GRADING

IM-NHS-080-5(242)182--03-79

POWESHIEK Co.

LETTING DATE 01/22/2020

INDEX OF SHEETS

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

POWESHIEK COUNTY

GRADING

1.1 Miles West of IA 146
to 1.1 Miles East of IA 146

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

REVISIONS

TOTAL 213
PROJECT IDENTIFICATION NUMBER
04-79-080-010
PROJECT NUMBER
IM-NHS-080-5(242)182--03-79
R.O.W. PROJECT NUMBER
IMN-080-5(243)182--0E-79

For Project Location Map refer to Sheet A.2

146
DESIGN DATA RURAL

2014	AADT	9,590	V.P.D.
2045	AADT	14,600	V.P.D.
2045	DHV	1,730	V.P.H.
TRUCKS		10	%
Total Design ESALs		--	

I-80
DESIGN DATA RURAL

2014	AADT	27,800	V.P.D.
2045	AADT	55,200	V.P.D.
2045	DHV	4,100	V.P.H.
TRUCKS		37	%
Total Design ESALs		--	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	Nathan Carhoff	Primary Signature Block
CS.1	Matthew Cushman	Geotechnical
M.1	William Weber	Utilities

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER
NATHAN E. CARHOFF
19699
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature — XX-XX-XXXX Date

Nathan E. Carhoff, P.E.
Printed or Typed Name

My license renewal date is December 31, 2019

DMS PLANS

Pages or sheets covered by this seal: All Except CS, M and Q Sheets

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER A.1

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R-16W

R-15W

T-80N

T-79N

GRINNELL

MALCOM

GRANT

MALCOM

PLEASANT

WASHINGTON

POP. 9218

POP. 2874

GRINNELL REGIONAL AIRPORT

IOWA INTERSTATE R.R. LTD.

OAK GROVE

EWART

Little Bear Creek

DIAGONAL RD

North Fork English River

STA. 48+20.78
BEGIN PROJECT

STA. 165+84.36
END PROJECT

LOCATION MAP NOT TO SCALE

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER A.2

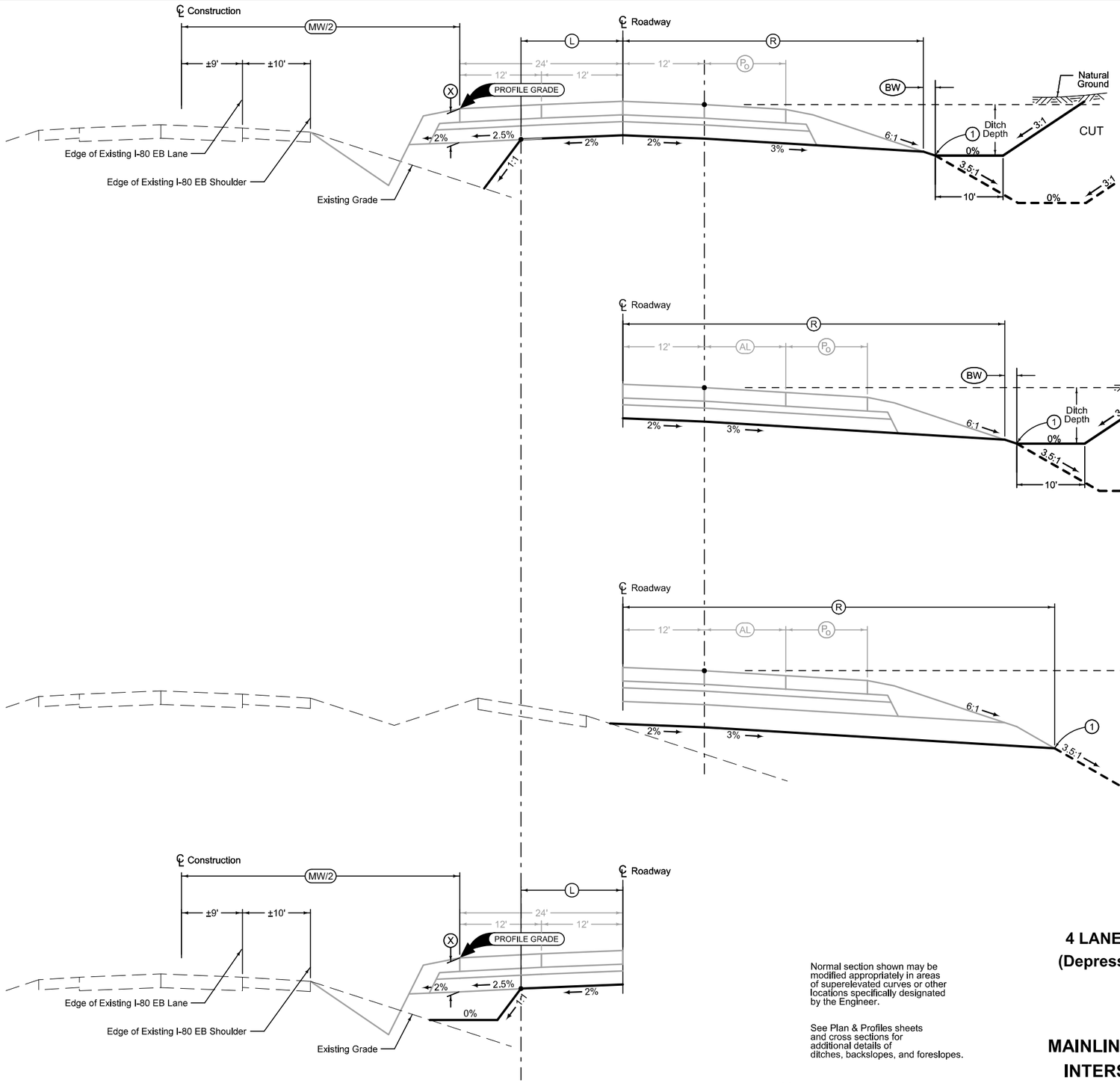
3:28:36 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_A01.dgn

LOCATION			DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet
INTERSTATE 80 EB	55+00.00	59+00.00	15	36.7	30	0	82
INTERSTATE 80 EB	59+00.00	60+00.00	15	36.7-44.2	30	0-1.8	82
INTERSTATE 80 EB	60+00.00	79+04.88	15	44.2	30	1.8	82
INTERSTATE 80 EB	98+00.00	105+75.31	15	44.2	30	1.8	82
INTERSTATE 80 EB	109+68.24	115+00.00	15	44.2	30	1.8	82
INTERSTATE 80 EB	150+00.00	155+00.00	15	44.2	30	1.8	82
INTERSTATE 80 EB	155+00.00	156+00.00	15	44.2-36.7	30	1.8-0	82
INTERSTATE 80 EB	156+00.00	159+50.00	15	36.7	30	0	82

LOCATION			DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet
INTERSTATE 80 EB	79+04.88	80+55.00	15	44.2-49.8	30	1.8-4.2	82
INTERSTATE 80 EB	80+55.00	90+55.00	15	49.8	30	4.2	82
INTERSTATE 80 EB	90+55.00	93+00.00	15	49.8-66.2	30	4.2	82
INTERSTATE 80 EB	93+00.00	94+75.00	15-0	66.2-77.9	30	4.2	82
INTERSTATE 80 EB	126+00.90	132.50.00	15	49.8	30	4.2	82
INTERSTATE 80 EB	132+50.00	138+50.00	15	49.8-44.2	30	4.2-1.8	82

LOCATION			DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet
INTERSTATE 80 EB	119+39.85	122+58.89	–	95 - 75	96	--	82

FILE NO.	LOCATION ENGLISH	DESIGN TEAM	DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet
INTERSTATE 80 EB	138+00.00	150+00.00	15	44.2	30	1.8	82



G_6_Grade_Depressed
Modified

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profiles sheets and cross sections for additional details of ditches, backslopes, and foreslopes.

(1) Refer to project plan and cross sections for specific location of foreslope change.

4 LANE GRADING
(Depressed Median)

MAINLINE GRADING
INTERSTATE 80

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER B.1

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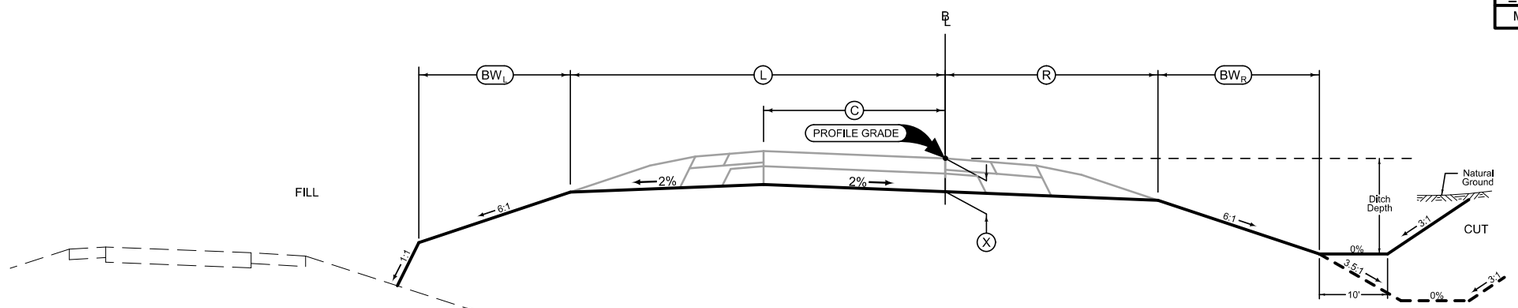
LOCATION				DIMENSIONS					
INTERCHANGE	RAMP	STATION TO STATION		(L) Feet	(R) Feet	(C) Feet	(X) Inches	(BW_L) Feet	(BW_R) Feet
IA HWY. 146	A	1513+00.00	1514+00.00	24 - 33.8	19.5	16	22	0	10.5
IA HWY. 146	A	1514+00.00	1517+00.00	33.8	19.5	16	22	0	10.5
IA HWY. 146	A	1517+00.00	1518+50.00	33.8 - 16	19.5	16	22	0	10.5
IA HWY. 146	A	1518+50.00	1519+00.00	16	19.5 - 30	16	22 - 40	0	10.5 - 0
IA HWY. 146	B	2594+75.00	2595+50.00	33.8	19.5	16	22	12.2 - 0	10.5
IA HWY. 146	B	2595+50.00	2596+50.00	33.8 - 16	19.5	16	22	0	10.5
IA HWY. 146	B	2596+50.00	2599+00.00	16 - 0	19.5	16 - 0	22	0	10.5
IA HWY. 146	B	2599+00.00	2602+50.00	0	19.5	0	22	0	10.5 - 0
IA HWY. 146	D	4509+46.66	4510+31.00	0	19.5	0	22	0	10.5
IA HWY. 146	D	4510+31.00	4511+00.00	0	19.5 - 30	0	22 - 40	0	10.5 - 0

G_1R_Grade
Modified



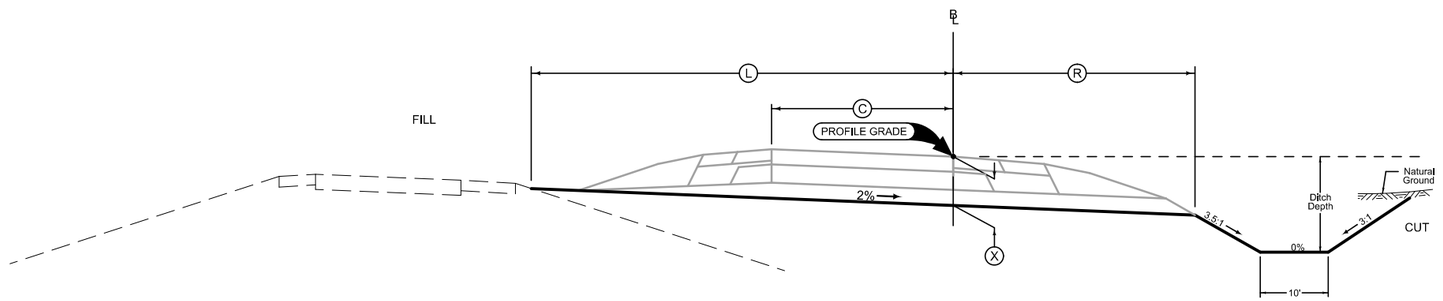
Section view is in direction of traffic.

Normal sections shown may be appropriately modified for areas specifically designated by the Engineer such as intersections or superelevated curves.

RAMP GRADING
IOWA 146 INTERCHANGE

LOCATION				DIMENSIONS			
INTERCHANGE	RAMP	STATION TO STATION		(L) Feet	(R) Feet	(C) Feet	(X) Inches
IA HWY. 146	A	1519+00.00	1519+50.00	16 - 12.5	30 - 32.4	16 - 12.5	40 - 48
IA HWY. 146	A	1519+50.00	1522+25.00	12.5 - 0	32.4	12.5 - 0	48
IA HWY. 146	D	4511+00.00	4514+50.00	0	30 - 46.8	0	40 - 96
IA HWY. 146	D	4514+50.00	4519+41.08	0 - 31.4	46.8	0 - 16	96

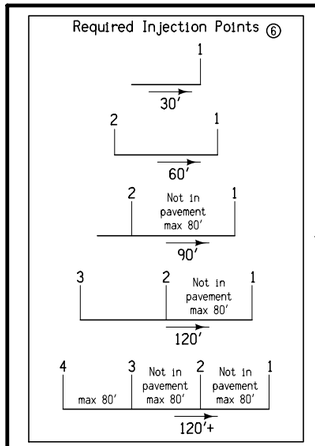
G_1R_Grade
Modified

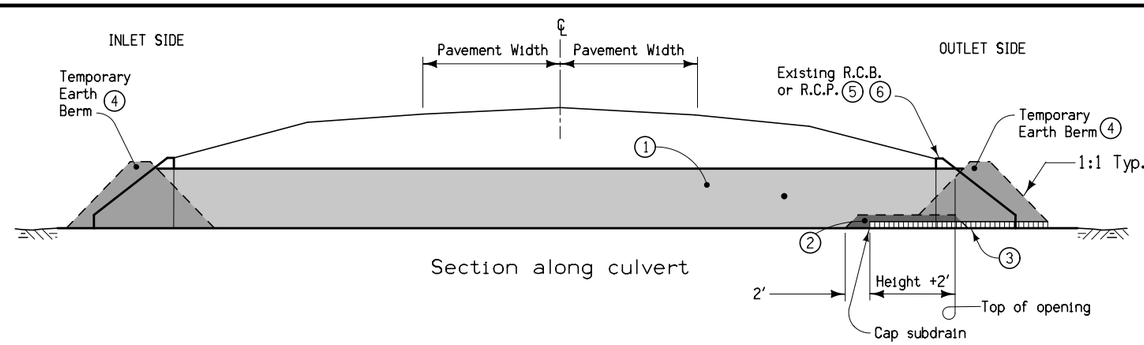


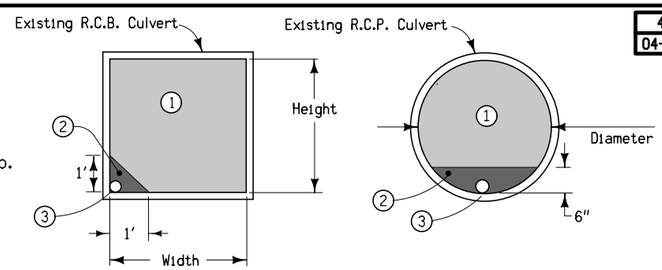
Section view is in direction of traffic.

Normal sections shown may be appropriately modified for areas specifically designated by the Engineer such as intersections or superelevated curves.

RAMP GRADING
IOWA 146 INTERCHANGE







4315
04-15-08

① Flowable Mortar.
② Granular Backfill.
③ 4" subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2'. Subdrain and granular backfill are incidental to flowable mortar.
④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
⑤ Removal of headwalls may be required.
⑥ Outlet shall be filled first. See injection point detail for additional information.

DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8' in either height or width. Circular structures less than 10' Dia.)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER B.2

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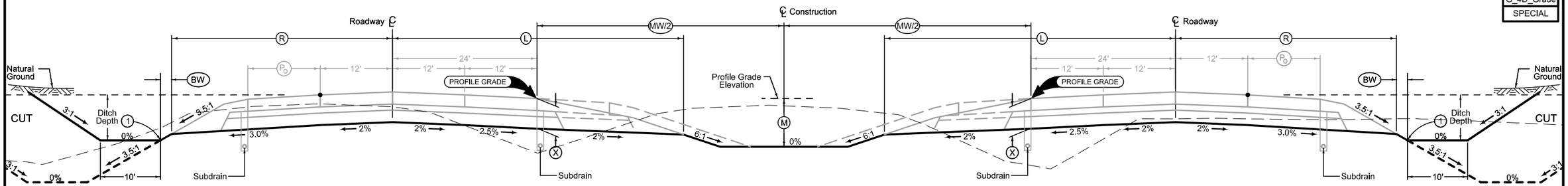
G_4D_Grade
SPECIAL



Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profiles sheets and cross sections for additional details of ditches and backslopes.

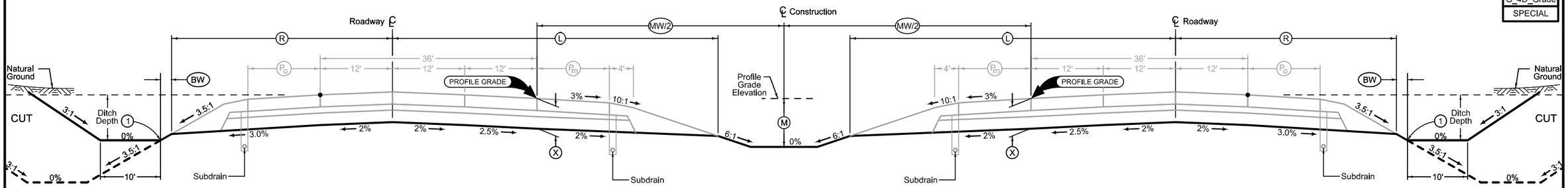
(1) Refer to project plan and cross sections for specific location of foreslope change.

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet	(M) Feet
INTERSTATE 80	55+00.00	159+50.00	30.0	44.2	30	1.8	82	4

For Information Only

TYPICAL CROSS SECTION
4 LANE GRADING
FINAL BUILD
IM-NHS-080-5(359)182--03-79

G_4D_Grade
SPECIAL



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See Plan & Profiles sheets and cross sections for additional details of ditches and backslopes.

(1) Refer to project plan and cross sections for specific location of foreslope change.

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet	(MW) Feet	(M) Feet
INTERSTATE 80	55+00.00	159+50.00	30.0	44.2	30	1.8	82	4

For Information Only

FUTURE:
TYPICAL CROSS SECTION
6 LANE GRADING
FINAL BUILD

ESTIMATED PROJECT QUANTITIES
(UP TO A 5 DIVISION PROJECT)

Division 1: IOWA DOT FUNDED ITEMS
Division 2: CITY OF GRINNELL FUNDED ITEMS

Item No.	Item Code	Item	Unit	Quantities										
				Estimated						As Built				
				Division 1	Division 2	Division 3	Division 4	Division 5	Total	Division 1	Division 2	Division 3	Division 4	Division 5
1	2101-0850001	CLEARING AND GRUBBING	ACRE	6.1					6.1					
2	2102-0425071	SPECIAL BACKFILL	CY	35668.3					35668.3					
3	2102-2625001	EMBANKMENT-IN-PLACE, CONTRACTOR FUNISHED	CY	273150					273150					
4	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	110374					110374					
5	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	50					50					
6	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	26921					26921					
7	2105-8425020	TOPSOIL, STRIP AND STOCKPILE	CY	3495					3495					
8	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	110374					110374					
9	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS		1				1					
10	2402-0425040	FLOODED BACKFILL	CY	1468.7					1468.7					
11	2416-0100015	APRONS, CONCRETE, 15 IN. DIA.	EACH	1					1					
12	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.	EACH	12					12					
13	2416-0100036	APRONS, CONCRETE, 36 IN. DIA.	EACH	4					4					
14	2416-0100054	APRONS, CONCRETE, 54 IN. DIA.	EACH	6					6					
15	2416-0100060	APRONS, CONCRETE, 60 IN. DIA.	EACH	6					6					
16	2416-0100072	APRONS, CONCRETE, 72 IN. DIA.	EACH	2					2					
17	2416-1000000	RIGID PIPE CULVERT, CONCRETE ROADWAY PIPE, 15 IN. DIA.	LF	128					128					
18	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	680					680					
19	2416-1180036	CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.	LF	270					270					
20	2416-1180054	CULVERT, CONCRETE ROADWAY PIPE, 54 IN. DIA.	LF	328					328					
21	2416-1180060	CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.	LF	278					278					
22	2416-1180072	CULVERT, CONCRETE ROADWAY PIPE, 72 IN. DIA.	LF	100					100					
23	2416-1262036	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 36 IN. DIA.	LF	384					384					
24	2416-1262054	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA.	LF	456					456					
25	2416-1262060	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 60 IN. DIA.	LF	612					612					
26	2416-1262072	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 72 IN. DIA.	LF	184					184					
27	2435-0130148	MANHOLE, SANITARY SEWER, SW-301, 48 IN.	EACH		5				5					
28	2435-0251218	INTAKE, SW-512, 18 IN.	EACH	1					1					
29	2435-0400000	EXTERNAL DROP CONNECTION, SW-307	EACH		1				1					
30	2503-0114212	STORM SEWER GRAVITY MAIN, TRENCHED, RCP, 2000D (CLASS III), 12 IN.	LF	108					108					
31	2504-0134015	SANITARY SEWER GRAVITY MAIN WITH CASING PIPE, TRENCHED, PVC, 15 IN.	LF		570				570					
32	2504-0144015	SANITARY SEWER GRAVITY MAIN WITH CASING PIPE, TRENCHLESS, PVC, 15 IN.	LF		470				470					
33	2504-0240036	REMOVE SANITARY SEWER PIPE LESS THAN OR EQUAL TO 36 IN.	LF		105				105					
34	2504-0240235	SANITARY SEWER ABANDONMENT, PLUG	EACH		2				2					
35	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	181.4					181.4					
36	2506-4984000	FLOWABLE MORTAR	CY	609.5					609.5					
37	2507-3250005	ENGINEERING FABRIC	SY	992.2					992.2					
38	2507-6800061	REVETMENT, CLASS E	TON	609.5					609.5					
39	2510-6745850	REMOVAL OF PAVEMENT	SY	342.5					342.5					
40	2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES	EACH		3				3					
41	2511-0300000	REMOVAL OF RECREATIONAL TRAIL	SY	426.3					426.3					
42	2518-6910000	SAFETY CLOSURE	EACH	7					7					
43	2519-1002072	FENCE, CHAIN LINK, 72 IN. HEIGHT	LF	385					385					
44	2519-3280000	FENCE, FIELD	LF	10746					10746					
45	2519-3300400	FIELD FENCE BRACE PANELS	EACH	183					183					
46	2519-4200120	REMOVAL OF FENCE, CHAIN LINK	LF	417.5					417.5					
47	2520-3350010	FIELD LABORATORY	EACH	1					1					
48	2526-8285000	CONSTRUCTION SURVEY	LS	1					1					
49	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OF SOLVENT-BASED	STA	5.7					5.7					
50	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	3.8					3.8					
51	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	887.5					887.5					
52	2528-8445110	TRAFFIC CONTROL	LS	1					1					
53	2533-4980005	MOBILIZATION	LS	1					1					
54	2551-0000110	TEMP CRASH CUSHION	EACH	4					4					
55	2554-0114012	WATER MAIN, TRENCHED, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.	LF	437					437					
56	2554-0134012	WATER MAIN WITH CASING PIPE, TRENCHED, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.	LF	40					40					
57	2554-0144012	WATER MAIN WITH CASING PIPE, TRENCHLESS, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.	LF	355					355					
58	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 11.25 DEGREE BEND, 12 IN.	EACH	2					2					
59	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 45 DEGREE BEND, 12 IN.	EACH	2					2					
60	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 90 DEGREE BEND, 12 IN.	EACH	2					2					
61	2554-0207012	VALVE, GATE, DIP, 12 IN.	EACH	1					1					
62	2554-0208012	TAPPING VALVE ASSEMBLY, 12 IN.	EACH	1					1					
63	2554-0211012	FLUSHING DEVICE (BLOWOFF), 12 IN.	EACH	1					1					
64	2599-9999005	CONNECTION TO EXISTING WATER MAIN	EACH	2					2					
65	2599-9999005	UNDERGROUND AIR VALVE SYSTEM	EACH	1					1					
66	2599-9999009	STEEL PIPE, 42 IN. DIA.	LF	90					90					
67	2599-9999009	STEEL PIPE, TRENCHLESS, 42 IN. DIA.	LF	60					60					
68	2601-2634100	MULCHING	ACRE	16.3					16.3					
69	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	16.3					16.3					
70	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT	SQ	95					95					
71	2602-0000020	SILT FENCE	LF	14207					14207					
72	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	10760					10760					
73	2602-0000050	SILT BASINS	EACH	32					32					
74	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	12034					12034					
75	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	2408					2408					
76	2602-0000130	TEMPORARY SEDIMENT CONTROL BASIN	EACH	3					3					
77	2602-0000135	REMOVAL OF TEMPORARY SEDIMENT CONTROL BASIN	EACH	9					9					
78	2602-0000140	MAINTENANCE OF TEMPORARY SEDIMENT CONTROL BASIN	EACH	3					3					
79	2602-0000160	ROCK CHECK DAM	LF	522					522					
80	2602-0000170	MAINTENANCE OF ROCK CHECK DAM	EACH	19					19					

100-1C
04-17-12

ESTIMATED PROJECT QUANTITIES
(UP TO A 5 DIVISION PROJECT)

Division 1: IOWA DOT FUNDED ITEMS
Division 2: CITY OF GRINNELL FUNDED ITEMS

Item No.	Item Code	Item	Unit	Quantities										
				Estimated						As Built				
				Division 1	Division 2	Division 3	Division 4	Division 5	Total	Division 1	Division 2	Division 3	Division 4	Division 5
81	2602-0000180	REMOVAL OF ROCK CHECK DAM	EACH	19					19					
82	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	857					857					
83	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	857					857					
84	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1					1					
85	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1					1					

100-1D
10-18-05

PROJECT DESCRIPTION

IM-NHS-080-5(242)182--03-79:
This project includes eastbound grading for the median widening and interchange reconstruction at Highway 146, including berms for the eastbound bridges over IA 146 and the Union Pacific Railroad.

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	**2101-0850001**	**CLEARING AND GRUBBING**
		Refer to Tab. 110-17 for details. Refer to Tab. 100-8.
-	-	-
2	**2102-0425071**	**SPECIAL BACKFILL**
		Refer to typicals on B Sheets, Tab 103-3, and cross sections for details. Overhaul will not be measured or paid for seperately, but shall be considered incidental to this item.
-	-	-
3	**2102-2625001**	**EMBANKMENT-IN-PLACE, CONTRACTOR FUNISHED**
		Refer to Tab. 108-30 and T Sheets for details.
-	-	-
4	**2102-2710070**	**EXCAVATION, CLASS 10, ROADWAY AND BORROW**
		Refer to T sheets and K Sheets for details. Dispose Class 10 waste material off-site. Overhaul will not be measured or paid for, but shall be considered incidental to roadway excavation on this project.
-	-	-
5	**2102-2712015**	**EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS**
		Refer to CS Sheets and Q Sheets. Overhaul will not be measured or paid for, but shall be considered incidental to roadway excavation on this project.
-	-	-
6	**2105-8425015**	**TOPSOIL, STRIP, SALVAGE AND SPREAD**
		Refer to T Sheets for details. Strip 8" and place 4" of topsoil on both mainline and sideroad. Topsoil is not to be placed on the median side.
-	-	-
7	**2105-8425020**	**TOPSOIL, STRIP AND STOCKPILE**
		Refer to T Sheets for details. Sufficient field measurements will be taken to assure reasonable conformity with the required depth of cut. The Contractor shall strip all required topsoil, stockpile topsoil at the location shown on RR.6, and follow applicable provisions for stripping and stockpiling of the topsoil in Section 2105 of the current specifications.
-	-	-
8	**2107-0875100**	**COMPACTION WITH MOISTURE CONTROL**
		Refer to T Sheets for details. Cubic yards shown on the contract documents as determined by the template fill volume. Shrinkage is not included in the moisture control quantity.
-	-	-
9	**2401-6745650**	**REMOVAL OF EXISTING STRUCTURES**
		Measurement and payment will be at the contract unit price for each underground air valve system (air release manhole) removed and includes all labor, equipment, and materials to remove ARI D-090-P air valve unit including excavation and backfill and any miscellaneous work including cleanup. Includes plugging 2 inch service line by folding over to crimp line. Underground air valve unit removed to remain property of the city. Notify city of removal for city personnel to pick up from within the project limits. Refer to M Sheets.
-	-	-
10	2402-0425040	FLOODED BACKFILL
11	2416-0100015	APRONS, CONCRETE, 15 IN. DIA.
12	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.
13	2416-0100036	APRONS, CONCRETE, 36 IN. DIA.
14	2416-0100054	APRONS, CONCRETE, 54 IN. DIA.
15	2416-0100060	APRONS, CONCRETE, 60 IN. DIA.
16	2416-0100072	APRONS, CONCRETE, 72 IN. DIA.
17	2416-1000000	RIGID PIPE CULVERT, CONCRETE ROADWAY PIPE, 15 IN. DIA.
18	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.
19	2416-1180036	CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.
20	2416-1180054	CULVERT, CONCRETE ROADWAY PIPE, 54 IN. DIA.
21	2416-1180060	CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.
22	2416-1180072	CULVERT, CONCRETE ROADWAY PIPE, 72 IN. DIA.
23	2416-1262036	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 36 IN. DIA.
24	2416-1262054	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA.
25	2416-1262060	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 60 IN. DIA.
26	2416-1262072	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 72 IN. DIA.

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ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
10	**2402-0425040**	**FLOODED BACKFILL**
11	**2416-0100015**	**APRONS, CONCRETE, 15 IN. DIA.**
12	**2416-0100024**	**APRONS, CONCRETE, 24 IN. DIA.**
13	**2416-0100036**	**APRONS, CONCRETE, 36 IN. DIA.**
14	**2416-0100054**	**APRONS, CONCRETE, 54 IN. DIA.**
15	**2416-0100060**	**APRONS, CONCRETE, 60 IN. DIA.**
16	**2416-0100072**	**APRONS, CONCRETE, 72 IN. DIA.**
17	**2416-1000000**	**RIGID PIPE CULVERT, CONCRETE ROADWAY PIPE, 15 IN. DIA.**
18	**2416-1180024**	**CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.**
19	**2416-1180036**	**CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.**
20	**2416-1180054**	**CULVERT, CONCRETE ROADWAY PIPE, 54 IN. DIA.**
21	**2416-1180060**	**CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.**
22	**2416-1180072**	**CULVERT, CONCRETE ROADWAY PIPE, 72 IN. DIA.**
23	**2416-1262036**	**CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 36 IN. DIA.**
24	**2416-1262054**	**CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA.**
25	**2416-1262060**	**CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 60 IN. DIA.**
26	**2416-1262072**	**CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 72 IN. DIA.**
		Refer to Tab. 104-3, D Sheets, and V Sheets for locations and details.
-	-	-
27	**2435-0130148**	**MANHOLE, SANITARY SEWER, SW-301, 48 IN.**
		Refer to tabulation on U sheets and M sheets for additional information. Includes all labor, equipment and materials required to connect existing sanitary sewer into new manholes. Includes handling and maintaining flow in existing sanitary sewer, including bypass pumping as required. Includes butyl sealant wrap on all exterior riser joints and external chimney seals on castings. Castings shall be two-piece type. Deeter castings not considered an approved equal.
-	-	-
28	**2435-0251218**	**INTAKE, SW-512, 18 IN.**
		Refer to Tab. 104-3, Tab. 104-5A, D Sheets, and V Sheets for locations and details.
-	-	-
29	**2435-0400000**	**EXTERNAL DROP CONNECTION, SW-307**
		Refer to tabulation on U sheets and M sheets for additional information. Includes 15 LF of ductile iron pipe sewer main as detailed in standard drawing.
-	-	-
30	**2503-0114212**	**STORM SEWER GRAVITY MAIN, TRENCHED, RCP, 2000D (CLASS III), 12 IN.**
		Refer to Tab. 104-3, Tab. 104-5A, D Sheets, and V Sheets for locations and details.
-	-	-
31	**2504-0134015**	**SANITARY SEWER GRAVITY MAIN WITH CASING PIPE, TRENCHED, PVC, 15 IN.**
		Refer to tabulations on U sheets and M sheets for additional information. ASTM F949 pipe not an acceptable pipe alternate.
-	-	-
32	**2504-0144015**	**SANITARY SEWER GRAVITY MAIN WITH CASING PIPE, TRENCHLESS, PVC, 15 IN.**
		Refer to tabulations on U sheets and M sheets for additional information. ASTM F949 pipe not an acceptable pipe alternate.
-	-	-
33	**2504-0240036**	**REMOVE SANITARY SEWER PIPE LESS THAN OR EQUAL TO 36 IN.**
		Refer to M sheets for locations and additional information.
-	-	-
34	**2504-0240235**	**SANITARY SEWER ABANDONMENT, PLUG**
		Refer to M sheets for locations and additional information. Includes plugging both casing pipe and carrier pipe where applicable.
-	-	-
35	**2505-4008120**	**REMOVAL OF STEEL BEAM GUARDRAIL**
		Refer to Tab. 110-7A.
-	-	-
36	**2506-4984000**	**FLOWABLE MORTAR**
		Refer to Tab. 110-9 and Typical 4315 on B Sheets. Silt inside existing culverts need not be removed prior to placing flowable mortar.
-	-	-
37	**2507-3250005**	**ENGINEERING FABRIC**
38	**2507-6800061**	**REVETMENT, CLASS E**
		Refer to Tab. 100-23 in RC Sheets for locations an details.
-	-	-
39	**2510-6745850**	**REMOVAL OF PAVEMENT**
		Refer to Tab. 110-1 and J Sheets for locations and details.
-	-	-
40	2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
40	2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES
		Refer to tabulation on U sheets and M sheets for additional information.
-	-	-
41	2511-0300000	REMOVAL OF RECREATIONAL TRAIL
		Refer to Tab. 110-5 and J Sheets for locations and details.
-	-	-
42	2518-6910000	SAFETY CLOSURE
		Refer to Tab. 108-13A.
-	-	-
43	2519-1002072	FENCE, CHAIN LINK, 72 IN. HEIGHT
44	2519-3280000	FENCE, FIELD
45	2519-3300400	FIELD FENCE BRACE PANELS
		Refer to Tab. 100-7 for details.
-	-	-
46	2519-4200120	REMOVAL OF FENCE, CHAIN LINK
		Refer to Tab. 100-8 for details.
-	-	-
47	2520-3350010	FIELD LABORATORY
		--
-	-	-
48	2526-8285000	CONSTRUCTION SURVEY
		In addition to other requirements of Section 2526 of the Standard Specifications, the Contractor shall include in their bid price the requirements of locating, monitoring, and reporting of the settlement plate data to the Engineer per Section 2106.03.E of the Standard Specifications and Chapter 6.43 of the Construction Manual.
-	-	-
49	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OF SOLVENT-BASED
50	2527-9263180	PAVEMENT MARKINGS REMOVED
		Refer to Tab. 108-22.
-	-	-
51	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE
		Refer to Tab. 108-33 and J Sheets for details.
-	-	-
52	2528-8445110	TRAFFIC CONTROL
		Refer to J Sheets.
-	-	-
53	2533-4980005	MOBILIZATION
		--
-	-	-
54	2551-0000110	TEMP CRASH CUSHION
		Refer to Tab. 108-30 for locations and details.
-	-	-
55	2554-0114012	WATER MAIN, TRENCHED, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.
		Refer to tabulation on U sheets and M sheets for additional information. Includes abandonment of existing water main as required for new construction. Caps and plugs used for abandonment of existing water main will not be measured and paid for and will be considered incidental to this bid item.
-	-	-
56	2554-0134012	WATER MAIN WITH CASING PIPE, TRENCHED, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.
57	2554-0144012	WATER MAIN WITH CASING PIPE, TRENCHLESS, POLYVINYL CHLORIDE PIPE (PVC), 12 IN.
		Refer to tabulation on U sheets and M sheets for additional information.
-	-	-
58	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 11.25 DEGREE BEND, 12 IN.
59	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 45 DEGREE BEND, 12 IN.
60	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON, 90 DEGREE BEND, 12 IN.
		Refer to tabulation on U sheets and M sheets for additional information. Retainer glands including restrained joint fittings will not be measured and paid for separately. Fittings used for temporary connections to remain property of the city after use. Notify city of removal for city personnel to pick up from within the project limits.
-	-	-
61	2554-0207012	VALVE, GATE, DIP, 12 IN.
		Refer to tabulation on U sheets and M sheets for location and additional information.
-	-	-
62	2554-0208012	TAPPING VALVE ASSEMBLY, 12 IN.
		Refer to tabulation on U sheets and M sheets for additional information. Item used for temporary connection of new water main during construction. Tapping valve assembly to remain property of the city. Notify city of removal for city personnel to pick up from within the project limits.
-	-	-
63	2554-0211012	FLUSHING DEVICE (BLOWOFF), 12 IN.
		Flushing device to remain property of the contractor.
-	-	-
64	2599-9999005	CONNECTION TO EXISTING WATER MAIN
		Refer to tabulation on U sheets and M sheets for additional information. Measurement and payment will be at the contract unit price for each connection to existing and includes all labor, equipment and materials including isolation and dewatering main and any repair/solid sleeve to make final connection.
-	-	-
65	2599-9999005	UNDERGROUND AIR VALVE SYSTEM
		Refer to tabulation on U sheets and M sheets for location and additional information. Measurement and payment will be at the contract unit price for each underground air valve system (air release manhole) installed and includes all labor, equipment and materials including 2 inch tap on water main, 2 inch water service line, excavation and backfill and miscellaneous associated work including cleanup. Air release valve system shall be ARI D-090-P 2 inch threaded connection with a 5 foot bury depth. Install service line tapped from the top of the water main with a 2 percent slope up to the air valve and to provide for adequate air release.
-	-	-
66	2599-9999009	STEEL PIPE, 42 IN. DIA.
67	2599-9999009	STEEL PIPE, TRENCHLESS, 42 IN. DIA.

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ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
66	2599-9999009	STEEL PIPE, 42 IN. DIA.
67	2599-9999009	STEEL PIPE, TRENCHLESS, 42 IN. DIA.
		Refer to Tab. 104-3, D Sheets, and V Sheets for locations and details.
-	-	-
68	2601-2634100	MULCHING
69	2601-2636043	SEEDING AND FERTILIZING (RURAL)
		Seeding, fertilizing, and mulching are intended for use on all final restoration areas within the project limits. Mulching is intended to be used for temporary seeding needed to comply with the NPDES Permit.
-	-	-
70	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT
		Refer to Tab. 100-22 in RC Sheets for locations and details.
-	-	-
71	2602-0000020	SILT FENCE
		Refer to Tab. 100-17 in RC Sheets and R Sheets for locations and details. The tabulation includes estimated locations for placement of silt fence to address possible erosion during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
-	-	-
72	2602-0000030	SILT FENCE FOR DITCH CHECKS
		Refer to Tab. 100-18 in RC Sheets and R Sheets for locations and details. The tabulation includes estimated locations for placement of silt fence For ditch checks to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and maintenance.
-	-	-
73	2602-0000050	SILT BASINS
		Refer to Tab. 100-14 in RC Sheets and R Sheets for locations and details. The tabulation includes estimated locations for placement of silt basins to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 100% additional quantity for field adjustments and maintenance.
-	-	-
74	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS
		This item is included for silt fence and silt fence for ditch check removal required for staging reasons, removal to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
-	-	-
75	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK
		This item is included for clean out and repair of the silt fence and silt fence for ditch checks during the grading project.
-	-	-
76	2602-0000130	TEMPORARY SEDIMENT CONTROL BASIN
77	2602-0000135	REMOVAL OF TEMPORARY SEDIMENT CONTROL BASIN
78	2602-0000140	MAINTENANCE OF TEMPORARY SEDIMENT CONTROL BASIN
		Refer to Tab. 100-33 in RC Sheets and R Sheets for locations and details.
-	-	-
79	2602-0000160	ROCK CHECK DAM
80	2602-0000170	MAINTENANCE OF ROCK CHECK DAM
81	2602-0000180	REMOVAL OF ROCK CHECK DAM
		Refer to Tab. 100-32 in RC Sheets and R Sheets for locations and details.
-	-	-
82	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.
		Refer to Tab. 100-19 in RC Sheets and R Sheets for locations and details.
-	-	-
83	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE
		Included for removal of perimeter and sediment control devices. All material shall become the property of the contractor and removed from the project within 24 hours.
-	-	-
84	2602-0010010	MOBILIZATIONS, EROSION CONTROL
		--
-	-	-
85	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL
		--
-	-	-

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STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-401	10-15-19	Temporary Barrier Rail (Precast Concrete)
BA-500	04-19-16	Temporary Crash Cushions Sand Barrel
DR-101	04-18-17	Pipe Culvert (Bedding and Backfill)
DR-102	04-21-15	Pipe Culvert (Cover and Camber)
DR-103	04-21-15	Pipe Culvert (Installation Details)
DR-104	04-19-16	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-121	10-17-17	Connected Pipe Joints
DR-122	10-18-16	Construction of Type "C" Concrete Adaptors for Pipe Culvert Connections
DR-141	04-18-17	Pipe Bends and Half Pipe
DR-142	04-21-15	Culvert Pipe Tee Sections
DR-201	10-16-18	Concrete Aprons
DR-303	10-17-17	Subdrains (Longitudinal)
DR-306	10-16-18	Precast Concrete Headwall for Subdrain Outlets
DR-601	04-18-17	Reinforced Concrete Pipe Culvert
DR-602	04-18-17	Reinforced Concrete Pipe Culvert with Tees
DR-611	04-18-17	Reinforced Concrete Pipe Culvert Letdown Structure
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EC-101	04-19-16	Wood Excelsior Mat for Ditch Protection
EC-103	04-21-15	Wood Excelsior Mat for Slope Protection
EC-201	10-15-19	Silt Fence
EC-204	04-18-17	Perimeter and Slope Sediment Control Devices
EC-301	10-18-16	Rock Erosion Control (REC)
EC-302	10-16-18	Rock Check Dam
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EC-502	04-21-15	Seeding in Rural Areas
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EW-204	10-17-17	Bridge Berm Grading with Recoverable Slope (Barnroof Section)
EW-212	10-20-15	Settlement Plate
EW-301	10-20-15	Guardrail Grading
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PV-304	04-17-12	Superelevation Details Six Lane Roadway Depressed Median
SI-881	04-16-19	Special Signs for Workzones
SW-301	04-17-18	Circular Sanitary Sewer Manhole
SW-306	04-21-15	Chimney Seals for Sanitary Sewer Manholes
SW-307	04-17-18	Drop Connection for Sanitary Sewer
SW-512	04-17-18	Circular Area Intake
SW-601	04-21-15	Castings for Sanitary Sewer Manholes
SW-604	04-17-18	Castings for Area Intakes
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WM-102	10-18-16	Tracer System

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10-16-12

HERBICIDE

For all herbicide applications, the following provisions shall apply.

1. Follow all laws, rules and regulations related to the handling of pesticides, including but not limited to:
   a. Follow all herbicide label directions, restrictions, and precautions.
   b. The company responsible for the herbicide applicator must be licensed with Iowa Department of Agriculture and Land Stewardship (IDALS) as a commercial pesticide applicator company.
   c. The person applying the herbicide must be certified through IDALS as a pesticide applicator in Category 6, Right-of-Way. For herbicide applications that require an aquatic certification, the applicator must also be certified as a pesticide applicator in Category 5, Aquatics.
   d. Use herbicide and adjuvant products labeled for the application site:
      i. For applications on the primary highway right-of-way, use only products labeled for use on highway rights-of-way or roadsides.
      ii. For applications to or over water, use only products labeled for corresponding use in aquatic sites, unless intermittent pockets of standing water, such as tire ruts, and the product is labeled for such use.
      iii. For applications to areas in the water conveyance portion of the ditch that do not contain water at the time of application, use only products labeled for non-irrigation ditch banks or aquatic sites.
   e. Do not apply any herbicide to or over standing or flowing water unless required coverage is obtained under a National Pollutant Discharge and Elimination System (NPDES) Pesticide Discharge Permit through Iowa DNR. If standing or flowing water is encountered in areas when they need to be sprayed, notify Iowa DOT (Roadside Development) to determine if submittal of a Notice of Intent (NOI) is required.

2. Schedule work according to weather conditions and take measures to avoid off-target damage, such as runoff, leaching, drift and volatilization.
   a. Do not spray herbicide 24 hours prior to forecast precipitation that is expected to cause significant runoff conditions.
   b. For areas with saturated soil, such as ditch bottoms, do not spray herbicide 24 hours prior to forecast precipitation, unless using products labeled for aquatic sites.
   c. For conventional applications, avoid applications when wind speed exceeds 10 mph. For invert applications, avoid applications when wind speed exceeds 15 mph.
   d. For conventional foliar applications, use a drift retardant and maintain drift control throughout the application period by adding more to the tank as it breaks down from agitation.
   e. Avoid spraying volatile products when temperatures are forecast to exceed 85° F within 3 days.
   f. Check the IDALS Sensitive Crops Directory and do not spray adjacent to a listed operation when wind is blowing towards it.

3. Respond to allegations of any off-target damage attributed to handling and spraying of herbicide.

4. Provide the following documents to the Engineer for approval not less than 2 weeks prior to the application.
   a. A copy of the herbicide and adjuvant labels, including any applicable supplemental labels.
   b. A copy of the herbicide and adjuvant Material Safety Data Sheets (MSDS.)

5. Have copies of the herbicide and adjuvant labels and MSDSs on-hand and at locations of storage, transport, and application.

6. Schedule work to maximize efficiency of the herbicide application in relation to weather conditions and plant growth stage. Follow any label recommendations given as “for best results.”
   a. For weed applications:
      i. To determine if weeds are “actively growing,” use as a guideline that there needs to have been at least 1 hour of temperature above 65° F and 1 hour of sun in the day prior to, of, or forecast before a rain the day after the application.
      ii. For spring applications to thistles, apply after basal leaves of Canada thistles are fully extended, and after rosettes of musk thistle are at least 8 inches diameter, but before flower stage.
      iii. For fall applications to thistles, apply prior to the second hard freeze of 28° F, unless otherwise listed in the label directions.
   b. For tree and brush applications:

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10-16-12

HERBICIDE

      i. For foliar applications and cut stump/surface applications with water-soluble products, apply after leaves are fully opened in the spring and prior to leaf discoloration in the fall.
      ii. For cut stump applications with oil soluble products, do not apply during periods of heavy sap flow. Use as a guideline that heavy sap flow occurs in late winter to early spring when nighttime temperatures below 32° F are followed by daytime temperatures above 32° F with sunny conditions.
      iii. For cut stump and basal bark applications, add sufficient dye so that treated areas are visible to inspection 7 days after application.

7. Notify the Engineer prior to calibrating, mixing and applying herbicides, including incidental items.

8. Provide copies of daily spray logs to the RCE at the end of each week of spraying (form provided by Iowa DOT).

9. If Contractor does not complete spray item on schedule, the Engineer may adjust the schedule.

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10-18-05

UTILITIES
(POINT 25 PROJECT)

This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.

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10-18-11

MEDIAN CROSSOVER

The Contractor is prohibited from using any established or other type median crossover on this project unless specifically designated for the Contractor’s use by this plan.

271-4
10-18-11

DEMOLITION
(BUILDINGS)

PARCEL NO. 5
Break in the basement walls to a minimum depth of 1 foot below natural ground line. Break the floor in such a manner as to permit vertical drainage. Basement wall and floor removal are not required.

281-1
10-18-16

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide Permit 14, Permit No. 2019-0750. A copy of this permit is available from the Iowa DOT website (http://www.envpermits.iowadot.gov/). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

232-10
04-18-17

EMERALD ASH BORER

Any living, dead, cut or fallen material of the ash (Fraxinus spp.) including trees, nursery stock, logs, firewood, stumps, roots, branches, and composted or uncomposted ash chips can be freely moved within the yellow areas of the most recent Federal EAB Quarantine & Authorized Transit.

https://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab_quarantine_map.pdf.

Obtain appropriate Compliance Agreements from USDA APHIS PPQ prior to moving any of the above listed ash articles to areas outside the yellow zone on the map.

For questions, concerns, and general assistance, contact:

USDA APHIS PPQ, Iowa office, 515-414-3295

Or

Iowa Department of Agriculture & Land Stewardship
515-725-1470
Entomology@IowaAgriculture.gov

103-3
10-16-12

PROPOSED SUBGRADE TREATMENT

(For Additional Details see Soils Survey Sheet No. to .)

No.	Location		Description					Type		Quantity		Polymer Grid	Available From		Remarks
	Begin Station	End Station	Side	Type	Depth	Width	Area	Material	Shrink %				Quantity	Location or Station to Station	
					FT	FT	SF			CY	TON	SY	CY		
1	55+00.00	94+00.00	RT	Trench	2.0	54.0	108.0	SPECIAL BACKFILL (SEE ART. 4132)	0.00%	15,608.0	29,499.120				
2	98+00.00	105+75.31	RT	Trench	2.0	54.0	108.0	SPECIAL BACKFILL (SEE ART. 4132)	0.00%	3,109.2	5,876.464				
3	109+68.24	115+00.00	RT	Trench	2.0	54.0	108.0	SPECIAL BACKFILL (SEE ART. 4132)	0.00%	2,135.0	4,035.226				
4	122+50.00	122+58.89	RT	Trench	2.0	54.0	108.0	SPECIAL BACKFILL (SEE ART. 4132)	0.00%	43.6	82.328				
5	122+58.89	159+50.00	RT	Trench	2.0	54.0	108.0	SPECIAL BACKFILL (SEE ART. 4132)	0.00%	14,772.4	27,919.912				
									Total:	35,668.3					

108-30
04-16-13

CRASH CUSHIONS

* Bid Item
(1) Lane(s) to which the installation is adjacent.
(2) Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500

No.	(1) Direction of Traffic	Location Station	Side	Obstacle Width	Crash Cushion (Select One)*					Sand Barrel Details (2)					Earthwork*		Spare Parts Kit (Select One)*		Obstacle Description	Remarks
					Temporary	Temporary Redirective	Temporary Severe Use	Permanent	Permanent Severe Use	V Length	W Length	X Length	Y Length	Z Length	Excavation Class 10	Embankment in Place	Permanent	Permanent Severe Use		
				FT						FT	FT	FT	FT	FT	CY	CY	EACH	EACH		
1	EB	121+75.30	RT	2.00	1						24.25	5.25	3.25	12.00	0.0	36.2			TBR	
2	NB	5083+69.30	RT	2.00	1						24.25	5.25	3.25	12.00	0.0	24.5			TBR	SB Closure
3	NB	5084+78.00	LT	2.00	1						24.25	5.25	3.25	12.00	0.0	27.0			TBR	NB Closure
4	SB	5088+36.50	RT	2.00	1						24.25	5.25	3.25	12.00	0.0	19.6			TBR	SB Closure
		Total:			4										0.0	107.3				

108-33
04-19-16

TEMPORARY BARRIER RAIL

Possible Standards: BA-400, BA-401

* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

No.	Station to Station		Length	(Select One) Steel	(Select One) Concrete	Anchored*	Modular Glare Screen System	Remarks
			LF	BA-400	BA-401	(Y/N)	(Y/N)	
1	121+75.30	127+22.40	537.5		X	No	No	UPRR Bridge
2	5083+69.30	5084+84.30	112.5		X	No	No	
3	5084+78.00	5086+18.60	137.5		X	No	No	
4	5087+34.30	5088+36.50	100.0		X	No	No	
		Total:	887.5					

108-13A
08-01-08

SAFETY CLOSURES

Refer to Section 2518 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
55+00.00	1		I-80
94+00.00	1		Ramp B
98+00.00	1		Ramp B
112+00.00	1		Ramp D
123+09.00	1		Ramp D
159+50.00	1		I-80
2595+66.00	1		Ramp A
Total:	7		

110-17
04-18-17

CLEARING AND GRUBBING

Location		Work and Material Type	Trees, Stumps, and Logs and Down Timber Material Diameters												All Other Materials		Estimated Quantities			Remarks
Station to Station or Ref. Loc. Sign to Ref. Loc. Sign or Description	Direction of Travel		3"-6"	>6"-9"	>9"-12"	>12"-15"	>15"-18"	>18"-24"	>24"-30"	>30"-36"	>36"-42"	>42"-48"	>48"-60"	>60"-72"	>72"	Length	Width	Units	Area	Herbicide Application	
																FT	FT	Units	Acres	Each	
Sta. 54+45 to Sta. 57+52	EB	Trees - Clearing and Grubbing																	0.4		
Sta. 62+08 to Sta. 76+01	EB	Trees - Clearing and Grubbing																	1.2		
Sta. 87+96 to Sta. 88+88	EB	Trees - Clearing and Grubbing																	0.1		
Sta. 94+10 to Sta. 94+68	EB	Trees - Clearing and Grubbing																	0.1		
Sta. 99+06 to Sta. 106+07	EB	Trees - Clearing and Grubbing																	0.8		Infield B
Sta. 102+93 to Sta. 106+38	WB	Trees - Clearing and Grubbing																	0.7		Infield C
Sta. 109+20 to Sta. 113+32	EB	Trees - Clearing and Grubbing																	0.6		Infield D
Sta. 109+30 to Sta. 112+74	WB	Trees - Clearing and Grubbing																	1.0		Infield A
Sta. 115+87 to Sta. 123+36	EB	Trees - Clearing and Grubbing																	0.3		Parcel 5
Sta. 130+94 to Sta. 137+55	EB	Trees - Clearing and Grubbing																	0.4		
Sta. 145+87 to Sta. 159+82	EB	Trees - Clearing and Grubbing																	0.5		
																		Total	6.1		

100-08
04-17-18

REMOVAL OF FENCE

Removal of Field Fence is incidental to Clearing and Grubbing.

Location				Type	Length	Remarks
From		To				
Station	Offset	Station	Offset		LF	
54+08.20	126.9	99+43.76	289.49	Field	4570.2	
54+84.89	143.17	58+61.51	171	Chain Link	417.5	
80+53.17	164	80+56.71	101.47	Field	62.6	
111+29.24	427.81	123+58.91	37.2	Field	1379.2	
124+86.51	103.32	140+03.56	64.67	Field	1599.9	
133+95.78	100.61	134+00.05	153.05	Field	52.6	
139+99.11	99.03	140+19.57	100.01	Field	20.5	
140+06.64	64.68	160+00.20	118.11	Field	2024.1	
112+87.20	-466.94	123+72.89	-111.17	Field	1287.6	
124+09.16	-240.99	124+11.03	-258.68	Field	17.8	
			Totals:	Field	11014.5	
				Chain Link	417.5	

110-7A
04-17-12

REMOVAL OF STEEL BEAM GUARDRAIL

(1) Lane(s) to which the installation is adjacent.
(2) Includes length of End Terminals and End Anchors.

Location					Removal of Guardrail (2)
No.	Direction (1) of Traffic	Station to Station		Side	LF
1	EB	105+39.32	106+60.45	RT	121.6
2	EB	123+02.01	123+61.42	RT	59.8
				Total:	181.4

110-5
10-20-15

SIDEWALK REMOVAL

* Not a bid item

Begin Station	End Station	Area	Saw Cut*	Remarks
		SY	LF	
5082+39.17	5082+48.23	426.2	20.0	
	Total:	426.3		

110-1
04-16-13

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

Begin Station	End Station	Side	Pavement Type	Area	Saw Cut*	Remarks
				SY	LF	
120+08.23	121+21.41	RT	HMA	144.1	196.2	
122+00.30	123+59.47	RT	HMA	180.7	110.7	
125+08.89	125+86.17	RT	HMA	17.6	161.9	
			Total:	342.5	468.8	

190-61
10-15-13

EXISTING SIGNS TO BE REINSTALLED

SIGN DESCRIPTION	DIRECTION OF TRAVEL	LOCATION STATION	NUMBER OF POSTS	SQUARE TUBE STEEL POSTS	WOOD POSTS		INSTALLATION		SEE SIGNING NOTES
					4" x 4"	4" x 6"	TYPE	DIM 'X'	
					LF	LF			
GRINNEL COLLEGE	EB	68+06.85	2.0	X					
M.P. 182	EB	74+50.00	1.0	X					
GAS FOOD EXIT	EB	77+96.10	3.0	X					
GRINNEL/NEW SHARON EXIT	EB	87+78.84	2.0	X					
EXIT 182	EB	95+11.15	2.0		25.0				
MERGE	EB	116+75.00	1.0		12.5				
YIELD	EB	123+65.00	1.0		12.5				
M.P. 183	EB	129+00.00	1.0	X					
I-80	EB	133+75.00	1.0		12.5				
SPEED LIMIT	EB	145+35.00	1.0	X					
MONTEZUMA/DAVENPORT	EB	157+90.59	3.0	X					
LODGING	EB-RPB	2595+94.05	2.0	X					
FOOD	EB-RPB	2597+97.55	2.0	X					
GAS/FOOD	EB-RPB	2601+87.31	2.0	X					
LODGING	WB-RPA	1517+78.99	2.0	X					
FOOD	WB-RPA	1515+84.13	2.0	X					
GAS	WB-RPA	1514+21.01	2.0		25.0				

110-9
10-18-11

CULVERT ABANDONMENT

Refer to Details 4315 and 4316

* Not a bid item

Location Station	Description	Fill Material		4" Perforated Subdrain*	Remarks
		Flowable Mortar	Granular Backfill*		
		CY	TON	LF	
55+14.11	RCB	112.0			4' x 4' x 189'
88+32.54	Conc.	45.0			36" x 172'
94+18.78	Conc.	24.4			24" x 210'
114+74.82	RCB	52.2			2' x 3' x 235'
129+49.48	RCB	55.1			2' x 3' x 248'
135+33.11	Conc.	34.9			24" x 300'
137+97.70	Conc.	6.6			24" x 57'
140+11.22	RCB	154.1			4' x 5' x 208'
143+21.13	Conc.	62.3			36" x 238'
5085+00.00	Conc.	3.7			12" x 128'
5086+36.09	Conc.	49.9			30" x 140'
5090+50.61	Conc.	9.2			24" x 79'
Total:		609.5			

110-14
04-16-13

SANITARY OR STORM SEWER ABANDONMENT OR REMOVAL

* Not a bid item

Location/Description	Sanitary or Storm Sewer	Abandonment, Plug Only or Abandonment, Plug and Fill or Removal	Length of Pipe		Fill Material*	Remarks
			≤ 36 inch diameter	> 36 inch diameter	Flowable Mortar or CLSM	
			LF	LF	CY	
Sta. 5082+88.14 to Sta. 5083+90.19	Sanitary Sewer	Removal	101			
Sta. 5083+90.19 to Sta. 5088+21.98	Sanitary Sewer	Removal	429			
Sta. 5088+21.98 to Sta. 5091+84.33	Sanitary Sewer	Removal	360			
Sta. 5091+84.33 to Sta. 5093+55.20	Sanitary Sewer	Removal	168			
Sta. 5093+55.20 to Sta. 5094+11.37	Sanitary Sewer	Removal	62			

110-15
04-16-13

REMOVAL OF INTAKES AND UTILITY ACCESSES

No.	Location/Description	Type	Remarks
1	5083+90.21	Utilities	Not a bid item
2	5084+85.14	Intakes	Not a bid item
3	5085+50.48	Intakes	Not a bid item
4	5088+21.98	Utilities	Not a bid item
5	5091+84.33	Utilities	Not a bid item
6	5093+55.20	Utilities	Not a bid item

110-2
04-16-13

REMOVAL OF EXISTING STRUCTURES

Location	Description	Remarks
79+71.97	Remove Flared End Section	Not a bid item
93+87.95	Remove Flared End Section	Not a bid item
123+99.47	Remove 280.0 LF of 30" RCP	Not a bid item
124+89.65	Remove 253.0 LF of 30" RCP	Not a bid item
5083+06.58	Remove 44.0 LF of 30" RCP	Not a bid item
5085+42.84	Remove 40.0 LF of 24" RCP	Not a bid item

FENCING

* Bid Item

Refer to MI-101, MI-102, MI-103, MI-104, 510-3, and 510-5

Location				Side	Chain Link				Deer				Field				Channel Crossing		Remarks
From		To			Fence		Gate				Gate				Gate				
Station	Offset	Station	Offset		Length*	Type	No.*	Type	Fence Length*	Brace Panels*	No.*	Type	Fence Length*	Brace Panels*	No.*	Type	Length*	Type	
					LF		EACH		LF	EACH	EACH		LF	EACH	EACH		LF		
54+06.83	125.0	56+28.10	172.0	RT									228.7	6					
54+84.89	143.2	56+27.90	174.0	RT	148.0	72 IN.													
56+27.90	174.0	58+61.51	171.0	RT	236.7	72 IN.													
56+28.10	172.0	58+64.57	169.0	RT									239.6	6					
58+64.57	169.0	67+30.88	137.0	RT									869.3	6					
67+30.88	137.0	75+00.02	138.0	RT									769.1	6					
75+00.02	138.0	80+52.19	164.0	RT									552.8	6					
80+52.19	164.0	85+64.94	165.0	RT									512.7	6					
85+64.94	165.0	86+81.98	150.2	RT									118.0	4					
86+81.98	150.2	87+25.16	153.7	RT									43.3	4					
87+25.16	153.7	88+53.03	184.0	RT									131.4	4					
88+53.03	184.0	89+31.95	170.4	RT									80.1	4					
89+31.95	170.4	93+67.56	205.6	RT									437.0	6					
93+67.56	205.6	93+66.68	217.2	RT									11.6	1					
93+66.68	217.2	94+63.99	209.2	RT									97.6	4					
94+63.99	209.2	99+43.76	289.5	RT									486.4	6					
111+29.24	427.8	113+59.68	379.1	RT									230.4	6					
113+59.68	379.1	114+37.66	343.1	RT									85.9	4					
114+37.66	343.1	117+06.82	274.0	RT									277.9	6					
117+06.82	274.0	117+49.83	269.0	RT									43.3	4					
117+49.83	269.0	118+67.85	243.0	RT									120.8	4					
118+67.85	243.0	121+49.15	221.0	RT									282.2	6					
121+49.15	221.0	123+19.00	287.2	RT									182.3	6					
123+19.00	287.2	123+19.00	96.8	RT									190.4	6					
125+36.00	96.8	125+36.00	206.6	RT									109.7	4					
125+36.00	206.6	133+99.07	153.0	RT									864.7	6					
133+99.07	153.0	135+98.04	164.0	RT									199.3	6					
135+98.04	164.0	148+40.00	183.0	RT									1242.1	8					
148+40.00	183.0	154+91.96	174.0	RT									655.1	6					
154+91.96	174.0	159+49.75	143.0	RT									464.4	6					
159+49.75	143.0	160+00.20	118.1	RT									56.7	4					
112+87.20	466.9	115+27.41	449.0	LT									240.9	6					
115+27.41	449.0	115+44.33	421.2	LT									32.6	4					
115+44.33	421.2	118+19.74	324.0	LT									292.0	6					
118+19.74	324.0	120+79.91	278.0	LT									264.2	6					
120+79.91	278.0	123+44.87	276.0	LT									265.0	6					
123+44.87	276.0	124+11.03	258.7	LT									68.4	4					
		Totals:			385.0								10746.0	183					

PAVEMENT MARKING LINE TYPES

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.25
DCY4: Double Centerline (Yellow) @ 2.00
NPY4: No Passing Zone Line (Yellow) @ 1.25
BLW4: Broken Lane Line (White) @ 0.25
ELW4: Edge Line Right (White) @ 1.00
ELY4: Edge Line Left (Yellow) @ 1.00
RLW4: Ramp Edge Line Right (White) @ 1.00
SLW4: Solid Lane Line (White) @ 1.00

Location					Side			Length by Line Type (Unfactored)														Remarks
Road ID	Station to Station		Dir. of Travel	Marking Type	L	C	R	BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4	RLW4	SLW4							
								STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	
Ramp D	4520+80.00	4523+15.00	EB	Removal of Paint	X							2.35										
	4520+95.00	4522+40.00	EB	Removal of Paint			X					1.45										
	4520+80.00	4522+05.00	EB	Waterborne/Solvent Paint	X										1.25							
	4520+95.00	4525+40.00	EB	Waterborne/Solvent Paint			X							4.45								
				Factored Total: Waterborne/Solvent Paint				-	-	-	-	3.80	-	4.45	1.25	-	-	-	-	-	-	-	
				Bid Quantity: Painted Pavement Markings, Waterborne or Solvent-Based							5.70											
				Removal of Paint							3.80											

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.
* Not a bid item
(1) Diameter or equivalent diameter
(2) UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe RCP = Reinforced Concrete Pipe LCP = Arch or Elliptical Low Clearance Pipe STL = Steel SARC = Steel Arch Pipe
(3) Backfill according to DR-101

Drainage Area	Location	Type	Size (1)	Kind Of Pipe (2)	Length New Const.	Bedding Class	Design Cover (H)	Camber* (DR-102)	Apron No.		Apron Guard* (DR-213)	Elbow* (DR-141)	Diaphragm* (DR-501)	Tee Section* (DR-142)	"D" Section* (DR-141)	Reducer*	Type 'C' Connections* (DR-122)		Connected Pipe Joint* (DR-121)	4" Perforated Subdrain*	Flow Line Elevations				Dimensions Lin. Ft. Total		Dimensions Lin. Ft. Extensions		Skew Ahead Degrees		Dike			Class 20	Flowable Mortar	Floodable* Backfill	Porous* Backfill	Flooded Backfill (3)	Remarks
																														Rt.									
ACRE			IN		LF		FT	FT	IN	OUT	No.	No.	No.	No.	No.	No.	Type	No.	Type	FT	Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Location Station	Top Elevation	Type	CY	CY	(A) CY	(B) CY	(A+B) CY	
34.3	53+82.38	2000D	54	RCP	101	C	6.8	0.17	1	1		1							Type 3		953.00	968.00	953.26		61.0	40.0									344.9					Sheet V.1
28.4	55+10.00	2000D	54	RCP	244	C	8.2	0.17	1	1		2							Type 3		976.28	970.32	972.71		141.5	100.2			30						136.7					Sheet V.2
6.2	87+75.00	2000D	24	RCP	78	B	4.3	0.08	1	1									Type 3		994.14	991.26			19.0	59.0									49.8		45.6	5.9	51.5	V.3, Note 1
59.8	88+52.00	2000D	60	RCP	244	B	6.3	0.17	1	1									Type 3		987.00	988.90			125.0	119.0									423.1		158.4	10.5	168.9	Sheet V.4
5.2	93+68.00	2000D	24	RCP	80	B	3.6	0.08	1	1									Type 3		991.53	990.98			7.6	72.4									86.1	6.0	31.2	6.1	37.3	V.5, Note 1
1.8	94+18.78	2000D	24	RCP	24	C	2.9	0.08		1		2					C-1	1	Type 3		991.50		987.33				24.0								40.5					Sheet V.6
18.2	94+45.00	2000D	36	RCP	294		7.5	0.17	1	1									Type 3		985.47	988.08			147.0	147.0			10						273.2		112.0	26.0	138.0	Sheet V.7
2.3	109+44.00	2000D	18	RCP	130		18.2	0.33		1							C-1	1	Type 3		994.22	988.47						130.0								189.2	9.1	198.3	Sheet V.8
4.0	109+72.00	3000D	24	RCP	102	B	10.6	0.25		1									Type 3		1001.11	999.64			36.5	65.6									44.6					V.9, Note 1
154.9	110+00.00	3750D	60	RCP	454	C	37.8	0.58	1	1									Type 3		968.47	972.94			234.0	220.0									66.8		725.4	51.5	776.9	Sheet V.10
0.5	122+50.00	2000D	24	RCP	94	B	5.3	0.17	1	1									Type 3		1013.50	1009.25			30.9	63.1									5.2					V.11, Note 1
17.8	123+50.28	3750D	54	RCP	448	C	25.0	0.42	1	1									Type 3		976.84	979.63			228.0	220.0			5						821.8					Sheet V.12
9.4	124+10.70		42	STL	150	C	6.0	0.17													980.27	981.02			71.0	79.0									479.2					V.13, Note 2
5.0	129+87.00	3000D	36	RCP	354	C	15.6	0.33	1	1									Type 3		991.41	994.65			185.0	169.0				30					83.2					Sheet V.14
2.1	137+75.00	2000D	24	RCP	74	C	5.3	0.17		1									Type 3		981.66	980.83			20.0	54.0									60.5					V.15, Note 1
128.0	139+88.00	2000D	72	RCP	284	C	13.2	0.25	1	1									Type 3		966.03	968.92			147.1	136.9									144.2					Sheet V.16
2.5	150+00.00		18	RCP	54		2.7	0.08	1	1									Type 3		976.48	976.76			31.0	23.0										5.5	13.2	3.8	17.0	Sheet V.17
16.7	4510+10.00	2000D	42	RCP	108	C	8.5	0.17	1	1									Type 3		973.79	983.10			76.0	32.0									443.5					Sheet V.18
131.6	5083+35.00	2000D	60	RCP	202	C	9.5	0.17	1	1				1					Type 3		976.10	973.92			56.5	145.5									418.7					Sheet V.19
0.5	5083+35.00	2000D	12	RCP	108	C	9.0	0.17											Type 3		977.05	981.14													300.3					Sheet V.20
1.7	5089+75.00	2000D	24	RCP	100		6.6	0.17	1	1									Type 3		979.34	969.97															73.2	7.6	80.8	Sheet V.21

Totals:	Trenched	Trenchless	Aprons
12 RCP	108		
18 RCP	138	46.00	3
24 RCP	460	92.00	11
36 RCP	228	420.00	4
42 RCP	56	52.00	2
42 STL	90	60.00	
54 RCP	347	446.00	6
60 RCP	306	594.00	6
72 RCP	100	184.00	2

General Notes:

A. Refer to Culvert Plat Plans (V-Sheets).
B. Length of Construciton Includes Bends and T-Sections.
C. Pipe Joints Are Not Required For Trenchless Construction.
D. Shape Inlet and Outlet to Drain as Necessary.
1. LT/RT Dimensions Measured From EB Centerline.
2. LT/RT Dimensions Measured From UPRR Centerline.

INTAKES AND UTILITY ACCESSES

* Bid Item
** For SW-545

No.	Location Station	Type or Standard Road Plan*	Form Grade Elev.	Bottom Well Elev.	Extension Length** FT	Notes
1	5084+45.00	SW-512	986.1	980.6		

103-5
10-15-13

SETTLEMENT PLATES

Refer to Standard Road Plan EW-212

No.	Location		Remarks
	Station	Offset	

103-6
10-17-17

EMBANKMENT WITH MOISTURE CONTROL

Moisture Control is required for all Class 10 fill placed in all locations and depths. Stability berms placed outside the normal foreslope template and topsoil will not require Moisture Control.

103-7
08-01-08

SHRINKAGE DATA

Material	%	Remarks

107-31
04-19-11

PLOWING AND SHAPING

Refer to Standard Road Plan EW-101

Station to Station		D	Remarks
		FT	

104-5C
10-17-17

LIST OF SUBDRAIN WORK

Possible Standards: DR-121, DR-201, DR-203, DR-301, DR-302, DR-303, DR-305 and DR-306. Possible Detail: 500-10.

* Not a bid item

Location			Pipe			Aprons		Outlets				Connected Pipe Joints*		Trench Drain	Granular Material	Porous Backfill*	Class "A" Crushed Stone*	Remarks
No.	Station to Station	Type of Installation	Concrete, C.M.P., or Plastic	Dia.	Length	DR-201	DR-203	500-10	DR-305		DR-306	DR-121			Blanket			
		DR-301, DR-302, DR-303		IN	LF	No.	No.	No.	Type	No.	No.	Type	No.	LF	CY	CY	CY	

104-9
10-17-17

LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

Refer to Soils Sheets

* Not a bid item. Bridge berm quantities assume a trench depth of 24 inches.

Location				Depth	Longitudinal Subdrain (DR-303)							Subdrain Outlet		Porous* Backfill	Class "A"* Crushed Stone	Remarks
Line No.	Road or Lane Identification	Station to Station	Side	D	Shoulder		Backslope		Bridge Berm (EW-203 or EW-204)			DR-303, DR-305 or DR-306				
					Size	Length	Size	Length	Standard Road Plan and Type	Size	Length	Station	Standard Road Plan and Type			
				IN	IN	FT	IN	FT		IN	FT			CY	CY	

GEOTECHNICAL DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

LICENSED PROFESSIONAL ENGINEER
MATTHEW D. CUSHMAN
20478
IOWA

DRAFT

Signature Da

Matthew D. Cushman

Printed or Typed Name

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: CS.1, Q.1-Q.18

FILE NO.	ENGLISH	DESIGN TEAM Snder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER CS.1

SURVEY SYMBOLS

- LC Lot Corner
- BRG Bridge
- PPA Power Pole Co. 1
- SI Sign
- OUT Tile Outlet
- MH Utility Access (Manhole)
- TLNR Tree Line Right
- LUM Luminaire
- MIS Miscellaneous
- PIP Pipe Culvert
- SL Speed Limit Sign
- GDL Guard Rail (Rail and Cable)
- STA Storm Sewer Line Co. 1
- INB Storm Sewer Beehive Intake
- STP Stump
- TPD Telephone Pedestal
- TDC Tree Deciduous
- FW Wire Fence
- MM Mile Marker Post
- SHR Shrub
- GP Guard Post (Less Than 4 Posts)
- TEV Evergeen Tree
- EB Electrical Box
- TLNL Tree Line Left
- PLG Location of General Photo
- PR Electic Riser Pole
- COR Round Bridge Pier Column
- LIN Miscellaneous Line
- S Soil Sampling Site (Wetlands)
- COS Square Bridge Pier Column
- CON Concrete or A/C Slab
- ENP Edge Paved Entrance & Park Lot
- SNP Unpaved Shoulder
- EP Edge of Paved Roads (ML or SR)
- DU Centerline Draw or Stream (Up)
- SH Paved Shoulder
- GU Gutter In Front of Curb
- CU Back of Curb
- ENT Centerline BL of Entrance
- ENU Edge Unpaved Entrance & Parking
- EG Edge of Gravel Road
- D Centerline Draw or Stream (Down)
- GHB Underground High Pres Gas Co 2
- ELA Underground Electric Line Co. 1
- GLA Underground Gas Line Co. 1
- FOA Underground Fiber Optic Co. 1
- FOB Underground Fiber Optic Co. 2
- TLA Underground Telephone Line Co. 1
- SOP Size of Pipe or Culvert
- BLS Bridge Low Steel
- PRO Profile Shot
- BD Bridge Deck

UTILITY LEGEND

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REROw@alliantenergy.com

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Heather Dee
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PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

Reference Point
Station
Survey Line
Section Corner
Ground Line Intercept
Saw Cut
Guardrail
Trench Drain
HighTension Cable Guardrail
Sheet Pile
Pavement Removal
Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER D.1

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Sta.50+33.23, 37.90' LT
24"X53' RCP
D.A.= MEDIAN
BOTH CONC APRONS
(U.A.C.)

Sect. No. 31

Sect. No. 32

GRANT TWP.
T-80N R-16W
SEC. 31

Curve Data
Δ = 5° 42' 01.73" (LT)
T = 642.25
L = 1,283.45
R = 12,900.00
E = 15.98

PC Sta 47+66.89

PT Sta 60+50.34

I-80 Existing W.B.

I-80 Existing E.B.

I-80 Proposed E.B.

Proposed ROW

Existing ROW

Construction Limits

STA. 53+00.00
Begin E.B. Grading

POND

(U.A.C.)
Sta.49+54.80
Skew 31° LT AH
24"X192' RCP
D.A.= 6.1 AC
NORTH APRON RCP
SOUTH APRON CULVERT

(Plug & Abandon)
Sta.55+14.11
Skew 30° LT AH
4'X4'X189' RCB
D.A.= 28 AC

Sta. 53+82.38, 104.09' Rt.
Install 54" X 100'-3 RCP
F.L. = East 968.00
West 953.00
Other 953.26

Sta. 55+10.00
Install 54" X 243'-5½ RCP
Skew 30° Lt. Ahd.
F.L. = Lt. 976.28
Rt. 970.32
Other 972.71

0 100 FEET

(U.A.C.)
Sta.61+03.19
Skew 15° RT AH
24"X163' RCP
D.A.= 2.2 AC
BOTH CONC APRONS

I-80 (EBL)

+10.00
54" RCP
FL 970.32

+82.38
54" RCP
FL 953.00

+82.38
54" RCP
FL 968.00

Proposed Eastbound
Profile Grade

Sta 55+00.00
Begin Mainline Profile
Elev. = 984.40

Existing Ground
at Eastbound PGL

VPI +50,000
Elv 1,008.80
Len 1,100.00 ft
K = 336
SSD = 852 ft
DS = 75 MPH

V Ditch

Ditch Grade

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER
		SNYDER AND ASSOCIATES, INC.	POWESHIEK	IM-NHS-080-5(242)182--03-79	D.2

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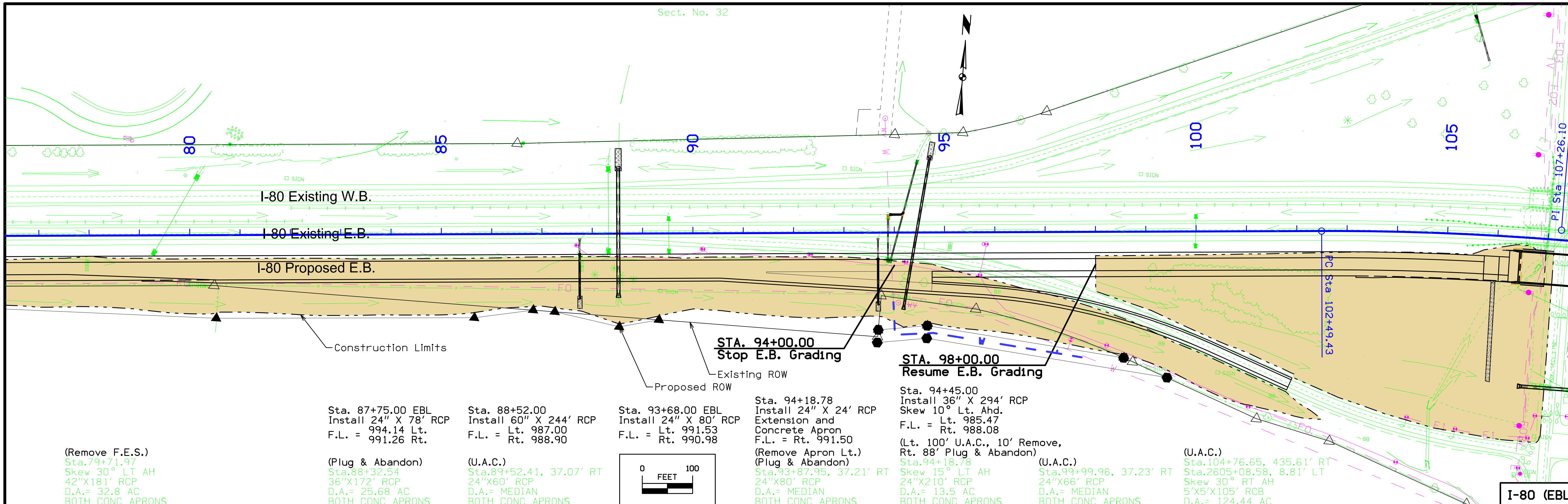

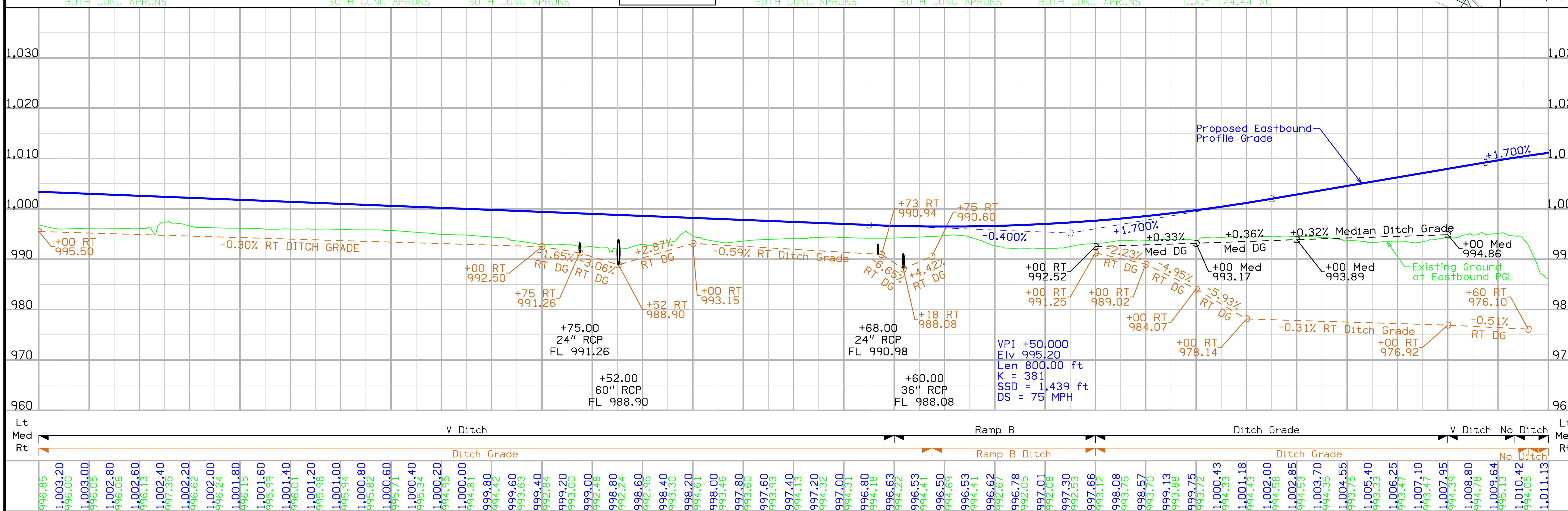

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER D.3

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Curve Data
Δ = 9° 33′ 38.31″ (RT)
T = 476.67
L = 951.13
R = 5,700.00
E = 19.90
e = 3.8%

Sta.107+56.06
Skew 35° LT AH
4′X5.7′X321′ RCB
D.A.= 131.58 AC
(Plug & Abandon)

Sta.114+74.82
Skew 10° RT AH
2′X3′X235′ RCB
D.A.=13.4 AC
(Plug & Abandon)

STA. 122+50.00
Resume E.B. Grading

Sect. No. 33

STA. 115+00.00
Stop E.B. Grading

PI Sta 107+26.10

PT Sta 112+00.55

UPRR

I-80 Existing W.B.

I-80 Existing E.B.

I-80 Proposed E.B.

Existing ROW
Proposed ROW
Construction Limits

Sta. 109+44.00 EBL
Install 18″ X 130′ RCP
F.L. = 994.22 Lt.
988.47 Rt.

(Remove Apron Rt.)
Sta.109+49.13, 2.10′ RT
15″X89′ RCP
D.A.= MEDIAN

Sta. 109+72.00 EBL
Install 24″ X 102′ RCP
F.L. = 1001.11 Lt.
999.64 Rt.

Sta. 110+00.00
Install 60″ X 454′ RCP
F.L. = Lt. 968.47
Rt. 972.94

Sta. 122+50.00 EBL
Install 24″ X 94′ RCP
F.L. = 1013.50 Lt.
1009.25 Rt.

Sta. 123+50.28
Install 54″ X 448′ RCP
Skew 5° Lt. Ahd.
F.L. = Lt. 976.84
Rt. 979.63

(Remove)
Sta.123+99.47
30″X280′ RCP
D.A.= 8.47 AC
BOTH APRONS RCP

Sta. 124+10.70, 263.25′ Rt
Install 42″ X 150′ Steel Pipe
F.L. = West 980.27
East 981.02

(Remove)
Sta.124+89.65
30″X253′ RCP
D.A.= 9.37 AC
BOTH APRONS RCP

Sta. 129+87.00
Install 36″ X 354′ RCP
Skew 30° Rt. Ahd.
F.L. = Lt. 991.41
Rt. 994.65

(Plug & Abandon)
Sta.129+49.48
Skew 30° RT AH
2′X3′X248′ RCB
D.A.= 5 AC

(Plug & Abandon)
Sta.135+33.11
Skew 45 LT AH
24″X300′ RCP
D.A.= 4.73 AC
NORTH APRON CUL
SOUTH APRON CUL

0 100 FEET

I-80 (EBL)

VPI +50.000
Elv 1,012.20
Len 350.00 ft
K = 350
SSD = 869 ft
DS = 75 MPH

Proposed Eastbound Profile Grade

+0.700% +0.200% +0.200% -2.850%

+72 Med
1001.53

+00 Med
1003.24

+0.40% Median Ditch Grade

+75 RT
1,009.50

+72.00
24″ RCP
FL 998.43

Existing Ground at Eastbound PGL

+4.80% RT Ditch Grade

+50.00
24″ RCP
FL 1009.25

+40 RT
994.78

+1.50% RT DG

+50 RT
996.43

-1.00% RT DG

+50 RT
995.43

-8.78% RT DG

+30 RT
979.63

+6.40% RT DG

+50.28
54″ RCP
FL 979.63

+40 RT
980.27

+87.00
36″ RCP
FL 994.65

Proposed Eastbound Profile Grade

+30 RT
988.54

-0.96% RT DG

-3.47% RT DG

+00 RT
986.90

+44.00
15″ RCP
FL 985.97

-13.12% RT DG

+50 RT
979.50

-0.88% RT DG

+00 RT
972.94

+89 RT
973.92

+50.00
60″ RCP
FL 972.94

VPI +00.000
Elv 1,017.45
Len 250.00 ft
K = 500
SSD = 1,039 ft
DS = 75 MPH

VPI +00.000
Elv 1,019.85
Len 1,200.00 ft
K = 393
SSD = 921 ft
DS = 75 MPH

1,030 1,020 1,010 1,000 990 980 970 960

Lt	No Ditch	V Ditch	Ditch Grade	V Ditch	Ramp D	V Ditch	No Ditch	V Ditch	Lt
Med	No Ditch		Ditch Grade		Ramp D Ditch	Ditch Grade		No Ditch	Ditch Grade	Med
Rt										Rt

107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137
986.25	986.28	986.20	986.34	998.03	998.35	998.69	999.56	1,000.65	1,001.37	1,001.78	1,002.11	1,002.49	1,002.63	1,002.83	1,003.33	1,003.75	1,004.14	1,004.46	1,004.72	1,006.58	1,008.29	1,012.47	1,013.70	1,013.86	1,013.40	1,013.12	1,013.02	1,012.84	1,012.27	987.91	992.29	1,007.06	1,008.65	1,007.96	1,006.81	1,005.32	1,004.09	1,003.55	1,002.37	1,001.51	1,000.62	999.82	999.12	998.74	998.40	997.62	996.84	995.57	993.65	992.17	990.31	988.81	988.39	988.15	985.93	991.35
1,011.76	1,012.33	1,012.82	1,013.24	1,013.60	1,013.95	1,014.30	1,014.65	1,015.00	1,015.35	1,015.70	1,016.05	1,016.40	1,016.74	1,017.04	1,017.29	1,017.49	1,017.64	1,017.75	1,017.85	1,017.95	1,018.05	1,018.15	1,018.25	1,018.35	1,018.45	1,018.55	1,018.65	1,018.72	1,018.72	1,018.66	1,018.11	1,017.79	1,017.42	1,016.98	1,016.47	1,015.91	1,015.28	1,014.58	1,013.82	1,013.00	1,012.12	1,011.17	1,010.16	1,009.08	1,007.94	1,006.74	1,005.47	1,004.14	1,002.75	1,001.33	999.90	998.48	997.05	995.63	994.20	992.77	991.35

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	D.4

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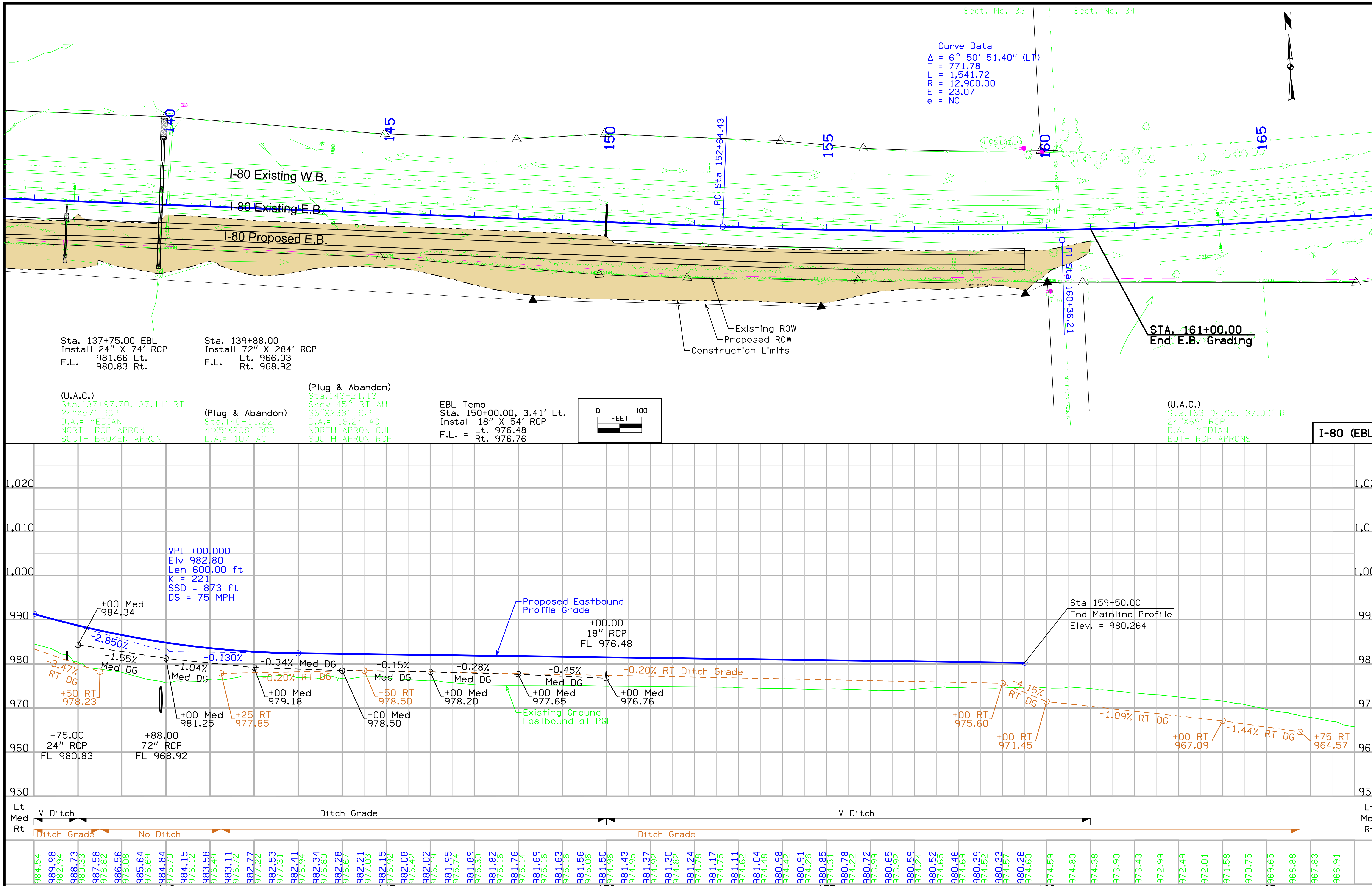

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER D.5

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Sta. 5083+35.00
Install 60" X 202' RCP
F.L. = Lt. 976.10
Other 977.05
Rt. 973.92

Sta. 5083+35.00, 40.53' Rt.
Install 12" X 108' RCP
F.L. = South 977.05
North 981.14

POT Sta 5086+30.91 (Hwy. 146) =
Sta. 107+25.34 (I-80)

Sta. 5084+45.00, 40.53' Rt.
Install SW-512 Intake, 18"
Inlet = 986.12

Plug & Abandon

E.B. Interstate 80

W.B. Interstate 80

POT Sta 5086+71.00

Survey ℄ (IA-146)

Existing ROW

Proposed ROW

Proposed ROW

Existing ROW

Construction Limits

(Remove)
Sta.5083+06.58, 131.15' RT
30"X44' RCP
BOTH CONC APRONS

(Remove)
Sta.5085+42.84, 144.27' RT
24"X40' RCP
CONC APRON & INTAKE

(Plug & Abandon)
Sta.5086+36.09, 6.44' RT
30"X140' RCP
D.A.= 9.93 AC
SOUTH CONC APRON
NORTH OUTLETS INTO
5'X5'RCB

Sta. 5089+75.00 NBL
Install 24" X 100' RCP
F.L. = Lt. 979.34
Rt. 969.97
Other 974.90

(Plug & Abandon)
Sta.5090+50.61, 92.91' RT
24"X79' RCP
D.A.= MEDIAN
BOTH CONC APRONS

(U.A.C.)
Sta.5076+18.43
4'X5.5'X142' RCB
D.A.= 69.7 AC

(U.A.C.)
Sta.5080+50.32, 88.39' RT
24"X49' RCP
D.A.= MEDIAN
BOTH CONC APRONS

(U.A.C.)
Sta.5097+30.10
8'X6'X194' RCB
D.A.= 72.1 AC

0 100
FEET

Existing Ground
Southbound Centerline

Existing Ground
Northbound Centerline

+51.97 RT
985.76

+59.43 RT
974.03

+63.69 RT
968.47

+92.06 RT
968.47

Ditch Grade

Lt
Med
Rt

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	E.1

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Survey Information

Poweshiek County
IM-NGS-080-5(242)182--03-79
Poweshiek County I-80 & IA 146 Intersection
PIN: 04-79-080-010
SAP: 0871

General Information

Measurement units for this survey are US survey feet. The Project includes replacement of dual ML I-80 bridges over Iowa 146, dual ML I-80 bridges over the single UPRR track east of IA 146, and reconstruction and widening of I-80 pavement to facilitate structure replacements from approximately MP 181 to 186. Project datum and control information matches survey performed previously for aerial photo control performed by the State.

Vertical Control

Vertical datum for this survey is relative to NAVD88.

This vertical control matches survey performed previously established by the State. CP1, CP2, CP3 and CP5001 through CP50005 were recovered and elevation verified with redundant 30-second observations utilizing the IaRTN.

No additional benchmarks were established for this survey.

Horizontal Control

Measurement units for this survey are US survey feet.

The project coordinate system is the Iowa Regional Coordinate System, Zone 9. This coordinate system matches survey performed previously survey established by the performed by the State. Horizontal datum is NAD83 (2011) for Epoch 2010.00. The projection parameters for Zone 9 of the IaRCS is defined below:

Transverse Mercator Projection
Origin Lat: 40°15' 00"N
Origin Central Meridian: 092°49' 00"W
Central Meridian Scale: 1.000027
False Northing: 7,200,000
False Easting: 19,500,000

CP1, CP2, CP3 and CP5001 through CP50005 were recovered and positions were verified with redundant 30-second observations utilizing the IaRTN.

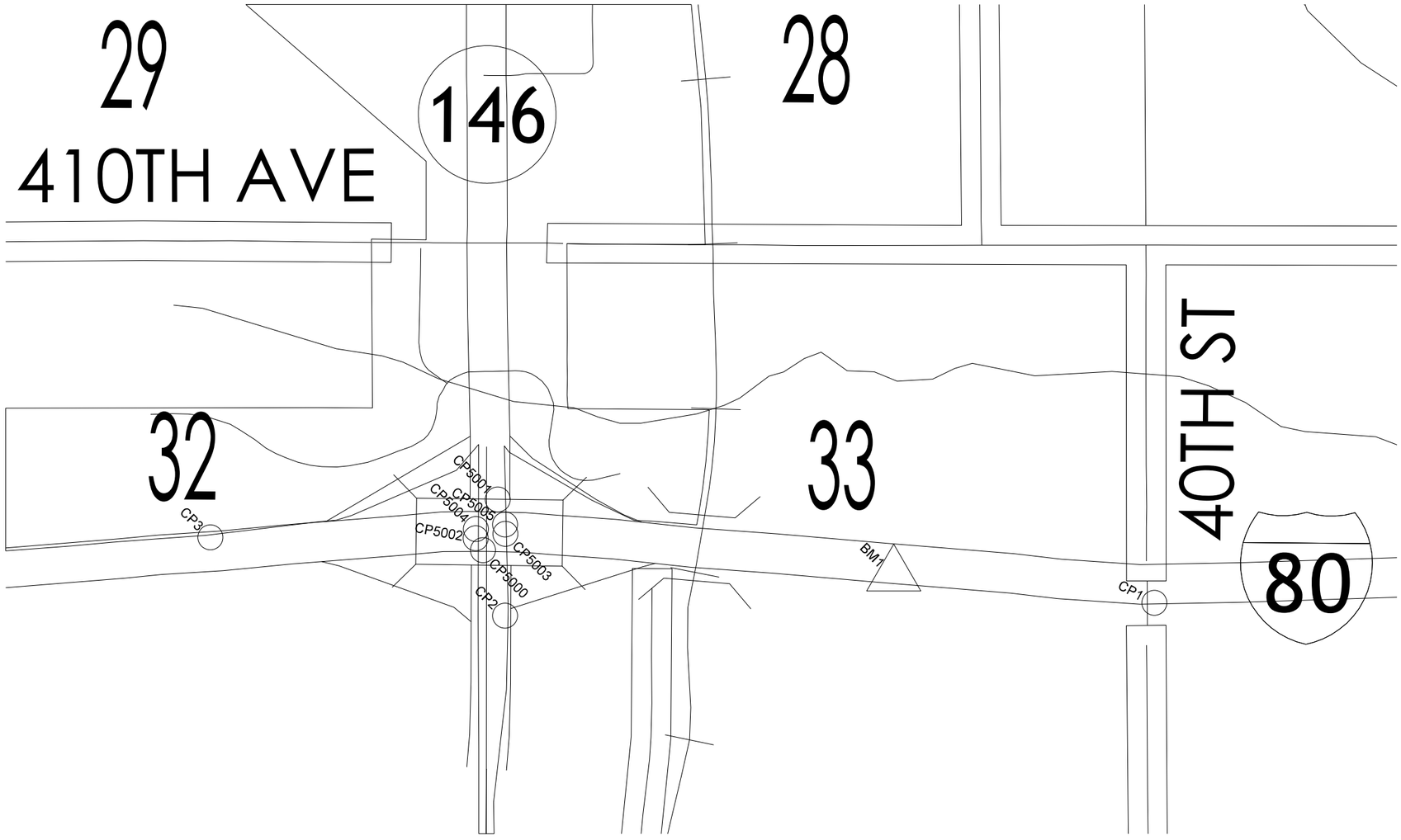
Alignment Information

Alignments for both I-80 and Ia 146 were created by the State. However, the I-80 alignment was extended to the east and west using As-Built plans No. 80-5(20)183 and 80-5(31)188.

Geopak Alignment Chains created:
I80 Interstate 80 Centerline
RTE146 Ia 146 Centerline

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00
VERT. DATUM: NAVD88
Ia. Regional Coordinate System Zone 9

Coordinate listing from next sheet will be used with IaRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 9

Point Name	Northing	Easting	Elevation	Feature Definition	Description
BM1	7726614.606	19527690.150	974.201	BM	BRASS MONUMENT
CP1	7726395.599	19529773.780	978.856	CP	CP FENO MONUNMENT W/ ALUM CAP
CP2	7726292.662	19524581.210	994.430	CP	CP FENO MONUNMENT W/ ALUM CAP
CP3	7726919.660	19522226.020	998.226	CP	CP FENO MONUNMENT W/ ALUM CAP
CP5000	7726816.920	19524404.890	986.390	CP	SET 5/8IN REBAR
CP5001	7727222.554	19524523.680	981.080	CP	SET 5/8IN REBAR
CP5002	7726911.697	19524346.720	1004.040	CP	SET 5/8IN REBAR
CP5003	7726947.372	19524584.130	1006.700	CP	SET 5/8IN REBAR
CP5004	7726985.382	19524349.060	1003.930	CP	SET 5/8IN REBAR
CP5005	7727022.376	19524582.070	1006.850	CP	SET 5/8IN REBAR

ALIGNMENT COORDINATES

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
I-80																			
50		10+00.00	7726602.00	19514717.12															
I80_P_3								47+66.89	7726531.01	19518483.34	54+09.15	7726518.90	19519125.48	60+50.34	7726570.64	19519765.65			
I80_P_6								102+49.43	7726908.90	19523951.09	107+26.10	7726947.30	19524426.21	112+00.55	7726906.26	19524901.11			
I80_P_9								152+64.43	7726556.30	19528949.89	160+36.21	7726489.84	19529718.80	168+06.16	7726515.53	19530490.16			
51		193+70.76	7726600.89	19533053.34															
Ramp A																			
RPA1461		1506+28.43	7727391.50	19524425.07															
RPA146_3								1507+21.07	7727391.78	19524517.71	1510+79.59	7727392.89	19524876.22	1514+23.02	7727221.54	19525191.14			
RPA146_6								1516+95.47	7727091.33	19525430.46	1519+27.55	7726980.41	19525634.32	1521+55.00	7726945.09	19525863.69			
RPA1468		1526+44.87	7726870.54	19526347.85															
Ramp B																			
RPB1461		2590+55.13	7726723.97	19522767.71															
RPB146_3								2595+66.19	7726731.17	19523278.72	2598+09.94	7726734.60	19523522.45	2600+48.34	7726651.37	19523751.55			
RPB146_6								2602+42.47	7726585.09	19523934.01	2604+14.51	7726526.35	19524095.71	2605+84.84	7726508.51	19524266.83			
RPB1468		2607+46.74	7726491.71	19524427.85															
Ramp C																			
RPC1461		3582+25.00	7726834.53	19521926.07															
RPC146_3								3592+25.00	7726915.09	19522922.82	3594+98.19	7726937.10	19523195.13	3597+68.03	7727031.33	19523451.55			
RPC1465		3608+05.20	7727389.07	19524425.08															
Ramp D																			
RPD1461		4507+14.55	7726492.77	19524427.85															
RPD146_3								4516+54.60	7726690.09	19525346.96	4519+54.52	7726753.04	19525640.19	4522+50.00	7726727.21	19525938.99			
RPD1465		4532+50.00	7726641.10	19526935.28															
Iowa 146																			
RTE1461		5050+00.00	7723296.52	19524437.73															
RTE1463		5086+71.00	7726967.50	19524426.38															
RTE1464		5120+00.00	7730296.48	19524416.09															
U.P. RR																			
UPRR1		6117+00.00	7726104.83	19526004.74															
UPRR3		6118+72.35	7726274.37	19526035.67															
UPRR4		6127+24.14	7727112.33	19526188.55															

SPIRAL OR CIRCULAR CURVE DATA

Name	Location	ΔSCS	Horizontal Alignment Data													Remarks
			Spiral Data								Curve Data					
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R	E	
I-80																
I80_P_3											5° 42' 01.7"	642.254	1283.449	12900	15.978	
I80_P_6											9° 33' 38.3"	476.671	951.129	5700	19.896	
I80_P_9											6° 50' 51.4"	771.78	1541.722	12900	23.066	
Ramp A																
RPA146_3											28° 43' 39.7"	358.517	701.95	1400	45.176	
RPA146_6											19° 47' 47.3"	232.080	459.533	1330	20.097	
Ramp B																
RPB146_3											20° 46' 15.6"	243.753	482.155	1330	22.152	
RPB146_6											14° 00' 40.7"	172.039	342.361	1400	10.531	
Ramp C																
RPC146_3											15° 33' 23.5"	273.193	543.025	2000	18.572	
Ramp D																
RPD146_3											17° 03' 24.4"	299.915	595.394	2000	22.362	

SUPERELEVATION DATA

See PV-300 Series

Road Identification	Circular Curve or Spiral Curve Name	Radius	Superelevation Data			Standard Road Plan	Section A-A	Section B-B	Section C-C	Section D-D	Section E-E	Section F-F	Case A	Case B	Case C	Case S	Case T	Case U	Remarks
			e	L	x														
		FT	%	FT	FT														
I-80	I80_P	5700	3.8	240	158	PV-304	99+23.43	99+55.03	100+81.43	102+07.83	102+39.43	103+21.43	102+49.43			102+70.90			
							115+26.55	114+94.95	113+68.55	112+42.15	112+10.55	111+28.55	112+00.55			111+79.08			
IA-146 Ramp A	A-1	1400	2.0	49	49	PV-303		1507+39.69	1507+66.64	1507+88.69									
							1515+06.32	1514+57.32	1514+23.02	1514+08.32									
IA-146 Ramp A	A-2	1330	6.0	186	62	PV-303	1516+27.27		1516+95.47	1517+51.27						1516+89.27	1516+89.27		
									1521+55.00	1520+99.20						1521+61.20	1521+61.20		
IA-146 Ramp B	B-1	1330	6.0	186	62	PV-303			2595+66.19	2596+21.99						2595+59.99	2595+59.99		
							2601+16.54		2600+48.34	2599+92.54						2600+54.54	2600+54.54		
IA-146 Ramp C	C-1	2000	5.4	168	62	PV-303			3592+25.00	3592+75.40									
							3598+23.63		3597+68.03	3597+17.63						3597+61.19	3597+61.19		
IA-146 Ramp D	D-1	2000	5.4	168	62	PV-303	4515+99.00		4516+54.60	4517+05.00						4516+61.44	4516+61.44		
									4522+50.00	4521+99.60									

N

STA. 68+07.52
End Transition Paving
Begin Paving

STA. 59+40.00
Begin Transition Paving

W.B. Interstate 80

E.B. Interstate 80

75+00
℄139'

67+31±℄
℄138'

58+65±℄
℄170'

56+28
℄173'

54+10.38℄
℄127'±EX.R/W

STA. 48+20.78
Begin Transition Paving

STA. 55+00.00
Begin Paving

POND

1

POWESHIEK ANIMAL LEAGUE
SHELTER & HUMANE SOCIETY

2

CARL E. EVANS

3

CARL E. EVANS LIFE ESTATE
MICHAEL EUGENE EVANS REM.
BEVERLY ANN LLOYD REM.

0 FEET 100

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 3-06-19
Color Legend:
- **Property Lines**
- **Temporary Easement**
- **Permanent Acquisition**

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.1

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N

10

WATERFORD GROUP LLC

Sect. No. 32

3600

3595

95

100

Ramp C

W.B. Interstate 80

CHA IM 080

E.B. Interstate 80

600

Ramp B

Interstate 80

IM 080

E.B. Interstate 80

75+00
℄139'

80+52±℄
℄165'

85+65
℄166'

86+82
℄151'±EX.R/W

89+32
℄171'EX.R/W

88+53
℄185'

87+25
℄155'±EX.R/W

93+68±℄
℄193'

93+66±℄
℄218.26'

94+65
℄185'

94+63.94
℄210.17'

98+55
℄250'±EX.R/W

99+41±
℄290.0

PERMANENT EASEMENT FOR UTILITY PURPOSES

3

CARL E. EVANS LIFE ESTATE
MICHAEL EUGENE EVANS REM.
BEVERLY ANN LLOYD REM.

4

RONALD EUGENE MORRISON

5

DONALD E. MORRISON TRUST,
DONALD E. MORRISON & IRENE L. MORRISON
REVOCABLE TRUST

0 100
FEET

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 3-06-19
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.2

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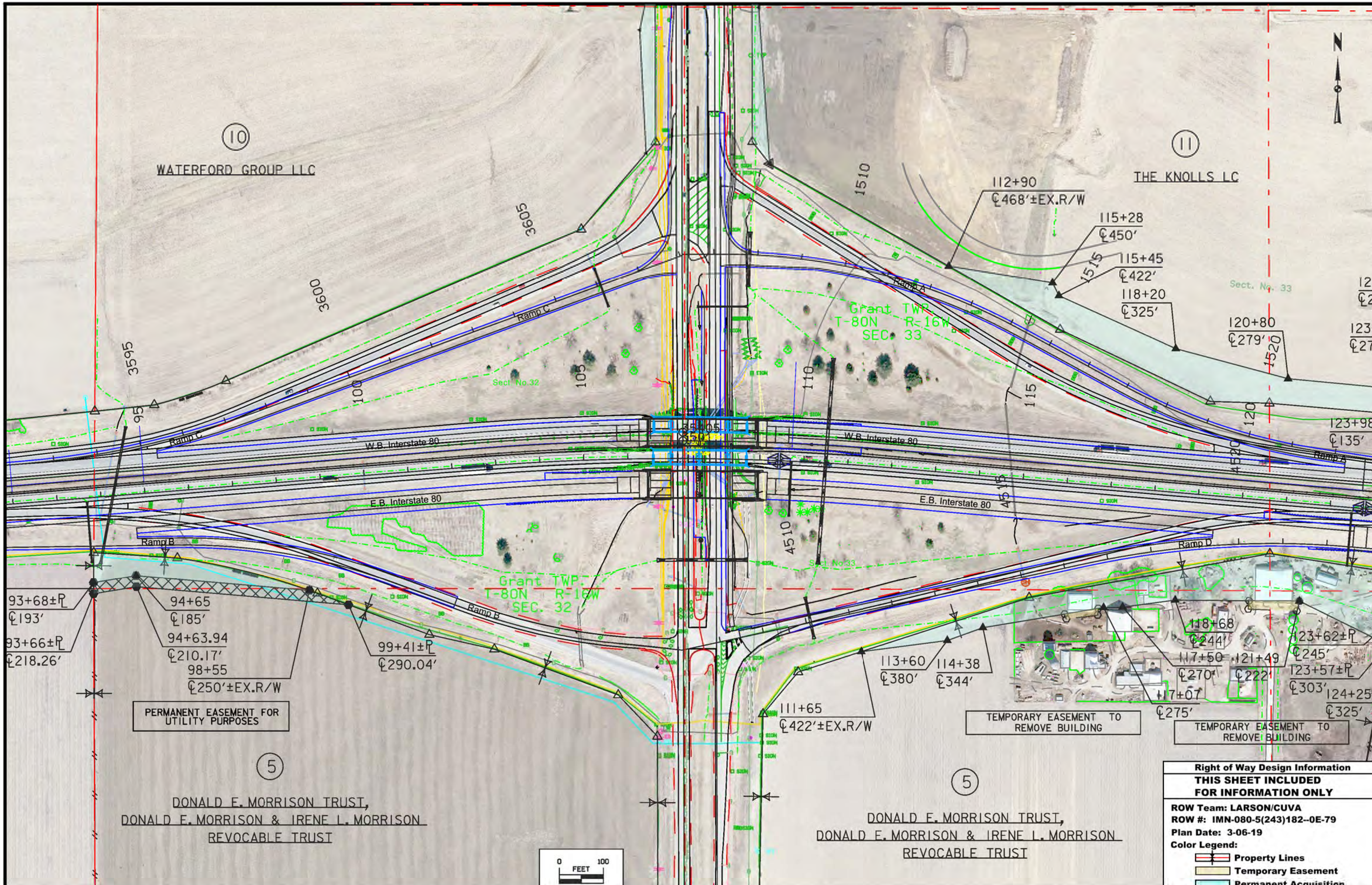

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 3-06-19
Color Legend:
- Property Lines
- Temporary Easement
- Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.3

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(11)
THE KNOLLS LC

115+28
℄450′
115+45
℄422′
118+20
℄325′
120+80
℄279′
123+45
℄277′
124+10±℄
℄260′
Sect. No. 33

(6R)
UNION PACIFIC RAILROAD

125+08±℄
℄235′
125+65
℄225′
128+65
℄220′
129+72
℄182′±EX.R/W
123+98±℄
℄135′
124+98±℄
℄130′

(12)
CAROLYN L. HASSELBRINK &
MARGARET E. IRVIN

118+68
℄244′
123+62±℄
℄245′
117+50
℄270′
121+49
℄222′
123+57±℄
℄303′
124+25
℄325′
117+07
℄275′
125+45
℄207′
124+74±℄
℄120′
125+50
℄285′
123+74±℄
℄120′
124+62±℄
℄250′
124+54±℄
℄334.41′
124+67
℄475′
124+40±℄
℄480′
133+99±℄
℄154′
135+98
℄165′

TEMPORARY EASEMENT TO
REMOVE BUILDING

(6R)
UNION PACIFIC RAILROAD

PERMANENT EASEMENT FOR
DRAINAGE PURPOSES

TEMPORARY EASEMENT TO
SHAPE

(7)
ROBERT DUANE MORRISON

(8)
PALMETTO MOON ENTERPRISES LLC

0 100
FEET

Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY
ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 6-18-19
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.4

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Ramp D

116+25
℄308'

116+20
℄297'±PROP.R/W

116+95
℄278'±PROP.R/W

116+95
℄293'

TEMPORARY EASEMENT TO
REMOVE BUILDING

5

DONALD E. MORRISON TRUST
DONALD E. MORRISON & IRENE L. MORRISON
REVOCABLE TRUST

120+35
℄231'±PROP.R/W

120+35
℄250'

TEMPORARY EASEMENT TO
REMOVE BUILDING

121+49
℄222'

121+45
℄245'

0 FEET 20

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 3/06/19
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.5

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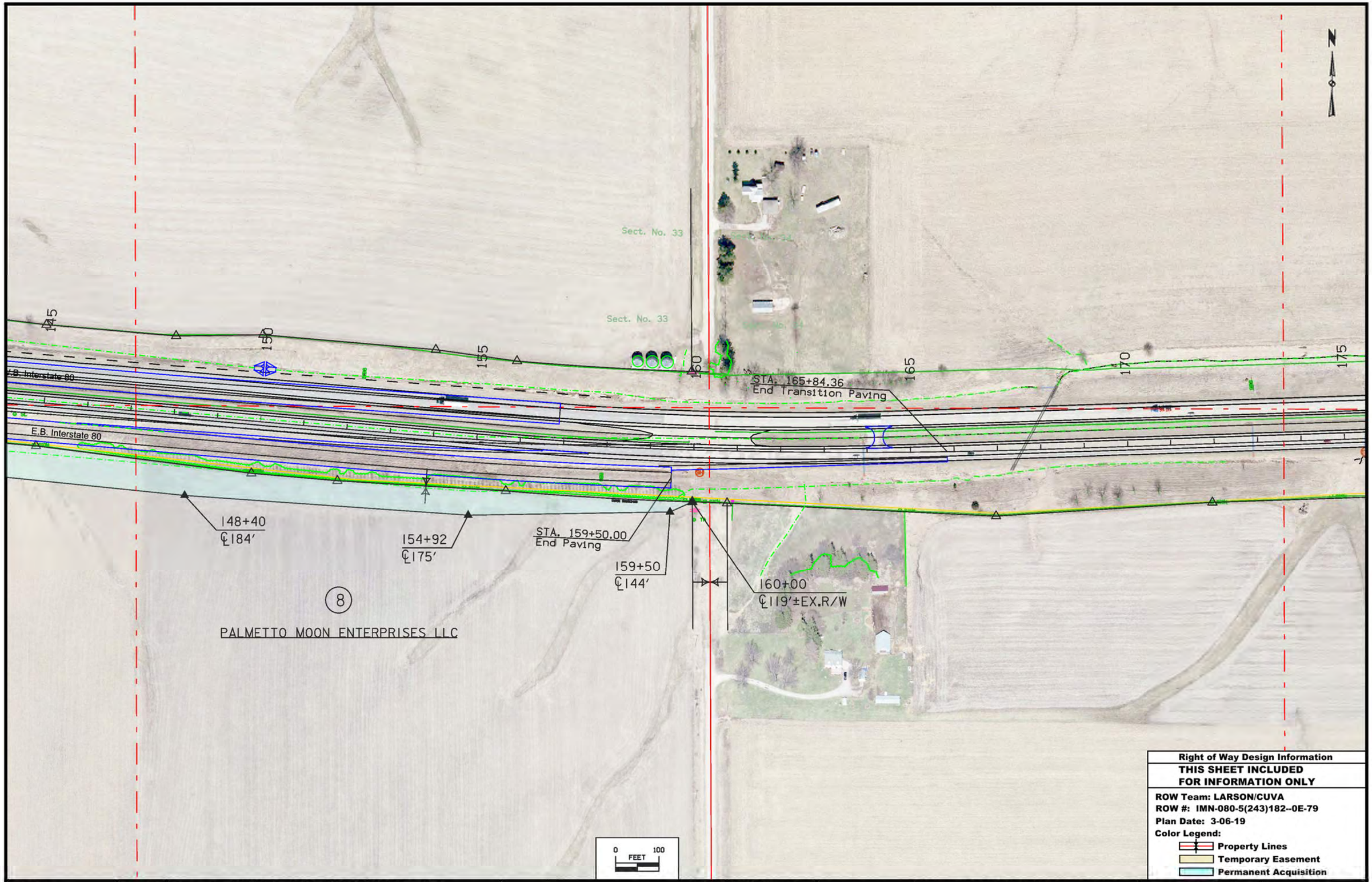

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER H.6

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10

WATERFORD GROUP LLC

Sect. No.32

103

5090

5095

5100

Sect. No. 33

5093+25
℄81'±EX.R/W

5096+05
℄95'

5097+45
℄66'±EX.R/W

5097+25
℄160'

5096+55
℄175'

5092+99.89(EX.R/W COR.)
℄199.16'

110

11

THE KNOLLS LC

Grant Twp
T-80N
SEC 32

0 FEET 50

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON/CUVA
ROW #: IMN-080-5(243)182--0E-79
Plan Date: 3-06-19
Color Legend:
- Property Lines
- Temporary Easement
- Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER HE.1

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108-26A
08-01-08

STAGING NOTES

Interstate 80 is a high volume roadway, construction activity in the area will disrupt traffic on Interstate 80 and Highway 146. Therefore, it is advisable to adopt a construction sequence that directs activities in an orderly manner and minimizes disruptions to traffic as much as practical.

It is recognized that as the various activities related to construction progress, certain situations may arise which will preclude adhering to the original construction sequence or which, in the opinion of the Contractor, should result in more efficient staging operations. Should the Contractor desire to deviate from the original plan, they shall submit a written alternative plan to the Resident Construction Engineer for approval.

General:
1. Refer to staging typical sections and details shown on other J Sheets.
2. Coordinate traffic control with Iowa DOT and Poweshiek County projects listed in Tabulation 111-01 and other projects in the area.

HIGHWAY 146 - TRAFFIC SHIFTS (MULTIPLE STAGES)
- Bridge beam installation shall occur during night time hours between 10:00 PM and 5:00 AM. Implement temporary road closures during beam installation per Standard Road Plan TC-451.

- Other bridge construction activities shall coincide with temporary lane and/or shoulder closures on NB/SB Highway 146. Install traffic control per Standard Road Plan TC-418. Do not impede NB/SB Highway 146 traffic using the exit and entrance ramps for I-80 during traffic shifts.

STAGE 1
Highway 146
- Construct bridge berms including IFI's and drainage improvements.

- Relocate sanitary sewer.

STAGE 2
Union Pacific Railroad
- Construct bridge berms including IFI's.

- Install drainage structures.

STAGE 3
Interstate 80
- Install traffic control to close shoulder at work areas designated in J Sheets prior to culvert construction or construction of other work to be completed within work area. Traffic control is only necessary if actively working in the designated work area.

- Construct culverts as shown on D and V Sheets.

STAGE 4
Interstate 80
- Perform eastbound lane grading as designated on J Sheets.

STAGE 5
Interstate 80
- Install traffic barrier along length of the bridge over Union Pacific Railroad per Modified Standard Road Plan TC-421 prior to beginning any bridge work.

- Coordinate bridge beam setting and decking operations over Union Pacific Railroad tracks with Owner.

- Remove existing pavement adjacent to Union Pacific Railroad bridge. Refer to IM-NHS-080-5(260)182--03-79 bridge plans for details.

108-23A
08-01-08

TRAFFIC CONTROL PLAN

In order to minimize vehicle traffic congestion, the contractor shall comply with the following restrictions, for the limits of construction.

Shoulder and/or lane closures (per Standard Road Plans TC-402, & TC-451) will be necessary for construction.

Traffic on Ramps A, B, C, and D will be maintained.

Use Portable Dynamic Message Signs (PDMS).

I-80
1. The Contractor shall maintain two lanes of traffic in both directions on I-80 at all times.

IA 146
1. Bridge beam setting over Highway 146 shall be during night time hours between 10:00 PM and 5:00 AM. Traffic will be maintained on Highway 146 at all times, other than when setting beams.

113-2
04-16-13

PEDESTRIAN PATH CLOSURES

Refer to TC-601.

*Assumes 6 foot wide barricade.
Closures may need to be removed and re-established.

Location	Side	Type III Barricades* No.	Remarks
Highway 146, Sta. 5086+67.45	R	1	

111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
IM-NHS-080-5(260)182--03-79	UPRR Bridge
IM-NHS-080-5(355)182--03-79	146 Bridge

108-25
10-21-14

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No travel restriction expected									

108-23B
10-17-17

* This is to only be used in conjunction with Tabulation 108-23A
Shaded area indicates times that road closures are not allowed

TRAFFIC CONTROL CLOSURE TABLE(S)

IA 146 Bridge Work

	AM																							Noon	PM																							
	12:00	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30
SUN																																																	
MON																																																	
TUE																																																	
WED																																																	
THU																																																	
FRI																																																	
SAT																																																	

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

Pavement Removal

Proposed Granular Subbase

Proposed Special Backfill

Proposed Granular Shoulder

Temporary Shoulder

Existing Shoulder Strengthening

Permanent Barrier Rail

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

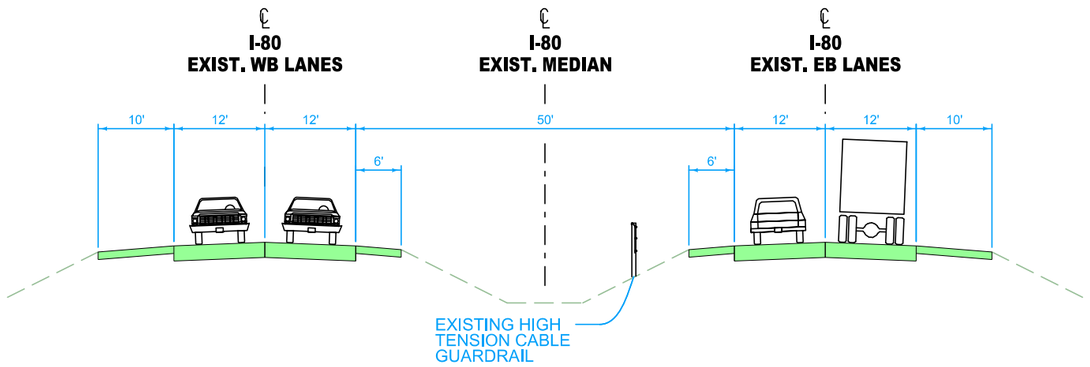
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Channelizing Device
- Drum
- Temporary Lane Separator
- Tubular Marker
- Channelizer Marker
- Concrete Barrier Marker
- Delineator
- Temporary Barrier Rail
- Pavement Removal
- Work Zone
- Crash Cushion
- Traffic Signal
- Flagger
- Temporary Floodlighting
- Traffic Sign
- Type III Barricade
- Type A Warning Light
- Direction of Traffic
- Safety Closure

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

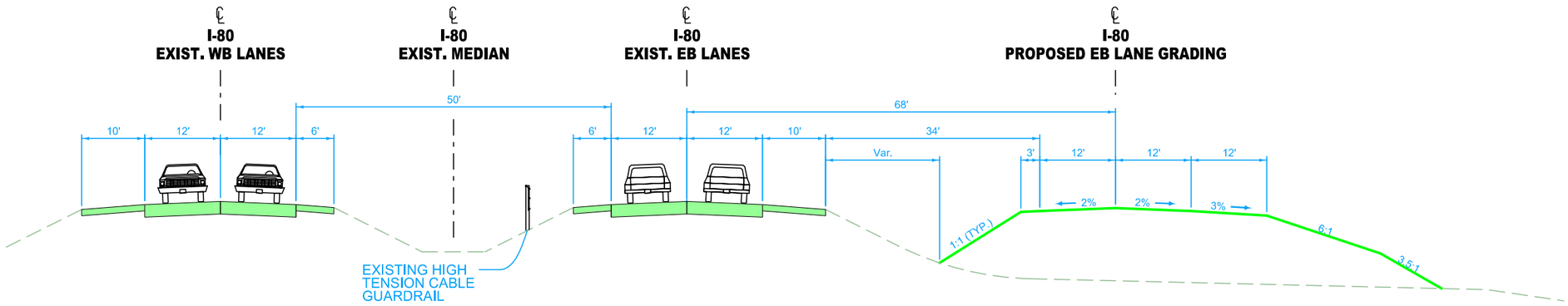
TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

TYPICAL 1
I-80



EXISTING TYPICAL SECTION
Shown Looking Eastbound

TYPICAL 2
I-80



EB GRADING TYPICAL SECTION
Shown Looking Eastbound

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.3

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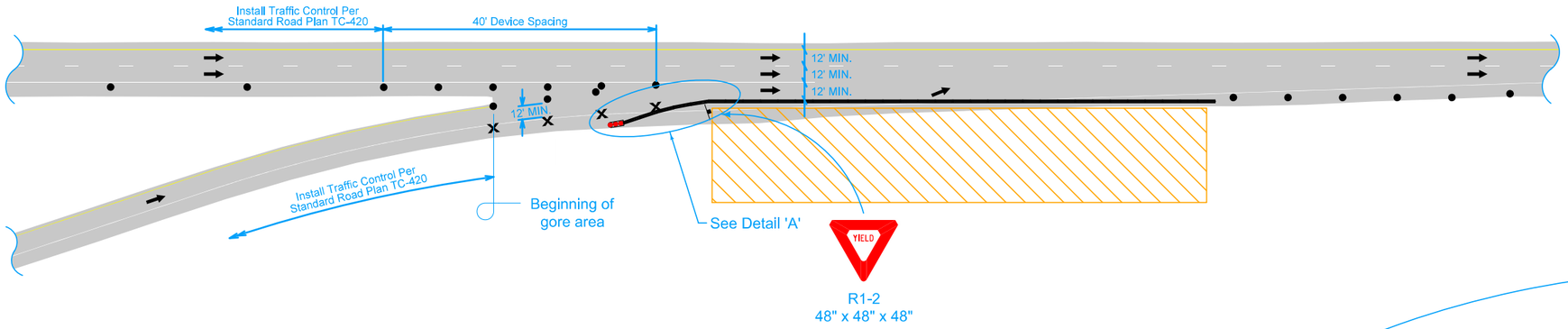
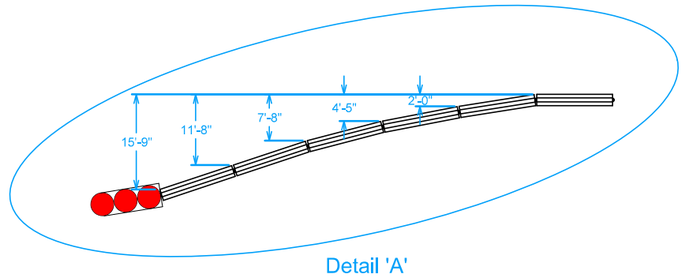
TYPICAL 3
I-80



LEGEND

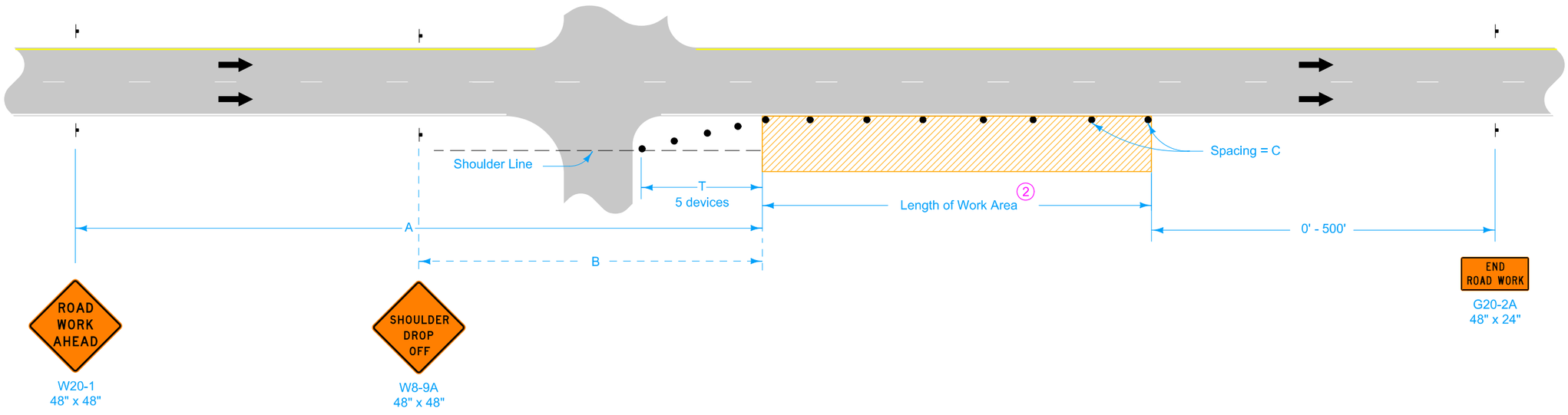
- Traffic Sign
- 42" Channelizer
- Work Area
- Direction of Traffic



Detail 'A'

LANE SHIFT THROUGH ENTRANCE RAMP
Ramp Traffic Shifted onto Gore

TYPICAL 4
I-80



LEGEND

- Traffic Sign
- 42" Channelizer
- Work Area
- Direction of Traffic

A	B	C (2)	T
700'	350'	80' (1)	45'

(1) When the length of a pavement edge drop-off is 1000 feet or less, the temporary fillet requirement of Article 1107.08 of the Standard Specifications does not apply. Reduce channelizer spacing to 40 feet.

(2) For work areas less than 200 feet long, use channelizers spaced at 20 foot centers or use a vehicle with an amber revolving light or amber strobe light.

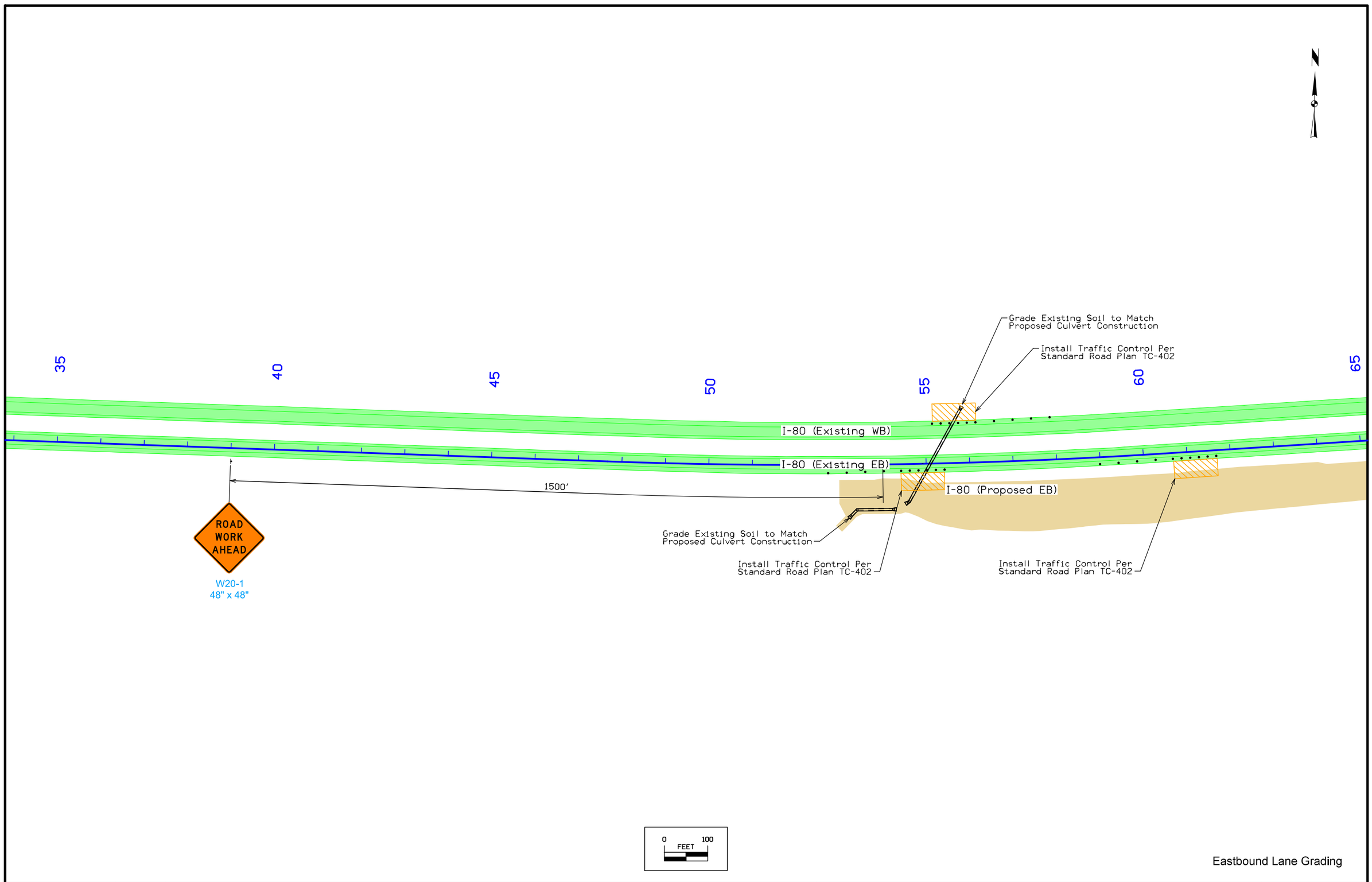
When a pavement edge drop-off exists, install a SHOULDER DROP-OFF sign.

No pavement edge drop-offs greater than pavement depth will be allowed during non-working hours.

Shoulder edge drop-offs shall be mitigated according to Article 1107.08.L2 of the Standard Specifications.

For work lasting less than one hour, refer to TC-1.

WORK WITHIN 15 FT OF TRAVELED WAY
Highway 146 and Ramp D



Eastbound Lane Grading

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.5

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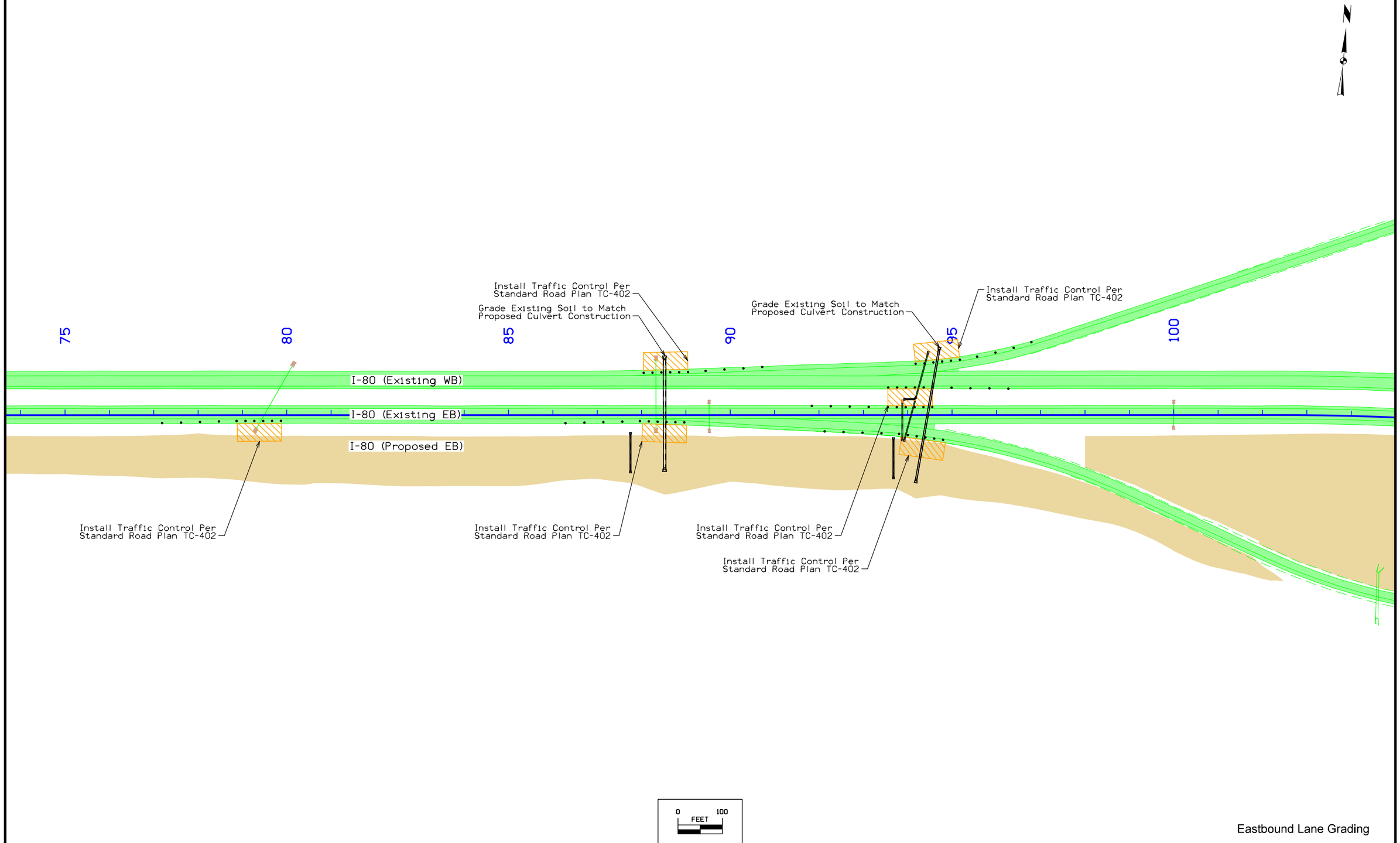

Eastbound Lane Grading

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.6

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105

110

115

120

125

130

Ramp A

Ramp D

I-80 (Existing WB)

I-80 (Existing EB)

I-80 (Proposed EB)

I-80 (Proposed EB)

Grade Existing Soil to Match Proposed Culvert Construction

Install Traffic Control Per Standard Road Plan TC-402

Grade Existing Soil to Match Proposed Culvert Construction

Install Traffic Control Per Standard Road Plan TC-402

Grade Existing Soil to Match Proposed Culvert Construction

Install Traffic Control Per Standard Road Plan TC-402

Grade Existing Soil to Match Proposed Culvert Construction

BE PREPARED TO STOP

W20-7B
48" x 48"

ROAD WORK AHEAD

W20-1
48" x 48"

YIELD

R1-2
48" x 48" x 48"

Install TBR on Pavement Adjacent to Bridge Construction Per Detail on J.4

Install Traffic Control Per Per Detail on J.4

Install Traffic Control Per Standard Road Plan TC-402

0 100
FEET

Eastbound Lane Grading

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.7

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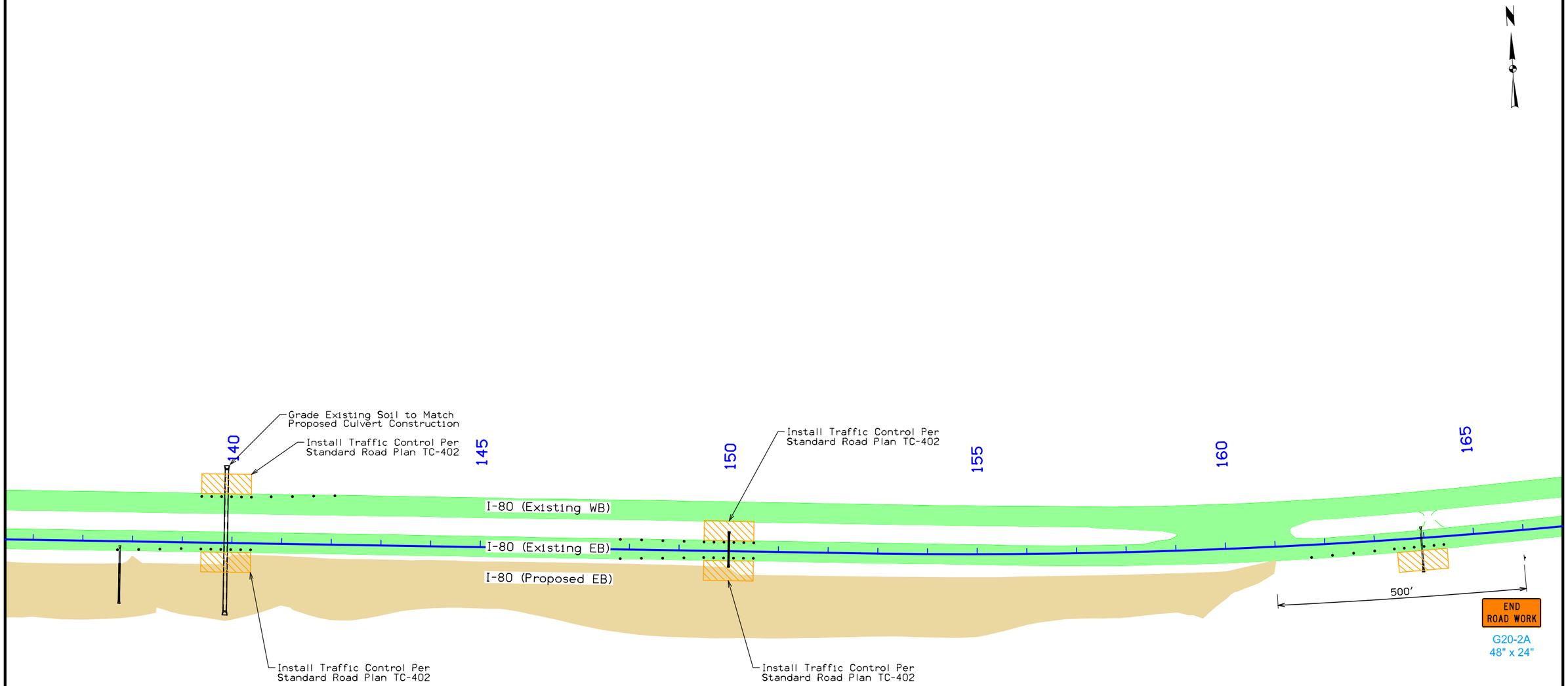

Eastbound Lane Grading

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.8

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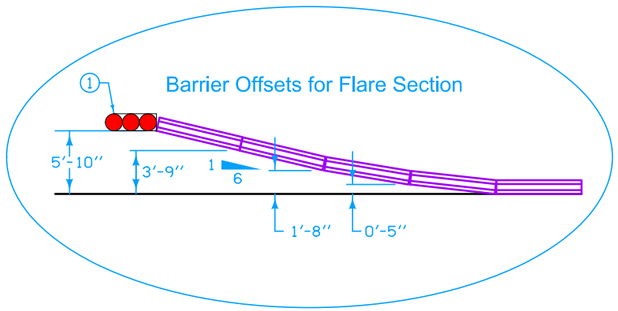

Detail 'A'

IA-146 (Existing SB)

8' SPACING

25' SPACING

Remove Existing Cable Guardrail

See Detail 'A'

See Detail 'A'

IA-146 (Existing NB)

NOTES:

Location of Temporary Barrier Rail to be approved by the Engineer.

Northbound Traffic: Install Temporary Barrier Rail on granular shoulder.
Southbound Traffic: Close Ramp D turn lane for Temporary Barrier Rail use.
Refer to TC-421.

Refer to BA-401 for Temporary Barrier Rail design and offset.

(1) Refer to Standard Road Plan BA-500

0 20 FEET

Staging Plan
TBR at Highway 146 Median
During Bridge and Culvert Construction

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.9

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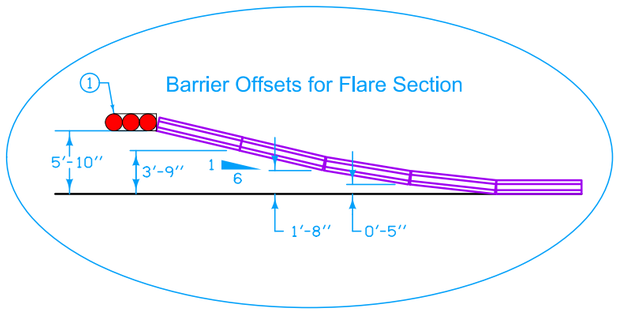

Detail 'A'

IA-146 (Existing SB)

IA-146 (Existing NB)

25' SPACING

25' SPACING

See Detail 'A'

See Detail 'A'

NOTES:

Location of Temporary Barrier Rail to be approved by the Engineer.

Northbound Traffic: Install Temporary Barrier Rail on granular shoulder.
Southbound Traffic: Close Ramp D turn lane for Temporary Barrier Rail use.
Refer to TC-421.

Refer to BA-401 for Temporary Barrier Rail design and offset.

(1) Refer to Standard Road Plan BA-500

0 20 FEET

Staging Plan
TBR at Highway 146 Median
During Bridge Construction / Demolition

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	J.10

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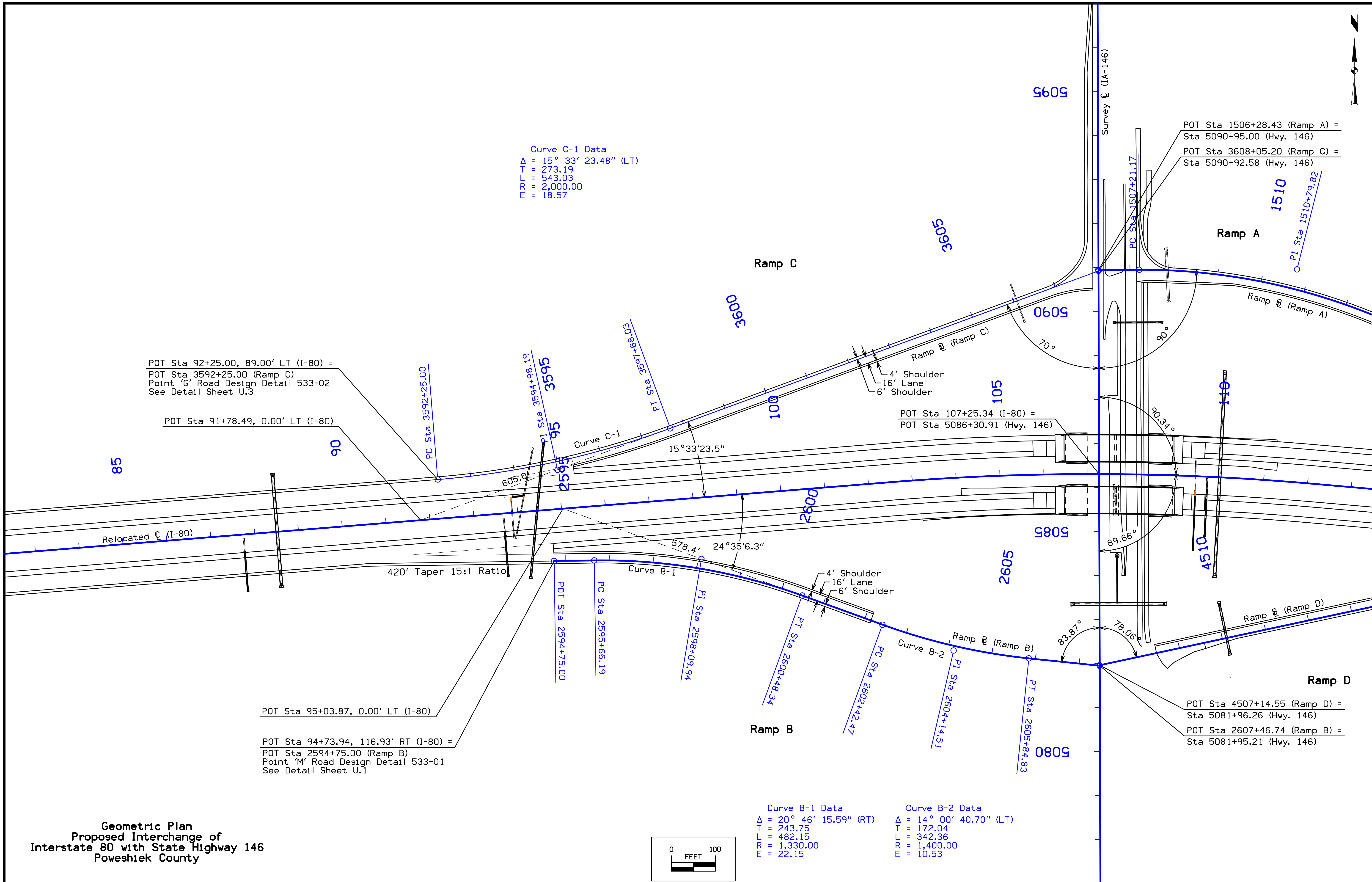

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER K.1

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Survey ℄ (IA-146)

POT Sta 1506+28.43 (Ramp A) =
Sta 5090+95.00 (Hwy. 146)

POT Sta 3608+05.20 (Ramp C) =
Sta 5090+92.58 (Hwy. 146)

PC Sta 1507+21.17

PI Sta 1510+79.82

Curve A-1 Data
Δ = 28° 44′ 17.10″ (RT)
T = 358.65
L = 702.20
R = 1,400.00
E = 45.21

Curve A-2 Data
Δ = 19° 48′ 24.64″ (LT)
T = 232.20
L = 459.77
R = 1,330.00
E = 20.12

Ramp A

Ramp C

70°

90°

Ramp ℄ (Ramp A)

Curve A-1

PT Sta 1514+23.37

4′ Shoulder
16′ Lane
6′ Shoulder

PC Sta 1516+95.24

PI Sta 1519+27.44

Curve A-2

PT Sta 1521+55.01

POT Sta 1522+25.00

POT Sta 122+26.06, 116.93′ LT (I-80) =
POT Sta 1522+25.00 (Ramp A)
Point 'M' Road Design Detail 533-01
See Detail Sheet U.1

POT Sta 122+38.13, 0.00′ LT (I-80)

POT Sta 107+25.34 (I-80) =
POT Sta 5086+30.91 (Hwy. 146)

89.66°

23°36′38″

420′ Taper 15:1 Ratio

574.2′

603.3′

90.34°

17°3′24.4″

Curve D-1

4′ Shoulder
16′ Lane
6′ Shoulder

Ramp ℄ (Ramp D)

PC Sta 4516+54.60

PI Sta 4519+54.52

PT Sta 4522+50.00

Relocated ℄ (I-80)

83.87°

78.06°

Ramp D

POT Sta 4507+14.55 (Ramp D) =
Sta 5081+96.26 (Hwy. 146)

POT Sta 2607+46.74 (Ramp B) =
Sta 5081+95.21 (Hwy. 146)

POT Sta 122+40.16, 0.00′ LT (I-80)

POT Sta 122+50.00, 89.00′ RT (I-80) =
POT Sta 4522+50.00 (Ramp D)
Point 'G' Road Design Detail 533-02
See Detail Sheet U.3

PT Sta 2605+46.83

Ramp B

Curve D-1 Data
Δ = 17° 03′ 24.45″ (RT)
T = 299.92
L = 595.39
R = 2,000.00
E = 22.36

0 100
FEET

Geometric Plan
Proposed Interchange of
Interstate 80 with State Highway 146
Poweshiek County

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	K.2

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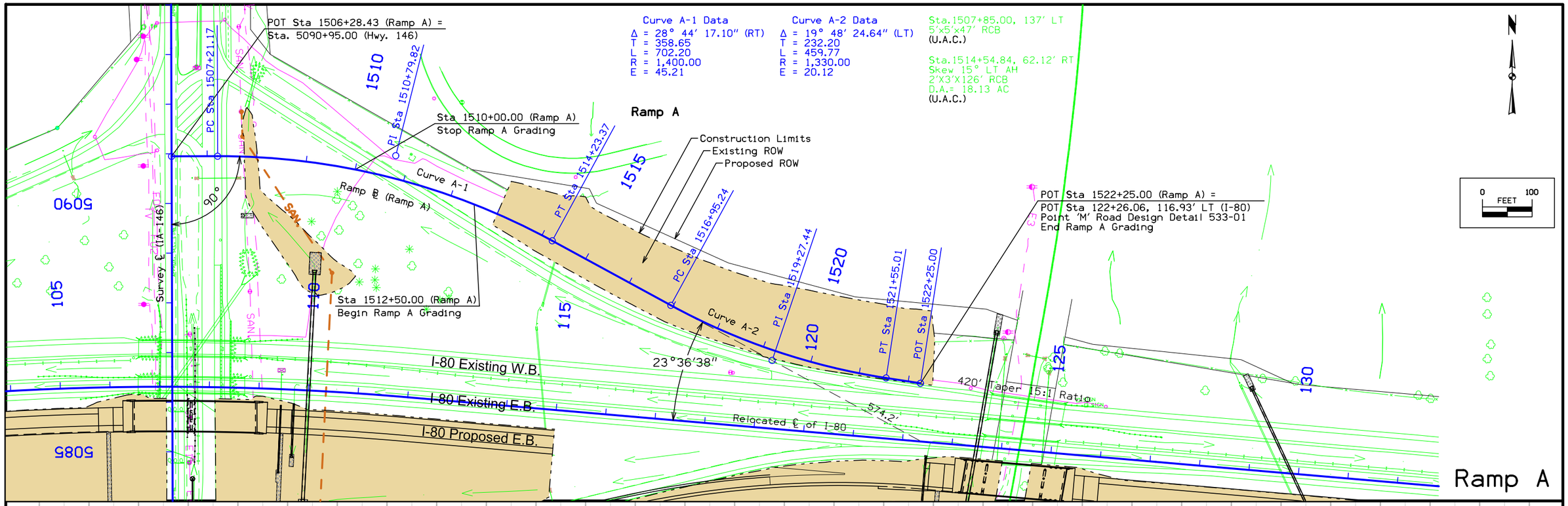

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	K.3

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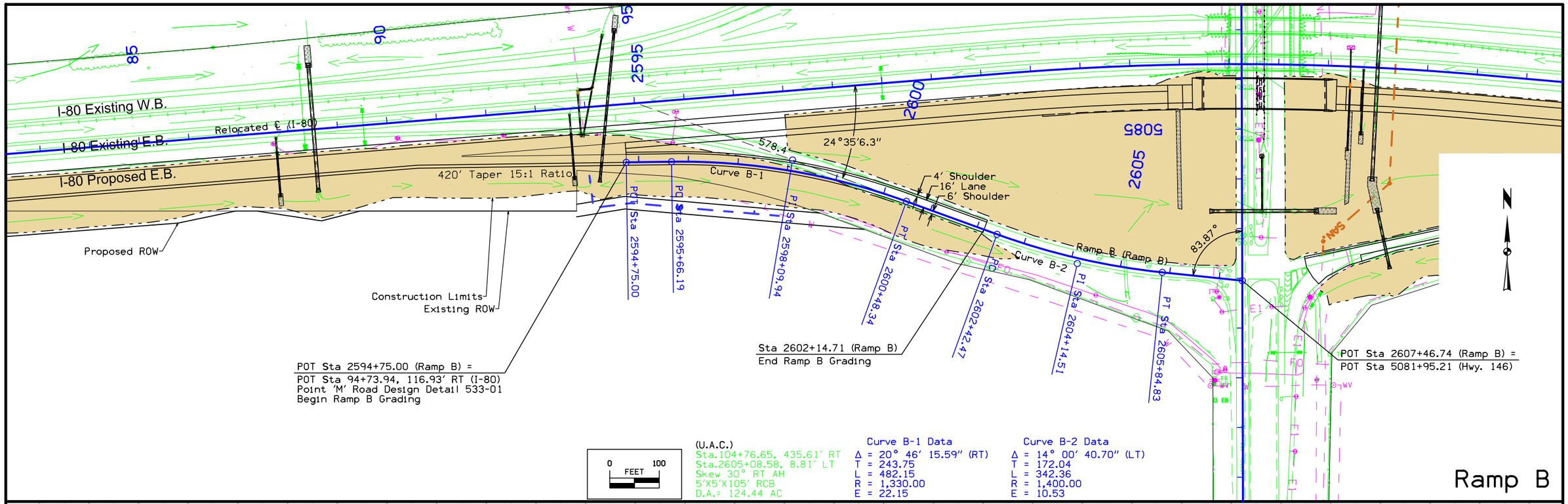

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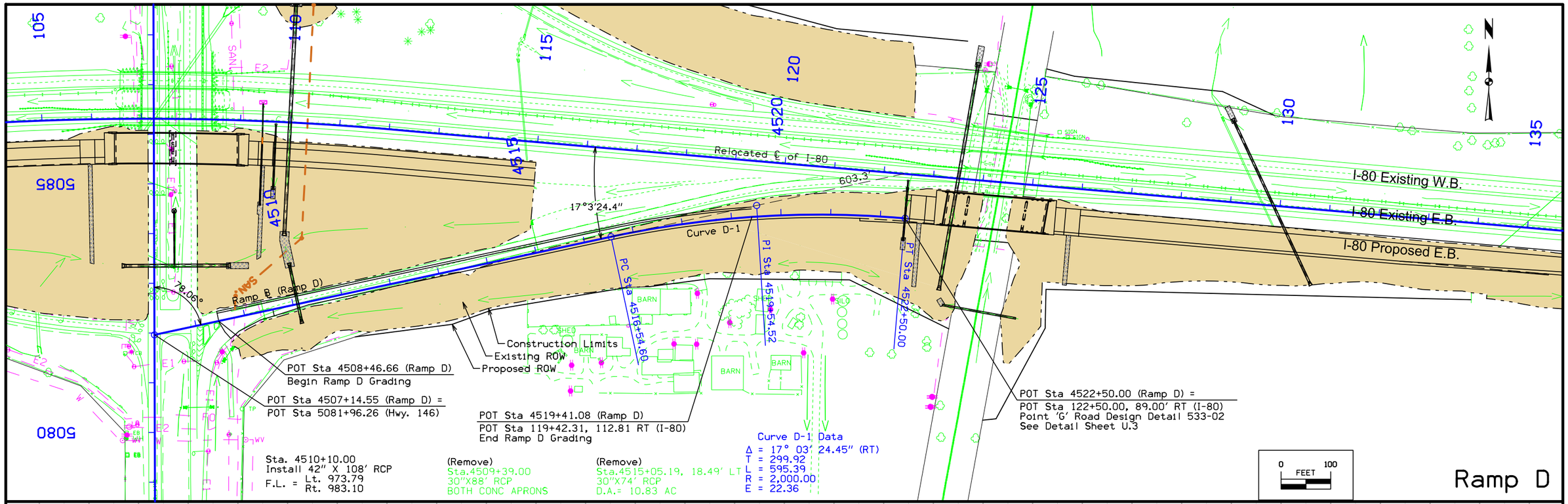

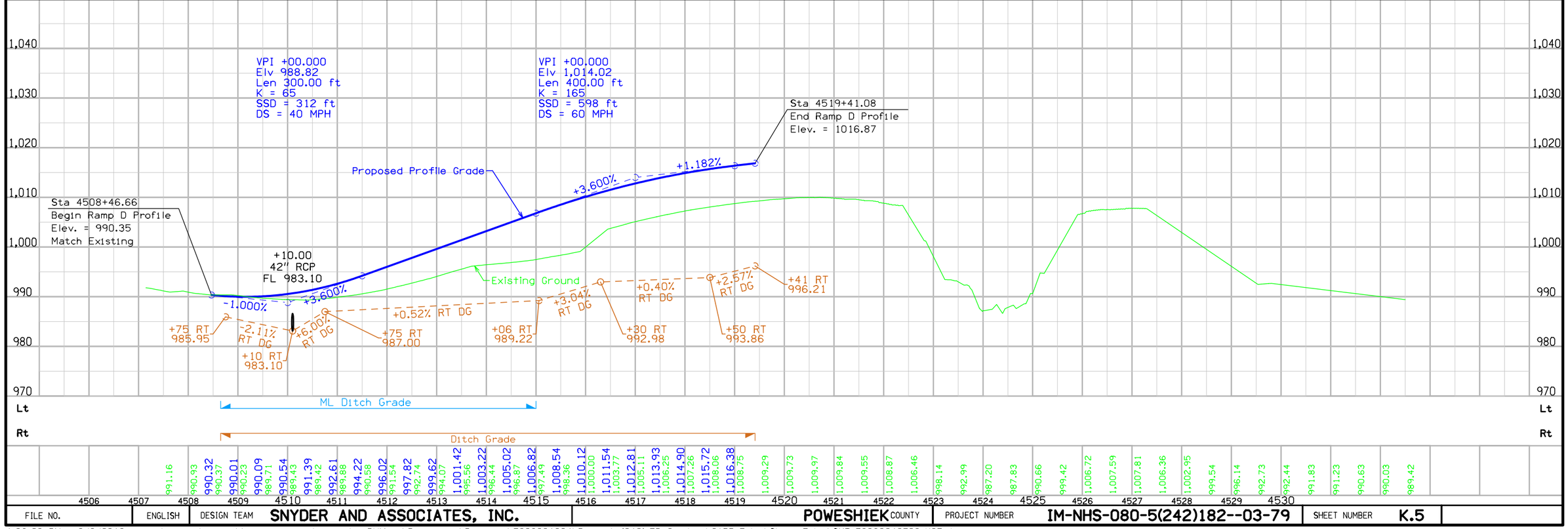

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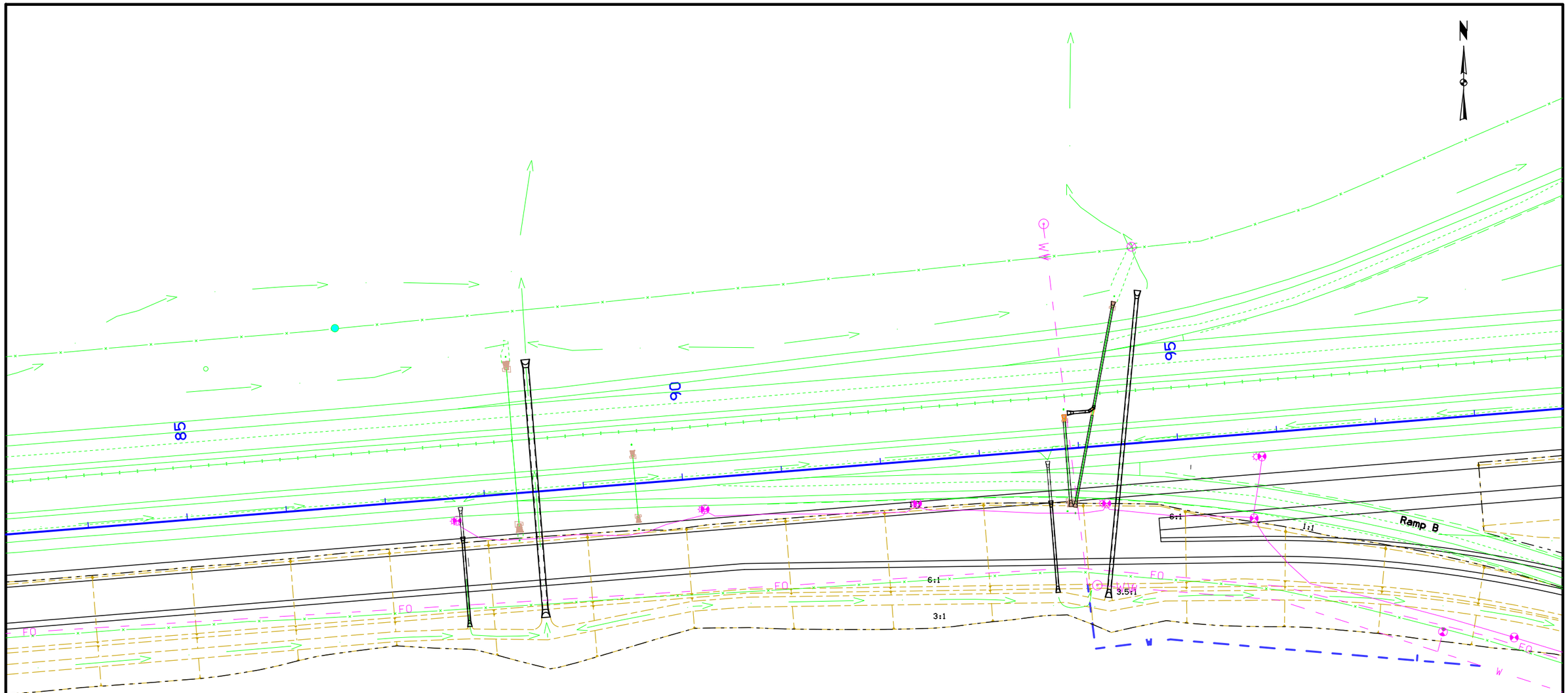

0 FEET 50

I-80 WITH IA 146
INTERCHANGE GRADING PLAN
RAMP B

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	K.6

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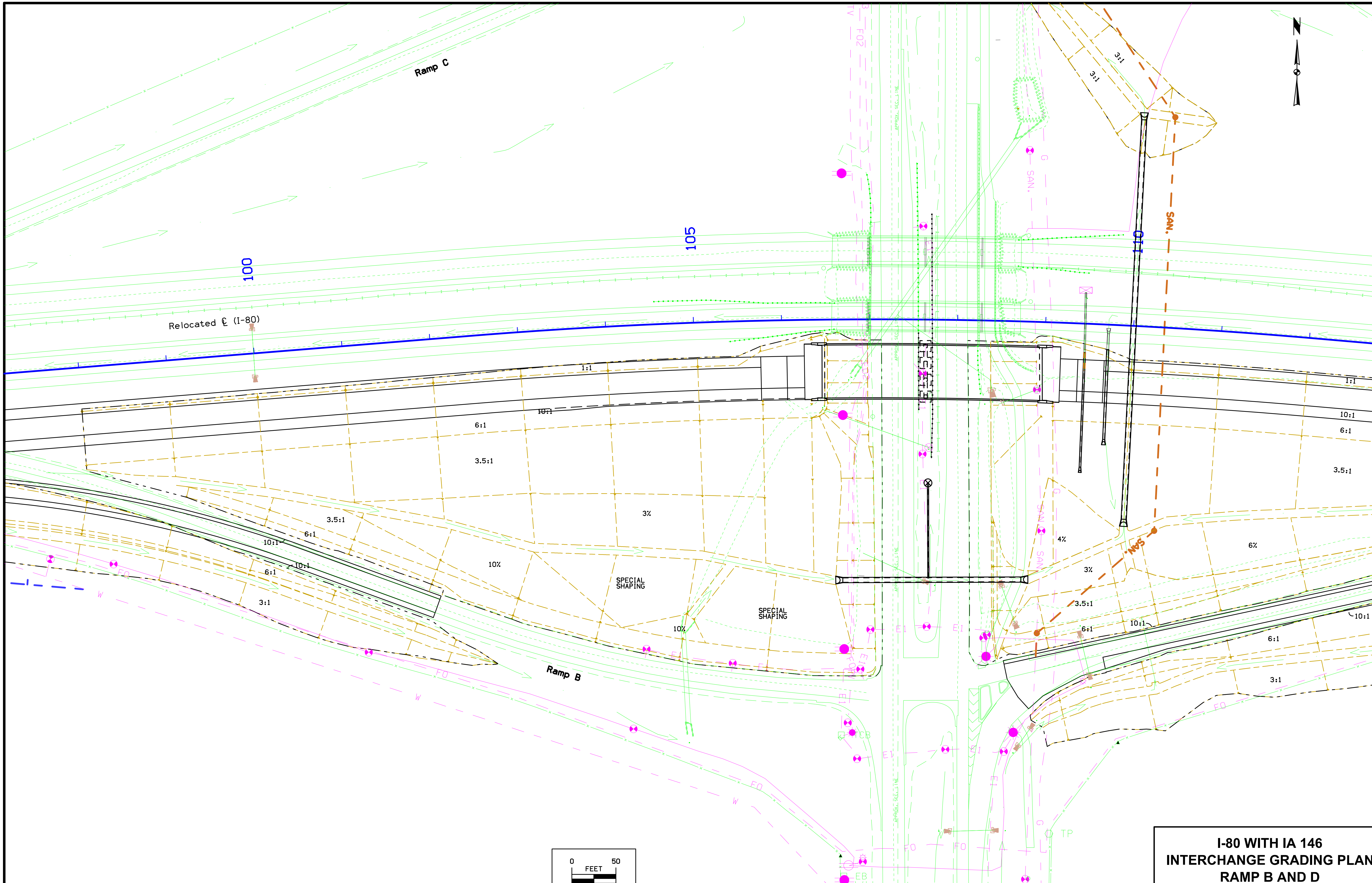

I-80 WITH IA 146
INTERCHANGE GRADING PLAN
RAMP B AND D

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER K.7

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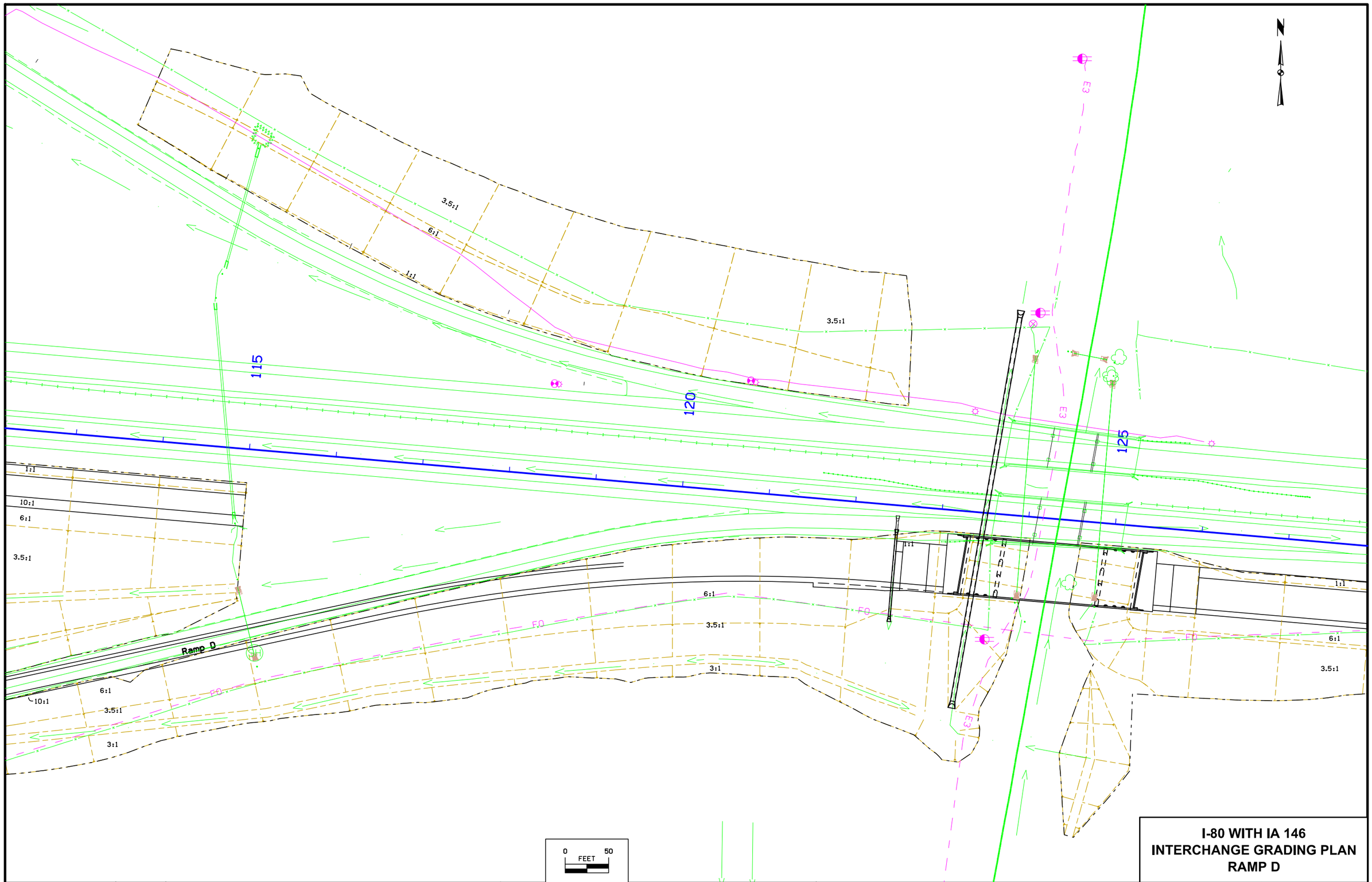

I-80 WITH IA 146
INTERCHANGE GRADING PLAN
RAMP D

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	K.8

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I-80 WITH IA 146
INTERCHANGE GRADING PLAN
RAMP A AND D

0 FEET 50

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	K.9

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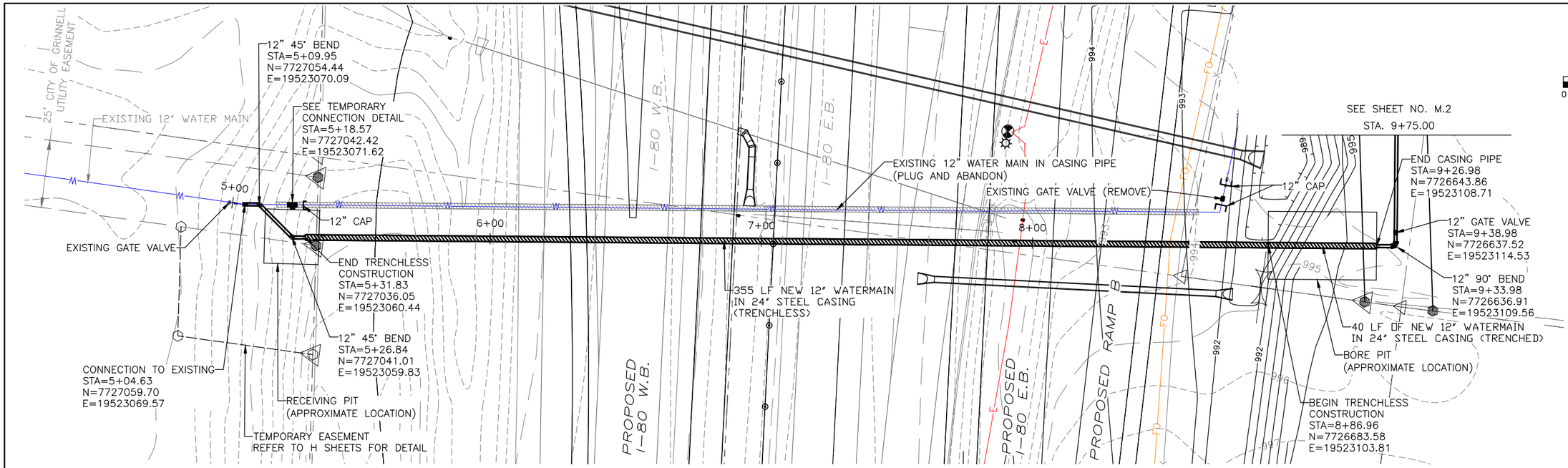
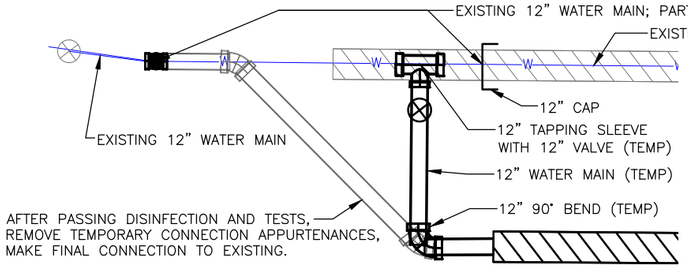


RIGHT OF WAY LEGEND

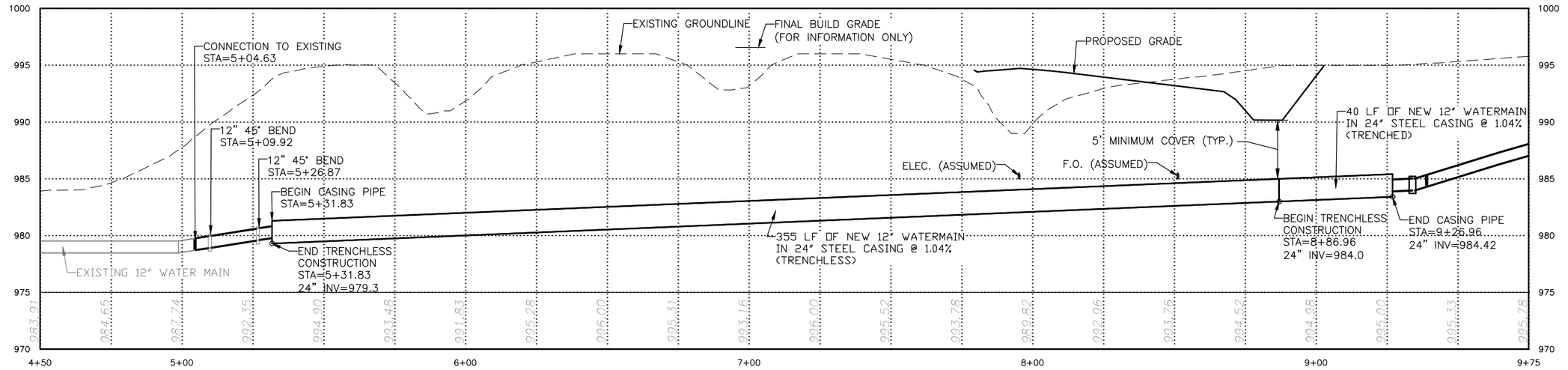
- Proposed Right of Way
- Existing Right of Way
- Existing and Proposed Right of Way
- Easement and Existing Right of Way
- Easement (Temporary)
- Easement
- Property Line



TEMPORARY CONNECTION DETAIL STA. 5+18.57

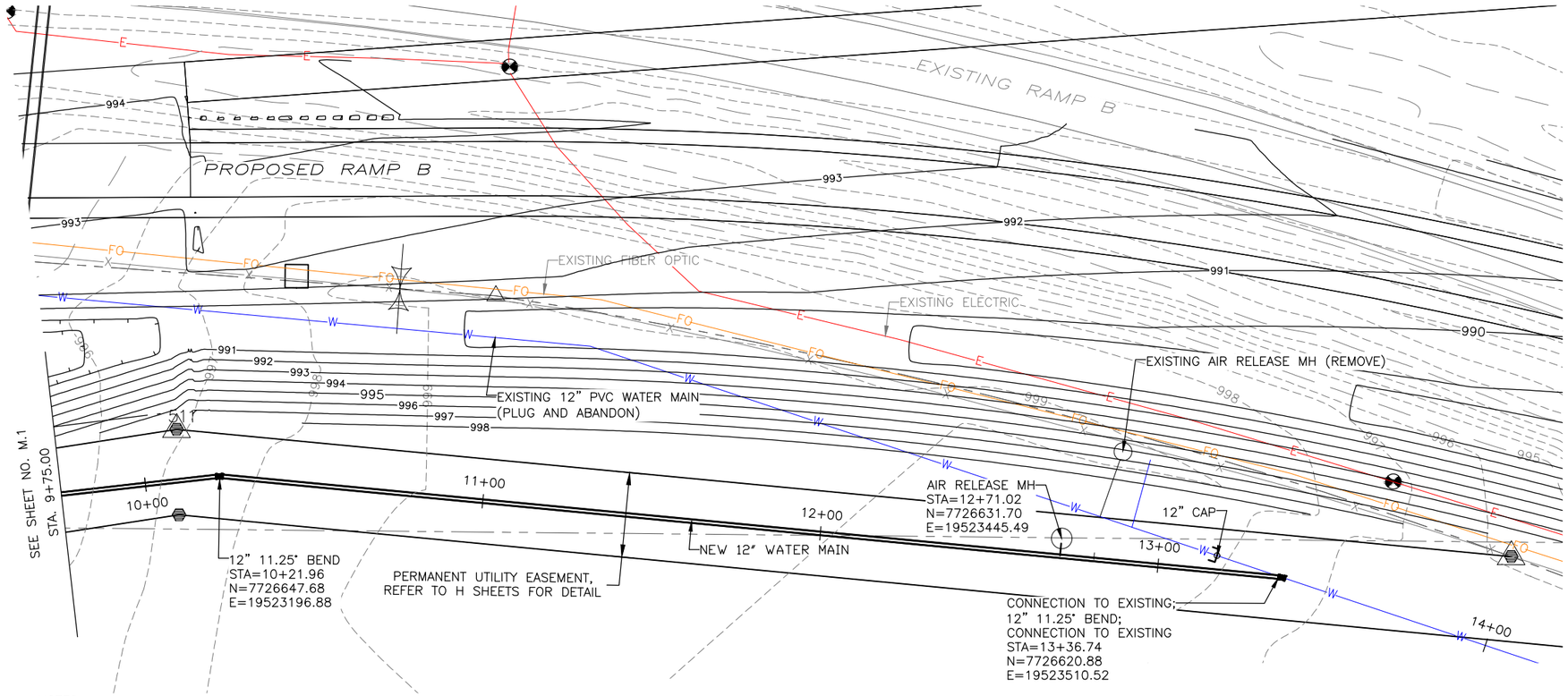
NOTES:

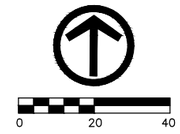
1) PLUGGING AND ABANDONMENT OF EXISTING WATER MAIN SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF NEW WATER MAIN. INCLUDES PIPE REMOVAL AT LIMITS OF ABANDONMENT TO ALLOW FOR NEW CONSTRUCTION. CAPS AND PLUGS USED WILL NOT BE MEASURED FOR PAYMENT.
2) CONNECTIONS TO EXISTING SHALL BE MADE OVER THE WEEKEND. SHUT DOWNS REQUIRE 2 WEEK NOTIFICATION AND COORDINATION WITH CITY AND GRINNELL MUTUAL.
3) REFER TO ADDITIONAL WATER MAIN NOTES AND DETAILS ON M.4 – M.5 SHEETS.
4) ALL JOINTS OF PIPE AND FITTINGS SHALL BE MECHANICAL RESTRAINED JOINT.
5) PROPOSED CONTOURS SHOWN FOR INFORMATIONAL PURPOSES, REFER TO OTHER SHEETS FOR GRADING.

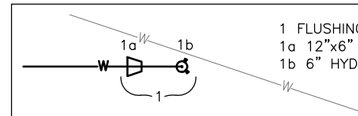


ENGLISH	IOWA DOT	DESIGN TEAM	Veenstra & Kimm, Inc.	POWESHEIK COUNTY	PROJECT NUMBER IM–NHS–080–5(242)182––03–79	SHEET NUMBER M.1

9/1/2019 12:20 PM V&K M:\PROJECTS\288151\288151–CIVIL\PRODUCTION DRAWINGS\288151 – M – WATER.DWG







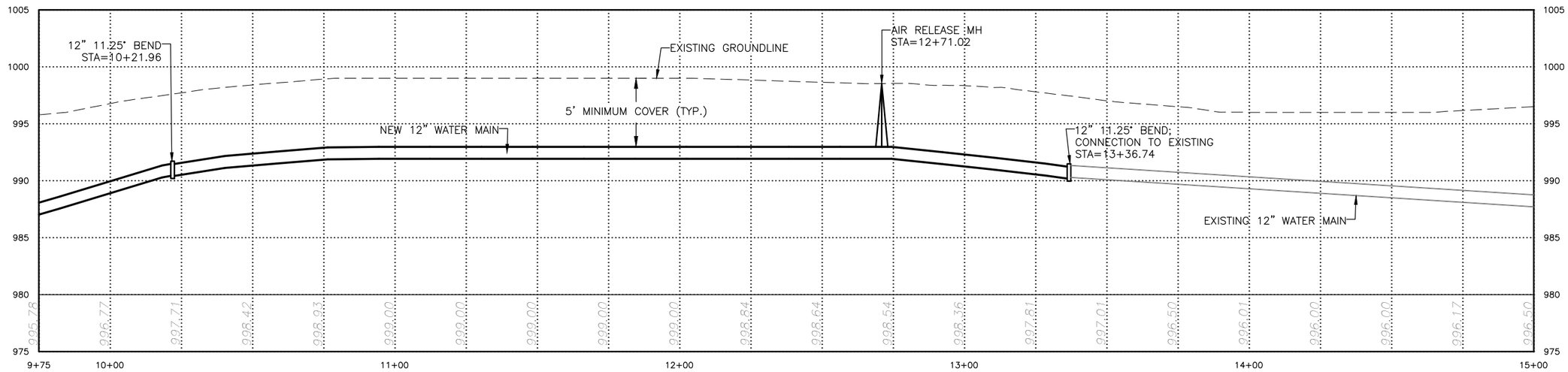
1 FLUSHING DEVICE (BLOWOFF)
1a 12"x6" REDUCER
1b 6" HYDRANT

FLUSHING DEVICE DETAIL 13+30

DISTANCE FROM REDUCER TO EXISTING MAIN SHALL BE < 20'.
CONNECT FROM REDUCER TO EXISTING WHEN PASSED.

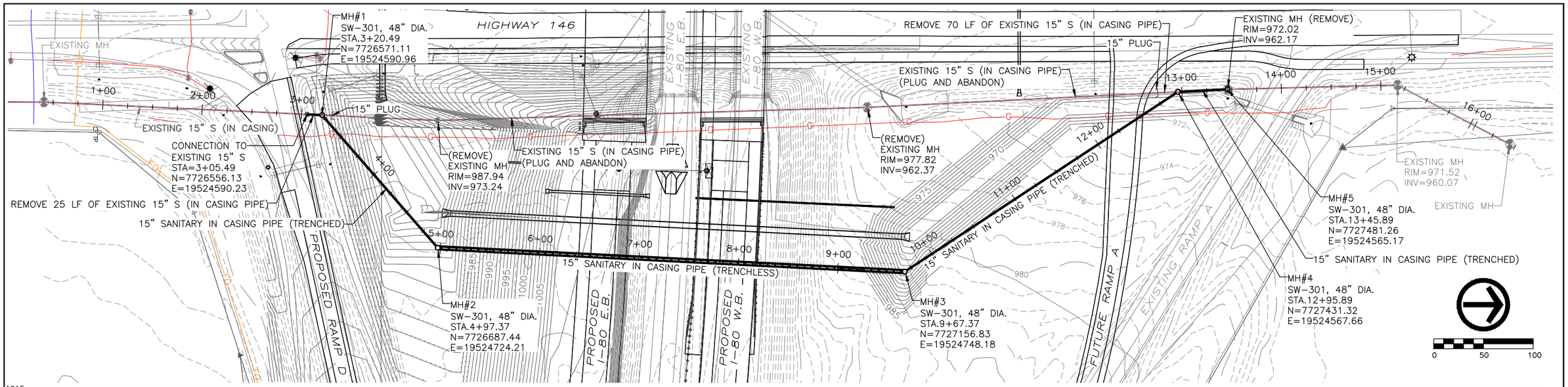
NOTES:

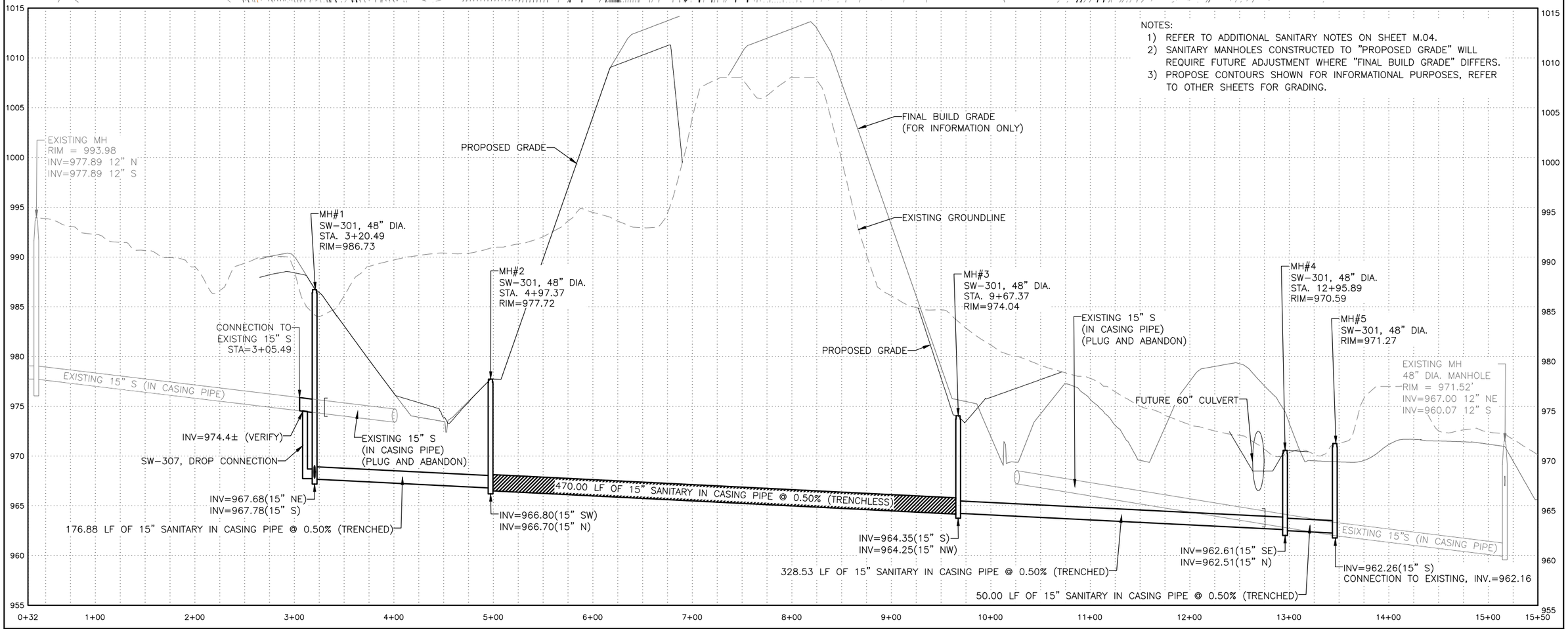
1) PLUGGING AND ABANDONMENT OF EXISTING WATER MAIN SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF NEW WATER MAIN. INCLUDES PIPE REMOVAL AT LIMITS OF ABANDONMENT TO ALLOW FOR NEW CONSTRUCTION. CAPS AND PLUGS USED WILL NOT BE MEASURED FOR PAYMENT.
2) CONNECTIONS TO EXISTING SHALL BE MADE OVER THE WEEKEND. SHUT DOWNS REQUIRE 2 WEEK NOTIFICATION AND COORDINATION WITH CITY AND GRINNELL MUTUAL.
3) REFER TO ADDITIONAL WATER MAIN NOTES AND DETAILS ON SHEETS M.4–M.5.
4) ALL JOINTS OF PIPE AND FITTINGS SHALL BE MECHANICAL RESTRAINED JOINT.
5) PROPOSED CONTOURS SHOWN FOR INFORMATIONAL PURPOSES, REFER TO OTHER SHEETS FOR GRADING.



ENGLISH	IOWA DOT	DESIGN TEAM	Veenstra & Kimm, Inc.	POWESHEIK COUNTY	PROJECT NUMBER IM–NHS–080–5(242)182––03–79	SHEET NUMBER M.2

9/1/2019 12:20 PM V&K M:\PROJECTS\288151\288151–CIVIL\PRODUCTION DRAWINGS\288151 – M – WATER.DWG





NOTES:
1) REFER TO ADDITIONAL SANITARY NOTES ON SHEET M.04.
2) SANITARY MANHOLES CONSTRUCTED TO "PROPOSED GRADE" WILL REQUIRE FUTURE ADJUSTMENT WHERE "FINAL BUILD GRADE" DIFFERS.
3) PROPOSE CONTOURS SHOWN FOR INFORMATIONAL PURPOSES, REFER TO OTHER SHEETS FOR GRADING.

ENGLISH	IOWA DOT	DESIGN TEAM	Veenstra & Kimm, Inc.	POWESHEIK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER M.3	REVISED

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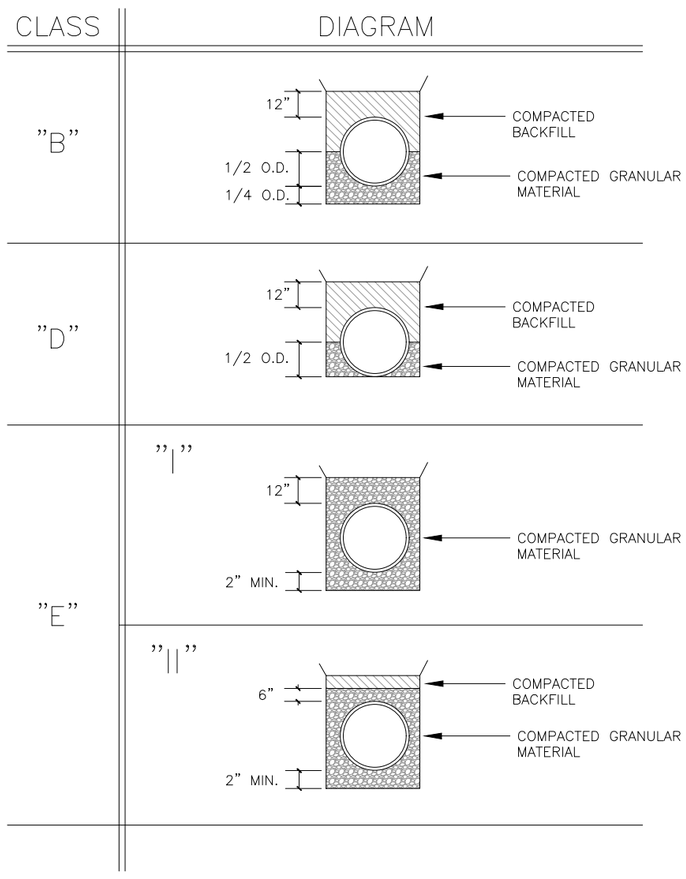
Pipe Envelope Requirements



WATER MAIN, FITTINGS, HYDRANTS AND VALVES (DIVISION 1)

VK-1
MODIFIED

Water Main Pipe							Fittings				Hydrant Assembly	Valves		
Pipe Diameter	Station to Station		Type of Pipe	Length LF	Installation Type	Notes	Type	Location (Sta.)	Orientation	Comments	Location (Sta.)	Types	Size (In.)	Location (Sta.)
12"	5+04.63	5+31.83	PVC	27.2	Trenched		12" 45 Deg Bend	5+09.95	Horz		13+30.00	Gate	12"	9+38.98
12"	5+18.57		PVC	12.9	Trenched	Temporary	12" 45 Deg Bend	5+26.84	Horz			Tapping	12"	5+18.57
12"	5+31.83	8+86.96	PVC	355.1	Trenchless	in casing pipe	12" 90 Deg Bend	5+26.84	Horz	Temporary				
12"	8+86.96	9+26.98	PVC	40.0	Trenched	in casing pipe	12" 90 Deg Bend	9+33.98	Horz					
12"	9+26.98	13+36.74	PVC	409.8	Trenched		12" 11.25 Deg Bend	10+21.96	Horz					
							12" 11.25 Deg Bend	13+36.74	Horz					

NOTES:
1) Refer to sheets M.1, M.2, and M.5 sheets for additional information.

SANITARY OR STORM SEWER ABANDONMENT OR REMOVAL

110-14
04-16-13

* Not a bid item

Location/Description	Sanitary or Storm Sewer	Abandonment, Plug Only or Abandonment, Plug and Fill or Removal	Length of Pipe ≤ 36 inch diameter LF	Length of Pipe > 36 inch diameter LF	Fill Material* Flowable Mortar or CLSM CY
Division 2					
3+20	Sanitary Sewer	Removal	25		
4+00 LT	Sanitary Sewer	Abandonment, Plug Only	105		
7+00 LT	Sanitary Sewer	Abandonment, Plug Only	430		
11+00 LT	Sanitary Sewer	Abandonment, Plug Only	360		
13+10	Sanitary Sewer	Removal	70		

NOTES:
1) Refer to sheet M.3 for additional information.

INTAKES AND UTILITY ACCESSES

104-5A
10-15-13

* Bid Item
** For SW-545

No.	Location Station	Type or Standard Road Plan*	Form Grade Elev.	Bottom Well Elev.	Extension Length** FT		Notes
	Division 2						
1	3+20.49	SW-301	986.73	967.18			Requires SW-307, Drop Connection
2	4+97.37	SW-301	977.72	966.20			
3	9+67.37	SW-301	974.04	963.75			
4	12+95.89	SW-301	970.59	962.01			Requires SW-601, Type C Casting
5	13+45.89	SW-301	971.27	961.66			Requires SW-601, Type C Casting

NOTES:
1) Refer to Sheet M.3 for additional information on Sanitary Sewer Structures.
2) Form Grade refers to Rim Elevation for Utility Access Structures.
3) Sanitary Manholes: Use rubber ring gasket, flexible joint, o-ring gasket, or equal; conform to ASTM C443; apply 12 inch wide heavy bitumastic coating on outside of manhole at joints around entire perimeter.
4) Manholes: provide high density polyethylene adjusting ring as necessary to place cover to grade; provide two adjusting rings minimum, maximum 12 inch height. Seal adjusting ring joints with bituminous jointing material.

REMOVAL OF INTAKES AND UTILITY ACCESSES

110-15
04-16-13

No.	Location/Description	Type	Remarks
Division 2			
1	4+00.92, 83.9' LT	Utilities	Sanitary MH, 14.7 FT Depth
2	9+21.14, 162.9' LT	Utilities	Sanitary MH, 15.5 FT Depth
3	13+45.89	Utilities	Sanitary MH, 9.9 FT Depth

NOTES:
1) Refer to sheet M.3 for additional information.

SANITARY SEWER (DIVISION 2)

VK-2
Modified

Pipe Diam	From	To	Type	Length	Slope	Inlet Elevation	Outlet Elevation	Other Elevation	Notes
15"	Existing	MH #1	DI	15.0	UAC	UAC	974.4 +/-	967.78	2
15"	MH #1	MH #2	PVC	176.9	0.50	967.68	966.80		
15"	MH #2	MH #3	PVC	470.0	0.50	966.70	964.35		Trenchless
15"	MH #3	MH #4	PVC	328.5	0.50	964.25	962.61		
15"	MH #4	MH #5	PVC	50.0	0.50	962.51	962.26		

NOTES:
1) Refer to Sheet M.3 for additional information.
2) Length not measured separately for payment. Include in item for SW-307 Drop Connection.

ADDITIONAL WATER MAIN NOTES:

TRENCH AND PIPE BEDDING:

Open trench shall be kept to a minimum.

The pipe envelope of the trench shall be only of sufficient width to provide free working space on each side of the pipe of not less than eight (8) inches. Prior to any trenching in any paved area, the surface shall be saw-cut over the trench area.

Trenches shall be kept free from water during pipe laying. Lay pipe on a dry trench with a minimum of five (5) feet of cover over the top of pipe.

A class "E-II" envelope, as shown on the "Pipe Envelope Requirements" on the U sheets shall be used for ductile iron and PVC pipe.

Compacted granular material shall be three-quarter (3/4) inch road stone, unless the diameter of the pipe is two (2) inches or less, in which case sand shall be used.

BACKFILLING:

Backfilling shall be completed immediately after the Engineer has recorded the location of connections and appurtenances. In no instance shall work be covered that has not been inspected and noted by the Engineer.

Backfilling shall be in accordance with AWWA C600 and C605 and of proper material for pipe envelope requirements and the location of the trench. In all cases, backfill material shall be free from boulders, frozen clods, large roots, or excessive sod and other vegetation. Backfill shall first be carefully hand tamped to the depth specified in the pipe envelope requirements as shown in the attached standard drawings.

Care shall be used to place and tamp this bedding course so as not to disturb joints, alignment, or grade of the pipe. Filling shall be carried on simultaneously on both side of the pipe.

Where the pipeline is place beneath a roadway, driveway, sidewalk or within five (5) feet of the edge of an existing or proposed pavement, after hand tamping the base course, the remainder of the backfill, to within twelve (12) inches of the surface, shall be three-quarter inch (3/4 inch) roadstone, and compacted to ninety-five percent (95%) maximum standard proctor density.

When the pipeline is clear of roadways or driveways to a distance of five (5) feet or more, after hand tamping the base course, the remaining backfill shall be consolidated in two (2) foot lifts with a mechanical tamper. All backfill shall be compacted to ninety-five percent (95%) maximum standard proctor density. Settlements, which develop during compaction, shall be filled to the top of the trench. When applicable, backfill shall be done with clean fill excavated from the trench. If for any cause, there is a shortage of approved selected filling material, the Contractor shall, at no additional cost to the City, furnish all the necessary earth to complete the backfilling in accordance with the above specifications as ordered by the Engineer. The Contractor as heretofore specified shall dispose of any undesirable excavated material.

ANCHORAGE OF BENDS, TEES, AND PLUGS:

All tees, crosses, plugs, caps, and bends exceeding twenty-two and one-half (22 ½) degrees shall be securely anchored by using a restrained mechanical joint system and thrust blocks as hereinafter specified. Plugged tees and crosses located in a straight run of pipe do not require the use of thrust-blocks.

VALVES:

All valves shall be in accordance with AWWA C500 and C509 and shall be Resilient Wedge (R/W) Valves, with mechanical joint ends. R/W valves with accessories shall be: standard design, ductile iron body ASTM A536; urethane or nitrile rubber coated ductile iron wedge; bronze trim, bubble tight, unobstructed waterway, and non-rising stem. All valves shall open counter clock-wise with non-rising stem with two (2) inch operating nut. Approved valves: Clow Corporation, Waterous Company AFC-2500 and Mueller Company A2360-20

VALVE BOXES:

Valve boxes not located in Portland cement concrete shall be three (3) piece screw type, Clow F-2450 (#6 base F-2465) or equal.

Valve boxes located in Portland cement concrete shall be a slip/slide type.

FIRE HYDRANTS:

All fire hydrants shall be Clow F-2500, Clow Medallion or Waterous Pacer and shall conform to AWWA C502. Fire hydrants shall be equipped with a six (6) inch mechanical joint inlet, five and one-quarter (5 ¼) inch MVO, two (2) two and one-half (2 ½) inch hose nozzles N.S.T., one (1) pumper nozzle with four and one-half (4 ½) inch N.S.T., shall open counter clock-wise with a National Standard pentagon operating nut, shall have a depth of trench of six (6) feet, have O-ring packing and shall be painted yellow.

TRACER WIRE:

Tracer wire shall be a #10 solid copper underground wire, with low density polyethylene insulation, light blue for water main. The minimum tracer wire insulation thickness shall not be less than 0.045 inches.

For directional bored water main use #12 steel core extra high strength hand drawn underground wire, light blue in color; 1,150 lbs. arc, tensile break load; Copperhead, or equal.

Tracer wire boxes - Valvco #LS25

Splices - Ideal Industries Underground direct burial wire connectors or approved equal; ground rod: Copperweld, or equal terminal point.

PRESSURE AND LEAKAGE TEST:

Hydrostatic test:

Test all pressure pipe after installation in accordance with AWWA Standard C600 for installation of water main.

Flush out the main to remove air before test; insert taps to release-trapped air and plug after test.

Test at 150-psi minimum pressure for two (2) hours; allowable pressure drop during test period shall be +/- 5 psi from the initial test pressure.

Leakage test:

Test all pressure pipe after installation in accordance with AWWA Standard C600 for installation of water main.

Pressure and leakage tests shall be made after the joints are complete and the trench partially backfilled, leaving joints and fittings exposed.

Each section of pipeline to be tested shall be subjected for two (2) hours to a pressure test of one hundred (100) psi; measure water loss by pumping from a drum or by similar means. Exposed pipe, joints, fittings, and valves shall be examined for leakage during the test. Any joint having visible leakage shall be repaired. Note: pressure in Grinnell's distribution system at "High" elevation is 75 psi, (75 x 1.25 = 93.75 psi , 100 psi).

No piping installation will be accepted if the rate of leakage for the section of line being tested exceeds the following equation:

$L = (S)(D)(P)^{0.5}/148{,}000$

Where:

L = allowable leakage, in gallons per hour

S = length of pipe tested, in feet

D = nominal pipe diameter, in inches

P = average test pressure, in pounds per square inch

DISINFECTION OF WATER MAINS (per approved Standard Water and Force Mains Specifications for the City of Grinnell):

The disinfection method used for this project can be either the tablet or the injection methods. The Contractor shall utilize one of the two options listed for the disinfection of mains and related appurtenances.

Tablet method:

The main shall be treated with a chlorine dose of 50 mg/l concentration. The following table gives the number of hypochlorite tablets of 5-G required for a dose of 50 mg/l.*

Length of Section – In feet	Diameter of Pipe In Inches					
	2	4	6	8	10	12
13 or less	1	1	2	2	3	5
18	1	1	2	3	5	6
20	1	1	2	3	5	7
30	1	2	3	5	7	10
40	1	2	4	6	9	14

*Based on 3 ⅓ g. available chlorine per tablet.

Placement of tablets:

Hypochlorite tablets shall be placed in each section of pipe and also in hydrants, hydrant branches, and other appurtenances. They shall be attached by adhesive, except for the tablets placed in hydrants and in the joints between the pipe sections. All the tablets within the main must be at the top of the main. If the tablets are fastened before the pipe section is placed in the trench, their position should be marked on the section to ensure that there will be no rotation. In placing tablets in joints, they are either crushed or placed on the inside annular space, or, if the type of assembly does not permit, they are rubbed like chalk on the butt ends of the sections to coat them with calcium hypochlorite.

The adhesive may be Permatex No.1 (A product of Permatex Company, Brooklyn, New York, and Kansas City, Kansas) or any alternative approved by the Engineer. There shall be no adhesive on the tablet except the broad side next to the surface to which the tablet is attached.

Injection method:

Shall be in accordance with AWWA C651; inject a solution of 1% calcium hypochlorite and water at slow rate to provide a minimum residual chlorine content of 25 mg/l in water main.

Minimum chlorine solution required to produce 25 mg/l concentration in 100 feet of pipe:

Diameter, inches	1% Chlorine Solution, gallon
4	0.16
6	0.36
8	0.65
10	1.02
12	1.44
16	2.60

Filling and contact:

When installation has been completed, the main shall be filled with water or solution at velocity of less than one foot per second (1 ft/sec). This water/solution shall remain in the pipe for at least twenty-four (24) hours.

After the required twenty-four (24) hours, the water shall be tested for free chlorine residual. The free chlorine residual shall be no less than ten (10) mg/l. If requirement is not met, repeat disinfection procedure.

Valves shall be manipulated so that the chlorine solution in the main being treated will not flow back into the main supplying the water.

Final flushing:

After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than one (1) mg/l. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline.

Bacteriologic tests:

After final flushing, and before the water main is placed in serviced, two (2) samples shall be collected from the end of the main and tested for bacteriologic quality and shall show the absence of coliform organisms at least twenty-four (24) hours apart per 1,200 lineal feet of pipe.

Samples shall be collected in sterile bottles treated with sodium thiosulfate. No hose or fire hydrant shall be used in the collection of sample(s). A suggested sampling tap consist of a standard corporation cock installed in the main with a copper tube gooseneck assembly.

Repetition of procedure:

If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. The tablet method cannot be used in these subsequent disinfections. The subsequent disinfection(s) shall be by the continuous feed method as described by the AWWA Standard for Disinfecting Water Mains.

The manner and sequence of venting, filling, flushing, and disinfecting mains, and the disposal of wasted water, shall be submitted to the City for approval before starting and disinfecting work. Admission of disinfectant solution into, or the flushing thereof, through existing mains shall be held to the minimum possible, and then only after adequate measures have been taken to effectively prevent any such solution or waste water from entering branch service connections to water customers.

WATER SERVICE NOTES

Pipe:

Service lines shall be a minimum of three-quarter (3/4) inch, unless otherwise noted on the plans. Pipe type shall be as follows: HDPE of copper tube size, 160 psi; or three-quarter (3/4) inch K type copper. Fittings and clamps shall conform to the fitting Standard, IAPMO DS 25-69, when joining polyethylene pipe.

Corporation stop:

Corporation stop shall be a minimum of three-quarter (3/4) inch with CC thread, and shall be Mueller H-9971, Ford F-200, or equal; conform to AWWA C800.

Bends:

For HDPE service lines: a one-eighth (1/8) bend, Mueller H 10022 or equal, or a one-quarter (1/4) bend, Mueller H 10023 or equal, with gasket shall be installed on each corporation to go from the corporation to the male iron thread.

For copper service lines: a one-eighth (1/8) bend, Ford LA 04-33 or equal, or a one-quarter (1/4) bend, Ford L 04-33 or equal, shall be installed on each corporation to go from the corporation to the male iron thread.

Curb valve:

For HDPE service lines: conform to AWWA C800, curb stop valves shall be a minimum of Ford B11-333 three-quarter (3/4) inch or equal. A five and one-half (5-1/2) foot curb stop box with rod shall be installed over the curb stop valve. The box shall have an arch patter base with a one (1) inch upper section

For copper service lines: conform to AWWA C800, the curb stop valves shall be a minimum of Ford B44-333 three-quarter (3/4) inch or equal. The box shall be the same as specified for HDPE pipe.

Saddles:

A stainless steel, double strap saddle, Smith Blair 317, Ford FS-101 style, or equal, shall be used when the water or force main in PVC pipe. If the water or force main is ductile iron, the main can be direct tapped. Saddles shall have CC (AWWA) thread.

AIR RELEASE VALVE MANHOLE

Valve:

ARI D-090-P, 2 inch threaded connection with a 5 foot bury depth. Air release line between water main and valve shall be 2 inch diameter, tapped from the top of the water main with a 2 percent slope up to air valve and to provide for air release. Air release line, fittings and clamps shall be as specified for water service pipe.

ADDITIONAL WATER MAIN NOTES

SURVEY SYMBOLS

- LC Lot Corner
- BRG Bridge
- PPA Power Pole Co. 1
- SI Sign
- OUT Tile Outlet
- MH Utility Access (Manhole)
- TLNR Tree Line Right
- LUM Luminaire
- MIS Miscellaneous
- PIP Pipe Culvert
- SL Speed Limit Sign
- GDL Guard Rail (Rail and Cable)
- STA Storm Sewer Line Co. 1
- INB Storm Sewer Beehive Intake
- STP Stump
- TPD Telephone Pedestal
- TDC Tree Deciduous
- FW Wire Fence
- MM Mile Marker Post
- SHR Shrub
- GP Guard Post (Less Than 4 Posts)
- TEV Evergeen Tree
- EB Electrical Box
- TLNL Tree Line Left
- PLG Location of General Photo
- PR Electic Riser Pole
- COR Round Bridge Pier Column
- LIN Miscellaneous Line
- S Soil Sampling Site (Wetlands)
- COS Square Bridge Pier Column
- CON Concrete or A/C Slab
- ENP Edge Paved Entrance & Park Lot
- SNP Unpaved Shoulder
- EP Edge of Paved Roads (ML or SR)
- DU Centerline Draw or Stream (Up)
- SH Paved Shoulder
- GU Gutter In Front of Curb
- CU Back of Curb
- ENT Centerline BL of Entrance
- ENU Edge Unpaved Entrance & Parking
- EG Edge of Gravel Road
- D Centerline Draw or Stream (Down)
- GHB Underground High Pres Gas Co 2
- ELA Underground Electric Line Co. 1
- GLA Underground Gas Line Co. 1
- FOA Underground Fiber Optic Co. 1
- FOB Underground Fiber Optic Co. 2
- TLA Underground Telephone Line Co. 1

- SOP Size of Pipe or Culvert
- BLS Bridge Low Steel
- PRO Profile Shot
- BD Bridge Deck

UTILITY LEGEND

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PLAN VIEW COLOR LEGEND OF SOILS SHEETS

LINEWORK	Design	Color No.	
Green	(2)		Existing Topographic Features and Labels
Purple (Halo)	(15)		Backslope Drains
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
SHADING	**Design**	**Color No.**	
Brown, Light	(236)		Core Out

PROFILE VIEW COLOR LEGEND OF SOILS SHEETS

LINEWORK	Design	Color No.	
Blue	(1)		Proposed Alignment, Stationing, and Alignment Annotation
Green	(2)		Existing Ground Line Profile
Green, Med	(227)		Topsoil
Green, Med	(227)		Slope Dressing Only
Orange	(6)		Loam
Brown, Dark	(238)		Class 10
Brown, Med	(237)		Sand
Red	(3)		Unsuitable A
Pink, Dark	(13)		Unsuitable B
Pink	(11)		Unsuitable C
Red	(3)		Shale
Red	(3)		Waste
Gray, Light	(48)		Broken and Weathered Rock
Gray, Med	(80)		Rock
Gray, V.Dark	(128)		Boulders

PATTERN AND SYMBOL LEGEND OF SOILS SHEETS

- Drill
- Dig/Core
- Date(s) Drilled_____
- Water
- Treatment
- Sandstone
- Dry
- Sand Blanket
- Unsuitable A
- Sample
- Soil Remediation Area
- Unsuitable B
- Plugged
- Select Soil
- Unsuitable C
- Moisture
- Select Sand
- Sandy Soil
- Shelby
- Slope Dressing Only
- Boulders
- Blow Count
- Broken and Weathered Rock
- Shale
- Dens. Core
- Rock

- Reference Point
- Survey Line
- Station
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Clearing & Grubbing Area
- Pavement Removal

RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- A/C Access Control

NOTE: Sounding and test boring data shown in the plans were accumulated for designing and estimating purposes. Their appearance on the plans does not constitute a guarantee that conditions other than those indicated will be encountered. Details and notes shown elsewhere shall be used for roadway and structure construction.

SOILS LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES Q)

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.1	REVISED

11:05:51 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01

50 55 60 65 70 75

I-80 Existing W.B.

I-80 Existing E.B.

I-80 Proposed E.B.

Proposed ROW

Existing ROW

Construction Limits

STA. 54+00.00
Begin E.B. Grading

POND

N

0 100 FEET

DRAFT

ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.2	REVISED

10:55:57 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

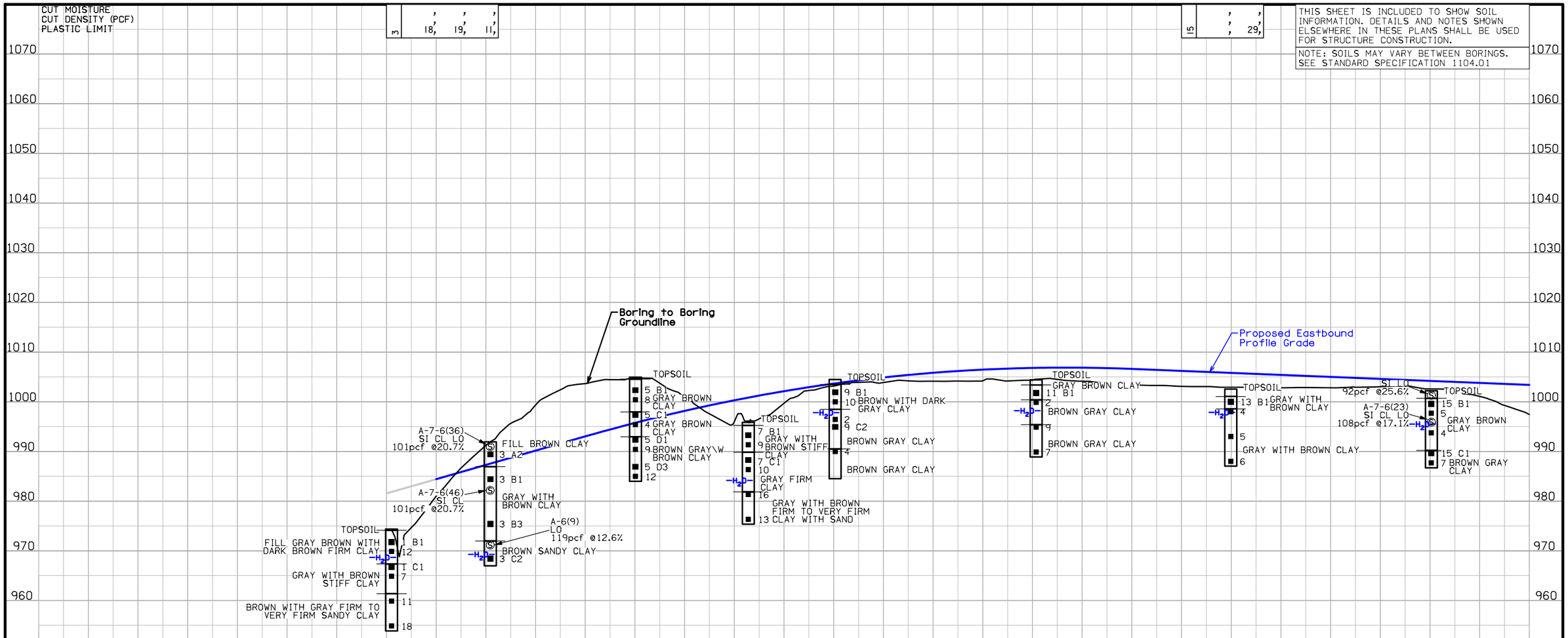
CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

3 , , , , , 18, 19, 11,

15 , , , , 29,

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



SHELBY TUBE CORE DATA

CORE NO.	1 B1	1 C1	3 A2	3 B1	3 B3	3 C2	5 B1	5 C1	5 D1	5 D3	7 B1	7 C1	9 B1	9 C2	11 B1	13 B1	15 B1	15 C1
DEPTH IN FEET	2	7	2	7	16	23	2	7	12	17.5	2	7	2	9	2	2	2	12
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	1620	1045	1585	2900	2085	705	2560	965	995	1695	960	1295	3475	690	2095	990	1315	1095
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	14	29	14	23	18	16	26	28	26	28	27	23	24	26	28	29	30	25
DRY DENSITY - PCF	91	93	92	100	108	114	97	93	97	95	97	96	98	94	94	92	88	98

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

EASTBOUND PROFILE

1 RT.111 | 3 RT.112 | 5 RT.95 | 7 RT.42 | 9 RT.86 | 11 RT.67 | 13 RT.72 | 15 RT.71

50 55 60 65 70 75

ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.3	REVISED

10:56:07 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

80	15,	,	,
	24, 96,	,	,
	,	19,	16,
85	,		
	16,		
87	,	,	,
	29,	25,	19,
89	,	,	,
	30,	24,	17,

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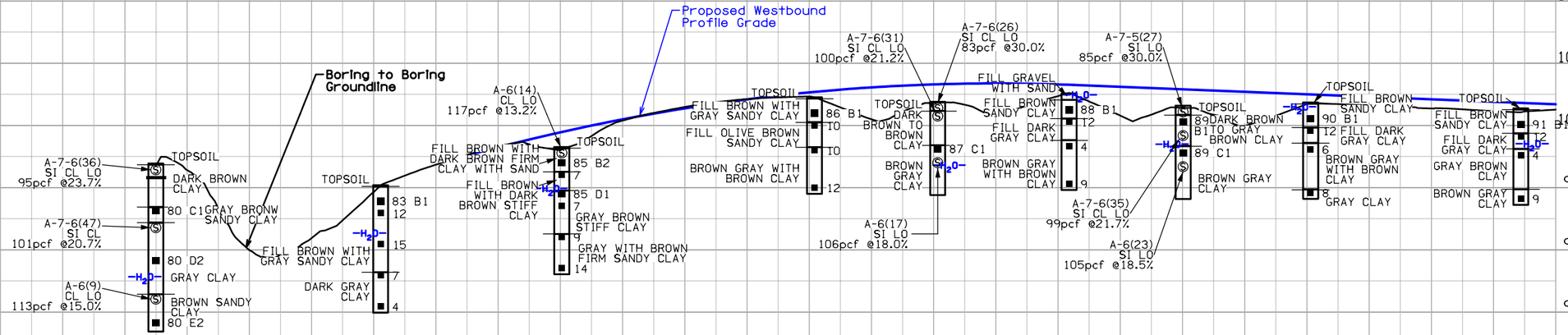

SHELBY TUBE CORE DATA

CORE NO.	80 C1	80 D2	80 E2	83 B1	85 B2	85 D1	86 B1	87 C1	88 B1	89 B1	89 C1	90 B1	91 B1
DEPTH IN FEET	7	15	25	2	2	7	2	7	2	2	7	2	2
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	6750	3240	710	2815	1220	1305	3445	515	3235	3760	425	3475	2970
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	15	18	16	12	16	29	11	33	11	24	35	12	11
DRY DENSITY - PCF	117	110	114	125	-	92	122	86	128	98	84	125	127

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

WESTBOUND PROFILE

80	83	85	86	87	88	89	90	91
LT.175	LT.99	LT.48	LT.99	LT.142	LT.100	LT.142	LT.100	LT.100

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.4	REVISED

10:56:17 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

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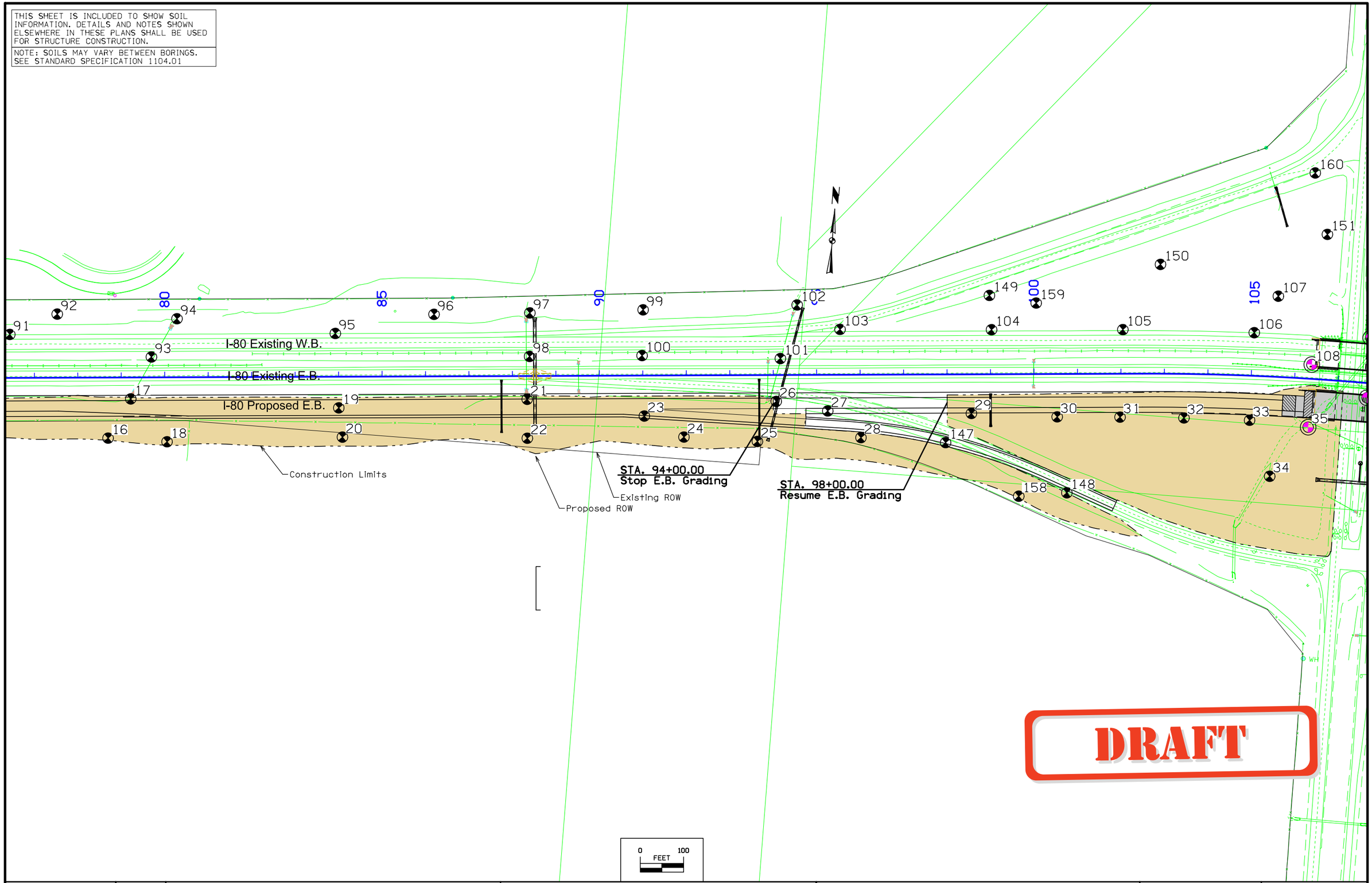

DRAFT

ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.5	REVISED

10:56:28 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

33 | 19, 111, ,

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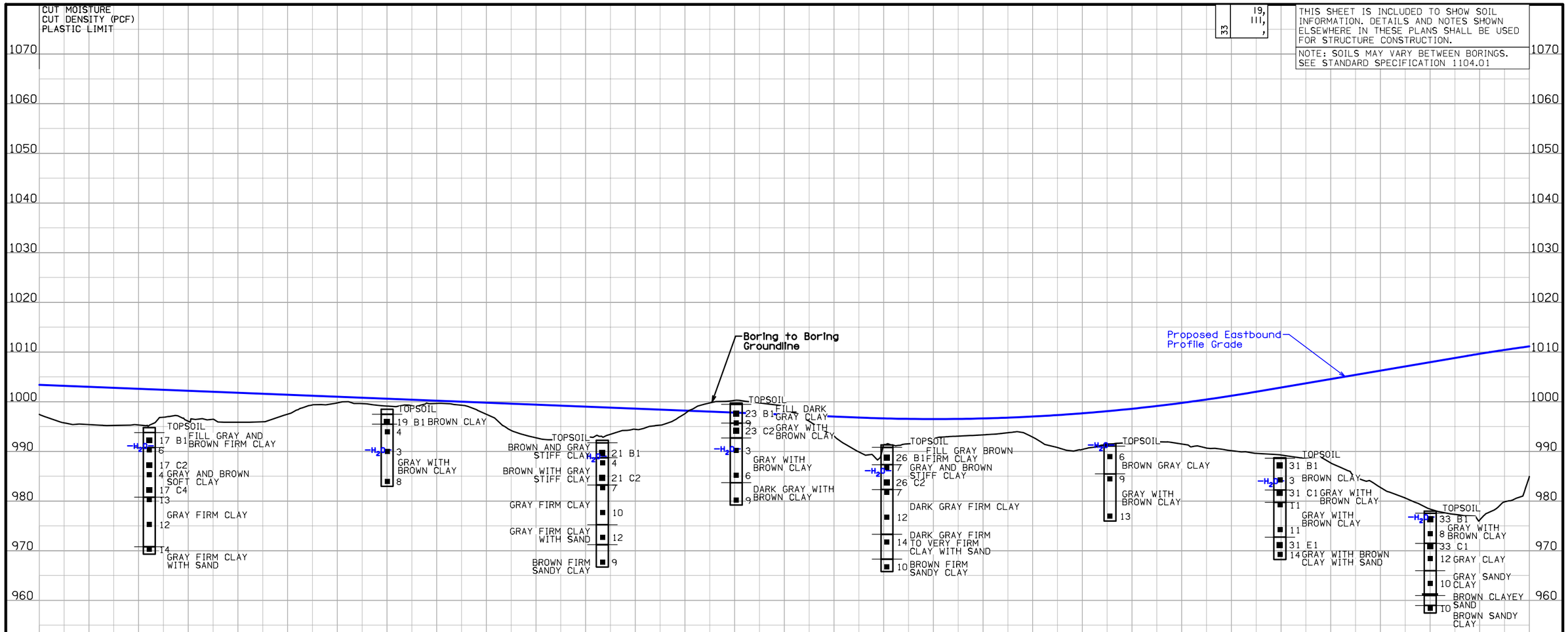
NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



SHELBY TUBE CORE DATA

CORE NO.	17 B1	17 C2	17 C4	19 B1	21 B1	21 C2	23 B1	23 C2	26 B1	26 C2	31 B1	31 C1	31 E1	33 B1	33 C1
DEPTH IN FEET	2	7	12	2	2	7	1.5	5	2	7	1	6.5	17	1	6.5
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	A-7-6(26)	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	2565	515	1245	2715	1290	915	5125	1415	2875	1135	195	1585	800	1290	625
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	20	29	25	25	26	27	22	28	22	30	33	26	22	29	28
DRY DENSITY - PCF	94	92	93	90	97	93	101	93	99	93	84	97	103	93	95

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

EASTBOUND PROFILE

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.6	REVISED

10:56:36 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

105 , , 14,

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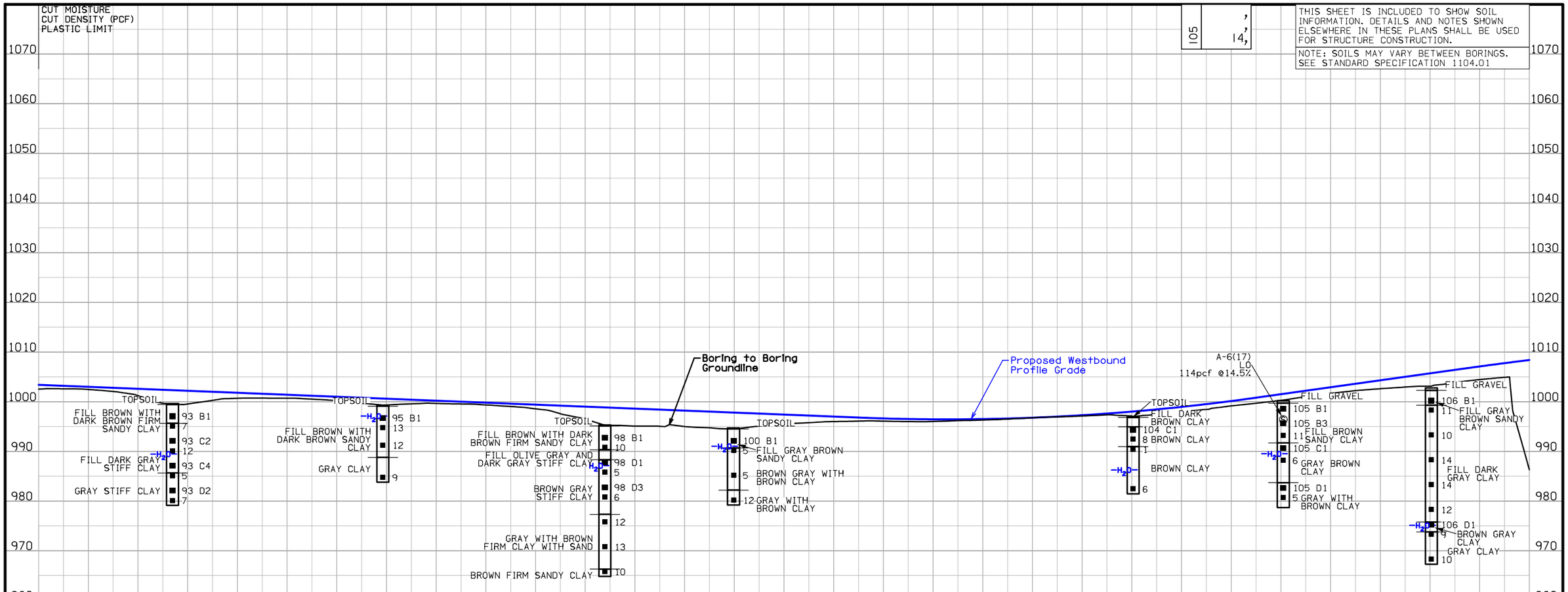
NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



SHELBY TUBE CORE DATA

CORE NO.	93 B1	93 C2	93 C4	93 D2	95 B1	98 B1	98 D1	98 D3	100 B1	104 C1	105 B1	105 B3	105 C1	105 D1	106 B1	106 D1
DEPTH IN FEET	2	7	12	17	2	2	7	12	2	2	1	4	9	17	2	27
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	5890	2085	1005	735	3360	1905	1175	535	1555	2825	1540	4270	1245	1600	1505	1605
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	13	28	31	34	15	15	29	28	19	14	24	23	27	26	13	25
DRY DENSITY - PCF	122	92	82	88	121	115	90	92	107	120	107	110	95	98	116	99

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

WESTBOUND PROFILE

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.7	REVISED

10:56:45 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

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NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01

STA. 115+00.00
Stop E.B. Grading

STA. 122+50.00
Resume E.B. Grading

UPRR

I-80 Existing W.B.

I-80 Existing E.B.

I-80 Proposed E.B.

Existing ROW
Proposed ROW
Construction Limits

DRAFT

0 FEET 100

ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.8	REVISED

10:56:57 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

45 , , , , 15, 17,

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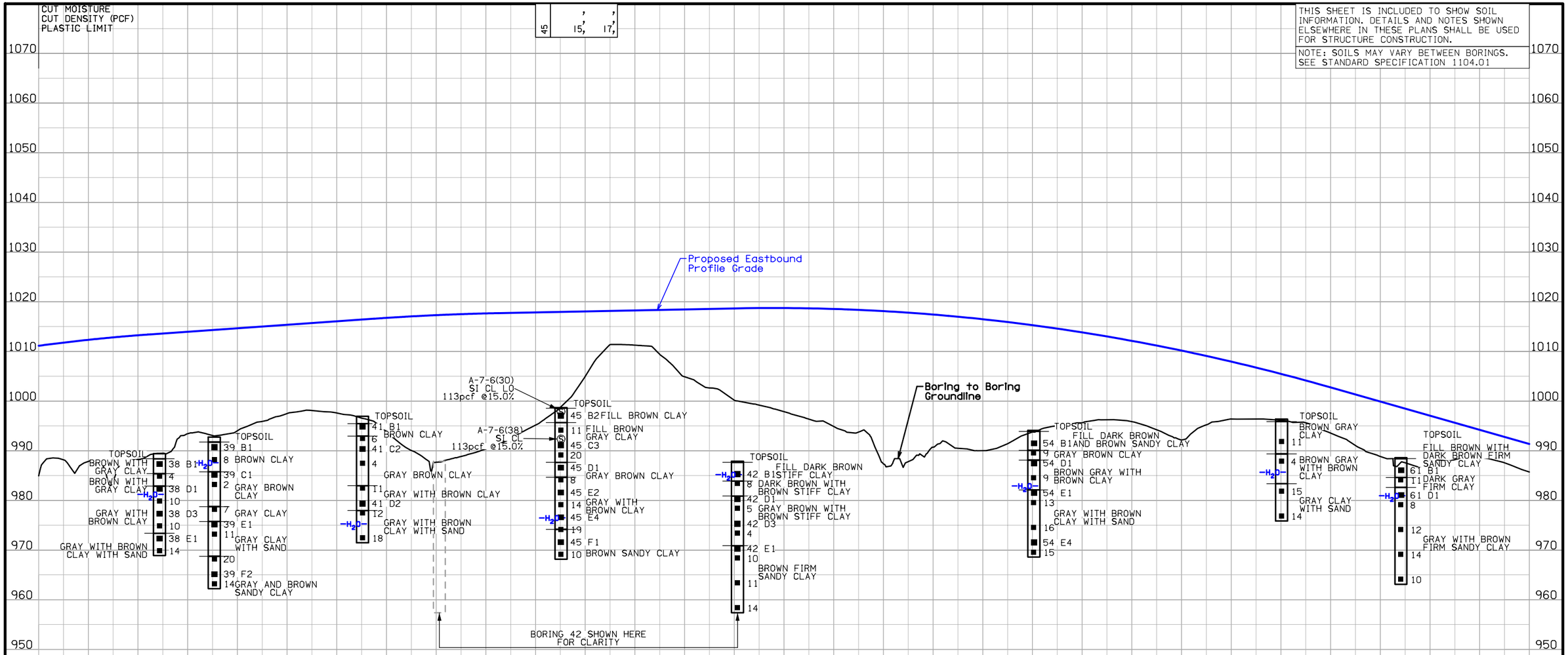
NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



DRAFT

SHELBY TUBE CORE DATA

CORE NO.	38 B1	38 D1	38 D3	38 E1	39 B1	39 C1	39 E1	39 F2	41 B1	41 C2	41 D2	42 B1	42 D1	42 D3	42 E1	45 B2	45 C3	45 D1	45 E2	45 E4	45 F1	54 B1	54 D1	54 E1	54 E4	61 B1	61 D1
DEPTH IN FEET	1.5	6.5	11.5	16.5	1.5	7	17	27	1.5	6	17	2	7	12	17	1	7	11.5	16.5	21.5	26.5	2	6	12	22	2	7
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	-	-	-	-	A-6(17)	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	.-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	CU	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	2385	2325	2345	3150	1420	360	1950	2610	1670	540	1860	1335	1135	830	840	3095	1840	1880	1185	2925	2215	3555	1580	2350	2830	1965	2455
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	20	24	23	21	25	32	23	21	24	31	23	26	28	27	20	20	26	23	28	22	17	20	24	24	21	21	24
DRY DENSITY - PCF	106	100	102	105	88	85	101	108	95	87	101	94	93	97	111	106	98	102	96	104	112	108	98	99	106	105	100

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

EASTBOUND PROFILE

38 RT.191 | 39 RT.80 | 41 RT.85 | 42 RT.83 | 45 RT.77 | 54 RT.91 | 59 RT.66 | 61 RT.53

110 115 120 125 130 135

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.9	REVISED

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

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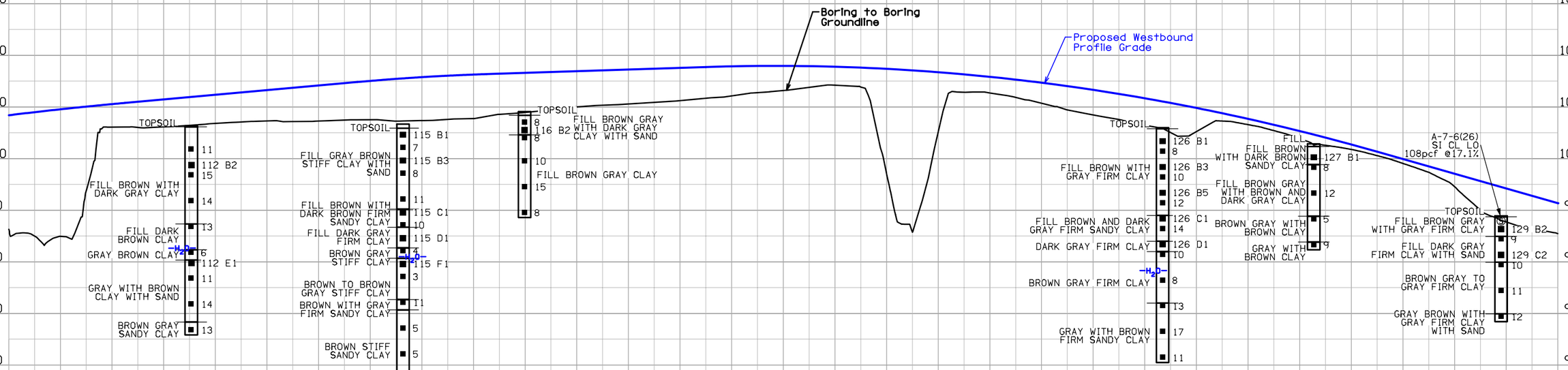
Boring to Boring Groundline

Proposed Westbound Profile Grade



SHELBY TUBE CORE DATA

CORE NO.	112 B2	112 E1	115 B1	115 B3	115 C1	115 D1	115 F1	116 B2	126 B1	126 B3	126 B5	126 C1	126 D1	127 B1	129 B2	129 C2
DEPTH IN FEET	7	26	1.5	6.5	16.5	21.5	26.5	3	2	7	12	17	22	2	2	7
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	A-7-6(24)	A-7-6(22)	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	1710	1520	1680	2005	3035	2035	795	2155	3170	1090	1525	3200	3045	945	2135	2630
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	19	25	23	23	21	26	29	21	21	25	24	25	24	14	21	28
DRY DENSITY - PCF	109	99	102	103	104	90	92	101	108	98	101	100	100	109	106	94

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

WESTBOUND PROFILE

112 LT.49 | 115 LT.43 | 116 LT.43 | 126 LT.37 | 127 LT.100 | 129 LT.43

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.10	REVISED

10:57:13 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

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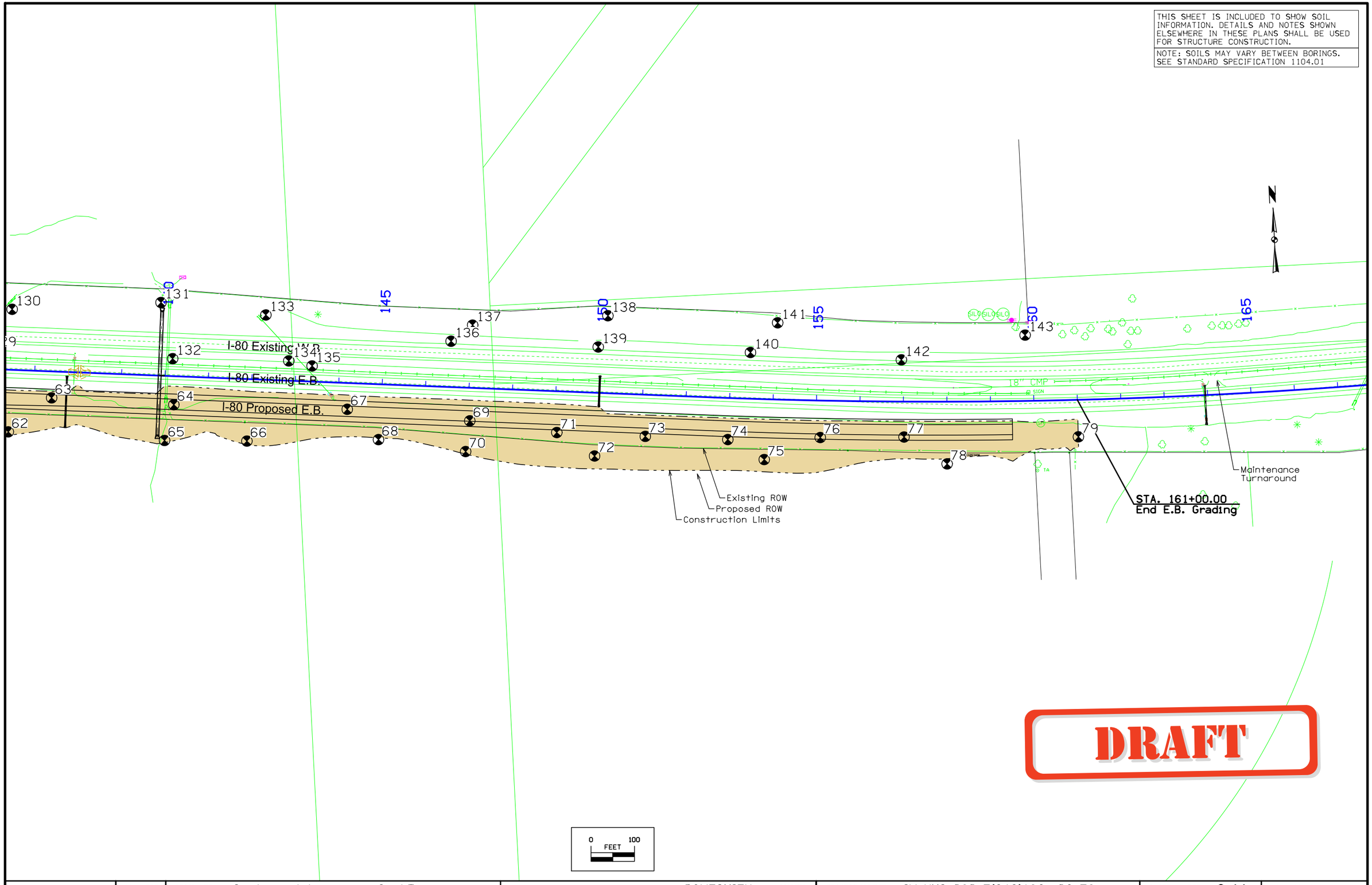

DRAFT

ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.11	REVISED

10:57:24 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

	66	71	73	74	76
CUT MOISTURE	, , ,	32, 24,	30, 25,	30,	21,
CUT DENSITY (PCF)	, , ,	86, 99,	88, 98,	90,	101,
PLASTIC LIMIT	19, 18, 16,	, ,	, ,	,	,

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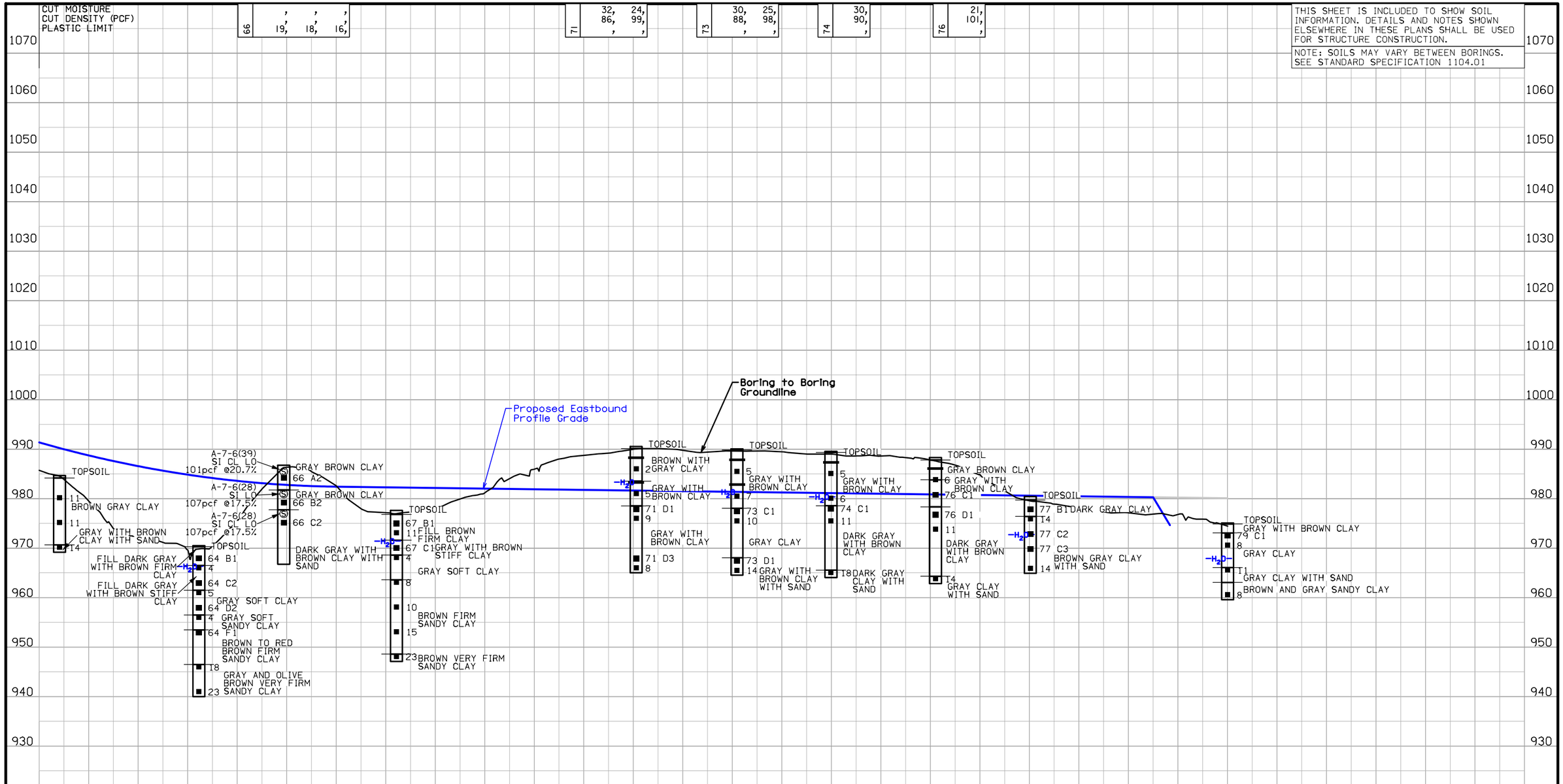

SHELBY TUBE CORE DATA

CORE NO.	64 B1	64 C2	64 D2	64 F1	66 A2	66 B2	66 C2	67 B1	67 C1	71 D1	71 D3	73 C1	73 D1	74 C1	76 C1	76 D1	77 B1	77 C2	77 C3	79 C1
DEPTH IN FEET	2	7	12	17	2	7	11	2	7	12	22	12	22	11	7	11	2	7	10	2
CLASSIFICATION (AASHTO)	-	-	A-6(20)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	1915	550	415	1585	4040	685	1365	4900	780	1845	1420	1030	1430	1410	480	1655	4590	2445	1390	2270
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	26	35	30	13	22	28	23	17	27	26	17	29	23	28	26	28	23	31	25	26
DRY DENSITY - PCF	94	81	89	119	95	97	98	105	92	97	112	91	102	94	95	91	94	93	96	94

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

EASTBOUND PROFILE

63	64	66	67	71	73	74	76	77	79
RT.61	RT.66	RT.143	RT.60	RT.95	RT.96	RT.96	RT.85	RT.82	RT.85

ENGLISH	IOWA DOT	DESIGN TEAM		COUNTY	PROJECT NUMBER	SHEET NUMBER	
		Snyder and Associates, Inc.\Terracon	POWESHIEK		IM-NHS-080-5(242)182--03-79	Q.12	REVISED

10:57:34 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

143	,	,
	,	,
	19,	18,

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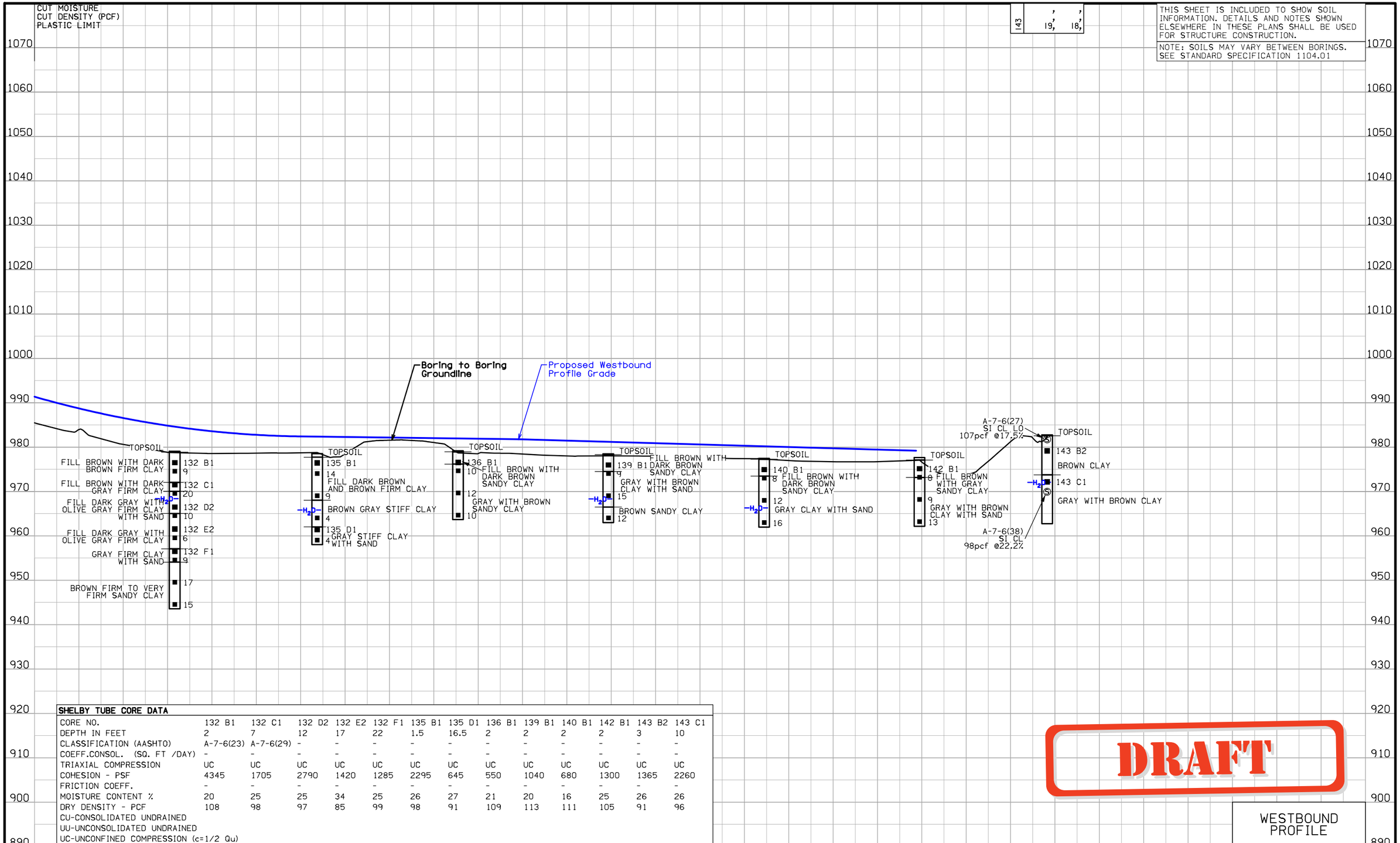
NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



SHELBY TUBE CORE DATA

CORE NO.	132 B1	132 C1	132 D2	132 E2	132 F1	135 B1	135 D1	136 B1	139 B1	140 B1	142 B1	143 B2	143 C1
DEPTH IN FEET	2	7	12	17	22	1.5	16.5	2	2	2	2	3	10
CLASSIFICATION (AASHTO)	A-7-6(23)	A-7-6(29)	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL. (SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	4345	1705	2790	1420	1285	2295	645	550	1040	680	1300	1365	2260
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	20	25	25	34	25	26	27	21	20	16	25	26	26
DRY DENSITY - PCF	108	98	97	85	99	98	91	109	113	111	105	91	96

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT

WESTBOUND PROFILE

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.13	REVISED

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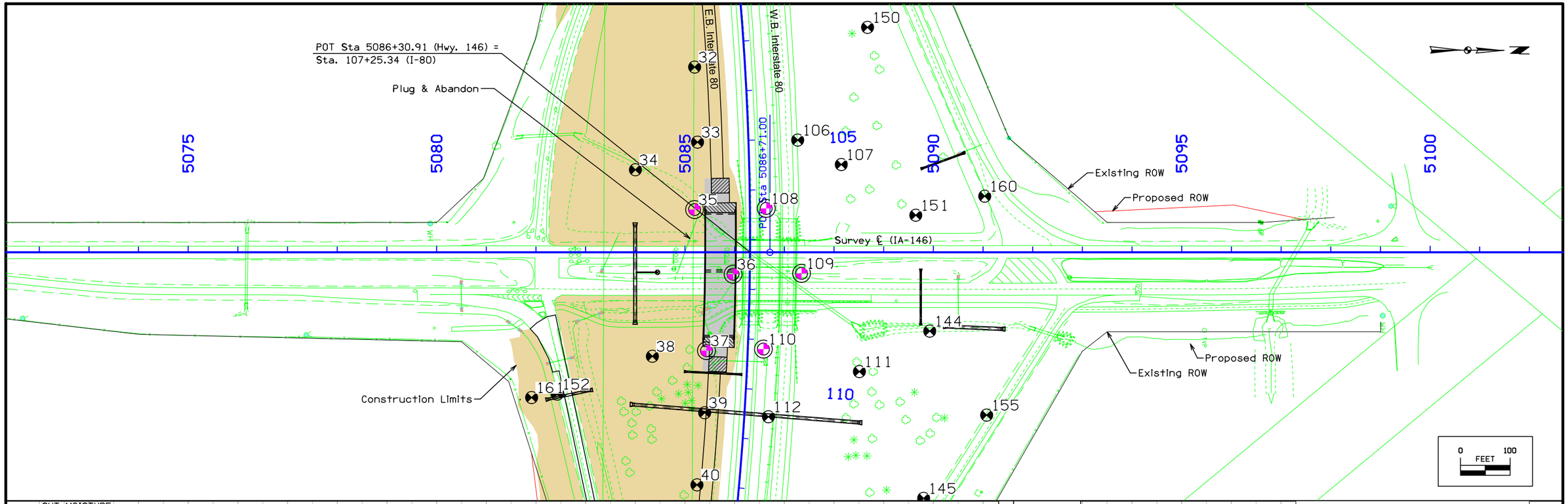
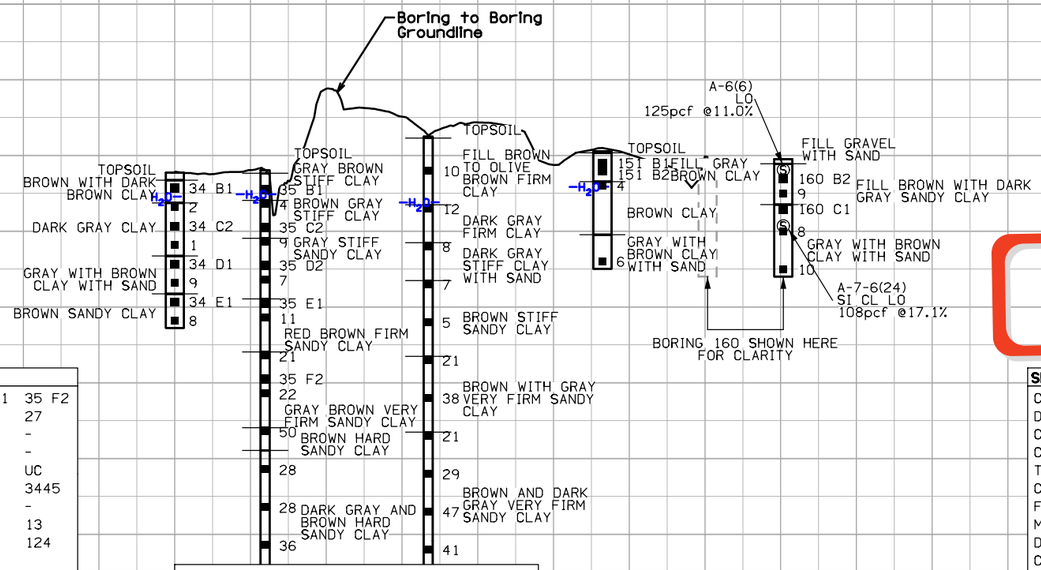


CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

160 , , 13, 19,

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



NOTE: BORINGS EXTEND DEEPER THAN SHOWN. LOWER PORTIONS MASKED TO FIT SHEET.

DRAFT

SHELBY TUBE CORE DATA

CORE NO.	34 B1	34 C2	34 D1	34 E1	35 B1	35 C2	35 D2	35 E1	35 F2
DEPTH IN FEET	1.5	6.5	11.5	16.5	2	7	12	17	27
CLASSIFICATION (AASHTO)	-	A-7-6(31)	-	-	-	-	A-6(10)	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	CU	UC	UC
COHESION - PSF	630	395	1250	1105	1065	2020	265	925	3445
FRICTION COEFF.	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	30	37	31	18	23	21	21	19	13
DRY DENSITY - PCF	89	81	94	112	92	106	107	109	124

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

SHELBY TUBE CORE DATA

CORE NO.	151 B1	151 B2	160 B2	160 C1
DEPTH IN FEET	1	2	2	6
CLASSIFICATION (AASHTO)	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC
COHESION - PSF	2240	1565	1360	2000
FRICTION COEFF.	-	-	-	-
MOISTURE CONTENT %	14	16	15	20
DRY DENSITY - PCF	112	109	117	106

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.14	REVISED

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POT Sta 1506+28.43 (Ramp A) =
Sta. 5090+95.00 (Hwy. 146)

Sta 1510+00.00 (Ramp A)
Stop Ramp A Grading

Ramp A

Construction Limits
Existing ROW
Proposed ROW

Curve A-1

Ramp B (Ramp

Sta 1512+50.00 (Ramp A)
Begin Ramp A Grading

Survey ℄ (IA-14)

Curve A-2

POT Sta 1522+25.00 (Ramp A) =
POT Sta 122+26.06, 116.93' LT (I-80)

POT Sta 1526+44.88 (Ramp A) =
POT Sta 126+45.00, 89.00' LT (I-80)
End Ramp A Grading

0 FEET 100

I-80 Existing W.B.

I-80 Existing E.B.

Relocated ℄ of I-80

574.2'

420' per 15:1 Ratio

I-80 Proposed E.B.

5090

5085

105 110 115 120 125 130 135

160 155 144 145 156 146 157 151 107 106 109 113 114 118 123 125 124 127 108 110 112 115 116 117 119 120 122 121 126 052A 33 35 36 37 39 40 41 42 44 45 43 38 34 154 46 47 48 49 50 51 52 54 55 162

Ramp A

CUT MOISTURE
CUT DENSITY (PCF)
PLASTIC LIMIT

155	,	,
	14,	15,
145	21,	
	105,	
118	29,	
	,	
	,	

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1,020 1,010 1,000 990 980 970 960 950 940

Boring to Boring Groundline

Proposed Profile Grade

TOPSOIL
FILL DARK BROWN CLAY WITH SAND
144 B1
FILL DARK BROWN CLAY
BROWN GRAY AND GRAY CLAY
GRAY CLAY WITH SAND
A-6(5) LO 126pcf @10.7%
A-6(10) CL LO 112pcf @15.5%
FILL BROWN WITH DARK BROWN SANDY CLAY
FILL GRAVEL WITH SAND
155 B2
BROWN GRAY TO BROWN AND GRAY CLAY
155 C2
BROWN WITH GRAY SANDY CLAY
BROWN SANDY CLAY
BORING 145 SHOWN HERE FOR CLARITY
TOPSOIL
145 B2 FILL BROWN CLAY WITH SAND
GRAY WITH BROWN CLAY
BROWN SANDY CLAY
FILL GRAVEL
146 B1 FILL DARK BROWN AND BROWN SANDY CLAY
FILL BROWN GRAY TO GRAY CLAY WITH SAND
DARK BROWN SANDY CLAY
BROWN TO DARK BROWN CLAY
TOPSOIL
FILL DARK GRAY AND GRAY BROWN CLAY WITH SAND
BROWN CLAY
BROWN CLAY
ORG=4.1%
TOPSOIL
118 B1
BROWN GRAY WITH BROWN CLAY
118 B3
118 C2
GRAY WITH BROWN CLAY WITH SAND
118 C4
BROWN SANDY CLAY

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SHELBY TUBE CORE DATA

CORE NO.	118 B1	118 B3	118 C2	118 C4
DEPTH IN FEET	1.5	6.5	11.5	16.5
CLASSIFICATION (AASHTO)	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC
COHESION - PSF	810	745	1215	820
FRICTION COEFF.	-	-	-	-
MOISTURE CONTENT %	27	27	24	17
DRY DENSITY - PCF	90	94	100	105

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

SHELBY TUBE CORE DATA

CORE NO.	144 B1	145 B2	146 B1	155 B2	155 C2
DEPTH IN FEET	1	2	1	2	8
CLASSIFICATION (AASHTO)	-	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC
COHESION - PSF	3630	2185	1130	4875	1515
FRICTION COEFF.	-	-	-	-	-
MOISTURE CONTENT %	22	20	14	10	25
DRY DENSITY - PCF	100	97	115	129	99

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

144 RT.101 | 155 LT.32 | 145 RT.53 | 146 RT.19 | 117 RT.57 | 118 LT.120

1505 1510 1515 1520 1525

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon		POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.15	REVISED

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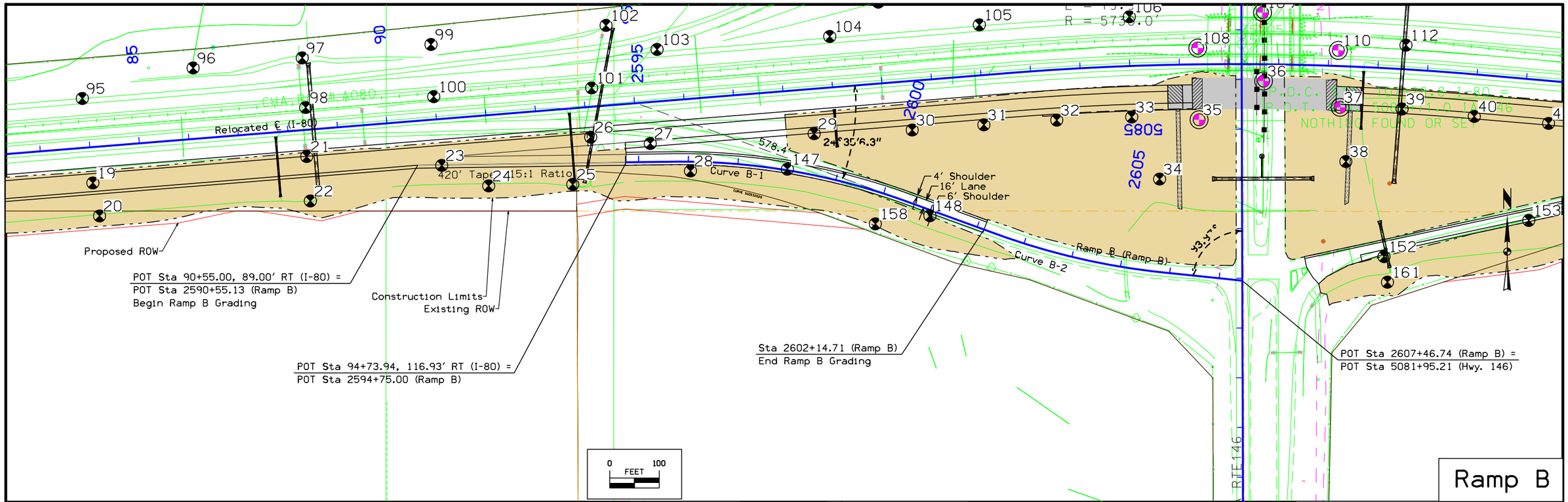
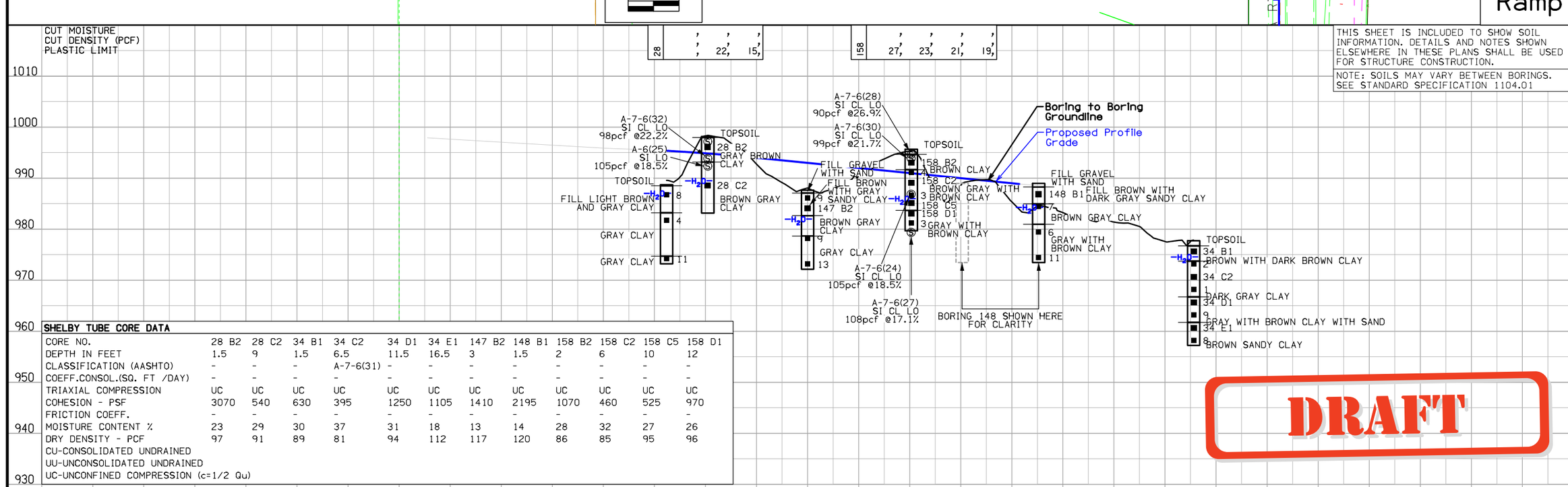


Ramp B



SHELBY TUBE CORE DATA													
CORE NO.	28 B2	28 C2	34 B1	34 C2	34 D1	34 E1	147 B2	148 B1	158 B2	158 C2	158 C5	158 D1
DEPTH IN FEET	1.5	9	1.5	6.5	11.5	16.5	3	1.5	2	6	10	12
CLASSIFICATION (AASHTO)	-	-	-	A-7-6(31)	-	-	-	-	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	3070	540	630	395	1250	1105	1410	2195	1070	460	525	970
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	23	29	30	37	31	18	13	14	28	32	27	26
DRY DENSITY - PCF	97	91	89	81	94	112	117	120	86	85	95	96

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

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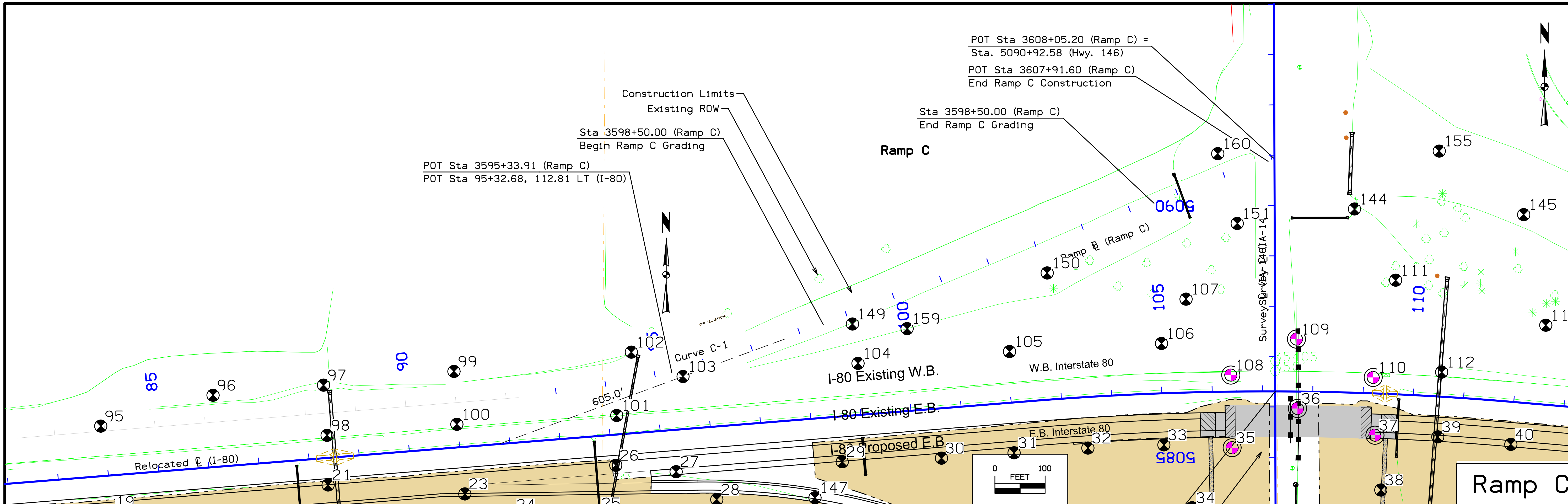
ENGLISH	IOWA DOT	DESIGN TEAM Snyder and Associates, Inc.\Terracon	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Q.16	REVISED

10:58:21 AM kekausalik N:\Projects\2019\08195063\CAD\Soils\SHT\SHT_79080242Z09_Q1.sht


POT Sta 3608+05.20 (Ramp C) =
Sta. 5090+92.58 (Hwy. 146)
POT Sta 3607+91.60 (Ramp C)
End Ramp C Construction
Sta 3598+50.00 (Ramp C)
End Ramp C Grading
Construction Limits
Existing ROW
Sta 3598+50.00 (Ramp C)
Begin Ramp C Grading
POT Sta 3595+33.91 (Ramp C)
POT Sta 95+32.68, 112.81 LT (I-80)
Ramp C
I-80 Existing W.B.
W.B. Interstate 80
I-80 Existing E.B.
Proposed E.B.
E.B. Interstate 80
Relocated ℄ (I-80)
Curve C-1
605.0'
FEET
0
100
Ramp C

CUT MOISTURE						
CUT DENSITY (PCF)						
PLASTIC LIMIT						

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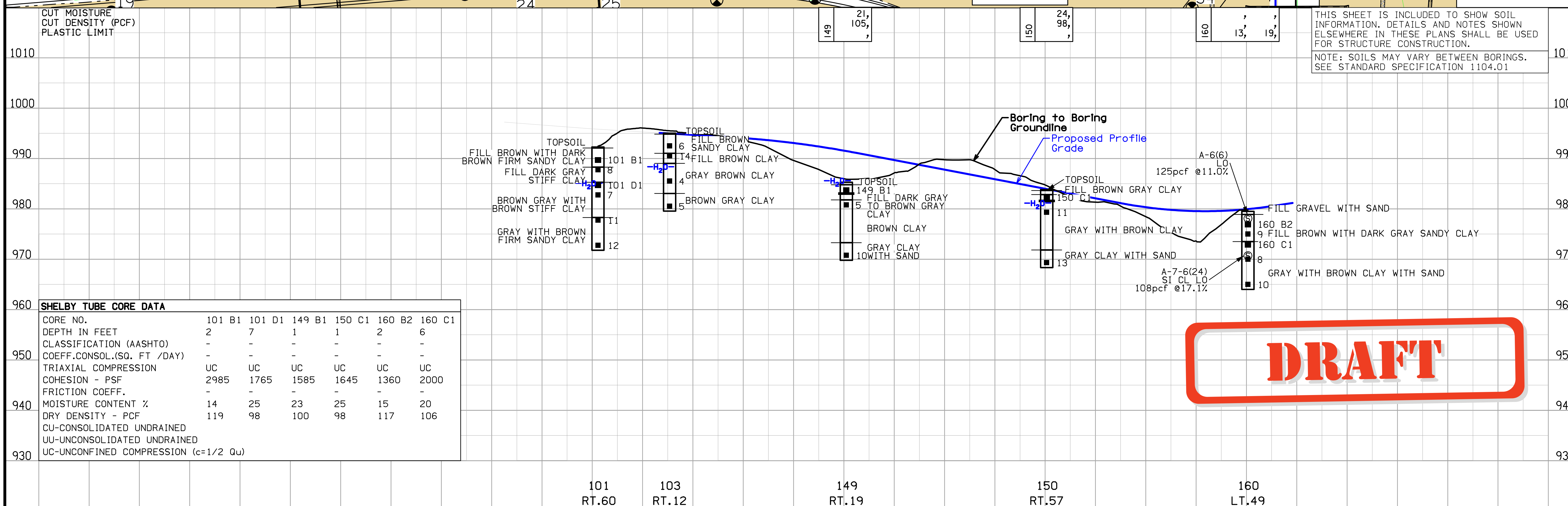
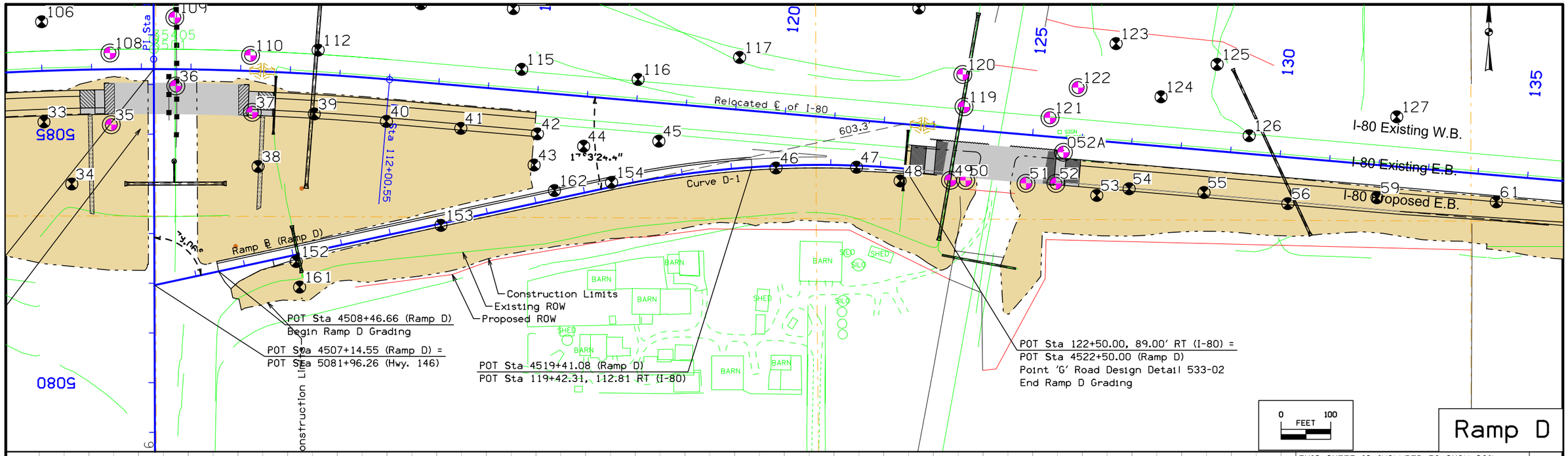

Boring to Boring Groundline
Proposed Profile Grade
TOPSOIL
FILL BROWN WITH DARK BROWN FIRM SANDY CLAY
FILL DARK GRAY STIFF CLAY
BROWN GRAY WITH BROWN STIFF CLAY
GRAY WITH BROWN FIRM SANDY CLAY
101 B1
101 D1
FILL BROWN SANDY CLAY
FILL BROWN CLAY
GRAY BROWN CLAY
BROWN GRAY CLAY
149 B1
FILL DARK GRAY TO BROWN GRAY CLAY
BROWN CLAY
GRAY CLAY WITH SAND
150 C1
FILL BROWN GRAY CLAY
GRAY WITH BROWN CLAY
GRAY CLAY WITH SAND
A-6(6)
LO
125pcf @11.0%
FILL GRAVEL WITH SAND
160 B2
FILL BROWN WITH DARK GRAY SANDY CLAY
160 C1
GRAY WITH BROWN CLAY WITH SAND
A-7-6(24)
SI CL LO
108pcf @17.1%
101 RT.60
103 RT.12
149 RT.19
150 RT.57
160 LT.49

SHELBY TUBE CORE DATA

CORE NO.	101 B1	101 D1	149 B1	150 C1	160 B2	160 C1
DEPTH IN FEET	2	7	1	1	2	6
CLASSIFICATION (AASHTO)	-	-	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC
COHESION - PSF	2985	1765	1585	1645	1360	2000
FRICTION COEFF.	-	-	-	-	-	-
MOISTURE CONTENT %	14	25	23	25	15	20
DRY DENSITY - PCF	119	98	100	98	117	106

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

DRAFT



Ramp D

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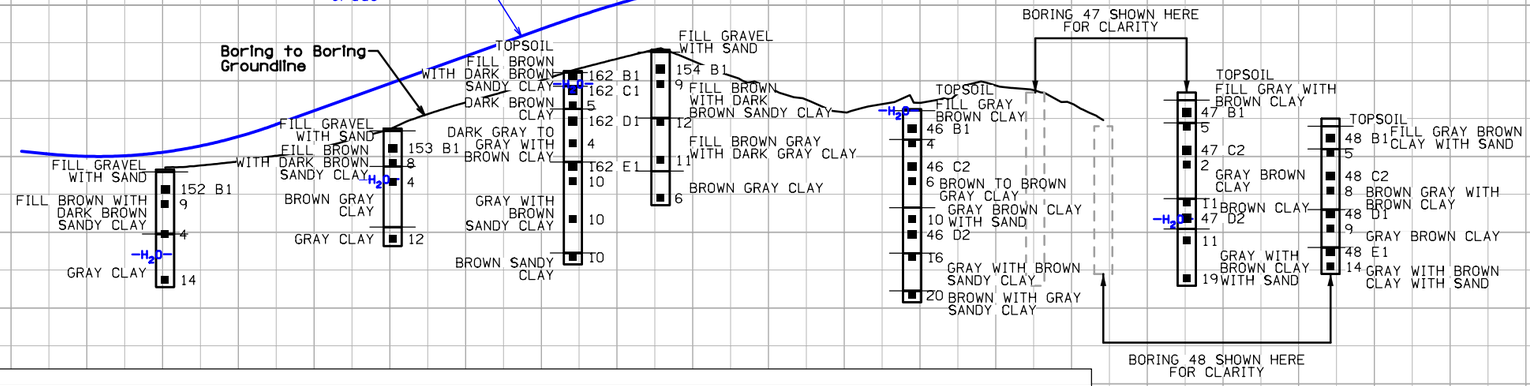
NOTE: SOILS MAY VARY BETWEEN BORINGS. SEE STANDARD SPECIFICATION 1104.01



SHELBY TUBE CORE DATA																			
CORE NO.	46 B1	46 C2	46 D2	47 B1	47 C2	47 D2	48 B1	48 C2	48 D1	48 E1	152 B1	153 B1	154 B1	162 B1	162 C1	162 D1	162 E1
DEPTH IN FEET	2	7	16	2	7	16	2	7	12	17	2	2	2	0	2	6	12
CLASSIFICATION (AASHTO)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COEFF.CONSOL.(SQ. FT /DAY)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIAXIAL COMPRESSION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
COHESION - PSF	1605	575	1695	2720	535	990	1945	450	1440	2930	1935	4975	3130	725	510	350	2365
FRICTION COEFF.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE CONTENT %	21	29	24	25	29	25	22	31	26	22	17	12	11	24	43	29	25
DRY DENSITY - PCF	99	92	100	98	86	97	102	86	97	103	113	119	125	103	70	91	101

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

152 RT.14 | 153 RT.4 | 162 LT.14 | 154 LT.9 | 46 RT.4 | 47 RT.3 | 48 RT.26

DRAFT

ENGLISH	IOWA DOT	DESIGN TEAM	Snyder and Associates, Inc.\Terracon	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	Q.18	REVISED

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POLLUTION PREVENTION PLAN

This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 OR an Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) individual storm water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP).

This Base PPP includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed per plan revisions or by contract modification, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

I. ROLES AND RESPONSIBILITES

A. Designer:
1. Prepares Base PPP included in the project plan.
2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
3. Is signature authority on the Base PPP.

B. Contractor:
1. Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
2. Designates a Water Pollution Control Manager (WPCM), who has the duties and responsibilities as defined in Section 2602 of the Standard Specifications.
3. Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2602 of the Standard Specifications.
4. Installs and maintains appropriate controls. This work may be subcontracted.
5. Supervises and implements good housekeeping practices.
6. Conducts joint required inspections of the site with inspection staff. When Contractor is not mobilized on site, Contractor may delegate this responsibility to a trained or certified subcontractor. Contracting Authority also may waive joint inspection requirement during winter shutdown. In both circumstances, WPCM (or trained or certified delegate from the Contractor) is still responsible to review and sign inspection reports.
7. Complies with training and certification requirements of Section 2602 of the Standard Specifications.

C. Subcontractors:
1. Sign a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP if responsible for sediment or erosion controls or involved in land disturbing activities. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
2. Implement good housekeeping practices.

D. RCE/Project Engineer:
1. Is Project Storm Water Manager.
2. On projects where DOT is the Contracting Authority, is current with erosion control training or certification.
3. Takes actions necessary to ensure compliance with storm water requirements including, where appropriate, issuing stop work orders, and directing additional inspections at construction project sites that are experiencing problems with achieving permit compliance.
4. Orders the taking of measures to cease, correct, prevent, or minimize the consequences of non-compliance with the storm water requirements of the Applicable Permit.
5. Supervises all work necessary to meet storm water requirements at the Project, including work performed by contractors and subcontractors.
6. Requires employees, contractors, and subcontractors to take appropriate responsive action to comply with storm water requirements, including requiring any such person to cease or correct a violation of storm water requirements, and to order or recommend such other actions as necessary to meet storm water requirements.
7. Is familiar with the Project PPP and storm water site map.
8. On projects where DOT is Contracting Authority, is responsible for monitoring inspection reports on a monthly basis, to determine whether deficiencies identified in inspection reports were adequately and timely addressed, and if not, has the authority and responsibility to direct immediate actions to correct the deficiencies.
9. Is the point of contact for the Project for regulatory officials, Inspector, contractors, and subcontractors regarding storm water requirements.
10. Is signature authority on Notice of Discontinuation.

E. Inspector:
1. Updates PPP whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.
2. Maintains an up-to-date record that identifies contractors and subcontractors as co-permittees.
3. Makes these plans available to the DNR upon their request.
4. Conducts joint required inspections of the site with the contractor/subcontractor.
5. Completes an inspection report after each inspection.
6. Is signature authority on storm water inspection reports.

II. PROJECT SITE DESCRIPTION

A. This Pollution Prevention Plan (PPP) is for the construction of a Grading.
B. This PPP covers approximately 126.56 acres with an estimated 105.25 acres being disturbed. The portion of the PPP covered by this contract has 33.88 acres disturbed.
C. The PPP is located in an area of 3 soil association (Tama-Muscatine-Downs). The estimated weighted average runoff coefficient number for this PPP after completion will be 0.37.
D. Storm Water Site Map is located in the R sheets. Proposed slopes are shown in cross sections, details, or standard road plans. Supplemental information is located in the Tabulations in the C or CE sheets.
E. The base storm water site map is amended by contract modifications and progress payments (fieldbook entries) of completed erosion control work. Also, due to project phasing, erosion and sediment controls shown on project plans may not be installed until needed, based on site conditions. For example, silt fence ditch checks will typically not be installed until the ditch has been installed. Installed locations may also be modified from tabulation locations by field staff. Installed locations will be documented by fieldbook entries.
F. Runoff from this work will flow into Sugar Creek and North English River.

110-12
04-16-19

POLLUTION PREVENTION PLAN

III. CONTROLS

A. The Contractor's ECIP specified in Article 2602.03 of the Standard Specifications for accomplishment of storm water controls should clearly describe the intended sequence of major activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented.
B. Preserve vegetation in areas not needed for construction.
C. Sections 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used and installed locations may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water monitoring inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B of the Standard Specifications.

1. EROSION AND SEDIMENT CONTROLS

a. Stabilization Practices
1) Site plans will ensure that existing vegetation or natural buffers are preserved where attainable and disturbed portions of the site will be stabilized.
2) Initialize stabilization of disturbed areas immediately after clearing, grading, excavating, or other earth disturbing activities have:
a) Permanently ceased on any portion of the site, or
b) Temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.
3) Staged permanent and/or temporary stabilizing seeding and mulching shall be completed as the disturbed areas are completed. Incomplete areas shall be stabilized according to paragraph III, C, 1, a, 2, b above.
4) Permanent and Temporary Stabilization practices to be used for this project are located in the storm water site map (when included), Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C sheets. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation (105-4) in the C sheets.
5) Preservation of existing vegetation within right-of-way or easements will act as vegetative buffer strips.
6) Preservation of topsoil: Bid items to be used for this project are located in the Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or is referenced in Section 2105 of the Standard Specifications.

b. Structural Practices
1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include: silt basins that provide 3600 cubic feet of storage per acre drained or equivalent sediment controls, outlet structures that withdraw water from surface when discharging basins, and controls to direct storm water to vegetated areas.
2) Structural practices to be used for this project are located in the storm water site map (when included), Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B sheets or are referenced in the Standard Road Plans Tabulation (105-4) located in the C sheets.

c. Storm Water Management
1) Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge locations and along length of outfall channel as necessary to provide a non-erosion velocity flow from structure to water course. If included with this project, these items are located in the storm water site map (when included) and Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation. The installation of these devices may be subject to Section 404 of the Clean Water Act.

2. OTHER CONTROLS

a. Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.
1) Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.
2) Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.
3) Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.
4) Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.
5) Spill Prevention and Control - Implement chemical spill and leak prevention and response procedures to contain and clean-up spills and prevent material discharges to the storm drain system and waters of the state.
6) Concrete Residuals and Washout Wastes - Waste shall not be discharged to a surface water and is not allowed to adversely affect a water of the state. Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located. Designated washout areas should be located at least 50 feet away from storm drains, streams or other water bodies. Care should be taken to ensure these facilities do not overflow during storm events.
7) Concrete Grooving/Grinding Slurry – Do not discharge slurry to a waterbody or storm drain. Slurry may be applied on foreslopes or removed from the project.
8) Vehicle and Equipment Storage and Maintenance Areas - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onsite fuels and proper disposal of used engine oil or other fluids on site. Employ washing practices that prevent contamination of surface and ground water from wash water. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
9) Litter Management - Ensure employees properly dispose of litter. Minimize exposure of trash if exposure to precipitation or storm water would result in a discharge of pollutants.
10) Dewatering – Properly treat water to remove suspended sediment before it re-enters a waterbody or discharges off-site. Measures are also to be taken to prevent scour erosion at dewatering discharge point.

3. APPROVED STATE OR LOCAL PLANS
During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

IV. MAINTENANCE PROCEDURES

The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

POLLUTION PREVENTION PLAN

V. INSPECTION REQUIREMENTS

A. Inspections shall be made jointly by the Contractor and the Contracting Authority at least once every seven calendar days. Storm water monitoring inspections will include:
   1. Date of the inspection.
   2. Summary of the scope of the inspection.
   3. Name and qualifications of the personnel making the inspection.
   5. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
   6. Major observations related to the implementation of the PPP.
   7. Identification of corrective actions required to maintain or modify erosion and sediment control measures.

B. Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be made.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of headwalls or blocks, Class A stone, erosion stone or other appropriate materials. This also includes uncontaminated groundwater from dewatering operations, which will be controlled as discussed in Section III of the PPP.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

A. Base PPP - Initial Pollution Prevention Plan.
B. Amended PPP - May include Plan Revisions or Contract Modifications for new items, storm water monitoring inspection reports, and fieldbook entries made by the inspector.
C. IDR - Inspector’s Daily Report – this contains the inspector’s daily diary and bid item postings.
D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
E. Signature Authority - Representative authorized to sign various storm water documents.

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____
Signature

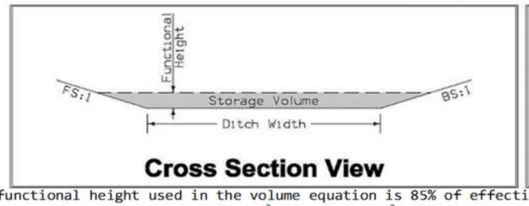
_____
Printed or Typed Name

_____
Signature

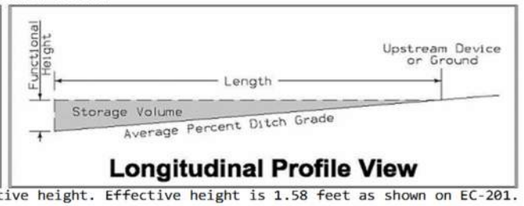
_____

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



Cross Section View



Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: [0.5*Spacing*(0.5*H^2*FS+DW*H+0.5*H^2*BS)]

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Avg.% Slope	Volume*	
				LF	LF	LF	FS:1	BS:1	FT	Ditch Grade	CF	
1	1	55+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	55+50.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	56+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	56+50.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	57+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	57+50.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.8%	538.7	
1	1	58+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.7%	538.7	
1	1	58+50.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.7%	538.7	
1	1	59+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.5%	646.4	
1	1	59+60.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	2.4%	646.4	
1	1	60+20.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.1%	723.4	
1	1	60+80.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.9%	723.4	
1	1	61+55.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.7%	723.4	
1	1	62+30.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.5%	964.6	
1	1	63+05.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.2%	964.6	
1	1	64+05.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.7%	1495.1	
1	1	65+60.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.5%	3038.5	
2	1	68+80.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.6%	1495.1	
2	1	71+95.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.4%	3038.5	
2	1	75+10.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.4%	3038.5	
2	1	75+85.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.0%	723.4	
2	1	76+60.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.0%	723.4	
2	1	77+60.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.1%	964.6	
2	1	80+75.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.3%	3038.5	
2	1	83+90.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.3%	3038.5	
2	1	87+05.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.3%	3038.5	
2	1	87+80.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.6%	723.4	
2	1	88+30.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	3.0%	482.3	
2	1	89+00.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.9%	482.3	
2	1	89+50.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.9%	482.3	
3	1	91+45.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.6%	1495.1	
3	1	93+00.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.6%	1495.1	
3	1	93+40.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	3.7%	385.8	
3	1	93+80.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	3.9%	385.8	
3	1	94+25.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.9%	482.3	
4	1	2595+80.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	0.8%	1669.8	
4	1	2597+35.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	0.8%	1669.8	
4	1	2598+90.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	0.8%	1669.8	
4	1	2600+45.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	0.8%	1669.8	
4	1	2602+00.00	RT	28.0	2.8	14.0	6.0	3.0	10.0	0.8%	1669.8	
4	1	2602+50.00	RT	23.8	2.4	11.9	6.0	3.0	5.8	2.9%	397.6	
4	1	2603+00.00	RT	18.0	1.8	9.0	6.0	3.0	0.0	2.9%	202.9	
5	1	98+35.00	RT	22.5	2.3	11.3	3.5	6.0	3.5	2.2%	398.0	
5	1	98+95.00	RT	28.5	2.9	14.3	3.5	6.0	9.5	2.2%	639.8	
5	1	99+30.00	RT	29.0	2.9	14.5	3.5	6.0	10.0	5.0%	385.0	
5	1	99+65.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	5.0%	345.5	
5	1	100+00.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	5.0%	345.5	
5	1	100+25.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
5	1	100+50.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
5	1	100+75.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
5	1	101+00.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
5	1	104+15.00	RT	50.0	5.0	25.0	10.0	10.0	10.0	0.3%	4956.0	
5	1	105+70.00	RT	50.0	5.0	25.0	10.0	10.0	10.0	0.6%	2438.7	
6	1	110+00.00	RT	50.0	5.0	25.0	10.0	10.0	10.0	0.6%	2438.7	
6	1	110+75.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	111+00.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	111+25.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	111+50.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	111+75.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	112+00.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	112+25.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	6.0%	320.1	
6	1	112+50.00	RT	35.0	3.5	17.5	3.5	10.0	10.0	6.0%	320.1	
6	1	112+75.00	RT	33.0	3.3	16.5	3.5	10.0	10.0	6.0%	320.1	

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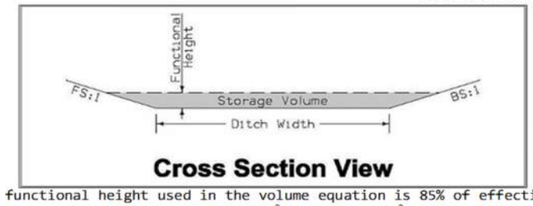
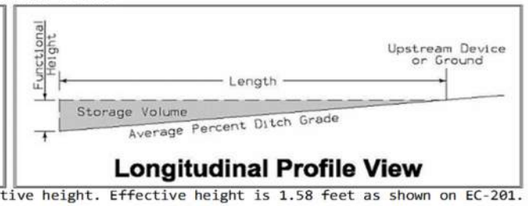
SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



Cross Section View



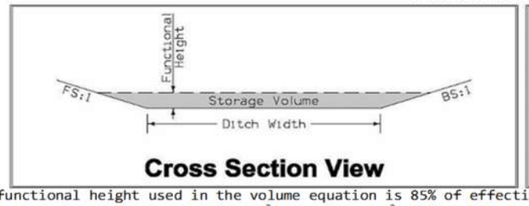
Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: [0.5*Spacing*(0.5*H^2*FS+DW*H+0.5*H^2*BS)]

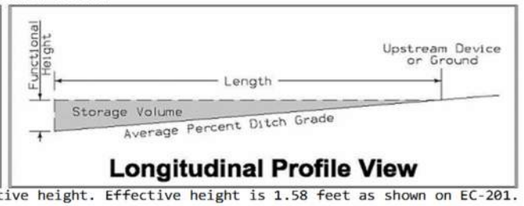
Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Avg.% Slope	Volume*	
				LF	LF	LF	FS:1	BS:1	FT	Ditch Grade	CF	
6	1	113+00.00	RT	31.0	3.1	15.5	3.5	10.0	10.0	6.0%	320.1	
6	1	113+25.00	RT	29.0	2.9	14.5	3.5	10.0	10.0	6.0%	320.1	
6	1	113+50.00	RT	27.0	2.7	13.5	3.5	10.0	10.0	6.0%	320.1	
6	1	113+75.00	RT	26.0	2.6	13.0	3.5	10.0	10.0	6.0%	320.1	
6	1	114+00.00	RT	25.0	2.5	12.5	3.5	10.0	10.0	6.0%	320.1	
6	1	114+25.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
6	1	114+50.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
6	1	114+75.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
6	1	115+00.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	6.0%	246.8	
6	1	115+25.00	RT	22.0	2.2	11.0	3.5	3.5	8.0	6.0%	213.2	
6	1	115+50.00	RT	20.2	2.1	10.1	3.5	3.5	6.2	6.0%	183.0	
6	1	115+75.00	RT	18.2	1.9	9.1	3.5	3.5	4.2	6.0%	149.4	
6	1	116+00.00	RT	16.3	1.7	8.2	3.5	3.5	2.3	6.0%	117.5	
6	1	116+25.00	RT	14.4	1.5	7.2	3.5	3.5	0.4	6.0%	85.6	
7	1	4509+30.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.1%	723.4	
7	1	4509+90.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	2.1%	723.4	
7	1	4510+25.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	6.0%	241.1	
7	1	4510+50.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	6.0%	241.1	
7	1	4510+75.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.6%	1495.1	
7	1	4512+30.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.6%	1495.1	
7	1	4513+85.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.0%	1495.1	
7	1	4515+40.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	3.0%	482.3	
7	1	4515+90.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	3.0%	482.3	
7	1	4516+40.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.4%	3038.5	
7	1	4518+50.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.3%	964.6	
7	1	4519+50.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.5%	964.6	
8	1	121+50.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.1%	964.6	
9	5	125+60.00	RT	81.0	8.1	40.5	3.5	0.0	16.0	1.1%	1232.2	
9	5	126+20.00	RT	120.0	12.0	60.0	3.5	0.0	16.0	1.1%	1232.2	
9	5	127+20.00	RT	66.0	6.6	33.0	3.5	0.0	16.0	3.3%	554.5	
9	5	127+65.00	RT	61.0	6.1	30.5	3.5	0.0	16.0	3.8%	492.9	
9	5	128+05.00	RT	100.0	10.0	50.0	3.5	0.0	16.0	1.7%	924.2	
10	5	129+60.00	RT	101.0	10.1	50.5	3.5	0.0	14.0	1.5%	1097.9	
10	5	130+60.00	RT	118.0	11.8	59.0	3.5	0.0	14.0	1.1%	1097.9	
10	5	130+90.00	RT	83.0	8.3	41.5	3.5	0.0	20.0	2.1%	1125.6	
10	5	131+50.00	RT	57.0	5.7	28.5	3.5	0.0	20.0	1.1%	1500.8	
11	5	132+20.00	RT	70.0	7.0	35.0	3.5	0.0	24.0	2.4%	1061.7	
11	5	132+55.00	RT	62.0	6.2	31.0	3.5	0.0	22.0	5.0%	572.3	
11	5	132+85.00	RT	54.0	5.4	27.0	3.5	0.0	20.0	5.1%	450.2	
11	5	133+10.00	RT	48.0	4.8	24.0	3.5	0.0	18.0	5.8%	341.6	
11	5	133+85.00	RT	96.0	9.6	48.0	3.5	0.0	16.0	2.0%	924.2	
11	5	134+20.00	RT	54.0	5.4	27.0	3.5	0.0	14.0	4.7%	384.3	
11	1	135+75.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.0%	1495.1	
11	1	137+30.00	RT	28.0	2.8	14.0	3.5	3.0	10.0	1.0%	1495.1	
11	5	137+95.00	RT	70.0	7.0	35.0	3.5	0.0	26.0	3.9%	761.5	
11	5	138+20.00	RT	56.0	5.6	28.0	3.5	0.0	26.0	7.9%	475.9	
11	5	138+45.00	RT	56.0	5.6	28.0	3.5	0.0	26.0	9.6%	475.9	
11	5	138+70.00	RT	56.0	5.6	28.0	3.5	0.0	26.0	10.4%	475.9	
11	5	138+95.00	RT	54.0	5.4	27.0	3.5	0.0	24.0	9.4%	442.4	
11	5	139+20.00	RT	52.0	5.2	26.0	3.5	0.0	22.0	6.0%	408.8	
11	5	139+50.00	RT	55.0	5.5	27.5	3.5	0.0	20.0	5.1%	450.2	
11	5	139+75.00	RT	48.0	4.8	24.0	3.5	0.0	18.0	5.9%	341.6	
11	5	140+00.00	RT	48.0	4.8	24.0	3.5	0.0	18.0	6.0%	341.6	
11	5	140+25.00	RT	50.0	5.0	25.0	3.5	0.0	20.0	6.5%	375.2	
11	5	140+50.00	RT	52.0	5.2	26.0	3.5	0.0	22.0	8.2%	408.8	
11	5	140+75.00	RT	54.0	5.4	27.0	3.5	0.0	24.0	9.6%	442.4	
11	5	141+00.00	RT	66.0	6.6	33.0	3.5	0.0	26.0	4.2%	666.3	
11	1	141+35.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.2%	3038.5	
12	1	146+35.00	RT	28.0	2.8	14.0	3.5	3.0	10.0	0.2%	3038.5	
12	1	149+50.00	RT	28.0	2.8	14.0	3.5	3.0	10.0	0.2%	3038.5	
12	1	152+65.00	RT	28.0	2.8	14.0	3.5	3.0	10.0	0.2%	3038.5	
12	1	155+80.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.2%	3038.5	

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



Cross Section View



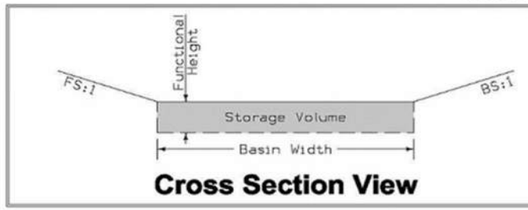
Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: [0.5*Spacing*(0.5*H^2*FS+DW*H+0.5*H^2*BS)]

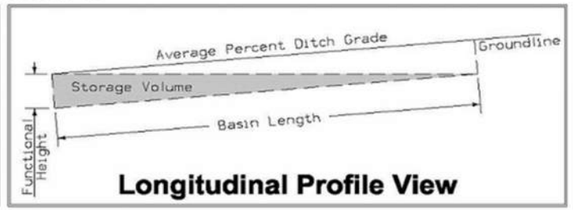
Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Avg.% Slope	Volume*	
				LF	LF	LF	FS:1	BS:1	FT	Ditch Grade	CF	
12	1	158+95.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	0.2%	3038.5	
12	1	159+30.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	4.1%	337.6	
12	1	159+65.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	4.1%	337.6	
12	1	160+00.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	4.1%	337.6	
12	1	161+00.00	RT	23.0	2.3	11.5	3.5	3.0	10.0	1.1%	964.6	
13	1	3598+10.00	RT	29.0	2.9	14.5	6.0	3.5	10.0	3.9%	439.9	
13	1	3598+50.00	RT	29.0	2.9	14.5	6.0	3.5	10.0	3.9%	439.9	
13	1	3598+90.00	RT	29.0	2.9	14.5	6.0	3.5	10.0	3.9%	439.9	
13	1	3599+25.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.7%	345.5	
13	1	2599+60.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.7%	345.5	
13	1	3599+95.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.7%	345.5	
13	1	3600+30.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.1%	345.5	
13	1	3600+65.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.1%	345.5	
13	1	3601+00.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	4.1%	345.5	
13	1	3601+50.00	RT	37.0	3.7	18.5	10.0	3.5	10.0	3.0%	640.1	
13	1	3602+00.00	RT	37.0	3.7	18.5	10.0	3.5	10.0	3.0%	640.1	
13	1	3605+15.00	RT	50.0	5.0	25.0	10.0	10.0	10.0	0.4%	4956.0	
14	1	1508+55.00	RT	22.0	2.2	11.0	3.0	3.0	10.0	0.1%	2967.4	
14	1	1509+30.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	2.1%	960.2	
14	1	1509+90.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	2.1%	960.2	
14	1	1510+50.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	4.9%	448.1	
14	1	1510+85.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	4.9%	448.1	
14	1	1511+20.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	4.9%	448.1	
14	1	1511+55.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	4.9%	448.1	
14	1	1511+90.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	2.2%	768.1	
14	1	1512+50.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	3.5%	576.1	
14	1	1512+95.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	3.5%	576.1	
14	1	1513+40.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	3.5%	576.1	
14	1	1513+85.00	RT	37.0	3.7	18.5	3.5	10.0	10.0	3.5%	576.1	
14	1	1514+30.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.2%	246.8	
14	1	1514+55.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.2%	246.8	
14	1	1514+80.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.2%	246.8	
14	1	1515+05.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.2%	246.8	
14	1	1515+30.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1515+55.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1515+80.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1516+05.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1516+30.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1516+55.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
14	1	1516+80.00	RT	24.0	2.4	12.0	3.5	3.5	10.0	9.0%	246.8	
15	5	1510+80.00	LT	59.0	5.9	29.5	3.5	0.0	14.0	4.1%	384.3	
15	5	1511+15.00	LT	63.0	6.3	31.5	3.5	0.0	14.0	1.6%	823.4	
16	5	1512+05.00	LT	78.0	7.8	39.0	3.5	0.0	14.0	3.0%	549.0	
16	5	1512+30.00	LT	45.0	4.5	22.5	3.5	0.0	14.0	6.5%	274.5	
16	5	1512+55.00	LT	45.0	4.5	22.5	3.5	0.0	14.0	6.2%	274.5	
16	5	1512+80.00	LT	46.0	4.6	23.0	3.5	0.0	14.0	9.2%	274.5	
16	5	1513+25.00	LT	67.0	6.7	33.5	3.5	0.0	14.0	3.5%	494.1	
16	5	1514+00.00	LT	100.0	10.0	50.0	3.5	0.0	14.0	1.6%	823.4	
16	5	1514+25.00	LT	48.0	4.8	24.0	3.5	0.0	14.0	13.4%	274.5	
16	5	1514+50.00	LT	44.0	4.4	22.0	3.5	0.0	14.0	10.1%	274.5	
16	5	1514+75.00	LT	63.0	6.3	31.5	3.5	0.0	14.0	3.4%	494.1	
16	5	1515+20.00	LT	63.0	6.3	31.5	3.5	0.0	14.0	3.2%	494.1	
16	5	1515+65.00	LT	94.0	9.4	47.0	3.5	0.0	14.0	2.0%	823.4	
16	5	1516+40.00	LT	164.0	16.4	82.0	3.5	0.0	14.0	0.8%	1701.8	
16	5	1517+95.00	LT	280.0	28.0	140.0	3.5	0.0	14.0	0.3%	3458.4	
17	5	1522+15.00	LT	143.0	14.3	71.5	3.5	0.0	14.0	0.8%	1701.8	
17	5	1522+90.00	LT	101.0	10.1	50.5	3.5	0.0	14.0	1.7%	823.4	
17	5	1523+40.00	LT	76.0	7.6	38.0	3.5	0.0	14.0	2.8%	549.0	
		Total		7173.0								
		Bid Quantity		10760.0	1077.0	5380.0						
				+50% Adj.	10% Bid	50% Bid						

SILT BASINS

Possible Standard: EW-403



Cross Section View



Longitudinal Profile View

* The functional height used in the volume equation is 95% of effective height. Effective height is 3 feet as shown in EW-403.
* Volume equation: (0.5*Length*(Width*Height+Width*(Height-Length*Avg%Slope))

Basin No.	Location		Bid Items		Stormwater Storage Volume Summary					Remarks
	Station	Side	Installation	Removal	Basin Width	Basin Length	Height	Avg. % Slope	Volume*	
			EACH	EACH	FT	FT	FT		CF	
1	54+72.00	RT	1		10.0	50.0	2.85	18.8%	712.5	
2	87+47.00	RT	1		10.0	50.0	2.85	1.7%	1212.5	
2	88+85.00	RT	1		10.0	50.0	2.85	2.9%	1062.5	
3	93+40.00	RT	1		10.0	50.0	2.85	3.7%	962.5	
3	94+17.00	RT	1		10.0	50.0	2.85	2.9%	1062.5	
4	2601+90.00	RT	1		10.0	50.0	2.85	0.7%	1337.5	
6	109+63.00	RT	1		10.0	50.0	2.85	0.9%	1312.5	
6	110+77.00	RT	1		10.0	50.0	2.85	5.0%	800.0	
9	125+33.00	RT	1		10.0	50.0	2.85	0.4%	1375.0	
10	128+59.00	LT	1		10.0	50.0	2.85	5.0%	800.0	
11	137+44.00	RT	1		10.0	50.0	2.85	1.0%	1300.0	
11	139+88.00	RT	1		10.0	50.0	2.85	4.0%	925.0	
12	161+25.00	RT	1		10.0	50.0	2.85	1.4%	1250.0	
13	3606+05.37	RT	1		10.0	50.0	2.85	0.3%	1387.5	
15	1510+52.00	LT	1		10.0	50.0	2.85	4.5%	862.5	
17	1523+62.95	LT	1		10.0	50.0	2.85	1.0%	1300.0	
	Total		16							
	uantity (x 2)		32							

100-34
10-17-17

STORMWATER DRAINAGE BASIN AND STORAGE

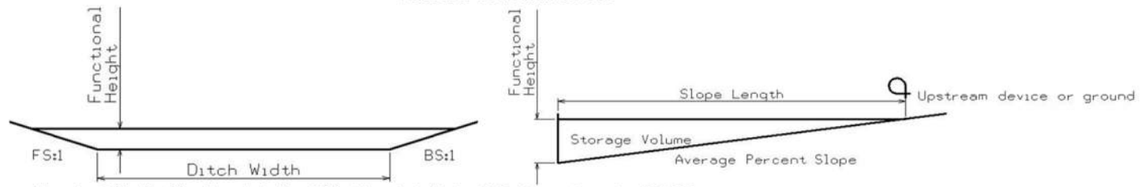
Refer to EC Standards and 570s Details.

Drainage Basin Location						Summary of Stormwater Storage							Remarks
Basin No.	Station to Station		Side	Discharge Point		Total Disturbed Area	Disturbed Area with Storage Provided	Disturbed Area without Storage Provided	Best Management Practice	Total Storage Volume Provided	Total Storage Volume Required	Storage Volume Met?	
				Station	Side	Acres	Acres	Acres		CF	CF	Yes/No	
1	48+20.00	68+00.00	RT	54+30.00	RT	4.0	4.0	0.0		14947.7	14400.0	Yes	
2	68+00.00	90+27.00	RT	88+52.00	RT	6.5	6.5	0.0		23544.3	23400.0	Yes	
3	90+27.00	95+00.00	RT	93+87.37	RT	1.4	1.4	0.0		6269.2	5040.0	Yes	
4	2595+00.00	2602+50.00	RT	2603+00.00	RT	1.3	1.3	0.0		10287.3	4680.0	Yes	
5	94+60.00	107+30.00	RT	106+61.80	RT	6.2	6.2	0.0		34291.9	22320.0	Yes	
6	107+98.00	120+78.00	RT	110+00.00	RT	5.5	5.5	0.0		11980.2	19800.0	No	
7	4508+63.00	4520+78.00	RT	4510+10.00	RT	2.8	2.8	0.0		12346.8	10080.0	Yes	
8	120+78.00	124+23.00	RT	123+30.36	RT	1.8	1.8	0.0		3247.0	6480.0	No	
9	124+23.00	128+76.00	RT	124+89.35	RT	2.1	2.1	0.0		7668.6	7560.0	Yes	
10	128+76.00	131+83.00	RT	130+75.50	RT	0.9	0.9	0.0		5622.3	3240.0	Yes	
11	131+83.00	149+40.00	RT	139+88.00	RT	5.0	5.0	0.0		18054.5	18000.0	Yes	
12	149+40.00	165+85.00	RT	165+75.00	RT	3.4	3.4	0.0		18419.8	12240.0	Yes	
13	95+14.00	107+12.00	LT	105+40.00	LT	5.4	5.4	0.0		30053.6	19440.0	Yes	
14	108+00.00	119+27.00	LT	108+60.00	LT	6.0	6.0	0.0		36616.2	21600.0	Yes	
15	1510+37.00	1511+51.00	LT	1510+75.00	LT	0.1	0.1	0.0		2070.2	360.0	Yes	
16	1511+51.00	1520+57.00	LT	1514+35.00	LT	2.7	2.7	0.0		10210.6	9720.0	Yes	
17	1520+57.00	1523+90.00	LT	1523+63.00	LT	1.1	1.1	0.0		4374.2	3960.0	Yes	

100-32
10-16-18

ROCK CHECK DAM

Possible Standard: EC-302



* The functional height used in the volume equation is 90% of effective height. Effective height is 2 feet as shown in EC-302.
* Volume equation: [0.5*Spacing*(0.5*H^2*FS+DW*H+0.5*H^2*BS)]

Basin No.	Location			Bid Items			Stormwater Storage Volume Summary					Remarks
	Station	Side	Offset	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Avg. % Slope	Volume*	
			FT	LF	Each	Each	FS:1	BS:1	FT		CF	
6	4510+20.77	LT		46.0	1	1	7.0	7.5	10.0	12.0%	414.9	
6	4510+32.41	LT		38.0	1	1	3.5	7.5	10.0	12.0%	358.2	
6	4510+44.05	LT		50.0	1	1	10.0	6.0	10.0	12.0%	439.2	
8	121+70.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	121+90.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	122+10.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	122+30.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	122+50.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	122+70.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	122+90.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
8	123+10.00	RT		26.0	1	1	3.5	3.0	10.0	8.6%	285.3	
9	7126+20.86	RT		17.0	1	1	3.0	3.0	2.0	9.6%	133.2	
9	7126+40.56	RT		19.0	1	1	3.0	3.0	4.0	9.6%	169.2	
9	7126+60.27	RT		21.0	1	1	3.0	3.0	6.0	9.6%	205.2	
9	7126+79.97	RT		23.0	1	1	3.0	3.0	8.0	9.6%	241.2	
9	7127+10.75	RT		25.0	1	1	3.0	3.0	10.0	15.4%	277.2	
9	7127+30.66	RT		25.0	1	1	3.0	3.0	10.0	15.4%	277.2	
9	7127+50.57	RT		25.0	1	1	3.0	3.0	10.0	15.4%	277.2	
9	7127+40.48	RT		25.0	1	1	3.0	3.0	10.0	15.4%	277.2	
		Total		522.0	19	19						

100-23
04-17-18

ROCK EROSION CONTROL

Refer to EC-301 and Detail 570-8

Location				(L)	(W)	Rock Erosion Control (REC)					Material Bid Quantities			Remarks
Road Identification	Begin Station	End Station	Side			Type 1	Type 2	Type 3	Type 4	Type 5	Eng. Fabric	Class E Revetment	Erosion Stone	
			Lt./Rt.	FT	FT	Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection	SY	TON	TON	
I-80	52+94.70	53+32.37	RT	12	42				X		81.8	52.9		
	54+29.98	54+61.63	RT	12	33.4				X		66.5	42.1		
	87+70.75	87+79.25	RT	8.5	24.1				X		39.0	21.5		
	88+46.00	88+58.00	LT	12	44				X		85.3	55.4		
	93+63.75	93+72.25	RT	8.5	18				X		30.6	16.1		
	94+74.25	94+92.97	LT	10	35				X		60.7	36.8		
	109+67.75	109+76.25	RT	8.5	24.1				X		39.0	21.5		
	109+94.00	110+06.00	LT	12	44				X		85.3	55.4		
	122+45.75	122+54.25	RT	8.5	24.1				X		39.0	21.5		
	123+27.90	123+43.85	RT	9.5	14				X		27.0	14.0		
	123+64.33	123+79.48	LT	11.6	42				X		79.7	51.2		
	128+72.67	128+98.83	LT	10	35				X		60.7	36.8		
	137+70.75	137+79.25	RT	8.5	18				X		30.6	16.1		
	139+81.25	139+94.75	LT	13.5	49.3				X		103.6	69.9		
	163+88.75	164+01.25	RT	8.5	24.1				X		39.0	21.5		
IA 146	5083+29.00	5083+41.00	RT	12	44				X		85.3	55.4		
	5089+70.75	5089+79.25	RT	8.5	24.1				x		39.0	21.5		
										Total:	992.2	609.5		

100-17
04-20-10

TABULATION OF SILT FENCES

Refer to EC-201

Location			Length	Remarks
Begin Station	End Station	Side	LF	
55+75.00	61+00.00	RT	595.0	Includes 'J' Hooks
99+75.00	106+25.00	RT	735.0	Includes 'J' Hooks
101+50.00	106+25.00	RT	545.0	Includes 'J' Hooks
109+05.00	115+70.00	RT	750.0	Includes 'J' Hooks
109+05.00	113+00.00	RT	450.0	Includes 'J' Hooks
125+30.00	130+45.00	RT	585.0	Includes 'J' Hooks
147+30.00	155+30.00	RT	670.0	Includes 'J' Hooks
99+50.00	106+25.00	LT	760.0	Includes 'J' Hooks
101+70.00	106+25.00	LT	520.0	Includes 'J' Hooks
104+70.00	106+25.00	LT	180.0	Includes 'J' Hooks
109+05.00	116+15.00	LT	795.0	Includes 'J' Hooks
109+05.00	114+70.00	LT	635.0	Includes 'J' Hooks
109+05.00	110+25.00	LT	160.0	Includes 'J' Hooks
110+90.00	112+30.00	LT	180.0	Includes 'J' Hooks
1512+85.00	1523+25.00	LT	1155.0	Includes 'J' Hooks
1516+60.00	1523+25.00	LT	750.0	Includes 'J' Hooks
4514+00.00	4523+10.00	RT	1010.0	Includes 'J' Hooks
4521+85.00	4523+15.00	RT	170.0	Includes 'J' Hooks
	Total		10645.0	
	Bid Quantity		13307.0	plus 25% adjustment
	Maintenance		1331.0	10% of bid
	Removal		6654.0	50% of bid

100-19
04-19-16

PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

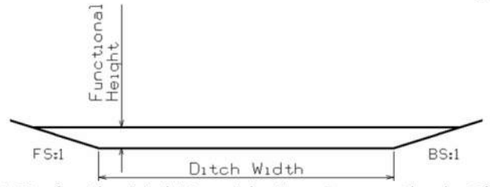
Possible Standards: EC-204

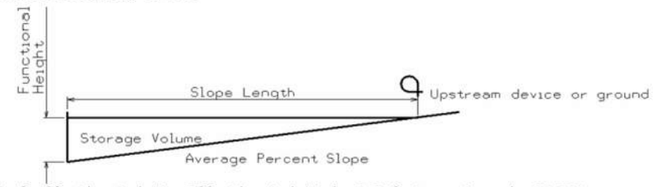
Location			Length of Installation			Remarks
Begin Station	End Station	Side	9 inch Dia	12 inch Dia	20 inch Dia	
			LF	LF	LF	
54+26.50		RT		42.0		
55+83.90		LT		42.0		
61+22.97		RT		39.0		
79+27.17		RT		39.0		
87+75.00		RT		39.0		
88+52.00		RT		42.0		
93+99.37		RT		39.0		
99+50.00		RT		39.0		
109+72.00		RT		39.0		
110+00.00		RT		42.0		
114+89.22		RT		39.0		
114+55.19		LT		39.0		
123+30.70		RT		42.0		
130+73.80		RT		39.0		
137+75.00		RT		39.0		
139+88.00		RT		45.0		
152+00.00		RT		39.0		
158+27.06		LT		39.0		
163+94.55		LT		39.0		
5083+35.00		LT		42.0		
5084+45.00		M		14.0		
5089+75.00		RT		39.0		
	Total:			857.0		

100-33
10-16-18

TEMPORARY SEDIMENT CONTROL BASIN

Possible Standard: EC-601





* The functional height used in the volume equation is 95% of effective height. Effective height is 2.5 feet as shown in EC-601.

* Volume equation: $[(1/4(FS*H^2))+(DW*H)+(1/4*(BS*H^2))]*(H/Avg\%Slope)$

Basin No.	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
	Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Average % Slope	Volume*	
			Each	Each	Each	FS:1	BS:1	FT		CF	
5	106+32.00	RT	1	1	1	10.0	10.0	10.00	0.4%	23796.4	
13	105+30.00	LT	1	1	1	10.0	10.0	10.00	0.5%	19037.1	
14	108+89.00	LT	1	1	1	3.0	3.0	10.00	0.2%	24148.9	
	Total:		3	3	3						
	Bid Quantity:		3	9	3						

100-22
04-21-15

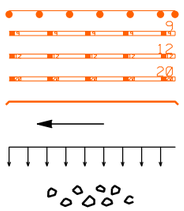
ROLLED EROSION CONTROL

Refer to EC-101, EC-103 and EC-104

Location				(L)	(W)	Turf Reinforcement Mat (TRM) (EC-104)				Slope Protection (EC-103)	Special Ditch Control (EC-101)	Remarks
Road Identification	Begin Station	End Station	Side			Type 1	Type 2	Type 3	Type 4			
				FT	FT	Squares	Squares	Squares	Squares	Squares	Squares	
I-80	87+00.00	90+00.00	LT	300	6						18	
	87+50.00	89+50.00	RT	200	16						32	
	98+00.00	105+50.00	LT	750	6						45	
			Total:								95	

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)183--03-79	SHEET NUMBER RC.6

LINE STYLE LEGEND OF EROSION CONTROL SHEETS



Silt Fence
Perimeter and Slope Sediment Control Device (9")
Perimeter and Slope Sediment Control Device (12")
Perimeter and Slope Sediment Control Device (20")
Open-Throat Curb Intake Sediment Filter
Concentrated Flow
Sheet Flow
Rock Check Dam

CELL LEGEND OF EROSION CONTROL SHEETS

Temporary Sediment Control basin

Erosion Control for Circular Intake or Manhole Well

Erosion Control for Rectangular Intake or Manhole Well

Grate Intake Sediment Filter Bag

Silt Basin

Silt Fence Tail

Stormwater Drainage Basin Discharge Point

V-Ditch

SLOPE PROTECTION, WOOD EXCELSIOR MAT

EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES R)

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	RR.1

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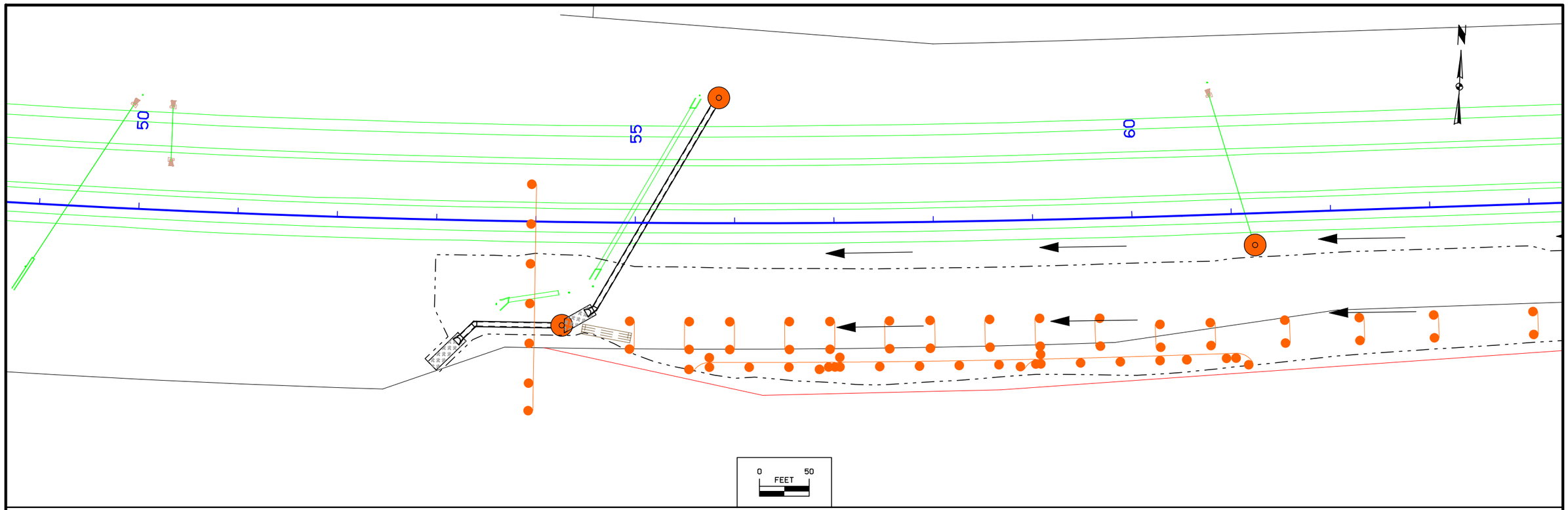

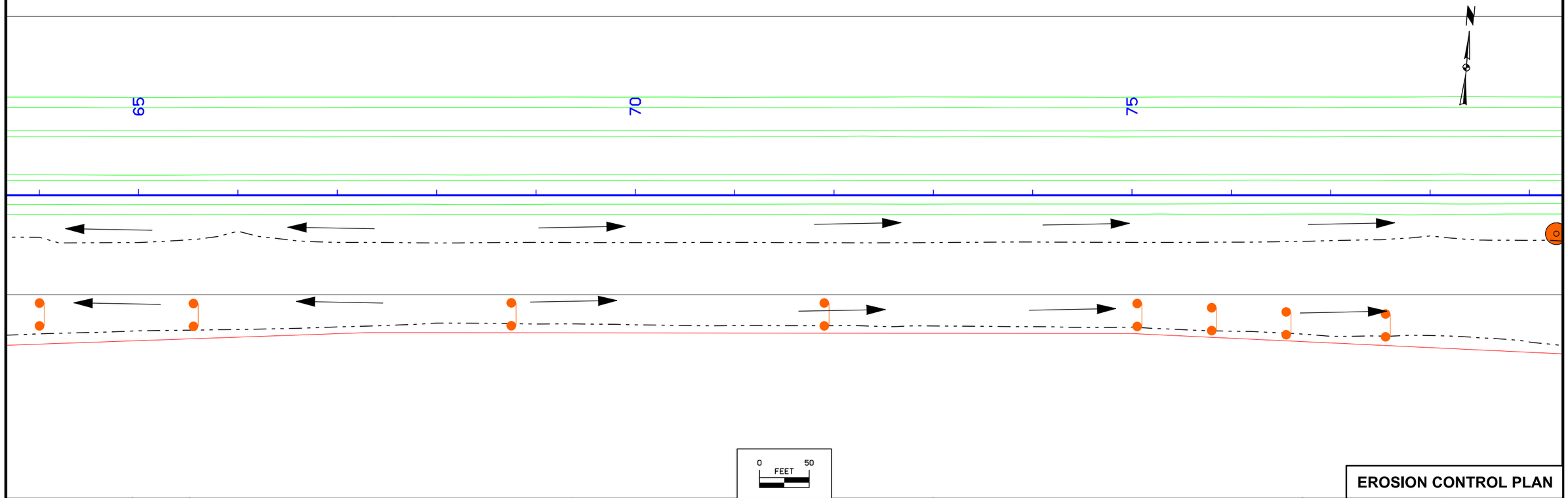

EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(355)183--03-79	SHEET NUMBER RR.2

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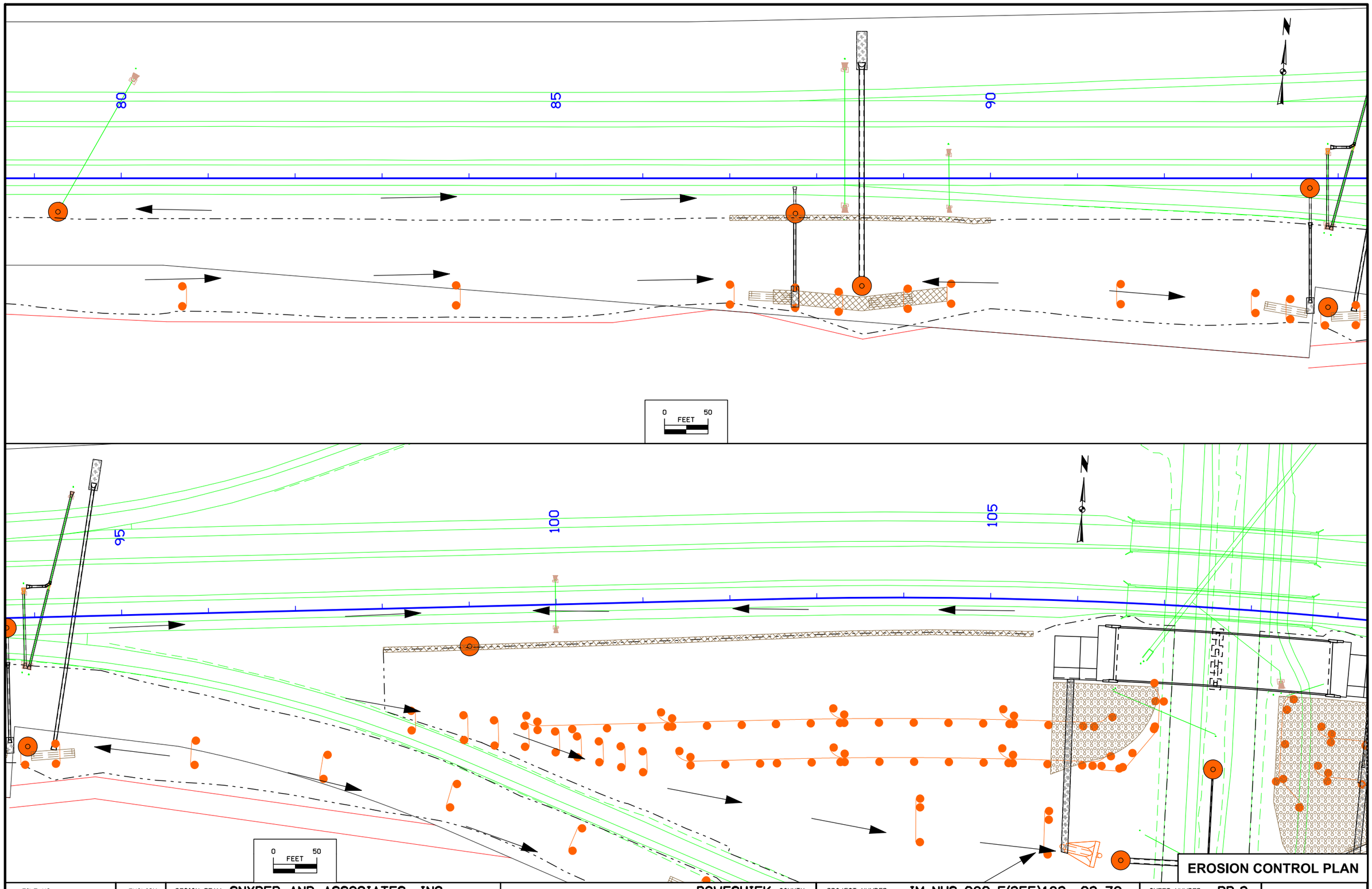

EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(355)183--03-79	SHEET NUMBER	RR.3

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110

115

120

0 50
FEET

125

130

135

0 50
FEET

EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(355)183--03-79	SHEET NUMBER RR.4

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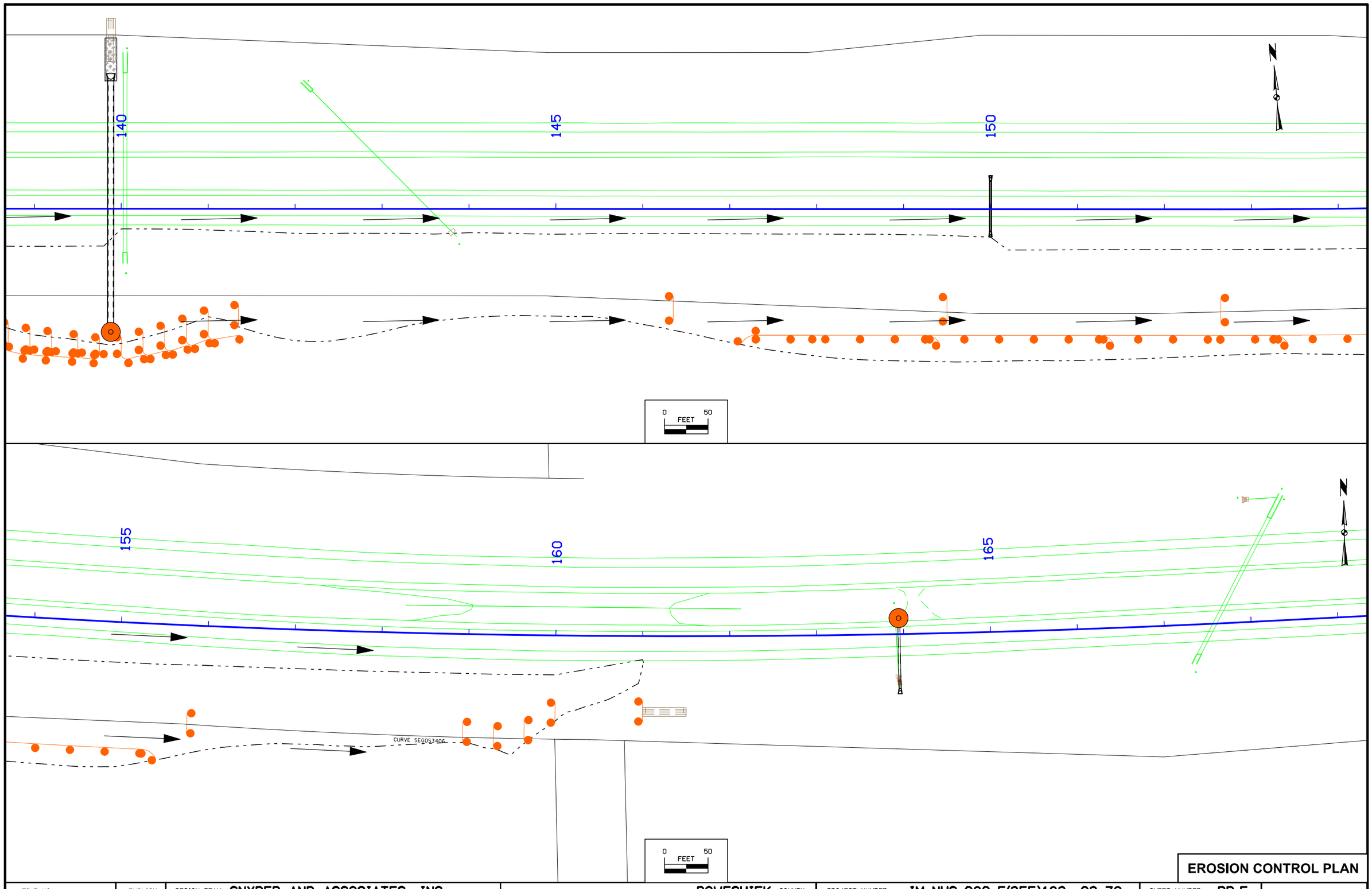

EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(355)183--03-79	SHEET NUMBER RR.5

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1510

1515

1520

Staging Area for Topsoil Stockpile

0 FEET 50

RAMP A
EROSION CONTROL PLAN

2595

2600

2605

0 FEET 50

RAMP B
EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(355)183--03-79	SHEET NUMBER RR.6

3:42:00 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_RR06.dgn

4515

4520

PI Sta 4519+54.52

PC Sta 4516+54.60

PT Sta 4522+60.08

Curve Data
Δ = 17° 03' 24.45" (RT)
T = 299.92
R = 595.39
L = 2,000.00
E = 22.36

0 50 FEET

RAMP D
EROSION CONTROL PLAN

125

0 50 FEET

UPRR CROSSING
EROSION CONTROL PLAN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(355)183--03-79	SHEET NUMBER RR.7

3:42:07 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_RR07.dgn

GRANT TWP.
T-80N R-16W
SEC. 31

Sect. No. 31

Sect. No. 32

50 55 60 65 70 75

Basin 1
4.04 AC

Basin 2
6.45 AC

0 100
FEET

80 85 90 95 100 105

Basin 2
6.45 AC

Basin 3
1.41 AC

Basin 4
1.33 AC

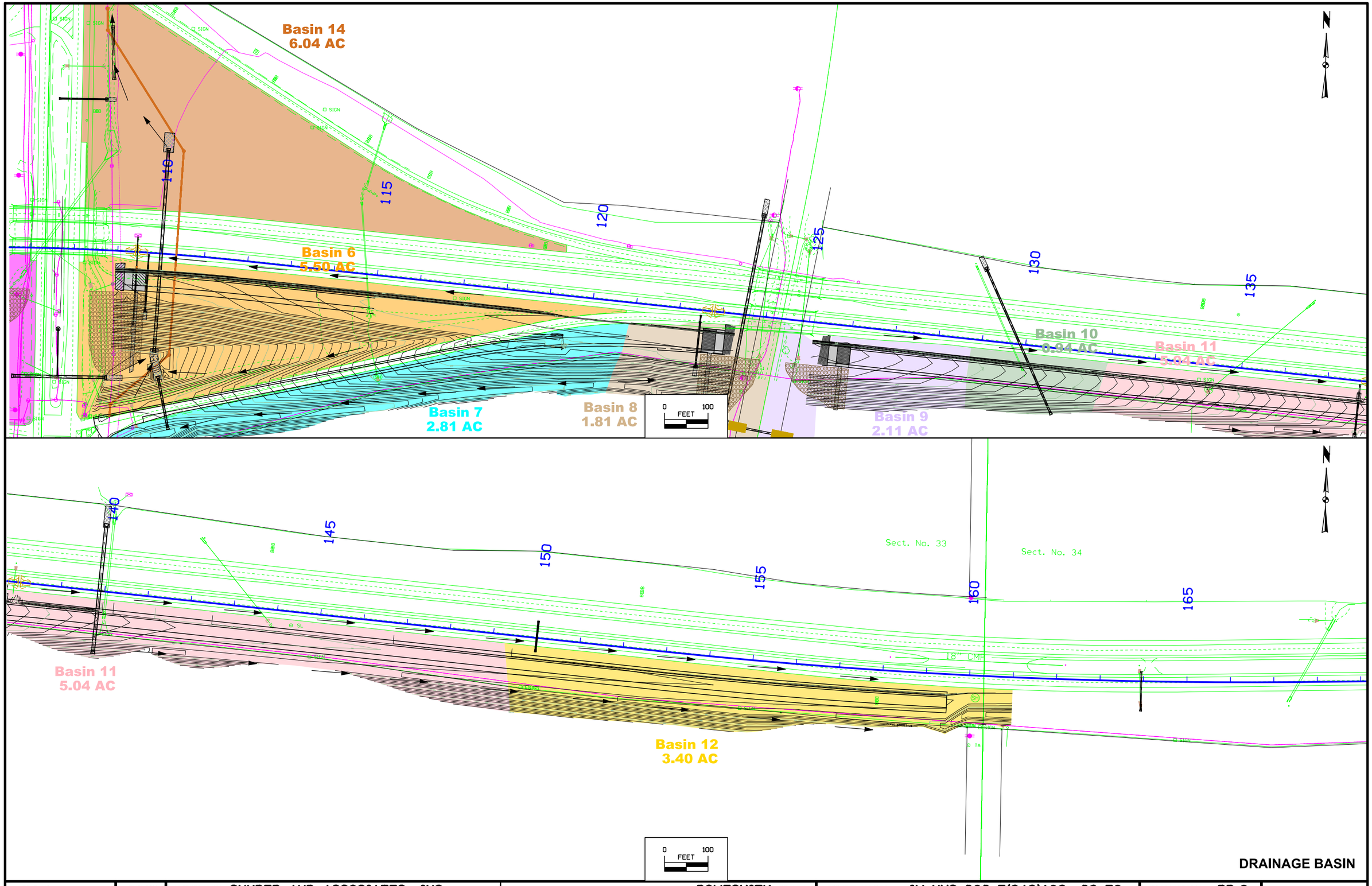
Basin 5
5.40 AC

0 100
FEET

DRAINAGE BASIN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER RR.8

3:42:19 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_RR08.dgn



DRAINAGE BASIN

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER RR.9

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Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
ML080																						
55+00.00	22	22	22	139	139	181	-159	0	0	0	10	14	-14									
55+10.00	211	211	211	448	448	582	-371	0	0	0	46	64	-64									
55+50.00	596	596	596	335	335	436	161	0	0	0	63	88	-88									
56+00.00	1,013	1,013	1,013	139	139	181	832	0	0	0	70	98	-98									
56+50.00	1,446	1,446	1,446	54	54	70	1,376	0	0	0	73	102	-102									
57+00.00	866	866	866	36	36	47	819	0	0	0	76	106	-106									
57+50.00	929	929	929	35	35	46	884	0	0	0	76	106	-106									
58+00.00	1,727	1,727	1,727	39	39	51	1,676	0	0	0	73	102	-102									
58+50.00	1,598	1,598	1,598	41	41	53	1,545	0	0	0	70	98	-98									
59+00.00	1,503	1,503	1,503	41	41	53	1,450	0	0	0	67	94	-94									
59+50.00	1,459	1,459	1,459	41	41	53	1,406	0	0	0	66	92	-92									
60+00.00	1,381	1,381	1,381	36	36	47	1,334	0	0	0	63	88	-88									
60+50.00	1,210	1,210	1,210	24	24	31	1,179	0	0	0	60	84	-84									
61+00.00	990	990	990	22	22	29	961	0	0	0	56	78	-78									
61+50.00	789	789	789	29	29	38	751	0	0	0	51	71	-71									
62+00.00	621	621	621	30	30	39	582	0	0	0	48	67	-67									
62+50.00	525	525	525	22	22	29	496	0	0	0	45	63	-63									
63+00.00	482	482	482	14	14	18	464	0	0	0	43	60	-60									
63+50.00	412	412	412	15	15	20	393	0	0	0	41	57	-57									
64+00.00	199	199	199	17	17	22	177	0	0	0	39	55	-55									
64+50.00	150	150	150	20	20	26	124	0	0	0	37	52	-52									
65+00.00	238	238	238	29	29	38	200	0	0	0	36	50	-50									
65+50.00	197	197	197	52	52	68	129	0	0	0	35	49	-49									
66+00.00	167	167	167	56	56	73	94	0	0	0	34	48	-48									
66+50.00	139	139	139	42	42	55	84	0	0	0	33	46	-46									
67+00.00	113	113	113	36	36	47	66	0	0	0	31	43	-43									
67+50.00	85	85	85	44	44	57	28	0	0	0	28	39	-39									
68+00.00	65	65	65	70	70	91	-26	0	0	0	27	38	-38									
68+50.00	62	62	62	95	95	124	-62	0	0	0	28	39	-39									
69+00.00	63	63	63	101	101	131	-68	0	0	0	28	39	-39									
69+50.00	74	74	74	95	95	124	-50	0	0	0	29	41	-41									
70+00.00	57	57	57	81	81	105	-48	0	0	0	30	42	-42									
70+50.00	65	65	65	67	67	87	-22	0	0	0	30	42	-42									
71+00.00	102	102	102	66	66	86	16	0	0	0	30	42	-42									
71+50.00	106	106	106	62	62	81	25	0	0	0	30	42	-42									
72+00.00	70	70	70	48	48	62	8	0	0	0	31	43	-43									
72+50.00	71	71	71	31	31	40	31	0	0	0	31	43	-43									
73+00.00	127	127	127	28	28	36	91	0	0	0	31	43	-43									
73+50.00	157	157	157	28	28	36	121	0	0	0	31	43	-43									
74+00.00	191	191	191	24	24	31	160	0	0	0	32	45	-45									
74+50.00	203	203	203	19	19	25	178	0	0	0	32	45	-45									
75+00.00	180	180	180	18	18	23	157	0	0	0	33	46	-46									
75+50.00	139	139	139	36	36	47	92	0	0	0	36	50	-50									
76+00.00	97	97	97	131	131	170	-73	0	0	0	38	53	-53									
76+50.00	81	81	81	305	305	397	-316	0	0	0	41	57	-57									
77+00.00	78	78	78	482	482	627	-549	0	0	0	43	60	-60									
77+50.00	7	7	7	56	56	73	-66	0	0	0	4	6	-6									
77+55.00	64	64	64	514	514	668	-604	0	0	0	38	53	-53									
78+00.00	86	86	86	557	557	724	-638	0	0	0	44	62	-62									
78+50.00	132	132	132	510	510	663	-531	0	0	0	47	66	-66									
79+00.00	16	16	16	47	47	61	-45	0	0	0	5	7	-7									
79+04.88	98	98	98	309	309	402	-304	0	0	0	47	66	-66									
79+50.00	16	16	16	20	20	26	-10	0	0	0	5	7	-7									
79+54.88	271	271	271	161	161	209	62	0	0	0	50	70	-70									
80+00.00	193	193	193	204	204	265	-72	0	0	0	55	77	-77									
80+50.00	16	16	16	26	26	34	-18	0	0	0	5	7	-7									
80+55.00	208	208	208	268	268	348	-140	0	0	0	46	64	-64									
81+00.00	220	220	220	286	286	372	-152	0	0	0	51	71	-71									
81+50.00	296	296	296	178	178	231	65	0	0	0	54	76	-76									
82+00.00	440	440	440	78	78	101	339	0	0	0	57	80	-80									
82+50.00	548	548	548	38	38	49	499	0	0	0	59	83	-83									
83+00.00	316	316	316	19	19	25	291	0	0	0	59	83	-83									
83+50.00	316	316	316	14	14	18	298	0	0	0	59	83	-83									
84+00.00	594	594	594	14	14	18	576	0	0	0	59	83	-83									
84+50.00	622	622	622	12	12	16	606	0	0	0	59	83	-83									
85+00.00	342	342	342	12	12	16	326	0	0	0	57	80	-80									
85+50.00	145	145	145	30	30	39	106	0	0	0	51	71	-71									
86+00.00																						
Subtotals:	26,002	26,002	26,002	6,976	6,976	9,069	16,933	0	0	0	2,892	4,049	-4,049									

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER T.1

12/5/2017 11:24:04 AM cpicker C:\Users\cpicken\Desktop\Earthwork.xlsm

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
86+00.00	164	164	164	187	187	243	-79	0	0	0	44	62	-62									
86+50.00	78	78	78	397	397	516	-438	0	0	0	40	56	-56									
87+00.00	101	101	101	453	453	589	-488	0	0	0	43	60	-60									
87+50.00	80	80	80	205	205	267	-187	0	0	0	24	34	-34									
87+75.00	119	119	119	154	154	200	-81	0	0	0	28	39	-39									
88+00.00	558	558	558	170	170	221	337	0	0	0	71	99	-99									
88+50.00	33	33	33	4	4	5	28	0	0	0	3	4	-4									
88+52.00	743	743	743	105	105	137	607	0	0	0	74	104	-104									
89+00.00	601	601	601	110	110	143	458	0	0	0	65	91	-91									
89+50.00	503	503	503	72	72	94	409	0	0	0	53	74	-74									
90+00.00	627	627	627	52	52	68	559	0	0	0	49	69	-69									
90+50.00	814	814	814	71	71	92	722	0	0	0	52	73	-73									
91+00.00	278	278	278	25	25	33	246	0	0	0	17	24	-24									
91+15.53	639	639	639	66	66	86	553	0	0	0	38	53	-53									
91+50.00	965	965	965	117	117	152	813	0	0	0	55	77	-77									
92+00.00	516	516	516	137	137	178	338	0	0	0	55	77	-77									
92+50.00	358	358	358	156	156	203	155	0	0	0	51	71	-71									
93+00.00	500	500	500	181	181	235	265	0	0	0	45	63	-63									
93+50.00	106	106	106	74	74	96	10	0	0	0	15	21	-21									
93+68.00	108	108	108	97	97	126	-18	0	0	0	18	25	-25									
93+87.95	29	29	29	22	22	29	0	0	0	0	4	6	-6									
93+92.19	60	60	60	35	35	46	15	0	0	0	8	11	-11									
94+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
94+07.96	0	0	0	0	0	0	0	0	0	0	0	0	0									
94+45.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
94+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
94+74.98	0	0	0	0	0	0	0	0	0	0	0	0	0									
95+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
95+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
96+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
96+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
97+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
97+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
98+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
98+50.00	1	1	1	507	507	659	-658	0	0	0	18	25	-25									
99+00.00	6	6	6	512	512	666	-660	0	0	0	34	48	-48									
99+23.43	19	19	19	250	250	325	-306	0	0	0	26	36	-36									
99+50.00	53	53	53	305	305	397	-344	0	0	0	40	56	-56									
99+55.03	14	14	14	61	61	79	-65	0	0	0	8	11	-11									
100+00.00	212	212	212	601	601	781	-569	0	0	0	86	120	-120									
100+50.00	464	464	464	815	815	1,060	-596	0	0	0	120	168	-168									
100+81.43	442	442	442	588	588	764	-322	0	0	0	89	125	-125									
101+00.00	168	168	168	377	377	490	-322	0	0	0	58	81	-81									
101+50.00	640	640	640	1,150	1,150	1,495	-855	0	0	0	176	246	-246									
102+00.00	664	664	664	1,336	1,336	1,737	-1,073	0	0	0	212	297	-297									
102+07.83	118	118	118	225	225	293	-175	0	0	0	37	52	-52									
102+39.43	862	862	862	951	951	1,236	-374	0	0	0	155	217	-217									
102+49.43	272	272	272	315	315	410	-138	0	0	0	51	71	-71									
102+50.00	16	16	16	18	18	23	-7	0	0	0	3	4	-4									
102+70.90	551	551	551	684	684	889	-338	0	0	0	111	155	-155									
103+00.00	720	720	720	1,060	1,060	1,378	-658	0	0	0	164	230	-230									
103+06.03	141	141	141	239	239	311	-170	0	0	0	35	49	-49									
103+18.34	279	279	279	510	510	663	-384	0	0	0	71	99	-99									
103+21.43	68	68	68	133	133	173	-105	0	0	0	18	25	-25									
103+50.00	592	592	592	1,363	1,363	1,772	-1,180	0	0	0	167	234	-234									
103+55.02	97	97	97	263	263	342	-245	0	0	0	30	42	-42									
103+95.93	702	702	702	2,400	2,400	3,120	-2,418	0	0	0	251	351	-351									
104+00.00	38	38	38	264	264	343	-305	0	0	0	26	36	-36									
104+50.00	372	372	372	3,548	3,548	4,612	-4,240	0	0	0	324	454	-454									
105+00.00	427	427	427	4,194	4,194	5,452	-5,025	0	0	0	338	473	-473									
105+00.47	2	2	2	43	43	56	-54	0	0	0	3	4	-4									
105+50.00	220	220	220	4,821	4,821	6,267	-6,047	0	0	0	345	483	-483									
105+75.31	117	117	117	2,720	2,720	3,536	-3,419	0	0	0	185	259	-259									
106+00.00	202	202	202	2,709	2,709	3,522	-3,320	0	0	0	189	265	-265									
106+05.29	61	61	61	567	567	737	-676	0	0	0	41	57	-57									
106+25.31	305	305	305	2,092	2,092	2,720	-2,415	0	0	0	156	218	-218									
106+45.32	366	366	366	973	973	1,265	-899	0	0	0	148	207	-207									
108+98.20	0	0	0	0	0	0	0	0	0	0	0	0	0									
109+00.00	34	34	34	1	1	1	33	0	0	0	5	7	-7									
Subtotals:	17,225	17,225	17,225	39,485	39,485	51,331	-34,106	0	0	0	4,572	6,401	-6,401									

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
109+00.00	1,049	1,049	1,049	610	610	793	256	0	0	0	120	168	-168									
109+18.24	1,368	1,368	1,368	1,303	1,303	1,694	-326	0	0	0	125	175	-175									
109+38.24	407	407	407	381	381	495	-88	0	0	0	36	50	-50									
109+44.00	424	424	424	403	403	524	-100	0	0	0	37	52	-52									
109+50.00	1,263	1,263	1,263	1,220	1,220	1,586	-323	0	0	0	110	154	-154									
109+68.24	256	256	256	250	250	325	-69	0	0	0	22	31	-31									
109+72.00	1,846	1,846	1,846	1,745	1,745	2,269	-423	0	0	0	163	228	-228									
110+00.00	2,080	2,080	2,080	2,008	2,008	2,610	-530	0	0	0	195	273	-273									
110+34.79	450	450	450	860	860	1,118	-668	0	0	0	83	116	-116									
110+50.00	167	167	167	2,829	2,829	3,678	-3,511	0	0	0	258	361	-361									
111+00.00	86	86	86	1,585	1,585	2,061	-1,975	0	0	0	138	193	-193									
111+28.55	337	337	337	1,170	1,170	1,521	-1,184	0	0	0	99	139	-139									
111+50.00	742	742	742	1,585	1,585	2,061	-1,319	0	0	0	127	178	-178									
111+79.08	259	259	259	1,129	1,129	1,468	-1,209	0	0	0	86	120	-120									
112+00.00	1	1	1	30	30	39	-38	0	0	0	2	3	-3									
112+00.55	96	96	96	538	538	699	-603	0	0	0	40	56	-56									
112+10.55	456	456	456	1,717	1,717	2,232	-1,776	0	0	0	120	168	-168									
112+42.15	88	88	88	432	432	562	-474	0	0	0	29	41	-41									
112+50.00	364	364	364	2,815	2,815	3,660	-3,296	0	0	0	170	238	-238									
113+00.00	99	99	99	3,011	3,011	3,914	-3,815	0	0	0	149	209	-209									
113+50.00	0	0	0	1,202	1,202	1,563	-1,563	0	0	0	50	70	-70									
113+68.55	0	0	0	2,264	2,264	2,943	-2,943	0	0	0	79	111	-111									
114+00.00	0	0	0	4,161	4,161	5,409	-5,409	0	0	0	108	151	-151									
114+50.00	1	1	1	4,109	4,109	5,342	-5,341	0	0	0	83	116	-116									
114+94.95	0	0	0	473	473	615	-615	0	0	0	9	13	-13									
115+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
115+26.55	0	0	0	0	0	0	0	0	0	0	0	0	0									
115+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
116+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
119+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
119+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
120+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
120+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
121+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
121+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
121+59.51	0	0	0	0	0	0	0	0	0	0	0	0	0									
122+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
122+41.93	0	0	0	0	0	0	0	0	0	0	0	0	0									
122+50.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
122+58.89	60	60	60	647	647	841	-781	0	0	0	30	42	-42									
122+66.85	56	56	56	592	592	770	-714	0	0	0	27	38	-38									
123+00.00	447	447	447	2,663	2,663	3,462	-3,015	0	0	0	120	168	-168									
125+30.90	203	203	203	2,364	2,364	3,073	-2,870	0	0	0	78	109	-109									
125+50.00	0	0	0	1,476	1,476	1,919	-1,919	0	0	0	32	45	-45									
125+50.90	0	0	0	77	77	100	-100	0	0	0	2	3	-3									
126+00.00	1	1	1	4,141	4,141	5,383	-5,382	0	0	0	93	130	-130									
126+00.90	0	0	0	74	74	96	-96	0	0	0	2	3	-3									
126+50.00	1	1	1	3,896	3,896	5,065	-5,064	0	0	0	95	133	-133									
127+00.00	1	1	1	3,635	3,635	4,726	-4,725	0	0	0	94	132	-132									
128+00.00	3	3	3	6,200	6,200	8,060	-8,057	0	0	0	163	228	-228									
128+50.00	1	1	1	2,587	2,587	3,363	-3,362	0	0	0	68	95	-95									
129+00.00	1	1	1	2,353	2,353	3,059	-3,058	0	0	0	61	85	-85									
130+00.00	3	3	3	4,590	4,590	5,967	-5,964	0	0	0	117	164	-164									
131+00.00	3	3	3	3,777	3,777	4,910	-4,907	0	0	0	102	143	-143									
131+50.00	2	2	2	1,303	1,303	1,694	-1,692	0	0	0	39	55	-55									
132+00.00	2	2	2	1,031	1,031	1,340	-1,338	0	0	0	32	45	-45									
132+50.00	1	1	1	920	920	1,196	-1,195	0	0	0	31	43	-43									
132+50.06	0	0	0	1	1	1	-1	0	0	0	0	0	0									
133+00.00	1	1	1	989	989	1,286	-1,285	0	0	0	35	49	-49									
133+50.00	1	1	1	1,119	1,119	1,455	-1,454	0	0	0	37	52	-52									
134+00.00	1	1	1	1,231	1,231	1,600	-1,599	0	0	0	37	52	-52									
134+50.00	15	15	15	1,273	1,273	1,655	-1,640	0	0	0	44	62	-62									
134+50.06	0	0	0	2	2	3	-3	0	0	0	0	0	0									
135+00.00	73	73	73	1,067	1,067	1,387	-1,314	0	0	0	53	74	-74									
135+50.00	207	207	207	669	669	870	-663	0	0	0	58	81	-81									
135+50.06	0	0	0	1	1	1	-1	0	0	0	0	0	0									
136+00.00	347	347	347	354	354	460	-113	0	0	0	60	84	-84									
136+50.00	371	371	371	241	241	313	58	0	0	0	56	78	-78									
137+00.00	276	276	276	247	247	321	-45	0	0	0	48	67	-67									
Subtotals:	13,916	13,916	13,916	87,350	87,350	113,555	-99,639	0	0	0	4,052	5,673	-5,673									

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
137+00.00	131	131	131	300	300	390	-259	0	0	0	35	49	-49									
137+50.00	13	13	13	208	208	270	-257	0	0	0	11	15	-15									
137+75.00	1	1	1	331	331	430	-429	0	0	0	8	11	-11									
138+00.00	1	1	1	1,014	1,014	1,318	-1,317	0	0	0	24	34	-34									
138+50.00	1	1	1	1,450	1,450	1,885	-1,884	0	0	0	39	55	-55									
139+00.00	1	1	1	1,762	1,762	2,291	-2,290	0	0	0	51	71	-71									
139+50.00	2	2	2	1,978	1,978	2,571	-2,569	0	0	0	57	80	-80									
140+00.00	1	1	1	2,996	2,996	3,895	-3,894	0	0	0	59	83	-83									
141+00.00	128	128	128	554	554	720	-592	0	0	0	21	29	-29									
141+50.00	475	475	475	163	163	212	263	0	0	0	49	69	-69									
142+00.00	667	667	667	79	79	103	564	0	0	0	55	77	-77									
142+50.00	482	482	482	108	108	140	342	0	0	0	49	69	-69									
143+00.00	217	217	217	214	214	278	-61	0	0	0	36	50	-50									
143+50.00	76	76	76	302	302	393	-317	0	0	0	26	36	-36									
144+00.00	31	31	31	305	305	397	-366	0	0	0	21	29	-29									
144+50.00	23	23	23	262	262	341	-318	0	0	0	20	28	-28									
145+00.00	26	26	26	152	152	198	-172	0	0	0	21	29	-29									
145+50.00	204	204	204	60	60	78	126	0	0	0	27	38	-38									
146+00.00	623	623	623	55	55	72	552	0	0	0	38	53	-53									
146+50.00	1,080	1,080	1,080	64	64	83	997	0	0	0	51	71	-71									
147+00.00	682	682	682	75	75	98	585	0	0	0	63	88	-88									
147+50.00	1,005	1,005	1,005	77	77	100	905	0	0	0	73	102	-102									
148+00.00	2,010	2,010	2,010	72	72	94	1,916	0	0	0	79	111	-111									
148+50.00	2,102	2,102	2,102	65	65	85	2,018	0	0	0	83	116	-116									
149+00.00	2,147	2,147	2,147	62	62	81	2,066	0	0	0	84	118	-118									
149+50.00	2,140	2,140	2,140	56	56	73	2,067	0	0	0	85	119	-119									
150+00.00	2,092	2,092	2,092	38	38	49	2,043	0	0	0	84	118	-118									
150+50.00	2,065	2,065	2,065	27	27	35	2,030	0	0	0	83	116	-116									
151+00.00	1,987	1,987	1,987	30	30	39	1,948	0	0	0	82	115	-115									
151+50.00	1,878	1,878	1,878	30	30	39	1,839	0	0	0	80	112	-112									
152+00.00	1,805	1,805	1,805	31	31	40	1,765	0	0	0	78	109	-109									
152+50.00	1,768	1,768	1,768	31	31	40	1,728	0	0	0	75	105	-105									
153+00.00	1,730	1,730	1,730	33	33	43	1,687	0	0	0	74	104	-104									
153+50.00	1,682	1,682	1,682	36	36	47	1,635	0	0	0	74	104	-104									
154+00.00	872	872	872	40	40	52	820	0	0	0	76	106	-106									
154+50.00	854	854	854	44	44	57	797	0	0	0	75	105	-105									
155+00.00	1,436	1,436	1,436	49	49	64	1,372	0	0	0	70	98	-98									
155+50.00	1,045	1,045	1,045	63	63	82	963	0	0	0	59	83	-83									
156+00.00	670	670	670	85	85	111	560	0	0	0	48	67	-67									
156+50.00	394	394	394	108	108	140	254	0	0	0	41	57	-57									
157+00.00	169	169	169	125	125	163	7	0	0	0	39	55	-55									
157+50.00	114	114	114	137	137	178	-64	0	0	0	39	55	-55									
158+00.00	155	155	155	156	156	203	-48	0	0	0	36	50	-50									
158+50.00	100	100	100	182	182	237	-137	0	0	0	31	43	-43									
159+00.00	137	137	137	206	206	268	-131	0	0	0	38	53	-53									
159+50.00																						
ML080																						
Totals:	92,365	92,365	92,365	148,026	148,026	192,434	-100,069	0	0	0	13,863	19,409	-19,409									

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	T.4

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
RPA146																						
1507+75.89																						
1507+91.70	207	207	207	0	0	0	207	0	0	0	53	74	-74									
1508+00.00	141	141	141	0	0	0	141	0	0	0	29	41	-41									
1508+50.00	711	711	711	0	0	0	711	0	0	0	126	176	-176									
1509+00.00	939	939	939	0	0	0	939	0	0	0	107	150	-150									
1509+50.00	1,292	1,292	1,292	0	0	0	1,292	0	0	0	120	168	-168									
1509+52.35	68	68	68	0	0	0	68	0	0	0	6	8	-8									
1510+00.00	1,007	1,007	1,007	0	0	0	1,007	0	0	0	96	134	-134									
1513+00.00	2,048	2,048	2,048	3,722	3,722	4,839	-2,791	0	0	0	439	615	-615									
1513+50.00	2	2	2	1,539	1,539	2,001	-1,999	0	0	0	72	101	-101									
1514+00.00	2	2	2	2,091	2,091	2,718	-2,716	0	0	0	84	118	-118									
1514+08.32	0	0	0	401	401	521	-521	0	0	0	15	21	-21									
1514+23.03	0	0	0	782	782	1,017	-1,017	0	0	0	30	42	-42									
1514+50.00	1	1	1	1,550	1,550	2,015	-2,014	0	0	0	57	80	-80									
1514+57.32	0	0	0	423	423	550	-550	0	0	0	15	21	-21									
1515+00.00	1	1	1	2,479	2,479	3,223	-3,222	0	0	0	85	119	-119									
1515+06.32	0	0	0	372	372	484	-484	0	0	0	12	17	-17									
1515+50.00	1	1	1	2,607	2,607	3,389	-3,388	0	0	0	87	122	-122									
1516+00.00	1	1	1	3,022	3,022	3,929	-3,928	0	0	0	101	141	-141									
1516+27.27	1	1	1	1,643	1,643	2,136	-2,135	0	0	0	57	80	-80									
1516+50.00	1	1	1	1,360	1,360	1,768	-1,767	0	0	0	48	67	-67									
1516+89.27	1	1	1	2,311	2,311	3,004	-3,003	0	0	0	85	119	-119									
1516+95.47	0	0	0	359	359	467	-467	0	0	0	14	20	-20									
1517+00.00	0	0	0	261	261	339	-339	0	0	0	10	14	-14									
1517+50.00	2	2	2	2,800	2,800	3,640	-3,638	0	0	0	112	157	-157									
1517+51.27	0	0	0	69	69	90	-90	0	0	0	3	4	-4									
1518+00.00	2	2	2	2,590	2,590	3,367	-3,365	0	0	0	113	158	-158									
1518+50.00	2	2	2	2,476	2,476	3,219	-3,217	0	0	0	122	171	-171									
1519+00.00	2	2	2	2,298	2,298	2,987	-2,985	0	0	0	121	169	-169									
1519+50.00	2	2	2	2,172	2,172	2,824	-2,822	0	0	0	117	164	-164									
1520+00.00	2	2	2	2,058	2,058	2,675	-2,673	0	0	0	119	167	-167									
1520+50.00	2	2	2	1,996	1,996	2,595	-2,593	0	0	0	123	172	-172									
1520+99.20	2	2	2	1,942	1,942	2,525	-2,523	0	0	0	124	174	-174									
1521+00.00	0	0	0	31	31	40	-40	0	0	0	2	3	-3									
1521+50.00	2	2	2	2,011	2,011	2,614	-2,612	0	0	0	130	182	-182									
1521+55.00	0	0	0	208	208	270	-270	0	0	0	13	18	-18									
1521+61.20	0	0	0	262	262	341	-341	0	0	0	16	22	-22									
1521+92.12	1	1	1	1,376	1,376	1,789	-1,788	0	0	0	84	118	-118									
1522+00.00	0	0	0	367	367	477	-477	0	0	0	22	31	-31									
1522+25.00	1	1	1	1,198	1,198	1,557	-1,556	0	0	0	71	99	-99									
RPA146																						
Totals:	6,444	6,444	6,444	48,776	48,776	63,409	-56,965	0	0	0	3,040	4,256	-4,256									

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER T.5

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
RPB146																						
2594+75.00	351	351	351	43	43	56	295	0	0	0	26	36	-36									
2595+00.00	465	465	465	102	102	133	332	0	0	0	33	46	-46									
2595+28.99	354	354	354	77	77	100	254	0	0	0	25	35	-35									
2595+50.00	169	169	169	37	37	48	121	0	0	0	12	17	-17									
2595+59.99	105	105	105	23	23	30	75	0	0	0	8	11	-11									
2595+66.19	560	560	560	126	126	164	396	0	0	0	42	59	-59									
2596+00.00	354	354	354	80	80	104	250	0	0	0	27	38	-38									
2596+21.99	442	442	442	92	92	120	322	0	0	0	34	48	-48									
2596+50.00	763	763	763	148	148	192	571	0	0	0	62	87	-87									
2597+00.00	404	404	404	136	136	177	227	0	0	0	63	88	-88									
2597+50.00	329	329	329	125	125	163	167	0	0	0	63	88	-88									
2598+00.00	517	517	517	108	108	140	377	0	0	0	60	84	-84									
2598+50.00	369	369	369	81	81	105	264	0	0	0	55	77	-77									
2599+00.00	46	46	46	10	10	13	33	0	0	0	8	11	-11									
2599+08.00	209	209	209	47	47	61	148	0	0	0	44	62	-62									
2599+50.00	165	165	165	34	34	44	121	0	0	0	45	63	-63									
2599+92.54	25	25	25	4	4	5	20	0	0	0	8	11	-11									
2600+00.00	174	174	174	25	25	33	142	0	0	0	58	81	-81									
2600+48.34	4	4	4	1	1	1	3	0	0	0	2	3	-3									
2600+50.00	11	11	11	2	2	3	8	0	0	0	6	8	-8									
2600+54.54	98	98	98	11	11	14	84	0	0	0	33	46	-46									
2600+80.00	74	74	74	7	7	9	65	0	0	0	27	38	-38									
2601+00.00	59	59	59	4	4	5	54	0	0	0	22	31	-31									
2601+16.54	105	105	105	6	6	8	97	0	0	0	43	60	-60									
2601+50.00	61	61	61	4	4	5	56	0	0	0	27	38	-38									
2601+73.48	56	56	56	4	4	5	51	0	0	0	27	38	-38									
2602+00.00	28	28	28	3	3	4	24	0	0	0	14	20	-20									
2602+14.71	55	55	55	5	5	7	49	0	0	0	28	39	-39									
2602+50.00																						
RPB146																						
Totals:	6,352	6,352	6,352	1,345	1,345	1,749	4,604	0	0	0	902	1,263	-1,263									

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
RPD146																						
4509+00.00																						
4509+46.66	134	134	134	30	30	39	95	0	0	0	60	84	-84									
4509+50.00	4	4	4	3	3	4	0	0	0	0	5	7	-7									
4510+00.00	333	333	333	46	46	60	273	0	0	0	80	112	-112									
4510+10.00	128	128	128	9	9	12	116	0	0	0	19	27	-27									
4510+31.00	239	239	239	20	20	26	213	0	0	0	38	53	-53									
4510+31.07	1	1	1	0	0	0	1	0	0	0	0	0	0									
4510+50.00	151	151	151	20	20	26	125	0	0	0	30	42	-42									
4511+00.00	284	284	284	66	66	86	198	0	0	0	64	90	-90									
4511+50.00	314	314	314	94	94	122	192	0	0	0	62	87	-87									
4512+00.00	475	475	475	123	123	160	315	0	0	0	69	97	-97									
4512+50.00	315	315	315	128	128	166	149	0	0	0	72	101	-101									
4513+00.00	412	412	412	109	109	142	270	0	0	0	73	102	-102									
4513+50.00	653	653	653	48	48	62	591	0	0	0	69	97	-97									
4514+00.00	373	373	373	88	88	114	259	0	0	0	61	85	-85									
4514+50.00	153	153	153	308	308	400	-247	0	0	0	56	78	-78									
4515+00.00	90	90	90	583	583	758	-668	0	0	0	56	78	-78									
4515+50.00	75	75	75	776	776	1,009	-934	0	0	0	60	84	-84									
4515+99.00	115	115	115	838	838	1,089	-974	0	0	0	65	91	-91									
4516+00.00	3	3	3	18	18	23	-20	0	0	0	1	1	-1									
4516+50.00	179	179	179	891	891	1,158	-979	0	0	0	69	97	-97									
4516+54.60	19	19	19	82	82	107	-88	0	0	0	6	8	-8									
4516+61.44	29	29	29	122	122	159	-130	0	0	0	10	14	-14									
4517+00.00	192	192	192	698	698	907	-715	0	0	0	55	77	-77									
4517+05.00	28	28	28	93	93	121	-93	0	0	0	7	10	-10									
4517+50.00	152	152	152	929	929	1,208	-1,056	0	0	0	66	92	-92									
4518+00.00	83	83	83	1,224	1,224	1,591	-1,508	0	0	0	71	99	-99									
4518+50.00	81	81	81	1,492	1,492	1,940	-1,859	0	0	0	67	94	-94									
4519+00.00	70	70	70	1,715	1,715	2,230	-2,160	0	0	0	69	97	-97									
4519+41.03	128	128	128	1,412	1,412	1,836	-1,708	0	0	0	63	88	-88									
4519+41.08	0	0	0	2	2	3	-3	0	0	0	0	0	0									
RPD146																						
Totals:	5,213	5,213	5,213	11,967	11,967	15,558	-10,345	0	0	0	1,423	1,993	-1,993									

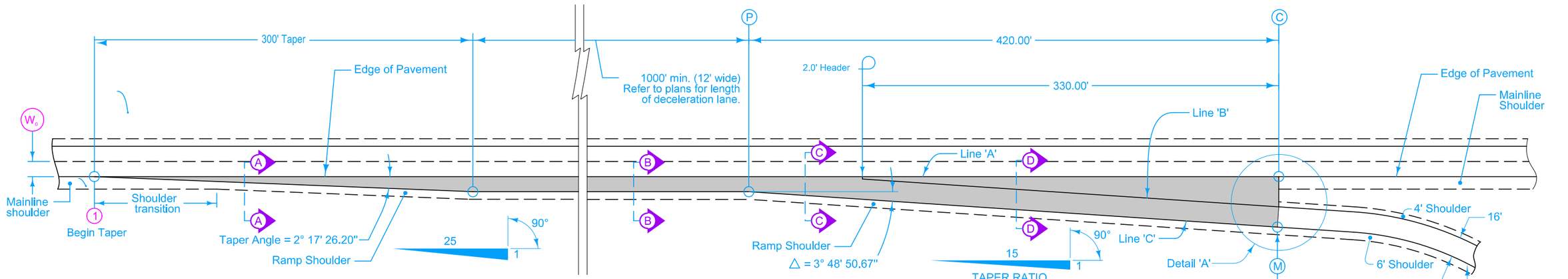
Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

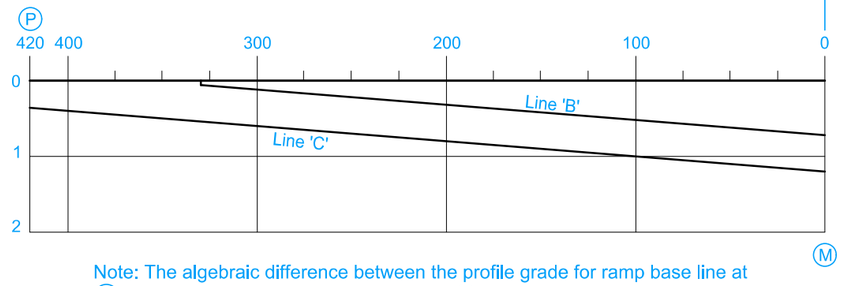
107-28
04-21-15

Station	Cut			Fill				Checks (EW-102)		Topsoil										
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink									
Summary:																						
ML080	92,365	92,365	92,365	148,026	148,026	192,434	-100,069	0	0	0	13,863	19,409	-19,409									
RPA146	6,444	6,444	6,444	48,776	48,776	63,409	-56,965	0	0	0	3,040	4,256	-4,256									
RPB146	6,352	6,352	6,352	1,345	1,345	1,749	4,604	0	0	0	902	1,263	-1,263									
RPD146	5,213	5,213	5,213	11,967	11,967	15,558	-10,345	0	0	0	1,423	1,993	-1,993									
Project Totals:	110,374	110,374	110,374	210,114	210,114	273,150	-162,775	0	0	0	19,228	26,921	-26,921									

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER AND ASSOCIATES, INC.	POWESHIEK	COUNTY	PROJECT NUMBER	IM-NHS-080-5(242)182--03-79	SHEET NUMBER	T.8



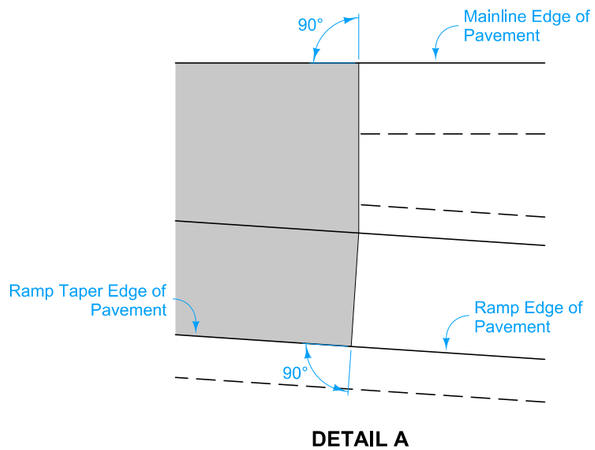
PLAN



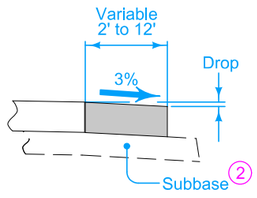
Note: The algebraic difference between the profile grade for ramp base line at Ⓜ and realtive profile grade of mainline at Ⓒ is 0.20%

PROFILE

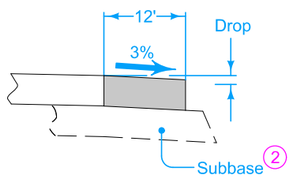
TABLE OF OFFSETS AND DROPS FOR 16' RAMP TAPER																			
DISTANCE (Ft.)	420	400	375	350	330	325	300	275	250	225	200	175	150	125	100	75	50	25	0
OFFSET (Ft.)	12.00	13.37	15.04	16.70	18.04	18.37	20.04	21.70	23.37	25.04	26.70	28.37	30.04	31.70	33.37	35.04	36.70	38.37	40.00
DROP (Ft.)	0.36	0.40	0.45	0.50	0.54	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20



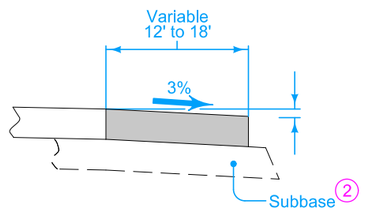
DETAIL A



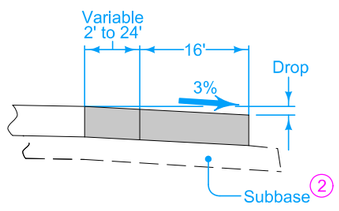
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP			
W_0	Shoulder Width beyond Edge of Mainline Pavement		
	8'	10'	12'
12'	NA	100'	150'

NOTE: W_0 is the width of the outside lane to the Edge of Pavement.

Construct ramp exit pavement the same thickness as mainline pavement.

For joint detail, see PV-101.

1. For header construction detail at the end of taper, see Typical 7101 or Typical 7102.
2. Construct subbase for ramp exit pavement the same thickness as mainline subbase.

IOWA DOT

ROAD DESIGN DETAIL

REVISION	
1	07-01-19

533-01

SHEET 1 of 2

REVISIONS: Modified TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP and circle note 3.

PARALLEL DECELERATION TAPER FOR 16' RAMP (60 MPH DESIGN SPEED)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER U.1

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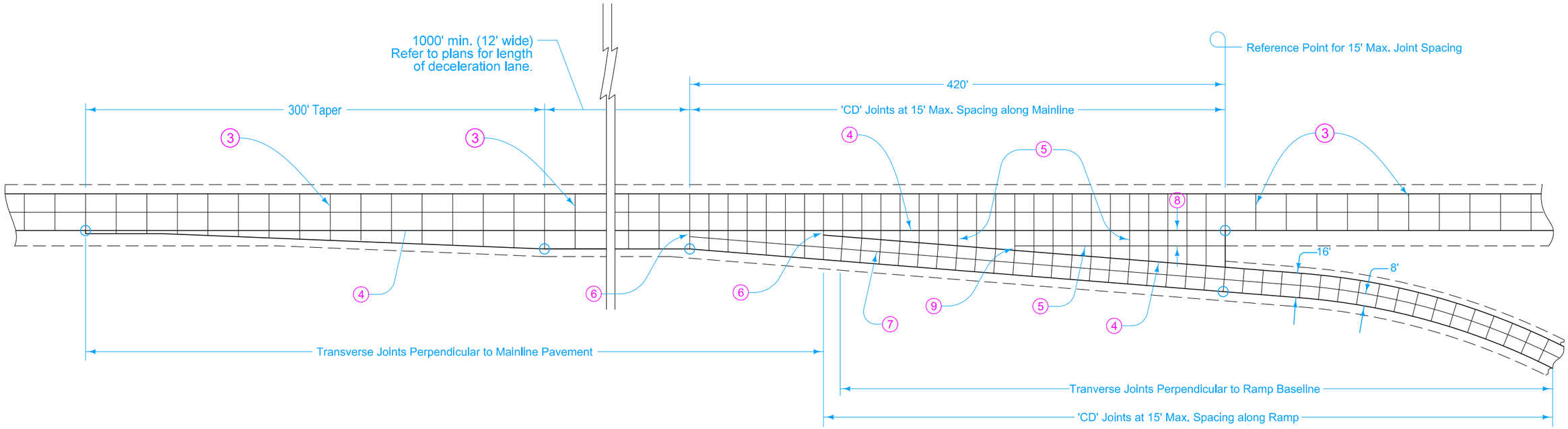

16' EXIT RAMP WITH PARALLEL DECELERATION LANE

(3) 'CD' Joints at 17' spacing.

(4) 'BT-2' or 'KT-2' Joint.

(5) 'C' Joint.

(6) 'B' Joint. 2' minimum, 4' maximum.

(7) 'L-2' Joint.

(8) 10' minimum or equal to mainline shoulder width.

(9) 'B' or 'C' Joint. 2' minimum. 4' maximum.

IOWA DOT

REVISION

1	07-01-19

ROAD DESIGN DETAIL

533-01

SHEET 2 of 2

REVISIONS: Modified TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP and circle note 3.

PARALLEL DECELERATION TAPER FOR 16' RAMP (60 MPH DESIGN SPEED)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER U.2

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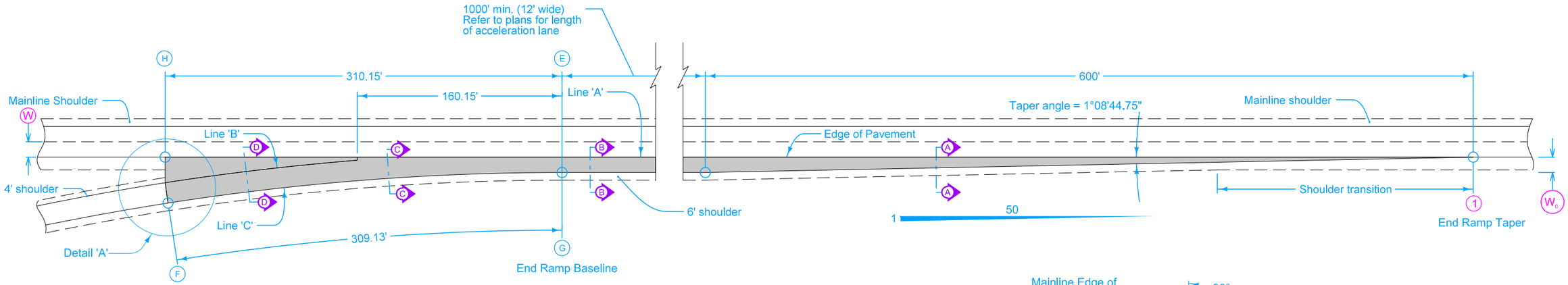
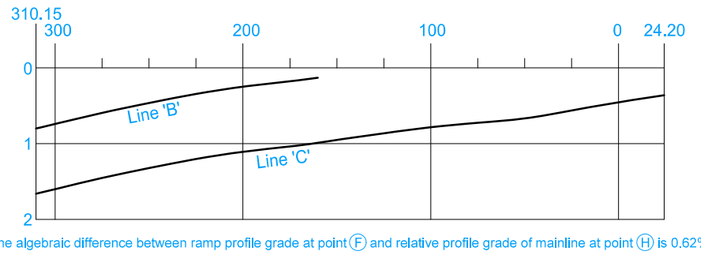
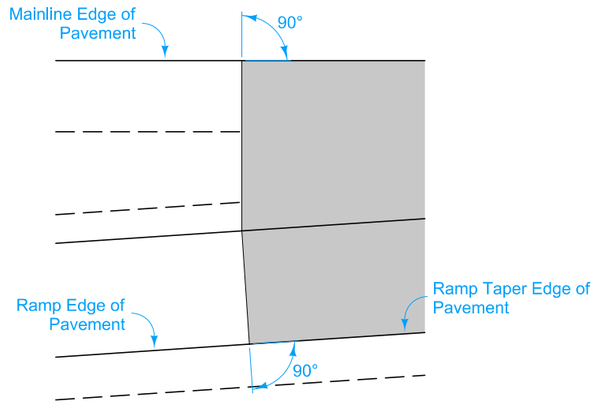




Pt. 'G' to Pt. 'F'
△ = 8° 51' 20.88"
T = 154.87'
L = 309.13'
E = 5.99'
R = 2000.00'

NOTE: The algebraic difference between ramp profile grade at point (F) and relative profile grade of mainline at point (H) is 0.62%

TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP			
W_0	Shoulder Width beyond Edge of Mainline Pavement		
	8'	10'	12'
12'	NA	100'	150'



DETAIL A

H E

TABLE OF OFFSETS AND DROPS FOR 16' RAMP TAPER																		
DISTANCE FROM POINT (E) ALONG LINE 'A' (Ft.)		310.15	300	275	250	225	204	200	175	160.15	150	125	100	75	50	25	0	24.2
From Line 'A' To Line 'B'	OFFSET (Ft.)	20.00	18.45	14.84	11.56	8.60	6.30	5.95	3.61	2.37								
	SLOPE (%)	← Constant 4.0% Slope →						4.11	4.92	5.40								
	DROP (Ft.)	0.80	0.74	0.59	0.46	0.34	0.25	0.24	0.18	0.13								
From Line 'B' To Line 'C'	OFFSET (Ft.)	← Constant 16' Offset →																
	SLOPE (%)	← Constant 5.4% Slope →																
	DROP (Ft.)	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86								
From Line 'A' To Line 'C'	OFFSET (Ft.)										17.63	15.91	14.50	13.41	12.63	12.16	12.00	12.00
	SLOPE (%)										5.40	5.40	5.40	5.40	5.40	4.59	3.78	3.00
	DROP (Ft.)	1.66	1.60	1.45	1.32	1.20	1.11	1.10	1.04	0.99	0.95	0.86	0.78	0.72	0.68	0.56	0.45	0.36
DISTANCE FROM POINT (G) ALONG LINE 'C' (Ft.)		309.13	298.73	273.67	248.66	223.68	202.73	198.74	173.83	159.04	150.14	125.08	100.04	75.02	50.01	25.00	0.00	

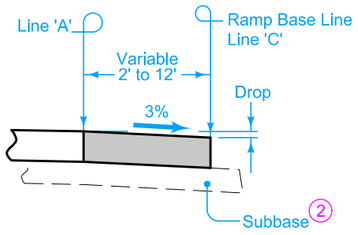
F G

Construct ramp exit pavement the same thickness as mainline pavement.

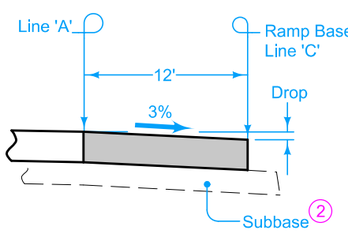
For joint detail, see PV-101.

(1) For header construction detail at the end of taper, see Typical 7101 or Typical 7102.

(2) Construct subbase for ramp exit pavement the same thickness as mainline subbase.



SECTION A-A



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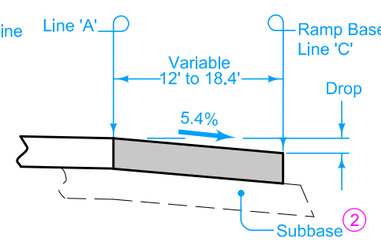
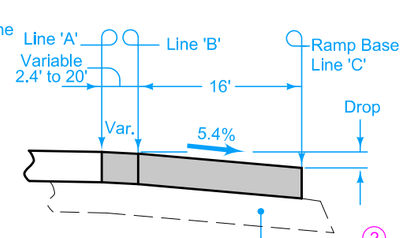


SECTION C-C



SECTION D-D

IOWA DOT

ROAD DESIGN DETAIL

REVISION 1 07-01-19

533-02

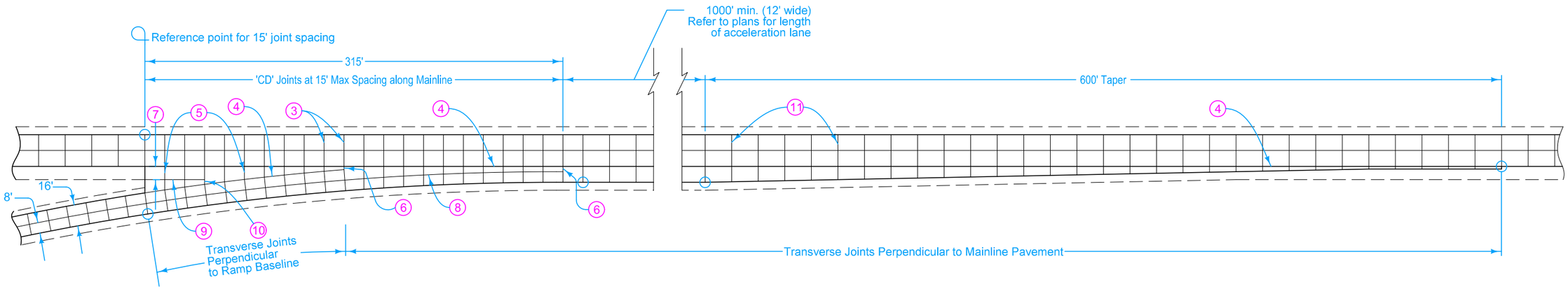
SHEET 1 of 2

REVISIONS: Added TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP and modified circle note 11.

PARALLEL ACCELERATION TAPER FOR 16' RAMP (60 MPH DESIGN SPEED)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER U.3

3:44:14 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_U01.dgn



(3) 'CD ' Joints at 15' spacing.

(4) 'BT-2' or 'KT-2' Joint.

(5) 'C' Joint.

(6) 'B' Joint. 2' minimum, 4' maximum.

(7) 10' minimum or equal to mainline shoulder width.

(8) 'L-2' Joint.

(9) 'C' Joint parallel to mainline pavement.

(10) 'B' or 'C' Joint. 2' minimum, 4' maximum.

(11) 'CD ' Joints at 17' spacing.

IOWA DOT

ROAD DESIGN DETAIL

REVISION	
1	07-01-19

533-02

SHEET 2 of 2

REVISIONS: Added TABLE OF SHOULDER TRANSITION LENGTHS WITH 6' SHOULDER ON RAMP and modified circle note 11.

PARALLEL ACCELERATION TAPER FOR 16' RAMP (60 MPH DESIGN SPEED)

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER U.4

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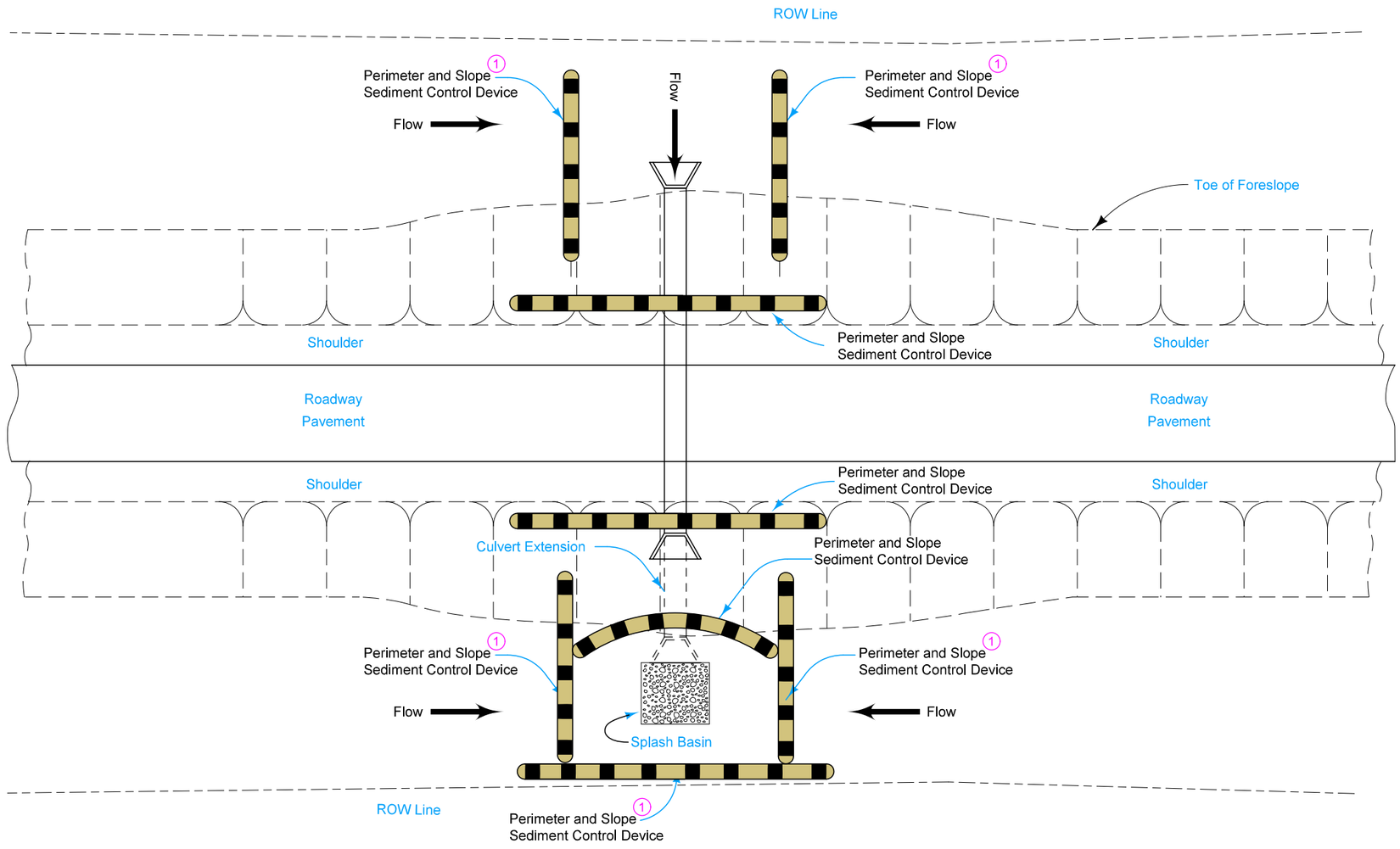
See Standard Road Plans EC-201, EC-204, and EC-301 for installation details.

(1) Silt Fence for Ditch Check may be substituted at no additional cost to the Contracting Authority.



Possible Contract Items:
- Perimeter and Slope Sediment Control Device
- Erosion Stone
- Class E Revetment
- Engineering Fabric

Possible Tabulations:
- 100-19
- 100-23
- 100-34

IOWA DOT

ROAD DESIGN DETAIL

REVISION	
NEW	10-15-19

570-11

SHEET 1 of 1

REVISIONS: New.

TEMPORARY SEDIMENT CONTROL FOR CULVERT EXTENSION WITH EXPOSED SOIL

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER U.5

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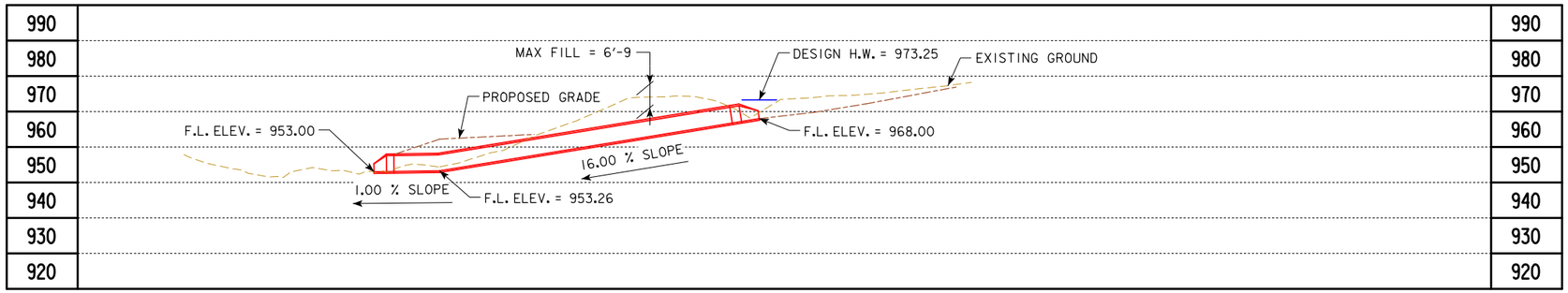
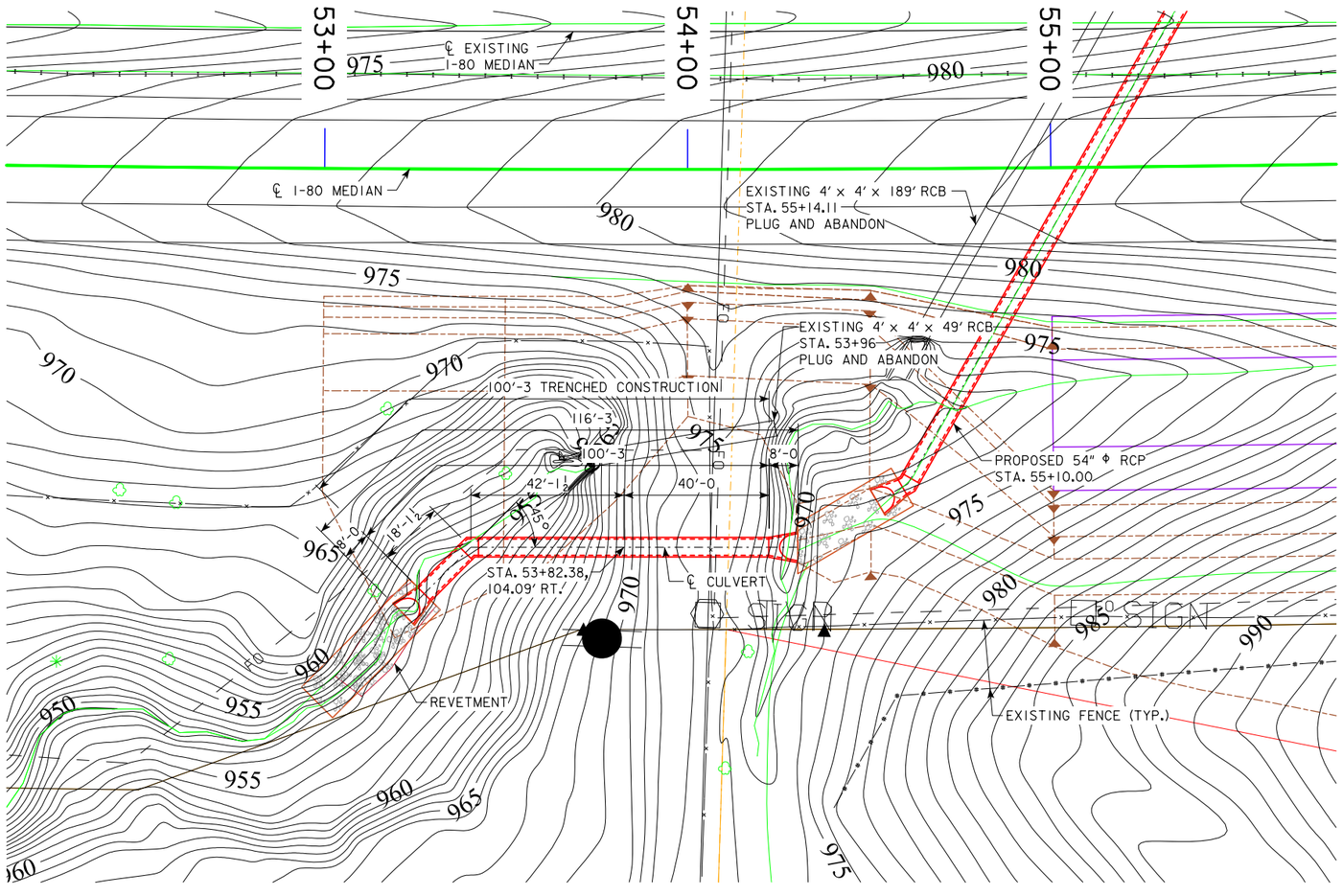
BENCH MARK NO. CP3: ELEV. 998.226 N. 7726919.660 E. 19522226.020 CP FENO MONUMENT W/ALUM. CAP.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

CURVE DATA

P.I. STA. 54+09.15
P.C. STA. 47+66.89
P.T. STA. 60+50.34
Δ = 5° 42' 01.73" (LT.)
T = 642.25
L = 1,283.45
R = 12,900.00
E = 15.98

UTILITIES LEGEND:

FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

HYDRAULIC DATA

DRAINAGE AREA = 34.33 ACRES
Q_{50} = 128.13 CFS

LOCATION

I-80
T-80N R-16W
SECTION 31/32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695082°
LONGITUDE -92.746739°

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW

54" X 100'-3 REINFORCED CONCRETE PIPE PLAT PLAN

STATION 53+82.38, 104.09' RT., ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.1

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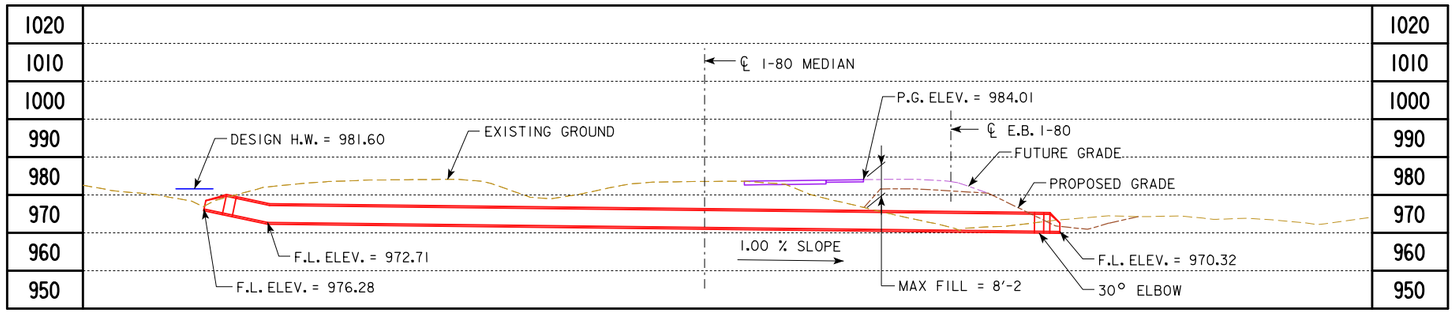

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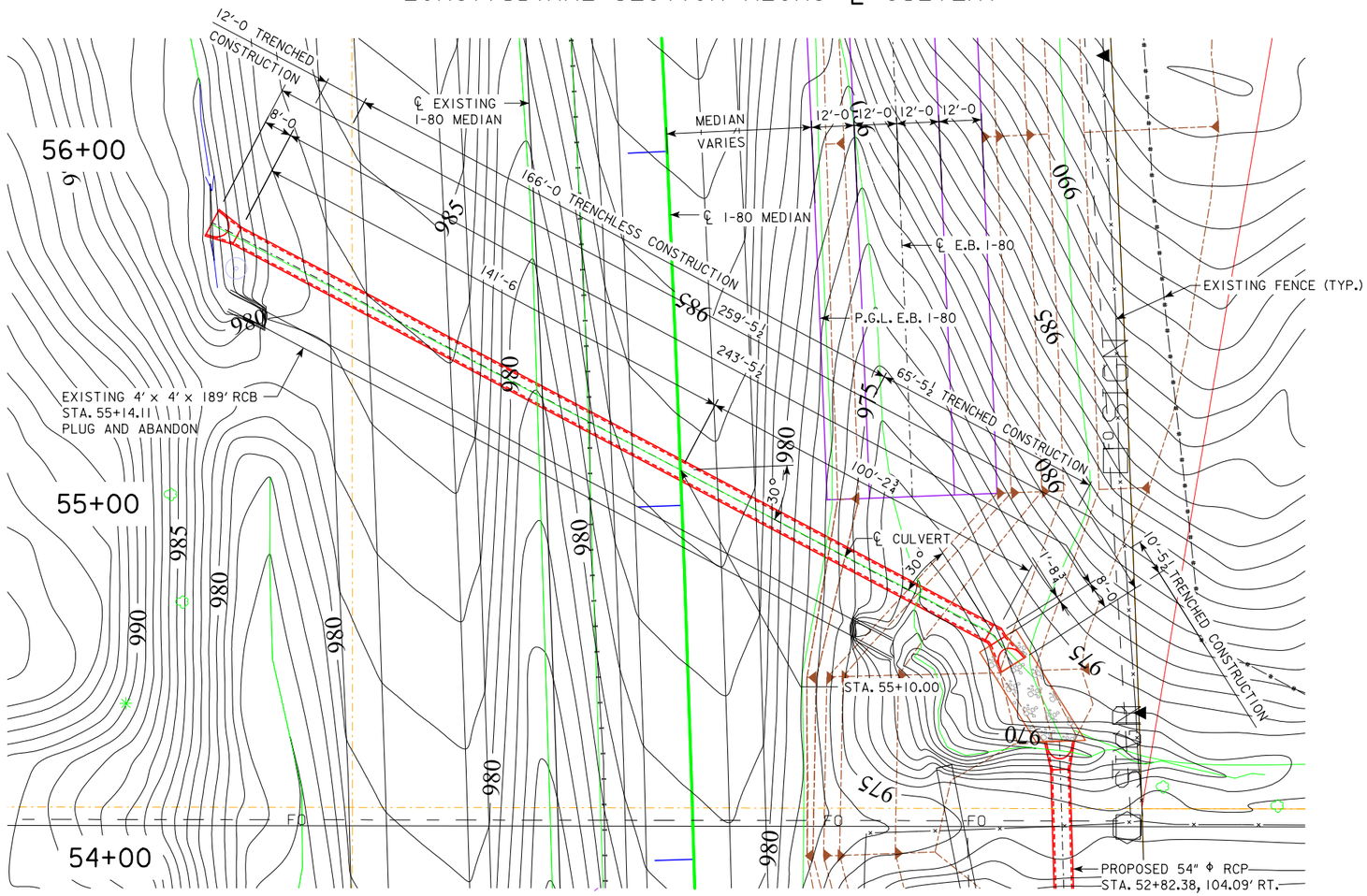

PLAT PLAN

CURVE DATA

P.I. STA. 54+09.15
P.C. STA. 47+66.89
P.T. STA. 60+50.34
Δ = 5° 42' 01.73" (LT.)
T = 642.25
L = 1,283.45
R = 12,900.00
E = 15.98

UTILITIES LEGEND:

FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

HYDRAULIC DATA

DRAINAGE AREA = 28.38 ACRES
Q_{50} = 108.90 CFS

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695093°
LONGITUDE -92.746272°

TRAFFIC ESTIMATE

2014 AADT	27,800	V.P.D.
2045 AADT	55,200	V.P.D.
2045 DHV	4,100	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 30° SKEW (L.A.)

54" X 243'-5½ REINFORCED CONCRETE PIPE PLAT PLAN

STATION 55+10.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.2

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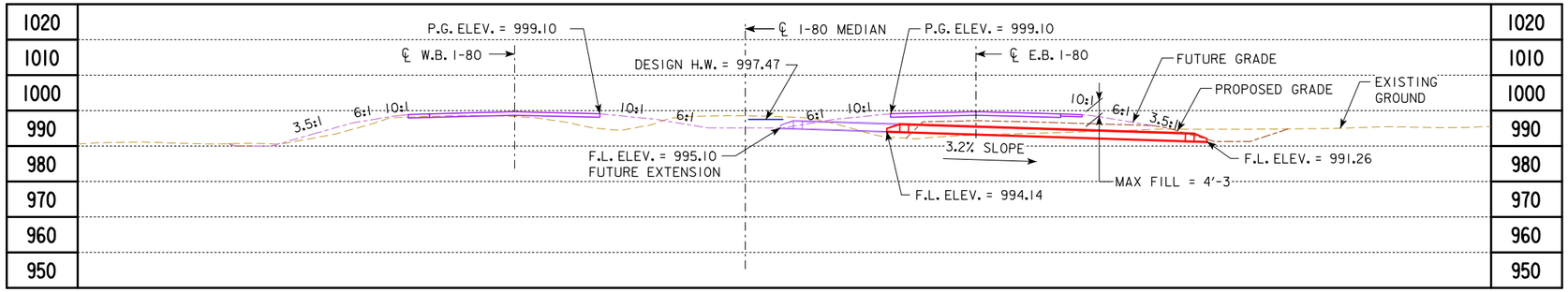
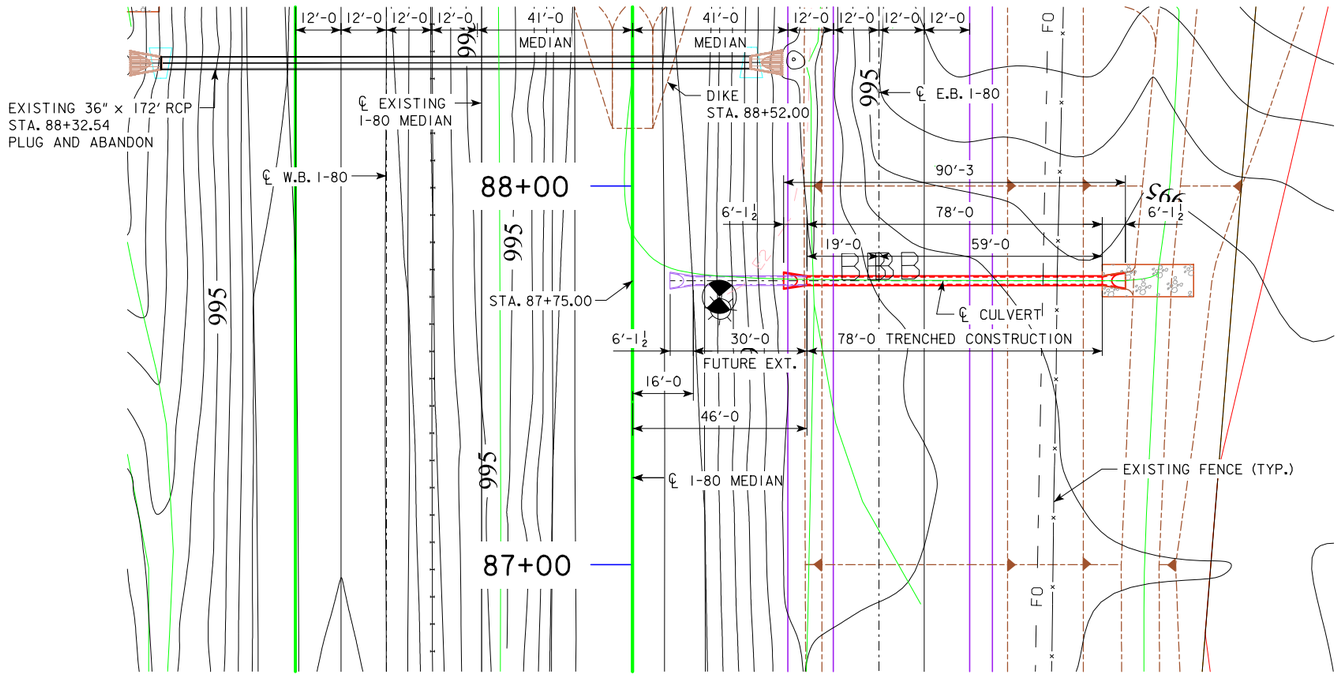


LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

N

0 ENGLISH 40
SCALE IN FEET

HYDRAULIC DATA

DRAINAGE AREA = 6.23 ACRES
Q_{50} = 17.27 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT
FO - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695776°
LONGITUDE -92.734353°

TRAFFIC ESTIMATE

2014 AADT	13,600	V.P.D.
2045 AADT	27,200	V.P.D.
2045 DHV	1,930	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

DESIGN FOR 0° SKEW

24" X 78'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 87+75.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR S.B.I. NO. 117.1203.01G POWESHIEK COUNTY PROJECT NUMBER IM-NHS-080-5(242)182-03-79 SHEET NUMBER V.3

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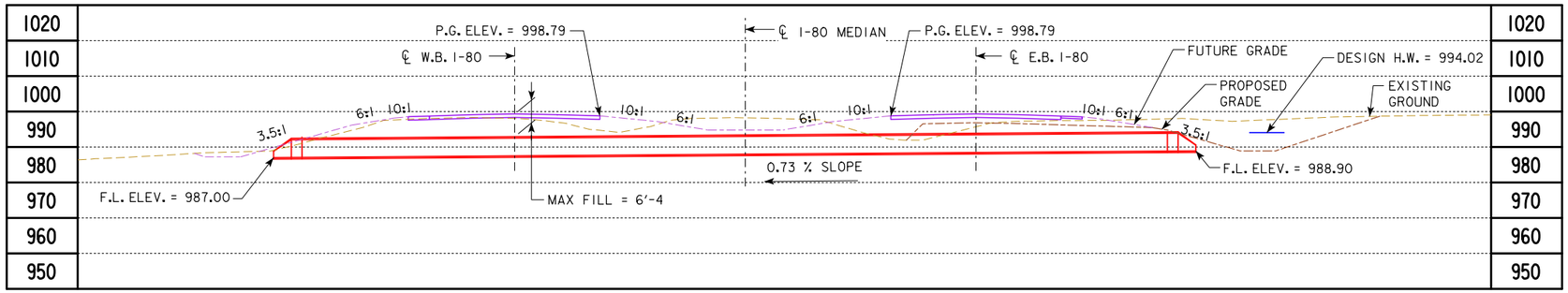

LONGITUDINAL SECTION ALONG ℄ CULVERT

PLAT PLAN

N

0 ENGLISH 40
SCALE IN FEET

HYDRAULIC DATA

DRAINAGE AREA = 59.80 ACRES
Q_{50} = 136.07 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695793°
LONGITUDE -92.734072°

TRAFFIC ESTIMATE

2014 AADT	27,800	V.P.D.
2045 AADT	55,200	V.P.D.
2045 DHV	4,100	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	_	

DESIGN FOR 0° SKEW

60" X 244'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 88+52.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.4

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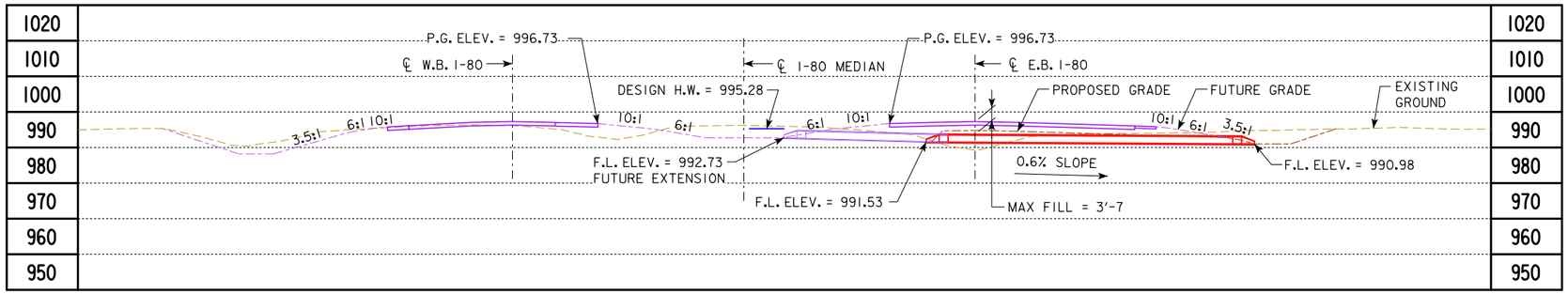

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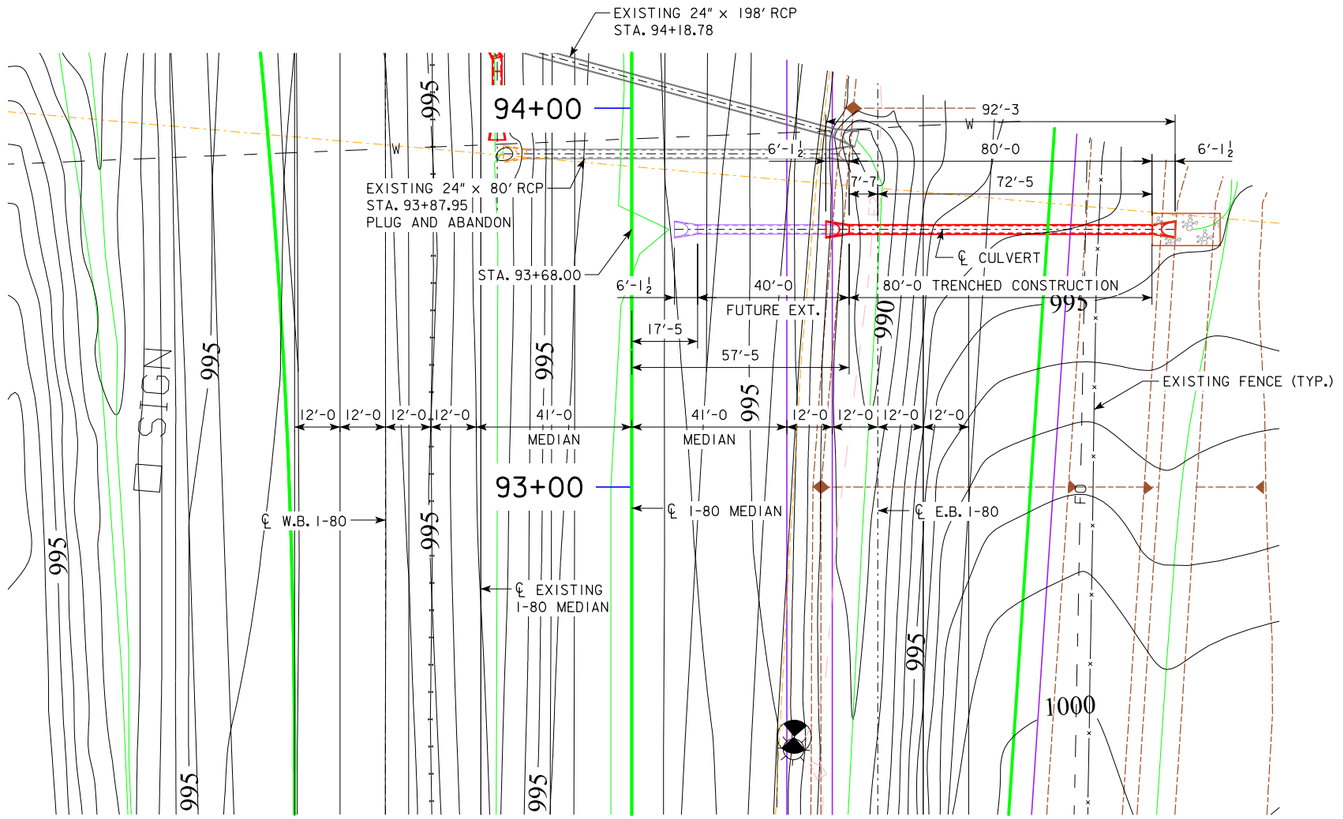

PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 5.22 ACRES
Q_{50} = 19.14 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK
W - WATER - CITY OF GRINNFILL

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695906°
LONGITUDE -92.732188°

TRAFFIC ESTIMATE

2014 AADT	13,600	V.P.D.
2045 AADT	27,200	V.P.D.
2045 DHV	1,930	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
24" X 80'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 93+68.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR | S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.5

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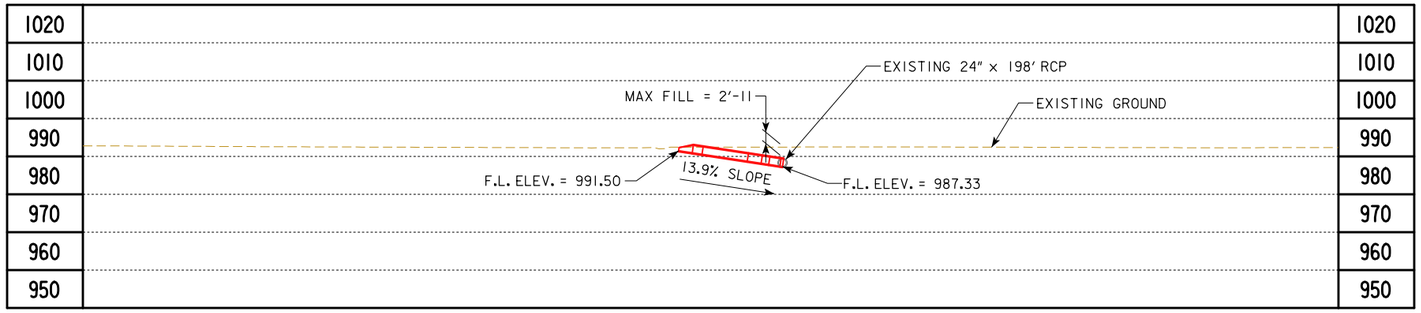

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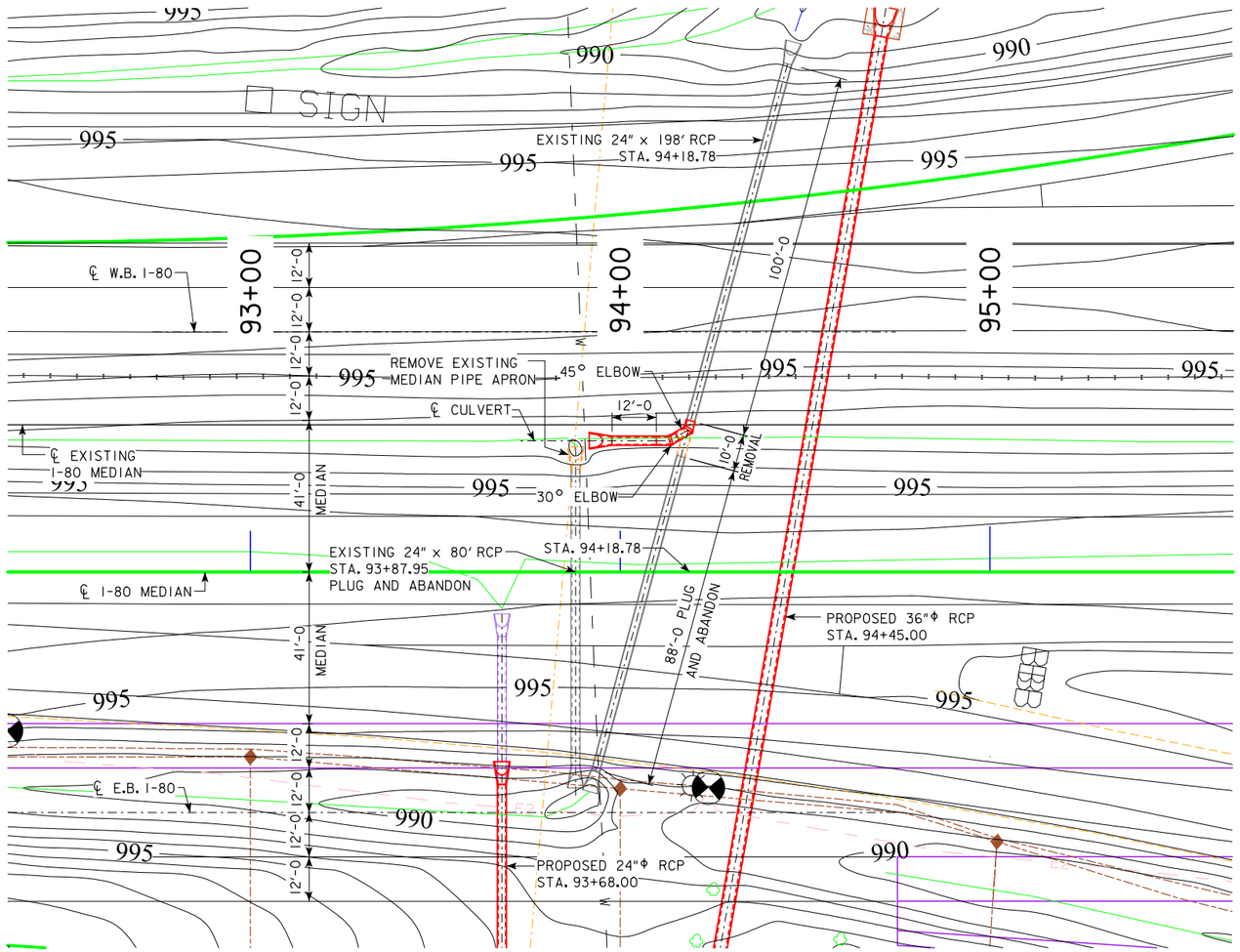

PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 1.8 ACRES
Q_{50} = 10.8 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK
W - WATER - CITY OF GRINNFILL

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695917°
LONGITUDE -92.732003°

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
24" X 24'
REINFORCED CONCRETE PIPE EXT.
PLAT PLAN

STATION 94+18.78 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.6

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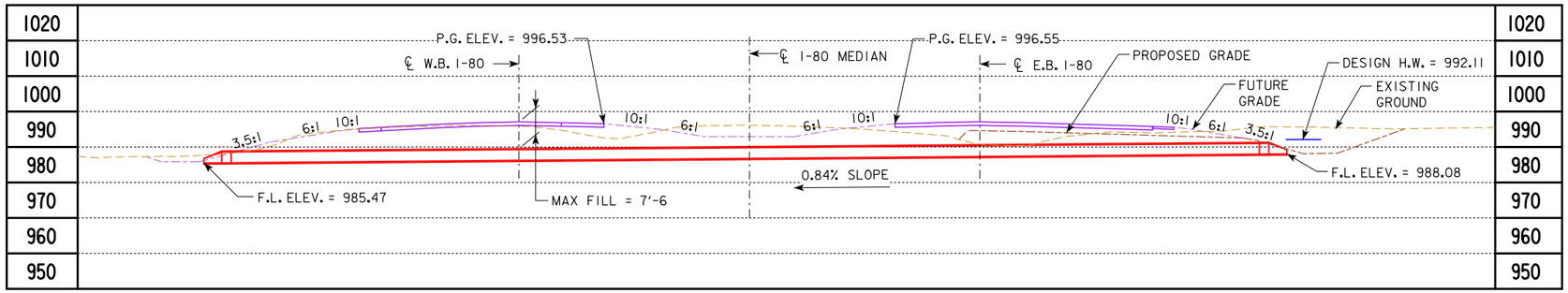
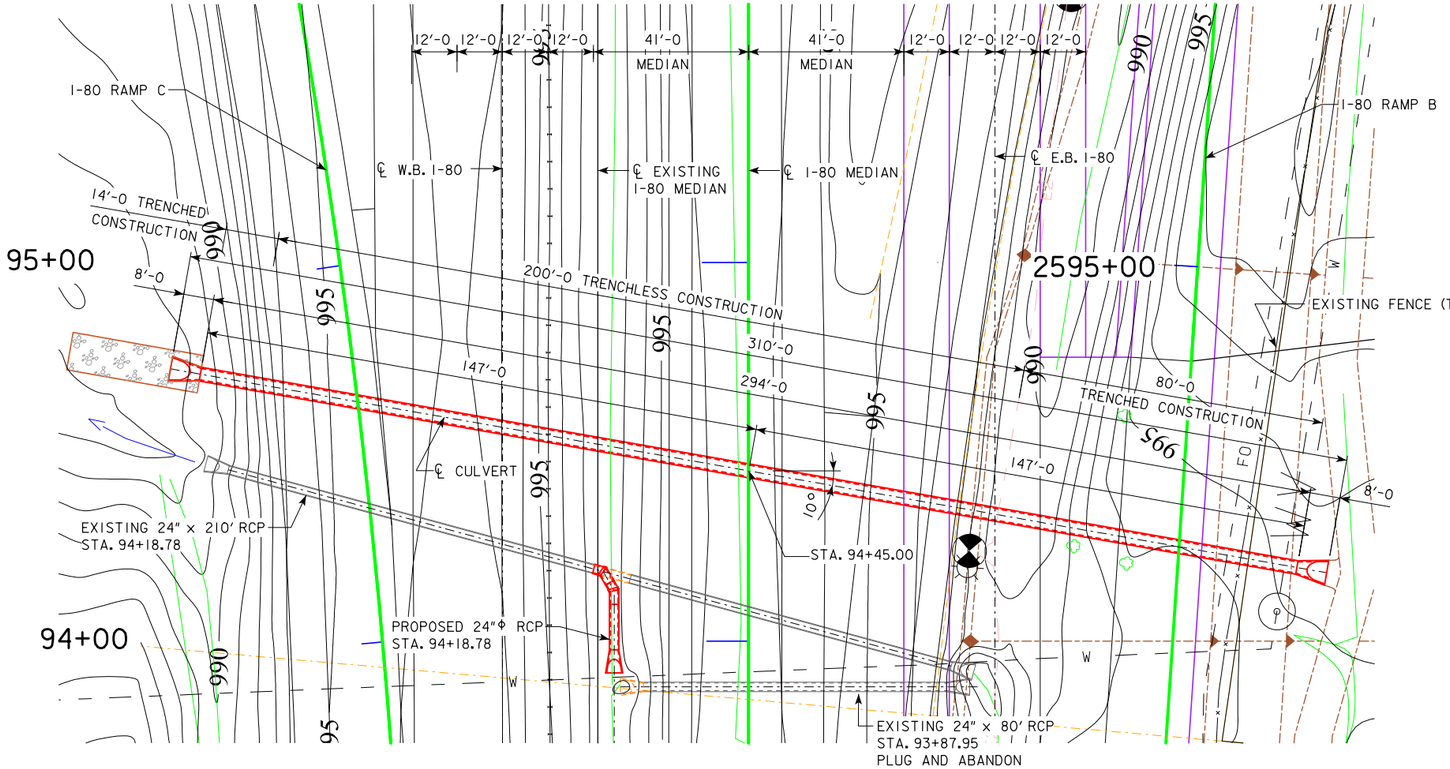


LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 18.16 ACRES
Q_{50} = 54.93 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK
W - WATER - CITY OF GRINNFILL

LOCATION

I-80
T-80N R-16W
SECTION 32
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695922°
LONGITUDE -92.731907°

TRAFFIC ESTIMATE

2014 AADT	27,800	V.P.D.
2045 AADT	55,200	V.P.D.
2045 DHV	4,100	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

SHUCK-BRITSON

DESIGN FOR 10° SKEW (L.A.)

36" X 294'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 94+45.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.7

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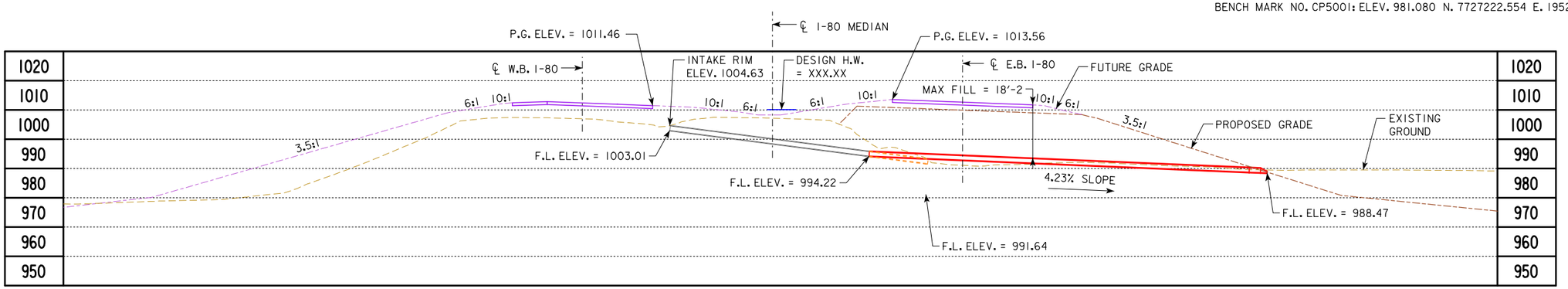
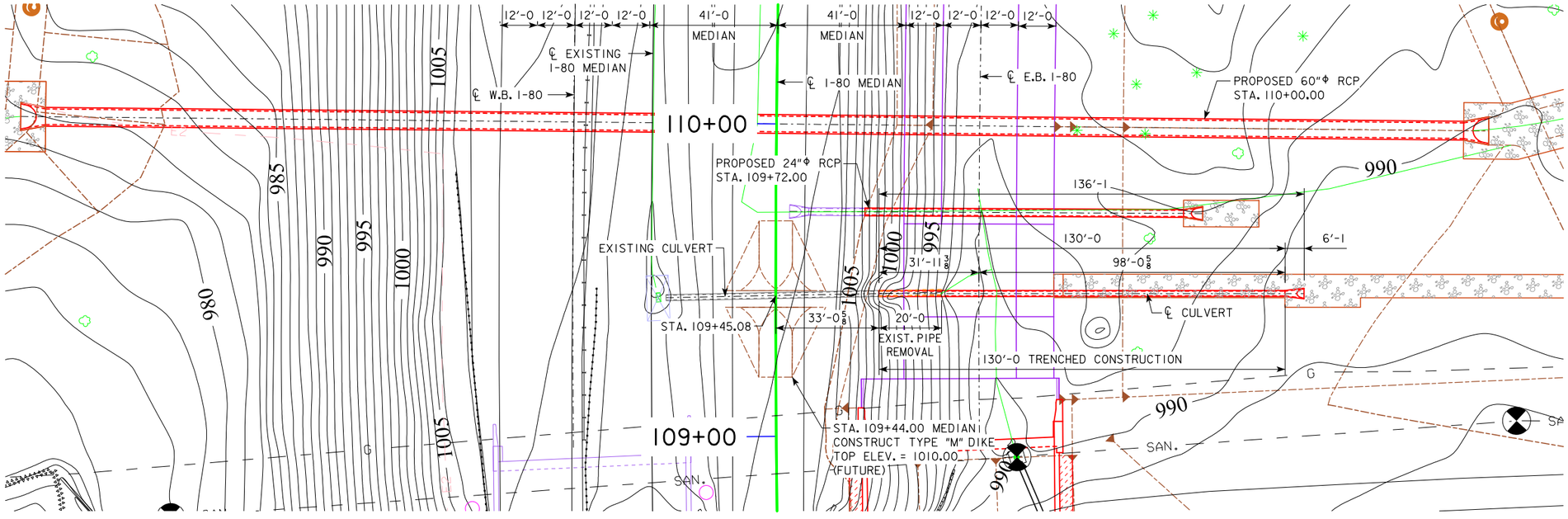


LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 2.34 ACRES
Q_{50} = 11.14 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.696130°
LONGITUDE -92.726328°

TRAFFIC ESTIMATE

2014 AADT	13,600	V.P.D.
2045 AADT	27,200	V.P.D.
2045 DHV	1,930	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

CURVE DATA

PI STA. 107+26.10
PC STA. 102+49.43
PT STA. 112+00.55
Δ = 9° 33' 38.31" (RT.)
T = 476.67
L = 951.13
R = 5,700.0
E 19.90

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
18" X 130'
REINFORCED CONCRETE PIPE EXT.
PLAT PLAN

STATION 109+45.08 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

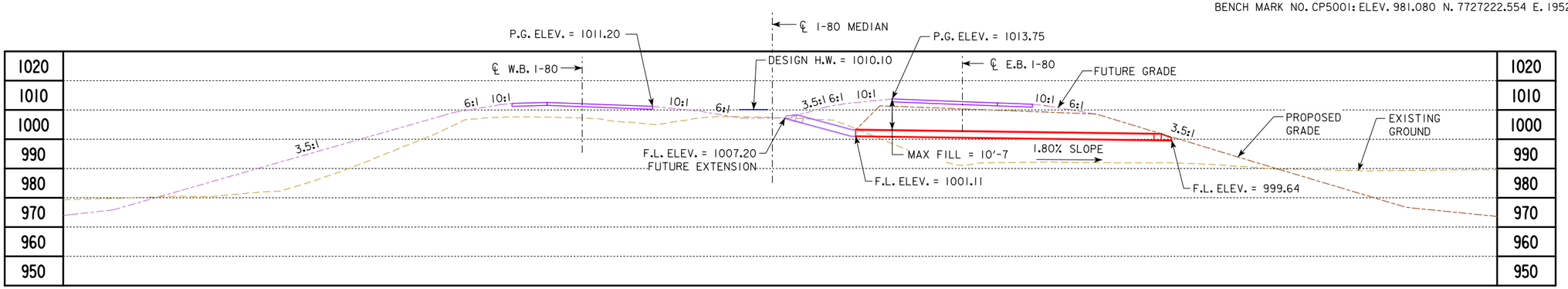
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

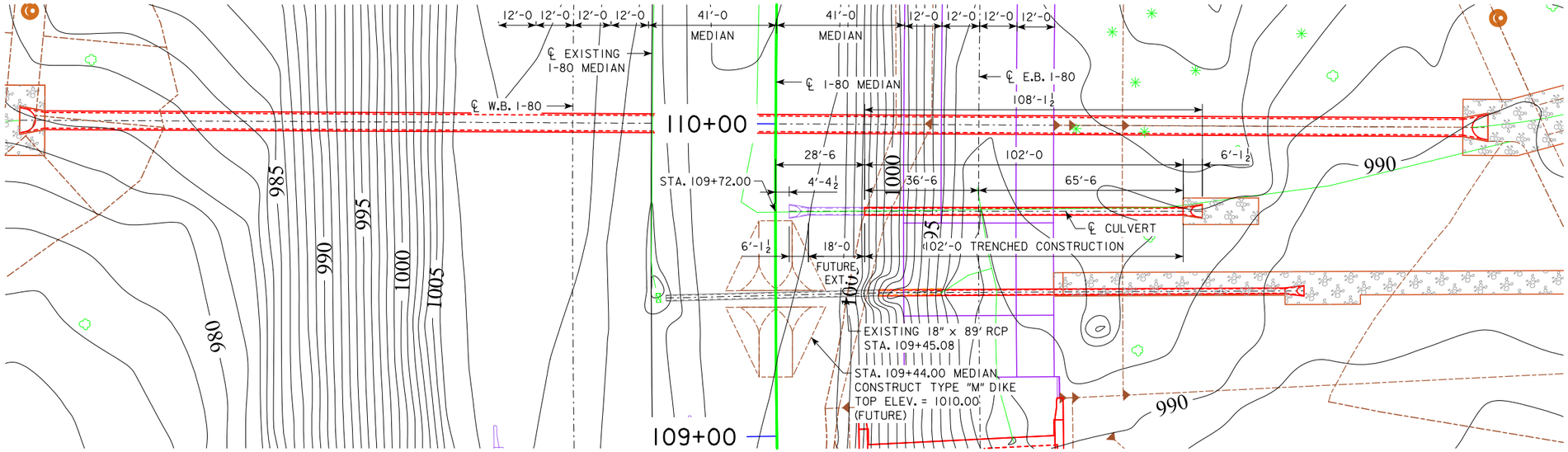
DESIGN TEAM SMK/JLH/SR | S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.8

9/9/2019 11:30:26 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_109+45.08 11x17_pdf.pltcfg

BENCH MARK NO. CP5001: ELEV. 981.080 N. 7727222.554 E. 19524523.680 SET 5/8 INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 3.98 ACRES
Q_{50} = 13.43 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.696130°
LONGITUDE -92.726328°

TRAFFIC ESTIMATE

2014 AADT	13,600	V.P.D.
2045 AADT	27,200	V.P.D.
2045 DHV	1,930	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

CURVE DATA

PI STA. 107+26.10
PC STA. 102+49.43
PT STA. 112+00.55
Δ = 9° 33' 38.31" (RT.)
T = 476.67
L = 951.13
R = 5,700.0
E 19.90

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW

24" X 102'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 109+72.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

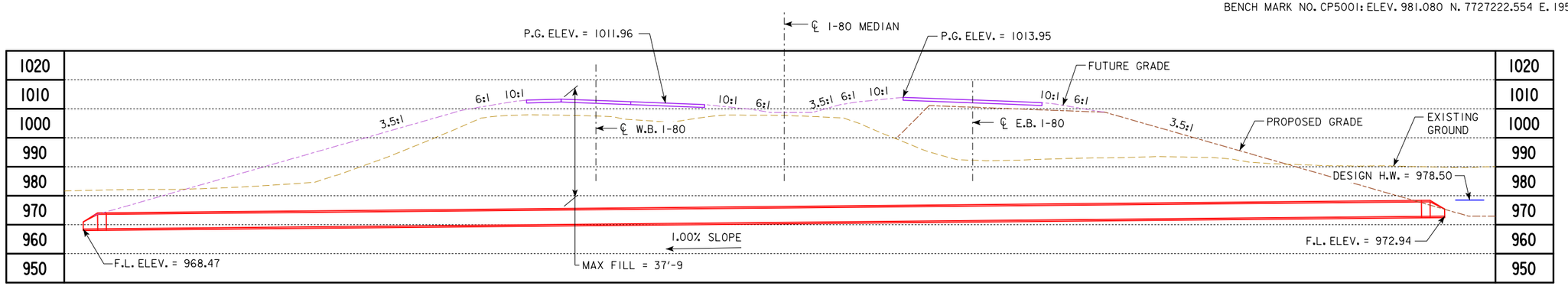
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

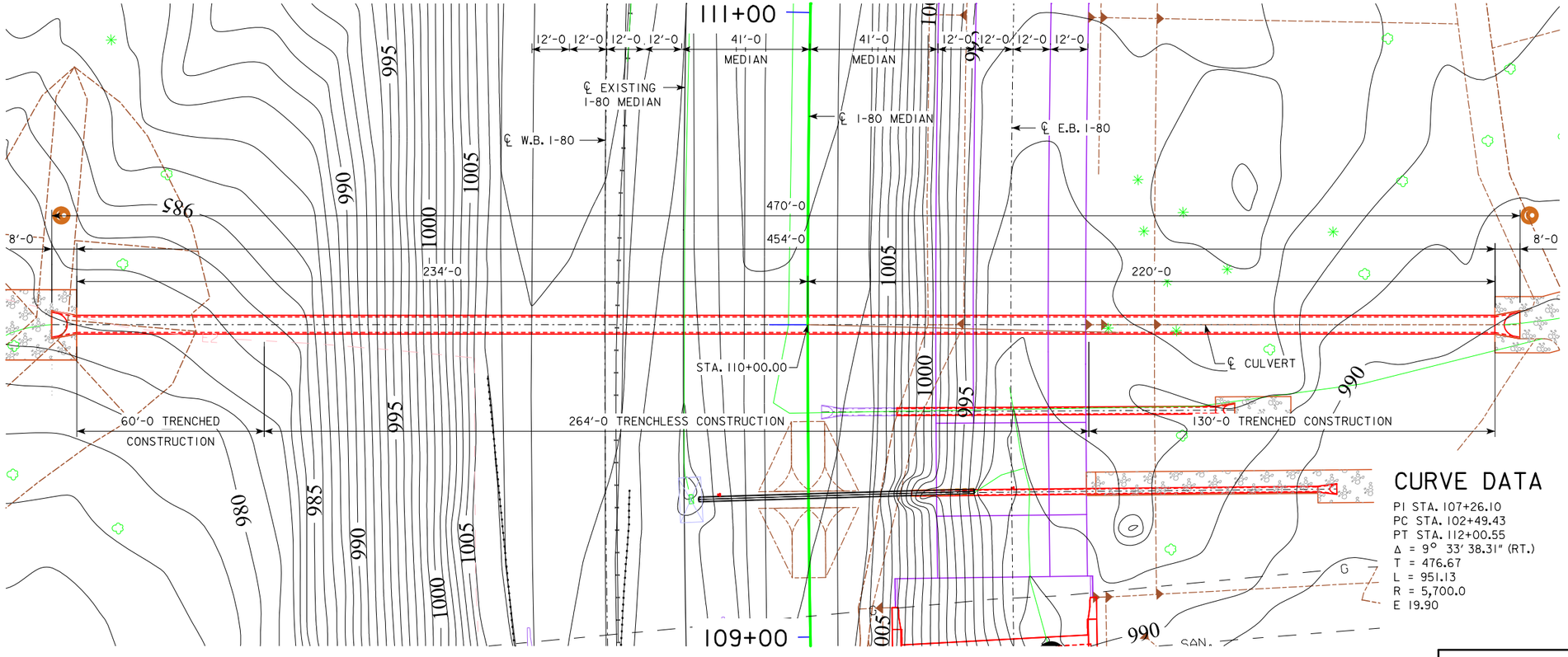
DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.9

9/9/2019 11:30:28 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_109+72.00 11x17_pdf.pltcfg

BENCH MARK NO. CP5001: ELEV. 981.080 N. 7727222.554 E. 19524523.680 SET 5/8 INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 154.93 ACRES
Q_{50} = 142.85 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.696127°
LONGITUDE -92.726225°

CURVE DATA

PI STA. 107+26.10
PC STA. 102+49.43
PT STA. 112+00.55
Δ = 9° 33' 38.31" (RT.)
T = 476.67
L = 951.13
R = 5,700.0
E 19.90

TRAFFIC ESTIMATE

2014 AADT	27,800	V.P.D.
2045 AADT	55,200	V.P.D.
2045 DHV	4,100	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
60" X 454'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 110+00.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.10

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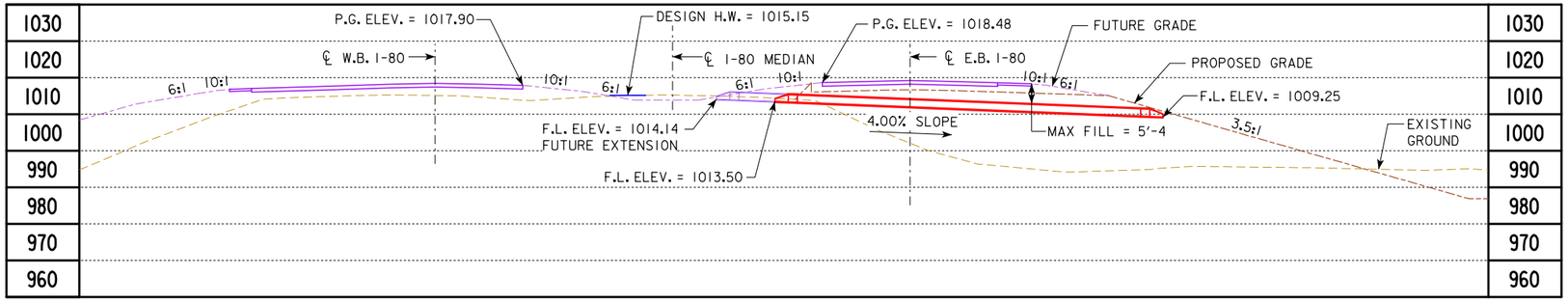
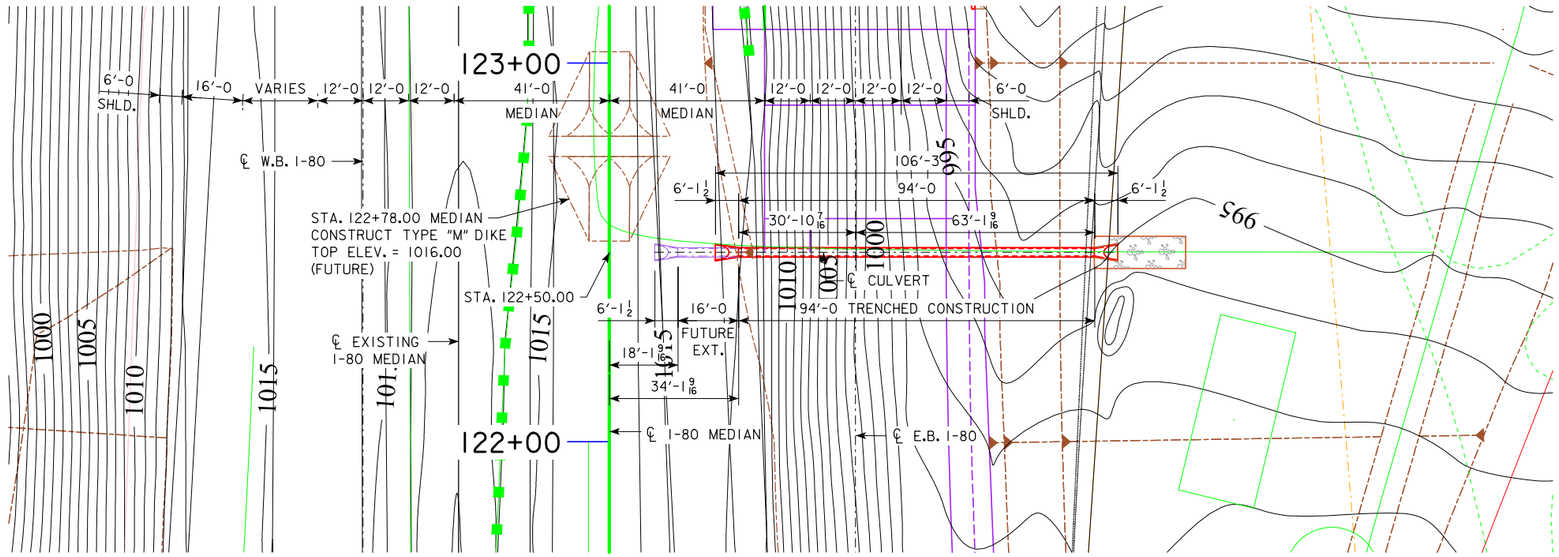
BENCH MARK NO. CP5003: ELEV. 1006.700 N. 7726947.372 E. 19524584.130 SET $\frac{5}{8}$ INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 0.47 ACRES
Q_{50} = 3.98 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DEPARTMENT OF TRANSPORATION
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695837°
LONGITUDE -92.721665°

TRAFFIC ESTIMATE

2014 AADT	13,600	V.P.D.
2045 AADT	27,200	V.P.D.
2045 DHV	1,930	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
24" X 94'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 122+50.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

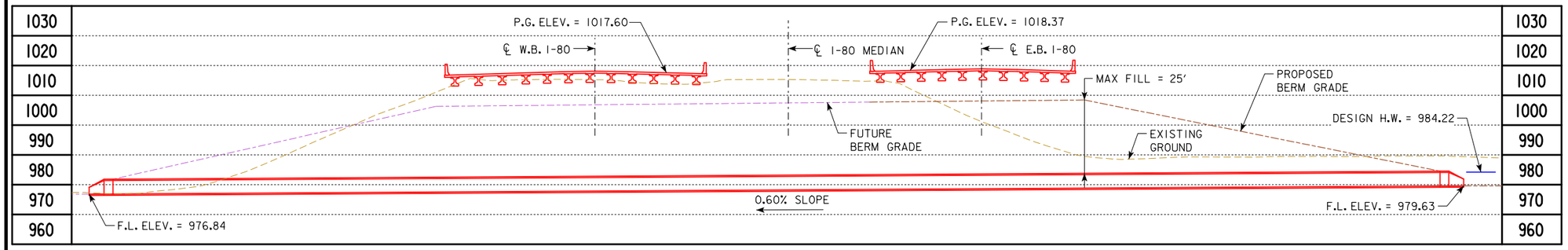
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

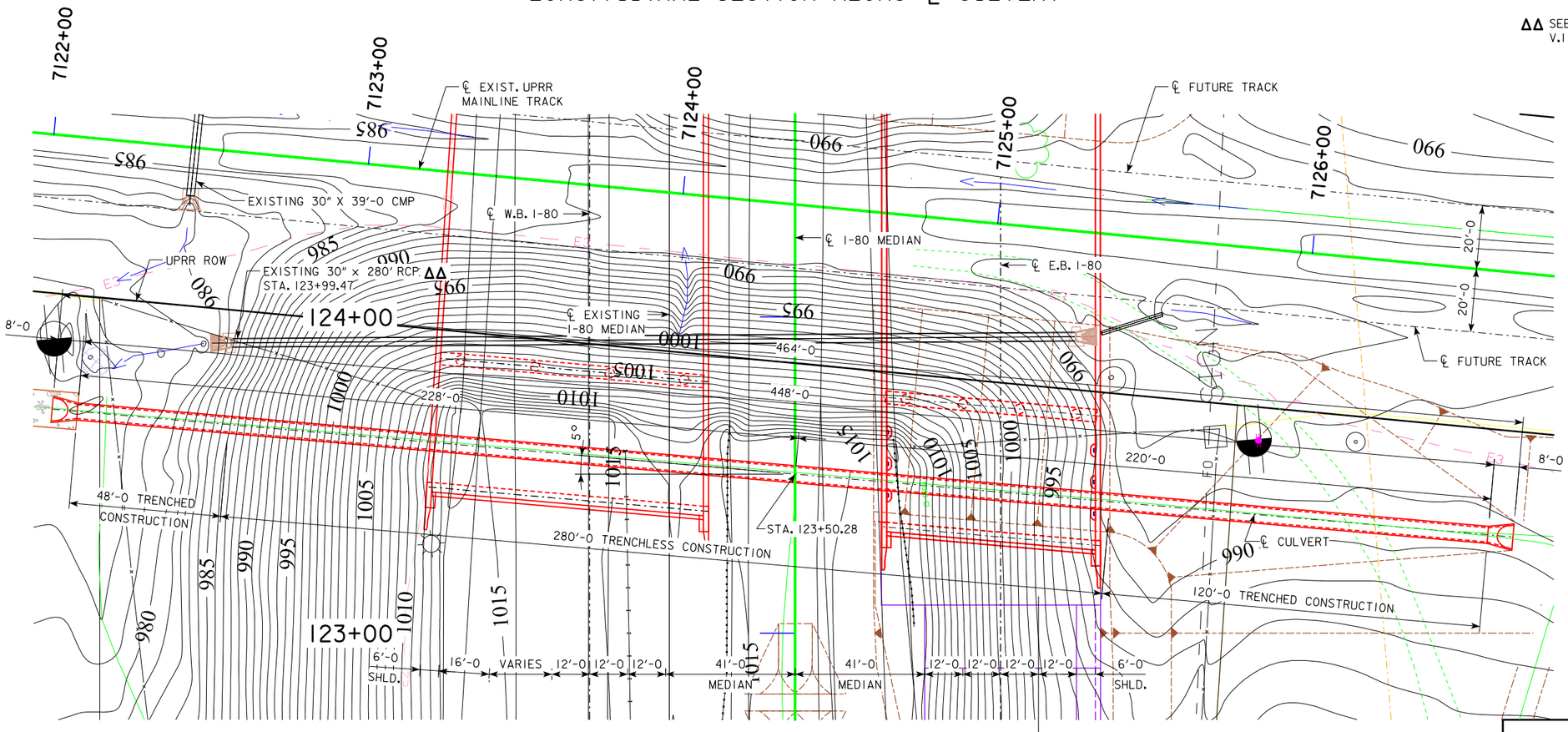
DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.11

9/9/2019 11:30:31 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_122+50.00 11x17_pdf.pltcfg

BENCH MARK NO. CP5003: ELEV. 1006.700 N. 7726947.372 E. 19524584.130 SET $\frac{5}{8}$ INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 17.84 ACRES
Q_{50} = 77.06 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DEPARTMENT OF TRANSPORTATION
E3 - ELECTRIC - ALLIANT ENERGY
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK
⊕ - UTILITY POLE

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695813°
LONGITUDE -92.721299°

TRAFFIC ESTIMATE

2014 AADT	26,500	V.P.D.
2045 AADT	53,700	V.P.D.
2045 DHV	4,100	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

UNION PACIFIC RAILROAD
CALL BEFORE YOU DIG
1-800-336-9193

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 5° SKEW (L.A.)

54" X 448'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 123+50.28 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

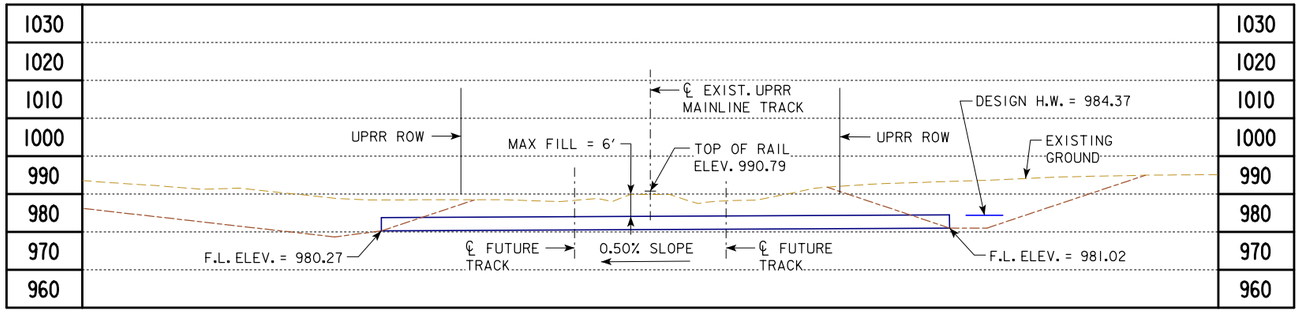
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

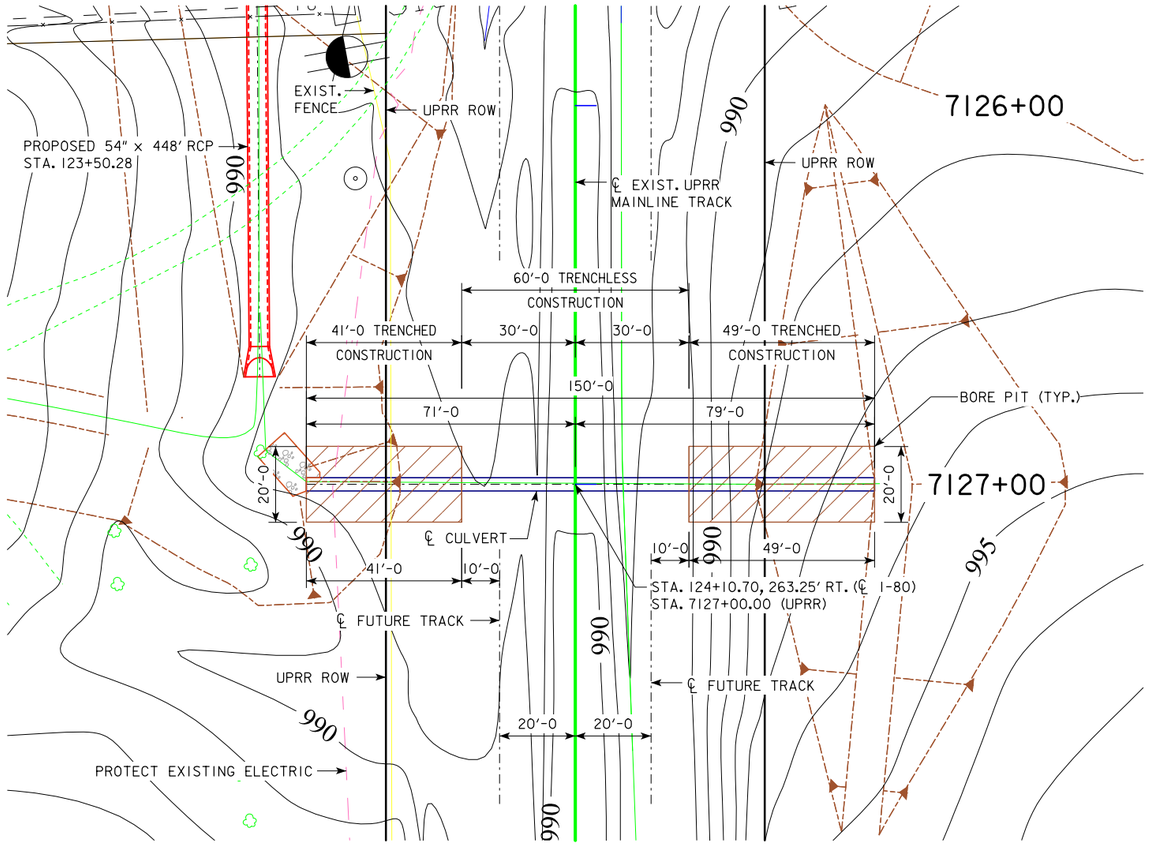
DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.12

9/9/2019 11:30:36 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_123+50.28 11x17_pdf.pltcfg

BENCH MARK NO. CP5003: ELEV. 1006.700 N. 7726947.372 E. 19524584.130 SET $\frac{5}{8}$ INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

UNION PACIFIC RAILROAD
CALL BEFORE YOU DIG
1-800-336-9193

N

0 ENGLISH 40
SCALE IN FEET

HYDRAULIC DATA

DRAINAGE AREA = 9.36 ACRES
Q_{50} = 42.52 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DEPARTMENT OF TRANSPORTATION
E3 - ELECTRIC - ALLIANT ENERGY
FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695079°
LONGITUDE -92.721163°

DESIGN FOR 0° SKEW
42" X 150'
STEEL PIPE
PLAT PLAN

STATION 124+10.70, 263.25' RT. ℄ I-80 NOVEMBER, 2019
POWESHIEK COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G		POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.13

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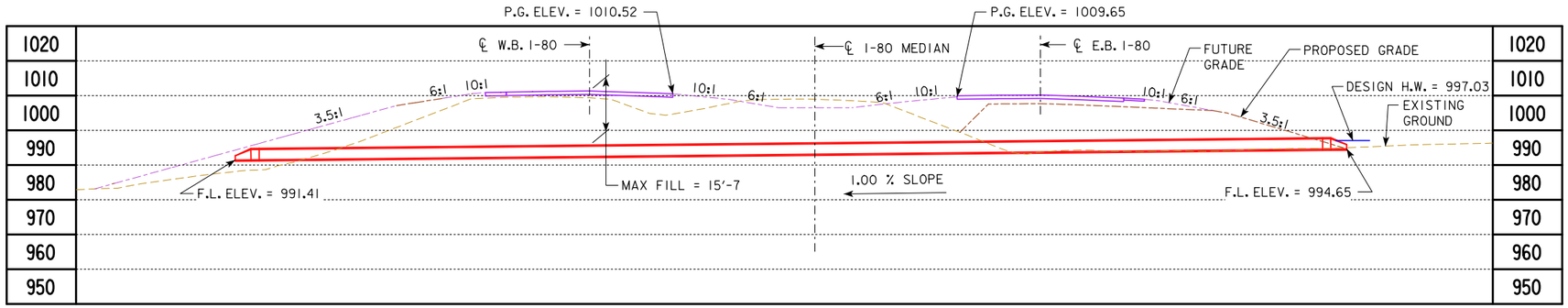
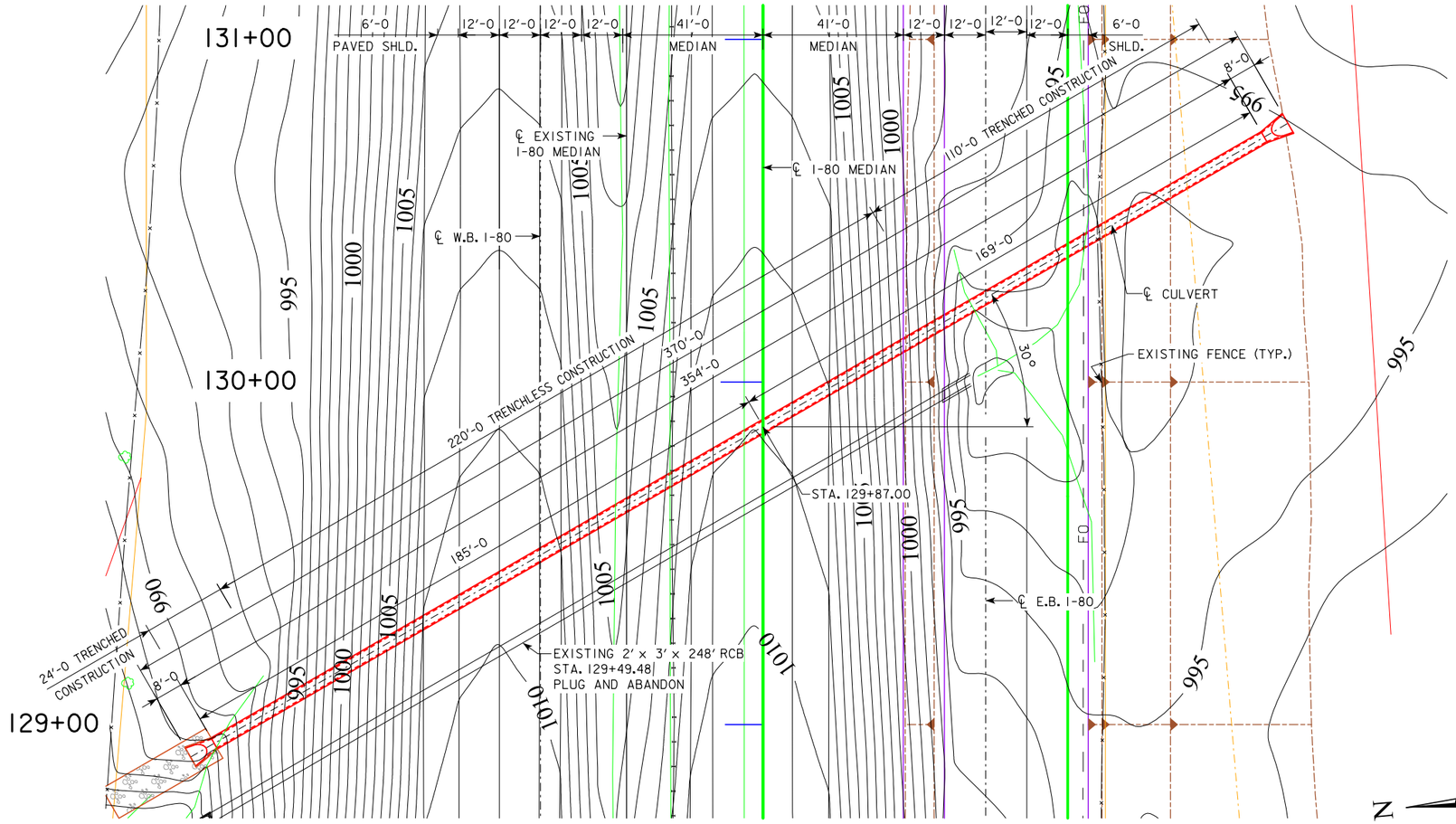


LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 5.00 ACRES
Q_{50} = 24.82 CFS

UTILITIES LEGEND:

FO - FIBER OPTIC - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695661°
LONGITUDE -92.718977°

TRAFFIC ESTIMATE

2014 AADT	26,500	V.P.D.
2045 AADT	53,700	V.P.D.
2045 DHV	3,800	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

DESIGN FOR 30° SKEW (R.A.)

36" X 354'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 129+87.00 ℄ I-80 — NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.14

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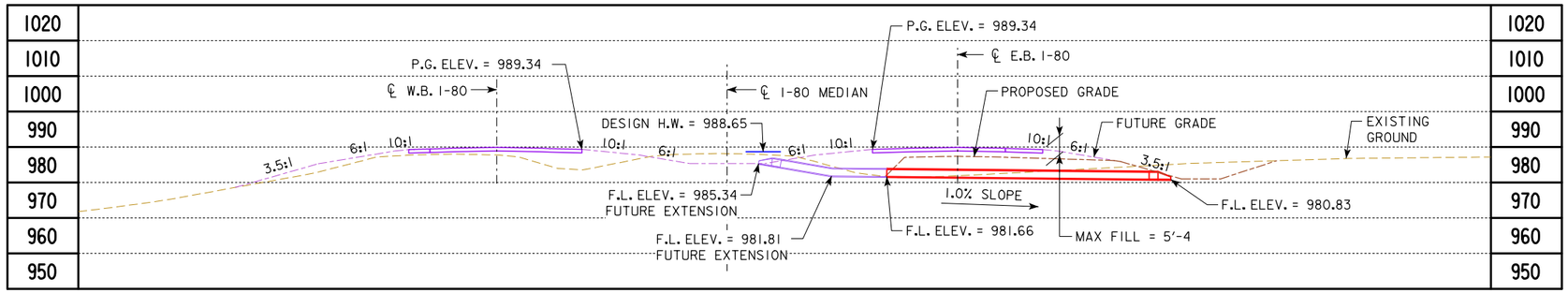
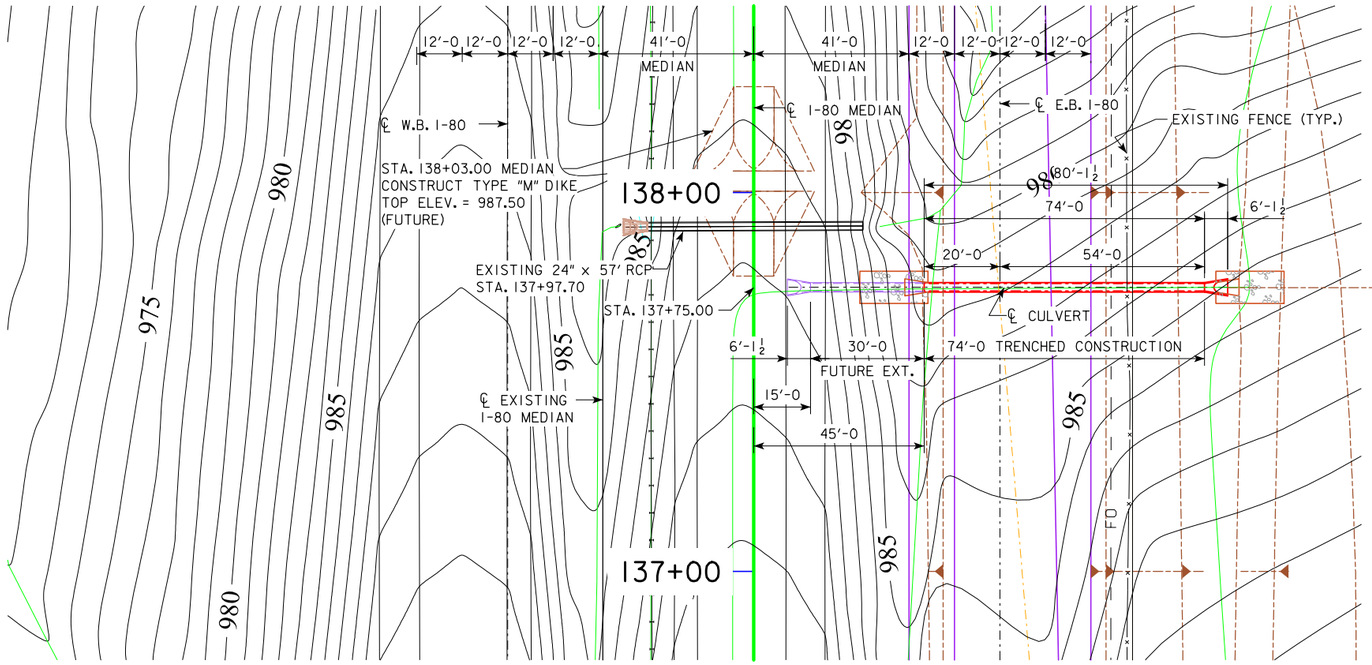


LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 2.11 ACRES
Q_{50} = 14.75 CFS

UTILITIES LEGEND:

EI - ELECTRIC - MID AMERICAN ENERGY
FO - FIBER OPTIC - CITY OF ANKENY FIBER
FO4 - FIBER OPTIC - CENTURYLINK
FO5 - FIBER OPTIC - IOWA DOT
FO6 - FIBER OPTIC - WINDSTREAM
San.2 - SANITARY SEWER - CITY OF ANKENY
✸ - UTILITY POLE
⊙ - MANHOLE
□ UB - UTILITY BOX

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695472°
LONGITUDE -92.716103°

TRAFFIC ESTIMATE

2014 AADT	13,100	V.P.D.
2045 AADT	26,700	V.P.D.
2045 DHV	1,800	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
24" X 74'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 137+75.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

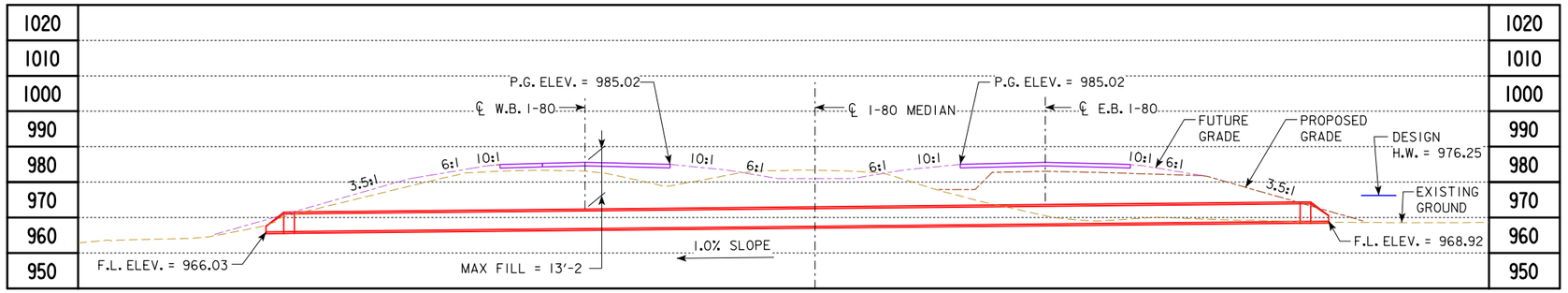
DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

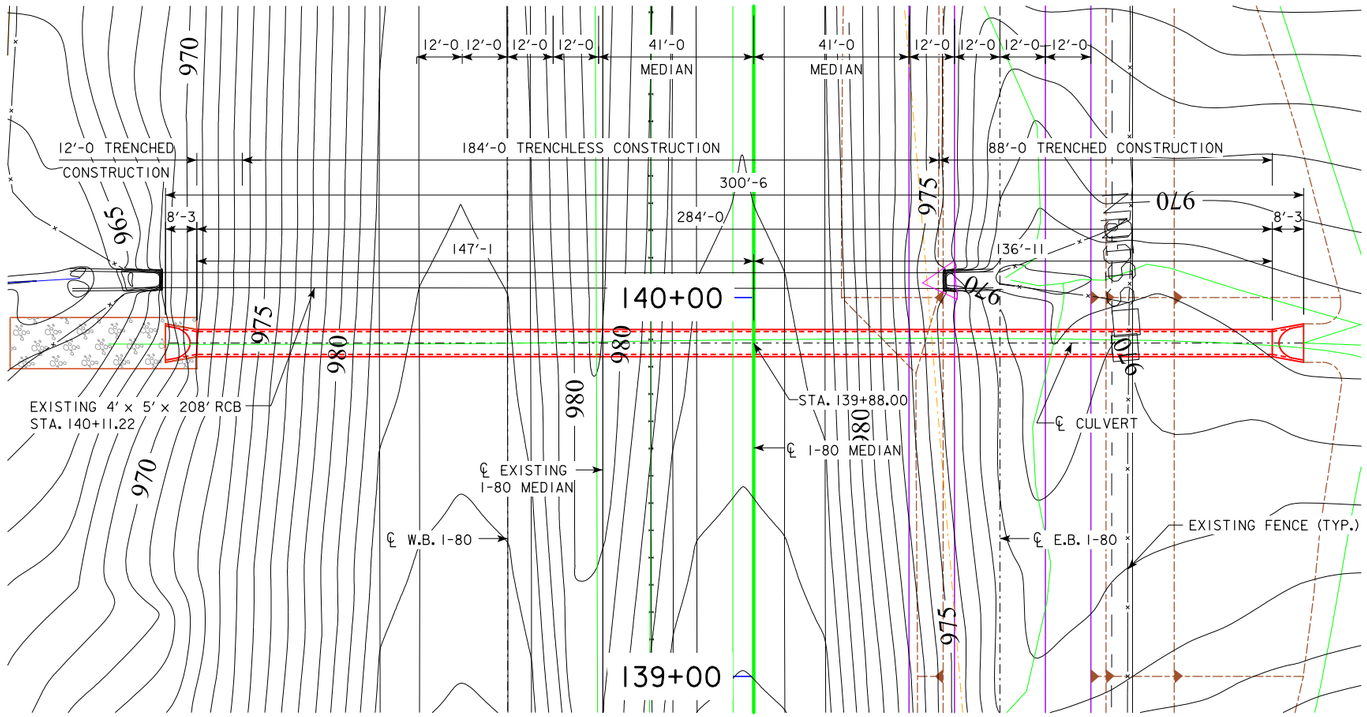
DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.15

9/9/2019 11:30:42 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_137+75.00 11x17_pdf.pltcfg

BENCH MARK NO. BM1: ELEV. 974.201 N. 7726614.606 E. 19527690.150 BRASS MONUMENT.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

N

0 ENGLISH 40
SCALE IN FEET

HYDRAULIC DATA

DRAINAGE AREA = 127.98 ACRES
Q_{50} = 281.23 CFS

UTILITIES LEGEND:

FO - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695421°
LONGITUDE -92.715326°

TRAFFIC ESTIMATE

2014 AADT	26,500	V.P.D.
2045 AADT	53,700	V.P.D.
2045 DHV	3,800	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

DESIGN FOR 0° SKEW

72" X 284'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 139+88.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO. _____

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G		POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.16

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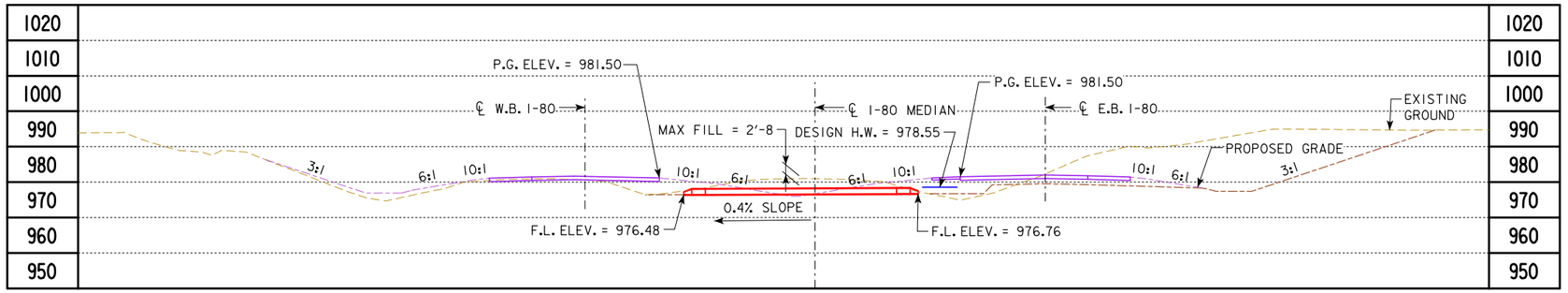
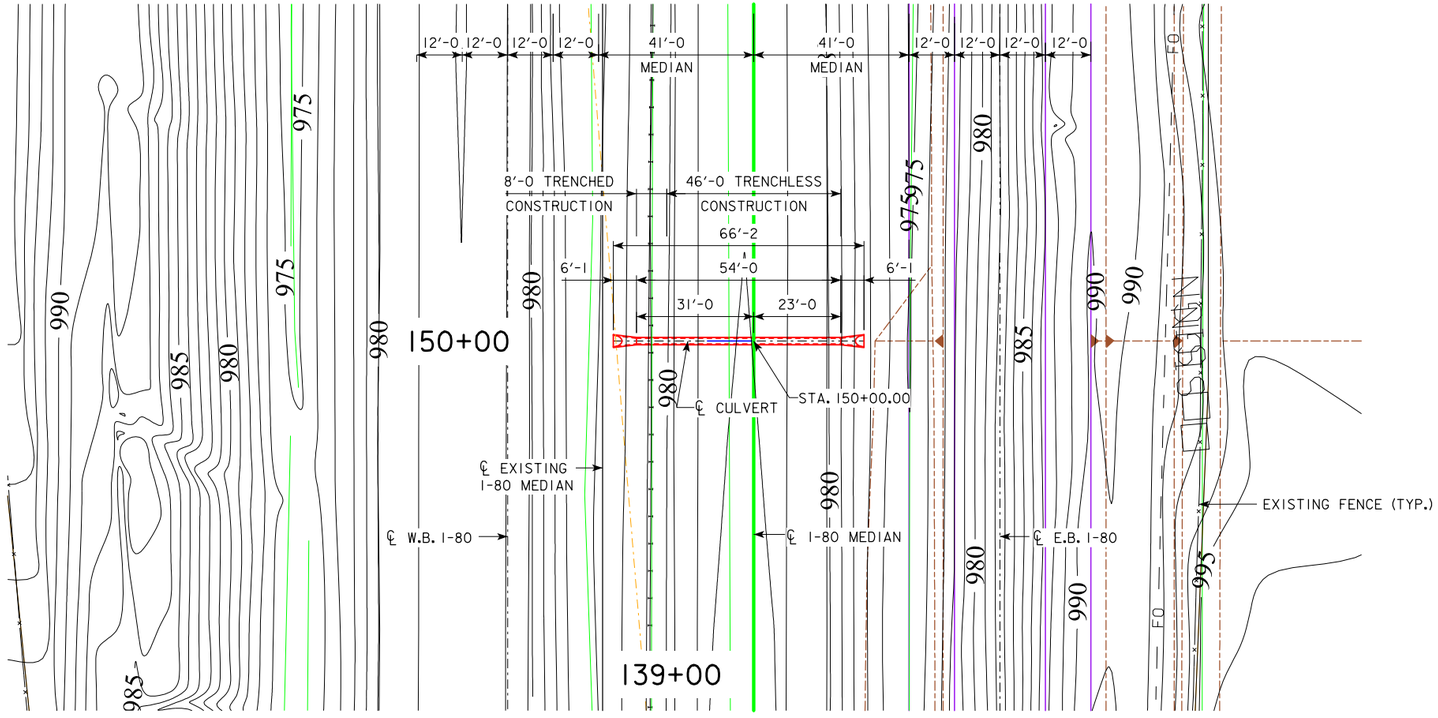
BENCH MARK NO. BM1: ELEV. 974.201 N. 7726614.606 E. 19527690.150 BRASS MONUMENT.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 2.5 ACRES
Q_{50} = 8.04 CFS

UTILITIES LEGEND:

FO - IOWA COMMUNICATIONS NETWORK

LOCATION

I-80
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695178°
LONGITUDE -92.711634°

TRAFFIC ESTIMATE

2014 AADT	26,500	V.P.D.
2045 AADT	53,700	V.P.D.
2045 DHV	3,800	V.P.H.
TRUCKS	37	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW

18" X 54'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 150+00.00 ℄ I-80 NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.17

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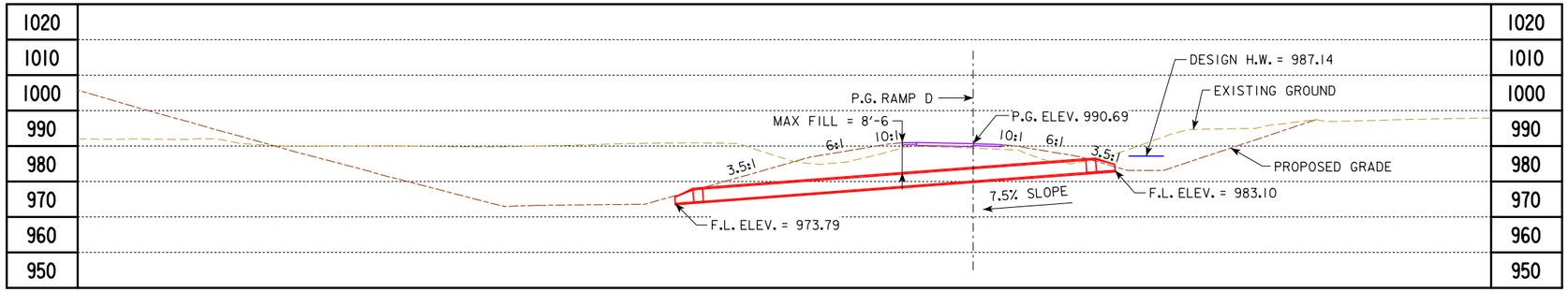

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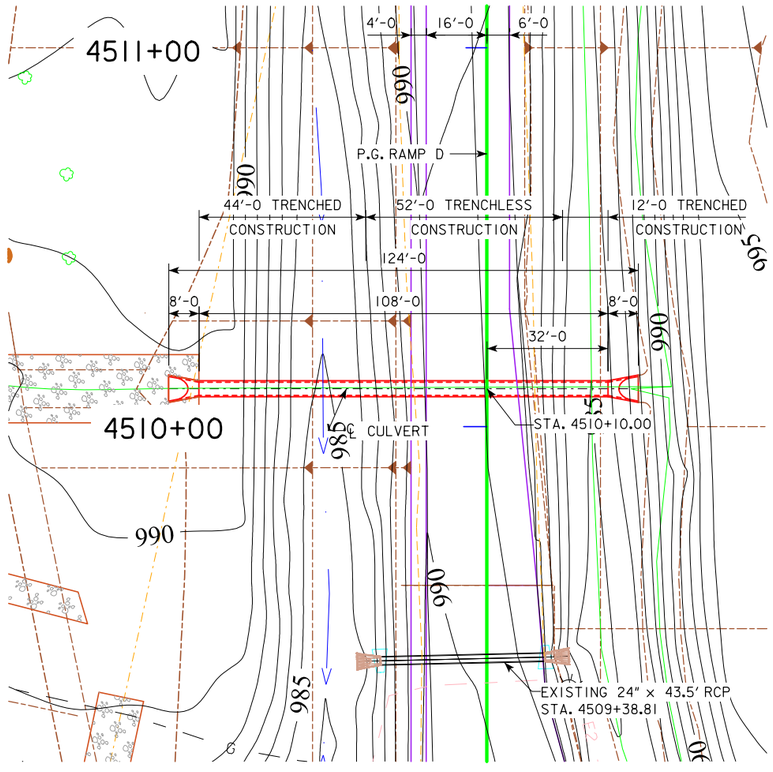

PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 16.72 ACRES
Q_{50} = 67.11 CFS

UTILITIES LEGEND:

E2 - ELECTRIC - IOWA DOT

LOCATION

I-80 RAMP D
T-80N R-16W
SECTION 33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695124°
LONGITUDE -92.726169°

TRAFFIC ESTIMATE

2014 AADT	1,120	V.P.D.
2045 AADT	2,100	V.P.D.
2045 DHV	306	V.P.H.
TRUCKS	36	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

SHUCK-BRITSON

DESIGN FOR 0° SKEW
42" X 108'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 4510+10.00 ℄ RAMP D — NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.18

9/9/2019 11:30:47 AM jgustafson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\BRPrelim\Snyder\CADD\STR_79080242_Shuck-Britson_Z09.dgn P_79_4510+10.00 11x17_pdf.pltcfg

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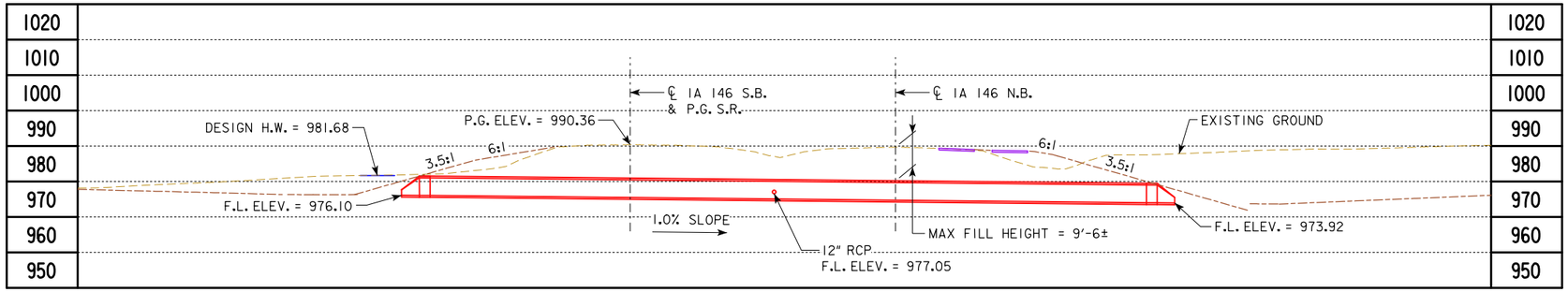

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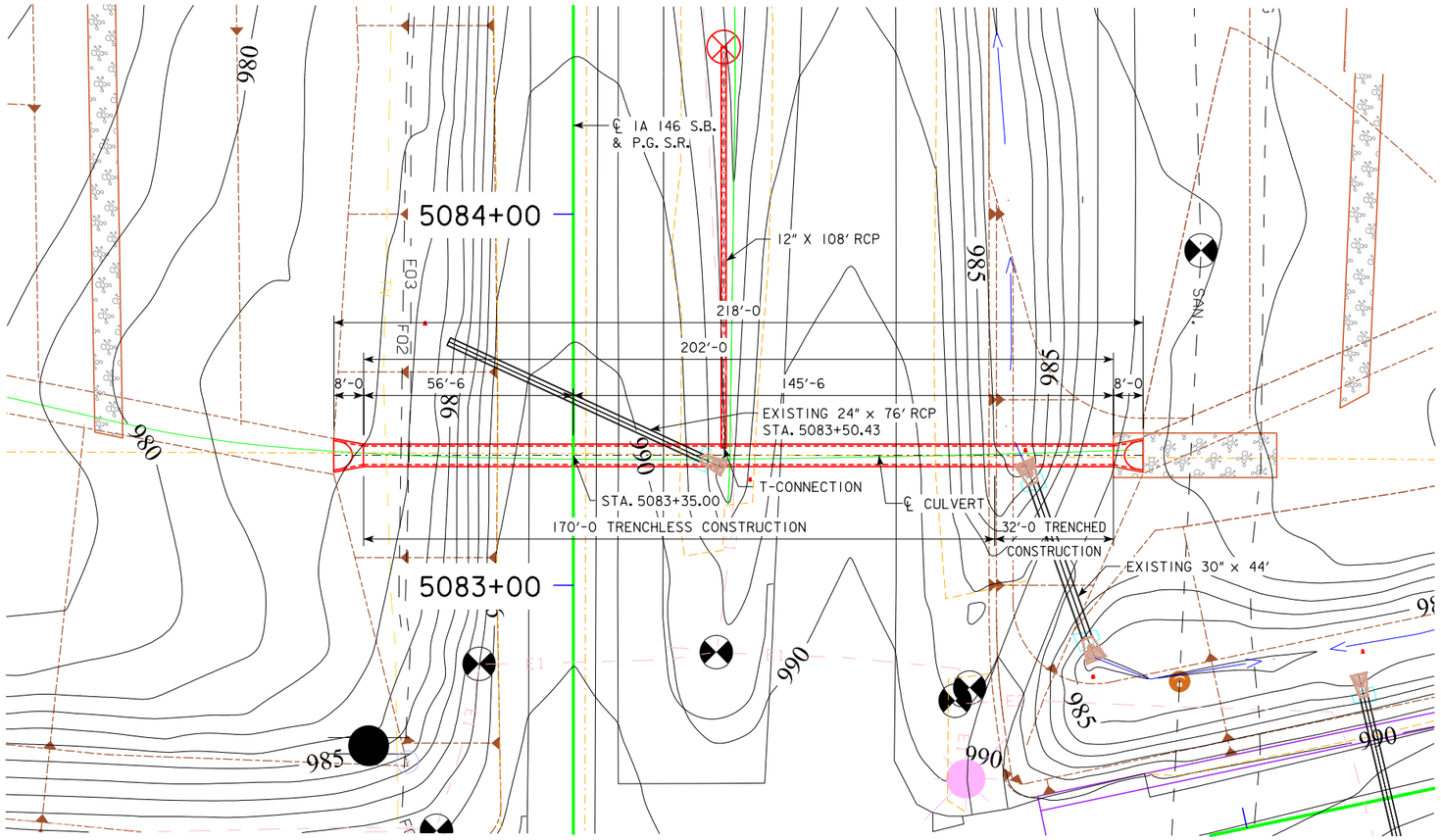

PLAT PLAN

N

0 ENGLISH 40
SCALE IN FEET

HYDRAULIC DATA

DRAINAGE AREA = 131.57 ACRES
Q_{50} = 143.49 CFS

UTILITIES LEGEND:

G - GAS - ALLIANT ENERGY
FO2 - FIBER OPTIC - AUREON NETWORK SERVICES
E1 - ELECTRIC - CITY OF GRINNELL
E2 - ELECTRIC - IOWA DOT
TV - TELEVISION - MEDIACOM
FO3 - FIBER OPTIC - WINDSTREAM COMMUNICATIONS
San. - SANITARY
- UTILITY POLE
- UTILITY ACCESS (MANHOLE)
- STORM SEWER BEEHIVE INTAKE

LOCATION

IA 146
T-80N R-16W
SECTION 32/33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695335°
LONGITUDE -92.727228°

TRAFFIC ESTIMATE

2014 AADT	9,590	V.P.D.
2045 AADT	14,600	V.P.D.
2045 DHV	1,730	V.P.H.
TRUCKS	10	%
TOTAL DESIGN ESALs	-	

DESIGN FOR 0° SKEW

60" X 202'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 5083+35.00 ℄ IA 146 S.B. NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.19

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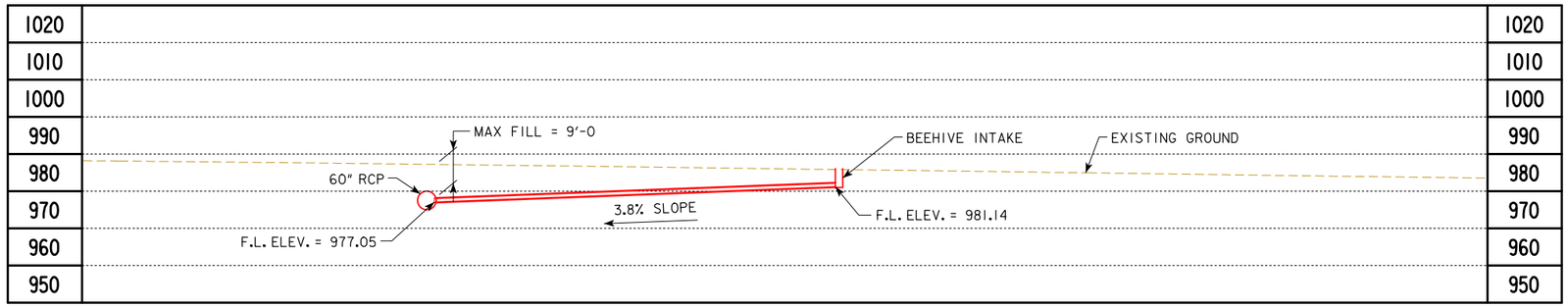
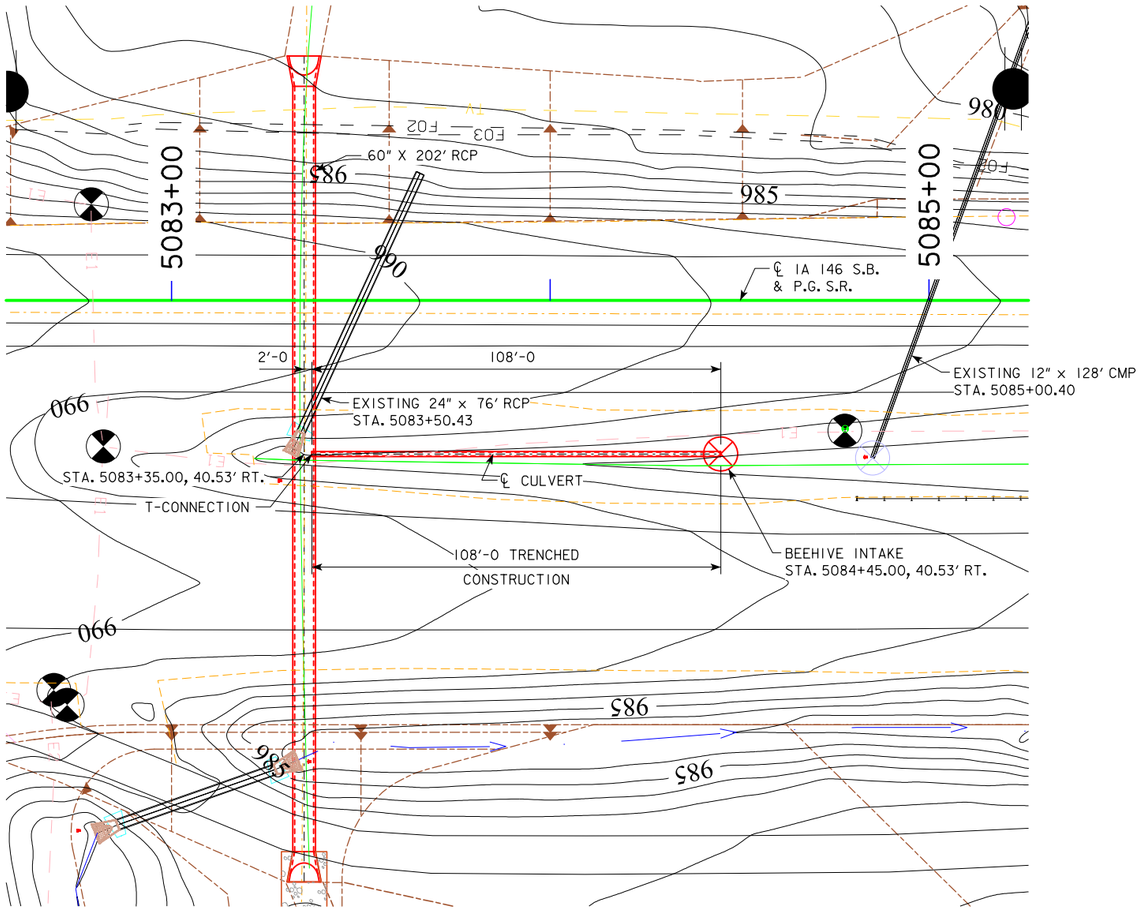
BENCH MARK NO. CP5001: ELEV. 981.080 N. 7727222.554 E. 19524523.680 SET 5/8 INCH REBAR.



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 0.50 ACRES
Q_{50} = 4.4 CFS

UTILITIES LEGEND:

G - GAS - ALLIANT ENERGY
FO2 - FIBER OPTIC - AUREON NETWORK SERVICES
E1 - ELECTRIC - CITY OF GRINNELL
E2 - ELECTRIC - IOWA DOT
TV - TELEVISION - MEDIACOM
FO3 - FIBER OPTIC - WINDSTREAM COMMUNICATIONS
San. - SANITARY
- UTILITY POLE
- UTILITY ACCESS (MANHOLE)
- STORM SEWER BEEHIVE INTAKE

LOCATION

IA 146
T-80N R-16W
SECTION 32/33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.695335°
LONGITUDE -92.727228°

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW

12" X 108'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 5083+35.00, 40.53' RT. ℄ IA 146 S.B. NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR/JLK S.B.I. NO. 117.1203.01G | POWESHIEK COUNTY | PROJECT NUMBER IM-NHS-080-5(242)182-03-79 | SHEET NUMBER V.20

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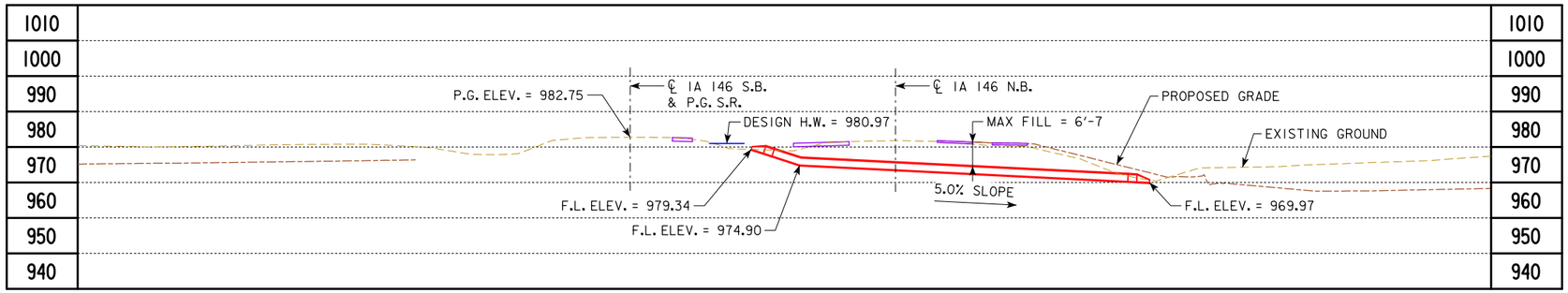

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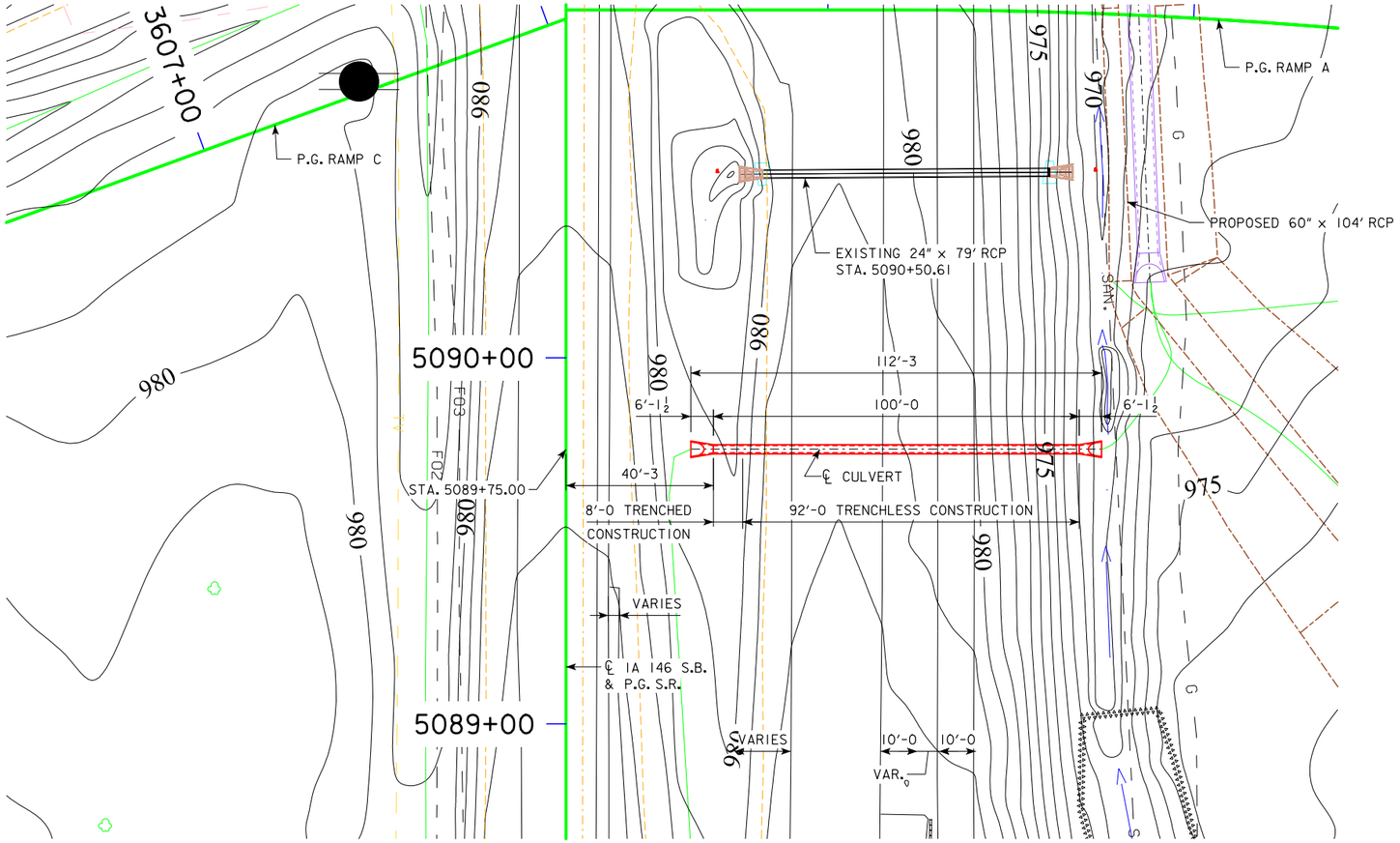

PLAT PLAN

HYDRAULIC DATA

DRAINAGE AREA = 1.69 ACRES
Q_{50} = 9.84 CFS

UTILITIES LEGEND:

G - GAS - ALLIANT ENERGY
FO2 - FIBER OPTIC - AUREON NETWORK SERVICES
E1 - ELECTRIC - CITY OF GRINNELL
E2 - ELECTRIC - IOWA DOT
TV - TELEVISION - MEDIACOM
FO3 - FIBER OPTIC - WINDSTREAM COMMUNICATIONS
San. - SANITARY
- UTILITY POLE
- UTILITY ACCESS (MANHOLE)
- STORM SEWER BEEHIVE INTAKE

LOCATION

IA 146
T-80N R-16W
SECTION 32/33
GRANT TOWNSHIP
POWESHIEK COUNTY
LATITUDE 41.697092°
LONGITUDE -92.727233°

TRAFFIC ESTIMATE

2014 AADT	3,880	V.P.D.
2045 AADT	5,435	V.P.D.
2045 DHV	655	V.P.H.
TRUCKS	10	%
TOTAL DESIGN ESALs	-	

N

0 ENGLISH 40
SCALE IN FEET

DESIGN FOR 0° SKEW
24" X 100'
REINFORCED CONCRETE PIPE
PLAT PLAN

STATION 5089+75.00 ℄ IA 146 S.B. NOVEMBER, 2019

POWESHIEK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 31512 DESIGN NO.

SHUCK-BRITSON

DESIGN TEAM SMK/JLH/SR/JLK	S.B.I. NO. 117.1203.01G	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182-03-79	SHEET NUMBER V.21

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LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- Additional Topsoil Removal
- Subrade Treatment
- Granular Shoulder
- Pavement
- Existing Pipe\RCB
- Proposed Pipe\RCB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- Topsoil (Class 10)
- Slope Dressing Only
- Class 10 Materials
- Select Loams And Clay-Loams
- Select Sand
- Unsuitable Type A Disposal
- Unsuitable Type B Disposal
- Unsuitable Type C Disposal
- Shale
- Waste
- Broken and Weathered Rock
- Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

SYMBOL LEGEND OF CROSS SECTION SHEETS

Existing Right-of-Way Limit

Proposed Right-of-Way Limit

Temporary Right-of-Way Limit

CROSS SECTION LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES W, X, Y, & Z)

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980
960

55+50.00

55+10.00

55+00.00

54+50.00

54+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.2

3:45:40 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

58+00.00

57+50.00

57+00.00

56+50.00

56+00.00

960

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.3

3:45:41 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

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1000
980

60+50.00

60+00.00

59+50.00

59+00.00

58+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.4

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ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

63+00.00

62+50.00

62+00.00

61+50.00

61+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.5

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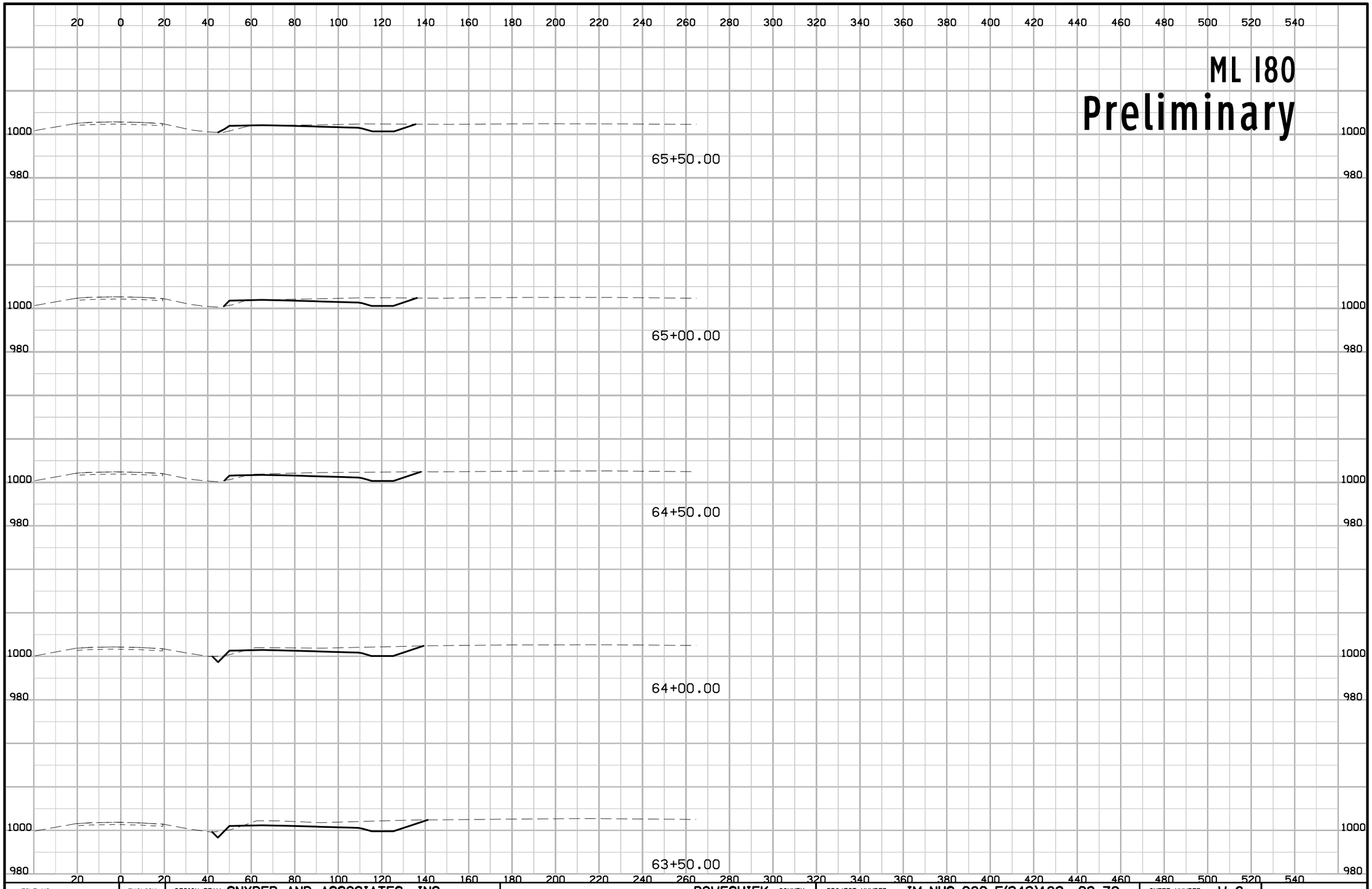
ML 180

Preliminary



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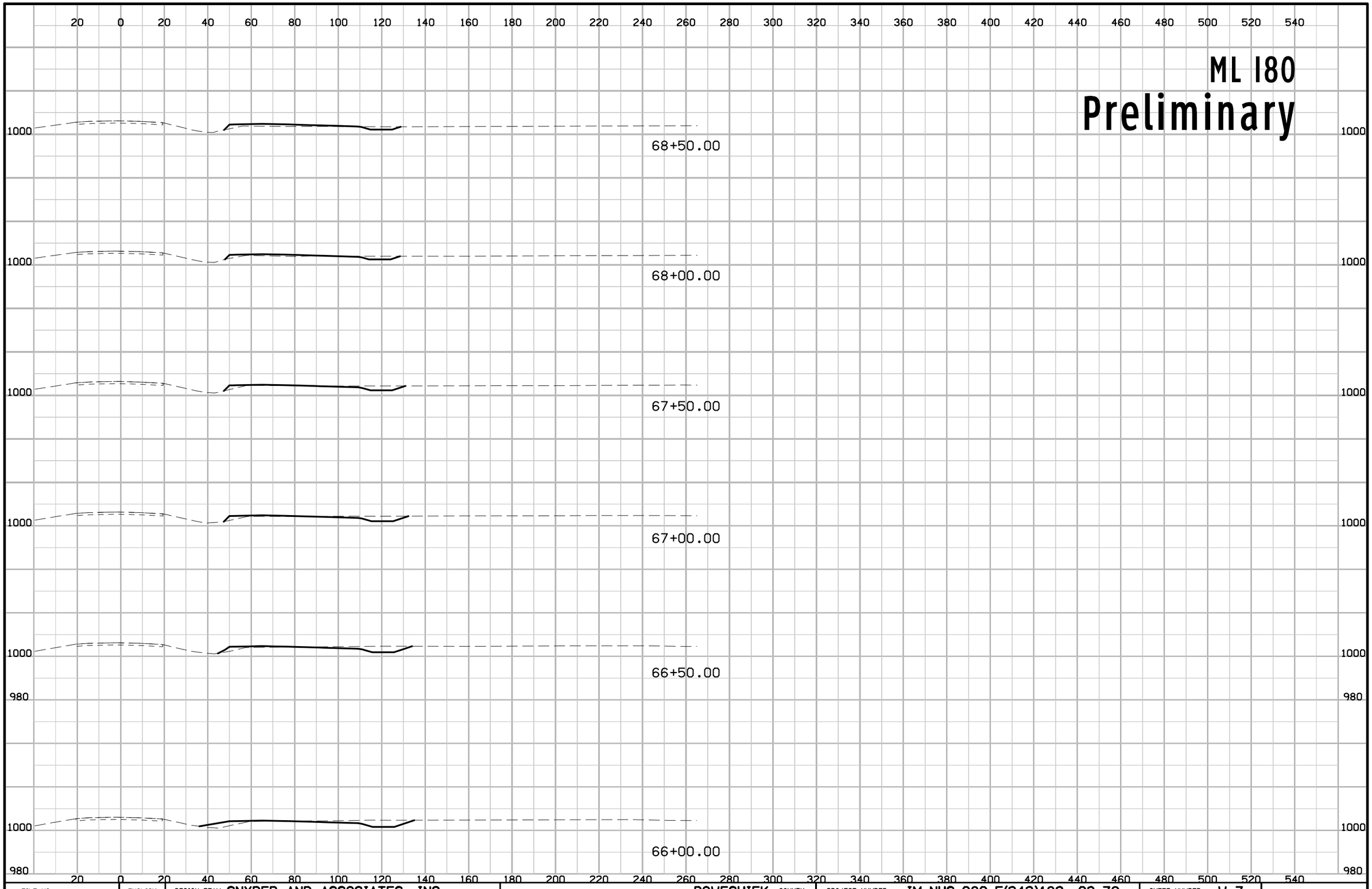
ML 180

Preliminary



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ML 180

Preliminary

1000
980

71+50.00

1000

71+00.00

1000

70+50.00

1000

70+00.00

1000

69+50.00

1000

69+00.00

1000

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.8

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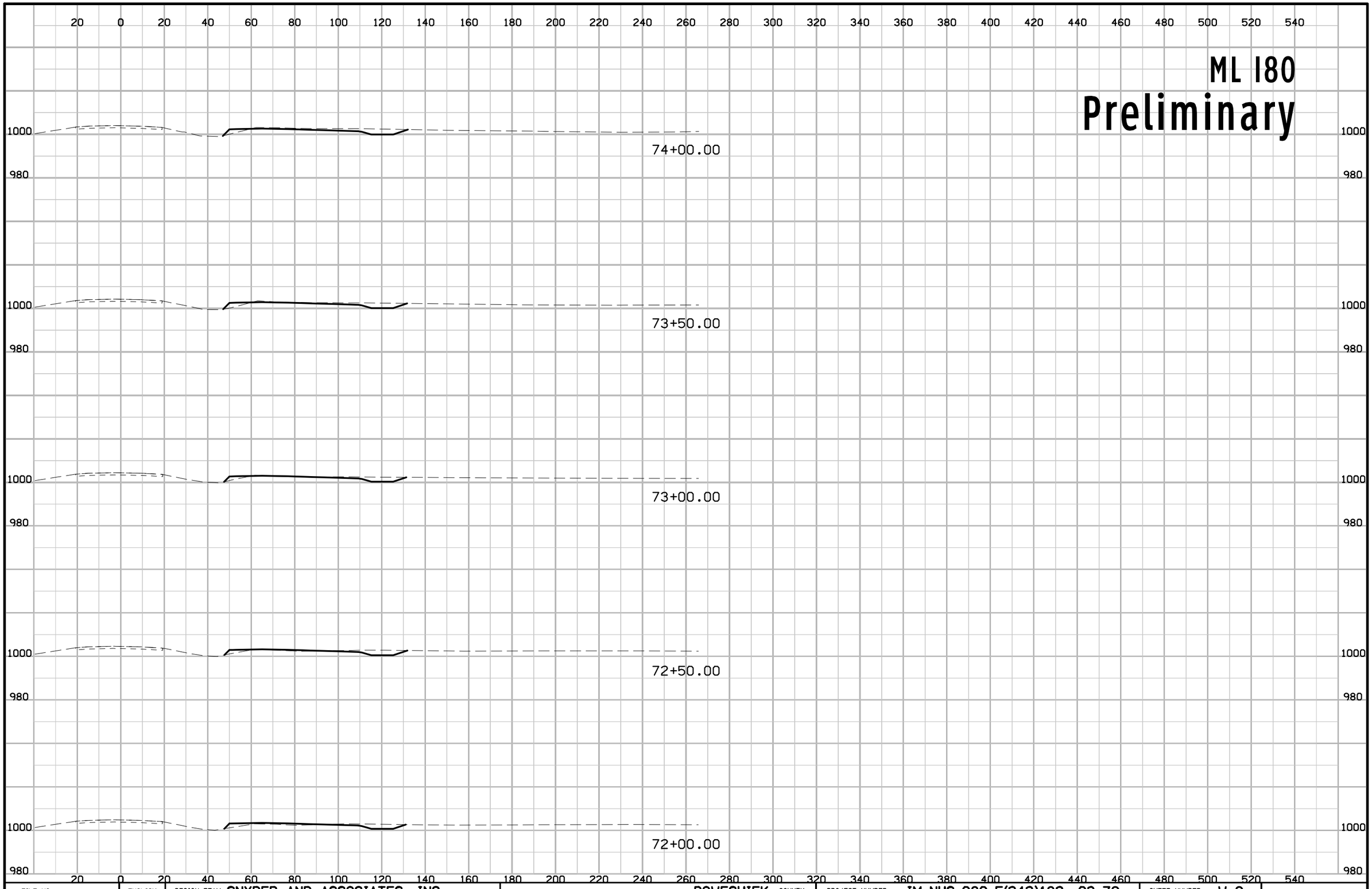
ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.9

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ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

76+50.00

76+00.00

75+50.00

75+00.00

74+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.10

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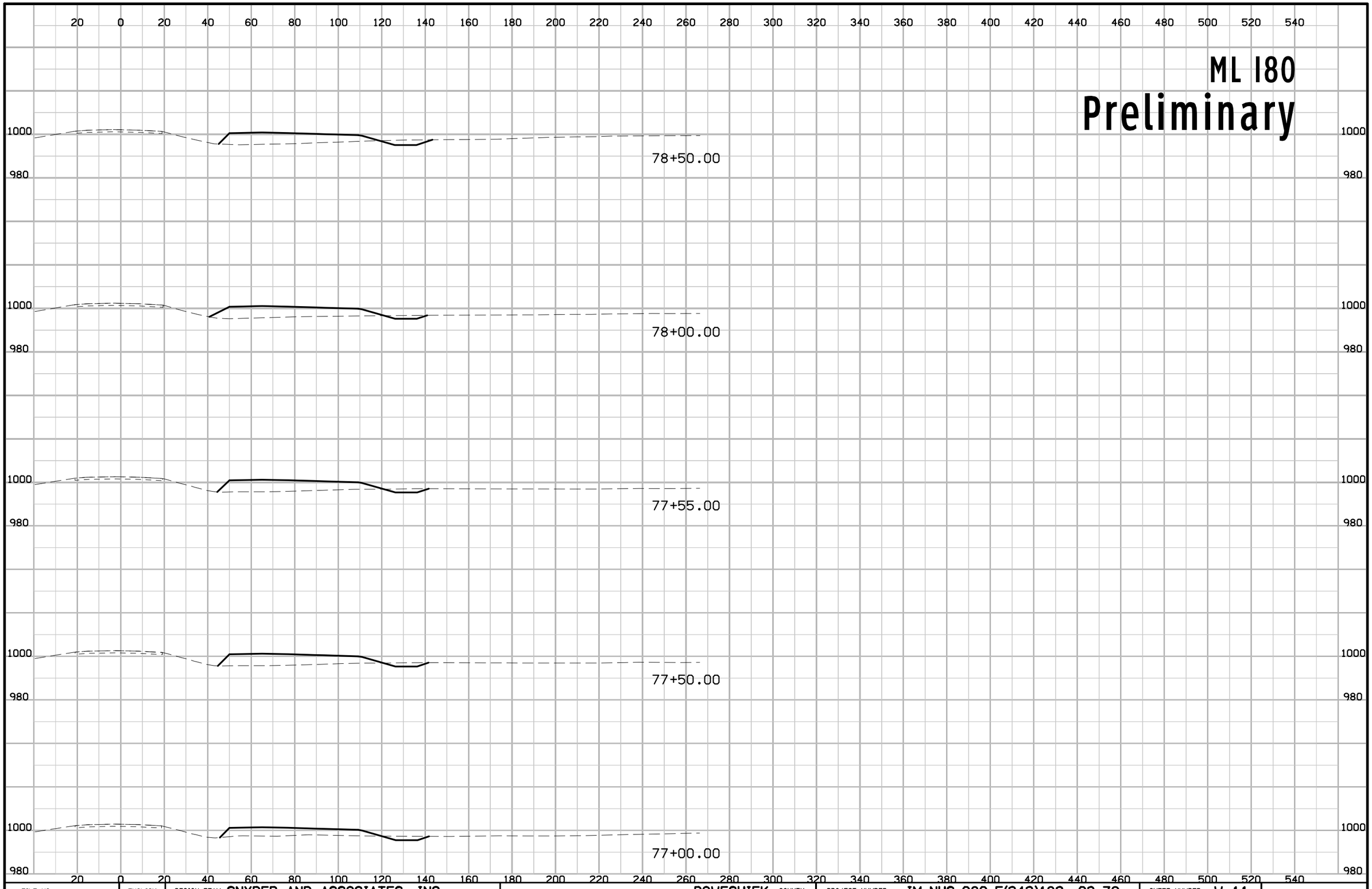
ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.11

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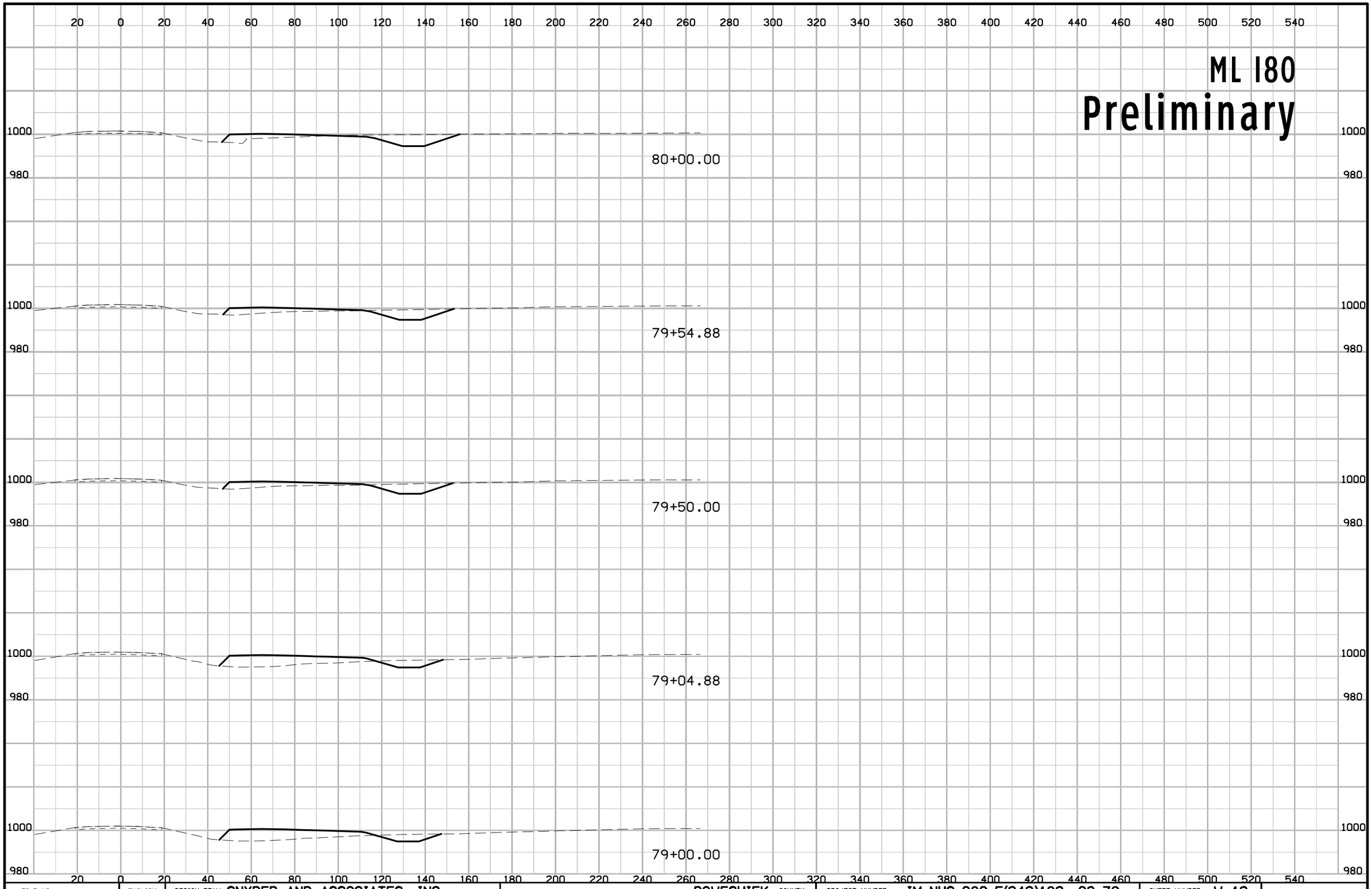
ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.12

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ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

82+00.00

81+50.00

81+00.00

80+55.00

80+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.13

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ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

84+50.00

84+00.00

83+50.00

83+00.00

82+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.14

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ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

87+00.00

86+50.00

86+00.00

85+50.00

85+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.15

3:45:58 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML I80

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

89+00.00

980

88+52.00

980

88+50.00

980

88+00.00

980

87+75.00

980

87+50.00

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.16

3:45:59 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

91+15.53

91+00.00

90+50.00

90+00.00

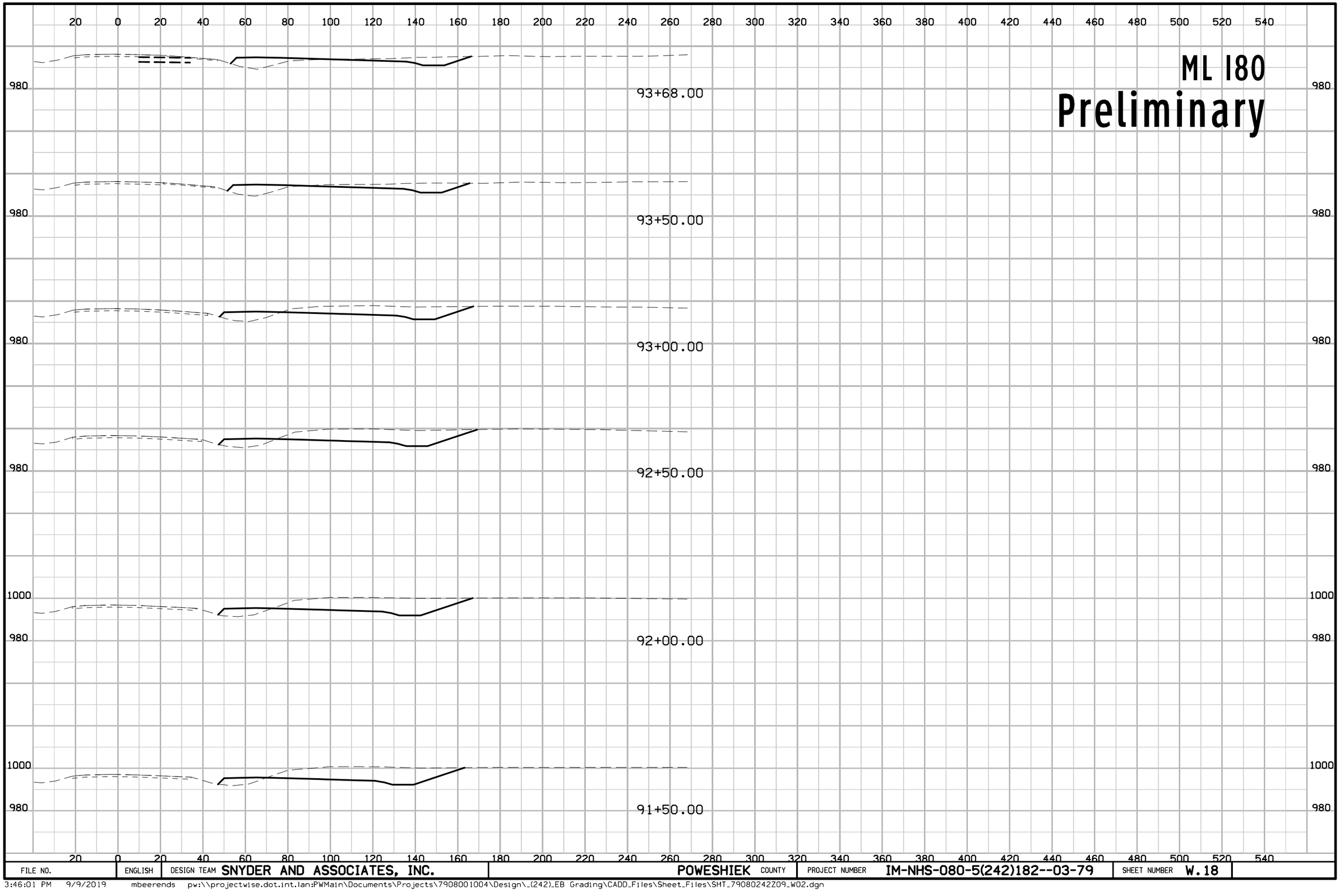
89+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.17

3:46:00 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

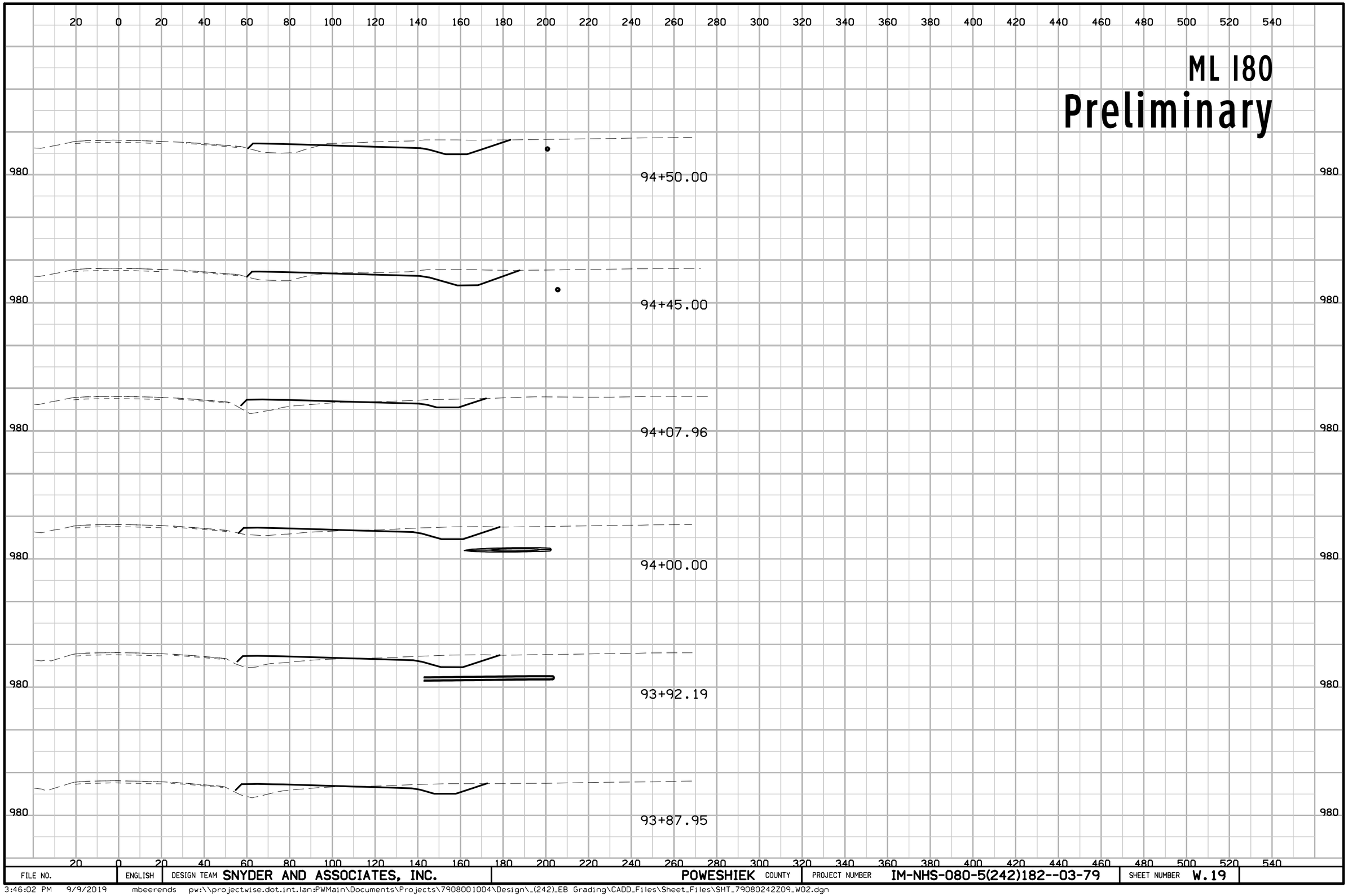


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.18

3:46:01 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.19

3:46:02 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

ML 180
Preliminary

980 — 97+00.00 — 980

980 — 96+50.00 — 980

980 — 96+00.00 — 980

980 — 95+50.00 — 980

980 — 95+00.00 — 980

980 — 94+74.98 — 980

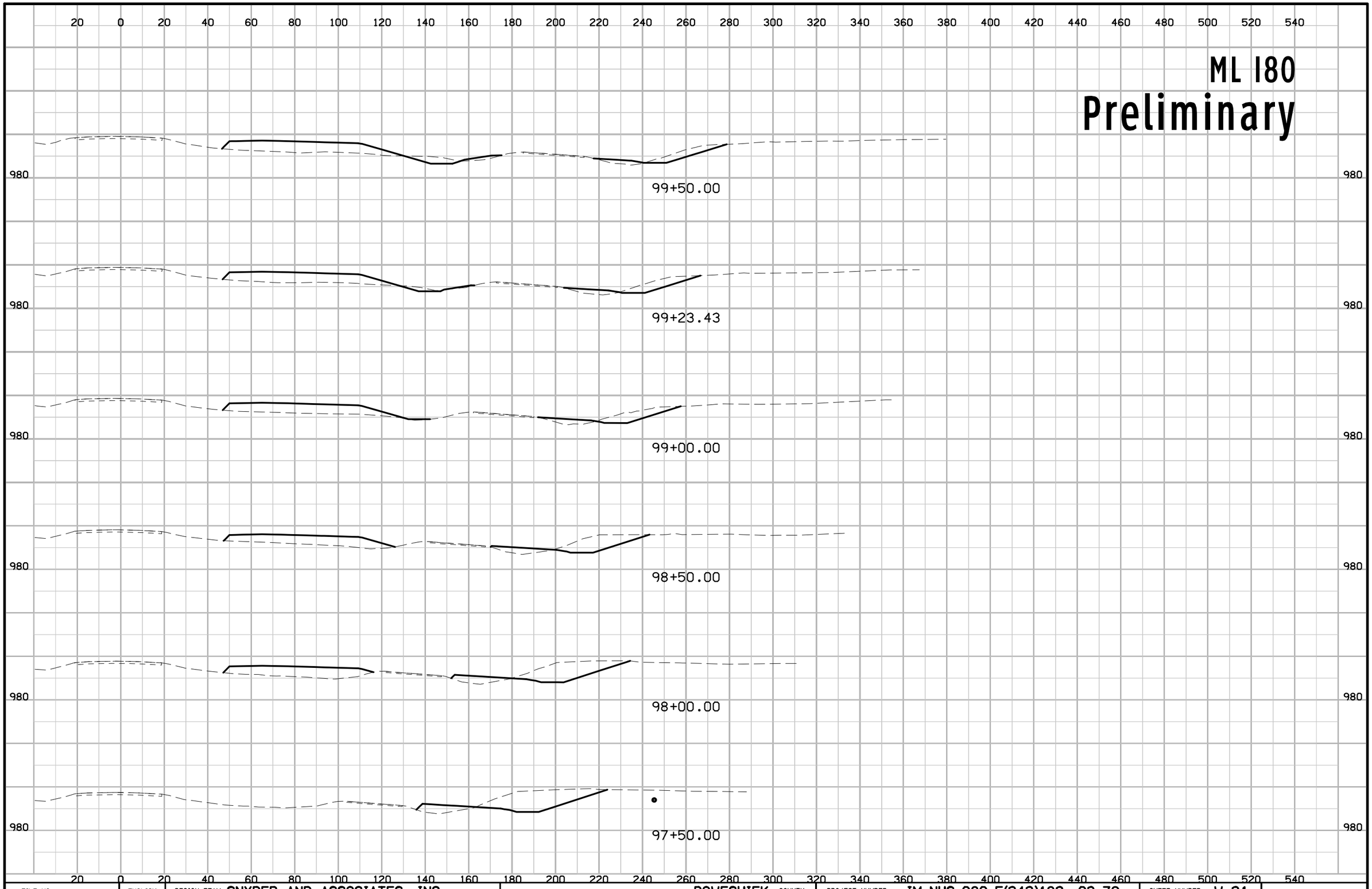
20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.20

3:46:03 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.21

3:46:04 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

101+00.00

100+81.43

100+50.00

100+00.00

99+55.03

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.22

3:46:04 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

102+39.43

102+07.83

102+00.00

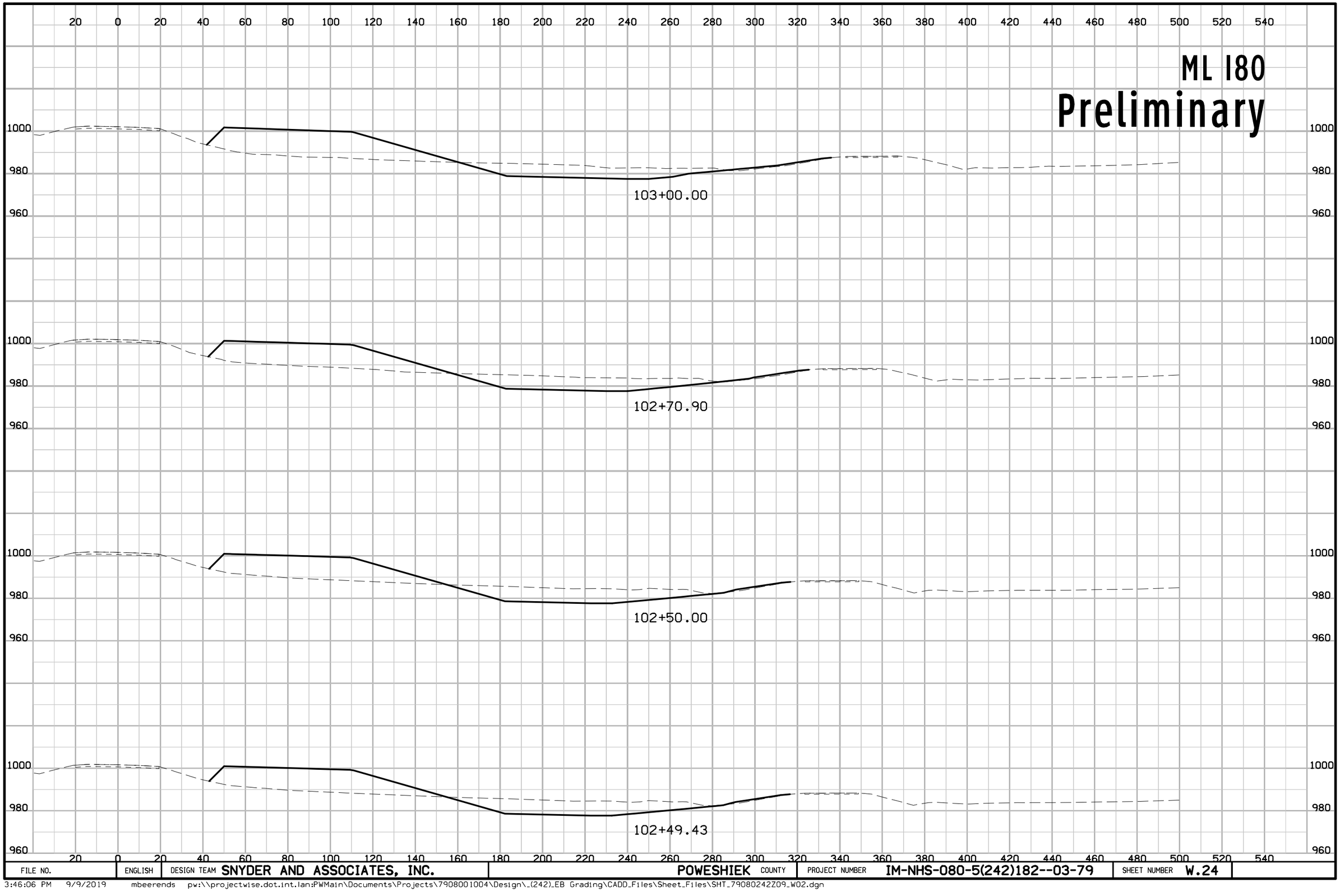
101+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.23

3:46:05 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.24

3:46:06 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

103+50.00

103+21.43

103+18.34

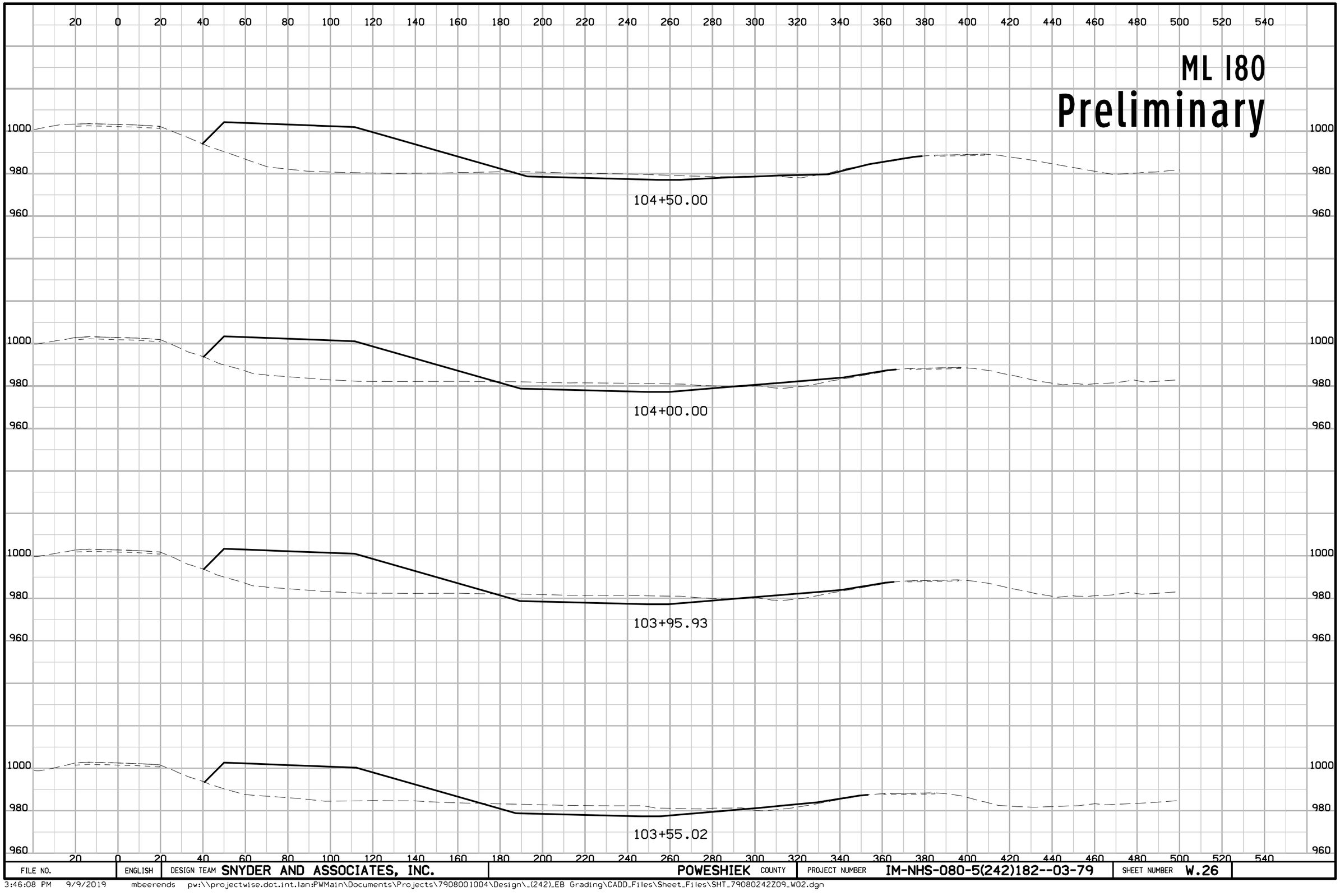
103+06.03

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.25

3:46:07 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

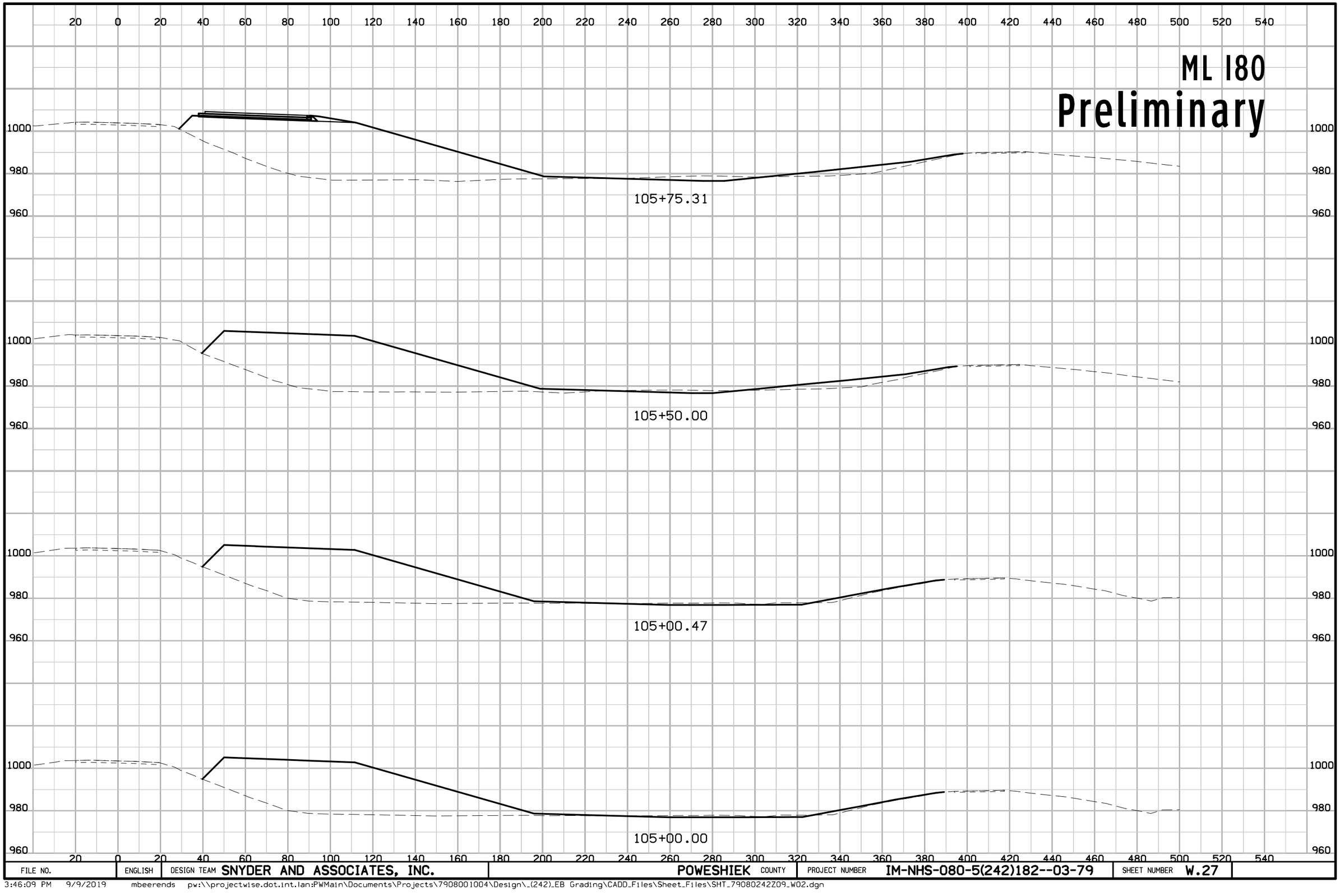


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.26

3:46:08 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

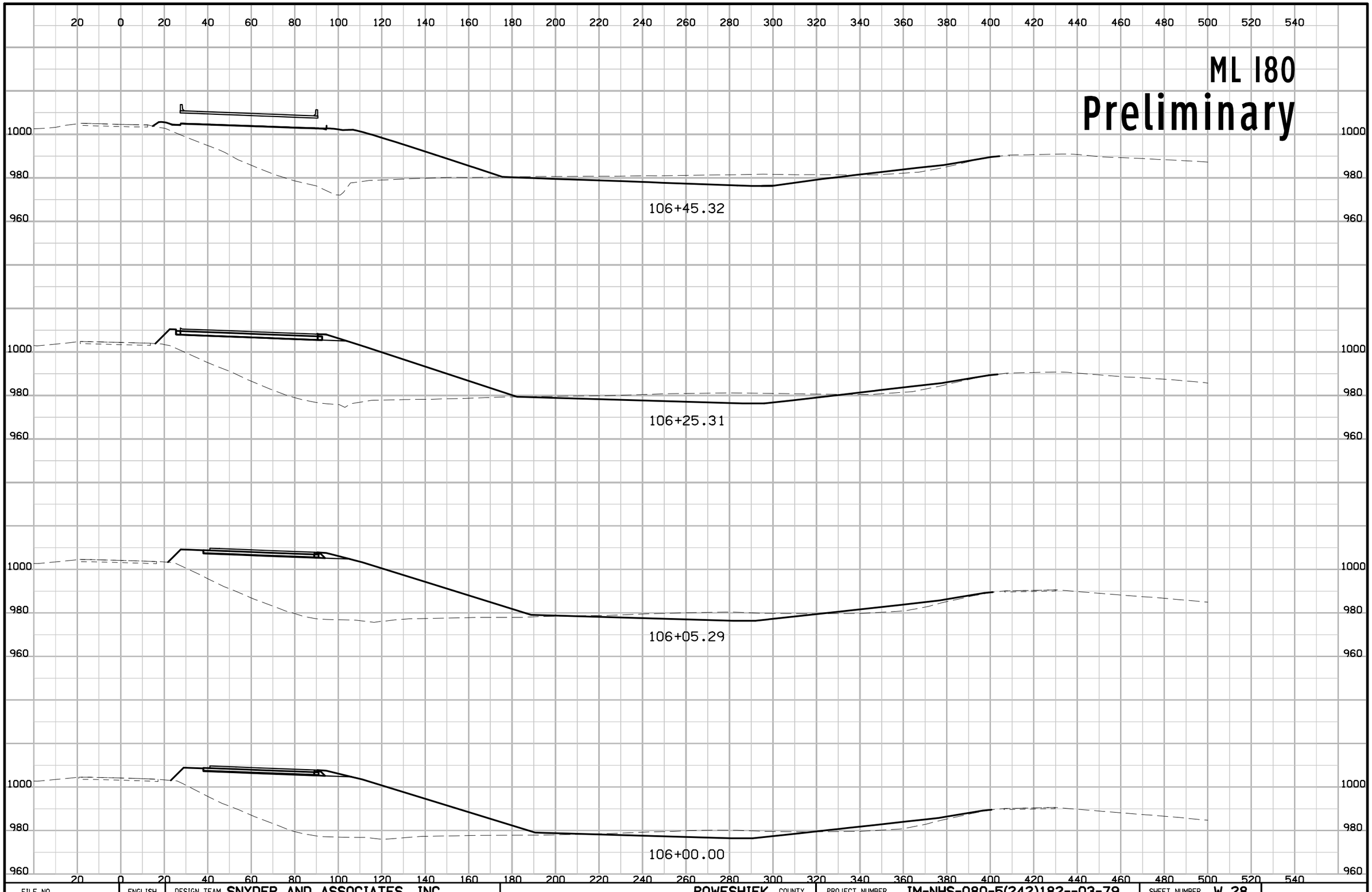


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.27

3:46:09 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

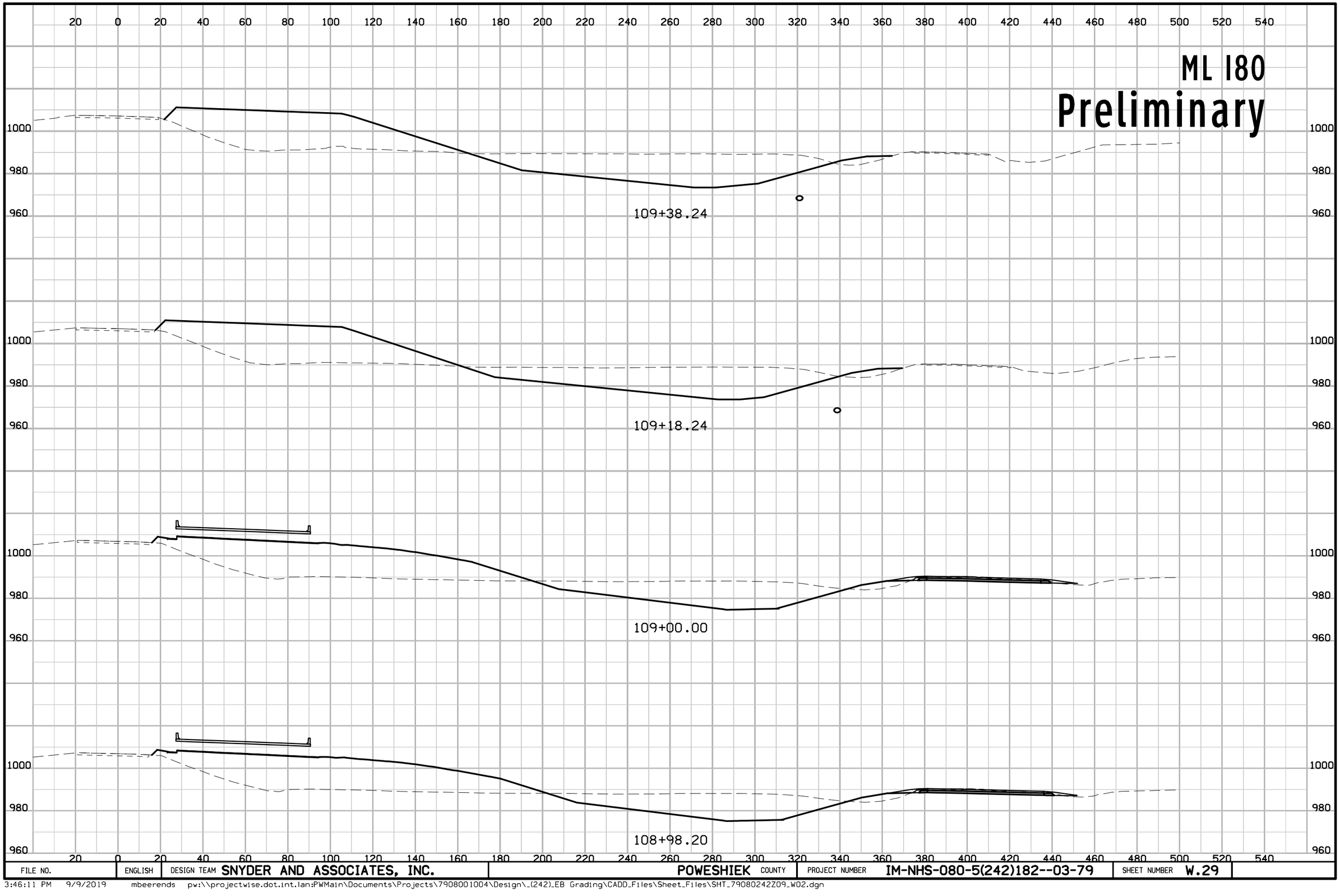


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.28

3:46:10 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

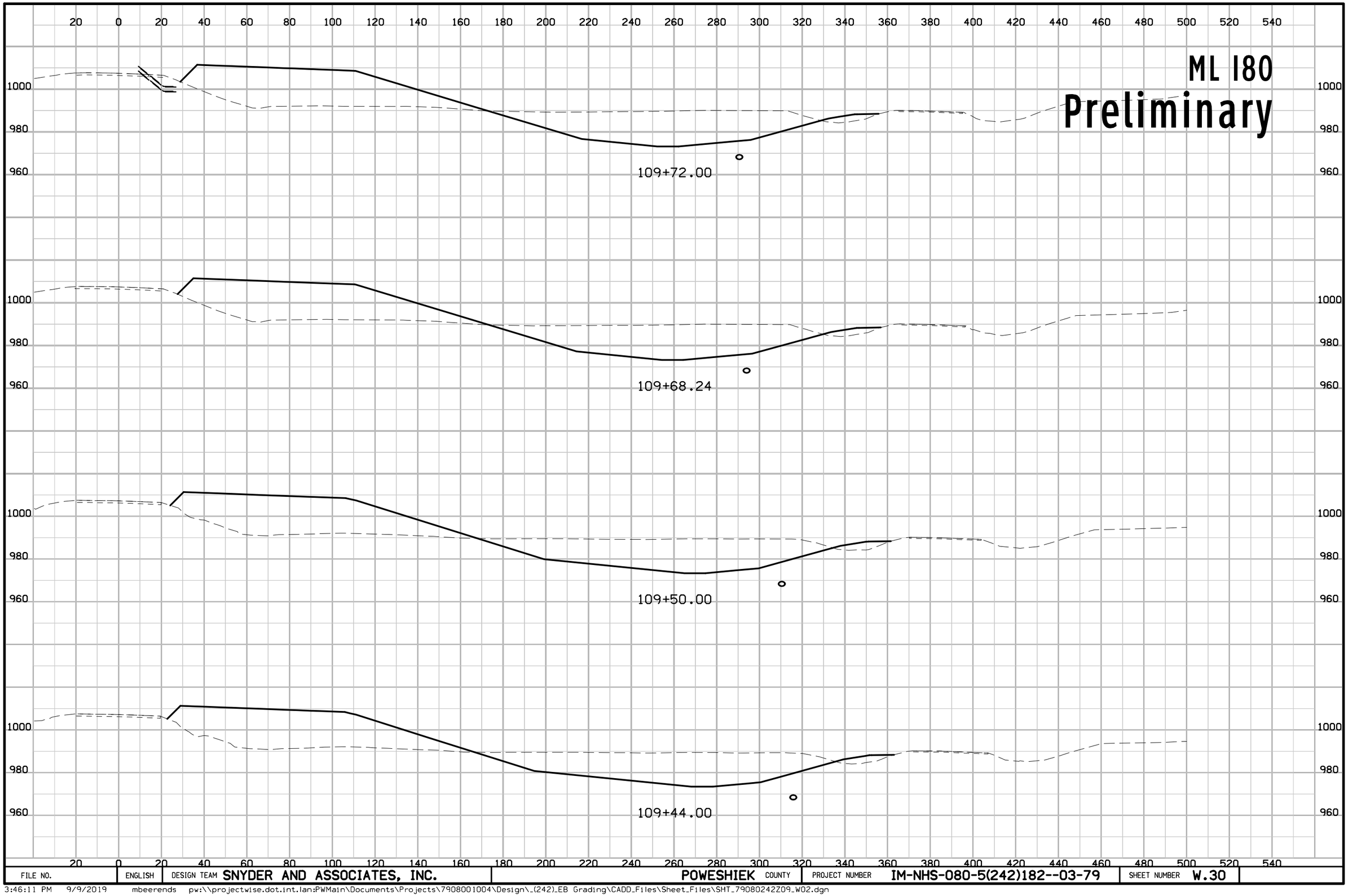


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.29

3:46:11 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

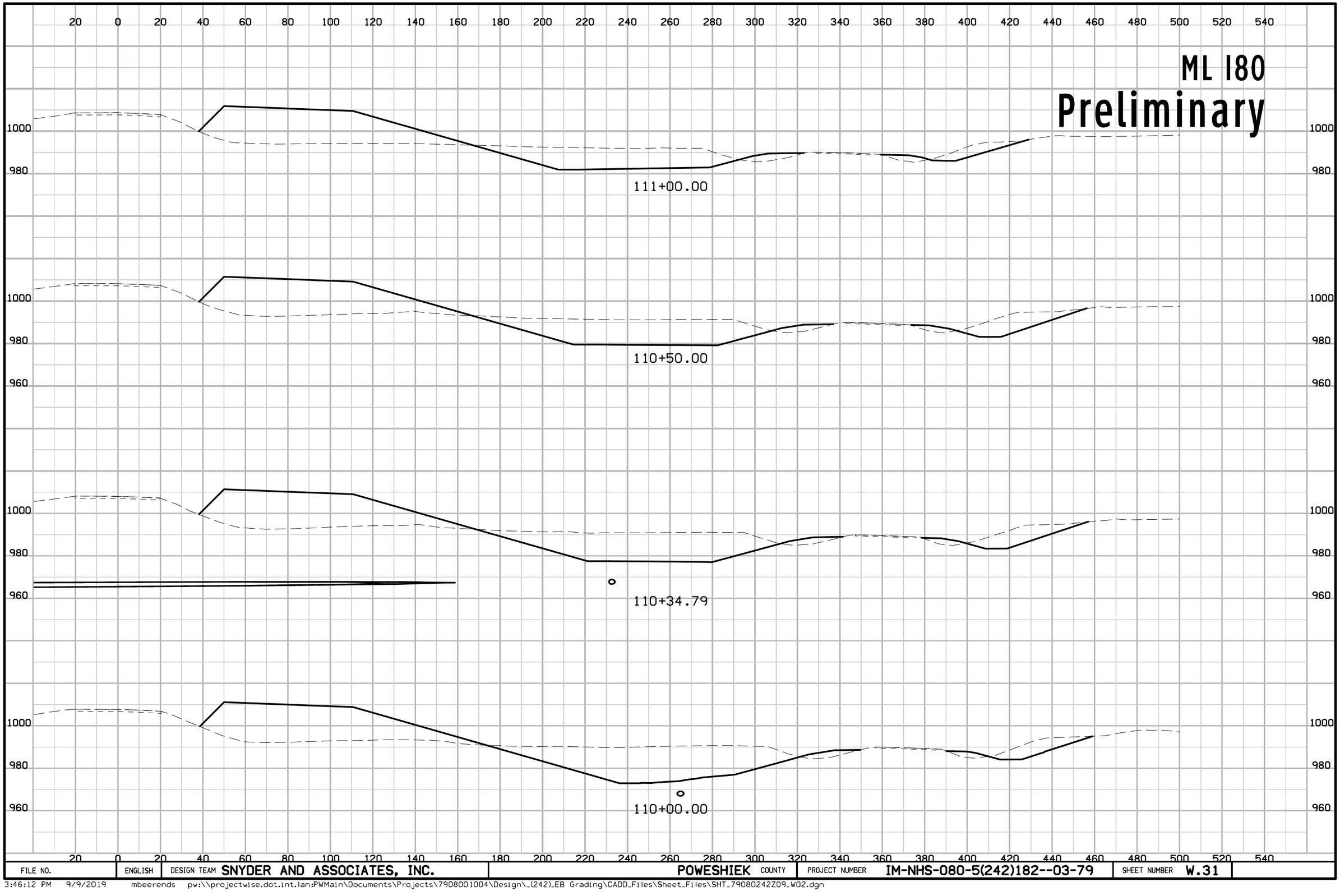


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.30

3:46:11 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.31

3:46:12 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

112+00.55

112+00.00

111+79.08

111+50.00

111+28.55

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.32

3:46:13 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

113+00.00

112+50.00

112+42.15

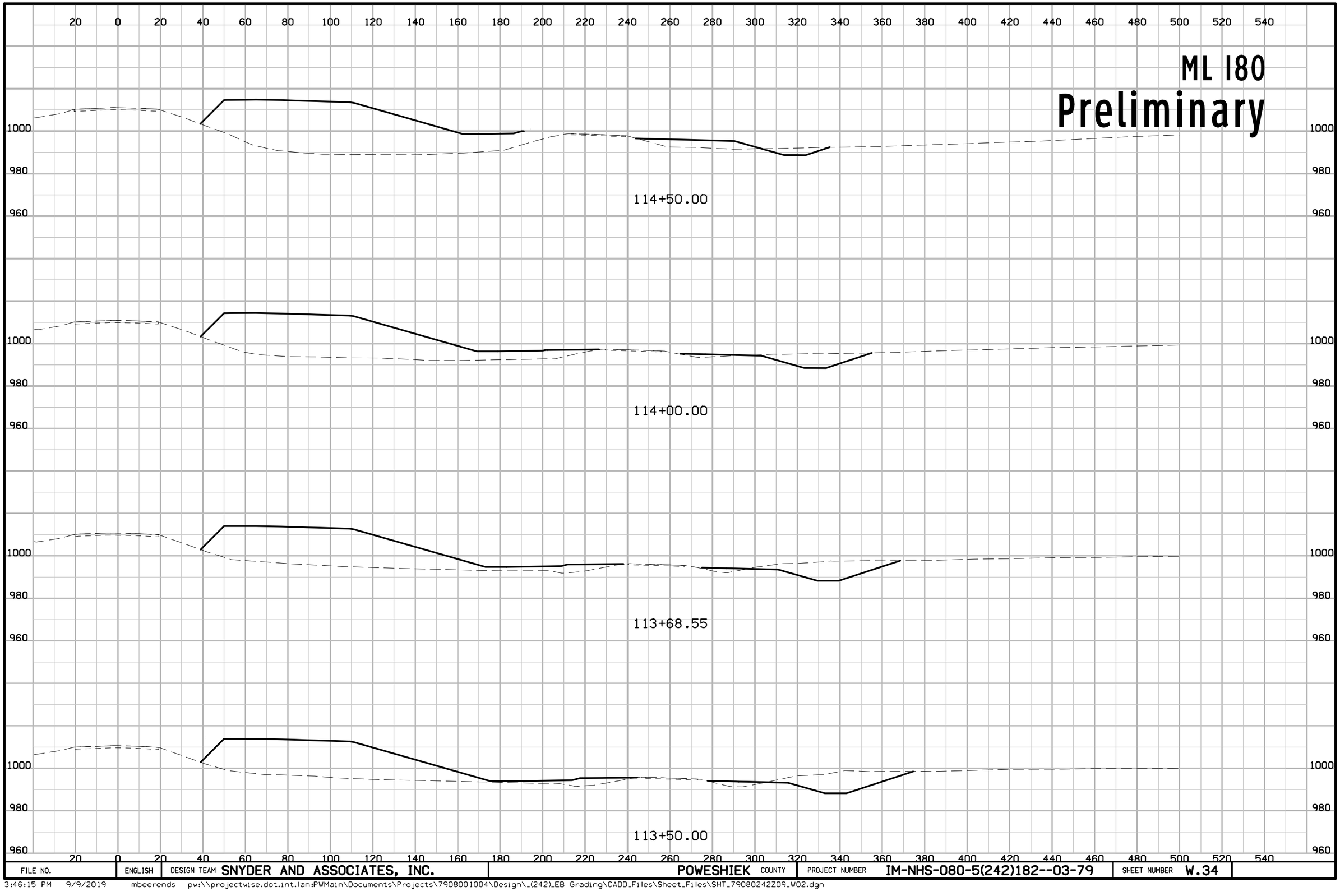
112+10.55

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.33

3:46:14 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

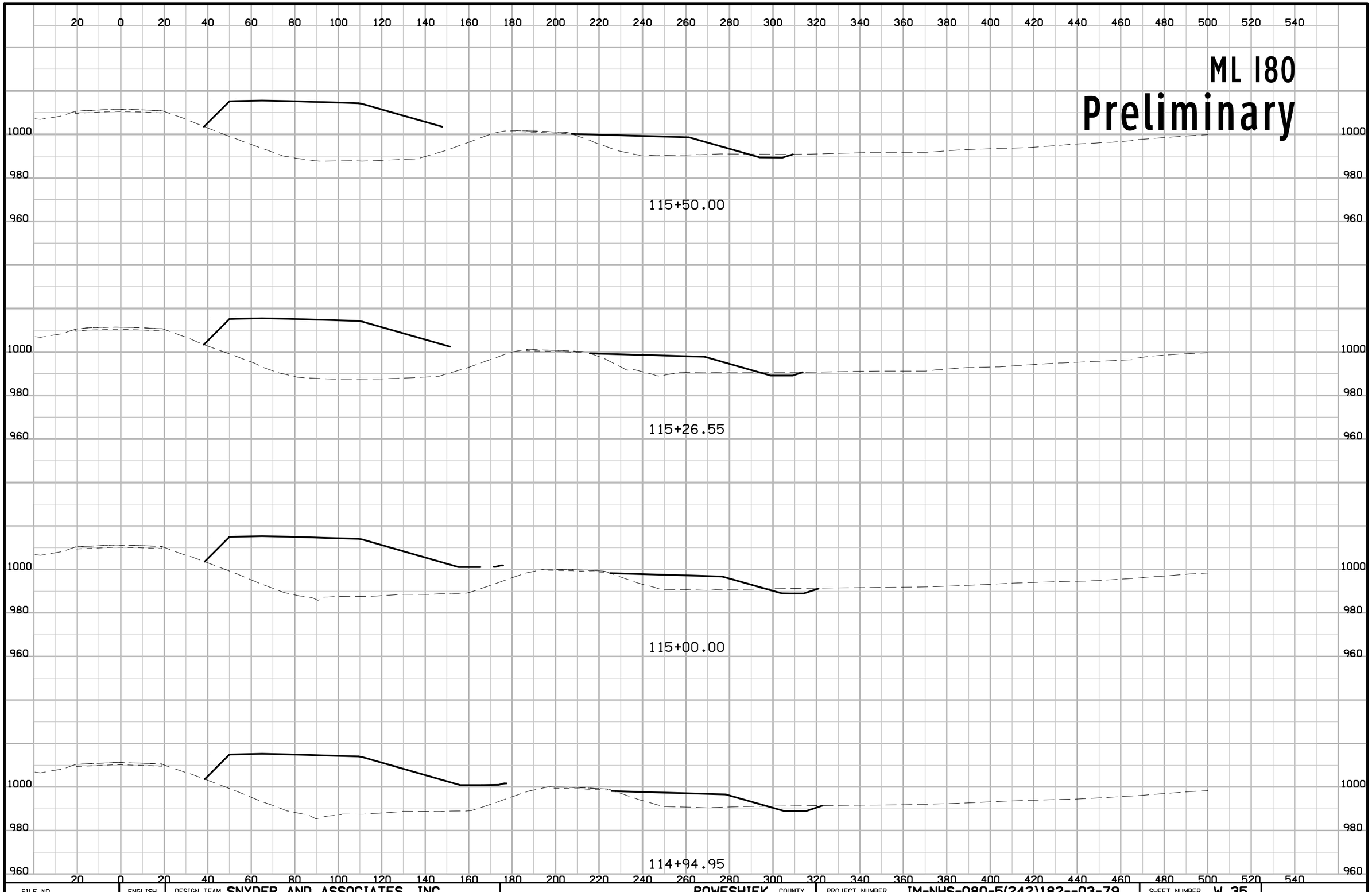


FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.34

3:46:15 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.35

3:46:16 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

117+50.00

117+00.00

116+50.00

116+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.36

3:46:17 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

119+50.00

119+00.00

118+50.00

118+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.37

3:46:17 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

121+50.00

121+00.00

120+50.00

120+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.38

3:46:18 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

122+50.00

122+41.93

122+00.00

121+59.51

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.39

3:46:19 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

123+08.89

123+00.00

122+66.85

122+58.89

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.40

3:46:20 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

125+50.00

1000
980

125+30.90

1000
980

123+50.28

1000
980
960

123+28.89

1000
980
960

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.41

3:46:21 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

126+50.00

126+00.90

126+00.00

125+50.90

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.42

3:46:22 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980
960

128+50.00

128+00.00

127+50.00

127+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.43

3:46:23 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

130+00.00

129+87.00

129+50.00

129+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.44

3:46:24 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML I80

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

132+50.00

132+00.00

131+50.00

131+00.00

130+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.45

3:46:24 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

1000
980

134+50.00

134+00.00

133+50.00

133+00.00

132+50.06

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.46

3:46:25 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980

960

136+50.00

136+00.00

135+50.06

135+50.00

135+00.00

134+50.06

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.47

3:46:26 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980

960

138+50.00

138+00.00

137+75.00

137+50.00

137+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.48

3:46:27 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980
960

140+50.00

140+00.00

139+88.00

139+50.00

139+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.49

3:46:28 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

ML 180

Preliminary

980
960

143+00.00

142+50.00

142+00.00

141+50.00

141+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.50

3:46:29 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

145+50.00

145+00.00

144+50.00

144+00.00

143+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.51

3:46:30 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980
960

148+00.00

147+50.00

147+00.00

146+50.00

146+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.52

3:46:31 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980
960

150+50.00

980
960

150+00.00

980
960

149+50.00

980
960

149+00.00

980
960

148+50.00

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.53

3:46:31 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

153+00.00

152+50.00

152+00.00

151+50.00

151+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.54

3:46:32 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540

980
960

155+50.00

155+00.00

154+50.00

154+00.00

153+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.55

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ML 180

Preliminary

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980
960

158+00.00

157+50.00

157+00.00

156+50.00

156+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.56

3:46:34 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

160+50.00

160+00.00

159+50.00

159+00.00

158+50.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.57

3:46:35 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_W02.dgn

ML 180

Preliminary

161+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER W.58

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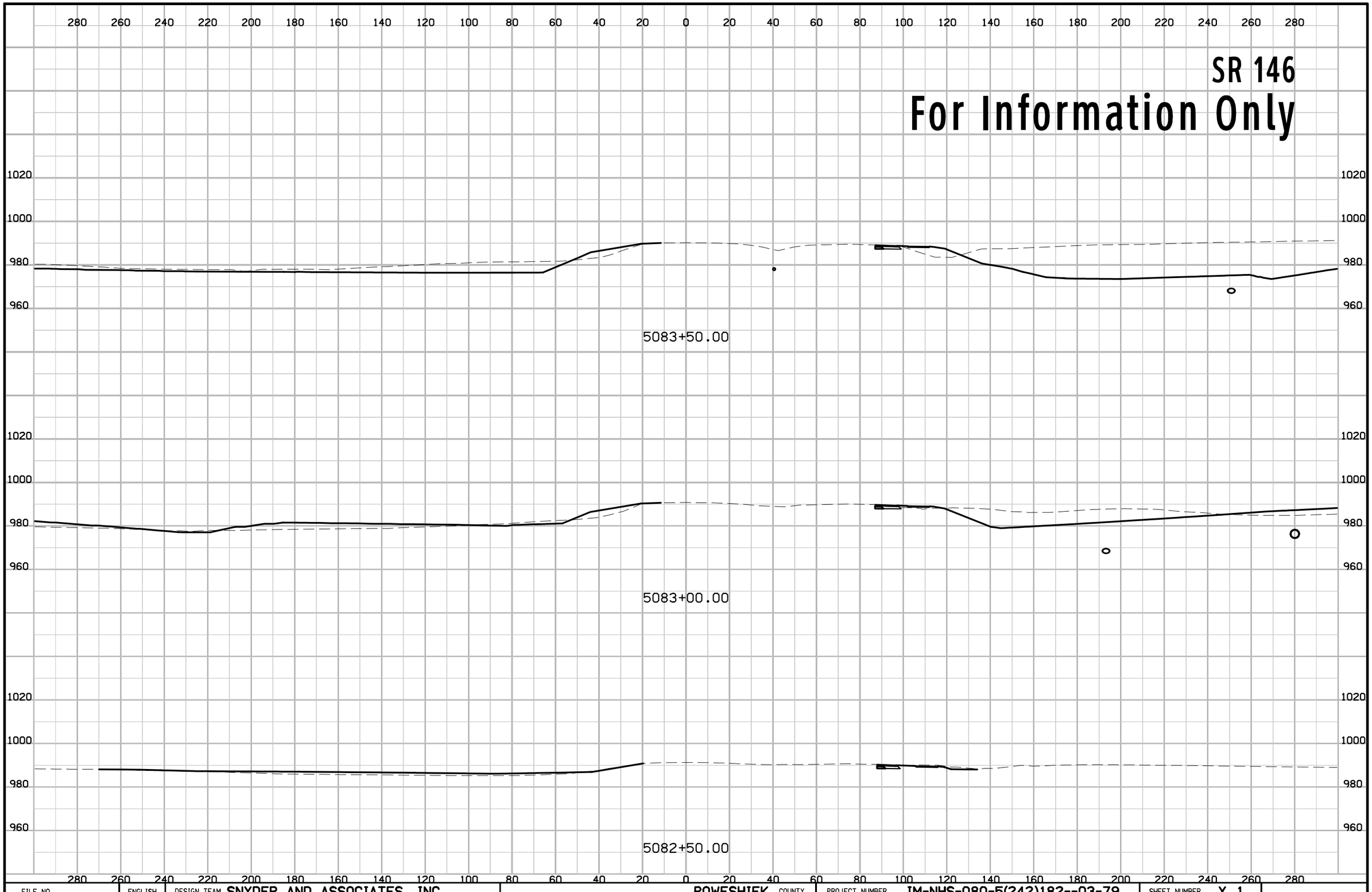
SR 146

For Information Only



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER X.1

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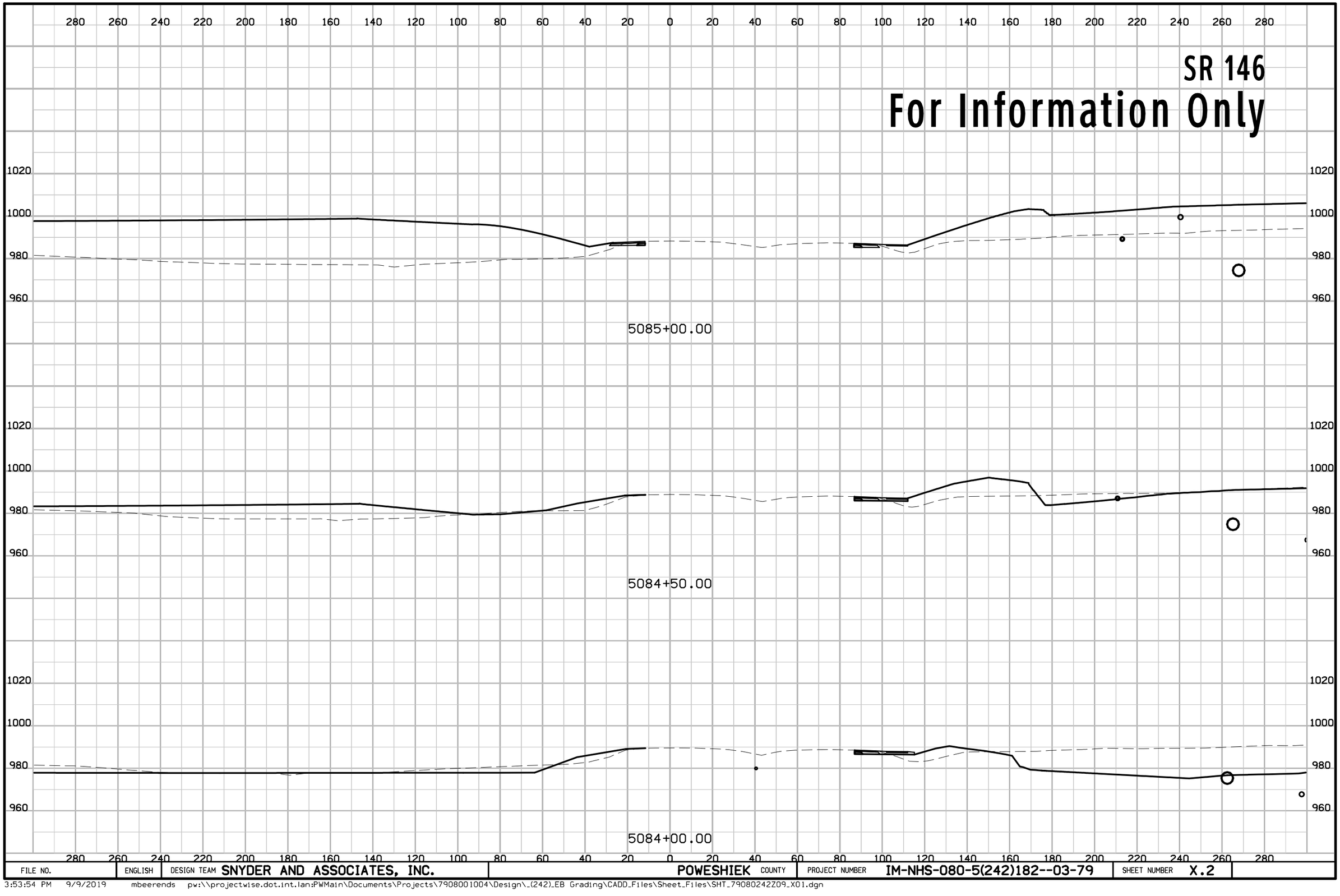
SR 146

For Information Only



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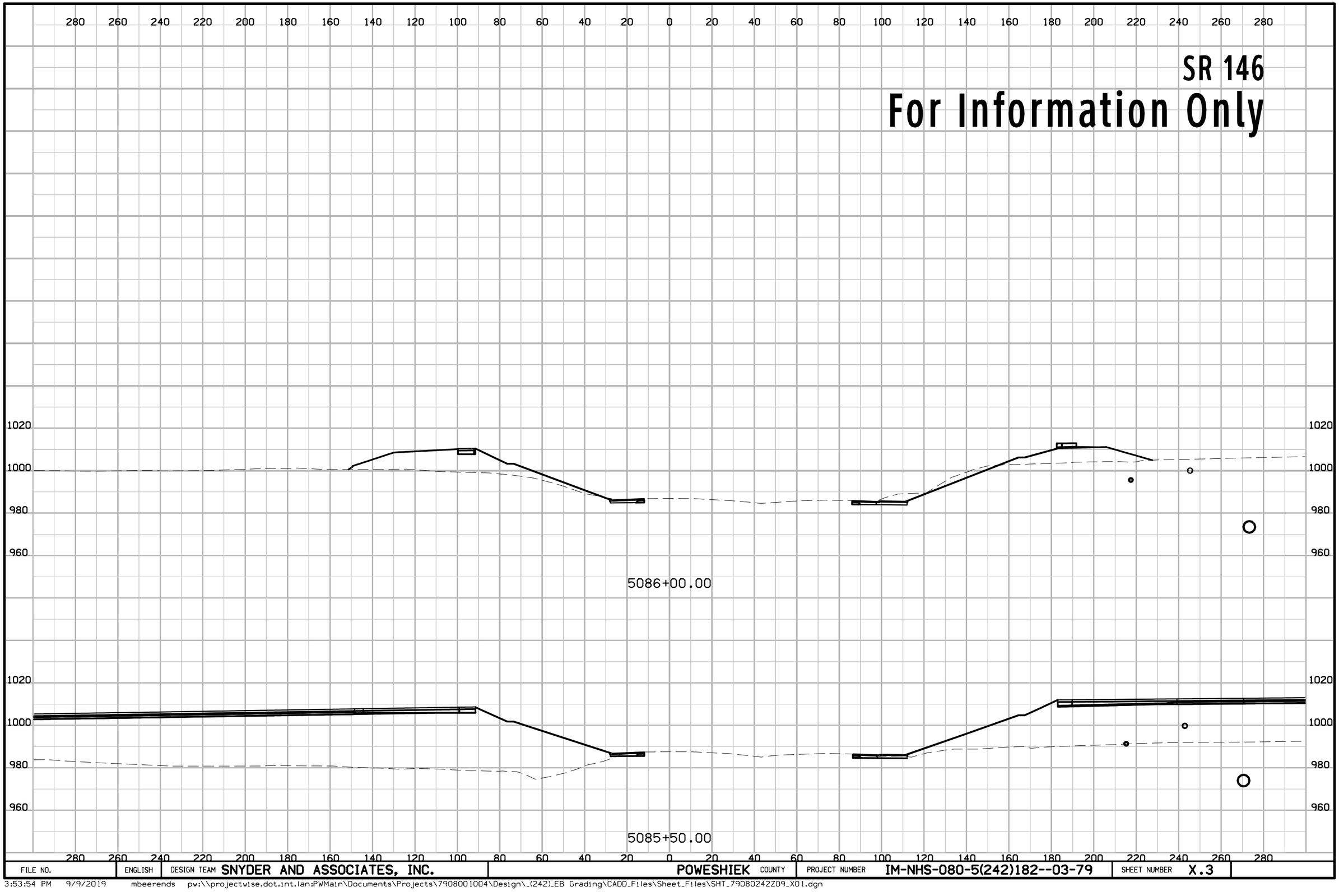
SR 146

For Information Only



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER X.3

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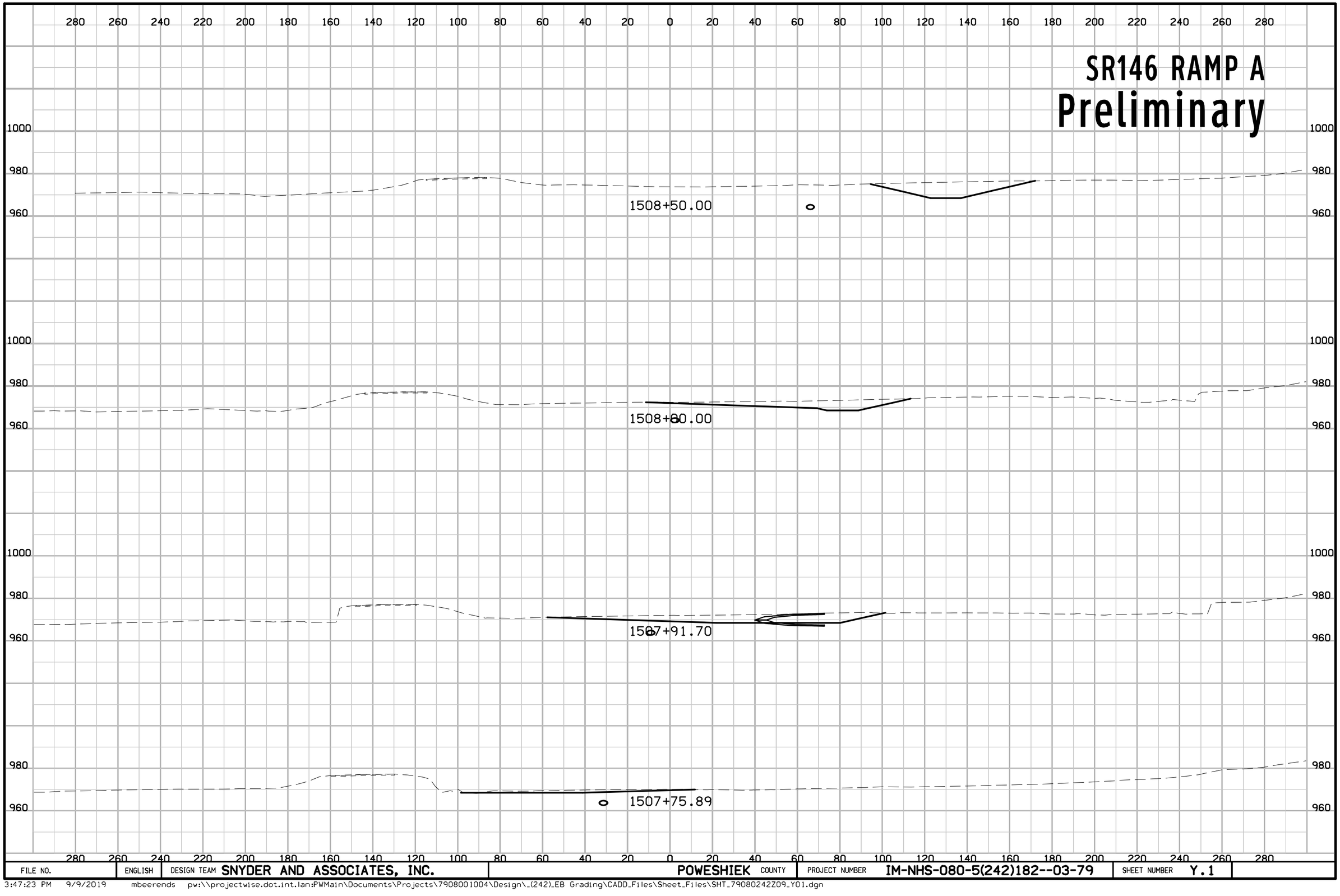
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.1

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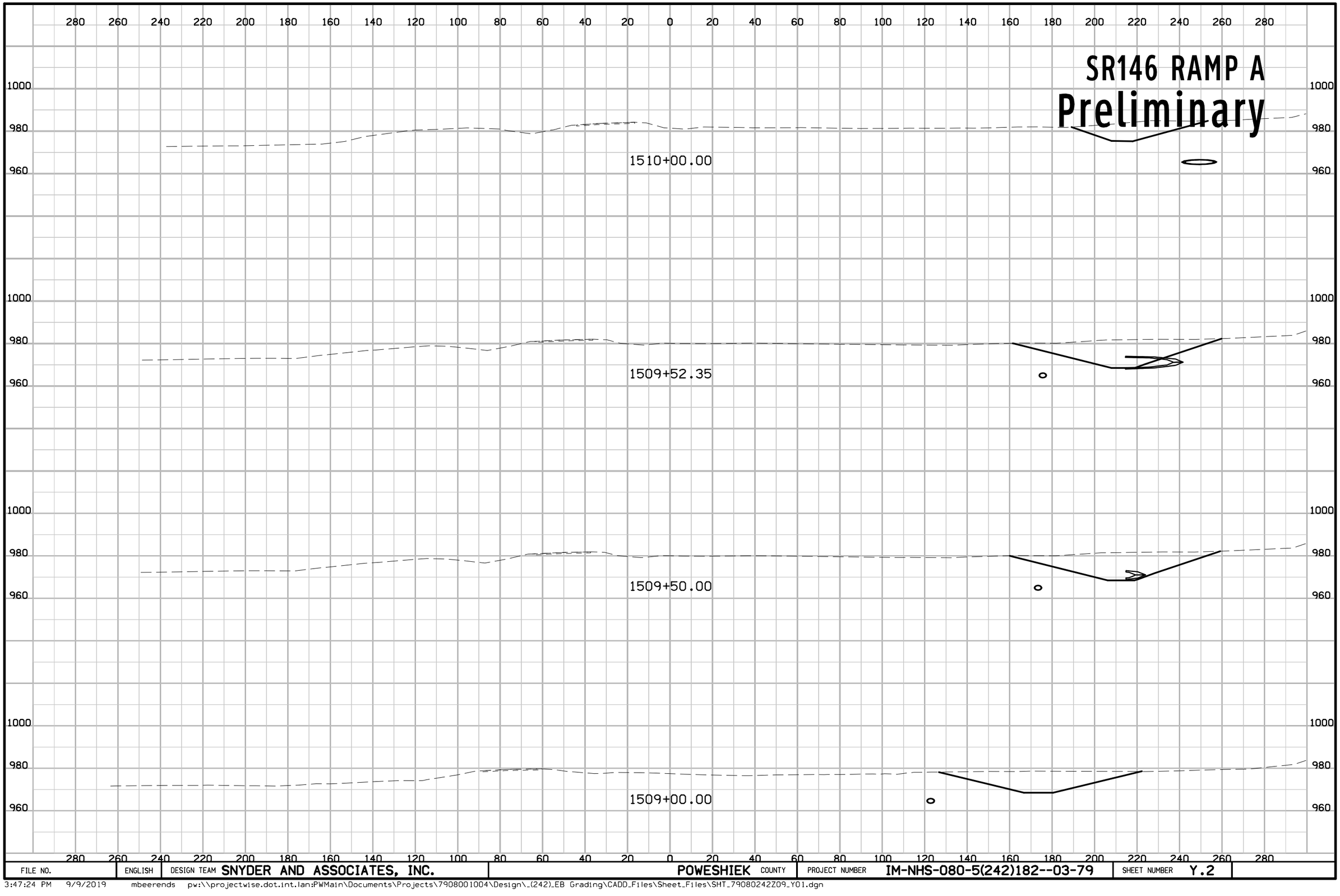
SR146 RAMP A

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.2

3:47:24 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_Y01.dgn

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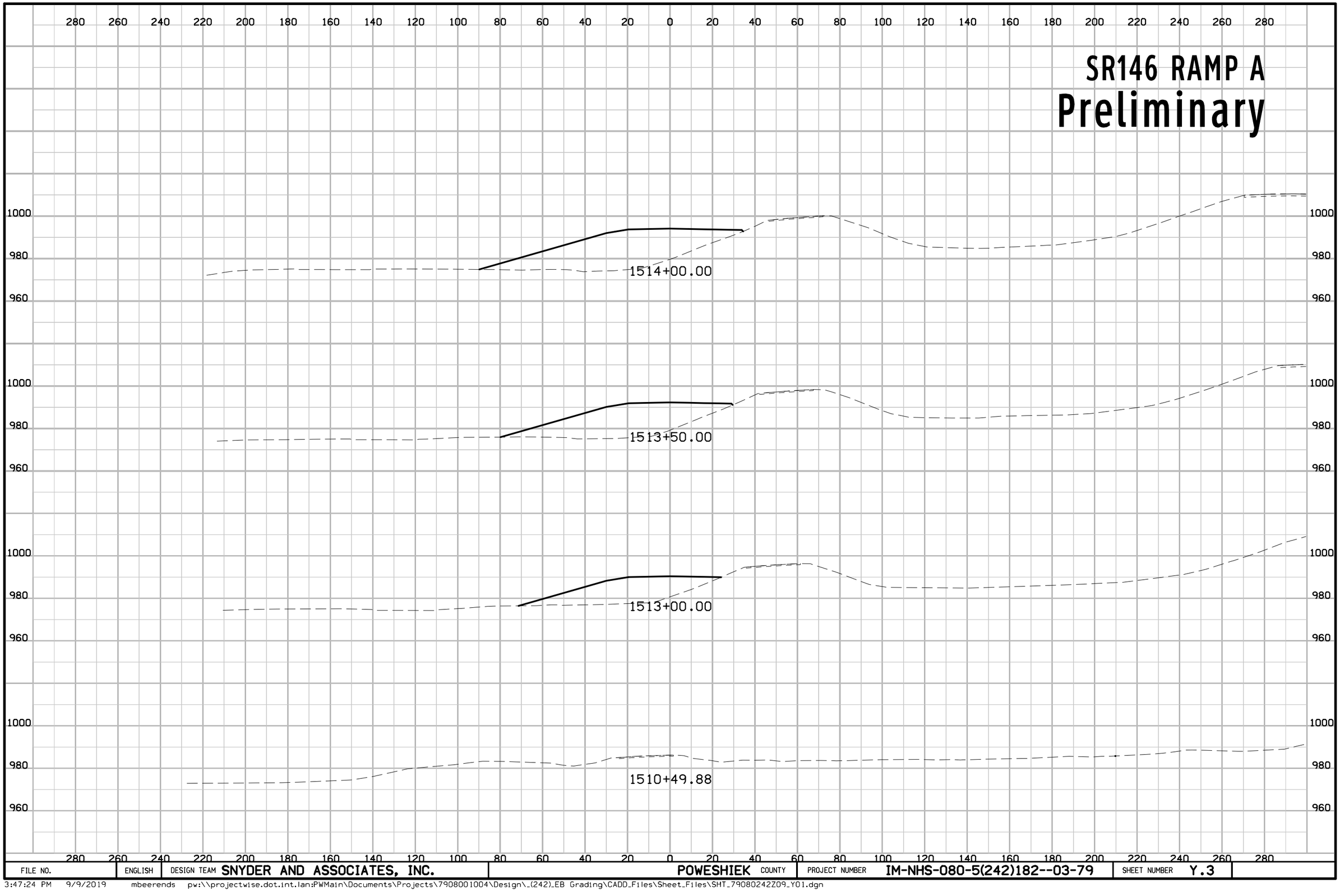

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.3

3:47:24 PM 9/9/2019 mbeerends pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7908001004\Design_(242)_EB Grading\CADD_Files\Sheet_Files\SHT_79080242Z09_Y01.dgn

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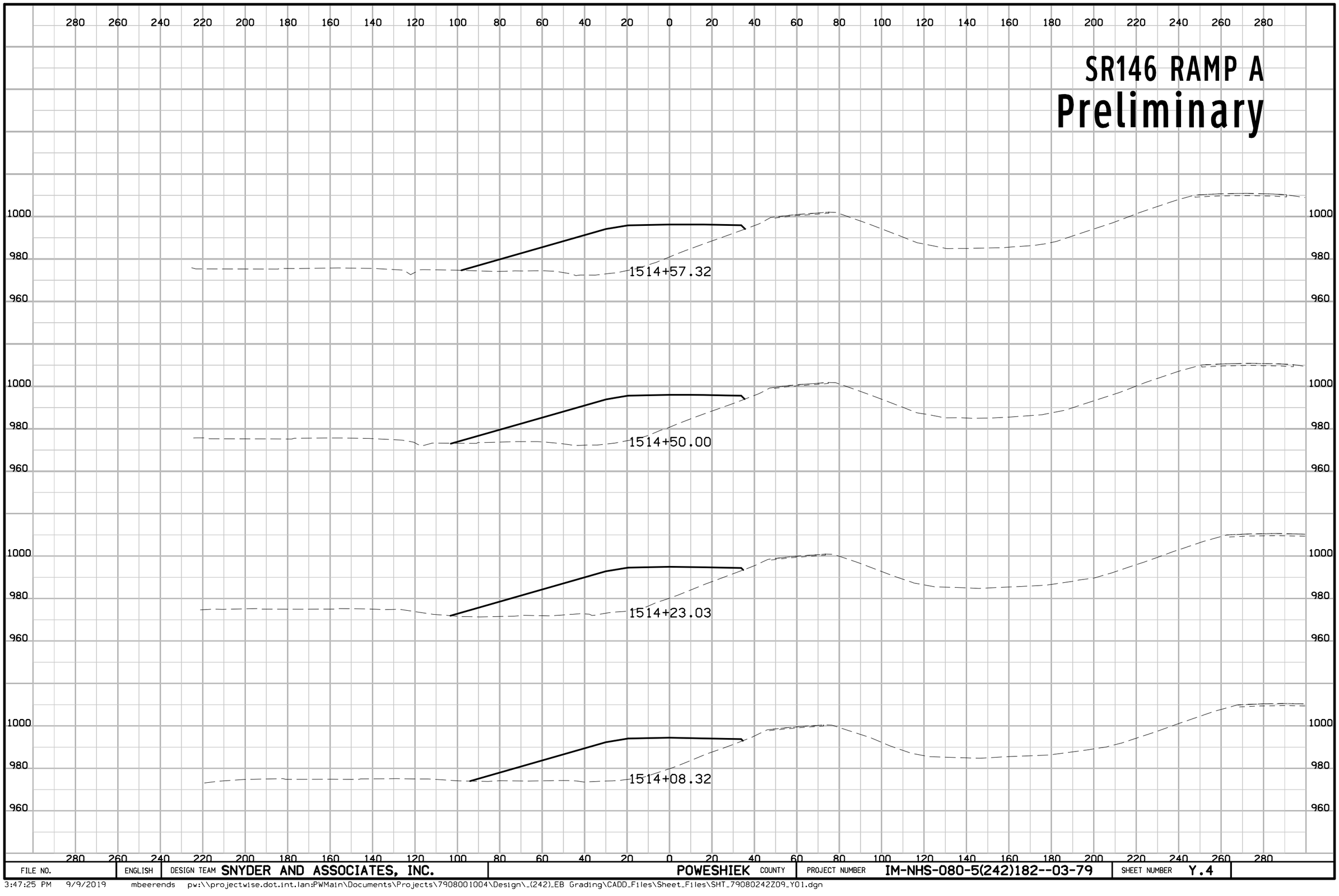

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.4

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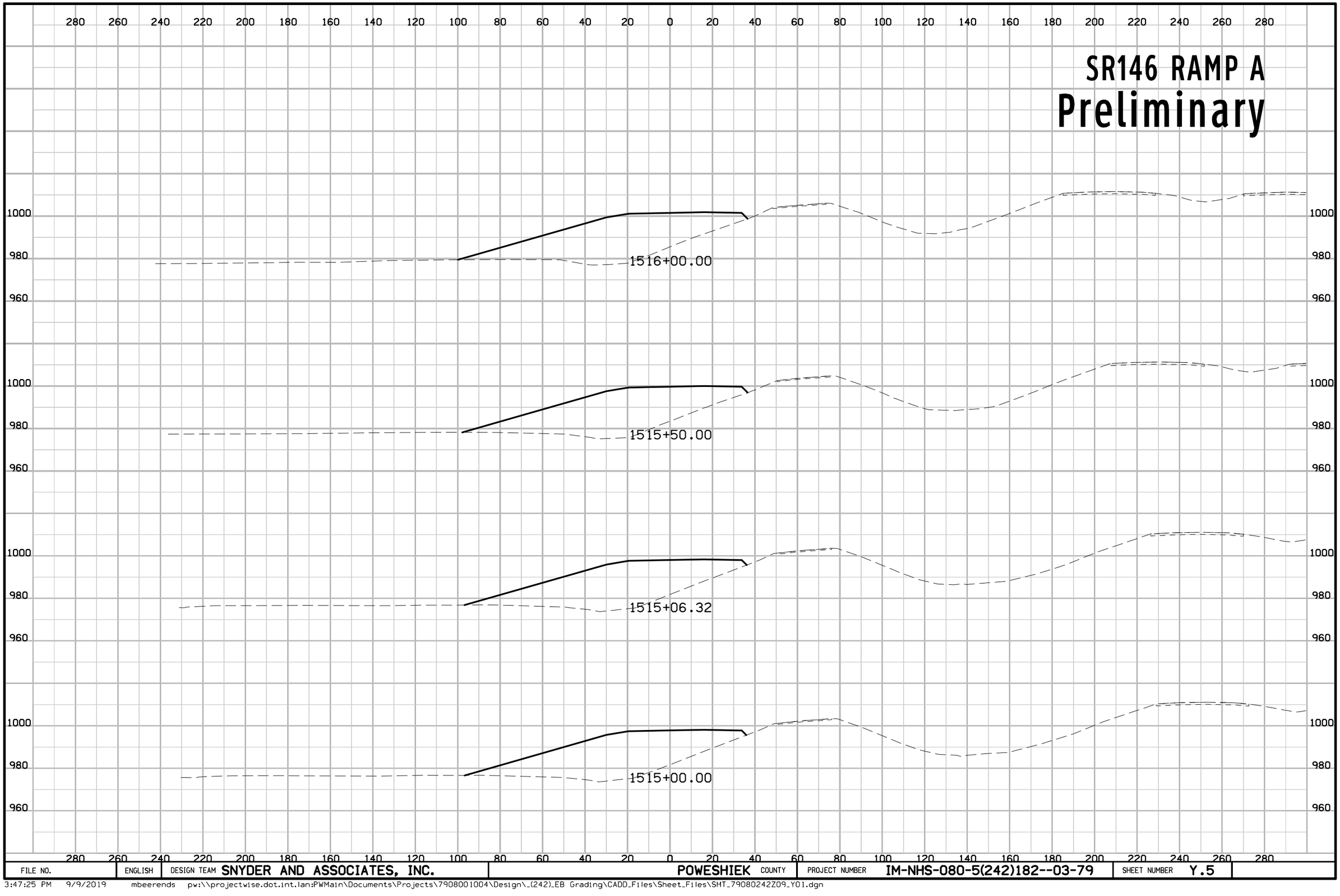
SR146 RAMP A
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.5

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SR146 RAMP A
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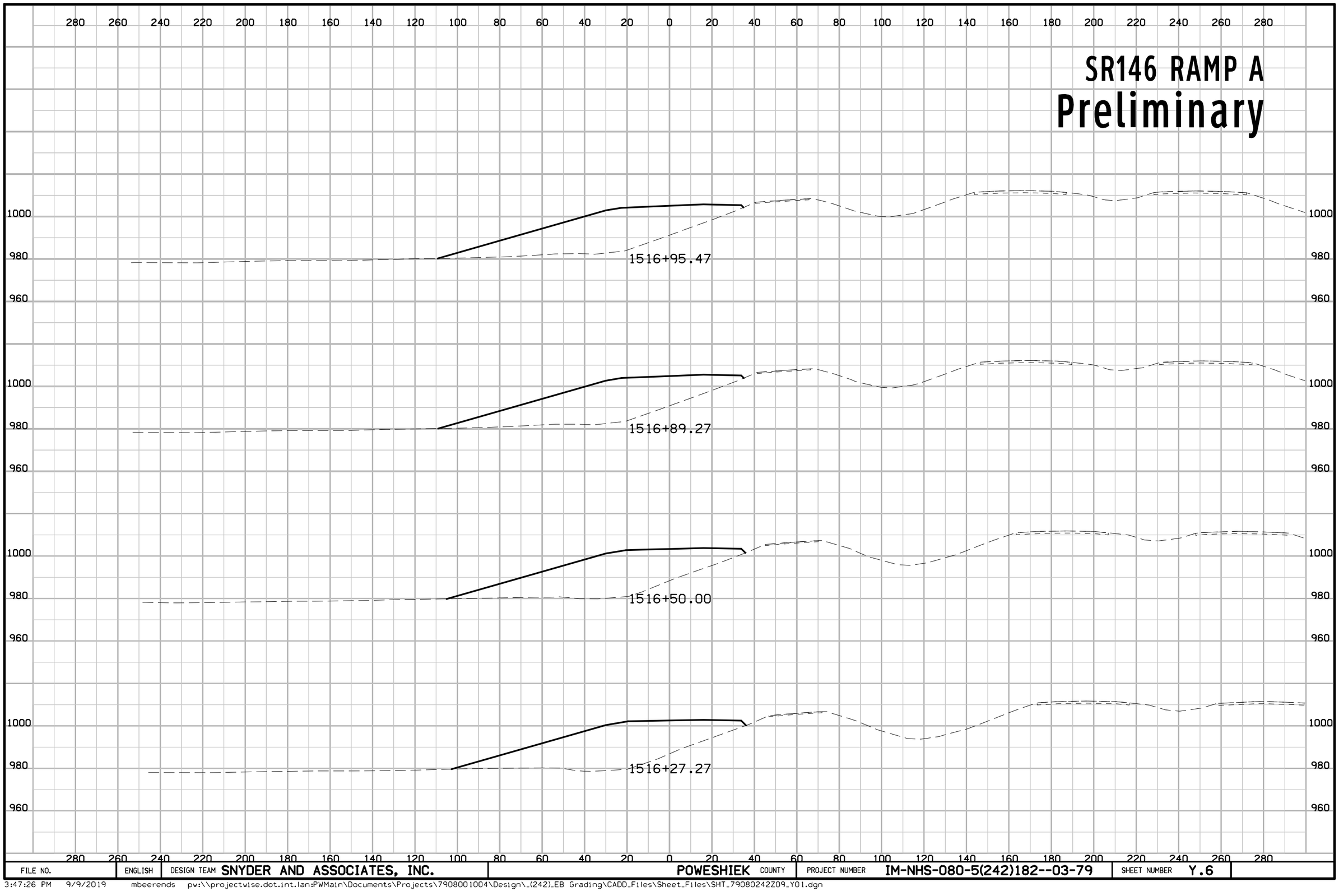

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.6

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SR146 RAMP A
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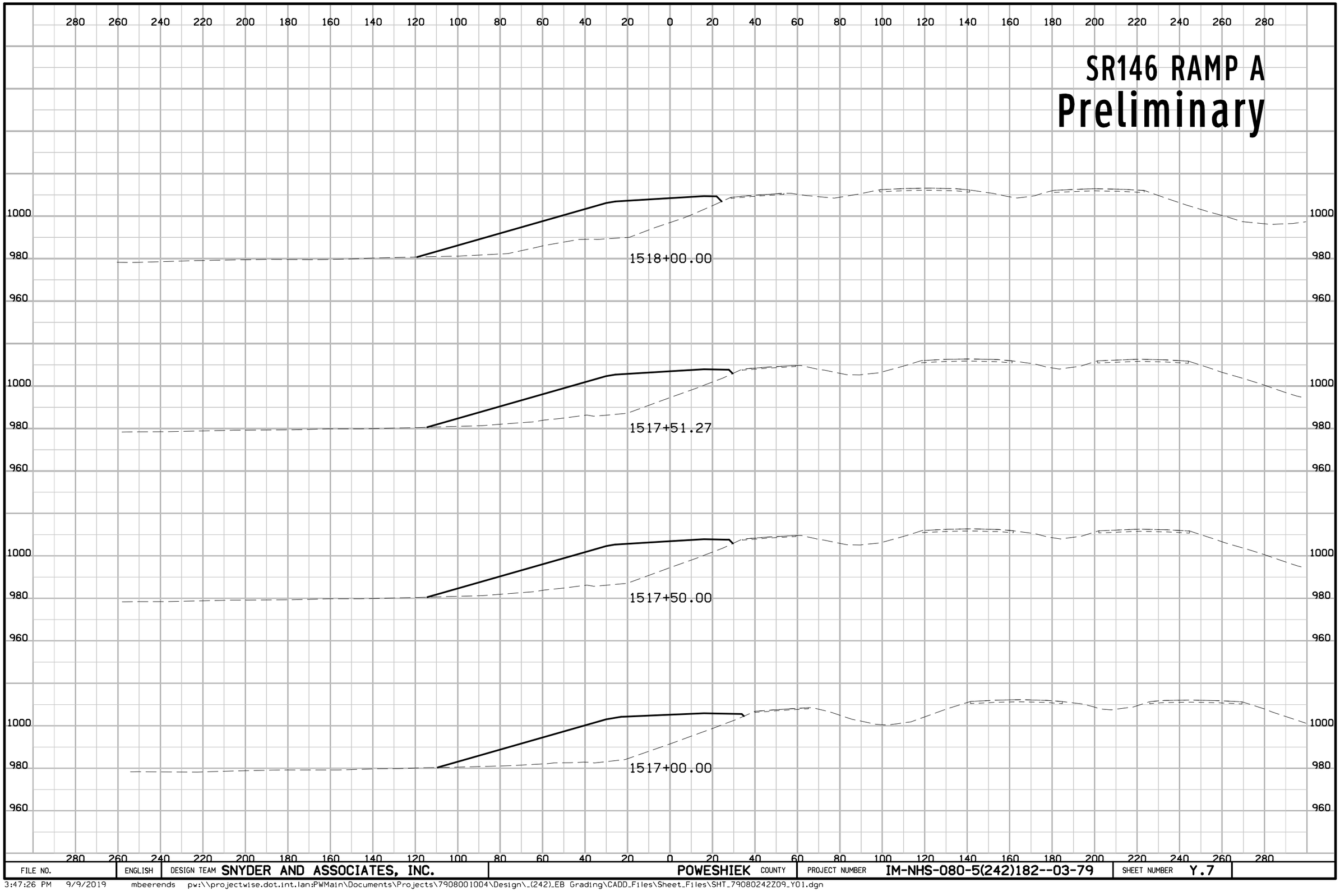

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.7

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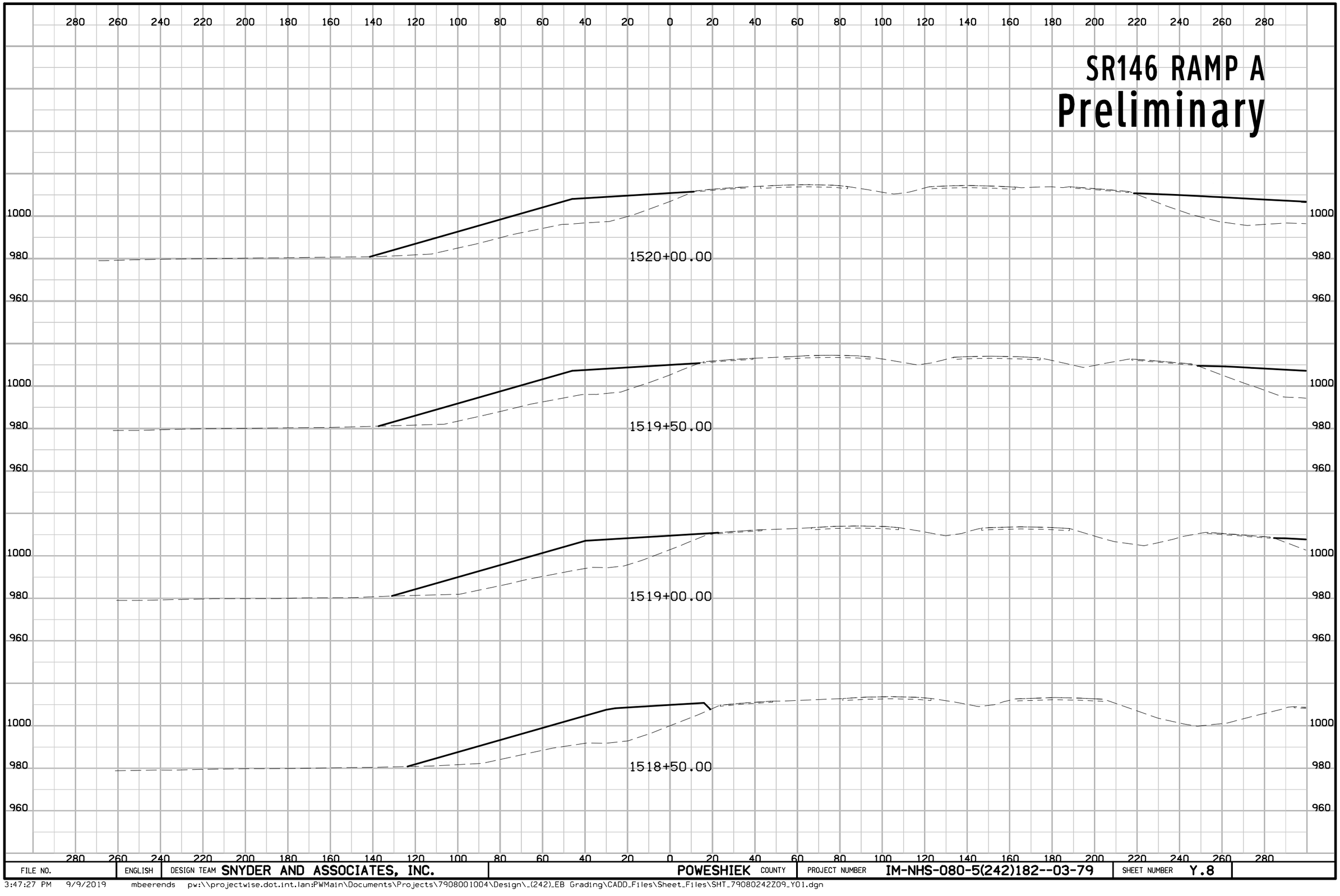
SR146 RAMP A
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.8

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SR146 RAMP A
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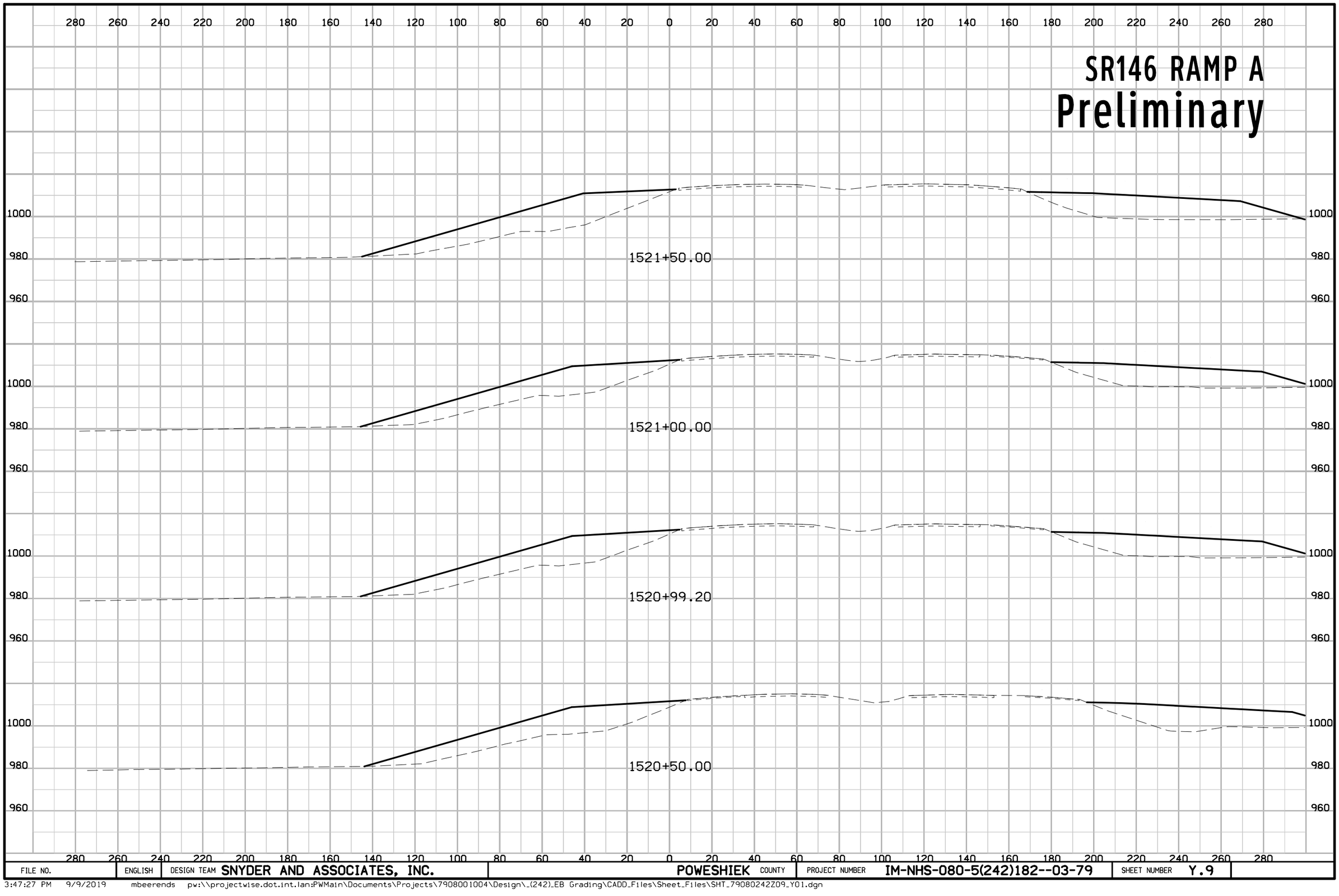

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.9

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SR146 RAMP A
Preliminary

280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

1000
980
960

1522+00.00

1521+92.12

1521+61.20

1521+55.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.10

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SR146 RAMP A
Preliminary

1522+49.99

1522+25.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.11

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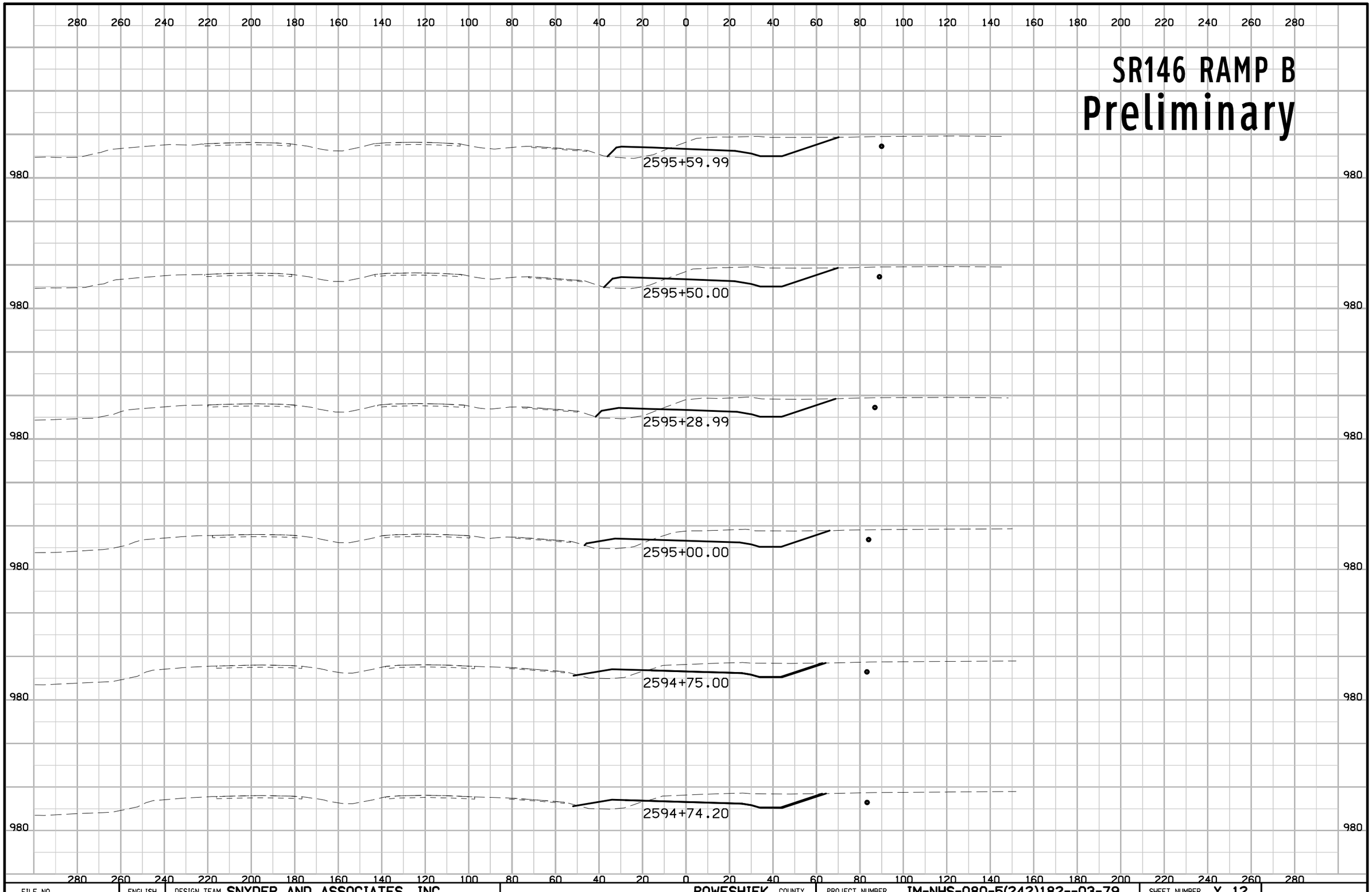
SR146 RAMP B
Preliminary



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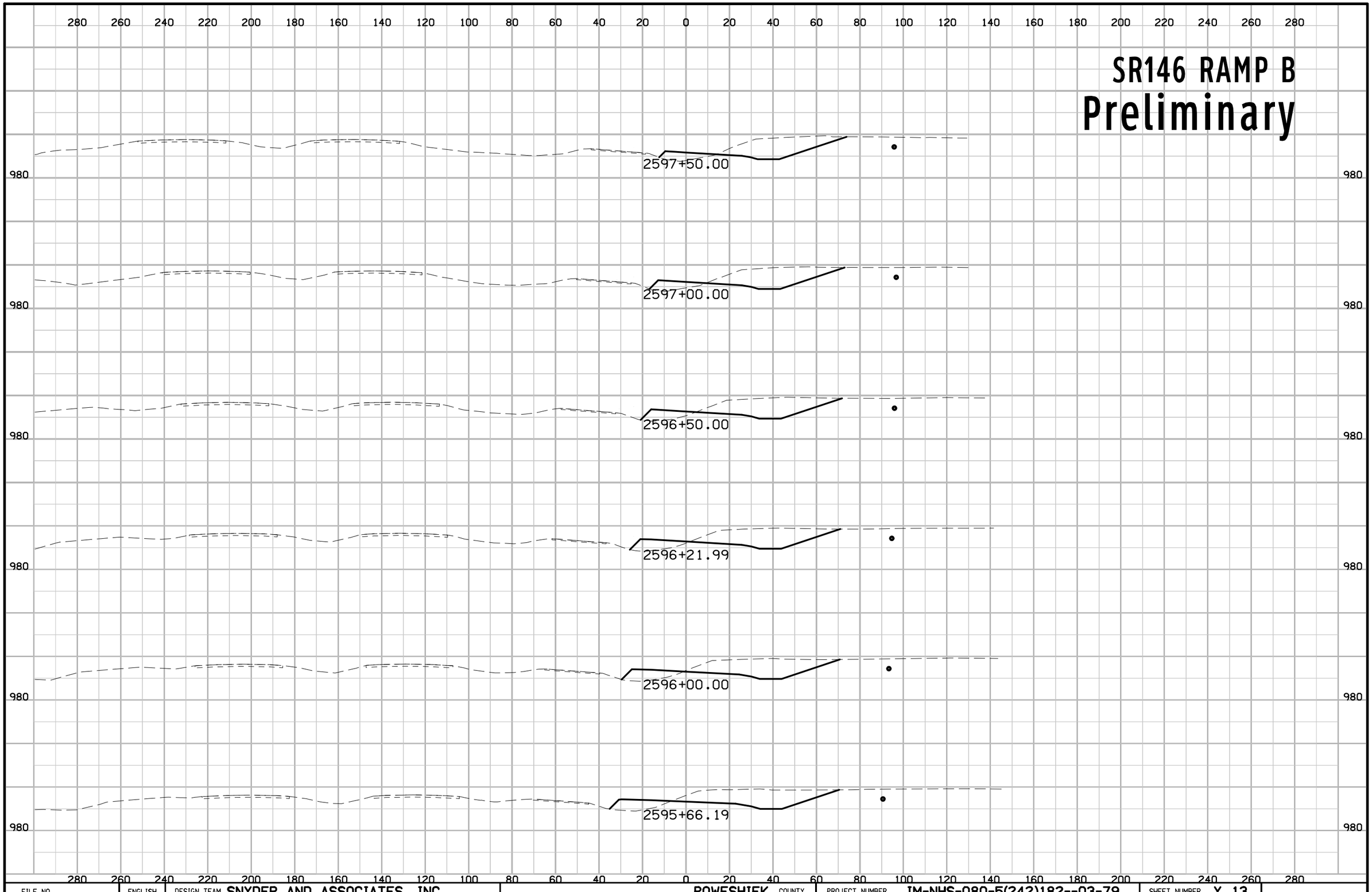
SR146 RAMP B
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.13

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SR146 RAMP B

Preliminary

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1000
980

2599+92.54

980

2599+50.00

980

2599+08.00

980

2599+00.00

980

2598+50.00

980

2598+00.00

980

280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.14

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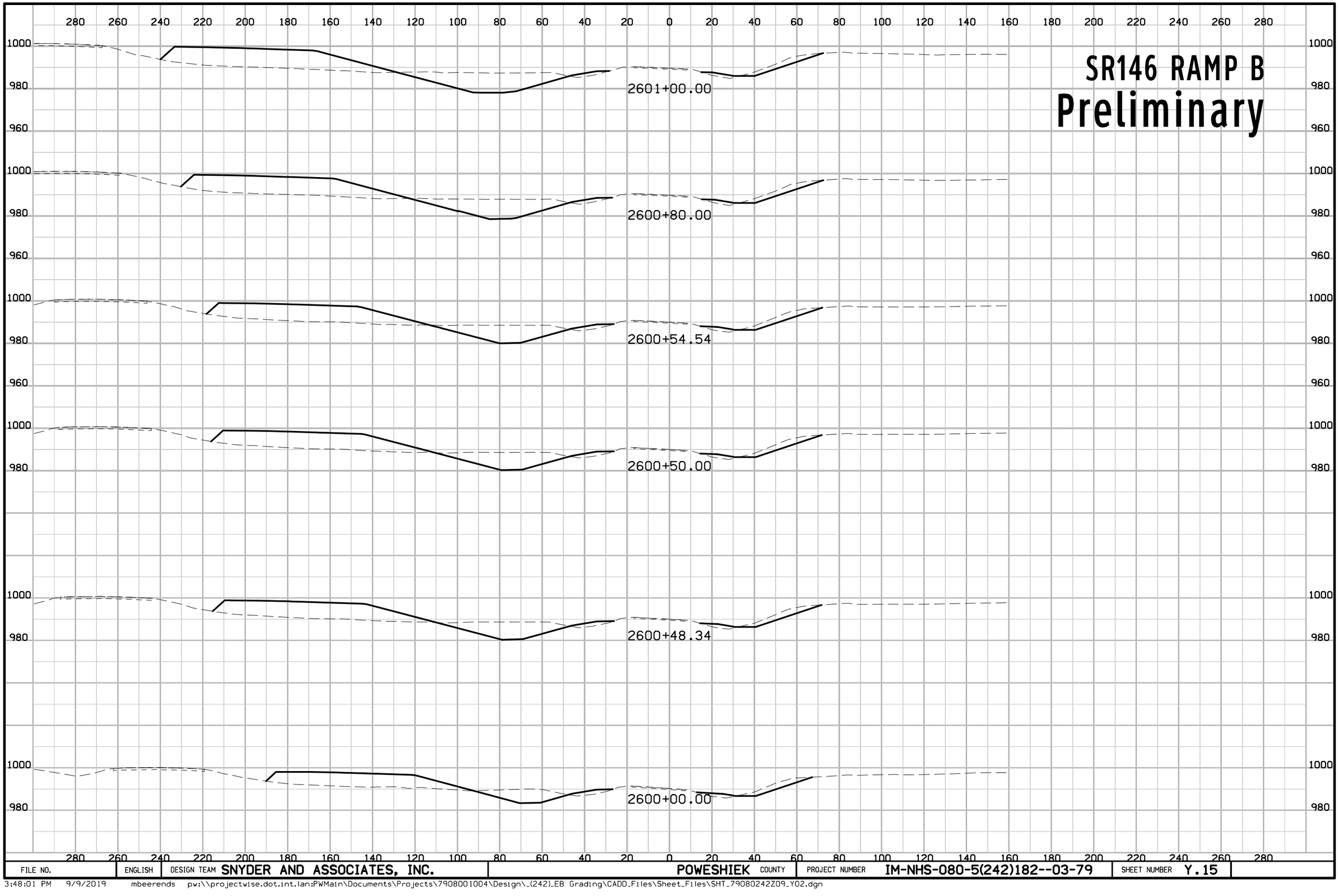
SR146 RAMP B
Preliminary



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SR146 RAMP B
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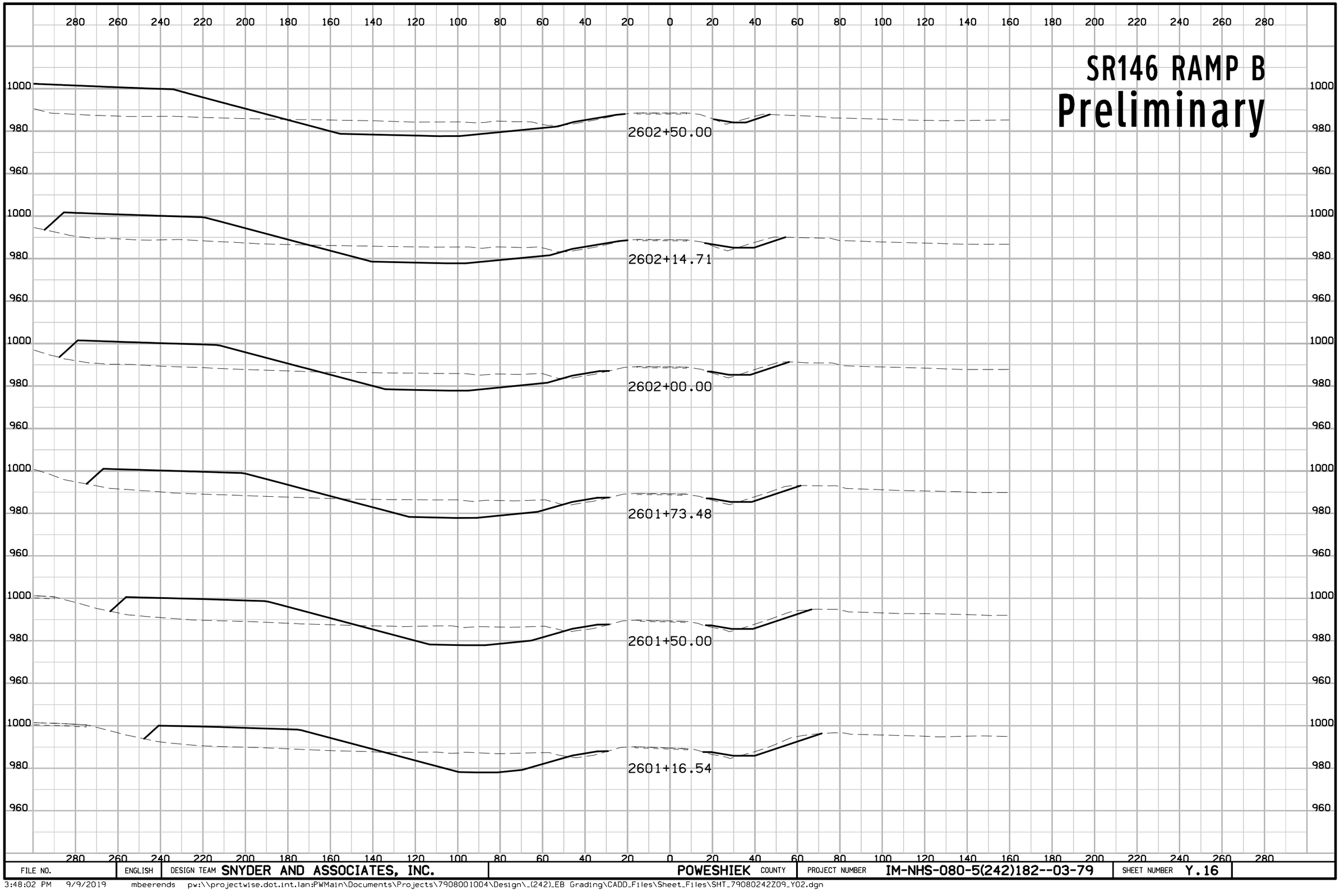

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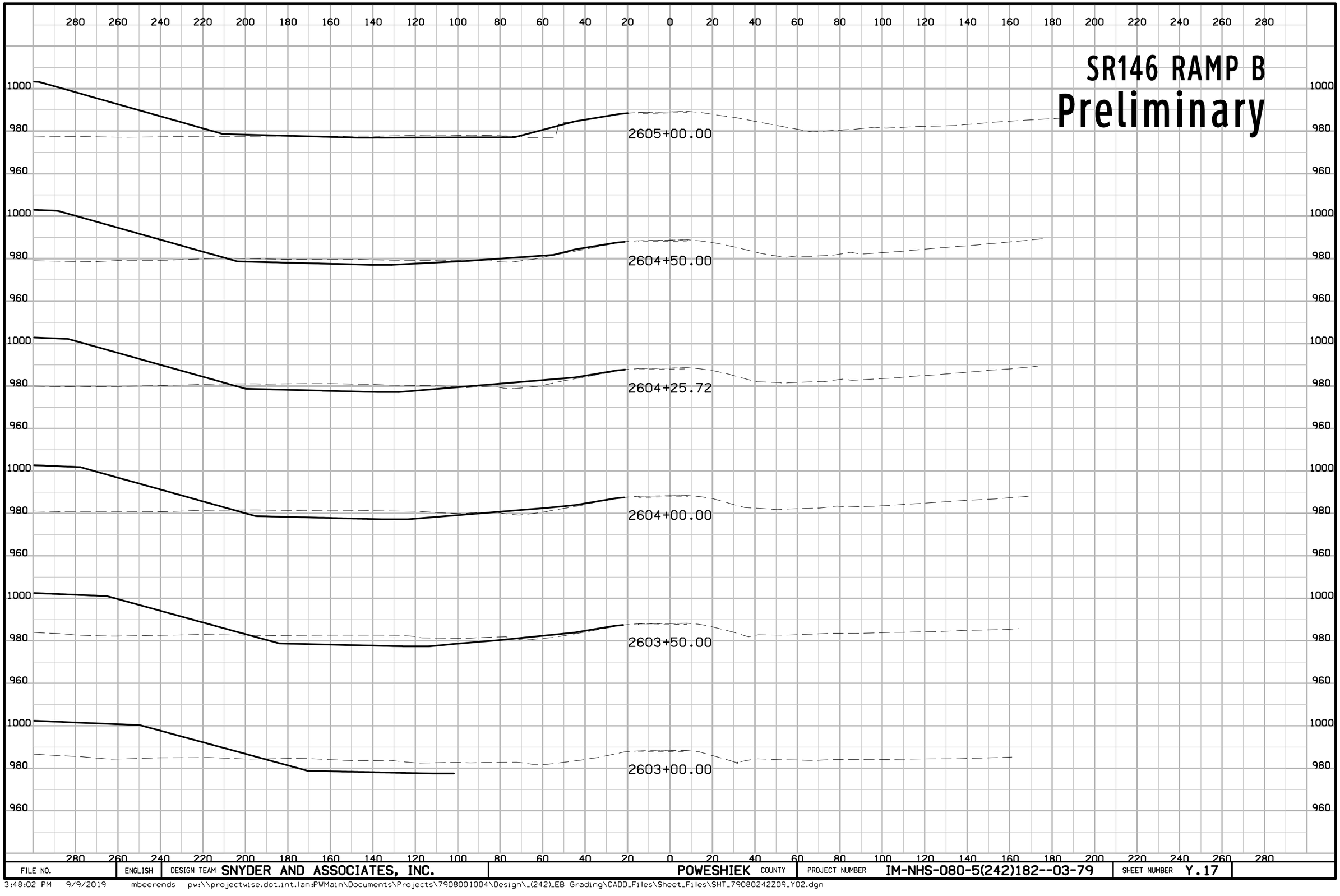

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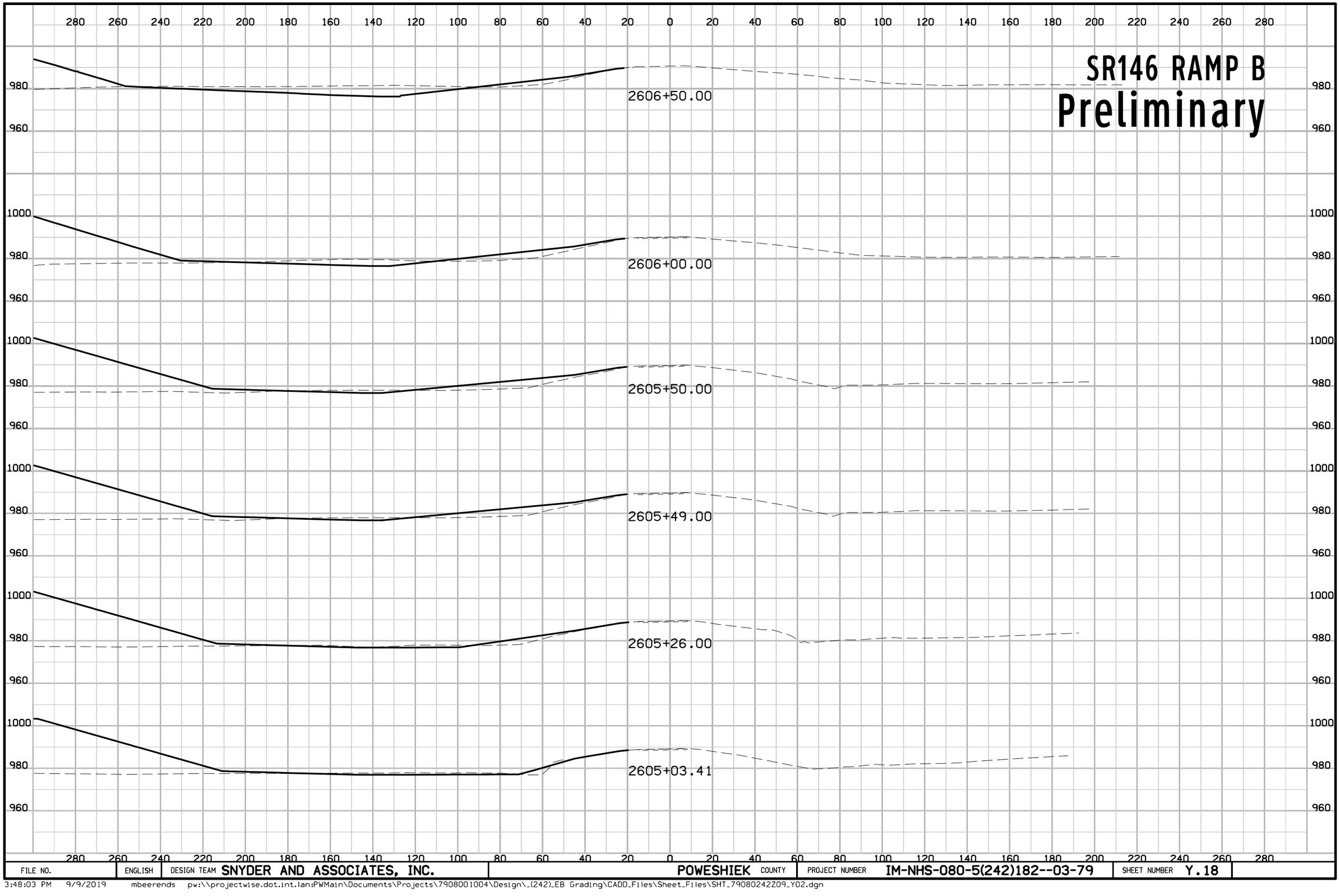

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SR146 RAMP B
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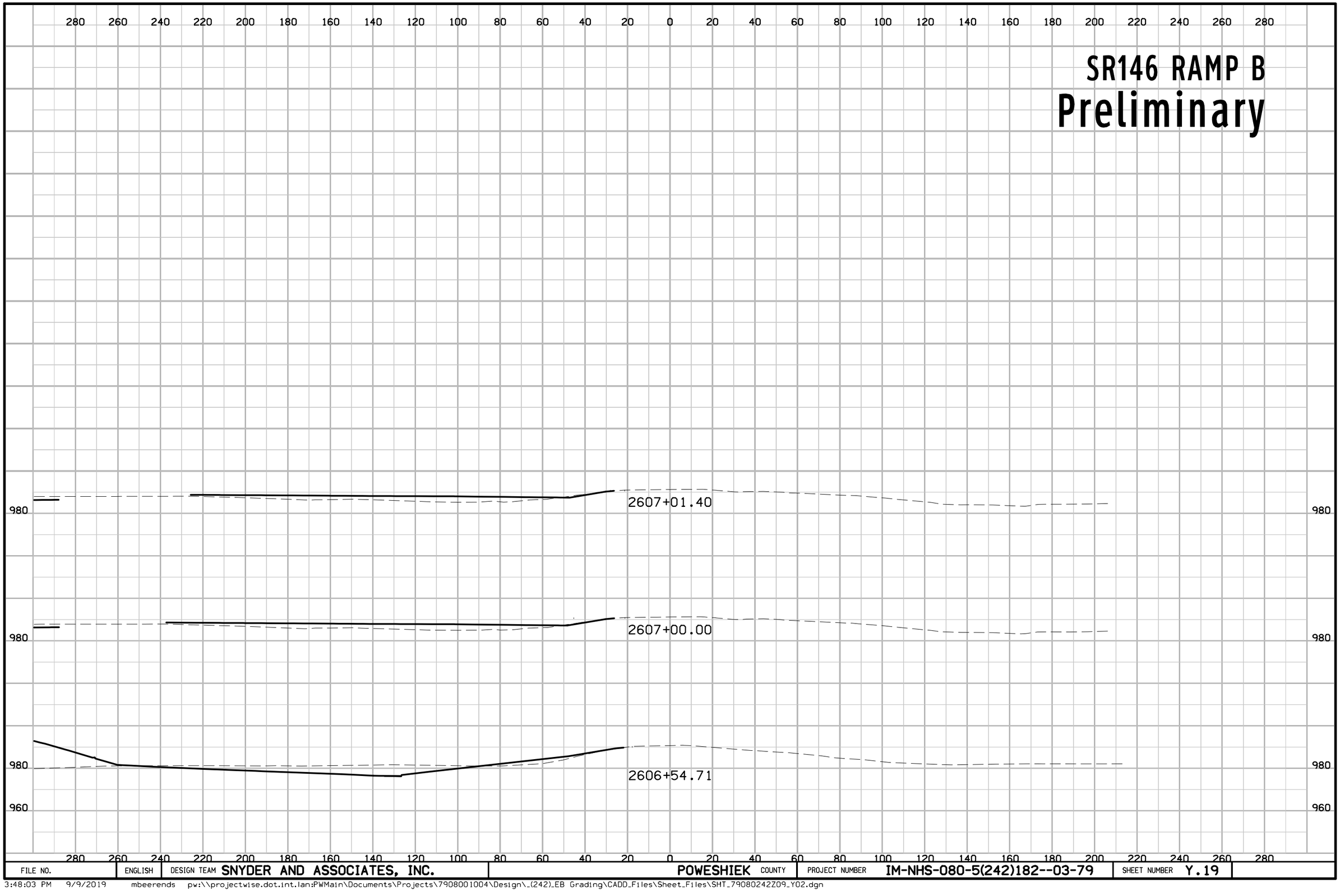

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.19

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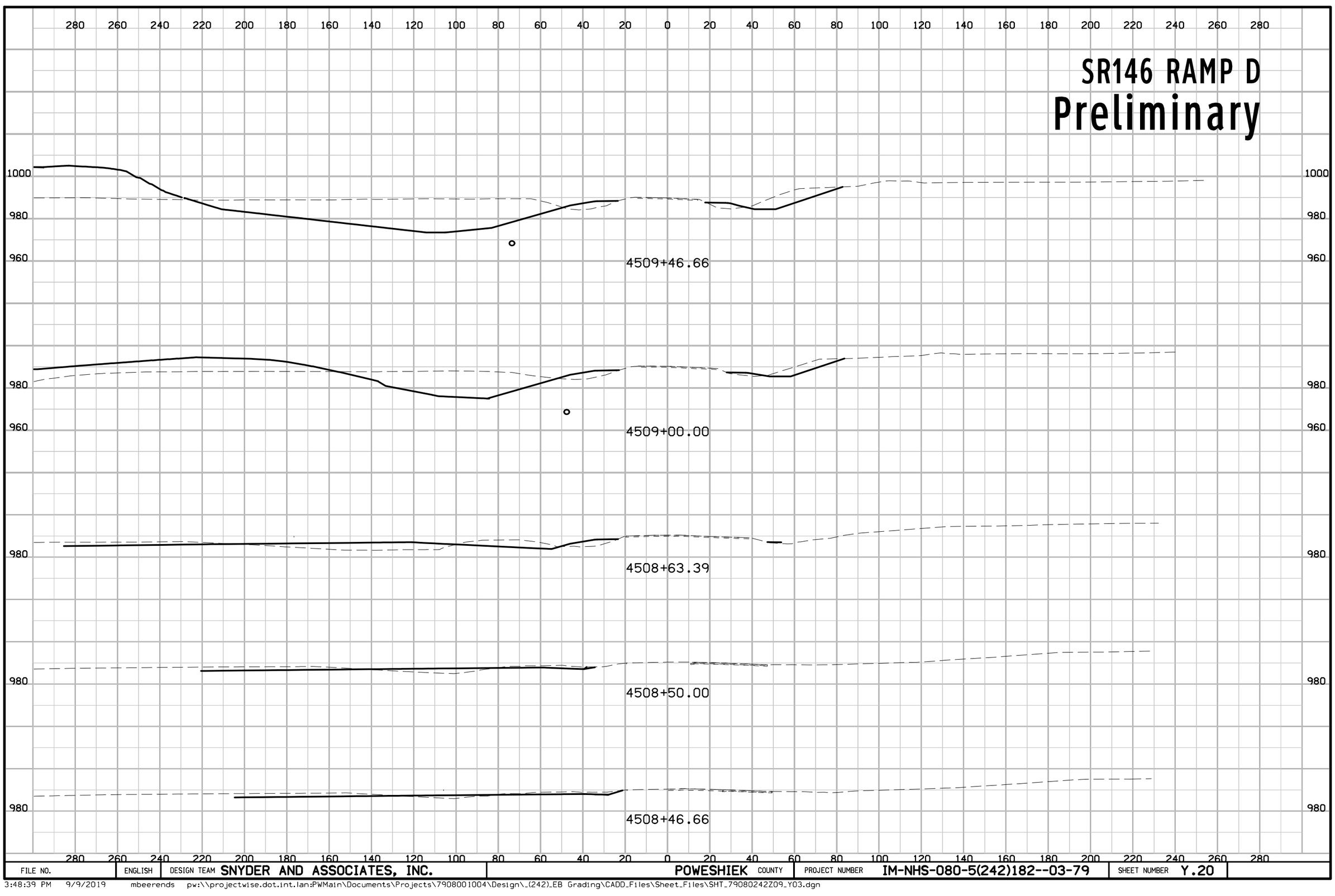
SR146 RAMP D

Preliminary



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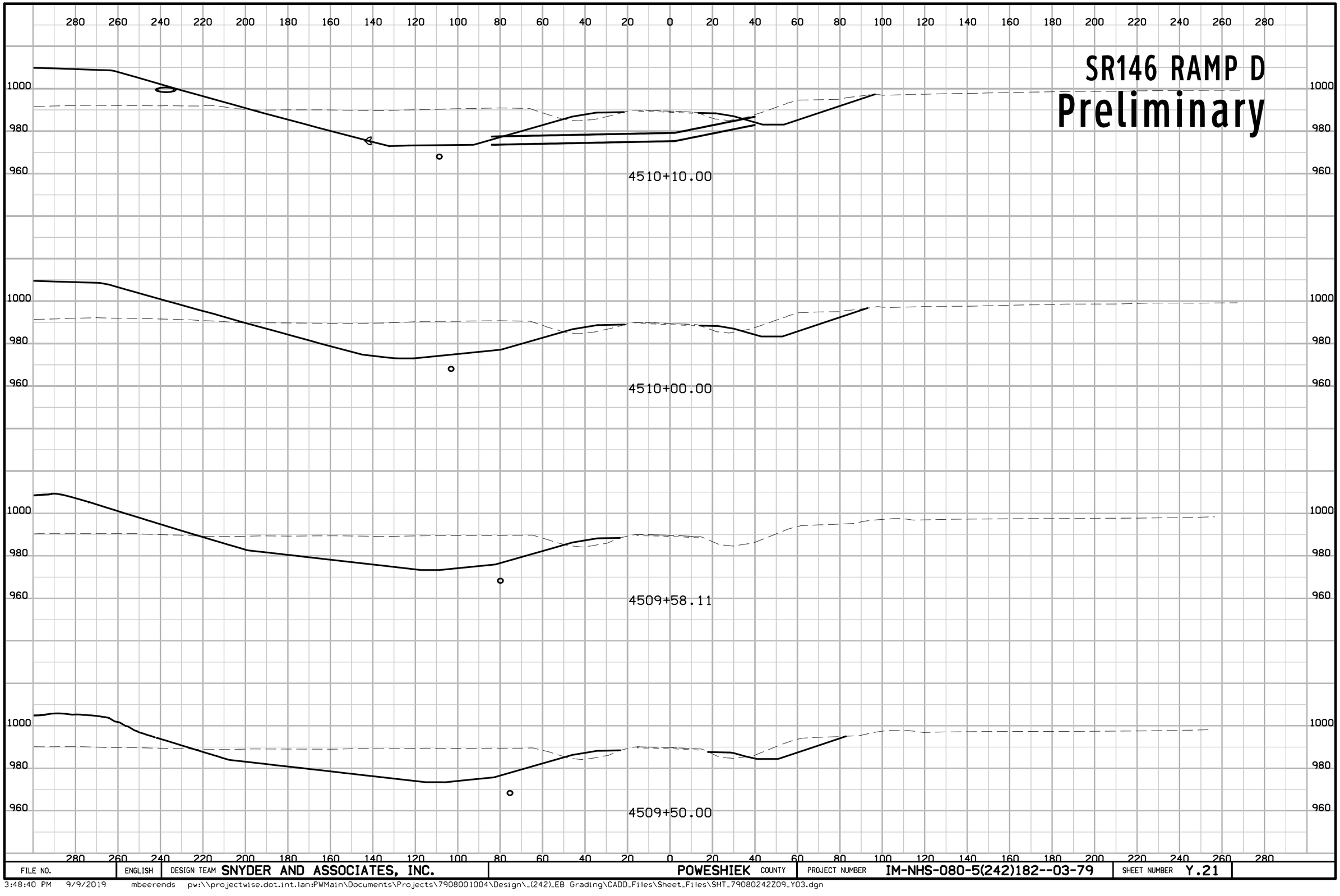
SR146 RAMP D

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.21

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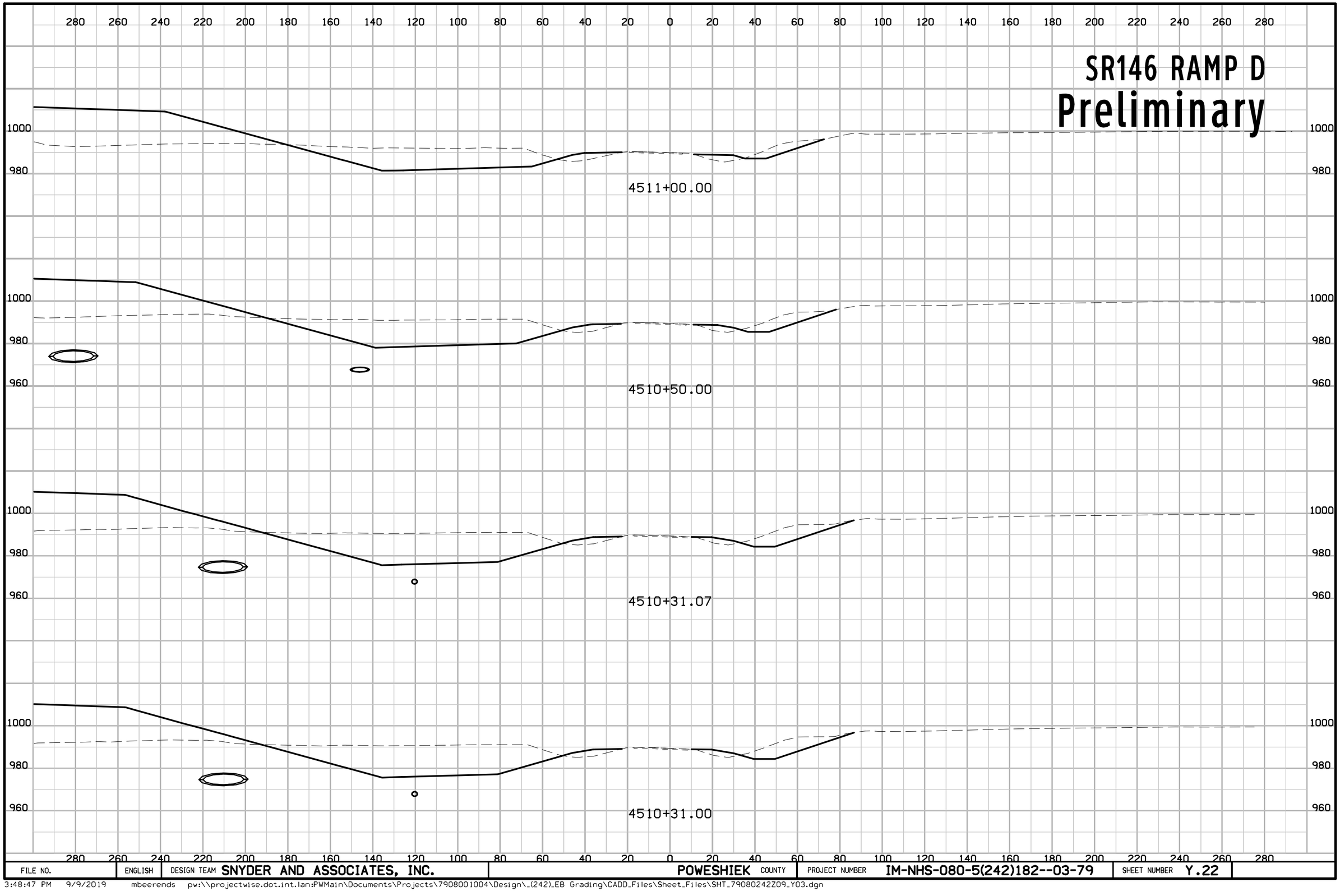
SR146 RAMP D

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.22

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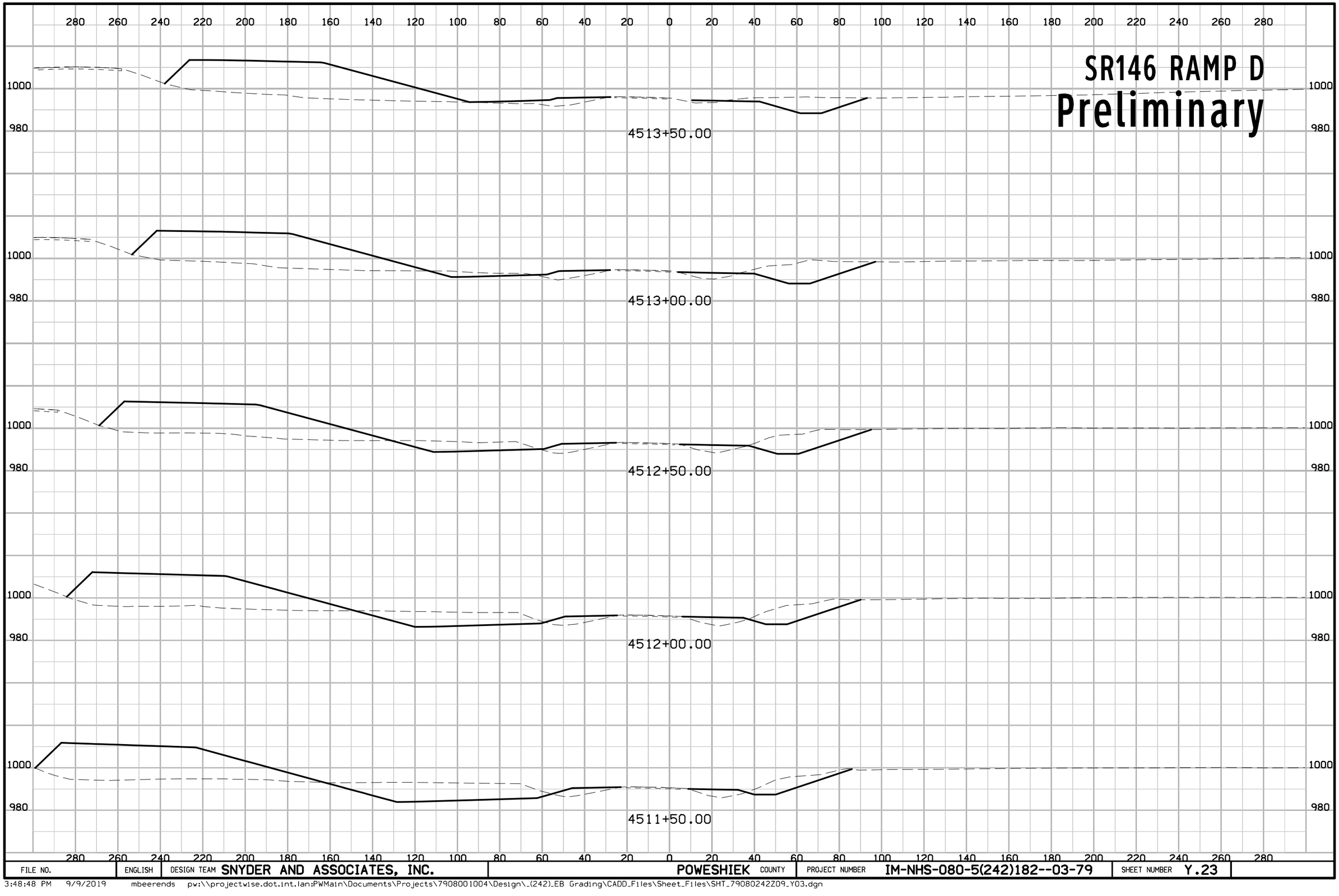

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SR146 RAMP D
Preliminary

280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

1000
980

4515+99.00

4515+50.00

4515+00.00

4514+50.00

4514+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.24

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Preliminary

280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

1000
980
960

4517+00.00

4516+61.44

4516+54.60

4516+50.00

4516+00.00

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.25

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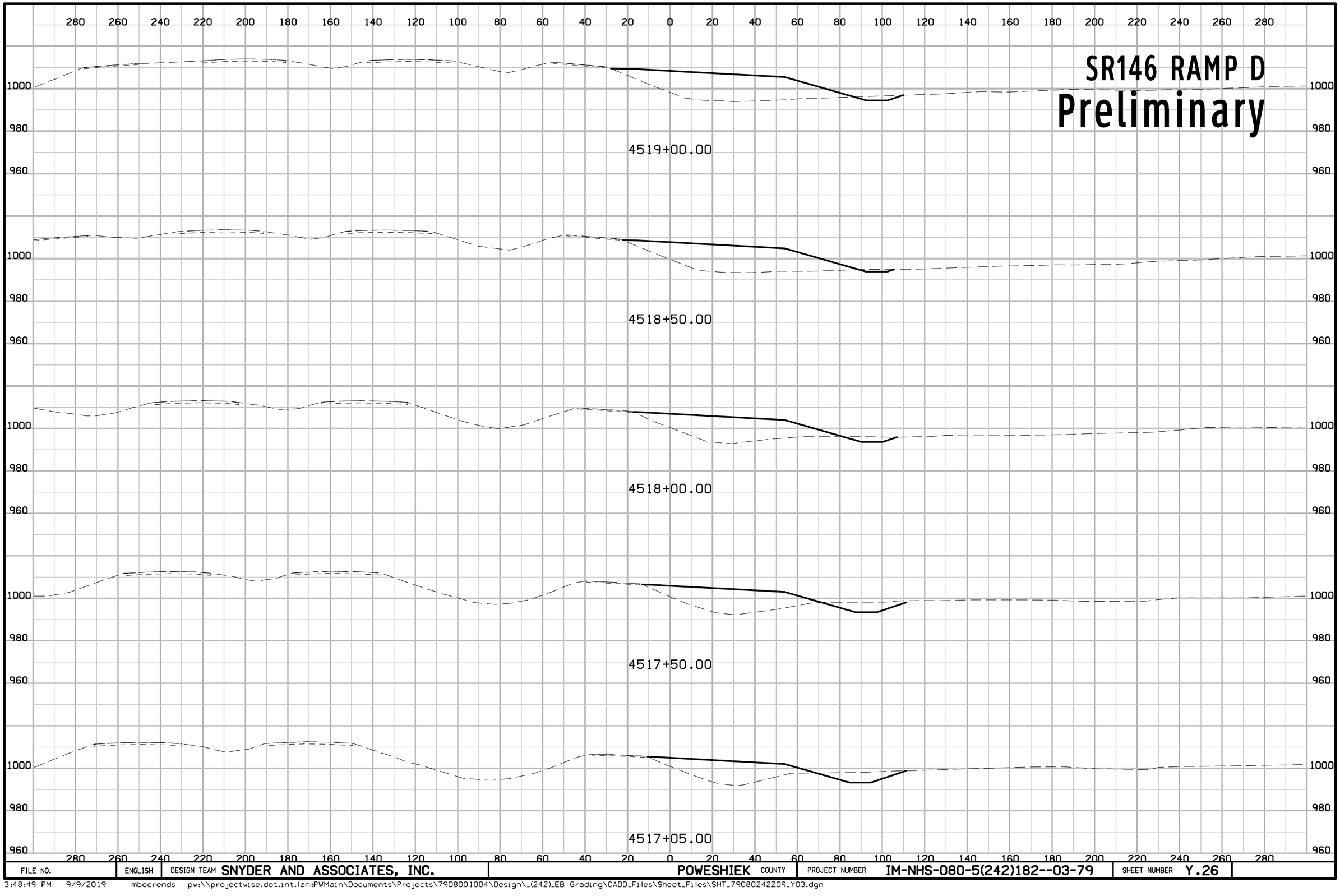
SR146 RAMP D

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.26

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SR146 RAMP D

Preliminary

4519+41.08

4519+41.03

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	POWESHIEK COUNTY	PROJECT NUMBER IM-NHS-080-5(242)182--03-79	SHEET NUMBER Y.27

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