BRIDGE REPLACEMENT - PPCB
BRFIMX-080-4(56)134--14-77

LETTING DATE
JAN. 18, 2017

POLK COUNTY

POLK COUNTY - DESIGN NO. 1317

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (175)
- COUNTY HIGHWAY (S27)
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES — ABBEY ROAD
- UNINCORPORATED PLACE — ELWOOD

IOWA DOT
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

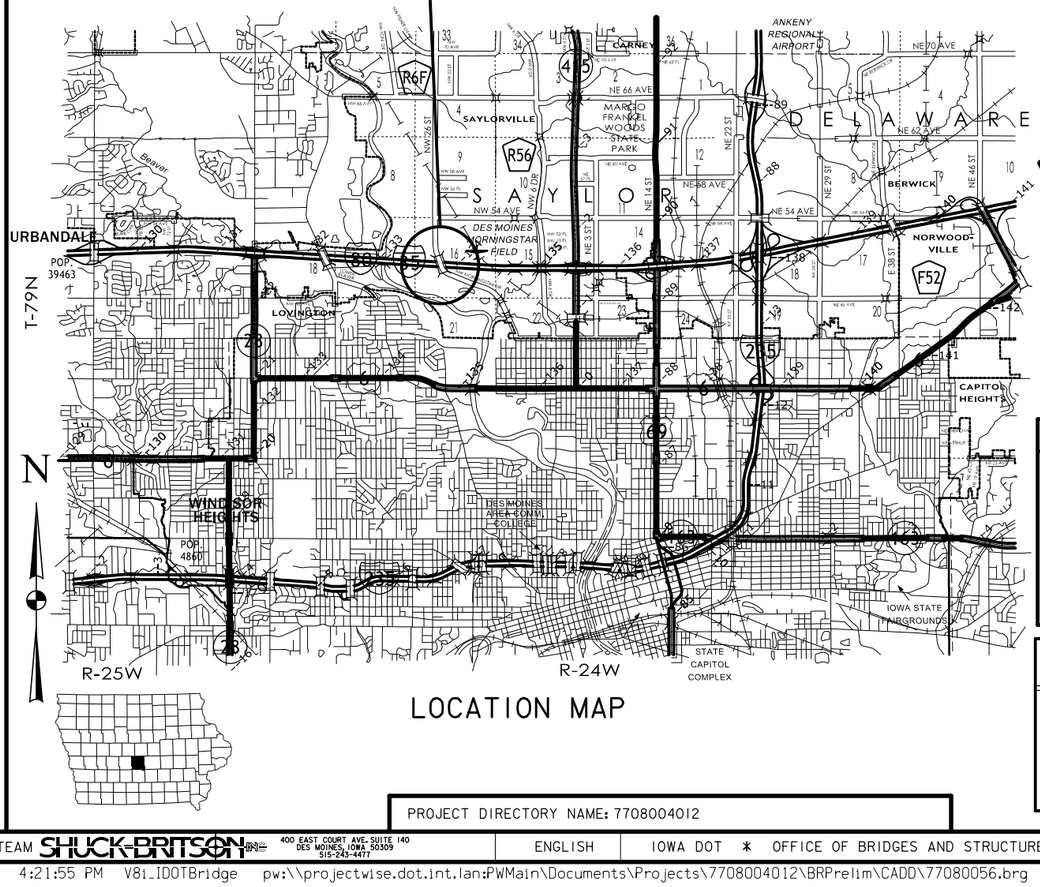
INTERSTATE ROAD SYSTEM

POLK COUNTY

BRIDGE REPLACEMENT - PPCB

NW MORNINGSTAR DRIVE OVER I-35/80

DESIGN NO. 1317



LOCATION MAP

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

ALL WORKING DRAWINGS INCLUDING SHOP DRAWINGS AND FALSEWORK DRAWINGS WILL BE CHECKED BY:
SHUCK-BRITSON INC.
400 EAST COURT AVE., SUITE 140
DES MOINES, IOWA 50309
skunz@shuck-britson.com

PRELIMINARY
NOT FOR CONSTRUCTION

ANTICIPATED PROJECT DEVELOPMENT SCHEDULE

D2-DESIGN FIELD EXAM
05-11-2015
D3-PLANS FOR PRELIMINARY BRIDGE
05-29-2015 (D2+3 WEEKS)
BI-BRIDGES AND STRUCTURES LAYOUT
07-10-2015 (D3+6 WEEKS)
S2-IDENTIFICATION OF SOILS RELATED ROW ISSUES
07-10-2015 (D3+6 WEEKS)
D5-PLANS TO ROW
08-07-2015 (S2+4 WEEKS)
T2-ACQUISITION PLATS AND LEGAL DESCRIPTIONS
01-15-2016 (D5+23 WEEKS)

REVISIONS

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

	TOTAL SHEETS
	54
PROJECT NUMBER	
BRFIMX-080-4(56)134--14-77	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
12-77-080-040	

INDEX OF SHEETS

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	Steven M. Kunz	Structural Design
B.1	Cindy A. Spencer	Roadway Design

DESIGN DATA URBAN

(I-35/80)

2016	AADT	96,000	V.P.D.
2036	AADT	135,000	V.P.D.
2036	DHV	13,500	V.P.H.
TRUCKS		15	%
Total Design ESALs			

DESIGN DATA URBAN

(NW MORNINGSTAR DRIVE)

2016	AADT	3,860	V.P.D.
2036	AADT	4,510	V.P.D.
2036	DHV	450	V.P.H.
TRUCKS		8	%
Total Design ESALs			

MAP NOT TO SCALE

T-79N R-24W
SECTION 16
WEBSTER TOWNSHIP
POLK COUNTY

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET C.1

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER — Steven M. Kunz 14321 — 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.

B1 SUBMITTAL XX

Signature — Date

Steven M. Kunz

Printed or Typed Name

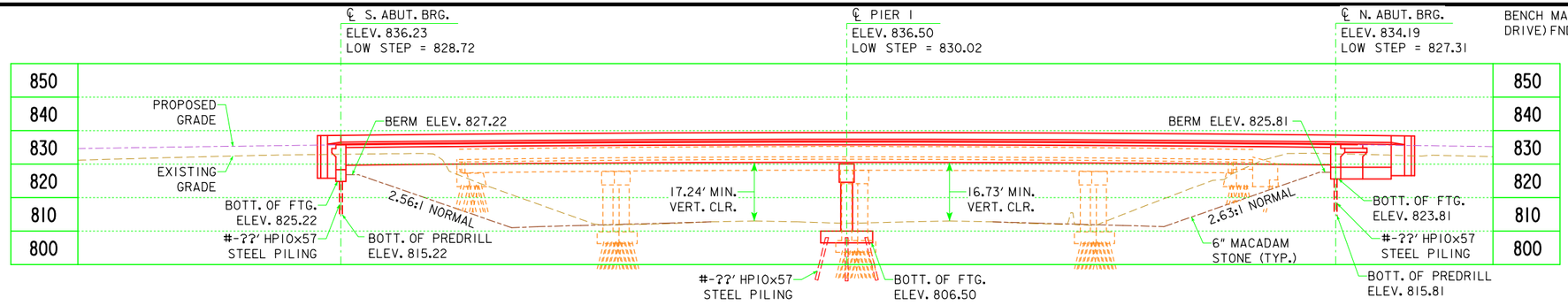
My license renewal date is December 31, 2015

Pages or sheets covered by this seal: _____

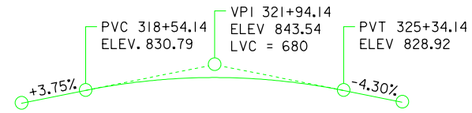
PROJECT DIRECTORY NAME: 7708004012

DESIGN TEAM SHUCK-BRITSON INC. 400 EAST COURT AVE. SUITE 140 DES MOINES, IOWA 50309 515-243-4477 | ENGLISH | IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES | FILE NO. 31245 | POLK COUNTY | PROJECT NUMBER BRFIMX-080-4(56)134--14-77 | SHEET NUMBER 1

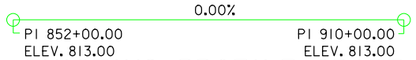
8/7/2015 4:21:55 PM V8i_IDOTBridge pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7708004012\BRPrelim\CADD\77080056.brg 77DDDDS000 11x17_pdf.pltcfg



BENCH MARK NO. BMI STA. 332+48.67, 40.464 RT (℄ PROP. NW MORNINGSTAR DRIVE) FND RR SPIKE, ELEV. 804.496.



PROPOSED PROFILE GRADE
(NW MORNINGSTAR DRIVE)



EXISTING PROFILE GRADE
(I-35/80)
(U.A.C.)

MINIMUM VERTICAL CLEARANCE

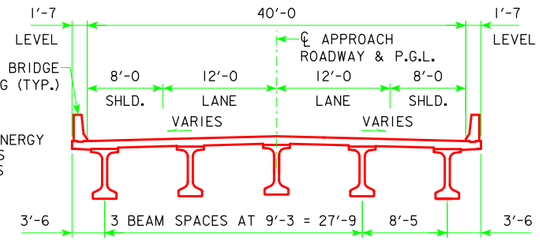
OVERHEAD STATION = 322+67.12, OFFSET 18.08 LT
OVERHEAD ELEVATION = 835.82
DEPTH OF SUPERSTRUCTURE = 6.08 FT
UNDERPASS STATION = 879+70.11, OFFSET 25.44 LT
UNDERPASS ELEVATION = 813.00
MINIMUM VERTICAL CLEARANCE = 16.73 FT

LONGITUDINAL SECTION ALONG ℄ APPROACH ROADWAY

NOTE: THE DIMENSION FROM THE TOP OF BRIDGE DECK/CROWN TO THE PROFILE GRADE LINE VARIES AS FOLLOWS:
1. 0.00 FT BELOW THE P.G.L. FROM THE SOUTH ABUTMENT PAVING NOTCH TO STA. 321+74.33.
2. VARIES FROM 0.00 FT BELOW THE P.G.L. AT STA. 312+74.33 TO 0.03 FT BELOW THE P.G.L. AT STA. 322+70.43.
3. 0.03 FT BELOW THE P.G.L. FROM STA. 322+70.43 TO THE NORTH ABUTMENT PAVING NOTCH.

UTILITIES LEGEND:

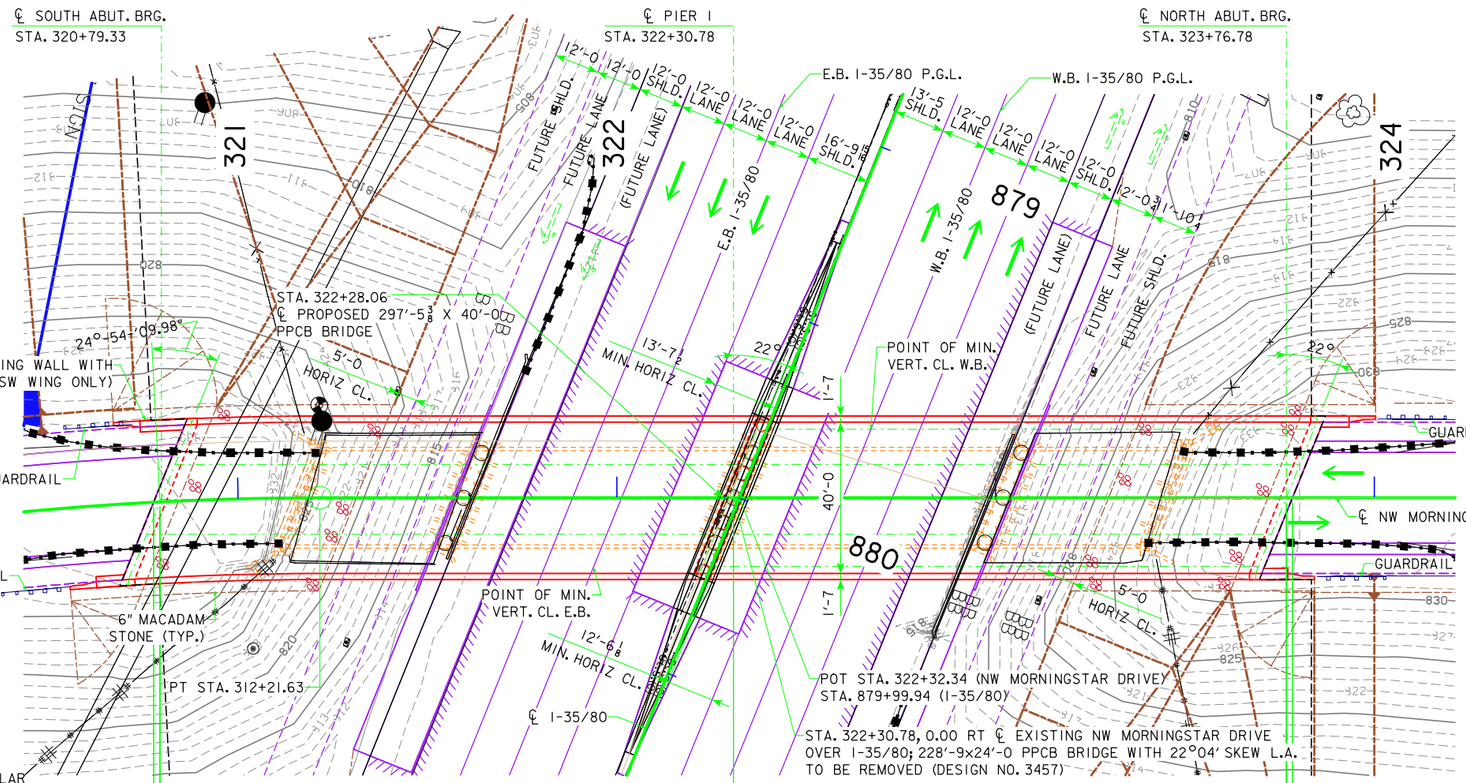
E - BURIED ELECTRIC LINE - MIDAMERICAN ENERGY
FO - FIBER OPTIC - IOWA NETWORK SERVICES
W - WATER LINE - DES MOINES WATER WORKS
C - COMMUNICATION LINE - CENTURYLINK



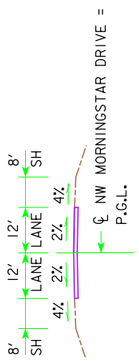
TYPICAL BRIDGE SECTION
SPAN 2 SHOWN, SEE SHEET 4 FOR FRAMING PLAN

CURVE DATA

PI STA. 317+89.56
Δ = 48° 44' 27.09" (RT)
T = 378.25
L = 710.32
R = 835.00
e = 6.0%
I = 144'
x = 48'
PC STA. 314+11.31
PT STA. 321+21.63



TYPICAL APPROACH SECTION



NOTES:
PIER TYPE - FRAME PIER
PIER TO BE DESIGNED FOR VEHICULAR COLLISION FORCE
BEAM TYPE - BTE BEAMS, DEPTH = 63"
TL-5 BRIDGE RAILING PROPOSED
BRIDGE IS LOCATED IN A SUPERELEVATION TRANSITION
2 - SPAN GRADING SHOWN.
SOUTH ABUT. BOTT. FTG. IS LEVEL.
NON-STANDARD WINGWALL LENGTHS REQUIRED AT SW WINGWALL ONLY

SITUATION PLAN
ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED

NW MORNINGSTAR DRIVE TRAFFIC ESTIMATE

2016	AADT	3,860	V.P.D.
2036	AADT	4,510	V.P.D.
2036	DHV	450	V.P.H.
TRUCKS		8	%
TOTAL DESIGN ESALs		-	

I-35/80 TRAFFIC ESTIMATE

2016	AADT	96,000	V.P.D.
2036	AADT	135,000	V.P.D.
2036	DHV	13,500	V.P.H.
TRUCKS		15	%
TOTAL DESIGN ESALs		-	

LOCATION

NW MORNINGSTAR DRIVE OVER I-35/80
T-79N R-24W
SECTION 16
SAYLOR TOWNSHIP
POLK COUNTY
FHWA NO. 41521
BRIDGE MAINT. NO. 7733.80080
LATITUDE 41.650106°
LONGITUDE -93.652668°
PRELIMINARY

DESIGN FOR VARIABLE SKEW (L.A.)

297'-5 3/8 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

SPANS (151'-5 3/8, 146'-0) (BTE BEAM TYPE)

SITUATION PLAN

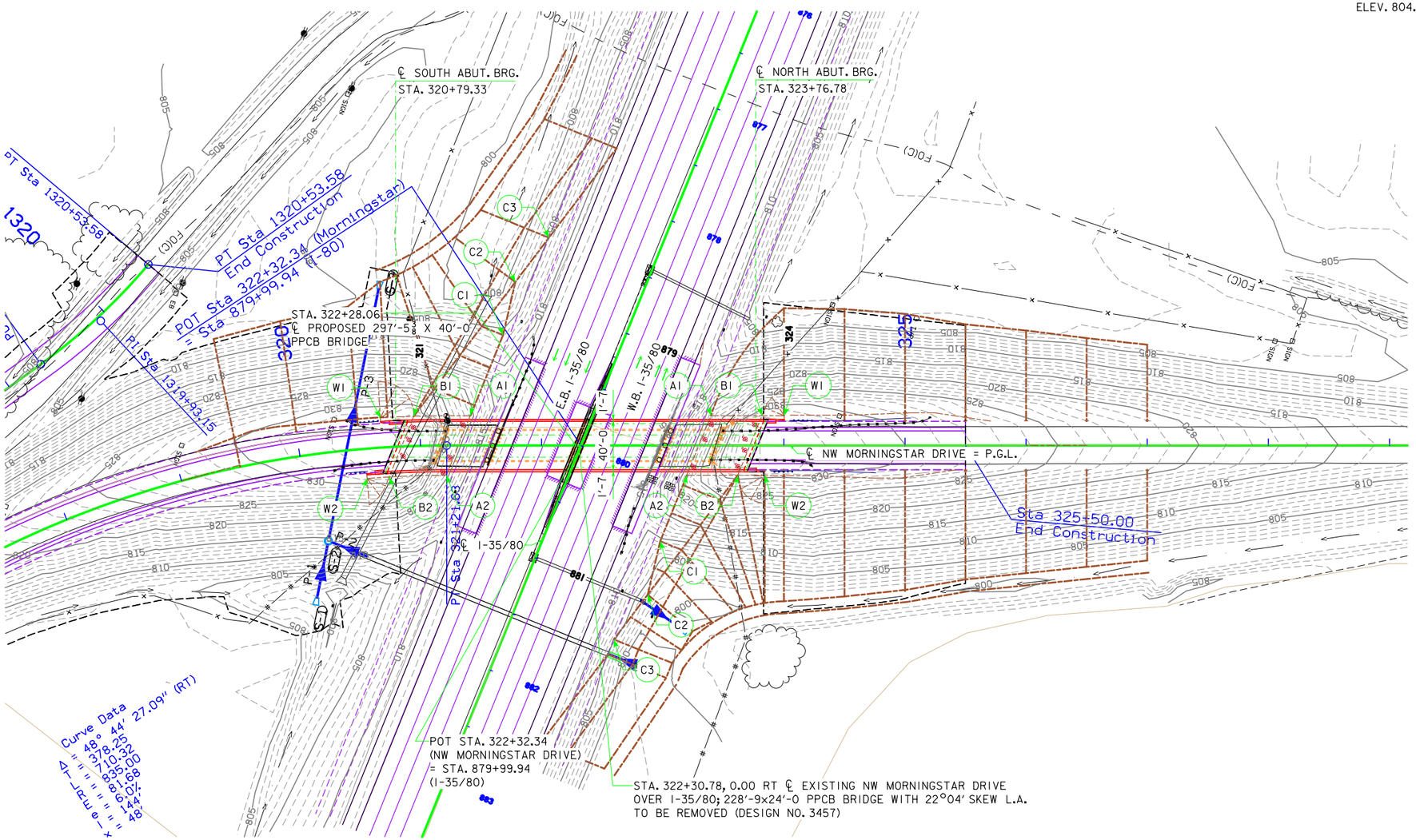
STATION 322+28.06 JULY, 2015

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ___ OF ___ FILE NO. 31245 DESIGN NO. 1317

BENCH MARK NO. BM1 STA. 332+48.67, 40.464 RT
(℄ PROP. NW MORNINGSTAR DRIVE) FND RR SPIKE
ELEV. 804.496.



SITE PLAN

NOTE:
FOR MACADAM STONE SLOPE PROTECTION SECTIONS AND ESTIMATED QUANTITIES SEE STANDARD SHEET 1006.

NOTE: 2 - SPAN GRADING SHOWN.

BERM SLOPE LOCATION TABLE

POINTS	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	321+40.53	24.58 LT	811.00	323+39.68	24.58 LT	811.00
A2	321+21.02	24.58 RT	811.00	323+19.77	24.58 RT	811.00
B1	320+95.17	24.58 LT	827.22	323+81.86	24.58 LT	825.81
B2	320+72.67	24.58 RT	827.22	323+61.99	24.58 RT	825.81
W1	320+68.39	24.58 LT	837.16	324+00.36	24.58 LT	833.06
W2	320+53.88	24.58 RT	834.57	323+84.20	24.58 RT	833.49

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

RECOVERABLE BERM LOCATION TABLE

	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
C1	879+39.52	93.75 LT	810.82	880+48.54	90.46 LT	810.90
C2	878+95.14	100.81 RT	810.52	880+93.33	97.48 LT	810.60
C3	878+50.76	88.88 RT	811.00	881+38.12	85.49 LT	811.08
B	880+29.38	136.92 RT	827.22	879+74.01	129.39 LT	825.81

POINTS (C1), (C2) AND (C3) FOR THE ABUTMENTS ARE BEYOND THE LIMITS OF THIS SHEET. SEE THE RECOVERABLE BERM LOCATION TABLE FOR THEIR LOCATIONS, OFFSETS AND ELEVATIONS. REFER TO RL-15 FOR TYPICAL LOCATIONS.

N

0 ENGLISH 100
SCALE IN FEET

PRELIMINARY

DESIGN FOR VARIABLE SKEW (L.A.)

297'-5⅜ X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

SPANS (151'-5⅜, 146'-0) (BTE BEAM TYPE)

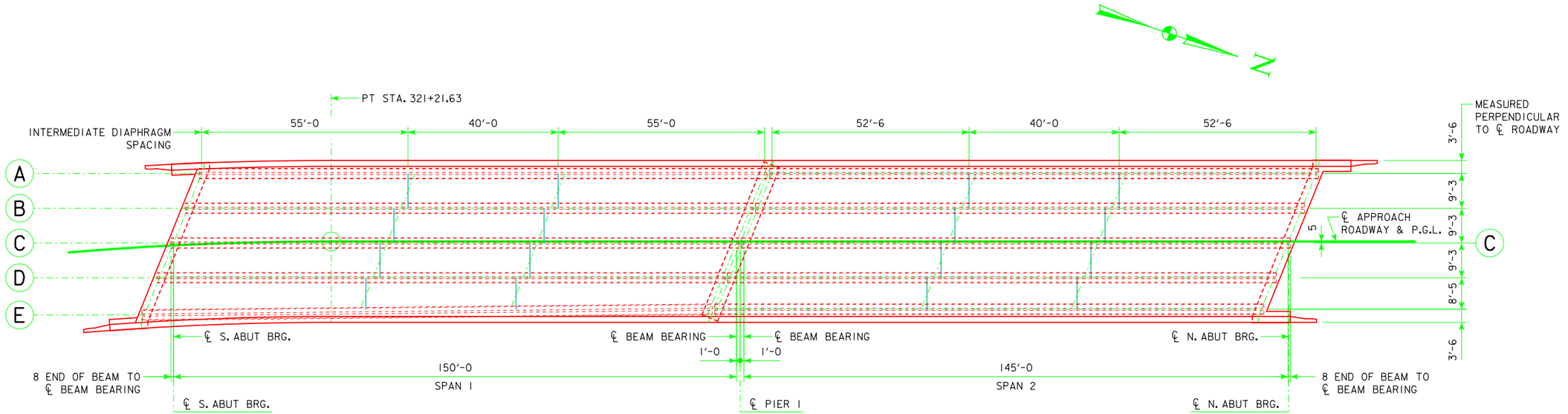
SITE PLAN

STATION 322+28.06 JULY, 2015

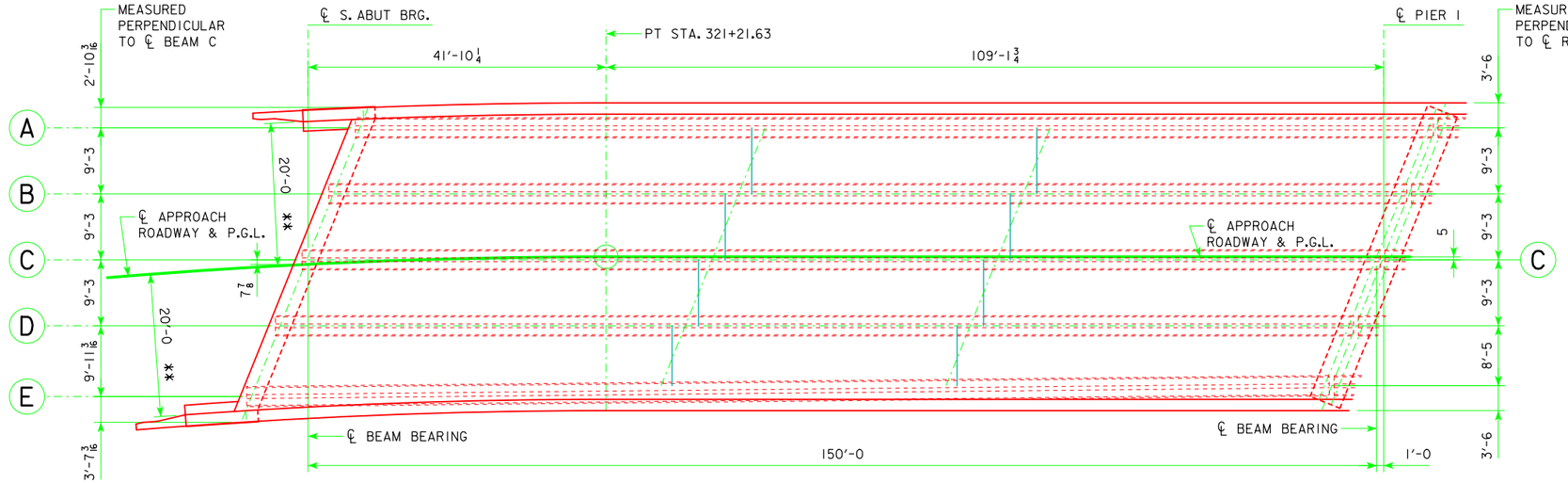
POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ____ OF ____ FILE NO. 31245 DESIGN NO. 1317



PLAN



SPAN 1

SPAN 1
TABLE OF BEAM DIMENSION

BEAM LINE	LENGTH ℄ BRG. TO ℄ BRG.
A	150'-0
B	150'-0
C	150'-0
D	150'-0
E	150'-7 7/16

** NOTE: MEASURED RADIALLY BETWEEN ℄ APPROACH ROADWAY AND GUTTER LINE

NOTE: BEAM E IN SPAN 1 WILL REQUIRE A SPECIAL BEAM DESIGN DUE TO NON-STANDARD LENGTH.

PRELIMINARY

DESIGN FOR VARIABLE SKEW (L.A.)

297'-5 3/8 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

SPANS (151'-5 3/8, 146'-0) (BTE BEAM TYPE)

FRAMING PLAN

STATION 322+28.06 JULY, 2015

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ___ OF ? FILE NO. 31245 DESIGN NO. 1317

DESIGN TEAM SHUCK-BRITSON 400 EAST COURT AVE. SUITE 140 DES MOINES, IOWA 50309 515-243-4477 S.B.I. NO. 112.0556.03P

POLK COUNTY | PROJECT NUMBER BRFIMX-080-4(56)134--14-77 | SHEET NUMBER 4

7/9/2015 11:28:50 AM V8i_IDOTBridge pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\7708004012\BRPrelim\CADD\77080056.brg 77DDDDS020 11x17_pdf.pltcfg

Roadway	Morningstar			
PIN Number	12-77-080-040		**Submittal Date**	
Project Number	BRFIMX-080-4(56)134--14-77			**Approval Date**
District	District 1	**Assistant District Engineer**	Tony Gustafson	
County	Polk (77)		**or**	
Route	Morningstar	**Office Director**		
Location	Over I-35/80			
Work Type	Bridge Replacement - PPCB			
Segment Manager				
Designer	Snyder & Associates, Inc.			

Design Manual Section 1C-1
last update: 05-06-14

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	50
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		14	12	15
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	6" standard
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	3:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3:1
	Curbed roadways	2%	not steeper than 3:1	
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	2.5:1
Transverse Slopes	w/ drainage structures	8:1	6:1	8:1
	w/o drainage structures	10:1	6:1	10:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	
Bridge width—new	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	40'
Bridge width—existing		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	16.5'
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	
	Over railroad	23.3	23.3	
	Sign trusses and pedestrian bridges	17.5	17	
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	

Roadway Design Speed (mph) =														
Design Manual Section 1C-1 last update: 05-06-14			**Design Criteria for High Speed Roadways**											
Design Element			Preferred Criteria Design Speed, mph						Acceptable Criteria Design Speed, mph						Project Values
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	425
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e_{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	833
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	150
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	84
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	96
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.5%
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	4		3				7	6	6	--	--	--	
		Rural roadways							5	5	4	4	4	4	5%
		Interstates							5	5	4	4	4	4	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						18'

Design year ADT =	2,600					
Design Manual Section 1C-1 last update: 05-06-14	**Effective Shoulder Width and Type for Two-Lane Highways**					
Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	2*	8' effective 3' on slab 5' granular
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	2*	
On all other NHS	10	4				
On non-NHS routes with design year ADT > 3000	10	4	Design year ADT < 400 vpd	4	2*	
On non-NHS routes with design year ADT < 3000	8	2*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes:

Does not assume bicycle accommodation on bridge.

FINAL PROJECT CONCEPT STATEMENT

Bridge over I-35/80
on Morningstar Drive

Polk County
Project # BRFIMX-080-4(56)134--14-77
PIN: 12-77-080-040
Maintenance No. 7733.8O080
FHWA No. 41520

Prepared for:
Iowa Department of Transportation
Highway Division
Office of Bridges and Structures
Ronald J. Meyer, P.E.

Prepared by: Snyder & Associates, Inc./Shuck-Britson Inc.

January 8, 2015

I. STUDY AREA

A. Project Description

This project involves the replacement of the Morningstar Drive Bridge over I-35/80 (Maint. No. 7733.8O080), approximately 1.7 miles west of the I-35/80 / 2nd Avenue (Iowa 415) interchange.

B. Present Facility--Need for Project

The existing bridge is a 228'-9 x 24' PPCB Bridge with a 22 degree skew, and was built in 1958. It is a four span structure with interior span lengths of 71'-3, which does not allow for the future expansion of I-35/80 to a 5-lane section in each direction. The bridge was raised in 1998 after being repeatedly struck. It was designed for H-15 loading, which is below the current standards, and is classified as structurally deficient

due to the deck being in serious condition with a condition rating of 3. The existing bridge deck is 5 ½" thick, has not been overlaid, and has corresponding hollows on top and bottom. The bridge is classified as functionally obsolete due to the narrow deck width. The 24 foot roadway clear width on the structure is narrower than the adjacent roadway, which is paved to a width of 30 feet. The existing substructure is supported on treated wood piling. If a new, wider superstructure were to be constructed on the existing substructure, the substructure would need to be widened, as well. Because of the poor condition, the original design loading, and the narrow width of the structure, this bridge should be replaced.

Morningstar Drive in the vicinity of the project is a paved rural roadway with two approximately 4 foot wide granular shoulders. The roadway is posted with a 55 mph speed limit, although a curve just south of the bridge is signed with a 40 mph suggested speed. Although the curve begins immediately south of the bridge, the bridge deck has a normal crown throughout without superelevation or superelevation transition.

Historically, Morningstar Drive / NW 26th Street has been a local roadway, connecting northern Des Moines to NW 66th Avenue in Polk County, and ending there. It wasn't until the 1990's that NW 26th Street was connected to Oralabor Road in Ankeny and became a direct link between the cities. The ensuing years have also seen a large population growth in Ankeny. In 1950, Ankeny's population was 1,229. In 1960 the population more than doubled to 2,964, and by 1990 the population was 18,482. The most recent census showed a population of 45,582. As the multiple existing arterials between Ankeny and Des Moines reach capacity, additional traffic may opt for the Morningstar route to 12th Street in Des Moines, connecting to Euclid Avenue, ML King Parkway, and downtown Des Moines.

C. Traffic Estimates

Traffic history was studied to 1996, with traffic counts ranging from 2,090 VPD in 2008 (when the area was flooded, likely depressing traffic counts) to 2,570 VPD in 2004. Overall, traffic on the roadway has seen minimal growth in the past 16 years, likely because the roadway transitions into a residential street (12th Street) in Des Moines rather than an arterial roadway.

In determining bridge width and number of lanes on the replacement bridge, the no-interchange scenario is assumed.

D. Crash History

Only one minor crash is reported at this location since 2002, involving a fatigued driver running off the road into the ditch.

E. Sufficiency Ratings

The official federal bridge sufficiency rating is 55.4 and the unofficial federal bridge sufficiency rating is 54.8.

F. Access Control

Access rights will not be acquired on this project.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternate #1: Replace Bridge with 2-Span, Curved CWPG Bridge on Similar Alignment – Existing 55 mph Posted Speed

In addition to the deficient bridge, review of the site indicated deficient roadway geometry. Existing Morningstar Drive has a 764 foot radius horizontal curve immediately south of the bridge, which corresponds with a posted speed of 40 mph, on a roadway with a posted speed limit of 55 mph. The existing vertical alignment is also deficient at the bridge; the crest vertical curve has a K value of 81, which is an acceptable value for a posted speed of 45 mph. Consideration was given to the possibility of leaving the current horizontal and vertical alignments in service and simply replacing the bridge in-place. This could theoretically lessen construction costs dramatically. However, this is not feasible due to the greater beam depth that would be required for a 2-span bridge. Safety of the roadway also needs to be considered with the still significant cost of the bridge replacement. During site visits, it was noted that southbound traffic tends to drive the centerline of the bridge in order to negotiate the upcoming curve. Sight distance is a challenge, and a higher accident rate could follow any increase in traffic. It was determined that an alignment updated to the current design criteria for the posted speed should be investigated.

Alternate #1 updates the proposed horizontal alignment to a posted speed of 55 mph throughout, increasing the radius of the curve south of the bridge to 1,330 feet, at full (6%) superelevation, holding the existing tangents to the north and east. The proposed bridge will be in the curve, which also will increase the skew of the bridge relative to the interstate (skew increases along curve) to approximately 35 degrees at the south abutment.

The profile was also revised to a 55 mph posted speed, with 16.5 feet of vertical clearance over the interstate, which is assumed to have 5 lanes in each direction in the design year. Approximately 2,592 feet of the roadway alignment (inclusive of the bridge) will be reconstructed, which will require grading, paving, drainage, shoulders, and associated work.

Replace the existing 228'-9 x 24' four-span PPCB Bridge with a 311'-4 x 40' two-span curved continuous steel plate girder bridge. The bridge will be superelevated to accommodate the updated roadway geometry. The rural roadway cross section includes two 12 foot lanes with 8 foot shoulders, which is considered an "acceptable" design for an arterial roadway ("preferred" design would utilize 10 foot shoulders). All other items associated with the bridge, including approach pavement, shoulders, and guardrail will be included with the project.

ROW will be needed east of Morningstar Drive, both north and south of I-35/80, to accommodate the raised profile, widening of the shoulders to 8 feet, and updating the foreslopes to 4:1. ROW value was assumed at $12,000 per acre due to the land's tendency to flood.

Estimated Construction Cost – Alternate #1

Bridge Item	Estimated Cost
New Bridge – CWPG Bridge	$ 1,562,400
Remove Existing Bridge	45,400
Mobilization @ 10%	160,800
Contingency @ 20%	353,700
Bridge Total	**$ 2,122,300**

Roadway Item	Estimated Cost
Pavement Removal	$ 39,500
Guardrail Removal	2,600
Concrete Barrier Rail Removal	9,300
Class 10 Excavation	609,900
Steel Beam Guardrail Items	18,900
Bridge End Drains, RF-40	11,400
HMA Paving	205,300
Modified Subbase	68,900
Granular Shoulders	96,600
Bridge Approach	80,000
Culvert, 54" Concrete Roadway Pipe	12,800
Remove and Reinstall Pipe Apron	500
Special Structure	5,000
Wetland Mitigation	50,000
Traffic Control @ 5%	60,500
Mobilization @ 5%	63,600
Contingency @ 30%	400,400
Roadway Subtotal:	**$1,735,200**
ROW	18,700
Roadway Total:	**$1,753,900**

Total Combined Bridge and Roadway: $3,876,200

Alternate #2: Replace Bridge with 2-Span PPCB Bridge on Relocated Alignment

The realignment of Morningstar Drive would provide a tangent crossing with a minimal skew, which would result in a shorter bridge with better potential for future widening if development occurs in the area. The roadway could potentially be extended south in the future. The design relocated the roadway east of the existing crossing to avoid impacts to two existing residences south and west of the existing roadway, the Neil Smith Trail, and potential 4F issues along the Des Moines River immediately west of the project area. Because Morningstar Drive is posted at 45 mph and enters an urban neighborhood south and east of the project area, the relocation assumed a "transitional" facility with a 50 mph design speed north of I-35/80 and a 45 mph design speed south of I-35/80. The proposed horizontal curves will not carry superelevation transition onto the proposed bridge.

The vertical alignment was designed to provide 16.5 feet of vertical clearance over I-35/80, which is assumed to have 5 lanes in each direction in the design year. The extra vertical clearance accounts for future symmetrical widening of the bridge. Approximately 2,665 feet of the roadway alignment (inclusive of the bridge) will be reconstructed, which will require grading, paving, drainage, shoulders, and associated work.

Replace the existing 228'-9 x 24' four-span PPCB Bridge with a 290'-0 x 40' two-span PPCB Bridge, which will have an 11 degree skew relative to the interstate. The transitional roadway cross section includes two 12 foot lanes with 8 foot granular shoulders. All other items associated with the bridge, including approach pavement, shoulders, and guardrail will be included with the project.

ROW will be needed east of Morningstar Drive north and south of I-35/80. The relocation of the roadway would be designed to not interfere with existing ponds on the quarry property north of I-35/80. There might be some opportunity upon completion of construction to sell the ground the existing roadway sits on north of I-35/80, as the proposed embankment is generally outside the footprint of the existing roadway.

Estimated Construction Cost – Alternate #2

Bridge Item	Estimated Cost
New Bridge – PPCB Bridge	$ 1,201,800
Remove Existing Bridge	45,400
Mobilization @ 10%	124,700
Contingency @ 20%	274,400

Bridge Total	**$ 1,646,300**

Roadway Item	Estimated Cost
Pavement Removal	$ 40,700
Guardrail Removal	2,600
Concrete Barrier Rail Removal	9,300
Class 10 Excavation	1,151,200
Steel Beam Guardrail Items	17,900
Bridge End Drains, RF-40	11,400
HMA Paving	214,200
Modified Subbase	71,900
Granular Shoulders	100,600
Bridge Approach	69,000
Culvert, 54" Concrete Roadway Pipe	37,400
Culvert, Trenchless 54" Concrete Pipe	152,000
Aprons, 54" Concrete	9,800
Wetland Mitigation	50,000
Traffic Control @ 5%	96,900
Mobilization @ 5%	101,700
Contingency @ 30%	641,000
Roadway Subtotal:	**$2,777,600**
ROW	63,600
Roadway Total:	**$2,841,200**

Total Combined Bridge and Roadway: $4,487,500

Alternate #3: Replace Bridge with 2-Span, PPCB Bridge on Similar Alignment – 45 mph Posted Speed

Although the speed limit through the project area is 55 mph, the speed drops about a mile east to 45 mph, then drops further as the roadway enters a residential neighborhood. This alternate reduces the speed through the project area to 45 mph. This allows for a smaller, 835 foot radius horizontal curve at full (6%) superelevation, although it still results in a portion of the horizontal curve and the superelevation transition on the bridge. The lower design speed allows for use of a shorter vertical curve, but the vertical profile is still higher than existing and leads to additional fill and more extensive reconstruction than would otherwise be necessary to simply correct the horizontal geometry. To reduce fill required, a 3:1 foreslope is being assumed with this option. No ROW acquisition should be necessary with this alternate.

Replace the existing 228'-9 x 24' four-span PPCB Bridge with a 298'-2 x 40' two-span PPCB Bridge. Only a short length of the south end of the bridge is within the curve, so straight beams can be used for the full length of bridge. The bridge will be in a superelevation transition to accommodate the updated roadway geometry. The rural

roadway cross section includes two 12 foot lanes with 8 foot shoulders, which is considered an "acceptable" design for an arterial roadway ("preferred" design would utilize 10 foot shoulders). All other items associated with the bridge, including approach pavement, shoulders, and guardrail will be included with the project.

Skew on the bridge varies from 22 degrees at the north end to 25 degrees at the south end.

Estimated Construction Cost – Alternate #3

Bridge Item	Estimated Cost
New Bridge – PPCB Bridge	$ 1,301,200
Remove Existing Bridge	45,400
Mobilization @ 10%	134,700
Contingency @ 20%	296,300
Bridge Total	**$ 1,777,600**

Roadway Item	Estimated Cost
Pavement Removal	$ 36,100
Guardrail Removal	2,600
Concrete Barrier Rail Removal	9,300
Class 10 Excavation	426,400
Steel Beam Guardrail Items	17,900
Bridge End Drains, RF-40	11,400
HMA Paving	187,900
Modified Subbase	62,800
Granular Shoulders	88,400
Bridge Approach	74,100
Culvert, 54" Concrete Roadway Pipe	4,400
Remove and Reinstall Pipe Apron	500
Wetland Mitigation	50,000
Traffic Control @ 5%	48,600
Mobilization @ 5%	51,000
Contingency @ 30%	321,400
Roadway Total:	**$1,392,800**

Total Combined Bridge and Roadway: $3,170,400

B. Detour Analysis

Morningstar Drive will be closed to traffic during construction of Alternates #1 and #3. Under Alternate #2, the bridge can be constructed while the existing roadway remains open to traffic. Shorter duration closures will be necessary on Morningstar Drive to

construct tie-ins to the new alignment on the north and south ends.

Under any alternative, I-35/80 will generally remain open to traffic, except for very limited closures as necessary to demolish the existing bridge and to set beams for the proposed bridge. During these closures, through interstate traffic would be routed onto I-235.

C. Recommendations

Due to its lower construction cost while still providing an improved design over the existing roadway, Alternate #3 is recommended. It provides a 45 mph roadway on a similar alignment to the existing, but with more safety features built in, including superelevation transition and sight distance. It will also require little or no right-of-way.

D. Construction Sequence

It is anticipated that the project will be let under a single contract.

E. Program Status

Site data has been developed by Snyder & Associates, Inc. This project is listed in the 2013-2017 Iowa Highway Program with $1,258,000 programmed for construction in FY 2016. Upon approval of the Project Concept, a schedule of events will be developed.

Full Depth PCC Shoulder

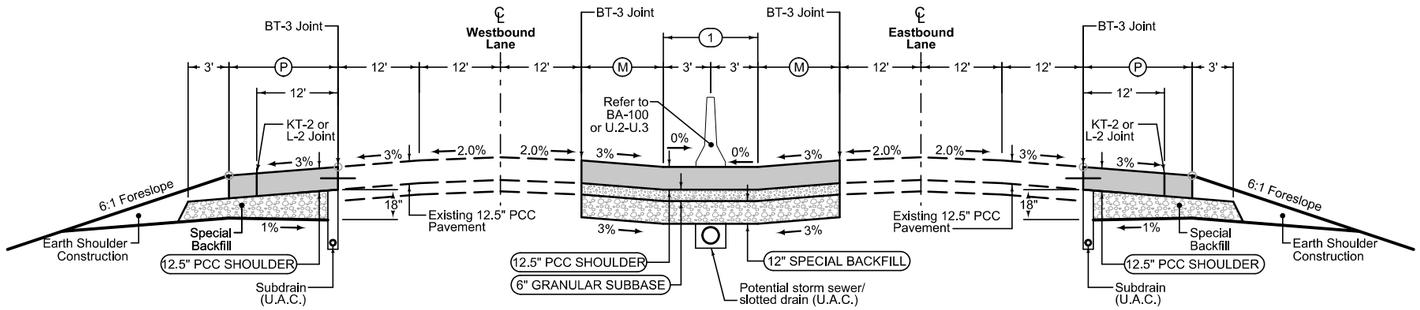
Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 20' spacing

			4_P_FullPCC_ MODIFIED
Direction of Travel	BEGIN STATION	END STATION	(P) Feet
WB	879+01.45	879+46.54	17.0
WB	879+46.54	879+99.13	17.5
WB	879+99.13	880+51.53	17.0

Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 20' spacing

			4_P_FullPCC_ MODIFIED
Direction of Travel	BEGIN STATION	END STATION	(M) Feet
B	879+67.25	880+32.75	12.0



Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 20' spacing

			4_P_FullPCC_ MODIFIED
Direction of Travel	BEGIN STATION	END STATION	(P) Feet
EB	879+49.64	880+02.07	17.0
EB	880+02.07	880+54.62	17.5
EB	880+54.62	880+99.71	17.0

(1) Refer to U sheets for details of barrier rail construction and location placement within median.

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.

Cindy A. Spencer, P.E. Date

License Number 17561

My License Renewal Date is December 31, 2014

Pages or sheets covered by this seal:

B.1-B.2, C.1, D.1-D.3, E.1, G.1-G.3, J.1-J.6, U.1-U.3, W.1-W.19, X.1-X.5.

PRELIMINARY

INTERSTATE 35/80

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	B.1

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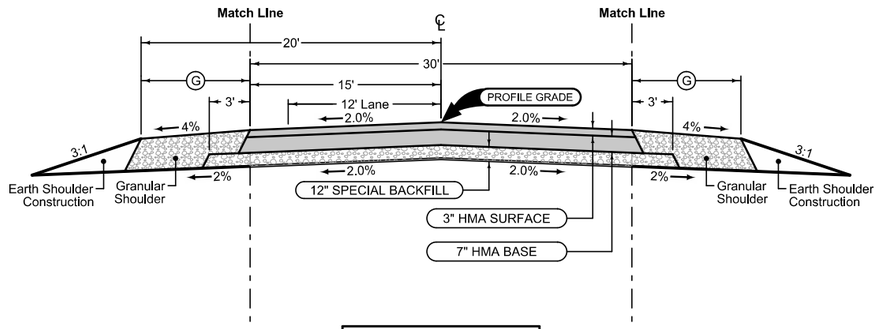
Granular Shoulder

2_G_SR_ MODIFIED		
STATION TO STATION		Ⓖ Feet
310+22.71	325+50.00	5



2H_ 10-19-10	
STATION TO STATION	
310+22.71	325+50.00

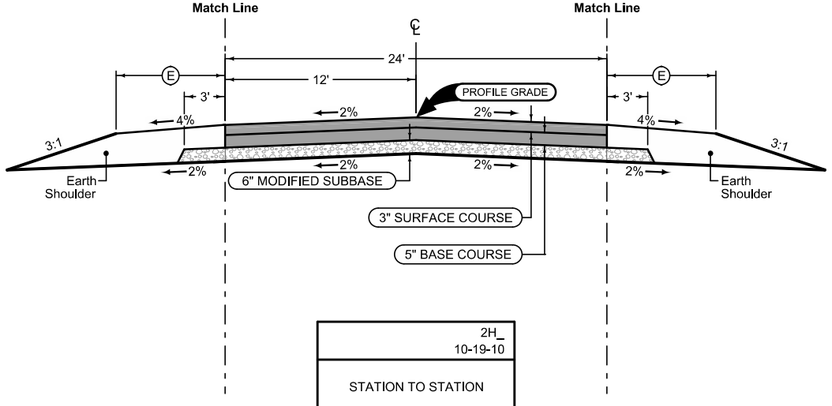
Granular Shoulder

2_G_SR_ MODIFIED		
STATION TO STATION		Ⓖ Feet
310+22.71	325+50.00	5

MORNINGSTAR DRIVE

Earth Shoulder

2_E_ 10-18-11		
STATION TO STATION		Ⓔ Feet
1314+03.91	1320+53.58	4.0



2H_ 10-19-10	
STATION TO STATION	
1314+03.91	1320+53.58

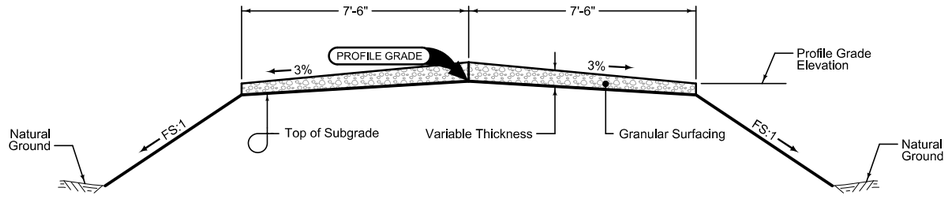
Earth Shoulder

2_E_ 10-18-11		
STATION TO STATION		Ⓔ Feet
1314+03.91	1320+53.58	4.0

ACCESS DRIVE

LOCATION			DIMENSIONS	
ROAD IDENTIFICATION	STATION TO STATION		FS	BS
Temporary Access	-	-	3	-

G_2_GradeGran
MODIFIED



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

See plan & profile sheets and cross sections for additional details of ditches and backslopes.

Place Granular Surfacing as follows:
Grading design application rate is ___ tons per mile.
Paving design application rate is ___ tons per mile.

GRADING AND GRANULAR SURFACING

TEMPORARY ACCESS DRIVE

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 SARC = Steel Arch Pipe

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 Rt.	Dike Location Station	Dike Top Elevation	Dike Type	Class 20	Flowable Mortar	Floodable* Backfill	Porous* Backfill	Flooded Backfill	Remarks
																					Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.									
ACRE			IN		LF		FT	FT	IN	OUT	No.	No.	No.	No.	No.	No.	Type	No.	Type	FT															CY	CY	(A)	(B)	(A+B)	
	881+00.00 LT	2000D	24	RCP	40	B	6.5										C-1	1	Type 2		798.89		801.87		137.8		40.0		11											R&R ex. FES
10.0	881+51.31	2000D	54	RCP	34	B			1								C-2	1	Type 2		798.82		798.57		127.7		34.0													
0.6	1314+47.46	2000D	15	RCP	108	B	8.5		1	1	2										803.07	805.50			58.1	62.1				36										

ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.
(1) Refer to MI-210
(2) Refer to EW-501.
(3) Refer to EW-501 or EW-502.
*Predetermined for access point not constructed with this project.

Location		Type	Length of Opening (1)			W	(1)(2) PR	(2) SR	Pipe Culvert (3)					Aprons	Driveway Surface Area		Driveway Surfacing Material	Remarks
Station	Side	A, B, C, Safety Ramp, or Predetermined*	Case	1½" Dropped Curb	3" Dropped Curb				H	Size	Pipe Length	Lt.	Rt.		HMA	PCC		
			1 or 2	LF	LF	FT	FT	FT	FT	IN	LF	LF	LF	No.	SY	SY	TON	
311+52.00	R	C				15.0												
312+00.00	L	C				15.0												
335+22.00	L	C				15.0												
1318+66.00	L	C				15.0												

STANDARD ROAD PLANS

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

Number	Date	Title
BA-100	04-20-10	44" Concrete Median Barrier (Full Section)
BA-101	10-21-14	44" Concrete Median Barrier Width Transition
BA-102	10-21-14	44" Concrete Barrier (Half Section)
BA-106	10-21-14	Reinforced Paved Shoulder for Concrete Barrier
BA-200	10-18-11	Steel Beam Guardrail Components
BA-201	10-20-15	Steel Beam Guardrail Barrier Transition Section
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	10-18-11	Steel Beam Guardrail End Terminal
BA-401	04-16-13	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-10	Temporary Crash Cushions Sand Barrel
BR-203	04-21-15	Double Reinforced 12" Approach
BR-213	04-21-15	Bridge Approach (Abutting Pavement)
DR-101	04-21-15	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	04-21-15	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-121	10-20-15	Connected Pipe Joints
DR-122	04-21-15	Construction of Type "C" Concrete Adaptors for Pipe Culvert Connections
DR-201	04-21-15	Concrete Aprons
DR-213	04-21-15	Pipe Apron Guard
DR-402	04-21-15	Rock Flume for Bridge End Drain
DR-601	10-20-15	Reinforced Concrete Pipe Culvert
DR-622	04-21-15	Pipe Extension Horizontal Bend One or Both Ends
EC-201	04-21-15	Silt Fence
EC-301	04-21-15	Rock Erosion Control (REC)
EW-203	04-21-15	Bridge Berm Grading with Recoverable Slope (Non-Barnroof Section)
EW-301	10-20-15	Guardrail Grading
EW-501	10-20-15	Rural Entrance
MI-101	10-20-15	Fencing Layout
MI-103	10-20-15	Deer Fence and Field Fence Construction
PM-110	04-16-13	Line Types
PM-111	04-21-15	Symbols and Legends
PV-3	10-18-11	Safety Edge
PV-12	10-20-15	Milled Shoulder Rumble Strips

105-4
10-18-11

STANDARD ROAD PLANS

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

Number	Date	Title
PV-101	04-21-15	Joints
PV-102	04-15-14	PCC Curb Details
PV-301	04-19-11	Superelevation Details Two Lane Roadway
SI-172	04-15-14	Delineators
SI-173	04-20-10	Object Markers
SI-211	10-19-10	Object Marker and Delineator Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-252	10-20-15	Routes Closed to Traffic
TC-402	04-21-15	Work Within 15 ft of Traveled Way

SECTION 404 PERMIT AND CONDITIONS

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

SURVEY SYMBOLS

- FW Wire Fence
- SI Sign
- TPD Telephone Pedestal
- SL Speed Limit Sign
- TLNL Tree Line Left
- MIS Miscellaneous
- PR Electic Riser Pole
- LIN Miscellaneous Line
- PLG Location of General Photo
- PIP Pipe Culvert
- GP Guard Post (Less Than 4 Posts)
- BB Billboard
- TVP TV Pedestal
- PPA Power Pole Co. 1
- EB Electrical Box
- TOP Top of Bridge Pier
- CUL Culvert
- TLNR Tree Line Right
- GDL Guard Rail Steel
- UB Utility Box
- BRG Bridge
- TDC Tree Deciduous
- SHR Shrub
- COR Round Bridge Pier Column
- MH Utility Access (Manhole)
- FWD Wood Fence
- LUM Luminaire
- LP L.P. Tank
- SEP Septic Tank
- FCL Chain Link and Security Fence
- OUT Tile Outlet
- D Centerline Draw or Stream (Down)
- ENU Edge Unpaved Entrance & Parking
- EP Edge of Paved Roads (ML or SR)
- ENT Centerline BL of Entrance
- DU Centerline Draw or Stream (Up)
- ENP Edge Paved Entrance & Park Lot
- SH Paved Shoulder
- CON Concrete or A/C Slab
- EG Edge of Gravel Road
- FO1C Fiber Optic Co. 1 - Quality C
- PRO Profile Shot
- BLS Bridge Low Steel
- BD Bridge Deck
- BCL Bridge Centerline
- SBR Size of Bridge

UTILITY LEGEND

- MidAmerican Energy
- MidAmerican Energy
- FO(C) - INS Fiber Optic - Quality C

UTILITY CONTACTS

(DWW) DES MOINES WATER WORKS
Contact Name : Jana Hodges or Chris Mlynarik
Contact Phone: 5152838729
Contact Email: hodges@dmww.com or Mlynarik@dmww.com

(ICN) IOWA COMMUNICATIONS NETWORK
Contact Name : Joel Schroeder
Contact Phone: 8002891901
Contact Email: locate.desk@windstream.com

(INS) IOWA NETWORK SERVICES
Contact Name : Jeff Klocko
Contact Phone: 5158300445
Contact Email: jeff@netins.com

(M57E) MIDAMER-ELEC
Contact Name : Craig Ranfeld
Contact Phone: 5152526632
Contact Email: MECDSMDesignLocates@midamerican.com

(M57G) MIDAMER-GAS
Contact Name : Craig Ranfeld
Contact Phone: 5152526632
Contact Email: MECDSMDesignLocates@midamerican.com

(US4) CTLQL-CENTURYLINK
Contact Name : Tom Sturmer
Contact Phone: 3036648090
Contact Email: Thomas.sturmer@centurylink.com

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
- Survey Line
- Station
- 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 & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	D.1

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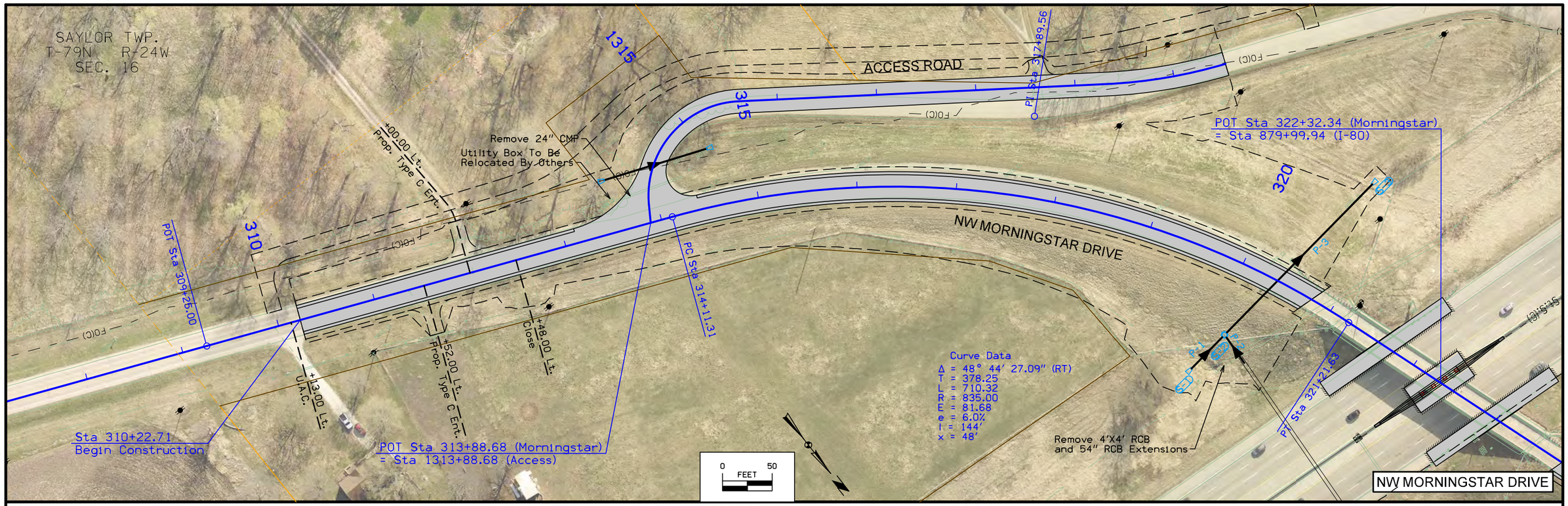
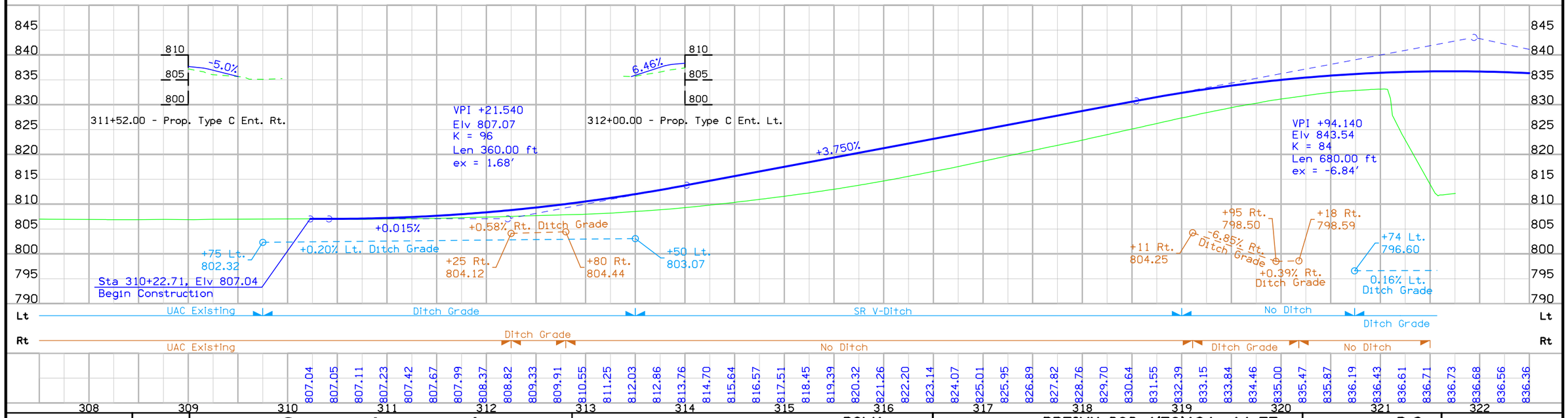


C= 862 CY
F+30%=18,807 CY
-17,945 CY

+53.88

C= 3,556 CY
F+30%=6,162 CY
-2,606 CY



FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	D.2

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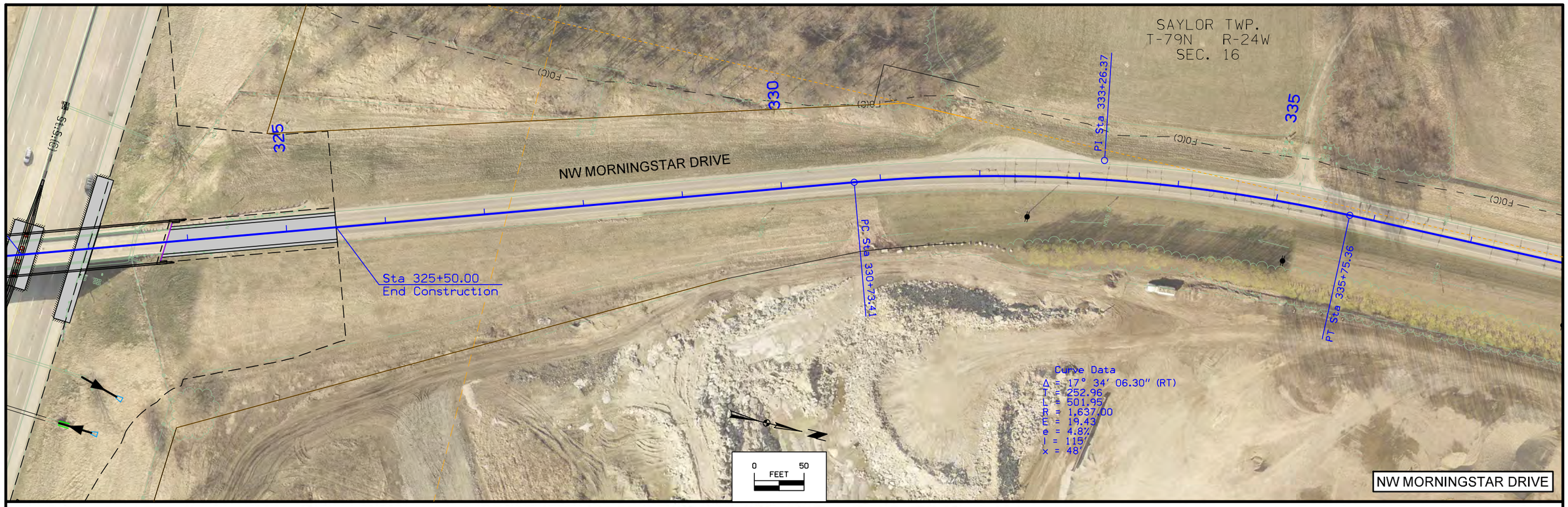
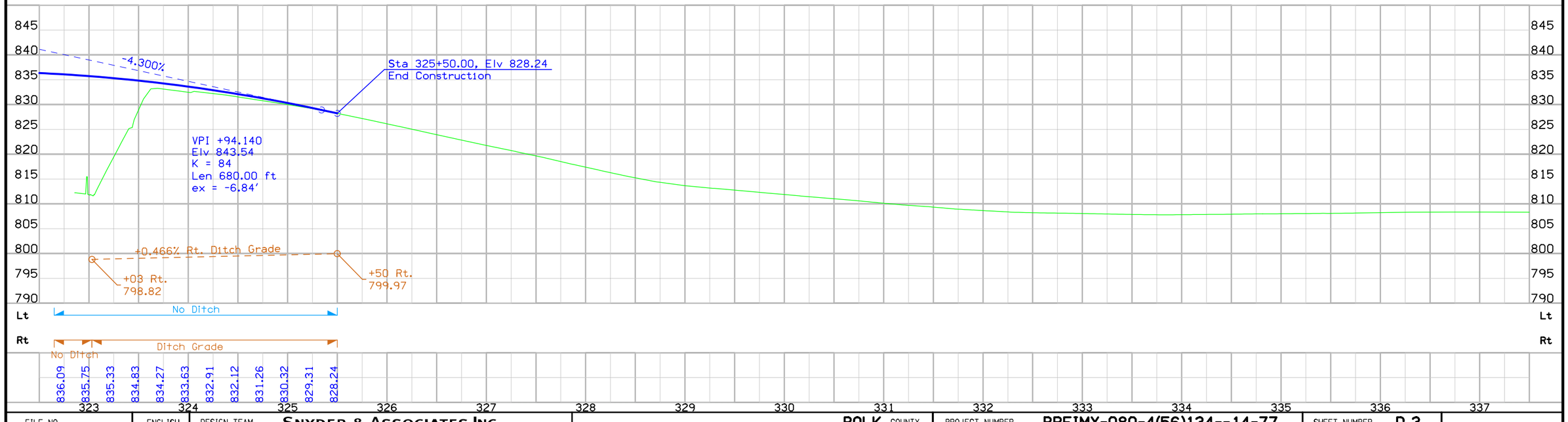


+00.36

C= 238 CY
F+30%=833 CY
-645 CY



FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	D.3

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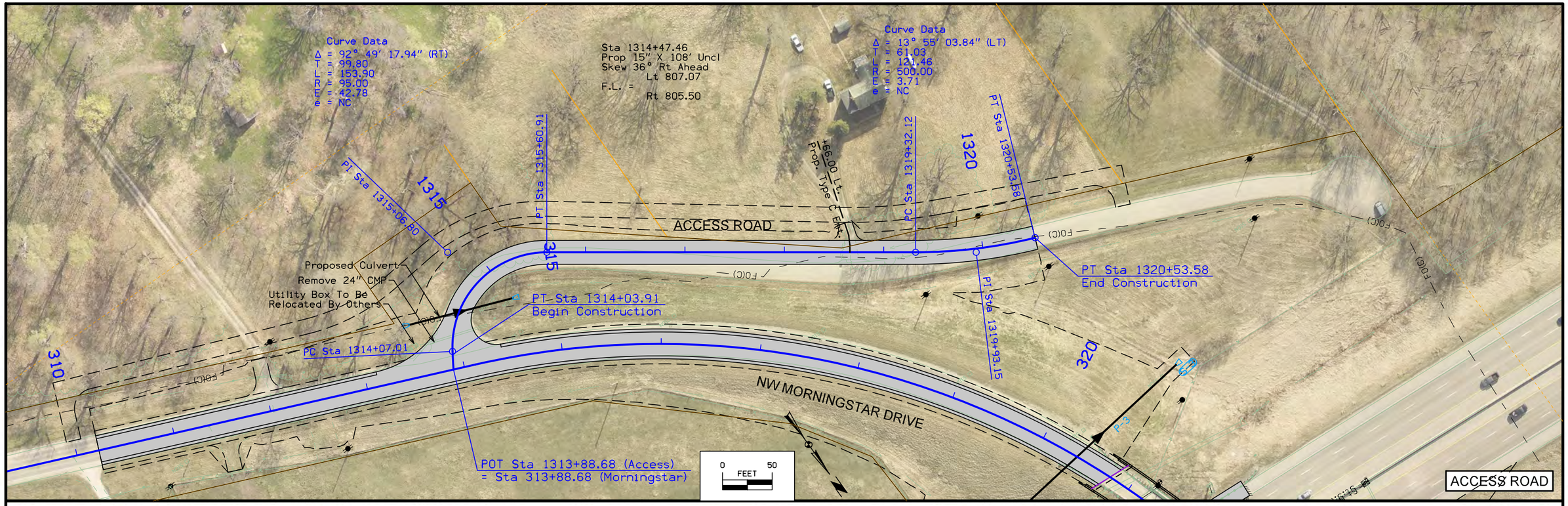
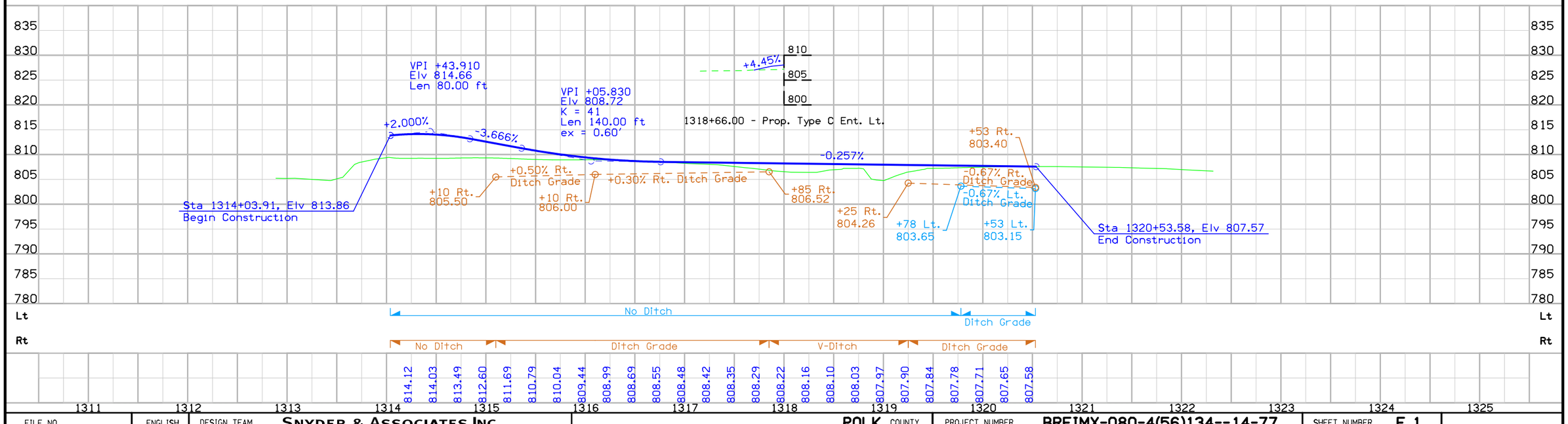


C= 729 CY
F+30%= 1,537 CY
-808 CY



FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	E.1

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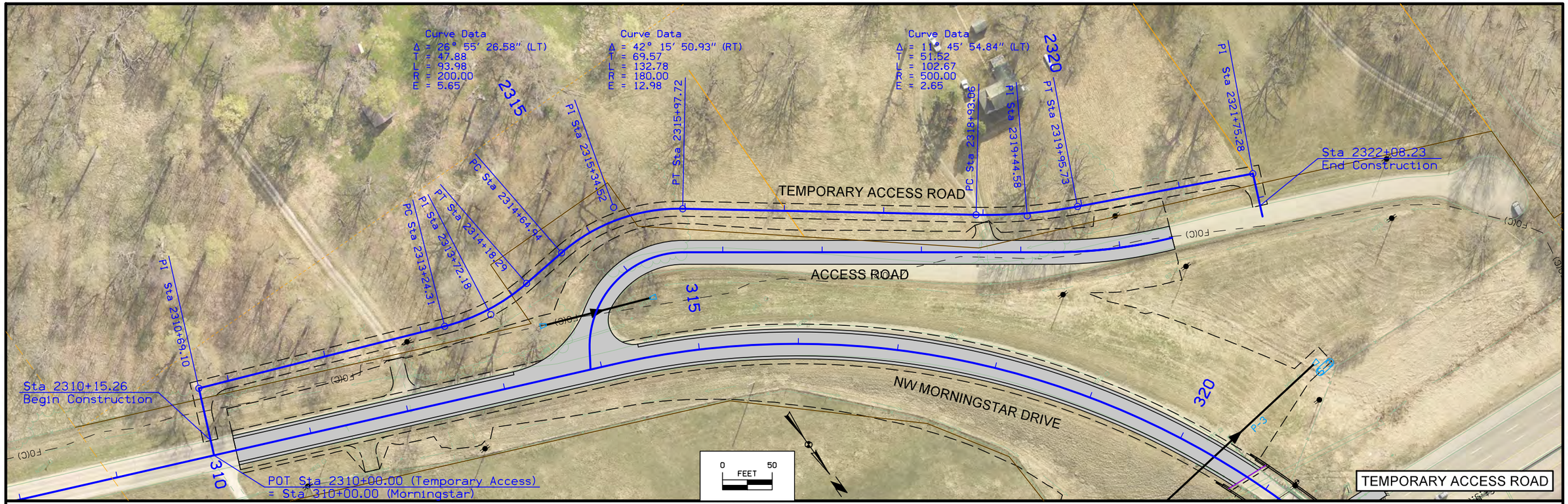

Profile of Temporary Access Road to Follow Existing Ground.

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	F.1

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Survey Information

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction of the Morningstar bridge over I-80. Project datum and control information is provided by Design Survey Office. This project is a complete field survey for the digital terrain model.

Vertical Control

Vertical datum for this survey is relative to NAVD88.

Vertical control from Project IM-35-3(115)85--13-77was converted from metric to NAVD88. A digital level loop was run from BM #523 (IR-35-2(204)73—12-77) through the project benchmarks and returned to BM #523. The loop error was allowable and the error was distributed proportionately among the project bench marks.

Vertical equations are as follows:

Datum Benchmark
This survey observed two (2) As-Built plan bench marks to compare to local ground control:

BM 523 Project IM-35-3(115)85--13-77 Elev. 804.11 NAVD88 (245.052m NGVD29)
Survey Elev. = 804.109

BM 522 Project IM-35-3(115)85--13-77Elev. 801.876 NAVD88 (244.371m NGVD29)
Survey Elev. = 801.876

Horizontal Control

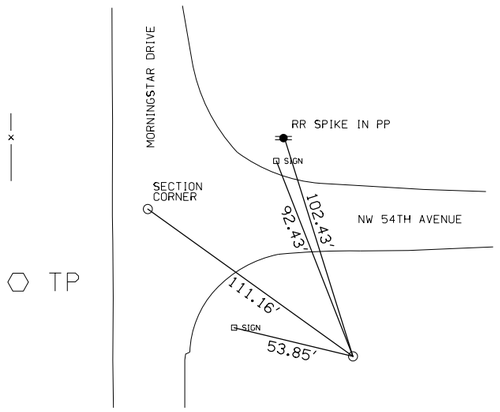
A one-step coordinate system was created using control provided by the Design Survey Office. Control matches the control used for Project IM-35-3(115)85--13-77. The original control is published in metric, but converted to US survey feet for this project.

Alignment Information

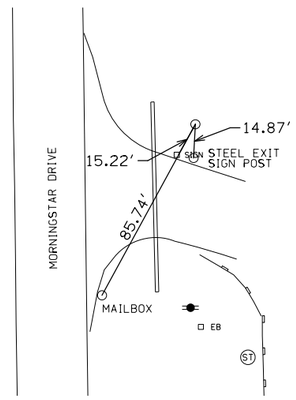
The horizontal alignment for this survey is a retrace of As-Built Plans IM-35-3(72)81—13-77 for Interstate 80/35 (metric) and 35-3-(3)77 (English) was reviewed for this survey. Survey stationing was equated to the plan at Sta. 880+00 at the intersection of I-80 and NW Morningstar Drive and run back and ahead without equation throughout the survey.

Geopak Alignment Chains created:
SUR_I80 I 80 Mainline
SUR_MORN Morningstar Drive

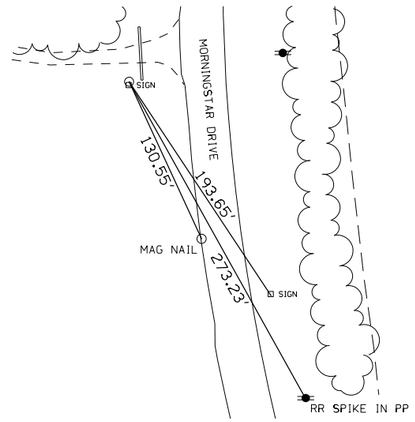
C.P. STA. 875+29.85, LT. 3029.231 I-80
C.P. 9, FND 1/2" REBAR
N=604289.665, E=1598408.679



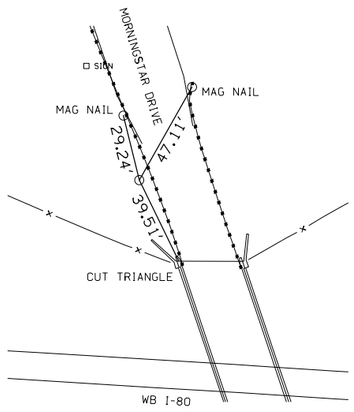
C.P. STA. 875+62.66, LT. 2215.47 I-80
C.P. 10, FND 1/2" REBAR
N=603475.422, E=1598391.587



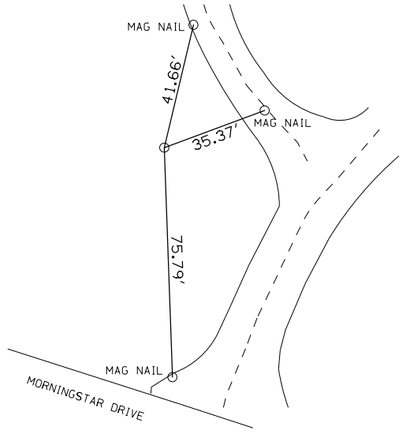
C.P. STA. 335+02.37, LT. 58.38
C.P. 11, FND 1/2" REBAR
N=602450.882, E=1598284.464



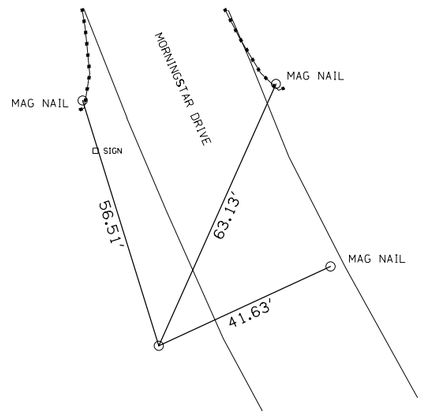
C.P. STA. 323+90.91, LT. 18.30
C.P. 12, FND 1/2" REBAR
N=601381.835, E=1598624.542



C.P. STA. 904+23.61, RT. 1103.91 I-80
C.P. 16, FND 1/2" REBAR
N=599987.041, E=1601043.855



C.P. STA. 319+88.24, LT. 32.85
C.P. 100, SET 1/2" REBAR WITH RED CAP
N=600994.568, E=1598750.848



VERTICAL CONTROL

Point	North	East	Elevation	Station	Offset	Feature	Description
BM1	602212.197	1598417.440	804.496	332+48.67	40.464	BM	FND RR SPIKE
BM3	604387.377	1598377.959	807.906			BM	FND RR SPIKE
BM523	601313.810	1598848.540	804.109	322+55.14	172.405	BM	FND IHC INLET HD.RCB LEFT
BM600	599896.990	1601712.975	802.096			BM	FND RR SPIKE
BM601	600474.450	1599706.836	805.481	308+81.69	55.350	BM	FND RR SPIKE
BM602	601346.327	1598641.878	836.356	323+51.73	-13.166	BM	FND CUT TRIANGLE

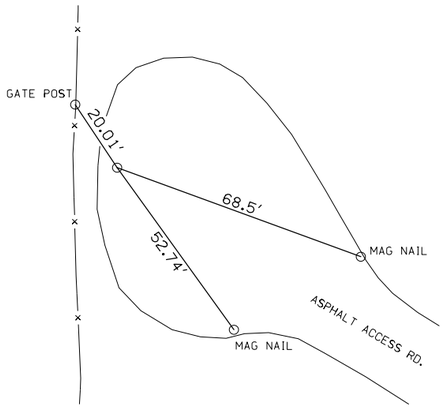
SURVEY SYMBOLS

- FW Wire Fence
- SI Sign
- TPD Telephone Pedestal
- SL Speed Limit Sign
- TLNL Tree Line Left
- MIS Miscellaneous
- PR Electic Riser Pole
- LIN Miscellaneous Line
- PLG Location of General Photo
- PIP Pipe Culvert
- GP Guard Post (Less Than 4 Posts)
- BB Billboard
- TVP TV Pedestal
- PPA Power Pole Co. 1
- EB Electrical Box
- TOP Top of Bridge Pier
- CUL Culvert
- TLNR Tree Line Right
- GDL Guard Rail Steel
- UB Utility Box
- BRG Bridge
- TDC Tree Deciduous
- SHR Shrub
- COR Round Bridge Pier Column
- MH Utility Access (Manhole)
- FWD Wood Fence
- LUM Luminaire
- LP L.P. Tank
- SEP Septic Tank
- FCL Chain Link and Security Fence
- OUT Tile Outlet
- D Centerline Draw or Stream (Down)
- ENU Edge Unpaved Entrance & Parking
- EP Edge of Paved Roads (ML or SR)
- ENT Centerline BL of Entrance
- DU Centerline Draw or Stream (Up)
- ENP Edge Paved Entrance & Park Lot
- SH Paved Shoulder
- CON Concrete or A/C Slab
- EG Edge of Gravel Road
- FO(C) - FO1C Fiber Optic Co. 1 - Quality C
- PRO Profile Shot
- BLS Bridge Low Steel
- BD Bridge Deck
- BCL Bridge Centerline
- SBR Size of Bridge

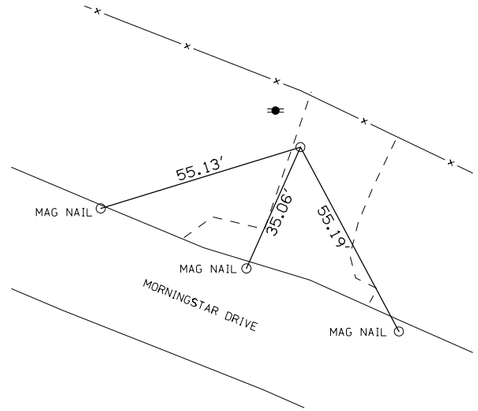
UTILITY LEGEND

- MidAmerican Energy
- MidAmerican Energy
- FO(C) - INS Fiber Optic - Quality C

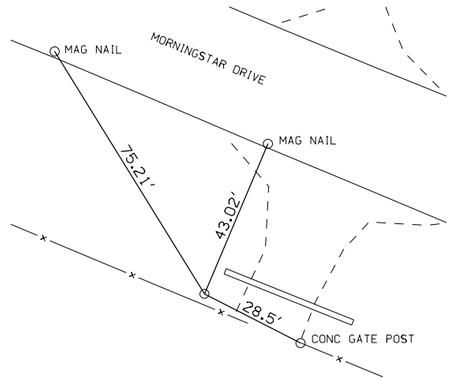
C.P. STA. 321+23.40, LT. 397.12
C.P. 101, SET MAG NAIL
N=601007.681, E=1598350.542



C.P. STA. 312+57.75, RT. 47.86
C.P. 102, SET 1/2" REBAR WITH RED CAP
N=600612.679, E=1599357.027



C.P. STA. 302+71.94, LT. 55.65
C.P. 103, SET 1/2" REBAR WITH RED CAP
N=600136.706, E=1600226.496



C ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER G.3

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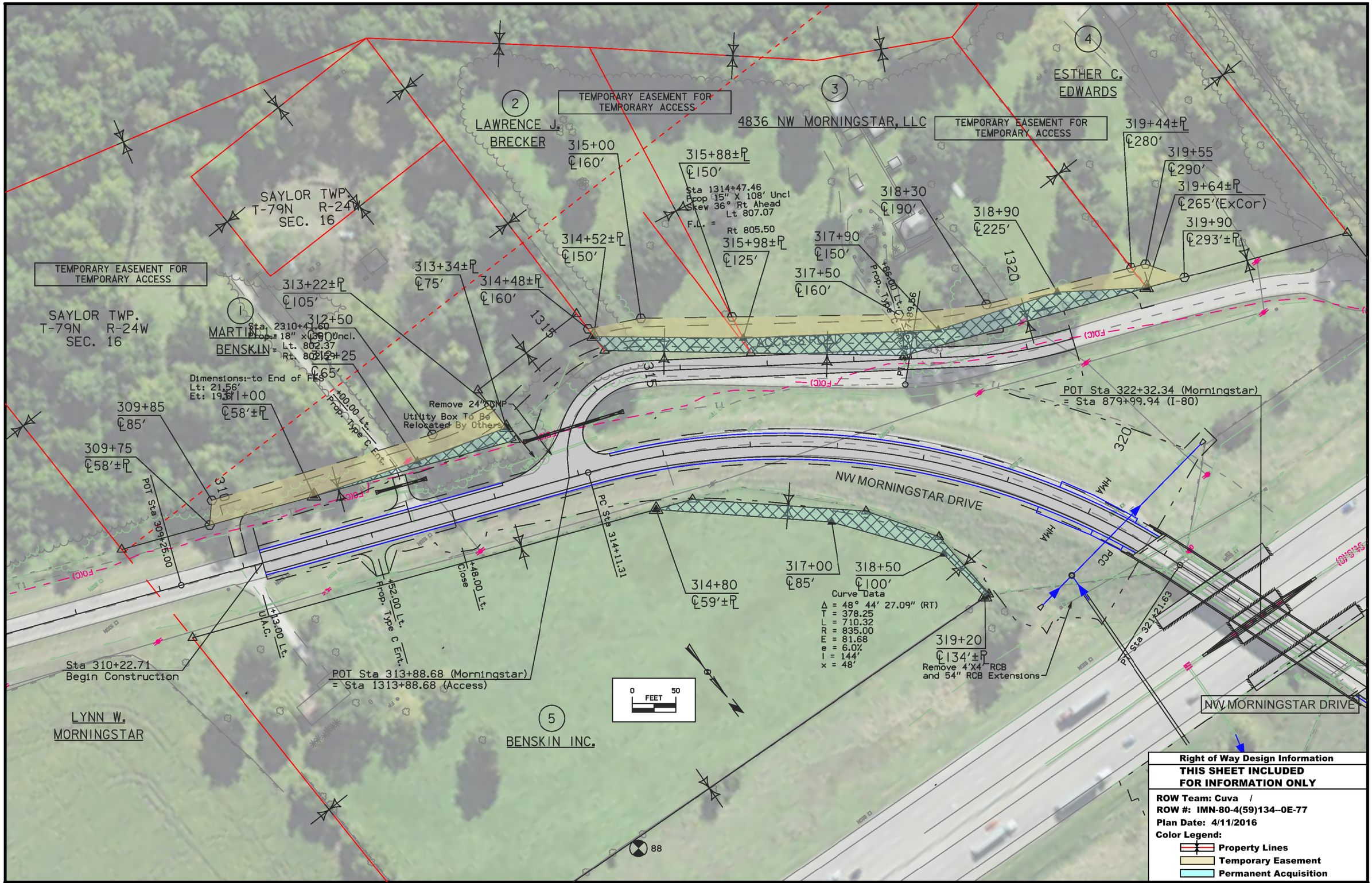

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: Cuva /
ROW #: IMN-80-4(59)134--0E-77
Plan Date: 4/11/2016
Color Legend:
- Property Lines
- Temporary Easement
- Permanent Acquisition

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	H.1

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108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. Morningstar Drive will be closed to traffic during construction. Traffic will follow the marked detour shown in the J Sheets.
2. Access to local properties will be maintained throughout construction. When it is necessary to close the access road near Sta. 314+00 LT, a temporary accessway will be made available for use.
2. Limited closures will be necessary on I-35/80 for removal of existing bridge and for setting of beams. A detour route has been established on Sheet J.6. Contractor will be responsible for installing, maintaining, and removing detour signage, including uncovering and re-covering detour signs as necessary. Closures will be short-term and restricted to off-peak travel hours (12:00 AM to 6:00 AM). Notify the Engineer at least 72 hours in advance of the proposed closure; the Engineer has final approval of proposed time and duration of closure. Use Standard Road Plan TC-454 to transition traffic off the Interstate only at Merle Hay Road and at U.S. 69; use existing traffic signals at base of ramps in lieu of flaggers shown in details.
4. All lanes of I-35/80 will remain open to traffic at all other times. Shoulder closures with lane shifts will be required. Refer to Sheets J.3 and J.4 for additional information.

108-26A
08-01-08

STAGING NOTES

1. Erect detour signage and interstate barrier rail prior to beginning construction.
2. Construct bridge.
3. Remove detour signage and traffic control upon completion of bridge.

I-35/80 Staging:
Staged construction of work on the interstate will be necessary in order to maintain a minimum of 40.0 feet between temporary barrier rail installations (3 lanes plus 2 feet shy distance each side). Staged work may mean that the median pier and abutment are worked on at separate times, or that a limited work area may be available at either location for a time. Sequencing of construction and determination of staging on the interstate is at the discretion of the Contractor.

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 Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

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
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

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

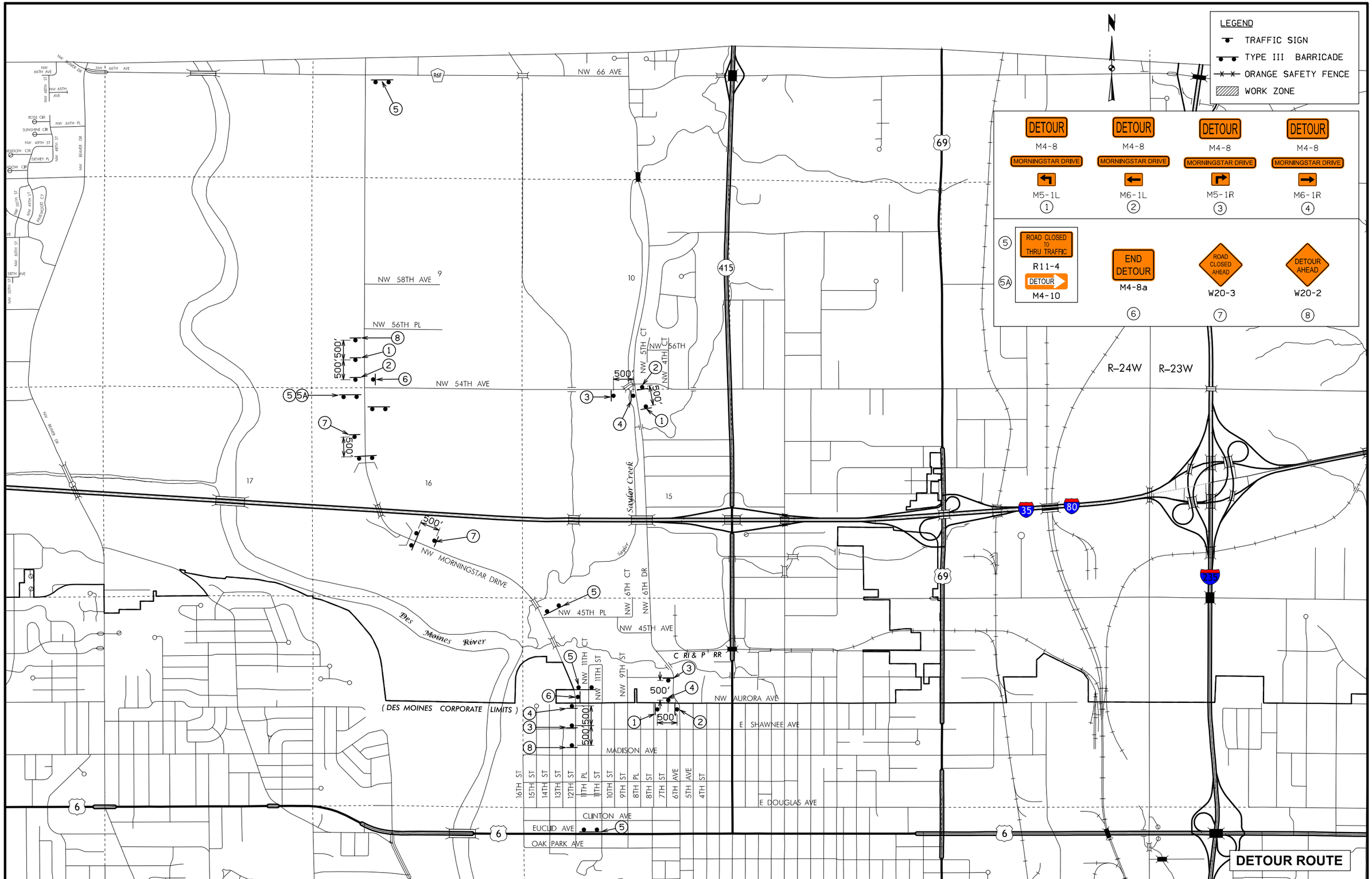
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

●	Channelizing Device		Crash Cushion (Temp or Perm)
×	Drum		Traffic Signal
◘	Temporary Lane Separator		Flagger
◆	Tubular Marker		Temporary Floodlighting
♦	Channelizer Marker		Traffic Sign
△	Concrete Barrier Marker		Type III Barricade
ς	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout		

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

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)



FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	J.3

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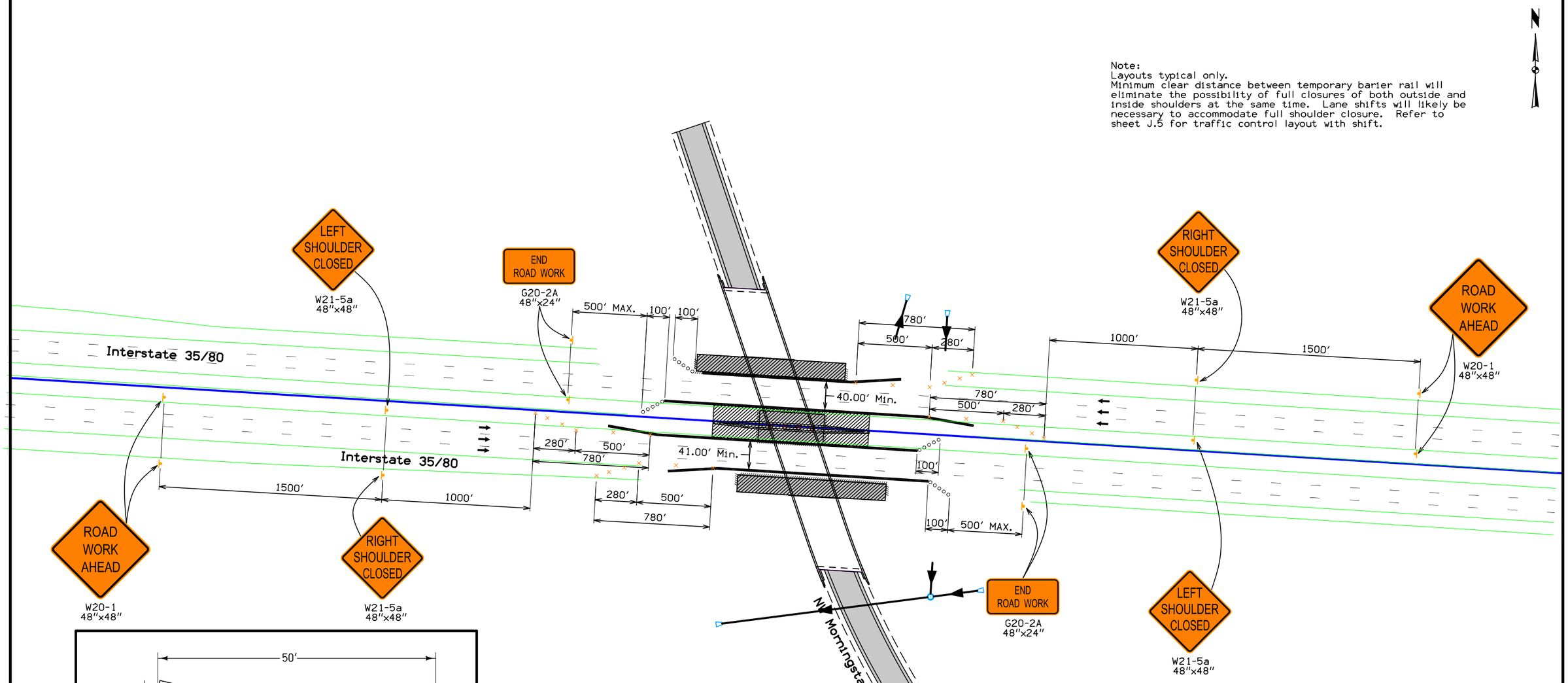
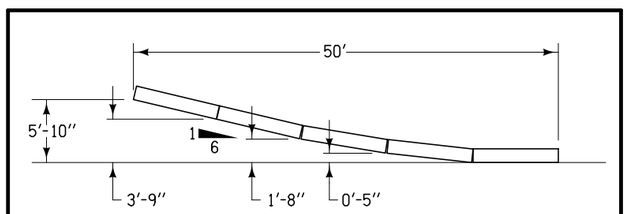
Note:
Layouts typical only.
Minimum clear distance between temporary barrier rail will eliminate the possibility of full closures of both outside and inside shoulders at the same time. Lane shifts will likely be necessary to accommodate full shoulder closure. Refer to sheet J.5 for traffic control layout with shift.





TEMPORARY CONCRETE BARRIER OFFSETS FOR FLARE SECTIONS (APPROACH END ONLY)

LEGEND
- Work Zone
- Temporary Crash Cushion
- Sign
- Channelizing device (42")
- Drum (Spacing = 65 feet)

TRAFFIC CONTROL LAYOUT
I-35/80 - NO SHIFT

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	J.4

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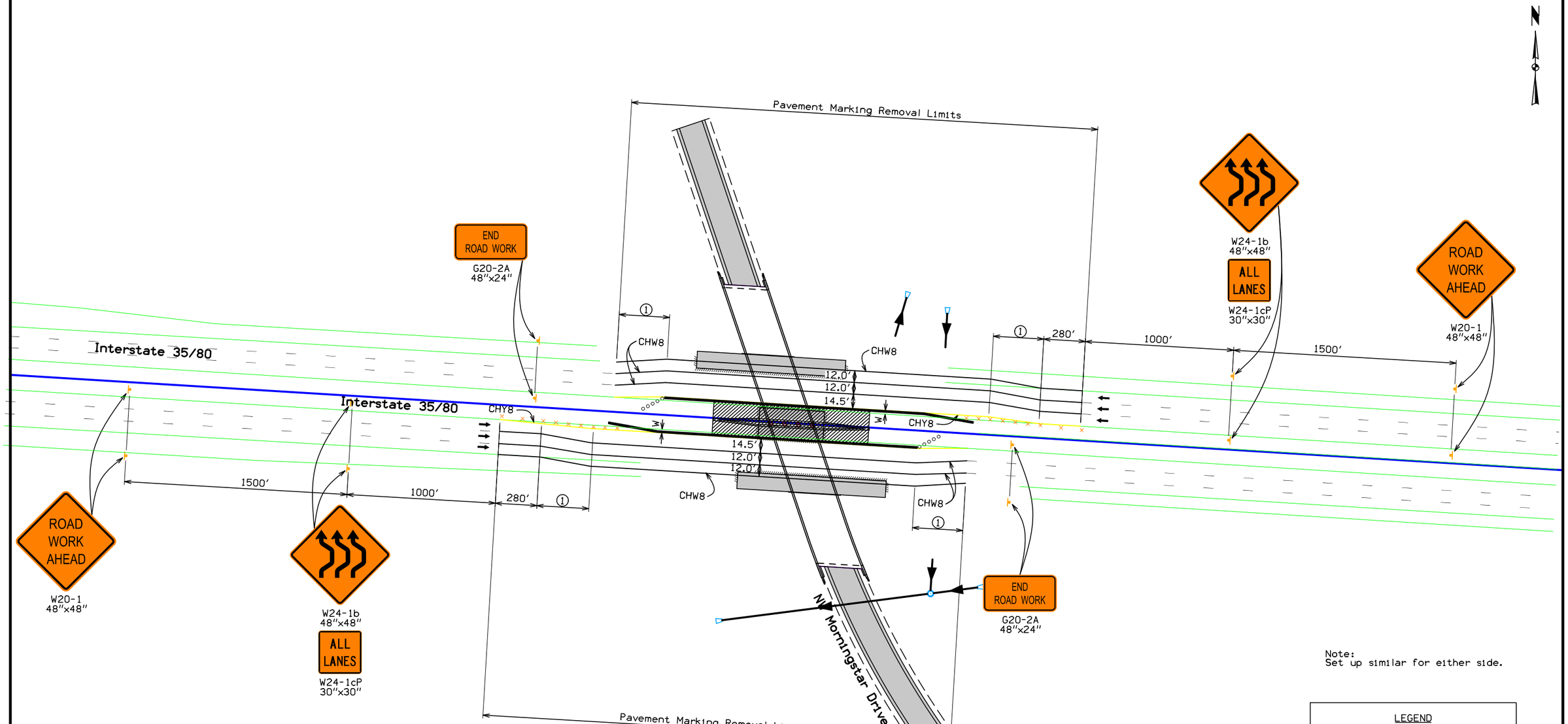

Note:
Set up similar for either side.

① 200 ft or 49(W), whichever is greater, where w=largest shift dimension.

When a temporary lane shift is necessary:

1. Place solid white line (CHW8) between all lanes and on the outside of the inside lane throughout the shifted area. Also place a yellow lane line (CHY8) on median side through this area.
2. Install sign W1-4 1000 ft prior to shift on both shoulders.

LEGEND

- Work Zone
- Temporary Crash Cushion
- Sign
- Channelizing device (42")
- Drum (Spacing = 65 feet)

TRAFFIC CONTROL LAYOUT
I-35/80 - TYPICAL SHIFT

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	J.5

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REFER TO J.1 AND STANDARD ROAD PLAN TC-451 FOR ADDITIONAL INFORMATION.

LEGEND

TRAFFIC SIGN

1 DETOUR NORTH EAST — INTERSTATE 35 INTERSTATE 80

2 DETOUR NORTH EAST — INTERSTATE 35 INTERSTATE 80

3 DETOUR NORTH EAST — INTERSTATE 35 INTERSTATE 80

4 DETOUR SOUTH WEST — INTERSTATE 35 INTERSTATE 80

5 DETOUR SOUTH WEST — INTERSTATE 35 INTERSTATE 80

6 DETOUR SOUTH WEST — INTERSTATE 35 INTERSTATE 80

INTERSTATE CLOSURE DETOUR ROUTE

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER J.6

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STORM SEWER

* Bid Item
** For SW-545

For bedding and backfill purposes under Primary roads, use material complying with Article 4120.04 (Class A Crushed Stone) of the Standard Specifications for all bedding and backfill. Place and compact the material according to Article 2435.03, A and Article 2552.03, E (Class I materials).

INTAKES AND UTILITY ACCESSES

No.	Location Station and Offset	*Type or Standard Road Plan	Form Grade Elev.	Bottom Well Elev.	Extension Length** FT	Notes
1	319+94.20, 123.4'R	DR-201				
2	320+14.35, 72.6'R	SW-404	816.39	796.97		
3	320+74.23, 136.8'L	DR-201				

PIPES

Design Length, Slope, and Flowlines are calculated from inside wall to inside wall along CL of pipe. An additional 6 ft length is added to Design Length to account for estimated length to center of structures.

Line Number	Intake/ Utility Access No. From	To	Class 'D'	Pipe Diameter IN	Bid* Length FT	Design Length FT	Slope %	Flow Lines Inlet Elevation	Outlet Elevation	Other Elevation	Pipe Profile Sheet No.	Notes
P1	1	2	3000D	24	47	53.1	0.4	798.50	798.29			
P2	Ex	2	2000D	54	28	28	0.85		797.56	797.80		Verify flowlines in field
P3	2	3	3750D	54	210	218	0.4	797.47	796.60			

Sta 881+00.00 Lt
Prop 24" X 46.0' 2000D RCP Extension
Skew = 11° Lt Ahead
Lt 798.89
F.L. =
Other 801.87

Sta 881+51.31 Lt
Prop 54" X 34.0' 2000D RCP Extension
With Type C-2 Connection and FES
Lt 798.82
F.L. =
Other 798.57

Protect Pipe

Sta 879+01.45
66.40' Lt.

Remove
Barrier Rail

Sta 880+51.53
66.30' Lt.

Remove
Guardrail

Remove
Existing Headwall

0 FEET 20

F.O.(C)

877 878 879 880 881 882 883

St.S.(C)
St.S.(C)

Remove
Guardrail

Sta 879+49.64
69.69' Lt.

Remove
Barrier Rail

Sta 880+99.71
69.47' Lt.

S-1 S-2 S-3 P-1 P-3

Notes:

1. Refer to Standard Road Plan EW-204 for additional information on outside shoulder reconstruction.
2. Refer to BA-101 and BA-102 for median barrier reconstruction information.

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	U.1

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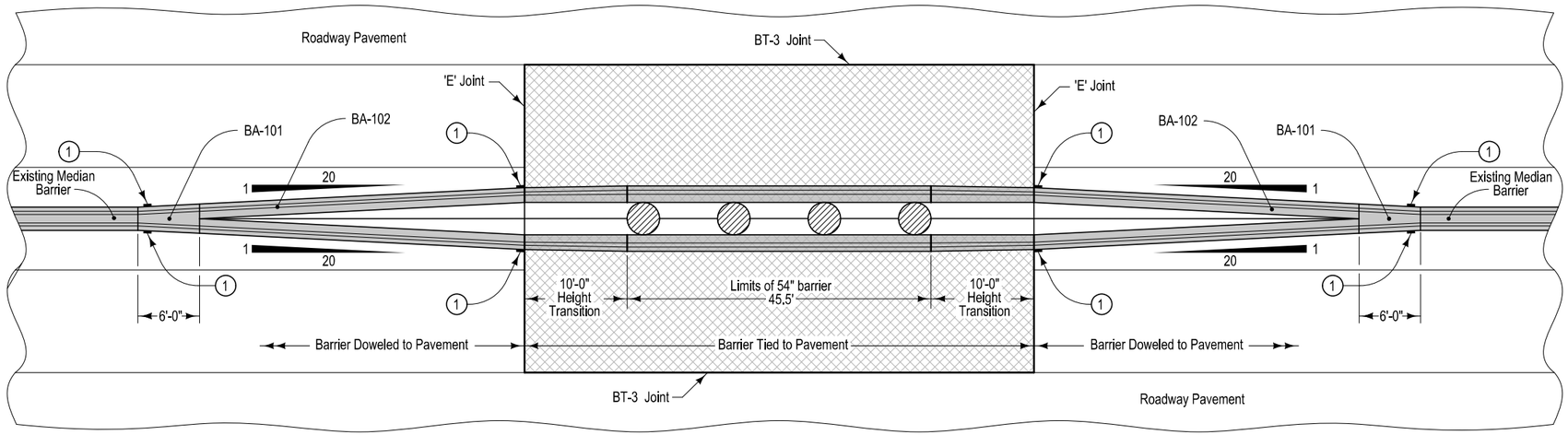


Reinforced Paved Shoulder
Refer to BA-106

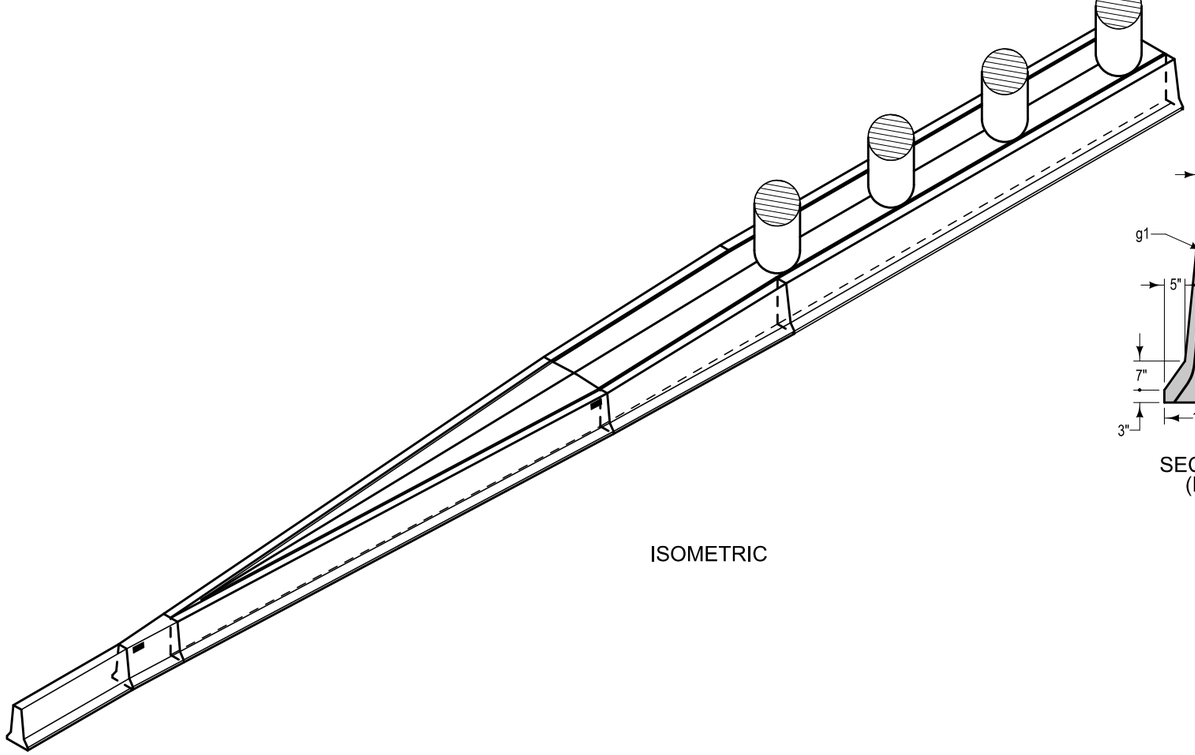
PLAN

Use Grade 60 epoxy-coated reinforcing bars. Provide 2 inches minimum cover. Anchor all reinforcement to prevent movement. Secure each section at the front, back, and at 3'-6" intervals using a method approved by the Engineer.

Possible Contract Items:

1. Concrete Barrier, 54", as per plan
2. Concrete Barrier, Transition Section
3. Concrete Barrier, BA-101
4. Concrete Barrier, BA-102
5. Granular Backfill
6. Reinforced Paved Shoulder
7. Crushed Red Brick

(1) Barrier Markers



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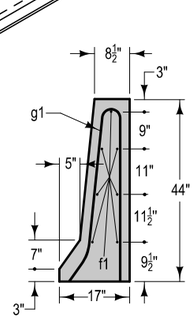
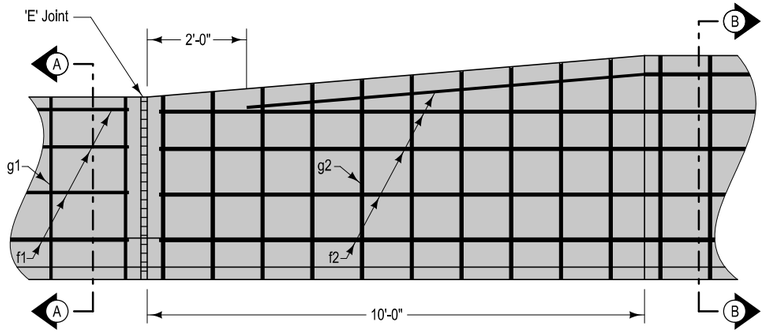
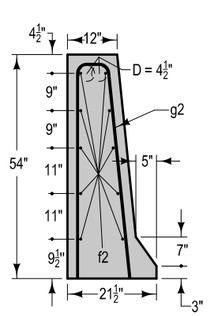


SECTION A-A
(BA-102)



ELEVATION



SECTION B-B

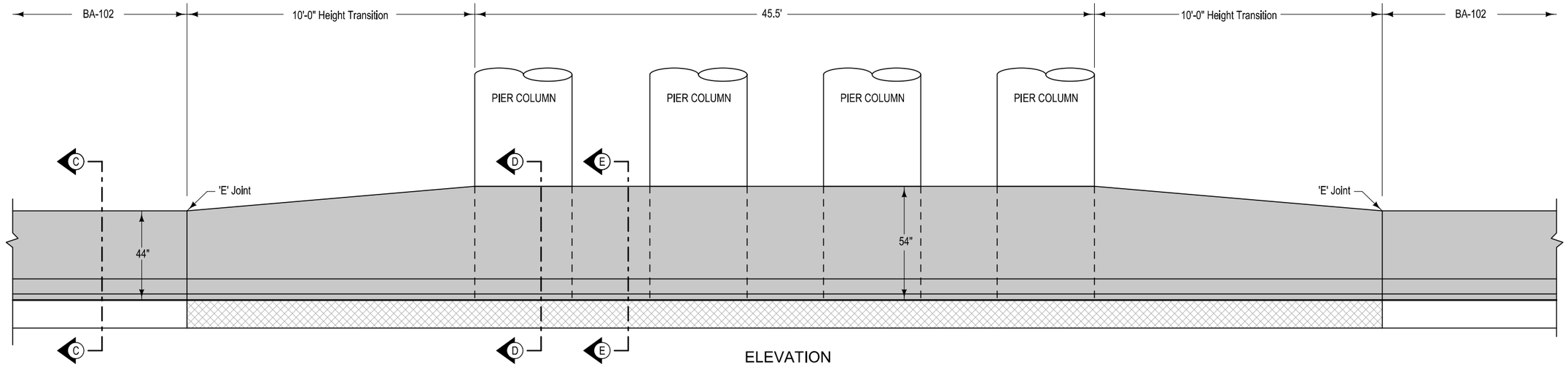
HEIGHT TRANSITION

REINFORCING BAR LIST		
Bar	Size	Spacing
f1	5	—
f2	6	—
g1	5	18"
g2	6	12"

Refer to Standard Road Plans BA-100, BA-101, BA-102 and BA-106 for additional concrete barrier details.

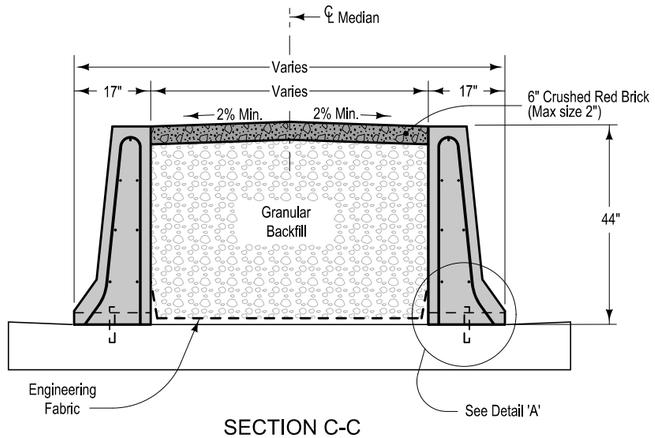
CONCRETE BARRIER AT BRIDGE PIERS

(SHEET 1 OF 2)

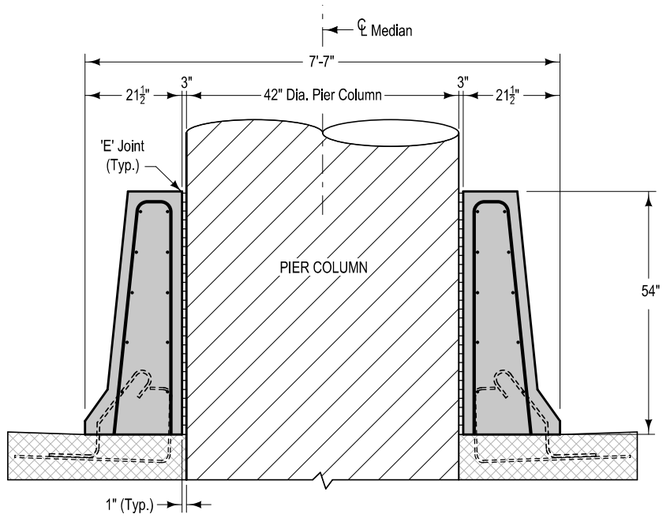


ELEVATION

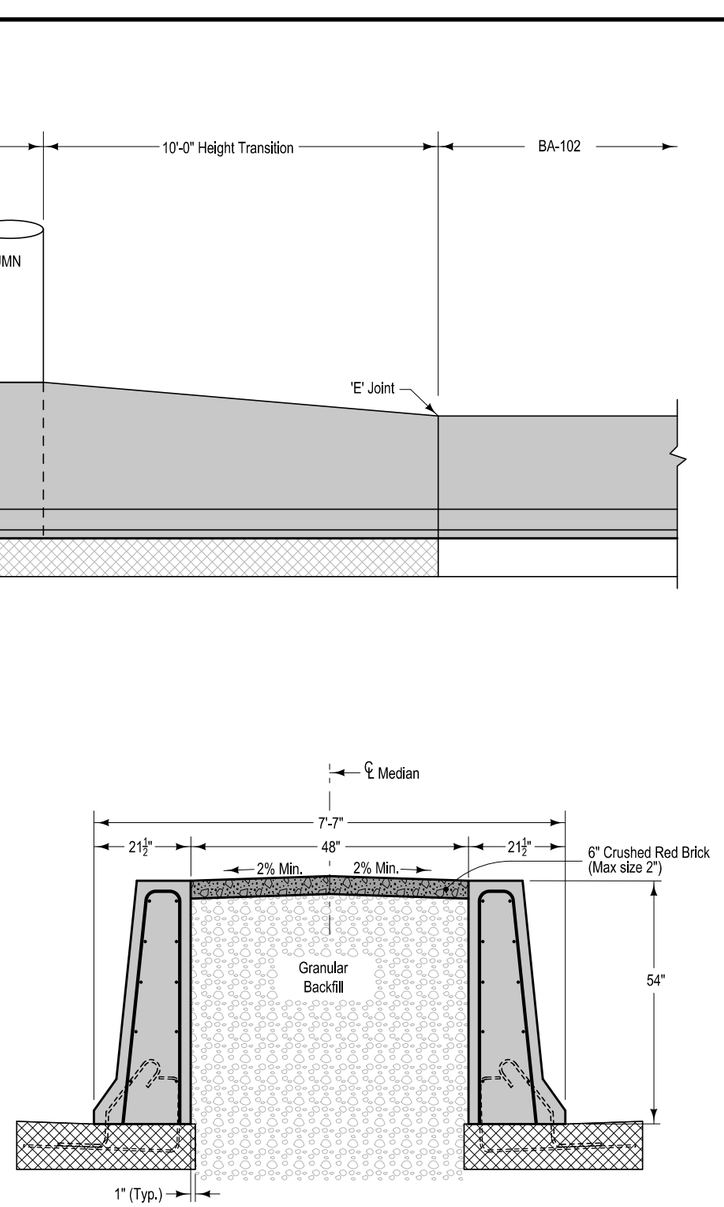
Reinforced Paved Shoulder
Refer to BA-106



SECTION C-C



SECTION D-D



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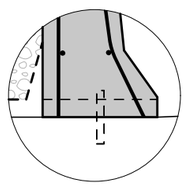


DETAIL 'A'

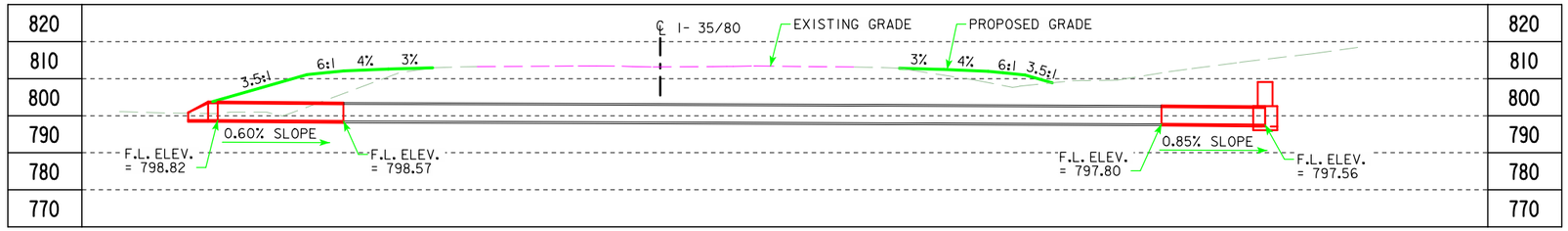
3" Weep Hole (2)

(2) Construct weep holes from 3 inch diameter PVC pipe. Maximum spacing between weep holes is 20 feet. However, keep holes at least 5 feet from any transverse joints. Cover interior of weep holes with copper screening or galvanized hardware cloth. Attach engineering fabric at least 6 inches above top of weep holes in a manner approved by the engineer. The cost of supplying and installing weep holes, engineering fabric, and screening will be considered incidental to concrete barrier items.

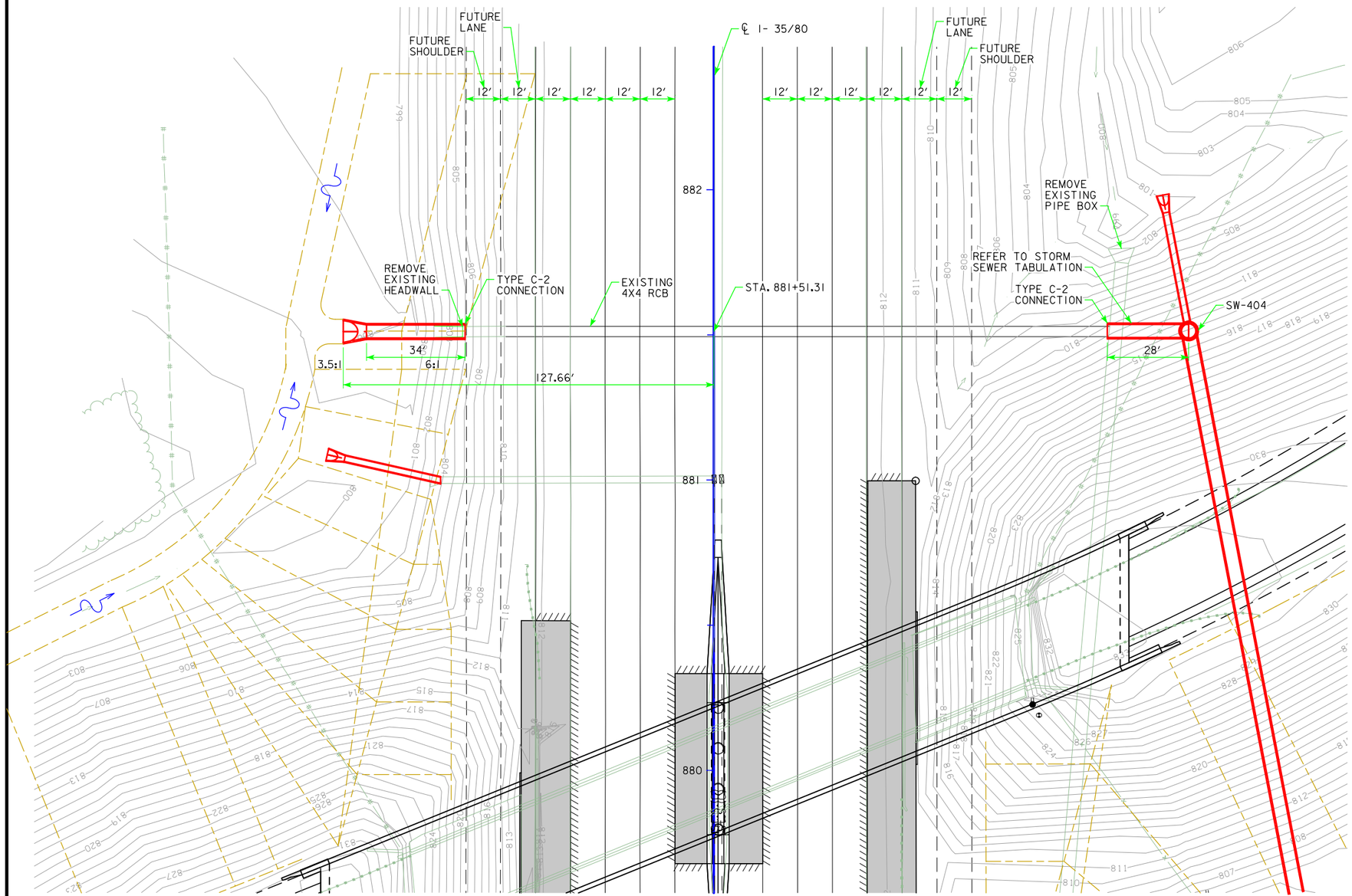
NOTE: Do not construct weep holes in areas of reinforced paved shoulder.

CONCRETE BARRIER AT BRIDGE PIERS

(SHEET 2 OF 2)



LONGITUDINAL SECTION ALONG ℄ CULVERT



PLAT PLAN

BENCH MARK NO.602, ELEV. 836.356, STA. 323+51.73, 13.166 LT, FND CUT TRIANGLE

0 20 FEET

HYDRAULIC DATA

DRAINAGE AREA = 9.84 ACRES FLAT
DESIGN DISCHARGE, Q_{50}= 16.55 cfs

UTILITIES LEGEND:

REFER TO SHEET D.1

LOCATION

I-35/80
T-79N R-24W
SECTION 16
SAYLOR TOWNSHIP
POLK COUNTY

DESIGN FOR 0° SKEW

54" X 34′ AND 54" X 28′ REINFORCED CONCRETE PIPE EXTENSIONS PLAT PLAN

STA. 881+51.31 ℄ I-35/80 AUGUST 2015

POLK COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	V.1

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LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- Additional Topsoil Removal
- Subgrade 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)

- TS — Topsoil (Class 10)
- SLOPE DRESSING — Slope Dressing Only
- CL 10 — Class 10 Materials
- SEL LO — Select Loams And Clay-Loams
- SEL SA — Select Sand
- UNS A — Unsuitable Type A Disposal
- UNS B — Unsuitable Type B Disposal
- UNS C — Unsuitable Type C Disposal
- SHALE — Shale
- WASTE — Waste
- B&W LS — Broken and Weathered Rock
- ROCK — Solid Rock
- BLDRS — 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 ROW — Existing Right-of-Way Limit

Proposed ROW — Proposed Right-of-Way Limit

Temporary ROW — Temporary Right-of-Way Limit

CROSS SECTION LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	W.1

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NW Morningstar Drive

Preliminary

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

820
810
800
790
780

310+50.00

310+22.71

310+00.00

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	W.2

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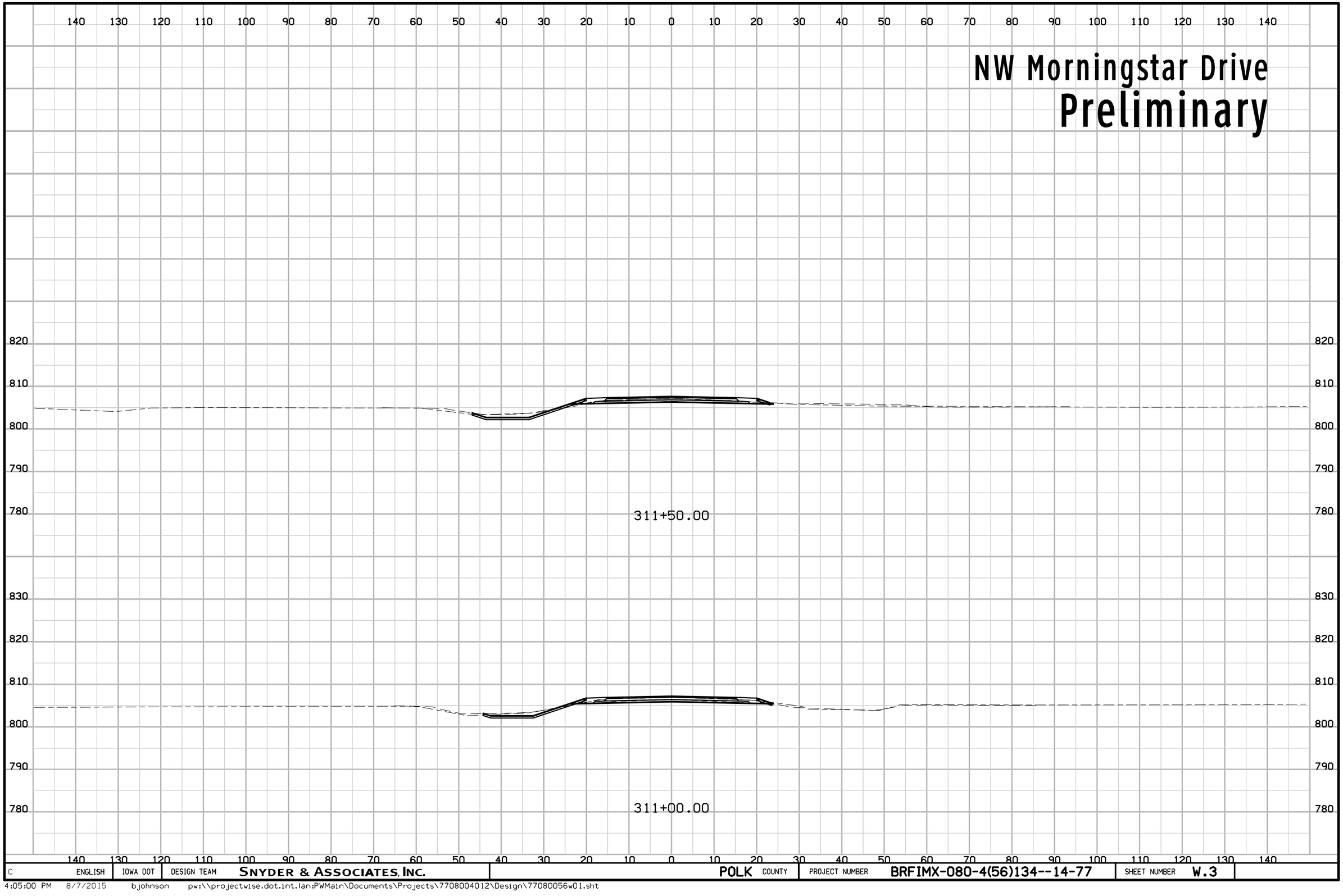
NW Morningstar Drive

Preliminary



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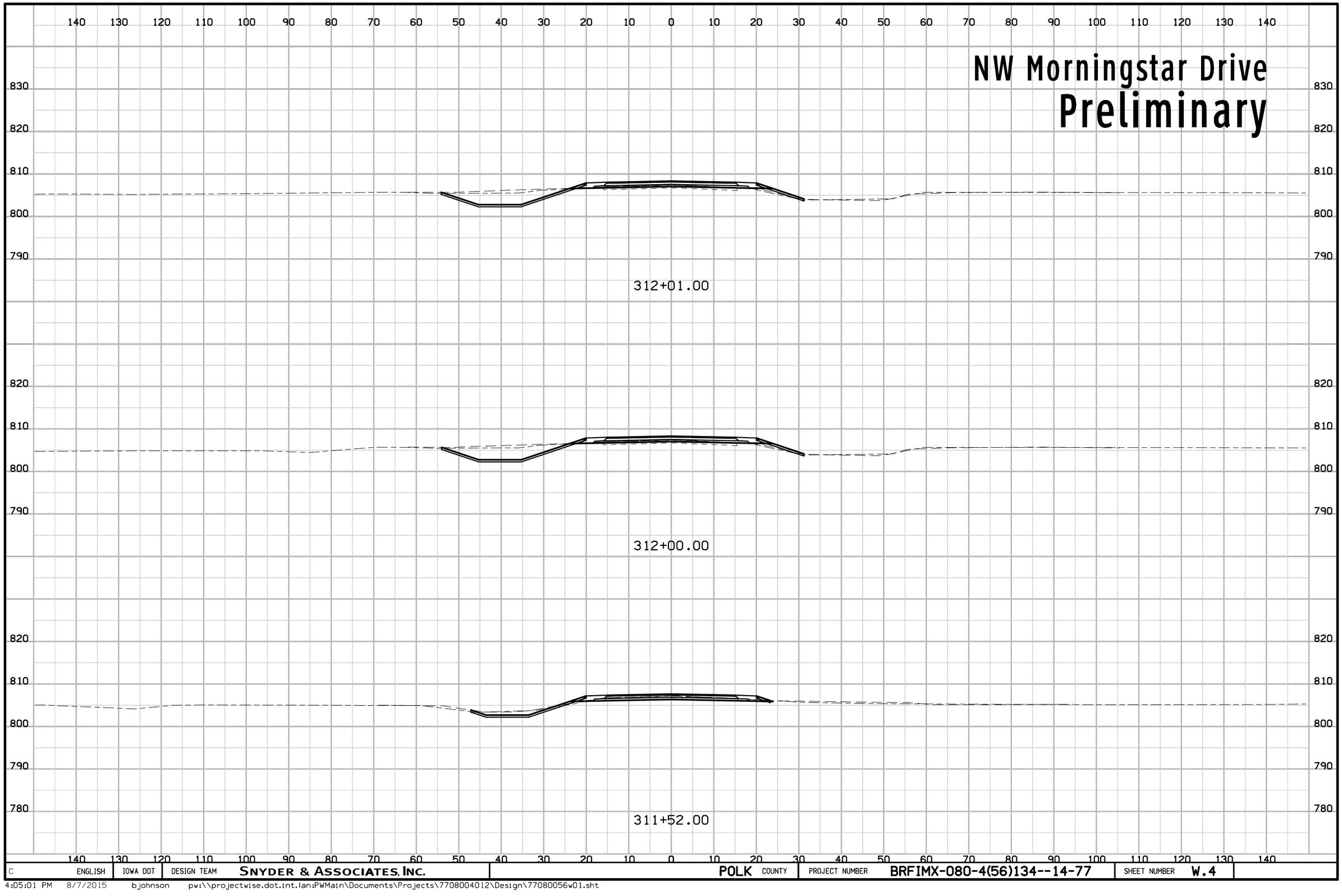
NW Morningstar Drive

Preliminary



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NW Morningstar Drive

Preliminary

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820
810
800
790

313+50.00

830
820
810
800
790

313+00.00

830
820
810
800
790

312+50.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER W.5

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NW Morningstar Drive

Preliminary

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830 820 810 800 790

315+00.00

830 820 810 800 790

314+50.00

830 820 810 800 790

314+00.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER W.6

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NW Morningstar Drive

Preliminary

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820
810
800
790

316+50.00

830
820
810
800
790

316+00.00

820
810
800
790
780

315+50.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER W.7

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NW Morningstar Drive

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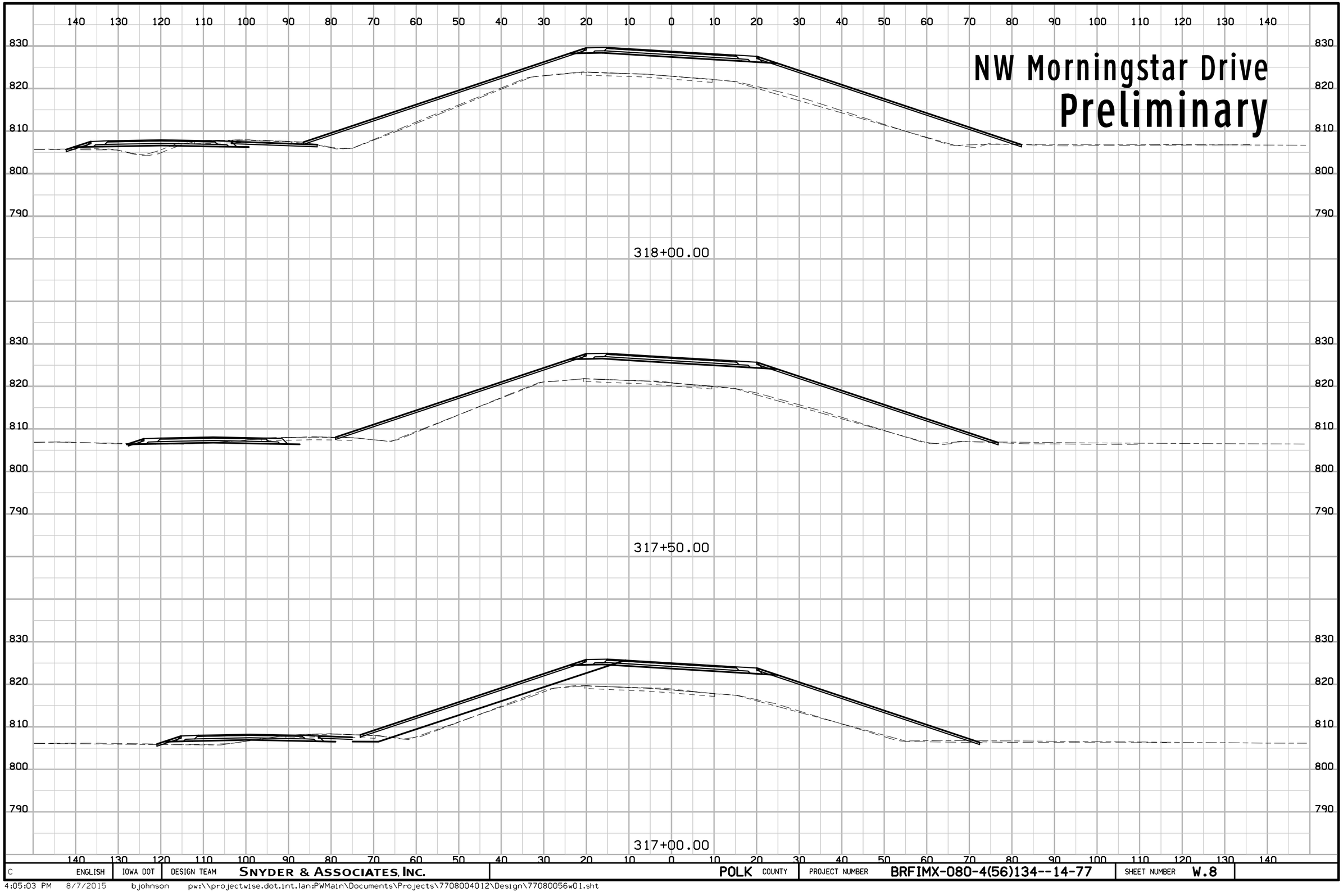

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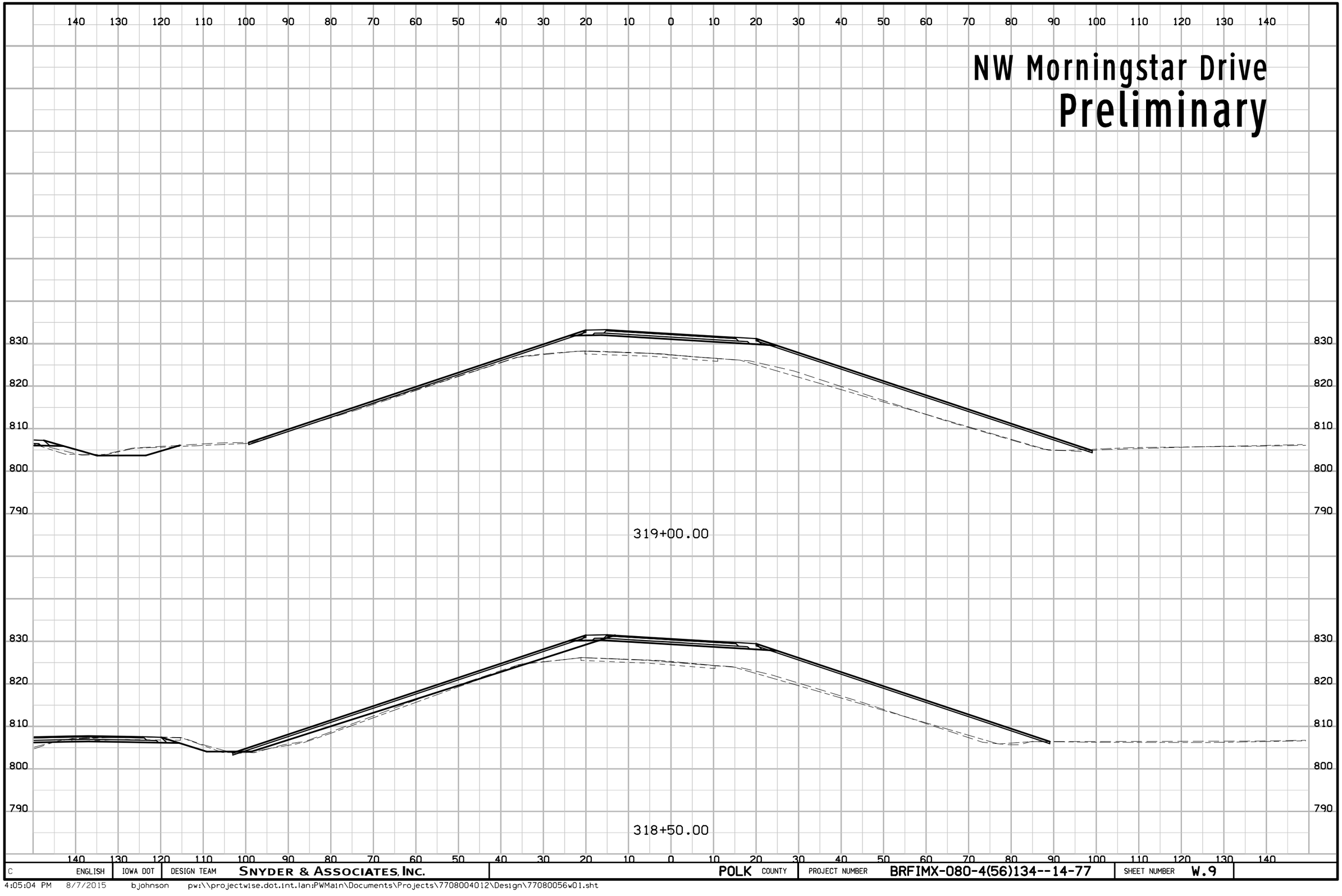
NW Morningstar Drive

Preliminary



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NW Morningstar Drive

Preliminary

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830
820
810
800
790
780

320+00.00

830
820
810
800
790

319+50.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER W.10

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NW Morningstar Drive

Preliminary

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830 820 810 800

321+00.00

830 820 810 800

320+50.00

830 820 810 800 790

320+38.66

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER W.11

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NW Morningstar Drive

Preliminary

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840
830
820
810
800
790

322+00.00

321+50.00

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	W.12

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NW Morningstar Drive

Preliminary

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840
830
820
810
800
790

323+00.00

322+50.00

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	W.13

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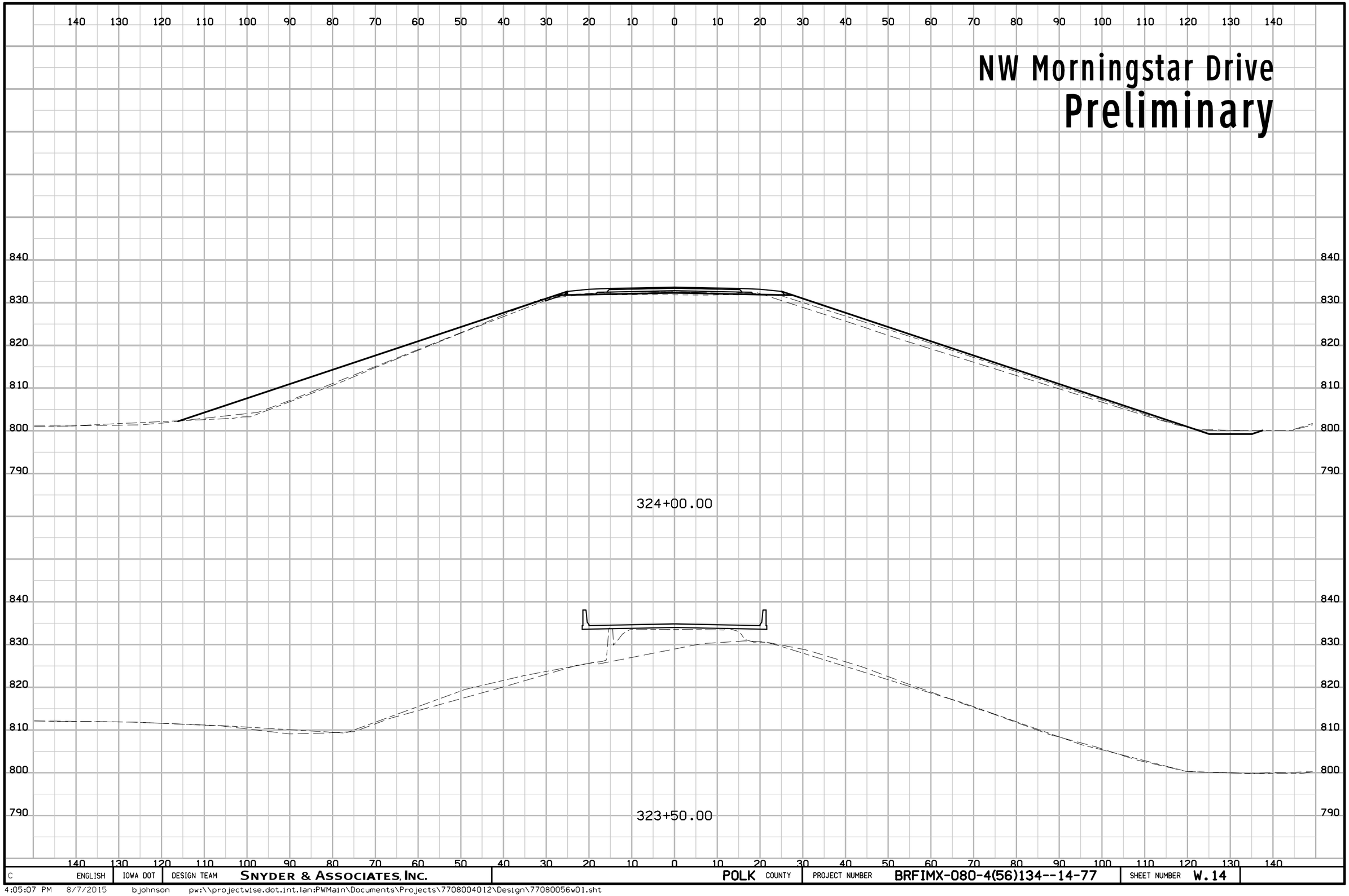
NW Morningstar Drive

Preliminary



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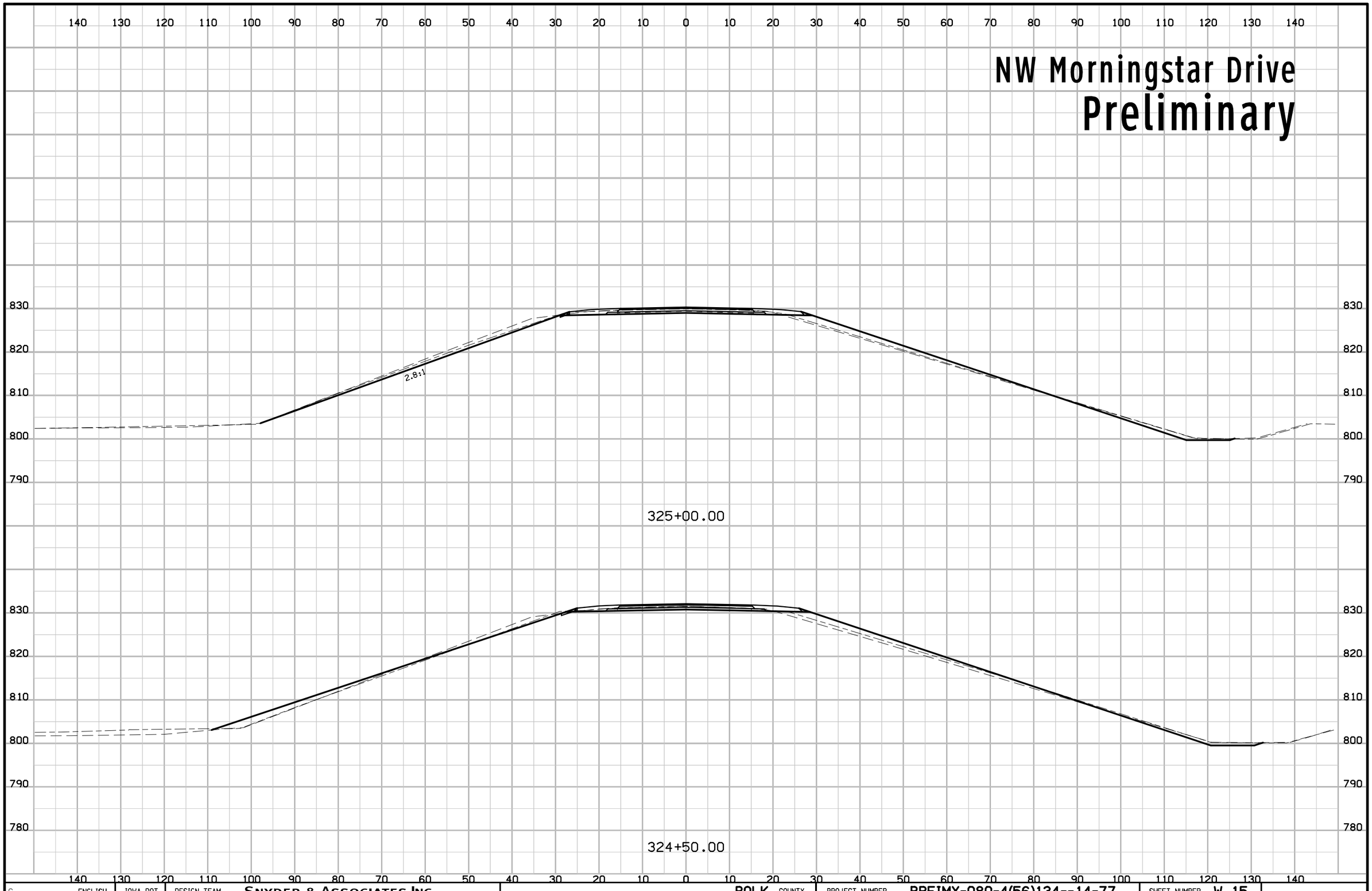
NW Morningstar Drive

Preliminary



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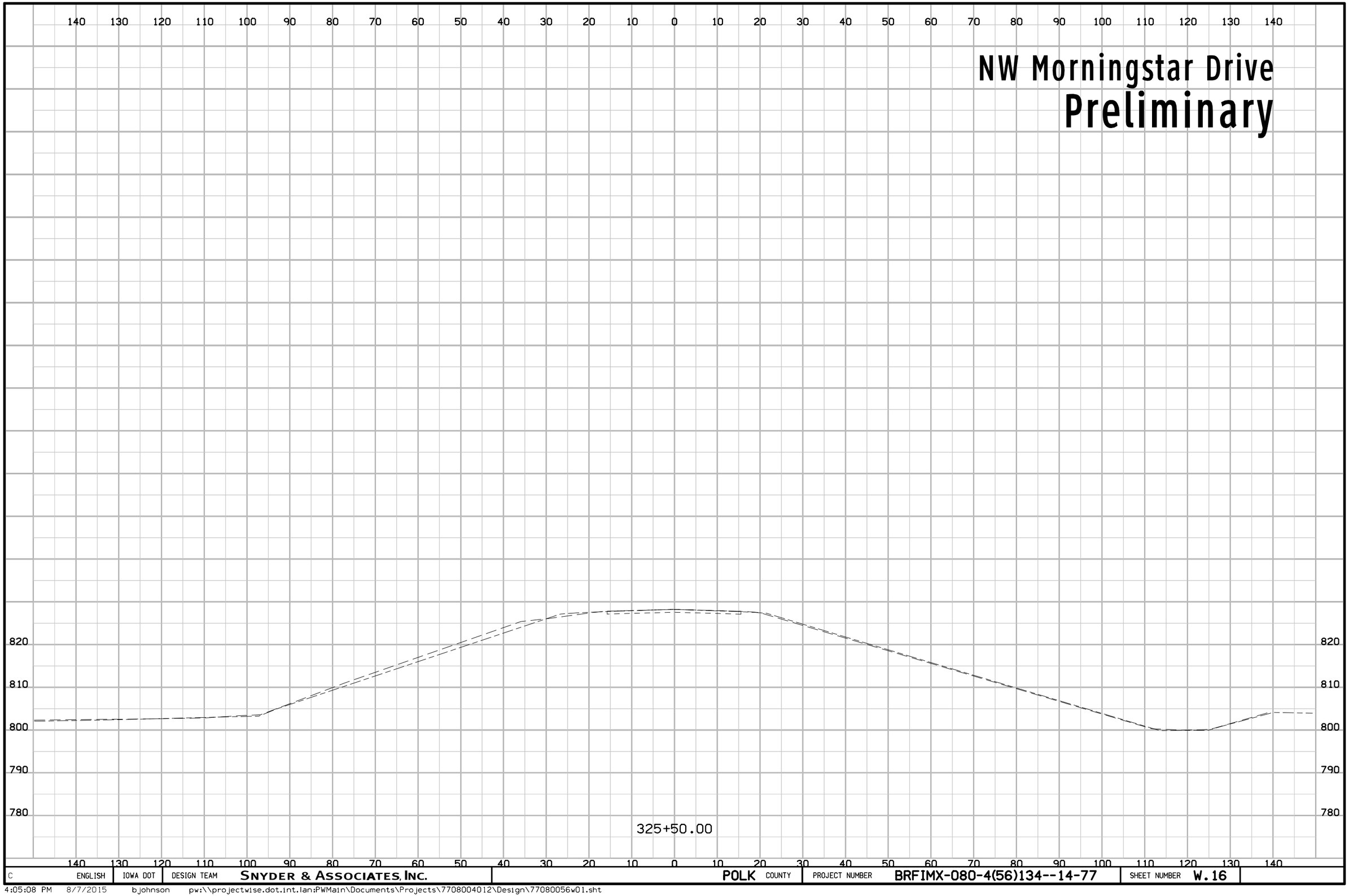
NW Morningstar Drive

Preliminary



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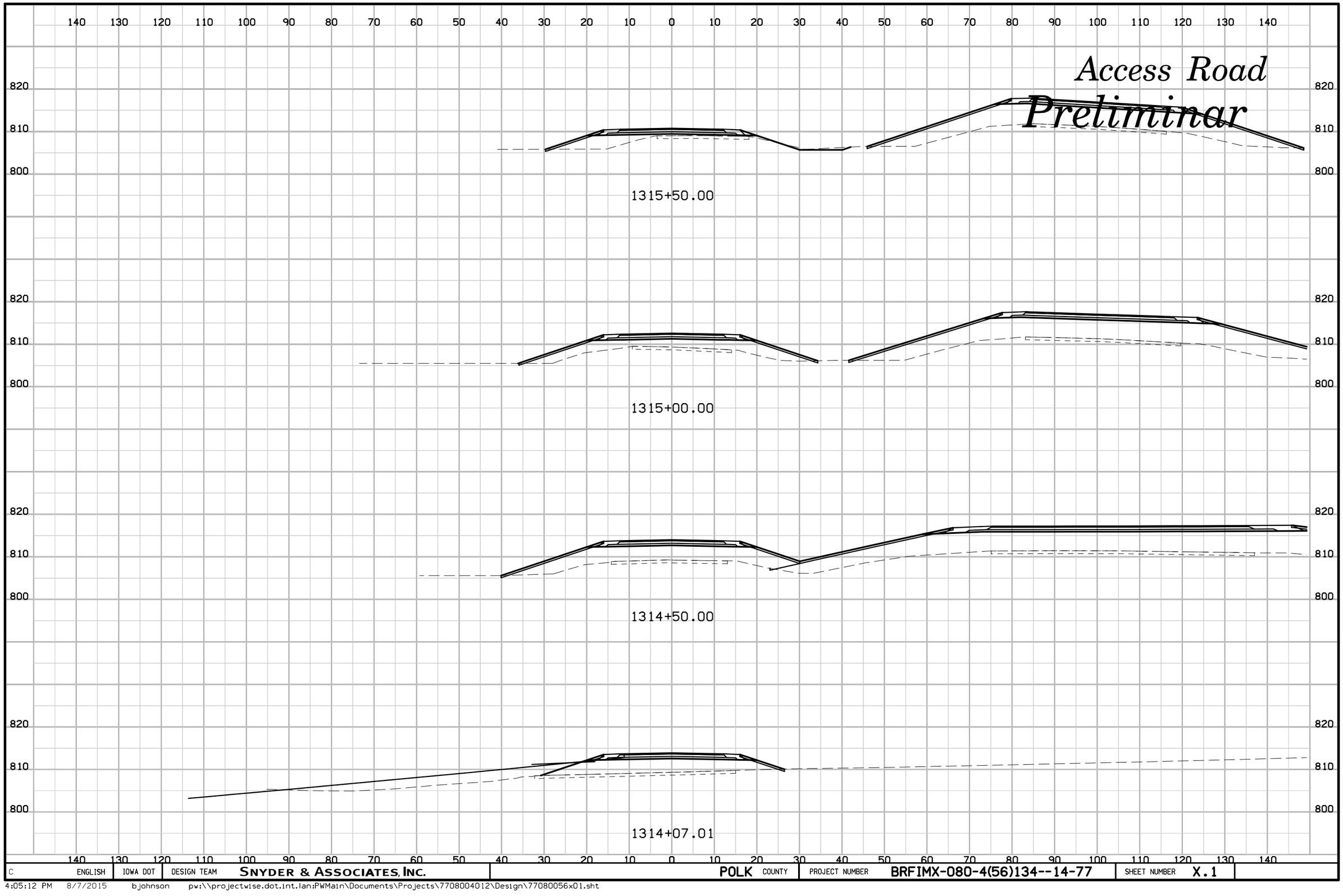
Access Road

Preliminar



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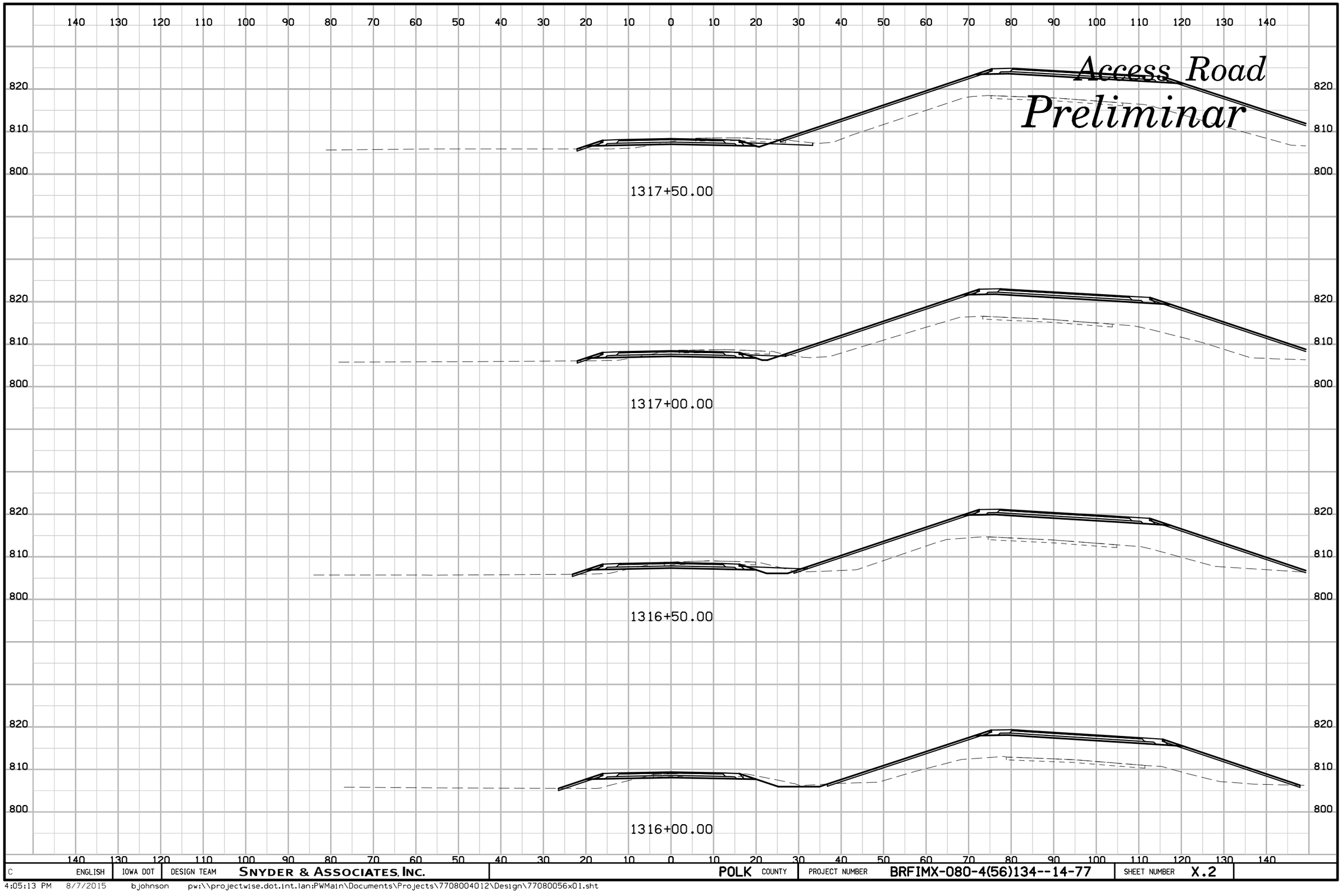
Access Road

Preliminar



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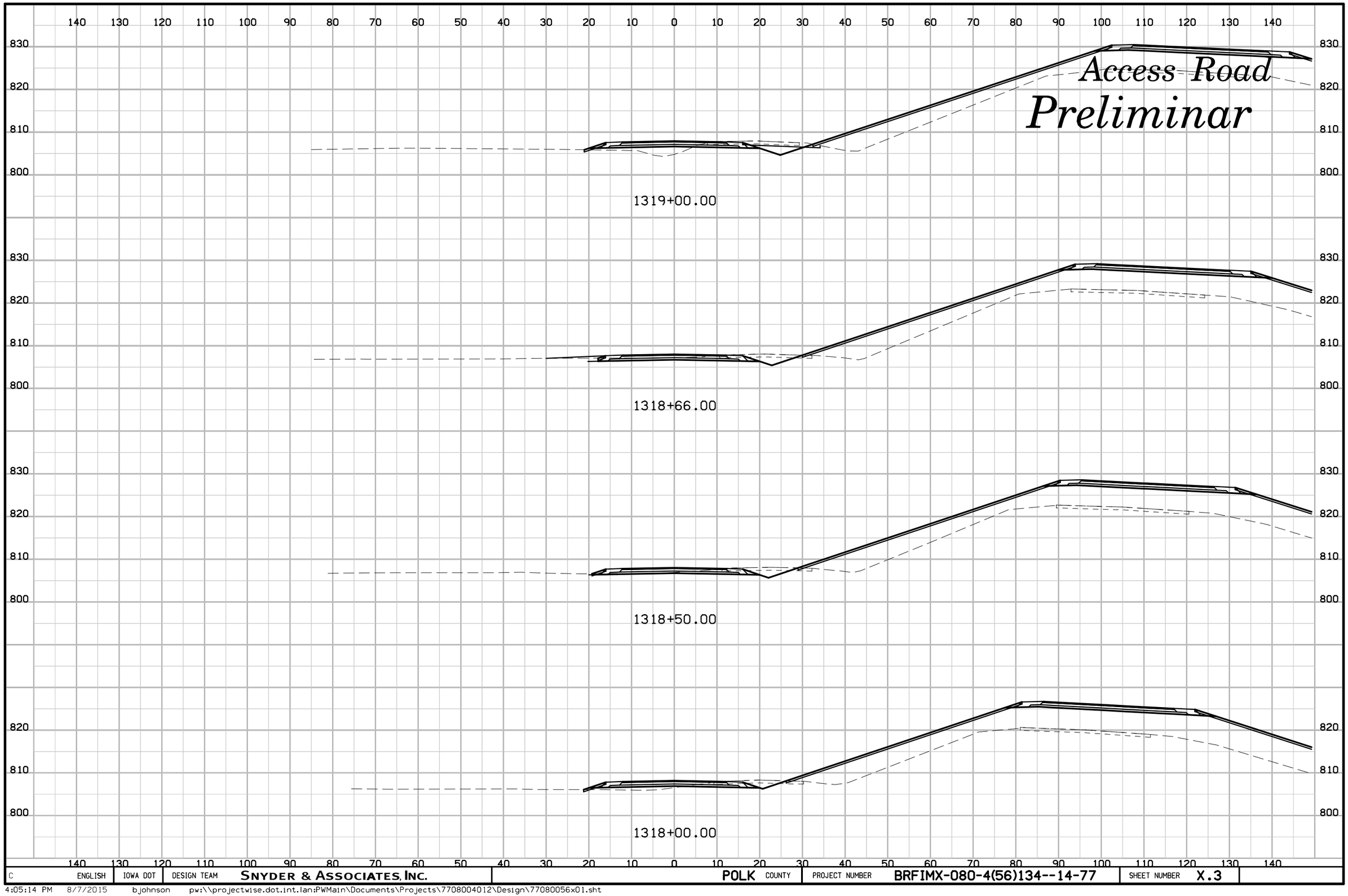

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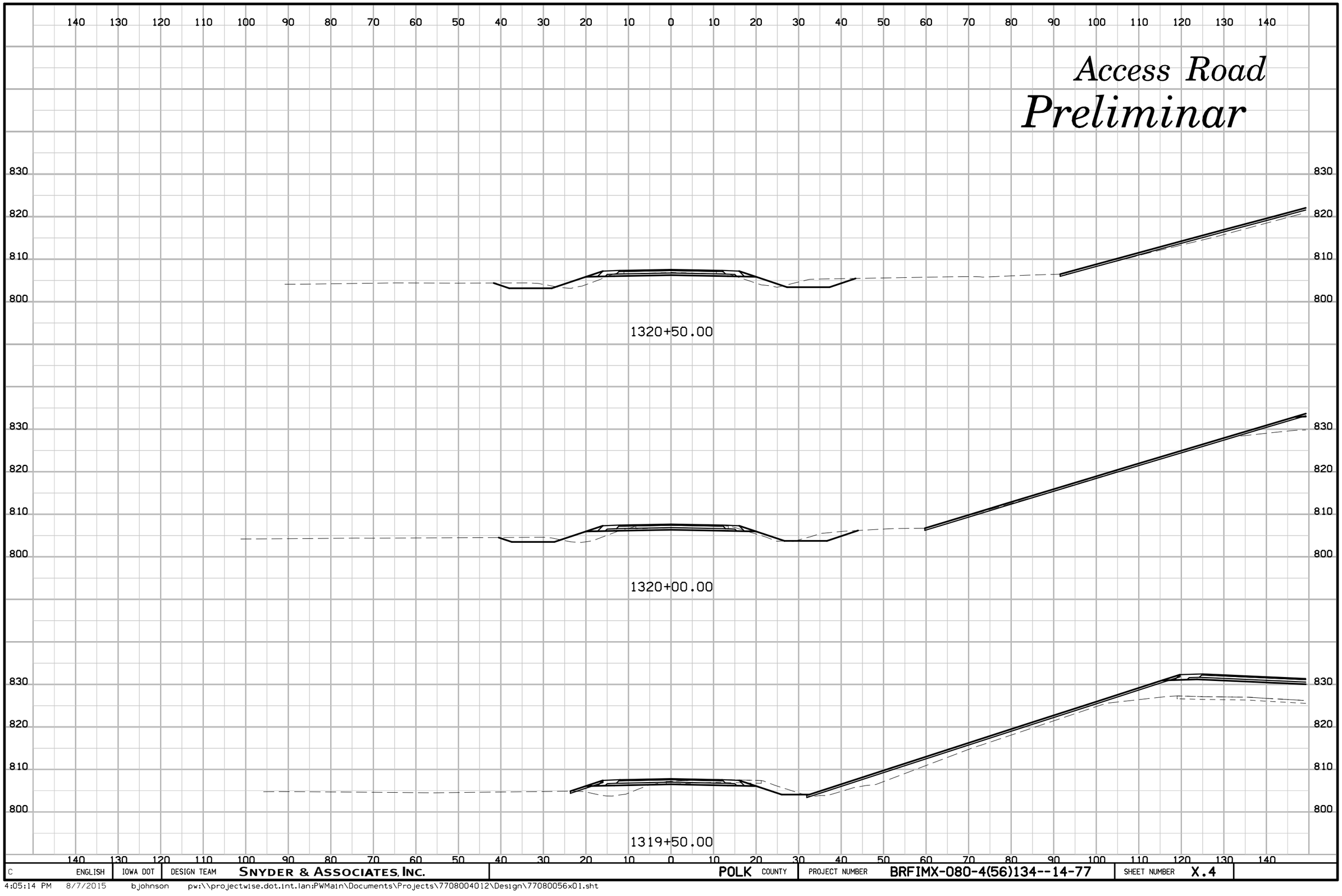
Access Road

Preliminar



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140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Access Road

Preliminar

830
820
810
800

1321+00.00

830
820
810
800

1320+53.58

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

C	ENGLISH	IOWA DOT	DESIGN TEAM	SNYDER & ASSOCIATES, INC.	POLK COUNTY	PROJECT NUMBER	BRFIMX-080-4(56)134--14-77	SHEET NUMBER	X.5

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