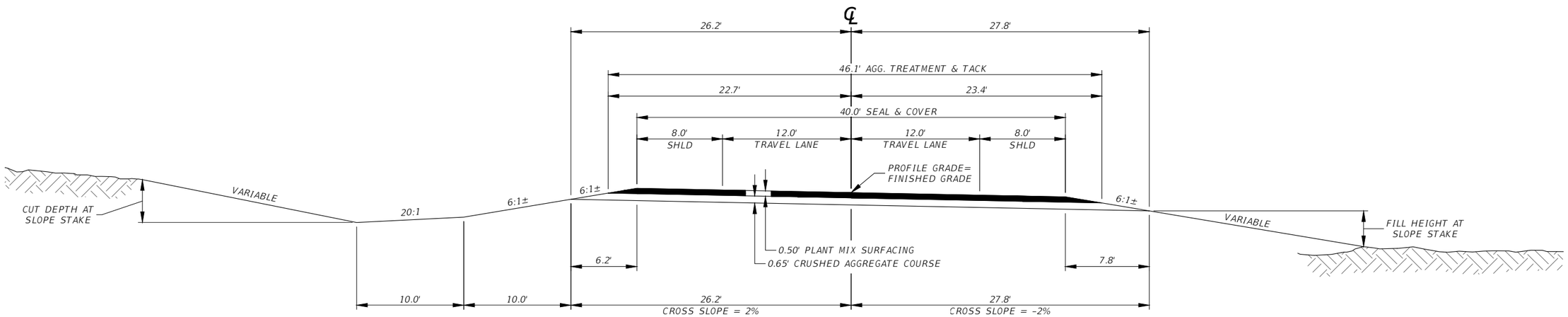
* BACK SLOPES	
0' - 5'	5:1
5' - 10'	3:1
10' - 15'	2:1
OVER 15'	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 4

MAINLINE

134+05.48	TO	135+04.90 B.E.	
135+76.03 B.E.	TO	136+75.48	
136+75.48	TO	137+75.48	TRANS TYP NO 4 TO TYP NO 3



QUANTITIES

UNIT	AGGREGATE COVER	AGGREGATE PLANT MIX	AGGREGATE CR. AGG. COURSE	AGGREGATE	UNIT	BITUMINOUS MATERIAL ASPHALT CEMENT	BITUMINOUS MATERIAL SEAL	BITUMINOUS MATERIAL AGG. TREATMENT	BITUMINOUS MATERIAL EMULSIFIED ASPHALT TACK**
AREA square feet		21.52	32.53		square yards PER STATION		444	512	1,024
cubic yards PER STATION		79.7	120.5		tons PER STATION	8.29	0.79		
tons PER STATION		153.6			gallons PER STATION				51
square yards PER STATION	444								

** BASED ON 2 APPLICATIONS

3	MDT	MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdTYPz02.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS
2			8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022	
1			2:01 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY

GRANITE CR - 3M NW VIRGINIA CITY | CRSII-STPB 29-1(64)17

UPN 8932000 | 6

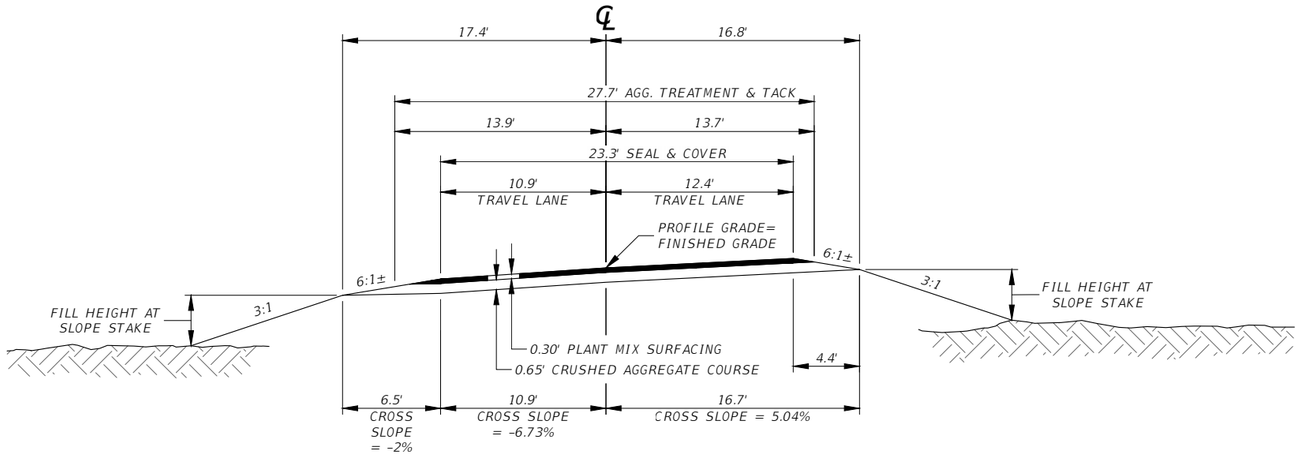
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TYPICAL SECTION NO. 5

MAINLINE - CONN. TO PTW

152+80.08 END CONNECTION



QUANTITIES									
UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
	COVER	PLANT MIX	CR. AGG. COURSE			ASPHALT CEMENT	SEAL	AGG. TREATMENT	EMULSIFIED ASPHALT TACK**
AREA square feet		7.50	19.77		square yards PER STATION		259	308	308
cubic yards PER STATION		27.8	73.2		tons PER STATION	2.89	0.46		
tons PER STATION		53.6			gallons PER STATION				15
square yards PER STATION	259								

** BASED ON 1 APPLICATION

* FILL SLOPES	
0' - 10'	6:1
10' - 20'	4:1
20' - 30'	3:1
OVER 30'	2:1

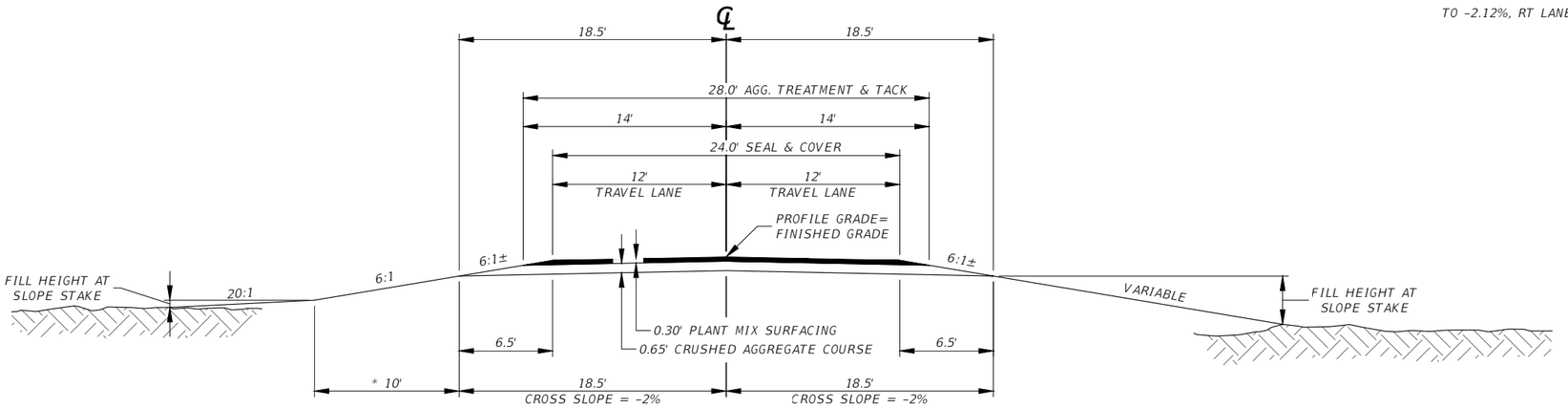
* BACK SLOPES	
0' - 5'	5:1
5' - 10'	3:1
10' - 15'	2:1
OVER 15'	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 6

GRANITE CREEK ROAD

10+16.16	TO	10+65.00	BEGIN PUBLIC APPROACH
			TRANS LT LANE -0.86% TO -1.82%, RT LANE 0.86% TO -0.87%
10+65.00	TO	10+80.00	TRANS TYP NO 6 TO TYP NO 7, CONT TRANS LT LANE -1.82%
			TO -2.12%, RT LANE -0.87% TO -1.41%



QUANTITIES									
UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
	COVER	PLANT MIX	CR. AGG. COURSE			ASPHALT CEMENT	SEAL	AGG. TREATMENT	EMULSIFIED ASPHALT TACK**
AREA square feet		7.81	21.14		square yards PER STATION		267	312	312
cubic yards PER STATION		28.9	78.3		tons PER STATION	3.01	0.48		
tons PER STATION		55.7			gallons PER STATION				16
square yards PER STATION	267								

** BASED ON 1 APPLICATION

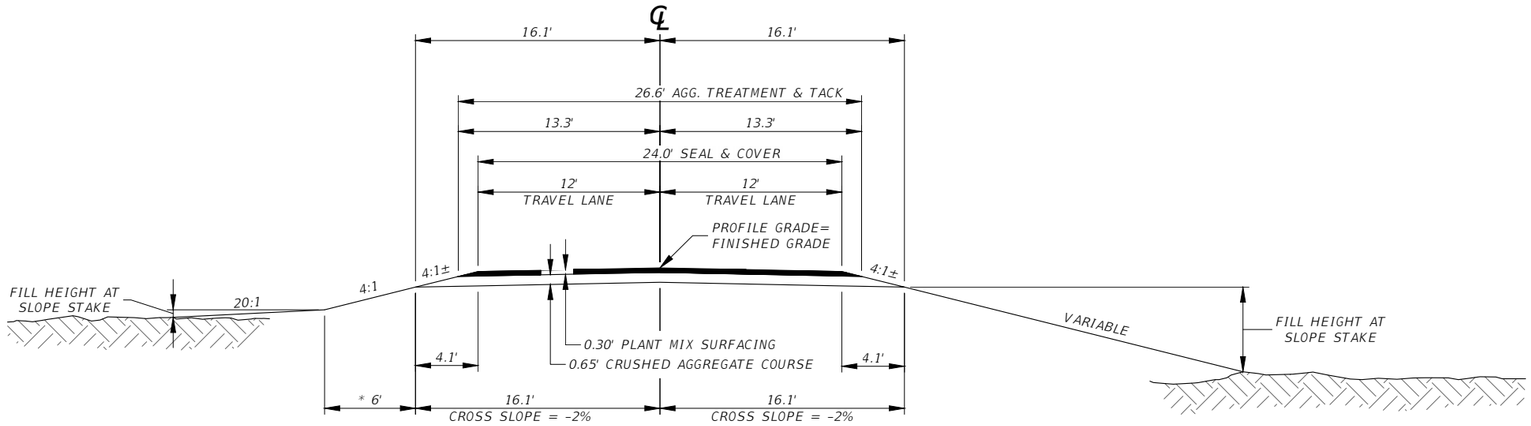
3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdTYPz03.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR - 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022		
1		2:01 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000 / 7

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TYPICAL SECTION NO. 7

GRANITE CREEK ROAD

10+80.00 TO 11+25.00 TRANS LT LANE -2.12% TO -3%, RT LANE -1.41% TO -3%
THEN TO TYP NO 8



QUANTITIES									
UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
	COVER	PLANT MIX	CR. AGG. COURSE			ASPHALT CEMENT	SEAL	AGG. TREATMENT	EMULSIFIED ASPHALT TACK**
AREA square feet		7.59	19.13		square yards PER STATION		267	296	296
cubic yards PER STATION		28.1	70.9		tons PER STATION	2.93	0.48		
tons PER STATION		54.2			gallons PER STATION				15
square yards PER STATION	267								

** BASED ON 1 APPLICATION

* FILL SLOPES	
0' - 10'	4:1
10' - 20'	3:1
20' - 30'	2:1
OVER 30'	2:1

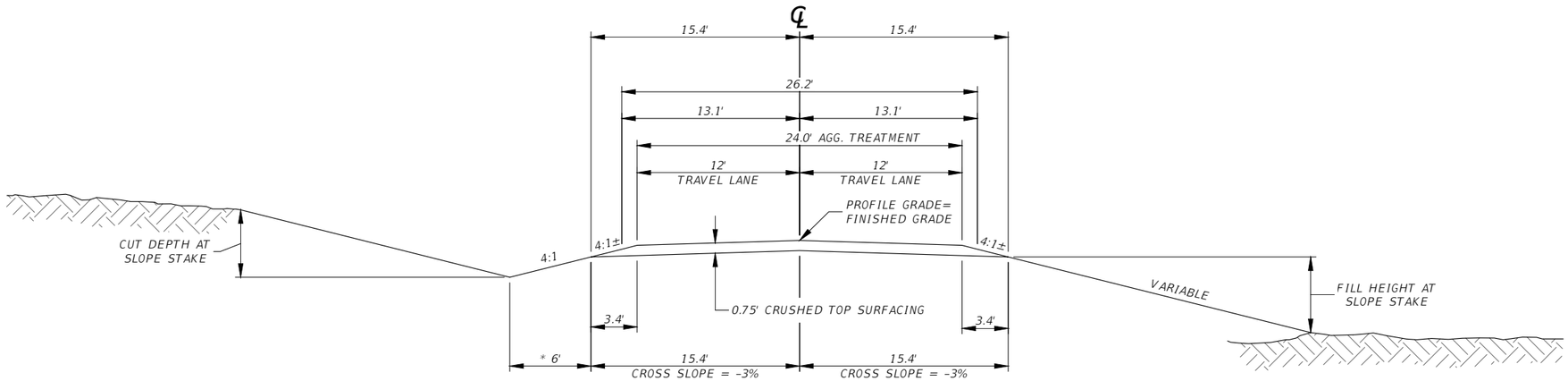
* BACK SLOPES	
0' - 5'	4:1
5' - 10'	2:1
10' - 15'	2:1
OVER 15'	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 8

GRANITE CREEK ROAD

11+25.00 TO 12+91.10
12+91.10 TO 13+75.00 TRANS LT LANE -3% TO 1.60%, RT LANE -3% TO -0.49%
13+75.00 END PUBLIC APPROACH



QUANTITIES									
UNIT	AGGREGATE				UNIT	BITUMINOUS MATERIAL			
		CR. TOP SURFACING						AGG. TREATMENT	
AREA square feet		20.56			square yards PER STATION			267	
cubic yards PER STATION		76.1			tons PER STATION				
tons PER STATION					gallons PER STATION				
square yards PER STATION									

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdTYPz04.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR - 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022		
1		2:02 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000 / 8

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SUMMARY

GRADING

STATION		cu. yards		REMARKS
FROM	TO	EXC.	EMB. IN PLACE	
125+96.33	135+04.90 B.E.	1,202	5,997	
				GRANITE CREEK BRIDGE
135+76.03 B.E.	151+53.01	5,467	673	
TOTAL		# 6,669	6,670	

FOR INFORMATION ONLY

ADDITIONAL GRADING

STATION		cu. yards			REMARKS
		INCL. IN GRADING FRAME		ADD. EMB. IN PLACE #	
FROM	TO	EXC.	EMB. IN PLACE		
125+03.33	125+96.33	100	15		CONNECTION TO PTW
134+60.17	135+04.90 B.E.	40			BRIDGE END BACKFILL SUBEXCAVATION
135+04.90 B.E.	135+76.03 B.E.	1,270	405		STREAM RESTORATION GRADING
135+76.03 B.E.	136+23.59	95			BRIDGE END BACKFILL SUBEXCAVATION
137+30.00		10			FARM FIELD APP RT
144+84.50		100			FARM FIELD APP LT
151+53.01	152+80.08	570	135		CONNECTION TO PTW
10+16.16	13+75.00	225	1,650		PUBLIC APP LT
SUBTOTAL		~	~	0	

REMOVE STRUCTURE

STATION	lump sum	REMARKS
	REMOVE STRUCTURE	
133+45.84	1	26' W X 39.5' L, GRANITE CREEK NBI #P00029017+08501 STRUCTURE ID #05715
TOTAL	1	

SURFACING

STATION		linear feet				FOR	AGGREGATE				BITUMINOUS MATERIAL			REMARKS
							sq. yards	tons	cu. yards		tons	gals.	sq. yards	
FROM	TO	GROSS	NET	+			COVER TYPE 1	PLANT MIX BIT. SURF. COMM. PG 64 28	CRUSHED AGG. COURSE	CR. TOP SURF. (MODIFIED) #	EMULSIFIED ASPHALT CHFRS-2P	EMULSIFIED ASPHALT TACK	AGG. TREAT.	
125+96.33	133+05.48	709.15	709.15				2,525	514	677		4.5	142	2,808	TYP NO 2
133+05.48	134+05.48	100.00	100.00				400	139	111		0.7	46	454	TRANS TYP NO 3 TO TYP NO 4
134+05.48	135+04.90 B.E.	99.42	99.42				441	153	120		0.8	51	509	TYP NO 4
135+04.90 B.E.	135+76.03 B.E.	71.13	1.13		70.00	BRIDGE								GRANITE CREEK
135+76.03 B.E.	136+75.48	99.45	99.45				442	153	120		0.8	51	509	TYP NO 4
136+75.48	137+75.48	100.00	100.00				400	139	111		0.7	46	454	TRANS TYP NO 4 TO TYP NO 3
137+75.48	151+53.01	1,377.53	1,377.53				4,904	999	1,314		8.8	276	5,455	TYP NO 2
						ADDITIONAL SURFACING	684	250	377	292	1.2	66	2,069	
TOTAL		2,556.68	2,486.68	0.00	70.00		9,796	2,347	2,830	292	17.5	678	12,258	

SEE SPECIAL PROVISIONS

ADDITIONAL SURFACING (INCLUDED IN SURFACING FRAME)

STATION		linear feet				FOR	AGGREGATE				BITUMINOUS MATERIAL			REMARKS
							sq. yards	tons	cu. yards		tons	gals.	sq. yards	
FROM	TO	GROSS	NET	+			COVER TYPE 1	PLANT MIX BIT. SURF. COMM. PG 64 28	CRUSHED AGG. COURSE	CR. TOP SURF. (MODIFIED) #	EMULSIFIED ASPHALT CHFRS-2P	EMULSIFIED ASPHALT TACK	AGG. TREAT.	
125+03.33	125+96.33	93.00	93.00			BEGIN CONNECTION TO PTW	293	60	80		0.5	17	332	TRANS TYP NO 1 TO TYP NO 2
151+53.01	152+80.08	127.07	127.07			END CONNECTION TO PTW	391	80	107		0.7	23	447	TRANS TYP NO 2 TO TYP NO 5
132+96.41	135+04.90 B.E.					GUARDRAIL AGG WIDENING RT			11					
134+00.05	135+04.90 B.E.					GUARDRAIL AGG WIDENING LT			8					
134+72.16	135+04.90 B.E.					EMBANKMENT PROTECTOR RT		1					10	
135+76.03 B.E.	136+80.66					GUARDRAIL AGG WIDENING RT			8					
135+76.03 B.E.	137+44.70					GUARDRAIL AGG WIDENING LT			10					
						APPROACHES		109	153	292		27	1,280	
SUBTOTAL		~	~	~	~		684	250	377	292	1.2	66	2,069	

SEE SPECIAL PROVISIONS

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SUMMARY

RUMBLE STRIPS

STATION		miles			gals	REMARKS
		RUMBLE STRIPS			EMULSIFIED ASPHALT FOG SEAL #	
FROM	TO	CONTIN-UOUS	INTER-MITTENT	CENTERLINE TYPE 1		
125+03.33	132+47.49			0.1	8	CENTERLINE
133+63.52	135+04.90 B.E.			0.1	2	CENTERLINE
135+76.03 B.E.	152+80.08			0.3	19	CENTERLINE
SUBTOTAL		0.0	0.0	0.5	29	
TOTAL		0.0		0.5	~	

FOR INFORMATION ONLY, INCLUDE IN THE COST OF RUMBLE STRIPS

EMBANKMENT PROTECTORS

STATION		linear feet				cu. yards	REMARKS
		EMBANKMENT PROTECTOR 18"		CONCRETE CURB 4"		BANK PROTECTION	
FROM	TO	LEFT	RIGHT	LEFT	RIGHT	TYPE 3	
134+72.16	135+04.90 B.E.		22		39.7	3.0	RT
SUBTOTAL			22		39.7		
TOTAL		22		39.7		3.0	

REVEGETATION

STATION		lump sum	cu. yards	acres			REMARKS
		REVEGE-TATION	TOPSOIL SALVAGING & PLACING	SEED	FERTILIZER	CONDITION SEEDBED	
FROM	TO						
125+03.33	135+04.90 B.E.	0.4	454	1.7		1.7	
135+76.03 B.E.	152+80.08	0.6	504	3.2		3.2	
TOTAL		1	# 958	# 4.9	# 0.0	# 4.9	

FOR INFORMATION ONLY

EMBANKMENT FOUNDATION TREATMENT *

STATION		cu. yards		sq. yards	REMARKS
		SPECIAL BORROW NEAT LINE	SPECIAL EMBANKMENT (ROCK FILL)	GEOTEXTILE STABILIZATION	
FROM	TO				
127+75.00	134+60.17	2,437		3,928	EMBANKMENT FOUNDATION TREATMENT
134+60.17	135+04.90 B.E.	447		343	USE SPECIAL BORROW IN PLACE OF EMB. IN PLACE FOR ROADWORK
135+76.03 B.E.	150+86.28	12,631		10,466	USE SPECIAL BORROW IN PLACE OF EMB. IN PLACE FOR ROADWORK
136+18.99	136+52.01		23		SPECIAL EMBANKMENT (ROCK FILL) IN PONDS
136+48.62	138+00.28		858		SPECIAL EMBANKMENT (ROCK FILL) IN PONDS
137+30.00		713	111	493	FARM FIELD APP RT. USE SPECIAL BORROW IN PLACE OF EMB. IN PLACE
139+93.19	141+37.59		517		SPECIAL EMBANKMENT (ROCK FILL) IN PONDS
142+15.98	146+86.33		1,269		SPECIAL EMBANKMENT (ROCK FILL) IN PONDS
144+84.80		60			FARM FIELD APP LT. USE SPECIAL BORROW IN PLACE OF EMB. IN PLACE
147+06.62	148+51.76		412		SPECIAL EMBANKMENT (ROCK FILL) IN PONDS
10+16.16	12+91.10	429		907	EMBANKMENT FOUNDATION TREATMENT
TOTAL		16,717	3,190	16,137	

* SEE DETAILS AND CROSS SECTIONS

BRIDGE END BACKFILL *

STATION		cu. yards	sq. yards	REMARKS
		BRIDGE END BACKFILL	GEOTEXTILE STABILIZATION	
FROM	TO	TYPE 3		
134+60.17	135+04.90 B.E.	430	73	
135+76.03 B.E.	136+23.69	468	171	
TOTAL		898	244	

* SEE DETAIL AND CROSS SECTIONS

TOPSOIL

STATION		cu. yards	REMARKS
		IMPORTING TOPSOIL & PLACING	
FROM	TO		
125+03.33	135+04.90 B.E.	446	
135+76.03 B.E.	152+80.08	1,191	
TOTAL		1,637	

BIOENGINEERED BANK # (LUMP SUM)

STATION		lump sum	cubic yards			square yards			linear feet		each	acres	REMARKS
		BIOENGINEERED BANK	TOPSOIL	EMB. IN PLACE	STREAMBED MATERIAL	COIR NETTING	EROSION CONTROL BLANKET HIGH PERF.	EROSION CONTROL BLANKET LONG TERM	12" COIR LOGS	FASCINE	WILLOW CUTTINGS ##	SEED	
FROM	TO												
10+52.16	11+68.27	0.5	70	21	17.6	339	339	247	344	114	1,005	0.1	LT
10+59.51	11+73.36	0.5	74	21	17.2	338	338	267	343	115	998	0.1	RT
		1	~	~	~	~	~	~	~	~	~	~	

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INCLUDES 15% MORTALITY FACTOR

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SUMMARY

GUARDRAIL

STATION		linear feet				each				REMARKS
		REMOVE GUARDRAIL		BOX BEAM GUARDRAIL		BOX BEAM TERMINAL SECTION		BOX BEAM BRIDGE APPROACH SECTION TYPE 2		
FROM	TO	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	
NEW RAIL										
133+33.82	135+04.76				108		1		1	
134+23.82	135+04.76			18		1		1		
135+76.16	136+57.10				18		1		1	
135+76.16	137+11.10			72		1		1		
REMOVE RAIL										
132+39.60	134+53.09		216.0							
132+95.77	134+50.34	176.9								
SUBTOTAL		176.9	216.0	90	126	2	2	2	2	
TOTAL		392.9		216		4		4		

TEMPORARY GUARDRAIL

STATION		linear feet				each				REMARKS
		TEMPORARY METAL GUARDRAIL		TEMPORARY BARRIER RAIL		TEMPORARY CONCRETE BARRIER RAIL		TEMPORARY IMPACT ATTENUATOR		
FROM	TO	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	
125+08.77	133+30.40				820				1	CONNECT TO EX. BRIDGE RAIL
133+65.81	152+82.78				1,930				1	CONNECT TO EX. BRIDGE RAIL
SUBTOTAL		0.0	0.0	0	2,750	0	0	0	2	
TOTAL		0		2,750		0		2		

RANDOM RIPRAP

STATION		cu. yards		sq. yards		REMARKS
		RANDOM RIPRAP		GEOTEXTILE PERM. EROS. CNTRL. HIGH SURV. CLASS B	RIPRAP REVEGE-TATION	
FROM	TO	CL. 1	CL. 2			
134+78.16	135+24.36		208.8	334	61	
135+56.00	136+02.48		218.2	346	66	
TOTAL		0.0	427.0	680	127	

PAVEMENT MARKINGS

ITEM	UNIT	INTERIM APPLICA-TION #	FINAL APPLICA-TION	TOTAL
STRIPING - WHITE PAINT	gallon	38		38
STRIPING - YELLOW PAINT	gallon	36		36
WORDS & SYMBOLS - WHITE PAINT	gallon			0
STRIPING - WHITE EPOXY	gallon		25	25
STRIPING - YELLOW EPOXY	gallon		24	24
WORDS & SYMBOLS - WHITE EPOXY	gallon			0
TEMPORARY STRIPING	linear feet			0
FINAL SWEEP AND BROOM	course mile		0.5	0.5

BASED ON 2 APPLICATIONS.

FENCING

STATION		linear feet					each					linear feet		REMARKS
		FARM FENCE		WILDLIFE-FRIENDLY FENCE		TEMP. FENCE	FARM FENCE PANEL				DEADMAN	FARM GATE		
							SINGLE		DOUBLE					
FROM	TO	TYPE F4M	TYPE F5W	TYPE 1 WF-4-SBBS-16	48-WF-5-SBBBS-12W #		FW	FM	FW	FM		TYPE G2	TYPE G3	
126+81.94	132+44.96				538				3					LT, TIE TO EXISTING FENCE AT BEGINNING, END WITH DOUBLE PANEL AT GRANITE CR. RD.
133+56.76	135+05.17				121				3					LT, TIE TO PUBLIC APP. FENCE, WING TO BRIDGE
135+75.76	144+76.87				887				3					LT, WING TO BRIDGE
144+76.87	144+92.57												16	LT
144+92.57	149+29.51				396				3					LT
149+29.51	149+45.10											16		LT
149+45.10	152+50.08		260				2		2					LT, TIE TO EXISTING FENCE
10+83.58	11+40.99				17				2					RT, TIE TO MAINLINE FENCE
11+40.99	11+59.01												16	RT
11+59.01	14+09.33				209				3					RT, TIE TO EXISTING FENCE
TOTAL		0	260	0	2,168	0	2	0	19	0	3	16	32	

SEE DETAIL FOR FENCING CONFIGURATION AND POST SPACING

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SUMMARY

CULVERT SUMMARY RECAP

BASIC BID	linear feet				cu. yards					each	sq. yards
	NEW PIPE (TOTAL)	RELAY PIPE CULVERT	CLEAN CULVERT PIPE	REMOVE PIPE CULVERT	FOUND-ATION MATERIAL	GRANULAR BEDDING MATERIAL	SPECIAL BACKFILL	CONTROLLED LOW STRENGTH MATERIAL (CLSM)	FILL & ABANDON PIPE	PLUG ENDS & ABANDON PIPE	GEOTEXT. STAB.
18" DR	44										
24" DR	352							36.8			
66" DR	98							86.2			
TOTAL	~	0	0	0.0	0	0	0	123.0	0	0	0

CULVERTS (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS									PIPE OPTIONS in			END SECTIONS		cu. yards		sq. yards	linear feet	SKEW ANGLE	CULVERT IN PL. in x ft	REMARKS
	CULVERT PIPE in	linear feet				cu. yards			sq. yards	STEEL - 2 2/3 X 1/2 CORR. CONCRETE ALUMINUM - 2 2/3 x 1/2 CORR.	CLASS OR THK.	COATING *	LEFT	RIGHT	FOUND-ATION MATERIAL	GRANULAR BEDDING MATERIAL	GEOTEXT. STAB.	HEIGHT OF COVER			
		LENGTH OF PIPE	RELAY PIPE CULVERT	CLEAN CULVERT PIPE	REMOVE PIPE CULVERT	FOUND-ATION MATERIAL	GRANULAR BEDDING MATERIAL	CONTROLLED LOW STRENGTH MATERIAL (CLSM)	GEOTEXT. STAB.												
132+35.82	24	72								24 CSP	0.109	YES	FETS	FETS				2.4			DRAIN
										24 RCP	CL 3	NO	FETS	FETS							
										24 CAP	0.060	NO	FETS	FETS							
133+44.44	66	98						86.2		66 CSP 3 X 1 CORR.	0.064	NO						3.7	8° RT		DRAIN. FILL WITH CLSM AND BURY ENDS AT THE END OF CONSTRUCTION
										66 RCP	CL 2	NO									
										66 CAP 3 X 1 CORR.	0.075	NO									
133+52.09	24	88						36.8		24 CSP	0.109	YES	FETS	FETS				2.9	11° RT		DRAIN. BACKFILL WITH CLSM WHERE ADJACENT TO CULVERT AT 133+44
										24 RCP	CL 3	NO	FETS	FETS							
										24 CAP	0.060	NO	FETS	FETS							
140+85.40	24	110								24 CSP	0.109	YES	FETS	FETS				4.6	26° LT		DRAIN
										24 RCP	CL 3	NO	FETS	FETS							
										24 CAP	0.060	NO	FETS	FETS							
142+08.46	24	82								24 CSP	0.109	YES	FETS	FETS				3.3	15° LT		DRAIN
										24 RCP	CL 3	NO	FETS	FETS							
										24 CAP	0.060	NO	FETS	FETS							
TOTAL	~	~	0	0	0.0	0	0	123.0	0	~	~	~	~	~	~	~	~	~	~	~	

* SEE STANDARD SPEC. SEC. 709.12
Δ 3" x 1" CORR.
θ STEP BEVEL
NOT MEASURED FOR PAYMENT, INCLUDE IN COST OF CULVERT

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS					PIPE OPTIONS in				END SECTIONS		linear feet	SKEW ANGLE	CULVERT IN PL. in x ft	REMARKS
	CULVERT PIPE in	linear feet				STEEL - 2 2/3 x 1/2 CORR. 0.109 THK. *	CONCRETE - CLASS 4	ALUMINUM - 2 2/3 x 1/2 CORR. 0.064 THK.	CORRU-GATED POLY-ETHYLENE PIPE	LEFT	RIGHT	HEIGHT OF COVER			
		LENGTH OF PIPE	REMOVE PIPE CULVERT	RELAY PIPE CULVERT	CLEAN CULVERT PIPE										
144+84.80	18	44				~	18	~	~	FETS	FETS	0.5			LT
TOTAL	~	~	0.0	0	0	~	~	~	~	~	~	~	~	~	

* COAT PIPE PER STANDARD SPEC. SEC. 709.12

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HYDRAULIC DATA SUMMARY *

STATION	STREAM NAME (IF NAMED)	DRAINAGE AREA (mi^2)	SIZE/TYPE STRUCTURE ① ② ⑤	DESIGN FLOOD MAGNITUDE (cfs)	DESIGN FLOOD FREQUENCY (%)	DESIGN FLOOD H.W. ELEV. (ft)	BASE FLOOD (1%) MAGNITUDE (cfs)	BASE FLOOD (1%) H.W. ELEV. (ft)	OVERTOPPING FLOOD ③ ④ MAGNITUDE (cfs)	OVERTOPPING FLOOD ③ ④ APPROX. FREQUENCY (%)	OVERTOPPING FLOOD ③ ④ H.W. ELEV. (ft)	REMARKS (FLOOD OF RECORD), Qp(max), etc.) ⑥
135+40.48	GRANITE CREEK	42	59' – 1 SPAN BRIDGE	455	2	5,418.31	541	5,418.59	757	0.2	5,419.19	Qp(MAX)

NOTES: * H.W. ELEVATIONS SHOWN ARE BASED UPON PEAK FLOW ANALYSIS UNLESS NOTED IN REMARKS COLUMN.

① STRUCTURE SIZE OR TYPE AND RELATED HYDRAULIC DATA MAY NOT REFLECT CHANGES MADE DUE TO R/W OR OTHER CONSIDERATIONS (I.E. STOCKPASS ADDED, STRUCTURE SIZE OR TYPE CHANGED, ROAD GRADE CHANGED DURING CONSTRUCTION, ETC.)

② BRIDGE LENGTH SHOWN EQUALS THE WATER SURFACE WIDTH IN THE OPENING AT THE DESIGN H.W. ELEVATION MEASURED NORMAL TO FLOW.

③ OVERTOPPING IS DEFINED AS FLOW OVER THE ROAD, FLOW THROUGH A SIGNIFICANT RELIEF STRUCTURE OR FLOW OVER THE BASIN DIVIDE WHICHEVER IS LOWER.

④ FOR THOSE CROSSINGS NOTED BY Qp(max) IN THE REMARKS COLUMN OVERTOPPING DOES NOT OCCUR AND THE FLOOD MAGNITUDE LISTED CORRESPONDS TO THE FLOOD OF SECTION 650.115 (a)(1)(ii) OF FEDERAL-AID POLICY GUIDE; SUBCHAPTER G, PART 650, SUBPART A (DEC. 1991).
THE FLOOD SPECIFIED IS SUBJECT TO STATE-OF-THE-ART CAPABILITY TO ESTIMATE THE EXCEEDANCE PROBABILITY (PIPES 0.5%; BRIDGE 0.2%).

⑤ HIGH WATER ELEVATIONS MAY VARY SLIGHTLY DEPENDING UPON THE PIPE OPTION SELECTED.

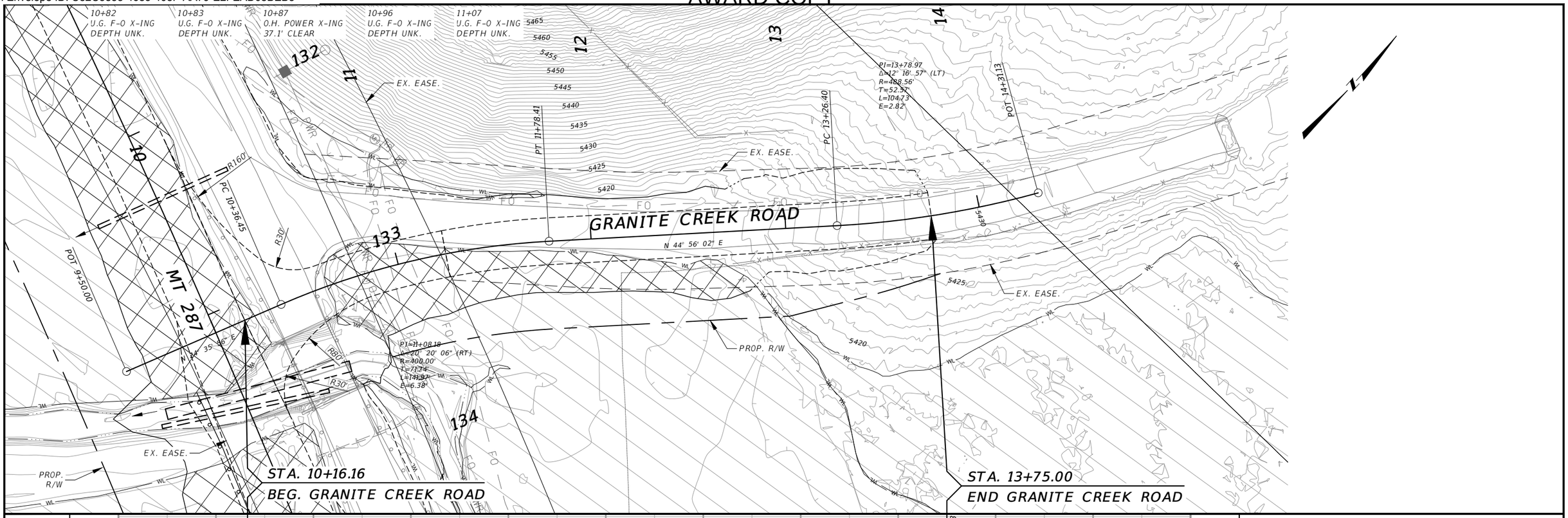
⑥ PROCEDURE MEMORANDUM NO. 10, HYDRAULICS MANUAL CHAPTER 9 APPENDIX H.

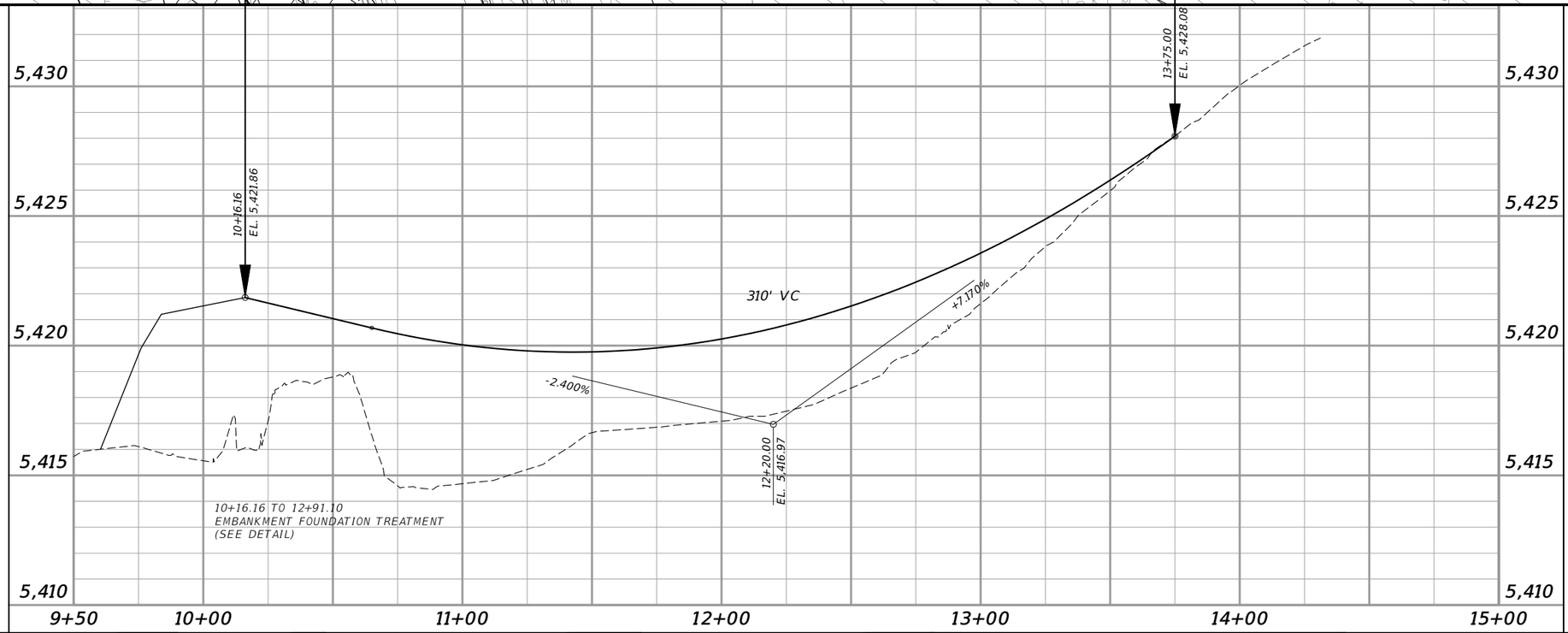
EXCEEDANCE PROBABILITIES

25 YEAR	4% CHANCE
50 YEAR	2% CHANCE
100 YEAR	1% CHANCE
200 YEAR	0.5% CHANCE
500 YEAR	0.2% CHANCE

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DETAIL

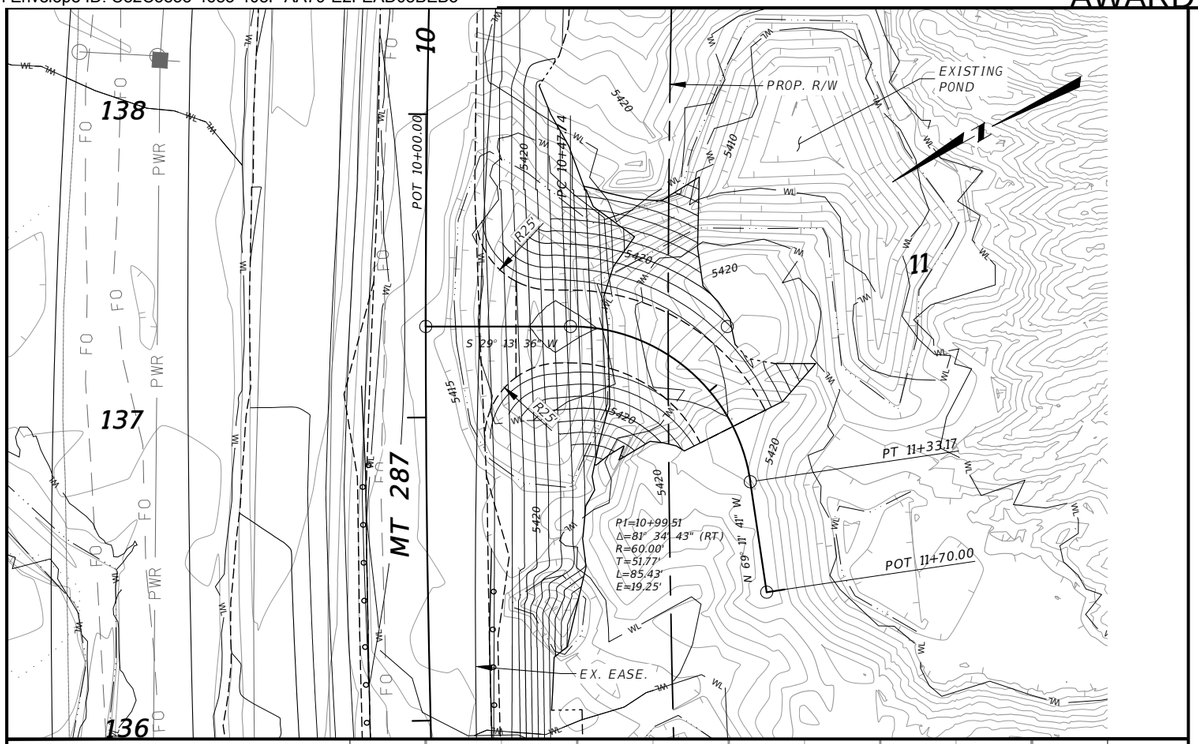
PUBLIC APPROACH
GRANITE CREEK ROAD
133+10.00 LT

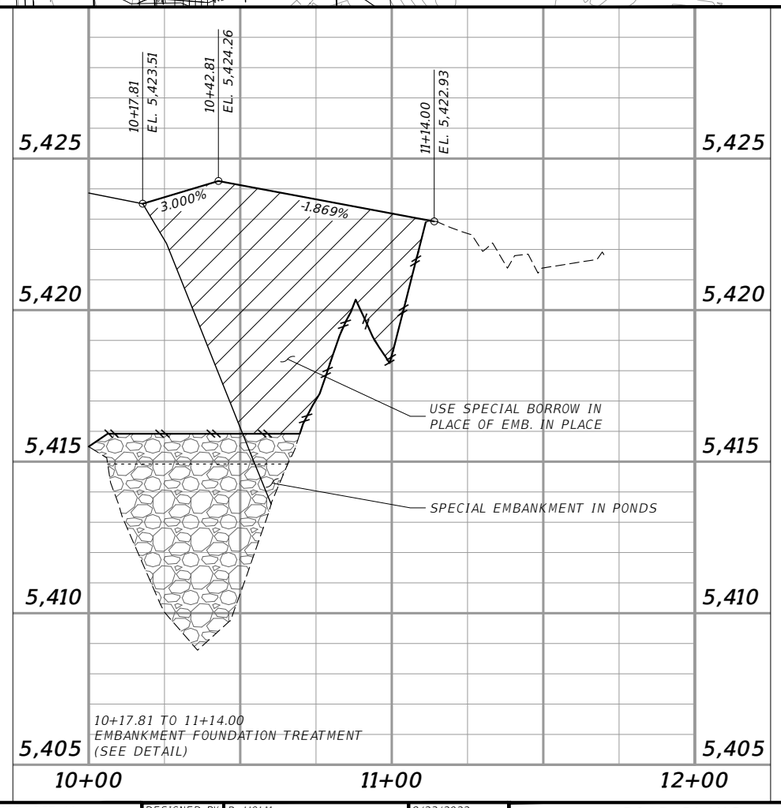
SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

3	MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz01.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:03 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	14

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APPROACH 137+30.00 ALIGNMENT COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
10+00.00	POT	401,971.215	1,325,582.912	BEGIN ALIGNMENT
10+17.81	POT	401,955.672	1,325,574.216	BEGIN APPROACH
10+47.74	PC	401,929.553	1,325,559.603	
11+14.00	POC	401,898.906	1,325,504.623	END APPROACH
11+33.17	PT	401,902.762	1,325,485.930	
11+70.00	POT	401,915.844	1,325,451.500	END ALIGNMENT

DETAIL

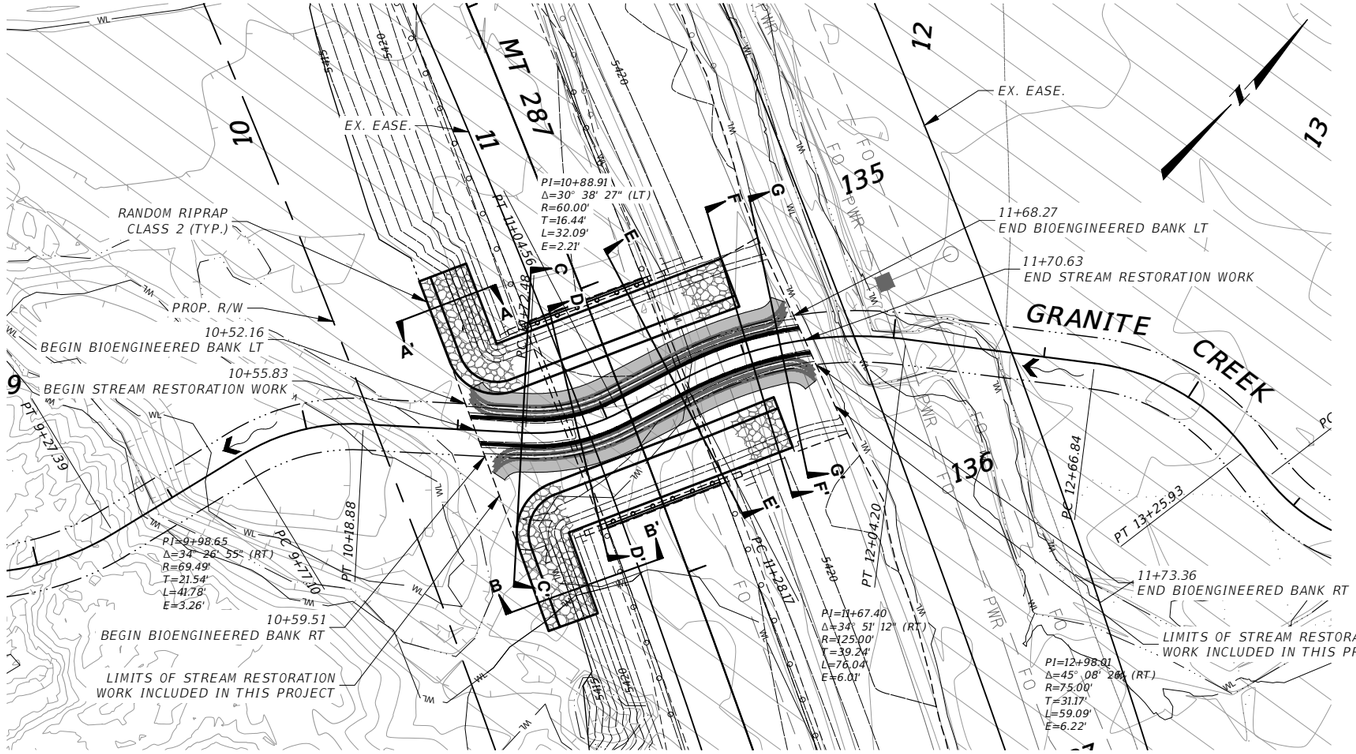
FARM FIELD APPROACH 137+30.00 RT

SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz10.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022		UPN 8932000 / 15
1		2:03 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	

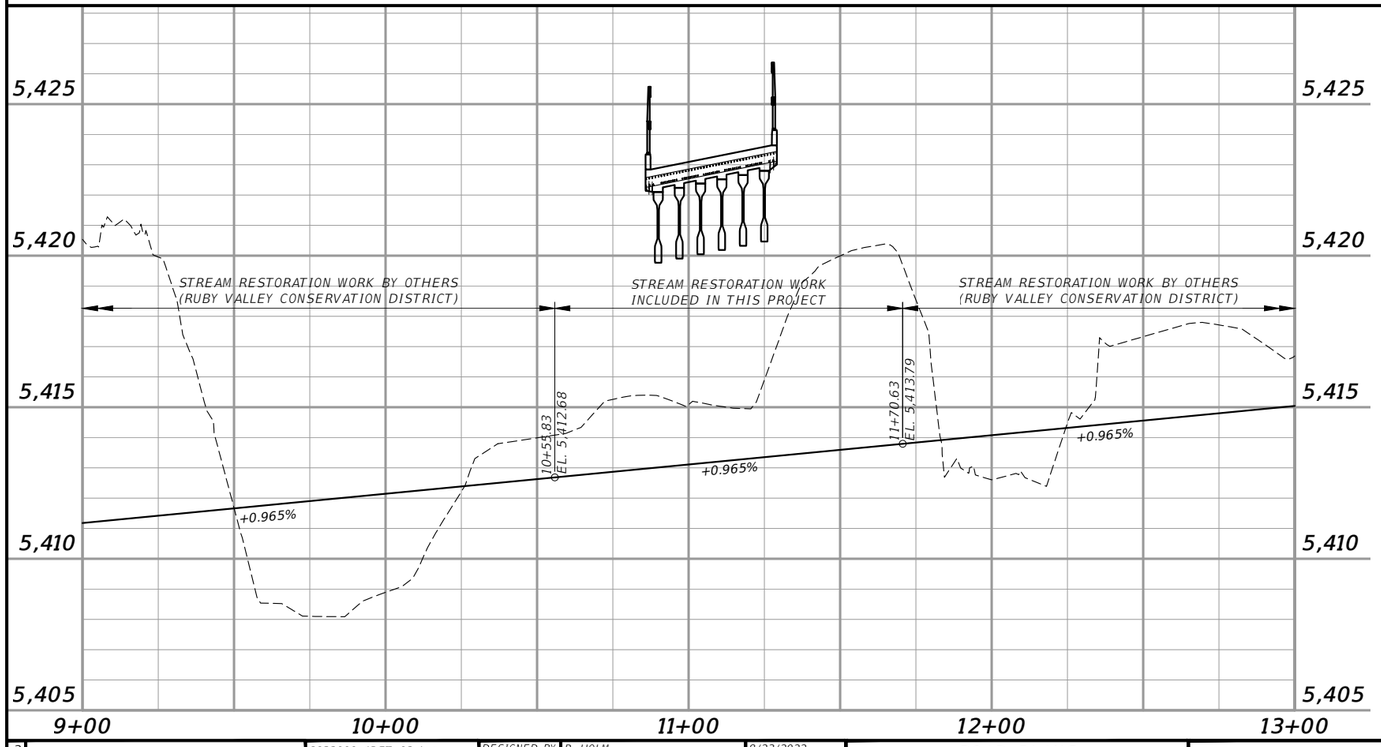
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GRANITE CREEK ALIGNMENT COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
9+27.39	POT	401,915.954	1,325,319.117	BEGIN ALIGNMENT
9+77.10	PC	401,963.587	1,325,333.359	
10+18.88	PT	401,997.756	1,325,356.294	
10+55.83	POT	402,020.961	1,325,385.046	BEGIN STREAM RESTORATION WORK
10+72.48	PC	402,031.417	1,325,398.000	
11+04.56	PT	402,057.141	1,325,416.535	
11+28.17	PC	402,079.254	1,325,424.783	
11+70.63	POC	402,115.784	1,325,446.032	END STREAM RESTORATION WORK
12+04.20	PT	402,138.350	1,325,470.754	
12+66.84	POT	402,174.000	1,325,522.253	END ALIGNMENT



DETAIL

GRANITE CREEK STREAM RESTORATION

SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz02.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:03 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	16

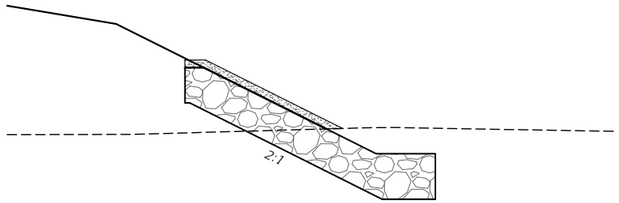
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LEGEND

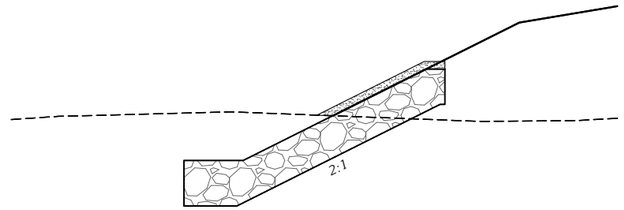
RANDOM RIPRAP

TOPSOIL

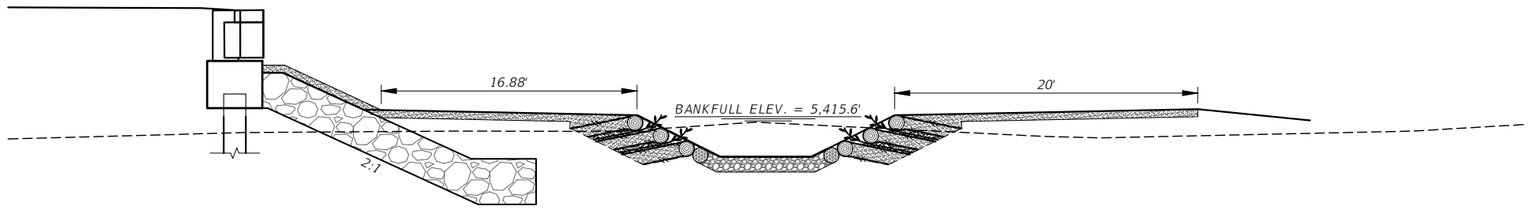
STREAMBED MATERIAL



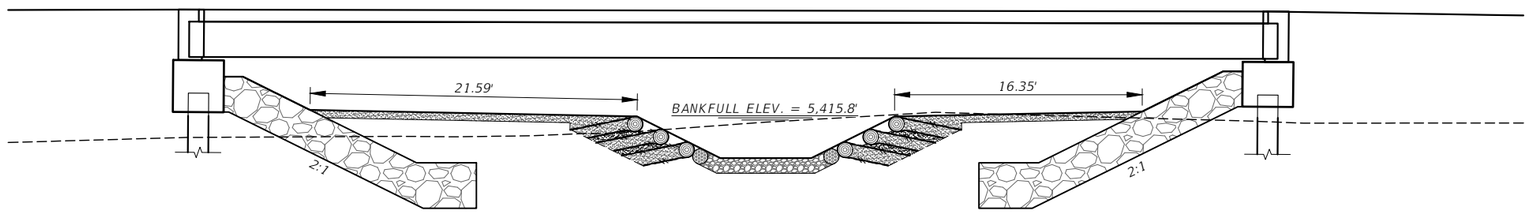
SECTION A-A'



SECTION B-B'



SECTION C-C'



SECTION D-D'

DETAIL

STREAM CHANNEL CROSS SECTIONS

SCALE: 1" = 10'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz06.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR - 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:04 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	17

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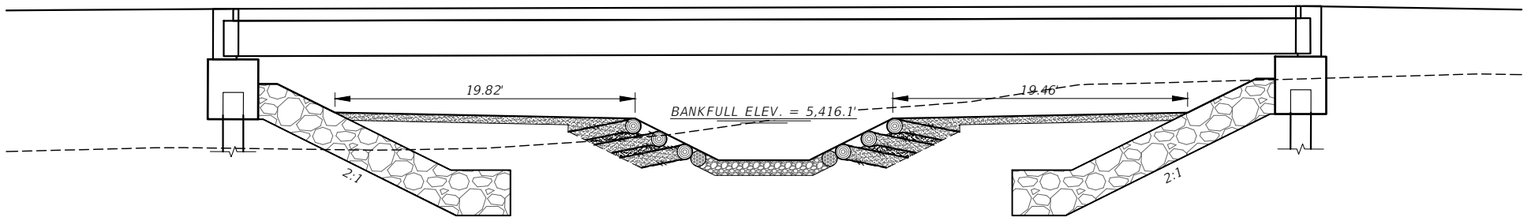
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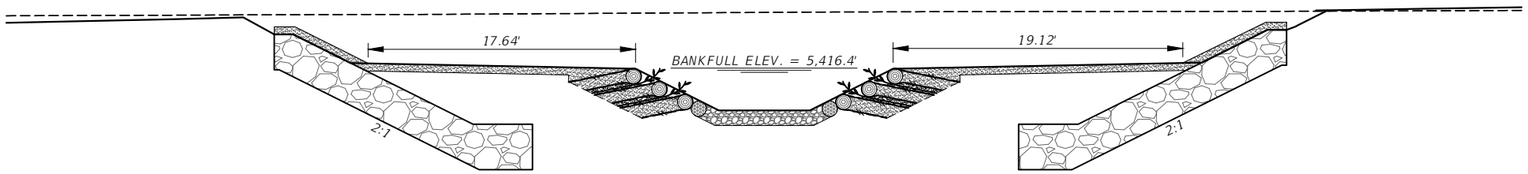
RANDOM RIPRAP

TOPSOIL

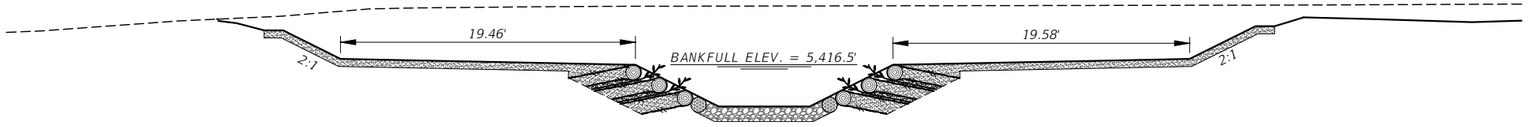
STREAMBED MATERIAL



SECTION E-E'



SECTION F-F'



SECTION G-G'

DETAIL

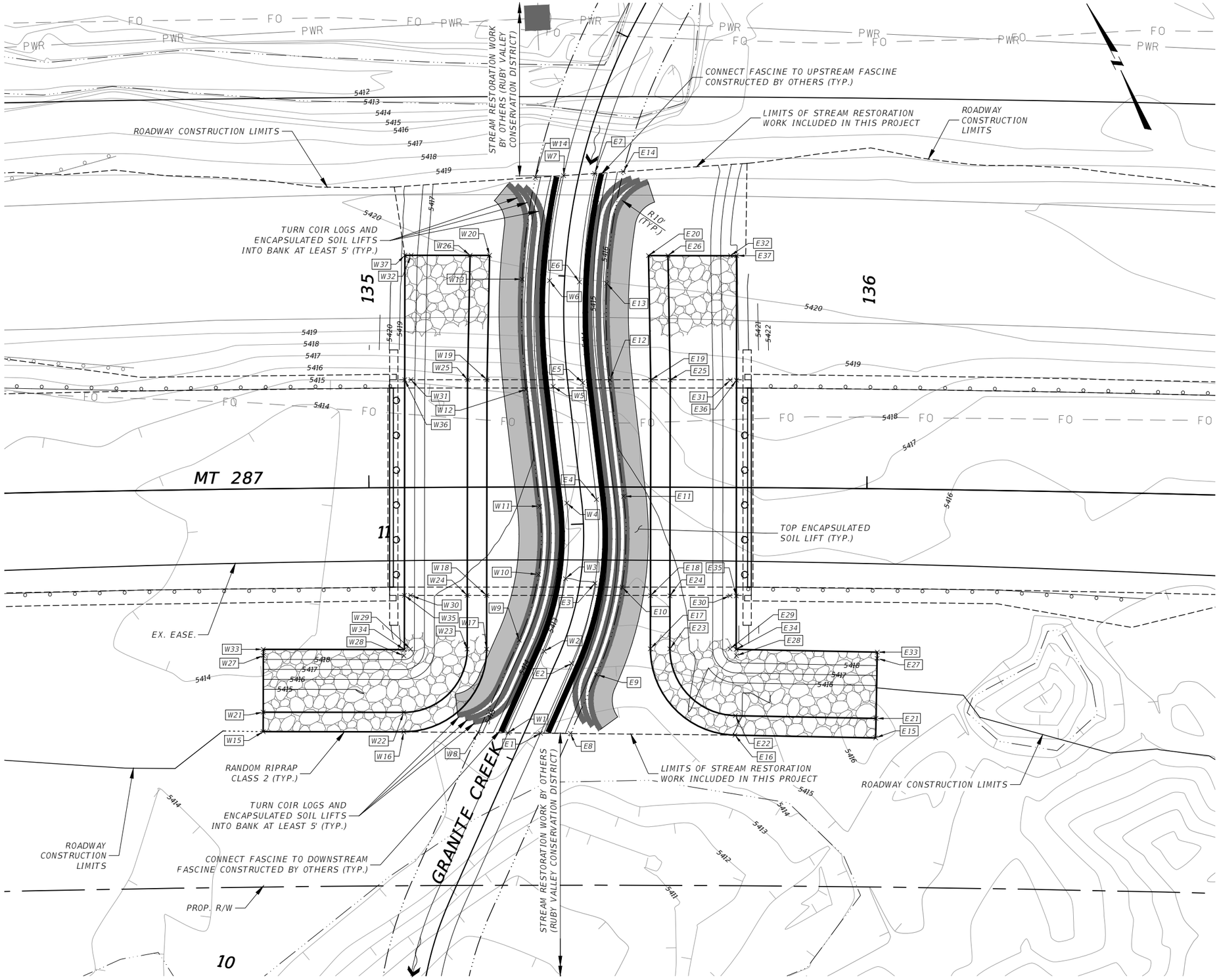
STREAM CHANNEL CROSS SECTIONS

SCALE: 1" = 10'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz06.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR - 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:04 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	18

DocuSign Envelope ID: C82C5853-4683-408F-AA79-E2FEAD08BEB3

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RIPRAP & BIOENGINEERED BANK COORDINATE TABLE

POINT NAME	N OR Y COORDINATE	E OR X COORDINATE	ELEVATION	DESCRIPTION
W1	403,022.48	1,325,382.15	5,412.67	TOE OF BANK
W2	402,033.75	1,325,396.12	5,412.85	TOE OF BANK
W3	403,044.79	1,325,406.56	5,413.00	TOE OF BANK
W4	402,058.19	1,325,413.72	5,413.16	TOE OF BANK
W5	402,080.30	1,325,421.97	5,413.38	TOE OF BANK
W6	403,099.55	1,325,431.04	5,413.59	TOE OF BANK
W7	402,117.01	1,325,443.15	5,413.79	TOE OF BANK
W8	403,025.27	1,325,376.85	5,415.40	TOP OF BANK
W9	402,038.03	1,325,392.66	5,415.60	TOP OF BANK
W10	402,048.00	1,325,402.10	5,415.75	TOP OF BANK
W11	402,060.11	1,325,408.57	5,415.91	TOP OF BANK
W12	402,082.22	1,325,416.82	5,416.13	TOP OF BANK
W13	403,102.29	1,325,426.77	5,416.33	TOP OF BANK
W14	402,119.27	1,325,437.92	5,416.52	TOP OF BANK
W15	402,045.13	1,325,338.51	5,412.70	TOP OF KEYWAY
W16	402,032.22	1,325,363.62	5,412.70	TOP OF KEYWAY
W17	402,039.40	1,325,386.91	5,412.70	TOP OF KEYWAY
W18	403,048.99	1,325,390.94	5,412.70	TOP OF KEYWAY
W19	402,087.53	1,325,410.76	5,412.70	TOP OF KEYWAY
W20	402,109.54	1,325,422.62	5,412.70	TOP OF KEYWAY
W21	402,048.61	1,325,340.30	5,412.70	TOP OF KEYWAY
W22	402,035.69	1,325,365.41	5,412.70	TOP OF KEYWAY
W23	402,041.19	1,325,382.53	5,412.70	TOP OF KEYWAY
W24	402,050.78	1,325,387.46	5,412.70	TOP OF KEYWAY
W25	402,089.31	1,325,407.28	5,412.70	TOP OF KEYWAY
W26	402,111.33	1,325,419.14	5,412.70	TOP OF KEYWAY
W27	402,058.71	1,325,315.50	5,418.38	TOP OF SLOPE
W28	402,045.80	1,325,370.61	5,418.38	TOP OF SLOPE
W29	402,046.38	1,325,372.42	5,418.38	TOP OF SLOPE
W30	402,055.97	1,325,377.36	5,418.38	TOP OF SLOPE
W31	402,094.51	1,325,397.17	5,418.38	TOP OF SLOPE
W32	402,110.74	1,325,408.61	5,418.62	TOP OF SLOPE
W33	402,059.84	1,325,346.08	5,418.38	TOP OF BENCH
W34	402,046.87	1,325,371.27	5,418.38	TOP OF BENCH
W35	402,056.55	1,325,376.24	5,418.38	TOP OF BENCH
W36	402,095.08	1,325,396.06	5,418.38	TOP OF BENCH
W37	402,117.32	1,325,407.49	5,418.62	TOP OF BENCH
E1	402,019.44	1,325,387.94	5,412.70	TOE OF BANK
E2	402,029.08	1,325,399.83	5,412.85	TOE OF BANK
E3	402,041.28	1,325,411.43	5,413.00	TOE OF BANK
E4	402,056.09	1,325,419.35	5,413.16	TOE OF BANK
E5	403,078.21	1,325,427.59	5,413.38	TOE OF BANK
E6	402,096.55	1,325,436.23	5,413.58	TOE OF BANK
E7	402,114.53	1,325,448.90	5,413.80	TOE OF BANK
E8	402,010.65	1,325,393.24	5,415.47	TOP OF BANK
E9	402,024.80	1,325,403.34	5,415.60	TOP OF BANK
E10	403,038.06	1,325,415.89	5,415.75	TOP OF BANK
E11	402,054.17	1,325,424.50	5,415.91	TOP OF BANK
E12	402,076.28	1,325,432.75	5,416.13	TOP OF BANK
E13	402,093.80	1,325,441.00	5,416.33	TOP OF BANK
E14	402,112.25	1,325,454.20	5,416.56	TOP OF BANK
E15	401,987.91	1,325,447.41	5,412.70	TOP OF KEYWAY
E16	402,001.28	1,325,422.51	5,412.70	TOP OF KEYWAY
E17	403,024.46	1,325,415.31	5,412.70	TOP OF KEYWAY
E18	402,033.95	1,325,420.19	5,412.70	TOP OF KEYWAY
E19	402,072.49	1,325,440.00	5,412.70	TOP OF KEYWAY
E20	403,094.94	1,325,451.01	5,412.70	TOP OF KEYWAY
E21	401,991.35	1,325,449.26	5,412.70	TOP OF KEYWAY
E22	403,004.72	1,325,424.37	5,412.70	TOP OF KEYWAY
E23	402,023.68	1,325,418.78	5,412.70	TOP OF KEYWAY
E24	402,032.16	1,325,423.66	5,412.70	TOP OF KEYWAY
E25	403,070.70	1,325,443.48	5,412.70	TOP OF KEYWAY
E26	402,093.15	1,325,454.48	5,412.70	TOP OF KEYWAY
E27	403,001.98	1,325,454.97	5,418.73	TOP OF SLOPE
E28	402,015.35	1,325,430.08	5,418.73	TOP OF SLOPE
E29	402,017.16	1,325,429.51	5,418.73	TOP OF SLOPE
E30	403,026.64	1,325,434.39	5,418.73	TOP OF SLOPE
E31	402,065.18	1,325,454.21	5,418.73	TOP OF SLOPE
E32	403,087.41	1,325,466.64	5,418.97	TOP OF SLOPE
E33	402,003.08	1,325,455.56	5,418.73	TOP OF BENCH
E34	402,016.50	1,325,430.58	5,418.73	TOP OF BENCH
E35	403,026.07	1,325,435.50	5,418.73	TOP OF BENCH
E36	402,064.61	1,325,455.32	5,418.73	TOP OF BENCH
E37	403,086.84	1,325,466.75	5,418.97	TOP OF BENCH

NOTES:

1. FINISHED GRADE CONTOURS REPRESENT TOP OF RIPRAP.

DETAIL
RIPRAP & BIOENGINEERED BANK LAYOUT

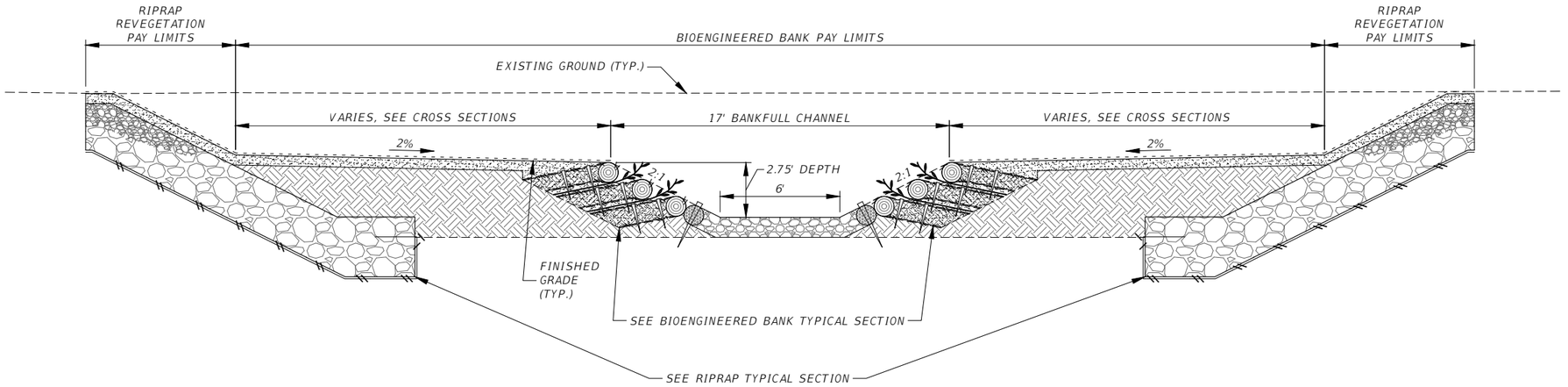
SCALE: 1" = 20'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz03.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022	MADISON COUNTY	UPN 8932000	19
1		2:05 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022			

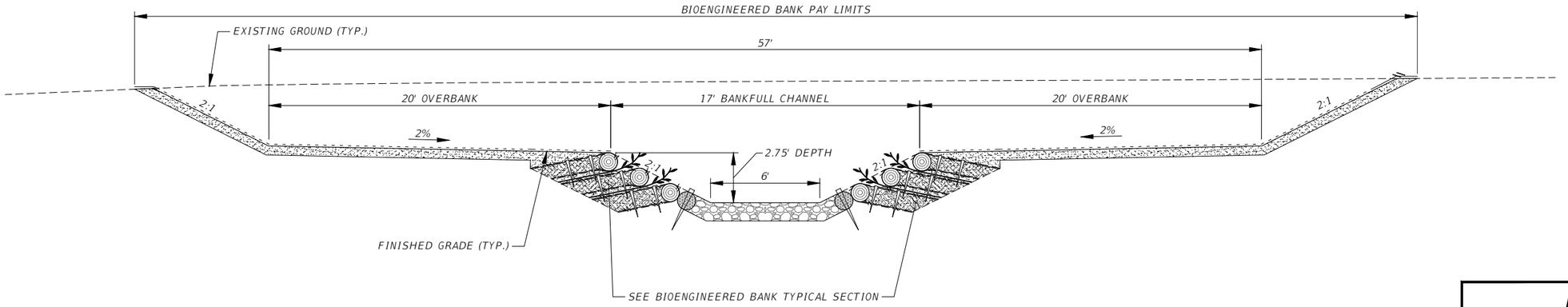
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DETAIL

STREAM CHANNEL TYPICAL SECTION WITH RIPRAP



STREAM CHANNEL TYPICAL SECTION WITHOUT RIPRAP



DETAIL

STREAM CHANNEL TYPICAL SECTIONS

NO SCALE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz05.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:06 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	20

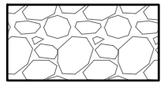
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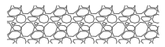
DETAIL

RIPRAP TYPICAL SECTION

LEGEND



RANDOM RIPRAP



FILTER MATERIAL NO. 2

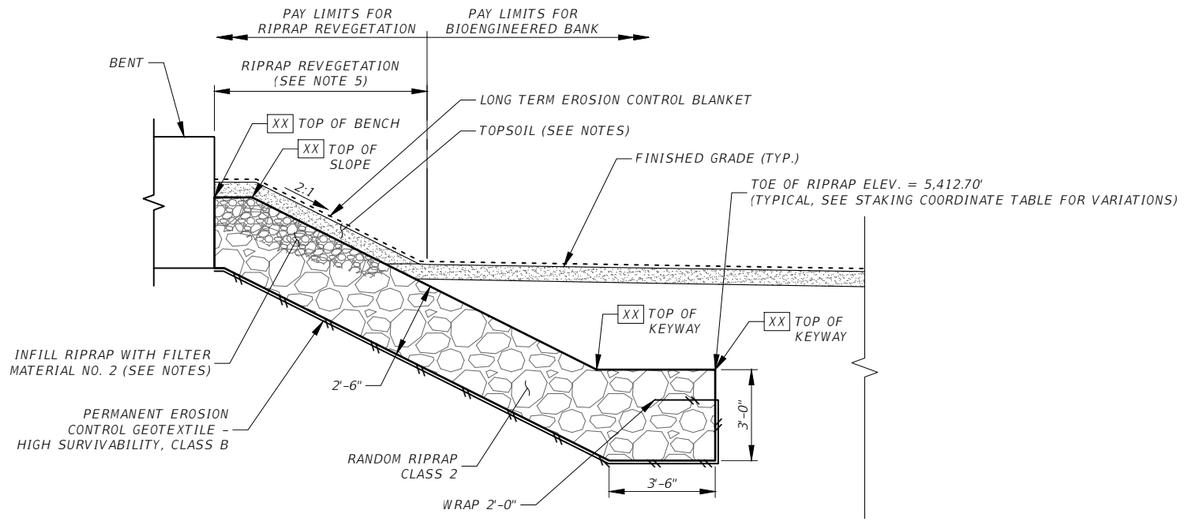


TOPSOIL

XX TYPICAL STAKING POINT

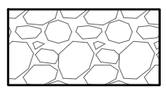
NOTES:

1. FILL RIPRAP VOIDS WITH FILTER MATERIAL NO. 2, OR A MATERIAL OF SIMILAR GRADATION OBTAINED ON SITE TO PROVIDE A UNIFORM SURFACE FOR THE PLACEMENT OF TOPSOIL, AS APPROVED BY THE PROJECT MANAGER.
2. PLACE TOPSOIL WITH A MINIMUM THICKNESS OF 6".
3. REFER TO THE SPECIAL PROVISIONS FOR PLANTING AND SEEDING SPECIFICATIONS.
4. THIS DETAIL IS TO BE USED AS A VISUAL GUIDE FOR RIPRAP REVEGETATION. REFER TO THE PLAN SHEETS AND CROSS SECTIONS FOR SPECIFIC ELEVATIONS AND GEOMETRIC CONFIGURATION OF THE RIPRAP LAYOUT.
5. DO NOT INSTALL RIPRAP REVEGETATION BENEATH THE VERTICAL PROJECTION OF THE BRIDGE.



BIOENGINEERED BANK TYPICAL SECTION

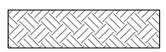
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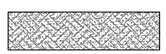
RANDOM RIPRAP



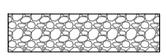
TOPSOIL



EMBANKMENT IN PLACE



50/50 MIX TOP SOIL AND EMBANKMENT

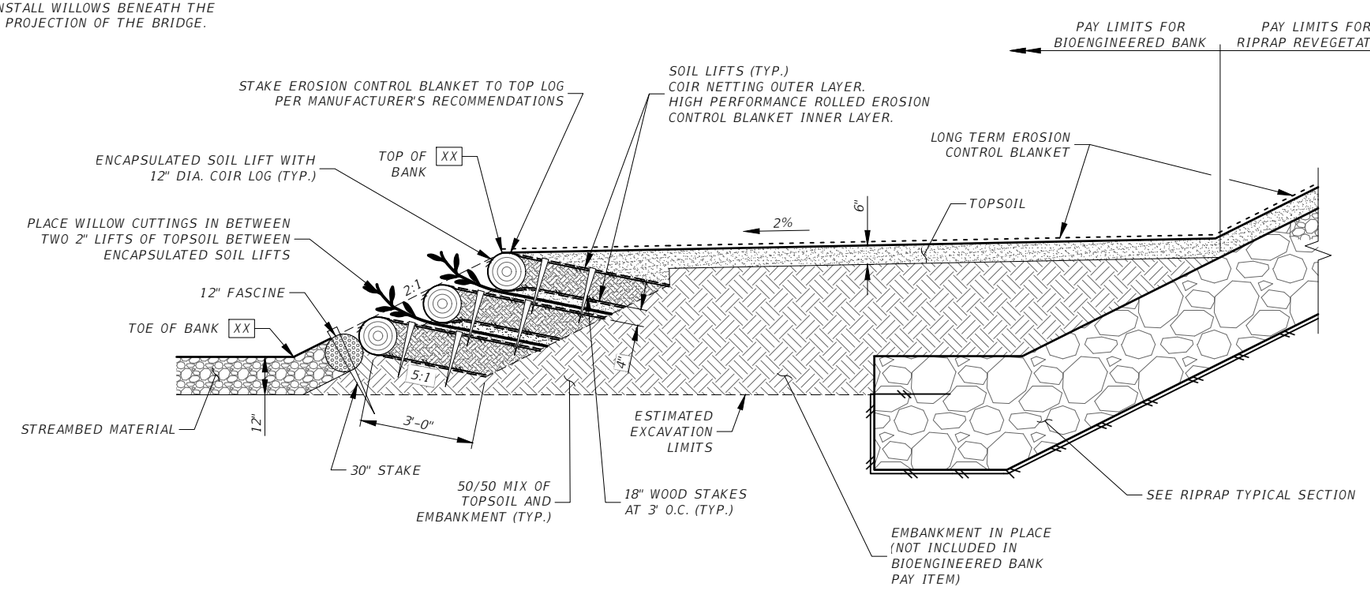


STREAMBED MATERIAL

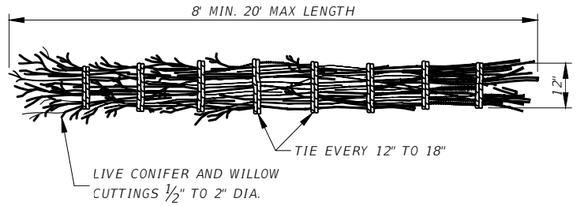
XX TYPICAL STAKING POINT

NOTES:

1. DO NOT INSTALL WILLOWS BENEATH THE VERTICAL PROJECTION OF THE BRIDGE.



FASCINE



NOTES:

1. STAKE FASCINE EVERY 3' O.C.
2. OVERLAP ADJACENT FASCINE BUNDLES A MIN. OF 18". OVERLAP IN THE DOWNSTREAM DIRECTION TO PREVENT RIVER FLOW FROM DISLODGING FASCINE.
3. SUMMARY FRAME QUANTITY DOES NOT INCLUDE OVERLAP.

DETAIL

RIPRAP TYPICAL SECTION

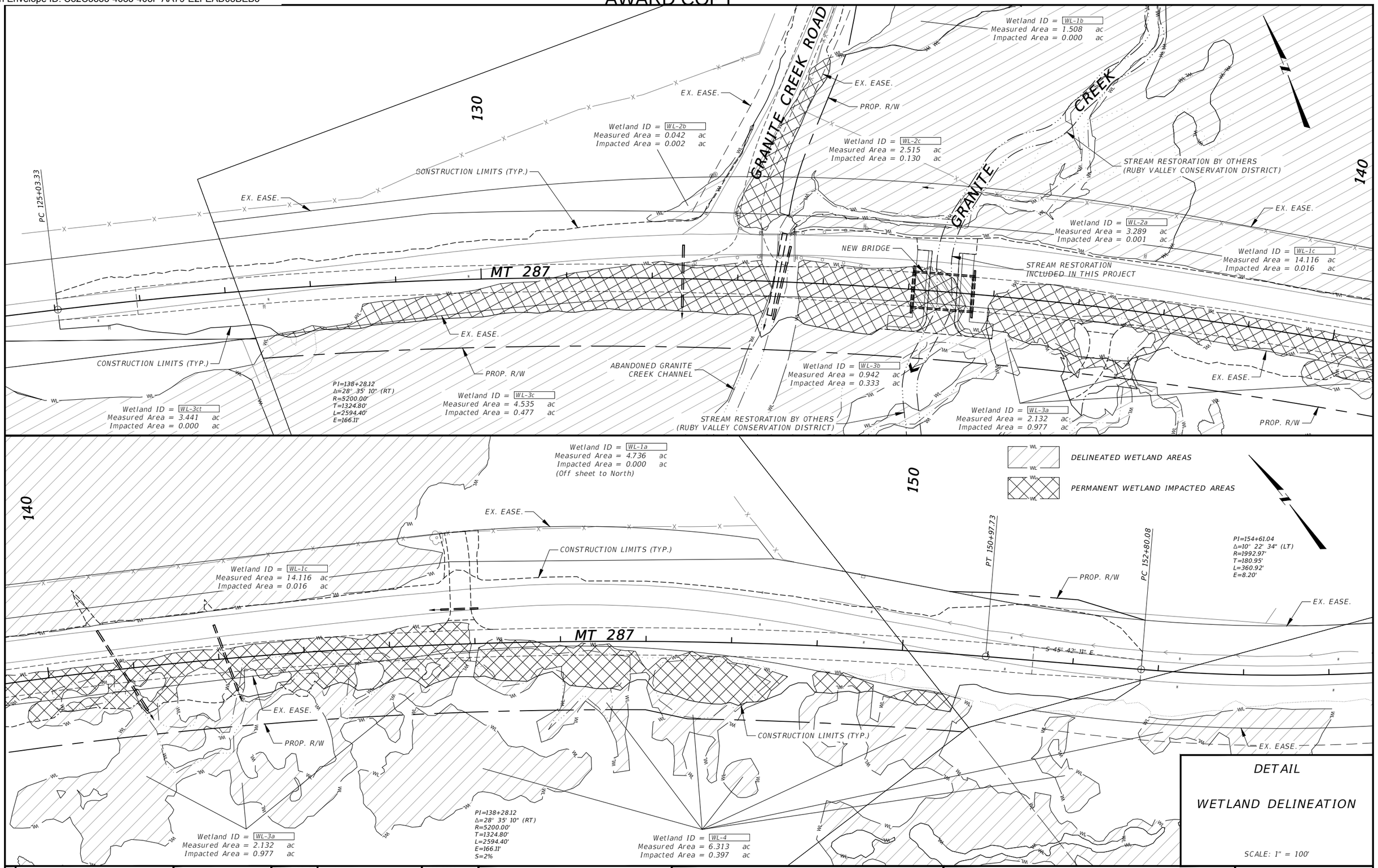
BIOENGINEERED BANK TYPICAL SECTION

NO SCALE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz12.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:07 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	21

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DETAIL

WETLAND DELINEATION

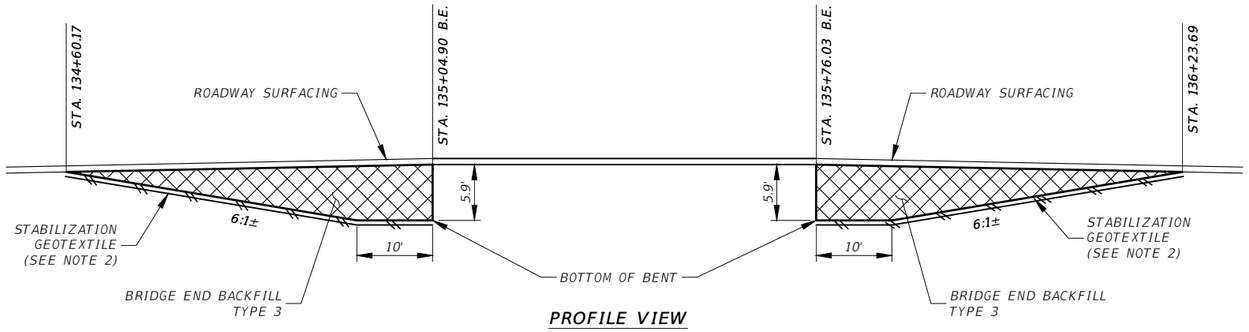
SCALE: 1" = 100'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz09.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022	MADISON COUNTY	UPN 8932000 / 22
1		2:08 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022		

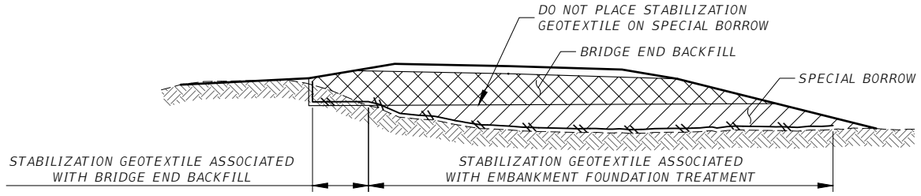
DocuSign Envelope ID: C82C5853-4683-408F-AA79-E2FEAD08BEB3

AWARD COPY

DETAIL



PROFILE VIEW

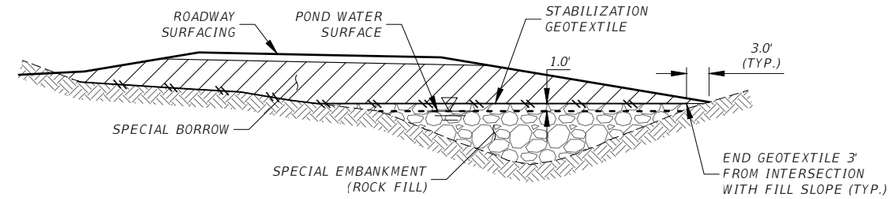


TYPICAL SECTION

BRIDGE END BACKFILL

NOTE:

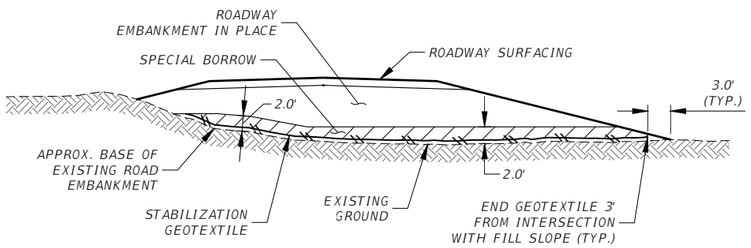
1. TYPE 3 BRIDGE END BACKFILL RECOMMENDED. TYPE 1 BRIDGE END BACKFILL OR TYPE 2 BRIDGE END BACKFILL CAN ALSO BE USED.
2. PLACE STABILIZATION GEOTEXTILE ONLY ON NATIVE MATERIAL. DO NOT PLACE STABILIZATION GEOTEXTILE ON SPECIAL BORROW. PLACE STABILIZATION GEOTEXTILE CONTIGUOUSLY FROM EMBANKMENT FOUNDATION TREATMENT TO BRIDGE END BACKFILL.



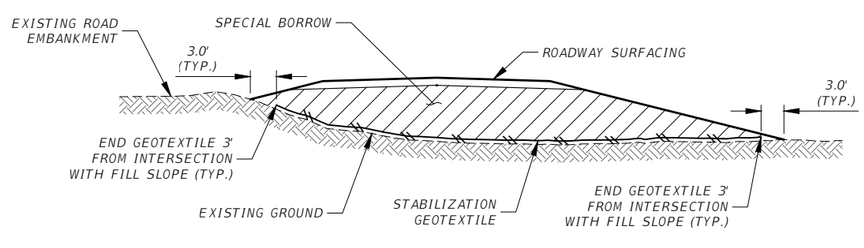
SPECIAL EMBANKMENT IN PONDS

NOTES:

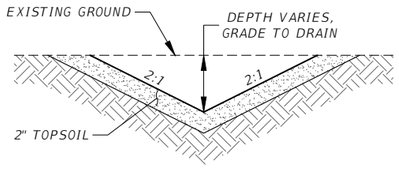
1. PLACE SPECIAL EMBANKMENT (ROCK FILL) IN STANDING WATER TO AN ELEVATION 12" ABOVE THE EXISTING WATER LEVEL IN THE POND.
2. IF USING EXISTING DREDGE PILE MATERIAL FOR SPECIAL EMBANKMENT (ROCK FILL), SCREEN MATERIAL TO MEET THE REQUIREMENTS OF THE SPECIAL PROVISION.
3. USE SPECIAL BORROW TO INFILL VOIDS IN THE TOP LAYER OF SPECIAL EMBANKMENT AND TO PROVIDE A LEVEL PLATFORM FOR PLACEMENT OF STABILIZATION GEOTEXTILE.
4. SEE SPECIAL PROVISIONS.



127+75.00 TO 134+60.17
10+16.16 TO 12+91.10



134+60.17 TO 135+04.90 B.E.
135+76.03 B.E. TO 150+86.28



140+62 AND 141+98

CULVERT INLET DITCH SECTION

EMBANKMENT FOUNDATION TREATMENT

NOTES:

1. MOW VEGETATION PRIOR TO PLACING STABILIZATION GEOTEXTILE.
2. SEE SPECIAL PROVISIONS.

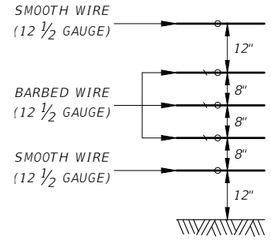
DETAIL
BRIDGE END BACKFILL
SPECIAL EMBANKMENT IN PONDS
EMBANKMENT FOUNDATION TREATMENT
DITCH SECTION
NO SCALE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdDETz04.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022			
1		2:08 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022	MADISON COUNTY	UPN 8932000	23

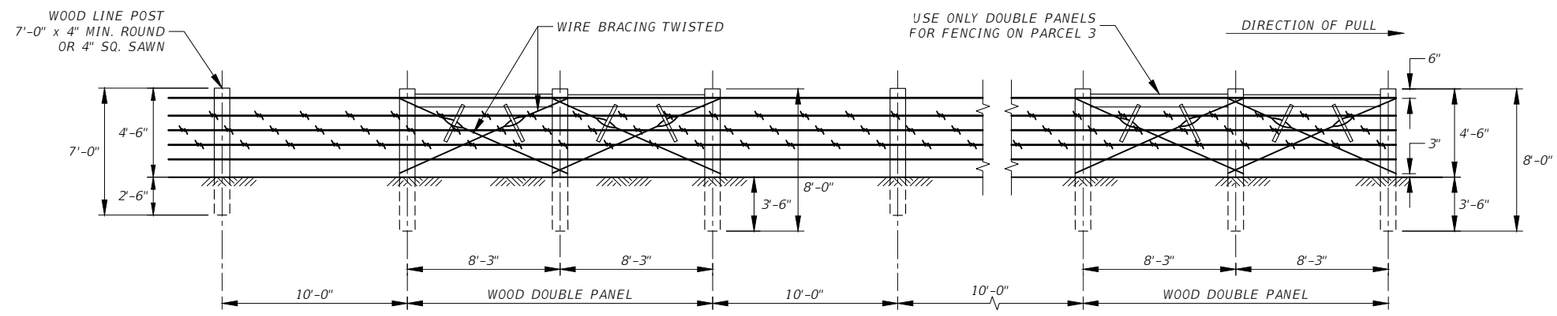
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DETAIL

WIRE SPACING TABLE
WILDLIFE-FRIENDLY FARM FENCE
48" FENCE HEIGHT
WF-5-SBBBS-12-W



○ DENOTES STAPLE AND/OR TIE LOCATIONS



NOTES:

1. LINE POST SPACING IS 10'-0" CENTER TO CENTER FOR TYPE WF-5-SBBBS-12-W FENCING.
2. "W" DENOTES WOOD POSTS, IE. TYPE WF-5-SBBBS-12-W.
3. SEE DTL. DWG. NO. 607-00, 607-01, 607-05, 607-10, AND 607-15 FOR ADDITIONAL FENCING DETAILS.
4. SEE THE SPECIFICATIONS FOR POST AND WIRE REQUIREMENTS.

DETAIL

WILDLIFE FRIENDLY FENCE

NO SCALE

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NOTE:
BORING ST-3 LOCATED OUTSIDE PROJECT LIMITS (119+90, 7.4' LT). CONTRACTOR MAY USE IT AT THEIR DISCRETION.

GRANITE CREEK ROAD

MT 287

GRANITE CREEK

130

140

150

TP-1

TP-2

TP-3

ST-1

ST-2

ST-3

ST-4

ST-101

ST-102

ST-102A

PC 125+03.33

STA. 125+03.33
BEG. CONN. TO PTW

S 74° 17' 22" E

R/W 127+31.66
55.47' EASE. = R/W
EX. ACQUISITION
BEG.

R/W 127+38.71
80'
R/W = PROPERTY LINE

STA. 125+96.33
BEG. CRSII-STPB 29-1(64)17

129+44.47 R/W
78.30'
FENCE LOCATION

R/W 10+71.99
67.75'
R/W = EASE.
FENCE LOCATION

13+75.00 R/W
30'
R/W = EX. EASE.
END ACQUISITION

13+00.00 R/W
45'

10+83.58 R/W
45'
R/W = R/W
BEG. ACQUISITION
FENCE LOCATION

138+19.97 R/W
78.50'
FENCE LOCATION

144+74.02 R/W
96.70'
FENCE LOCATION

EX. EASE.

PWR

FO

PI=138+28.12
Δ=28° 35' 10" (RT)
R=5200.00'
T=1324.80'
L=2594.40'
E=166.11'
S=2%

PI=154+61.04
Δ=10° 22' 34" (LT)
R=1992.97'
T=180.95'
L=360.92'
E=8.20'

S 45° 42' 11" E

150+00.00 R/W
72.50'
EX EASE. = R/W
BEG. ACQUISITION LT

PT 150+97.73 R/W
75'

152+00.00 R/W
75'

PC 152+80.08 R/W
57.75'
R/W = EX. EASE.
END ACQUISITION LT

R/W 147+00.00
80'

R/W 147+50.00
90'

R/W 150+78.00
90'
R/W = PROPERTY LINE

R/W 150+84.39
84.35' = EX. EASE.
R/W = EX. MONUMENT
CALC. R/W MONUMENT
END ACQUISITION RT

STA. 152+80.08
END CONN. TO PTW

STA. 151+53.01
END CRSII-STPB 29-1(64)17

132+35.82 NEW 24" DR.
133+44.44 NEW 66" DR. SKEW 8° RT
133+52.09 NEW 24" DR. SKEW 11° RT
133+45.84 26' X 39.5' BRIDGE IN PL. REMOVE
134+75.00 NEW 18" EMB. PROTECTOR RT
135+40.48 NEW 43.3' X 75.0' BRIDGE

140+85.40 NEW 24" DR. SKEW 26° LT
142+08.46 NEW 24" DR. SKEW 15° LT
144+84.80 NEW 18" APP. PIPE LT

125+03.33 TO 125+96.33
CONNECTION TO PTW

133+10.00
PUBLIC APP. LT

137+30.00
FARM FIELD APP. RT

144+84.80
FARM FIELD APP. LT

151+53.01 TO 152+80.08
CONNECTION TO PTW

132+95.77 TO 134+50.34
REMOVE GUARDRAIL LT
NEW GUARDRAIL

132+39.60 TO 134+53.09
REMOVE GUARDRAIL RT

+33.82 LT
+23.82 RT
+04.76 LT
+76.16 RT
+57.10 LT
+11.10 RT

134+00.05 TO 135+04.90 B.E.
GUARDRAIL AGG. WIDENING LT

135+76.03 B.E. TO 136+80.66
GUARDRAIL AGG. WIDENING RT

132+96.41 TO 135+04.90 B.E.
GUARDRAIL AGG. WIDENING RT

135+76.03 B.E. TO 137+44.70
GUARDRAIL AGG. WIDENING LT

134+78.16 TO 135+24.36
CLASS 2 RIPRAP
(SEE DETAIL)

135+56.00 TO 136+02.48
CLASS 2 RIPRAP
(SEE DETAIL)

125+03.33 EL. 5,416.91
125+96.33 EL. 5,419.17
126+79.86 EL. 5,421.98
134+25.00 EL. 5,422.66
135+04.90 B.E. EL. 5,423.06
135+76.03 B.E. EL. 5,423.42
137+25.00 EL. 5,424.16
131+50.00 EL. 5,419.89
142+50.00 EL. 5,421.70
151+53.01 EL. 5,445.60
151+70.73 EL. 5,446.35
152+80.08 EL. 5,447.97

+2.871%
-0.443%
-0.443%
+1.008%
+1.008%
+0.500%
+0.500%
-0.470%
-0.470%
+2.677%
+2.677%
+1.479%

353' VC
400' VC
150' VC
250' VC
800' VC
219' VC

+36
+44
+52
+85
+08

127+75.00 TO 134+60.17
EMBANKMENT FOUNDATION TREATMENT
(SEE DETAIL)

134+60.17 TO 135+04.90 B.E.
EMB. FOUNDATION TREATMENT
(SEE DETAIL)

134+60.17 TO 135+04.90 B.E.
BRIDGE END BACKFILL
(SEE DETAIL)

135+76.03 B.E. TO 150+86.28
EMBANKMENT FOUNDATION TREATMENT
(SEE DETAIL)

135+76.03 B.E. TO 136+23.69
BRIDGE END BACKFILL
(SEE DETAIL)

136+18.99 TO 136+52.01
SPECIAL EMB. IN PONDS
(SEE DETAIL)

136+48.62 TO 138+00.28
SPECIAL EMB. IN PONDS
(SEE DETAIL)

139+93.19 TO 141+47.59
SPECIAL EMB. IN PONDS
(SEE DETAIL)

142+15.98 TO 146+86.33
SPECIAL EMB. IN PONDS
(SEE DETAIL)

147+06.62 TO 148+51.76
SPECIAL EMB. IN PONDS
(SEE DETAIL)

5,470
5,460
5,450
5,440
5,430
5,420
5,410
5,400
5,390

125+00 130+00 135+00 140+00 145+00 150+00

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdPLPz01.dwg	DESIGNED BY	R. HOLM	8/23/2022	ROAD PLANS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		8/23/2022	REVIEWED BY	J. WEAVER	8/23/2022	MADISON COUNTY	UPN 8932000 / 25
1		2:08 PM ryan holm	CHECKED BY	K. YAKAWICH	8/23/2022		

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SUMMARY
SIGNING & DELINEATION QUANTITIES

MATERIAL	TOTAL	UNIT
SIGNS-ALUM REFL SHEET IV	20.4	SQ. FOOT
SIGNS-ALUM REFL SHEET XI	5.2	SQ. FOOT
SIGNS-ALUM SHEET INCR IV		SQ. FOOT
SIGNS-ALUM SHEET INCR XI		SQ. FOOT
OERLAY-SHEET ALUMINUM		POUNDS
POLES-TREATED WOOD 4 IN	40	LINEAR FT.
POLES TREATED WOOD 5 IN		LINEAR FT.
POLES-TREATED TIMBER-CLASS 4		LINEAR FT.
POLES-TREATED TIMBER-CLASS 3		LINEAR FT.
POSTS-TUBULAR STEEL		POUNDS
POSTS-TUBULAR STEEL-SQ-PERF		POUNDS
POSTS-STEEL STRUCTURAL SIGN		POUNDS
OVERHEAD STR/METAL-CANTILEVER		EACH
OVERHEAD STR/METAL-BRIDGE		EACH
POSTS - STEEL U SIGN	20	POUNDS
HIGHWAY TRAFFIC STRIPING-WHITE		GAL.(S)
HIGHWAY TRAFFIC STRIPING-YELLOW		GAL.(S)
WORDS & SYMBOLS		GAL.(S)
DELINEATOR DES A	24	EACH
DELINEATOR DES B		EACH
DELINEATOR DES C		EACH
DELINEATOR DES D	2	EACH
DELINEATOR DES E		EACH
DELINEATOR DES F		EACH
DELINEATOR DES G		EACH
DELINEATOR-DES H		EACH
REMOVE SIGNS	8	EACH
REMOVE SIGNS-GUIDE		EACH
RESET SIGNS		EACH
RESET SIGNS-GUIDE		EACH
FRANGIBLE SIGN POST BKWY-		EACH
FRANGIBLE SIGN POST BKWY-		EACH
SQUARE TUBULAR SLIP BASE BKWY--3 IN		EACH

FINALS

DATE:_____

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SIGN LOCATION AND SPECIFICATIONS

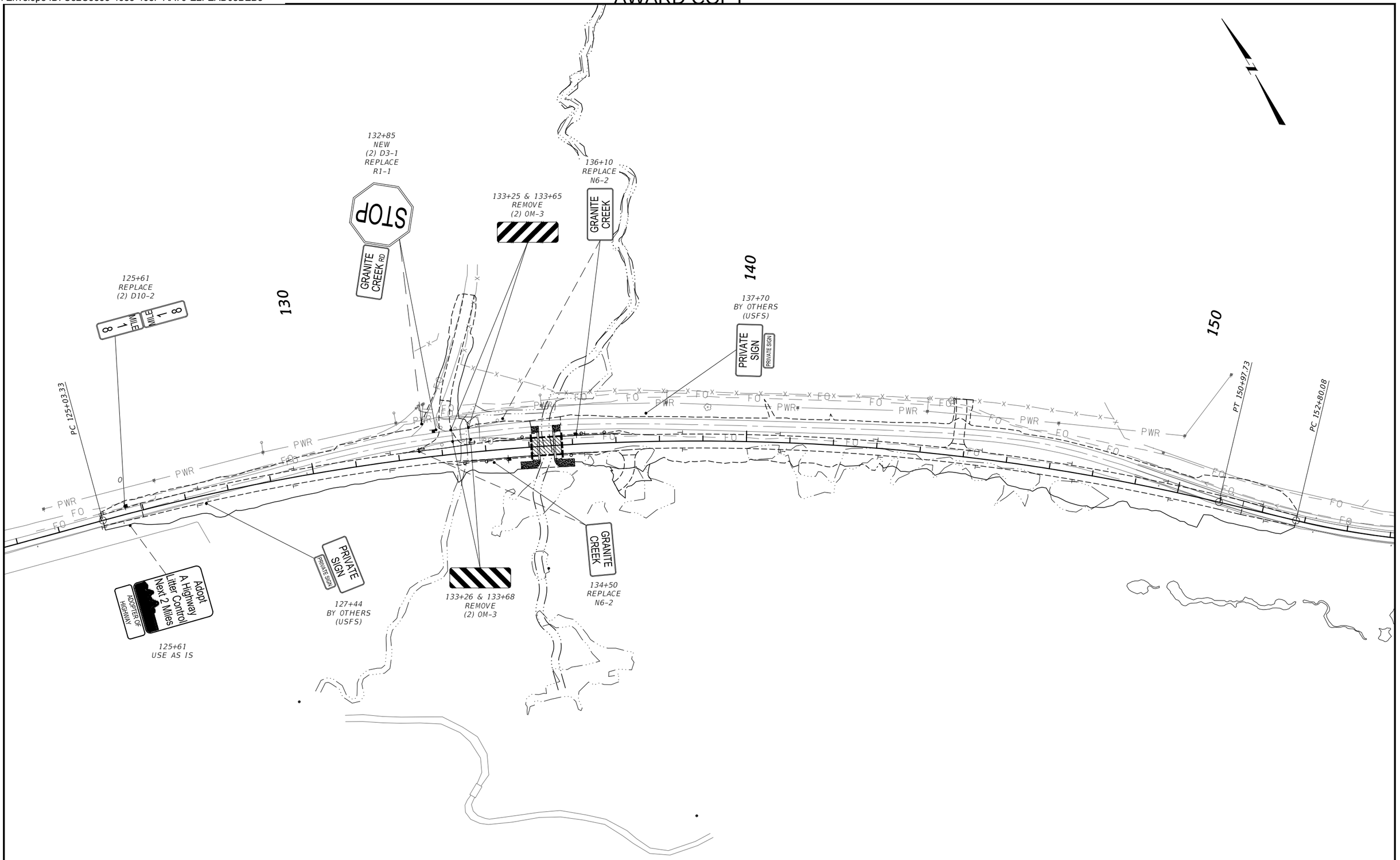
STATION	RAMP NO.	SIGN NO.	PANEL SIZE	REFL SHTG TYPE: BACK-GROUND	REFL SHTG TYPE: LEGEND	FEET: CLEARANCE	FEET: SIGN SUPPORT SPACING	FEET: TYPE OF SUPPORT	CANTILEVER	FEET: SUPPORT LENGTH (ESTIMATED)	FEET: SUPPORT LENGTH (INSTALLED)	FEET: MOUNTING HEIGHT	FEET: FOUNDATION DEPTH	SIGN PANEL (SQ. FT.): SHEET ALUMINUM	SIGN PANEL (SQ. FT.): ALUMINUM SHEET INCREMENT	SIGN PANEL (SQ. FT.): ALUMINUM SHEET OVERLAY	TIMBER POLE (LINEAR FT.): 4" TOP DIA.	TIMBER POLE (LINEAR FT.): 5" TOP DIA.	TIMBER POLE (LINEAR FT.): 6" TOP DIA.	STEEL POST (LBS.): ROUND TUBULAR	STEEL POST (LBS.): SQUARE TUBULAR	STEEL POST (LBS.): STRUCTURAL STEEL	STEEL POST (LBS.): "U" POST	BREAK AWAY	SIGNS: REMOVE	SIGNS: RESET	GUIDE: REMOVE	GUIDE: RESET	REMARKS
125+61 RT		N7-1 N7-1P	USE AS IS																									*	ADOPT A HIGHWAY
125+61 LT		(2) D10-2	10X27	IV	IV	4-0		2 LB/FT STL. U		10-0		4-0	3-0	3.8 IV									20		1				(2) D10-2 = 18
127+44 RT		BY OTHERS (USFS)																											GRANITE CREEK ACCESS
132+85 LT		(2) D3 R1-1	30X18 30X30	IV XI	IV XI	6-0		4" DIA. POLE		14-6		5-0	3-0	7.6 IV 5.2 XI			16								1					NEW D3 = GRANITE CR ROAD
133+25 LT		OM-3	REMOVE																						1				
133+26 RT		OM-3	REMOVE																						1				
133+65 LT		OM-3	REMOVE																						1				
133+68 RT		OM-3	REMOVE																						1				
134+50 RT		N6-2	36X18	IV	IV	2-0		4" DIA. POLE		11-0		5-0	3-0	4.5 IV			12								1					BEHIND GUARDRAIL GRANITE CREEK
136+10 LT		N6-2	36X18	IV	IV	2-0		4" DIA. POLE		11-0		5-0	3-0	4.5 IV			12								1					BEHIND GUARDRAIL GRANITE CREEK
137+70 LT		BY OTHERS (USFS)																											GRANITE CREEK ACCESS
TOTALS														20.4 IV 5.2 XI			40						20		8				

*NOTE: WHERE ADOPT A HIGHWAY SIGN(S) EXIST ON A PROJECT, CONTRACTOR WILL CONFIRM THAT THE GROUP NAME ON THE SIGN(S) CURRENTLY EXISTING AT THE TIME OF CONSTRUCTION CORRESPONDS TO THE GROUP NAME ON THE SIGN(S) SHOWN IN THE PLANS. IF THE NAME IS DIFFERENT, FIELD PROJECT MANAGER WILL CONTACT TRAFFIC AND SAFETY BUREAU SIGNING SECTION WITH CORRECT NAME AND A NEW SIGN DESIGN WILL BE PROVIDED.

DELINEATION TABLE		
	DESIGN "A"	24
	DESIGN "B"	
	DESIGN "C"	
	DESIGN "D"	2
	DESIGN "E"	
	DESIGN "F"	
	DESIGN "G"	
	DESIGN "H"	
	DESIGN "J"	
	DESIGN "BJ"	
	DESIGN "GJ"	

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3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000siPLNz01.dwg	DESIGNED BY	L. WILLIAMS	7/18/2022	SIGNING PLANS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/18/2022	REVIEWED BY	R. HOLM	7/18/2022			
1		3:10 PM ryan holm	CHECKED BY	J. WEAVER	7/18/2022	MADISON COUNTY	UPN 8932000	SHEET S3

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ASSOCIATED PROJECT AGREEMENT NUMBERS	
P. E.	CRSII-STPB 29-1(64)17

MONTANA DEPARTMENT OF TRANSPORTATION

DocuSigned by:
Karl Yakawich
4791B33005A9454...
DATE 12/16/2022



BRIDGE PLANS AND QUANTITIES

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

GRANITE CREEK - 3M NW VIRGINIA CITY

MADISON COUNTY

BRIDGE IDENTIFICATION	
MDT STR ID	NBI NUMBER
05715	000000202205715

SCALES SHOWN ON BRIDGE PLAN SHEETS ARE FOR FULL SIZE (22 X 34) PRINTS REDUCED PRINTS ARE APPROXIMATELY ONE-HALF ORIGINAL SCALE

LIST OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
BRIDGE DRAWINGS		
B1	27825	LIST OF DRAWINGS & ESTIMATED BRIDGE PLAN QUANTITIES
B2	27826	GENERAL LAYOUT AT STA. 135+40.48
B3	27827	FOOTING PLAN
B4	27828	BENT NO. 1 & BENT NO. 2
B5	27829	BENT NO. 1 & BENT NO. 2 DETAILS
B6	27830	BENT NO. 1 & BENT NO. 2 BILL OF REINFORCING STEEL
B7	27831	ERECTION PLAN
B8	27832	SLAB DETAILS

DWG. NO.	TITLE
STANDARD DRAWINGS	
PSD (REVISED 1-30-15)	STANDARD PILE SPLICE DETAILS AND PILE TIPS
M-28 (REVISED 2-26-15)	STANDARD PRESTRESSED CONCRETE BEAM TYPE MT-28
SL-7 (REVISED 3-15-17)	STANDARD SLAB AND DIAPHRAGM DETAILS
SBR-W830 (REVISED 3-15-17)	STANDARD BRIDGE RAIL TYPE W830

ESTIMATED BRIDGE PLAN QUANTITIES

LOCATION	LENGTH (FT)	CONCRETE - CLASS STRUCTURE (YD^3)	CONCRETE - CLASS STRUCTURE LOW SLUMP (YD^3)	TRANSVERSE DECK GROOVING (YD^2)	PRESTRESSED BEAM-TYPE MT-28 (FT)	REINFORCING STEEL		BRIDGE RAIL-W830 (FT)	DYNAMIC LOAD TEST (EACH)	16" DIA. x 1/2" PIPE PILES		PILE CUTTING SHOE (EACH)
						REGULAR (LB)	EPOXY (LB)			FURNISH STEEL PILE - PIPE (LB)	DRIVE STEEL PILE (FT)	
BENT NO. 1		32.2				3288	574		1	21194	241	6
BENT NO. 2		32.2				3288	574		1	16869	188	6
SUPERSTRUCTURE	70.0		83.4	317.0	420.0	154	15678	143.0				
TOTAL	70.0	64.4	83.4	317.0	420.0	6730	16826	143.0	2	38063	429	12

SHEET NO. B1

LIST OF DRAWINGS & ESTIMATED BRIDGE PLAN QUANTITIES

SCALE: No Scale

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

								K.F.Y.	07-13-22
								P.K.S.	07-13-22
REVISED	REVISED	REVISED	REVISED	CHECKED	DRAWN	DESIGNED		G.C.G.	07-13-22

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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE 29

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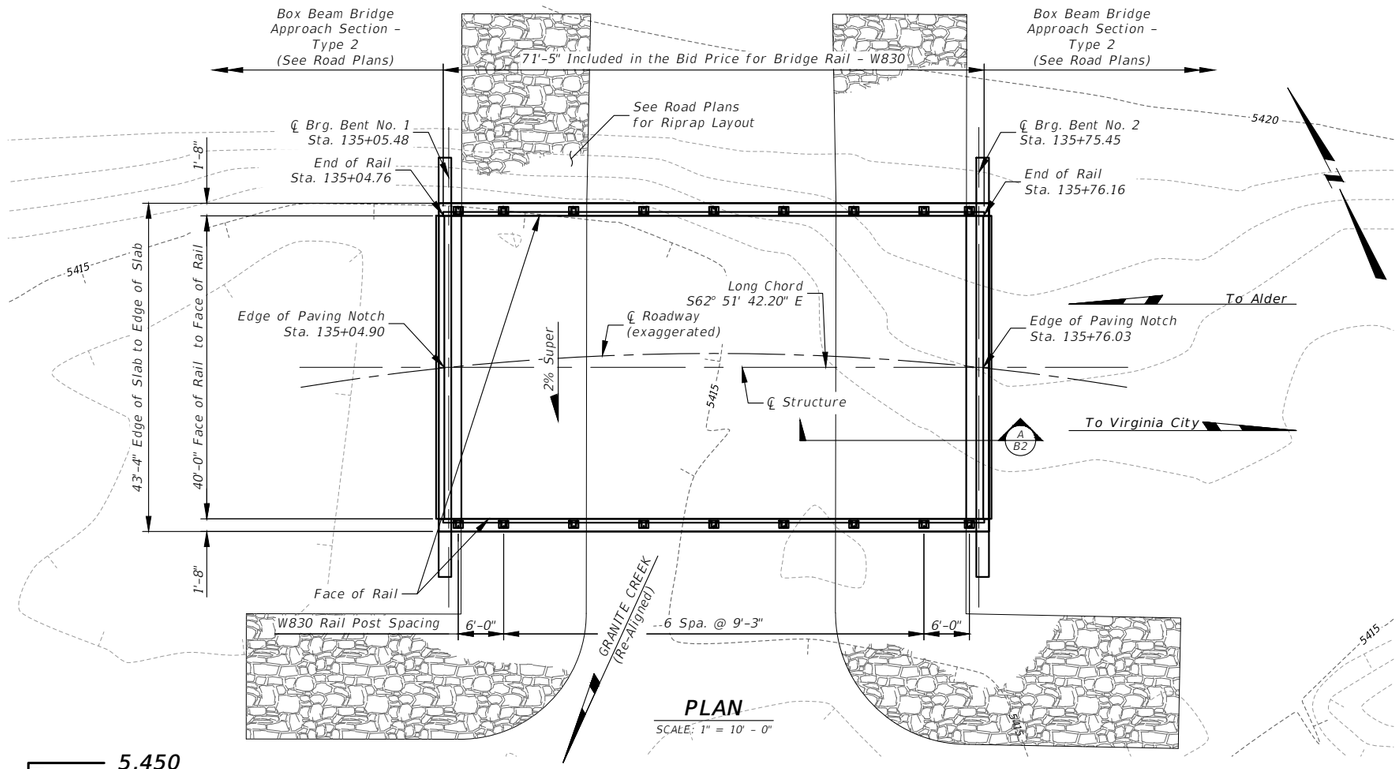
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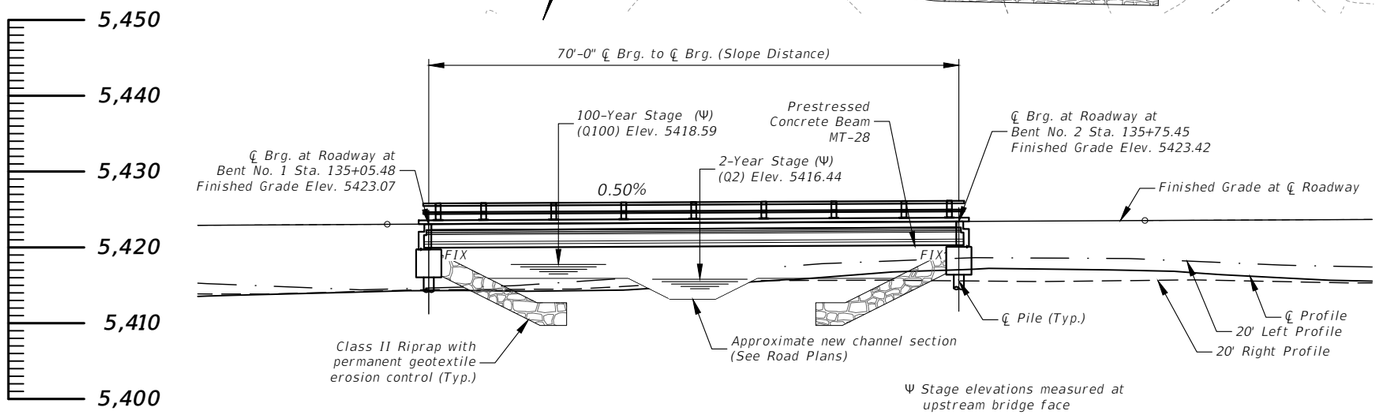
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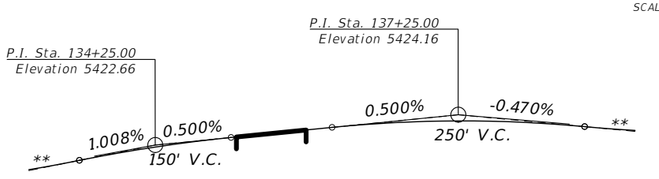
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ELEVATION

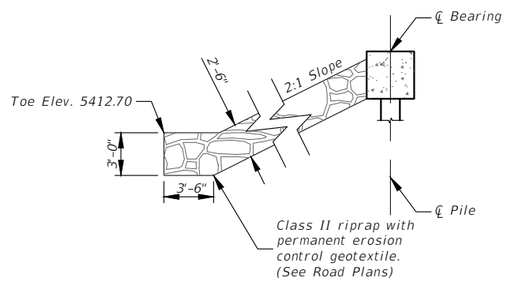
SCALE: 1" = 10' – 0"



**Note: See Road Plans

PROFILE GRADE

No Scale



A B2 RIPRAP CROSS-SECTION

SCALE: 3/16" = 1–0

NOTES

FINISHED GRADE: Finished grade of bridge at centerline roadway is the same as the Profile Grade shown on the Road Plans.

LIVE LOAD: Standard HL–93 Loading.

SPECIFICATIONS: Montana Department of Transportation Standard and Supplemental Specifications for Road and Bridge Construction; 2020 Edition; V 3.0 and any amendments thereto, and the Special Provisions govern unless otherwise noted. The design was prepared in accordance – with AASHTO LRFD Bridge Design Specifications, Ninth edition with current Interim revisions.

REINFORCING STEEL: Use new deformed type reinforcing steel meeting the requirements of AASHTO M 31 Grade 60 or ASTM Specification A 706 Grade 60 as specified. Include all costs associated with furnishing and placing new reinforcing steel in the unit price bid for either Reinforcing Steel or Reinforcing Steel – Epoxy Coated.

REINFORCING STEEL SUFFIX: The suffix E denotes epoxy coated reinforcing steel.

REINFORCING STEEL COVER: Unless specified otherwise on the drawings, the minimum concrete cover measured from the face of the concrete to the face of any reinforcing steel is 2" except as noted below:

Bottom of Slab:	1"
Top of Slab:	2 ½"
Bottom of Abutment Caps:	3"
Concrete Barriers and Curbs:	1 ½"

Concrete cover to any tie bar is ½" less than what is listed above.

CAST IN PLACE CONCRETE: Unless otherwise approved or specified, use Concrete Class – Structure for all substructure concrete and Concrete Class Structure Low Slump for all deck concrete.

CONCRETE STRENGTH: Use f'c = 4000 p.s.i. for Concrete Class Structure & Class Structure – Low Slump.

STRUCTURE EXCAVATION: Include structure excavation in the unit price bid for Concrete Class Structure.

UTILITIES: Call 1–800–424–5555 for utility locates at least two working days prior to starting any constrcution activity that could disturb the utility.

EXISTING STRUCTURES: Remove the existing structure (see Road Plan sheets).

STATE PLANE COORDINATES: Stations shown on the bridge plans are state plane grid stations based on (NAD83–2011). Dimensions shown on the bridge plans are horizontal ground distances and not state plane grid distances. The combination scale factor (CSF) at this location is 0.99956394.

Horizontal ground distance x CSF = Grid Distance
Grid Distance/CSF = Distance to stake.

HYDRAULIC DATA

Drift:	Light
Low Scour Elevation:	5410.34
Ice:	Moderate
Drainage Area:	42 sq. mi.
2–Year Flow:	124 cfs
∗2–Year Stage (Q2):	5416.44
2–Year Velocity:	3.99 fps
50–Year Flood Flow:	455 cfs
∗50–Year Flood Stage (Q50):	5418.31
50–Year Flood Velocity:	3.19 fps
100–Year Flood Flow:	541 cfs
∗100–Year Flood Stage (Q100):	5418.59
100–Year Flood Velocity:	3.54 fps
Actual Low Beam Elevation:	5419.59
Allowable Low Beam Elevation:	5419.59

Also See Hydraulic Data Summary Sheet.
∗Stage elevations (shown in table, above) are measured approximately 100 feet upstream of the proposed bridge and include backwater.
Ψ Stage elevations (shown in the Elevation) are measured at upstream bridge face.

SHEET NO. B2

GENERAL LAYOUT AT STA. 135+40.48

SCALE: As Noted

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

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REVISED						DRAWN	P.K.S.
REVISED						CHECKED	K.F.Y.
REVISED							
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ROUTE 29

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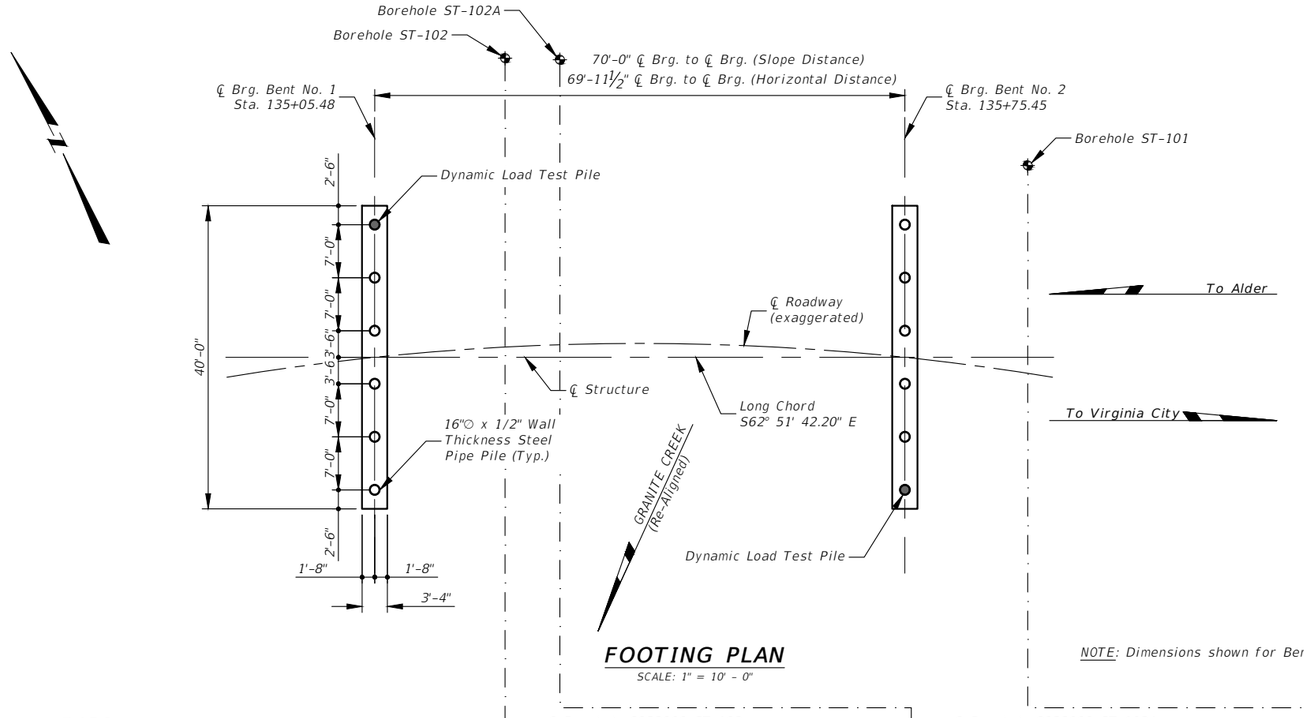
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FOOTING PLAN

SCALE: 1" = 10'-0"

NOTE: Dimensions shown for Bent No. 1 are typical for Bent No. 2.

PILE INFORMATION

LOCATION	DESIGN PILE TIP ELEVATION	MAXIMUM PILE CUT-OFF ELEVATION (FT)	PILE TIP TREATMENT	REQUIRED BEARING RESISTANCE DURING DRIVING (KIPS)	MAXIMUM PILE REACTION UNDER SERVICE I (KIPS)
BENT NO. 1	5376.00	5417.60	CUTTING SHOE	314.0	138.0
BENT NO. 2	5385.00	5417.90	CUTTING SHOE	314.0	138.0

COORDINATE TABLE

LOCATION	N OR Y COORDINATE	E OR X COORDINATE	DESCRIPTION
BENT NO. 1	402076.58	1325384.67	Centerline bearing at centerline roadway
BENT NO. 2	402044.66	1325446.94	Centerline bearing at centerline roadway

NOTES

SOILS AND FOUNDATION MATERIALS: The footing plan shows points where SK Geotechnical drilled boreholes.

The series of numbers on the Log of Borings shows the number of blows from a 140 pound hammer with a 30" drop required to drive a 2" split spoon sampler 6" (Standard Penetration Test). The length of the split spoon sampler is 18". The sample length is measured as three 6" intervals. If the split spoon sampler did not penetrate 6" after 50 blows, the Log of Borings shows the measured penetration within that particular interval.

See the Special Provisions for original boring logs and additional subsurface information.

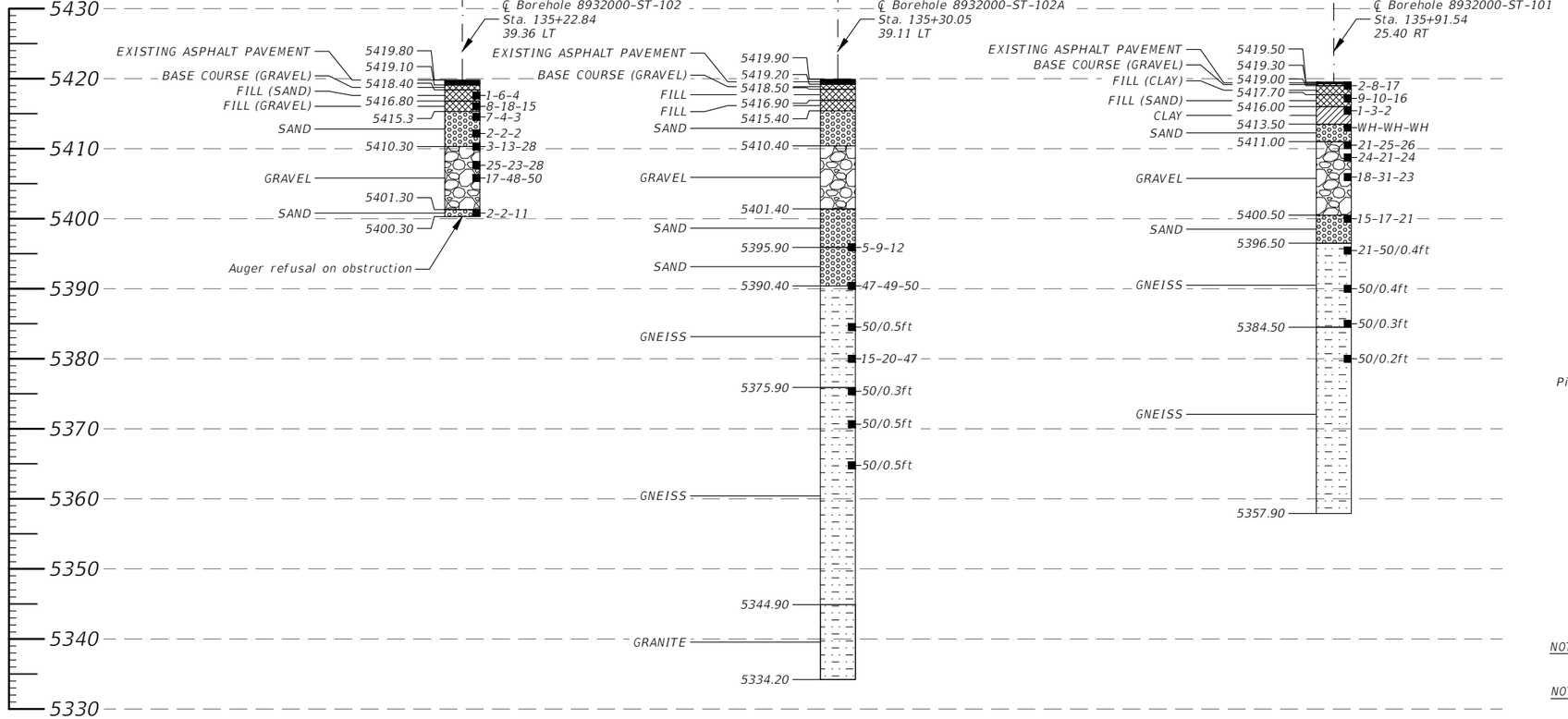
Do not start driving abutment service piles until the abutment test pile analysis is complete.

See Std. Dwg. No. PSD for pile splice and pile tip details.

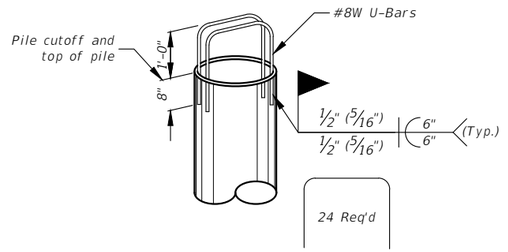
Contact MDT Geotechnical Section at 406-444-6281 if pile tip elevations deviate more than 1 foot from the elevations indicated.

Pile furnish quantities increased by 5 feet per Dynamic Load Test Pile to accommodate Dynamic Load Test.

Pile are to be fitted with inside fit cutting shoes.



SUMMARY OF LOG OF BORINGS



PILE REINFORCING DETAIL

Not To Scale

NOTE: Orient #8W U-bars such that the top of the bar is parallel to the ℄ Brg.

NOTE: Include all costs associated with furnishing and installing rebar in piles in the unit price bid for Furnish Steel Pile - Pipe.

NOTE: Use a certified welder to weld according to AWS D1.4. Use filler material meeting the requirements of AWS A5.5.

SHEET NO. B3

FOOTING PLAN

SCALE: 1" = 10'-0"

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

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REVISED			07-13-22	P.K.S.
REVISED			07-13-22	G.C.G.
CHECKED				
DRAWN				
DESIGNED				

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MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

ROUTE 29

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UPN NUMBER 8932000

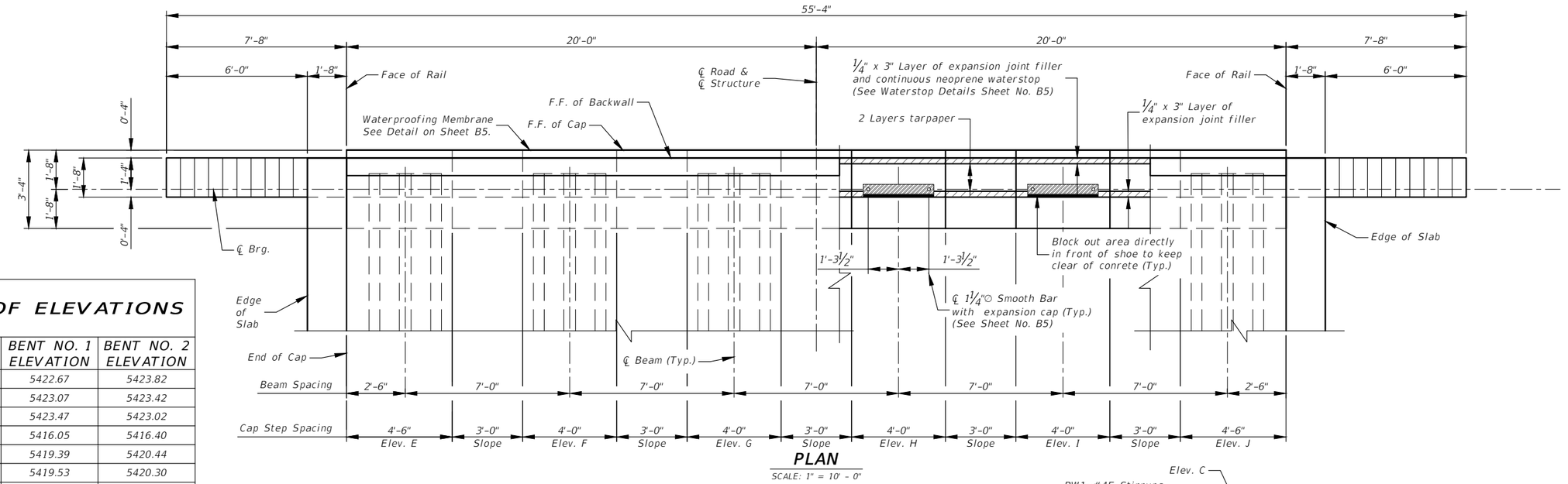
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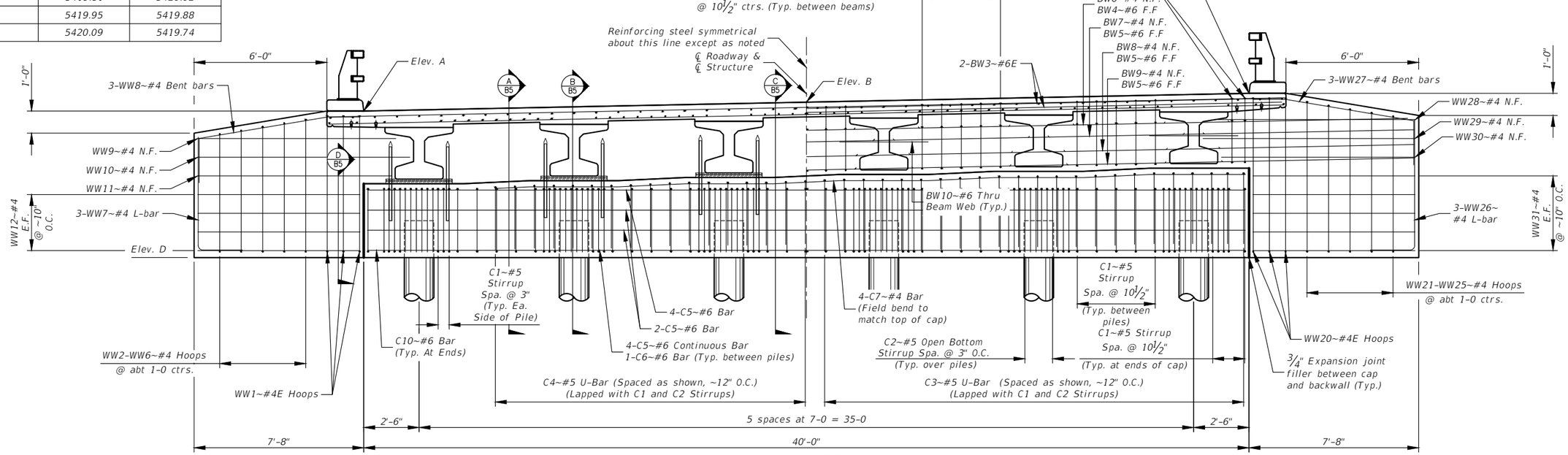
TABLE OF ELEVATIONS

DESIGNATION	BENT NO. 1 ELEVATION	BENT NO. 2 ELEVATION
A	5422.67	5423.82
B	5423.07	5423.42
C	5423.47	5423.02
D	5416.05	5416.40
E	5419.39	5420.44
F	5419.53	5420.30
G	5419.67	5420.16
H	5419.81	5420.02
I	5419.95	5419.88
J	5420.09	5419.74



PLAN
SCALE: 1" = 10' - 0"

Note: BW2~#4E L-Bars lapped with S200 bars (not shown for clarity).



ELEVATION
SCALE: 1" = 10' - 0"
(Bent No. 1 Looking Back On Line)
(Bent No. 2 Opposite Hand Looking Ahead On Line)

NOTES

NOTE: For cap and backwall reinforcement see Sheet B6.

NOTE: Include all costs associated with furnishing and placing the expansion joint filler, tarpaper and neoprene waterstop in the unit price bid for Concrete Class Structure.

NOTE: Securely nail expansion joint filler to pile cap concrete and hold in proper position while placing backwall concrete.

NOTE: N.F. denotes near face. F.F. denotes fill face. E.F. denotes each face.

NOTE: Lap #4 bars 2-0 minimum.
Lap #5 bars 2-6 minimum.
Lap #6 bars 3-0 minimum.
Lap #5E bars 3-0 minimum.

NOTE: Ensure reinforcing steel does not interfere with anchor bolt placement and that dowels (D1) are within the confining reinforcing steel in backwall (BW6-BW9).

SHEET NO. B4

BENT NO. 1 & BENT NO. 2

SCALE: 1"= XX'-0"

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

	REVISED	REVISED	REVISED	REVISED	CHECKED	DRAWN	DESIGNED
G.C.G.						K.F.Y.	P.K.S.	G.C.G.
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MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

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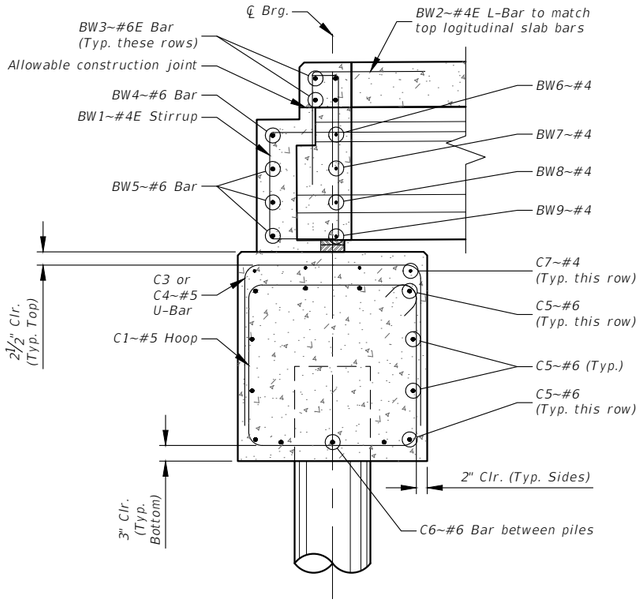
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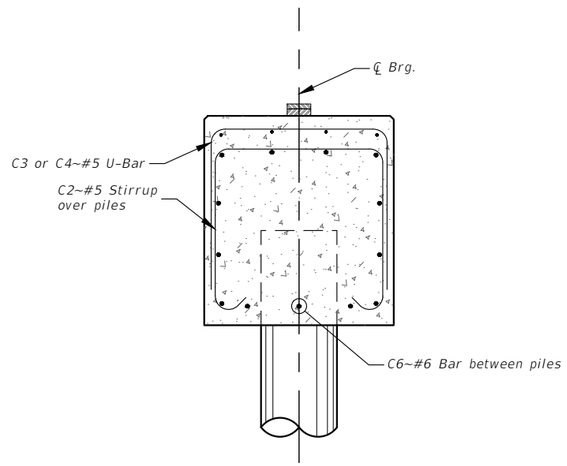
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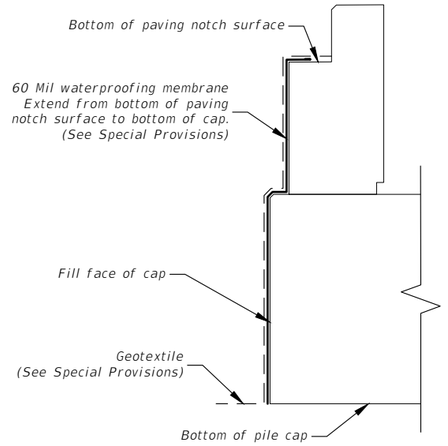
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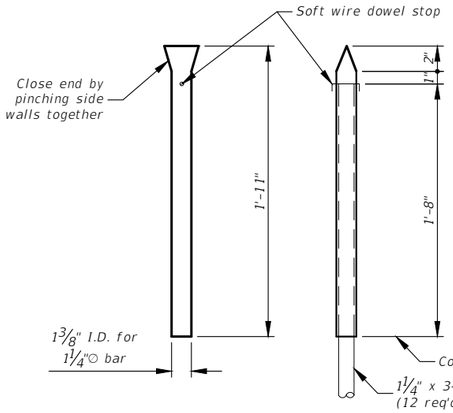
A / B5 SECTION BETWEEN PILES
SCALE: 3/4" = 1-0



B / B5 SECTION AT PILES
SCALE: 3/4" = 1-0



WATERPROOF MEMBRANE DETAIL
No Scale

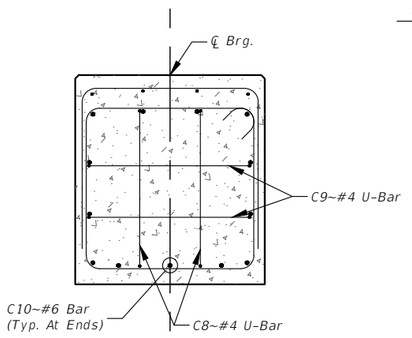


NOTE: Include all costs to furnish and install expansion caps, shoes, fiber reinforced pads and embedded plates in the unit price bid for Prestressed Beams ~ Type MT-28.

NOTE: Use structural steel meeting the requirements of AASHTO M 314 Grade 36 for expansion caps. Galvanize the expansion caps meeting the requirements of AASHTO M 232.

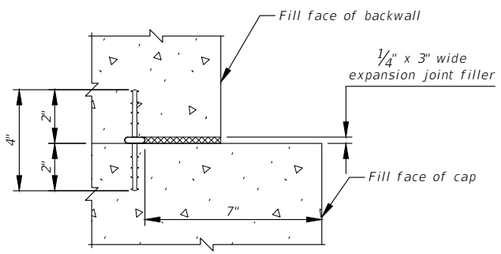
METAL EXPANSION CAP
No Scale

REINFORCING STEEL BAR MARK LOCATIONS	
BAR MARK	LOCATION
C	CAP
BW	BACKWALL
WW	WINGWALL



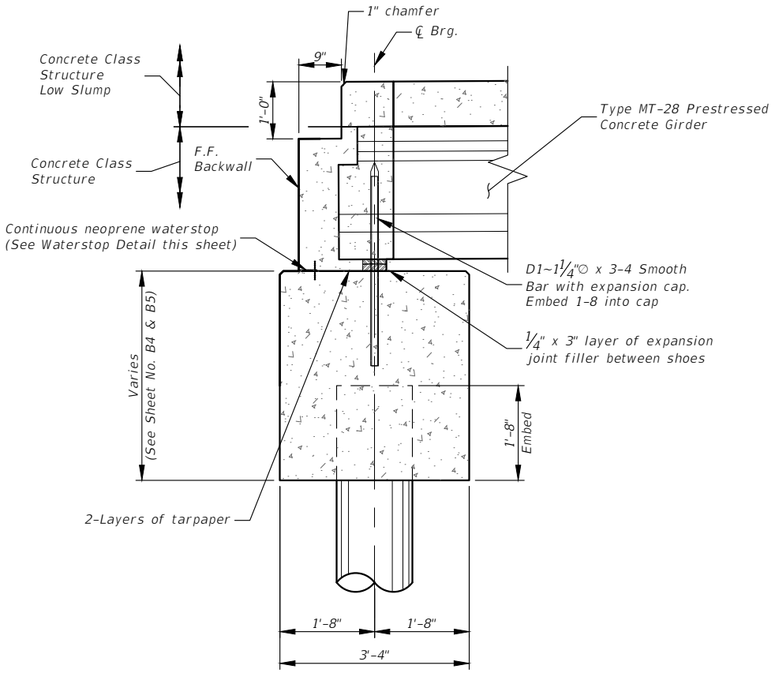
NOTE: Other cap reinforcing shown is not labeled here for clarity.

D / B5 END OF CAP REINFORCING
SCALE: 3/4" = 1-0



WATERSTOP DETAIL
No Scale

NOTE: Hold waterstop in accurate position while placing concrete.



C / B5 BENT SECTION
SCALE: 3/4" = 1-0

SHEET NO. B5

BENT NO. 1 & BENT NO. 2 DETAILS

SCALE: 3/4" = 1'-0"

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

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REVISED					07-13-22	G.C.G.	
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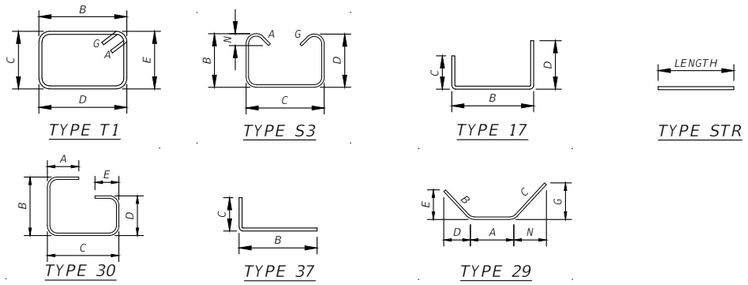
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BILL OF REINFORCING STEEL

FOR ONE BENT ONLY
(ALL DIMENSIONS ARE OUT TO OUT)



Mark	Size	No.	Type	Length	A	B	C	D	E	G	N
C1	#5	65	T1	12-9	0-5½	3-0	2-10½	3-0	2-10½	0-5½	
C2	#5	36	S3	9-9	0-5½	2-10½	3-0	2-10½		0-5½	0-3¾
C3	#5	23	17	9-4		3-0	3-2	3-2			
C4	#5	17	17	8-8		3-0	2-10	2-10			
C5	#6	12	STR	39-8							
C6	#6	5	STR	5-3							
C7	#4	4	STR	33-9½							
C8	#4	4	17	6-9		2-9	2-0	2-0			
C9	#4	4	17	6-10		2-10	2-0	2-0			
C10	#6	2	STR	1-6							
BW1	#4E	29	30	7-4½	0-7	2-10½	1-4	1-10	0-9		
BW2	#4E	22	37	6-0		3-0	3-0				
BW3	#6E	4	STR	44-1							
BW4	#6	1	STR	54-8							
BW5	#6	3	STR	54-11							
BW6	#4	5	STR	4-7							
BW7	#4	5	STR	6-2							
BW8	#4	5	STR	4-8							
BW9	#4	5	STR	4-6							
BW10	#6	6	STR	4-0							
WW1	#4E	3	T1	15-8	0-4½	1-4	6-1½	1-4	6-1½	0-4½	
WW2	#4	1	T1	15-4	0-4½	1-4	5-11½	1-4	5-11½	0-4½	
WW3	#4	1	T1	15-1	0-4½	1-4	5-10	1-4	5-10	0-4½	
WW4	#4	1	T1	14-9	0-4½	1-4	5-8	1-4	5-8	0-4½	
WW5	#4	1	T1	14-5	0-4½	1-4	5-6	1-4	5-6	0-4½	
WW6	#4	1	T1	14-1	0-4½	1-4	5-4	1-4	5-4	0-4½	
WW7	#4	3	37	7-5		5-5	2-0				
WW8	#4	3	29	9-4	5-10½	1-5½	2-0	1-5½	0-2½	1-11½	0-4
WW9	#4	1	STR	8-11							
WW10	#4	1	STR	9-7							
WW11	#4	1	STR	8-9							
WW12	#4	8	STR	7-4							
WW20	#4E	3	T1	17-4	0-4½	1-4	6-11½	1-4	6-11½	0-4½	
WW21	#4	1	T1	17-0	0-4½	1-4	6-9½	1-4	6-9½	0-4½	
WW22	#4	1	T1	16-8	0-4½	1-4	6-7½	1-4	6-7½	0-4½	
WW23	#4	1	T1	16-4	0-4½	1-4	6-5½	1-4	6-5½	0-4½	
WW24	#4	1	T1	16-0	0-4½	1-4	6-3½	1-4	6-3½	0-4½	
WW25	#4	1	T1	15-8	0-4½	1-4	6-1½	1-4	6-1½	0-4½	
WW26	#4	3	37	7-10		5-10	2-0				
WW27	#4	3	29	9-4	5-10½	1-5½	2-0	1-5½	0-2½	1-11½	0-4
WW28	#4	1	STR	8-11							
WW29	#4	1	STR	9-7							
WW30	#4	1	STR	8-9							
WW31	#4	10	STR	7-4							
D1	1¼" ∅	12	STR	3-4							

SHEET NO.
B6

BENT NO. 1 & BENT NO. 2 BILL OF REINFORCING STEEL

SCALE: No Scale

BRIDGE OVER
GRANITE CREEK

AT STA.
135+40.48

FEDERAL AID PROJECT
CRSII-STPB 29-1(64)17

MADISON COUNTY

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					07-13-22	07-13-22	07-13-22
					K.F.Y.	P.K.S.	G.C.G.

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MONTANA DEPARTMENT OF TRANSPORTATION
BRIDGE BUREAU

ROUTE
29

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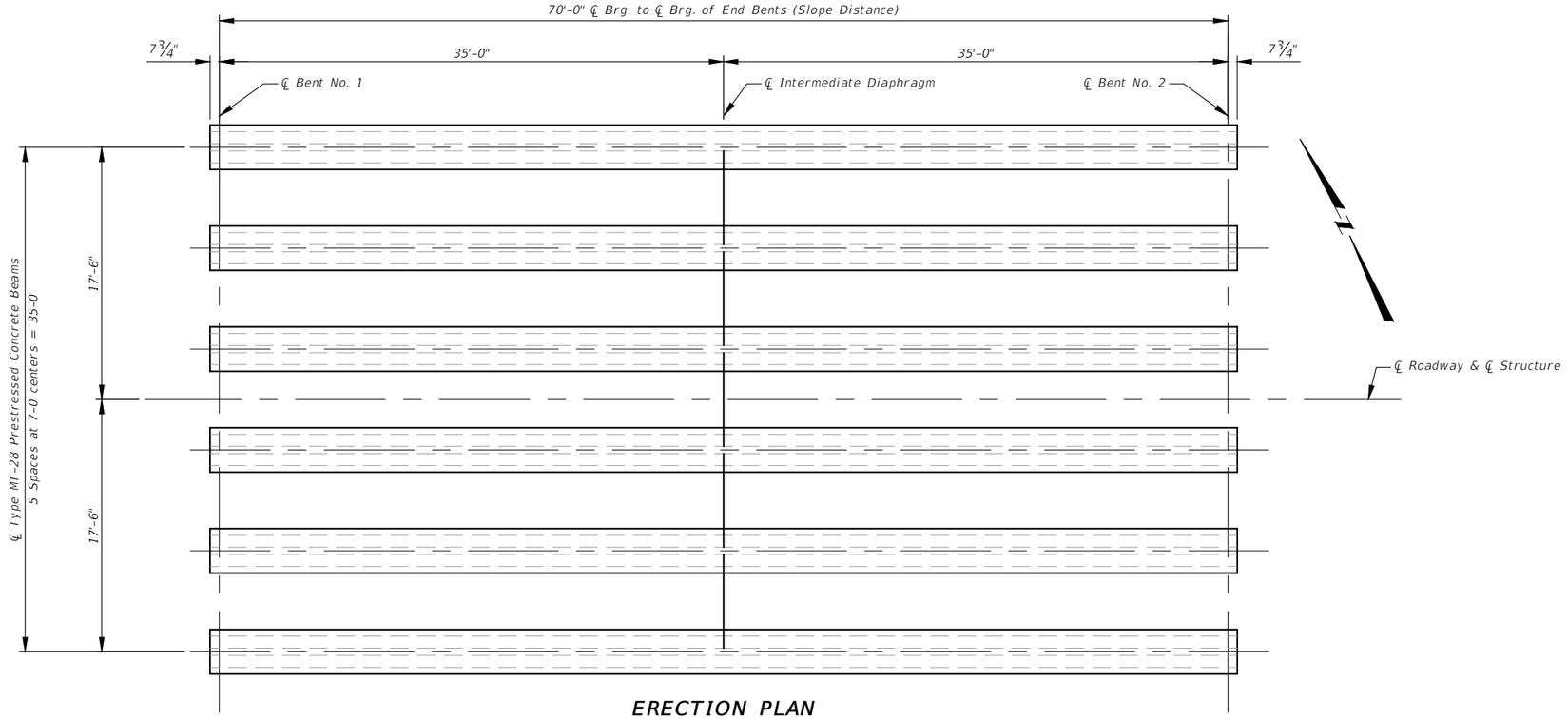
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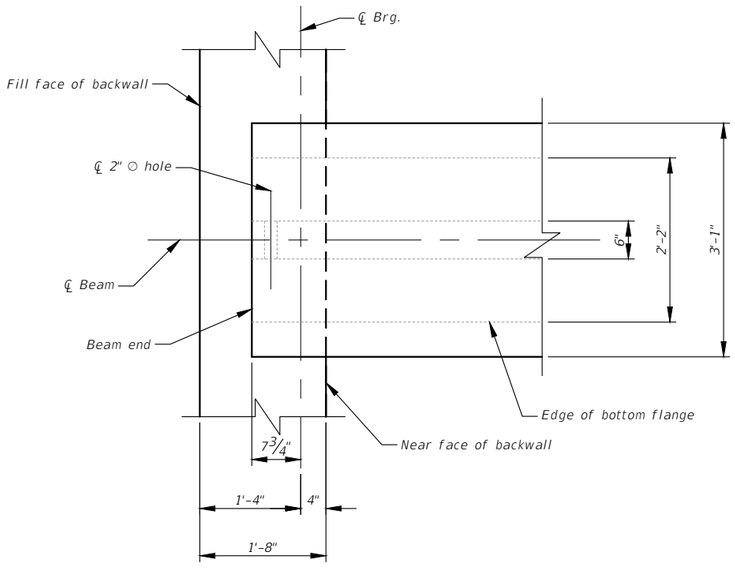
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ERECTION PLAN

SCALE: 1" = 20'-0"



A / B7 BEAM END DETAIL

SCALE: 1" = 1'-0"

DEAD LOAD DEFLECTION TABLE

TYPE MT-28 PRESTRESSED CONCRETE BEAM

SPAN LENGTH	TENTH POINT				
	0.1	0.2	0.3	0.4	0.5
70-0 (Int.)	5/8	1	1 3/8	1 1/2	1 5/8
70-0 (Ext.)	5/8	1 1/4	1 5/8	1 3/4	1 7/8

NOTE: Deflections symmetrical about 0.5 point and do not include beam dead load.

PRESTRESSED BEAM DESIGN PARAMETERS

AASHTO Specifications	LRFD 9th edition with current interims
Structure Type	Simple Span
Deck Concrete Strength	4000 psi
Deck Concrete Density	150 lb/ft3
Prestressing Strand	270 ksi Low Relaxation – (0.500" or 0.600" diameter)
Shear Reinforcing	AASHTO M 31 Grade 60
Alternate Shear Reinforcing	Welded Wire Reinforcement – AASHTO M55, M221, or M54
Section Property Calculations	Gross Section
Prestress Loss Method	Approximate Losses per LRFD 5.9.5 and 5.9.5.3
Shear Computation Method	Sectional Model per LRFD 5.7.3
Beam / Slab Interface	Intentionally Roughened to 1/4" amplitude
Load Rating Requirements	AASHTO LRFR Design Load

PRESTRESSED BEAM LOAD TABLE

LOAD TYPE	LOADS	APPLICATION METHOD
Barrier Load	0.173 kip/ft per rail	Equally to all beams
Future Wearing Surface	0.01 kip/ft2 applied between curbs	Equally to all beams
Intermediate Diaphragm	1.09 kip/diaphragm	At point load
Exterior Diaphragm	0.54 kip/diaphragm	At point load
Additional Dead Load	--------	--------
Live Load	LRFD – HL-93	per AASHTO LRFD for type (k) sufficiently connected to act as a unit

SHEET NO. B7

ERECTION PLAN

SCALE: As Noted

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

REVISED			
REVISED			
REVISED			
REVISED			
CHECKED	07-13-22	K.F.Y.	
DRAWN	07-13-22	P.K.S.	
DESIGNED	07-13-22	G.C.G.	

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ROUTE 29

REF POINT REF POINT

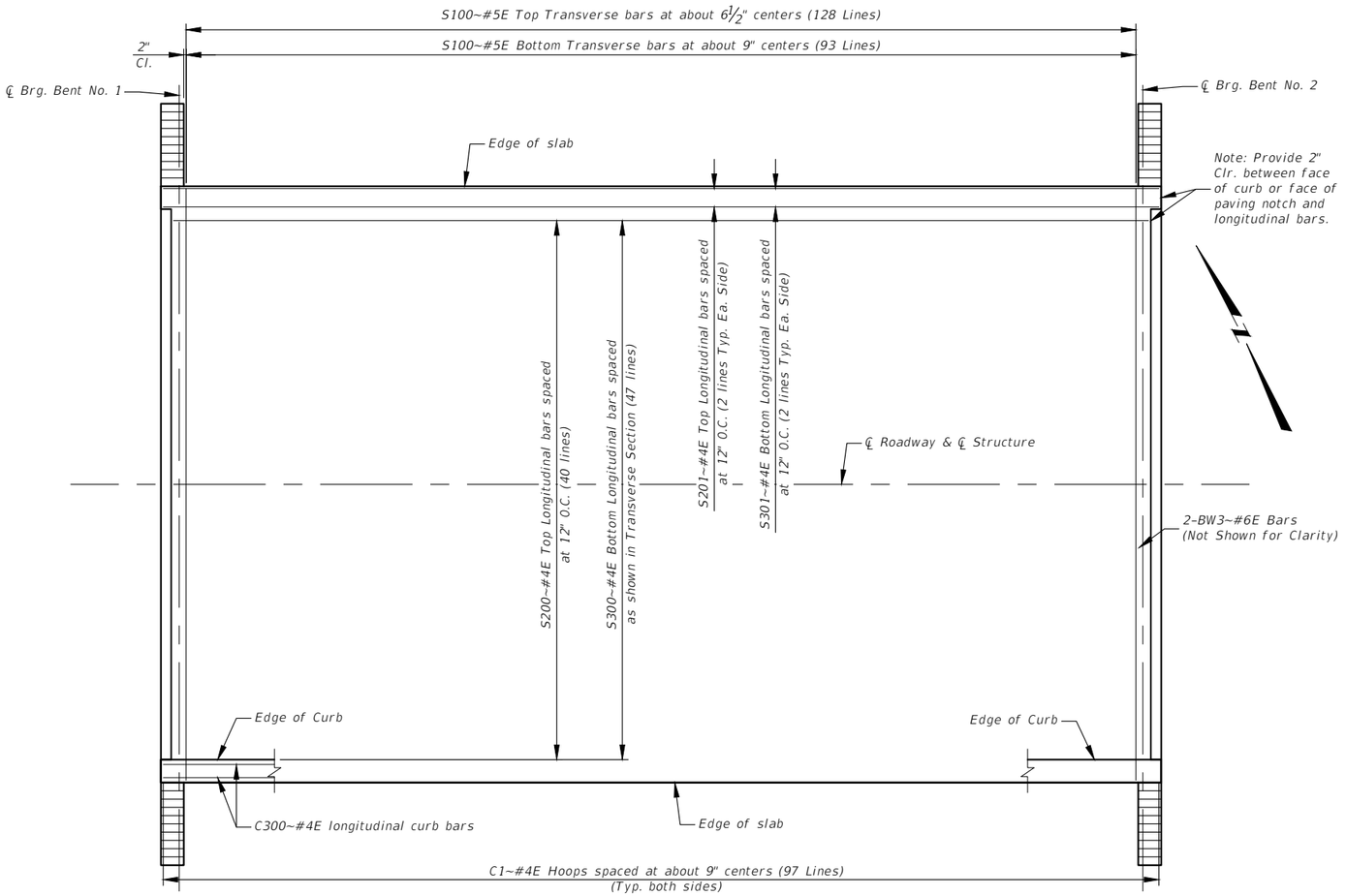
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UPN NUMBER 8932000

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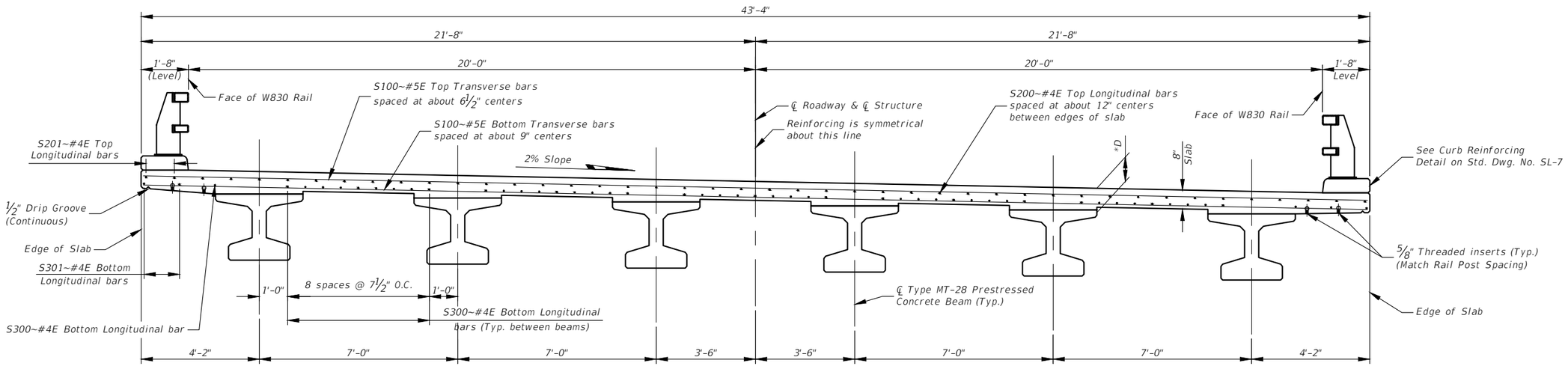
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REINFORCING STEEL PLACEMENT DIAGRAM

SCALE: 3/32" = 1' - 0"

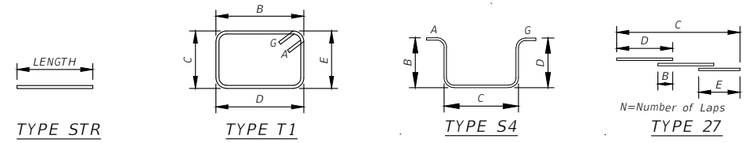


TRANSVERSE SECTION

No Scale
(Looking back on line)

BILL OF REINFORCING STEEL

(ALL DIMENSIONS ARE OUT TO OUT)



Mark	Size	No.	Type	Length	A	B	C	D	E	G	N
C1	#4E	194	T1	5-1	0-4½	1-3	0-11	1-3	0-11	0-4½	
C300	#4E	4	27	74-8		2-4	72-4	40-0	34-8		1
D5	#4	10	STR	5-10							
D6	#6	10	STR	5-10							
D7	#4E	25	S4	5-3	0-5	1-11	0-7	1-11		0-5	
D8	#6	4	STR	4-0							
S100	#5E	221	STR	42-11							
S200	#4E	40	27	71-3		2-4	70-10	40-0	31-3		1
S201	#4E	4	27	73-2		2-4	72-4	40-0	33-2		1
S300	#4E	47	27	71-3		2-4	70-10	40-0	31-3		1
S301	#4E	4	27	73-2		2-4	72-4	40-0	33-2		1

NOTE: 4" additional per lap splice has been provided for construction tolerances.
Lap #4E longitudinal bars 2-0 minimum, 2-4 lap provided.
Lap #5E longitudinal bars 3-0 minimum.

REINFORCING STEEL BAR MARK LOCATIONS

BAR MARK	LOCATION
C	CURB
D	DIAPHRAGM
S	SLAB

*NOTE: Dimension D = 9" @ ℄ Brg. (Varies at tenth points). See Dead Load Deflection Table and Camber Diagram on Sheet No. B7.

NOTE: See Std. Dwg. No. SL-7 for additional slab, curb, rail, drip groove and threaded insert and diaphragm information.

SHEET NO. B8

SLAB DETAILS

SCALE: As Noted

BRIDGE OVER GRANITE CREEK

AT STA. 135+40.48

FEDERAL AID PROJECT CRSII-STPB 29-1(64)17

MADISON COUNTY

REVISED				CHECKED	K.F.Y.
REVISED				DRAWN	P.K.S.
REVISED				DESIGNED	G.C.G.
REVISED				12-02-22	G.C.G.

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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE 29

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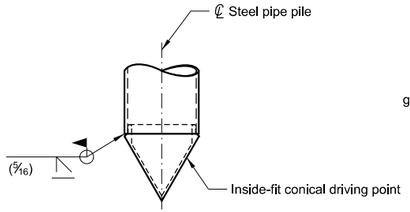
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UPN NUMBER 8932000

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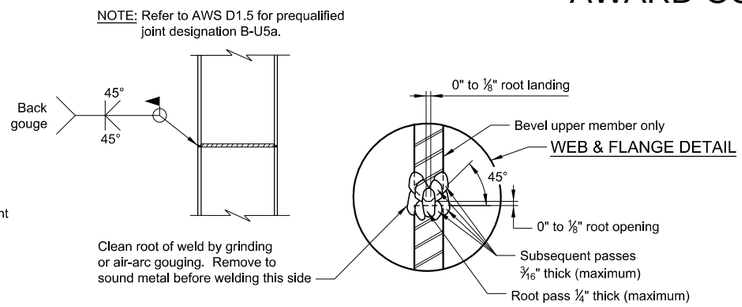
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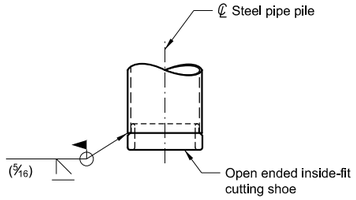
CONICAL DRIVING POINT WELD DETAIL

Slip driving point inside pipe.



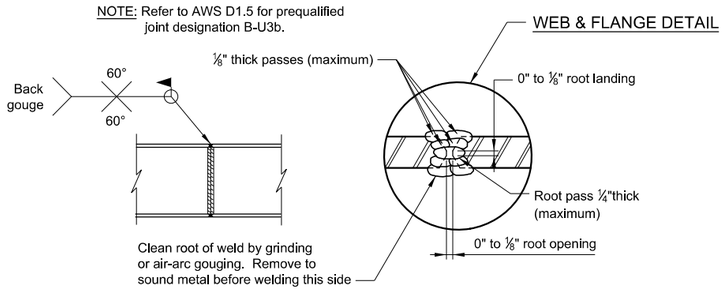
PILE EXTENSION AFTER DRIVING

(Pile Vertical)



CUTTING SHOE WELD DETAIL

Slip shoe inside pipe.



PILE EXTENSION BEFORE DRIVING

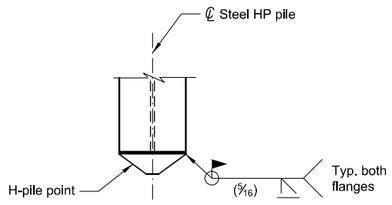
WELDED SPLICES FOR STEEL HP PILES

NOTES

PILE SPLICES: Use only E7018 series electrodes. Prepare the weld surfaces to a smooth, uniform finish. Remove all fins, tears, loose scale, slag, rust, grease, moisture and other material that would prevent proper welding.

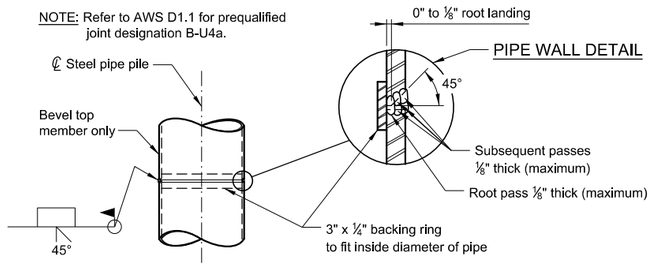
PILE TIPS: Use only E7018 series electrodes to attach pile tips.

PILE TYPE: See Footing Plan sheets for correct pile type, pile tip and pile tip elevations.



H-PILE POINT WELD DETAIL

Do not weld web or inside of flanges.



PILE EXTENSION AFTER DRIVING

(Pile Vertical)

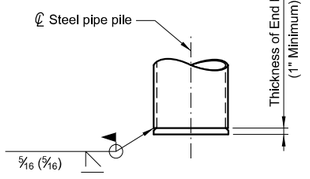
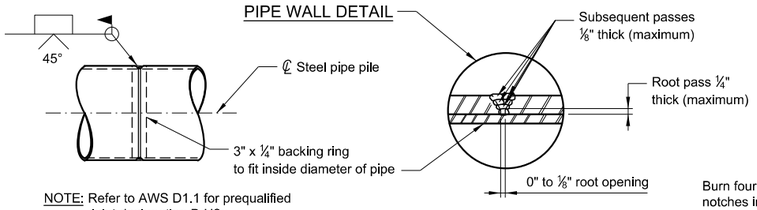


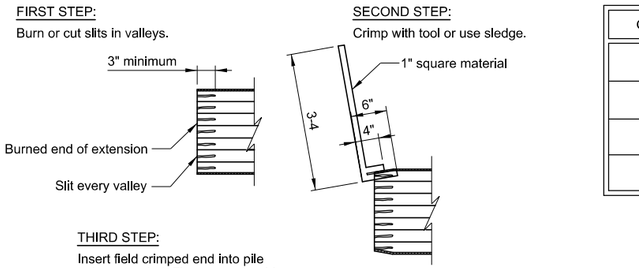
PLATE END WELD DETAIL

Align plate with outside of pipe.

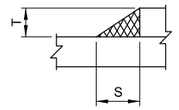


PILE EXTENSION BEFORE DRIVING

WELDED SPLICES FOR STEEL PIPE PILES

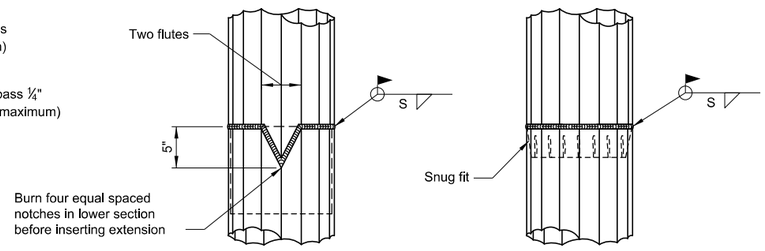


Gage of Pile T	Weld Size S
9 gage (0.1495")	1/4"
7 gage (0.1793")	5/16"
5 gage (0.2092")	5/16"
3 gage (0.2391")	3/8"



FIELD CRIMPING DETAIL FOR CUT-OFF EXTENSIONS

NOTE: Refer to AWS D1.1 for weld requirements.



FACTORY CRIMPED EXTENSION

FIELD CRIMPED EXTENSION

WELDED SPLICES FOR STEEL FLUTED PILES

STANDARD PILE SPLICE DETAILS AND PILE TIPS

No Scale

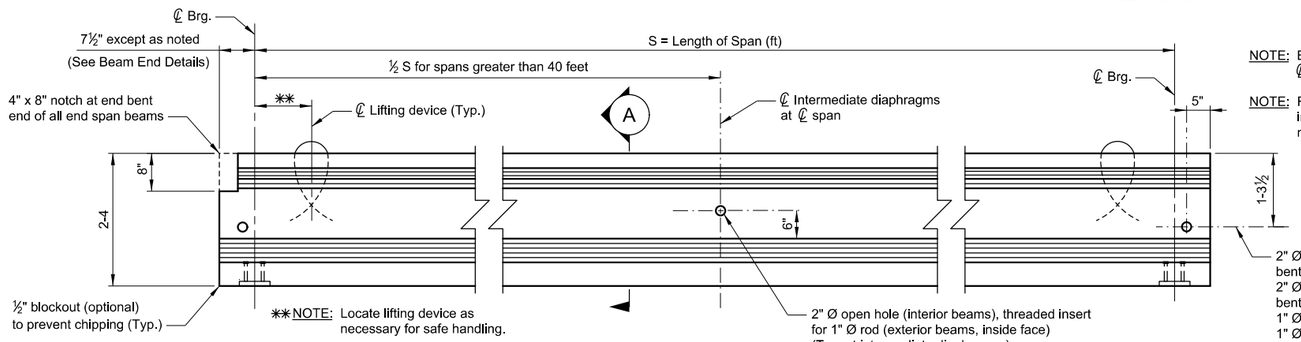
MDT MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

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APPROVED	1-30-15	D.F.J.
CHECKED	1-30-15	D.F.J.
DRAWN	1-23-15	T.J.B.
$DATE$	$TIME$	$FILEABBREV$

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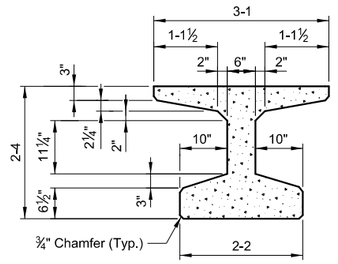


ELEVATION

NOTE: Beam is symmetrical about ℄ of span except as noted.

NOTE: For spans 40 feet or less, intermediate diaphragms are not required.

2" Ø open hole at end bent ~ all beams.
2" Ø open hole at intermediate bents ~ interior beams.
1" Ø threaded insert for 1" Ø x 2-3 rod at inside face of exterior beams at intermediate bents.
Embed rod 2" inside beam.



SECTION A

NOTES

SPECIFICATIONS: For design specifications, see General Layout. Design and fabricate the beam to support the dead load and live load stresses and provide a minimum ultimate moment capacity shown on the Erection Plan. Show stresses in the beam under each loading condition that is anticipated in the manufacture, handling and service life of the beam.

PRESTRESSING STEEL: Use 0.500" diameter or 0.600" diameter, 7 wire strand prestressing steel.

HARDWARE: Threaded inserts, hold down devices, lifting devices and any other hardware which is to be incorporated in the beam will be approved by the Engineer before fabrication is begun.

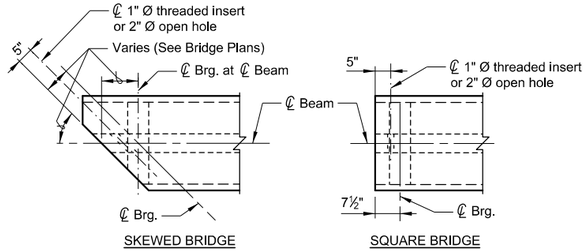
DIAPHRAGMS: See Erection Plan for location of diaphragms when structure is skewed.

BEAM LENGTH: Increase the overall length of the beam 0.0075 inches per foot of length to allow for elastic shortening, shrinkage and creep.

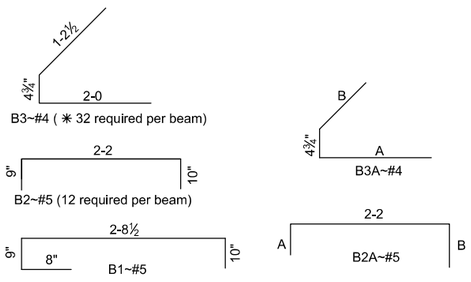
SHOES: Paint shoes according to Standard Specifications. See details on Bridge Plans if expansion shoes are required. See General Layout for type of shoes required.

REINFORCING STEEL: See General Layout.

SHEAR REINFORCING: The shear and end reinforcement shown on this drawing is the Department's minimum. Increase reinforcing if needed to meet the requirements of the AASHTO code specified on the General layout.

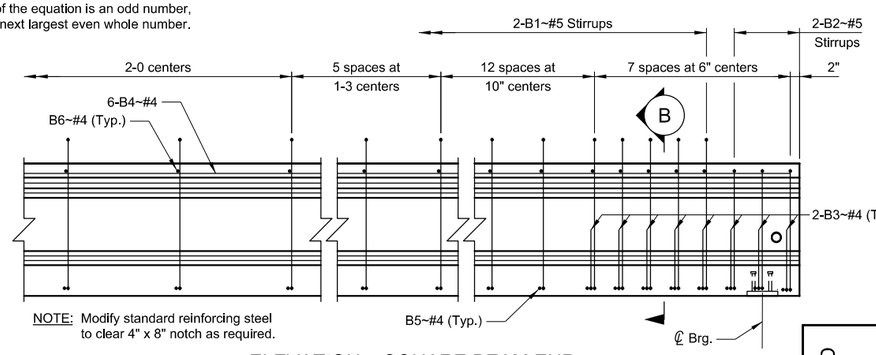


BEAM END DETAILS

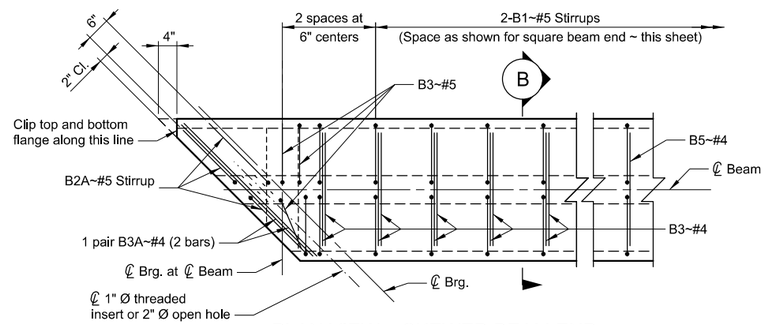


NOTE: Use the following equation to determine the number of B1~#5 stirrups required per beam:
N = ((S - 38.5) / 2 + 43) x 2

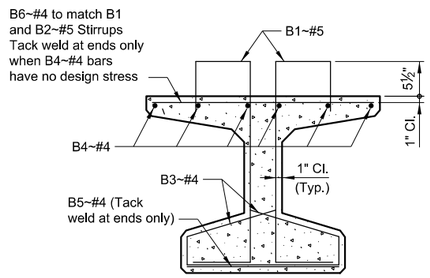
If the result of the equation is an odd number, round to the next largest even whole number.



ELEVATION ~ SQUARE BEAM END



PLAN VIEW ~ SKEWED BEAM END

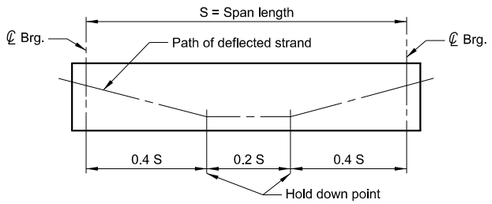


SECTION B

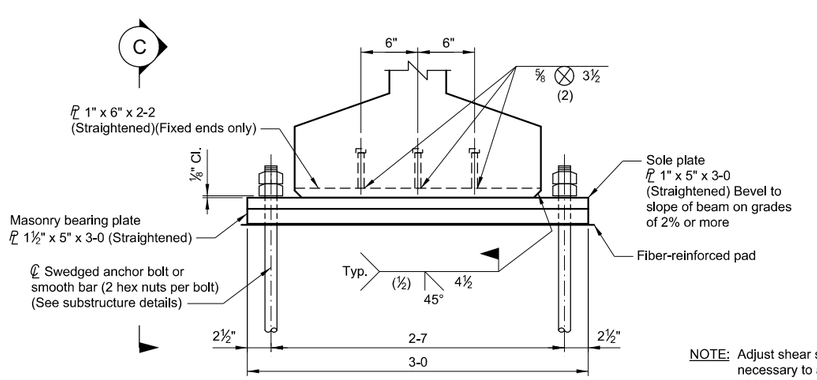
✳NOTE: Number shown is for square beam ends. Number required for skewed beam ends varies.

NOTE: The number of B2A~#5 stirrups required per beam varies due to varying skew.

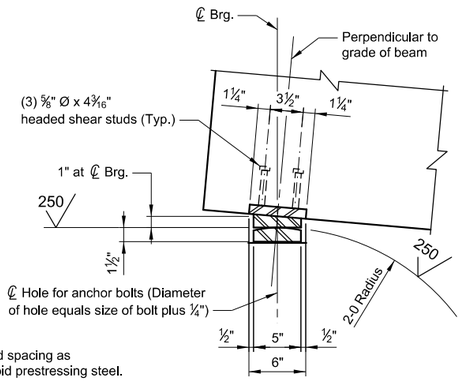
NOTE: Length of A and B varies due to varying skew.



TYPICAL DEFLECTED STRAND
FOR PRE-TENSIONING SYSTEM



END VIEW



VIEW C

NOTE: Adjust shear stud spacing as necessary to avoid prestressing steel.

FIXED SHOE DETAILS

NOTE: Include all costs to furnish and install anchor bolts, nuts, shoes, fiber reinforced pads and embedded plates in the unit price bid for Prestressed Beams ~ Type MT-28.

NOTE: See substructure details for length and size of anchor bolts.

NOTE: Use structural steel meeting the requirements of AASHTO M 270 Grade 36 for embedded plates and shoes. Use structural steel meeting the requirements of AASHTO M 314 Grade 36 for anchor bolts. Galvanize the anchor bolts meeting the requirements of AASHTO M 232. Use headed shear studs meeting the requirments of AASHTO M 169 Grades 1010 through 1020.

STANDARD PRESTRESSED CONCRETE BEAM
TYPE MT-28

No Scale

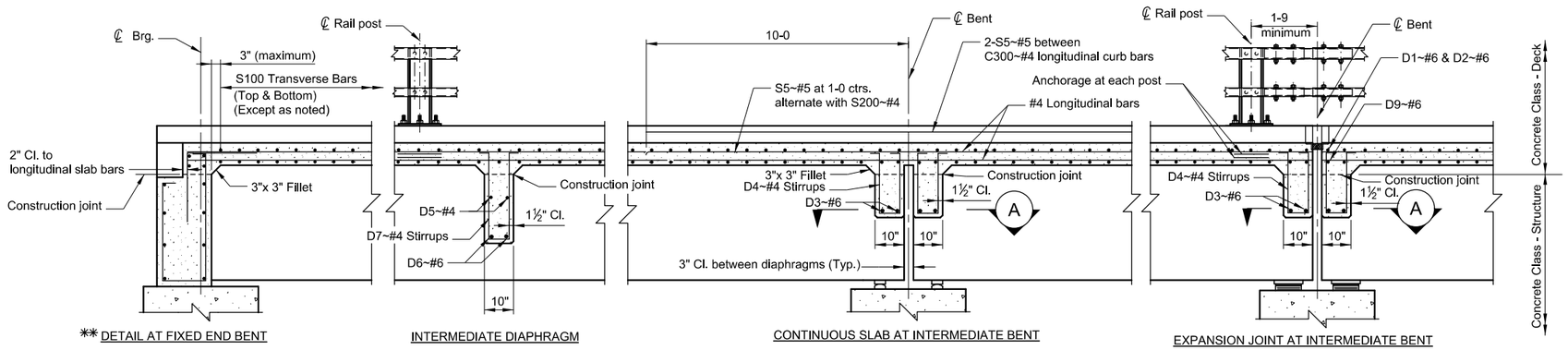
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MONTANA DEPARTMENT OF TRANSPORTATION
BRIDGE BUREAU

REVISED			$FILEABBREV$
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REVISED	2-26-15	D.F.J.	$TIME$
APPROVED	11-12-08	D.F.J.	
CHECKED	6-6-08	J.S.O.	
DRAWN	2-26-08	T.J.B.	$DATE$

DRAWING NO.
M-28

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LONGITUDINAL SECTION

NOTES

Use details shown on this sheet only as they apply to the project. See the General Layout or Other Sheets for beam spacing, slab thickness, size and spacing of S100 bars, number and spacing of S200 and S300~#4 bars, deck joint arrangement, rail and curb length, rail post spacing, bill of reinforcing steel and roadway width.

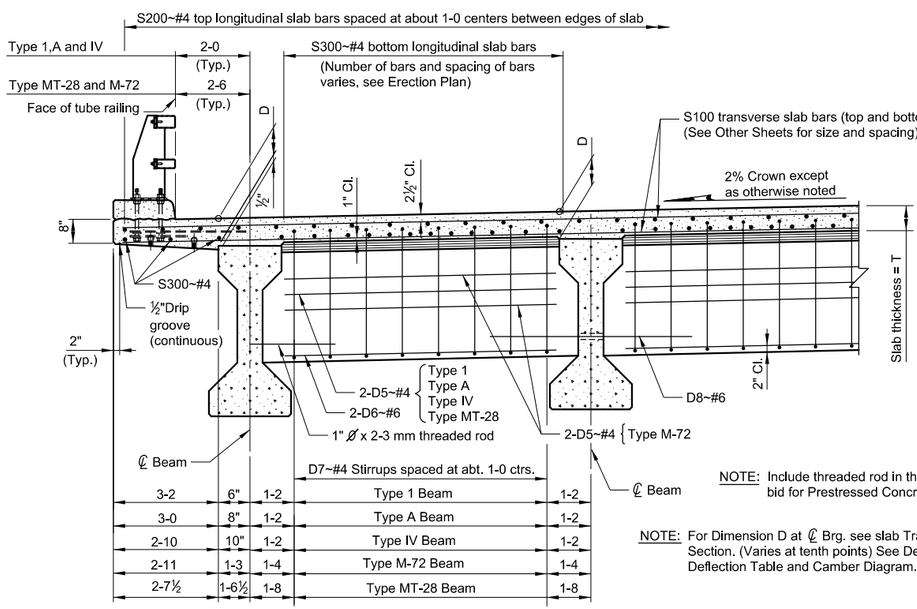
When adjoining spans have a different number of longitudinal slab bars, make the longitudinal bars of the shorter span continuous over the bent and extend them 3-0 into the longer span.

If the bridge is skewed, place the transverse slab reinforcing steel as shown on Other Sheets.

Do not place concrete curb for at least 72 hours after concrete in slab has taken initial set.

See Standard Bridge Rail Type W740 or W830 drawing for rail and slab anchorage details.

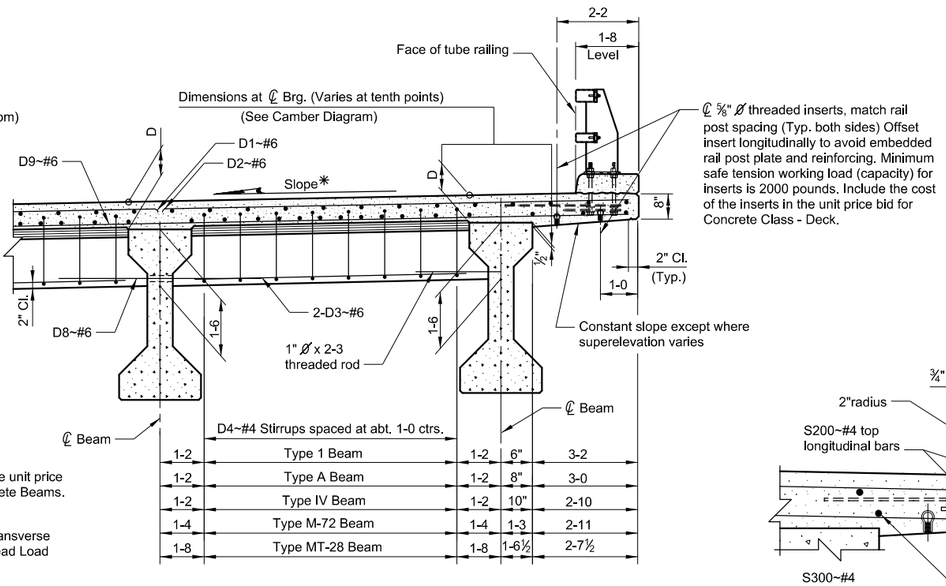
** NOTE: Use a detail for end bents with expansion joints similar to the detail for an expansion joint at an intermediate bent.



NOTE: Include threaded rod in the unit price bid for Prestressed Concrete Beams.

NOTE: For Dimension D at ℄ Brg. see slab Transverse Section. (Varies at tenth points) See Dead Load Deflection Table and Camber Diagram.

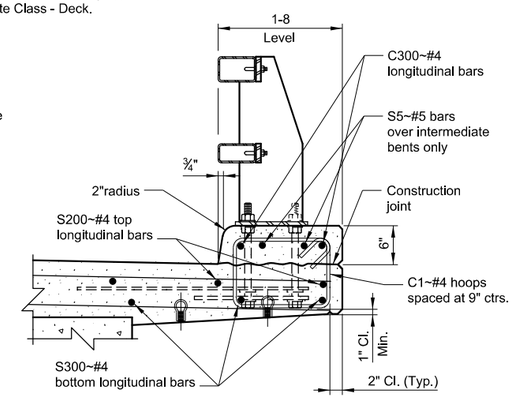
TRANSVERSE SECTION NEAR INTERMEDIATE DIAPHRAGM AT LOW SIDE



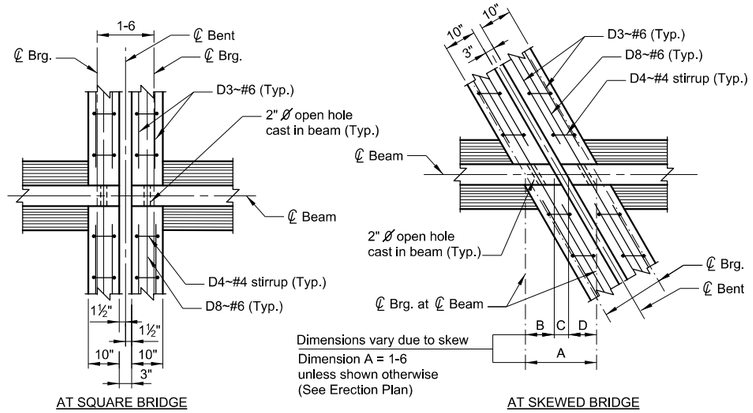
℄ ⅝" Ø threaded inserts, match rail post spacing (Typ. both sides) Offset insert longitudinally to avoid embedded rail post plate and reinforcing. Minimum safe tension working load (capacity) for inserts is 2000 pounds. Include the cost of the inserts in the unit price bid for Concrete Class - Deck.

TRANSVERSE SECTION NEAR INTERMEDIATE BENT AT HIGH SIDE

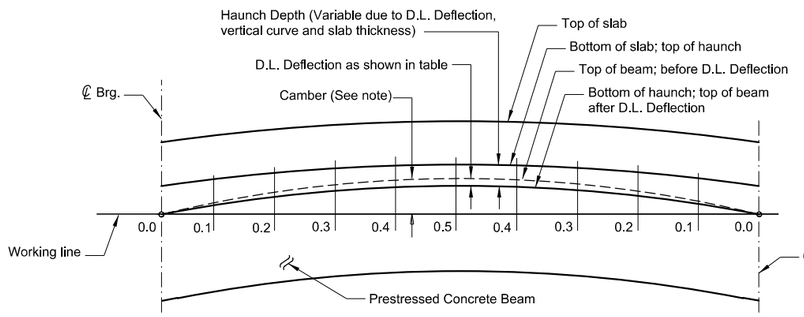
*NOTE: Detail shown is for superelevations other than normal crown.



CURB REINFORCING DETAIL



SECTION A-A



CAMBER DIAGRAM

NOTE: Camber is noted as the distance from the working line to the top of beam and may vary from theoretically calculated D.L. deflection.

NOTE: See Erection plan for theoretical D.L. Deflection Table for Prestressed Concrete Beams.

STANDARD SLAB AND DIAPHRAGM DETAILS

No Scale

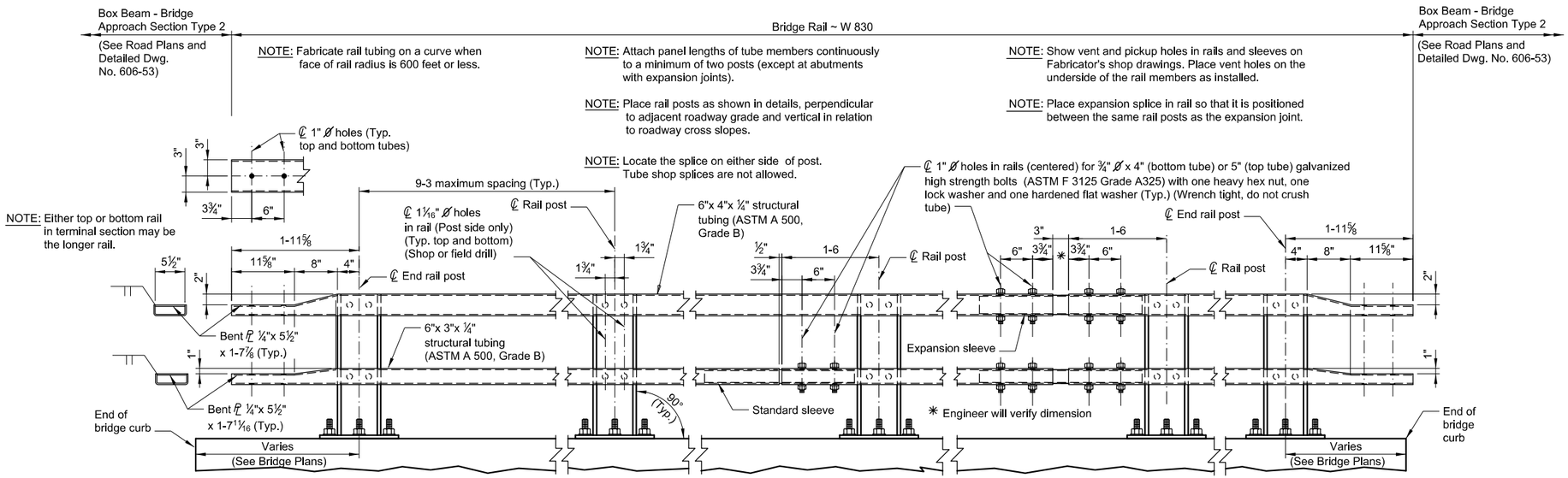
MDT MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

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REVISED	5-30-14	D.F.J.	
REVISED	3-21-12	D.F.J.	
APPROVED	3-26-08	D.F.J.	
CHECKED	10-9-07	D.J.R.	
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ELEVATION AT BOX BEAM GUARDRAIL CONNECTION

NOTE: Do not provide a tube splice in first panel unless it crosses an expansion joint.

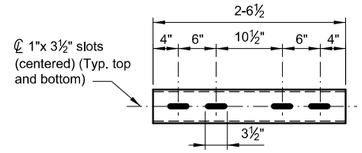
STANDARD SPLICE

(Top or bottom rail)

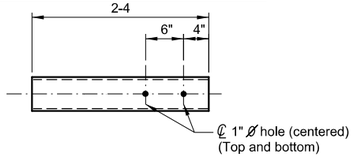
EXPANSION SPLICE

(Top and bottom rail)

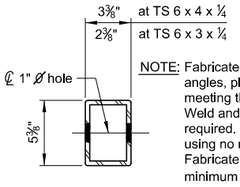
INSIDE ELEVATION OF RAIL



EXPANSION SLEEVE DETAIL



STANDARD SLEEVE DETAIL



NOTE: Fabricate sleeves using channels, angles, plates, or bent plates meeting the dimensions shown. Weld and grind smooth as required. Fabricate sleeves using no more than four welds. Fabricate sleeves with a minimum wall thickness of 3/16".

SLEEVE FABRICATION OPTIONS

NOTES

GALVANIZING: Galvanize all bolts, nuts, washers and pipe sleeves in accordance with ASTM F 2329.

REFLECTORS: Place a white reflector on top of the top tube rail at equal spacing (not to exceed 30 foot spacing) between ends of rail. See Dtl. Dwg. No. 605-00 for reflector detail. Mount the reflector on the tube rail with an approved adhesive. Include the cost of reflector in the unit price bid for Bridge Rail ~ W830.

PAYMENT: Payment for Bridge Rail ~ W830 per linear foot includes compensation for the cost of Concrete Class Deck in the curb and for all resources necessary to complete the work. See the General Layout for the number of linear feet for payment of Bridge Rail ~ W830. Use rail post plates and base plates conforming to AASHTO M 270 Grade 36 T3. Use AASHTO M 270 Grade 36 for all other plates.

ERECTION: Place rail posts as shown in details, perpendicular to adjacent roadway grade and vertical in relation to roadway cross slopes. Place posts in proper alignment prior to placement of curb.

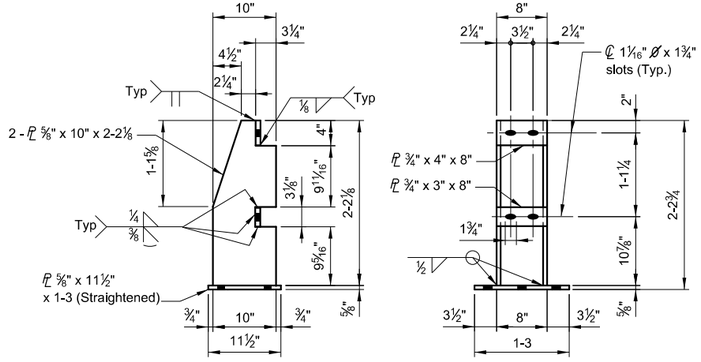
PAINTING: Paint all posts, structural tubing and plates (except as noted) in accordance with the Standard Specifications. Galvanizing the posts, structural tubing and plates in accordance with AASHTO M 111 will be allowed.

EXCEPTIONS: Use details shown on this drawing only as they apply to the project. Anchorage details may vary. Refer to other drawings for variations in these details.

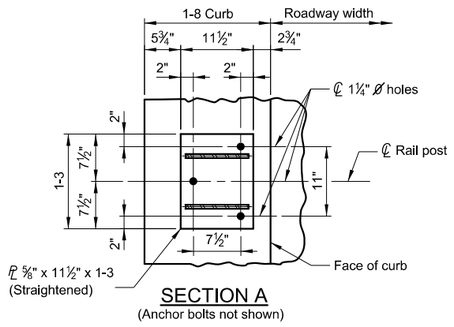
FABRICATION: For the purposes of fabrication, this rail system is considered an ancillary item. The requirements of subsection 1.3.7 of AASHTO/AWS D1.5 apply.

RAIL WEIGHT: For informational purposes only, the rail weight is approximately 123.0 lb/ft for the curb and 50.0 lb/ft for the rail.

POST ASSEMBLY DETAIL

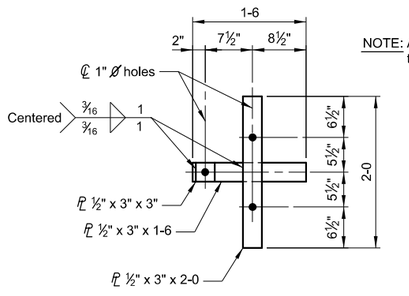


POST DETAILS



SECTION A

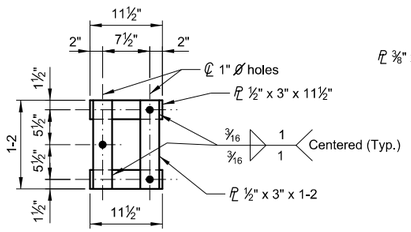
(Anchor bolts not shown)



NOTE: Anchor bolts may be tack welded to anchorage (shop or field).

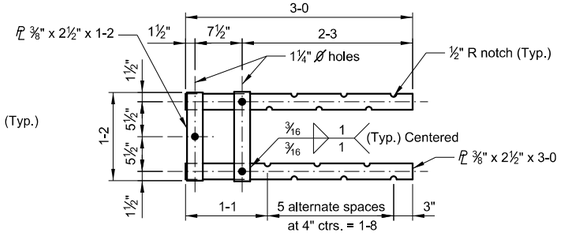
VIEW B

(Showing lower anchorage)
(Do not galvanize)
(Anchor bolts not shown)



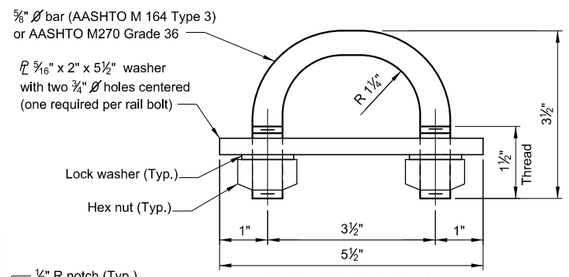
VIEW B (U-TYPE BENT)

(Do not galvanize)
(Anchor bolts not shown)



VIEW B

(Showing upper anchorage)
(Do not galvanize)
(Anchor bolts not shown)



RAIL BOLT DETAIL

STANDARD BRIDGE RAIL TYPE W830

No Scale

MDT MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

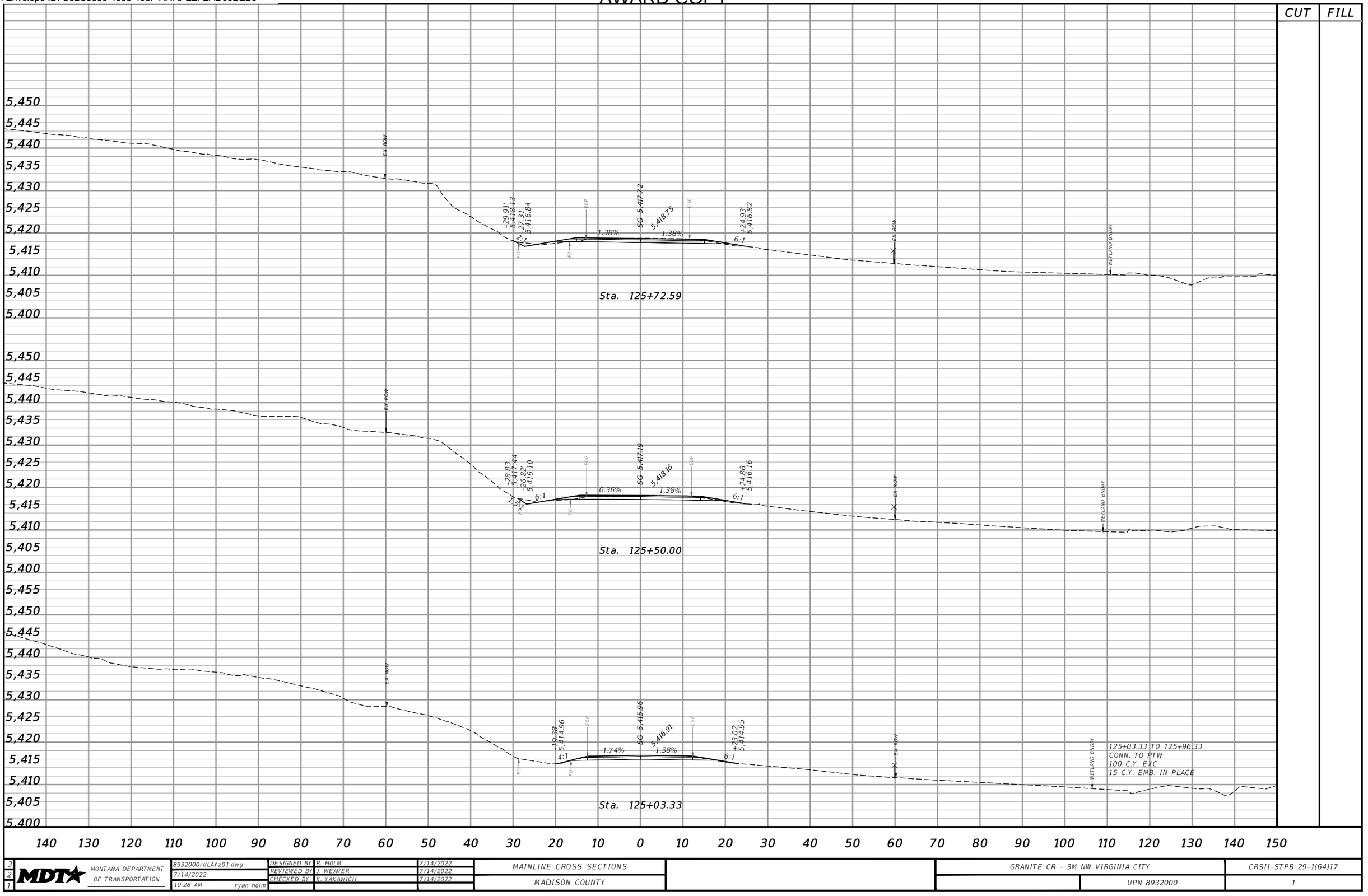
REVISED	3-15-17	D.F.J.	
REVISED	5-20-14	D.F.J.	
REVISED	2-1-11	D.F.J.	
APPROVED	3-26-08	D.F.J.	
CHECKED	3-20-08	D.J.R.	
DRAWN	8-2-06	L.M.S.	
$DATE$	$TIME$	$FILEABBREV$	

DRAWING NO. SBR-W830

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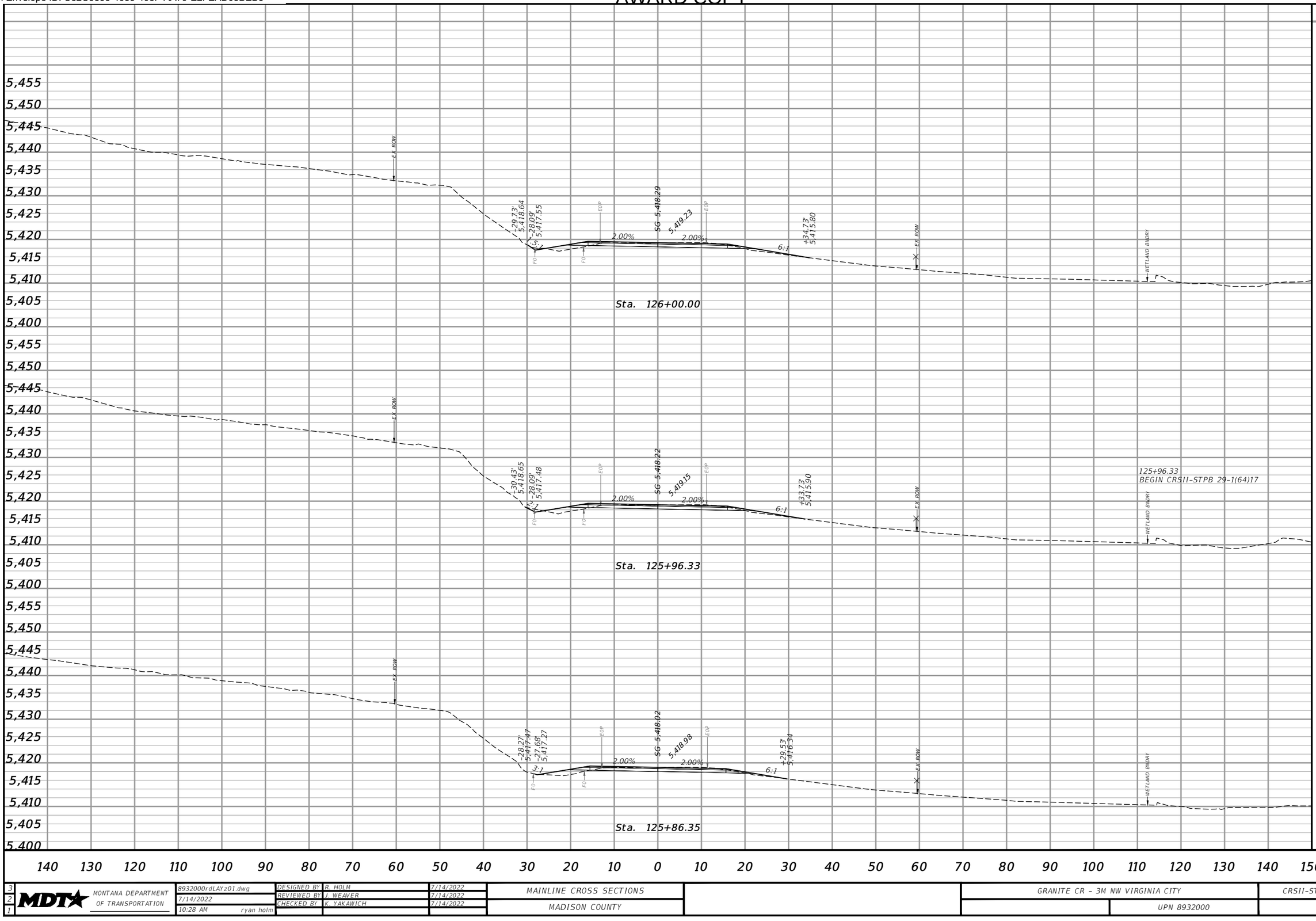
CUT	FILL



3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	1

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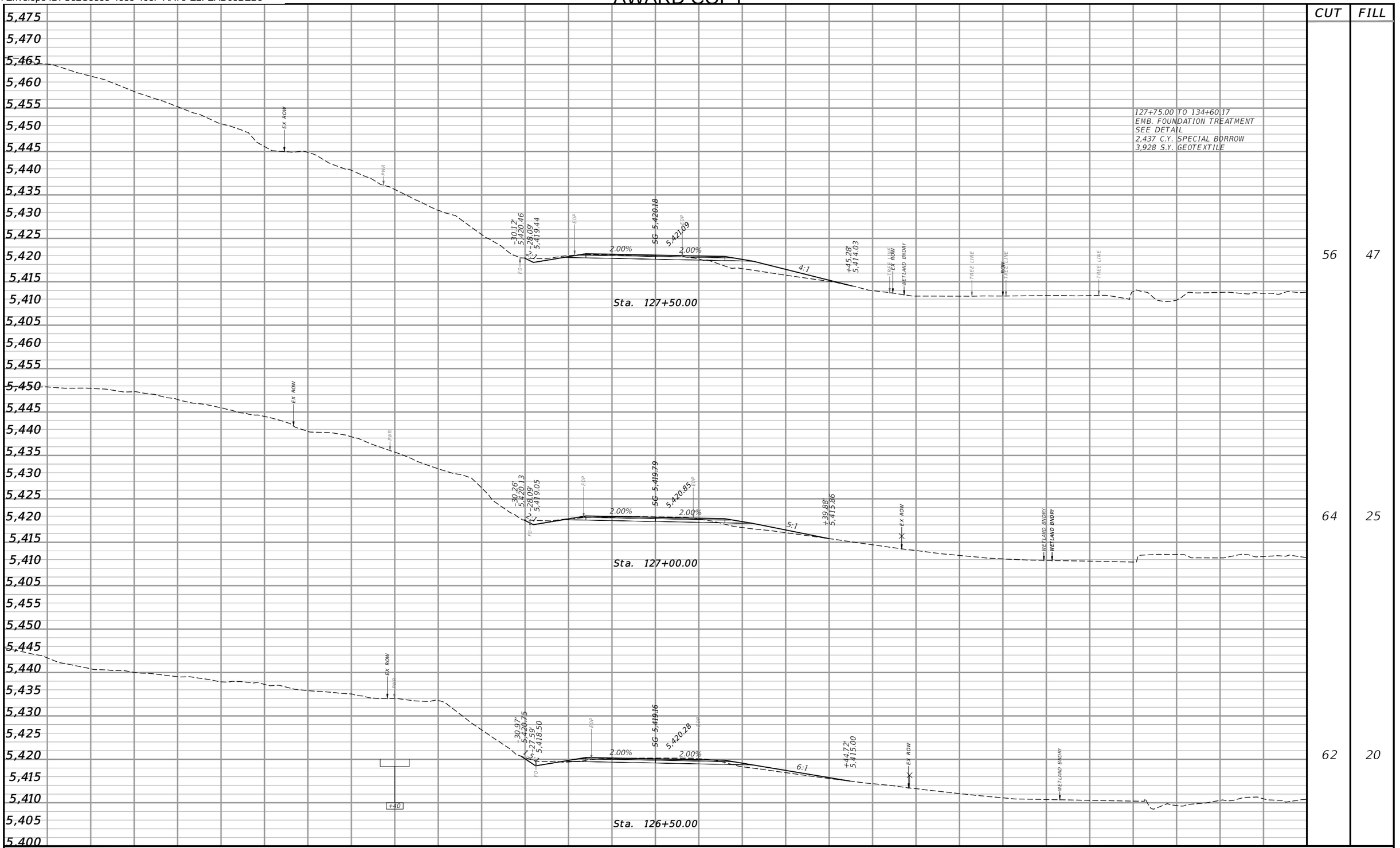


CUT	FILL
4	1
0	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	2

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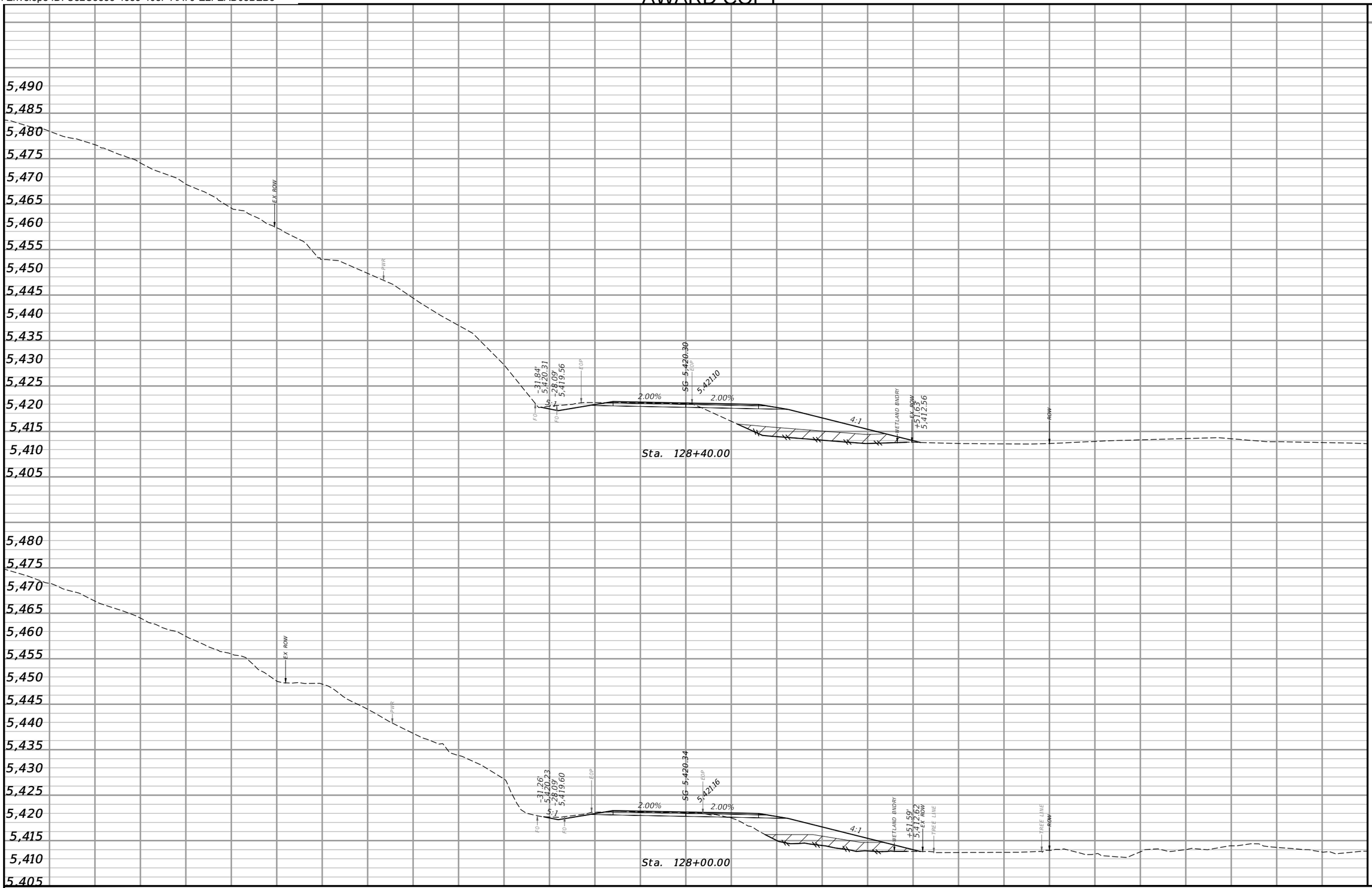


CUT	FILL
56	47
64	25
62	20

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 3

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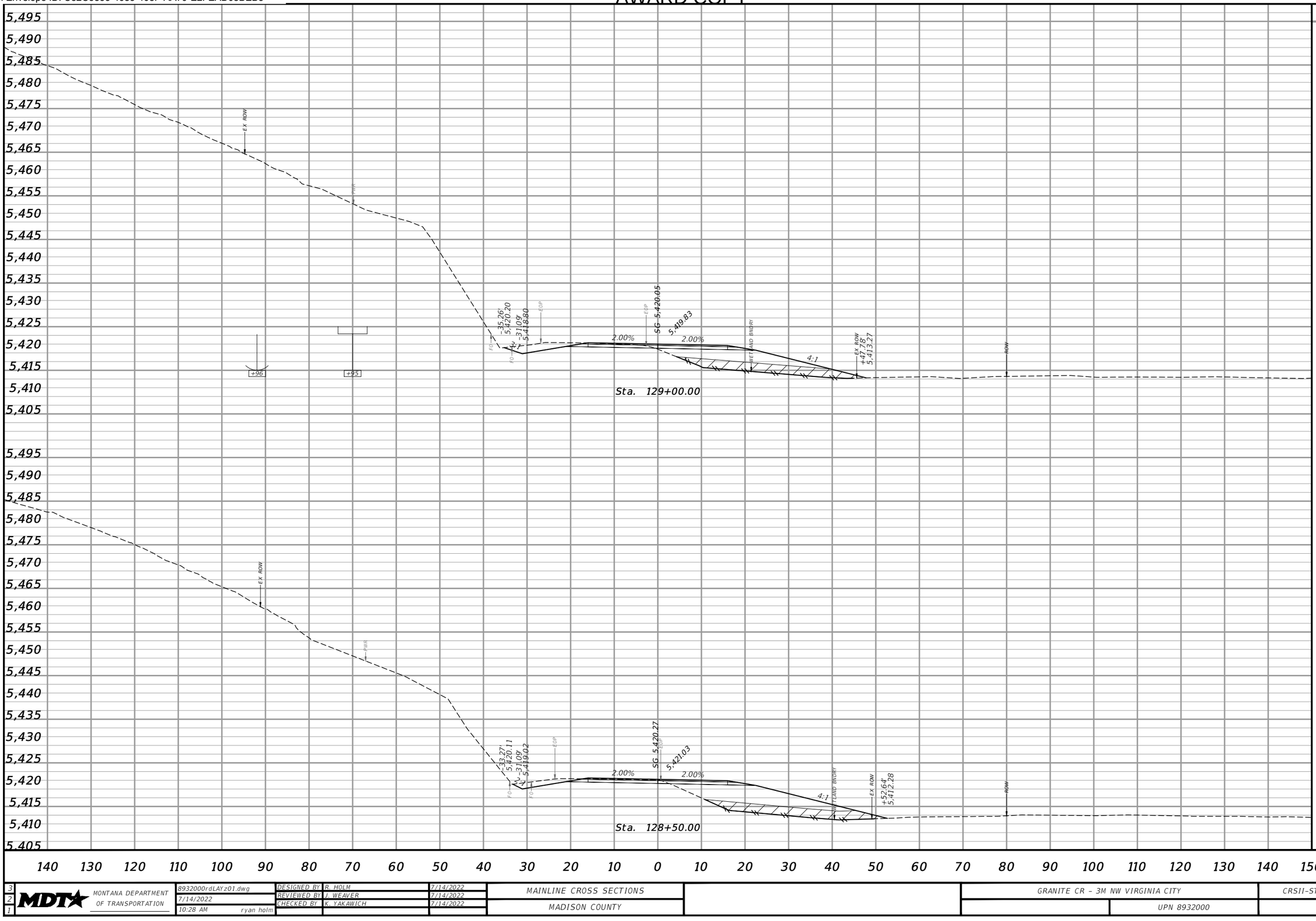


CUT	FILL
37	129
48	96

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 4

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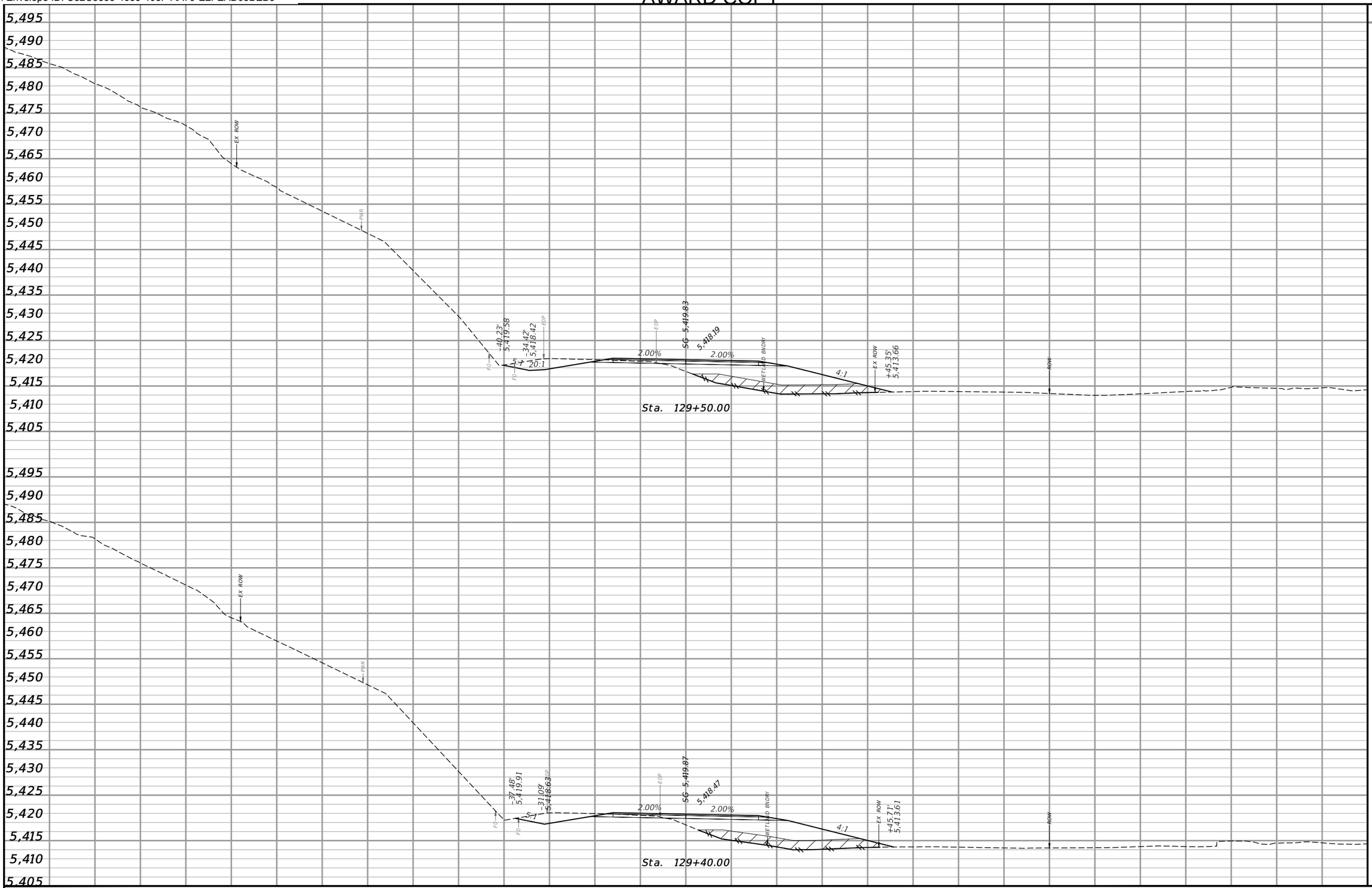


CUT	FILL
60	173
10	40

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	5

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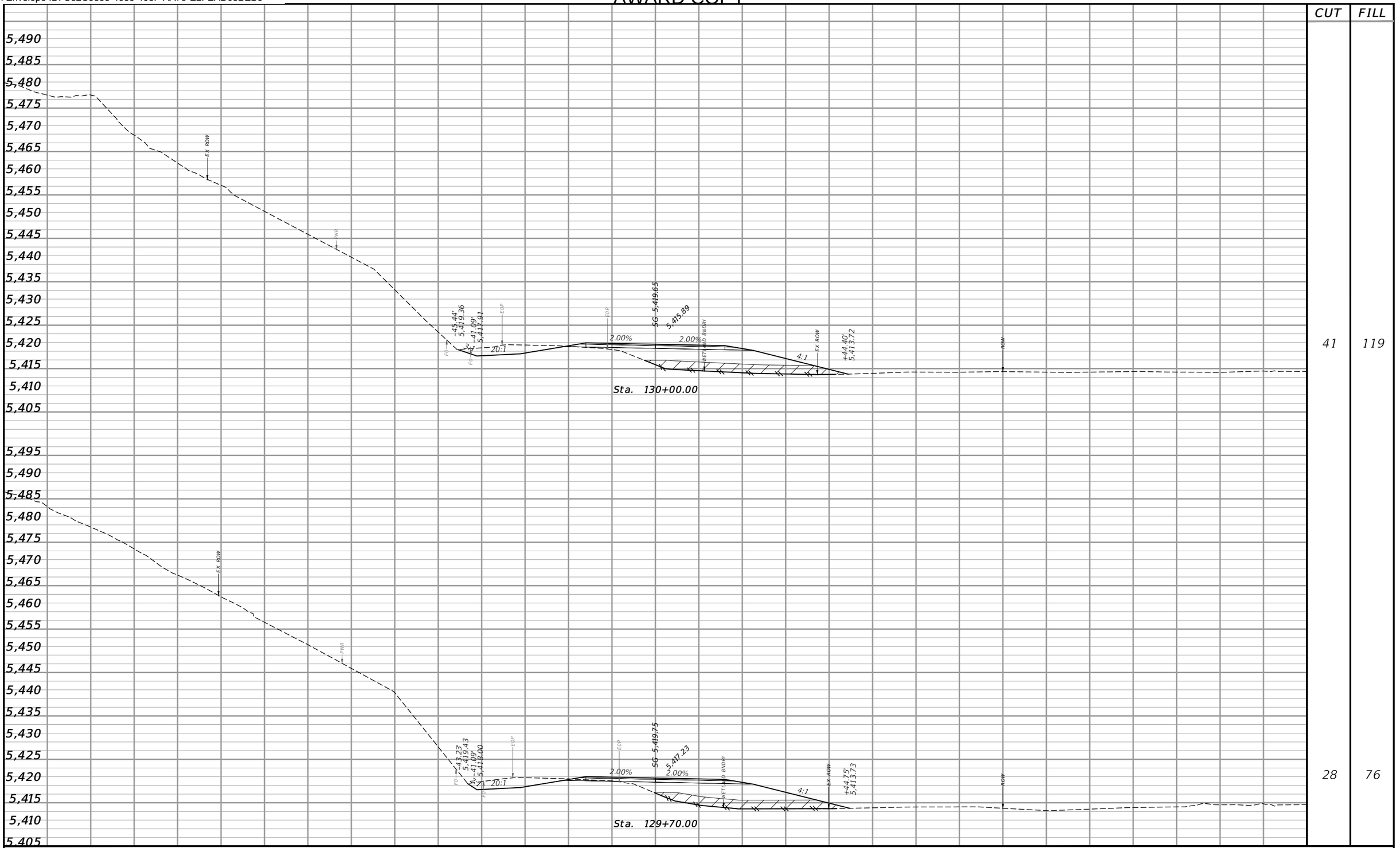


CUT	FILL
13	38
49	131

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	6

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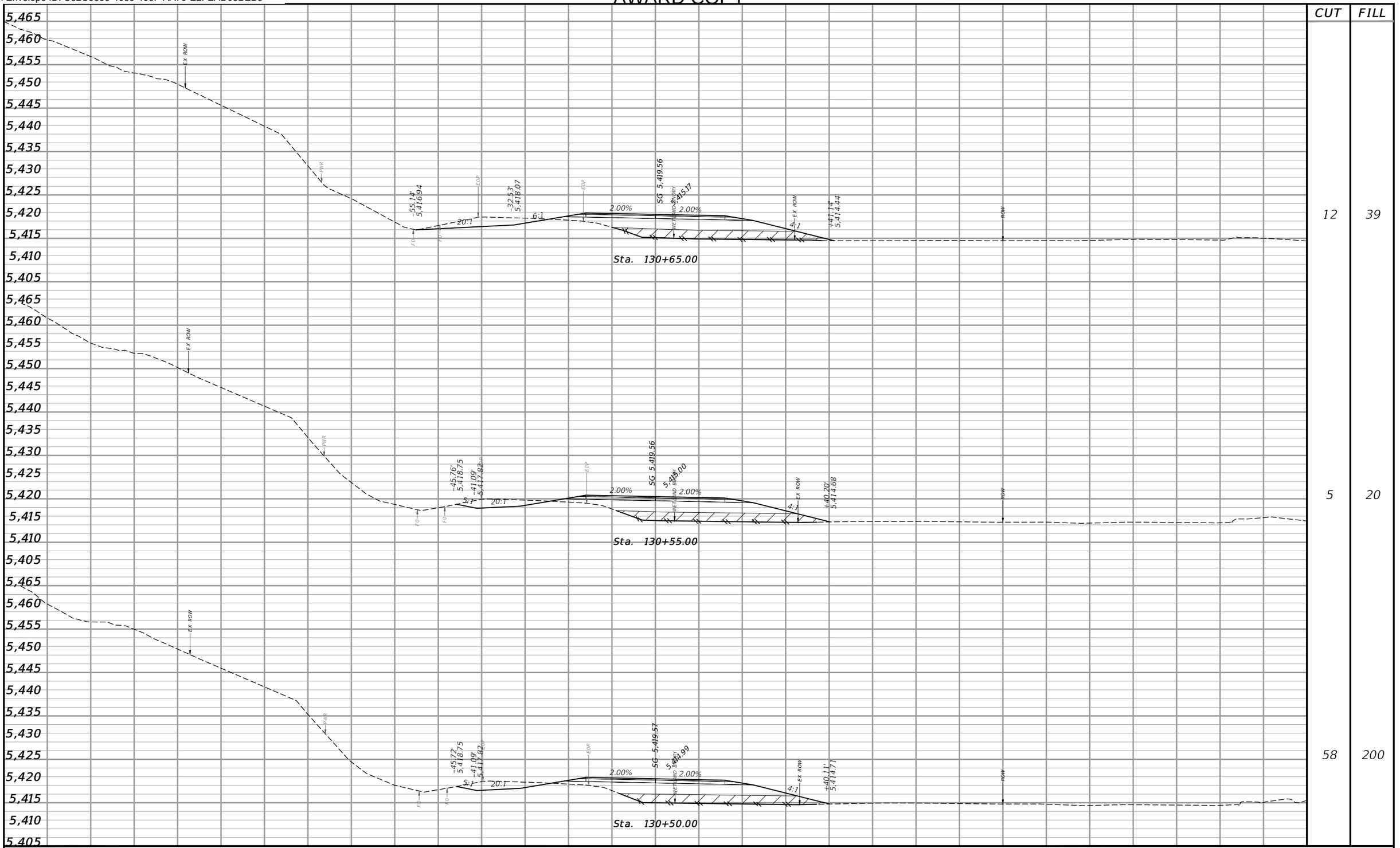


CUT	FILL
41	119
28	76

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	7

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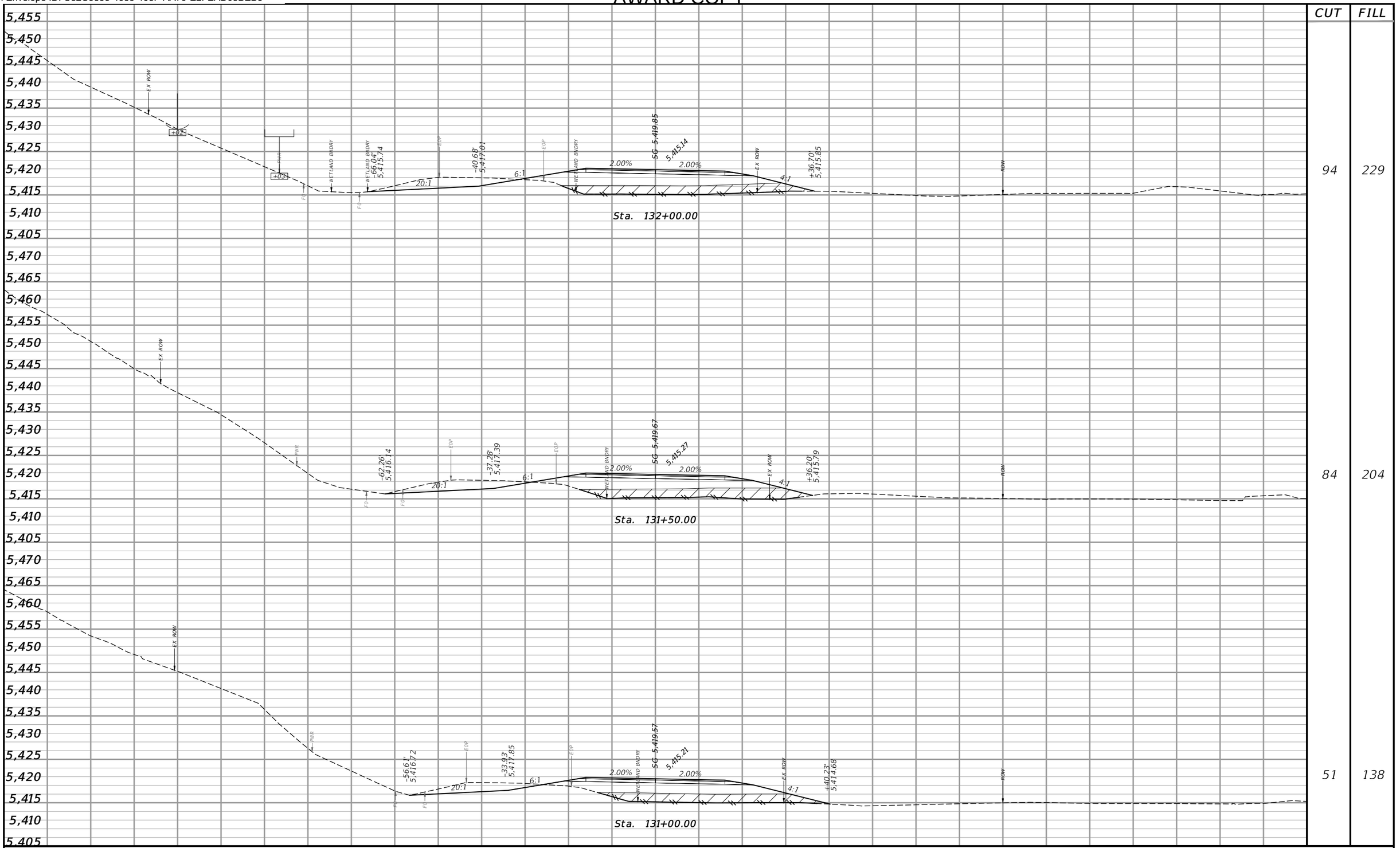


CUT	FILL
12	39
5	20
58	200

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 8

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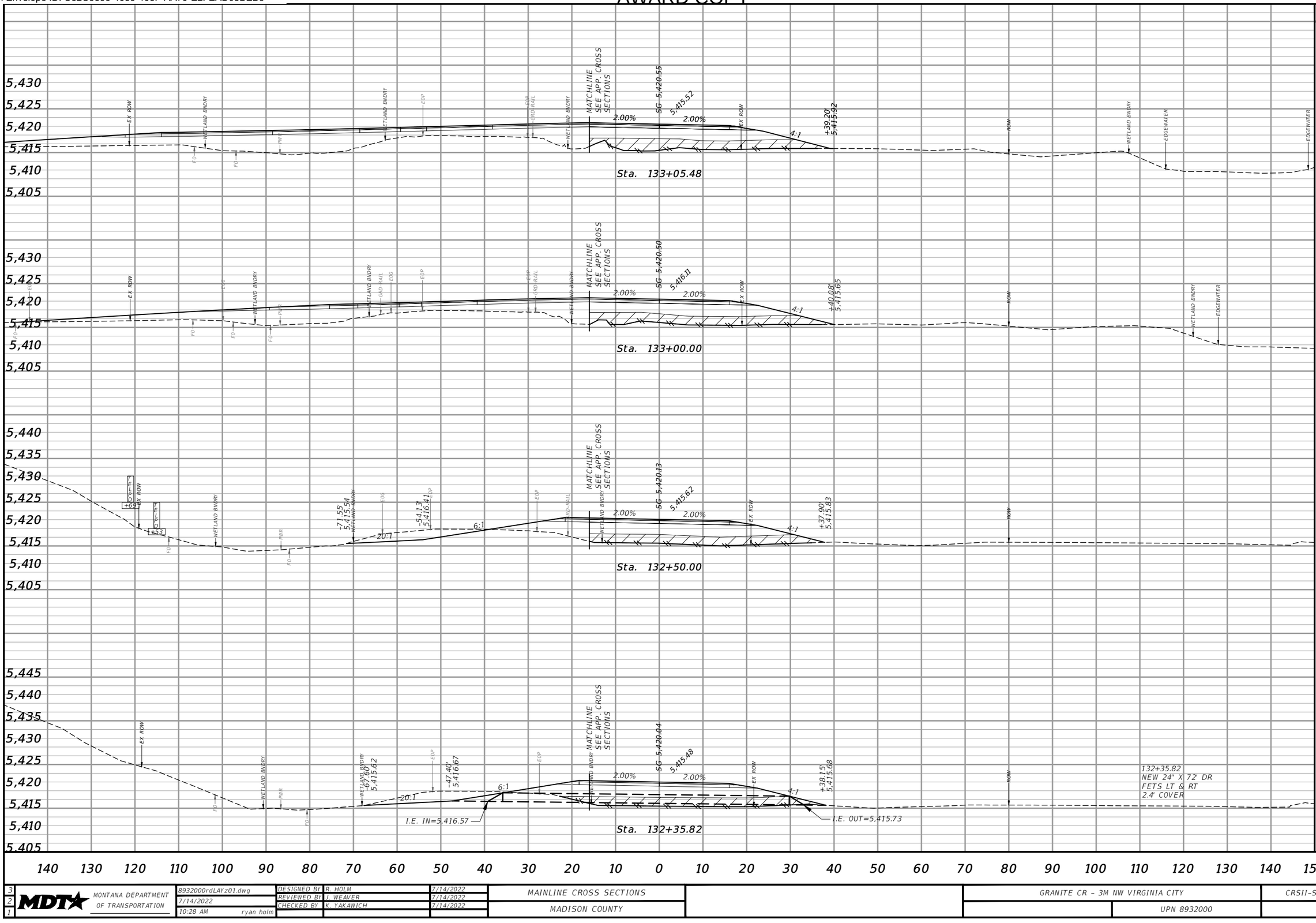


CUT	FILL
94	229
84	204
51	138

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	9

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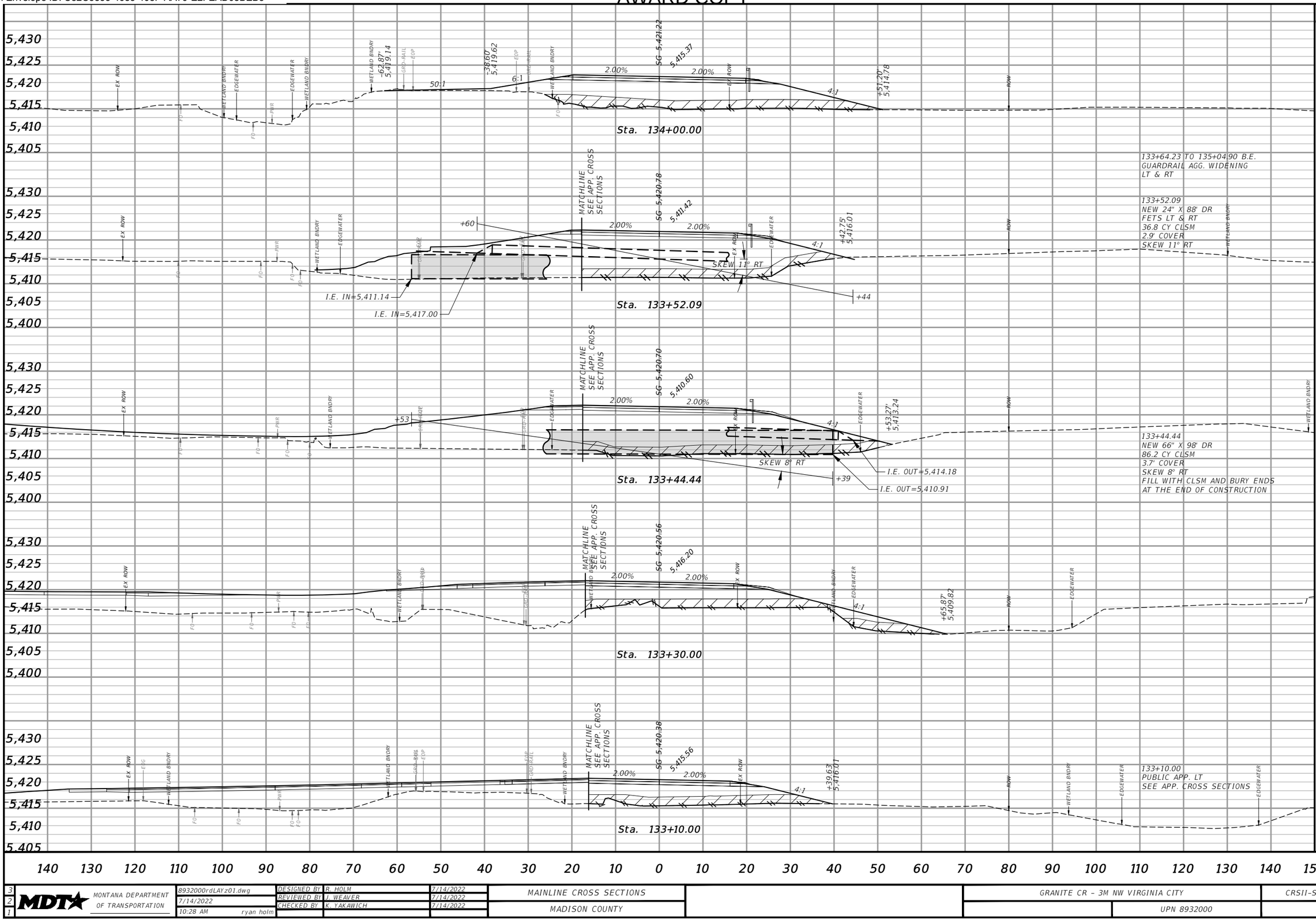


CUT	FILL
0	22
0	202
0	55
35	155

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 10

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133+64.23 TO 135+04.90 B.E.
GUARDRAIL AGG. WIDENING
LT & RT

133+52.09
NEW 24" X 88' DR
FETS LT & RT
36.8 CY CLSM
2.9' COVER
SKEW 11° RT

133+44.44
NEW 66" X 98' DR
86.2 CY CLSM
3.7' COVER
SKEW 8° RT
FILL WITH CLSM AND BURY ENDS
AT THE END OF CONSTRUCTION

133+10.00
PUBLIC APP. LT
SEE APP. CROSS SECTIONS

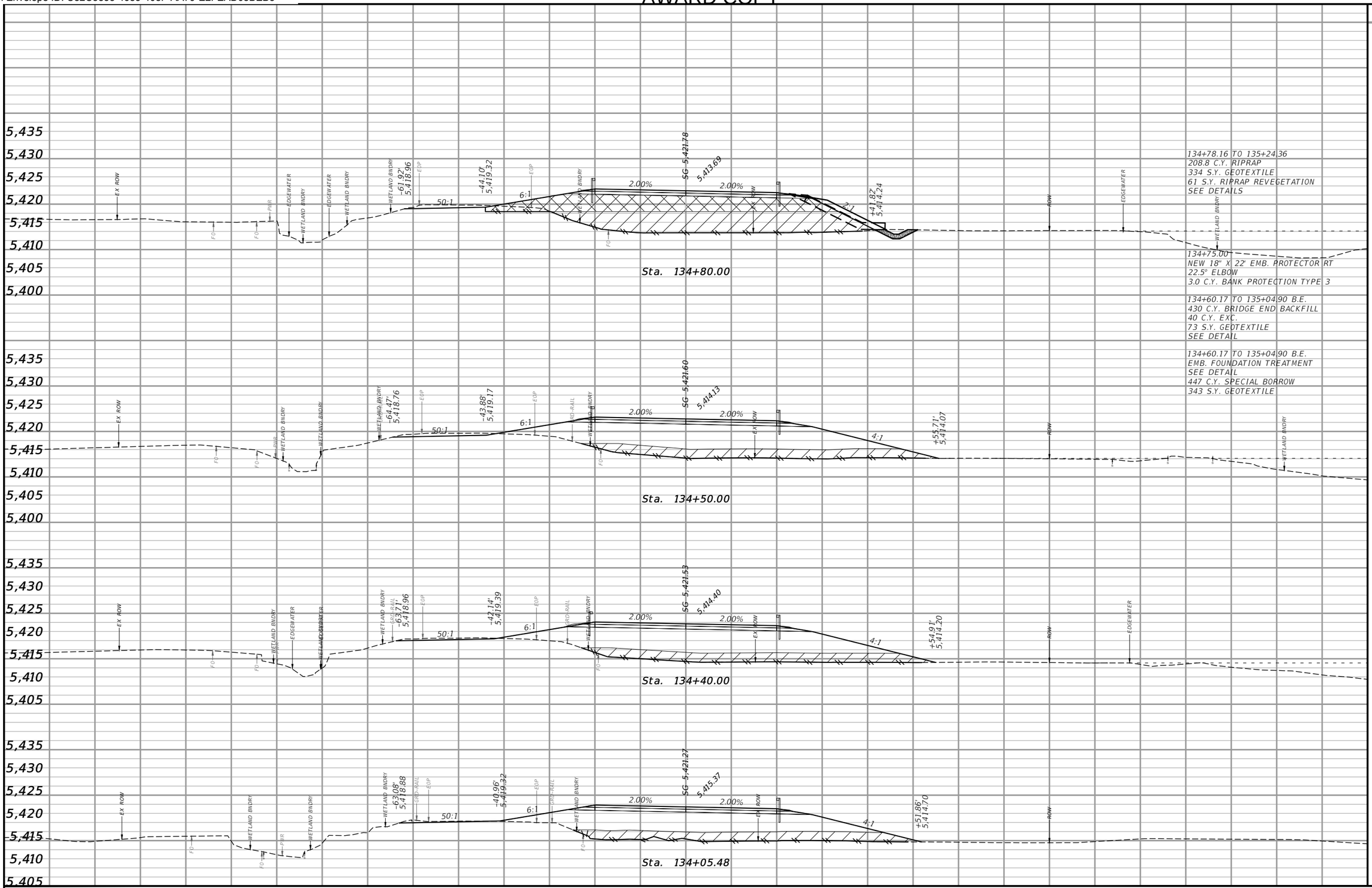
CUT	FILL
1	539
1	109
0	151
0	92
0	18

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:28 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 11

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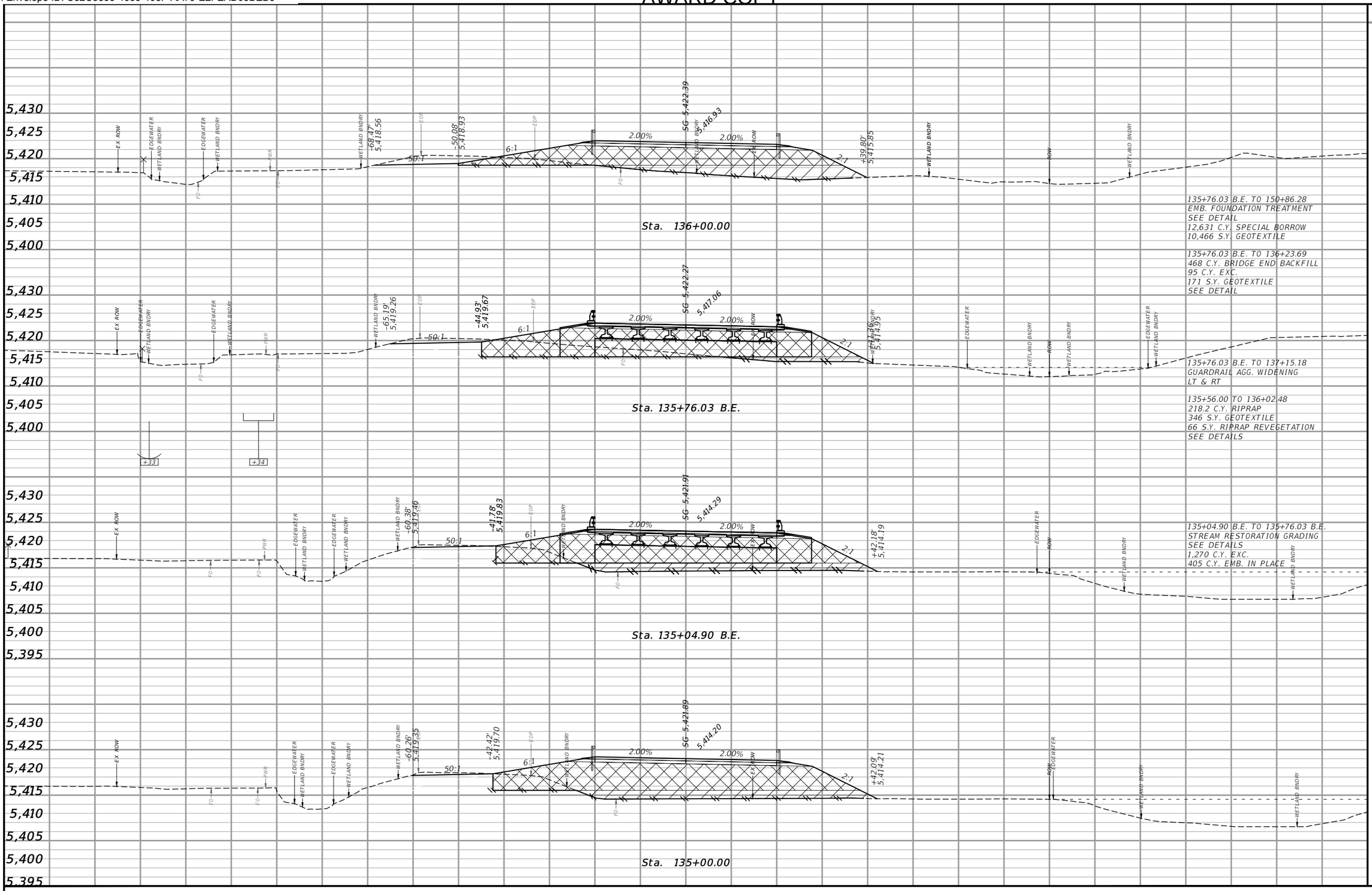


CUT	FILL
6	130
3	125
7	388
1	55

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:29 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	12

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CUT	FILL
23	0
0	0
1	0
6	0

135+76.03 B.E. TO 150+86.28
EMB. FOUNDATION TREATMENT
SEE DETAIL
12,631 C.Y. SPECIAL BORROW
10,466 S.Y. GEOTEXTILE

135+76.03 B.E. TO 136+23.69
468 C.Y. BRIDGE END BACKFILL
95 C.Y. EXC.
171 S.Y. GEOTEXTILE
SEE DETAIL

135+76.03 B.E. TO 137+15.18
GUARDRAIL AGG. WIDENING
LT & RT

135+56.00 TO 136+02.48
218.2 C.Y. RIPRAP
346 S.Y. GEOTEXTILE
66 S.Y. RIPRAP REVEGETATION
SEE DETAILS

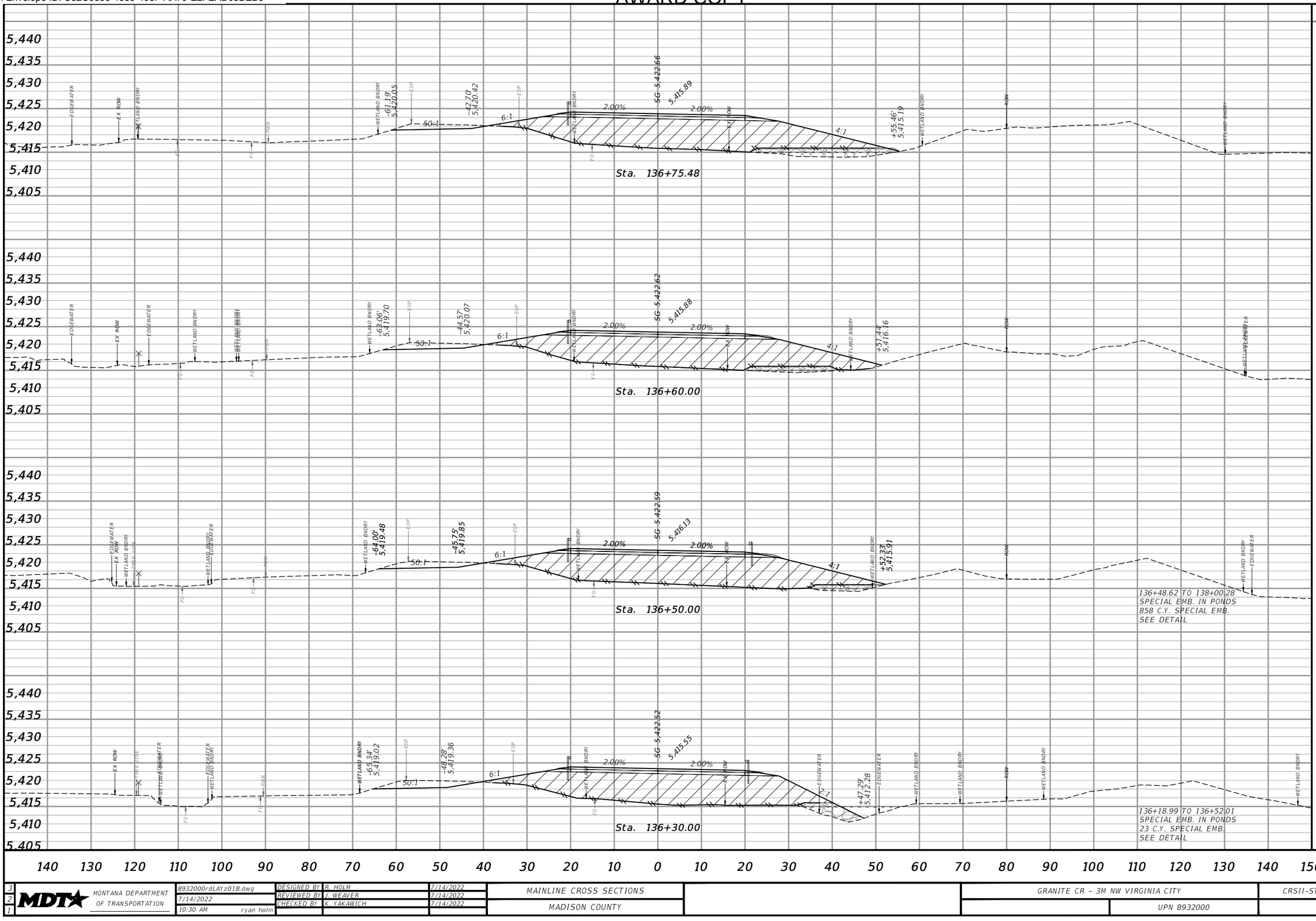
135+04.90 B.E. TO 135+76.03 B.E.
STREAM RESTORATION GRADING
SEE DETAILS
1,270 C.Y. EXC.
405 C.Y. EMB. IN PLACE

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:29 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 13

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AWARD COPY



CUT	FILL
12	0
9	0
20	0
34	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:30 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 14

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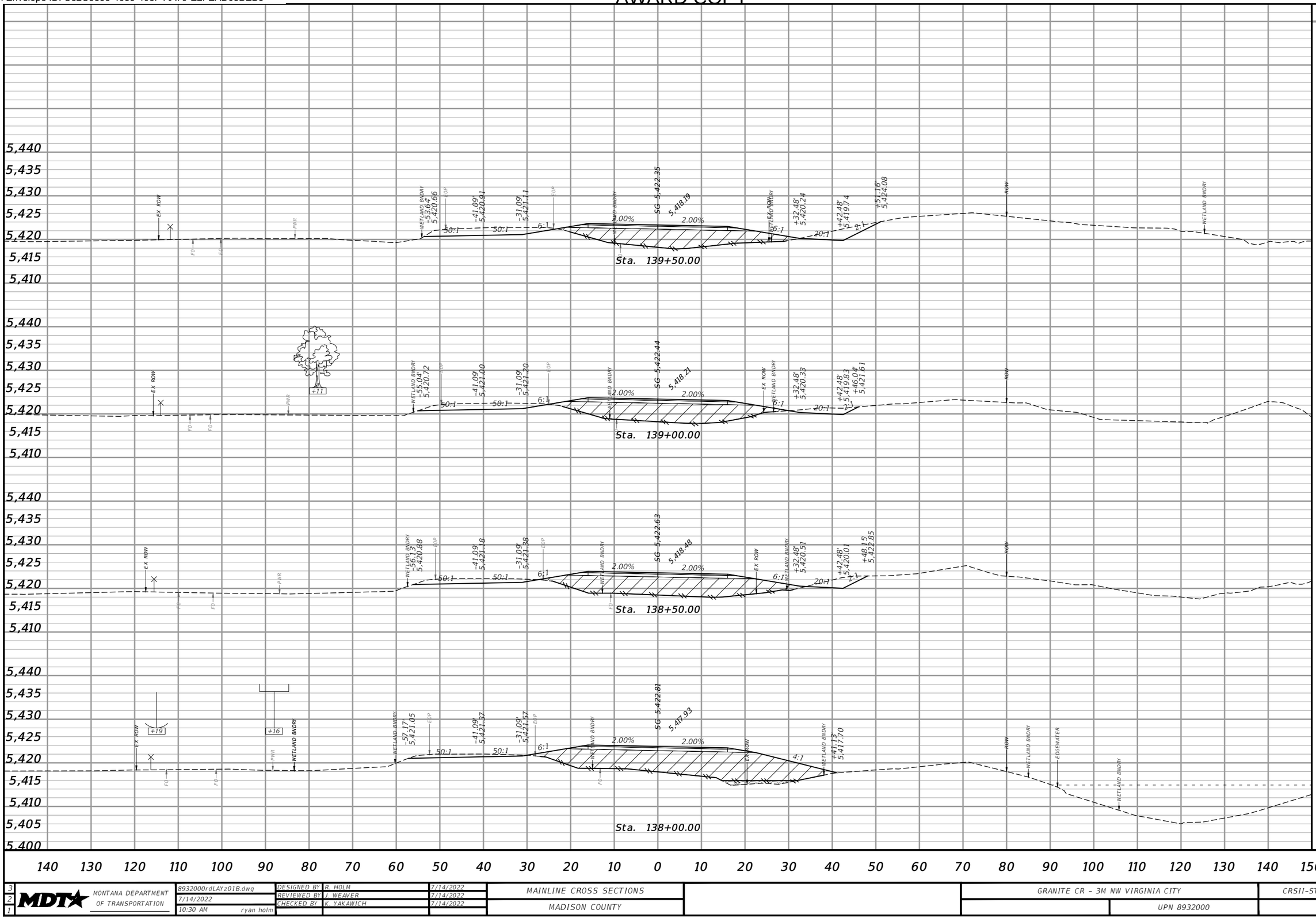
AWARD COPY

CUT	FILL
9	0
6	0
11	0
15	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		UPN 8932000 / 15
1		10:30 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	

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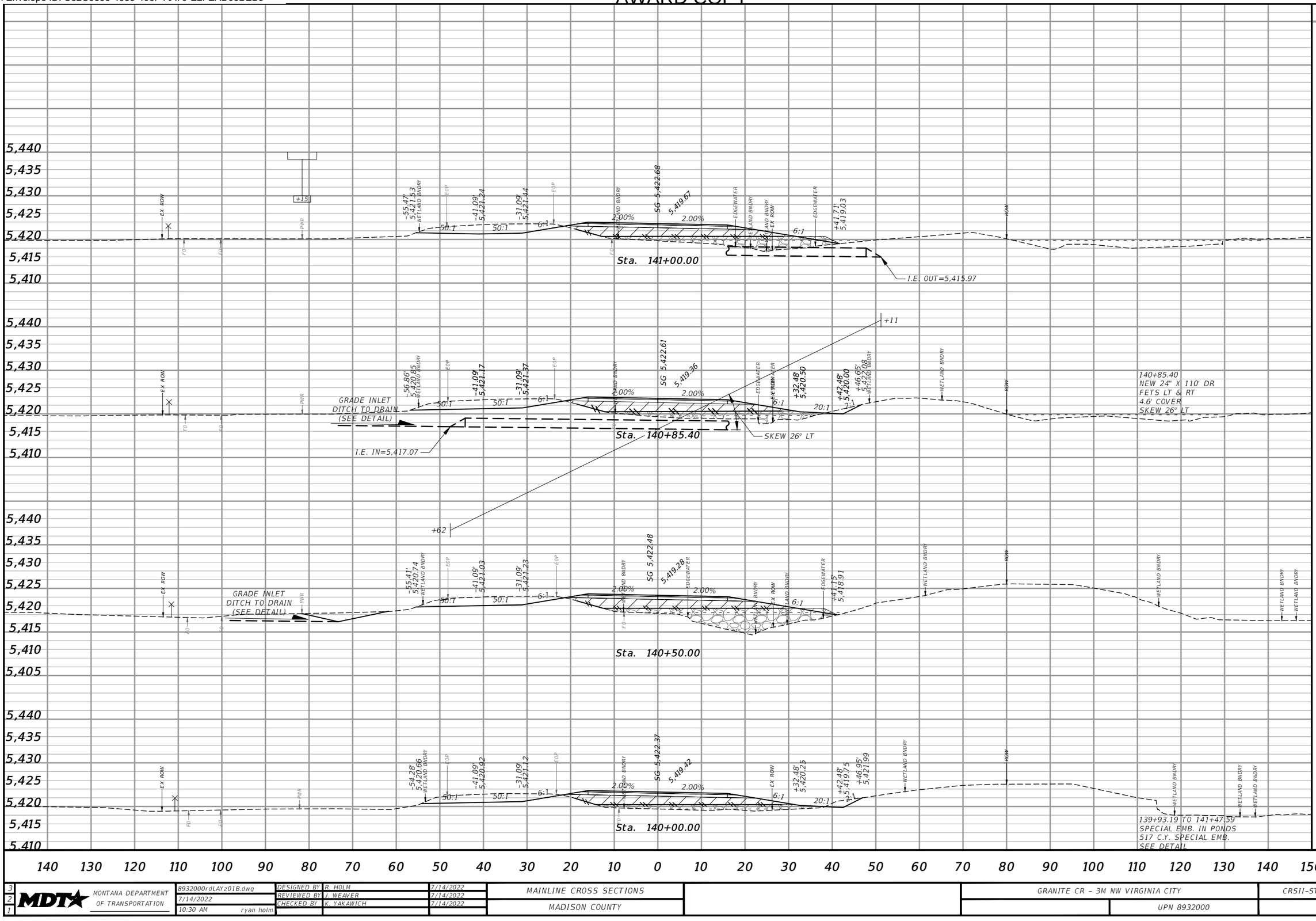


CUT	FILL
108	0
87	0
55	0
12	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
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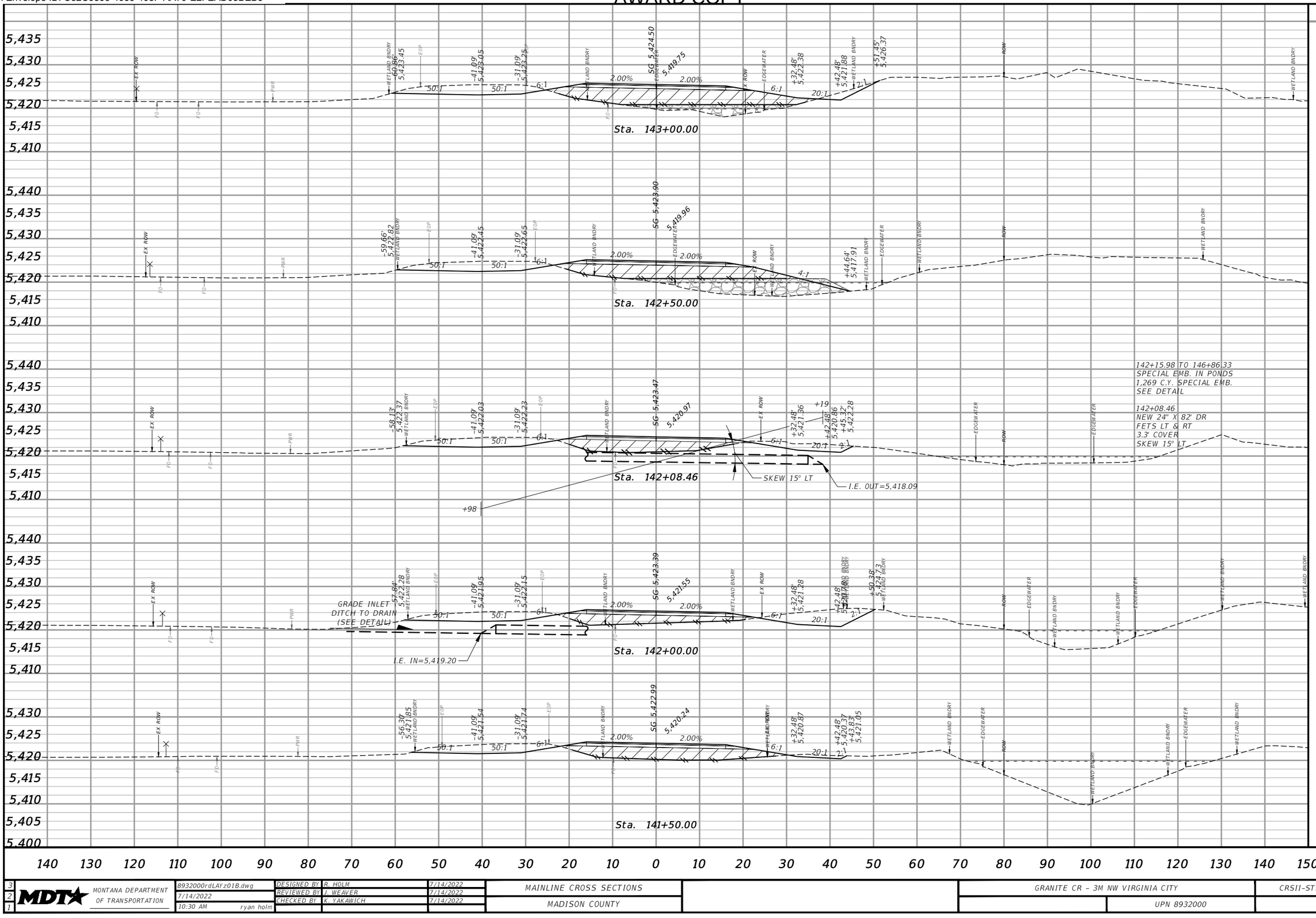
CUT	FILL
31	0
74	0
99	0
113	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:30 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 17

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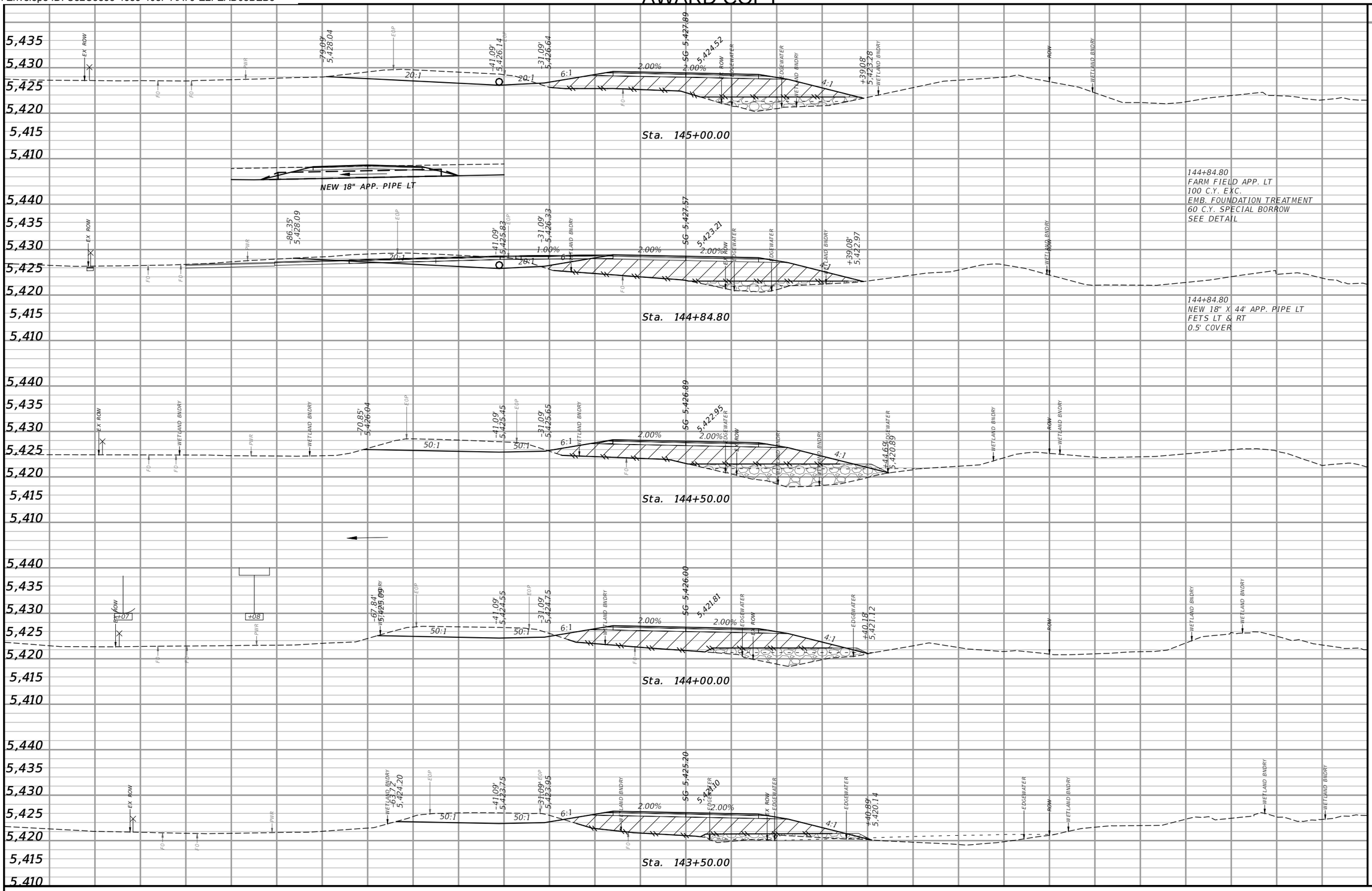
CUT	FILL
126	0
113	0
32	0
165	0
105	0



3	MDT	MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2			7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1			10:30 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	18

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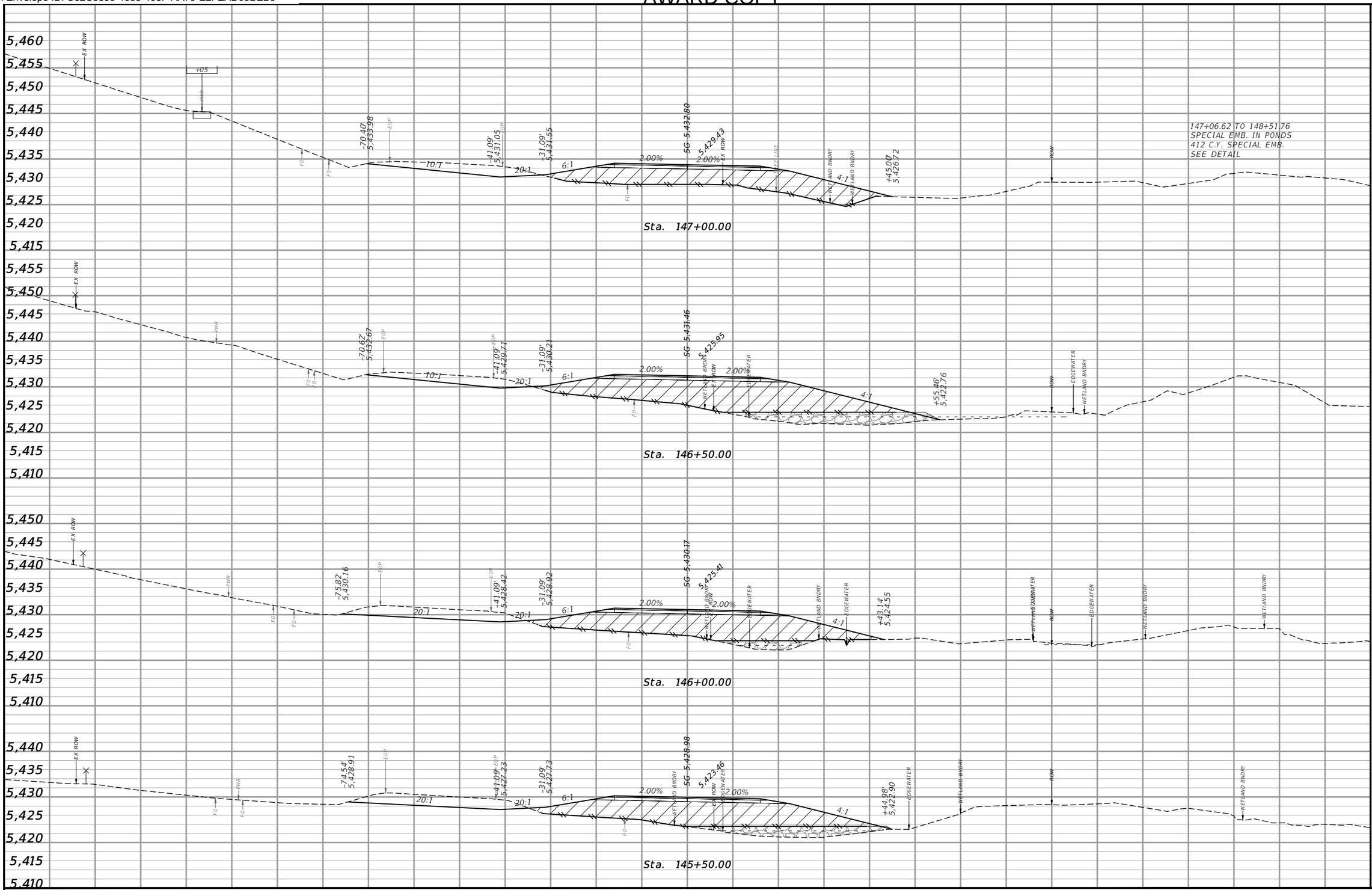


CUT	FILL
51	0
114	0
142	0
130	0
131	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:30 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 19

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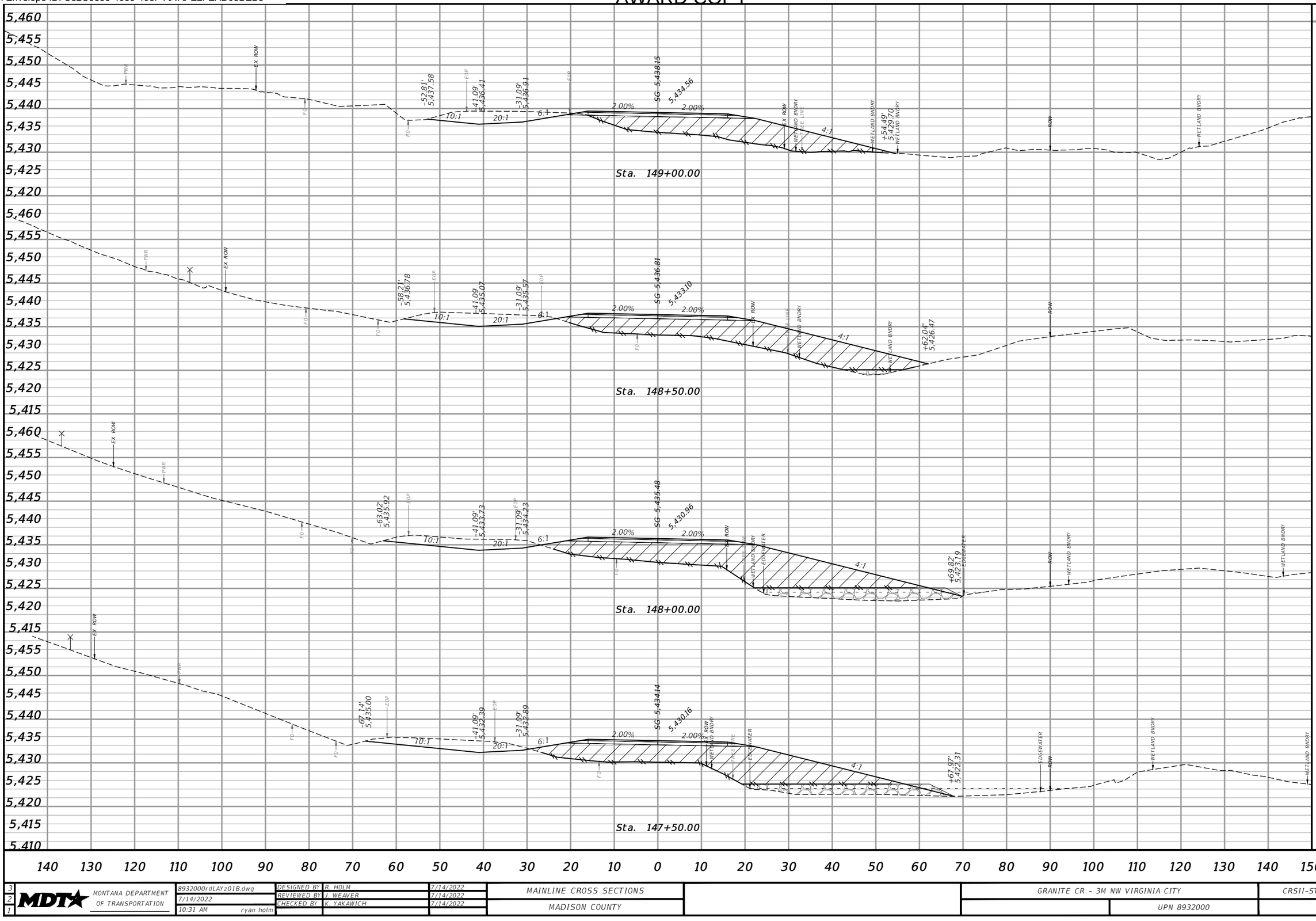


CUT	FILL
103	0
119	0
143	0
152	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 20

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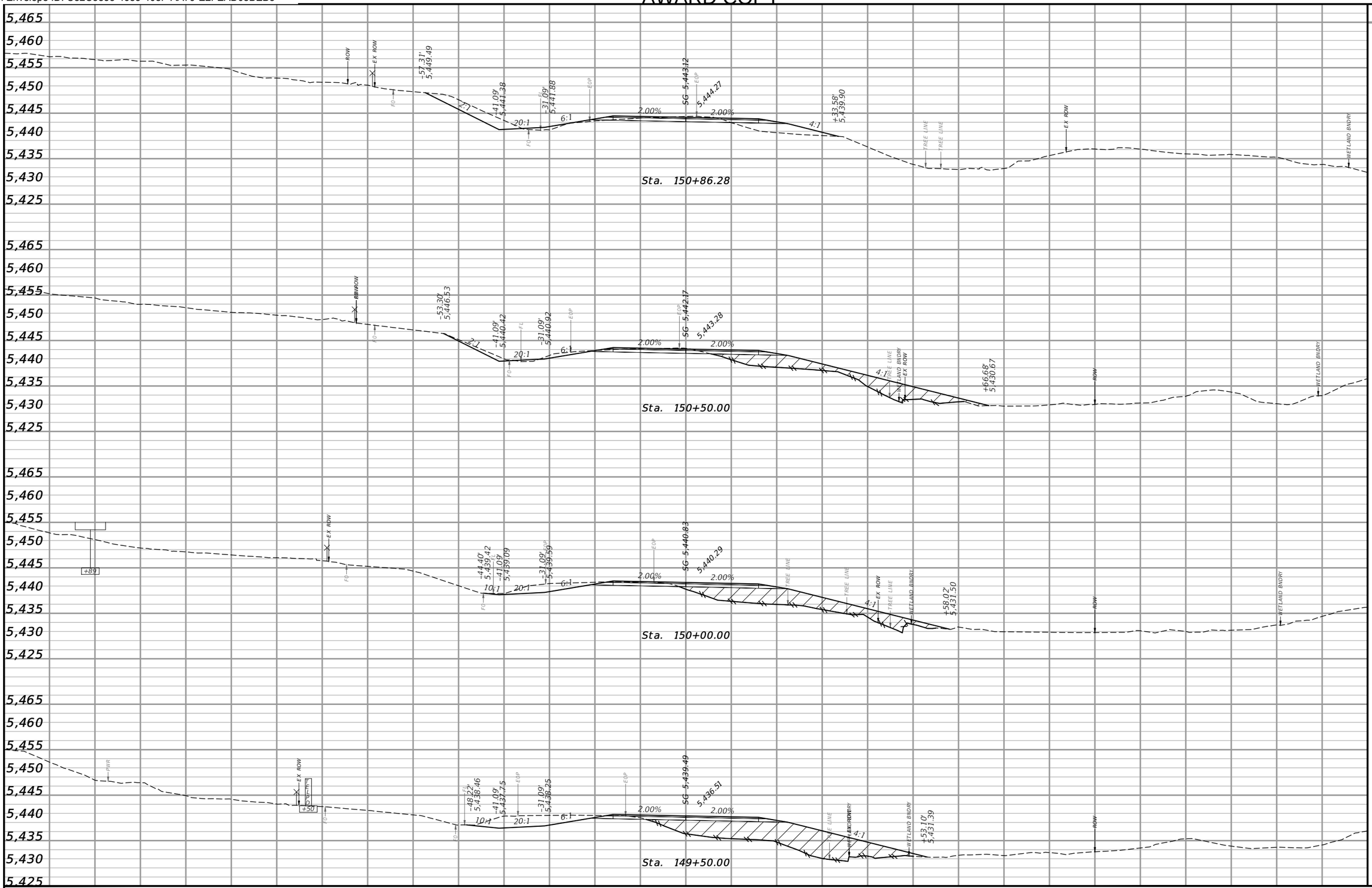


CUT	FILL
125	0
127	0
125	0
116	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 21

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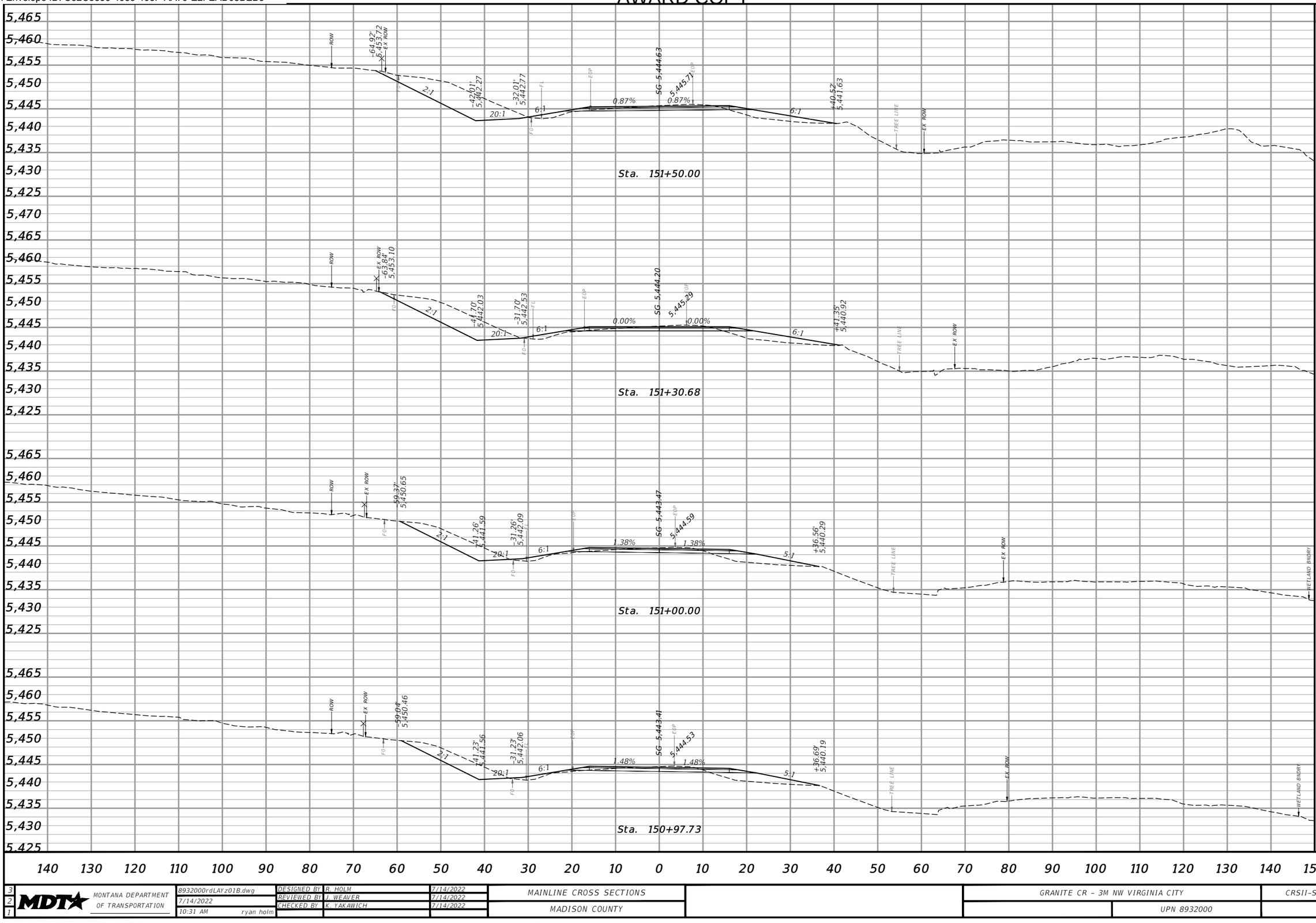


CUT	FILL
60	25
66	1
85	0
110	0

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	22

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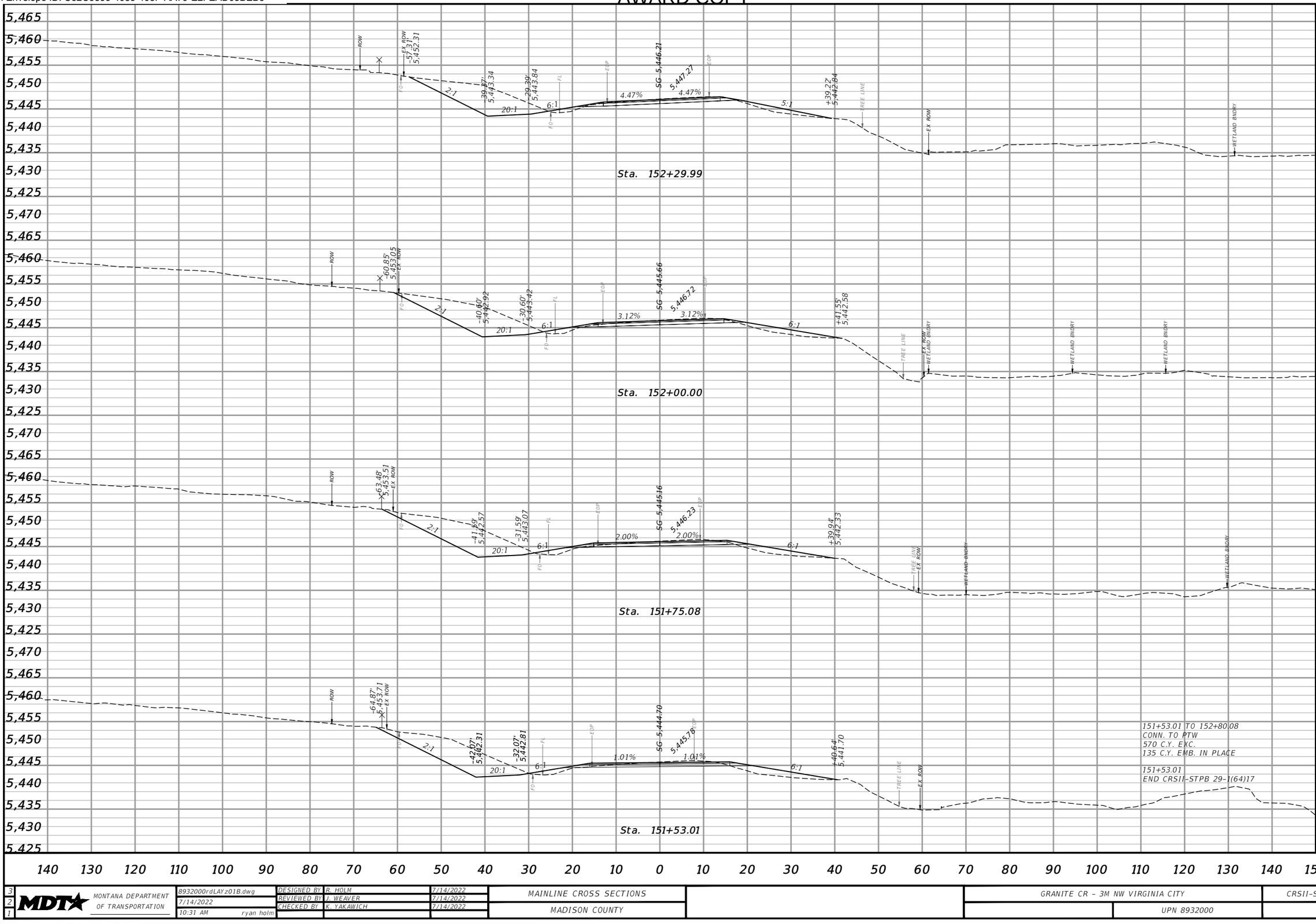


CUT	FILL
97	25
115	42
7	3
28	16

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	23

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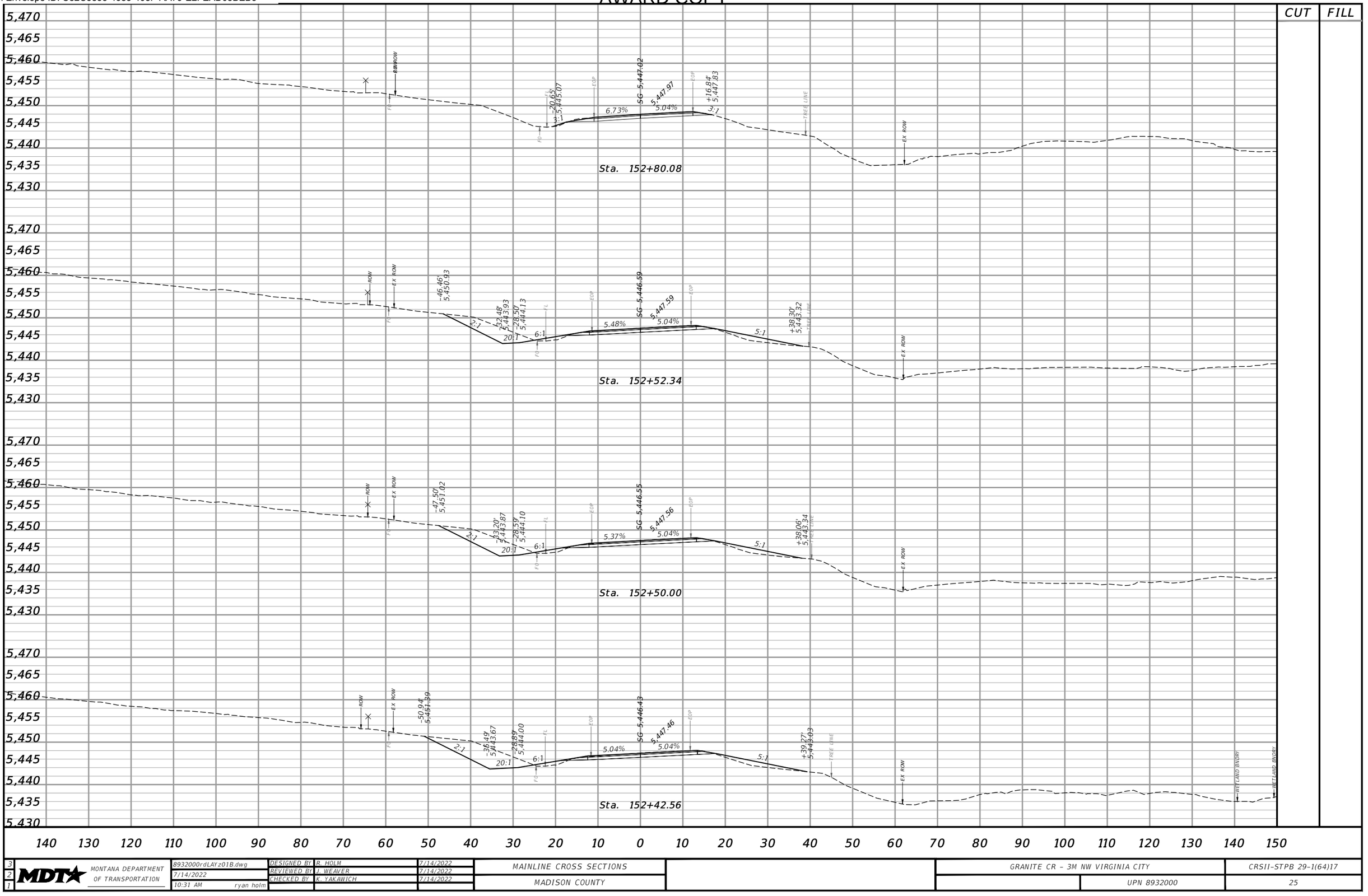
CUT	FILL
16	4

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	24

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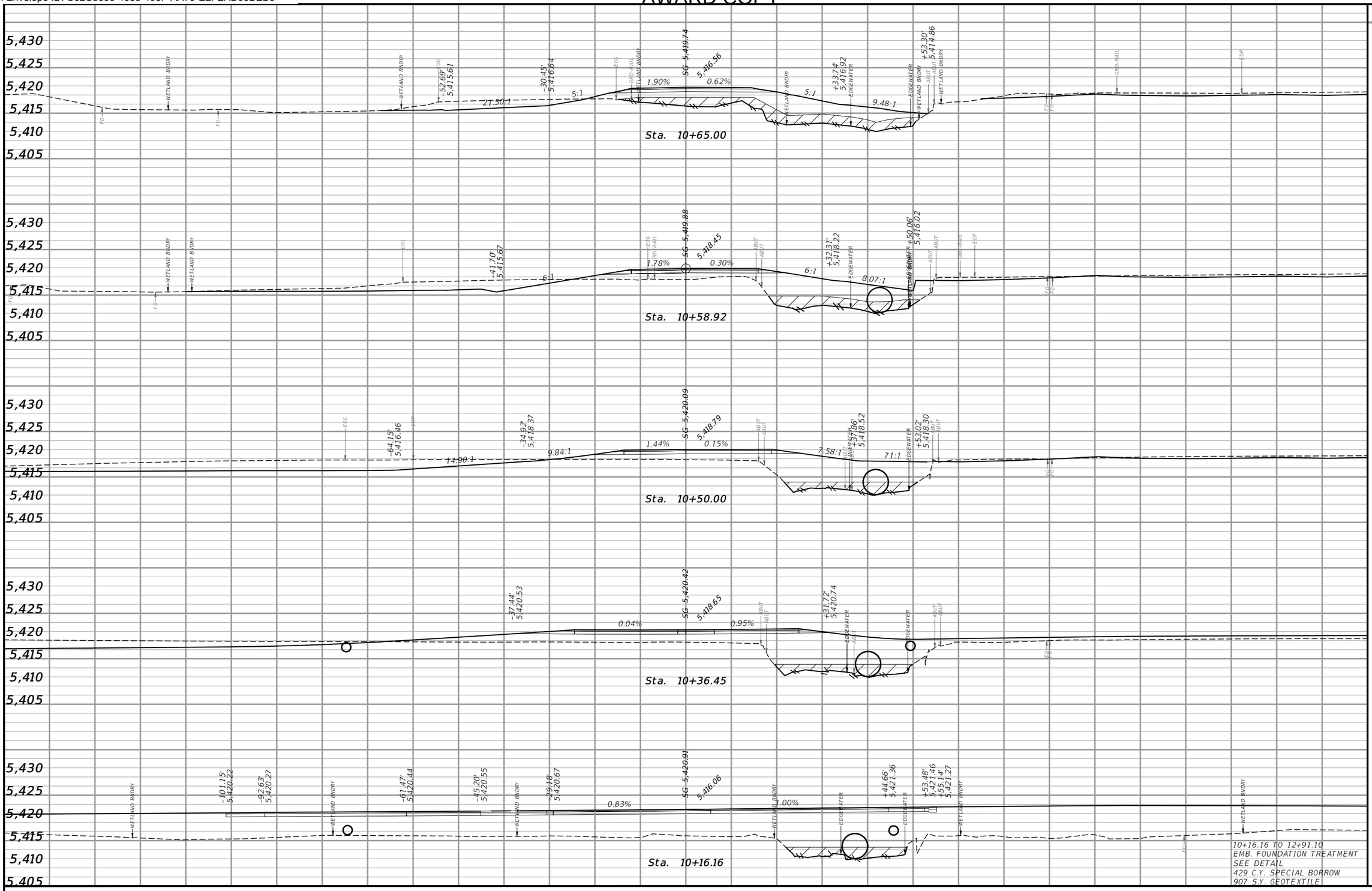
CUT	FILL



3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz01B.dwg	DESIGNED BY	R. HOLM	7/14/2022	MAINLINE CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:31 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	25

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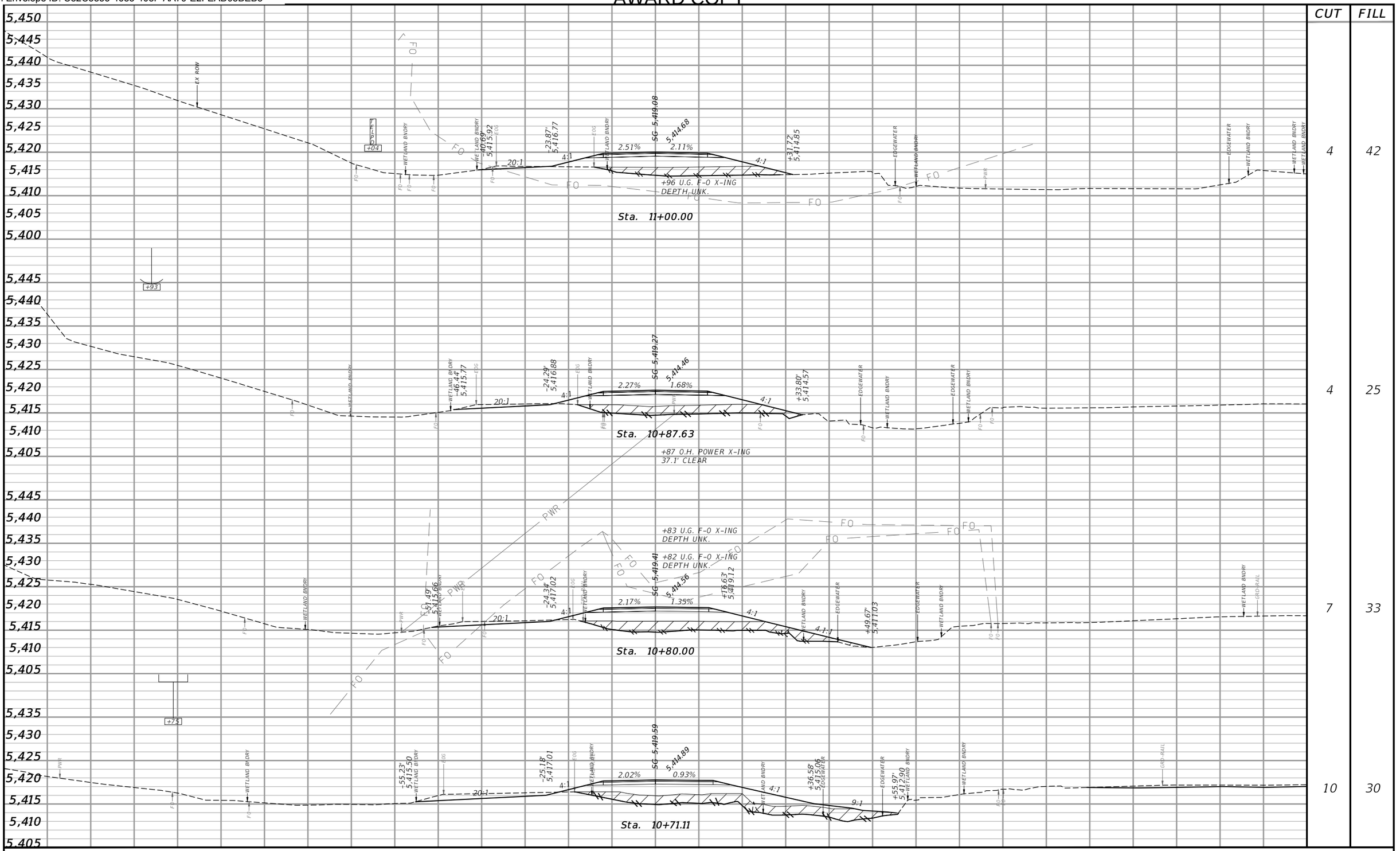
CUT	FILL
16	38
36	69
39	147
10	443
0	0

10+16.16 TO 12+91.10
EMB. FOUNDATION TREATMENT
SEE DETAIL
429 C.Y. SPECIAL BORROW
907 S.Y. GEOTEXTILE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:20 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	26

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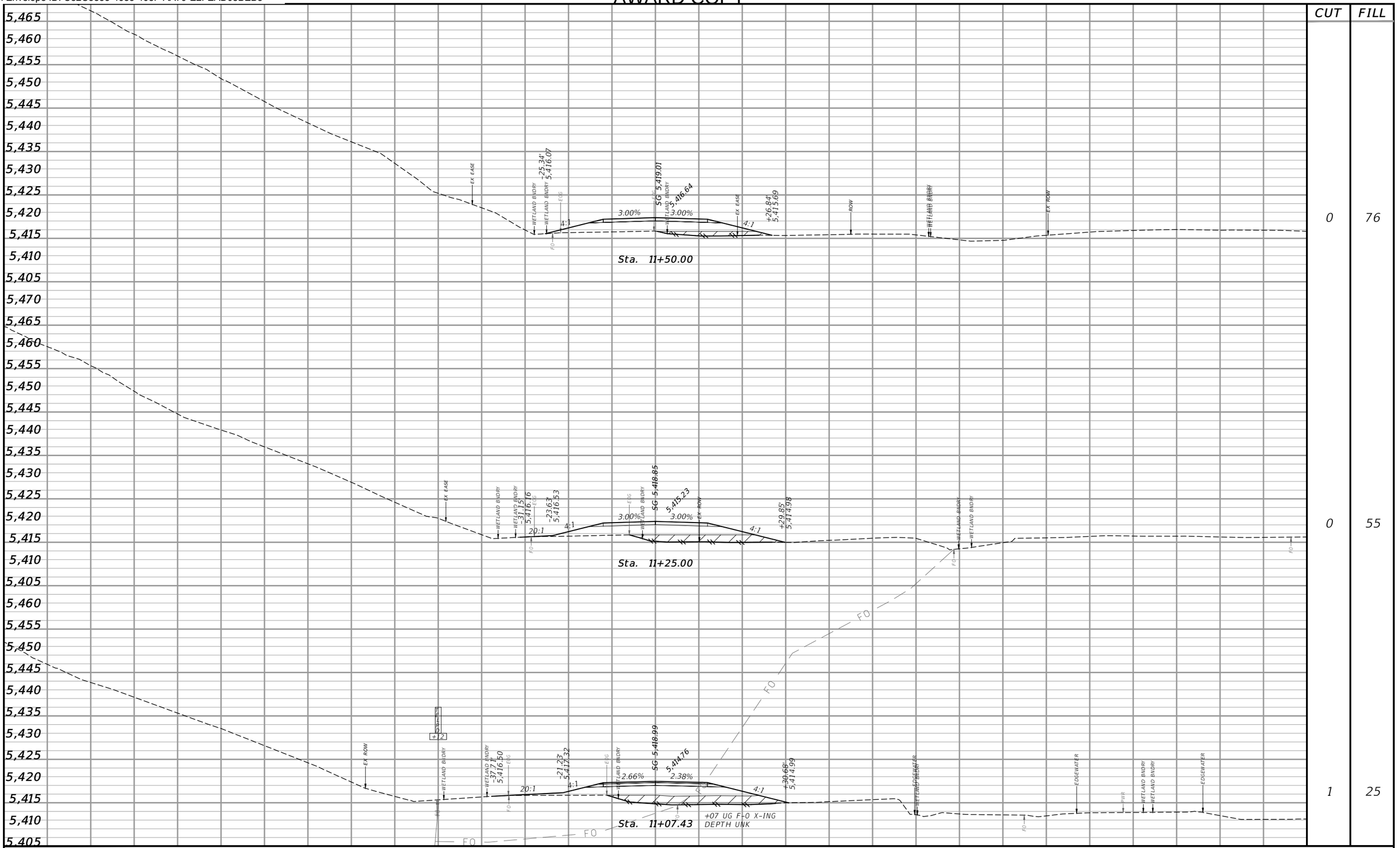


CUT	FILL
4	42
4	25
7	33
10	30

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	27

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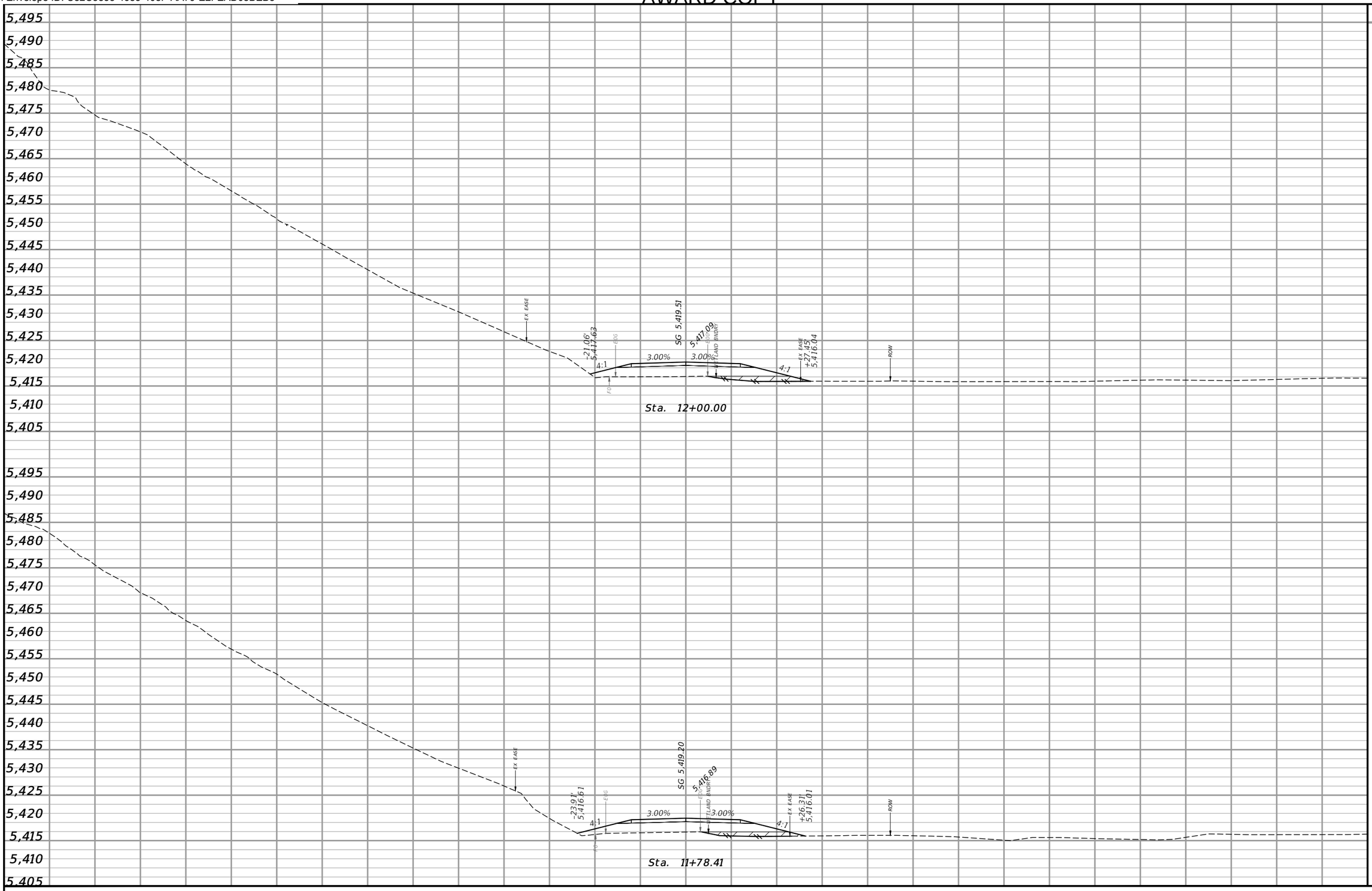
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3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	28

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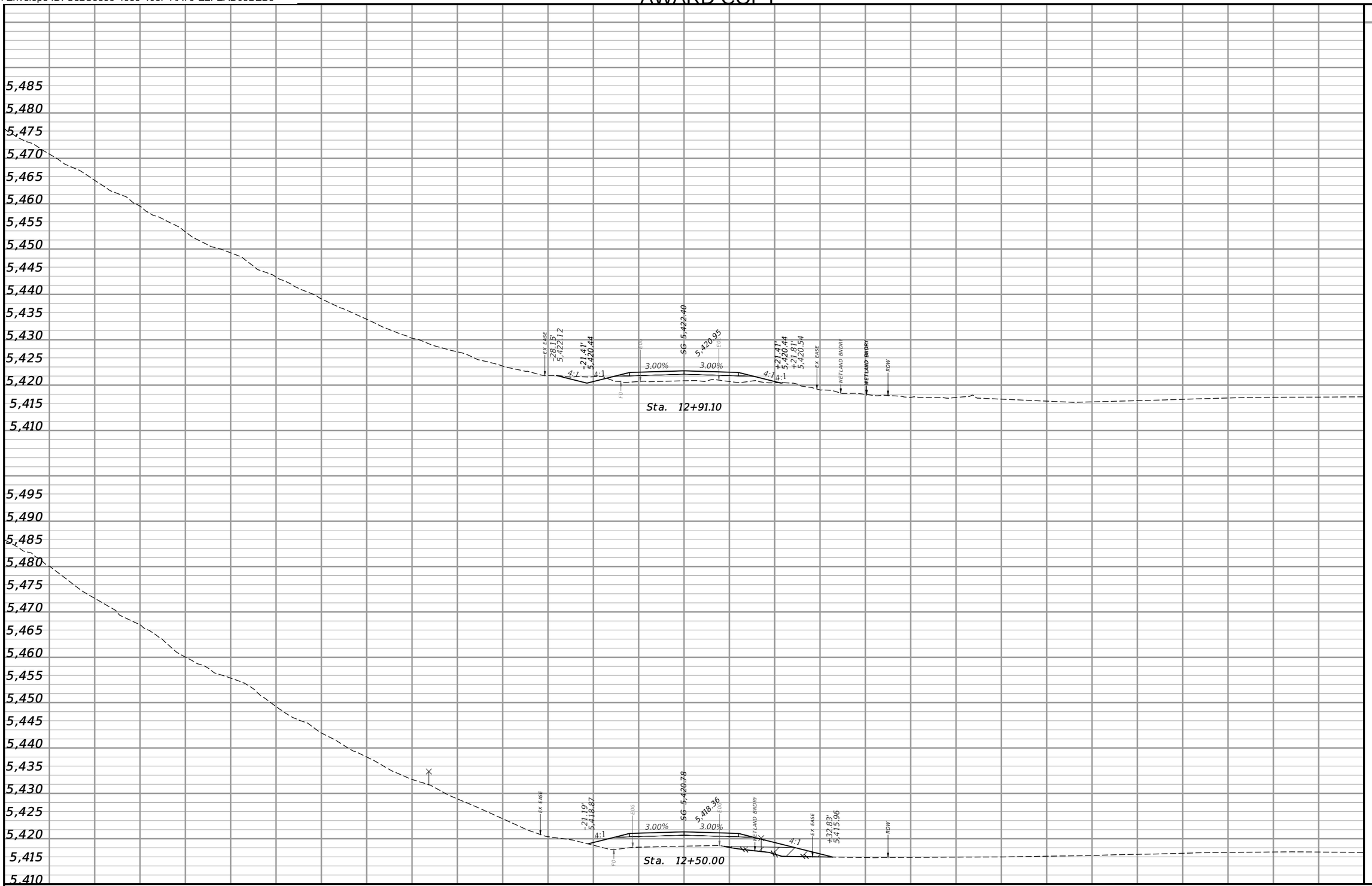


CUT	FILL
0	66
0	89

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	29

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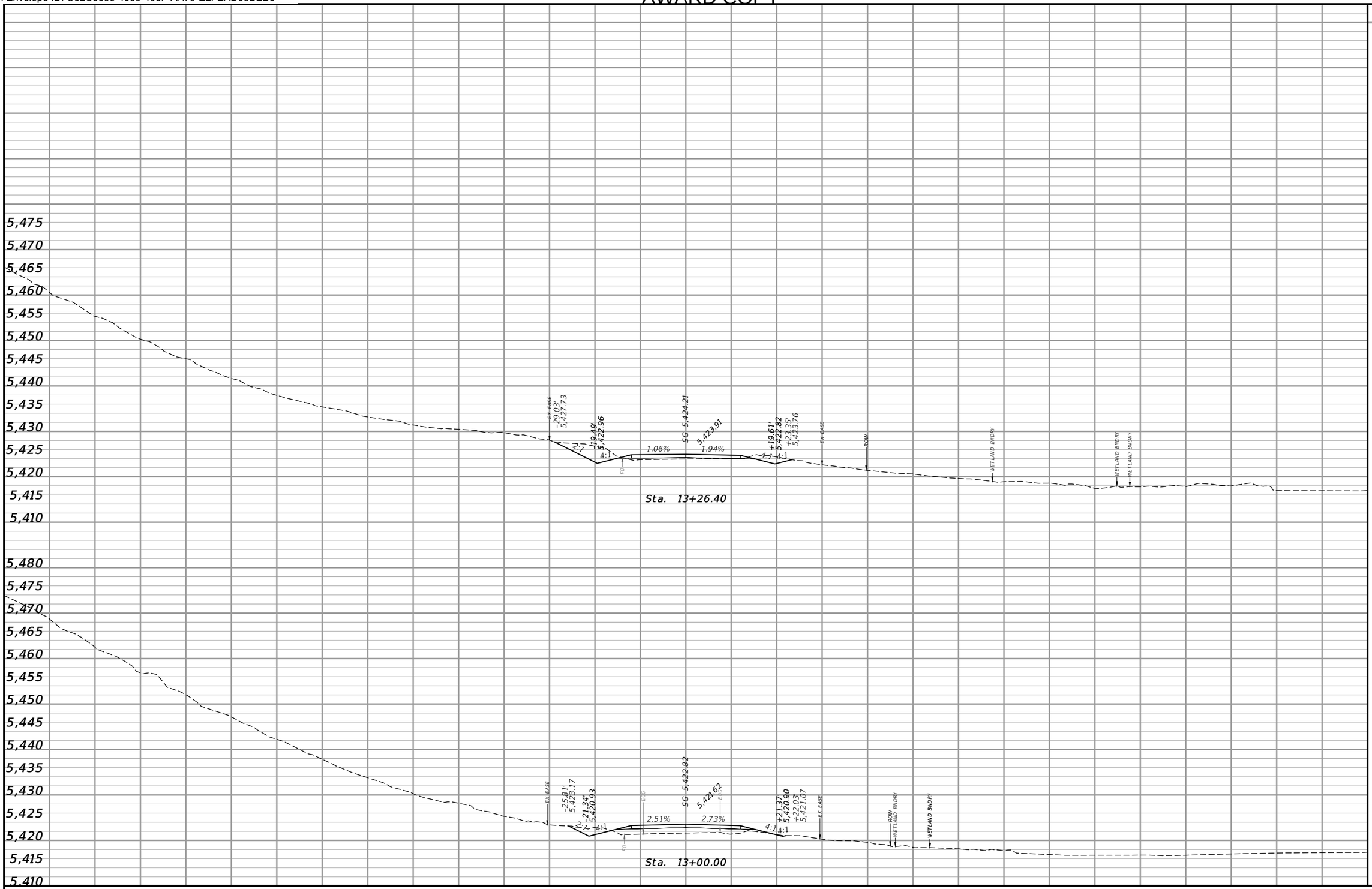


CUT	FILL
6	101
0	158

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	30

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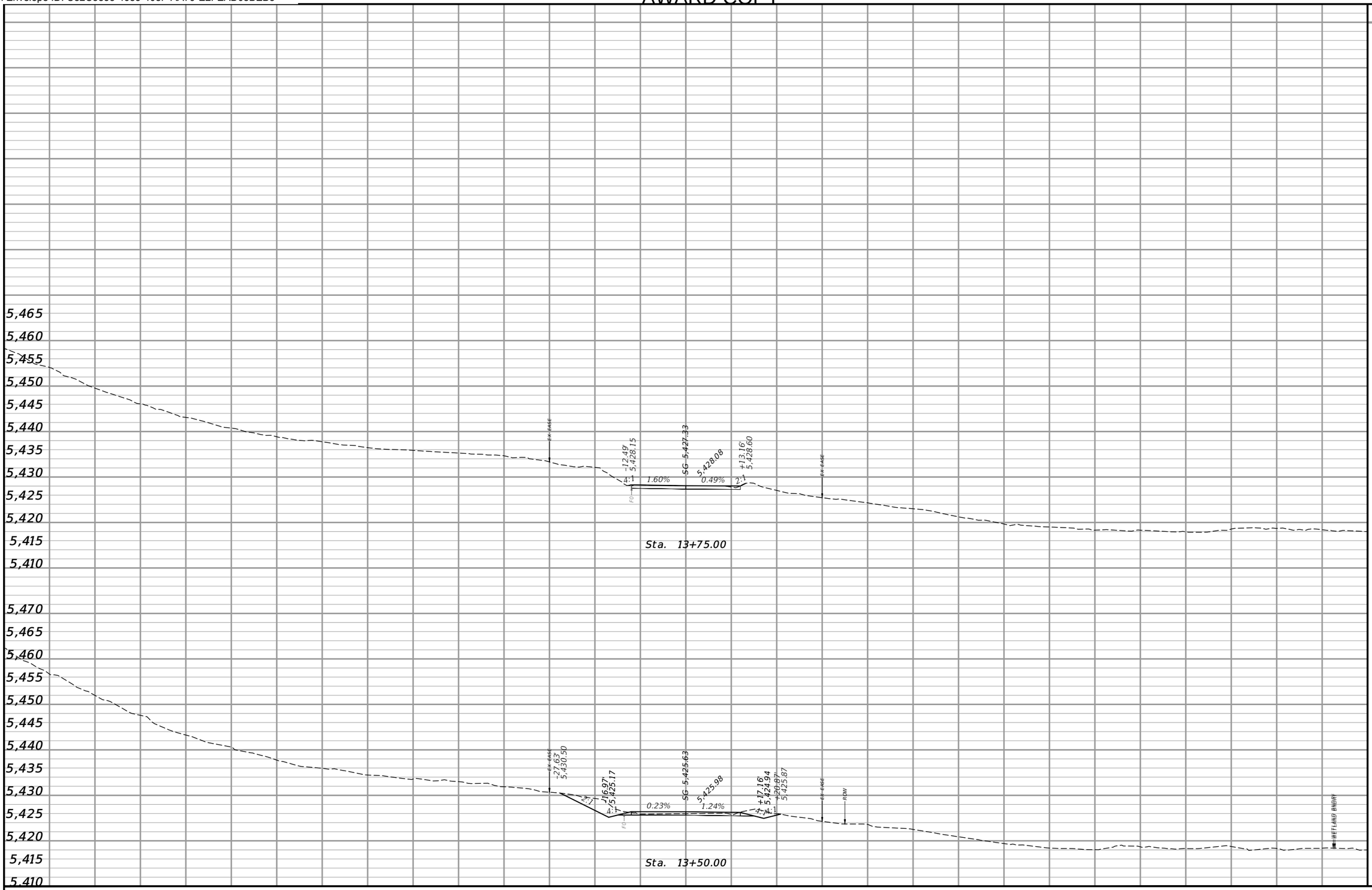


CUT	FILL
23	19
3	13

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY / CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022		
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000 / 31

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CUT	FILL
28	0
36	3

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	8932000rdLAYz02.dwg	DESIGNED BY	R. HOLM	7/14/2022	APPROACH CROSS SECTIONS	GRANITE CR – 3M NW VIRGINIA CITY	CRSII-STPB 29-1(64)17
2		7/14/2022	REVIEWED BY	J. WEAVER	7/14/2022			
1		10:21 AM ryan holm	CHECKED BY	K. YAKAWICH	7/14/2022	MADISON COUNTY	UPN 8932000	32