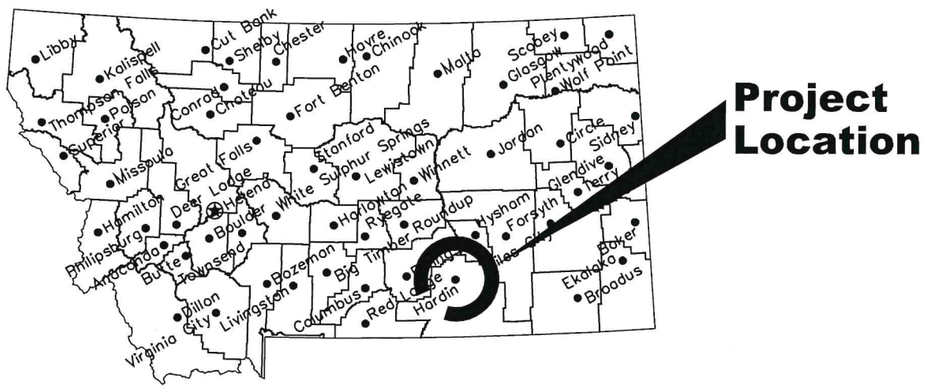
MONTANA FISH, WILDLIFE & PARKS

Grant Marsh FAS
2020 Road Repair Project

Near Hardin, Bighorn County, Montana

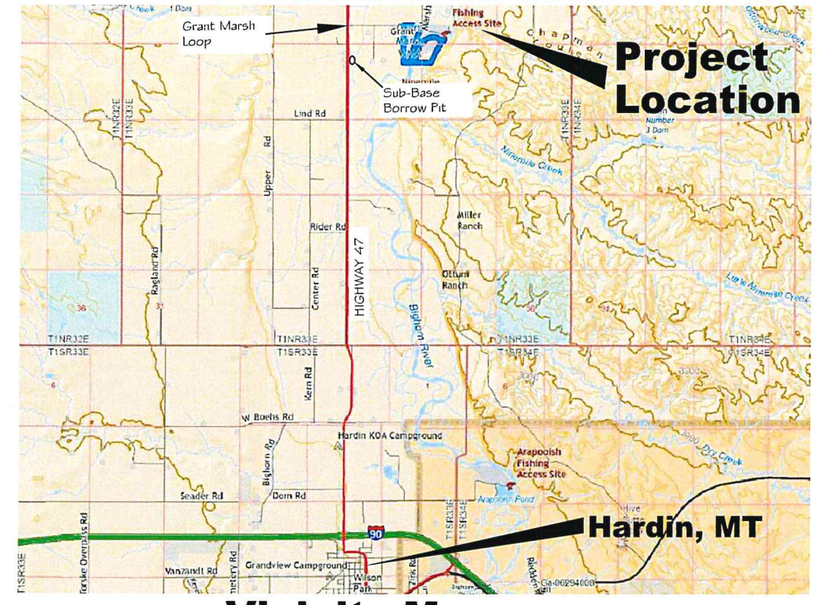
FWP Project No. 7173729



Location Map

No Scale

North



Vicinity Map

No Scale

MONTANA FISH, WILDLIFE AND PARKS
DESIGN AND CONSTRUCTION BUREAU

MAILING ADDRESS:
PO BOX 200701
HELENA, MT 59620-0701

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1522 9th AVENUE
HELENA, MT 59601

TEL 406.841.4000
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DRAWING INDEX

1 COVER SHEET
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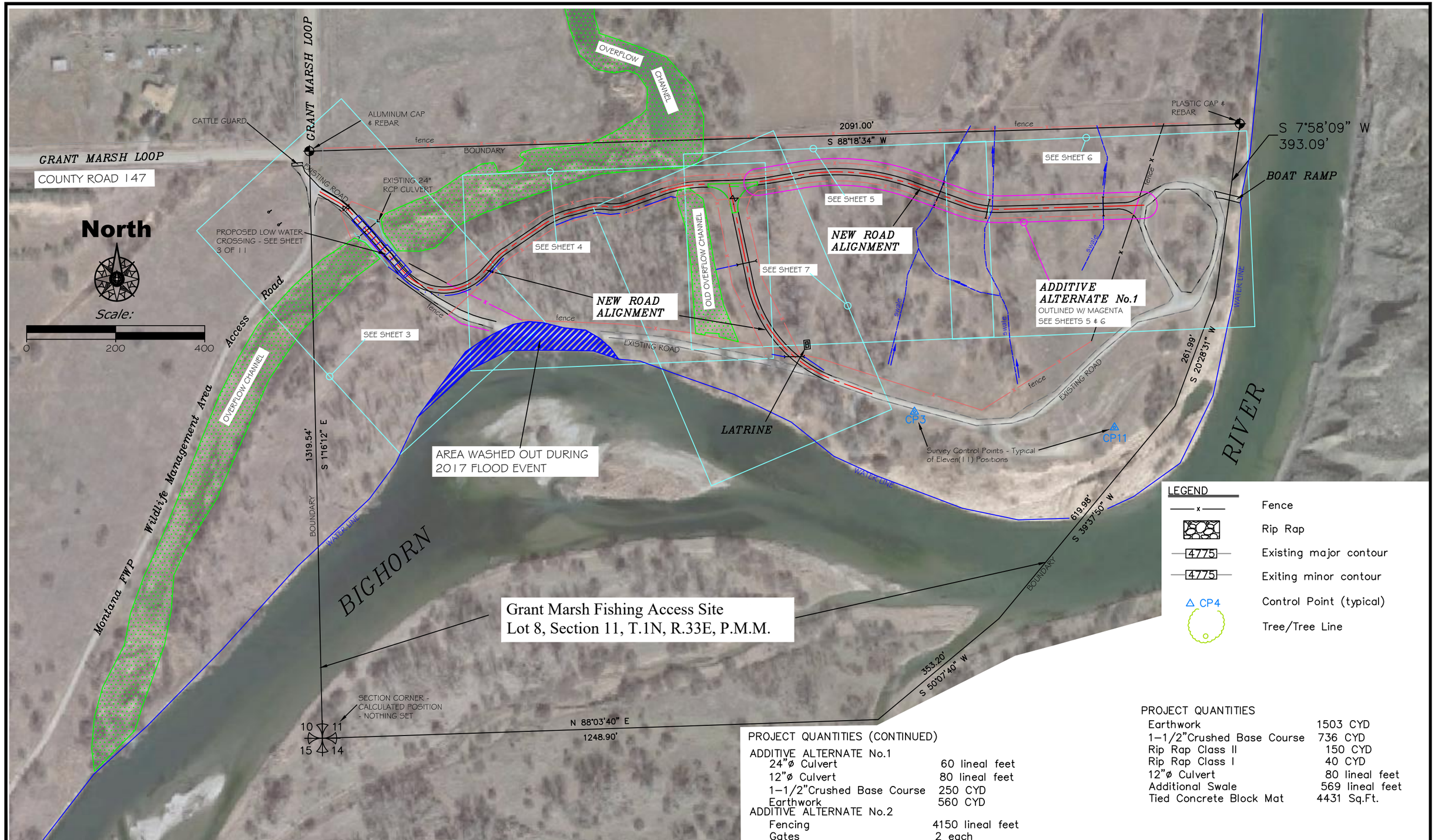
MONTANA
PHILLIP N. JAGODA
No. 49280PE
LICENSED PROFESSIONAL ENGINEER

Tom Mannatt July 1, 2020	APPROVED BY: DATE:	APPROVED BY: DATE:	Montana Fish, Wildlife & Parks
DRAWN BY: DATE:			Cover Sheet
Phillip Jagoda July 1, 2020	APPROVED BY: DATE:	APPROVED BY: DATE:	Grant Marsh Fishing Access Site
CHECKED BY: DATE:			

SHEET: 1 of 11



PROJECT QUANTITIES (CONTINUED)

ADDITIVE ALTERNATE No.1	
24"ø Culvert	60 lineal feet
12"ø Culvert	80 lineal feet
1-1/2"Crushed Base Course	250 CYD
Earthwork	560 CYD
ADDITIVE ALTERNATE No.2	
Fencing	4150 lineal feet
Gates	2 each

PROJECT QUANTITIES

Earthwork	1503 CYD
1-1/2"Crushed Base Course	736 CYD
Rip Rap Class II	150 CYD
Rip Rap Class I	40 CYD
12"ø Culvert	80 lineal feet
Additional Swale	569 lineal feet
Tied Concrete Block Mat	4431 Sq.Ft.

Tom Mannatt	July 1, 2020			
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Phillip Jagoda	July 1, 2020			
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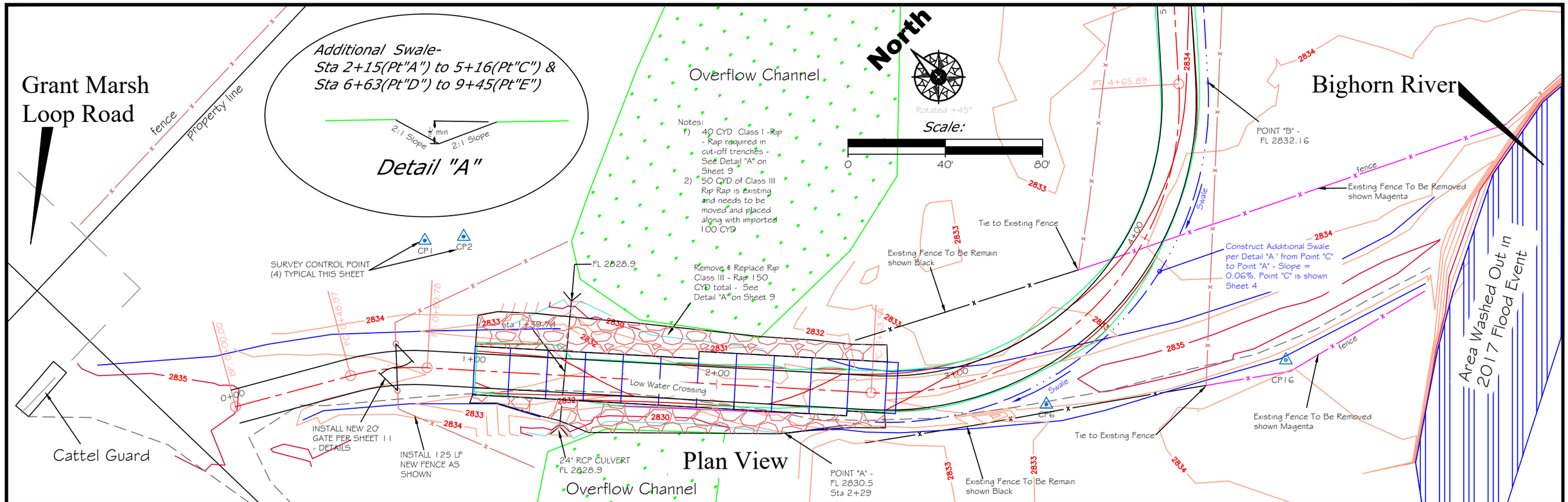
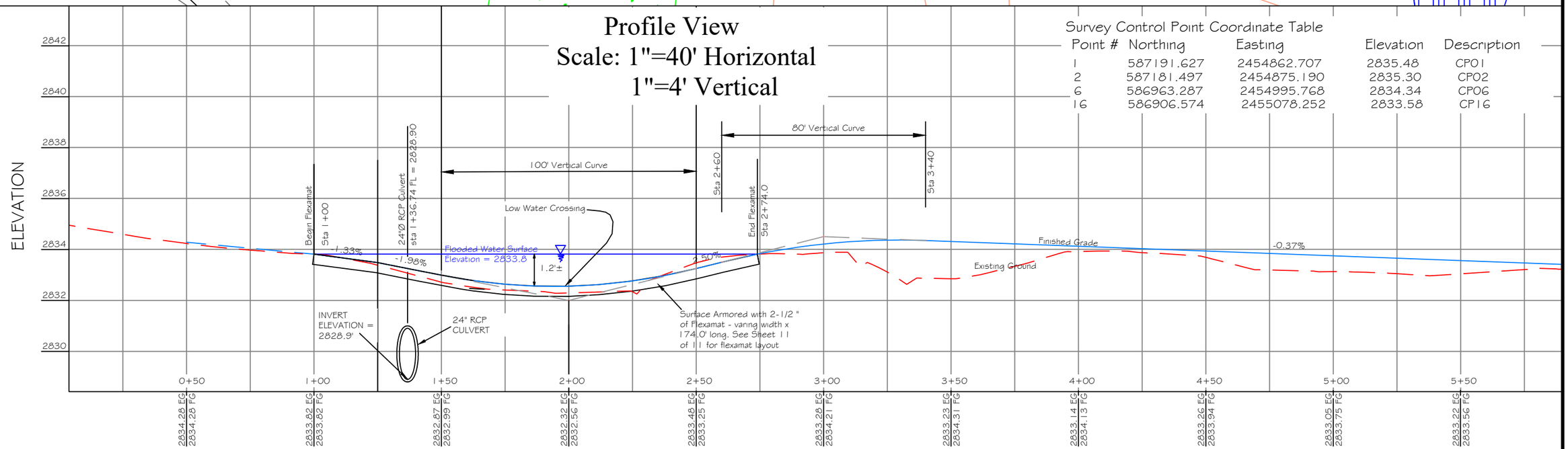
Montana Fish, Wildlife & Parks

Site Plan
Grant Marsh Fishing Access Site

SHEET: 2 of 11



Profile View
Scale: 1"=40' Horizontal
1"=4' Vertical



Survey Control Point Coordinate Table

Point #	Northing	Easting	Elevation	Description
1	587191.627	2454862.707	2835.48	CP01
2	587181.497	2454875.190	2835.30	CP02
6	586963.287	2454995.768	2834.34	CP06
16	586906.574	2455078.252	2833.58	CP16

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Phillip Jagoda July 1, 2020	APPROVED BY: DATE:	APPROVED BY: DATE:	
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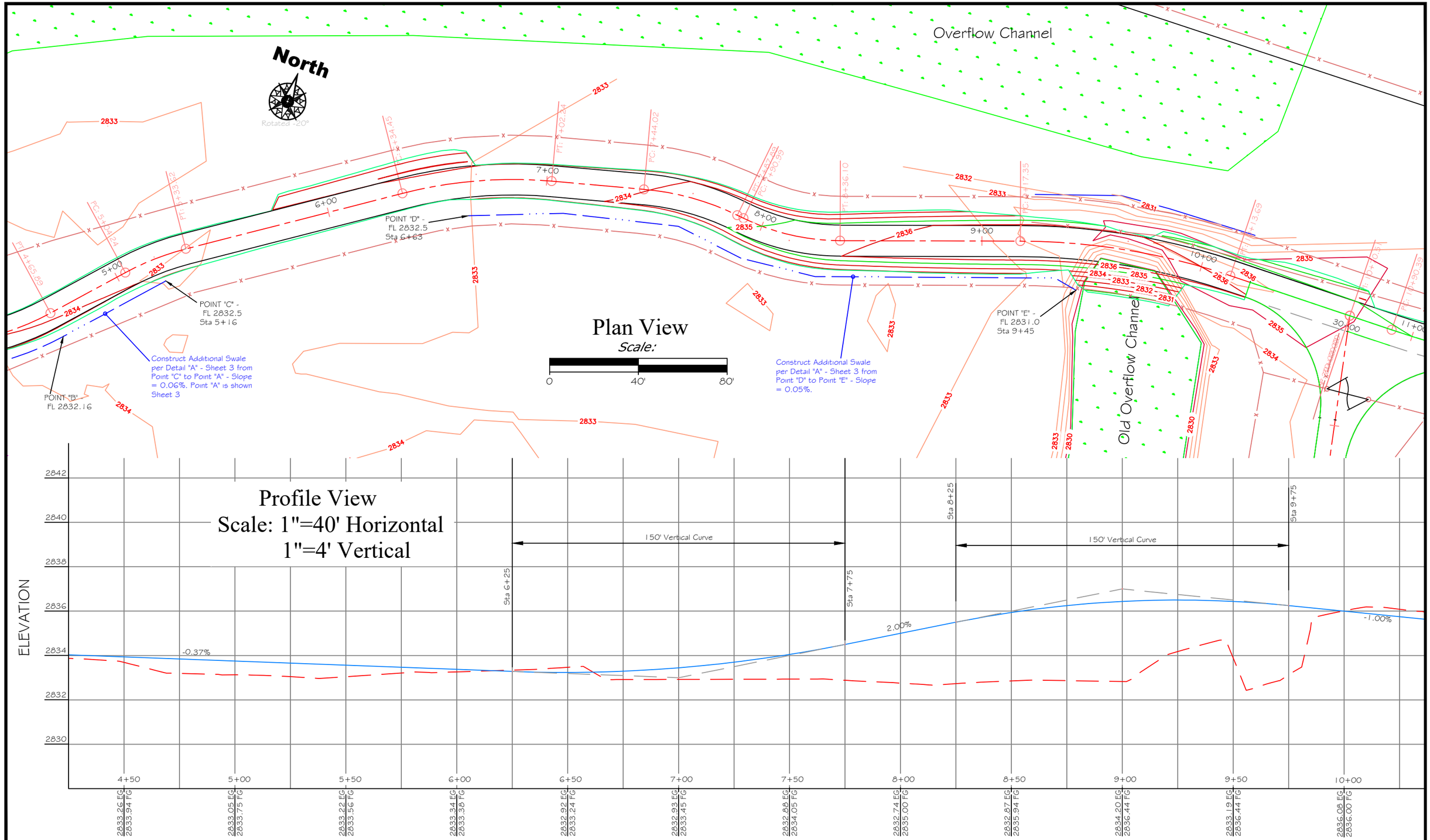
Plan & Profile Sta. 0+50 to 4+50
Grant Marsh Fishing Access Site

SHEET: 3 of 11



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Phillip Jagoda CHECKED BY: DATE: July 1, 2020	APPROVED BY: DATE:	APPROVED BY: DATE:	

Plan & Profile Sta. 4+50 to 10+00

Grant Marsh Fishing Access Site

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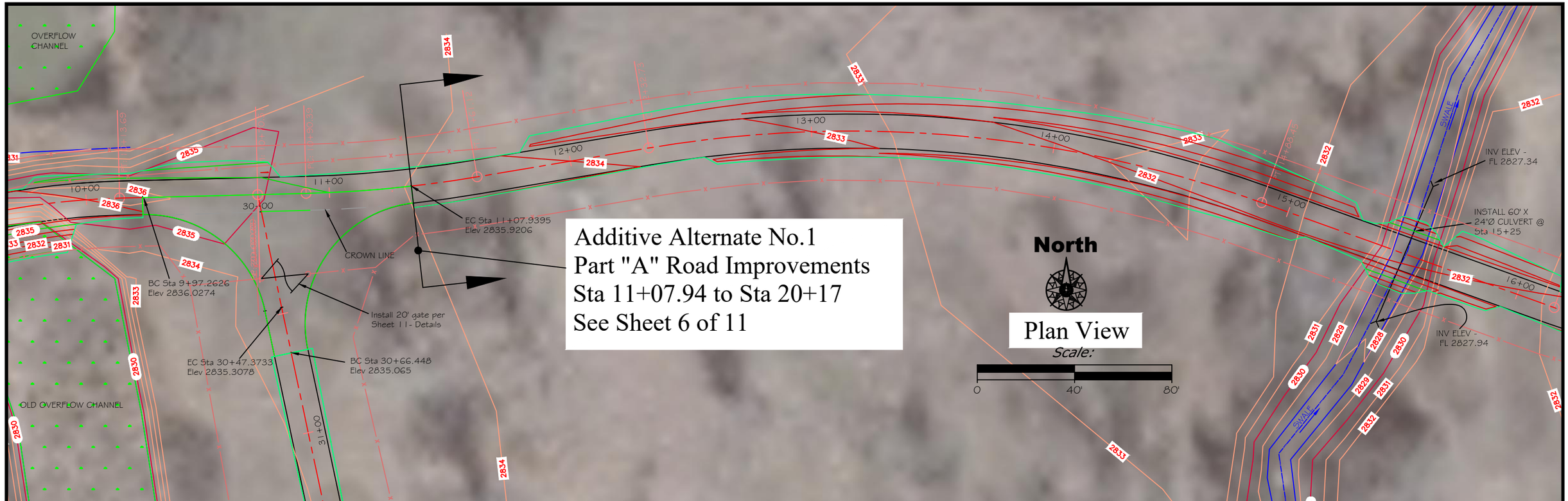
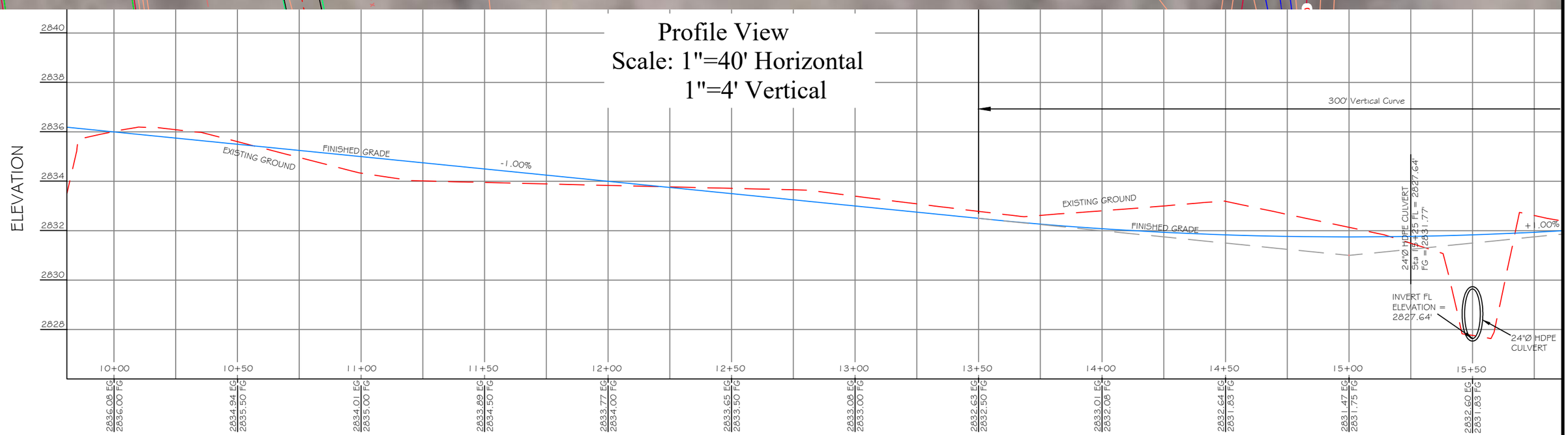


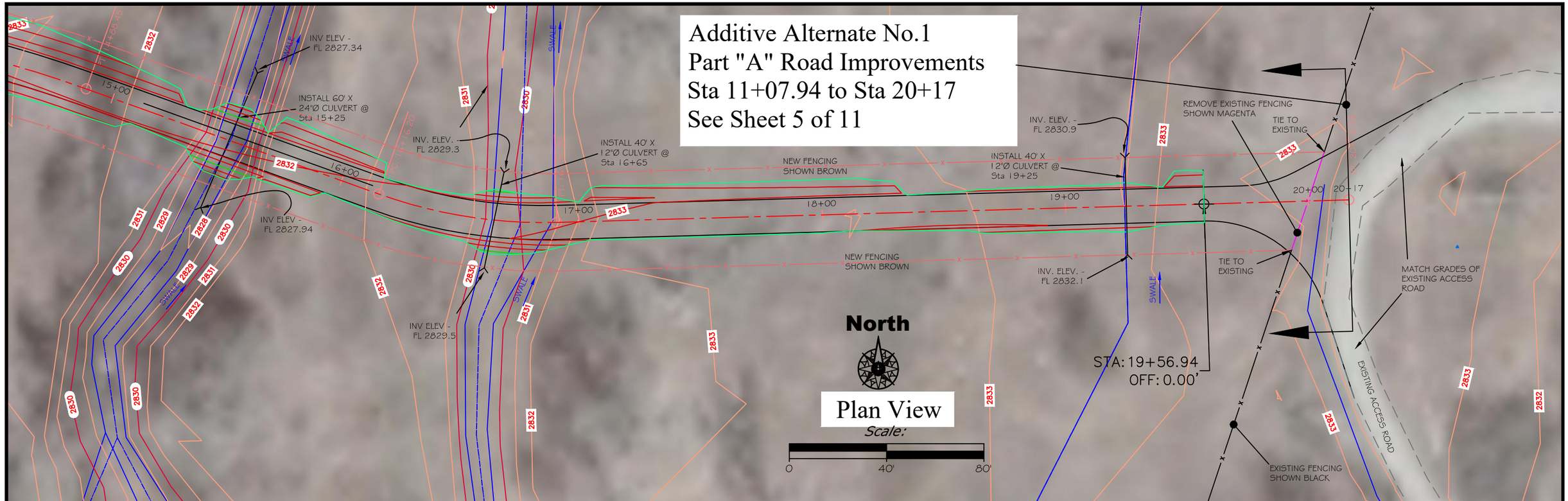


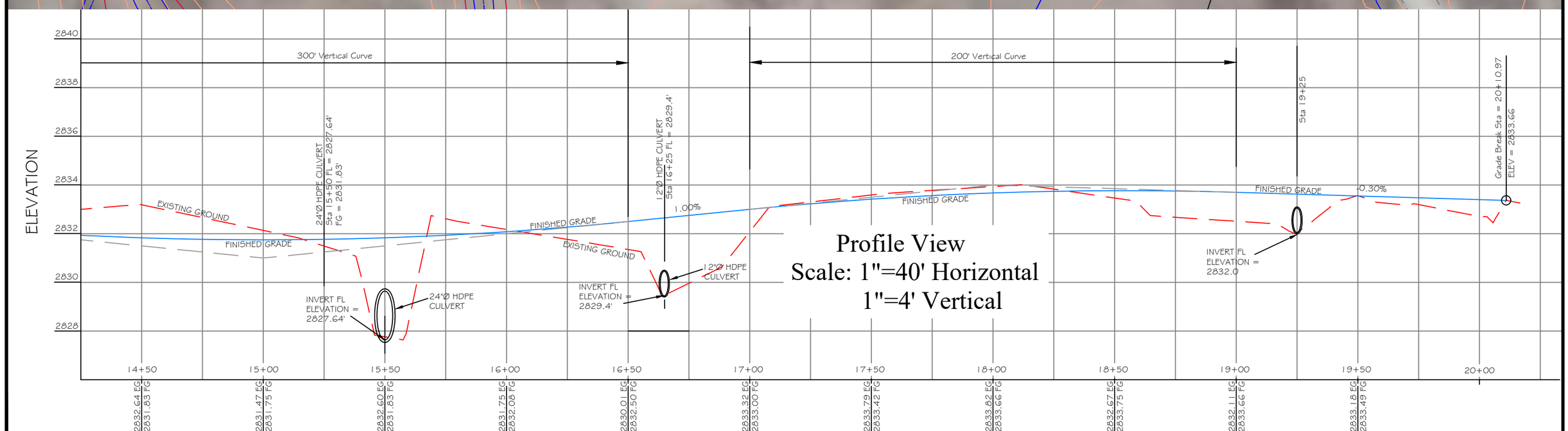
Tom Mannatt July 1, 2020 DRAWN BY: DATE:	REVISED BY: DATE:	APPROVED BY: DATE:	Montana Fish, Wildlife & Parks
Phillip Jagoda July 1, 2020 CHECKED BY: DATE:	APPROVED BY: DATE:	APPROVED BY: DATE:	

Plan & Profile Sta. 10+00 to 15+50

Grant Marsh Fishing Access Site

SHEET: 5 of 11





Tom Mannatt July 1, 2020 DRAWN BY: DATE: Phillip Jagoda July 1, 2020 CHECKED BY: DATE:	REVISED BY: DATE: APPROVED BY: DATE:	APPROVED BY: DATE: APPROVED BY: DATE:	Montana Fish, Wildlife & Parks 141

Plan & Profile 15+50 to 20+00

Grant Marsh Fishing Access Site

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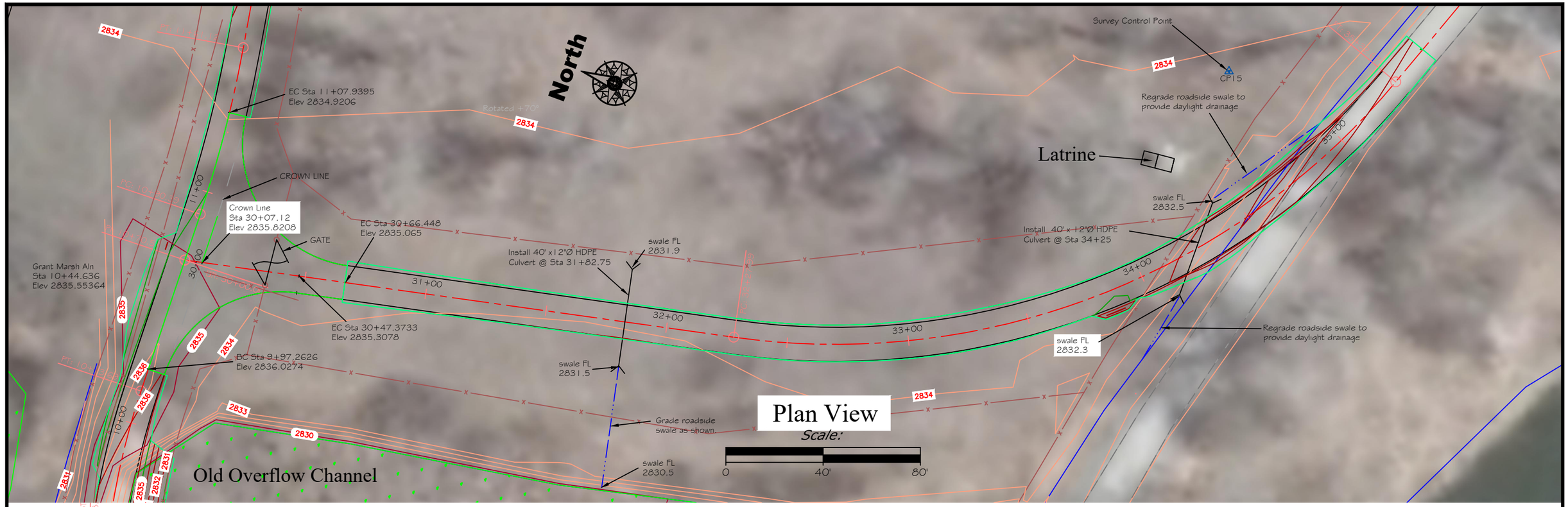

Tom Mannatt? July 1, 2020
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Phillip Jagoda July 1, 2020
CHECKED BY: DATE:

REVISED BY: DATE:
APPROVED BY: DATE:

APPROVED BY: DATE:
APPROVED BY: DATE:

Montana Fish, Wildlife & Parks

Plan & Profile Sta 30+00 to 35+50

Grant Marsh Fishing Access Site

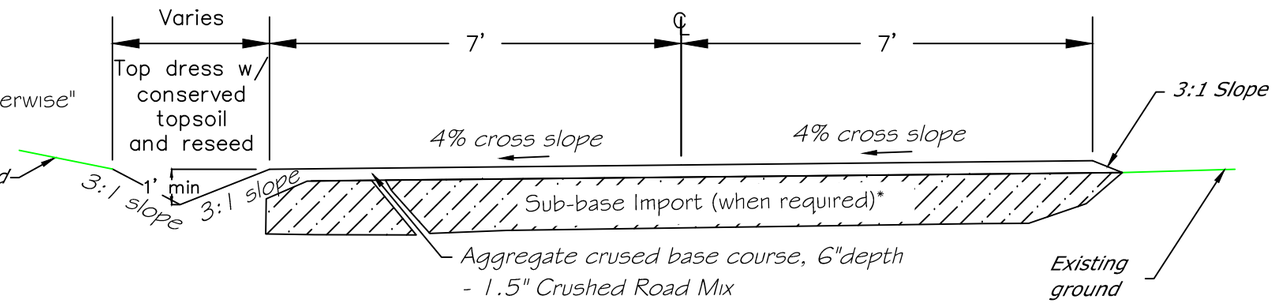
SHEET: 7 of 11

TYPICAL SECTION NO. 1 - Access Road w/ Aggregate Base

(Not to Scale)

TYPICAL U.N.O.

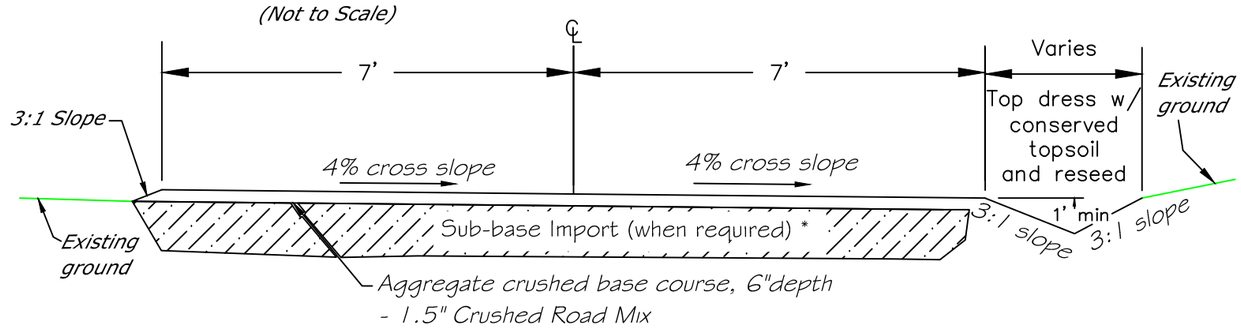
U.N.O. denotes
" unless noted otherwise"



TYPICAL SECTION NO. 2 - Access Road w/ Aggregate Base

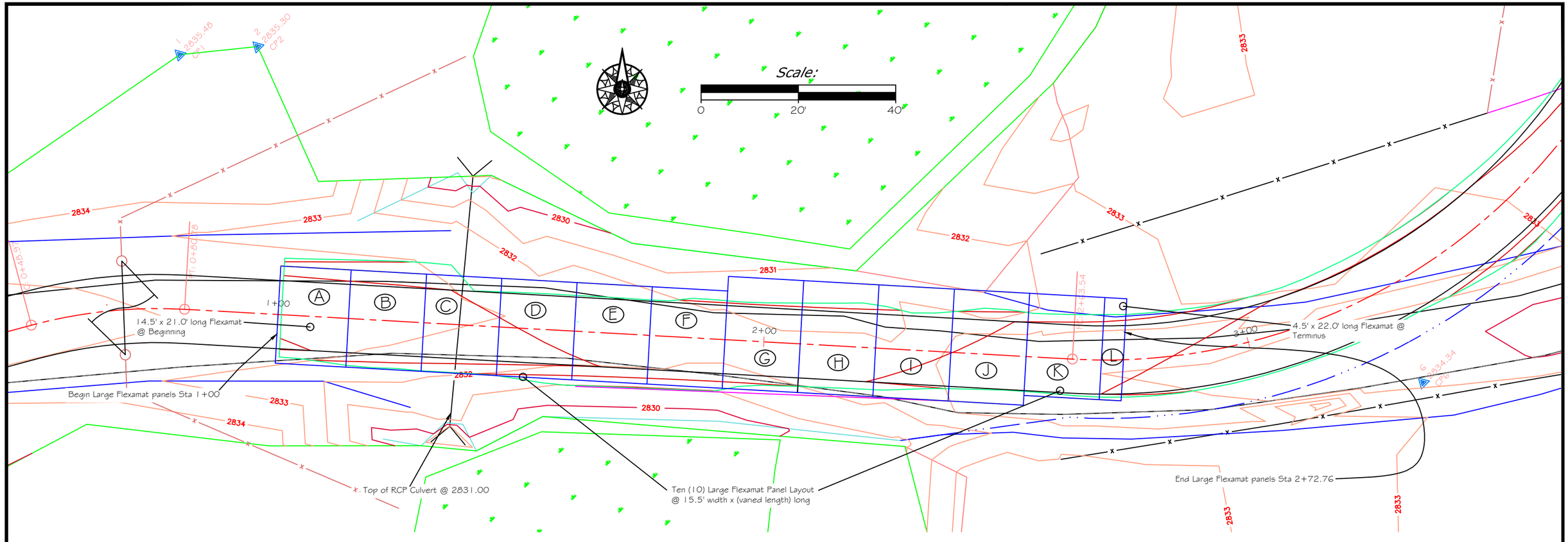
(Not to Scale)

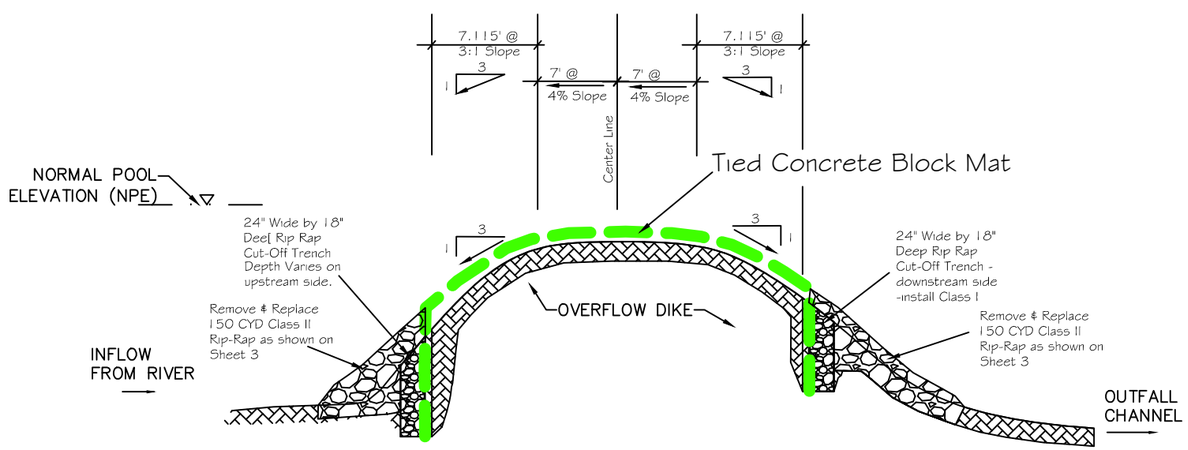
1+00 to 3+25



* Note: Owner supplied Sub-Base import is available on State lands approximately 1/2 miles south of project site off of Highway 47. Contact the the Owners representative on how to access the borrow site. The borrow pit location is shown on the Cover Sheet Vicinity Map - see sheet 1 of 11.

Tom Mannatt July 1, 2020 DRAWN BY: DATE: Phillip Jagoda July 1, 2020 CHECKED BY: DATE:	REVISED BY: DATE: APPROVED BY: DATE:	APPROVED BY: DATE: APPROVED BY: DATE:	Montana Fish, Wildlife & Parks 143 Road Typical Sections Grant Marsh Fishing Access Site SHEET: 8 of 11





A
9

CROSS-SECTION

RIGHT VIEW

Tied Concrete Block Mat Layout Schedule

Panel Letter	Layout Width (ft)	Layout Length (ft)	Roadway Embedment inches	Embankment Embedment* inches	Total width (ft)	Total Length (ft)	Panel Area square feet
A	14.5'	21.0'	12"	18"	15.5'	24.0'	372.0 sq.ft.
B	15.5'	21.0'	0"	18"	15.5"	24.0'	372.0 sq.ft.
C	15.5'	21.0'	0"	18"	15.5"	24.0'	372.0 sq.ft.
D	15.5'	21.0'	0"	18"	15.5"	24.0'	372.0 sq.ft.
E	15.5'	21.0'	0"	18"	15.5"	24.0'	372.0 sq.ft.
F	15.5'	21.0'	0"	18"	15.5"	24.0'	372.0 sq.ft.
G	15.5'	24.0'	0"	18"	15.5"	27.0'	418.5 sq.ft
H	15.5'	24.0'	0"	18"	15.5"	27.0'	418.5 sq.ft
I	15.5'	24.0'	0"	18"	15.5"	27.0'	418.5 sq.ft
J	15.5'	24.0'	0"	18"	15.5"	27.0'	418.5 sq.ft
K	15.5'	22.0'	0"	18"	15.5"	25.0'	387.5 sq.ft
L	4.5'	22.0'	12"	18"	5.5"	25.0'	137.5 sq.ft
					Total:		4,431.00 sq.ft.

Note: * The embankment embedment is 18" on the upstream side and 18" on the downstream side, with a total adjustment to the width of 36".

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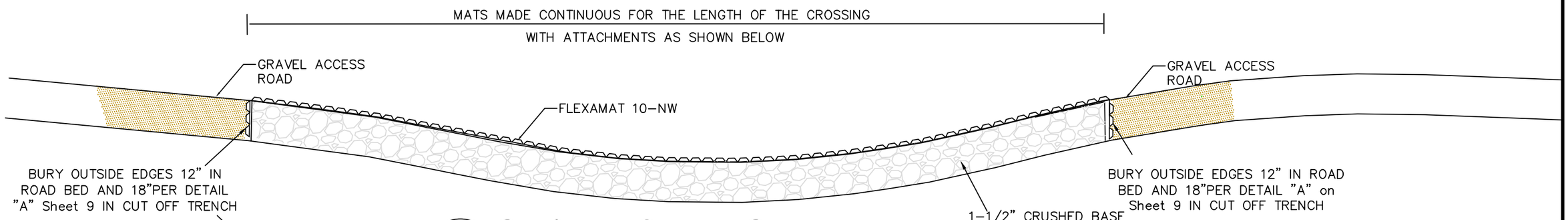
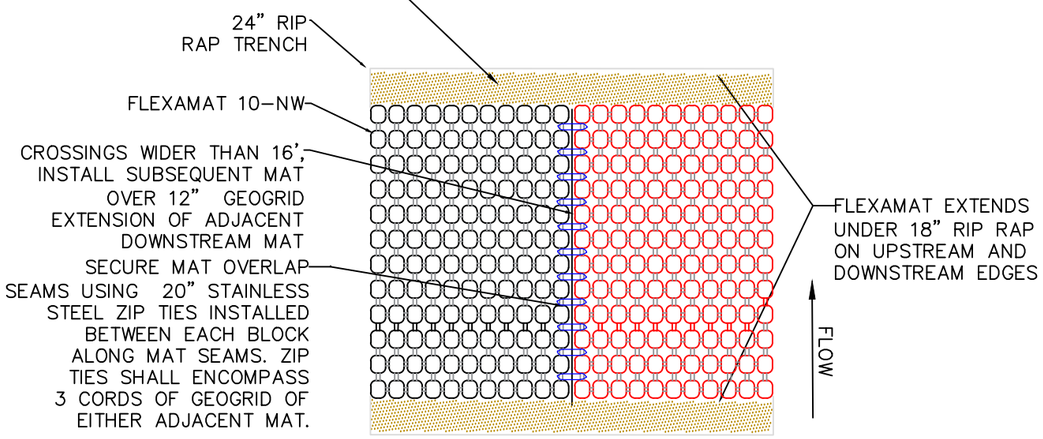
Tied Concrete Block Mat Layout
Grant Marsh Fishing Access Site

SHEET: 9 of 11



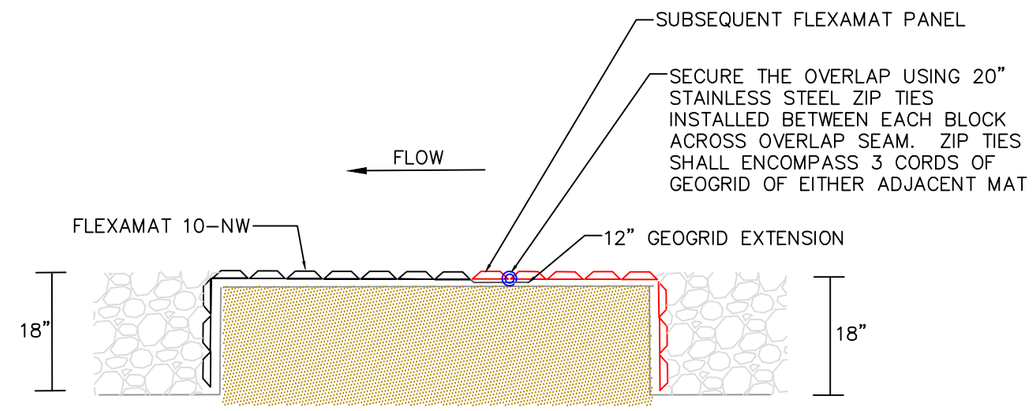
A/10 Surface Cross Section

NTS



B/10 Detail 1

NTS



C/10 Detail 2

NTS

Note: References to Flexamat are equivalent to Tied Concrete Block Mat per Specifications Section 2250, typical this sheet.

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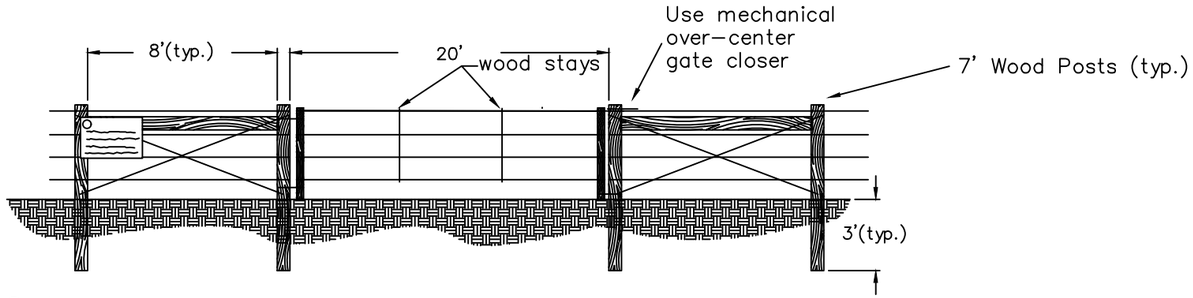
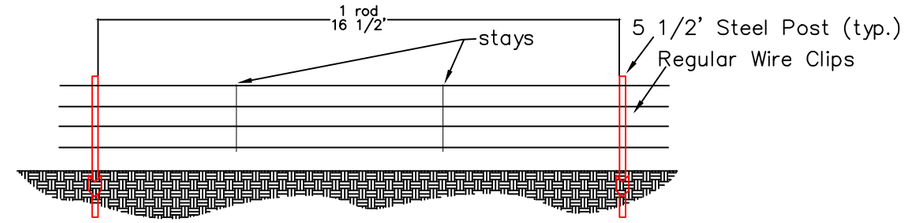
SHEET: 10 of 11



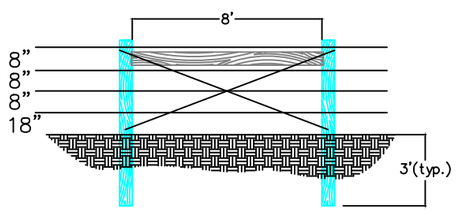
Gate

* Top and bottom wire to be Smooth, and bottom wire 18" above the ground.



Typical Steel Post Fence

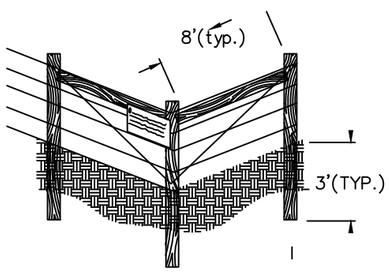
* Top and bottom wire to be Smooth, and bottom wire 18" above the ground.



Single Panel

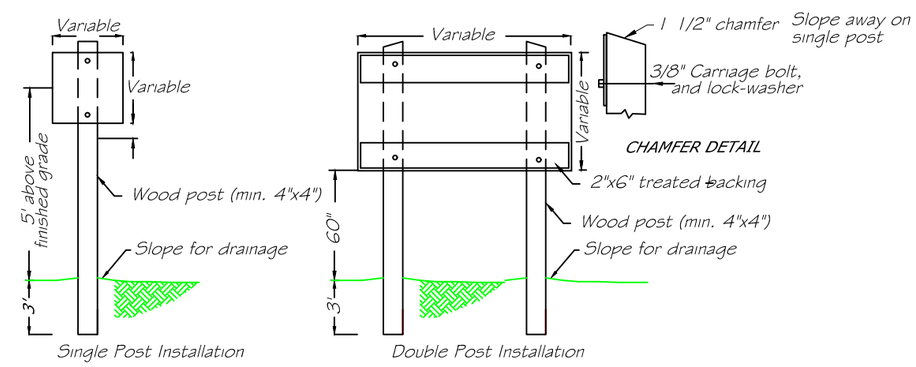
Typical Four Wire Fence Details

NOT TO SCALE



Corner

Use for Angled and Square Corners



NOTES:
1. Use pressure treated timbers for all sign posts. Need break-away holes (or device) for larger posts.
2. Coat all posts with preservative for all drilled holes and cut surfaces.
3. Use cadmium plated or galvanized steel for all bolts, nuts & washers.
4. Place bolts to not interfere with sign lettering. Paint bolt heads to match sign.
5. Center signle post panels to post, overhang panels 3" beyond posts for double post installations. Extend all posts 3" above sign panels.
6. See break-away detail for posts larger than 4 inches in diameter.

SIGN POST MOUNTING DETAIL

(Not to Scale)

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Montana Fish, Wildlife & Parks

Typical Details

Grant Marsh Fishing Access Site

SHEET: 11 of 11