

**POTTAWATTAMIE CO.** IM-NHS-080-1(370)4--03-78  
 GRADING  
 LETTING DATE 4/15/2014

INDEX OF SHEETS	
No.	DESCRIPTION
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A.2	Location Map Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 8	Typical Cross Sections and Details
<b>C Sheets</b>	<b>Quantities and General Information</b>
C.1 - 4	Estimated Project Quantities & Reference Information
C.5 - 16	Tabulations
<b>CS Sheets</b>	<b>Soils Tabulations</b>
CS.1 - 2	Soils Tabulations
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 15	"I-80"
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<b>E Sheets</b>	<b>Side Road Plan and Profile Sheets</b>
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* E.7 - 8	Channel "3100"
* E.9	Channel "3200"
* E.10	Channel "3300"
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* E.12	BNSF-S Railroad
<b>F Sheets</b>	<b>Detour or Temporary Pavement Sheets</b>
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* K.11 - 12	Ia 192 Loop A Plan and Profile Sheets
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V.1	Bridge and Culvert Situation Plans



# Iowa Department of Transportation

## Highway Division

### PLANS OF PROPOSED IMPROVEMENT ON THE

# INTERSTATE ROAD SYSTEM

# POTTAWATTAMIE COUNTY

## GRADING

I-29/80 In Council Bluffs - I-80 WB Fr. WB Viaduct To Madison Ave. and I-29 NB Fr Indian Cr. To Espressway

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

**NO MILEAGE SUMMARY**

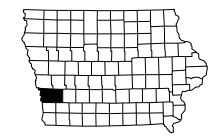


For Project Location Map Refer to Sheet A.2

REVISIONS

TOTAL
PROJECT IDENTIFICATION NUMBER
04-78-029-010-03
PROJECT NUMBER
IM-NHS-080-1(370)4--03-78
R.O.W. PROJECT NUMBER

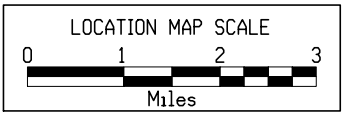
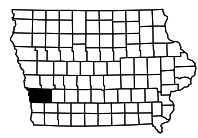
INDEX OF SHEETS	
No.	DESCRIPTION
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1 - 46	"I-80" Cross Sections
W.47 - 91	"I-29" Cross Sections
W.92 - 104	Detour "301300" Cross Sections
W.105 - 110	"SUR29NB" Cross Sections
<b>X Sheets</b>	<b>Side Road Cross Sections</b>
X.1 - 19	"23rd Ave" Cross Sections
X.20 - 50	"29th Ave" Cross Sections
X.51 - 53	"29th Ave Detour" Cross Sections
X.54 - 57	"Harry Langdon Blvd" Cross Sections
X.58 - 71	"Channel 3100" Cross Sections
X.72 - 73	"Channel 3200" Cross Sections
X.74 - 83	"Channel 3300" Cross Sections
X.84 - 87	"Channel 3400" Cross Sections
X.88	"BNSF-S" Cross Section
<b>Y Sheets</b>	<b>Ramp Cross Sections</b>
Y.1 - 12	"I-29/I-80 Ramp A" Cross Sections
Y.13 - 24	"I-29/I-80 Ramp B" Cross Sections
Y.25 - 37	"I-29/I-80 Ramp E" Cross Sections
Y.38 - 40	"I-29/I-80 Ramp G" Cross Sections
Y.41 - 44	"IA 192 Loop A" Cross Sections
<b>Z Sheets</b>	<b>Borrow Cross Sections</b>
Z.1	Borrow Cross Sections
	* Color Plan Sheets

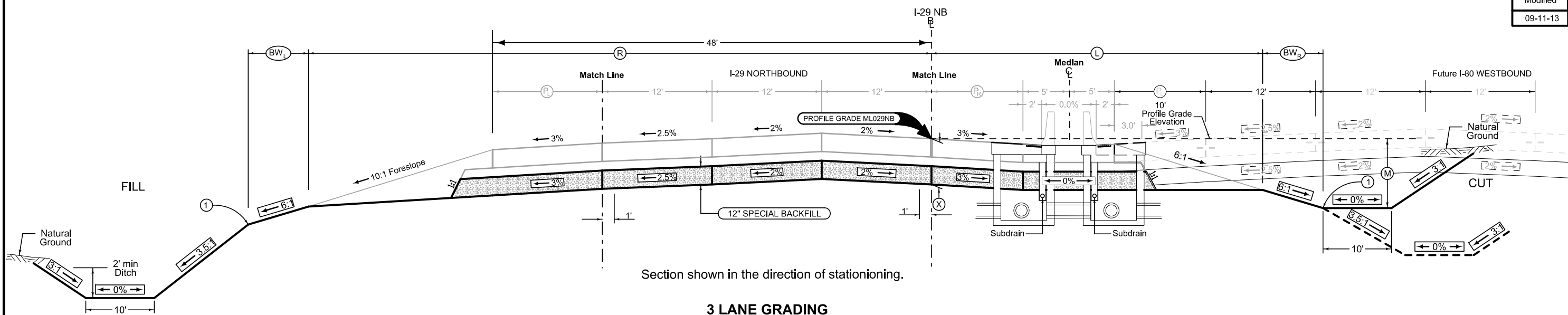


INTERSTATE 80			
DESIGN DATA URBAN			
2004	AADT	62,700	V.P.D.
2030	AADT	124,400	V.P.D.
2030	DHV	14,900	V.P.H.
	TRUCKS	26	%
Total	Design ESALs	--	

INTERSTATE 29			
DESIGN DATA URBAN			
2004	AADT	27,300	V.P.D.
2030	AADT	48,100	V.P.D.
2030	DHV	6,120	V.P.H.
	TRUCKS	18	%
Total	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	R. David Skogerboe	Primary Signature Block
CS.1	Emad Farouz	Geotechnical
C.9	David R. Claman	Hydraulic





Section shown in the direction of stationing.

**3 LANE GRADING**

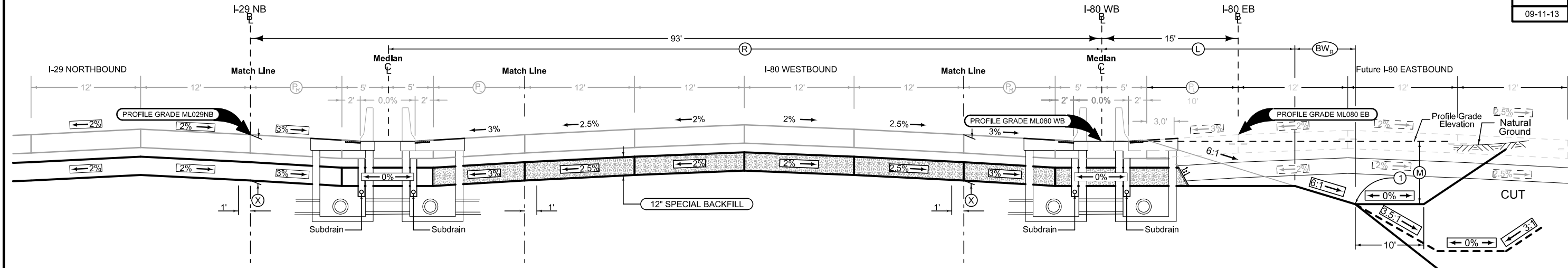
LOCATION		DIMENSIONS								
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW <sub>L</sub> ) Feet	(BW <sub>R</sub> ) Feet	(M) Feet	(P <sub>L</sub> ) Feet	(P <sub>R</sub> ) Feet	
I-29 NB	8536+50 - 8547+00	X	X	0	X	X	X	X	X	
	8549+00 - 8552+17									
	8559+00 - 8589+00									

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.

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

**I-29 NB**



Section shown in the direction of stationing.

**4 LANE GRADING**

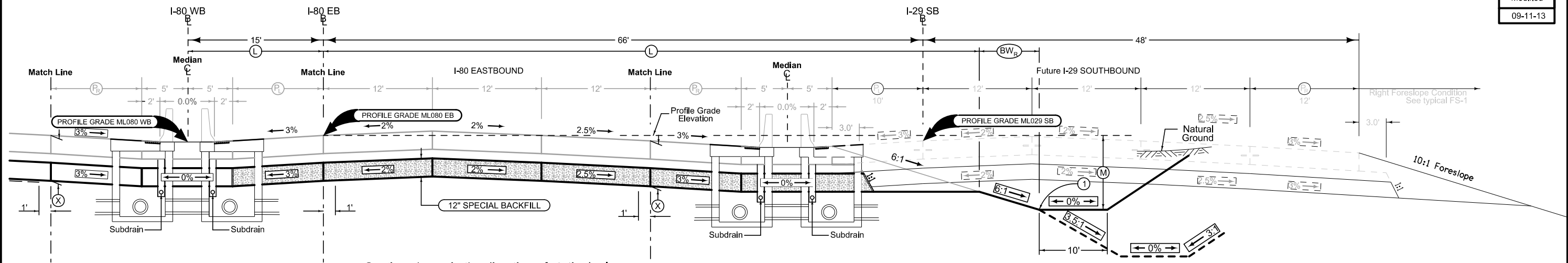
LOCATION		DIMENSIONS							
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW <sub>R</sub> ) Feet	(M) Feet	(P <sub>L</sub> ) Feet	(P <sub>R</sub> ) Feet	
I-80 WB	7533+75 - 7547+50	X	X	X	X	X	X	X	
	7550+25 - 7552+18								
	7559+00 - 7579+19								
	7612+58 - 7616+75								

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.

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

**I-80 WB**



Section shown in the direction of stationing.

**3 LANE GRADING**

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

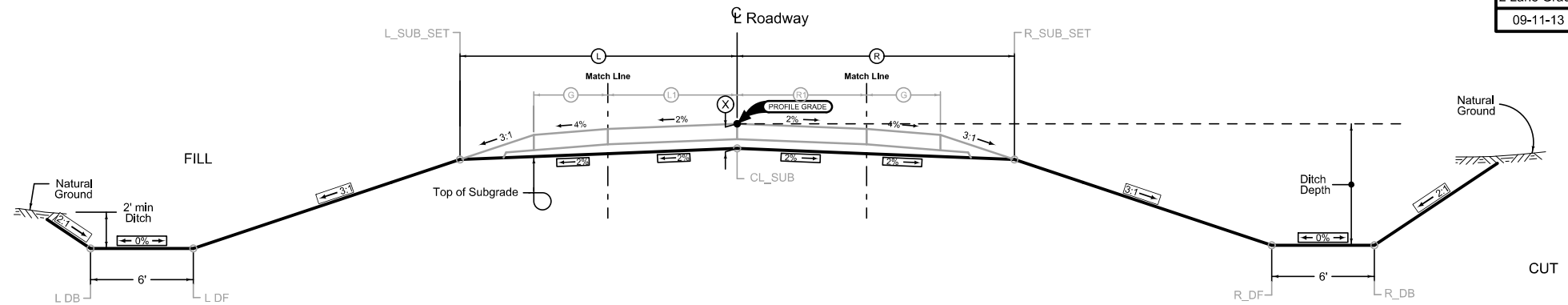
See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

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

LOCATION		DIMENSIONS							
ROAD IDENTIFICATION	STATION TO STATION	Ⓛ Feet	Ⓡ Feet	ⓧ Inches	Ⓛ <sub>WB</sub> Feet	Ⓜ Feet	Ⓟ Feet	Ⓟ <sub>2</sub> Feet	
I-80 EB	7569+50    7579+19	X	X	X	X	X	X	X	

**I-80 EB**

LOCATION			DIMENSIONS		
ROAD IDENTIFICATION	STATION TO STATION		(L)	(R)	(X)
			Feet	Feet	Inches
23RD AVE	3009+25.00	3030+70.14	21.1	21.1	20
29TH AVE	3820+34.00	3820+58.94	24-2-21.1	25.1	20
29TH AVE	3820+58.94	3821+34.77	21.1	25.1	20
29TH AVE	3821+34.77	3822+34.77	21.1	25.1-21.1	20
29TH AVE	3822+34.77	3857+46.30	21.1	21.1	20



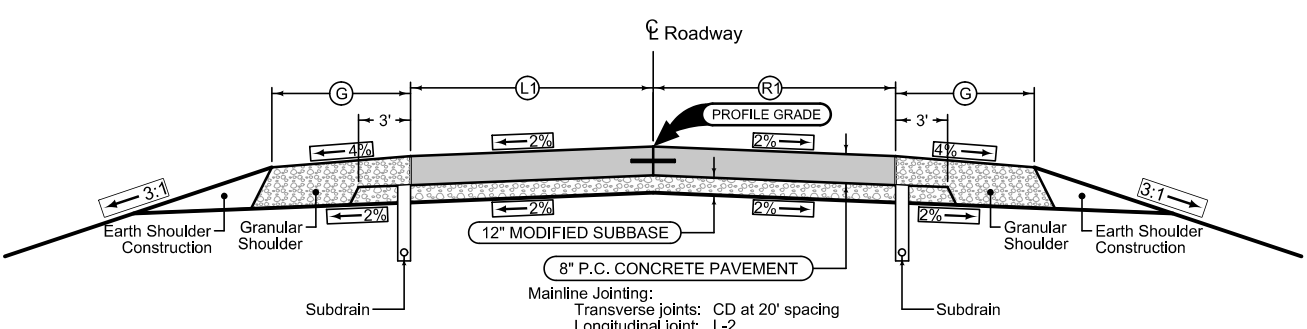
2 Lane Grade  
09-11-13

Section shown in the direction of stationing.

**2 LANE GRADING**

2\_G\_ 10-19-10

ROADWAY IDENTIFICATION	STATION TO STATION		(G)
			Feet
23RD AVE	3009+25.00	3030+70.14	4
29TH AVE	3820+34.00	3857+46.30	4



2\_G\_ 10-19-10

ROADWAY IDENTIFICATION	STATION TO STATION		(G)
			Feet
23RD AVE	3009+25.00	3030+70.14	4
29TH AVE	3820+34.00	3857+46.30	4

2P\_ 10-19-10

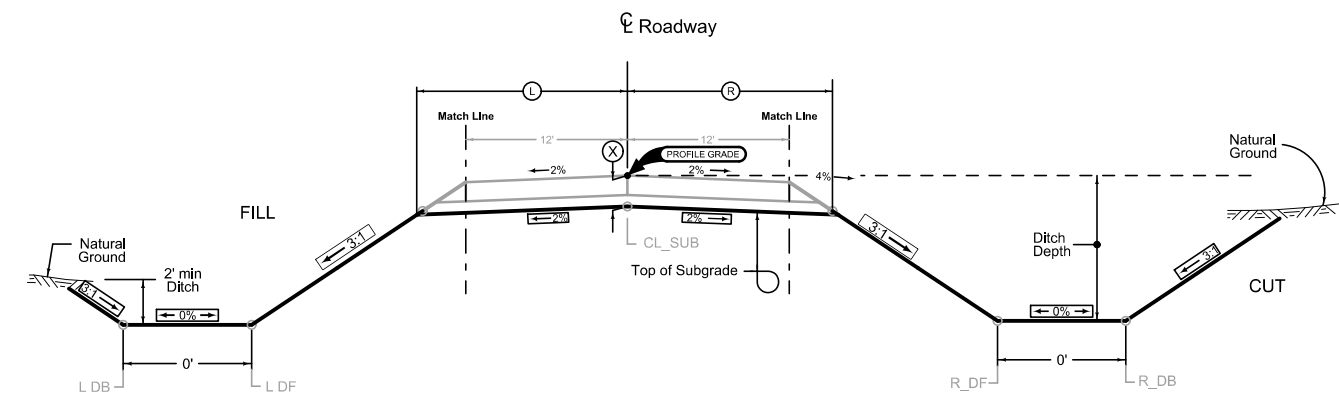
ROADWAY IDENTIFICATION	STATION TO STATION		(L1)	(R1)
			Feet	Feet
23RD AVE	3009+25.00	3030+70.14	12	12
29TH AVE	3820+34.00	3820+58.94	15.2-12	16
29TH AVE	3820+58.94	3821+34.77	12	16
29TH AVE	3821+34.77	3822+34.77	12	16-12
29TH AVE	3822+34.77	3857+46.30	12	12

See Tab 100-24 for pavement quantities.  
See Tab 112-9 for shoulder quantities.

**2 LANE PAVING**

Modified  
09-11-13

LOCATION		DIMENSIONS		
ROAD IDENTIFICATION	STATION TO STATION	(L)	(R)	(X)
		Feet	Feet	Inches
29TH AVE DETOUR	13818+53.00   18820+49.00	X	X	14.0

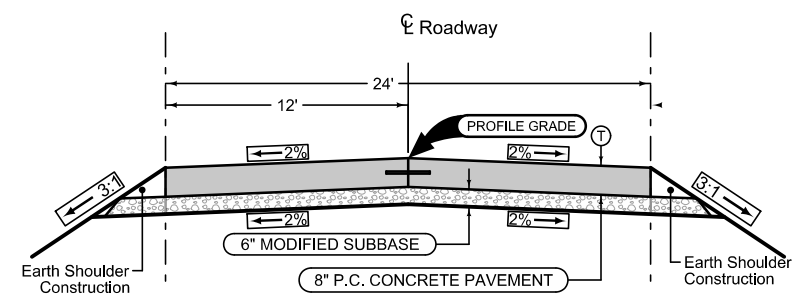


Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.

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

**29TH AVE DETOUR**

Modified  
09-11-13



Section shown in the direction of stationing.

Mainline Jointing:  
Transverse joints: CD at 20' spacing  
Longitudinal joint: L-2

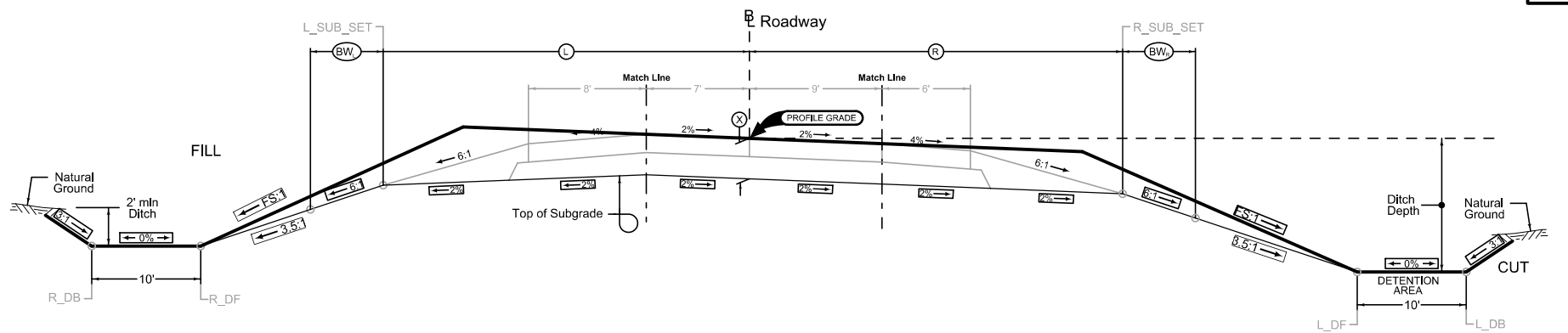
LOCATION	
ROAD IDENTIFICATION	STATION TO STATION
29TH AVE DETOUR	13818+53.00   13820+49.00

See Tab 100-24 for pavement quantities.  
See Tab 112-9 for shoulder quantities.

**29TH AVE DETOUR**

Modified  
09-11-13

LOCATION		DIMENSIONS						
ROAD IDENTIFICATION	STATION TO STATION	(L)	(R)	(X)	(X)	(BW <sub>L</sub> )	(BW <sub>R</sub> )	FS
		Feet	Feet	Inches	Inches	Feet	Feet	
IA 192 EXIT LOOP A/ I-29 NB DETOUR	301302+22.59   301321+94.02	X	X	24.0	20.5	X	X	3:1 or flatter

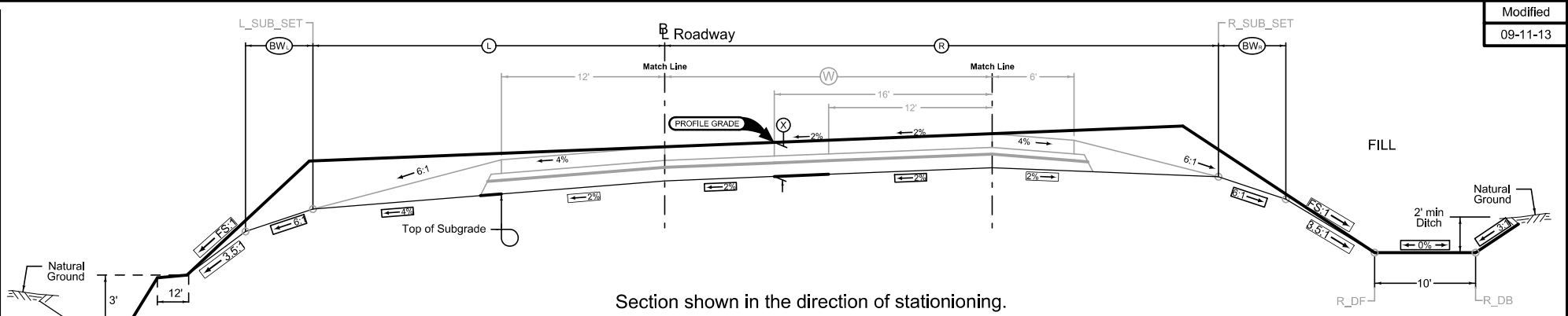


Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.

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

**DETOUR 301300**

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW <sub>L</sub> ) Feet	(BW <sub>R</sub> ) Feet	FS
I-80 WB TO I-29 NB RAMP A	61571+76.08	61576+50.00	X	X	29.5	X	X	3:1 or flatter
I-80 WB TO I-29 NB RAMP A	61576+50.00	61579+22.89	X	X	29.5	X	X	3:1 or flatter



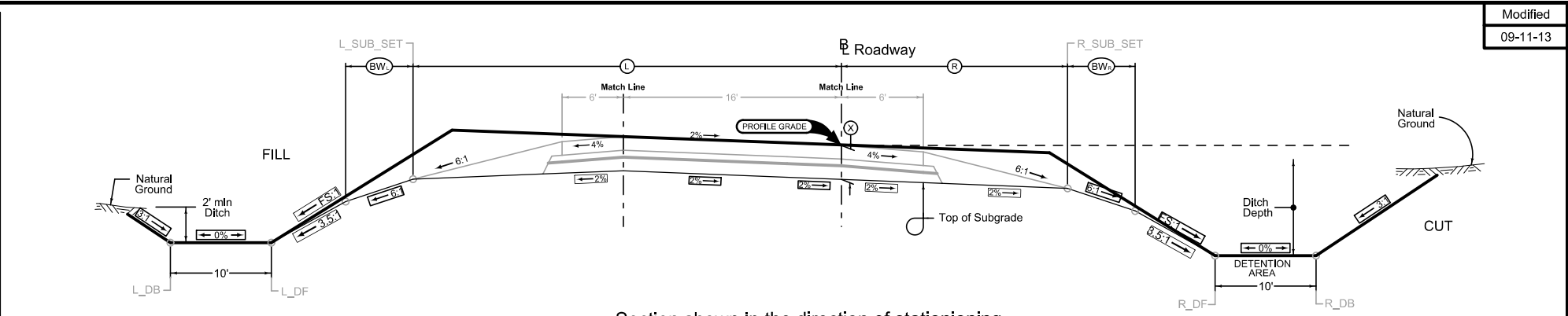
Section shown in the direction of stationing.

**I-80 WB TO I-29 NB RAMP A**

Modified  
09-11-13

Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.  
  
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW <sub>L</sub> ) Feet	(BW <sub>R</sub> ) Feet	FS
I-80 EB TO I-29 SB RAMP B	62574+50.00	62581+75.00	X	X	29.5	X	X	3:1 or flatter



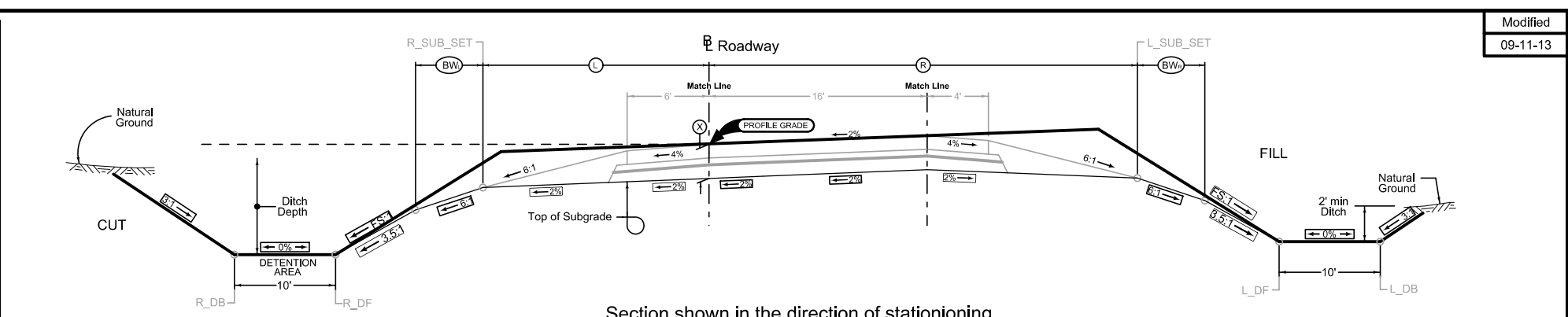
Section shown in the direction of stationing.

**I-80 EB TO I-29 SB RAMP B**

Modified  
09-11-13

Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.  
  
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW <sub>L</sub> ) Feet	(BW <sub>R</sub> ) Feet	FS
I-29 NB TO I-80 WB RAMP E	65561+51.55	65570+03.02	X	X	29.5	X	X	3:1 or flatter



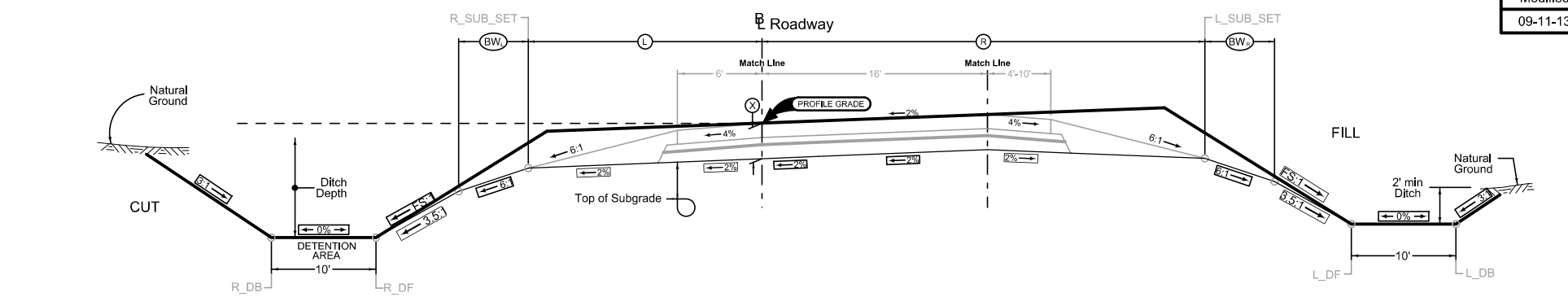
Section shown in the direction of stationing.

**I-29 NB TO I-80 WB RAMP E**

Modified  
09-11-13

Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.  
  
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

LOCATION		DIMENSIONS						
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW) <sub>L</sub> Feet	(BW) <sub>R</sub> Feet	FS	
I-80 EB TO I-29 SB RAMP B	67465+40.00 67466+22.70	X	X	29.5	X	X	3:1 or flatter	



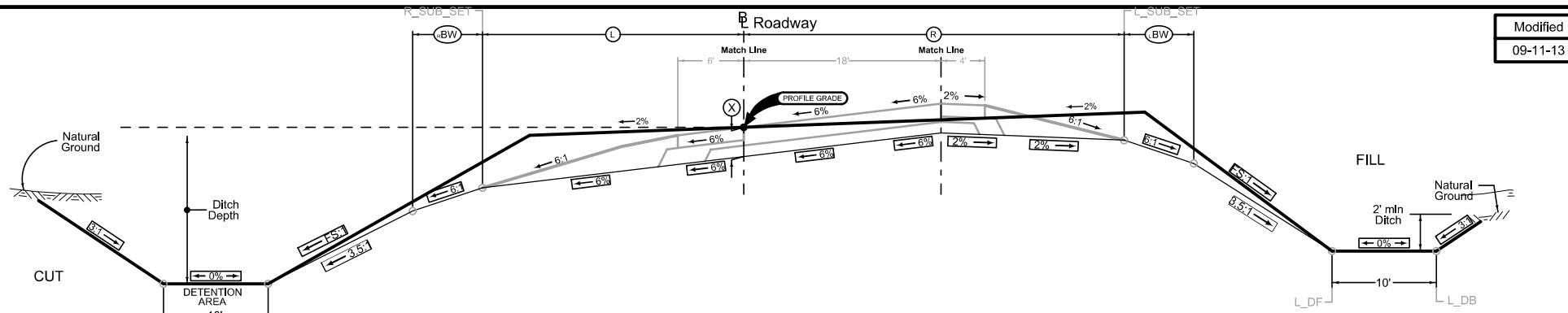
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

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

**I-80 WB TO I-29 SB RAMP G**

Modified 09-11-13

LOCATION		DIMENSIONS						
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW) <sub>L</sub> Feet	(BW) <sub>R</sub> Feet	FS	
IA 192 LOOP A	51542+12.04 51551+40.00	X	X	22	X	X	3:1 or flatter	



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.

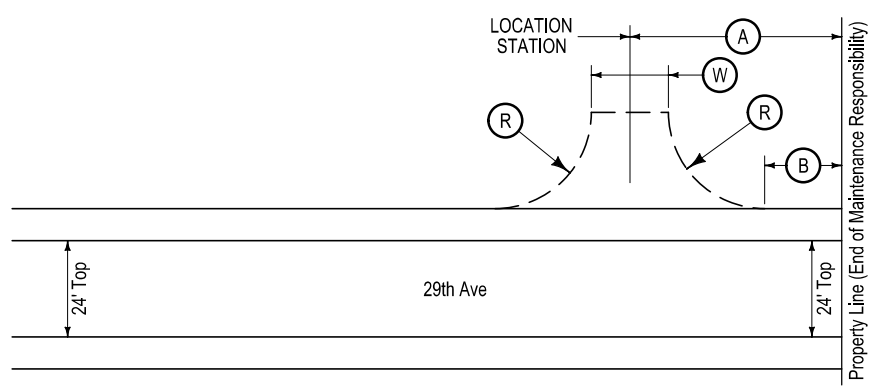
**IA 192 LOOP A**

Modified 09-11-13



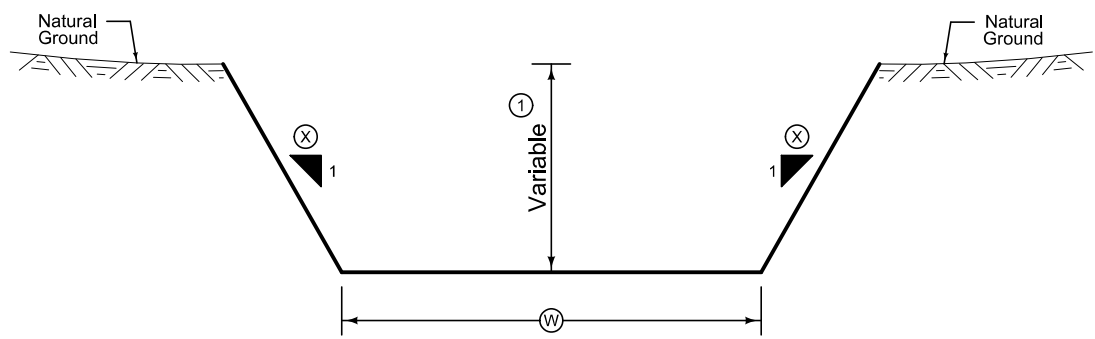
MTA

TABULATION OF LOCATIONS				
STATION	(W)	(A)	(B)	(R)
29th 3855+50.0	24			35



TYPICAL DETAILS OF MAINTENANCE TURNAROUNDS

Modified  
09-11-13



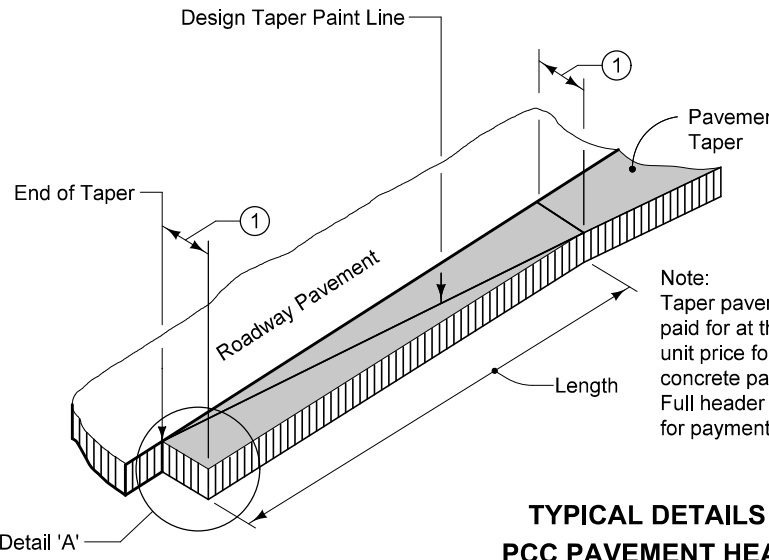
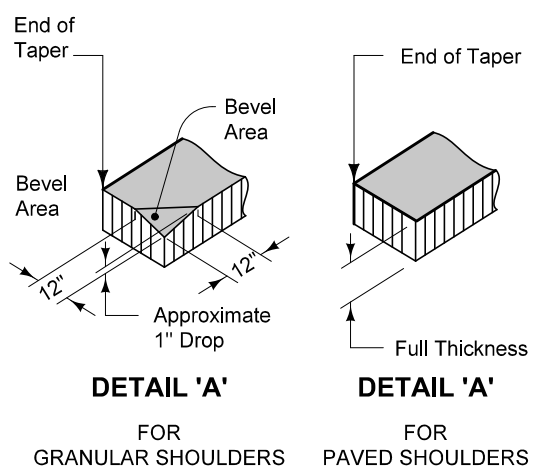
INDEPENDENT CHANNEL GRADING

ROAD IDENTIFICATION	LOCATION		DIMENSIONS	
	STATION TO STATION		(W) Feet	(X)
CHANNEL 3100	73100+90.78	73110+45.79	12.0	3.5
CHANNEL 3100	73120+48.46	73126+72.15	16.0	4.0
CHANNEL 3200	73200+00.00	73203+82.17	12.0	3.0
CHANNEL 3300	73300+00.00	73312+11.93	10.0	3.0

Notes:  
① Refer to Plan and Profile and Cross Section sheets for additional details.

TYPICAL CROSS SECTION INDEPENDENT CHANNEL

7101  
10-19-10

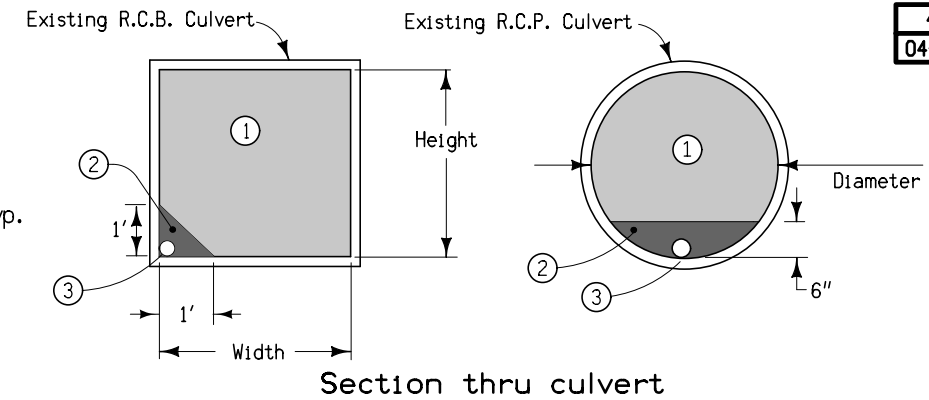
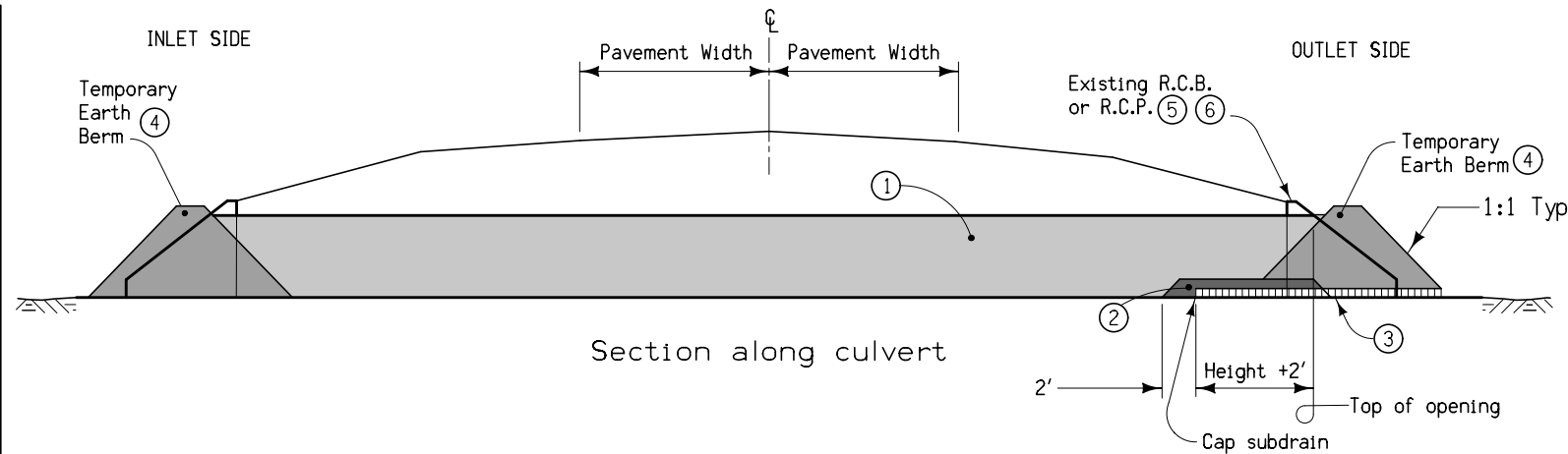
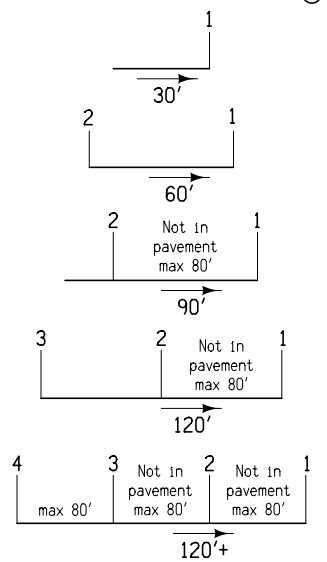


Note:  
Taper pavement to be paid for at the contract unit price for P.C. concrete pavement. Full header is included for payment.

TYPICAL DETAILS OF PCC PAVEMENT HEADER

① Normal width is 2'-0". Construct 4'-0" width when butting into 4' wide HMA shoulders (See Typical 7154A).

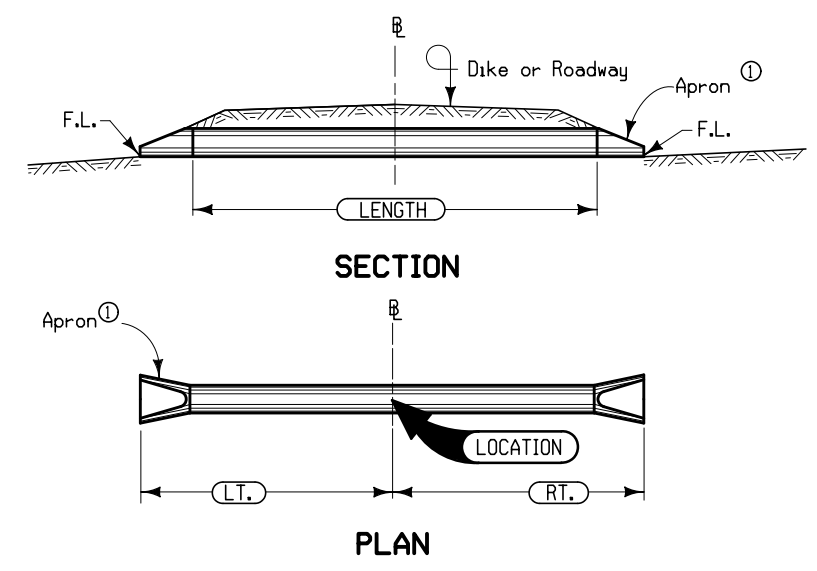
Required Injection Points ⑥



- 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.)**

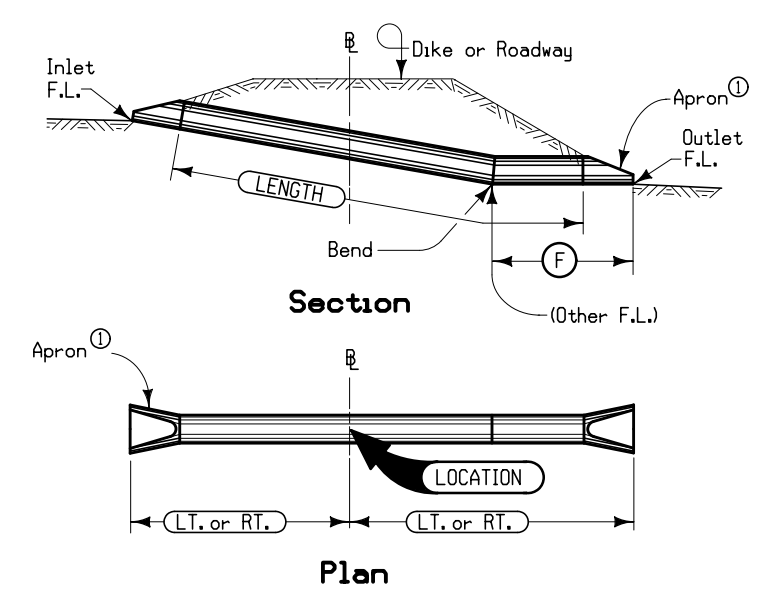
1101  
04-30-02



Notes:  
 CL shall be CL of roadway, dike, survey, or other; as detailed on plans.  
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of line perpendicular to the CL (example skew Rt. ahead 30°).  
 Refer to tabular listing and other plans for additional information.  
 ① See Standard Road Plan RF-3 For Conc. or RF-5 for Metal.

PIPE CULVERT

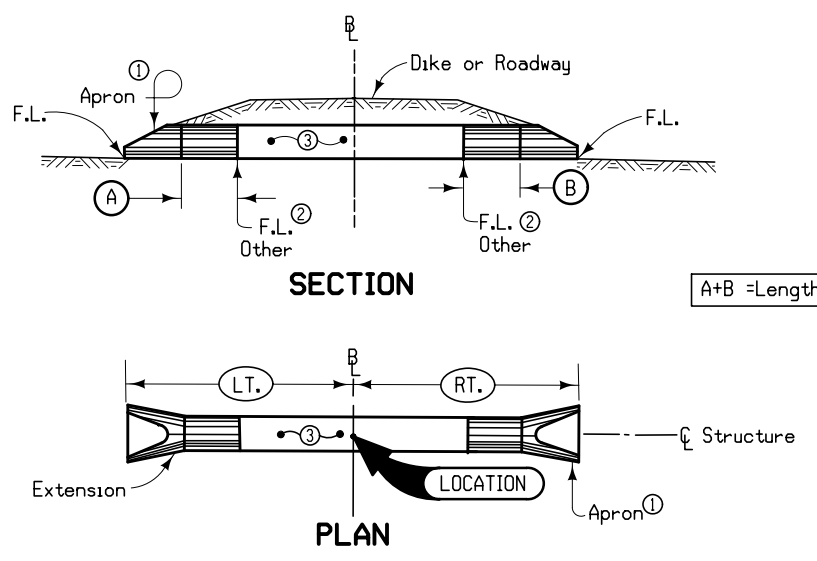
1201  
10-16-12



CL shall be CL of roadway, dike, survey, or other; as detailed on plans.  
 "Bend" may be accomplished by use of metal elbow, Pipe Adapter (RF-2), Type "D" Section or Concrete Elbow (RF-13) as specified.  
 ① See Standard Road Plan RF-3 For Conc. or RF-5 for Metal.  
 ② is from bend to end of outlet.

PIPE CULVERT LETDOWN STRUCTURE

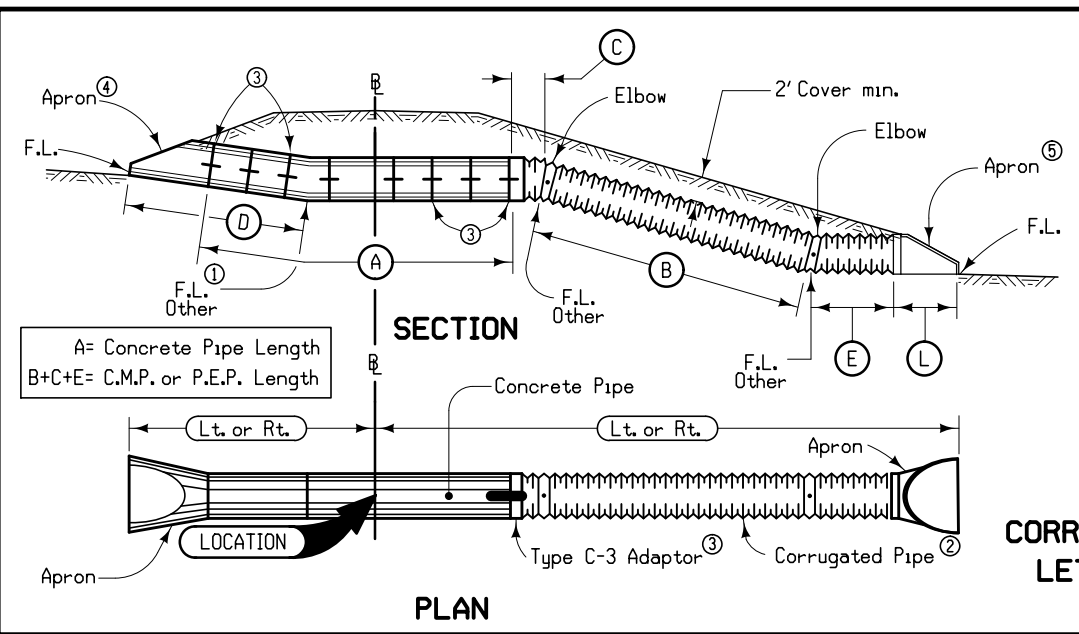
1301  
10-03-00



Notes:  
 CL shall be CL of roadway, dike, survey, or other; as detailed on plans.  
 Extension shall be on line of existing structure to Lt., Rt. or both as specified. Adaptors may be required, see Standard Road Plan RF-2.  
 Refer to tabular listing and other plans for additional information.  
 ① See Standard Road Plan RF-3 for concrete, RF-5 for metal.  
 ② Optional type "D" section only when specified in tabulation.  
 ③ Existing structure.

PIPE EXTENSION

1501  
04-20-10



CL shall be CL of roadway, dike, survey, or other; as detailed on plans.  
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of a line perpendicular to the CL.  
 Refer to Tabulation 104-3.  
 ① Optional D section only when specified in tabulation.  
 ② Standard type joint couplings are required. (See Materials I.M. 441)  
 ③ See RF-2 & RF-14.  
 ④ See RF-3.  
 ⑤ See RF-5 for Metal and Polyethylene.

CORRUGATED PIPE - CONCRETE LETDOWN STRUCTURE WITH METAL APRON

100-1A  
07-15-97

**ESTIMATED PROJECT QUANTITIES  
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	17.2	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	1,136,752.0	
3	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	50.0	
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	53,399.0	
5	2105-8425020	TOPSOIL, STRIP AND STOCKPILE	CY	16,142.0	
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	1,034,372.0	
7	2107-3825025	GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN	CY	62,510.0	
8	2112-0000100	WICK DRAIN	LF	1,917,000.0	
9	2115-0100000	MODIFIED SUBBASE	CY	7,231.1	
10	2121-7425010	GRANULAR SHOULDERS, TYPE A	TON	3,363.9	
11	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	114.00	
12	2301-1033080	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 8 IN.	SY	17,493.3	
13	2301-6911722	PORTLAND CEMENT CONCRETE PAVEMENT SAMPLES	LS	1.00	
14	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	923.6	
15	2402-0425040	FLOODED BACKFILL	CY	658.0	
16	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	999.0	
17	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.	EACH	14	
18	2416-0100036	APRONS, CONCRETE, 36 IN. DIA.	EACH	2	
19	2416-0100048	APRONS, CONCRETE, 48 IN. DIA.	EACH	8	
20	2416-0100054	APRONS, CONCRETE, 54 IN. DIA.	EACH	2	
21	2416-0100060	APRONS, CONCRETE, 60 IN. DIA.	EACH	2	
22	2416-0102236	APRON, LOW CLEARANCE CONCRETE, EQUIVALENT DIAMETER 36 IN.	EACH	2	
23	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	534	
24	2416-1180036	CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.	LF	70	
25	2416-1180048	CULVERT, CONCRETE ROADWAY PIPE, 48 IN. DIA.	LF	562	
26	2416-1180060	CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.	LF	44	
27	2416-1200236	CULVERT, LOW CLEARANCE CONCRETE ROADWAY PIPE, EQUIVALENT DIAMETER 36 IN.	LF	48	
28	2416-1262048	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 48 IN. DIA.	LF	312	
29	2416-1262054	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA.	LF	108	
30	2417-0225015	APRONS, METAL, 15 IN. DIA.	EACH	1	
31	2417-0225024	APRONS, METAL, 24 IN. DIA.	EACH	2	
32	2417-0341036	REMOVE AND REINSTALL METAL APRONS LESS THAN OR EQUAL TO 36 IN.	EACH	1	
33	2417-1060024	CULVERT, CORRUGATED METAL ROADWAY PIPE, 24 IN. DIA.	LF	129	
34	2422-0360018	APRONS, UNCLASSIFIED, 18 IN. DIA.	EACH	22	
35	2422-0360024	APRONS, UNCLASSIFIED, 24 IN. DIA.	EACH	2	
36	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA.	LF	874	
37	2422-1722024	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 24 IN. DIA.	LF	132	
38	2435-0140300	MANHOLE, STORM SEWER, SW-403	EACH	1	
39	2435-0256200	INTAKE, SW-562	EACH	1	
40	2501-8400170	TEMPORARY SHEET PILES AND SHORING	LS	1.00	
41	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	13,313.0	
42	2502-8212204	SUBDRAIN, PERFORATED PLASTIC PIPE, 4 IN. DIA.	LF	4100	
43	2502-8220196	SUBDRAIN OUTLET, RF-19E	EACH	66	
44	2502-8220197	SUBDRAIN OUTLET (RF-19F)	EACH	17	
45	2503-0110024	STORM SEWER GRAVITY MAIN, TRENCHED, 24 IN.	LF	92.0	
46	2503-0120024	STORM SEWER GRAVITY MAIN, TRENCHLESS, 24 IN.	LF	877.0	
47	2503-0200036	REMOVE STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN.	LF	36	
48	2503-0200236	REMOVE AND REINSTALL STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN.	LF	35	
49	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	0.0	
50	2506-4984000	FLOWABLE MORTAR	CY	94.3	
51	2507-8029000	EROSION STONE	TON	0.0	
52	2510-6745850	REMOVAL OF PAVEMENT	SY	6,845.0	
53	2517-4225210	RAILROAD APPROACH SECTION, P.C.C.	SY	83.6	
54	2518-6910000	SAFETY CLOSURE	EACH	12	
55	2519-4200120	REMOVAL OF FENCE, CHAIN LINK	LF	3,868.7	
56	2527-9263117	PAINTED PAVEMENT MARKINGS, DURABLE	STA	143.58	
57	2527-9263143	PAINTED SYMBOLS AND LEGENDS, DURABLE	EACH	2	
58	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	4,700.0	
59	2528-8445110	TRAFFIC CONTROL	LS	1.00	
60	2533-4980005	MOBILIZATION	LS	1.00	
61	2537-8900000	REMEDICATION OF PETROLEUM CONTAMINATED SOIL	CY	4,928.0	
62	2537-8900100	SAMPLING AND TESTING FOR PETROLEUM CONTAMINATION (WATER AND SOIL SAMPLES FOR REMEDIATION OF PETROLEUM CONTAMINATED SOIL)	EACH	2	
63	2551-0000110	TEMP CRASH CUSHION	EACH	4	
64	2595-0000011	INSURANCE WHEN WORKING IN RAILROAD RIGHT-OF-WAY, STANDARD, FOR IOWA INTERSTATE	LS	1.00	
65	2595-0000106	BNSF AND NS INSURANCE PROVISIONS	LS	1.00	
66	2595-0000110	CBEC INSURANCE PROVISIONS	LS	1.00	
67	2595-6470000	RAIL (RAILROAD)	TLF	197.0	
68	2595-7400200	REMOVAL OF RAILROAD TRACK	TLF	197.0	
69	2599-9999009	('LINEAR FEET' ITEM) CULVERT, CORRUGATED METAL ROADWAY PIPE, 15 IN. DIA.	LF	15.0	
70	2599-9999010	('LUMP SUM' ITEM) INSTRUMENTATION	LS	1.00	
71	2599-9999018	('SQUARE YARDS' ITEM) HMA UNDERLAYMENT	SY	194.6	
72	2599-9999019	('TRACK LINEAR FEET' ITEM) RAILROAD CROSSING, PCC	TLF	56.9	
73	2601-2633100	MOWING	ACRE	10.0	
74	2601-2634100	MULCHING	ACRE	63.5	
75	2601-2634105	MULCHING, BONDED FIBER MATRIX	ACRE	3.0	
76	2601-2636015	NATIVE GRASS SEEDING	ACRE	5.0	
77	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	61.5	

100-1A  
07-15-97

**ESTIMATED PROJECT QUANTITIES  
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
78	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	66.5	
79	2601-3000112	MONITORING WELL ABANDONMENT	EACH	2	
80	2602-0000020	SILT FENCE	LF	47,050.0	
81	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	5,050.0	
82	2602-0000050	SILT BASINS	EACH	26	
83	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	4,100.0	
84	2602-0000212	FLOATING SILT CURTAIN (HANGING)	LF	100	
85	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN	LF	50	
86	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	14640	
87	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	1000	
88	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	15640	
89	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	
90	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
1	2101-0850001	CLEARING AND GRUBBING
-	-	-
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW Refer to "T" sheets. ----- Overhaul will not be measured or paid for, but shall be considered incidental to roadway excavation on this project. ----- Includes 1,005,021 cu. yds. from optional Borrow. Refer to Sheet R.1-R. for details. ----- Includes 131,731 cu. yds. of suitable material from Template Cut. ----- Refer to "Special Provision for Alternate Borrow Areas (Loess Hills)" for the Contractor's responsibilities for locating alternate borrow areas in the Loess Hills Region of Western Iowa. ----- Lateral 5 is considered a contaminated area. Any contaminated soil encountered as part of the project excavation shall be disposed of as per Section 2537 of the Standard Specifications. If any water with an obvious sheen is removed from Lateral 5 it should be containerized and disposed of properly. Contact the Office of Location and Environment at 515-239-1741 for disposal questions. ----- Item includes placing 10 settlement plates. Refer to Standard Road Plan EW-212 and Tab 103-5 on sheet CS.1 for locations and details.
3	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS Refer to Tab. 103-7 on Sheet CS.1. Dispose of excess material according to Article 1106.07 of the current specifications.
4	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD
5	2105-8425020	TOPSOIL, STRIP AND STOCKPILE Refer to tab 103-4 on sheet C.13. Refer to cross sections for undercut location.
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL Item is for all fill material on the project. Shrinkage is not included in the quantity. Refer to Tab 103-6 on sheet CS.1 and "Developmental Specification for Compaction With Moisture Control" for additional details. Includes 971,862 CY of Class 10 and 62,510 CY of granular blanket material.
7	2107-3825025	GRANULAR MATERIAL FOR BLANKET AND SUBDRAIN Item is for granular blanket. Refer to Q sheets and sheet CS.1 for locations and details.
8	2112-0000100	WICK DRAIN Refer to Q sheets and Tab "Wick" on sheet CS.1 for locations and details.
9	2115-0100000	MODIFIED SUBBASE Refer to Typical "2 Lane Pave" on Sheet B.3 and Tab 100-24 on sheet C.7 for locations and details.
10	2121-7425010	GRANULAR SHOULDERS, TYPE A
11	2123-7450000	SHOULDER CONSTRUCTION, EARTH Refer to Typical "2 Lane Pave" on Sheet B.3. Requires 1152.3 cu. yds. of earth shoulder fill Refer to Tab. 112-9 on Sheet C.8.
12	2301-1033080	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 8 IN. Refer to Typical "2 Lane Pave" and "29th Det" on sheet B.3 and B.4, and Tab 100-24 on sheet C.7 for details.
13	2301-6911722	PORTLAND CEMENT CONCRETE PAVEMENT SAMPLES
14	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE Item is for entrances on 23rd and 29th Ave. Quantity calculated using 4" surface thickness. Refer to tab 102-3 on C Sheet. 16.6 ton included for 29th Ave. temporary widening between STA 3850+90 and STA 3853+10.
15	2402-0425040	FLOODED BACKFILL Refer to Tab 104-3 on sheet C.9 and Standard Road Plan RF-30A for details.
16	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT Refer to Tab 104-3 on sheet C.9 locations and details.
17	2416-0100024	APRONS, CONCRETE, 24 IN. DIA. 4- 24" Aprons for storm sewer see sheet M sheets for locations and details. 10- 24" Aprons. Refer to tab 104-3 on sheet C.9.
18	2416-0100036	APRONS, CONCRETE, 36 IN. DIA.
19	2416-0100048	APRONS, CONCRETE, 48 IN. DIA.
20	2416-0100054	APRONS, CONCRETE, 54 IN. DIA.
21	2416-0100060	APRONS, CONCRETE, 60 IN. DIA.
22	2416-0102236	APRON, LOW CLEARANCE CONCRETE, EQUIVALENT DIAMETER 36 IN.
23	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.
24	2416-1180036	CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.
25	2416-1180048	CULVERT, CONCRETE ROADWAY PIPE, 48 IN. DIA.

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
26	2416-1180060	CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.
27	2416-1200236	CULVERT, LOW CLEARANCE CONCRETE ROADWAY PIPE, EQUIVALENT DIAMETER 36 IN.
28	2416-1262048	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 48 IN. DIA.
29	2416-1262054	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA. Refer to Tab 104-3 on sheet C.9 locations and details. RF-14, Type 3 connections are required for all concrete joints.
30	2417-0225015	APRONS, METAL, 15 IN. DIA. Refer to sheets M.3 - M.13 and Tab 104-5b on sheet M.1 for locations and details.
31	2417-0225024	APRONS, METAL, 24 IN. DIA. 1- 24" Apron for storm sewer see sheet M sheets for locations and details. 1- 24" Apron. Refer to tab 104-3 on sheet C.9.
32	2417-0341036	REMOVE AND REINSTALL METAL APRONS LESS THAN OR EQUAL TO 36 IN. Refer to D-10 on Tab 104-5B, sheet M.11, for location and details.
33	2417-1060024	CULVERT, CORRUGATED METAL ROADWAY PIPE, 24 IN. DIA. 114ft -Refer to Tab 104-3 on sheet C.9 for locations and details. 15 ft -Refer to sheets M.3 - M.13 and Tab 104-5b on sheet M.1 for locations and details.
34	2422-0360018	APRONS, UNCLASSIFIED, 18 IN. DIA.
35	2422-0360024	APRONS, UNCLASSIFIED, 24 IN. DIA.
36	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA.
37	2422-1722024	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 24 IN. DIA. Refer to Tab 102-3 on sheet C.11 for details.
38	2435-0140300	MANHOLE, STORM SEWER, SW-403
39	2435-0256200	INTAKE, SW-562 Refer to sheets M.3 - M.14 and Tab 105-4 on sheet M.1 for details.
40	2501-8400170	TEMPORARY SHEET PILES AND SHORING
41	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA. Refer to Tab 104-9 on sheet CS.2 for locations and details.
42	2502-8212204	SUBDRAIN, PERFORATED PLASTIC PIPE, 4 IN. DIA. Refer to Tab 104-5C on sheet CS.1 for locations and details.
43	2502-8220196	SUBDRAIN OUTLET, RF-19E Refer to Tab. 104-9 on Sheet CS.2 for locations and details.
44	2502-8220197	SUBDRAIN OUTLET (RF-19F) Refer to Tab 104-5C on sheet CS.1 for locations and details.
45	2503-0110024	STORM SEWER GRAVITY MAIN, TRENCHED, 24 IN.
46	2503-0120024	STORM SEWER GRAVITY MAIN, TRENCHLESS, 24 IN. Refer to sheets M.3 - M.13 and Tab 104-5b on sheet M.1 for locations and details.
47	2503-0200036	REMOVE STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN. Refer to Tab 110-14 on sheet C.10 for details.
48	2503-0200236	REMOVE AND REINSTALL STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN. Item is for removal of 35' and reinstalling 12' of 15" CMP. Refer to D-10 on Tab 104-5B, sheet M.1, for location and details.
49	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab 110-7A on sheet C.14 for details.
50	2506-4984000	FLOWABLE MORTAR 45.3 CY is for culvert abandonment. Refer to Typical 4315 on sheet B.8 and Tab 110-9 on sheet C.10 for details. 49 CY is for backfill over the culvert. Refer to Tab 104-3 on sheet C.9 for details.
51	2507-8029000	EROSION STONE
52	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab 110-1 on sheet C.7 and 102-5 on sheet C.8. Includes 64 LF of saw cut.
53	2517-4225210	RAILROAD APPROACH SECTION, P.C.C. Refer to Tab 112-3 on sheet C.xx for locations.
54	2518-6910000	SAFETY CLOSURE Includes 1 road and 11 hazard closures. Refer to Tab. 108-13A on Sheet C.11 for locations and details.
55	2519-4200120	REMOVAL OF FENCE, CHAIN LINK Refer to Tab 100-7 on sheet C.11 for details.

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
56	2527-9263117	<b>PAINTED PAVEMENT MARKINGS, DURABLE</b> Refer to Tab 108-22 on sheet C.16 for details.
57	2527-9263143	<b>PAINTED SYMBOLS AND LEGENDS, DURABLE</b> Refer to Tab 108-29 on sheet C.16 for details.
58	2528-8400048	<b>TEMPORARY BARRIER RAIL, CONCRETE</b> Refer to Tab 108-33 on sheet C.15 for locations and details.
59	2528-8445110	<b>TRAFFIC CONTROL</b>
60	2533-4980005	<b>MOBILIZATION</b>
61	2537-8900000	<b>REMEDICATION OF PETROLEUM CONTAMINATED SOIL</b> Item is for excavated material on 29th Ave. from Sta. 3853+50 to 3857+50.  Lateral 5 is considered a contaminated area. Any contaminated soil encountered as part of the project excavation shall be disposed of as per Section 2537 of the Standard Specifications. If any water with an obvious sheen is removed from Lateral 5 it should be containerized and disposed of properly. Contact the Office of Location and Environment at 515-239-1741 for disposal questions.
62	2537-8900100	<b>SAMPLING AND TESTING FOR PETROLEUM CONTAMINATION (WATER AND SOIL SAMPLES FOR REMEDIATION OF PETROLEUM CONTAMINATION)</b>
63	2551-0000110	<b>TEMP CRASH CUSHION</b> Refer to Tab 108-30 on sheet C.15 for locations and details.
64	2595-0000011	<b>INSURANCE WHEN WORKING IN RAILROAD RIGHT-OF-WAY, STANDARD, FOR IOWA INTERSTATE</b> Refer to "Special Provisions for Work on Railroad Right-of-Way (Iowa Interstate)" for details.
65	2595-0000106	<b>BNSF AND NS INSURANCE PROVISIONS</b> Refer to "Special Provisions for Work on Railroad Right-of-Way (BNSF)" for details.
66	2595-0000110	<b>CBEC INSURANCE PROVISIONS</b> Refer to "Special Provisions for Work on Railroad Right-of-Way (CBEC)" for details.
67	2595-6470000	<b>RAIL (RAILROAD)</b> Refer to sheet U.9 and "Special Provision for Railroad Track" for additional information.
68	2595-7400200	<b>REMOVAL OF RAILROAD TRACK</b> Refer to sheet U.9 for location. Item includes removal of both rails, tie plates, ties, connectors, railroad spikes, ballast and subballast, obliterating old roadbed, and any other items associated with the existing track.  Method of Measurement: The engineer will calculate the number of lineal feet of railroad track removed according to the contract documents.  Basis of Payment: For the quantity of railroad track removed, the contractor shall be paid the contract unit price per lineal foot. This price shall be full compensation for all materials, labor, equipment and tools necessary for removing the railroad track as shown in the plans.
69	2599-9999009	<b>('LINEAR FEET' ITEM) CULVERT, CORRUGATED METAL ROADWAY PIPE, 15 IN. DIA.</b> Refer to sheets M.3 - M.13 and Tab 104-5b on sheet M.1 for locations and details.
70	2599-9999010	<b>('LUMP SUM' ITEM) INSTRUMENTATION</b> Refer to Q sheets, sheet CS.1, and "Special Provisions for Instrumentation" for locations and details.
71	2599-9999018	<b>('SQUARE YARDS' ITEM) HMA UNDERLAYMENT</b> Refer to sheet U.9 and "Special Provision for HMA Underlayment" for additional information.
72	2599-9999019	<b>('TRACK LINEAR FEET' ITEM) RAILROAD CROSSING, PCC</b> Refer to sheet U.9 and "Special Provision for Railroad Track" for additional information.
73	2601-2633100	<b>MOWING</b> Estimate based on two mowings of 'Native Grass Seeding' areas. Areas inaccessible to field equipment shall be cut with appropriate hand equipment and kept current with the mowing of adjacent areas.  Mowings shall take place when the vegetation is between 12 and 18 inches tall and mowed between four and eight inches in height.
74	2601-2634100	<b>MULCHING</b> Mulching per Article 2601.03, E, 2. Anchor mulch into the soil using mulch anchoring equipment with a minimum of two passes.  Included for areas requiring reshaping and seedbed preparation. Mulch shall be Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations.

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
		Mulch Rate: 1 1/2 tons of dry cereal straw or native grass straw per acre.
75	2601-2634105	<b>MULCHING, BONDED FIBER MATRIX</b> A Bonded Fibre Matrix shall be applied as mulch for all areas ten feet adjacent to shoulders and median areas.  The seed and fertilizer for the area to be covered shall be applied before the Bonded Fibre Matrix Hydraulic Mulch application.  Application rate shall be a minimum of 3000 lbs per acre.
76	2601-2636015	<b>NATIVE GRASS SEEDING</b> All designated areas shall be seeded per Article 2601.03, C, 5.  Native grass will be seeded between station 8559+00 and 8576+00 outside eight feet adjacent to the shoulder.  All seed for "Native Grass Seeding" will be supplied by the contractor.  All forb seed will be applied through the native grass drill wildflower or small seed box. Forb seed will not be allowed to be mixed and applied with the native grass seed.  Cover crop will be required to be applied through the cool season or cover crop seed box. The cover crop seed will not be allowed to be mixed and applied with the native grass seed.  All seed shall be planted at a maximum 1/8 inch depth.  Ensure no seeding is accomplished when wet soil conditions would cause the seed to be placed deeper than specified.  Fill seed boxes loosely without packing seed to allow agitator wheels to run freely and the seed flows freely through the drill.  The no-till coulters shall be set to penetrate between 1/4 and 1/2 inch below the soil surface.  Operate the drill so that the drive wheel maintains ground contact at all times.  Perform two passes with the drill, the second pass being offset from the first pass. Operate the tractor between 3 to 5 mph; slow enough to prevent the drill from bouncing.  Remove any seed remaining in the drill at the end of each day. At the completion of all seeding remove remaining seed from the drill by vacuum or other means then hand broadcast remaining seed on the project.  The Engineer will review the limits prior to seeding with the Contractor.
77	2601-2636043	<b>SEEDING AND FERTILIZING (RURAL)</b> All areas adjacent mainline and all side roads shall be seeded and fertilizer per Article 2601.03, C, 3.  All seed and fertilizer for shall be applied with ground driven equipment. A no till drill shall be used to apply all seed.  Seedbed preparation will be required in all areas where rills or gullies are present and determined by the Engineer.
78	2601-2642100	<b>STABILIZING CROP - SEEDING AND FERTILIZING</b> Included for disturbed areas as directed by the Engineer.  All disturbed areas shall be seeded and fertilizer per Article 2601.03, C, 1.
79	2601-3000112	<b>MONITORING WELL ABANDONMENT</b> Refer to XX sheets for locations and details of existing monitoring wells. Bid item includes all necessary equipment, labor, materials, and items necessary to abandon wells. Abandoning wells shall be accomplished by pulling casing and sandpoint out of the ground, allowing the hole to collapse and fill. If the sandpoint and casing cannot be extracted, they shall be tremied full of neat cement or completely sealed with bentonite products. Casing pipe and any curbing, frost pit, or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location. Refer to Standard Specification 2538 and Iowa Administrative Code 567 Chapter 39 for additional details.
80	2602-0000020	<b>SILT FENCE</b> Refer to Tab. 100-17 on sheet C.12. The tabulation includes estimated locations for placement of "Silt Fence" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
81	2602-0000030	<b>SILT FENCE FOR DITCH CHECKS</b> Refer to Tab 100-18 on sheet C.12 for 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 replacements.
82	2602-0000050	<b>SILT BASINS</b>

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
-	-	Refer to Tab. 100-14 on sheet C.13. 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 adjustment and maintenance.
83	2602-0000101	<b>MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK</b> Item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the grading project. Refer to Tab 100-17 and 100-18 on sheet C.12 for details.
84	2602-0000212	<b>FLOATING SILT CURTAIN (HANGING)</b>
85	2602-0000240	<b>MAINTENANCE OF FLOATING SILT CURTAIN</b> Refer to Tab 100-10 on sheet C.12 and "Developmental Specification for Floating Silt Curtain" for locations and details.
86	2602-0000312	<b>PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.</b> Refer to Tab 100-19 on sheet C.x for locations.  Item is included for temporary perimeter sediment control and water velocity reduction. Devices should be installed at the top fo the foreslope. Verify specific locations with the Engineer prior to placement.  Perimeter and Slope Sediment Control Devices will be required to be constructed out of wood excelsior.
87	2602-0000320	<b>PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.</b> Item is included for temporary perimeter sediment control, inlet protection, and water velocity reduction on slopes or ditches at locations to be determined during construction. Verify specific locations with the Engineer prior to beginning placement.  Perimeter and Slope Sediment Control Devices will be required to be constructed out of wood excelsior.
88	2602-0000350	<b>REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE</b> 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.
89	2602-0010010	<b>MOBILIZATIONS, EROSION CONTROL</b>
90	2602-0010020	<b>MOBILIZATIONS, EMERGENCY EROSION CONTROL</b>

105-4  
10-18-11

**STANDARD ROAD PLANS**

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

Number	Date	Title
BA-401	04-16-13	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-10	Temporary Crash Cushions Sand Barrel
EC-201	04-20-10	Silt Fence
EC-202	04-15-14	Floating Silt Curtain
EW-101	04-19-11	Embankment and Rebuilding Embankments
EW-102	10-15-13	Allowable Placement of Unsuitable Soil in Embankments
EW-110	10-15-13	Ditch Blocks and Dikes
EW-201	04-17-12	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-204	04-17-12	Bridge Berm Grading with Recoverable Slope (Barnroof Section)
EW-212	04-15-14	Settlement Plate
EW-301	04-19-11	Guardrail Grading
EW-403	10-15-13	Temporary Erosion Control Measures
EW-501	10-15-13	Rural Entrance
EW-503	04-15-14	Side Road Grading
PM-110	04-16-13	Line Types
PM-111	10-16-12	Symbols and Legends
PM-240	04-16-13	Railroad Crossing on Two-Lane Roadway
PV-101	04-15-14	Joints
PV-106	10-15-13	PCC Railroad Approach Section
PV-301	04-19-11	Superelevation Details Two Lane Roadway
RF-3	10-15-13	Concrete Aprons
RF-5	04-16-13	Metal Pipe Aprons and Beveled Ends
RF-13	10-18-11	Pipe Bends and Half Pipe
RF-14	04-16-13	Connected Pipe Joints
RF-19C	10-16-12	Subdrains (Longitudinal)
RF-19E	10-16-12	Outlets for Longitudinal, Transverse and Backslope Subdrains
RF-19F	10-16-12	Subdrain Outlets (Standard Subdrain, Pressure Release and Special)
RF-30A	04-15-14	Pipe Culvert (Bedding and Backfill)
RF-30B	10-19-10	Pipe Culvert (Cover and Camber)
RF-30C	04-16-13	Pipe Culvert (Installation Details)
RF-31	03-28-95	Depth of Cover Tables for Concrete Pipe
RF-32	10-19-10	Depth of Cover Tables for Corrugated Pipe
RF-42	04-15-14	Low Clearance Concrete Pipe Aprons
SW-101	04-21-09	Trench Bedding and Backfill Zones
SW-401	04-21-09	Circular Storm Sewer Manhole
SW-403	04-21-09	Deep Well Rectangular Storm Sewer Manhole
SW-562	10-20-09	Vertical Throat Area Intake
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-211	04-17-12	Lane Closure on Low Volume Roadway
TC-402	10-15-13	Shoulder Closure (Multi-Lane)
TC-418	10-15-13	Lane Closure on Divided Highway

213-3  
Modified

**SUBSOIL TILLAGE**

All stockpile areas, haul roads, and areas used for equipment on this project require subsoil tillage to an average depth of 16 to 20 inches prior to placement of topsoil and/or stabilizing crop seeding. Complete this tillage at 3 foot maximum centers and at right angles to the finished slope.

Use tillage equipment equipped with an arrowhead type shoe that will provide lateral displacement and limit the movement of the subsoil to the surface. Obtain the Engineer's approval for the equipment. This work is incidental to other work on the project.

Following the subsoil tillage, the area is to remain in a "loosened" condition. Additional compaction or the operation of heavy equipment, other than required for topsoil placement and shaping, will not be allowed on areas which have received subsoil tillage.

252-1  
10-16-12

**TEMPORARY CROSSINGS AND DETOURS**

Blading, shaping, and other work in preparation for maintaining temporary crossings or detours is incidental to other work. Furnish and spread additional granular surfacing needed for temporary crossings or detours during construction at the contract price.

254-1  
10-02-01

**INCIDENT MANAGEMENT**

An incident management plan, provided by the District Office, will be discussed at the pre-construction conference.

262-5  
10-18-05

**UTILITIES  
(POINT 25 PROJECT)**

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



**POLLUTION PREVENTION PLAN**

This Base Pollution Prevention Plan (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 RESPONSIBILITIES****A. Designer:**

1. Prepares Base PPP included in the project plan.
2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
3. Signature authority on the Base PPP and NOI.

**B. Contractor/Subcontractor:**

1. Affected contractors/subcontractors are co-permittees with the IDOT and will sign a certification statement adhering to the requirements of the NPDES permit and this PPP plan. 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. Submit a detailed schedule according to Article 2602 of the Specifications and any additional plan notes.
3. Install and maintain appropriate controls.
4. Supervise and implement good housekeeping practices.
5. Conduct joint required inspections of the site with inspection staff.
6. Signature authority on Co-Permittee Certification Statements and storm water inspection reports.

**C. RCE/Inspector:**

1. Update 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. Maintain an up-to-date list that identifies contractors and subcontractors as co-permittees.
3. Make these plans available to the DNR upon their request.
4. Conduct joint required inspections of the site with the contractor/subcontractor.
5. Complete an inspection report after each inspection.
6. Signature authority on storm water inspection reports and Notice of Discontinuation (NOD).

**II. PROJECT SITE DESCRIPTION**

A. This Pollution Prevention Plan (PPP) is for the construction of a construction of I-80/I-29.

B. This PPP covers approximately 1255 acres with an estimated 1066 acres being disturbed. The portion of the PPP covered by this contract has 71.4 acres disturbed.

C. The PPP is located in an area of one soil association (Luton-Onawa-Salix)

The estimated average SCS runoff curve number for this PPP after completion will be 83.

D. Storm Water Site Map - Multiple sources of information comprise the base storm water site map including:

1. Drainage patterns - Plan and Profile sheets and Situation plans.
2. Proposed Slopes - Cross Sections.
3. Areas of Soil Disturbance - construction limits shown on Plan and Profile sheets.
4. Location of Structural Controls - Tabulations on C sheets.
5. Locations of Non-structural Controls - Tabulations on C sheets.
6. Locations of Stabilization Practices - generally within construction limits shown on Plan and Profile sheets.
7. Surface Waters (including wetlands) - Plan and Profile sheets.
8. Locations where storm water is discharged - Plan and Profile sheets.

E. The base site map is amended by contract modifications and progress payments of completed erosion control work.

F. Runoff from this work will flow into Lateral 5 to Mosquito Creek to Missouri River.

**III. CONTROLS**

A. The contractor's work plan and sequence of operations specified in Article 2602.03 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. Section 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures.

Actual quantities used 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.

**1. EROSION AND SEDIMENT CONTROLS****a. Stabilization Practices**

- 1) Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized.
- 2) Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased.
- 3) Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. Other stabilizing methods shall be used outside the seeding time period.
- 4) Stabilization measures to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan. Additional items may be found in the Inspector's Daily Reports (IDR) or Contract Modifications.

**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.
- 2) Structural items to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan, 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 of the plan or are referenced in the Standard Road Plans Tabulation.

**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. The installation of these devices may be subject to Section 404 of the Clean Water Act.

**POLLUTION PREVENTION PLAN****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 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 - Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located.
- 7) Vehicle and Equipment Cleaning - Employ washing practices that prevent contamination of surface and ground water from wash water.
- 8) Vehicle and Equipment Fueling and Maintenance - Perform on site fueling and maintenance in accordance with all environmental laws such as proper storage of on-site fuels and proper disposal of used engine oil or other fluids on site.
- 9) Litter Management - Ensure employees properly dispose of litter.

**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.

**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.
4. Rainfall amount.
5. Review 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. Identify 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 and complete all actions within 3 calendar days of the inspection.

**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 patio blocks, Class A stone, erosion stone or other appropriate materials.

**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.

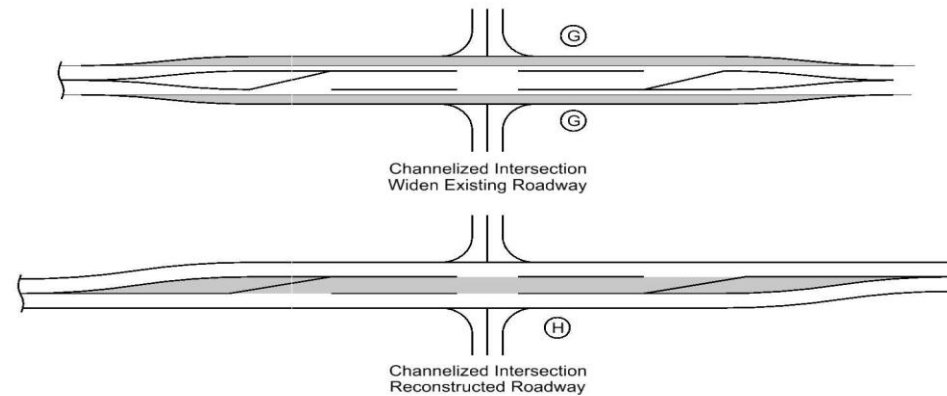
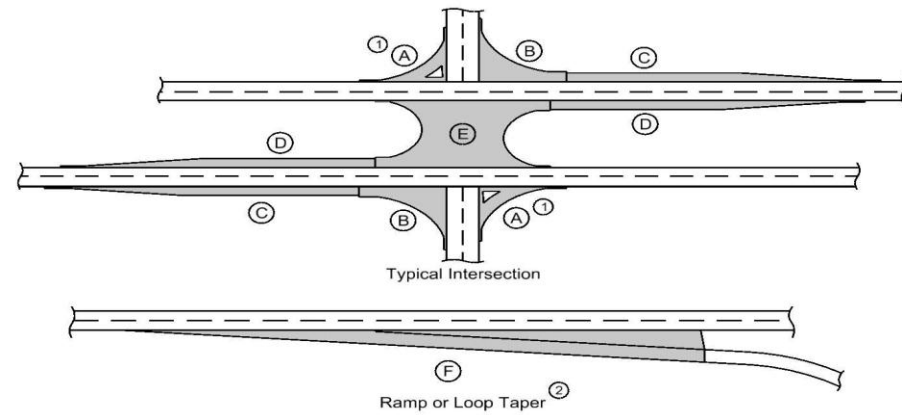
B. Amended PPP - May include Plan Revisions or Contract Modifications for new items and fieldbook entries made by the inspector.

C. IDR - Inspector's Daily Report - this contains the inspector's daily diary and 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.

E. Signature Authority - Representative from Designer, Contractor/Subcontractor, or RCE/Inspector authorized to sign various storm water documents.

PCC PAVEMENT



- ① Does not include island area or curb. Refer to tabulation 112-4 for quantities.
- ② Refer to PV-410, PV-411, PV-412, and PV-414.
- ③ Quantity includes Pavement Header.

Road Identification	Location		Mainline			Area ③								Total Area By Pavement Thickness		Special Backfill TONS	Modified Subbase CY	Granular Subbase SY	Remarks
	Direction of Travel	Station to Station	Width FT	Length FT	Area SY	A SY	B SY	C SY	D SY	E SY	F SY	G SY	H SY	SY					
														8 IN	10% IN				
23RD AVE		3009+25.00 - 3030+70.14	24.0	2145.1	5720.4	300.4	392.6							6413.4			2726.1		
29TH AVE		3820+34.00 - 3822+34.77	31-24	200.8	605.3									605.3			243.7		
29TH AVE		3822+34.77 - 3841+41.70	24.0	1906.9	5085.1									5085.1			2140.6		
29TH AVE		3841+86.17 - 3855+32.39	24.0	1346.2	3589.9									3589.9			1545.7		
29TH AVE		3855+32.39 - 3857+46.30	24.0	213.9	570.4	442.7	170.0							1183.1			454.9		
29TH AVE DETOUR		13818+53.00 - 13820+49.00	37-24	196.0	551.9	28.7	35.8							616.4			120.1		
TOTAL														17493.3		7231.1			

100-27  
10-20-09

**PAVEMENT SMOOTHNESS + PCC TEXTURE**

Road Identification	Begin Station	End Station	Proposed Posted Speed			Remarks
			35 or less	40 - 45	over 45	
23RD AVE	3030+70.14	3007+00.00	X			
29TH AVE	3820+34.00	3841+41.70	X			
29th AVE	3841+81.17	3857+46.30	X			
29TH AVE DETOUR	13818+53.00	13820+49.00	X			

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	
3820+51.00	3848+11.00	RT		6845.0	64.0	29TH AVE

**EXISTING PAVEMENT**

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks	
	County	Route	Dir. of Travel	Begin Milepost	End Milepost				Type	Depth	Type	Depth	Type	Depth	Type	Depth	Source	Type	Durability Class			Type
1	78	29TH AVE					HMA		Unknown													

**SHOULDERS**

- ① Lane(s) to which the shoulder is adjacent.
- ② Bid Item
- ③ Applies only for Paved Shoulders constructed on project with existing granular shoulders.
- ④ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 0, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Road Identification	① Direction OF Traffic	Location			Quantities														Remarks										
		Station to Station	Side	P Width FT	G Width FT	L Length FT	Class 13 Excavation CY ②	Hot Mix Asphalt		Binder TONS	Paved Shoulder SY ②	Reinforced Paved Shoulder SY ②	Special Backfill				Modified Subbase CY ②	Granular Shoulder		Earth Shoulder Construction Alternates									
								TON	TON/STA				HMA Alternate		PCC Alternate			TON ②		TON/STA	STA ②	HMA CY ④	PCC CY ④						
													TON ②	TON/STA	TON ②	TON/STA													
23RD AVE		3009+25.00	3030+36.38	LT													632.6	30.0	21.1				E shoulder const. CY						
23RD AVE		3009+25.00	3030+36.38	RT													632.6	30.0	21.1				213.5						
29TH AVE		3820+34.00	3830+39.53	LT													301.3	30.0	10.1				101.7						
29TH AVE		3831+27.55	3841+45.56	LT													305.0	30.0	10.2				102.9						
29TH AVE		3841+58.65	3857+46.30	LT													475.7	30.0	15.9				160.5						
29TH AVE		3821+12.00	3841+69.22	RT													616.3	30.0	20.6				208						
29TH AVE		3841+82.31	3855+19.25	RT													400.5	30.0	13.4				135.2						
29TH AVE		3855+78.27	3857+46.30	RT															1.7				17						
TOTAL																3363.9		114.0											1152.3

DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.

\* Not a bid item

① UNCL = Unclassified Pipe    CMP = Corrugated Metal Pipe    RCP = Reinforced Concrete Pipe    LCP = Arch or Elliptical Low Clearance Pipe    SARC = Steel Arch Pipe

Drainage Area ACRE	Location	Type	Size IN	Kind Of Pipe ①	Length New Const. LF	Bedding Class	Design Cover (H)		Apron No.	Apron Guard* (RF-26)	Elbow* (RF-13)	Diaphragm* (RF-7)	Tee Section* (RF-21)	"D" Section* (RF-13)	Reducer*	Adaptors* (RF-2)	Connected Pipe Joint* (RF-14)	4" Perforated Subdrain*	Flow Line Elevations				Dimensions Lin. Ft.				Skew Ahead Degrees		Dike				Class 20 CY	Flowable Mortar CY	Floodable* Backfill CY	Porous* Backfill CY	Flooded Backfill CY	Remarks									
							FT	FT											Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Location Station	Top Elevation							Type	CY	CY	CY	CY	CY			
																																													Total	Extensions	Rt.
	I-80 7615+25.70	1301	24	CMP	114		17.8	(1)	1							C-4	1		994.30		997.36						170.3		15								62.0										
	I-29 8578+91.00	1101	48	RCP	298		3.6	(1)	1	1									977.00	983.08						180.0	134.0		65								0.0										
	I-29 RampA 61580+56.99	1201	48	RCP	188		11.7	(1)	1	1									972.05	971.52						282.0			66								279.0										
	I-29 RAMPB 62578+90.00	1101	24	RCP	236		19.0	(1)	1	1									979.23	981.79						146.1	102.1												0.0	2.0	106.0	16.0	122.0				
	IA192 RampA 51547+85.00	1101	24	RCP	124		13.0	(1)	1	1						C-1	1		972.02	987.00	972.28					82.1	53.1												208.0	1.0	93.0	9.0	102.0	F=20			
	23RD AVE 33.7 3029+90.00	1101	36	LCP	48	B	2.0			1	1								973.32	973.70						34.0	30.0												75.0	7.0	37.0	5.0	42.0				
	29TH AVE 3830+00.00	1101	24	RCP	58	B	3.0	(1)	1	1									973.74	974.52						42.1	28.1												71.0	7.0	42.0	5.0	47.0				
	56.8 3840+60.00	1101	48	RCP	76	B	3.8	(1)	1	1									972.48	972.20						45.0	47.0		36										90.0	9.0	117.0	8.0	125.0				
	34.7 3842+20.00	1101	36	RCP	70	B	3.7	(1)	1	1									974.00	973.50						41.0	45.0		42											45.0	8.0	81.0	7.0	88.0			
	208.9 3853+07.00	1101	60	RCP	44	B	2.7	(1)	1	1									972.33	971.88						42.0	40.0		32												82.0	10.0	106.0	8.0	114.0		
	29TH DETOUR 13820+25.00	1101	24	UNCL	34	B	1.5			1	1								975.21	975.05						22.6	23.6														37.0	5.0	15.0	3.0	18.0		
	H Langdon Blvd 3715+50.00	1101	54	RCP	108		10.0	(1)	1	1									979.23	986.05						78.0	46.0																trenchless				
	BNSF 1081+59.00	1101	48	RCP	312		4.5	(1)	1	1									974.00	975.00						141.0	187.0		15															trenchless			
	DET 301300 31310+50.00	1101	24	RCP	82		3.8	(1)	1	1									976.12	976.46						48.1	46.1																50.0				
	(1) refer to Q sheets																																									999.0	49.0			658.0	TOTAL

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	
Harry Langdon Blvd 3714+25 - 16' Rt to 52' Rt	Storm Sewer	Removal	36			

110-9  
10-18-11

**CULVERT ABANDONMENT**

Refer to Details 4315 and 4316

\* Not a bid item

Location Station	Description	Fill Material		4"	Remarks
		Flowable Mortar	Granular Backfill*	Perforated Subdrain*	
		CY	TON	LF	
I-80 7612+60	24" x 129' RCP/CMP	5.3	0.2	8.0	Remove 81' CMP on Outlet End (Typical 1501)
Harry Langdon 3712+33	3'x3' RCB	40.0	0.2	10.0	

### 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			Pipe Culvert ③			Aprons		Driveway Surface Area		Driveway Surfacing Material	Remarks				
Station	Side	A, B, C, Safety Ramp, or Predetermined*	Case 1 or 2	1 1/2" Dropped Curb LF	3" Dropped Curb LF	W FT	PR ① ② FT	SR ② FT	H FT	Size IN	Pipe Length LF	Lt. LF	Rt. LF		No.	Driveway Surface Area		TON
																HMA SY	PCC SY	
23RD AVE																		
3011+08.00	LT	B				45.0	35.0		2.2	18.0	72.0	41.8	42.4	2			82.600	
3015+04.00	LT	B				45.0	35.0		2.8	18.0	76.0	44.1	44.1	2			104.500	
3015+04.00	RT	B				45.0	35.0		2.5	18.0	72.0	42.1	42.1	2			91.300	
3018+00.00	LT	B				45.0	35.0		3.9	18.0	92.0	52.1	52.1	2			72.100	
3019+06.00	RT	B				45.0	35.0		3.2	18.0	82.0	47.1	47.1	2			88.600	
3025+00.00	RT	B				45.0	35.0		2.4	18.0	72.0	42.1	42.1	2			103.300	
29TH AVE																		
3828+00.00	LT	B				45.0	35.0		2.0	18.0	68.0	40.0	40.2	2			107.700	
3830+82.14	RT	B				24.0	15.0										23.400	
3836+48.00	LT	B				45.0	35.0		2.9	18.0	76.0	45.1	43.1	2			106.600	
3849+25.00	LT	B				45.0	35.0		2.7	18.0	78.0	45.1	45.1	2			63.100	
3853+85.00	LT	B				24.0	35.0		5.5	18.0	82.0	38.6	55.6	2			63.800	
3855+50.00	RT	B				24.0	35.0		5.7	18.0	104.0	56.6	60.0	2		219.4		
Langdon Blvd	RT	C				24.0	15.0		7.8	24.0	132.0	70.1	74.1	2			Refer to typical MTA	
										TOTAL	18"	874.0			22	219.4	907.000	
											24"	132.0			2			

### SAFETY CLOSURES

Refer to Section 2518 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
ML 80			
7612+58.28		1	
7616+75.00		1	
7547+50.00		1	
7552+18.79		1	
7559+00.00		1	
7579+19.31		1	
I-29			
8547+00.00		1	
8549+00.00		1	
8552+17.18		1	
8559+00.00		1	
8589+00.00		1	
23rd Ave			
3009+25.00	1		

### FENCING

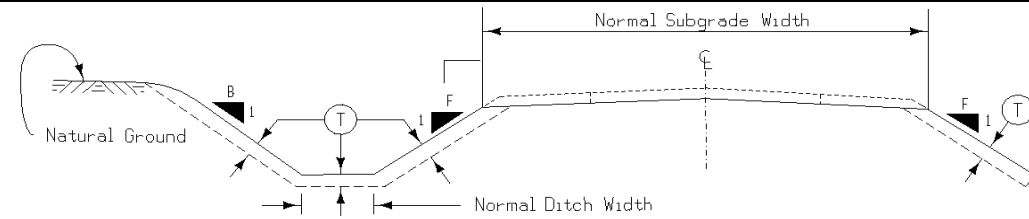
\* Bid Item

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		Fence Length*	Brace Panels*	Gate		Fence Length*	Brace Panels*	Gate		Length*	Type	
Station	Offset	Station	Offset		Length*	Type	No.*	Type			No.*	Type			No.*	Type			
					LF		EACH		LF	EACH	EACH		LF	EACH	EACH		LF		
7557+05.34	22.9	7588+81.37	514.3		3386.0	72 IN.												Removal of Chain Link Fence	
7612+22.69	43.6	7616+35.00	158.2		482.7	72 IN.												Removal of Chain Link Fence	



**TABULATION OF SPREADING TOPSOIL**



Perform this work according to Section 2105. Prior to placing topsoil on any cohesive soil, scarify the area to be covered to a minimum depth of 3 inches.

Appropriate adjustments have been made in the template quantities to reflect the placement of topsoil on foreslope, backslope and ditch bottom as detailed hereon.

Placement Description						Topsoil Excavation Available From						
Area	Quantity	Location	Side	Slope	(T)	Remarks	Amount Reserved	Station to Station	Remarks			
No.	CY	Station to Station	L. or R.	B. or F.	IN		CY					
1	39.0	7533+75.00	7548+00.00			8.0		ML080_1A	4551.0	7533+75.00	7548+00.00	ML080_1A stripp 24"
2	0.0	7548+50.00	7552+75.00			8.0		ML080_1B	1004.0	7548+50.00	7552+75.00	ML080_1B stripp 24"
3	4381.0	7558+25.00	7580+50.00			8.0		ML080_2	9454.0	7558+25.00	7580+50.00	ML080_2 stripp 24"
4	1977.0	7612+00.00	7617+00.00			8.0		ML080_3	7372.0	7612+00.00	7617+00.00	ML080_3 stripp 24"
5	981.0	8536+50.00	8537+00.00			8.0		MLE029_1A	6187.0	8536+50.00	8537+00.00	MLE029_1A stripp 24"
6	840.0	8548+00.00	8552+75.00			8.0		MLE029_1B	4850.0	8548+00.00	8552+75.00	MLE029_1B stripp 24"
7	10087.0	8558+25.00	8589+50.00			8.0		MLE029_2	1876.0	8558+25.00	8589+50.00	MLE029_2 stripp 24"
8	1254.0	31305+00.00	31311+75.00			8.0		DET301300_1	27.0	31305+00.00	31311+75.00	DET301300_1 stripp 24"
9	854.0	31318+00.00	31320+50.00			8.0		DET301300_2	2173.0	31318+00.00	31320+50.00	DET301300_2 stripp 24"
10	4319.0	3009+25.00	3030+70.14			8.0		23RD	0.0	3009+25.00	3030+70.14	23RD
11	7797.0	3820+34.00	3857+46.30			8.0		29TH	0.0	3820+34.00	3857+46.30	29TH
12	150.0	13818+00.00	13820+49.00			8.0		29THDET	0.0	13818+00.00	13820+49.00	29THDET
13	988.0	3712+20.00	3716+50.00			8.0		HLAN EX	1759.0	3712+20.00	3716+50.00	HLAN EX stripp 24"
14	1756.0	73101+22.00	73108+50.00			8.0		DG3100_1	3770.0	73101+22.00	73108+50.00	DG3100_1 stripp 24"
15	2055.0	73118+50.00	73126+72.00			8.0		DG3100_2	3856.0	73118+50.00	73126+72.00	DG3100_2 stripp 24"
16	402.0	73200+00.00	73203+82.16			8.0		DG3200	859.0	73200+00.00	73203+82.16	DG3200 stripp 24"
17	1532.0	73300+00.00	73312+00.00			8.0		DG3300	840.0	73300+00.00	73312+00.00	DG3300 stripp 24"
18	477.0	+34.00	5+69.00			8.0		DG3400	543.0	+34.00	5+69.00	DG3400 stripp 24"
19	3161.0	61571+76.08	61579+75.00			8.0		E029A	4237.0	61571+76.08	61579+75.00	E029A stripp 24"
20	3538.0	62573+50.00	62582+50.00			8.0		E029B	4001.0	62573+50.00	62582+50.00	E029B stripp 24"
21	0.0	65561+51.55	65570+03.02			8.0		E029E	328.0	65561+51.55	65570+03.02	E029E stripp 24"
22	1210.0	67464+75.00	67467+00.00			8.0		E029G	3326.0	67464+75.00	67467+00.00	E029G stripp 24"
23	938.0	2271+17.00	2274+50.00			8.0		SUR29NB	2566.0	2271+17.00	2274+50.00	SUR29NB stripp 24"
24	4663.0	51546+00.00	51551+39.99			8.0		IA192A	5962.0	51546+00.00	51551+39.99	IA192A stripp 24"
	53399.0								69541.0			TOTAL

**SILT BASINS**

Refer to EW-403

Location Station	Side	Remarks
I-29		
8578+91.00	LT	
I-29 RampA		
61580+56.99	LT	
I-29 RAMPB		
62578+90.00	LT	
IA192 RampA		
51547+85.00	LT	
23RD AVE		
3029+90.00	LT	
29TH AVE		
3830+00.00	LT	
3840+60.00	LT	
3842+20.00	LT	
3853+07.00	LT	
29TH DETOUR		
13820+25.00	RT	
Langdon Blvd		
3715+50.00	RT	
BNSF		
1081+59.00	RT	
DET 301300		
31310+50.00	LT	



GRADING FOR GUARDRAIL INSTALLATIONS															107-23 10-18-11	
① Lane(s) to which the installation is adjacent. Refer to EW-301																
Location				Dimensions (Feet)									Earthwork		Remarks	
No.	① Direction of Traffic	Station	Side	Foreslope at Guardrail	X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Excavation Class 10		Embankment In Place
														CY		CY
1	WB	7612+33.19	LT	0.250694444	25.0	5.0			115.0	5.0	190.0	7.2	47.0	208.6		Proposed Guardrail - Existing I-80 Westbound.

REMOVAL OF STEEL BEAM GUARDRAIL						110-7A 04-17-12
① Lane(s) to which the installation is adjacent.						
② Includes length of End Terminals and End Anchors.						
Location						
No.	① Direction of Traffic	Station to Station		Side	Removal of Guardrail	
					② LF	
1	NB	3712+13.50	3712+73.50	East		60.0
2	NB	3712+96.56	3716+26.24	East		330.0
3	WB	7612+26.69	7613+82.53	South		156.0
4	EB	7612+26.87	7613+82.53	North		156.0
5	NB	3712+96.56	3716+32.66	East		336.5

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST															108-8A 10-19-10		
Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211.																	
① See Standards for list of materials.																	
Location Station			Layout Lengths				Delineators and Object Markers				Bid Items ①				Remarks		
			VT1	VF	VT2	ET Terminal	Type	Delineator			Object Marker	End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail		End Terminal	
Type 1	Type 2	Type 3						Standard	Flared for Cable Connection	Adapter							
No.	Station	Offset	LF	LF	LF	LF	White No.	No.	OM-3L No.	OM-3R No.	BA-202 Type	BA-201 No.	BA-200 LF	BA-205 No.	BA-206 No.	BA-210 No.	
1	7612+33.19	84.3' LT	28.100		56.25	50.0		2									
2	3716+32.66	17.0' RT				50.0											

### CRASH CUSHIONS

- ① \* 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.	Direction of Traffic	Location Station	Side	Obstacle Width FT	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	W	X	Y	Z	Excavation Class 10 CY	Embankment in Place CY	Permanent EACH	Permanent Severe Use EACH		
										Length FT	Length FT	Length FT	Length FT	Length FT						
		ML 80																		
1	WB	7515+83.60	Med	2.00	1						3.35	24.25	8.60	6.60	12.90		10.0			
2	WB	7548+27.60	out	2.00	1						2.21	24.25	7.46	5.46	12.59		7.2			
3	WB	7582+00.00	out	2.00	1						2.21	24.25	7.46	5.46	12.59		7.2			
4	WB	7618+00.00	out	2.00	1						2.21	24.25	7.46	5.46	12.59		7.2			

### TEMPORARY BARRIER RAIL

Refer to BA-400 and 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 LF	(Select One)		Anchored* (Y/N)	Remarks
				Steel BA-400	Concrete BA-401		
	ML 80 WB						
1	7533+64.00	7548+27.60	1412.5		X	N	
2	7570+80.00	7582+00.00	1175.0		X	N	
3	7612+12.20	7615+83.50	375.0		x	N	
4	7614+10.00	7618+00.00	400.0		x	N	
5	7612+16.26	7615+45.00	350.0		x	N	
	I-29						
6	2269+49.42	2273+74.48	425.0		x	N	
	Detour 301300						
7	31318+00.00	31319+56.00	162.5		x	N	
	Langdon Blvd						
8	3712+13.50	3712+73.50	62.5		x	N	
9	3712+96.56	3716+26.24	337.5		x	N	

**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.  
 BCY4: Broken Centerline (Yellow) @ 0.25  
 ELY4: Edge Line Left (Yellow) @ 1.00

\*\*\*MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

DCY4: Double Centerline (Yellow) @ 2.00  
 SLW2: Stop Line (White) @ 6.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

Road ID	Station to Station		Dir. of Travel	Marking Type	Side			Length by Line Type (Unfactored)													Remarks								
					L	C	R	BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4	SLW2	STA	STA	STA	STA	STA	STA		STA	STA	STA					
23RD AVE	3007+00.00	3030+70.14		Durable Paint	X										25.09														
23RD AVE	3007+00.00	3030+70.14		Durable Paint		X		23.64																					
23RD AVE	3007+00.00	3030+70.14		Durable Paint			X								24.84														
29TH AVE	3820+34.00	3057+26.30		Durable Paint	X										33.63														
29TH AVE	3820+34.00	3057+26.30		Durable Paint		X		34.10			3.17																		
29TH AVE	3820+34.00	3057+26.30		Durable Paint			X								37.30														
				Factored Total: Durable Paint				14.44		-	3.96		-	120.86		-	4.32		-	-	-	-	-	-	-	-	-	-	-
				Bid Quantity: Painted Pavement Markings, Durable																									

**PAVEMENT MARKING SYMBOLS AND LEGENDS**

Refer to PM-111

Road Identification	Location		STAW	RTAW	LTAW	CSRW	CSLW	CSTW	CRLW	FERW	LLRW	RLRW	RRCW	BSW	WCSW	WPSB	SCHOOL	XING	STOP	AHEAD	ONLY	BIKE	LANE	EXIT	Remarks	
	Station	Side																								
29TH AVE	3840+57.00	RT																								
29TH AVE	3842+71.00	LT																								

**LIST OF SUBDRAIN WORK**

Refer to Standard Road Plans RF-3, RF-5, RF-14, RF-19A, RF-19B, RF-19C, RF-19E and RF-19F

\* Not a bid item

No.	Location		Type of Installation	Pipe			Aprons		Outlets		Connected Pipe Joints (RF-14)*	Trench Drain	Granular Material	Porous Backfill*	Class "A" Crushed Stone*	Remarks	
	Station to Station			Concrete C.M.P., C.M.P. Coated, or Plastic	Dia.	Length	RF-3	RF-5	RF-19E	RF-19F							
										Type							No.
1	7540+00.00		TYPE 2	Plastic	4"	165			A	1					I-80		
2	7545+00.00		TYPE 2	Plastic	4"	225			A	1					I-80		
	7538+68.23	7547+50.00											3980.0		GRANULAR BLANKET(GI Area #1)		
3	7549+52.86		TYPE 2	Plastic	4"	220			A	1					I-80		
	7548+45.33	7552+64.93											3560.0		GRANULAR BLANKET(GI Area #2)		
4	7560+00.00		TYPE 2	Plastic	4"	290			A	1					I-80		
5	7565+00.00		TYPE 2	Plastic	4"	320			A	1					I-80		
6	7570+00.00		TYPE 2	Plastic	4"	440			A	1					I-80		
	7558+25.00	7574+00.00											19240.0		GRANULAR BLANKET(GI Area #3)		
7	7575+00.00		TYPE 2	Plastic	4"	670			A	1					I-80		
	7574+00.00	7580+23.71											10910.0		GRANULAR BLANKET(GI Area #4)		
8	61578+50.00		TYPE 2	Plastic	4"	385			A	1					System Ramp A		
	61577+83.03	61580+80.08											2190.0		GRANULAR BLANKET(GI Area #8)		
9	62580+00.00		TYPE 2	Plastic	4"	170			A	1					System Ramp B		
	62574+00.00	62582+47.54											4490.0		GRANULAR BLANKET(GI Area #5)		
10	8580+00.00		TYPE 2	Plastic	4"	205			A	1					I-29 NB		
11	8585+00.00		TYPE 2	Plastic	4"	140			A	1					I-29 NB		
12	8589+36.16		TYPE 2	Plastic	4"	215			A	1					I-29 NB		
13	301311+00.00		TYPE 2	Plastic	4"	105			A	1					DET301300		
	8579+37.26	8589+60.13											7630.0		GRANULAR BLANKET(GI Area #6)		
14	7613+00.00		TYPE 2	Plastic	4"	160			A	1					I-80		
15	7616+00.00		TYPE 2	Plastic	4"	190			A	1					I-80		
	7612+00.00	7616+75.00											2350.0		GRANULAR BLANKET(GI Area #7)		
16	301319+00.00		TYPE 2	Plastic	4"	105			A	1					DET301300		
	301318+00.00	301320+44.09											740.0		GRANULAR BLANKET(GI Area #12)		
17	8597+80.00		TYPE 2	Plastic	4"	95			A	1					I-29 NB		
	8596+38.11	8599+85.02											920.0		GRANULAR BLANKET(GI Area #13)		
	67463+93.32	67466+89.60											1620.0		GRANULAR BLANKET(GI Area #11)		
	3830+00.00	3836+50.00											1020.0		GRANULAR BLANKET(GI Area #10A)		
	3840+50.00	3844+00.00											840.0		GRANULAR BLANKET(GI Area #10B)		
	3851+00.00	3856+00.00											970.0		GRANULAR BLANKET(GI Area #10C)		
	3007+00.00	3013+00.00											2050.0		GRANULAR BLANKET(GI Area #9)		

TABULATION OF WICK DRAINS					
Location		Spacing Ft.	No. of Wick Drains	Total Length Ft.	Remarks
Station to Station					
7540+00	7547+50	5	219000.0	5300.0	I-81 Westbound and I-29 Northbound
7549+50	7552+15	6	119000.0	3300.0	I-81 Westbound /I-29 Northbound/IA 192 LOOP A
7559+00	7574+00	7	337000.0	12900.0	I-81 Westbound /I-29 Northbound/ Ramp F
7574+00	7579+00	6	365000.0	10000.0	I-81 Westbound /I-81 Eastbound/I-29 Northbound/ Ramp A
62575+00	62582+50	6	120000.0	4100.0	Ramp B
8580+00	8590+00	6	255000.0	7000.0	I-29 Northbound and Detour 301300
7611+00	7616+50	5	129000.0	3100.0	I-80Westbound
61578+00	61580+00	5	105000.0	2900.0	Ramp A Bridge- West Approach
3007+00	3013+00	7	36000.0	1400.0	23rd Ave
3830+00	3856+00	7	108000.0	1900.0	29th Ave
67464+50	67466+50	5	55000.0	2200.0	Ramp G
31318+00	31320+00	5	31000.0	1000.0	Detour 301300
2271+17	2274+50	5	38000.0	1200.0	I-29 NB Detour

SHRINKAGE DATA		
Material	%	Remarks
CLASS 10	25%	ENTIRE PROJECT
TOPSOIL SALVAGE	40%	
BOULDER ESTIMATE		50 CY

PIEZOMETERS			
No.	Location		Remarks
	Station	Offset	
1	61579+00	60' RT	SYSTEM RP A
2	7613+35	105' LT	ML 80
3	67466+50	80' RT	SYSTEM RP G

INCLINOMETERS			
No.	Location		Remarks
	Station	Offset	
1	8552+14	28' LT	I-29 NB
2	7579+75	10' RT	I-80
3	61579+50	30' LT	SYSTEM RP A
4	7615+50	130' LT	I-80
5	67466+75	0'	SYSTEM RP G
6	301321+85	60' LT	DET 301300

**EMBANKMENT WITH MOISTURE CONTROL**

Moisture content shall be within the limits of minus 2 and plus 2 percentage points of Optimum Moisture Content for maximum density within the area described and listed below.

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.

Moisture Control is also required on all select subgrade treatments.

Proposed Subgrade Treatment:  
Quantity:

SETTLEMENT PLATES				
Refer to Standard Road Plan EW-212				
No.	Location		Remarks	
	Station	Offset		
1	8544+48	3' LT	I-29 NB	
2	8551+24	29' LT	I-29 NB	
3	8563+02	5' RT	I-29 NB	
4	8570+35	20' RT	I-29 NB	
5	7578+00	0.0	I-80	
6	61578+00	0.0	SYSTEM RP A	
7	8586+00	6' LT	I-29 NB	
8	7614+25	53' LT	I-80	
9	67466+00	0.0	SYSTEM RP G	
10	301319+25	75' LT	DET 301300	

**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.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**EMAD FAROUZ**  
Printed or Typed Name  
My license renewal date is December 31, 20 14

Pages or sheets covered by this seal: CS-1-CS-2,Q-1-Q-53



### SURVEY SYMBOLS

RET Retaining Walls	EB EB Electrical Box
E2 ELB Underground Electric Line Co. 2	PPA Power Pole Co. 1
F07 FOG Underground Fiber Optic Co. 7	MM Mile Marker Post
G2 GLB Underground Gas Line Co. 2	SL SIGN SL Speed Limit Sign
F08 FOH Underground Fiber Optic Co. 8	TVP TV Pedestal
St.S.2 STB Storm Sewer Line Co. 2	TSL Traffic Signal and Luminaire
T1le TIL Tile Line	GV Gas Valve
St.S. STA Storm Sewer Line Co. 1	WEL Well
E1 ELA Underground Electric Line Co. 1	TPA Telephone Pole Co. 1
E3 ELC Underground Electric Line Co. 3	INB Storm Sewer Beehive Intake
F03 FOC Underground Fiber Optic Co. 3	HT Electrical Highline Tower
W WLA Underground Water Line Co. 1	TCB TCB Traffic Signal Box
San. SAA Sanitary Sewer Line Co. 1	RRB RRB Railroad Signal Box
BB BB Billboard	TSB TSB Telephone Switch Box
St.S.3 STC Storm Sewer Line Co. 3	SI SIGN SI Sign
F02 FOB Underground Fiber Optic Co. 2	TEV Evergreen Tree
G3 GLC Underground Gas Line Co. 3	BB Billboard
F10 FOJ Underground Fiber Optic Co. 10	FP FP Filler Pipe
G-HP GHA Underground High Pres Gas Co 1	TR Telephone Riser Pole
G4-HP GHD Underground High Pres Gas Co 4	SHR Shrub
G4 GLD Underground Gas Line Co. 4	RRF Railroad Frog
G5 GLE Underground Gas Line Co. 5	RR Centerline of Railroad Tracks
G GLA Underground Gas Line Co. 1	PPB Power Pole Co. 2
MH Utility Access (Manhole)	D Centerline Draw or Stream (Down)
SI SIGN SI Sign	FCL Chain Link and Security Fence
LUM Luminaire	EW Edge of Water
TSG Traffic Signal	FW Wire Fence
IN Storm Sewer Intake	FWD Wood Fence
T1 TLA Underground Telephone Line Co. 1	GDL Guard Rail Steel
WV Water Valve	DIK Centerline of Dike or Dam
FHD Fire Hydrants	UB Utility Box
T2 TLB Underground Telephone Line Co. 2	TLNL Tree Line Left
F06 FOF Underground Fiber Optic Co. 6	F05 FOE Underground Fiber Optic Co. 5
F04 FOD Underground Fiber Optic Co. 4	TLNR Tree Line Right
G2-HP GHB Underground High Pres Gas Co 2	RRW Railroad Switch
G3-HP GHC Underground High Pres Gas Co 3	D Centerline Draw or Stream (Down)
GPR Guard Post (4 or More Posts)	RRS Railroad Signal
FOA Underground Fiber Optic Co. 1	WHU RV Water Hook Up
FLG Flag Poles	AST Above Ground Storage Tank
GP Guard Post (Less Than 4 Posts)	HDG Hedge Row
UST Underground Tank	RIP Rip-Rap
STP Stump	TVA Underground TV Cable Co. 1
LP L.P. Tank	FOI Underground Fiber Optic Co. 9
TV Satellite TV Dish	T4
TDC Tree Deciduous	T3 TLC Underground Telephone Line Co. 3
OUT Tile Outlet	W3 WLC Underground Water Line Co. 3
TGP Telegraph Pole	WHD Water Hydrant
TPD Telephone Pedestal	F11 FOK Underground Fiber Optic Co. 11
PR Electric Riser Pole	

### UTILITY LEGEND

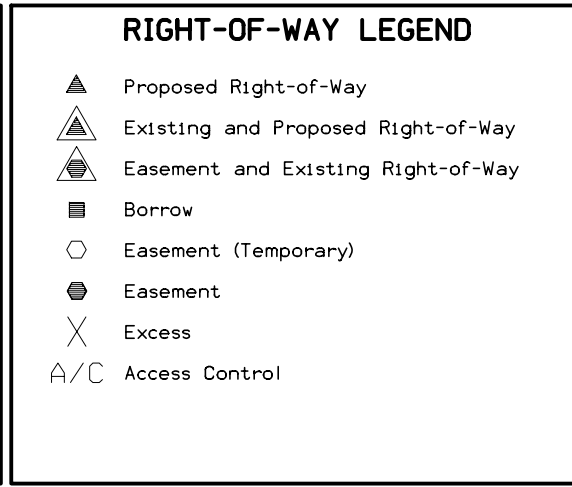
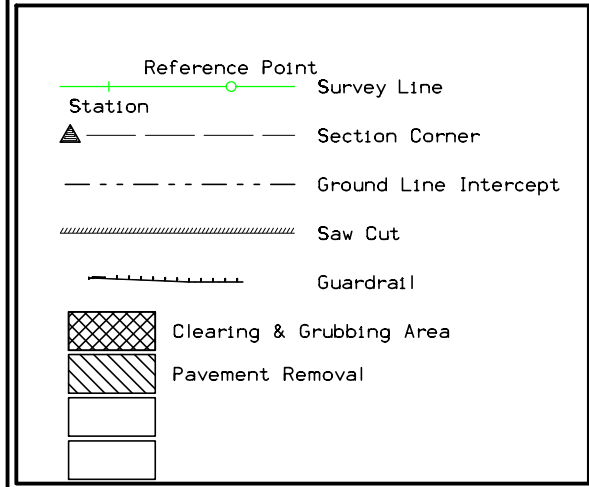
TP	CenturyLink - Local Ed Krieger 7404 N 78th Street, Bldg A Omaha, NE 68122 402-572-5856 edward.krieger@centurylink.com
T2	COX COMMUNICATIONS Dave Kloch 401 North 117th, Suite 101 Omaha, NE 68154 402-934-0550 dave.kloch@cox.com
TVP	
San.	CITY OF COUNCIL BLUFFS Sanitary Sewer Dave Vermillion 209 Pearl Street Council Bluffs, IA 51503 712-328-4635 dvermillion@CouncilBluffs-ia.gov
W	CITY OF COUNCIL BLUFFS Brian Cady 2000 N 25th St P.O. Box 309 Council Bluffs, IA 51502 712-328-1006 x.1039 bcady@cbwaterworks.com
GV	BLACK HILLS ENERGY Brad Fleming 1102 East First Street Pawnee, NE 68046 402-221-2714 brad.fleming@blackhillscorp.com
St. S.	City of Council Bluffs & IA DOT/State of Iowa Dick Mattox 3540 South Expressway Council Bluffs, IA 51501 712-369-6332 dick.mattox@dot.iowa.gov
G	OneOk NGL Pipeline, LLC Troy Schuermann P.O. Box 29 2001 S. Hwy 81 Medford, OK 73759 580-395-8329 troy.schuermann@oneok.com

### PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	Description
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.	Description	
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
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.	Description
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

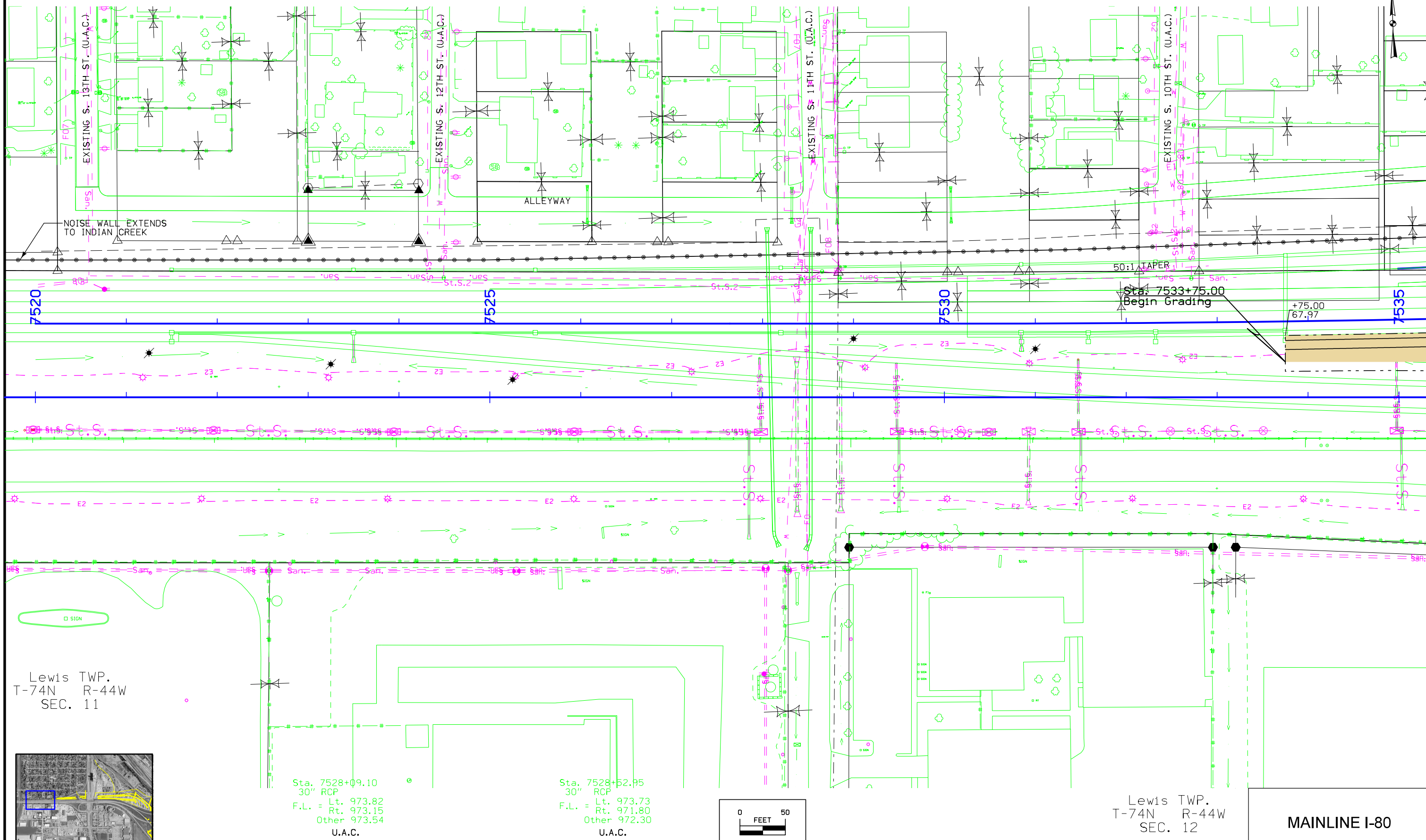


# PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

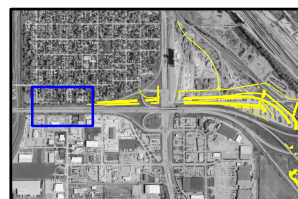
(COVERS SHEET SERIES D, E, F, & K)

Lewis TWP.  
T-74N R-44W  
SEC. 2

Lewis TWP.  
T-74N R-44W  
SEC. 1



Lewis TWP.  
T-74N R-44W  
SEC. 11

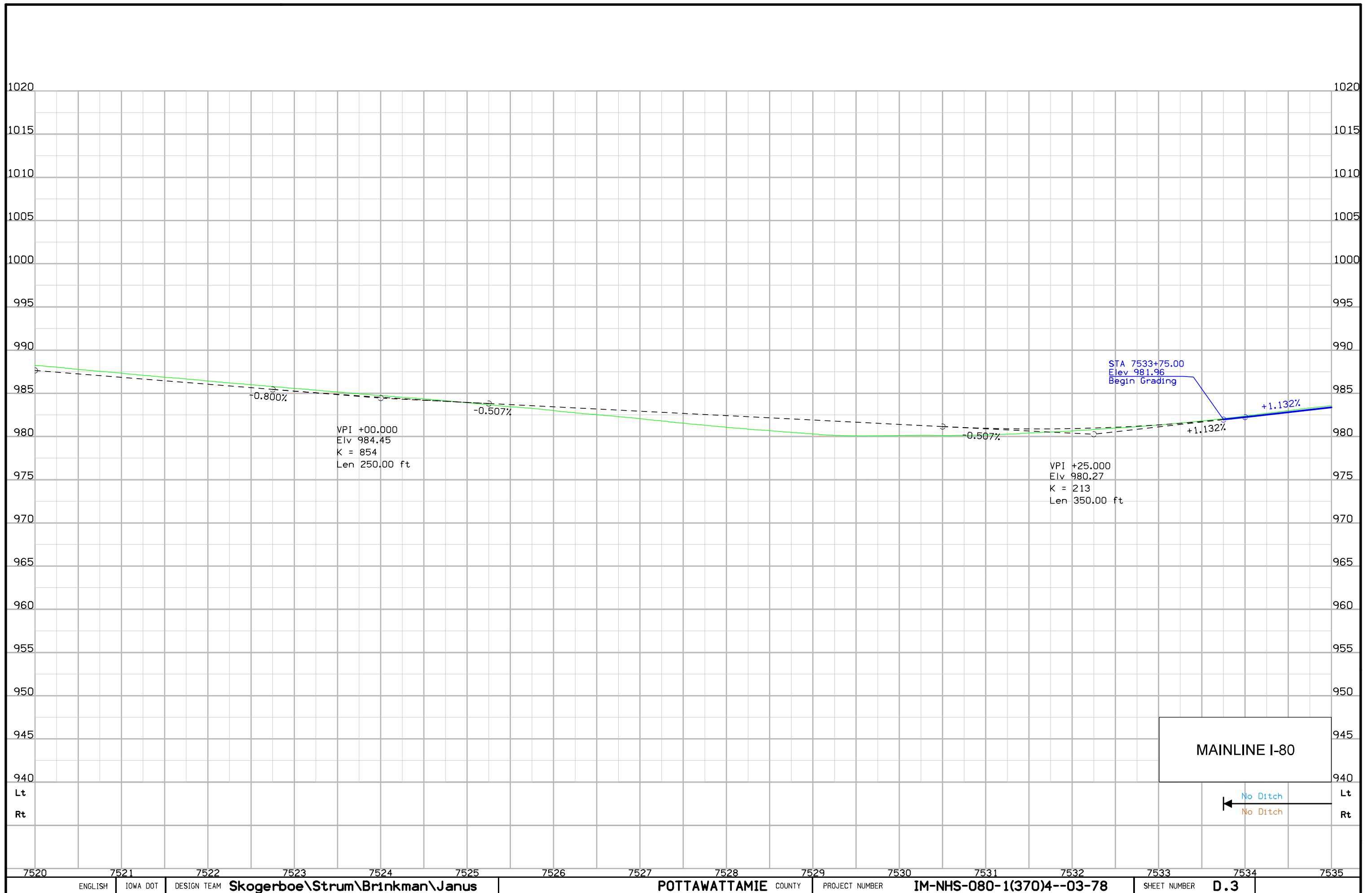


Sta. 7528+09.10  
30" RCP  
F.L. = Lt. 973.82  
Rt. 973.15  
Other 973.54  
U.A.C.

Sta. 7528+52.95  
30" RCP  
F.L. = Lt. 973.73  
Rt. 971.80  
Other 972.30  
U.A.C.

Lewis TWP.  
T-74N R-44W  
SEC. 12

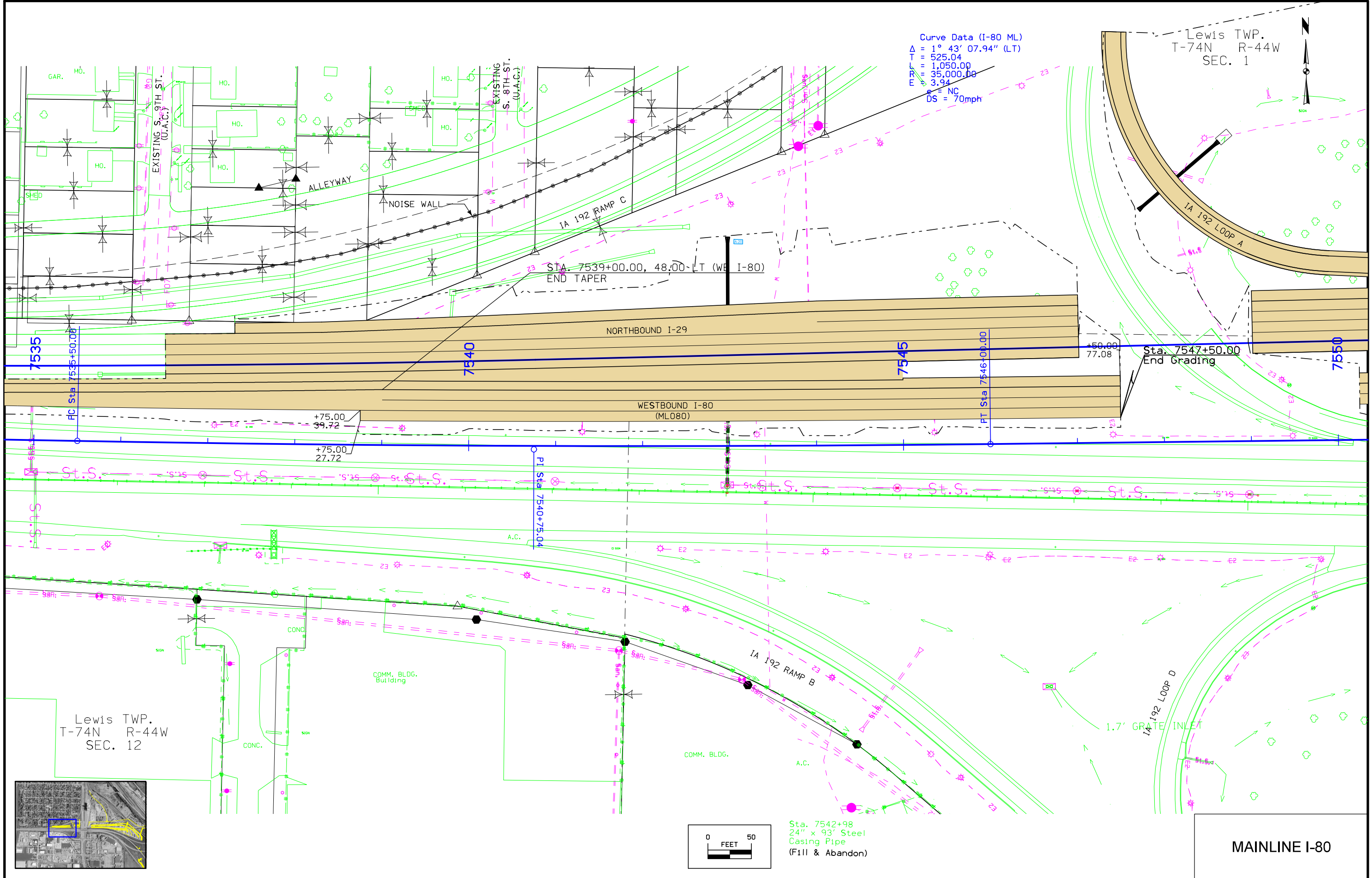
MAINLINE I-80



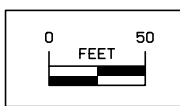
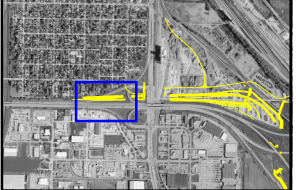


Curve Data (I-80 ML)  
 $\Delta = 1^\circ 43' 07.94''$  (LT)  
 $T = 525.04$   
 $EA = 1,050.00$   
 $EB = 35,000.00$   
 $EC = 3.94$   
 $DS = NC$   
 $DS = 70\text{mph}$

Lewis TWP.  
 T-74N R-44W  
 SEC. 1

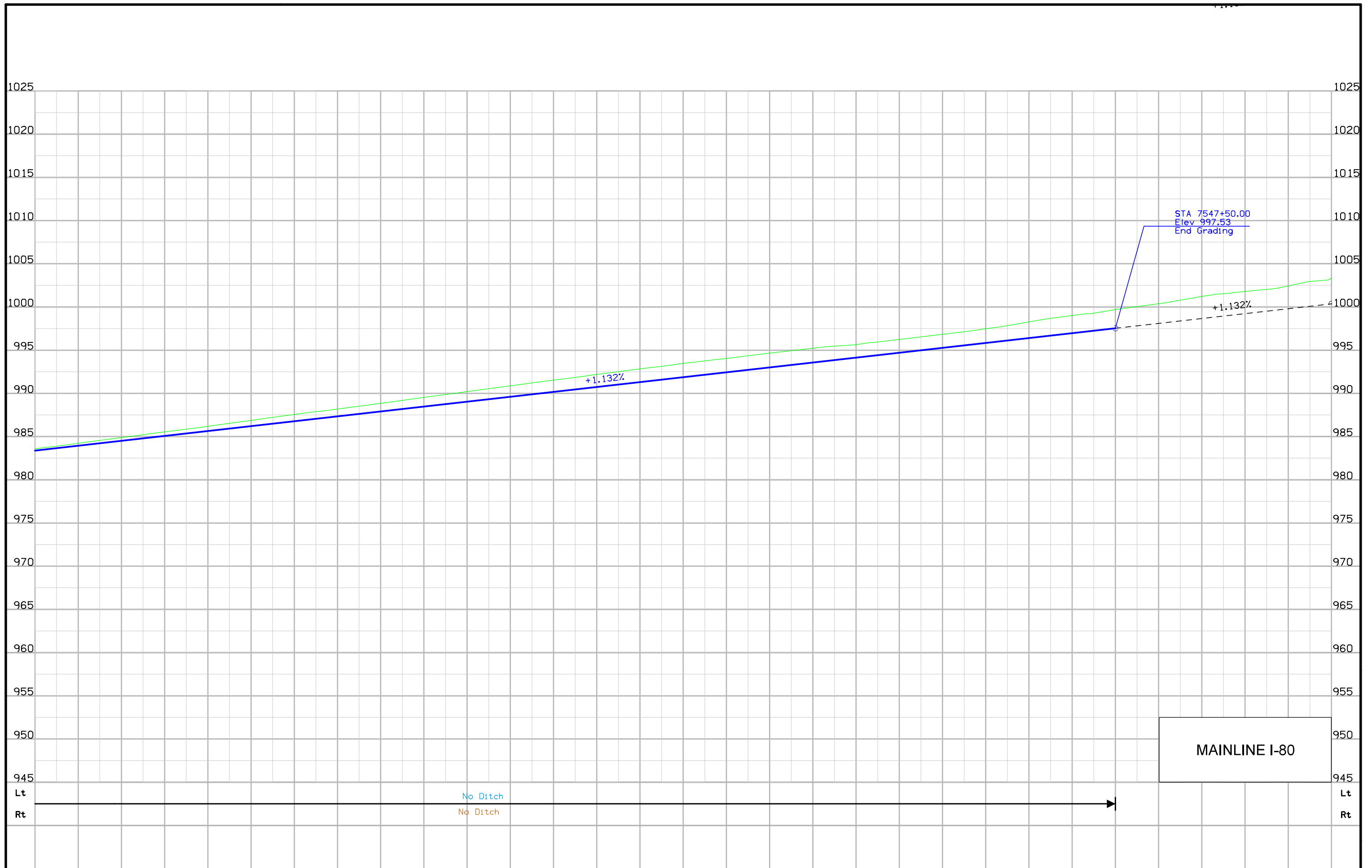


Lewis TWP.  
 T-74N R-44W  
 SEC. 12

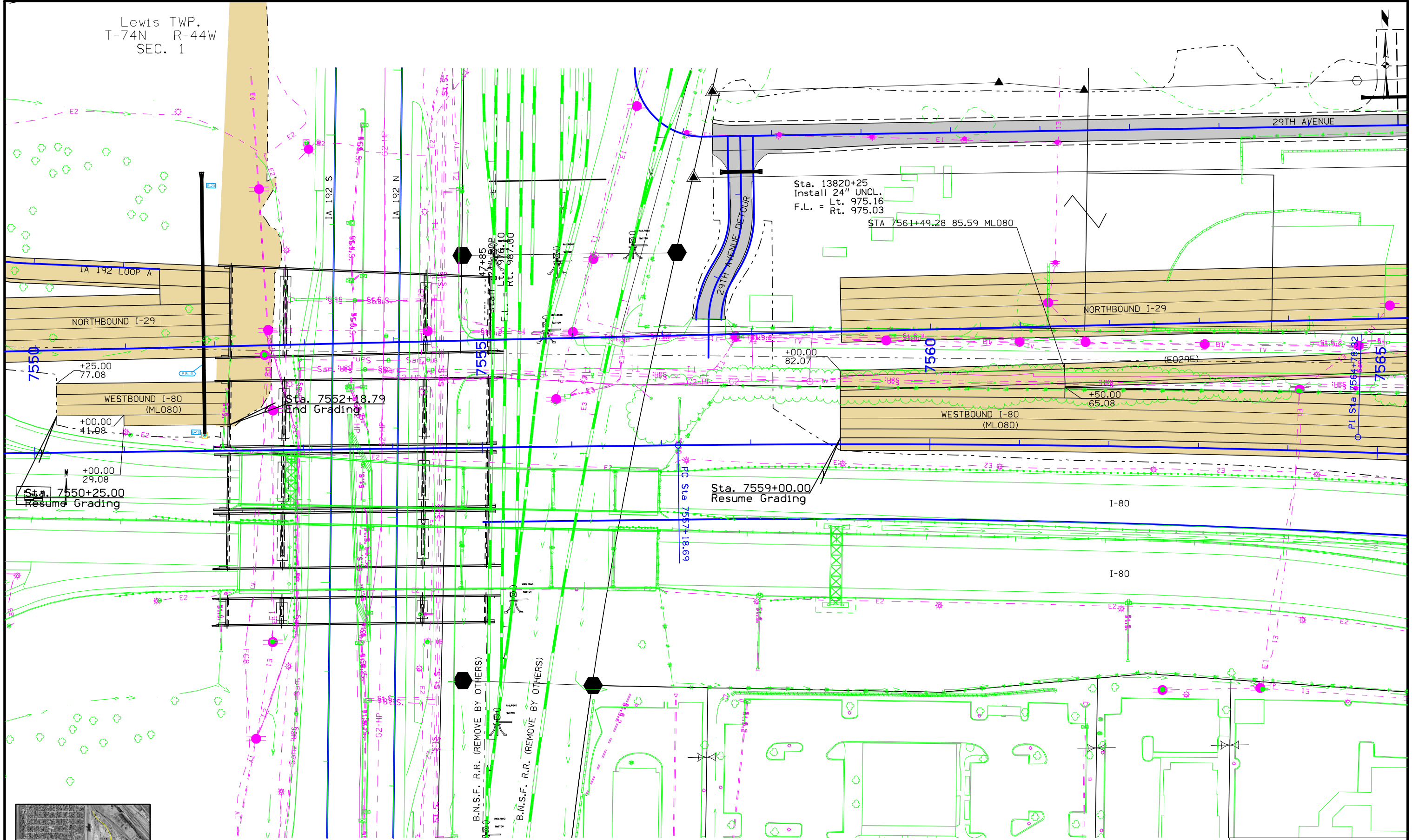


Sta. 7542+98  
 24" x 93' Steel  
 Casing Pipe  
 (Fill & Abandon)

**MAINLINE I-80**



Lewis TWP.  
T-74N R-44W  
SEC. 1



Sta. 13820+25  
Install 24" UNCL.  
Lt. 975.16  
F.L. = Rt. 975.03

STA 7561+49.28 85.59 ML080

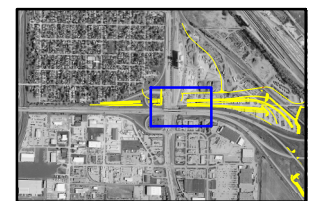
Sta. 7552+18.79  
End Grading

Sta. 7550+25.00  
Resume Grading

Sta. 7559+00.00  
Resume Grading

B.N.S.F. R.R. (REMOVE BY OTHERS)

B.N.S.F. R.R. (REMOVE BY OTHERS)

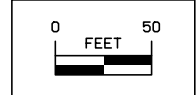


Sta. 7551+90.00  
Install RF-38

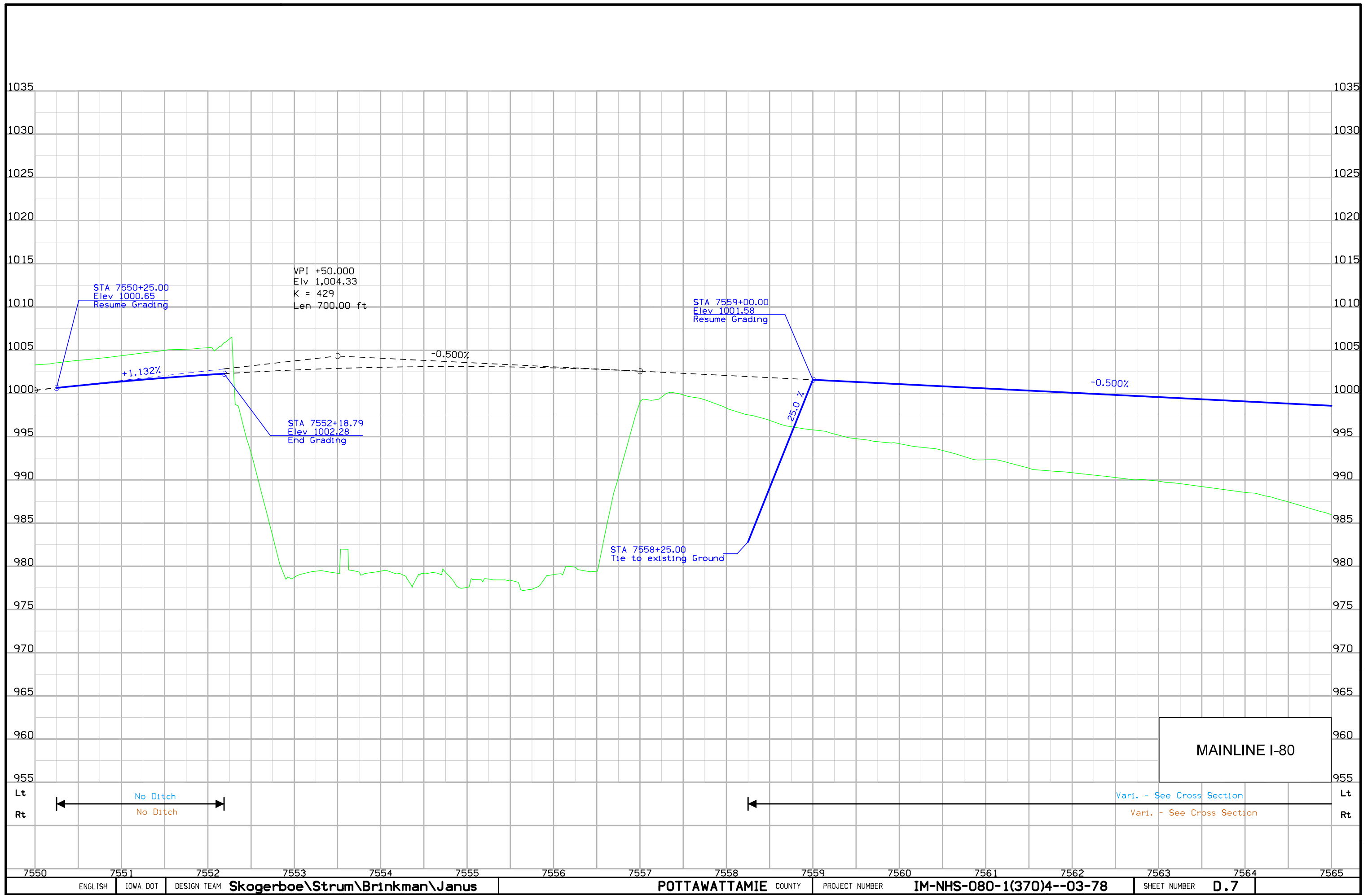
Sta. 7552+10  
15" x 64' CMP  
Remove

Lewis TWP.  
T-74N R-44W  
SEC. 12

Sta. 7557+18  
15" x 75' CMP  
U.A.C.

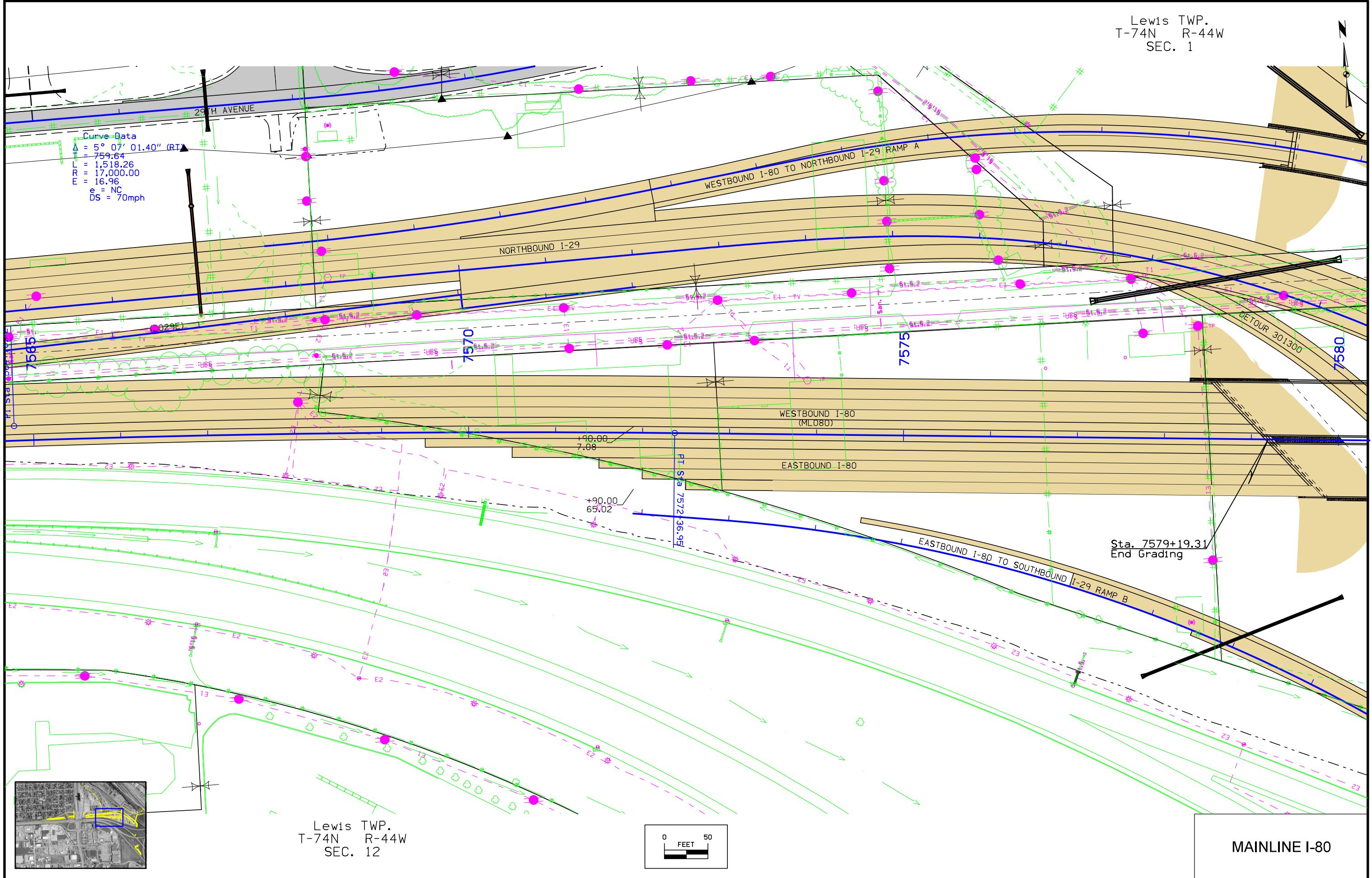


MAINLINE I-80

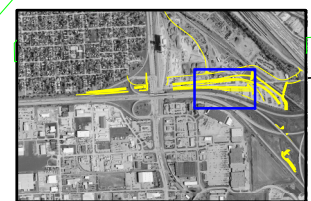


Lewis TWP.  
T-74N R-44W  
SEC. 1

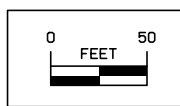
Curve Data  
A = 5° 07' 01.40" (RT)  
L = 759.64  
R = 1,518.26  
E = 17,000.00  
e = 16.96  
DS = 70mph



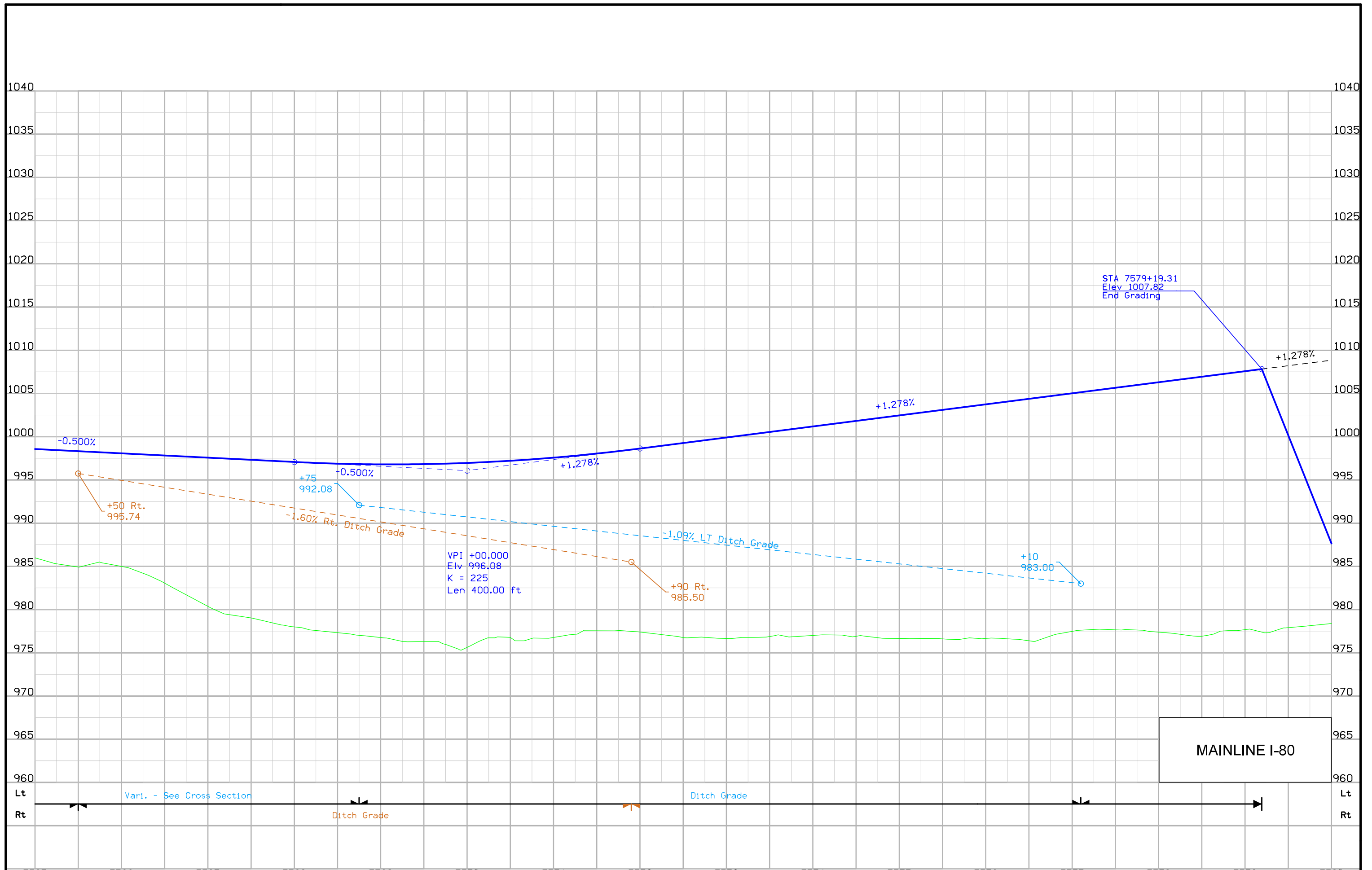
Sta. 7579+19.31  
End Grading



Lewis TWP.  
T-74N R-44W  
SEC. 12

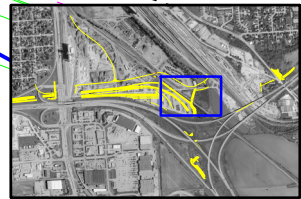
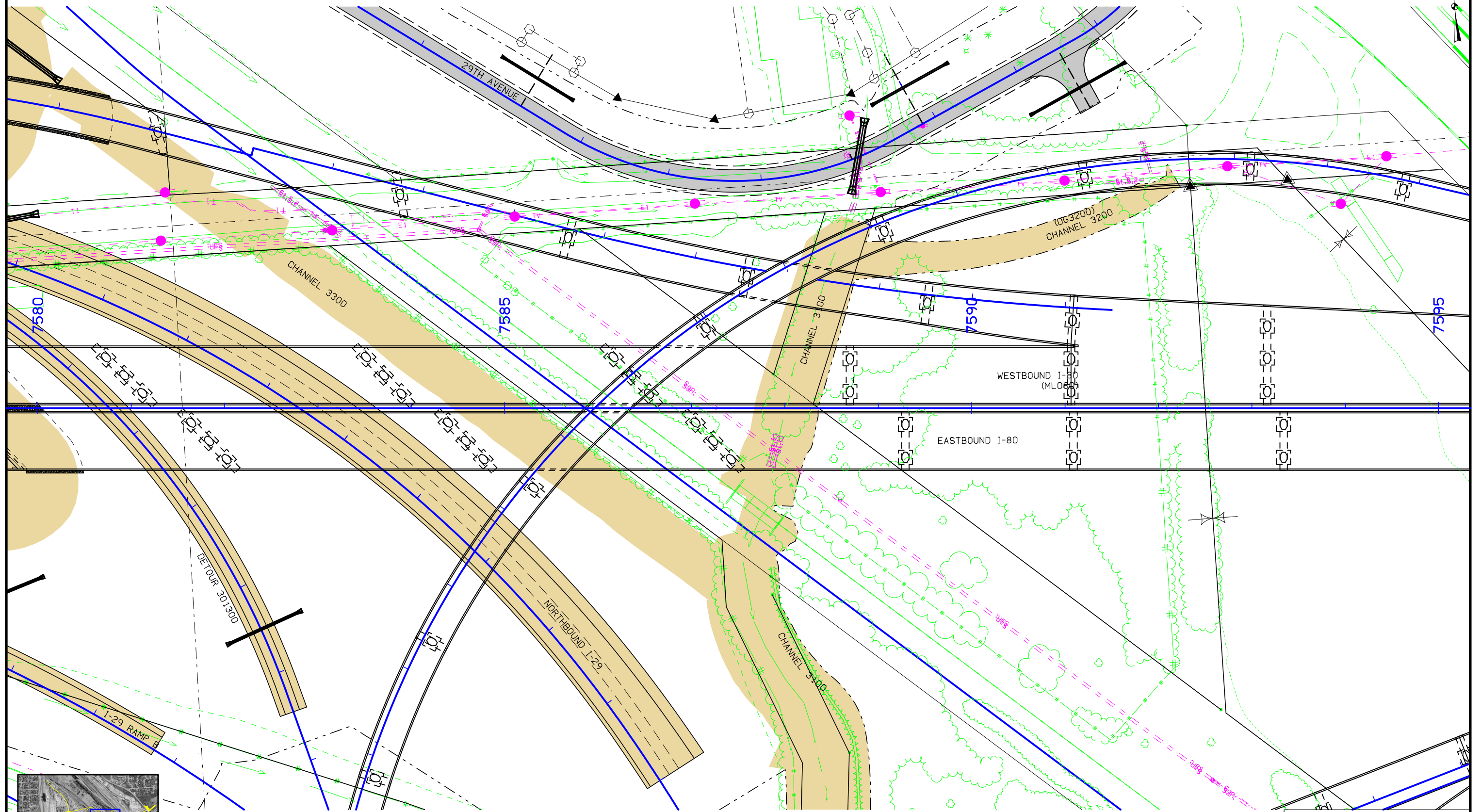


**MAINLINE I-80**

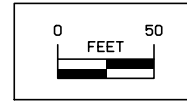


Lewis TWP.  
T-74N R-44W  
SEC. 1

Lewis TWP.  
T-74N R-43W  
SEC. 6

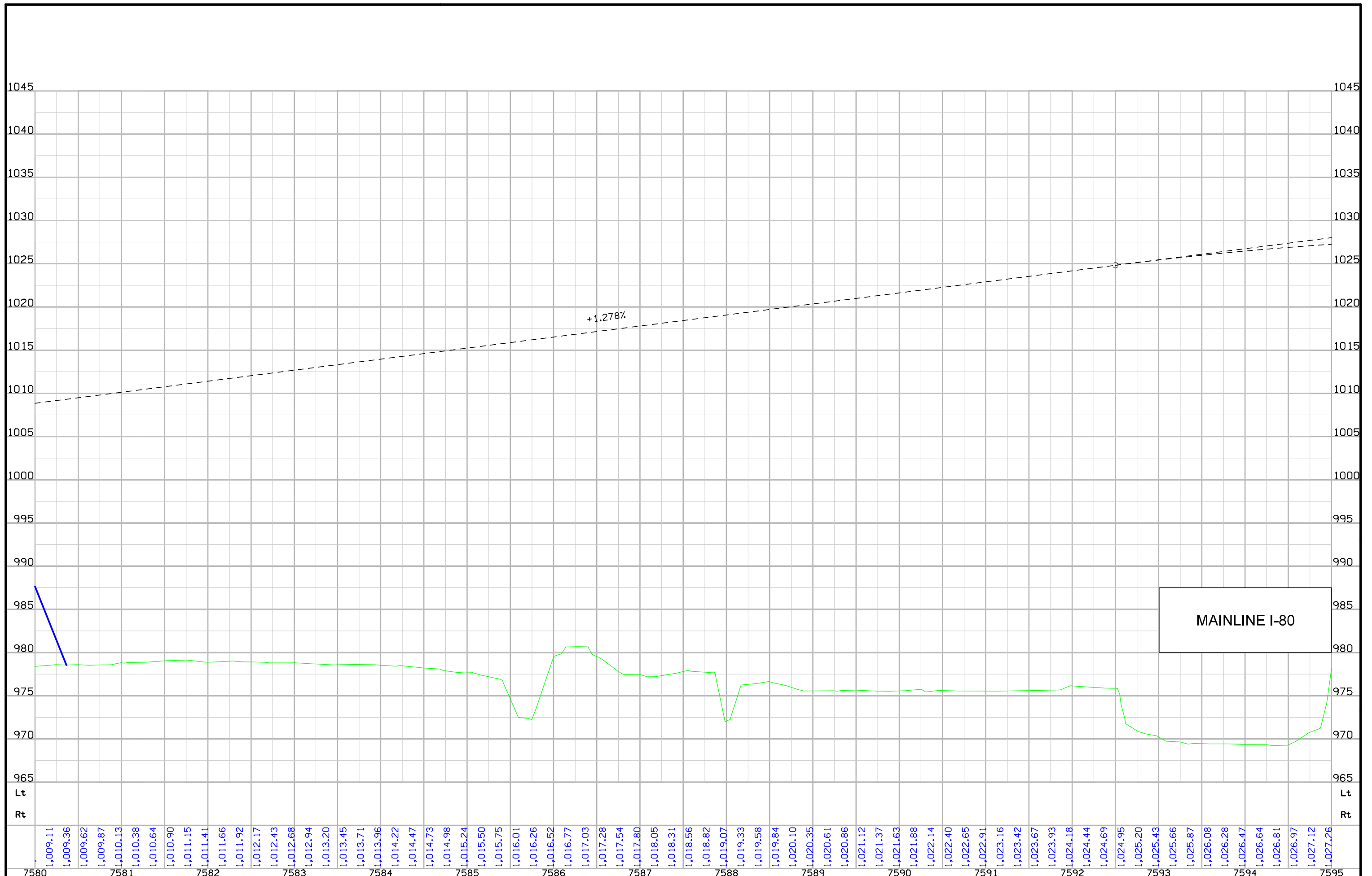


Lewis TWP.  
T-74N R-44W  
SEC. 12



Lewis TWP.  
T-74N R-43W  
SEC. 7

**MAINLINE I-80**

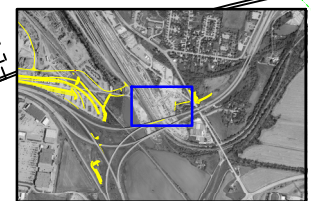
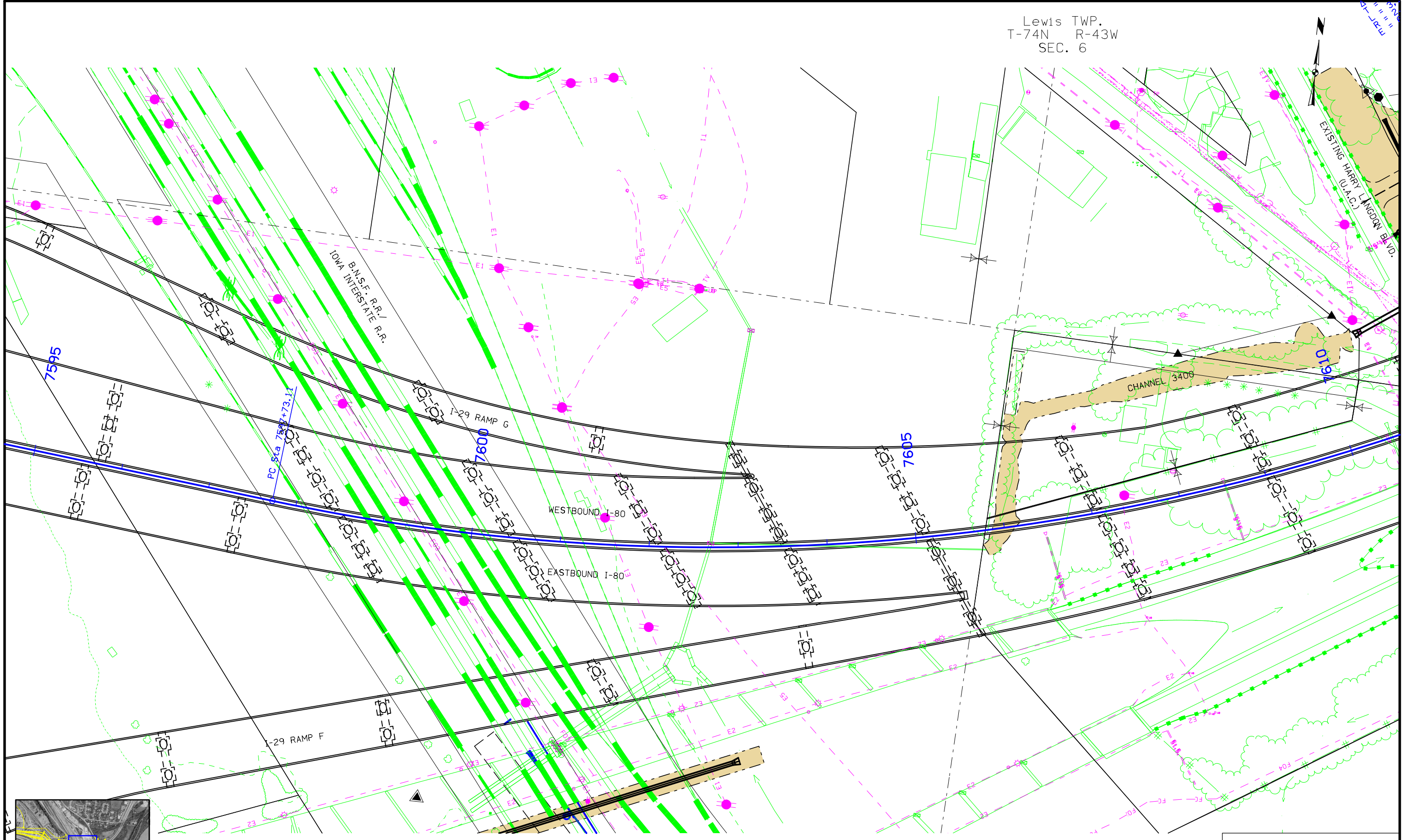


MAINLINE I-80

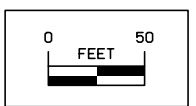
+1.278%



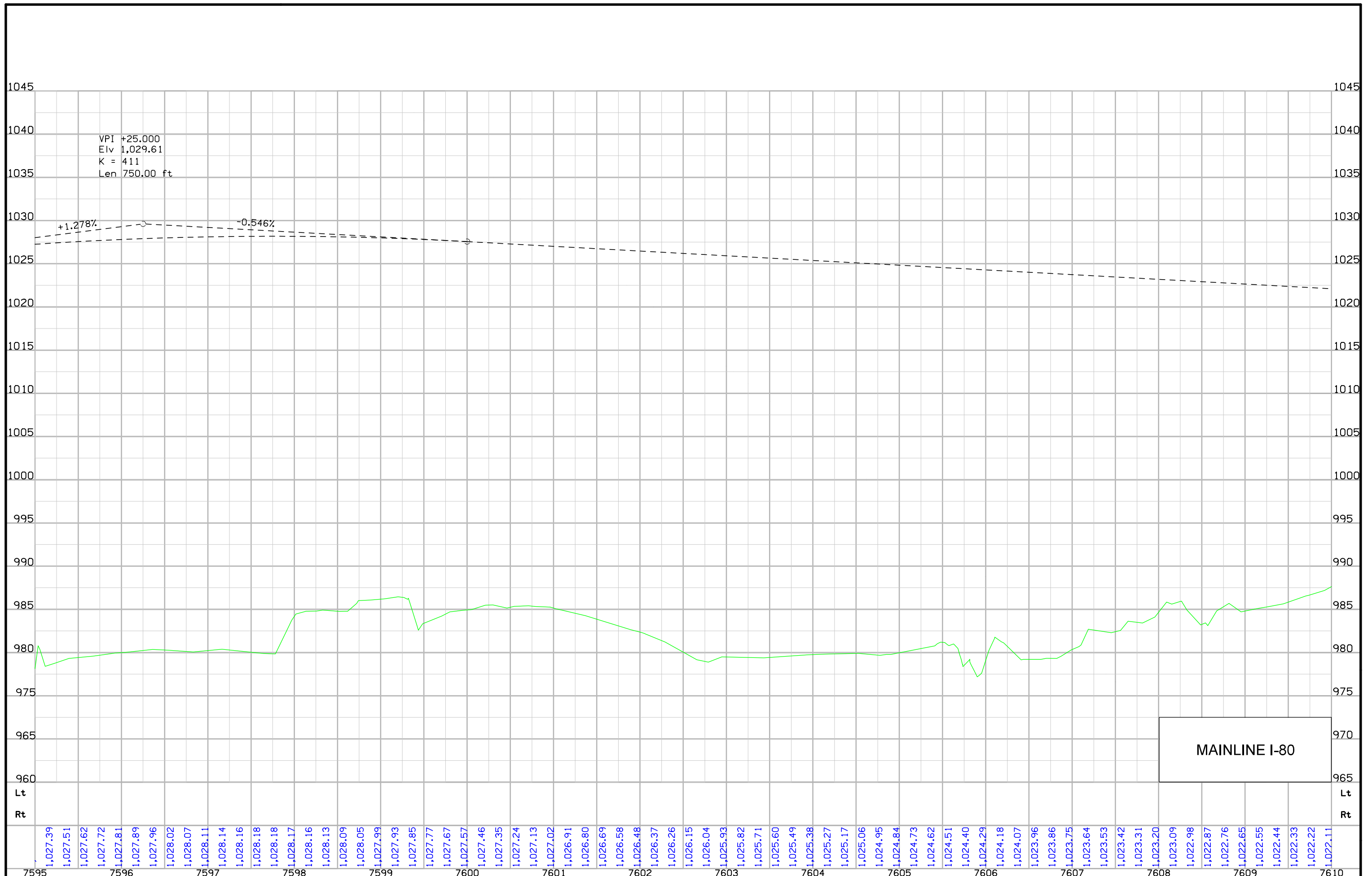
Lewis TWP.  
T-74N R-43W  
SEC. 6



Lewis TWP.  
T-74N R-43W  
SEC. 7

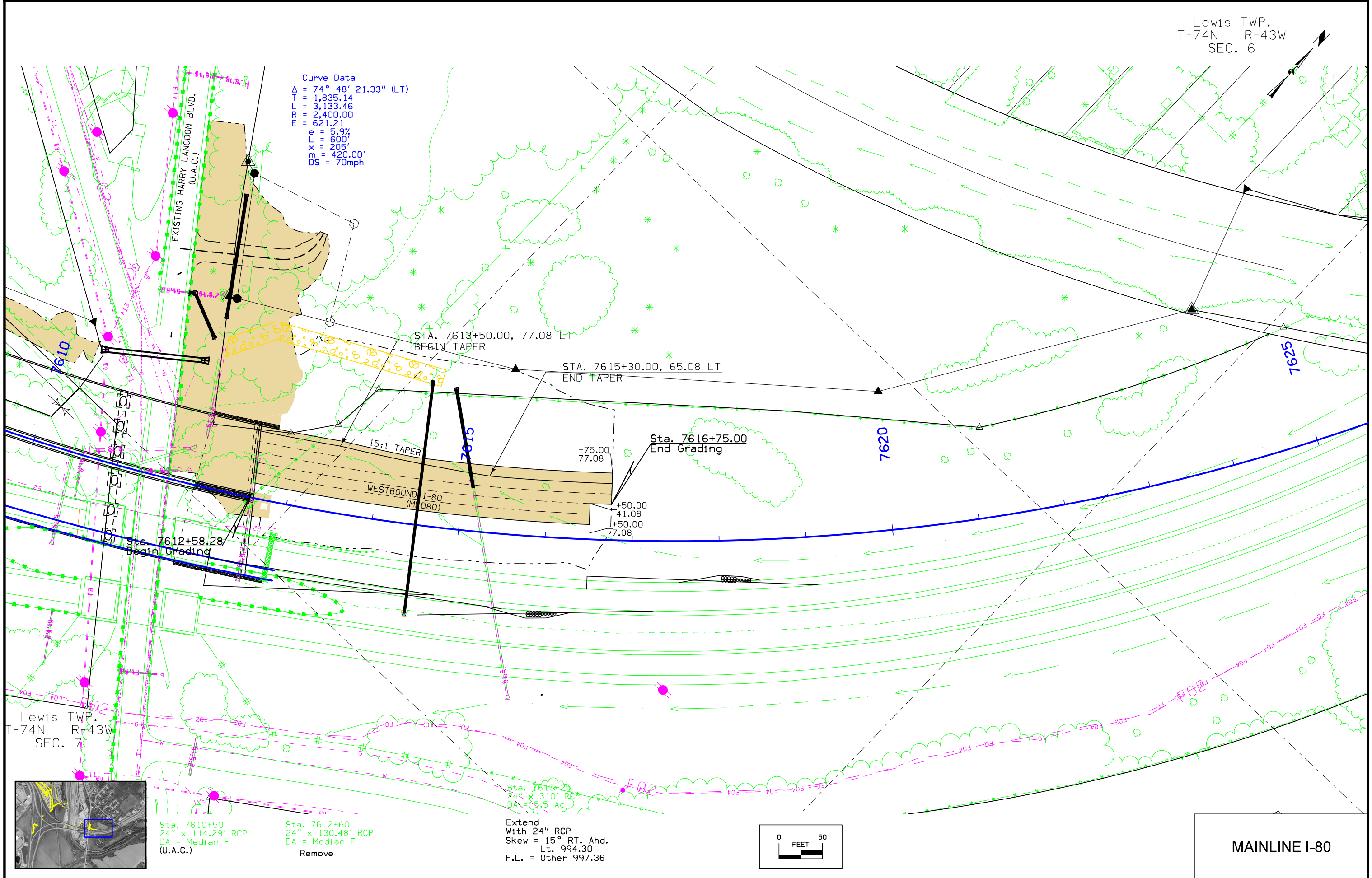


**MAINLINE I-80**

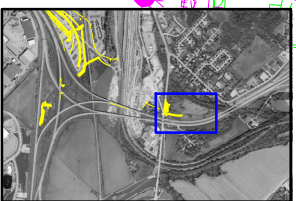


7595	1,027.39	1,027.51	1,027.62	1,027.72	1,027.81	1,027.89	1,027.96	1,028.02	1,028.07	1,028.11	1,028.14	1,028.16	1,028.18	1,028.18	1,028.17	1,028.16	1,028.13	1,028.09	1,028.05	1,027.99	1,027.93	1,027.85	1,027.77	1,027.67	1,027.57	1,027.46	1,027.35	1,027.24	1,027.13	1,027.02	1,026.91	1,026.80	1,026.69	1,026.58	1,026.48	1,026.37	1,026.26	1,026.15	1,026.04	1,025.93	1,025.82	1,025.71	1,025.60	1,025.49	1,025.38	1,025.27	1,025.17	1,025.06	1,024.95	1,024.84	1,024.73	1,024.62	1,024.51	1,024.40	1,024.29	1,024.18	1,024.07	1,023.96	1,023.86	1,023.75	1,023.64	1,023.53	1,023.42	1,023.31	1,023.20	1,023.09	1,022.98	1,022.87	1,022.76	1,022.65	1,022.55	1,022.44	1,022.33	1,022.22	1,022.11
7595	7596	7597	7598	7599	7600	7601	7602	7603	7604	7605	7606	7607	7608	7609	7610																																																												

Curve Data  
 $\Delta = 74^\circ 48' 21.33''$  (LT)  
 $PI = 1,835.14$   
 $PC = 3,133.46$   
 $PT = 2,400.00$   
 $LC = 621.21$   
 $EA = 5.9\%$   
 $EB = 600'$   
 $EC = 205'$   
 $DS = 420.00'$   
 $DS = 70\text{mph}$



Lewis TWP.  
T-74N R-43W  
SEC. 7

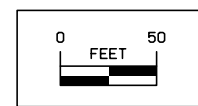


Sta. 7610+50  
24" x 114.29' RCP  
DA = Median F  
(U.A.C.)

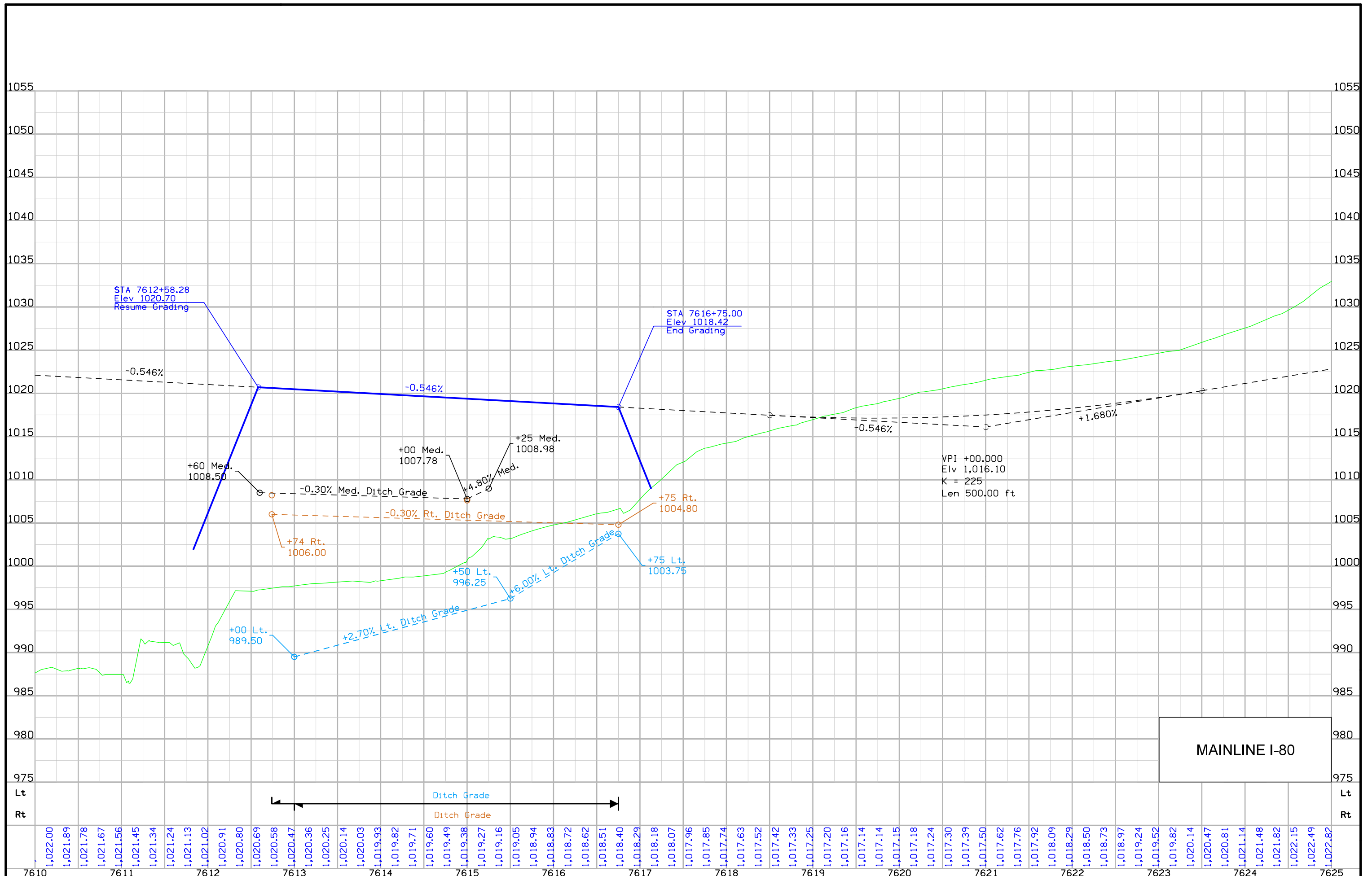
Sta. 7612+60  
24" x 130.48' RCP  
DA = Median F  
Remove

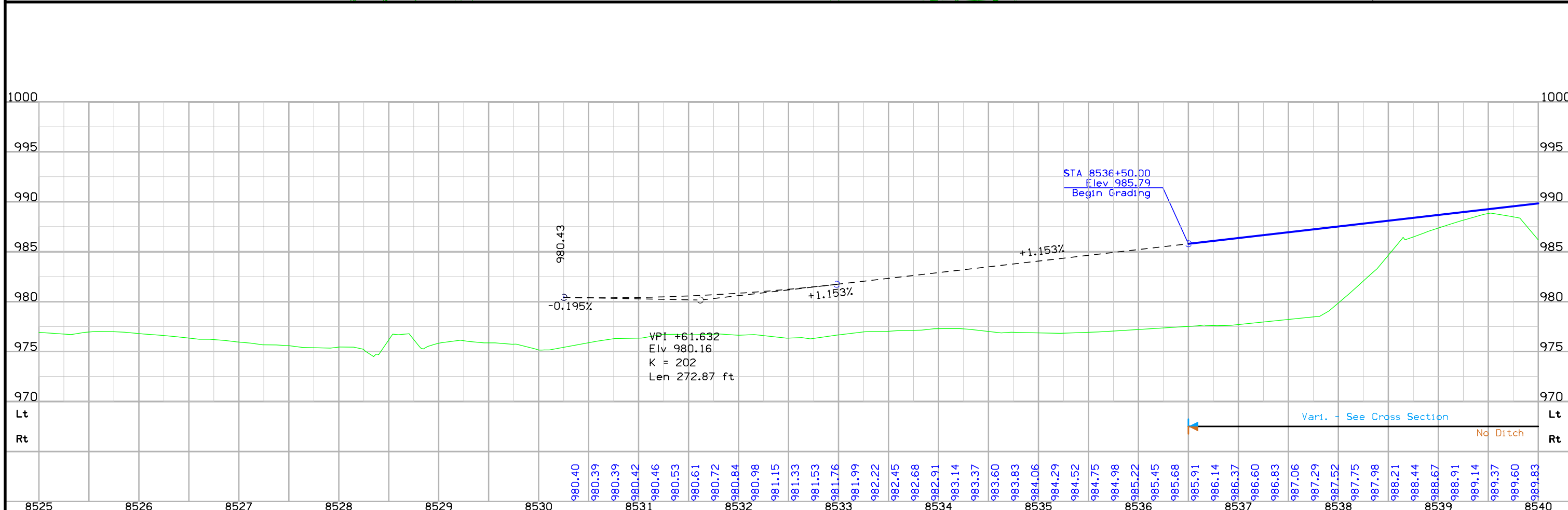
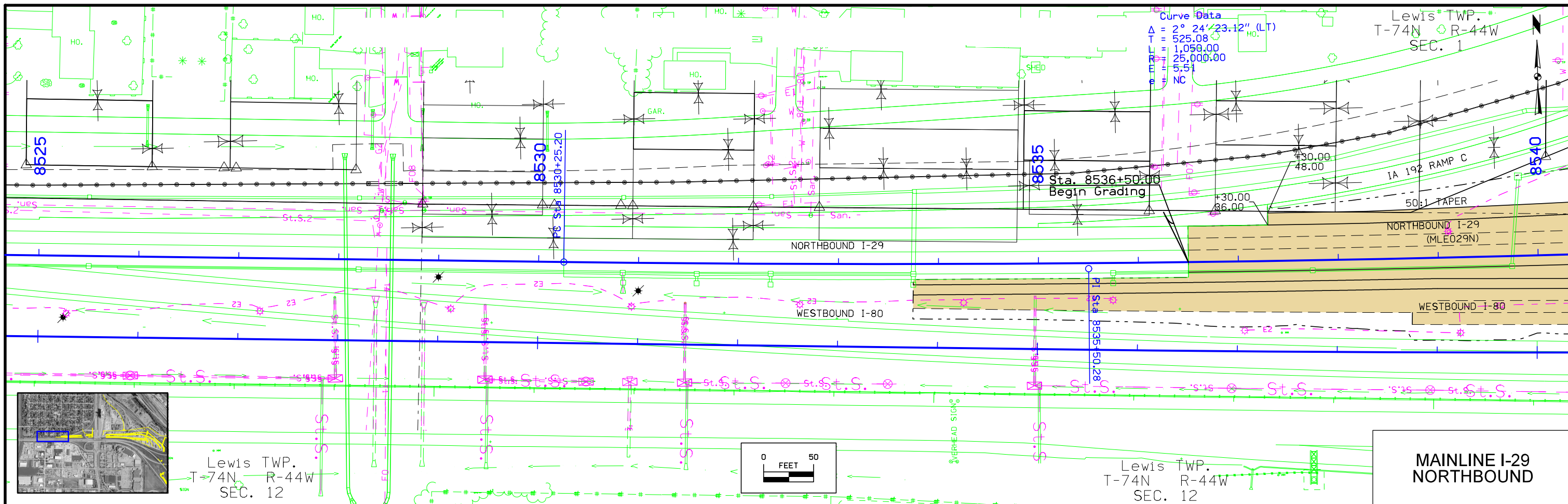
Sta. 7615+25  
24" x 310' RCP  
DA = (5.5 Ac.)

Extend  
With 24" RCP  
Skew = 15° RT. Ahd.  
Lt. 994.30  
F.L. = Other 997.36

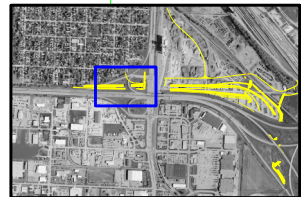
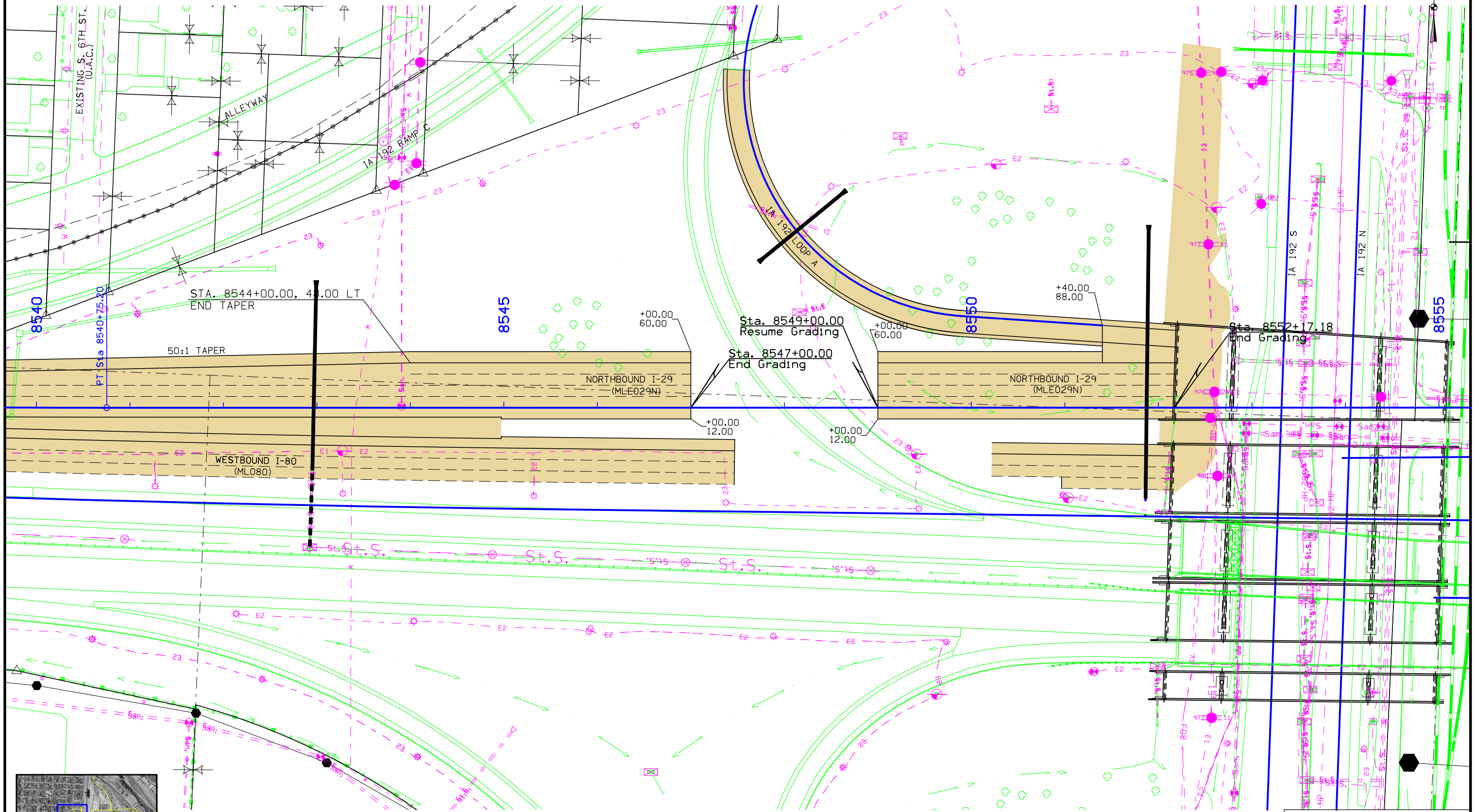


**MAINLINE I-80**

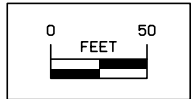




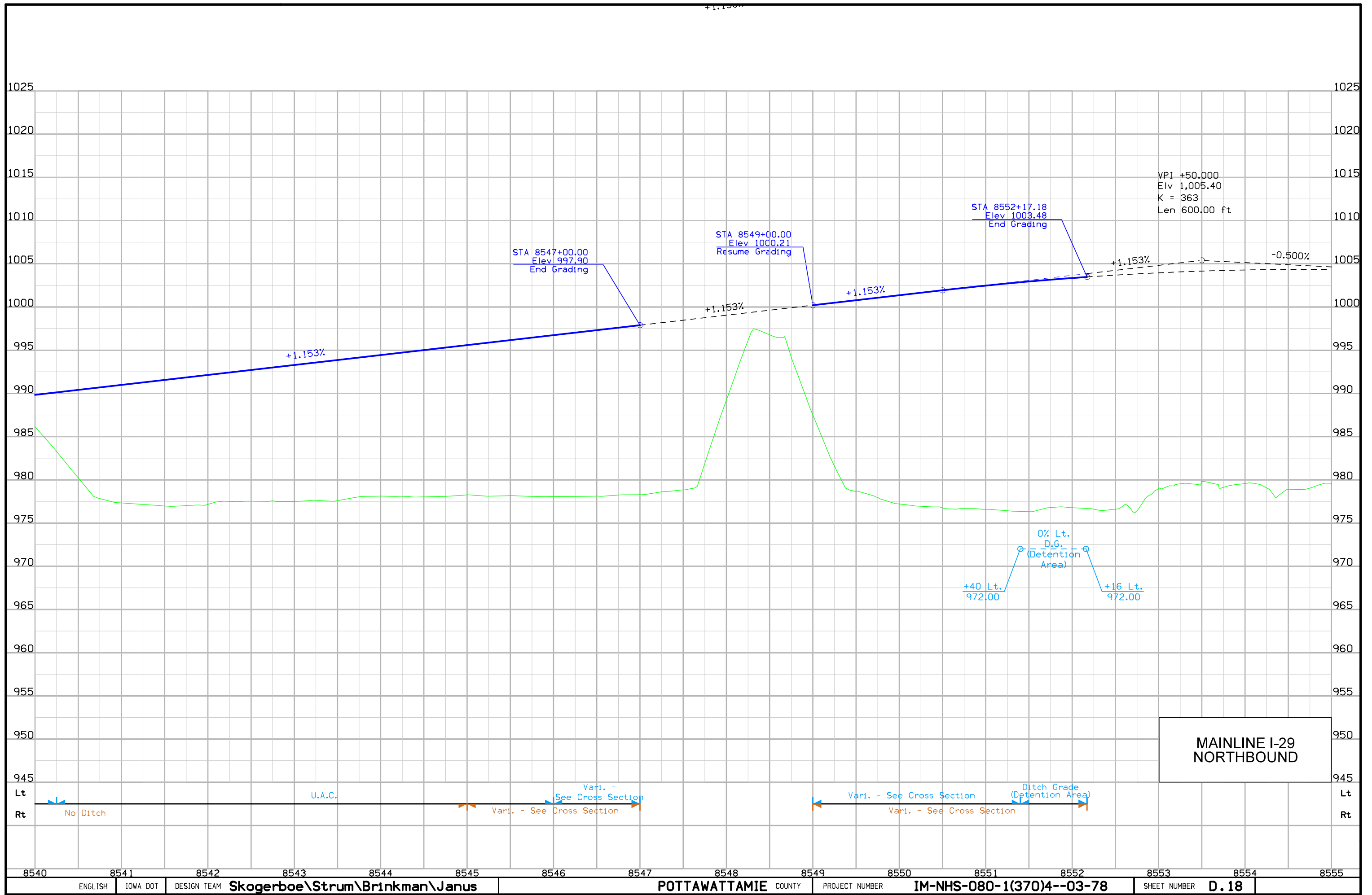
Lewis TWP.  
T-74N R-44W  
SEC. 1



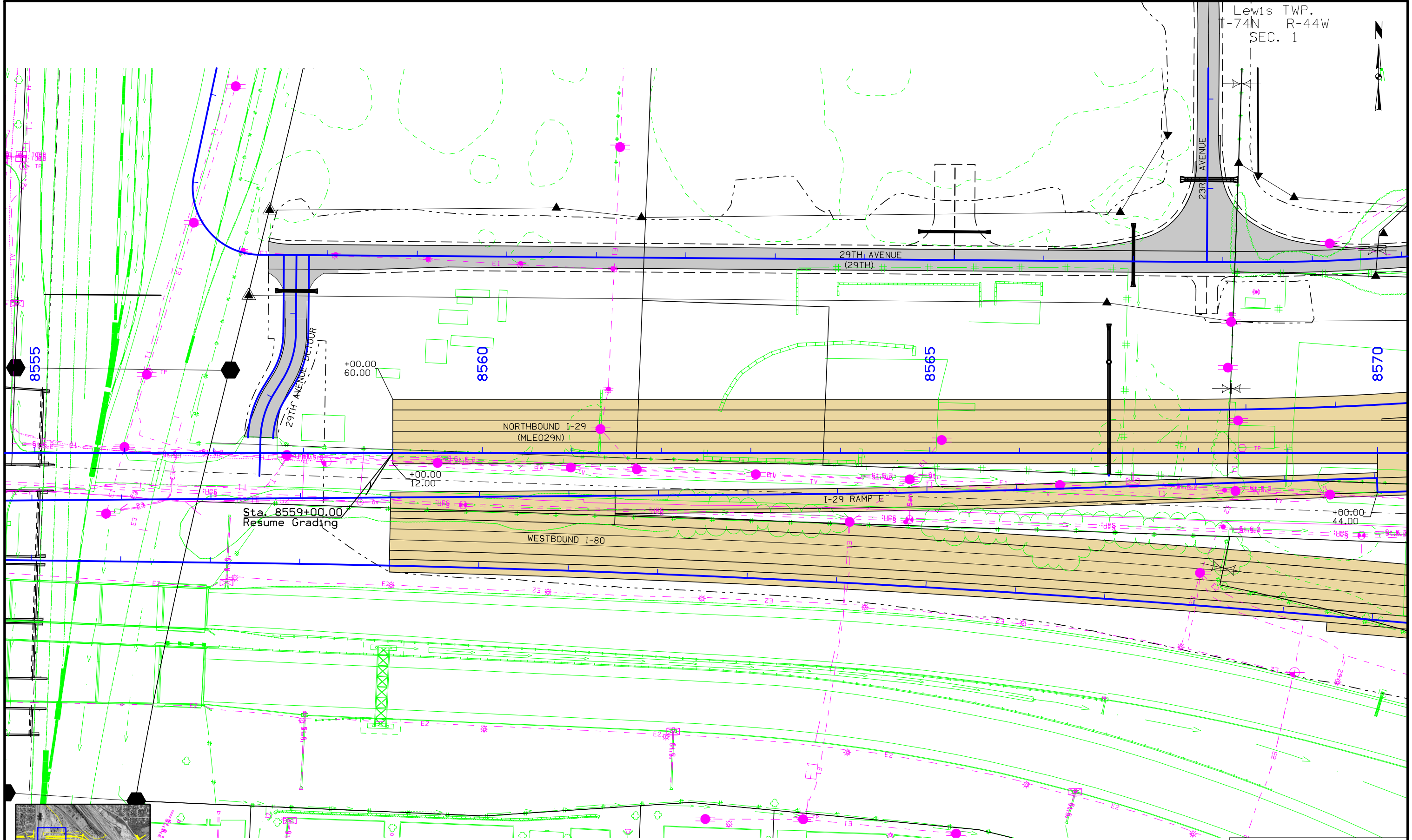
Lewis TWP.  
T-74N R-44W  
SEC. 12



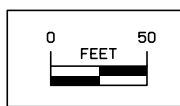
**MAINLINE I-29  
NORTHBOUND**



Lewis TWP.  
T-74N R-44W  
SEC. 1



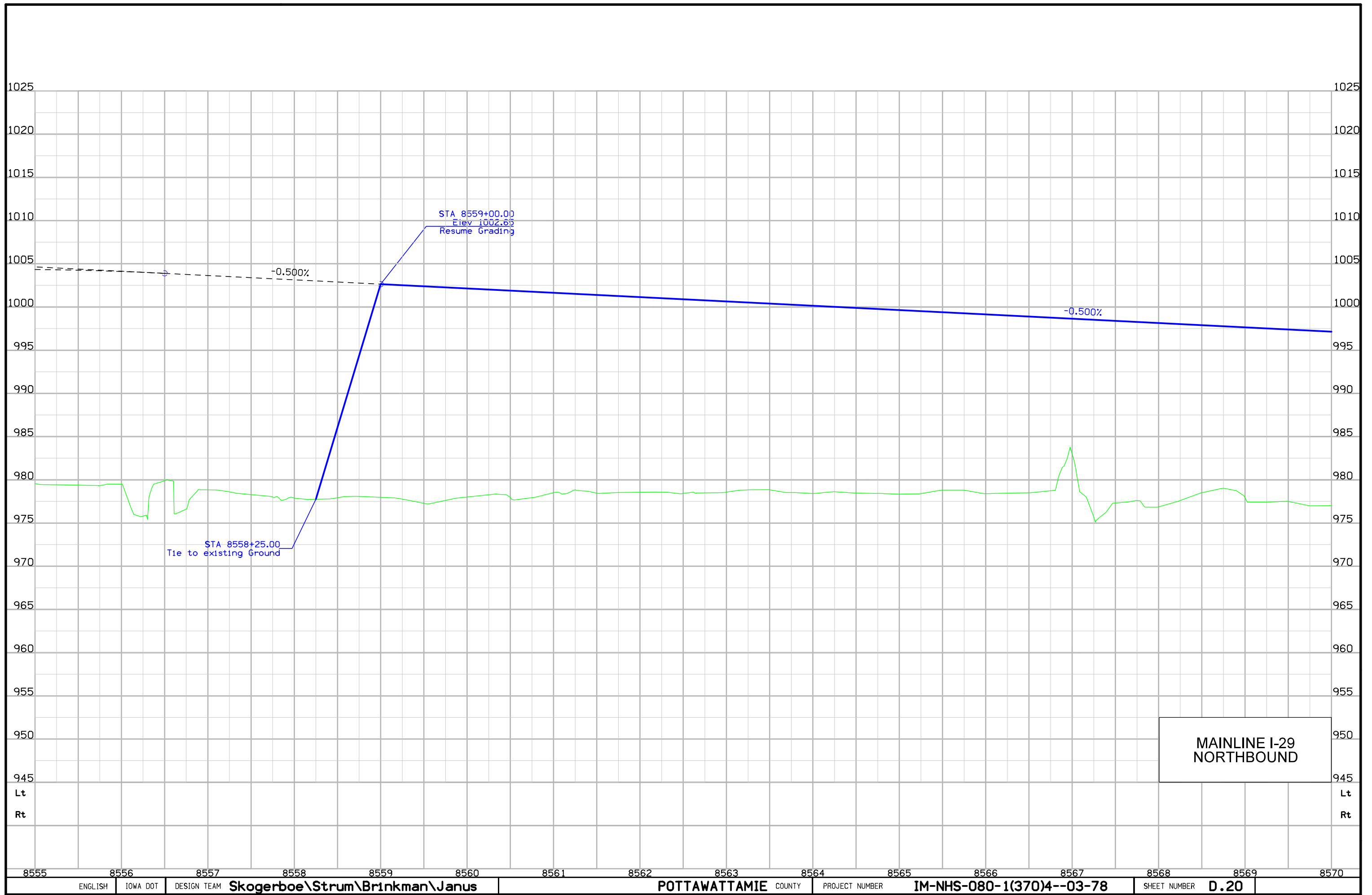
Lewis TWP.  
T-74N R-44W  
SEC. 12



Sta. 8567+91.00  
Install 24" RCP  
Lt. 988.70  
Rt. 989.80

**MAINLINE I-29  
NORTHBOUND**





MAINLINE I-29  
NORTHBOUND

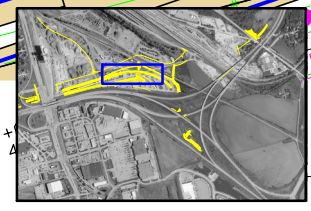
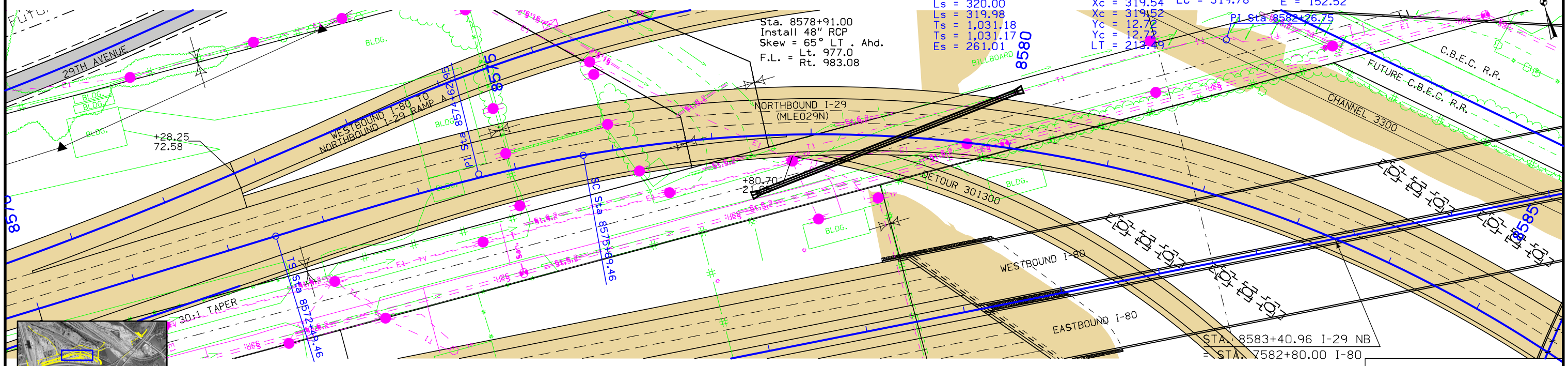
Lewis TWP.  
T-74N R-44W  
SEC. 1

SCS PI Sta 8582+80.64  
 $\Delta = 65^\circ 56' 21.09''$  (RT)  
 Theta =  $6^\circ 50' 28.63''$   
 Theta =  $6^\circ 50' 27.09''$   
 Ls = 320.00  
 Ls = 319.98  
 Ts = 1,031.18  
 Ts = 1,031.17  
 Es = 261.01

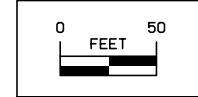
P = 3.18  
 P = 3.18  
 K = 159.92  
 K = 159.91  
 Xc = 319.54  
 Xc = 319.52  
 Yc = 12.73  
 Yc = 12.73  
 LT = 213.48  
 LT = 213.49

Curve Data  
 $\Delta = 52^\circ 15' 25.36''$  (RT)  
 T = 657.29  
 L = 1,222.16  
 R = 1,340.00  
 E = 152.52

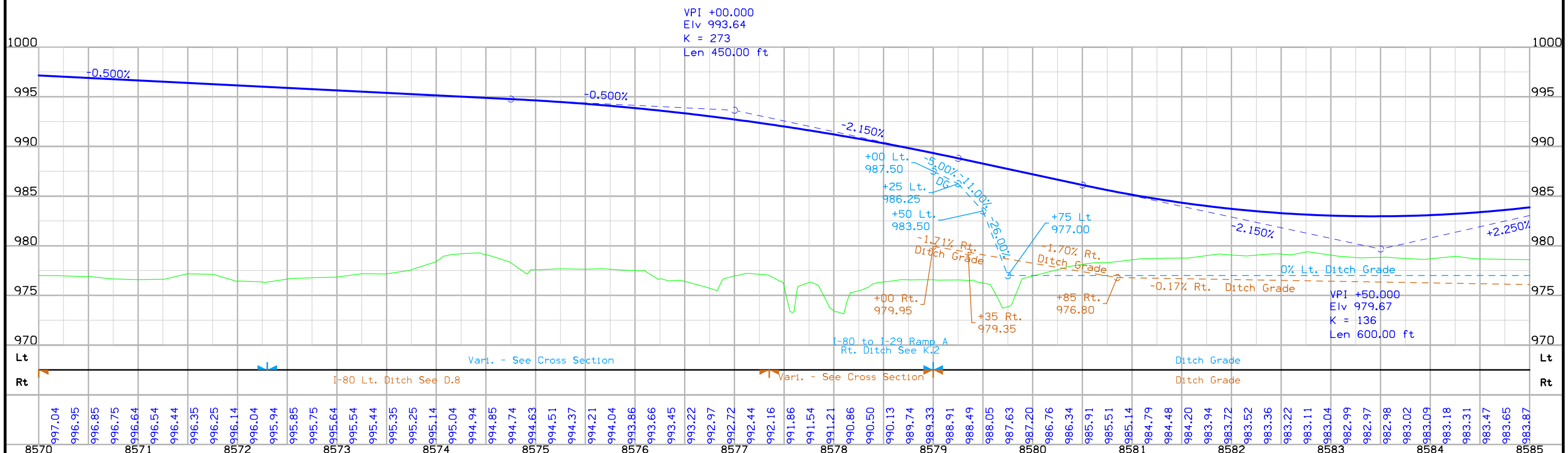
e = 6.0%  
 L = 320'  
 x = 107'

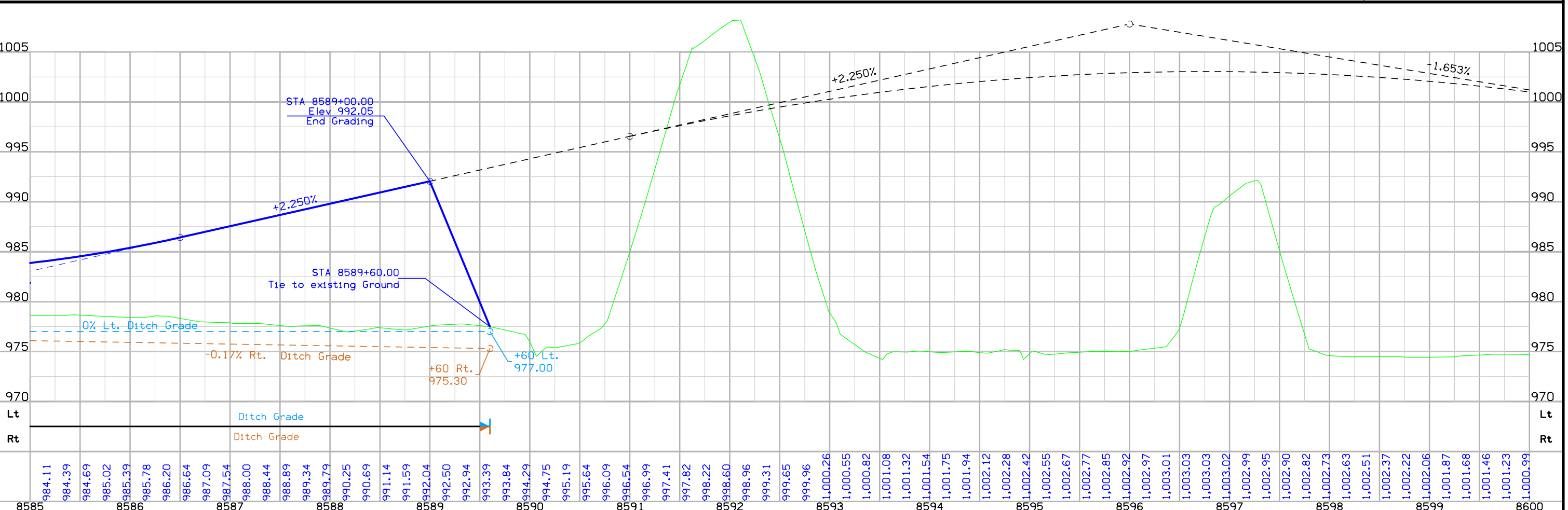
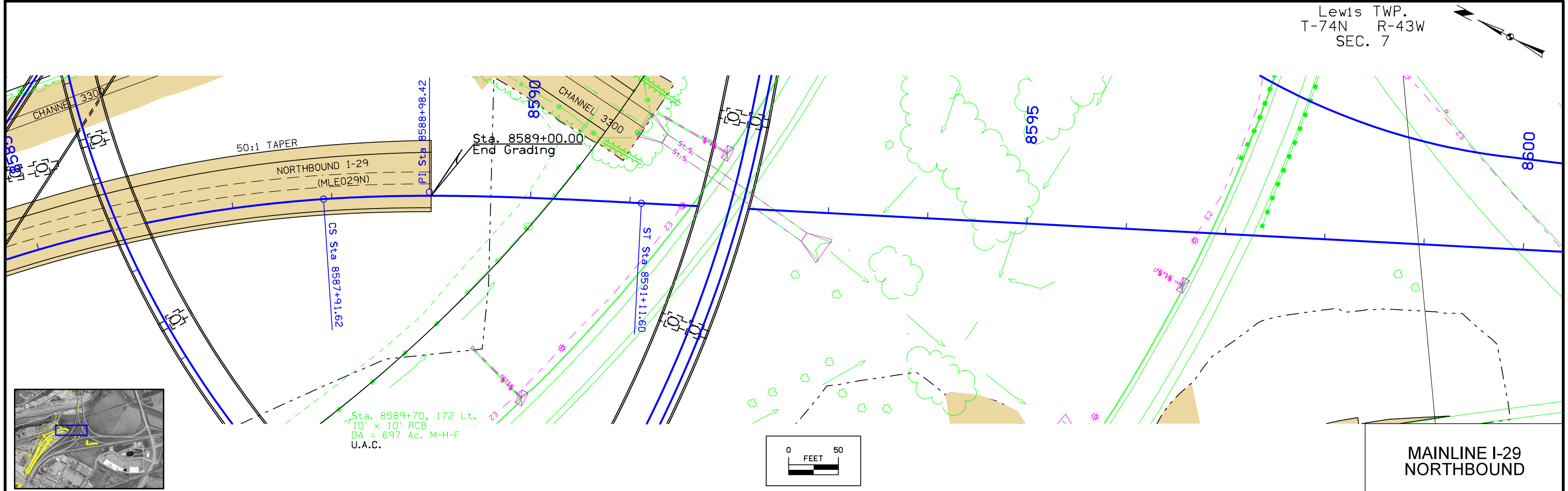


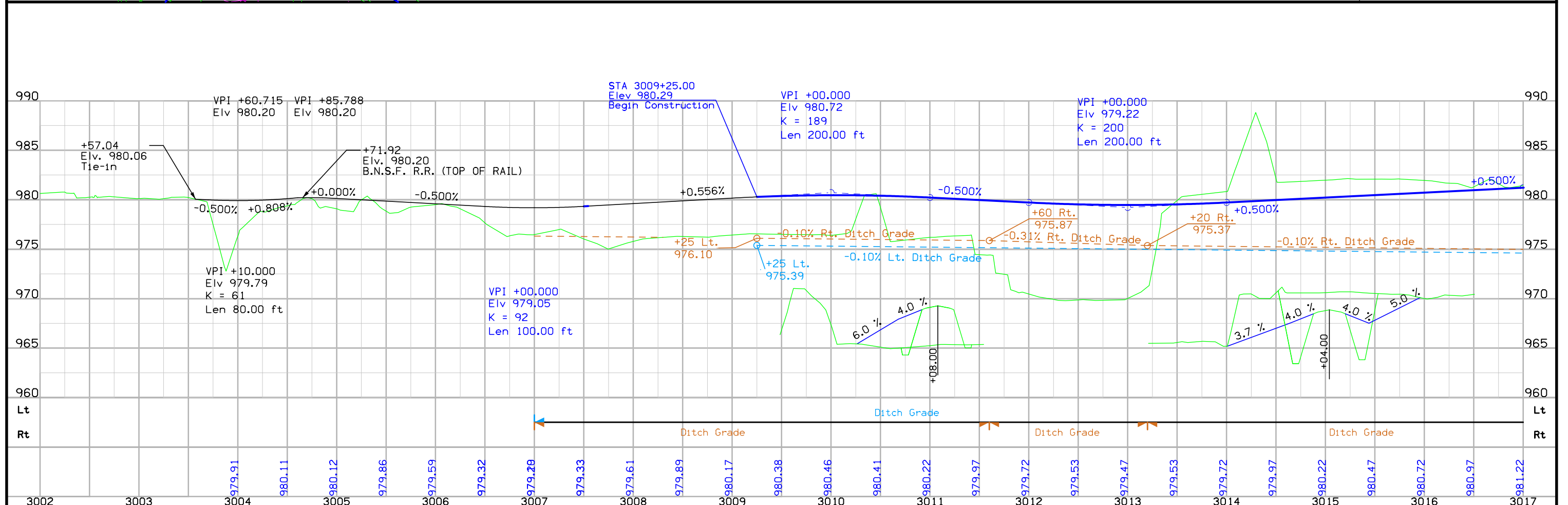
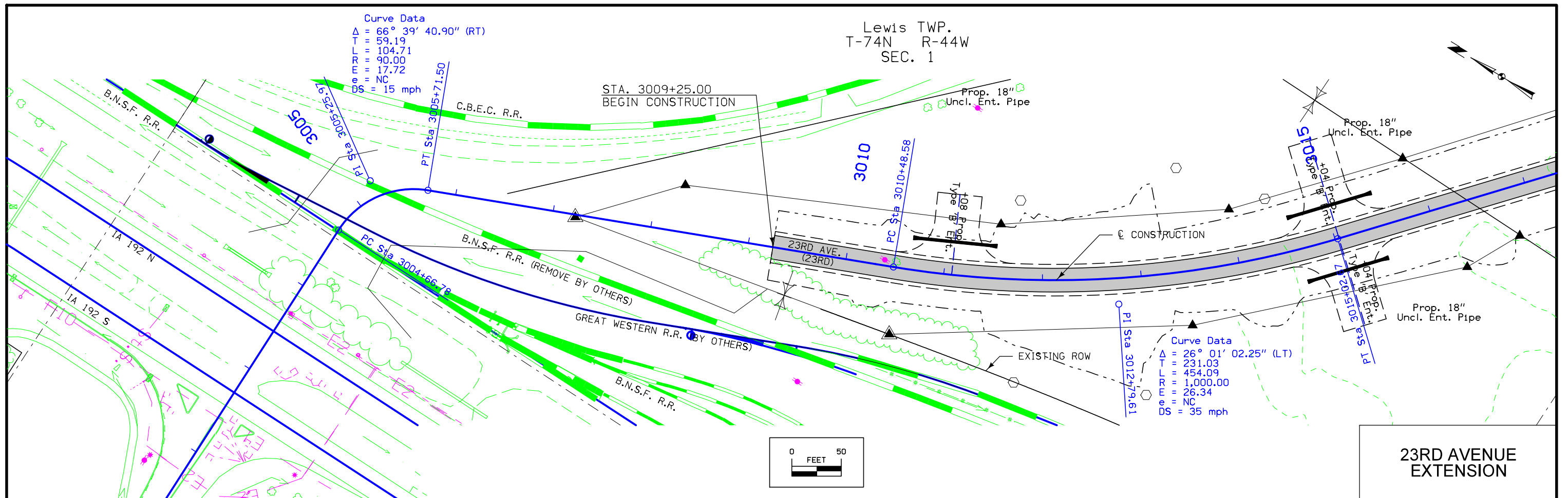
Lewis TWP.  
74N R-44W  
SEC. 12



MAINLINE I-29  
NORTHBOUND



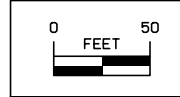
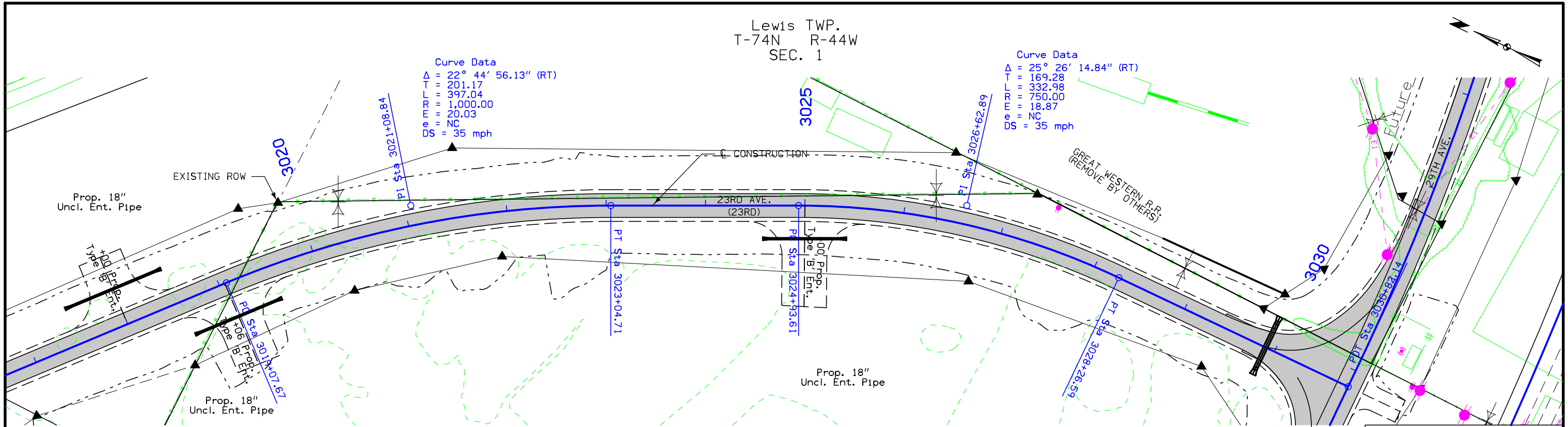




Lewis TWP.  
T-74N R-44W  
SEC. 1

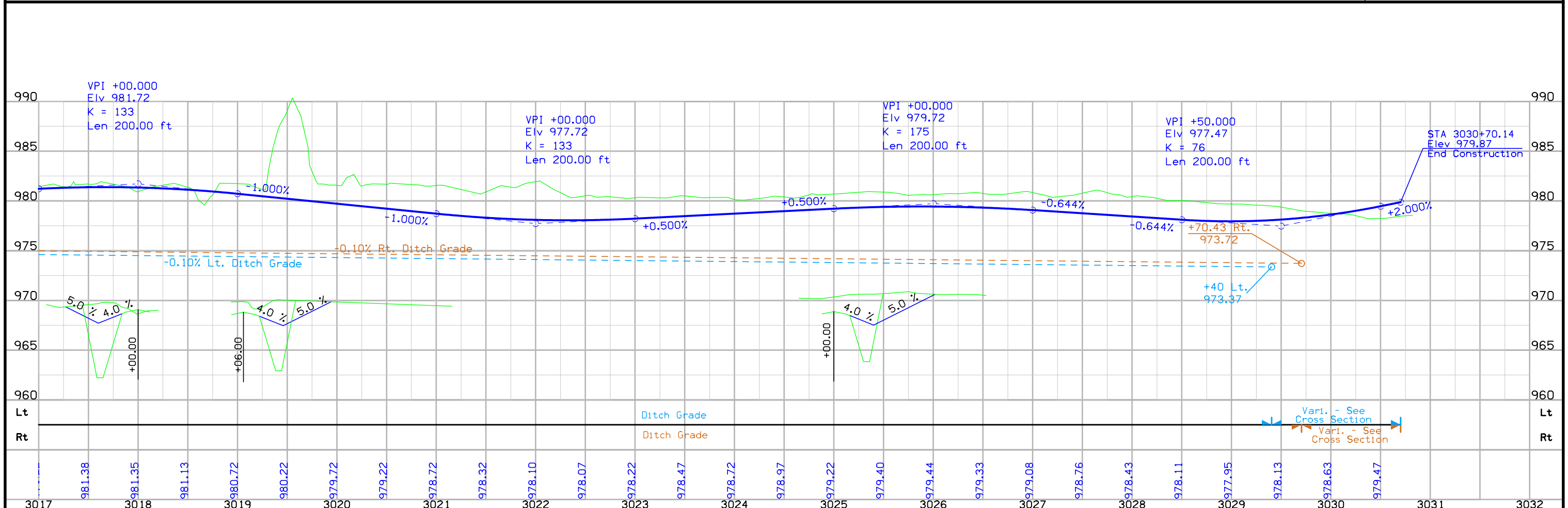
Curve Data  
 $\Delta = 22^\circ 44' 56.13''$  (RT)  
 $T = 201.17$   
 $L = 397.04$   
 $R = 1,000.00$   
 $e = 20.03$   
 $e = NC$   
 $DS = 35$  mph

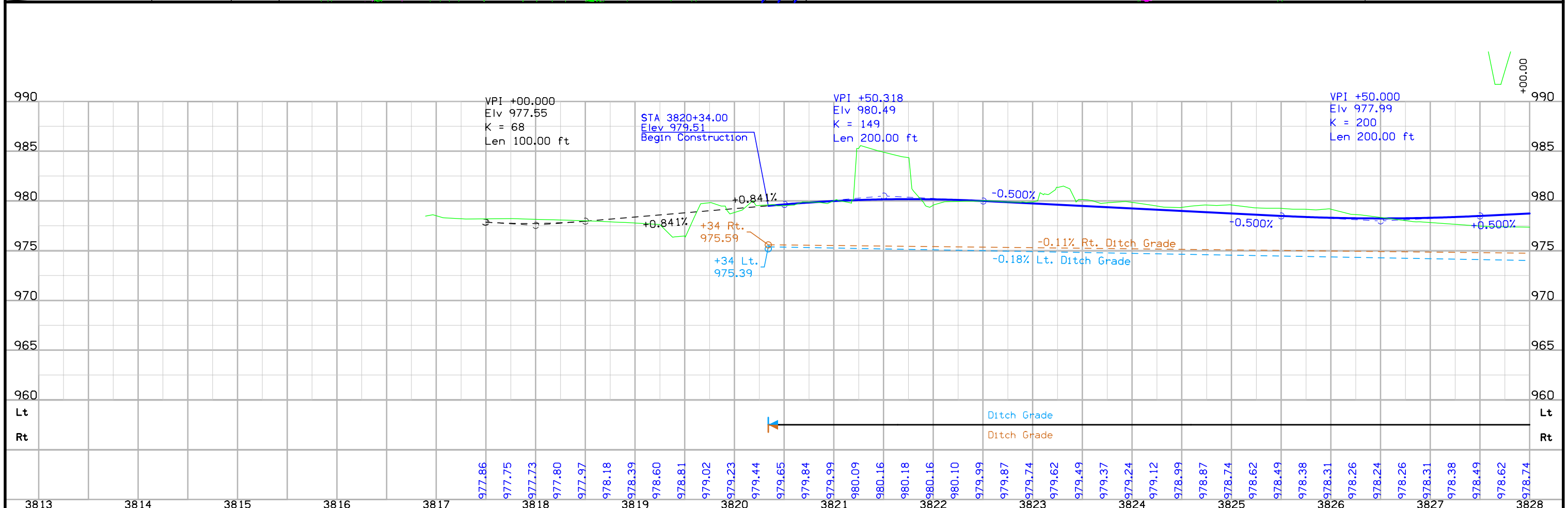
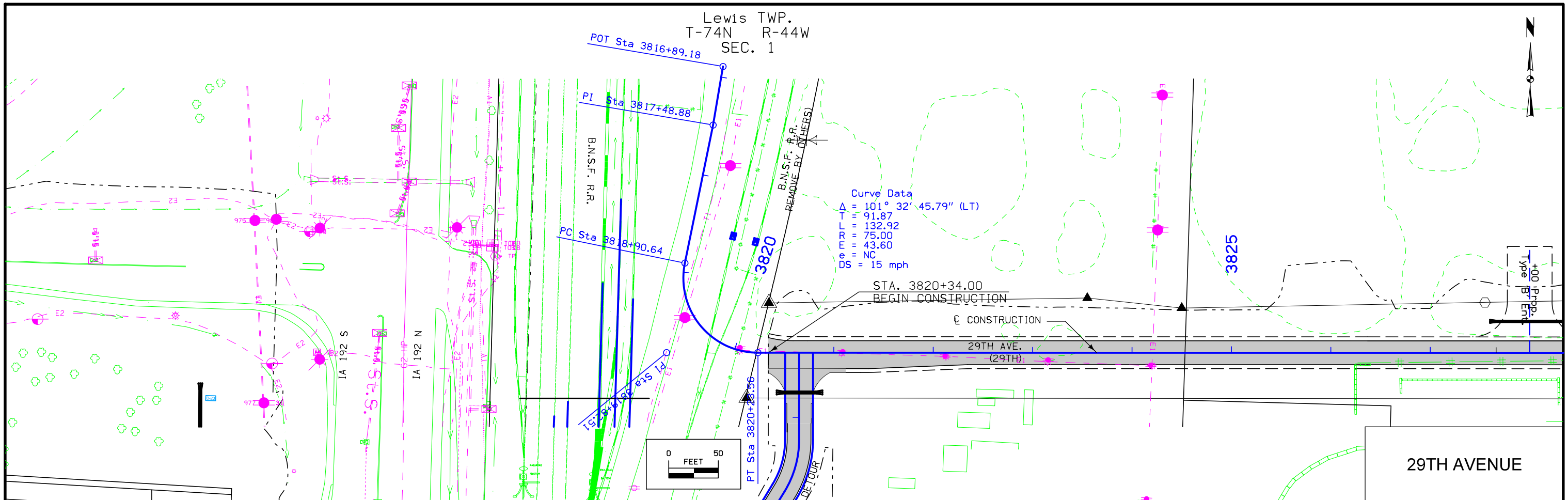
Curve Data  
 $\Delta = 25^\circ 26' 14.84''$  (RT)  
 $T = 169.28$   
 $L = 332.98$   
 $R = 750.00$   
 $e = 18.87$   
 $e = NC$   
 $DS = 35$  mph



Sta. 3029+90  
 Install 44"x27" LCP  
 F.L. = Lt. 973.32  
 F.L. = Rt. 973.70  
 DA = 32.7 Ac

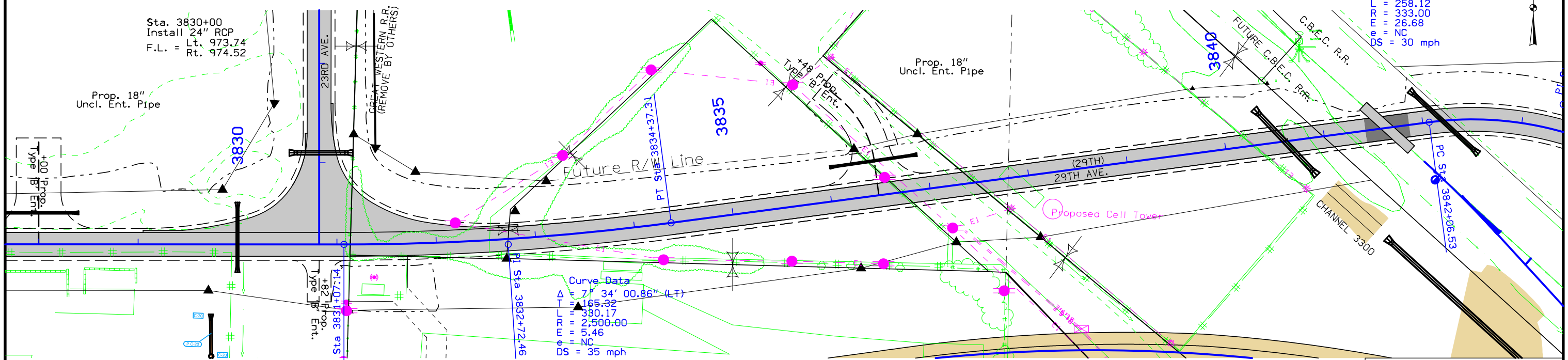
**23RD AVENUE  
EXTENSION**





Lewis TWP.  
T-74N R-44W  
SEC. 1

Curve Data  
 $\Delta = 44^\circ 24' 42.67''$  (RT)  
 $T = 135.93$   
 $L = 258.12$   
 $R = 333.00$   
 $e = 26.68$   
 $DS = 30$  mph

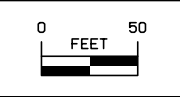


Sta. 3830+00  
Install 24" RCP  
F.L. = Lt. 973.74  
Rt. 974.52

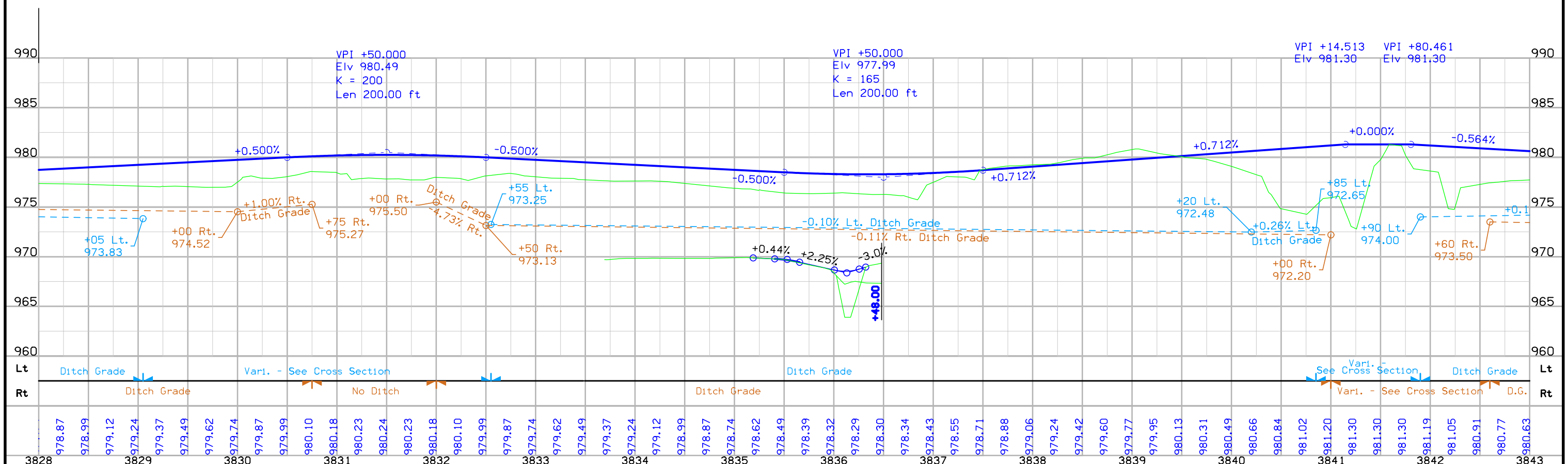
Curve Data  
 $\Delta = 7^\circ 34' 00.86''$  (LT)  
 $T = 165.32$   
 $L = 330.17$   
 $R = 2,500.00$   
 $e = 5.46$   
 $DS = NC$

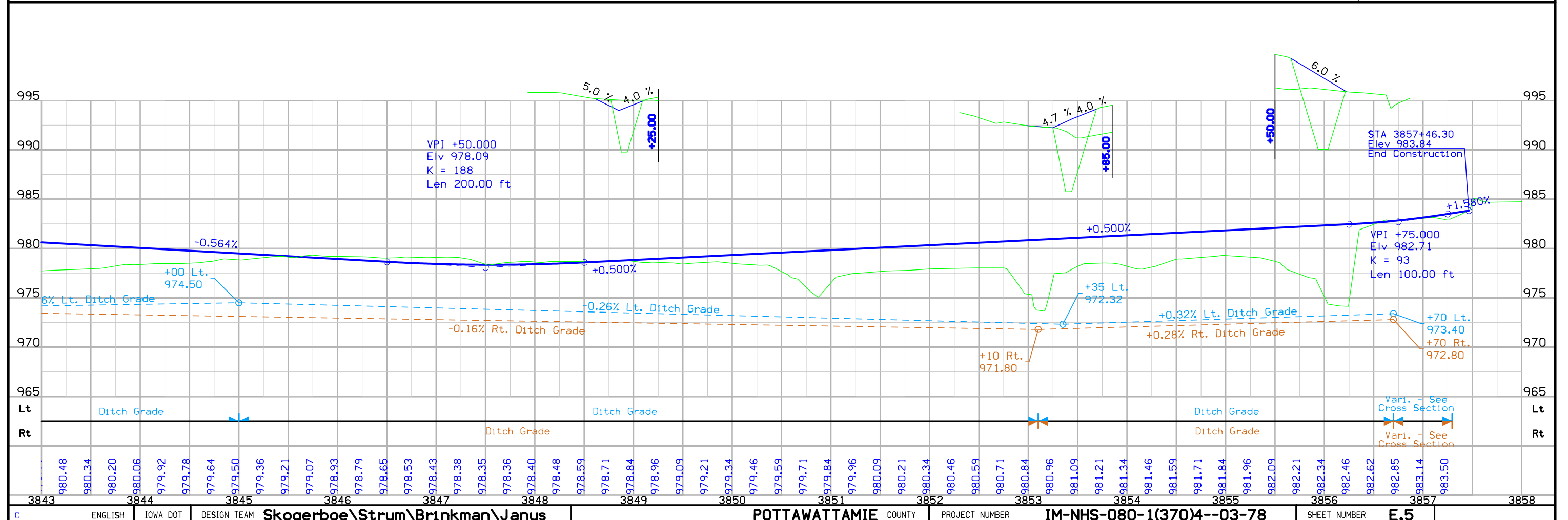
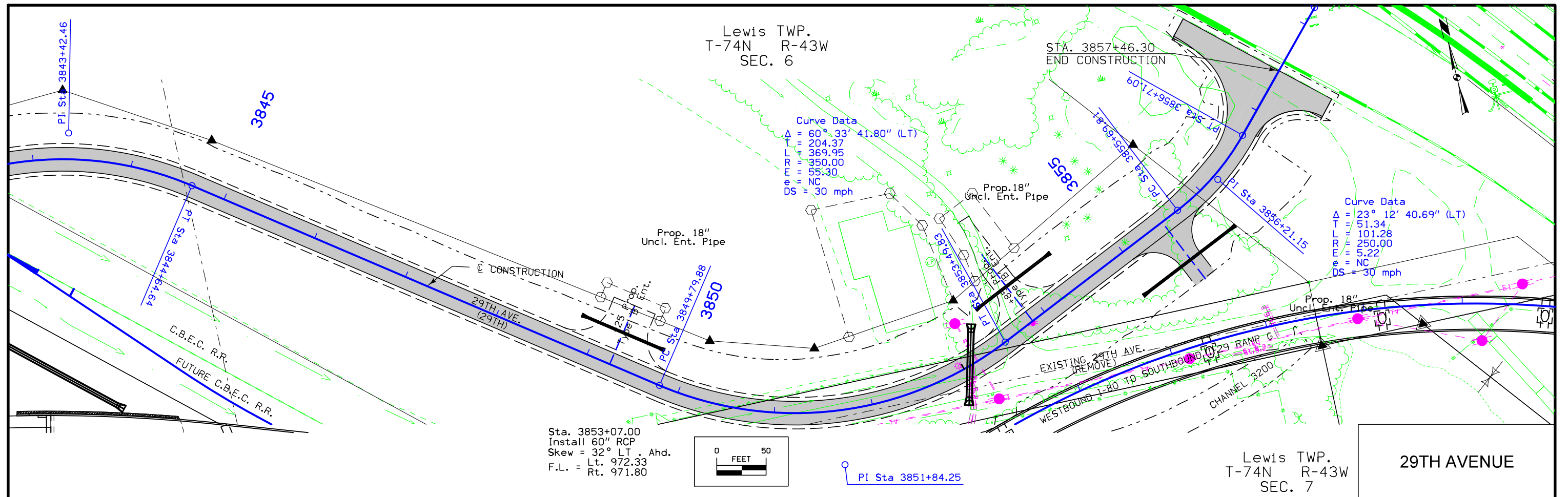
Sta. 3840+60.00  
Install 48" RCP  
Skew =  $36^\circ$  RT. Ahd.  
F.L. = Lt. 972.48  
Rt. 972.20

Sta. 3842+20.00  
Install 48" RCP  
Skew =  $42^\circ$  RT. Ahd.  
F.L. = Lt. 974.00  
Rt. 973.50

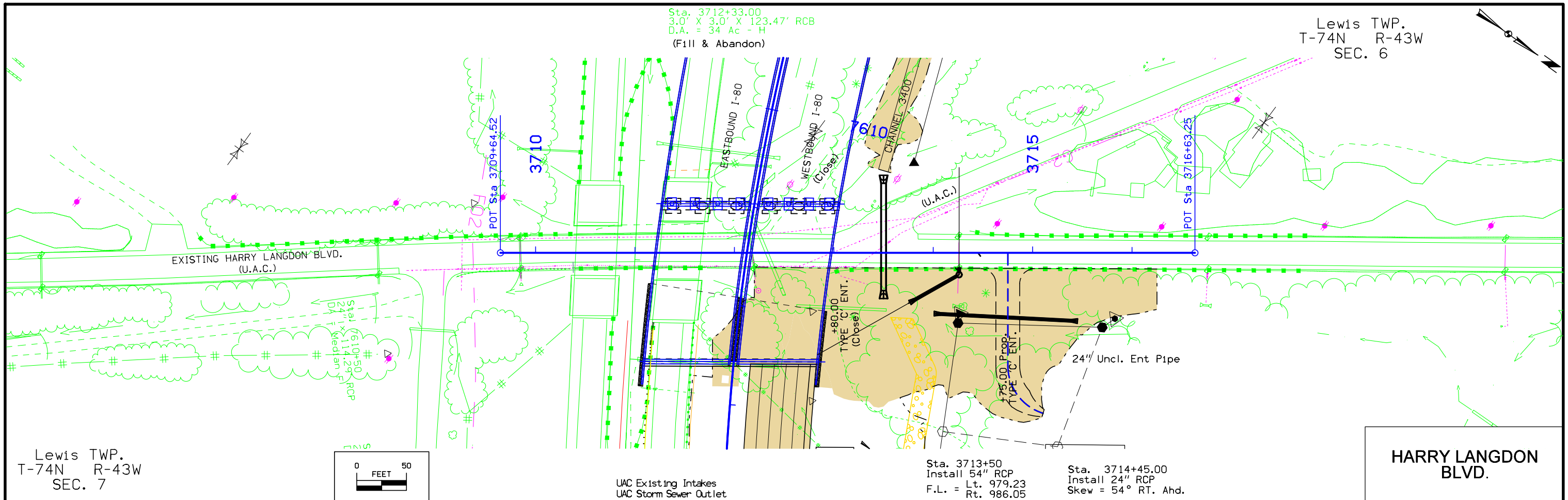


29TH AVENUE





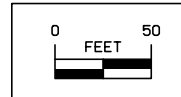




Sta. 3712+33.00  
 3.0' X 3.0' X 123.47' RCB  
 D.A. = 34' Ac - H  
 (Fill & Abandon)

Lewis TWP.  
 T-74N R-43W  
 SEC. 6

Lewis TWP.  
 T-74N R-43W  
 SEC. 7

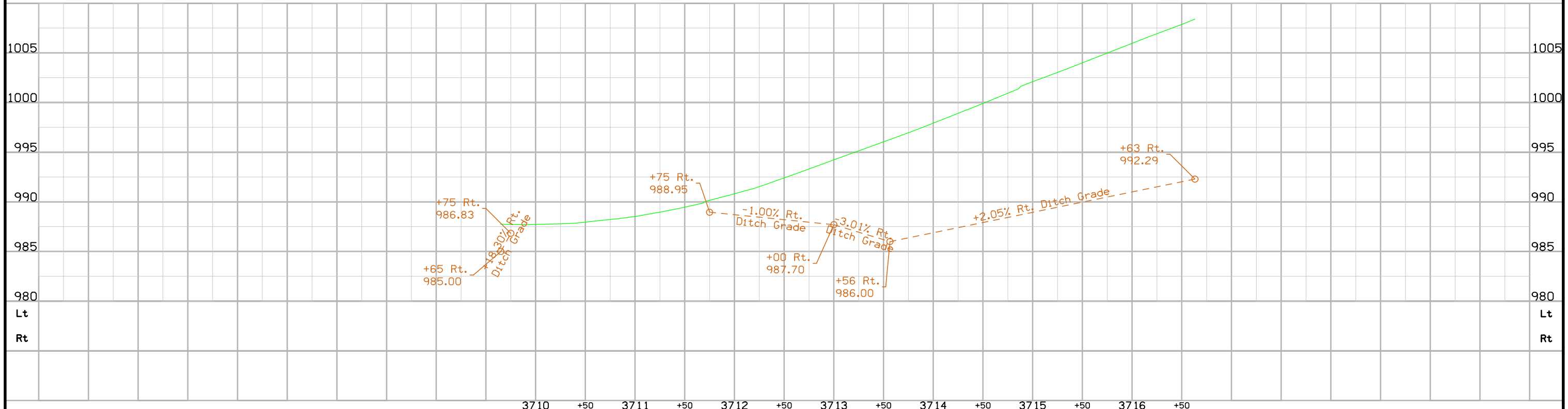


UAC Existing Intakes  
 UAC Storm Sewer Outlet

Sta. 3713+50  
 Install 54" RCP  
 F.L. = Lt. 979.23  
 Rt. 986.05

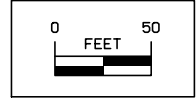
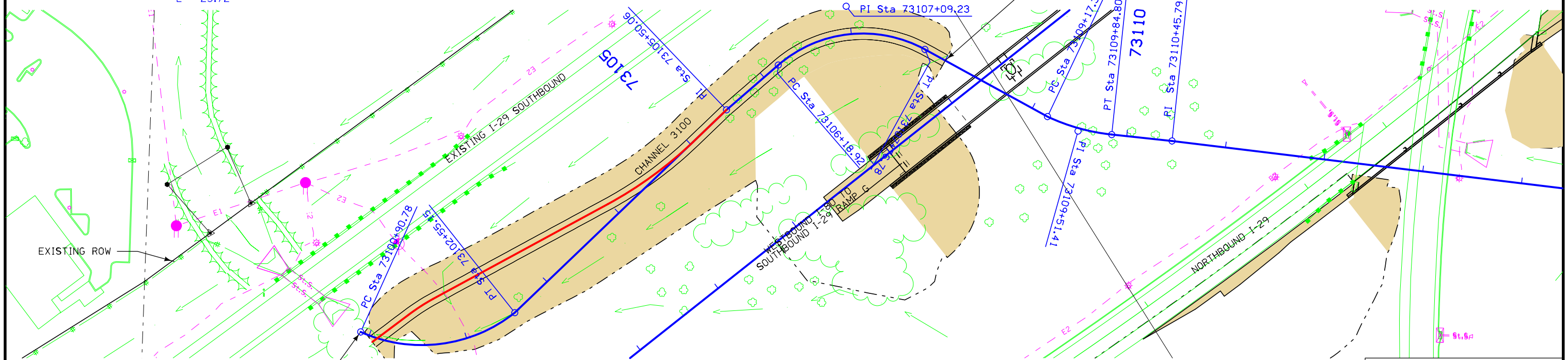
Sta. 3714+45.00  
 Install 24" RCP  
 Skew = 54° RT. Ahd.

**HARRY LANGDON  
 BLVD.**

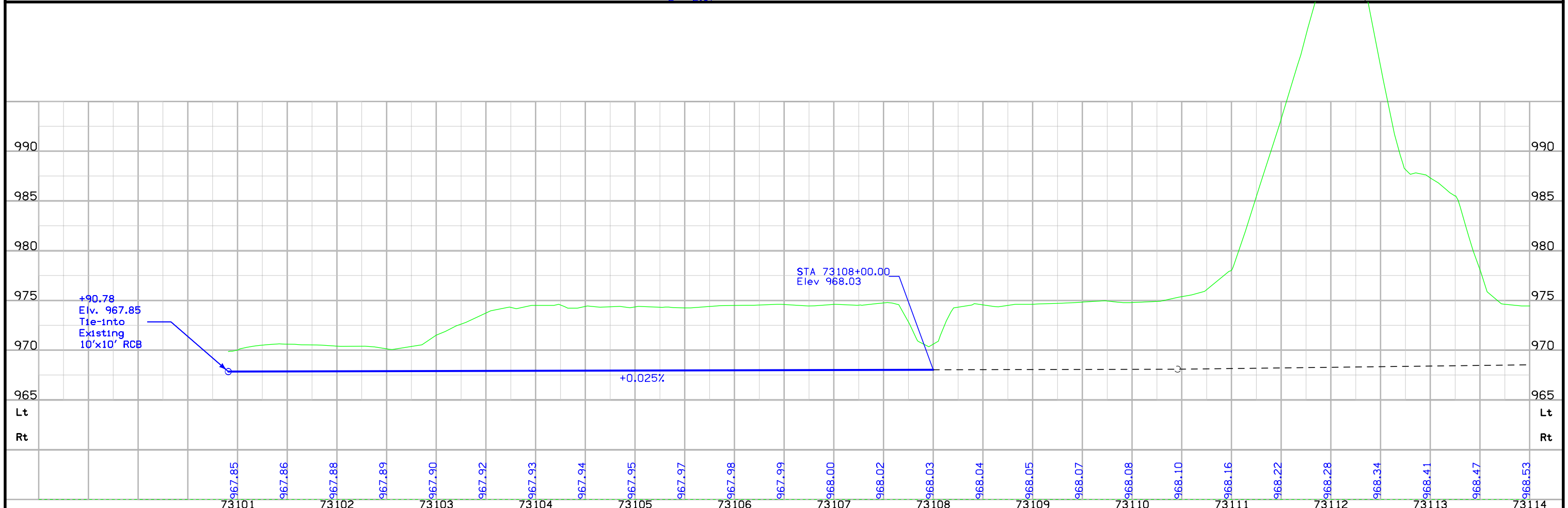


Lewis TWP.  
T-74N R-43W  
SEC. 18

Curve Data  
 $\Delta = 62^\circ 47' 08.27''$  (LT)  
 R = 150.00  
 T = 91.53  
 L = 164.37  
 E = 25.72



CHANNEL ALIGNMENT  
3100



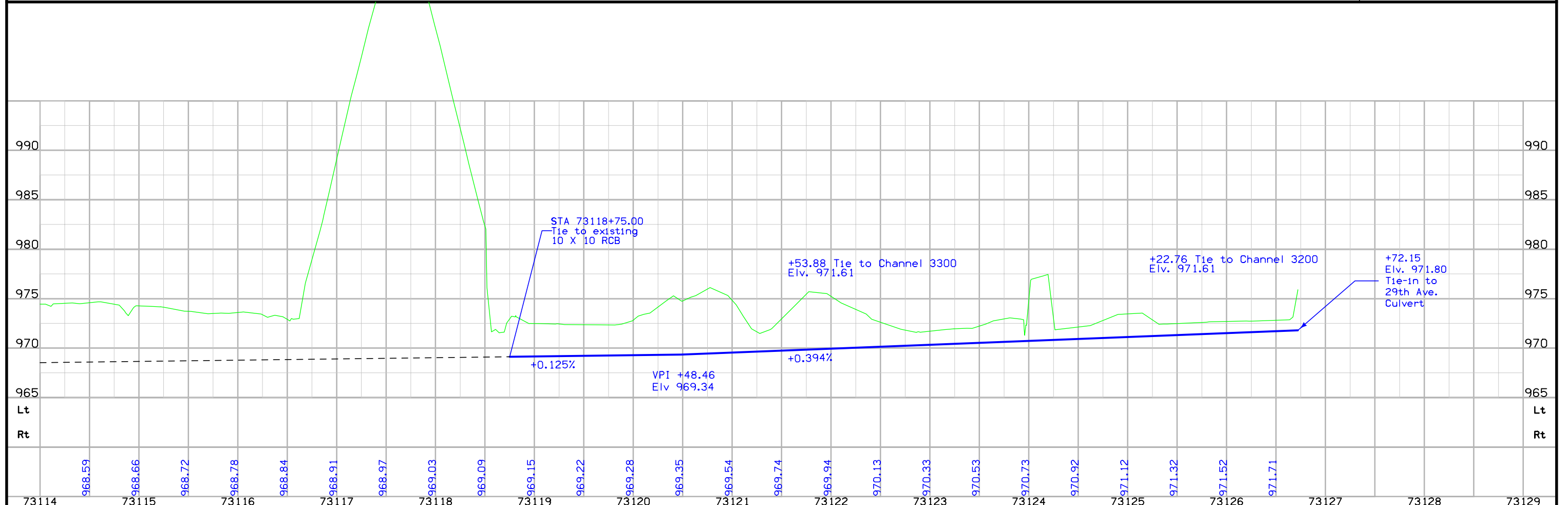
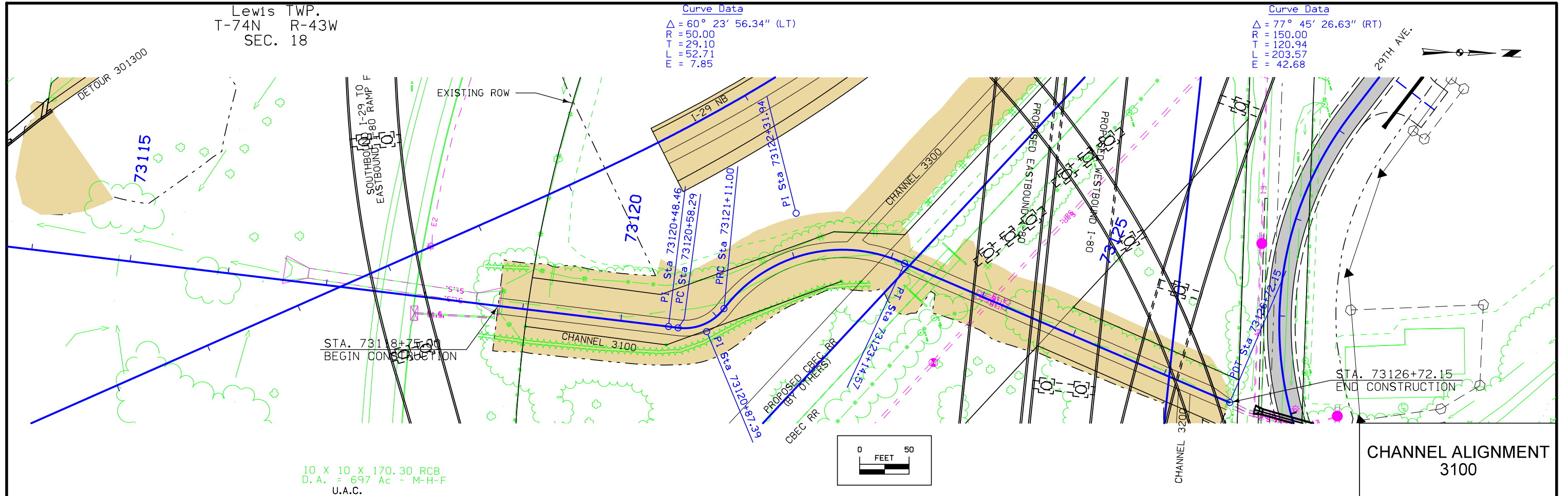
Lewis TWP.  
T-74N R-43W  
SEC. 18

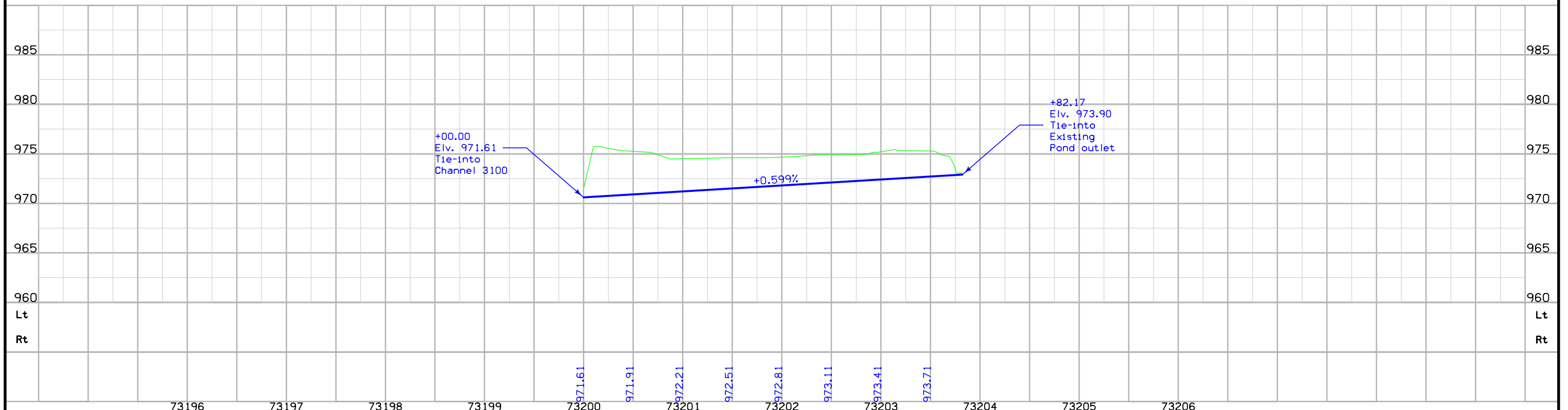
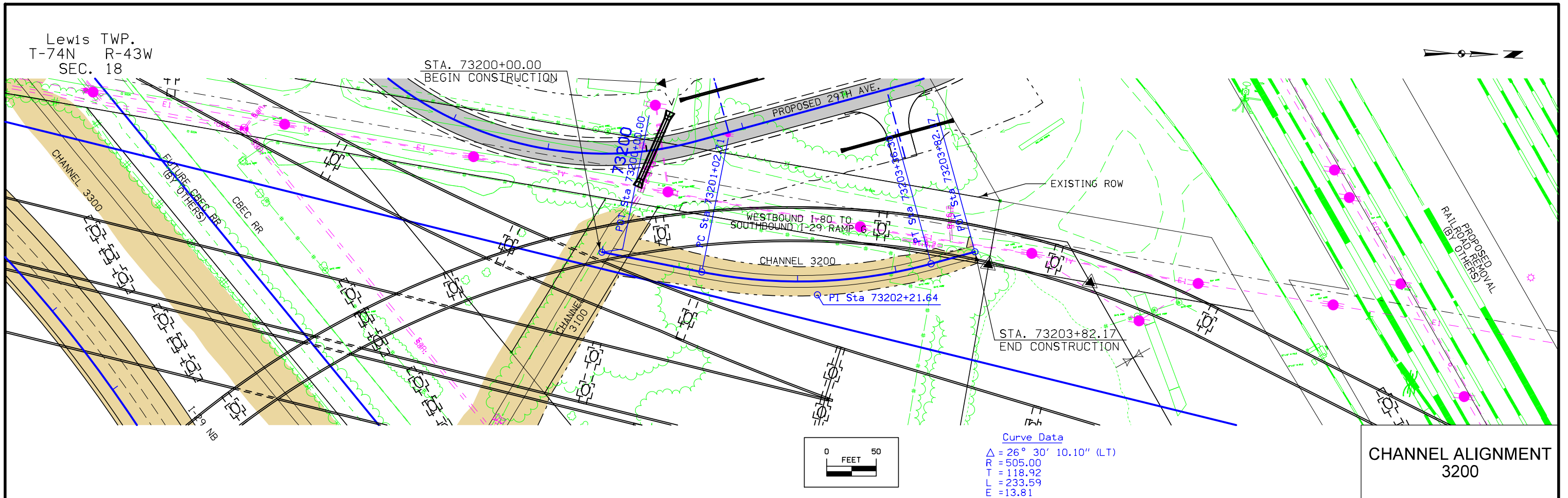
Curve Data

$\Delta = 60^\circ 23' 56.34''$  (LT)  
R = 50.00  
T = 29.10  
L = 52.71  
E = 7.85

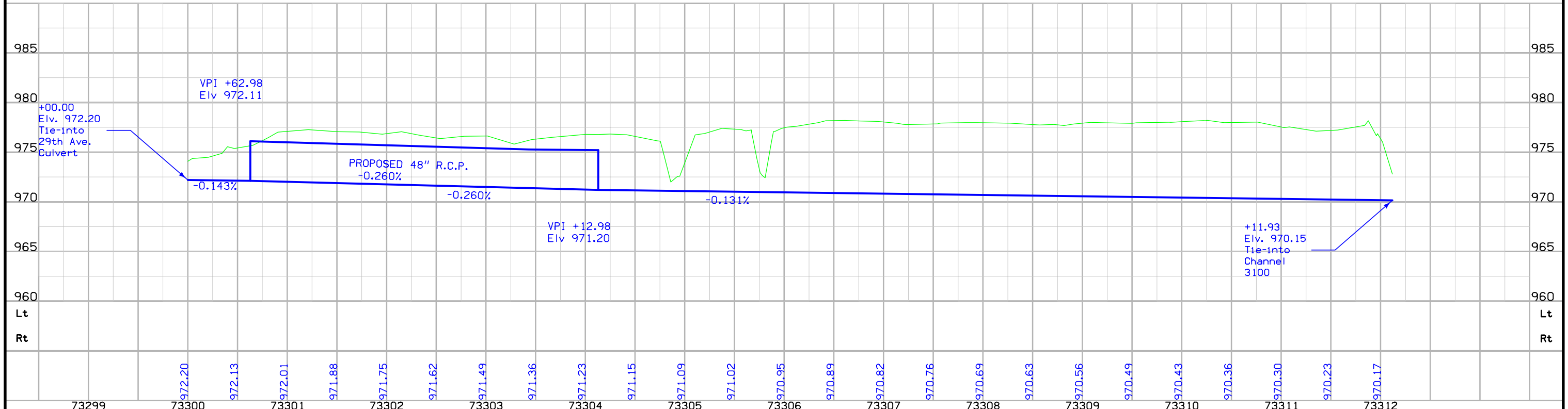
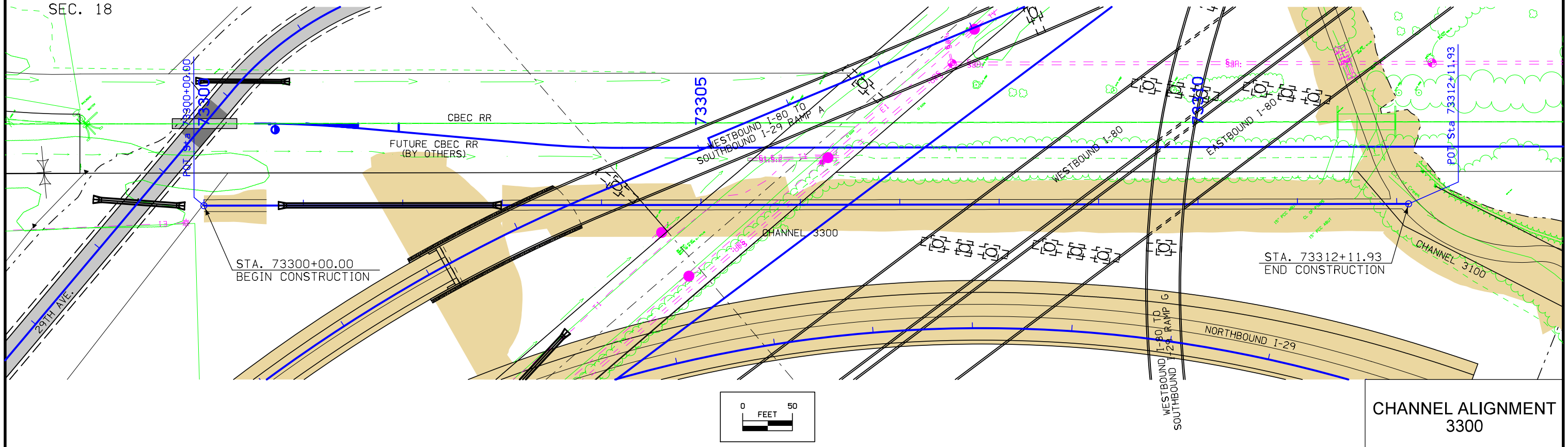
Curve Data

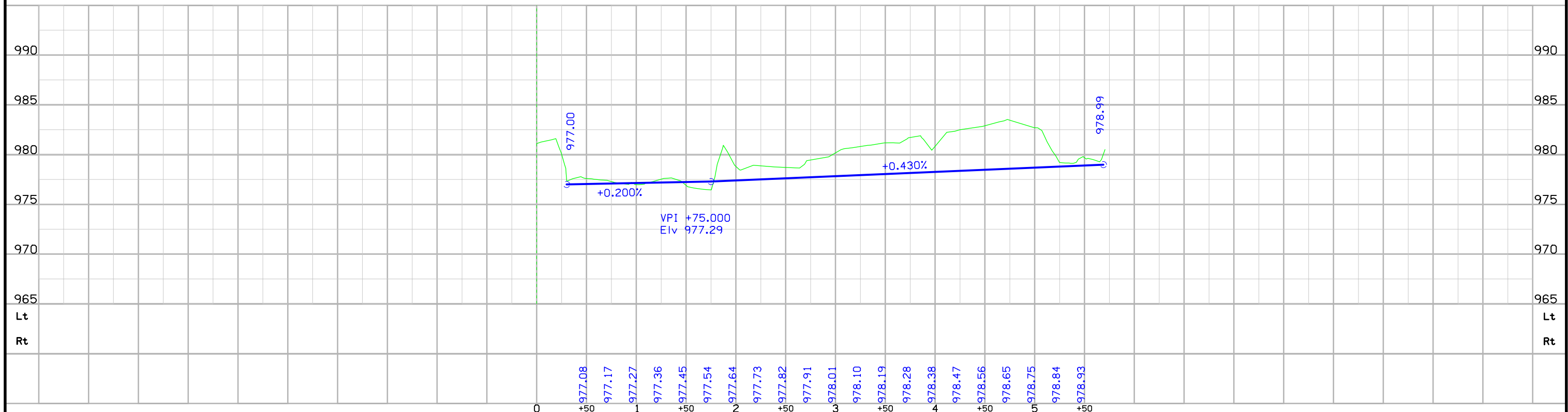
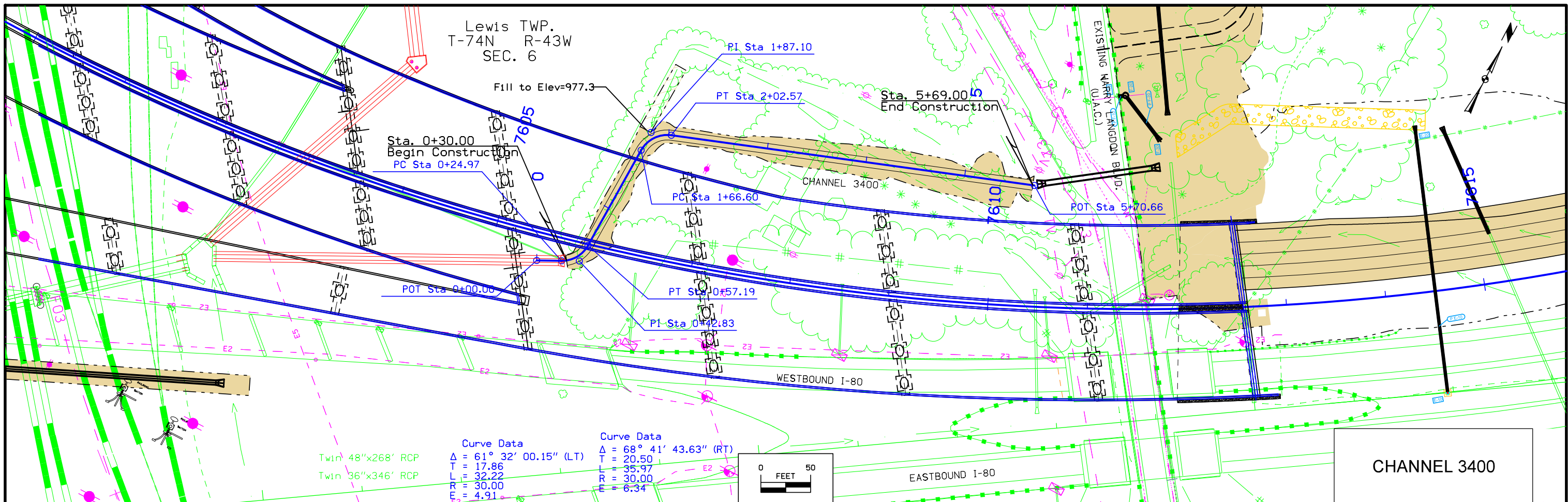
$\Delta = 77^\circ 45' 26.63''$  (RT)  
R = 150.00  
T = 120.94  
L = 203.57  
E = 42.68





Lewis TWP.  
T-74N R-43W  
SEC. 18

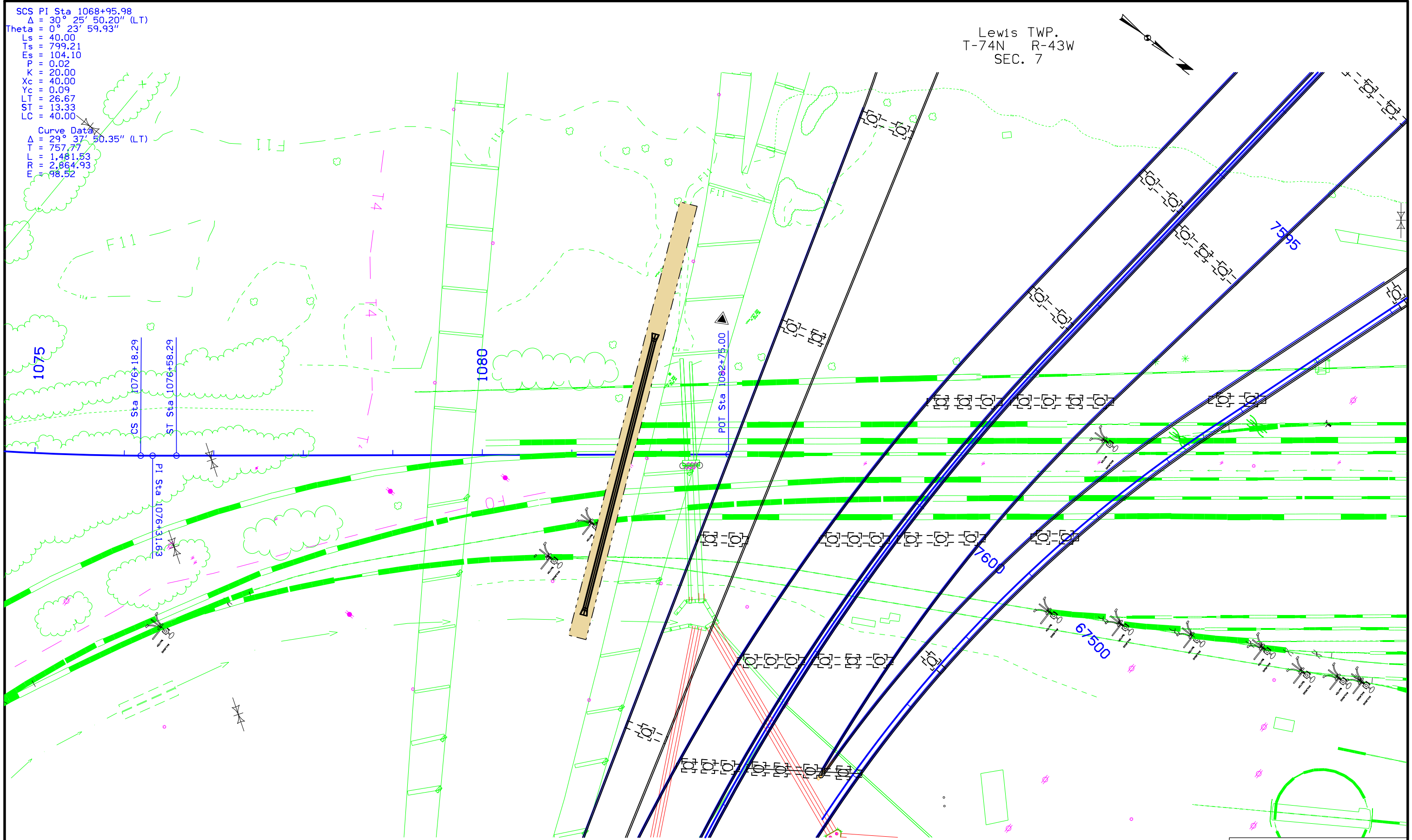
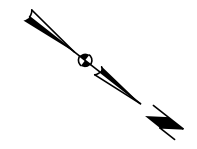




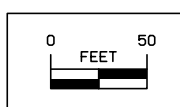
SCS PI Sta 1068+95.98  
 $\Delta = 30^\circ 25' 50.20''$  (LT)  
 Theta =  $0^\circ 23' 59.93''$   
 Ls = 40.00  
 Ts = 799.21  
 Es = 104.10  
 P = 0.02  
 K = 20.00  
 Xc = 40.00  
 Yc = 0.09  
 LT = 26.67  
 ST = 13.33  
 LC = 40.00

Curve Data  
 $\Delta = 29^\circ 37' 50.35''$  (LT)  
 T = 757.77  
 L = 1,481.53  
 R = 2,864.93  
 E = 98.52

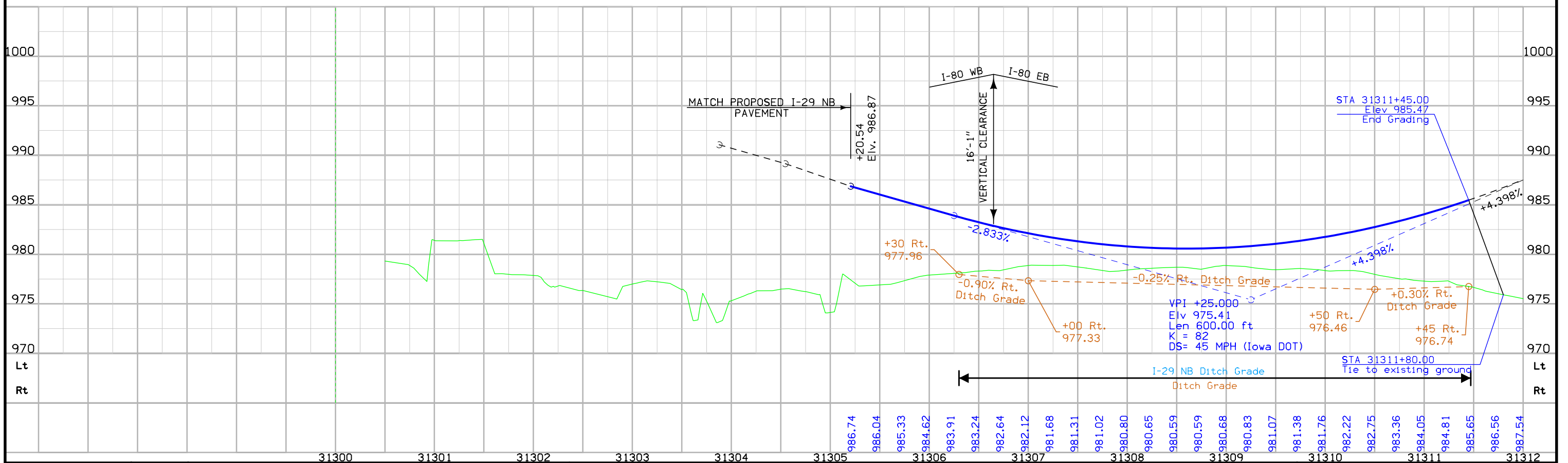
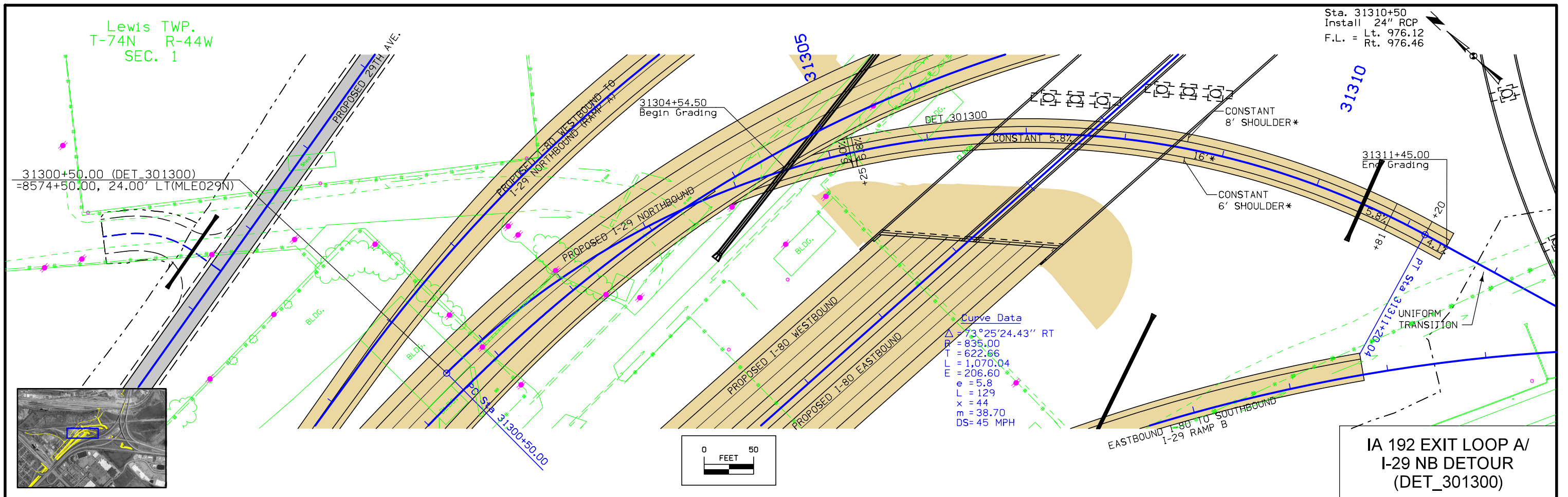
Lewis TWP.  
 T-74N R-43W  
 SEC. 7



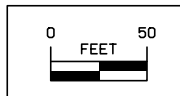
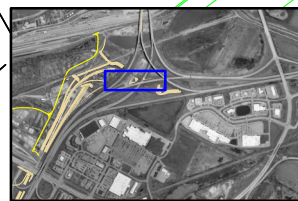
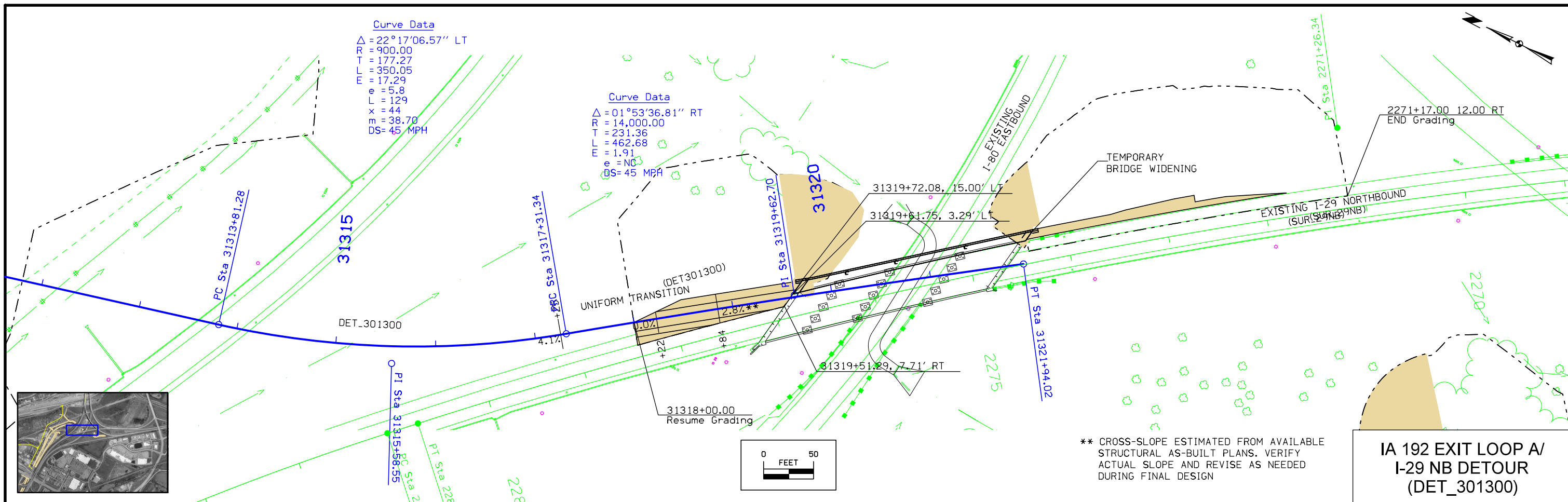
Sta. 1081+59.00  
 Install 48" RCP  
 Skew =  $14.5^\circ$  RT. Ahd.  
 F.L. = Lt. 974.00  
 Rt. 975.00



BNSF-S

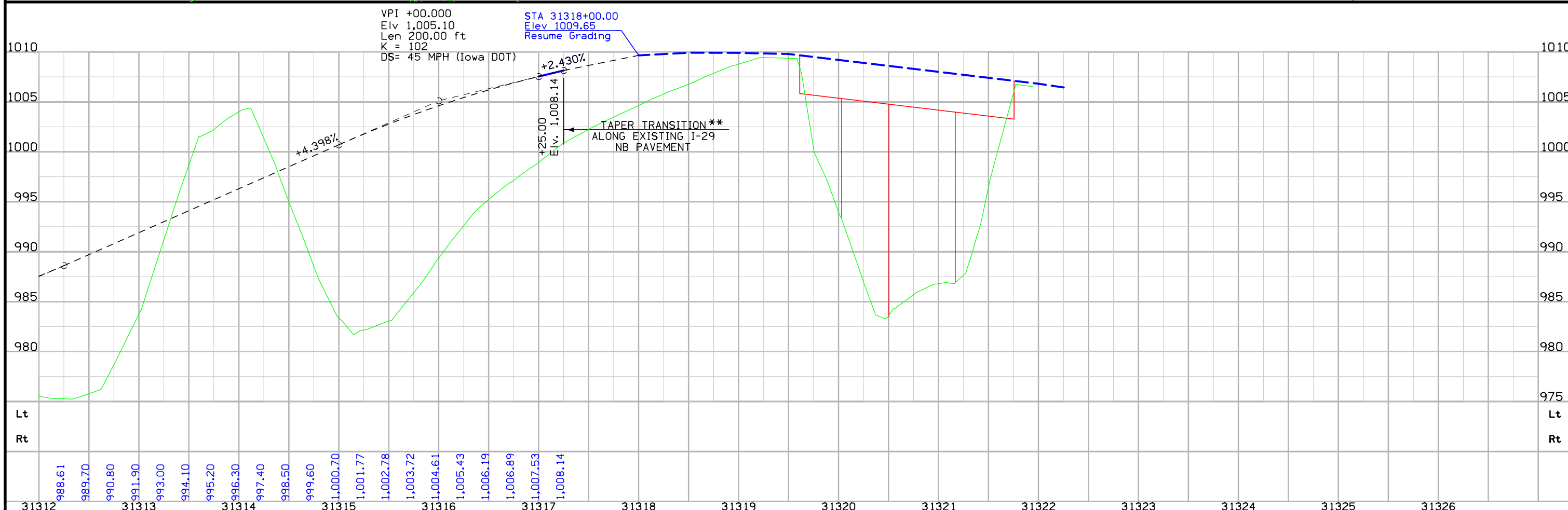






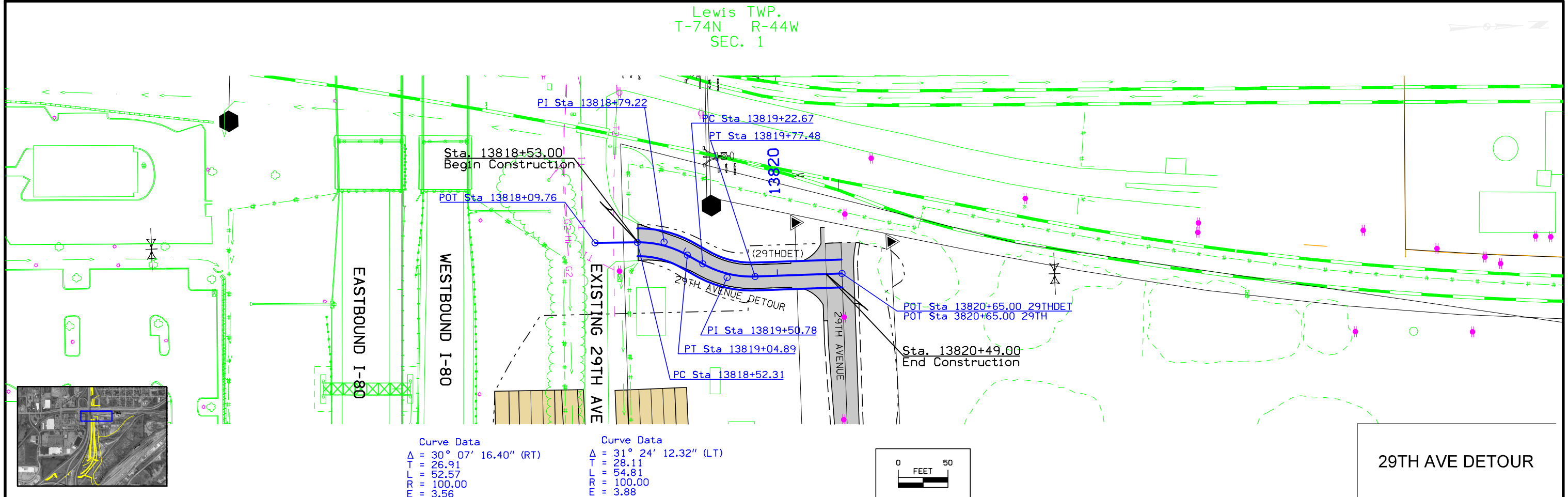
\*\* CROSS-SLOPE ESTIMATED FROM AVAILABLE STRUCTURAL AS-BUILT PLANS. VERIFY ACTUAL SLOPE AND REVISE AS NEEDED DURING FINAL DESIGN

**IA 192 EXIT LOOP A/  
I-29 NB DETOUR  
(DET\_301300)**

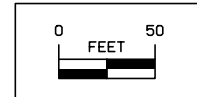


31312	31313	31314	31315	31316	31317	31318	31319	31320	31321	31322	31323	31324	31325	31326
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

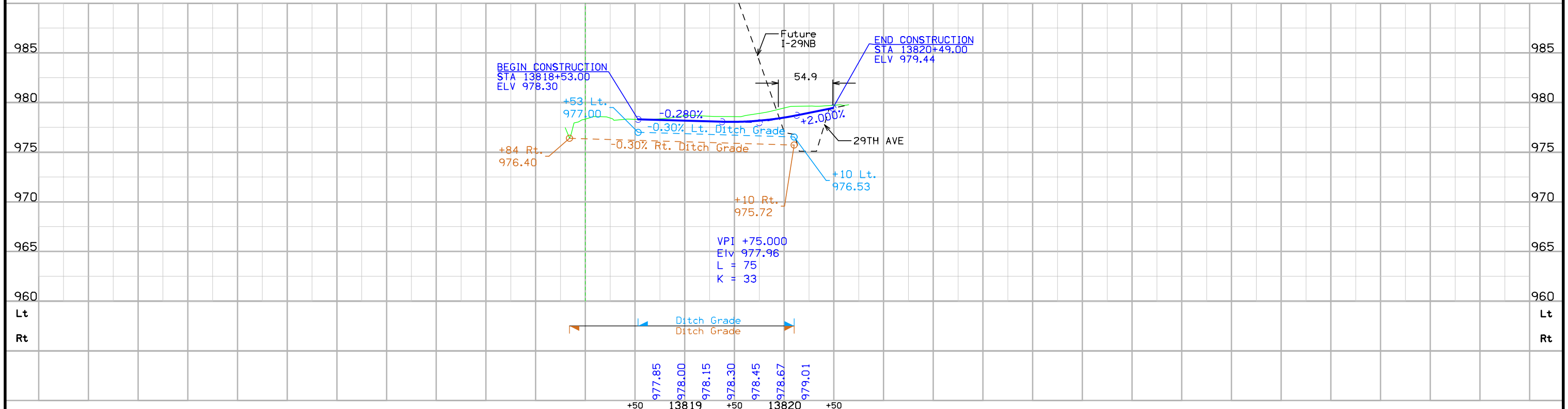
Lewis TWP.  
T-74N R-44W  
SEC. 1



Curve Data		Curve Data	
$\Delta$	= 30° 07' 16.40" (RT)	$\Delta$	= 31° 24' 12.32" (LT)
T	= 26.91	T	= 28.11
L	= 52.57	L	= 54.81
R	= 100.00	R	= 100.00
E	= 3.56	E	= 3.88



29TH AVE DETOUR



General Information

Iowa I Call Job # 001391563 Called 5/11/00 Joint Meet 5/24/00

DTM Survey in English Units

Horizontal Datum 2000 Survey

Horizontal datum is relative to NAD83 (1996)  
This survey is a retrace of present I-80 & I-29, GPS survey in English units.

Stationing for I-29 survey was obtained from S.T. Sta. 206+15.89  
I-IG-80-(54)2- - 04-78 Asbuilt Plans. This stationing was carried northerly & westerly to E.O.P at Nebraska Ave.

Stationing for I-80 east was obtained from Sta 4271+90.00 I-IG-80-1(54)2-04-78  
Asbuilt plans. This stationing was carried easterly to E.O.P.

Stationing for I-80 west was obtained from P.I. Sta 7432+60.60  
I-80-1(53)0- - 01-78  
Asbuilt plans. This stationing was backed westerly to Missouri River Bridge.

Equations Follow:

S.T. Sta 206+15.89 I-29 Survey =  
S.T. Sta 206+15.89 I-IG-80-1(54)2- - 04-78 Asbuilt Plans

POT Sta 271+90.50 I-29 Survey =  
POT Sta 271+90.00 I-IG-80-1(54)2-04-78 Asbuilt Plans =  
PI Sta 4271+90.00 I-80 East Survey

PI Sta 431+38.21 I-29 Survey =  
PI Sta 432+60.60 I-80-1(53)0- - 01-78 Asbuilt Plans =  
PI Sta 7432+60.60 I-80 West Survey

I-29 North Horizontal Datum 2001 Survey

This 2001 survey is a continuation of I-29 2000 survey and is a retrace of present I-29 northerly. Except two new P.I.'s were established at Interstate 480 interchange to take out two laterals in existing alignment. Stationing was obtained from POT Sta 471+99.749 2000 survey. This stationing was carried to EOP.

Equations Follow:

Pn:29 POT Sta 471+99.749 This Survey =  
POT Sta 471+99.749 IM-80-1(257)1-13-78 2000 Survey

Pn:112 PI Sta 483+63.803 This Survey =  
PI Sta 484+85.0 I-IG-29-3(5)54-04-78 Asbuilt Plans

Pn:113 POT Sta 494+81.156 This Survey =  
POT Sta 496+01.85 I-IG-29-3(5)54-04-78 Asbuilt Plans =  
POT Sta 233+00 I-IG-29-3(17)54-04-78 Asbuilt Plans

Pn:119 CN Sta 576+76.226 - 131.394 Rt. This Survey =  
Old POC Sta 152+00 CL Median I-29-3(6)56-78-24 Asbuilt Plans

Pn:121 Cp Sta 591+18.767 This Survey =  
POT Sta 667+39.4 I-IG-29-3(8)57-04-78 Asbuilt Plans =  
POT Sta 137+36.35 Howard, Needles, Tammen, & Bergendoff Survey

Pn:135 CP Sta 701+43.667 -0.075 Lt This Survey =  
POT Sta 777+64.19 Back =  
POT Sta 776+95.47 Ahead I-IG-29-3(8)57-04-78 Asbuilt Plans

Pn:139 CN Sta 724+16.133 This Survey =  
St Sta 799+68.15 =  
POT Sta 99+81.47 I-IG-29-3(8)57-04-78 Asbuilt Plans

Pn:146 PI Sta 851+44.277 This Survey =  
PI Sta 226+59.94 920(3) Paving Plans

I-29 Horizontal Datum 10/28/05 thru 08/15/06 Survey

This 2005 thru 2006 survey is a continuation of the 2000 survey. This alignment is a retrace of present I-29 alignment. The alignment was extended south from ST 206+15.89 from the original survey to POT Sta. 118+39.49. Stationing was obtained from ST Sta. 206+15.89 from the original survey.

Equations Follow:

PI 199+05.70 this survey  
= PI 199+05.69 P.C.C. Paving Plans I-IG-29-2(7)49-04-78

TS 191+47.86 this survey  
= TS 180+02.90 Back  
= TS 191+47.80 Ahead P.C.C. Paving Plans I-IG-29-2(7)49-04-78

POT 118+39.49 this survey  
= POT 106+93.40 As-Built Plans I-IG-29-2(8)43-04-65

I-80 East Horizontal Datum 2001 Survey

This 2001 survey is a continuation of the 2000 survey and is a retrace of present I-80 alignment northeasterly. Stationing was obtained from PI Sta. 4271+90.019 2000 survey. This stationing was carried ahead to the EOP.

Equations Follow:

PI Sta. 4271+90.019 This Survey=  
PI Sta. 4271+90.019 2000 J. Adams I-80 Survey=  
POT Sta. 271+90.50 2000 J. Adams I-29 Survey=  
PI Sta. 4271+90.0 From 1973 I-IG-80-1(54)2-04-78 Asbuilt Plan

PI Sta. 4304+81.31 This Survey=  
POT Sta. 4304+81.31 From 2000 J. Adams Survey

PI Sta. 4313+63.72 This Survey=  
PI Sta. 1023+64.25 From I-IG-80-1(58)4-04-78 1974 Asbuilt Plan

POT Sta. 4373+48.51 This Survey=  
ST Sta. 1083+51.48 From I-IG-80-1(58)4-04-78 1974 Asbuilt Plan =  
POT Sta. 81+86.39 Original Survey

PI Sta. 4454+27.55 This Survey=  
PI Sta. 162+72.0 From I-80-1(52)6-01-78 1973 Asbuilt Plan

POT Sta. 4547+27.97 This Survey=  
POT Sta. 252+29.4 From I-80-1(52)6-01-78 1973 Asbuilt Plan =  
ST Sta. 256+60.39 From Romesburg Survey

Target # 1231 Y = 458055.500 X = 983022.353 This Survey = CP 1-5  
Y = 536693.762 X = 2771064.708 Neb. DOR

Target # 1255 Y = 457978.378 X = 979143.943 This Survey  
= CP 0-1 Y = 536326.988 X = 2767205.601 Neb DOR

Target # 1250 Y = 458048.962 X = 980334.723 This Survey  
= CP 0-3 Y = 536486.624 X = 2768387.744 Neb. DOR

Target # 1245 Y = 458125.637 X = 981686.602 This Survey  
= CP 0-5 Y = 536664.388 X = 2769730.077 Neb. DOR

GPS # 024 Y = 457776.51 X = 986065.97 This Survey  
= CP 1-8 Y = 536644.443 X = 2774123.328 NEB.. DOR

GPS # 030 Y = 457925.91 X = 978423.73 This Survey  
= # 455-2 Y = 536220.699 X = 2766491.335 Neb. DOR

South 24th St. Horizontal Datum 10/28/05 thru 08/15/06 Survey

Alignment for South 24th St., south of I-80/29 has changed, and a new alignment from US 275/IA 92 north to just south of I-80/29 along South 24th St. was generated. This new alignment is named H0320F1.a1. Plans for this new alignment were provided by HMG Associates Inc, Project # STP-U-1642(638)-70-78.

Equations Follow:

POT 14163+54.95 Side Road "N" this survey  
=POT 0+00.00 Project # STP-U-1642(638)-70-78 Plans provided by HMG Associates Inc

PI 14166+92.60 Side Road "N" this survey  
=PI 3+37.66 Project # STP-U-1642(638)-70-78 Plans provided by HMG Associates Inc.

PI 14186+72.93 Side Road "N" this survey  
=PI 23+17.98 Project # STP-U-1642(638)-70-78 Plans provided by HMG Associates Inc

PI 14194+11.48 Side Road "N" this survey  
=PI 30+56.49 Project # STP-U-1642(638)-70-78 Plans provided by HMG Associates Inc

Vertical Datum (2000 Survey)

This survey is relative to NGS NAVD 88 datum.  
NGS # W 131, pid-mj0607 Elev. = 979.50 ft. was used as datum bm. This datum plane was carried northerly & westerly along I-29 to NGS # P 127 pid-mj0660. Elev. = 1011.00 where adjustment was made. Equations to other benches follows :

BM # 501 Elev. = 979.50 ft. this survey =  
NGS # W 131 Elev. = 979.50

BM # 900 Elev. = 1011.00 ft. this survey =  
NGS # P 127 Elev. = 1011.00 ft. =  
BM # P 127 Elev. = 1011.00 ft. Project # RM-1642(2)- - 90-78 City Of Council Bluffs

BM # 514 Elev. = 1006.78 ft. this survey =  
BM # 615A Elev. = 1006.38 ft. I-80-1(53)0- - 01-78 Asbuilt Plans

BM # 517 Elev. = 991.04 ft. this survey =  
BM 30A Elev. = 990.61 ft. I-80-1(53)0 - - 01-78 Asbuilt Plans =  
BM #2-H Elev. = 991.04 ft. Neb. DOR

BM # 536 Elev. = 974.86 ft. this survey =  
BM # 0-C Elev. = 974.90 ft. Neb. DOR

BM # 530 Elev. = 978.18 ft. this survey =  
BM # 0-B Elev. = 978.24 ft. Neb. DOR

Vertical Datum(I-29 North 2001 Survey)

This survey is relative to NAVD 88 datum and I-29 2000 survey. Bm# 527  
EI = 1011.883 of 2000 survey was used as datum bm.  
This datum plane was carried northerly to NGS # V 180 Pid # nj1380 ( BM # 590)  
el = 977.44 where adjustment was made.

Equations Follow:

BM # 527 Elev. = 1011.883 this survey =  
BM # 527 Elev. = 1011.883 IM-80-1(257)1-13-78 2000 Survey

BM # 558 Elev. = 976.79 this survey =  
BM # 20A Elev. = 976.51 I-IG-29-3(17)54-04-78 1973 Asbuilt Plans

BM # 560 Elev. = 1000.542 this survey =  
BM # 16D Elev. = 1000.25 I-IG-29-3(17)54-04-78 1973 Asbuilt Plans

BM # 566 Elev. = 999.13 this survey =  
BM # H-6A Elev. = 998.78 I-29-3(6)56-78-24 1974 Asbuilt Plans

BM#577 Elev. = 996.952 this survey =  
USGS J 139 Elev. = 996.82 =  
BM#206 Elev. = 996.46 I-IG-29-3(8)57-04-78 1972 Asbuilt Plans

BM# 582 Elev. = 1018.967 this survey =  
BM # 216A Elev. = 1018.66 I-IG-29-3(8)57-04-78 1972 Asbuilt Plans

BM # 590 Elev. = 977.44 T this survey =  
NGS B-180 Elev. = 977.44 PID#MJ1380 NAVD 88

Vertical Datum(I-80 East 2001 Survey)

This survey is relative to NAVD 88 datum and I-80 2000 survey. Bm # 504 elev. 1002.280 of the 2000 survey was used as a datum bm. This datum plane was carried northeasterly to NGS 1020.910 (pid#mj0550) elev. 1021.18 where adjustments were made.

Equations Follow:

BM # 504 Elev. 1002.280 this survey =  
BM # 504 Elev. 1002.280 from 2000 Survey

BM # 595 Elev. 986.89 this survey =  
BM # 4 Elev. 986.53 FROM I-IG-80-1(58)1-04-78 1974 Asbuilt Plan =  
TBM # 2 Elev. 988.92 FROM IA.#375 F-280 Plan

BM # 613 Elev. 1013.71 this survey =  
BM # 101 Elev. 1013.34 from I-80-1(51)6-01-78 1973 Asbuilt Plan

BM # 623 Elev. 1182.605 this survey =  
BM # 124 Elev. 1182.14 from I-80-1(51)6-01-78 1973 Asbuilt Plan

BM # 629 Elev. 1021.18 this survey =  
NGS#1020.910 Elev. 1021.18 (PID # MJ0550)

Vertical Datum 10/28/05 thru 08/15/06 Survey

This survey is relative to NAVD 88. BM 544 from the original survey was destroyed. New benches were set throughout this survey and three wire bench level runs were then run.

Vertical Datum 9/13/06 thru 9/26/06

BM # 516 from the original survey was destroyed. BM # 677 was set to replace BM # 516 and a three wire level bench run was then run starting at BM # 515 to BM # 517 where adjustments were made.

BENCHMARKS ELEVATION

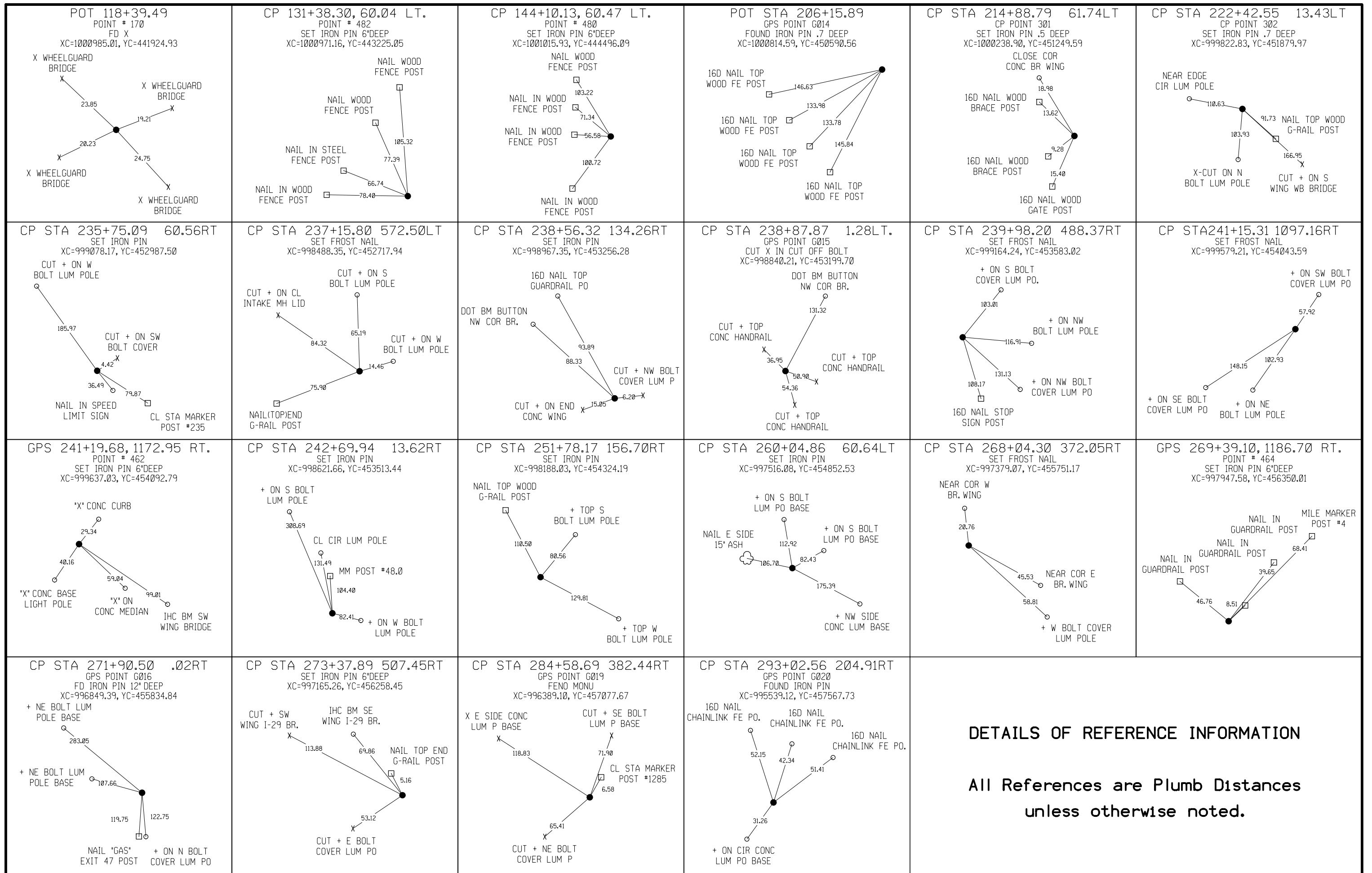
Table with columns: No., Sta., Elev., Description. Contains benchmark data for various points like No. 505, 506, 502, 503, 504, 507, 537, 508, 538, 539.

Main table with columns: No., Sta., Elev., Description. Contains detailed survey data for points No. 512 through 530 and 525 through 532.

Table with columns: No., Sta., Elev., Description. Contains detailed survey data for points No. 527 through 679.

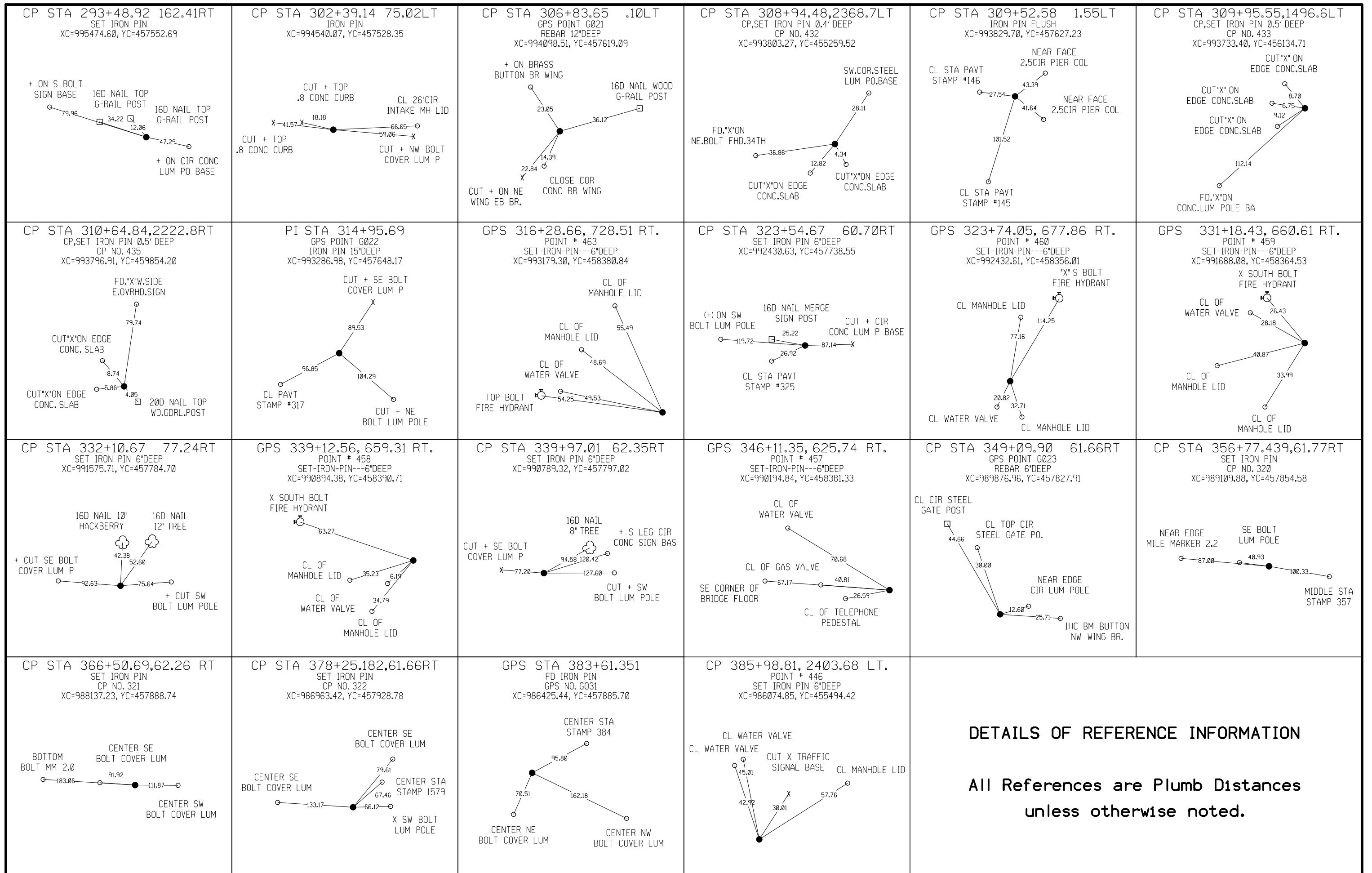
No. 575 Sta. 615+92.883 64.28 Rt. CUT"X"N.SIDE-CON-LUM-BASE----- 984.363  
No. 577 Sta. 631+08.233 549.18 Lt. FD-USGS-STAMPED-J139-1948  
PID#MJ0770  
BM 577 ELEV. 996.952  
THIS SURVEY=  
USGS J 139 ELEV. 996.82  
(NAVD 88 DATUM)=  
BM#206 ELEV. 996.46  
I-IG-29-3(8)57--04-78  
1972 ASBUILT PLAN----- 996.952  
No. 576 Sta. 632+21.531 80.93 Rt. CUT"X"NW.COR.4X4-CONC  
INTAKE COVER----- 980.324  
No. 578 Sta. 644+61.729 58.88 Rt. CUT"X"NW.COR.CONC-INTAKE  
COVER----- 991.293  
No. 579 Sta. 651+71.681 58.78 Rt. CUT"X"SW.SIDE-HNDRL-NB.  
LANE BRIDGE OVER 25 TH----- 1006.524  
No. 580 Sta. 653+28.630 60.38 Lt. CUT"X"NE.SIDE-HNDRL-SB.  
LANE BRIDGE OVER 25 TH----- 1009.136  
No. 519 Sta. 657+31.923 15603.28 Rt. CUT-X-SOUTH-SIDE-CONC  
SIGN-BASE----- 975.272  
No. 581 Sta. 661+45.299 88.85 Lt. CUT"X"NW.HDRL.SB.LANE  
BRIDGE OVER OLD RR----- 1019.438  
No. 582 Sta. 667+20.719 18.00 Rt. FD-IHC-NE.COR.WING-NB.  
LANE BRIDGE OVER OLD RR  
BM#582 ELEV. 1018.967  
THIS SURVEY=  
BM#216A ELEV. 1018.66  
I-IG-29-3(8)57--04-78  
1972 ASBUILT PLAN----- 1018.967  
No. 583 Sta. 679+66.903 75.55 Rt. FD-IHC-RT.HDWL-6X8-RCB----- 982.137  
No. 584 Sta. 698+79.474 7.58 Rt. CUT"X"INLET-24"-RCP-MEDIA  
STA 775----- 976.013  
No. 585 Sta. 708+48.375 23.66 Rt. FD-IHC-SE.WING-NB.LANE  
BRIDGE OVER 16 TH ST.----- 1003.694  
No. 586 Sta. 711+36.830 18.61 Lt. CUT"X"NW.HDRL-NB.LANE  
BRIDGE OVER 16 TH ST.----- 1006.590  
No. 587 Sta. 721+70.490 54.65 Lt. FD-IHC-L-T-HDWL-TWIN-10X10  
RCB UNDER NB LANES STA  
797+25 +/------ 984.707  
No. 588 Sta. 742+47.090 181.13 Rt. SET-RR-SPK-W.SIDE-P.POLE  
STA 118+00----- 979.513  
No. 589 Sta. 760+87.333 116.15 Rt. SET-RR-SPK-W.SIDE-P.POLE  
STA 138+00----- 981.394  
No. 590 Sta. 780+56.044 116.40 Rt. FD-NGS-BM-B-180-STEEL-ROD  
IN-SLEEVE  
PID#MJ1380  
NAVD-88-ELEV=977.44----- 977.440  
No. 591 Sta. 790+24.203 121.36 Rt. SET-RR-SPK-W.SIDE-P.-POLE----- 978.740  
No. 592 Sta. 810+59.905 110.06 Rt. SET-RR-SPK-W.SIDE-P.POLE----- 982.703  
No. 636 Sta. 208+64.51 135.14 Lt. SET\RR SPK E SIDE BR.POST----- 978.532  
No. 635 Sta. 287+11.38 6564.40 Rt. FD\RR SPK N SIDE RISER  
POLE 3RD POLE W OF INTERS  
MADISON & WOODBURY AVES.----- 1019.376  
No. 677 Sta. 334+84.61 76.50 Rt. SW BOLT LUM POLE----- 978.593  
No. 640 Sta. 156+84.54 137.25 Rt. CUT X BALL ROW RAIL----- 972.920  
No. 639 Sta. 170+00.76 115.74 Lt. SET\RR SPK E SIDE BR.POST----- 976.507  
No. 638 Sta. 181+45.74 60.44 Lt. CUT X N. END WHEELGUARD  
SOUTHBOUND I-29 BRIDGE  
OVER RR TRACKS----- 1008.306  
No. 637 Sta. 195+80.26 12.58 Rt. CUT X TOP INLET APRON  
24" RCP----- 978.427  
No. 509 Sta. 4276+16.701 383.23 Rt. FD-IHC-BM-BUTTON-SE-WING  
I-29-BR.-OVER-I-80-TO-W.----- 1010.197  
No. 510 Sta. 4276+77.619 254.61 Lt. FD-IHC-BM-SE-WING-BR.  
I-80/I-29-BR-OVER-I-80-E.----- 1007.367  
No. 511 Sta. 4283+69.335 460.79 Lt. FD-IHC-BM-NW-WING-BR.  
OVER-POND&RR-TRACKS  
I-80-WESTBOUND----- 1011.613  
No. 552 Sta. 4284+97.162 38.70 Rt. FD-IHC-BM-TOP-WING-SW-COR  
BRIDGE-I-80-WEST-BOUND----- 1010.243  
No. 597 Sta. 4298+67.763 81.85 Lt. FD IHC SE.COR.WING WB.LNE  
I-80 BRG OVER RR.YARD----- 1012.698  
No. 596 Sta. 4299+02.245 55.39 Rt. FD IHC SE.COR.WING EB.LNE  
I-80 BRG OVER RR.YARD----- 1009.530  
No. 598 Sta. 4303+17.382 59.83 Rt. FD DOT BUTTON SW.COR.HNDL  
EB.LANE I-80 BRG.OVER  
H.LANGDON BLVD.----- 1010.293

No. 595 Sta. 4304+21.331 148.69 Lt. FD IHC INLET 3X3 RCB  
ON H.LANGDON BLVD.  
BM# 595 ELEV. 986.89 THIS  
SURVEY=  
BM# 4 ELEV. 986.53 FROM  
I-IG-80-1(58)4--04-78  
1974 AB PLAN=  
TBM# 2 ELEV. 988.92 FROM  
IA.#375 F-280 PLAN----- 986.894  
No. 599 Sta. 4304+65.040 62.50 Lt. CUT"X"NE.COR.HNDRL.W.B.  
LANE I-80 BRG OVER  
H. LANGDON BLVD.----- 1011.092  
No. 600 Sta. 4317+81.751 105.96 Rt. CUT"X"E.CONC.SIGN BASE  
(GAS-FOOD-LODGING-EXIT 5----- 1034.911  
No. 601 Sta. 4321+44.921 55.32 Rt. FD IHC SE.COR.WING E.B.  
LANE I-80 BRG.OVER OLD RR----- 1042.522  
No. 602 Sta. 4323+29.186 55.22 Lt. FD IHC NW.COR.WING W.B.  
LANE I-80 BRG.OVER OLD RR----- 1043.789  
No. 603 Sta. 4335+16.615 66.64 Rt. CUT"X"E.SIDE CONC.LUM BAS  
JUST N. N.B. MADISON EXIT----- 1028.111  
No. 604 Sta. 4344+23.877 59.60 Rt. CUT"X"SE.COR.HNDRL E.B.  
LANE I-80 BRG.OVR MAD.AVE----- 1019.332  
No. 605 Sta. 4345+73.212 59.26 Lt. CUT"X"NW.COR.HNDRL.W.B.  
LANE I-80 BRG.OVR MAD.AVE----- 1024.233  
No. 606 Sta. 4358+52.811 78.37 Lt. CUT"X"NW.COR.CONC.WING WB  
LANE I-80 BRG.OVR RR&STRM----- 1025.952  
No. 607 Sta. 4363+21.110 64.57 Rt. CUT"X"SE.COR.CONC.WING EB  
LANE I-80 BRG.OVR RR&STRM----- 1021.810  
No. 608 Sta. 4373+08.616 153.21 Rt. SET RR.SPK.NW.SIDE P.POLE  
STA. 1083+12 +/------ 1012.498  
No. 609 Sta. 4386+84.771 126.49 Lt. FD.CONC.MON. STA.95+21+/------ 1013.424  
No. 610 Sta. 4392+80.169 93.33 Rt. FD.IHC INLET HDWL.4X4 RCB  
STA. 101+20 +/------ 1010.341  
No. 611 Sta. 4402+97.319 17.06 Rt. FD.IHC NW.COR.CONC.WING  
E.B.LANE I-80BRG.OVR.RD.----- 1028.157  
No. 612 Sta. 4404+07.949 60.98 Lt. COT"X"NE.COR.CONC.WING  
W.B.LANE I-80 BRG.OVR.RD.----- 1028.964  
No. 613 Sta. 4405+67.300 129.40 Rt. FD.IHC INLET HDWL.6X6 RCB  
BM # 613 ELEV. 1013.71  
THIS SURVEY=  
BM # 101 ELEV. 1013.34  
FROM I-80-1(51)6--01-78  
1973 AB PLAN----- 1013.705  
No. 614 Sta. 4423+59.730 67.85 Rt. CUT"X"OUTLET 24" RCP  
STA. 132+00 +/------ 1021.342  
No. 615 Sta. 4434+44.039 61.04 Lt. FD.IHC SW.COR.WING W.B.  
I-80 BRG. OVER RD.----- 1027.569  
No. 616 Sta. 4437+31.302 60.71 Rt. CUT"X"NE.COR.WING E.B.  
I-80 BRG. OVER RD.----- 1028.474  
No. 617 Sta. 4452+62.621 111.78 Lt. CUT"X" CONC.SIGN BASE  
STA.161+15 +/- NW.SIDE RD----- 1059.930  
No. 618 Sta. 4460+69.629 100.48 Lt. CUT"X" CONC.SIGN BASE  
STA.169+14 +/- NW.SIDE RD----- 1086.069  
No. 619 Sta. 4470+92.202 100.81 Rt. CUT"X"CONC.SIGN BASE  
STA.179+45 +/- SE.SIDE RD----- 1116.865  
No. 620 Sta. 4482+50.239 145.95 Rt. CONC.MON.IN SE.FENCE LINE  
BM # 620 ELEV. 1144.34  
THIS SURVEY=  
BM # 117 ELEV. 1144.51  
FROM I-80-1(51)6--01-78  
1973 AB PLAN----- 1144.335  
No. 621 Sta. 4493+68.756 150.17 Rt. SET TWIN 60D NAILS IN WD.  
FENCE POST E.P.I STA.202+2----- 1141.883  
No. 622 Sta. 4513+88.256 65.08 Rt. CUT"X" NW.SIDE CONC.LUM  
BASE SE.SIDE E.B. LANE----- 1168.647  
No. 623 Sta. 4521+76.422 17.14 Lt. FD.IHC SE.COR.WING W.B.  
LANE BRG.OVER U.S.HWY. 6  
BM # 623 ELEV. 1182.60  
THIS SURVEY=  
BM # 124 ELEV. 1182.14  
FROM I-80-1(51)6--01-78  
1973 AB PLAN----- 1182.595  
No. 624 Sta. 4524+58.600 61.23 Rt. CUT"X"NE.COR.WING E.B.  
LANE BRG.OVER U.S.HWY. 6----- 1181.706  
No. 625 Sta. 4535+21.208 90.90 Lt. CUT"X" CONC.LUM.BASE NW.  
SIDE RD.STA. 243+52 +/------ 1160.175  
No. 626 Sta. 4546+94.518 135.69 Lt. SET RR.SPK.SE.SIDE P.POLE  
STA. 259+70 +/------ 1138.090



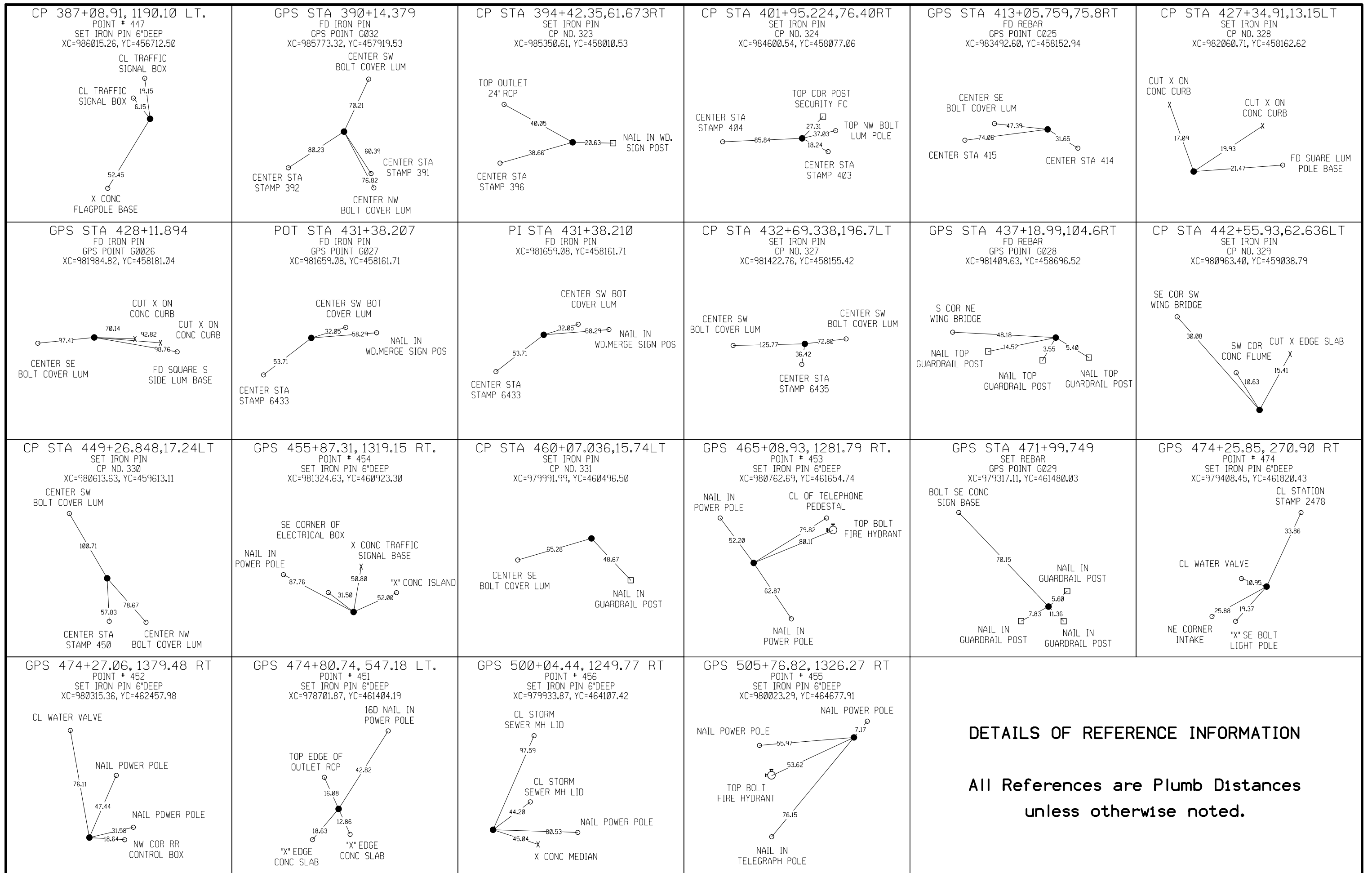
**DETAILS OF REFERENCE INFORMATION**

**All References are Plumb Distances unless otherwise noted.**



**DETAILS OF REFERENCE INFORMATION**

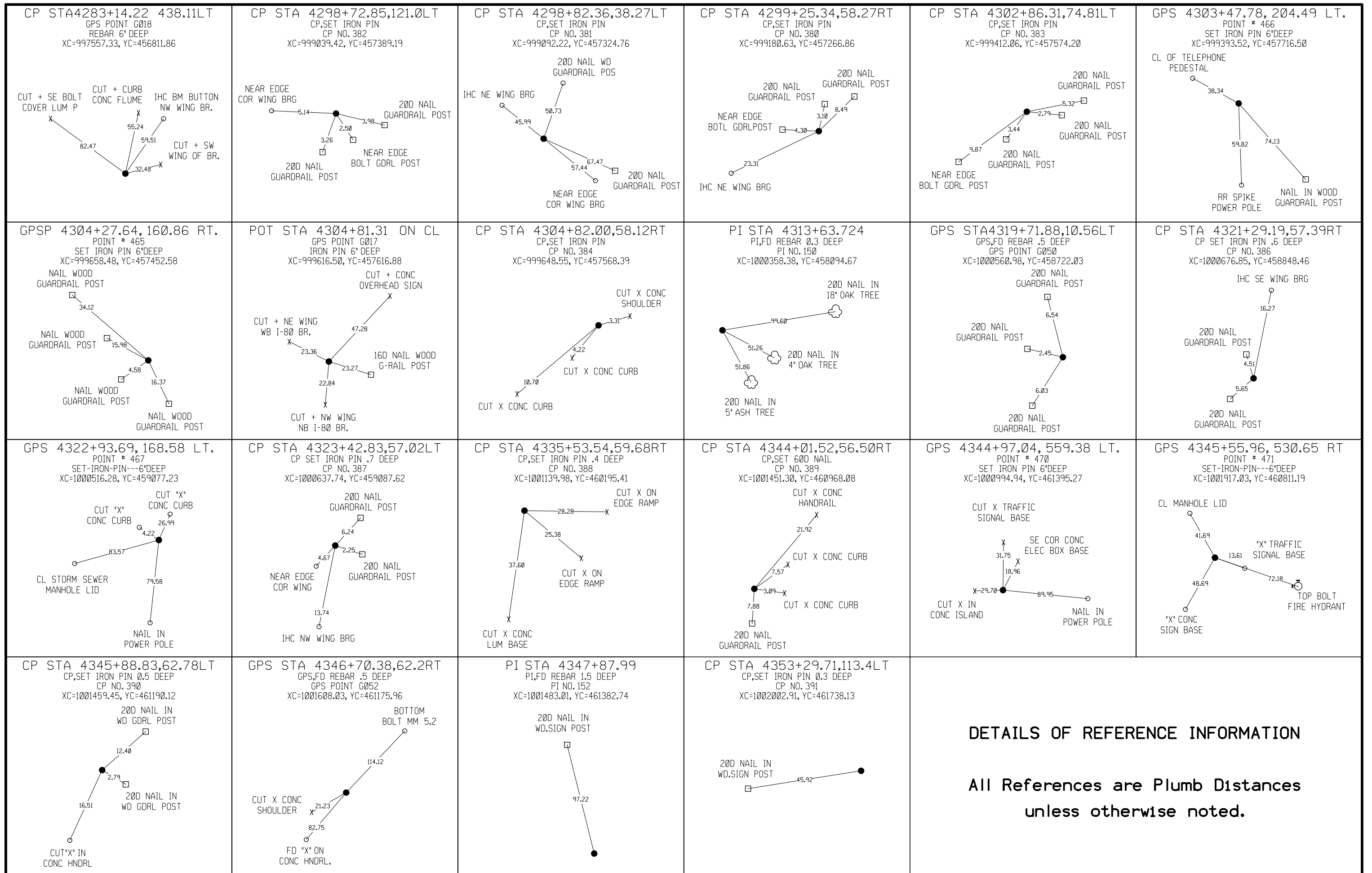
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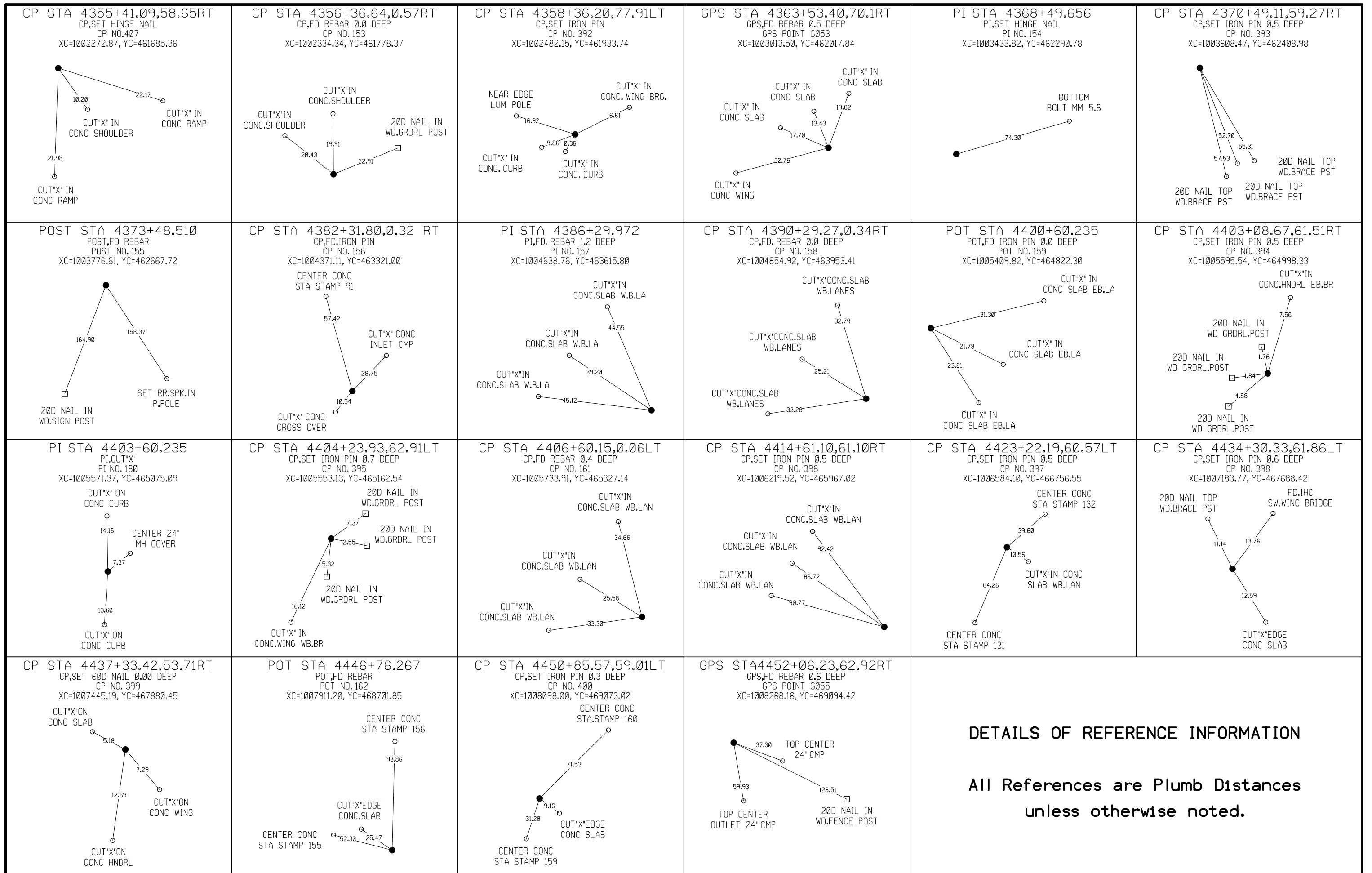
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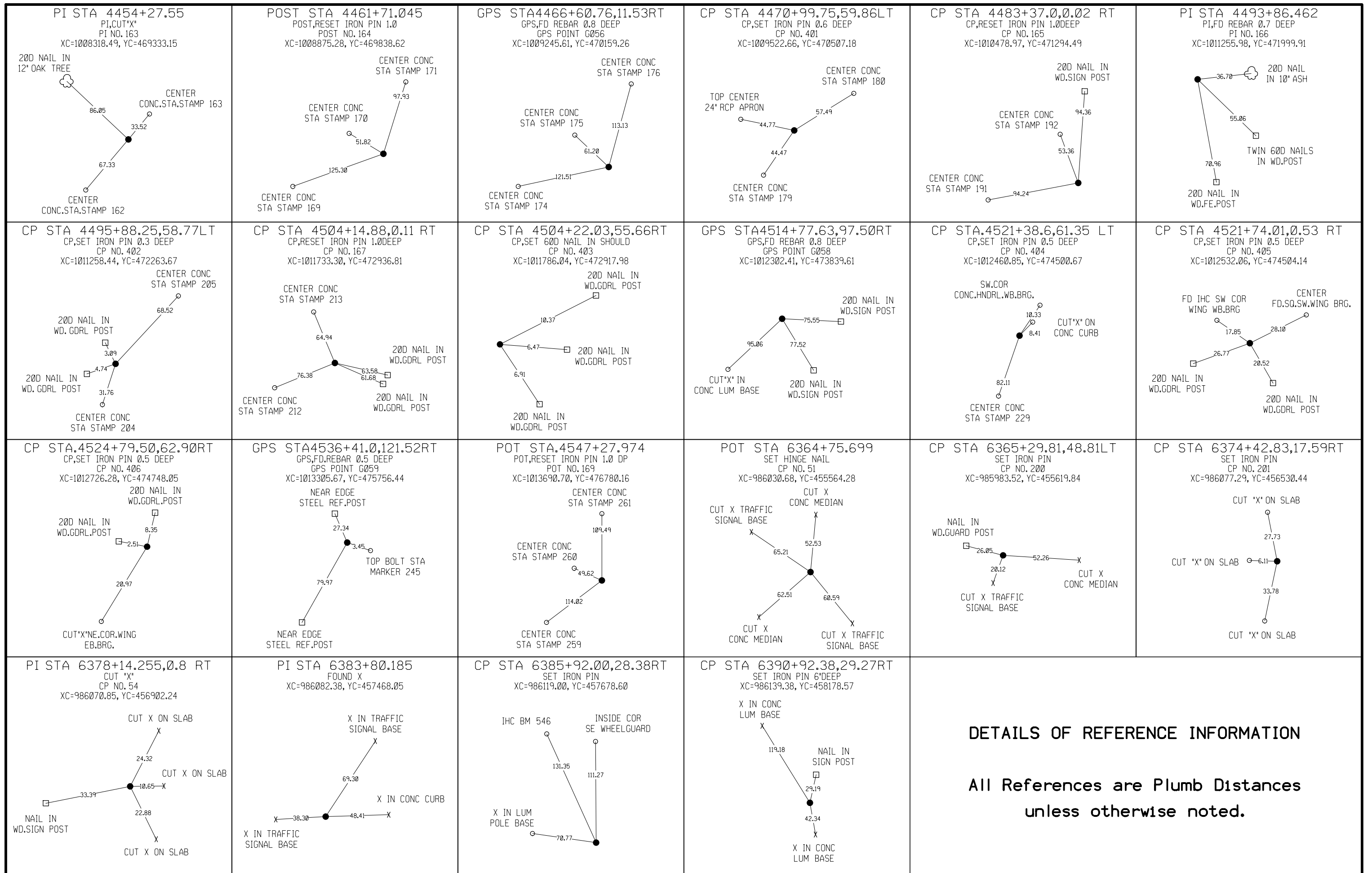
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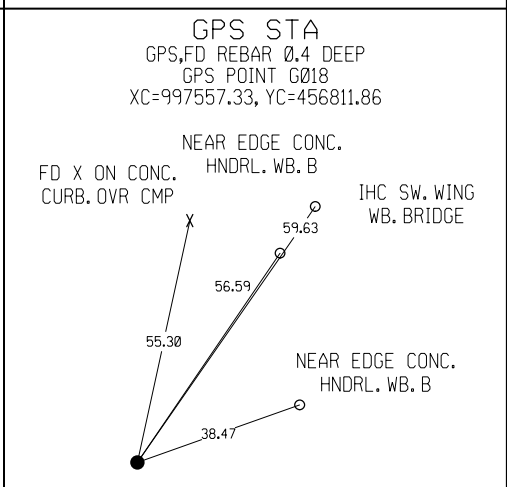
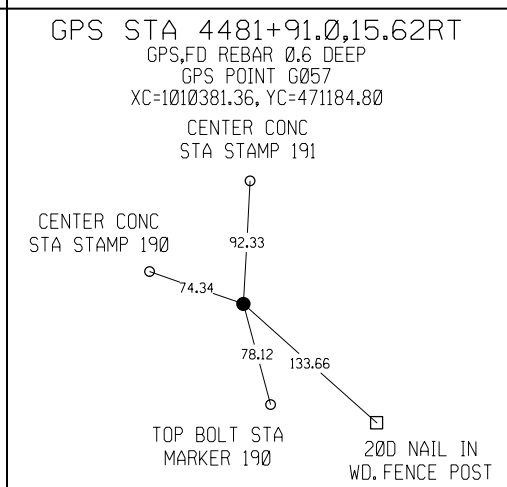
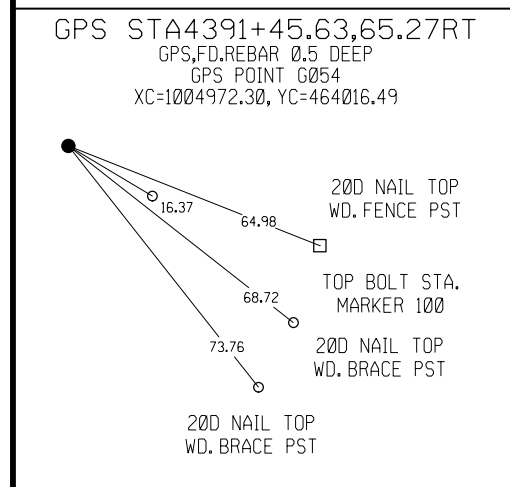
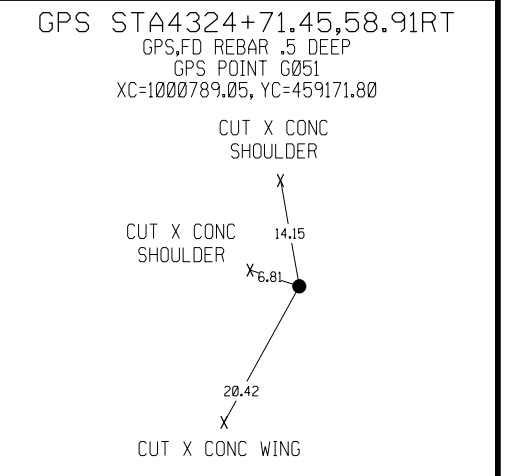
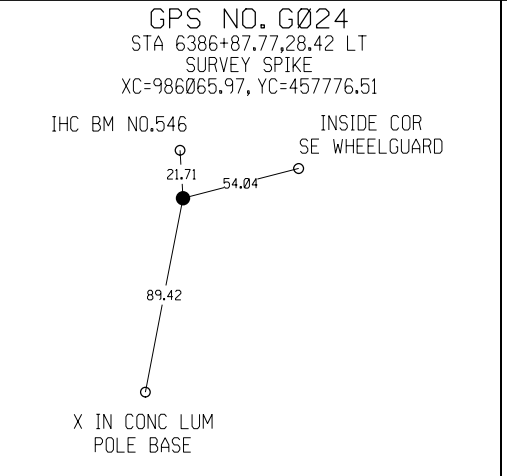
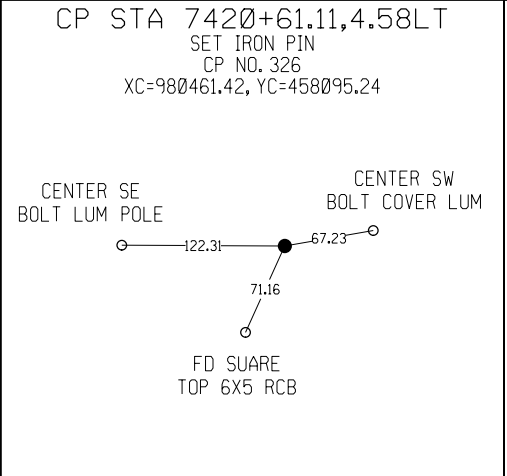
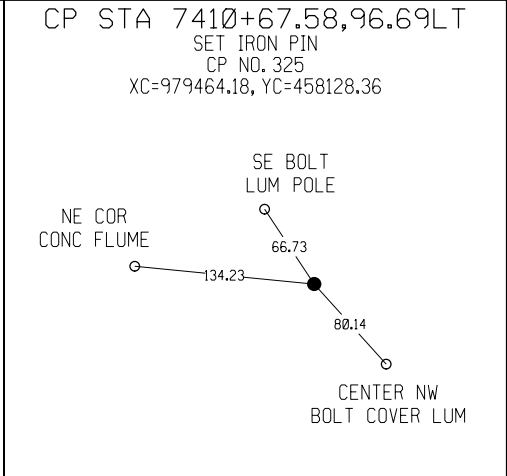
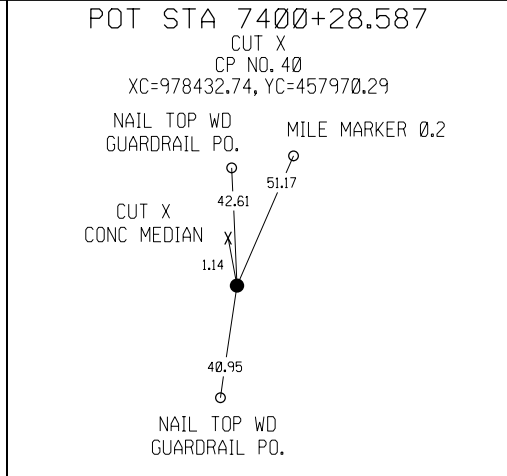
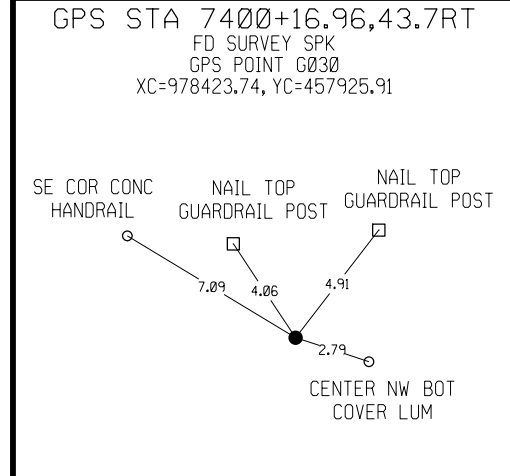
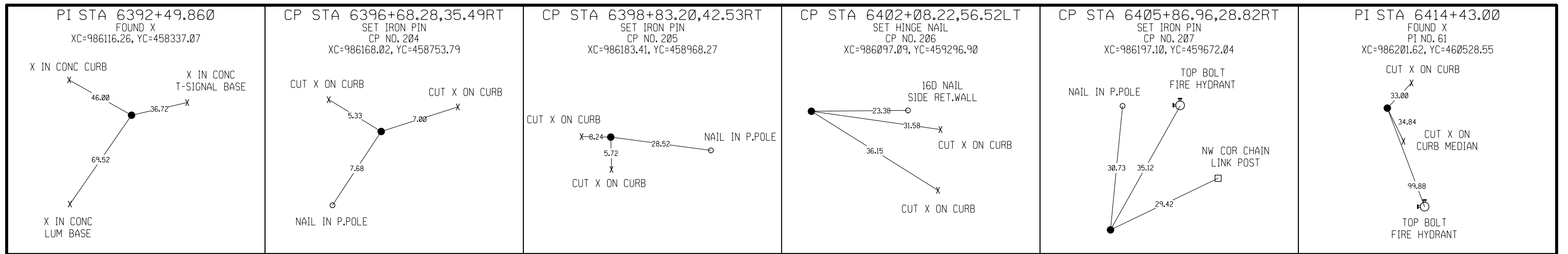
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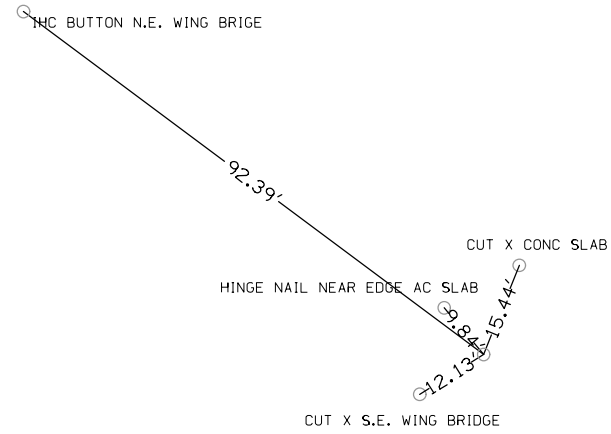
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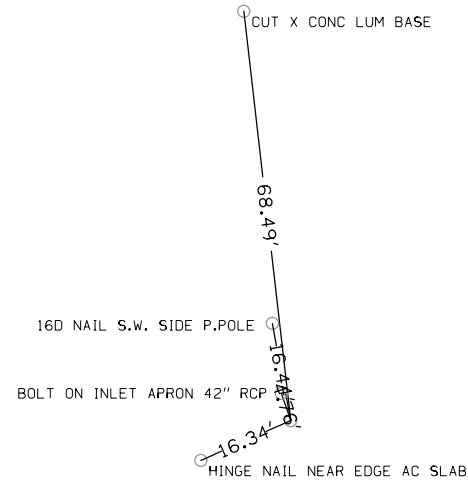
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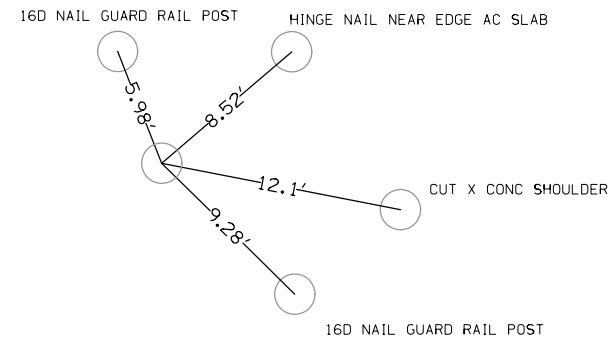
CP Off Chain  
 GPS 81, Found Rebar  
 N=454635.47, E=1000312.87



CP Sta.327+71.90, 112.28 Rt.  
 GPS 82, Found Rebar  
 N=455417.79, E=1001221.03

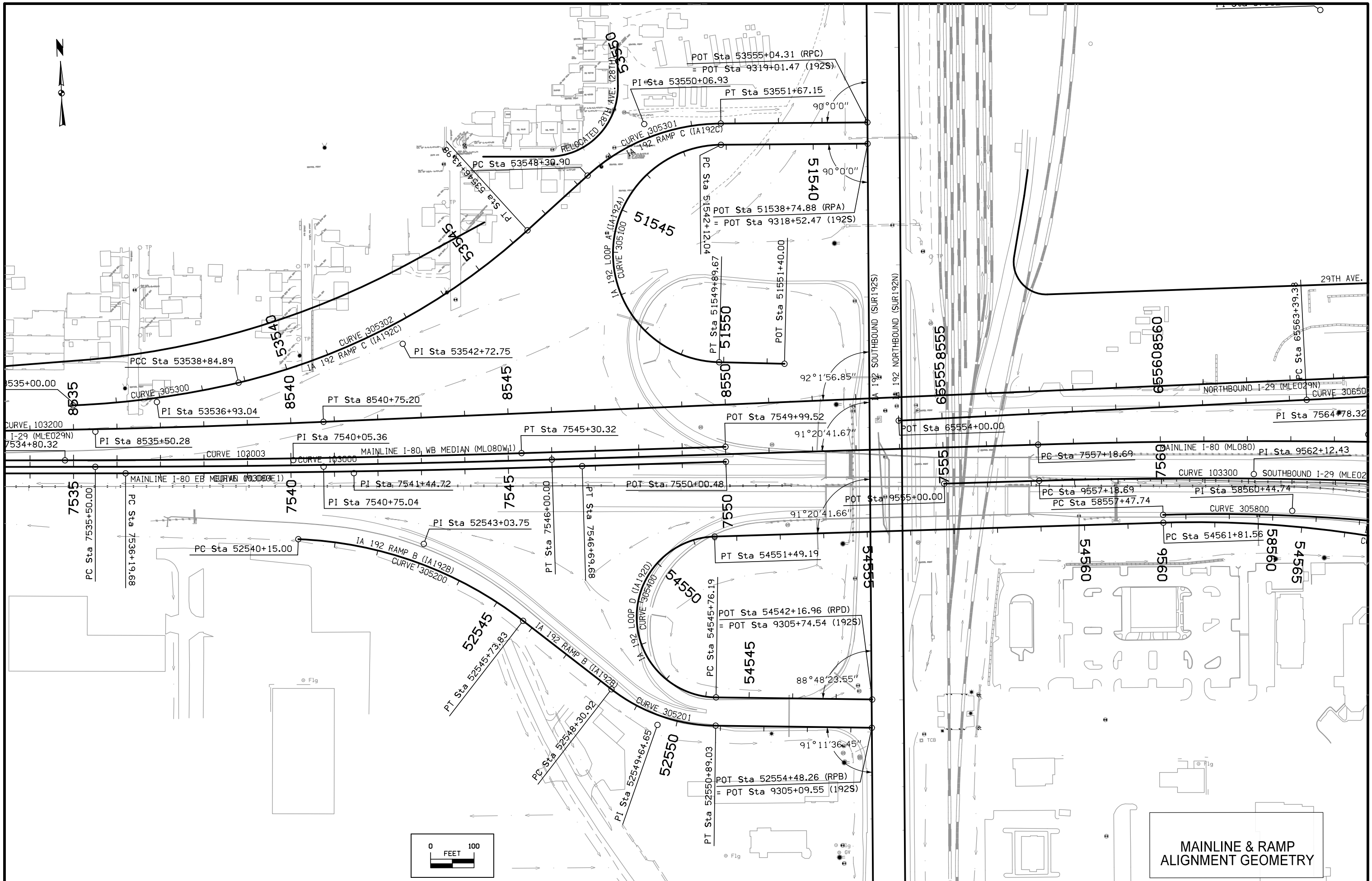


CP 327+36.62, 1055.15 Lt.  
 GPS 83, Found Rebar  
 N=456302.10, E=1000457.86

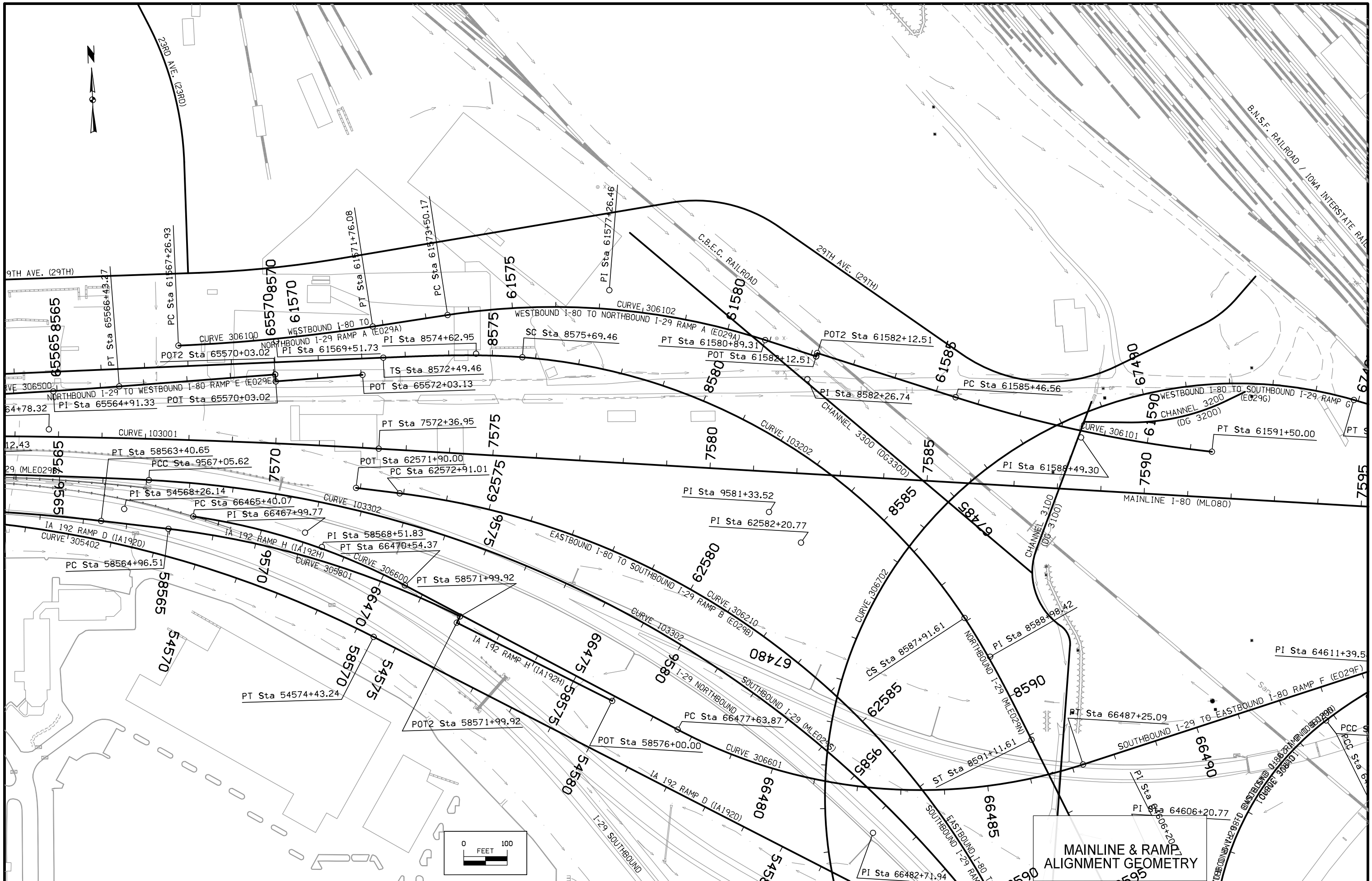


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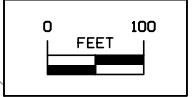
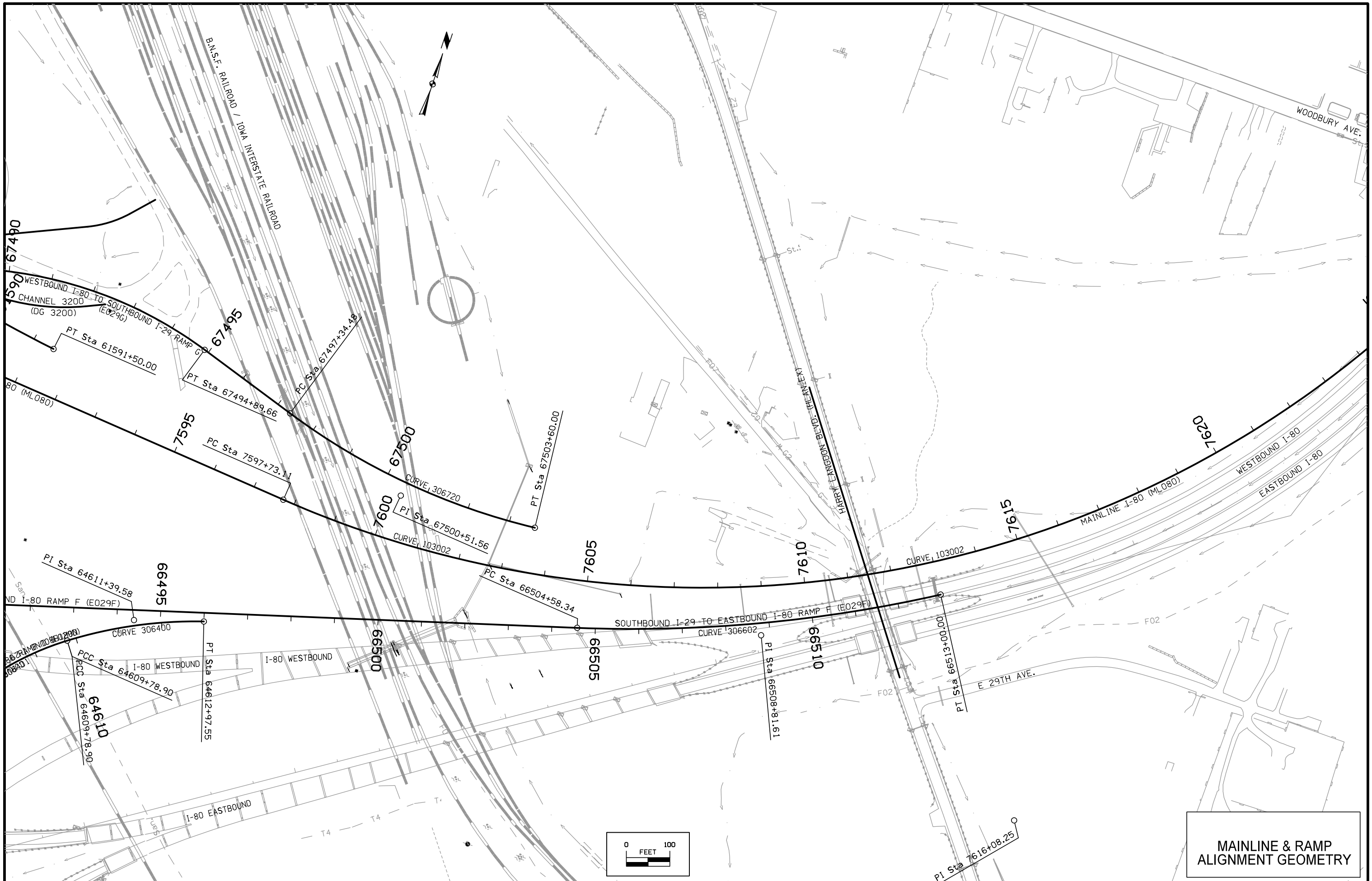
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 unless otherwise noted.



MAINLINE & RAMP  
 ALIGNMENT GEOMETRY

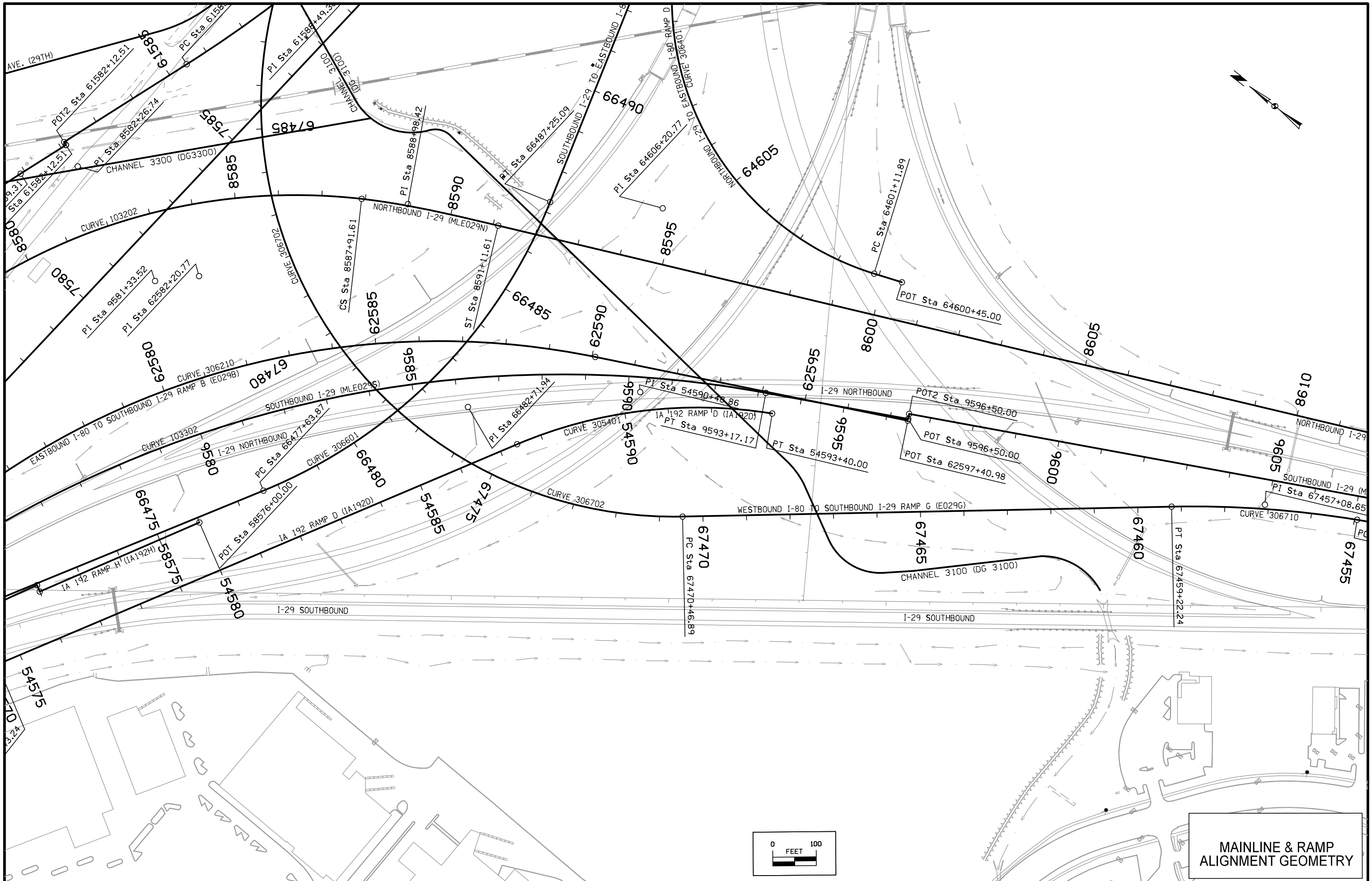


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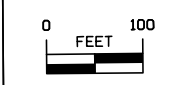


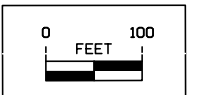
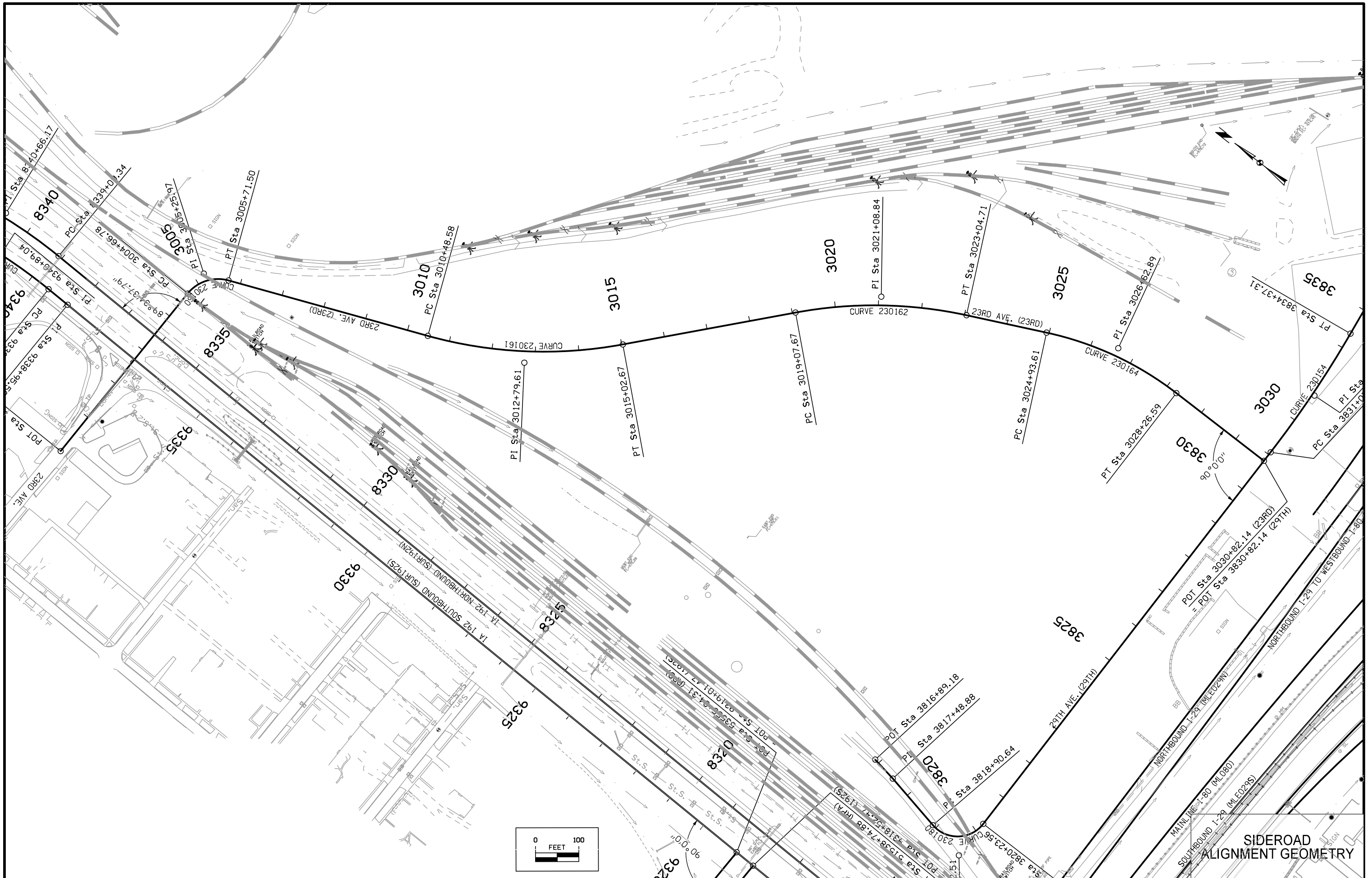
**MAINLINE & RAMP  
ALIGNMENT GEOMETRY**



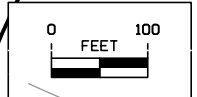
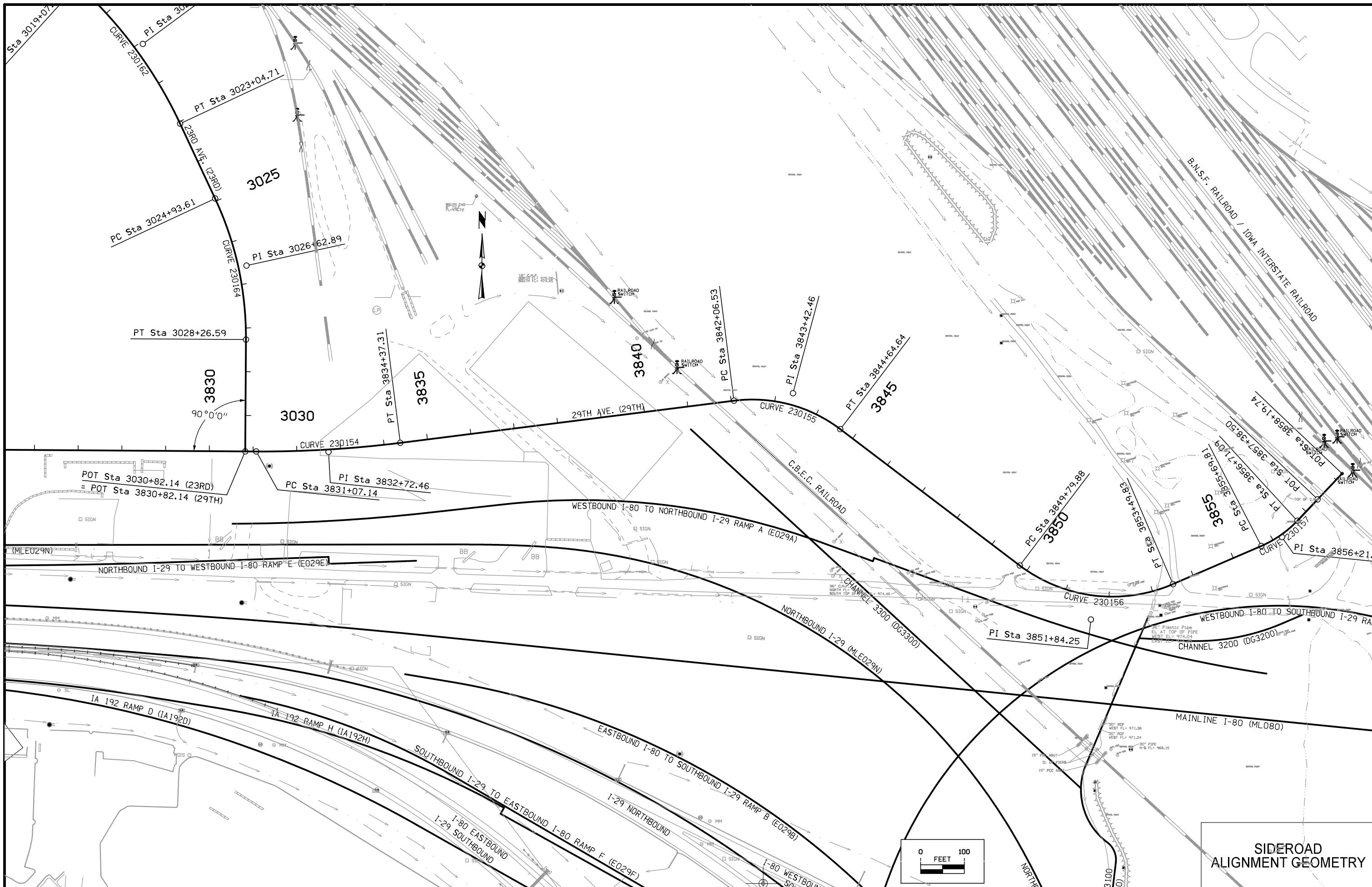


**MAINLINE & RAMP  
ALIGNMENT GEOMETRY**





SIDEROAD  
ALIGNMENT GEOMETRY



**SIDEROAD  
ALIGNMENT GEOMETRY**



ALIGNMENT COORDINATES

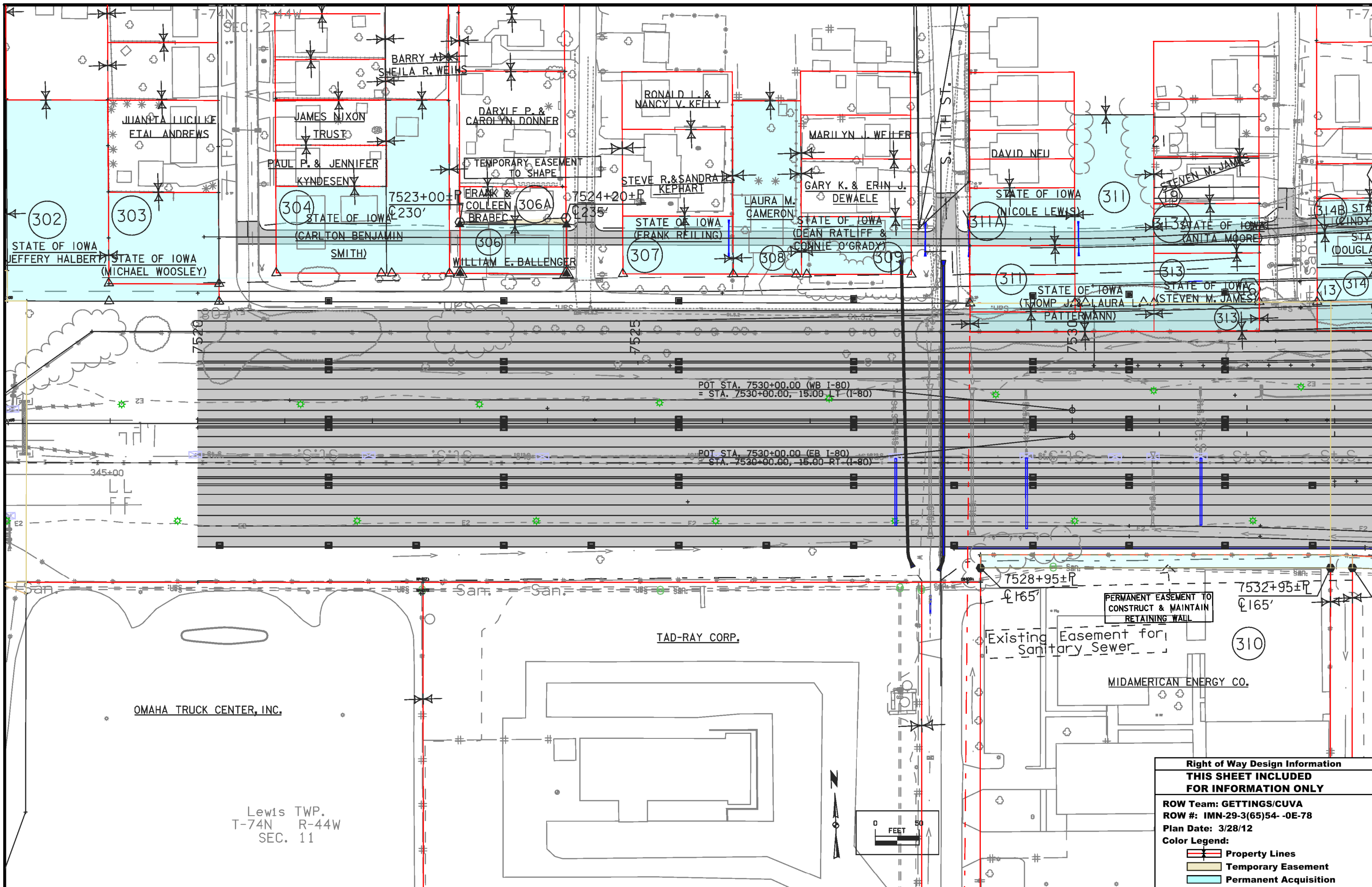
101-16  
10-20-09

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)
Detour 301300																			
930130000		31300+50.00	457,870.53	995,841.80															
930130000							31300+50.00	457,870.53	995,841.80	31306+72.66	457,845.94	996,463.97	31311+20.04	457,242.61	996,617.91				
930130005							31313+81.28	456,989.48	996,682.49	31315+58.55	456,817.71	996,726.32	31317+31.34	456,675.40	996,832.01				
930130010							31317+31.34	456,675.40	996,832.01	31319+62.70	456,489.65	996,969.95	31321+94.02	456,299.45	997,101.67				
930130004		31321+94.02	456,299.45	997,101.67															
29th Ave Detour																			
230190		13817+79.76	457,781.31	994,141.33															
230192							13818+52.31	457,853.84	994,142.97	13818+79.22	457,880.75	994,143.58	13819+04.89	457,903.71	994,157.60				
230193							13819+22.67	457,918.89	994,166.87	13819+50.78	457,942.88	994,181.53	13819+77.48	457,970.99	994,181.53				
230194		13820+65.00	458,058.51	994,181.55															
Channel 3100																			
DG3100-1							73100+90.78	455,310.15	997,286.09	73101+82.31	455,394.02	997,322.77	73102+55.15	455,464.99	997,264.96				
73190		73105+50.06	455,675.65	997,058.58															
DG3100-2							73106+18.92	455,727.20	997,012.93	73107+09.23	455,794.82	996,953.06	73107+76.78	455,874.52	996,995.54				
DG3100-3							73109+17.38	455,998.60	997,061.66	73109+51.41	456,029.52	997,075.87	73109+84.80	456,063.40	997,079.05				
73191		73110+45.79	456,124.13	997,084.75															
73192		73120+48.46	457,120.85	997,193.90															
DG3100-4							73120+58.29	457,130.60	997,195.07	73120+87.39	457,159.49	997,198.54	73121+11.00	457,176.78	997,175.13				
DG3100-5							73121+11.00	457,176.78	997,175.13	73122+31.94	457,248.63	997,077.84	73123+14.57	457,358.94	997,127.42				
73193		73126+72.15	457,689.31	997,264.25															
Channel 3200																			
73200		73200+00.00	457,643.68	997,245.35															
DG3200-1							73201+02.71	457,638.75	997,347.94	73202+21.64	457,633.05	997,466.73	73203+36.30	457,680.95	997,575.58				
73201		73203+82.17	457,699.42	997,617.56															
Channel 3300																			
73300		73300+00.00	458,114.94	996,217.12															
73303		73312+11.93	457,300.12	997,114.26															
Channel 3400																			
73400		0+00.00	457,426.06	998,923.34															
DG3400-1							0+24.97	457,437.36	998,945.62	0+42.83	457,445.44	998,961.54	0+57.19	457,463.29	998,962.03				
DG3400-2							1+66.60	457,572.66	998,965.04	1+87.10	457,593.15	998,965.61	2+02.57	457,600.07	998,984.90				
73401		5+70.66	457,724.33	999,331.39															

**SPIRAL OR CIRCULAR CURVE DATA**

101-17  
04-19-11

Name	Location	Δ <sub>scs</sub>	Horizontal Alignment Data								Remarks				
			Spiral Data				Curve Data								
			θs	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	Δ <sub>c</sub>	T	L	R	E
C102002	ML 080										7° 20' 38.90" RT	1,476.08'	2,948.13'	23,000.00'	47.32'
C102005	ML 080										1° 57' 57.90" LT	343.18'	686.29'	20,000.00'	2.94'
103000	ML 080										1° 43' 07.94" LT	525.04'	1,050.00'	35,000.00'	3.94'
103001	ML 080										5° 07' 01.40" RT	759.64'	1,518.26'	17,000.00'	16.96'
103002	ML 080										74° 48' 21.33" LT	1,835.14'	3,133.46'	2,400.00'	621.21'
103042	ML 080										43° 57' 46.65" RT	928.40'	1,764.79'	2,300.00'	180.31'
103043	ML 080										27° 35' 08.88" LT	846.95'	1,661.05'	3,450.00'	102.44'
103044	ML 080										4° 22' 12.00" LT	858.46'	1,716.09'	22,500.00'	16.37'
MLE029N_BGC-1	ML 29N										2° 24' 23.12" LT	525.08'	1,050.00'	25,000.00'	5.51'
MLE029N_BGC-2	ML 29N	65° 56' 21.09" RT	6° 50' 27.09"	320.00'	TS	106.81'	319.54'	12.72'	213.48'	106.81'	52° 15' 25.36" RT	657.29'	1,222.16'	1,340.00'	152.52'
MLE029N_BGC-3	ML 29N										12° 30' 49.15" LT	493.37'	982.82'	4,500.00'	26.97'
230160	23rd Ave										66° 39' 40.90" RT	59.19'	104.71'	90.00'	17.72'
230161											26° 01' 02.25" LT	231.03'	454.09'	1,000.00'	26.34'
230162											22° 44' 56.13" RT	201.17'	397.04'	1,000.00'	20.03'
230164											25° 26' 14.84" RT	169.28'	332.98'	750.00'	18.87'
230180	29th Ave										101° 32' 45.79" LT	91.87'	132.92'	75.00'	43.60'
230154											7° 34' 00.86" LT	165.32'	330.17'	2,500.00'	5.46'
230155											44° 24' 42.67" RT	135.93'	258.12'	333.00'	26.68'
230156											60° 33' 41.80" LT	204.37'	369.95'	350.00'	55.30'
230157											23° 12' 40.69" LT	51.34'	101.28'	250.00'	5.22'
305100	IA 192 Loop A										178° 13' 06.18" LT	16,078.41'	777.62'	250.00'	15,830.36'
306100	I 29 Ramp A										6° 16' 35.99" LT	224.80'	449.15'	4,100.00'	6.16'
306102											26° 28' 06.57" RT	376.29'	739.14'	1,600.00'	43.65'
306101											11° 31' 29.34" LT	302.74'	603.44'	3,000.00'	15.24'
306210	I 29 Ramp B										54° 38' 08.16" RT	929.76'	1,716.43'	1,800.00'	225.94'
306500	I 29 Ramp E										1° 27' 03.38" LT	151.95'	303.88'	12,000.00'	0.96'
306710	I 29 Ramp G										10° 26' 37.58" LT	214.77'	428.35'	2,350.00'	9.79'
306702											147° 19' 35.72" RT	3,241.04'	2,442.77'	950.00'	2,427.40'
306720											23° 07' 20.45" LT	317.07'	625.52'	1,550.00'	32.10'
930130000	Detour 301300										73° 25' 24.43" RT	622.66'	1,070.04'	835.00'	206.60'
930130005											22° 17' 06.57" LT	177.27'	350.05'	900.00'	17.29'
930130010											1° 53' 36.81" RT	231.36'	462.68'	14,000.00'	1.91'
230192	29th Ave Detour										30° 07' 16.40" RT	26.91'	52.57'	100.00'	3.56'
230193											31° 24' 12.32" LT	28.11'	54.81'	100.00'	3.88'
230180											101° 32' 45.79" LT	91.87'	132.92'	75.00'	43.60'
230154											7° 34' 00.86" LT	165.32'	330.17'	2,500.00'	5.46'
230155											44° 24' 42.67" RT	135.93'	258.12'	333.00'	26.68'
230156											60° 33' 41.80" LT	204.37'	369.95'	350.00'	55.30'
230157											23° 12' 40.69" LT	51.34'	101.28'	250.00'	5.22'



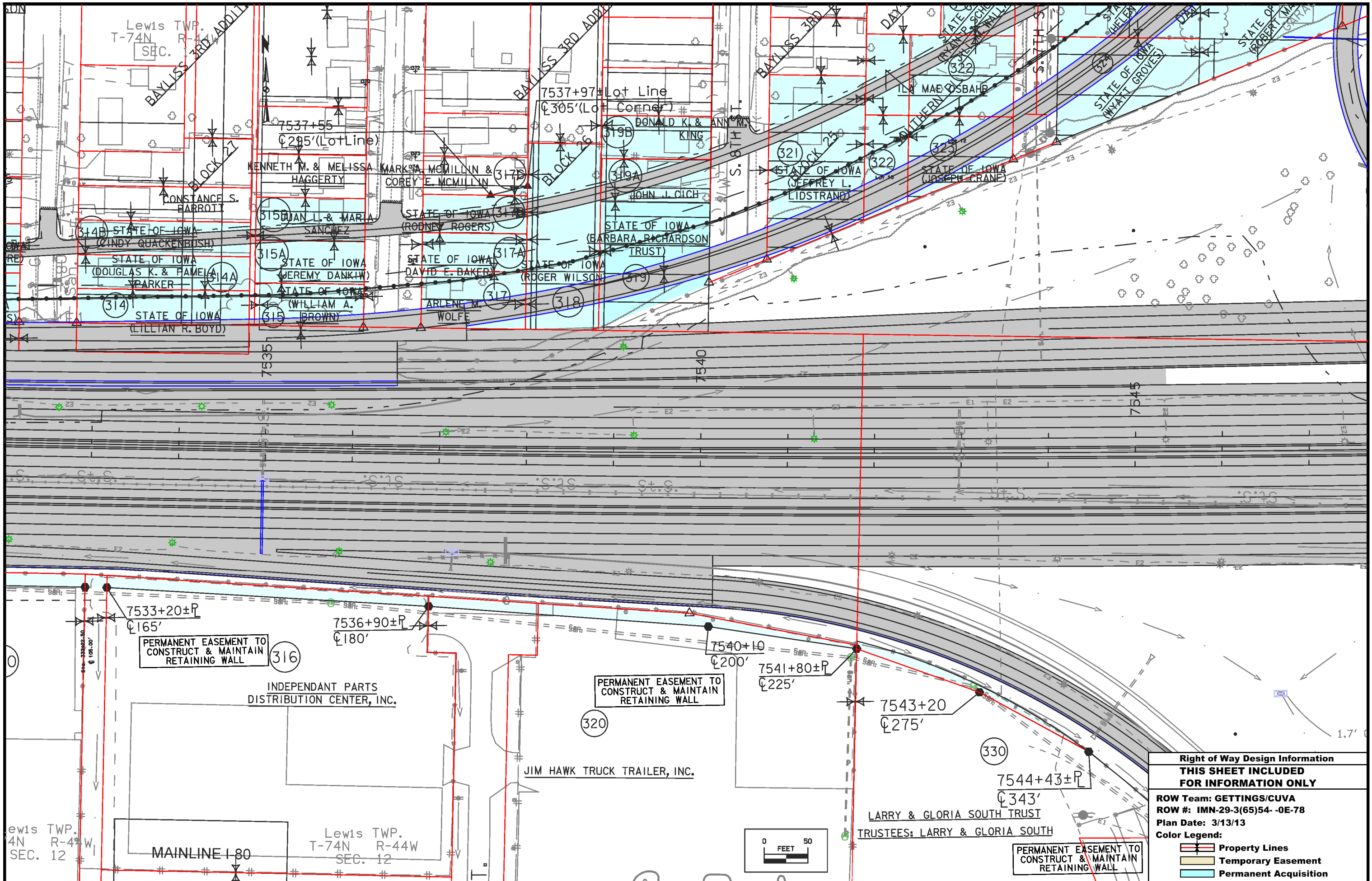
OMAHA TRUCK CENTER, INC.

Lewis TWP.  
T-74N R-44W  
SEC. 11

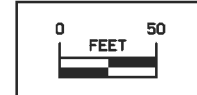
TAD-RAY CORP.

MIDAMERICAN ENERGY CO.

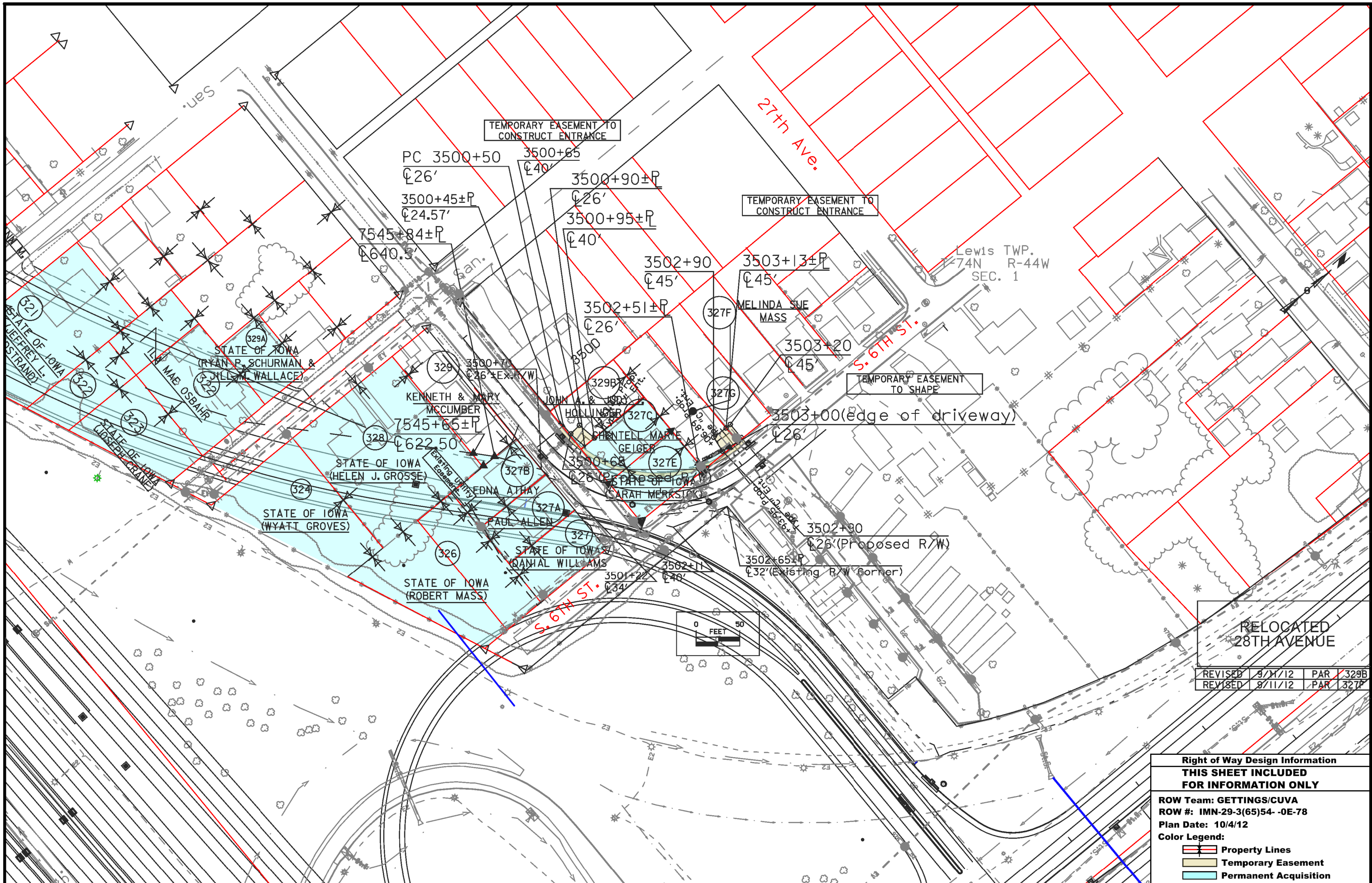
Right of Way Design Information	
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>	
ROW Team: GETTINGS/CUVA	
ROW #: IMN-29-3(65)54--0E-78	
Plan Date: 3/28/12	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



<b>Right of Way Design Information</b>	
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>	
ROW Team: GETTINGS/CUVA	
ROW #: IMN-29-3(65)54--0E-78	
Plan Date: 3/13/13	
Color Legend:	
<span style="color: red;">—</span>	Property Lines
<span style="background-color: yellow;">—</span>	Temporary Easement
<span style="background-color: lightblue;">—</span>	Permanent Acquisition







TEMPORARY EASEMENT TO  
CONSTRUCT ENTRANCE

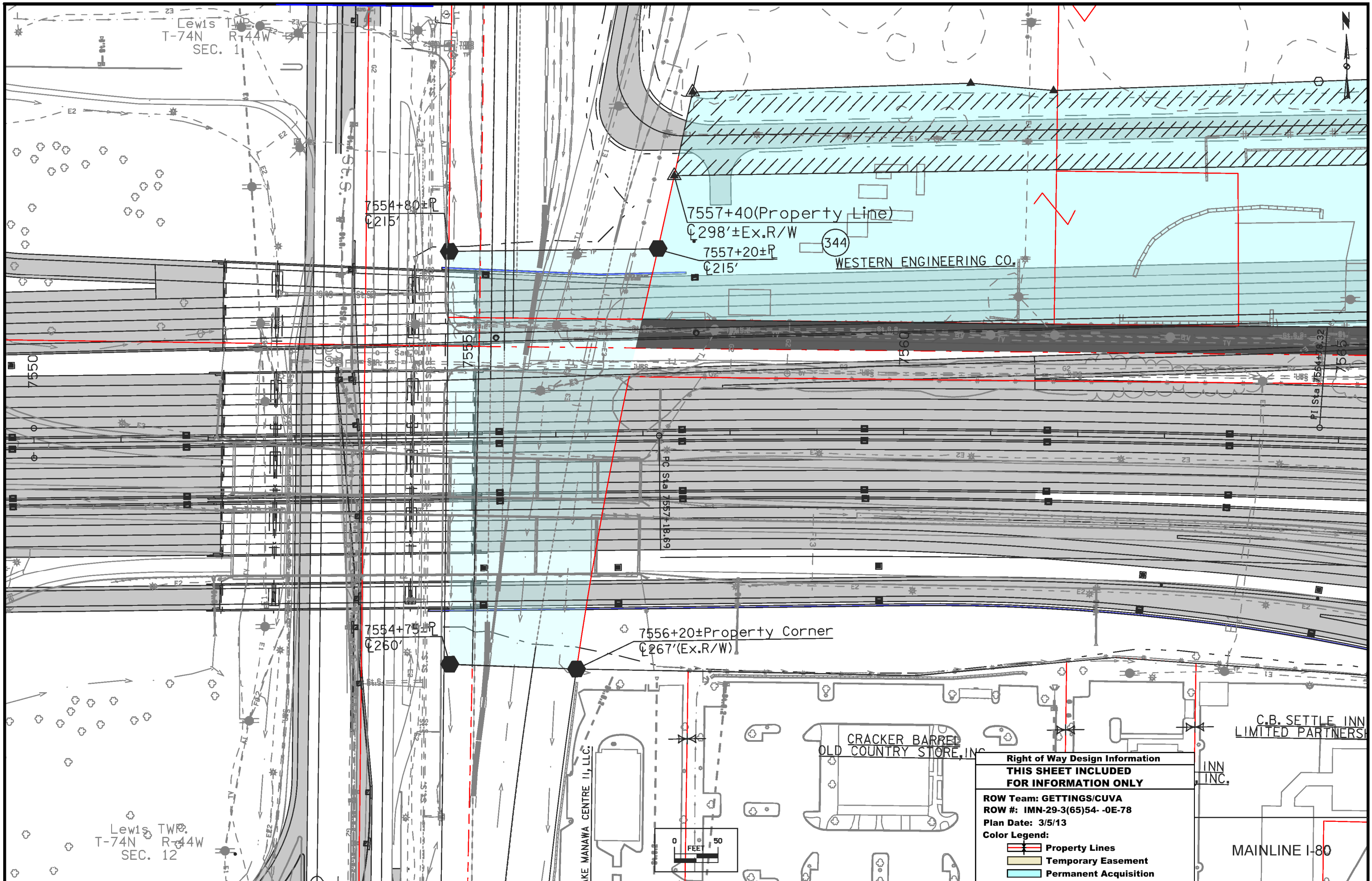
TEMPORARY EASEMENT TO  
CONSTRUCT ENTRANCE

TEMPORARY EASEMENT  
TO SHAPE

RELOCATED  
28TH AVENUE

REVISED	9/11/12	PAR	329B
REVISED	9/11/12	PAR	327F

<b>Right of Way Design Information</b>	
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>	
ROW Team: GETTINGS/CUVA	
ROW #: IMN-29-3(65)54--0E-78	
Plan Date: 10/4/12	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



Lewis TWP.  
T-74N R-44W  
SEC. 1

Lewis TWP.  
T-74N R-44W  
SEC. 12

7554+80±P  
C215'

7557+40(Property Line)  
C298'±Ex.R/W  
7557+20±P  
C215'

344  
WESTERN ENGINEERING CO.

7554+75±P  
C260'

7556+20±Property Corner  
C267'(Ex.R/W)



Right of Way Design Information  
**THIS SHEET INCLUDED  
FOR INFORMATION ONLY**

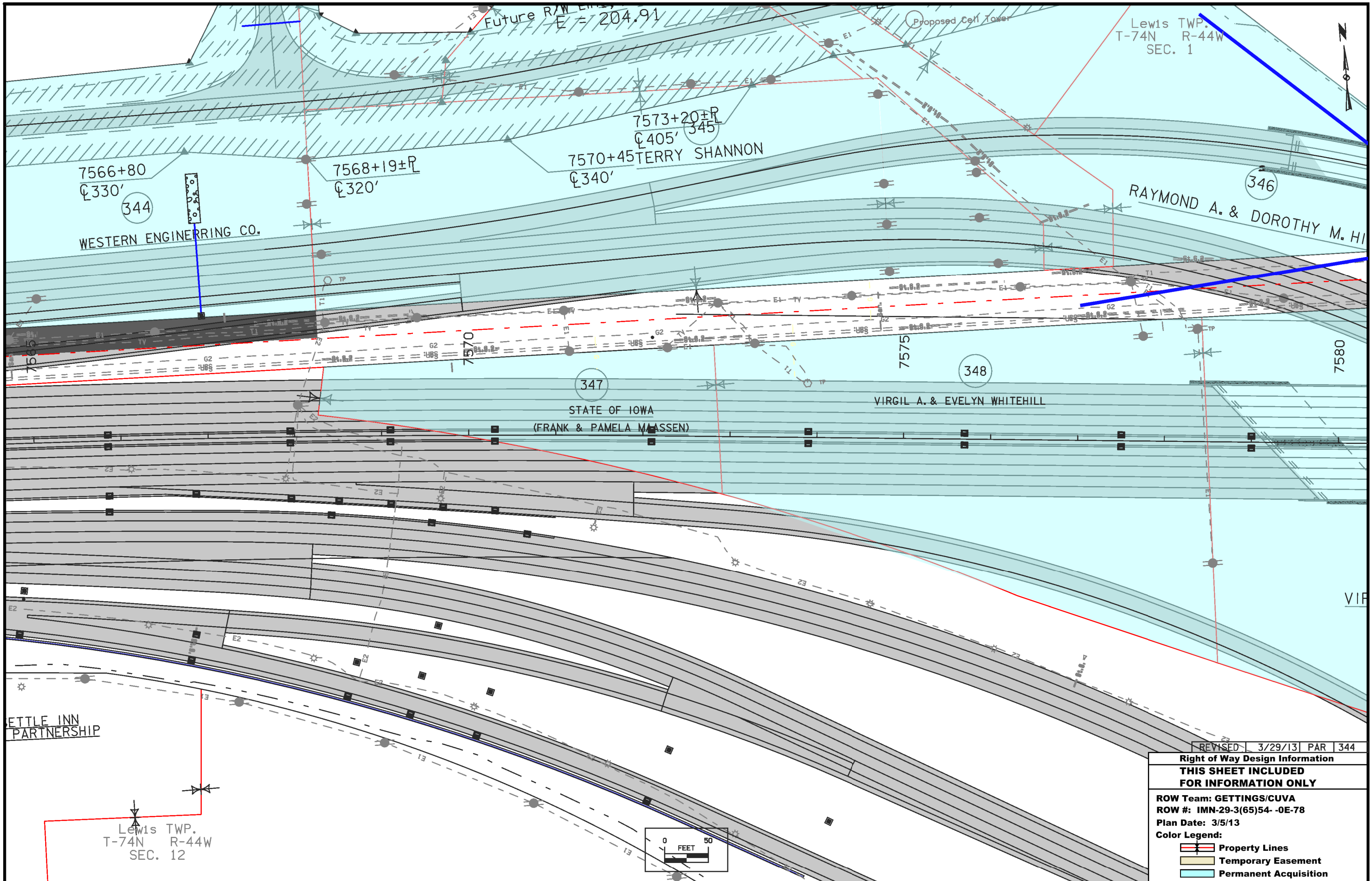
ROW Team: GETTINGS/CUVA  
ROW #: IMN-29-3(65)54--0E-78  
Plan Date: 3/5/13

Color Legend:  
 Property Lines  
 Temporary Easement  
 Permanent Acquisition

INN INC.

C.B. SETTLE INN  
LIMITED PARTNERS

MAINLINE I-80

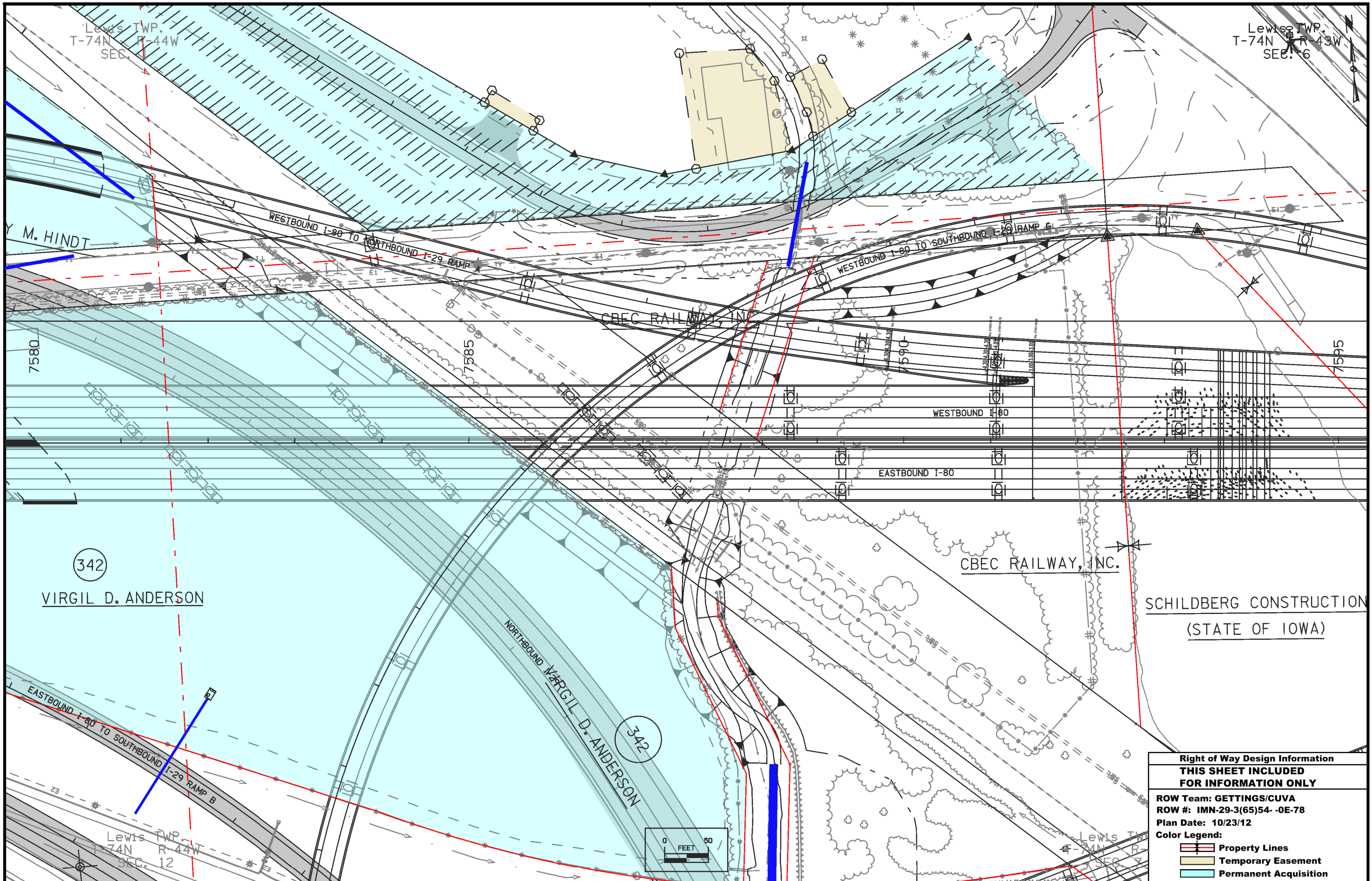


REVISED 3/29/13 PAR 344

**Right of Way Design Information**  
**THIS SHEET INCLUDED**  
**FOR INFORMATION ONLY**

ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54- -0E-78  
 Plan Date: 3/5/13  
 Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition



Lewis TWP.  
T-74N R-44W  
SEC. 11

Lewis TWP.  
T-74N R-43W  
SEC. 6

M. HINDT

7580

7585

7590

7595

342

VIRGIL D. ANDERSON

342

NORTHBOUND VIRGIL D. ANDERSON

EASTBOUND I-80 TO SOUTHBOUND I-29 RAMP B

WESTBOUND I-80 TO NORTHBOUND I-29 RAMP A

WESTBOUND I-80 TO SOUTHBOUND I-29 RAMP C

CBEC RAILWAY, INC.

WESTBOUND I-80

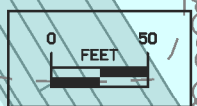
EASTBOUND I-80

CBEC RAILWAY, INC.

SCHILDBERG CONSTRUCTION  
(STATE OF IOWA)

Lewis TWP.  
T-74N R-44W  
SEC. 12

Lewis TWP.  
T-74N R-43W  
SEC. 6

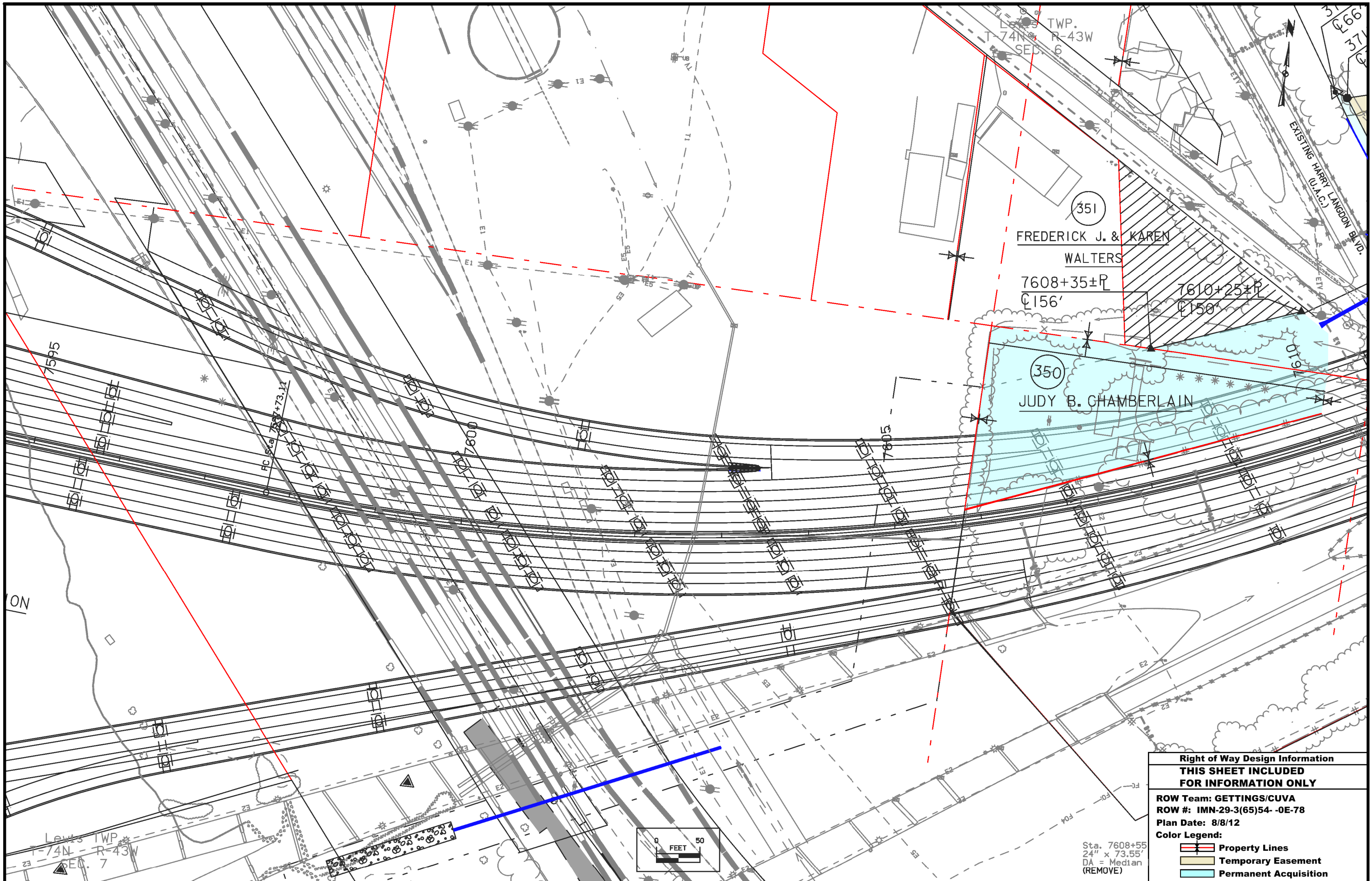


**Right of Way Design Information**  
**THIS SHEET INCLUDED FOR INFORMATION ONLY**

ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54--0E-78  
 Plan Date: 10/23/12

**Color Legend:**

- Property Lines
- Temporary Easement
- Permanent Acquisition



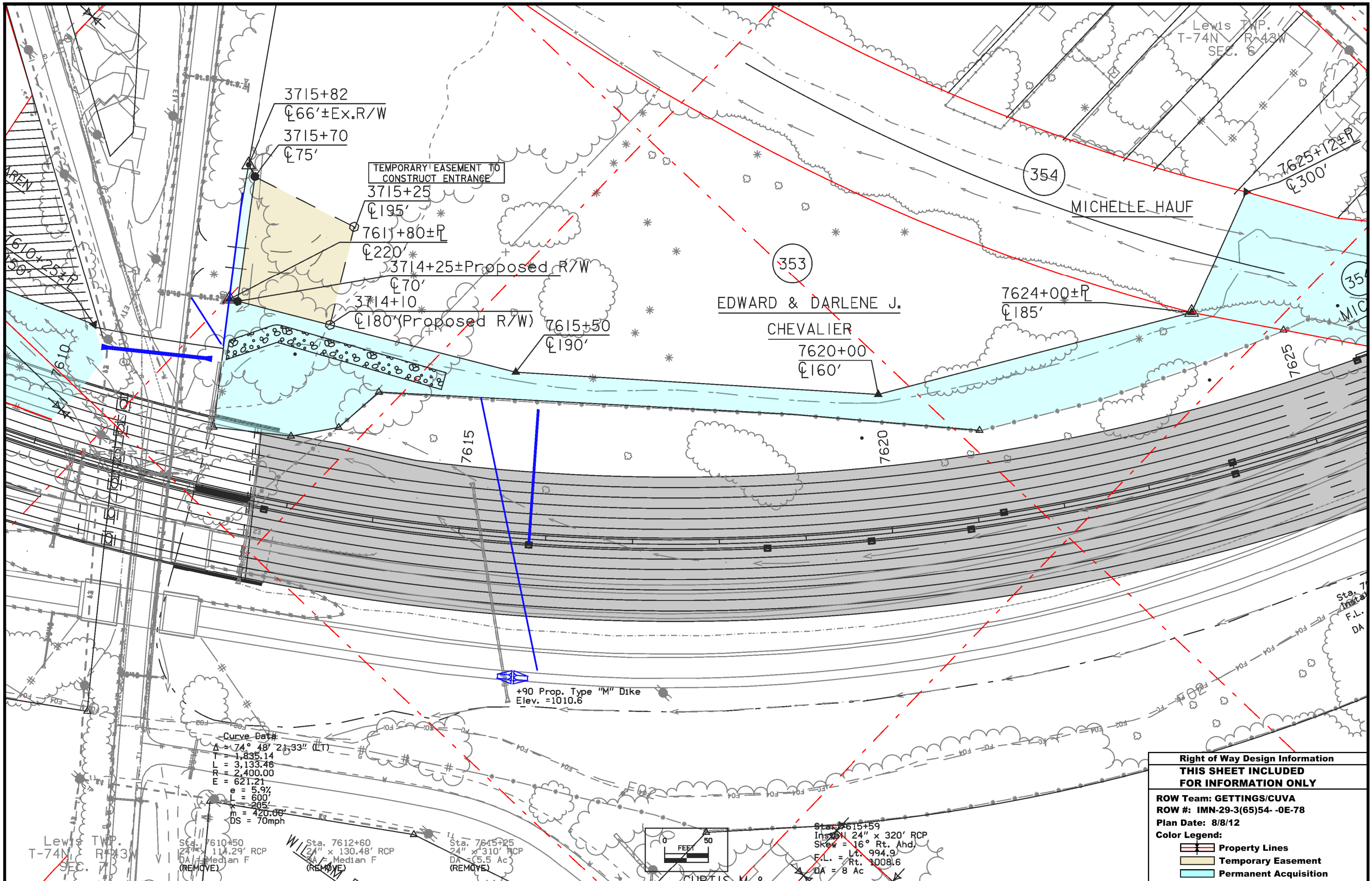
(351)  
 FREDERICK J. & KAREN  
 WALTERS  
 7608+35±R  
 156'

(350)  
 JUDY B. CHAMBERLAIN  
 7610+25±R  
 150'

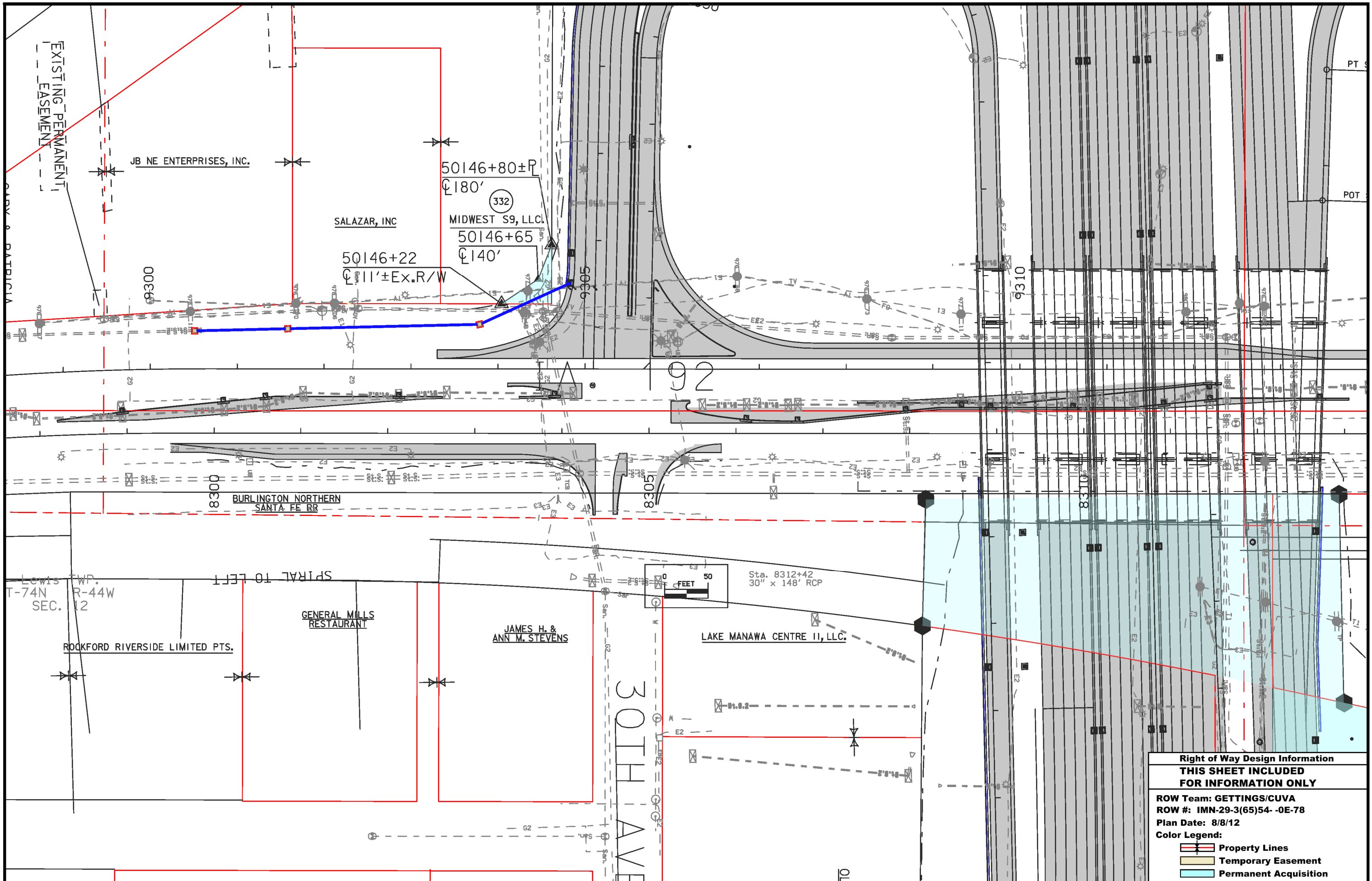
<b>Right of Way Design Information</b>	
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>	
ROW Team: GETTINGS/CUVA	
ROW #: IMN-29-3(65)54--0E-78	
Plan Date: 8/8/12	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

Sta. 7608+55  
 24" x 73.55'  
 DA = Median  
 (REMOVE)





<b>Right of Way Design Information</b>	
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ROW Team: GETTINGS/CUVA	
ROW #: IMN-29-3(65)54--0E-78	
Plan Date: 8/8/12	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



EXISTING PERMANENT EASEMENT

JB NE ENTERPRISES, INC.

SALAZAR, INC

50146+80±P  
 180'

332  
 MIDWEST S9, LLC

50146+65  
 140'

50146+22  
 111'±Ex.R/W

BURLINGTON NORTHERN  
 SANTA FE BR

Lewis TWP.  
 T-74N R-44W  
 SEC. 12

GENERAL MILLS  
 RESTAURANT

ROCKFORD RIVERSIDE LIMITED PTS.

JAMES H. &  
 ANN M. STEVENS

LAKE MANAWA CENTRE II, LLC.

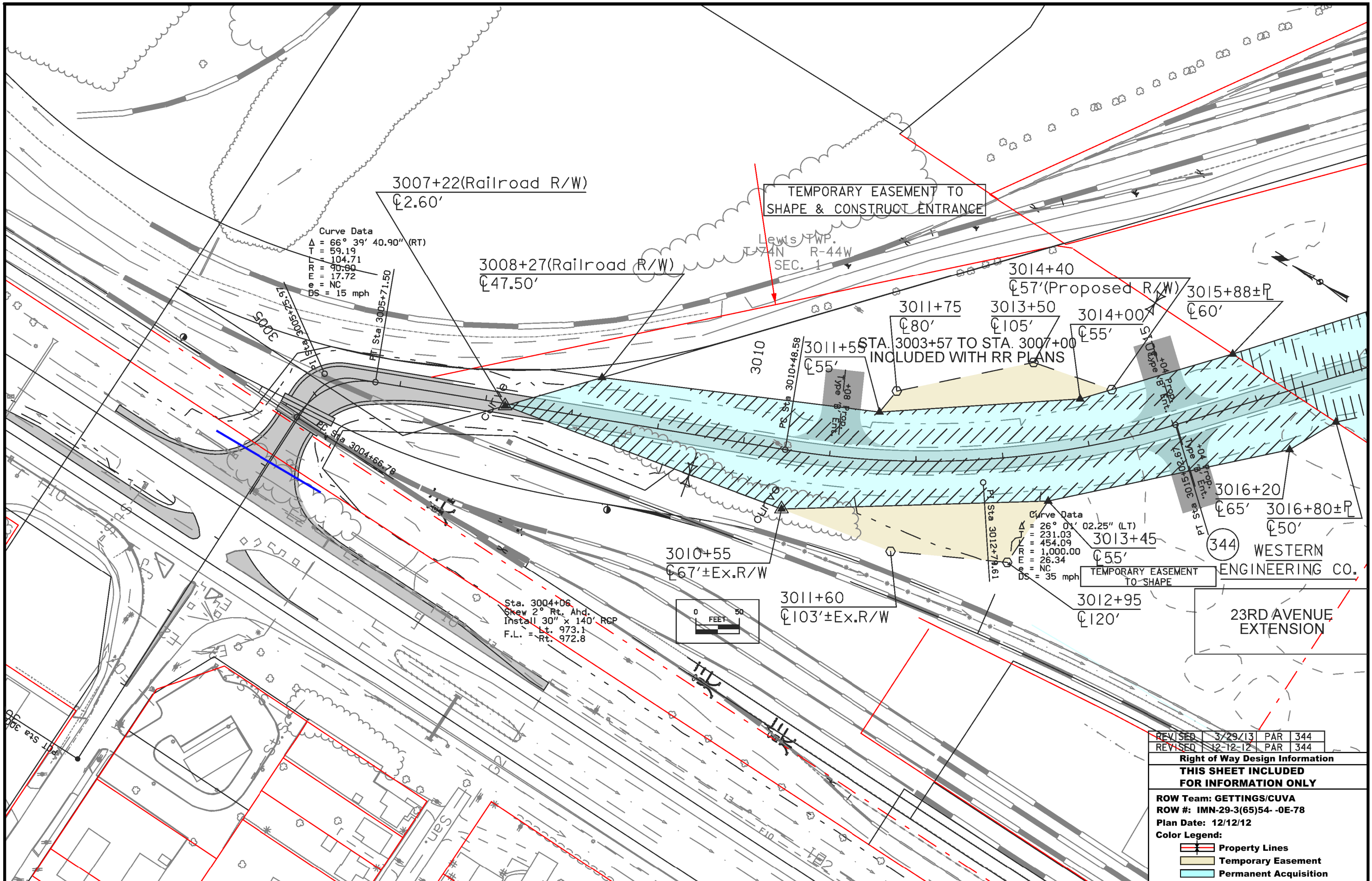
30TH AVE

Sta. 8312+42  
 30" x 148' RCP

**Right of Way Design Information**  
**THIS SHEET INCLUDED FOR INFORMATION ONLY**

ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54- -0E-78  
 Plan Date: 8/8/12  
 Color Legend:

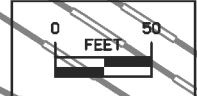
- Property Lines
- Temporary Easement
- Permanent Acquisition



Curve Data  
 $\Delta = 66^\circ 39' 40.90''$  (RT)  
 $T = 59.19$   
 $L = 104.71$   
 $LR = 90.80$   
 $E = 17.72$   
 $e = NC$   
 $DS = 15$  mph

Curve Data  
 $\Delta = 26^\circ 01' 02.25''$  (LT)  
 $T = 231.03$   
 $L = 454.09$   
 $R = 1,000.00$   
 $E = 26.34$   
 $e = NC$   
 $DS = 35$  mph

Sta. 3004+06  
 Skew  $2^\circ$  Rt. Ahd.  
 Install  $30'' \times 140''$  RCP  
 Lt. 973.1  
 Rt. 972.8



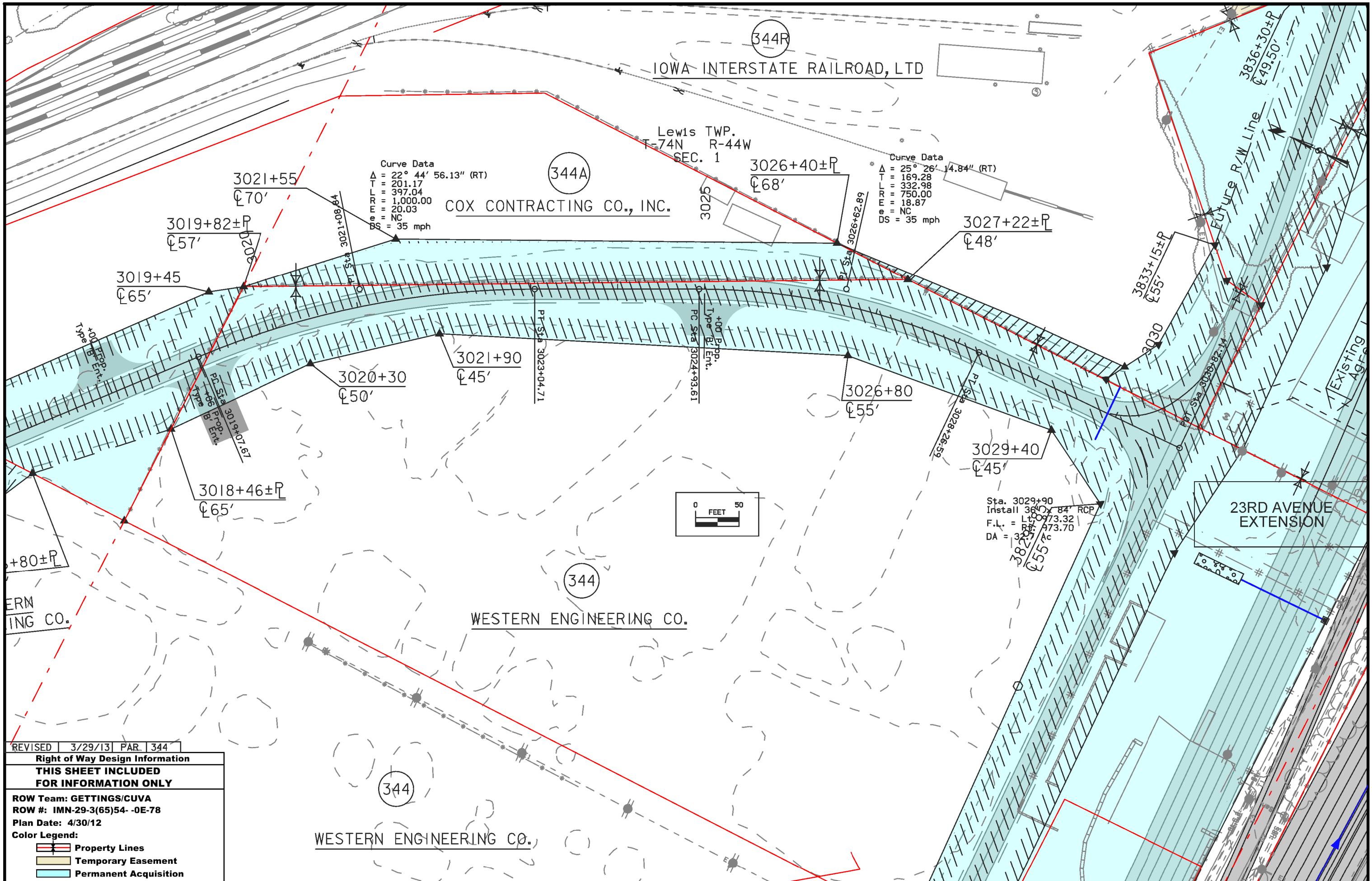
REVISED	3/29/13	PAR	344
REVISED	12-12-12	PAR	344

**Right of Way Design Information**  
**THIS SHEET INCLUDED FOR INFORMATION ONLY**

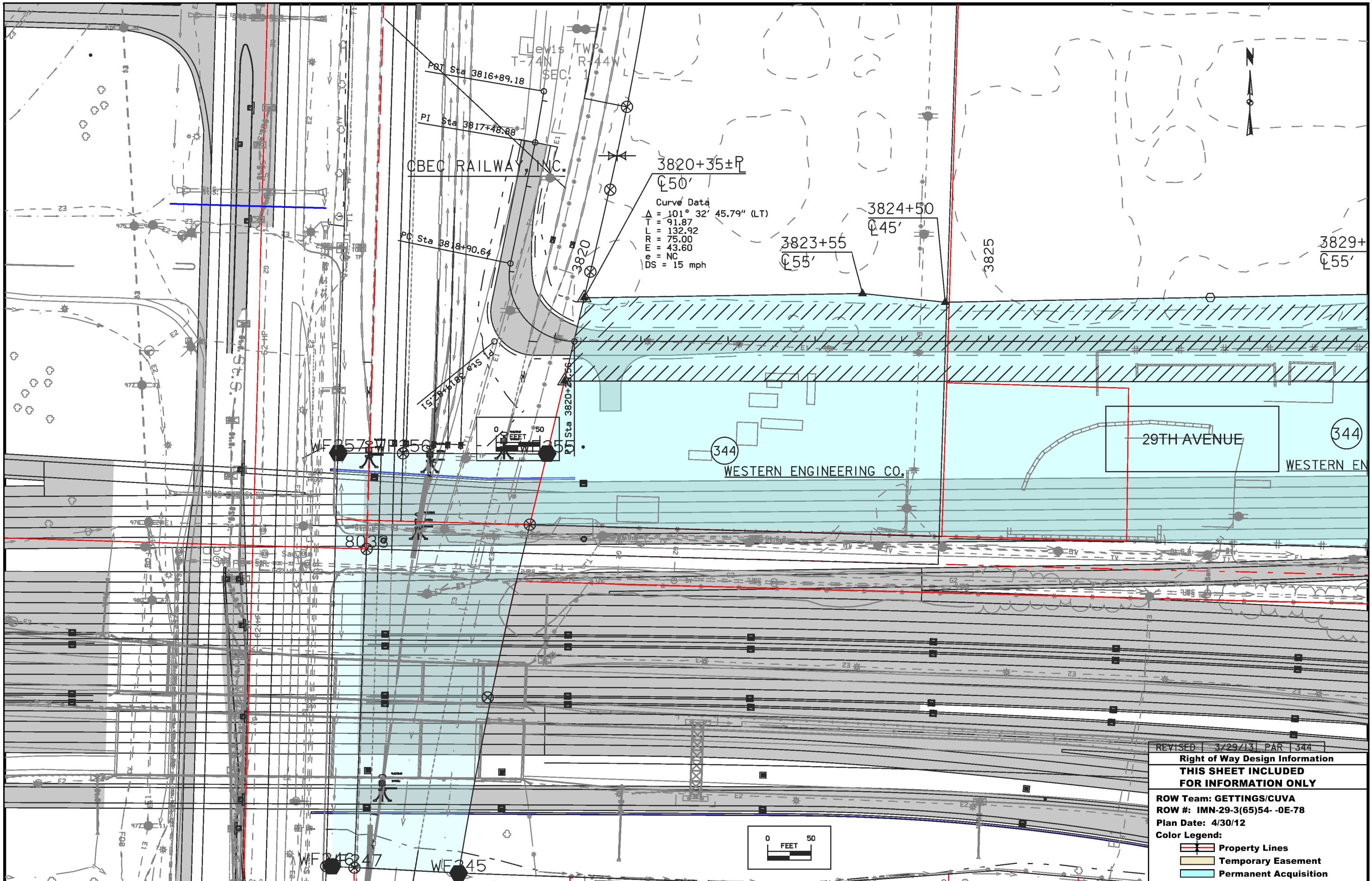
ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54--0E-78  
 Plan Date: 12/12/12

Color Legend:  
 Property Lines  
 Temporary Easement  
 Permanent Acquisition





REVISED	3/29/13	PAR	344
<b>Right of Way Design Information</b>			
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>			
ROW Team: GETTINGS/CUVA			
ROW #: IMN-29-3(65)54-0E-78			
Plan Date: 4/30/12			
<b>Color Legend:</b>			
	Property Lines		
	Temporary Easement		
	Permanent Acquisition		

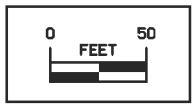


REVISED 3/29/13 PAR 344

**Right of Way Design Information**  
**THIS SHEET INCLUDED**  
**FOR INFORMATION ONLY**

ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54--0E-78  
 Plan Date: 4/30/12

**Color Legend:**  
 Property Lines  
 Temporary Easement  
 Permanent Acquisition



**Right of Way Design Information**  
**THIS SHEET INCLUDED FOR INFORMATION ONLY**

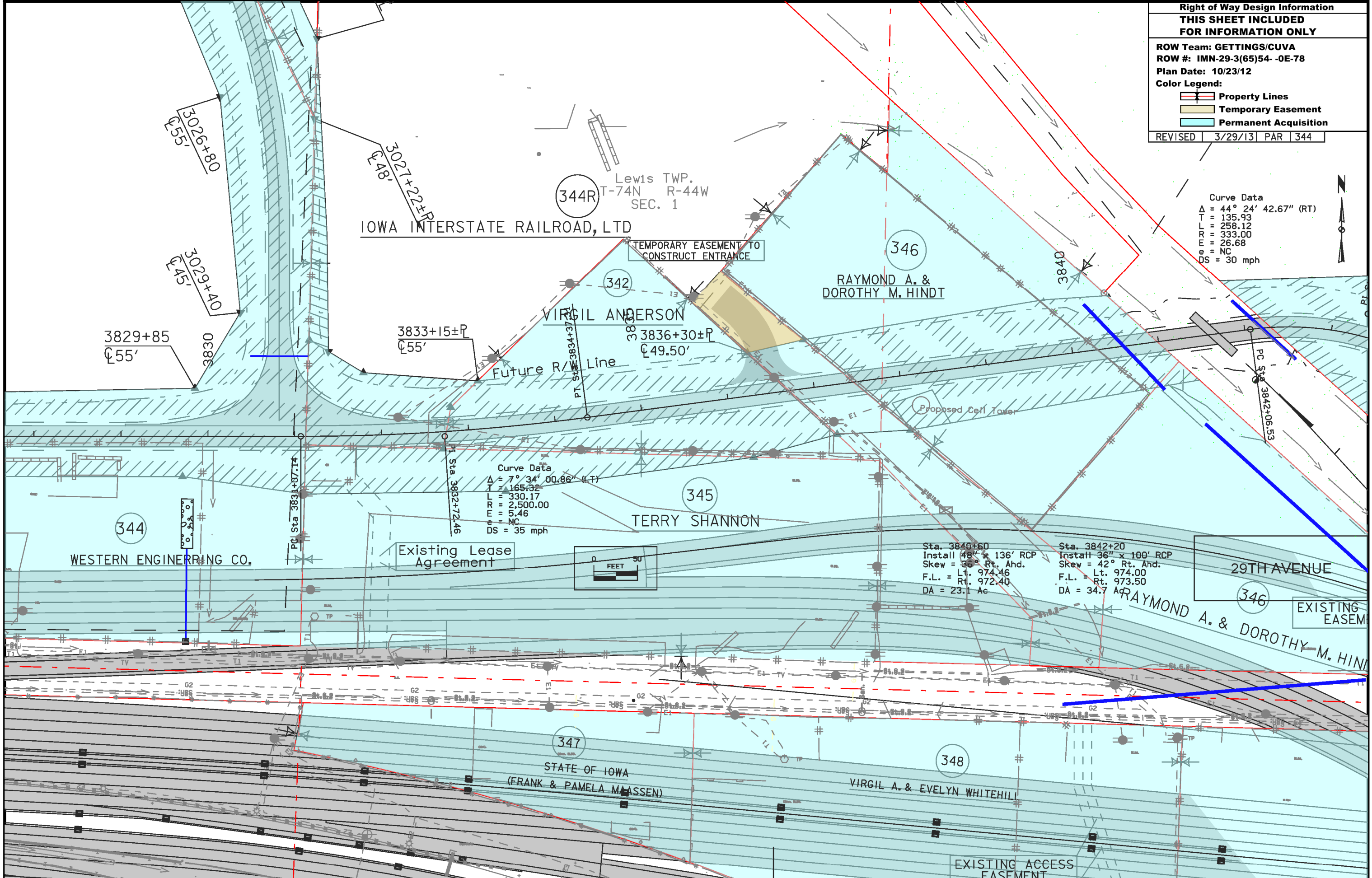
ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54-0E-78  
 Plan Date: 10/23/12

**Color Legend:**

- Property Lines
- Temporary Easement
- Permanent Acquisition

REVISED 3/29/13 PAR 344

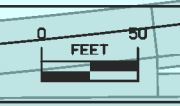
**Curve Data**  
 $\Delta = 44^\circ 24' 42.67''$  (RT)  
 T = 135.93  
 L = 258.12  
 R = 333.00  
 E = 26.68  
 e = NC  
 DS = 30 mph



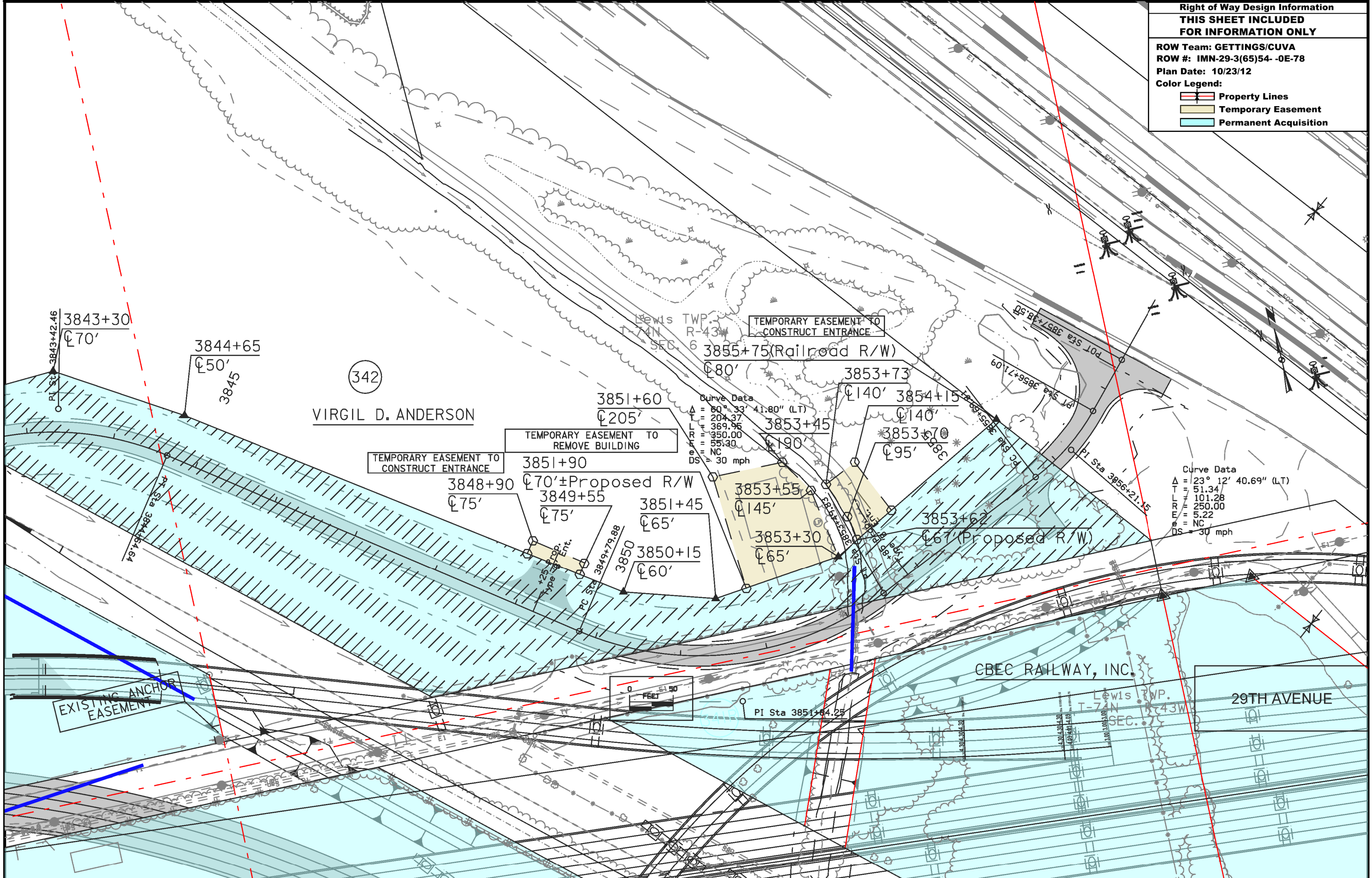
**Curve Data**  
 $\Delta = 7^\circ 34' 00.86''$  (LT)  
 T = 165.32  
 L = 330.17  
 R = 2,500.00  
 E = 5.46  
 e = NC  
 DS = 35 mph

Sta. 3840+60  
 Install 48" x 136' RCP  
 Skew = 36° Rt. Ahd.  
 F.L. = Lt. 974.46  
 F.L. = Rt. 972.40  
 DA = 23.1 Ac

Sta. 3842+20  
 Install 36" x 100' RCP  
 Skew = 42° Rt. Ahd.  
 F.L. = Lt. 974.00  
 F.L. = Rt. 973.50  
 DA = 34.7 Ac



**Right of Way Design Information**  
**THIS SHEET INCLUDED FOR INFORMATION ONLY**  
 ROW Team: GETTINGS/CUVA  
 ROW #: IMN-29-3(65)54-0E-78  
 Plan Date: 10/23/12  
 Color Legend:  
 - Property Lines  
 - Temporary Easement  
 - Permanent Acquisition

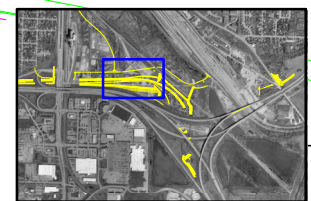
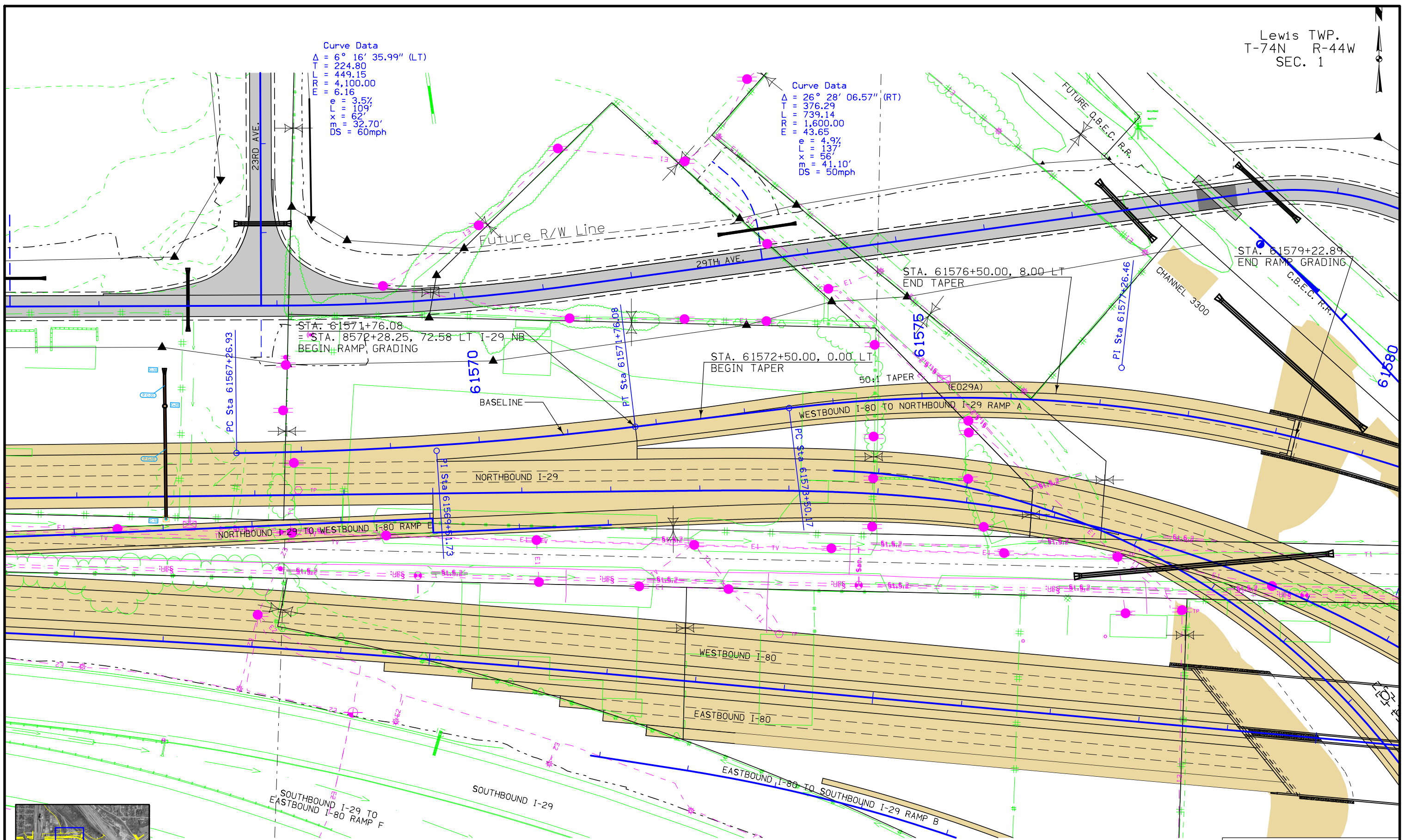




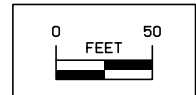
Lewis TWP.  
T-74N R-44W  
SEC. 1

Curve Data  
 $\Delta = 6^\circ 16' 35.99''$  (LT)  
 $T = 224.80$   
 $L = 449.15$   
 $R = 4,100.00$   
 $E = 6.16$   
 $L_e = 3.5\%$   
 $X = 109'$   
 $Y = 62'$   
 $X = 32.70'$   
 $DS = 60\text{mph}$

Curve Data  
 $\Delta = 26^\circ 28' 06.57''$  (RT)  
 $T = 376.29$   
 $L = 739.14$   
 $R = 1,600.00$   
 $E = 43.65$   
 $L_e = 4.9\%$   
 $X = 137'$   
 $Y = 56'$   
 $X = 41.10'$   
 $DS = 50\text{mph}$

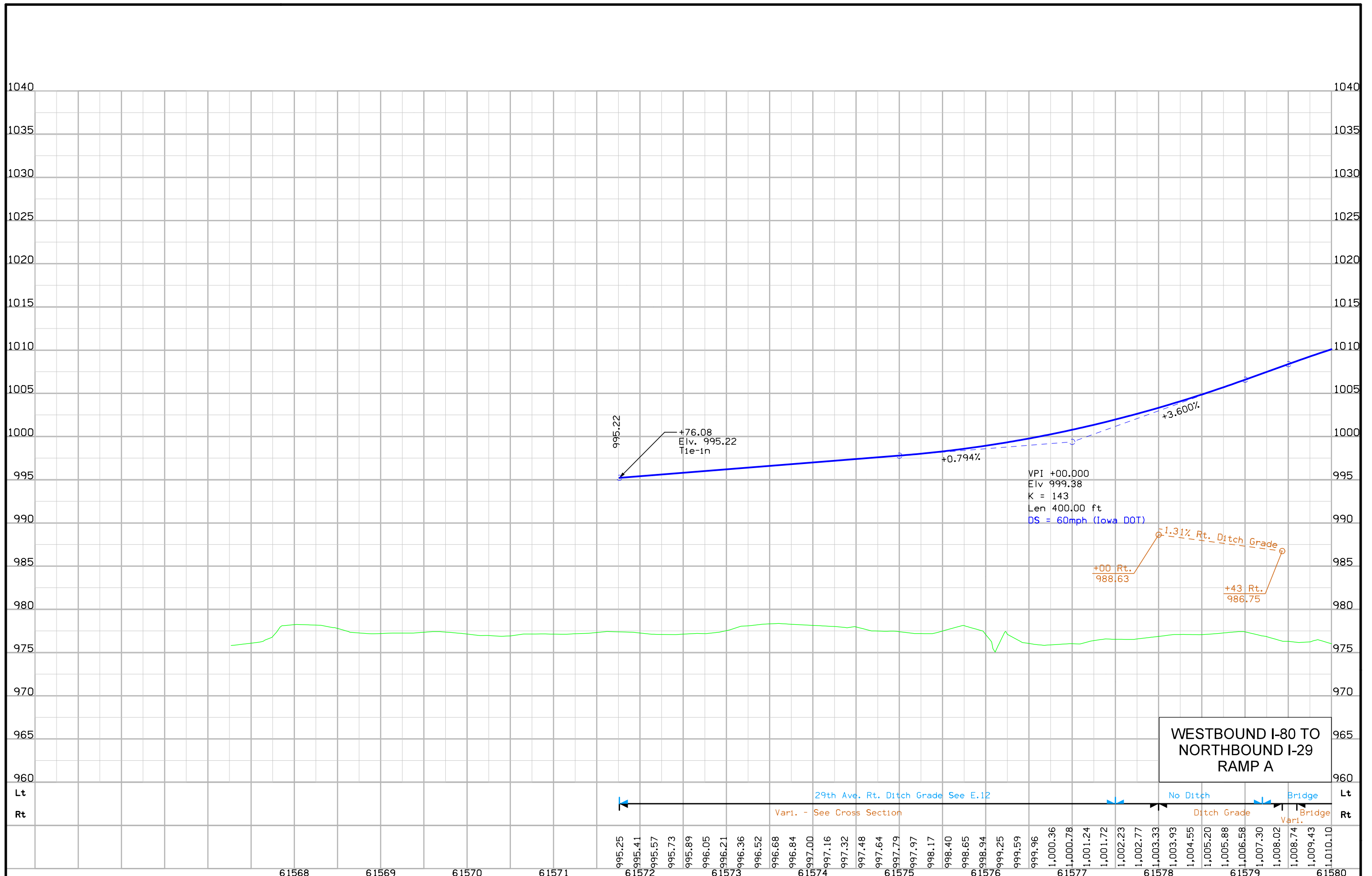


Lewis TWP.  
T-74N R-44W  
SEC. 12



Sta. 61578+00, 144.4' Lt.  
 Install 48" RCP  
 F.L. = Lt. 972.05  
 Rt. 971.52  
 DA = 71.6 Ac

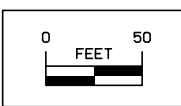
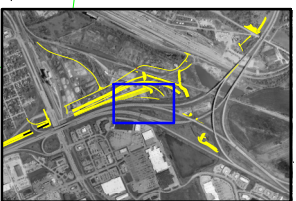
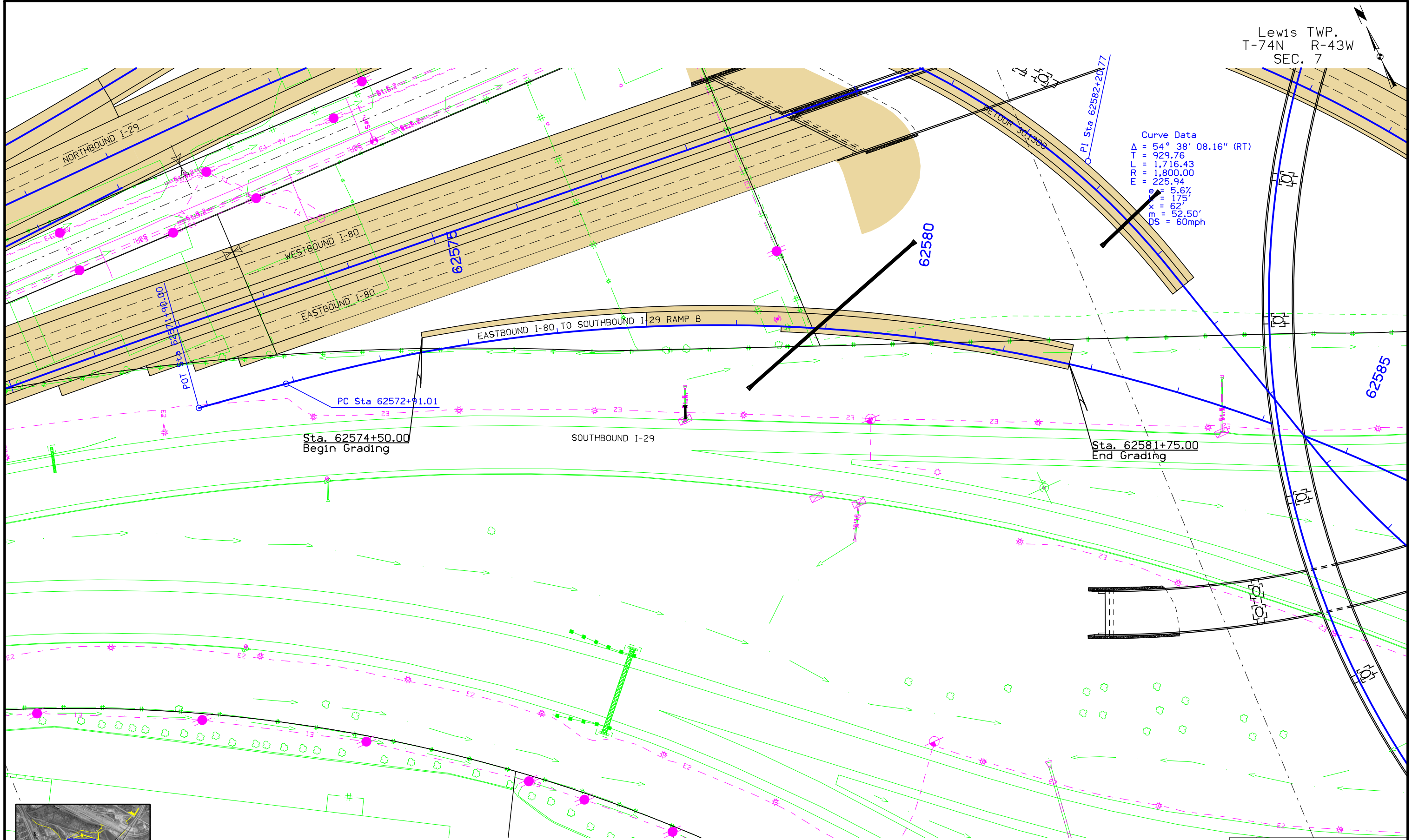
**WESTBOUND I-80 TO  
NORTHBOUND I-29  
RAMP A**



**WESTBOUND I-80 TO  
NORTHBOUND I-29  
RAMP A**

Lewis TWP.  
T-74N R-43W  
SEC. 7

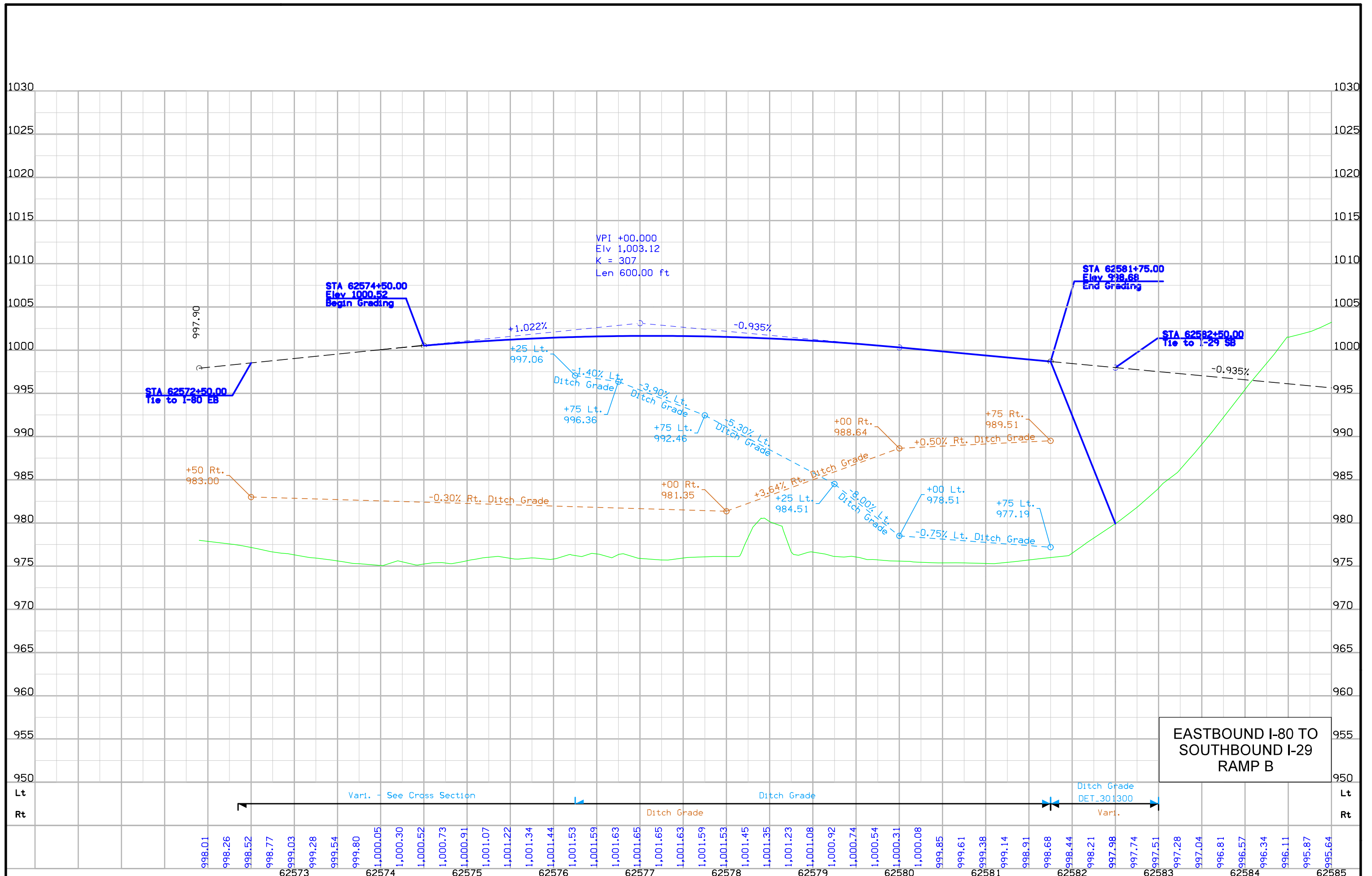
Curve Data  
 $\Delta = 54^\circ 38' 08.16''$  (RT)  
T = 929.76  
L = 1,716.43  
R = 1,800.00  
E = 225.94  
e = 5.6%  
f = 175'  
x = 62'  
m = 52.50'  
DS = 60mph



Sta. 62578+90  
Install 24" RCP  
Skew = 45° LT. Ahd.  
F.L. = Lt. 979.23  
Rt. 981.79

**EASTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP B**





**EASTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP B**

Lt	Vari. - See Cross Section															Ditch Grade															Ditch Grade DET_301300															Lt							
Rt																Ditch Grade															Vari.															Rt							
	998.01	998.26	998.52	998.77	999.03	999.28	999.54	999.80	1,000.05	1,000.30	1,000.52	1,000.73	1,000.91	1,001.07	1,001.22	1,001.34	1,001.44	1,001.53	1,001.59	1,001.63	1,001.65	1,001.63	1,001.59	1,001.53	1,001.45	1,001.35	1,001.23	1,001.08	1,000.92	1,000.74	1,000.54	1,000.31	1,000.08	999.85	999.61	999.38	999.14	998.91	998.68	998.44	998.21	997.98	997.74	997.51	997.28	997.04	996.81	996.57	996.34	996.11	995.87	995.64	
	62573	62574	62575	62576	62577	62578	62579	62580	62581	62582	62583	62584	62585																																								

Lewis TWP.  
T-74N R-44W  
SEC. 1

Curve Data  
Δ = 1° 27' 03.38" (LT)  
T = 151.95  
L = 303.88  
R = 12,000.00  
E = 0.96  
e = NC  
DS = 60mph

STA. 65561+51.55  
= STA. 7561+49.28, 85.59 LT I-80  
BEGIN RAMP GRADING

EQUATION:  
STA. 65570+03.02 (AHEAD)  
= STA. 65570+03.02, 16.00 RT (BACK)  
= STA. 8570+00.00, 44.00 RT (I-29 NB)  
END RAMP GRADING

65560

65565

65570

NORTHBOUND I-29

NORTHBOUND I-29 TO WESTBOUND I-80 RAMP E

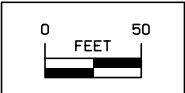
WESTBOUND I-80

EASTBOUND I-80

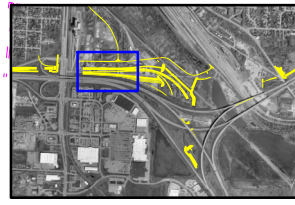
50:1 TAPER

30:1 TAPER

Lewis TWP.  
T-74N R-44W  
SEC. 12



NORTHBOUND I-29 TO  
WESTBOUND I-80  
RAMP E





+51.55  
Elev. 1000.11  
Tie-in

-0.616%

-0.400%

VPI +35.000  
Elev 998.98  
K = 926  
Len 200.00 ft  
DS = 60mph (Iowa DOT)

+03.02  
Elev. 996.31  
Tie-in

NORTHBOUND I-29 TO  
WESTBOUND I-80  
RAMP E

Vari. - See Cross Section

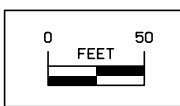
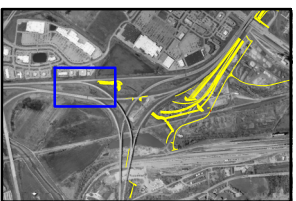
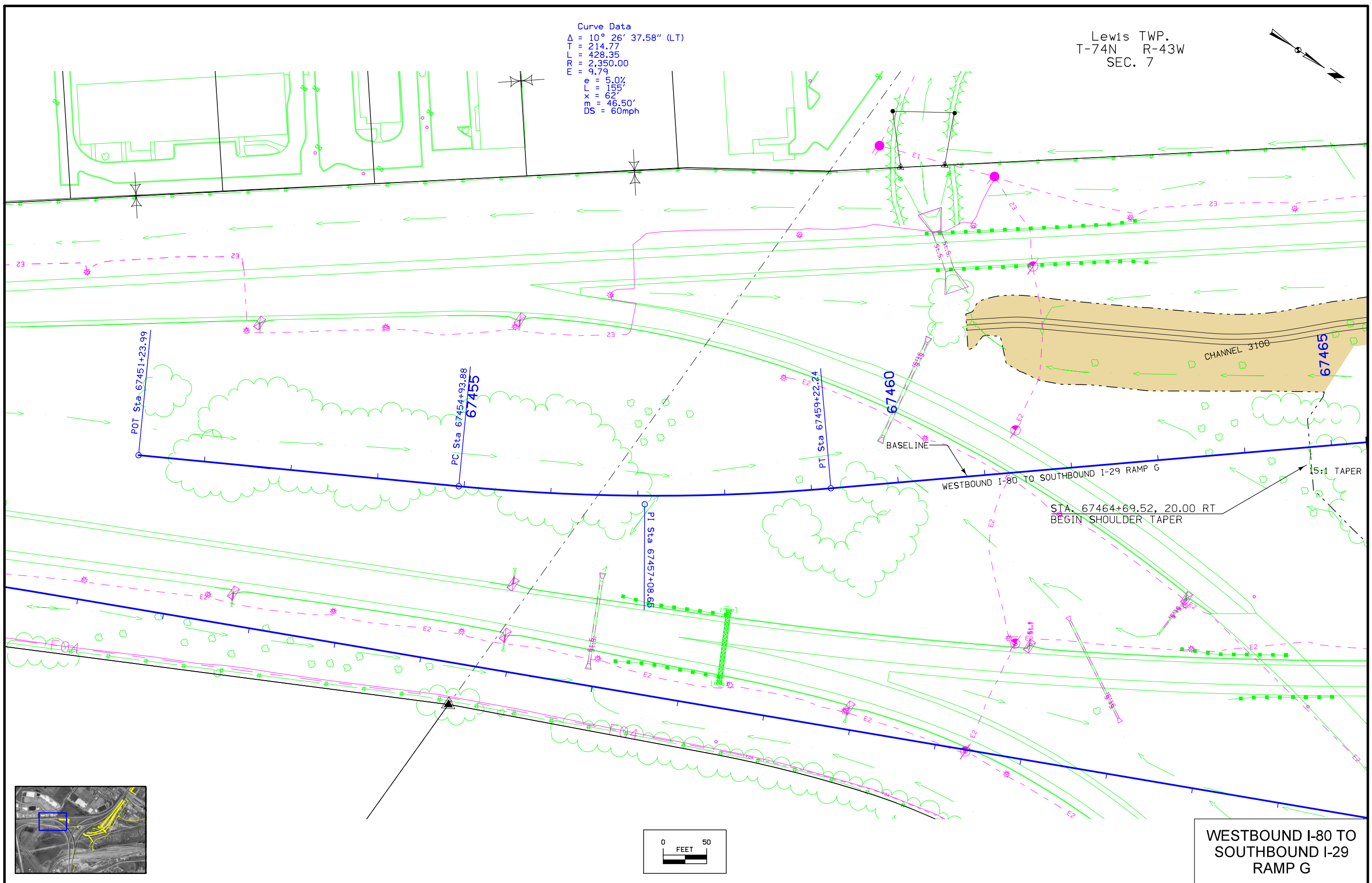
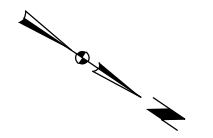
Vari. - See Cross Section

I-80 Lt. Ditch See D.8

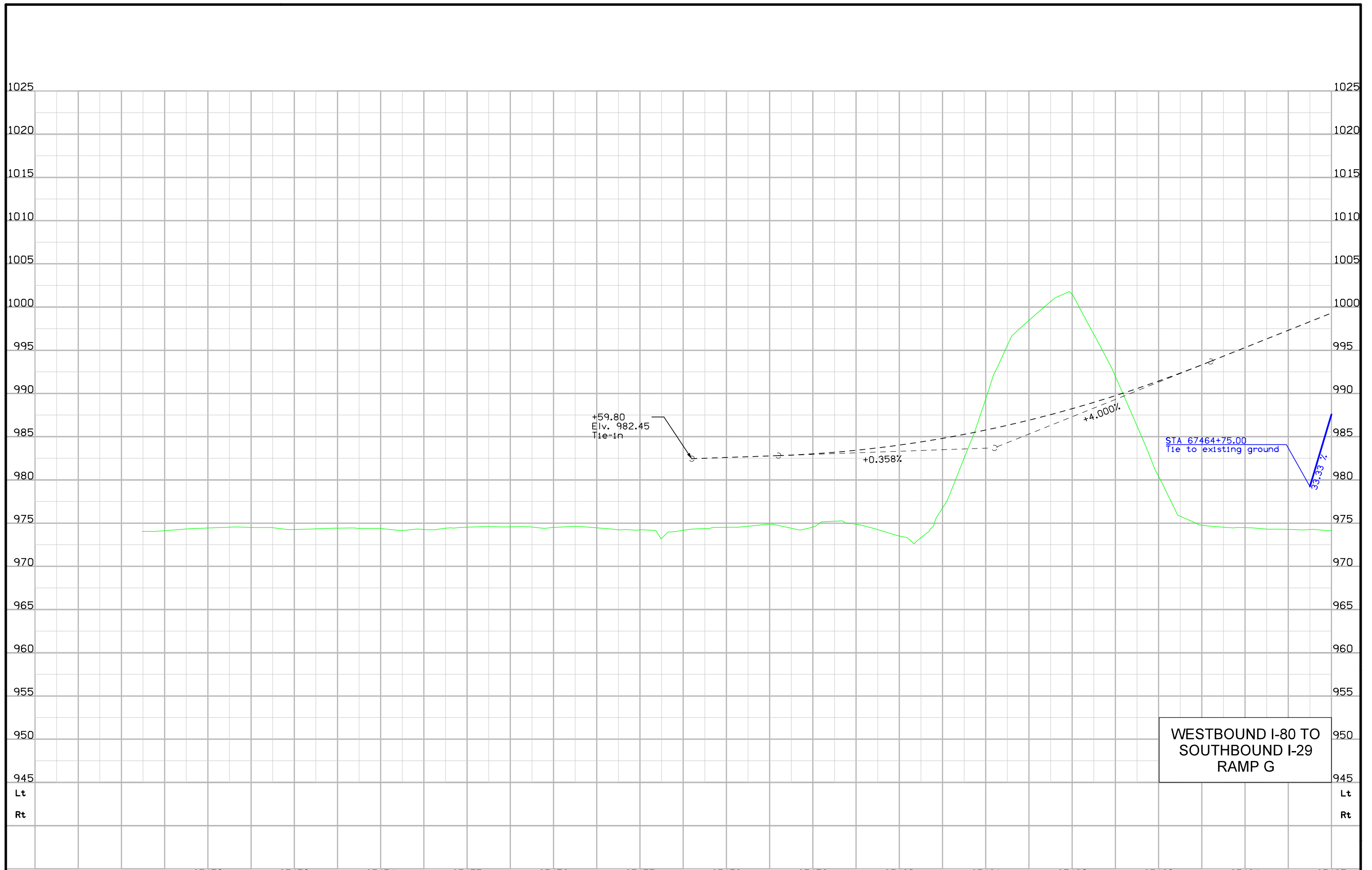
65558 65559 65560 65561 65562 65563 65564 65565 65566 65567 65568 65569 65570 65571

Lewis TWP.  
T-74N R-43W  
SEC. 7

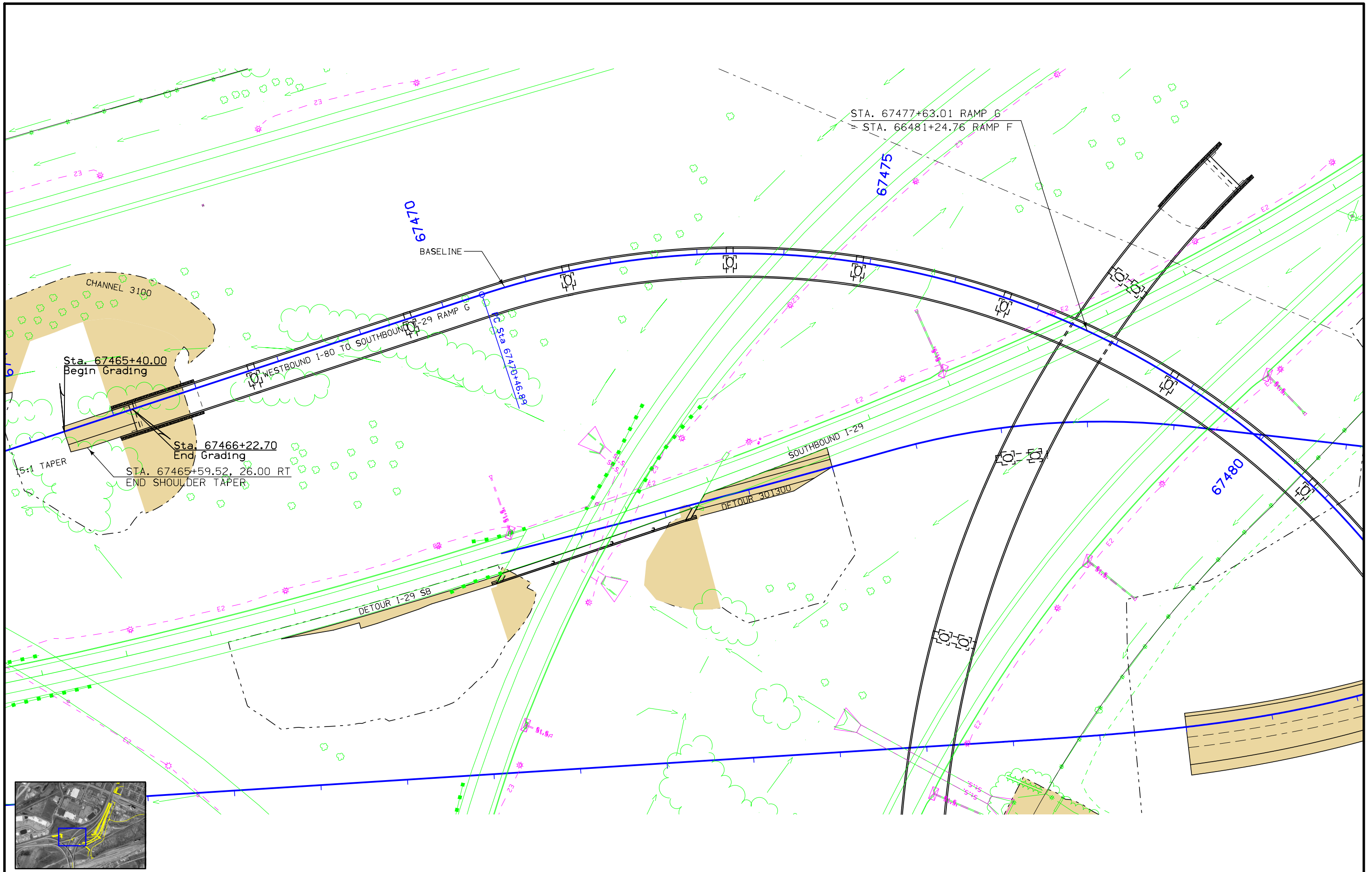
Curve Data  
Δ = 10° 26' 37.58" (LT)  
T = 214.77  
L = 428.35  
R = 2,350.00  
E = 9.79  
e = 5.0%  
L = 155'  
x = 62'  
m = 46.50'  
DS = 60mph



WESTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP G

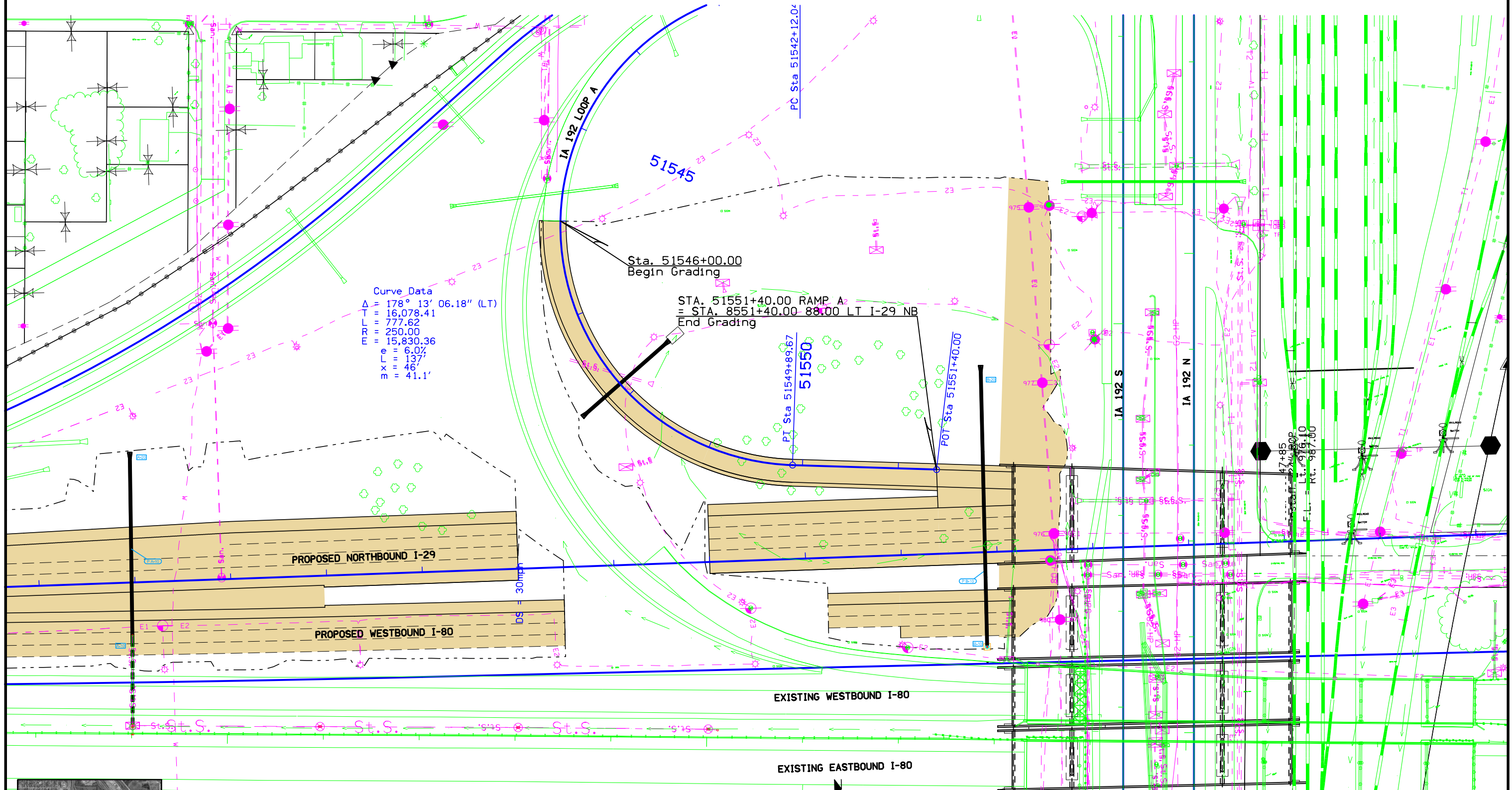


WESTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP G





Lewis TWP.  
T-74N R-44W  
SEC. 1



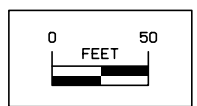
PROPOSED NORTHBOUND I-29  
DS = 30HP

PROPOSED WESTBOUND I-80  
DS = 30HP

EXISTING WESTBOUND I-80

EXISTING EASTBOUND I-80

DETENTION  
Sta. 51545+70 skewed 15°  
24" x 140' RCP  
F.L. = Lt. 972.0  
Rt. 972.0

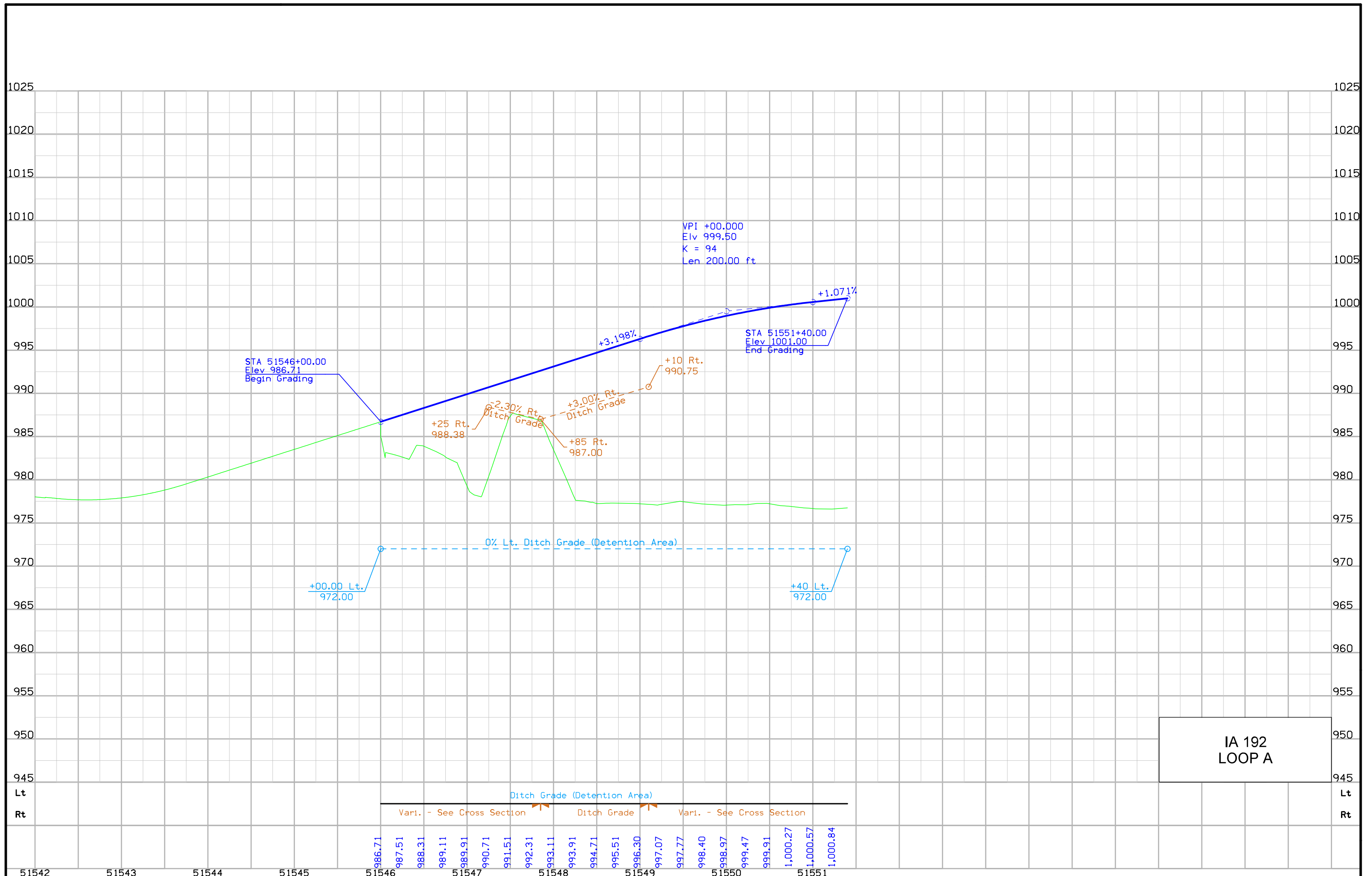


Sta. 51547+85  
Install 24" RCP  
F.L. = Lt. 972.02  
Rt. 987.00  
Other 972.28

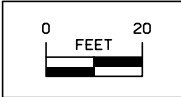
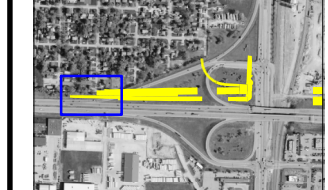
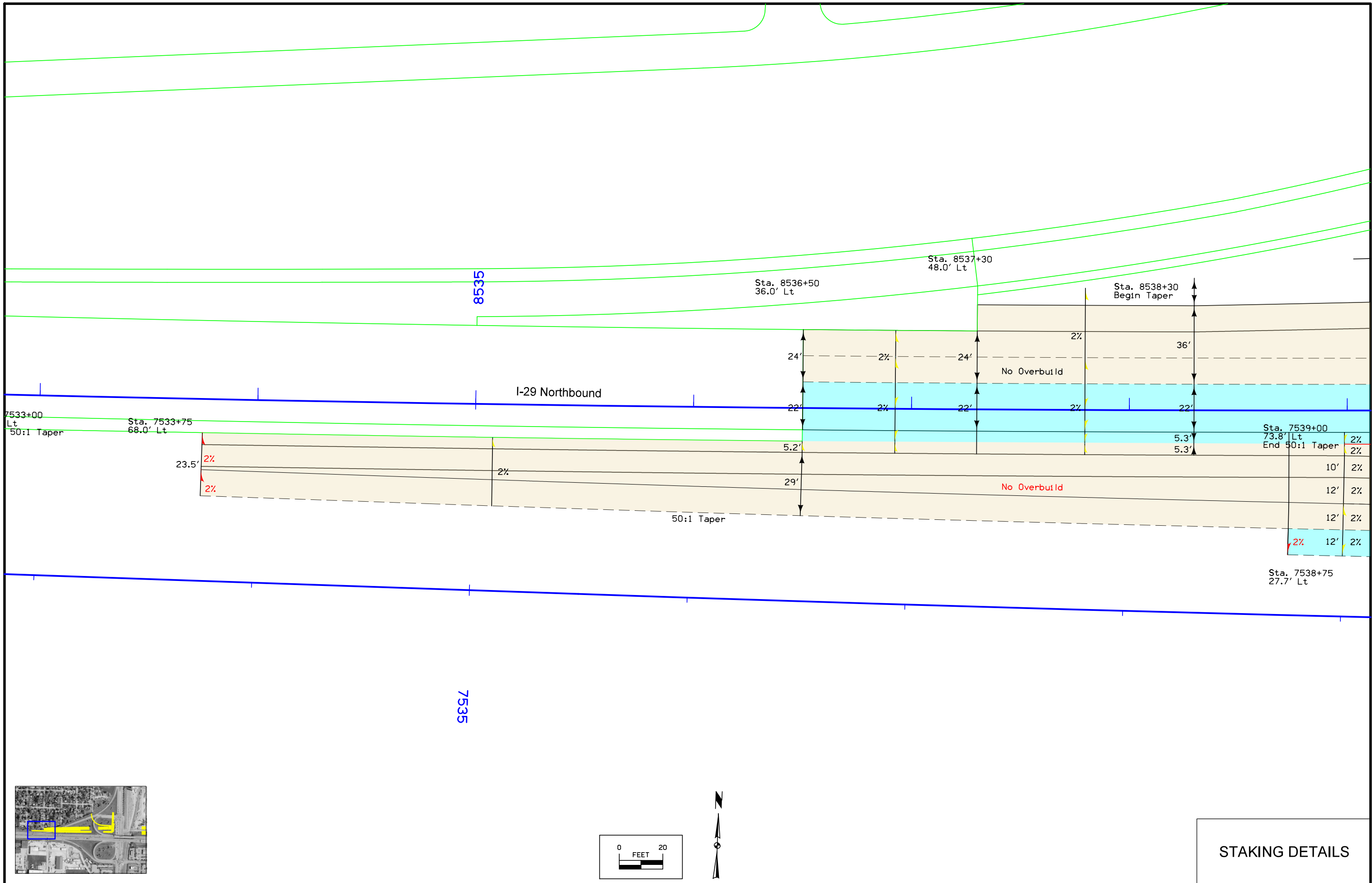
Lewis TWP.  
T-74N R-44W  
SEC. 12

IA 192  
LOOP A

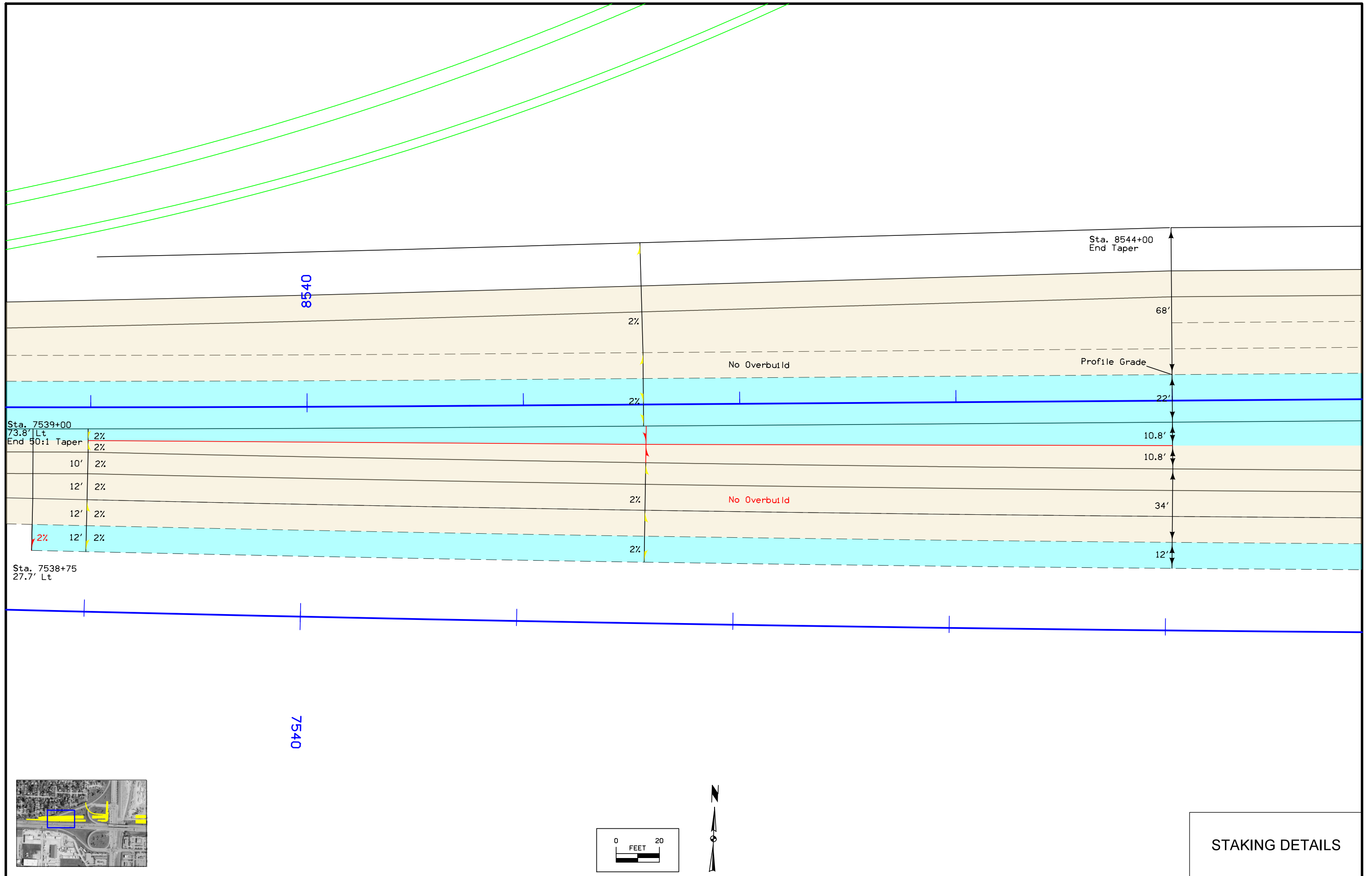




IA 192  
LOOP A



**STAKING DETAILS**



Sta. 7539+00  
 73.8' Lt  
 End 50:1 Taper

2%  
 2%

10' 2%

12' 2%

12' 2%

2% 12' 2%

Sta. 7538+75  
 27.7' Lt

8540

7540

Sta. 8544+00  
 End Taper

68'

22'

10.8'

10.8'

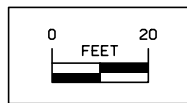
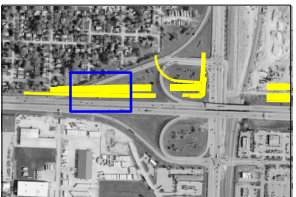
34'

12'

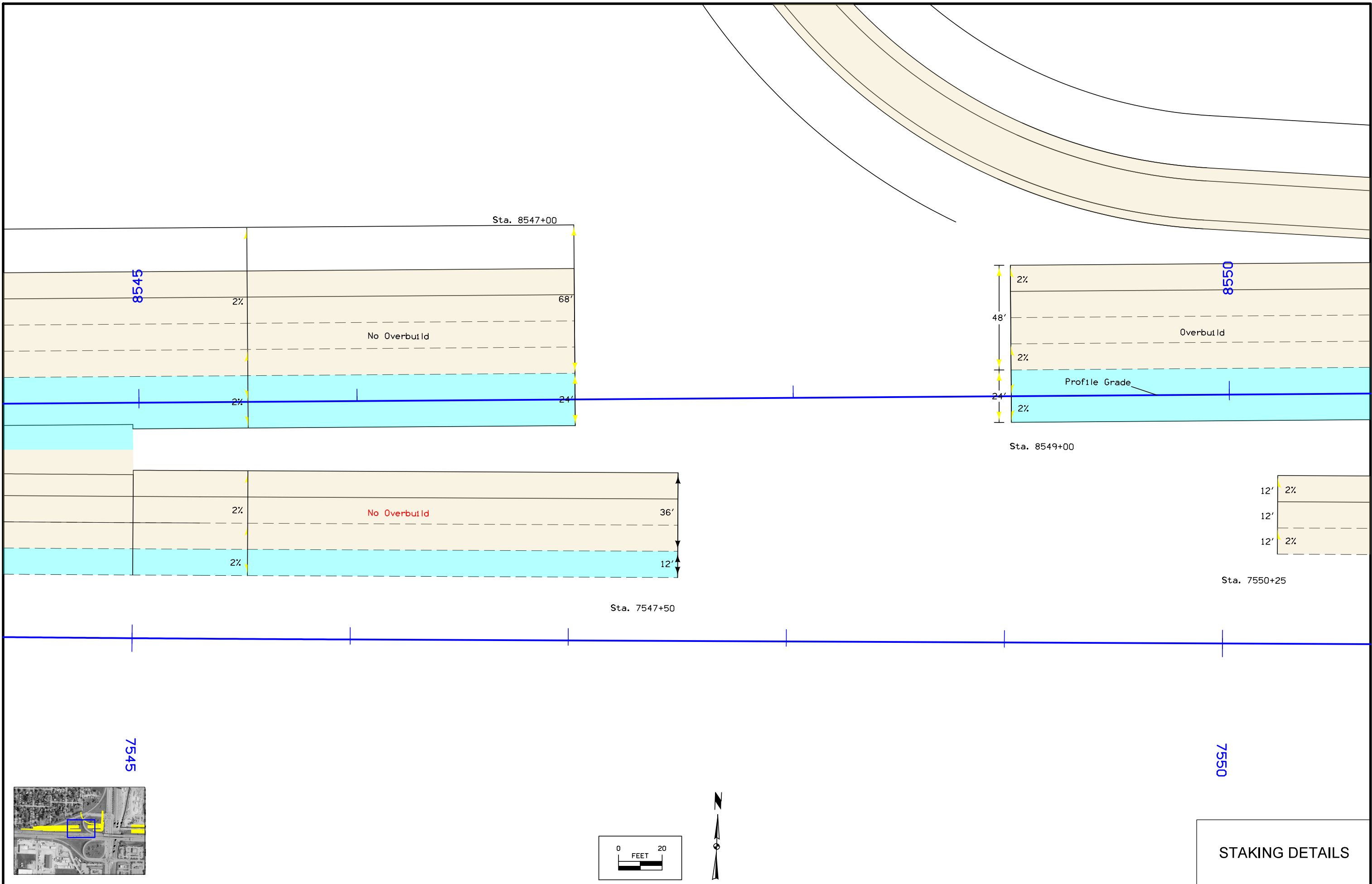
No Overbuild

No Overbuild

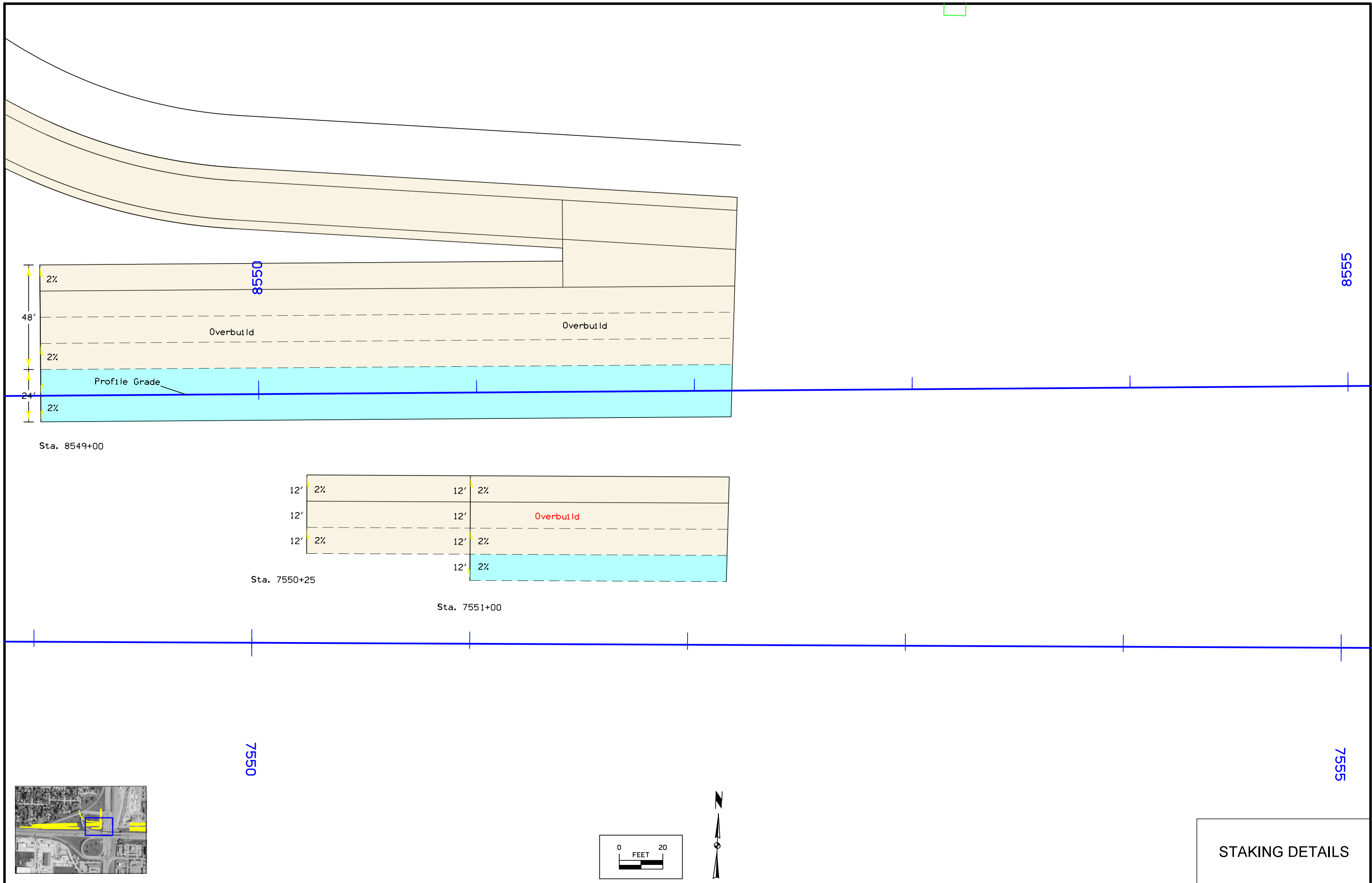
Profile Grade



**STAKING DETAILS**

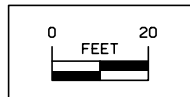
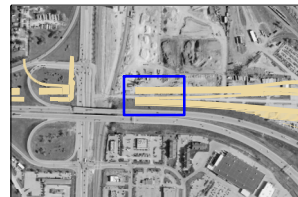
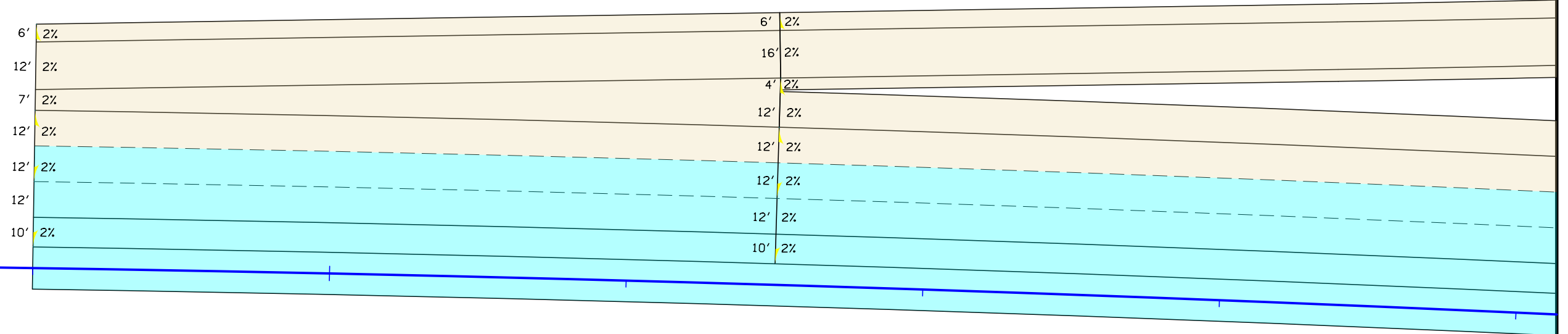
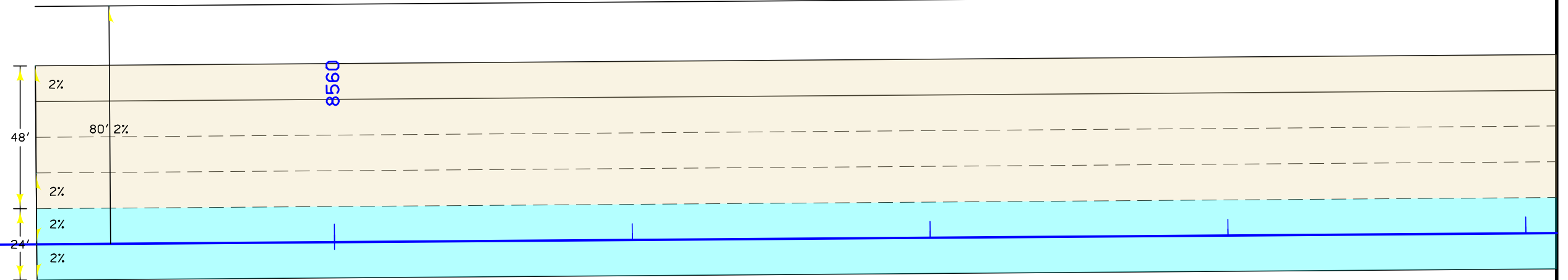


STAKING DETAILS

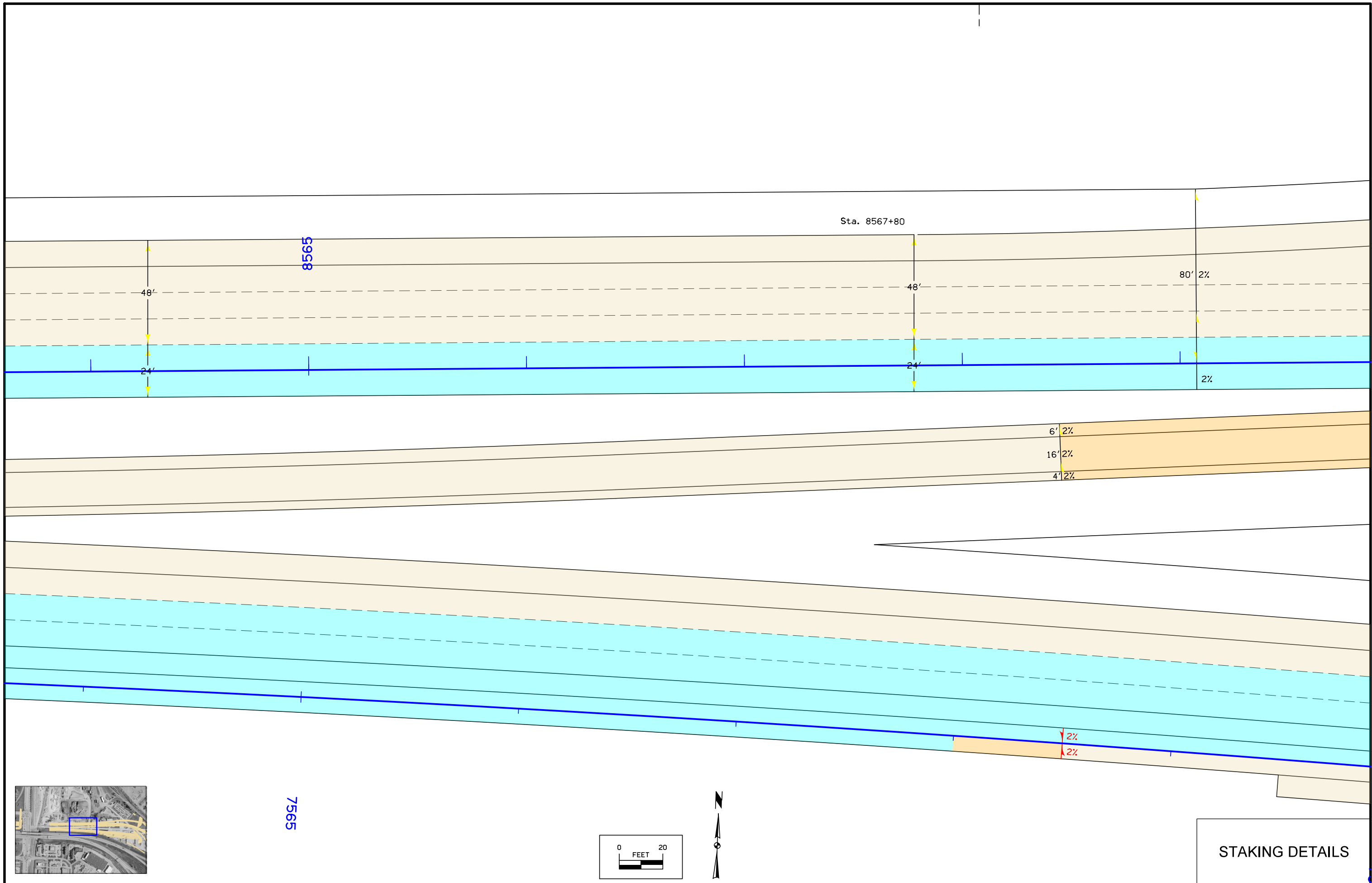


STAKING DETAILS

Sta. 8559+00

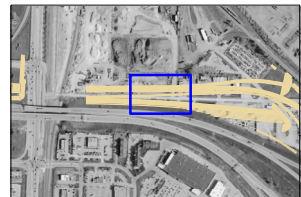


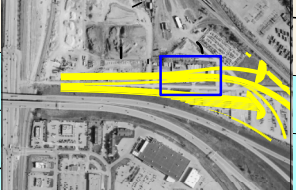
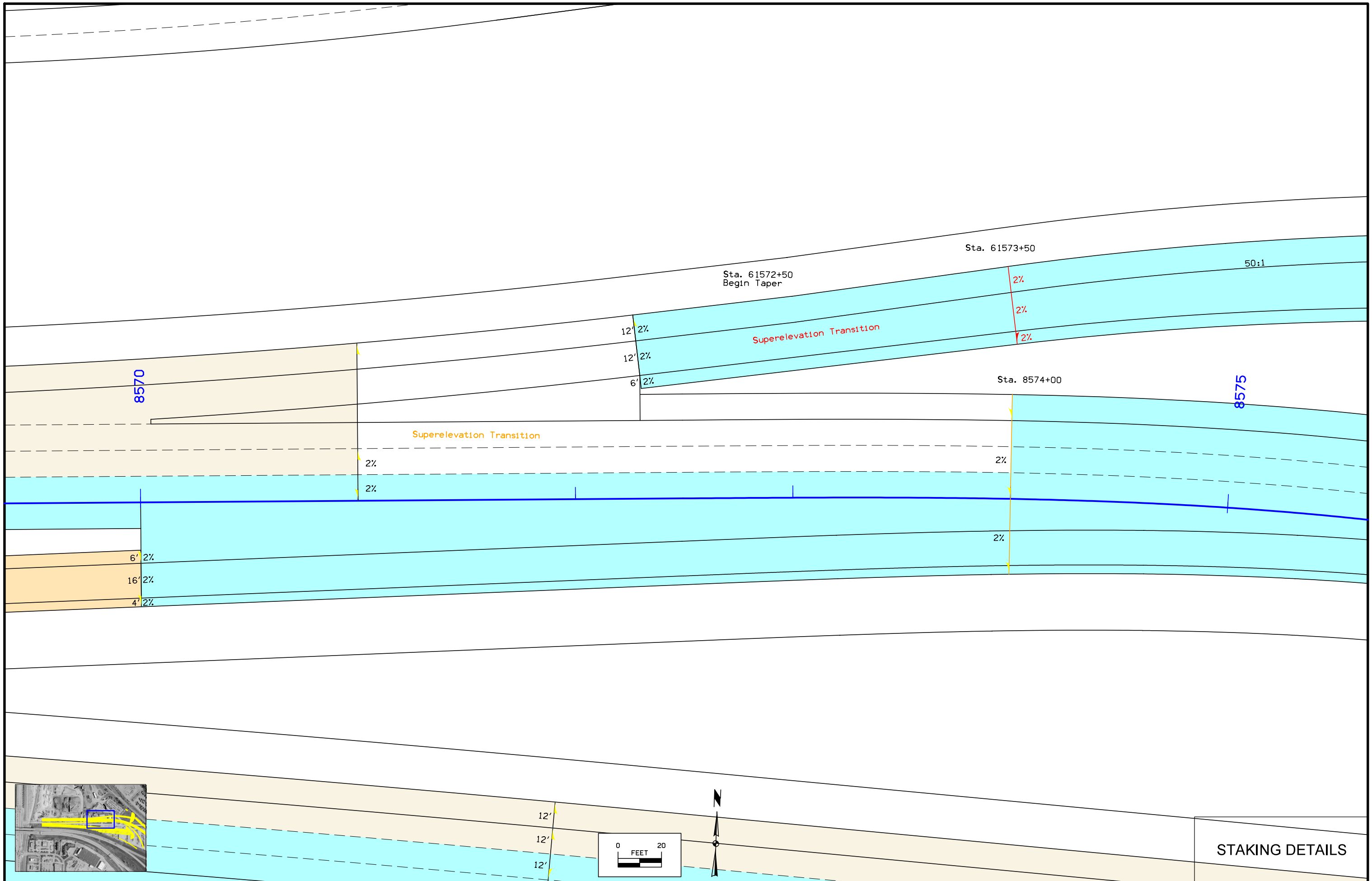
STAKING DETAILS



8565

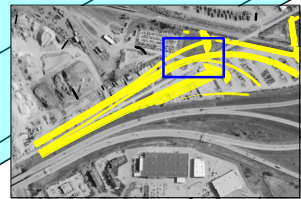
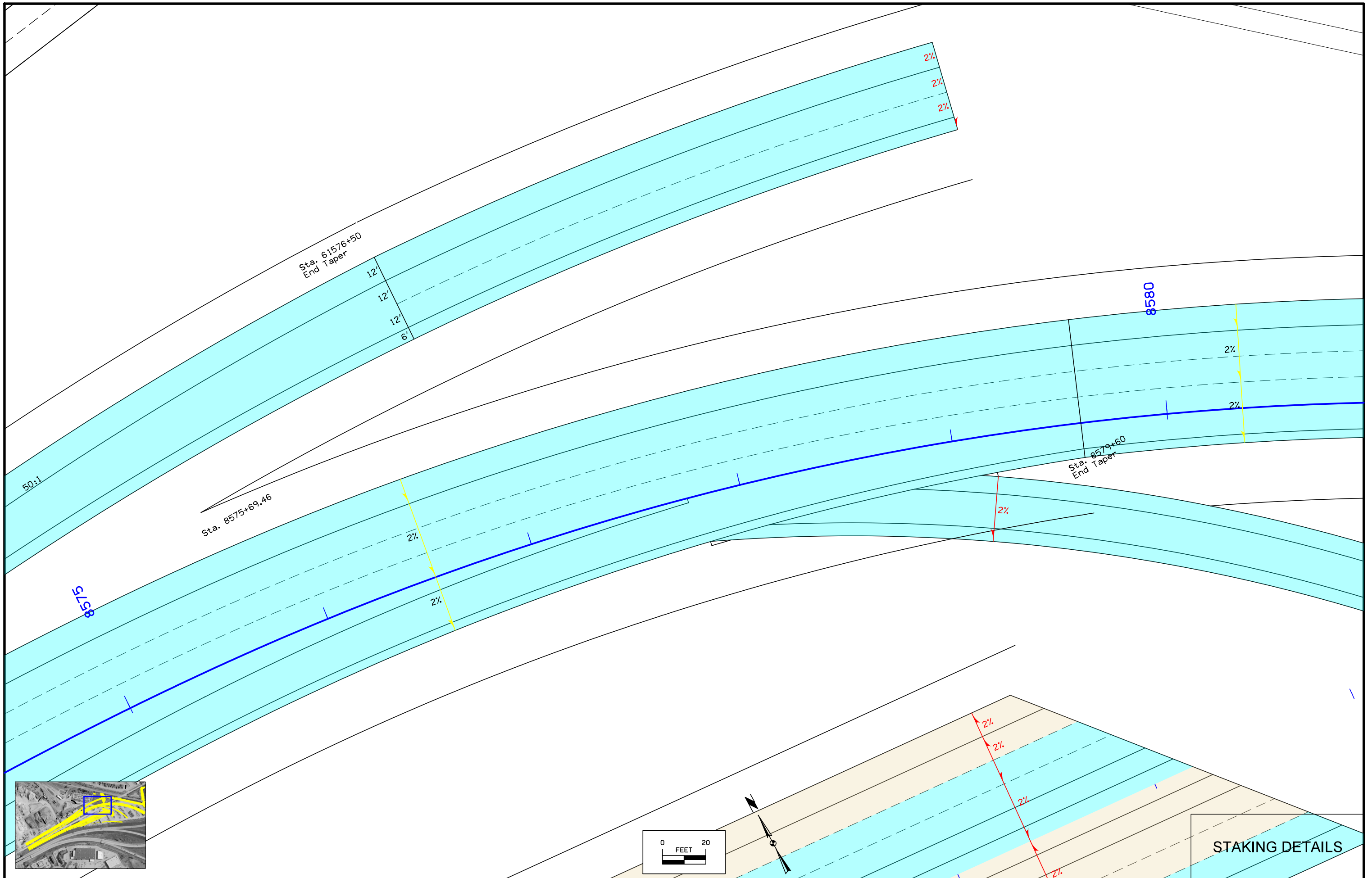
7565

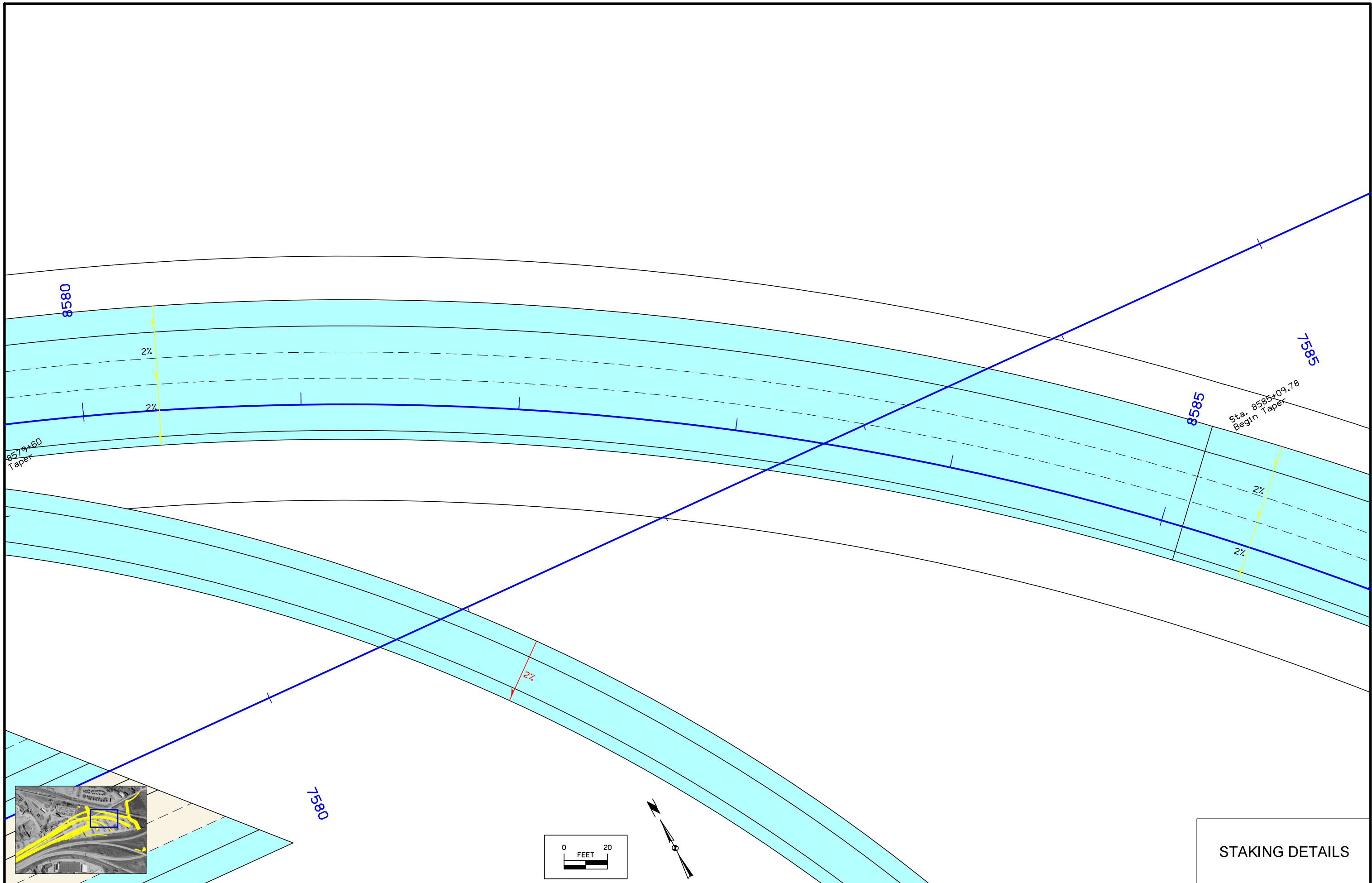


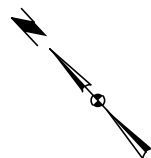
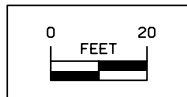
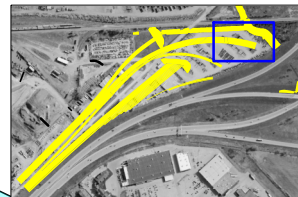
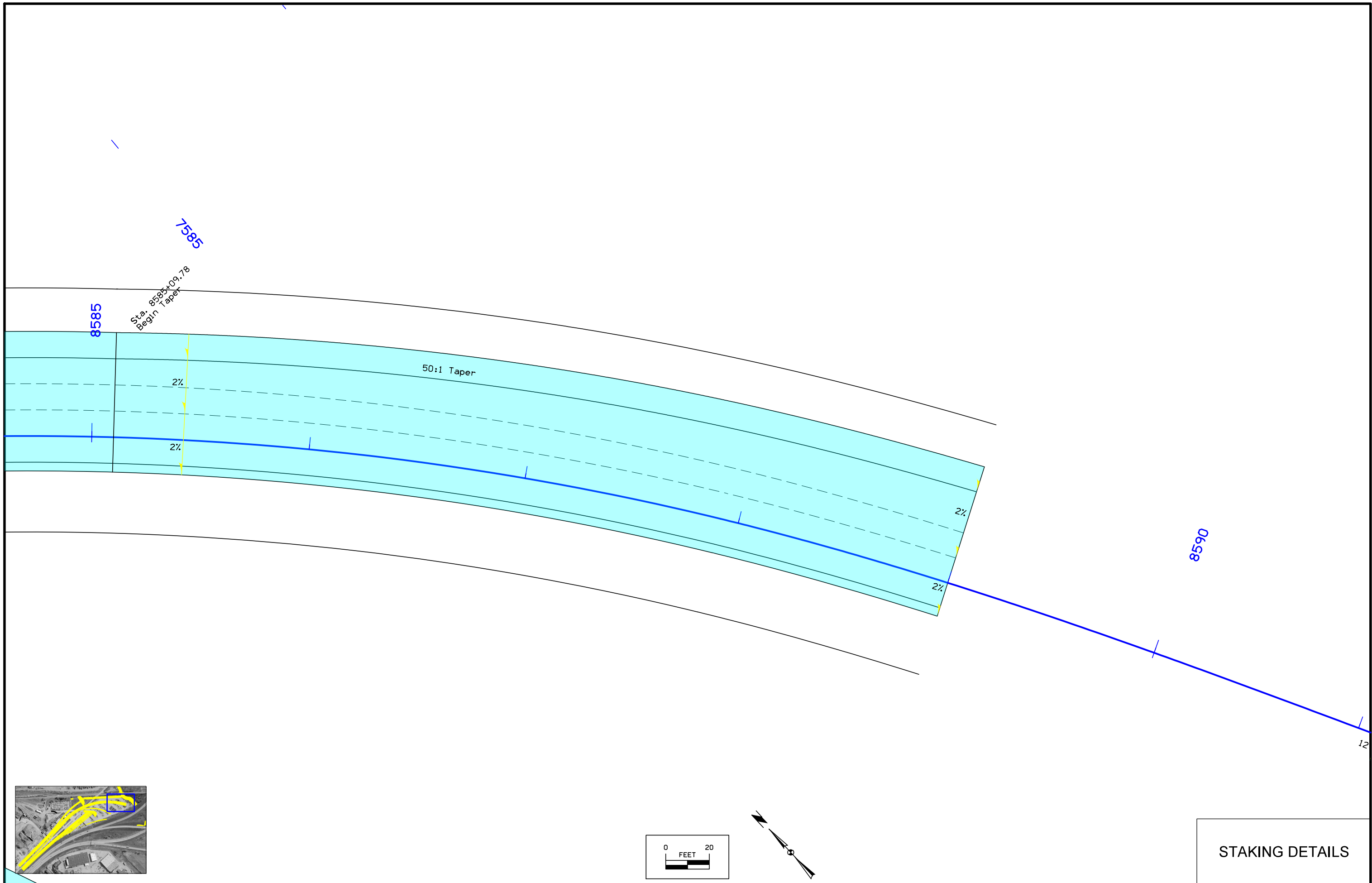


STAKING DETAILS

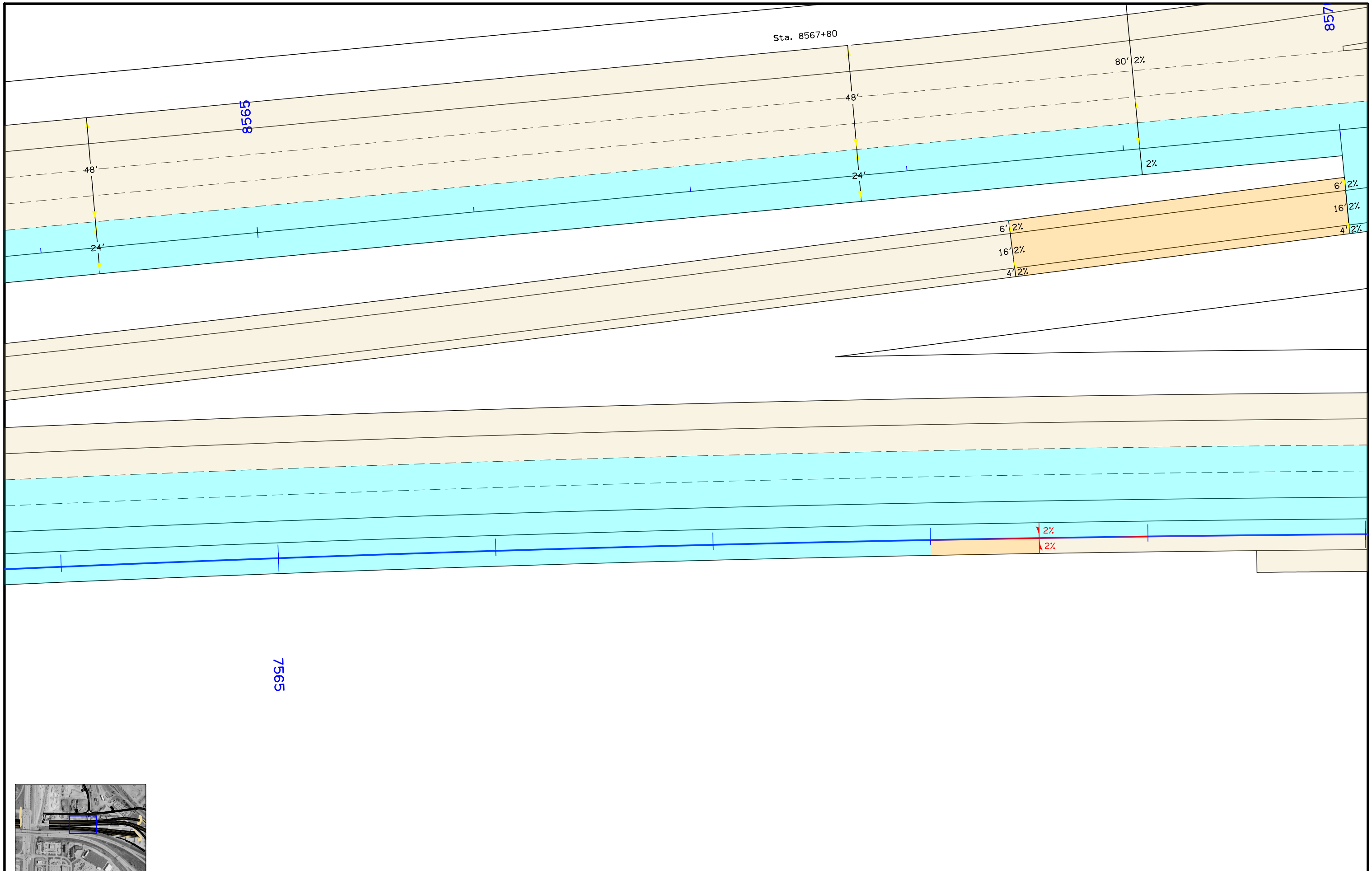




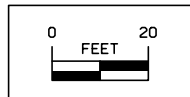
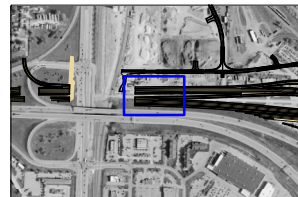
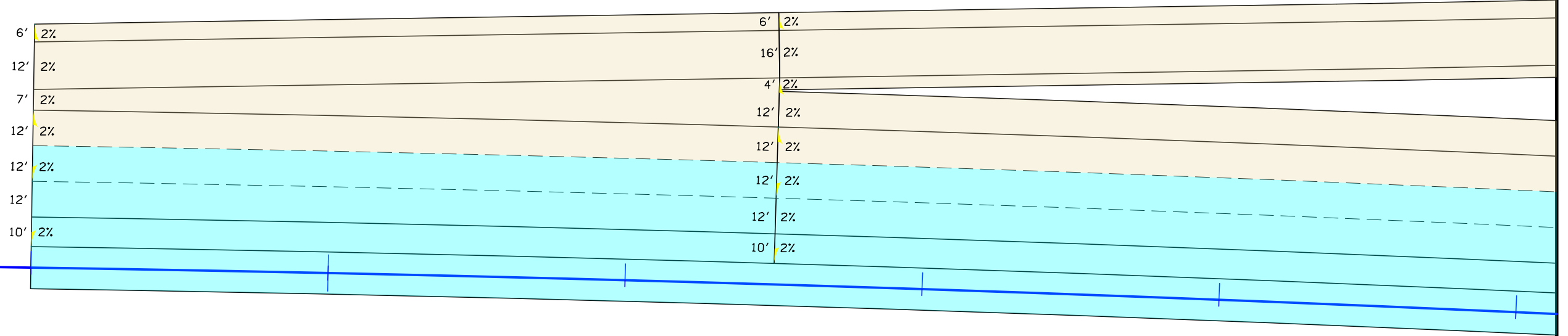
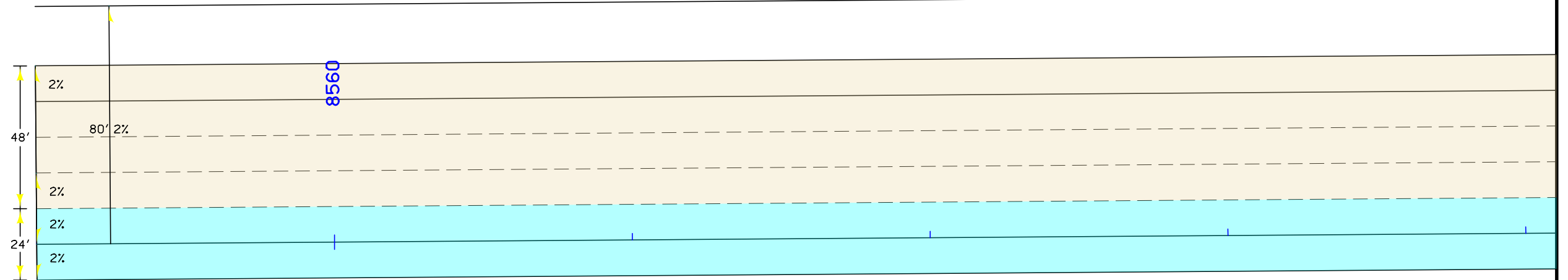




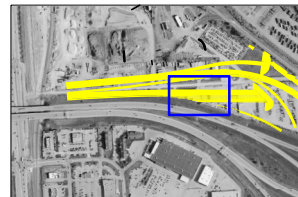
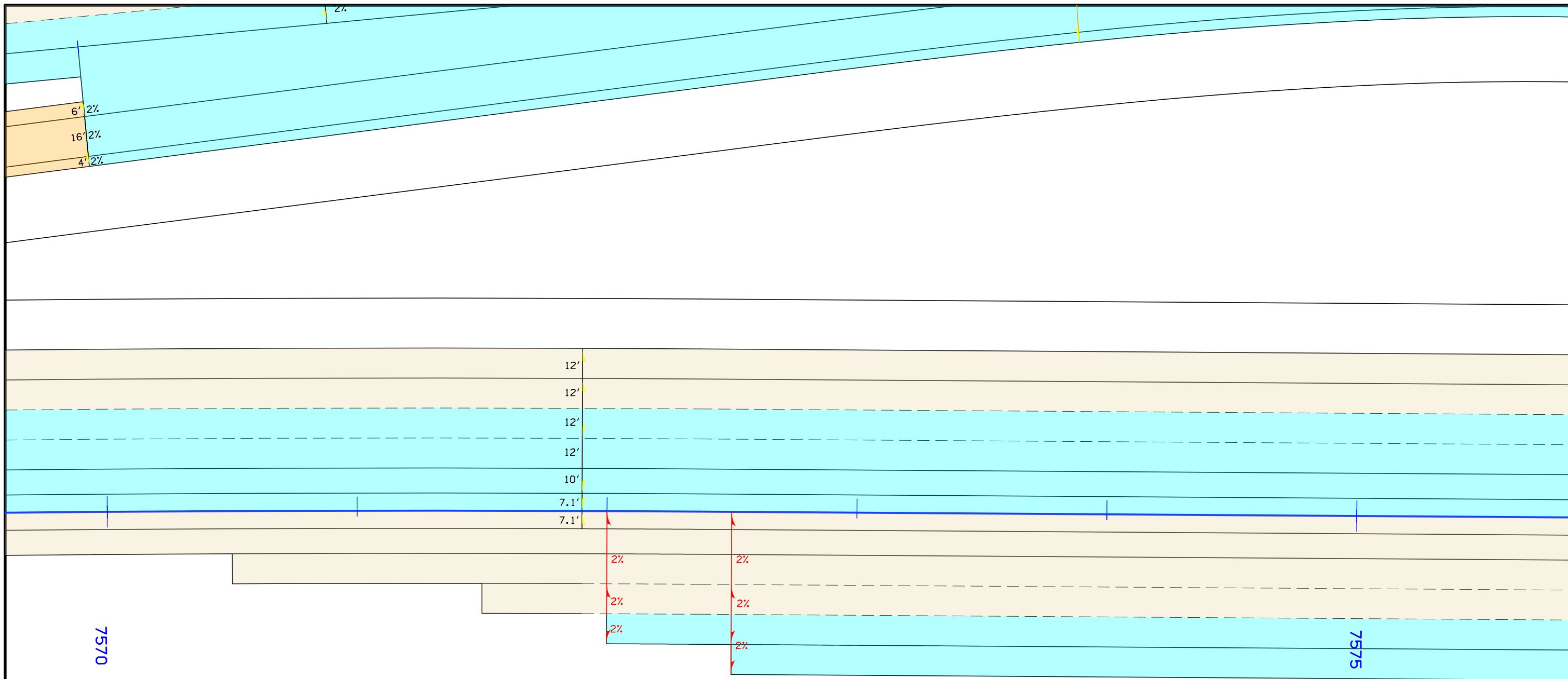
STAKING DETAILS

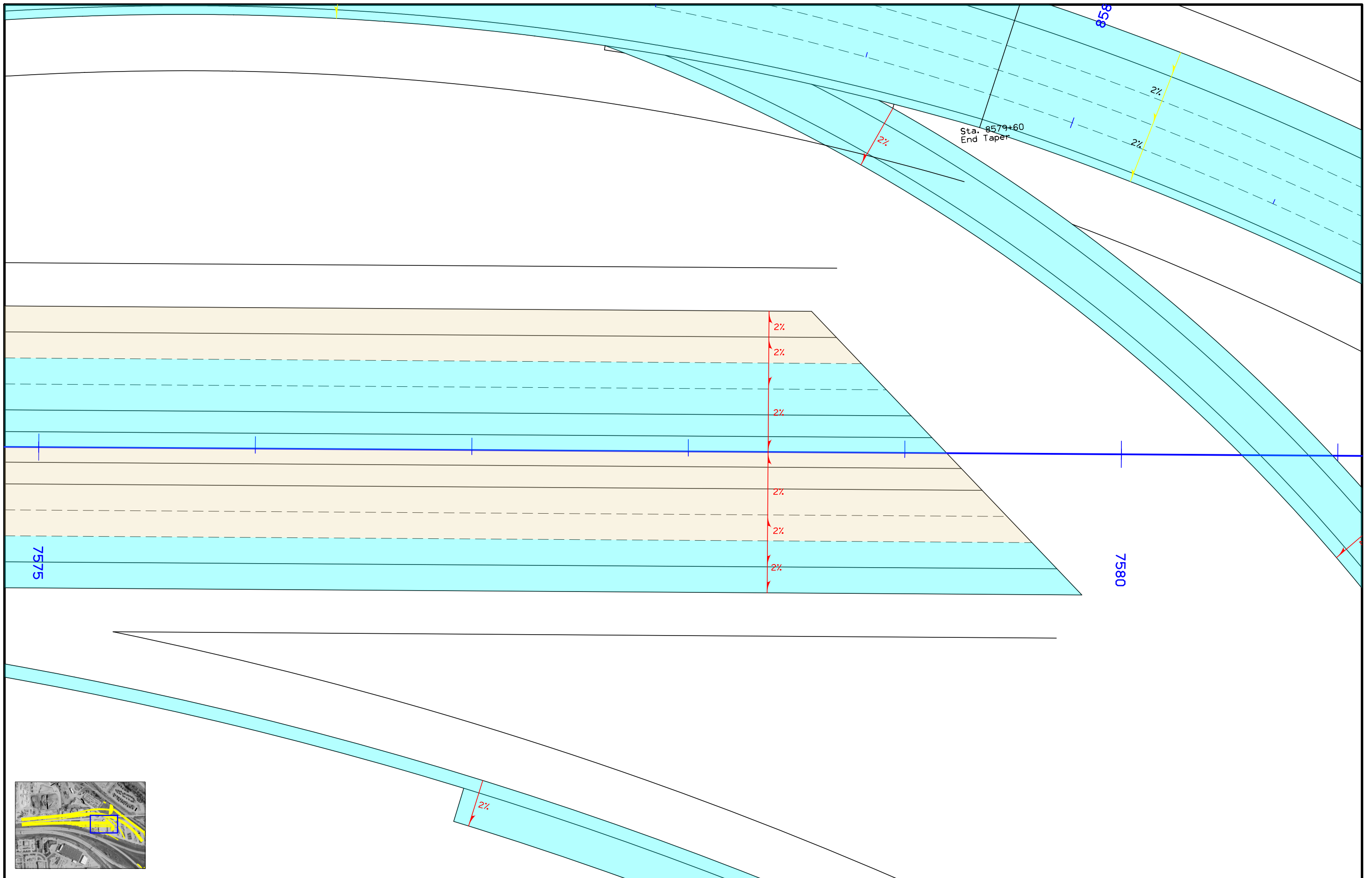


Sta. 8559+00



STAKING DETAILS





ENGLISH

IOWA DOT

DESIGN TEAM **Skogerboe\Strum\Brinkman\Janus**

**POTTAWATTAMIE** COUNTY

PROJECT NUMBER

**IM-NHS-080-1(370)4--03-78**

SHEET NUMBER **L.14**

### STORM SEWER

① Diameter or equivalent diameter  
\* Bid Item  
\*\* For SW-545

INTAKES AND UTILITY ACCESSES							PIPES												
							Design Length, Slope, and Flowlines are calculated from inside wall to inside wall along CL of pipe. An additional 3 ft length is added to each side of the Design Length to account for estimated length to center of structures.												
No.	Location Station and Offset	*Type or Standard Road Plan	Form Grade	Bottom Well	Extension Length**	Notes	Line Number	Intake/Utility Access No.		Class 'D'	Pipe Size	Bid* Length	Design Length	Slope %	Flow Lines			Pipe Profile Sheet No.	Notes
			Elev.	Elev.	FT			IN	FT		FT				Inlet Elevation	Outlet Elevation	Other Elevation		
I-80							P-A-10	A-10	A-20	2000	24	196	196.0	4.39	980.87	972.27		M.2	Remove Apron and Extend
A-10	7523+50 - 38.13' Lt			980.87															
A-20	7523+50 - 240.00' Lt			972															
I-80							P B-10	B-10	B-20	2000	24	192	190.0	2	995.53	991.69		M.4	
B-10	7551+90 - 17.6' Lt	SW-562	1000	995.03															
B-20	7551+90 - 211.1' Lt	RF-13 - 15 deg		991.69															
B-30	7551+90 - 274.7' Lt	RF-13 - 15 deg		972.7															
B-40	7551+90 - 311.1' Lt	RF-3		972.54															
I-29 NB							P C-10	C-10	C-20	2000	24	126	122.8	3.3	988.54	984.49		M.6	
C-10	8567+00 - 24.5' Rt	SW-562	996.28	988.04															
C-20	8567+00 - 101.7' Lt	SW-403	988.6	976.26															
C-30	8567+00 - 137.8' Lt	RF-3		976.57															
ESI Ramp B							P D-10	D-10	D-20	CMP	15	15	12.0		Verify	984.15		M.8	Remove 35' & Reinstall 12'
D-10	62577+41 - 104' Rt	Existing Intake																	
I-80							P B-10	B-10	B-20	2000	24	92	90.0	3	1001.68	998.98		M.10	Trenchless
E-10	7614+50 - 102.9' Rt	SW-562	1007.9	1001.18															
E-20	7614+50 - 164.6' Lt	RF-5		993.59															Trenched
Harry Langdon Blvd							P B-15	B-10	B-20	CMP	24	175	175.0	3	998.98	993.73		M.10	
F-10	3714+25 - 16' Rt	Existing Intake				Verify Existing Elev													
F-20	3414+25 - 22' Rt	SW-401 - 60"	998.1	986.85			P F-10	10	20	2000	24	12	8.0	2.1	992.11	991.94		M.12	
F-30		RF-3		986.51			P F-20	20	30	2000	24	50	48.0	2	987.6	986.64		M.12	



## SURVEY SYMBOLS

RET Retaining Walls	EB Electrical Box
E2 - ELB Underground Electric Line Co. 2	PPA Power Pole Co. 1
F07 - FOG Underground Fiber Optic Co. 7	MM Mile Marker Post
G2 - GLB Underground Gas Line Co. 2	SL Speed Limit Sign
F08 - FOH Underground Fiber Optic Co. 8	TVP TV Pedestal
St.S.2 - STB Storm Sewer Line Co. 2	TSL Traffic Signal and Luminaire
T11e - TIL Tile Line	GV Gas Valve
St.S. - STA Storm Sewer Line Co. 1	WEL Well
E1 - ELA Underground Electric Line Co. 1	TPA Telephone Pole Co. 1
E3 - ELC Underground Electric Line Co. 3	INB Storm Sewer Beehive Intake
F03 - FOC Underground Fiber Optic Co. 3	HT Electrical Highline Tower
W - WLA Underground Water Line Co. 1	TCB Traffic Signal Box
San. - SAA Sanitary Sewer Line Co. 1	RRB Railroad Signal Box
BB Billboard	TSB Telephone Switch Box
St.S.3 - STC Storm Sewer Line Co. 3	SI Sign
F02 - FOB Underground Fiber Optic Co. 2	TEV Evergreen Tree
G3 - GLC Underground Gas Line Co. 3	BB Billboard
F10 - FOJ Underground Fiber Optic Co. 10	FP Filler Pipe
G-HP - GHA Underground High Pres Gas Co 1	TR Telephone Riser Pole
G4-HP - GHD Underground High Pres Gas Co 4	SHR Shrub
G4 - GLD Underground Gas Line Co. 4	RRF Railroad Frog
G5 - GLE Underground Gas Line Co. 5	RR Centerline of Railroad Tracks
G - GLA Underground Gas Line Co. 1	PPB Power Pole Co. 2
MH Utility Access (Manhole)	D Centerline Draw or Stream (Down)
SI Sign	FCL Chain Link and Security Fence
LUM Luminaire	EW Edge of Water
TSG Traffic Signal	FW Wire Fence
IN Storm Sewer Intake	FWD Wood Fence
T1 - TLA Underground Telephone Line Co. 1	GDL Guard Rail Steel
WV Water Valve	DIK Centerline of Dike or Dam
FHD Fire Hydrants	UB Utility Box
T2 - TLB Underground Telephone Line Co. 2	TLNL Tree Line Left
F06 - FOF Underground Fiber Optic Co. 6	F05 - FOE Underground Fiber Optic Co. 5
F04 - FOD Underground Fiber Optic Co. 4	TLNR Tree Line Right
G2-HP - GHB Underground High Pres Gas Co 2	RRW Railroad Switch
G3-HP - GHC Underground High Pres Gas Co 3	D Centerline Draw or Stream (Down)
GPR Guard Post (4 or More Posts)	RRS Railroad Signal
F0 - FOA Underground Fiber Optic Co. 1	WHU RV Water Hook Up
FLG Flag Poles	AST Above Ground Storage Tank
GP Guard Post (Less Than 4 Posts)	HDG Hedge Row
UST Underground Tank	RIP Rip-Rap
STP Stump	TV - TVA Underground TV Cable Co. 1
LP L.P. Tank	F09 - FOI Underground Fiber Optic Co. 9
TV Satellite TV Dish	T4 -
TDC Tree Deciduous	T3 - TLC Underground Telephone Line Co. 3
OUT Tile Outlet	W3 - WLC Underground Water Line Co. 3
TGP Telegraph Pole	WH WHD Water Hydrant
TPD Telephone Pedestal	F11 - FOK Underground Fiber Optic Co. 11
PR Electric Riser Pole	

## UTILITY LEGEND

TP	CenturyLink - Local Ed Krieger 7404 N 78th Street, Bldg A Omaha, NE 68122 402-572-5856 edward.krieger@centurylink.com
T2	COX COMMUNICATIONS Dave Kloch 401 North 117th, Suite 101 Omaha, NE 68154 402-934-0550 dave.kloch@cox.com
TVP	
San.	CITY OF COUNCIL BLUFFS Sanitary Sewer Dave Vermillion 209 Pearl Street Council Bluffs, IA 51503 712-328-4635 dvermillion@Councilbluffs-ia.gov
W	CITY OF COUNCIL BLUFFS Brian Cady 2000 N 25th St P.O. Box 309 Council Bluffs, IA 51502 712-328-1006 x.1039 bcady@cbwaterworks.com
GV	BLACK HILLS ENERGY Brad Fleming 1102 East First Street Papillion, NE 68046 402-221-2714 brad.fleming@blackhillscorp.com
St.S.	City of Council Bluffs & IA DOT/State of Iowa Dick Mattox 3540 South Expressway Council Bluffs, IA 51501 712-366-6332 dick.mattox@dot.iowa.gov
G	OneOk NGL Pipeline, LLC Troy Schuermann P.O. Box 29 2001 S. Hwy 81 Medford, OK 73759 580-395-6329 troy.schuermann@oneok.com
E1	
F07	
F08	
T1	
St.S.2	

## PLAN VIEW COLOR LEGEND OF STORM SEWER SHEETS

LINEWORK	Design Color No.	Description
Gray, Dark	(112)	Existing Topographic Features, Utilities, and Labels
Black	(17)	Proposed Storm Sewer Details, Alignment, Stationing, T/c Marks, and Alignment Annotation

SHADING	Design Color No.	Description
Gray, Light	(48)	Proposed Pavement Shading

## PROFILE VIEW COLOR LEGEND OF STORM SEWER SHEETS

LINEWORK	Design Color No.	Description
Gray, Dark	(112)	Existing Ground Line Profile and Existing Utilities Information
Black	(17)	Proposed Pipes and Intakes

## PLAN VIEW LINE STYLE LEGEND OF STORM SEWER SHEETS

	Plug and Abandon Existing Pipe or Structure
	Removal of Existing Pipe or Structure
	Previously Constructed Pipe or Structure
	Direction of Pipe Flow

## PROFILE VIEW LINE STYLE LEGEND OF STORM SEWER SHEETS

	Existing Ground
	Proposed Ground
	Previously Constructed Pipe or Structure
	Proposed Pipe or Structure

## RIGHT-OF-WAY LEGEND

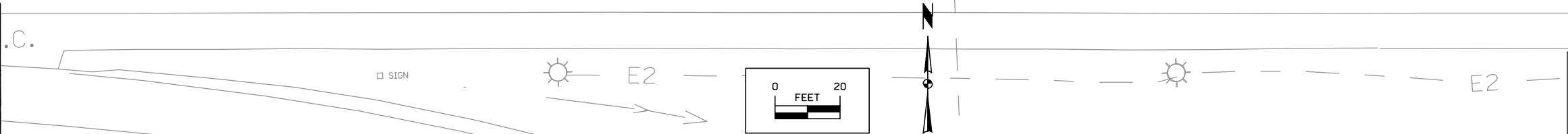
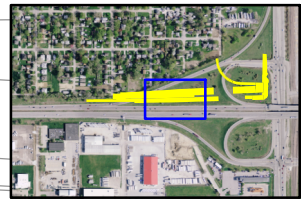
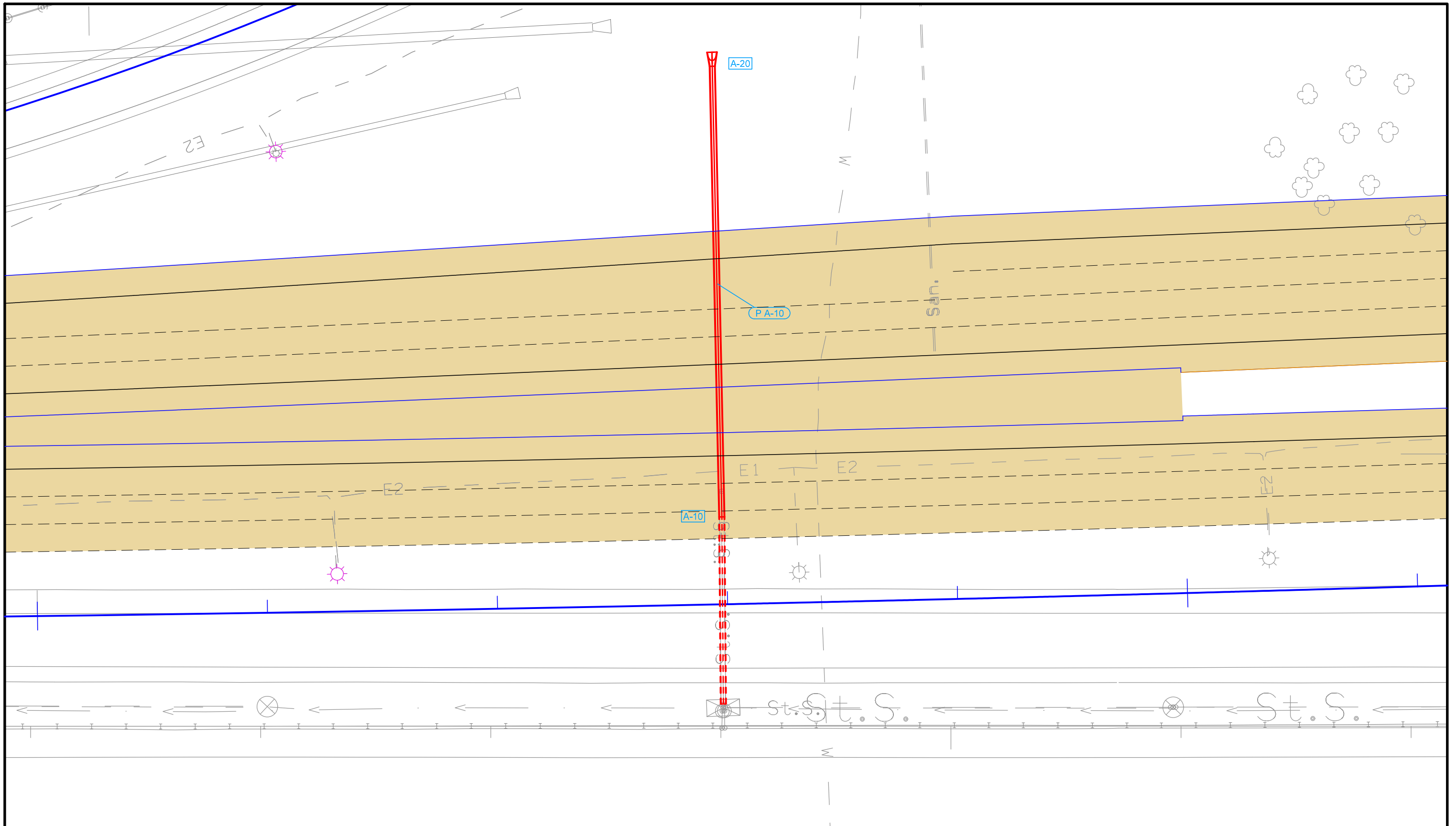
	Proposed Right-of-Way
	Existing and Proposed Right-of-Way
	Easement and Existing Right-of-Way
	Borrow
	Easement (Temporary)
	Easement
	Excess
	Access Control

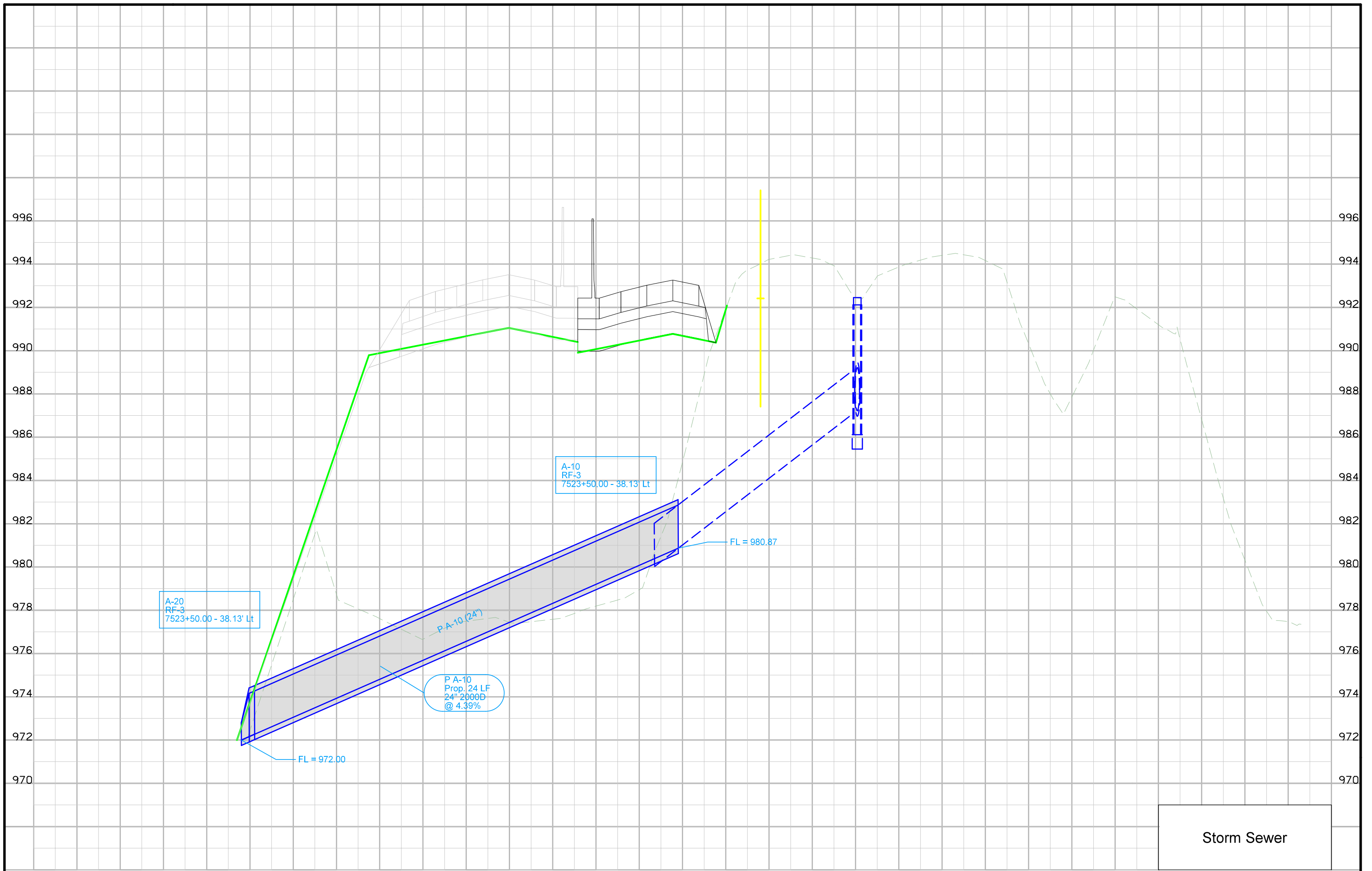
Reference Point	
	Station
	Survey Line
	Section Corner
	Ground Line Intercept
	Saw Cut
	Guardrail
	Clearing & Grubbing Area
	Pavement Removal

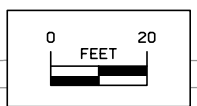
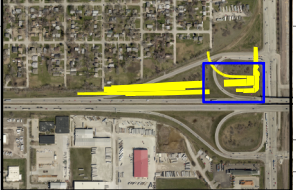
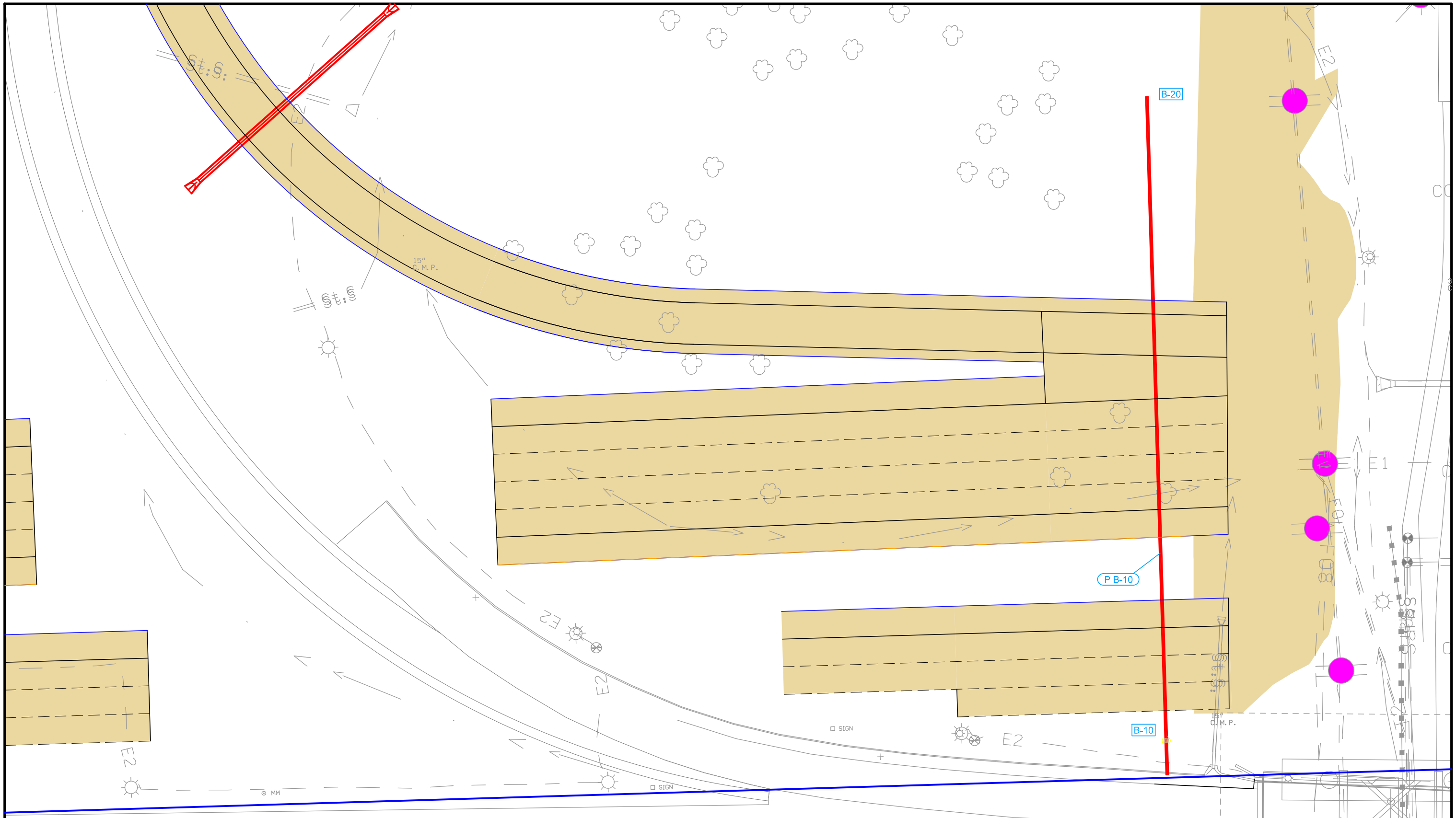
# STORM SEWER LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES M)

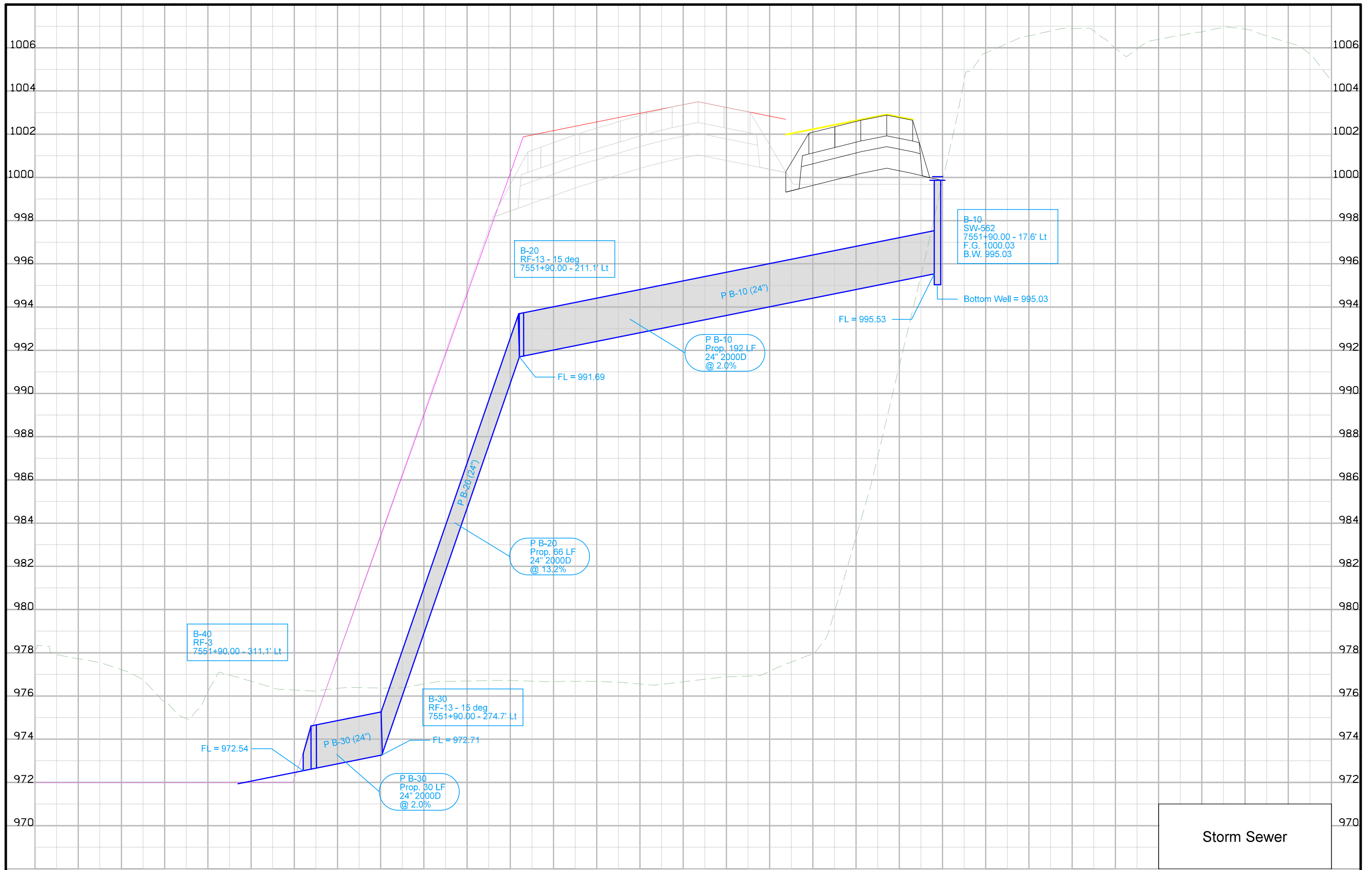


**STORM SEWER**

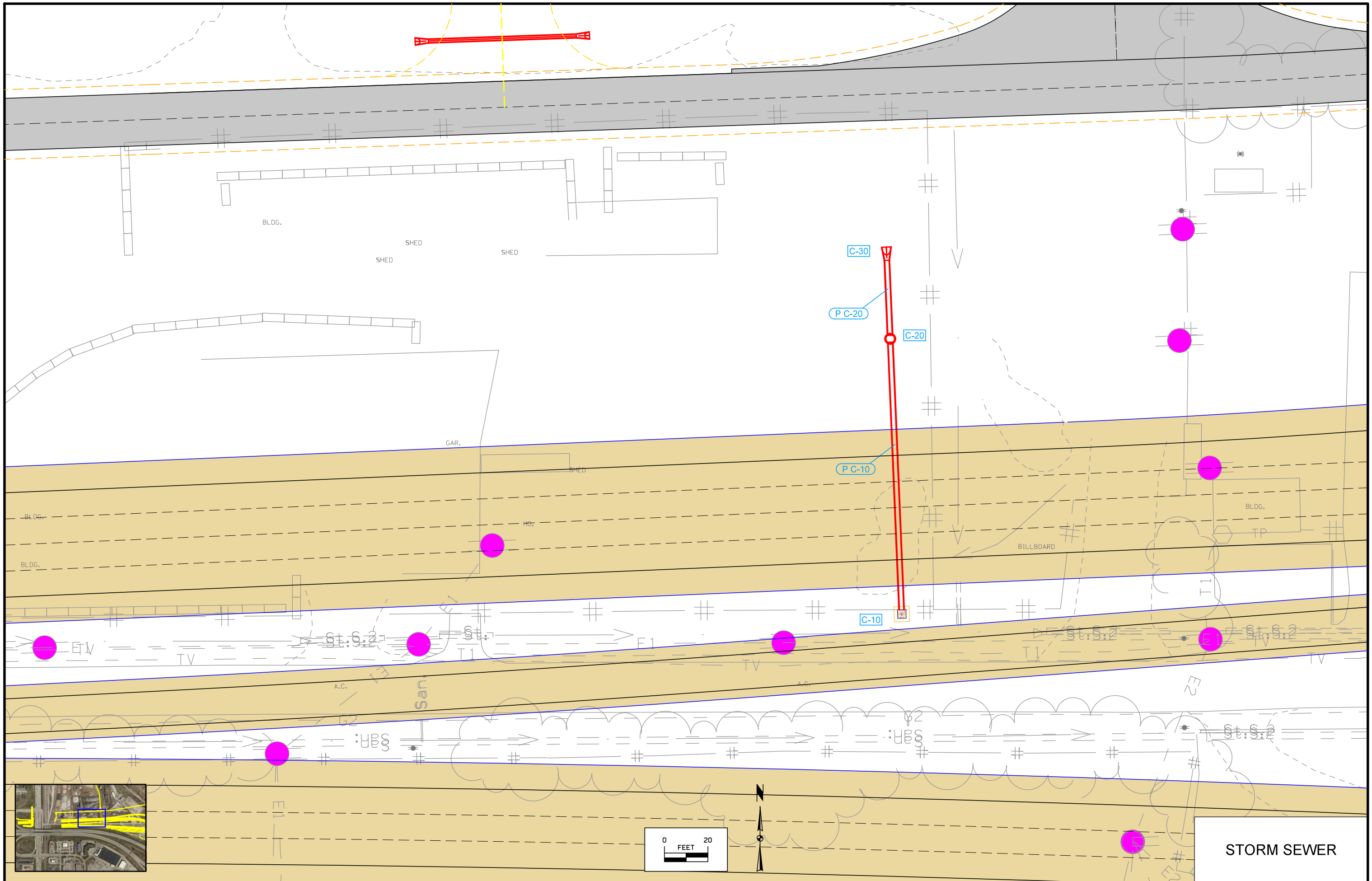


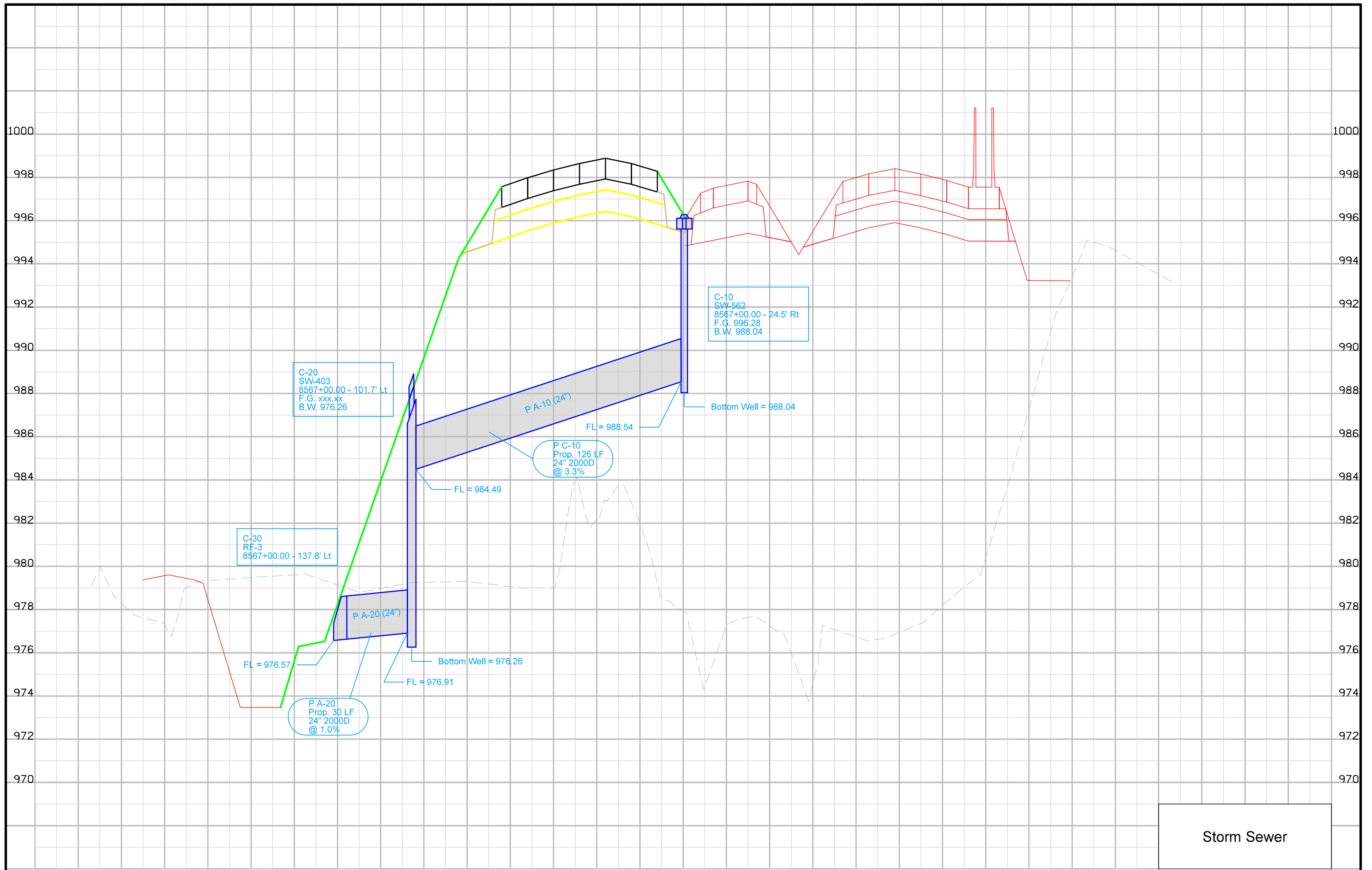


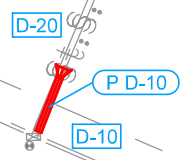
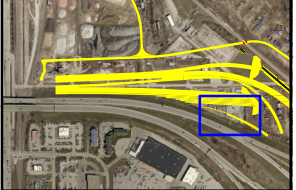
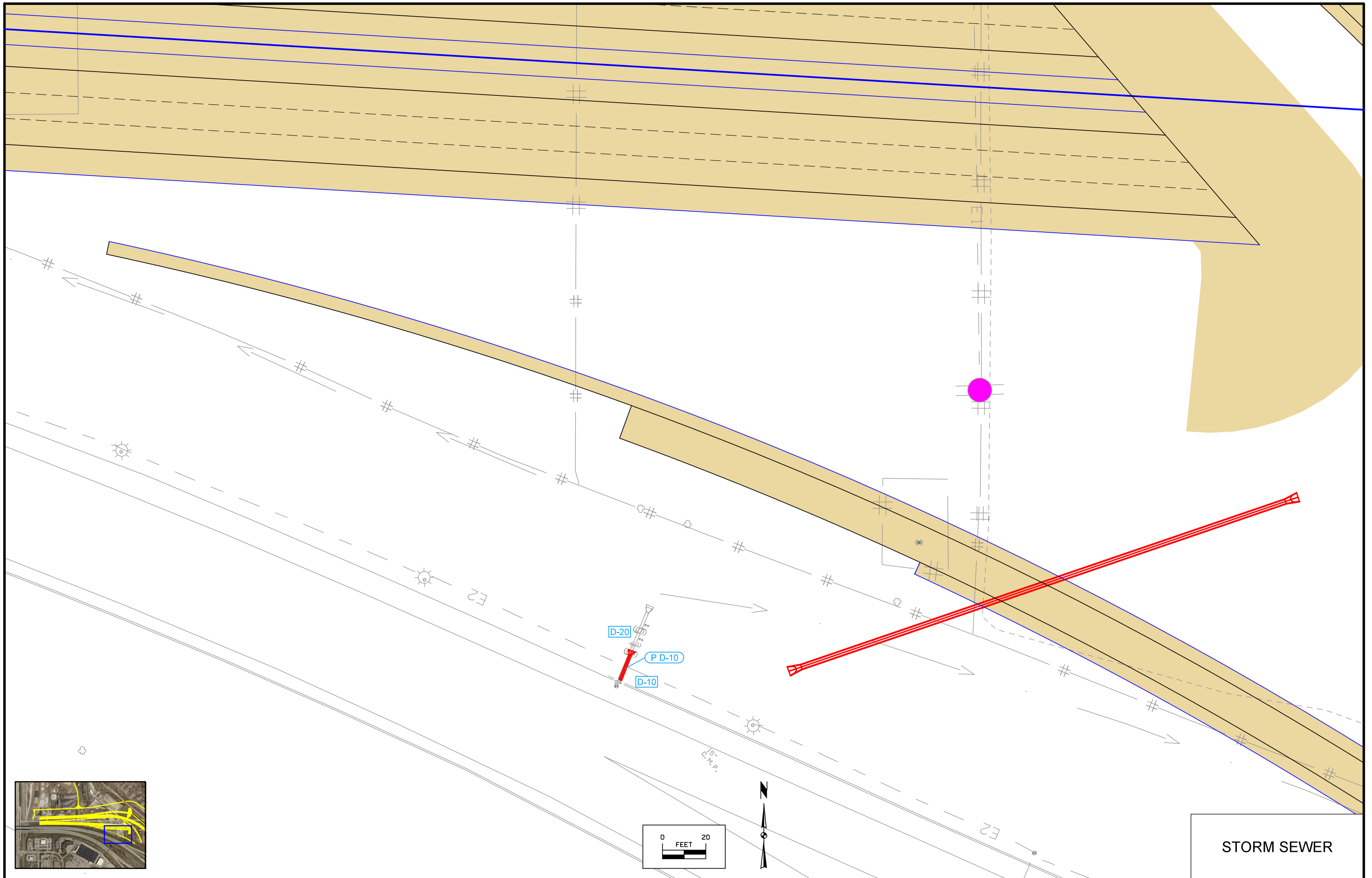
OVERHEAD SIGN  
**STORM SEWER**



Storm Sewer



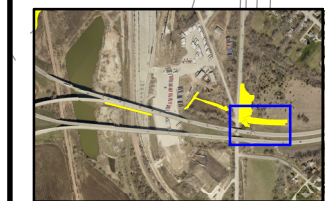
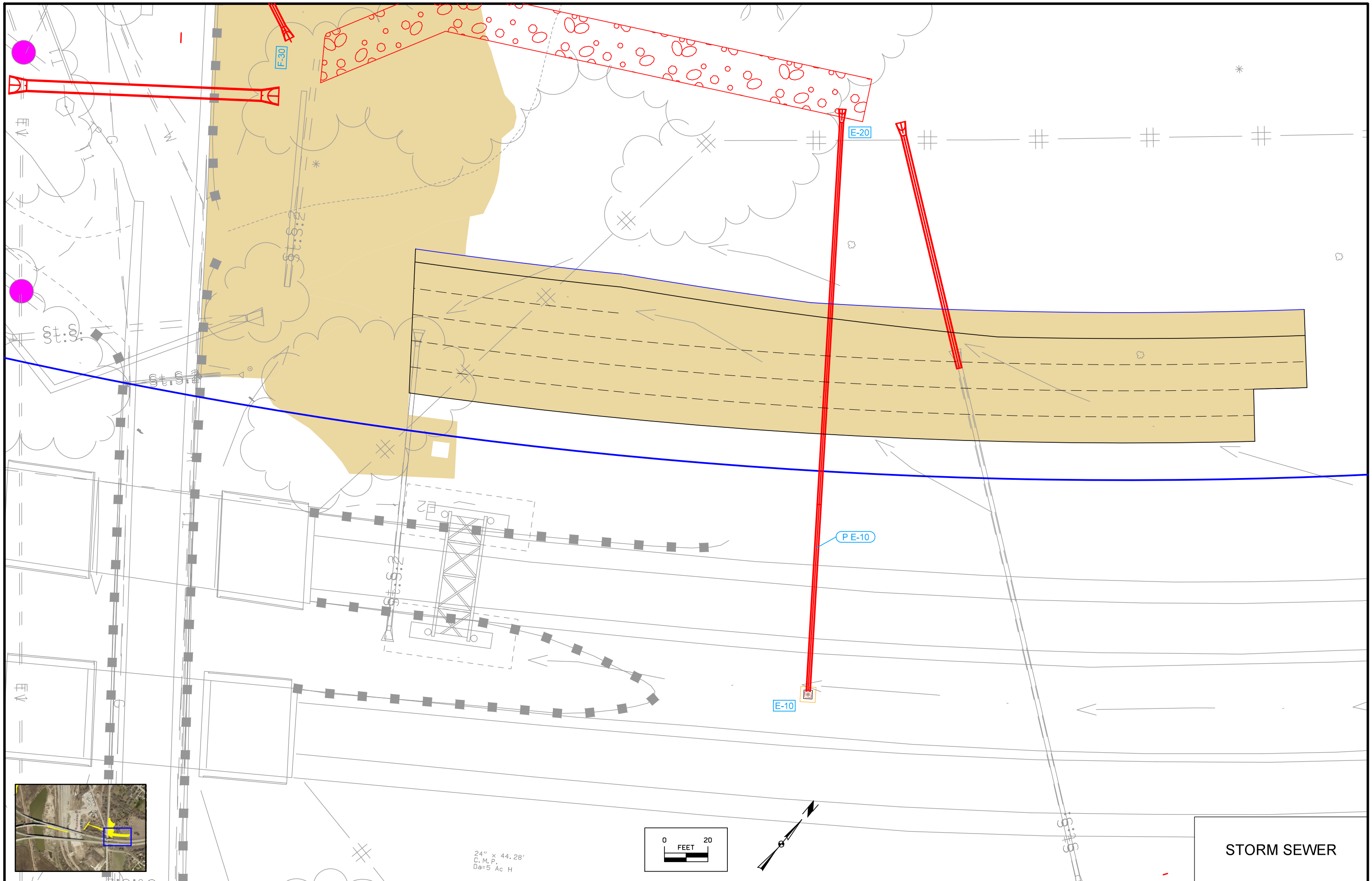




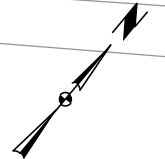
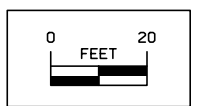
**STORM SEWER**



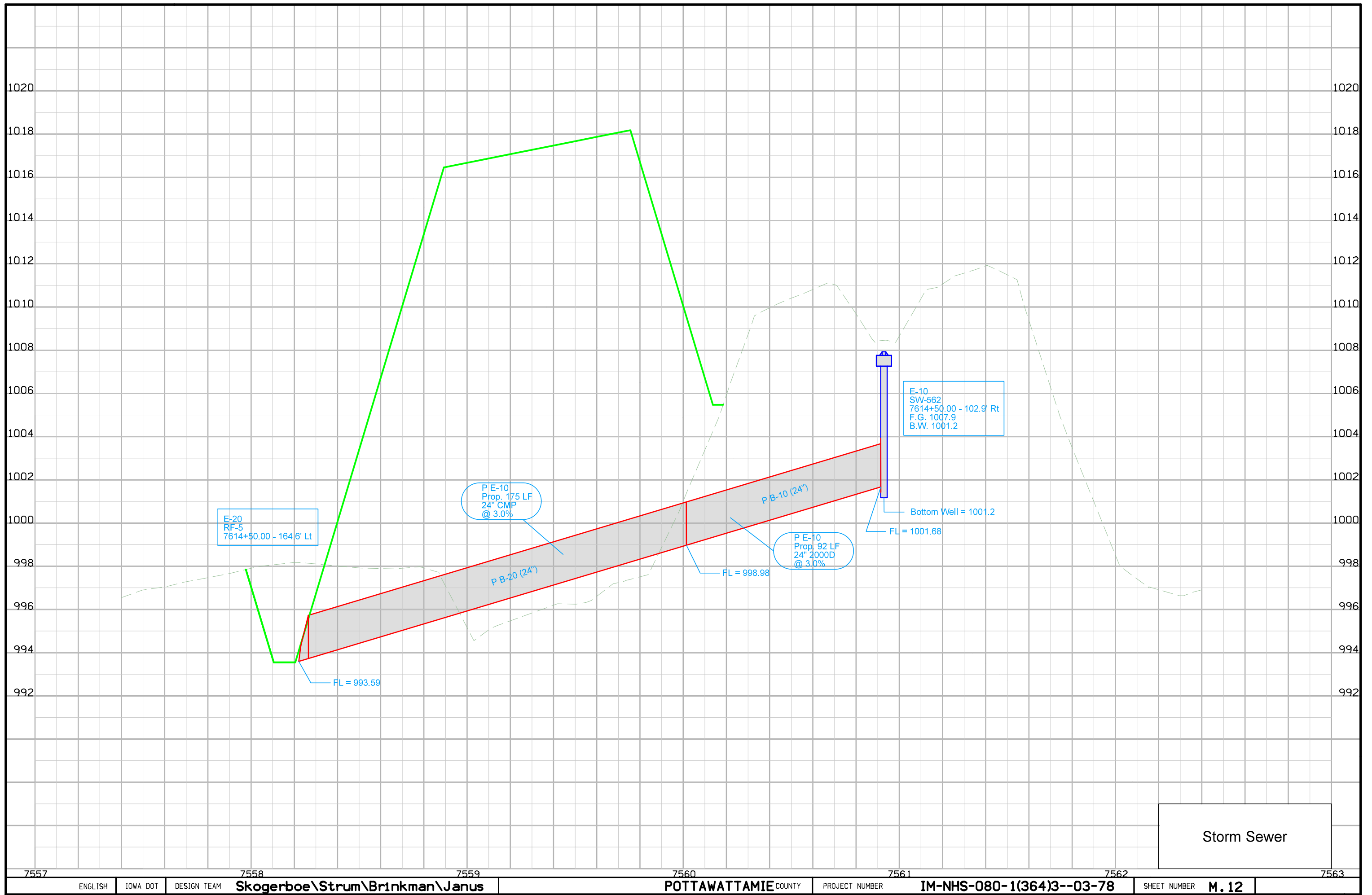




**STORM SEWER**



24" x 44.28'  
C.M.P.  
Da=5 Ac H



E-20  
RF-5  
7614+50.00 - 164.6' Lt

P E-10  
Prop. 175 LF  
24" CMP  
@ 3.0%

P E-10  
Prop. 92 LF  
24" 2000D  
@ 3.0%

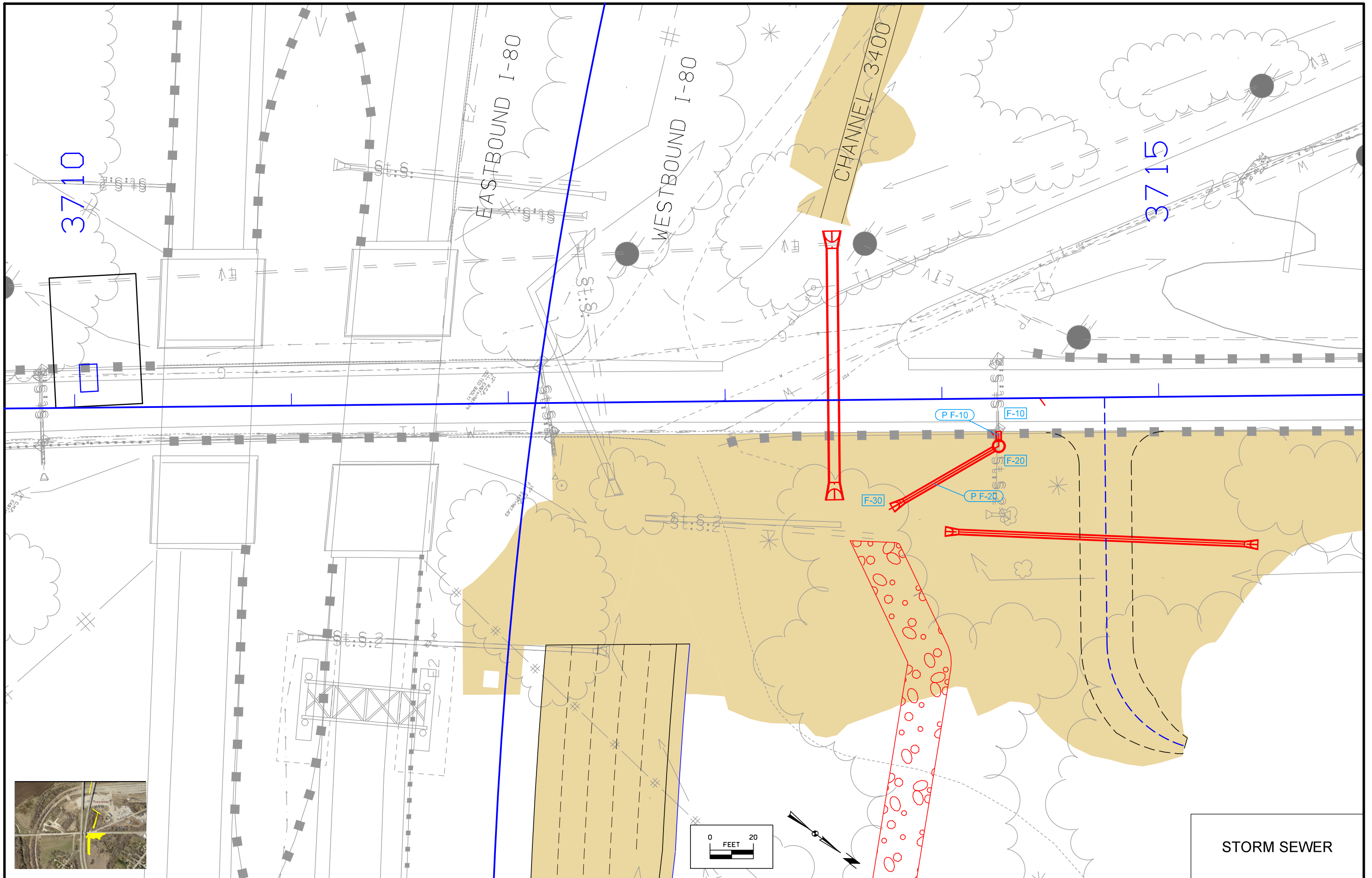
E-10  
SW-562  
7614+50.00 - 102.9' Rt  
F.G. 1007.9  
B.W. 1001.2

FL = 993.59

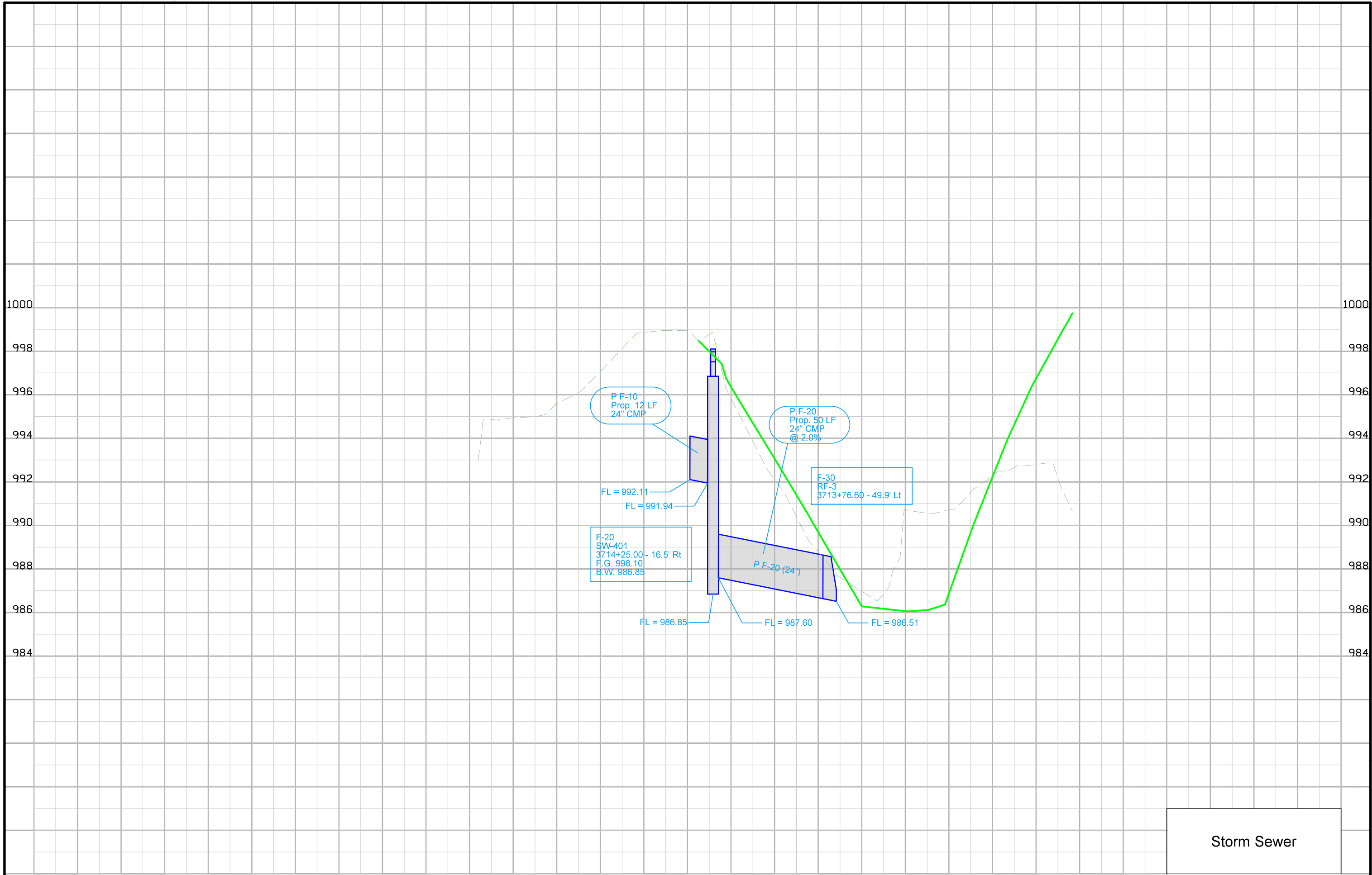
FL = 998.98

Bottom Well = 1001.2  
FL = 1001.68

Storm Sewer



STORM SEWER



Storm Sewer

### SURVEY SYMBOLS

- EW Edge of Water
- HDG Hedge Row
- INB Storm Sewer Beehive Intake
- BNK Stream Bank
- ENU Edge Unpaved Entrance & Parking
- SNP Unpaved Shoulder
- FCL Chain Link and Security Fence
- FWD Wood Fence
- GDL Guard Rail (Rail and Cable)
- RR Centerline of Railroad Tracks
- RET Retaining Walls
- RIP Rip-Rap
- TEV Evergreen Tree
- TDC Tree Deciduous
- LUM Luminaire
- PPA Power Pole Co. 1
- SI Sign
- TA Tower Anchor
- SWP Swamp or Marsh
- MIS Miscellaneous
- UB Utility Box
- MH Utility Access (Manhole)
- IN Storm Sewer Intake
- TV Satellite TV Dish
- GP Guard Post (Less Than 4 Posts)
- FHD Fire Hydrants
- FLG Flag Poles
- TSG Traffic Signal

### UTILITY LEGEND

- E3 Alliant Energy  
Contact: Jason Hogen  
Phone: 608-458-4871
- E4 Alliant Energy  
Contact: Jason Hogen  
Phone: 608-458-4871
- San. City of Cedar Rapids  
Contact: Ken Russell/Haley Roe  
Phone: 319-286-5956  
Fax: 319-286-5911
- San.2 City of Palo  
Contact: Stacy Dix/Tom Watson  
Phone: 319-851-2731  
Fax: 319-851-2734
- T1 IMON Communication  
Contact: Lennox Marner  
Phone: 319-261-4640  
Fax: 319-261-4636
- F0 Iowa Communications Network  
Contact: Kent Freise  
Phone: 515-725-4725
- F02 Iowa Network Services  
Contact: Jeff Klocko  
Phone: 515-830-0445
- E1 Linn County REC  
Contact: Johnna Nunemaker/Rob Hursh  
Phone: 319-377-5754 (Ext: 216)
- E2 Linn County REC  
Contact: Johnna Nunemaker/Rob Hursh  
Phone: 319-377-5754 (Ext: 216)
- G MidAmerican Energy Co.  
Contact: Greg Wildebour/Kerri Temple  
Phone: 319-298-5162  
Fax: 319-298-5164
- TV Mediacom Broadband, LLC  
Contact: John Kuba  
Phone: 319-395-9699
- F05 PAETEC  
Contact: Steven Gritman  
Phone: 319-790-7560
- T2 Qwest Communication  
Contact: Vaughn Doughrty  
Phone: 319-399-7487
- T3 Qwest Communication  
Contact: Vaughn Doughrty  
Phone: 319-399-7487
- E5 ITC Midwest  
Contact: Chad Levi  
Phone: 319-297-6765

### PLAN VIEW COLOR LEGEND OF SOILS SHEETS

LINEWORK	Design Color No.	Description
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.	Description
Brown, Light	(236)	Core Out

### PROFILE VIEW COLOR LEGEND OF SOILS SHEETS

LINEWORK	Design Color No.	Description
Blue	(1)	Proposed Alignment, Stationing, and Alignment Annotation
Green	(2)	Existing Ground Line Profile
Green, Med	(227)	Class 10 Topsoil
Green, M.Light	(226)	Unsuitable A Topsoil
Green, Light	(225)	Unsuitable B Topsoil
Green, V.Light	(224)	Unsuitable C Topsoil
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

Soils Book No.	Date(s) Drilled	Description	Description

### UNIQUE SYMBOLS FOR THIS PROJECT

- BORING
- SETTLEMENT PLATE
- GROUND IMPROVEMENTS - RIGID INCLUSION
- GROUND IMPROVEMENTS - RIGID INCLUSION - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS

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

### RIGHT-OF-WAY LEGEND

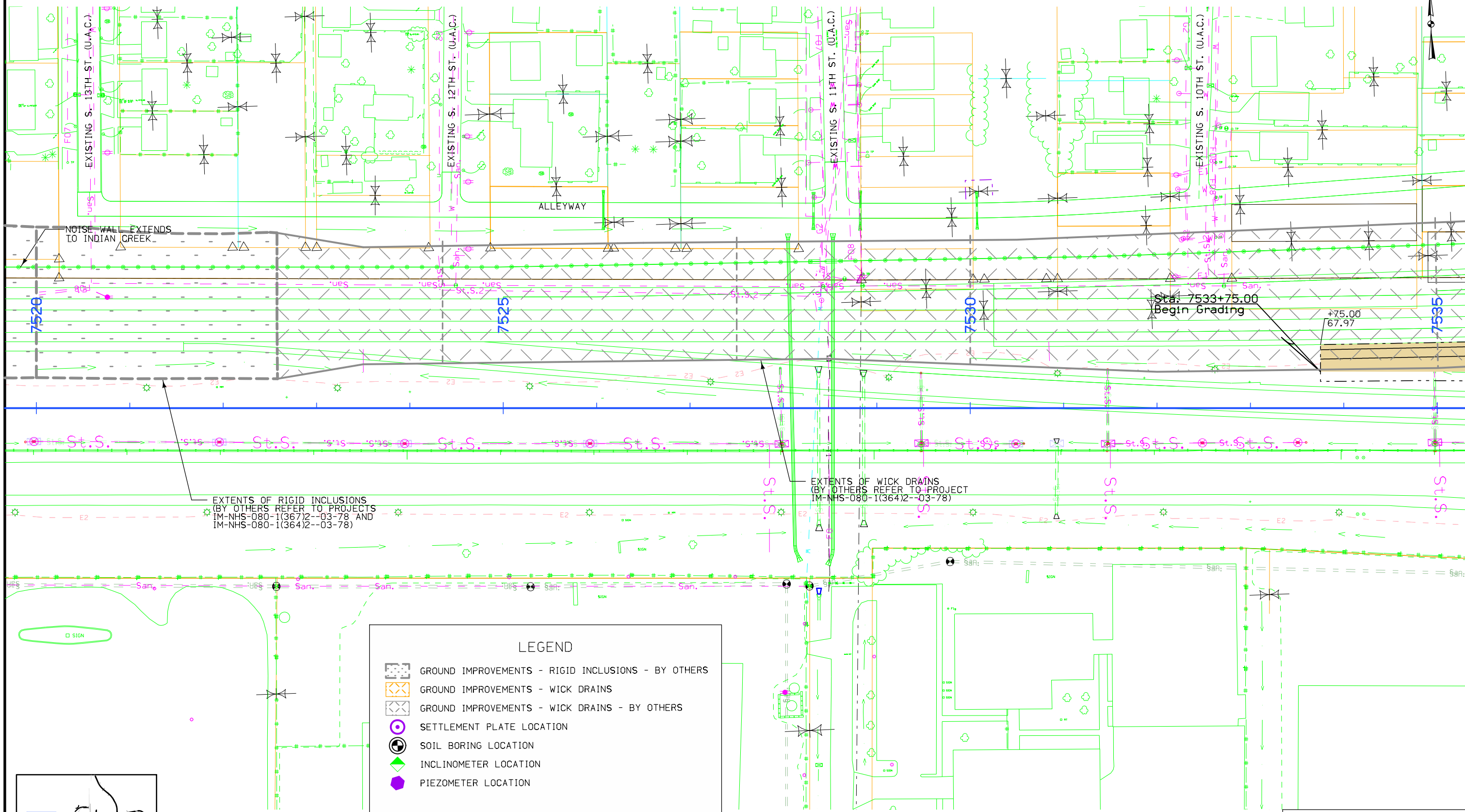
- Proposed Right-of-Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- Access Control

## SOILS LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES Q & R)

Lewis TWP.  
T-74N R-44W  
SEC. 2

Lewis TWP.  
T-74N R-44W  
SEC. 1



EXTENTS OF RIGID INCLUSIONS  
(BY OTHERS REFER TO PROJECTS  
IM-NHS-080-1(367)2--03-78 AND  
IM-NHS-080-1(364)2--03-78)

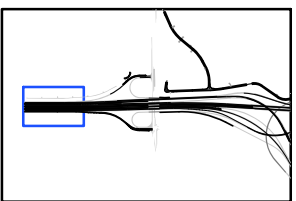
EXTENTS OF WICK DRAINS  
(BY OTHERS REFER TO PROJECT  
IM-NHS-080-1(364)2--03-78)

Sta. 7533+75.00  
Begin Grading

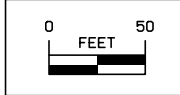
+75.00  
67.97

**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

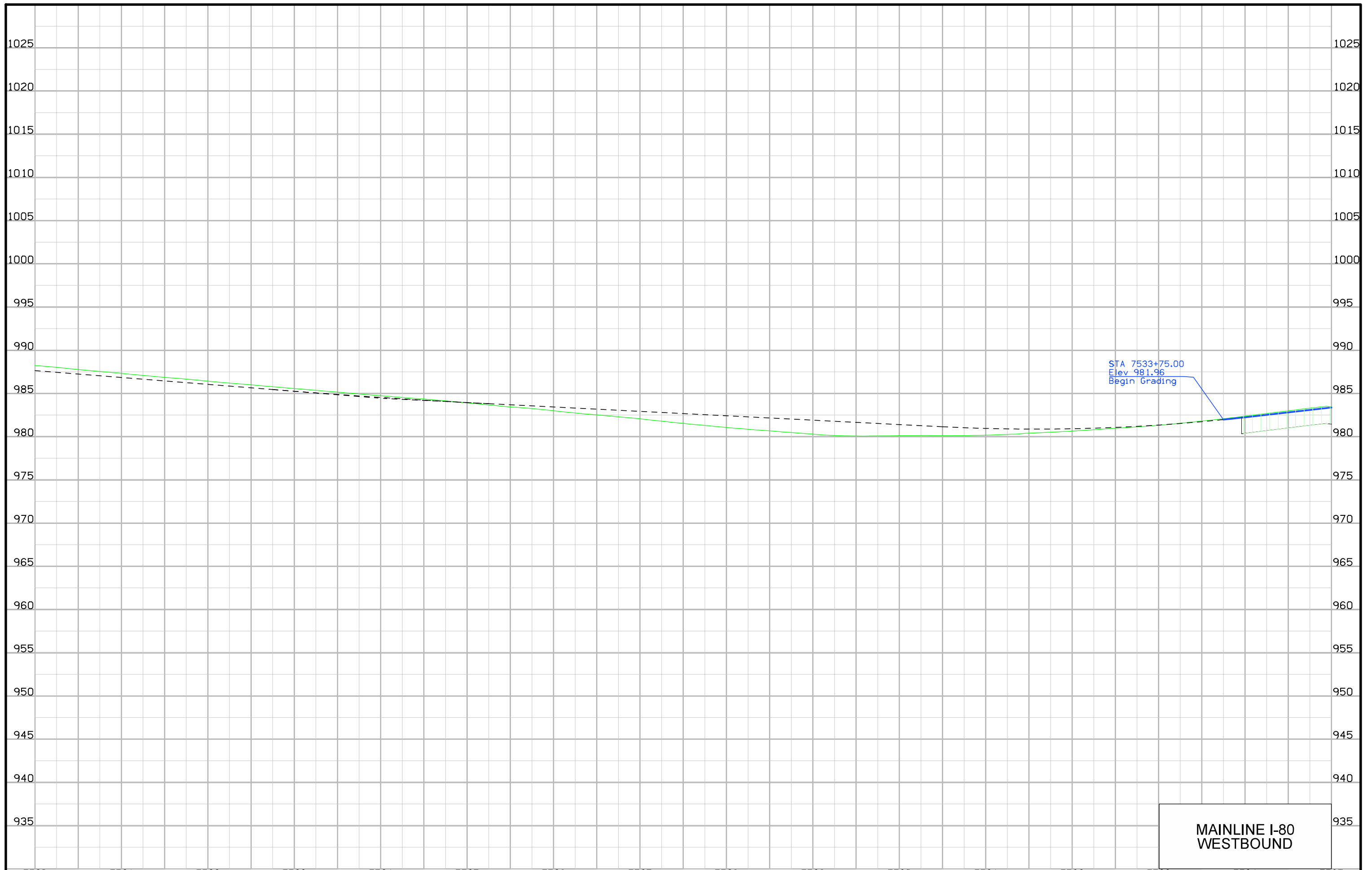


Lewis TWP.  
T-74N R-44W  
SEC. 11



Lewis TWP.  
T-74N R-44W  
SEC. 12

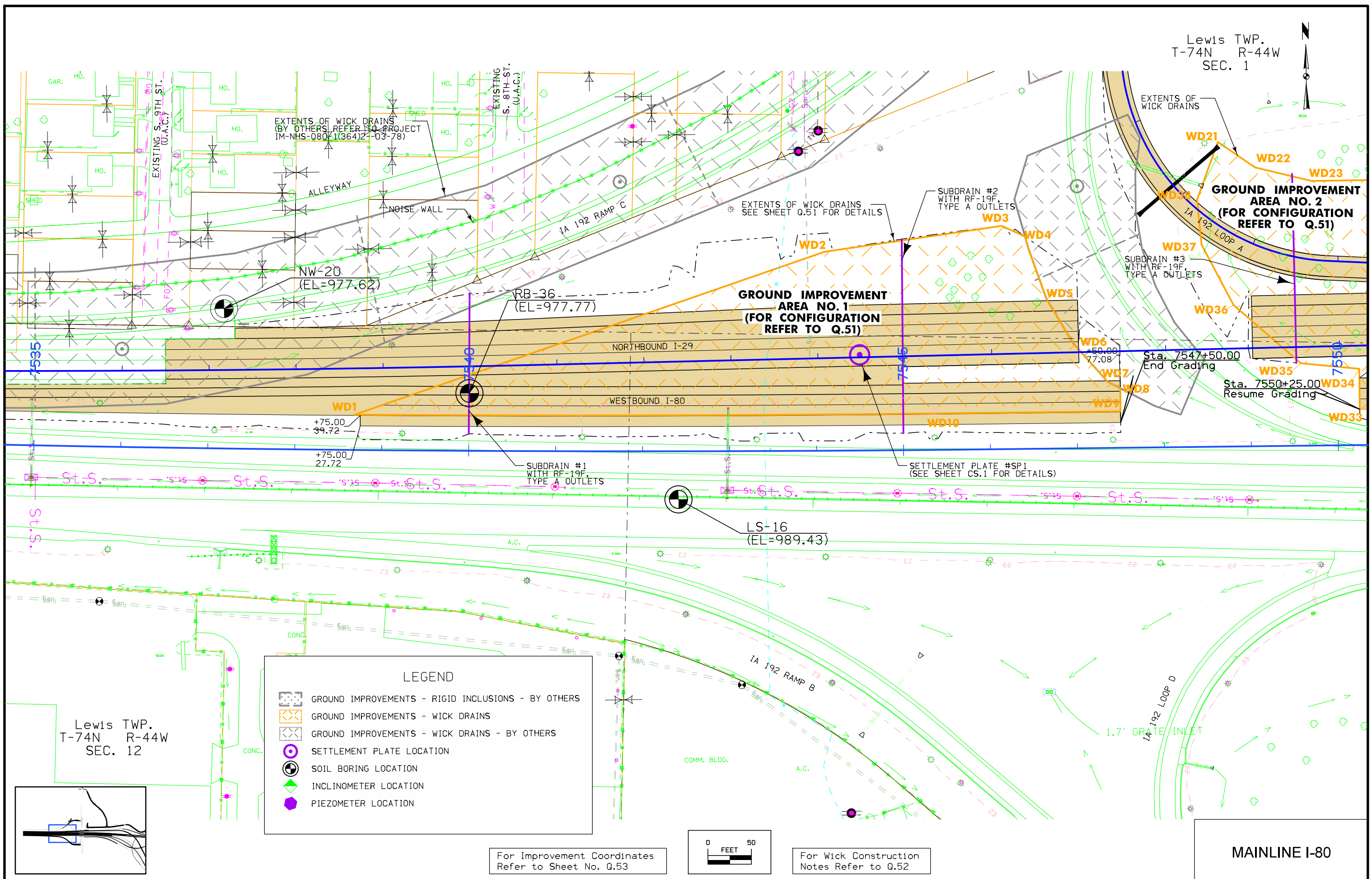
**MAINLINE I-80**



MAINLINE I-80  
WESTBOUND



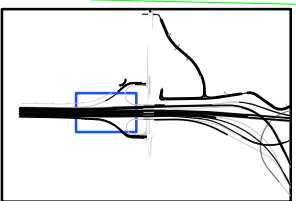
Lewis TWP.  
T-74N R-44W  
SEC. 1



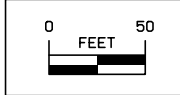
**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

Lewis TWP.  
T-74N R-44W  
SEC. 12

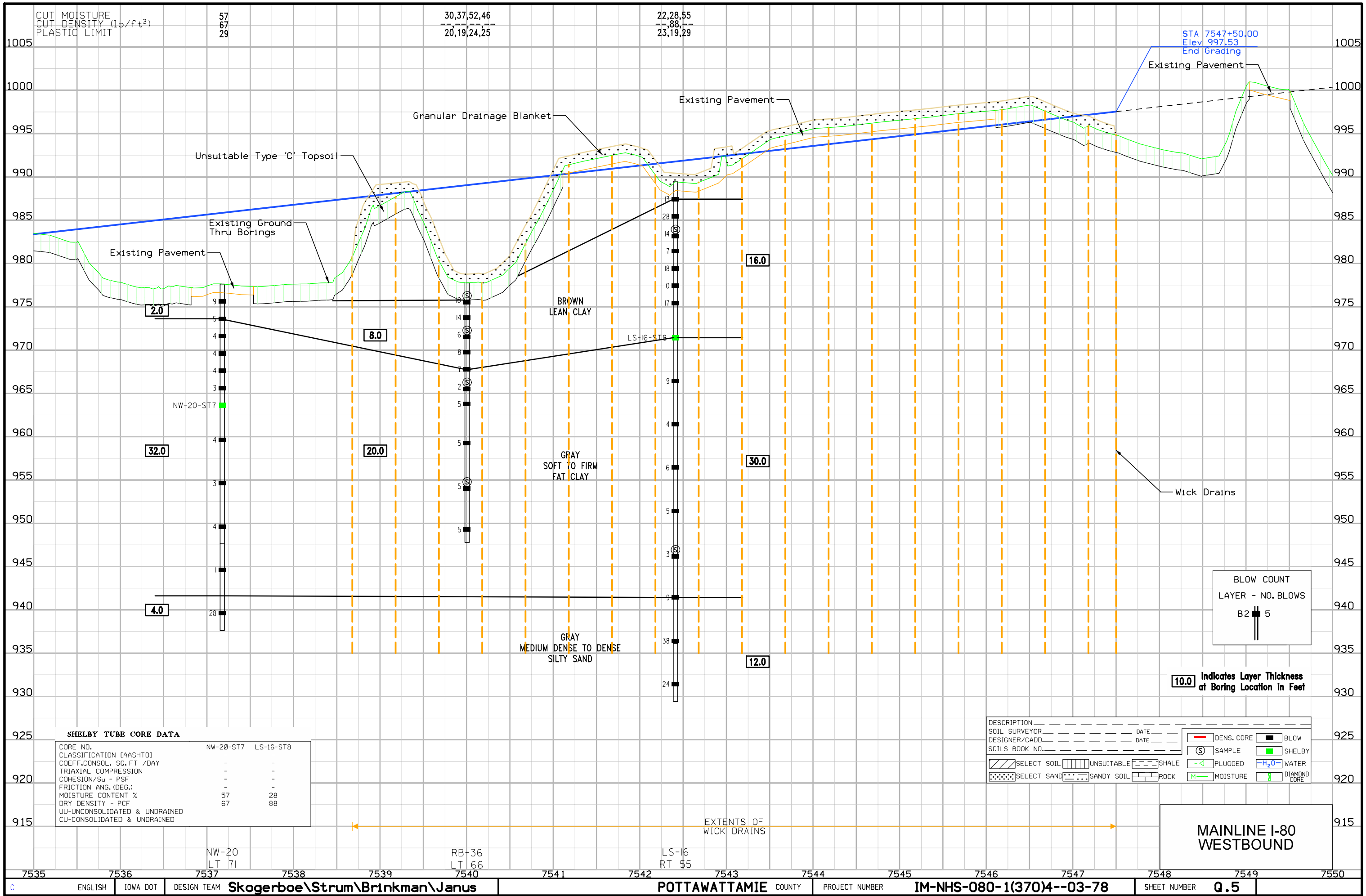


For Improvement Coordinates  
Refer to Sheet No. Q.53



For Wick Construction  
Notes Refer to Q.52

**MAINLINE I-80**



**SHELBY TUBE CORE DATA**

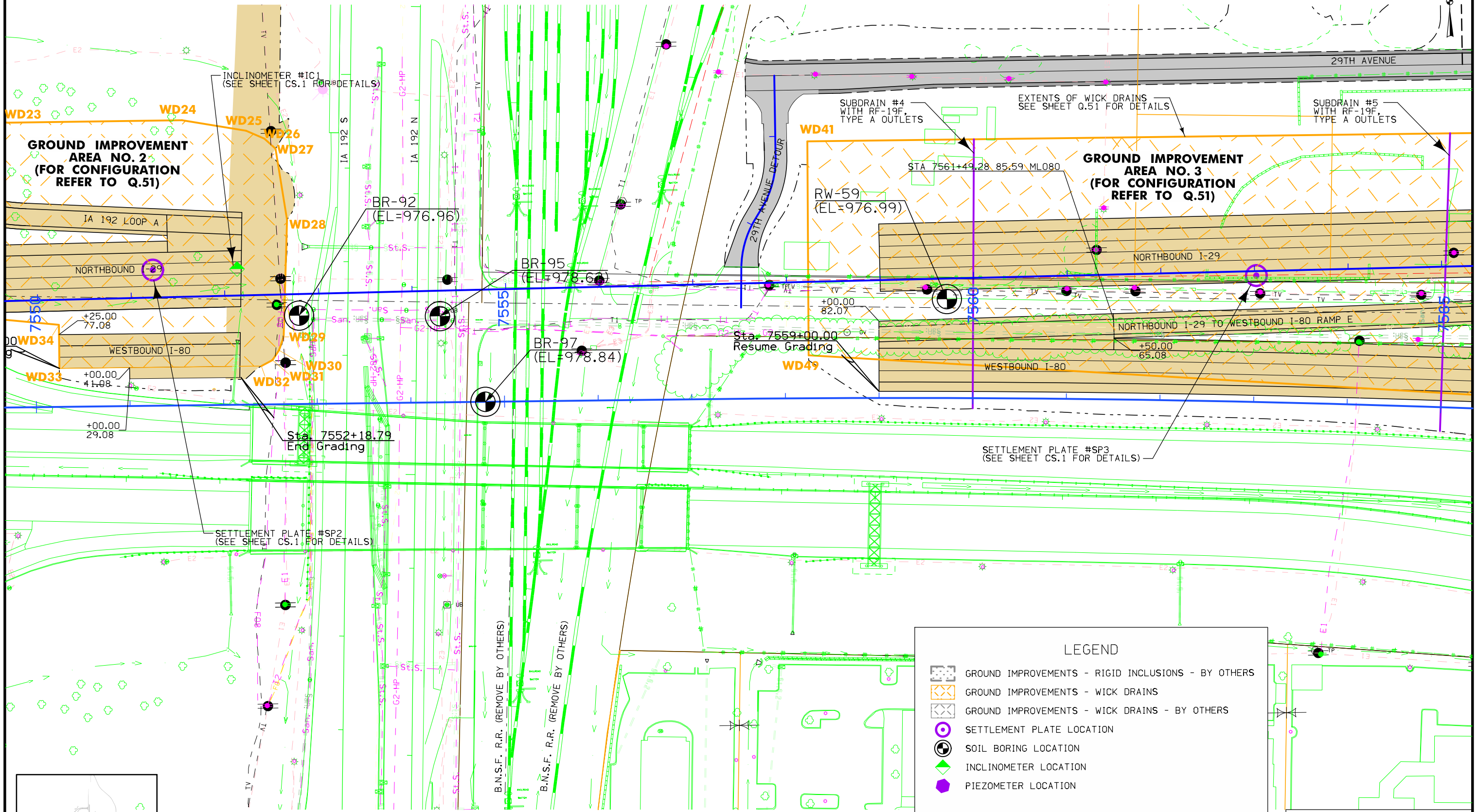
CORE NO.	NW-20-ST7	LS-16-ST8
CLASSIFICATION [AASHTO]	-	-
COEFF. CONSOL. SQ. FT / DAY	-	-
TRIAxIAL COMPRESSION	-	-
COHESION/S <sub>u</sub> - PSF	-	-
FRICTION ANG. (DEG.)	-	-
MOISTURE CONTENT %	57	28
DRY DENSITY - PCF	67	88
UU-UNCONSOLIDATED & UNDRAINED	-	-
CU-CONSOLIDATED & UNDRAINED	-	-

**DESCRIPTION**

SOIL SURVEYOR _____	DATE _____	DESIGNER/CADD _____	DATE _____
SOILS BOOK NO. _____			
[Symbol] SELECT SOIL	[Symbol] UNSUITABLE	[Symbol] SHALE	[Symbol] BLOW
[Symbol] SELECT SAND	[Symbol] SANDY SOIL	[Symbol] ROCK	[Symbol] SHELBY
[Symbol] PLUGGED	[Symbol] WATER	[Symbol] MOISTURE	[Symbol] DIAMOND CORE

**MAINLINE I-80 WESTBOUND**

Lewis TWP.  
T-74N R-44W  
SEC. 1

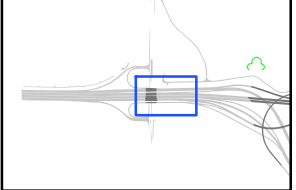


**GROUND IMPROVEMENT AREA NO. 2**  
(FOR CONFIGURATION REFER TO Q.51)

**GROUND IMPROVEMENT AREA NO. 3**  
(FOR CONFIGURATION REFER TO Q.51)

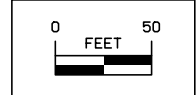
**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION



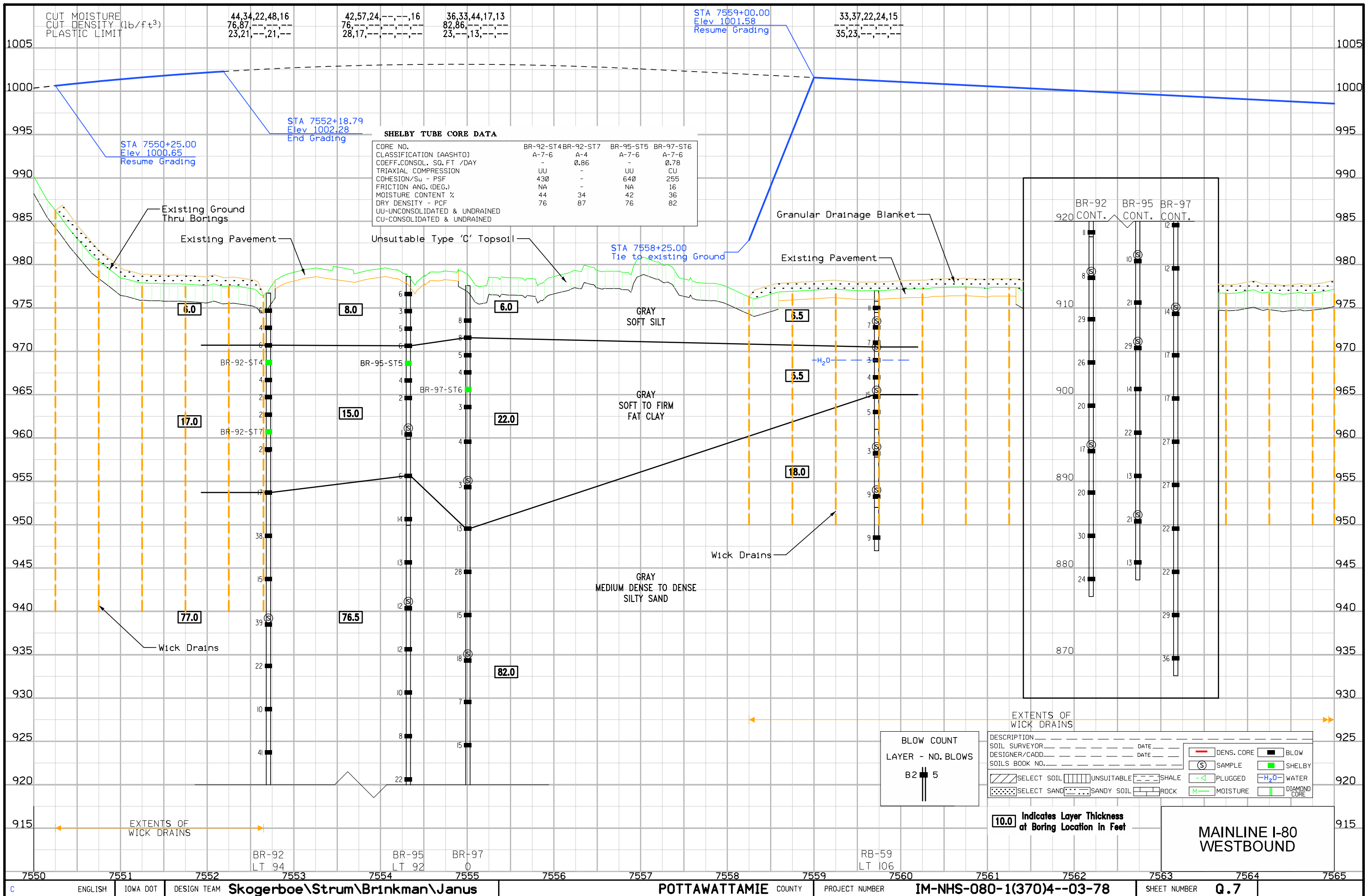
Lewis TWP.  
T-74N R-44W  
SEC. 12

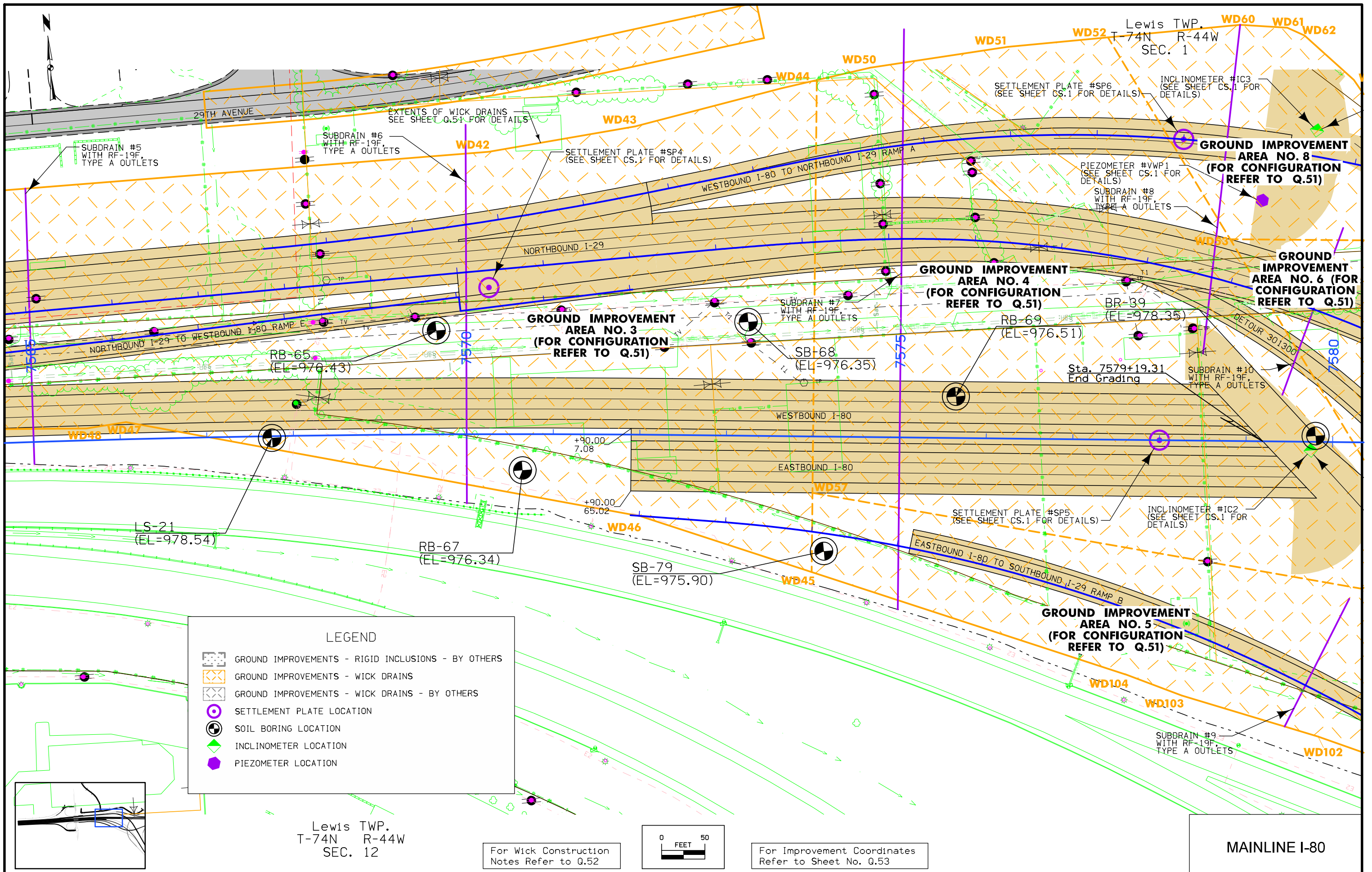
For Wick Construction  
Notes Refer to Q.52

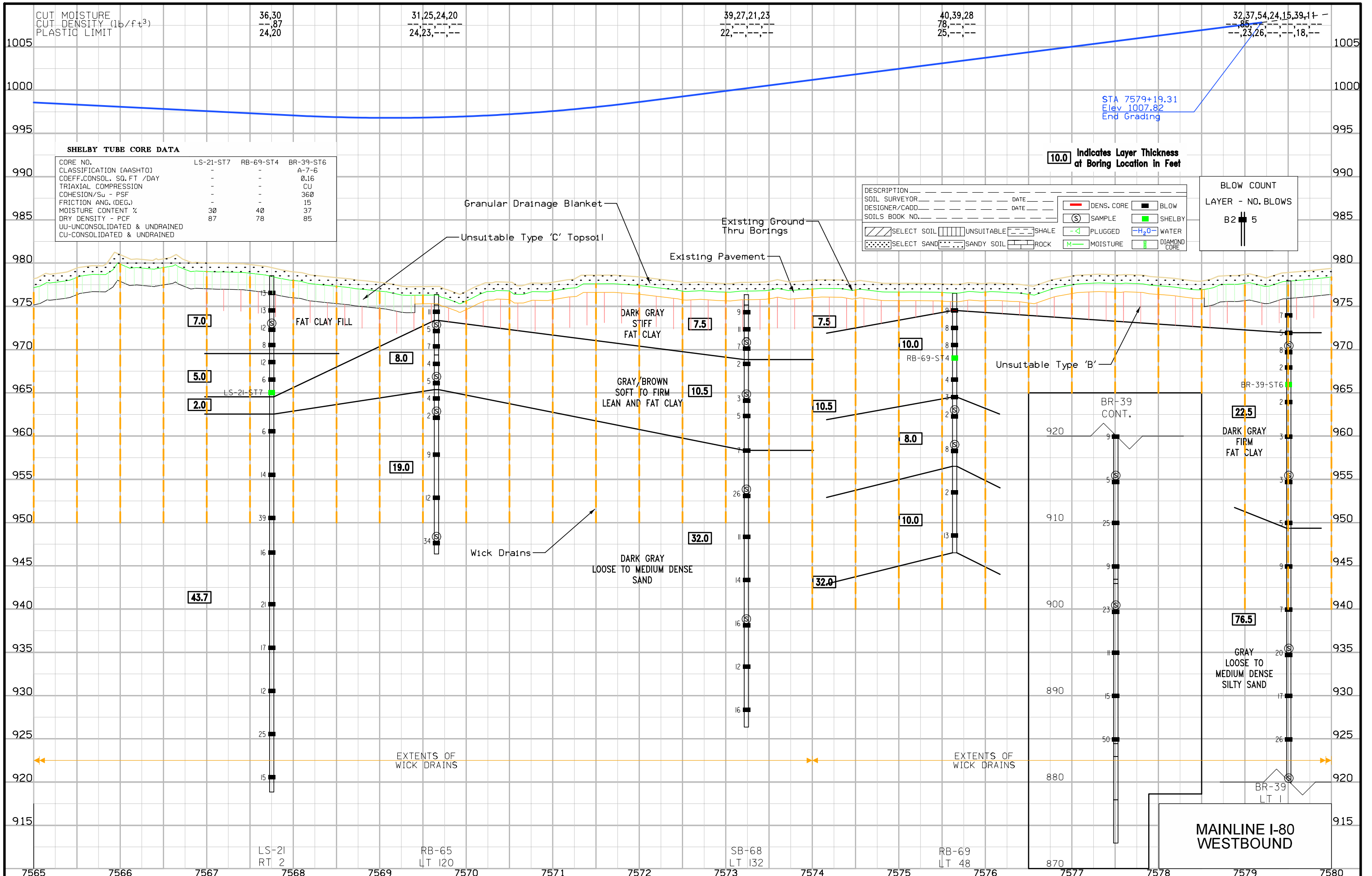


For Improvement Coordinates  
Refer to Sheet No. Q.53

**MAINLINE I-80**







CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

36,30  
87  
24,20

31,25,24,20  
24,23,-,-

39,27,21,23  
22,-,-,-

40,39,28  
78,-,-  
25,-,-

32,37,54,24,15,39,11  
85,-,-  
23,26,-,-,18,-

**SHELBY TUBE CORE DATA**

CORE NO.	LS-21-ST7	RB-69-ST4	BR-39-ST6
CLASSIFICATION (AASHTO)	-	-	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	-	0.16
TRIAxIAL COMPRESSION	-	-	CU
COHESION/S <sub>u</sub> - PSF	-	-	360
FRICTION ANG. (DEG.)	-	-	15
MOISTURE CONTENT %	30	40	37
DRY DENSITY - PCF	87	78	85
UU-UNCONSOLIDATED & UNDRAINED			
CU-CONSOLIDATED & UNDRAINED			

**10.0** Indicates Layer Thickness at Boring Location in Feet

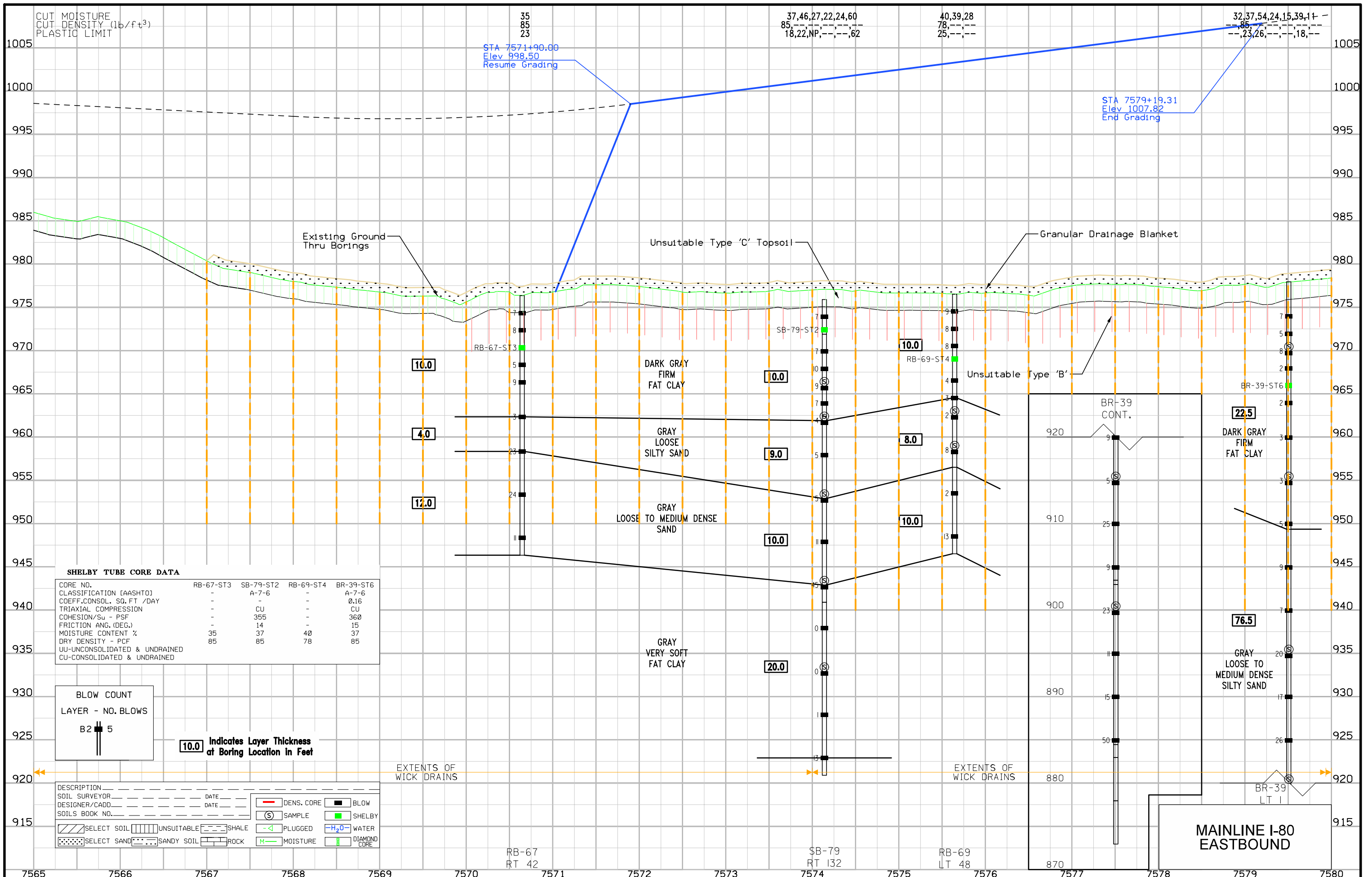
DESCRIPTION		DATE
SOIL SURVEYOR		
DESIGNER/CADD		
SOILS BOOK NO.		

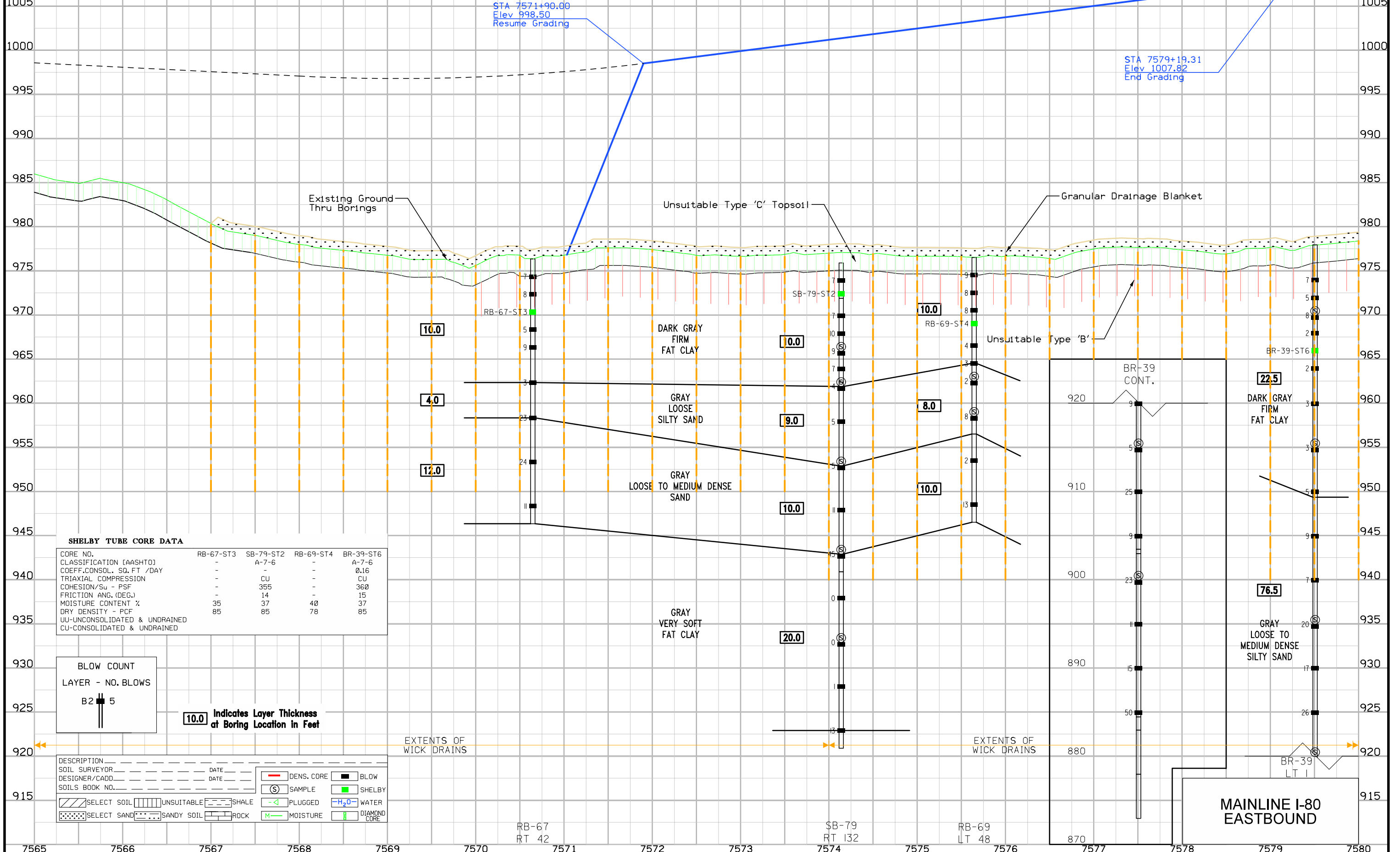
[Red Box]	DENS. CORE	[Black Box]	BLOW
[Circle with S]	SAMPLE	[Green Box]	SHELBY
[Blue Box]	PLUGGED	[Blue Box]	WATER
[Green Box]	MOISTURE	[Green Box]	DIAMOND CORE
[Diagonal Lines]	SELECT SOIL	[Horizontal Lines]	UNSUITABLE
[Dotted]	SELECT SAND	[Vertical Lines]	SHALE
[Stippled]	SANDY SOIL	[Cross-hatched]	ROCK

**BLOW COUNT**  
LAYER - NO. BLOWS

B2 | 5

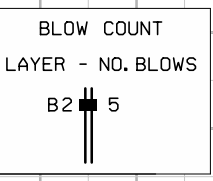


CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT



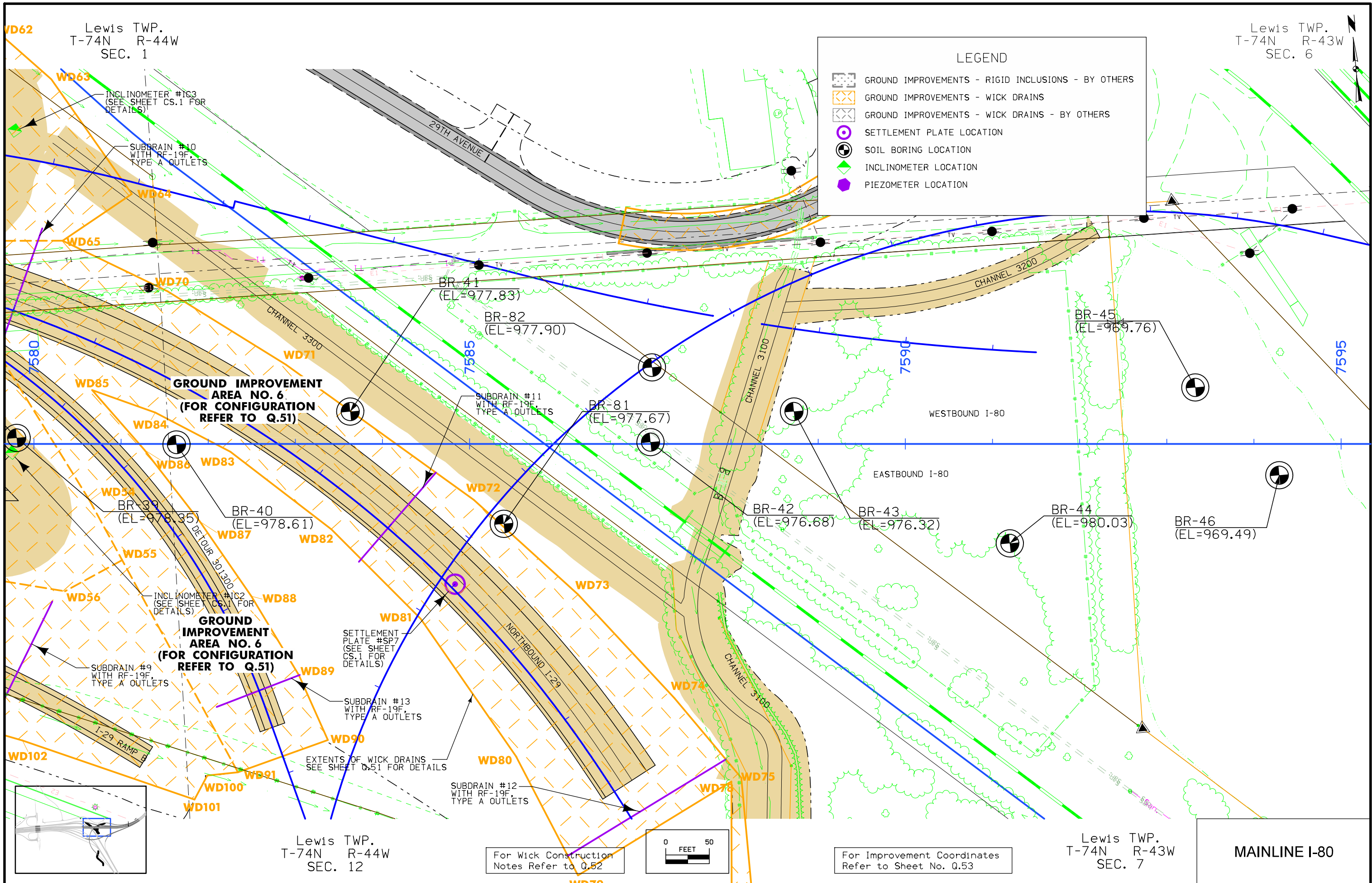
**SHELBY TUBE CORE DATA**

CORE NO.	RB-67-ST3	SB-79-ST2	RB-69-ST4	BR-39-ST6
CLASSIFICATION (AASHTO)	-	A-7-6	-	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	-	-	0.16
TRIAXIAL COMPRESSION	-	CU	-	CU
COHESION/S <sub>u</sub> - PSF	-	355	-	360
FRICTION ANG. (DEG.)	-	14	-	15
MOISTURE CONTENT %	35	37	40	37
DRY DENSITY - PCF	85	85	78	85
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				



10.0 Indicates Layer Thickness at Boring Location in Feet

DESCRIPTION	SOIL SURVEYOR	DATE	DESIGNER/CADD	DATE
SELECT SOIL	UNSATURABLE	SHALE	PLUGGED	WATER
SELECT SAND	SANDY SOIL	ROCK	MOISTURE	DIAMOND CORE



**LEGEND**

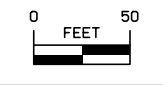
	GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
	GROUND IMPROVEMENTS - WICK DRAINS
	GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
	SETTLEMENT PLATE LOCATION
	SOIL BORING LOCATION
	INCLINOMETER LOCATION
	PIEZOMETER LOCATION

**GROUND IMPROVEMENT AREA NO. 6 (FOR CONFIGURATION REFER TO Q.51)**

**GROUND IMPROVEMENT AREA NO. 6 (FOR CONFIGURATION REFER TO Q.51)**

Lewis TWP.  
T-74N R-44W  
SEC. 12

For Wick Construction  
Notes Refer to Q.52

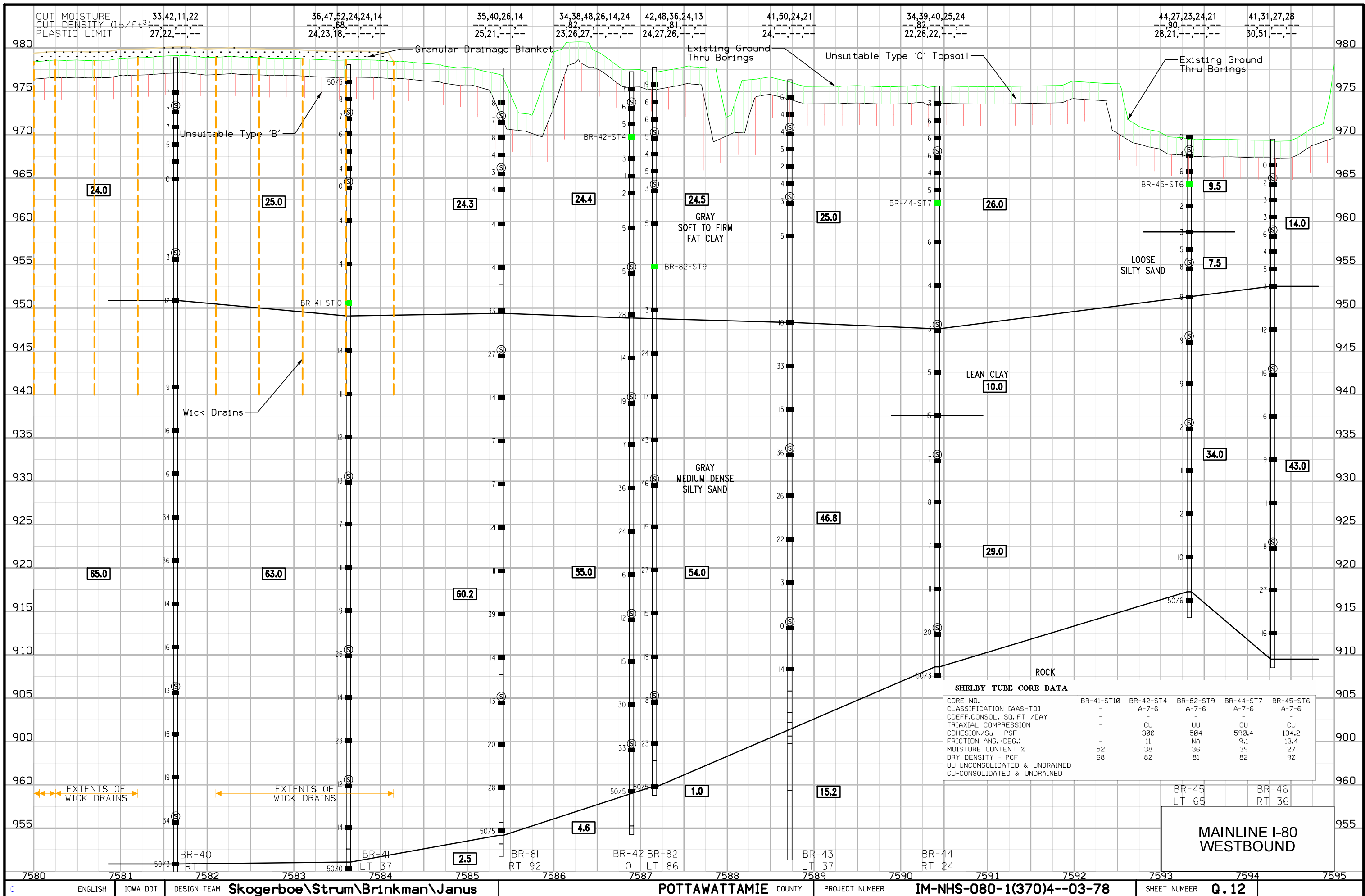


For Improvement Coordinates  
Refer to Sheet No. Q.53

Lewis TWP.  
T-74N R-43W  
SEC. 7

**MAINLINE I-80**

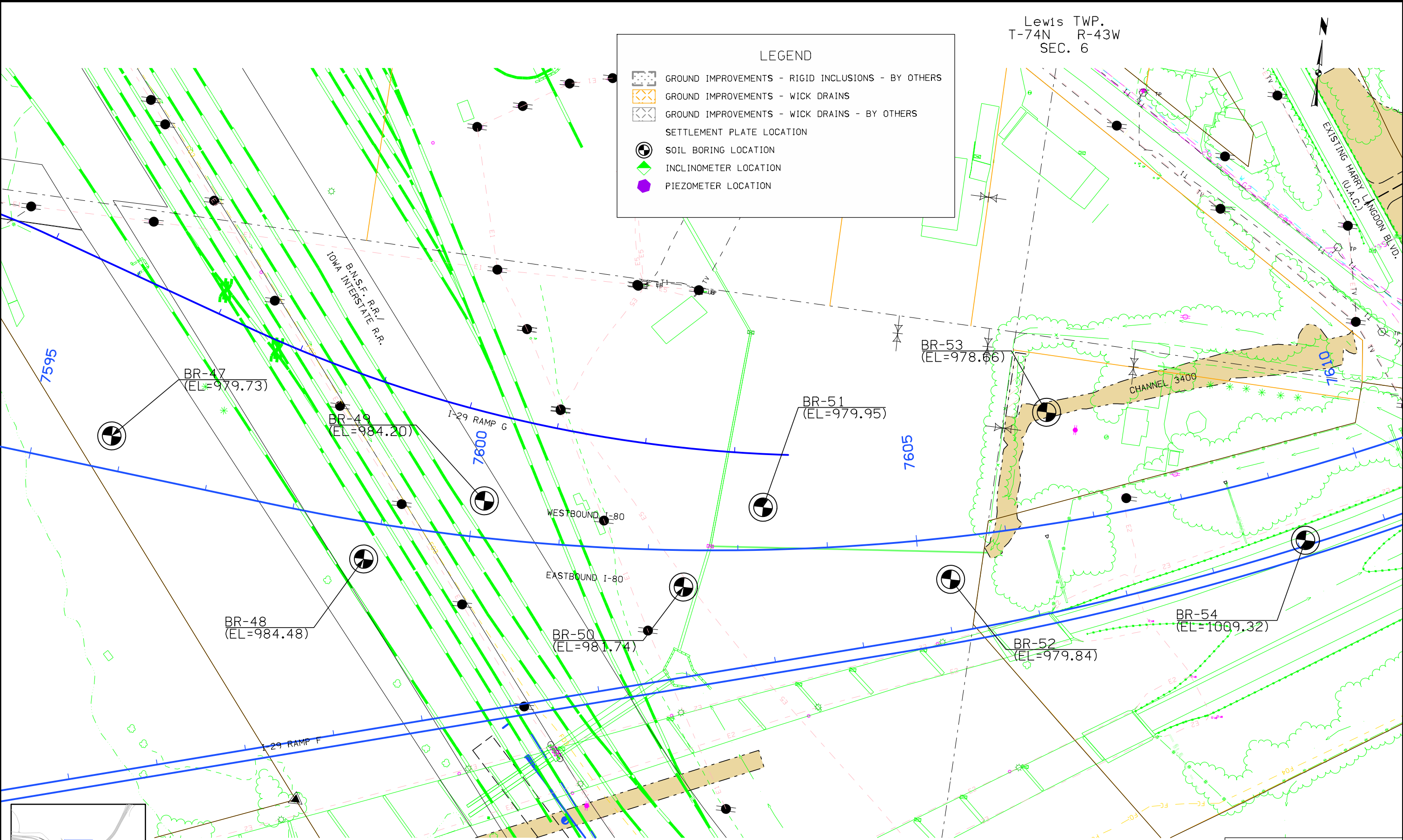




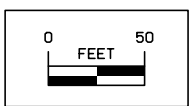
Lewis TWP.  
T-74N R-43W  
SEC. 6

**LEGEND**

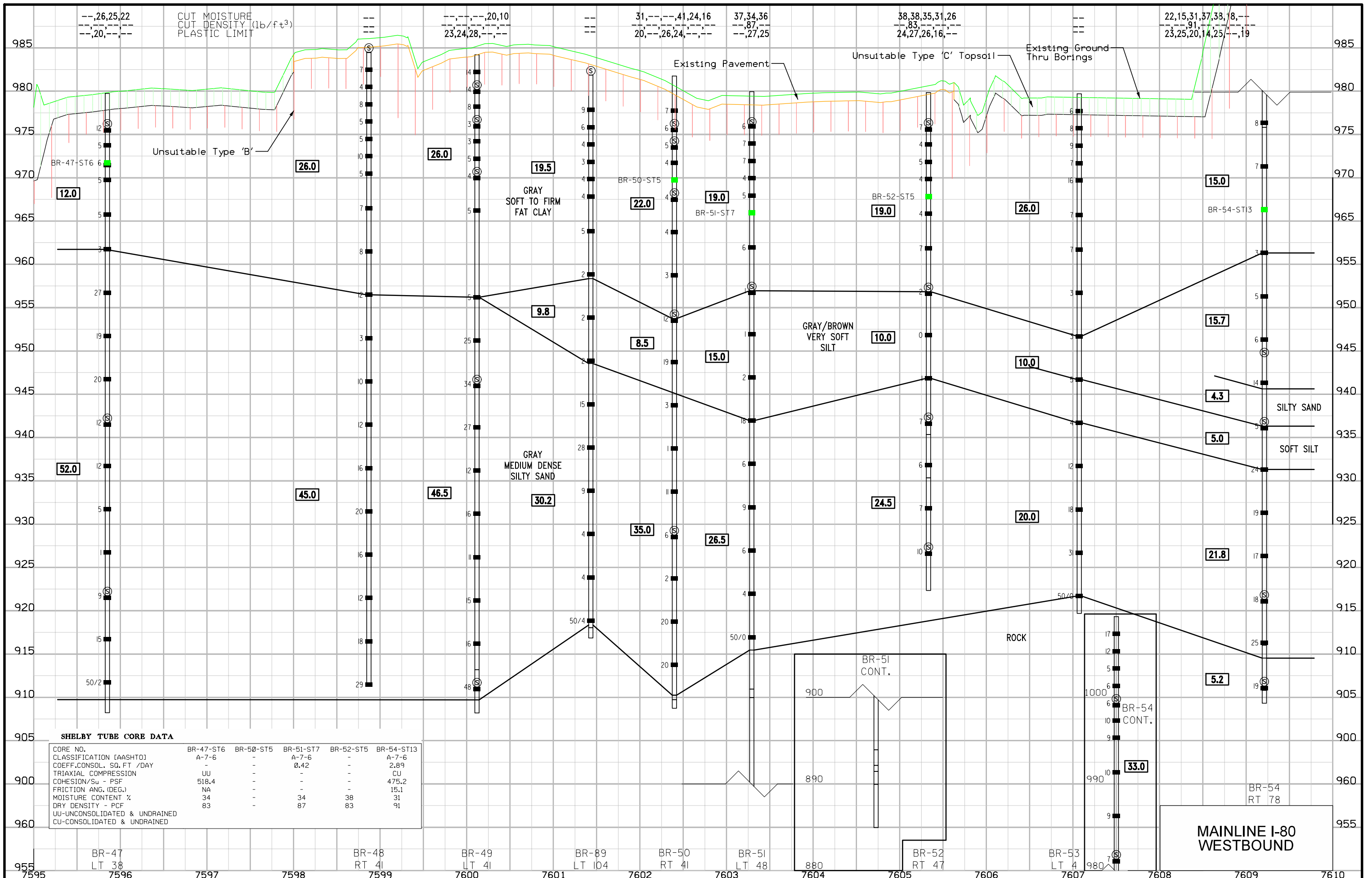
- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION



Lewis TWP.  
T-74N R-43W  
SEC. 7



**MAINLINE I-80**



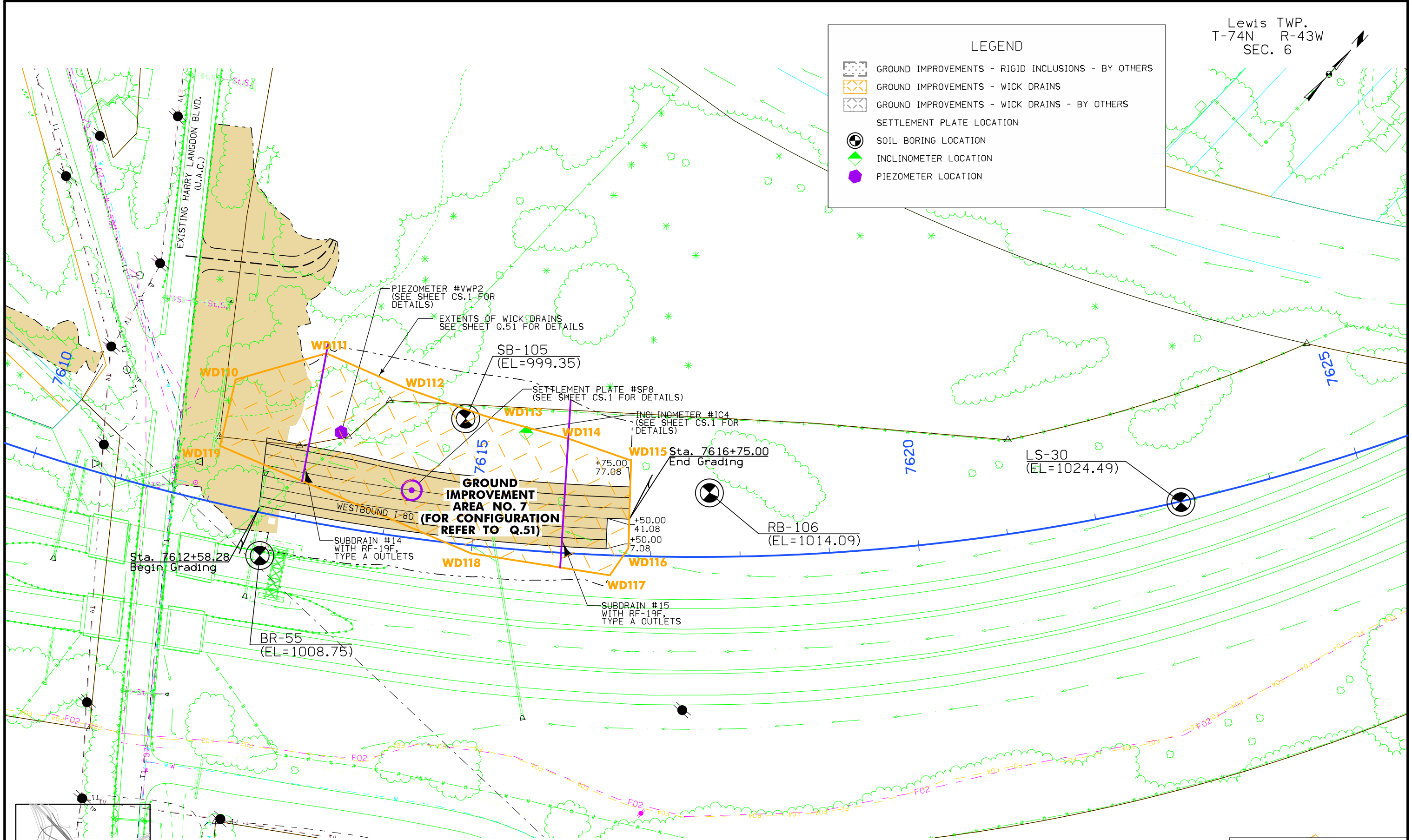
**SHELBY TUBE CORE DATA**

CORE NO.	BR-47-ST6	BR-50-ST5	BR-51-ST7	BR-52-ST5	BR-54-ST13
CLASSIFICATION (AASHTO)	A-7-6	-	A-7-6	-	A-7-6
COEFF. CONSOL. SO. FT / DAY	-	-	0.42	-	2.89
TRIAxIAL COMPRESSION	UU	-	-	-	CU
COHESION/S <sub>u</sub> - PSF	518.4	-	-	-	475.2
FRICTION ANG. (DEG.)	NA	-	-	-	15.1
MOISTURE CONTENT %	34	-	34	38	31
DRY DENSITY - PCF	83	-	87	83	91
UU-UNCONSOLIDATED & UNDRAINED					
CU-CONSOLIDATED & UNDRAINED					

Lewis TWP.  
T-74N R-43W  
SEC. 6

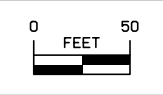
LEGEND

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



**GROUND IMPROVEMENT AREA NO. 7**  
**(FOR CONFIGURATION REFER TO Q.51)**

Sta. 7612+58.28  
Begin Grading

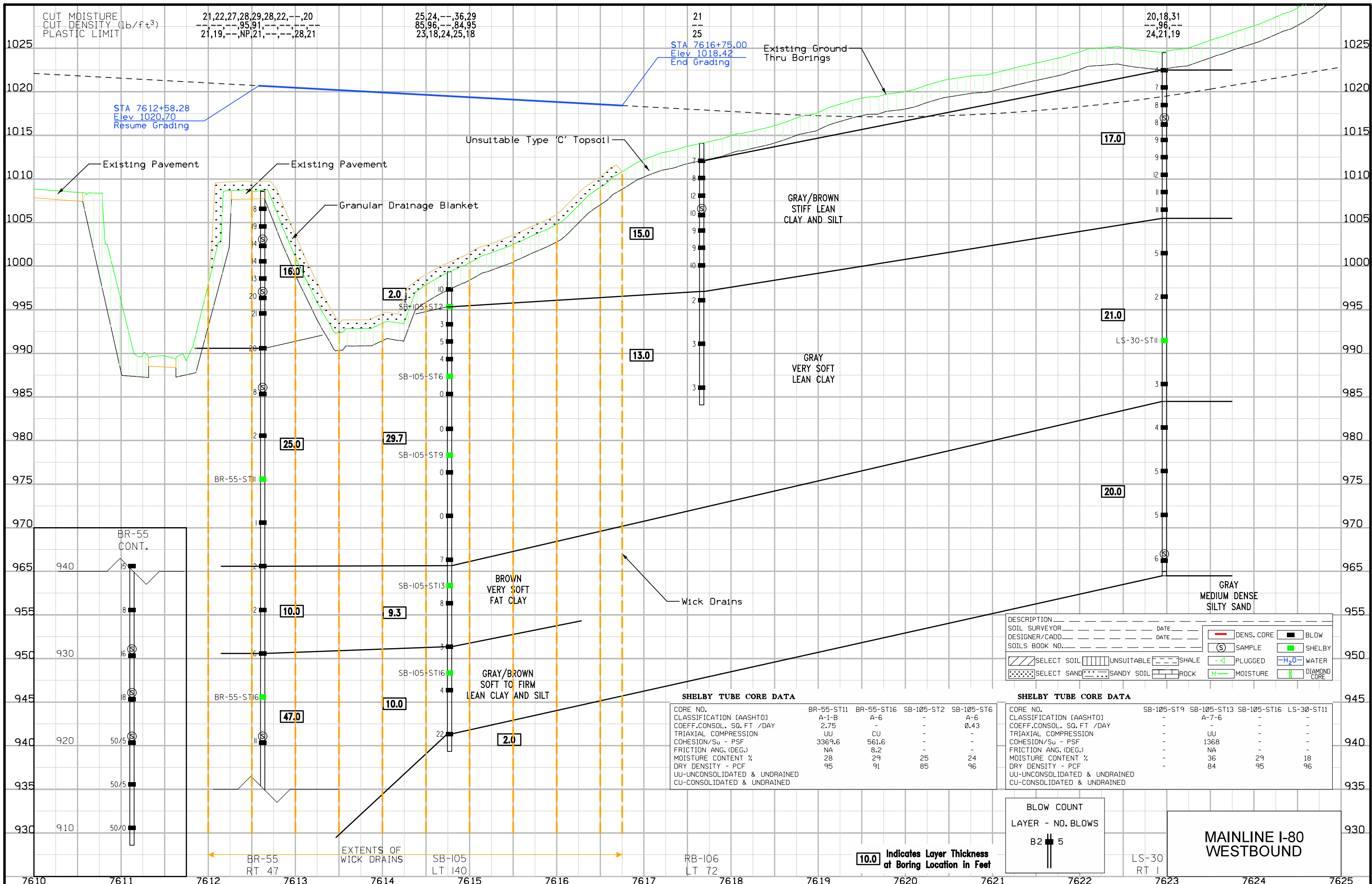


For Wick Construction  
Notes Refer to Q.52

For Improvement Coordinates  
Refer to Sheet No. Q.53

**MAINLINE I-80**

Lewis TWP.  
T-74N R-43W  
SEC. 7



CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

21,22,27,28,29,28,22,--,20  
--95,91,--,--84,95  
21,19,--,NP,21,--,--,28,21

25,24,--,36,29  
85,96,--,84,95  
23,18,24,25,18

21  
25

20,18,31  
--96,--  
24,21,19

STA 7612+58.28  
Elev 1020.70  
Resume Grading

STA 7616+75.00  
Elev 1018.42  
End Grading

**SHELBY TUBE CORE DATA**

CORE NO.	BR-55-ST11	BR-55-ST16	SB-105-ST2	SB-105-ST6
CLASSIFICATION [AASHTO]	A-1-B	A-6	-	A-6
COEFF. CONSOL. SQ. FT / DAY	2.75	-	-	0.43
TRIAxIAL COMPRESSION	UU	CU	-	-
COHESION/Su - PSF	3369.6	561.6	-	-
FRICTION ANG. (DEG.)	NA	8.2	-	-
MOISTURE CONTENT %	28	29	25	24
DRY DENSITY - PCF	95	91	85	96
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				

**SHELBY TUBE CORE DATA**

CORE NO.	SB-105-ST9	SB-105-ST13	SB-105-ST16	LS-30-ST11
CLASSIFICATION [AASHTO]	-	A-7-6	-	-
COEFF. CONSOL. SQ. FT / DAY	-	-	-	-
TRIAxIAL COMPRESSION	UU	-	-	-
COHESION/Su - PSF	-	1368	-	-
FRICTION ANG. (DEG.)	-	NA	-	-
MOISTURE CONTENT %	-	36	29	18
DRY DENSITY - PCF	-	84	95	96
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				

**DESCRIPTION**

SOIL SURVEYOR \_\_\_\_\_ DATE \_\_\_\_\_

DESIGNER/CADD \_\_\_\_\_ DATE \_\_\_\_\_

SOILS BOOK NO. \_\_\_\_\_

[Symbol] SELECT SOIL [Symbol] UNSUITABLE [Symbol] SHALE [Symbol] PLUGGED [Symbol] H<sub>2</sub>O WATER  
 [Symbol] SELECT SAND [Symbol] SANDY SOIL [Symbol] ROCK [Symbol] MOISTURE [Symbol] DIAMOND CORE

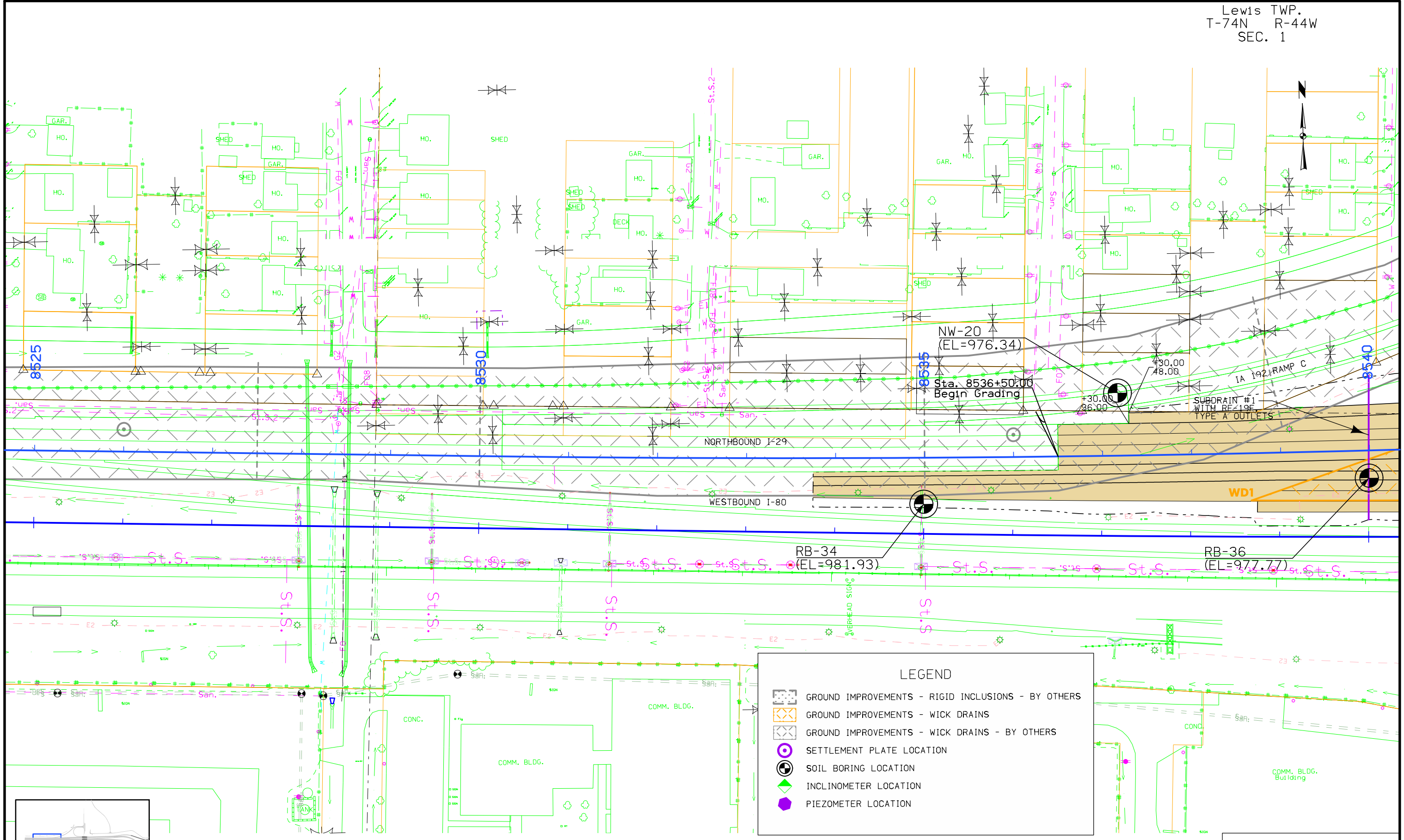
**BLOW COUNT**

LAYER - NO. BLOWS

B2 5

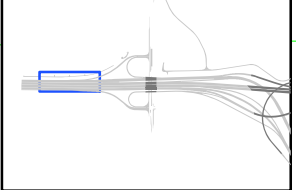
**MAINLINE I-80 WESTBOUND**

10.0 Indicates Layer Thickness at Boring Location in Feet



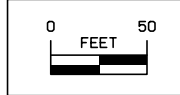
**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION



Lewis TWP.  
T-74N R-44W  
SEC. 12

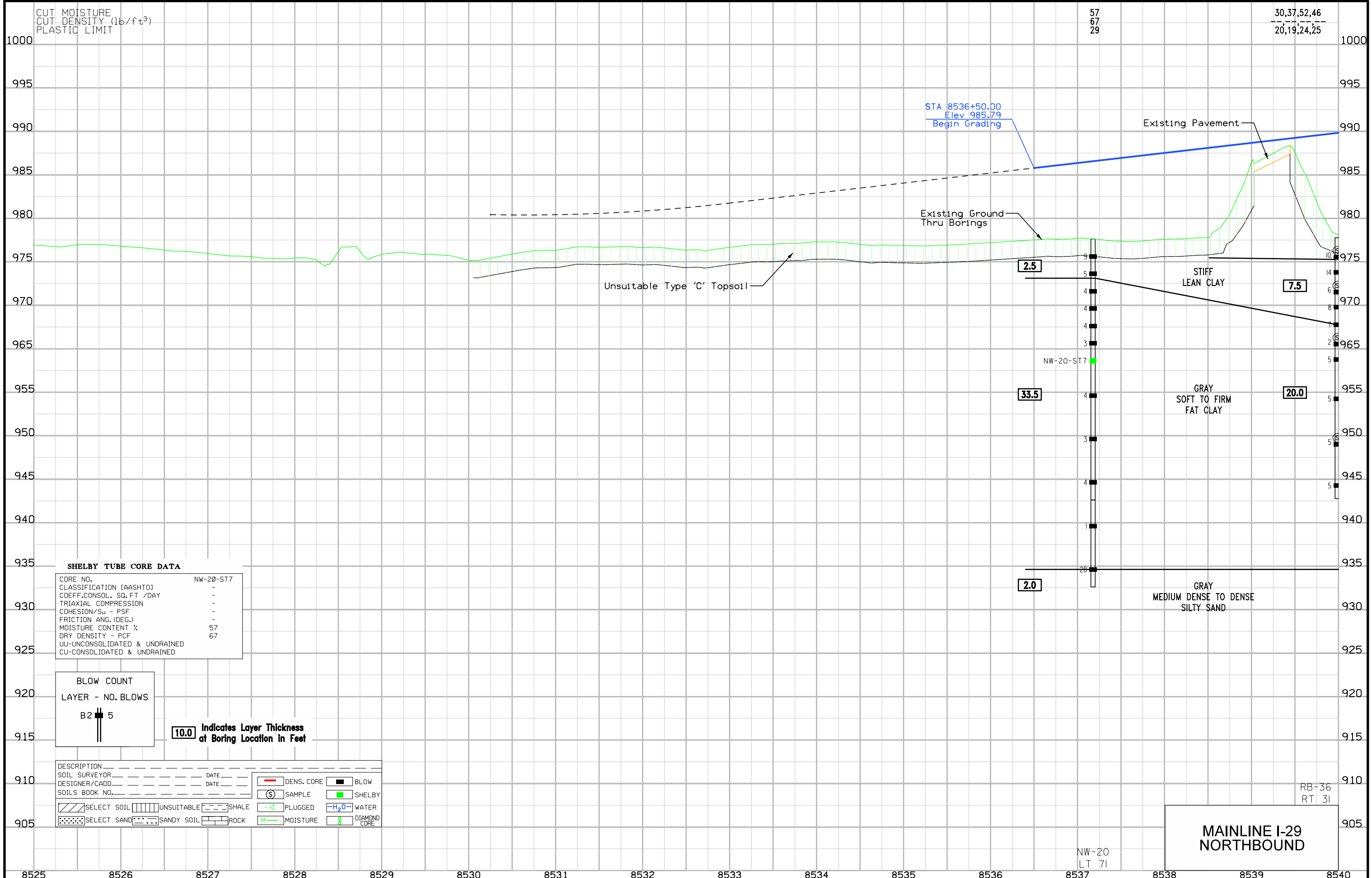
For Improvement Coordinates  
Refer to Sheet No. Q.53



For Wick Construction  
Notes Refer to Q.52

Lewis TWP.  
T-74N R-44W  
SEC. 12

**MAINLINE I-29  
NORTHBOUND**



**SHELBY TUBE CORE DATA**

CORE NO.	NW-20-ST7
CLASSIFICATION [AASHTO]	-
COEFF. CONSOL. SQ. FT / DAY	-
TRIAXIAL COMPRESSION	-
COHESION/S <sub>u</sub> - PSF	-
FRICTION ANG. (DEG.)	-
MOISTURE CONTENT %	57
DRY DENSITY - PCF	67
UU-UNCONSOLIDATED & UNDRAINED	-
CU-CONSOLIDATED & UNDRAINED	-

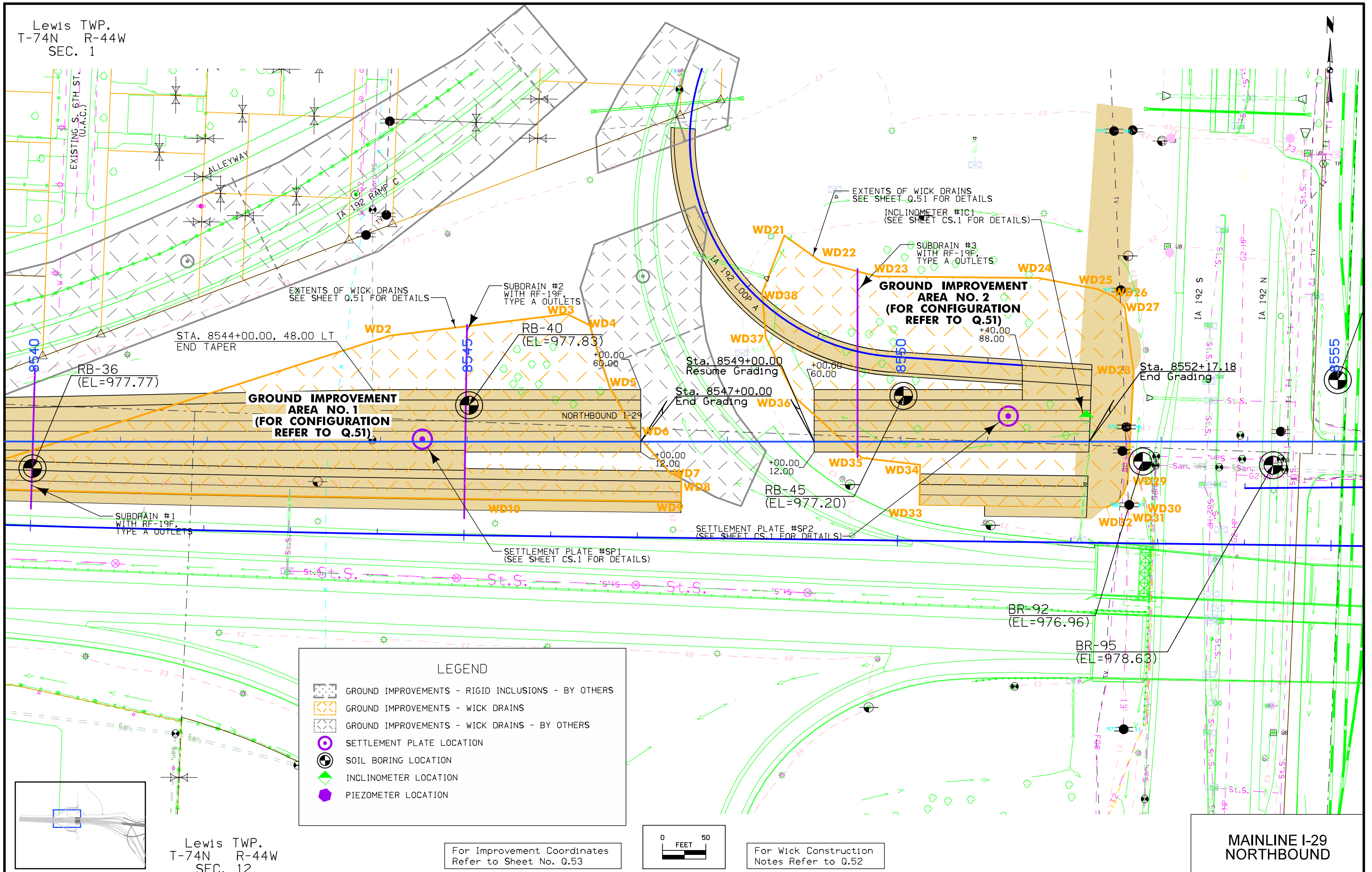
**BLOW COUNT**

LAYER - NO. BLOWS	
B2	5

**10.0** Indicates Layer Thickness at Boring Location in Feet

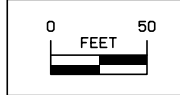
DESCRIPTION	DATE	DENS. CORE	BLOW
SOIL SURVEYOR	DATE	SAMPLE	SHELBY
DESIGNER/CADD	DATE	PLUGGED	WATER
SOILS BOOK NO.		MOISTURE	DIAMOND CORE
SELECT SOIL	UNSUITABLE	SHALE	
SELECT SAND	SANDY SOIL	ROCK	

Lewis TWP.  
T-74N R-44W  
SEC. 1



Lewis TWP.  
T-74N R-44W  
SEC. 12

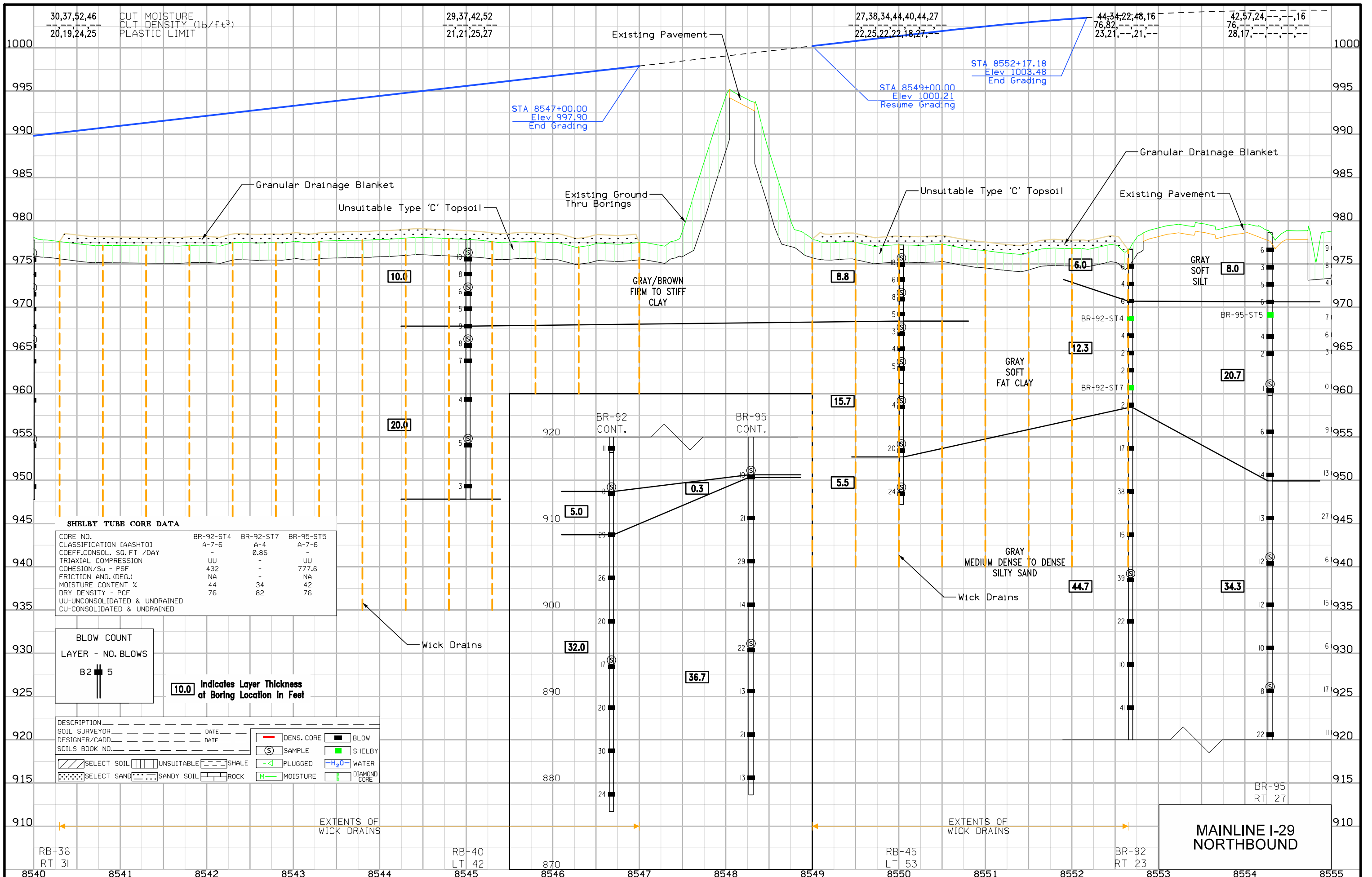
For Improvement Coordinates  
Refer to Sheet No. Q.53



For Wick Construction  
Notes Refer to Q.52

**MAINLINE I-29  
NORTHBOUND**





30,37,52,46  
20,19,24,25

CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

29,37,42,52  
21,21,25,27

27,38,34,44,40,44,27  
22,25,22,22,18,27

44,34,22,48,16  
76,82,---,---,---  
23,21,---,---,---

42,57,24,---,---,16  
76,---,---,---,---  
28,17,---,---,---

**SHELBY TUBE CORE DATA**

CORE NO.	BR-92-ST4	BR-92-ST7	BR-95-ST5
CLASSIFICATION [AASHTO]	A-7-6	A-4	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	0.86	-
TRIAxIAL COMPRESSION	UU	-	UU
COHESION/S <sub>u</sub> - PSF	432	-	777.6
FRICTION ANG. (DEG.)	NA	-	NA
MOISTURE CONTENT %	44	34	42
DRY DENSITY - PCF	76	82	76
UU-UNCONSOLIDATED & UNDRAINED			
CU-CONSOLIDATED & UNDRAINED			

**BLOW COUNT**

LAYER - NO. BLOWS

B2 || 5

10.0 Indicates Layer Thickness at Boring Location in Feet

DESCRIPTION	DATE	DATE	DATE
SOIL SURVEYOR			
DESIGNER/CADD			
SOILS BOOK NO.			

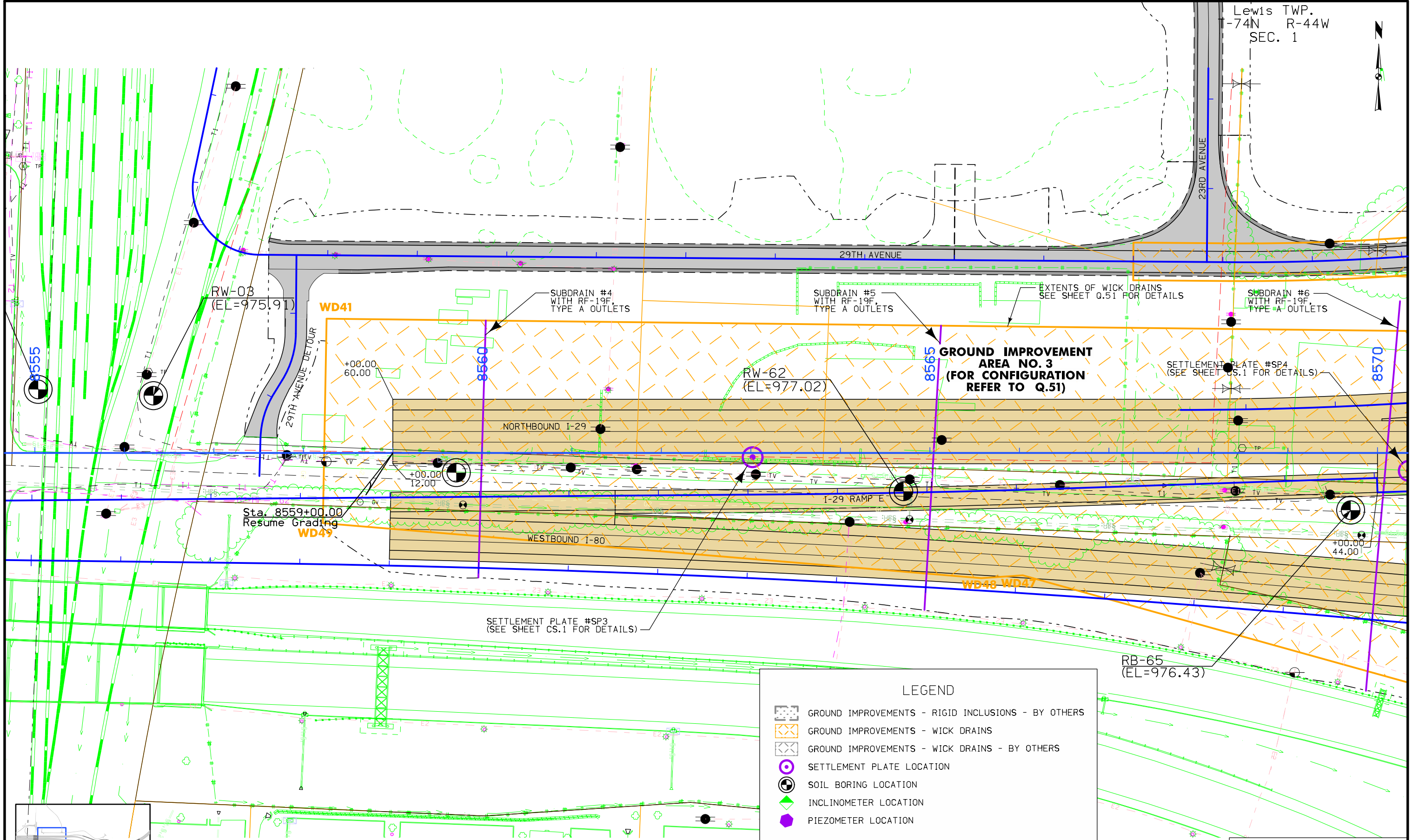
SELECT SOIL	UNSATURABLE	SHALE	DENS. CORE	BLOW
SELECT SAND	SANDY SOIL	ROCK	SAMPLE	SHELBY
			PLUGGED	H <sub>2</sub> O
			MOISTURE	DIAMOND CORE

EXTENTS OF WICK DRAINS

EXTENTS OF WICK DRAINS

MAINLINE I-29 NORTHBOUND

Lewis TWP.  
T-74N R-44W  
SEC. 1



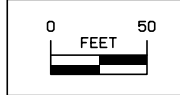
**GROUND IMPROVEMENT  
AREA NO. 3  
(FOR CONFIGURATION  
REFER TO Q.51)**

**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

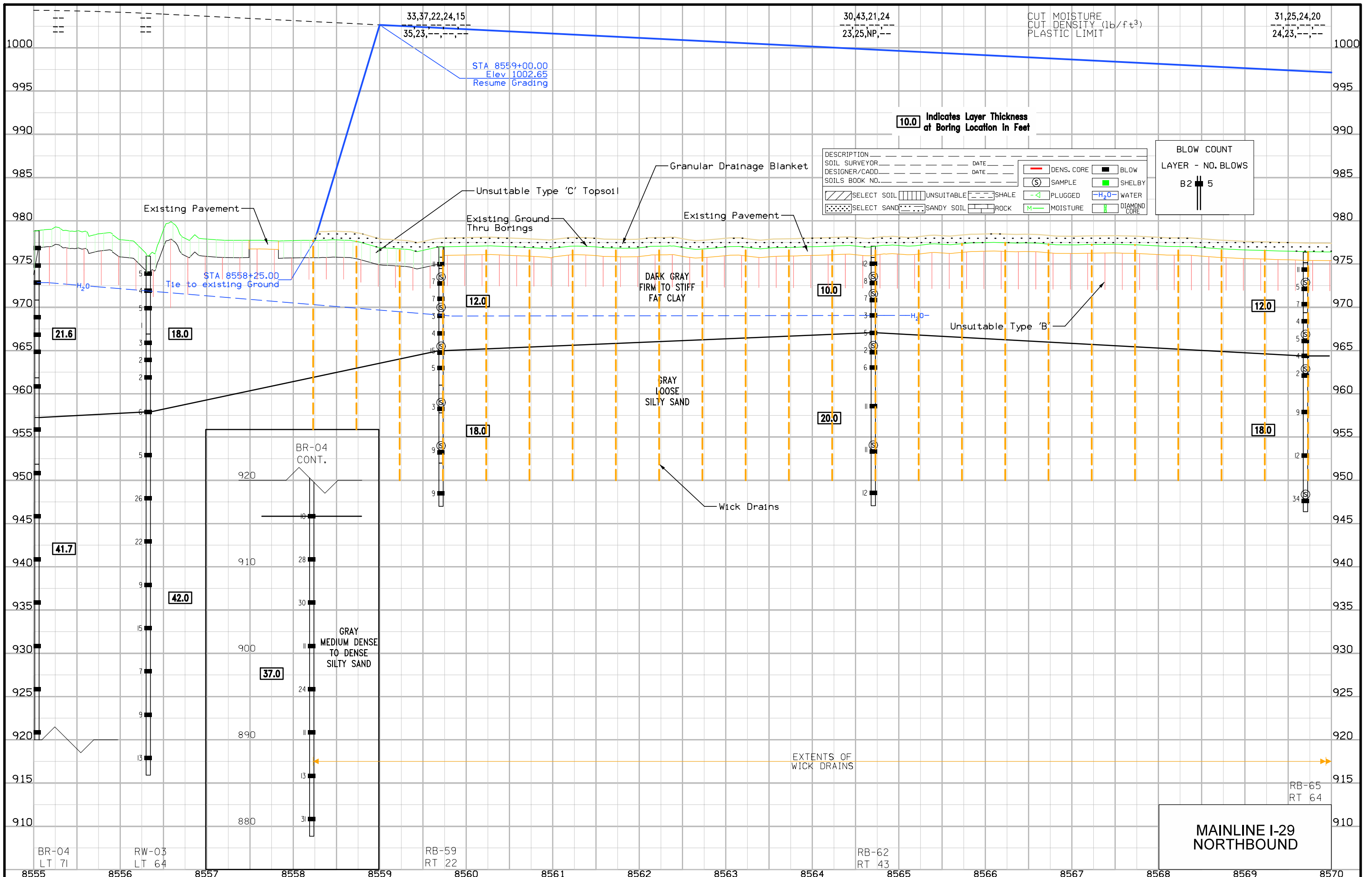
Lewis TWP.  
T-74N R-44W  
SEC. 12

For Improvement Coordinates  
Refer to Sheet No. Q.53



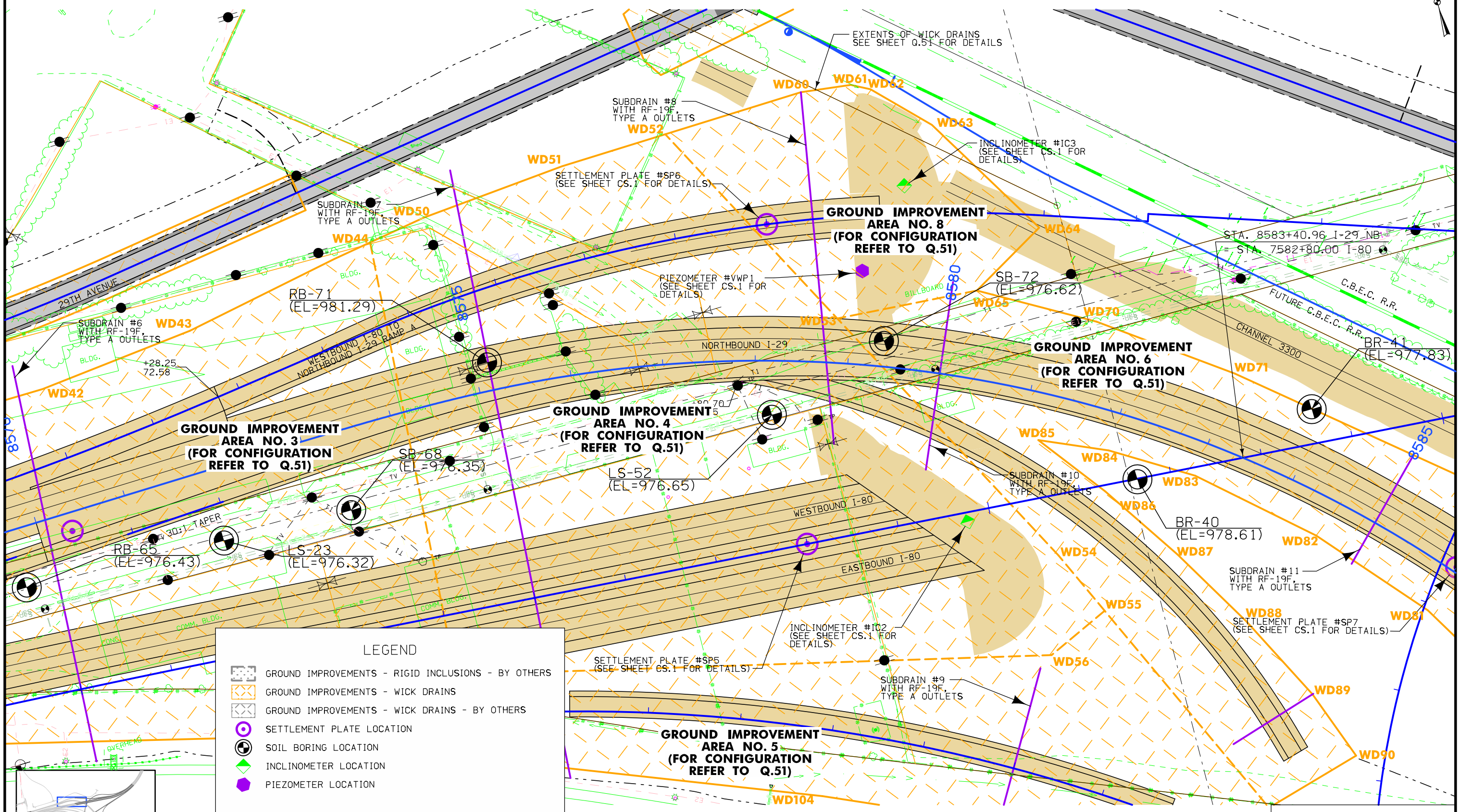
For Wick Construction  
Notes Refer to Q.52

**MAINLINE I-29  
NORTHBOUND**



**MAINLINE I-29  
NORTHBOUND**

Lewis TWP.  
T-74N R-44W  
SEC. 1

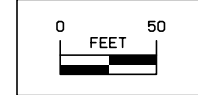


**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

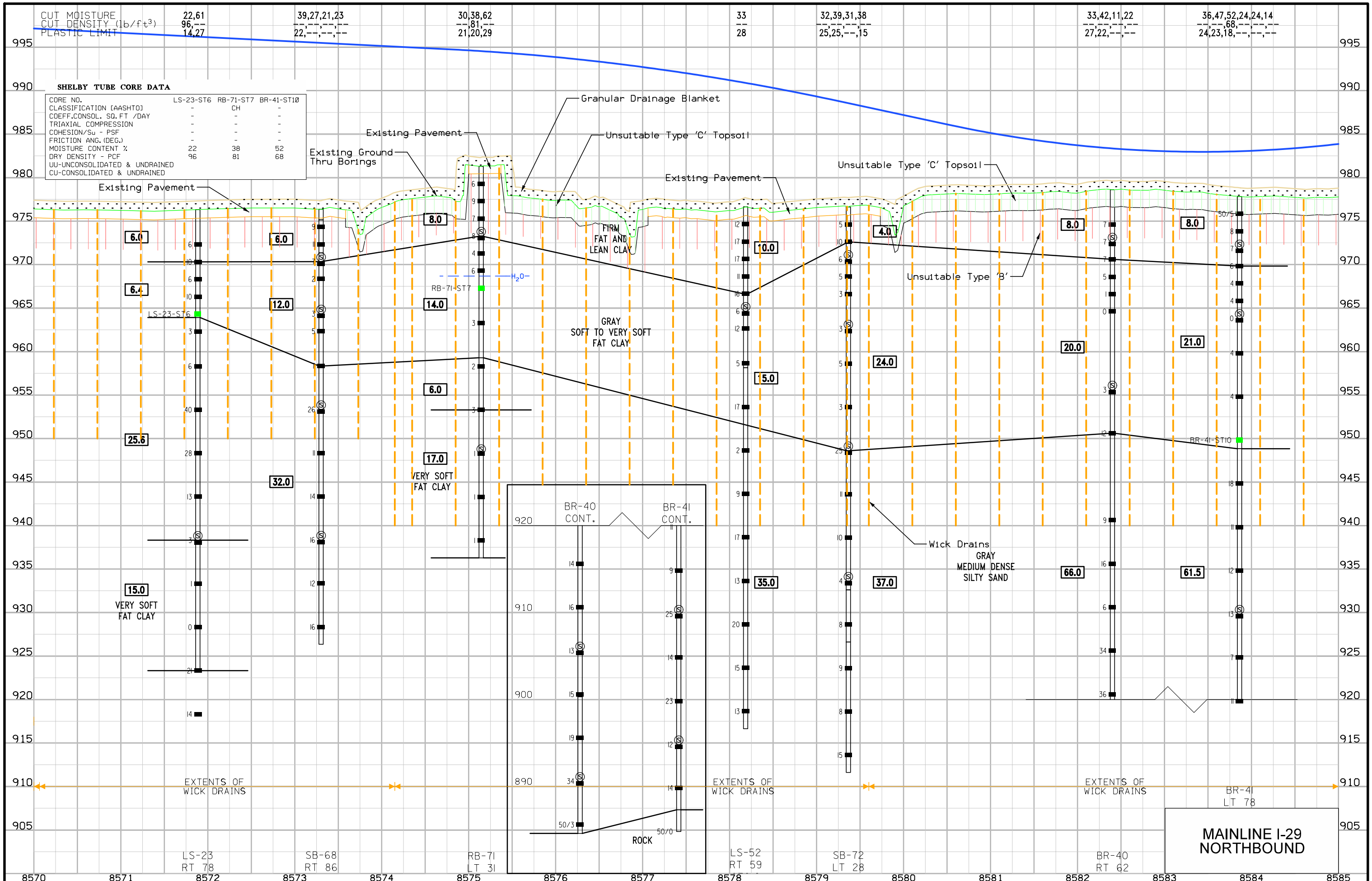
Lewis TWP.  
T-74N R-44W  
SEC. 12

For Improvement Coordinates  
Refer to Sheet No. Q.53



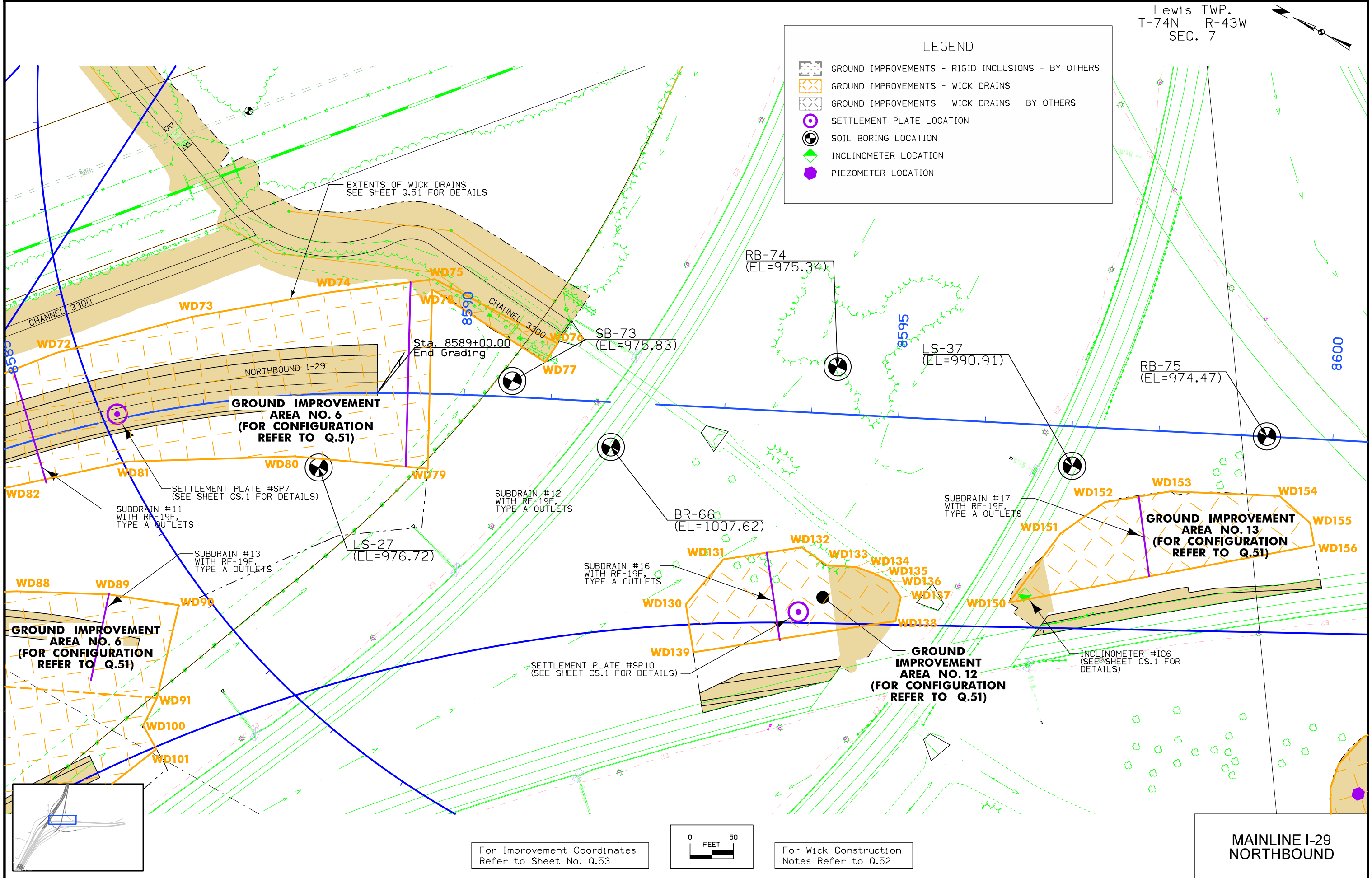
For Wick Construction  
Notes Refer to Q.52

**MAINLINE I-29  
NORTHBOUND**

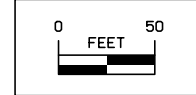


**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

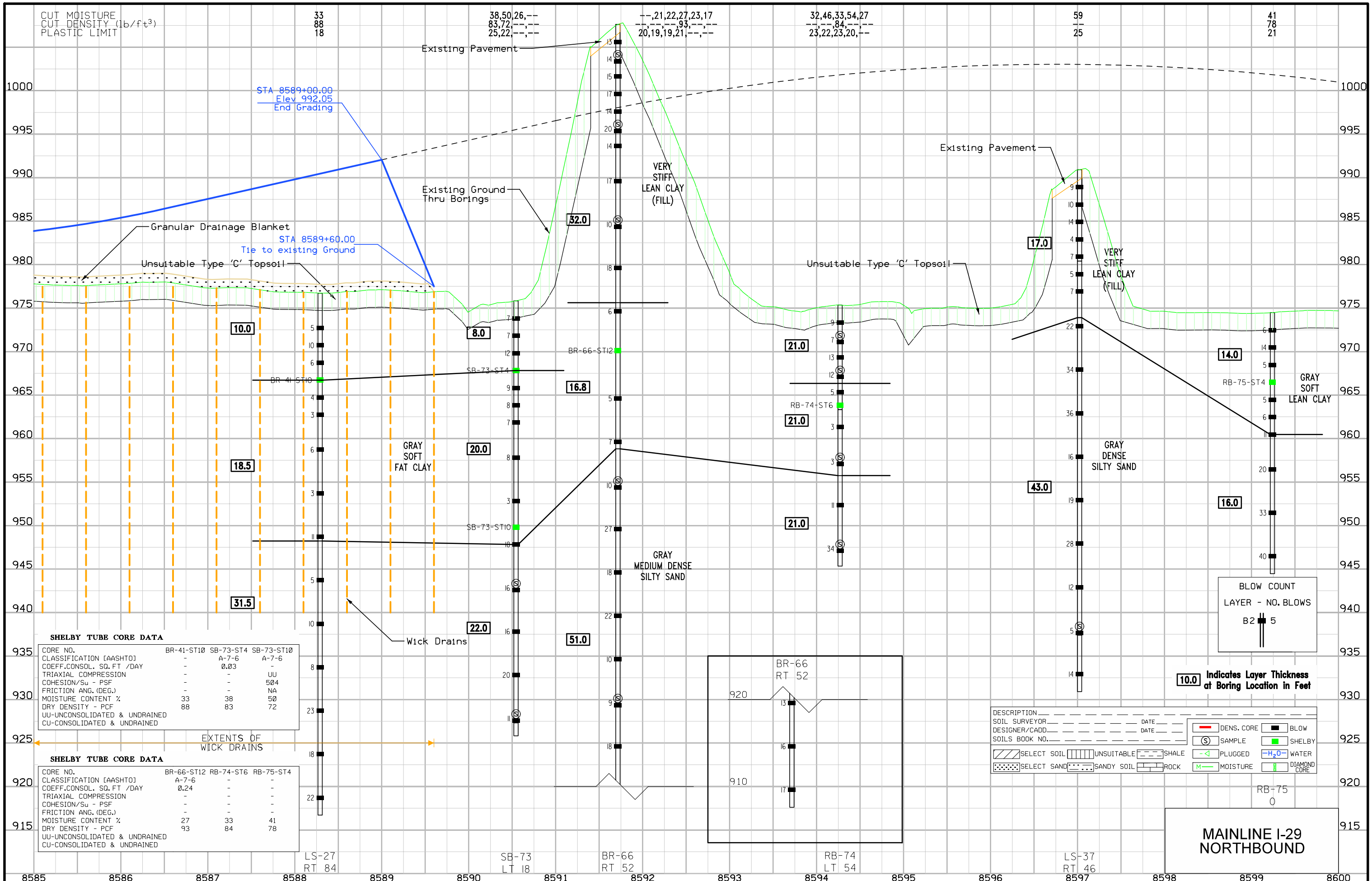


For Improvement Coordinates  
Refer to Sheet No. Q.53



For Wick Construction  
Notes Refer to Q.52

**MAINLINE I-29  
NORTHBOUND**



**SHELBY TUBE CORE DATA**

CORE NO.	BR-41-ST10	SB-73-ST4	SB-73-ST10
CLASSIFICATION [AASHTO]	-	A-7-6	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	0.03	-
TRIAxIAL COMPRESSION	-	-	UU
COHESION/S <sub>u</sub> - PSF	-	-	504
FRICTION ANG. (DEG.)	-	-	NA
MOISTURE CONTENT %	33	38	50
DRY DENSITY - PCF	88	83	72
UU-UNCONSOLIDATED & UNDRAINED	-	-	-
CU-CONSOLIDATED & UNDRAINED	-	-	-

**SHELBY TUBE CORE DATA**

CORE NO.	BR-66-ST12	RB-74-ST6	RB-75-ST4
CLASSIFICATION [AASHTO]	-	-	-
COEFF. CONSOL. SQ. FT / DAY	0.24	-	-
TRIAxIAL COMPRESSION	-	-	-
COHESION/S <sub>u</sub> - PSF	-	-	-
FRICTION ANG. (DEG.)	-	-	-
MOISTURE CONTENT %	27	33	41
DRY DENSITY - PCF	93	84	78
UU-UNCONSOLIDATED & UNDRAINED	-	-	-
CU-CONSOLIDATED & UNDRAINED	-	-	-

**BLOW COUNT**  
 LAYER - NO. BLOWS  
 B2 5

10.0 Indicates Layer Thickness at Boring Location in Feet

DESCRIPTION	DATE	DATE
SOIL SURVEYOR		
DESIGNER/CADD		
SOILS BOOK NO.		








  

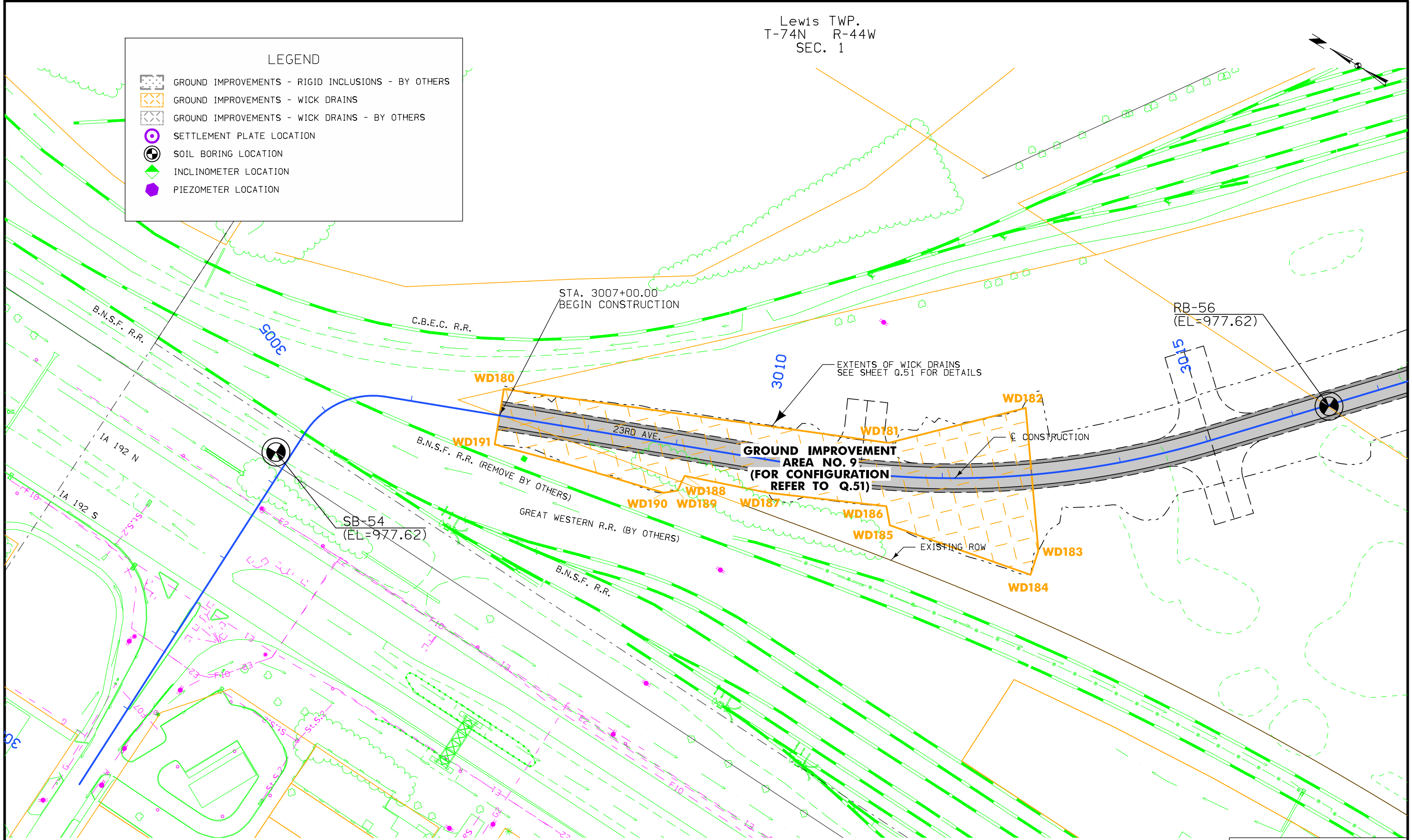
[Red Line]	DENS. CORE	[Black Square]	BLOW
[Circle with S]	SAMPLE	[Green Square]	SHELBY
[Green Line]	PLUGGED	[Blue Line]	WATER
[Green Line]	MOISTURE	[Green Square]	DIAMOND CORE
[Hatched Box]	SELECT SOIL	[Dashed Box]	SHALE
[Dotted Box]	SELECT SAND	[Cross-hatched Box]	ROCK
[Dotted Box]	SANDY SOIL		

**MAINLINE I-29 NORTHBOUND**

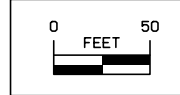
Lewis TWP.  
T-74N R-44W  
SEC. 1

**LEGEND**

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



For Wick Construction  
Notes Refer to Q.52



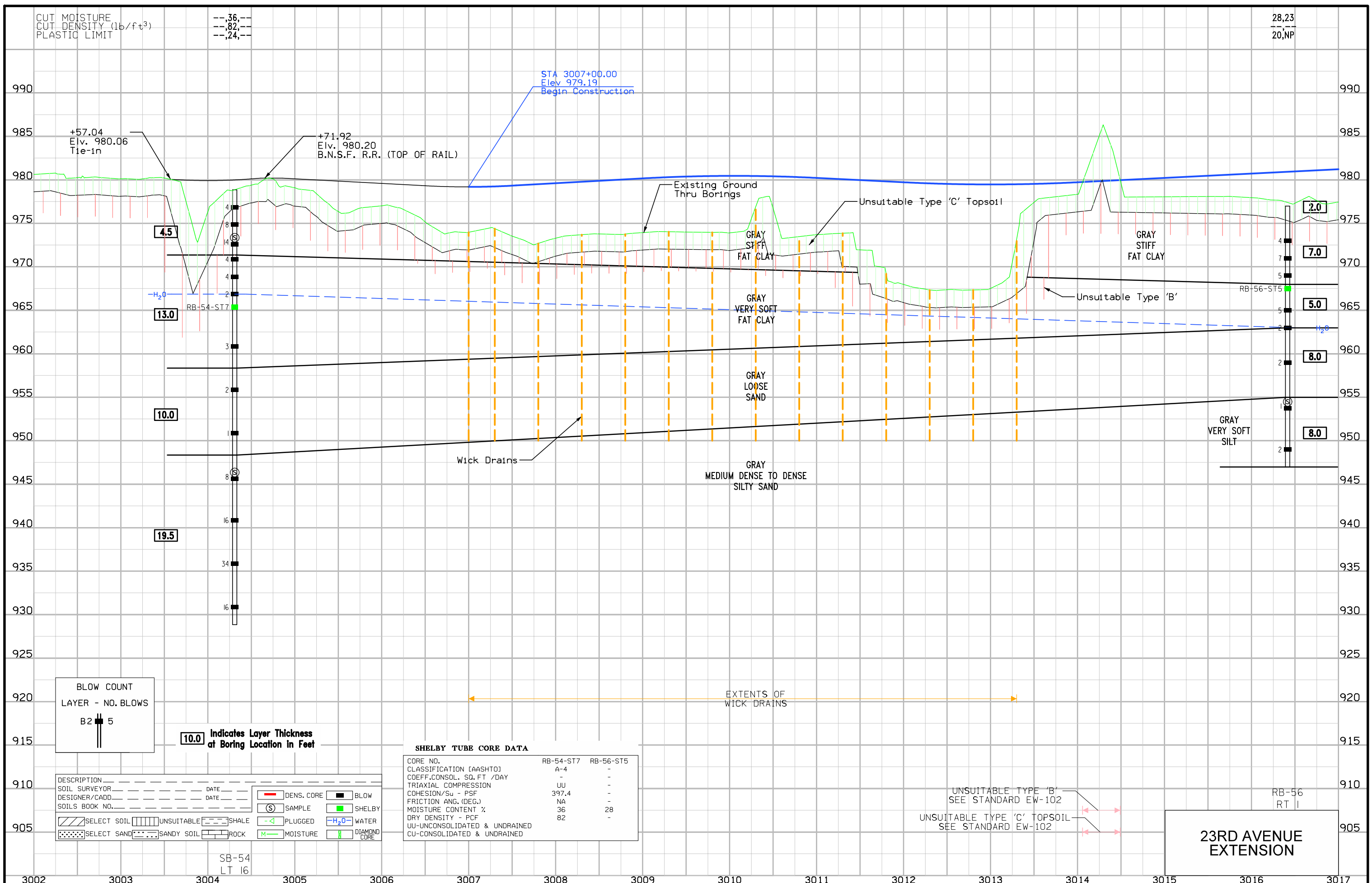
For Improvement Coordinates  
Refer to Sheet No. Q.53

**23RD AVENUE  
EXTENSION**



CUT MOISTURE ---.36,--  
 CUT DENSITY (lb/ft³) ---.82,--  
 PLASTIC LIMIT ---.24,--

28,23  
 20,NP



**BLOW COUNT**  
 LAYER - NO. BLOWS  
 B2 5

**10.0** Indicates Layer Thickness at Boring Location in Feet

**SHELBY TUBE CORE DATA**

CORE NO.	RB-54-ST7	RB-56-ST5
CLASSIFICATION (AASHTO)	A-4	-
COEFF. CONSOL. SQ. FT / DAY	-	-
TRIAxIAL COMPRESSION	UU	-
COHESION/S <sub>u</sub> - PSF	397.4	-
FRICTION ANG. (DEG.)	NA	-
MOISTURE CONTENT %	36	28
DRY DENSITY - PCF	82	-
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

DESCRIPTION	---	---	---	---	---	---	---	---	---
SOIL SURVEYOR	---	---	---	---	---	---	---	---	---
DESIGNER/CADD	---	---	---	---	---	---	---	---	---
SOILS BOOK NO.	---	---	---	---	---	---	---	---	---
SELECT SOIL	▨	▨	▨	▨	▨	▨	▨	▨	▨
UNSATURABLE	▨	▨	▨	▨	▨	▨	▨	▨	▨
SHALE	▨	▨	▨	▨	▨	▨	▨	▨	▨
PLUGGED	▨	▨	▨	▨	▨	▨	▨	▨	▨
WATER	▨	▨	▨	▨	▨	▨	▨	▨	▨
SELECT SAND	▨	▨	▨	▨	▨	▨	▨	▨	▨
SANDY SOIL	▨	▨	▨	▨	▨	▨	▨	▨	▨
ROCK	▨	▨	▨	▨	▨	▨	▨	▨	▨
MOISTURE	▨	▨	▨	▨	▨	▨	▨	▨	▨
DIAMOND CORE	▨	▨	▨	▨	▨	▨	▨	▨	▨

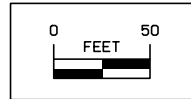
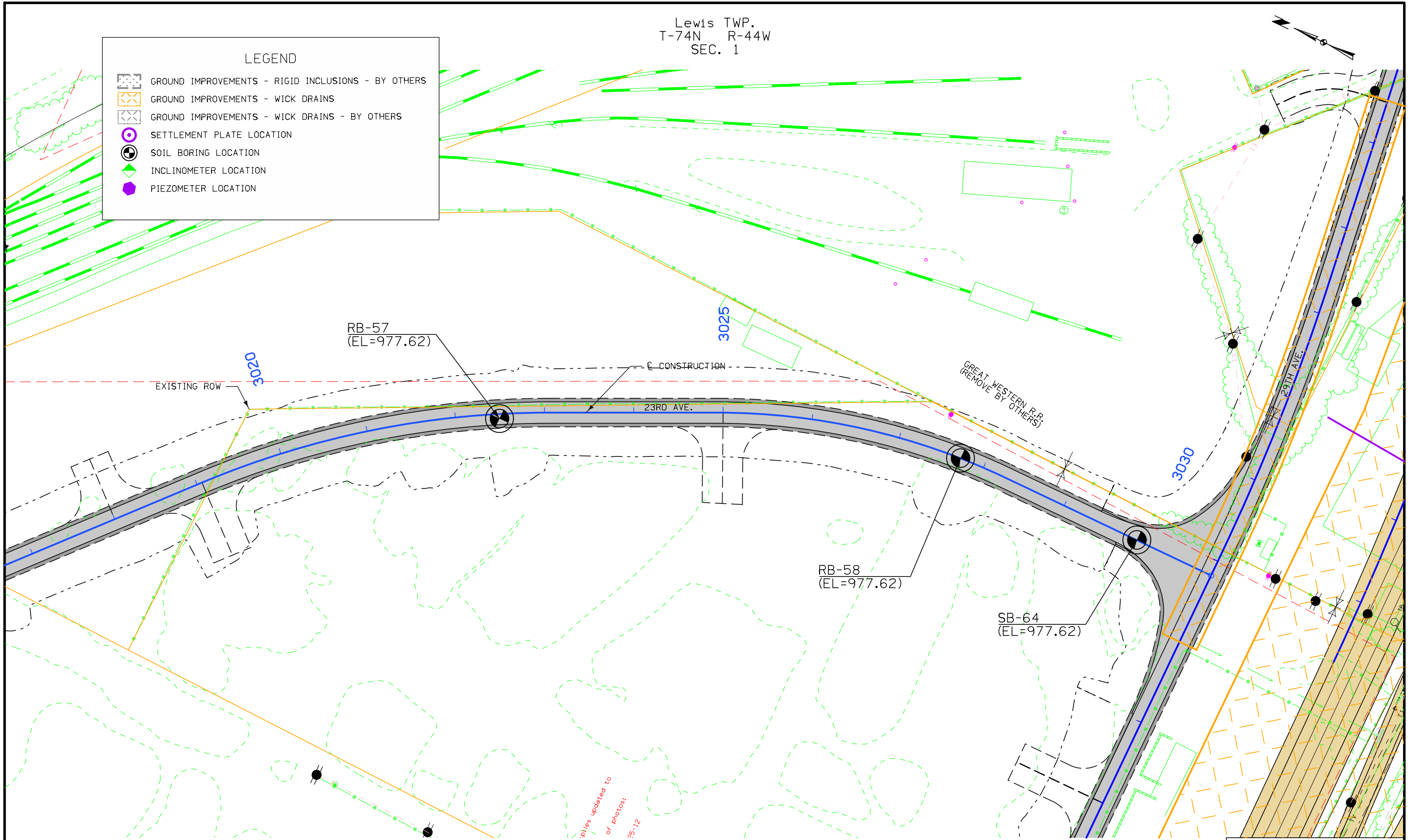
UNSATURABLE TYPE 'B'  
 SEE STANDARD EW-102  
 UNSATURABLE TYPE 'C' TOPSOIL  
 SEE STANDARD EW-102

**23RD AVENUE EXTENSION**

Lewis TWP.  
T-74N R-44W  
SEC. 1

LEGEND

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



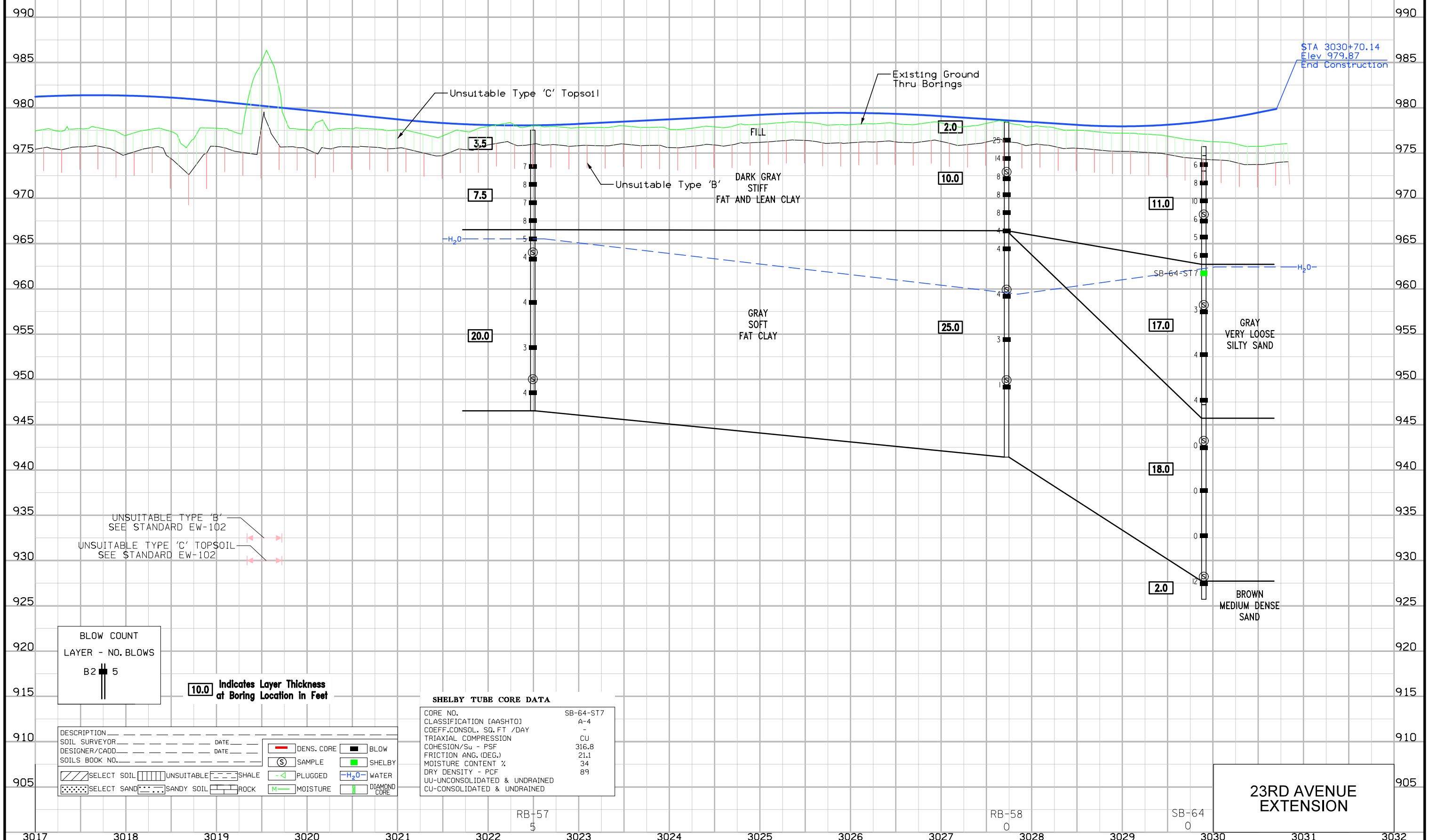
23RD AVENUE  
EXTENSION

CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

---,33  
---,19

37,---,61  
22,---,NP

41,34,---,53,---  
---,89,---,---  
22,25,---,25,---



STA 3030+70.14  
Elev 979.87  
End Construction

Unsuitable Type 'C' Topsoil

Existing Ground  
Thru Borings

FILL

Unsuitable Type 'B'  
DARK GRAY  
STIFF  
FAT AND LEAN CLAY

GRAY  
SOFT  
FAT CLAY

GRAY  
VERY LOOSE  
SILTY SAND

BROWN  
MEDIUM-DENSE  
SAND

UNSUITABLE TYPE 'B'  
SEE STANDARD EW-102  
UNSUITABLE TYPE 'C' TOPSOIL  
SEE STANDARD EW-102

BLOW COUNT  
LAYER - NO. BLOWS  
B2 5

10.0 Indicates Layer Thickness  
at Boring Location in Feet

**SHELBY TUBE CORE DATA**








CORE NO.	SB-64-ST7
CLASSIFICATION (AASHTO)	A-4
COEFF. CONSOL. SQ. FT / DAY	-
TRIAxIAL COMPRESSION	CU
COHESION/Su - PSF	316.8
FRICTION ANG. (DEG.)	21.1
MOISTURE CONTENT %	34
DRY DENSITY - PCF	89
UU-UNCONSOLIDATED & UNDRAINED	
CU-CONSOLIDATED & UNDRAINED	

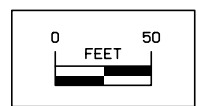
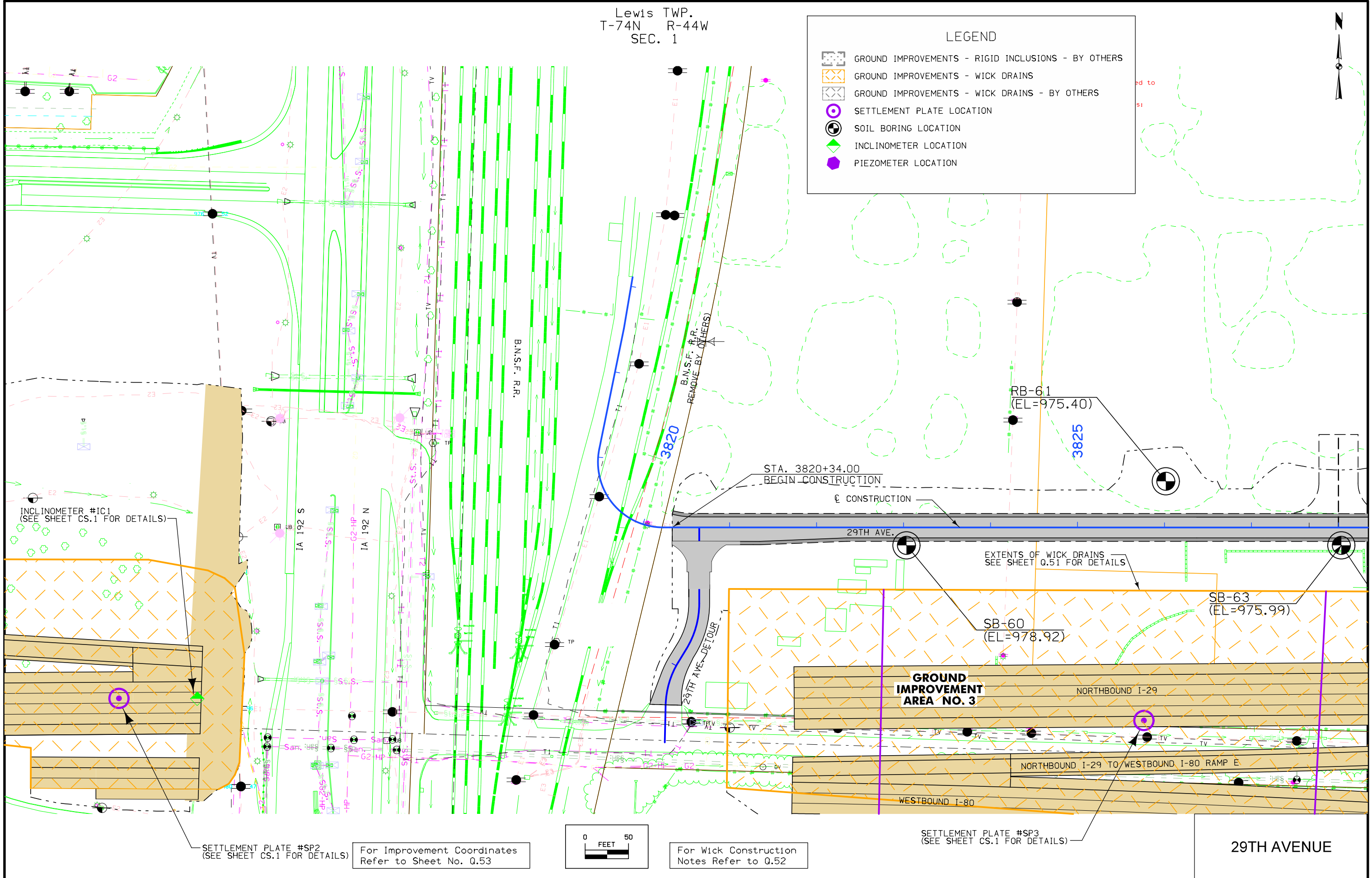
DESCRIPTION	SOIL SURVEYOR	DATE	DENS. CORE	BLOW
DESIGNER/CADD	DATE		SAMPLE	SHELBY
SOILS BOOK NO.			PLUGGED	WATER
SELECT SOIL	UNSUITABLE	SHALE	MOISTURE	DIAMOND CORE
SELECT SAND	SANDY SOIL	ROCK		

23RD AVENUE  
EXTENSION

Lewis TWP.  
T-74N R-44W  
SEC. 1

**LEGEND**

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



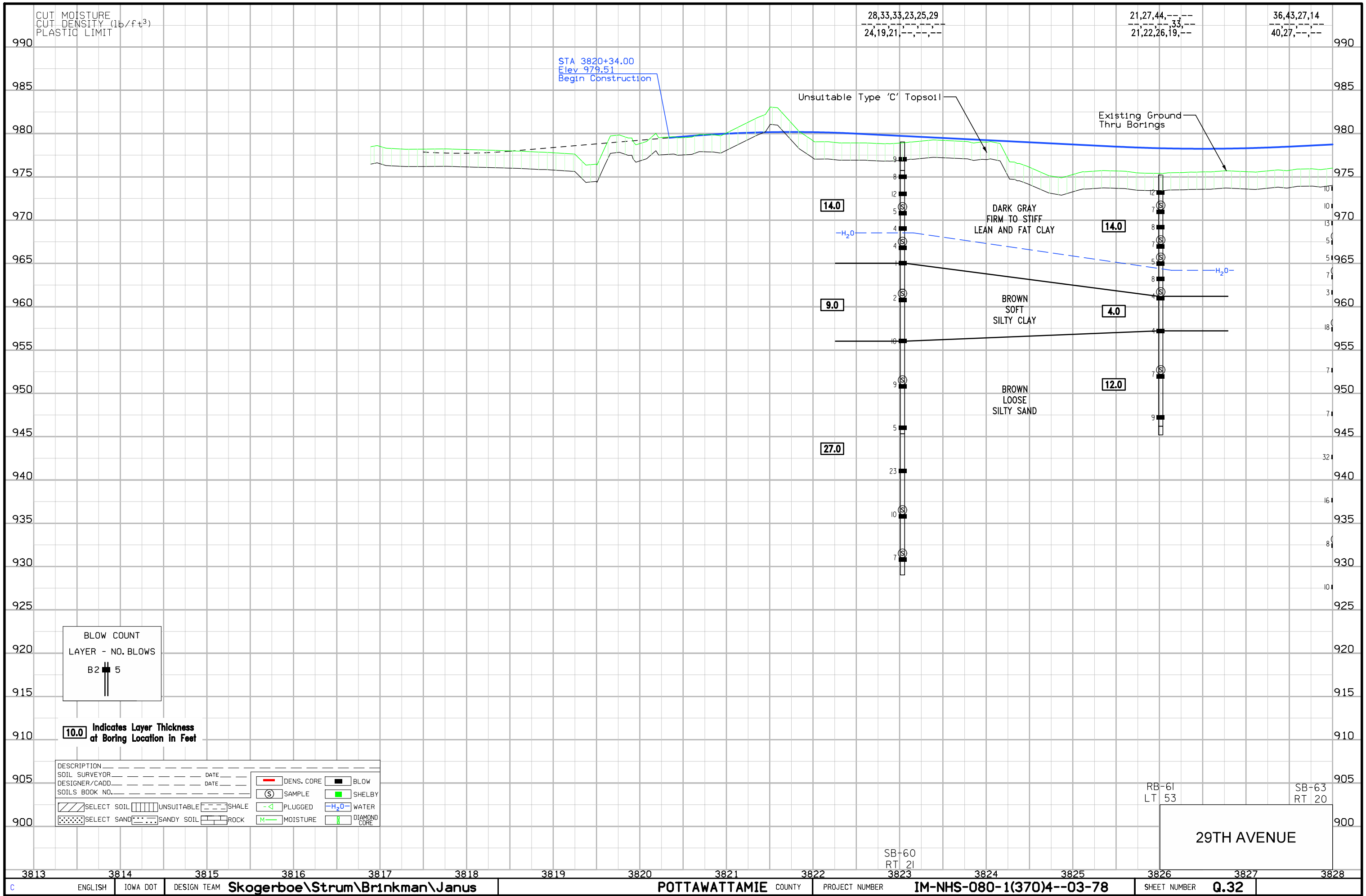
SETTLEMENT PLATE #SP2  
(SEE SHEET CS.1 FOR DETAILS)

For Improvement Coordinates  
Refer to Sheet No. Q.53

For Wick Construction  
Notes Refer to Q.52

SETTLEMENT PLATE #SP3  
(SEE SHEET CS.1 FOR DETAILS)

29TH AVENUE



CUT MOISTURE  
 CUT DENSITY (lb/ft<sup>3</sup>)  
 PLASTIC LIMIT

28,33,33,23,25,29  
 24,19,21,---,---,---

21,27,44,---,---  
 21,22,26,19,---

36,43,27,14  
 40,27,---,---

STA 3820+34.00  
 Elev 979.51  
 Begin Construction

Unsuitable Type 'C' Topsoil

Existing Ground Thru Borings

DARK GRAY  
 FIRM TO STIFF  
 LEAN AND FAT CLAY

BROWN  
 SOFT  
 SILTY CLAY

BROWN  
 LOOSE  
 SILTY SAND

14.0

14.0

9.0

4.0

12.0

27.0

BLOW COUNT  
 LAYER - NO. BLOWS  
 B2 5

10.0 Indicates Layer Thickness  
 at Boring Location in Feet

DESCRIPTION	DATE	DENS. CORE	BLOW
SOIL SURVEYOR	DATE	SAMPLE	SHELBY
DESIGNER/CADD	DATE	PLUGGED	WATER
SOILS BOOK NO.		MOISTURE	DIAMOND CORE
SELECT SOIL	UNSUITABLE	SHALE	
SELECT SAND	SANDY SOIL	ROCK	

RB-61  
 LT 53

SB-63  
 RT 20








29TH AVENUE

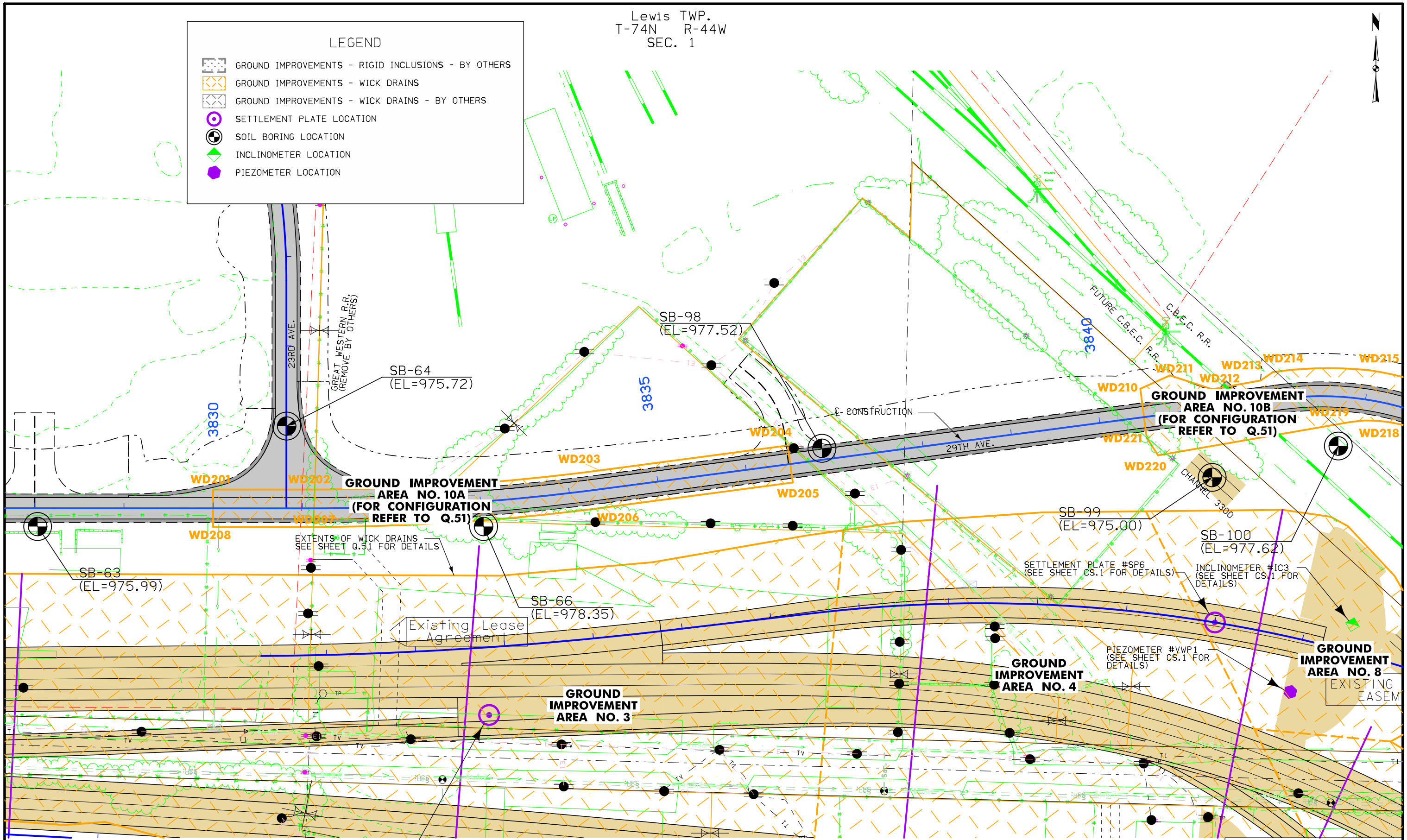
SB-60  
 RT 21

Lewis TWP.  
T-74N R-44W  
SEC. 1



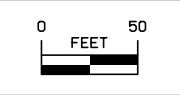
**LEGEND**

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



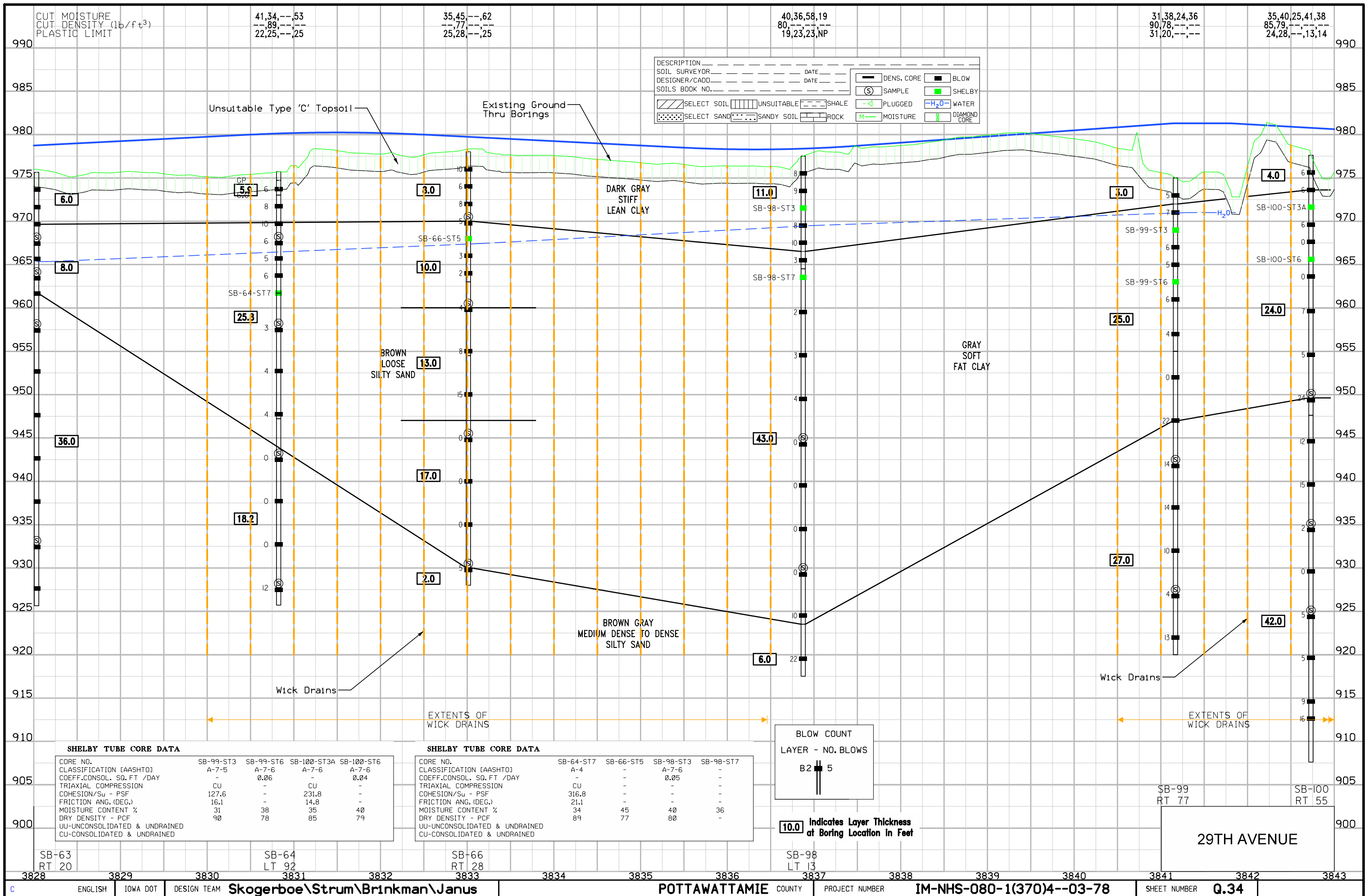
SETTLEMENT PLATE #SP4  
(SEE SHEET CS.1 FOR DETAILS)

For Wick Construction  
Notes Refer to Q.52



For Improvement Coordinates  
Refer to Sheet No. Q.53

29TH AVENUE



CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

41,34,--53  
--89,--  
22,25,--25

35,45,--62  
--77,--  
25,28,--25

40,36,58,19  
80,--  
19,23,23,NP

31,38,24,36  
90,78,--  
31,20,--

35,40,25,41,38  
85,79,--  
24,28,--13,14

DESCRIPTION \_\_\_\_\_ DATE \_\_\_\_\_  
 SOIL SURVEYOR \_\_\_\_\_ DATE \_\_\_\_\_  
 DESIGNER/CADD \_\_\_\_\_ DATE \_\_\_\_\_  
 SOILS BOOK NO. \_\_\_\_\_

[Symbol] DENS. CORE [Symbol] BLOW  
 [Symbol] SAMPLE [Symbol] SHELBY  
 [Symbol] PLUGGED [Symbol] WATER  
 [Symbol] MOISTURE [Symbol] DIAMOND CORE

[Symbol] SELECT SOIL [Symbol] UNSUITABLE [Symbol] SHALE  
 [Symbol] SELECT SAND [Symbol] SANDY SOIL [Symbol] ROCK

**SHELBY TUBE CORE DATA**

CORE NO.	SB-99-ST3	SB-99-ST6	SB-100-ST3A	SB-100-ST6
CLASSIFICATION [AASHTO]	A-7-5	A-7-6	A-7-6	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	0.06	-	0.04
COHESION/S <sub>u</sub> - PSF	127.6	-	231.8	-
FRICITION ANG. (DEG.)	16.1	-	14.8	-
MOISTURE CONTENT %	31	38	35	40
DRY DENSITY - PCF	90	78	85	79
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				

**SHELBY TUBE CORE DATA**

CORE NO.	SB-64-ST7	SB-66-ST5	SB-98-ST3	SB-98-ST7
CLASSIFICATION [AASHTO]	A-4	-	A-7-6	-
COEFF. CONSOL. SQ. FT / DAY	-	-	0.05	-
COHESION/S <sub>u</sub> - PSF	316.8	-	-	-
FRICITION ANG. (DEG.)	21.1	-	-	-
MOISTURE CONTENT %	34	45	40	36
DRY DENSITY - PCF	89	77	80	-
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				








**BLOW COUNT**  
 LAYER - NO. BLOWS  
 B2 5

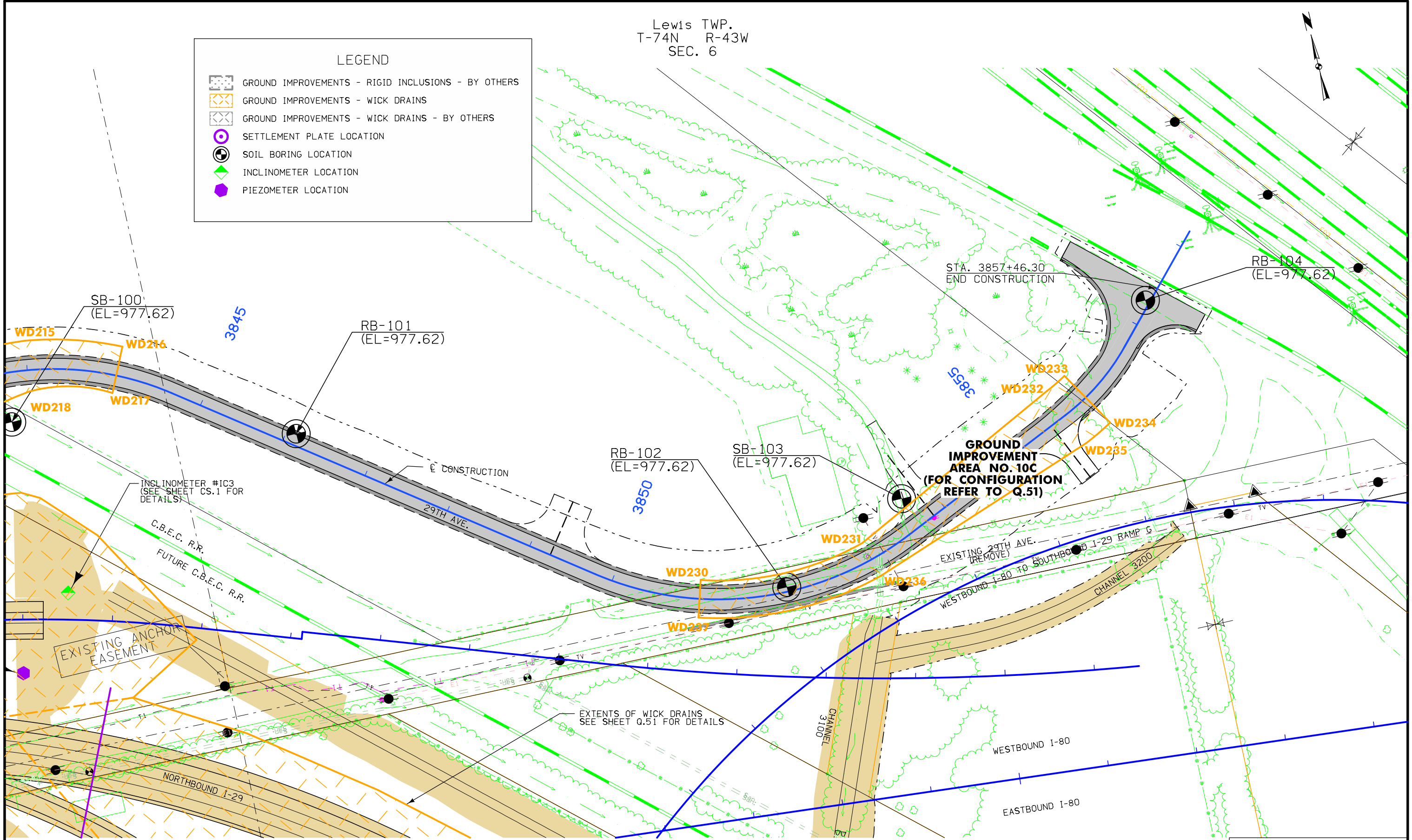
**10.0** Indicates Layer Thickness at Boring Location in Feet

**29TH AVENUE**

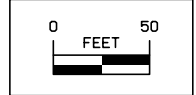
Lewis TWP.  
T-74N R-43W  
SEC. 6

**LEGEND**

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



For Improvement Coordinates  
Refer to Sheet No. Q.53

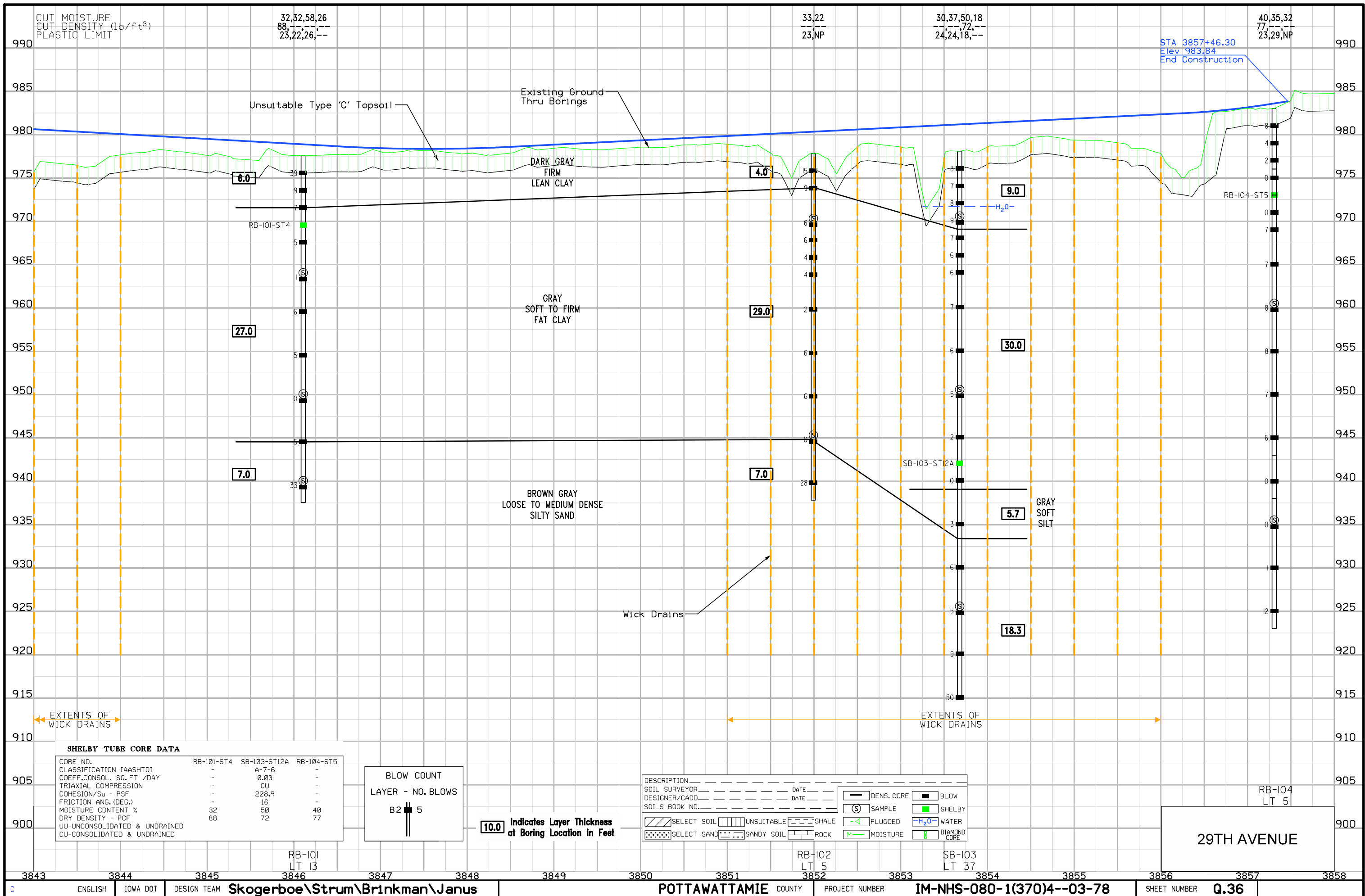


For Wick Construction  
Notes Refer to Q.52

Lewis TWP.  
T-74N R-43W  
SEC. 7

29TH AVENUE





**SHELBY TUBE CORE DATA**

CORE NO.	RB-101-ST4	SB-103-ST12A	RB-104-ST5
CLASSIFICATION [AASHTO]	-	A-7-6	-
COEFF. CONSOL. SQ. FT / DAY	-	0.03	-
TRIAxIAL COMPRESSION	-	CU	-
COHESION/S <sub>u</sub> - PSF	-	228.9	-
FRICTION ANG. (DEG.)	-	16	-
MOISTURE CONTENT %	32	50	40
DRY DENSITY - PCF	88	72	77
UU-UNCONSOLIDATED & UNDRAINED			
CU-CONSOLIDATED & UNDRAINED			

**BLOW COUNT**

LAYER - NO. BLOWS

B2 5

**DESCRIPTION**








SOIL SURVEYOR \_\_\_\_\_ DATE \_\_\_\_\_

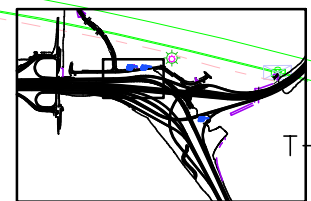
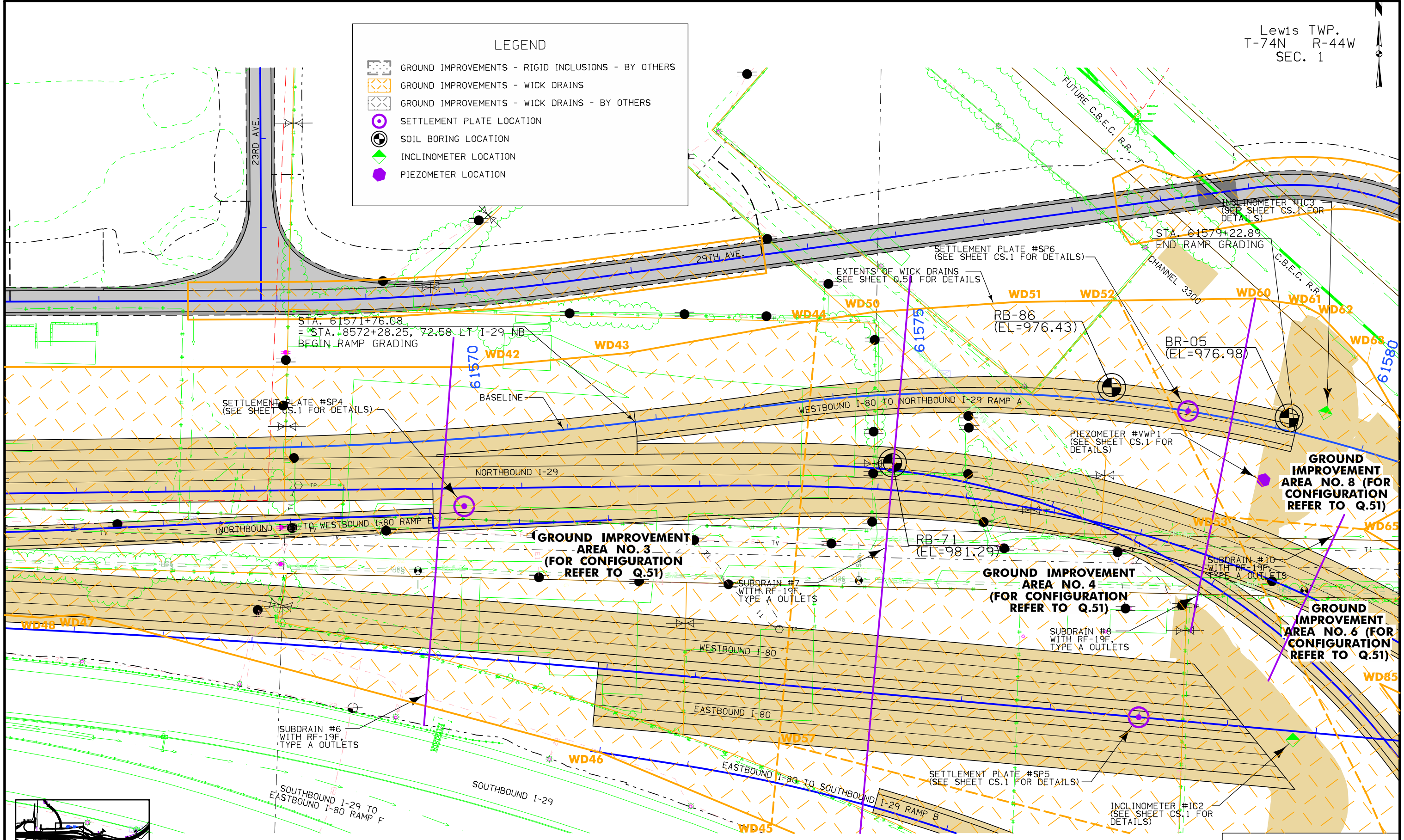
DESIGNER/CADD \_\_\_\_\_ DATE \_\_\_\_\_

SOILS BOOK NO. \_\_\_\_\_

	SELECT SOIL		UNSUITABLE		SHALE		PLUGGED		H <sub>2</sub> O		MOISTURE		BLOW		SHELBY		DIAMOND CORE
	SELECT SAND		SANDY SOIL		ROCK												

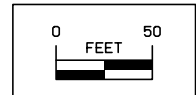
**LEGEND**

-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



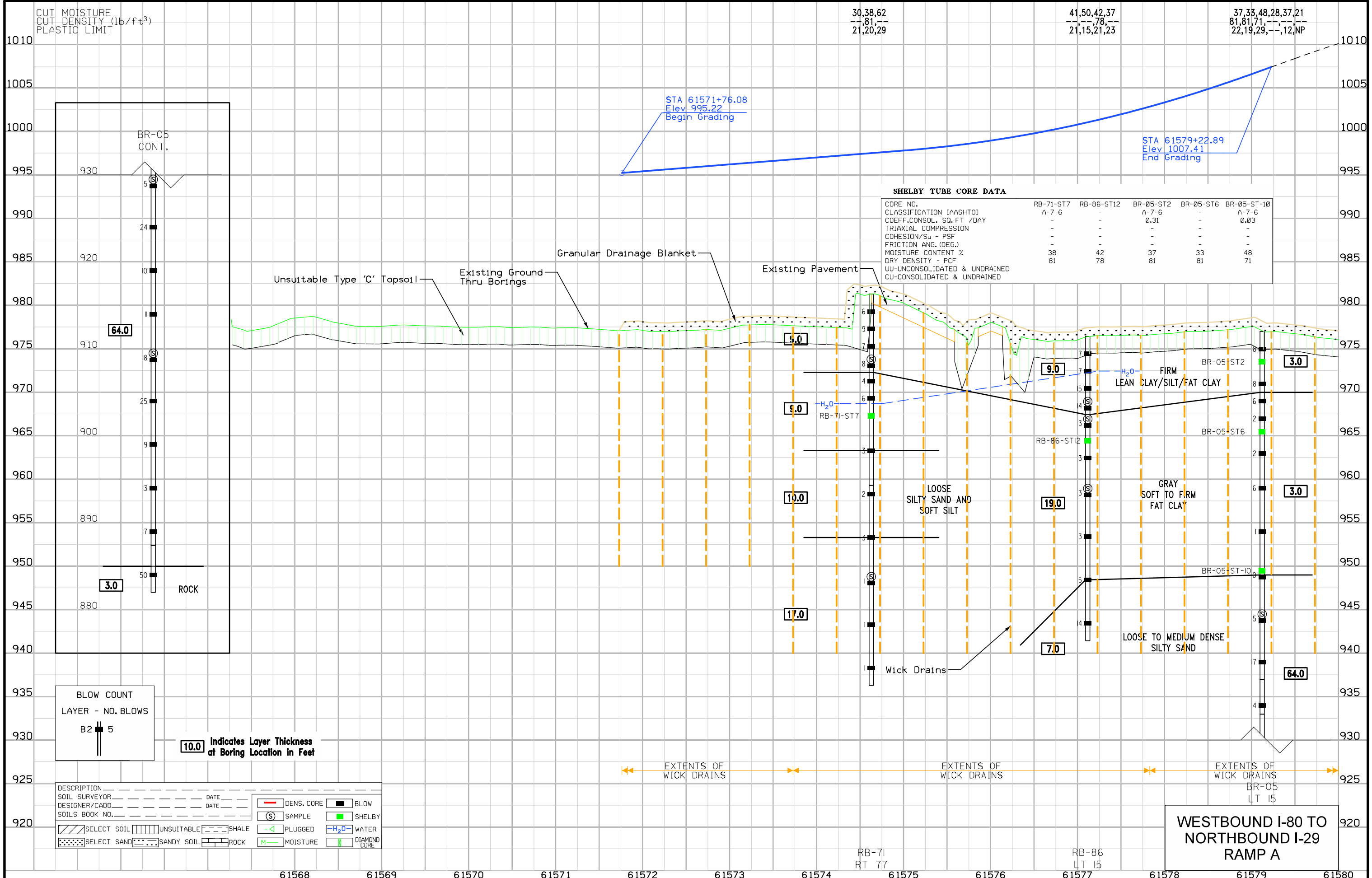
Lewis TWP.  
T-74N R-44W  
SEC. 12

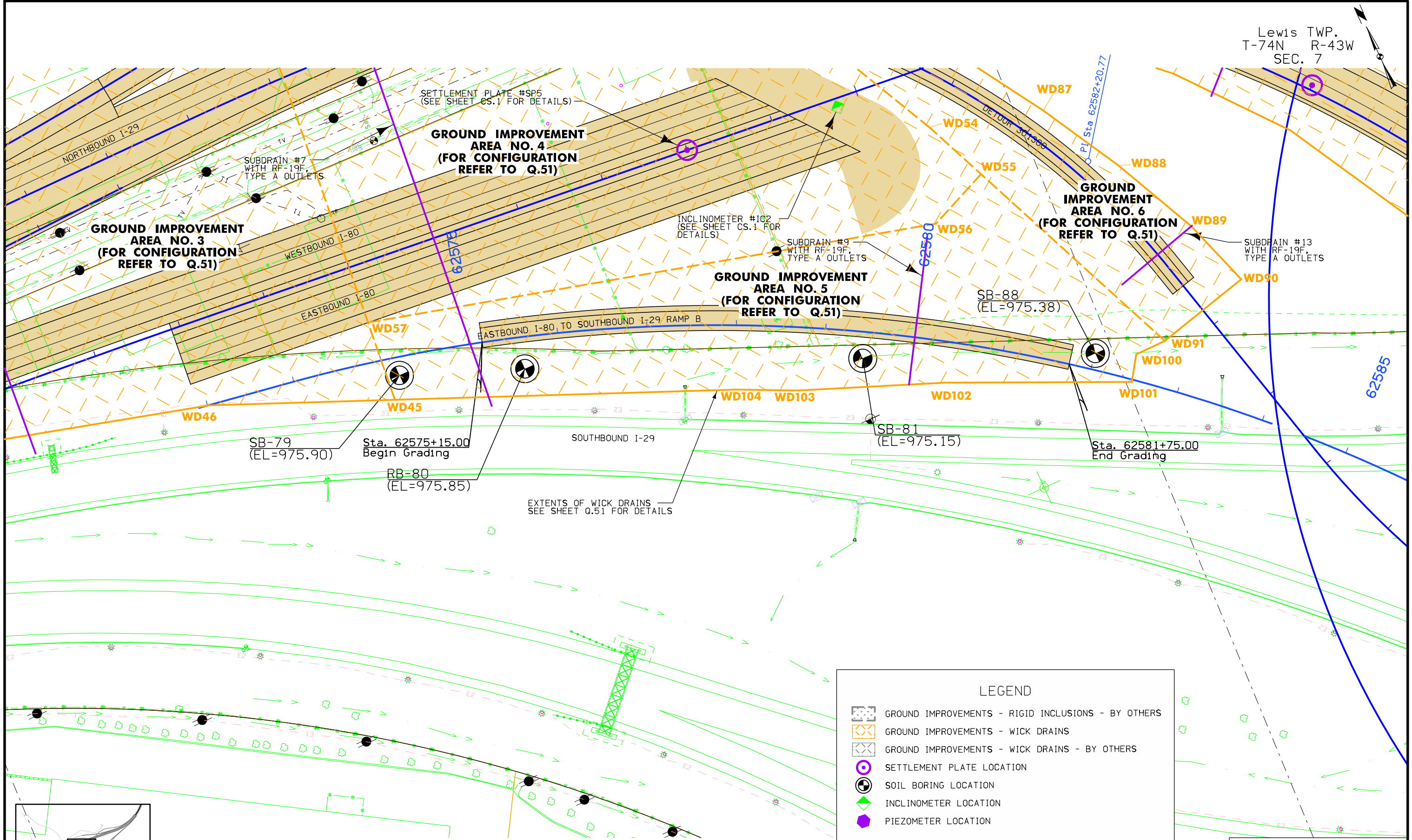
For Wick Construction  
Notes Refer to Q.52



For Improvement Coordinates  
Refer to Sheet No. Q.53

WESTBOUND I-80 TO  
NORTHBOUND I-29  
RAMP A





**GROUND IMPROVEMENT AREA NO. 4**  
(FOR CONFIGURATION REFER TO Q.51)

**GROUND IMPROVEMENT AREA NO. 3**  
(FOR CONFIGURATION REFER TO Q.51)

**GROUND IMPROVEMENT AREA NO. 5**  
(FOR CONFIGURATION REFER TO Q.51)

**GROUND IMPROVEMENT AREA NO. 6**  
(FOR CONFIGURATION REFER TO Q.51)

SB-79  
(EL=975.90)

Sta. 62575+15.00  
Begin Grading

RB-80  
(EL=975.85)

SOUTHBOUND I-29

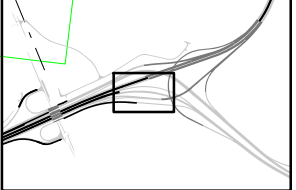
SB-81  
(EL=975.15)

Sta. 62581+75.00  
End Grading

EXTENTS OF WICK DRAINS  
SEE SHEET Q.51 FOR DETAILS

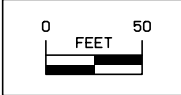
**LEGEND**

	GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
	GROUND IMPROVEMENTS - WICK DRAINS
	GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
	SETTLEMENT PLATE LOCATION
	SOIL BORING LOCATION
	INCLINOMETER LOCATION
	PIEZOMETER LOCATION



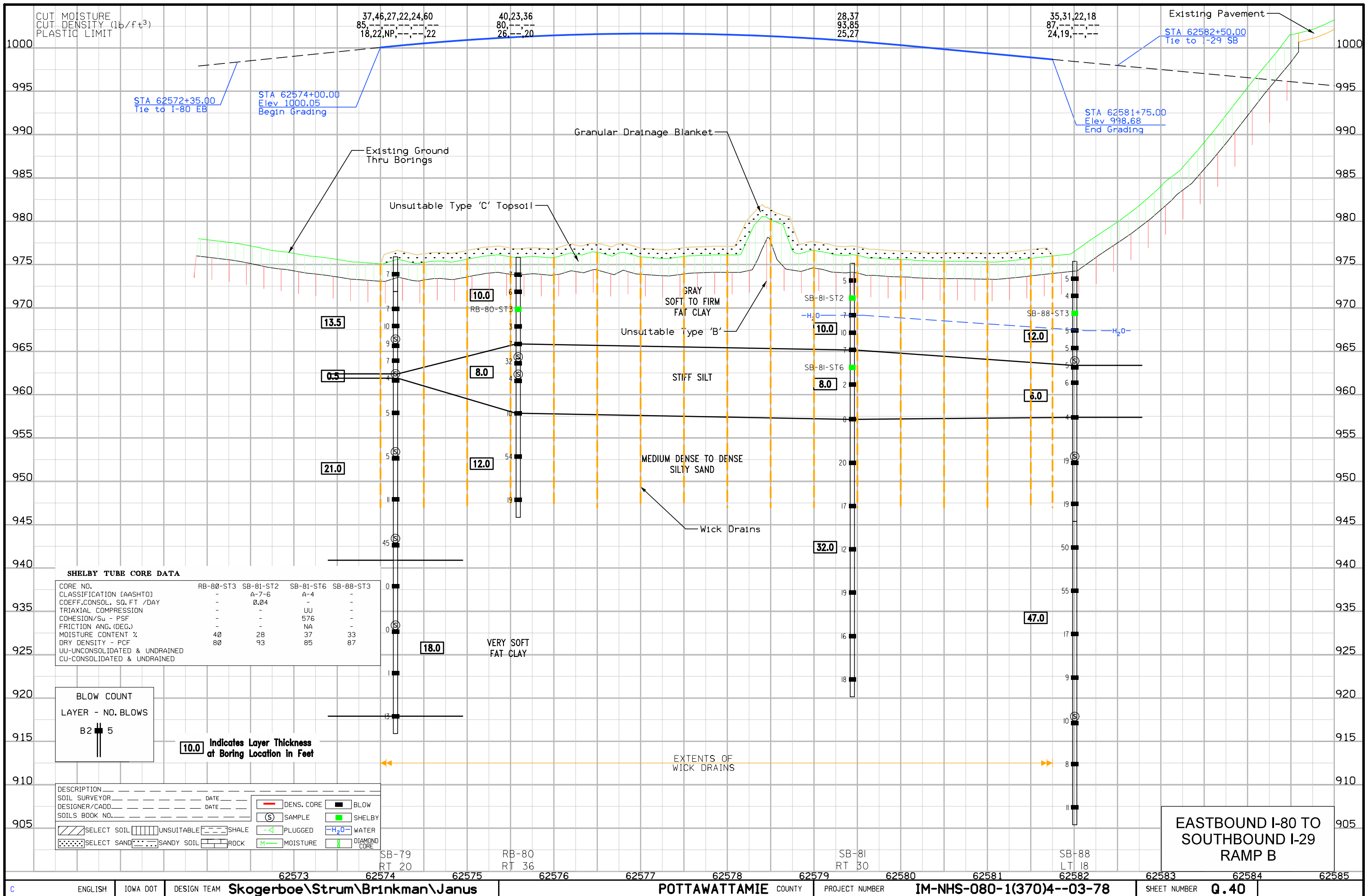
Lewis TWP.  
T-74N R-44W  
SEC. 12

For Wick Construction  
Notes Refer to Q.52



For Improvement Coordinates  
Refer to Sheet No. Q.53

**EASTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP B**



**SHELBY TUBE CORE DATA**

CORE NO.	RB-80-ST3	SB-81-ST2	SB-81-ST6	SB-88-ST3
CLASSIFICATION [AASHTO]	-	A-7-6	A-4	-
COEFF. CONSOL. SQ. FT / DAY	-	0.04	-	-
TRIAxIAL COMPRESSION	-	-	UU	-
COHESION/S <sub>u</sub> - PSF	-	-	576	-
FRICTION ANG. (DEG.)	-	-	NA	-
MOISTURE CONTENT %	40	28	37	33
DRY DENSITY - PCF	80	93	85	87
UU-UNCONSOLIDATED & UNDRAINED				
CU-CONSOLIDATED & UNDRAINED				

**BLOW COUNT**

LAYER - NO. BLOWS

B2 5

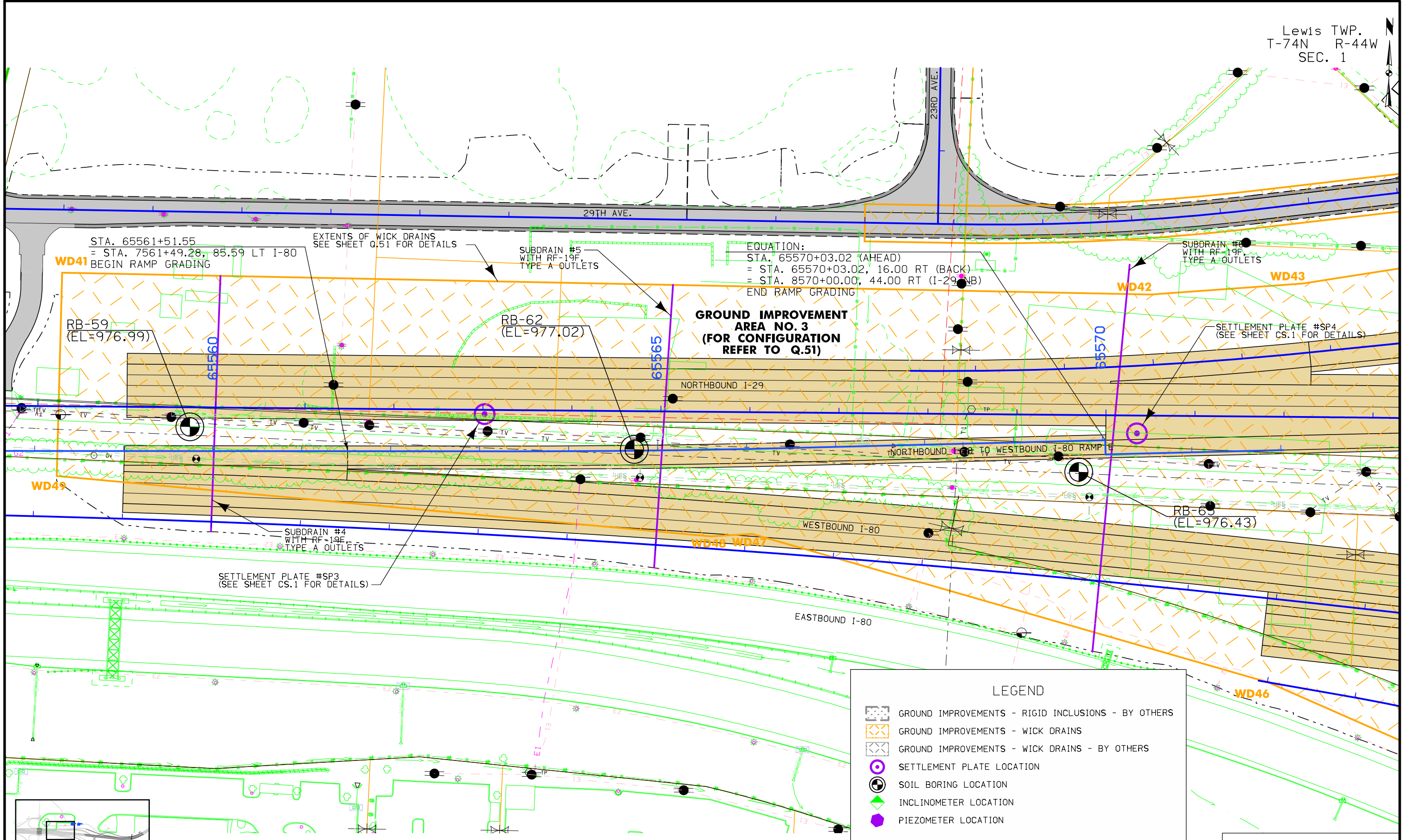
10.0 Indicates Layer Thickness at Boring Location in Feet

**DESCRIPTION**

SOIL SURVEYOR _____ DATE _____	DENS. CORE	BLOW
DESIGNER/CADD _____ DATE _____	(S) SAMPLE	SHELBY
SOILS BOOK NO. _____	PLUGGED	H <sub>2</sub> O WATER
SELECT SOIL	UNSUITABLE	SHALE
SELECT SAND	SANDY SOIL	ROCK
		MOISTURE
		DIAMOND CORE

**EASTBOUND I-80 TO SOUTHBOUND I-29 RAMP B**

Lewis TWP.  
T-74N R-44W  
SEC. 1

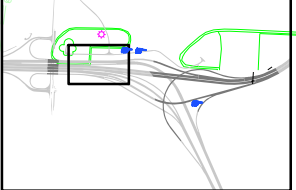


EQUATION:  
STA. 65570+03.02 (AHEAD)  
= STA. 65570+03.02, 16.00 RT (BACK)  
= STA. 8570+00.00, 44.00 RT (I-29 NB)  
END RAMP GRADING

**GROUND IMPROVEMENT  
AREA NO. 3  
(FOR CONFIGURATION  
REFER TO Q.51)**

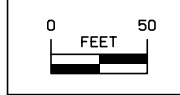
**LEGEND**

	GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
	GROUND IMPROVEMENTS - WICK DRAINS
	GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
	SETTLEMENT PLATE LOCATION
	SOIL BORING LOCATION
	INCLINOMETER LOCATION
	PIEZOMETER LOCATION



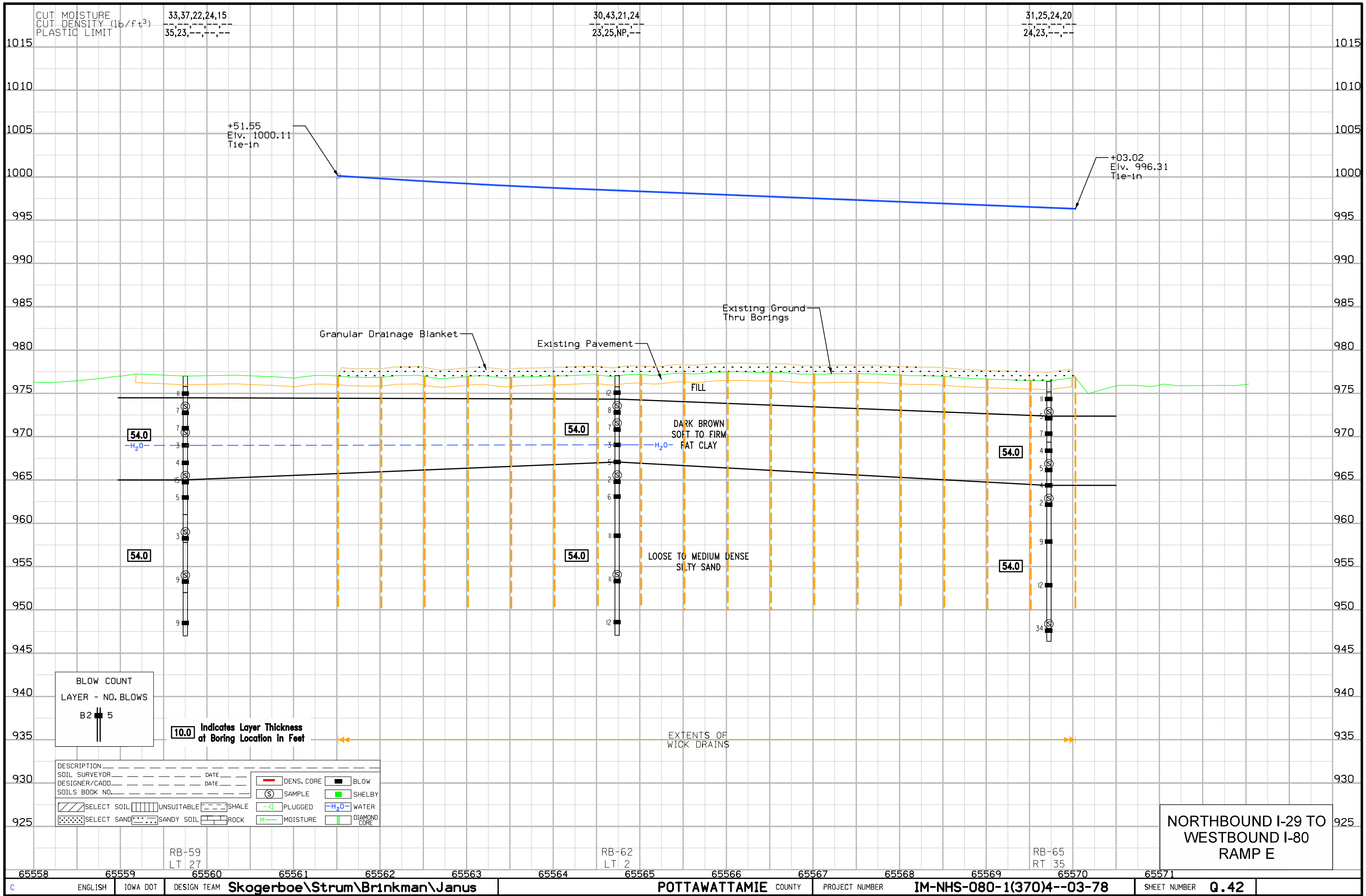
Lewis TWP.  
T-74N R-44W  
SEC. 12

For Wick Construction  
Notes Refer to Q.52

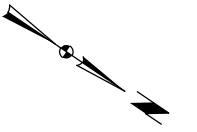


For Improvement Coordinates  
Refer to Sheet No. Q.53








**NORTHBOUND I-29 TO  
WESTBOUND I-80  
RAMP E**

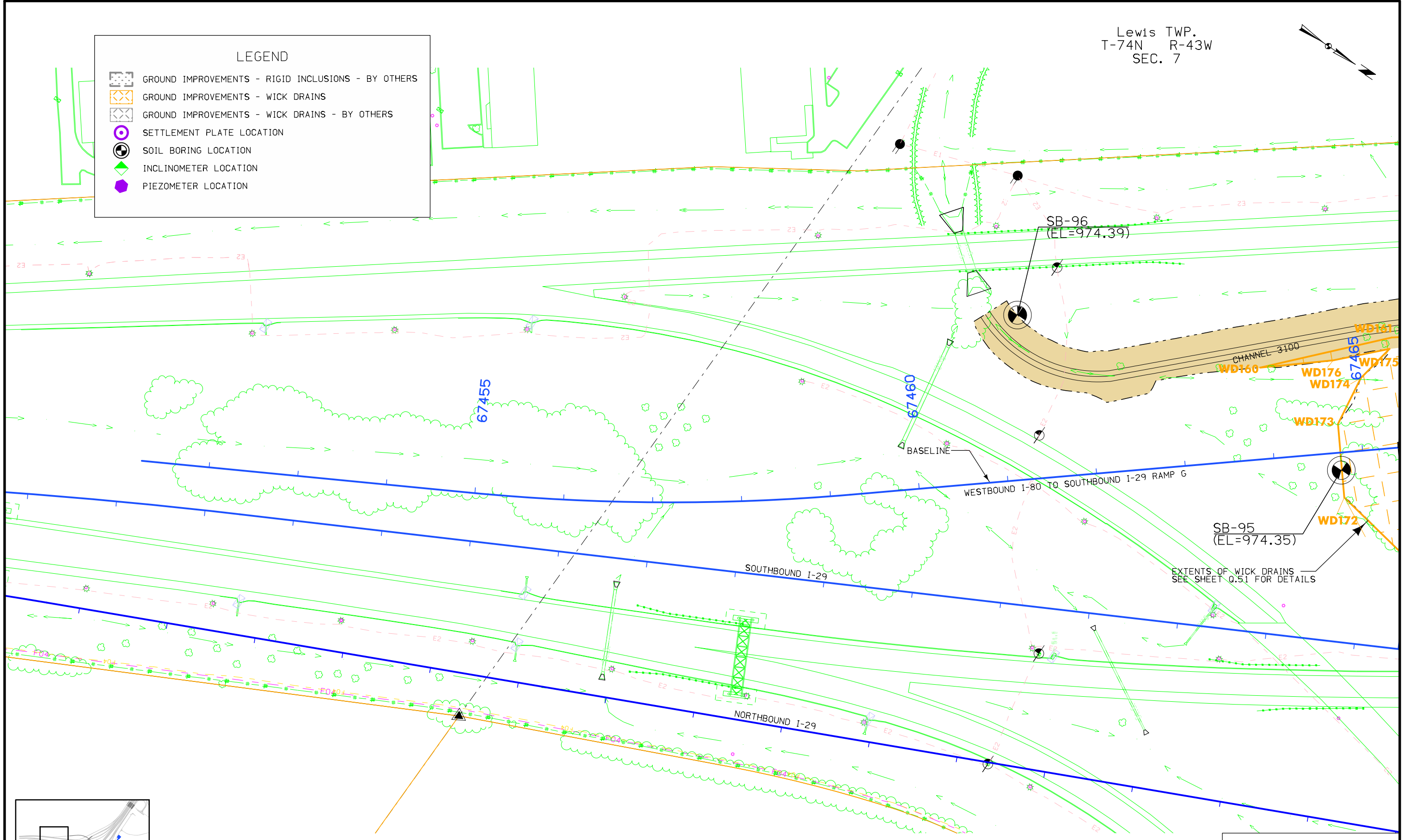


Lewis TWP.  
T-74N R-43W  
SEC. 7

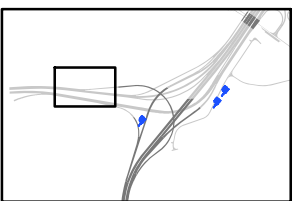


**LEGEND**

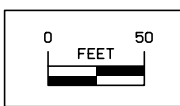
-  GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
-  GROUND IMPROVEMENTS - WICK DRAINS
-  GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
-  SETTLEMENT PLATE LOCATION
-  SOIL BORING LOCATION
-  INCLINOMETER LOCATION
-  PIEZOMETER LOCATION



EXTENTS OF WICK DRAINS  
SEE SHEET Q.51 FOR DETAILS



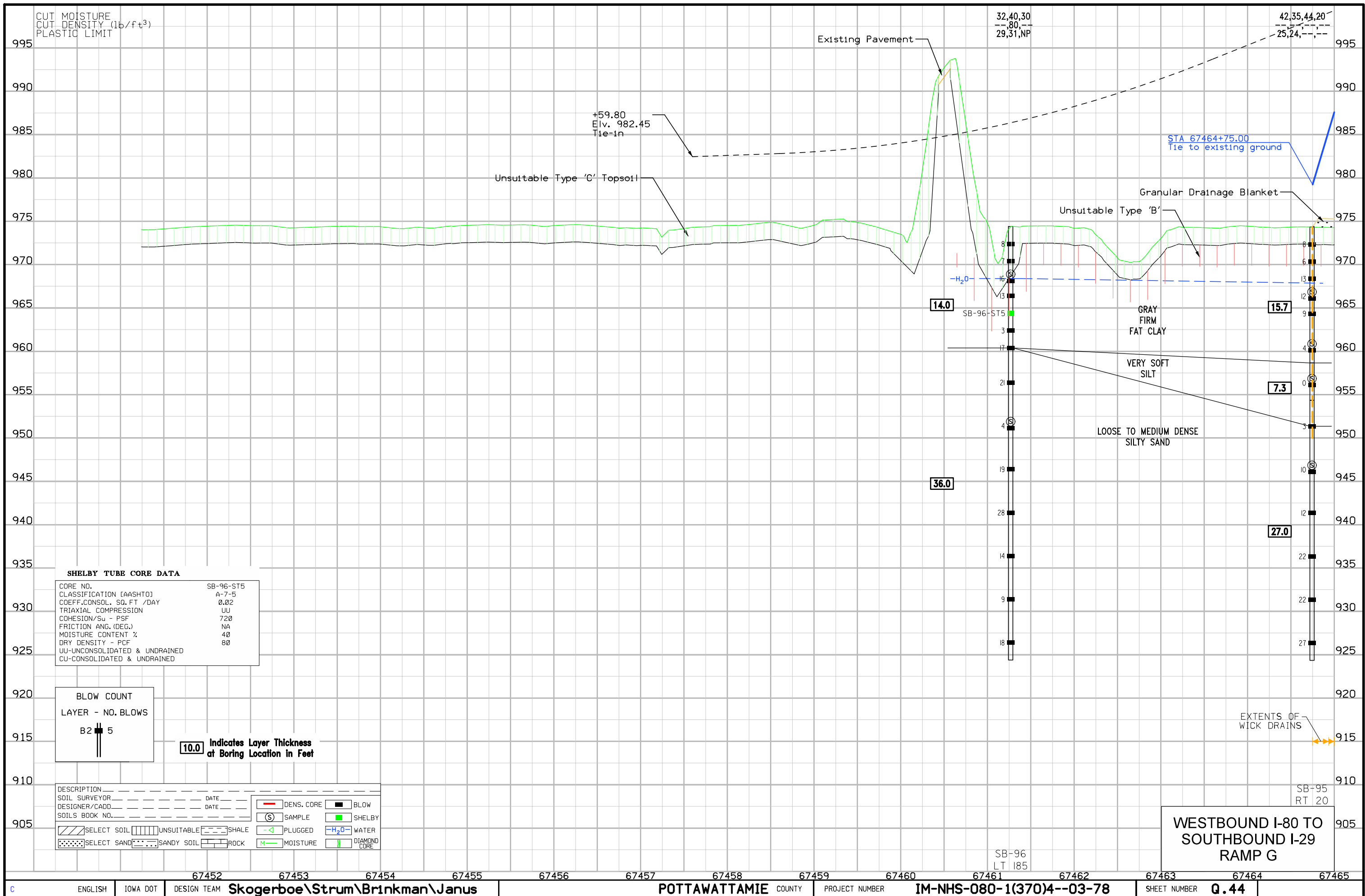
For Wick Construction  
Notes Refer to Q.52



For Improvement Coordinates  
Refer to Sheet No. Q.53

**WESTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP G**





CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

32,40,30  
80,80,80  
29,31,NP

42,35,44,20  
25,24,24,24

+59.80  
Elev. 982.45  
Tie-in

STA 67464+75.00  
Tie to existing ground

Unsuitable Type 'C' Topsoil

Granular Drainage Blanket

Unsuitable Type 'B'

SB-96-ST5

GRAY FIRM FAT CLAY

VERY SOFT SILT

LOOSE TO MEDIUM DENSE SILTY SAND

14.0

15.7

7.3

36.0

27.0

SB-96  
LT 185

SB-95  
RT 20

WESTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP G

**SHELBY TUBE CORE DATA**

CORE NO.	SB-96-ST5
CLASSIFICATION (AASHTO)	A-7-5
COEFF. CONSOL. SQ. FT / DAY	0.02
TRIAxIAL COMPRESSION	UU
COHESION/S <sub>u</sub> - PSF	720
FRICTION ANG. (DEG.)	NA
MOISTURE CONTENT %	40
DRY DENSITY - PCF	80
UU-UNCONSOLIDATED & UNDRAINED	
CU-CONSOLIDATED & UNDRAINED	

**BLOW COUNT**

LAYER - NO. BLOWS

B2	5
----	---

10.0 Indicates Layer Thickness at Boring Location in Feet

DESCRIPTION	DATE	DESIGNER/CADD	DATE
SOIL SURVEYOR	DATE	DESIGNER/CADD	DATE
SOILS BOOK NO.			

[Symbol]	SELECT SOIL	[Symbol]	UNSUITABLE	[Symbol]	SHALE
[Symbol]	SELECT SAND	[Symbol]	SANDY SOIL	[Symbol]	ROCK
[Symbol]	DENS. CORE	[Symbol]	BLOW	[Symbol]	SHELBY
[Symbol]	SAMPLE	[Symbol]	PLUGGED	[Symbol]	H <sub>2</sub> O WATER
[Symbol]	MOISTURE	[Symbol]	DIAMOND CORE		

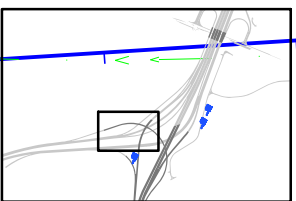
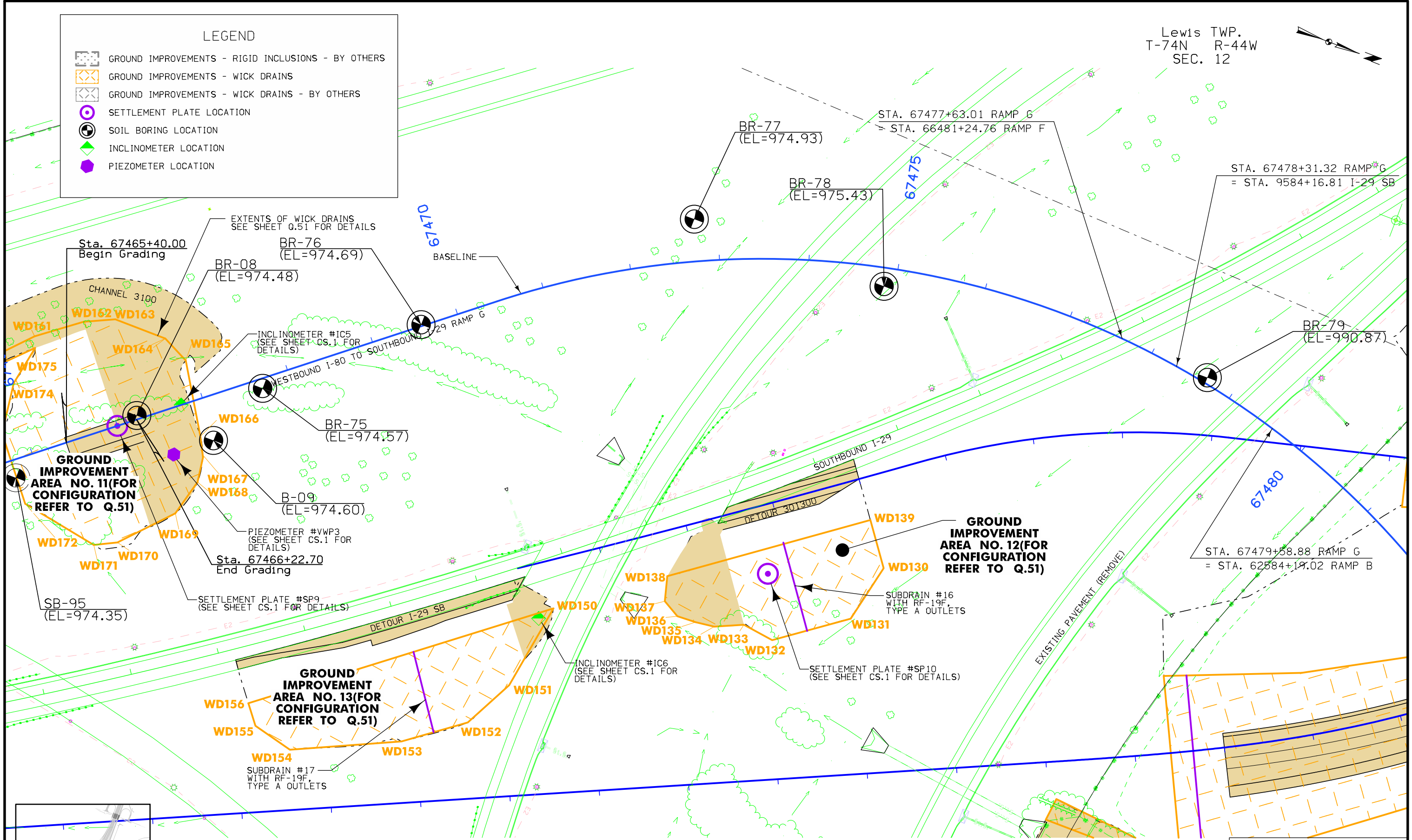
67452 67453 67454 67455 67456 67457 67458 67459 67460 67461 67462 67463 67464 67465

Lewis TWP.  
T-74N R-44W  
SEC. 12



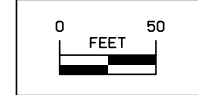
**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION



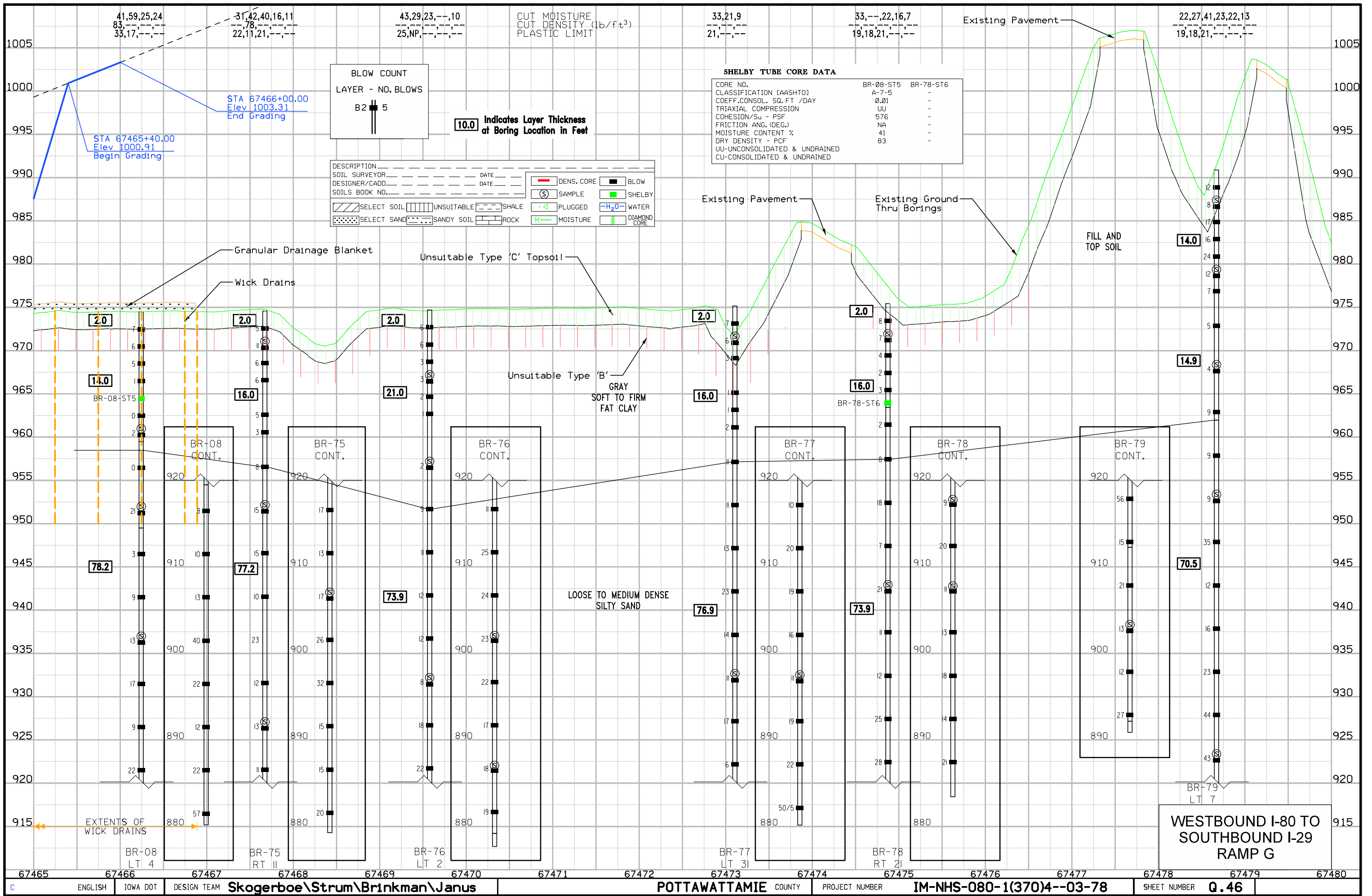
Lewis TWP.  
T-74N R-43W  
SEC. 7

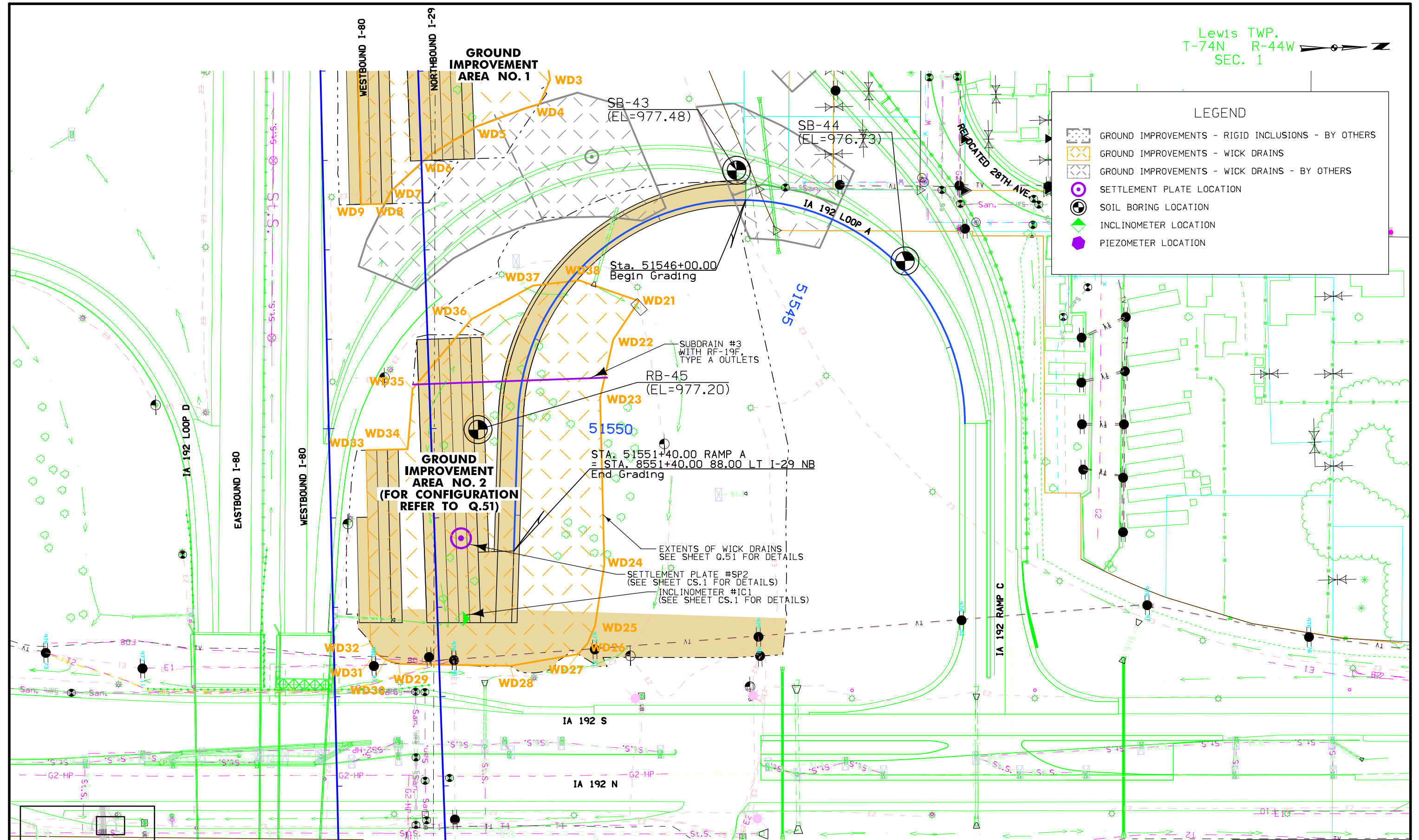
For Wick Construction  
Notes Refer to Q.52



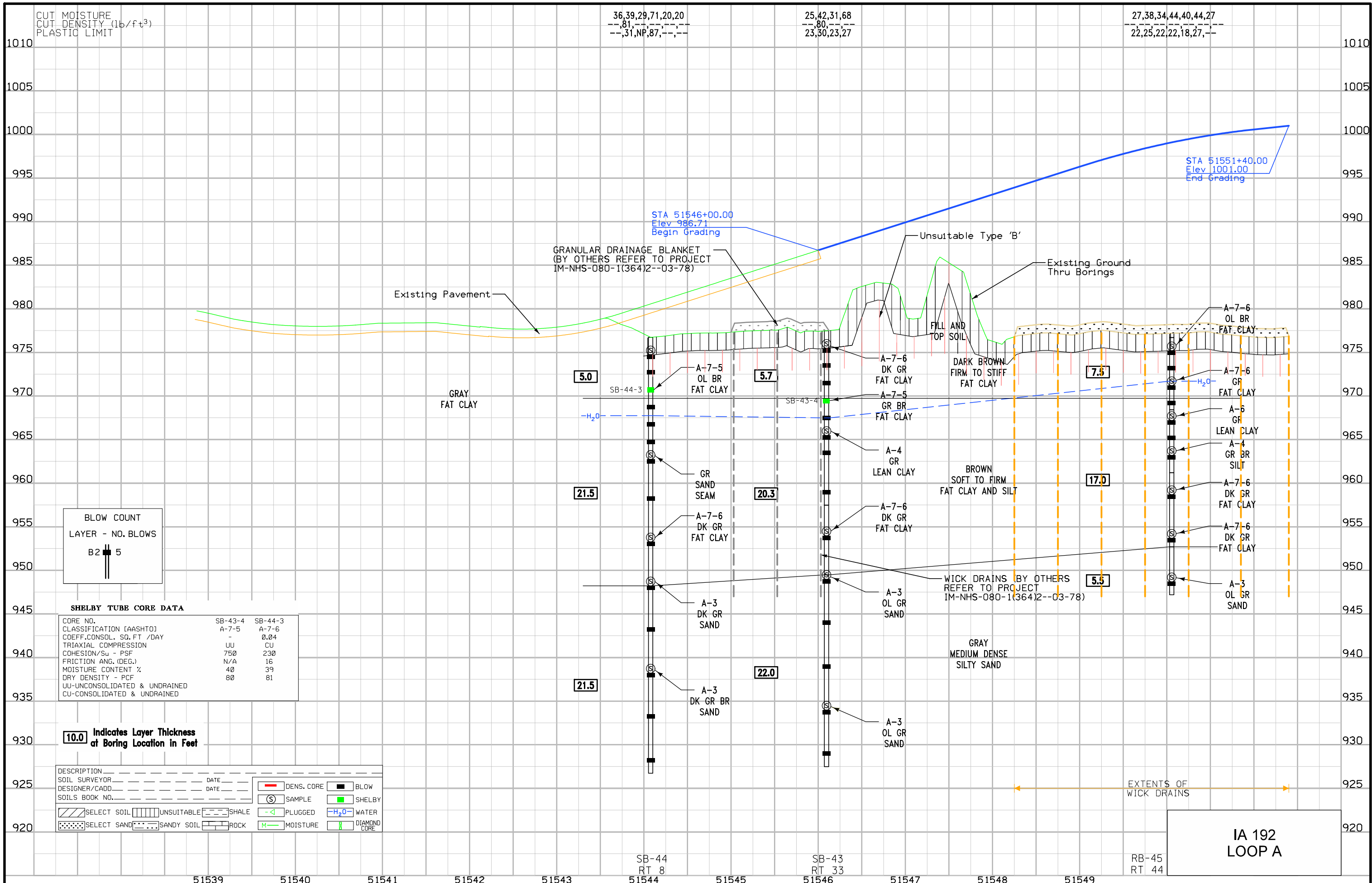
For Improvement Coordinates  
Refer to Sheet No. Q.53

**WESTBOUND I-80 TO  
SOUTHBOUND I-29  
RAMP G**





LEGEND	
	GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
	GROUND IMPROVEMENTS - WICK DRAINS
	GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
	SETTLEMENT PLATE LOCATION
	SOIL BORING LOCATION
	INCLINOMETER LOCATION
	PIEZOMETER LOCATION



CUT MOISTURE  
CUT DENSITY (lb/ft<sup>3</sup>)  
PLASTIC LIMIT

36,39,29,71,20,20  
--81,--2,--2,--2,--2,--2  
--31,NP,87,--2,--2

25,42,31,68  
--80,--2,--2,--2,--2,--2  
23,50,23,27

27,38,34,44,40,44,27  
22,25,22,22,18,27,--

STA 51551+40.00  
Elev 1001.00  
End Grading

STA 51546+00.00  
Elev 986.71  
Begin Grading

GRANULAR DRAINAGE BLANKET  
(BY OTHERS REFER TO PROJECT  
IM-NHS-080-1(364)2--03-78)

Unsuitable Type 'B'

Existing Ground  
Thru Borings

Existing Pavement

GRAY  
FAT CLAY

5.0

5.7

7.5

21.5

20.3

17.0

21.5

22.0

5.5

**BLOW COUNT**  
LAYER - NO. BLOWS

B2	5
----	---

**SHELBY TUBE CORE DATA**

CORE NO.	SB-43-4	SB-44-3
CLASSIFICATION [AASHTO]	A-7-5	A-7-6
COEFF. CONSOL. SQ. FT / DAY	-	0.04
TRIAxIAL COMPRESSION	UU	CU
COHESION/Su - PSF	750	230
FRICTION ANG. (DEG.)	N/A	16
MOISTURE CONTENT %	40	39
DRY DENSITY - PCF	80	81
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

**10.0** Indicates Layer Thickness  
at Boring Location in Feet

DESCRIPTION	DATE	DATE	DATE
SOIL SURVEYOR			
DESIGNER/CADD			
SOILS BOOK NO.			

	DENS. CORE		BLOW
	SAMPLE		SHELBY
	UNSUITABLE		WATER
	SELECT SOIL		MOISTURE
	SELECT SAND		DIAMOND CORE
	SHALE		PLUGGED
	SANDY SOIL		ROCK

EXTENTS OF  
WICK DRAINS

**IA 192  
LOOP A**

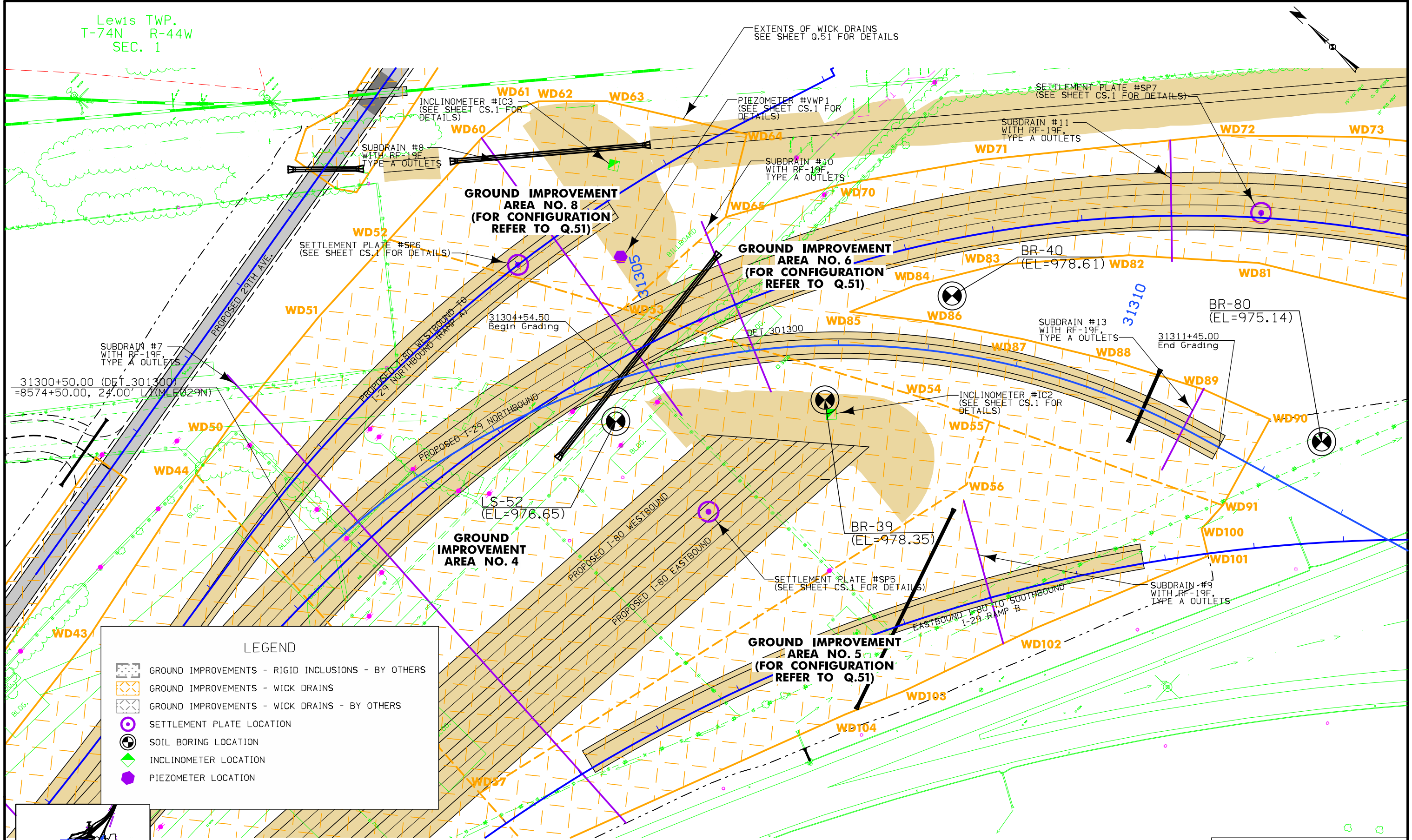
SB-44  
RT 8

SB-43  
RT 33

RB-45  
RT 44

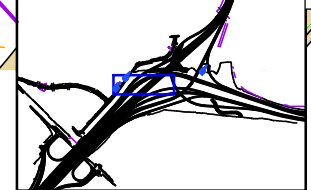
51539 51540 51541 51542 51543 51544 51545 51546 51547 51548 51549

Lewis TWP.  
T-74N R-44W  
SEC. 1

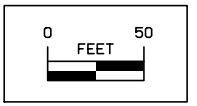


**LEGEND**

- GROUND IMPROVEMENTS - RIGID INCLUSIONS - BY OTHERS
- GROUND IMPROVEMENTS - WICK DRAINS
- GROUND IMPROVEMENTS - WICK DRAINS - BY OTHERS
- SETTLEMENT PLATE LOCATION
- SOIL BORING LOCATION
- INCLINOMETER LOCATION
- PIEZOMETER LOCATION

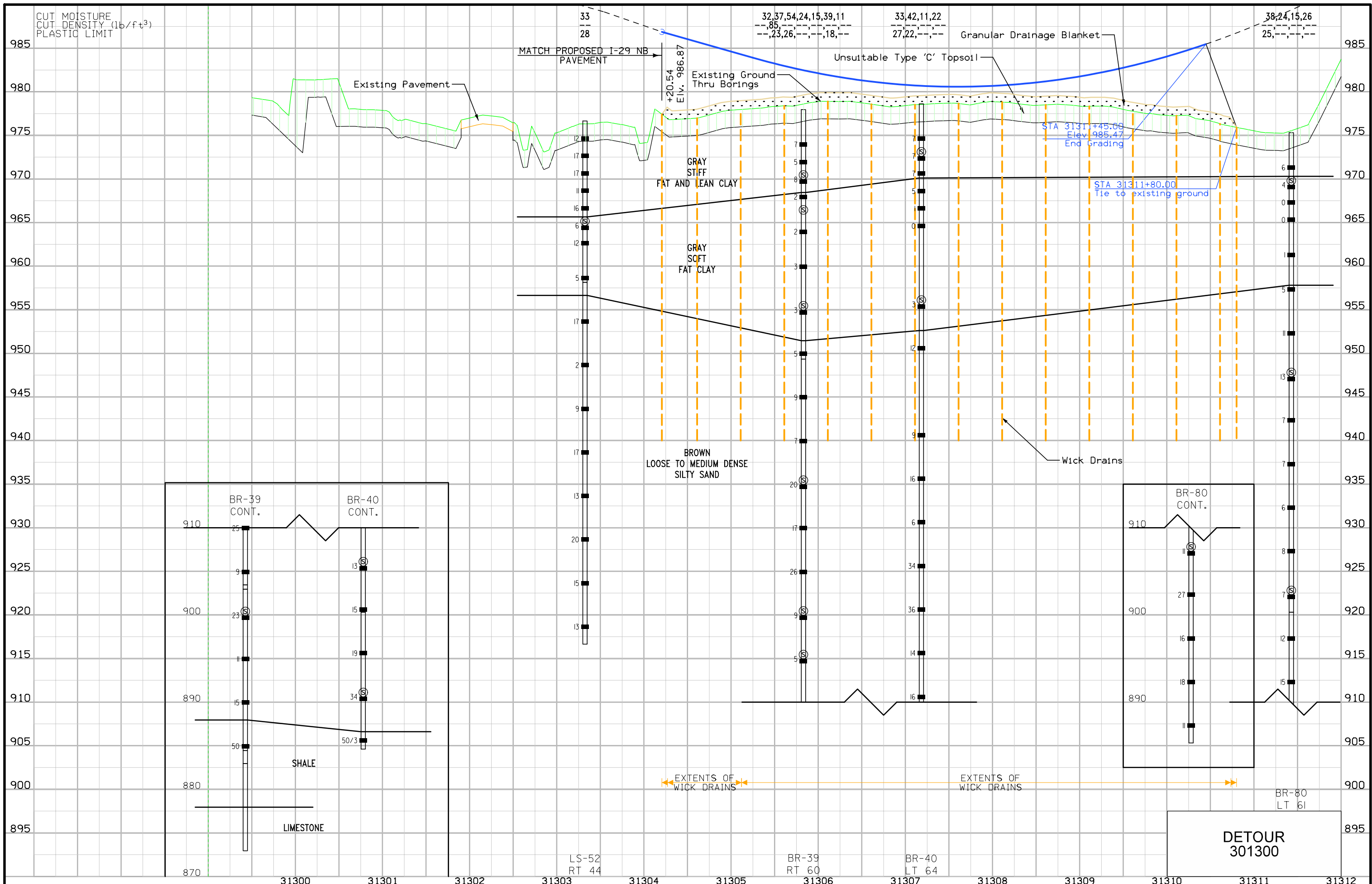


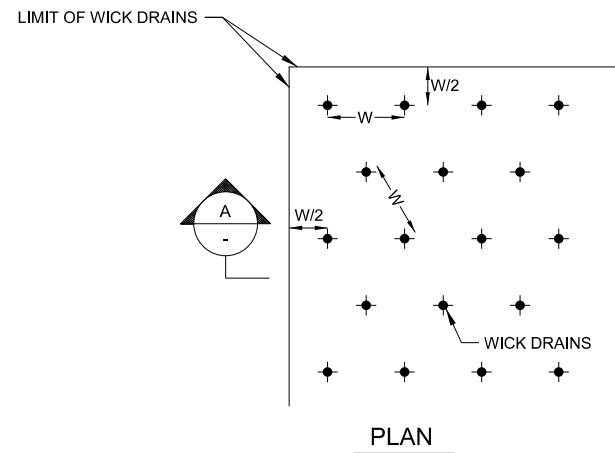
For Wick Construction  
Notes Refer to Q.52



For Improvement Coordinates  
Refer to Sheet No. Q.53

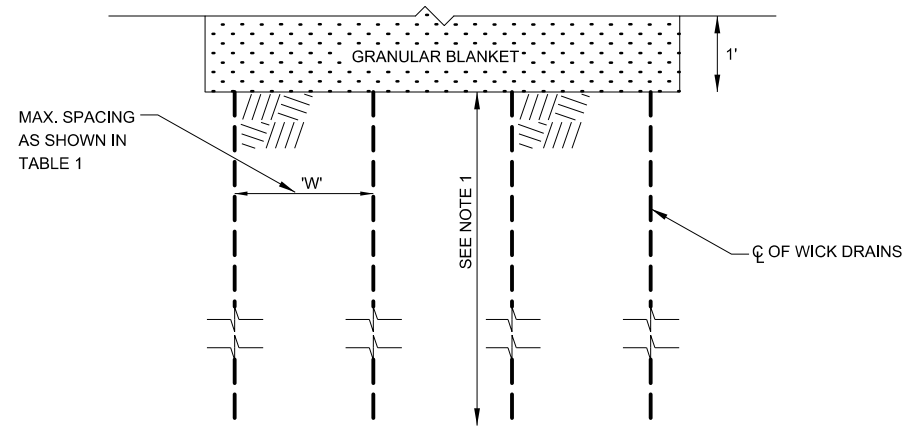
IA 192 EXIT LOOP A/  
I-29 NB DETOUR  
(DET\_301300)





NOTES:  
W = MAXIMUM SPACING BETWEEN  
WICK DRAINS SEE TABLE 1

1 TYPICAL WICK DRAIN LAYOUT  
NTS



NOTES:  
1. SEE TABLE 1 FOR ESTIMATED TIP ELEVATIONS  
OF WICK DRAINS

A SECTION A-A'  
NTS

Table 1: Wick Drains Design Configuration Summary

Improvement Area	Alignment	Station Limits		Wick Drain Spacing (ft)	Estimated Tip Elevation	Required Holding Period after Stage I Construction (Days)	Stage 1 Maximum Fill Height (ft)	Stage 1 Maximum Elevation (ft)	Required Holding Period after grading completion (Before Paving) (Days)	Linear Footage (feet)
1	I-81 Westbound and I-29 Northbound	7540+00	7547+50	5	935	N/a	N/a	N/a	200	219,000
2	I-81 Westbound /I-29 Northbound/IA 192 LOOF	7549+50	7552+15	6	940	N/a	N/a	N/a	200	119,000
3	I-81 Westbound /I-29 Northbound/ Ramp F	7559+00	7574+00	7	950	N/a	N/a	N/a	200	337,000
4	I-81 Westbound /I-81 Eastbound/I-29 Northbound	7574+00	7579+00	6	940	N/a	N/a	N/a	200	365,000
5	Ramp B	62575+00	62582+50	6	947	N/a	N/a	N/a	200	120,000
6	I-29 Northbound and Detour 301300	8580+00	8590+00	6	940	N/a	N/a	N/a	200	255,000
7	I-80 Westbound	7611+00	7616+50	5	935	60	17	1005	140	129,000
8	Ramp A Bridge- West Approach	61578+00	61580+00	5	940	60	20	996	140	105,000
9	23rd Ave	3007+00	3013+00	7	950	N/a	N/a	N/a	100	36,000
10	29th Ave	3830+00	3856+00	7	920	N/a	N/a	N/a	100	108,000
11	Ramp G	67464+50	67466+50	5	950	60	18	993	140	55,000
12	Detour 301300	31318+00	31320+00	5	945	60	25	1000	140	31,000
13	I-29 NB Detour	2271+17	2274+50	5	945	60	25	1000	140	38,000
<b>Total</b>										<b>1,917,000</b>

Table 2: Recommended Camber Under Drainage Structures

Number	Location	Type	Recommended CAMBER (ft)
T3	Area 2-IA 192 Loop A	24 inches RCP	0.8
9	Area 3- I-29 Northbound	24 inches RCP	1.1
17	Area 4- I-29 Northbound	48 inches	1
T1,13	Area 5- Ramp B	24 inches RCP	1.1
T2	Area 6- Detour 301300	24 inches RCP	0.25
10A	Area 8- Ramp A	48 inches RCP	0.67
9A	Area 9- 23rd Ave	36 inches RCP	No
10,11,12	Area 10- 29th Ave	48 and 54 inches RCP	0.75
19A	BNSF-S Culvert	48 inches RCP	0.33
20B	Area 7- H. Langdon Blvd	48 and 54 inches RCP	0.75
21A, 21B	Area 7- I-80 Westbound	24 inches RCP	1.1

DETAILS FOR  
WICK DRAINS



**INSTRUMENTATION NOTES:**

**VIBRATING WIRE PIEZOMETERS:**

1. Vibrating Wire Piezometers shall be installed by a qualified Contractor at the locations shown in the plans.
2. The Contractor shall notify the Engineer at least 10 workdays in advance of the start of the installation and shall be responsible for maintenance of the data logging equipment during and after construction. The Engineer shall be on site during installation of the Vibrating Wire Piezometers.
3. A two level Vibrating Wire Piezometers (GEOKON MODEL 4500S or equivalent) shall be installed in one borehole immediately following the foundation soil preparation at the location shown in the plans. The two piezometer transducers shall be located 15 and 25 feet below ground surface. The wiring shall be protected during construction.
3. The Contractor shall take initial readings 24 hours after completing installation and testing of each piezometer. Readings shall consist of minimum of two reading surveys per 24 hours using real time remote and automated monitoring operations.
4. For the duration of the project, piezometers shall continue to be monitored after completion of the fill placement and beyond through a duration of 25 weeks. The readings shall consist of real time monitoring with daily monitoring frequency and available online to the Engineer.

**INCLINOMETERS:**

1. Inclinator casings and inclinometers shall be installed by a qualified Contractor at the locations shown in the plans and after the embankment fill is completed.
2. The Contractor shall drill, sample, and log borings of soil drilled for the purpose of installing inclinometer casing. Borings for inclinometers shall be drilled using 6" minimum inside diameter casing and water or, where ground conditions permit, using drilling mud in a 6" diameter borehole.
3. The inclinometers shall have a minimum length of 60' below existing ground surface plus the height of the fill at the locations of the inclinometer plus 3'.
4. The casing shall protrude 3' above finished grade. The Contractor shall flag and protect inclinometer locations. Provide the top of each inclinometer casing with a cap, and with a locked protective metal housing extending below grade. All cables shall be protected and routed through a PVC pipe to ensure that these are not damaged during construction activities.
5. The Contractor shall notify the Engineer at least 10 workdays in advance of the start of installation and shall be responsible for maintenance of the data logging equipment during and after construction. The Engineer shall be on site during installation of the inclinometers.
6. The Contractor shall take initial inclinometer readings 24 hours after completing installation and testing of each inclinometer casing. Readings shall consist of a minimum of two reading surveys per 24 hours using real time remote and automated monitoring operations, at 2' intervals throughout the depth of the inclinometer casing.
7. For the duration of the project, inclinometers shall continue to be monitored after completion of the fill placement and beyond through a duration of 52 weeks. The readings shall consist of real time monitoring with daily monitoring frequency and available online to the Engineer.

**SETTLEMENT PLATES:**

1. Settlement plates shall be installed by the grading contractor at the locations shown in the plans as per detail shown in Standard Roadway plan EW-212.
2. Care shall be taken to protect the settlement plates from damage during placement of the embankment fill from equipment traffic or construction activities.
3. Settlement plate readings shall be taken by The Contractor during construction and by Iowa DOT personnel after end of construction. All relevant information such as location of benchmarks and readings shall be transferred by The Contractor to the Iowa DOT at the end of construction.
4. Settlement plate readings shall be taken at the start and end of placing of each embankment lift and at weekly intervals after the fill is placed to its final height for a period of 10 weeks at the end of fill placement and once every two weeks for 42 weeks thereafter. Additional readings over additional duration may be needed based on the settlement plates readings.

**CONSTRUCTION NOTES:**

**NOTES FOR WICK DRAINS:**

1. Wick drains shall be installed in triangular pattern at the spacing shown in Table 1 within the limits shown at the locations shown in the plans in accordance with the Standard Specification 2112 for Wick Drains.
2. Before installing the wick drains, the grading contractor shall strip the existing ground of topsoil, organic matter, roots, etc. The topsoil shall be stockpiled for use in slope dressing for the embankment fill.
3. Before installing the wick drains, the grading contractor shall grade the ground to drain as shown on the plans. Subdrains shall be installed at location shown in the plans.
4. Before installing the wick drains, the contractor shall place a 1 foot thick granular drainage blanket within the area indicated on the plans.
5. The wick drains shall be installed to the elevation shown in the plans and provided in Table 1 of Q.51 or refusal whichever occurs earlier.
6. Approx. 78,150 cu. yds. (62,510 cu.yds. + 25% shrinkage) of granular drainage material is required for the granular blanket. The material used for the granular blanket can be the same material that is used for the embankment, provided the material meets the requirement in the following note.
7. If the granular material is provided by the Contractor from another site, it shall meet the requirements of Standard Specifications 4133 for Granular Backfill Material.
8. Approx. 56,300 wick drains shall be installed for an approximate total length of 1,917,000 feet of wick drains.
9. The grading contractor shall strip the topsoil from the foreslope of the existing embankment and stockpile it for slope dressing for the new fill.

**STAGE CONSTRUCTION NOTES:**

1. Some Embankment as summarized in Table 1 on sheet Q.51 shall be constructed in two-stages with the maximum elevation at each stage and waiting period shown in the Table.
2. A Two-level Vibrating Wire Piezometers (VWP) (GEOKON MODEL 4500S or equivalent) shall be installed in one borehole immediately following the foundation preparation at the location shown in the plans. The piezometer shall be installed in accordance with instrumentation note.
3. The Engineer will evaluate the settlement rate and confirms that the primary consolidation or elastic settlement is complete, the rate of settlement has stabilized, and that clay gained enough strength to allow Stage II construction.

**CONSTRUCTION SEQUENCE AND RECOMMENDED CAMBER:**

1. Before installing the wick drains, the grading contractor shall strip the existing ground of topsoil, organic matter, roots, etc. The topsoil shall be stockpiled for use in slope dressing for the embankment fill.
2. Wick drains shall be installed to the elevation shown in the plans and provided in Table 1 of Q.51 or refusal whichever occurs first in accordance with Standard Specification 2112 for Wick Drains.
3. Upon installation of the wick drains. The pipes shall be installed in accordance with Standard RF-30A.
4. Maximum camber for proposed drainage structures is presented in Table 2 of Q.51 and in accordance with Standard RF-30B.

**DETAILS FOR  
WICK DRAINS**









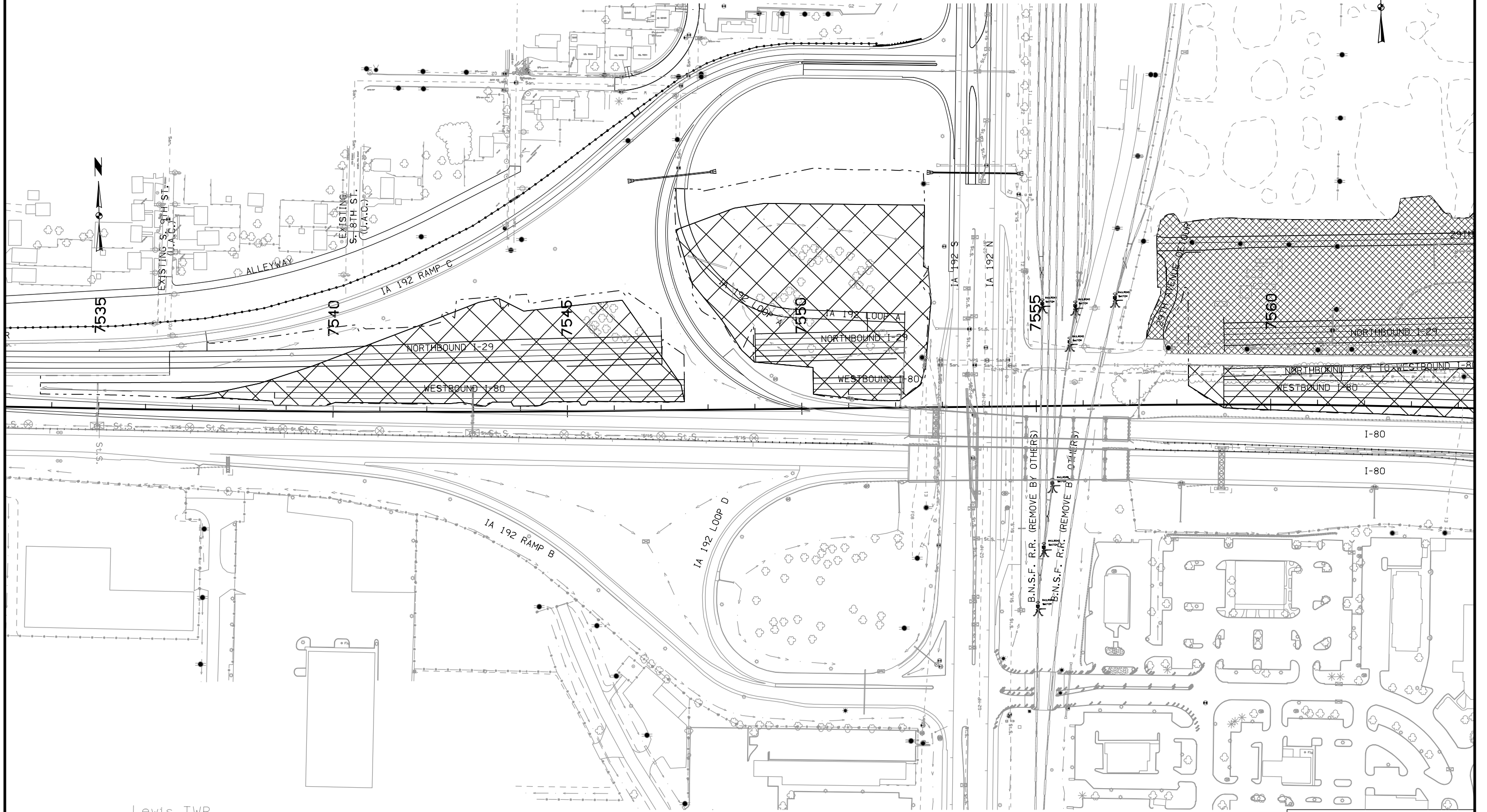




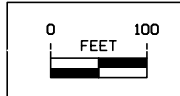




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T-74N R-44W  
SEC. 1

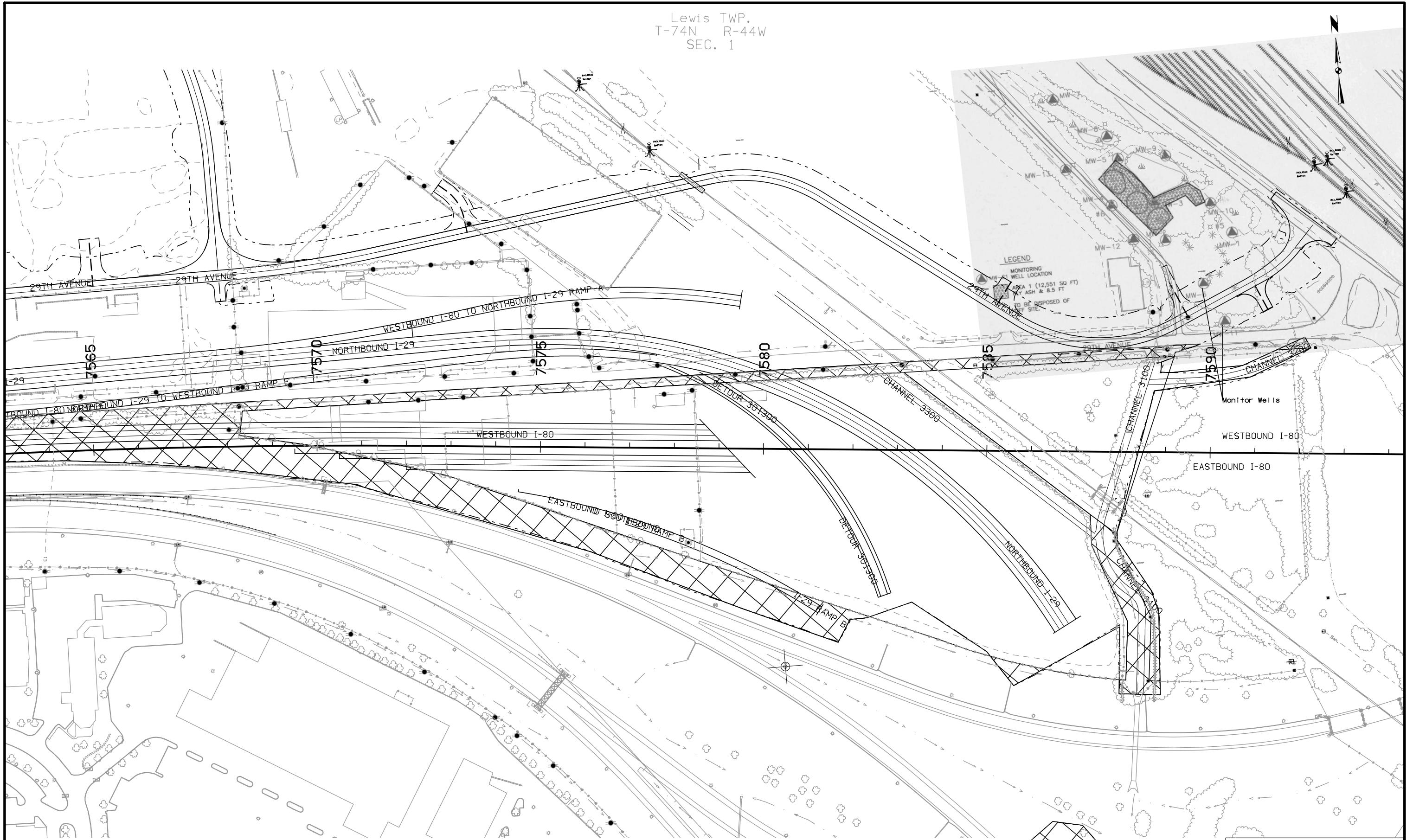


Lewis TWP.  
T-74N R-44W  
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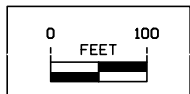


Clearing and Grubbing  
Details

Lewis TWP.  
T-74N R-44W  
SEC. 1



Lewis TWP.  
T-74N R-44W  
SEC. 12

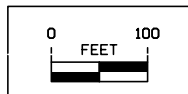


Clearing and Grubbing  
Details

Lewis TWP.  
T-74N R-43W  
SEC. 6

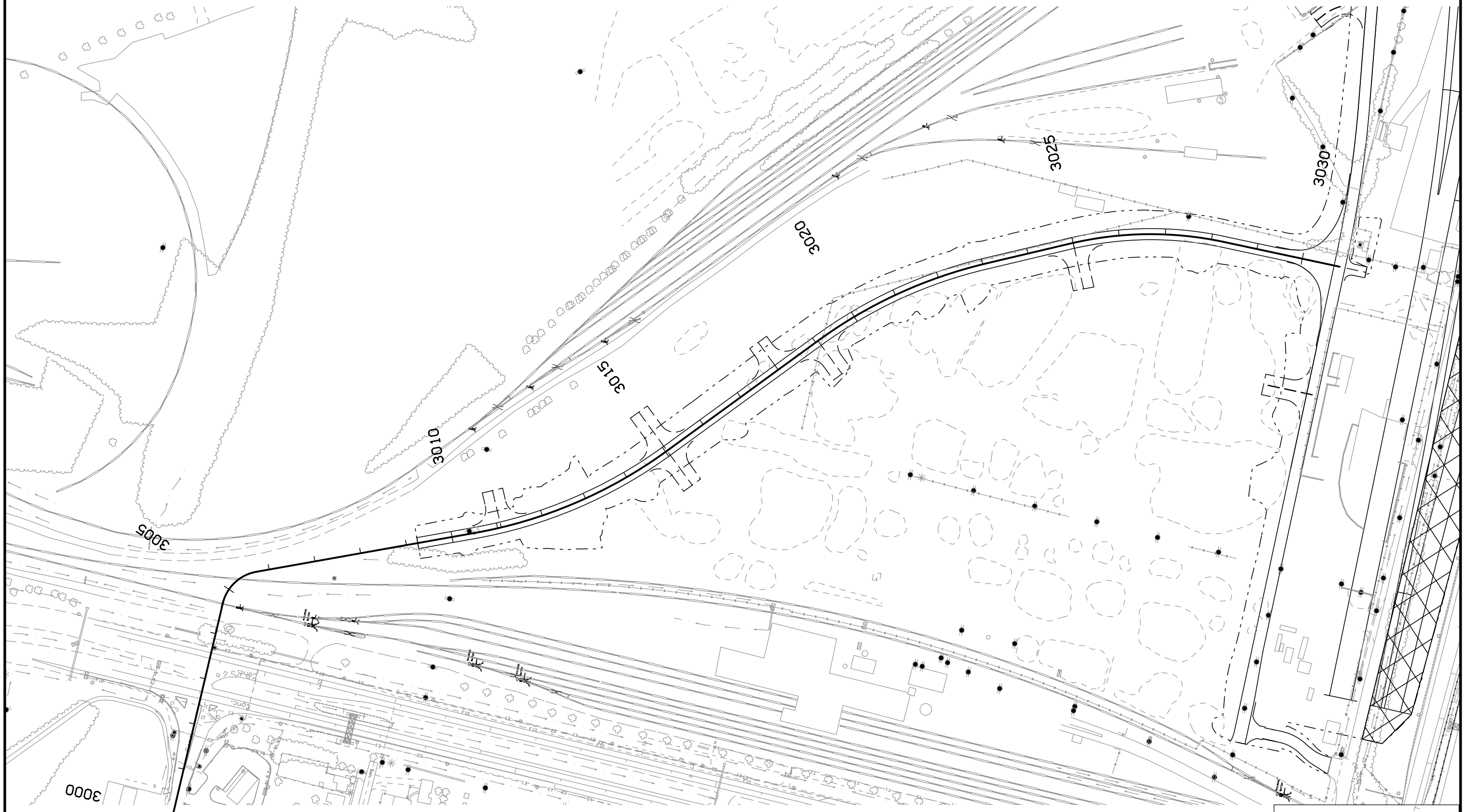


Lewis TWP.  
T-74N R-43W  
SEC. 7

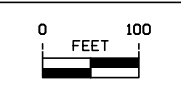


Clearing and Grubbing  
Details

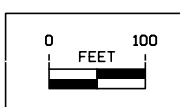
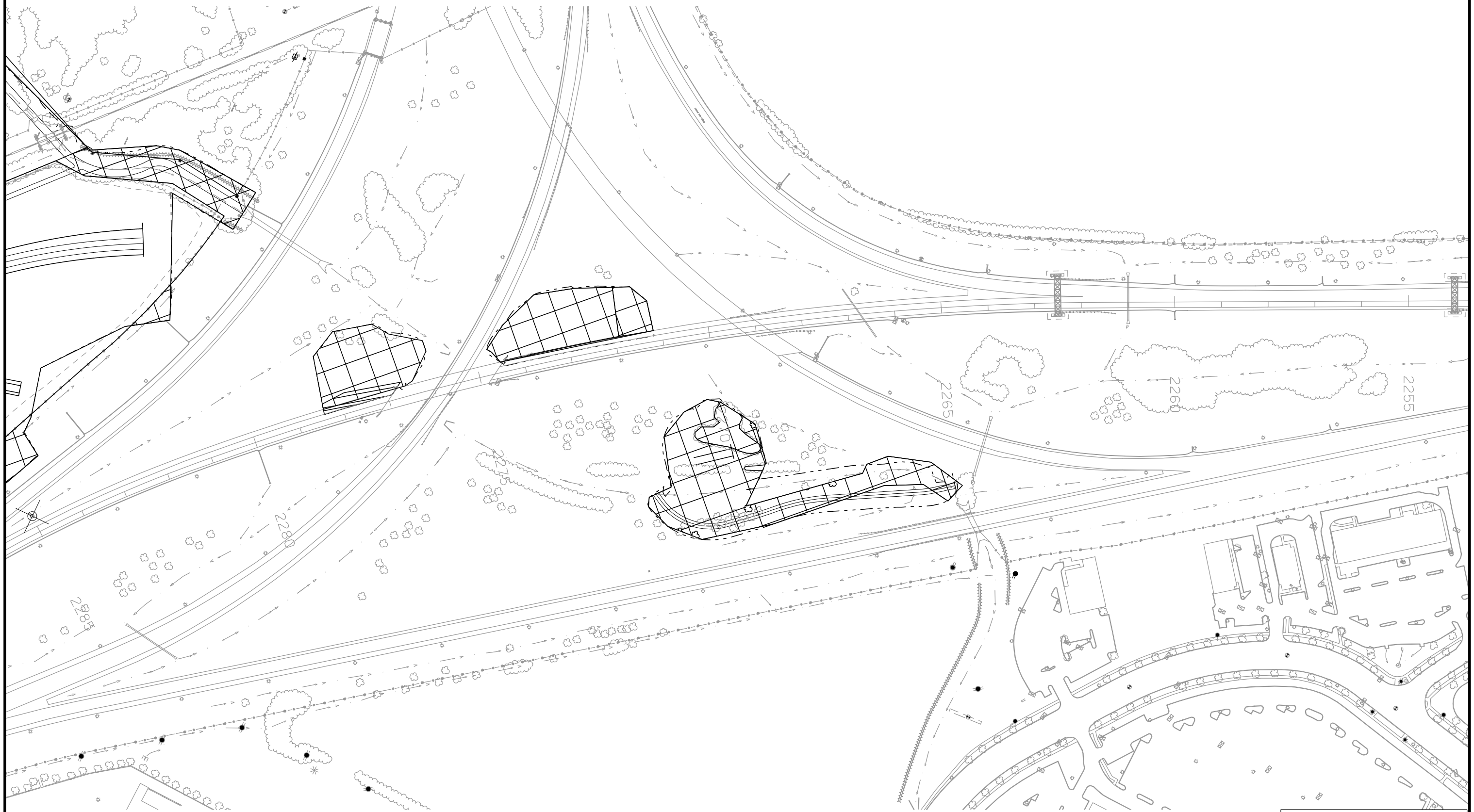
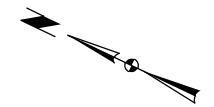
Lewis TWP.  
T-74N R-44W  
SEC. 1



Clearing and Grubbing  
Details

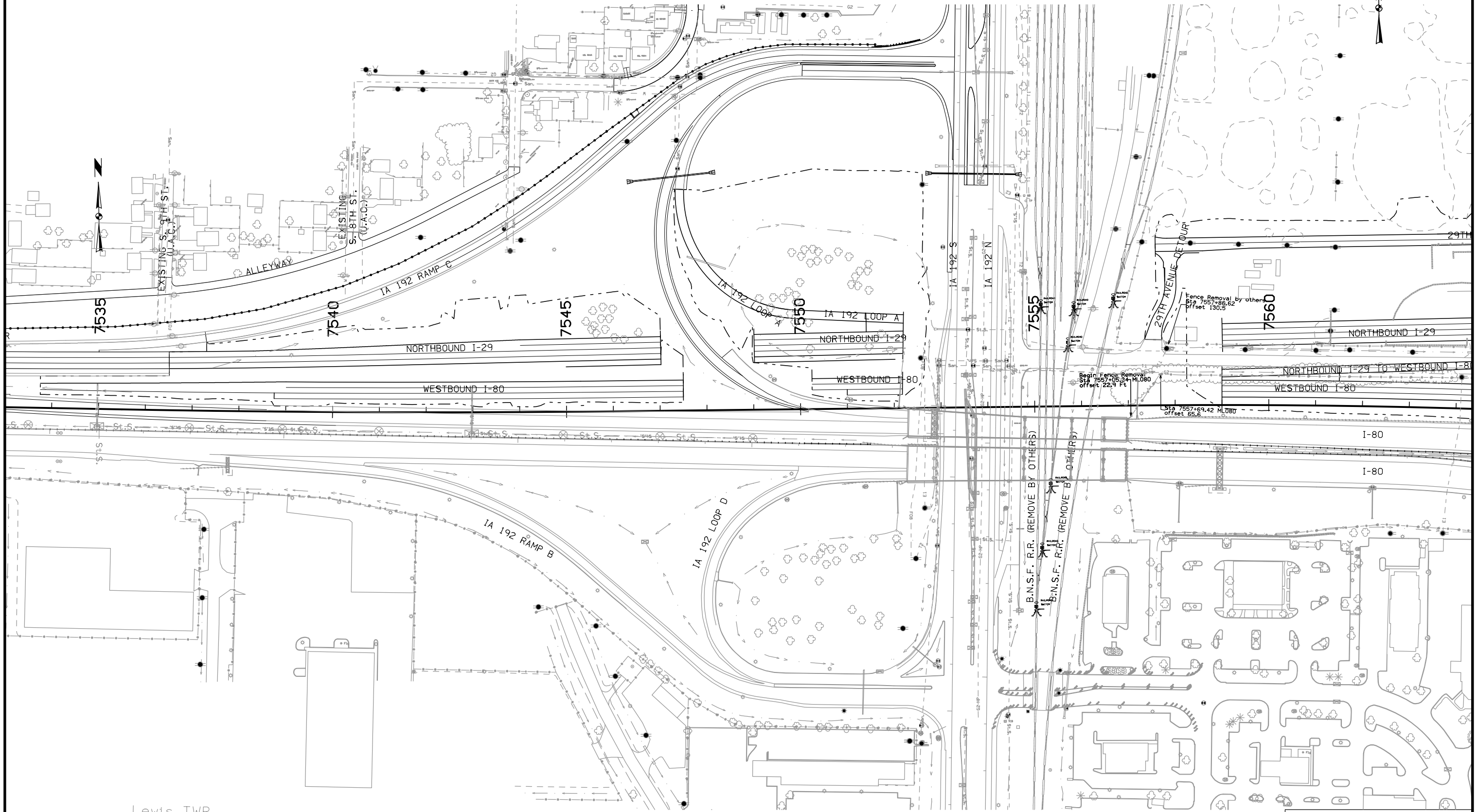


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SEC. 7

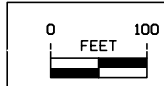


Clearing and Grubbing  
Details

Lewis TWP.  
T-74N R-44W  
SEC. 1

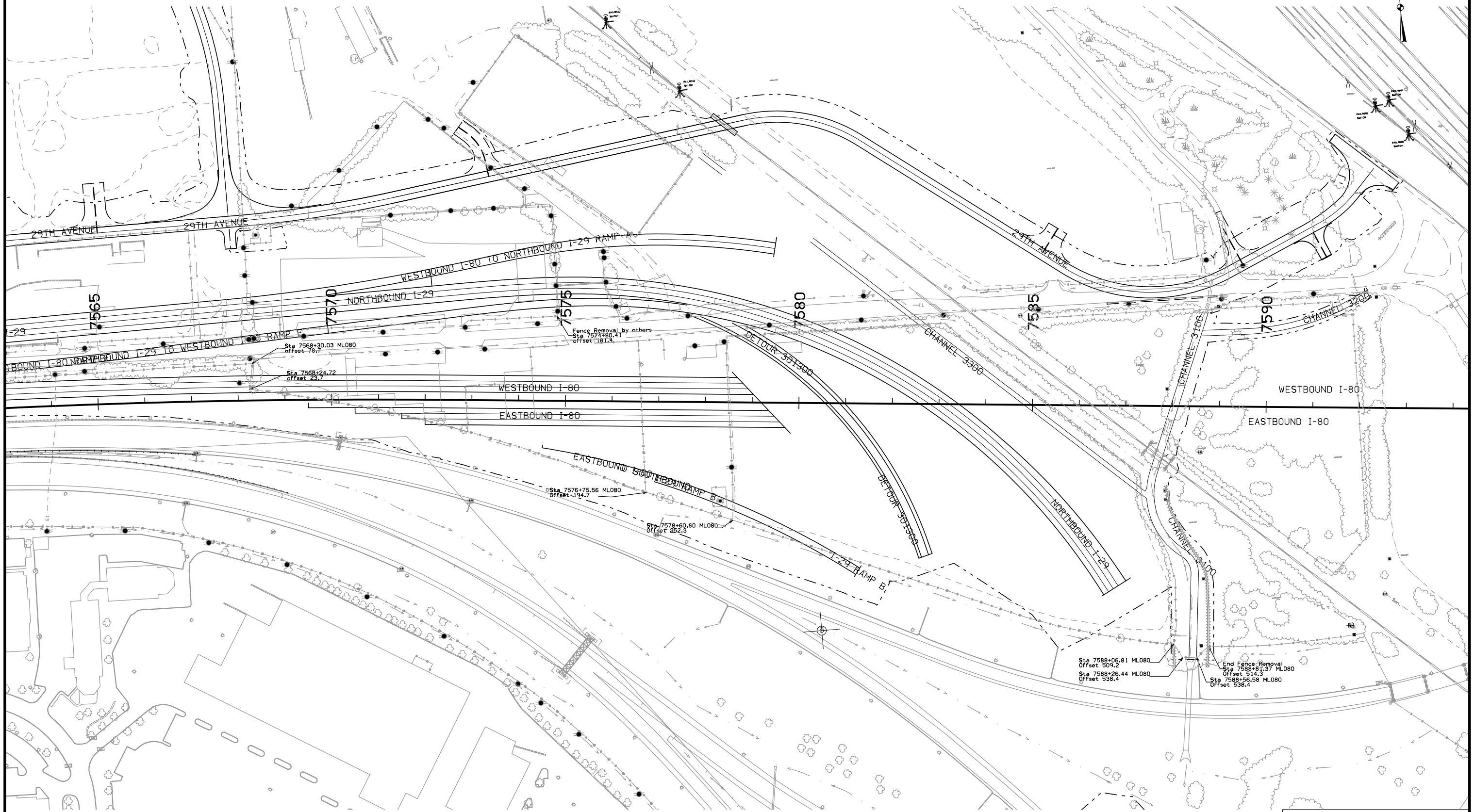


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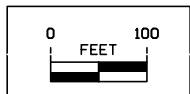


Fence Removal  
Details

Lewis TWP.  
T-74N R-44W  
SEC. 1



Lewis TWP.  
T-74N R-44W  
SEC. 12

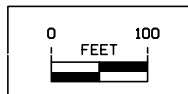


Fence Removal  
Details

Lewis TWP.  
T-74N R-43W  
SEC. 6



Lewis TWP.  
T-74N R-43W  
SEC. 7



Fence Removal  
Details



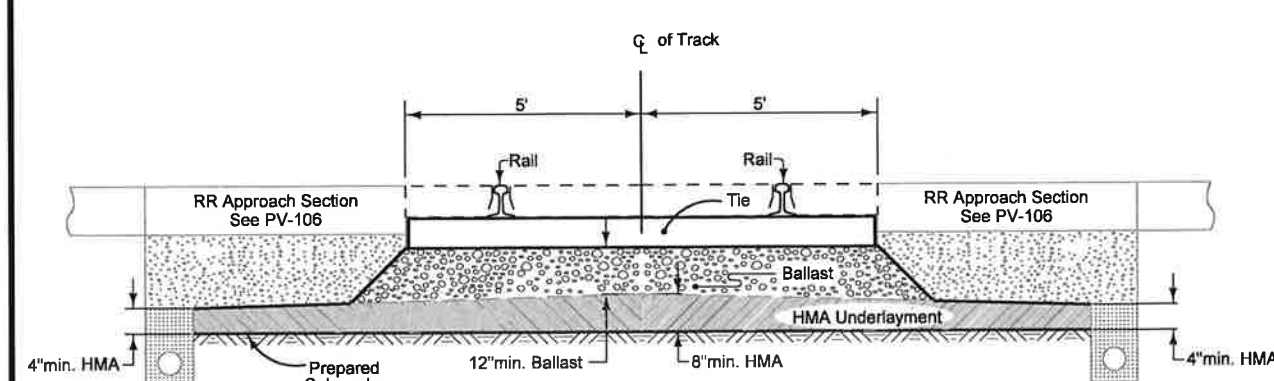
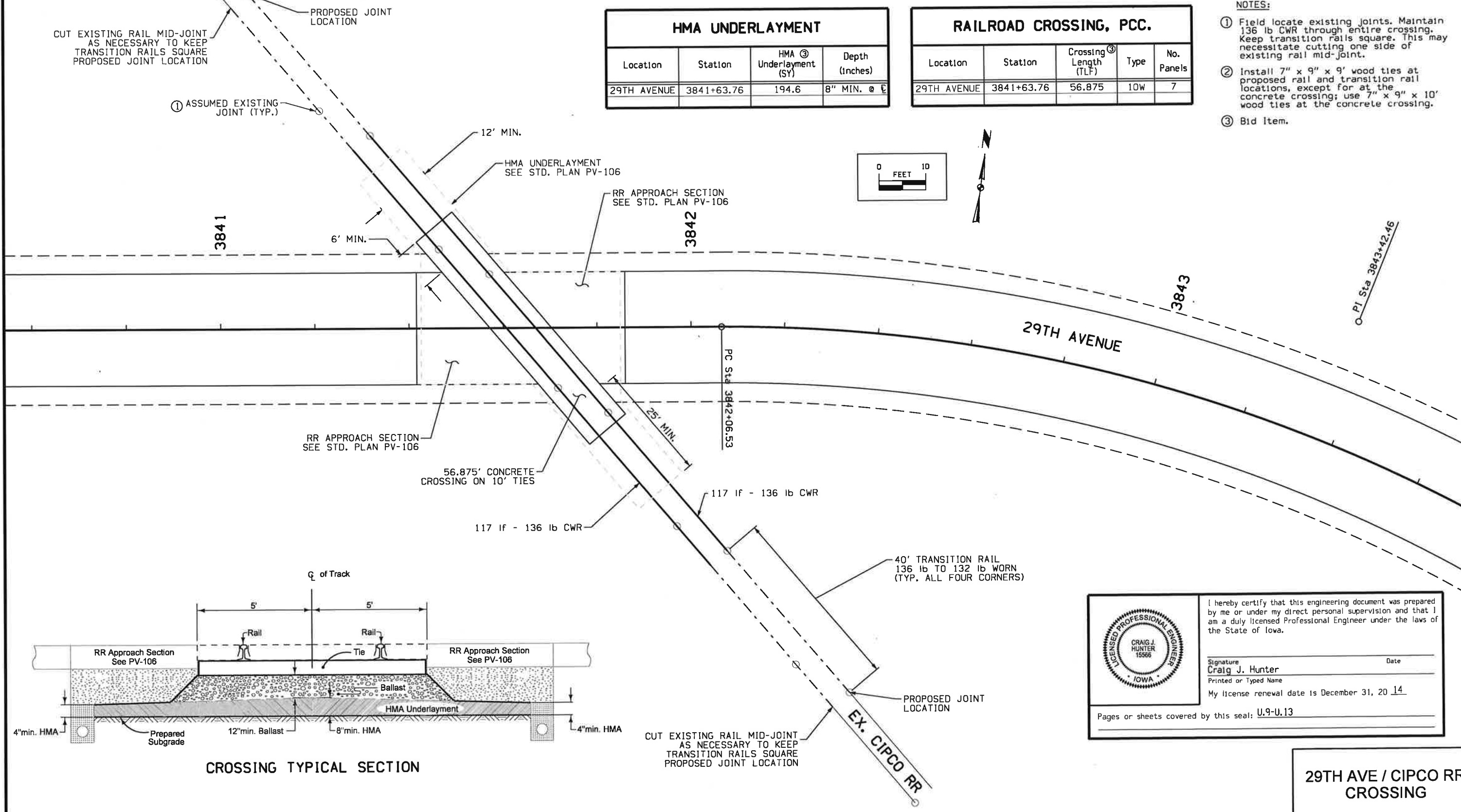
RAIL (RAILROAD)												
Location	Station	Track ③ Construction (TLF)	Rail		Transition		Joints		Wood Ties			
			Type	Length (feet)	Type	Length (feet)	Type	No.	Type	No.	Type	No.
29TH AVENUE	3841+63.76	197	136 lb RE CWR	234	136lb to 132lb worn	160	132 lb	4	7" x 9" x 9.0'	88	7" x 9" x 10.0'	36

REMOVAL OF RAILROAD TRACK		
Location	Station	Removal of ③ Railroad Track (TLF)
29TH AVENUE	3841+63.76	197

HMA UNDERLAYMENT			
Location	Station	HMA ③ Underlayment (SY)	Depth (Inches)
29TH AVENUE	3841+63.76	194.6	8" MIN. @ ④


RAILROAD CROSSING, PCC.				
Location	Station	Crossing ③ Length (TLF)	Type	No. Panels
29TH AVENUE	3841+63.76	56.875	10W	7

- NOTES:
- Field locate existing joints. Maintain 136 lb CWR through entire crossing. Keep transition rails square. This may necessitate cutting one side of existing rail mid-joint.
  - Install 7" x 9" x 9' wood ties at proposed rail and transition rail locations, except for at the concrete crossing; use 7" x 9" x 10' wood ties at the concrete crossing.
  - Bid Item.



CROSSING TYPICAL SECTION

CUT EXISTING RAIL MID-JOINT AS NECESSARY TO KEEP TRANSITION RAILS SQUARE PROPOSED JOINT LOCATION



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.

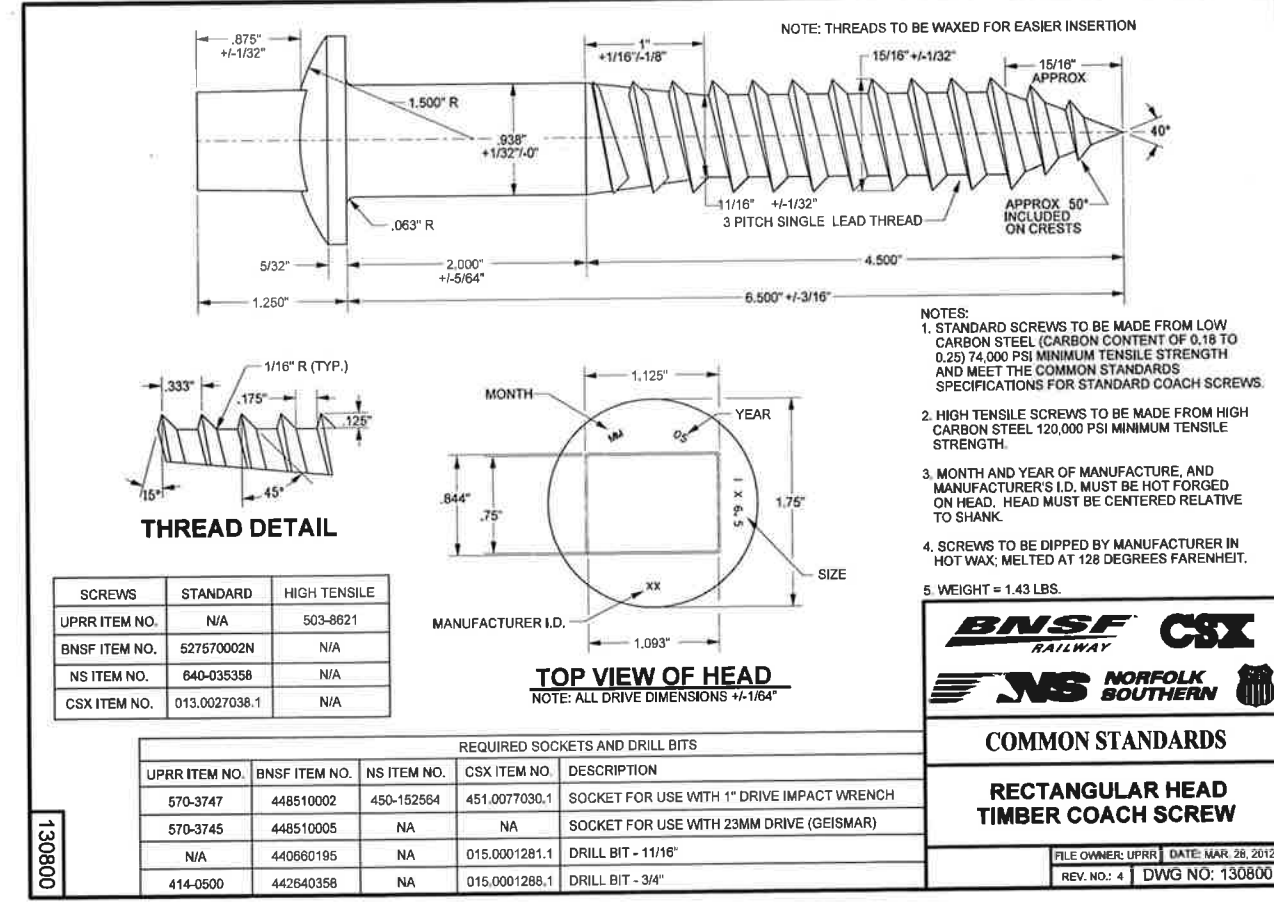
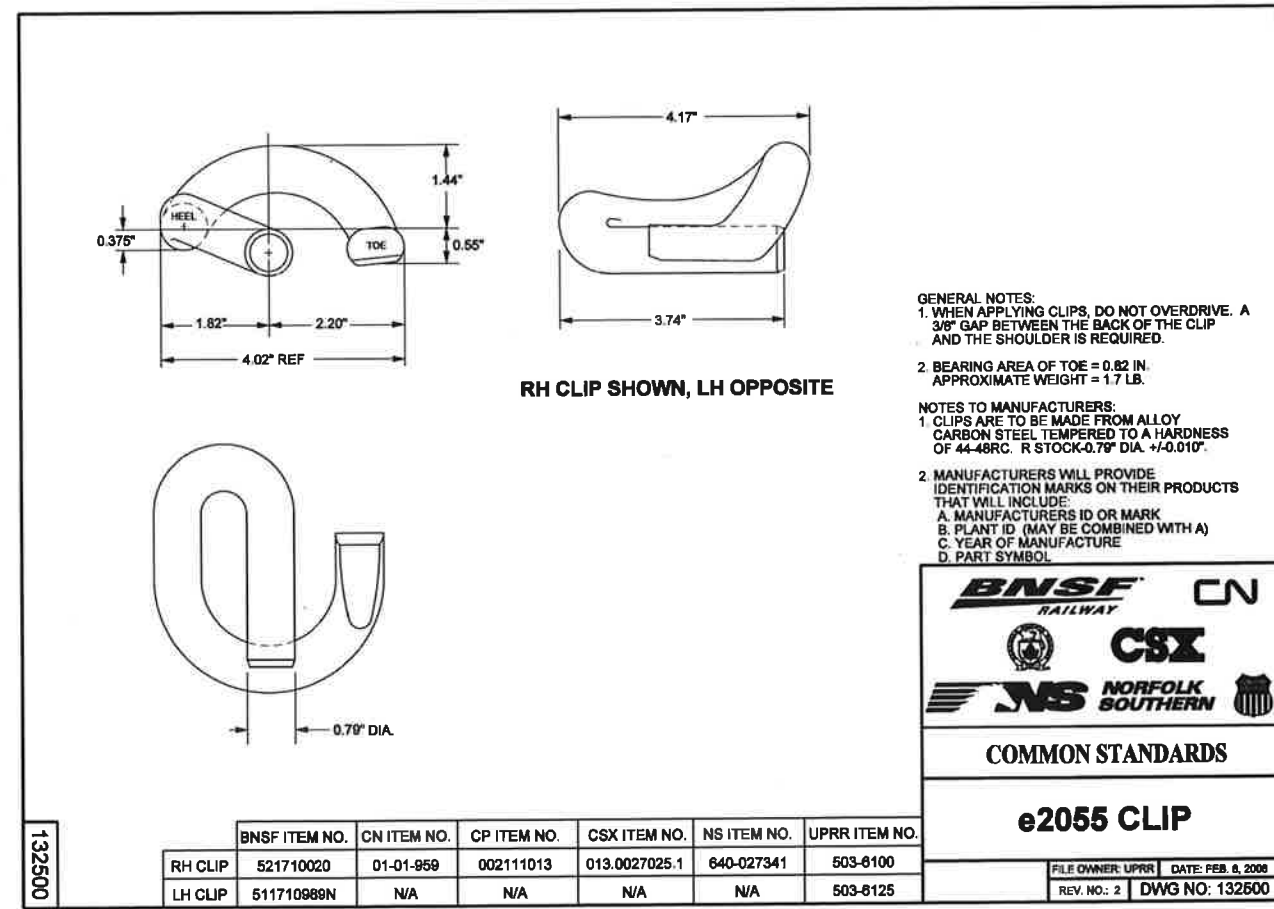
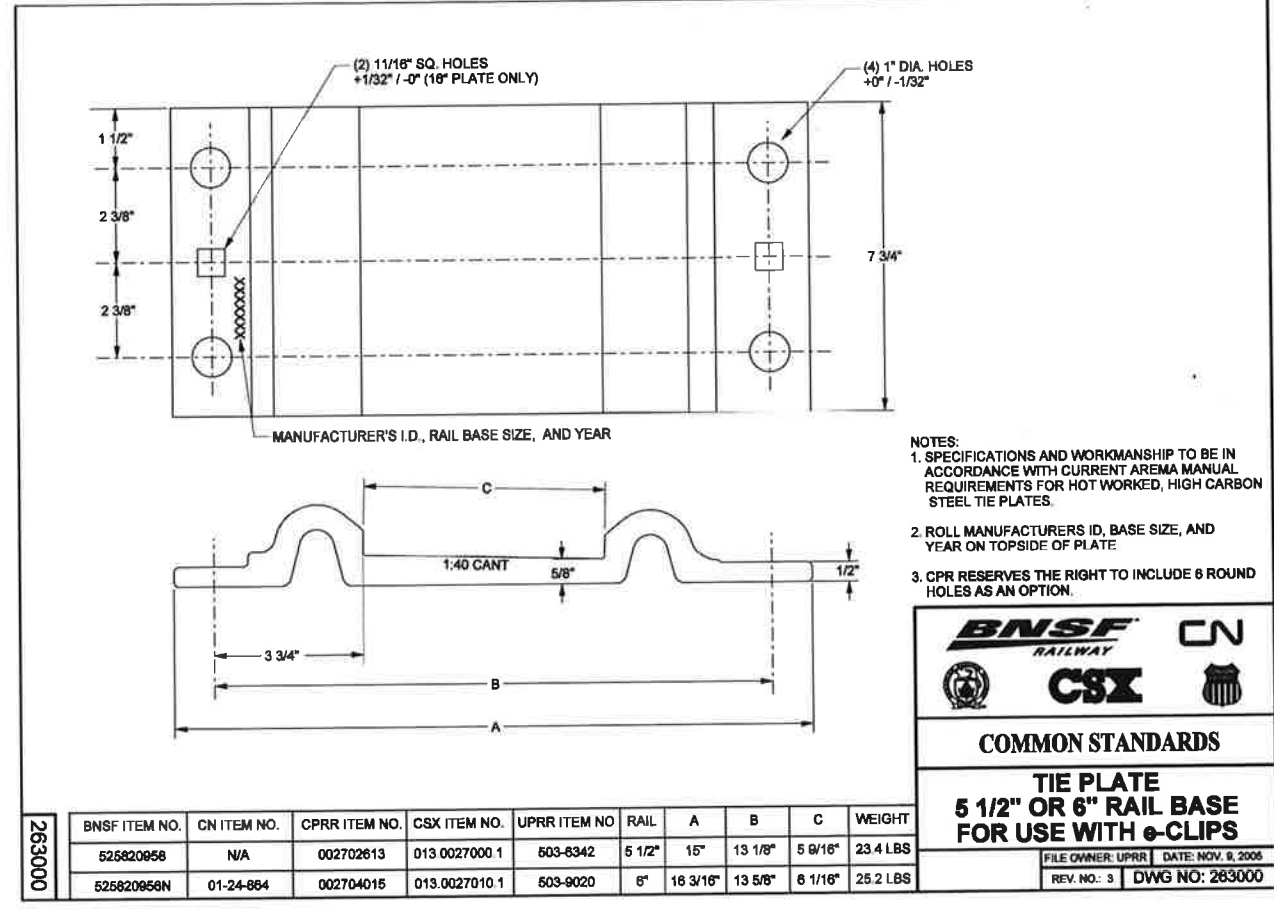
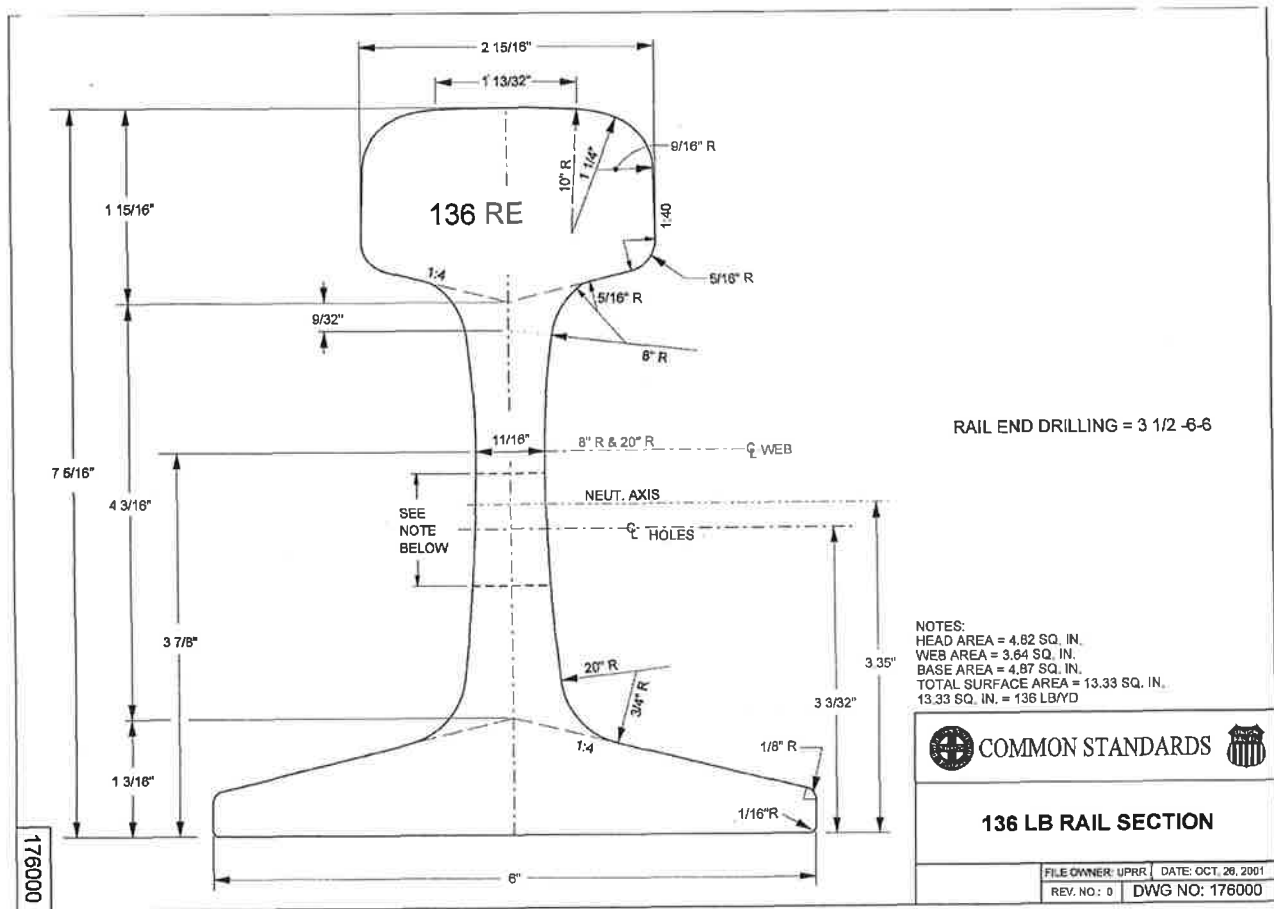
Signature: Craig J. Hunter Date: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

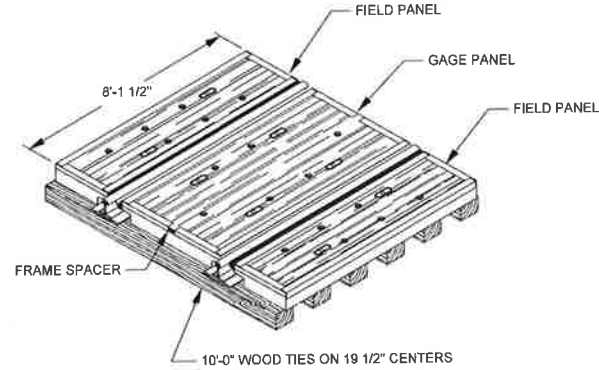
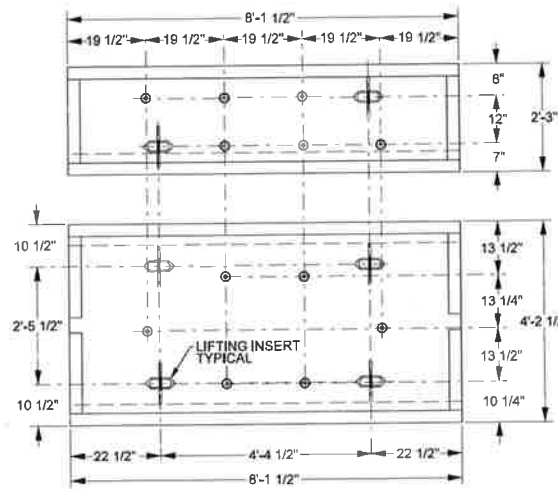
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29TH AVE / CIPCO RR CROSSING







NOTES:  
 1/4\"/>

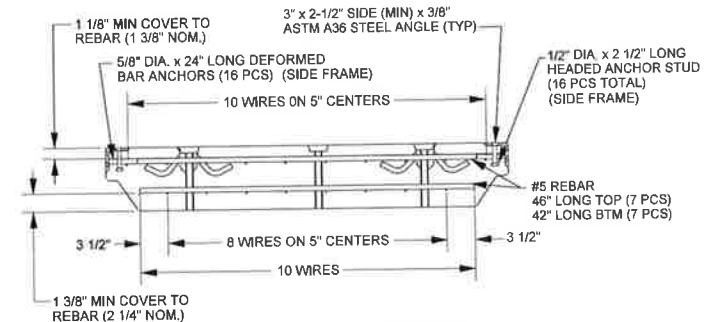
CROSSING TYPE - 10W

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7 1/8"	2850 LBS.	1550 LBS.
133-141	7 7/8"	3125 LBS.	1675 LBS.

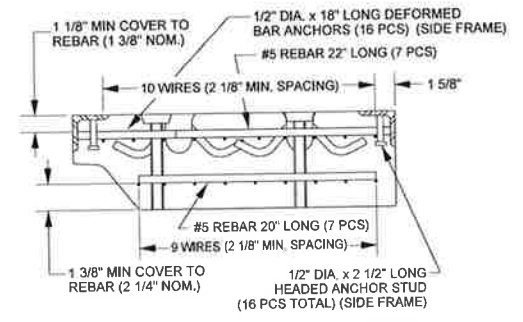
ITEM NUMBERS			
133-141 LB. UPRR 540-1301	133-141 LB. BNSF 055590975	115 LB. UPRR 540-0202	115 LB. BNSF 055590973

**COMMON STANDARDS**  
**LAYOUT FOR CONCRETE PANELS ON 10'-0\"/>**

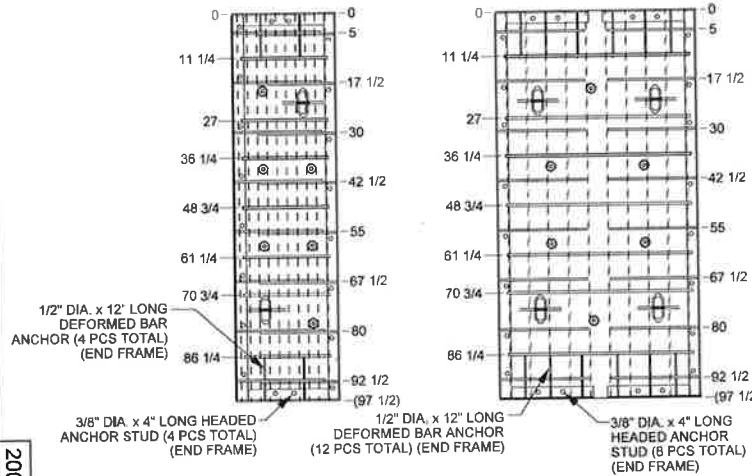
FILE OWNER: UPRR DATE: APRIL 24, 2001  
 REV. NO.: 0 DWG NO: 200100



CROSS SECTION - GAGE PANEL



CROSS SECTION - FIELD PANEL



FIELD PANEL

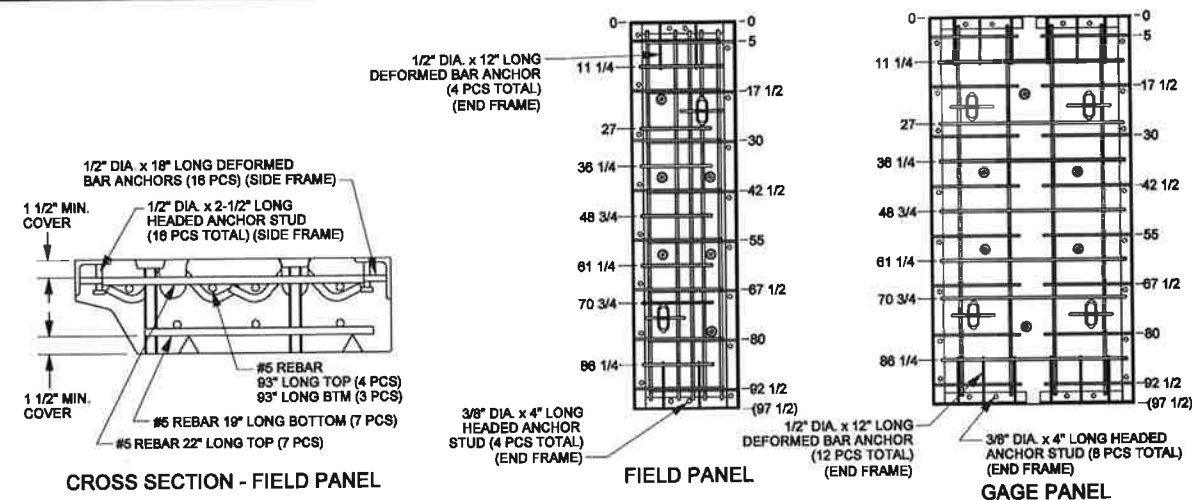
GAGE PANEL

NOTES:  
 28 DAY CONCRETE COMPRESSIVE STRENGTH = 7000psi  
 MIN. TRANSFER COMPRESSIVE STRENGTH = 4500psi  
 PRESTRESSING WIRE SHALL BE 5.25mm DIA. CONFORMING WITH  
 ASTM A-881 "STEEL WIRE DEFORMED, STRESS RELIEVED OR LOW  
 RELAXATION FOR PRESTRESSED CONCRETE TIES" WITH A MINIMUM  
 BREAKING STRENGTH OF 8800 LBF.  
 WIRE SHALL BE TENSIONED IN ACCORDANCE WITH PCI  
 REQUIREMENTS TO 6960LBF PER WIRE.

CROSSING TYPE - 10W

**COMMON STANDARDS**  
**PRESTRESSED CONCRETE PANELS FOR 10'-0\"/>**

FILE OWNER: UPRR DATE: APRIL 24, 2001  
 REV. NO.: 0 DWG NO: 200101



CROSS SECTION - FIELD PANEL

FIELD PANEL

GAGE PANEL

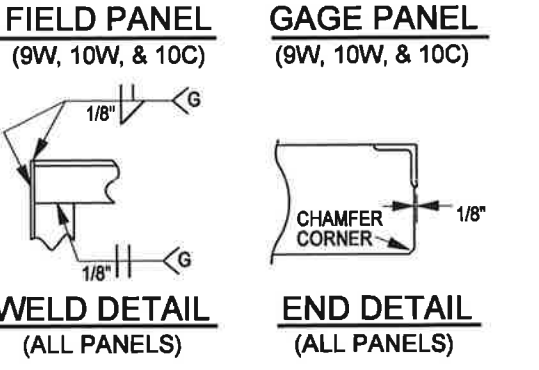
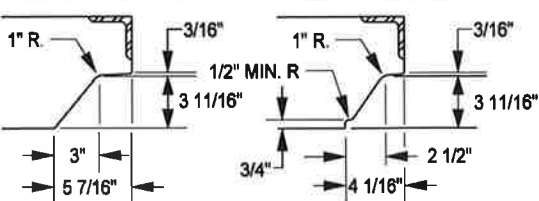
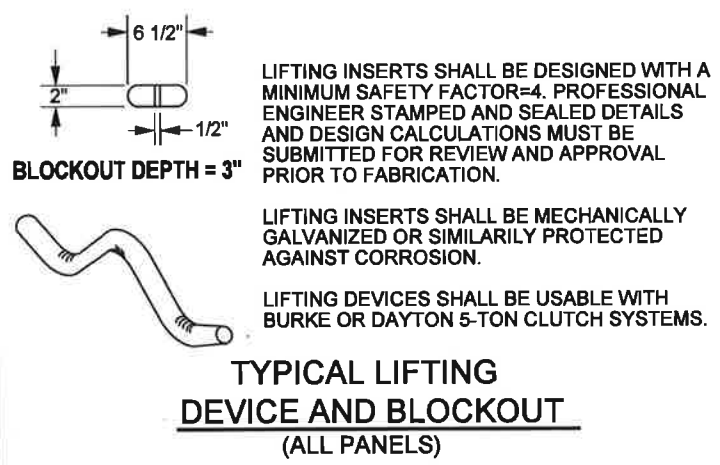
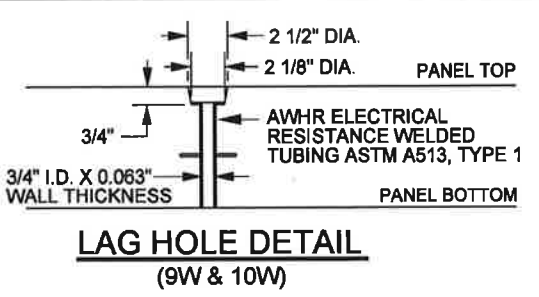
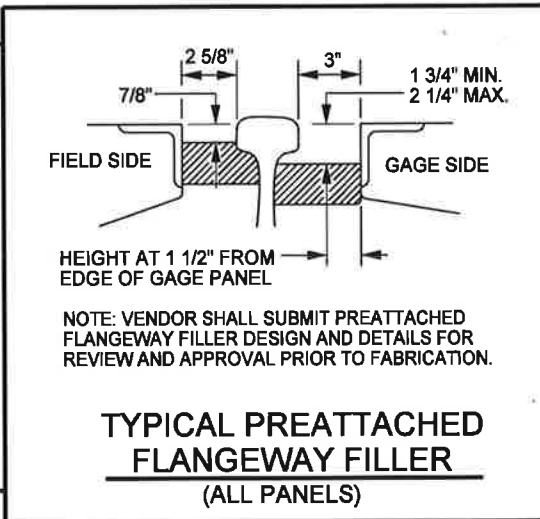
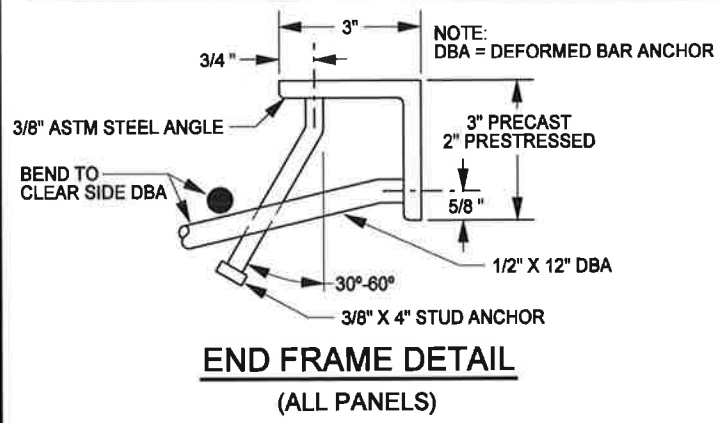
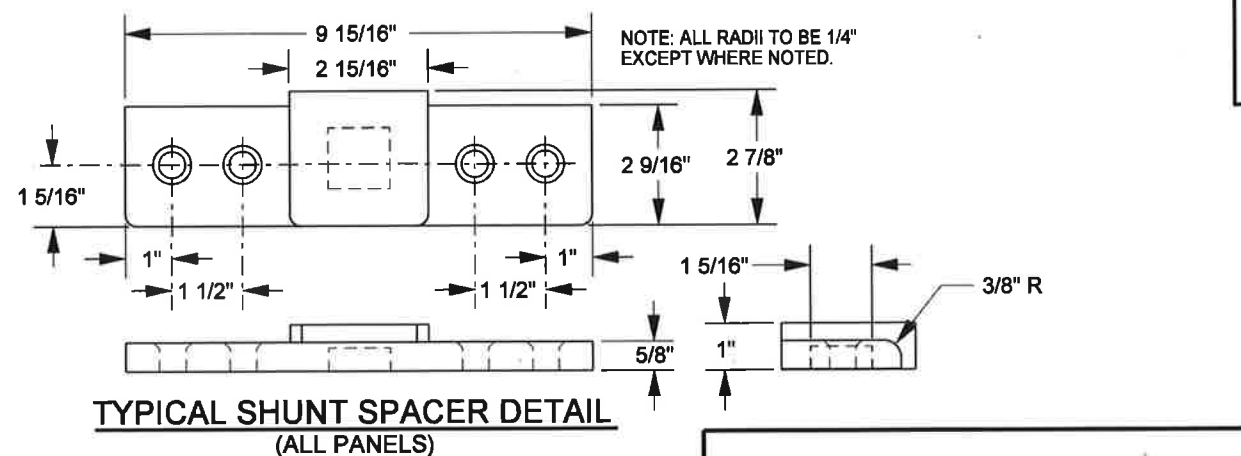
NOTES:  
 CONCRETE COMPRESSIVE STRENGTH SHALL BE  
 AS FOLLOWS:  
 @ 28DAYS = 8000 psi MINIMUM  
 @ SHIPMENT = 4000 psi MINIMUM  
 @ REMOVAL FROM FORMS = 2500 psi MINIMUM.

CROSSING TYPE - 10W

**COMMON STANDARDS**  
**PRECAST CONCRETE PANELS FOR 10'-0\"/>**

FILE OWNER: UPRR DATE: APRIL 24, 2001  
 REV. NO.: 0 DWG NO: 200102

200102



**TYPICAL DETAILS FOR CONCRETE PANELS**

FILE OWNER: UPRR DATE: APRIL 30, 2003  
 REV. NO.: 3 DWG NO: 200900

**MATERIAL SPECIFICATIONS:**

- STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36 SPECIFICATIONS. WELDING TO BE PER AWS CODE.
- ALL EXPOSED STEEL TO RECEIVE ONE COAT PRIMER.
- END ANGLES FOR GAGE PANEL SHOULD HAVE 3" GAP MINIMUM TO IMPROVE SHUNT RESISTANCE. REINFORCING MATERIAL AND CLADDING TO BE CONSTRUCTED TO MEET SHUNTING REQUIREMENT. A NON-CONDUCTIVE SPACER TO BE ATTACHED TO GAGE FRAME.
- CLADDING ON ENDS OF PANELS SHOULD EXTEND BEYOND CONCRETE 1/8" (+1/8", -0") TO IMPROVE MATCH WITH ADJACENT PANELS.
- REINFORCING STEEL SHALL CONFORM TO CURRENT ASTM A615 SPECIFICATION, GRADE 60. IF ANY WELDING OF REINFORCEMENT STEEL IS REQUIRED, MATERIAL SHALL CONFORM TO ASTM A706 SPECIFICATION, GRADE 60.
- CONCRETE MATERIAL MIXING, PLACING AND CURING TO BE IN ACCORDANCE WITH PCI "MANUAL FOR QUALITY CONTROL: PRECAST AND PRESTRESSED CONCRETE," MANUAL 115, EDITION 4. CEMENT SHALL HAVE NO MORE THAN 0.6% TOTAL ALKALI CONTENT. MAXIMUM WATER/CEMENT RATIO=0.44 (BY WEIGHT). AIR ENTRAINMENT=6%+/- 1% IN PLASTIC CONCRETE. SLUMP 3" MAXIMUM.
- COPIES OF THE CONCRETE DESIGN MIX TO BE SUBMITTED TO RAILROADS FOR APPROVAL PRIOR TO THE START OF THE CASTING OPERATION.
- TOP SURFACE SHALL BE NON-CRACK DESIGN AND IS TO BE SEALED TO PREVENT ION MIGRATION DUE TO SALTING.
- CURING SHALL FOLLOW THE RECOMMENDATIONS AND PROCEDURES OF PCI IN 4TH EDITION DIVISION 4.
- 3/16" WEEP/INSPECTION HOLES SHALL BE PLACED EVERY 2-FT. MIN. ALONG THE TOP OF THE STEEL FRAME ALONG A LINE 3/4" FROM OUTSIDE EDGE.
- FLANGWAY FILLER TO BE PERMANENTLY PREATTACHED AND HAVE THE FOLLOWING PROPERTIES:
  - \* TENSILE STRENGTH (ASTM D412) 850PSI MIN.
  - \* ULTIMATE ELONGATION (ASTM D412) 400% MIN.
  - \* TEAR STRENGTH (ASTM D624) AT 25 DEGREES CELSIUS, 150-PLI MIN.
  - \* HARDNESS (ASTM D2240) 75+/-5% SHORE A.
  - \* COMPRESSION SET (ASTM 395 METHOD B) 100 DEGREES CELSIUS FOR 70 HOURS 45% MAX.
  - \* ACCELERATED AGING TEST (ASTM D573) 70 HOURS AT 100 DEGREES CELSIUS MUST NOT EXHIBIT A REDUCTION IN PROPERTIES BY GREATER THAN 20%.
  - \* OZONE RESISTANCE TEST (ASTM D518) MUST HAVE NO CRACKING AFTER EXPOSURE TO 50-PPHM OZONE FOR 96 HOURS AT 40 DEGREES CELSIUS.
  - \* VOLUME RESISTIVITY = 1X10<sup>12</sup> (OHM-CM) OR GREATER (ASTM D257), BUT USING 18% NaCl/WATER SOLUTION IN PLACE OF DISTILLED WATER FOR 168 HOURS AT 25 DEGREES CELSIUS AND TESTED AT 500 VDC.
  - \* ELECTRICAL RESISTANCE: MINIMUM RESISTANCE 10 MEGA OMS MEASURED AT 500 VDC.
  - \* LOW TEMPERATURE BRITTLENESS (ASTM D2137) AT -40 DEGREES CELSIUS.
- A SAMPLE SECTION OF THE FLANGWAY MATERIAL SHALL BE PHYSICALLY TESTED BY APPLYING A LATERAL FORCE OF 10 LB/IN AT 50 DEGREES CELSIUS. THE MAXIMUM LATERAL DISPLACEMENT OF THE TEST IS NOT TO EXCEED 1/4" (CROSSING TYPE 10C ONLY). TEST RESULTS MUST BE SUBMITTED FOR RAILROAD APPROVAL.
- MANUFACTURER TO DESIGN THE PREATTACHED FLANGWAY FILLER TO ALLOW FOR REMOVAL OF PANELS FOR MAINTENANCE WITHOUT DAMAGING THE FLANGWAY FILLER OR ANY OTHER COMPONENTS DESIGNED TO HOLD IT TOGETHER..

**TOLERANCES:**

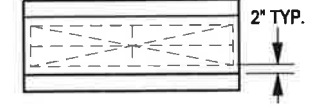
- OUT OF SQUARE 3/16" (MEASURED ALONG THE DIAGONAL)
- LENGTH, WIDTH, AND THICKNESS: +/- 1/8"
- THE BOTTOM SURFACE, WHICH WILL BE IN CONTACT WITH THE TIES, SHALL NOT UNDULATE IN ANY DIRECTION MORE THAN 3/32". SEE SPECIAL TESTING NOTE 3 BELOW.
- REINFORCEMENT PLACEMENT SHALL BE +/- 3/4" HORIZONTAL, +/- 1/8" VERTICAL.

**FINISH:**

- ALL RECESSES AND MINOR CONCRETE SPALLS ARE TO BE FILLED AND FINISHED TO THE PANEL DIMENSIONS USING THE PROPER BONDING AGENT AND REPAIR MATERIAL SURFACE OF THE REPAIRED AREA IS TO MATCH THE COLOR AND TEXTURE OF THE SURROUNDING AREAS.
- THE DRIVING SURFACE IS TO HAVE A LIGHT BROOM FINISH OR AS APPROVED BY RAILROADS. THE ADDITION OF WATER TO THE CONCRETE SURFACE FINISH DURING CASTING IS NOT PERMITTED.

**SPECIAL TESTING:**

- TWICE ANNUALLY, VENDORS SHALL SUBMIT (VIA AN INDEPENDENT TESTING LABORATORY TO THE RAILROADS) THE FOLLOWING TEST ON THE APPROVED MIXED DESIGN:
  - \* ASTM C686 FREEZE/THAW
  - \* ASTM C227 MORTAR BAR METHOD
  - \* ASTM C1260 AT TOTAL ALKALI BURDEN = 0.06%
- GAGE PANELS SHALL BE DESIGNED WITH SHUNT RESISTANT FEATURES IN ORDER TO PROVIDE A MINIMUM ELECTRICAL RESISTANCE IN ACCORDANCE WITH THE STANDARD ELECTRICAL TEST (DWG 500930).
- A REPRESENTATIVE SAMPLE OF PANELS SHALL BE CHECKED PERIODICALLY FOR BOTTOM FLATNESS BY USING A STRAIGHT EDGE CALIBRATED TO WITHIN +/- 1/32" AND A TAPER GAGE AS FOLLOWS:
  - 8 POSITIONS OF FLATBAR (—) CHECK FLATNESS AT EACH POSITION USING TAPER GAGE.



**GENERAL:**

- THE MANUFACTURER SHALL BE ISO 9000 OR AAR M-1003 CERTIFIED. ALL TESTING PERSONNEL SHALL BE A MINIMUM OF ACI LEVEL I CERTIFIED.
- THE FABRICATOR SHALL BE RESPONSIBLE FOR LOADING AND PROPERLY SECURING ALL PRECAST CONCRETE MEMBERS FOR SHIPMENT.
- THE MANUFACTURER SHALL WARRANTY PRODUCT FOR A MINIMUM OF TEN YEARS AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP.
- MANUFACTURER TO PERMANENTLY MARK EACH PANEL WITH A CONCRETE IMPRINT FOR SIZE OF RAIL, WEIGHT OF PANEL, MANUFACTURER'S I.D., MONTH/DAY/YEAR OF MANUFACTURE, AND CROSSING TYPE. END OF EACH PANEL TO BE STENCILED PAINTED WITH SIZE OF RAIL, WEIGHT OF PANEL AND CROSSING TYPE.



**GENERAL SPECIFICATIONS FOR ROAD CROSSINGS WITH CONCRETE PANELS**

FILE OWNER: UPRR DATE: MARCH 21, 2003  
 REV. NO.: 1 DWG NO: 200901