	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	23495	1	1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

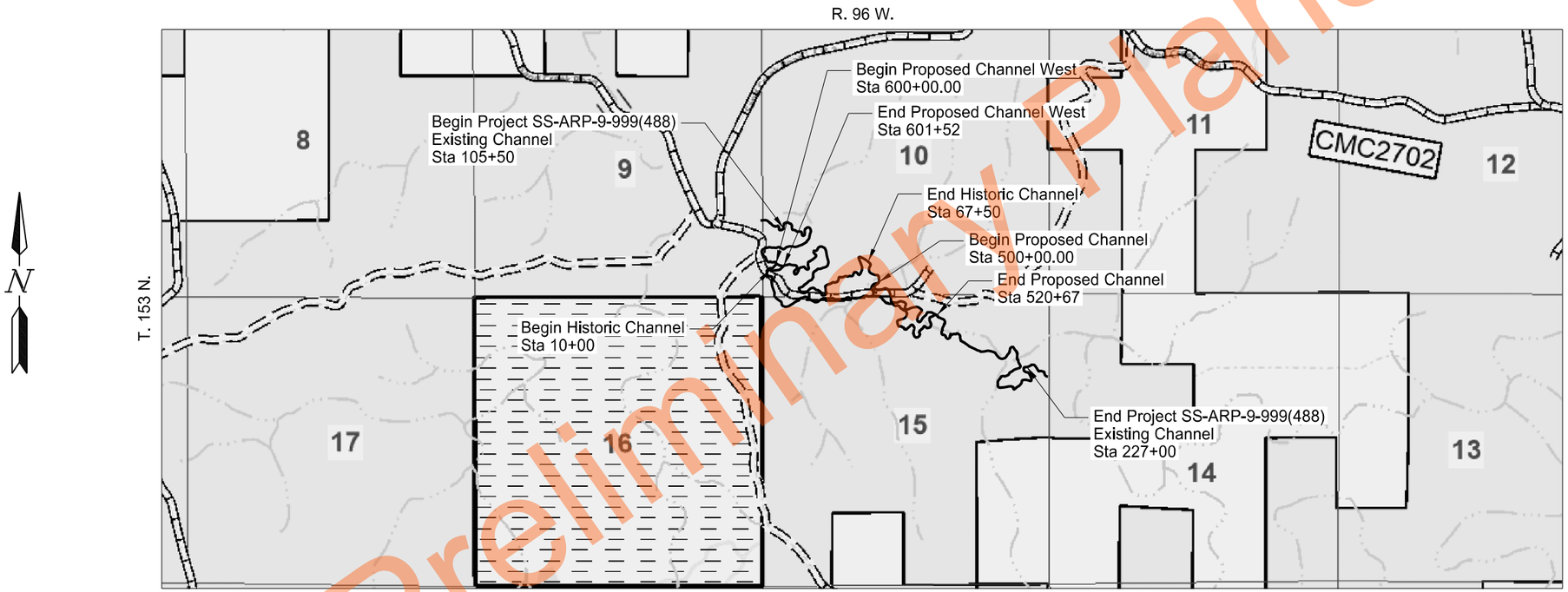
SS-ARP-9-999(488) PCN 23495

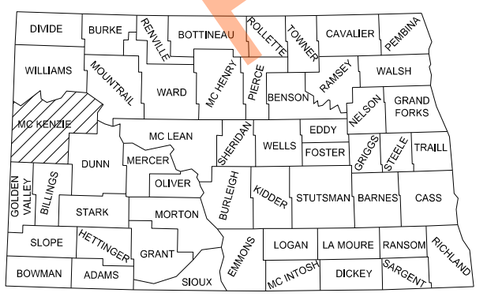
McKenzie County
Sand Creek

Grading, Stream Mitigation, and Incidentals

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	07/1/2025
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SS-ARP-9-999(488) PCN 23495	3.643	3.643





STATE COUNTY MAP

Preliminary Plans

DESIGNER Amy Anderson, PE	
DESIGNER Jessica Prevost	
DESIGNER Trenton Eliason, PE	

US FOREST SERVICE	
Approval Name	Date Signed
CURTIS GRUDNIEWSKI	Digitally signed by CURTIS GRUDNIEWSKI Date: 2026.09.08 07:44:15 -06'00'

ND DEPARTMENT OF TRANSPORTATION OFFICE OF PROJECT DEVELOPMENT	
Approval Name	Date Signed
Kirk Hoff	09/08/26

WSB

REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
PE-40598
DATE 09/08/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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D-261-1	Erosion Control - Fiber Roll Placement Details

SPECIAL PROVISIONS

Number	Description
SSP 1	Temporary Erosion and Sediment Best Management Practices
306(25)	United States Forest Service Considerations
307(25)	Utility Coordination
358(25)	Cultural Resources Construction Monitoring
PSP 44(25)	Permits and Environmental Considerations
486(25)	Soil Stabilization
586(25)	Interim Completion

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N

SCALE IN FEET
0 500 1000

FS 8693

Sand Creek Rd

Sand Creek Rd

Construction Access

Existing Channel

Historic Channel

Proposed Channel West

Access Road

Proposed Channel

BWP

BWH

TSF

Preliminary Plans

Legend:

- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- BWP Fence Barbed Wire - Pneumatic Install
- BWH Fence Barbed Wire - Hand Install
- TSF Temporary Safety Fence
- Temporary Construction Access
- Staging and Stockpile Area
- Common Ex and Topsoil Staging Only
- Existing Pipeline

Scope of Work

Site Location Map

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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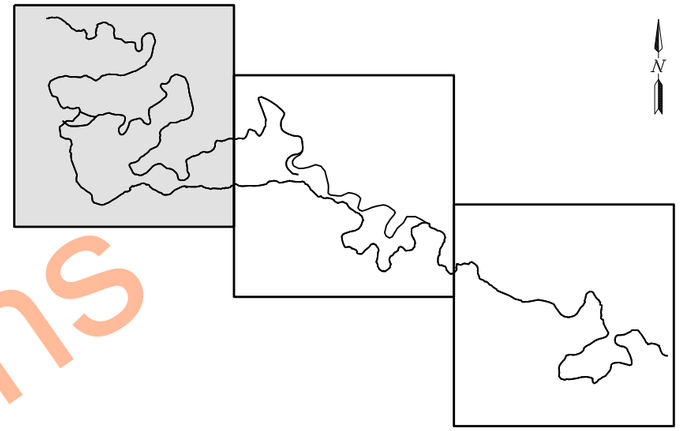

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Temporary Stream Crossing
- Staging and Stockpile Area
- Common Ex and Topsoil Staging Only
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- TSF — Temporary Safety Fence
- BWP — Fenceline - Pneumatic Install
- BWH — Fenceline - Hand Install
- Grading (Toe Wood, Ditch Block, Floodplain, Left Bench Typical, Right Bench Typical) See Section 60

Scope of Work

Proposed Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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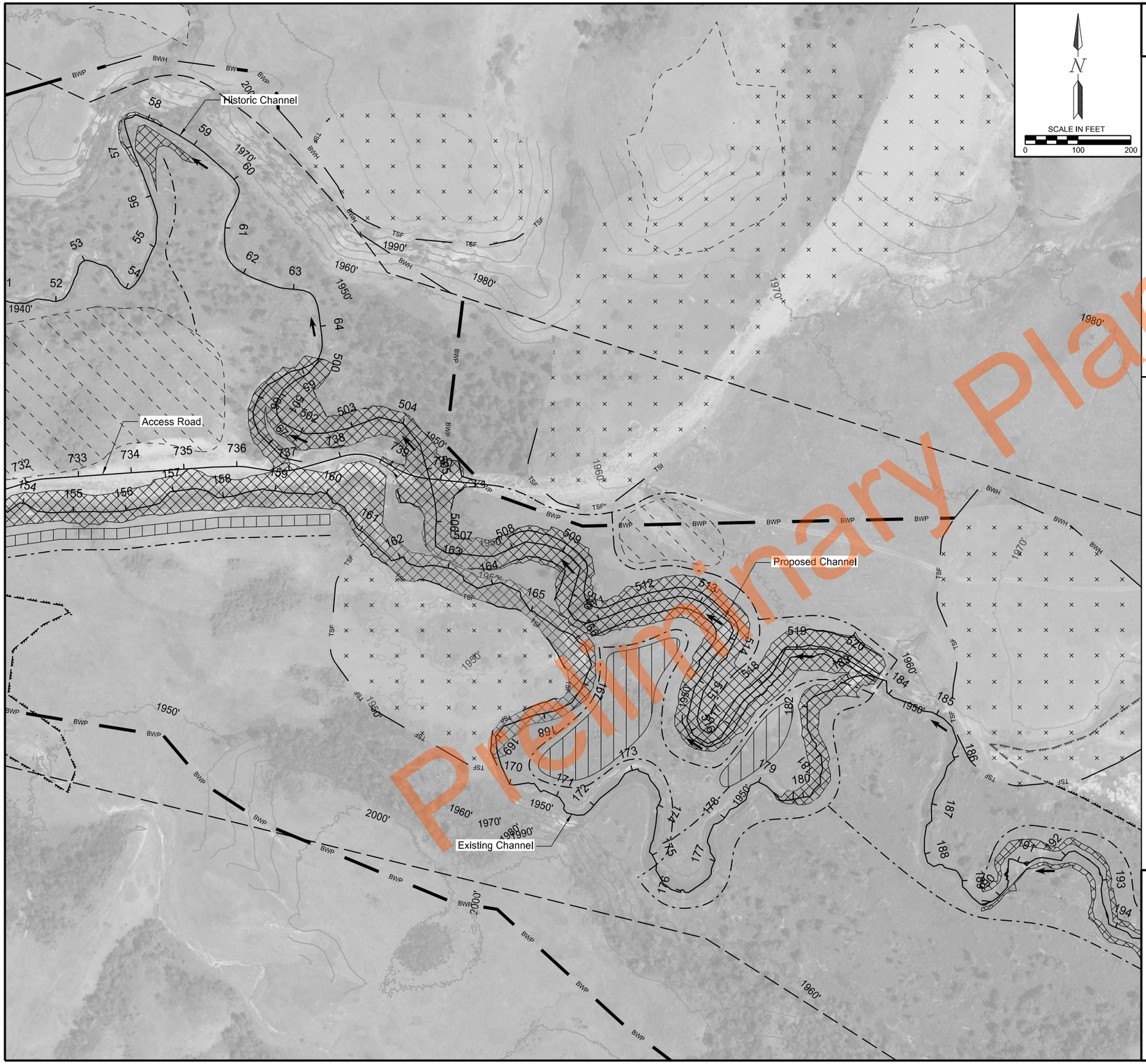

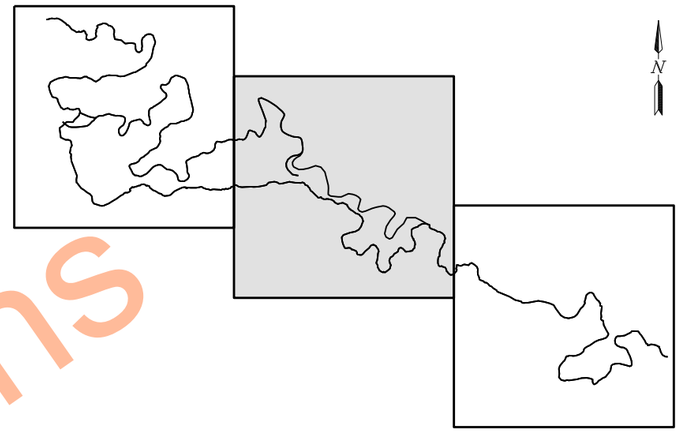

Note:
Cultural monitors must be present prior to commencement of work in Avoidance Area Mitigation.

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
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- DASK Avoidance Area
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- BWP Fenceline - Pneumatic Install
- BWH Fenceline - Hand Install
- Grading (Toe Wood, Ditch Block, Floodplain, Left Bench Typical, Right Bench Typical) See Section 60

Scope of Work

Proposed Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
ANDERSON
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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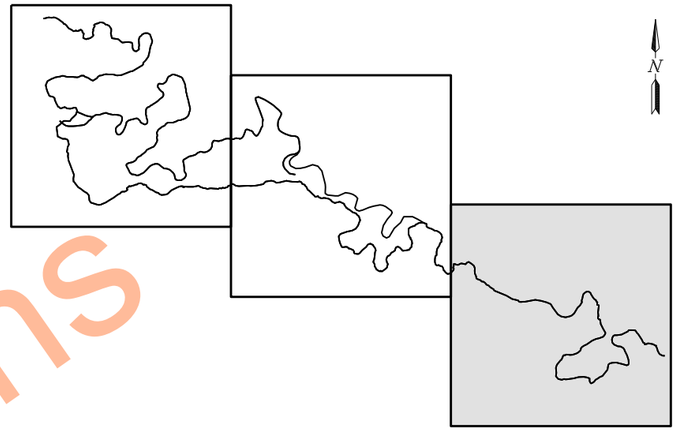

N

SCALE IN FEET
0 100 200

Existing Channel

Legend:
- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Temporary Stream Crossing
- Staging and Stockpile Area
- Common Ex and Topsoil Staging Only
- Avoidance Area
- Avoidance Area Mitigation
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- BWH — Fenceline - Hand Install
- Grading (Toe Wood, Ditch Block, Floodplain, Left Bench Typical, Right Bench Typical) See Section 60

Scope of Work

Proposed Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
ANDERSON
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

100-P01 ELEVATIONS: All final elevations in the plans are to top of topsoil. Project Engineer or Project Representative will be onsite during construction to assist in determining the final elevations.

100-P02 PROJECT REPRESENTATIVE: Russell Senske, NDDOT Wetland Specialist. (701) 328-2188.

Prior to construction and in both seasons no construction is allowed until the Contractor has received confirmation from the Engineer and the U.S. Forest Service has been notified by the Project Representative.

107-P01 PARKING OF EQUIPMENT VEHICLES AND STORED MATERIALS: Equipment cannot be left on the project after completion of work outlined in Section E of SP 586(25) and the resumption of work as specified in Section F in SP 586(25). Stockpiled natural materials may remain on site during that period.

108-P01 WEEKLY PLANNING & REPORTING MEETING: Project Representative or Project Engineer will conduct a planning and reporting meeting weekly.

108-P02 PRECONSTRUCTION CONFERENCE: Project Representative will coordinate USFS attendance at the mandatory preconstruction conference.

108-P03 AVOIDANCE AREAS: No Work is allowed within areas labeled as “Avoidance Area” or “DASK Avoidance Area”. Work in areas labeled as “Avoidance Area Mitigation” is allowed but only within grading limits and as necessary to complete grading and stabilization work. Cultural resources monitors must be present prior to commencement of work in areas labeled “Avoidance Area Mitigation” and during clearing and grubbing. Final grading activities within areas labeled “Avoidance Area Mitigation” to be completed by low impact equipment.

201-P01 CLEARING AND GRUBBING: Remove trees and brush less than 8 inches in diameter according to Section 201. Harvest trees that measure 8 inches in diameter or larger at breast height (defined as 36 inches from the ground) according to Note 201-P02. Cultural resources monitors must be present during Clearing and Grubbing.

201-P02 TREE REMOVAL: Harvest the number of trees stated in the quantities for use in toe wood from the proposed channel alignment footprint, floodplain grading areas, or the staging and stockpile areas. Trees harvested for toe wood shall be either hardwood species, cedars, or junipers. Use of softwood species for toe wood requires the approval of the Project Engineer. Prioritize tree harvest for toe wood from areas indicated on the Plans for clearing and grubbing. Trees harvested for toe wood shall be 8” diameter at breast height (DBH) and harvested with the root ball intact, the root ball shall be no smaller than 3 ft in diameter. Trees for toe wood can be stockpiled within the staging area until needed.

Trees which are not to be removed during tree harvest shall be flagged by the U.S. Forest Service. Tree harvest shall include the acquisition, harvest, transport, and delivery of trees of the plan quantity.

Tree removal is only permitted during the Inactive Season for the Northern Long-Eared Bat, see Note EN-3.

203-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

203-385 AVERAGE HAUL: No average haul has been computed for this project.

203-P01 TOPSOIL: Remove and salvage the estimated quantity of topsoil as specified in the plans. Place topsoil evenly over all areas where it is required. The depth of the proposed topsoil will be 4 inches minimum. Topsoil from the site is to be used within the project area and not transported offsite. The Engineer will pay plan quantity for “Topsoil.”

203-P02 DITCH BLOCK: All ditch blocks are to be free of woody debris prior to construction and Common Excavation – Type C compaction.

Preliminary Plans



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NOTES

251-P01 WETLAND SEED: Replace Table 251-02 with the following seed mix for all areas noted as Wetland Seed:

Sand Creek Wetland Seed Mix		
Common name	**Scientific Name**	**PLS (lbs/ac)**
Green Wheatgrass	*Elymus hoffannii*	3
Slender Wheatgrass	*Elymus trachycaulus*	3
Reed Mannagrass	*Glyceria grandis*	2
Prairie Cordgrass	*Spartina pectinata*	2
Fowl Bluegrass	*Poa palustris*	0.5
American Sloughgrass	*Beckmannia syzigachne*	0.5
Fox sedge	*Carex vulpinoidea*	0.5
Woolly sedge Or Plains Oval Sedge	*Carex pellita or Carex brevior*	0.5
Great Bur Reed	*Sparganium eurycarpum*	0.5
Purple prairie clover	*Dalea purpurea*	0.5
Blue vervain	*Vervena hastata*	0.5
Swamp milkweed	*Asclepias incarnata*	0.5
		14

251-P02 COVER CROP: Cover crop for temporary stabilization shall be oats (*Avena sativa*) applied at a rate of 64 lbs per acre per standard specs.

251-P03 SEEDING CLASS III: Use the following seed mix (USFS Seed Mix 13) where Seeding Class III is specified.

USFS Seed Mix 13		
Common Name	**Scientific Name**	**PLS (lbs/ac)**
Canada wildrye	*Elymus canadensis*	2.8
Green needlegrass	*Nassella viridula*	2.4
Western wheatgrass	*Pascopyrum smithii*	4.9
Blue grama	*Bouteloua gracilis*	0.3
Prairie sandreed	*Calamovilfa longifolia*	0.8
Little bluestem	*Schizachyrium scoparium*	0.8
Sideoats grama	*Bouteloua curtipendula*	1.2
Purple prairieclover	*Dalea purpurea*	0.25
White prairieclover	*Dalea candida*	0.3
Stiff sunflower	*Helianthus pauciflorus*	0.7
Stiff goldenrod	*Oligoneuron rigidum*	0.1
Purple coneflower	*Echinacea angustifolia*	0.5
Prairie coneflower	*Ratibida columnifera*	0.1

202-P01 RIPRAP-REMOVAL: Remove existing riprap as shown in the plans and stockpile on site. Use stockpiled riprap for toe rock. Include all costs for removing, stockpiling, and installing existing riprap in the unit bid price for “Riprap-Removal.” The Engineer will pay plan quantity for “Riprap-Removal.”

256-P01 RIFFLE: Riprap Grade III will be measured and paid by weight. Provide scale tickets for all material brought on site. The contract unit price of riprap includes the cost of providing materials, excavation and preparing the work area, and placement of material as shown on the plans.

256-P02 RIPRAP – SPECIAL: Gradation for Riprap – Special shall be as follows.

Size (in)	% Smaller
18	-
15	-
12	100
9	75
6	50
4	-
3	-
2	10
1	-

302-P01 DRAINAGE AGGREGATE: Drainage Aggregate will be measured and paid by weight. Drainage Aggregate will consist of Class 2 Aggregate as defined in 816.02. Install drainage aggregate following construction requirements for Type C Compaction, described herein.

Construct drainage aggregate in lifts not to exceed 8 inches of loose material over the full width of the toe wood and riffle locations per plans. If the first layer of fill is over material that will prevent achieving proper compaction, the Engineer may adjust the lift thickness. Uniformly compact each lift by operating grading equipment over the entire area.

Preliminary Plans



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NOTES

752-P01 FENCE BARBED WIRE 4 STRAND-STEEL POST: Install fence as shown on the plans. Avoidance areas within the project area must not be disturbed and fencing must be installed prior to the commencement of any construction. Fencing will consist of two strand barbed wire fence with smooth wires above and below. All costs to provide, place, and maintain the fence shall be included in the bid price for Fence Barbed Wire 4 Strand-Steel Post.

Certified Biologist or Project Engineer or Project Representative and Cultural Resource Monitor need to be onsite during installation of Fence Barbed Wire 4 Strand-Steel Post.

752-P02 CORNER ASSEMBLY BARBED WIRE: Posts for Corner Assembly Barbed Wire do not need to be set in concrete.

970-P01 TOE WOOD: Install toe wood working from upstream to downstream across the project. See detail in Section 20 Sheet 1 for installation details. Toe wood will be measured in the field by the front (stream side) of the installation. Payment for toe wood will be measured by the linear foot. Include all cost of materials required to build toe wood except live stakes, seed, and hydromulch in the unit cost. Additional payment will not be made for purchase, handling, transport, or installation of material needed to construct toe wood.

970-P02 LIVE STAKES: Protect Live Stakes during transport, delivery, and staging. Transportation of Live Stakes will be in an enclosed trailer, cab, or vehicle to prevent loss of moisture. Live Stakes item includes purchase, transport, and installation of live stakes and purchase, transport, installation, and disposal of tree tubes in the cost per unit of Live Stakes.

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ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): The North Dakota Department of Transportation has made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 SPAWNING RESTRICTION: Do not work within Sand Creek from April 15 to June 1.

EN-2 AVOIDANCE AREAS: The Project Engineer will contact the project representative to coordinate any meetings needed to identify the limits of the avoidance area. The center coordinates of fenced areas are shown in the table below. These avoidance areas will be fenced by the Contractor prior to commencement of any construction. Provide the fence and fence posts, install the fence in the location designated in the plans, maintain the fence, and remove the fence upon completion of the project. All costs to provide, place, maintain, and remove the fence shall be included in the price bid for temporary fence.

Location	Avoidances
103.0198960°W 48.0813555°N	515 LF Temporary Safety Fence
103.0124873°W 48.0809061°N*	1395 LF Temporary Safety Fence
103.0115530°W 48.0816440°N	400 LF Temporary Safety Fence (South border adjacent to project work area only)
103.0079514°W 48.0809316°N	1600 LF Temporary Safety Fence
103.0065670°W 48.0788470°N	485 LF Temporary Safety Fence
103.0040259°W 48.0795893°N	1565 LF Temporary Safety Fence
103.0239490°W 48.0806900°N	475 LF Temporary Safety Fence
103.0130340°W 48.0831030°N	620 LF Temporary Safety Fence (South border adjacent to project work area only)
103.0055770°W 48.0759730°N	465 LF Temporary Safety Fence
103.0187080°W 48.0799880°N	545 LF Temporary Safety Fence
103.0192150°W 48.0793760°N	570 LF Temporary Safety Fence

*This site is the avoidance area mitigation where work will be authorized as shown in the plans.

EN-3 THREATENED AND ENDANGERED SPECIES: The project is located near/within suitable habitat for the species listed in the following table

SPECIES	HABITAT	PRESENCE
Dakota Skipper	Native Prairie	Year-Round
Northern Long-Eared Bat	Forested/Wooded Areas/Bridges/Box Culverts/Caves/Mines	Active Season: April 15 - October 31* Inactive Season: Nov 1 – April 14*
Whooping Crane	Wetlands/Shallow Marshes/Wet Meadows/Flooded Agricultural Land	Spring Migration: April – May Fall Migration: October - November
Sharptail Grouse	Mixed grass prairie interspersed with trees and shrubs	Active Season: April 15 – June 15

*Time frames can differ slightly, depending on the year

If any of the above threatened and endangered species are identified within 1 mile of the project, the Contractor will notify the Engineer immediately and cease construction activities in the vicinity until an avoidance area is established. The Engineer will establish an avoidance area that is at least a 0.5 mile and immediately coordinate with the USFWS (701-355-8513), FHWA (701-221-9464), and NDDOT Environmental and Transportation Services (701-328-2188). The Contractor will not resume work within the avoidance area until the Engineer has confirmed with the agencies that work may proceed (either the species have left the area, or approved avoidance/minimization measures have been implemented).

A NDDOT biologist will be on site during construction of the barbed wire fenceline. A threatened and endangered species poster or pamphlet will be provided on all job sites. Manual installation methods will be used for installing the fence line in areas that have been determined to be identified as Dakota Skipper (DASK) Avoidance Areas. Fenceline will follow preexisting cattle trails within DASK Avoidance Areas to further reduce Impact. Areas of suitable habitat within the temporary fence buffer will be avoided by placing the fence and cattle trails on the outer perimeter of patches of habitat. Fences in this area will be installed outside of the flight period, June 10 to July 25, and by hand.

EN-4 SHARP TAIL GROUSE: There is one previously known sharp-tailed grouse lek within 1 mile of the project. Two surveys will be conducted by a qualified Biologist to determine if this one known lek site is active by April 15th. If this previously known lek is determined to be active, suspend all construction activity within a 1 mile perimeter of the active lek site from sunrise to 2 hours after sunrise from April 15th to June 15th. The 1 mile perimeter includes Section 10,15 and 16, Township 153 N, Range 96 W (Sta 105+50 – south termini to Sta 227+00).

EN-5 WETLAND MITIGATION: After completion of the mitigation Project, the Engineer will complete the Onsite Mitigation Certification Form SFN 61042. Any sedimentation from project occurring within wetlands or streams will be removed.

EN-6 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota Game and Fish Department (NDGFD) or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail – bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

Preliminary Plans

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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ENVIRONMENTAL NOTES

EN-7 CULTURAL DISCOVERIES NOTIFICATION: No Work is permitted within areas labeled as “Avoidance Area.” Work in areas labeled as “Avoidance Area Mitigation” is authorized but only within grading limits and as necessary to complete grading and stabilization work. Cultural resources monitors must be present prior to commencement of work in areas labeled “Avoidance Area Mitigation” and during clearing and grubbing. Cultural resources monitor will notify USFS and Project Representative of all paleo or cultural discoveries as per the discovery plan SP 358(25) during grading in the Avoidance Area Mitigation and clearing and grubbing locations.

Preliminary Plans

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	SS-ARP-9-999(488)				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
107	0200	CULTURAL RESOURCE CONSTRUCTION MONITORING	L SUM	1				1
201	0300	CLEARING & GRUBBING	ACRE	21.36				21.36
201	0370	REMOVAL OF TREES 10IN	EA	100				100
202	0400	REMOVAL OF RIPRAP - LOOSE ROCK	CY	130				130
203	0103	COMMON EXCAVATION-TYPE C	CY	31788				31788
203	0109	TOPSOIL	CY	7564				7564
251	0300	SEEDING CLASS III	ACRE	16.32				16.32
251	1000	WETLAND SEED	ACRE	5.11				5.11
251	2000	TEMPORARY COVER CROP	ACRE	21.44				21.44
253	0101	STRAW MULCH	ACRE	32.65				32.65
253	0201	HYDRAULIC MULCH	ACRE	10.22				10.22
256	0301	RIPRAP GRADE III	TON	2444				2444
256	0501	RIPRAP-SPECIAL	TON	413				413
260	0300	SILT FENCE	LF	5825				5825
260	0301	REMOVE SILT FENCE	LF	5825				5825
261	0112	FIBER ROLLS 12IN	LF	8596				8596
261	0113	REMOVE FIBER ROLLS 12IN	LF	8596				8596
262	0100	FLOTATION SILT CURTAIN	LF	305				305
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	305				305
302	0113	AGGREGATE BASE COURSE CL 3	TON	316				316
302	0250	DRAINAGE AGGREGATE	TON	159				159
702	0100	MOBILIZATION	L SUM	1				1
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	504				504
752	0320	FENCE BARBED WIRE 4 STRAND-STEEL POST	LF	16409				16409
752	0911	TEMPORARY SAFETY FENCE	LF	8778				8778
752	2140	VEHICLE GATE 8FT X 16FT	EA	2				2
752	2160	WIRE GATE	EA	10				10
752	3140	CORNER ASSEMBLY BARBED WIRE	EA	69				69
752	3975	SINGLE BRACE ASSEMBLY BARBED WIRE-WOOD POST	EA	20				20
752	4100	DOUBLE BRACE ASSEMBLY BARBED WIRE	EA	4				4
902	0400	MACHINE HYGIENE	L SUM	1				1
970	0595	TOE WOOD	LF	365				365
970	2000	LIVE STAKE	EA	375				375

Preliminary Plans

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BASIS OF ESTIMATE

Aggregate Base Course Cl 3	1.875 Ton/CY
Drainage Aggregate	1.875 Ton/CY
Riprap Grade III	1.5 Ton/CY
Toe Rock	2 Ton/LF
Seeding & Mulching	All disturbed areas and stockpile surfaces within the project limits minus hard surfaces.

Preliminary Plans

Basis of Estimate

Sand Creek

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AMY R
DATE 09/04/2026
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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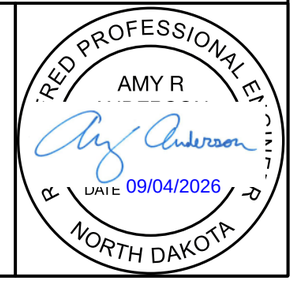
Channel Name	Common Excavation - Type C	Embankment	Excess Material	Topsoil (6" Stripping)	Topsoil (4" Min. Placement)	Excess Topsoil
	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)
	Pay Item			Pay Item		
	A	B	C = A - B	D	E	F = D - E
Existing	4027	28836	-24809	150	1582	-1432
Historic	1236	1702	-466	50	177	-127
Proposed	25343	1102	24241	2449	938	1511
Proposed West	1182	106	1076	140	61	79
Staging Areas				4775	4775	0
Total	**31788**	**31746**	**42** ^{3}	**7564**	**7533**	**31** ^{3}

Notes:
1. Quantity shown for embankment has been increased by 25% to account for shrinkage.
2. Needed materials to come from other channels.
3. Excess materials and topsoil to be disposed of within project boundary.
4. Common Excavation - Type C to be paid as a plan quantitiy.
5. Topsoil placement will be used for the ditch block, staging areas, toe wood grading areas, floodplain grading areas and bench areas. See section 30 for more details.

Preliminary Plans

Earthwork Summary

Sand Creek



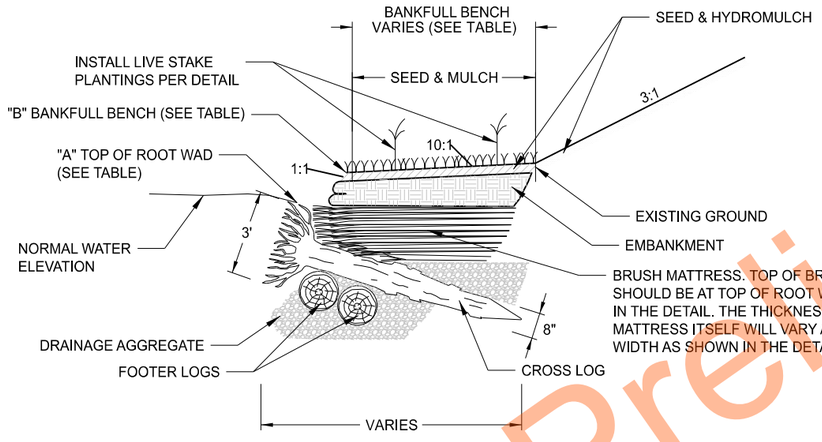
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	1

TOE WOOD CONSTRUCTION NOTES

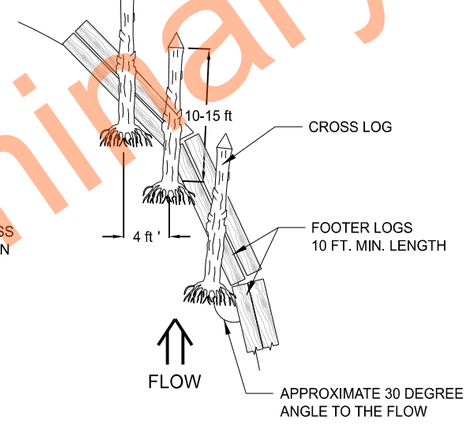
1. HARVEST TREES FOR TOE WOOD FROM CLEARING AND GRUBBING AREAS AS SPECIFIED IN NOTES 201-P01 AND 201-P02.
2. FOOTER LOGS AND CROSS LOGS WILL BE HARDWOOD SPECIES AND FREE FROM DECAY OR ROT. PRIORITIZE USE OF JUNIPER AND CEDARS AS FOOTERS.
3. 8 INCH MINIMUM DIAMETER FOR FOOTER LOGS AND CROSS LOGS. MEASURE AT SHARPENED END FOR CROSS LOGS. MEASURE ANYWHERE ALONG LENGTH OF FOOTER LOGS.
4. INTACT ROOT BALLS WITH A MINIMUM DIAMETER OF 3 FEET IS REQUIRED FOR ALL CROSS LOGS. ALL CROSS LOGS WILL HAVE A SHARPENED END AND BE DRIVEN INTO THE BANK WITH A SPACING OF 4 FEET ON CENTER.
5. USE DRAINAGE AGGREGATE AS BEDDING AND BACKFILL OVER TOP OF THE CROSS LOG. BEDDING WILL EXTEND A MINIMUM OF 4 FEET TOWARD THE CENTER OF THE CHANNEL FROM THE BACK OF THE FOOTER LOGS AND BACKFILL WILL EXTEND A MINIMUM OF 7 FEET TOWARD THE STREAM BANK FROM THE ROOT BALL. BEDDING AND BACKFILL WILL MAINTAIN A MINIMUM THICKNESS OF 1 FOOT.
6. BRUSH MATTRESS MATERIAL WILL CONSIST OF SMALL LOGS, LIMBS, TREE TOPS, AND RESIDUAL WOOD MATERIAL LESS THAN 3 INCHES IN DIAMETER. BRUSH MATTRESS MATERIAL WILL BE WORKED INTO THE ROOT BALL.
7. BACKFILL MATERIAL CONSISTS OF COMPACTED SOIL GENERATED FROM ON-SITE EXCAVATION WITH A MINIMUM THICKNESS OF 2 FEET.
8. THE EXPOSED FRONT FACE OF THE BACKFILL MATERIAL WILL BE RESTRAINED AND PROTECTED BY WRAPPING AND STAKING WITH GEOCOIR/DEKOWE 700, EXCEL CC-4 ALL NATURAL, OR APPROVED EQUAL. BLANKET WILL BE STAKED WITH STAKES AS SHOWN IN DETAIL.
9. THE TOP LAYER OF THE TOE WOOD STRUCTURE WILL BE SEEDED AND HAVE HYDRAULIC MULCH APPLIED ACCORDING TO THE SITE RESTORATION PLAN.
10. ENGINEER SHALL MEASURE THE LENGTH OF TOE WOOD IN THE FIELD BY LENGTH OF THE FRONT (STREAM SIDE) OF THE INSTALLATION.
11. PAYMENT FOR TOE WOOD WILL BE BY THE LINEAR FOOT. INCLUDE ALL COST OF MATERIAL PURCHASED AND INSTALLED EXCEPT LIVE STAKES, SEED, AND HYDROMULCH IN THE UNIT COST PER LINEAR FOOT. SUCH PAYMENT IS FULL COMPENSATION FOR FURNISHING ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS TO COMPLETE THE WORK AS SPECIFIED.

Toe Wood Summary

Channel Alignment	Top of Root Wad Elevation (A)	Front of Bench Elevation (B)	Bench Width (FT)	Start Station	End Station	Lt/Rt	Length (LF)
Existing	1958	1959	5	209+60	210+30	Lt	70
Existing	1961	1962	5	225+90	227+10	Lt	120
Proposed	1945	1946	5	509+75	511+50	Rt	175
						Total =	365

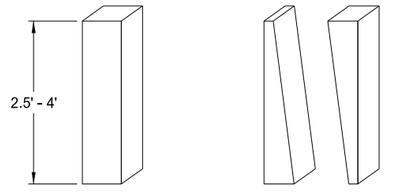


TOE WOOD DETAIL - PROFILE VIEW
NOT TO SCALE



TOE WOOD DETAIL - PLAN VIEW
NOT TO SCALE

NOTES:
1. A MINIUM OF TWO CROSS LOGS PER FOOTER LOG IS REQUIRED TO ANCHOR FOOTER LOG.
2. CROSS LOGS ARE TO BE POINTED UPSTREAM INTO FLOW WITH TRUNKS PARALLEL.



DEAD STOUT STAKES, CUT FROM UNTREATED 2 BY 4'S (ABOUT 50 BY 100 MILLIMETERS), ARE USED IN MANY SOIL BIOENGINEERING TECHNIQUES TO ANCHOR BRANCHES OR EROSION CONTROL BLANKETS.

DEAD STOUT STAKE DETAIL
NOT TO SCALE

General Details

Toe Wood

Sand Creek

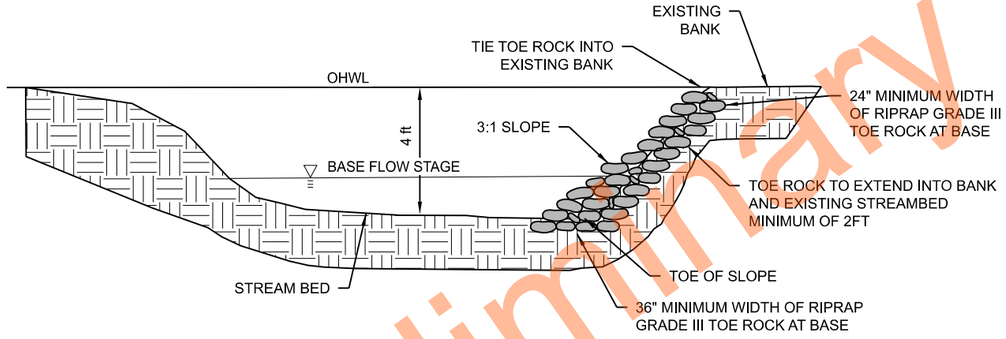
REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/08/2026
NORTH DAKOTA

Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	2

TOE ROCK CONSTRUCTION NOTES

1. EXCAVATE AND SHAPE THE FOUNDATION FOR THE RIPRAP AS SHOWN ON THE PLANS. DEPOSIT RIPRAP UNDER THE WATER AND DIRECTLY ON THE FOUNDATION, DO NOT DISCHARGE THE RIPRAP ABOVE THE WATER SURFACE.
2. RIPRAP PLACED ON EACH SEPARATE AREA MUST HAVE A MINIMUM THICKNESS OF 80% OF PLAN DIMENSIONS AND AVERAGE THICKNESS OF AT LEAST 90% OF PLAN DIMENSIONS.
3. RIPRAP SHALL BE MEASURED AND PAID BY VOLUME INSTALLED. CONTRACTOR WILL BE REQUIRED TO PROVIDE SCALE TICKETS FOR ALL MATERIAL BROUGHT ON SITE.
4. THE CONTRACT UNIT PRICE OF RIPRAP INCLUDES THE COST OF PROVIDING MATERIALS, EXCAVATING AND PREPARING THE WORK AREA, AND PLACEMENT OF MATERIALS AS SHOWN ON THE PLANS.



TOE ROCK DETAIL
NOT TO SCALE

Toe Rock Summary

Channel Alignment	Start Station	End Station	Lt/Rt	Length (LF)	Weight (TON)
Existing	106+45	108+05	Lt	160	320
Existing	125+40	126+90	Rt	150	300
Historic	38+00	39+90	Rt	190	380
Historic	43+70	45+15	Rt	145	290
Historic	56+60	58+30	Lt	170	340
Proposed	506+05	507+75	Rt	170	340
			Total =	985	1970

Notes:

1. Estimated quantity of toe rock is based on a placement rate of 2 tons per linear foot. This is intended to be an average for estimated purposes.

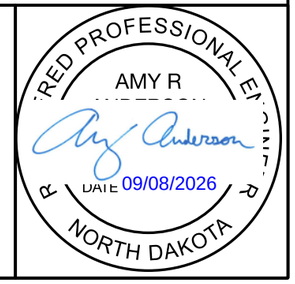
2. Lt indicates placement on left bank while looking downstream, Rt indicates placement on right bank while looking downstream

Preliminary Plans

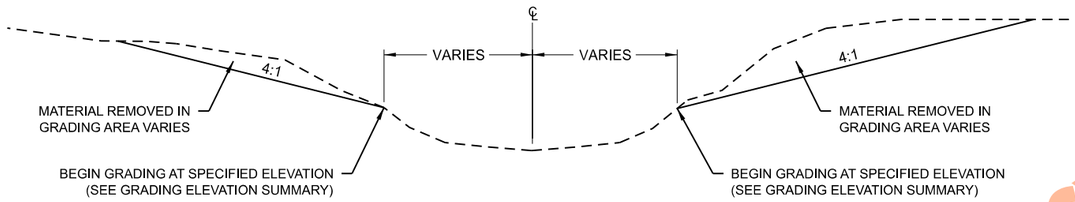
General Details

Toe Rock

Sand Creek



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	3



FLOODPLAIN GRADING DETAIL
NOT TO SCALE

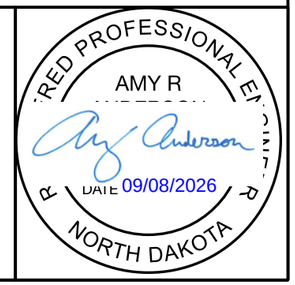
Floodplain Grading Summary				
Channel Alignment	Start Station	End Station	Grading Elevation	Lt/Rt
Existing	129+00	131+75	1928.00	Lt
Existing	189+60	192+20	1955.00	Lt
	192+20	199+05	1956.00	Lt
Existing	189+60	190+15	1955.00	Rt
	190+15	199+75	1956.00	Rt
Existing	201+30	203+75	1956.00	Rt
Existing	206+25	212+60	1958.00	Rt
Historic	37+60	40+05	1938.00	Lt
Historic	43+60	45+30	1938.00	Lt

Preliminary Plans

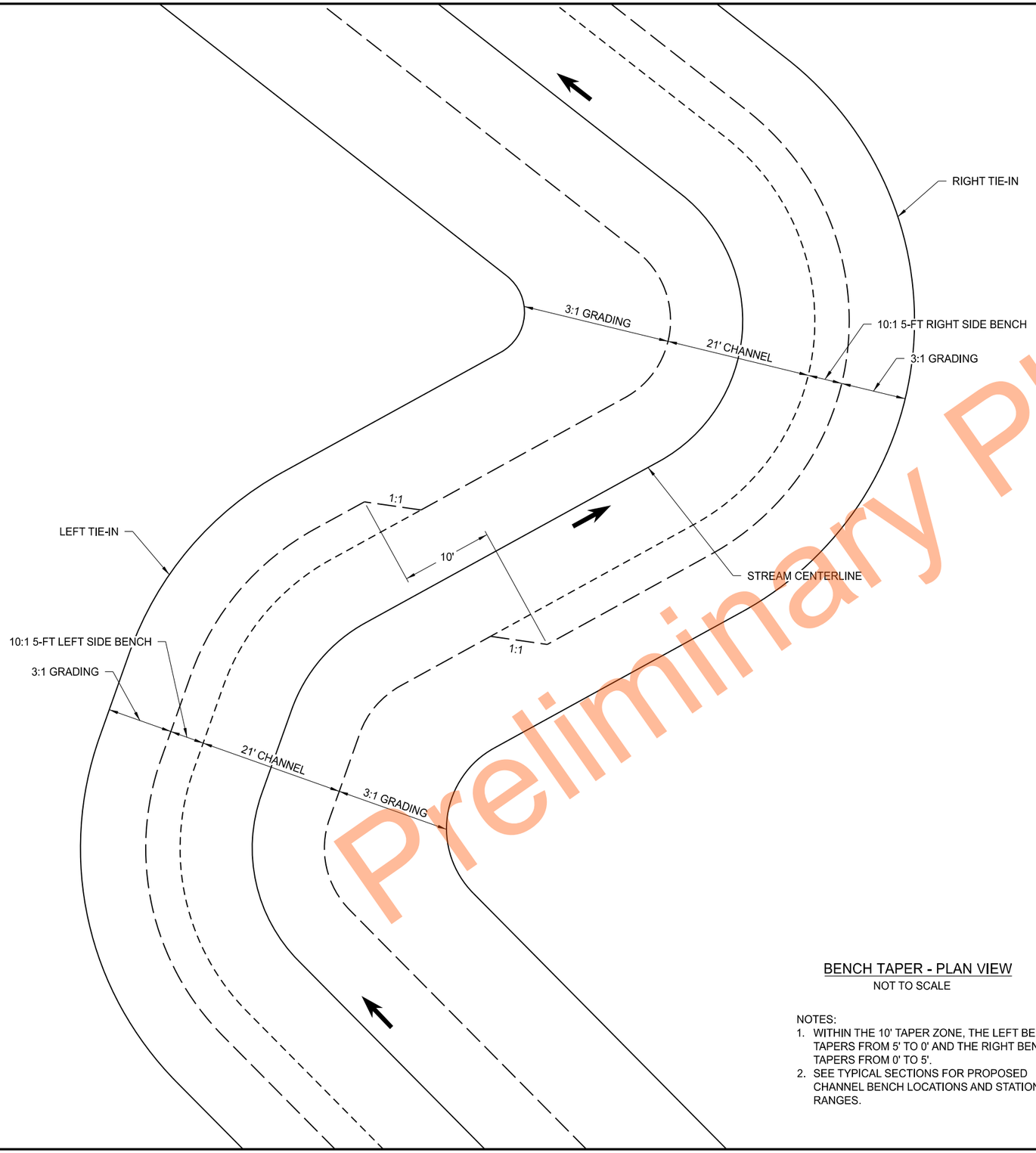
General Details

Floodplain Grading

Sand Creek



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	4



Preliminary Plans

BENCH TAPER - PLAN VIEW

NOT TO SCALE

NOTES:
1. WITHIN THE 10' TAPER ZONE, THE LEFT BENCH TAPERS FROM 5' TO 0' AND THE RIGHT BENCH TAPERS FROM 0' TO 5'.
2. SEE TYPICAL SECTIONS FOR PROPOSED CHANNEL BENCH LOCATIONS AND STATION RANGES.

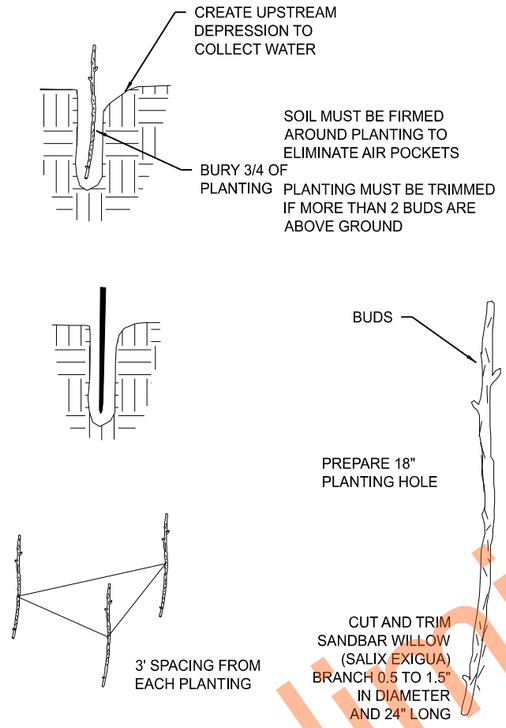
General Details

Typical Bench Tapers

Sand Creek

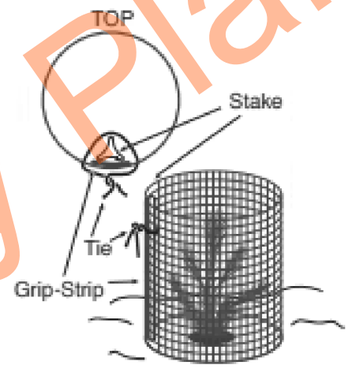
REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/08/2026
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	5



LIVE STAKE PLANTING DETAIL
NOT TO SCALE

LIVE STAKE PROTECTION



LIVE STAKE PROTECTION
NOT TO SCALE

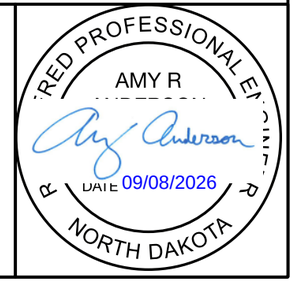
Preliminary Plans

NOTES:
1. LIVE STAKES MUST BE HARVESTED AND INSTALLED BETWEEN NOVEMBER 1ST AND APRIL 15TH. ONLY DORMANT STAKES MUST BE INSTALLED.
2. LIVE STAKES MUST BE STORED IN COOL WATER AFTER HARVEST, DURING TRANSPORT, AND UNTIL INSTALLATION. THE STAKES MUST BE LABELED IMMEDIATELY AFTER HARVEST SO THAT THEY ARE STORED WITH THE BOTTOM SIDE IN WATER AND PLANTED WITH PROPER ORIENTATION IN ORDER TO FACILITATE GROWTH.
3. LIVE STAKES MUST BE PROTECTED FROM BROWSING AND GRAZING FOR THE FIRST GROWING SEASON. LIVE STAKE PROTECTION WILL CONSIST OF 12" MIRACLE TUBE TREE GROW TUBE OR APPROVED EQUAL. PURCHASE, TRANSPORT, INSTALLATION, REMOVAL, AND DISPOSAL OF TREE TUBES IS INCLUDED IN THE COST PER UNIT OF LIVE STAKES.

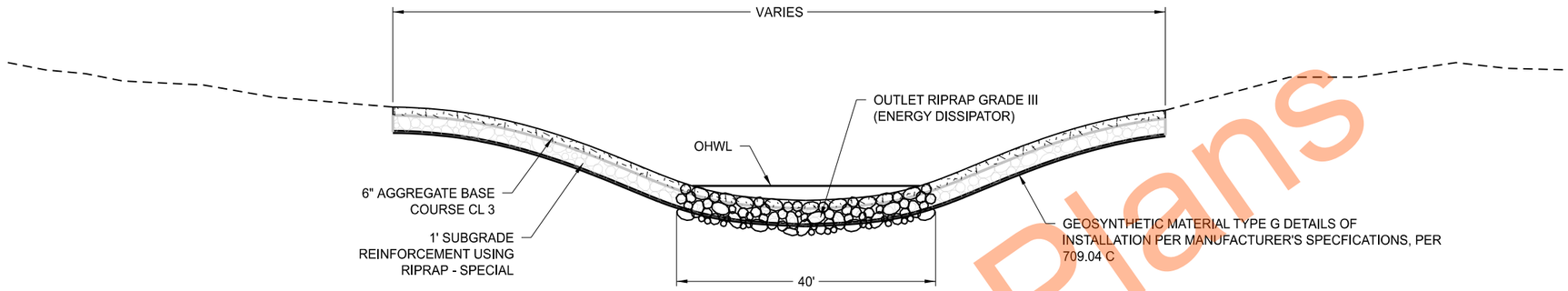
General Details

Planting Details

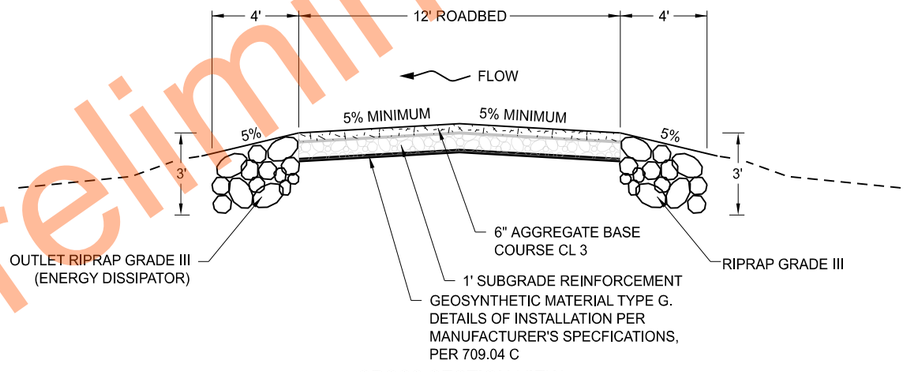
Sand Creek



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	6



PROFILE VIEW
NOT TO SCALE



CROSS SECTION VIEW
NOT TO SCALE

NOTES:

1. CONSTRUCT LOW WATER CROSSING AT LOCATIONS SHOWN IN THE PLANS.
2. OUTLET DIMENSIONS WILL VARY TO CONFORM WITH NATURAL DRAINAGE ELEVATION.
3. THE MINIMUM SLOPE OF OUTLET RIPRAP WILL BE -5%.
4. SUBGRADE REINFORCEMENT ROCK WILL BE RIPRAP - SPECIAL, TOPPED WITH AGGREGATE BASE COURSE CL 3.
5. UNLESS SPECIFIED OTHERWISE, SUBGRADE REINFORCEMENT FINISHED WIDTH WILL BE EQUAL TO THE FINISHED ROADBED WIDTH SHOWN ON DRAWINGS.
6. GEOSYNTHETIC MATERIAL TYPE G IS SPECIFIED PER 709.04 C. FURNISH AND INSTALL ON ALL LOW WATER CROSSINGS.
7. LOW WATER CROSSINGS WILL USE COMPACTION CONTROL, TYPE C.
8. SEE PLAN AND PROFILE SHEETS AND CROSS SECTIONS FOR ADDITIONAL INFORMATION.
9. SEE QUANTITIES SPECIFIED ON SEC 60 SHEETS 43-45.

General Details

Low Ford Crossing

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/08/2026
NORTH DAKOTA

Preliminary Plans

TYPICAL INSTALLATIONS
May vary with conditions

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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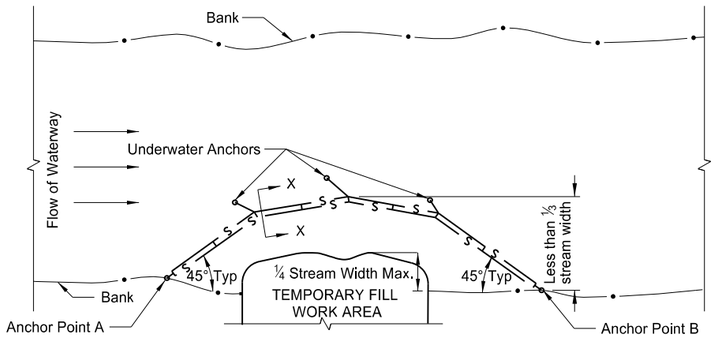
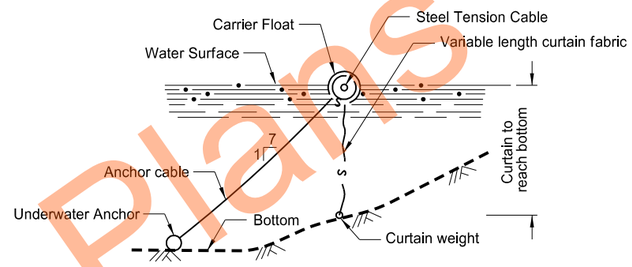


PLAN VIEW

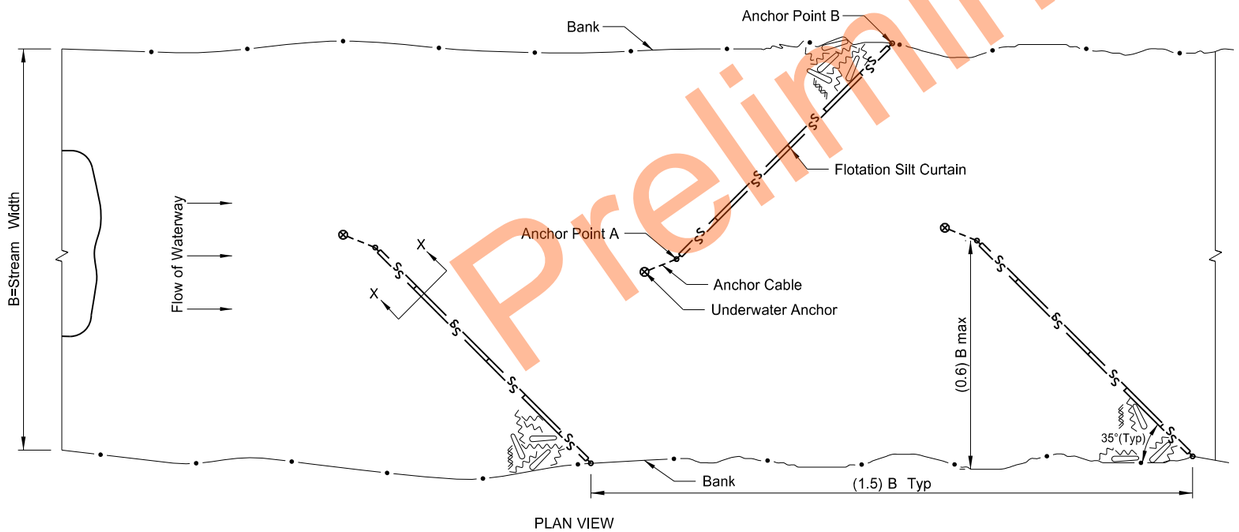
FLOTATION SILT CURTAIN - TYPE WORK AREA

DESIGN GUIDELINES:
When temporary work encroaches less than ¼ of the width of stream.



SECTION X-X
FLOTATION SILT CURTAINS

Note:
Maximum water velocity for moving water = 5 ft/sec



PLAN VIEW

FLOTATION SILT CURTAIN - TYPE HERRING BONE PATTERN

DESIGN GUIDELINES:
When temporary work encroaches more than ⅓ width of the stream
Or where stream width doesn't allow use of Type Moving Water

General Details

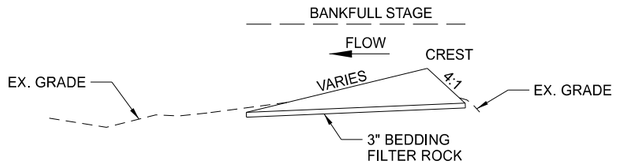
Temporary Erosion Control - Flotation Silt Curtain

Sand Creek

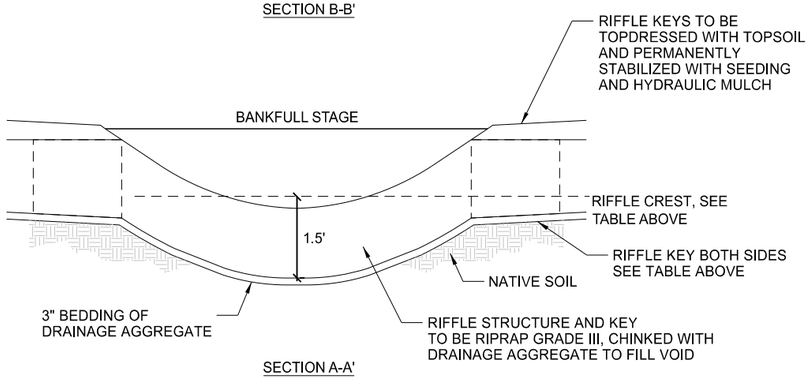
REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/08/2026
NORTH DAKOTA

Preliminary Plans

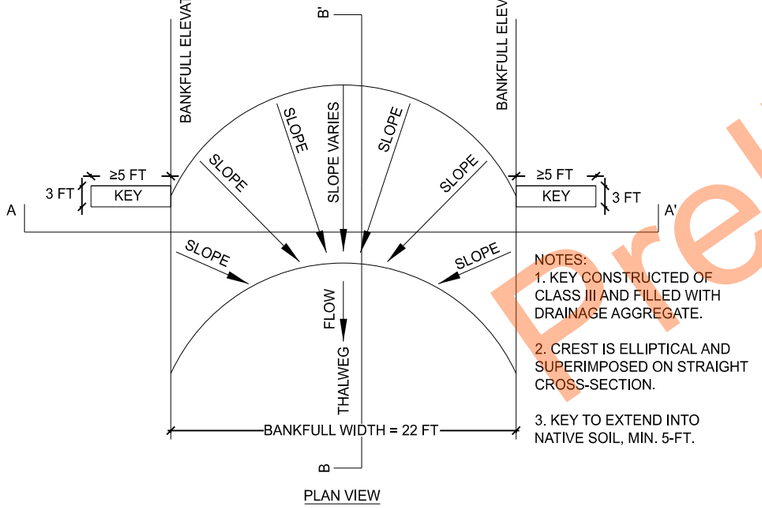
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	8



SECTION B-B'



SECTION A-A'



PLAN VIEW

NOTES:
1. KEY CONSTRUCTED OF CLASS III AND FILLED WITH DRAINAGE AGGREGATE.

2. CREST IS ELLIPTICAL AND SUPERIMPOSED ON STRAIGHT CROSS-SECTION.

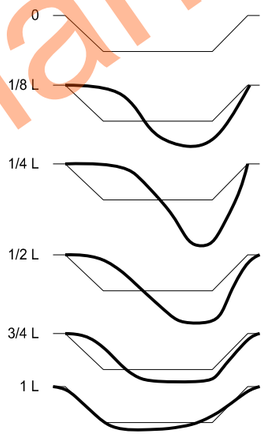
3. KEY TO EXTEND INTO NATIVE SOIL, MIN. 5-FT.

RIFFLE DETAIL
NOT TO SCALE

RIFFLE ELEVATION TABLE				
STATION	ELEVATION (FT)			
	CREST	KEY	US TIE IN	DS TIE IN
500+85	1943.50	1945.00	1943.00	1943.20
503+45	1945.00	1946.50	1944.20	1944.00
506+00	1945.50	1947.00	1944.70	1944.70
508+45	1947.00	1948.50	1947.50	1946.00
510+15	1947.40	1948.90	1946.50	1946.50
512+60	1948.00	1949.50	1947.70	1947.00
514+90	1948.40	1949.90	1947.80	1948.00
518+35	1948.70	1950.20	1948.00	1948.00
520+50	1949.00	1950.50	1947.80	1948.80
601+20	1927.00	1928.50	1926.00	1926.00

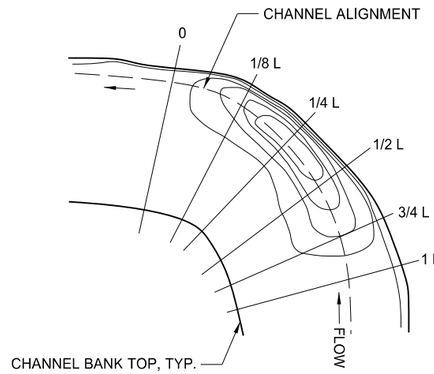
RIFFLE QUANTITY TABLE		
STATION	RIPRAP GRADE III (TON)	DRAINAGE AGGREGATE (TON)
500+85	55	19
503+45	41	14
506+00	55	19
508+45	46	15
510+15	41	14
512+60	46	15
514+90	46	15
518+35	55	19
520+50	52	17
601+20	37	12
TOTAL =	**474**	**159**

RIFFLE CONSTRUCTION NOTES:
1. RIFFLE WILL BE CONSTRUCTED BY FIRST CONSTRUCTING A STREAM CROSSING WHICH WILL ALLOW EQUIPMENT TO CROSS THE CHANNEL DURING LOW FLOWS. THE STREAM CROSSING WILL BE MADE OF THE SAME MATERIAL AS THE RIFFLE.
2. EXCAVATE AND SHAPE THE FOUNDATION FOR THE FILTER ROCK AND THE RIPRAP AS SHOWN ON THE PLANS. DEPOSIT FILTER ROCK UNDER THE WATER AND DIRECTLY ON THE FOUNDATION, DO NOT DISCHARGE THE FILTER ROCK ABOVE THE WATER SURFACE.
3. WHEN A CROSSING IS NOT LONGER NEEDED, SHAPE THE RIFFLE ACCORDING TO THE SLOPE AND DIMENSIONS SHOWN IN THE PLANS FROM DOWNSTREAM TO UPSTREAM AND FROM CENTER TO BANKS.
4. RIPRAP PLACED ON EACH SEPARATE AREA MUST HAVE A MINIMUM THICKNESS OF 80% OF PLAN DIMENSIONS AND AVERAGE THICKNESS OF 90% PLAN DIMENSIONS.
5. RIFFLES ARE TO BE AT FINISH GRADE WHEN NEW CHANNEL IS COMPLETE. RIFFLES DO NOT NEED TO BE SEEDED OR STABILIZED WHILE NEW CHANNEL IS OFFLINE AND ESTABLISHING VEGETATION.
6. TEMPORARY CROSSINGS OF THE PROPOSED CHANNEL ARE TO BE AT PROPOSED RIFFLE LOCATIONS.



SECTION SEQUENCE

POOL AND BAR GRADING NOTES:
1. CONTOUR INTERVAL = 0.5 FT
2. L = LENGTH OF CHANNEL BEND FROM START TO END OF RADIUS ALONG THE CHANNEL CENTERLINE, AS DEFINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION
3. MATERIAL EXCAVATED FROM POOL WILL BE USED TO BUILD A LATERAL BAR ADJACENT TO THE POOL



PLAN

POOL AND BAR GRADING DETAIL
NOT TO SCALE

General Details

Riffle Detail

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/08/2026
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	20	9

MATERIALS

A. POSTS
   1. LINE POSTS: STANDARD STEEL T POST, 1.33 LB/FT WITH A STEEL ANCHORPLATE, 66" MINIMUM LENGTH; 2 7/8"X96" MIN. DRILL STEM PIPE; OR PRESSURE TREATED WOOD POST WITH A MIN. SIZE OF 4"X78"
   2. BRACE POST: 2 7/8"X96" MIN. DRILL STEM PIPE OR PRESSURE TREATED WOOD POST WITH MIN. SIZE OF 6"X96"
   3. HORIZONTAL OR BRACING POST: PRESSURE TREATED WOOD POST WITH MIN. SIZE OF 4"X96" OR 2 7/8"X96" MIN. DRILL STEM PIPE

B. WIRE
   1. BARBED WIRE: GALVANIZED, 12 1/2 GAUGE, STRENGTH 90,000 T0 105,000 PSI OR HI-TENSILE 14 GAUGE
   2. BARBLESS WIRE: GALVANIZED, 12 1/2 GAUGE
   3. SMOOTH WIRE (FOR BRACE WIRE): NO. 9, GALVANIZED

C. WIRE FASTENERS
   1. STAPLES: GALVANIZED 1 1/2" LONG, 72 PER POUND
   2. WIRE CLIPS: GALVANIZED 12 1/2 GAUGE

CONSTRUCTION

A. ALIGNMENT: THE FENCE WILL BE BUILT IN STRAIGHT LINE SEGEMENTS FROM BRACE TO BRACE. ALL TURNS WILL REQUIRE A CORNER BRACE WHICH WILL BE INSTALLED WITH THE ANGLE OF THE BRACE IN LINE WITH THE FENCE DIRECTION.

B. CLEARING: ALL BRUSH WILL BE CLEARED TO THE WIDTH NECESSARY TO CONSTRUCT THE FENCE (10' MAX.). ALL WIRES SHALL BE FREE OF BRUSH AND LIMBS. CLEARING OF FENCE ALIGNMENT IS INCIDENTAL TO THE COST OF THE FENCE.

C. LINE POSTS: SPACING FOR LINE POSTS WILL BE 16.5' BETWEEN POSTS. STEEL POSTS WILL BE DRIVEN UNTIL THE ANCHORPLATE IS AT LEAST 4" INTO THE GROUND. WOODEN POSTS WILL BE BURIED 30" IN THE GROUND AND WILL BE TAMPED IN LAYERS AROUND THE POST UNTIL FIRM. DRILL STEM POSTS WILL BE BURIED AT A MINIMUM OF 5' IN THE GROUND.

D. LINE BRACES: LINE BRACES WILL BE PLACED A MINIMUM OF EVERY 1/4 MILE OF STRETCH. CORNER OR GATE BRACES WILL COUNT AS LINE BRACES IF PLACED WITHIN A 1/4 MILE OF THE LAST LINE BRACE. LINE BRACES WILL CONSIST OF TWO BRACE POSTS AND ONE HORIZONTAL POST. THE BRACE POSTS WILL BE SET 42" IN THE GROUND AND TAMPED IN LAYERS AROUND THE POST UNTIL FIRM. USE DOUBLE WIRE OF NO. 9 SMOOTH WIRE TWISTED TIGHT. THE TWIST STICK (E.G. REBAR) SHALL BE SECURED IN PLACE. FOR STEEL (DRILL STEM PIPE) BRACES, REFER TO DRAWING.

E. CORNER BRACES: CORNER BRACES WILL BE PLACED AT ALL TURNS IN FENCE, CONSTRUCTED AS DESCRIBED ABOVE AND SHOWN ON THE DRAWING. FOR STEEL (DRILL STEM PIPE) BRACES, REFER TO DRAWING.

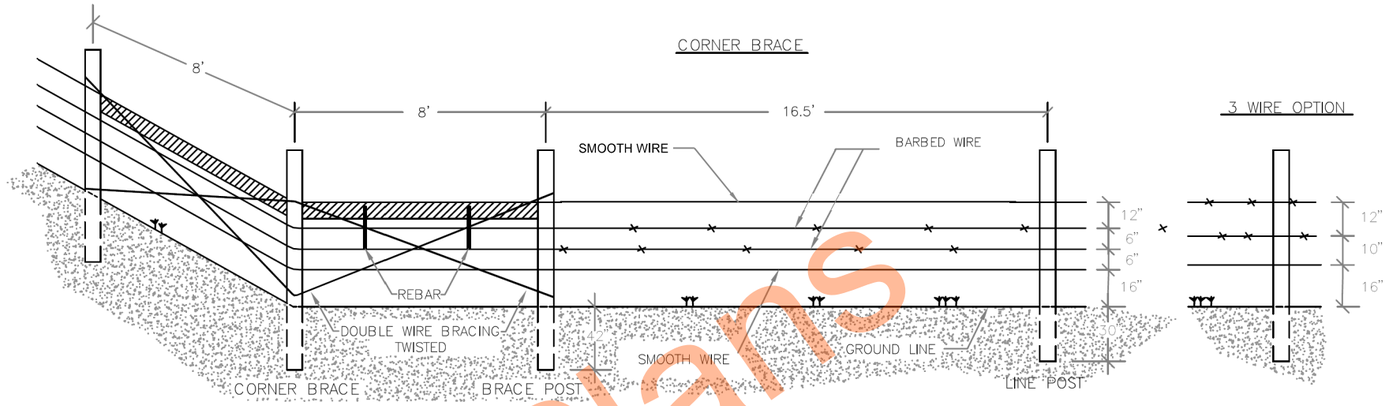
F. WIRE: SPACING AS INDICATED ON THE DRAWING. IN NO CASE SHALL TOP WIRE EXCEED 40". BOTTOM WIRE WILL BE SMOOTH. ENDS OF LINE WIRES SHOULD BE WRAPPED TWICE AROUND THE POST, STAPLED, AND TWISTED BACK ON THE STETCHED LINE WIRE SIX TIMES AT ABOUT A RIGHT ANGLE.

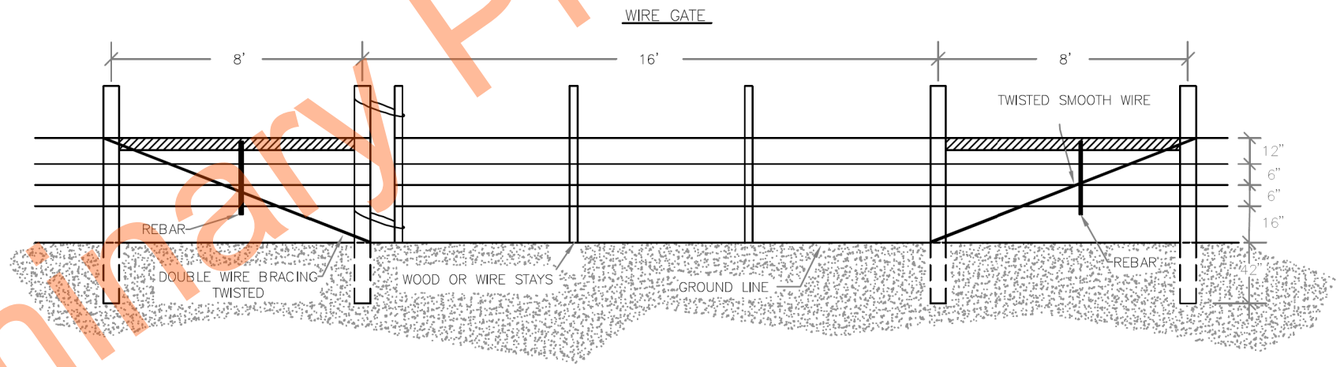
G. GATES: CONSTRUCT USER-FRIENDLY GATES. FOR BARBED WIRE GATES, USE WOOD OR WIRE STAYS. GATE CLOSURE SHOULD BE AN EASY OPEN DEVICE OR MAKE A GATE CLOSURE USING A SMOOTH WIRE LOOP TWISTED TOGETHER OR A LENGTH OF CHAIN ATTACHED TO THE PERMANENT GATE POST THAT CAN BE WRAPPED AROUND THE NON-STATIONARY GATE POST TO ATTACH TO A SPIKE ON THE PERMANENT POST.

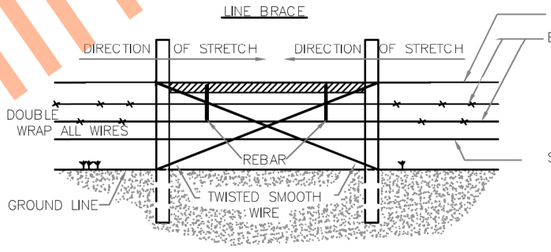
H. INCLUDE THE COST FOR WIRE GATE IN THE UNIT PRICE BID FOR FENCE BARBED WIRE 4 STRAND-STEEL POST.

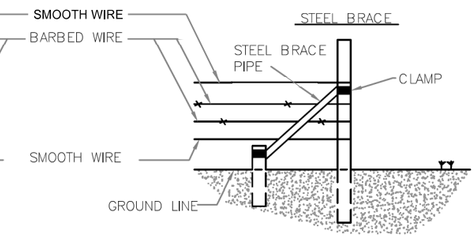
I. STEEL GATES TO INCLUDE FASTENERS. PRICE FOR GATES TO INCLUDE PROCUREMENT, TRANSPORT, AND INSTALLATION.

J. GATES TO BE 16' WIDE, TOP OF GATE NO HIGHER THAN 52", 14 GAGE STEEL, 1 1/2" TUBING.









NO SCALE

DWG NAME	DRAWN BY
DPG LRMP PERMANENT FENCE	RICARDO CANTO

REV. NO.	REV. BY	DATE

General Details

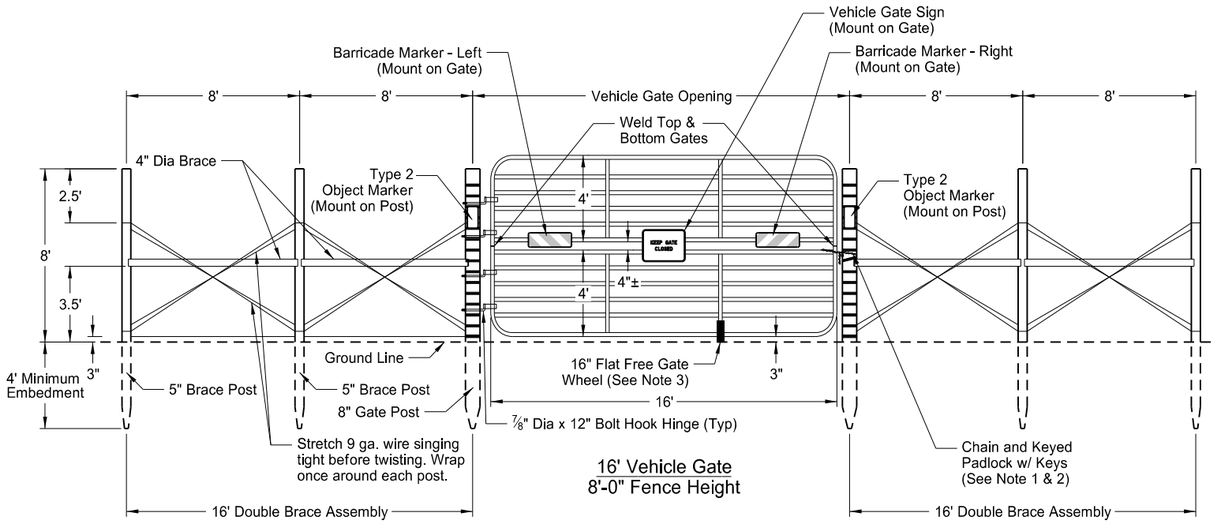
Fence Installation Detail

Sand Creek

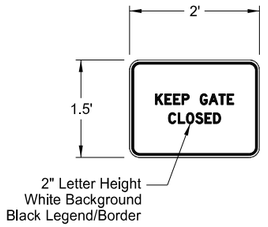
REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
DATE 09/08/2026
NORTH DAKOTA

Preliminary Plans

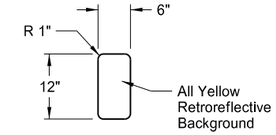
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	20	10



16' Vehicle Gate
8'-0" Fence Height

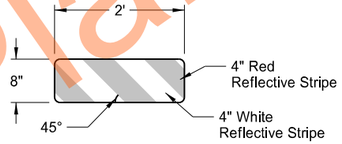


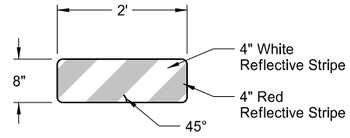
Vehicle Gate Sign
Not to Scale



Type 2 Object Markers will be mounted on gate posts. Markers will be mounted to posts right and left of the gate as well as to both the front and back of said posts.

Type 2 Object Marker
Not to Scale

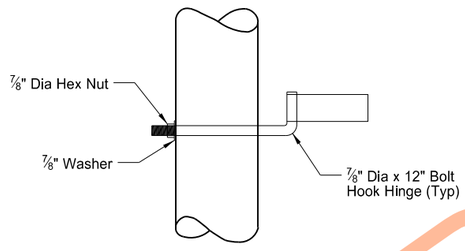




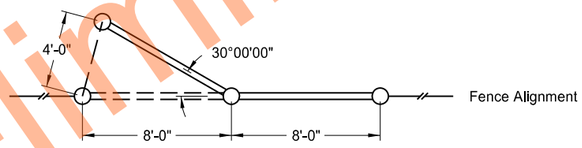
Barricade Markers will be mounted on gate. Markers will be mounted on each side of center as well as to the front and back of the gate.

Barricade Marker - Left
Not to Scale

Barricade Marker - Right
Not to Scale

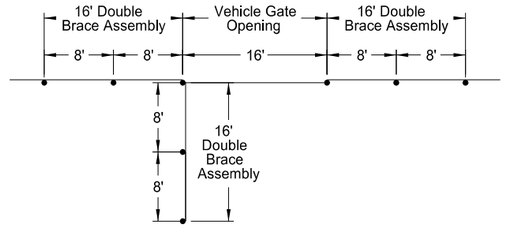


Gate Hinge Detail
Not to Scale



If fence deflects more than 4'-0" from alignment, a standard corner assesmbly is required. Otherwise, use a double brace assembly.

Decision Criteria for Double Brace Assembly vs. Corner Assembly
Not to Scale



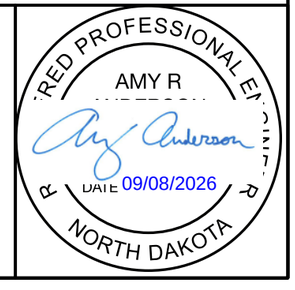
16' Vehicle Gate - Plan View
8'-0" Fence Height

Notes:
1. Provide a 3' - 4" x No. 2 Electrically Welded Twist Link Chain.
2. The NDDOT will supply the padlock and keys upon installation of the vehicle gates.
3. Provide a minimum 16" diameter flat free front mount gate wheel for each hinged gate. The wheel should roll easily over turf, stone, gravel, paved, and uneven surfaces.
4. Include all costs for labor, equipment, and materials to supply and install vehicle gates and signs according to the above details or as approved by the Engineer in the unit price bid for "VEHICLE GATE 8FT X 16FT".
5. Double brace assemblies will be measured and paid for separately. No deduction in measured pay length of woven wire fence for double brace assemblies. Additional material and labor for each double brace assembly will be paid for at the bid for "DOUBLE BRACE ASSEMBLY BARBED WIRE".
6. Engineer has the authority to modify grading to ensure gates can open adequately.
7. Refer to Section 80 for proposed fencing layouts.

General Details

Vehicle Gate Details

Sand Creek



Preliminary Plans

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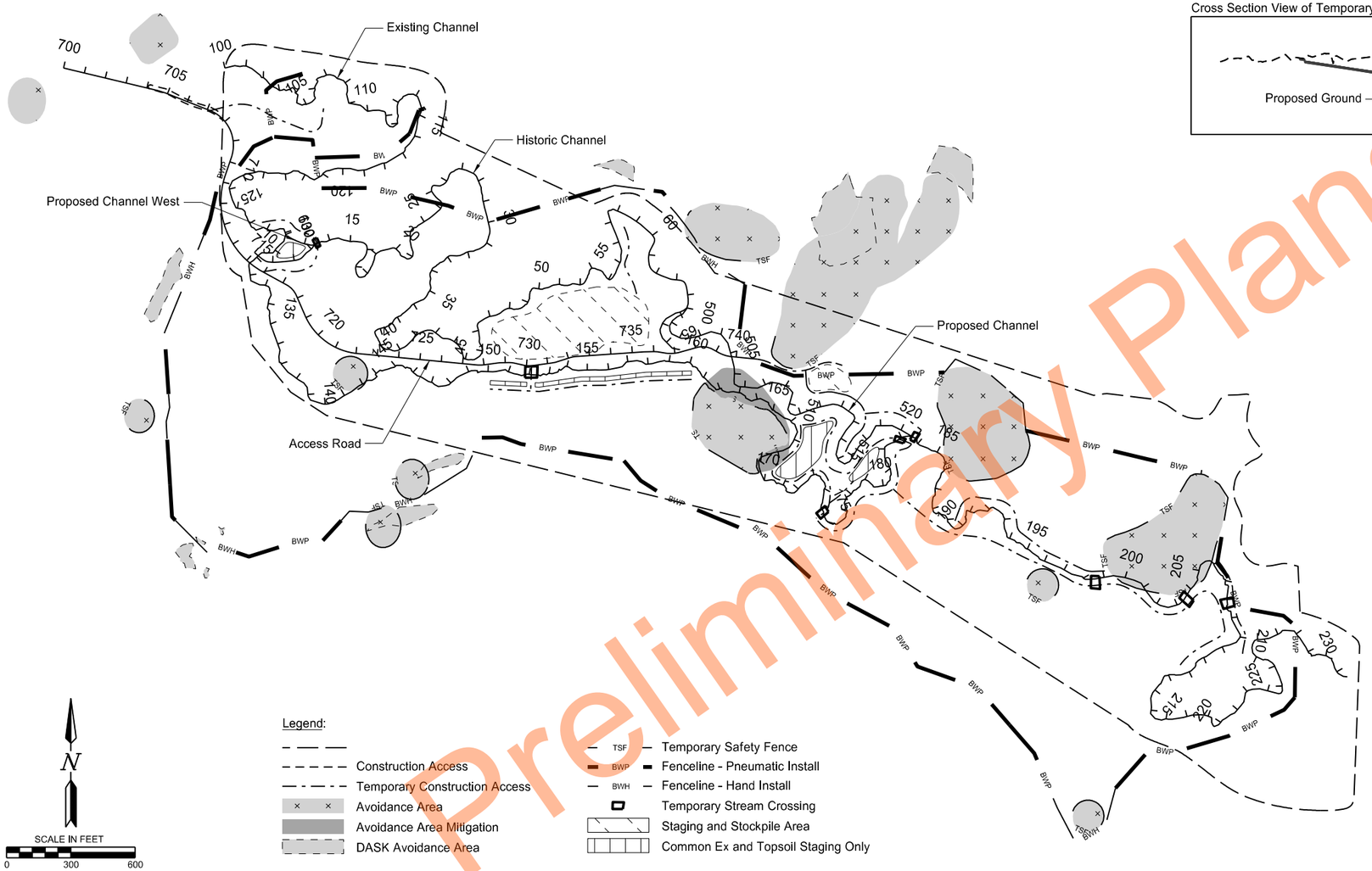
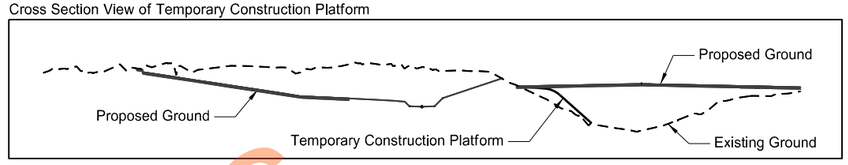
Staging Overview



Temporary Construction Platform

Cross Section View of Temporary Construction Platform



Notes:

1. Temporary construction platform installation is permitted during excavation of the proposed channel between stations 506+00 to 508+00 and 510+00 to 511+00.
2. Build a temporary construction platform in the existing Sand Creek channel for use while excavating the proposed Sand Creek channel.
3. Installation of the temporary construction platform cannot disrupt the flow of Sand Creek in the existing channel.
4. Temporary construction platform must be removed following completion of proposed channel excavation between stations 506+00 to 508+00 and 510+00 to 511+00.
5. Volume of material required for temporary construction platform has not been included in the Section 8 estimated quantities. No additional payment will be made for installation or removal of temporary construction platform.
6. Contractor will be responsible for compliance with all erosion control requirements within temporary construction platform.
7. No additional payment will be made for installation or removal of erosion control materials required within the temporary construction platform.

Preliminary Plans

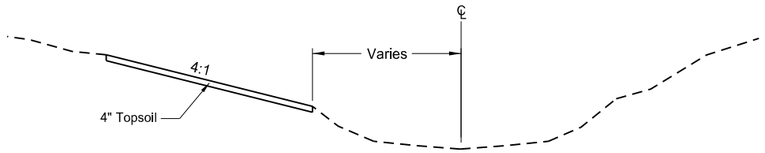
General Details

Staging

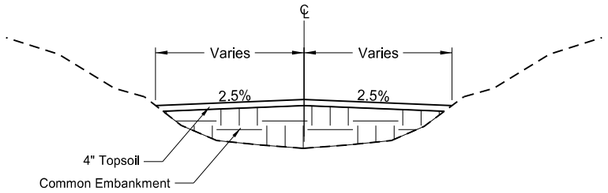
Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
DATE 09/08/2026
NORTH DAKOTA

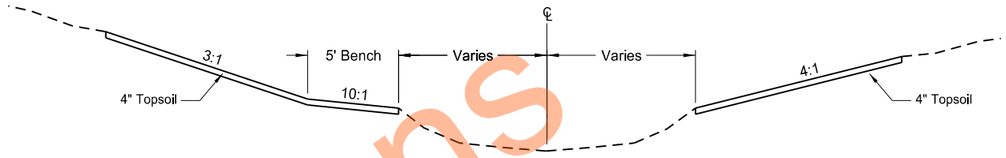
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	30	1



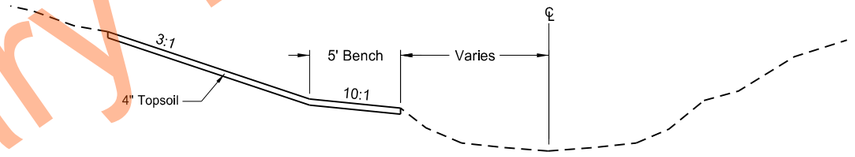
Floodplain Grading LT
Sta 129+00 to Sta 131+75
Sta 37+60 to Sta 40+05 (Historic Channel)
Sta 43+60 to Sta 45+30 (Historic Channel)



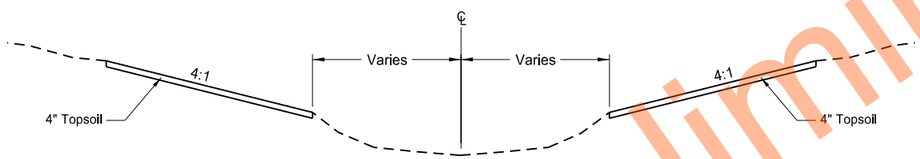
Ditch Block
Sta 146+10 to Sta 169+45
Sta 179+50 to Sta 183+00
Sta 10+75 to Sta 12+90 (Historic Channel)
Sta 65+20 to Sta 67+25 (Historic Channel)



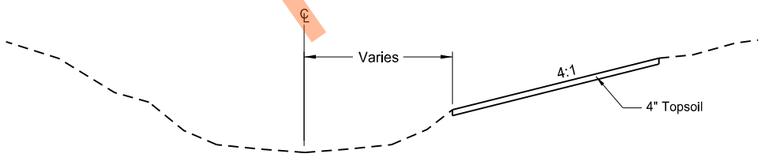
Toe Wood Grading LT with Floodplain Grading RT
Sta 209+60 to Sta 210+30



Toe Wood Grading LT
Sta 225+90 to Sta 227+10



Floodplain Grading LT and RT
Sta 189+60 to Sta 199+05



Floodplain Grading RT
Sta 199+05 to Sta 199+75
Sta 201+30 to Sta 203+75
Sta 206+25 to Sta 209+60
Sta 210+30 to Sta 212+60

Notes:
1. All stationing refers to the Existing Channel alignment unless otherwise noted.
2. See Gerneral Details and Plan and Profile sheets for grading details.

Typical Sections

Existing Channel

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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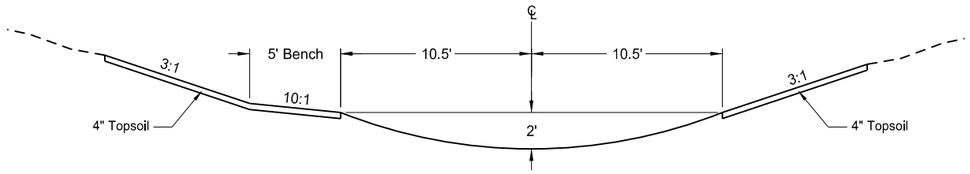
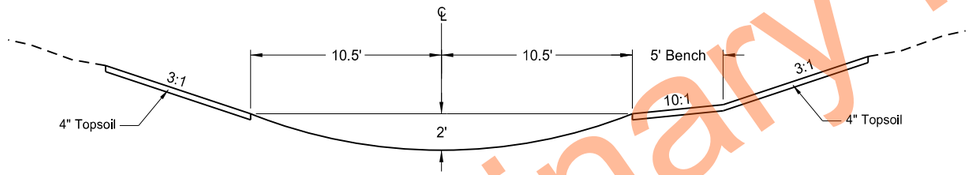
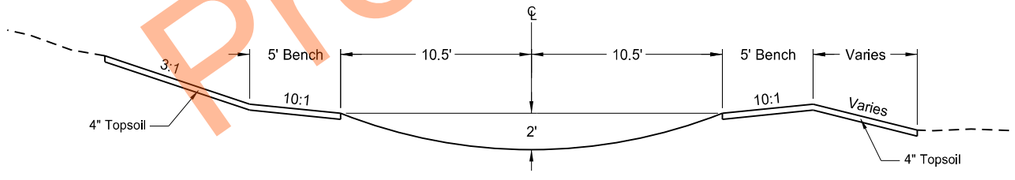
	ND	SS-ARP-9-999(488)	30	2



Left Side Bench
Sta 500+00 to Sta 502+75
Sta 505+50 to Sta 508+00
Sta 514+75 to Sta 517+75



Right Side Bench
Sta 502+75 to Sta 505+50
Sta 508+00 to Sta 509+75
Sta 511+50 to Sta 514+75
Sta 517+75 to Sta 520+67
Sta 600+00 to Sta 601+52 (Proposed Channel West)



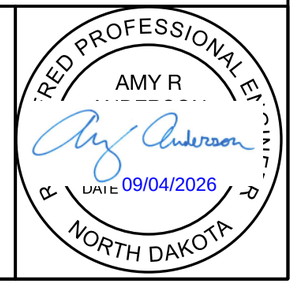
Left Side Bench with Toe Wood Grading RT
Sta 509+75 to Sta 511+50

Notes:
1. All stationing refers to the Proposed Channel alignment unless otherwise noted.
2. See Plan and Profile sheets for grading details.

Typical Sections

Proposed Channel

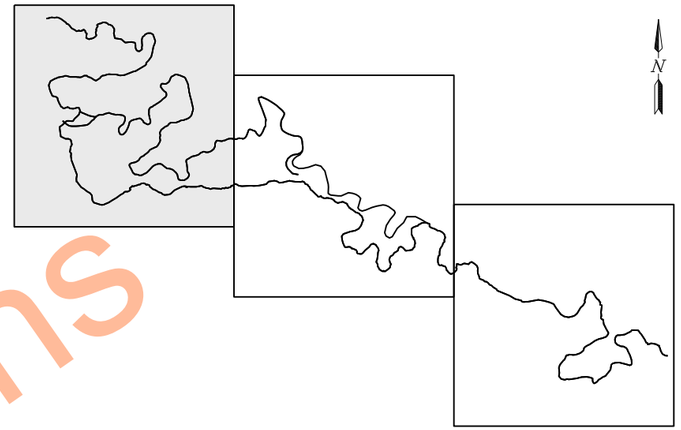
Sand Creek



Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	40	1





SPEC	CODE	BID ITEM	QTY	UNIT
201	300	CLEARING AND GRUBBING		
		SHEET 1	5.27	ACRE

Legend:

- XXXX' — Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Clearing & Grubbing
- Removal of Riprap - Loose Rock

Notes:

1. Existing Turf Reinforcement Mat (TRM) beneath existing riprap. Include the cost for removal and disposal of TRM in the unit price bid for "REMOVAL OF RIPRAP - LOOSE ROCK"
2. During ditch block construction within avoidance areas contractor is to use footprint of existing channel for access to the maximum extent feasible in order to minimize disturbance within avoidance areas.
3. All ditch blocks need to be free of woody debris before fill placement begins.
4. Cultural resources monitors must be present during clearing and grubbing.

Removals

Existing Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
NORTH DAKOTA
DATE 09/04/2026

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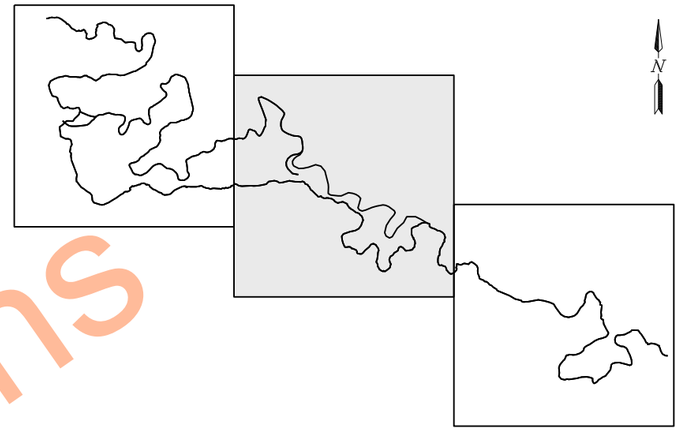
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	40	2



SPEC	CODE	BID ITEM	QTY	UNIT
201	300	CLEARING AND GRUBBING SHEET 2	14.55	ACRE
202	400	REMOVAL OF RIPRAP - LOOSE ROCK SHEET 2	130	CY

Legend:

- XXXX' — Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Clearing & Grubbing
- Removal of Riprap - Loose Rock

Notes:

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3. All ditch blocks need to be free of woody debris before fill placement begins.
4. Cultural resources monitors must be present during clearing and grubbing.

Removals

Existing Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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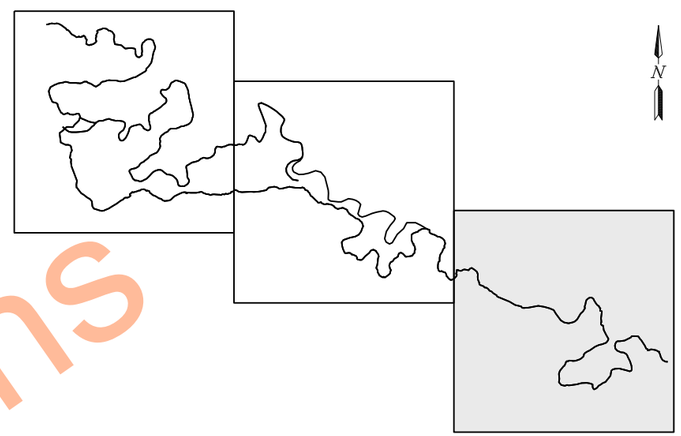
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	40	3





SPEC	CODE	BID ITEM	QTY	UNIT
201	300	CLEARING AND GRUBBING		
		SHEET 3	1.54	ACRE

Legend:

- XXXX' — Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Clearing & Grubbing
- Removal of Riprap - Loose Rock

Notes:

1. Existing Turf Reinforcement Mat (TRM) beneath existing riprap. Include the cost for removal and disposal of TRM in the unit price bid for "REMOVAL OF RIPRAP - LOOSE ROCK"
2. During ditch block construction within avoidance areas contractor is to use footprint of existing channel for access to the maximum extent feasible in order to minimize disturbance within avoidance areas.
3. All ditch blocks need to be free of woody debris before fill placement begins.
4. Cultural resources monitors must be present during clearing and grubbing.

Removals

Existing Conditions

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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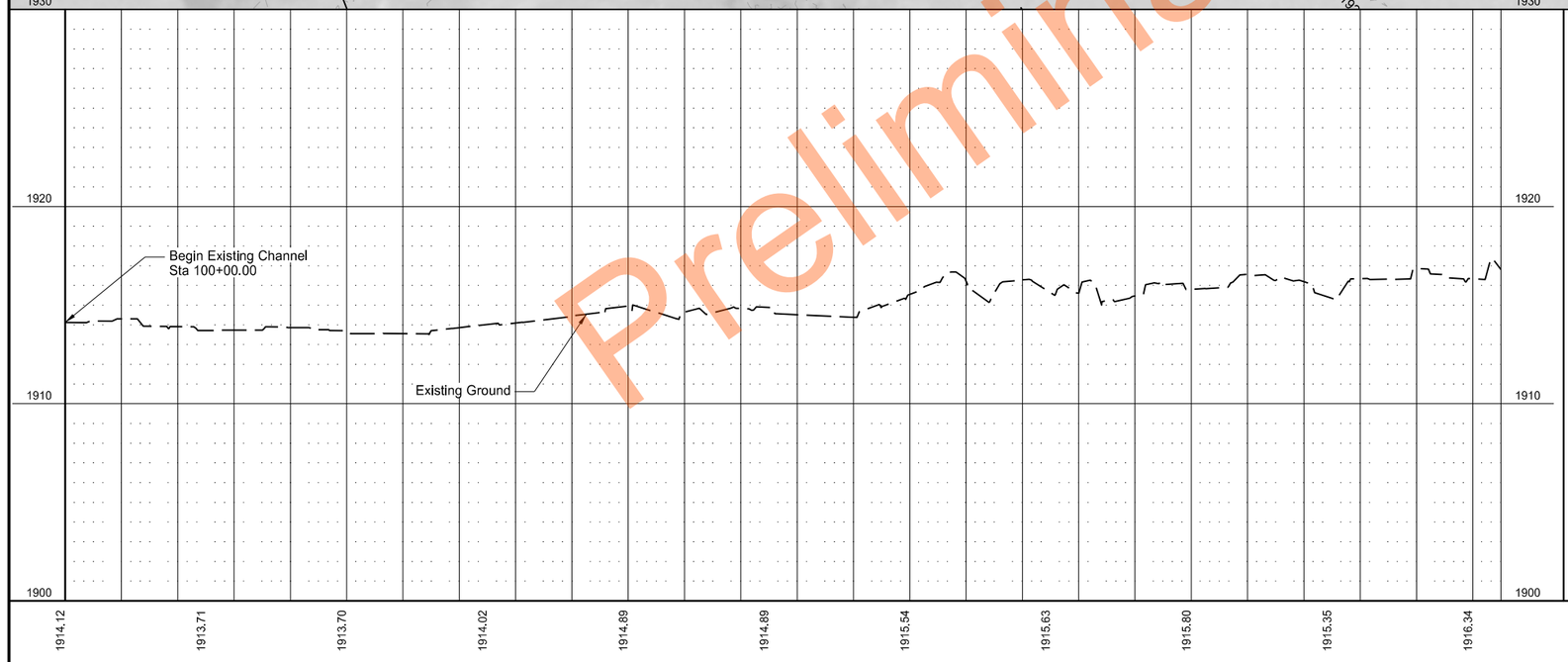
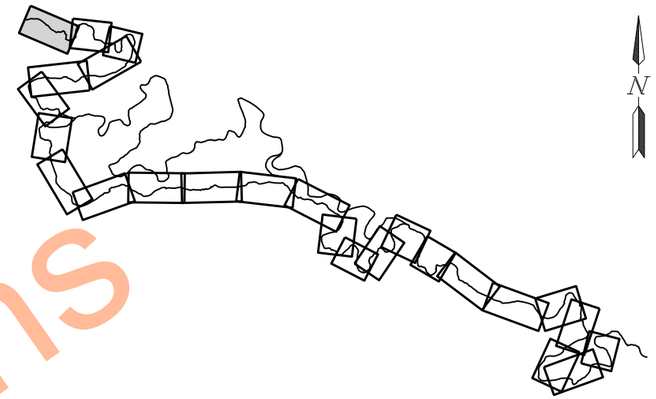
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	60	1







Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Temporary Construction Access
- BWP Fence Barbed Wire - Pneumatic Install
- BWH Fence Barbed Wire - Hand Install
- TSF Temporary Safety Fence
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle

Plan and Profile

Existing Channel

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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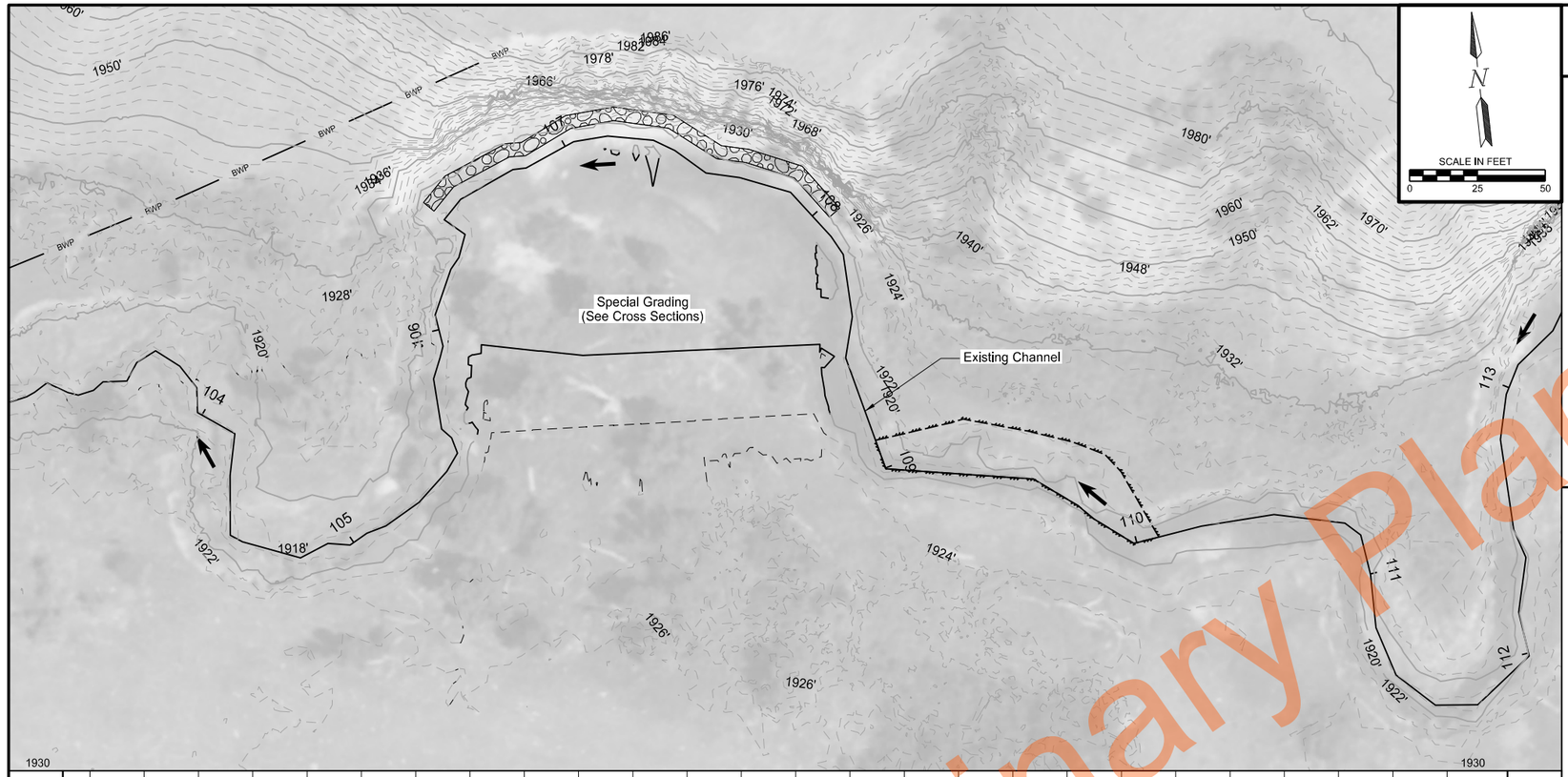
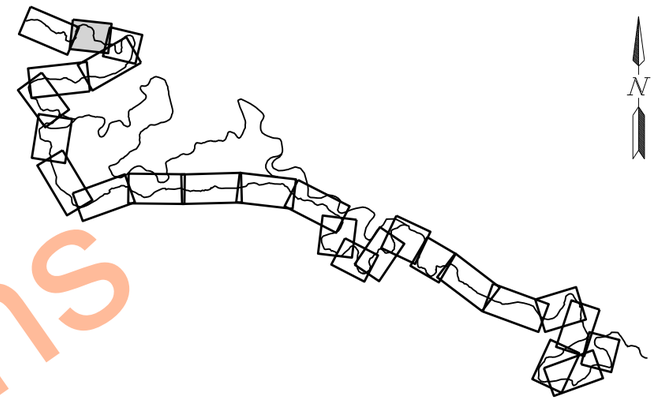
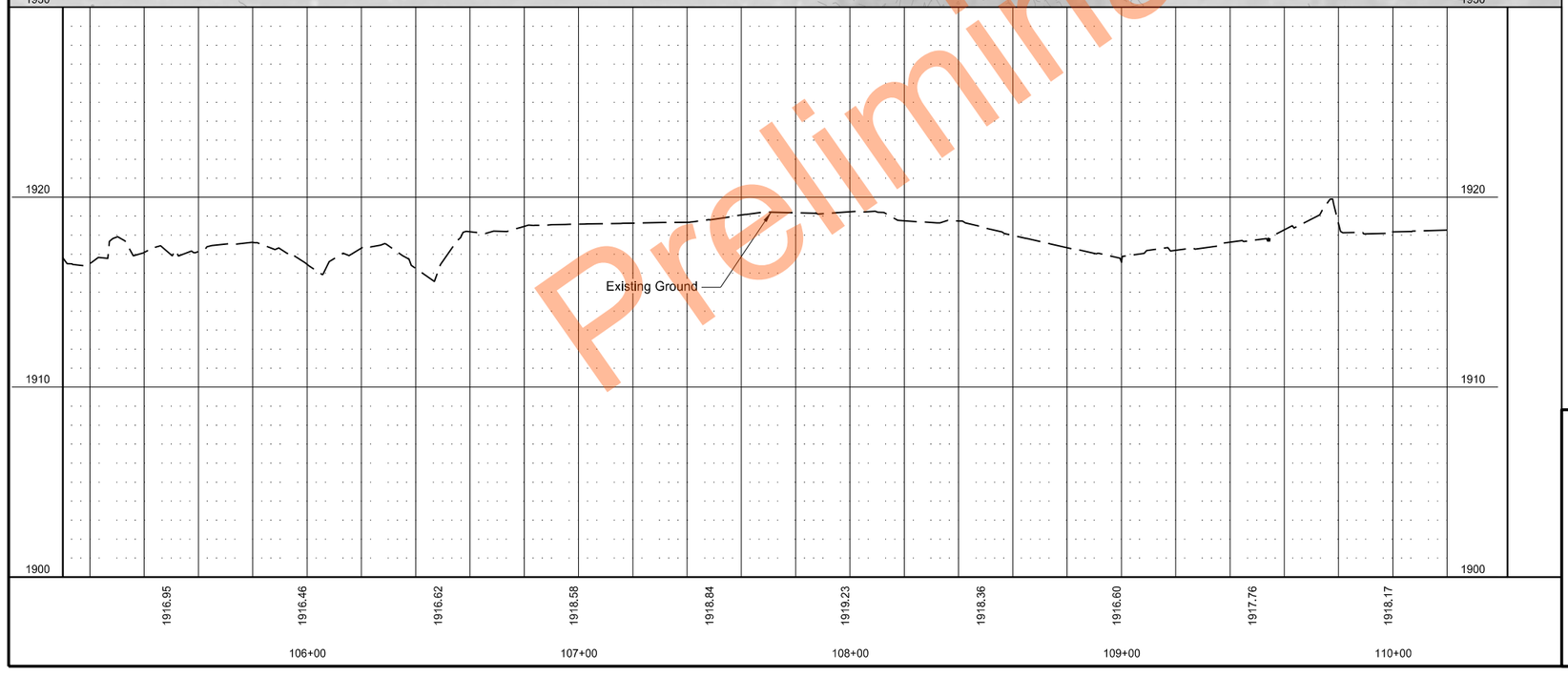
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	2







Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
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Plan and Profile

Existing Channel

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
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DATE 09/04/2026
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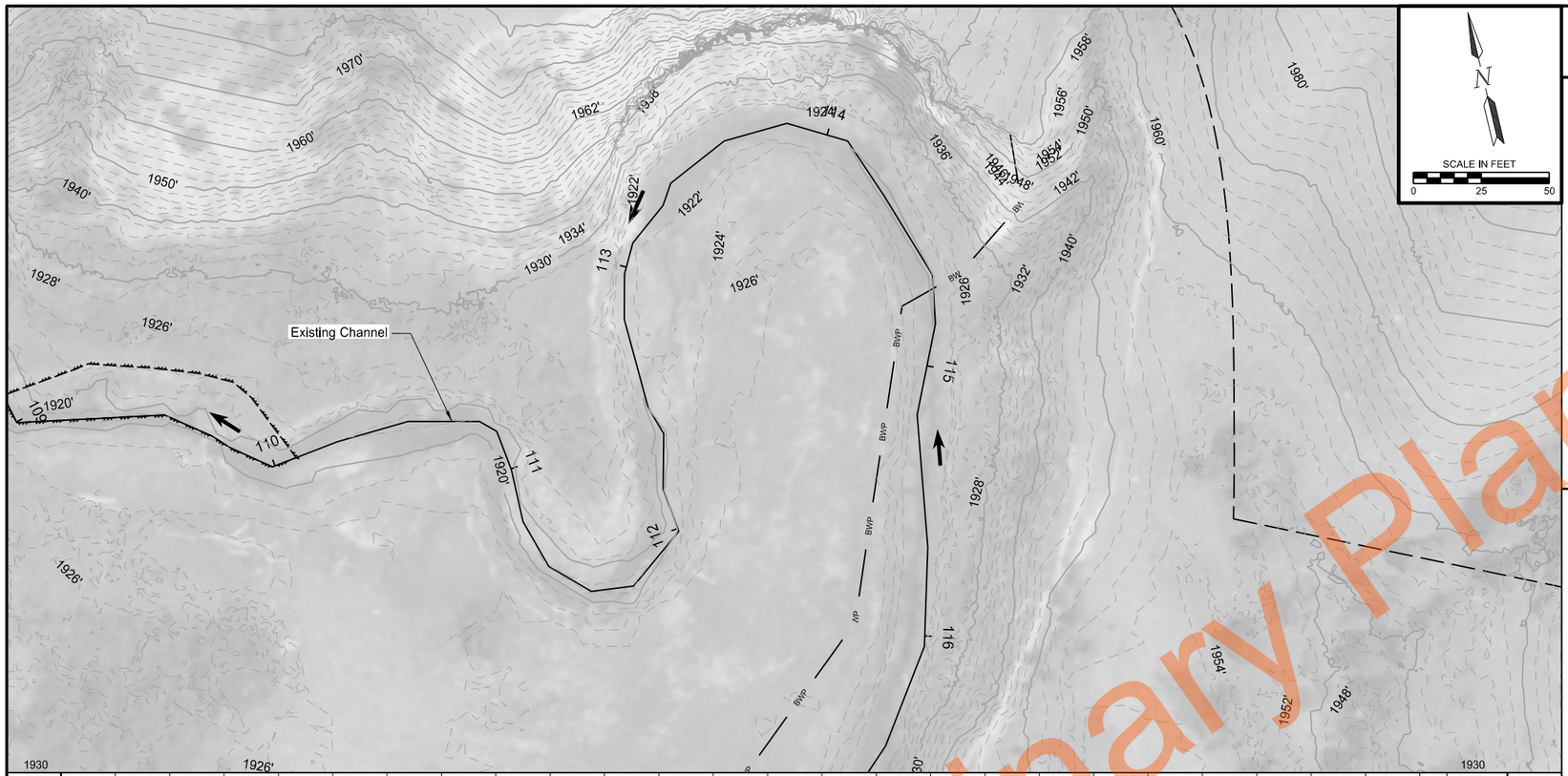
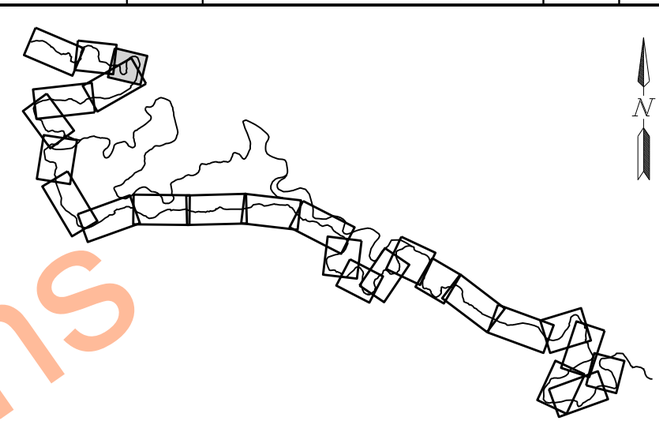
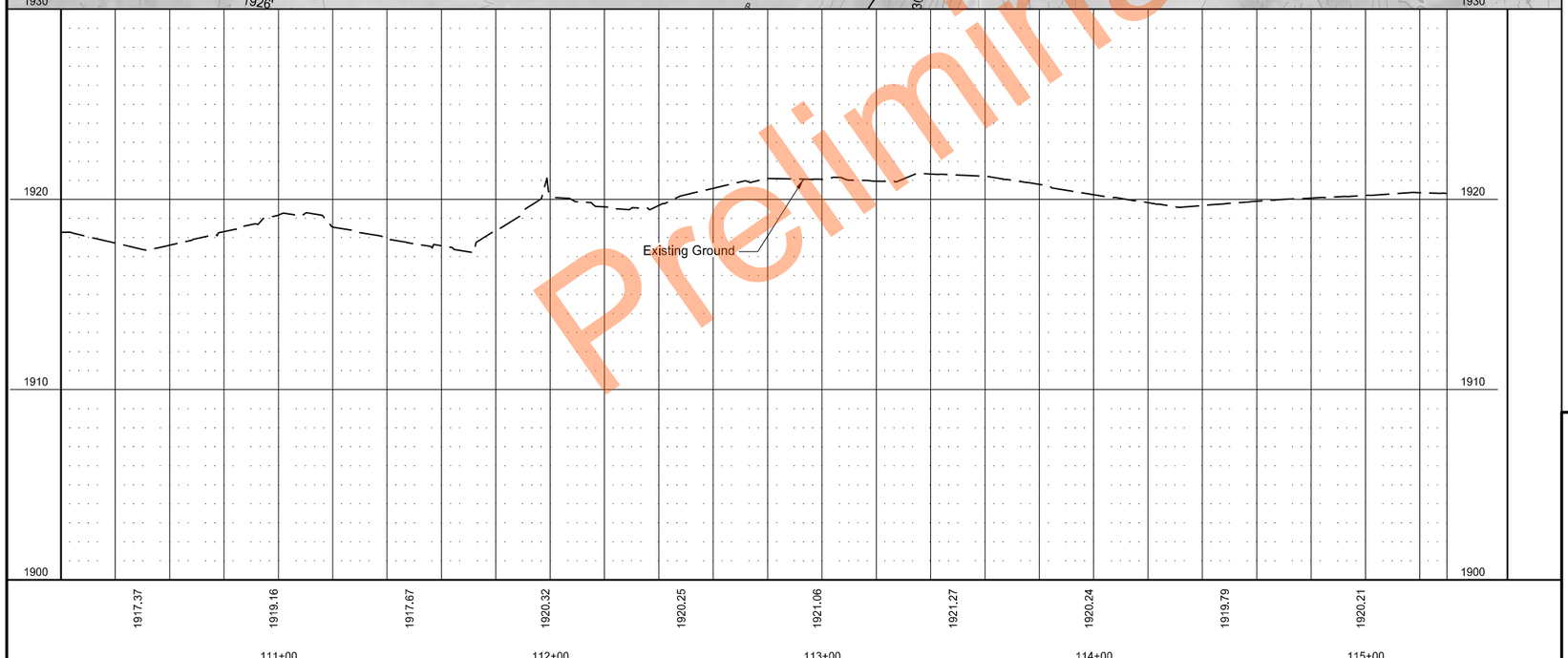
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	3







Legend:

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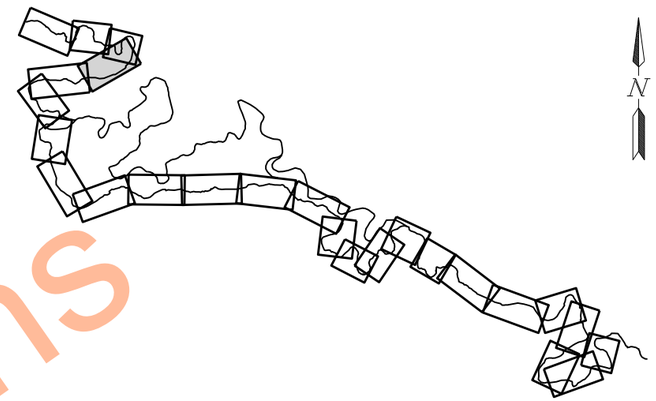
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	4





Legend:

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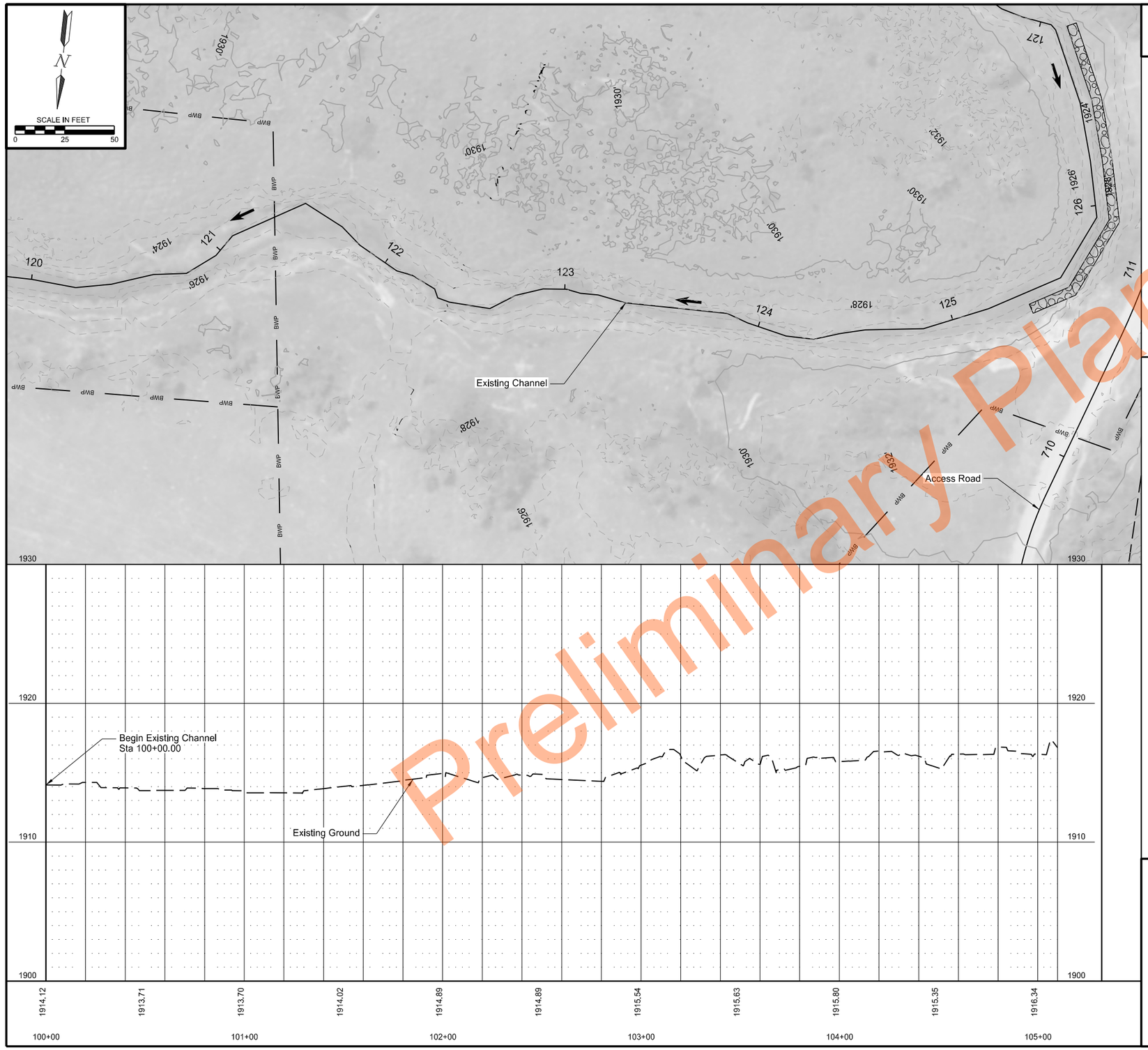
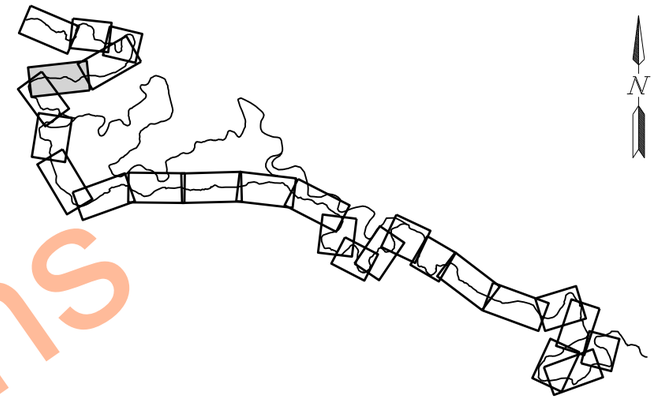
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	5





Legend:

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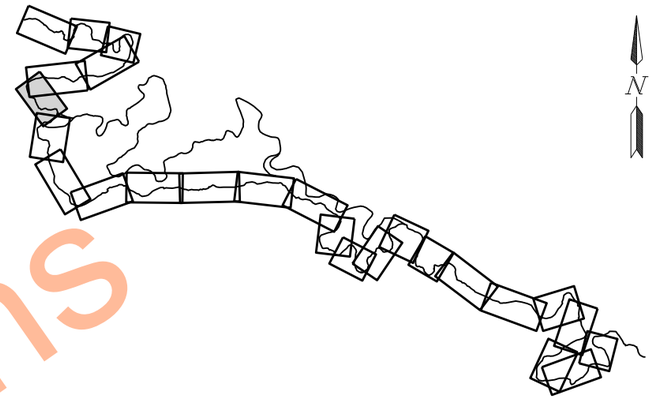
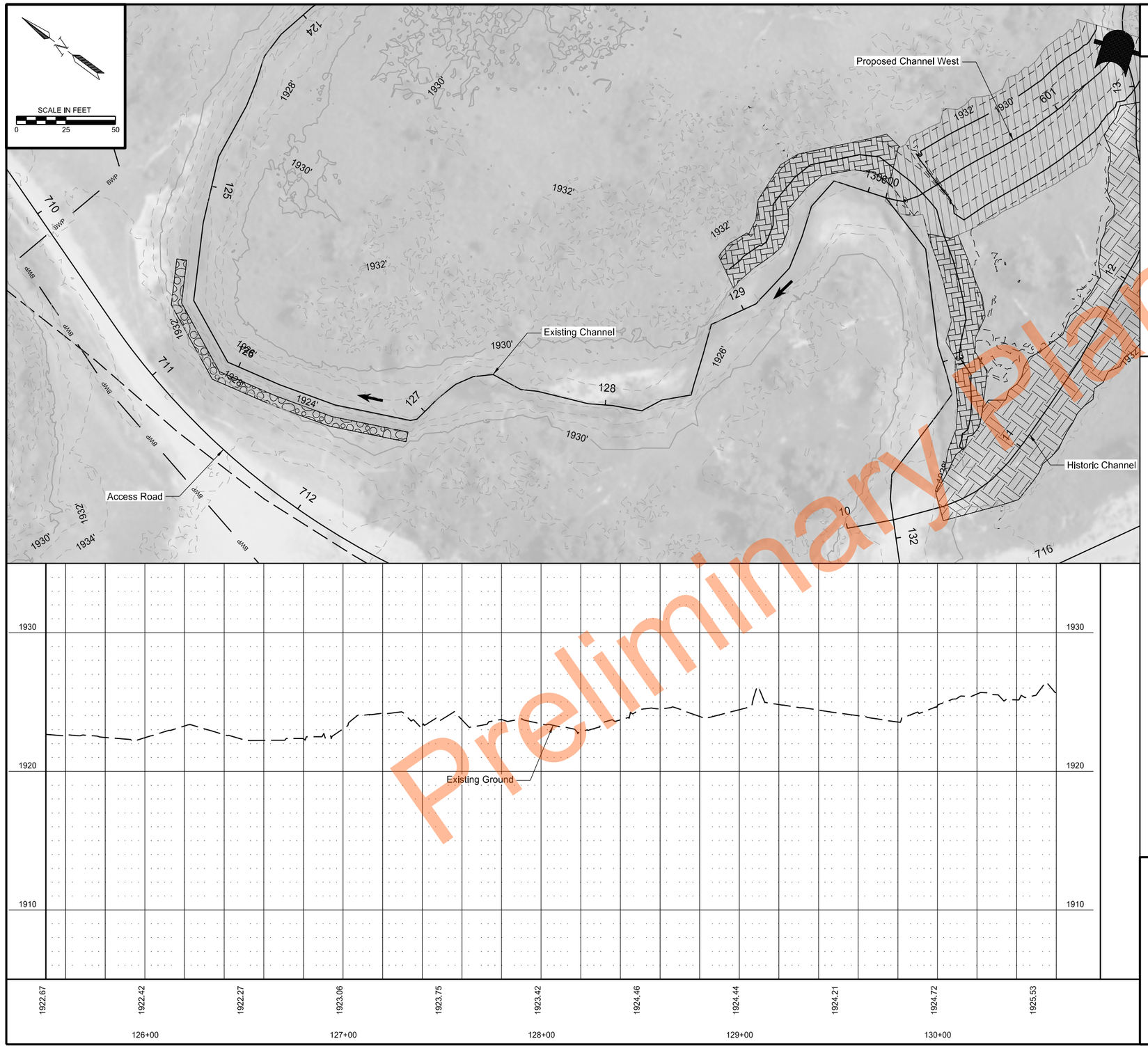
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	6





Legend:

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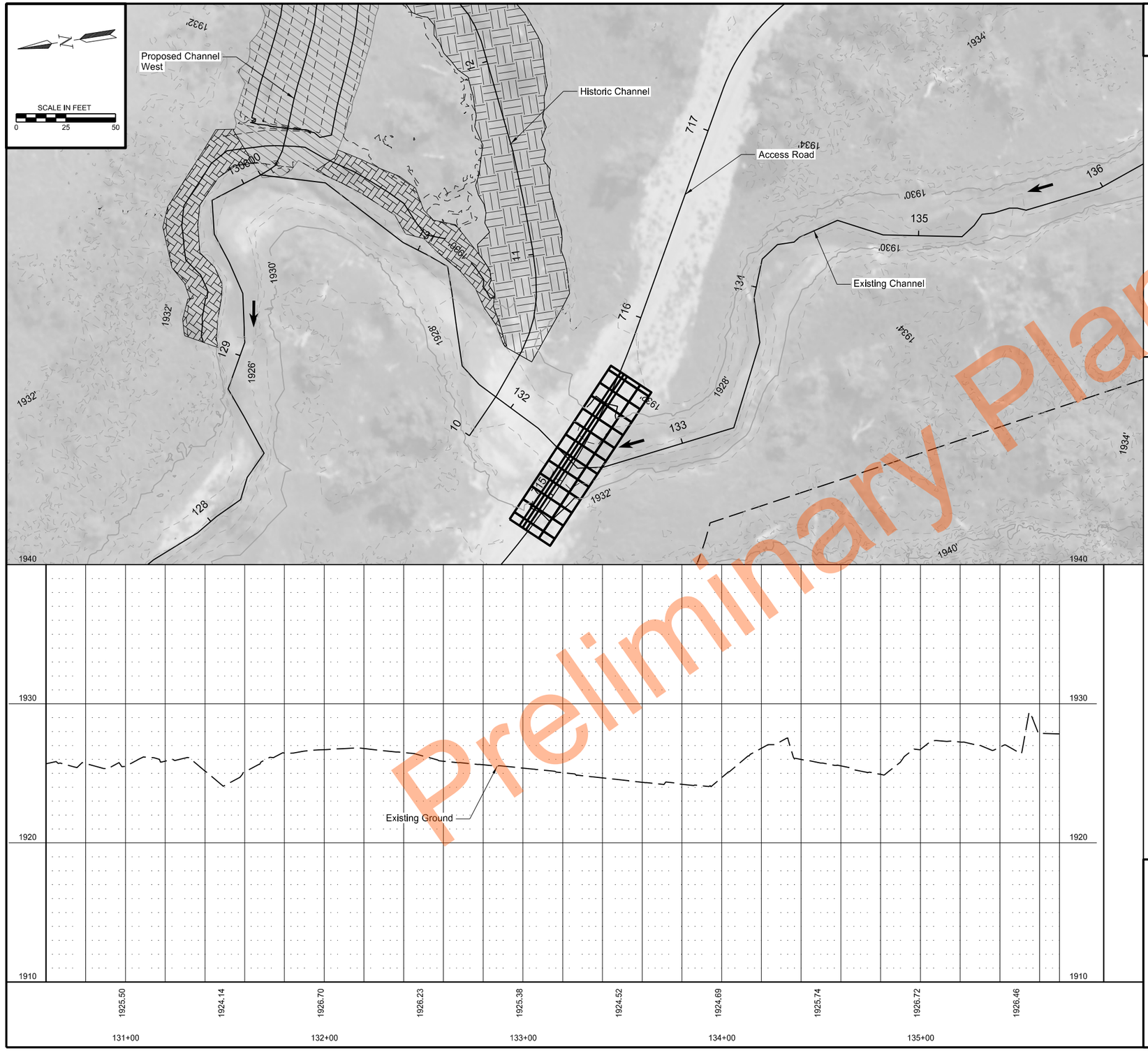
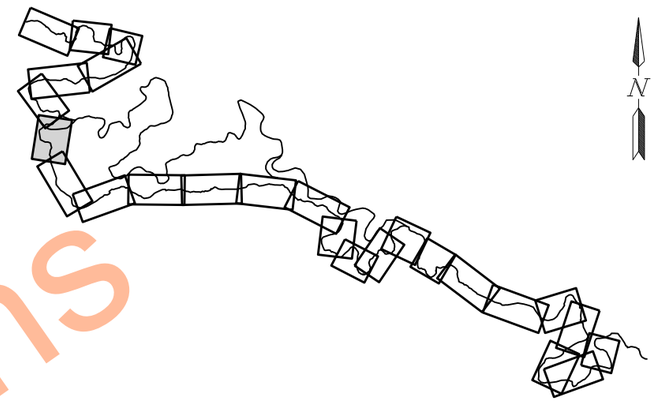
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	7





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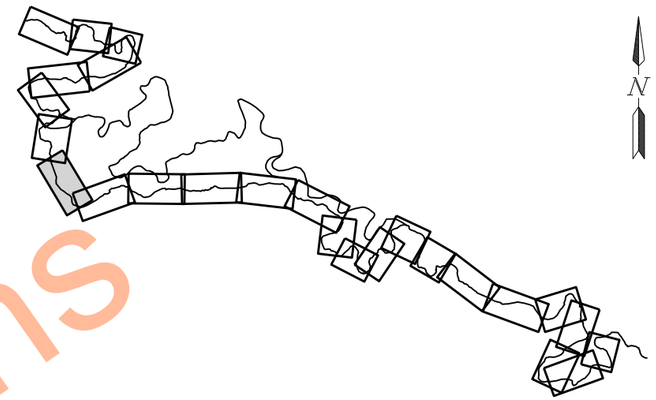
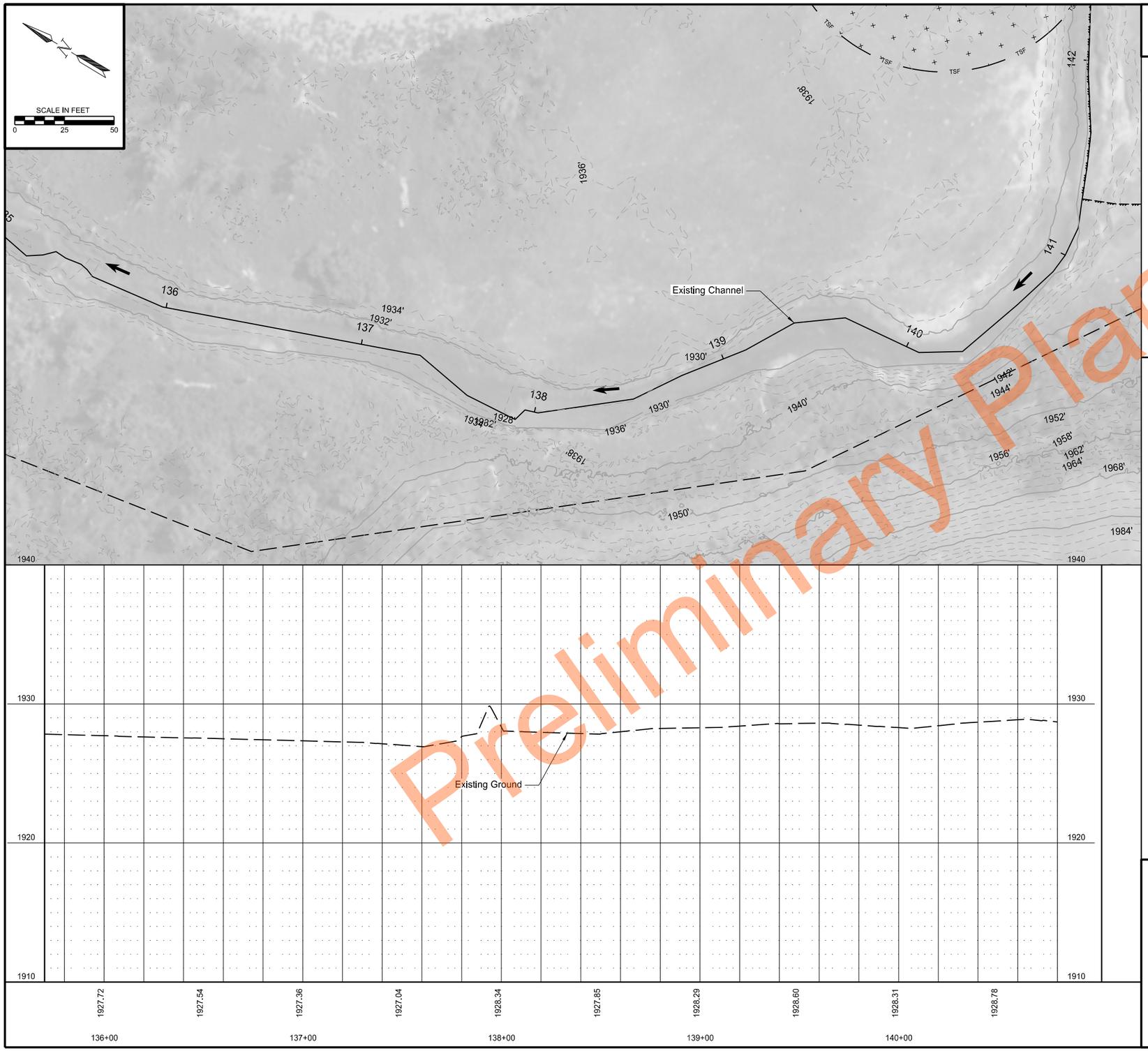
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	8





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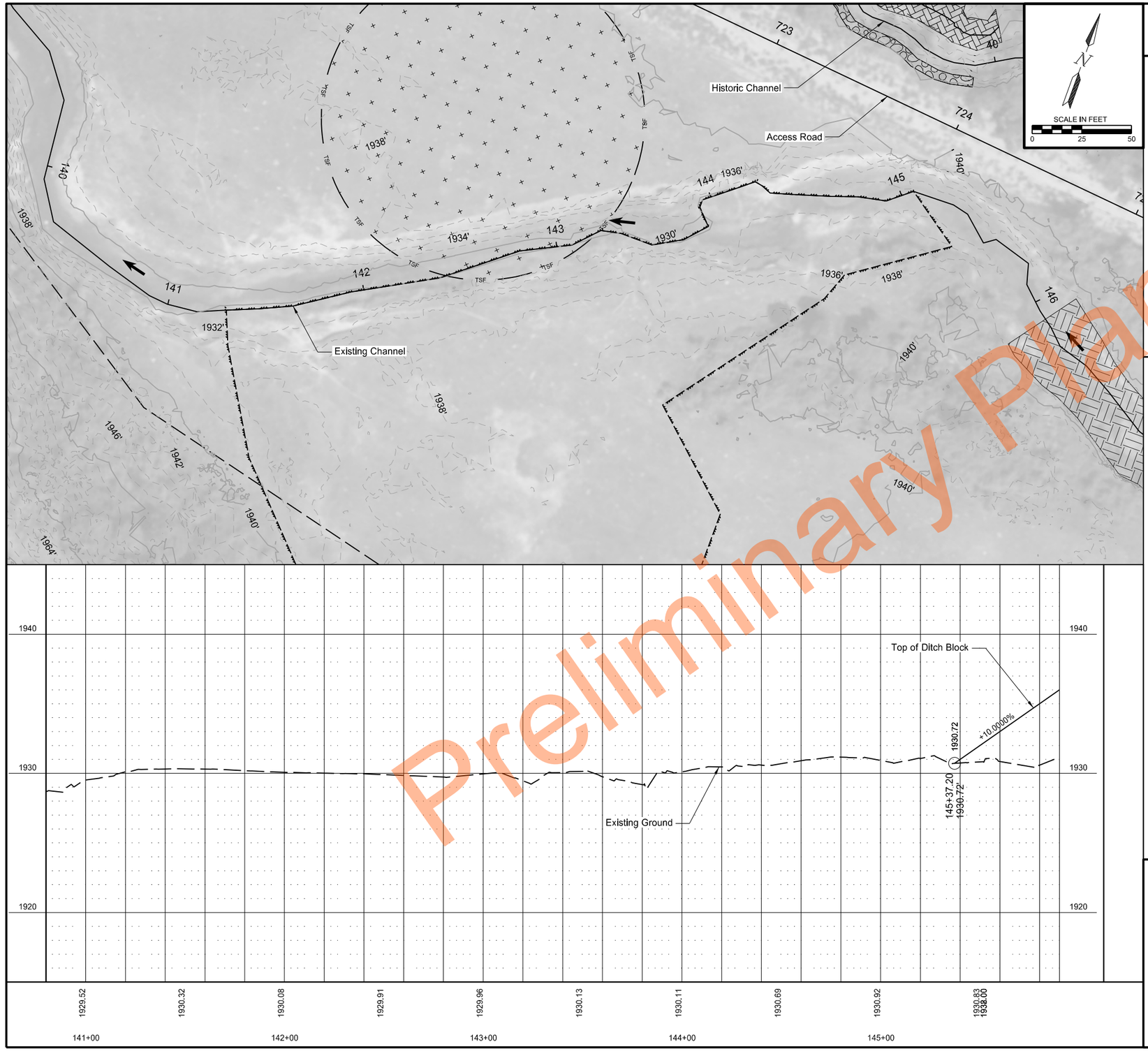
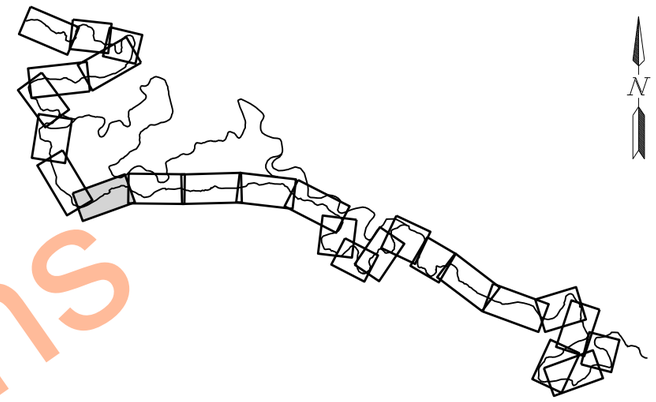
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	9





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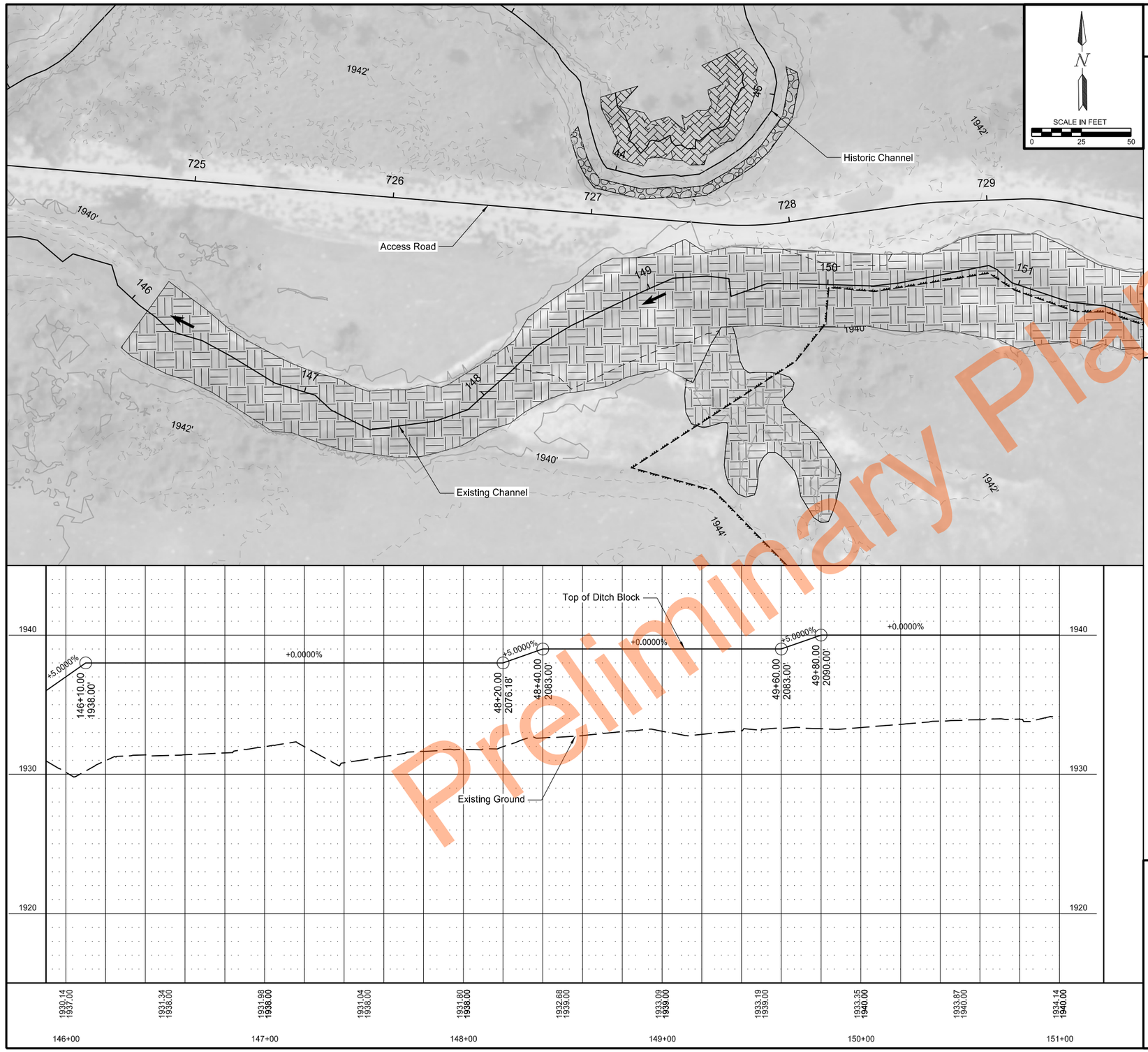
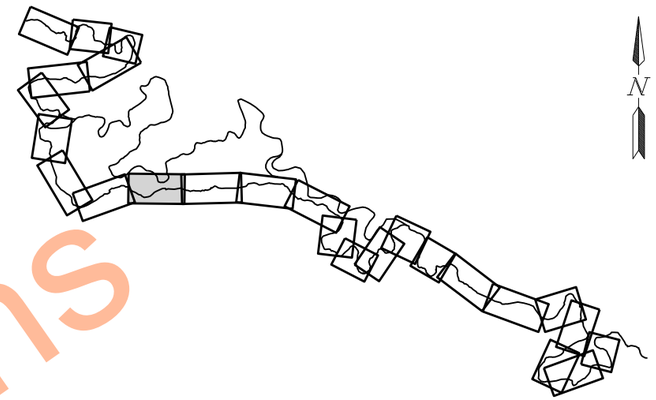
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	10





Legend:

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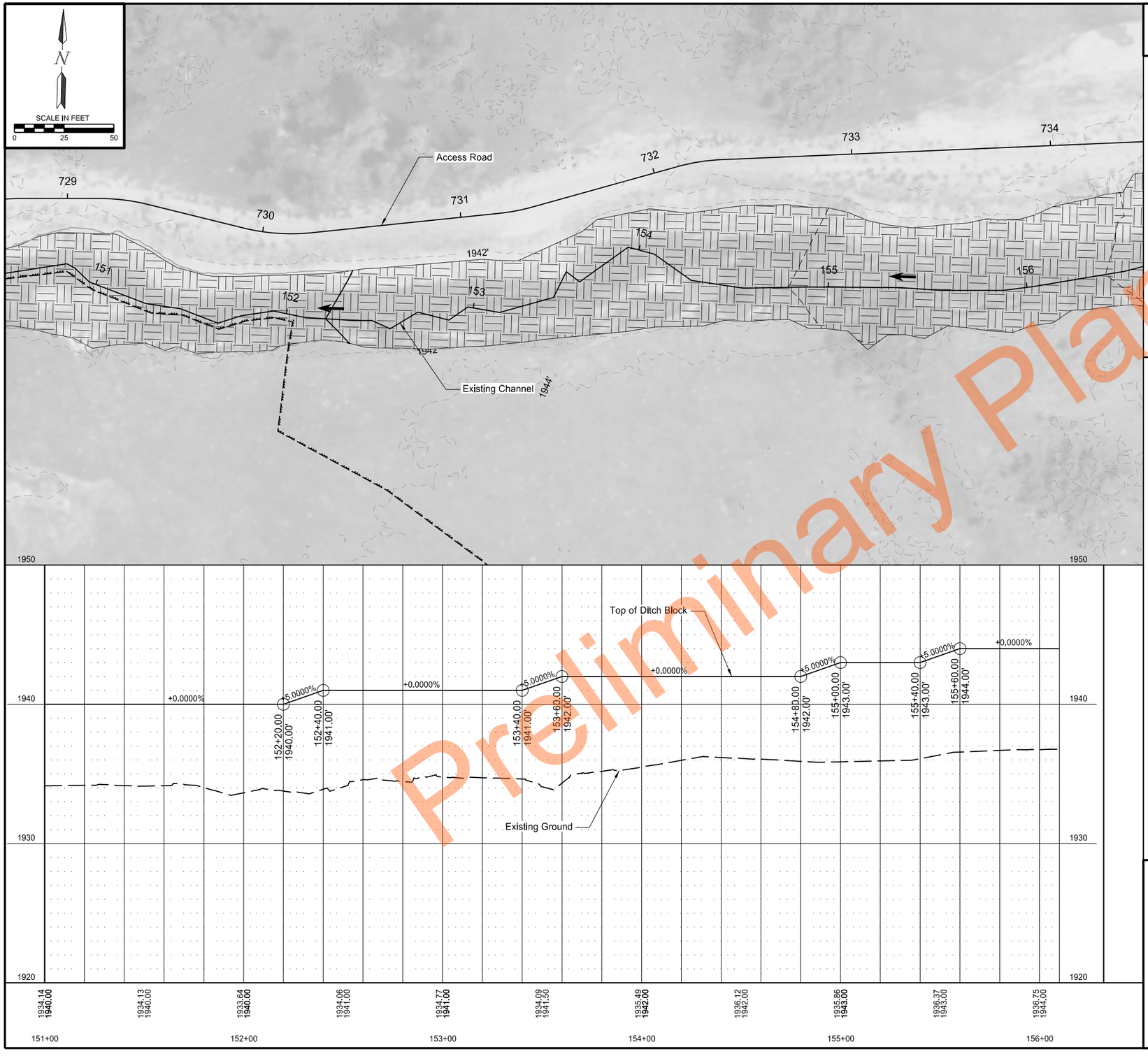
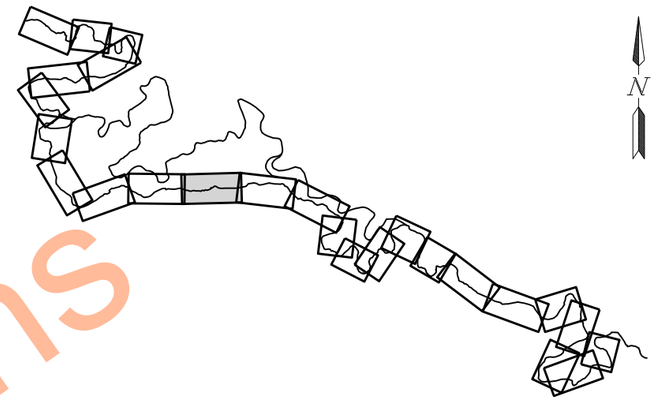
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	11





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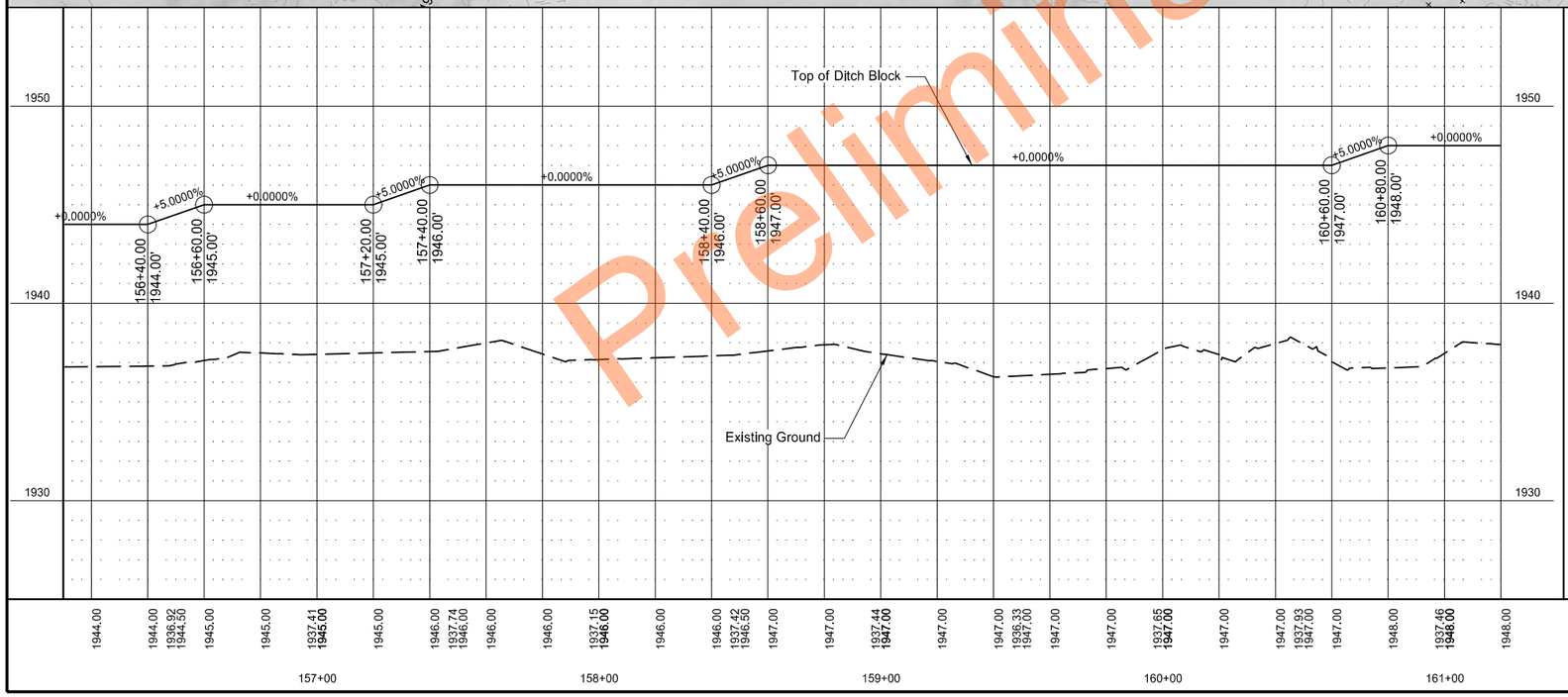
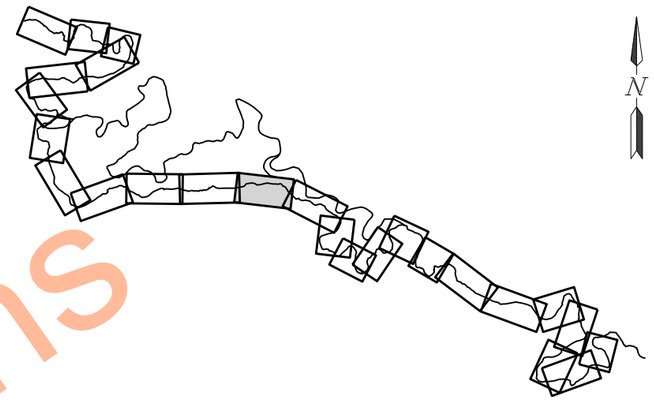
ND	SS-ARP-9-999(488)	60	12







Legend:

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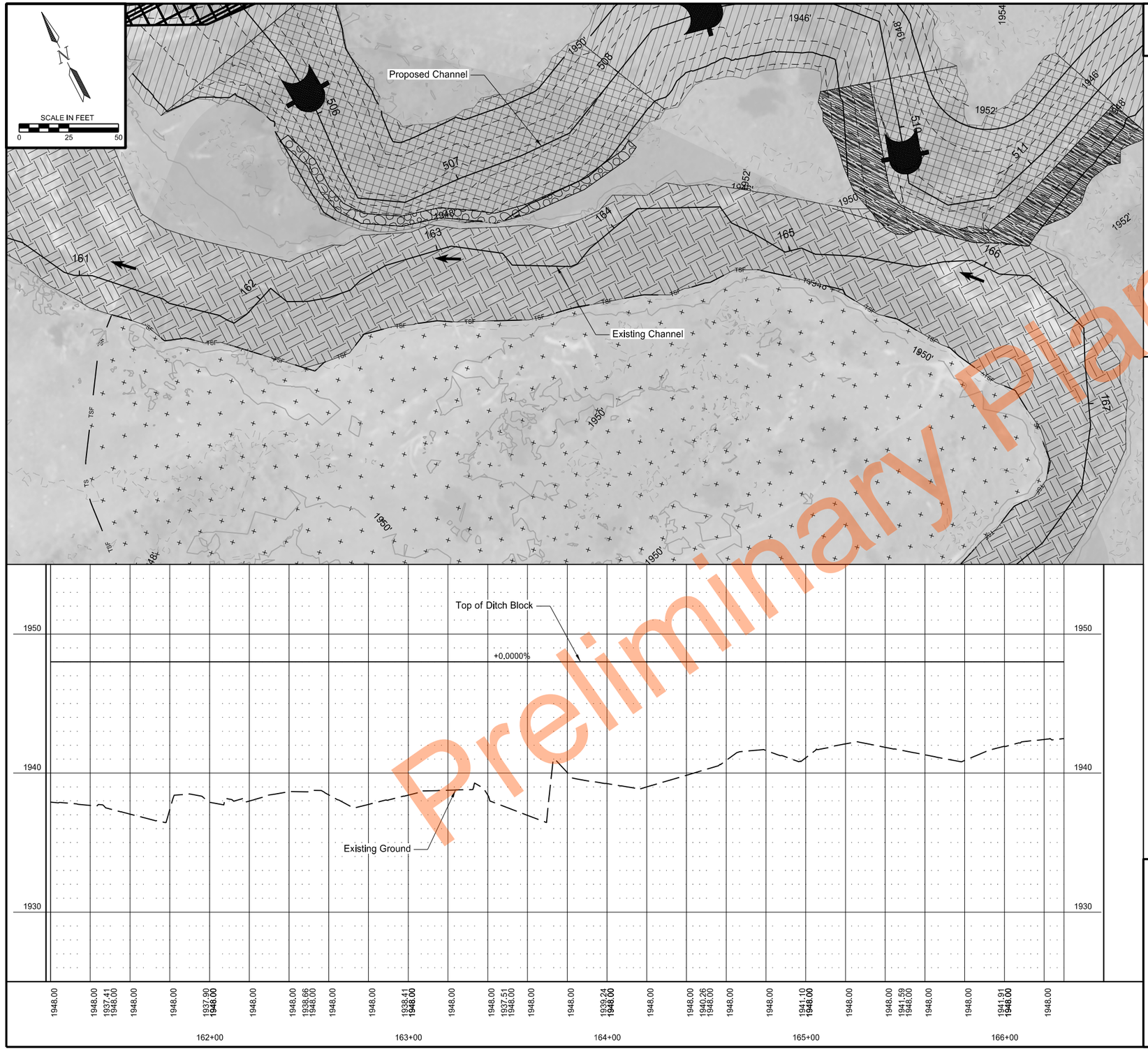
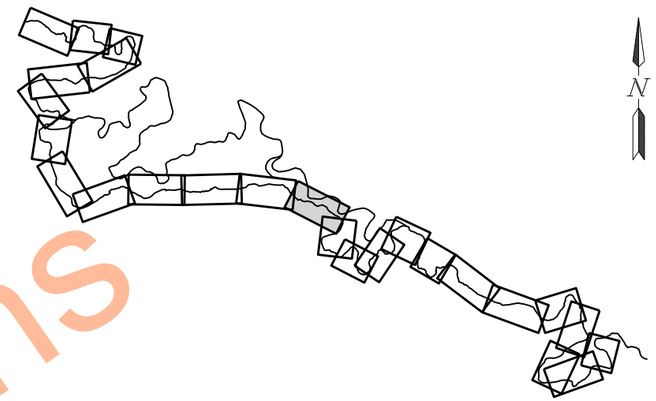
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	13





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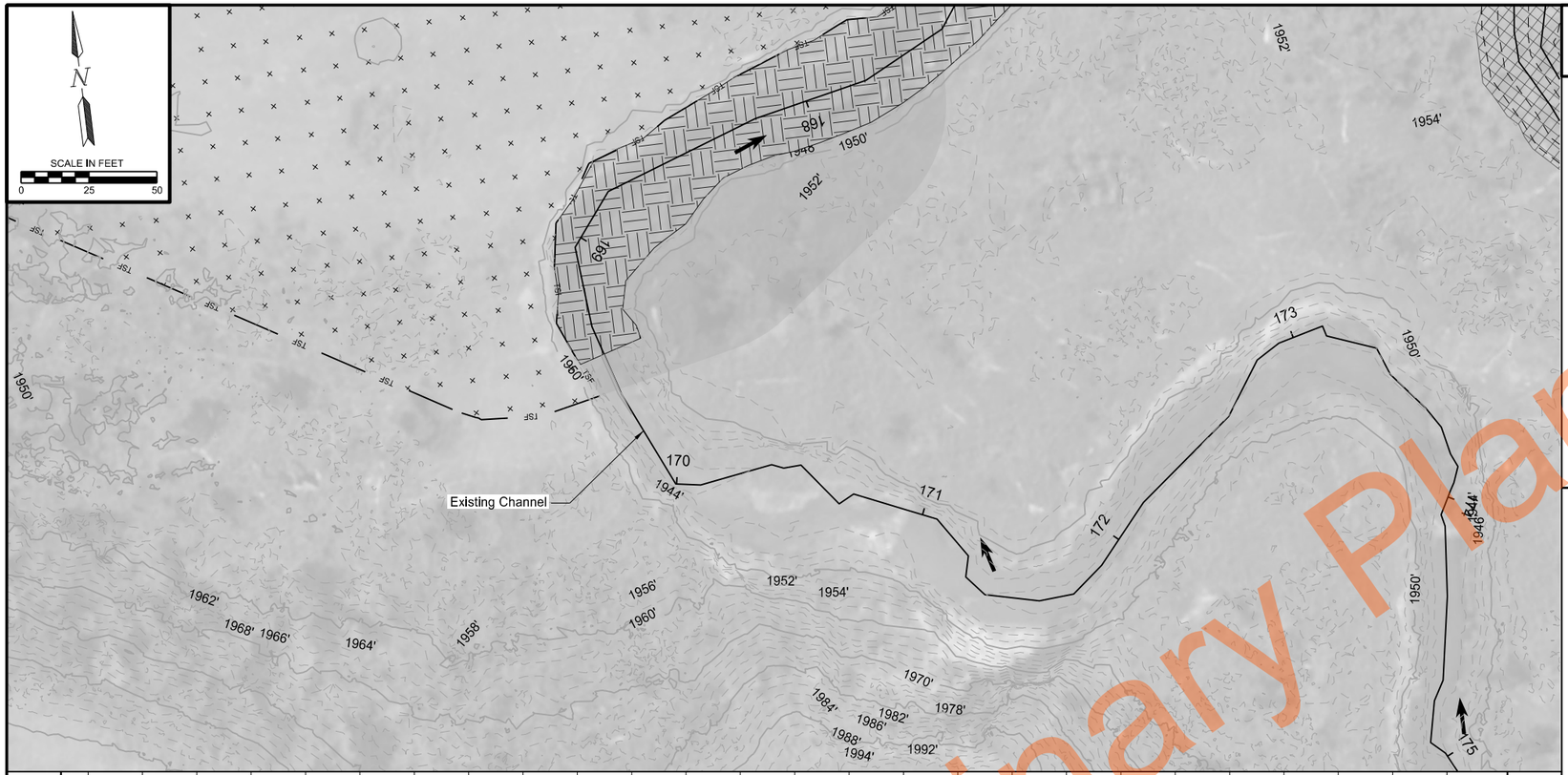
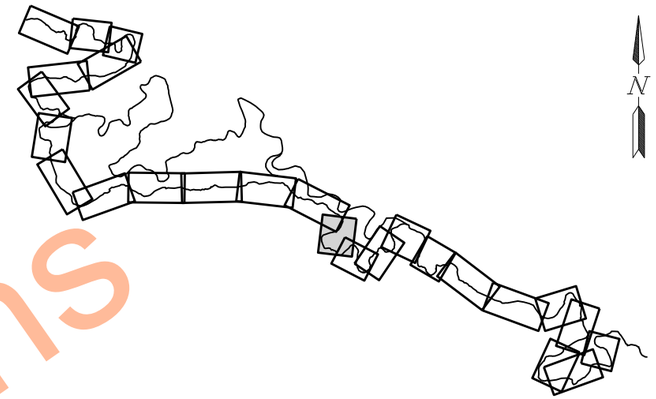
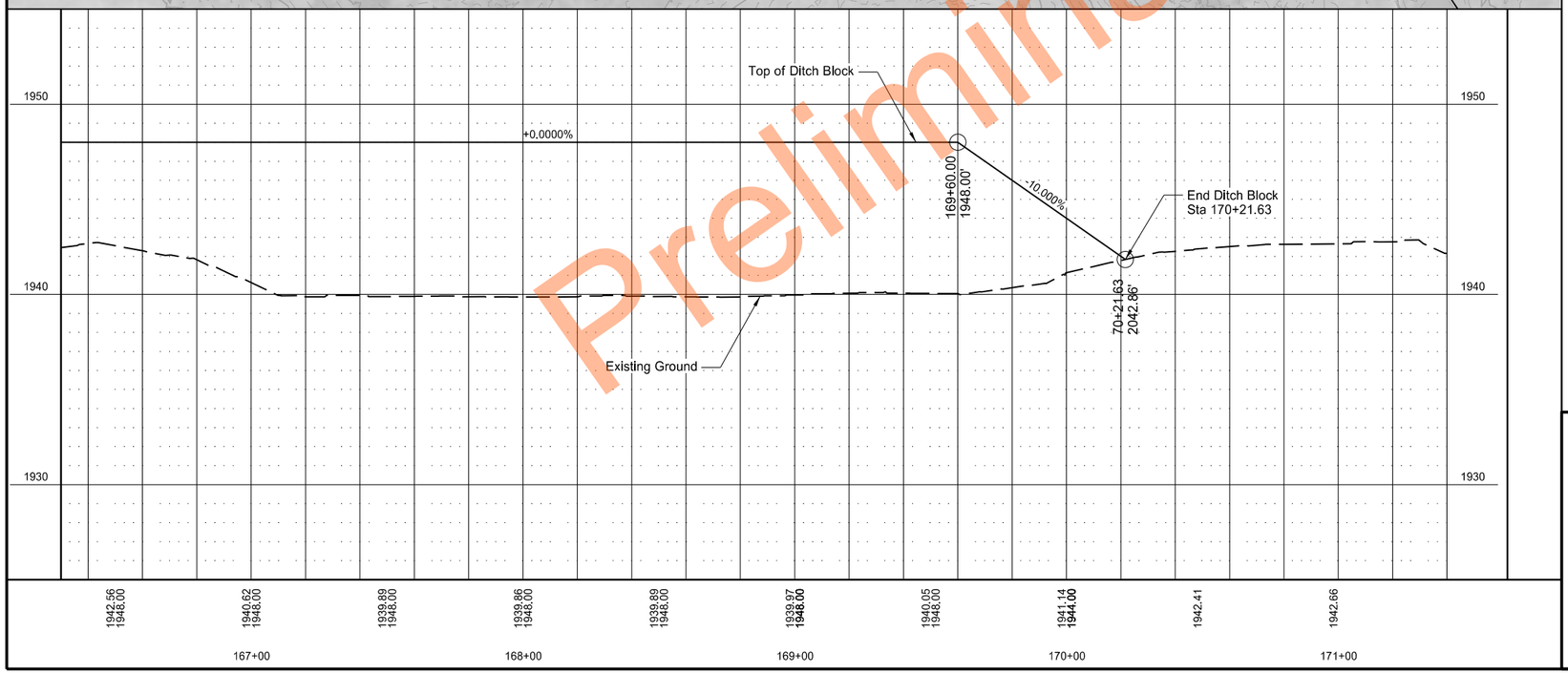
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	14







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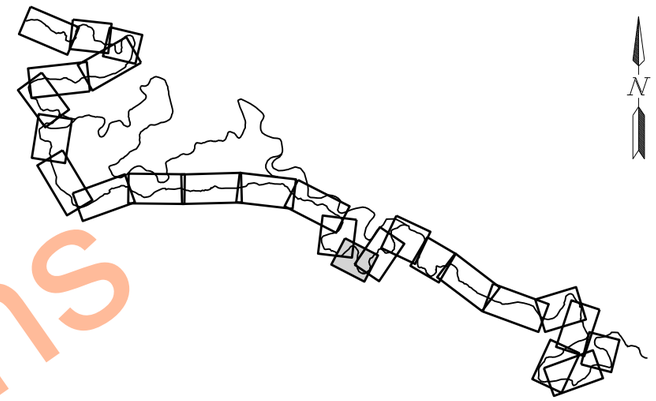
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	15





Legend:

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- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Temporary Construction Access
- BWP Fence Barbed Wire - Pneumatic Install
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Existing Channel

Sand Creek

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DATE 09/04/2026
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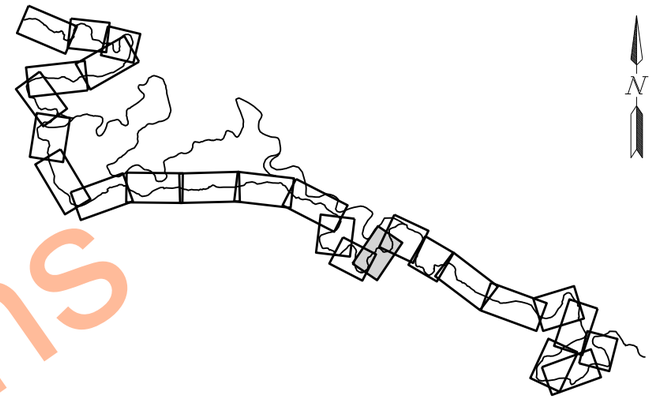
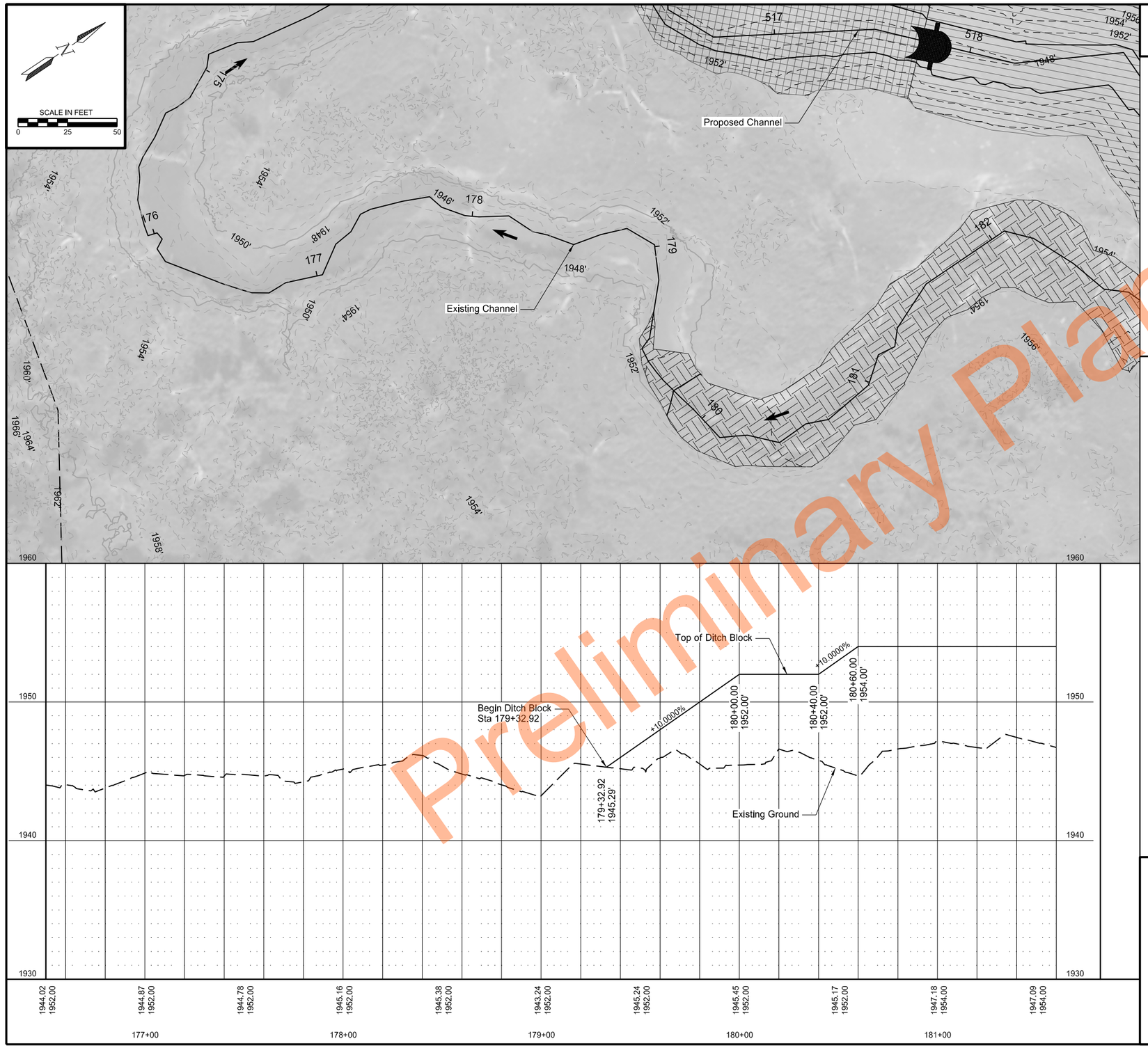
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	16





Legend:

- —XXXX'— Proposed Contour (Major)
- —XXXX'— Proposed Contour (Minor)
- —XXXX'— Existing Contour (Major)
- —XXXX'— Existing Contour (Minor)
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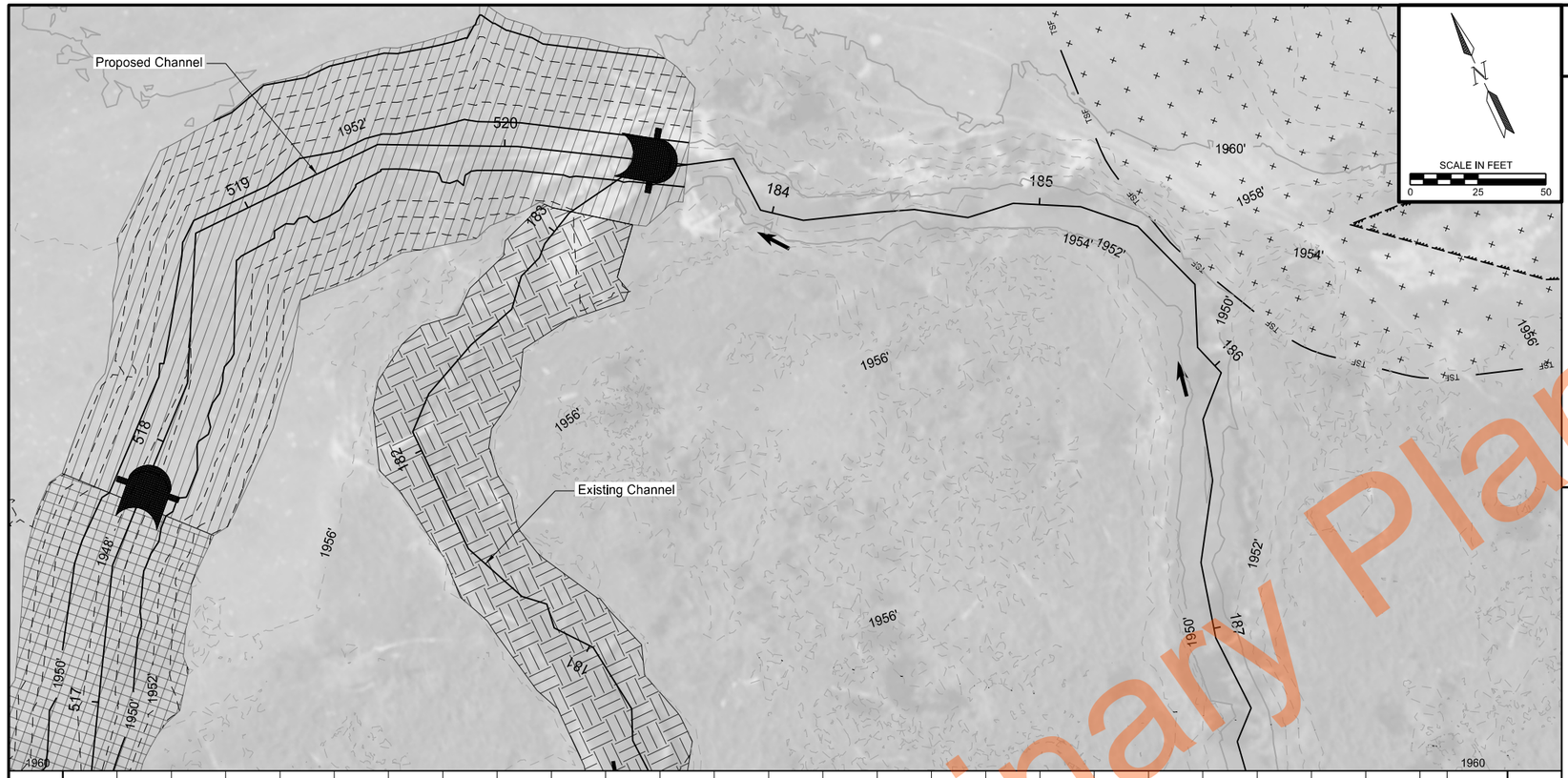
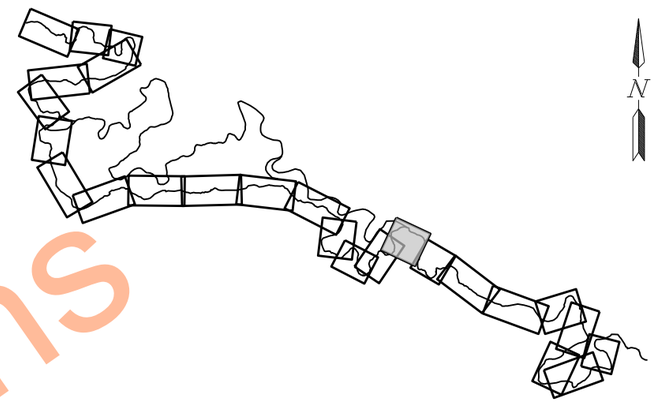
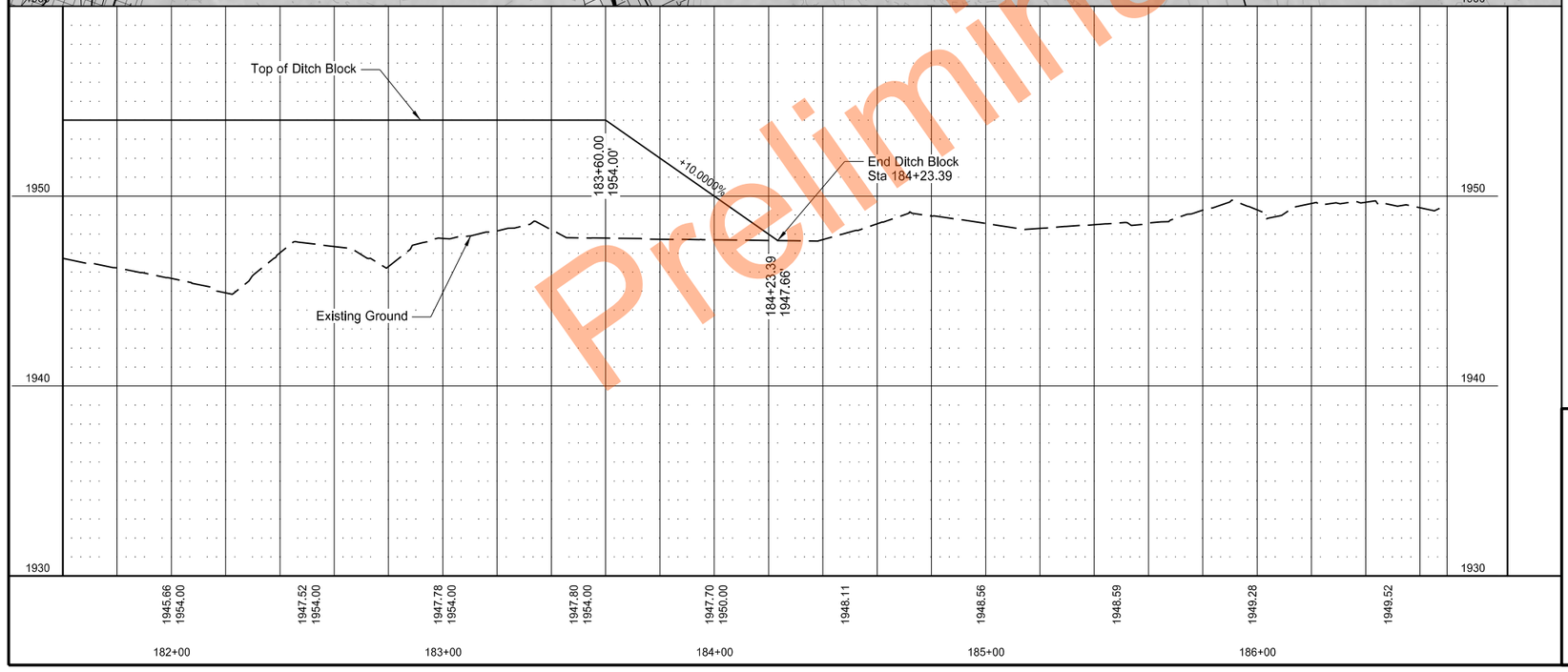
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	17







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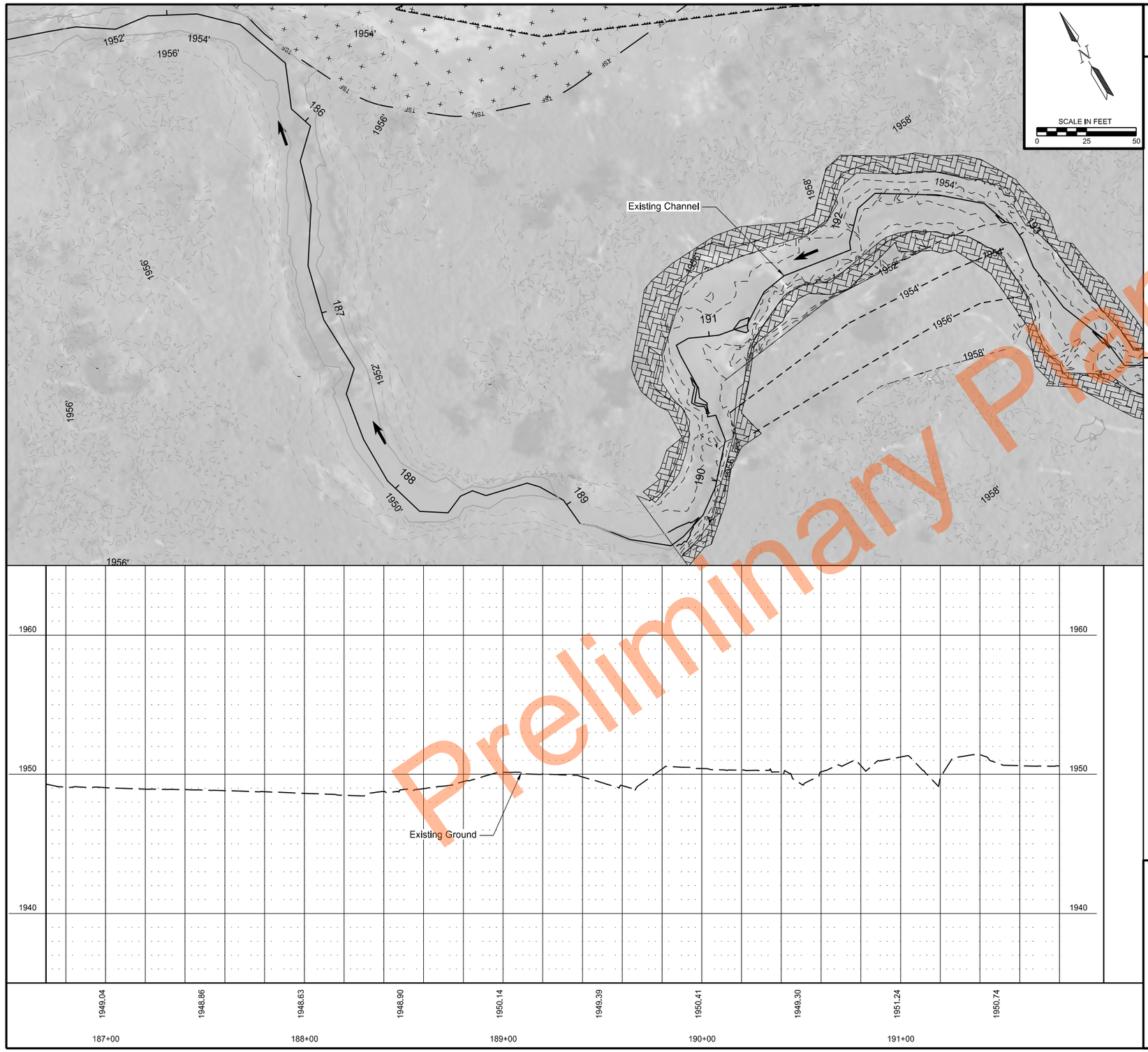
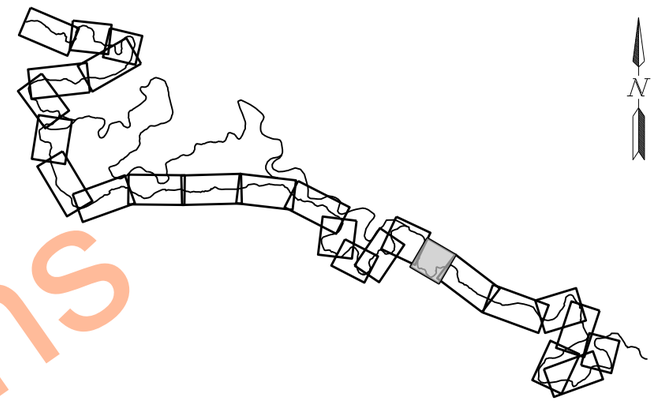
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	18





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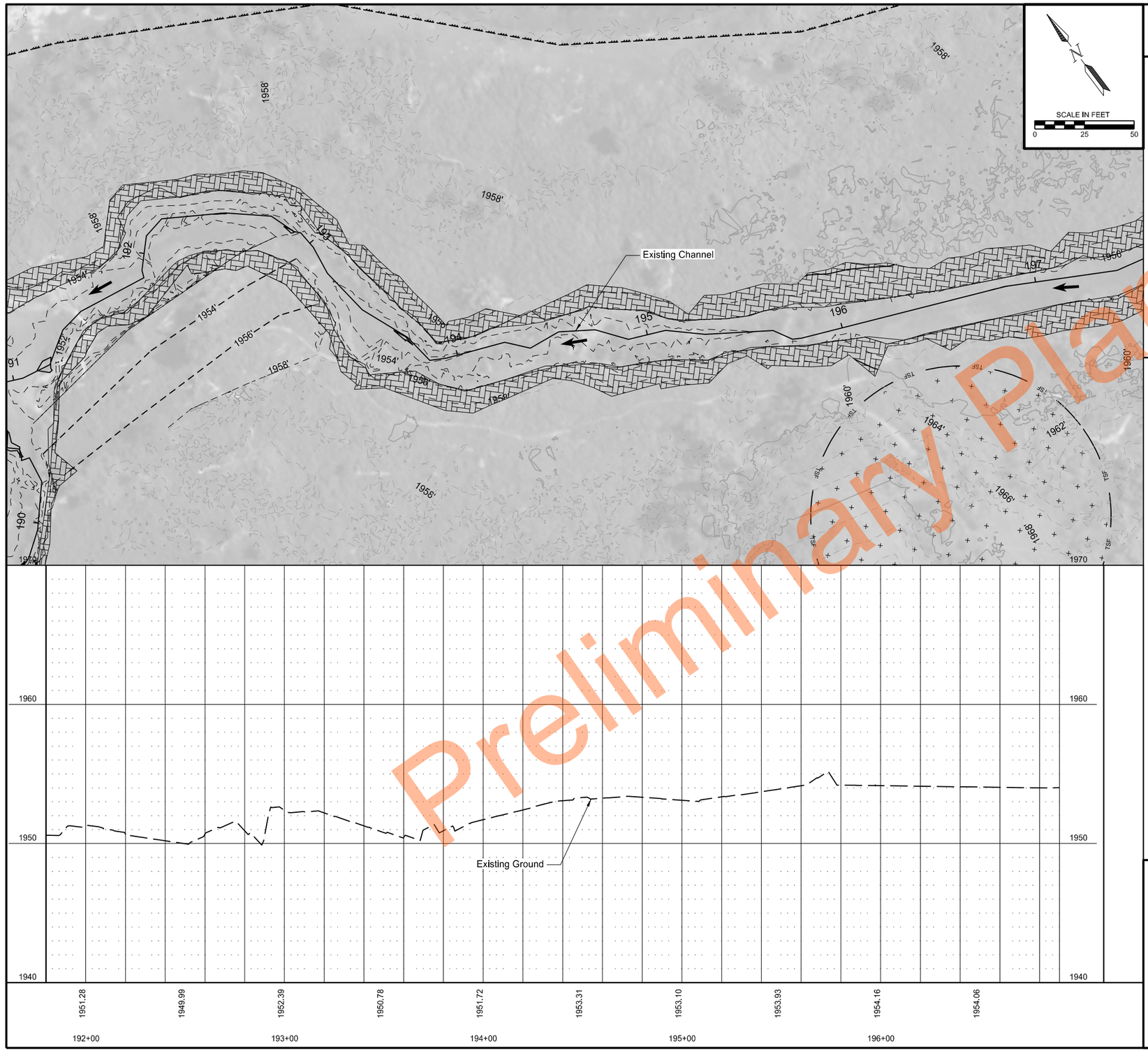
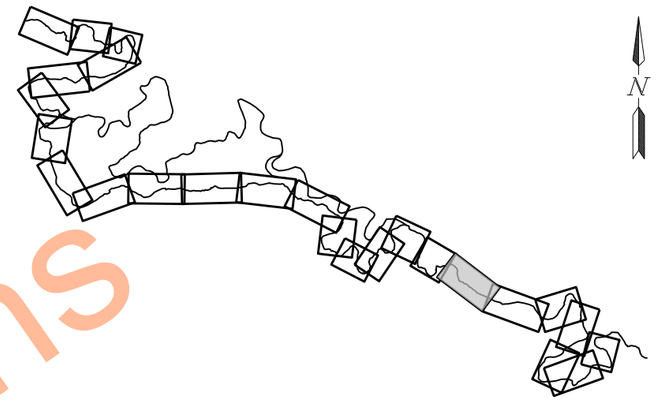
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	19





Legend:

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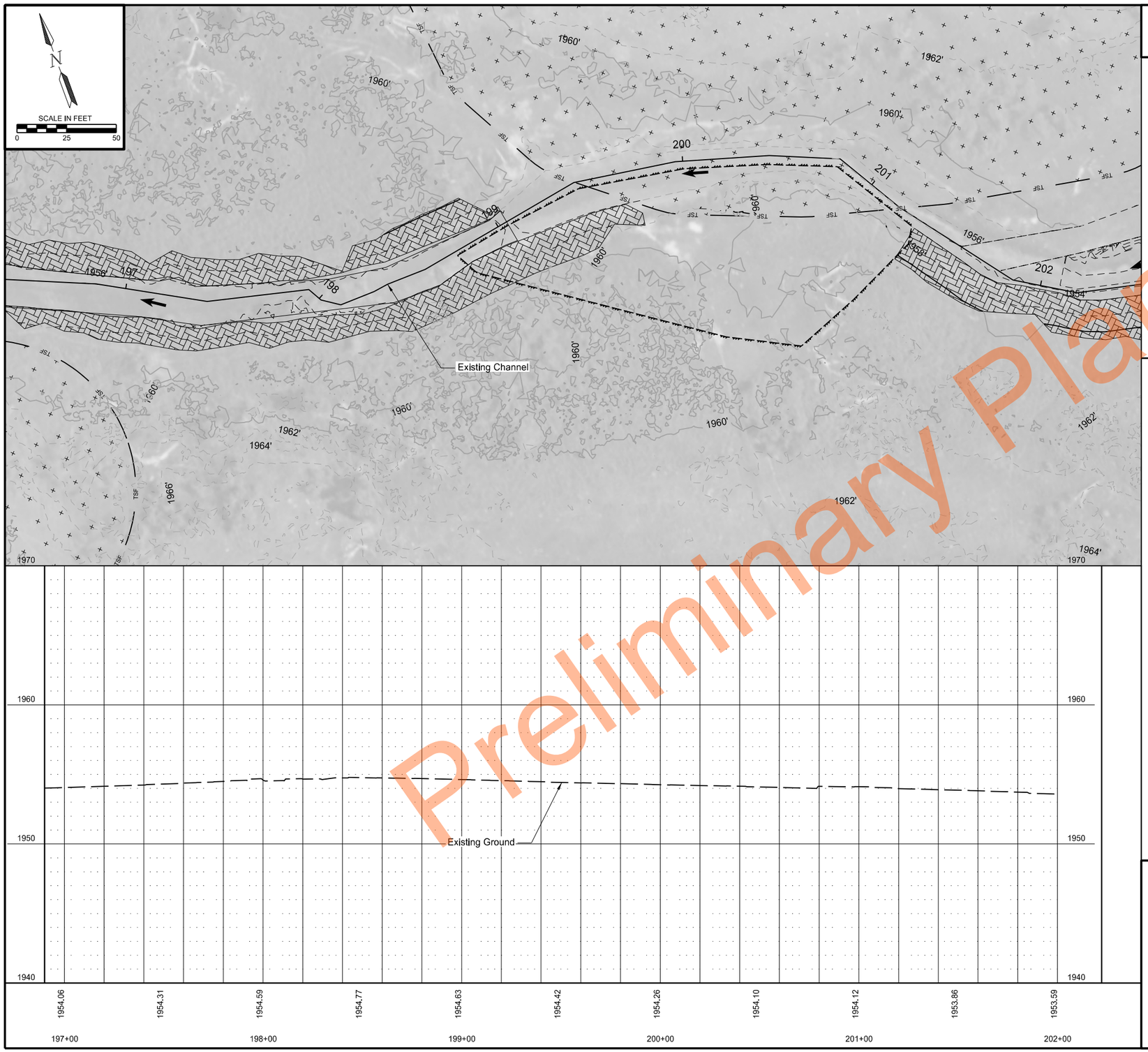
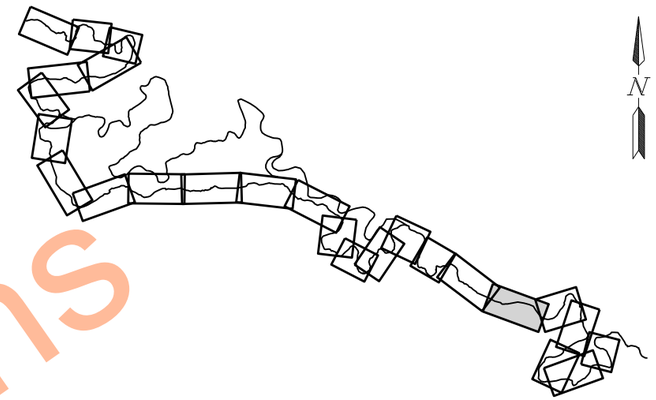
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	20





Legend:

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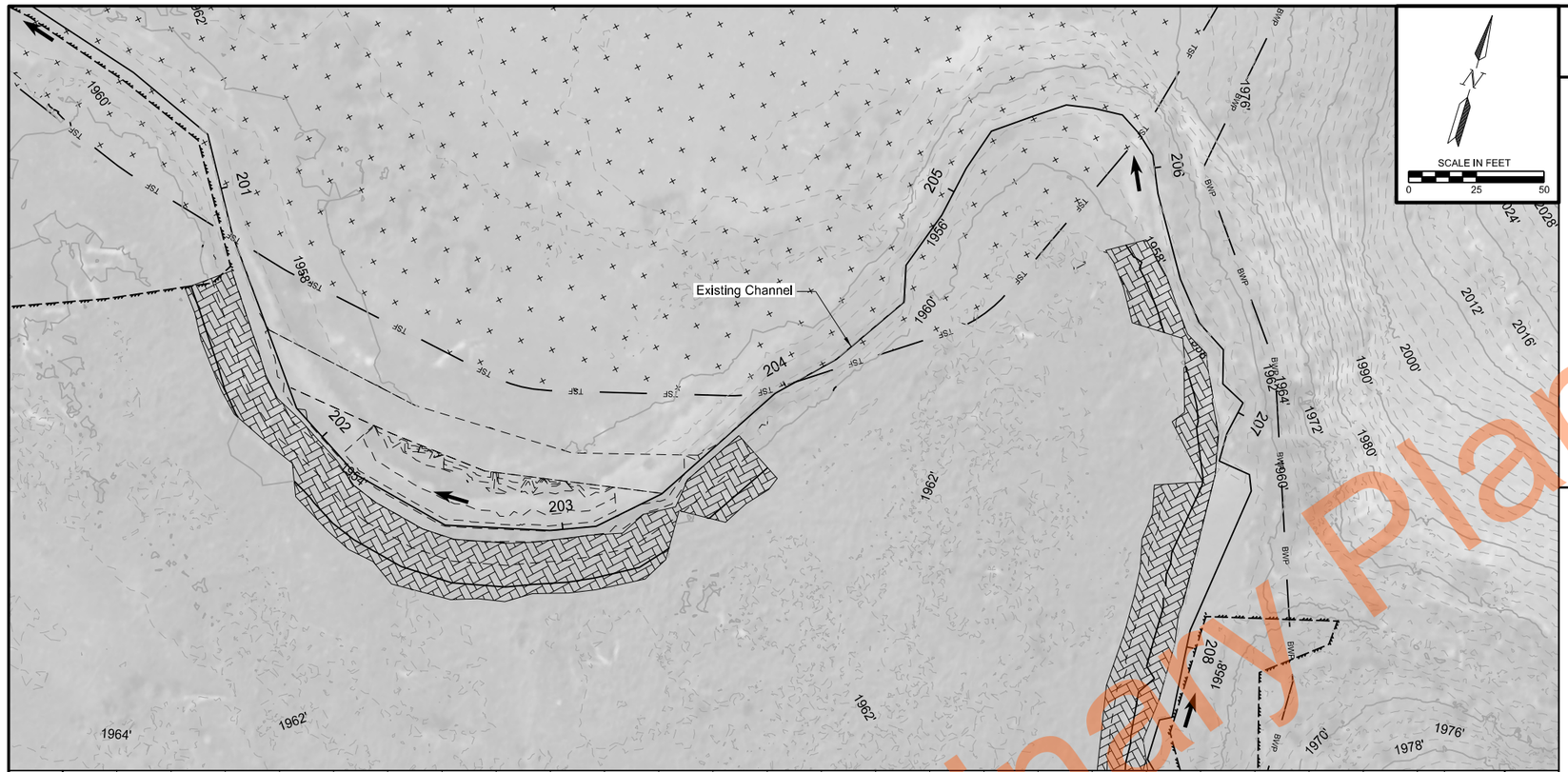
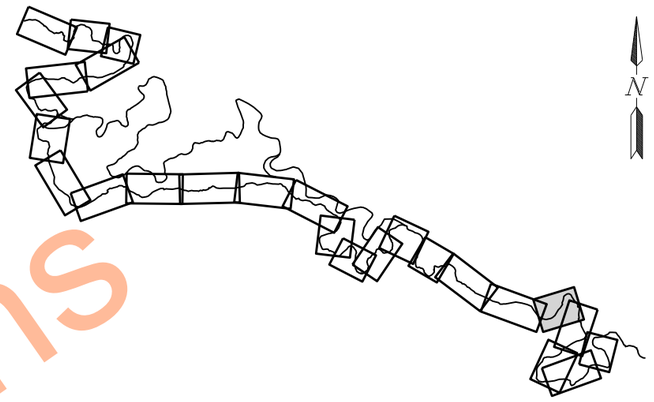
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	21





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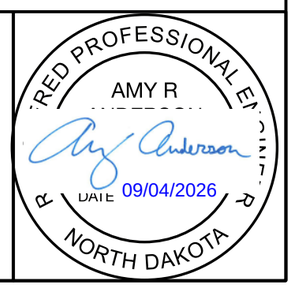

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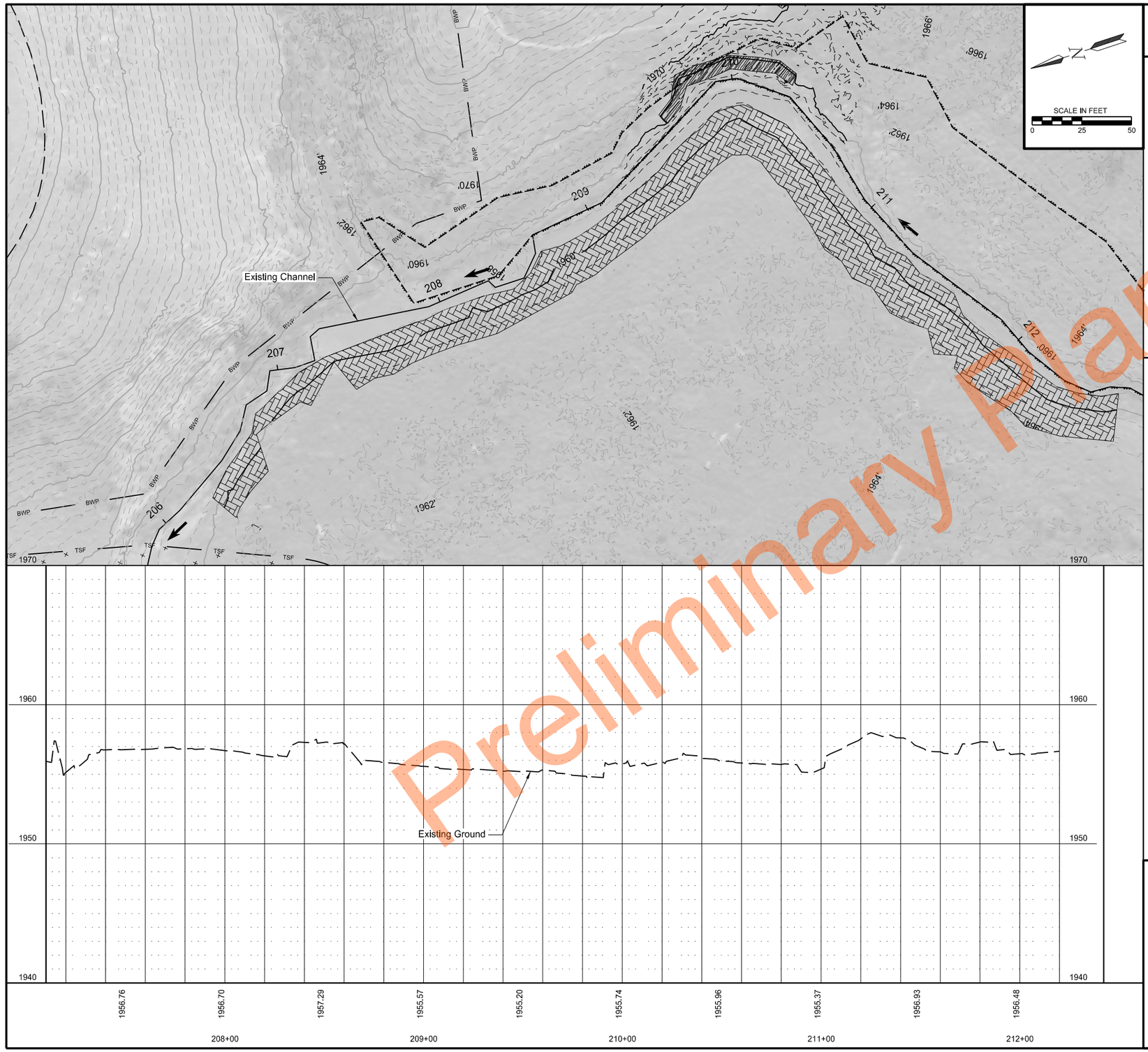
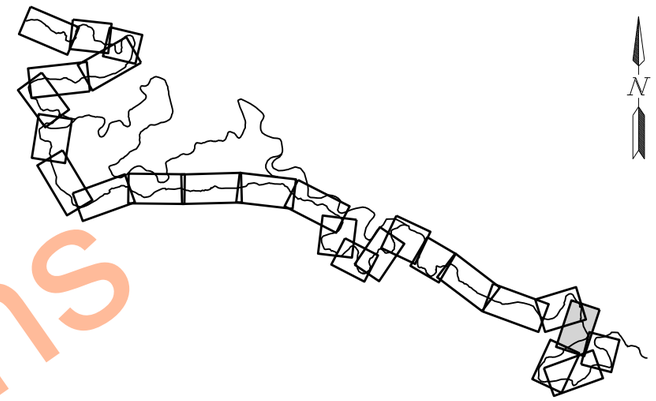
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	22





Legend:

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Sand Creek

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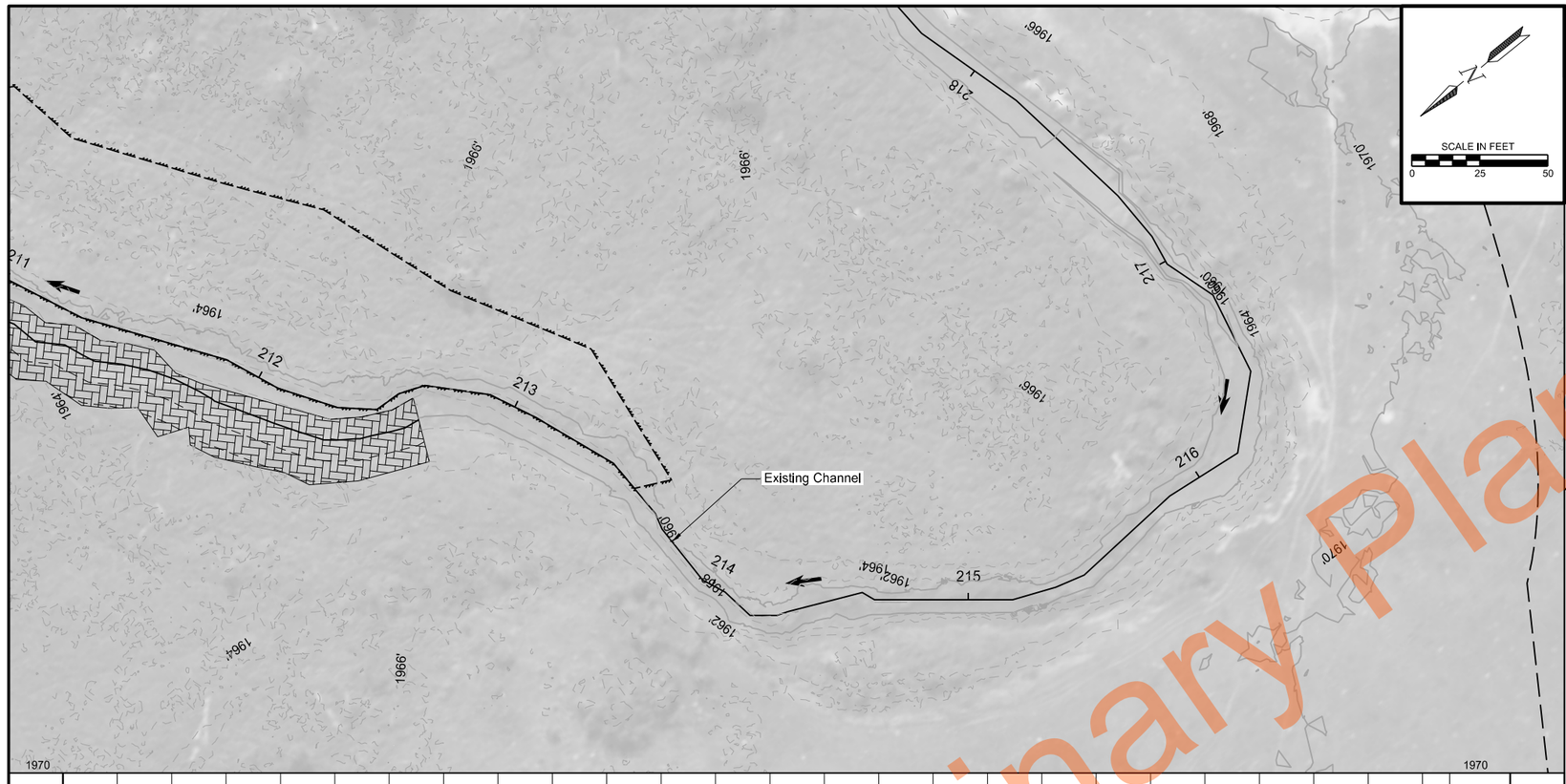
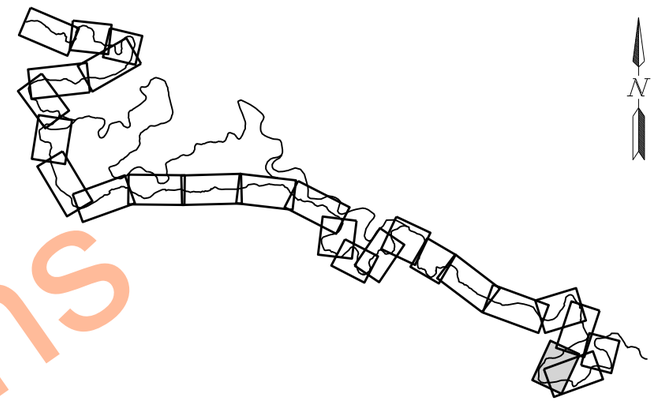
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	60	23





Legend:

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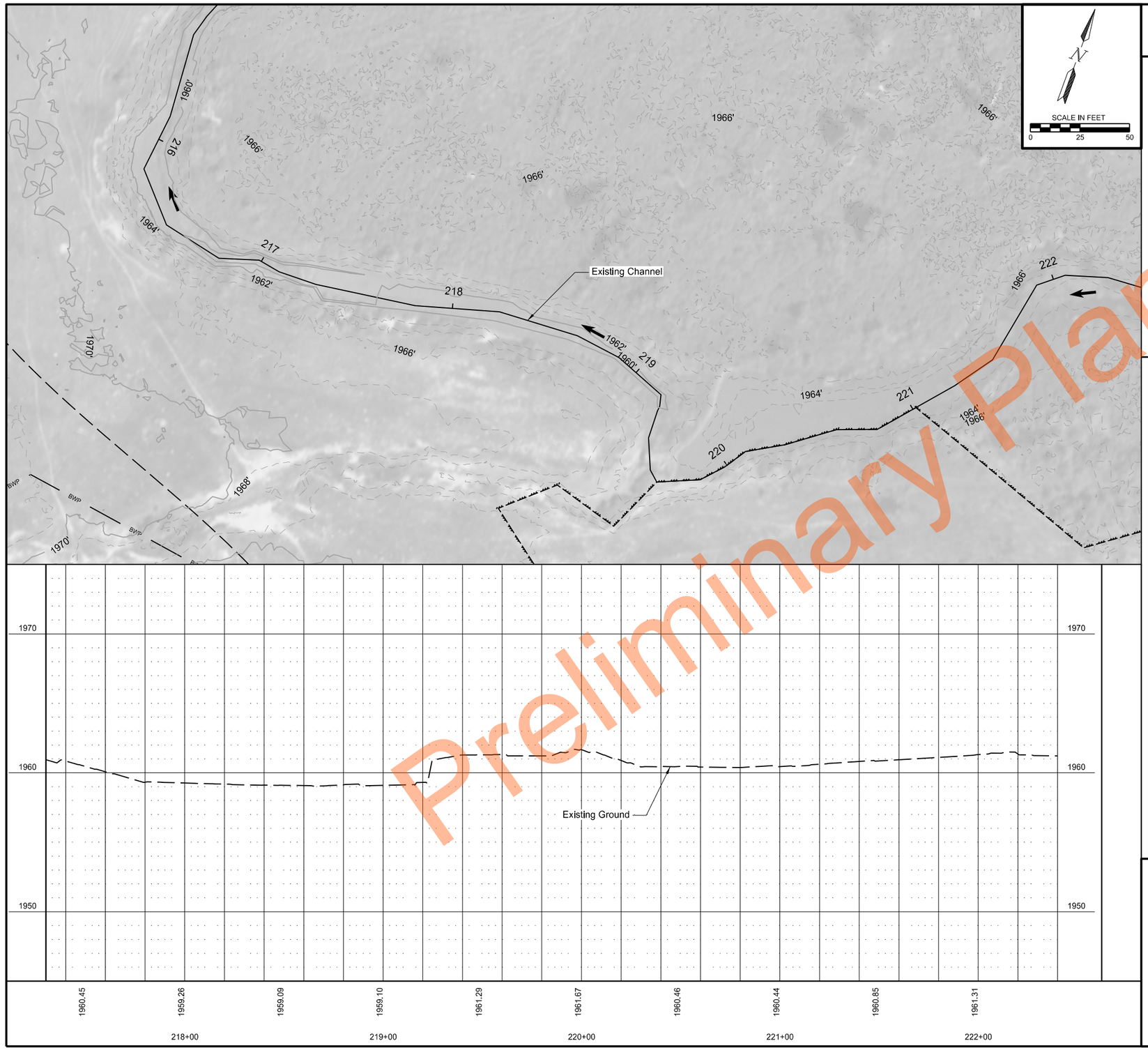
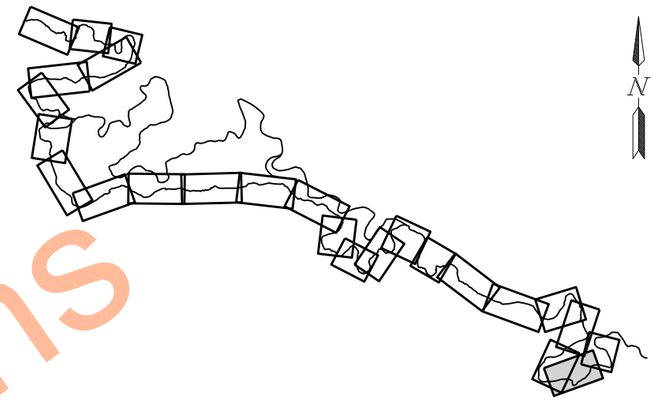
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	24





Legend:

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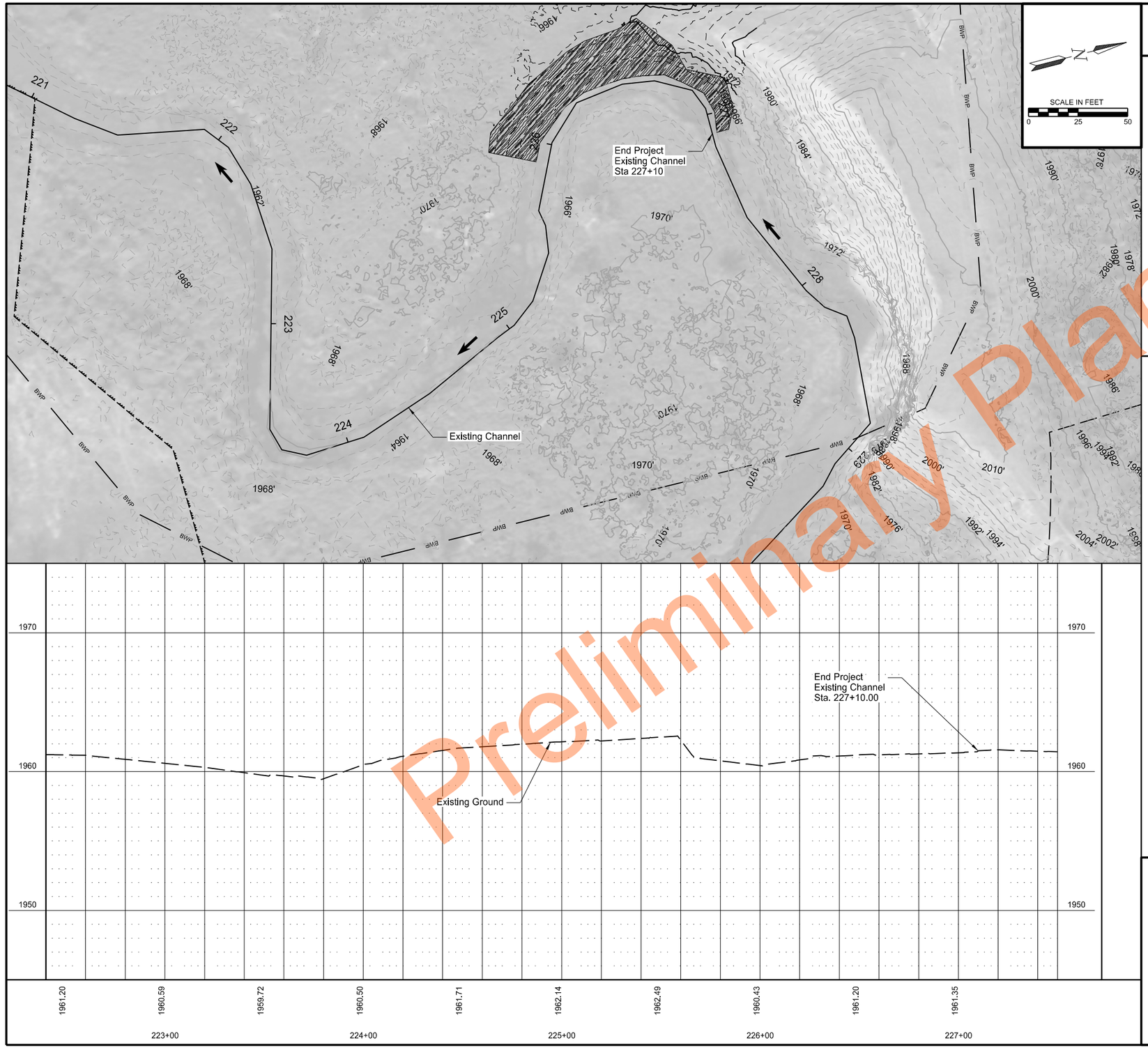
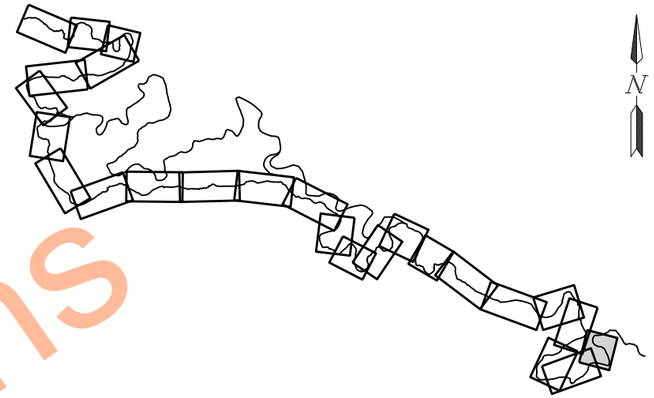
ND	SS-ARP-9-999(488)	60	25





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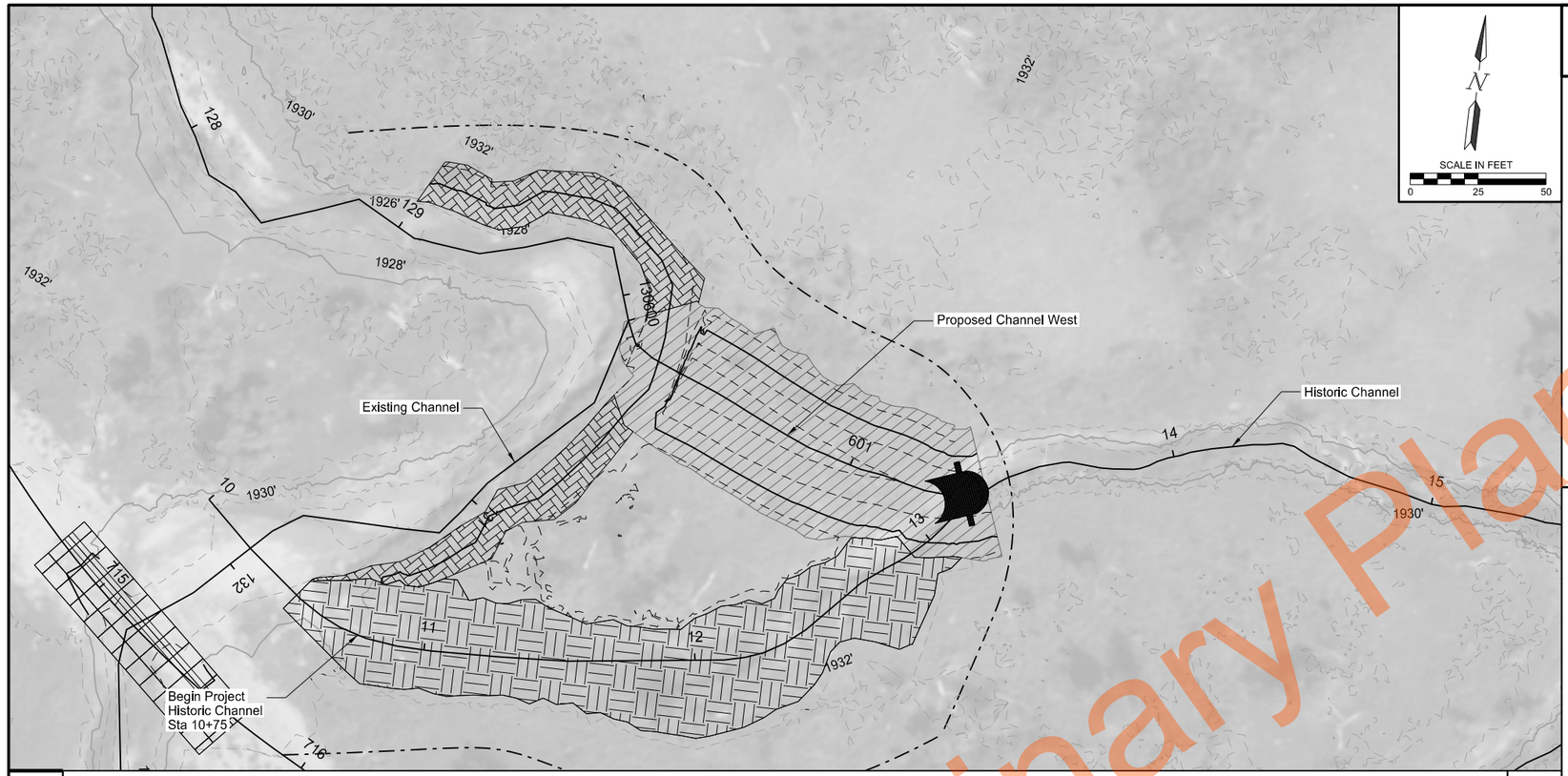
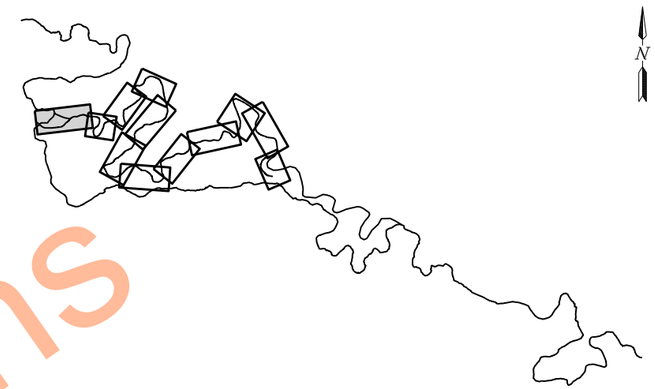
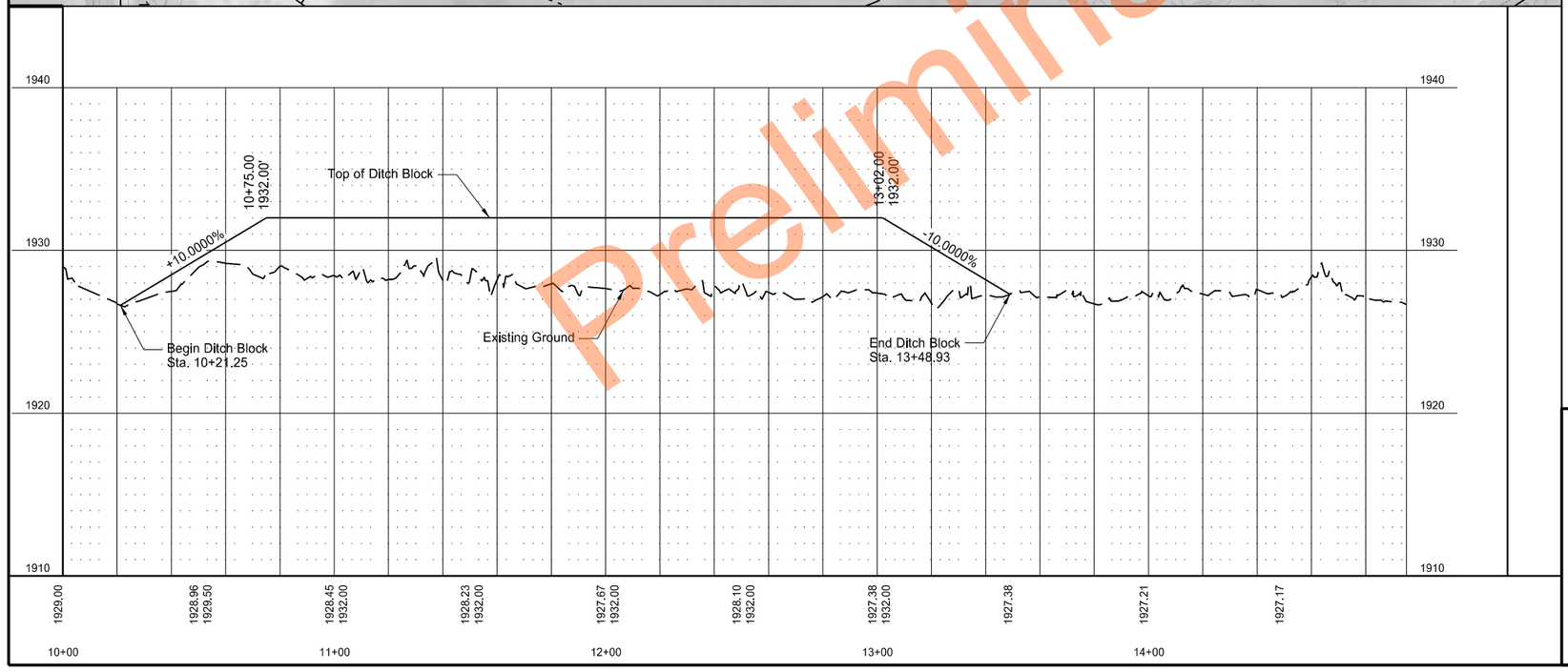
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	26







Legend:

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Historic Channel

Sand Creek

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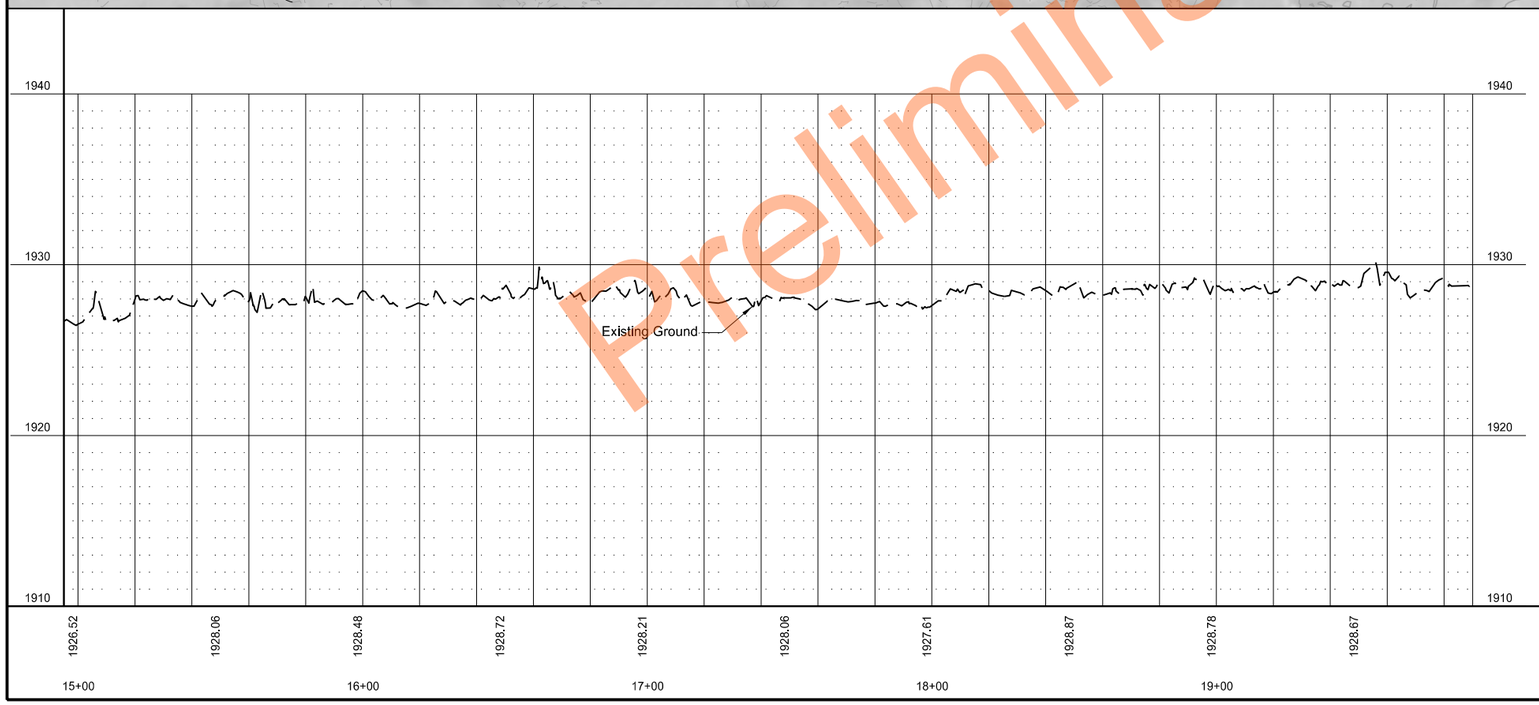

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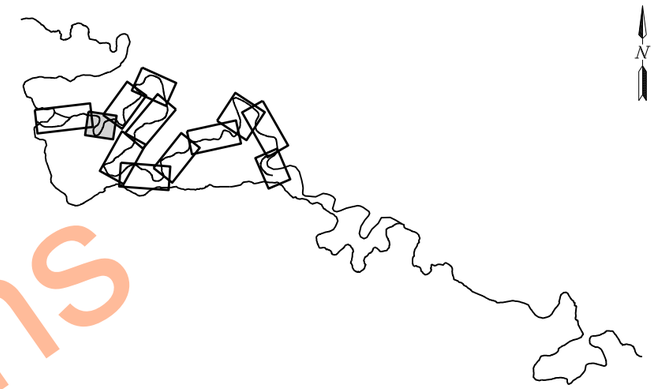

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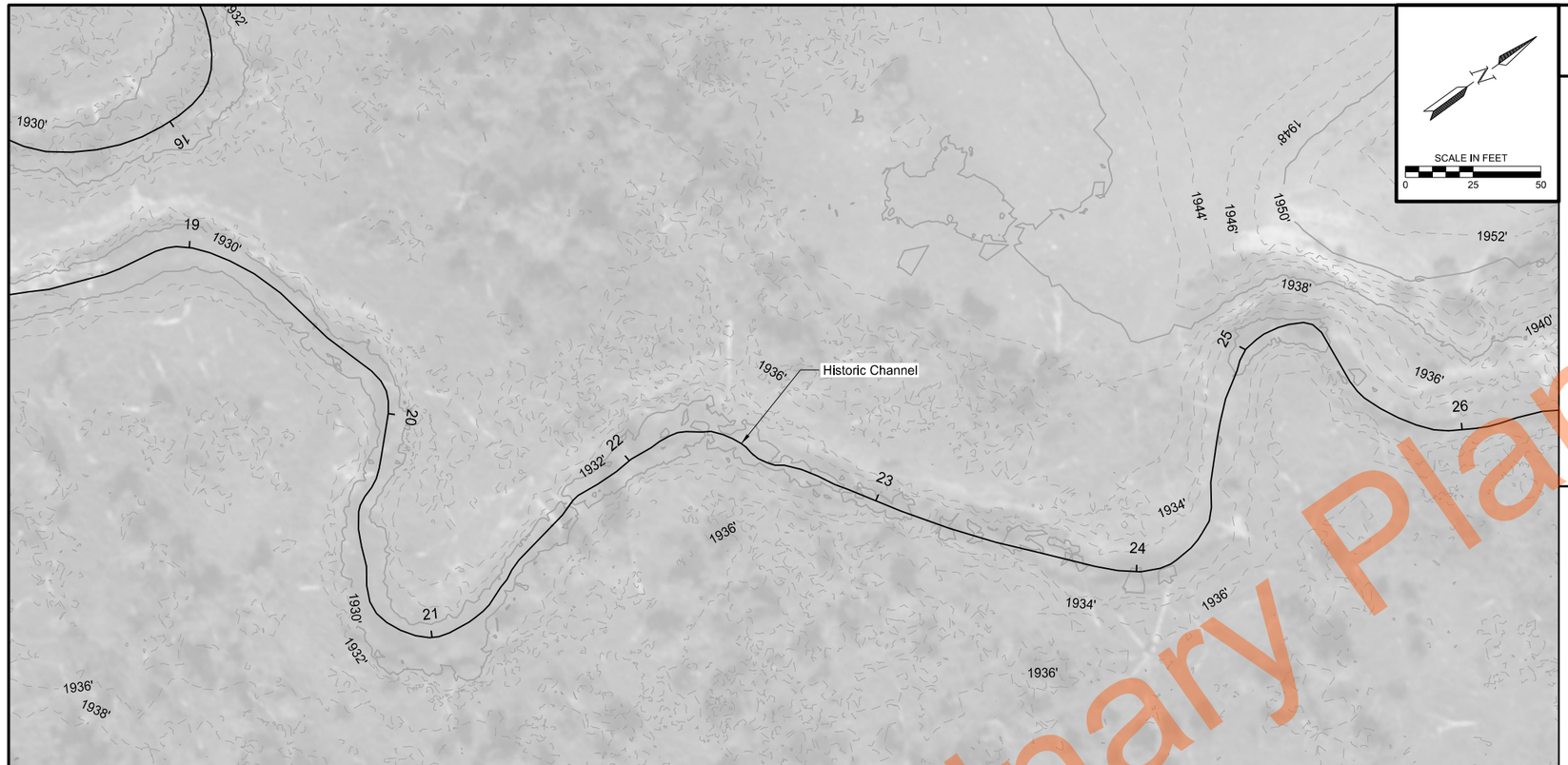
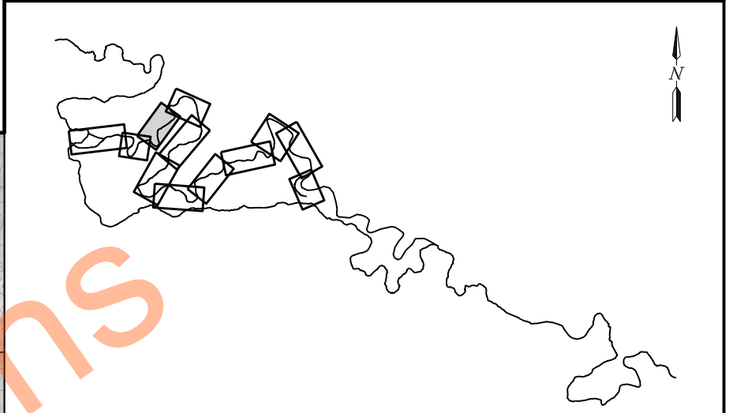
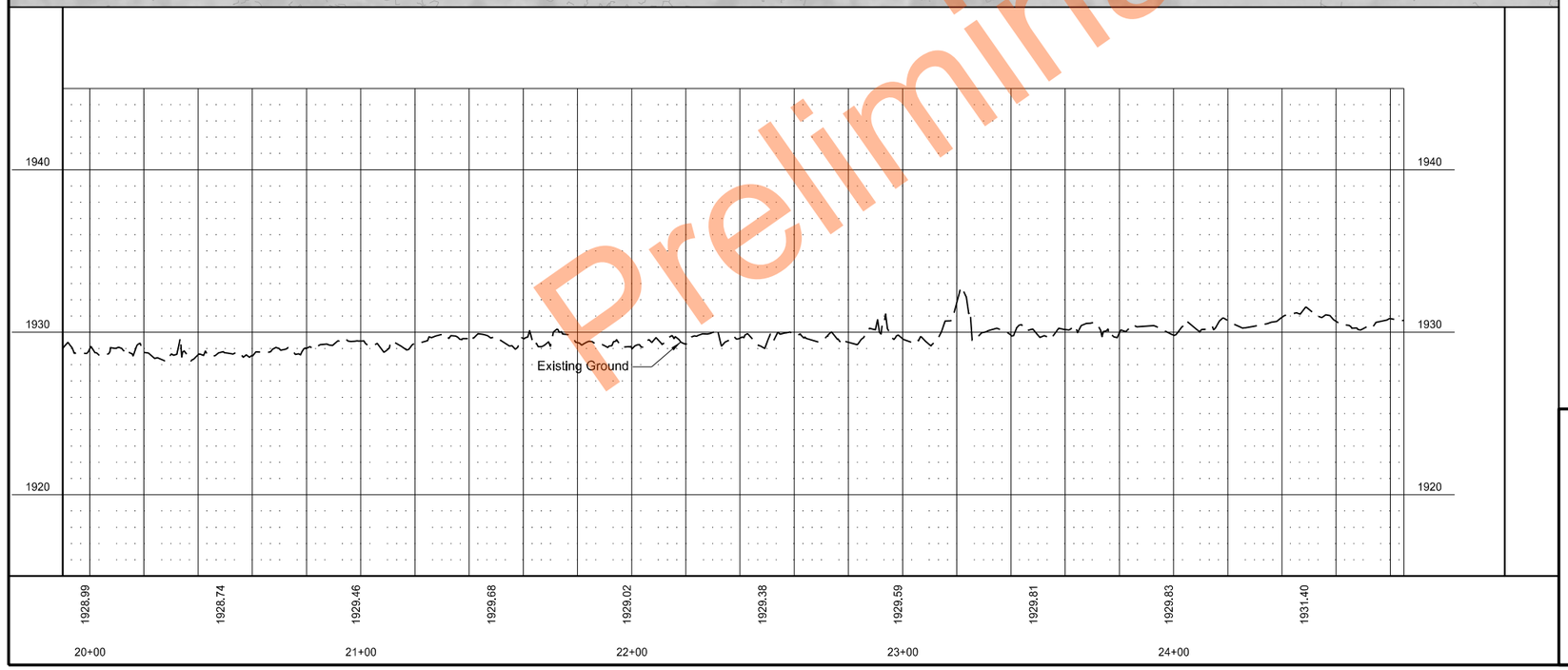
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	28







Legend:

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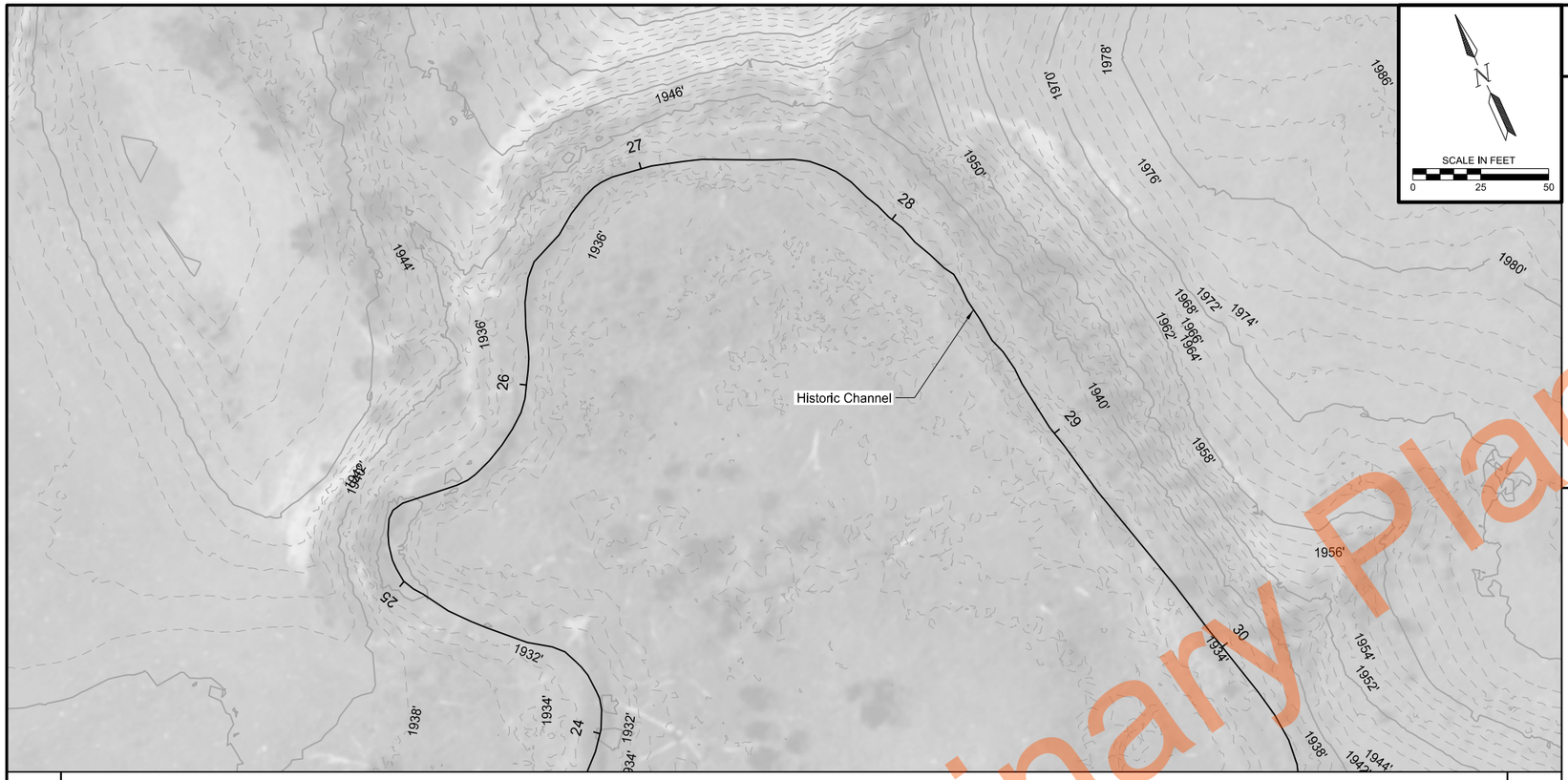

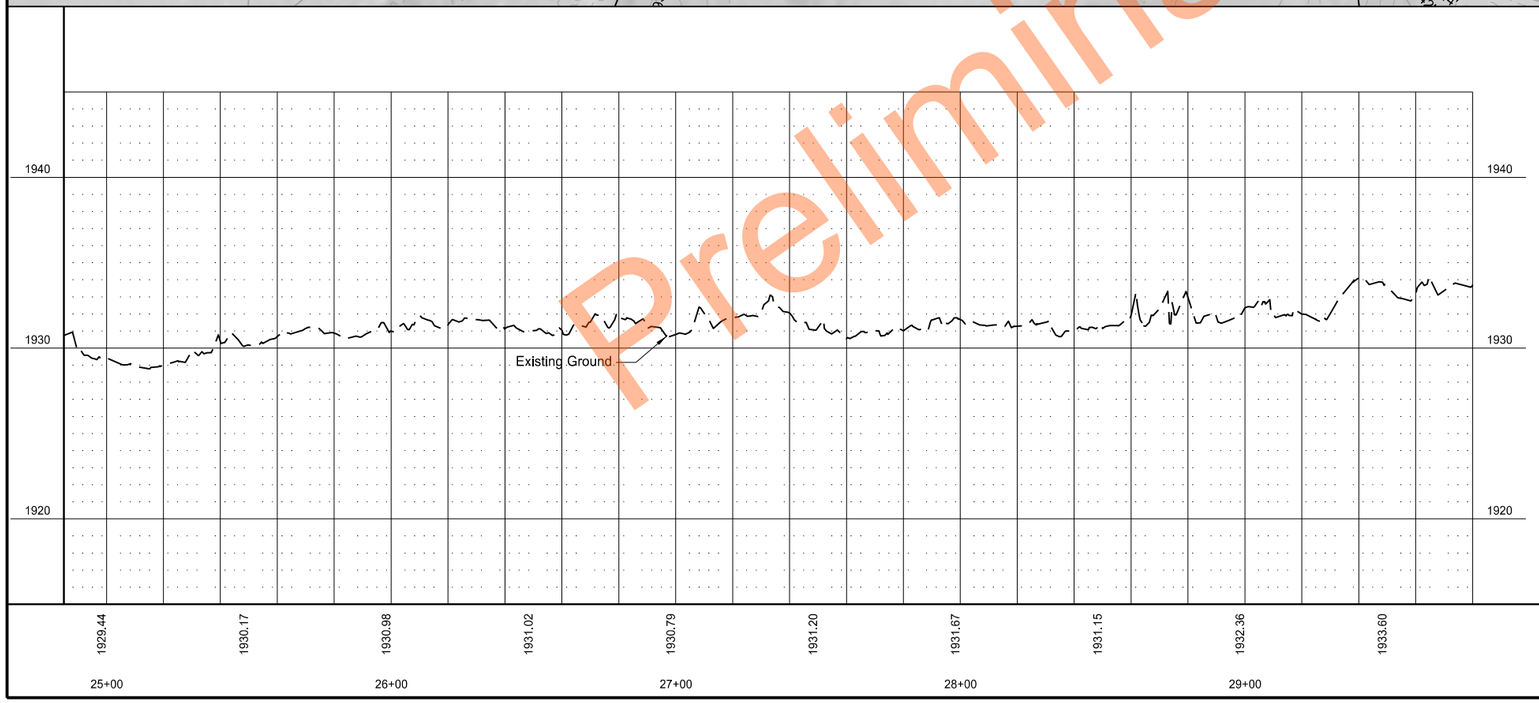

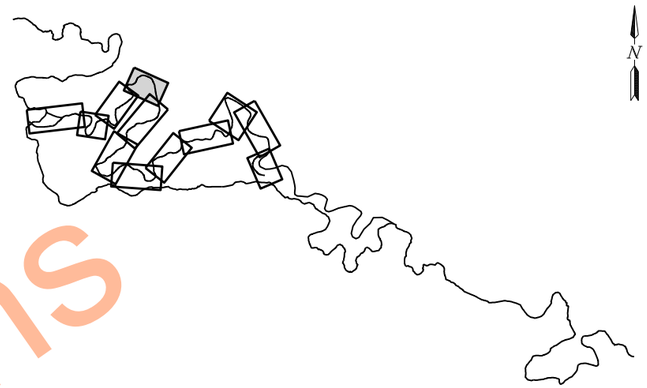

Legend:

- XXXX' Proposed Contour (Major)
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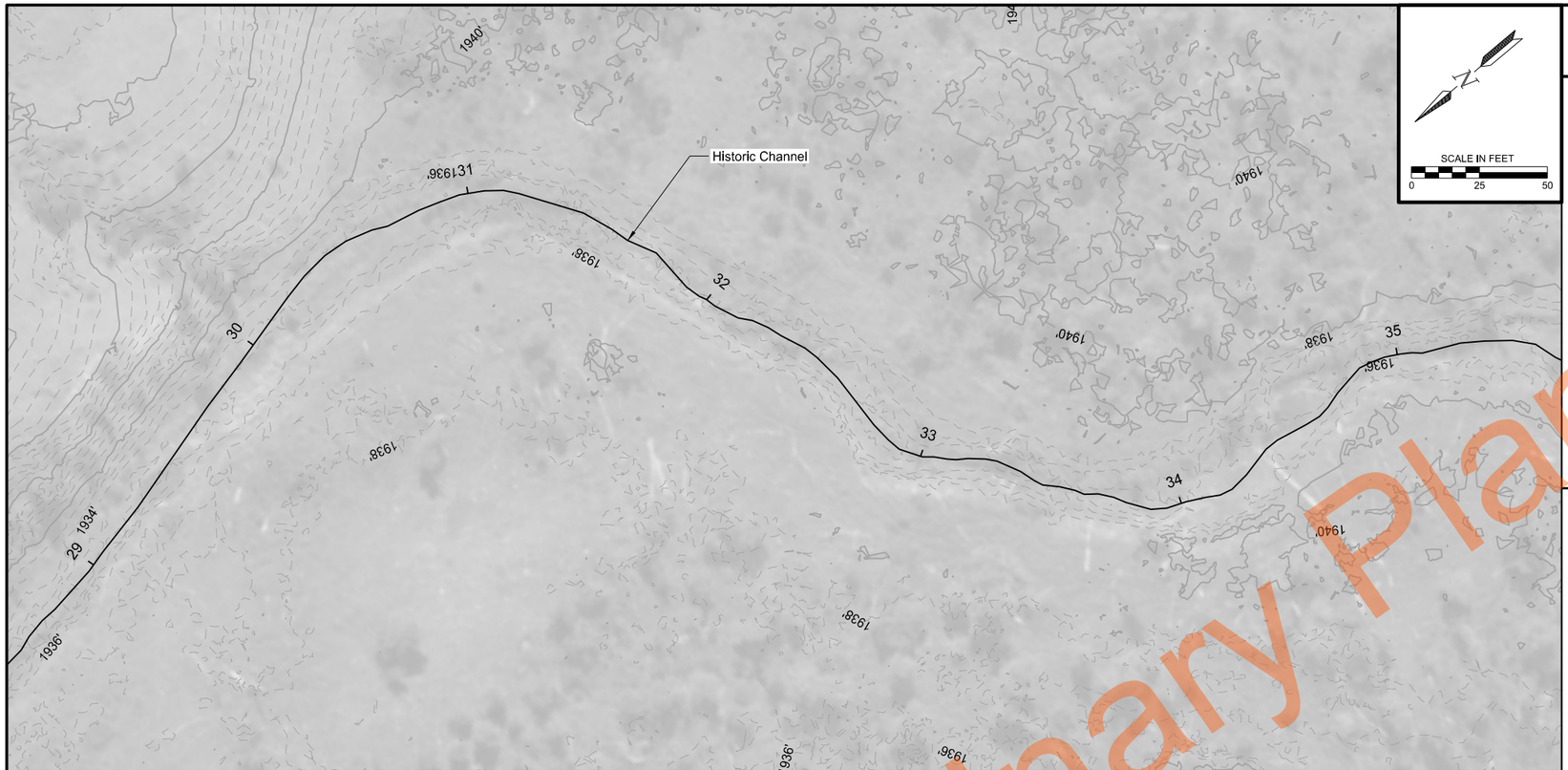

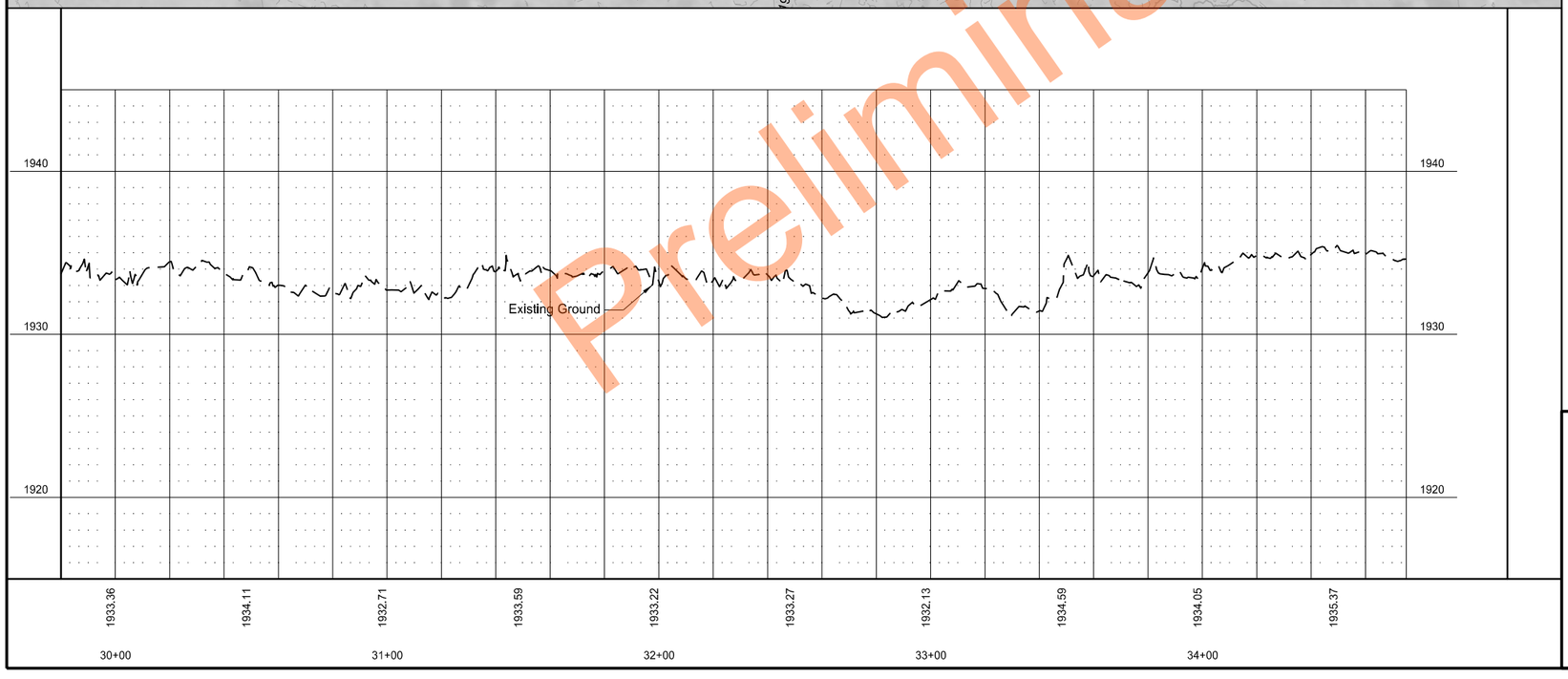

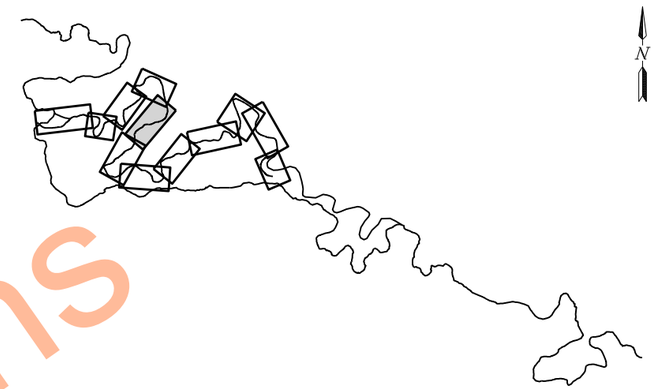

Legend:

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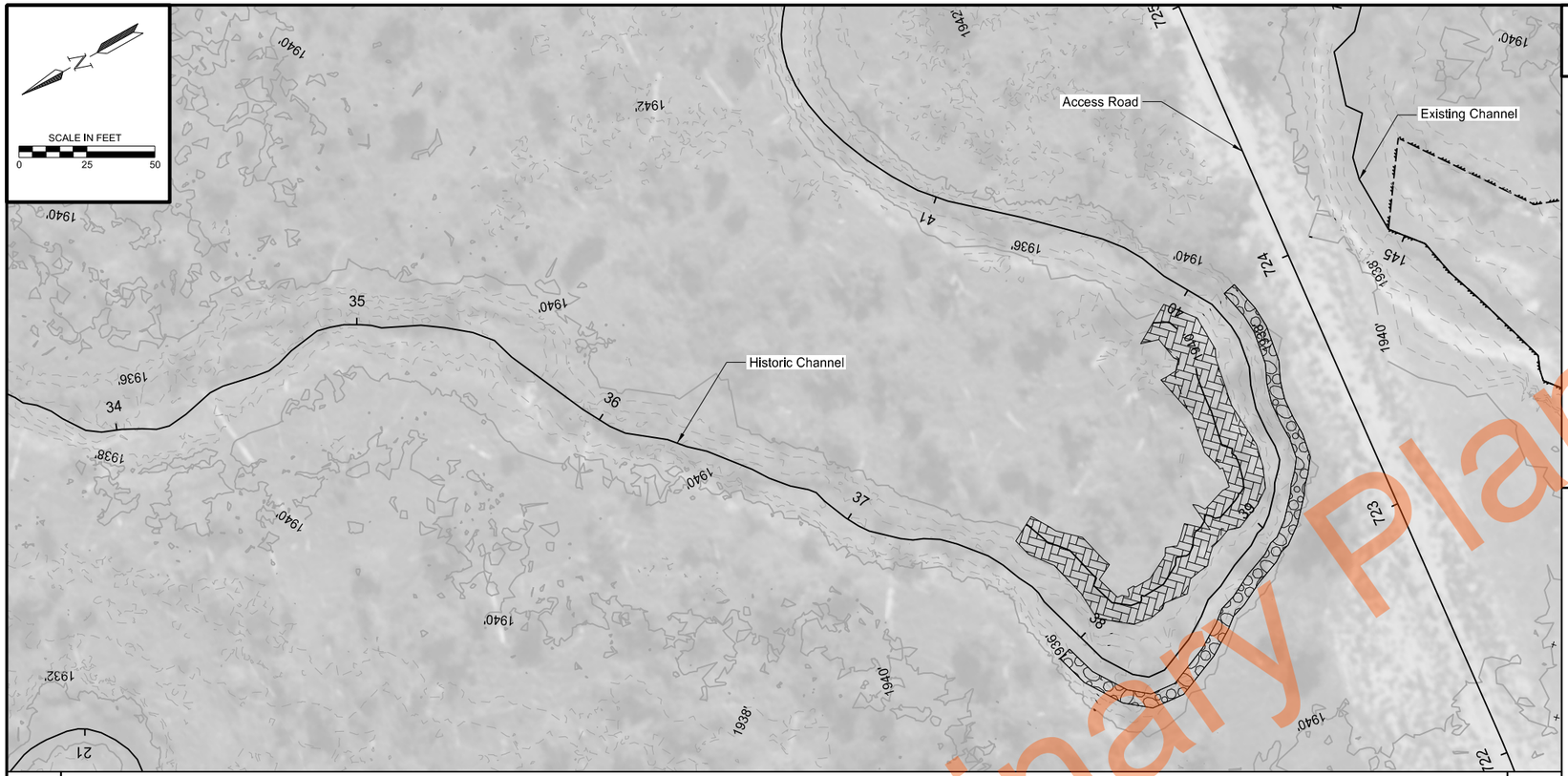

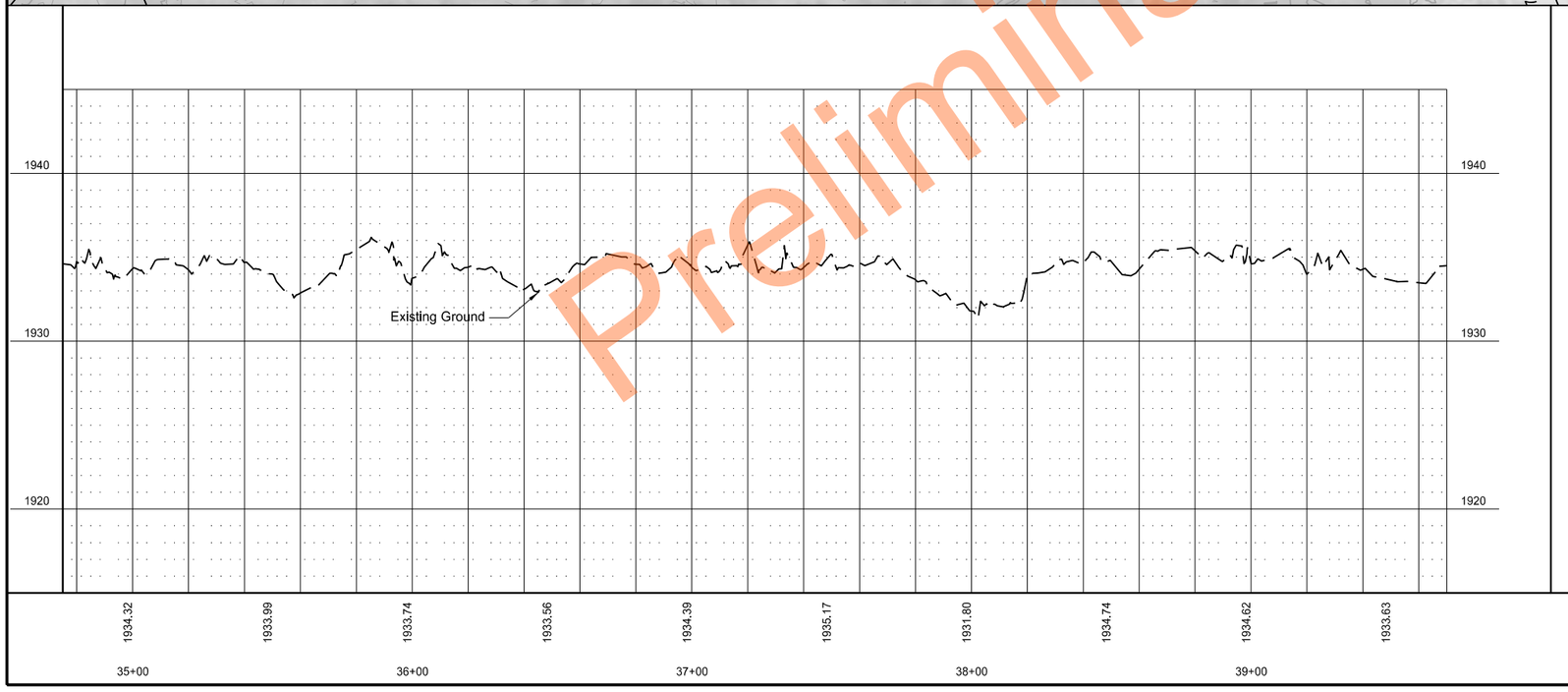

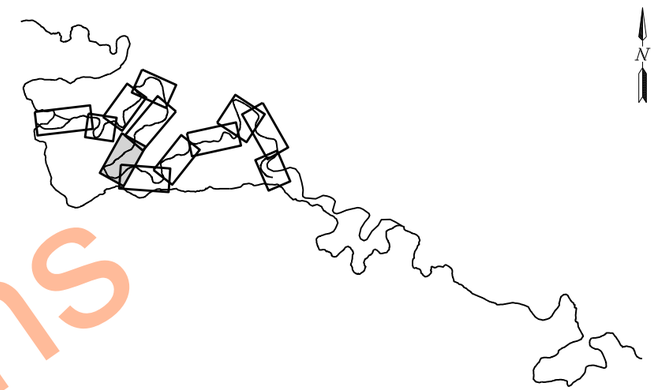

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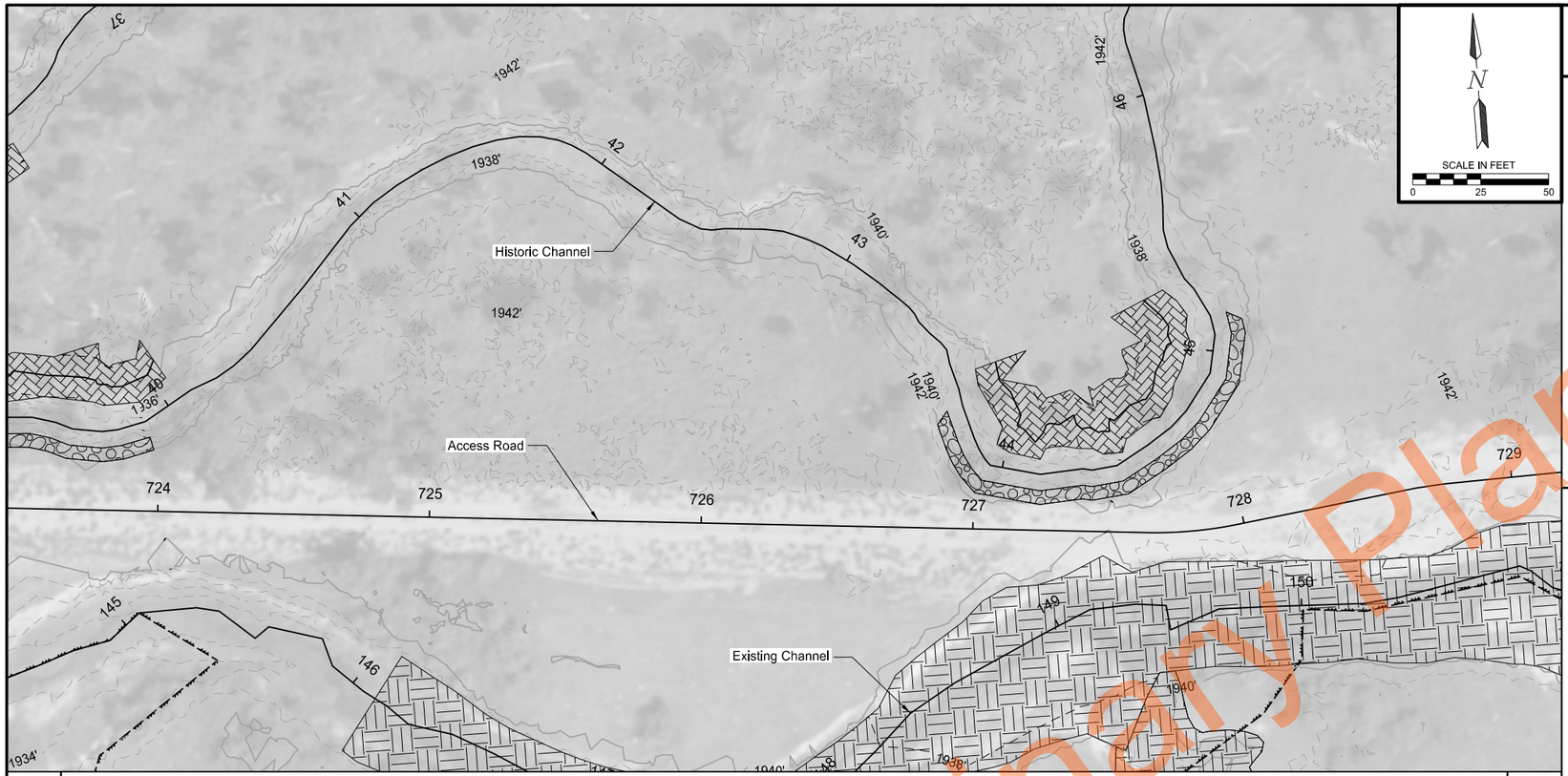

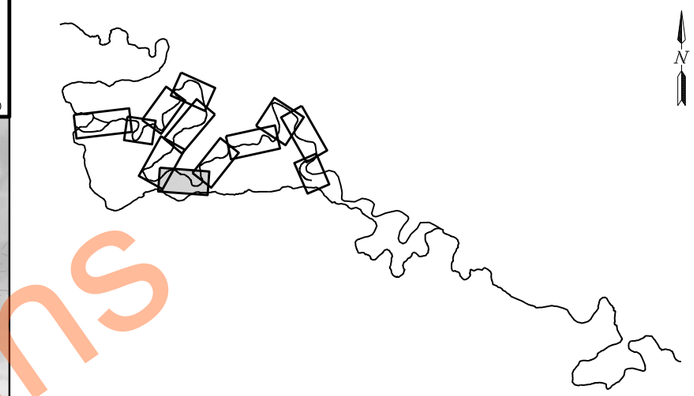

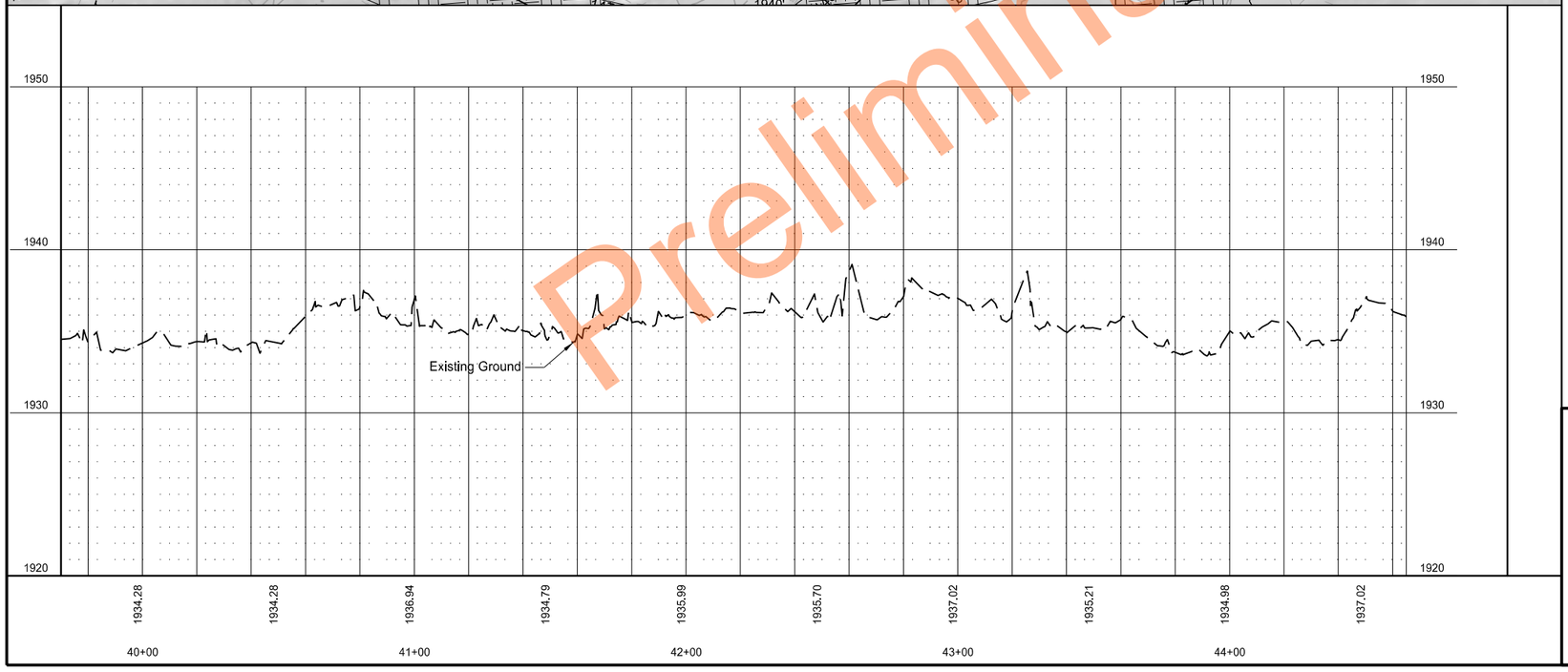

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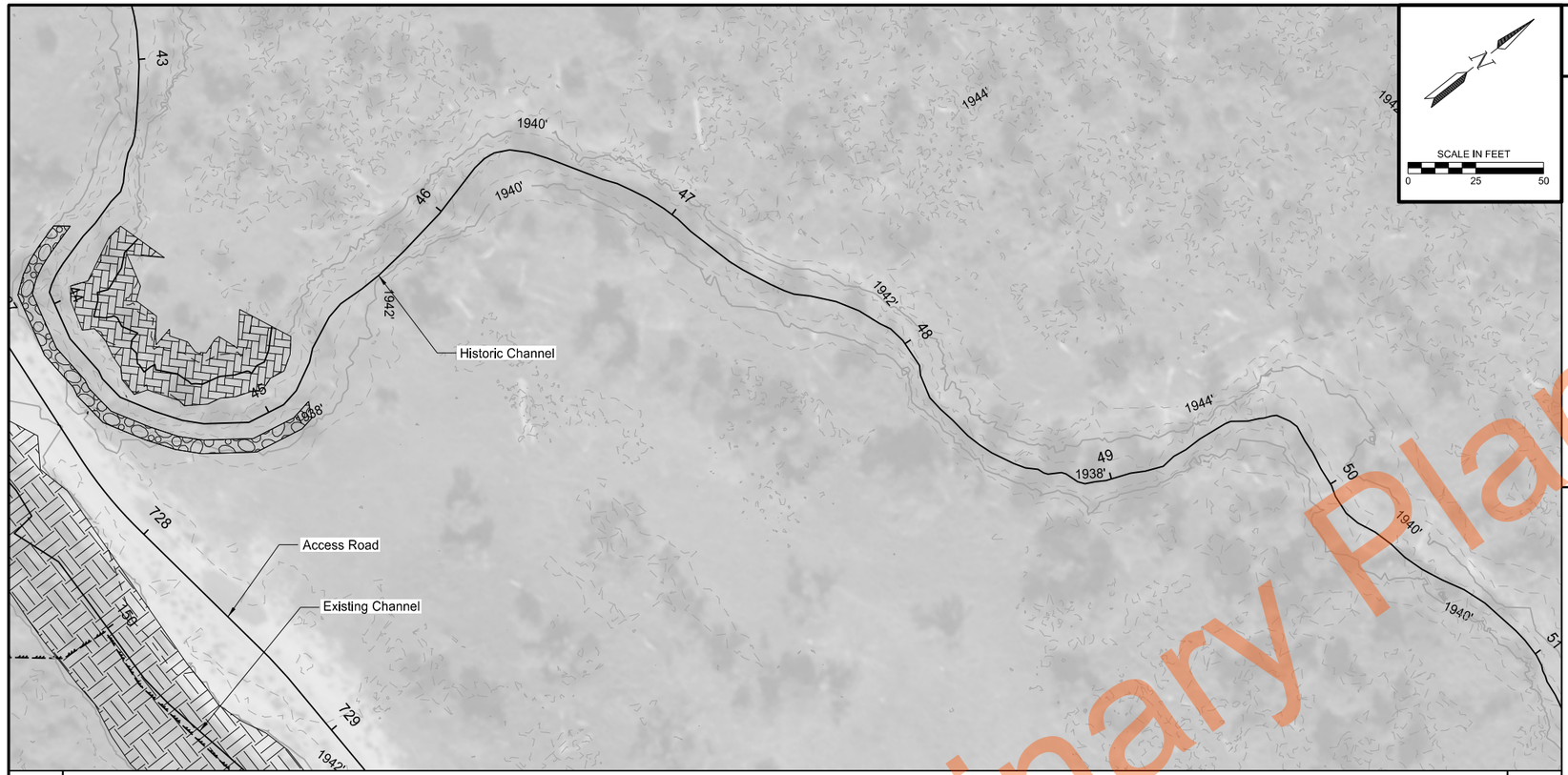

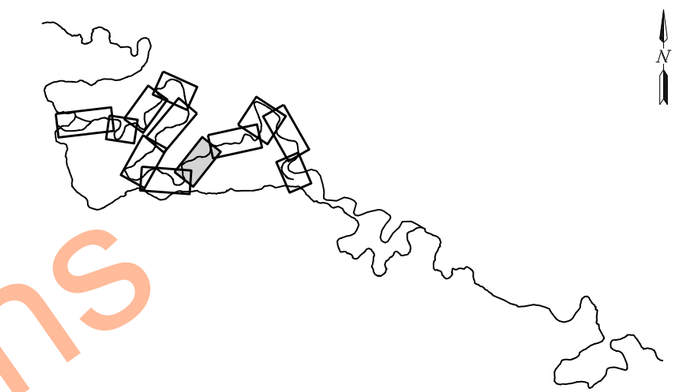

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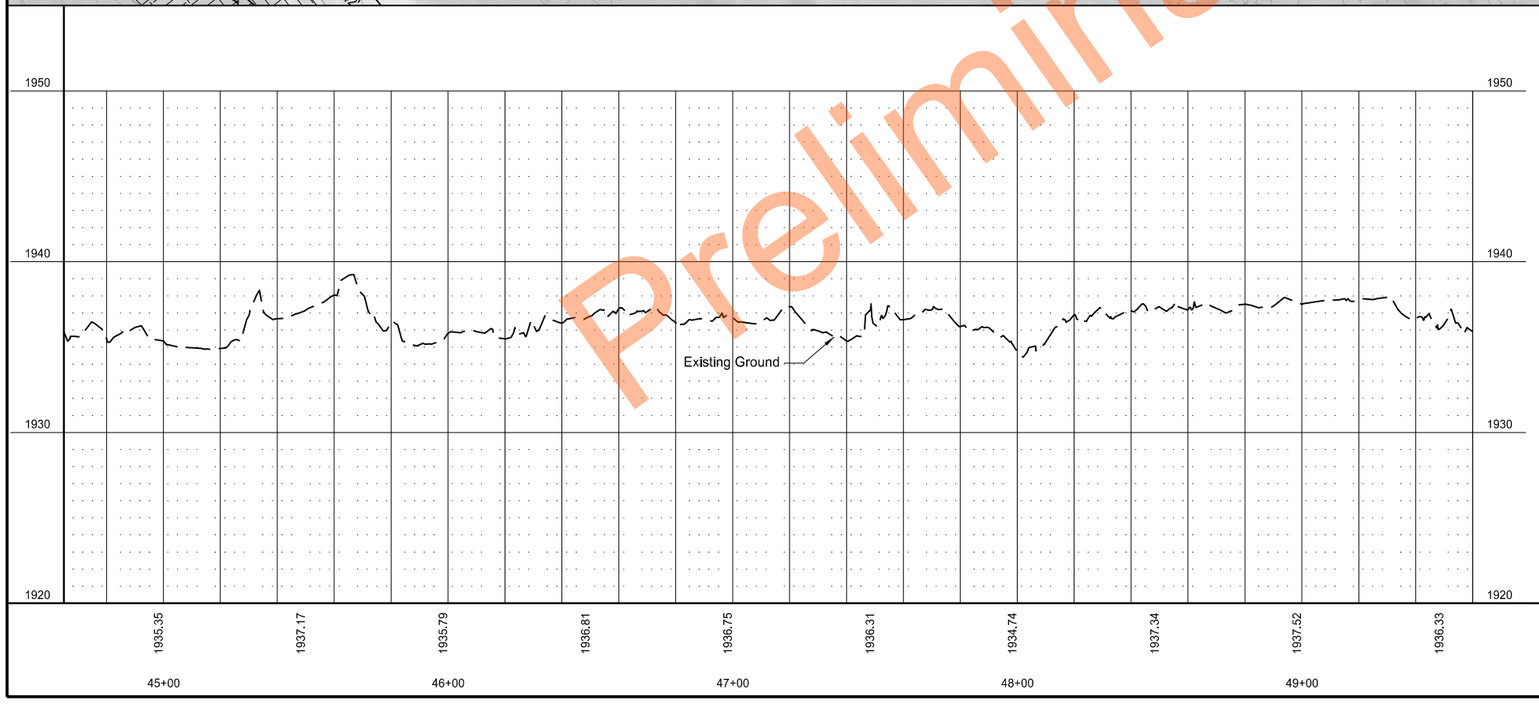

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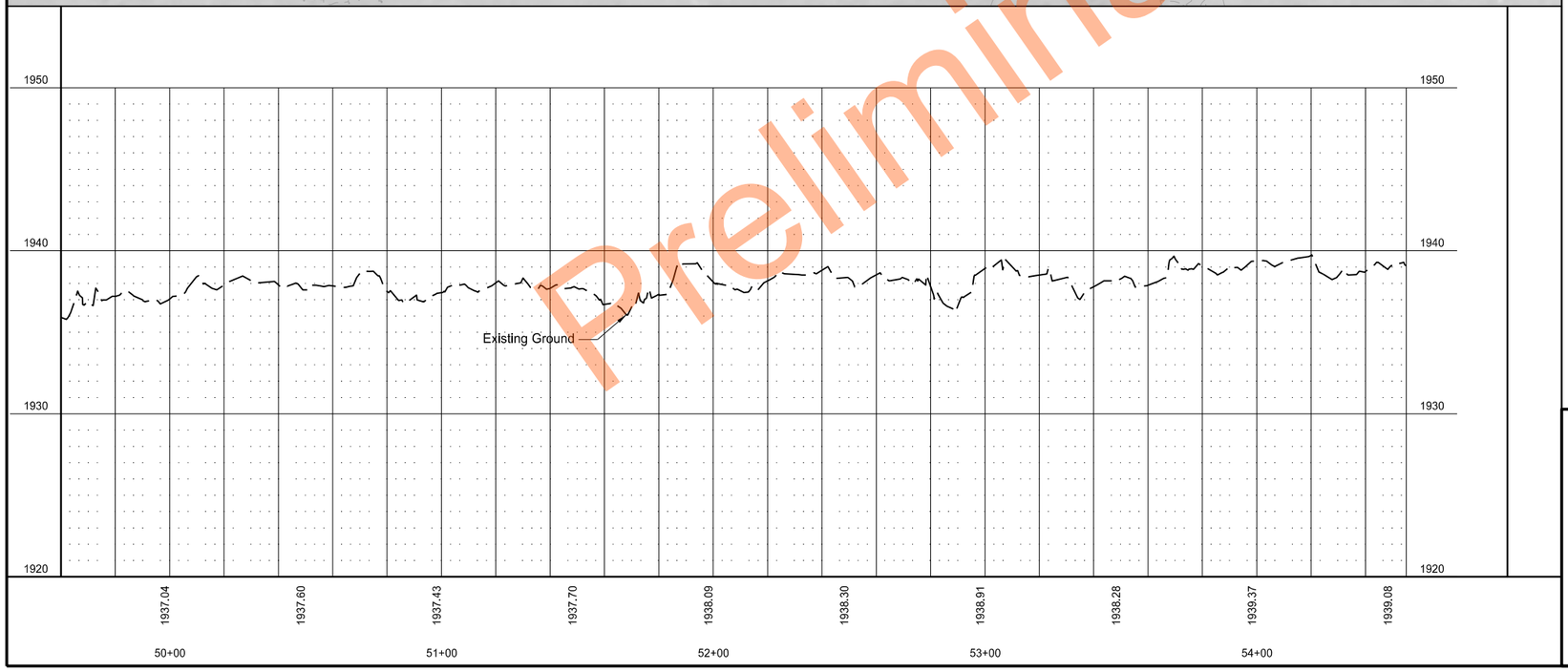

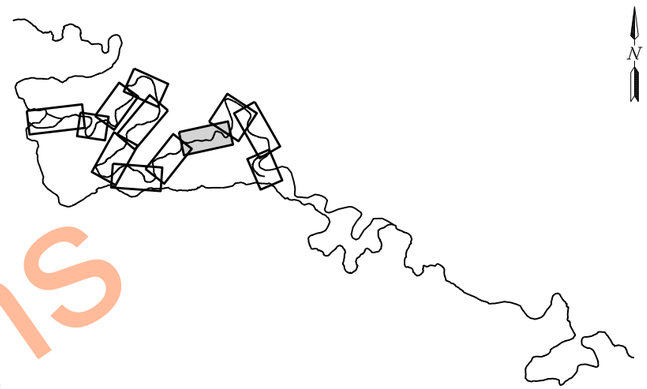

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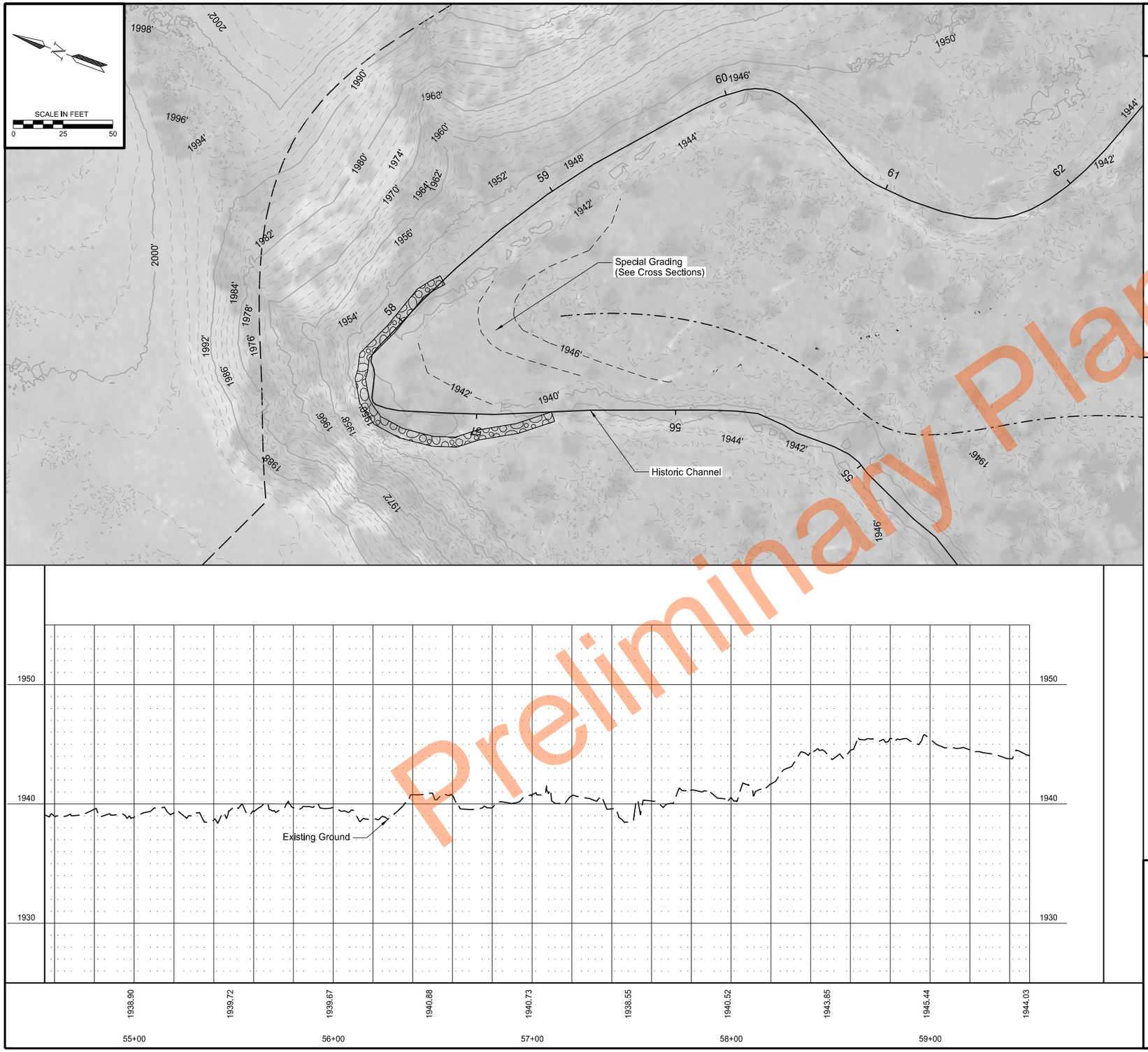

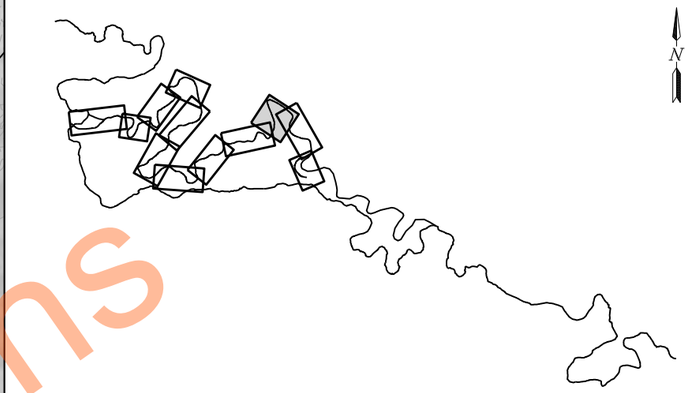

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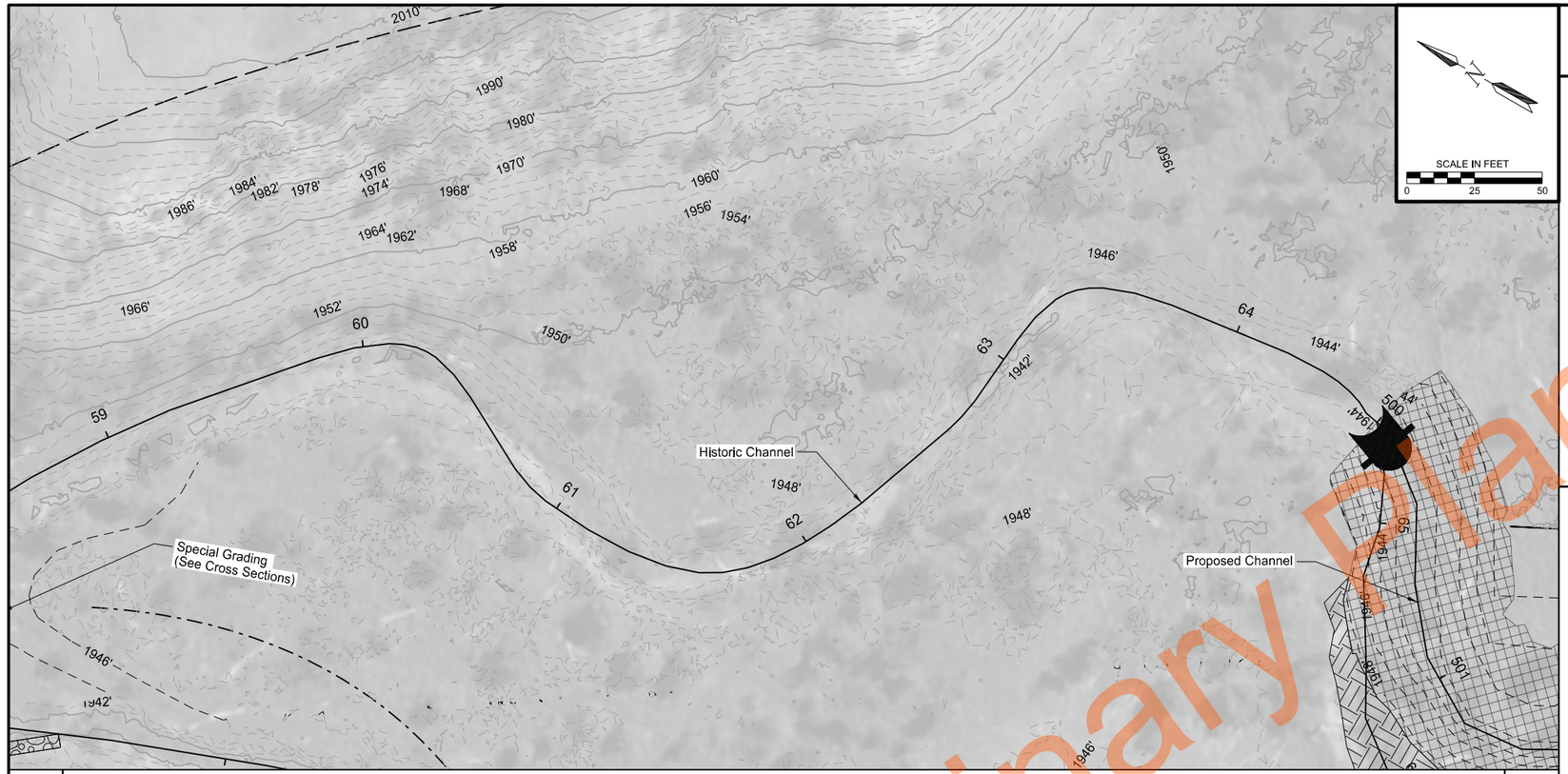

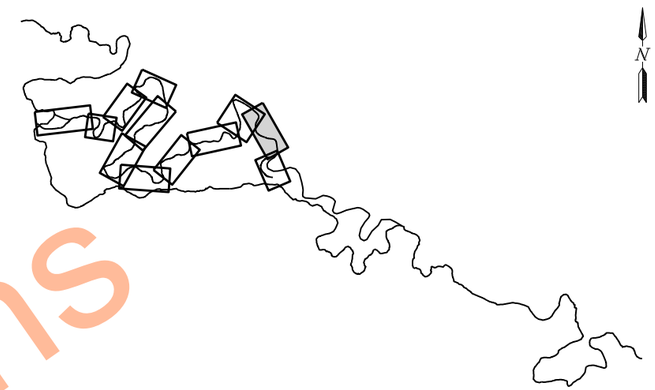

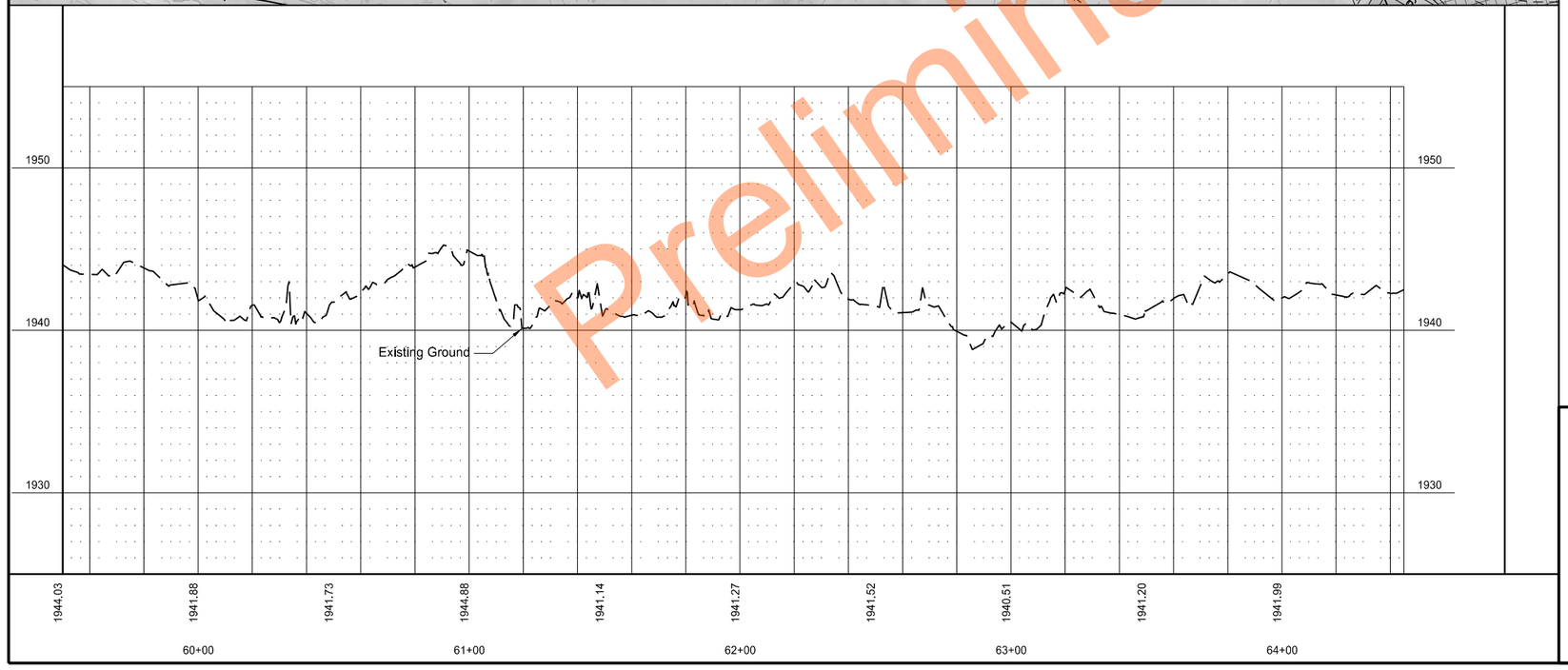

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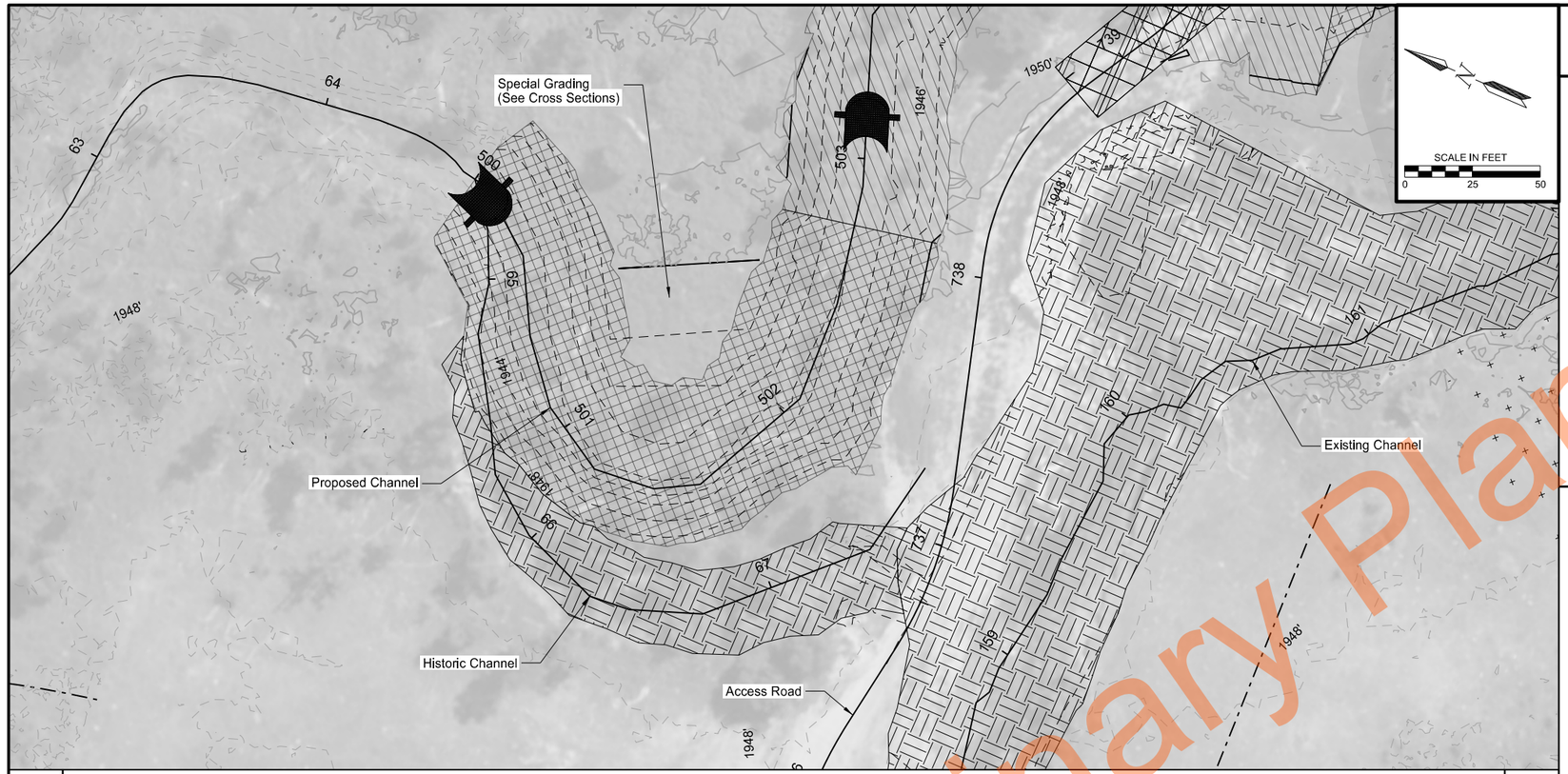

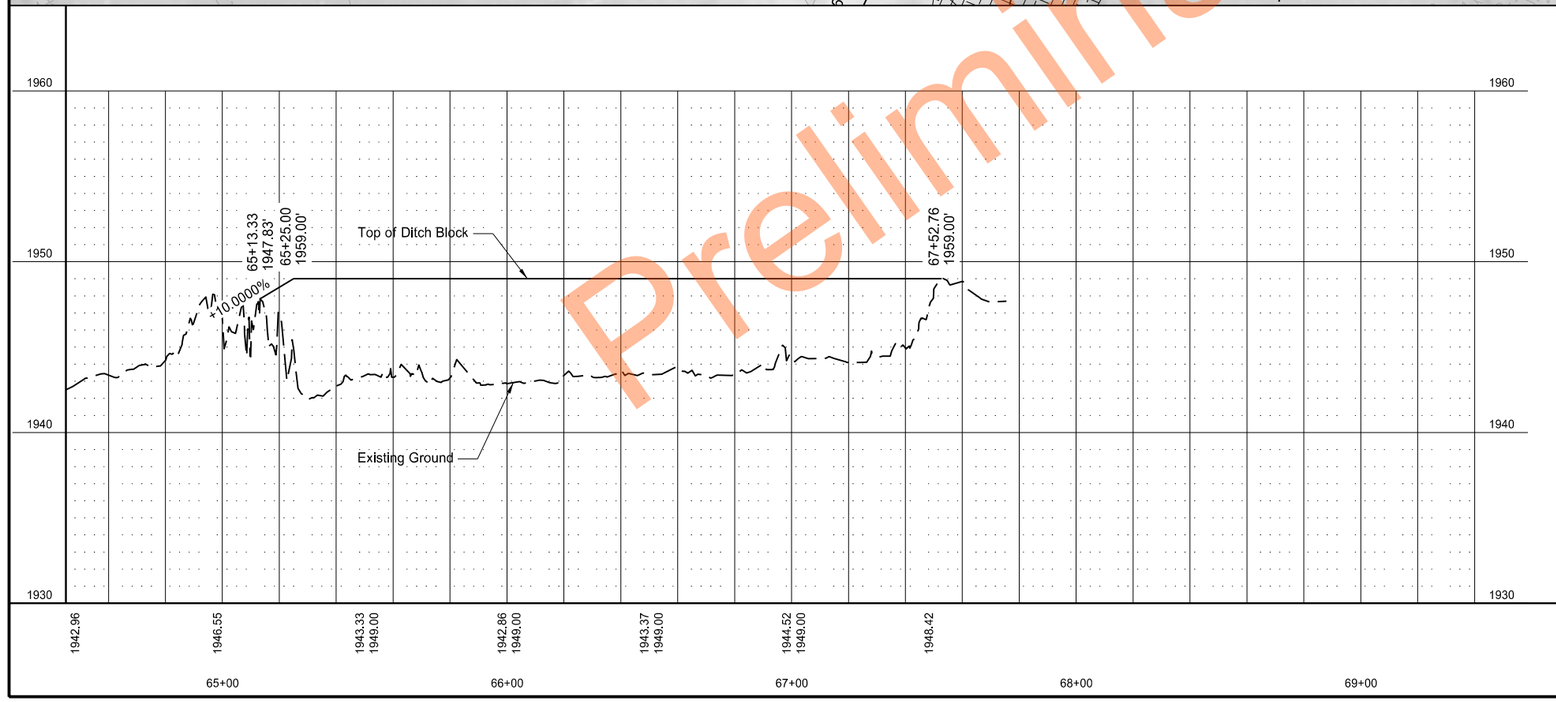

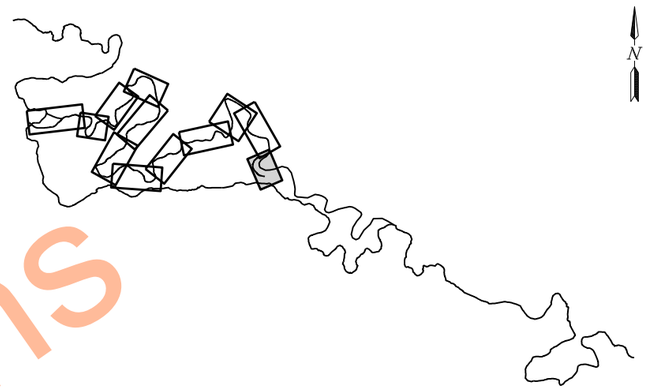

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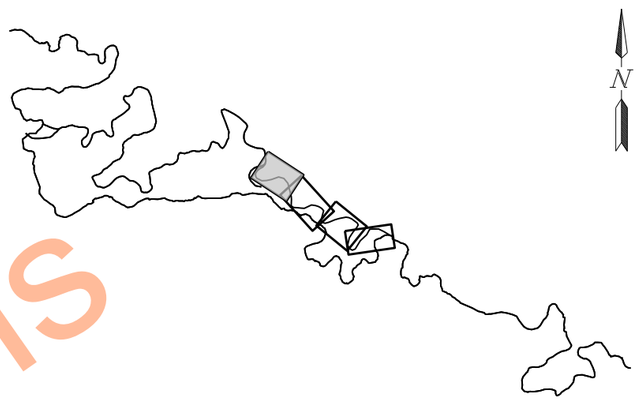

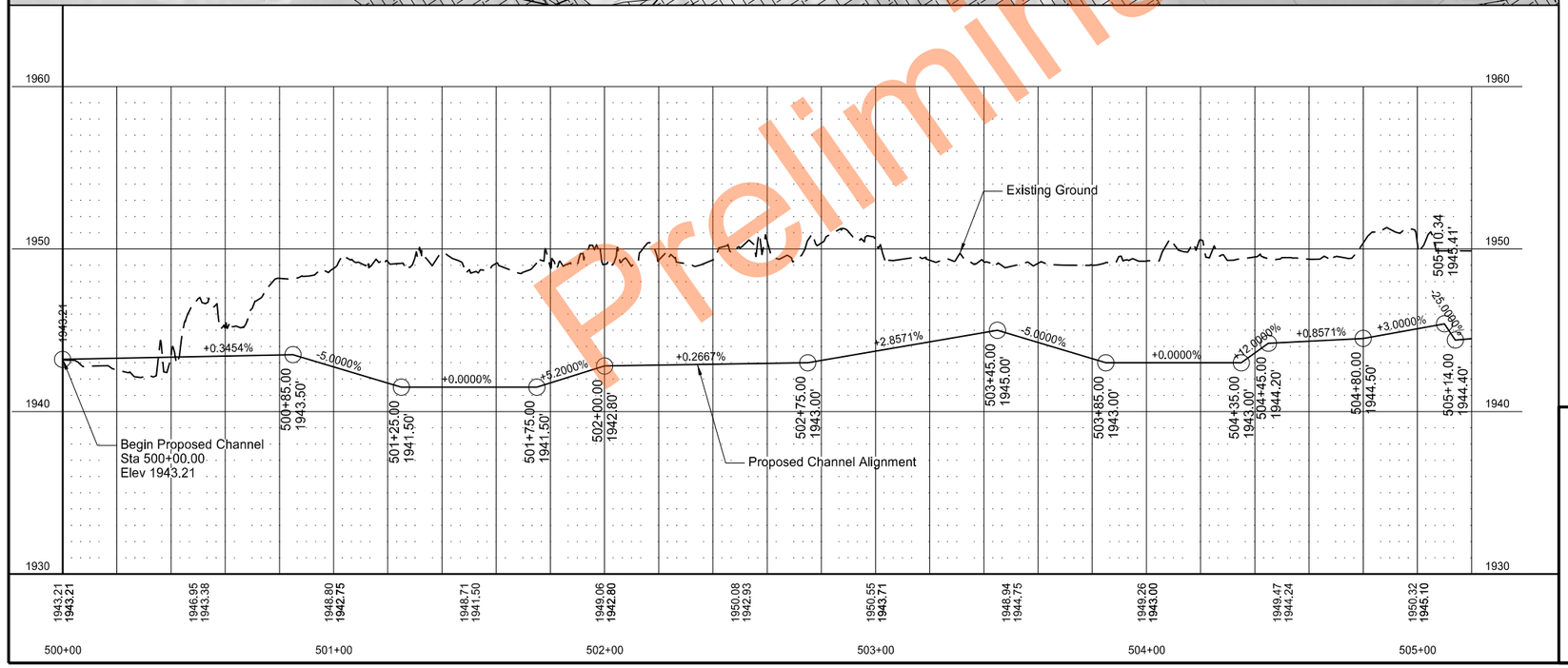

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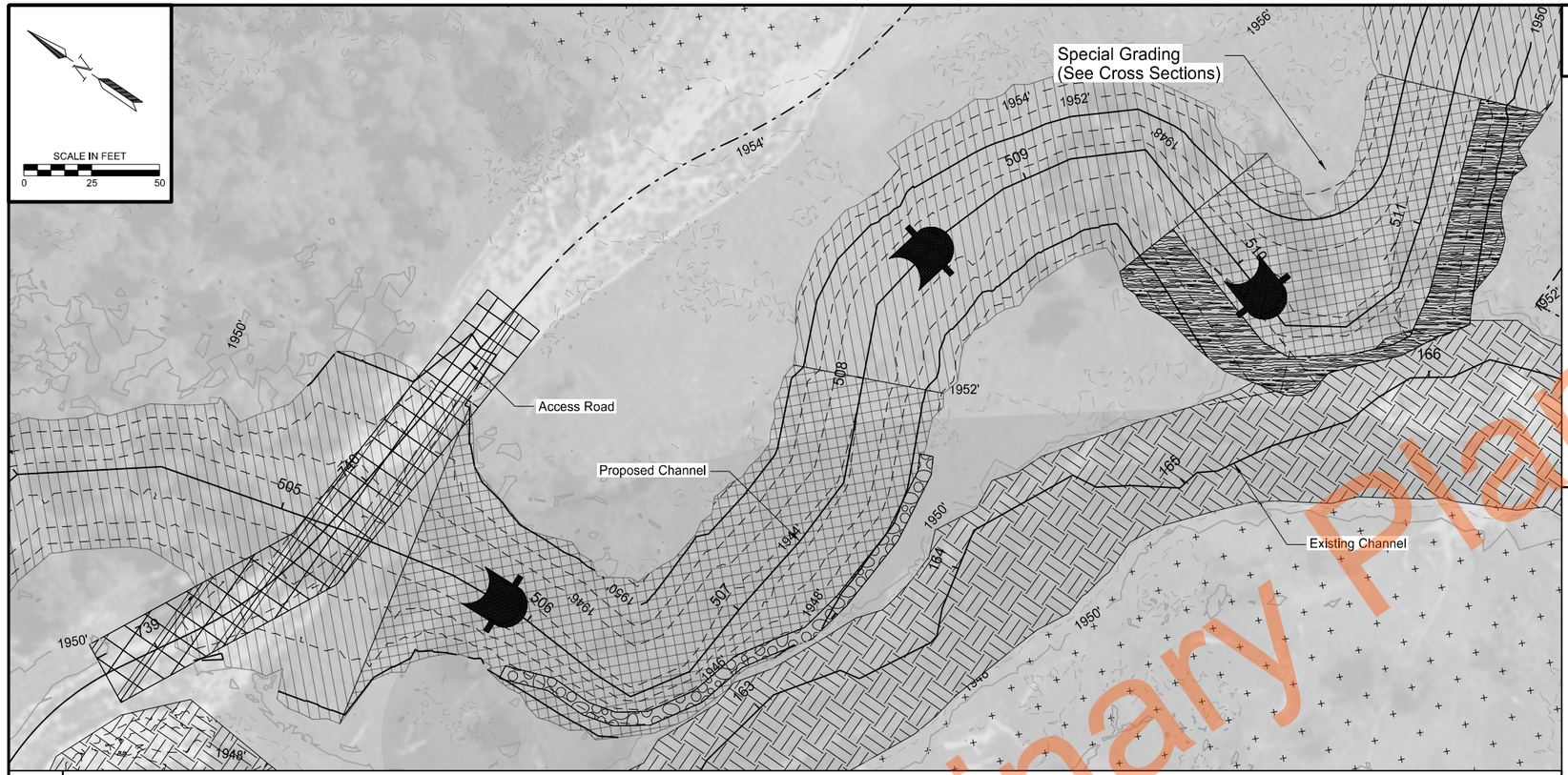

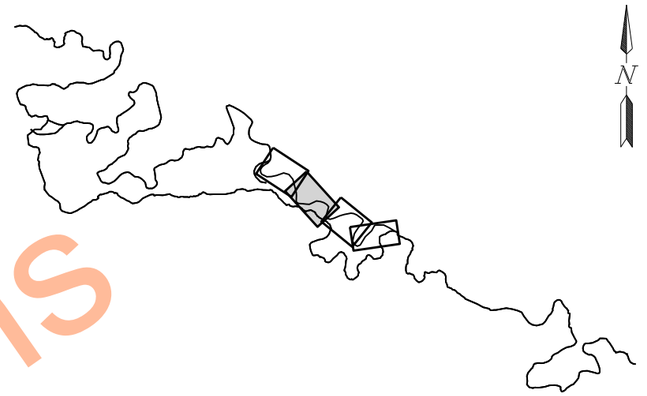

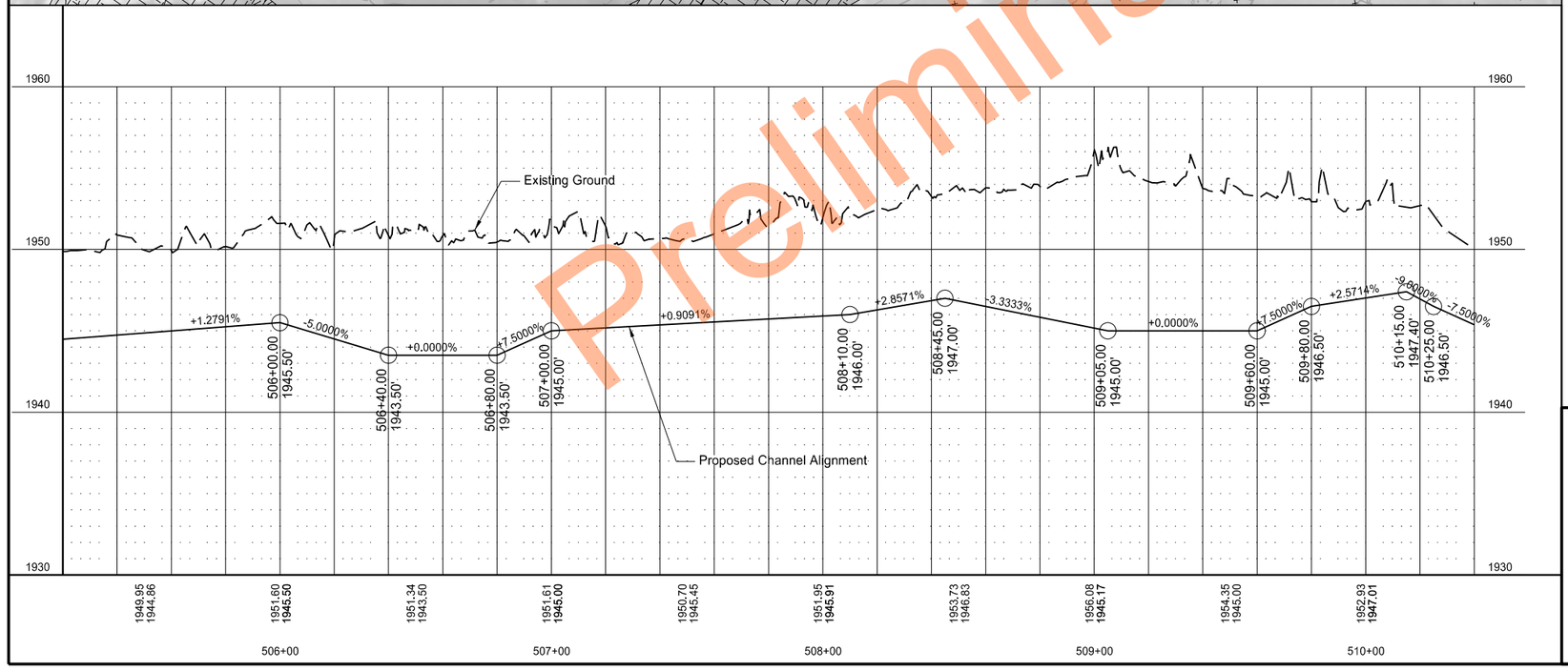

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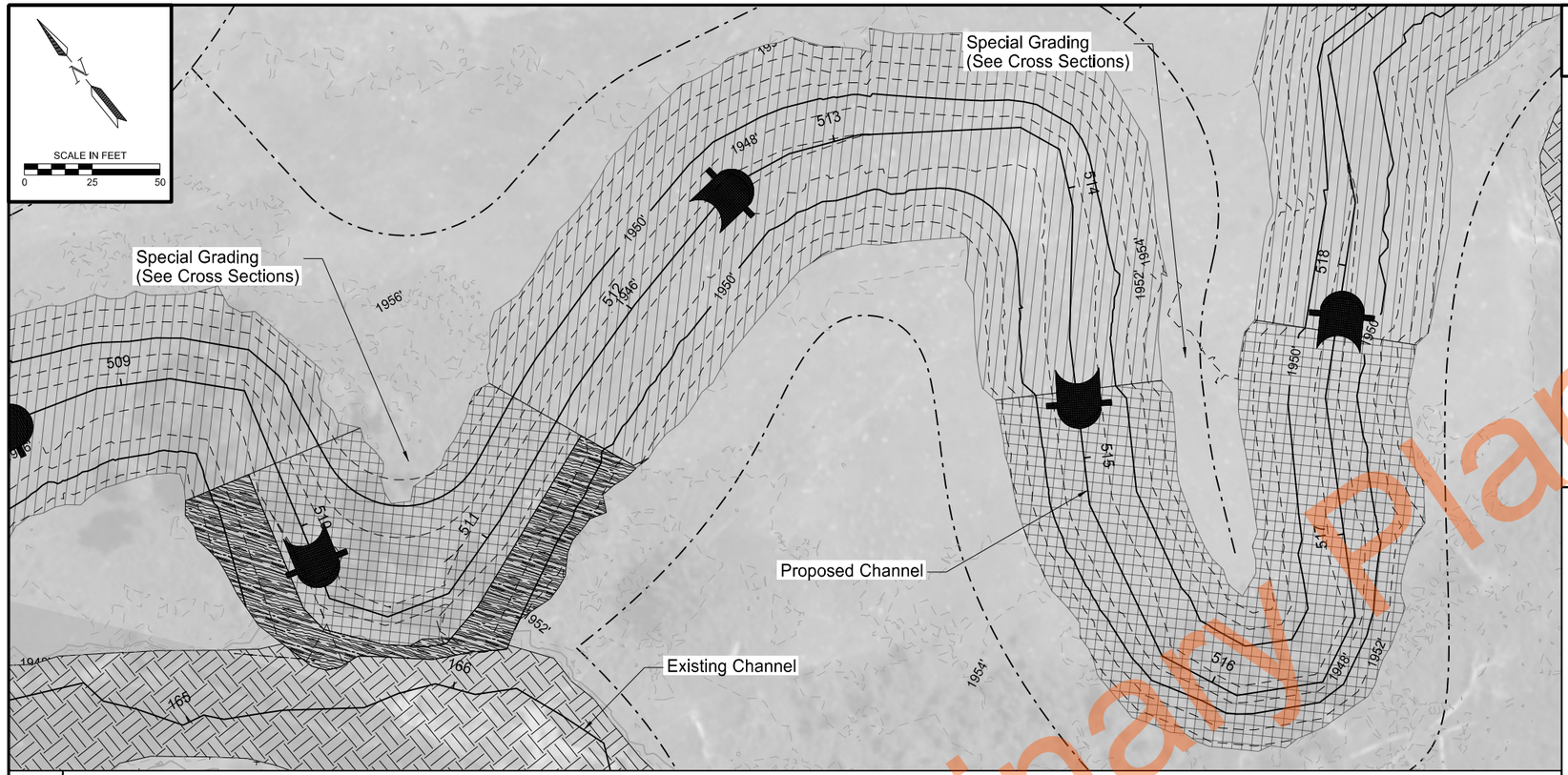

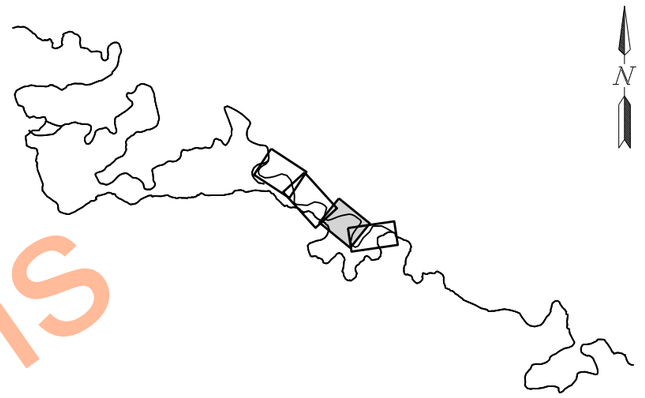

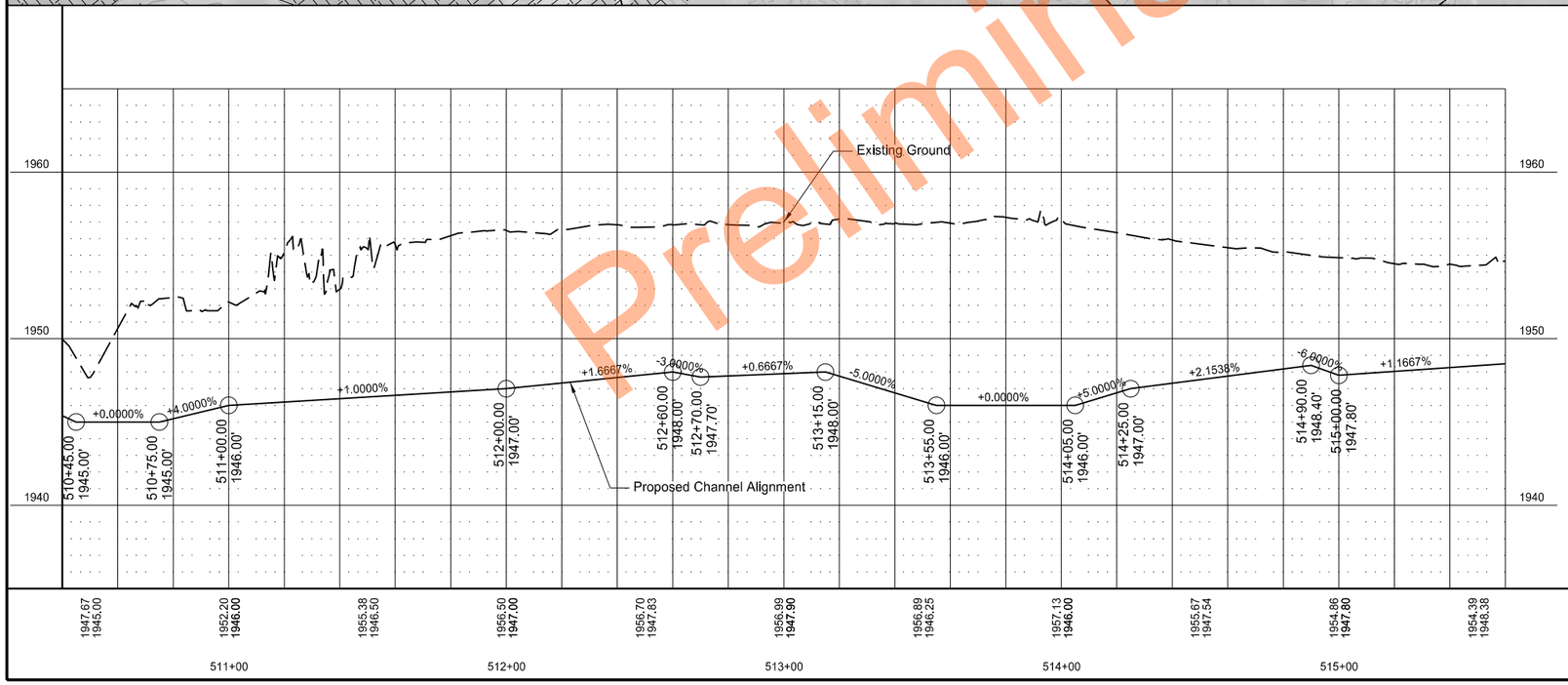

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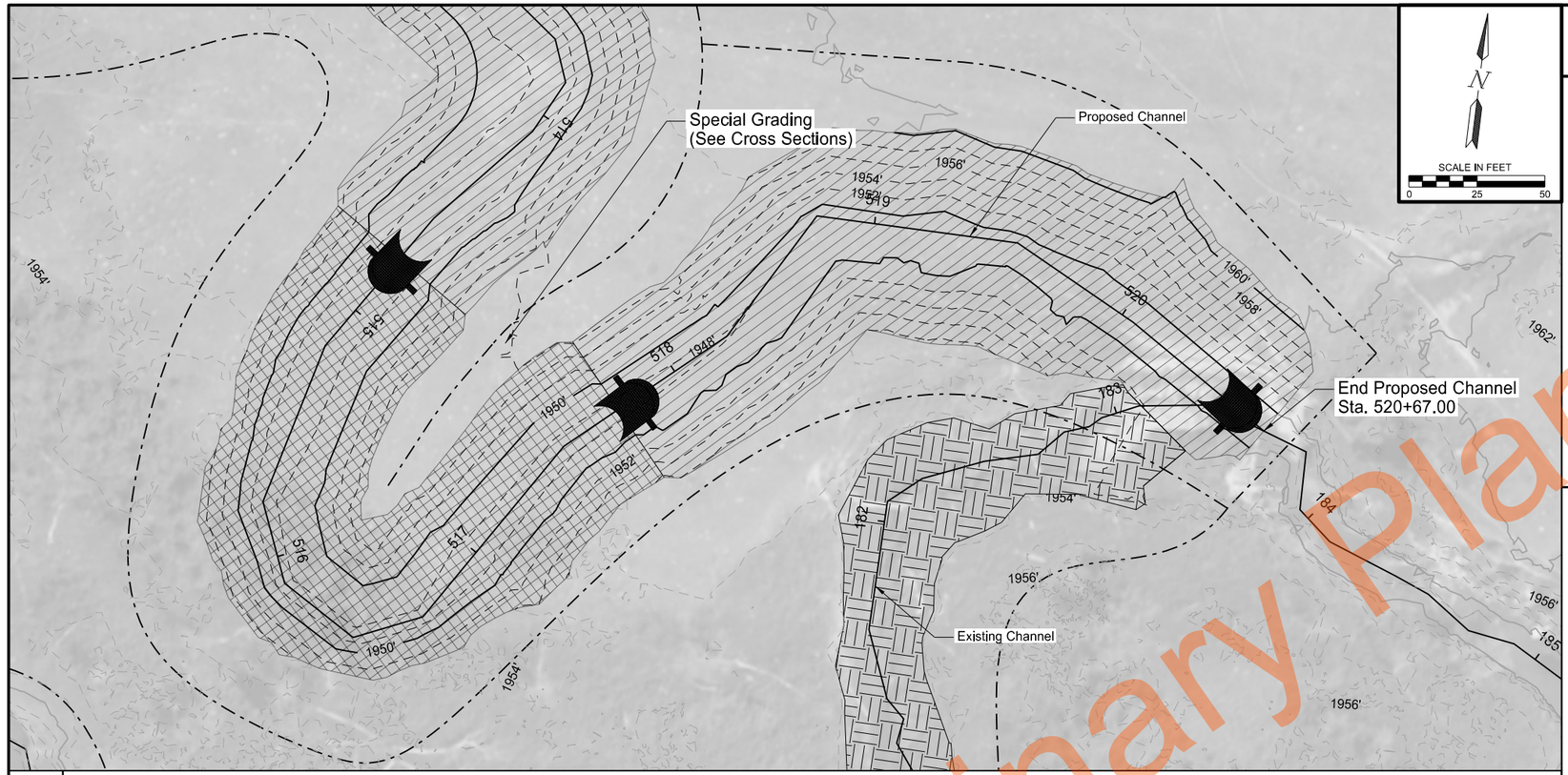
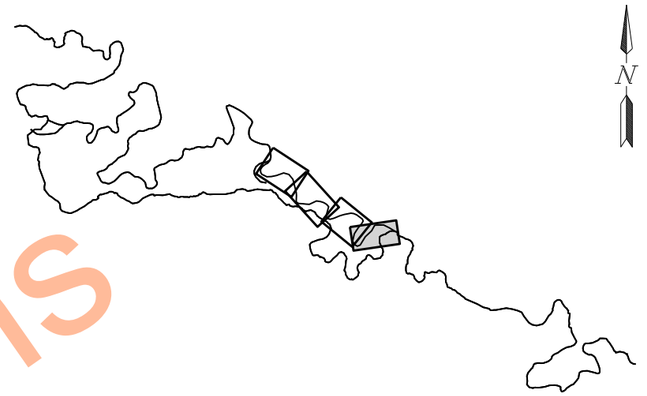
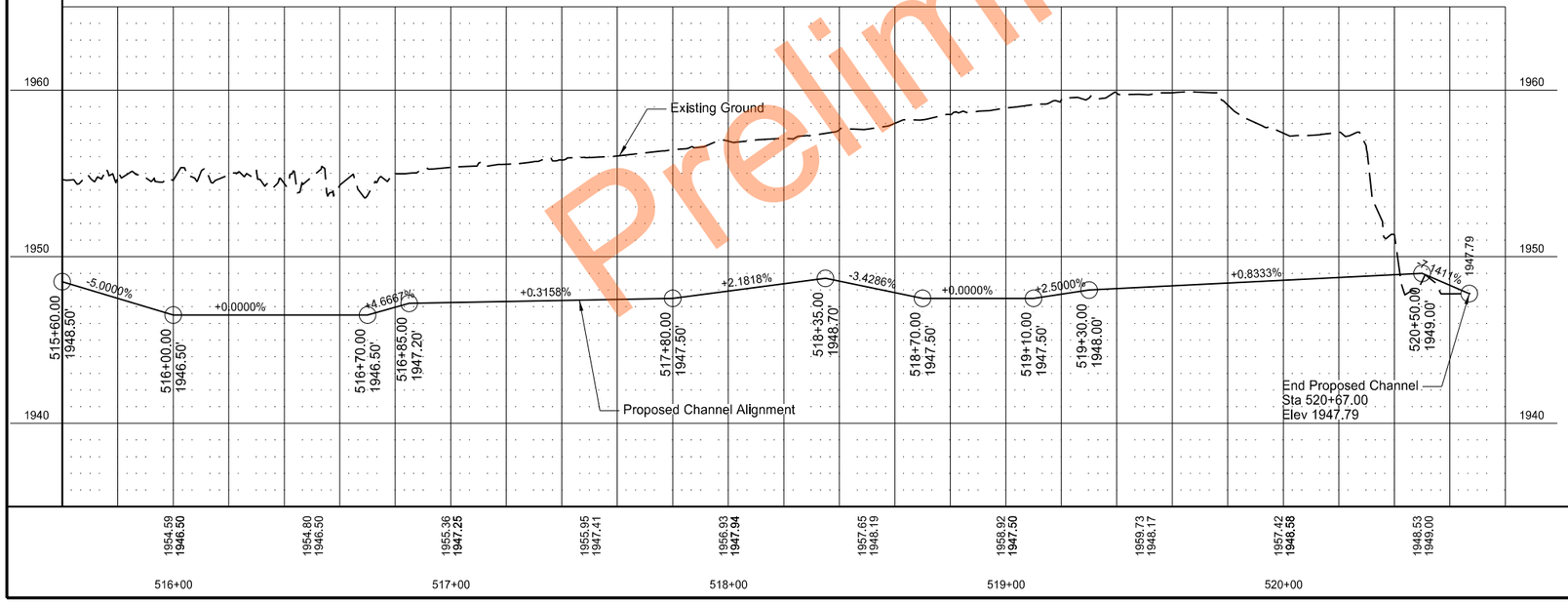
ND	SS-ARP-9-999(488)	60	41





Legend:

- —XXXX'— Proposed Contour (Major)
- —XXXX'— Proposed Contour (Minor)
- —XXXX'— Existing Contour (Major)
- —XXXX'— Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle



Plan and Profile

Proposed Channel

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R ANDERSON
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

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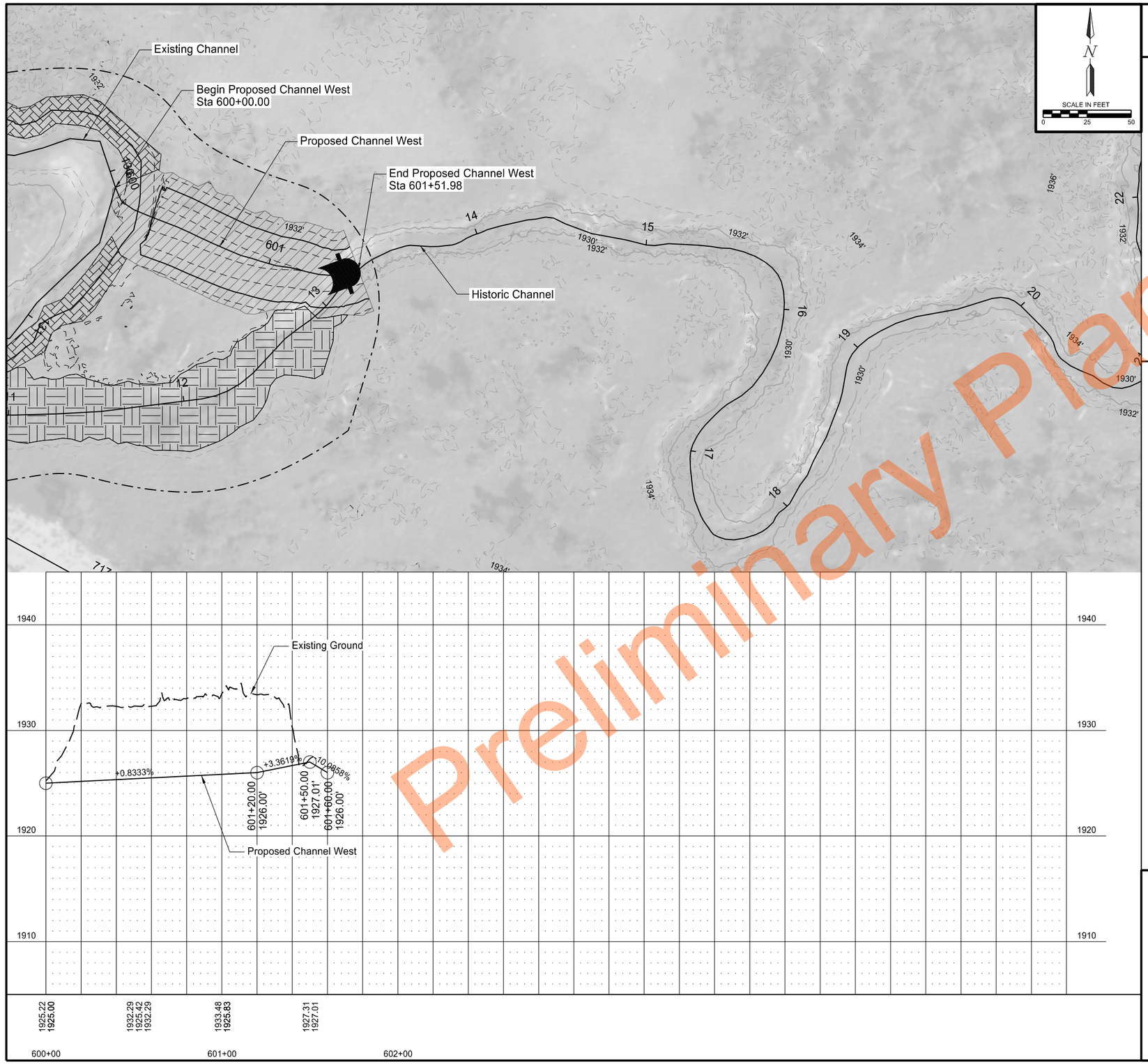
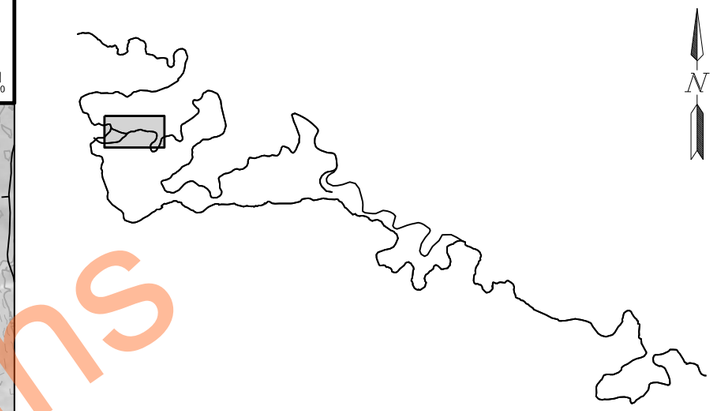
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	42





Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle

Plan and Profile

Proposed Channel West

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
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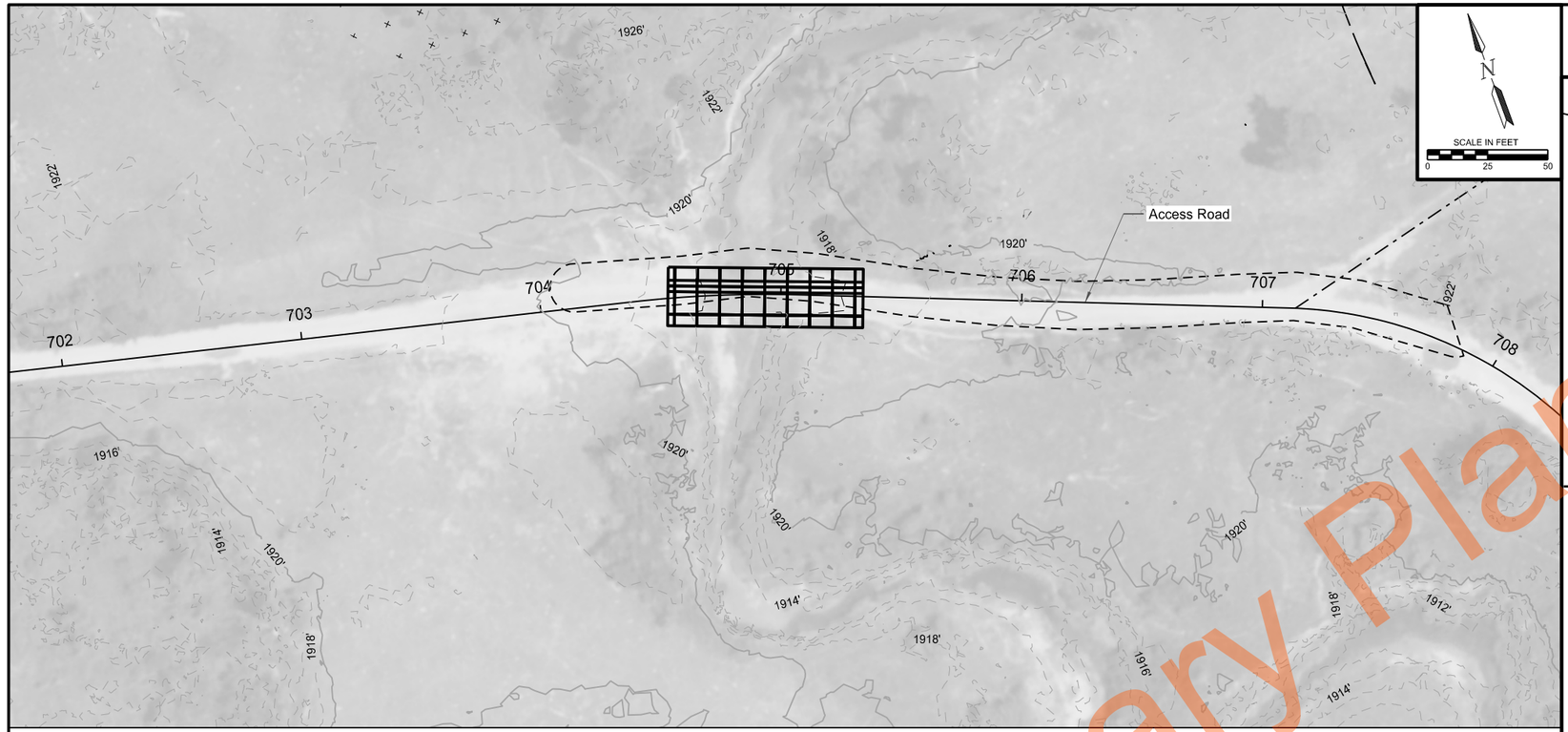
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	43



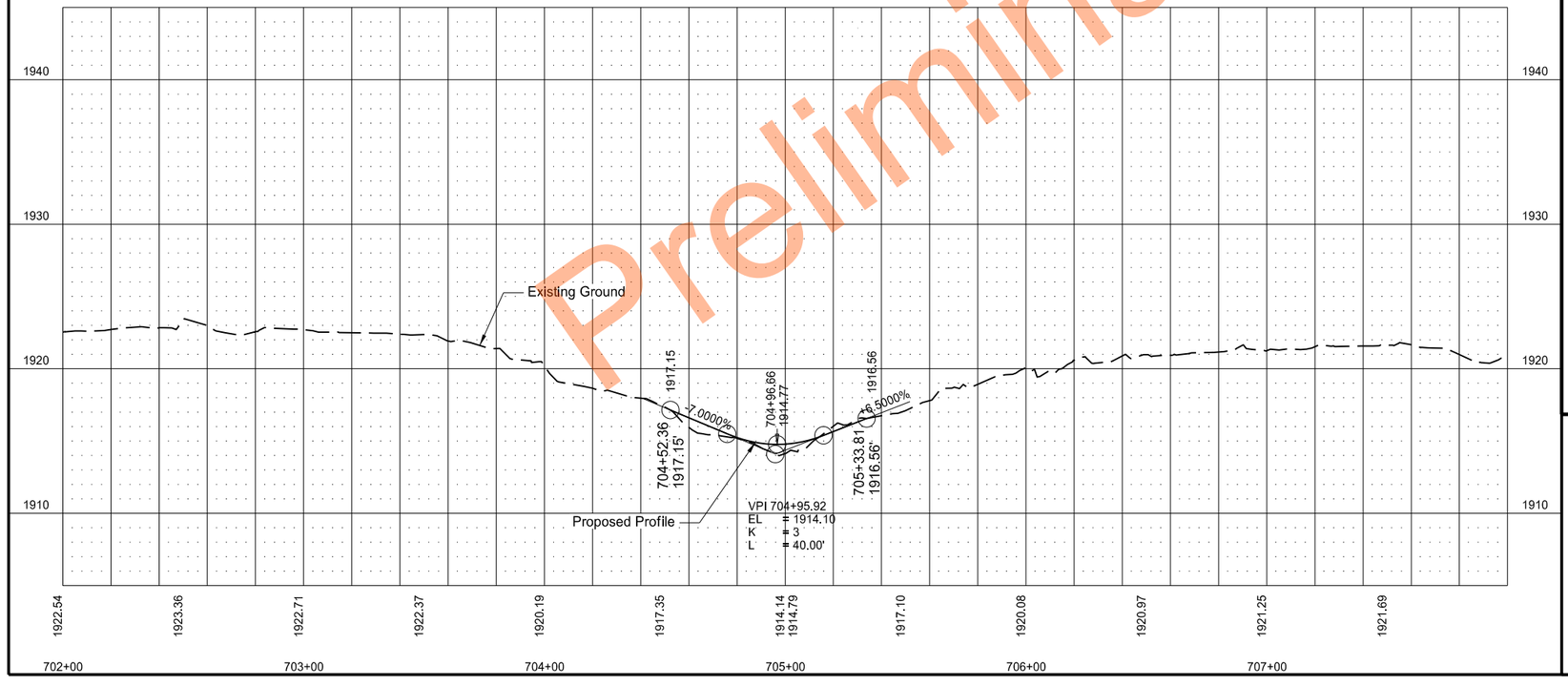


SPEC	CODE	BID ITEM	QTY	UNIT
256	501	RIPRAP-SPECIAL		
		ACCESS ROAD STA 704+53.02 TO STA 705+34.10	54	TON
		OUTLET RIPRAP STA 704+77 TO STA 705+17	54	TON
		TOTAL	108	TON
302	114	AGGREGATE BASE COURSE CL 3		
		ACCESS ROAD STA 704+53.02 TO STA 705+34.10	68	TON
709	100	GEOSYNTHETIC MATERIAL TYPE G		
		ACCESS ROAD STA 704+53.02 TO STA 705+34.10	109	SY

Notes:
RIPRAP GRADE III Rate: 1.5 TON / CY
AGGREGATE BASE COURSE Rate: 1.875 TON / CY

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle



Plan and Profile

Access Road
Low Ford Crossing 1

Sand Creek

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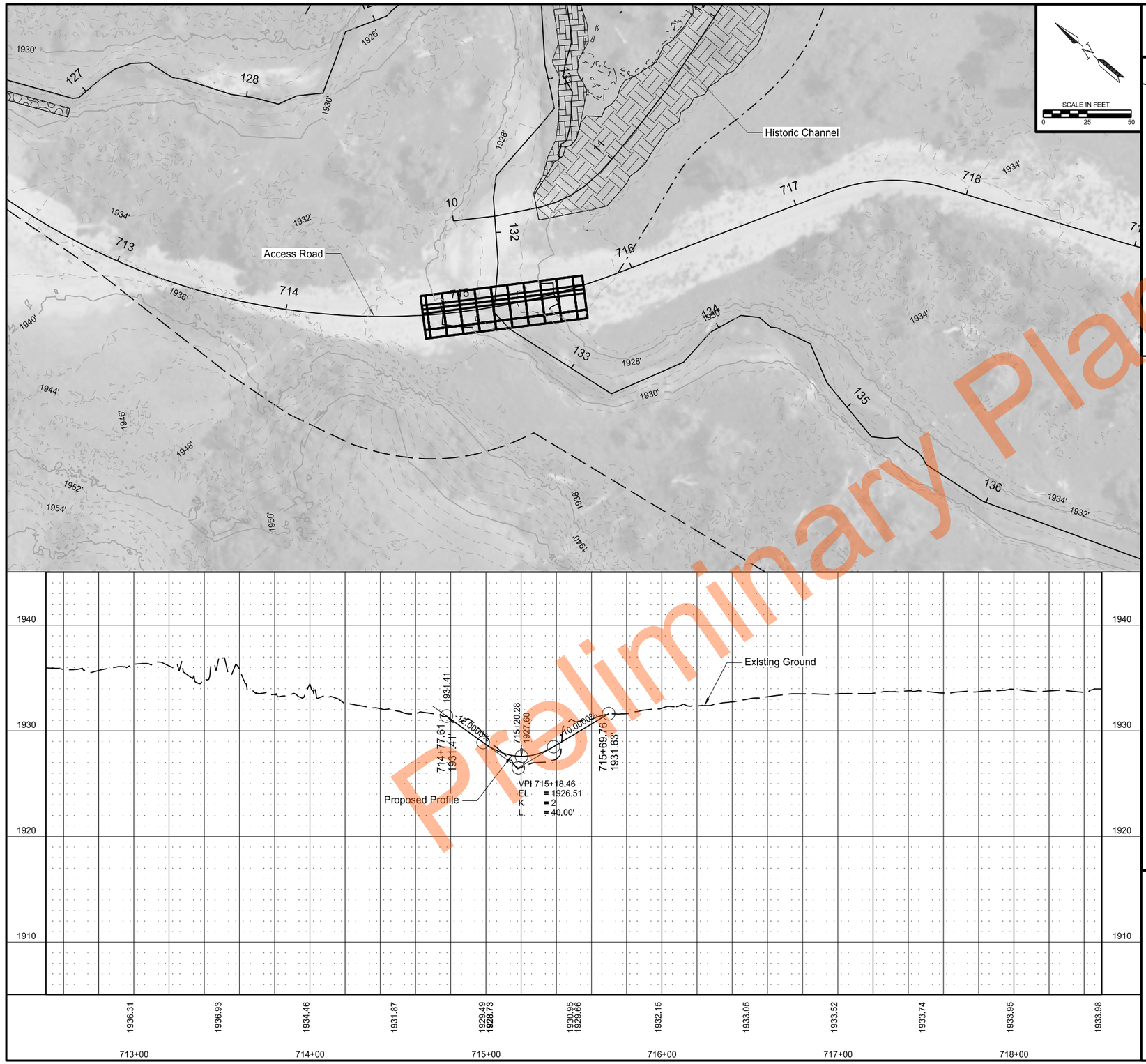

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	60	44



SPEC	CODE	BID ITEM	QTY	UNIT
256	501	RIPRAP-SPECIAL		
		ACCESS ROAD STA 714+77.98 TO STA 715+70.90	61	TON
		OUTLET RIPRAP STA 715+00 TO STA 715+40	54	TON
		TOTAL	115	TON
302	114	AGGREGATE BASE COURSE CL 3		
		ACCESS ROAD STA 714+77.98 TO STA 715+70.90	79	TON
709	100	GEOSYNTHETIC MATERIAL TYPE G		
		ACCESS ROAD STA 714+77.98 TO STA 715+70.90	123	SY

Notes:
RIPRAP GRADE III Rate: 1.5 TON / CY
AGGREGATE BASE COURSE Rate: 1.875 TON / CY

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle

Plan and Profile

Access Road
Low Ford Crossing 2

Sand Creek

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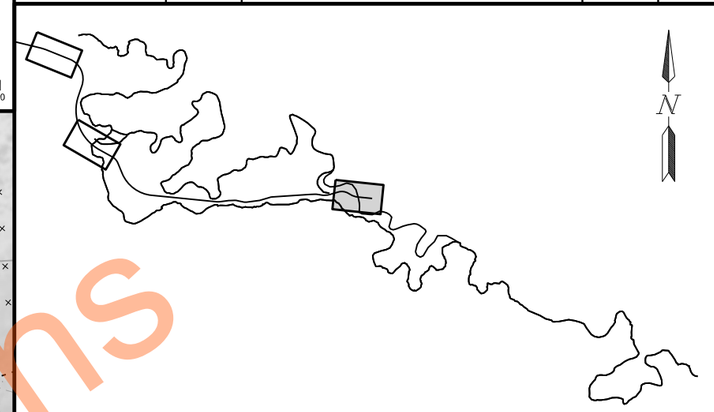
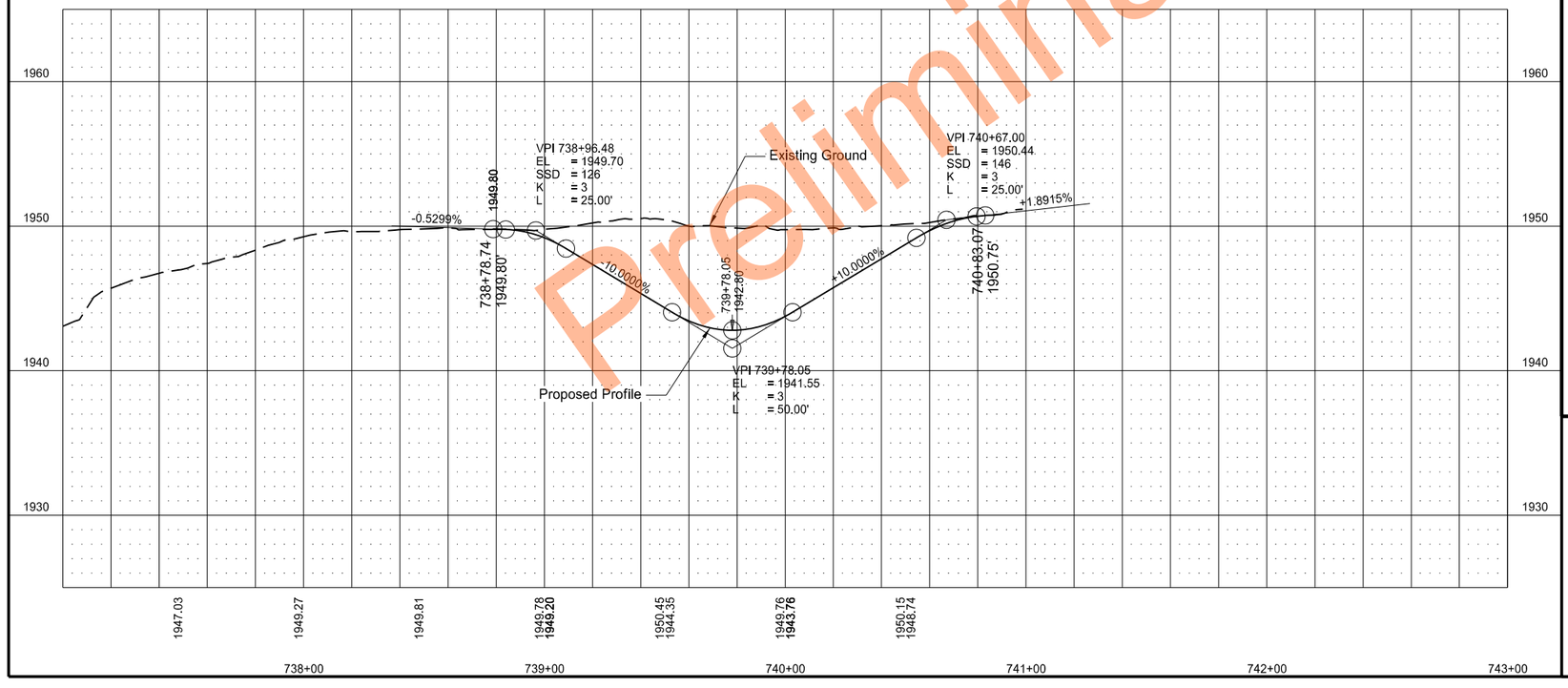
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	60	45





SPEC	CODE	BID ITEM	QTY	UNIT
256	501	RIPRAP-SPECIAL		
		ACCESS ROAD STA 738+78.74 TO STA 740+83.07	136	TON
		OUTLET RIPRAP STA 739+58 TO STA 739+98	54	TON
		TOTAL	190	TON
302	114	AGGREGATE BASE COURSE CL 3		
		ACCESS ROAD STA 738+78.74 TO STA 740+83.07	169	TON
709	100	GEOSYNTHETIC MATERIAL TYPE G		
		ACCESS ROAD STA 738+78.74 TO STA 740+83.07	272	SY



Notes:
RIPRAP GRADE III Rate: 1.5 TON / CY
AGGREGATE BASE COURSE Rate: 1.875 TON / CY

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Proposed Contour (Minor)
- XXXX' Existing Contour (Major)
- XXXX' Existing Contour (Minor)
- Flow Direction
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Toe Wood
- Floodplain Grading
- Ditch Block
- Toe Rock
- Grading per Left Side Bench Typical
- Grading per Right Side Bench Typical
- Low Ford Crossing
- Proposed Rock Riffle

Plan and Profile

Access Road
Low Ford Crossing 3

Sand Creek

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	1

Silt Fence Summary

Alignment	Begin			End			Length (1) (ft)
	Sta	Offset (ft)	Lt/Rt	Sta	Offset (ft)	Lt/Rt	
Historic Channel	11+19	29.6	Lt	12+82	25.2	Lt	330
Existing Channel	150+13	41.4	Rt	151+82	36.6	Rt	380
	150+48	162.0	Lt	158+10	181.6	Lt	1801
	152+30	36.5	Rt	160+22	22.3	Rt	1505
	166+57	94.3	Lt	170+81	29.7	Lt	831
	178+22	50.3	Lt	182+07	31.8	Lt	444
Proposed Channel	511+70	128.8	Lt	513+05	93.9	Lt	534
						Total =	5825

Flotation Silt Curtain Summary

Alignment	Begin			End			Length (1) (ft)
	Sta	Offset (ft)	Lt/Rt	Sta	Offset (ft)	Lt/Rt	
Existing Channel	189+25	23.7	Lt	189+59	23.7	Rt	60
	201+21	30.1	Lt	201+19	30.1	Rt	60
	205+95	18.8	Lt	205+95	41.5	Rt	60
	225+74	38.1	Lt	225+78	26.4	Rt	65
Access Road	704+48	21.3	Rt	705+10	16.3	Rt	60
						Total =	305

Fiber Rolls Summary

Alignment	Begin			End			Length (1) (ft)
	Sta	Offset (ft)	Lt/Rt	Sta	Offset (ft)	Lt/Rt	
Existing Channel	106+17	7.1	Rt	108+28	8.0	Rt	193
	129+00	11.8	Lt	130+09	7.0	Lt	112
	130+29	9.2	Lt	131+75	22.4	Lt	145
	189+48	20.3	Lt	199+05	6.4	Lt	914
	189+60	7.5	Rt	199+75	15.6	Rt	953
	201+30	4.3	Rt	203+75	2.8	Rt	256
	201+59	3.8	Lt	203+57	3.8	Lt	189
	206+25	8.5	Rt	212+60	3.1	Rt	596
	209+60	3.4	Lt	210+30	5.9	Lt	78
	225+90	5.9	Lt	227+10	2.3	Lt	129
Proposed Channel West	600+00	7.0	Lt	601+52	10.5	Lt	152
	600+16	10.5	Rt	601+52	10.5	Rt	160
Historic Channel	37+60	10.0	Lt	40+05	8.9	Lt	212
	43+60	8.2	Lt	45+30	9.1	Lt	155
	56+03	13.7	Rt	59+28	21.1	Rt	271
Proposed Channel	500+05	10.5	Lt	505+13	10.5	Lt	508
	505+38	10.5	Lt	520+67	10.5	Lt	1520
	500+12	10.5	Rt	505+04	10.5	Rt	509
	505+32	10.5	Rt	520+67	10.5	Rt	1544
						Total =	8596

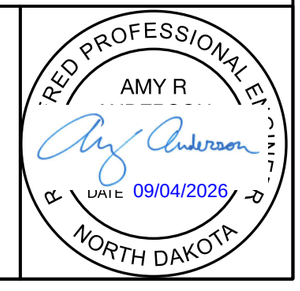
Preliminary Plans

Notes:
(1) Length based on plan view

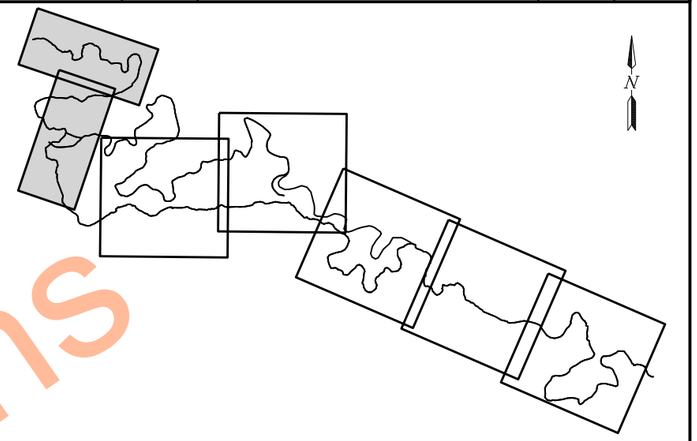
Temporary Erosion Control

Summary Tables

Sand Creek



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	2



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 2	1,367	ACRE
253	0101	STRAW MULCH		
		SHEET 2	0.723	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 2	0.644	ACRE
260	0300	SILT FENCE		
		SHEET 2	330	LF
261	0112	FIBER ROLLS 12IN		
		SHEET 2	762	LF
262	0100	FLOTATION SILT CURTAIN		
		SHEET 2	60	LF

Legend:

- Proposed Contour (Major) — xxxx'
- Existing Contour (Major) — xxxx'
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain — s
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

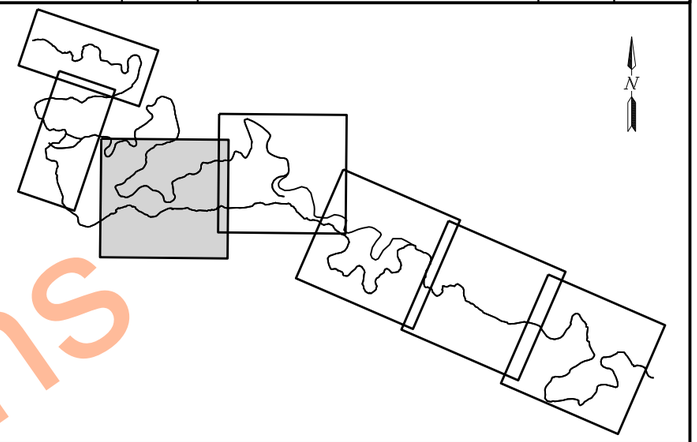
Temporary Erosion Control

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	3



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 3	4.081	ACRE
253	0101	STRAW MULCH		
		SHEET 3	3.929	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 3	0.152	ACRE
260	0300	SILT FENCE		
		SHEET 3	1568	LF
261	0112	FIBER ROLLS 12IN		
		SHEET 3	367	LF

Legend:

- Proposed Contour (Major)
- Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

Temporary Erosion Control

Sand Creek

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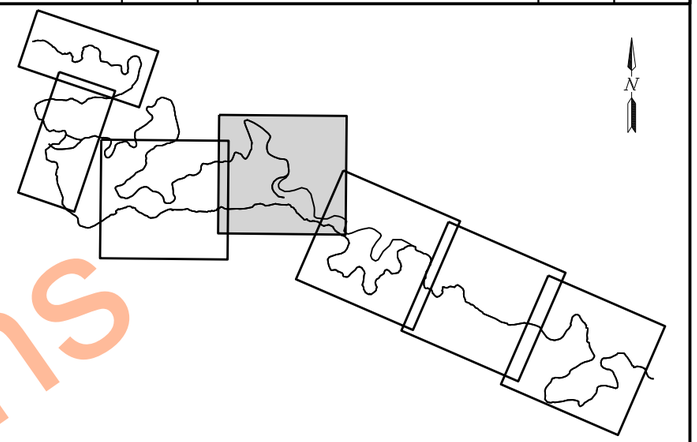
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	4



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 4	7.219	ACRE
253	0101	STRAW MULCH		
		SHEET 4	5.898	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 4	1.321	ACRE
260	0300	SILT FENCE		
		SHEET 4	2118	LF
261	0112	FIBER ROLLS 12IN		
		SHEET 4	1920	LF

Legend:

- Proposed Contour (Major)
- Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

Temporary Erosion Control

Sand Creek

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DATE 09/04/2026
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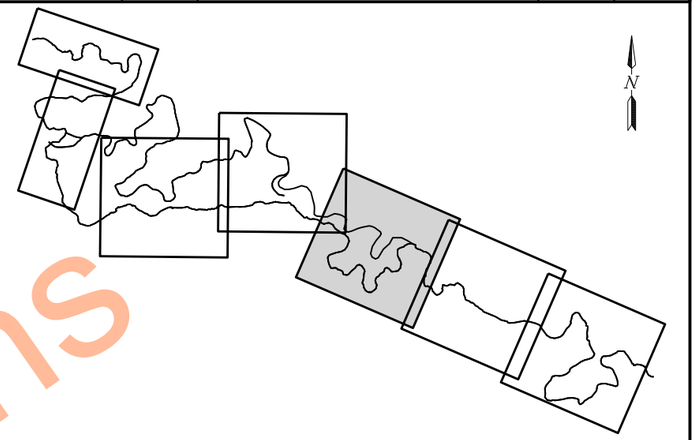
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	5



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 5	6.702	ACRE
253	0101	STRAW MULCH		
		SHEET 5	4.868	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 5	1.834	ACRE
260	0300	SILT FENCE		
		SHEET 5	1809	LF
261	0112	FIBER ROLLS 12IN		
		SHEET 5	2432	LF

Legend:

- Proposed Contour (Major)
- Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

Temporary Erosion Control

Sand Creek

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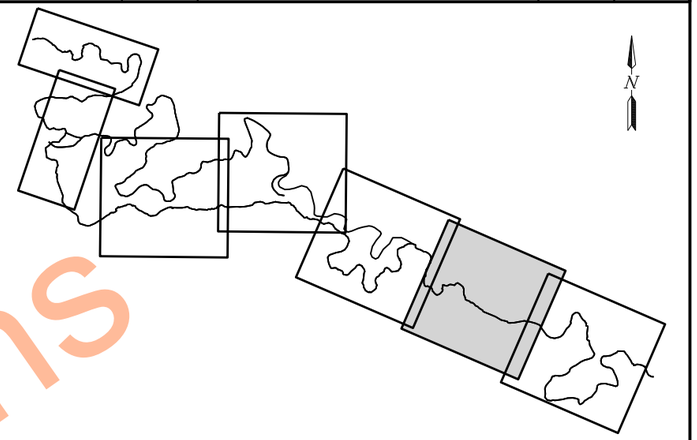
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	6



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 6	1.139	ACRE
253	0101	STRAW MULCH		
		SHEET 6	0.521	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 6	0.618	ACRE
261	0112	FIBER ROLLS 12IN		
		SHEET 6	1867	LF
262	0100	FLOTATION SILT CURTAIN		
		SHEET 6	60	LF

Legend:

- Proposed Contour (Major)
- Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

Temporary Erosion Control

Sand Creek

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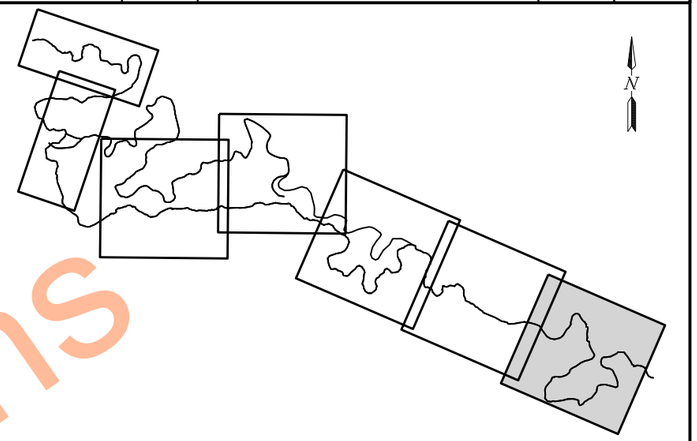
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	76	7



SPEC	CODE	BID ITEM	QTY	UNIT
251	2000	TEMPORARY COVER CROP		
		SHEET 7	0.927	ACRE
253	0101	STRAW MULCH		
		SHEET 7	0.385	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 7	0.542	ACRE
261	0112	FIBER ROLLS 12IN		
		SHEET 7	1248	LF
262	0100	FLOTATION SILT CURTAIN		
		SHEET 7	185	LF

Legend:

- xxxx' Proposed Contour (Major)
- xxxx' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Temporary Cover Crop & Hydraulic Mulch
- Temporary Cover Crop & Straw Mulch
- Overflow Direction

Temporary Erosion Control

Sand Creek

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NORTH DAKOTA
DATE 09/04/2026

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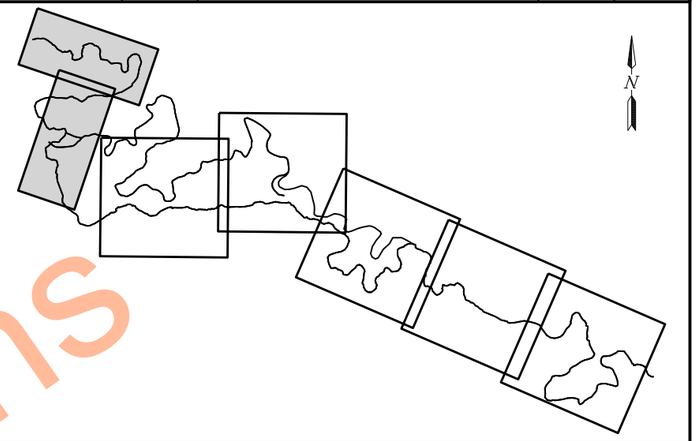
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	1



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 1	0.723	ACRE
251	1000	WETLAND SEED		
		SHEET 1	0.644	ACRE
253	0101	STRAW MULCH		
		SHEET 1	0.723	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 1	0.644	ACRE
260	0301	REMOVE SILT FENCE		
		SHEET 1	330	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 1	762	LF
262	0101	REMOVE FLOTATION SILT CURTAIN		
		SHEET 1	60	LF

Legend:

- Proposed Contour (Major) — xxxx'
- Existing Contour (Major) — xxxx'
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- Floating Silt Curtain — S
- Silt Fence — –x–
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

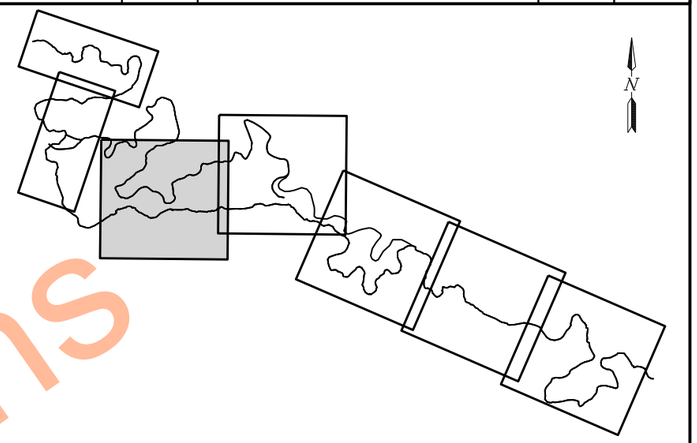
Permanent Erosion Control

Sand Creek

REGISTERED PROFESSIONAL ENGINEER
AMY R
DATE 09/04/2026
NORTH DAKOTA

Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	2



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 2	3.929	ACRE
251	1000	WETLAND SEED		
		SHEET 2	0.152	ACRE
253	0101	STRAW MULCH		
		SHEET 2	3.929	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 2	0.152	ACRE
260	0301	REMOVE SILT FENCE		
		SHEET 2	1568	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 2	367	LF

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

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Sand Creek

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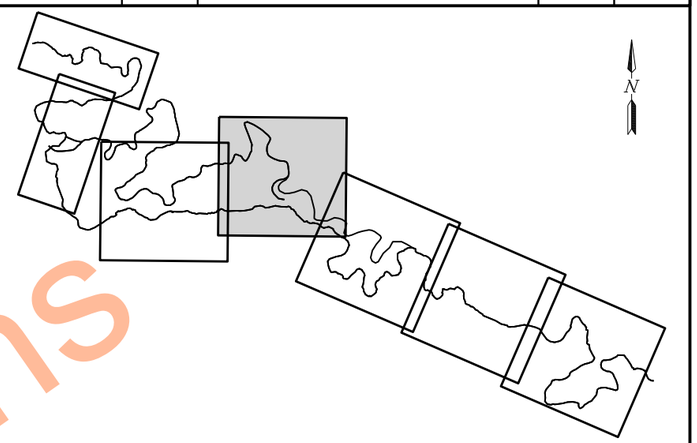
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	3



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 3	5.898	ACRE
251	1000	WETLAND SEED		
		SHEET 3	1.321	ACRE
253	0101	STRAW MULCH		
		SHEET 3	5.898	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 3	1.321	ACRE
260	0301	REMOVE SILT FENCE		
		SHEET 3	2118	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 3	1920	LF

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

Permanent Erosion Control

Sand Creek

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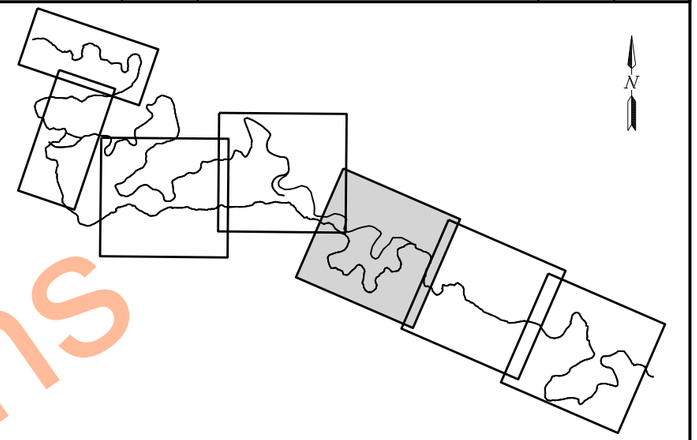
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	4



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 4	4.868	ACRE
251	1000	WETLAND SEED		
		SHEET 4	1.834	ACRE
253	0101	STRAW MULCH		
		SHEET 4	4.868	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 4	1.834	ACRE
260	0301	REMOVE SILT FENCE		
		SHEET 4	1809	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 4	2432	LF

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

Permanent Erosion Control

Sand Creek

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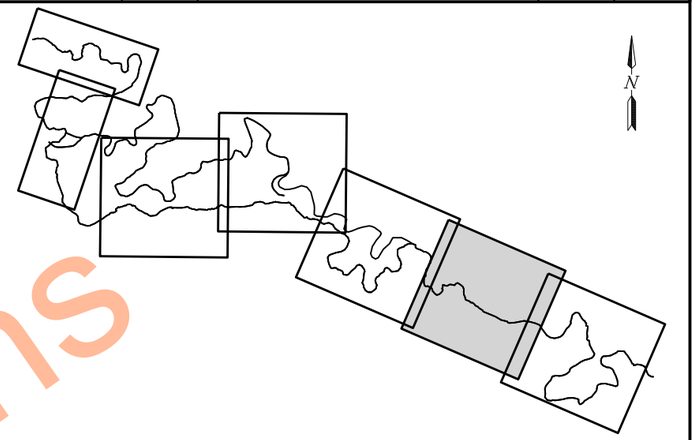
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	5



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 5	0.521	ACRE
251	1000	WETLAND SEED		
		SHEET 5	0.618	ACRE
253	0101	STRAW MULCH		
		SHEET 5	0.521	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 5	0.618	ACRE
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 5	1867	LF
262	0101	REMOVE FLOTATION SILT CURTAIN		
		SHEET 5	60	LF

Legend:

- XXXX' Proposed Contour (Major)
- XXXX' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

Permanent Erosion Control

Sand Creek

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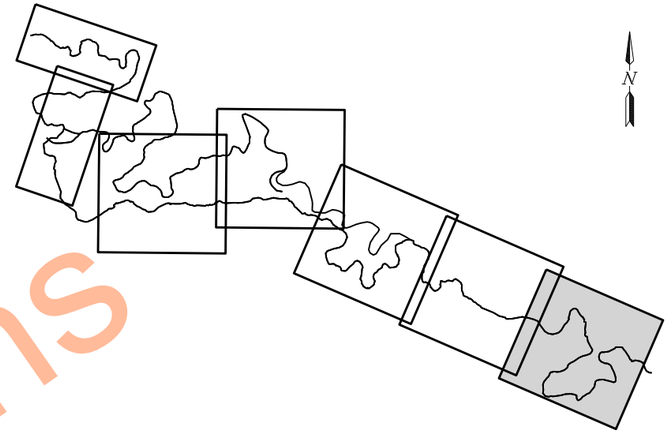
Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	77	6



SPEC	CODE	BID ITEM	QTY	UNIT
251	0300	SEEDING CLASS III		
		SHEET 6	0.385	ACRE
251	1000	WETLAND SEED		
		SHEET 6	0.542	ACRE
253	0101	STRAW MULCH		
		SHEET 6	0.385	ACRE
253	0201	HYDRAULIC MULCH		
		SHEET 6	0.542	ACRE
261	0113	REMOVE FIBER ROLLS 12IN		
		SHEET 6	1248	LF
262	0101	REMOVE FLOTATION SILT CURTAIN		
		SHEET 6	185	LF

Legend:

- xxxx' Proposed Contour (Major)
- xxxx' Existing Contour (Major)
- Direction of Flow
- Wetland Boundary
- Project Boundary
- Construction Access
- Temporary Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- Fiber Roll 12IN
- S Floating Silt Curtain
- Silt Fence
- Wetland Seed & Hydraulic Mulch
- Seeding Class III & Straw Mulch
- Overflow Direction

Permanent Erosion Control

Sand Creek

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Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	80	1

Sheet	Point number	X	Y	Description
2	2000	1352530.555	405940.052	Corner Assembly
2	2001	1352314.879	405873.464	Corner Assembly
2	2002	1352264.338	405831.529	Corner Assembly
2	2003	1352300.924	405612.837	Corner Assembly
2	2004	1352481.909	405599.427	Corner Assembly
2	2005	1352492.541	405516.042	Corner Assembly
2	2006	1352817.309	405527.035	Corner Assembly
2	2007	1352934.606	405629.093	Corner Assembly
2	2008	1352978.019	405738.386	Corner Assembly
2	2009	1353001.741	405745.356	Corner Assembly
2	2010	1353029.545	405765.418	Corner Assembly
2	2011	1353031.205	405791.478	Corner Assembly
2	2012	1352206.499	405569.043	Corner Assembly
2	2013	1352137.772	405476.066	Corner Assembly
2	2014	1352072.865	405491.574	Corner Assembly
2	2015	1352045.090	405415.003	Kink Point
2	2016	1352003.221	405226.576	Kink Point
2	2017	1351790.173	404696.462	Corner Assembly
2	2018	1351814.438	404350.938	Corner Assembly
2	2019	1351798.242	404283.448	Corner Assembly
2	2020	1352510.592	405374.422	Corner Assembly
2	2021	1352753.484	405375.693	Kink Point
2	2022	1353116.011	405292.543	Kink Point
2	2023	1353273.398	405229.681	Corner Assembly
2	2024	1353325.567	405223.759	Corner Assembly
2	2025	1353200.352	404065.297	Corner Assembly
2	2026	1353272.648	404208.266	Corner Assembly
2	2027	1353368.764	404210.885	Corner Assembly
2	2028	1353454.172	404179.345	Kink Point
3	2029	1351825.694	403839.348	Corner Assembly
3	2030	1352004.761	403658.015	Corner Assembly
3	2031	1352073.948	403690.956	Corner Assembly
3	2032	1352184.723	403653.840	Corner Assembly
3	2033	1352412.388	403725.890	Corner Assembly
3	2034	1352529.598	403728.412	Corner Assembly
3	2035	1352654.374	403865.669	Corner Assembly
3	2036	1352741.549	403861.234	Corner Assembly
3	2037	1352975.070	403925.693	Kink Point

Sheet	Point number	X	Y	Description
4	2038	1353891.490	405387.497	Corner Assembly
4	2039	1354114.178	405357.141	Corner Assembly
4	2040	1354149.679	405316.191	Corner Assembly
4	2041	1354151.188	405286.751	Corner Assembly
4	2042	1354264.778	405141.541	Corner Assembly
4	2043	1354309.368	405050.044	Corner Assembly
4	2044	1354501.397	404924.413	Corner Assembly
4	2045	1354469.516	404651.533	Corner Assembly
4	2046	1354558.080	404558.914	Corner Assembly
4	2047	1354728.055	404498.069	Corner Assembly
4	2048	1355431.851	404513.473	Corner Assembly
4	2048A	1355483.392	404576.186	Corner Assembly
4	2048B	1355650.451	404499.395	Kink Point
4	2049	1355799.343	404370.613	Corner Assembly
4	2050	1355811.008	404242.204	Corner Assembly
4	2051	1353935.628	404101.257	Corner Assembly
4	2052	1354013.772	404009.086	Corner Assembly
4	2053	1354133.273	403931.603	Kink Point
4	2054	1354480.025	403787.169	Kink Point
4	2055	1354566.560	403773.110	Corner Assembly
4	2056	1354927.913	403461.809	Kink Point
5	2057	1356634.792	404048.545	Corner Assembly
5	2058	1356715.728	403991.130	Corner Assembly
5	2059	1356722.384	403887.152	Corner Assembly
5	2060	1356705.578	403624.010	Corner Assembly
5	2061	1356751.893	403562.449	Corner Assembly
5	2062	1356792.217	403452.188	Corner Assembly
5	2063	1356792.894	403417.498	Corner Assembly
5	2064	1357013.984	403377.493	Corner Assembly
5	2065	1357064.254	403335.529	Corner Assembly
5	2066	1357067.889	402996.236	Corner Assembly
5	2067	1357017.518	402938.772	Corner Assembly
5	2068	1356759.444	402816.489	Kink Point
5	2069	1356501.587	402739.220	Corner Assembly
5	2070	1356393.438	402755.643	Corner Assembly
5	2071	1356229.945	402571.915	Corner Assembly
5	2072	1356182.979	402400.088	Corner Assembly
5	2073	1356043.619	402317.610	Corner Assembly
5	2074	1355959.229	402478.849	Kink Point
5	2075	1355851.088	402735.747	Corner Assembly
5	2076	1355575.225	403043.827	Corner Assembly
5	2077	1355306.034	403140.717	Corner Assembly
5	2078	1355191.534	403320.311	Corner Assembly

Preliminary Plans

Fencing

Sand Creek

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	80	2

SPEC	CODE	BID ITEM	QTY	UNIT
752	320	FENCE BARBED WIRE 4 STRAND-STEEL POST		
		SHEET 2	5363	LF
752	911	TEMPORARY SAFETY FENCE		
		SHEET 2	1304	LF
752	2140	VEHICLE GATE 8FT X 16FT		
		SHEET 2	2	EA
752	2160	WIRE GATE		
		SHEET 2	3	EA
752	3140	CORNER ASSEMBLY BARBED WIRE		
		SHEET 2	24	EA
752	3975	SINGLE BRACE ASSEMBLY BARBED WIRE - WOOD POST		
		SHEET 2	6	EA
752	4100	DOUBLE BRACE ASSEMBLY BARBED WIRE		
		SHEET 2	4	EA

SCALE IN FEET
0 100 200

Notes:
See Section 20 for Gate Details.

Legend:
- XXXX' Existing Contour (Major)
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Temporary Construction Access
- BWP Fence Barbed Wire - Pneumatic Install
- BWH Fence Barbed Wire - Hand Install
- TSF Temporary Safety Fence
- Wire Gate
- Vehicle Gate 8FT X 16FT
- Corner Assembly Barbed Wire
- XXXX Point Number

Fencing

Sand Creek

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Preliminary Plans

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-ARP-9-999(488)	80	3

SPEC	CODE	BID ITEM	QTY	UNIT
752	320	FENCE BARBED WIRE 4 STRAND-STEEL POST		
		SHEET 3	1593	LF
752	911	TEMPORARY SAFETY FENCE		
		SHEET 3	792	LF
752	2160	WIRE GATE		
		SHEET 3	1	EA
752	3140	CORNER ASSEMBLY BARBED WIRE		
		SHEET 3	8	EA
752	3975	SINGLE BRACE ASSEMBLY BARBED WIRE - WOOD POST		
		SHEET 3	2	EA

Notes:
See Section 20 for Gate Details.

Legend:
- XXXX' Existing Contour (Major)
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Temporary Construction Access
- BWP Fence Barbed Wire - Pneumatic Install
- BWH Fence Barbed Wire - Hand Install
- TSF Temporary Safety Fence
- Wire Gate
- Vehicle Gate 8FT X 16FT
- Corner Assembly Barbed Wire
- (XXXX) Point Number

Fencing

Sand Creek

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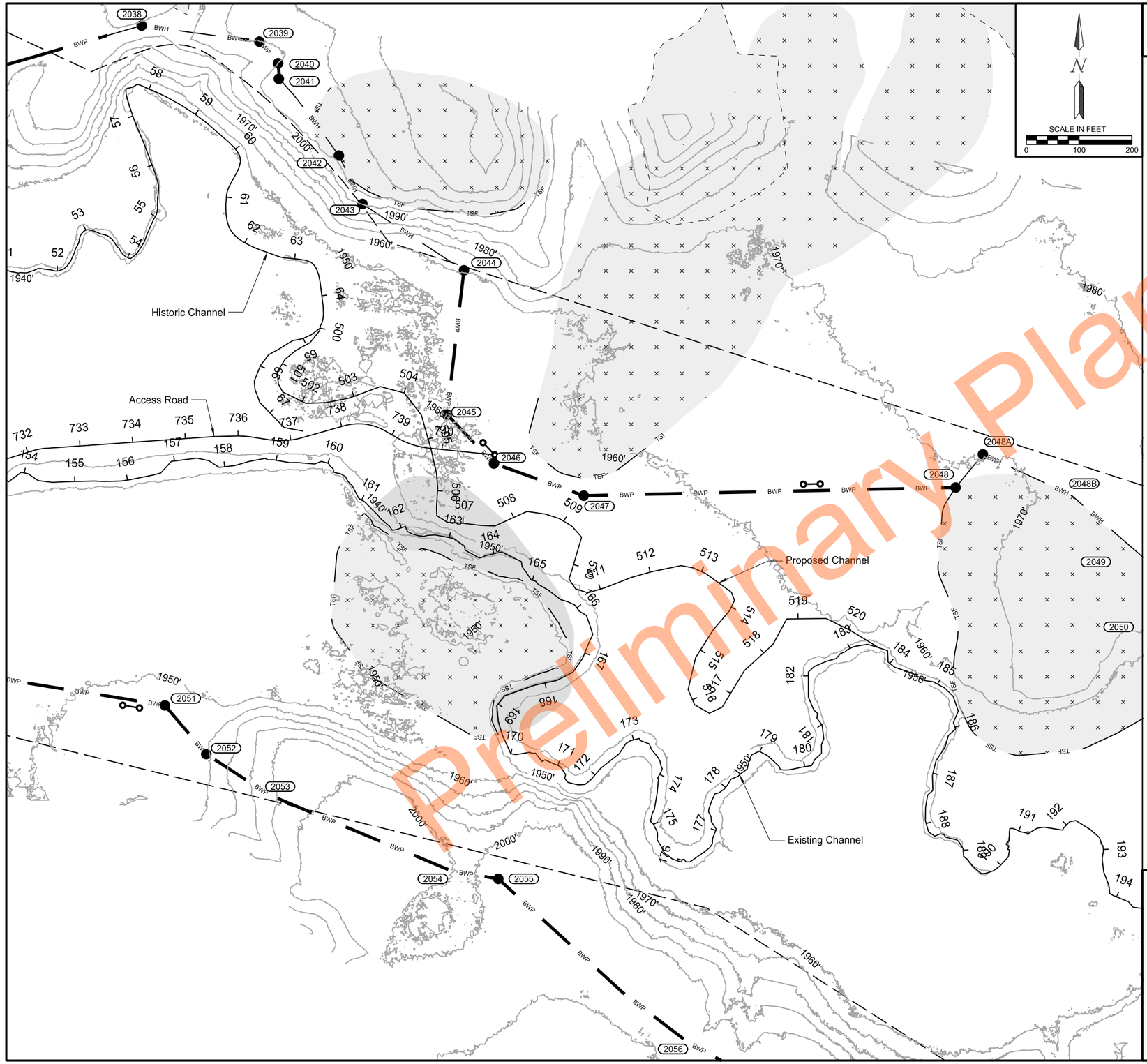
Preliminary Plans



Preliminary Plans

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	80	4

SPEC	CODE	BID ITEM	QTY	UNIT
752	320	FENCE BARBED WIRE 4 STRAND-STEEL POST		
		SHEET 4	4463	LF
752	911	TEMPORARY SAFETY FENCE		
		SHEET 4	3271	LF
752	2160	WIRE GATE		
		SHEET 4	3	EA
752	3140	CORNER ASSEMBLY BARBED WIRE		
		SHEET 4	17	EA
752	3975	SINGLE BRACE ASSEMBLY BARBED WIRE - WOOD POST		
		SHEET 4	6	EA

Notes:
See Section 20 for Gate Details.

Legend:
- XXXX' — Existing Contour (Major)
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Temporary Construction Access
- BWP — Fence Barbed Wire - Pneumatic Install
- BWH — Fence Barbed Wire - Hand Install
- TSF — Temporary Safety Fence
- Wire Gate
- Vehicle Gate 8FT X 16FT
- Corner Assembly Barbed Wire
- (XXXX) Point Number

Fencing

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-ARP-9-999(488)	80	5

SPEC	CODE	BID ITEM	QTY	UNIT
752	320	FENCE BARBED WIRE 4 STRAND-STEEL POST		
		SHEET 5	5118	LF
752	911	TEMPORARY SAFETY FENCE		
		SHEET 5	2452	LF
752	2160	WIRE GATE		
		SHEET 5	3	EA
752	3140	CORNER ASSEMBLY BARBED WIRE		
		SHEET 5	20	EA
752	3975	SINGLE BRACE ASSEMBLY BARBED WIRE - WOOD POST		
		SHEET 5	6	EA

Proposed Channel

Existing Channel

SCALE IN FEET
0 100 200

Notes:
See Section 20 for Gate Details.

Legend:
- XXXX' Existing Contour (Major)
- Project Boundary
- Construction Access
- Avoidance Area
- Avoidance Area Mitigation
- DASK Avoidance Area
- Temporary Construction Access
- BWP Fence Barbed Wire - Pneumatic Install
- BWH Fence Barbed Wire - Hand Install
- TSF Temporary Safety Fence
- Wire Gate
- Vehicle Gate 8FT X 16FT
- Corner Assembly Barbed Wire
- XXXX Point Number

Fencing

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Preliminary Plans