Appendix A

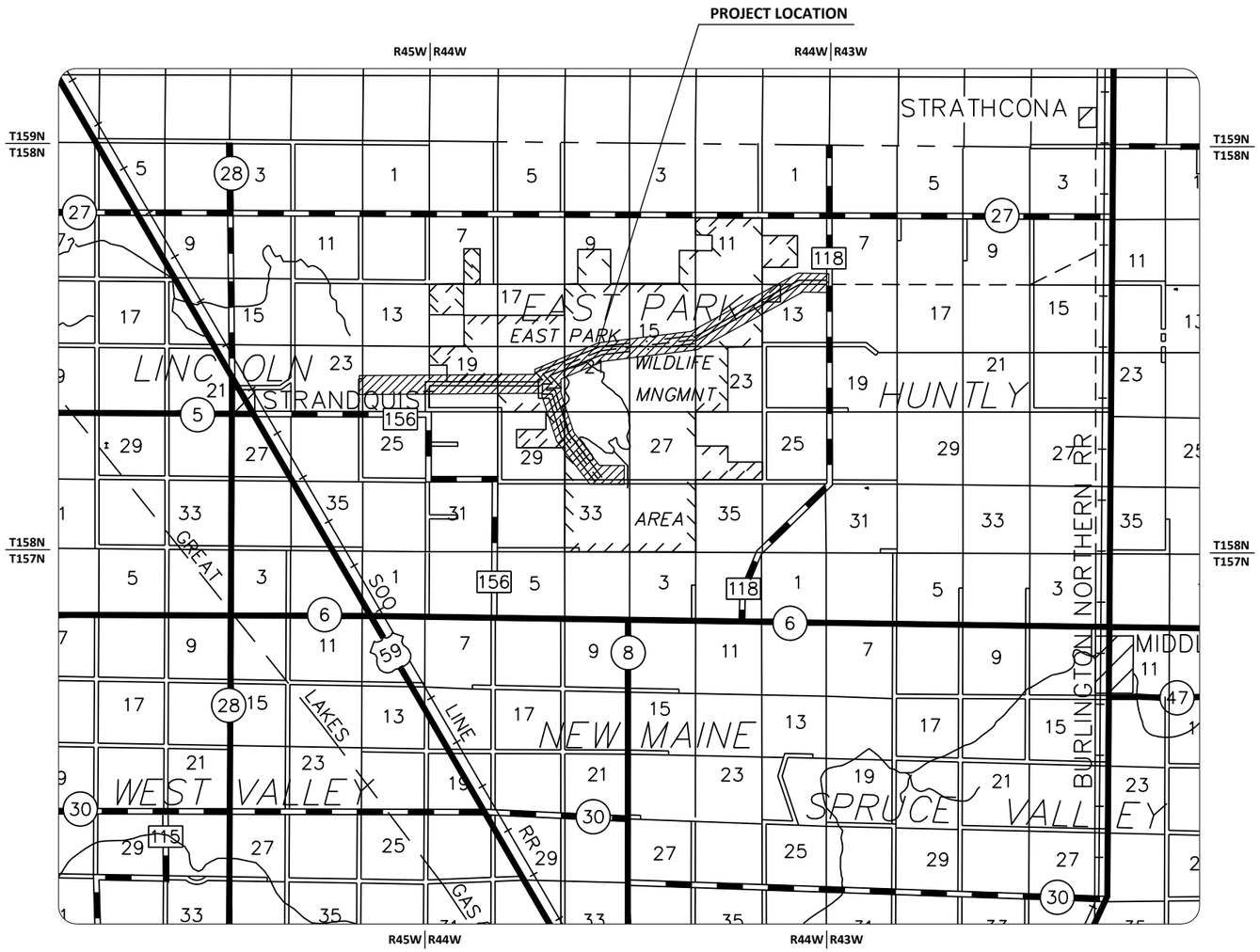
Nelson Slough Improvement Project – Preliminary Plans

PRELIMINARY PLAN (NOT FOR CONSTRUCTION) FOR

MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
NELSON SLOUGH IMPROVEMENT PROJECT

WARREN, MINNESOTA

FEBRUARY, 2021



LOCATION MAP

HORIZONTAL AND VERTICAL CONTROL

- ALL COORDINATES LISTED IN THIS PLAN ARE MN/DOT, MARSHALL COUNTY, U.S. FOOT
- ALL ELEVATIONS ARE NAVD 88 DATUM

SHEET INDEX

1	COVER
2	ESTIMATED QUANTITIES AND NOTES
3-4	TYPICAL SECTIONS
5	ROCK DROP DETAILS
6	REFERENCE SHEET
7-21	LEVEE PLAN & PROFILE
22-29	OUTLET PLAN & PROFILE
30-34	INLET PLAN & PROFILE
35-38	STRUCTURAL DETAILS

GOVERNING SPECIFICATIONS:

THE 2018 EDITION OF THE MINNESOTA "STANDARD SPECIFICATIONS FOR CONSTRUCTION" ALONG WITH THE CONTRACT SPECIAL PROVISIONS SHALL GOVERN.

NOTE:

UNDERGROUND UTILITIES WERE NOT LOCATED AS PART OF THE PRELIMINARY SURVEY OR DATA GATHERING FOR THIS SITE.

STATE LAW REQUIRES THE EXCAVATOR TO CONTACT GOPHER STATE ONE-CALL AT (800) 252-1166 FOR UTILITY LOCATION 48 HOURS PRIOR TO START OF EXCAVATION WORK.

UTILITY COMPANIES PRESENT:

CENTURY LINK	(855) 742-6062
GARDEN VALLEY TELEPHONE	(218) 687-5251
RED LAKE ELECTRIC	(218) 253-2168

HOUSTON engineering, inc.
125 3RD STREET EAST
THIEF RIVER FALLS, MN 56701
P: 218.681.2951
www.houstoneng.com

PRELIMINARY
NOT FOR CONSTRUCTION

Project No. 3429-0048

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ESTIMATED QUANTITIES

TAB	NOTE	SPEC. NO.	ITEM	UNIT	QUANTITY
			Mobilization	LS	1
			Traffic Control	LS	1
			Side Inlet Pipe (18" CMP)	LF	160
			Side Inlet Pipes (24" CMP)	LF	120
			18" Flapgate	EA	4
			24" Flapgate	EA	3
			Erosion Control	LS	1
			Clear and Grub	AC	65
			Strip, Stockpile, Reinstall Topsoil	CY	52,000
			Import and Install Gravel	TON	5,050
			Random Riprap, Class II	CY	720
			Excavation	CY	142,400
			Install Approved Levee Material Onsite Source	CY	228,935
			Remove Concrete Structure	EA	1
			Structural Excavation	LS	1
			Dewatering	LS	1
			Structural Backfill	LS	1
			Structural Concrete	CY	1,750
			Sheet Pile	SF	4,480
			Weir Gate (120"x42")	EA	4
			Weir Gate (120"x18")	EA	3
			Trash Rack	LF	105
			Catwalk	LF	310

BASIS OF ESTIMATED QUANTITIES

SHRINKAGE FOR EARTHWORK MATERIALS (DIKE)	COMPACT TO SPECIFIED
AGGREGATE SURFACING, CLASS 1	1.875 TON/CY
(COMPACTED DRY DENSITY) (ASSUMED MOIST. = 5%)	
GRANULAR BEDDING (CV)	1.875 TON/CY
GRANULAR BACKFILL (CV)	1.875 TON/CY
SEED. MIXTURE 25-141	59 LB/ACRE
SEED. MIXTURE 22-111	30.5 LB/ACRE
MULCH MATERIAL, TYPE 1	2 TON/ACRE
FERTILIZER, TYPE 1 (40-20-10)	200 LB/ACRE

STANDARD PLATES

THE FOLLOWING MN/DOT STANDARD PLATES, AS APPROVED BY THE FHWA, SHALL APPLY.

3040F	CORRUGATED METAL PIPE CULVERT (2-23"x1/2" CORRUGATION)
3041D	CORRUGATED METAL PIPE CULVERT (3"x1" CORRUGATION)
3123J	METAL APRON FOR C.S. PIPE
3124B	METAL APRON CONNECTION
3221C	CORRUGATED STEEL PIPE COUPLING BAND

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

ESTIMATED QUANTITIES

HOUSTON engineering, inc.

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SHEET 2

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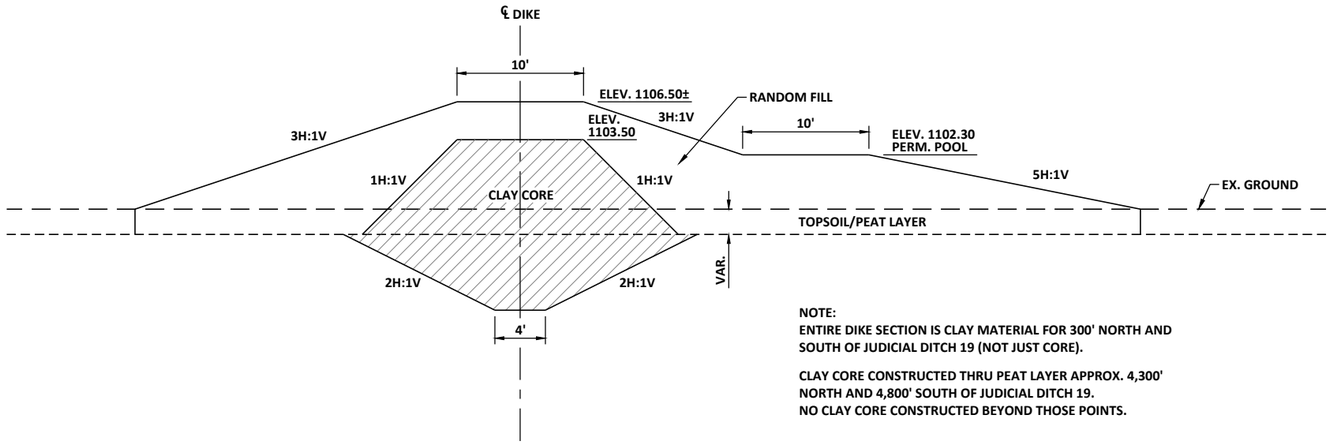
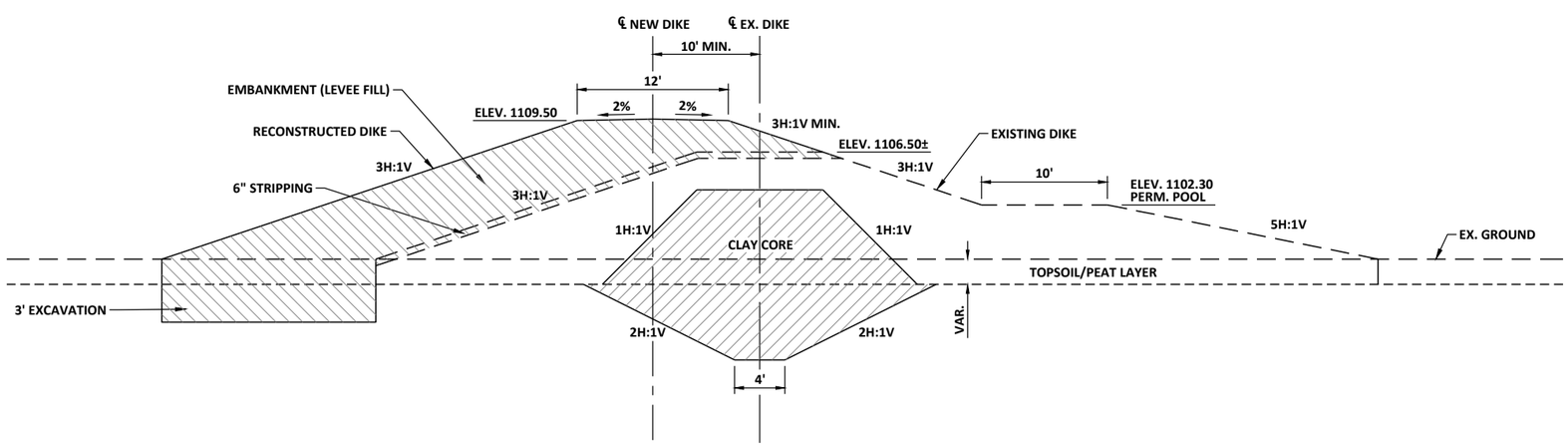


NOTE:
ENTIRE DIKE SECTION IS CLAY MATERIAL FOR 300' NORTH AND SOUTH OF JUDICIAL DITCH 19 (NOT JUST CORE).

CLAY CORE CONSTRUCTED THRU PEAT LAYER APPROX. 4,300' NORTH AND 4,800' SOUTH OF JUDICIAL DITCH 19.
NO CLAY CORE CONSTRUCTED BEYOND THOSE POINTS.

TYPICAL SECTION - EXISTING DIKE

NOT TO SCALE



TYPICAL SECTION - RECONSTRUCTED DIKE

NOT TO SCALE - STA 23+00 TO STA 196+00

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NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

TYPICAL SECTIONS

HOUSTON ENGINEERING, INC.

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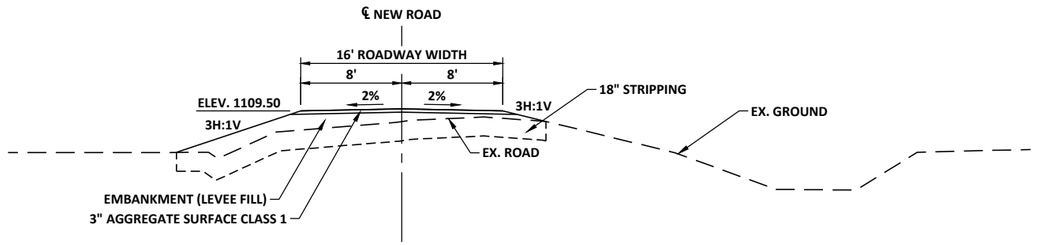
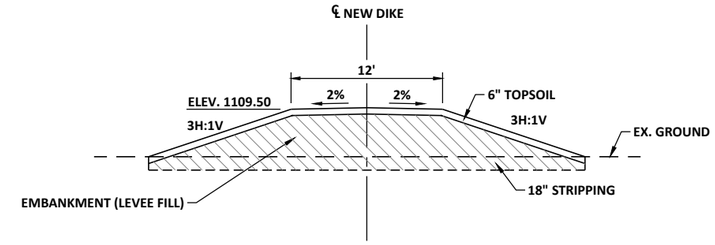


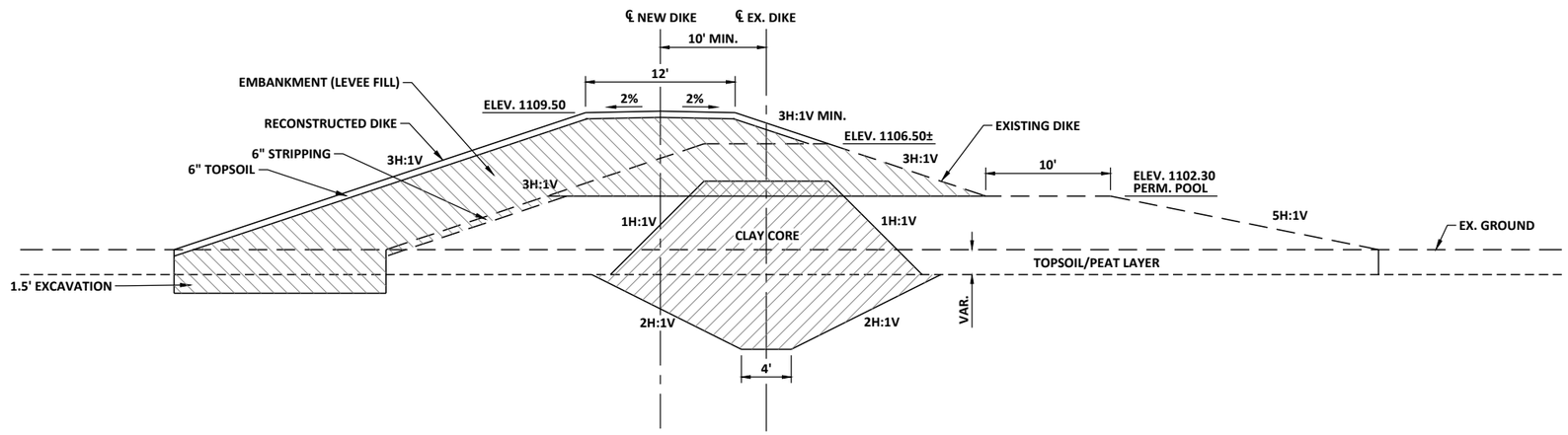
TYPICAL SECTION - TWP. ROAD RECONSTRUCTION

NOT TO SCALE - STA 285+00 TO STA 339+74



TYPICAL SECTION - NEW DIKE CONSTRUCTION

NOT TO SCALE - STA 3+86 TO STA 23+00



TYPICAL SECTION - RECONSTRUCTED DIKE

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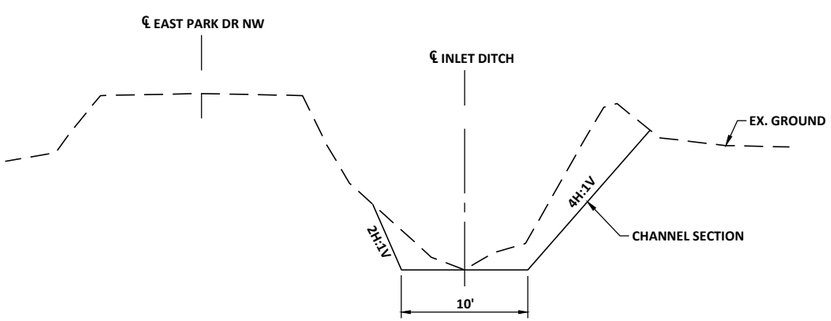
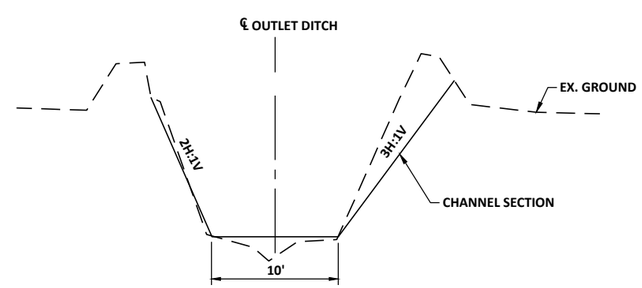


TYPICAL SECTION - JD 19 INLET CONSTRUCTION

NOT TO SCALE - STA 0+00 TO STA 119+06



TYPICAL SECTION - JD 19 OUTLET CONSTRUCTION

NOT TO SCALE - STA 83+50 TO STA 260+50

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MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

TYPICAL SECTIONS

HOUSTON ENGINEERING, INC.

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SHEET	4

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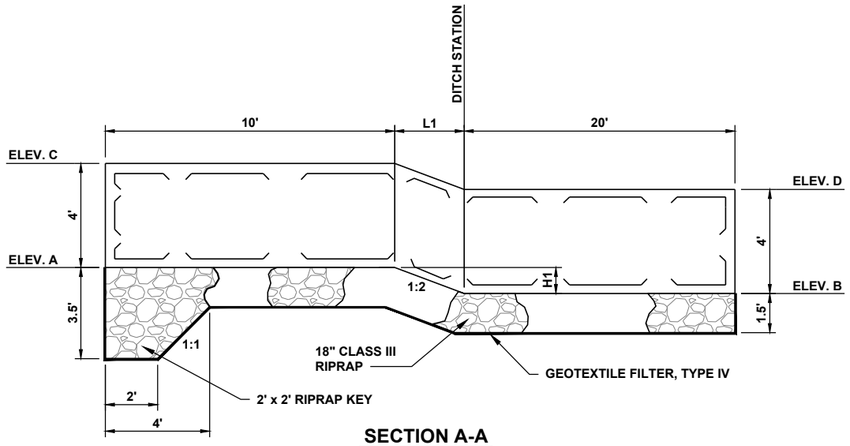

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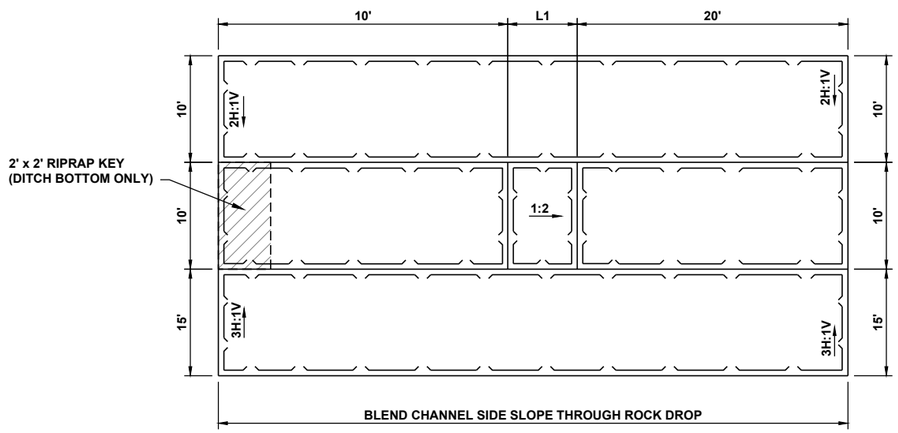

ROCK DROP STRUCTURE

NOT TO SCALE

ROCK DROP STRUCTURE DIMENSIONS AND QUANTITIES							
JD 19 OUTLET DITCH							
DITCH STATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D	H1 (FEET)	L1 (FEET)	CLASS II RIPRAP (CY)
95+20	1060.75	1059.00	1065.75	1064.00	1.75	3.5	74
105+20	1063.00	1061.75	1068.00	1066.75	1.25	2.5	72
125+20	1066.50	1065.00	1071.50	1070.00	1.5	3	73
149+20	1070.50	1068.90	1075.50	1073.90	1.6	3.2	74
164+20	1073.80	1072.00	1078.80	1077.00	1.8	3.6	75
175+20	1076.10	1074.90	1081.10	1079.90	1.2	2.4	72
190+20	1078.50	1077.60	1083.50	1082.60	0.9	1.8	71

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ROCK DROP DETAILS

HOUSTON ENGINEERING, INC.

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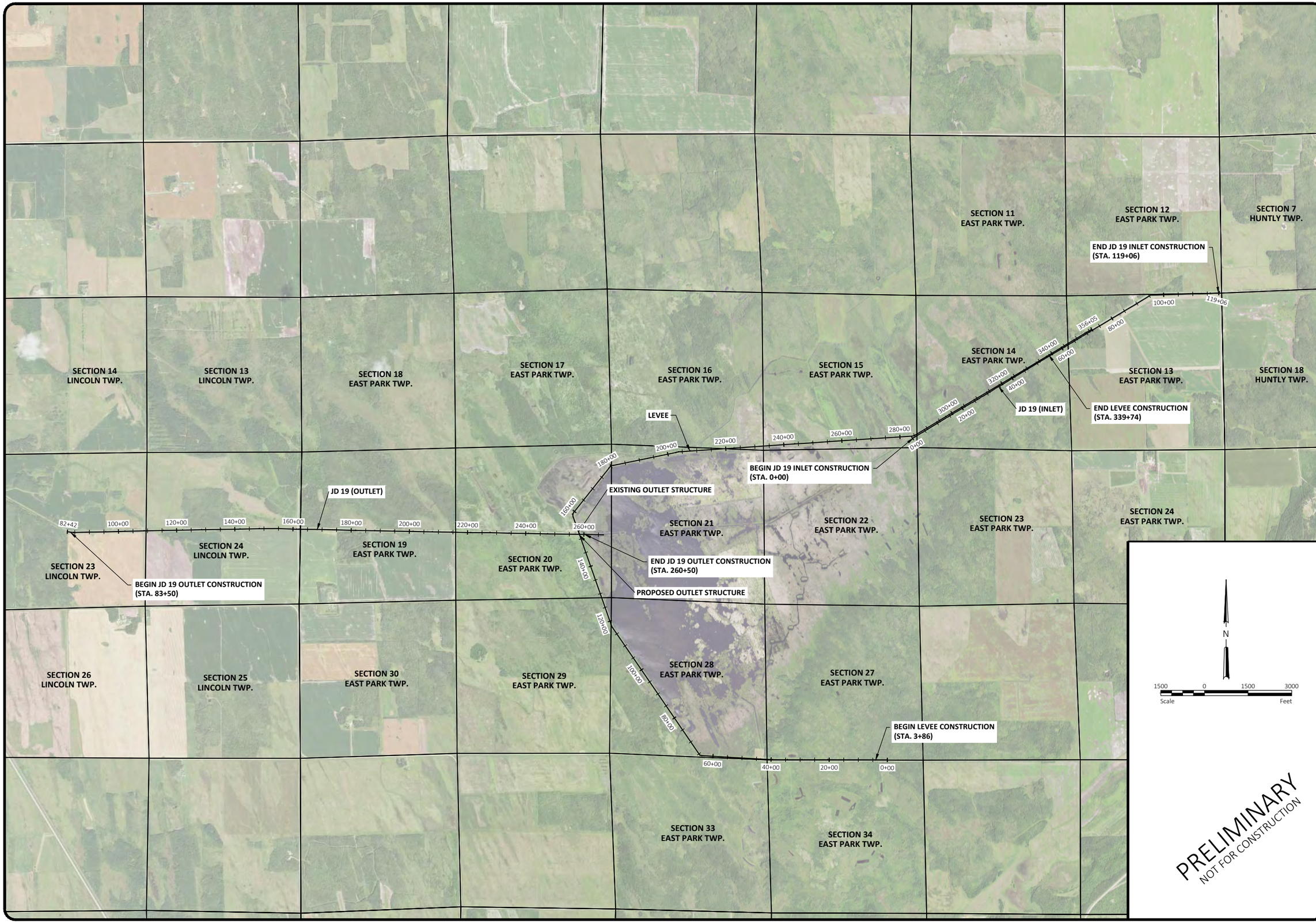

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REFERENCE SHEET

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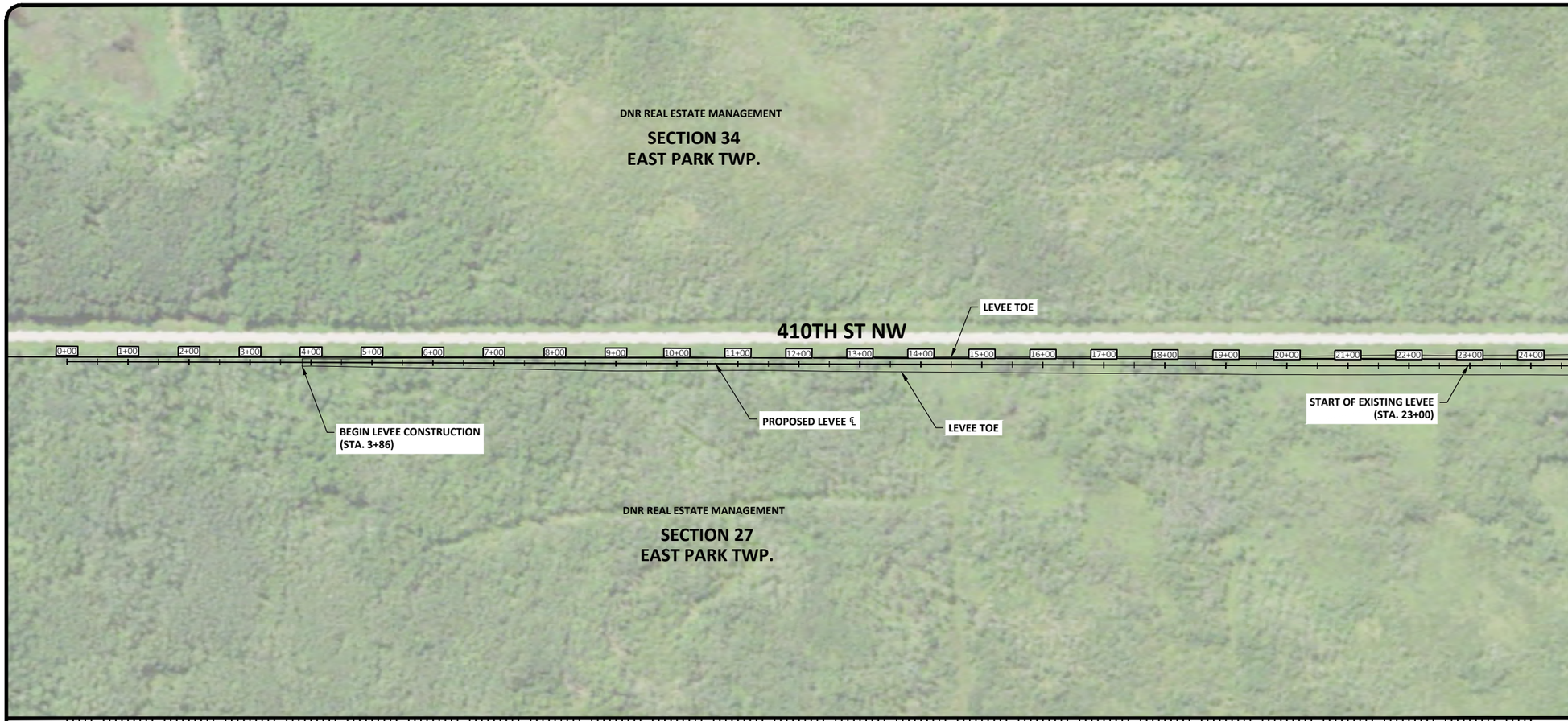

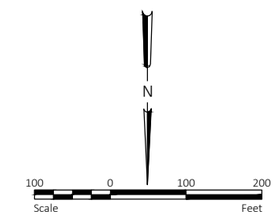

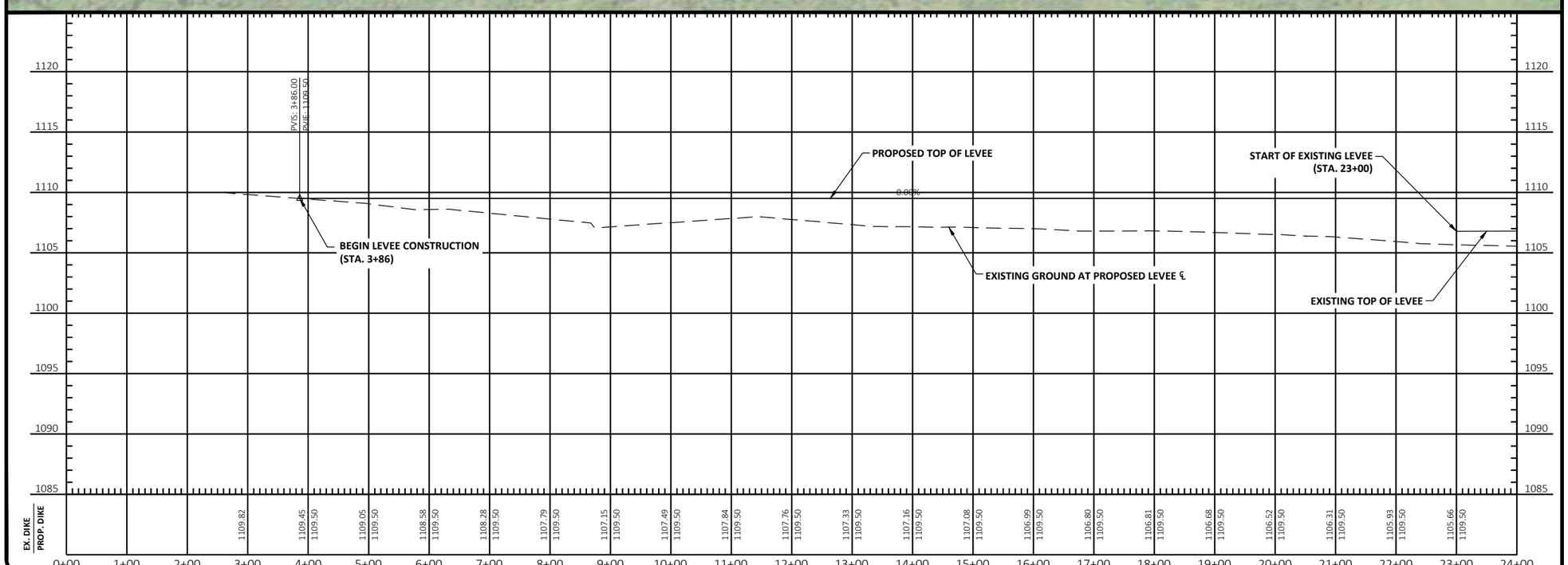

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NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

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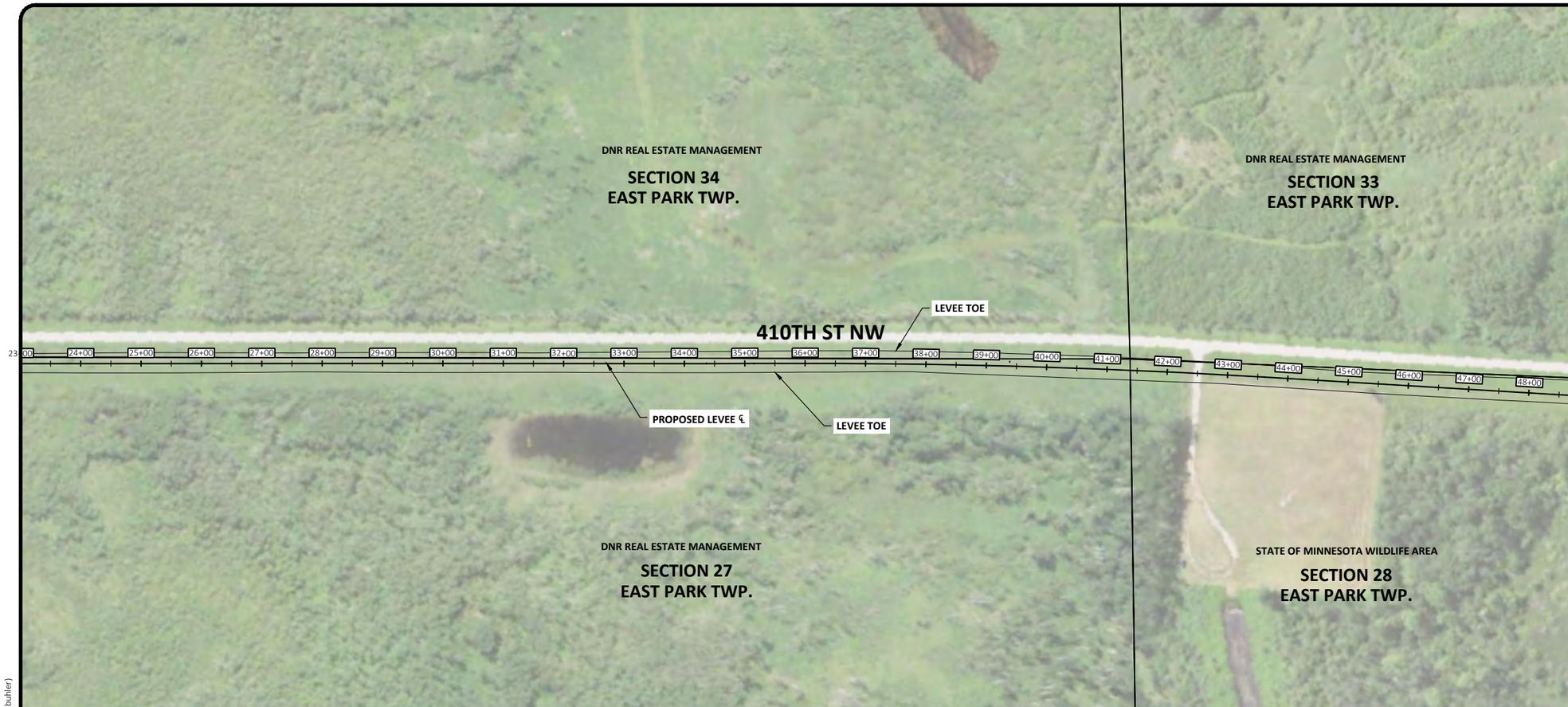

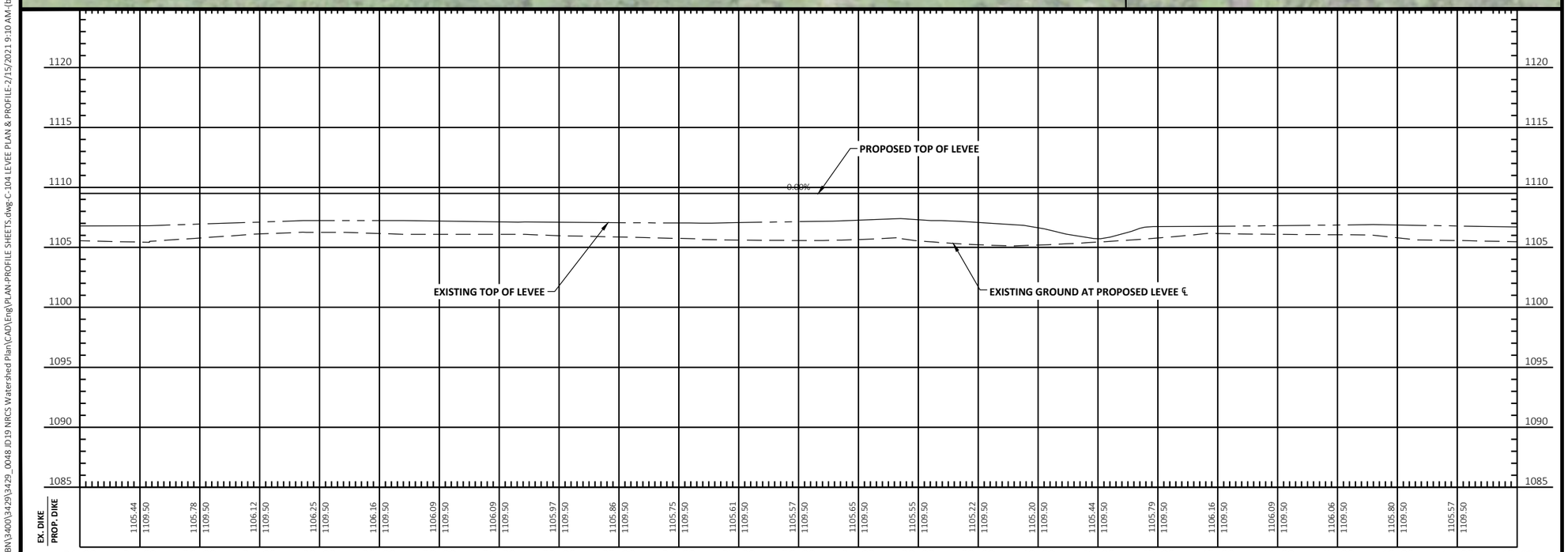

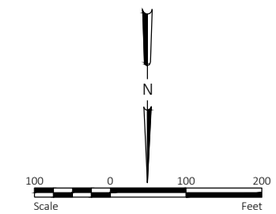

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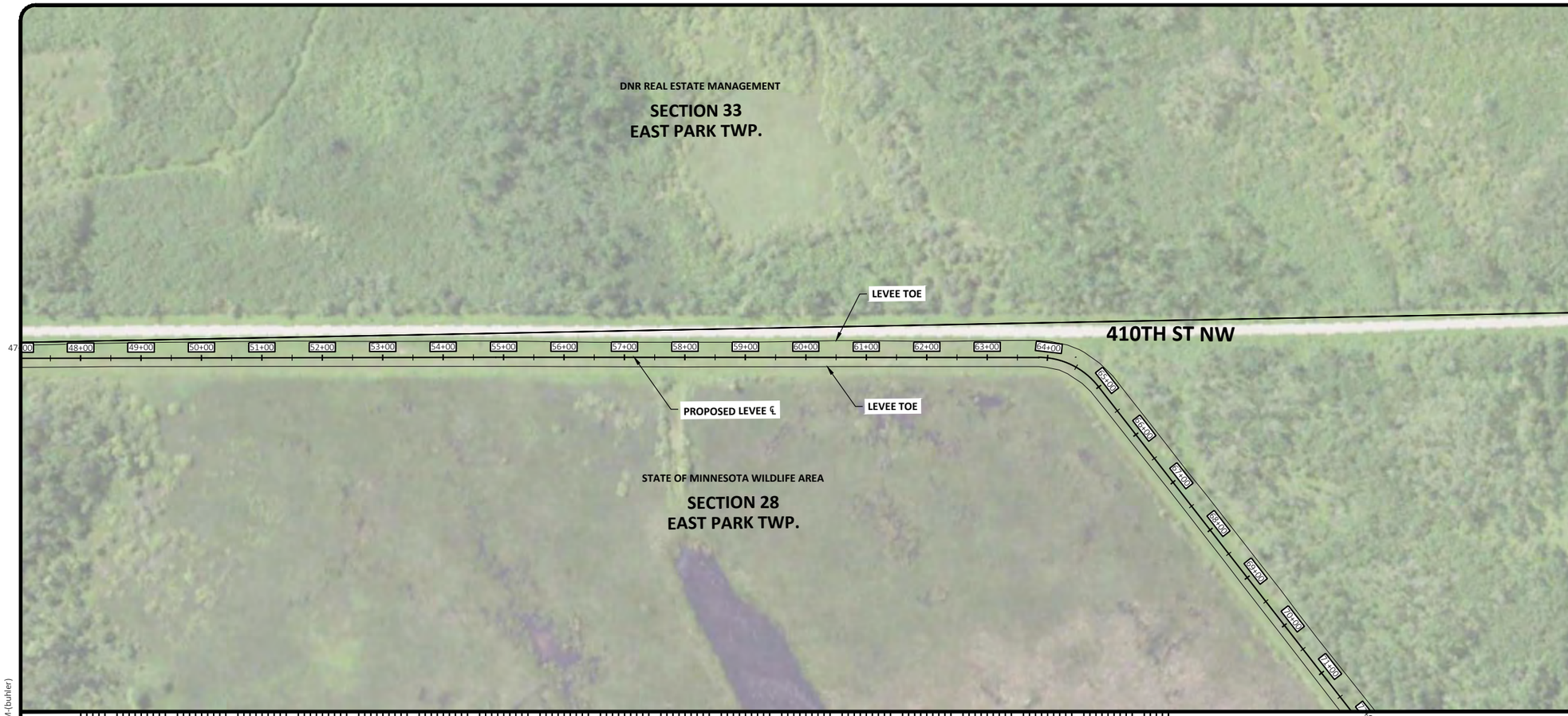

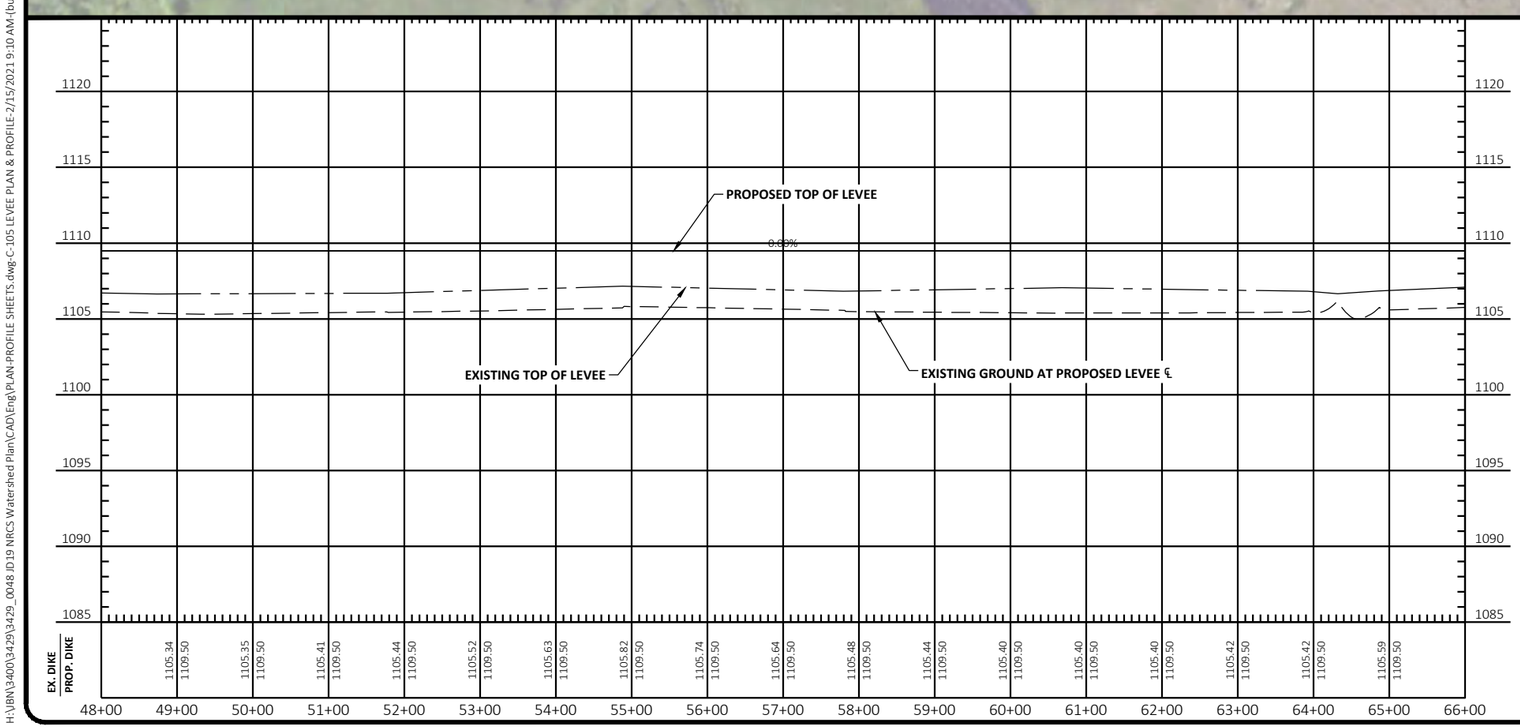

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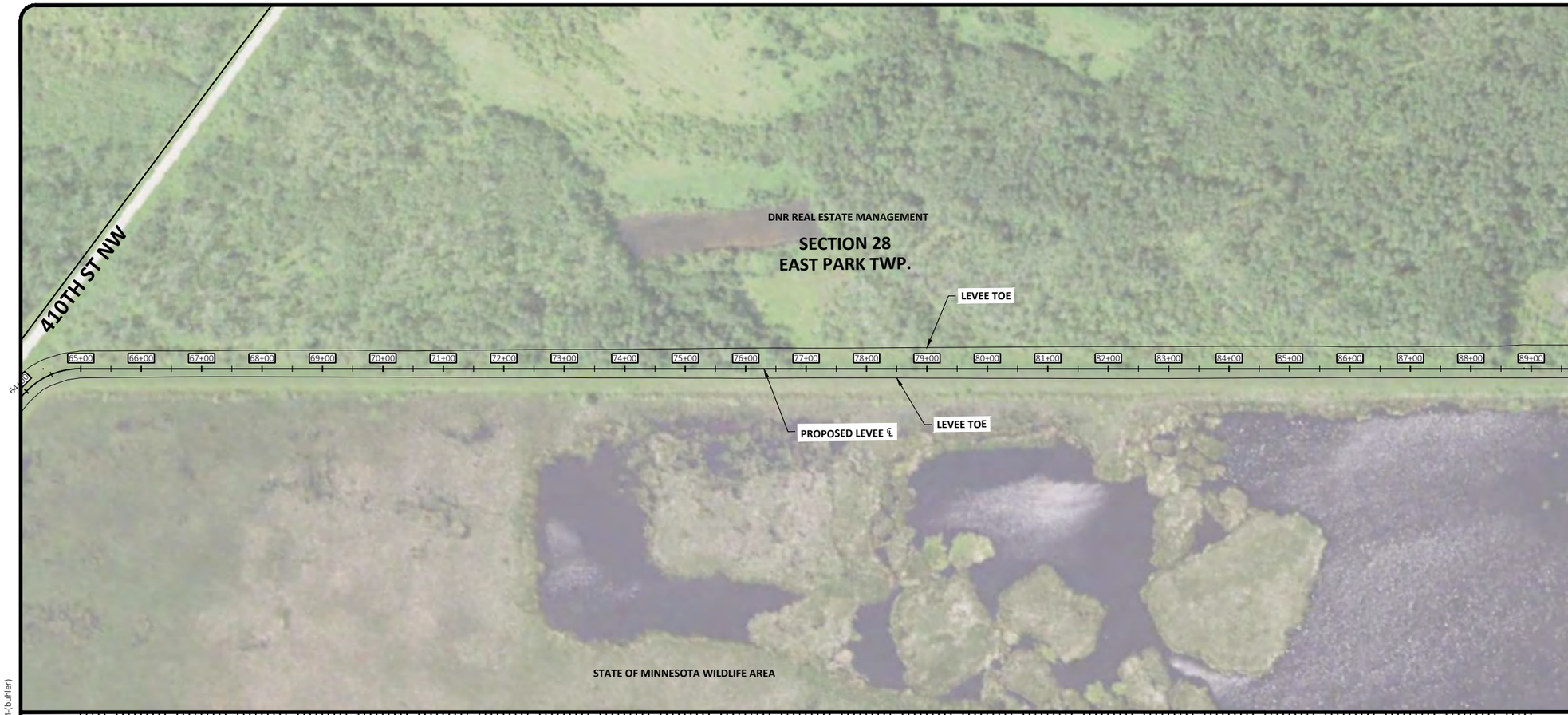

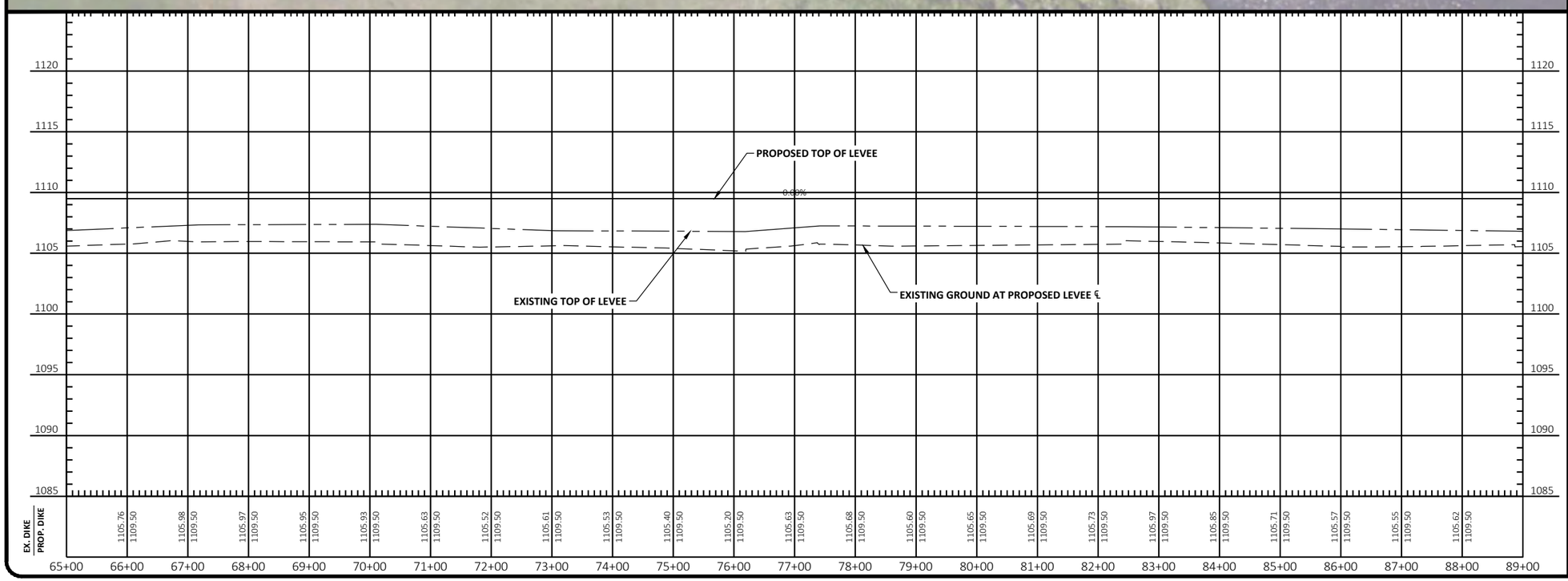

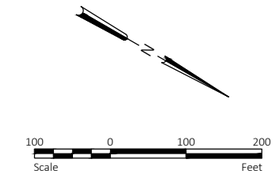

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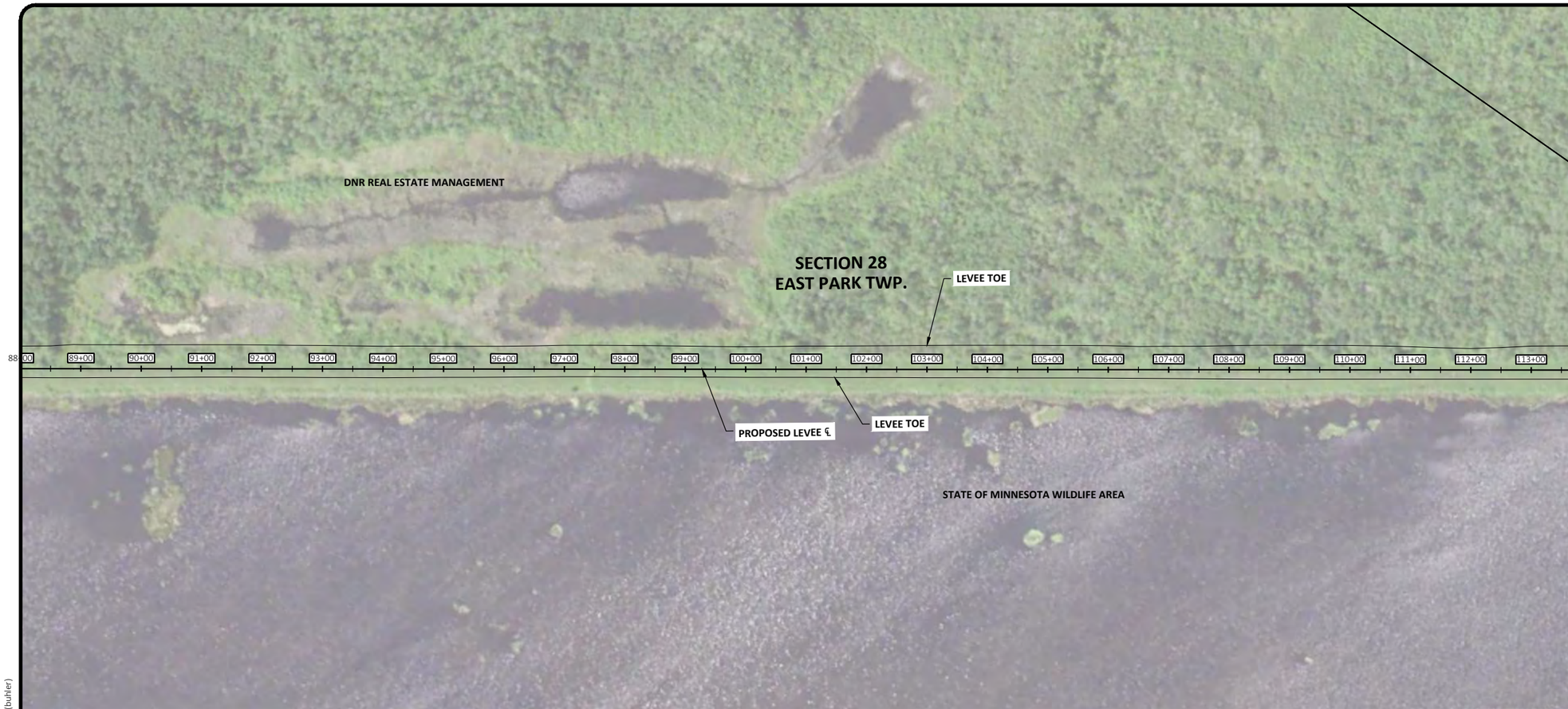

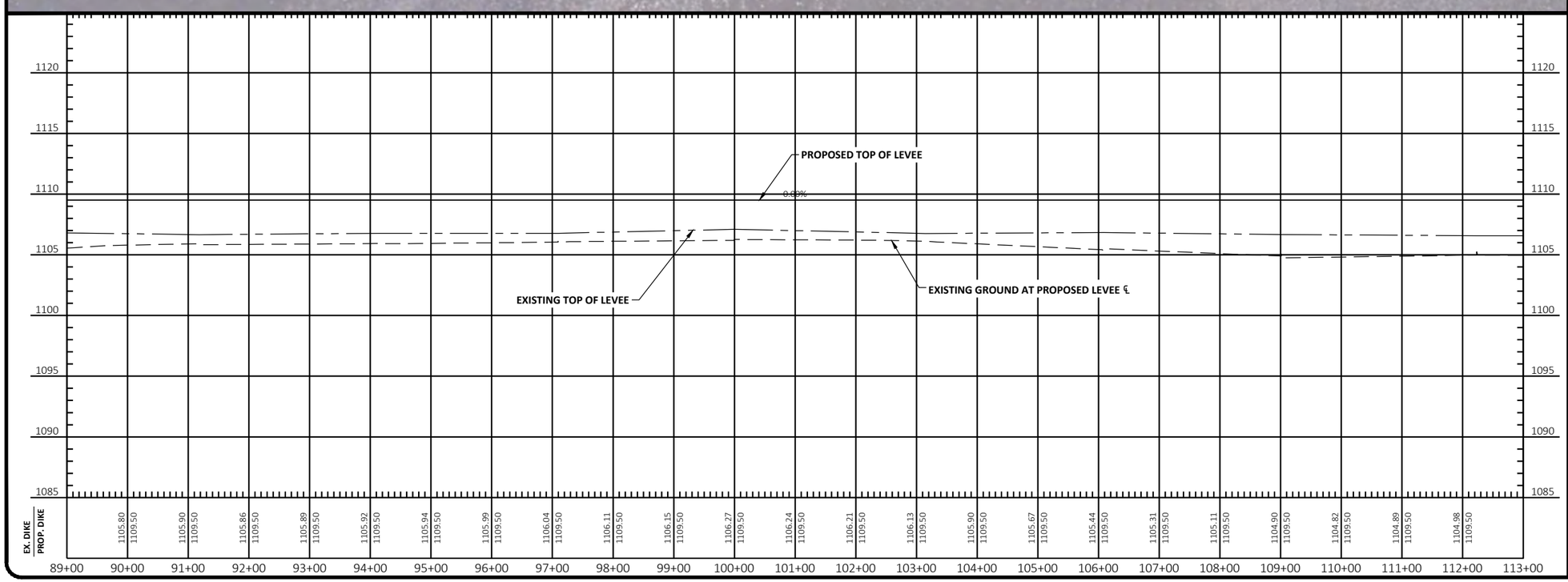

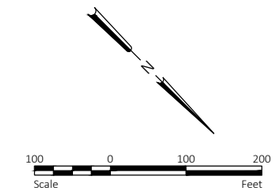

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WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

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Scale: As Shown
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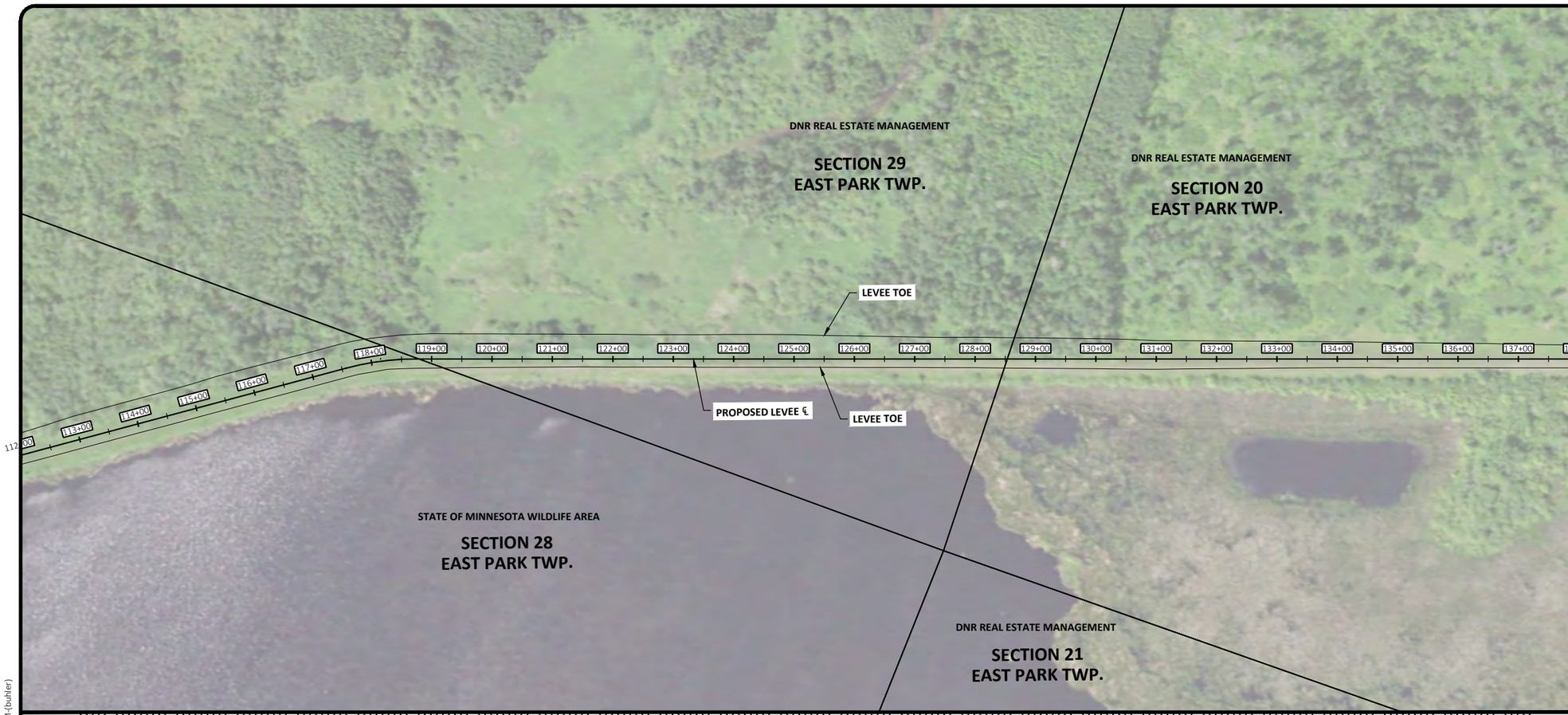

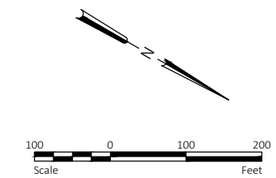

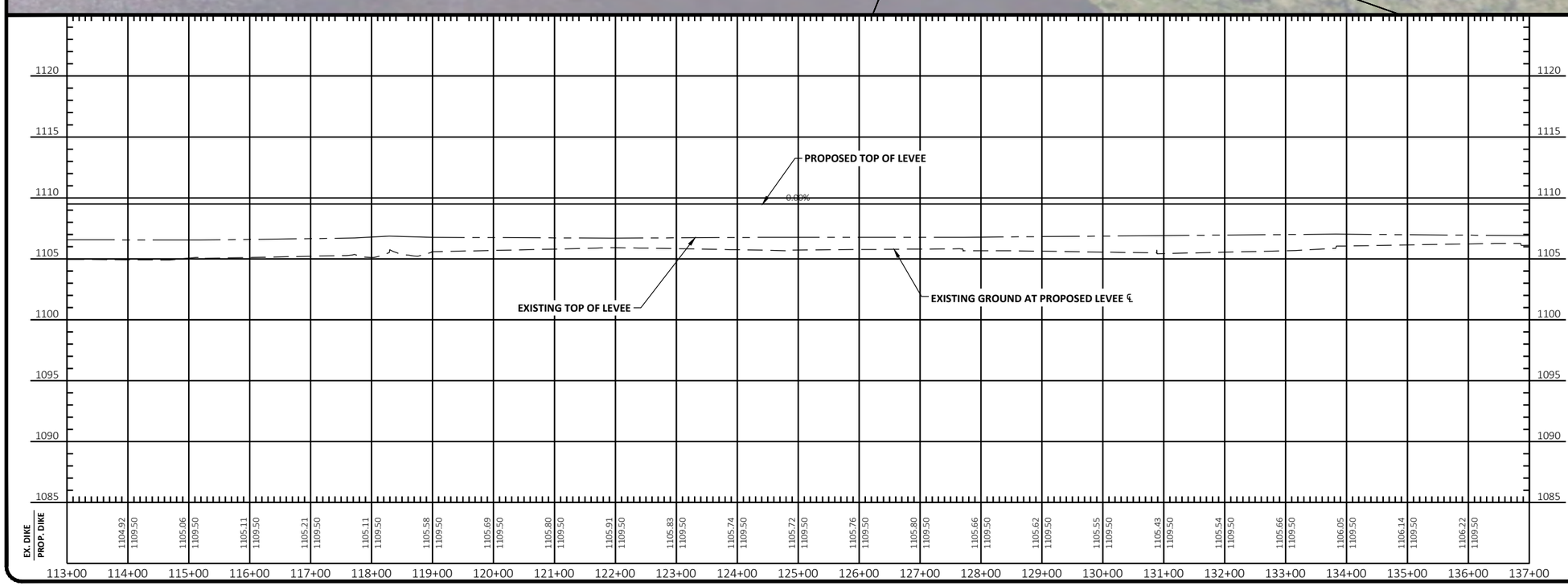

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Project No.: 3429-0048
SHEET 12

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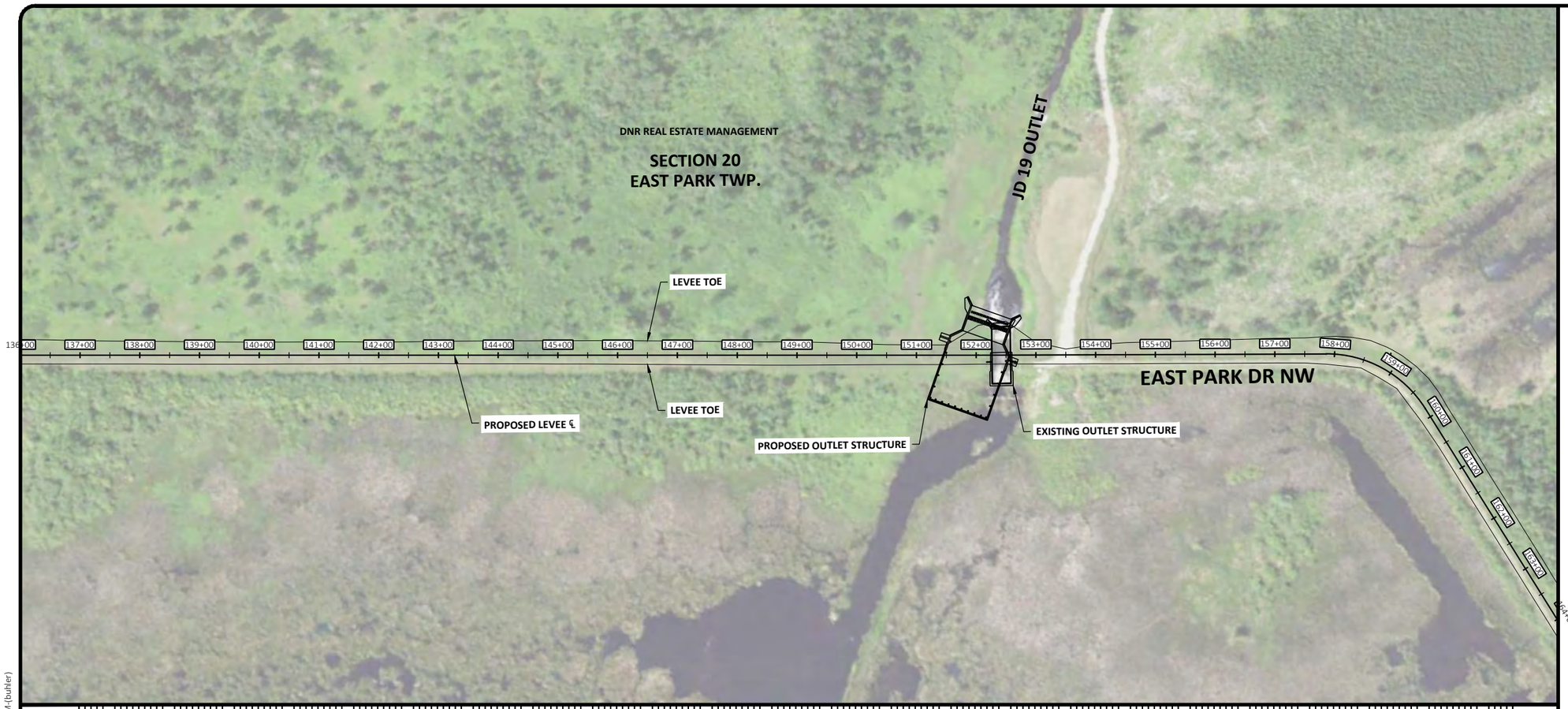

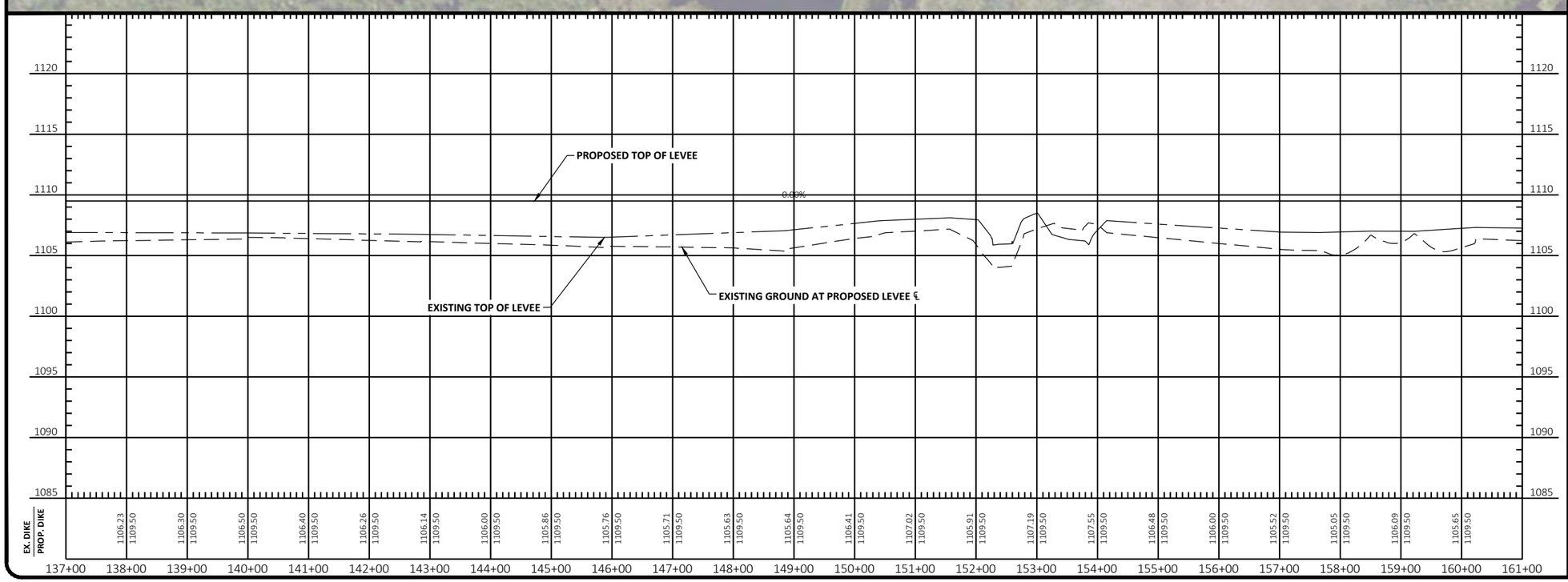

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Scale Feet

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 13

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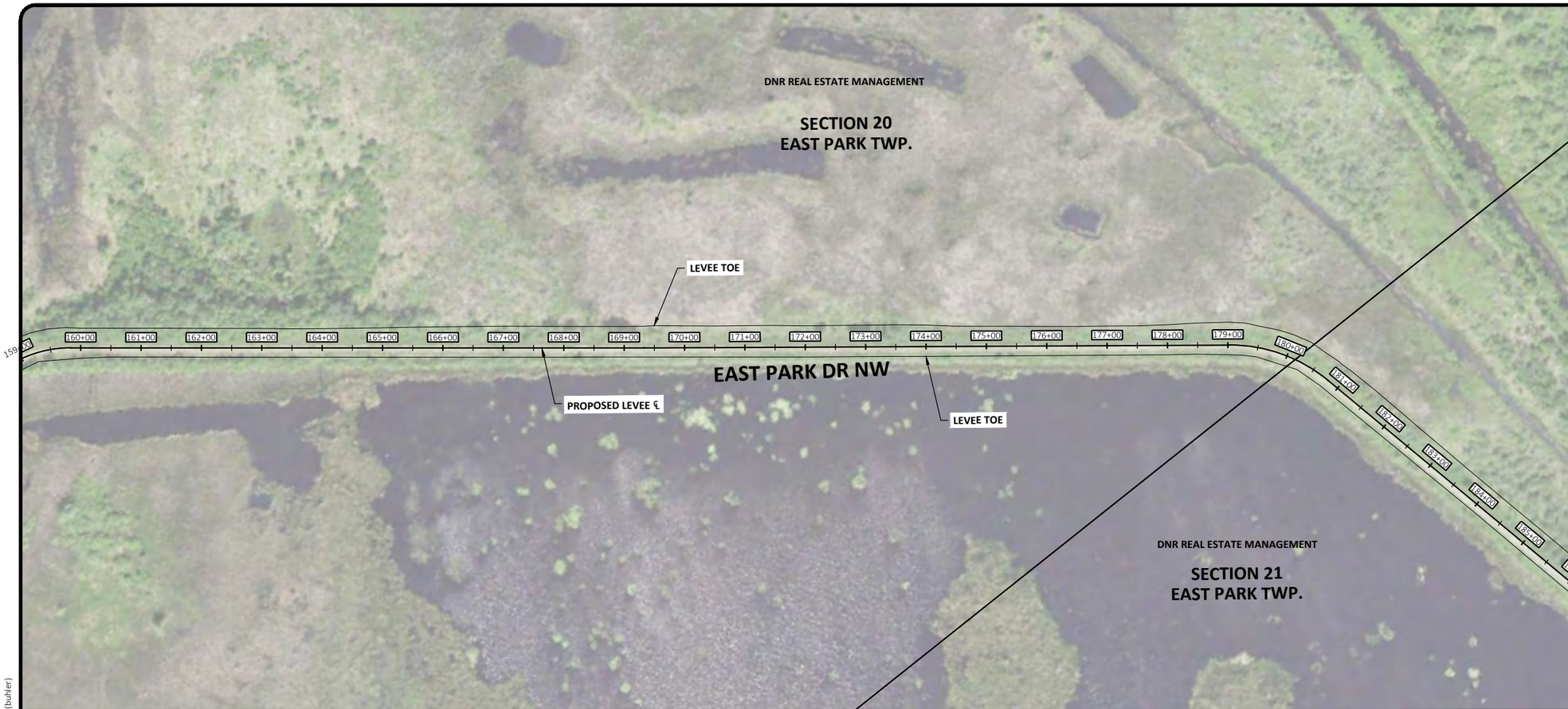

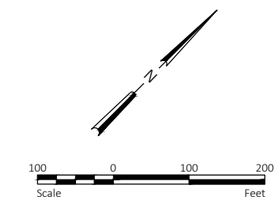

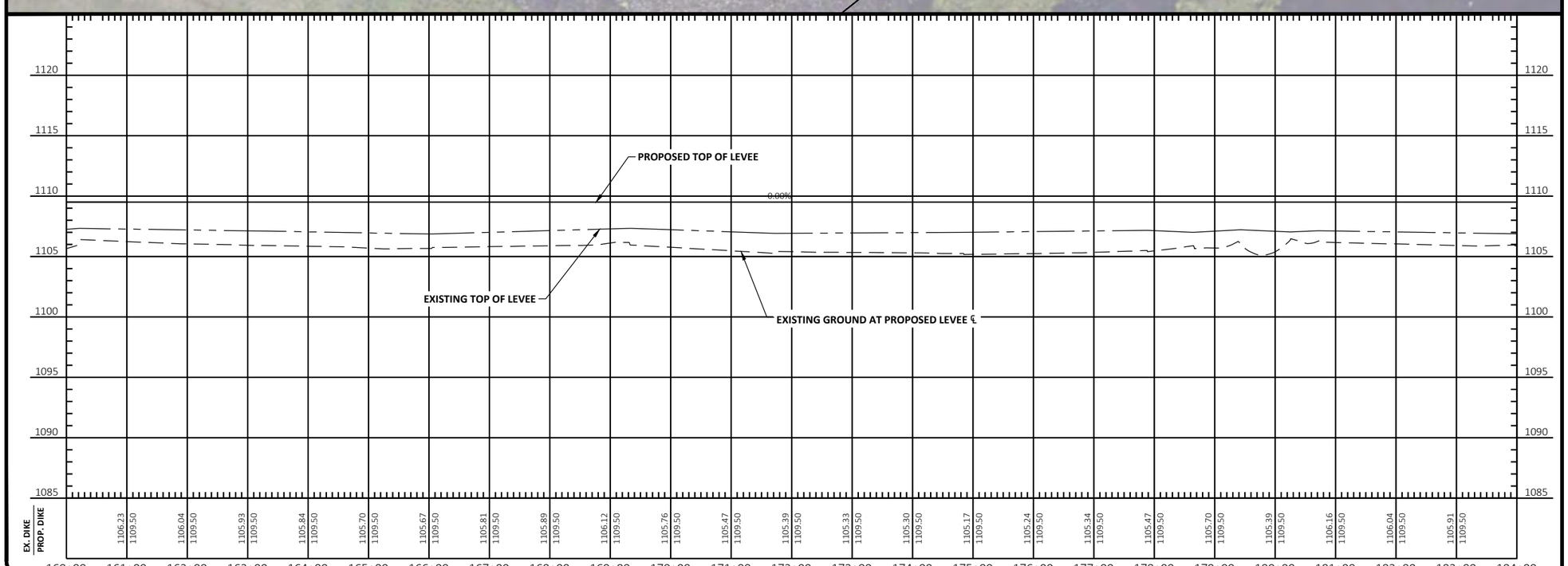

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	14

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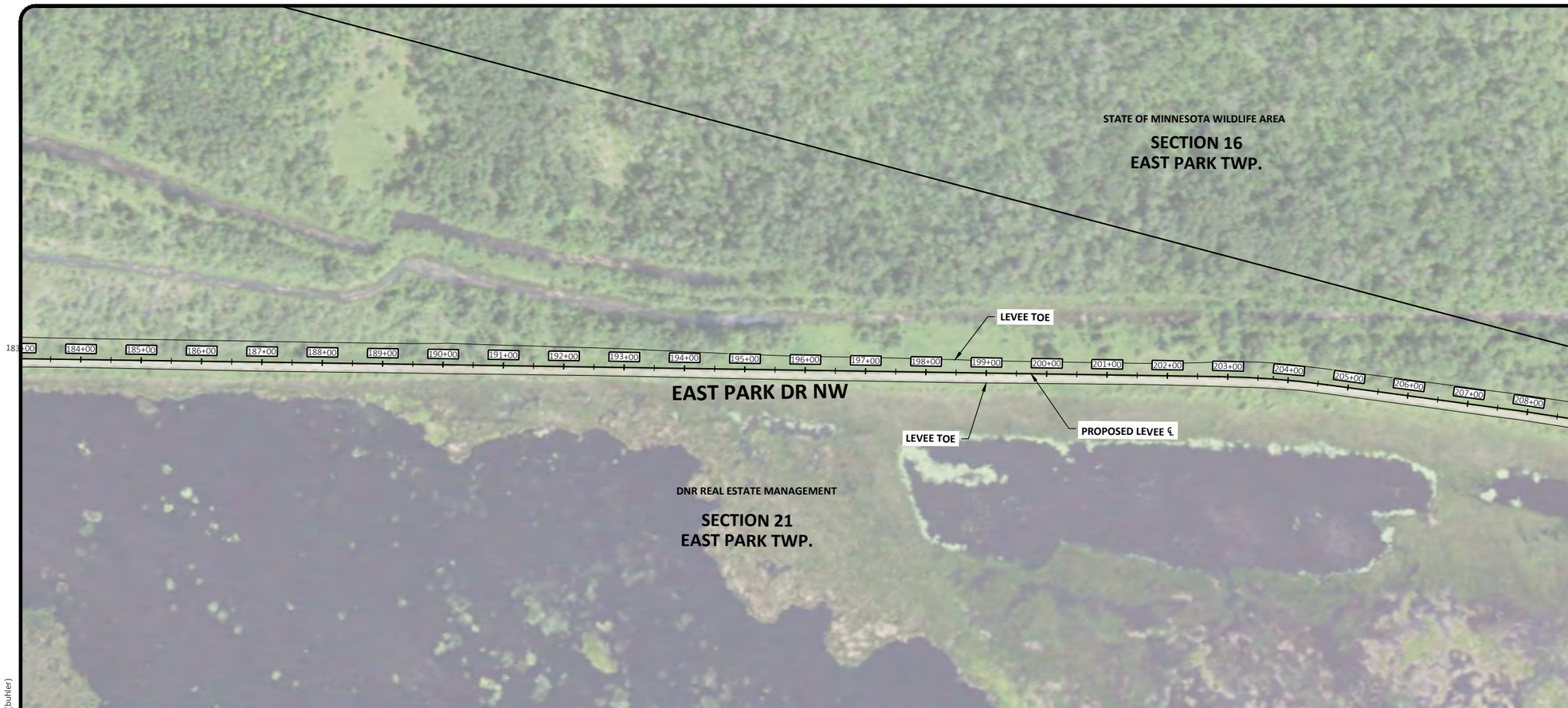

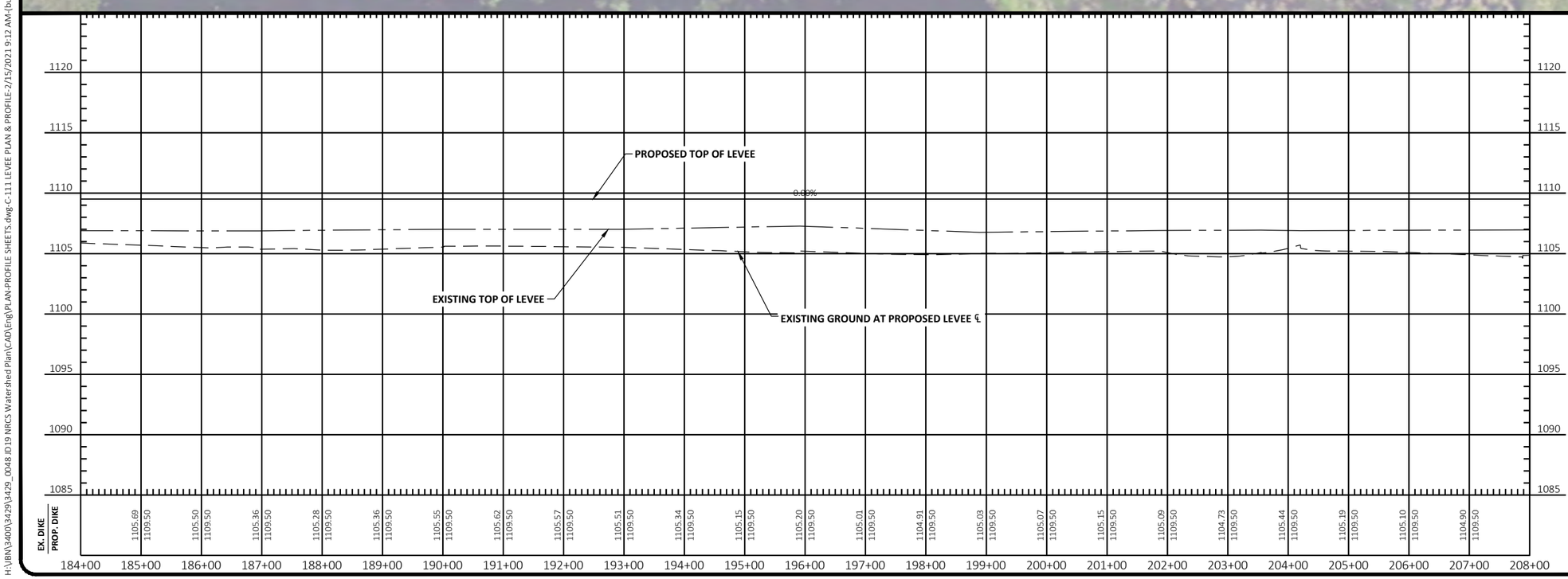

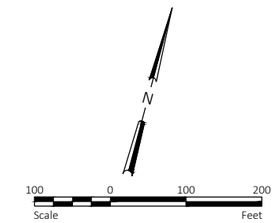

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
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Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 15

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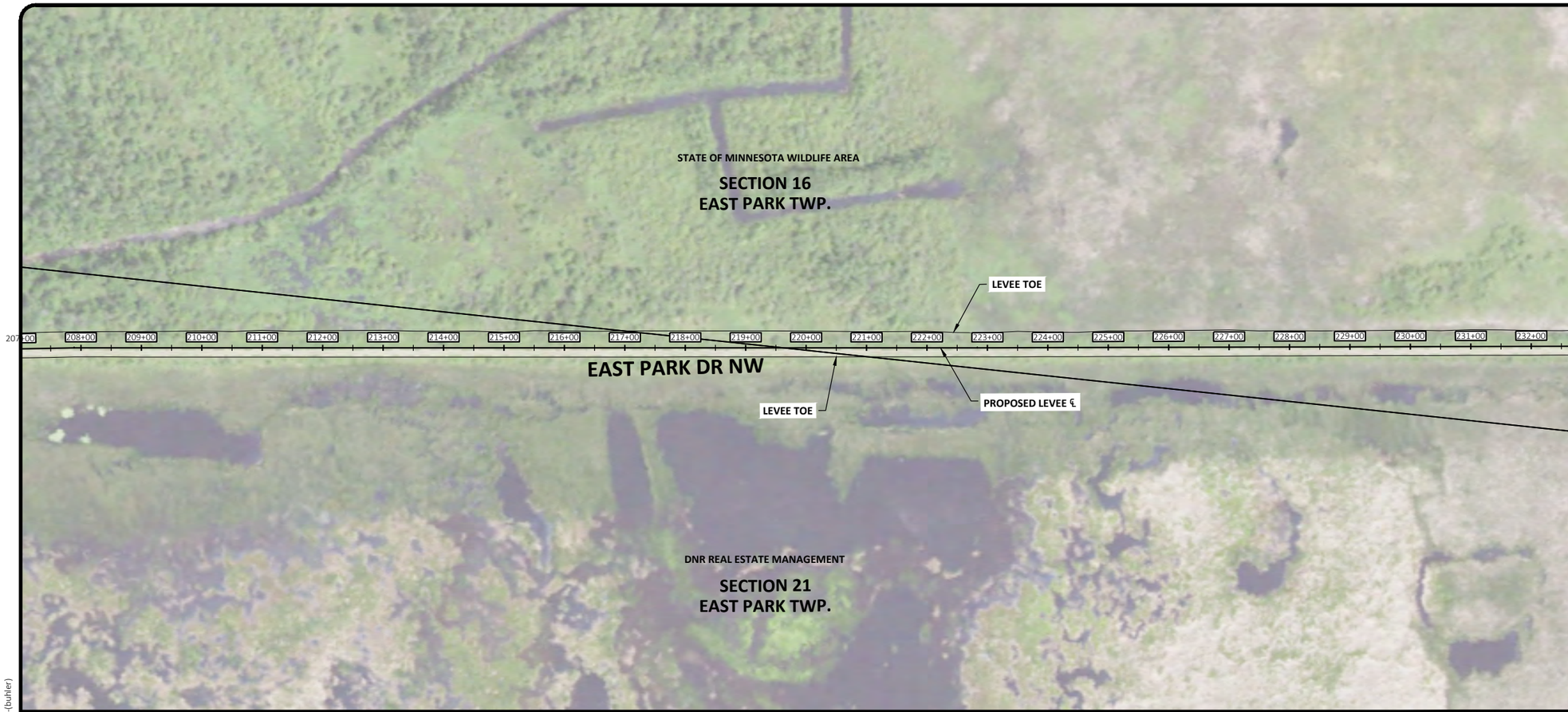

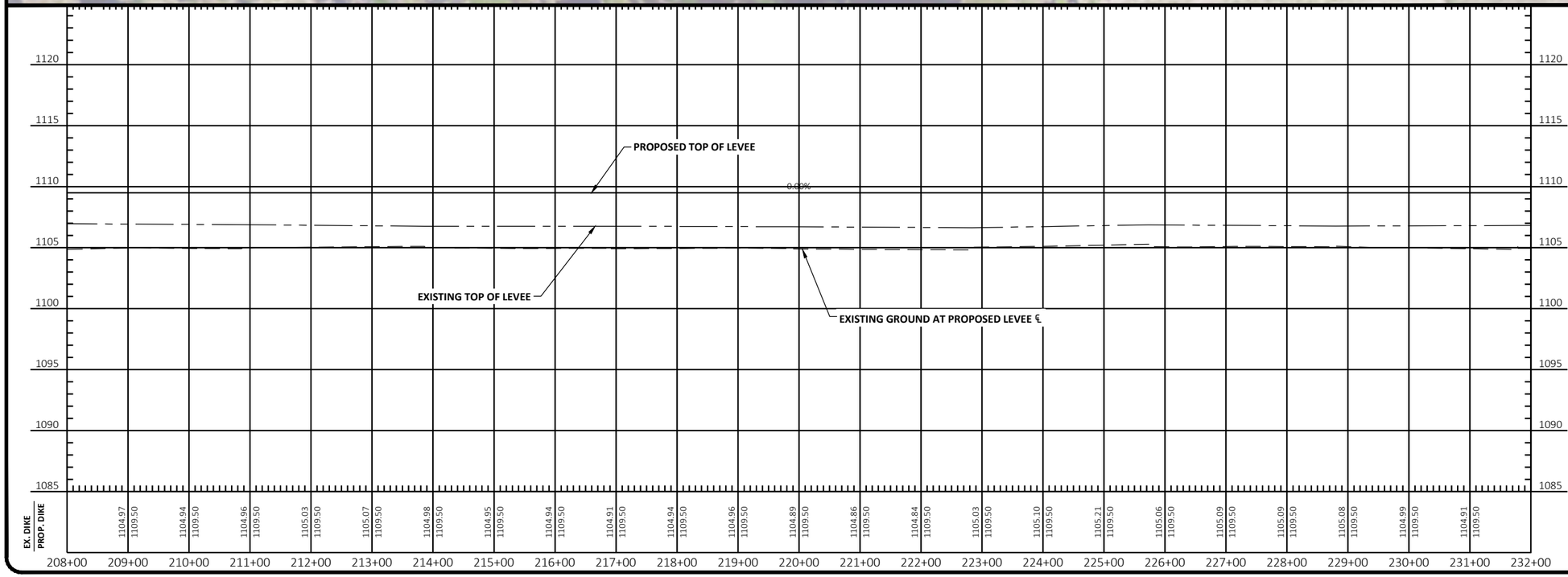

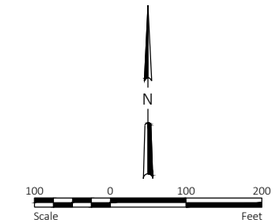

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	16

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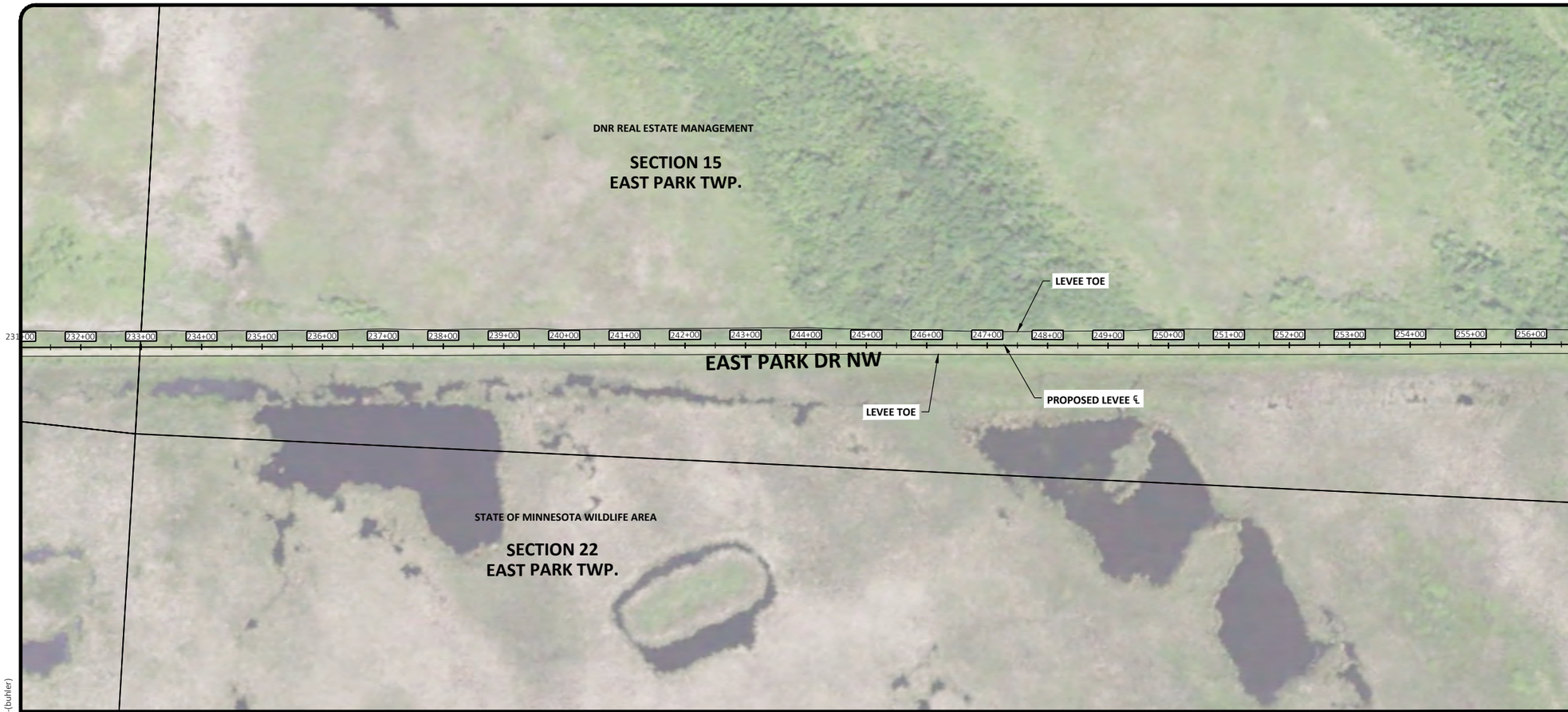

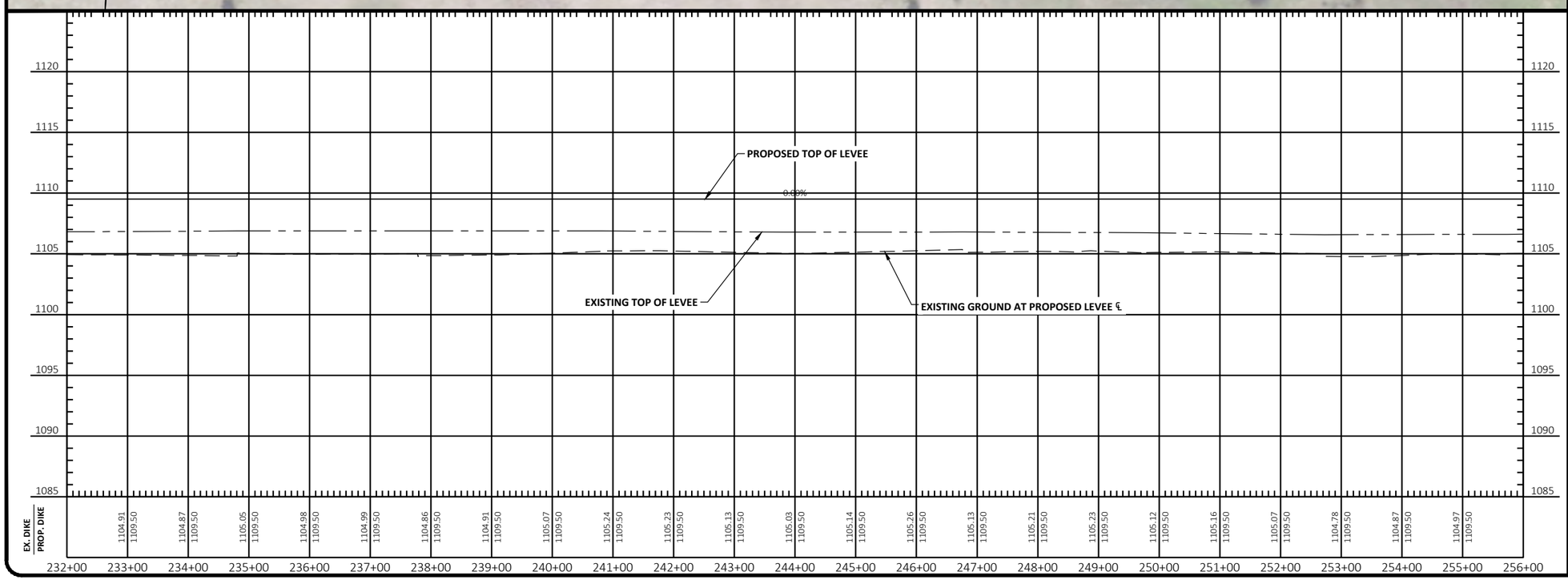

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Scale Feet

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
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Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 17

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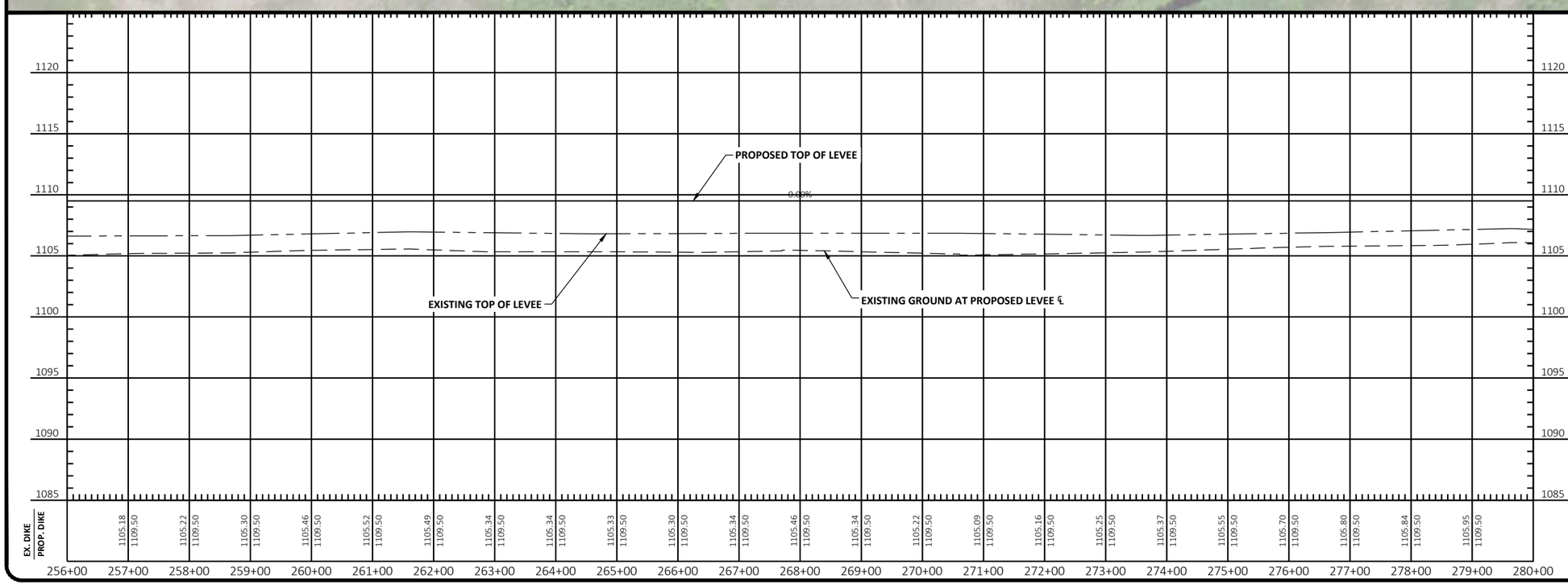

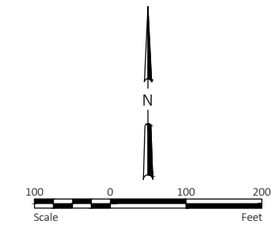

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 18

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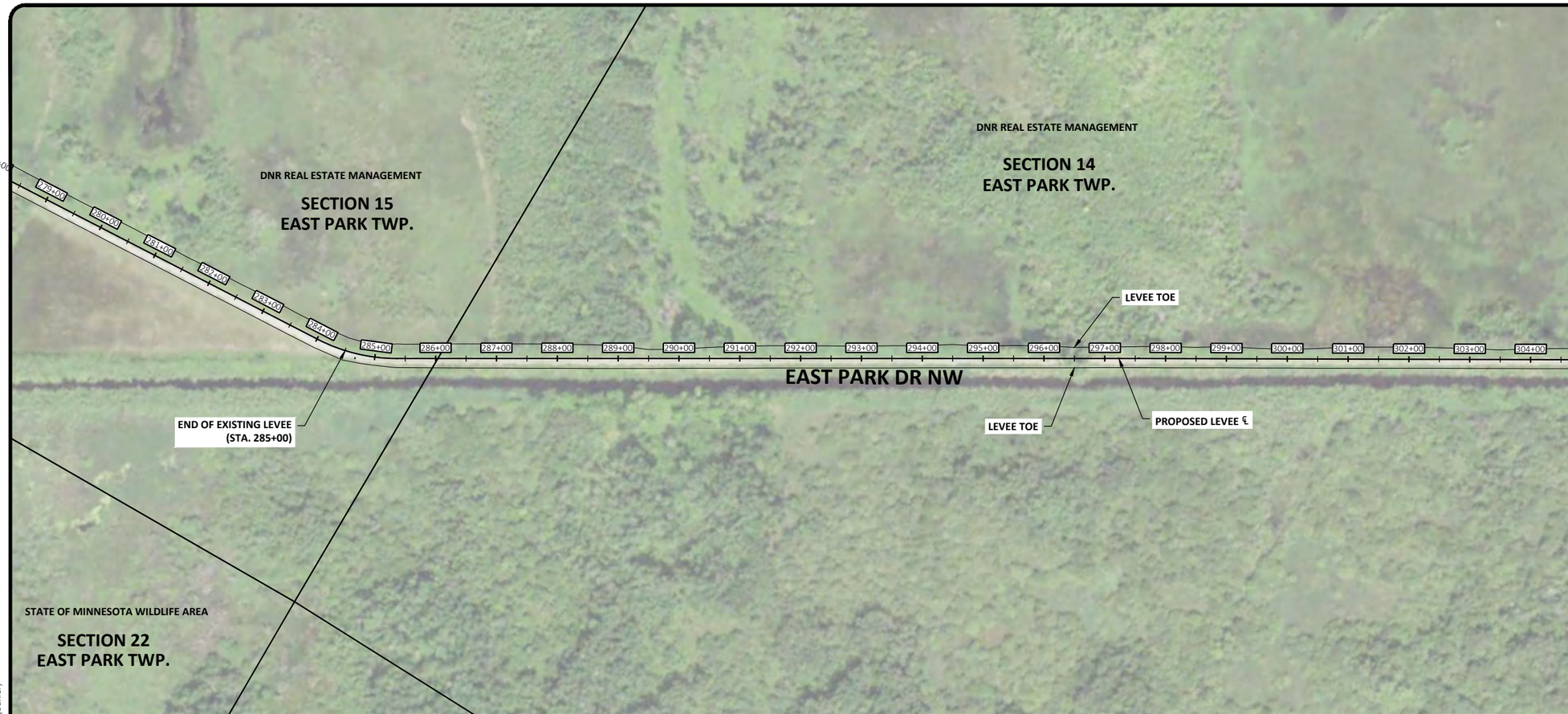

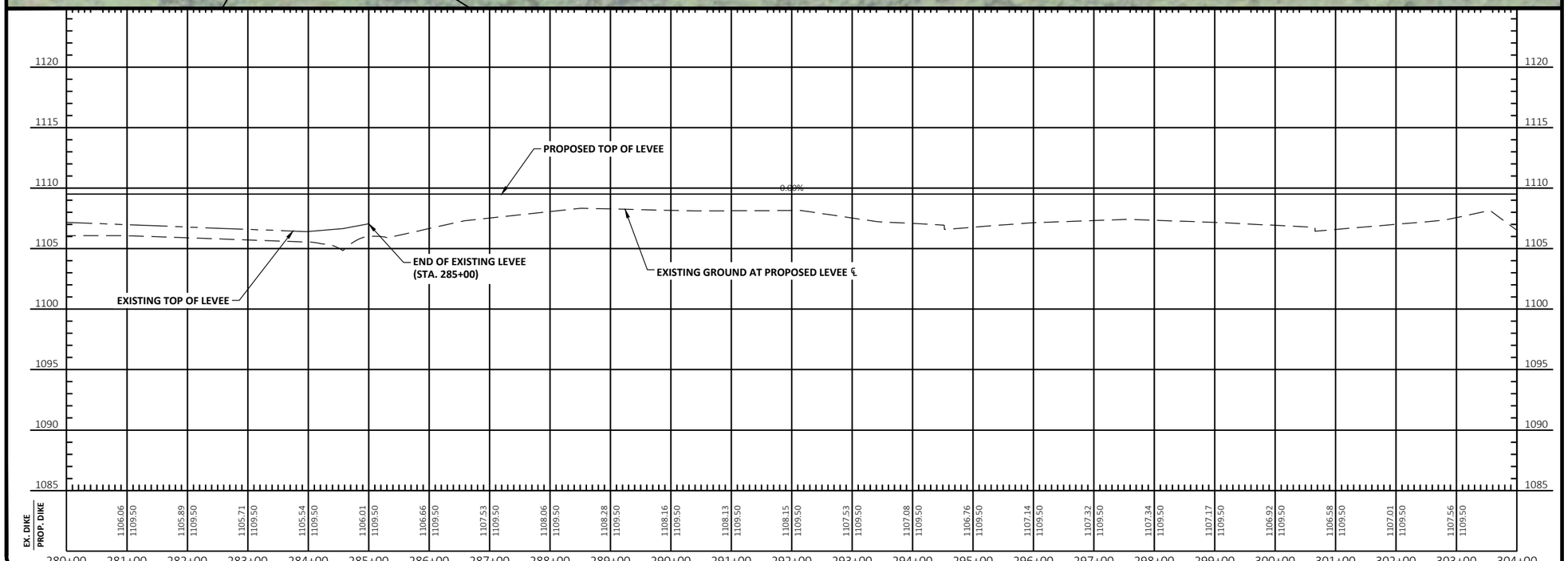

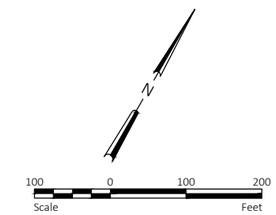

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 19

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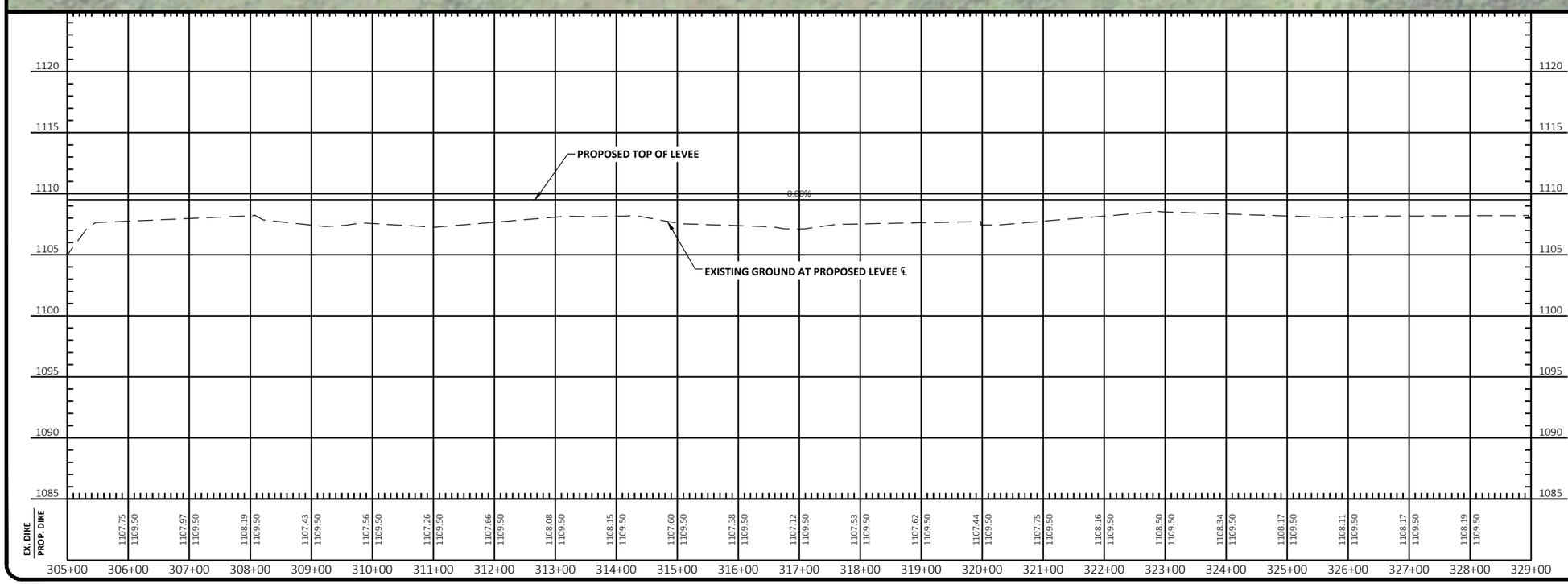

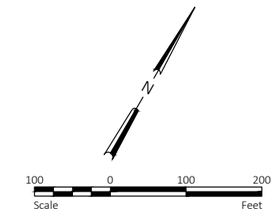

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 20

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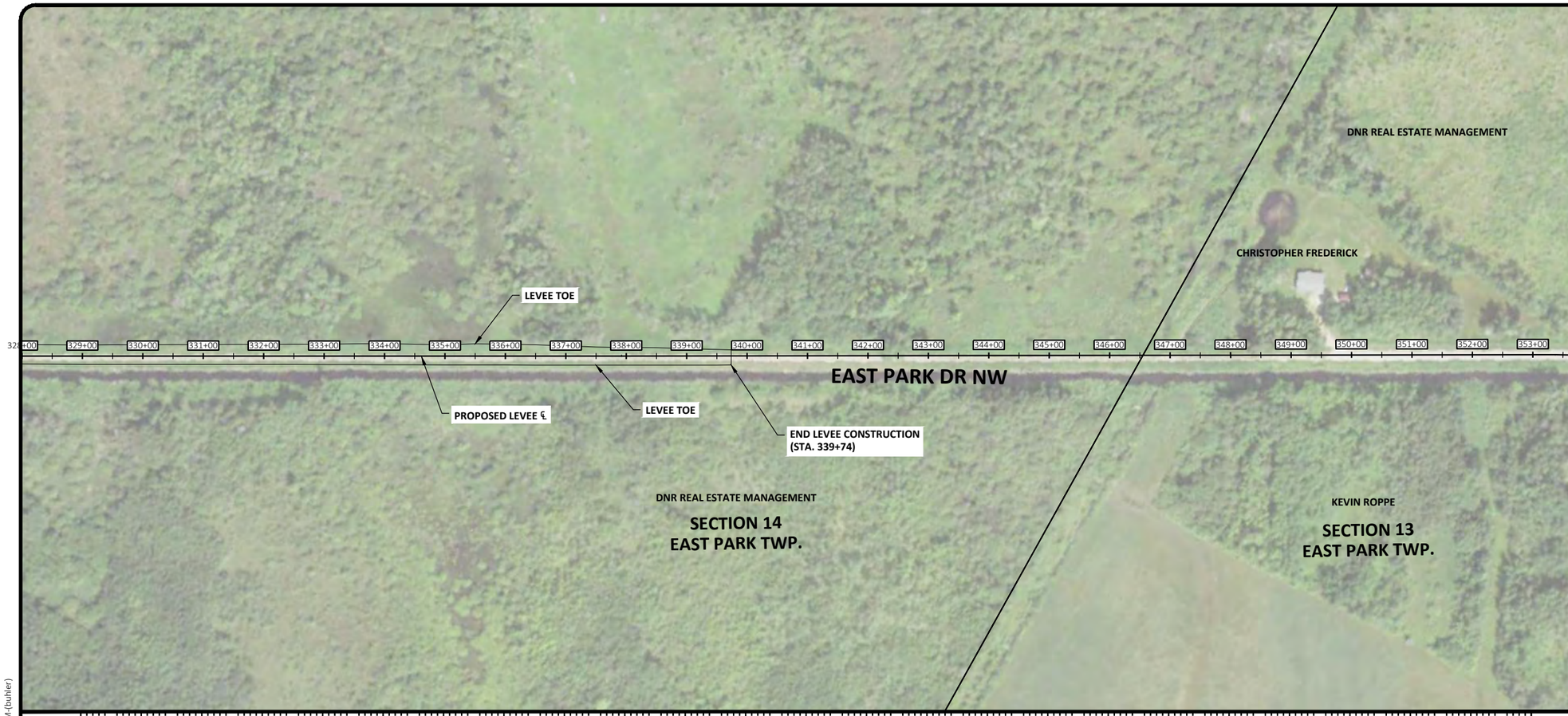

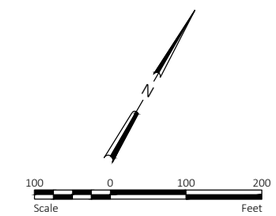

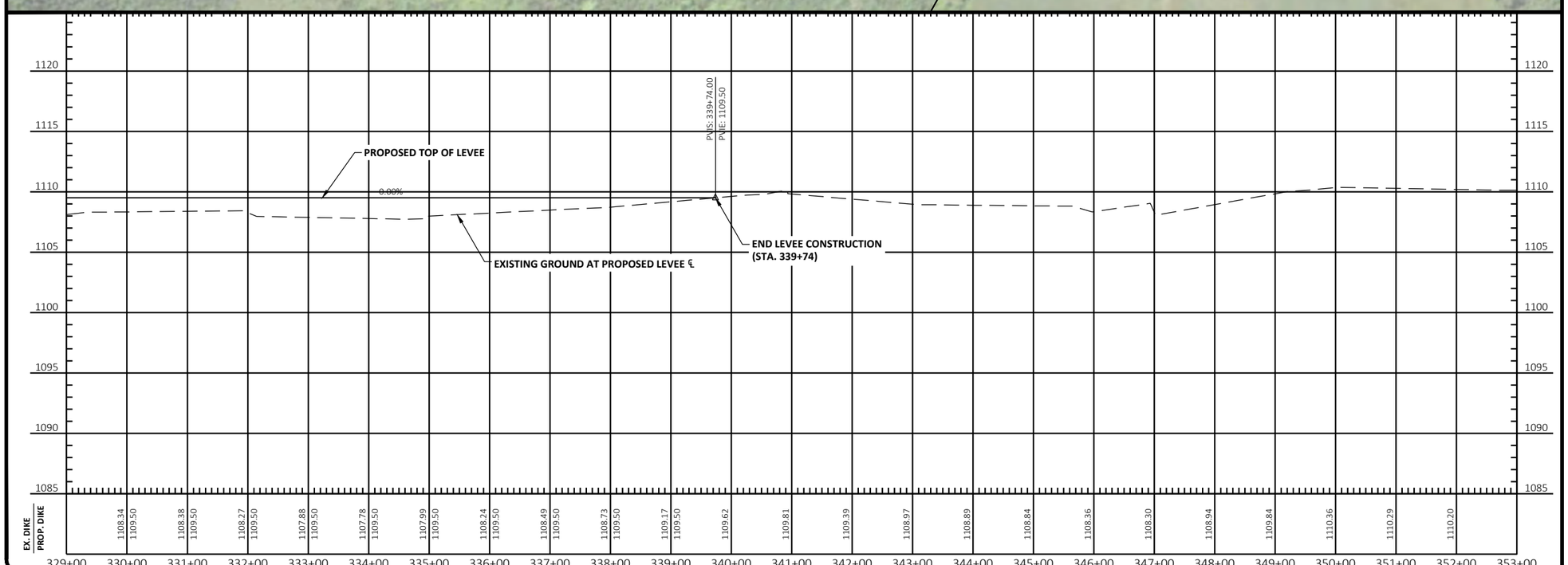

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

LEVEE PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 21

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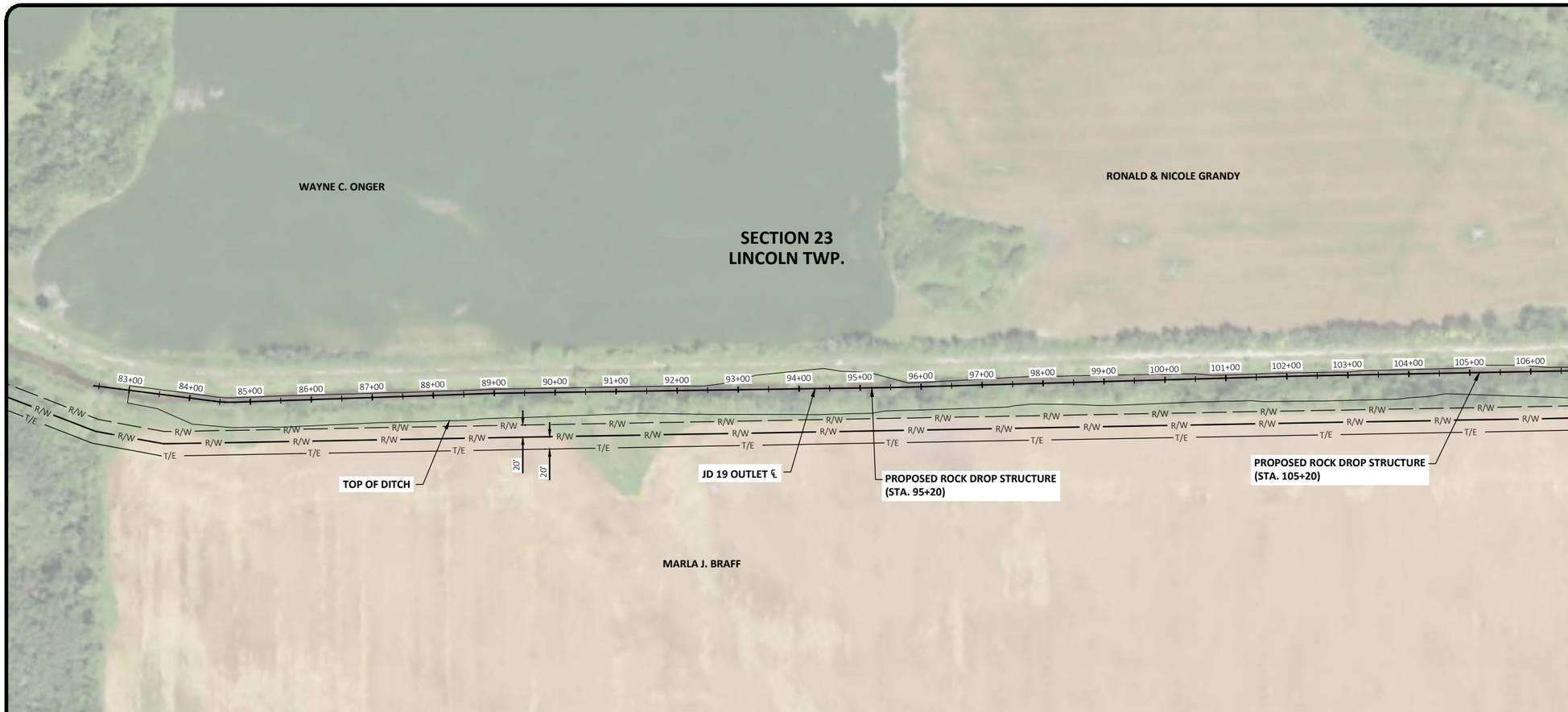

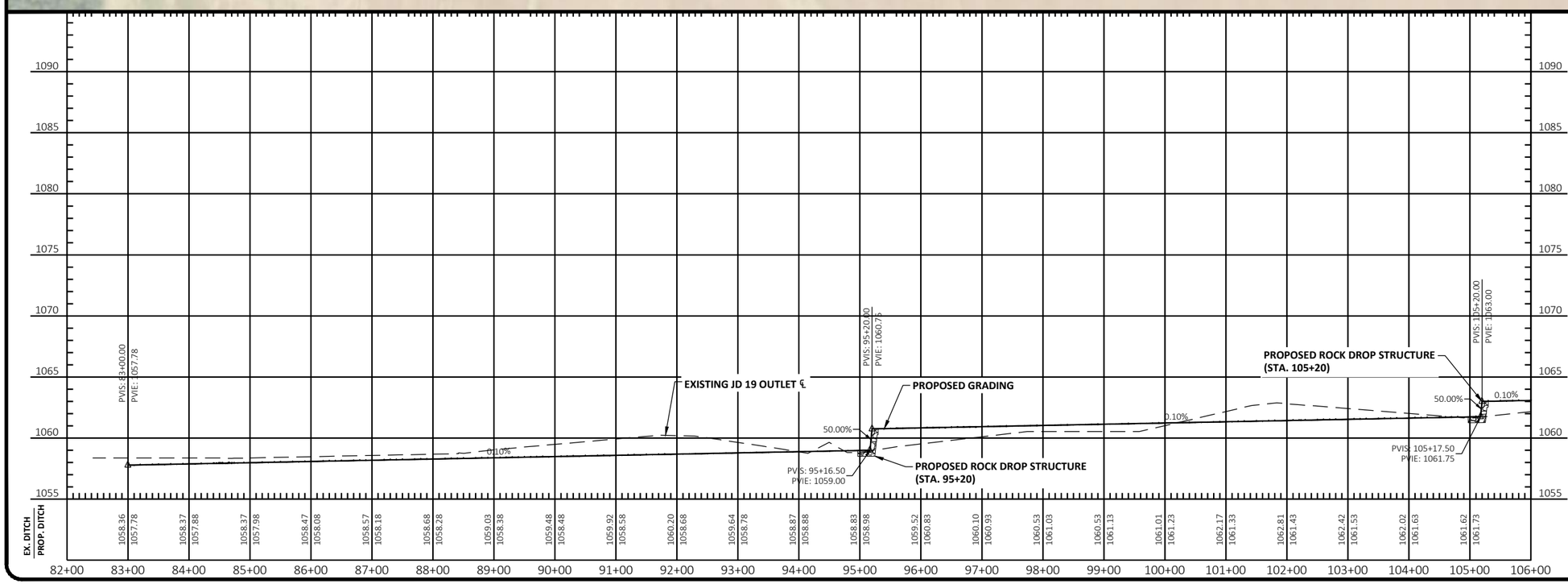

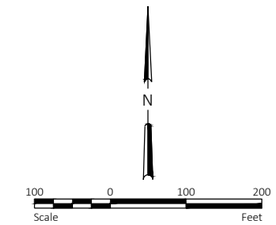

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	22

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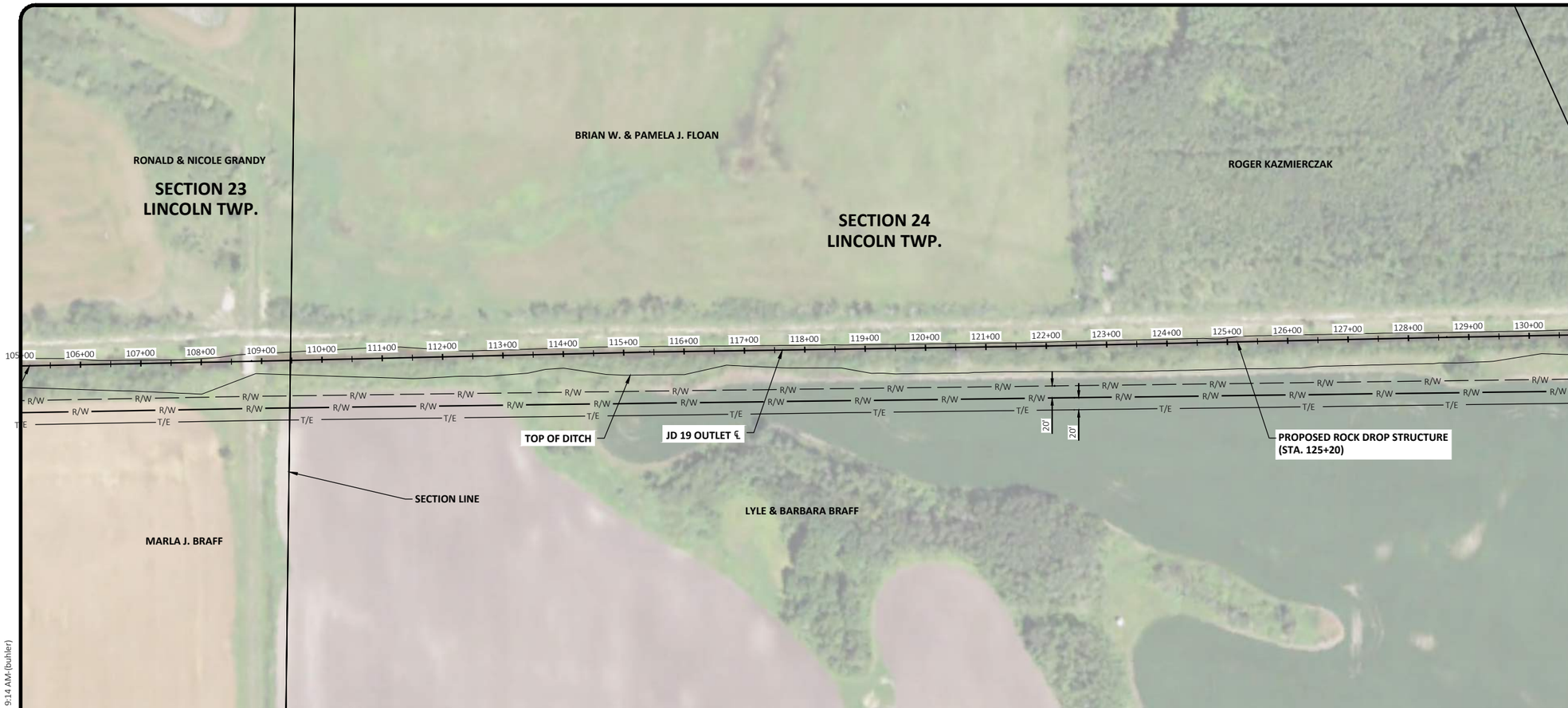

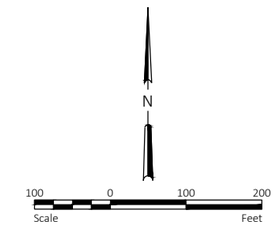

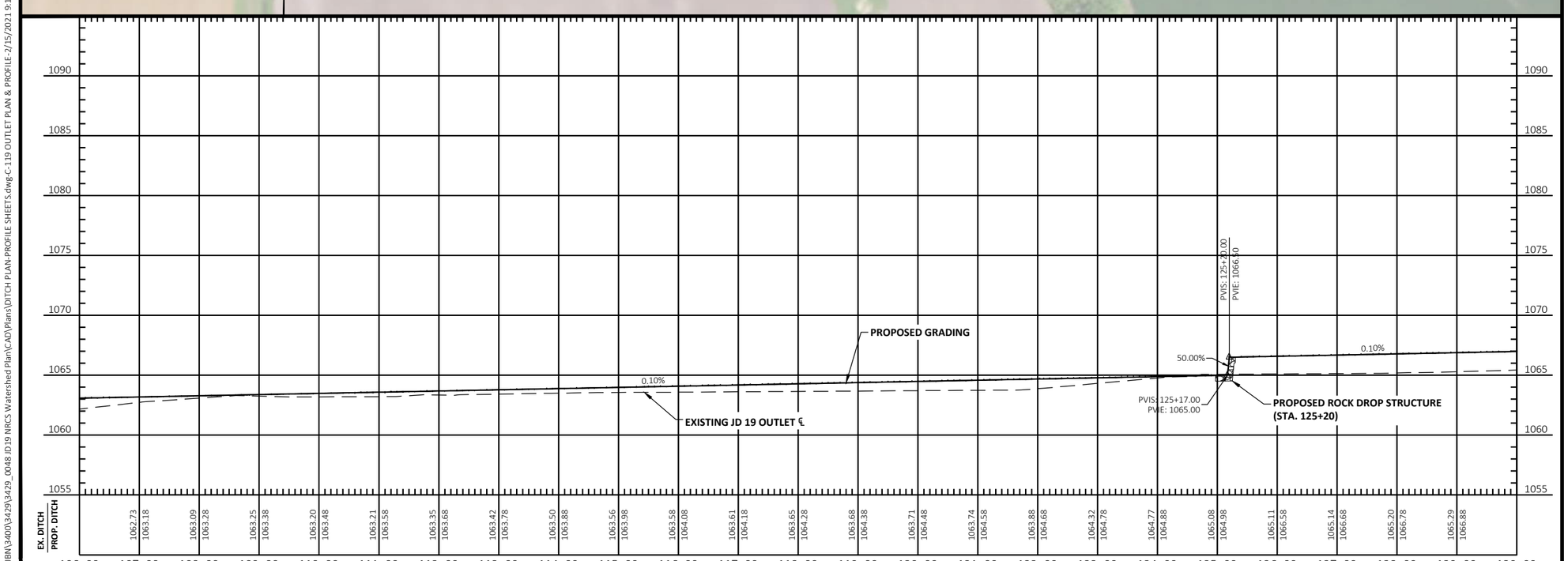

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
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Date	2-15-2021
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Project No.	3429-0048
SHEET	23

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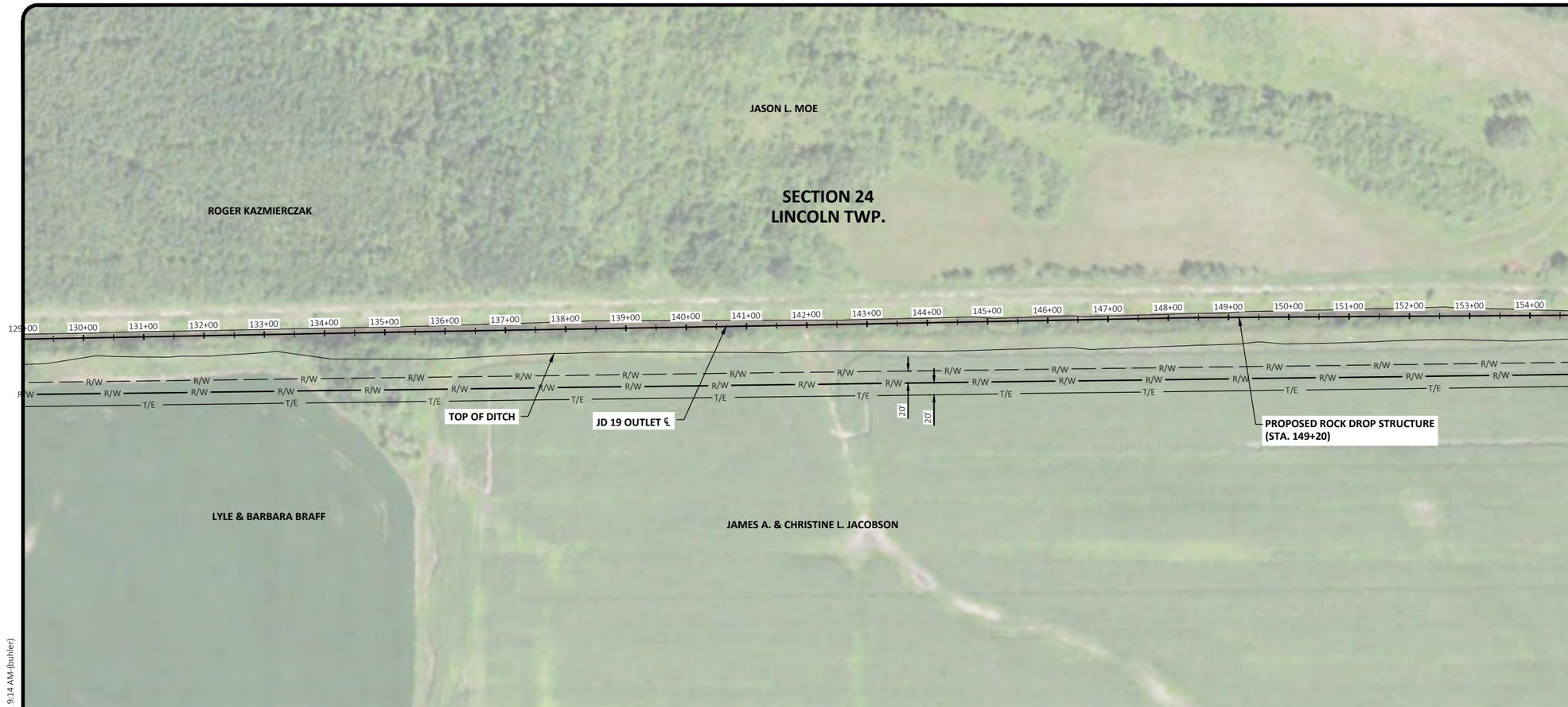

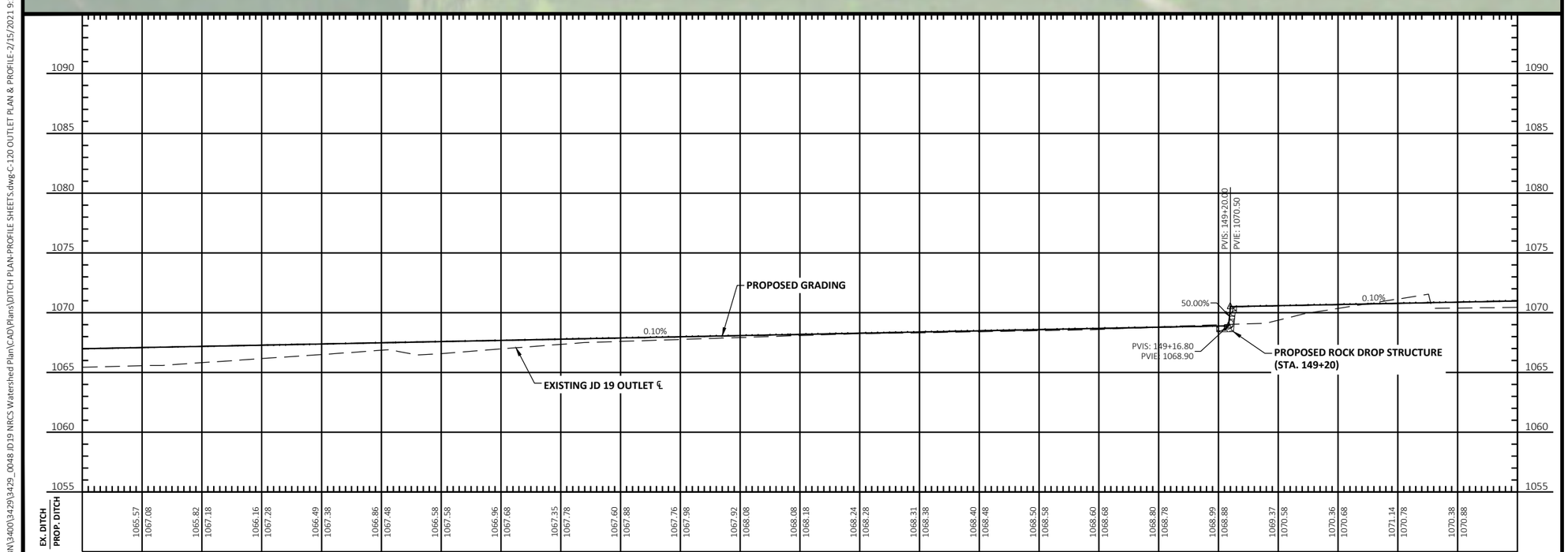

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

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SHEET	24

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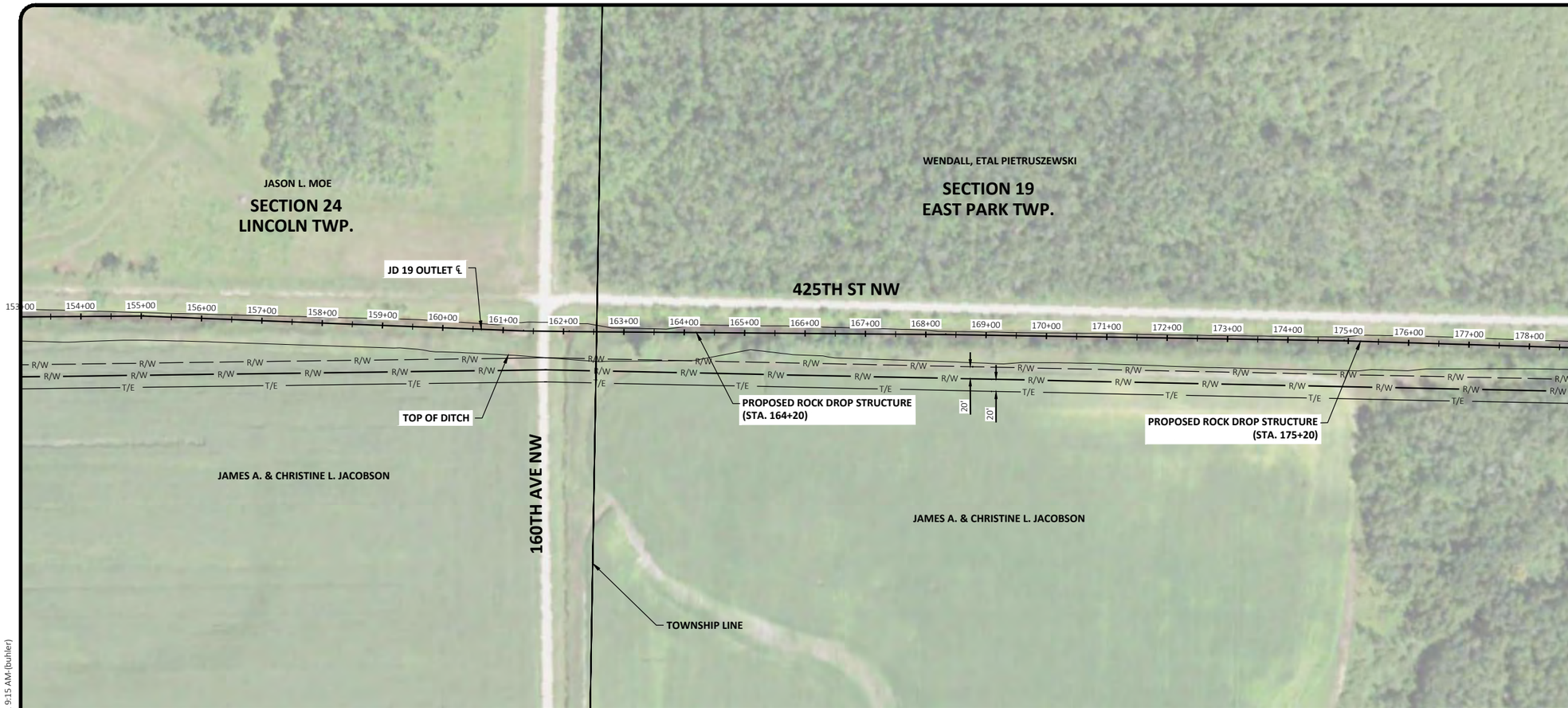

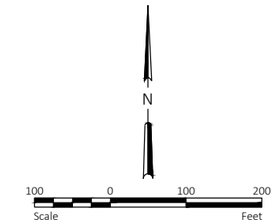

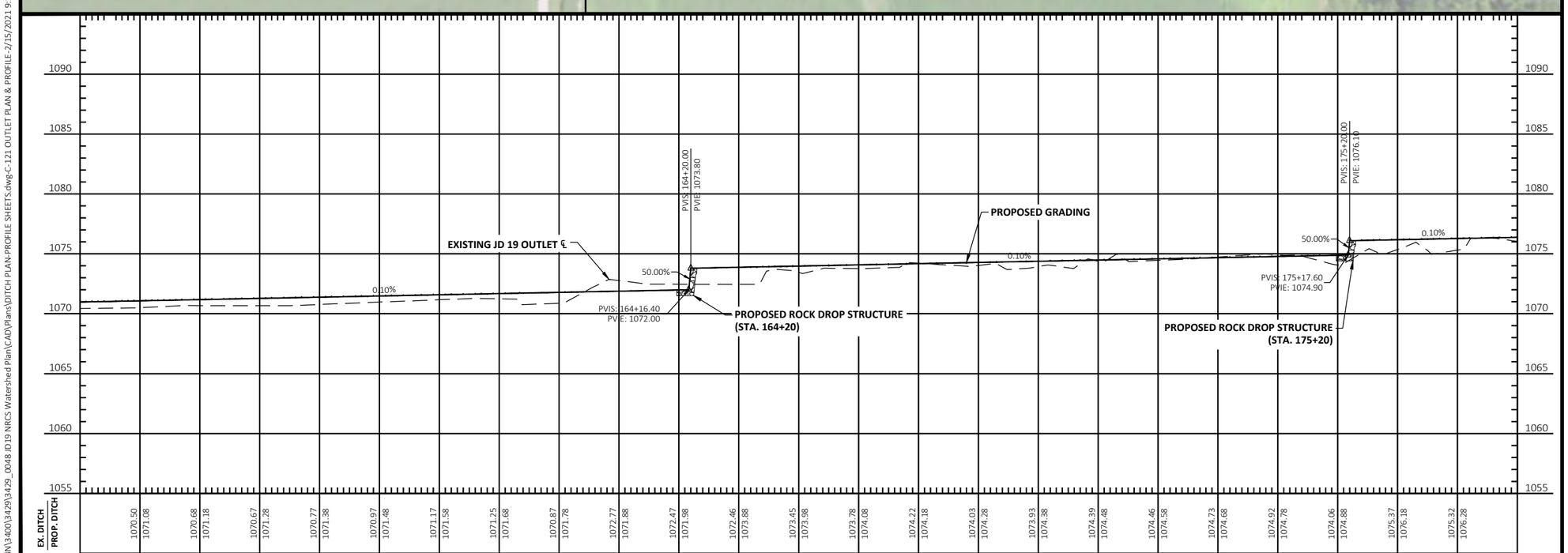

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	25

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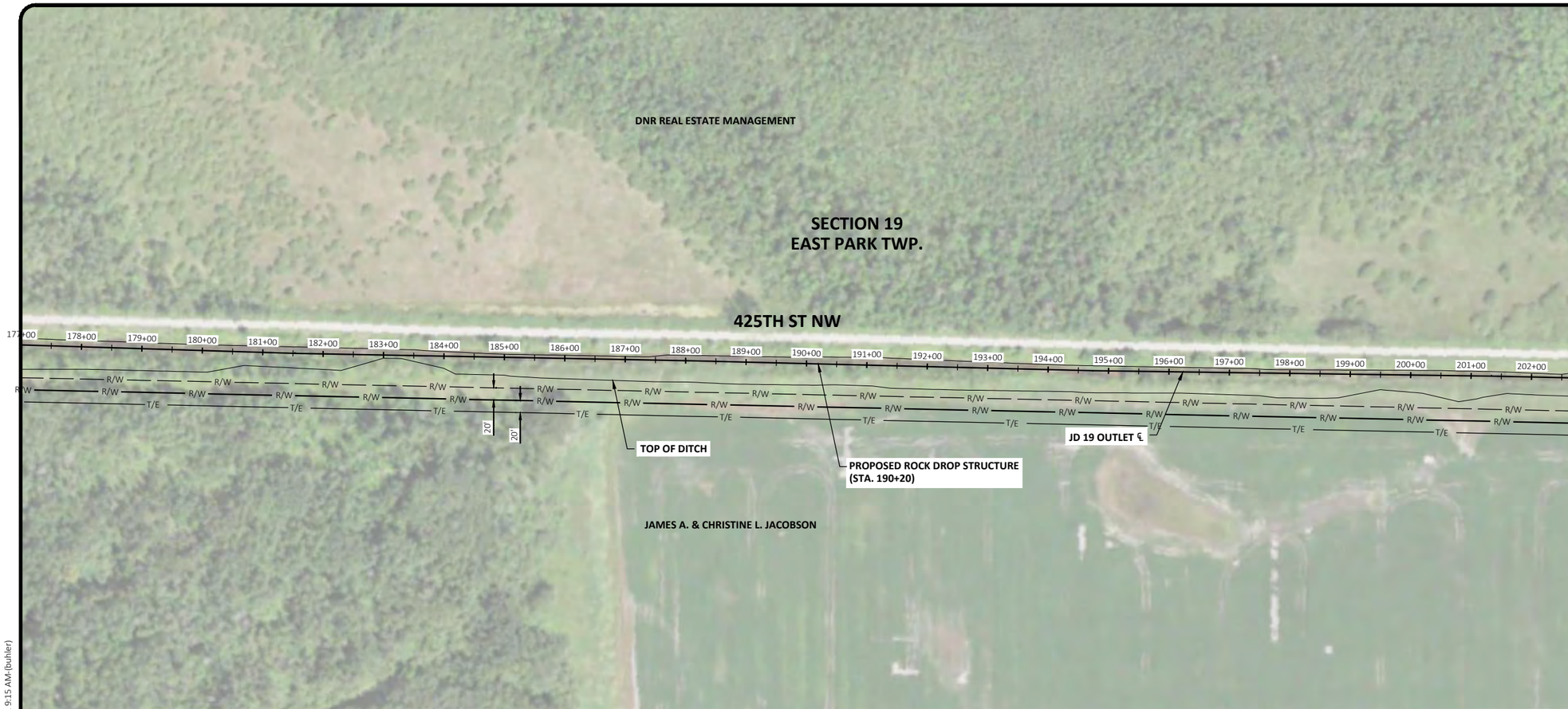

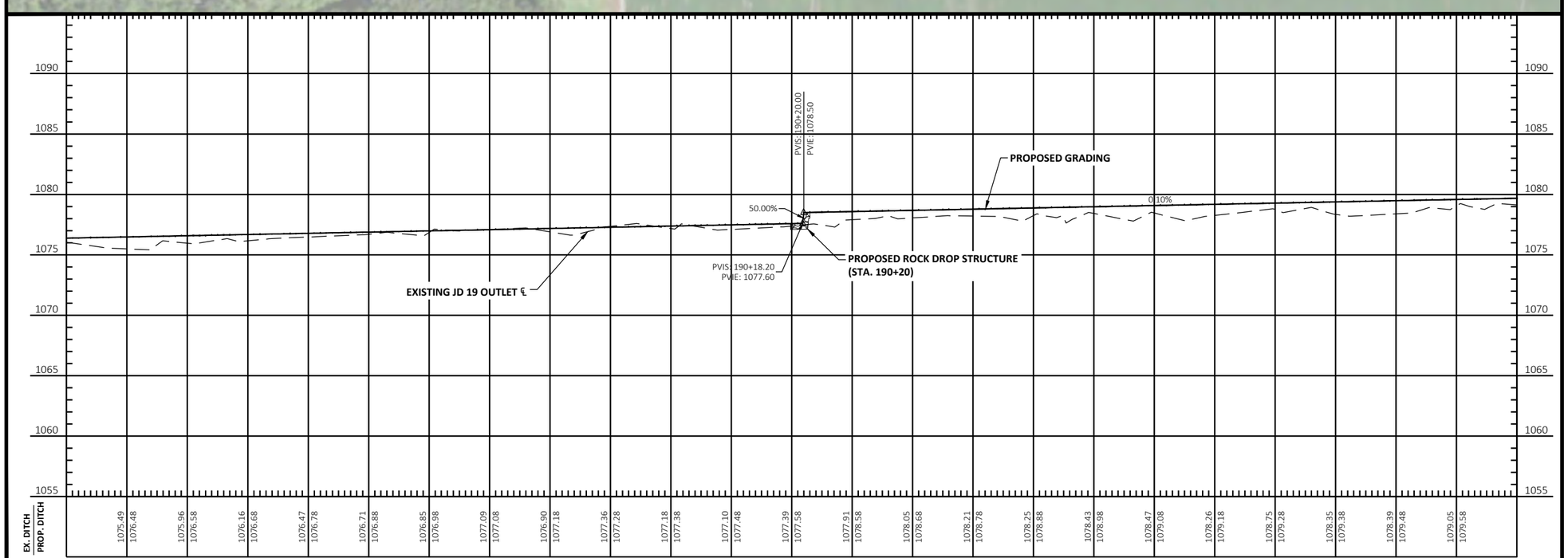

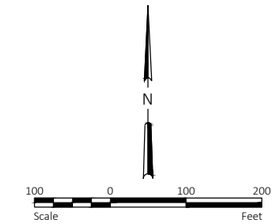

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	26

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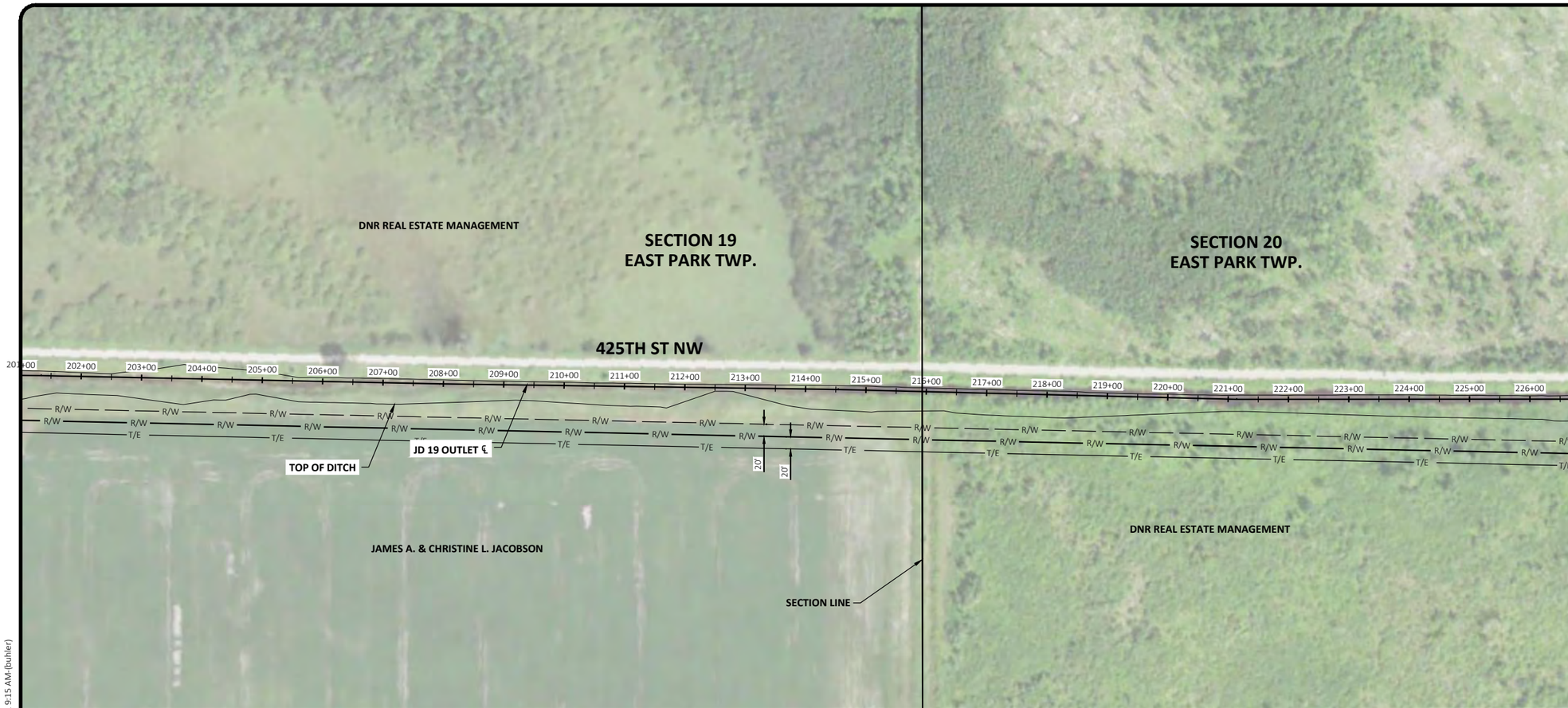
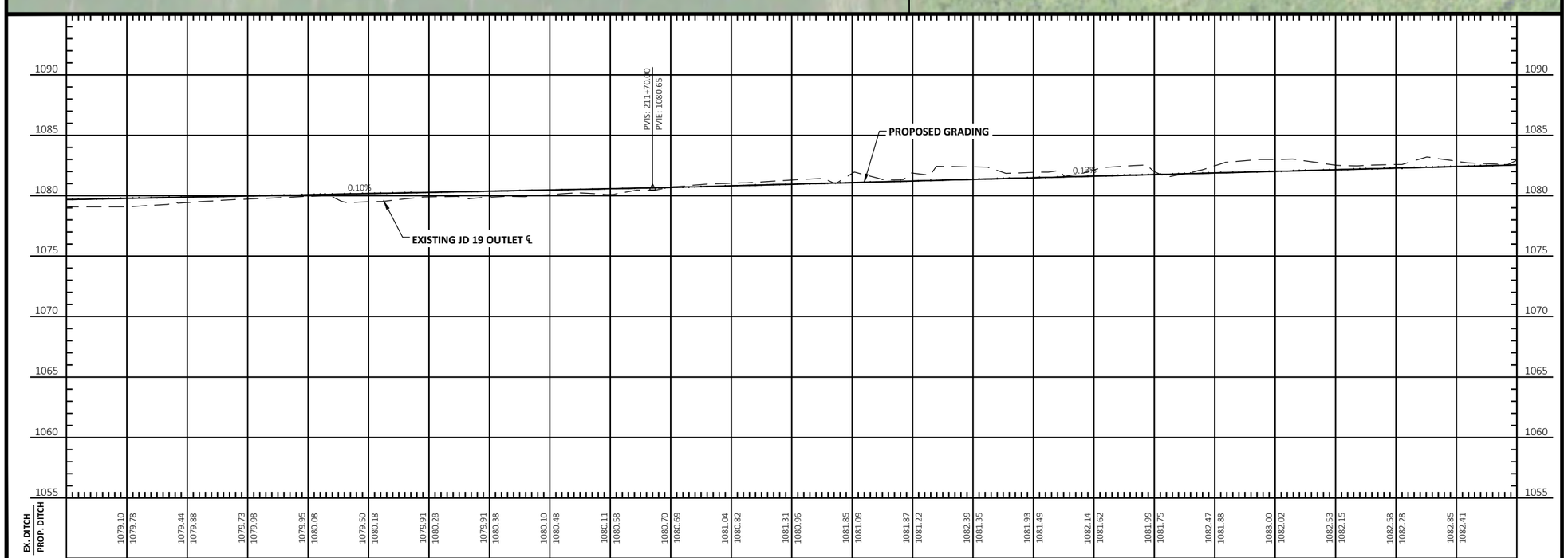
HEI NO. 3429-048





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Scale Feet

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	27

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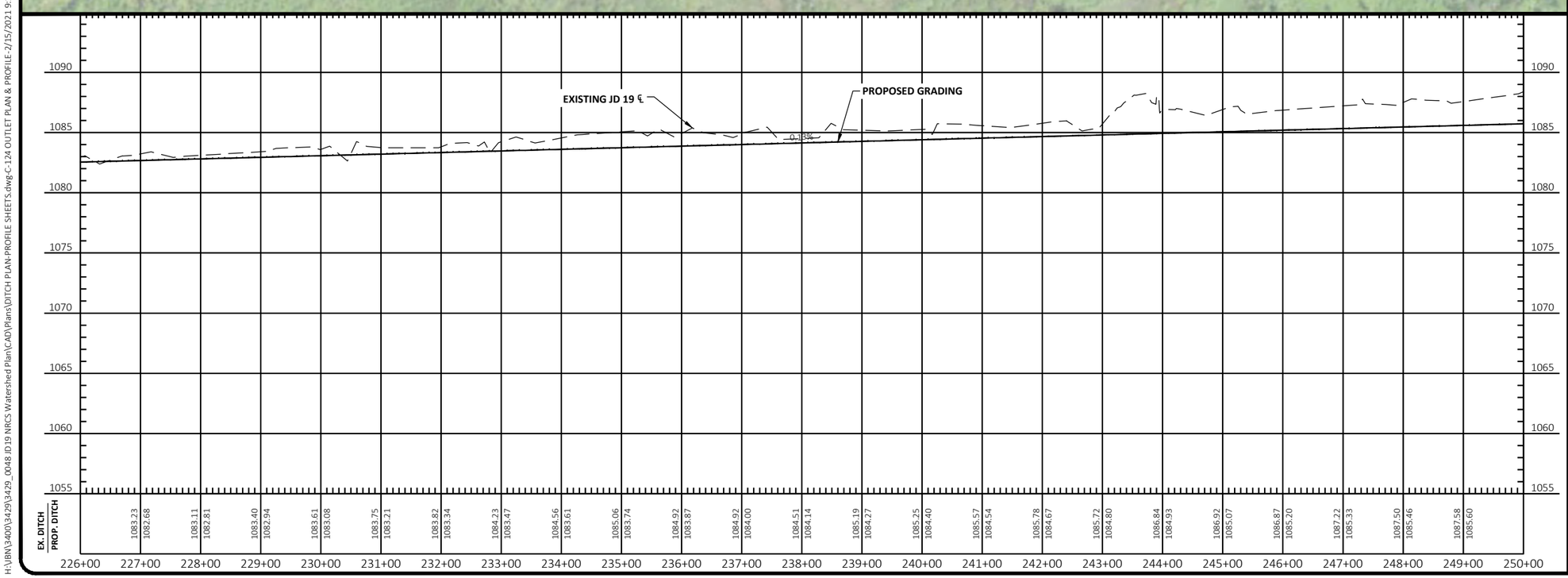

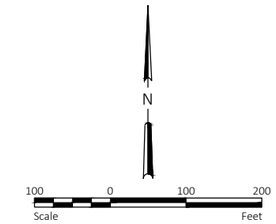

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
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SHEET	28

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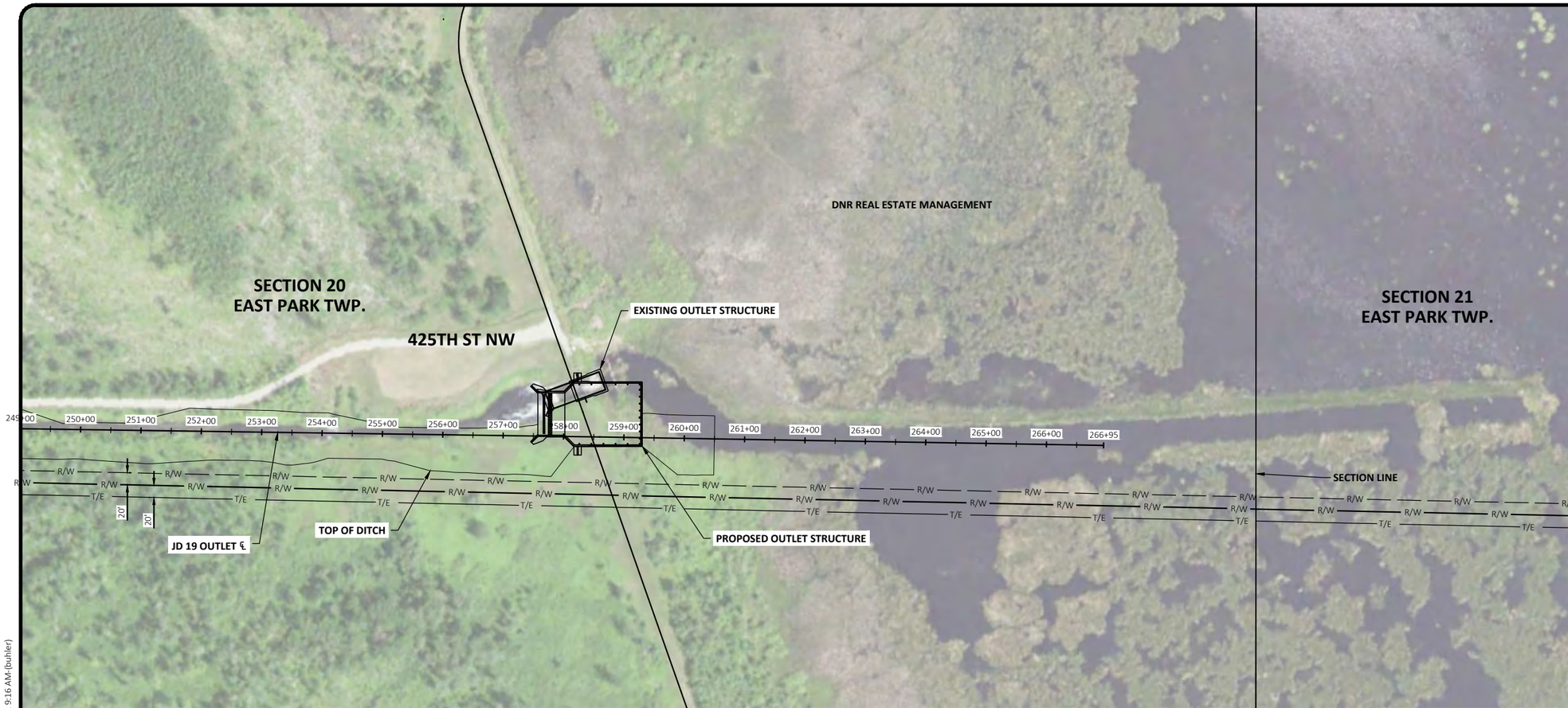

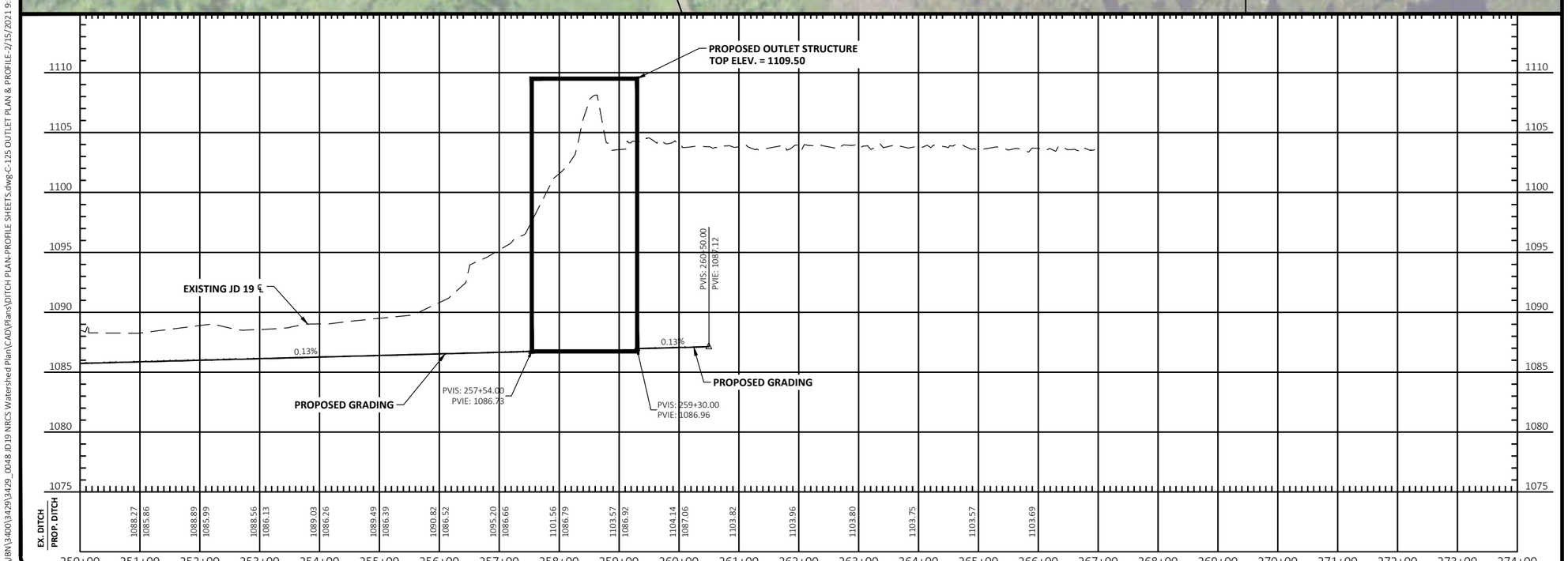

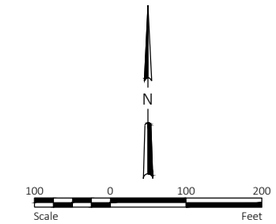

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

OUTLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
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Date	2-15-2021
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SHEET	29

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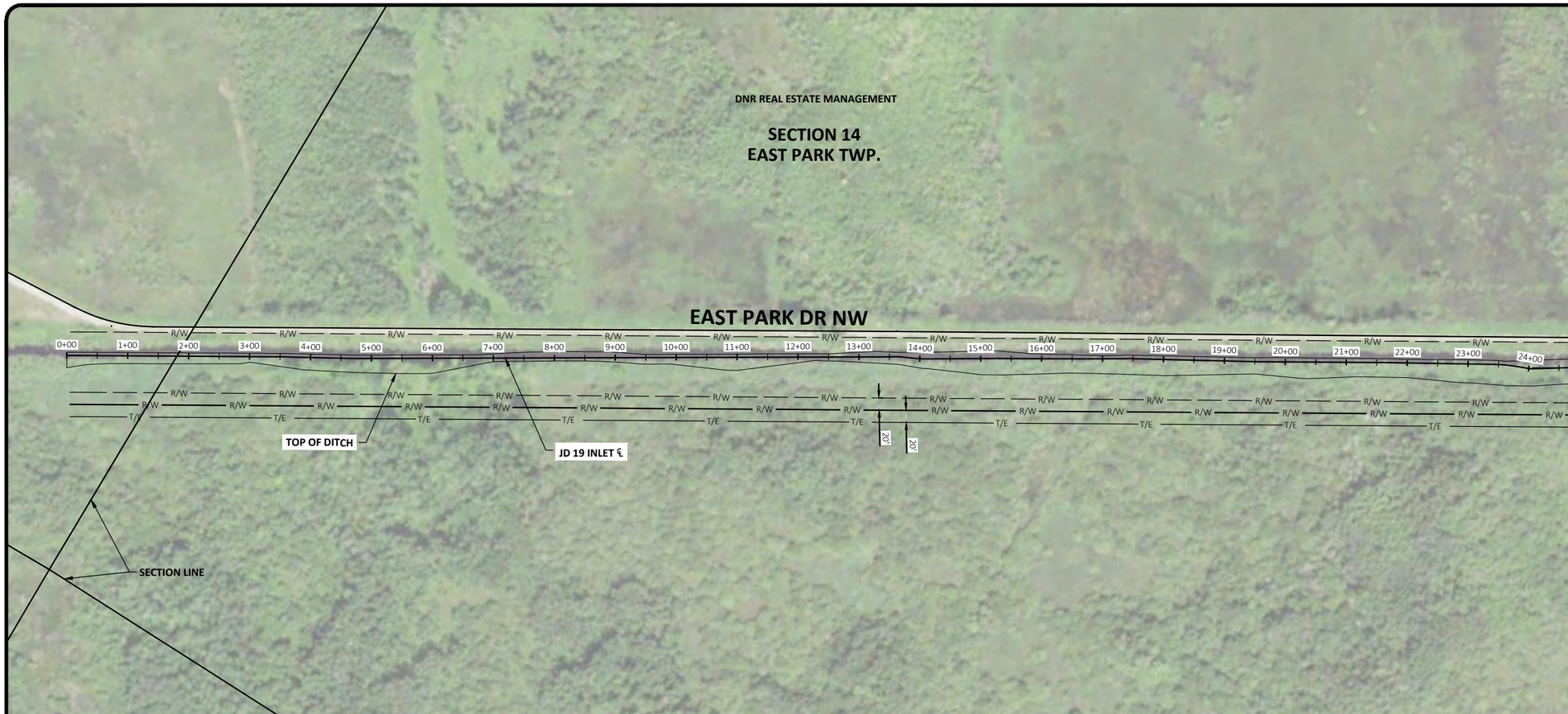

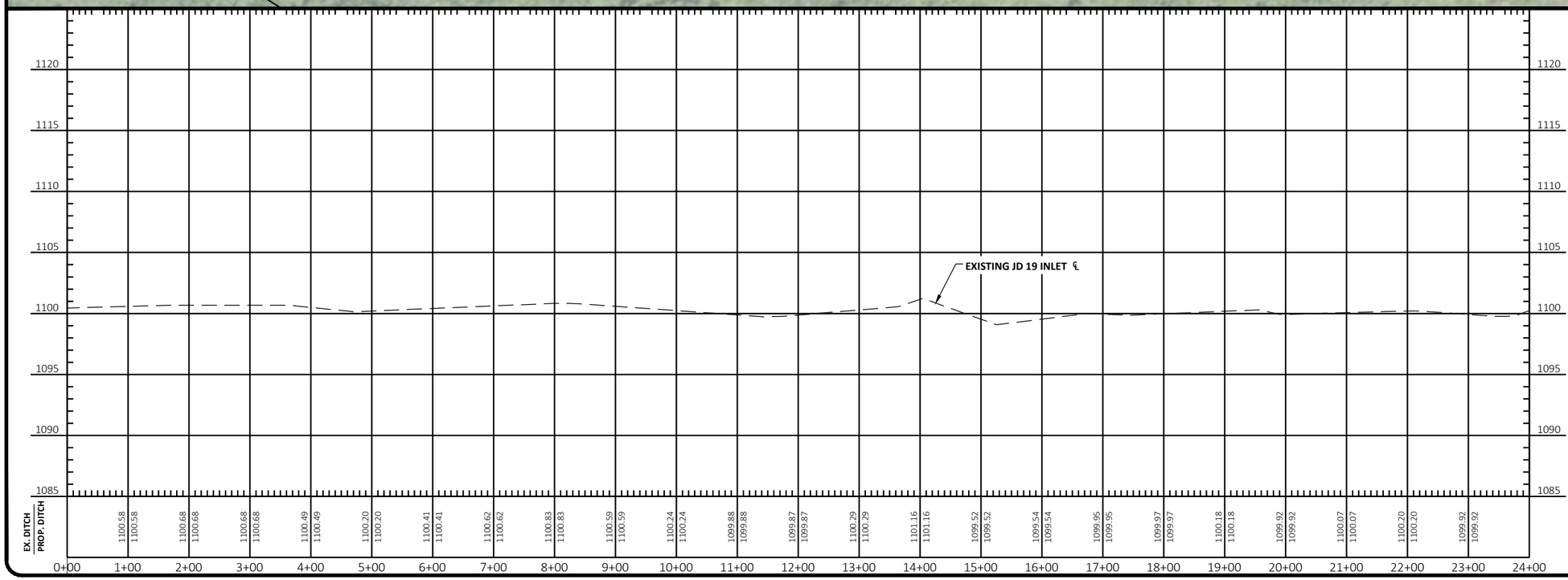

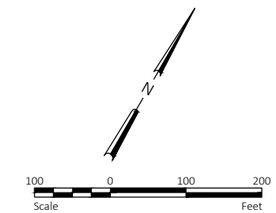

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

INLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
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SHEET	30

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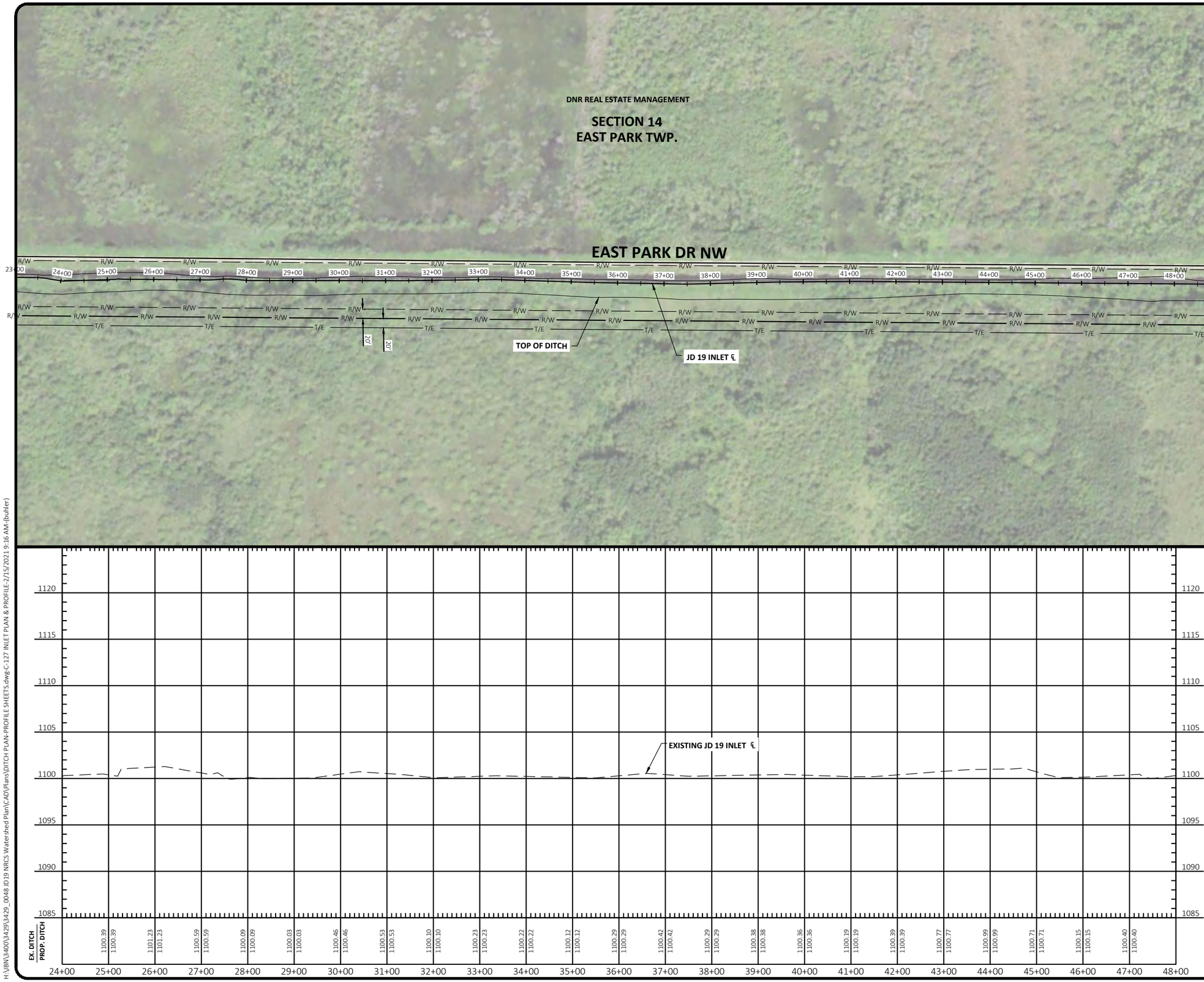

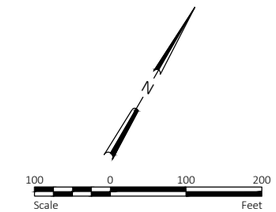

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

INLET PLAN & PROFILE

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SHEET	31

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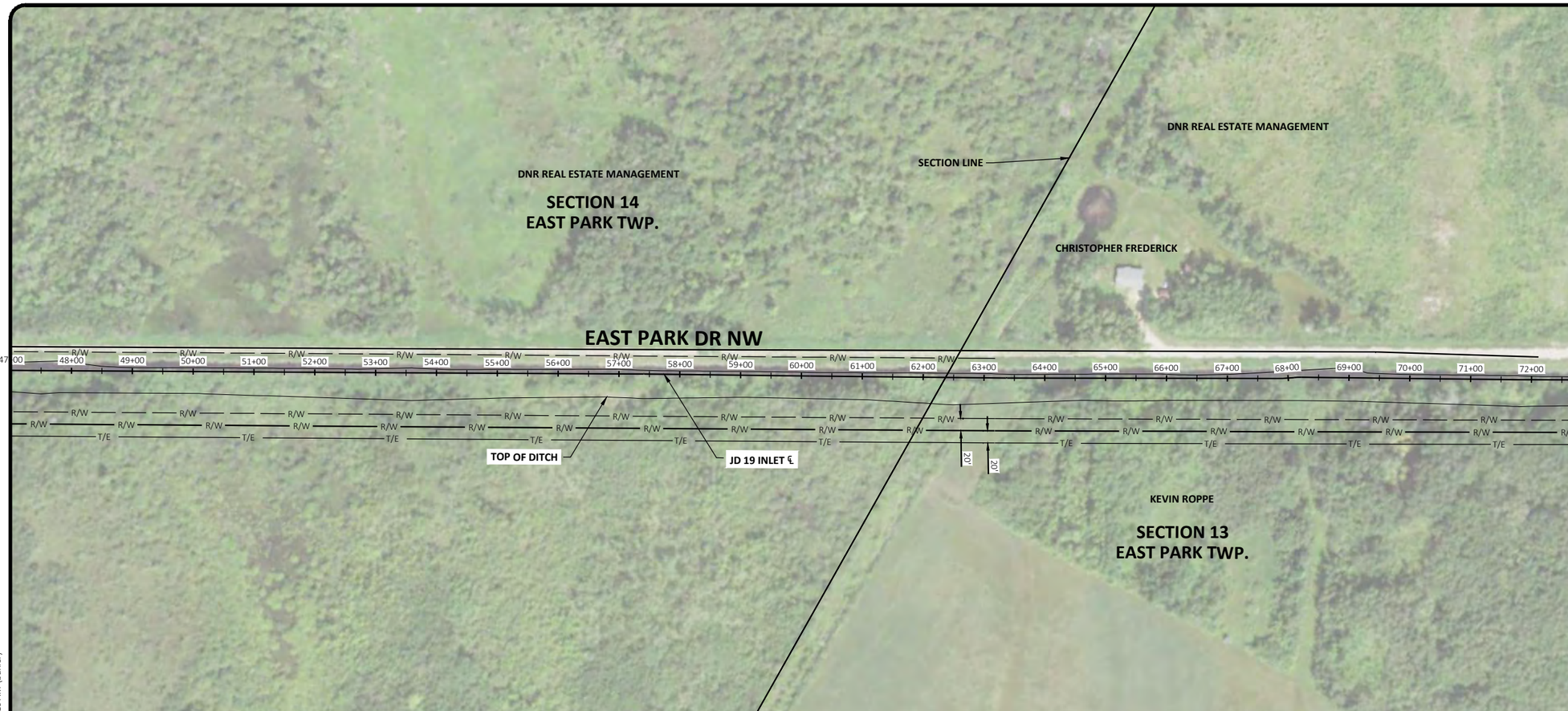

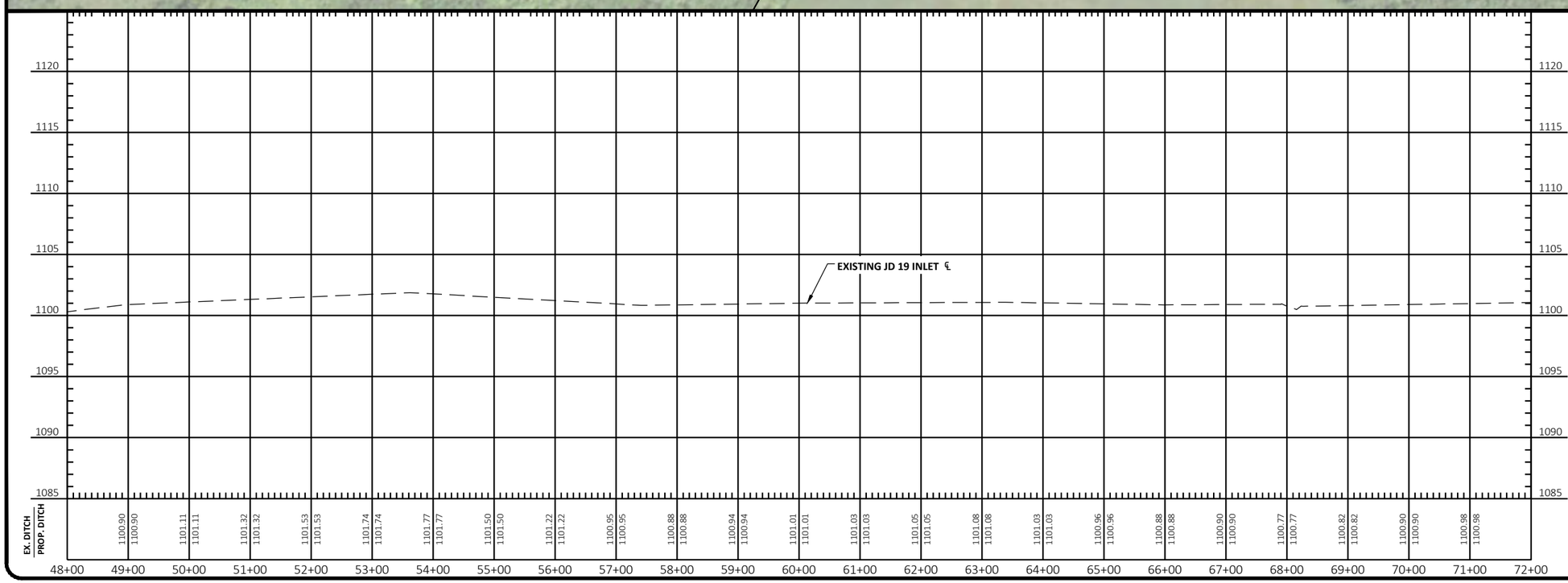

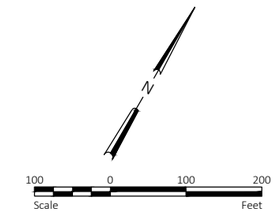

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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

INLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

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Date	2-15-2021
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Project No.	3429-0048
SHEET	32

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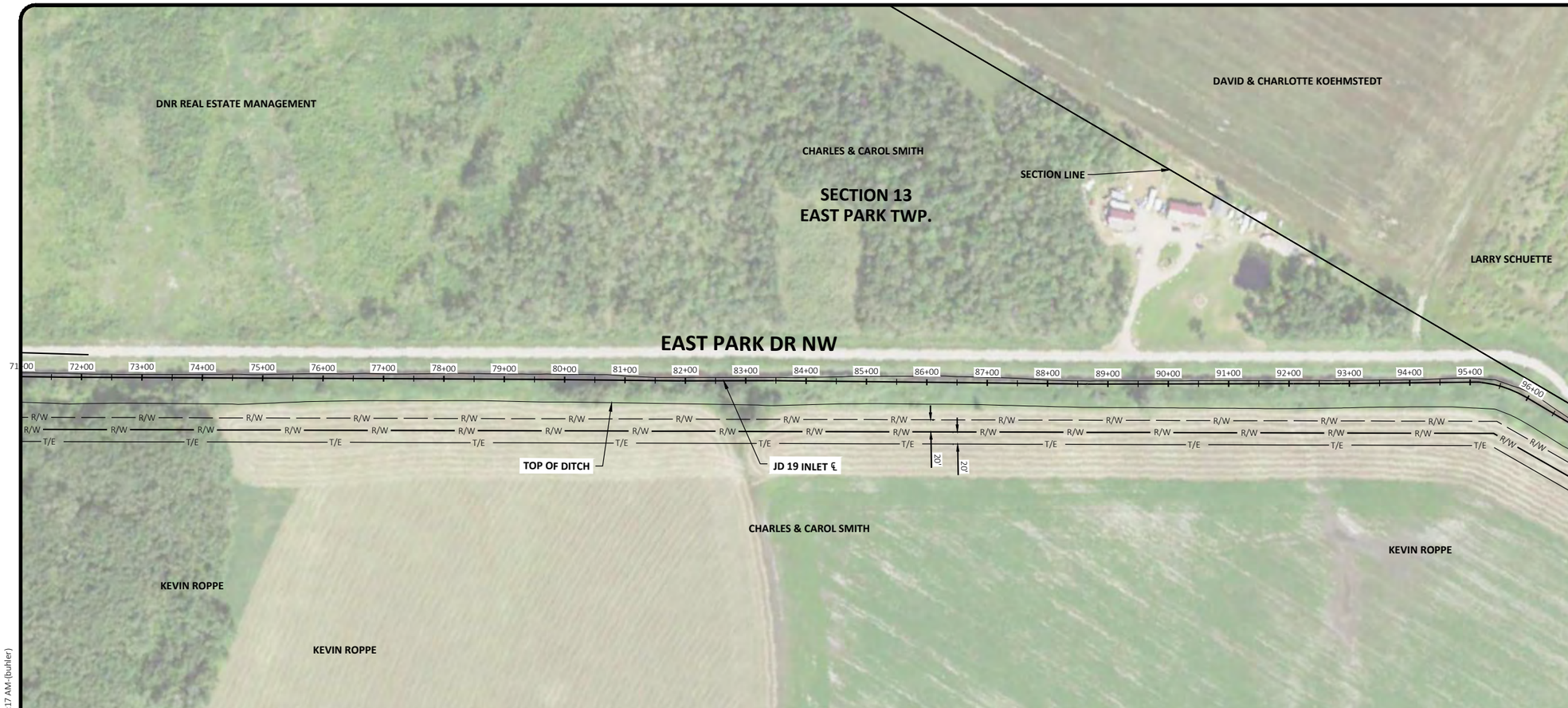

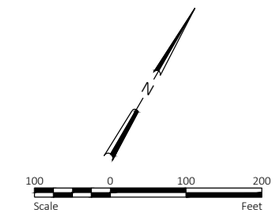

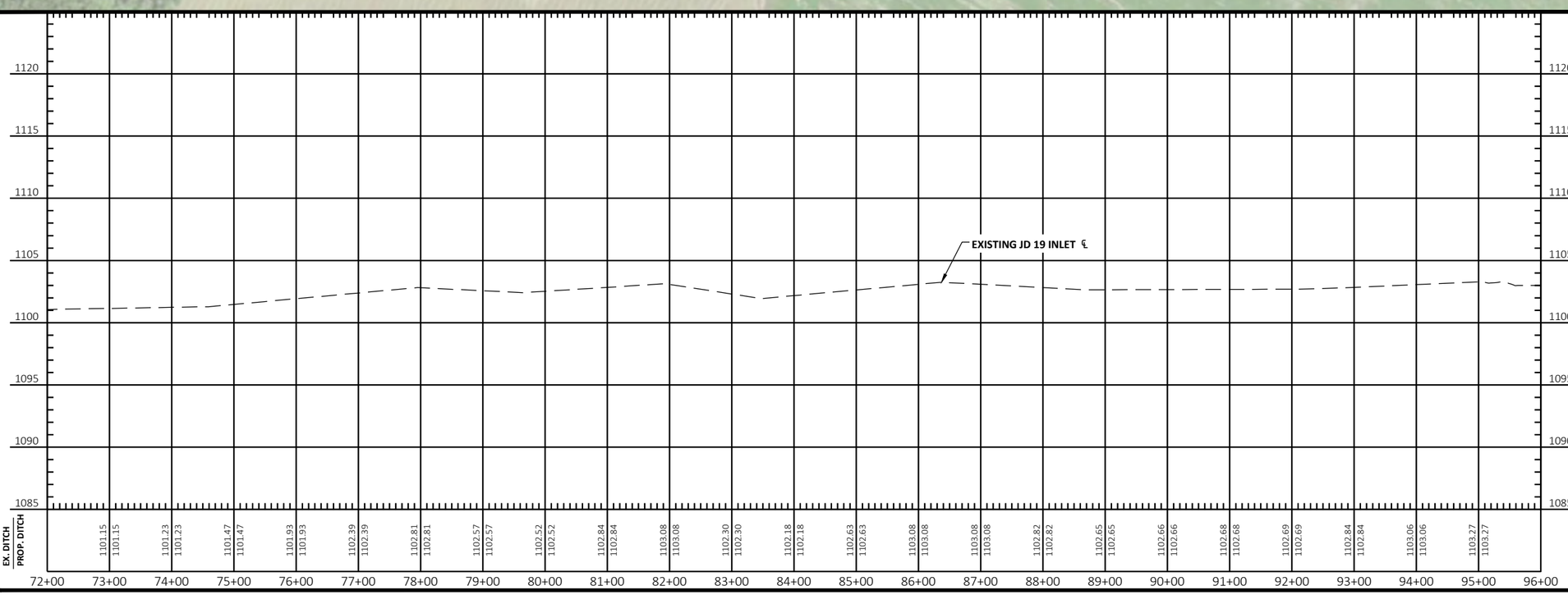

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NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

INLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	33

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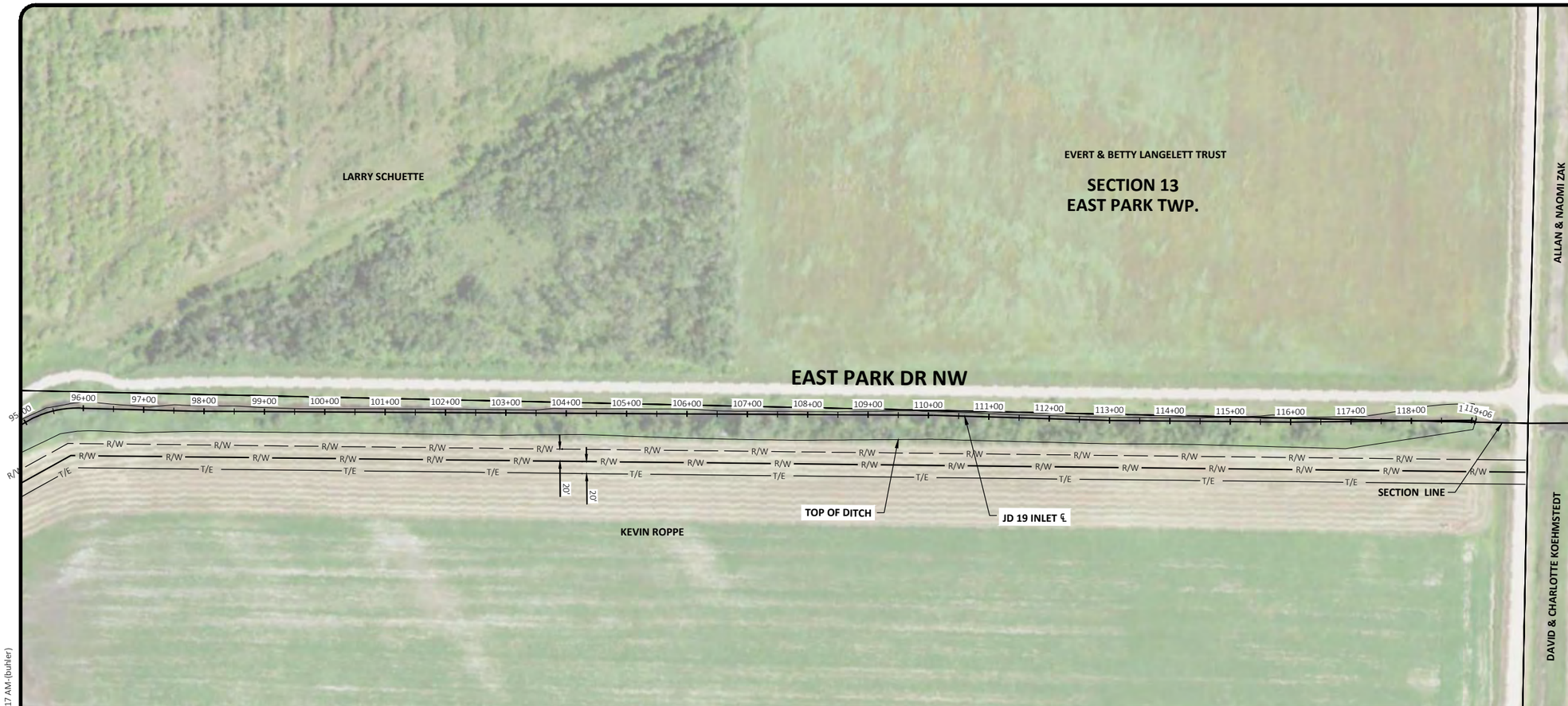

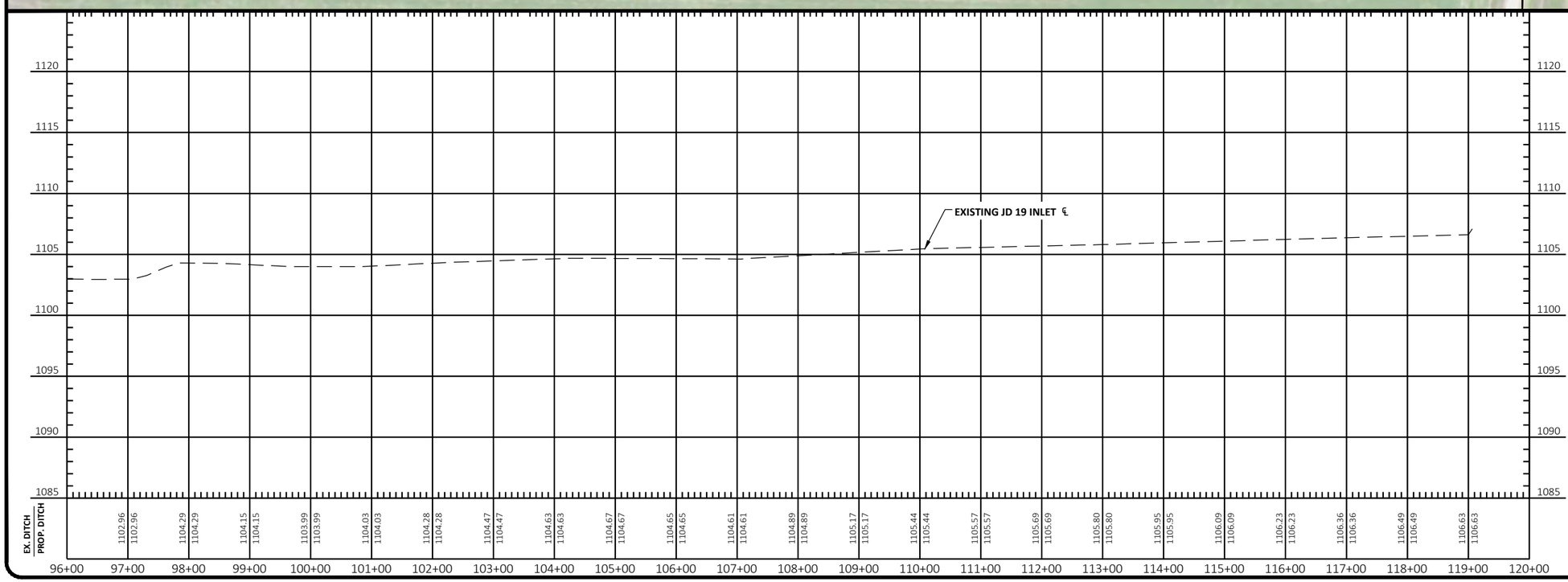

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PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

INLET PLAN & PROFILE

HOUSTON ENGINEERING, INC.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 34

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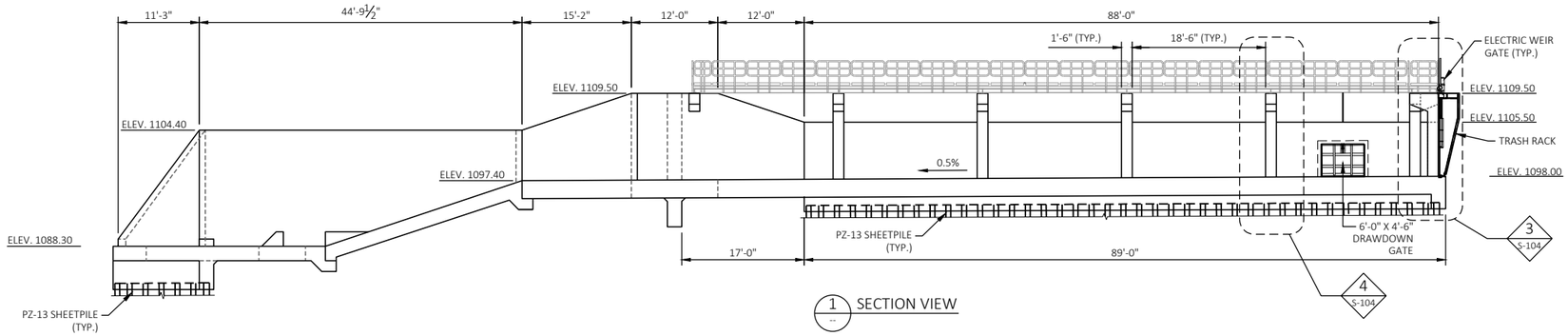

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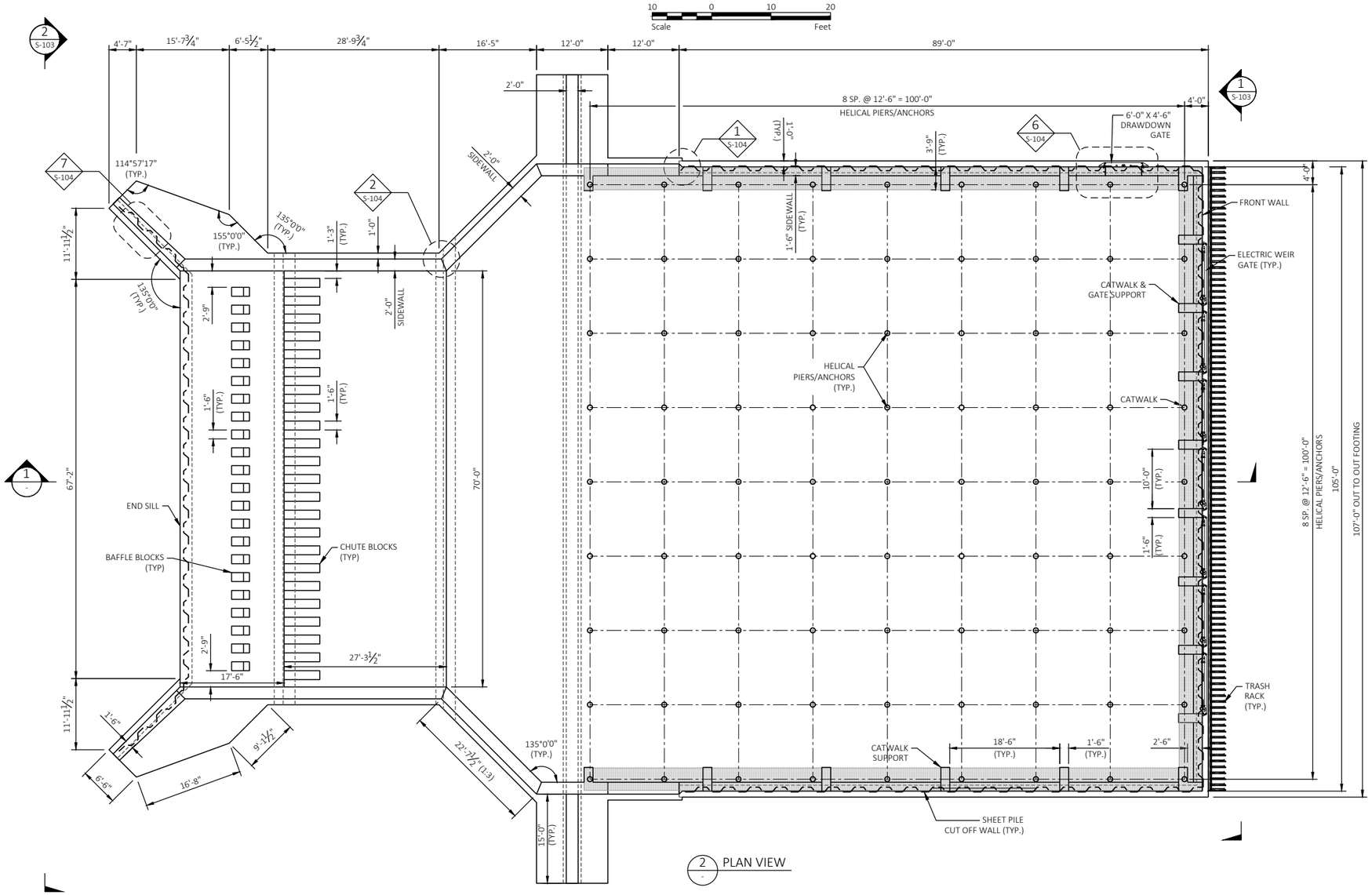

2 PLAN VIEW

Scale 10 0 10 20 Feet

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

STRUCTURAL DETAILS

HOUSTON engineering, inc.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	35

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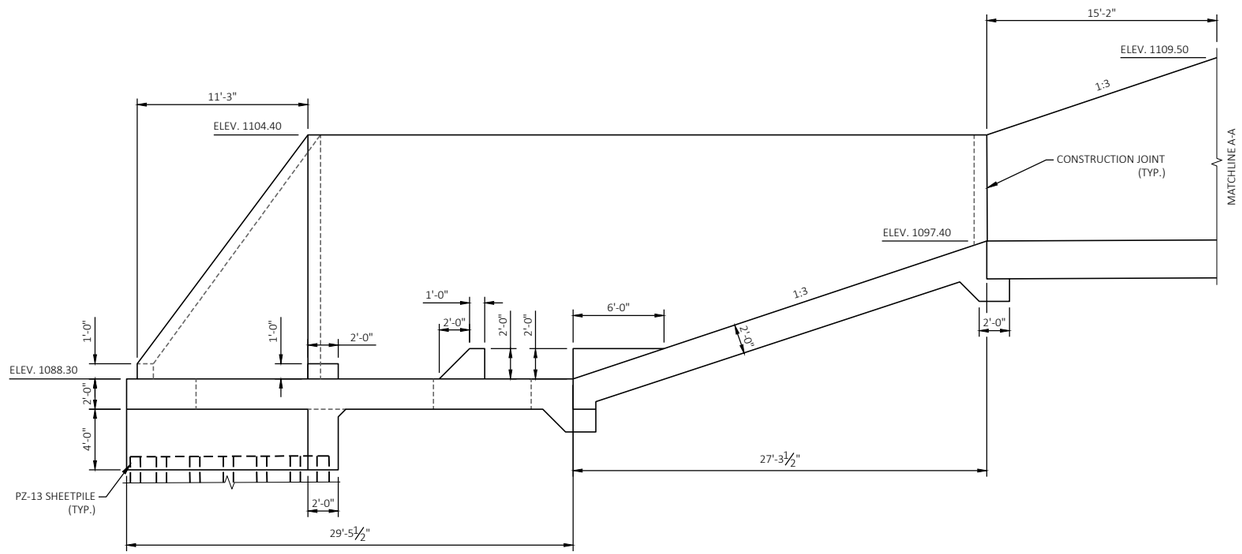
HEI NO. 3429-048



1 SECTION VIEW SAF STILLING BASIN

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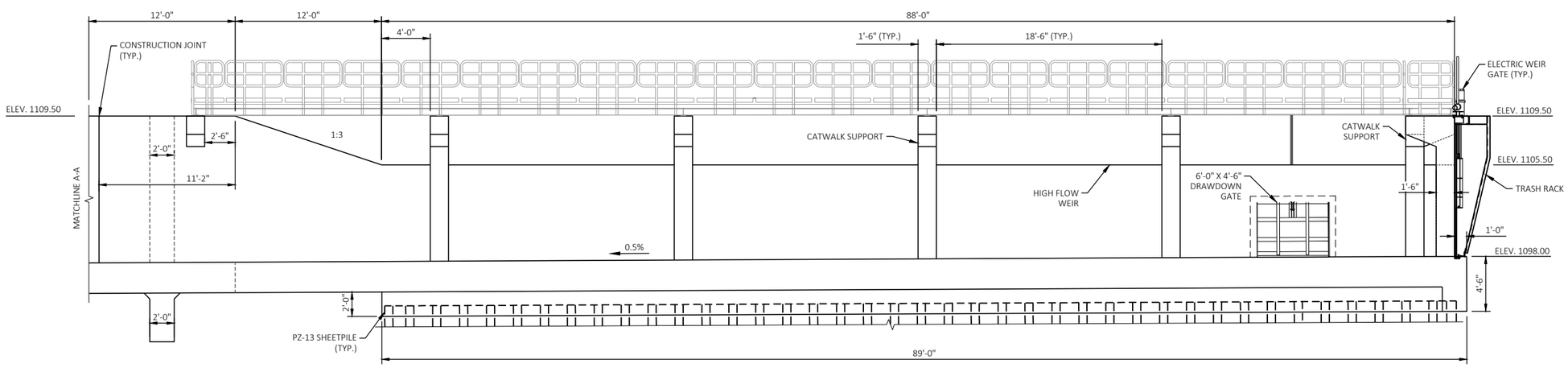
Scale Feet



2 SECTION VIEW INTAKE

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Scale Feet

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

STRUCTURAL DETAILS

HOUSTON engineering, inc.

Drawn By: BGJ
Checked By: TAN
Date: 2-15-2021
Scale: As Shown
Project No.: 3429-0048
SHEET 36

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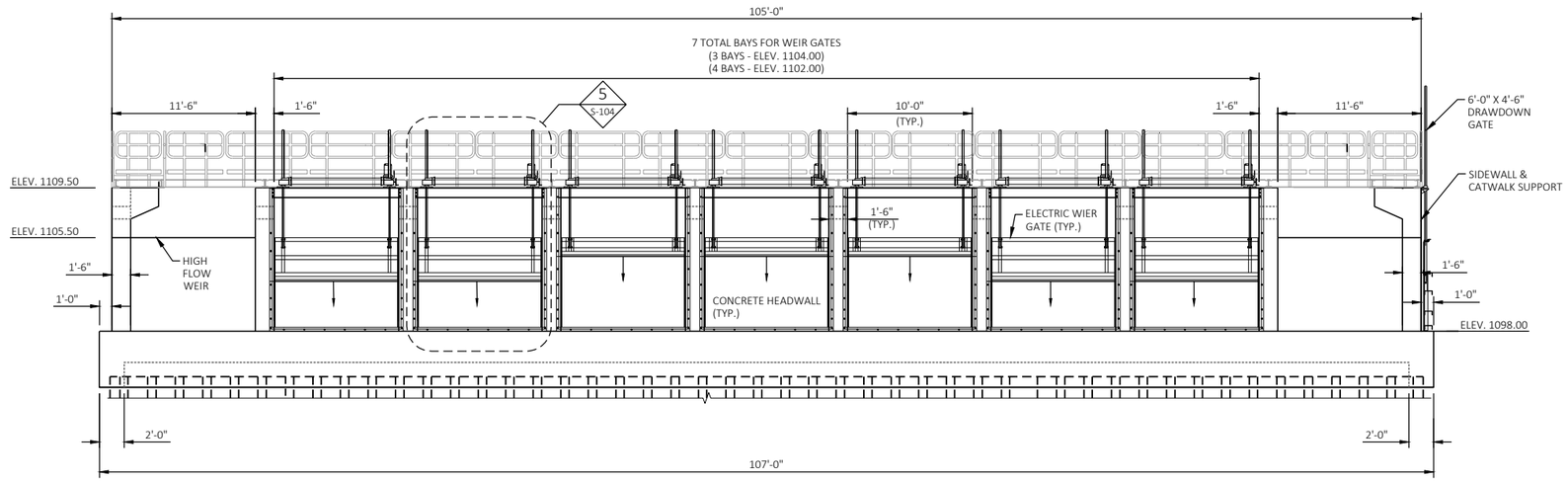
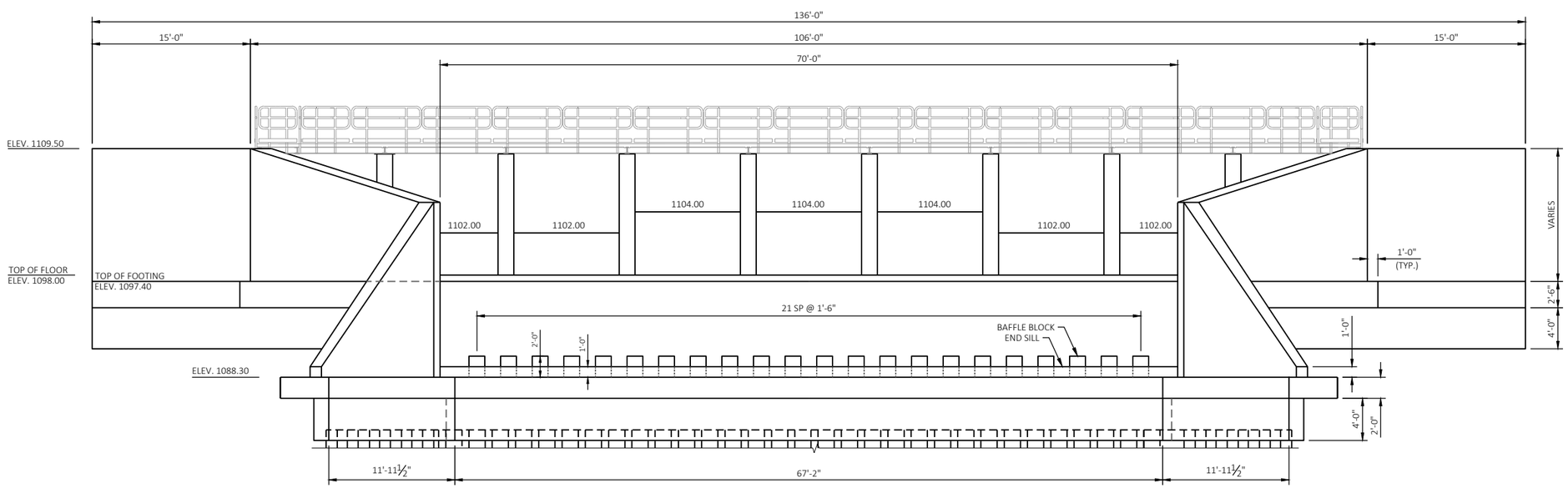


1 FRONT WALL DETAIL

NOTE:
TRASH RACK OMITTED FOR CLARITY.

6 0 6 12
Scale Feet



2 OUTLET DETAIL

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Scale Feet

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
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SHEET	37

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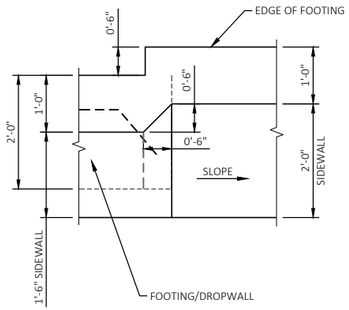
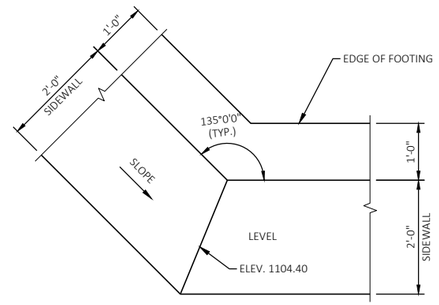


1 S-101 SIDE WALL CORNER PLAN



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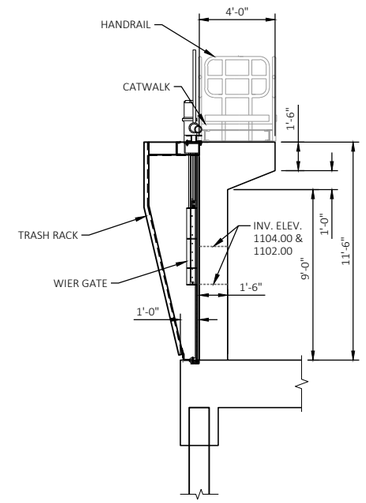
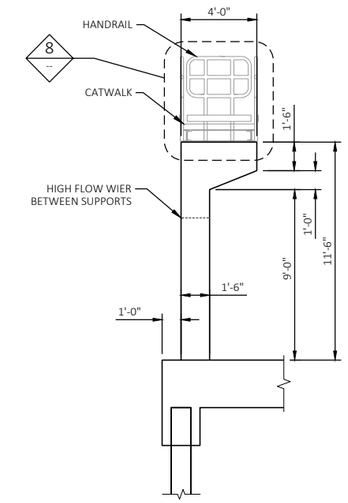
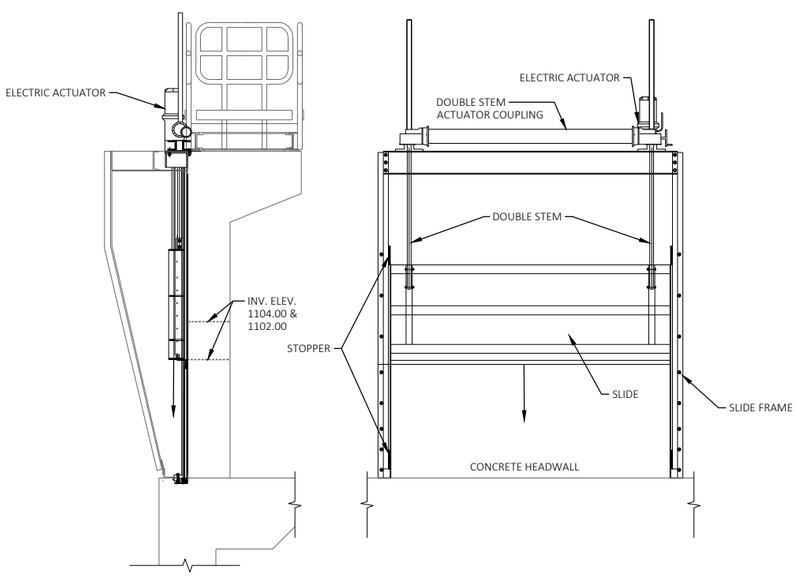


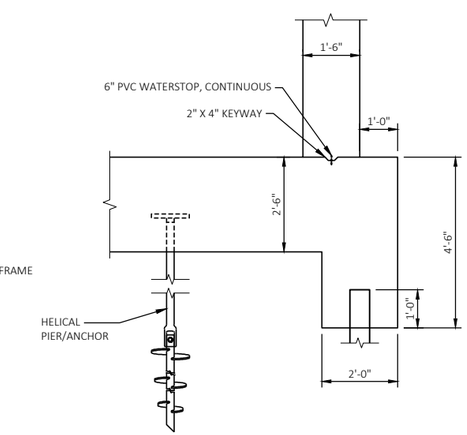
3 S-101 FRONT WALL CATWALK SUPPORT DETAIL



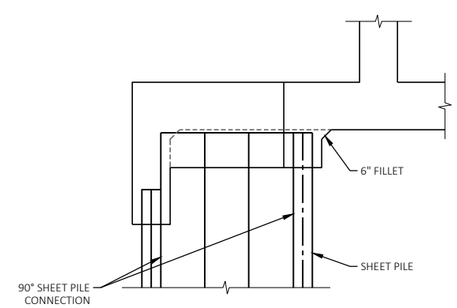
4 S-101 SIDE WALL CATWALK SUPPORT DETAIL



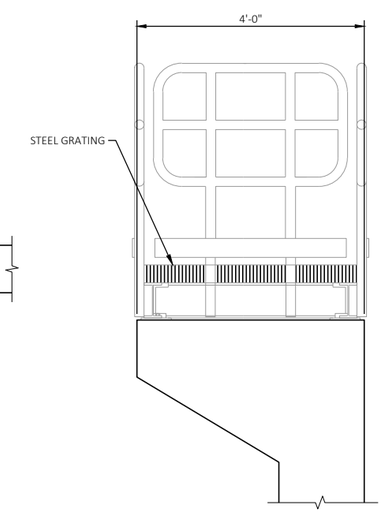
5 S-103 WEIR GATE DETAIL



6 S-101 SIDE WALL TOE DETAIL



7 S-101 WINGWALL TOE SECTION



8 S-101 CATWALK CONNECTION DETAIL

PRELIMINARY
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No.	Revision	Date	By

NELSON SLOUGH IMPROVEMENT PROJECT
MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT
WARREN, MINNESOTA

STRUCTURAL DETAILS

HOUSTON engineering, inc.

Drawn By	BGJ
Checked By	TAN
Date	2-15-2021
Scale	As Shown
Project No.	3429-0048
SHEET	38

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Appendix B

Minnesota State Historic Preservation Office

Letters

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

May 12, 2021

Benjamin Hengel
Houston Engineering
1401 21st Ave N
Fargo, ND 58102

RE: Middle-Snake-Tamarac Rivers Watershed District
Nelson Slough Improvement Project (Judicial Ditch 19)
Marshall and Roseau Counties
SHPO Number: 2021-1663

Dear Benjamin Hengel:

Thank you for consulting with our office during the preparation of an Environmental Assessment Worksheet for the above-referenced project.

We have reviewed the document titled *Phase Ia Literature Search, Judicial Ditch 19 Watershed Plan and Environmental Assessment, Marshall and Roseau Counties, Minnesota* (July 2018) as prepared by McFarlane Consulting. We agree with the consultant's recommendation that a Phase I archaeological survey is warranted for this project. We look forward to reviewing the results of the Phase I survey when they become available.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

Please contact Kelly Gragg-Johnson in our Environmental Review Program at kelly.graggjohnson@state.mn.us if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

August 4, 2021

Benjamin Hengel
Houston Engineering
1401 21st Ave N
Fargo, ND 58102

RE: Middle-Snake-Tamarac Rivers Watershed District
Nelson Slough Improvement Project (Judicial Ditch 19)
Marshall County
SHPO Number: 2021-1663

Dear Benjamin Hengel:

Thank you for continuing consultation with our office during the preparation of an Environmental Assessment Worksheet for the above-referenced project.

We have reviewed the cultural resources survey report titled *Phase Ia Literature Search and Field Inspection, Nelson Slough Improvement Project, Marshall County, Minnesota* (July 2021) as prepared by McFarlane Consulting. Based on the results of the investigations, we conclude that there are no properties listed in the National or State Registers of Historic Places and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

If you have any questions regarding our review of this project, please contact Kelly Gragg-Johnson, Environmental Review Program Specialist, at kelly.graggjohnson@state.mn.us.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

Appendix C

Natural Heritage Information System Letter

From:	Bump, Samantha (DNR)
To:	Benjamin Hengel
Cc:	Mielke, Sara (DNR); Thibodeaux, Jaime (DNR); Westmark, Amy (DNR); Skancke, Jennie (DNR); Marty, Becky (DNR); Klamm, Stephanie (DNR)
Subject:	RE: NHIS Data Concurrence - Nelson"s Slough
Date:	Wednesday, August 18, 2021 5:11:10 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png Location Map.pdf MN NHIS Map.pdf image008.png

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Hi Benjamin,
I have reviewed the below assessment for the potential of the Nelson's Slough project to impact rare features and have the following additional comments:

Ecologically Significant Areas

- The Minnesota Biological Survey (MBS) has identified multiple Sites of Biodiversity Significance within the project area. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Factors taken into account during the ranking process include the number of rare species documented within the site, the quality of the native plant communities in the site, the size of the site, and the context of the site within the landscape. These Sites contain several high-quality native plant communities.

  There is also an area ranked as Below within the project area that the Minnesota Biological Survey considered for Sites of Biodiversity Significance, but were determined to be below the minimum biodiversity threshold for statewide significance. These areas, however, have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat.

  We encourage you to consider project alternatives that would minimize disturbance to these ecologically significant areas. Actions to minimize disturbance may include, but are not limited to, the following recommendations:
    - Minimize vehicular disturbance in the area (allow only vehicles/equipment necessary for construction activities);
    - Do not park equipment or stockpile supplies in these sensitive areas;
    - Do not place spoil within these sensitive areas;
    - Use effective erosion prevention and sediment control measures;
    - Inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of invasive species;
    - As much as possible, operate within already-disturbed areas;

- Revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible; and
- Use only weed-free mulches, topsoils, and seed mixes. Of particular concern are birdsfoot trefoil (Lotus corniculatus) and crown vetch (Coronilla varia), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas.

GIS shapefiles of MBS Sites of Biodiversity Significance and DNR Native Plant Communities can be downloaded from the MN Geospatial Commons. Please contact me if you do not have access to the appropriate mapping services.

- If the Wetland Conservation Act (WCA) is applicable to this project, please note that wetlands within Outstanding MBS Sites of Biodiversity Significance or particular native plant communities may qualify as "rare natural communities" under this Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community.

- The proposed project is within an area identified as Prairie Core in the Minnesota Prairie Conservation Plan, a twenty-five year strategy for accelerating prairie conservation in the state. To meet the Plan's goals, areas within Prairie Core Areas will need to include restoration. As such, any efforts toward prairie or grassland restoration after project construction are encouraged.

State-listed Species

- Trumpeter Swans (*Cygnus buccinator*), a state-listed species of special concern, have been documented within Nelson's Slough. During the breeding season, trumpeter swans select small ponds and lakes with extensive beds of cattails, bulrush, sedges, and/or horsetail. Ideal habitat includes about 100 m of open water for take-off, stable levels of unpolluted water, emergent vegetation, low levels of human disturbance, and the presence of muskrat (*Ondatra zibethicus*) houses and American beaver (*Castor canadensis*) lodges for use as nesting platforms. Construction activities that occur during the nesting season, late April through early June, could disrupt nesting swans and should be avoided if possible. Water levels should reach their highest level by early April in potential nesting areas to avoid flooding nests. Please contact the DNR Regional Nongame Specialist, Amy Westmark, with questions regarding this species.

- Franklin's Gull (*Leucophaeus pipixcan*), a state-listed species of special concern, has been documented within Nelson's Slough. These species nest in large prairie marshes in colonies. Water level fluctuations, human disturbances, and disease has impacted this species population. There is not a known nesting colony for this species at this

location.

- American White Pelican (*Pelecanus erythrorhynchos*), a state-listed species of special concern, has been documented within Nelson's Slough. These species typically nest in colonies on bare islands, isolated from predators and humans. There is not a known nesting colony for this species at this location.

- The Yellow Rail (*Coturnicops noveboracensi*), a state-listed bird species of special concern, has been documented in the vicinity of Nelson Slough. They are dependent on wetland systems and are extremely vulnerable to changes in hydrology; even a slight change of one inch in water depth can cause yellow rails to abandon the area. Yellow rails start nesting in late May and the young typically fledge by the end of June. If possible, avoid changing water levels from early May through mid-July to minimize impacts to this nesting bird species.

Please contact the DNR Regional Nongame Specialist, Amy Westmark (amy.westmark@state.mn.us) with any questions on these bird species. Also, if any active nests are discovered or any birds are showing distress due to construction activities, contact her as soon as possible.

- McCalla's willow (*Salix maccalliana*), a state-listed species of special concern, has been documented in nearby wetlands. This willow species is a small shrub found in high-quality shrubby wetlands in the northwestern area of the state. This species has the potential to be found in the direct vicinity of the proposed project and, if present, could be impacted. If desirable, surveys could be completed to better understand impacts to this and other potentially present state-listed species.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details

change or construction has not occurred within one year as additional review may be required.
The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. Please let me know if you have any questions.

Have a great day,

Samantha Bump
NHIS Review Specialist | Ecological & Water Resources
Minnesota Department of Natural Resources
Samantha.Bump@state.mn.us

DEPARTMENT OF NATURAL RESOURCES

From: Benjamin Hengel <bhengel@houstoneng.com>
Sent: Friday, July 23, 2021 1:18 PM
To: Bump, Samantha (DNR) <samantha.bump@state.mn.us>
Cc: Mielke, Sara (DNR) <sara.mielke@state.mn.us>
Subject: RE: NHIS Data Concurrence

Hi Samantha,

Here is your requested information. The data identified in the provided map include the most recent data obtained from the NHIS.

Location
Townships: Lincoln and East Park Township
PLS: Sections 21, 22, 23, 27 & 28, Township 158N, Range 44W
County: Marshall County, Minnesota

Description
The Middle-Snake-Tamarac Rivers Watershed District in an effort to improve flood protection proposes the Nelson Slough Improvement Project that includes stabilizing several miles of Judicial Ditch 19 (JD 19) and improvements to Nelson Slough structures. The improvements to Nelson Slough include replacement of the outlet structure and increase the existing embankment freeboard, which

currently does not meet standards of today's practice. Channel stabilization to JD 19 will include stabilizing the channel with the installation of rock drop structures and flattening side slopes in strategic locations for improved slope stability. The current outlet structure at Nelson Slough will be 50 years old in September 2021 and is in need of rehabilitation. JD 19 was constructed in the early 1900's and immediately upstream and downstream from the Nelson Slough site has severe channel erosion, causing slope stability issues and sediment transfer downstream. Upon completion, the proposed project will provide a reduction in flood damage to adjacent agricultural lands and to public transportation infrastructure within the JD 19 sub watershed, downstream Tamarac River and Red River of the North. The proposed project will also positively impact the overall wildlife habitat at Nelson Slough by providing a more stable impoundment water level.

The proposed Nelson Slough Improvement Project which is located in a landscape predominately made up of freshwater emergent, freshwater pond, freshwater scrub-shrub, and freshwater forested wetlands. Nelson Slough is also within the East Park Wildlife Management Area and is identified by the DNR as a Public Water (East Park WMA; ID: 45001100). Nelson Slough was created through construction of levees and an outlet structure that allows water to flow through the Judicial Ditch 19 system. The habitats that will be impacted from the improvements to these levees include forested, shrub, and emergent wetland habitats as well as some upland hardwood forests and upland grasslands. The impacts will occur along the outer edges of the levees and not within Nelson Slough. Replacement of the current outlet structure will result in a temporary drawdown of Nelson Slough. All construction on JD 19 will occur within the banks of the ditch system and no habitats outside of the banks will be impacted.

Avoidance and Minimization

The preliminary design phase of the project was utilized to maximize the reduction in adverse effects to the MBS native plant communities, rare features, sensitive resources, and species identified as threatened, endangered, or of special concern. Prior to construction, the project proposer will coordinate with the MN DNR and USFWS to ensure that no threatened or endangered species are present within the construction zone. If a protected species is observed during construction, all activities will pause and coordination with federal and state agencies will occur prior to continuing construction activities. All impacts within public waters will be mitigated through a Minnesota Public Works Permit and purchasing wetland credits required within the permit conditions. All wetland impacts outside the public waters jurisdiction will be mitigated through a Wetland Conservation Act (WCA) Permit and purchasing wetland credits required within the permit conditions. A permit application will be submitted to the USACE and mitigation will be based on the agencies "jurisdictional determination".

The adverse effects to the native aquatic resources will be the results of fluctuating water levels and construction of the outlet structure. During construction, best management practices will be utilized to prevent surface water contamination, sedimentation, stormwater runoff, soil contamination, and spread of invasive species. Construction of the outlet structure will require the impoundment to be drawn down or the outlet area will need to be dammed in order to access the soil bed. A drawdown period will temporarily displace wildlife utilizing the impoundment and potentially kill aquatic species during construction. Drawdowns also improve water quality, improve aquatic vegetation diversity, kill undesirable fish, and increase invertebrate abundance. The adverse effect to the native plant

communities and habitats along the Nelson Slough embankments will be mitigated through reseeding utilizing a Minnesota BWSR northwest native seed mix. Reseeding will be done where applicable. For sites that cannot be reseeded the watershed district will work with the DNR to develop a vegetative management plan. During and after construction, erosion control devices will be utilized to reduce soil erosion and sedimentation. All erosion control devices will be environmentally friendly to reduce impacts to wildlife.

Best management practices (BMPs) for erosion and sedimentation control during construction will include, but are not limited to, sediment control logs, erosion control blankets, rock check dams, sediment basins, and silt fences. Erosion and sedimentation controls will be used to avoid impacts to adjacent land, wetlands, JD 19 and Tamarac River downstream, and sensitive habitat areas. Construction is also being proposed in phases to minimize erosion and sediment transfer caused from construction activity. The construction of the outlet structure and the levee work is being proposed as the first phase with BMP's mentioned above in place to control erosion. Phase two would include the construction work proposed for the inlet and outlet stabilization. With the levee and outlet structure work completed, the gates can be closed creating a large sediment basin for the inlet stabilization and also cutting off any upstream flows impacting the downstream grade stabilization. Rock check dams would also be proposed at the downstream side of the outlet grade stabilization work to minimize sediment transfer downstream.

Let me know if there is anything else you need.

Thanks,

Benjamin Hengel
Scientist II
Houston Engineering, Inc.
O 701.237.5065 | D 701.499.9468 | C 701.353.9372

From: Bump, Samantha (DNR) <samantha.bump@state.mn.us>
Sent: Wednesday, July 21, 2021 4:56 PM
To: Benjamin Hengel <bhengel@houstoneng.com>
Cc: Mielke, Sara (DNR) <sara.mielke@state.mn.us>
Subject: RE: NHIS Data Concurrence

[External Email]

Hi Benjamin,
I need additional information from you to consider your concurrence request complete.

- The location of your project - TRS
- Description of the project including existing land use/cover/habitat that will be impacted (wetlands, streams, crops, prairie, groundwater, etc.)
- Accurate description of how impacts to rare resources will be avoided and/or minimized (including state-listed species, calc fens, native plant communities, MBS Sites, etc.).

Also, make sure you are using the data from your license agreement LA-1049 that was provided in March to access the most updated data. If this assessment is not feasible to complete accurately, please feel free to submit the attached form to me and I will complete the assessment for you. Let me know if you have any questions.

Thank you,

Samantha Bump
NHIS Review Specialist | Ecological & Water Resources
Minnesota Department of Natural Resources
Samantha.Bump@state.mn.us

From: Benjamin Hengel <bhengel@houstoneng.com>
Sent: Monday, July 12, 2021 3:28 PM
To: MN_NHIS, Review (DNR) <Review.NHIS@state.mn.us>; Bump, Samantha (DNR) <samantha.bump@state.mn.us>
Subject: NHIS Data Concurrence

Good Afternoon,

On behalf of the Middle-Snake-Tamarac Rivers Watershed District, Houston Engineering, Inc. (HEI) is preparing an Environmental Assessment Worksheet (EAW) for a 2,594.66-acre project corridor. The purpose of this correspondence is to request concurrence with the NHIS data presented in this EAW. Houston Engineering purchased an agreement that allows access to NHIS shapefiles. Attached to this email is a map that shows the current 2021 NHIS Features and the project corridor. The map shows the locations of the NHIS features and WILL NOT be included in the EAW document. The description of the features within the Document are copied below:

"The MN DNR, Natural Heritage Information System (NHIS) (LA-944) was consulted to identify the presence of rare features in relation to the project corridor. A review of the NHIS data identified one rare feature within the project corridor. This rare feature is the beach heather (Hudsonia tomentosa), a vascular plant observed during a survey in August of 1947. The beach heather is predominately found on active sand dunes, but some are found on sandy beaches of large lakes beyond the reach of the lake's waves. The species populations are trending downward as a result of development, agriculture, and spread of invasive species.

There are also five rare features located within a one-mile radius of the project corridor. These rare

features include:

- *Northern Barrens Tiger Beetle (Cicindela patruela) – observed in 1973-09-03.*
- *Least Darter (Etheostoma microperca) – observed in 2001-08-23.*
- *Red-shouldered Hawk (Buteo lineatus) – 3 sites – observed in 1991-06-23, 1992-04-24, and 1992-04-29."*

Please review the attached and provide a letter of concurrence.

Thanks,

Benjamin Hengel
Scientist II
Houston Engineering, Inc.
O 701.237.5065 | **D** 701.499.9468 | **C** 701.353.9372

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