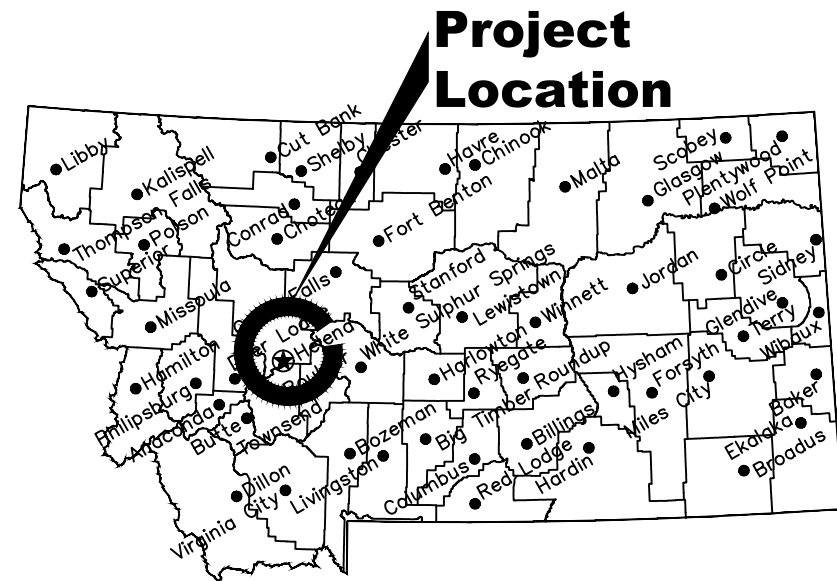


MONTANA FISH, WILDLIFE & PARKS

# Beartooth Wildlife Management Area Road Maintenance & Gravel Pit Project

near Holter Lake, MT

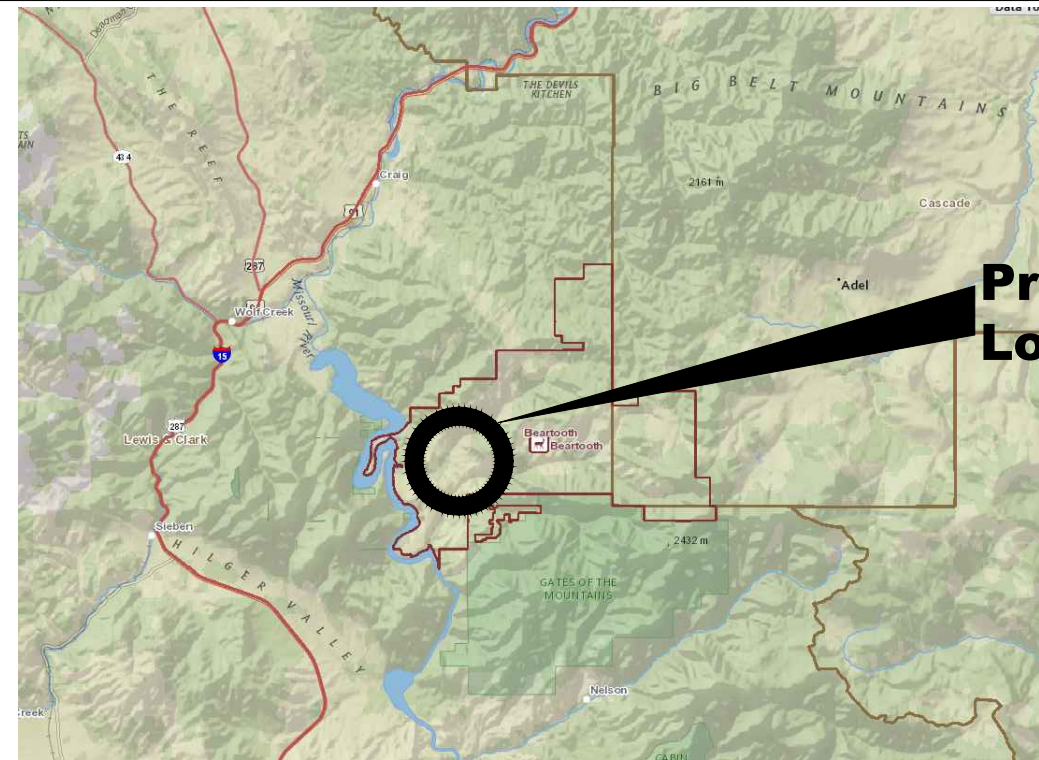
#7215402



**Project Location**

**Location Map**

No Scale



**Project Location**

**Vicinity Map**

No Scale

North



MONTANA FISH, WILDLIFE AND PARKS  
DESIGN AND CONSTRUCTION

MAILING ADDRESS: PO BOX 200701  
HELENA, MT 59620-0701  
TEL 406.841.4000  
FAX 406.841.4004  
<https://fwp.mt.gov/aboutfwp/design-and-construction>

PHYSICAL ADDRESS:  
1522 9th AVENUE  
HELENA, MT 59601

## DRAWING INDEX

Sheet Number	Sheet Title	Sheet Number	Sheet Title	Sheet Number	Sheet Title
1	COVER SHEET	6	SITE PLAN STA 18+21 to 24+00	11	ROAD DETAIL SHEET
2	SITE LOCATION PLAN	7	PROFILE VIEW STA 0+00 to 6+00	12	WILLOW CREEK EAST PIT SITE PLAN
3	SITE PLAN STA 0+00 to 6+00	8	PROFILE VIEW STA 6+00 to 12+00	13	PIT DETAIL SHEET
4	SITE PLAN STA 6+00 to 12+00	9	PROFILE VIEW STA 12+00 to 18+00	14	WILLOW CREEK EAST PIT DETAILS
5	SITE PLAN STA 12+00 to 18+21	10	PROFILE VIEW STA 18+00 to 24+00		

P. Jagoda 2/03/2023  
DRAWN BY: DATE:  
J. Mangum 5/30/2023  
CHECKED BY: DATE:

APPROVED BY: DATE:  
APPROVED BY: DATE:

APPROVED BY: DATE:  
APPROVED BY: DATE:

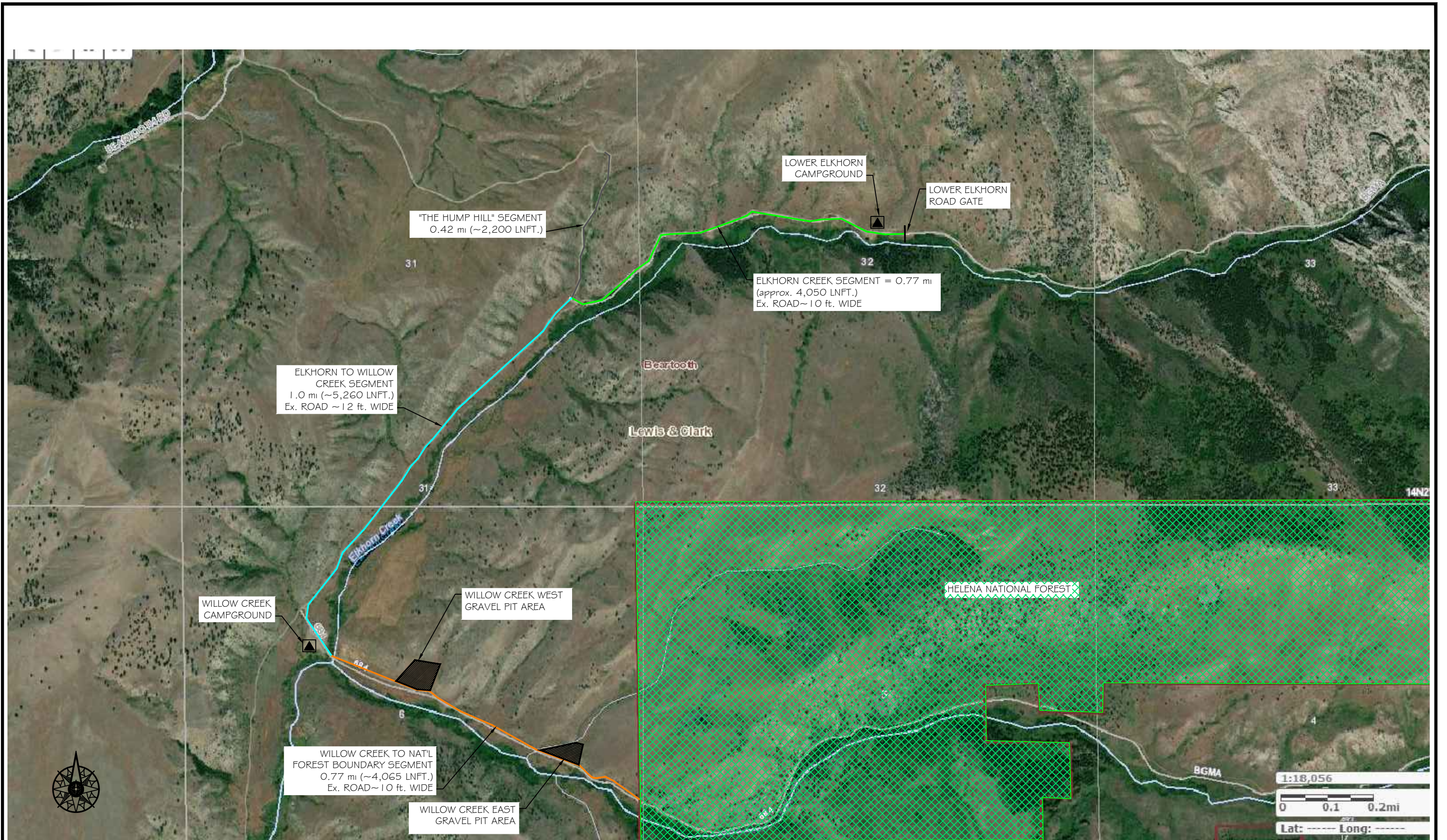


**MONTANA FISH,  
WILDLIFE & PARKS**

Cover Sheet

Beartooth WMA - Road Maintenance & Gravel Pit Project

SHEET: 1 of 14



P. Jagoda 2/03/2023  
DRAWN BY: DATE:  
J. Mangum 5/30/2023  
CHECKED BY: DATE:

REVISED BY: DATE:  
APPROVED BY: DATE:

APPROVED BY: DATE:  
APPROVED BY: DATE:

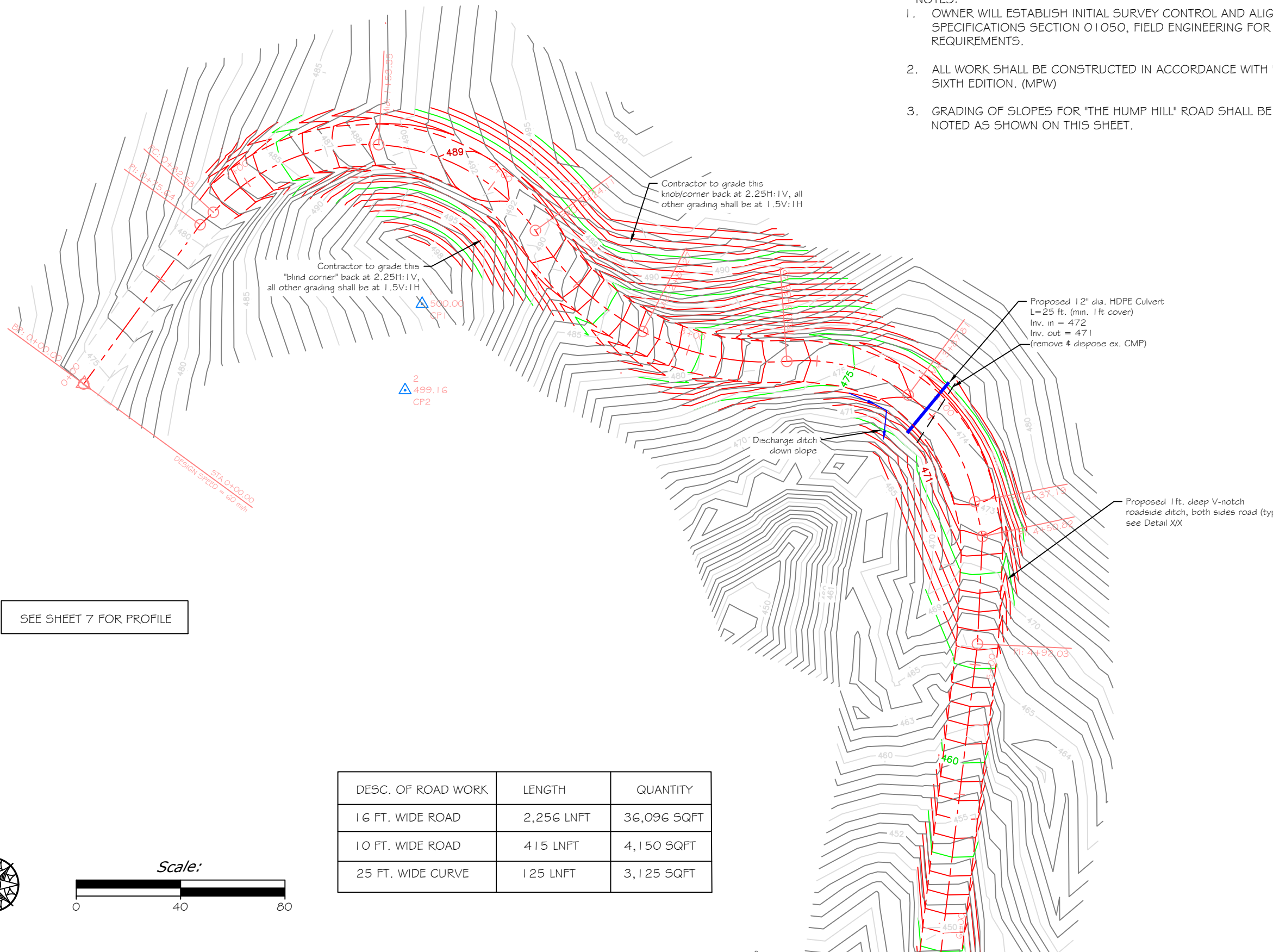


**MONTANA FISH,  
WILDLIFE & PARKS**

**SITE LOCATION PLAN**  
Beartooth WMA - Road Maintenance Project & Proposed Gravel Pits

**NOTES:**

1. OWNER WILL ESTABLISH INITIAL SURVEY CONTROL AND ALIGNMENT GRADE STAKES, SEE TECHNICAL SPECIFICATIONS SECTION 01050, FIELD ENGINEERING FOR ADDITIONAL CONTRACTOR SURVEYING REQUIREMENTS.
2. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH "MONTANA PUBLIC WORKS SPECIFICATIONS", SIXTH EDITION. (MPW)
3. GRADING OF SLOPES FOR "THE HUMP HILL" ROAD SHALL BE COMPLETED AT 1.5H:1V, UNLESS OTHERWISE NOTED AS SHOWN ON THIS SHEET.



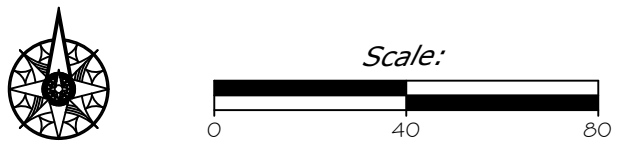
**LEGEND**

EXISTING FEATURES	
CONTROL POINT	
EDGE OF ROAD	
BARBED WIRE FENCE	
EX. CONTOUR	
TREE	
EX. CMP PIPE	
PROPOSED FEATURES	
EDGE OF ROAD	
GRAVEL SURFACED AREA 16' WIDE ROAD	
4-STRAND FENCE	
HDPE CULVERT	
VEHICLE PULL-OFF	
GRAVEL SURFACED CURVE 25' WIDE	
GRAVEL SURFACED AREA 10' WIDE ROAD	

Desc.	Northing	Easting	Elev.
CP1	5000.0000	5000.0000	500.0000
CP2	4966.9317	4993.4623	499.1630
CP3	4823.5864	5360.3264	488.5053
CP4	3342.7795	4793.0637	256.1048

SEE SHEET 7 FOR PROFILE

DESC. OF ROAD WORK	LENGTH	QUANTITY
16 FT. WIDE ROAD	2,256 LNFT	36,096 SQFT
10 FT. WIDE ROAD	415 LNFT	4,150 SQFT
25 FT. WIDE CURVE	125 LNFT	3,125 SQFT



P. Jagoda	2/03/2023	REVISD BY:	DATE:	APPROVED BY:	DATE:
DRAWN BY:	DATE:				
J. Mangum	5/30/2023	APPROVED BY:	DATE:	APPROVED BY:	DATE:
CHECKED BY:	DATE:				

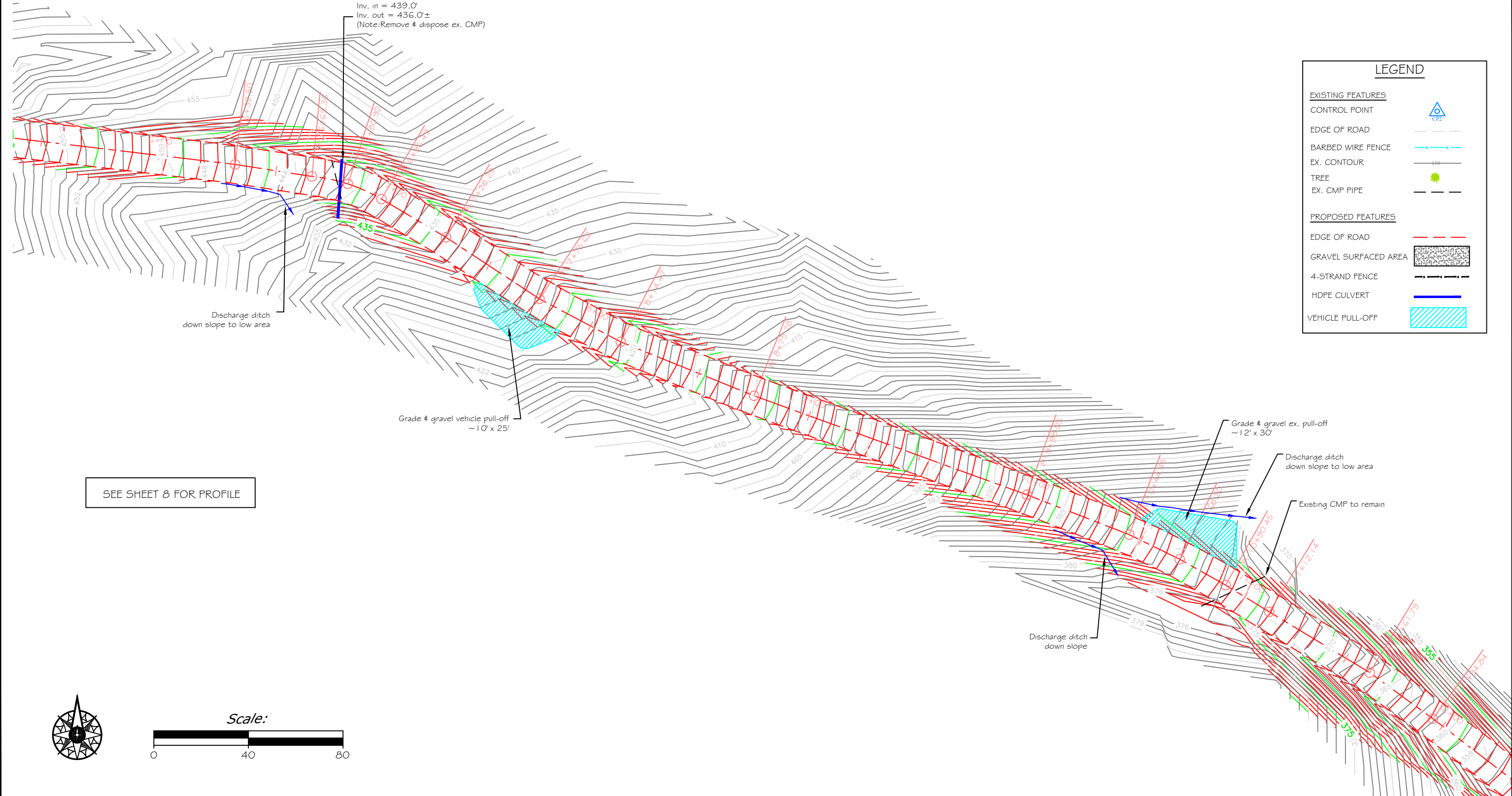


**Site Plan - STA 0+00 to 6+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project

- NOTES:
1. GRADING OF SLOPES FOR "THE HUMP HILL" ROAD SHALL BE COMPLETED AT 1.5H:1V, UNLESS OTHERWISE NOTED.
  2. VEHICLE PULL-OFFS TO CONSIST OF GRADED & COMPACTED SUBGRADE OVERLAIN BY 6-INCHES OF ROAD GRAVEL.

Proposed 12" dia. HDPE Culvert  
 L=25 ft. (min. 1 ft cover)  
 Inv. in = 439.0'  
 Inv. out = 436.0'±  
 (Note: Remove & dispose ex. CMP)

LEGEND	
<b>EXISTING FEATURES</b>	
CONTROL POINT	
EDGE OF ROAD	
BARBED WIRE FENCE	
EX. CONTOUR	
TREE	
EX. CMP PIPE	
<b>PROPOSED FEATURES</b>	
EDGE OF ROAD	
GRAVEL SURFACED AREA	
4-STRAND FENCE	
HDPE CULVERT	
VEHICLE PULL-OFF	



Discharge ditch  
down slope to low area

Grade & gravel vehicle pull-off  
~10' x 25'

Grade & gravel ex. pull-off  
~12' x 30'

Discharge ditch  
down slope to low area

Existing CMP to remain

Discharge ditch  
down slope

SEE SHEET 8 FOR PROFILE



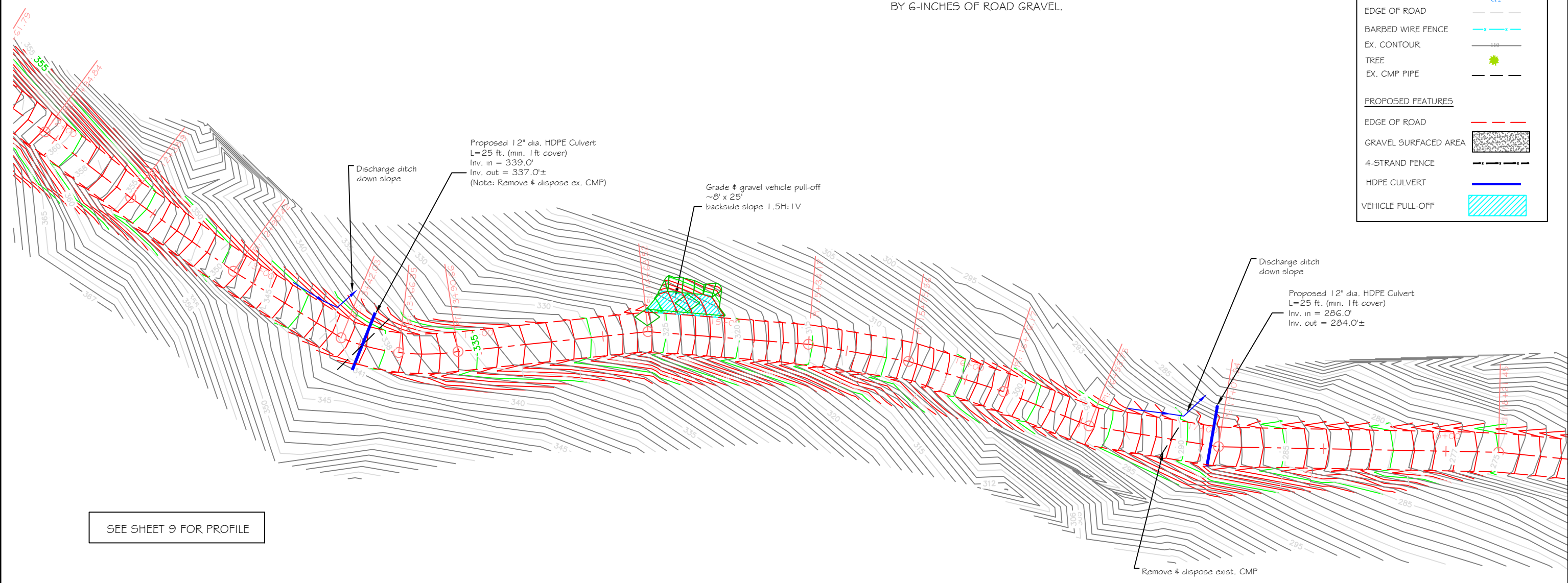
P. Jagoda DRAWN BY:	2/03/2023 DATE:	REVISD BY:	DATE:	APPROVED BY:	DATE:
J. Mangum CHECKED BY:	5/30/2023 DATE:	APPROVED BY:	DATE:	APPROVED BY:	DATE:



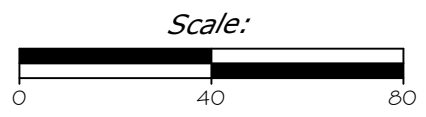
Site Plan - STA 6+00 to 12+00  
 Beartooth WMA - Road Maintenance & Gravel Pit Project

- NOTES:
1. GRADING OF SLOPES FOR "THE HUMP HILL" ROAD SHALL BE COMPLETED AT 1.5H:1V, UNLESS OTHERWISE NOTED.
  2. VEHICLE PULL-OFFS TO CONSIST OF GRADED & COMPACTED SUBGRADE OVERLAIN BY 6-INCHES OF ROAD GRAVEL.

LEGEND	
<b>EXISTING FEATURES</b>	
CONTROL POINT	
EDGE OF ROAD	
BARBED WIRE FENCE	
EX. CONTOUR	
TREE	
EX. CMP PIPE	
<b>PROPOSED FEATURES</b>	
EDGE OF ROAD	
GRAVEL SURFACED AREA	
4-STRAND FENCE	
HDPE CULVERT	
VEHICLE PULL-OFF	



SEE SHEET 9 FOR PROFILE

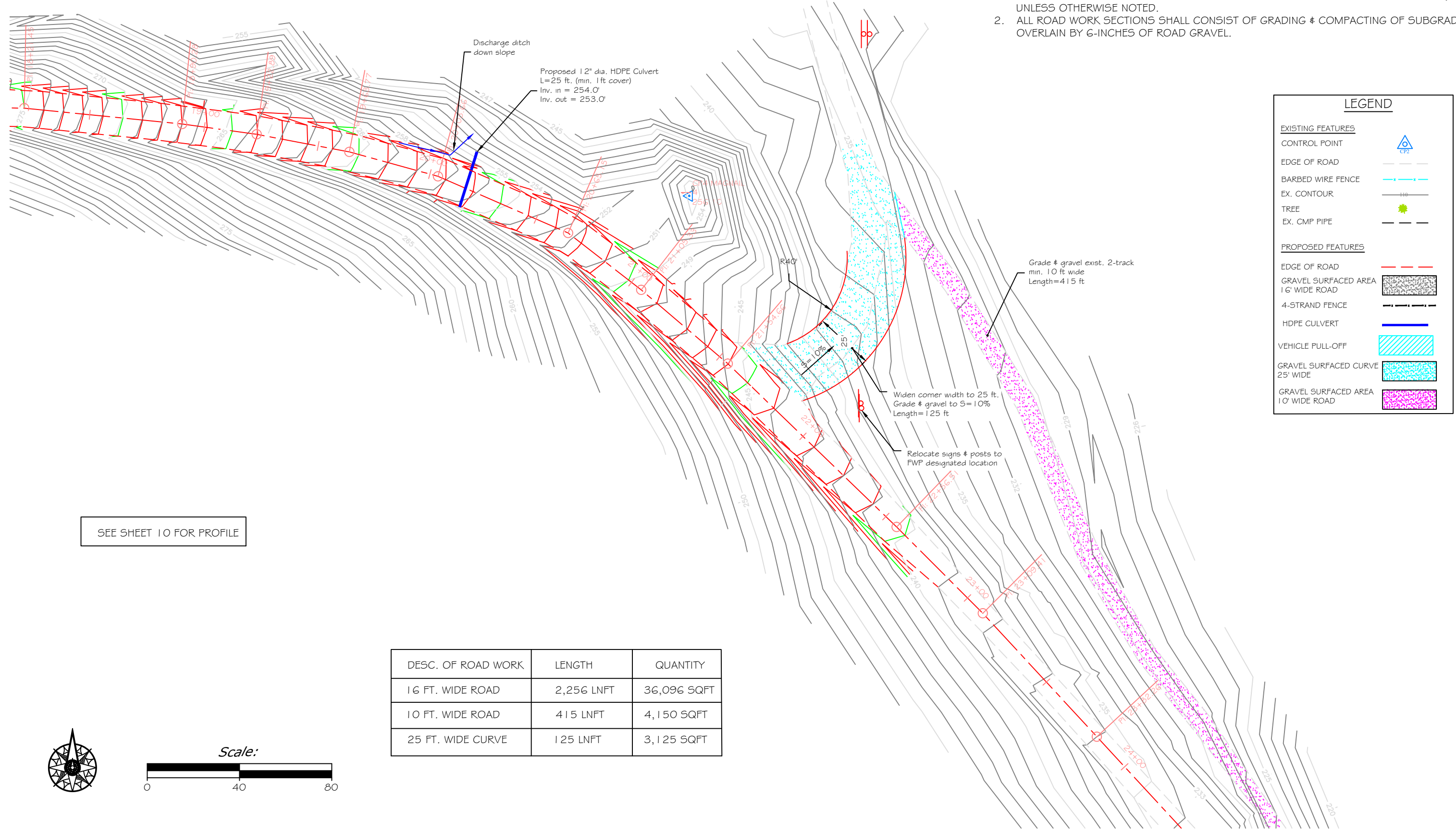


P. Jagoda DRAWN BY:	2/03/2023 DATE:	REVISD BY:	DATE:	APPROVED BY:	DATE:
J. Mangum CHECKED BY:	5/30/2023 DATE:	APPROVED BY:	DATE:	APPROVED BY:	DATE:



**Site Plan - STA 12+00 to 18+21**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project

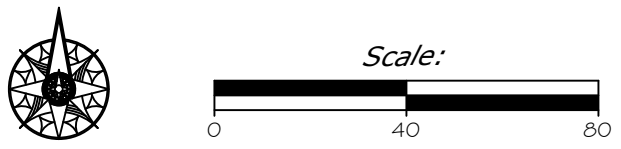
- NOTES:
1. GRADING OF SLOPES FOR "THE HUMP HILL" ROAD SHALL BE COMPLETED AT 1.5H:1V, UNLESS OTHERWISE NOTED.
  2. ALL ROAD WORK SECTIONS SHALL CONSIST OF GRADING & COMPACTING OF SUBGRADE OVERLAIN BY 6-INCHES OF ROAD GRAVEL.



LEGEND	
<b>EXISTING FEATURES</b>	
CONTROL POINT	
EDGE OF ROAD	
BARBED WIRE FENCE	
EX. CONTOUR	
TREE	
EX. CMP PIPE	
<b>PROPOSED FEATURES</b>	
EDGE OF ROAD	
GRAVEL SURFACED AREA 16' WIDE ROAD	
4-STRAND FENCE	
HDPE CULVERT	
VEHICLE PULL-OFF	
GRAVEL SURFACED CURVE 25' WIDE	
GRAVEL SURFACED AREA 10' WIDE ROAD	

SEE SHEET 10 FOR PROFILE

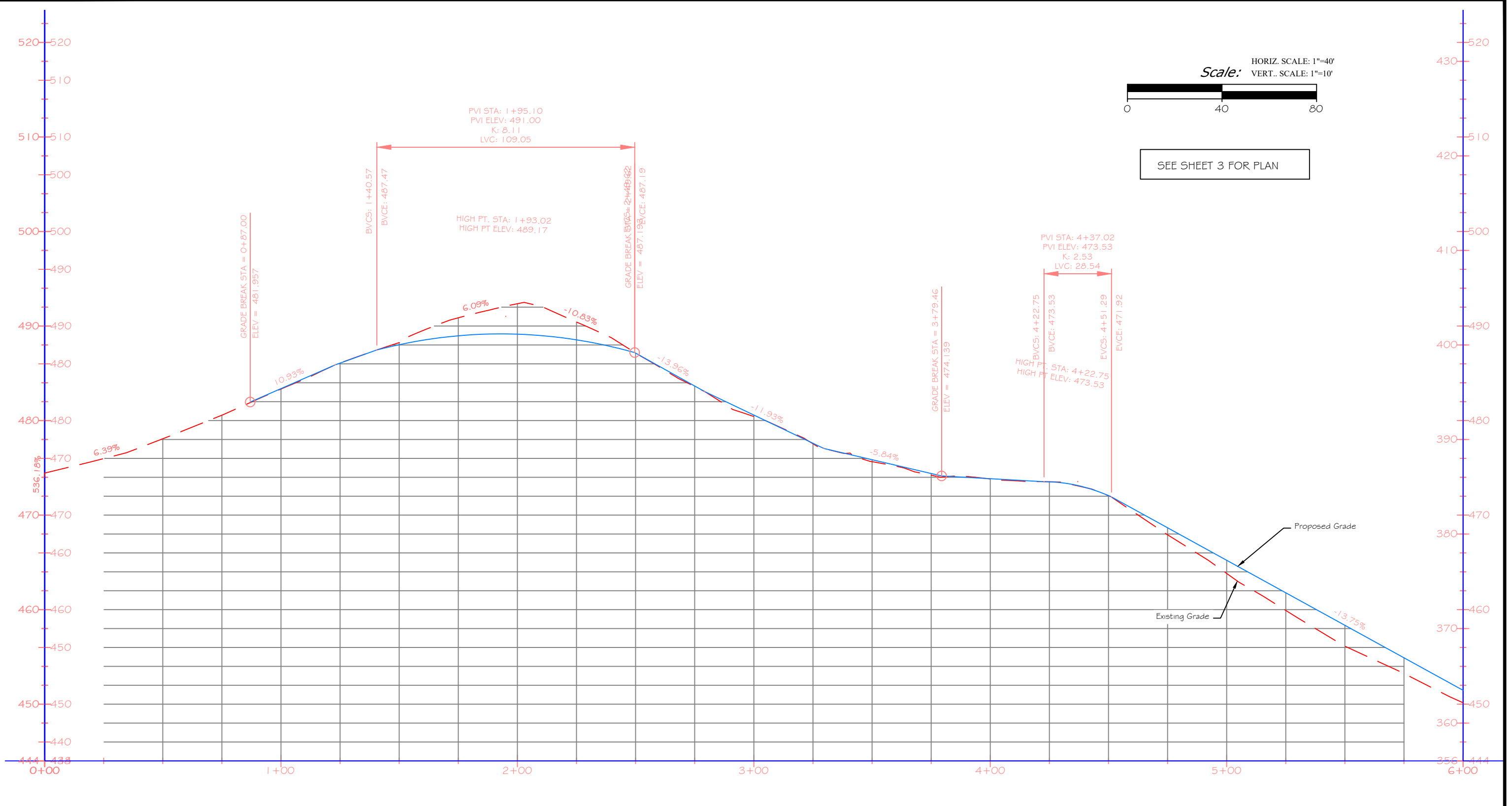
DESC. OF ROAD WORK	LENGTH	QUANTITY
16 FT. WIDE ROAD	2,256 LNFT	36,096 SQFT
10 FT. WIDE ROAD	415 LNFT	4,150 SQFT
25 FT. WIDE CURVE	125 LNFT	3,125 SQFT



P. Jagoda DRAWN BY:	2/03/2023 DATE:	REVISD BY:	DATE:	APPROVED BY:	DATE:
J. Mangum CHECKED BY:	5/30/2023 DATE:	APPROVED BY:	DATE:	APPROVED BY:	DATE:



**Site Plan - STA 18+21 to 24+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project



474.11	483.33	492.36	480.43	473.82	463.83	450.15
474.11	483.33	492.36	480.43	473.82	463.83	450.15
0+00	1+00	2+00	3+00	4+00	5+00	6+00

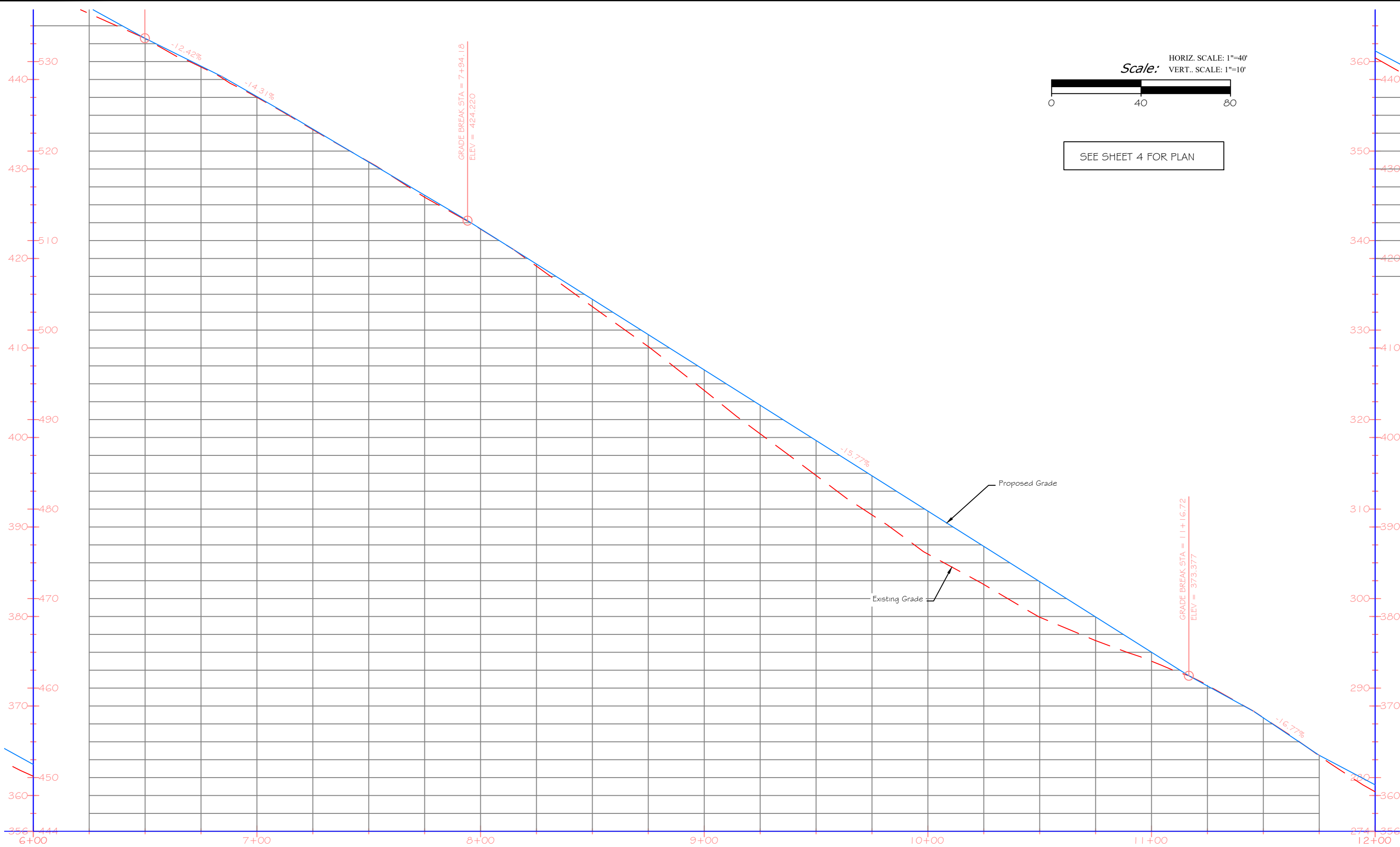
P. Jagoda 2/03/2023  
 DRAWN BY: DATE:  
 J. Mangum 5/30/2023  
 CHECKED BY: DATE:

REVISED BY: DATE:  
 APPROVED BY: DATE:

APPROVED BY: DATE:  
 APPROVED BY: DATE:



**Profile View - STA 0+00 to 6+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project



P. Jagoda 2/03/2023  
 DRAWN BY: DATE:  
 J. Mangum 5/30/2023  
 CHECKED BY: DATE:

REVISED BY: DATE:  
 APPROVED BY: DATE:

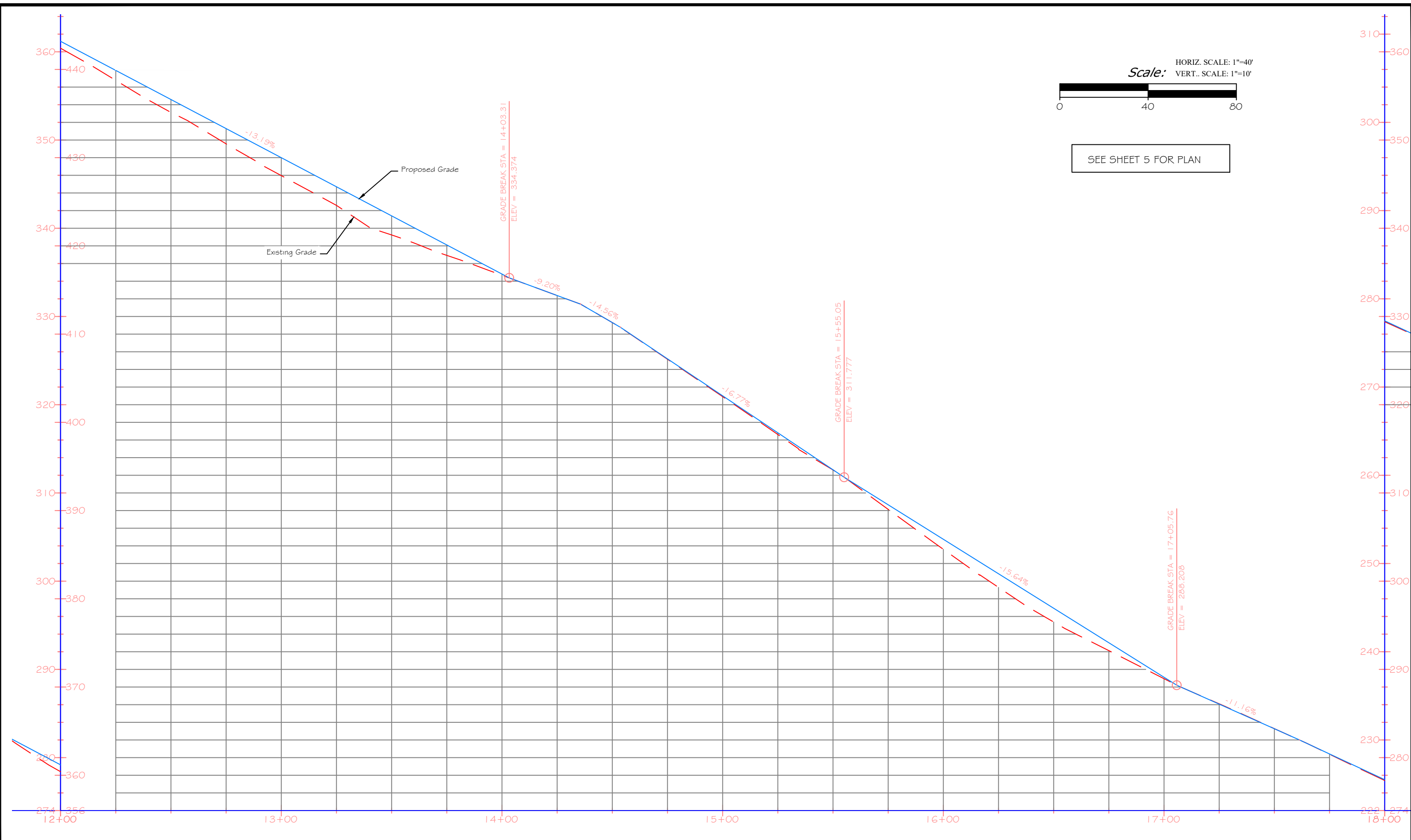
APPROVED BY: DATE:  
 APPROVED BY: DATE:



**MONTANA FISH,  
 WILDLIFE & PARKS**

**Profile View - STA 6+00 to 12+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project





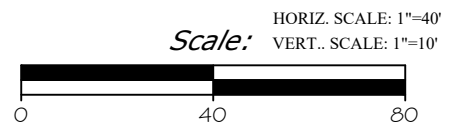
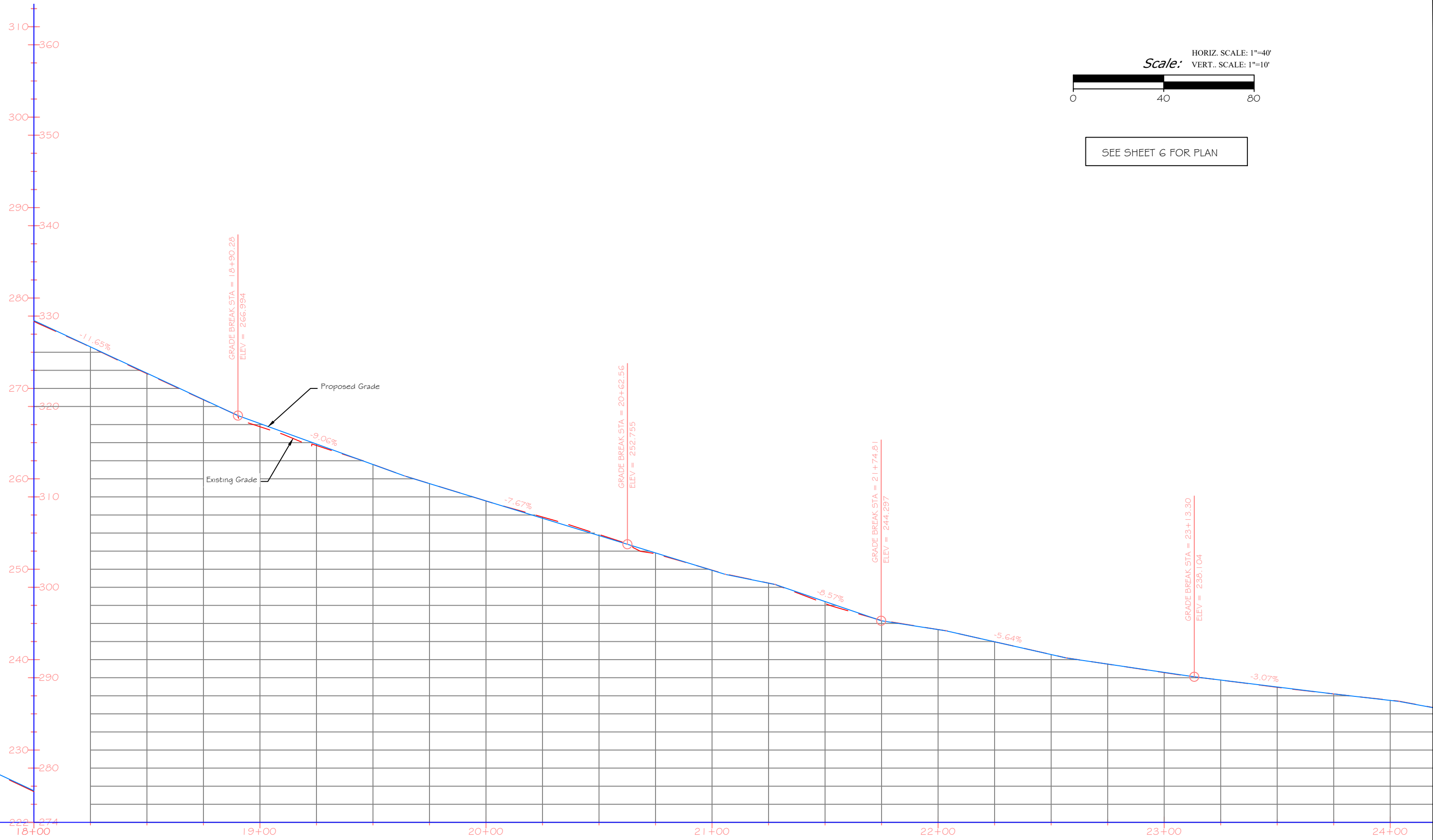
P. Jagoda 2/03/2023  
 DRAWN BY: DATE:  
 J. Mangum 5/30/2023  
 CHECKED BY: DATE:

REVISED BY: DATE:  
 APPROVED BY: DATE:

APPROVED BY: DATE:  
 APPROVED BY: DATE:



**Profile View - STA 12+00 to 18+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project



SEE SHEET 6 FOR PLAN

P. Jagoda 2/03/2023  
 DRAWN BY: DATE:  
 J. Mangum 5/30/2023  
 CHECKED BY: DATE:

REVISED BY: DATE:  
 APPROVED BY: DATE:

APPROVED BY: DATE:  
 APPROVED BY: DATE:



**Profile View - STA 18+00 to 24+00**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project

SHEET: 10 of 14



- NOTES:
- GRAVEL PITS SHALL BE OPERATED IN ACCORDANCE WITH DEQ PERMIT #XXXX AND ALL REQUIREMENTS SET FORTH IN PERMIT.
  -

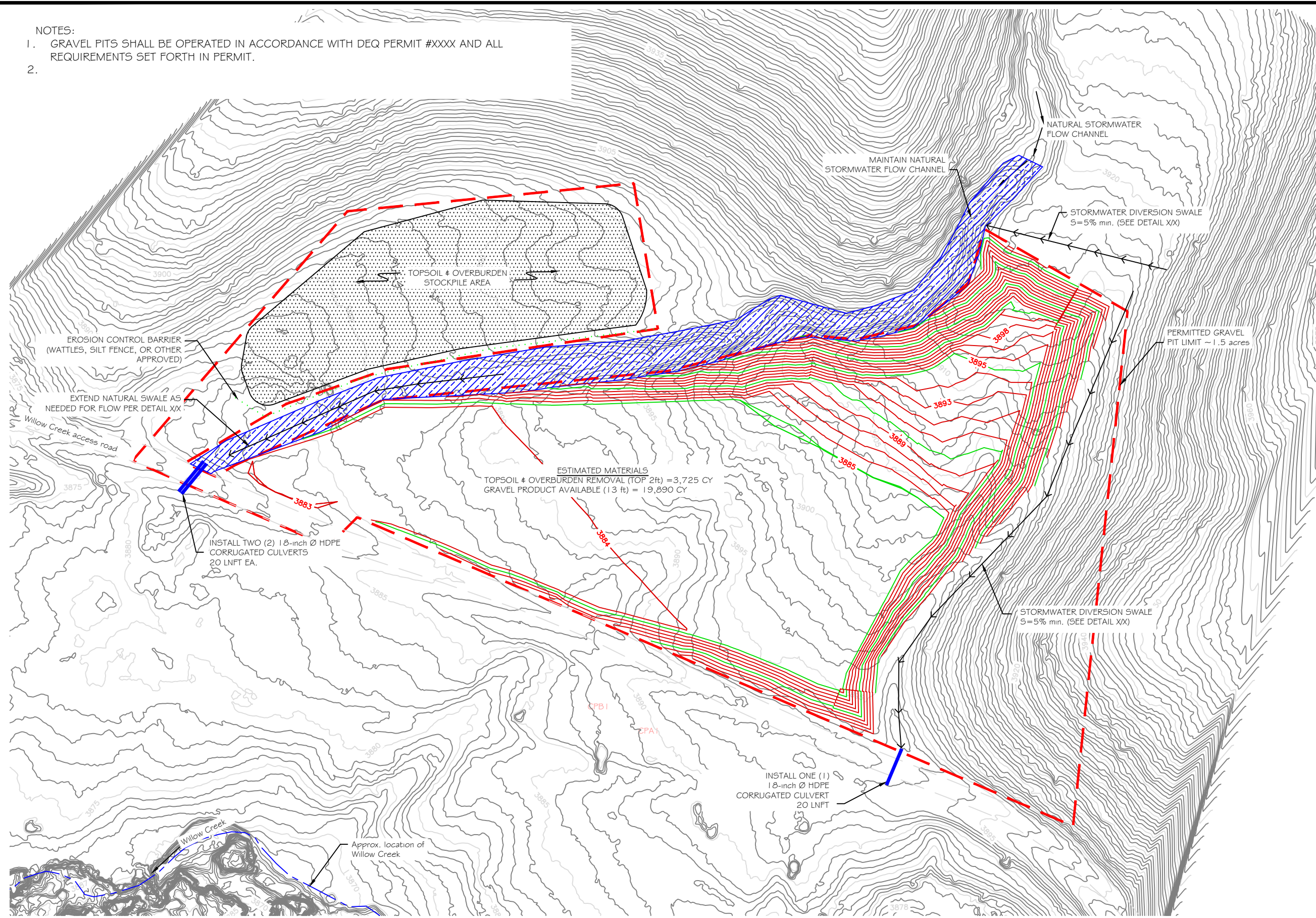
**LEGEND**

**EXISTING FEATURES**

- CONTROL POINT
- EDGE OF ROAD
- BARBED WIRE FENCE
- EX. CONTOUR
- PERMITTED GRAVEL PIT AREA

**PROPOSED FEATURES**

- EDGE OF ROAD
- SOIL STOCKPILE AREA
- SW DIVERSION SWALE
- HDPE CULVERT
- EROSION CONTROL BARRIER

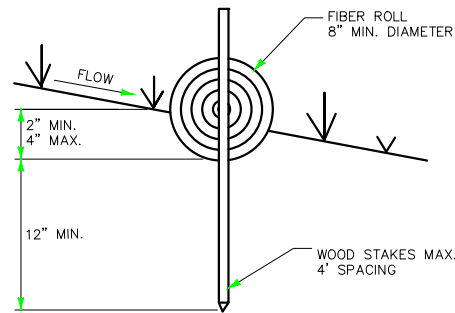


P. Jagoda	2/03/2023	J. Mangum	3/31/23	APPROVED BY:	DATE:
DRAWN BY:	DATE:	REVISED BY:	DATE:		
J. Mangum	5/30/2023			APPROVED BY:	DATE:
CHECKED BY:	DATE:				



**MONTANA FISH,  
WILDLIFE & PARKS**

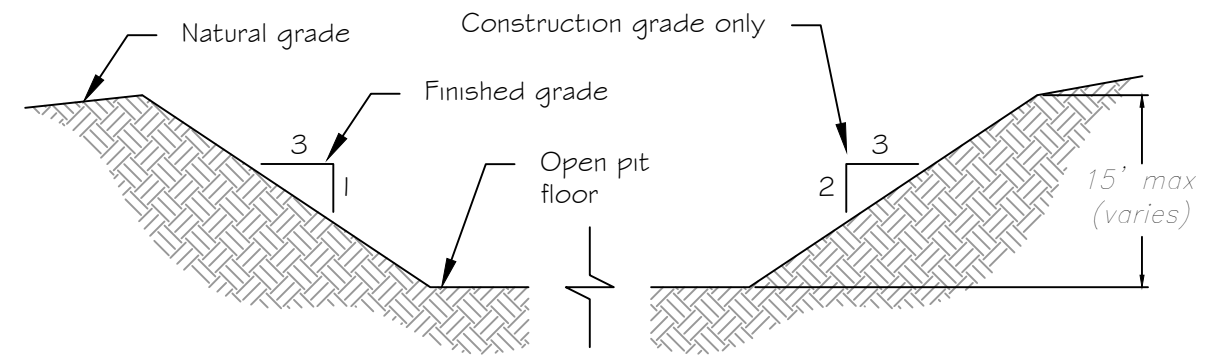
**Willow Creek East Gravel Pit**  
Beartooth WMA - Road Maintenance & Gravel Pit Project



**Fiber Roll Detail**

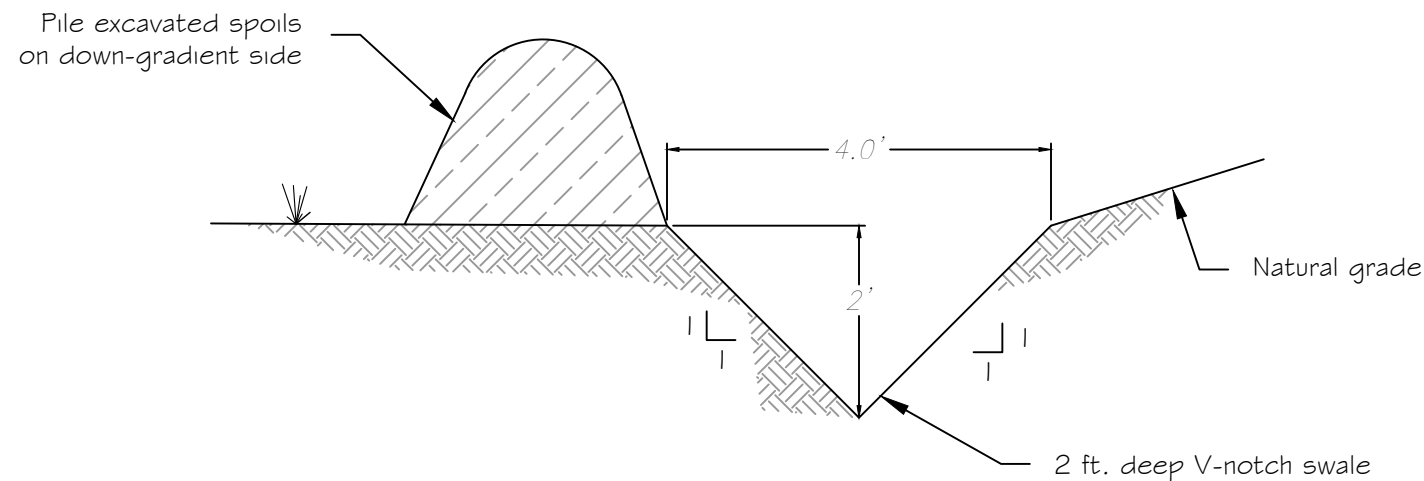
A FIBER ROLL CONSISTS OF WEED-FREE STRAW, FLAX, COCONUT, OR OTHER SIMILAR FIBER MATERIALS BOUND INTO TIGHT TUBULAR ROLLS ENCASED IN NATURAL FIBER OR UV-DEGRADABLE POLYPROPYLENE NETTING, AND PLACED ON THE FACE OF SLOPES AT REGULAR INTERVALS TO INTERCEPT RUNOFF, REDUCE ITS FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW, AND PROVIDE SOME REMOVAL OF SEDIMENT FROM THE RUNOFF.

FIBER ROLLS MAY BE USED ALONG THE TOP, FACE, AND AT GRADE BREAKS OF EXPOSED AND ERODIBLE SLOPES TO SHORTEN SLOPE LENGTH AND SPREAD RUNOFF AS SHEET FLOW. ROLLS MAY BE USED AS CHECK DAMS IF APPROVED BY THE ENGINEER. FOR USE AS CHECK DAMS, PLACE FIBER ROLLS AT 50 FT. MAXIMUM SPACING OR AS APPROVED BY THE ENGINEER.



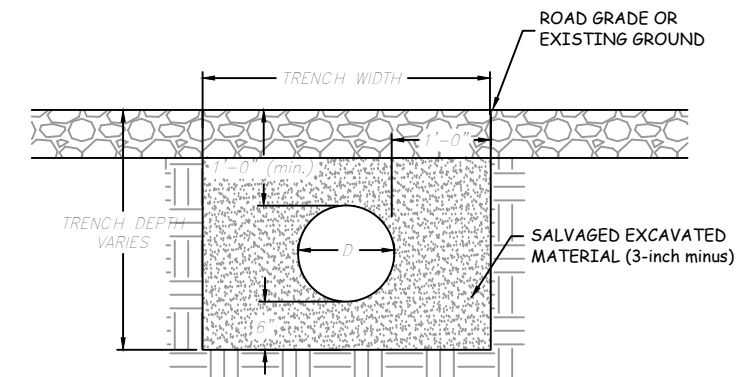
**STANDARD OPENCUT MINE DETAIL**

SCALE: NTS



**STORMWATER DIVERSION SWALE DETAIL**

SCALE: 1"=2'



**CULVERT TRENCH DETAIL**

SCALE: 1"=2'

**NOTES:**

1. Excavated material from the trench may be salvaged and reused as backfill, providing all oversized rocks are removed (3-inch minus)
2. Minimum of 1 ft. of cover over culvert shall be required.

Scale:



P. Jagoda	2/03/2023
DRAWN BY:	DATE:
J. Mangum	5/30/2023
CHECKED BY:	DATE:

REVISED BY:	DATE:
APPROVED BY:	DATE:

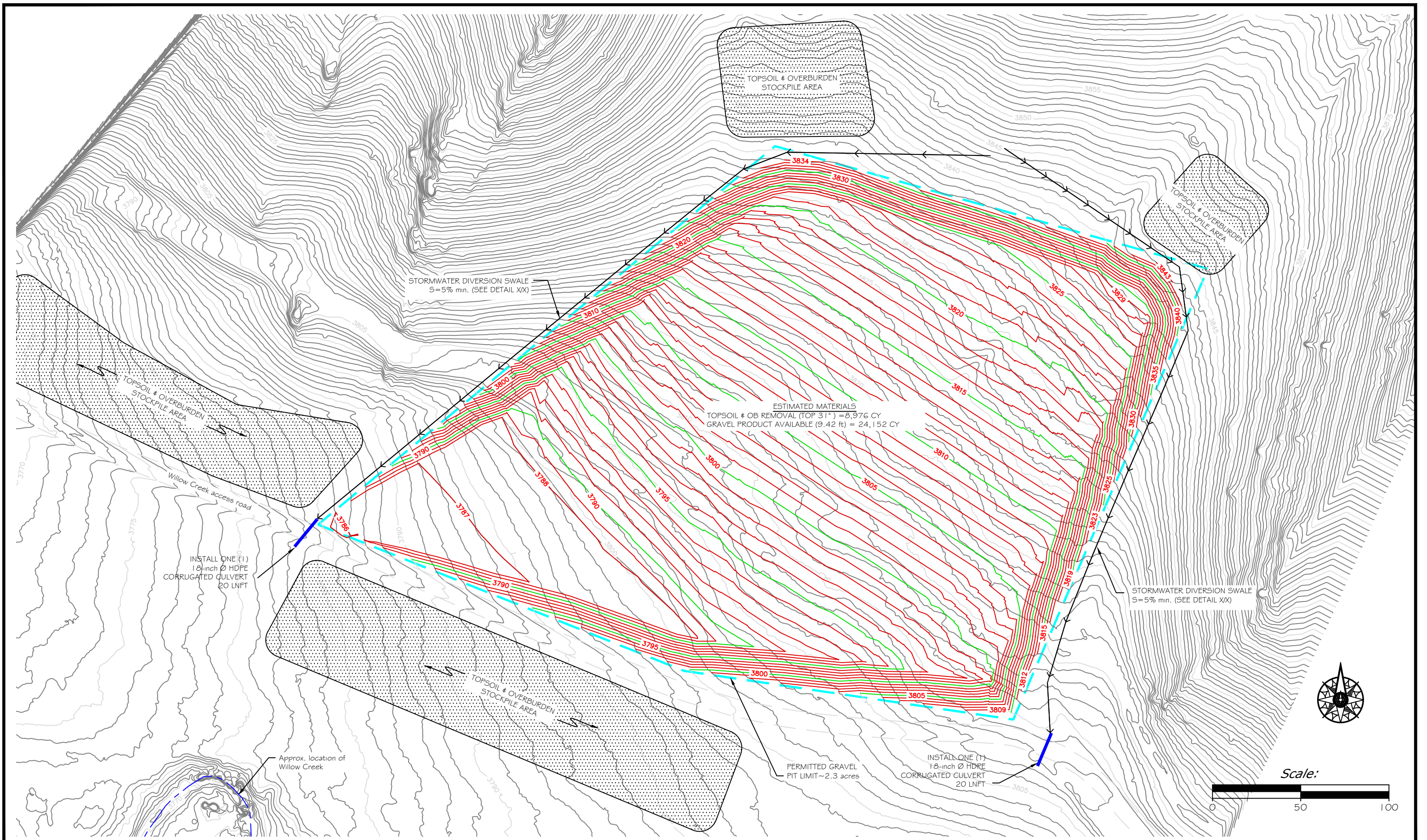
APPROVED BY:	DATE:
APPROVED BY:	DATE:



**MONTANA FISH,  
WILDLIFE & PARKS**

**Willow Creek Gravel Pits - Detail Sheet**  
Beartooth WMA - Road Maintenance & Gravel Pit Project

SHEET: 13 of 14



P. Jagoda 2/03/2023  
 DRAWN BY: DATE:  
 J. Mangum 5/30/2023  
 CHECKED BY: DATE:

REVISED BY: DATE:  
 APPROVED BY: DATE:

APPROVED BY: DATE:  
 APPROVED BY: DATE:



**Willow Creek West Gravel Pit**  
 Beartooth WMA - Road Maintenance & Gravel Pit Project

SHEET: 14  
 of 14