

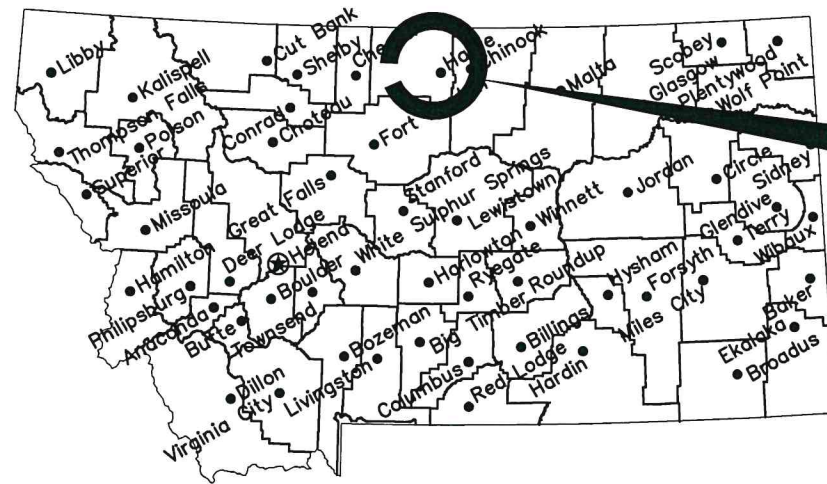
MONTANA FISH, WILDLIFE & PARKS

Fresno Tailwater FAS

Erosion Control

Near Havre, MT

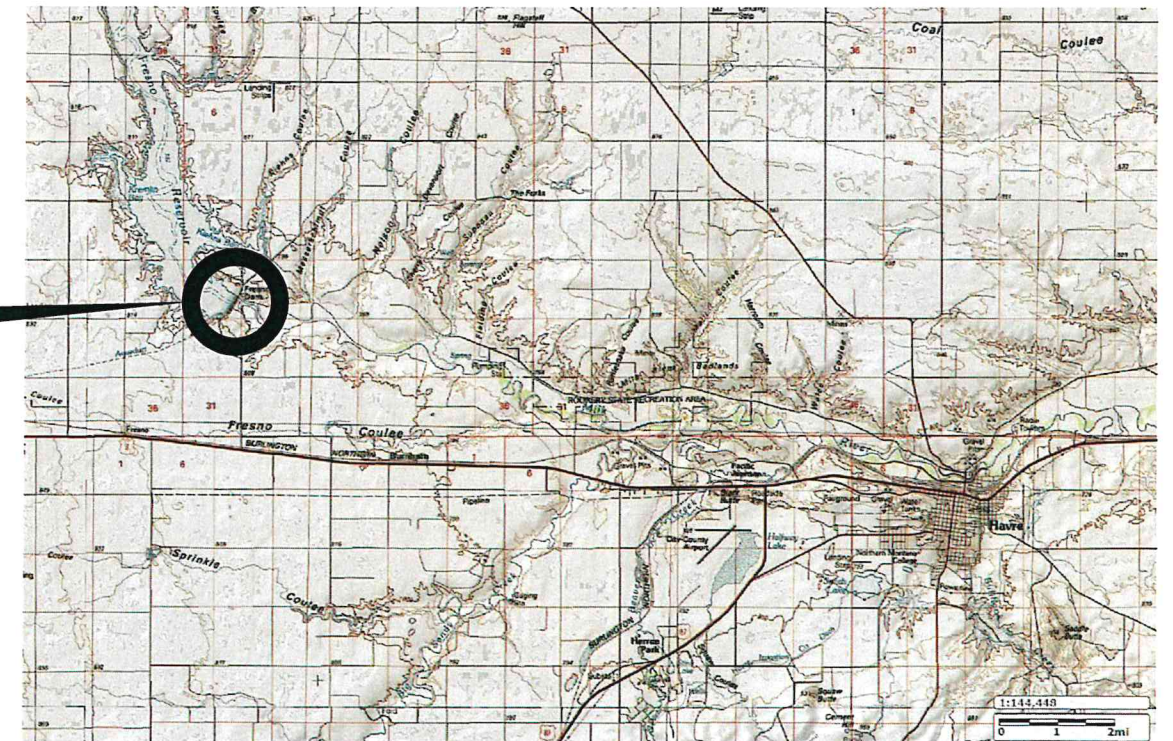
FWP # 7193735



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

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fwp.mt.gov/Doing Business/Design&Construction

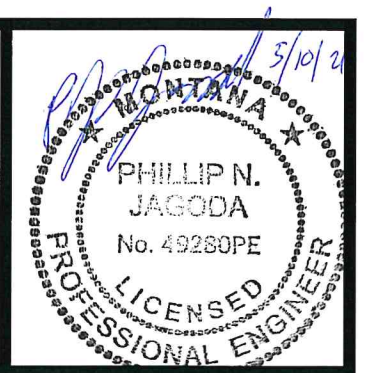
PHYSICAL ADDRESS:

1522 9th AVENUE

HELENA, MT 59601

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| 6 | DETAILS |



| | |
|-------------|------------|
| J. Renenger | 12/23/2020 |
| DRAWN BY: | DATE: |
| P. Jagoda | 12/31/2020 |
| CHECKED BY: | DATE: |

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**MONTANA FISH,
WILDLIFE & PARKS**

COVER

Fresno Tailwater FAS Erosion Control

SHEET: 1 of 6

| Estimated Quantities | | | | | | |
|-----------------------|--------------------------------|---------------------------|--------------------------|---------------------------|------------------------------|-------------------------|
| Location | CY | | | | | SY |
| | Furnish and Install Clean Fill | Furnish Class III Rip Rap | Salvage Fill From Island | Install Class III Rip Rap | Furnish and Install Top Soil | Non- Woven * Geotextile |
| Existing Scour Hole | 980 | 240 | | 350 | 90 | 250 |
| River Island | | | 300 | | | |
| BASE BID TOTAL | 980 | 240 | 300 | 350 | 90 | 250 |

* FOR INFORMATIONAL PURPOSES ONLY

NOTES:

- 1) EXISTING ROCK STOCK PILES ESTIMATED QUANTITIES:
 - A. 60 CUBIC YARDS CLASS II RIP RAP
 - B. 110 CUBIC YARDS CLASS III RIP RAP
 - C. 85 CUBIC YARDS OVERSIZED RAILROAD BALLAST
- 2) EXISTING CLASS II RIP RAP AND OVERSIZED BALLAST TO BE USED TO ARMOR UPSTREAM FILL AREAS.
- 3) AERIAL IMAGERY IS OUTDATED AND DOES NOT ACCURATELY DEPICT THE CURRENT RIVER CONDITIONS.
- 4) RAW SURVEY DATA WILL BE PROVIDED TO SHOW EXISTING TOPOGRAPHY AS OF NOVEMBER 2020.
- 5) DEWATERING AND DIVERSION DAMS WILL BE REQUIRED FOR COMPACTION OF FILL BELOW CURRENT WATER LEVEL.
- 6) FILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT GREATER THAN 12".
- 7) FILL FROM RIVER ISLAND SHALL BE STOCKPILED AND DRIED TO MIX WITH IMPORTED FILL.
- 8) RIP RAP SHALL BE PLACED WITH LARGEST ROCKS AT THE TOE OF THE SLOPE.
- 9) FINAL CLEANUP SHALL INCLUDE GRADING THE EXISTING RAILROAD BALLAST RAMP.

| Estimated Quantities Below High Water* | |
|--|-----|
| | CY |
| Excavation from Island | 300 |
| Fill at Scour Hole | 900 |
| Rip Rap-Class III | 185 |

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**MONTANA FISH,
 WILDLIFE & PARKS**

SUMMARY
 Fresno Tailwaters FAS Erosion Control

SHEET: 2 of 6



TURN RIP RAP BANK AWAY FROM RIVER TO PREVENT SCOURING

CONSTRUCT RIP RAP BANK - 1 85 LF
APPROX. 350 CY
APPROX. 1 85 CY BELOW OHWM

STRIP +/- 1.5' TO EXISTING BED SURFACE ELEVATION AND SALVAGE FILL FROM ISLAND APPROX. 300 CY BELOW OHWM

BACKFILL EXISTING SCOUR HOLE
APPROX. 1 280 CY
APPROX. 900 CY BELOW OHWM

EXISTING ROCK STOCKPILES

GRADE EXISTING RAILROAD BALLAST RAMP

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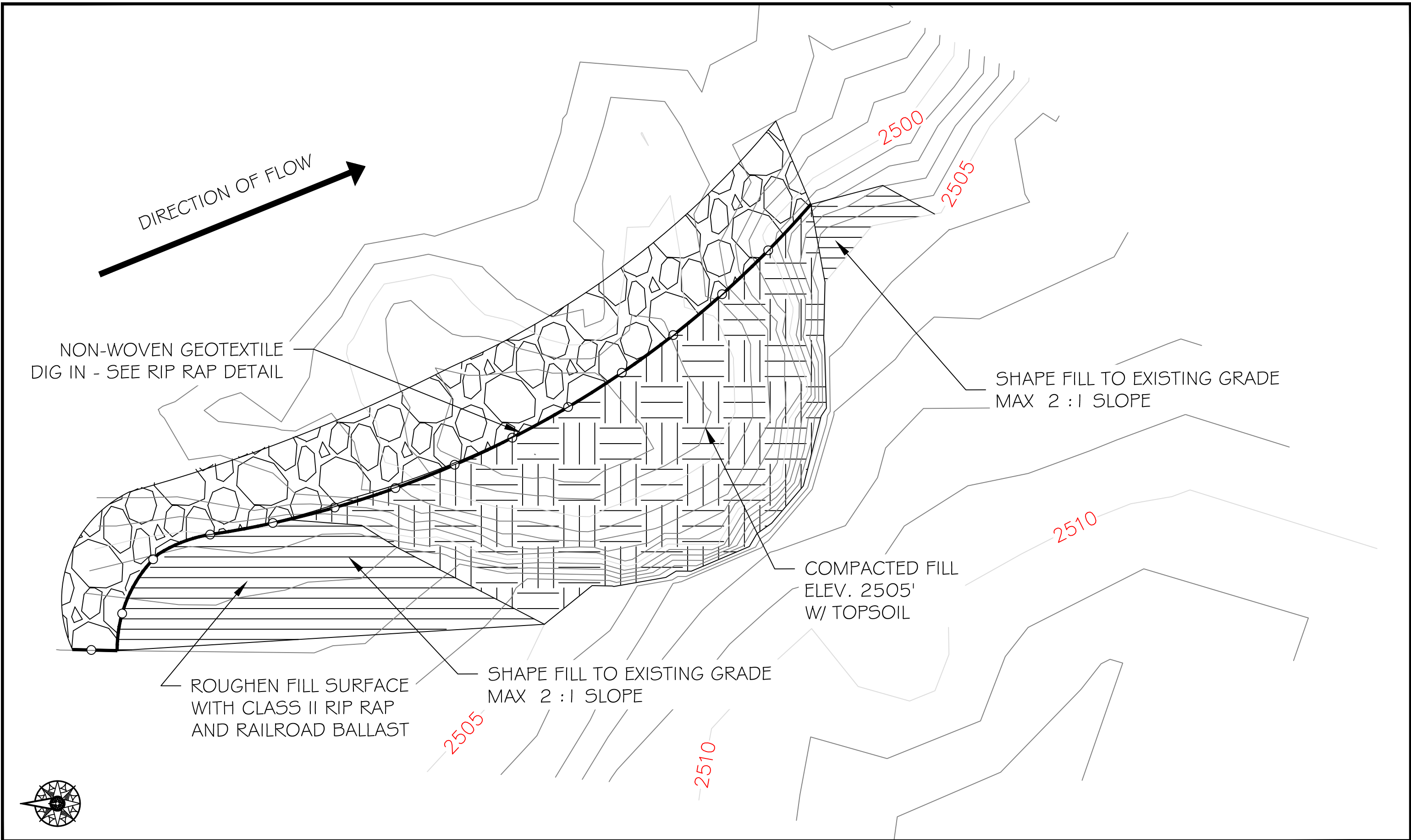
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**MONTANA FISH,
WILDLIFE & PARKS**

SITE PLAN
Fresno Tailwaters FAS Erosion Control

SHEET: 3 of 6



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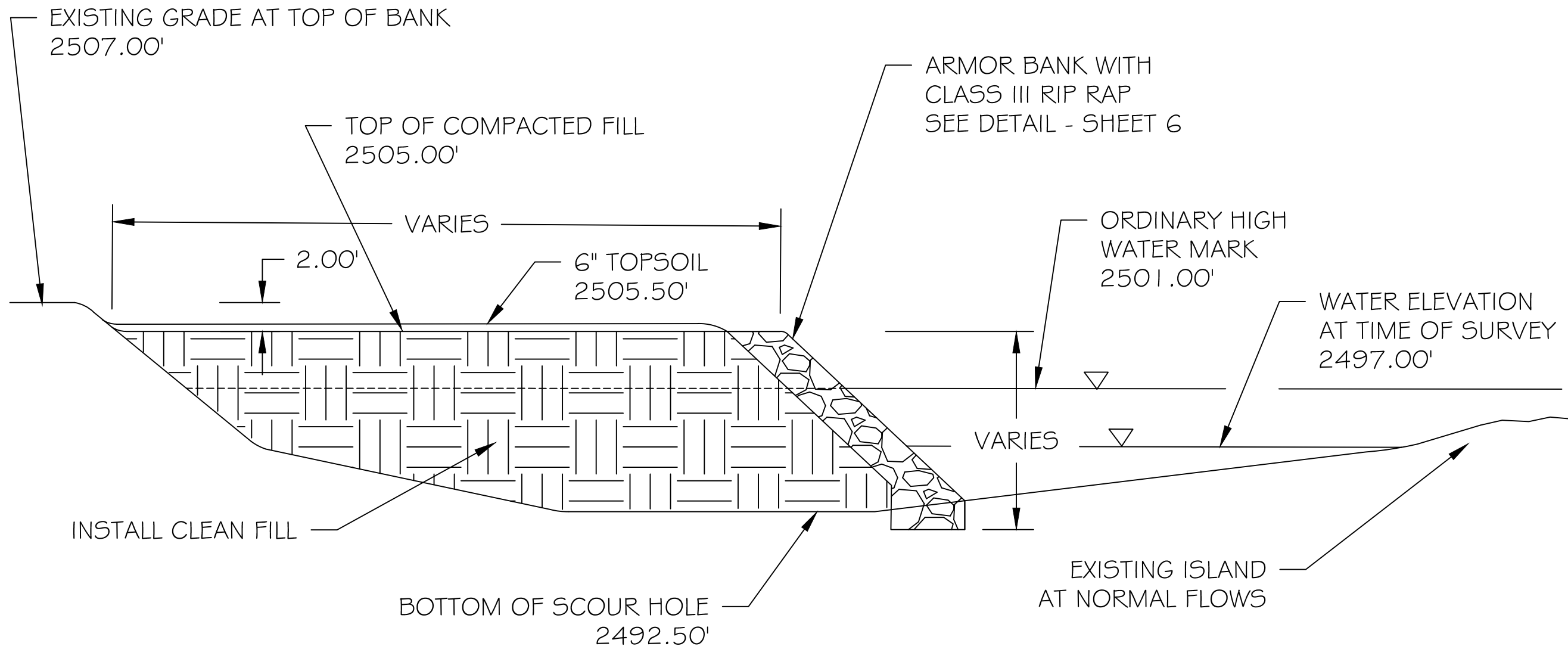
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**MONTANA FISH,
 WILDLIFE & PARKS**

SITE PLAN TOPOGRAPHY
 Fresno Tailwaters FAS Erosion Control

SHEET: 4
 of 6



RIP RAP BANK STABILIZATION CROSS SECTION

| | |
|--------------------------|---------------------|
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| P. Jagoda CHECKED BY: | 12/31/2020 DATE: |

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| REVISER: REVISER: | DATE: DATE: |
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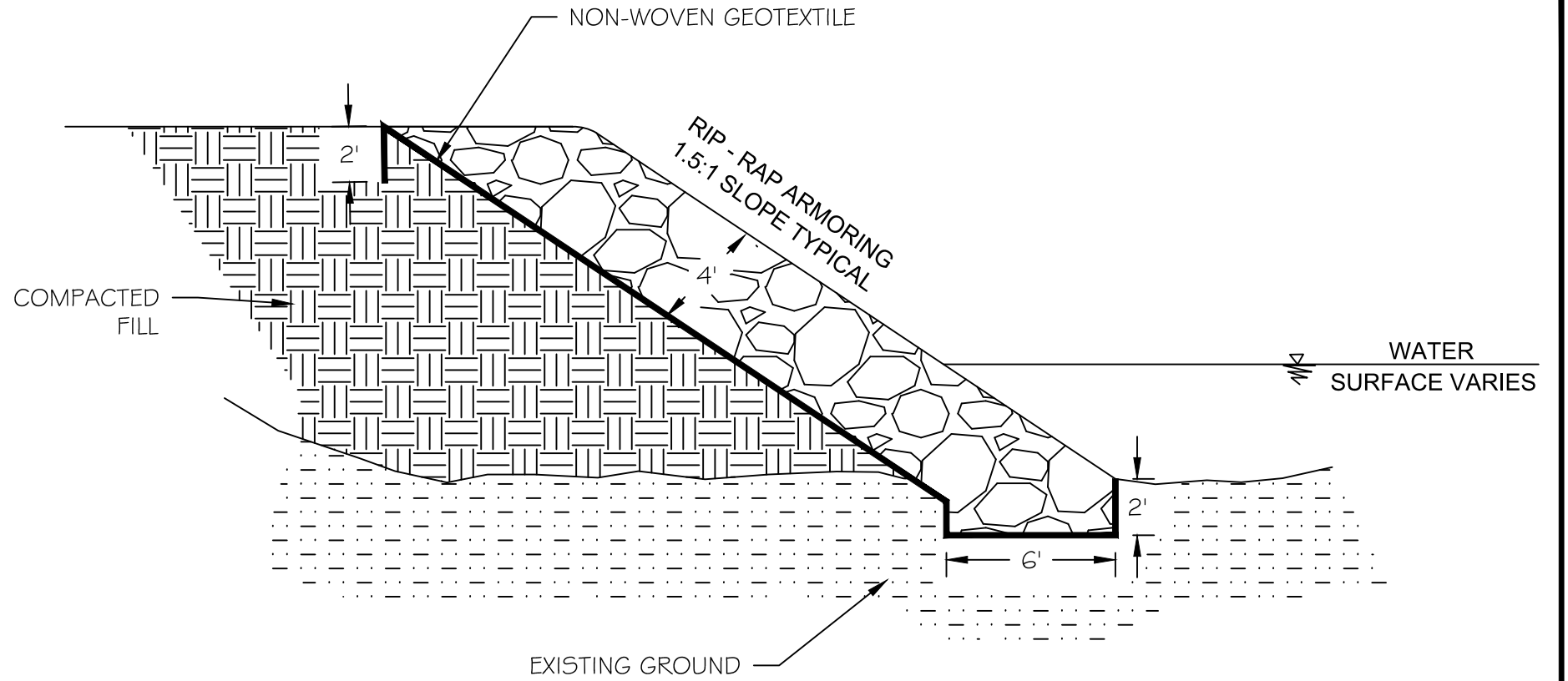
**MONTANA FISH,
WILDLIFE & PARKS**

BANK STABILIZATION CROSS SECTION
Fresno Tailwaters FAS Erosion Control

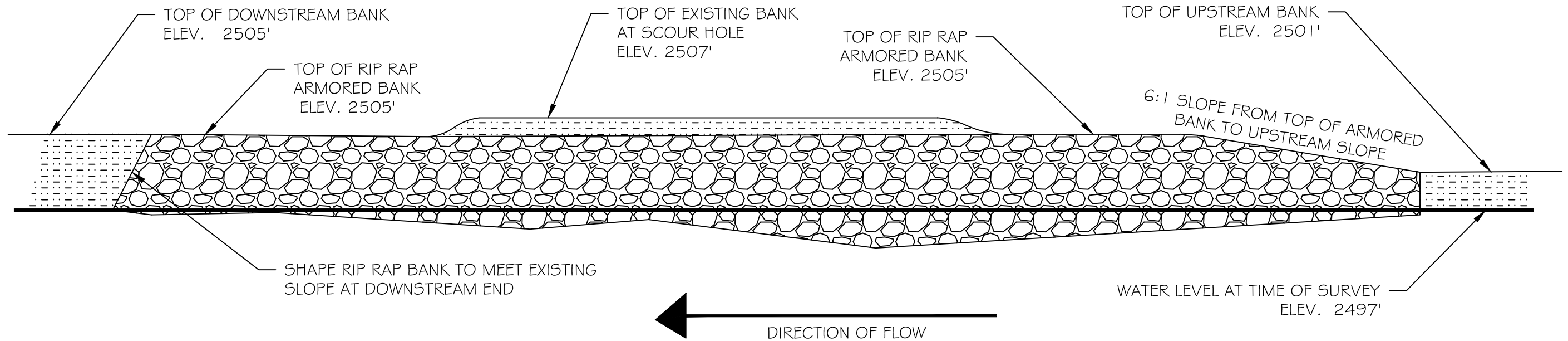
SHEET: 5 of 6

RIP RAP SECTION NOTES:

1. Riprap Materials: Provide in accordance with State of Montana Transportation standards for Class III Riprap.
2. Provide stone that is hard, durable and angular in shape, resistant to water action and weathering, free from overburden, spoil, shale, structural defects and organic material.
3. Each stone must have its greatest dimension not greater than three times its least dimension.
4. Do not use rounded stone or boulders from a streambed source as rip-rap. Do not use shale or stones with shale seams.
5. Angular faces of stones shall inter-lock to provide stable surface.
6. Installed Thickness: 4 ft average & 6 ft at toe
7. Non-woven geotextile shall be trenched in 2' down at edge of rip rap. Trenching shall be required at the top of bank and on the upstream edge of fabric.



RIP RAP BANK DETAIL



RIP RAP BANK DETAIL

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**MONTANA FISH,
WILDLIFE & PARKS**

RIP RAP DETAIL
Fresno Tailwaters FAS Erosion Control

SHEET: 6
of 6