Illinois Department of Transportation

Memorandum

To:	Dave Broviak	Attn: Brad Duncan
From:	Mike Short MS	
Subject:	Roadway Geotechnical Report *	
Date:	May 25, 2018	

* Route: FAP 46 (IL 251)
Section: (1)-1-2
County: LaSalle
Contract No.: 66F12

Attached is the Roadway Geotechnical Report for the subject project.

An electronic copy of the report is available in ProjectWise at:

pw:\\IL084EBIDINTEG.illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Miscellaneous\SOILS\Archive\Roadway\LaSalle County\IL 251 2.1 mi South of I-80 – Co 66F12 – RGR 2018.pdf

If you have any questions, please contact Mike Short at 815-433-7085.

MS:bz/Soils/RoadwayGeotechReport #66F12

cc: Mike Short
Kyle Videgar
Resident Engineer

ROADWAY GEOTECHNICAL REPORT

SLOPE STABILITY INVESTIGATION AND STUDY

ILLINOIS 251, 2.1 MILES SOUTH OF I-80

FAP 46 (IL 251)
Section (1)I-2
D-93-020-16
C-93-019-16
Contract 66F12
LaSalle County

Illinois Department of Transportation

Region 2, District 3

Prepared by:
Mike Short
District 3 Geotechnical Engineer
1-815-433-7085
Michael.Short@Illinois.gov

May 25, 2018

TABLE OF CONTENTS

I. GENERAL INFORMATION 4
A. Report Purpose 4
B. Project Location, Description, and Scope 4
C. Summary of Current Conditions 4
D. History 5
II. SUBSURFACE INVESTIGATION 7
A. Field Investigation 7
B. Aerial Inspections 8
C. Groundwater Conditions 8
D. Existing Pavement Conditions 10
E. Soils 10
F. Bedrock 10
G. Laboratory Testing 10
III. SLOPE FAILURE INVESTIGATION 11
A. Inclinometer Data 11
B. Slope Modeling 11
IV. SLOPE REPAIR OPTIONS 12
A. Repair Options Considered 12
B. Selected Option 12
V. RECOMMENDATIONS 13
A. Geotechnical Reports 13
B. Inclinometers 13
C. Surface Drainage 13
D. Existing Sheet Pile 13
E. West Side of IL 251 13
VI. CONCLUSION 14
A. Additional Information 14

LIST OF APPENDICES

Location Map ..... A
Existing Plan B-1
Existing Typical Section B-2
Existing Cross Sections B-3
Proposed Plan View of Project C-1
SN 050-8801 Draft TSL Drawing C-2
SN 050-8802 Draft TSL Drawing C-3
Photos of East Side of IL 251 ..... D-1
Photos of West Side of IL 251 ..... D-2
1962 Construction Plan Sheets E-1
1962 Correspondence E-2
1983 Construction Plan Sheets E-3
1983 Correspondence E-4
1988 Correspondence E-5
1989 Correspondence E-6
1991 Correspondence E-7
1992 Construction Plan Sheets E-8
1993 Proposed Plans E-9
1993 Proposed Special Provisions E-10
1993 Roadway Geotechnical Report E-11
1997 Correspondence E-12
2001 Construction Plan Sheets E-13
2011 Correspondence E-14
Subsurface Investigation Plan Sheet F-1
Electrical Resistivity Survey Report F-2
Soil Borings F-3
Piezometers F-4
Inclinometers F-5
Dynamic Cone Penetrometers F-6
Unmanned Aerial Vehicle Photographs G-1
Unmanned Aerial Vehicle Thermal Camera Images G-2
Pavement and Shoulder Photos ..... H
Laboratory Test Results I-1
Shelby Tube Test Results I-2
Plan and Profile Sheets with Inclinometer Data ..... J
Slope Stability Analysis ..... K
Options Considered November 2017 ..... L-1
Options Studied in Depth December 2017 ..... L-2
Geotechnical Reports Special Provision M-1
Inclinometer and Piezometer Adjustment Special Provision M-2
Inclinometer Casing Special Provision M-3

I. GENERAL INFORMATION

A. Report Purpose

The purpose of this report is to present recommendations on how to repair the existing slope stability problems on the east side of Illinois 251 at the project location.

B. Project Location, Description, and Scope

A location map is provided in Appendix A.

The project is located on Illinois 251, 2.1 miles south of I-80 in Peru. The site is in Peru Township, Section 16 of T33N, R1E, 3rd Principal Meridian, LaSalle County, Illinois.

A plan view of the existing roadway and the slope failure are in Appendix B-1. The existing typical section is in Appendix B-2. Existing cross sections are in Appendix B-3.

The proposed improvements include construction of a retaining wall parallel to IL 251 (proposed SN 050-8801), regrading the existing slope, replacing shoulder drains and associated pipes, and constructing new retaining walls (SN 050-8802) to replace the existing wingwalls at the existing box culvert SN 050-2524 to address a slope failure and minimize future maintenance at this location. Structure Geotechnical Reports are being prepared separately for the proposed SN 050-8801 and SN 050-8802. A proposed plan view of the project is provided in Appendix C-1. A draft TSL drawing of SN 050-8801 is in Appendix C-2. A draft TSL drawing of SN 050-8802 is in Appendix C-3.

C. Summary of Current Conditions

A group of significant slope failures have occurred at Station 162+90. On the east side of IL 251, the slope failures have affected the shoulder of the roadway, requiring multiple repairs to the shoulder. Currently, there is a significant gap between the concrete shoulder and the soil underneath it. A corrugated metal pipe used to convey surface water from the shoulder of the road to the toe of the slope has failed and has slid down the slope. Due to the slope movement, the slope is uneven and surface water ponds on the surface at multiple locations. A retaining wall near the toe of the slope is leaning significantly and is at risk of failure. The southeast wingwall of the box culvert has collapsed and the east end of the box culvert is cracked and broken. Scour is present in the creek at the east end of the box culvert. The chimney drain installed in 1983 has been damaged and is no longer effective. Various photos of the east side of IL 251 are in Appendix D-1.

On the west side of IL 251 evidence of slope movement is present as the slope has pushed over a paved ditch, causing the paved ditch to be turned upside down. Additionally, plans for previous construction projects indicate the presence of a slope failure in this area. However, none of the slope movement on the west side of IL 251 is currently affecting the roadway, therefore these movements are not the focus of this report. Various photos of the west side of IL 251 are in Appendix D-2.

D. History

Illinois 251 at this location was originally constructed in 1962 on contract 20893. While SN 050-2524, a box culvert 10 feet wide and 8 feet high, was being backfilled, the southeast wingwall tipped out approximately 20 inches. It was believed the wingwall had broken at the construction joint above the footing. Additionally, a slope failure occurred approximately 60 feet south of the culvert. Soil borings were performed, and various remedies were proposed which included removal and replacement of the wingwall backfill, removal and replacement of the wingwall and footing, and installation of French drains with a perforated corrugated metal pipe to allow water to escape from the embankment. There are no records indicating if any of these repairs were completed. Relevant plan sheets from 1962 are provided in Appendix E-1. Correspondence from 1962 is provided in Appendix E-2.

In 1974, Contract 22520 shows reconstructing the slope by removing some material, constructing benches into the remaining embankment and adding new embankment. However, the as built plans contain the note “all earthwork deleted from contract”, so it is assumed this work was not performed.

In 1983, the slope was investigated and recommendations were made to install edge of pavement drains, stabilized shoulders, bituminous curb, chimney drains, and to grade the existing slope. In 1984, Contract 38025 included the construction of chimney drains and a sheet pile wall. Plan sheets from 1984 are included in Appendix E-3. Correspondence from 1983 is provided in Appendix E-4.

In 1988, the slope was investigated and recommendations were made to remove approximately the top 10 feet of embankment and replace it with porous granular embankment with perforated drainage pipes. This material was not encountered in any of the soil borings. There are no records indicating if any of these repairs were completed. Correspondence from 1988 is provided in Appendix E-5.

In 1989, a recommendation was made to install vertical trenches at two or three locations along the pavement edge, place a fiber mat drain at the back of the trench and install a perforated drainage pipe in the bottom of the trench to carry collected water out of the slope. There are no records indicating if any of these repairs were completed. Correspondence from 1989 is provided in Appendix E-6.

In 1991, recommendations were made to excavate the area under the shoulder and install a drainage mat and porous granular embankment, reconstruct the HMA shoulder, and replace the guardrail. Correspondence from 1991 is provided in Appendix E-7. Some of these improvements were made in 1991, however it is unclear if every recommendation was implemented.

In 1992, contract 86362 included construction of a shoulder drain on the east side of IL 251 at Station 162+00. On the west side of IL 251, a paved ditch leading towards the culvert was rerouted into an inlet structure and a pipe installed to convey water to the box culvert by discharging via a pipe extending over the box culvert headwall. This appears to have been a construction change as the plans show the construction of a riser in the top of the box culvert to accept the pipe. In addition, the northwest wingwall was extended. The plans contained a note indicating the paved ditch on the west side had been buried by a slope failure. Plan sheets from 1992 are in Appendix E-8. Photos of this area are in Appendix D-2.

In 1993, the slope was investigated and recommendations were made to install a 24 inch diameter perforated pipe under IL 251 to intercept and collect groundwater before it could saturate the embankment. A complete set of plans and special provisions for this work was prepared, however it was never built. Proposed plans from 1993 are provided in Appendix E-9. Proposed special provisions from 1993 are in Appendix E-10. A Roadway Geotechnical Report from 1993 is in Appendix E-11.

In 1997, the slope was investigated and recommendations were made to remove a pile of earth and bituminous material located behind the guardrail near the top of the slope. This pile is no longer present at the site. It was also noted that the sheet piling had rotated and settlement was occurring along the northbound shoulder. Correspondence from 1997 is provided in Appendix E-12.

In 2001, Contract 66133 included repairs to the shoulder, which consisted of pipe underdrain, CA07 aggregate, and geotechnical fabric; all of which were placed under the shoulder. Plan sheets from 2001 are in Appendix E-13.

In 2011, an inspection was made of the slope and a detailed list of observations and needed repairs was made. This information is in Appendix E-14.

In 2017, the District's Maintenance forces installed a concrete patch supported by sleeper slabs at the shoulder of the slope failure. During construction, while placing aggregate to bring the base up to the correct grade, the slope moved and additional aggregate needed to be added. While placing concrete, movement of the slope was observed. During the months after the concrete patch was placed, the slope continued to move, creating a significant void under the shoulder. Also in 2017, the slope was graded to try to limit the forces driving the slope failure. During 2017 a significant investigation of the slope was initiated.

II. SUBSURFACE INVESTIGATION

A. Field Investigation

A subsurface investigation of an electrical resistivity survey, soil borings, piezometers, inclinometers, and dynamic cone penetrometer (DCP) testing was executed to determine the physical characteristics of the soils beneath the pavement. In addition, previous investigations consisting of soil borings and inclinometers were researched and reviewed. Appendix F-1 shows the approximate locations of the electrical resistivity survey, soils borings, piezometers, inclinometers, and dynamic cone penetrometer tests. Appendix F-2 contains the report from the electrical resistivity survey. Appendix F-3 has soil boring logs. Appendix F-4 has piezometer information. Appendix F-5 has inclinometer information. Appendix F-6 has the results of the dynamic cone penetrometer tests.

A summary of the subsurface investigation locations is provided in Table 1.

The electrical resistivity survey was performed by the Illinois State Geological Survey in June 2017. This survey identified an interface where the slope failure could be originating. This information was used to determine locations to install piezometers and inclinometers to provide additional information to determine the exact elevation of the slope movement and the subsurface conditions at that location.

Identification Number	Investigation Type	Ground Surface Elevation	Station	Offset	Offset Direction	Boring Date	Location Comment	Boring Depth
1	Soil Profile	595	162+90	57	Lt.	4/13/1992	('92 Boring #1)	38.5
2	Soil Profile	593.68	163+40	32	Lt.	2/8/1993	('93 Boring #2)	65
3	Soil Profile	594.7	162+70	33	Rt.	3/25/1993	('93 Boring #3)	27.5
4	Soil Profile	573.95	162+90	100	Lt.	6/21/2000	('00 Boring #1)	40
5	Soil Profile	572.85	162+42	100	Lt.	6/21/2000	('00 Boring #2)	32
6	Soil Profile	552.35	162+90	190	Lt.	6/22/2000	('00 Boring #3)	18
7	Soil Profile	595.8	163+00	36	Lt.	9/22/1983	('83 Boring #1)	12
8	Soil Profile	596	162+92	36	Lt.	9/22/1983	('83 Boring #2)	12
9	Soil Profile	596.3	162+75	36	Lt.	9/22/1983	('83 Boring #3)	12
10	Soil Profile	597.2	162+25	36	Lt.	9/22/1983	('83 Boring #4)	12
11	Soil Profile	595.8	163+00	36	Lt.	9/19/1983	('83 Boring #5)	29
12	Soil Profile	596	162+85	36	Lt.	9/17/1983	('83 Boring #6)	15
13	Soil Profile	599.8	161+00	36	Lt.	9/17/1983	('83 Boring #7)	15
14	Soil Profile	604.8	159+00	36	Lt.	9/17/1983	('83 Boring #8)	13
15	Soil Profile	609.8	157+00	36	Lt.	9/17/1983	('83 Boring #9)	7
16	Box Culvert	580.6	161+82	83	Lt.	4/12/1962	('62 Boring #2)	41.5
17	Box Culvert	587.4	161+25	74	Rt.	4/13/1962	('62 Boring #3)	44.5
18	Box Culvert	577	161+96	121	Lt.	4/13/1962	('62 Boring #4)	40.5

19	Box Culvert	576	161+79	117	Lt.	4/14/1962	('62 Boring #5)	37
20	Box Culvert	547.1	162+27	202	Lt.	4/14/1962	('62 Boring #6)	8.3
21	Soil Profile	596	162+90	36	Lt.	4/4/1988	('88 Boring #1)	12
22	Soil Profile	594.9	163+45	36	Lt.	4/4/1988	('88 Boring #2)	9
23	Soil Profile	597	162+36	36	Lt.	4/4/1988	('88 Boring #3)	12
24	Soil Profile	593.11	164+50	38	Lt.	4/29/2016	('16 Boring #1)	31.5
25	Soil Profile	595.87	163+00	32	Lt.	4/29/2016	('16 Boring #2)	29
ST 01 (2017)	Shelby Tube	596	162+90	30.5	Lt.	4/4/2017		32.5
26	Soil Profile	597.69	162+40	31.31	Lt.	3/13/2018		60
27	Soil Profile	597.32	162+18	31.29	Lt.	3/13/2018		45
I-1	Inclinometer	582.56	162+70.95	88.5	Lt.	9/7/2017		20
I-2	Inclinometer	579.9	162+00.33	94.8	Lt.	9/7/2017		37.5
I-3	Inclinometer	568.21	162+34.87	131.8	Lt.	9/6/2017		30
I-4	Inclinometer	566.08	162+92.8	157.43	Lt.	9/6/2017		18
P-1	Piezometer	591.04	163+28.82	56.2021	Lt.	9/5/2017		20
P-2	Piezometer	588.41	162+80.58	83.16	Lt.	9/5/2017		15
P-3	Piezometer	573.42	162+75	108	Lt.	9/5/2017		22.5

Table 1: Subsurface Investigation Summary.

B. Aerial Inspections

To obtain a different perspective of the slope failure, an unmanned aerial vehicle was used to fly over the site with survey equipment and high definition cameras. This inspection did not identify any areas of concern that were not already visible from the ground. Additionally, a thermal imaging camera was used to identify groundwater just below the ground surface, but only seepage already visible from the ground surface was identified. Images from the unmanned aerial vehicle's conventional camera are in Appendix G-1 and images from the thermal imaging camera are in Appendix G-2.

C. Groundwater Conditions

Complete precipitation data for the period prior to the 2017 subsurface investigation is provided in Table 2. Variations in groundwater elevation caused by precipitation are not expected to be significant.

Groundwater was recorded in some of the soil borings. During inspection at the site, water was frequently seen seeping from the slope. Some of the soil borings indicate very high water contents in the subsurface soils, which are believed to be a significant contributor to the slope failure. Piezometer data indicated groundwater elevations below the ground surface and an insignificant relationship between groundwater elevation and precipitation.

Month	Year	Actual Precipitation	Normal Precipitation	Departure From Normal (+/-)	Cumulative Actual Precipitation	Cumulative Normal Precipitation
		Inch	Inch	Inch	Inch	Inch
January	2015	1.08	1.46	-0.38	1.08	1.46
February	2015	0.68	1.42	-0.74	1.76	2.88
March	2015	0.25	2.68	-2.43	2.01	5.56
April	2015	2.78	3.58	-0.80	4.79	9.14
May	2015	7.26	4.57	2.69	12.05	13.71
June	2015	6.60	4.09	2.51	18.65	17.80
July	2015	3.06	4.06	-1.00	21.71	21.86
August	2015	1.15	4.09	-2.94	22.86	25.95
September	2015	4.12	3.62	0.50	26.98	29.57
October	2015	2.17	2.99	-0.82	29.15	32.56
November	2015	4.51	2.83	1.68	33.66	35.39
December	2015	4.82	2.28	2.54	38.48	37.67
2015 Sub-Total		**38.48**	**37.67**	**0.81**	-	-
January	2016	0.47	1.46	-0.99	0.47	1.46
February	2016	0.52	1.42	-0.90	0.99	2.88
March	2016	3.28	2.68	0.60	4.27	5.56
April	2016	1.51	3.58	-2.07	5.78	9.14
May	2016	5.96	4.57	1.39	11.74	13.71
June	2016	4.04	4.09	-0.05	15.78	17.80
July	2016	5.49	4.06	1.43	21.27	21.86
August	2016	7.11	4.09	3.02	28.38	25.95
September	2016	2.31	3.62	-1.31	30.69	29.57
October	2016	2.48	2.99	-0.51	33.17	32.56
November	2016	1.97	2.83	-0.86	35.14	35.39
December	2016	0.88	2.28	-1.40	36.02	37.67
2016 Sub-Total		**36.02**	**37.67**	**-1.65**	-	-
January	2017	1.89	1.46	0.43	1.89	1.46
February	2017	1.76	1.42	0.34	3.65	2.88
March	2017	3.60	2.68	0.92	7.25	5.56
April	2017	6.36	3.58	2.78	13.61	9.14
May	2017	3.47	4.57	-1.10	17.08	13.71
June	2017	3.05	4.09	-1.04	20.13	17.80
July	2017	5.07	4.06	1.01	25.20	21.86
August	2017	3.27	4.09	-0.82	28.47	25.95
September	2017	0.05	3.62	-3.57	28.52	29.57
October	2017	6.59	2.99	3.60	35.11	32.56
November	2017	1.51	2.83	-1.32	36.62	35.39
December	2017	0.63	2.28	-1.65	37.25	37.67
2017 Sub-Total		**37.25**	**37.67**	**-0.42**	-	-
January	2018	0.88	1.46	-0.58	0.88	1.46
February	2018	3.18	1.42	1.76	4.06	2.88
March	2018	0.99	2.68	-1.69	5.05	5.56
2018 Sub-Total		5.05	5.56	-0.51	-	-
Total		**116.80**	**118.57**	**-1.77**	-	-

Table 2: Precipitation Data for Peru, Illinois

D. Existing Pavement Conditions

The existing pavement is in excellent condition; however the shoulder is in very poor condition and has been replaced multiple times over the years. There is currently a large void under the shoulder of the roadway. The poor condition of the shoulder is directly attributed to slope movement. Photos of the shoulder are in Appendix H.

E. Soils

The highway at this location transitions from a cut area to the south of the slope failure to a fill at the slope failure. The existing embankment is approximately 420 feet wide and 60 feet high.

Many soil borings have been performed over the years. The 1962 soil borings, which were performed during construction to investigate the wingwall failure, indicate the presence of ice in the new embankment, indicating the embankment may have been constructed of frozen soil, or on frozen soil.

Other soil borings indicate the embankment soils have low strengths and high moisture contents. The soil types are typically reported as clay or shale, with some indications that mine waste was used to construct the embankment. Soil borings taken in 2017 and 2018 indicate some of the fill material is stiff to very stiff at lower depths.

F. Bedrock

The depth to bedrock was identified in many of the soil borings. The bedrock consists of shale, with some limestone and coal layers. The bedrock generally slopes down towards the northeast. Table 1 contains information on the bedrock elevation at each of the soil borings.

G. Laboratory Testing

In 2016, soil samples were obtained for performing Atterberg Limit, grain size, and standard Proctor tests. These tests indicate the soils are clays and silty clays and are not frost susceptible. The results of these tests are in Appendix I-1.

In 2017, a shelby tube boring was performed. Results from the shelby tube boring are in Appendix I-2.

III. SLOPE FAILURE INVESTIGATION

A. Inclinometer Data

The two inclinometers labeled 162+90 and 162+50 were installed in 1988 and 1998, respectively. Information regarding the station, offset, and elevation of the inclinometers had to be interpreted from information available in the old project files, so this information should be considered approximate. The original inclinometer readings were identified in the old project files, and were entered into the current computer software.

The inclinometers labeled I-1, I-2, I-3, and I-4 were installed in 2017. Current survey methods such as GPS were used to determine the station, offset, and elevation of the inclinometers.

The slope inclinometer data was plotted on the original construction plan and profile sheets to determine the location of the movement in relation to the original ground surface. When reviewing these sketches, it is important to note the inclinometers were plotted at the nearest cross section, which requires the user to carefully interpret the data based on adjacent cross sections. The plan and profile sheets and cross sections with inclinometer data plotted are in Appendix J. The inclinometer plots and inclinometer data are in Appendix F-5. The inclinometer data is summarized in Table 3. The inclinometer data suggests that at 162+90, 162+50, I-1 and I-4, the embankment is moving at the interface between the weaker embankment and the bedrock surface. At I-3, a failure plane is located within the embankment. At I-2, there is no evidence of embankment movement.

Inclinometer	Station	Offset	Original Ground Surface Elevation	Top of Rock Elevation	Elevation of Movement
162+90	162+90	35 LT	584	584	584
162+50	162+50	46 LT	567	567	567
I-1	162+70.95	88.54 LT	570	567.8	566.5
I-2	162+00.33	94.80 LT	558	549.3	N/A
I-3	162+34.87	131.79 LT	551	545.3	553.0
I-4	162+92.8	157.43 LT	560	558.2	558.0

Table 3: Inclinometer Data Summary

Based on the visual inspections, construction records, and an analysis of the existing slope, it is believed that the underlying cause of the slope failure is excessive moisture within the embankment.

B. Slope Modeling

The District had a consultant prepare a computer model of the slope for analysis. This information is provided in Appendix K.

Correct Station is 162+84

Correct Station is 162+84. Updated by MAS 11-19-2019

IV. SLOPE REPAIR OPTIONS

A. Repair Options Considered

Many repair methods were considered by the District. The options considered consisted of a dry land bridge over the slope failure, sheet pile retaining wall (with and without tiebacks), secant drilled shaft retaining wall, drilled soldier pile retaining wall, removing and replacing the embankment with soil, removing and replacing the embankment with aggregate, utilizing expanded polystyrene fill, deep patch repair, additional drains, and plate piles. A presentation from November 2017 in which various options were discussed is attached in Appendix L-1. At this meeting, three options were chosen for further analysis: drilled soldier pile retaining wall, removing and replacing the embankment with aggregate and expanded polystyrene, and horizontal wick drains.

Additional analyses and evaluations of these three options were performed. Sketches of these options are provided in Appendix L-2.

B. Selected Option

Based on cost analysis, it was decided to pursue a drilled solder pile retaining wall to retain the roadway. The retaining wall is to be built parallel to IL 251, just east of the guardrail. Additionally, the existing wingwalls for SN 050-2524 will be removed and replaced with new drilled soldier pile wingwalls, and the existing embankment will be reshaped to minimize loads on the slope.

V. RECOMMENDATIONS

A. Geotechnical Reports

The Roadway Geotechnical Report and Structure Geotechnical Reports for this project should be made available to the contractor during the bidding phase. A special provision for this is included in Appendix M-1.

B. Inclinometers

Inclinometer I-4 is no longer in service. Inclinometers 162+90 and 162+50 have already been buried in the slope and are likely to be encountered during construction. These three inclinometers should be abandoned and sealed in accordance with Section 672 of the Standard Specifications for Road and Bridge Construction.

The remaining piezometers and inclinometers should be maintained after construction to facilitate future long-term monitoring of the slope by adjusting the elevation of the top of the piezometers and inclinometers to match the proposed ground surface elevations. A special provision for this work is in Appendix M-2.

Inclinometer casing should be installed adjacent to one drilled soldier pile in the retaining wall and one in the proposed southwest wingwall of the box culvert. A special provision for this work is in Appendix M-3.

C. Surface Drainage

The existing system to convey surface water from the roadway to the creek is in disrepair and must be completely removed and replaced.

D. Existing Sheet Pile

The existing steel sheet pile wall should be removed. The soils near the sheet pile wall should be regraded to provide positive drainage of surface water and to improve stability of the slope.

E. West Side of IL 251

The failed paved ditch should be removed and replaced with an inlet structure and buried pipe to carry water to the creek. By burying the pipe, the weight of the soil will help to reduce the risk of future slope movements in this area.

VI. CONCLUSION

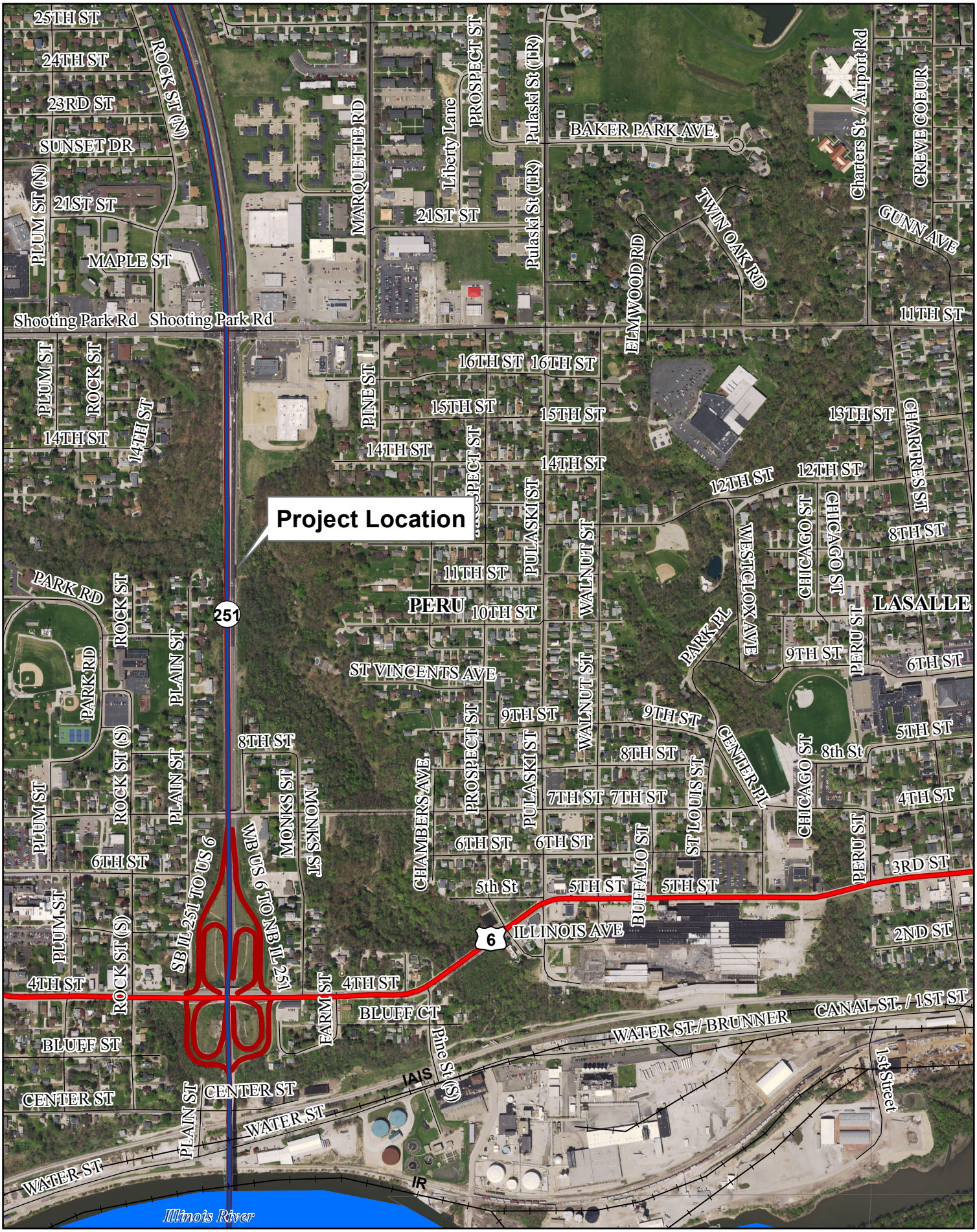
A. Additional Information

If there are any questions about this report or any additional information is required, please contact the District Geotechnical Engineer.

APPENDIX

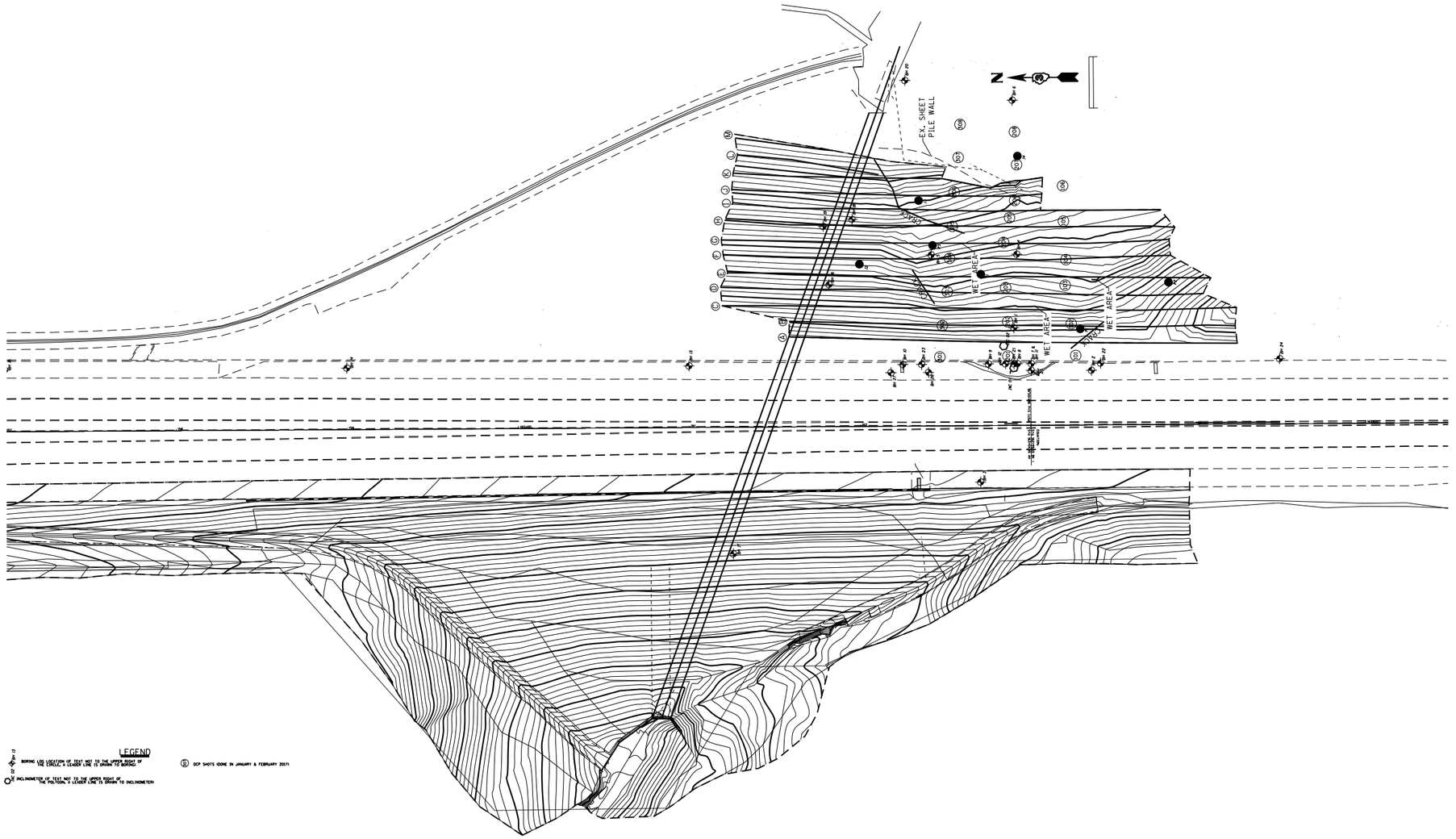
A

Location Map



APPENDIX

B-1



MODEL: Default
FILE NAME: pw:\\IL084EBIDINTEG.illinois.gov:PWIDOT Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADSheets\D3xxxxx-sht-plnprf.dgn

USER NAME = fergusonjh	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 100.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 5/16/2018	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

East & West Section

SCALE: _____ | SHEET __ OF __ SHEETS | STA. _____ | TO STA. _____

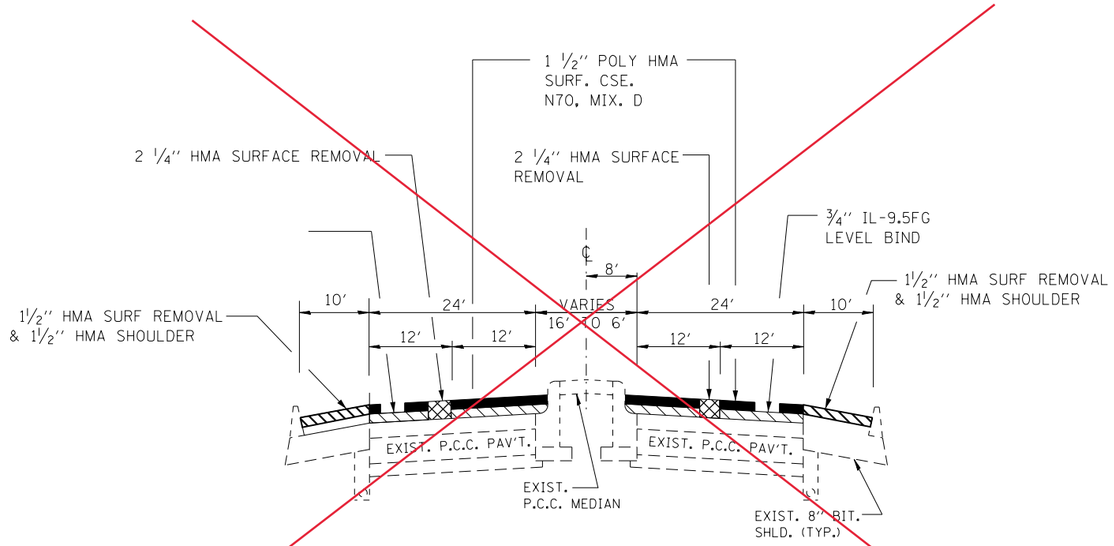
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. _____

ILLINOIS | FED. AID PROJECT

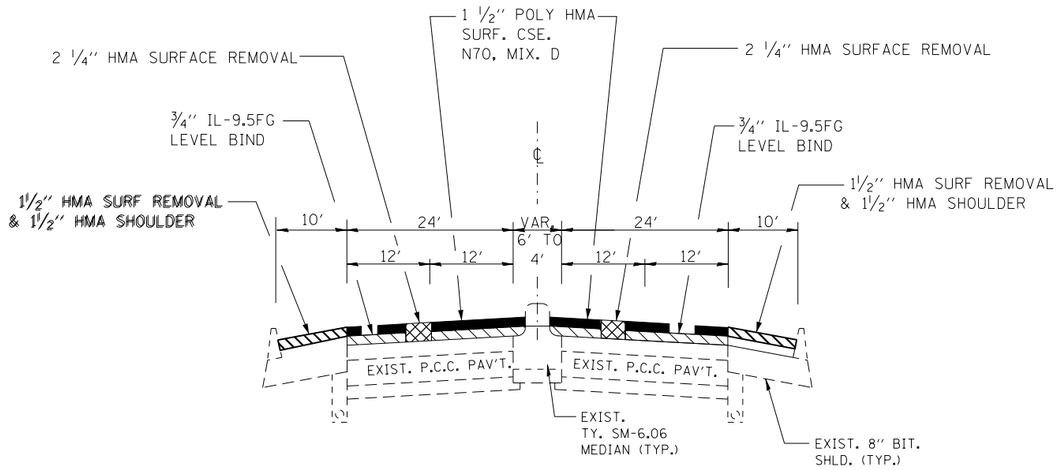
APPENDIX

B-2



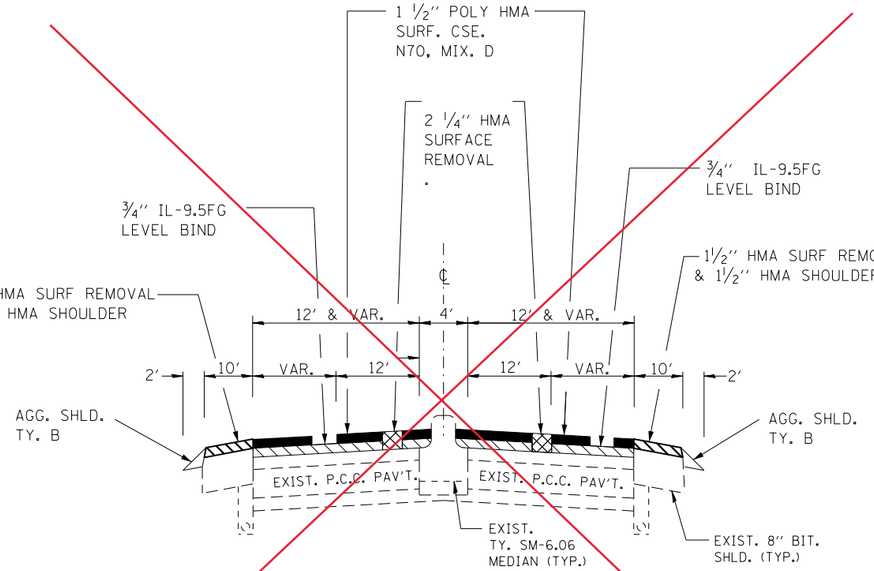
TYPICAL SECTION NO. 19

STA. 153+05 TO STA. 162+01.53



TYPICAL SECTION NO. 21

STA. 162+01.53 TO STA. 175+43.35



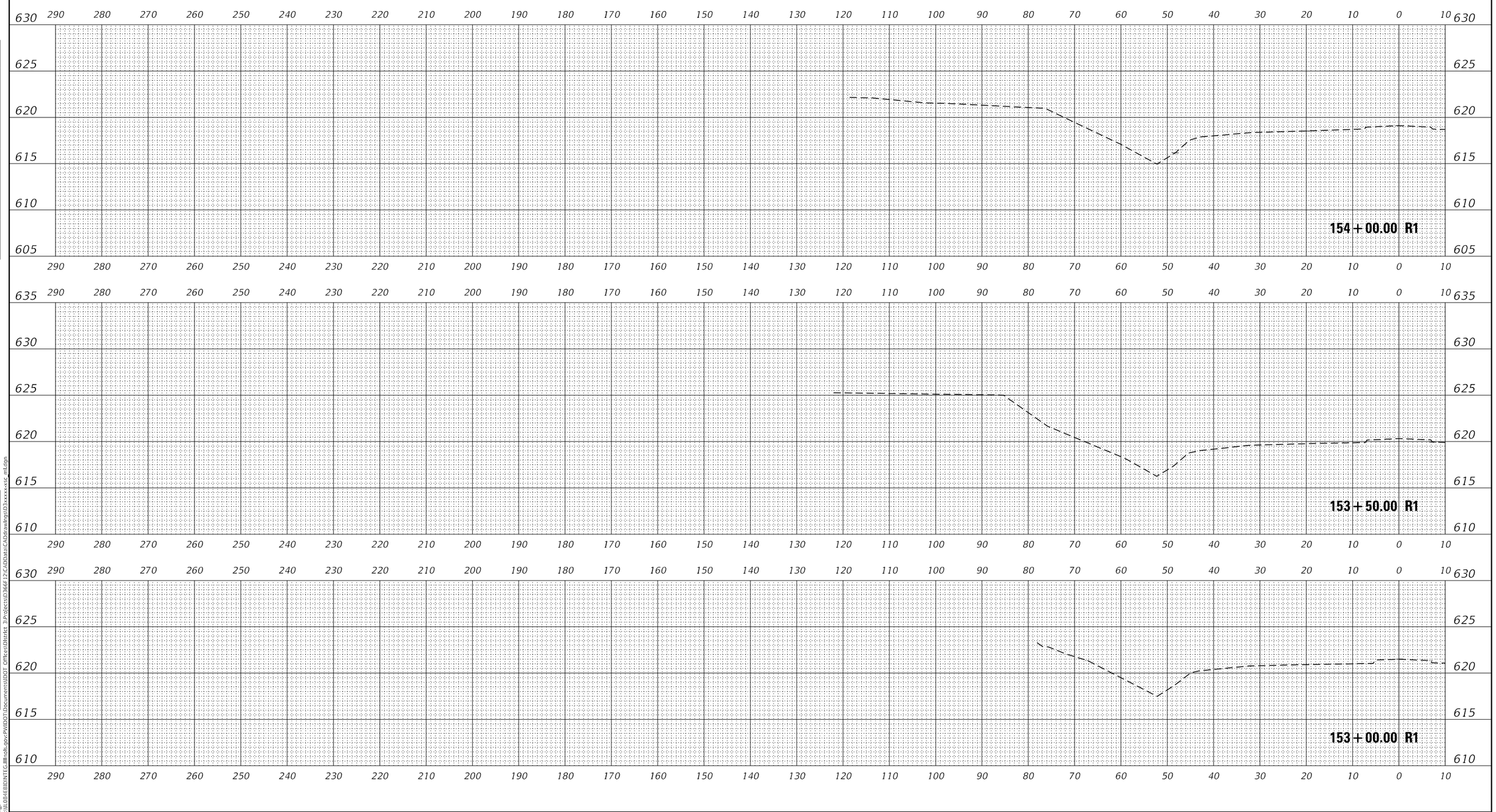
TYPICAL SECTION NO. 20

STA. 175+43.35 TO STA. 176+60
STA. 178+60 TO STA. 187+56
STA. 189+56 TO STA. 193+08.12

FILE NAME = c:\pw_work\pwidot\duncanbd\d0296614\D366C07-sht-typical.dgn	USER NAME = duncanbd	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTIONS	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	PLOT SCALE = 5000.0000 ' / in.	DRAWN -	REVISED -			46	(1,1Z)RS-4	LASALLE	54	16
	PLOT DATE = 6/14/2014	CHECKED -	REVISED -					CONTRACT NO. 66C07		
		DATE -	REVISED -		SCALE: SHEET OF SHEETS STA. TO STA.			ILLINOIS FED. AID PROJECT		

APPENDIX

B-3



FINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

BY	DATE

BY	DATE

MODEL: 25 rev L3
FILE NAME: pw:\\0084EBIDINTEG.illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D3666 F12\CADData\CADdrawings\D3xxxx-xxSC mL.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____
	DRAWN - _____	REVISED - _____
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____

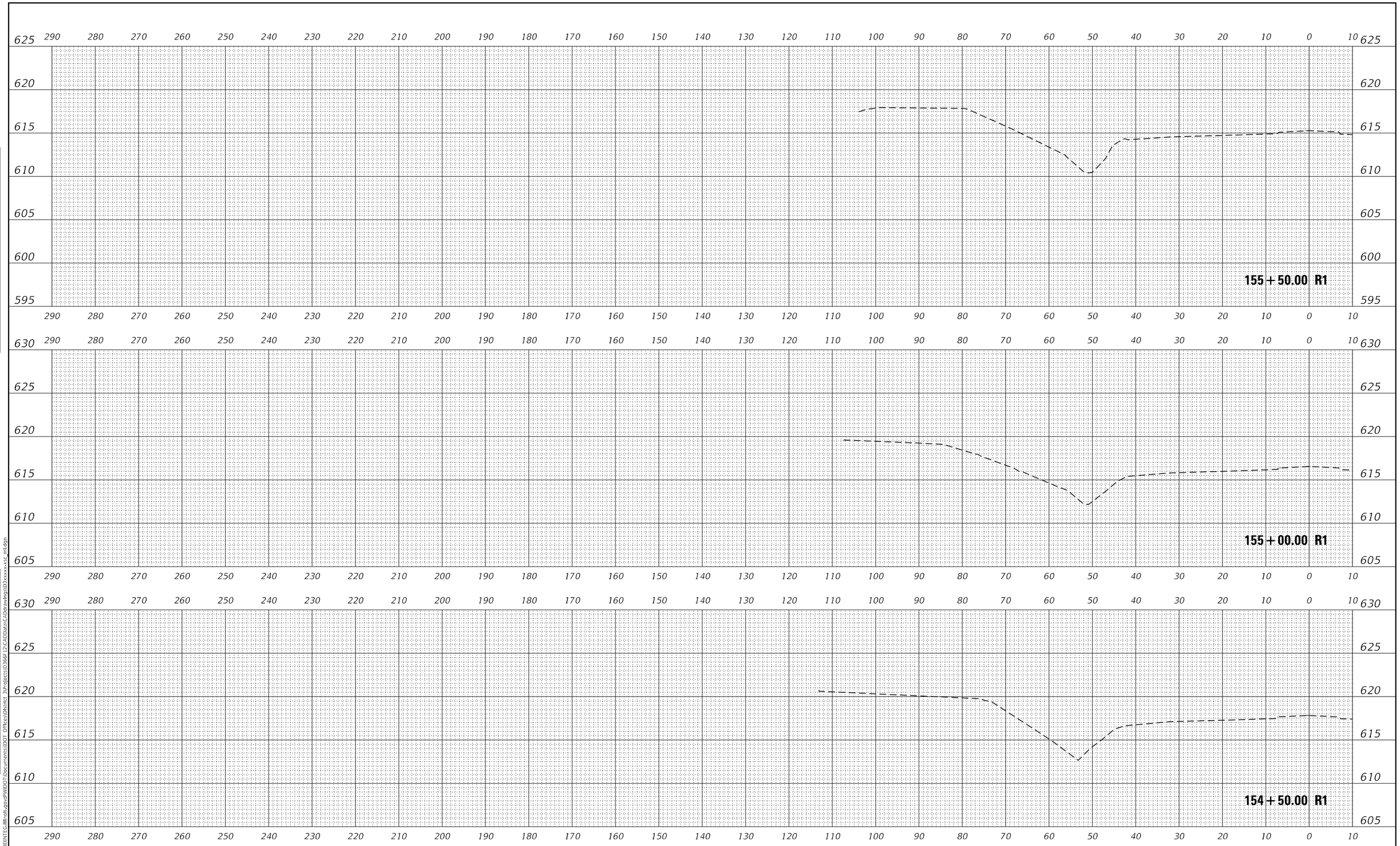
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 153+00.00 R1 TO STA. 154+00.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT



FINAL SURVEY

NO.	NOTE BOOK	PAGES	TEMPLATE	PLOTTED	SURVEYED	AREAS CHECKED	BY	DATE

ORIGINAL SURVEY

NO.	NOTE BOOK	PAGES	TEMPLATE	PLOTTED	SURVEYED	AREAS CHECKED	BY	DATE

MODEL: 25 rev1_3
FILE NAME: pw:\\U084EBIDINTEC.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxxxxSC_mt.dgn

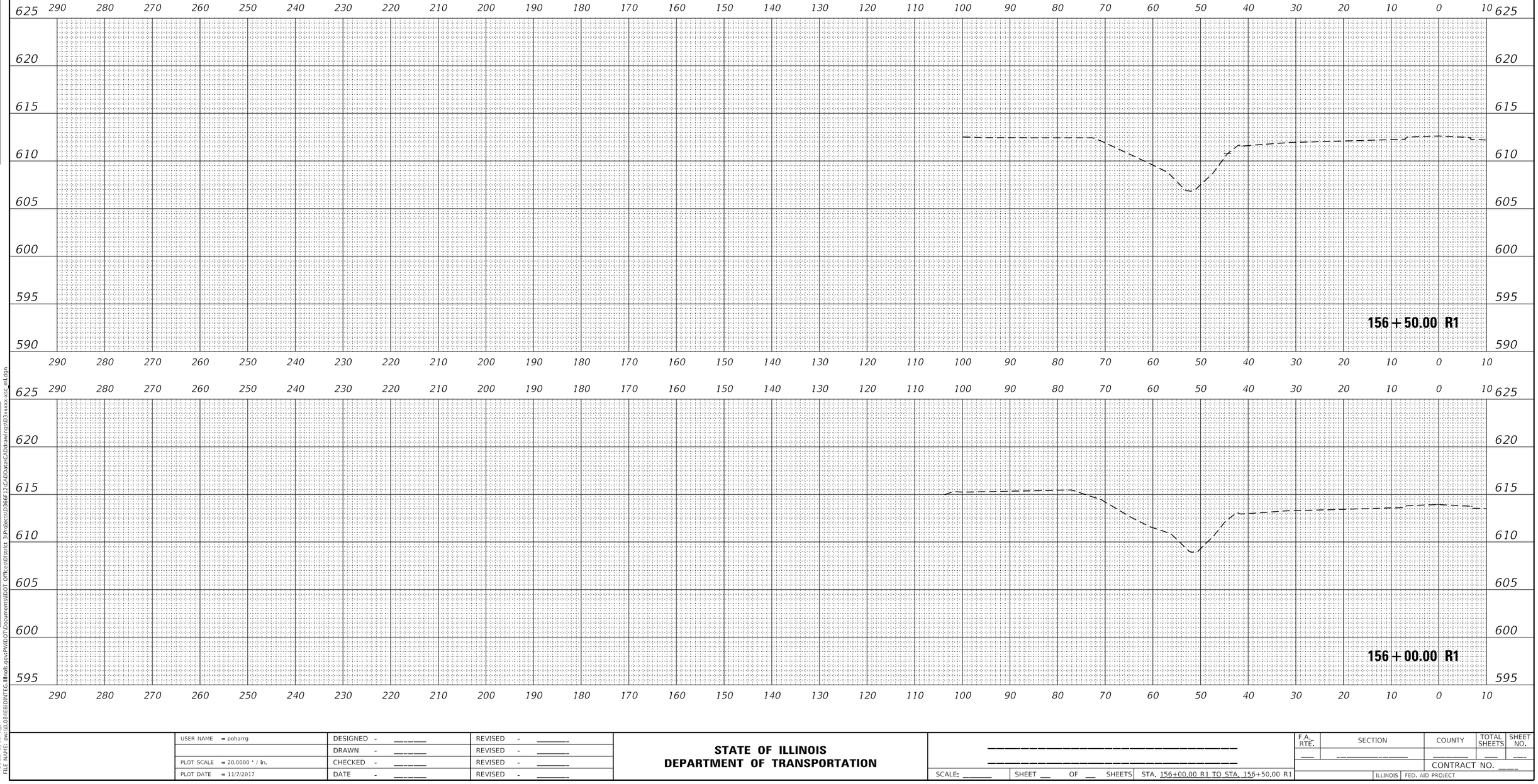
USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 154+50.00 R1 TO STA. 155+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
		ILLINOIS	FED. AID PROJECT	

DATE	BY	FINAL SURVEY	NOTE BOOK	NO.
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		



DATE	BY	ORIGINAL SURVEY	NOTE BOOK	NO.
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		

MODEL: 25 rxxL3
FILE NAME: pw:\\UGB4EBIDINTEC.illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdraw\rxgs\D3xxxxxxsc mLdgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

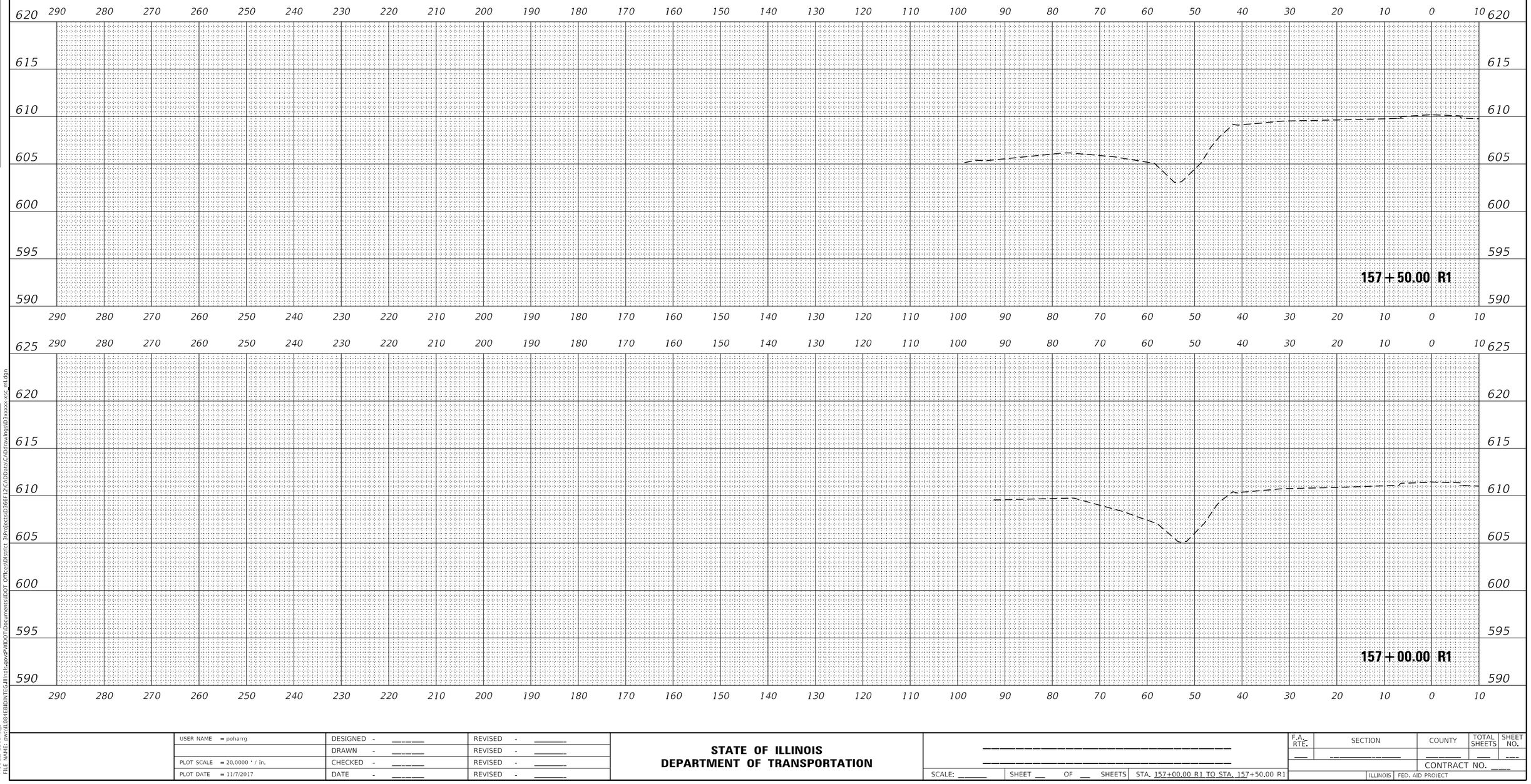
SCALE: _____ | SHEET __ OF __ SHEETS | STA. 156+00.00 R1 TO STA. 156+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
		ILLINOIS	FED. AID PROJECT	

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY

DATE



ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY

DATE

MODEL: 251ex4_3
FILE NAME: pw:\\IL084EIBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxxxxsc_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 157+00.00 R1 TO STA. 157+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

DATE	BY	
		SURVEYED
		PLOTTED
		TEMPLATE
		AREAS
		AREAS CHECKED

FINAL SURVEY — NOTE BOOK — NO.

620 615 610 605 600 595 590 585 580

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

158 + 50.00 R1

620 615 610 605 600 595 590 585 580

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

158 + 00.00 R1

620 615 610 605 600 595 590 585 580

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

DATE	BY	
		SURVEYED
		PLOTTED
		TEMPLATE
		AREAS
		AREAS CHECKED

ORIGINAL SURVEY — NOTE BOOK — NO.

MODEL: 25 ixv4_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\StDistrict 3\Projects\D3661212\CADData\CADdrawings\D3xxxxxxss_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 158+00.00 R1 TO STA. 158+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
	PLOTTED		
	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		

615 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 615

610 605 600 595 590 585 580 575 570

159 + 00.00 R1

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
	PLOTTED		
	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		

MODEL: 25 ext_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xxSC ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

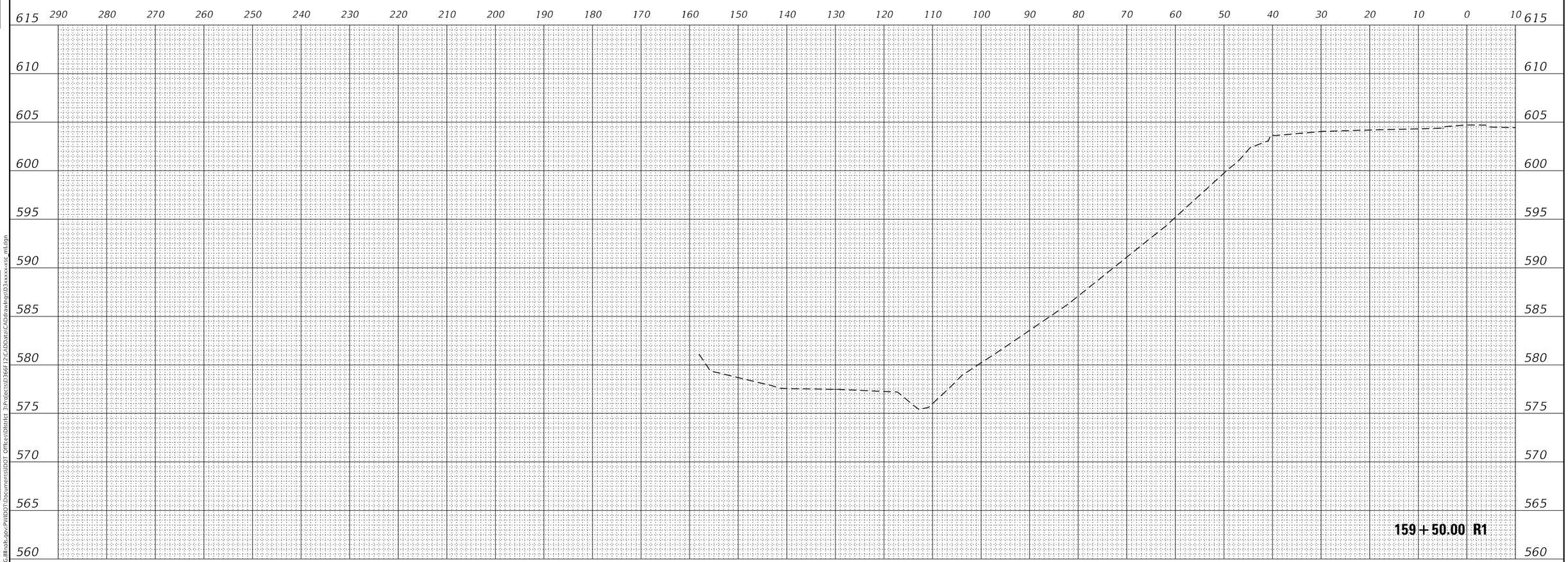
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 159+00.00 R1 TO STA. 159+00.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. _____		
	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	
NOTE BOOK	
NO.	

DATE	BY
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	



ORIGINAL SURVEY	
NOTE BOOK	
NO.	

DATE	BY
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	

MODEL: 25 lexcl_3
FILE NAME: pw:\\IL084EBIDNITE.IllinoIs.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADD\Data\CADdrawings\D3xxxx-xxSC m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

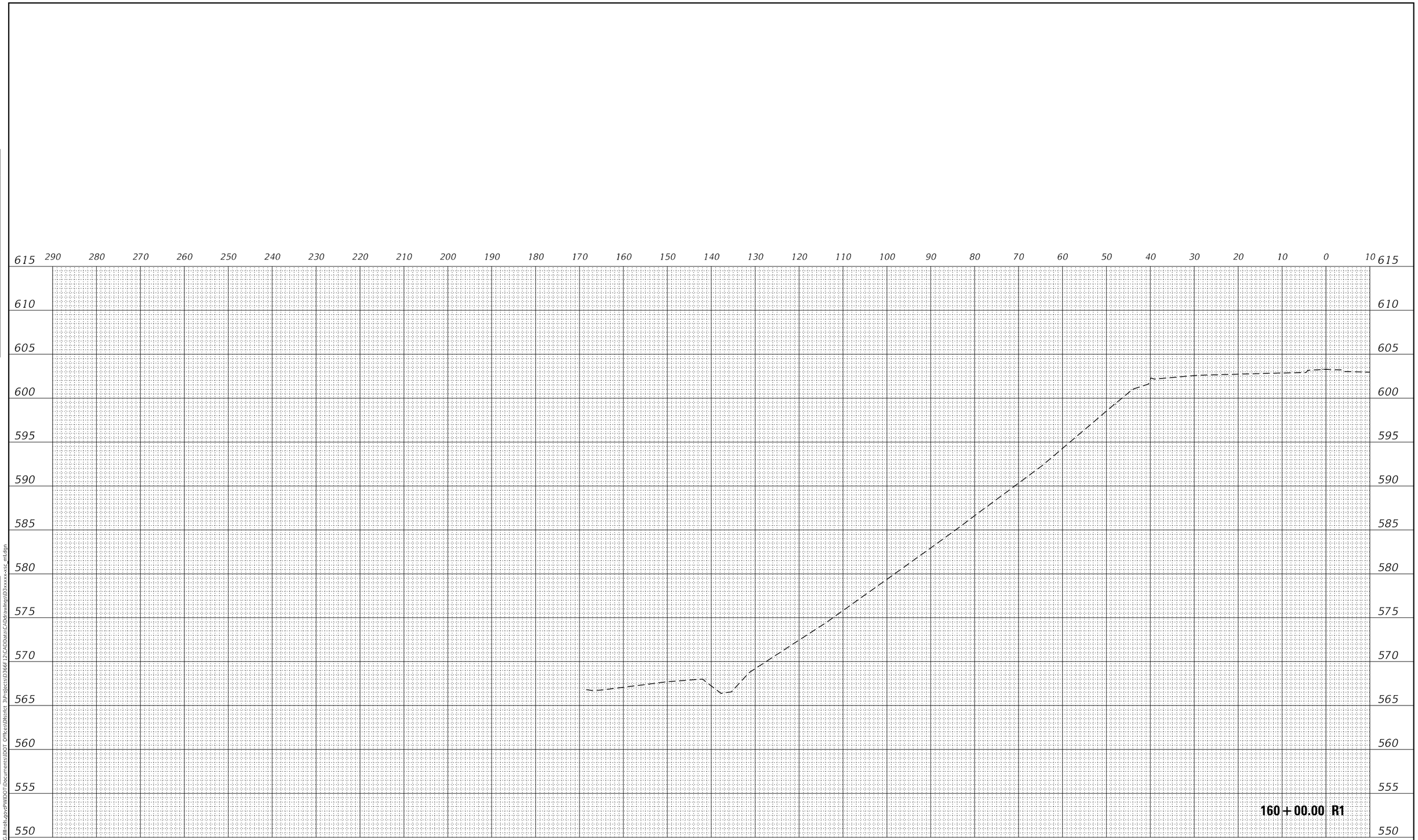
SCALE: _____ | SHEET __ OF __ SHEETS | STA. 159+50.00 R1 TO STA. 159+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	___	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

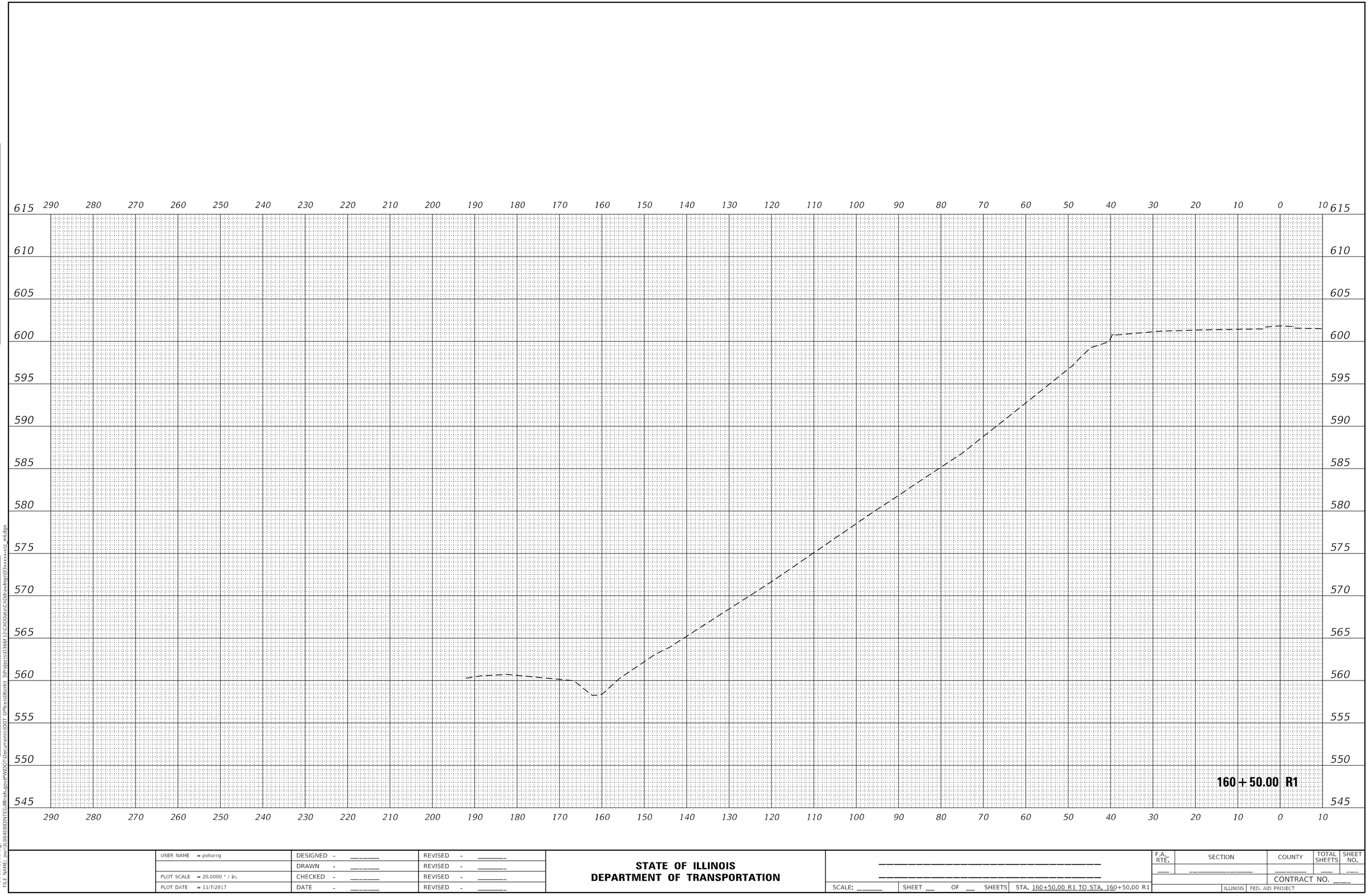
FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		



ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		

MODEL: 25ext_L3
FILE NAME: pw:\\L084EBIDINTEG.illinois.gov:PWIDOT\Documents\IDOT Offices\Districts\D366F12\CADData\CADdrawings\D3xxxxx-sscmi.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	**STATE OF ILLINOIS**	_____	F.A. RTE. ___
	DRAWN - _____	REVISED - _____	**DEPARTMENT OF TRANSPORTATION**	_____	SECTION _____
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____		SCALE: _____ SHEET __ OF __ SHEETS STA. 160+00.00 R1 TO STA. 160+00.00 R1	COUNTY _____
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____			TOTAL SHEETS ___
					SHEET NO. ___
					CONTRACT NO. ____
					ILLINOIS FED. AID PROJECT



FINAL SURVEY

NOTE BOOK

NO.

BY

DATE

SURVEYED

PLOTTED

TEMPLATE

AREAS

AREAS CHECKED

ORIGINAL SURVEY

NOTE BOOK

NO.

BY

DATE

SURVEYED

PLOTTED

TEMPLATE

AREAS

AREAS CHECKED

MODEL: 25 lexel_3

FILE NAME: pw:\\IL084EBI0NTEC.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CAD\Data\CADdrawings\03xxxx-xxSC m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 160+50.00 R1 TO STA. 160+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

DATE	BY	FINAL SURVEY
		SURVEYED
		PLOTTED
		TEMPLATE
		AREAS
		AREAS CHECKED
		NOTE BOOK
		NO.

610 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 610

605 605

600 600

595 595

590 590

585 585

580 580

575 575

570 570

565 565

560 560

555 555

550 550

545 545

540 540

535 535

161+00.00 R1

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

ORIGINAL SURVEY	BY	DATE
		SURVEYED
		PLOTTED
		TEMPLATE
		AREAS
		AREAS CHECKED
NOTE BOOK		
NO.		

MODEL: 25 lexcl_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366f12\CADD\Data\CADdrawings\D3xxxx-xxsc_ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 161+00.00 R1 TO STA. 161+00.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	___	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

610 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 610

605 605

600 600

595 595

590 590

585 585

580 580

575 575

570 570

565 565

560 560

555 555

550 550

545 545

540 540

535 535

530 530

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

161 + 50.00 R1

DATE	BY	FINAL SURVEY	NOTE BOOK	NO.
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		

DATE	BY	ORIGINAL SURVEY	NOTE BOOK	NO.
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		

MODEL: 751ex1_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xxSC_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 161+50.00 R1 TO STA. 161+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

610 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 610

605 605

600 600

595 595

590 590

585 585

580 580

575 575

570 570

565 565

560 560

555 555

550 550

545 545

540 540

535 535

530 530

525 525

162 + 00.00 R1

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

FINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

BY	DATE

BY	DATE

MODEL: 25 lexrL3
FILE NAME: pw:\\IL084EBIDINTEG.illinois.dgn:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xxSE ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 162+00.00 R1 TO STA. 162+00.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. _____		
		ILLINOIS	FED. AID PROJECT	

DATE	BY		
		SURVEYED	
		PLOTTED	
		TEMPLATE	
		AREAS	
		AREAS CHECKED	
FINAL SURVEY	NOTE BOOK		
	NO.		

DATE	BY		
		SURVEYED	
		PLOTTED	
		TEMPLATE	
		AREAS	
		AREAS CHECKED	
ORIGINAL SURVEY	NOTE BOOK		
	NO.		

610 605 600 595 590 585 580 575 570 565 560 555 550 545 540 535

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

162 + 50.00 R1

MODEL: 751ex1_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xsc_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

_____
_____

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 162+50.00 R1 TO STA. 162+50.00 R1

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. _____

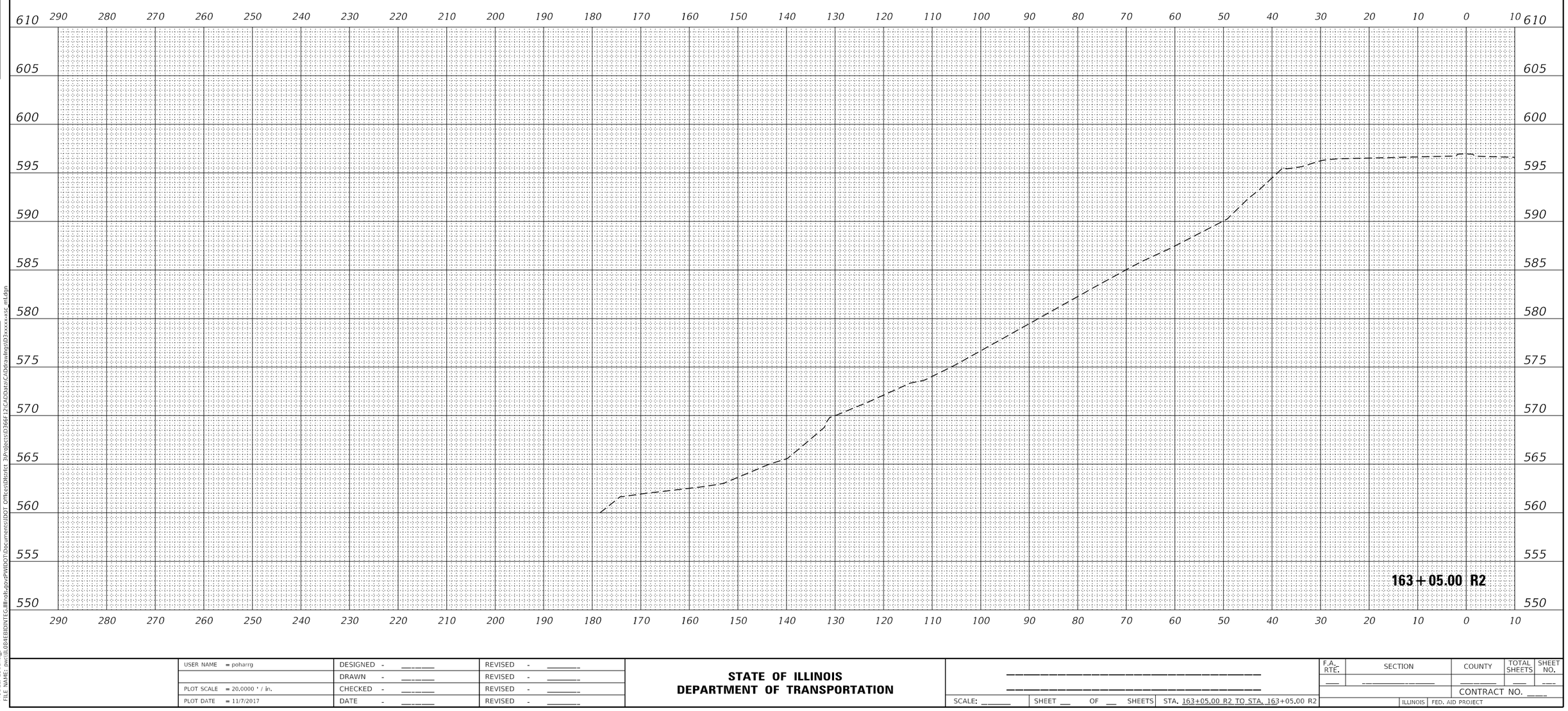
ILLINOIS | FED. AID PROJECT

FINAL SURVEY	
NOTE BOOK	
NO.	

	DATE
	BY
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	

ORIGINAL SURVEY	
NOTE BOOK	
NO.	

	DATE
	BY
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	



USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 163+05.00 R2 TO STA. 163+05.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
	ILLINOIS	FED. AID PROJECT		

MODEL: 25ext3
FILE NAME: pw:\\IL084EBIDINTEG.illinois.gov:PWIDOT\Documents\IDOT Offices\Idsdot 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-sscml.dgn



FINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

BY	DATE

ORIGINAL SURVEY	NOTE BOOK	NO.
	SURVEYED	
	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

BY	DATE

MODEL: 251excl_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois-pw:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CAD\Data\CADdrawings\03xxxx-xx-xx_ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

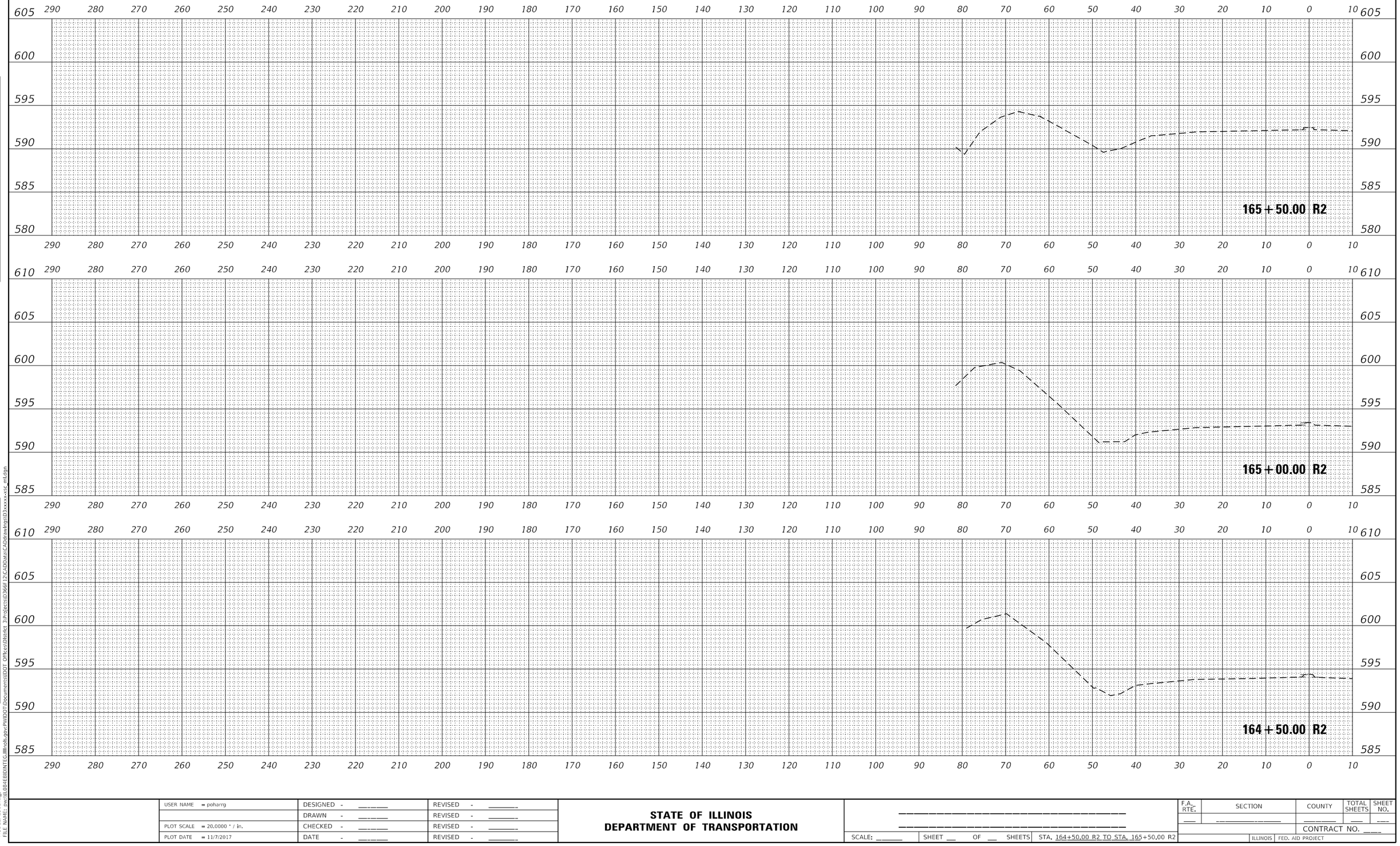
_____
_____

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 163+50.00 R2 TO STA. 164+00.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	___	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT



USER NAME = poharrg	DESIGNED - _____	REVISED - _____	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 164+50.00 R2 TO STA. 165+50.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

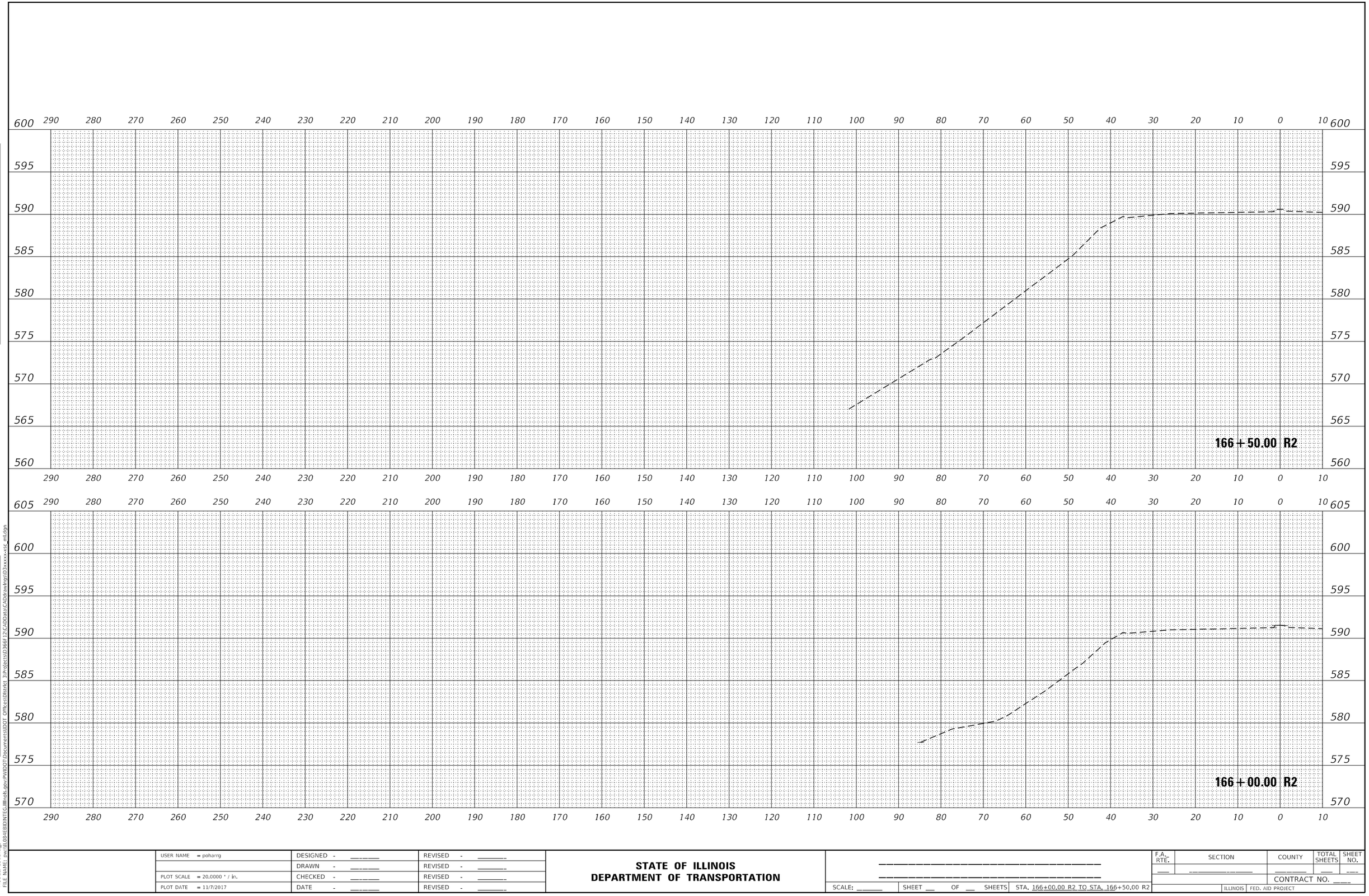
MODEL: 25 jexcl_3
FILE NAME: pw:\\IL084EBIDINTEC.IllinoisAccv:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\03xxxx-xxSC m1.dgn

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



MODEL: 25 ex v1_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D3661212\CADData\CADdrawings\D3xxxxxxsc_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 166+00.00 R2 TO STA. 166+50.00 R2

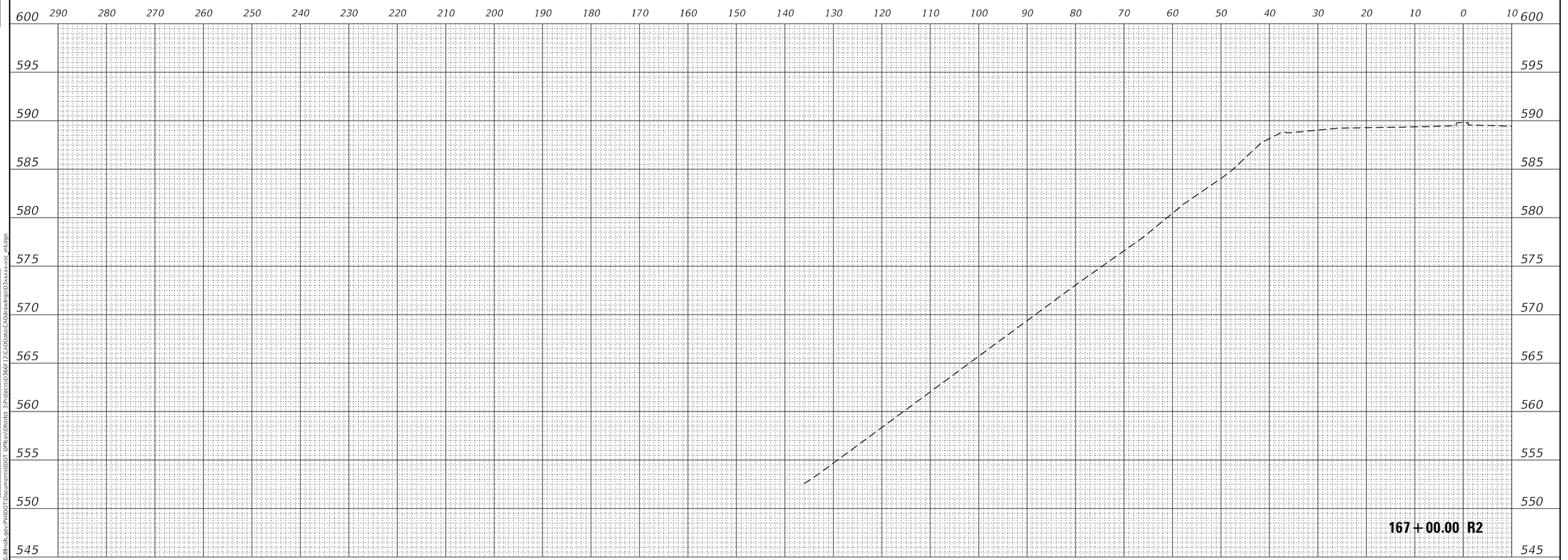
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

FINAL SURVEY	
NOTE BOOK	
NO.	

	BY	DATE
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		



ORIGINAL SURVEY	
NOTE BOOK	
NO.	

	BY	DATE
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

MODEL: 25ext_3
FILE NAME: pw:\\IL084EBIDINTEG.illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxxx-sc_ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 167+00.00 R2 TO STA. 167+00.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED

ORIGINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED

600 595 590 585 580 575 570 565 560 555 550 545 540 535 530

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

167 + 50.00 R2

MODEL: 751ex1_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxxx-sSc_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

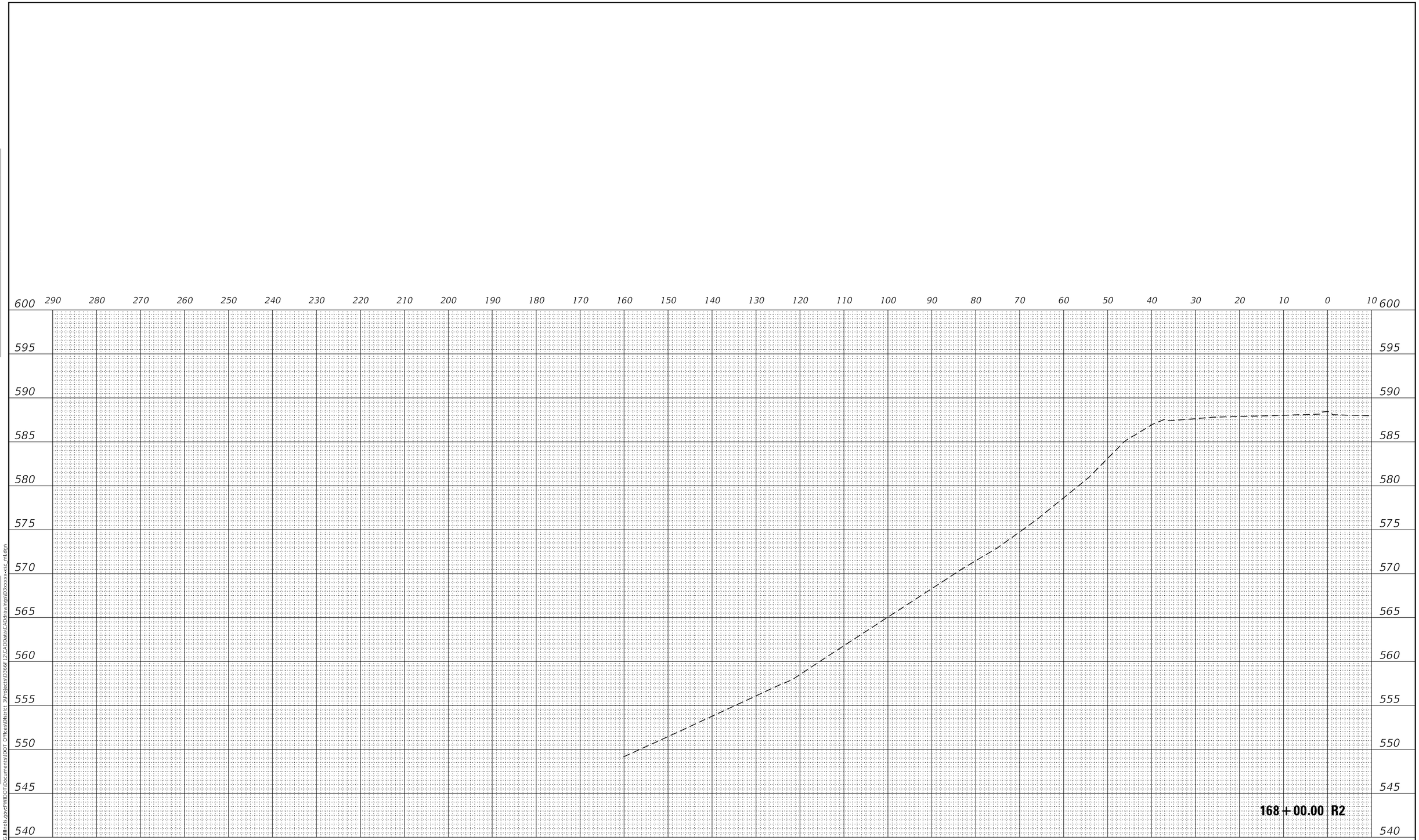
SCALE: _____ | SHEET __ OF __ SHEETS | STA. 167+50.00 R2 TO STA. 167+50.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. _____

ILLINOIS | FED. AID PROJECT

FINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
TEMPLATE		
NOTE BOOK		
AREAS		
NO.	AREAS CHECKED	

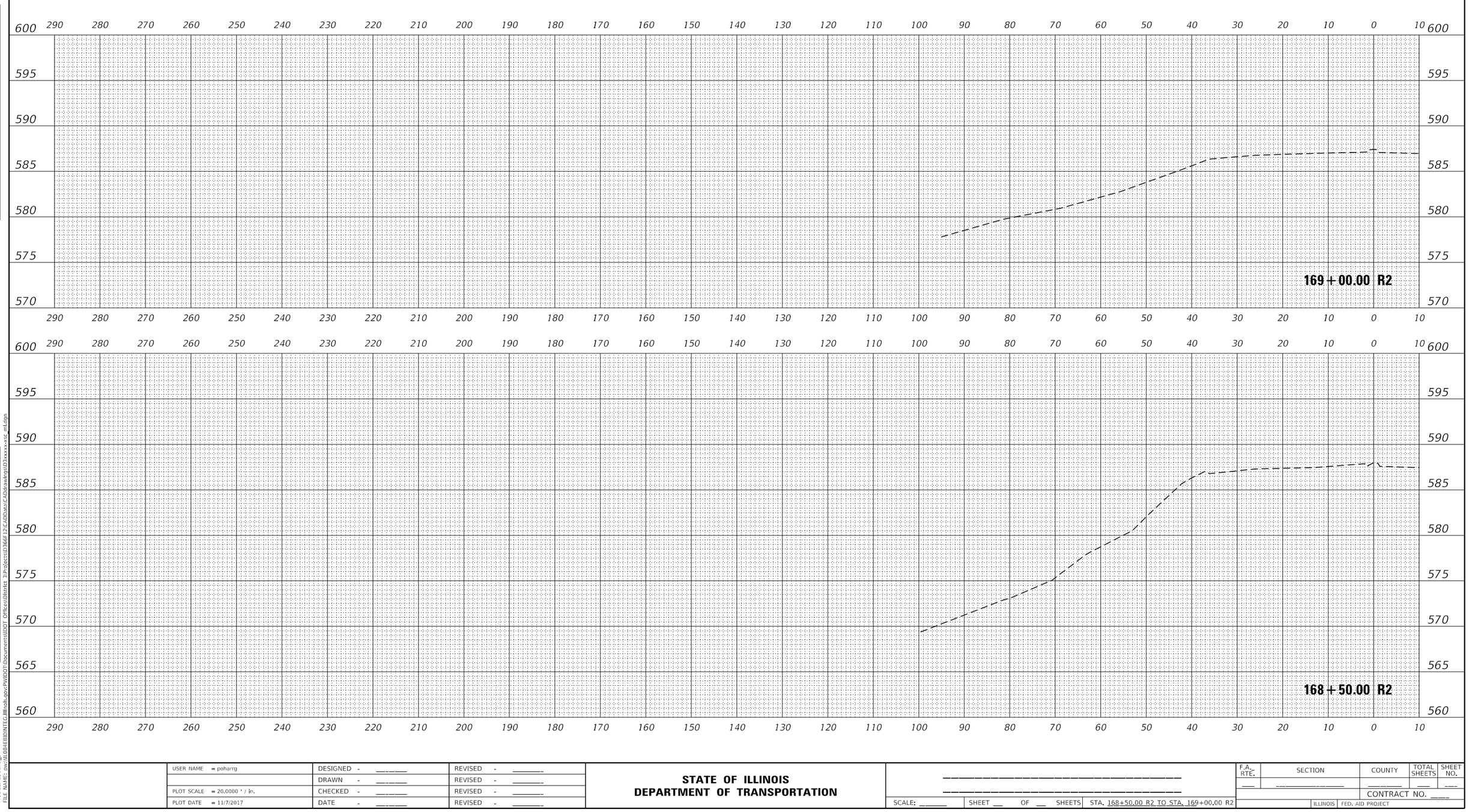


ORIGINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
TEMPLATE		
NOTE BOOK		
AREAS		
NO.	AREAS CHECKED	

MODEL: 25 rxxL3
FILE NAME: pw:\\U084EBIDINTEC:illinois-gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdraw\ngs\D3xxxxxxsc_ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	**STATE OF ILLINOIS**	_____	
	DRAWN - _____	REVISED - _____	**DEPARTMENT OF TRANSPORTATION**	_____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____		SCALE: _____	SHEET __ OF __ SHEETS STA. 168+00.00 R2 TO STA. 168+00.00 R2
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____			

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
	ILLINOIS	FED. AID PROJECT		



USER NAME = poharrg	DESIGNED - _____	REVISED - _____	**STATE OF ILLINOIS**
	DRAWN - _____	REVISED - _____	**DEPARTMENT OF TRANSPORTATION**
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 168+50.00 R2 TO STA. 169+00.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

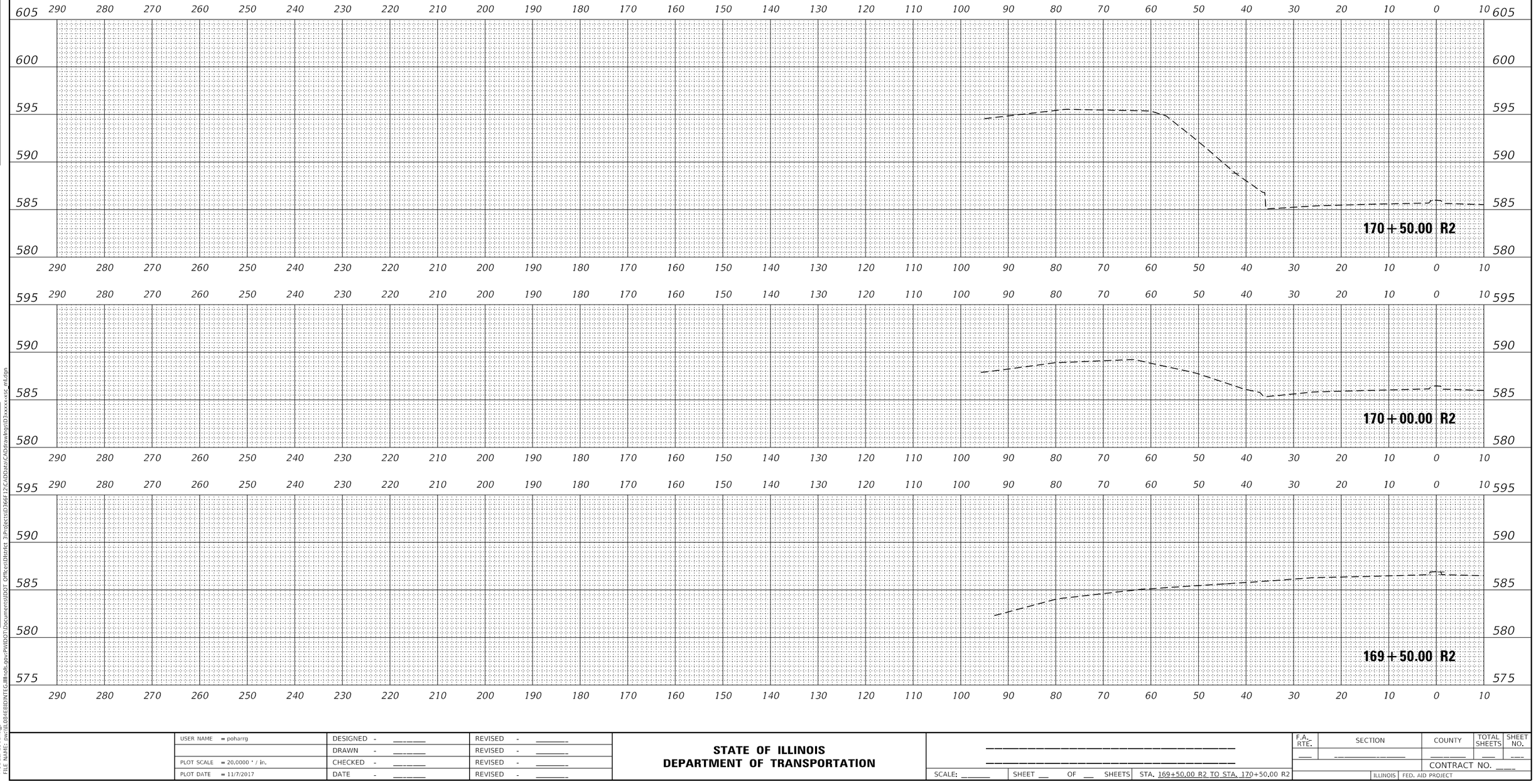
CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

FINAL SURVEY — NOTE BOOK NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

MODEL: 25 level_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xxsc_m1.dgn



USER NAME = poharrg	DESIGNED - _____	REVISED - _____	**STATE OF ILLINOIS**
	DRAWN - _____	REVISED - _____	**DEPARTMENT OF TRANSPORTATION**
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 169+50.00 R2 TO STA. 170+50.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

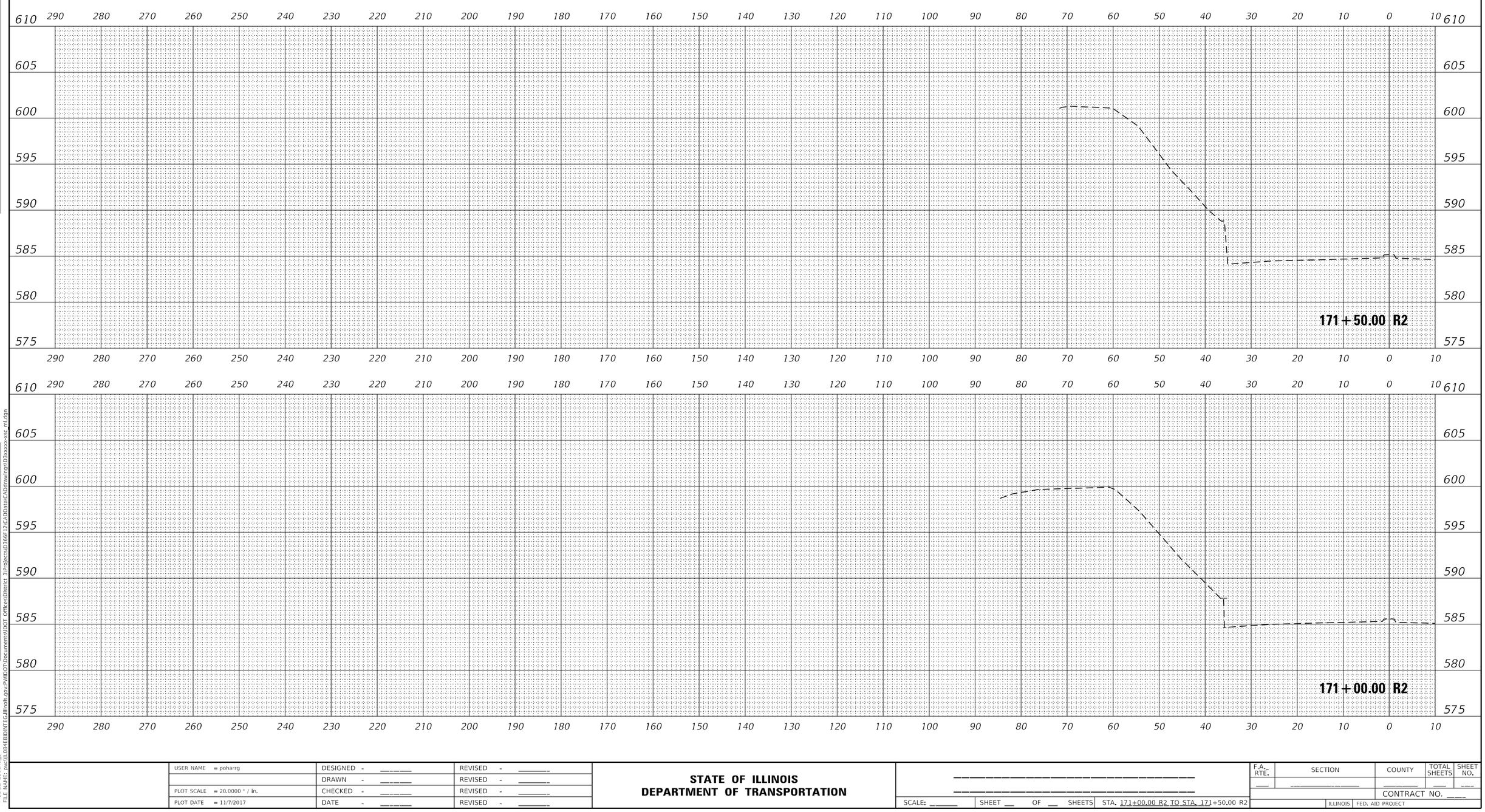
ILLINOIS | FED. AID PROJECT

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

MODEL: 25 level_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\D3xxxx-xsc_m1.dgn

DATE	BY		
		SURVEYED	
		PLOTTED	
		TEMPLATE	
		AREAS	
		AREAS CHECKED	
FINAL SURVEY	NOTE BOOK		
	NO.		

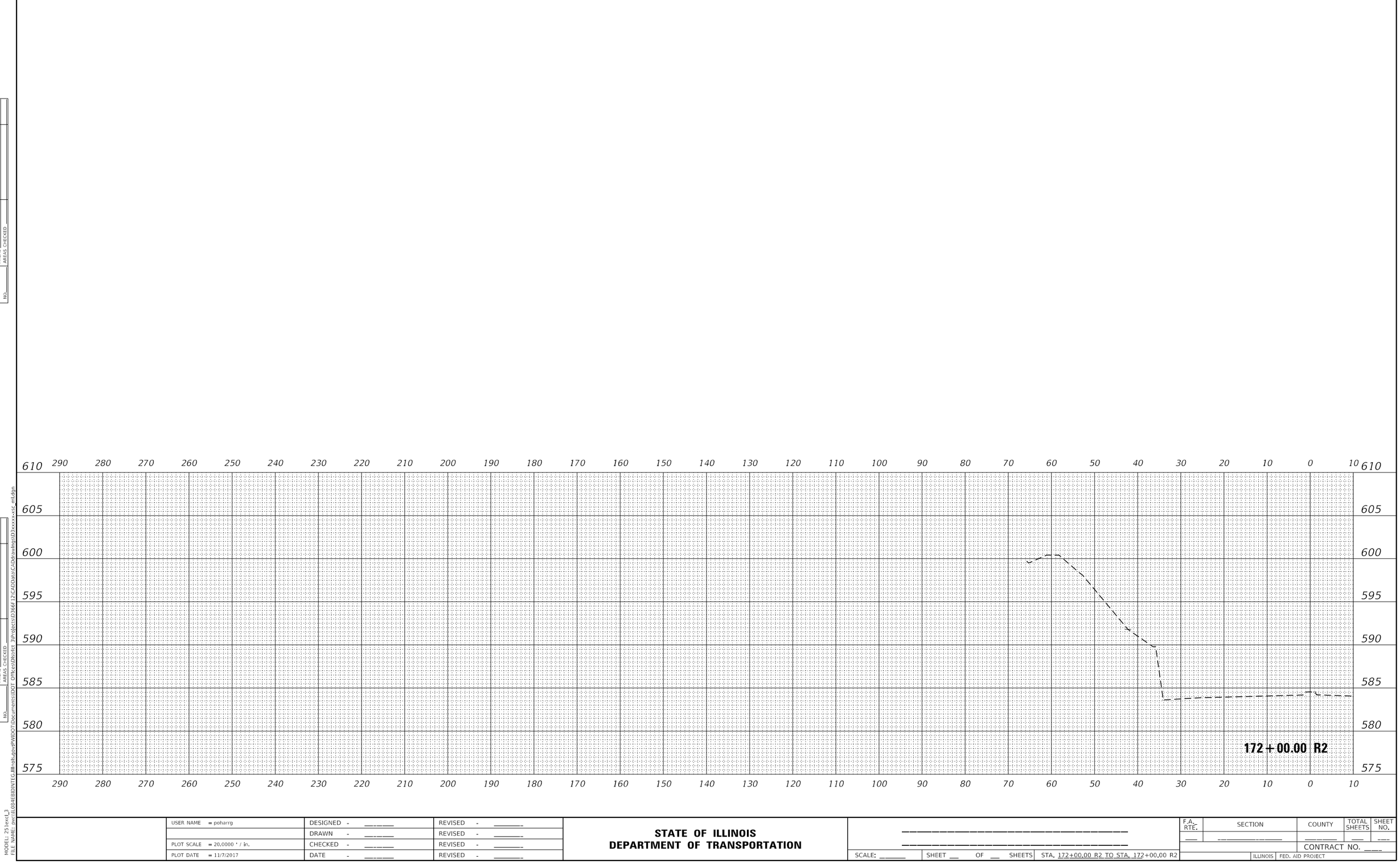


ORIGINAL SURVEY		
	NOTE BOOK	SURVEYED
		PLOTTED
		TEMPLATE
		AREAS
	NO.	AREAS CHECKED

MODEL: 251ex-L3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.gov:PWIDOT\Documents\IDOT Offices\District 3\Projects\D3661212\CADData\CADdrawings\D3xxxxxxsc_m1.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	**STATE OF ILLINOIS**	_____	F.A. RTE. ___ / SECTION ___ / COUNTY _____ / TOTAL SHEETS ___ / SHEET NO. ___
	DRAWN - _____	REVISED - _____	**DEPARTMENT OF TRANSPORTATION**	_____	CONTRACT NO. ____
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____		SCALE: _____ / SHEET __ OF __ SHEETS / STA. 171+00.00 R2 TO STA. 171+50.00 R2	ILLINOIS / FED. AID PROJECT
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____			

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		



ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		

MODEL: 25 level_3
FILE NAME: pw:\\IL084EBIDINTEG.Illinois.dot:PWIDOT\Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADdrawings\d3xxxx-xsc_ml.dgn

USER NAME = poharrg	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 20.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 11/7/2017	DATE - _____	REVISED - _____	

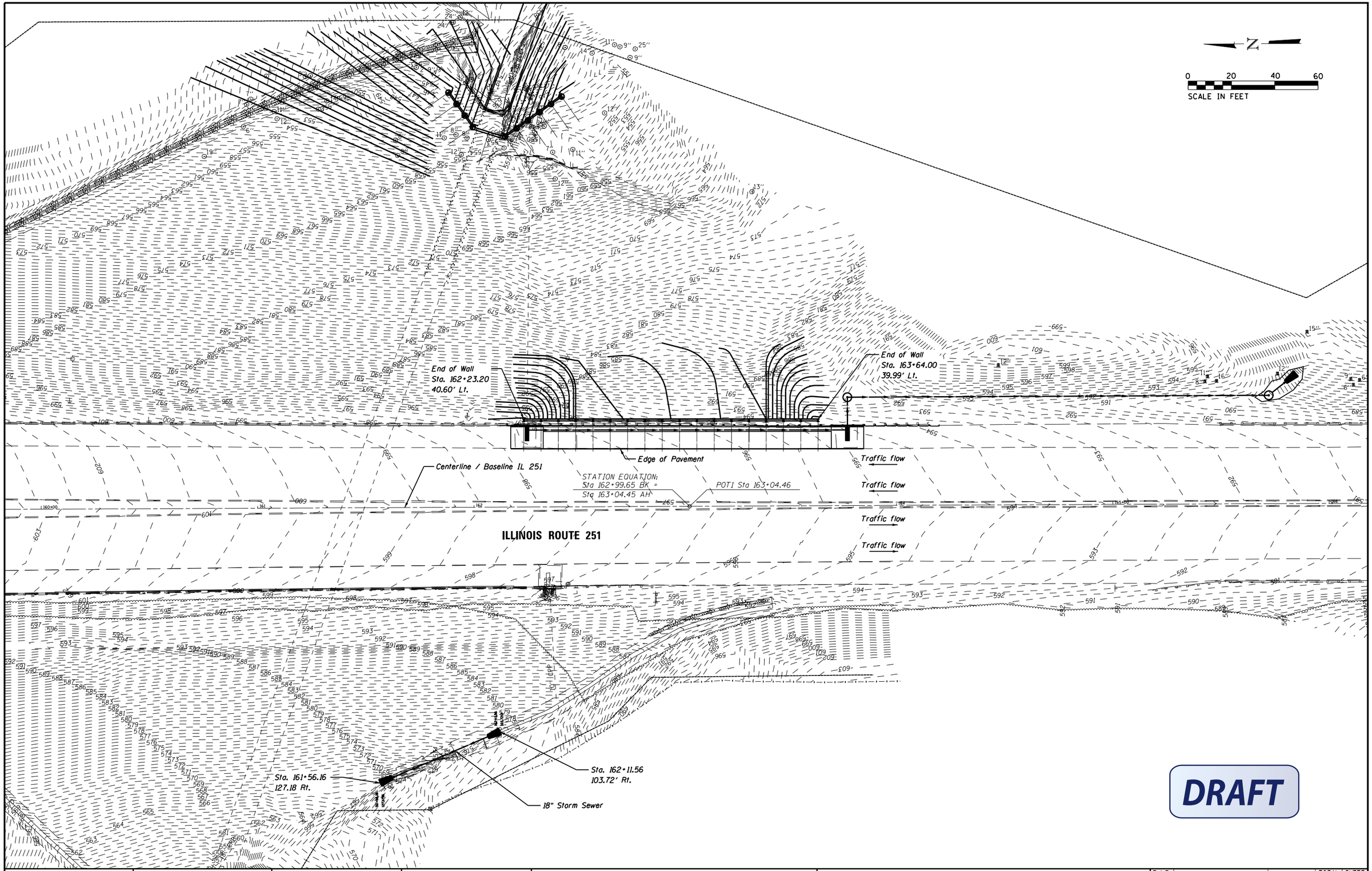
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____ | SHEET __ OF __ SHEETS | STA. 172+00.00 R2 TO STA. 172+00.00 R2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___
		CONTRACT NO. ____		
		ILLINOIS	FED. AID PROJECT	

APPENDIX

C-1



FILE NAME = D366F12-sht-TSL.dgn	USER NAME = CHAMLIN	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GRADING AND DRAINAGE PLAN			F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CHAMLIN & ASSOCIATES, INC.		DRAWN -	REVISED -					46	(D)1-2	LaSalle		
	PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -							CONTRACT NO. 66F12		
	PLOT DATE = 2/23/2018	DATE -	REVISED -		SCALE: 1"=20'	SHEET 1 OF 2 SHEETS	STA. 160+00 TO STA. 166+00		ILLINOIS	FED. AID PROJECT		

D366F12-sht-grading-drainage-plan.dgn 2/23/2018 1:53:06 PM User=nanciv

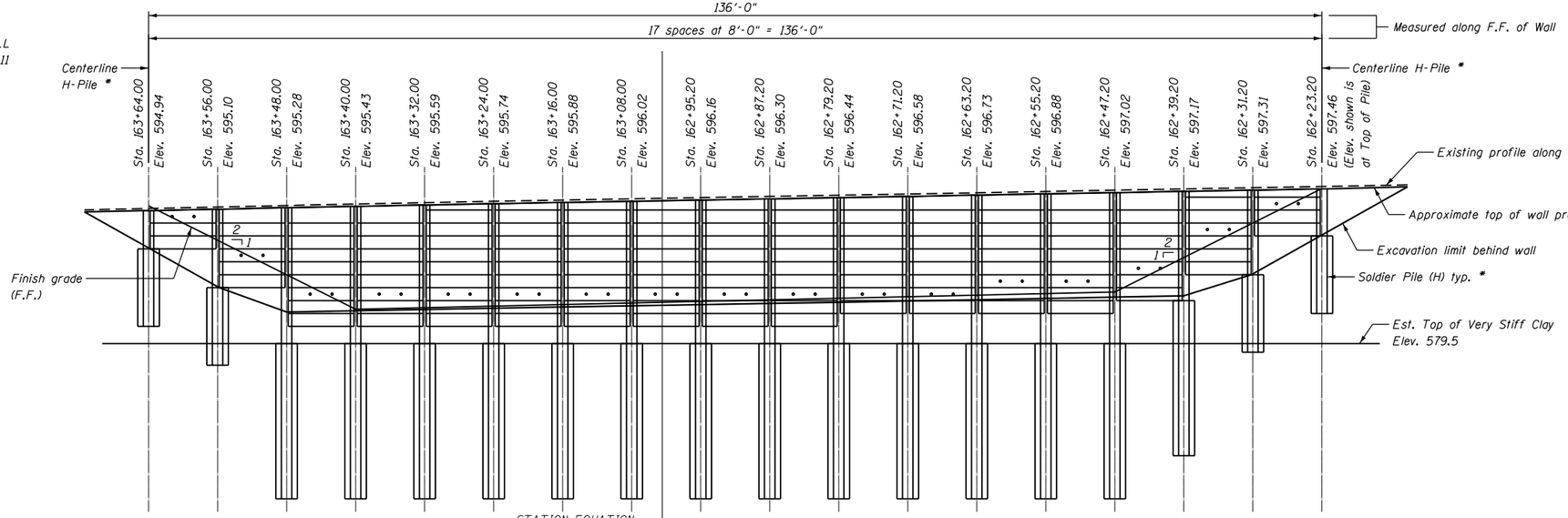
APPENDIX

C-2

BENCHMARK 1
CHISELED SQUARE TOP OF WALL
SOUTH OF CONTROL POINT 251511
Sta 170+01.86
36.3502 LT.
N 1700365.8430
E 768236.4840
ELEV. 586.78

Existing Structure: None

Traffic Control:
Outside Lane Closure



ELEVATION

(Looking at F.F. of wall)

* Pile section, spacing, tip elevation, and shaft diameter to be determined during final design.

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

PRECAST UNITS

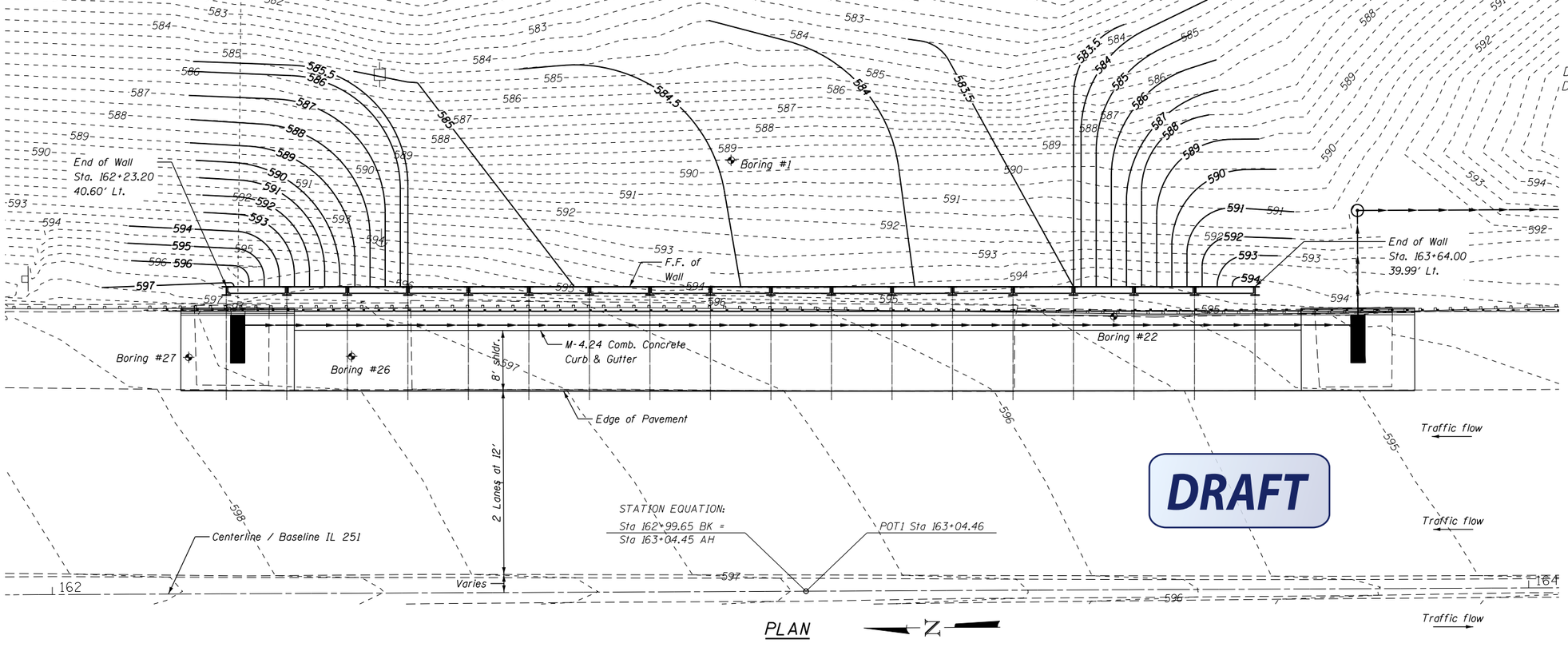
f'c = 6,000 psi
fy = 60,000 psi (Reinforcement)

HIGHWAY CLASSIFICATION

F.A.P. 46 - IL 251
Functional Class: Other Principal Arterial
ADT: 8050 (2015); 10600 (2038)
DHV: .084
Design Speed: 45 m.p.h.
Posted Speed: 45 m.p.h.

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.070
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.122
Soil Site Class = C

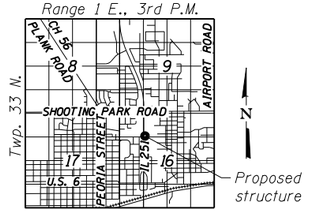


PLAN

See station and elevation call outs in Elevation view.

PROFILE GRADE IL 251

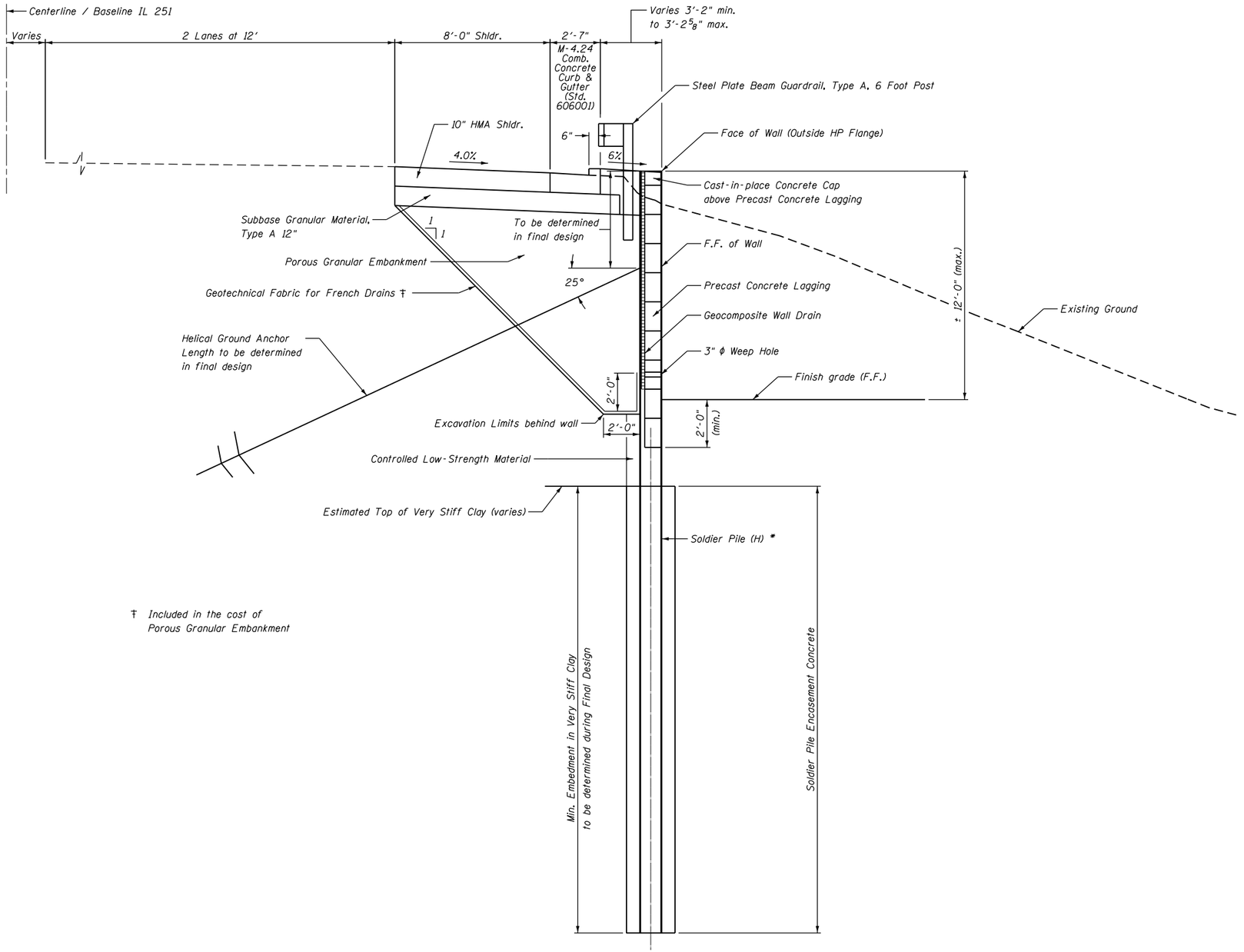
(Along Top of Pile)



LOCATION SKETCH

GENERAL PLAN & ELEVATION
IL ROUTE 251
F.A.P. 46
SECTION (1)I-2
LASALLE COUNTY
STATION 162+23.20 TO 163+64.00
STRUCTURE NO. 050-8801

FILE NAME = D366F12-sht-TSL.dgn	USER NAME = CHAMLIN	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CHAMLIN & ASSOCIATES, INC.		DRAWN -	REVISED -			46	(1)I-2	LaSalle		
	PLOT SCALE = 16.0000 ' / in.	CHECKED -	REVISED -					CONTRACT NO. 66F12		
	PLOT DATE = 4/25/2018	DATE -	REVISED -		SCALE: 1"=8' SHEET 1 OF 2 SHEETS STA. 162+23.20 TO STA. 163+64.00			ILLINOIS FED. AID PROJECT		



† *Included in the cost of Porous Granular Embankment*

TYPICAL WALL SECTION

(Looking North)

* *Pile section, spacing, tip elevation, and shaft diameter to be determined during final design.*

DRAFT

DETAILS
IL ROUTE 251
F.A.P. 46
SECTION (1)I-2
LASALLE COUNTY
STATION 162+23.20 TO 163+64.00
STRUCTURE NO. 050-8801

FILE NAME = D366F12-sht-TSL-DETAIL.dgn	USER NAME = CHAMLIN	DESIGNED -	REVISED -
CHAMLIN & ASSOCIATES, INC.		DRAWN -	REVISED -
	PLOT SCALE = 6.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/25/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: 1"=3' | SHEET 2 OF 2 SHEETS | STA. 162+23.20 TO STA. 163+64.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
46	(1)I-2	LaSalle		
		CONTRACT NO. 66F12		
	ILLINOIS FED. AID PROJECT			

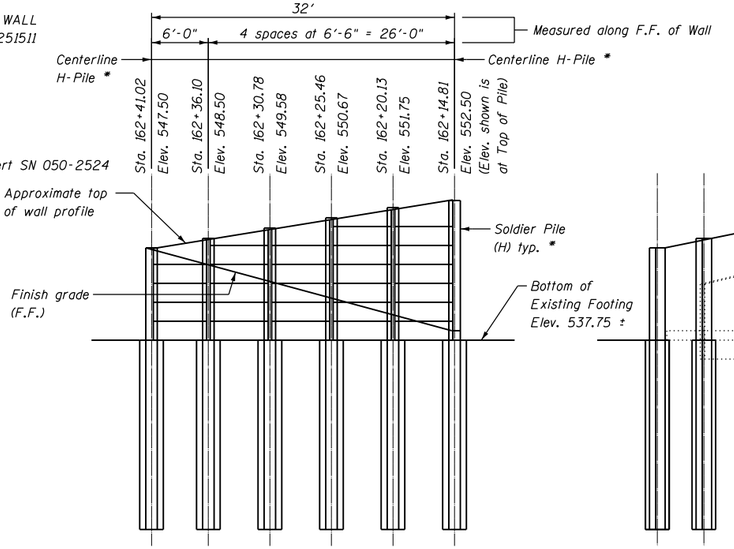
APPENDIX

C-3

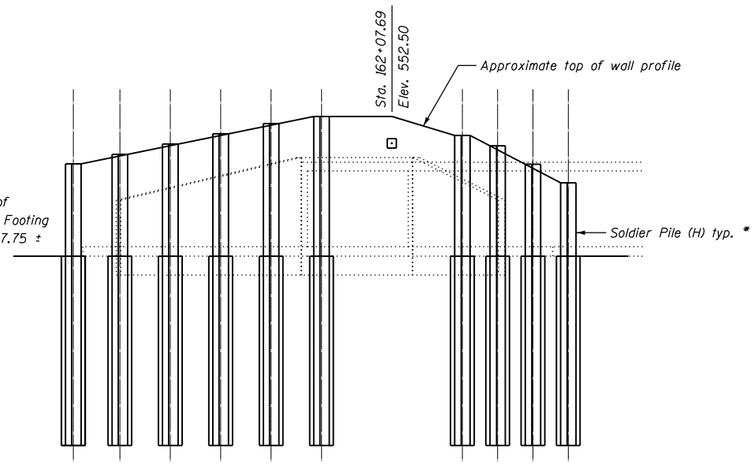
BENCHMARK 1
CHISELED SQUARE TOP OF WALL
SOUTH OF CONTROL POINT 251511
Sta 170+01.86
36.3502 LT.
N 1700365.8430
E 768236.4840
ELEV. 586.78

Existing Structure: Box Culvert SN 050-2524

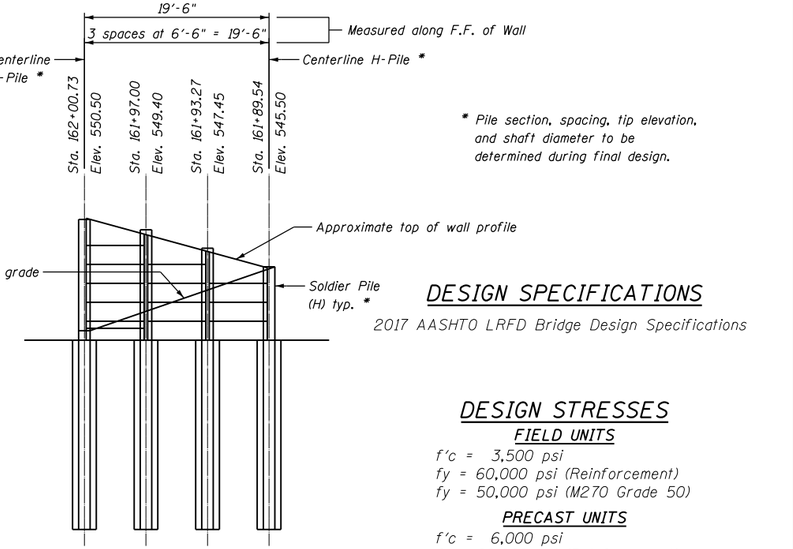
Traffic Control:
Outside Lane Closure



ELEVATION SOUTH WALL
(Looking at F.F. of wall)
(Looking Southwest)



ELEVATION
(Looking at F.F. of wall)
(Looking West)



ELEVATION NORTH WALL
(Looking at F.F. of wall)
(Looking Northwest)

* Pile section, spacing, tip elevation, and shaft diameter to be determined during final design.

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

PRECAST UNITS

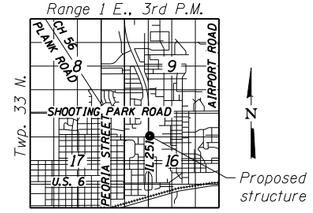
f'c = 6,000 psi
fy = 60,000 psi (Reinforcement)

HIGHWAY CLASSIFICATION

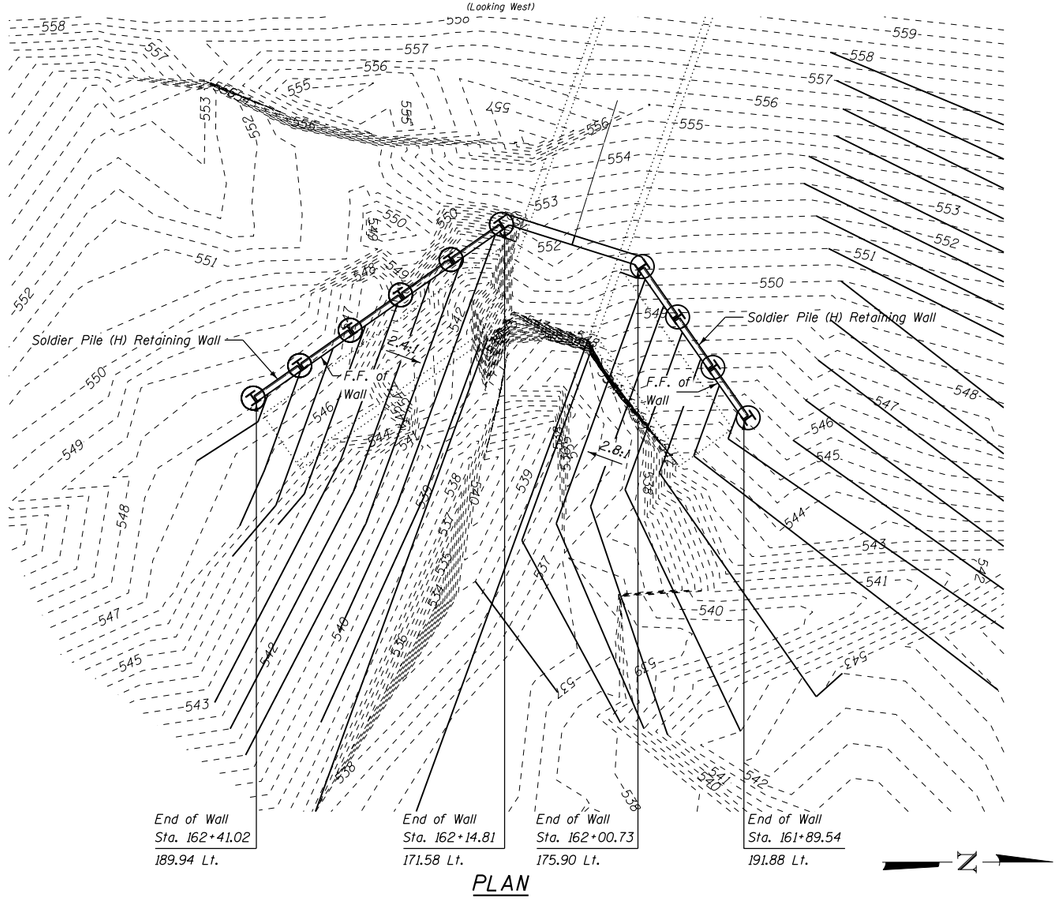
F.A.P. 46 - IL 251
Functional Class: Other Principal Arterial
ADT: 8050 (2015); 10600 (2038)
DHV: .084
Design Speed: 45 m.p.h.
Posted Speed: 45 m.p.h.

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.070
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.122
Soil Site Class = C



LOCATION SKETCH



PLAN

DRAFT

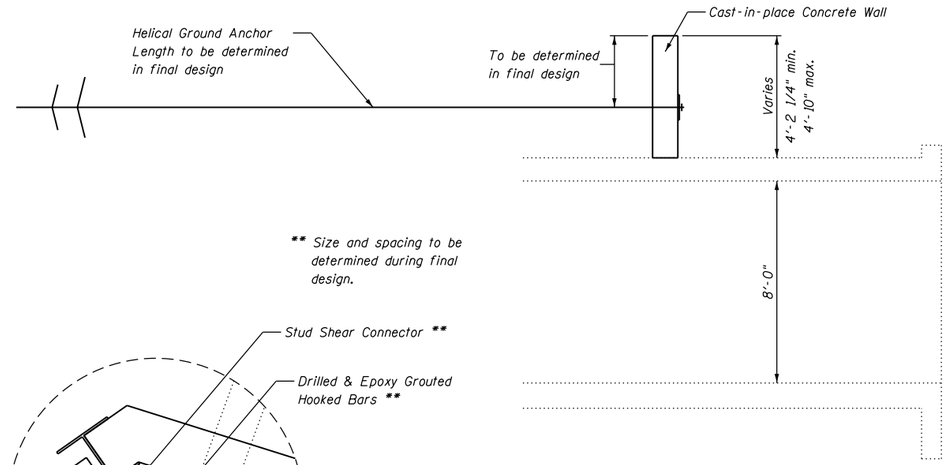
GENERAL PLAN & ELEVATION
IL ROUTE 251
F.A.P. 46
SECTION (1)I-2
LASALLE COUNTY
STATION 161+89.54 TO 162+41.02
STRUCTURE NO. 050-8802

FILE NAME = D366F12-sht-TSL.dgn	USER NAME = CHAMLIN	DESIGNED -	REVISED -
CHAMLIN & ASSOCIATES, INC.		DRAWN -	REVISED -
	PLOT SCALE = 16.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/25/2018	DATE -	REVISED -

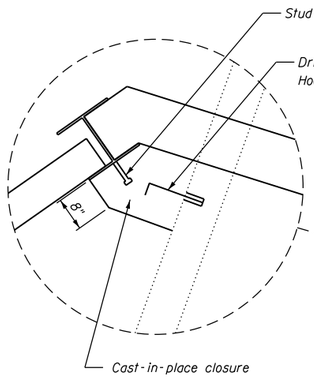
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: 1"=8' | SHEET 1 OF 2 SHEETS | STA. 162+23.20 TO STA. 163+64.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
46	(1)I-2	LaSalle		
		CONTRACT NO. 66F12		
		ILLINOIS FED. AID PROJECT		

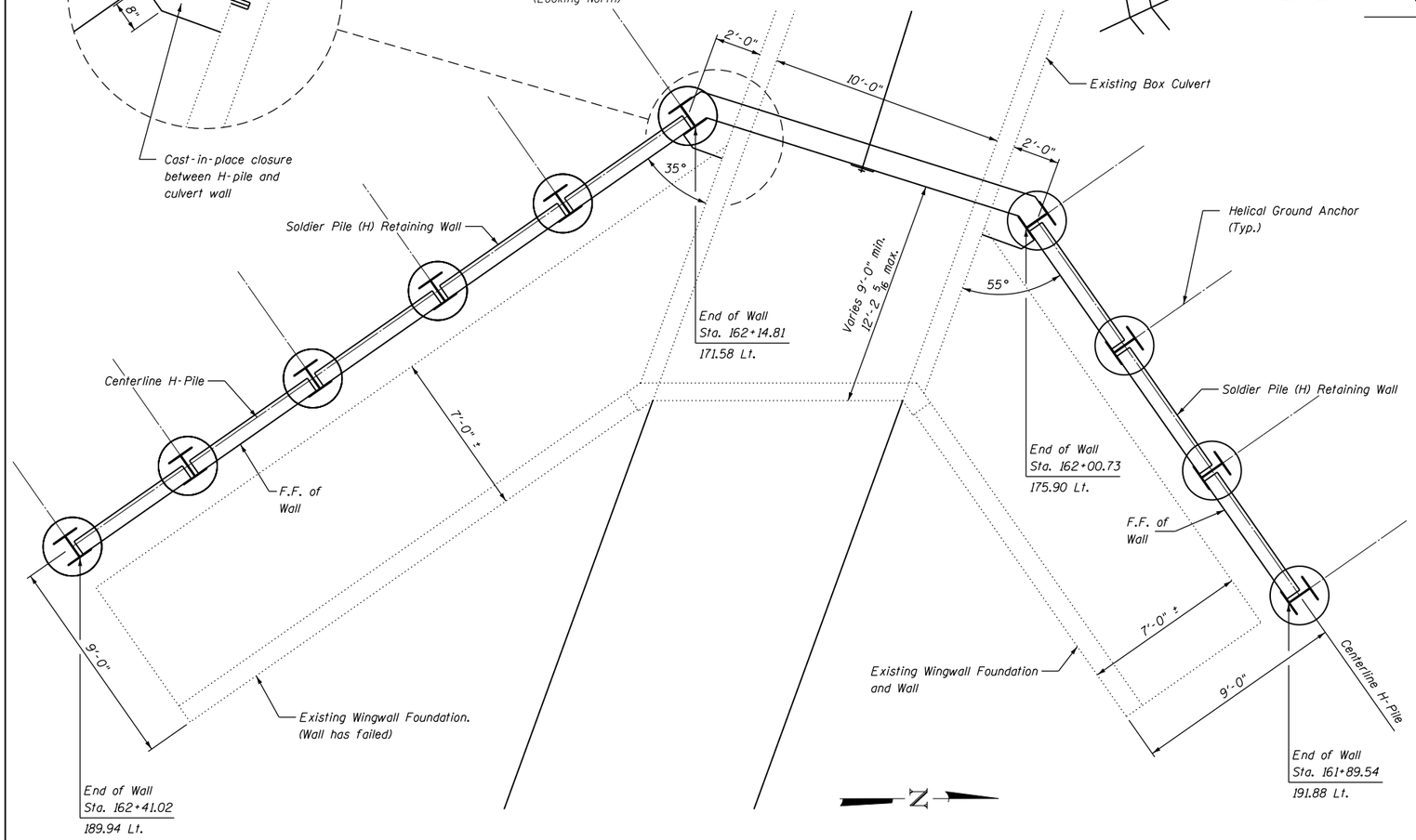


** Size and spacing to be determined during final design.

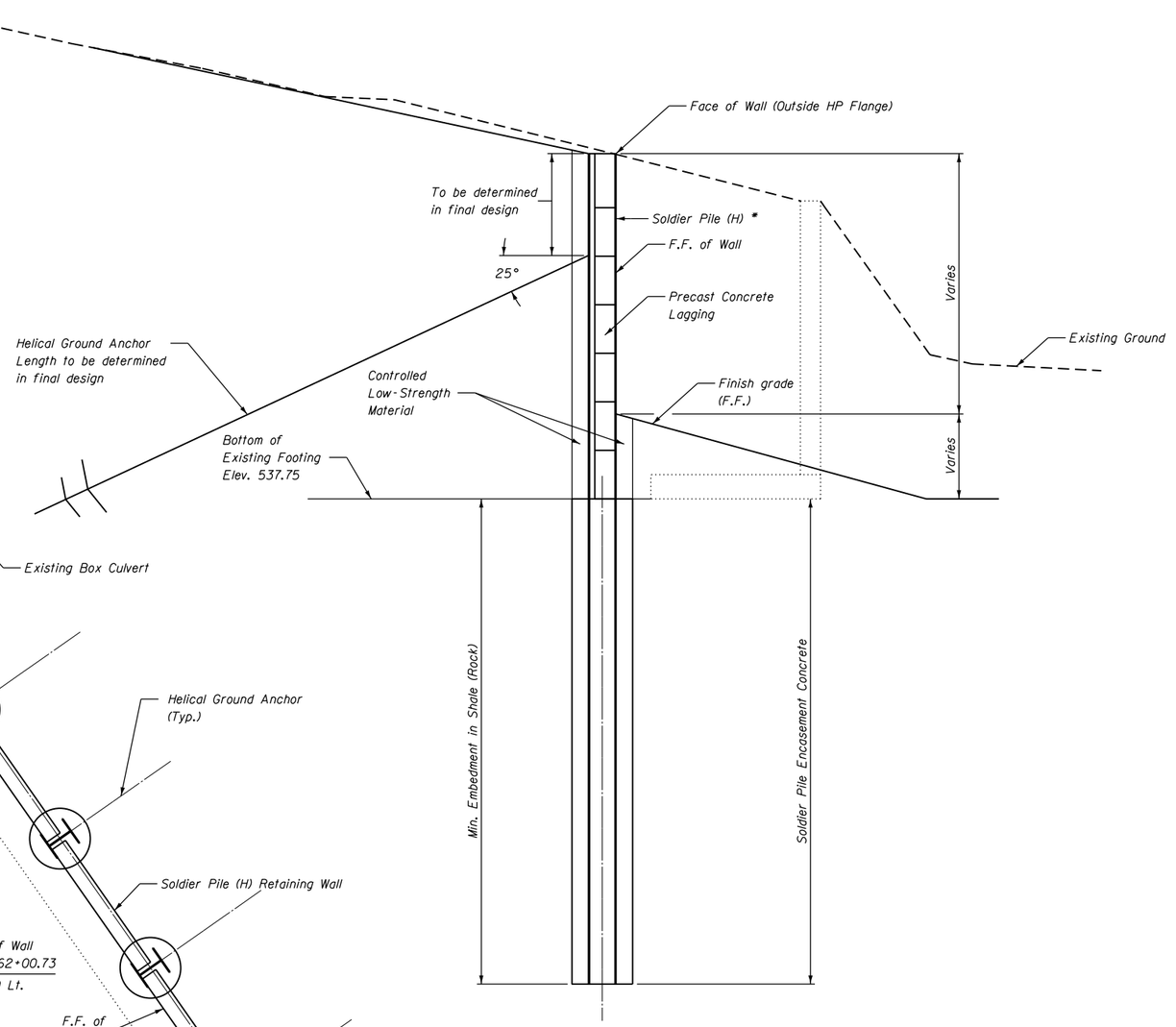


WALL SECTION ABOVE BOX CULVERT

(Looking North)



PLAN



TYPICAL WALL SECTION

(Looking Northwest or Northeast)

* Pile section, spacing, tip elevation, and shaft diameter to be determined during final design.

DRAFT

DETAILS
IL ROUTE 251
F.A.P. 46
SECTION (1)I-2
LASALLE COUNTY
STATION 161+89.54 TO 162+41.02
STRUCTURE NO. 050-8802

FILE NAME = D366F12-sht-TSL.dgn	USER NAME = CHAMLIN	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CHAMLIN & ASSOCIATES, INC.		DRAWN -	REVISED -			46	(1)I-2	LaSalle		
	PLOT SCALE = 6.0000 ' / in.	CHECKED -	REVISED -					CONTRACT NO. 66F12		
	PLOT DATE = 4/25/2018	DATE -	REVISED -		SCALE: 1"=8' SHEET 2 OF 2 SHEETS STA. 162+23.20 TO STA. 163+64.00			ILLINOIS	FED. AID PROJECT	

APPENDIX

D-1






04/04/2016




04/04/2016




09/26/2017

APPENDIX

D-2






04/04/2016






04/04/2016

APPENDIX

E-1

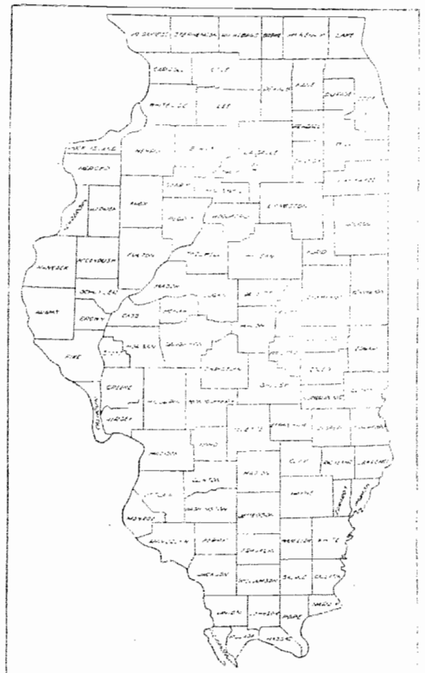
SECTION	SEC	COUNTY	SHEET NO.	TOTAL SHEETS
178	1-Z	LA SALLE	127	1
		ILLINOIS PROJECT	FU-254(9)	

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED
FEDERAL AID HIGHWAY

INDEX :- SHEET Nº 13

SCALES		
PLAN	1 INCH	100 FT.
PROFILE HOR.	1 INCH	100 FT.
PROFILE, VERT.	1 INCH	10 FT
CROSS-SECTIONS	1 INCH	5 FT

F.A. ROUTE 178 SEC. 1Z & SEC. 1-2
LA SALLE COUNTY
PROJECT FU-254(9)



LOCATION OF SECTION INDICATED THUS:—

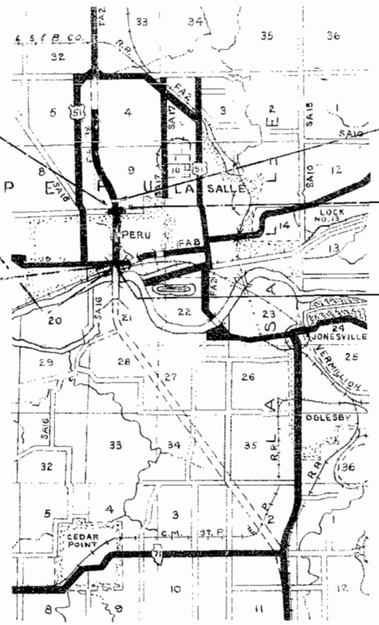
PREGRADING, STA. 67+00 TO STA. 142+00

PROPOSED IMPROVEMENT SHOOTING PARK ROAD BEGINS STA. 1+10.17 ENDS STA. 18+89.83

PAVING, STA. 142+00 TO STA. 193+08.17

PROJECT FU-254(9)
PROPOSED IMPROVEMENT ENDS STA. 193+08.17

PROPOSED IMPROVEMENT FOURTH STREET:
BEGINS STA. 0+76.50(E) ENDS STA. 6+00(E)
BEGINS STA. 0+72(W) ENDS STA. 5+00(W)


PERU
LA SALLE
OGLESBY
DONESVILLE
CEDAR POINT
SALT CREEK
I.C.R.R.
I.C.R.R.
SAUK
FARM
BLUFF
ROCK
LOCK NO. 1
SALT CREEK
SAUK
SAUK
SAU

F.A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

M.H. NO.	ITEM	LOCATION	ELEV. TOP LID	FL INLET	FL OUTLET
1	MANHOLE TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	46' LT. STA. 147+50	631.30		609.38
	92' LIN. FT. STORM SEWER TY. 4 EXTRA STRENGTH CLAY PIPE 24"	46' LT. STA 147+50 TO 46' RT. STA. 147+50			
2	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	46' RT. STA. 147+50	630.18	609.10	609.00
	160' LIN. FT. STORM SEWER TY. 4 EXTRA STRENGTH CLAY PIPE 24"	46' RT. STA. 147+50 TO 46' RT. STA. 149+10			
3	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	46' RT. STA. 149+10	628.03	E. 606.92 N. 606.92	606.82
	92 LIN. FT. STORM SEWER TY. 4 EXTRA STRENGTH CLAY PIPE 10"	46' LT. STA. 149+10 TO 46' RT. STA. 149+10			
4	MANHOLE, TYPE A, 4' DIA., WITH TYPE 1 FRAME & CLOSED LID	46' LT. STA. 149+10	628.00		607.20
	340 LIN. FT. STORM SEWER TY. 4 EXTRA STRENGTH CLAY PIPE 24"	46' RT. STA. 149+10 TO 39' RT. STA. 152+50			
5	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	39' RT. STA. 152+50	620.97	602.40	602.30
	500 LIN. FT. STORM SEWER TY. 3 EXTRA STRENGTH CLAY PIPE 24"	39' RT. STA. 152+50 TO 37.91' RT. STA. 157+50			
6	MANHOLE, TYPE A, 5' DIA. WITH TYPE 1 FRAME & CLOSED LID	37.91 RT. STA 157+50	608.51	595.80	595.70

P.O.T. STA. 138+26.71
IRON PIN 14" DEEP

P.T. STA. 147+91.89
IRON PIN 12" DEEP

P.O.T. STA. 148+30.15
GO & S.& W. 1" DEEP

P.O.T. STA. 153+10.50
IRON PIN 14" DEEP

P.O.T. STA. 159+03.10
IRON PIN 2" DEEP

178 | I-2 | LA SALLE | 227 | 31 | FU-254(9)

SECTION 1-2 ENDS STATION 148+00
SECTION 1Z BEGINS STATION 148+00

NOTE: FOR CONSTRUCTION DETAILS STA. 147+00 TO STA. 150+00 AND CROSSROAD STA. 148+30.15 SEE SHEET NO. 59
FOR GEOMETRICS OF INTERSECTION F.A. RT. 178 AND CROSSROAD STA 148+30.15 SEE SHEET NO. 58

REMOVE SUPERELEVATION AND ATTAIN CROWN AS INDICATED ON SHEET NO. 59

CONSTRUCT CATCH BASIN TYPE A 3'DIA (NO TRAP) WITH SPECIAL FRAME AND GRATE 8' LT STA 142+80
CONSTRUCT 55 LIN FT STORM SEWER TYPE 2 12" 8' LT STA 144+80 TO 62' LT STA 144+80
CONSTRUCT SPECIAL SLOPE HEADWALL TYPE D-12-4 0.42 CU YDS CL X CONC. 63' LT STA 144+80

STA. 148+30.15 F.A. RT. 178 = STA. 10+00 CROSSROAD

MARQUETTE MANOR INC.

MARQUETTE MANOR INC.
SEC. 9 T.33N. R1E. 3P.M.

MRS. M.D. BLAKELY

MRS M. D. BLAKELY

NOTE: ERECT ONE STANDARD 2158 SIGN ON THE RIGHT OF WAY AT THE SOUTH WEST CORNER OF F.A. RT. 178 AND SHOOTING PARK ROAD

SEC. 16 T.33N. R1E. 3P.M.

P.O.T. STA. 132+87.25
IRON PIN 12" DEEP

P.I. STA. 134+54.90
IRON PIN 14" DEEP

℄ F.A. ROUTE 178

℄ CURVE DATA F.A.RT. 178
P.I. STA. 134+54.9
∠ = 207°-16'
Δ = 27°-16'
R = 5729.65'
D = 1°-00'
T = 1389.68'
L = 2726.67'
E = 166.12'
S = 0.02'/'
P.C. STA. 120+65.22
℄ P.T. STA. 147+91.89
TAN. BACK P.T. STA. 148+44.58

P. C. C. PAVEMENT BEGINS STA. 142+00

PROJECT FU-254(9)
SECTION 1-2 BEGINS
STATION 142+00

147+81.5 - R.O.W. = 132'
147+03.3 - R.O.W. = 100'
147+01 R.O.W. = 100'
147+78.5 R.O.W. = 132'
148+78.5 R.O.W. = 132'
148+81.5 R.O.W. = 132'
149+56 R.O.W. = 78'
149+59.3 R.O.W. = 17.8'
158+00 R.O.W. = 75'
158+76 R.O.W. = 81.5'
160+00 R.O.W. = 225'
161+00 R.O.W. = 225'
161+52 R.O.W. = 142.5'
14+50 R.O.W. = 50'
14+83.80 R.O.W. = 35'

M.H. #1
M.H. #2
M.H. #3
M.H. #4
M.H. #5
M.H. #6

℄ SHOOTING PARK ROAD
BARN
CONSTR. AGREE. 140' LT. - 12+00
CONSTR. AGREE. 140' LT. - 14+83.8

PAVED DITCH 51' LT. STA. 157+00 TO 212' LT. STA. 162+18.82
℄ PAVED DITCH
PAVED DITCH 51' RT. STA. 157+00 TO 203' RT. STA. 160+47
℄ PAVED DITCH

CH. CH. 160+45 R.O.W. = 255'
CH. CH. 161+12 R.O.W. = 255'

B.M. NO 14A S.& W. IN P.P.
LT. STA. 7+58 (X-RD.) ELEV. 630.49

P.I. STA. 148+50
1200' V.C.
ELEV. 632.38

B.M. NO. 15 SPK. & CAP HOR. IN 24" OAK
115' RT. STA. 156+20. ELEV. 616.38

B.M. NO. 16 SPK. & CAP VER. IN 48" ELM
40' LT. STA. 159+90. ELEV. 570.19

-0.25%
-2.57%
-1.3%
-1.3%
-1.3%
-1.3%

PROFILE EXISTING GROUND LINE ON ℄
℄ PROFILE PROPOSED IMPROVEMENT
FL PROPOSED SEWER

+54 SPEC. CUT = 0
SPEC. FILL = 26,875 CU YDS
14,307 CU. YDS. SPEC. FILL TO BE OBTAINED FROM EXCESS SPEC. CUT ON O.-N.W. RAMP
19,286 CU.YDS. SPEC. FILL TO BE OBTAINED FROM EXCESS SPEC. CUT ON I.-NW. RAMP
+55

+00
+51.65
CUT = 16,931 CU.YDS.
FILL = 13,543 CU.YDS.

640 630 620 610 600 590 580 570 560

634.6 634.3 634.2 632.3 631.3 630.8 630.5 630.6 632.6 632.4 633.0 634.50 632.2 634.25 632.7 634.00 632.4 (633.75) 633.73 631.6 (633.50) 633.26 630.5 (633.26) 632.65 629.7 (633.00) 631.82 629.3 (632.75) 630.79 628.3 (632.50) 629.58 (632.42) 629.17 (632.36) 628.70 628.6 (631.09) 628.17 628.0 (628.62) 626.56 626.9 (625.98) 624.77 626.5 (623.38) 622.78 625.0 (620.81) 620.69 620.7 (618.25) 618.22 614.3 615.67 612.2 613.10 608.9 610.53 601.7 607.96 595.8 605.39 565.9 (602.85) 602.89

130 1 2 3 4 135 6 7 8 9 140 1 2 3 4 145 6 7 8 +30.15 9 150 1 2 3 4 155 6 7 8 9 160

F.A. RT. 178 SEC. 1-2 & SEC. 1Z LASALLE COUNTY

P.O.T. STA. 163+70 IRON PIN 2" DEEP
P.O.T. STA. 165+03.79 IRON PIN 2" DEEP
P.O.T. STA. 170+42.7 IRON PIN 4" DEEP
P.O.T. STA. 173+87 X IN CONC. PAVT.
P.O.T. STA. 179+00 IRON PIN 2" DEEP
P.O.T. 184+99.35 X IN S.W. JOINT (WITH A NAIL)

160 165 170 175 180 185 190

NOTE:
FOR CONTROL DATA & CONSTRUCTION DETAILS STA. 175+43.35 TO STA 193+08.17 SEE SHEET NOS. 39 TO 55

REMOVAL OF HOUSE AND ITS APPURTENANCES 125' LT. STA. 182+25 SHALL BE INCIDENTAL TO THE CONTRACT AND THE COST OF SUCH REMOVAL INCLUDED IN THE CONTRACT UNIT PRICE PER CUBIC YARD FOR EARTH EXCAVATION

P.T. STA. 4+82.28 CHAN. CH.
Δ = 158°
Δ = 22°
D = 37°-07'
R = 154.34
T = 30'
L = 59.26
E = 2.89

CONSTRUCT MANHOLE TYPE A, 4' DIA., WITH TYPE 1 FRAME & CLOSED LID 190' LT. STA. 161+44. ELEV. TOP OF LID = 549.00 FL INLET = 536.44, FL OUTLET = 536.34

RIGID FRAME BOX CULVERT (10'x8'x375'-7") 170.37' RT. OF STA. 160+84.99 TO 182.58' LT. OF STA. 162+13.46

CHANNEL CHANGE: STA 2+58.08 CH. CHAN. = STA. 161+47 ℄ F.A. RTE. 178 Δ = 70°

CHANNEL CHANGE: STA 1+66.37 CH. CHAN. = STA. 168+12 ℄ F.A. RTE. 178. Δ = 75°

EXISTING SEWER TO BE ABANDONED

CONSTRUCT MANHOLE TYPE A (4' DIA) WITH TYPE 1 FRAME & CLOSED LID 170' RT STA. 160+64 ELEV. TOP LID = 556.50 FL. INLET = 541.00, FL. OUTLET = 540.90 CONSTRUCT 366 LINEAL FEET CAST IRON SOIL PIPE 18" 168' RT. STA. 160+64 TO 188' LT. STA. 161+44

1-MANHOLE TO BE FILLED 80' RT. STA. 160+77

EXISTING 18" SANITARY SEWER

CONSTRUCT MANHOLE TYPE A (4' DIA.) WITH TYPE 1 FRAME & CLOSED LID 104' RT. STA. 168+95.32 ELEV. TOP OF LID = 577.5 CONSTRUCT 236 LINEAL FEET CAST IRON SOIL PIPE 12" 126' LT. STA. 168+92 TO 102' RT. STA. 168+95.32

B.M. NO. 17 A SPIKE VER IN LOCUST 30 LT. STA. 165+65. ELEV. 593.09

P.I. STA. 0+38 CH. CH. Δ = 144° Δ = 36° D = 48°-59' R = 116.95 T = 38' L = 73.48 E = 6.02

P.I. STA. 0+27 CHAN. CHANGE Δ = 135°-35' Δ = 44°-25' D = 83°-48' R = 68.37' T = 27.91' L = 53.0' E = 5.48'

P.T. STA. 3+65 CHANNEL CHANGE Δ = 163° Δ = 11° D = 18°-23' R = 311.56 T = 30' L = 59.82 E = 1.44

RETAINING WALL 240' LT. STA 170+00 TO 40' LT. STA. 171+14.96 (SEE DETAIL SHEET)

PAVED DITCH 119' RT. STA. 168+46.16 TO 56' RT. STA. 169+13

PAVED DITCH 47' RT. STA. 165+68 TO 117' RT. STA. 168+35.53

PAVED DITCH 204' RT. STA. 160+60 TO 48' RT. 163+37

PIPE CULVERT TY. 3A 24" x 282', FL LT. 539.39, FL RT. 559.01 171' LT. STA. 167+66.19 TO 109' RT. STA. 168+41.2 STD. 2051 DS-24-2 HDWLLS. 3.1 CU. YDS. CLASS X CONC. 180 LBS. REINFORCEMENT BARS.

CONSTRUCT 24 LINEAL FEET TYPE 6 CURB & GUTTER 119' RT. STA. 173+75 TO 119' RT. STA. 173+99
CONSTRUCT CATCH BASIN TYPE A 3' DIA. WITH SPECIAL FRAME & GRATE 119' RT. STA. 173+76 (NO TRAP)
CONSTRUCT 19 LINEAL FEET 12" STORM SEWER TYPE 1 120' RT. STA. 173+77.5 TO 120' RT. STA. 173+96.5
FL 173+77.5 = 597.45, FL 173+96.5 = 597.00

B.M. NO 18. □ IN SIDEWALK S.E. COR. LINCOLN & 8TH STS. 95' LT STA. 174+02. ELEV. 598.48

1 EACH - PLUGGING STREET SEWERS AND HOUSE CONNECTIONS 4" TO 12" 80' LT. STA. 173+87

1 EACH - PLUGGING STREET SEWERS AND HOUSE CONNECTIONS 4" TO 12" 250' RT. STA. 173+87

CONSTRUCT CATCH BASIN TYPE A 3' DIA. (NO TRAP) WITH SPECIAL FRAME & GRATE 119' RT. STA. 173+98
CONSTRUCT SPECIAL SLOPE HEADWALL TYPE D 12-2 48' RT. STA. 173+98
34 CU. YDS. CLASS X CONC.
CONSTRUCT 72 LINEAL FEET 12" C.M.P.

CHAIN LINK FENCE 4' HIGH SEE SHEET NO. 86

25.3 ACRES TREE REMOVAL STA. 158+76 TO STA. 193+08.17

℄ EXISTING DETOUR ROAD

EXISTING STRUCTURE PREVIOUS EXCAVATION

℄ F.A. RTE. 178

CHAIN LINK FENCE 4' HIGH SEE SHEET NO. 86

2 CATCH BASINS TO BE FILLED 217.6' RT STA 184+92.8 & 217.6 RT STA 184+68.8

CONSTRUCT 2.8 LIN FT TYPE 6 CURB 232.6' RT. STA 184+66.8 TO 232.6' RT STA 184+94.8

CONSTRUCT 96 SQ FT P.C.C. SIDEWALK (5") 228' RT STA 184+68.3 TO 228' RT 184+93.3

RETAINING WALL, 10' RT. STA. 3+23 TO 10' RT. STA. 6+53 SEE DETAIL SHEET NO. 73

154 LIN. FT. WOOD GUARD RAIL REMOVAL

STA. 188+55.90 F.A.RT. 178 STA. 0+00 E & W. FOURTH ST.

EXISTING STRUCTURE

M.H. # 15

ADAMS ST. PLAIN ST. FIFTH ST. FOURTH ST. EIGHTH ST. SEVENTH ST. LINCOLN AVE. NINTH ST.

M.H. #7 M.H. #8 M.H. #9 M.H. #10 M.H. #11 M.H. #12 M.H. #13 M.H. #14

B.M. NO. 20 □ IN S.W. S.E. CORNER LINCOLN & 5TH STS.-110' LT STA. 184+99.5. ELEV. 575.77

SPECIAL CUT = 97,149
SPECIAL FILL = 77,719
OVERHAUL = 296,048

Rl. STA. 165+00 1200' V.C. ELEV. = 589.97

-2.5%
-1.3%
-1.4%
-0.886%
-1.4%
-1.5%
-3.0%
-3.4%
-3.47%
-3.4%
-3.0%
-2.0%
-2.0%

PROFILE EXISTING GROUND LINE ON ℄

℄ PROFILE PROPOSED IMPROVEMENT

Rl PROPOSED SEWER

Rl. STA. 175+00 800' V.C. ELEV. = 581.01

℄ SEVENTH ST.

Rl. STA. 186+00 400' V.C. ELEV. = 542.84

℄ FOURTH ST.

+55 +51.65 +26.42 +55.90

CUT = 35,588 CU. YDS.
FILL = 30,682 CU. YDS.
OVERHAUL = 178 STA.-YDS.
2765 CU. YDS. EARTH TO BE OBTAINED FROM EXCESS CUT ON O.-NE. RAMP

CUT = 49,208 CU. YDS.
FILL = 556 CU. YDS.
7,682 CU. YDS. EXCESS EARTH TO BE USED ON O.-SW. RAMP (WITHIN FREEHAUL DISTANCE)
40,204 CU. YDS. EXCESS EARTH CUT TO BE USED BETWEEN STAS. 67+00 TO 142+00 (F.A. RTE. 178)
OVERHAUL = 2,543,305 STA.-YDS.
WASTE = 628 CU. YDS.

610 600 590 580 570 560 550 540

160 (602.82) 602.89
- (600.25) 600.53
565.7 (597.68) 598.31
2 (595.11) 596.23
3 602.4 (592.24) 594.28
4 603.1 (589.97) 592.48
165 577.6 (588.07) 590.62
6 554.6 (588.18) 589.
7 558.9 (587.28) 587.91
8 580.9 (586.39) 586.47
9 590.6 (585.49) 585.76
170 602.4 (584.59)
- 600.7 (583.69) 583.54
2 597.8 (582.80) 582.16
3 (581.90) 580.46
4 597.8 (581.01) 578.44
175 596.5 (577.54) 576.09
6 (571.81) 571.81
+50 592.7 (574.07) 573.43
7 +59.41 (572.01) 571.69
8 588.4 (570.60) 570.44
9 583.3 567.13
180 571.8 563.46
- 568.8 560.15
2 568.0 556.72
3 571.0 553.25
4 578.2 549.78
185 576.6 (546.31) 546.52
6 572.7 (542.84) 543.08
7 564.0 (541.04) 541.25
8 558.8 539.24
9 553.2 537.49
190 548.1 535.64
+55.90

B.M. NO. 17 A SPIKE VER IN LOCUST 30 LT. STA. 165+65. ELEV. 593.09

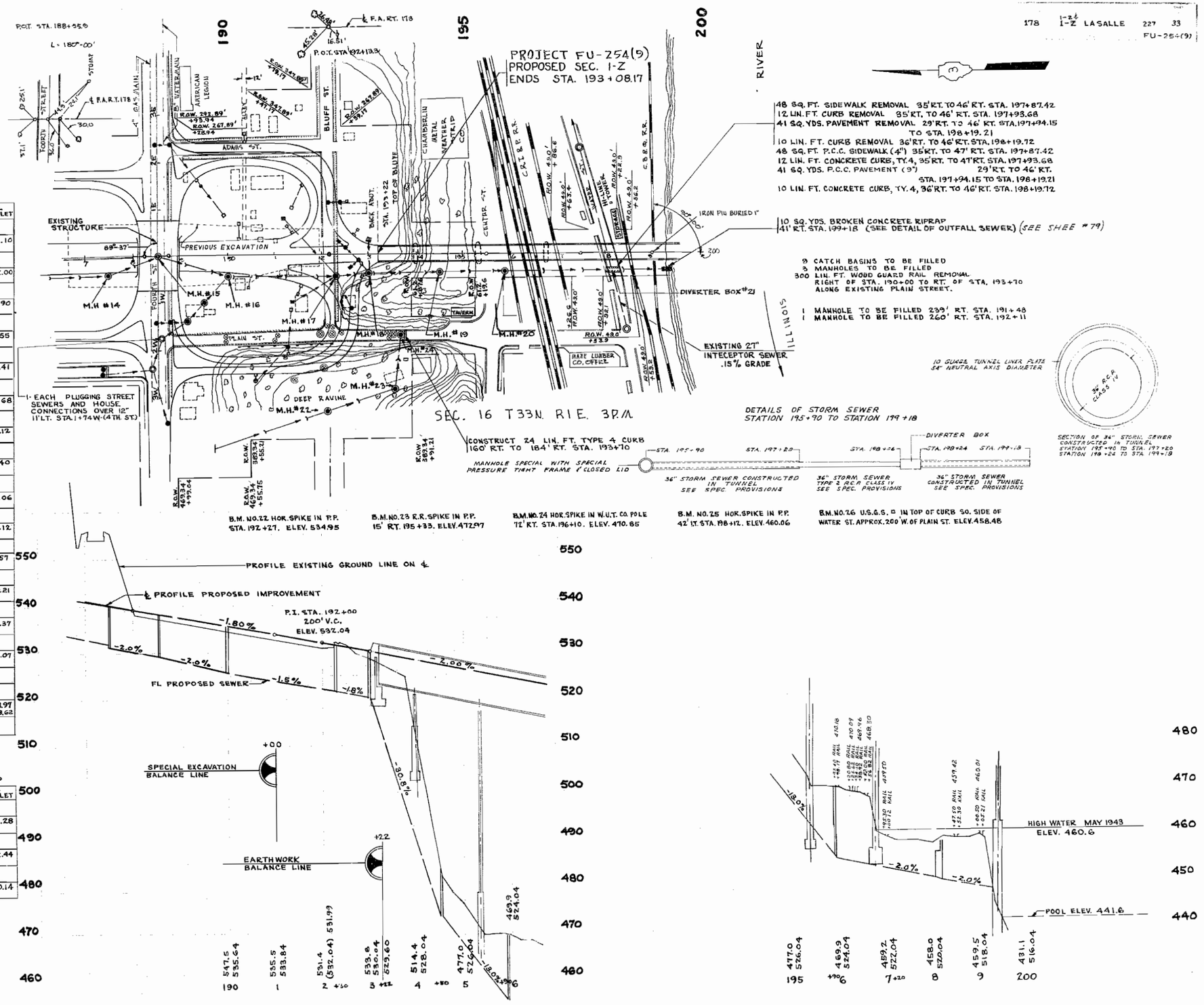
B.M. NO 18. □ IN SIDEWALK S.E. COR. LINCOLN & 8TH STS. 95' LT STA. 174+02. ELEV. 598.48

B.M. NO. 20 □ IN S.W. S.E. CORNER LINCOLN & 5TH STS.-110' LT STA. 184+99.5. ELEV. 575.77

F.A. RT. 178 SEC. 1-2 & SEC. 1 Z LA SALLE COUNTY

178 | 1-2 & 1-Z | LA SALLE | 227 | 33
FU-254(9)

NOTE: ERECT ONE STANDARD 2158 SIGN ON THE RIGHT OF WAY AT THE NORTH EAST CORNER OF F.A. RT. 178 AND FOURTH ST.



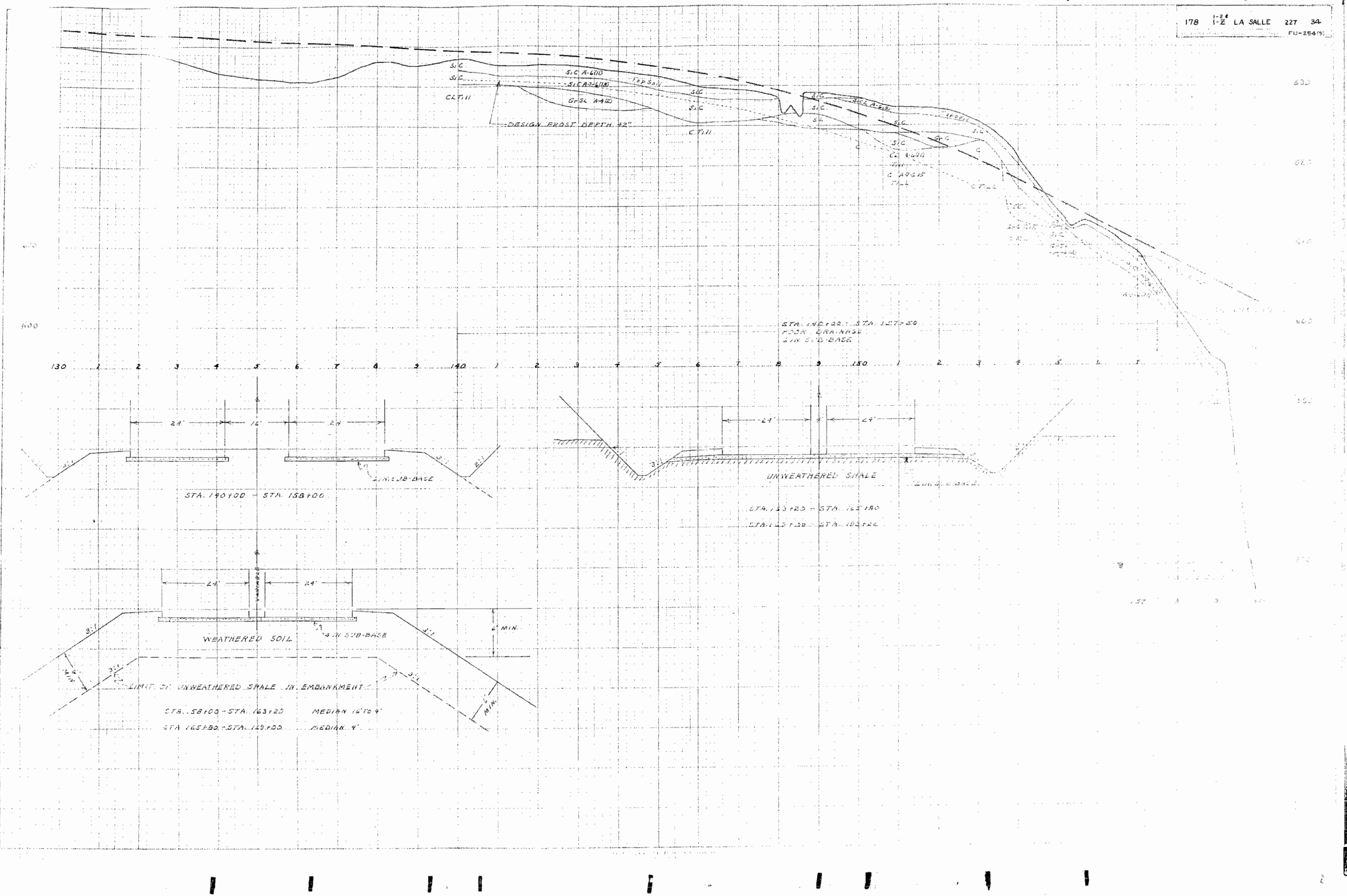
M.H. NO.	ITEM	LOCATION	ELEV. TOP LID	FL INLET	FL OUTLET
	500 LIN. FT. STORM SEWER TY. 2 & EXTRA STRENGTH CLAY PIPE 24"	37.91 RT. STA 157+50 TO 35.2' RT. STA. 162+50			
7	MANHOLE, TYPE A, 5' DIA. WITH TYPE 1 FRAME & CLOSED LID	35.2 RT. STA. 162+50	596.51	589.20	589.10
	500 LIN. FT. STORM SEWER TY. 2 CLAY SEWER PIPE 24"	35.2' RT. STA 162+50 TO 33' RT. STA. 167+50			
8	MANHOLE TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	33' RT. STA. 167+50	587.12	582.10	582.00
	500 LIN. FT. STORM SEWER TY. 2 CLAY SEWER PIPE 24"	33' RT. STA. 167+50 TO 33' RT. STA. 172+50			
9	MANHOLE TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	33' RT. STA. 172+50	582.14	575.00	574.90
	350 LIN. FT. STORM SEWER TY. 2 CLAY SEWER PIPE 24"	33' RT. STA. 172+50 TO 33' RT. STA. 176+00			
10	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	33' RT. STA. 176+00	575.35	569.65	569.55
	168' LIN. FT. STORM SEWER TY. 2 CLAY SEWER PIPE 24"	33' RT. STA. 176+00 TO STA. 177+59.40			
11	MANHOLE TYPE A SPECIAL, 5' DIA WITH SPECIAL FRAME & CLOSED LID	STA. 177+59.40	572.44	564.51	564.41
	342 LIN. FT. STORM SEWER TY. 2 24"	STA. 177+59.40 TO 30' RT. STA. 181+00			
12	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	30' RT. STA. 181+00	560.51	552.78	552.68
	396 LIN. FT. STORM SEWER TY. 2 24"	30' RT. STA. 181+00 TO 40' RT. STA. 184+96			
13	MANHOLE, TYPE A, 5' DIA. WITH TYPE 1 FRAME & CLOSED LID	40' RT. STA. 184+96	545.96	539.22	539.12
	254 LIN. FT. STORM SEWER TY. 2 24"	40' RT. STA. 184+96 TO 35' RT. STA. 187+50			
14	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	35' RT. STA. 187+50	539.90	531.50	531.40
	112. LIN. FT. STORM SEWER TY. 2 27"	35' RT. STA. 187+50 TO STA. 188+55.90			
15	MANHOLE, TYPE A SPECIAL, 5' DIA. WITH SPECIAL FRAME & CLOSED LID	STA. 188+55.90	538.98	529.16	529.06
	149' LIN. FT. STORM SEWER TY. 2 27"	STA. 188+55.90 TO 38' RT. STA. 190+00			
16	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	38' RT. STA. 190+00	535.37	526.08	525.12
	230 LIN. FT. STORM SEWER TY. 2 36"	38' RT. STA. 190+00 TO 45' RT. STA. 192+30			
17	MANHOLE, TYPE A, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	45' RT. STA. 192+30	532.60	521.67	521.57
	70 LIN. FT. STORM SEWER TY. 2 36"	45' RT. STA. 192+30 TO 41' RT. STA. 193+00			
18	MANHOLE, SPECIAL, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	41' RT. STA. 193+00	529.70	520.31	520.21
	156 LIN. FT. STORM SEWER TY. 2 36" SPECIAL SEE SPECIAL PROVISIONS	41' RT. STA. 193+00 TO 41' RT. STA. 194+50			
19	MANHOLE, SPECIAL, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	41' RT. STA. 194+50	482.62	474.02	473.37
	140 LIN. FT. STORM SEWER TY. 2 36"	41' RT. STA. 194+50 TO 41' RT. STA. 195+90			
20	MANHOLE, SPECIAL, 5DIA. WITH SPEC. PRESSURE TIGHT FRAME & CLOSED LID SEE SP. PROV.	41' RT. STA. 195+90	470.49	455.17	455.07
	130 LIN. FT. STORM SEWER CONSTRUCTED IN TUNNEL 36" SEE SP. PROV.	41' RT. STA. 195+90 TO 41' RT. STA. 197+20			
	86 LIN. FT. STORM SEWER TY. 2 36" RCP CLASS IV SEE SP. PROVISIONS	41' RT. STA. 197+20 TO 41' RT. STA. 198+06			
21	DIVERTER BOX WITH SPEC. PRESSURE TIGHT FRAMES & CLOSED LIDS SEE SP. PROV.	41' RT. STA. 198+15	VARIES	450.75	E 448.97 S 449.62
	94 LIN. FT. STORM SEWER CONSTRUCTED IN TUNNEL 36" SEE SP. PROV.	41' RT. STA. 198+24 TO 41' RT. STA. 199+18			

24" STORM SEWER
143.5' RT. STA. 1+48 TO 94' RT. STA. 5+03 O-S.W. RAMP

M.H. NO.	ITEM	LOCATION	ELEV. TOP LID	FL INLET	FL OUTLET
	250 LIN. FT. STORM SEWER TY. 3 24"	143.5 RT. STA. 1+48 O-SW. TO 66.5 RT. STA. 3+66 O-SW.			
22	DROP MANHOLE, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	66.5 RT. STA. 3+66 O-SW.	514.3	507.28	503.28
	148 LIN. FT. STORM SEWER TY. 2 24"	66.5 RT. STA. 3+66 O-SW. TO 115' RT. STA. 4+47 O-SW.			
23	DROP MANHOLE, 5' DIA., WITH TYPE 1 FRAME & CLOSED LID	115' RT. STA. 4+47 O-SW.	506.00	498.84	492.44
	110 LIN. FT. STORM SEWER TY. 3 24"	115' RT. STA. 4+47 O-SW. TO 91' RT. STA. 5+03 O-SW.			
24	MANHOLE TYPE A, 5' DIA. WITH TYPE 1 FRAME & CLOSED LID	94' RT. STA. 5+03 O-SW.	496.00	490.24	490.14

F.A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

178	1-2 & 1-Z	LA SALLE	227	34	
					FU-254(9)



F.A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

178	1-Z4 / 1-Z	LA SALLE	227	35	

FED. ROAD DIST. NO. 9 — ILLINOIS — FED. AID PROJECT FAP-254(9)

I.D.H.A. SURVEYS — F.A. RTE. 178 — TEMPORARY AREAS — LANDS UNCLAIMED — NO. —

WEATHERED SOIL
SEE NOTE
DESIGN FROST DEPTH 42"
SHALE
ROCK
SIC
C A-7-6(4)
C A-7-6(4)
N-18
N-37
N-74
STIFF
C
HARD
SHALE
HARD
ROCK ELEV. 100' LT. ℄
ROCK
WEATHERED SOIL
SEE NOTE
SIC
C
STIFF
SHALE
N-218
N-44
N:208-0.7' GRAY SHALE
N-160
HARD
SOFT
HARD
RED SHALE
GRAY SHALE
C A-7-6(4)
SHALE
HARD
A-7-6(16)
A-7-6(8)
ROCK
ROCK ELEV. 160' LT. ℄
BRIDGE BORING
SIC
C
TILL
STIFF
SHALE
N-37
N-30
N-51
N-22
N-126
N-144
SHALE
HARD
Shale
Coal
Shale
Red Shale
SIC
A-7-6(4)
C
A-7-6(8)
SHALE
SOFT
N-22
N-104
N-24
SHALE
SOFT
FILL
SIC
C
TILL
STIFF
SHALE
HARD
STOP W/PUSH TUBE
GRAY SHALE
RED SHALE
GRAY SHALE
DESIGN FROST DEPTH 42"

NOTE: ⋯⋯ INDICATES ELEVATION OF SHALE & ELEVATION OF SPECIAL EXCAVATION
——— INDICATES BOUNDARY OF DIFFERENT COLORED SHALE
SH. SHALE
W-50 BLOW COUNT REQUIRED TO DRIVE 1 FT. I.D. SPOON SAMPLER 12" USING A 140 LB. DROP HAMMER FALLING 30" AT 225 BLOWS PER MINUTE
STA. 180+00 - STA. 182+50 - RAVINE CONTAINS RUBBISH TO BE REMOVED WITHOUT NEW
——— & GRADE OF UNWEATHERED SHALE IN EMBANKMENT

STA. 157+50 - STA. 163+20
GOOD DRAINAGE
4 IN. SUB-BASE

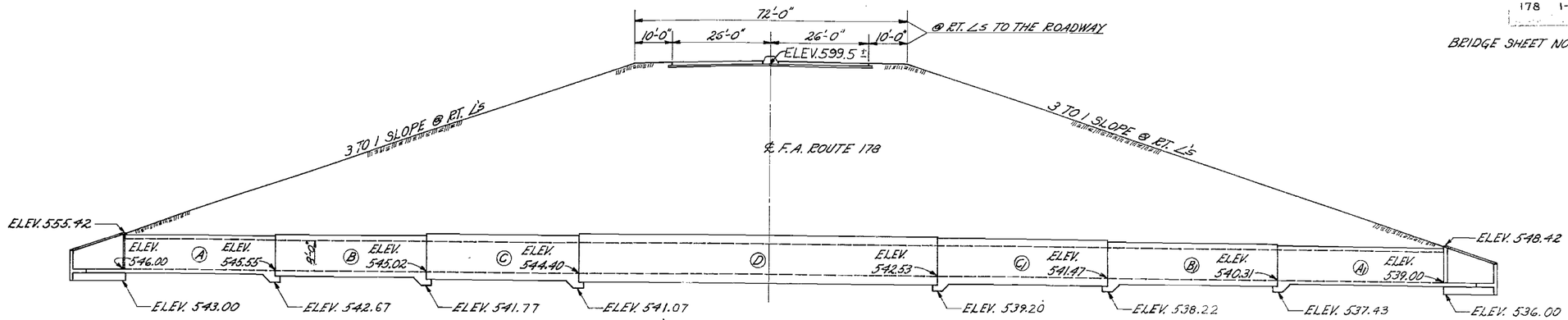
STA. 163+20 - STA. 165+80
POOR DRAINAGE
6 IN. SUB-BASE

STA. 165+80 - STA. 169+00
GOOD DRAINAGE
9 IN. SUB-BASE

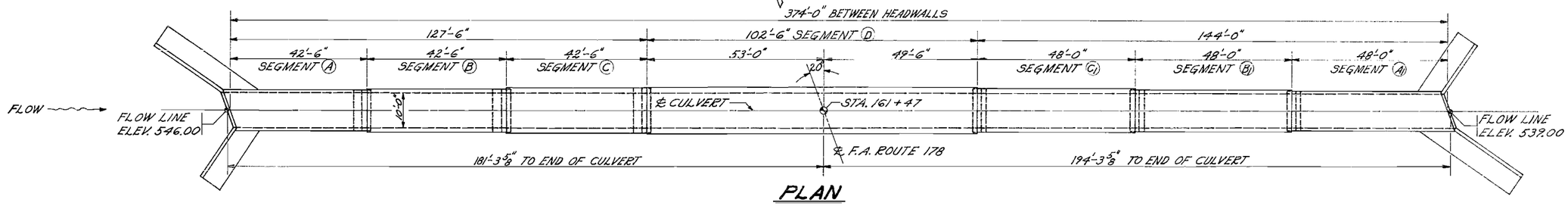
STA. 169+00 - STA. 193+62
POOR DRAINAGE
6 IN. SUB-BASE

1-2&1Z
178 1-Z LA SALLE 227 67
FU-254(9)

BRIDGE SHEET NO. 1 OF 4 SHEETS



ELEVATION

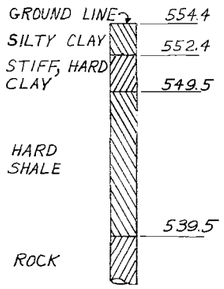


PLAN

NOT TO SCALE
ALL DIMENSIONS ARE ℄ DIMENSIONS

SOIL DATA

TAKEN FROM SOIL PROFILE ALONG ℄ OF PROPOSED ROADWAY.



SOIL DATA ARE SHOWN ON THE PLANS AS A GUIDE ONLY TO BIDDERS IN ESTIMATING SOIL CONDITIONS WHICH MAY BE ENCOUNTERED IN THE WORK.

DESIGN STRESSES

F_s = 20,000 P.S.I.
F_c = 1,400 P.S.I. (BARREL)
F_c = 1,000 P.S.I. (WING WALLS)
n = 10

GENERAL NOTES

CLASS X CONCRETE SHALL BE USED THROUGHOUT.
THE APPLICABLE PROVISIONS OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, ADOPTED JANUARY 2, 1958, BY THE ILLINOIS DIVISION OF HIGHWAYS, SHALL GOVERN EXECUTION OF THIS WORK.
CONSTRUCTION OF THE CULVERT SEGMENTS SHALL BEGIN WITH SEGMENTS A AND A1 AND PROCEED TOWARDS THE CENTER OF THE CULVERT.
THE WING WALL FOOTINGS SHALL BE CONSTRUCTED MONOLITHICALLY WITH SEGMENTS A AND A1.

TOTAL BILL OF MATERIAL

ITEM	UNITS	TOTAL
CLASS X CONCRETE	CU. YDS.	749.3
REINFORCEMENT BARS	LBS.	230,980

CULVERT
F.A. ROUTE 178, SECTION 1Z
STATION 161+47

DESIGNED BY H. H. CORDES, E. H. CORDES CHECKED BY H. H. CORDES, E. H. CORDES DRAWN BY L. C. LUND, E. RUTHE CHECKED BY H. H. CORDES, E. H. CORDES	BRIDGE SHEETS 1 TO 4 INCL. PREPARED BY CORDES CONSULTING ENGINEERS 2415 CHARLES STREET ROCKFORD, ILLINOIS	APPROVED BY 12-21-59 Henry W. Porter

FILE NO. 50-17-2-5034

APPENDIX

E-2

Bridge Files

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

G. P. 150 REV.

OFFICE MEMORANDUM

To: S. L. Edwards

From: W. E. Emerson

Date: May 4, 1962

Subject: Box Culvert Wingwall Failure

F.A. Route 178
Section 1-2, & 1-3
LaSalle County

Station 161+47

A meeting was held at the site of the subject structure on April 25, 1962. The following were in attendance:

J. M. Martin, District 3, Engineer of Construction
Linde Como, District 3, Asst. Engineer of Construction
Victor Benson, Resident Engineer
Ralph Pike, Cells Engineer
Abram Bierbo, Paving Engineer
Miles E. Byers, Bureau of Materials
Otto Haley, Bureau of Design
C. R. Benson, Bureau of Design
J. L. Arlington, Bureau of Public Roads
Mr. Hollerich, J. P. Hollerich Construction Company
Mr. Rolander, Lake Shelton Construction Company

Subsequent to the completion of construction of the subject culvert, the earth backfill was placed, and the grading of the embankment carried forward to a point about 6 feet below design subgrade elevation. Grading was then curtailed because of movement noted in the southeast wing wall of the culvert.

Previous to this meeting, at the suggestion of Mr. S. L. Edwards of the Bureau of Construction and Mr. Byers of the Bureau of Materials, the District Boring Crew made a number of borings through the fill to determine the character of the culvert backfill material. Their borings disclosed that the standard penetration tests were lower in the backfill than in the subsequently placed embankment, the moisture contents were higher, and the apparent densities (where they could be determined) were as low as about 80% of optimum dry weight.

At the time of this visit, the southeast wing wall had tipped out a 20 inches at the top of the wall. It appeared that the wall had broken, and probably at the construction joint just above the footing.

Subsequent to the tipping of the wall, a slide had developed in the embankment. The slide generally moved toward the ring, and seems to begin about 40 feet south of the culvert in the embankment slope. It is surmised that the slide is being encouraged by ground water moving on top of and lubricating a shale layer upon which the culvert and the embankment are founded. The slope of the shale is such as to move the water toward the culvert.

It was suspected that the wing wall failed because of poorly compacted backfill which became saturated after its placement. In an attempt to verify this, a sample of the soil was taken from the culvert backfill through a recently cored test hole located in the culvert about five feet from the culvert-wing wall juncture. The results of laboratory tests indicate that the backfill material was at about 73% of optimum dry density, and its moisture content ranged about 1% of the liquid limit. The soil data appears on the attached sheet. The test results would seem to substantiate the original supposition relating to poor compaction.

It was decided that the wing wall backfill would have to be removed and the wing wall reconstructed. Probably both the footing and wall will have to be replaced. In the latter case, the new wall and footing will be constructed in front of the culvert. It was suggested that the new wall should be backfilled with porous granular backfill.

Since a slide has developed in the immediate area of the broken wing, it was suggested that a trench be made above the slide area at approximate right angles to the centerline of the roadway. The trench would be extended into the shale, and a 4" C.M.P. placed with suitable granular backfill in an attempt to cut off the flow of ground water, and thereby improve the stability of the slide in the embankment. Reconstruction behind the wing should preferably be delayed until the P.C.M.P. drain has been installed for a few days.

The treatment of the wing wall will depend upon what is discovered upon removal of the backfill.

W.E.B.

WEB:lc

cc - E. M. P. Novello
J. D. Bradley
C. S. Hendrix

FA ROUTE 178
SEC. 12, 3, 1-2
LA SALLE CO.
STA. 161+47

LABORATORY DATA

PROC. OPT. DRY WT.	116.1
OPTIMUM MOIST.	14.6 %
FIELD MOIST.	56.9 %
SPECIFIC GRAV.	2.68
LIQUID LIMIT	38%
PLASTICITY INDEX	16

THE POINTS ON THE CURVE BELOW REPRESENT WET WEIGHT DENSITIES OF SATURATED (ALL VOIDS WATER FILLED) SOIL.

WEIGHT IN POUNDS PER CUBIC FOOT (SATURATED SAMPLE)

PROCTOR OPTIMUM

90% DENSITY

80% DENSITY

70% DENSITY

(SAMPLE FROM FIELD)

FIELD MOISTURE AS % OF OPT. MOISTURE = 253%

FIELD DENSITY (DRY) % PROCTOR OPT. = 72.2%

G.R.S.

% MOISTURE

EUGENE DIETZGEN CO. MADE IN U.S.A.

NO. 340-L110 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
1 CYCLE X 10 DIVISIONS PER INCH

Drudge File

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

G. F. 150 REV.

OFFICE MEMORANDUM

To: E. L. Marcotte

From: W. E. Deeman

Date: May 4, 1942

Subject: Rep. Culvert Waverly Failure

F.A. Route 278
Section 1-B, & 1-B2
LaSalle County

Station 102+47

A meeting was held at the site of the subject structure on April 25, 1942. The following were in attendance:

J. H. Martin, District 3, Engineer of Construction
Mario Cerro, District 3, Asst. Engineer of Construction
Victor Peterson, Resident Engineer
Ralph Bell, Soils Engineer
Norman Bleuler, Testing Engineer
Miles E. Byrd, Bureau of Materials
Cecil Kelly, Bureau of Design
C. E. Jenkins, Bureau of Design
J. L. Anderson, Bureau of Public Roads
Mr. Hollerbach, J. J. Hollerbach Construction Company
Mr. Dolander, Erie Dolander Construction Company

Subsequent to the completion of reconstruction of the subject culvert, the earth backfill was placed, and the grading of the embankment carried forward to a point about 6 feet below design subgrade elevation. Grading was then curtailed because of movement noted in the southeast wing wall of the culvert.

Previous to this meeting, at the suggestion of Mr. E. E. Tilley of the Bureau of Construction and Mr. Byrd of the Bureau of Materials, the District Boring Crew made a number of borings through the fill to determine the character of the culvert backfill material. These borings detected that the standard penetration tests were lower in the backfill than in the undisturbed natural embankment, the moisture contents were higher, and the standard densities (where they could be determined) were as low as about 100 of optimum dry weight.

May 4, 1953

At the time of this visit, the northeast wing wall had tipped out a 20 inches at the top of the wall. It appeared that the wall had broken, and probably at the construction joint just above the footing.

Subsequent to the tipping of the wall, a slide had developed in the embankment. The slide generally moved toward the wing, and seems to begin about 10 feet south of the culvert in the embankment slope. It is surmised that the slide is being encouraged by ground water moving on top of an impervious shale layer upon which the culvert and the embankment was founded. The slope of the slide is such as to move the water toward the culvert.

It was suggested that the wing wall failed because of poorly compacted backfill which became saturated after its placement. In an attempt to verify this, a sample of the wall was taken from the culvert backfill through a recently cored weep hole located in the culvert about five feet from the culvert-footing wall junction. The results of laboratory tests indicate that the backfill material was at about 79% of optimum dry density, and the moisture contents within about 1% of the liquid limit. The soil data appears on the attached sheet. The test results would seem to substantiate the original supposition relating to poor compaction.

It was decided that the wing wall backfill would have to be removed and the wing wall reconstructed. Probably both the for wing and wall will have to be replaced. In the latter case, the new wall and footing will be reconstructed just off the culvert. It was suggested that the new wall should be backfilled with pervious granular backfill.

Since a slide has developed in the immediate area of the broken wing, it was suggested that a trench be made above the slide area at approximate right angles to the centerline of the roadway. The trench would be excavated into the shale, and a P.C.M.P. placed with suitable granular backfill in an attempt to cut off the flow of ground water, and thereby improve the stability of the slide in the embankment. Reconstruction behind the wing should preferably be delayed until the P.C.M.P. drain had been installed for a few days.

The treatment of the wing wall will depend upon what is discovered upon removal of the backfill.

M.E.B.

mb:ls

cc - T. H. P. Howells
S. L. Stevens
C. S. Whalen

FA ROUTE 178
SEC. 12 #1-2
LA SALLE CO.
STA 161+47

LABORATORY DATA

PROC. OPT. DRY WT.	116.1
OPTIMUM MOIST.	14.6 %
FIELD MOIST.	36.9 %
SPECIFIC GRAV.	2.68
LIQUID LIMIT	38%
PLASTICITY INDEX	16

THE POINTS ON THE CURVE BELOW REPRESENT WET WEIGHT DENSITIES OF SATURATED (ALL VOIDS WATER FILLED) SOIL.

EUGENE DIETZGEN CO. MADE IN U.S.A.

NO. 340-L110 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
1 CYCLE X 10 DIVISIONS PER INCH

WEIGHT IN POUNDS PER CUBIC FOOT (SATURATED SAMPLE)

160 140 130 120 115 110

PROCTOR OPTIMUM

90% DENSITY

80 % DENSITY

FIELD CONDITION

70% DENSITY

FIELD MOISTURE AS % OF OPT. MOISTURE = 253%

FIELD DENSITY (DRY) % PROCTOR OPT. = 72.2%

10 15 20 25 30 35 40 45

% MOISTURE

STATE OF ILLINOIS

DEPARTMENT OF PUBLIC WORKS AND BUILDINGS

DIVISION OF HIGHWAYS

OFFICE MEMORANDUM

G. F. 158 REV.

To: Dolph Hoke

From: Gordon R. Benson

Date: June 12, 1962

Subject: FA Route 178
Section 1Z & 1-2
LaSalle County

Station 161+47

Attached are two rather vague prints of our copy of the office memo to Mr. Sherertz concerning the wingwall failure on the subject improvement.

I offer my apologies for having neglected to include District 3 in the original memo. I enclose two copies now so that you can give one to Mr. Martin in Construction, if you wish.

Gordon Benson

GRB:MJZ
Enc.

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

REPORT OF EMBANKMENT COMPACTION

Report No.: _____ Date Reported: May 2, 1962 District: #3

Contractor: Eric Bolander Route: F.A. 178

Equipment: Excavating: _____ Section: 1 Z & 1-2

Hauling: _____ Project: FU-254(9)

Compacting: _____ City: Peru

Source of Material: Roadway Excavation Soil Type: Clay County: La Salle

Water Required: _____ Aeriation Required: _____

Station	Ref. to C.L.	Elevation			Moisture			Dry Density		
		Ground Line	Grade Line	of Tests	Proctor Opt. Percent	Actual Content Percent	Percent of Optimum	Maximum Proctor #/cu.ft.	Actual Comptd. #/cu.ft.	Percent of Maximum
161+47										
*South	179 Rt.	599.5	541.3		18.2	24.1	132	109.0	100.7	92.3
*South	169 Rt	599.5	541.7		18.2	26.8	147	109.0	96.5	88.5
*North	164 Rt	599.5	541.7		19.3	34.5	179	107.8	88.5	82.2
*South	86 Rt	599.5	543.8		19.1	20.1	105	109.6	102.1	93.3
*South	16 Rt	599.5	545.2		17.7	33.2	188	108.2	85.3	78.8
*North	16 Rt	599.5	545.2		18.3	24.7	135	107.6	94.5	90.8

NOTE: Shelby Tubes were used to obtain density samples in culvert backfill. Standard Proctor were run on material obtained from each density test location.

Unless otherwise noted Standard "Proctor" and "Sand" methods are used.

Remarks: *Indicates sample was obtained through weep holes cut in north or south wall of culvert barrel. Weep holes were cut approximately 25 inches above flow line of culvert.
Tests made April 18 to 27, 1962

Original to: Orville A. Evans
Copies to: T. H. F. Norris
J. D. Lindsay
E. L. Sherertz
C. S. Monnier

Resident Engineer: _____

Inspector: _____

(49899—5M Sets—1-57) 2

Form LM-18

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

REPORT OF EMBANKMENT COMPACTION

Report No.: _____ Date Reported: May 2, 1962 District: 3

Contractor: Erick Bolander Route: F.A. 178

Equipment: Excavating: _____ Section: 1Z, 1-2

Hauling: _____ Project: FU-254(9)

Compacting: _____ City: Peru

Source of Material: Roadway Excavation Soil Type: clay County: LaSalle

Water Required: _____ Aeriation Required: _____

Station	Ref. to C.L.	Elevation			Moisture			Wet Density		
		Ground Line	Grade Line	of Tests	Proctor Wet. Opt. Percent	Actual Content Percent	Percent of Optimum	Maximum Proctor #/cu.ft.	Actual Comptd. #/cu.ft.	Percent of Maximum
Note South	179Rt		599.5	541.3	18.2	24.1	132	109.0	104.0	95.4
South	169Rt		599.5	541.7	18.2	26.8	147	109.0	99.7	91.4
North	164Rt		599.5	541.7	19.3	34.5	179	107.8	91.5	84.9

Unless otherwise noted Standard "Proctor" and "Sand" methods are used.

Remarks:

Original to:
Copies to:

Resident Engineer: _____

Inspector: _____

STATE OF ILLINOIS

R. R. BARTELSMEYER
CHIEF HIGHWAY ENGINEER

DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
W. J. Payne, Jr. DIRECTOR

DIVISION OF HIGHWAYS

IN YOUR REPLY PLEASE REFER TO FILE:

OFFICE OF DISTRICT ENGINEER
700 EAST NORRIS DRIVE
OTTAWA

District Engineer	
Asst. Dist. Engr.	
Local Rds. & Sts.	
Research	
Construction	
Design	
Right of Way	
Materials	
Maintenance	
Bur. Service	
Traffic	
Dist. Accr. Secy.	
Claims	
Dist. Office	
Hole	

Ja 178 Sec 1-2, 1-2
LaSalle Co.

April 30 / 96

Mr O. A Evans
Dist Hwy Engr
Jor East Northern

Dear Sir:

Herewith is the result of compaction test requested behind the South East wing of box culvert sta 161+41 on the above named Route and section: Depth - 2.5' below surface

Soil yell Br silty clay

Wet density	121 #/cu ft
Moisture	20.5 %
Dry opt Moist.	19.6
Dry density	101 #/cu ft
Max dry density	105 #/cu ft
% of Max density	96 %

Sincerely yours,
Victor P Bonnacchi

W. J. PAYES, JR., DIRECTOR

RALPH R. BARTELSMEYER
CHIEF HIGHWAY ENGINEER

DIVISION OF HIGHWAYS
OFFICE OF DISTRICT ENGINEER
700 EAST NORRIS DRIVE
OTTAWA

IN YOUR REPLY PLEASE
REFER TO FILE:

April 26, 1962

FA Route 178
Section 1 Z & 1-2
Project FU-254(9)
LaSalle County

Eric Bolander Construction Company
Winchester Road
Libertyville, Illinois

Gentlemen:

At the meeting held on April 25 at the site of the work where the wing wall at culvert Station 161+47 has moved, the following instructions were given:

Drain holes are to be drilled at 10-foot centers in the walls. The dirt back of these walls is to be augered out through the drain holes and porous granular material forced through the holes into the back fill. Drain holes are also to be drilled, one in each short wing and two in the northwest wing. Holes are to be dug back of the wings at these locations and porous granular material placed back of the drain holes.

At the head of the slide approximately 60 feet south of the east end of the culvert, a trench is to be dug into the fill and extending down into the shale. Perforated pipe and porous granular material are to be placed in this trench in an attempt to drain water from under the fill. This should stand a few days and then the southeast wing should be removed to the top of the footing.

Please notify this office when work starts on removing the wing in order that we may have a representative present.

It will be satisfactory to proceed with fill of the main embankment except that a 20-foot strip is to be left along the east side of the fill, and this portion shall be built after the culvert wing wall is repaired.

Very truly yours,

Orville A. Evans
District Engineer

JHM/
cc [illegible]lerich Company
[illegible]son
[illegible]rie

hi

BOOK NO. 1

COUNTY La Salle

SECTION 17 & 1-2

ROUTE FA-178

ROAD

TOWNSHIP

DATE April 12 19 62

PARTY

CHIEF Fa Crouch

ASSISTANT Fleming

" Buckley

" Divers

Doherty

PROPERTY

STATE OF ILLINOIS

DEPARTMENT OF PUBLIC WORKS AND BUILDINGS

DIVISION OF HIGHWAYS

SPRINGFIELD, ILLINOIS

(41918—3M Books—8-61) 2 Form B. D. 182

Sta. 161+55
75.5' Lt. ℄
On Skew at 90° S. Side of Culv.

Bearing #1

Flow Line Elev. 540.00 Ft.
3.67 Culv.
Top Culv. 553.67
Start Sampling @ 554.67

0 - 26.5 Fill

26.5 - 27.5 Soft Tan Sandy Clay

Layered To 37' But Could Not
Had A Few In Tan Colored White
Colored.

B.H. = 526.6
3.7
W.T. = 522.9
3.5
B.H. = 523.1
3.3.4.7
2.7.0

— W.T. 10 Feet Tube

Penetrometer Map Deeper.
Approx. Shear Was Not Taking The

Sta 121 + 52
33° 11' ℄
on Skew
ϕ = 20°

Boring #2
8' S.℄ Culvert
4-13-62

Survey + Loca Co +

Note: Bore [illegible] Sta 120.7 Elev = 543.2
Sta 64.3 Elev = 544.3

Flow Line El. = 541.79
9.67
551.46
Start Sampling at 551.46

BM = 546.6
4.4
N2 = 585.0
7.4
Ground Elev = 580.6
554.5
66.1

0 - 25.5		Fill	Moisture	S/O	N	Q_u
25.5 - 27.0	lt Br & Gr	Clay (Shaley)	#267	17.6	N=26	3.0 S
27.0 - 28.5	gl Br & Gr	Clay	#268	16.1	N=12	2.3 S
28.5 - 30.0	rd Br & Gr	Clay	#269	20.7	N=4	1.7 S
30.0 - 31.5	rd Br & Gr	Clay	#270	23.3	N=9	1.4 S
31.5 - 33.0	rd Br	Clay, Sand & Gravel	#271	22.6	N=7	2.0 E
33.0 - 35.5	rd Br	Lge Fragments Clay	#272	24.7	N=7	2.0 E
35.0 - 37.0	rd Br & Gr	Clay	#273	23.5	N=11	2.5 E
37.0 - 38.5	rd Br & Gr	Clay (Shaley)	#274	27.6	N=7	2.0 E
38.5 - 40.0	rd Br & Gr	Clay (Shaley) Fragments of Ice	#275	24.2	N=7	2.0 E

Boring #3
T.C.L. Culvert
4-13-62

Flow Line Elev. 554.72
7.62
554.38
Stock Supply 557.38 or 30' of Cover

BM = 558.4
4.8
W.S. = 553.2
5.8
Fl. Elev. = 547.4
552.2
30.0'

		Moisture %		
2.0	Red Brn Clay	#276 15.2	N=19	3.5 E
5	Gray Brn Clay	#277 18.8	N=10	—
0	Red Brn Clay	#278 20.0	N=9	2.13 E
0	Red Brn Clay	#279 21.0	N=10	2.4 E
2.0	Red Brn Clay	#280 24.4	N=1	1.0 E
5	Red Brn Clay	#281 26.6	N=3	0.5 E
0	Red Brn Clay	#282 25.9	N=5	0.9 E
0	Red Brn Clay	#283 21.7	N=18/6"	1.5 E

Gr Shale At Bottom
of Hole - Very Hard

Sta 181+55
121'23 ℄

Boring #4
2' S. of Culvert
4-12-62

Survey of Hwy 40 #1

Fld Surf Elev

Flow Line El. = 540.89
2.33
553.19
Bot Inside 553.19

B.M. = 575.9
2.4
578.3
5.3
Gd. El. = 577.0
555.2
24.2

0 – 24.0	Fill		Moisture %			
24.0 – 25.5	rd Br & Gr	Clay	#634	21.0	N=12	2.91 E
25.5 – 27.0	rd Br & Gr	Clay	#635	22.4	N=7	2.0 E
27.0 – 28.5	rd Br & Gr	Clay	#636	20.6	N=11	2.20 E
28.5 – 30.0	rd Br & Gr	Clay	#637	20.9	N=10	2.0 E
30.0 – 31.5	rd Br & Gr	Clay	#638	26.5	N=5	1.0 E
31.5 – 33.0	rd Br	Clay	#639	26.2	N=5	1.0 E
33.0 – 34.5	rd Br & Gr	Clay	#640	26.7	N=8	0.70 E
34.5 – 36.0	rd Br & Gr	Clay	#123	24.4	N=6	1.0 E
36.0 – 37.5	rd Br & Gr	Clay (6" layer of	124	30.7	N=7	0.35 E
37.5 – 38.5	rd Br & Gr	Clay	125	20.8	N=12	2.0 E

6" bottom

9-14-62

						550.3
0 - 8.5	Fill		Moist.	9%		92.7
8.5 - 11.0	Brn Clay		#26	19.4	N = 21	0.15 E
11.5 - 16.0	Red Brn Clay		#27	18.9	N = 16	0.05 E
16.0 - 18.5	Red Brn Clay (Shaley)		#28	13.4	N = 11	0.1 E
18.5 - 20.0	Red Brn Clay		#29	24.0	N = 5	0.0 E
20.5 - 23.5	Red Brn Clay		#30	28.4	N = 3	0.09 E
23.5 - 26.0	Red Brn Clay		#31	30.0	N = 1	0.05 E
26.0 - 28.5	Red Brn Clay		#32	33.2	N = 2	0.05 E
28.5 - 31.0	Red Brn Clay		#33	31.4	N = 2	0.42 E
31.0 - 36.0	Red Brn Clay		#34	29.8	N = 15	1.5 E
36.0 - 36.5	Red Brn	- SHALE - HARD	#44	17.6		

Boring #6
10'3" of clay

Top of Hard Clay = 547.78
+ 2.42
550.20
+ 7.25
Bottom of Hard Clay = 557.07

	Moist	%
Clay	#135	27.0
Clay	#136	27.8
Clay	#137	25.8
Clay	#138	25.7
Clay	#139	33.4
Clay	#140	26.3
Clay	#141	28.1
Clay	#142	27.4

No water in hole

April 23, 1962

#4 S. Wall 105' from E. End.

19" recovery

Cores made to date -

N. Wall	** 25'	from E. end
S. Wall	* 5'	" "
	* 15'	" "
	* 25'	" "
	* * 35'	" "
	* * 45'	" "
	* * 55'	" "
	* * * 65'	" "
	* * * 75'	" "
	* * * 105'	" "

* Soil moved thru entire thickness of wall

* * Soil moved into wall 6"-8"

* * * Soil moved into wall 1-2"

April 18, 1962

Shelby Tubes

(#1) S. Wall of culvert 15' from E end
Shelby tube
Recovery
25½" above Floor of culvert

(#2) S. WALL of culvert 25' FROM EAST END
25½" above floor of culvert

[#3] NORTH WALL 25' FROM EAST END
25½" above floor of culvert
Pushed easily.

April 24, 1962

(#5) S. Wall 20' from W. end.
Recovery 19"
Pushed by hand all the way.
Felt granular all the way.
Sand & gravel at bottom of tube
Water runs from hole - Ice cold - Poured 1 qt in 1'30"
Augered in hole 3' - Sand & Gravel - a few little pieces of clay -

(#6) N. Wall 25' from W. end
Recovery 14"
Gravel & Sand & Some clay 1 qt in 2 minutes
Water runs from hole -

April 24, 1962

Proctor Samples

S-wall 25' from E end
Corresponds to Shelby Tube Sample #2

0-1' very wet
1'-2' considerably dryer
2'-3' Dryer & stiffer, but still above PL

N. Wall 25' from E end
(Shelby to be #3)

0-3' Very wet all the Way.

April 25

Shelby tube Sample

(#7) S. Wall 175' from E end.

Within 5 minutes after removing the PCC core, the soil had moved 8" into the culvert wall

Shelby tube pushed easily (by hand) to about 2½'

Used a pry to force it to 3'.

17" Recovery

(#8)

N Wall 175' from E. end

Pushed hard all the way.

15" Recovery

April 27, 1962

Proctor Samples

S. Wall 105' from East end
(Shelby tube #4)

S. Wall 175' from East end
(Shelby Tube #7)
Several buckets of soil extruded from hole since core was cut on 4-25-62

N. Wall 175' from East end
(Shelby tube #2)

FA-178

sec 1-Z

Sample No.	Location Wall	Culvert End	Length in	Dia. in	Total wt Gr.	Tube wt. Gr.	Sample wt.	Area in^2	Vol. in^3	Vol. ft^3	wt. lb.	Wet Density	% Moist.	Dry Density	
1A	South	15' from East	6.94	1.91	950	288	662	2.86	19.25	.1114	1.458	130.9	23.7	102.4	
1B	South	15' from East	6.82	1.91	915	282	633	2.86	18.90	.1094	1.394	127.4	24.6	98.2	4-24
2A	South	25' from East	8.78	1.91	1189	362	827	2.86	24.30	.1407	1.822	129.4	26.5	102.0	
2B	South	25' from East	8.58	1.91	1121	351	770	2.86	23.75	.1375	1.695	123.3	27.1	93.8	
3	North	25' from East	8.76	1.91	1134	351	783	2.86	24.27	.1403	1.725	123.0	34.5	88.5	
4A	South	105' from E.	8.44	1.91	1058	331	727	2.86	23.39	.1353	1.602	118.3	21.2	97.5	
4B	South	105' from E.	8.66	1.91	1188	341	847	2.86	23.98	.1387	1.866	134.6	19.0	109.5	
5A	South	20' from W.	6.82	1.91	850	280	570	2.86	18.89	.1092	1.255	114.9	17.5	94.6	
5B	South	20' from W.	5.96	1.91	803.5	244.5	559.0	2.86	16.50	.0954	1.231	129.0	14.3	109.2	
5C	South	20' from W.	6.32	1.91	880	258.5	621.5	2.86	17.50	.1013	1.368	135.0	15.7	112.9	4-25
6A	North	25' from W.	6.24	1.91	852.0	259.0	593.0	2.86	17.28	.1000	1.305	130.5	12.5	112.2	
6B	North	25' from W.	6.10	1.91	801.0	253.0	548.0	2.86	16.89	.0976	1.207	123.7	14.2	104.8	
7A	South	175' from E.	5.76	1.91	705.5	237.5	468.0	2.86	15.95	.0922	1.032	111.8	35.1	80.1	4-26
7B	South	175' from E.	5.90	1.91	728.0	244.0	484.0	2.86	16.35	.0945	1.067	112.9	39.7	78.2	
7C	South	175' from E.	5.36	1.91	708.5	220.5	488.0	2.86	14.85	.0854	1.075	125.8	24.7	97.6	
8A	North	175' from E.	7.18	1.91	893.5	276.5	617.0	2.86	19.90	.1151	1.359	118.1	21.8	93.7	
8B	North	175' from E.	6.90	1.91	874.5	265.0	629.5	2.86	19.11	.1105	1.387	125.5	27.6	95.2	

FA-178 Red Soil Max Wet Density 129.6 Wet Optimum Moisture 17.3

Sec -1-Z South Wall Max Dry Density 109.0 Dry Optimum Moisture 18.2

Sample No.	Location Wall	Culvert End	Wet Density	% Moisture	Dry Density	% Max Dry Density	% Optimum Moisture
1A	South Wall	15' from East	130.9	23.7	105.9	97.6	130.2
1B	South	15' from East	127.4	24.6	102.2	93.7	135.0
2A	South	25' from East	129.4	26.5	102.3	93.8	145.5
2B	South	25' from East	123.3	27.1	97.0	88.9	148.8
3	North	25' from East	123.0	34.5	91.5	84.9	178.7
4A	South	105' from East	118.3	21.2	97.7	89.5	116.4
4B	South	105' from East	134.6	19.0	113.2	103.8	104.4
	Red & Grey Soil	North Wall	Wet Density 127.3	Wet opt 21.0	Dry Density 107.6	Dry opt 18	

FA-178

Max. Dry Density 112.0 Dry opt. Moist. 16.0

Max. Wet Density _____ Wet opt. Moist. _____

4-24-62

Sec 1

Sample No.	Location from East End of Culvert	Wet Density	% Moisture	Dry Density	% Max. Dry Density	% Optimum Moisture
1A	South Wall 15' in	130.9	23.1	105.9	94.5	144
1B	South Wall 15' in	127.4	24.6	102.2	91.2	154
2A	South Wall 25' in	129.4	26.5	102.3	91.3	166
2B	South Wall 25' in	123.3	27.1	97.0	86.6	169
3	North Wall 25' in	123.0	34.5	91.5	81.7	216
4A	South Wall 105' in	118.3	21.2	97.7	87.3	132
4B	South Wall 105' in	134.6	19.0	113.2	101.1	119

Tube #2

PROCTOR WORK SHEET

Date 4-26-62

Rt. _____ Section S-WALL Project _____ County _____

Sta. _____ Ft. from ℄ 25' FROM E END Elev. _____

Color of Soil _____ Type _____

Mold Factor (1/vol. of Mold/453.6 6614

Weight of Mold, grams 2004

Test	Wet Weight soil and mold, gr.	Wet Weight of soil, gr.	Wet Weight soil lbs. Per Cu. Ft.	Dry Weight soil lbs. Per Cu. Ft.
1	3830	1826	120.77	105.9
2	3880	1876	124.07	107.5
3	3910	1906	126.06	108.2
4	3948	1944	128.57	109.0
5	3963	1959	129.56	108.4
6	3955	1951	129.03	107.0

MOISTURE DETERMINATION

Test Number	Wet Wt. Soil & Pan		Dry Wt. Soil & Pan		Weight Pan	Dry Wt. Soil	Moisture loss	Percent Moisture
4 15	59.85	63.64	54.34	57.88				14.0
6 27	60.33	64.88	54.46	58.24				15.4
8 39	62.45	64.07	56.04	57.00				16.5
10 4 16	61.16	66.17	54.35	58.35				17.9
12 5 13	62.46	68.47	62.47	59.64				19.5
14 6 15	61.68	65.19	53.87	56.59				20.7

Wet Maximum Density, lbs. per cu. ft. 129.6
Dry Maximum Density, lbs. per cu. ft. 109.0
Wet Optimum Moisture, Per Cent 19.5
Dry Optimum Moisture, Per Cent 18.2

Remarks:

Form S-9-13-51

DH:cd

TUBE # 3

PROCTOR WORK SHEET

Date 4-26-62

N. WALL

Rt. _____ Section _____ Project _____ County _____

Sta. 25' Ft. from ℄ FROM ℄ END Elev. _____

Color of Soil _____ Type _____

Mold Factor (1/vol. of Mold/453.6 6614

Weight of Mold, grams 2004

Test	Wet Weight soil and mold, gr.	Wet Weight of soil, gr.	Wet Weight soil lbs. Per Cu. Ft.	Dry Weight soil lbs. Per Cu. Ft.
1	3927	1923	127.18	105.8
2	3918	1914	126.59	107.4
3	3906	1902	125.79	106.2
4	3844	1840	121.69	103.7
5	3817	1813	119.84	103.0
6				

MOISTURE DETERMINATION

Test Number	Wet Wt. Soil & Pan		Dry Wt. Soil & Pan		Weight Pan	Dry Wt. Soil	Moisture loss	Percent Moisture
16	17	67.29	66.03	58.50	57.46				20.6
18	19	61.37	61.73	53.82	54.39				19.3
20	21	69.65	65.40	61.10	57.82				18.4
22	23	58.48	68.99	52.48	61.07				16.7
24	25	59.57	60.92	53.42	54.73				16.1
6									

Wet Maximum Density, lbs. per cu. ft. 127.3
Dry Maximum Density, lbs. per cu. ft. 107.8
Wet Optimum Moisture, Per Cent 21.0
Dry Optimum Moisture, Per Cent 19.3

Remarks:

Form S-9-13-51

DH:cd

SHELBY TUBE # 4

PROCTOR WORK SHEET

SMALL 105' FROM EAST END Date 5-2-62

____ Rt. ____ Section ____ Project ____ County ____

____ Sta. ____ Ft. from ℄ ____ Elev. ____

Color of Soil ____ Type ____

Mold Factor (1/vol. of Mold/453.6 6614
Weight of Mold, grams 2004

Test	Wet Weight soil and mold, gr.	Wet Weight of soil, gr.	Wet Weight soil lbs. Per Cu. Ft.	Dry Weight soil lbs. Per Cu. Ft.
1	3960	1956	129.36	106.4
2	3974	1970	130.29	108.5
3	3962	1958	129.50	109.2
4	3908	1904	125.93	107.0
5				
6				

MOISTURE DETERMINATION

Test Number	Wet Wt. Soil & Pan		Dry Wt. Soil & Pan		Weight Pan	Dry Wt. Soil	Moisture loss	Percent Moisture
37	138	64.99	67.93	56.24	58.62				21.7
39	240	62.58	66.29	54.72	57.82				20.2
41	342	65.99	63.92	58.18	56.20				18.6
43	444	61.43	61.68	54.62	54.72				17.7
5									
6									

Wet Maximum Density, lbs. per cu. ft. 130.3
Dry Maximum Density, lbs. per cu. ft. 109.6
Wet Optimum Moisture, Per Cent 20.2
Dry Optimum Moisture, Per Cent 19.1

Remarks:

Form S-9-13-51

DH:cd

TUBE #7

PROCTOR WORK SHEET

S WALL 175' FROM EAST END Date 5-1-62

____ Rt. ____ Section ____ Project ____ County ____

____ Sta. ____ Ft. from ℄ ____ Elev. ____

Color of Soil ____ Type ____

Mold Factor (1/vol. of Mold/453.6 .6614

Weight of Mold, grams 2004

Test	Wet Weight soil and mold, gr.	Wet Weight of soil, gr.	Wet Weight soil lbs. Per Cu. Ft.	Dry Weight soil lbs. Per Cu. Ft.
1	3948	1944	128.57	107.6
2	3926	1922	127.12	108.2
3	3936	1932	127.78	108.1
4	3872	1868	123.54	106.3
5	3819	1815	120.04	104.0
6	3941	1937	128.11	106.8

MOISTURE DETERMINATION

Test Number	Wet Wt. Soil & Pan	Dry Wt. Soil & Pan	Weight Pan	Dry Wt. Soil	Moisture loss	Percent Moisture
25 126	60.38 59.73	53.19 52.41				19.5
27 228	64.44 66.19	57.09 58.71				17.6
29 330	58.74 62.50	52.25 55.26				18.1
31 432	59.23 60.94	53.26 54.60				16.2
33 534	60.86 60.82	55.01 54.67				15.4
35 636	61.40 69.53	53.65 60.41				20.9

Wet Maximum Density, lbs. per cu. ft. 128.6
Dry Maximum Density, lbs. per cu. ft. 108.2
Wet Optimum Moisture, Per Cent 19.5
Dry Optimum Moisture, Per Cent 17.7

Remarks:

Form S-9-13-51

DH:cd

TUBE # 8

N. WALL
175' FROM EAST END

PROCTOR WORK SHEET

Date 4-1-62

____Rt.____Section____Project____County____

____Sta.____Ft. from ℄____Elev.____

Color of Soil____Type____

Mold Factor (1/vol. of Mold/453.6 6614
Weight of Mold, grams 2004

Test	Wet Weight soil and mold, gr.	Wet Weight of soil, gr.	Wet Weight soil lbs. Per Cu. Ft.	Dry Weight soil lbs. Per Cu. Ft.
1	3949	1945	128.63	107.1
2	3939	1935	127.98	107.3
3	3917	1913	126.52	107.3
4	3880	1876	124.07	106.8
5				
6				

MOISTURE DETERMINATION

Test Number	Wet Wt. Soil & Pan	Dry Wt. Soil & Pan	Weight Pan	Dry Wt. Soil	Moisture loss	Percent Moisture
45 46	69.13 66.79	60.19 57.98				20.1
47 48	70.23 64.99	61.87 57.07				19.2
53 54	61.93 58.34	55.00 52.01				17.8
51 52	61.39 62.94	54.73 56.33				16.4
5						
6						

Wet Maximum Density, lbs. per cu. ft. 128.7
Dry Maximum Density, lbs. per cu. ft. 107.6
Wet Optimum Moisture, Per Cent 20.6
Dry Optimum Moisture, Per Cent 18.3

Remarks:

Form S-9-13-51

DH:cd

APPENDIX

E-3

RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.46	1(RS&I)	LASALLE	142	1
F.H.W.A. REG. 4		ILLINOIS	PROJECT HES 46(12)	2

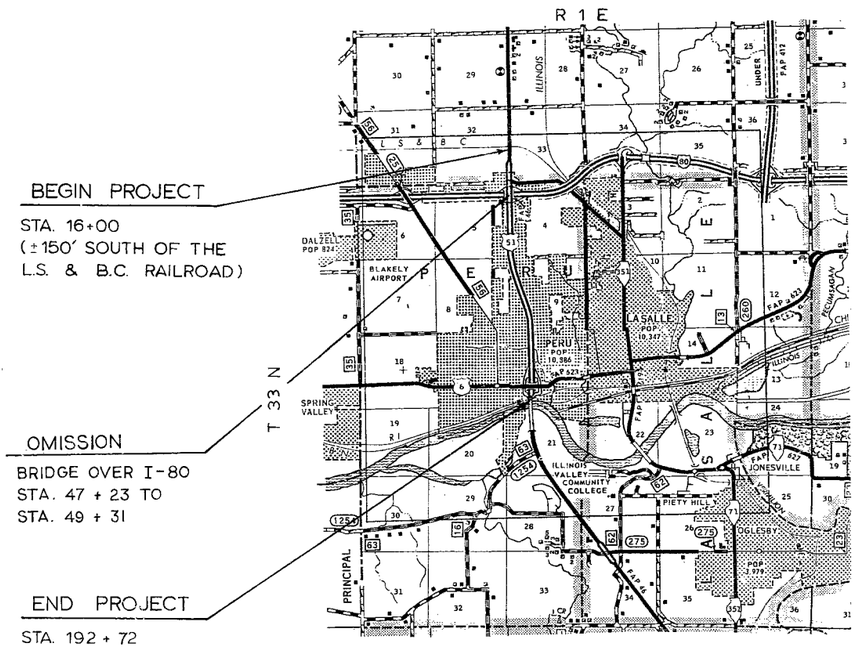
NOTE:
SEE SHEET NO. 15
FOR INDEX OF SHEETS
AND STANDARDS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

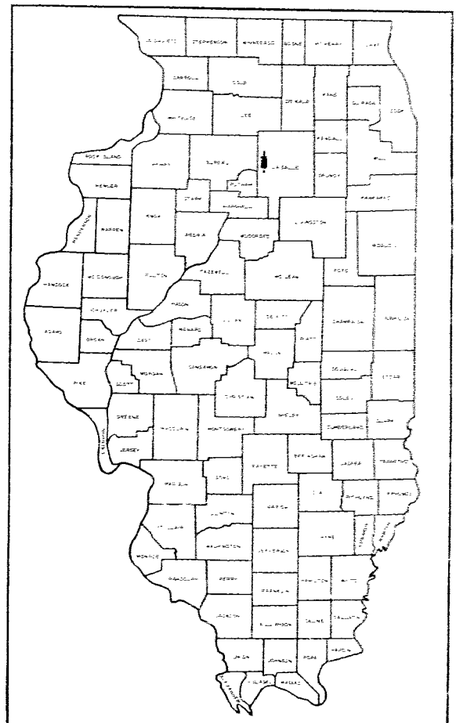
F. A. ROUTE 46 (U.S. 51)
SECTION 1(RS & I)
LA SALLE COUNTY
PROJECT F-HES-46(12)

C-93-128-83



APPROXIMATE SCALE: 1 INCH = 1 MILE

P-93-017-82



LOCATION OF SECTION INDICATED THUS: —

1485 (94) MAJOR HIGHWAY 8.02 (B-10)
D_S = 3.8

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED 3-28 1984
R H Bennett
DISTRICT ENGINEER

EXAMINED 4-6 1984
D J Wolaver

PASSED 4-6 1984
John A Ollis
ENGINEER OF BUREAU OF CONTRACTS

APPROVED 4-6 1984
Thomas J Domagalski
DIRECTOR DIVISION OF HIGHWAYS

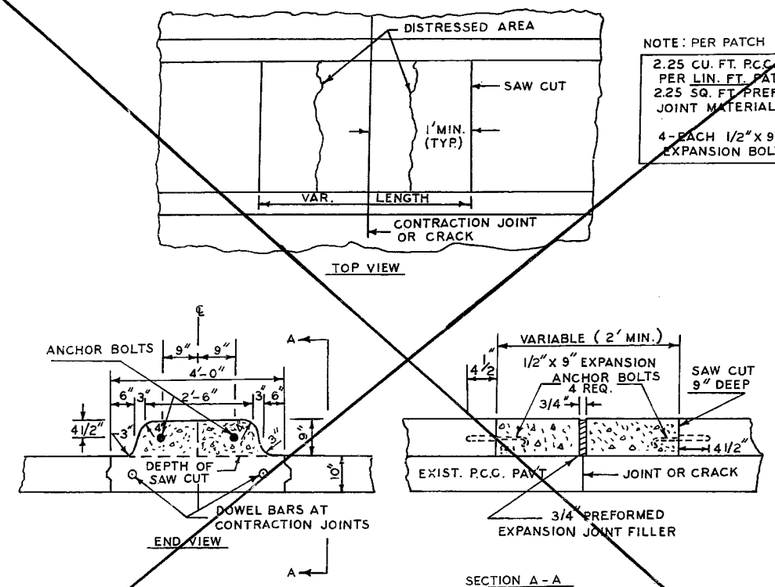
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
Division Engineer Date

PROJECT ENGINEER : DON DROPEK
SQUAD CHIEF : CHUCK EBERHARD
DIMMICK & PERU TOWNSHIPS
J.U.L.I.E. NO. 800-892-0123

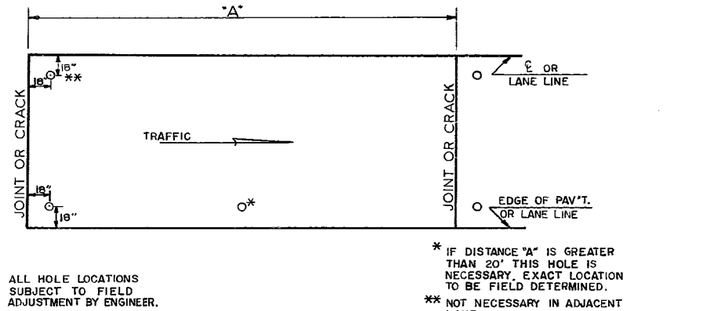
CONTRACT NO. 38025

GROSS LENGTH OF IMPROVEMENT = 17,672.00 FEET = 3.347 MILES
BRIDGE OMISSION = 208.00 FEET = 0.039 MILES
NET LENGTH OF IMPROVEMENT = 17,464.00 FEET = 3.308 MILES

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
F.A. 46	1(RS#1)	LA SALLE	142	12
F.H.W.A. REG. 4	ILLINOIS	PROJECT		



DETAILS OF CONC. MEDIAN PATCHING
STA. 176+30 TO STA. 193+22

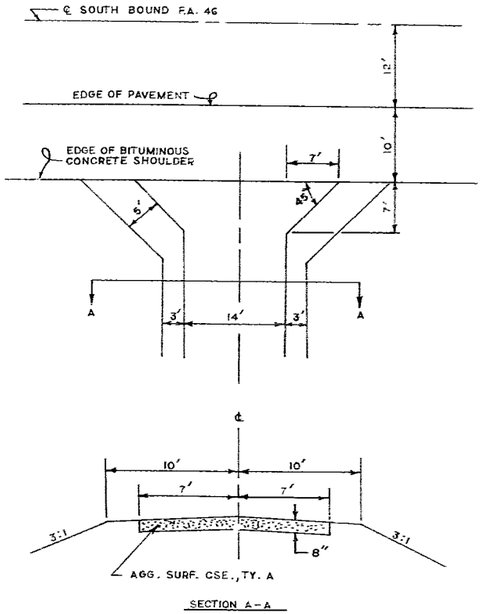


ALL HOLE LOCATIONS SUBJECT TO FIELD ADJUSTMENT BY ENGINEER.

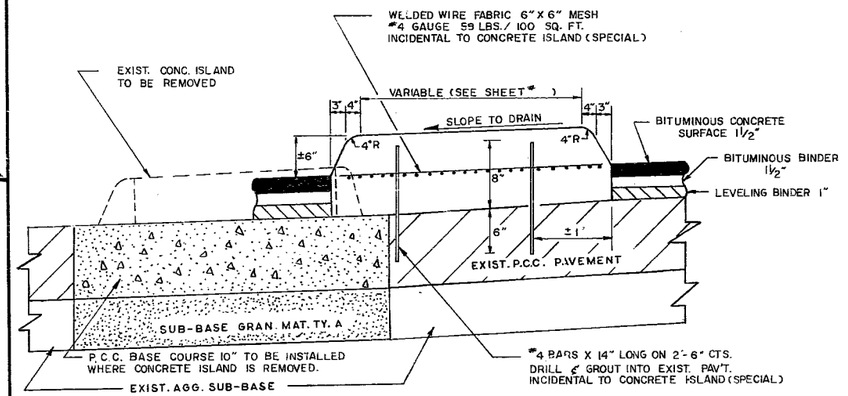
* IF DISTANCE "A" IS GREATER THAN 20' THIS HOLE IS NECESSARY. EXACT LOCATION TO BE FIELD DETERMINED.

** NOT NECESSARY IN ADJACENT LANE.

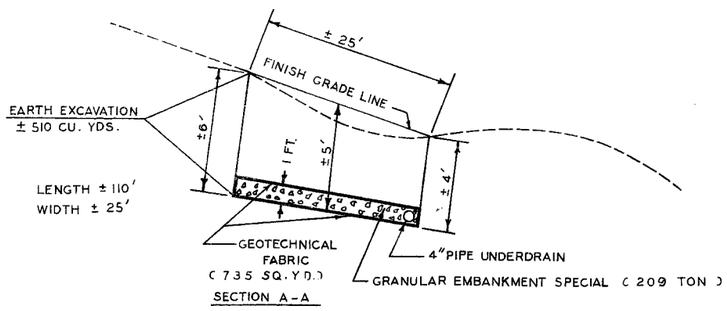
HOLE PATTERN FOR UNDERSEALING



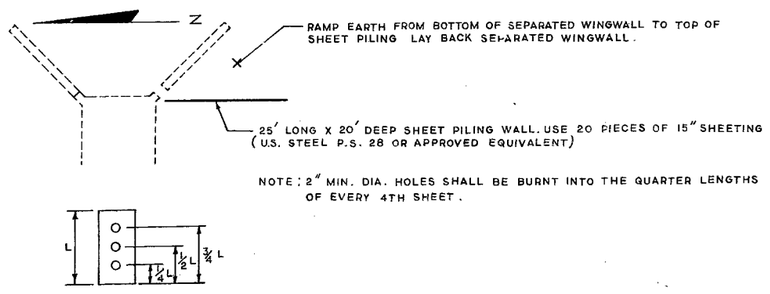
PLAN AT FIELD ENTRANCE
STA. 106+75 RT.



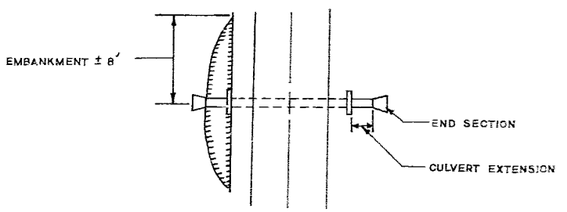
CONCRETE ISLAND (SPECIAL)
RAMP C AND U.S. 51 INTERSECTION
WENZEL ROAD ALL QUADRANTS
SHOOTING PARK ROAD ALL QUADRANTS
MALL ENTRANCE RT. ℄ LT. (4 ISLANDS)



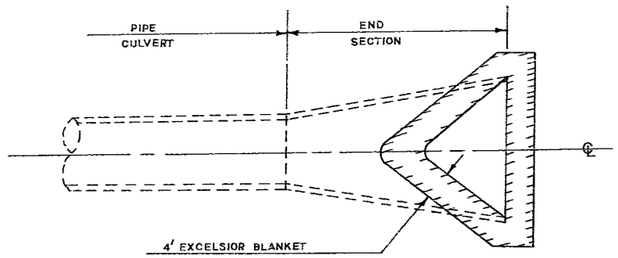
PROPOSED CHIMNEY DRAIN SYSTEM @ SLOPE FAILURE LT. STA. 163+00



SHEET PILING DETAIL
± 200' LT. STATION 162+20



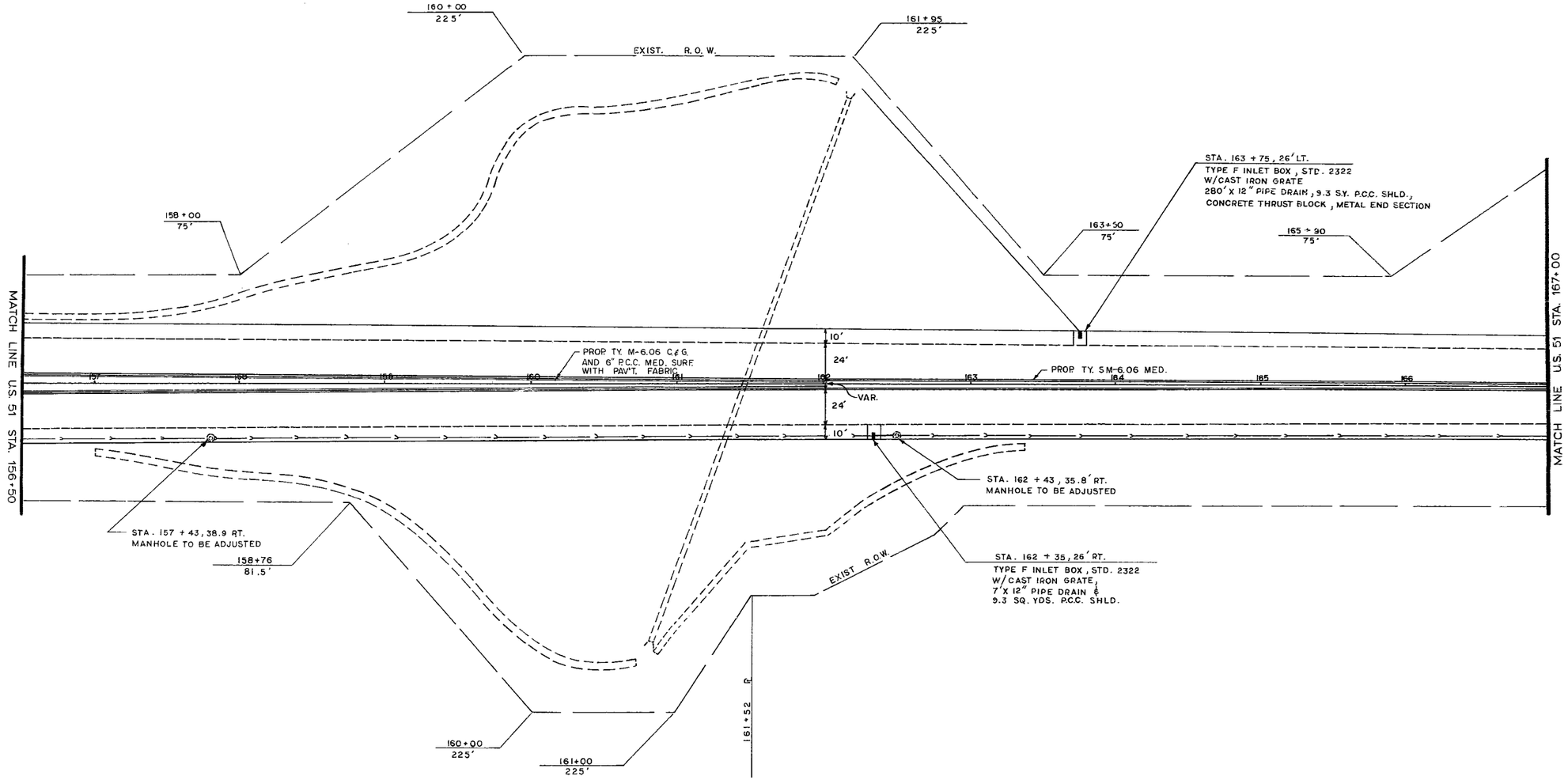
TYPICAL SECTION AT CULVERT EXTENSIONS



EXCELSIOR BLANKET AT PROPOSED END SECTIONS

SPECIAL DETAILS

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 48	1(2 S(1)	LA SALLE		55
FHWA REG 4	ILLINOIS	PROJECT		



SCALE : 1"= 40'

STA. 156+50 TO STA. 167+00

APPENDIX

E-4

Soils Micheci

Illinois Department of Transportation

Memorandum

To: R. A. Chiado

From: W. N. Flaa

Subject: Shoulder and Slope Treatment*

Date: November 22, 1983

* FA Route 46
Section 1RS
LaSalle County
P-93-017-82

Additional soil borings were taken between September 17 and 22, 1983. A soil profile along the east shoulder is included with this memorandum. Soil strengths and moisture contents were mostly within acceptable limits.

It should be noted that this area has been a perenial problem with the south east wing wall of the box culvert being removed and replaced soon after the original construction.

The underlying impervious shale layer slopes towards the east. Any accumulated moisture in the embankment must exit through the slope as the material below the fill is impervious.

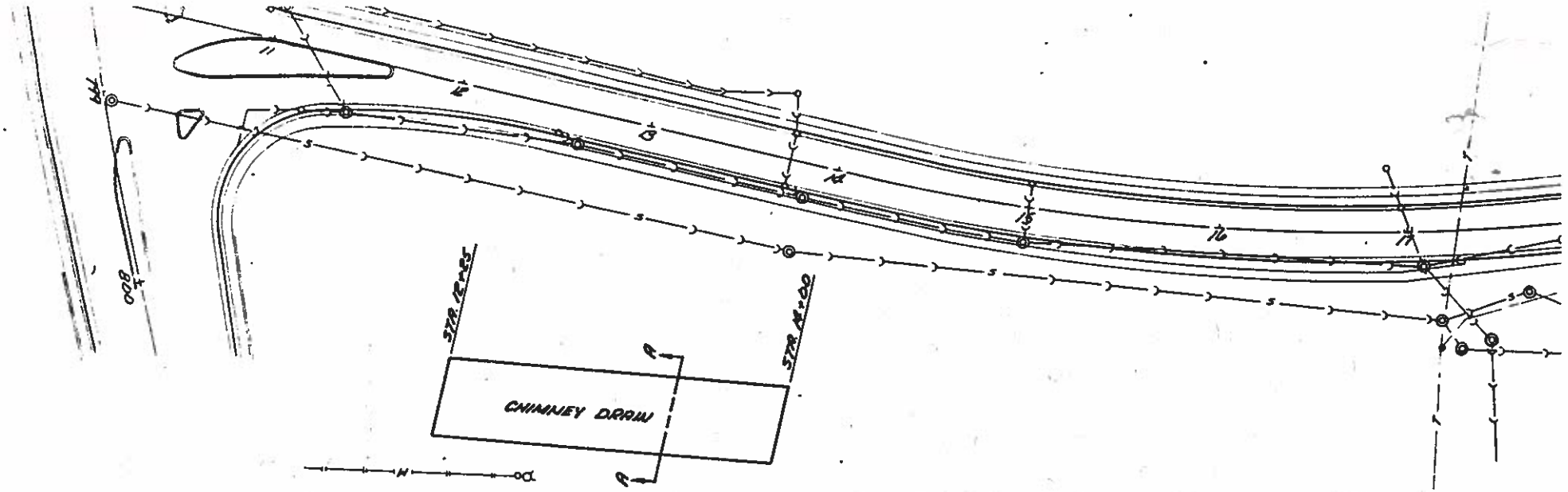
At this time most of the eastern sideslope is stable with the bushes high up on the slope and almost all of the trees lower down are still in a vertical position.

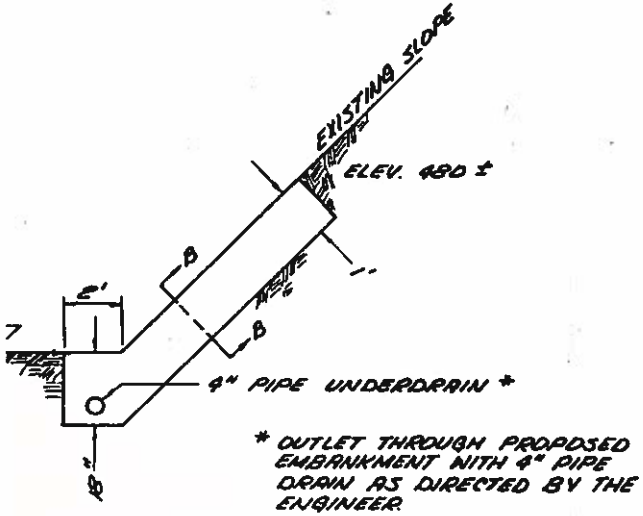
We propose the narrow diagonal portion on the slope that has moved be removed down to competent material. A granular blanket "chimney drain" should be placed on the stripped down area enclosed in geotechnical fabric and outletted at the bottom of the ravine. This is similar to the reconstruction procedure on Route 71 in Ottawa.

For the shoulder problem area, at least 12 inches of the existing shoulder material should be removed down to stable material and reconstructed using standard construction procedures. Edge of pavement drains, 4 inch granular subbase and bituminous curbing are necessary features for the shoulder reconstruction. This is similar to the railroad embankment treatment on FAI Route 57 at Gilman.

After the chimney drain is installed and functioning additional soil can be added to bring the embankment back to its original slope.

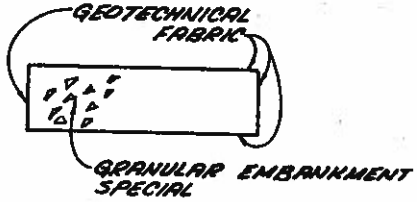
WHB:sj
cc: C. Eberhard



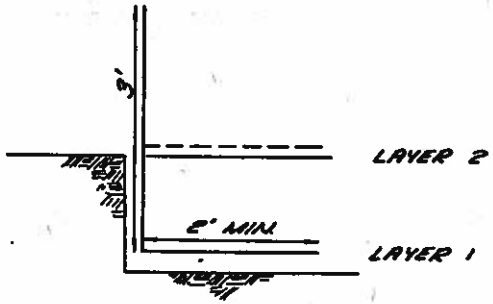


* OUTLET THROUGH PROPOSED EMBANKMENT WITH 4" PIPE DRAIN AS DIRECTED BY THE ENGINEER

SECTION A-A



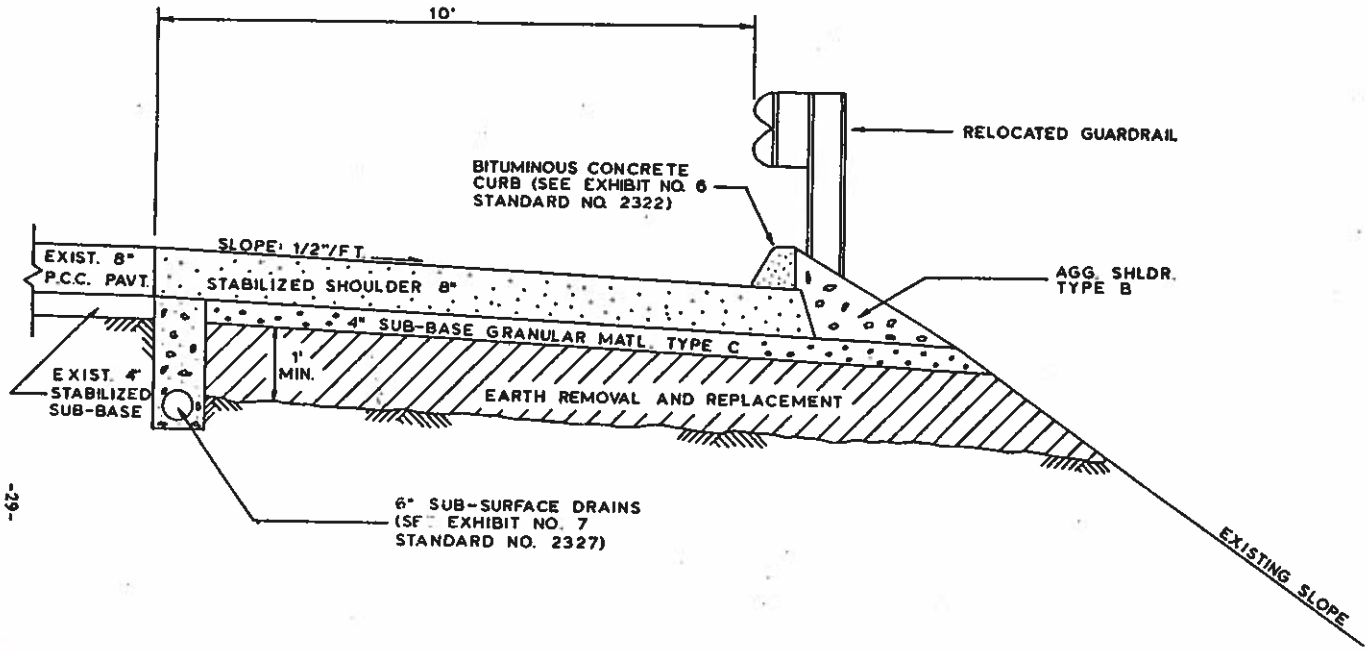
SECTION B-B



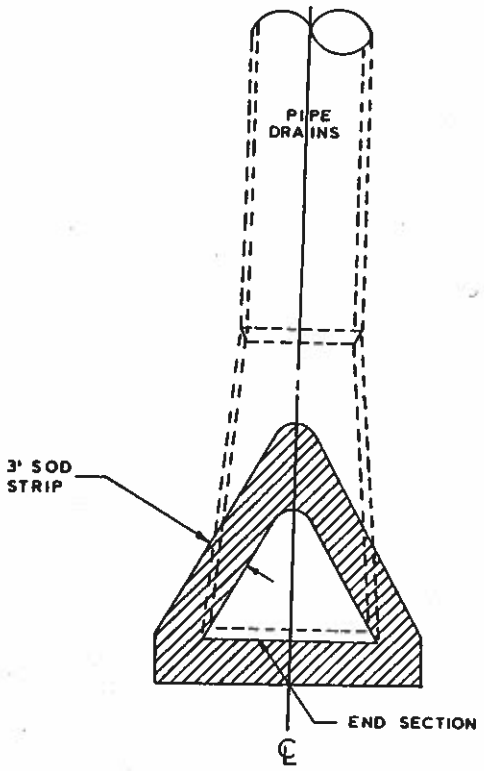
INSTALLATION GEOTECHNICAL FABRIC

QUANTITIES
CHIMNEY DRAINS

GEOTECHNICAL FABRIC	1705	SQ. YDS
GRANULAR EMBANKMENT, SPECIAL	535	TONS
PIPE UNDERDRAINS 4" (SPECIAL)	175	LIN. FT.
PIPE DRAINS 4" (SPECIAL)	40	LIN. FT.



TYPICAL SECTION
OUTER SHOULDER RECONSTRUCTION



SOD AT
PROPOSED
METAL END SECTIONS

EXHIBIT NO. 5

Illinois Department of Transportation

Memorandum

To: Bill Flaa

From: Ralph Chiado **By:** Don Dropek

Subject: *SLOPE FAILURE

Date: November 18, 1983

*F.A. Route 46 (U.S. 51)
Section 1RS
LaSalle County

A slope failure exists on the east side of U.S. Route 51 south of Shooting Park Road in the vicinity of Station 163+00 on the subject improvement. Continued field inspection at this location has shown the slide to be increasing in magnitude since borings were requested on September 15 of this year.

Since the subject improvement is scheduled for a March 1984 letting and plans should be in Springfield in January, I am requesting a recommendation by your bureau be made as soon as possible as to construction operations necessary to alleviate this situation.

DJD:lml

Illinois Department of Transportation

Memorandum

To: Bill Flaa **Attn:** Bill Beck

From: Ralph Chiado **By:** Don Dropek

Subject: SOIL BORINGS*

Date: September 15, 1983

*F.A. Route 46
Section 1RS
LaSalle County

Due to an ongoing slope failure located at the subject route and section, I am requesting soil borings be taken from left of Station 159+00 to left of Station 171+00.

CE:lml

Soils

Illinois Department of Transportation

Memorandum

To: J. F. Piggott

From: W. N. Flaa

Subject: Pavement Undersealing*

Date: August 3, 1983

* SB12,FAU6101, FAP46(US51)
Section 1RS
LaSalle County

Due to the high traffic volume and underlying soil conditions it is recommended that pavement undersealing be used to prevent premature deterioration of the pavement structure.

WHB:sj

FPP

Illinois Department of Transportation

Memorandum

To: J. F. Piggott

From: W. N. Flaa

Subject: Underdrain Use*

Date: June 9, 1983

* FAP Route 46
Section 1RS
LaSalle County
P-93-017-82

This is in reply to your memorandum of June 1, 1983. Carl Pattelli is suggesting a pipe underdrain beneath the ditch line north of the 7th street overhead and west of the roadway.

The ditch line runs on shale at this location. I do not think there would be any benefit to placing a perforated drain below this elevation.

Planning has indicated that the ditch grade will be changed as part of the shoulder rehabilitation operation. This should take care of any standing water.

WHB:sj

cc: C. Pattelli
Soils

Illinois Department of Transportation

Memorandum

To: B. Flaa

From: J. F. Piggott

Subject: U.S. Route 51 - Peru

Date: June 1, 1983

On a recent field trip for the purpose of developing plans for the reconstruction of U.S. Route 51 in Peru, Carl Pattelli called our attention to an erosion problem he was having with the back slopes on the west side of the roadway just north of the 7th Street overhead. Carl suggested that some type of underdrain be provided to get rid of the water.

It would be appreciated if somebody from your Soils Department contact Mr. Pattelli to pin-point the problem and to furnish this office with a recommendation relative to the construction item needed to correct the situation.

— Ditch running on shale
Intercept water at top of slope?
Lagged Ditches

ATTN: W. BECK

Files

C. Eberhard

FIELD CHECK*

April 25, 1983

*S.B.I. 2, F.A.U. 6101, F.A.P. 46 (U.S. 51)
Section 1RS
LaSalle County

The proposed improvement for the subject route and section was field checked on April 20, 1983 by Don Dropek, Ed Hatcher, Ed Krysiak, Carl Patelli and myself. Listed below are the pertinent comments.

1. Begin job ± 150' south of the LaSalle and Bureau County Railroad which is located approximately 3,000' north of Int. 80. Use a butt jt. taper sloped at 20 ft. per inch.

2. Mainline improvement consists of 1 1/2" surface course plus 5/8" leveling binder. Inside shoulders consist of 6' bit. + 2' agg. Outside shoulders consist of 10' bit. This is a 5 yr. design improvement.

3. The concrete median from the LaSalle Road int. north should be repaired where needed. The C-4 median shall be ground down to allow for a min. resurfacing of 1 1/2". Full 2 1/8" resurfacing up to median curb (no taper).

4. Plans should contain details of any special work on median shoulders or inlets.

5. No mailbox turnouts.

6. Run stab. shldr. thru private and field entrances.

7. LaSalle Road (west) should be resurfaced full thickness to ± 50' west of int. then a taper at gas station entrance.

8. Butt jts. @ bridge abutments.

9. End pipe underdrains each side of intersections.

10. Existing outside stab. shldr. should be resurfaced and the guardrail raised where required.

11. At the int. of U.S. 51 and the I-80 south ent. + exit ramps, remove all islands and C+G. Except the north median nose. Roger Wright has examined the geometrics here for a previous project. Will check further.

12. At all intersections with grass medians, Carl Patelli would like the first 100' of median to be all bit. material, and if not bit. then all gravel. We agreed to place full 8" agg. median inside the standard 8' shoulder.

13. Check with Lee McCumsey on a few field entrances to see if permits were issued.

14. On 36th St. int. continue 2 1/8" resurfacing ±140' rt.

15. All raised reflectors shall be removed. Check into possibility of replacing with low profile reflectors.

16. At Wenzel Rd. intersection, 2 1/8" resurfacing to ±160' right of int. then taper down.

17. The concrete median between Wenzel Rd. and Shooting Park Rd. should be removed and replaced with C-4 median in the narrow area and all stab. shldr. and barrier wall in the wider area.

18. The box culvert east of U.S. 51 between Shooting Park Rd. and U.S. 6 has a separated wingwall. We should place sheet piling to hold ground in place, dig out behind the separated wingwall and lay it back (like a slopewall) rather than remove it.

19. Check with Materials Dept. on a solution to slope failure right above the box culvert named above. We could possibly use sheet piling and/or pipe underdrains to solve problem. See #20.

20. Carl Patelli suggested placing C+G along the shldr. in the above mentioned location. The east C+G would drain into an inlet which would carry the water down the fill slope to the creek. The west C+G would drain into the existing paved ditch. The Materials Dept. agrees with this proposal and suggests for the slope failure mentioned in #19 above that we push the loose material back in place and reseed it.

21. The paved ditch and box culvert west of U.S. 51 in the same above mentioned area should be left alone.

22. Carl Patelli would like pipe underdrains along the toe of the backslopes near U.S. 6, and along the ent. + exit ramps where we are placing stab. shldr. The Materials Department agrees except for the placement of underdrains at the toes of the above mentioned backslopes. However, they will check into this further.

23. All eight ramps @ U.S. 6 int. should be resurfaced with 5/8" Lev. Bind. + 1 1/2" Surface Course.

24. All eight ramps @ U.S. 6 int. should get Std. Stab. Shldr. where possible.

25. At the above location, the gutter on the inside of the inside four ramps should be removed and replaced with 10" stab. shldrs.

26. The following clearances were obtained:

N.B. lanes U.S. 51 to U.S. 6 overpass	=	14'-5"
S.B. lanes U.S. 51 to U.S. 6 overpass	=	14'-7"
N.B. lanes U.S. 51 to 7th St. overpass	=	14'-6"
S.B. lanes U.S. 51 to 7th st. overpass	=	15'-0"

We may have to grind down one or two inches before resurfacing here.

27. This field check covered only the west half of the improvement. A field check of the east half of the improvement and a patching survey have yet to be accomplished.

28. Some of the above decisions will have to be reviewed and accepted at the Bureau Chief level.

Bill B.

Illinois Department of Transportation

Memorandum

To: J. F. Piggott

From: W. N. Flaa

Subject: Slope Failure*

Date: April 22, 1983

* F.A.P. Route 46
Section 1RS
LaSalle County
P-93-017-82

William Beck looked at a slope failure in the foreslope in the first large fill area south of Shooting Park Road on U.S. Route 51.

Edge of pavement drains and stabilized shoulders are proposed as part of rehabilitation for this section. A bituminous curb is also recommended at the outside edge of the stabilized shoulder. Surface runoff comes downhill from the north has saturated the foreslope of this location.

A pay item for reshaping and seeding the existing slope should be included in the contract.

Planning has indicated that reconstruction is not scheduled until 1984 or 1985. In the meantime, some sort of temporary berm should be constructed to carry the pavement surface water past this area of instability.

WHB:sj

cc: C. Pattelli

APPENDIX

E-5

Illinois Department of Transportation

Memorandum

To: R. H. Blasius

From: E.M. Krysiak

Subject: Route 251 Shoulder Settlement Repairs

Date: April 27, 1988

I. OGLESBY

The bluff line on the south side of the Illinois River near Oglesby has always been vulnerable to shallow slumps when water has reached the underlying shale layers.

A few hundred feet west of IDOT's shoulder slump in Trovero's Subdivision, there are roadways thru the bluff that have failed and then have been abandoned because there was not an economically viable method of repair.

Previous corrective measures for IDOT's problem area thru the bluff have been directed toward intercepting surface water and water traveling underneath the pavement from reaching the critical area which is just past the point where the roadway passes from a cut section to a fill section. Once cracks have developed in this embankment, it is extremely difficult to stop water from reentering the region of distress.

The material used in the fill section embankment is a mixture of shale layers, sand layers, and good soil layers that do not have a regular pattern. All we know for sure is that the sand layers can carry water and, also, if the shale layers become lubricated with water, their soil strength in the embankment approaches zero.

At this time, we are recommending the fallback position we had two years ago if the water interception strategies did not work. This is a design that has been "roughed out" by Gordon Benson and Bob Brownfield, former employees of the bridge office's foundation section.

This recommendation is "I" beams drilled and grouted in the fill 60 feet left of centerline on 8 foot centers with cable tie backs from the top of the "I" beams back into the embankment. Timber whalers are placed between the "I" beams to construct a wall 12 feet by 250 feet backfilled with material to create a berm effect.

A. Station Limits 261+00 to 263+50 (250 feet)
B. HP 10x42 Piles 28 Feet Long, Precored and Grouted
C. One Inch Diameter 150 KSI Grouted Anchors
D. Timber Whalers 5" By 12" By 8'

Total Estimated Cost: $150,215

Traffic Control	25,000
(33) 28' Steel Piles, Recored and Grouted $23/Ft.	21,250
9' Precoring Bouldery Soil @ 6.90/Ft.	2,050
7' Precoring Weak Rock @ 17.25/Ft.	4,000
(375) Treated Timbers 5"x12"x8' @ 30/Each	11,250
462 Yds. Earthwork @ 11.50/Yd.	5,315
250' Steel Whaler @ 29/Ft.	7,250
(17) Rock Anchors @ 2300/Each	39,100
	$115,215

After the slope treatment is completed, the shoulder, gutter and guardrail can be reconstructed and the pavement resurfaced.

Shoulder Material	6,000
Concrete Gutter	2,200
Remove and Realign Guardrail	2,000
Resurfacing	25,000
	$35,000

II. PERU

The slump in the Route 251 outside shoulder on the northbound side behind Eagles was investigated and could be included under this contract. Again, shale was used as embankment material and when it accumulates moisture it loses cohesive soil strength.

Low strength, high moisture content soils were found down to a depth of ten feet at the settlement location, Station 162+90. We recommend removal and replacement with PGE material between Station 162+65 to 163+15 with a perforated drain at the back of the excavation daylighted to the sideslope.

Traffic Control	5,000
Temp Sheet Piling at EOP $10/Sq. Ft.	7,500
Removal and Replacement with PGE $16/Yd.	6,400
Perforated Drain $4/Ft.	320
Reconnect EOP Drain	100
4" Subbase Granular $4/Sq. Yd.	240
24" Cohesive Soil for Side Slope $8/Yd.	680
Remove and Reset Guardrail 100'	1,000
Reconstruct Bit. Shoulder & Curb $25/Sq. Yd.	1,500
Total Estimated Cost	$22,700

APPENDIX

E-6

Bill file

Illinois Department of Transportation

Memorandum

To: File

From: W. H. Beck

Subject: Route 251 Slope Movement Update

Date: November 21, 1989

In response to Mr. Micheli's frequent inquiries, we offer the following update.

There still is some movement of this sideslope failure eastward from the fault line shown on the plan view of the roadway. The fault line follows the direction of the original bluff before the relocation of U.S. Route 51 was built across the Illinois River Valley at Peru.

We have two inclinometer tubes that are still operational after Maintenance reconstructed the shoulder and gutter in 1988. The edge of roadway location (Tube IV) shows a sharp break at a depth of 17 feet. The side hill location (Tube III) shows a more gradual movement with most movement in the top ten feet from the surface.

Unstable slopes are almost always due to excess moisture that in turn weakens a susceptible soil layer. In this case, the water may be following the pavement structure down the five percent grade even after several attempts to cut off the water before it reaches the critical area. The other possibility for the water source is that it is travelling on top of one of the limestone stringers that are in the soil profile of the bluff and this can not be intercepted by any treatment available near the pavement structure.

The inclinometer tube readings are summarized below.

TUBE IV

Horizontal movement at a depth of 17.0 feet.

DESCRIPTION	INTERVAL	INTERVAL MOVEMENT	TOTAL MOVEMENT
Placement of Tube (June 1985)	- - -	0.0"	0.0"
Reading (July 1986)	64 Weeks	1.1"	1.1"
Reading (March 1988)	82 Weeks	1.4"	2.5"
Reading (Nov. 1989)	86 Weeks	2.7"	5.2"

TUBE III

Horizontal movement at a depth of 10.0 feet.

DESCRIPTION	INTERVAL	INTERVAL MOVEMENT	TOTAL MOVEMENT
Placement of Tube (May 1985)	- - -	0.0"	0.0"
Reading (July 1986)	60 Weeks	0.7"	0.7"
Reading (March 1988)	82 Weeks	0.3"	1.0"
Reading (Nov. 1989)	86 Weeks	0.7"	1.7"

I. High Tech Solution

This remains the solution in the April 27, 1988 memo to R. H. Blasius. This involves 28 foot H piles on ten foot centers cored and grouted at the base and with cable tie backs securing the tops. Our estimate at that time was $150,000.

II. Low Tech Solution

This treatment may very well stabilize the embankment but cannot be guaranteed.

Use a backhoe to cut vertical trenches at two or three locations along the pavement edge, place a fiber mat drain vertically at the back of the trench with a six inch perforated drain outlet at the bottom which would be daylighted to the east thru the sideslope.

The movement surface appears to be at 17 feet at the pavement edge so the vertical trench would have to be excavated to that depth. Backfill the trench with PGE material and filter fabric.

III. Overview

Any outside expert that we had look at this area does not think we have a major problem or risk a sudden slope failure looking at the slide development so far. The factor of safety for the slope is probably near 1.0 with fluctuations plus or minus due to seasonal ground water levels near the slide area.

Any correction activities should be done in the winter when the ground is frozen or during the summer dry weather period.

IV. The Other Slope Movement Location

The shoulder settlement on Route 251 near Eagles should be easily solved using the "Low Tech Solution."

WHB:lw

APPENDIX

E-7

Illinois Department of Transportation

Memorandum

To: P. M. GUSTIN ATTN: J. Micheli

From: E. M. KRYSIAK

Subject: SHOULDER SETTLEMENT REPAIRS

Date: 1-16-91

AS requested, WE HAVE REVIEWED the PREVIOUS RECOMMENDATIONS MADE for the SHOULDER SETTLEMENT REPAIR of APPROXIMATELY 100 feet of SHOULDER on Route 251 AT STATION 162+90 JUST SOUTH of SHOOTING PARK ROAD IN PERU.

AGAIN, SHALE WAS USED AS EMBANKMENT MATERIAL AND AN ACCUMULATION of MOISTURE SINCE the SLOPE & SHOULDER REPAIR IN 1985 CAUSED the present SETTLEMENT TO BEGIN IN 1988.

IT IS RECOMMENDED THAT SOFT SHOULDER MATERIAL be REMOVED down to A STABLE MATERIAL. THE INCLINOMETER SHOWS the MOVEMENT to BE AT ABOUT 15 feet IN depth. A 12 INCH DRAINAGE MAT SHOULD be PLACED VERTICALLY IN the BACK of the EXCAVATION AND fastened to A four INCH PERFORATED drain AT the bottom of ~~the EXCAVATION~~. ~~The drain should be~~ AND be daylighted to the SIDE SLOPE. THE SIDES of the EXCAVATION SHOULD ~~be~~ be covered by GEOTECHNICAL FABRIC AND then BACKFILLED by PGE. REMOVAL AND REPLACEMENT of the GUARD RAIL APPEARS LIKELY. RECONSTRUCTION of the SHOULDER SHOULD INCLUDE RECONNECTION of the EDGE of PAVEMENT DRAINS AND REPLACEMENT of the BITUMINOUS CURBING.

APPENDIX

E-8

"AS BUILT"

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 46	(1)RS-1	LASALLE	64	1
F.H.W.A. REG.	ILLINOIS	PROJECT STPF-46 (20)		

P-93-058-91

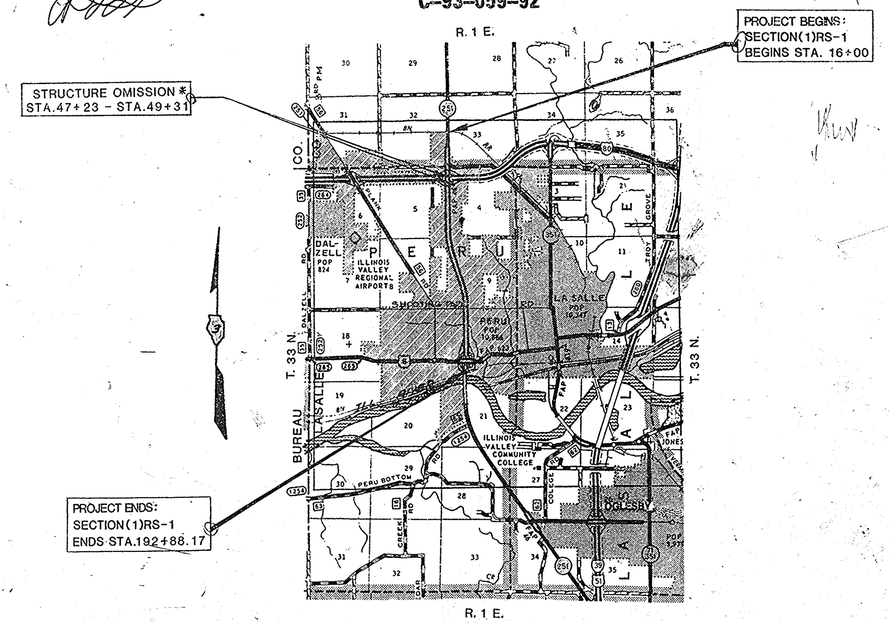
D-93-062-92

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
PLANS FOR PROPOSED
FEDERAL AID HIGHWAY

F.A.P. 46 (IL. 251)
SECTION (1) RS-1
PROJECT NO. STPF-46 (20)
LASALLE COUNTY
C-93-059-92

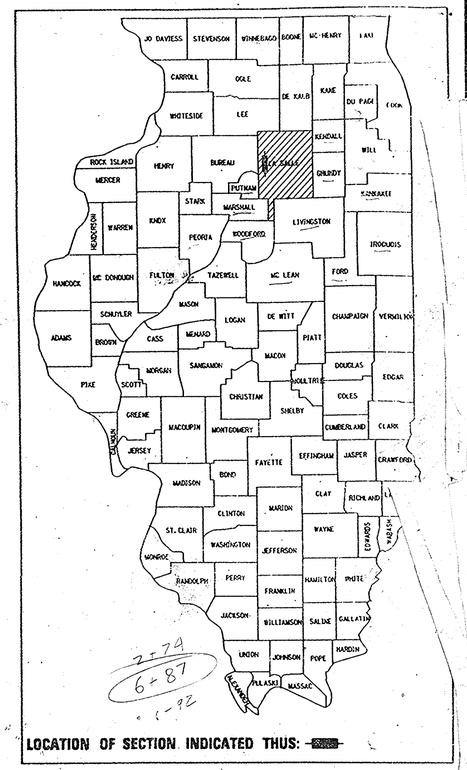
INDEX OF SHEETS

SHEET NO	DESCRIPTION
1	COVER SHEET
2	INDEX OF SHEETS & GENERAL NOTES
3-10	TYPICAL SECTIONS
11	SUMMARY OF QUANTITIES
12-16	SCHEDULES
17	CONCRETE TURN LANE DETAIL
18-21	TRAFFIC CONTROL DETAILS
22-26	DETAILS
27-45	PLAN VIEWS
46-51	TRAFFIC SIGNAL PLANS
52-63	PAVEMENT MARKING DETAILS
64	CROSS SECTIONS



* DUAL STRUCTURES:
NO'S 050-0077 & 050-0078

SCALE: 1 0 1 2 MILES



LOCATION OF SECTION INDICATED THUS: ▬

DESIGN DESIGNATION
ADT 18,800 (2013) MAJOR ARTERIAL (B-20)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED May 5 19 92
Ralph L. Dalton
DISTRICT ENGINEER

EXAMINED _____ 19 __

ENGINEER OF PLANS AND CONTRACTS

PASSED Sept 4 19 92
Gary D. Hawk
ENGINEER OF DESIGN

APPROVED _____ 19 92
Leon C. Weber
DIRECTOR, DIVISION OF HIGHWAYS

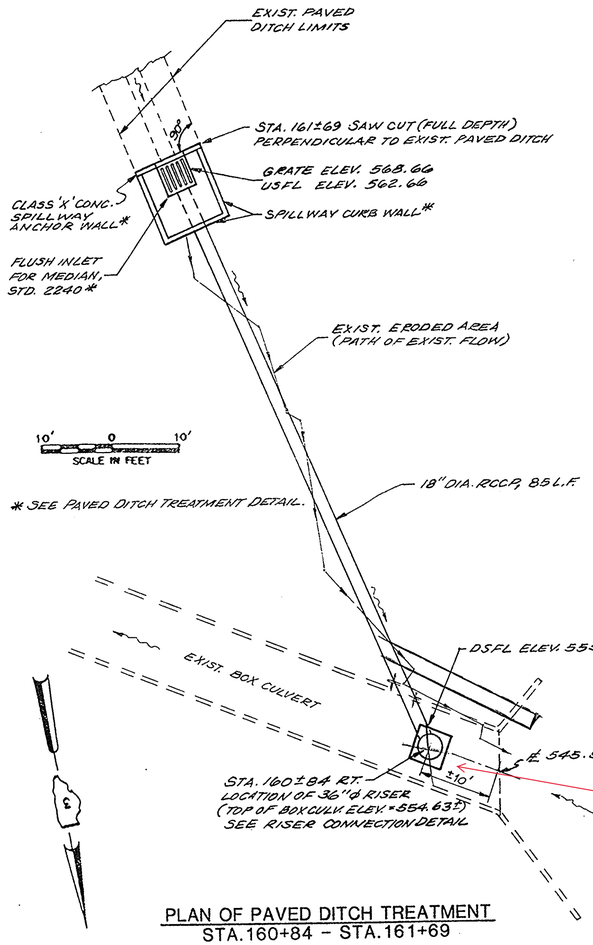
MICROFILMED _____
REEL NUMBER _____
AWARDED _____
RESIDENT ENGINEER Jon Leuenberger
AS BUILT CHANGES WERE MADE
ON THE FOLLOWING SHEETS 17, 24, 25, 30

DIST. 3 OFFICE: (815) 434-6131
JULIE 1-800-892-0123
PROJECT ENGINEER: L. SCHAUB
SQUAD LEADER: J. SPIKA, G. COOPER
TOWNSHIP: PERU TWP

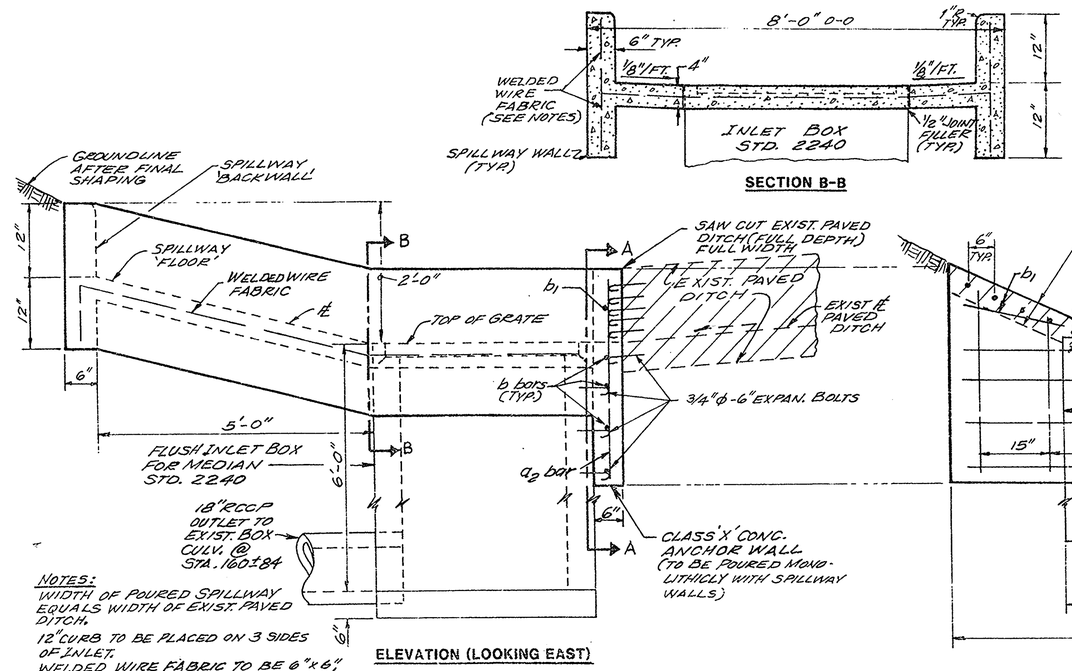
CONTRACT NO 86362

GROSS LENGTH OF IMPROVEMENT = 17,688.17 FT. = 3.350 MILES
NET LENGTH OF IMPROVEMENT = 17,480.17 FT. = 3.311 MILES

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO
FAP 46	(1)RS-1	LASALLE	64	24
F.H.W.A. REG. NO.	ILLINOIS			



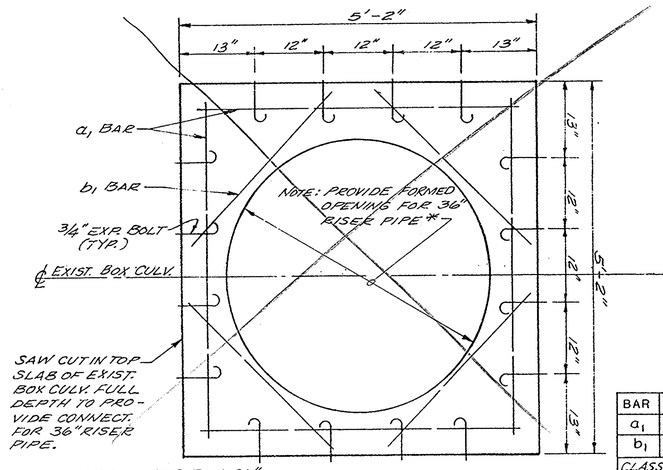
PLAN OF PAVED DITCH TREATMENT
STA.160+84 – STA.161+69



PAVED DITCH TREATMENT DETAIL
STA.161+69(RT.±106')

BAR	NO.	SIZE	LEN.	LBS.
a	3	#5	2'-0"	6
a_1	2	#5	2'-6"	5
a_2	2	#5	3'-0"	6
b	4	#5	7'-6"	31
b_1	2	#5	2'-0"	4
CLASS 'X' CONC. MISC. C.Y.				1.6
3/4"ϕ-6" EXPAN. BOLTS, EA.				25
REINF. BARS TOTAL = 55 lbs.				

Riser detail was not constructed. Instead, a HDPE pipe was placed to convey the water over the top of the headwall. See photos in Appendix D-2.



RISER CONNECTION DETAIL

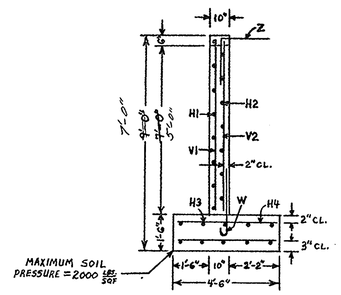
BAR	NO.	SIZE	LEN.	LBS.
a_1	4	#6	4'-8"	28
b_1	4	#6	2'-6"	15
CLASS 'X' CONC. MISC., C.Y.				0.5
3/4"ϕ-6" EXPAN. BOLTS, EA.				16
REINF. BARS TOTAL = 45 Lbs.				

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 46	(1)RS-1	LASALLE	64	25
F.H.W.A. REG. NO.	ILLINOIS			

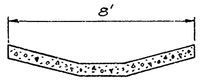
NOTES

Connect to existing NW Wingwall & Footing with 3/4" anchor bolts at 6"c-c.
For backfilling and embankment, see Standard Specifications.
Class X Concrete shall be used throughout.
Reinforcement Bars shall conform to the requirements of AASHTO M-31, M-42 or M-53 Grade 60.
Exposed edges shall be beveled 3/4".

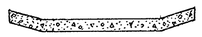
BAR	NO.	SIZE	LENGTH	LBS.	SHAPE
H1	8	#5	20'-9"	173.1	
H2	7	#4	20'-9"	97.0	
H3	10	#5	20'-6"	213.8	
H4	44	#4	4'-0"	117.6	
V1	11	#5	7'-2"	82.2	
V2	22	#4	7'-2"	105.3	
W	22	#6	3'-5"	112.9	
Z	5	#4	4'-0"	13.4	
REINFORCEMENT BARS TOTAL - 915 LBS.					
3/4" ANCHOR BOLTS (9" LONG) - 21 EACH					
CLASS X CONCRETE - 10.0 C.YD.					
RIP RAP CLASS A-4 - 15.0 S.YD.					
FILTER FABRIC FOR RIP RAP - 15.0 S.YD.					



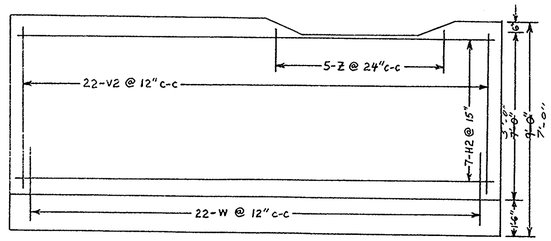
SECTION THRU WINGWALL



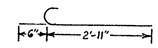
SECTION A-A



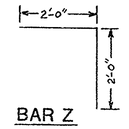
SECTION B-B



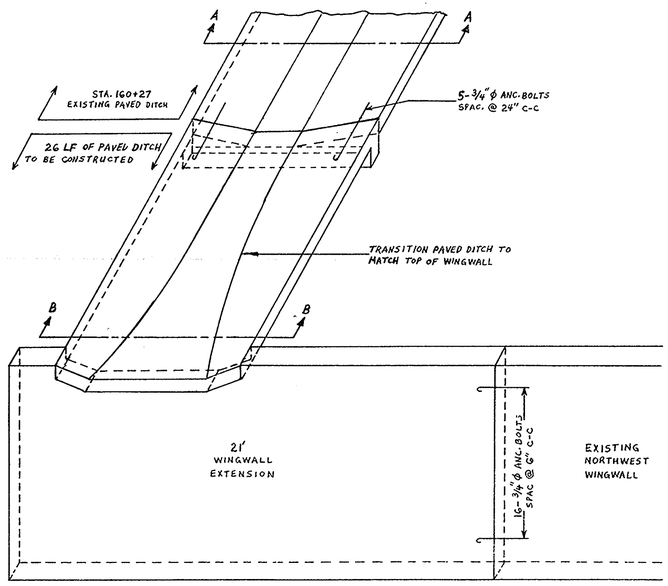
BACK FACE REINF.



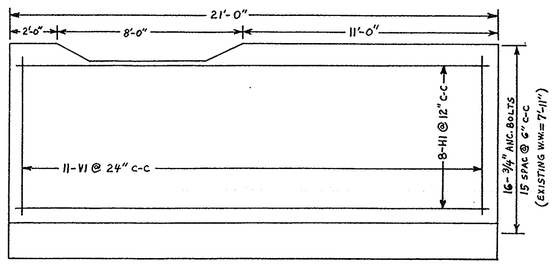
BAR W



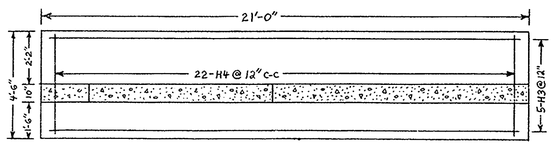
BAR Z



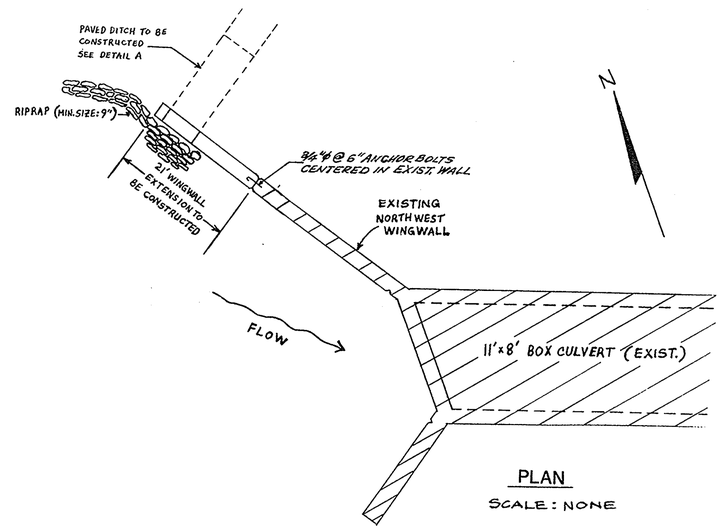
DETAIL A



FRONT FACE REINF.



FOOTING REINF.



PLAN

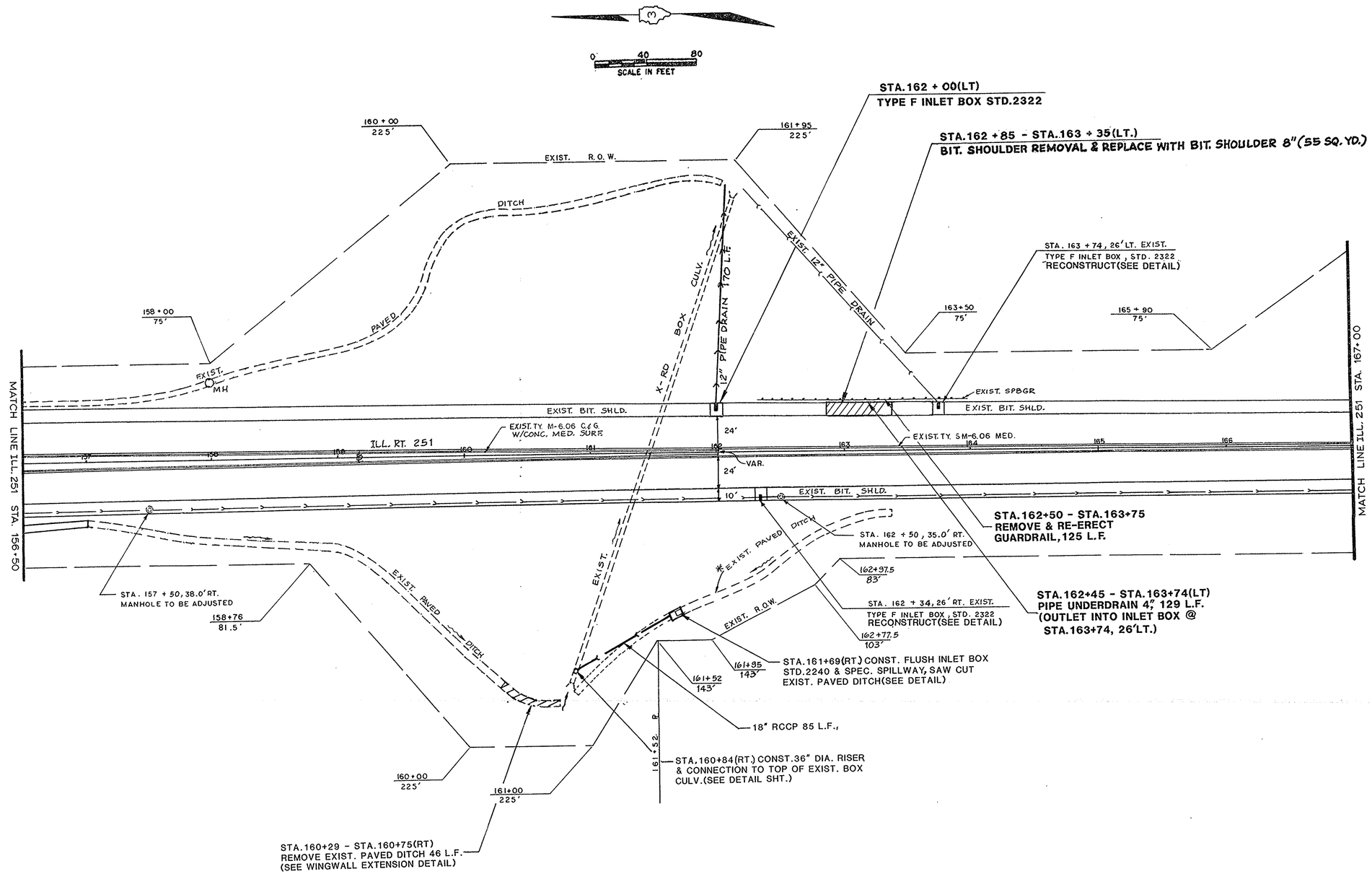
SCALE: NONE

WINGWALL EXTENSION

STA. 160+84 (RT.±182')

WINGWALL EXTENSION DETAILS

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 46	(1)RS-1	LA SALLE	64	43
F.H.W.A. REG. 4	ILLINOIS	PROJECT		



*NOTE:
EXIST. PAVED DITCH RT. STA. 160±84 TO STA. 161±69 HAS BEEN BURIED BY AN EARTH SLOPE FAILURE.

PLAN VIEW

STA. 156+50 TO STA. 167+00

APPENDIX

E-9

RETURN TO BRAD CRESTO
FILE # 712

ROUTE - FA 46 (ILL 251)
SECTION - (1)I
COUNTY - LASALLE
SHEET 1 OF 8

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISIONS OF HIGHWAYS

PLANS FOR PROPOSED
FEDERAL AID HIGHWAY

F.A. 46 (IL 251)
SECTION (1) I
LASALLE COUNTY

C-93-042-94

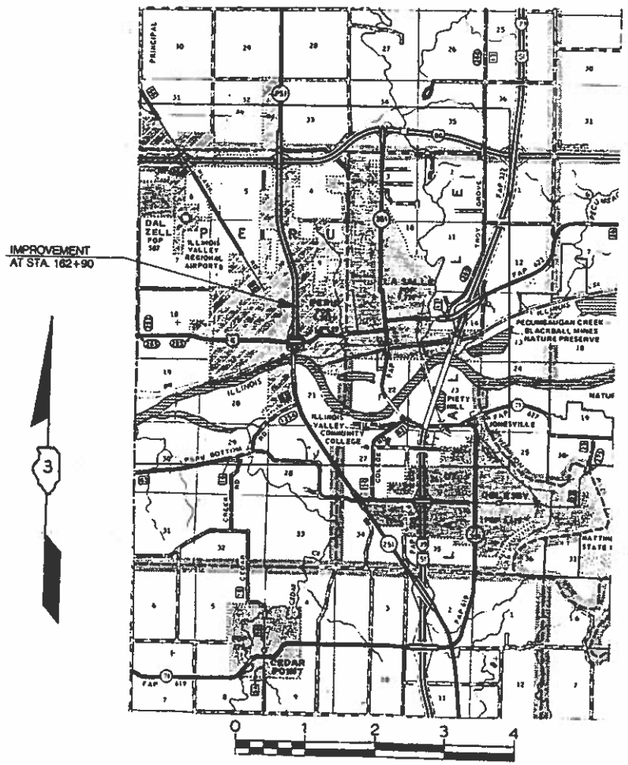
D-93-035-94

INDEX

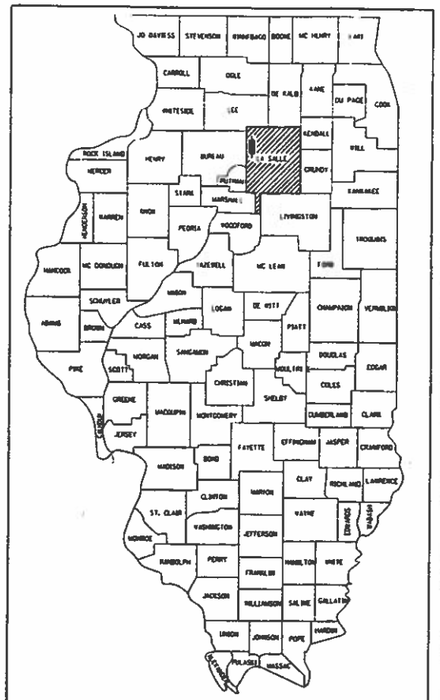
1	TITLE SHEET
2	SUMMARY OF QUANTITIES
3	PLAN AND PROFILE SHEET
4	PERMANENT EASEMENT AND ROW
5	BORING LOGS
6-8	CROSS SECTIONS

STANDARDS

1527-10	MANHOLE, TYPE A
2213-5	FRAME AND LIDS, TYPE 1
2228-5	METAL END SECTION FOR PIPE CULVERTS
2262-5	REINFORCED CONCRETE PIPE ELBOW AND PRECAST REINFORCED CONCRETE FLARED END SECTION
2298-10	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES
2299-14	DESIGN OF TRAFFIC CONTROL DEVICES
2300-4	FLAGMAN TRAFFIC CONTROL SIGN
2314-7	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES, MULTILANE,DIV. AND UNDIV., RURAL, DAY OR NIGHT
2315-9	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES, MULTILANE,DIV. AND UNDIV., RURAL, DAY



NEVER BUILT



PRINCIPLE ARTERIAL
1993 ADT - 10009
PU - 92.5 SU - 2.5 MU - 5.0

#225

MICROFILMED _____
REEL NUMBER _____
AWARDED _____
RESIDENT ENGINEER _____
AS BUILT CHANGES WERE MADE
ON THE FOLLOWING SHEETS _____

JULIE 1-800-892-0123

DISTRICT 3 NO. (815) 434-6131

PROJECT ENGINEER: LYLE SCHAUB
SQUAD LEADER: BRAD CRESTO
TOWNSHIP: PERU

CONTRACT NO. 86497

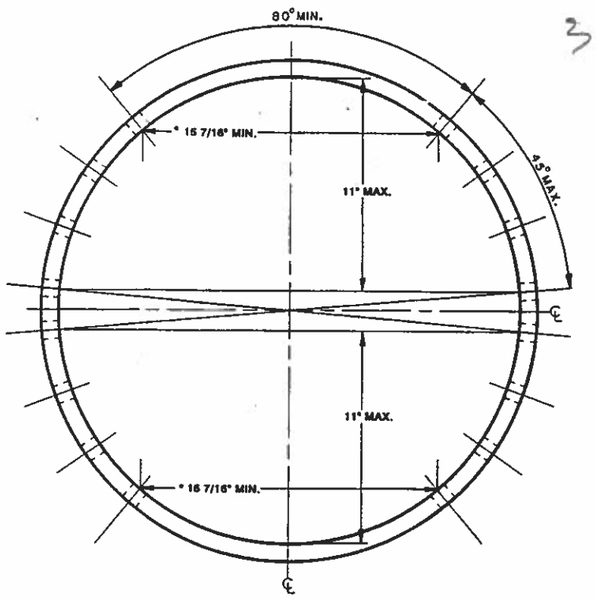
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED Feb 28 19 94
Ralph E. Dalton
DISTRICT ENGINEER

PASSED April 22 19 94
Gary Gould
ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED April 22 19 94
Ralph C. Wehner
DIRECTOR, DIVISION OF HIGHWAYS

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 46	(1) I	LASALLE	8	2
FHWA REG 4	ILLINOIS	PROJECT		



* AREA WHICH SHALL BE FREE OF PERFORATIONS.

24" STORM SEWER AND METAL LINER PERFORATION DETAIL

NOTE: PERFORATIONS TO BE SYMMETRICAL ABOUT CENTERLINE.

SUMMARY OF QUANTITIES

CODE NO.	ITEM	CONSTRUCTION TYPE CODE: Y007 UNIT	TOTAL QUANTITY
20200410	EARTH EXCAVATION (SPECIAL)	CU YD	250
51100211	PIPE CULVERT, TYPE 1, 6"	LN FT	175
61218400	MANHOLE, TYPE A, 4' DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1
64300400	EXCELSIOR BLANKET	SQ YD	118
64600400	ENGINEER'S FIELD OFFICE, TYPE A	MONTH	2
64800700	TRAFFIC CONTROL AND PROTECTION, STANDARD 2315	L SUM	1
X0301699	STORM SEWER JACKED IN PLACE, SPECIAL	LN FT	180

GENERAL NOTES

SEEDING WILL NOT BE PERMITTED AT ANY TIME WHEN THE GROUND IS FROZEN, WET, OR IN AN UNTILLABLE CONDITION. AREAS TO BE SEEDED SHALL BE DETERMINED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING UTILITY PROPERTY FROM CONSTRUCTION OPERATIONS AS OUTLINED IN ARTICLE 107.26 OF THE STANDARD SPECIFICATIONS. THE JULIE NUMBER IS 800-892-0123. A MINIMUM OF FORTY-EIGHT HOURS ADVANCE NOTICE IS REQUIRED.

MEMBERS OF JULIE KNOWN TO BE WITHIN THE LIMITS OF THE IMPROVEMENT ARE:

CITY OF PERU WATER AND SEWAGE DEPARTMENT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

PREPARED BY: Gregory L Mouth
ENGINEER OF STUDIES & PLANS

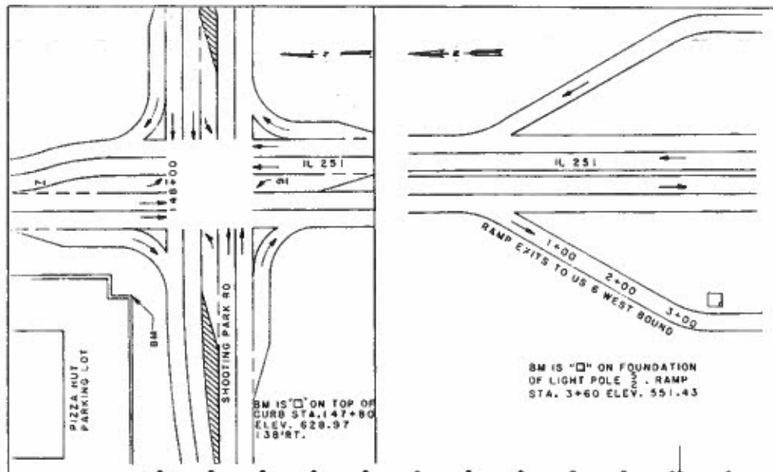
DATE: Feb 28, 1994

EXAMINED BY: Dan E. Mestelle
DISTRICT CONSTRUCTION ENGINEER

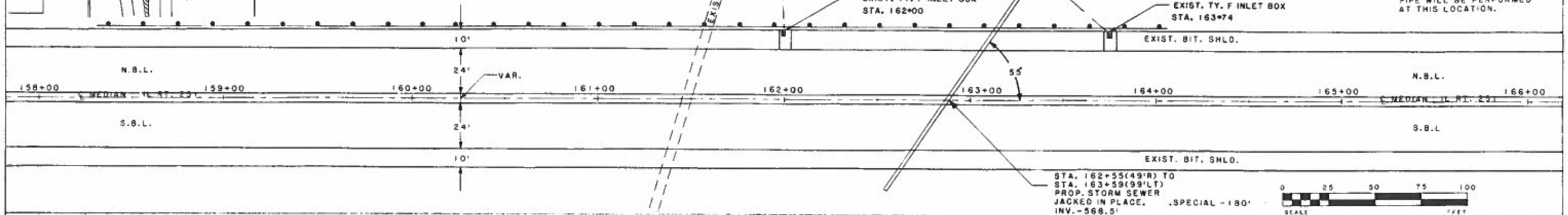
DISTRICT MATERIALS ENGINEER

DISTRICT OPERATIONS ENGINEER

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 44	(1) I	LASALLE	8	3
F.H.W.A. REG. 4	ILLINOIS	PROJECT		

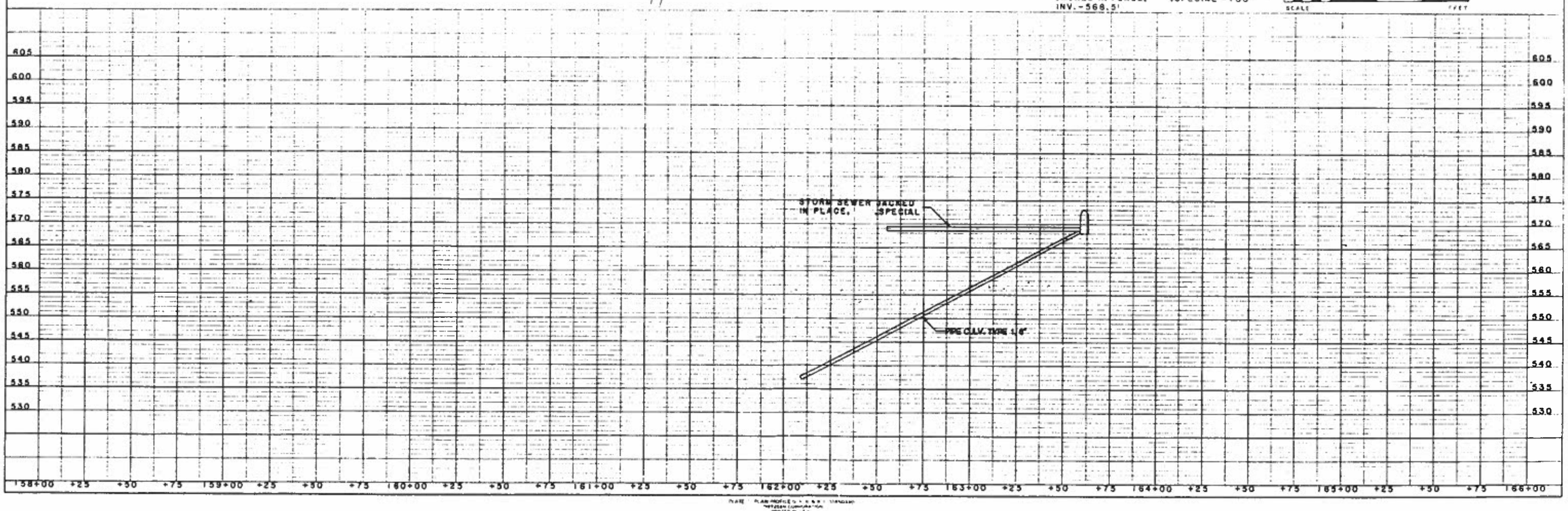


BM IS "□" ON FOUNDATION OF LIGHT POLE ON RAMP STA. 3+60 ELEV. 551.43



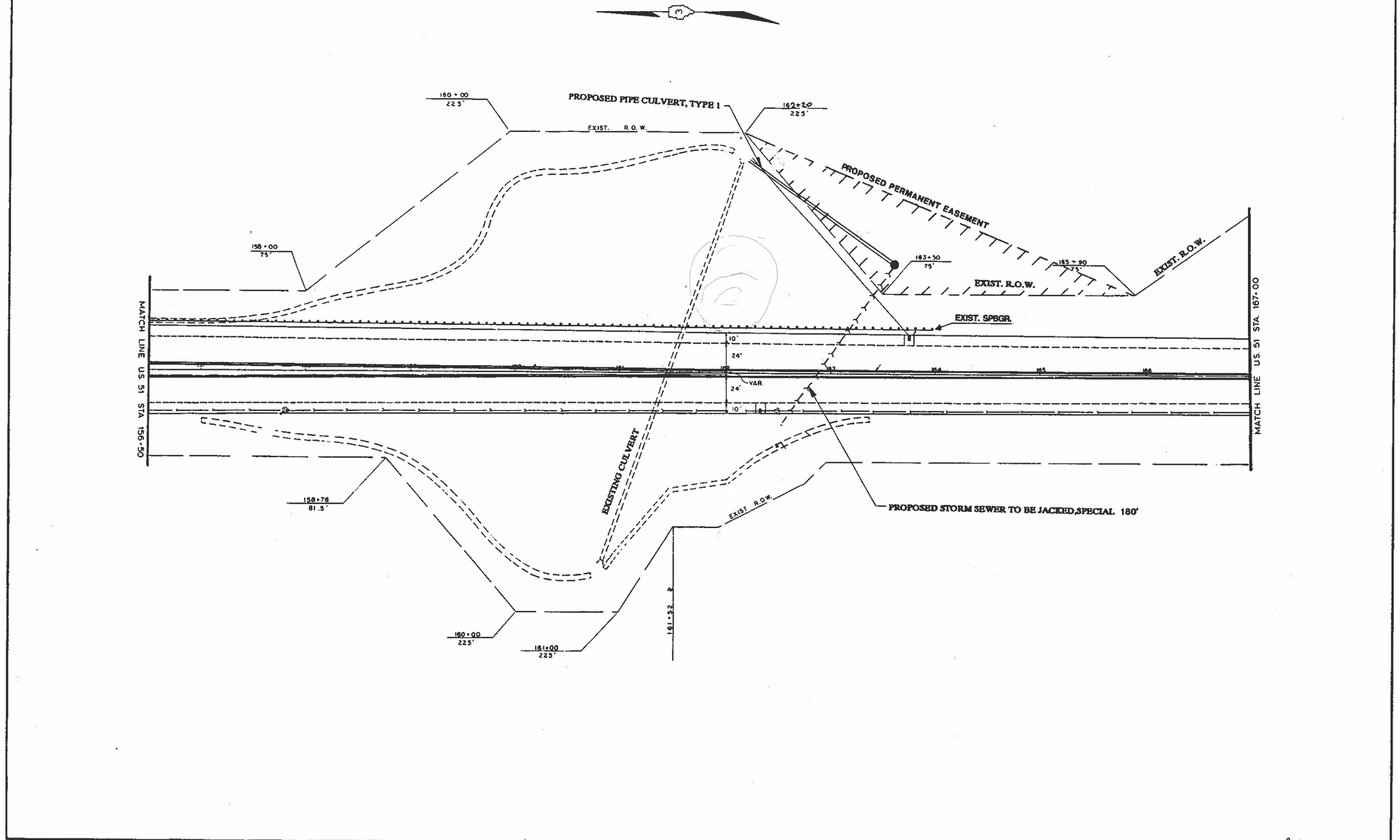
* LAY PIPE CULV. SUCH THAT THERE WILL BE 1' MIN. COVER OVER THE TOP OF THE PIPE BACK FILLED WITH EXCAVATED MATERIAL COST TO BE INCLUDED WITH PIPE CULV. TY. 1

** JACKING OF PERFORATED PIPE WILL BE PERFORMED AT THIS LOCATION.



PROFILE
SURVEYED
DRAWN
CHECKED
NOTE BOOK
FILE

ROUTE	SECTION	COUNTY	SHEETS	SHEET NUMBER
FA 46	(1) I	LA SALLE	8	4
FHWA REG 4	ILLINOIS	PROJECT		



STA. 156 + 50 TO STA. 167 + 00

RIGHT OF WAY AND PERMANENT EASEMENT

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
46	1B 1	LASALLE	8	5
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Three Materials
CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM
Bridge Foundation Boring Log

PROJECT ____ BRIDGE IL 251 NBL Date 04/13/92 Sh. 1 of 1
ROUTE FA 46(IL251) SHOULDER SLIDE Bored By K. Whittington
SEC. (1)I STA. 162+90 Checked By D. Lindeman
COUNTY LaSalle

Boring No. 1
Sta 162+90
O/S 57' LT CL

Surf Wat El. -
Grndwater El. at Compl -
At • Hrs • Date

	El.	N	Qu t/sf	W %
Ground Surface 595.0	0			
ACCESS FILL Brown SILTY CLAY, SILTY CLAY TILL & GRAVEL				
	-5			
588.5				
Loose Brown LOAM & SILTY CLAY with GRAVEL (FILL)			0.5	
WET SEAM @ 10.5'	-10		- - P	15
584.5				
			<0.5	
Weathered SHALE mixed with SILTY CLAY TILL, GRAVEL & COAL			- - P	29
(FILL)	-15		1.2	
			- - P	26
			1.2	
			- - P	26
			2.0	
576.5			- - P	23
Weathered SHALE mixed with Brown/Gray SILTY CLAY LOAM TILL (FILL)	-20		1.5	
			- - P	24
573.0				
SHALE & COAL (WATER)			- - 0.0	37

	El.	N	Qu t/sf	W %
572.5				
Brown SIC TILL (FILL)			0.5	
571.5			- - P	28
Mixed Red SILTY CLAY TILL & Weath. SHALE (FILL)	-25		0.5	
			- - P	27
569.5				
Gray Weathered SHALE			2.5	
			- - P	19
566.5				
NO SAMPLE IN TUBE ROCK IN END OF TUBE	-30			
AUGER SAMPLE IS Gray Weath. SHALE				
561.5				
Red/Gray Weathered SHALE	-35		32	
			44	
			56 - -	12
558.5				
Hard Red SHALE			4.0	
556.5			- - P	12
• GROUND WATER PLUGGED AT 129 DAYS AT ELEV. 584.0	-40			
GROUND WATER AT 116 DAYS AT ELEV. 576.6				
SAMPLES WERE TAKEN BY A CONTINUOUS 2 5/8" DIAMETER SAMPLING DEVICE	-45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fall. B Bulge S-Shear E-Estimated P-Penetrometer)

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Three Materials
CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM
Bridge Foundation Boring Log

PROJECT ____ BRIDGE IL 251 NBL Date 02/08/93 Sh. 1 of 2
ROUTE FA 46(IL251) SHOULDER SLIDE Bored By K. Whittington
SEC. (1)I STA. 162+90 Checked By D. Lindeman
COUNTY LaSalle

Boring No. 2
Sta 163+40
O/S 32' LT CL

Surf Wat El. ____
Grndwater El. at Compl ____
At 216 Hrs 574.1 Date

	El.	N	Qu t/sf	W %
Ground Surface 593.7	0			
Brown & Gray SILTY CLAY TILL (FILL)		3		
		5		
		8 - -	22	
588.7	-5			
Brown SILTY CLAY TILL, Pieces of Weathered SHALE & COAL (FILL)				
583.7	-10			
Mixed Red Brown & Gray Weathered SHALE		4		
		5		
		10 - -	18	
580.7				
Gray SHALE with thin LIMESTONE Layers	-15	50/4" - -	9	
		- - -	8	
574.7				
LITTLE VERMILION LIMESTONE	-20	12		
573.7		70		
Gray SHALE		18/1" - -	11	

	El.	N	Qu t/sf	W %
Gray SHALE			22	
570.2			28 - -	16
COAL with WATER			18 - -	45
569.2	-25			
			10	
			11	
			13 - -	17
	-30			
Gray SHALE to Red SHALE (AUGER SAMPLE)				
	-35			
	-40			
	-45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fall. B Bulge S-Shear E-Estimated P-Penetrometer)

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Three Materials
CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM
Bridge Foundation Boring Log

PROJECT ____ BRIDGE IL 251 NBL Date 03/25/93 Sh. 1 of 1
ROUTE FA 46(IL251) SHOULDER SLIDE Bored By K. Whittington
SEC. (1)I STA. 162+90 Checked By ____
COUNTY LaSalle

Boring No. 3
Sta 162+70
O/S 33' RT CL

Surf Wat El. ____
Grndwater El. at Compl ____
At ____ Hrs ____

	El.	N	Qu t/sf	W %
Ground Surface 594.7	0			
BIT. SHOULDER				
593.7				
Brown & Gray SILTY CLAY & SILTY CLAY TILL & Brown Weath. SHALE (FILL)	-5	8		
		8		
		8 - -	- -	
	-10			
583.7		4		
		5	1. OP	24
Black SIC TOPSOIL (ROOTS)		5 - -	-	52
582.7				
Gray & Red Brown CLAY (Weath. SHALE)		2		
		4		
	-15	5 - -	25	
		3		
578.7		4	2. OP	19
Gray Weath. SHALE		7 - -	-	17
577.7				
Gray Weathered SHALE & LIMESTONE Pieces	-20	30		
		47		
		33/2" - -	8	
574.7				
LITTLE VERMILION LIMESTONE		36 - -	-	
573.2		88/3" -	3	
Gray SHALE				

	El.	N	Qu t/sf	W %
Gray SHALE		46		
		105/4" - -	10	
		132 - -	9	
570.2				
COAL & WATER	-25	14		
569.7		16		
Gray SHALE		24 - -	28	
		8		
		14		
567.2		26 - -	22	
	-30			
	-35			
	-40			
	-45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fall. B Bulge S-Shear E-Estimated P-Penetrometer)

Project
Route FA 46(IL251)
Sec. (1)I
County LaSalle

Sh. 2 of 2

Boring No. 2
Sta 163+40
O/S 32' LT CL

	El.	N	Qu t/sf	W %
	-45			
	-50			
Gray to Red SHALE (AUGER SAMPLE)				
	-55			
	-60			
530.7				
TOP LASALLE LIMESTONE (AUGER SAMPLE)				
528.?	-65			
	-70			

	El.	N	Qu t/sf	W %
	-70			
	-75			
	-80			
	-85			
	-90			
	-95			

REVISIONS	
NAME	DATE

DRAWN BY C.A.D.O.

ILLINOIS DEPARTMENT OF TRANSPORTATION

SOIL BORING LOGS

DRAWN BY
CHECKED BY

Jan. 14, 1994 10:07:08
(BORLOGS) 20S0000.DGN

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 46	(1) T	LASALLE	8	6
F.H.W.A. REG. 4	ILLINOIS	PROJECT		

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

597

595

590

585

580

575

570

565

REMOVE EXIST. MATERIAL, PAID FOR AS EARTH EXCAVATION (SPECIAL) 250 CUYDS.

PROPOSED MANHOLE, TY. A, 4' TOP OF LID TO BE FLUSH WITH EXIST. GROUND LEVEL. APPROX TOP OF GRATE ELEV 577.40

PERFORATED METAL LINER (END APPROX. 1' FROM PROPOSED MANHOLE) (FOR ALTERNATIVE ONE ONLY)

BACKFILL WITH CA13, CA14, CA15, OR CA16 (FOR ALTERNATIVE ONE ONLY)

PROPOSED STORM SEWER JACKED IN PLACE, SPECIAL, 180'

CAP

566.5

1'

EARTH EXCAVATED FOR JACKING PIT INCLUDED IN UNIT BID PRICE FOR STORM SEWER JACKED IN PLACE, SPECIAL. HOLE TO BE FILLED WITH EXCAVATED MATERIAL UPON COMPLETION.

ORIGINAL SURVEY

STA. 162 + 90
MEASURED ALONG SKEW

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 46	(1) T	LASALLE	8	7

F.H.W.A. REG. 4 ILLINOIS PROJECT

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS CHECKED
BY
DATE

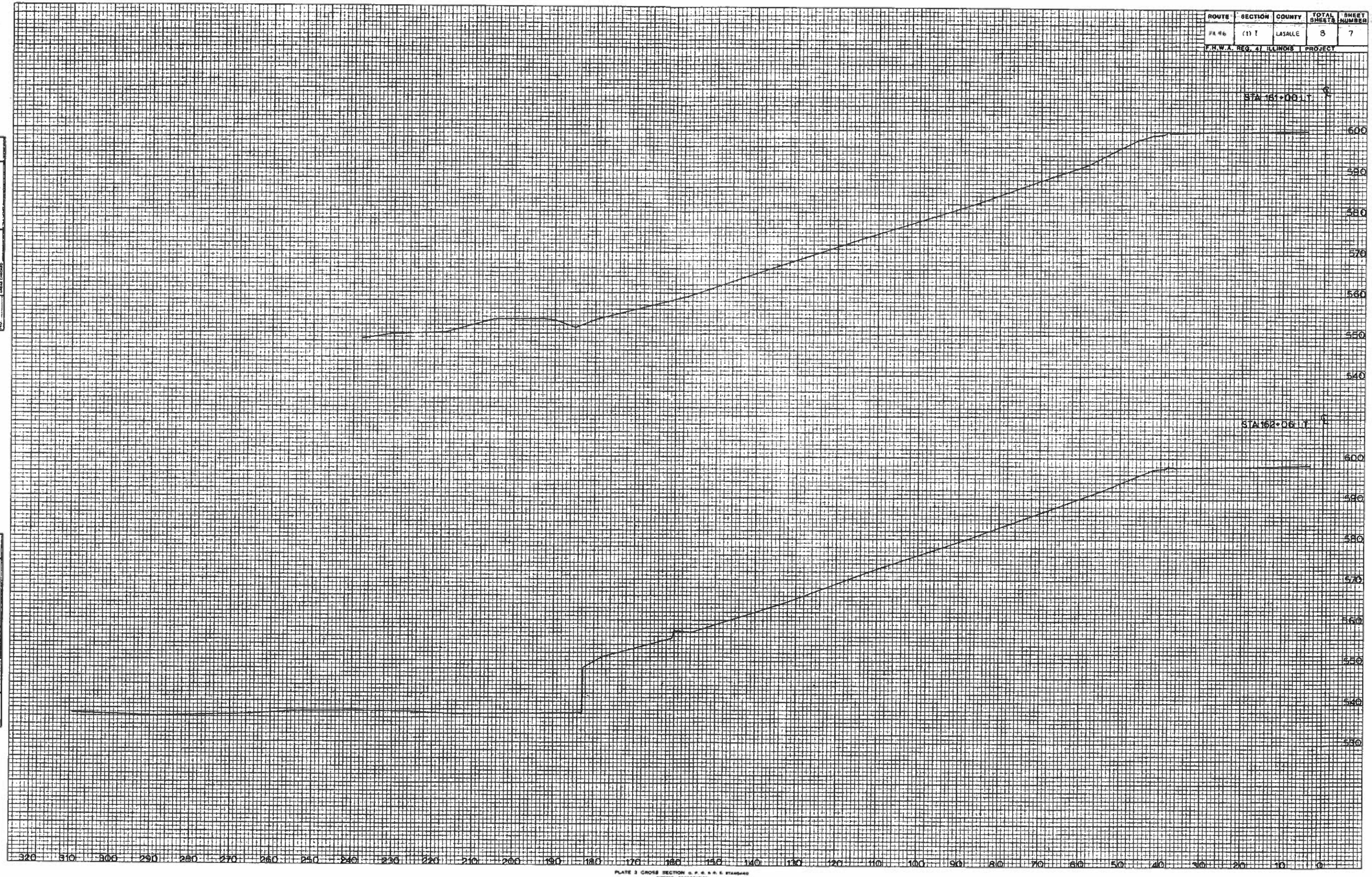


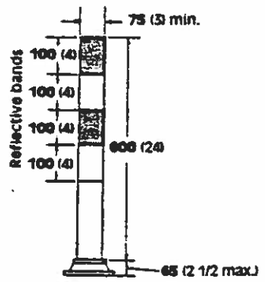
PLATE 3 CROSS SECTION U. P. R. R. & R. E. STANDARD
PEYDEN CORPORATION

FLEXIBLE DELINEATORS

Flexible delineators shall be tubular in shape and designed to bend under repeated impacts and return to an upright position without damage to the impacting vehicle or the tubes. They shall be attached to the pavement with epoxy meeting the recommendations of the delineator manufacturer. The use of studs will not be permitted without the approval of the Engineer.

The tubes shall be orange in color and have two reflectorized orange and two reflectorized white bands meeting the requirements for signs Article 784.06 of the Standard Specifications.

The tubes shall be readily removable from the bases to permit field replacement. All missing or severely damaged tubes shall be replaced prior to suspension of work each working day and once each non-working day on a schedule approved by the Engineer.



ONE OR TWO PIECE BASE

WING BARRICADES

The stripes shall be 150 (6) wide, alternating reflectorized orange and reflectorized white, sloping downward at 45° toward the side on which traffic will pass. The reflective sheeting shall meet the requirements of Articles 784.06 and 784.03 of the Standard Specifications and shall appear on both sides of barricades on two-lane highways.

Sand bags may be placed on the legs for ballast. No other types of weights will be allowed.

Flashing lights shall be used during hours of darkness and shall be mounted above the top rail of the side nearest traffic.

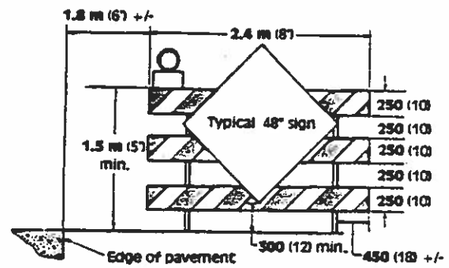
Barricade rails shall be wood no thicker than 25 (1), sheet aluminum, plastic or fiberglass.

The optional back bracing shown on the wood or metal barricade may be used provided it attaches to the upright no higher than 300 (12) above the bottom and provided that if wood is used, the bracing shall be no heavier than 50X100 (2X4) in size.

Other light weight designs may be used with the approval of the Engineer.

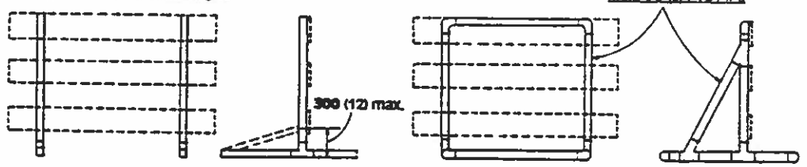
All heights shown shall be measured above the pavement surface.

The name of the agency, contractor, or supplier shall not be shown on the face parts of any barricades. Identification markings may be placed only on the back side of the barricade rails.



FRAMES SHALL BE NO HEAVIER THAN:

100x100 (4x4) (Nom. dim.) Wood or
50X50X3 (2X2X1/8) Steel tubing or
50X50X5 (2X2X3/16) Steel angles

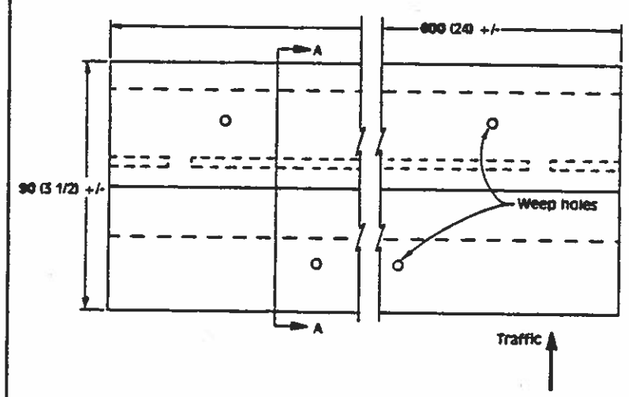


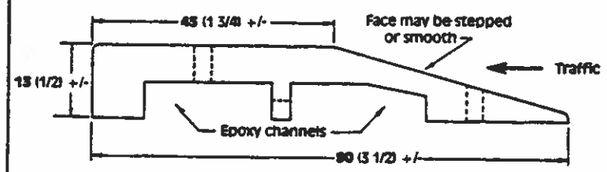
WOOD OR METAL SUPPORTS

PVC PIP SUPPORTS

TYPICAL DESIGNS

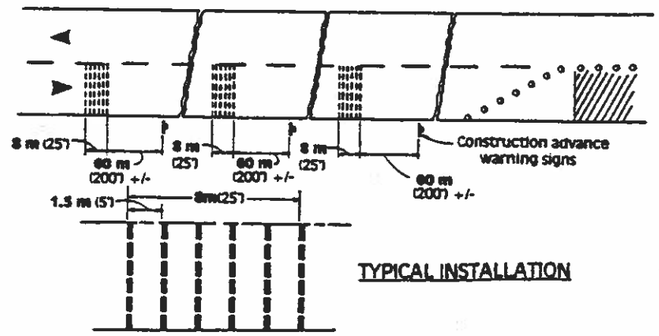
TEMPORARY RUMBLE STRIPS





A-A

DETAIL OF RUMBLE STRIPS



TYPICAL INSTALLATION

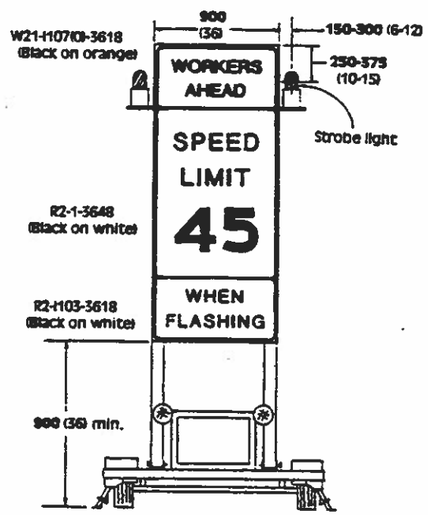
The rumble strip shall be black in color and formed of high strength formed polycarbonate. It shall be of one-piece construction with two channels on the underside for flexibility and proper adhesive bondage. The channels shall be interconnected at four or more locations to permit the bonding material to flow from one channel to the other. There shall be at least six weep holes through one or both channels to the upper surface of the strip and at least four through the leading edge of the strip to prevent air voids between the strip and the bonding material.

The rumble strip shall support a load of 2700 kg (6,000 lbs.). This shall be determined by placing a strip over the open end of a 25 (1) high vertically-positioned hollow metal cylinder having an internal diameter of 75 (3) and a wall thickness of 6 (1/4). The load shall be applied slowly through a 25 (1) diameter by 25 (1) high metal rod centered on the top flat portion of the strip. (No weep holes shall be in the compression area.) Breakage or significant permanent deformation of the strip shall constitute failure.

The strips shall be placed end to end and extend completely across the traffic lane. They shall be attached to the pavement with an adhesive meeting the recommendations of the rumble strip manufacturer.

Other similar designs may be used with the approval of the Engineer.

CONSTRUCTION SPEED LIMIT SIGN



The sign assembly shall be trailer mounted. The trailer shall conform to Article 784.05 of the Standard Specifications.

All signs shall be reflectorized meeting the requirements of Article 784.06 of the Standard Specifications. The signs may be combined on a single panel.

The flashing lights for the construction speed limit sign shall feature nondirectional amber lenses with reflectors and shall be visible through a range of 120° when viewed facing the sign. The lights, either strobe, halogen or incandescent lamps, shall be visible for a minimum distance of 1600 m (1 mile) and have a minimum flash rate of 40 per minute. A small flashing "on" indicator light shall be provided on the back of the sign visible for 150 m (500) to provide confirmation to workers the light is operating. The lights shall operate on either full battery power with solar panel charging (capable of maintaining a charged battery level) and 135 amp, 12 volt deep cycle battery(s) or a gasoline or diesel powered generator with a maximum fuel capacity of 95 L (25 gals).

The assembly shall only be used where specified or when approved by the Engineer. The flashing lights shall be activated ONLY when workers are present in a closed lane adjacent to one open to traffic. The speed limit shown shall be 80 km/h (45 mph) or 10 km/h (10 mph) below the normal posted speed limit whichever is lower. At all other times, the lights shall be turned off and the assembly removed or the sign covered.

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED June 15, 1994

ENGINEER OF OPERATIONS

ISSUED 4-3-89

DATE	REVISIONS
6-15-94	Added metric.
	Revised flexible delineator width.
	Revised notes.

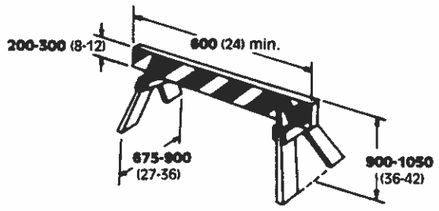
TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES HIGHWAY CONSTRUCTION AND CONTRACT MAINTENANCE

(Sheet 2 of 2)

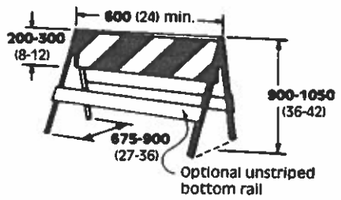
STANDARD 2290-10

F-6.01

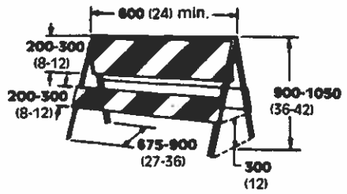
TYPE 1A BARRICADE



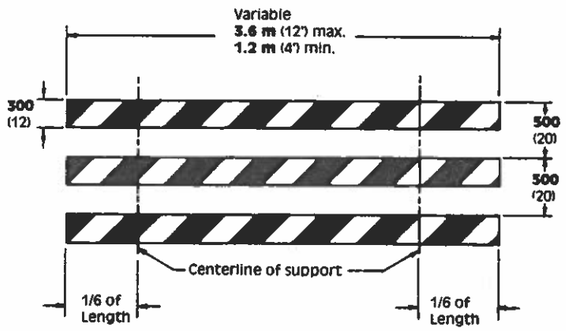
TYPE 1 BARRICADE

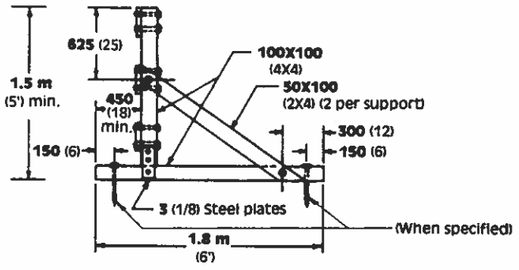


TYPE II BARRICADES

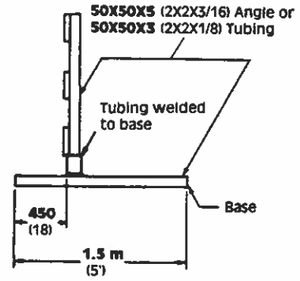


TYPE III BARRICADES



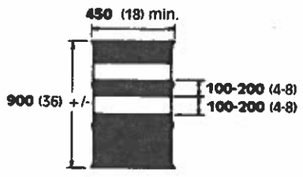


TYPICAL WOOD SUPPORT

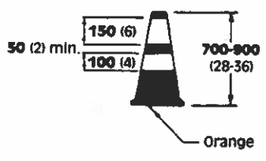


TYPICAL STEEL SUPPORT

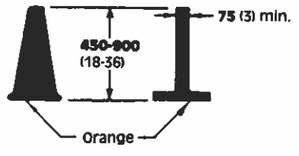
DRUMS



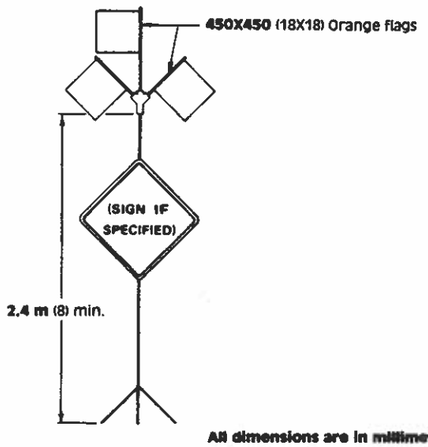
REFLECTORIZED CONES



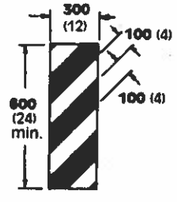
CONES



HIGH LEVEL WARNING DEVICE



VERTICAL PANELS



See note 14 for support or mounting requirements

All dimensions are in millimeters (inches) unless otherwise shown.

GENERAL NOTES

1. Type 1 and 1A Barricades are intended for use on lower speed roads and shall not be used where normal speeds are greater than 70 km/h (40 mph) unless the reflective area of the upper rail is at least 0.18 sq. meters (288 sq. in.).
2. Type I and Type II Barricades shall not be intermixed within an individual string of barricades.
3. Type III Barricades are intended for road and lane closures and shall not be used for channelization or delineation.
4. All heights shown shall be measured above the pavement surface.
5. Unless otherwise noted, the reflective sheeting used for barricades, drums and vertical panels shall meet the requirements of Article 784.03 and 784.06 of the Standard Specifications.
6. All barricades and vertical panels shall have alternating reflectorized white and reflectorized orange stripes sloping downward at 45° toward the side on which traffic will pass. Barricade stripes shall be 150 mm (6") in width on barricades 900 mm (36") or greater in length and 100 mm (4") in width on barricades less than 900 mm (36") in length. Type I and Type II Barricades shall be striped on both sides. Type III Barricades shall be striped on both sides where traffic approaches from either direction. Vertical panels placed on the outside of curves shall be striped on both sides. The predominant color for other barricade components shall be white, orange, or silver, except that galvanized metal or aluminum components may be used.
7. Drums shall be non-metallic and have alternating reflectorized orange and reflectorized white horizontal, circumfrential stripes 100-200 mm (4-8") in width. There shall be at least two orange and at least two white stripes on each drum. If nonreflective spaces are left between the orange and white stripes, they shall be no more than 50 mm (2") in width. All nonreflectorized portions of the drums shall be orange. Drums may be slightly conical in shape and may have one or more flat surfaces to minimize rolling when hit.
8. Frames for Type I or Type II Barricades shall be designed so as to provide a stable support and should be constructed of light weight steel or aluminum angles or tubing, wood, plastic, or rubber and have no rigid stay bracing for "A" frame designs. As Type III Barricades are only used at closures, they may be constructed of heavier materials then Type I or Type II Barricades. However, they should not have any vertical or sloping supports heavier than 100X100 mm (4"X4") lumber, 50X50X3 mm (2"X2"X1/8") steel tubing, or 50X50X5 mm (2"X2"X3/16") steel angles.
9. Barricade rails shall be no heavier than 25 mm (1") thick lumber or plywood except for the "sawhorse" design Type I A Barricade which may have a rail no heavier than 50 mm (2") thick lumber. Other light weight weather resistant materials such as plastic, fiberglass or sheet aluminum may be used. Barricade rails may be sloping or vertical. Nominal lumber dimensions may be used to satisfy wooden barricade component dimensions.
10. The name and phone number only of an agency, contractor, or supplier may be shown on the nonreflective surface of the face part of a barricade. Such identification shall be in one color and nonreflective with letters not to exceed 25 mm (1") in height.
11. When used, warning lights on barricades, drums, or vertical panels shall be mounted above the top of the device to the side on which traffic will pass and shall not obscure any reflectorized portion of this device.
12. Weights of concrete, stone, wood, or brick will not be allowed and all weights used to stabilize barricades other than sandbags must be rigidly attached to the legs of the barricades as close to the ground as possible. No sandbags will be allowed on the top rail of barricades. Sandbags may be placed on barricade legs, over striped bottom rails not facing traffic, over unstriped bottom rails, or suspended from the barricade rail or frame in such a manner so that the bulk of the sand is at least 450 mm (18") below the top of the barricade. Drums may be weighted internally with just enough sand, water, or other material to provide stability.
13. Cones shall be constructed of durable material able to withstand abuse by vehicular traffic. Minimum weights shall be 2 kg (4 lbs.) for 450 mm (18"), 3 kg (7 lbs.) for 700 mm (28") and 5 kg (10 lbs.) for 900 mm (36") cones with a minimum of 60 percent of the total weight in the base. Where posted speeds are greater than 70 km/h (40 mph) cones shall be a minimum of 700 mm (28") in height. Reflectorized cones are not required for day light operations, and shall only be used as specified on the plans or as approved by the Engineer. When used, reflectorized cones shall be a minimum 700 mm (28") in height and shall have two white reflective bands; one a minimum of 150 mm (6") wide placed 75 mm (3") from the top of the cone and the other a minimum of 100 mm (4") placed 50 mm (2") below the 150 mm (6") band.
14. Vertical panels may be either post mounted, frame supported or attached to the top of a barrier. Post mounted vertical panels shall be firmly attached to light weight wood or metal posts with the top a minimum height of 1.2 m (4') above the pavement surface, or as approved by the Engineer. Frame supported vertical panels shall conform to the General Notes 8, 9, 10 and 12 of this Standard and shall only be used where normal speeds are 70 km/h (40 mph) or less with the top a minimum height of 900 mm (36") above the pavement surface. This device shall only be used as specified on the plans or as directed by the Engineer.

Illinois Department of Transportation

APPROVED June 15, 1994

ENGINEER OF OPERATIONS

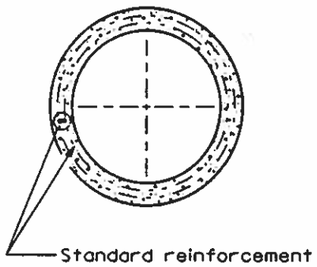
ISSUED 4-3-69

DATE	REVISIONS
6-15-94	Added metric. Revised notes.
	Added reflectorized cones.
	Type 1 and 1A barricades.

DESIGN OF TRAFFIC CONTROL DEVICES FOR HIGHWAY CONSTRUCTION AND MAINTENANCE

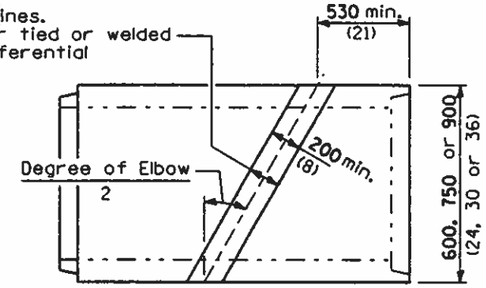
STANDARD 2299-14

F-6.02



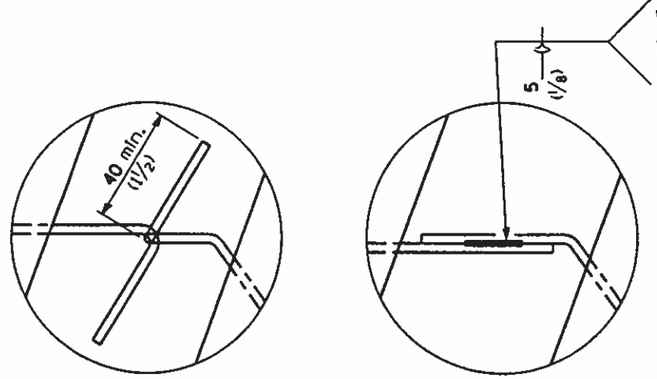
TRANSVERSE SECTION

Remove concrete along these lines.
Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement.



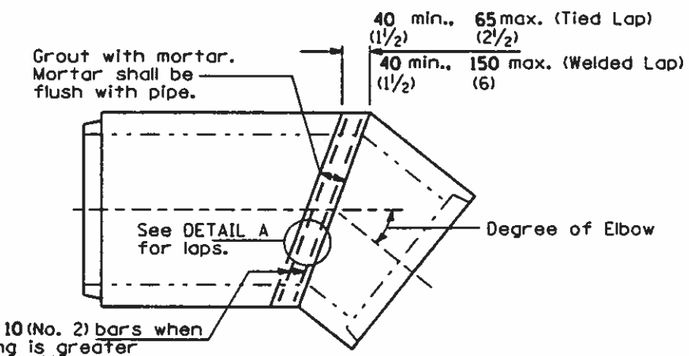
PLAN
Reinforced Concrete Pipe

Weld 20 (3/4) min. for wire 2.032 mm (W14) thru 4.877 mm (W6 ga.)
Weld 10 (3/8) min. for wire 5.067 mm (W5.5) thru 6.286 mm (W2.8 ga.)
(other wires shall be tied per detail)



TIED LAP WELDED LAP

DETAIL A



PLAN
Reinforced Concrete Pipe Elbow

All dimensions are in millimeters (inches) unless otherwise shown.

DN

Illinois Department of Transportation

APPROVED June 15, 1994
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED June 15, 1994
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 3-4-69

DATE	REVISIONS
6-15-94	Moved G.N. to Specs.
	Moved D.N.
	Added Metric.

REINFORCED CONCRETE PIPE ELBOW

STANDARD 2262-5

J-11.05

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NUMBER
FA 46	(1) 1	LASALLE	8	8

F.H.W.A. REG. 4 | ILLINOIS | PROJECT

FINAL SURVEY
NOTE BOOK
NO.
DATE
BY
SURVEYED
PLOTTED
TEMPLATE
AREA
AREA CHECKED

ORIGINAL SURVEY
NOTE BOOK
NO.
DATE
BY
SURVEYED
PLOTTED
TEMPLATE
AREA
AREA CHECKED

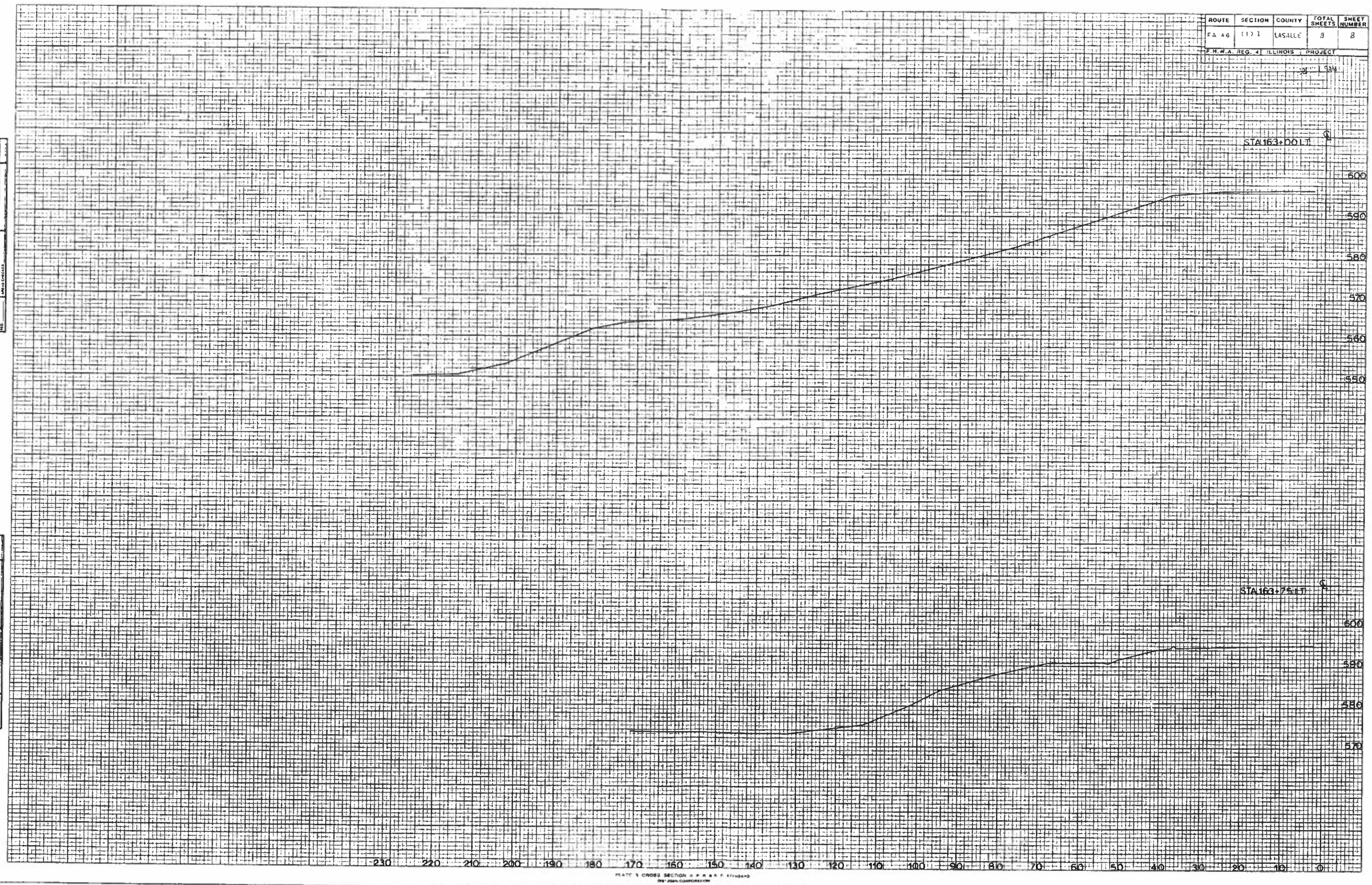
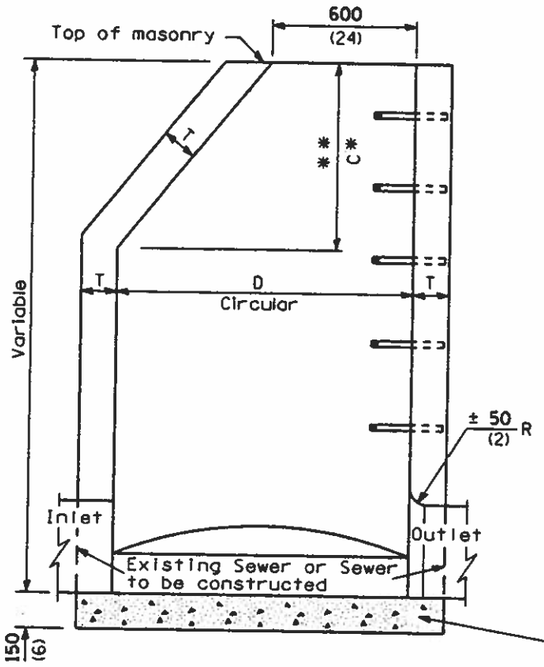
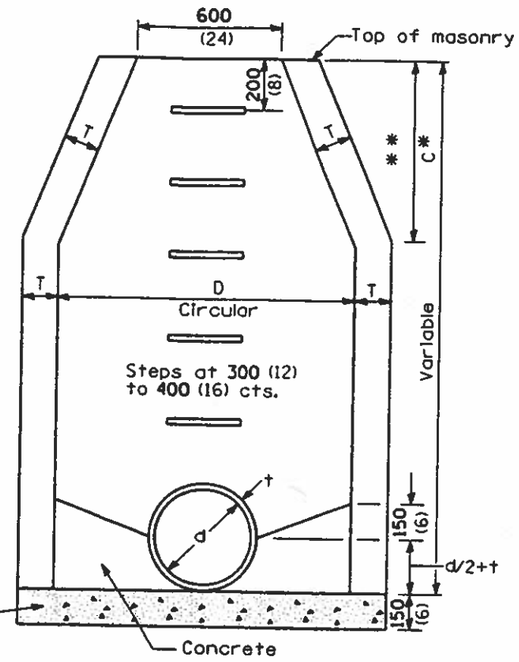


PLATE 3 CROSS SECTION O.P.R.R.T. STANDARD
DBF JOAN CORPORATION

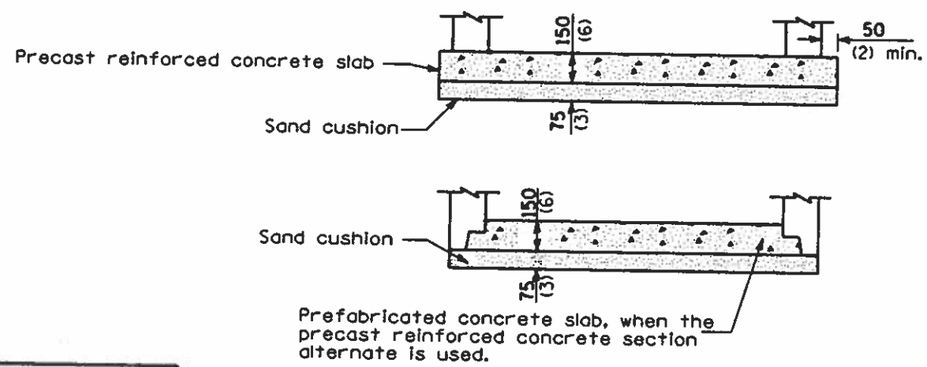


ELEVATION - ECCENTRIC



ELEVATION - CONCENTRIC

ALTERNATE MATERIALS FOR WALLS	D	C	T (min.)
Concrete Masonry Unit	1.2 m (4'-0")	750 (30)	125 (5)
	1.5 m (5'-0")	1.15 m (3'-9")	125 (5)
Brick Masonry	1.2 m (4'-0")	750 (30)	200 (8)
	1.5 m (5'-0")	1.15 m (3'-9")	200 (8)
Precast Reinforced Concrete Section	1.2 m (4'-0")	750 (30)	100 (4)
	1.5 m (5'-0")	1.15 m (3'-9")	125 (5)
Cast-in-place Concrete	1.2 m (4'-0")	750 (30)	150 (6)
	1.5 m (5'-0")	1.15 m (3'-9")	150 (6)



ALTERNATE BOTTOM SLAB

GENERAL NOTES

See Standard 2447 for details of steps.

* Dimension "C" for Precast Reinforced Concrete Sections may vary from the dimension given to plus 150 mm (6").

** See Standard 2354 for Optional Precast Reinforced Concrete Flat Slab Top.

All dimensions are in millimeters (inches) unless otherwise shown.

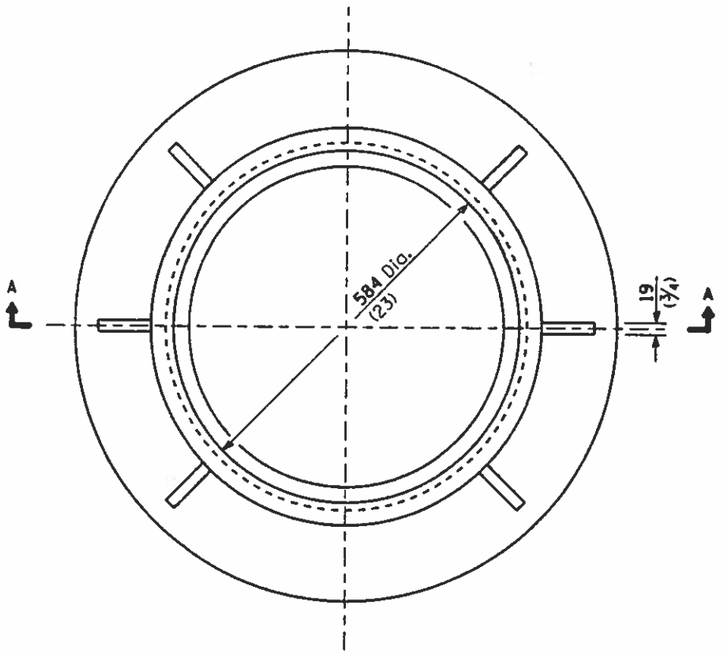
Illinois Department of Transportation
PASSED June 15, 1994
ENGINEER OF POLICY AND PROCEDURES
APPROVED June 15, 1994
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 11-5-93

DATE	REVISIONS
6-15-94	Moved G.N. to Specs.
	Deleted step details &
	Cook County note.

MANHOLE TYPE A

STANDARD 1527-10

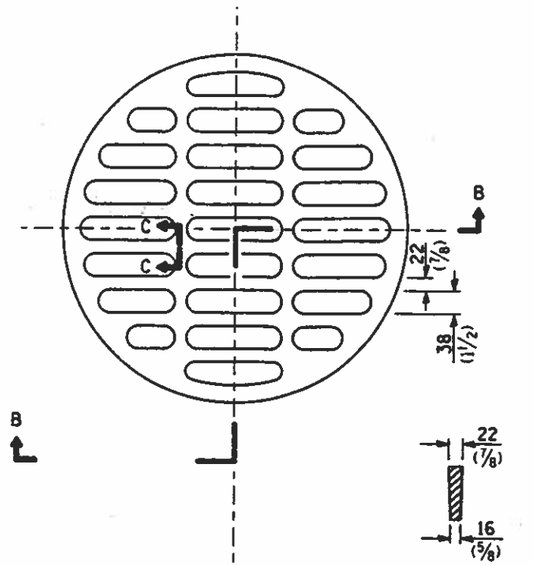
B-6.00



SECTION A-A
Gray Iron

CAST FRAME

177 kg (390 lbs)

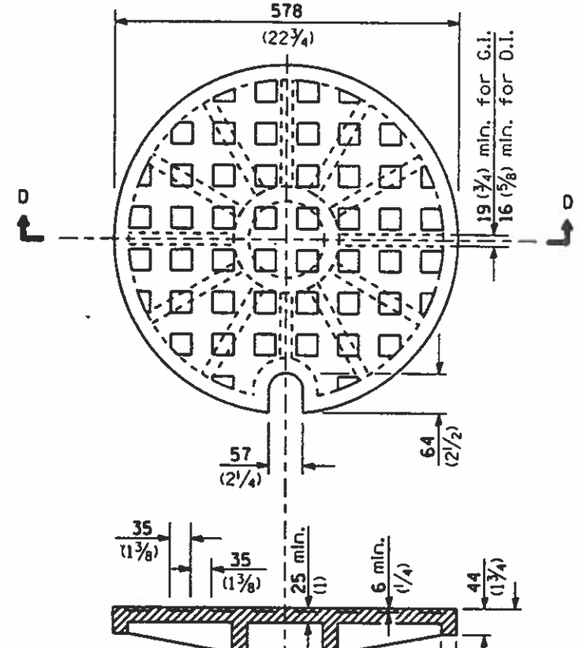


SECTION C-C

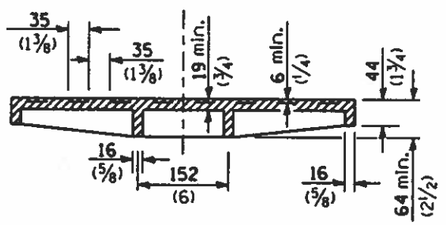
SECTION B-B

CAST OPEN LID

53 kg (116 lbs)



SECTION D-D
Gray Iron Lid
68 kg (150 lbs)



SECTION D-D
Ductile Iron Lid
52 kg (115 lbs)

CAST CLOSED LID

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

PASSED June 15, 1994
ENGINEER OF POLICY AND PROCEDURES

APPROVED June 15, 1994
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-65

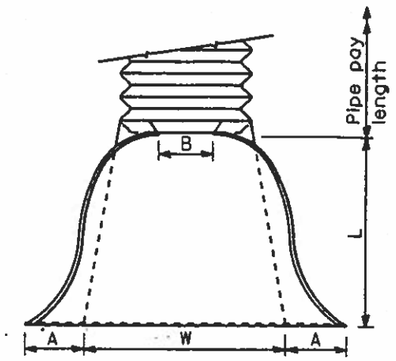
DATE	REVISIONS
6-15-94	Moved G.N. to Specs.
	Added Metric.

FRAME AND LIDS
TYPE 1

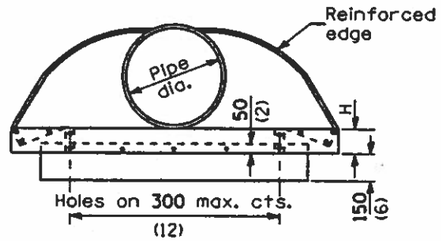
STANDARD 2213-5

B-10.30

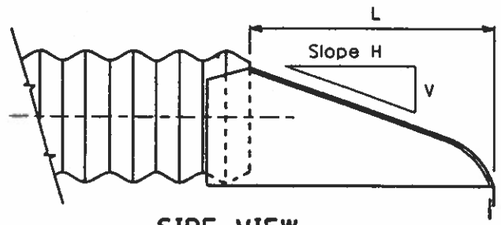
PIPE DIA.	THICK-NESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
		A	B	H	L	W		
		25± (1)	(max.)	25± (1)	38± (1½)	50± (2)		
300 (12)	1.63 (0.064)	150 (6)	150 (6)	150 (6)	535 (21)	610 (24)	1:2½	1 Pc.
375 (15)	1.63 (0.064)	180 (7)	205 (8)	150 (6)	660 (26)	760 (30)	1:2½	1 Pc.
450 (18)	1.63 (0.064)	205 (8)	255 (10)	150 (6)	785 (31)	915 (36)	1:2½	1 Pc.
525 (21)	1.63 (0.064)	230 (9)	305 (12)	150 (6)	915 (36)	1.065 m (42")	1:2½	1 Pc.
600 (24)	1.63 (0.064)	255 (10)	330 (13)	150 (6)	1.040 m (41")	1.220 m (48")	1:2½	1 Pc.
750 (30)	2.01 (0.079)	305 (12)	405 (16)	205 (8)	1.295 m (51")	1.525 m (60")	1:2½	1 Pc.
900 (36)	2.01 (0.079)	355 (14)	480 (19)	230 (9)	1.525 m (60")	1.830 m (72")	1:2½	2 Pc.
1050 (42)	2.77 (0.109)	405 (16)	560 (22)	280 (11)	1.750 m (69")	2.135 m (84")	1:2½	2 Pc.
1200 (48)	2.77 (0.109)	455 (18)	685 (27)	305 (12)	1.980 m (78")	2.285 m (90")	1:2¼	2 Pc.
1350 (54)	2.77 (0.109)	455 (18)	760 (30)	305 (12)	2.135 m (84")	2.590 m (102")	1:2	2 Pc.
1500 (60)	2.77 (0.109)	455 (18)	840 (33)	305 (12)	2.210 m (87")	2.895 m (114")	1:1¾	3 Pc.
1650 (66)	2.77 (0.109)	455 (18)	915 (36)	305 (12)	2.210 m (87")	3.050 m (120")	1:1½	3 Pc.
1800 (72)	2.77 (0.109)	455 (18)	990 (39)	305 (12)	2.210 m (87")	3.200 m (126")	1:1⅓	3 Pc.
1950 (78)	2.77 (0.109)	455 (18)	1.065 m (42")	305 (12)	2.210 m (87")	3.355 m (132")	1:1¼	3 Pc.
2250 (84)	2.77 (0.109)	455 (18)	1.145 m (45")	305 (12)	2.210 m (87")	3.505 m (138")	1:1⅙	3 Pc.



PLAN



END VIEW



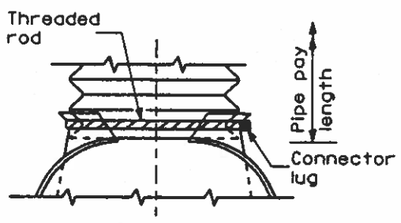
SIDE VIEW

END SECTION

NOTES

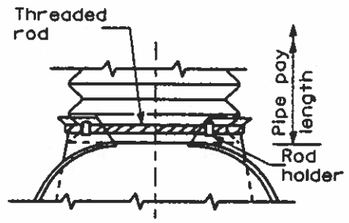
For 1500 mm (60") thru 2250 mm (84") sizes, reinforced edges shall be supplemented with stiffener angles. The angles shall be 51x51x6.4 mm (2x2x¼") for 1500 mm (60") thru 1800 mm (72") diameter and 64x64x6.4 mm (2½x2½x¼") for 1950 mm (78") thru 2250 mm (84") diameter. The angles shall be attached by M10 (⅜") rivets or bolts.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).



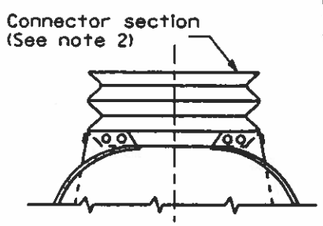
TYPE 1

For 300 (12) thru 600 (24) only (See Note 1)



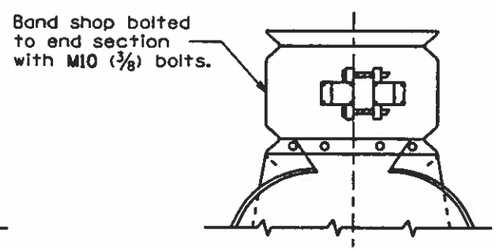
TYPE 2

For 750 (30) and 900 (36) only (See Note 1)



TYPE 3

(See Note 2)



TYPE 4

(See Note 3)



29 (1) Wide, 2.77 (0.109) thick strap with standard M12x150 (½x6) band bolt and nut.

ALTERNATE STRAP CONNECTOR

(For Type 1 only)

NOTES

1. Types 1 and 2 for pipes with annular ends only.
2. Type 3 connection can be used for all pipe sizes and includes 300 mm (12") of the pipe length. The connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. Stub shall be either 68 mm (2 ⅔") pitch x 13 mm (½") depth or 75 mm (3") pitch x 25 mm (1") depth annular corrugated pipe.
3. Type 4 connection can be used for all pipe sizes. Coupler shall be 68 mm x 13 mm (2 ⅔"x½") dimple, hugger, or annular band of 75 mm x 25 mm (3"x1"). The dimple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having helical ends, only the dimple band will be allowed.

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

PASSED June 15, 1994
ENGINEER OF POLICY AND PROCEDURES

APPROVED June 15, 1994
ENGINEER OF DESIGN AND ENVIRONMENT

95-6-21 ISSUED

CONNECTIONS OF END SECTIONS

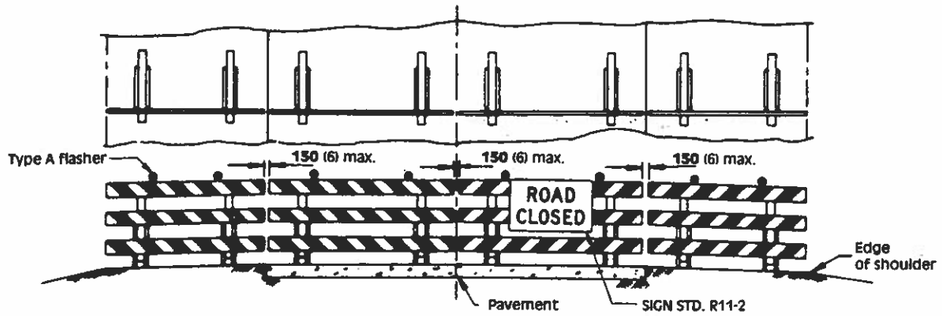
DATE	REVISIONS
6-15-94	Moved 3 Notes to specs.
	Added metric

METAL END SECTION FOR PIPE CULVERTS

STANDARD 2228-5

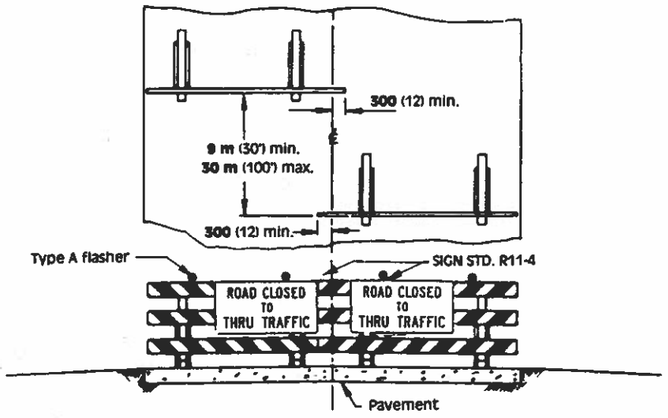
J-10.00

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD



ROAD CLOSED TO ALL TRAFFIC

Reflectorized striping may be omitted on the back side of barricades. The barricades shall be to the edge of the shoulders except when otherwise directed by the Engineer or shown on the detailed construction plans. When specified, Type A flashing lights shall be installed where shown.



ROAD CLOSED TO ALL THRU TRAFFIC

Reflectorized striping shall appear on both sides of barricades. The barricades shall be to the edge of the pavement, except when otherwise directed by the Engineer or shown on the detailed construction plans. When specified, Type A flashing lights shall be installed where shown.

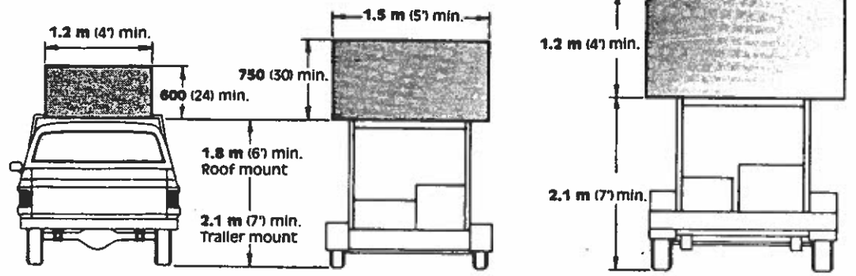
WORK LIMIT SIGNING

ROAD CONSTRUCTION NEXT X MILES	END CONSTRUCTION
G20-1(0) 6036	G20-2(0)-6024

X = Distance to END CONSTRUCTION sign.

ROAD CONSTRUCTION NEXT X MILES sign shall be installed in advance of the first work area at each end of projects over **3200 m** (2 miles) in length. The END CONSTRUCTION sign shall be erected near the end of these projects, unless another project is within **3200 m** (2 miles) beyond the end of the job.

ARROW BOARDS



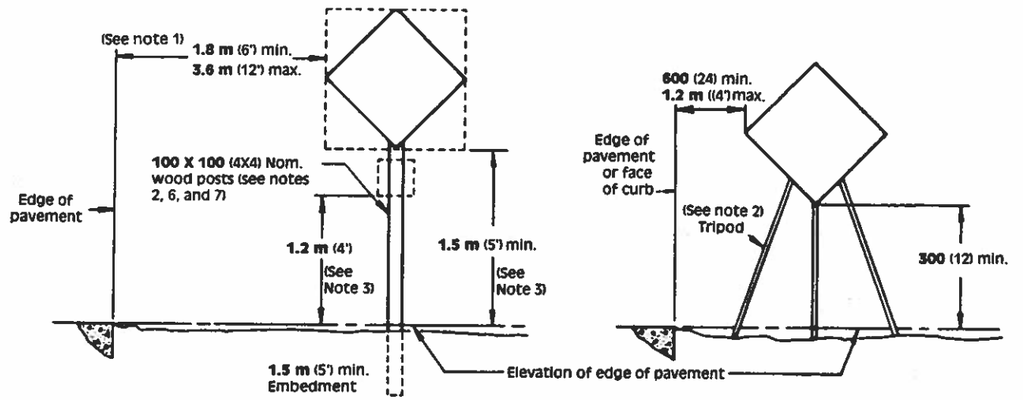
TYPE A ROOF MOUNTED

TYPE B ROOF OR TRAILER MOUNTED

TYPE C TRAILER MOUNTED

Arrow boards shall conform to Article 784.04 of the Standard Specifications. On roads with speed of **80 km/h** (45 mph) and above, Type C units are to be used for all operations 24 hours or more in duration and Type B units may be used for operations less than 24 hours in duration. Type A, B, or C units may be used for all operations on roads with speeds less than **80 km/h** (45 mph). Arrow boards shall not be used to direct passing moves into lanes used by opposing traffic.

TYPICAL SIGN INSTALLATIONS



1. **600** (24) minimum to face of curb.
2. Alternate designs and or materials may be permitted when authorized by the Engineer. All materials shall be substantial and durable.
3. Add **600** (24) if parking exists within **60 m** (200') in advance of the sign location or if pedestrian movement is likely to occur at any time during the project.
4. Signs on temporary supports shall be within 20° of a vertical position. Post mounted signs shall be erected and maintained within 5° of a vertical position.
5. Weights of concrete, stone, or brick will not be allowed and all weights used to stabilize signs other than sandbags must be rigidly attached to the sign support as close to the ground as possible.
6. Two posts shall be used for signs greater than **1.5 sq. m.** (16 sq. ft.) in area or where the height between the sign and the ground exceeds **2.1 m** (7'). Bracing no heavier than **50 X 100** (2X4) nominal dimensioned wood may be used for added support. Any brace placed parallel to the road shall be sloped down toward approaching traffic.
7. If approved by the Engineer, skids may be used to support signs where posts are impractical. If used, they shall not exceed the structural design of Type III barricades and shall be no greater than **1.2 m** (4') in length.

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED June 15, 1994

E. W. Jones
ENGINEER OF OPERATIONS

ISSUED 4-3-69

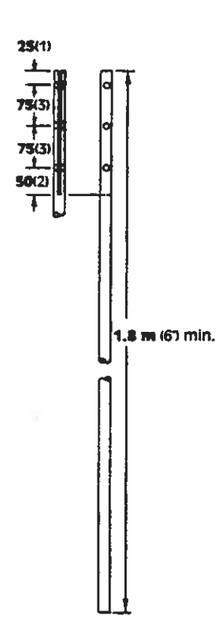
DATE	REVISIONS
6-15-94	Added metric. Lights on Ty. III Bar. Revised Road Const Ahead sign. Post mounted signs erect within 5°.

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES HIGHWAY CONSTRUCTION AND CONTRACT MAINTENANCE

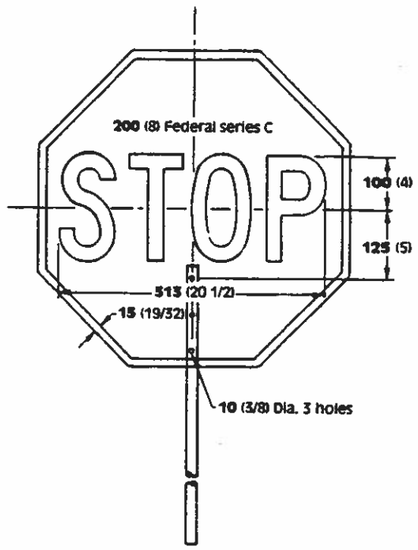
(Sheet 1 of 2)

STANDARD 2298-10

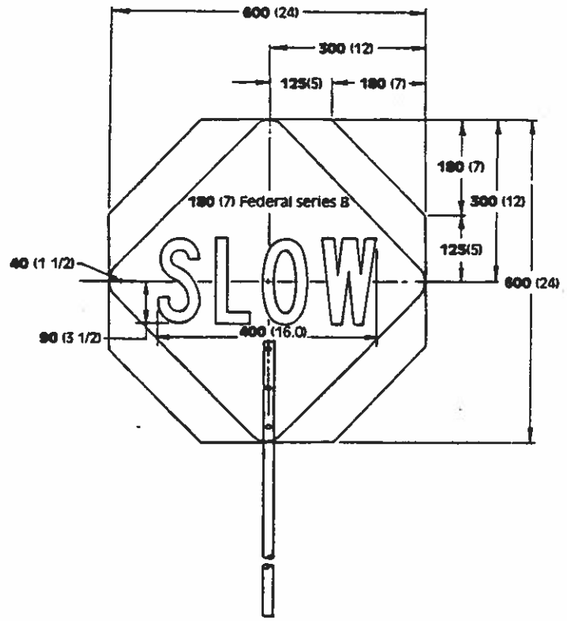
F-6.00



STAFF



FRONT SIDE



REVERSE SIDE

GENERAL NOTES

1. The "STOP" face shall consist of white letters and border on a red reflectorized background.
2. The "SLOW" face shall consist of black letters and border on an orange reflectorized background.
3. All reflective faces shall be fabricated with sheeting meeting the requirements of the Article 784.06 of the Standard Specifications.
4. Areas outside sign borders shall be light blue or black.
5. The portion of the staff within the sign face shall match the sign colors.
6. All colors and letters shall meet applicable federal standards.
7. The staff shall consist of two sections joined by a coupling located 1.5 m (5') from the bottom of the staff. Alternate designs may be used when approved by the Engineer. All materials shall be substantial and durable.
8. This sign shall be furnished by the contractor and shall be used by the flagger in lieu of flags or other signaling devices. The cost of furnishing and maintaining the sign shall be considered incidental to the contract and no additional compensation will be allowed.

Illinois Department of Transportation

APPROVED June 15, 1994

ENGINEER OF OPERATIONS

ISSUED 4-3-69

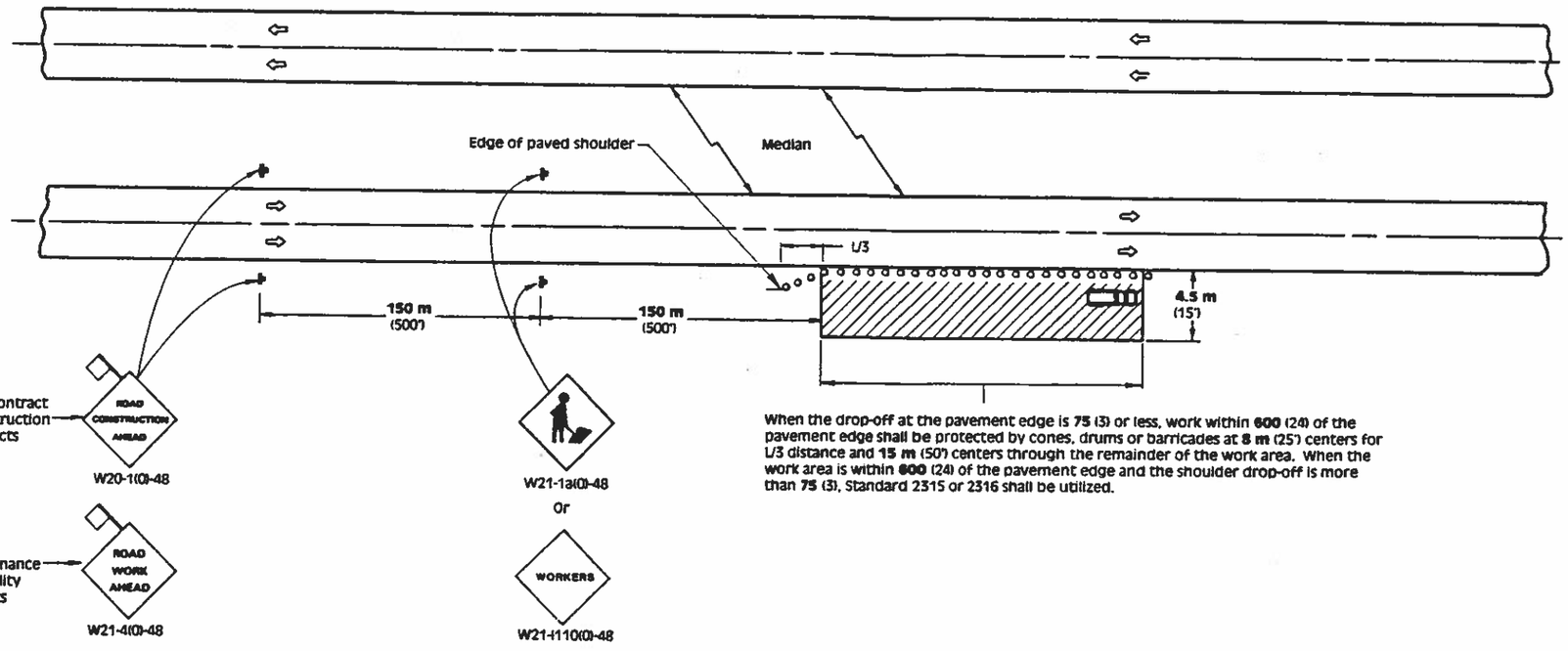
All dimensions are in millimeters (inches) unless otherwise shown.

DATE	REVISIONS
6-15-94	Added metric.
	Flagger paddle is octagonal
	Sheeting per Std Specs.

FLAGGER TRAFFIC CONTROL SIGN

STANDARD 2300-4

F-6.03



When the drop-off at the pavement edge is **75** (3) or less, work within **600** (24) of the pavement edge shall be protected by cones, drums or barricades at **8 m** (25') centers for L/3 distance and **15 m** (50') centers through the remainder of the work area. When the work area is within **600** (24) of the pavement edge and the shoulder drop-off is more than **75** (3), Standard 2315 or 2316 shall be utilized.

TYPICAL APPLICATIONS

Utility operations

Culvert extensions

Side slope changes

Guard rail installation and maintenance

Delineator installation

Landscaping operations

Sign installation and maintenance

Shoulder repair

GENERAL NOTES

1. Worker signs are to be removed when no work is being performed. Any unattended obstacle or excavation in the work area which in the opinion of the Engineer constitutes a hazard shall be protected by barricades at 15 m (50') centers, with flashing lights at night. If the hazard exceeds 30 m (100') in length, steady burning lights shall be substituted for flashing lights. When the distance is greater than 75 m (250'), barricade spacing may be increased to 30 m (100').
2. If the work operation requires that four or more work vehicles enter through traffic lanes in a one hour period, a flagger shall be provided and a FLAGGER sign shall be substituted for the WORKER sign. If the work operation is 4.5 m (15') or more off the pavement edge, no signing or cones will be required, unless two or more vehicles cross the 4.5 m (15') clear zone in one hour. If a flagger is required, the cost shall be incidental to the contract.
3. Signs mounted in the median may be omitted when the median is less than 3 m (10') wide.
4. Longitudinal dimensions may be adjusted to fit field conditions.
5. Flashing lights shall be installed above the first two warning signs in each series, during hours of darkness.
6. Barricades or drums with lights shall be used in lieu of cones for night operations.
7. Shoulder tapers should have a minimum length of L/3. Where L is:

SPEED LIMIT	FORMULA Metric	English
70 km/h (40 mph) or less	$L = \frac{WS^2}{150}$	$L = \frac{WS^2}{60}$
80 km/h (45 mph) or greater	L = 0.65 (WXS)	L = (W)(S)

W = Width of offset in **Meters** (Feet)

S = Normal posted speed **km/h** (mph)

SYMBOLS

- Work area
- **450X450** (18X18) min. Orange flag
- Sign on portable or permanent support
- Cone, drum or barricade

MULTILANE, DIVIDED AND UNDIVIDED, RURAL DAY OR NIGHT OPERATIONS.

Where at any time, any vehicle, equipment, workers or their activities will encroach in the area closer than **4.5 m** (15') up to the edge of the pavement.

All dimensions are in millimeters (inches) unless otherwise shown.

Illinois Department of Transportation

APPROVED June 15, 1994

ENGINEER OF OPERATIONS

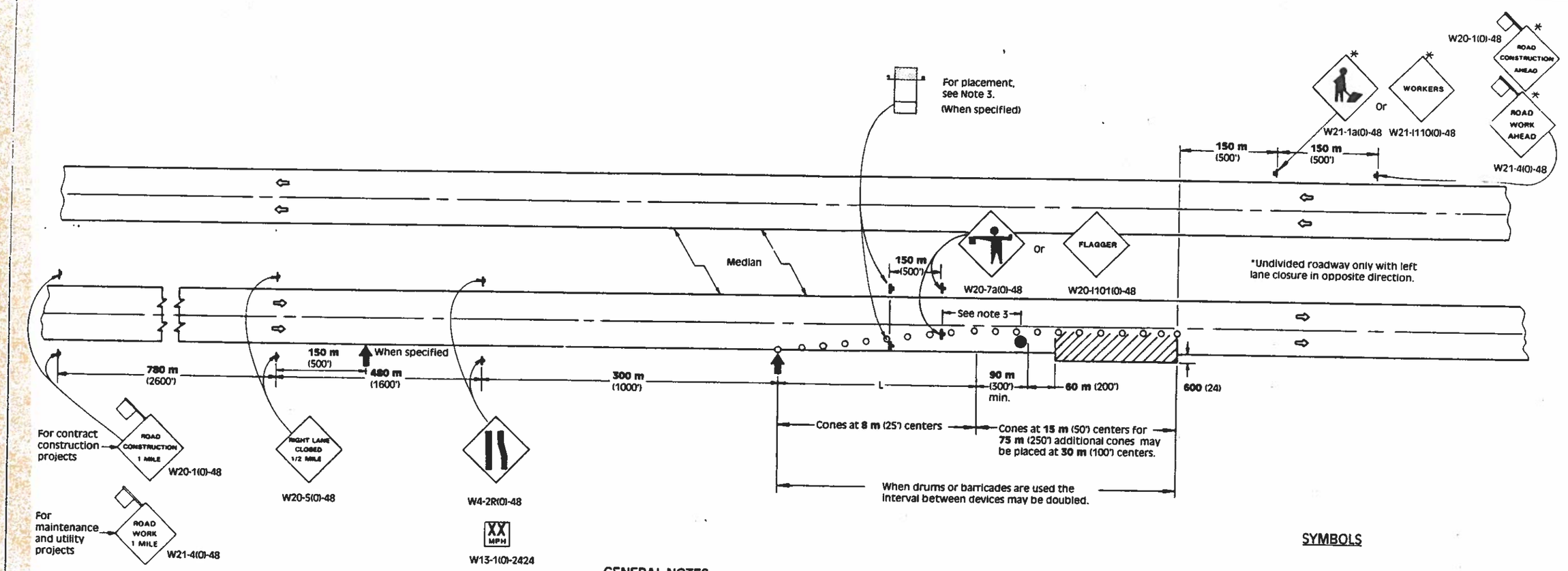
ISSUED 6-3-69

DATE	REVISIONS
6-15-94	Added metric.
	Added devices at pavement edge.
	Revised general notes.

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES HIGHWAY CONSTRUCTION AND CONTRACT MAINTENANCE

STANDARD 2314-7

F-6.19



TYPICAL APPLICATIONS

Pavement patch

Utility operations

Bituminous resurfacing

GENERAL NOTES

1. The "L" distance equals lane width times the taper ratio.

Normal Posted Speed		Taper Ratio (Length to pavement width)	
km/h	mph	m/mm	ft/ft
110	65	20/300	65/1
100	60	18/300	60/1
90	55	17/300	55/1
80—or less—	45	14/300	45/1

2. When no work is being performed, the flagger will not be required. If the flagger is not present, the FLAGGER and WORKER signs shall be removed or covered.
3. The CONSTRUCTION SPEED LIMIT signs (when specified) and the FLAGGER signs shall be moved as necessary to maintain a spacing of 150 m (500') to 750 m (2500') between the flagger and FLAGGER signs.
4. This standard also applies when work is being performed in the left lane. Under these conditions, LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown and cones shall be placed along the centerline throughout the taper and work area. On left lane closures with narrow medians, the arrow board at the beginning of the lane closure shall be relocated behind the taper as necessary so that a clearance of at least 1.2 m (4') can be maintained from the opposing traffic.
5. The speed limit to be shown on the CONSTRUCTION SPEED LIMIT signs and ADVISORY SPEED plates shall be 10 km/h (10 mph) less than the normal posted speed limit or 80 km/h (45 mph), whichever is less.
6. The flashing lights on the CONSTRUCTION SPEED LIMIT signs shall be activated only when workers are present in a lane adjacent to one open to traffic. At all other times, the flashing lights shall be turned off and the assembly removed or the signs covered.
7. All signs, cone, barricades and drums are to be removed at completion of the day's operations and the work area opened to traffic.
8. Median signs may be omitted when the median is less than 3 m (10').
9. This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans approved by the Engineer will be required.
10. Where posted speeds are greater than 70 km/h (40 mph), cones shall be a minimum of 700 mm (28") in height.
11. Longitudinal dimensions may be adjusted to fit field conditions. The lateral placement of the flagger may be varied from that shown. The flagger shall be stationed approximately 60 m (200') in advance of the work party.
12. At all times when workers are present, a flagger shall be positioned in advance of the first work operation as shown. (See note 2) An additional flagger, as required by paragraph 20 of Article 901.03 of the Standard Specifications, shall be positioned in advance of each separate activity of the operation that requires frequent encroachment into a lane open to traffic and will be paid for separately.
13. Form BT 725 shall be required.

SYMBOLS

- Arrow board
- Work area
- 450X450 (18X18) min. Orange flag
- Cone, drum, or barricade
- Sign on portable or permanent support
- Flagger with traffic control sign (note 12)
- Construction speed limit sign

MULTILANE, DIVIDED AND UNDIVIDED, RURAL DAY OPERATIONS ONLY

Where any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 600 (24) of the edge of pavement.

All dimensions are in millimeters (inches) unless otherwise shown.

DN

Illinois Department of Transportation

APPROVED June 15, 1994

R.W. Jones
ENGINEER OF OPERATIONS

ISSUED 4-2-69

DATE	REVISIONS
6-15-94	Added metric.
	Revised notes

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES HIGHWAY CONSTRUCTION AND CONTRACT MAINTENANCE

STANDARD 2315-9

F-6.20

APPENDIX

E-10

IL ROUTE
SECTION 1(1)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

TABLE OF CONTENTS

	Page
DESCRIPTION OF WORK	1
TRAFFIC CONTROL PLAN	1
KEEPING ROADS OPEN TO TRAFFIC	2
SEEDING	2
STATUS OF UTILITIES TO BE ADJUSTED	3
TREE REMOVAL	2
STORM SEWER JACKED IN PLACE, SPECIAL	3
CONTRACTOR ACCESS	4
EARTH EXCAVATION (SPECIAL)	4
EXCELSIOR BLANKET	4
REQUIRED DISADVANTAGED BUSINESS PARTICIPATION	5
PUBLIC CONVENIENCE AND SAFETY	13
SUBLETTING OF CONTRACTS	14
CONSTRUCTION AND MAINTENANCE SIGNS	15
CHANNELIZING DEVICES	16
GIVE EM A BRAKE SIGN	17
TRAFFIC CONTROL DEFICIENCY DEDUCTION	18
MOBILIZATION	19
PIPE MATERIAL	20
WORKING DAYS	21
DOMESTIC SOURCE FOR STEEL OR IRON	22
FAILURE TO COMPLETE THE WORK ON TIME	23

IL ROUTE 25[illegible]
SECTION 1(I)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the Standard Specifications for Road and Bridge Construction, adopted July 1, 1988 hereinafter referred to as the Standard Specifications; the latest edition of the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways in effect on the date of invitation for bids; the Standard Specifications for Traffic Control Items, adopted April 1, 1989; and the Supplemental Specifications and Recurring Special Provisions indicated on the check sheet included herein which apply to and govern the construction of IL Route 251, Section 1(I) in LaSalle County, and in case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and shall govern.

DESCRIPTION OF WORK: Jacking 180' of storm sewer under IL Route 251. Placing 175' of pipe culvert.

VEHICLE PARKING: Parking of personal vehicles within the right of way will be strictly prohibited. Parking of construction equipment within the right of way will be permitted only at locations approved by the engineer and never within median area or overnight on any roadway area.

TRAFFIC CONTROL PLAN:

Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction, the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways, these special provisions, and any special details and Highway Standards herein and in the plans and the Standard Specifications for Traffic Control Items.

Special attention is called to Articles 107.09, 107.14, 107.15, 107.31 and Sections 647 and 648 of the Standard Specifications and the following Highway Standards relating to traffic control.

Highway Standards:

2298 2299 2300 2314 2315

In addition, the following also relate to traffic control for this project:

SPECIAL PROVISIONS
- Keeping Roads Open to Traffic
- Vehicle Parking
- The Use of Drums
- Construction and Maintenance Signs
- Give'Em a Brake Sign
- Traffic Control Deficiency Deduction

SUPPLEMENTAL SPECIFICATIONS
- Legal Relations and Responsibility to Public (Flagmen)
- Miscellaneous Materials (Arrow Board)

RECURRING SPECIAL PROVISIONS
- Temporary Traffic Control Devices (Quality Standard)
- Certified Flaggers
- Type II Barricades

KEEPING ROADS OPEN TO TRAFFIC: Ill. Route 251 shall be kept open to two-way traffic at all times. When construction operations require, as directed by the engineer, temporarily closing one lane is permitted. Two lanes open to traffic will be required overnight and on holidays. Also, two lanes open to traffic will be required on weekends when no active construction work is being performed. The engineer will be the sole judge as to the necessity of lane closures and the length and duration of same.

SEEDING:

Effective July 1, 1990

Any areas disturbed by construction operations shall be seeded and mulched according to Sections 642 and 643 of the Standard Specifications and the other special provisions referring to seeding included herein.

When Seeding, Class (1, 1A, 2, 2A, or 3) is performed subsequent to June 1 and prior to October 1, Spring Oats shall be added to the seeding mixture at a rate of 48 pounds per acre.

This item will not be paid for separately, but shall be included in the unit bid price for pipe culvert, Type 1.

STATUS OF UTILITIES TO BE ADJUSTED:

Name & Address of Utility	Type	Location	Estimated Date Relocation Complete
City of Peru 3017 Fifth Street P.O. Box 424 Peru, IL 61354	Sanitary Sewer		No Conflicts Anticipated

TREE REMOVAL:

This item consists of removing trees at Station 163+59 (99 feet left) where the location of the jacking pit will be. The engineer will be the sole judge as to which trees shall be removed. Removal will consist of possibly removing ±6 shrub trees 3" to 4" in diameter. This item shall be included in the unit bid price for Storm Sewer Jacked in Place, Special.

STORM SEWER JACKED IN PLACE, SPECIAL:

This item will be performed in accordance with Section 606 of the Standard Specifications with the following exceptions:

Construction Requirements: Before any work is begun, the Contractor shall submit to the Engineer for approval the method the Contractor will use for jacking the storm sewer and all related work, including filling the area between the storm sewer and the metal liner. Borings indicate material cut will be a ±1' coal seam (carrying water) with shale layers above and below. These shales could have limestone nodules or lenses incorporated in them which may make directional drilling and pushing difficult. Construction shall be accomplished by one of the following alternatives:

Alternative 1: Construction shall be accomplished by first jacking a 24" metal liner for the entire 180' length, then installing a 12" PVC pipe inside the liner. The metal liner will be perforated the same as the reinforced concrete pipe. (See plans for storm sewer and metal liner perforation detail.) The voids between the liner and the pipe will be filled with material meeting the gradation requirements of CA13, CA14, CA15, or CA16. The end of the PVC pipe shall be capped.

Alternative 2: Construction shall be accomplished by jacking a 24" storm sewer as outlined in Section 606 of the Standard Specifications.

Materials: If Alternative 2 is used, the concrete pipe shall meet the requirements of Article 606.02(a) of the Standard Specifications, and the perforations shall conform to the requirements of AASHTO M175, Type 1 with the holes 1/4" in diameter. If Alternative 1 is used, it shall meet the requirements of Article 709.19 for POLV VINYL CHLORIDE (PVC) PIPE. The perforated holes of this pipe shall be 3/16" in diameter. The perforations shall be symmetrical about the centerline. (See plans.)

Accuracy of Placement: The Contractor will assure that the pipe will cut through the coal seam (located at approximate elevation 569-570 feet) throughout the length of the pipe. (Approximate flowline of the pipe will be 568.5 feet.)

Videotaping of Storm Sewer: After the work has been completed, the Contractor shall videotape the inside of the storm sewer for the entire length of the pipe, and furnish the Department with the original tape.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for storm sewer jacked in place, special, measured in place. This price will include the entire 180 foot length of the perforated storm sewer and, if Alternative 1 is used, the perforated metal liner and backfilling the voids between the liner and the storm sewer, videotaping inside the storm sewer, and all other materials and equipment necessary to install the storm sewer and all excavation (including excavation required for the jacking pit) except excavation in rock. Any sheeting or shoring needed for the jacking pit or anywhere else as described in 606.04 will be furnished by the contractor and incidental to Storm Sewer Jacked in Place Special.

CONTRACTOR ACCESS: Access to the location where drilling and jacking of the storm sewer will take place is the responsibility of the contractor. Removing guardrail to gain access will not be permitted unless approved by the engineer. If engineer permits guardrail removal, no compensation will be made to the contractor. Access at the end of the guardrail should be used to gain access. Depending on the size of the equipment used, some earthwork may be required to gain access. Some preliminary investigation should be performed to determine the extent of the earthwork required. This item shall not be paid for separately, but shall be included in the unit bid price of jacking and drilling storm sewer.

EARTH EXCAVATION (SPECIAL): This work shall consist of the removal and disposal of existing material shown on the cross section of the plans. The work will be done in accordance with the applicable portions of Section 202 of the Standard Specifications. The quantity in the plans is only an estimate. No price adjustments will be allowed due to a change in quantity. This work will be paid for at the contract unit price per cubic yard for EARTH EXCAVATION (SPECIAL).

EXCELSIOR BLANKET: All disturbed areas shall be excelsior blanketed and shall be seeded in accordance with Sections 642 and 643 of the Standard Specifications, except that the seeding and fertilizer nutrients will not be paid for separately, but shall be included into the cost of the excelsior blanket. This work will be paid for at the contract unit price per square yard for EXCELSIOR BLANKET.

IL ROUTE 25
SECTION 1(
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
REQUIRED DISADVANTAGED BUSINESS
PARTICIPATION

Effective May 2, 1975
Revised November 1, 1992

I. DEFINITIONS

This Special Provision is inserted in each contract which contains a Disadvantaged Business Enterprise (DBE) Utilization Goal as required by Section 106(c) of the Surface Transportation and Uniform Relocation Assistance Act of 1987, implemented by Subpart D of 49 CFR Part 23; and as required by the Illinois "Minority and Female Business Enterprise Act." For the purpose of this Special Provision, the following definitions apply:

A. "Disadvantaged Business" is a small business concern which is at least 51 per centum owned by one or more socially and economically disadvantaged individuals, and whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged owners.

B. "Disadvantaged Business Joint Venture" means an association of two or more businesses formed to carry out a single business enterprise for which they combine their property, capital, efforts, skills and knowledge. At least one of the partners in the venture must be a certified entity.

II. BIDDING CONSENT AND CONTRACT ASSURANCE

A. By submission of a bid, the bidder agrees to follow and consents to the terms of this Special Provision. In addition, the bidder assures that in consideration of the award of this contract that no less than _____ per centum of the awarded contract value of this contract shall be performed by one or more Disadvantaged Businesses. The bidder further agrees that it shall not discriminate on the basis of race, color, national origin or sex in the selection of subcontractors to meet this goal.

III. BIDDING PROCEDURE

A. Compliance with this Special Provision shall be by use of businesses certified by the Department as Disadvantaged Businesses. The Disadvantaged Businesses may perform work as subcontractors or as joint adventurers with the contractor. Joint Ventures will be

approved for use under this provision if at least one of the disadvantaged partners in the joint venture is a certified Disadvantaged Business; is responsible for a clearly-defined portion of the work that is at least equal to the percentage goal of this special provision; and shares in the ownership, control, management,

risks, and profits of the joint venture. In order for joint venture approval to be timely provided, the proposed joint venture must submit a joint venture agreement no later than seven (7) working days after the letting date. This requirement is in addition to any other requirements for joint venture approval or DBE credit. Joint venture subcontracts between DBE and non-DBE firms shall not be employed to effect compliance.

The Department maintains a list of certified disadvantaged and woman-owned contractors, vendors and suppliers for the purpose of providing a reference source to assist any bidder in meeting the requirements of this Special Provision. Generally, the bidder may rely upon the Directory and current Addendum to determine certified firms. However, changes can occur in a firm's certification eligibility between issuance of the DBE Directory or Addendum thereto and the letting date. Only those firms certified as of the letting date may be listed on or included in the Utilization Plan submitted pursuant to Section III. B. of this Special Provision. The Department reserves the right to compel the replacement of a business which is not certified as of the letting date. If that should occur, and the low bidder submits as part of his/her DBE Utilization Plan a firm that is no longer certified, the low bidder will be given the opportunity to replace that firm and submit a revised Plan.

B. Compliance with the bidding procedure of the Special Provision is required prior to the award of the contract and the failure of the as-read low bidder to comply will render the bid nonresponsive. In order to assure the timely award of the contract, the as-read low bidder must submit a Disadvantaged Business Utilization Plan on Department form SBE 2026 within seven (7) working days after the date of letting. To meet the seven (7) day requirement, the contractor may send the Plan by certified mail within the seven (7) working day period. If a question arises concerning the mailing date of a Plan, the mailing date will be established by the U.S. Postal Service postmark on the original certified mail receipt from the U.S.Postal Service. It is the responsibility of the as-read low bidder to ensure that the postmark is affixed within the seven (7) working days if the Contractor intends to rely upon mailing to satisfy the submission day requirement. The Plan is to be submitted to the Bureau of Small Business Enterprises, IDOT Administration Building, Springfield, Illinois 62764. The Department will not accept a Utilization Plan if it does not meet the seven (7) day submittal requirement and the Department reserves the right to invite any other bidder to submit a Utilization Plan for award consideration.

C. The Utilization Plan shall indicate that the bidder either will meet the contract goal or will seek a waiver or modification of the goal by demonstrating a good faith effort to meet the goal.

D. The Utilization Plan must tender to the Department a DBE Participation Statement for each Disadvantaged Business proposed for use in achieving the goal on Department form SBE 2025. The signatures on these forms must be original signatures. All elements of information indicated on the said form shall be provided, including but not limited to the following:

1. Identification of the Disadvantaged Businesses to be used;

2. The work to be done by each Disadvantaged Business identified by item number;

3. The price to be paid to each Disadvantaged Business for the identified work specifically stating:

   a. the contract pay item(s),

   b. the quantity, unit price and total for the work to be completed by the certified entity, and

   c. where partial pay items are to be performed by the certified entity, indicate the portion of each item and the subcontract dollar amount;

4. A statement signed by the bidder and each of the Disadvantaged Businesses evidencing availability and use on the project; and

5. If the bidder is a joint venture comprised of disadvantaged firms and nondisadvantaged firms, the plan must also include a clear identification of the portion of the work to be performed by the disadvantaged partner(s).

E. The Utilization Plan will be approved by the Department if the Plan meets the goal of the contract established in Paragraph II. A. The contract shall not be awarded until the Utilization Plan submitted by the bidder is approved. If the Utilization Plan is not approved or is deficient in a technical matter, the bidder will be notified and will be allowed no less than a five (5) working day period in order to cure the deficiency. The bidder may count toward its goal only expenditures, indicated on the Participation Statements, to certified businesses that will perform a commercially useful function in the work of the contract. A business shall be considered to perform a commercially useful function only when it is responsible for execution of a distinct element of the work and carrying out its responsibilities by actually performing, managing and supervising the work involved.

In accordance with 49 CFR Part 23.47, goal credit for participation may be counted in one or more of the following ways:

1. DBE prime contractor or joint venture (100 percent goal credit for the DBE's portion of the work).

2. DBE subcontractor (100 percent goal credit).

3. Equipment rental from a DBE firm (100 percent goal credit).

4. Purchase of material from a DBE supplier, fabricator or manufacturer:

   a. 60 percent goal credit for materials and supplies purchased from a DBE regular dealer.

   b. 100 percent goal credit for material purchased from a DBE manufacturer.

   c. 100 percent goal credit for material purchased from a DBE fabricator or a DBE supplier who substantially alters or changes a material before resale to a contractor.

5. Other expenditures made to DBE firms subject to Department approval.

F. If the bidder is unable to meet the contract goals, and has requested a modification or waiver of the Disadvantaged Business goal, as indicated on Department form SBE 2026, the waiver request must include the following elements:

   1. All information indicating why the contract goal should be modified or waived,

   2. Evidence of Disadvantaged Businesses contacted. The following information must be submitted in order to document initial and follow-up contact:

      a. An Initial Bid Solicitation List, indicating the names of the firms contacted, date of contact, method of contact, i.e., letter (specify if regular, express or registered mail), telephone or face-to-face contact, whether or not a response was received, and summary of the response. The solicitations shall contain at least the project identification, project location, types of work for which quotations are sought and the date, time and place quotations are due.

      b. A Certificate of Contact, certifying that the information provided on the Initial Bid Solicitation List is true and accurate.

c. Copies of all contact letters, if the bidder contacts DBE firms by letter. The letter must clearly encourage participation and specifically define the types of work for which bids are being sought.

d. A Follow-up Telephone Log, which indicates follow-up telephone contact after all types of initial contact. A telephone log must be submitted indicating the individual contacted, date of contact and response.

3. All evidence of good faith efforts made by the bidder, both prior to and after the letting, to secure the ready, willing, able and certified Disadvantaged Businesses necessary to meet the contract goals. See paragraph IV for information on what is meant by good faith efforts.

G. A waiver or modification request indicated on form SBE 2026 will be decided by the Department as follows. If the Department determines that the Contractor has utilized good faith efforts to secure the ready, willing and able certified Disadvantaged Enterprises necessary to comply with the Special Provision, and that certified enterprises are not reasonably available to perform on the project or that some other reason exists for waiver or modification of the goal, the Department shall modify or waive the goal of the Special Provision. The Department will advise the Contractor by certified mail. If the Department denies the request or modifies the goal in a manner other than that requested, the Department will notify the bidder of the determination by certified mail. The determination shall include a statement of additional efforts that the bidder may take in order to effect compliance. The bidder is not limited by the statement of additional efforts, but may take such other action beyond the stated additional efforts in order to cure. Thereafter, the bidder will be allowed no less than a five (5) working day period in order for the bidder to cure the deficiency and effect compliance. Failure to issue a denial determination within eighteen (18) working days after receipt of the written waiver request shall be deemed an approval of the request.

H. In the event the bid is rendered nonresponsive due to failure to submit a Disadvantaged Business Utilization Plan or failure to comply with the bidding procedures set forth herein, the Department may take one or more of the following actions: 1) cause a forfeiture of the penal sum of the bidder's proposal guaranty to the Department, 2) declare the bidder ineligible to rebid the project on any future letting if readvertised, or 3) suspend the bidder for one letting.

IV. GOOD FAITH EFFORTS

A. In order to demonstrate sufficient good faith efforts to achieve the designated goal percentages for Disadvantaged Businesses, the steps taken to obtain participation must be documented. The required

elements are:

1. That a reasonable number of relevant Disadvantaged Businesses were contacted,

2. That the work selected for allocation to Disadvantaged Businesses was chosen in order to increase the likelihood of achieving the stated goals,

3. That potential Disadvantaged Businesses were negotiated with in good faith, that conditions were not imposed on a Disadvantaged Business which are not imposed on all other subcontractors or that benefits ordinarily conferred on subcontractors for the type of work were not denied the Disadvantaged Business, and

4. That services of the Department and its supportive services contractors were used in the efforts to reach the contract goals.

B. In addition to the required elements which must be shown to demonstrate good faith, any other relevant information which supports the waiver request may be submitted, including but not limited to the following:

1. That any Department prebid meetings scheduled to inform Disadvantaged Businesses of subcontracting opportunities, were attended, and

2. That the historical track record of the contractor discloses a meaningful effort on the part of the contractor to achieve the goal of the program in Department contracts.

V. CONTRACT OBLIGATION

A. Compliance with this Special Provision is an essential part of this contract. After approval of the Utilization Plan and award of the contract, the Utilization Plan and Participation Statements shall become part of the contract. No changes to the Utilization Plan may be made without the prior written approval from the Department's Bureau of Small Business Enterprises. All items or partial items of work indicated or reserved for performance by the approved certified businesses shall be performed, managed and supervised by the business executing the Participation Statement. All requests for changes to the Utilization Plan shall be submitted in writing to:

Illinois Department of Transportation
Bureau of Small Business Enterprises
Contract Compliance Section
2300 South Dirksen Parkway
Springfield, Illinois 62764

B. In determining compliance with this Provision, the total dollars paid to eligible Disadvantaged Businesses shall be divided by the total awarded contract dollars to determine the percentage of performance. The Contractor shall maintain records of payment under this Provision and said records shall be made available to the Department upon request for inspection. After the performance of the final item of work or delivery of material by the approved DBE firm and within thirty (30) calendar days after payment has been made by the Department to the Contractor for such work or material (less any retainage), the Contractor shall submit a DBE Payment Agreement upon Department form SBE 2115 to the District Engineer, or if a disagreement exists, indicate to the District Engineer on this form why payment has not been made.

C. The Contractor may after award of the contract seek a modification or waiver of the goal for good cause upon a showing of a good faith effort to achieve the goal of the Special Provision. Examples of such good cause include but are not limited to nonperformance, breach of contract by an approved Disadvantaged Business and failure of the approved Disadvantaged Business to perform, manage and supervise its identified work. It is the responsibility of the contractor to prove the good cause and a good faith effort to achieve the goal in the light of the cause. All requests for waiver or modification of the goal will be considered as a change to the approved Utilization Plan and the contractor shall therefore submit a written request for the waiver or modification to the address listed in paragraph V. A. above. If the Department determines that the contractor has proven the good cause and a good faith effort to achieve the goal in light of the cause, the Department shall modify or waive the goal as requested. If the Department denies the request or modifies the goal in a manner other than that requested, the Department will notify the contractor of the determination by certified mail within twenty (20) working days after receipt of the request. Failure to issue a denial determination within twenty (20) working days after receipt of the written waiver request, shall be deemed an approval of the request. Unless the goal of the Special Provision is modified or waived for good cause upon a showing of a good faith effort, failure of the Contractor to have at least the designated goal of this contract performed by the Disadvantaged Businesses as indicated in the approved Utilization Plan will result in a reduction in contract payments, as liquidated and ascertained damages, determined by multiplying the awarded contract dollar value by the contract per centum goal and subtracting the dollar value of the work actually performed by approved DBE businesses. The Department reserves the

right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the contractor submits sufficient documentation pursuant to this Section demonstrating achievement of the goal or until such time as the goal is modified or waived by the

Department in accordance with this Special Provision or after liquidated damages have been determined and collected.

D. This Special Provision is in addition to all other Equal Employment Opportunity requirements of this contract.

6050I

IL ROUTE 25
SECTION 1(
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISIONS
FOR
PUBLIC CONVENIENCE AND SAFETY

Effective December 15, 1986

The provisions of the third paragraph of Article 107.09 concerning broken pavement, open holes or trenches on or adjacent to the traveled way during legal holiday periods shall not apply on multi-lane pavements on this project providing at least one lane in each direction is open to uninterrupted traffic.

3003I

IL ROUTE 25
SECTION 1(
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
SUBLETTING OF CONTRACTS

Effective January 1, 1988
Revised May 1, 1993

This Special Provision supercedes paragraph VII of Form FHWA 1273, Required Contract Provisions Federal-aid Construction Contracts.

108.01 Subletting of Contract. Revise this Article to read:

"The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of his/her right, title or interest therein, without written consent of the Engineer. In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with the Contractor's own organization, work amounting to not less than 50 percent of the total contract cost, except that any items designated in the contract as "specialty items" may be performed by subcontract and the cost of any such specialty items so performed by subcontract may be deducted from the total cost before computing the amount of work required to be performed by the Contractor with his/her own organization. Materials purchased or produced by the Contractor must be incorporated into the project by the Contractor's own organization if their cost is to be applied to the 50 percent requirement.

No subcontracts, or transfer of contract, shall in any case release the Contractor of his/her liability under the contract and bonds. All transactions of the Engineer shall be with the Contractor. The Contractor shall have a representative on the job at all times when either contract or subcontract work is being performed.

All requests to subcontract shall contain a certification that the subcontract agreement exists in writing and physically contains the required Federal and State Equal Employment Opportunity provisions and Labor compliance provisions, including the contract minimum wage requirements. The contractor shall permit Department or Federal representatives to examine the subcontract agreements upon notice."

4892I

IL ROUTE 2[illegible]
SECTION 1[illegible]
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
CONSTRUCTION & MAINTENANCE SIGNS

Effective March 1, 1992
Revised May 1, 1993

Revise the first paragraph in Article 718.17 of the Standard Specifications to read:

"All signs used for temporary traffic control shall meet the approval of the Engineer. The sheeting shall be mounted on a rigid material such as aluminum or exterior grade plywood. Signs utilizing a base of fabric, fiberboard or other highly flexible or frangible material will not be permitted, except that signs having a reflective sheeting face bonded to a durable plastic or fabric base will be permitted (a) in work zones with posted speeds above 45 miles per hour when workers are present to maintain the devices and (b) in all work zones having posted speeds of 45 miles per hour or less. All diamond-shaped construction warning signs used on mainline and ramps of Interstate and other freeways shall be fluorescent orange in color and meet the initial minimum brightness values of the orange sheeting shown in the table below."

Revise the first sentence of the third paragraph in Article 718.17 of the Standard Specifications to read:

"At the time of manufacturing the reflective sheeting shall have the following initial minimum brightness values at 0.2 and 0.5 divergence expressed as average candlepower per foot candle per square foot of material."

Revise the table in Article 718.17 of the Standard Specifications to read:

Color	Observation Angle 0.2 Entrance Angle		Observation Angle 0.5 Entrance Angle	
	-4	+30	-4	+30
Red	45.0	25.0	15.0	10.0
Silver/White	90.0	40.0	41.0	21.0
Yellow	60.0	30.0	25.0	13.0
Orange	100.0	30.0	40.0	15.0

5624I

IL ROUTE 25
SECTION 1(
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
CHANNELIZING DEVICES

Effective: April 1, 1993

Revise Article 718.18 of the Standard Specifications to read:

718.18 **Channelizing Devices.** At the time of manufacturing, the reflective sheeting used on barricades and vertical panels as shown on Highway Standard 2299 shall have the following initial minimum brightness values expressed as average candlepower per foot candle per square foot of material. Measurements shall be conducted in accordance with Federal Specification L-S-300C.

Color	Observation Angle 0.2 Entrance Angle		Observation Angle 0.5 Entrance Angle	
	-4	+30	-4	+30
Silver/White	140.0	60.0	50.0	28.0
Orange	42.0	15.0	14.0	8.0

The reflective sheeting on drums shall conform to the requirements as barricades and vertical panels except that drums with steady-burn lights shown for lane closure tapers and runarounds on Highway Standards 2316, 2317 and 2417 and flexible delineators shown on Highway Standard 2298 shall conform to the following initial minimum brightness values.

Color	Observation Angle 0.2 Entrance Angle		Observation Angle 0.5 Entrance Angle	
	-4	+30	-4	+30
Silver/White	250.0	100.0	95.0	50.0
Orange	100.0	30.0	40.0	15.0

The sheeting color and surface shall conform to the requirements contained in Article 718.17.

6204I

IL ROUTE 25
SECTION 1(I
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
GIVE 'EM A BRAKE SIGN

Effective August 1, 1989
Revised August 1, 1991

Give 'em a BRAKE Campaign Sign

This work shall consist of furnishing and erecting two 48" x 48" "Give 'em a BRAKE" warning signs (W-21-I109) in addition to the work zone signing required by the applicable traffic control plan and standards utilized for this project. The sheeting shall be Type B. On two-lane highways, these signs shall be erected midway between the first and second warning signs. Two of these signs shall be erected 1,000 feet in advance of the RIGHT (LEFT) LANE CLOSED 1/2 MILE signs on multilane highways. The signs shall remain in place for the duration of the project. Camera-ready artwork for the signs will be provided to sign manufacturing companies upon request (artwork may be obtained from the Central Bureau of Traffic at (217)782-3450).

The cost of furnishing, erecting, and removing these signs shall be included in the cost for Traffic Control Items as shown on the plans.

4480I

IL ROUTE 25
SECTION 1(
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION FOR TRAFFIC CONTROL DEFICIENCY DEDUCTION

Effective April 1, 1992

To ensure a prompt response to incidents involving the integrity of the work zone traffic control devices, the Contractor shall provide a telephone number where a responsible individual can be contacted on a 24-hour-a-day basis. When the Engineer is notified or determines a deficiency exists, (s)he shall be the sole judge as to whether the deficiency is an immediate safety hazard. The Contractor shall dispatch sufficient resources within 2 hours of notification to make needed corrections of deficiencies that constitute an immediate safety hazard. Other deficiencies shall be corrected within 12 hours. If the Contractor fails to restore the required traffic control and protection within the time limits specified above, the Engineer will impose a daily monetary deduction for each 24-hour period (or portion thereof) the deficiency exists. This time period will begin with the time of notification to the Contractor and end with the Resident Engineer's acceptance of the corrections. For this project, the daily deduction will be ___*___ per day. In addition, if the Contractor fails to respond, the Engineer may correct the deficiencies and the cost thereof will be deducted from monies due or which may become due the Contractor. This corrective action will in no way relieve the Contractor of his/her contractual requirements or responsibilities.

*The cost of the daily deduction will be calculated by dividing three percent of the awarded contract price by the number of calendar days anticipated for this project. The number of days anticipated for this project is ___25___. This procedure is to be followed regardless of whether the contract is based upon working days, contains a completion date, or has an incentive/disincentive clause.

5729I

IL ROUTE 2[illegible]
SECTION 1([illegible]
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
MOBILIZATION

Effective May 4, 1993

Replace Section 650 of the Standard Specifications with the following:

"650.01 Mobilization. This work shall consist of preparatory work and operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of offices, buildings and other facilities necessary for work on the projects; and for all other work or operations which must be performed or costs incurred when beginning work on the project.

Upon execution of the contract, 3% of the total contract bid will be paid as the original mobilization payment.

The 3% will be recovered in accordance with the following schedule.

(a). When 10% or more of the original contract amount is earned 1/5 of the original mobilization payment will be deducted from the current pay voucher.

(b). When 20% or more of the original contract amount is earned a cumulative 2/5 of the original mobilization payment will be deducted from the current pay voucher.

(c). When 30% or more of the original contract amount is earned a cumulative 3/5 of the original mobilization payment will be deducted from the current pay voucher.

(d). When 40% or more of the original contract amount is earned a cumulative 4/5 of the original mobilization payment will be deducted from the current pay voucher.

(e). When 50% or more of the original contract amount is earned the remaining balance of the original mobilization payment will be deducted from the current pay voucher."

6331I

IL ROUTE 1
SECTION 1(I)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
PIPE MATERIAL

Effective March 1, 1991

Revise the first sentence in Article 709.19 of the Standard Specifications to read:

"Perforated poly (vinyl chloride) (PVC) pipe shall conform to AASHTO M 278 except that it shall be made of PVC plastic having a minimum cell classification of 12454-C as defined in ASTM D 1784, and shall have a minimum pipe stiffness of 50 lbs. per in. per in. at 5 percent deflection and 4 rows of perforations at 2-inch centers will be acceptable for 12-inch and 15-inch diameter pipes."

Revise the first two sentences in Article 709.20 of the Standard Specifications to read:

"Poly (vinyl chloride) (PVC) pipe shall conform to AASHTO M 278 or ASTM F 679 except that it shall be made of PVC plastic having a minimum cell classification of 12454-C, as defined in ASTM D 1784 and shall have a minimum pipe stiffness at 5 percent deflection of 50 lbs. per in. per in. and shall withstand flattening to where the distance between the plates is twice the wall thickness plus 5 percent of the inside diameter."

Add "C" after the cell classification of PE 334413 in the first paragraph of Article 709.21 and the second paragraph of Article 709.22 of the Standard Specifications.

Revise cell classification "PE 314412" in the first paragraph of Article 709.26 of the Standard Specification to "PE 315412 C".

5212I

IL ROUTE 51
SECTION 1(I)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
WORKING DAYS

Effective: August 1, 1993

Revise the first sentence of the second paragraph of Article 108.04 to read:

"A working day shall be defined as any calendar day between May 1 and November 30 inclusive except Saturdays, Sundays or holidays observed by the Contractor's entire work force in Illinois."

6703I

IL ROUTE
SECTION 1(I)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
DOMESTIC SOURCE FOR STEEL OR IRON

Effective March 1, 1985
Revised October 1, 1993

Control of Materials. The requirements of Article 106.01 of the Standard Specifications, which require that all metal materials specified in Section 710 be domestically manufactured or produced, are hereby waived for this contract except as noted herein.

All steel or iron materials incorporated into this project shall be domestically manufactured or produced and, in addition, shall be domestically fabricated. The Contractor shall obtain from the steel or iron producer and/or fabricator, in addition to the mill analysis, a certification that all steel or iron materials meet these domestic source requirements.

The application of all coatings, epoxy, galvanizing, painting, etc. to metal products shall be domestically applied.

Metal materials other than steel or iron may be accepted provided, (1) the Contractor notifies the Department, in advance, of his/her intention to use other than domestically manufactured or produced material, (2) written evidence is provided in english, or compliance with all other requirements of the Specifications, and (3) physical tests conducted by the Bureau of Materials and Physical Research verify the acceptability of the material. The Contractor is responsible for complying with these conditions so that the material can be sampled and tested prior to the time it is required, and no material shall be incorporated in the work until approval is obtained from the Engineer.

6892I

State of Illinois
Department of Transportation

SPECIAL PROVISION FOR FAILURE TO COMPLETE THE WORK ON TIME

Effective: February 1, 1994
Revised: February 2, 1994

108.10 Failure to Complete the Work on Time. Revise the table of liquidated damages in this Article to read:

Schedule of Deductions for Each
Day of Overrun in Contract Time

Original Contract Amount		Daily Charge	
From More Than	To and Including	Calendar Day	Work Day
$ 0	$ 25,000	$ 250	$ 350
25,000	100,000	375	500
100,000	500,000	475	650
500,000	1,000,000	650	900
1,000,000	2,000,000	850	1,150
2,000,000	3,000,000	1,100	1,500
3,000,000	5,000,000	1,450	2,000
5,000,000	7,500,000	1,800	2,500
7,500,000	10,000,000	2,175	3,000
10,000,000	15,000,000	2,525	3,500
15,000,000	20,000,000	2,900	4,000
20,000,000	25,000,000	3,250	4,500
25,000,000	30,000,000	3,600	5,000
30,000,000	35,000,000	4,325	6,000
35,000,000	and over	5,400	7,500

7217I

IL ROUTE 251
SECTION 1(I)
LASALLE COUNTY
DOC 3119p - ARCHIVE 310d

INDEX OF CHECK SHEET FOR SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS

Adopted April 1, 1993

This Check Sheet contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS, SPECIAL PROVISIONS and TRAFFIC CONTROL ITEMS.

SUPPLEMENTAL SPECIFICATIONS

The SUPPLEMENTAL SPECIFICATIONS listed below supplement the "Standard Specifications for Road and Bridge Construction", adopted July 1, 1988. All SUPPLEMENTAL SPECIFICATIONS are applicable to and included, by reference, in all contracts advertised and awarded by the Department.

Std. Spec. Sec.		PAGE NO.
	ERRATA Standard Specifications for Road and Bridge Construction (Adop. 7-1-88) (Rev. 4-1-93).....	v
101	Definition of Terms (Rev. 6-1-90).....	1
105	Control of Work.....	2
107	Legal Relations and Responsibility to Public.....	3
108	Failure to Complete the Work on Time (Rev. 4-1-93).....	4
202	Roadway Excavation (Rev. 4-1-93).....	5
208	Granular Embankment, Special.....	6
212	Subgrade (Rev. 12-2-91).....	7
216	Topsoil.....	8
217	Final Shaping Trimming, and Finishing.....	9
218	Stabilized Subbase.....	10
301	Aggregate Base Course (Rev. 12-2-91).....	11
403	Bituminous Surface Treatment.....	12
406	Bituminous Concrete Binder and Surface Course, Class I (Rev. 12-2-91)..	13
408	Portland Cement Concrete Pavement (Rev. 4-1-93).....	15
409	Continuously Reinforced Portland Cement Concrete Pavement.....	20
410	Portland Cement Concrete Shoulders (Rev. 4-1-93).....	21
501	Removal of Existing Structures (Rev. 4-1-93).....	24
503	Concrete Structures (Rev. 4-1-93).....	25
504	Concrete For Structures And Incidental Construction (Rev. 12-2-91).....	27
505	Precast Concrete Structures (Rev. 4-1-93.).....	28
507	Steel Structures (Rev. 4-1-93).....	29
509	Cleaning and Painting Metal Structures.....	34
511	Pipe Culverts (Rev. 4-1-93).....	35
512	Reinforcement Bars.....	37
513	Test Piles.....	38

Std. Spec. Sec.		PAGE NO.
601	Riprap (Rev. 4-1-93)	39
603	Storm Sewers	40
607	Pipe Drains and Pipe Underdrains (Rev. 4-1-93)	41
612	Catch Basin, Manhole, Inlet and Valve Vault Construction Adjustment and Reconstruction	42
617	Removal of Existing Pavement, Curb, Gutter, Combination Texturing Existing Pavement	43
620	Pavement Patching (Rev. 4-1-93)	44
632	Delineators	46
643	Mulch and Excelsior Blanket	47
648	Traffic Control	48
653	Open Graded Asphalt Friction Course	49
654	Gabions and Slope Mattress	50
655	Concrete Barrier	53
659	Lime Stabilized Soil Mixture (Rev. 12-2-91)	54
674	Bituminous Curb	58
675	Fabric For Ground Stabilization	59
676	Silt Filter Fence	61
677	Removal and Replacement of Preformed Elastomeric Compression Joint Seal On Jointed PC Concrete Pavement	62
678	Sluice Gate (Rev. 4-1-93)	63
703	Fine Aggregates (Rev. 4-1-93)	64
704	Coarse Aggregate (Rev. 4-1-93)	65
705	Stone, Concrete Blocks and Broken Concrete for Erosion Protection, Sedimemt Control and Rockfill (Rev. 12-2-91)	66
707	Concrete Masonry Units	67
709	Drain Pipe and Tile (Rev. 4-1-93)	68
710	Metals (Rev. 4-1-93)	69
712	Paint Materials and Mixed Paints	72
715	Preformed Expansion Joint Filler	73
717	Materials for Planting	74
718	Miscellaneous Materials (Rev. 4-1-93)	75
719	Highway Lighting Materials	79
802	Bituminous Equipment (Rev. 4-1-93)	82
803	Portland Cement Concrete Equipment (Rev. 12-2-91)	84

RECURRING SPECIAL PROVISIONS

CHECK	SHEET #	PAGE NO.
1	R.R. Protection Liability Form (Eff. 6-10-58) (Rev. 9-29-67)	85
2	Reserved	95
X 3	State Required Contract Provisions All Federal - aid Construction Contracts (Eff. 2-1-69) (Rev. 10-1-83)	96
4	Specific Equal Employment Opportunity Responsibilities NonFederal - aid Contracts (Eff. 3-20-69) (Rev. 10-15-75)	97
5	Required Provisions - State Contracts (Eff. 4-1-65) (Rev. 4-1-93)	101

CHECK SHEET # PAGE NO.

6 Sand Module Impact Attenuators (Eff. 10-15-76) (Rev. 12-2-91)..... 104
7 Reserved..... 105
8 Reserved..... 106
9 Reserved..... 107
10 Reserved..... 108
11 Reserved..... 109
12 Reserved..... 110
13 Reserved..... 111
14 Calcium Nitrite Corrosion Inhibitor (Eff. 3-1-80) (Rev. 6-1-90)..... 112
15 Reserved..... 113
16 Hot Weather Concreting (Eff. 10-1-86) (Rev. 7-1-88)..... 114
17 Bituminous Stabilized Mixture (Hot-Mix Recycling) (Eff. 5-1-80) (Rev. 12-2-91)..... 115
18 Reserved..... 117
19 Erosion Control (Eff. 10-1-83) (Rev. 10-1-86)..... 118
20 Erosion Control Plan (Eff. 10-1-83)..... 120
21 Knitted Straw Mat (Eff. 8-1-87)..... 121
22 Flap Gates (Eff. 7-1-88)..... 122
23 Reserved..... 124
24 Reserved..... 125
25 Domestic Source for Steel or Iron (Eff. 3-1-85) (Rev. 2-1-93)..... 126
26 Relief Joint (Eff. 5-1-86)..... 127
27 Glare Screen Blades (Eff. 8-1-81)..... 128
28 Fabric Formed Concrete Revetment Mats (Eff. 11-15-79) (Rev. 7-1-88).... 129
29 Use of Fly Ash in Portland Cement Concrete (Eff. 3-1-86) (Rev. 12-2-91) 131
30 Reserved..... 132
31 Pavement Rehabilitation by the Heat-Scarify-Overlay Method (Eff. 4-1-84)..... 133
32 Single Pass Asphalt Repaving (Eff. 4-1-84)..... 134
33 Reserved..... 136
34 Reserved..... 137
35 Reserved..... 138
36 Traffic Barrier Terminal Type 3B (G.R.E.A.T. SYSTEM) (Eff. 10-1-86).... 139
37 Slipformed Parapet Wall (Eff. 11-22-82) (Rev. 6-1-90)..... 140
38 Insertion Lining of Pipe Culverts (Eff. 6-1-84) (Rev. 12-2-91)..... 142
39 Use of Geotechnical Fabric for French Drains (Eff. 4-15-82) (Rev. 7-1-88)..... 145
40 Measurement of Pavement Marking Quantities (Eff. 7-1-87)..... 146
41 Reserved..... 147
42 Reserved..... 148
43 Geocomposite Wall Drain (Eff. 11-1-86)..... 149
44 Reserved..... 150
45 Reserved..... 151
46 Portland Cement Concrete Patching Mixture (Eff. 10-1-84) (Rev. 5-1-86). 152
47 Asphalt Quantities and Cost Reviews (Eff. 7-1-88)..... 155
48 Crack Sealing Bituminous Pavement (Eff. 2-15-88) (Rev. 6-1-90)..... 156
49 Reserved..... 157
50 Reserved..... 158

CHECK	SHEET #	PAGE NO.
51	Filter Fabric For Use With Riprap (Eff. 4-1-88) (Rev. 12-2-91).....	159
52	Crack and Joint Sealing Portland Cement Concrete Pavement (Eff. 2-15-88) (Rev. 12-2-91).....	162
53	Reserved.....	164
54	Unexpected Regulated Substances (Eff. 9-1-89).....	165
55	Bituminous Concrete Binder and Surface Course Class I (Eff. 11-1-88)...	166
56	Maintenance Bridge Washing (Eff. 3-1-89) (Rev. 7-1-89).....	167
X57	Differing Site Conditions, Suspensions of Work and Significant Changes in the Character of Work (Eff. 5-1-88).....	168
X58	Temporary Traffic Control Devices (Eff. 12-2-91).....	170
59	Reserved.....	171
60	Structural Steel Tubing for Bridge Rail (Eff. 6-1-90).....	172
61	Rumble Strips (Eff. 10-1-90) (Rev. 4-1-93).....	173
62	Erosion Control Fiber Blanket (Eff. 3-1-91) (Rev. 4-15-91).....	174
63	Temporary Easements (Eff. 12-2-91).....	176
64	Aggregate Source Certification (Eff. 6-1-91).....	177
65	Bituminous Concrete Binder and Surface Course Class I, Type 3 (Eff. 8-1-89).....	178
66	Bridge Approach Shoulder Pavement And Bridge Approach Pavement Drains (Eff. 11-1-92) (Rev. 1-1-93).....	181
X67	Certified Flaggers (Eff. 11-1-92).....	182
68	Haul Road Stream Crossings, Other Temporary Stream Crossings, And In - Stream Work Pads (Eff. 1-2-92) (Rev. 6-1-92).....	183
69	Hinge Jointed Pavement Patches (Eff. 12-1-91).....	184
X70	Contract Claim (Eff. 3-2-92) (Rev. 7-1-92).....	185
71	Bridge Approach Pavement (Eff. 11-1-92).....	189
72	Removal and Disposal of Known Underground Storage Tanks (Eff. 9-1-89) (Rev. 1-15-90).....	190
73	Micro - Surfacing (Eff. 9-1-90) (Rev. 10-1-90).....	192
74	Saw Cut Grooving of Concrete Bridge Decks (Eff. 6-1-91) (Rev. 11-1-92).	195
X75	Type II Barricades (Eff. 3-1-92).....	196
76	Use of Anti - Stripping Additives for Class I, Type 1 and 2 Mixtures (Binder and Surface) (Eff. 9-1-89) (Rev. 6-1-91).....	197

BRIDGE SPECIAL PROVISIONS

BSP-1	Bridge Seat Sealer (Eff. 7-1-71) (Rev. 4-1-93).....	198
BSP-2	Portland Cement Mortar Fairing Course (Eff. 1-2-80).....	199
BSP-3	Concrete Joint Sealer (Eff. 7-1-71).....	200
BSP-4	Elastic Joint Filler (Eff. 7-1-71) (Rev. 10-1-86).....	202
BSP-5	Reserved.....	203
BSP-6	Waterproofing Membrane System (Eff. 4-15-74) (Rev. 12-2-91).....	204
BSP-7	Reserved.....	210
BSP-8	Sand Backfill (Vaulted Abutments) (Eff. 7-1-71) (Rev. 12-2-91)....	211
BSP-9	Reserved.....	212
BSP-10	Temporary Bridge Rail (Eff. 1-2-80).....	213
BSP-11	Epoxy Grouting Of Anchor Rods And Bars (Eff. 7-1-73) (Rev. 12-2-91).....	214

BSP-12 Reserved..... 215
BSP-13 Bituminous Density Test On Bridge Decks (Eff. 2-15-78) (Rev. 6-1-90)..... 216
BSP-14 Epoxy Crack Sealing (Eff. 10-1-83) (Rev. 6-1-90)..... 217
BSP-15 Epoxy Mortar Repair (Eff. 10-1-83) (Rev. 6-1-90)..... 218
BSP-16 Reserved..... 219

INDEX OF PAY ITEMS

PAGE NO.

Index of Pay Items..... 220

APPENDIX

Appendix (Metric Information)..... 227

Illinois Department of Transportation

Memorandum

To:	Gregg Mounts	Attn:	Brad Cresto
From:	Dan Mestelle DM JT	By:	Jim Threadgill
Subject:	Plan Review *		
Date:	February 15, 1994		

* FA Route 46 (IL 251)
Section (1)I
LaSalle County
Contract No. 86497

We have reviewed the subject plans and offer the following comments/questions:

1. How many WORKING DAYS?

2. Is it possible to completely fill the 180' long void between metal liner and P.V.C. pipe with CA 13, 14, 15 or 16? If not, the P.V.C. pipe may not be required.

3. Include a pay item to remove material placed on the foreslope. This material is apparently full of bituminous and concrete chunks; therefore, spreading on the foreslope would make a mess. If barricades and appropriate traffic control is used, the contractor should be allowed to remove the guardrail and replace during material removal.

4. Include EXCELSIOR BLANKET to repair all excavation and work areas. Change SEEDING AND FERTILIZER to be incidental to EXCELSIOR BLANKET.

5. Show location of sheet piling on plan view. A second manhole may be necessary to get the proposed pipe culvert east of the sheet piling.

JT:ma
#3548n

cc: D. Claus

Illinois Department of Transportation

Memorandum

To:	Andrew Svhira	Attn:	Gregg Mounts
From:	Edward Krysiak	By:	Bruce Hucker BAH
Subject:	Flooding and Drainage Problems		
Date:	February 3, 1994		

S.B.I. 2 (Peoria Street)
Section 71W&RS
City of Peru
LaSalle County
P-93-030-94
Contract 86537

We have contacted our field engineer for this area and offer the following comments:

- Flooding problems have been alleviated since the industrial park to the east has installed storm sewers and retention basins.
- Vandals continually deface and remove reflective markers at the termination point. Could something be done to alleviate this situation?

BAH:sj/7706i

Edward M Krysiak

Illinois Department of Transportation

Memorandum

To:	Andy Svihra	Attn:	Gregg Mounts
From:	Edward M. Krysiak	By:	Bob Etzenbach
Subject:	Plan Review*		
Date:	January 24, 1994		

*FA 46 (IL. 251)
Section (1)I
LaSalle County
Contract #86497

1. Add the Inserted Springfield Special Provisions #21 & #22.

2. The following Special Provisions were omitted:
   Keeping Roads Open To Traffic
   Give 'Em A Brake Sign
   Traffic Control Deficiency Deduction

Edward M Krysiak

RPE:bb
6671f

Illinois Department of Transportation

Memorandum

To:	G. Mounts	Attn:	B. Cresto
From:	D. L. Claus	By:	D. Lindeman
Subject:	Plan Review*		
Date:	January 20, 1994		

*Ill. 251
Section 1(I) Slope Repair
LaSalle County

I have reviewed the subject proposed plans and special provisions and offer the following comments.

Please delete the following "Recurring Special Provisions."

No. 25 - Domestic Source for Steel or Iron

Please include the following "Inserted Springfield Special Provisions."

No. 33 - Mobilization

Allow two options for storm sewer jacked in place:

1. PCC pipe as in 606.02(a) with perforations all around (16 rows).

2. A 24" metal liner, strength adequate to push, up to the contractor, with perforation same as the PCC alternate. Fill with 12" PVC perforated pipe and CA 13, 14, 15 or 16 in the annular void.

The contractor should submit his proposed method of installation of storm sewer or liner including installation of aggregate.

Any sheeting or shoring needed for the jacking pit or anywhere else as described in 606.04 will be furnished by the contractor and incidental to Storm Sewer Jacked In Place Special.

The specifications should note that the borings indicate material cut will be a ±1' coal seam (carrying water) with shale layers above and below. These shales could have limestone nodules or lenses incorporated in them which may make directional drilling and pushing difficult.

The final storm sewer pipe should be videotaped when finished.

Cross sections through the area should be included to aid in bidding site development.

The work pad at the Boring No. 1 location should be removed.

DJL:lw/1194m

cc: D. Mestelle

FILE COPY

#712

Illinois Department of Transportation

Memorandum

To:	D. L. Claus	Atten: D. Lindeman
From:	G. Mounts	By: B. Cresto
Subject:	Plan Review Revisions *	
Date:	January 14, 1994	

* Ill. Route 251
Section (I) Slope Repair
LaSalle County

We have read your comments on the plans of the above mentioned project and have made the following changes:

1.) The recurring Special Provisions and the inserted Springfield Special Provisions have been included in the contract.

2.) We agree that the system would be more efficient if the metal liner was removed. However, after extensive talks with L. J. Keefe (a contractor who in the past has performed much jacking and drilling of pipe), we believe the probability of pulling out the metal sleeve is very small.

3.) The metal liner will not be capped.

4.) The perforations in the metal liner will be slotted and be 1/8 inch wide. A detail of the pipe will be included in the plans to clarify location of the perforations.

5.) Tongue and groove joints have been specified in the plans. Optional use of reinforced concrete storm sewer has also been indicated in the plans.

6.) The pipe culvert has been downsized to 6" diameter.

7.) A permanent easement has been requested from Land Acquisition.

8.) The new drain locations and the existing guardrail have been included in the plans.

9.) The work pad will be removed. Boring logs will be included in the plans.

10.) Top of grate elevation has been indicated on the plans.

If you have any questions, please feel free to contact me.

3395p

FILE #712

Illinois Department of Transportation

Memorandum

To:	G. Mounts	Attn:	B. Cresto
From:	D. L. Claus	By:	D. Lindeman
Subject:	Plan Review*		
Date:	January 12, 1994		

*Ill. 251
Section 1(I) Slope Repair
LaSalle County

I have reviewed the subject proposed plans and special provisions and offer the following comments.

Please include the following "Recurring Special Provisions."

No. 57 - Differing Site Conditions
No. 70 - Contract Claim

Please include the following "Inserted Springfield Special Provisions."

No. 61 - Pipe Material
No. 67 - Domestic Source for Steel or Iron

If a non-perforated metal liner is used and later pulled out, the drainage system would be more efficient.

The metal liner does not need to be capped since this may be an impossible task and the voids are to be filled with pea gravel anyway.

The perforations in the metal liner will not be elliptical. Therefore, more description for perforations is needed. Could use slots 1/8" wide.

For storm sewer pipe, tongue and groove joints should be specified. Allow optional use of 606.02(a), Reinforced Concrete, Storm Sewer with Perforations, IAW AASHTO M65 and special provisions.

The pipe culvert leaving the manhole can be a smaller size, a minimum of 6" pipe drain can be used.

A permanent easement or right of way may be required unless the manhole is moved onto existing right of way.

Show new drain location ±162+00 and guardrail.

Include cross sections. Remove work pad at Boring No. 1 location and include boring logs in plans.

Show top of grate elevation for manhole.

DJL:lw/1173m

cc: D. Mestelle

APPENDIX

E-11

Illinois Department of Transportation

Memorandum

To: Ralph E. Dalton

From: D. L. Claus By: D. J. Lindeman

Subject: Shoulder Slide*

Date: June 16, 1993

*Ill. 251 (FA 46)
Section (1)I
LaSalle County

The Geotechnical Report for the slide repair behind Eagles in Peru has been approved by the Soils Committee. The approval memo and a copy of the report are attached.

This repair project is currently unfunded but can be initiated at any time. A temporary construction easement will be required as shown on the attached map.

DJL:lw/0497m

cc: J. Jereb
E. Krysiak
A. Svihra

Illinois Department of Transportation

Memorandum

To:	Ralph Dalton	Attn: D. L. Claus
From:	J. G. Gehler	By: James P. Hall
Subject:	Soils Report*	
Date:	June 1, 1993	Ref: 34-93

*Route: IL 251 (FA 46)
Section: (1) I
County: LaSalle
Location: Shoulder Slide

On its May 21, 1993 meeting, the Soils Committee reviewed the Soils Report for the above described section. The Committee has not reviewed the pavement design but presumes the pavement structure described in the Report is the result of a complete economic study. The recommendations for the soil treatment are considered satisfactory.

James P Hall

RMA:blc

cc: L. P. Renz
J. L. Easterly/S. Grabski
R. E. Anderson/E. Samara
Gary Gould/Mike Hine

IDOT - OTTAWA

JUN 04 '93

	INT	INFO	ACT
Dist. Engr.			
Prog. Dev.		C	
Studies/Plans			
Land Acq.			
Proj. Impl.		X	
Construction			
Materials			
Operations			
Local Roads			
Admin. Serv.			
All			
Gen. Dist.			
Confer With Me			

Bureau of Materials
District 53

Bureau Chief		✓
Secretary		
Office Coordinator		
Mixtures		
Soils	✓	
Physical Tests		
[illegible] Engineers		
Prestress Sup.		
Materials Personnel		
Circulate		

PM 158

Illinois Department of Transportation

Memorandum

To:	Soil Committee Members
From:	Ralph E. Dalton By: D. L. Claus
Subject:	Geotechnical Report*
Date:	May 7, 1993

*Ill. 251 (FA 46)
Section (1)I
LaSalle County
Shoulder Slide

Attached is a copy of a geotechnical report for approval by the soils committee. The report covers repairs to a slide on the subject project.

DJL:lw/0336m

cc: J. G. Gehler Attn: R. Alwahab
J. L. Easterly Attn: S. Grabski
G. Gould Attn: D. Pescitelli
R. E. Anderson Attn: E. Samara

GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

SHOULDER SLIDE STATION 162+90

April, 1993

0220m

TABLE OF CONTENTS

	Page No.
TEXT:	
Introduction	1
Location	1
History	1
Geology	1
Observations	2
Analysis	3
Recommendations	3
EXHIBITS:	
Location Map	5
April 26, 1962 Memo	6
May 4, 1962 Memo	7-9
Chimney Drain	10
Inclinometer Tube	11
Bedrock	12
Geologic Profile	13
Topographic Map	14
Local Topographic Map	15
Boring Logs	16-19
Slide Profile	20
Original Centerline Profile	21
Slide Calculations	22-23
Plan of Proposed Pipe	24
Profile of Proposed Pipe	25

INTRODUCTION:

This report described the geotechnical conditions leading to the slide failure on the east shoulder of Ill. 251 in the City of Peru. This report also discusses alternatives for repair of the slide and gives a recommendation for the apparent most cost effective alternate.

LOCATION:

The failure is located in the east shoulder and foreslopes of Ill. 251 between Shooting Park Road and U.S. Route 6 (Bridge Street), see location map. It is in the center of the E 1/2 NW 1/4 Sec 16 T33N-R1E of the 3rd PM.

HISTORY:

The problems at this location became evident during construction in April, 1962 when the wing wall for the culvert tilted as described in the attached April 26 and May 4, 1962 memoranda. The fill was poorly placed and a pipe was installed at the head of the slide to intercept ground water in the shale.

In the mid 1970's a project was let to clean the culvert out. It had silted in from material carried from an active slide directly west of the embankment. These slides are occurring at many locations along this valley.

In 1985 attempts were made to repair the slide in conjunction with a resurfacing project on U.S. 51 (currently Ill. 251). Repairs included a chimney drain (see attached) and a sheet pile wall consisting of flat sheets at the location shown in the attached local topographic map. These repairs did not work.

In 1988 an inclinometer tube was installed in the shoulder. This revealed movement 12-16 feet below grade. See attached graphical representation of data.

GEOLOGY:

The bedrock in the bluff consists of Pennsylvanian shales, limestones, coals and clays of the Bond Formation (see bedrock map). Noteworthy members include the LaSalle Limestone (below elev. 531), the Little Vermilion Limestone (elev. 565.5 to 566.5) and an un-named coal layer at elevation 569 to 570. The remainder of the profile consists of shale. See geologic profile attached, this was copied from a section at the Bailey Falls area, Sec 6 T32NR2E.

Tills deposited in the uplands in this area do not impact this failure.

After the Illinois River basin was cut into the relatively flat landscape during glacial times, the ravine was cut by water making its way to the lower river level. At this site there has been a removal of about 60 feet of material. The total relief from top of the surrounding area (±630) to the bottom of the Illinois River (±414) is over two hundred feet (see topography map).

The rock strata dip slightly to the east then rise abruptly at the LaSalle Anticline approximately 1 1/2-2 miles to the east.

OBSERVATIONS:

The following observations were used to determine the limits of the slide.

1. As can be seen in the attached topographic map, the slide falls at approximately right angles to the existing bluff. The total height of the bluff is approximately 60 feet.

2. As shown on the attached local topographic map, the slide currently involves the shoulder and guardrail. The slumping of the shoulder is proceeding very slowly at about three inches per year.

3. The existing box culvert wing wall has failed. The last 50 feet of Reinforced Concrete Box Culvert shows horizontal cracking on the wall adjacent to the slide.

4. Existing sheet piles have soil pushing over the top of the uphill side and soil moving away from and shearing along the sheets on the downhill side.

5. Soil is humping over stable soil toward the bottom of the hill.

6. Area in foreslope sunk ±1 1/2 feet lower than adjacent slope (162+30, 80 Lt.).

7. The CMP that drains the inlet at 163+75 has separated at several locations.

8. The inclinometer tube showed failure at ±14'.

9. The location of boring number 1 was selected based on the estimated elevation of the coal layer as it intercepts the old hill side. The observance of an extremely wet layer confirmed the location of the slip surface. The water level gradually rose to match that of the inclinometer tube at elevation 576.

10. Boring number 2 was installed for two reasons:

    a. To get a confirmed location of the limestone and coal strata and determine which strata carry water.

b. The boring was extended to the LaSalle Limestone. A 2" PVC pipe was installed for groundwater measurements and the borehole was backfilled with pea gravel. This hole was a test wick drain to see if the LaSalle Limestone could take the water from the coal layer. The coal supplies far too much water to be taken by the LaSalle Limestone. The water stabilized at elevation 574.

11. Boring number 3 was installed to get a location of the coal layer on the other side of the embankment.

12. The old hillside topography was estimated and shown as dashed lines on the local topographic map. This surface was used as the probable slide surface as shown on the slide profile.

13. From the original profile along the centerline (attached), it is apparent that the fill may have been placed on an existing failure. This is evident by the flat area at elevation 575, Station 162+70 and the narrow stream at the flow line.

14. The original construction matched the old slide along the bluff to the southeast. This had the effect of flattening the slope at the head of the new slide, putting more load on the slide plane and steepening the slope toward the bottom.

15. From borings, the coal layer elevation 569-570 is carrying plenty of water. This strata could be causing many of the problems currently experienced along this ravine.

ANALYSIS:

From the observations made in the field, the slide limits were interpreted. The horizontal limits are shown on the local topographic map. The vertical limits are shown in the slide profile which follows section A-A on the topographic map.

The existing slide is adjacent to an ongoing slide following the bluff to the southeast. This old slide plane is followed by our slide west until the embankment height and geometrics creates a berm large enough to create stability under the roadway.

From calculations attached using a wedge analysis and superimposing the hydraulic pressure behind the impervious fill material, a cohesive strength of 700 lb./s.f. would be required to maintain a safety factor of 1.0 (assuming γ=125 lb./c.f. and ϕ=0). If the hydraulic pressure could be removed, the safety factor would be increased to approximately 1.4.

RECOMMENDATIONS:

To accomplish drainage of the coal layer, we propose drilling and jacking a 2' diameter perforated pipe to intercept the coal layer behind the

slide area. This would cut off the water bearing strata from the slide and gravity drain the water away from the area. The pipe would be approximately 180' long. See attached plan and profile drawings.

This is estimated to cost approximately $75,000. An easement for the jacking pit would also be required.

Other options considered for repair of the slide are as follows:

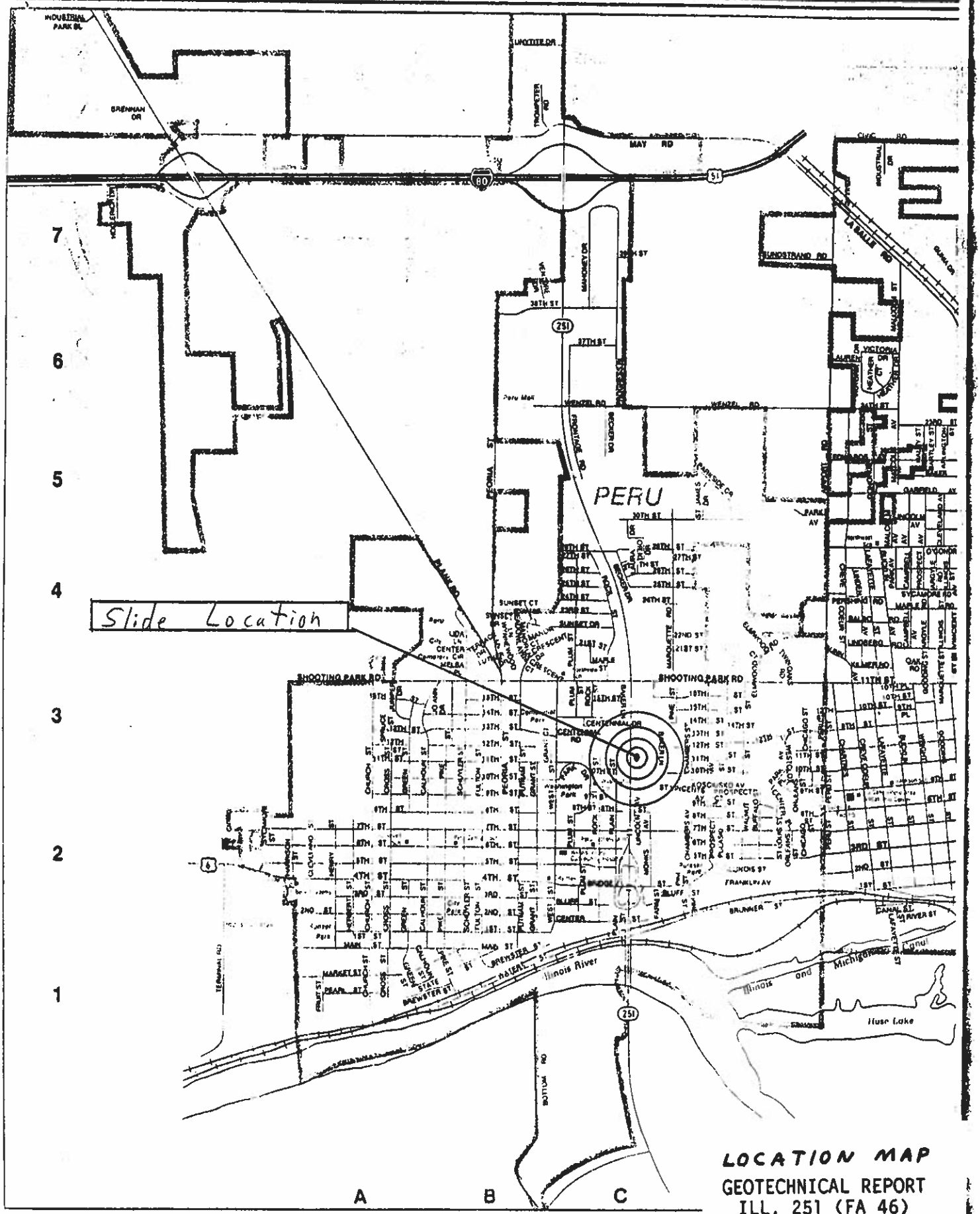
1. Cut and replace head of slide (under shoulder ±25' deep) - $135,000.

2. Cut trench across road above slide (±25' deep) - $170,000.

3. Remove and replace entire slide area (as was done on the south bluff slide) - $300,000.

4. Well points - ±$100,000 plus maintenance. This may not be as effective since entire water bearing strata is not intercepted. Could also drain vertical sand drains with a horizontal drain.

5. Do nothing - annual maintenance costs and safety hazard in shoulder. Risk potential for propogation into the driving lane.



LOCATION MAP

GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

STATE OF ILLINOIS

DEPARTMENT OF PUBLIC WORKS AND BUILDINGS

W. J. PAYES, JR., DIRECTOR

RALPH R. BARTELSMEYER
CHIEF HIGHWAY ENGINEER

DIVISION OF HIGHWAYS
OFFICE OF DISTRICT ENGINEER
700 EAST NORRIS DRIVE
OTTAWA

IN YOUR REPLY PLEASE
REFER TO FILE:

April 26, 1962

FA Route 178
Section 1 Z & 1-2
Project FU-254(9)
LaSalle County

Eric Bolander Construction Company
Winchester Road
Libertyville, Illinois

Gentlemen:

At the meeting held on April 25 at the site of the work where the wing wall at culvert Station 161+47 has moved, the following instructions were given:

Drain holes are to be drilled at 10-foot centers in the walls. The dirt back of these walls is to be augered out through the drain holes and porous granular material forced through the holes into the back fill. Drain holes are also to be drilled, one in each short wing and two in the northwest wing. Holes are to be dug back of the wings at these locations and porous granular material placed back of the drain holes.

At the head of the slide approximately 60 feet south of the east end of the culvert, a trench is to be dug into the fill and extending down into the shale. Perforated pipe and porous granular material are to be placed in this trench in an attempt to drain water from under the fill. This should stand a few days and then the southeast wing should be removed to the top of the footing.

Please notify this office when work starts on removing the wing in order that we may have a representative present.

It will be satisfactory to proceed with fill of the main embankment except that a 20-foot strip is to be left along the east side of the fill, and this portion shall be built after the culvert wing wall is repaired.

Very truly yours,

Orville A. Evans
District Engineer

JHM/mes
cc J. P. Hollerich Company
J. L. Anderson
T. H. F. Norris
D. Hoke
V. P. Bonucchi

Illinois Department of Transportation

Memorandum

To: E. L. Shererts

From: W. H. Baumann

Subject: Box Culvert Wing Wall Failure*

Date: May 4, 1962

*FA Route 178
Section 1-Z&1-2
LaSalle County
Station 161+47

A meeting was held at the site of the subject structure on April 25, 1962. The following were in attendance:

J. H. Martin, District 3, Engineer of Construction
Lindo Corso, District 3, Asst. Engineer of Construction
Victor Bonucci, Resident Engineer
Dolph Hoke, Soils Engineer
Herman Bieritz, Boring Engineer
Miles E. Byers, Bureau of Materials
Otis McCoy, Bureau of Design
G. R. Benson, Bureau of Design
J. L. Anderson, Bureau of Public Roads
Mr. Hollerich, J. P. Hollerich Construction Company
Mr. Bolander, Eric Bolander Construction Company

Subsequent to the completion of construction of the subject culvert, the earth backfill was placed and the grading of the embankment carried forward to a point about six foot below design subgrade elevation. Grading was then curtailed because of movement noted in the southeast wing wall of the culvert.

Previous to this meeting, at the suggestion of Mr. S. E. Wiley of the Bureau of Construction and Mr. Byers of the Bureau of Materials, the District Boring Crew made a number of borings through the fill to determine the character of the culvert backfill material. Their borings detected that the standard penetration tests were lower in the backfill then in the subsequently placed embankment, the moisture contents were higher and the standard densities (where they could be determined) were as low as about 82% of optimum dry weight.

At the time of this visit, the southeast wing wall had tipped out ±20 inches at the top of the wall. It appeared that the wall had broken and probably at the construction joint just above the footing.

Subsequent to the tipping of the wall, a slide had developed in the embankment. The slide generally moved toward the wing, and seems to begin about 60 feet south of the culvert in the embankment slope. It is surmised that the slide is being encouraged by ground water moving on top of and lubricating a shale layer upon which the culvert and the embankment are founded. The slope of the shale is such as to move the water toward the culvert.

It was suspected that the wing wall failed because of poorly compacted backfill which became saturated after its placement. In an attempt to verify this, a sample of the soil was taken from the culvert backfill through a recently cored weep hole located in the culvert about five feet from the culvert-wingwall juncture. The results of laboratory tests indicate that the backfill material was at about 72% of optimum dry density, and its moisture content within about 1% of the liquid limit. The soil data appears on the attached sheet. The test results would seem to substantiate the original supposition relating to poor compaction.

It was decided that the wing wall backfill would have to be removed and the wing wall reconstructed. Probably both the footing and wall will have to be replaced. In the latter case, the new wall and footing will be constructed free of the culvert. It was suggested that the new wall should be backfilled with porous granular backfill.

Since a slide has developed in the immediate area of the broken wing, it was suggested that a trench be made above the slide area at approximate right angles to the centerline of the roadway. The trench would be excavated into the shale, and a P.C.M.P. placed with suitable granular backfill in an attempt to cut off the flow of ground water, and thereby improve the stability of the slide in the embankment. Excavation behind the wing should preferably be delayed until the P.C.M.P. drain had been installed for a few days.

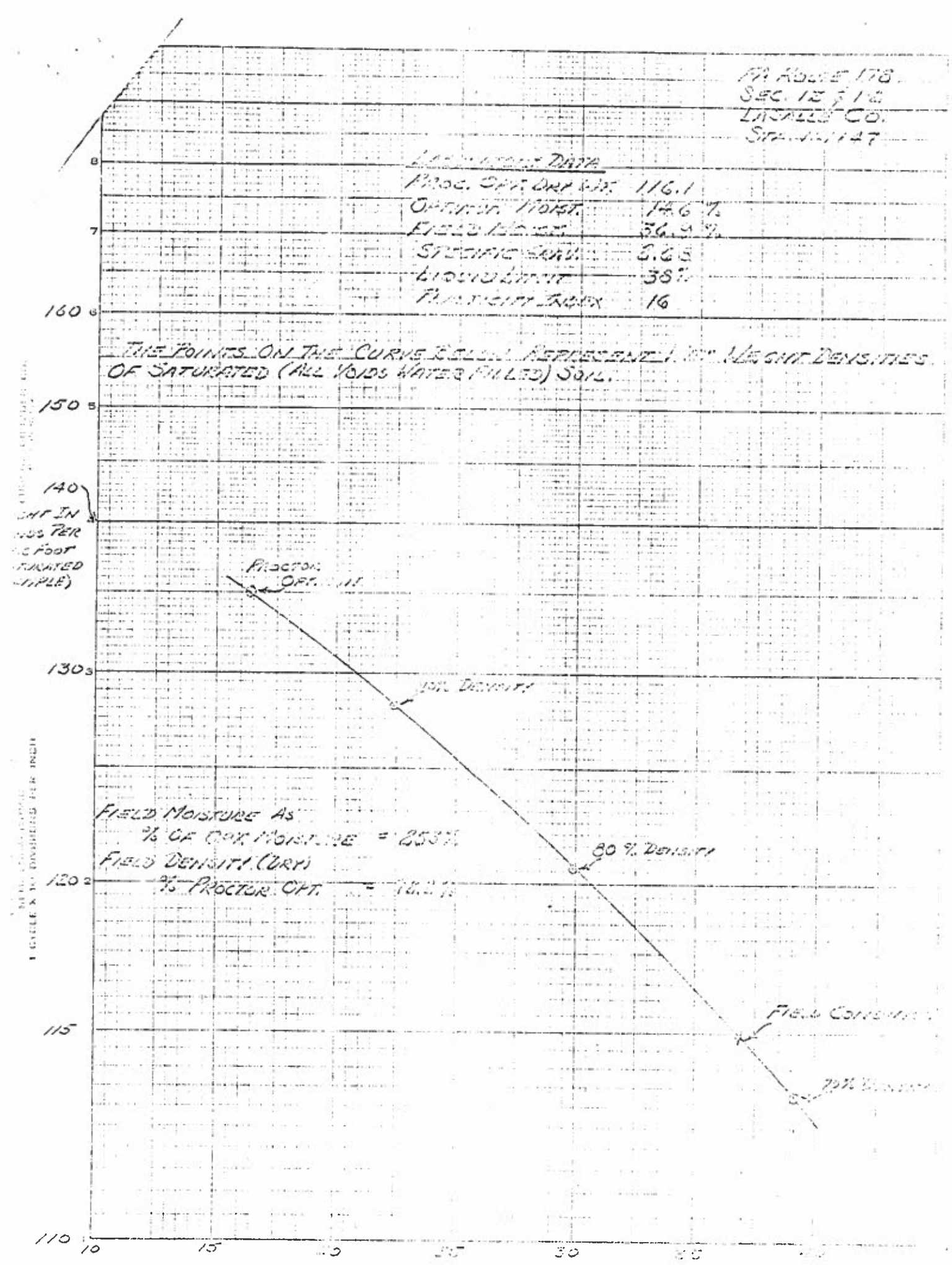
The treatment of the wing wall will depend upon what is discovered upon removal of the backfill.

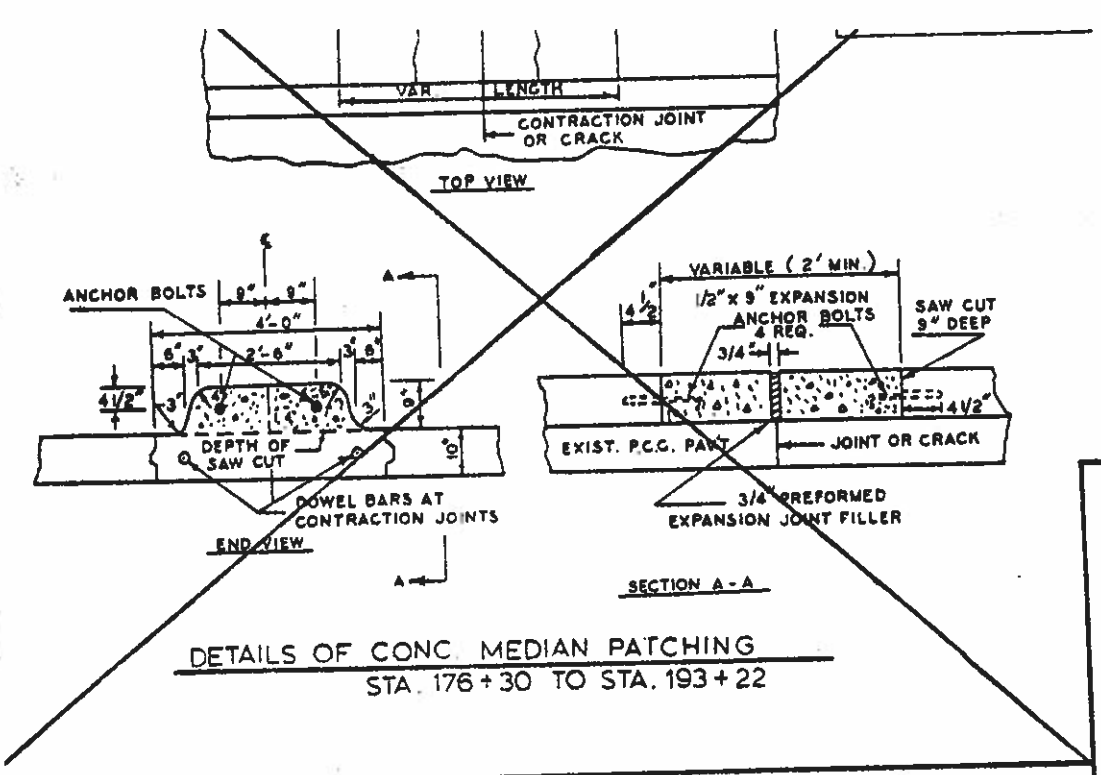
GRB:ls

cc: T. H. P. Norris
J. D. Lindsey
C. S. M

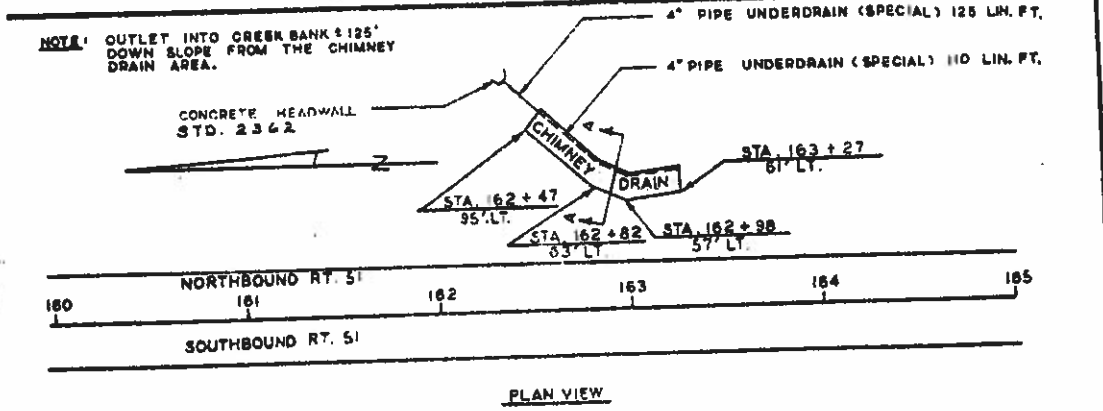
8

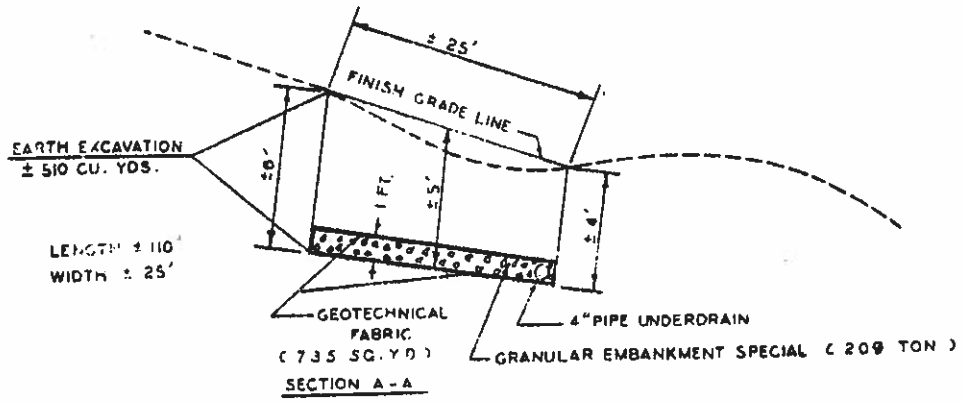
NOTE: REPRINT OF VAGUE ORIGINAL (4/1/93).


Mt. Adams 178
Sec. 12 T 1 R
Lincoln Co.
Sta. 11+47
Laboratory Data
Max. Dry Density 116.1
Optimum Moist. 14.6 %
Field Moist. 36.9 %
Specific Gravity 2.65
Liquid Limit 38%
Plasticity Index 16
The points on the curve shown represent Dry Weight Densities of Saturated (all voids water filled) Soil.
Proctor Opt.
100% Density
80 % Density
Field Moisture As % of Opt Moisture = 253%
Field Density (Dry) % Proctor Opt. = 78.2 %
Field Condition
70% Density
160
150
140
130
120
115
110
10
15
20
25
30
35
40
8
7
6
5
4
3
2



DETAILS OF CONC. MEDIAN PATCHING
STA. 176+30 TO STA. 193+22

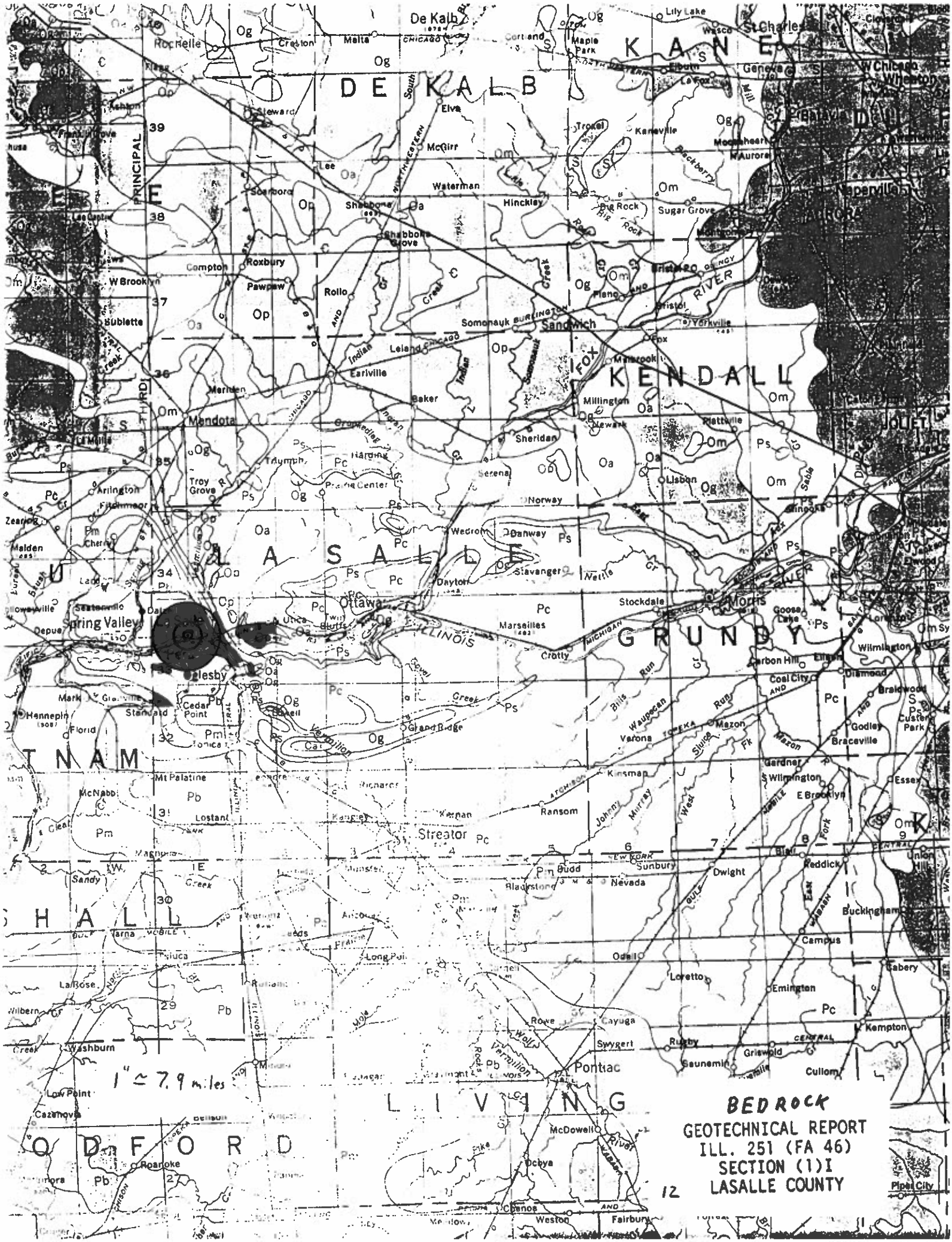


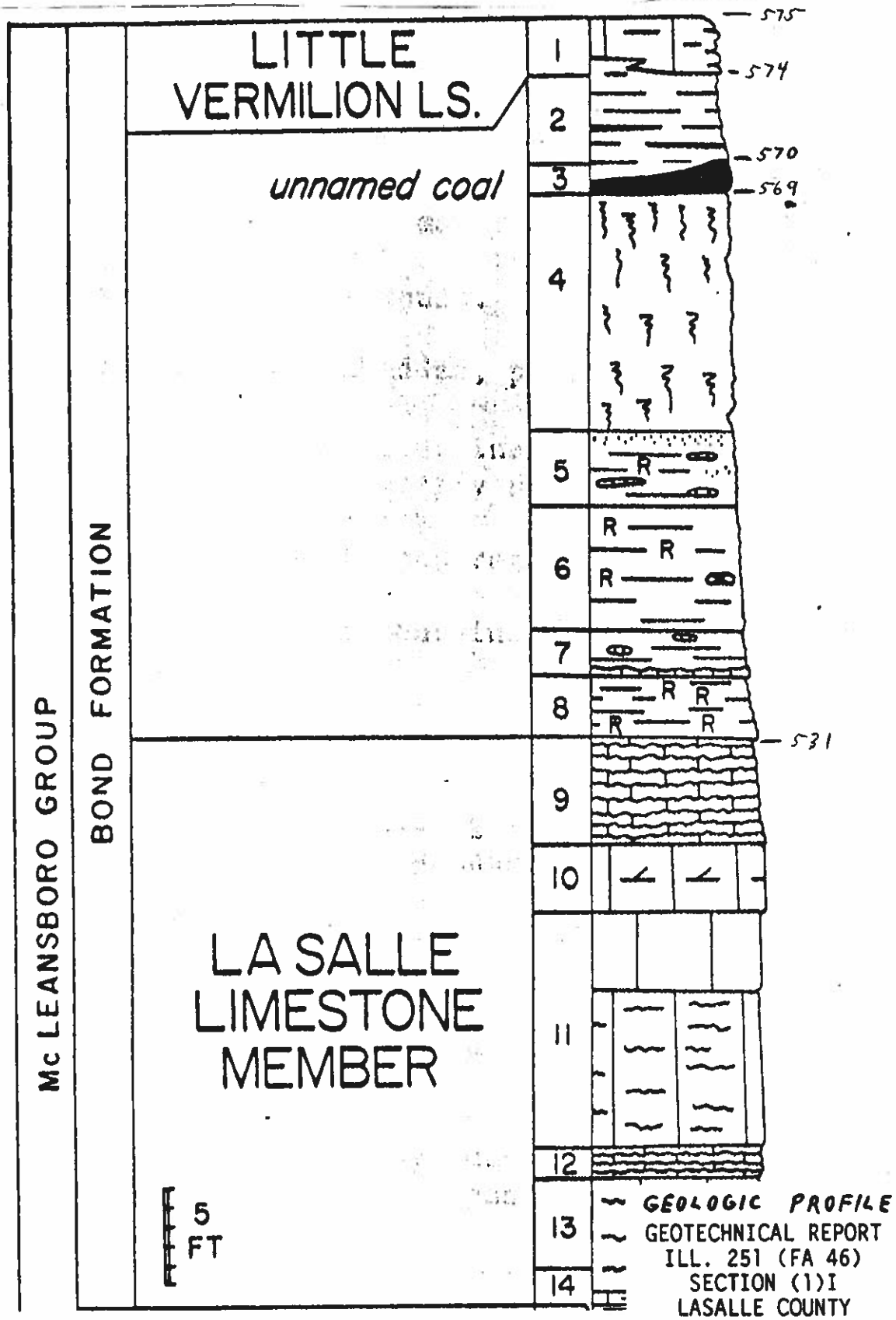


PROPOSED CHIMNEY DRAIN SYSTEM @ SLOPE FAILURE LT. STA. 163+00

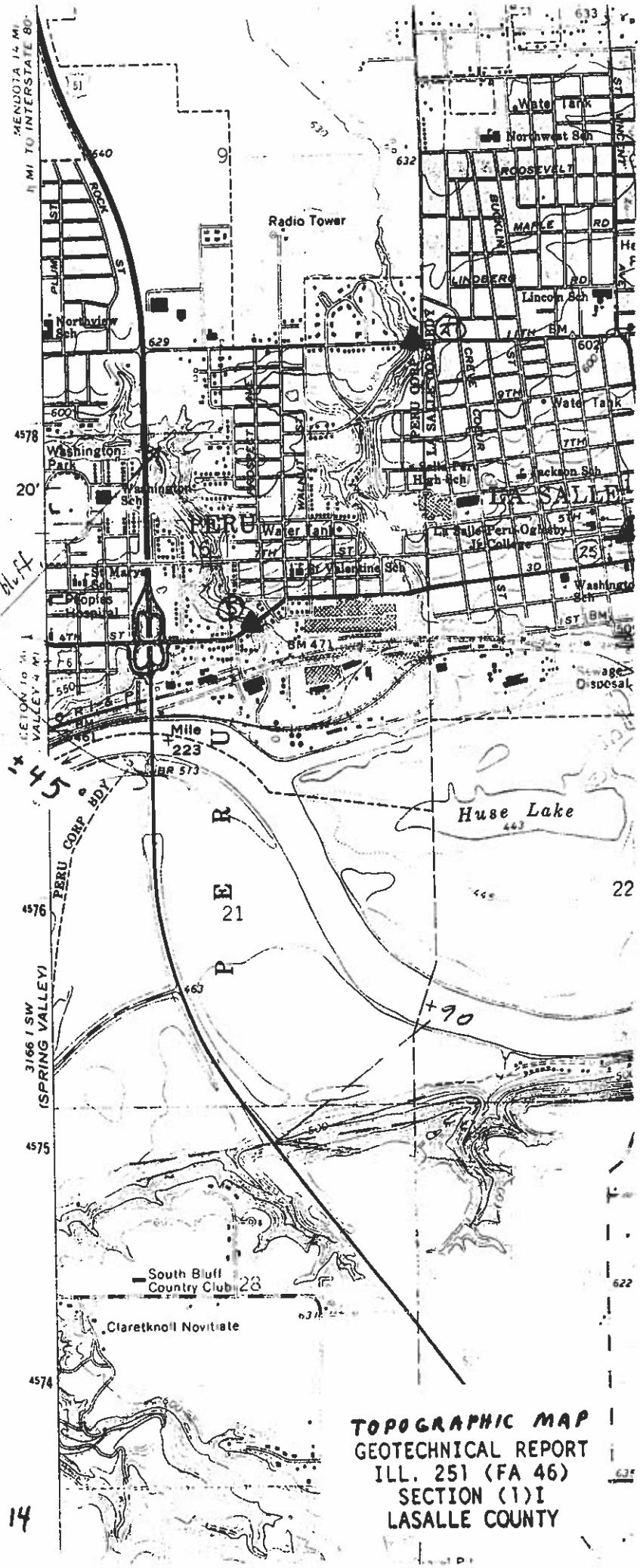
CHIMNEY DRAIN
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

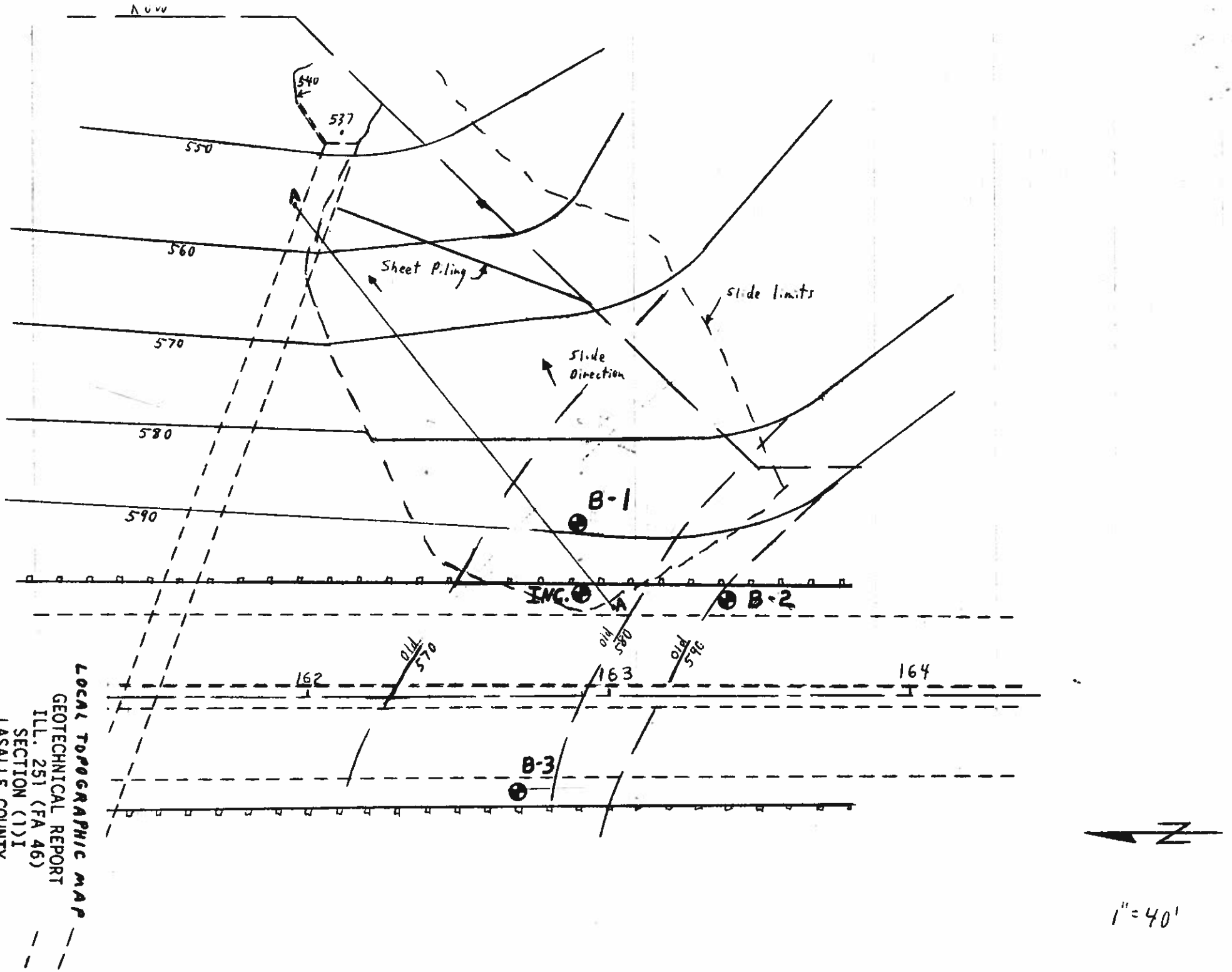
INCLINOMETER TUBE
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY


DE KALB
KANE
KENDALL
GRUNDY
LASALLE
LIVING
DODFORD
MARSHALL
PUTNAM
Rochelle
De Kalb
Malta
Creston
Lily Lake
St Charles
Geneva
Elva
Kaneville
Aurora
Naperville
Joliet
Waterman
McGirr
Hinckley
Big Rock
Sugar Grove
Shabbona
Shabbona Grove
Compton
Roxbury
Pawpaw
Rollo
Somonauk
Sandwich
Fox
Millington
Plattville
Sheridan
Lisbon
Norway
Serena
Mendota
Meriden
Earlville
Leland
Baker
Troy Grove
Triumph
Prairie Center
Arlington
Fitchmeor
Zearing
Malden
Spring Valley
Depue
Dayton
Ottawa
Utica
Starved Rock
Marseilles
Stockdale
Morris
Goose Lake
Wilmington
Carbon Hill
Coal City
Braidwood
Godley
Braceville
Custer Park
Gardner
S Wilmington
E Brooklyn
Essex
Kinsman
Mazon
Verona
Grand Ridge
Cedar Point
Glesby
Mt Palatine
McNabb
Hennepin
Florid
Lostant
Streator
Sandy
Ransom
Kempan
Dwight
Reddick
Buckingham
Campus
Odell
Loretto
Emington
Kempton
Gabery
Cayuga
Rowe
Swygert
Rutsby
Griswold
Saunemin
Cullom
Pontiac
Washburn
Tarna
Tonica
Long Point
LaRose
Wilbern
Low Point
Cazenovia
Roanoke
McDowell
Ocoya
Chenoa
Weston
Fairbury
Pipe City
Blackstone
Budd
Nevada
Sunbury
Varna
Lowell
Deer Park
Union Hill
Oak Ridge
Bellbun
Ancona
Rutland
Wenona
Meadows
Verona
Richards
Kansas
Reading
Arcola
Prairie
Beads
Mole
Wolf
Rocks
Vermilion
Illinois
Fox
Indian
Somonauk
Creek
Sandy
Clear
Mark
Florid
Pecatonica
Mazon
Fk
Waupecan
Bills
Run
Crotty
Michigan
Chicago
Burlington
Northwestern
Rock Island
Santa Fe
Atchison
Topeka
Mobile
Gulf
Illinois Central
New York Central
Wabash
Pennsylvania
Chicago Aurora
Elgin
Joliet
Yorkville
Oswego
Plano
Montgomery
Big Rock
Indian
Creek
Rock
Fox
Illinois
Vermilion
Mazon
Kankakee
Iroquois
Ford
Livingston
LaSalle
Grundy
Kendall
Kane
DeKalb
Principal
Third
1" ≃ 7.9 miles
BEDROCK
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY
12



GEOLOGIC PROFILE
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY


Direction of Slide perpendicular to Bluff
Gr 5-13-91
MENDOTA 14 MI
8 MI TO INTERSTATE 80
Water Tank
Northwest Sch
ROOSEVELT
Radio Tower
MAPLE RD
LINDBERG RD
Lincoln Sch
Northview Sch
629
632
633
640
600
4578
Washington Park
Washington Sch
PERU
Water Tank
LA SALLE
La Salle-Peru High Sch
Jackson Sch
La Salle-Peru-Oglesby Jr College
St Mary's Inf Sch
Peoples Hospital
St Valentine Sch
BM 471
Sewage Disposal
Mile 223
BR 573
PERU COMP BDY
Huse Lake
443
22
21
4576
463
+90
3166 I SW (SPRING VALLEY)
4575
South Bluff Country Club
28
Claretknoll Novitiate
4574
622
TOPOGRAPHIC MAP
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY



LOCAL TOPOGRAPHIC MAP
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

15

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Three Materials

Bridge Foundation
Boring Log

CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM

Sh. 1 of 1

PROJECT _____ BRIDGE IL 251 NBL Date 04/13/92

ROUTE FA 46(IL251) SHOULDER SLIDE Bored By K. Whittington

SEC. (1)I STA. 162+90 Checked By D. Lindeman

COUNTY LaSalle

Boring No. 1
Sta 162+90
O/S 57' LT CL

Surf Wat El. -
Grndwater El.
at Compl -
At * Hrs *

El.	N	Qu t/sf	W %
Ground Surface 595.0	0		
ACCESS FILL Brown SILTY CLAY, SILTY CLAY TILL & GRAVEL			
-5			
588.5			
Loose Brown LOAM & SILTY CLAY with GRAVEL (FILL)		0.5	
		- P	15
WET SEAM @ 10.5' -10			
584.5			
		<0.5	
Weathered SHALE mixed with SILTY CLAY TILL GRAVEL & COAL		- P	29
		1.2	
-15		- P	26
(FILL)			
		1.2	
		- P	26
		2.0	
576.5		- P	23
Weathered SHALE mixed with Brown/Gray -20 SILTY CLAY LOAM TILL (FILL)		1.5	
		- P	24
573.0			
SHALE & COAL (WATER)		- 0.0	37

El.	N	Qu t/sf	W %
572.5			
Brown SIC TILL(FILL)		0.5	
571.5		- P	28
Mixed Red SILTY CLAY TILL & Weath. SHALE (FILL) -25		0.5	
		- P	27
569.5			
Gray Weathered SHALE		2.5	
		- P	19
566.5			
NO SAMPLE IN TUBE -30 ROCK IN END OF TUBE			
AUGER SAMPLE IS Gray Weath. SHALE			
561.5		32	
Red/Gray Weathered SHALE -35		44 56 -	12
558.5			
Hard Red SHALE		4.0	
556.5		- P	12
* GROUND WATER PLUGGED AT 129 DAYS -40 AT ELEV. 584.0			
GROUND WATER AT 116 DAYS AT ELEV. 576.6			
SAMPLES WERE TAKEN BY A CONTINUOUS 2 5/8" DIAMETER SAMPLING DEVICE -45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

ILLINOIS DEPARTMENT OF TRANSPORTATION — **Bridge Foundation Boring Log**
District Three Materials
CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM

PROJECT _____ **BRIDGE** IL 251 NBL **Date** 02/08/93

ROUTE FA 46(IL251) SHOULDER SLIDE **Bored By** K. Whittington

SEC. (1)I **STA.** 162+90 **Checked By** D. Lindeman

COUNTY LaSalle

Boring No. 2
Sta 163+40
O/S 32' LT CL

Surf Wat El. _____
Grndwater El. at Compl _____
At 216 **Hrs** 574.1

El.	N	Qu t/sf	W %
Ground Surface 593.7 **0**			
Brown & Gray SILTY CLAY TILL (FILL)			
588.7 **-5**	3 5		
Brown SILTY CLAY TILL, Pieces of Weahtered SHALE & COAL (FILL)	8 - 22		
583.7 **-10**	4 5		
Mixed Red Brown & Gray Weathered SHALE	10 - 18		
580.7			
Gray SHALE with thin LIMESTONE Layers **-15**	50/4" - 9		
	- - 8		
574.7			
LITTLE VERMILION LIMESTONE 573.7 **-20**	12 70		
Gray SHALE	18/1" - 11		

El.	N	Qu t/sf	W %
Gray SHALE	22		
570.2	28 - 16		
COAL with WATER	18 - 45		
569.2			
-25			
	10		
	11		
	13 - 17		
-30			
Gray SHALE to Red SHALE			
(AUGER SAMPLE) **-35**			
-40			
-45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

Project _____
Route FA 46(IL251)
Sec. (1)I
County LaSalle

Boring No. 2 Sta 163+40 O/S 32' LT CL	El.	N	Qu t/sf	W %		El.	N	Qu t/sf	W %
	-45					-70			
	-50					-75			
Gray to Red SHALE (AUGER SAMPLE)	-55					-80			
	-60					-85			
530.7 TOP LASALLE LIMESTONE (AUGER SAMPLE) 528.7	-65					-90			
	-70					-95			

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Three Materials
Bridge Foundation Boring Log

CENTER E1/2 NW1/4 SECTION 16 T33N R1E 3PM

Sh. 1 of 1

PROJECT _____ BRIDGE IL 251 NBL Date 03/25/93

ROUTE FA 46(IL251) SHOULDER SLIDE Bored By K. Whittington

SEC. (1)I STA. 162+90 Checked By _____

COUNTY LaSalle

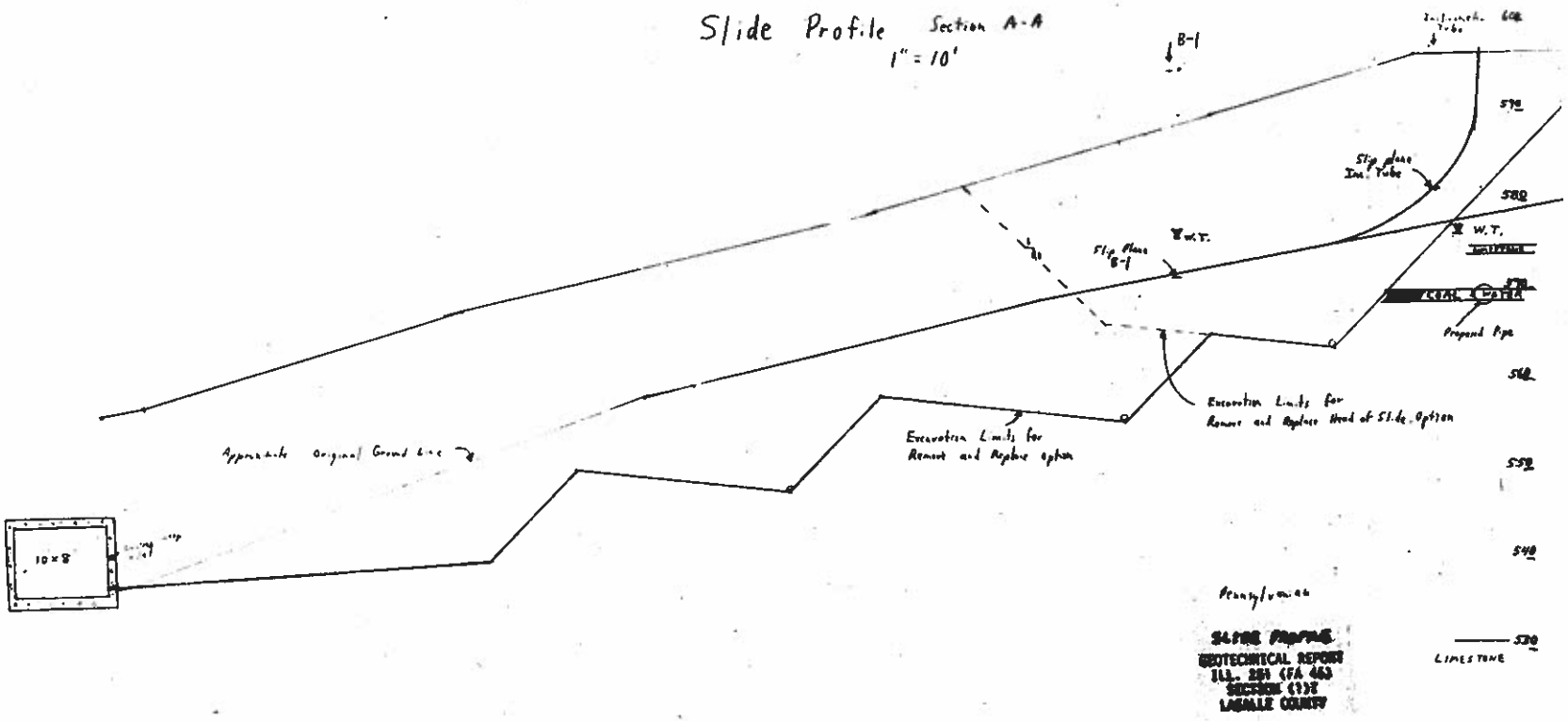
Boring No. 3
Sta 162+70
O/S 33'RT CL

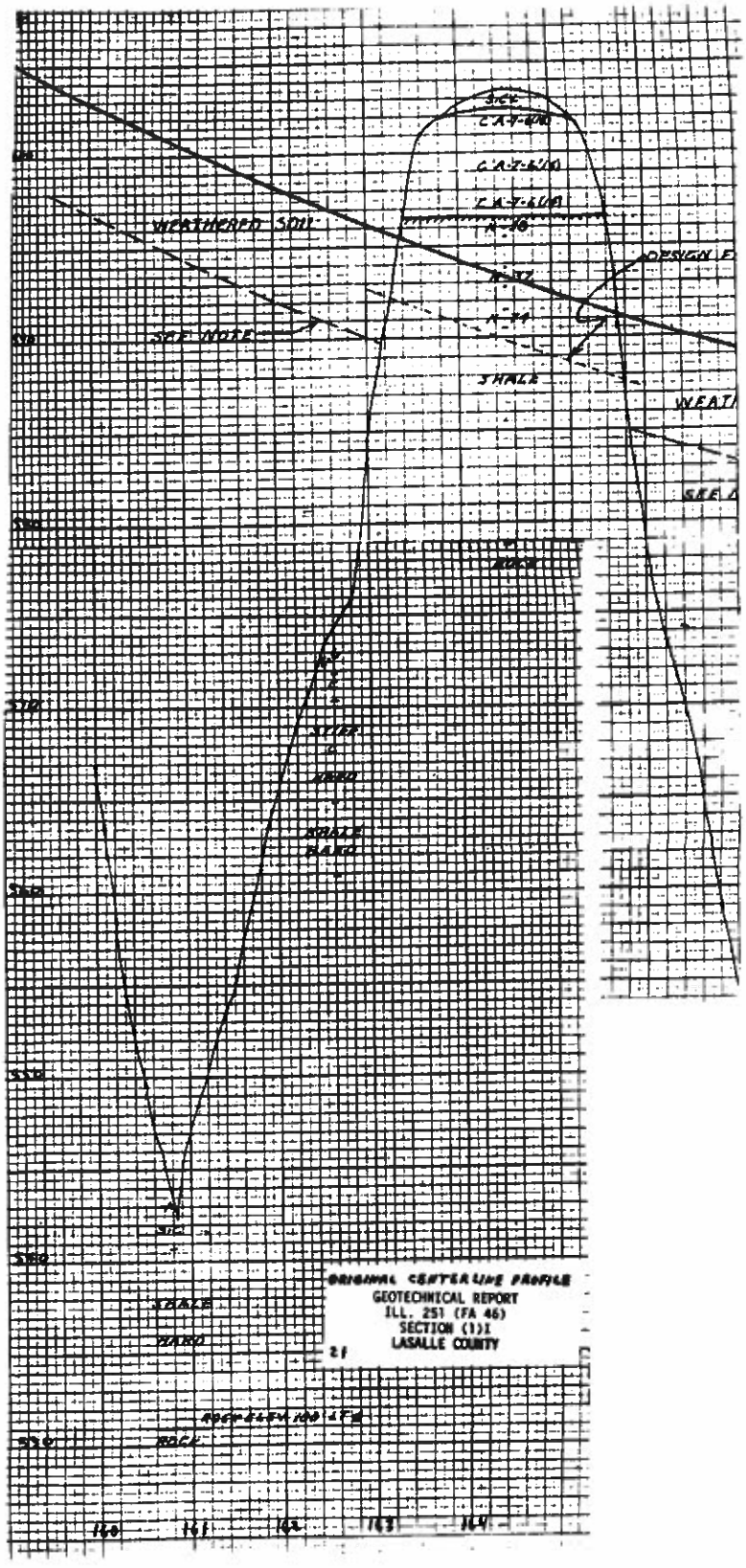
Surf Wat El. _____
Grndwater El.
at Compl _____
At _____ Hrs _____

	El.	N	Qu t/sf	W %
Ground Surface 594.7 0				
BIT. SHOULDER				
593.7				
Brown & Gray SILTY CLAY & SILTY CLAY TILL & Brown Weath. SHALE (FILL)	-5	8		
		8		
		8	-	-
	-10			
		4		
583.7		5	1.0P	24
Black SiC TOPSOIL (ROOTS) 582.7		5	-	52
Gray & Red Brown CLAY (Weath. SHALE)		2		
		4		
		5	-	25
	-15			
		3		
578.7		4	2.0P	19
Gray Weath. SHALE		7	-	17
577.7				
Gray Weathered SHALE & LIMESTONE Pieces		30		
		47		
		33/2"	-	8
574.7	-20			
LITTLE VERMILION LIMESTONE		36	-	-
		88/3"	-	3
573.2				
Gray SHALE				

	El.	N	Qu t/sf	W %
Gray SHALE		46		
		105/4"	-	10
		132	-	9
570.2				
COAL & WATER 569.7	-25	14		
		16		
Gray SHALE		24	-	28
		8		
		14		
567.2		26	-	22
	-30			
	-35			
	-40			
	-45			

N-Std Pentr Test: 2" OD Sampler, 140# Hammer Falling 30" (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)


Slide Profile Section A-A
1" = 10'
B-1
W.T.
Slip plane B-1
Slip plane Inc. Tube
Inclinometer Tube
W.T.
COAL & SHALE
Proposed Pipe
Excavation Limits for Remove and Replace Head of Slide Option
Excavation Limits for Remove and Replace option
Approximate original Ground Line
10'x8'
570
580
590
560
550
540
530
LIMESTONE
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION 5137
LASALLE COUNTY


WEATHERED SOIL
SEE NOTE
SHALE
WEATH
SEE A
ROCK
SHALE
HARD
SHALE
HARD
ROCK
ORIGINAL CENTERLINE PROFILE
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY
21

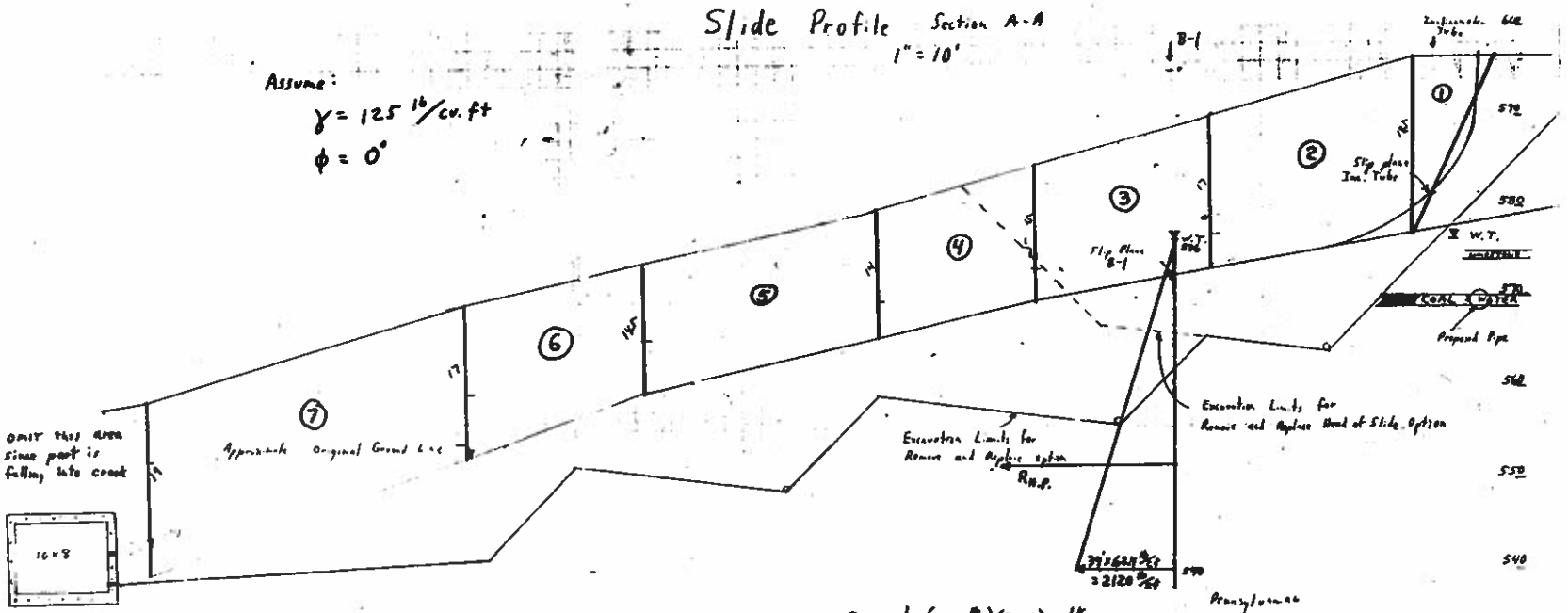
Slide Profile Section A-A

1" = 10'

Assume:

$\gamma = 125\ ^{lb}/_{cu.\ ft}$

$\phi = 0°$



$R_{n.p.} = \frac{1}{2}\left(2120\ ^{lb}/_{ft}\right)(34\ ft) = \frac{1^k}{1000\ lb}$

$R_{n.p.} = 36\ ^k/_{ft}$

SLIDE CALCULATIONS

GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

Wedge Analysis

Wedge #	~~Area~~	W(k)	α(°)	W sin α	L
1		11.0	65.2	10.0	21'
2		51.3	10.1	9.0	23'
3		39.0	10.2	6.9	20'
4		31.7	12.9	7.1	18'
5		46.3	13.0	10.4	27'
6		39.4	19.3	13.0	21'
7		79.9	19.4	26.5	38'
Σ				82.9	168'

Calculate existing Cohesion (c)

$$FS = 1 = \frac{\text{Resisting}}{\text{Driving}} = \frac{(\Sigma L)\, c}{(\Sigma W \sin\alpha) + R_{H.P.}}$$

$$1 = \frac{168' C}{82.9 + 36 \text{ k/ft}}$$

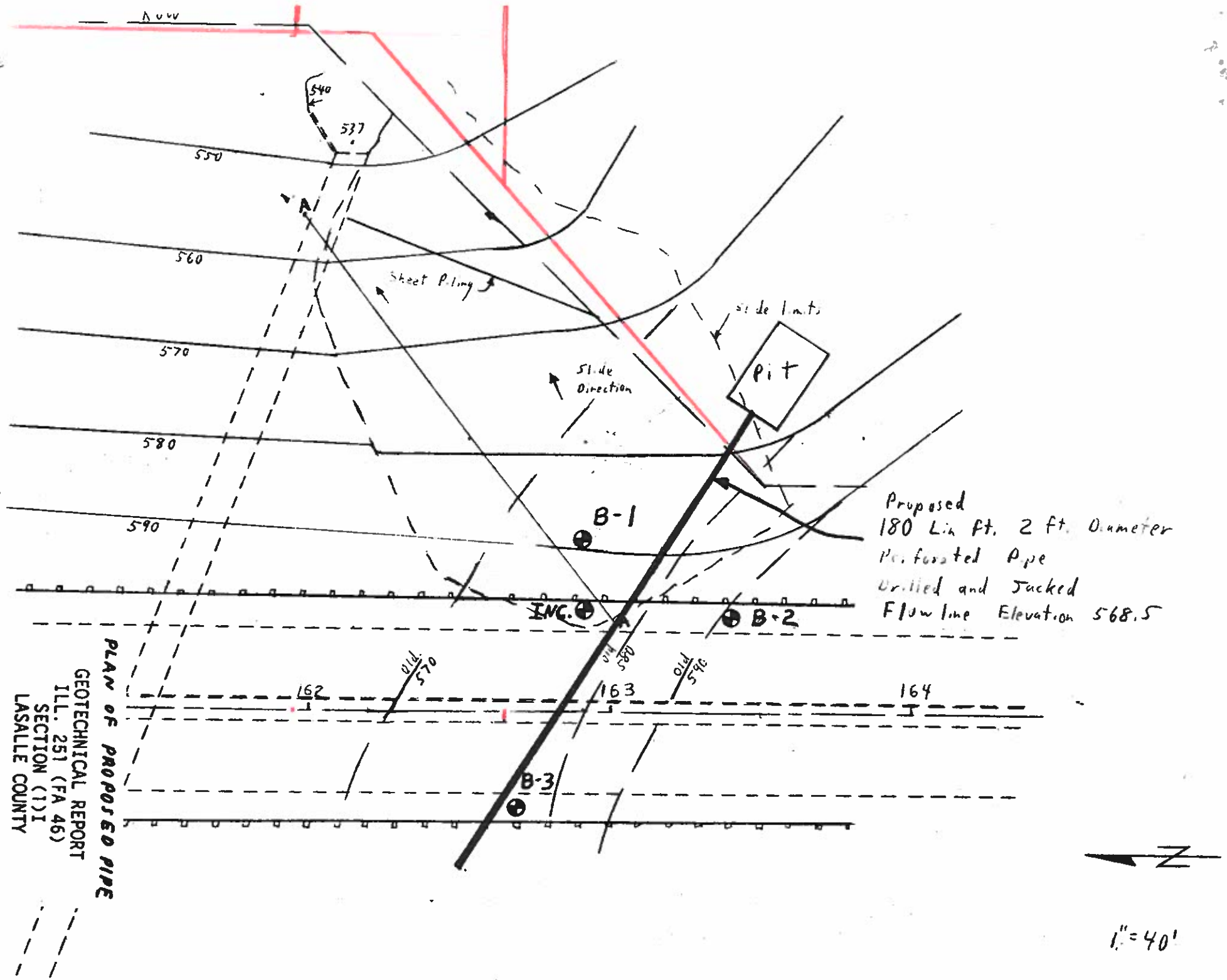
$$C = \frac{82.9 + 36}{168} = 0.7 \text{ k/ft}^2$$

Make $R_{H.P.} = 0$ by draining water

$$FS = \frac{(\Sigma L)\, c}{\Sigma W \sin\alpha} = \frac{(168)(0.7)}{82.9} = 1.42$$

SLIDE CALCULATIONS

GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY



24

PLAN OF PROPOSED PIPE

GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

PROFILE OF PROPOSED PIPE
GEOTECHNICAL REPORT
ILL. 251 (FA 46)
SECTION (1)I
LASALLE COUNTY

Illinois Department of Transportation

Memorandum

To:	D. Mestelle	Attn:	J. Threadgill
From:	D. L. Claus	By:	D. J. Lindeman
Subject:	Geotechnical Report*		
Date:	April 23, 1993		

*Ill. 251 (FA 46)
Section (1)I
LaSalle County
Shoulder Slide Behind Eagles

This is in response to your April 16, 1993 comments on the subject report.

- I agree it would be best to complete this work before the present job is finished.
- $300,000 is a lot of money for a shoulder repair.
- The minimum safety factor of 1.5 is used with estimates of stability. If the estimated S.F. is less than 1.5, more investigation is necessary. A S.F. of 1.3 is used after the more in depth study is done. S.F.'s less than 1.3 can also be approved in a Geotechnical Report. It is also noted that the soil strength should also increase which should raise the S.F. significantly (although indeterminant).
- The hydraulic pressure should gradually reduce to zero. From borings, this coal layer is extremely wet with free water. The shales that make up the vast majority of the profile are dry and impervious.
- No, this is not a known method. Jacking pipe is well known but perforated is not. This was a topic of discussion as to whether to jack a casing pipe first or whether to use smaller diameter horizontal drains in conjunction with vertical chimney drains. This was discussed in this office and we believe the chosen method is the most appropriate.

- The repairs on the wingwall and culvert barrel should be put off for a few years until we are sure that the slide is stable. The last 50 feet of box culvert should undergo at least epoxy crack sealing, but this too should be delayed.

- Pipe will be included to bring the water to the stream.

DJL:lw/0295m

cc: G. Mounts

CONTRACT MAINT

Illinois Department of Transportation

BUREAU OF MAINTENANCE
(D-3 - OTTAWA)

Memorandum

APR 20 '93

To:	E. Krysiak
From:	A. Svihra By: G. Mounts GM
Subject:	Shoulder Slide*
Date:	April 19, 1993

Bur. Chi.		
Secry.		
Serv. Engr.		
Brg. Engr.		
Off. Tech.		
Equip. Mgr.		
Landscape		
Brg. Tech		
Comm.		
F.E. (5)		
F.T. (7)		

* Illinois Route 251 (FA 46)
Section (1)I
LaSalle County
Shoulder Slide Behind Eagles

Attached is a copy of the geotechnical report for the slide area behind Eagles in Peru. As mentioned in Dave Lindeman's cover memo, this project is currently unfunded. Since the timing does not allow the work to be included in the U.S. Route 6 interchange contract, I recommend it be considered for the contract maintenance program.

GM:jw/0880d

DISTRICT 3
BUREAU OF OPERATIONS

PM 158

Illinois Department of Transportation

Memorandum

To: D. L. Claus

From: D. Mestelle DM BY: J. Threadgill

Subject: Geotechnical Report Review*

Date: April 16, 1993

Bureau of Materials
District #3

Bureau Chief		✓
Secretary		
Office Coordinator		
Mixtures		
Soils	✓	
Physical Tests		
Supervisors		
Prestress Sup.		
Materials Personel		
Circulate		

*IL 251 (FA 46)
Section (1)I
LaSalle County
Shoulder Slide Behind Eagles

After reviewing the subject report, we would like to express the following concerns:

- Work should be included under retaining wall project or a separate maintenance funded project prior to resurfacing the shoulders on the present roadway job. Current job replaces shoulder will this timing a good idea
- It maybe worthwhile to remove and replace the entire slide area for an additional $250,000 (as was successfully done on the south bluff). big $ for shoulder, may be fixed cheaper.
- Safety factor of 1.4 is below recommended minimum 1.5. 1.3 minimum with in depth calculation Analysis with Geotechnical report. 1.5 will be higher because of increase soil strength after water relieved
- Does resultant force from hydraulic pressure go to zero? yes over time
- Is jacking a 2' diameter perforated pipe a known constructable method? NO may bid as an equal alternate Sand drainmats (with drains) at lower elevation & intercept with 4' of horizontal granular
- Include wingwall repair with embankment stabilization. Does the last 50 ft. of box require repair/replacement? No. No. take him to stabilize may epoxy inject cracks in box & place new wingwall
- Include paved ditch or riprap at pipe outlet. design detail

cc: G. Mounts

Dave

Illinois Department of Transportation

Memorandum

To:	D. L. Mestelle	G. Mounts	
From:	D. L. Claus	By:	D. J. Lindeman
Subject:	Geotechnical Report*		
Date:	April 6, 1993		

*Ill. 251 (FA 46)
Section (1)I
LaSalle County
Shoulder Slide Behind Eagles

The attached is a geotechnical report for your review concerning the slide at Eagles in Peru. This project is currently unfunded but could be a future contract maintenance project. It could also be included with the retaining wall project at the U.S. 6 interchange which is under emergency funding.

DJL:lw/0225m

Illinois Department of Transportation

Memorandum

To: Ralph E. Dalton

From: D. L. Claus By: D. J. Lindeman

Subject: Slide*

Date: March 12, 1993

*Ill. 251 (FA 46)
Section (1)RS-1
LaSalle County
C-93-059-92

The slide on Ill. 251 south of Eagles, Sta. 163+00, in the east shoulder and foreslope has been active since its construction in April 1962. It has been a perpetual maintenance problem and potential safety hazard.

Recent investigations reveal a one foot thick coal layer approximately 23' below pavement grade that is furnishing a large amount of water to the slip surface. This coal layer is the only water bearing strata found. The little vermilion limestone is a few feet above the coal but is above the static water table. This slide plane appears to follow the old bluff face as shown in the attached modified textbook drawing of a slide beneath a side hill fill.

From calculations with an assumed failure plane following the old bluff line and a wedge analysis, it appears that if the hydrostatic pressures are relieved, the current safety factor of 1.0 would be increased to 1.09. An increase in soil strength should also be realized which would increase the safety factor substantially.

To accomplish drainage of the coal layer, we propose drilling and jacking a ±2' diameter perforated pipe to intercept the coal layer behind the slide area. This would cut off the water bearing strata from the slide and gravity drain the water away from the area. The pipe would be approximately 180' long.

Options considered were:

1. Preferred method - ±$50,000, and an easement would be required.

2. Cut and replace head of slide (under shoulder ±25' deep) - $135,000.

3. Cut trench across road above slide (±25' deep) - $170,000.

4. Remove and replace entire slide area (as was done on the south bluff slide) - ±$300,000.

5. Well points - ±$80,000 plus maintenance.

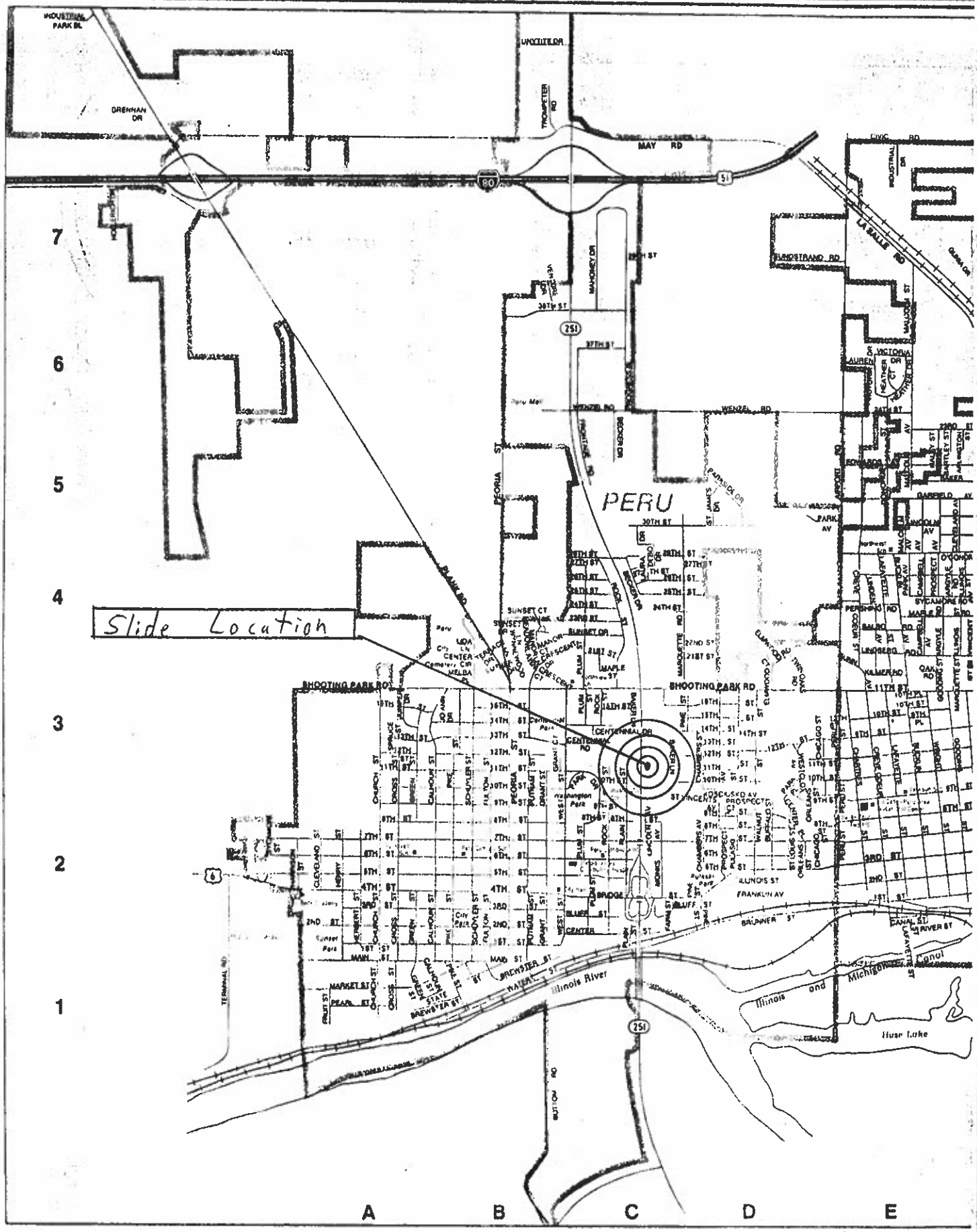
6. Do nothing - annual maintenance costs and safety hazard in shoulder.

This work could be accomplished by addition to the captioned construction project which was awarded to LaSalle County Asphalt recently. I recommend we approach the contractor for prices to do this work before a decision is made on whether an authorization would be feasible. Otherwise, this could be considered for a future contract maintenance project.

DJL:lw/0135m

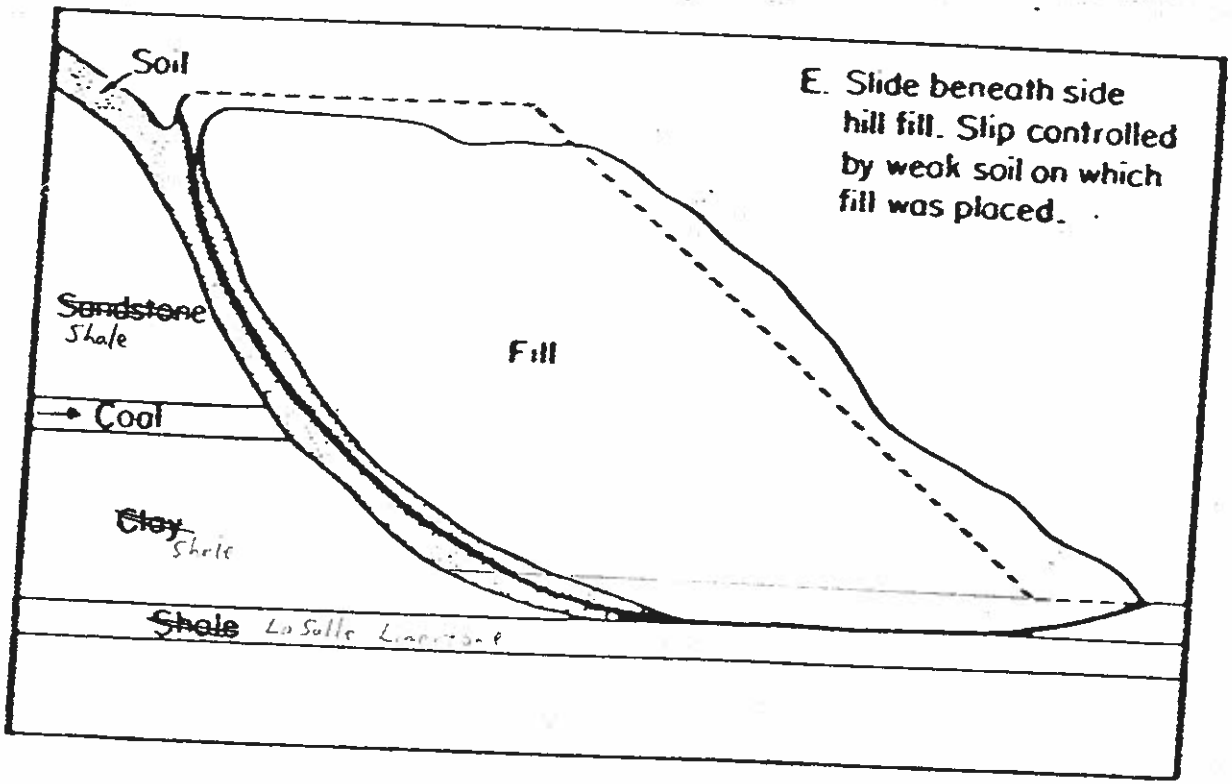
cc: D. Mestelle

Peru and La Salle



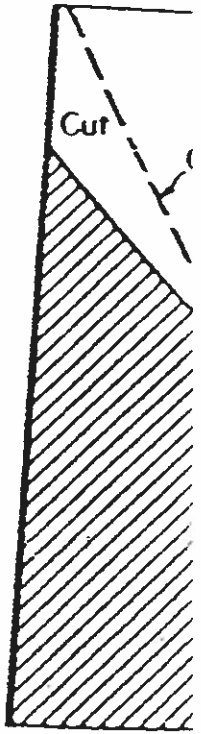
020183 © DonTech 1991 LaSalle, Ill.-C

Firm base

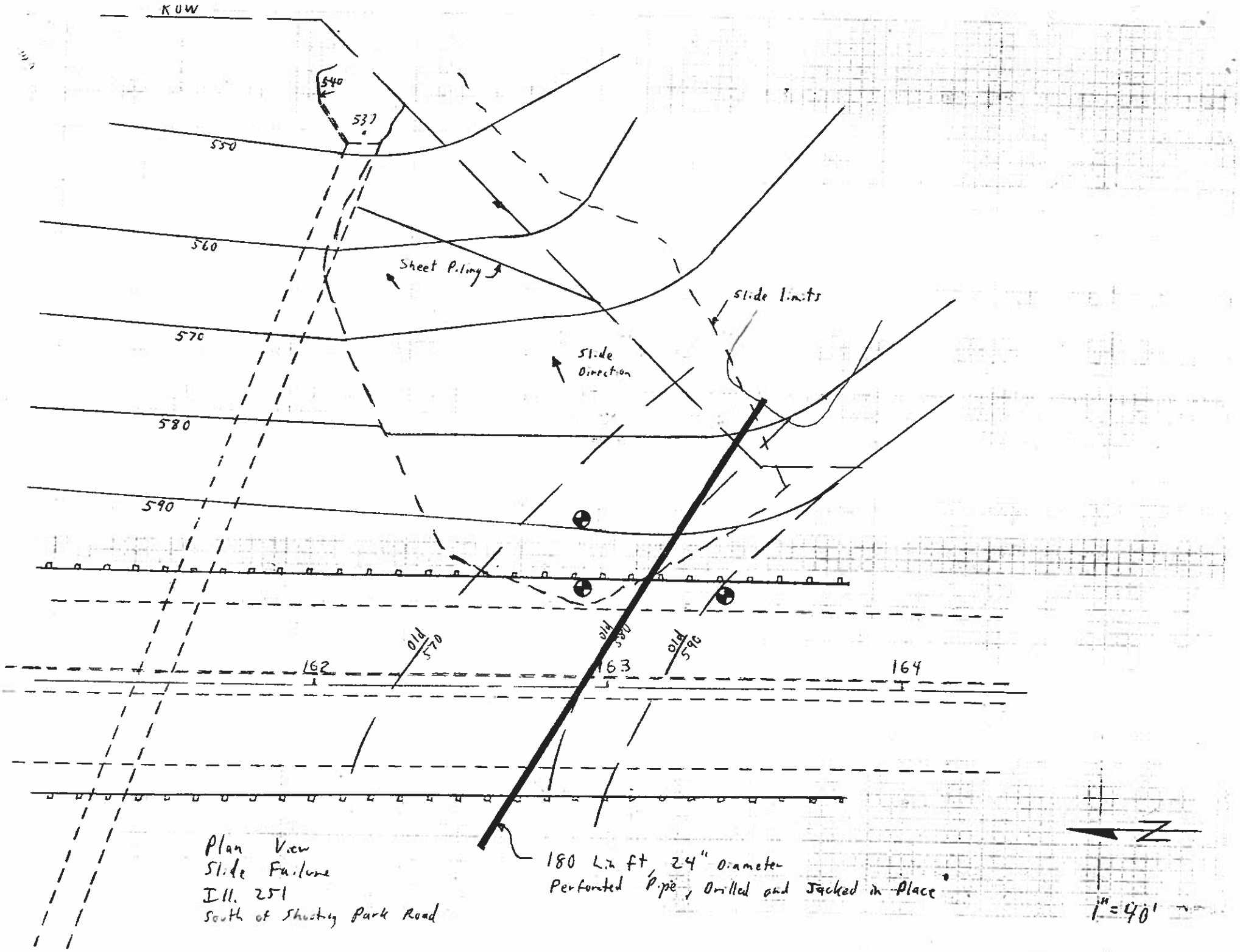


E. Slide beneath side hill fill. Slip controlled by weak soil on which fill was placed.

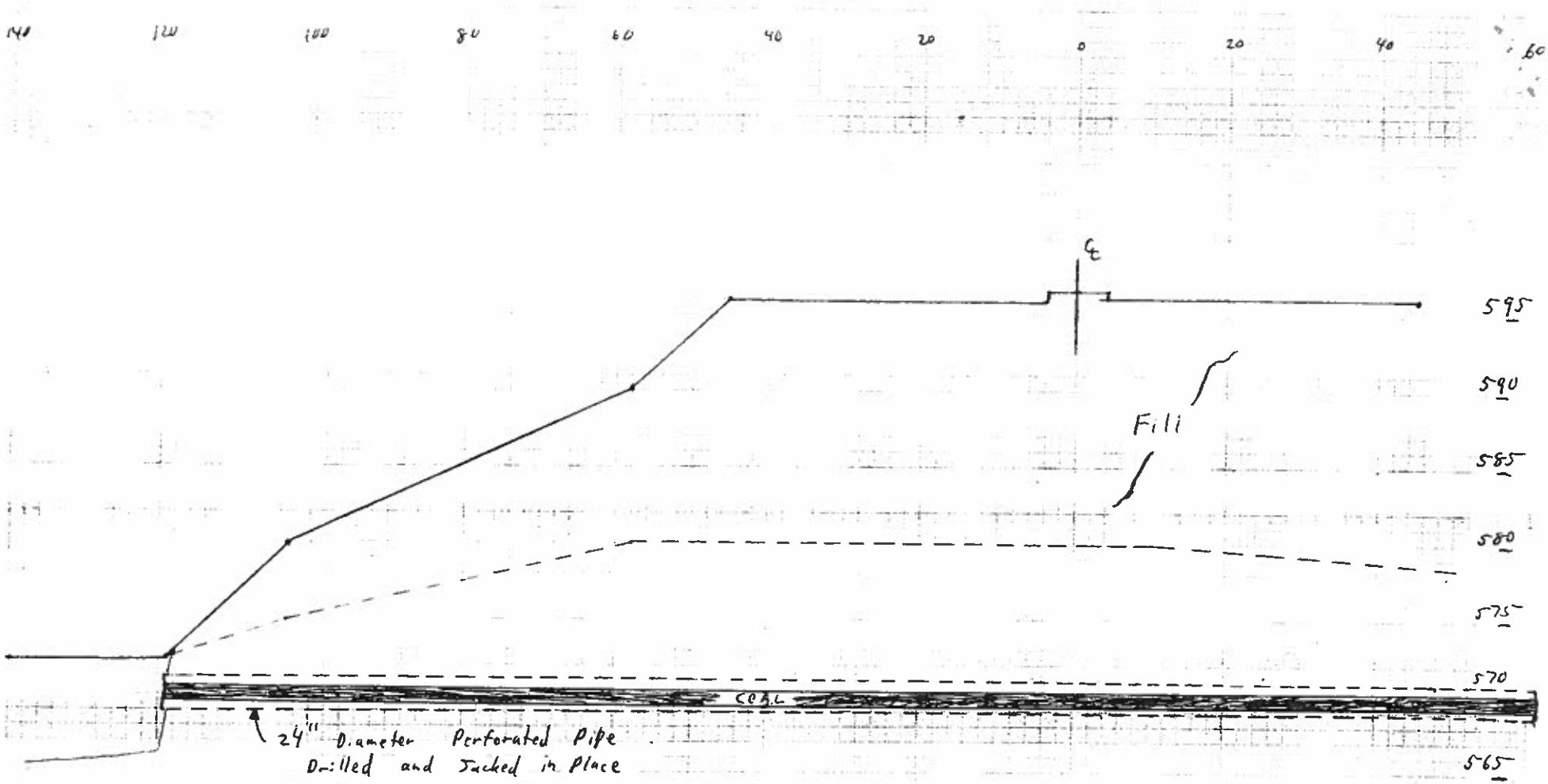
Perloff & Baron



G. Failure of embankment Gravel counterweight on left side prevents slide



Plan View
Slide Failure
Ill. 251
South of Shooting Park Road



X-Section along
Proposed Pipe
Ill. 251
So. of Shooting Park Road.

Hor. 1" = 20'
Vert 1" = 10'





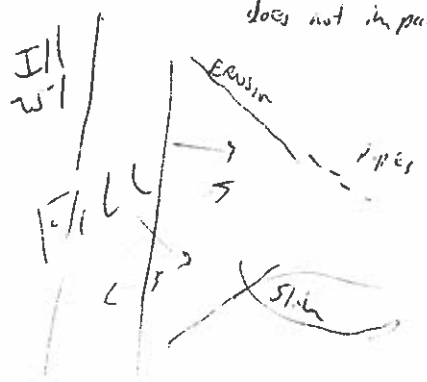
4-29-92

Next review S. of Slide area behind eagles

Next fill to ~~the~~ south of present slide

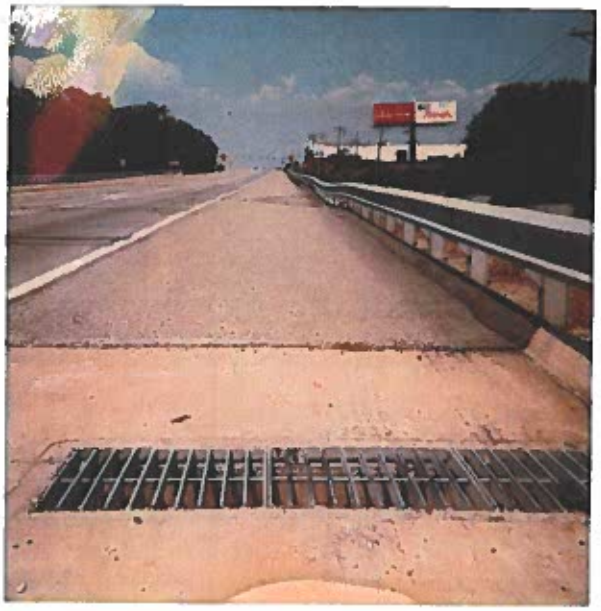
Only thing found here was erosion

along north slope & slide cut to west on south side does not impact roadway presently



8-14-91 Ill. 251 @ Route
East Side of Road





1+ Cracked wing wall East side south
culvert wall cracked, culvert wall
shows failure
cracks from headwall
back 50'.



Dirt encroaching paved ditch NE of
culvert headwall on East side

8-14-91 Ill. 137 @ Tuyler
west side of road,





Facade culvert looking west
South hillside slide engulfs entryway

South hillside slide forces
soil (including limestone layers)
over South wing wall. Note ditch water
runs over culvert top.



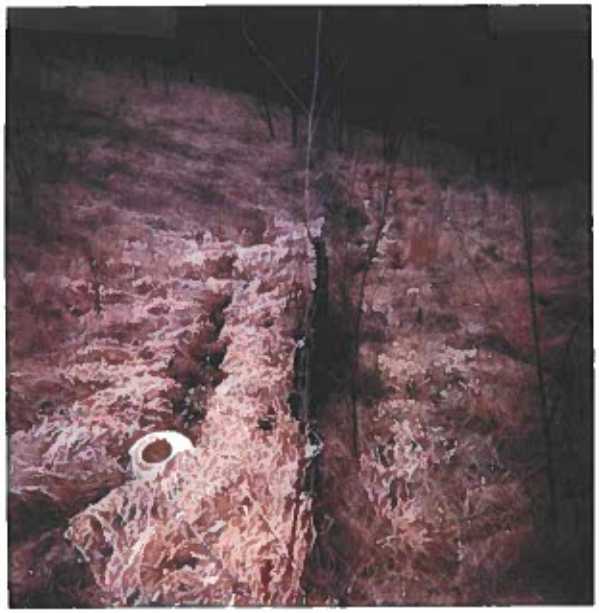


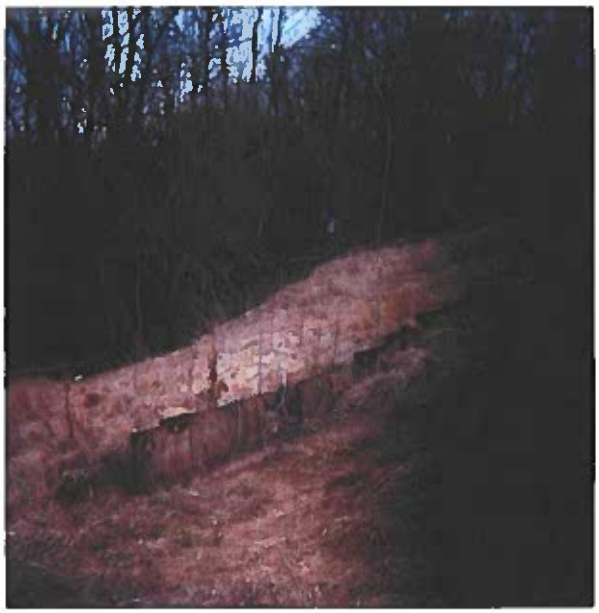
Paved ditch completely filled at culvert this photo is south of filled area looking north



← Looking SE section of old slide

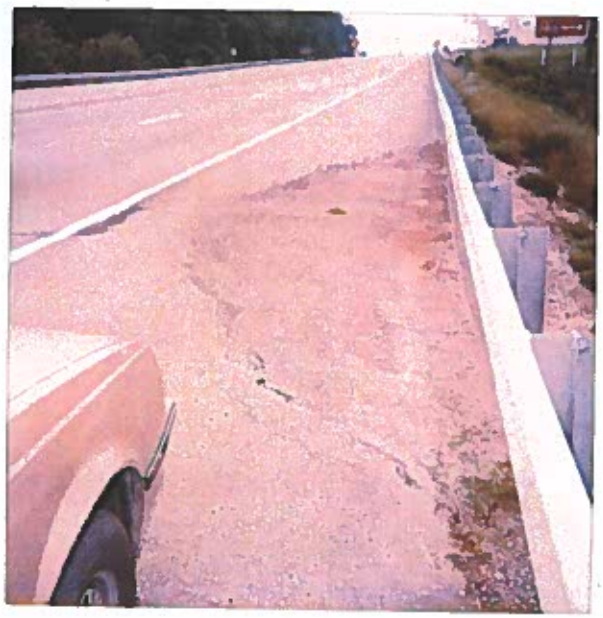






Sheets moving

trees being pushed over along south side of active slide



APPENDIX

E-12

Illinois Department of Transportation

Memorandum

To: Gregg Mounts

From: Donald L. Claus By: Terry L. McCleary

Subject: Slope Failure on IL 251 in Peru

Date: April 9, 1997

On December 30, 1996, measurements were taken on Illinois 251 between US 6 and Shooting Park Road. At that time, the northbound shoulder had sunk ±4". It was also noticed that the sheet piling placed in 1985 have rotated to the east.

On April 7, 1997, additional measurements were taken. The northbound shoulder has sank another inch, bringing the total settlement to ±5".

Immediately east of the guardrail at this location is a large mound of earth and bituminous. I believe this mound to be contributing to the failure of this slope.

Please make every effort possible to remove this mound and repair the shoulder. The bituminous shoulder should be removed and replaced with new bituminous.

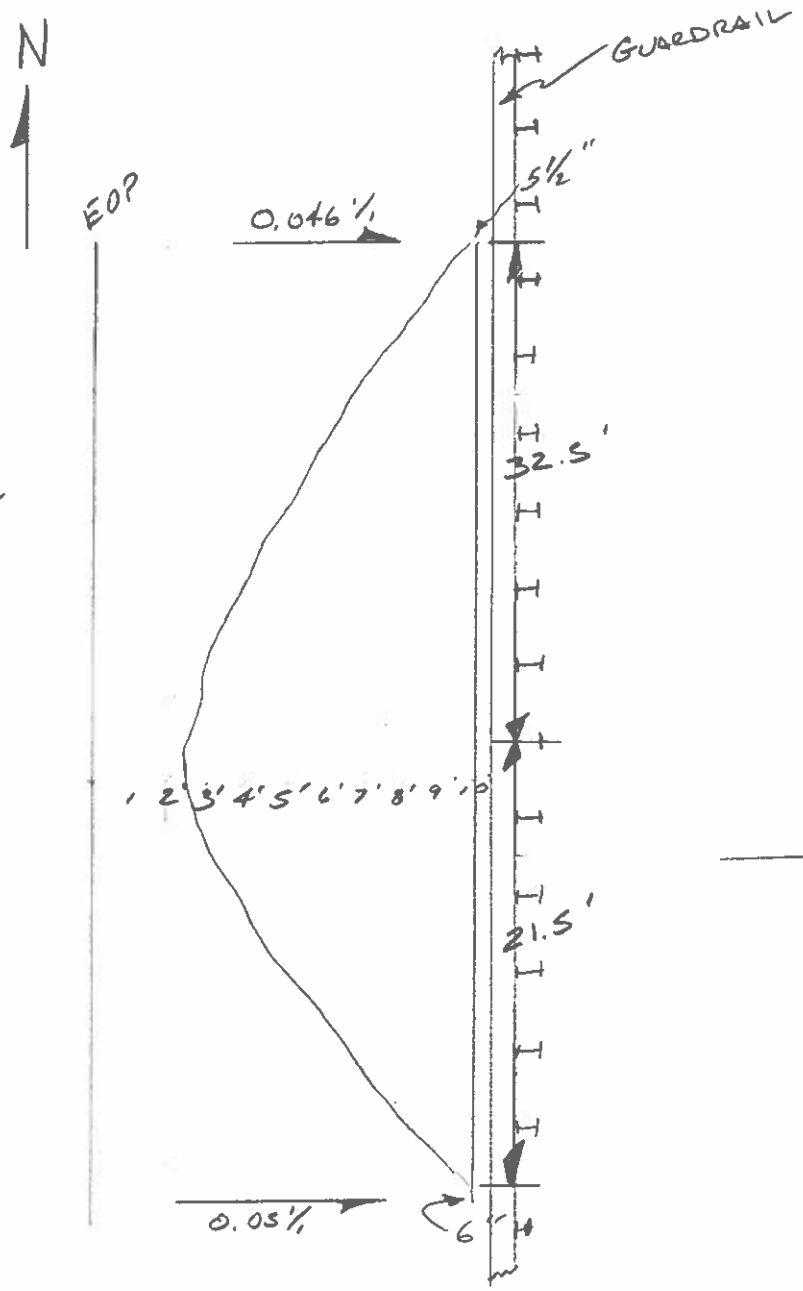
TLM:lw/SLOPE

1	1 3/8
2	2 7/8
3	4 3/4
4	6 1/4
5	7 1/4
6	8
7	8 5/8
8	9 1/4
9	9 5/8
10	9 3/4

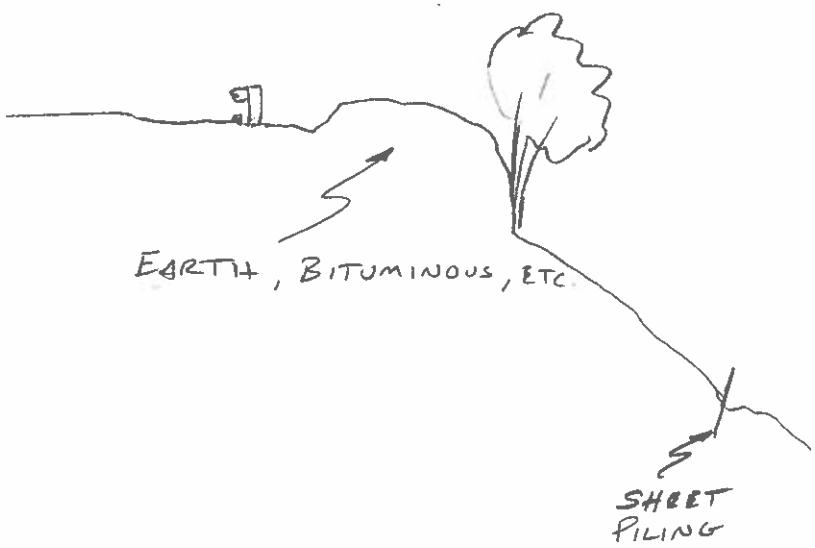
4-797
MEAS. SLIDE
RT 251 S.O
SHOOTING PARK

NOTE- 4" OVERLAP to PAVEMENT

MEAS. TAKEN: 12/30/96
BY: TLM, DM, TK



DIST. OUT FROM NBL EOP	MEASUREMENT	NORMAL SLOPE
1'	1"	0.6"
2'	2.25"	1.2"
3'	3.75"	1.8"
4'	5.5"	2.4"
5'	7"	3.0"
6'	7.75"	3.6"
7'	8.25"	4.2"
8'	8.75"	4.8"
9'	9.5"	5.4"
10'	10"	6"



FIELD NOTES:

- SHEET PILING NEAR BOTTOM OF HILL IS TILTING AWAY FROM ROADWAY TOWARDS THE EAST.
- SOMEONE, (IT APPEARS TO HAVE BEEN MAINT. OR CONST.) HAS PLACED EARTH AND CHUNKS OF BITUMINOUS CONCRETE JUST EAST OF THE GUARDRAIL. THIS IS A SIZEABLE MOUND AND MAY BE CONTRIBUTING TO THE FAILURE

APPENDIX

E-13

57

SEE SHEET #2 FOR INDEX OF SHEETS & STANDARDS

KOWALCZYK

10-22-03

DESK COPY

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
46	*	LASALLE	40	1
F.H.W.A. REG. 5		ILLINOIS PROJECT		

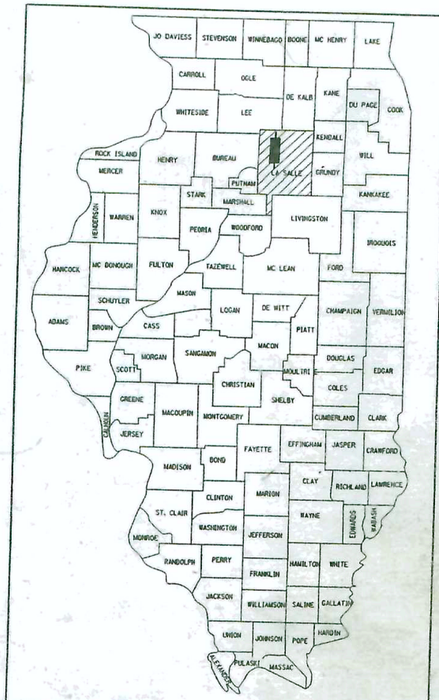
* (1, 1Z)RS-3, I

D-93-034-01

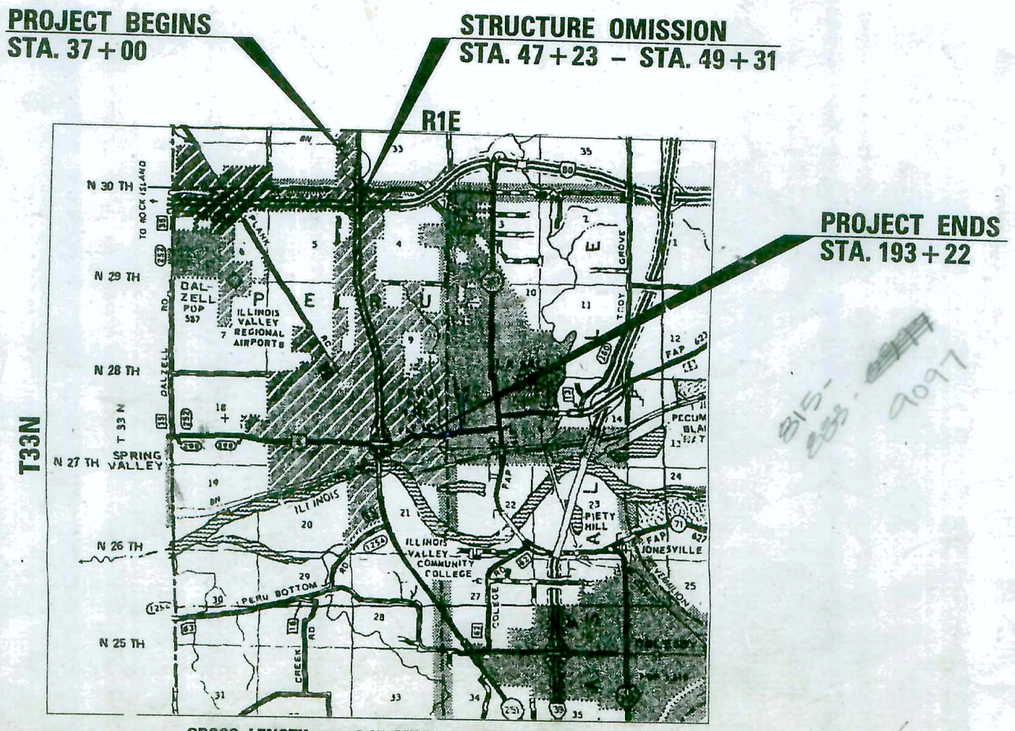
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED FEDERAL AID HIGHWAY

FAP 46 (IL 251)
SECTION (1, 1Z)RS-3,I
LASALLE COUNTY
C- 93-112-01

AS BUILT



LOCATION OF SECTION INDICATED THUS: ■



GROSS LENGTH = 7.95 MILES = 15622.03 FT.
NET LENGTH = 7.91 MILES = 15397.07 FT.

– HIGHWAY CLASSIFICATION –
URBAN OTHER PRINCIPAL ARTERIAL

1999	ADT	=	14300
%	P.V.	=	93.8
%	S.U.	=	2.3
%	M.U.	=	3.9

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED June 18, 2001
James L. Sexton Jr.
DISTRICT ENGINEER
June 29, 2001
Michael Kline
ENGINEER OF DESIGN AND ENVIRONMENT
June 29, 2001
James R. Slifer
DIRECTOR, DIVISION OF HIGHWAYS

PRINTED BY THE AUTHORITY OF THE STATE OF IL

MICROFILMED _____
REEL NUMBER _____
AWARDED _____
RESIDENT ENGINEER _____
AS BUILT CHANGES WERE MADE ON THE FOLLOWING SHEETS _____

JULIE 1-800-892-0123

DISTRICT 3 NO. (815) 434-6131

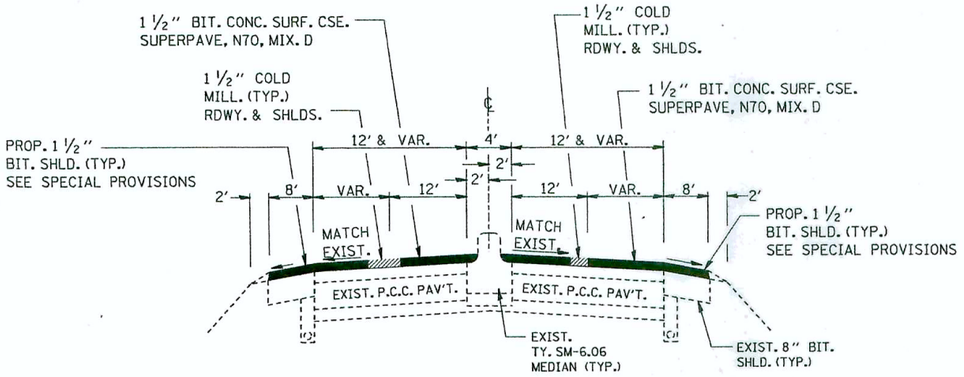
PROJECT ENGINEER: RICK POWELL
UNIT CHIEF: BRAD CRESTO
TOWNSHIP: PERU

CONTRACT NO. 66133

JUNE 15, 2001
/ED3401/details.dgn

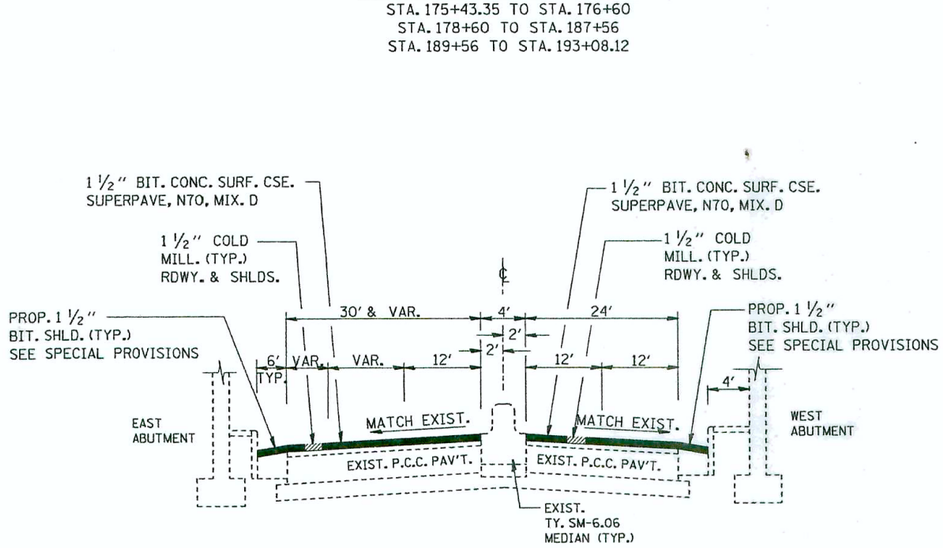
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
46	*	LASALLE	40	10
STA.	TO STA.			
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

* (1,1Z) RS-3, I



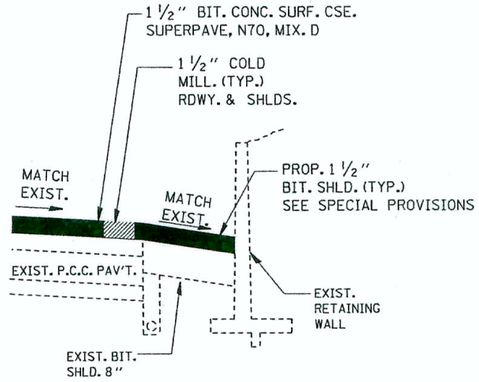
TYPICAL SECTION NO. 17

STA. 175+43.35 TO STA. 176+60
STA. 178+60 TO STA. 187+56
STA. 189+56 TO STA. 193+08.12



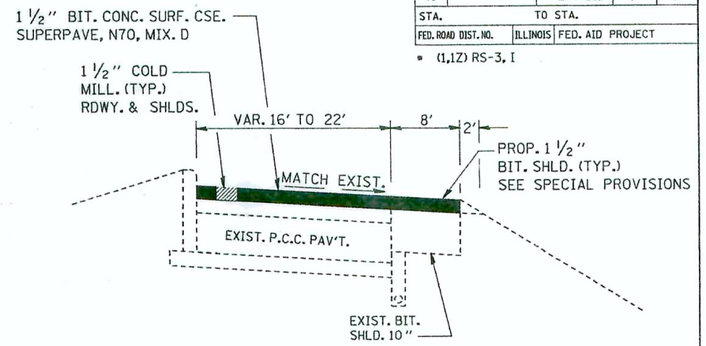
TYPICAL SECTION NO. 18

STA. 176+60 TO STA. 178+60
STA. 187+56 TO STA. 189+56



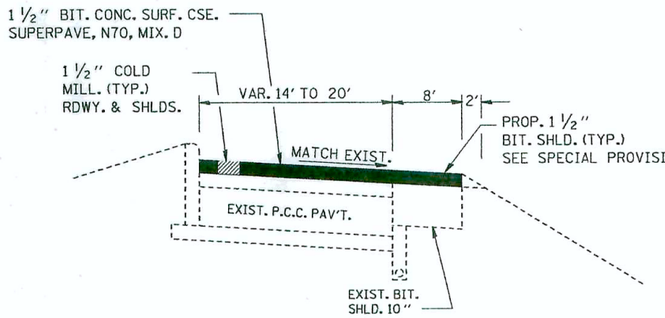
SHOULDER DETAIL AT RETAINING WALL

STA. 3+23 TO 6+53
N.W. OUTSIDE RAMP
WEST SHOULDER



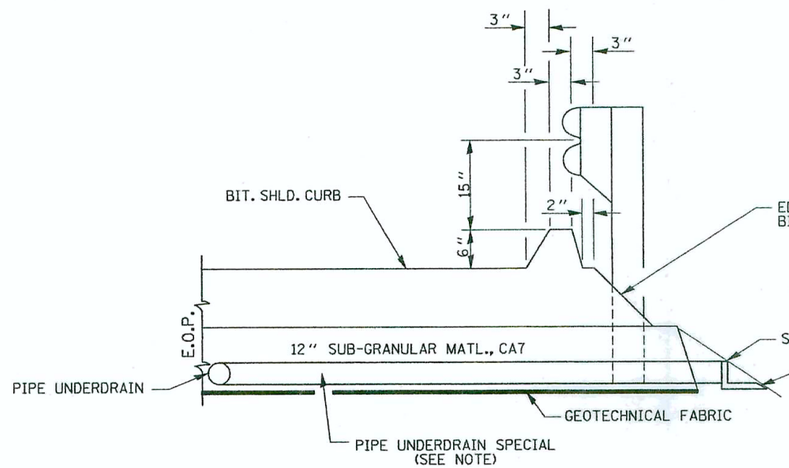
TYPICAL SECTION

INSIDE RAMPS
RT. 6 & 51 INTERCHANGE



TYPICAL SECTION

OUTSIDE RAMPS
RT. 6 & 51 INTERCHANGE



NOTE: UNDERDRAIN (SP) SHOULD BE LOCATED AT THE LOWEST ELEVATION.

SHOULDER REPAIR DETAIL

@ STA. ±162+90

REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

JUNE 18, 2001
E2003401\DETAIL.dgn

APPENDIX

E-14

Short, Michael A

From: Short, Michael A
Sent: Wednesday, January 16, 2013 9:54 AM
To: Spurlock, DLon B.
Cc: Phillips, Wayne L
Subject: FW: IL 251 slope stability

D'Lon,

Please see the email below from January 2012.

I have not worked to determine the exact scope of work for actually repairing the problem, however a list of options is included near the end of the email. If the scope of work and budget permit, it would be good to fix the actual slope. Please let me know if this scope of work is possible and I will start to do a more thorough analysis of the various options.

I will visit the site in the next couple weeks to verify that all of the recommendations indicated below still apply.

Thanks,
Mike

From: Short, Michael A
Sent: Thursday, January 05, 2012 3:28 PM
To: Hufnagel, Thomas J
Cc: Phillips, Wayne L; Magolan, Thomas J; Hucker, Bruce A; Rennels, David W
Subject: RE: IL 251 slope stability

Tom:

On December 21, 2011, Wayne Phillips and I visited the subject location and have the following comments:

East side of IL 251

1. The existing concrete and HMA shoulders on IL 251 should have a full height concrete curb installed to direct surface water to the existing shoulder inlets.
2. The entire slope is very wet and has many low spots that collect water. The entire slope should be graded to eliminate ponding of the surface water and direct the water toward the stream.
3. The existing slope should be seeded and covered with a heavy duty erosion control or excelsior blanket.
4. A pipe discharges just above the existing metal sheet pile wall. This discharge should be relocated to the bottom of the slope so that it discharges directly into the streambed. The source of this pipe should be investigated to determine if it is the north shoulder inlet or the chimney drain system.
5. The south shoulder inlet pipe has failed in many locations. This pipe should be repaired and extended to discharge the water directly into the streambed.
6. An underdrain headwall is present near the top of the slope. This underdrain should be relocated so it discharges into one of the existing shoulder inlets. If this is not feasible, it should be extended to the bottom of the slope so it discharges directly into the streambed.
7. The earth above the sheet pile wall should be graded to direct the surface water away from the sheet pile wall.
8. The southeast wingwall of the box culvert has failed and should be replaced.
9. The northeast wingwall of the box culvert appears to be experiencing scour under the footing.
10. The northeast wingwall of the box culvert appears to have moved slightly.
11. The east end of the box culvert needs repairs. The rest of the box culvert appears to be in good condition.

12. The paved ditch to the northeast of the box culvert is undermined (scour).
13. A 4 ft deep scour hole is present just downstream from the box culvert outfall.
14. The east box culvert outfall area should be checked for scour under the box culvert.
15. The existing guardrail shows signs of slope movement.
16. The slope has pushed up on top of the concrete headwall at the top of the box culvert.
17. The existing HMA adjacent to the concrete shoulder has settled. To mitigate the effects of this, the concrete shoulder has been ground down on the approach side to minimize damage to snow plows, etc. Removal of the existing concrete and replacement with HMA should be considered. The HMA would show distress as movement of the slope occurs, allowing us to monitor the situation better than with the concrete shoulder which "bridges" over the poor embankment and hides the issues.
18. There is a PVC pipe that sticks out from the embankment above the northeast wingwall of the box culvert. We could not find the origin of this pipe, however it may be the outlet from the chimney drain system. This should be confirmed so we can be sure the chimney drain system has adequate drainage.

West side of IL 251

1. The discharge of the south shoulder inlet into the paved ditch needs repairs.
2. The south paved ditch has failed and needs repairs and embankment shaping.
3. The south paved ditch has an inlet structure before the ditch reaches the box culvert. This inlet structure is connected to a pipe that discharges over the top of the headwall at the box culvert. The inlet is plugged with soil and debris and should be cleaned out. Some additional grading and shaping work may be needed to ensure the water enters the inlet.
4. The south wingwall isn't holding enough soil back – either the wingwall needs to be longer or the slope reshaped.
5. The north paved ditch is undermined in several spots.
6. The stream approaching the box culvert appears to be migrating and eroding the north bank of the stream.

The slope and the southeast wingwall failed during the original construction in 1962. At that time, samples were taken from the new embankment which found densities of 80% and high moisture. Additional weep holes were installed in the wingwall and a perforated pipe was installed to help drain water away from the embankment. Additional attempts to improve the slope have occurred since then:

1984: Installation of sheet pile wall and chimney drain system.

1992: Installation of the north shoulder inlet.

1992: Soil borings performed at the site indicate soils with high water contents and low strengths are present.

1992: On the west side of the box culvert, construction of the north wingwall extension and installation of a pipe to convey water from the south paved ditch to discharge over the top of the box culvert. The plans have a note indicating the modifications to the south paved ditch are necessary due to a slope failure.

1998: Slope inclinometers were installed in October 1998 to monitor slope movement. 0.17 inches of movement was identified at approximately elevation 567.5 in October 2000. No further readings have been taken.

2001: Shoulder on the east side of IL 251 repaired and underdrain outlet installed.

While there is a long list of items that should be done to help improve the situation, none of the items listed above will actually address the cause of the problem – they will just help to "buy time." Some ideas to actually repair the problem include:

1. Remove all of the embankment and the box culvert. Replace the box culvert and construct a new embankment using either soil or a clean aggregate with a drainage system.
2. Remove the top portion of the embankment and replace it with new fill. The depth of replacement would need to be determined.
3. Remove the top portion of the embankment and replace it with new lightweight fill. The depth of replacement would need to be determined.
4. Jack in place one or more perforated pipes at the interface between the original ground and the embankment. The goal is to intercept water flowing in an underground coal seam and direct the water away from the embankment and directly into the stream.

5. Flatten the existing slopes and extend the box culvert to make very flat slopes that would be unlikely to fail.
6. Use deep soil mixing to improve the existing embankment.

Detailed analysis of the various options would be necessary to evaluate the feasibility, effectiveness, and costs of the various options.

If you have any questions, please contact me.

Thanks,
Mike

Michael Short

Geotechnical Engineer
Illinois Department of Transportation, District 3
700 East Norris Drive; Ottawa, IL 61350
Phone: 1-815-433-7085; Cell: 1-815-378-0879; Fax: 1-815-433-7094
Michael.Short@illinois.gov

From: Hufnagel, Thomas J
Sent: Friday, December 16, 2011 8:58 AM
To: Short, Michael A
Cc: Phillips, Wayne L; Magolan, Thomas J; Hucker, Bruce A; Rennels, David W
Subject: IL 251 slope stability

Mike

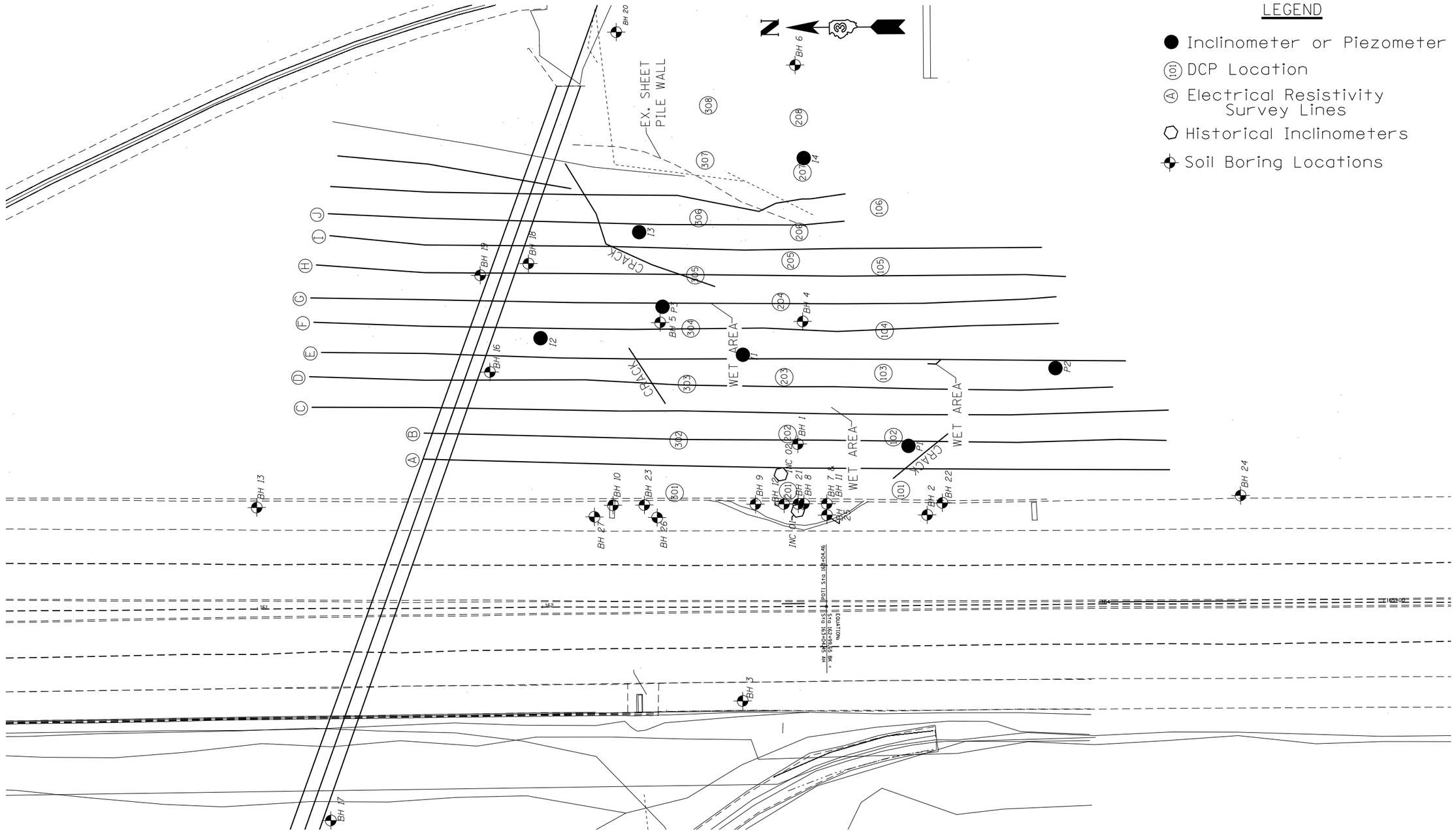
I know the subject of the slope stability on IL 251 south of Shooting Park Road in Peru has been studied in the past; has this been looked at recently? I am told the problem continues and may need some attention soon.

Currently we continue to maintain the roadway and shoulders but to do this we only add to the mass of moving material. Do you have any recommendations or an estimated extent of the problem?

Tom Hufnagel
Design and Plan Engineer, Operations
(815) 434-8418
Thomas.Hufnagel@illinois.gov

APPENDIX

F-1



USER NAME = fergusonjh	DESIGNED - _____	REVISED - _____	
	DRAWN - _____	REVISED - _____	
PLOT SCALE = 100.0000 ' / in.	CHECKED - _____	REVISED - _____	
PLOT DATE = 5/16/2018	DATE - _____	REVISED - _____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Zoomed Boring Section

SCALE: _____ | SHEET __ OF __ SHEETS | STA. _____ | TO STA. _____

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
___	_____	_____	___	___

CONTRACT NO. ____

ILLINOIS | FED. AID PROJECT

MODEL: Default
FILE NAME: pw:\\IL084EBIDINTEG.illinois.gov:PWIDOT Documents\IDOT Offices\District 3\Projects\D366F12\CADData\CADSheets\D3xxxxx-sht-zbrprf.dgn

APPENDIX

F-2

An electrical earth resistivity survey along northbound Illinois Route 251 in Peru, Illinois

Timothy H. Larson Riley Balikian Siqi Deng
Illinois State Geological Survey

June 2017

Purpose and location

We acquired ten earth resistivity profiles on the east embankment of Illinois Route 251 in order to investigate the cause of a slope failure within the embankment. Failure occurs where the roadway crosses an old stream now routed through a box culvert beneath the roadway. Problems with the embankment have been evident ever since it was first constructed in 1962 and several attempts have been made to mitigate the slide. Fill materials (clay and reworked shale) up to 30 feet thick overlie Pennsylvanian bedrock. The failure has reached the shoulder of the roadway causing a hazard. The goals of the survey are to:

- delineate the slumping material relative to the intact embankment;
- locate wet areas within the fill;
- locate drains and other structures from previous repairs;
- if possible, map the fill/bedrock interface.

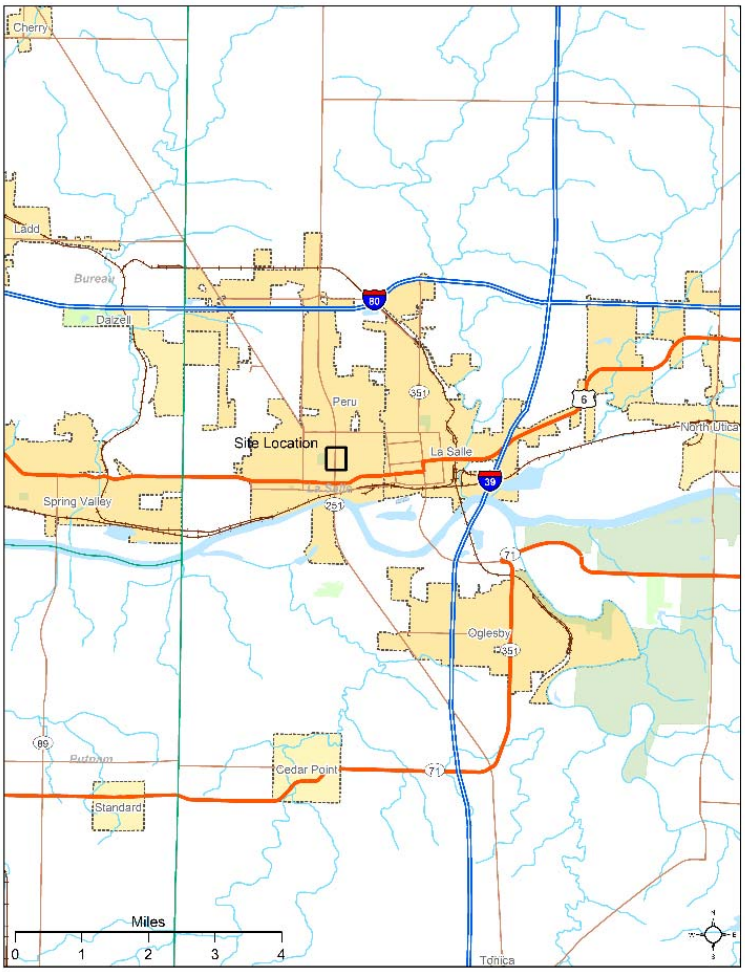


Figure 1. Site location in the Peru area.

The study area extends from about Station 161 + 28 feet to Station 164 + 23 feet from north to south along the highway and extends down slope a distance just over 100 feet (Figure 2). The ten profiles are parallel to the east edge of the shoulder of the highway, starting 10 feet east of the shoulder, and are spaced 10 feet apart from each other. Because of the presence of a sheet pile wall near the east end of the study area, the tenth line was shortened and spaced about 20 ft east of the ninth line. For reference, we include a map showing the approximate contours of the hillslope before construction of the embankment (Figure 3). The south end of the study area was cut down to the new grade, while the north end was filled to bring it up to grade. The stream running through the north end of the current embankment was routed into a box culvert passing through the northeast edge of the study area. Previous construction drawings suggest that a chimney drain may have been constructed within the study area. We indicate the approximate outline of where this feature was to be constructed (Figure 4). Two drains are present on the shoulder of the highway at approximately Station 163+70 and Station 162+33. We detected what appear to be pipes buried in the embankment leading from these shoulder drains.



Figure 2. The ten labelled EER profile lines running north-south on the east side of Highway 251. Contour lines indicating the elevation at the time of the survey are overlaid on a satellite image.



Figure 3. The ten EER profile lines overlaid on the contours of the original topography before construction of the current road grade.



Figure 4. Underground structures at the study site. See text for further explanation.

Survey method

Electrical earth resistivity surveying is a geophysical technique that takes advantage of the contrast in electrical properties of natural materials. The electrical resistivity of the materials is measured by injecting an electric current into the ground through two metal stakes (called the current dipole) and measuring the resulting electrical potential with two other stakes (called the potential dipole). The measurements in this study used the dipole-dipole electrode configuration: the four electrodes (stakes) are in a line with the two electrodes forming the current dipole next to the two electrodes forming the potential dipole. For the electrical earth resistivity tests conducted in this survey, 40 metal stakes are pushed into the ground at intervals of 2 meters along the survey line. The stakes are connected through multi-core cable to a computer-controlled resistivity meter (ABEM Terrameter 4000) and switching system (LUND imaging system). A control program sequentially switches various combinations of electrodes, operates the instrument, and stores the data. Profiles of continuous resistivity measurements are obtained at 2 m spaces and up to as much as about 8 m (25 ft) deep. Topographical information was then added to the data using information obtained by IDOT surveyors as we were collecting our data. A two-dimensional resistivity model is calculated from the electrical data using a finite element inversion program. Resistivity profiles plotted in Figure 5 are shown at the same horizontal and depth scales and with identical resistivity scales so that they can be more easily compared to each other. In general, the resistivity values measured in this study were very low. The resistivities are depicted using a logarithmic scale ranging from 1 ohm-m to 181 ohm-m.

Results

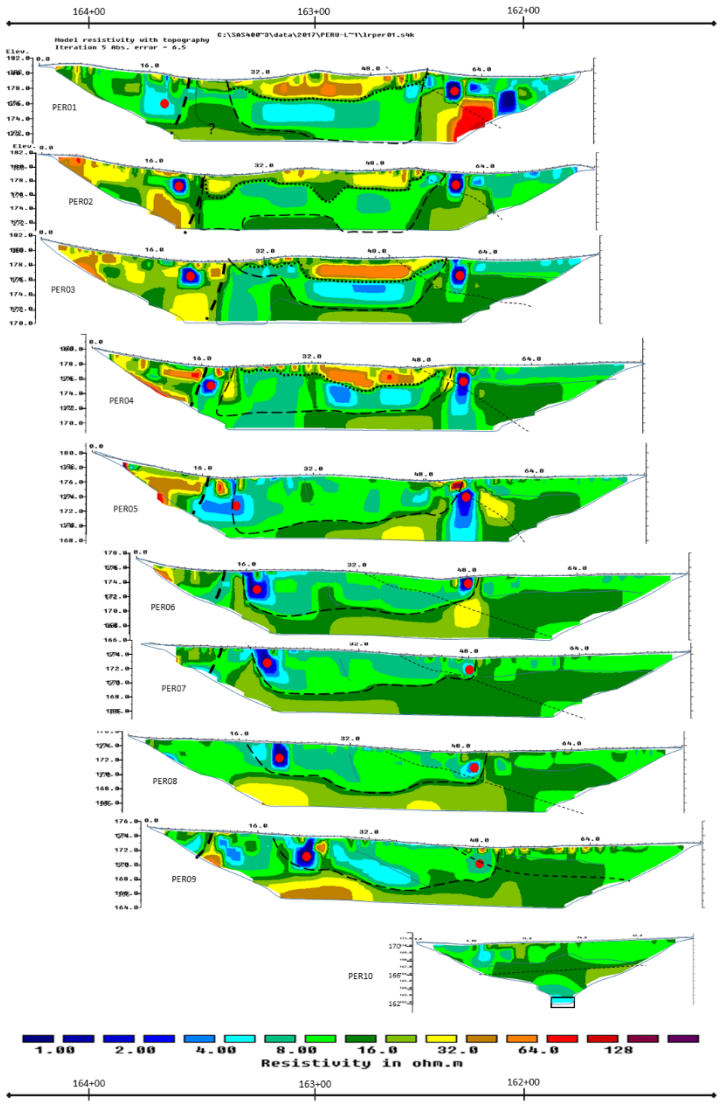
Figure 5a shows the 10 resistivity profiles at approximately their relative positions at the site. Figure 5b is our interpretation of important features on these profiles. The two drainpipes are very clearly imaged on the resistivity profiles. The northern pipe is approximately perpendicular to the roadway and appears to be placed at or very near the contact with the original hillslope. The southern pipe angles to the north as it proceeds downslope. Unfortunately, the very low resistivity values of the pipes are difficult to clearly image and various artifacts can be seen in the inverted resistivity profiles. This is unfortunate because the pipes seem to be placed at, or very near, important interfaces on the hillslope and thus obscure the images of these interfaces. The box culvert, carrying the re-routed stream may be indicated by the very low resistivity zone at the base of the tenth profile.

The shallow, relatively high-resistivity material imaged on profiles 1, 2, 3, and 4 appears to be a more recent fill material. It is in the same general area as the chimney drain, but is shifted to the north and extends from the west edge of the study site, whereas the chimney drain was intended to be constructed east of profile one. It is possible that the higher resistivity material in profiles one and two are distinct from the similar material imaged in profiles three and four. In this case, the materials imaged in profiles 3 and 4 could be consistent with a shortened chimney drain which does not continue as far north as planned. However, the presence of the northern drainpipe partly obscures the image of the northern end of the fill material. Two areas of relatively higher resistivity just north (Profile 5) or just below the drain pipe (Profile 6) are interpreted as artifacts related to the drain pipe, but they may also be a northern continuation of the fill material imaged on profiles 1 through 4.

The features described above are fairly well imaged on the resistivity profiles. Based on the consistent resistivity values and locations of the features we are relatively confident in our interpretations. Because the resistivity profiles are close together, we are able to compare them for other features, which may be subtle on any one profile, but when repeated on adjoining profiles suggest the presence of a physical interface and not merely noise in the resistivity data. In particular, a linear feature can be seen near the center of the base of most of the profiles. It separates a zone of relatively higher resistivity material below from a zone of relatively lower resistivity material above. The north and south boundaries of this feature are often obscured by artifacts from the buried drain pipes; however, we believe we can trace the edges with some confidence in most of the profiles. We also show this feature in profile on Figure 7. We connect these features into a contoured surface, shown in Figure 8. This surface is consistent with a slip surface between the competent slope (higher resistivity material) and a slump with lower resistivity material. The southern edge of this surface, though difficult to precisely image because of the presence of the drain pipe, appears to be fairly steep and to abut the zone of the relatively highly resistive undisturbed material on the far south end of profiles 2 through 6. On the north, the surface gradually moves farther north as it moves downslope. This feature is very subtle and the interpretation of a slip face is suggestive, not definitive.

In summary, the resistivity survey was able to image several features (drain pipes) from previous work at the site. A small area of fill material in the center of the embankment was also imaged. This fill may be part of a proposed chimney drain system. We were able to image a very subtle feature that is consistent with a slip-face. The sides of this feature blend into the image of the drain pipes which limit the resolution of this feature.

5 A.



5 B.

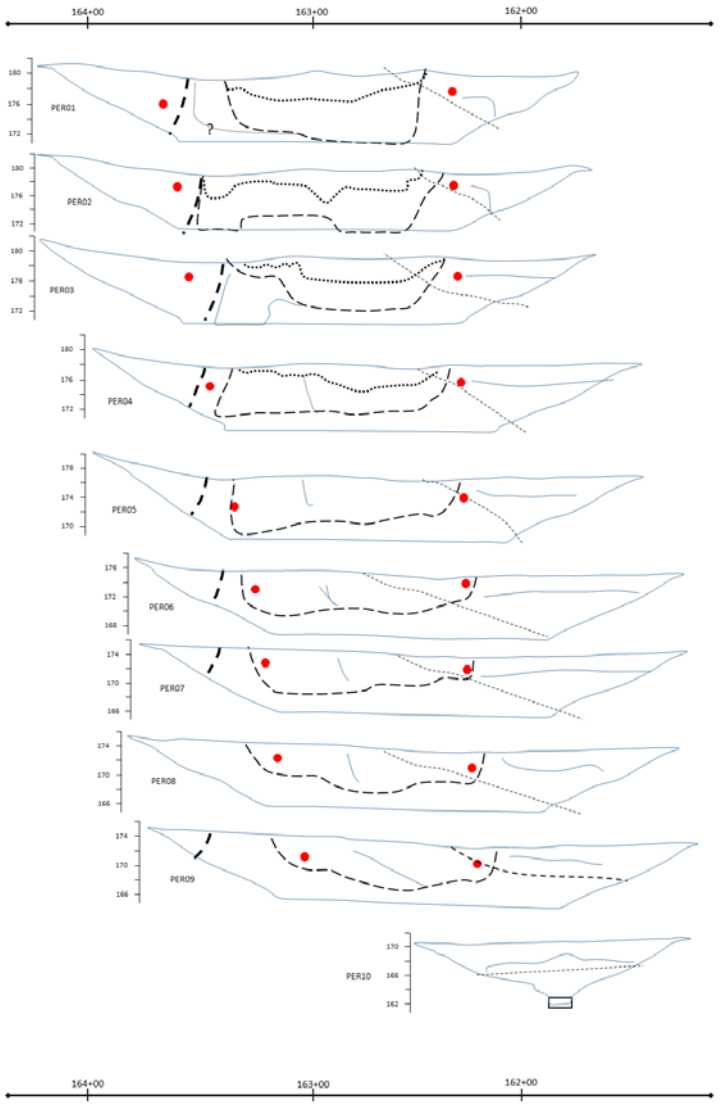


Figure 5. Results of the EER profiles, laid out horizontally and vertically to scale (although the profiles are not spaced to scale). Figure 5a shows the resistivity as calculated, in ohm-meters. Figure 5b shows our interpretation of important features.



Figure 6. Left: Contour of depth below surface of shallow, relatively high-resistivity material imaged on profiles 1-4. Right: Same contours, but overlain with location of chimney drain proposed for previous construction project.

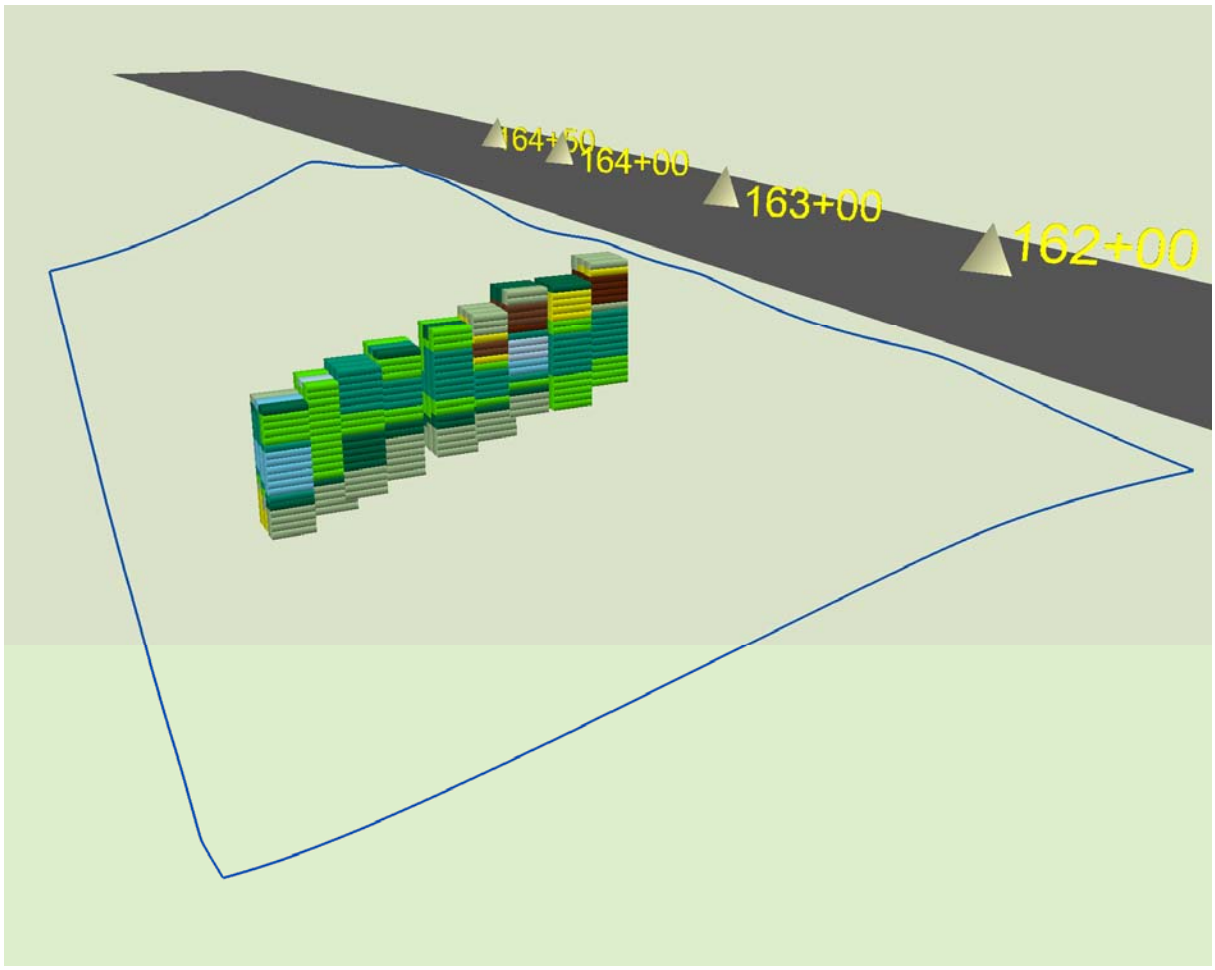


Figure 7. A slice through a 3D model showing the interfaces between layers in the embankment.

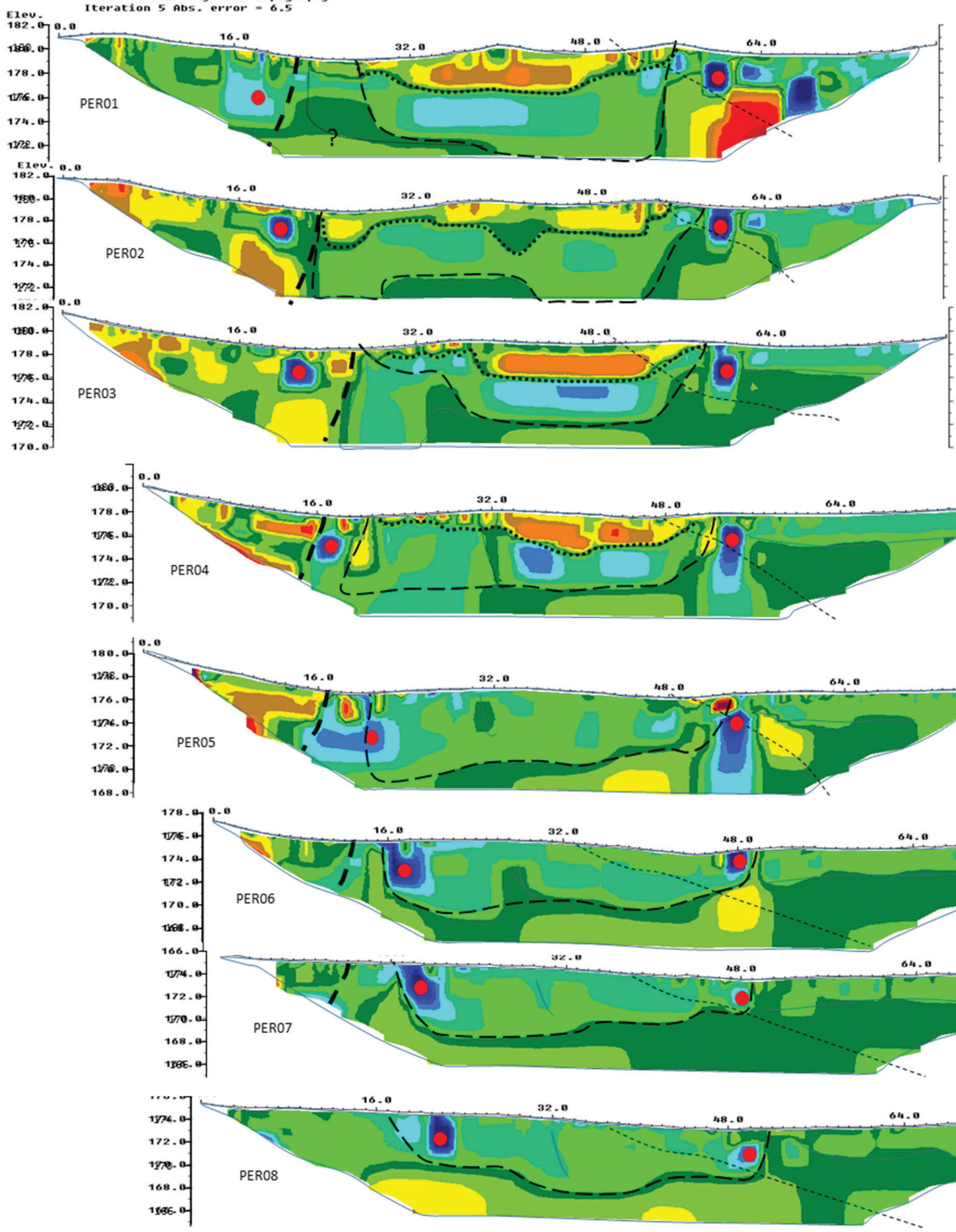


Figure 8. Contoured surface imaged in resistivity profiles and interpreted as a possible slip-face. Surface is overlain by map of ground-surface elevation.

164+00 163+00 162+00

C:\SAS400~3\data\2017\PERU-L~1\lrper01.s4k

Model resistivity with topography
Iteration 5 Abs. error = 6.5



164+00 163+00 162+00

164+00 163+00 162+00

180 176 172 PER01

180 176 172 PER02

180 176 172 PER03

180 176 172 PER04

178 174 170 PER05

176 172 168 PER06

174 170 166 PER07

174 170 166 PER08

174 170 166 PER09

170 166 162 PER10

164+00 163+00 162+00

APPENDIX

F-3

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/13/92

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Whittington

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 1 ('92 Boring #1)
Station 162+90
Offset 57.0 ft Lt.
Ground Surface Elev. 595.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. * ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
				Access Fill Brown Silty Clay Till, Silty Clay, Gravel
				* Groundwater: at 116 days = 576.6 Ft. at 129 days = Hole plugged due to cave in at 584.0 Ft.
-5				
588.50				
				Loose Brown Loam & Silty Clay with Gravel (Fill)
				Wet Seam @ 10.5'
	-	0.5 P	15	
-10				
584.50				
				Weathered Shale mixed with Silty Clay Till, Gravel & Coal (Fill)
	-	<0.5 P	29	
-15	-	1.2 P	26	
	-	1.2 P	26	
576.50	-	2.0 P	23	
				Weathered Shale mixed with Brown/Gray Silty Clay Loam Till (Fill)
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	-	1.5 P	24	Weathered Shale mixed with Brown/Gray Silty Clay Loam Till (Fill) *(continued)*
573.00				
572.50	-	0.0	37	Shale & Coal (Fill) Water
	-	0.5 P	28	Brown Silty Clay Till (Fill)
571.50				
	-	0.5 P	27	Mixed Red Silty Clay Till & Weathered Shale (Fill)
-25				
569.50				
				Gray Weathered Shale (Fill)
	-	2.5 P	19	
566.50				
				No Sample in Tube
-30				Limestone Rock in End of Tube
				Augered Sample is Gray Weathered Shale
561.50				
	32			Red/Gray Weathered Shale
-35	44 56	-	12	
558.50				
				Hard Red Shale
	-	4.0 P	12	
556.50				
				End of Boring
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 2/8/93

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Whittington

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 2 ('93 Boring #2)
Station 163+40
Offset 32.0 ft Lt.
Ground Surface Elev. 593.68 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After 216 **Hrs.** 574.1 ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown & Gray Silty Clay Till Fill
588.68 -5				
	3			Brown Silty Clay Till; Pieces of Weathered Shale & Coal (Fill)
	5		22	
	8			
583.68 -10				
	4			Mixed Reddish Brown & Gray Weathered Shale
	5		18	
	10			
580.68				
				Gray Shale with Thin Limestone Layers
-15				
	50/4"			
			9	
			8	
574.68				
				Limestone (Augering)
573.68 -20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	12			Gray Shale
	70		11	
	18/1"			
	22			
570.18	28		16	
	18		45	Coal (Free Water)
569.18				
-25				Gray Shale to Red Shale
	10			
	11		17	
	13			
-30				
-35				
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 2/8/93

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Whittington

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 2 ('93 Boring #2)
Station 163+40
Offset 32.0 ft Lt.
Ground Surface Elev. 593.68 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After 216 **Hrs.** 574.1 ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Shale to Red Shale *(continued)*				Gray Shale to Red Shale *(continued)*			
				530.68			
				Limestone (Augering)			
-45				528.68 -65			
				End of Boring			
-50				-70			
-55				-75			
-60				-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/25/93

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Whittington

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 3 ('93 Boring #3)
Station 162+70
Offset 33.0 ft Rt.
Ground Surface Elev. 594.70 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Bituminous Shoulder 593.70				
Brown & Gray Silty Clay & Silty Clay Till & Brown Weathered Shale (Fill)	-5	8		
		8		
		8		
	-10	4		
583.70		5	1.0	24
Black Silty Clay Topsoil with Organics, Sticks, Grass (Original Ground) 582.70		5	P	52
Gray & Reddish Brown Clay (Highly Weathered Shale)		2		
		4		25
		5		
	-15	3		
578.70		4	2.0	19
Gray Blocky Weathered Shale		7	P	17
577.70				
Gray Weathered Shale & Limestone Pieces		30		
		47		8
		33/2"		
	-20			
Limestone 574.50		36		
		88/3"		3
573.20				
Gray Shale				
		46		
		105/4"		10
		132		9
570.20				
Black Coal with Free Water 569.70	-25	14		
Gray Clay		16		28
		24		
		8		
		14		22
567.20		26		
End of Boring	-30			
	-35			
	-40			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 6/21/00

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** DPS

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 4 ('00 Boring #1)
Station 162+90
Offset 100.0 ft Lt. ***
Ground Surface Elev. 573.95 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion * ft
After Hrs. ** ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown & Gray Stiff Clay Loam with Gravel (Original Ground)	1		
	2	1.0	21
572.45	3	B	
Gray & Brown Stiff Clay Loam Till with trace of Coal	2		
	3	1.9	23
570.95	3	B	
Gray & Brown Medium Silty Clay Loam with trace of Gravel	2		
	3	0.9	28
	4	B	
568.95 -5	4		
Gray & Brown Stiff Clay Loam	H		
	1	1.2	24
567.45	2	B	
Gray & Brown Medium Silty Clay with small Coal seam at 7'	1		
	2	0.6	23
565.95	4	B	
Gray Stiff Silty Clay	2		
	4	1.8	20
	5	S	
563.95 -10	8		
Gray & Brown Very Stiff Silty Clay	4		
	10	3.9	20
562.45	14	S	
Brown & Gray Hard Silty Clay	8		
	22	>4.5	16
560.95	31	P	
Red Hard Shale (Soft)	14		
	23		15
	32		
558.95 -15	64		
Red Hard Shale			
	-	-	-
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Red Hard Shale *(continued)*			
	-	-	-
-25			
	-	-	-
-30			
	-	-	-
-35			
	-	-	-
533.95 -40			

* Hole Collapsed at 29.4 Ft. at Completion. No Groundwater above this point.

** At 24 hours, no Groundwater above Hole Collapse at 30.2 Ft.

*** Offset estimated from notes in file and 2016 survey data.

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 6/21/00

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** DPS

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 4 ('00 Boring #1)
Station 162+90
Offset 100.0 ft Lt. ***
Ground Surface Elev. 573.95 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion * ft
After Hrs. ** ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Limestone			
End of Boring			
-45			
-50			
-55			
-60			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 6/21/00

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** DPS

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 5 ('00 Boring #2)
Station 162+42 ***
Offset 100.0 ft Lt. ***
Ground Surface Elev. 572.85 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion * ft
After 24 **Hrs.** ** ft

Material	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown & Gray Medium Clay Loam		1		
		1	1.0	
	571.35	2	P	
Brown & Gray Stiff Clay Loam with trace of Coal		1		
		2	1.2	26
	569.85	3	B	
Brown & Gray Medium Silty Clay with trace of Gravel		1		
		2	1.0	26
		2	S	
	567.85 -5	4		
Brown & Gray Soft Silty Clay Loam		1		
		2	0.5	29
	566.35	3	S	
Brown & Gray Soft Silty Clay Loam with Wood & trace of Coal		1		
		3	0.5	37
	564.85	4	P	
Brown & Gray Medium Silty Clay Loam with trace of Coal		2		
		2	0.5	27
		3	B	
	562.85 -10	4		
Brown & Gray Medium Clay Loam		1		
		2	0.7	26
	561.35	4	B	
Gray & Brown Stiff Clay Loam with trace of Gravel		1		
		2	1.5	28
	559.85	6	B	
Red & Gray Very Stiff Shaley Clay		3		
		8	3.9	19
		10	S	
	557.85 -15	21		
Red Hard Shaley Clay		12		
		16	>4.5	16
	556.35	14	P	
Red & Gray Hard Shaley Clay		7		
		14	>4.5	10
	554.85	36	P	
Red & Gray Hard Shale		20		
		40		10
		60		
	552.85 -20			
Red Hard Shale		23		
		63		12
	547.35	37/3"		
		40		
	-25	100/4"		10
Soil Type Not Recorded				
	543.85			
Red to Gray Hard Shaley Clay		11		
	-30	20	6.4	18
	542.35	52	S	
Red & Gray Hard Shale		20		
		56		14
	540.85	44/2"		
* Hole Collapsed at 20.8 Ft. at Completion. No Groundwater above this point.				
** At 24 hours, no Groundwater above top of hole collapse at 20.8 Ft.	-35			
*** Station and Offset estimated from notes in file and 2016 survey data.				
End of Boring				
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 6/22/00

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** DPS

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 6 ('00 Boring #3)
Station 162+90 ***
Offset 190.0 ft Lt. ***
Ground Surface Elev. 552.35 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion * ft
After 24 **Hrs.** ** ft

Material Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Soft Silty Clay Loam			2		
			2	0.3	33
	550.85		3	P	
Brown & Gray Stiff Clay Loam with trace of Coal			2		
			3	1.8	26
	549.35		2	P	
Brown Stiff Clay Loam with Gravel			2		
			2	1.5	25
			4	P	
	547.35	-5	4		
Brown Medium Silty Clay with trace of Coal, Gravel at 6.5'			2		
			2	1.0	27
	545.85		5	P	
Brown Medium Silty Clay with trace of Gravel			2		
			2		27
	544.35		3		
Gray & Brown Medium Clay Loam			1		
			2	0.8	34
	543.02		3	B	
Black Medium Coal - Low Temp - Actual thickness of Coal may be as small as 2"	542.35	-10	4		
					115
			2		
Gray Stiff Clay Loam			2	1.9	33
	540.85		5	B	
Gray & Red Stiff Clay Loam			1		
			2	1.1	31
	539.35		4	S	
Red Hard Shaley Clay			5		
	538.35		11	6.3	17
Gray Hard Shaley Clay			15	S	
		-15	19	6.9	17
			8	S	
			17	>4.5	13
	535.85		52	P	
Gray Hard Shale			11		
			19		15
	534.35		81/1"		
Hard Limestone * Hole Collapsed at 15.0 Ft. at Completion. No Groundwater above this point.			100/0"		
		-20			

** At 24 hours, no Groundwater above top of hole collapse at 15.0 Ft.

*** Station and Offset estimated from notes in file and 2016 survey data.
End of Boring

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
-25			
-30			
-35			
-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/22/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 7 ('83 Boring #1)
Station 163+00
Offset 36.0 ft Lt. *
Ground Surface Elev. 595.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Silty Clay Till with Rock Pieces & Coal Pieces, etc.			
		2.0 P	27
591.80			
Gray & Red Shale Fill			
-5			
		3.5 P	16
Note: Boring was taken through the Northbound Shoulder			
-10			
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.		4.0 P	
583.80			
End of Boring			
-15			
-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/22/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 8 ('83 Boring #2)
Station 162+92
Offset 36.0 ft Lt. *
Ground Surface Elev. 596.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown, Gray, Red Shale Fill (Top 1.5' is Till)			
No sloppy free water but wet area around 9'			
		1.2 P	26
-5			
		0.7 P	37
Note: Boring was taken through the Northbound Shoulder		-	28
-10			
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.			
584.00			
End of Boring		2.5 P	25
-15			
-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/22/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 9 ('83 Boring #3)
Station 162+75
Offset 36.0 ft Lt. *
Ground Surface Elev. 596.30 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Poor Recovery 6'-12': Rocks and Tile jammed tube, No Free Water on tube or in samples			
-5			
		0.7 P	32
Note: Boring was taken through the Northbound Shoulder			
-10			
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.			
584.30			
End of Boring			
-15			
-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/22/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 10 ('83 Boring #4)
Station 162+25
Offset 36.0 ft Lt. *
Ground Surface Elev. 597.20 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Silty Clay Till Fill				
			2.0 P	24
594.70				
Gray & Red Shale Fill				
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.	-5		1.0 P	31
			3.5 P	20
				18
	-10			20
586.70				
Brown Till then Gray Shale Fill				
585.70				
Gray & Red Shale Fill 585.20				
End of Boring				23
	-15			
	-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/19/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 11 ('83 Boring #5)
Station 163+00
Offset 36.0 ft Lt. *
Ground Surface Elev. 595.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Reddish Brown Silty Clay with Shale				
593.30				
Lost sample 2.5' - 4.0'				22
Stiff Red to Gray & Yellow/Brown Silty Clay (Weathered Shale) (Fill)	-5	5		
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.		6 8	1.3	26
		4		
		6 7	1.7 P	23
	-10	2		
		5 6	1.4	21
583.80				
Stiff Gray Weathered Shale (Fill) mixed with Coal & Limestone at 15' - 16.5'		4		
		6 8	1.5 P	19
	-15	15		
		9 10	2.0 P	22
578.80				
Stiff to Very Stiff Lite Gray Weathered Shale		15		
		27 27		14
576.30				
	-20			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Soft (tube went 12" in 3 blows from 20' - 21') (Fill) Lite Brown Silty Loam wet (Very Soft) Hard at end of tube at 24' *(continued)*		2		
		1 9		24
		9		
571.80		11 11	0.5	23
Hard Gray Weathered Shale with Gypsum Crystals	-25	8		
[Rope is bad at pulley wheels]		13 16	4.0 P	26
		11		
567.30		22 22	4.0 P	24
Hard Black Weathered Shale 566.80				
End of Boring			4.0 P	23
	-30			
	-35			
	-40			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/17/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 12 ('83 Boring #6)
Station 162+85
Offset 36.0 ft Lt. *
Ground Surface Elev. 596.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				Brown Silty Clay Till Fill
				Some Free Water at 4'
		1.0 P	31	3" recovered on 6' - 9' push, Free Water slipped out of tube
				Sloppy from 6' - 7' material in this area looks like the Red Shale Coal Mine Slag that was used on shoulder North of Shooting Park Road.
		1.5 P		
-5				* Assumed offset and elevation based on location description in original field logs and soil profile found in file.
		0.7 P	22 29	
-10				
581.00 -15				Fill consisting of Limestone Pieces, Coal Pieces, Loam etc.
				End of Boring
-20				

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/17/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 13 ('83 Boring #7)
Station 161+00
Offset 36.0 ft Lt. *
Ground Surface Elev. 599.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown & Gray Silty Clay Fill - Has some Mine Tailings mixed in, Coal Pieces, etc., Pieces of Limestone, Shale etc.				
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.			1.7 P	24
	-5			
590.30			1.7 P	17
Gray Shale Fill	-10			
589.30				
Red Shale Mine Tailings (No Free Water)			2.0 P	18
586.80				
Gray Shale Fill with Limestone Pieces			2.0 P	22
584.80	-15			
No Free Water in the Boring End of Boring				
	-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/17/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 14 ('83 Boring #8)
Station 159+00
Offset 36.0 ft Lt. *
Ground Surface Elev. 604.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				Brown & Gray Silty Clay Fill - Has some Mine Tailings mixed in, Coal Pieces, etc., Pieces of Limestone, Shale etc.
				* Assumed offset and elevation based on location description in original field logs and soil profile found in file.
-5				
		2.0 P	25	
597.80				
				Gray Shale Fill
		1.2 P	23	
-10				
591.80				
				No Recovery Past 13' (No Free Water)
				End of Boring
-15				
-20				

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 9/17/83

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 15 ('83 Boring #9)
Station 157+00
Offset 36.0 ft Lt. *
Ground Surface Elev. 609.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Brown Blocky Silty Clay
607.80				
		3.0 P	23	Brown & Gray Silty Clay Fill - Has some Mine Tailings mixed in, Coal Pieces, etc., Pieces of Limestone, Shale etc.
-5				* Assumed offset and elevation based on location description in original field logs and soil profile found in file.
602.80				
				No Push Past 7'
				End of Boring
-10				
-15				
-20				

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/12/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 16 ('62 Boring #2)
Station 161+82 *
Offset 83.0 ft Lt.
Ground Surface Elev. 580.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After 24 **Hrs.** 544.7 ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description	Elevation (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
				Soil Type Not Recorded					
				* Station of boring estimated based on location description provided on original boring log.					
				(continued)		-25			
					555.10				
				Reddish Brown & Gray Clay & Shale Fill by Hollerich	553.60				
				Very Stiff Reddish Brown & Gray Clay & Shaley			22	3.1	18
					552.10				
				Stiff Yellow, Brown & Gray Clay Fill by Bolander			12	2.3	16
-10					550.60	-30			
				Soft Reddish Brown & Gray Clay			4	1.8	21
					549.10				
				Stiff Reddish Brown & Gray Clay			9	1.4	23
					547.60				
				Medium Reddish & Brown Clay			8		23
-15						-35			
				F.L. Elevation = 541.79	545.10				
				Top of Barrel Elevation = 551.46			7		25
				Split Tube Sampling Started 2 Feet above Top of Barrel	543.60				
				Stiff Reddish Brown & Gray Clay			11		24
					542.10				
				Medium Reddish Brown & Gray Clay (Shaley)			7		28
-20					540.60	-40			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/12/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 16 ('62 Boring #2)
Station 161+82 *
Offset 83.0 ft Lt.
Ground Surface Elev. 580.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After 24 **Hrs.** 544.7 ft ▽

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Medium Reddish Brown & Gray Clay (Shaley) (Ice Fragments)		7		24
539.10				
End of Boring				
	-45			
	-50			
	-55			
	-60			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/13/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 17 ('62 Boring #3)
Station 161+25 *
Offset 74.0 ft Rt.
Ground Surface Elev. 587.40 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
				Soil Type Not Recorded					
				* Station of boring estimated based on location description provided on original boring log.					
-5						-25			
-10						-30			
					555.90				
				Reddish Brown & Gray Clay & Shale Fill by Hollerich	554.40				
				Very Stiff Reddish Brown & Gray Clay & Shale Fill by Hollerich	552.90		19		15
-15				Stiff Yellow, Brown & Gray Clay Fill by Bolander	551.40	-35	10		19
				F.L. Elevation = 544.71					
				Top of Barrel Elevation = 554.38					
				Split Tube Sampling Started at Top of Barrel					
				Stiff Reddish Brown & Gray Clay	549.40		9		20
				Stiff Reddish Brown & Gray Clay	547.40	-40	10		21
-20									

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/13/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 17 ('62 Boring #3)
Station 161+25 *
Offset 74.0 ft Rt.
Ground Surface Elev. 587.40 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Soft Reddish Brown & Gray Clay		4		24
545.90				
Soft H. Brown & Gray Clay		3		27
544.40				
Medium H. Brown & Gray Clay		5		26
543.40				
Hard Reddish Brown & Gray Clay & Shale 542.90		18/6"		22
	-45			
Stopped Boring on Original Shale End of Boring				
	-50			
	-55			
	-60			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/13/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 18 ('62 Boring #4)
Station 161+96 *
Offset 121.0 ft Lt.
Ground Surface Elev. 577.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
				Soil Type Not Recorded				
				* Station of boring estimated based on location description provided on original boring log.				
-5								
-10								
-15								
				F.L. Elevation = 540.89				
				Top of Barrel Elevation = 550.19				
				Split Tube Sampling Started 1.3 Feet above Top of Barrel				
-20								

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Soil Type Not Recorded
				* Station of boring estimated based on location description provided on original boring log. *(continued)*
				553.00
				Reddish Brown & Gray Clay Fill by Hollerich
-25				
				551.50
	12		21	Stiff Reddish Brown & Gray Clay
				550.00
	7		22	Medium Reddish Brown & Gray Clay Fill by Bolander
				548.50
	11		21	Stiff Reddish Brown & Gray Clay
-30				547.00
	10		21	Stiff Reddish Brown & Gray Clay
				545.50
	5		27	Medium Reddish Brown & Gray Clay
				544.00
	5		26	Medium Reddish Brown Clay
				542.50
-35	8		27	Medium Reddish Brown & Gray Clay
				541.00
	6		24	Medium Reddish Brown & Gray Clay
				539.50
	7		31	Medium Reddish Brown & Gray Clay (2" Ice Layer)
				538.50
	28		21	Very Stiff Reddish Brown & Gray Clay
				538.00
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/13/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 18 ('62 Boring #4)
Station 161+96 *
Offset 121.0 ft Lt.
Ground Surface Elev. 577.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Reddish Brown Shale (Original Ground) *(continued)* 536.50				
End of Boring	-45			
	-50			
	-55			
	-60			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/14/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 19 ('62 Boring #5)
Station 161+79 *
Offset 117.0 ft Lt.
Ground Surface Elev. 576.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 540.7 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Soil Type Not Recorded			
* Station of boring estimated based on location description provided on original boring log.			
-5			
-10			
-15			
F.L. Elevation = 541.0			
Top of Barrel Elevation = 550.3			
Split Tube Sampling Started 1.2 Feet above Top of Barrel			
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Soil Type Not Recorded			
* Station of boring estimated based on location description provided on original boring log. *(continued)*			
553.00			
Reddish Brown & Gray Clay Fill by Hollerich			
551.50			
-25 Very Stiff Reddish Brown & Gray Clay	21	2.2	19
	16		19
548.50			
Stiff Clay (Shaley)	11		13
547.00			
Medium Clay	8		24
-30			
545.50			
Soft Reddish Brown & Gray Clay	3		28
544.00			
Very Soft Reddish Brown Clay	1		30
542.50			
Soft Reddish Brown Clay	2		33
-35 ▼	2		31
540.00			
Very Stiff Reddish Brown & Gray Clay	18		30
539.50 / 539.00			18
Reddish Brown Shale (Original Ground)			
End of Boring			
-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/14/62

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hand Auger **HAMMER TYPE**

STRUCT. NO. 050-2524
Station 161+47

BORING NO. 20 ('62 Boring #6)
Station 162+27 *
Offset 202.0 ft Lt.
Ground Surface Elev. 547.10 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Soil Type Not Recorded				
546.10				
Reddish Brown & Gray Clay				27
545.10				
Reddish Brown Clay				28
544.10				
Reddish Brown & Gray Clay				26
				26
	-5			
				33
541.10				
Reddish Brown Clay				26
				28
539.30				
Reddish Brown & Gray Clay 538.80				27
Sampled with Iwan type Auger from behind South East Wingwall				
Top of Headwall Elevation = 548.42	-10			
* Station of boring estimated based on location description provided on original boring log.				
End of Boring				
	-15			
	-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/4/88

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Push **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 21 ('88 Boring #1)
Station 162+90
Offset 36.0 ft Lt. *
Ground Surface Elev. 596.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Blacktop, CA05, CA07 size material				
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.				
592.50				
Fill - Brown Silty Clay Till mixed with Gray and Brownish with Shale (very little Silty Clay Till, mostly all Shale) (Shale Blocky with different orientations)	-5		2.0 P	
			0.7 P	31
			0.7 P	29
			0.5 P	27
Fill is Very Loose - Wet, but Crumbly at 8'			0.5 P	21
			0.5 P	24
Note: Qp Values logged as lowest at depths, they are somewhat variable in the fill. Some 4" layers go to 1.5 - 2.0 and then drop off to 0.5 in the next 4".	-10		0.5 P	22
			1.0 P	25
584.00				
End of Boring			2.0 P	24
	-15			
	-20			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/4/88

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Push **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 22 ('88 Boring #2)
Station 163+45
Offset 36.0 ft Lt. *
Ground Surface Elev. 594.90 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
Augered Blacktop 593.90				
w/Shale and some Till - Mine Pile Fill		2.5 P	25	
* Assumed offset and elevation based on location description in original field logs and soil profile found in file.		1.5 P	30	
-5				
Note: At this location - the fill seems more consistent in strengths (1.5 - 3.5) and moistures with the more loose lift only around 3'. All samples in tube were generally very cohesive.		3.5 P	21	
585.90		2.5 P	21	
End of Boring				
-10				
-15				
-20				

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/4/88

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY**

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Push **HAMMER TYPE**

STRUCT. NO.
Station

BORING NO. 23 ('88 Boring #3)
Station 162+36
Offset 36.0 ft Lt. *
Ground Surface Elev. 597.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Blacktop and Soil
				596.00
				w/Shale, Mine Dumps with some Till - Fill
		1.5 P	27	
				* Assumed offset and elevation based on location description in original field logs and soil profile found in file.
		1.5 P	28	
-5				
		2.0 P	25	
		1.0 P	26	
-10				Note: 9.5' - 10.5' mostly all Red Brown Burnt Shale (Loose and Blocky, Not Cohesive)
		0.5 P	20	
				585.00
		3.5 P	23	End of Boring
-15				
-20				

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/29/16

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Larry Myers

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude 41.334085, **Longitude** -89.119901

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. 24 ('16 Boring #1)
Station 164+50
Offset 38.0 ft Lt.
Ground Surface Elev. 593.11 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 573.1 ft
Upon Completion Dry ft
After 120 **Hrs.** 591.1 *** ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Millings, Brown & Gray Silty Clay Loam - Fill?
590.61				
	5			Hard Gray Silty Loam / Silty Clay Loam with Pieces of Gray Shale - Heavily Reworked Shale
	8	>4.5	14	
	13	P		
588.61				
-5				Hard Gray & Reddish Brown Weathered Shale
	8			
	13		14	
	25			
	12			
	21		14	
	38			
-10				
	8			
	21		15	
581.61	38			
				Hard Gray Shale
	8			
	19		15	
	34			
-15				
	64			Limestone Seams @ 15'
	38		8	
	100/2"			
	89			
	100/1"		9	
-20				Thicker Limestone Layer @ 19.5'

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	100/5"			with Small amount of Free Water in Limestone Layer @ approximately 20'
			6	The Water appears to be in the Limestone Seams between 20' and 22.5'
570.61				
	10		29	Hard Gray Shale *(continued)*
	18		18	Thin Coal Seam @ 22.5' (1" thick)
	29	*		Dark Gray Shale
				* Sample tube wet
-25				** Sample tube dry
	9			
	11		18	There was no indication of the
	30	**		Coal Layer in the auger cuttings.
566.11				
	11			Dense Greenish Gray Shale with Limestone Fragments
	31		10	*** Hole collapsed at 14 feet.
	64			High water table might be surface water from rains during the period when the hole was left open.
-30				
	11			
	26		16	
561.61	31			
				End of Boring
-35				
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/29/16

ROUTE FA 46 (IL 251) **DESCRIPTION** IL 251 North Bound Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Larry Myers

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**,
Latitude 41.334509, **Longitude** -89.119928

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. 25 ('16 Boring #2)
Station 163+00
Offset 32.0 ft Lt.
Ground Surface Elev. 595.87 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.4 ft
Upon Completion 571.9 ft
After 120 **Hrs.** 589.4 *** ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, CA6 and Millings Fill				
	590.87 -5			
Medium Brown, White, Black CA6, Millings, Sand Fill		5		
		6 6		9
		5		
	588.37	3 1	1.5 P	22
Stiff Brown Silty Clay Loam Till Fill with some Gray Silty Clay Loam Fill Intermixed		2		
		2 3	1.5 P	27
Well mixed with no defined layers between fill types.	-10	1		
		2 3	1.0 P	20
Proctor Sample 7.5 Ft - 12.5 Ft		1		
		2 3	1.5 P	23
	583.37			
Stiff Gray Silty Clay Loam with Coal Pieces - Fill, and some Brown Silty Clay Loam Fill		1		
		2 4	1.5 P	23
Proctor Sample 12.5 Ft - 15.5 Ft		2		
	-15	2 3	1.5 P	33
	580.37			
Very Stiff Gray, Brown Silty Clay Loam Till with Coal Pieces - Fill		3		
		4 5	3.5 P	22
		3		
		4 6	3.5 P	17
		3		
	-20	3 4	3.0 P	25
Very Stiff Gray, Brown Silty Clay Loam Till with Coal Pieces - Fill *(continued)*		1		
		2 3	2.0 P	25
* Rock in Shoe		1		
		4 5	*	20
	572.87			
Hard Brownish Gray Silty Clay Loam Till with Coal Pieces (Fill?)		5		
		7 10	>4.5 P	16
	-25	4		
		4 5	4.0 P	45
	569.87			
Hard Gray Weathered & Reworked Shale with Coal Pieces		4		
		6 8	>4.5 P	30
*** Hole collapsed at 9 Feet		5		
		7 9	>4.5 P	31
	566.87			
End of Boring				
	-30			
	-35			
	-40			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/4/17

ROUTE FA 46 (IL 251) **DESCRIPTION** Shelby Tube Samples from IL 251 Slope Failure South of Shooting Park Road in Peru **LOGGED BY** Larry Myers

SECTION (1)I **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**, **Latitude** 41.334514, **Longitude** -89.119934

COUNTY LaSalle **DRILLING METHOD** Push **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. ST 01 (2017)
Station 162+90
Offset 30.5 ft Lt.
Ground Surface Elev. 596.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.0 ft
Upon Completion 571.0 ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Material - No Samples Taken				Tube #6 Pushed 27.5" Recovered 18.0"			
591.00 -5				573.50			
Tube #1 Pushed 27.5" Recovered 19.0"				Tube #7 Pushed 27.5" Recovered 24.0"			
588.50				571.00 -25			
Tube #2 Pushed 27.5" Recovered 16.0"				Tube #8 Pushed 27.5" Recovered 17.0" Free Water at approximately 25 foot			
586.00 -10				568.50			
Tube #3 Pushed 27.5" Recovered 19.0" Large Rocks @ 12 foot				Tube #9 Pushed 27.5" Recovered 24.0"			
583.50				566.00 -30			
Tube #4 Pushed 27.5" Recovered 26.0"				Tube #10 Pushed 27.5" Recovered 24.0" Note: Rocks & Debris throughout fill hindering Recovery.			
581.00 -15				563.50			
Tube #5 Pushed 27.5" Recovered 14.0"				End of Boring			
578.50				-35			
Ribboned Sample from Rocks							
576.00 -20				-40			

SOIL BORING IL 251 NBL SLIDE.GPJ IL_DOT.GDT 5/17/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 3/13/18

ROUTE FA46 (IL 251) **DESCRIPTION** IL 251 north bound slope failure south of Shooting Park Road In Peru **LOGGED BY** TLM

SECTION 1 (I) **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**, **Latitude** 41.334549, **Longitude** -89.119928

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 050-8801
Station 162+25

BORING NO. BH-26
Station 162+40
Offset 31.3 ft Lt.
Ground Surface Elev. 597.69 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter 567.2 ft ▼
Upon Completion Dry ft
After ____ **Hrs.** - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				HMA Surface over 4" Aggregate
				596.36
	10			
				Stiff Brown Gray Clay Fill w/ rounded aggregate pieces, moist
	5 5	2.9 B	22	
	3			
-5	3 4	1.5 P	25	
	3			
	4 4	4.5 B	26	
	3			
				588.69
				Stiff Gray Clayey Reworked Shale Fill 588.19
-10	4 4	1.5 P	20	
				Stiff Red Clay Reworked Clayey Shale Fill, moist 587.19
	4			
				Stiff Gray Clay Fill w/ some cinders, moist
	6 7	2.3 S	22	
				584.69
	3			Very Stiff Gray Brown Clay Fill w/ some coal fragments, moist
-15	5 7	2.5 P	21	
				582.19
	2			Stiff Gray Clay Fill, moist
	3 6	2.0 P	24	
				579.69
	3			Very Stiff Gray Brown Clay Fill w/ black cinders (coal) and some limestone pieces, moist
-20	5 5	2.0 B	26	
	3			Very Stiff Gray Brown Clay Fill w/ black cinders (coal) and some limestone pieces, moist *(continued)*
	7 6	2.1 B	22	
	3			
-25	4 5	2.1 B	21	
	4			
	5 6	2.1 B	18	
	5			
-30	5 6	2.1 B	24	
				567.19 ▼
	3			Very Stiff Gray Clay, moist (fill?)
	5 7	2.1 B	28	
	5			
-35	8 13	2.4 S	23	
				562.19
	8			Hard Brown Silty Clay, moist
	17 24	4.5 P	17	
				560.69
				Hard Gray Silty Clay, moist
				559.69
	13			Hard Red Weathered Shale
-40	39 74	4.5 P	15	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 3/13/18

ROUTE FA46 (IL 251) **DESCRIPTION** IL 251 north bound slope failure south of Shooting Park Road In Peru **LOGGED BY** TLM

SECTION 1 (I) **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**, **Latitude** 41.334549, **Longitude** -89.119928

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 050-8801
Station 162+25

BORING NO. BH-26
Station 162+40
Offset 31.3 ft Lt.
Ground Surface Elev. 597.69 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter 567.2 ft ▼
Upon Completion Dry ft
After ____ **Hrs.** - ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard Red Weathered Shale *(continued)*			23		
			53 88	4.5 P	14
			23		
			40	-	8
MSPT for the last 6 inches of sample	552.69	-45	100/5.25 MSPT		
			20		
			100/6.33	-	10
MSPT for the last 6 inches of sample	547.69	-50	See MSPT		
			34		
	543.19		30	4.5	12
Red Clay		-55	30	S	
			46		
			125	-	11
	537.69	-60			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
End of Boring	-65			
	-70			
	-75			
	-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 3/13/18

ROUTE FA46 (IL 251) **DESCRIPTION** IL 251 north bound slope failure south of Shooting Park Road In Peru **LOGGED BY** TLM

SECTION 1 (I) **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**, **Latitude** 41.334707, **Longitude** -89.119931

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 050-8801
Station 162+25

BORING NO. BH-27
Station 162+18
Offset 31.3 ft Lt.
Ground Surface Elev. 597.32 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter Dry ft
Upon Completion Dry ft
After ____ **Hrs.** - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				12" HMA Shoulder over 3" of Aggregate Base
				596.07
	5			
	4 5	5.0 B	20	Red, Gray, Brown Shaley Clay Fill, moist
	2			
-5	3 4	1.7 S	19	
				591.82
	2			Red, Gray, Brown Shaley Clay w/ cinders and some limestone pieces, moist
	2 4	1.0 B	38	
	6			
-10	5 5	3.5 P	19	
	3			
				585.32
	5 7	3.3 B	19	Stiff Gray Clay w/ pieces of coal Fill, moist
	3			
-15	4 5	1.7 B	25	
	6			
	6 5	1.8 P	24	
	4			
-20	5 5	-	23	
				Stiff Gray Clay w/ pieces of coal Fill, moist *(continued)*
				573.32
	2			
-25	3 5	1.7 B	23	Stiff Red, Brown, Gray Clay Fill w/ pieces of limestone, moist
	6			
-30	7 12	1.8 B	23	
	18			
-35	18 8	-	3	Limestone Chunk
				562.32
	13			
-40	15 21	4.5 P	16	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 3/13/18

ROUTE FA46 (IL 251) **DESCRIPTION** IL 251 north bound slope failure south of Shooting Park Road In Peru **LOGGED BY** TLM

SECTION 1 (I) **LOCATION** NW 1/4, **SEC.** 16, **TWP.** 33N, **RNG.** 1E, 3rd **PM**, **Latitude** 41.334707, **Longitude** -89.119931

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 050-8801
Station 162+25

BORING NO. BH-27
Station 162+18
Offset 31.3 ft Lt.
Ground Surface Elev. 597.32 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter Dry ft
Upon Completion Dry ft
After ____ **Hrs.** - ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff Red, Brown, Gray Clay Fill w/ pieces of limestone, moist *(continued)*				
555.32				
Hard Red Gray Weathered Shale		23		
		54	-	9
552.32	-45	75		
End of Boring				
	-50			
	-55			
	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/7/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334579, **Longitude** -89.119679

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. I-1 Inclinometer
Station 162+70.95
Offset 88.5 ft Lt.
Ground Surface Elev. 582.56 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff mix of black/brown/gray/red Clay, moist		3		
		2 2	0.8 B	24
		1		
	-5	3 4	0.7 S	24
		2		
575.56		2 3	1.2 B	23
Some gravel (up to 3/4")		2		
	-10	2 2	0.8 P	24
572.06				
Stiff brown & gray Silty Clay, moist		2		
570.56		4 6	1.8 B	21
Coal				
569.56				
Very stiff to hard gray Gravelly Clay, moist		6		
	-15	8 12	3.0 P	13
		7		
		13 24	4.5 S	16
564.56				
Hard brown & gray Clay, moist red weathered Shale in shoe		12		
		20 40	4.5 P	12
562.56	-20			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
End of Boring				
	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/7/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334728, **Longitude** -89.119742

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. I-2 Inclinometer
Station 162+00.33
Offset 94.8 ft Lt.
Ground Surface Elev. 579.90 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff mix black/brown/gray/red Clay fill, moist, pieces of coal		4		
		3 4	2.0 P	16
		3		
	-5	3 3	1.4 B	22
	574.40			
Stiff gray Clay fill, moist, some red, some brown primarily gray, some gravel		4		
		4 5	1.9 B	23
		3		
	-10	4 5	1.4 B	29
	569.90			
switch to mud rotary at 10'		3		
		4 6	1.2 B	18
		2		
	-15	5 6	0.8 B	26
		3		
		5 7	1.8 B	23
		4		
	-20	5 5	1.8 P	16
	559.90			
Stiff brown/red/gray/black Clay, moist		4		
		5 7	1.4 B	18
	-25			24
		3		
		5 6	1.8 S	16
	551.90			
Very stiff red Clay, possibly weathered Shale, moist		4		
	-30	7 22	2.7 S	14
		26		
		35 50	5.7 S	13
		30		
	-35	35 29	5.9 S	15
		21		
		27 32	4.5 P	
	542.40			
End of Boring	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/6/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334667, **Longitude** -89.119575

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. I-3 Inclinometer
Station 162+34.87
Offset 131.8 ft Lt.
Ground Surface Elev. 568.21 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff black/brown/gray Clay fill, moist		4		
		3 3	2.0 P	16
565.96 Coal, fill				
565.21 Stiff reddish brown/gray Silty Clay fill, moist		3		
		2 3	1.5 B	21
	-5			
562.71 Stiff brown/gray Silty Clay, some organics, fill, moist (rock in shoe)		2		
		2 4	1.5 P	19
560.21 Med. stiff gray/reddish brown Clay, moist		2		
		2 3	0.6 B	29
	-10			
557.71 Soft dark gray/brown Clay with organics & gravel, moist		4		
		4 3	0.2 B	32
555.21 Stiff mix of red/gray Clay (reworked Shale fill?)		4		
553.71 Stiff red Clay fill, moist (reworked shale?)		5 6	1.7 B	17
	-15			
		6		
551.21 Stiff brown Clay, moist (some gray Clay)		8 11	1.4 S	15
550.21 Stiff red Clay, moist to dry (reworked shale, fill)		10		
		12 12	1.6 S	17
548.21	-20			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard red Clay, possibly weathered Shale, moist		11		
		11 21	4.3 S	17
		14		
		20 30	5.0 S	16
	-25			
		31		
		48 52	4.5 P	13
540.21 Hard gray weathered Shale		27		
		32 68	10.0 S	14
538.21	-30			
End of Boring				
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/6/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334518, **Longitude** -89.119649

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. I-4 Inclinometer
Station 162+92.8
Offset 157.4 ft Lt.
Ground Surface Elev. 566.08 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

Material	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Med. stiff to soft red/brown/black Clay (recent fill) moist		4		
		2 1		26
563.08				
Med. stiff gray Clay, moist, trace gravel		7		
		3 5	0.8 B	25
	-5			
560.58				
Hard red Clay, moist (likely weathered Shale)		4		
		5 6	4.5 P	18
		6		
		8 13	3.5,+4.5 S,P	13
	-10			
		16		
		21 39	3.7 S	11
		20		
		38 54	4.5 P	10
	-15			
		21		
		52 104	4.5 P	10
548.08				
End of Boring				
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/5/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334416, **Longitude** -89.119831

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. P-1 Piezometer
Station 163+28.82
Offset 56.2 ft Lt.
Ground Surface Elev. 591.04 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	2			Very stiff dark brown/brown/black Silty Clay fill, moist, some organics
	2 2	2.5 P	16	
588.04				
	1			Soft dark brown Silty Clay fill, trace gravel, moist
	2 3	0.5 B	17	cobble at 10.5' 1" recovey, rock in shoe
-5				
	1			
	1 2	0.5 P	28	
	1			
	1 2	0.8 P	27	
-10				
	4			
	4 6	0.5 P	23	
578.04				
	5			Hard brown/gray Silty Clay Loam, trace gravel, dry
	9 10	4.5 P	13	
576.04				
-15				
575.29				Coal augered up outside auger, dry
	4			Very stiff brown/gray Silty Clay, trace gravel, moist
	6 10	3.5 P	24	
573.04				
	7			Hard gray Clay, moist
	10 15	4.5 P	20	
571.04				
-20				

End of Boring

-25 -30 -35 -40

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/5/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude , **Longitude**

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. P-2 Piezometer
Station 162+80.58
Offset 83.2 ft Lt.
Ground Surface Elev. 588.41 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter 577.9 ft ▼
Upon Completion dry ft
After ____ **Hrs.** dry ft

Material	Depth (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff brown/gray Silty Clay to Clay fill, moist		2		
		3 3	1.3 P	19
		2		
584.41				
Stiff gray Silty Clay, moist	-5	3 5	1.4 B	19
582.91				
Hard gray Clay with occasional limestone pieces, dry		8		
		6 11	4.5 P	6
		24		
578.91				
Very stiff brown Silty Clay	-10	14 8	3.5 P	12
577.91 ▼				
Hard gray Silty Clay, dry		5		
576.41		8 15	4.5 P	19
Black Coal, dry				
574.61		6		
Very stiff gray Clay, dry		7 12	3.1 S	28
573.41	-15			
End of Boring				
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Mc Cleary Engineering
3705 Progress Blvd
Peru, Il 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 9/5/17

ROUTE IL 251 **DESCRIPTION** IL 251 NB Slope failure south of Shooting Park Rd. in Peru **LOGGED BY** TLM

SECTION (1)I-2 **LOCATION** South 1/2, **SEC.** 16, **TWP.** T33N, **RNG.** R1E,
Latitude 41.334572, **Longitude** -89.119609

COUNTY LaSalle **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. P-3 Piezometer
Station 162+75
Offset 108.0 ft Lt.
Ground Surface Elev. 573.42 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter dry ft
Upon Completion dry ft
After ____ **Hrs.** dry ft

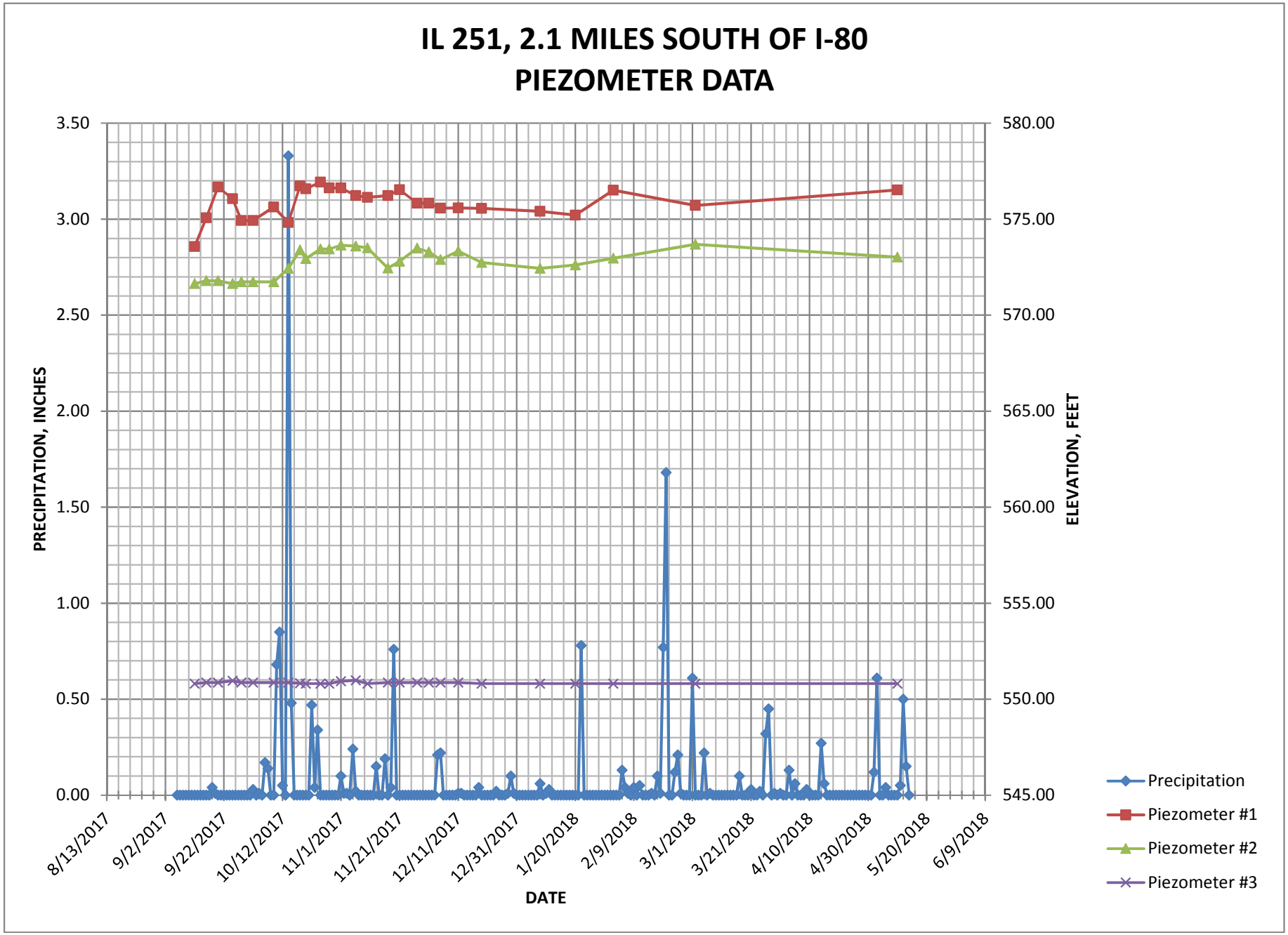
	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Stiff black/brown Silty Clay mixed with red & black cinder, some gray shale, moist		2		
		3 4	1.2 B	22
	570.42			
Med stiff gray/brown Silty Clay mixed with red Clay, some gravel & shale, moist		2		
	-5	2 2	0.8 P	24
		1		
		2 2	0.6 B	26
	565.42			
Med. stiff red & gray Clay mixed with gravel, moist		2		
	-10	2 2	0.8 P	24
	562.92			
Med. stiff gray Clay, moist		1		
		2 2	0.8 P	24
		1		
	-15	2 4	1.9 B	22
	556.92	8		
Hard red Shale, dry, clayey "argilacious", sample was broken up too small to test Picture #1, some gray shale pieces		9 13	1.9,+4.5 S,P	18
		12		
	-20	20 25	4.5 P	10

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard red Shale, dry, clayey "argilacious", sample was broken up too small to test Picture #1, some gray shale pieces *(continued)*		11		
		27 54	4.5 P	11
	550.92			
End of Boring				
	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

APPENDIX

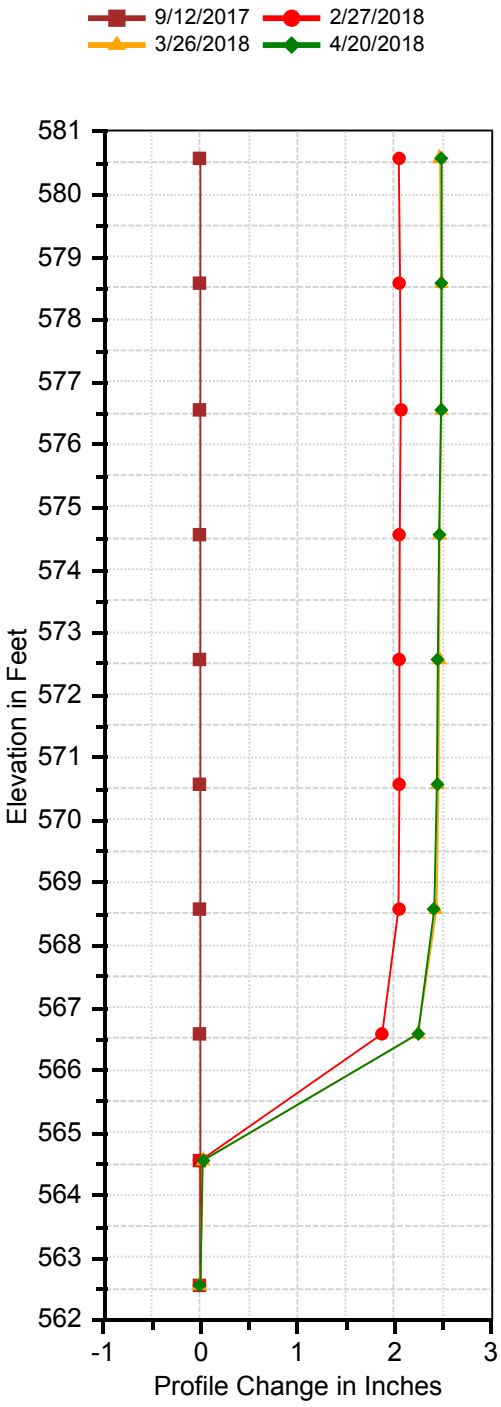
F-4


IL 251, 2.1 MILES SOUTH OF I-80
PIEZOMETER DATA
PRECIPITATION, INCHES
ELEVATION, FEET
DATE
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
580.00
575.00
570.00
565.00
560.00
555.00
550.00
545.00
8/13/2017
9/2/2017
9/22/2017
10/12/2017
11/1/2017
11/21/2017
12/11/2017
12/31/2017
1/20/2018
2/9/2018
3/1/2018
3/21/2018
4/10/2018
4/30/2018
5/20/2018
6/9/2018
Precipitation
Piezometer #1
Piezometer #2
Piezometer #3

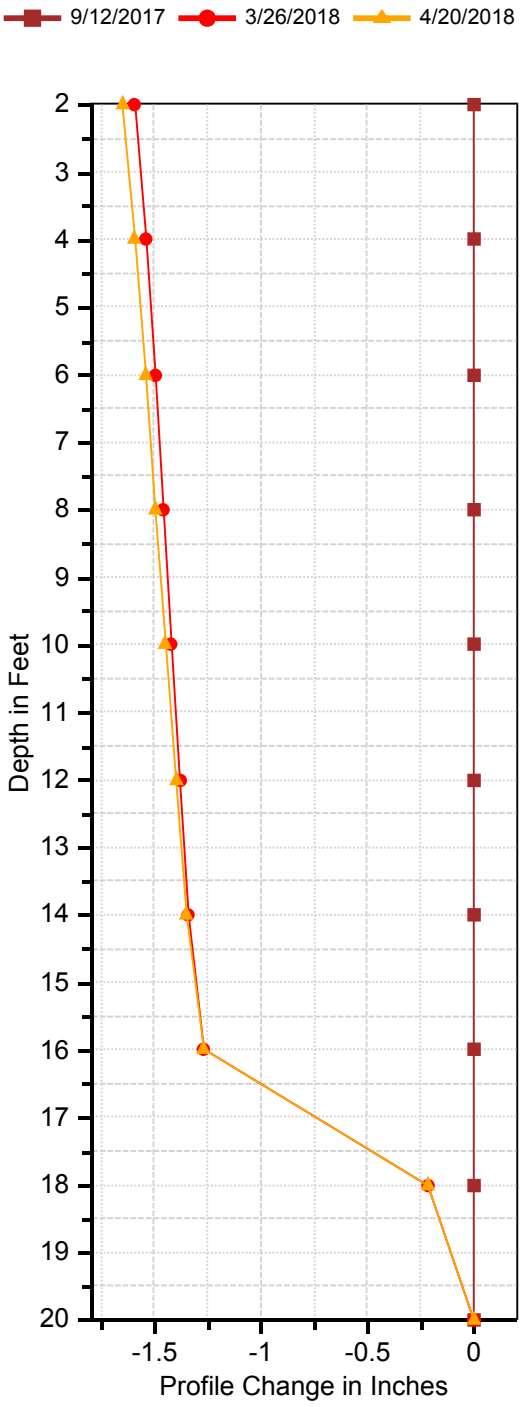
APPENDIX

F-5

IL_251 1 A



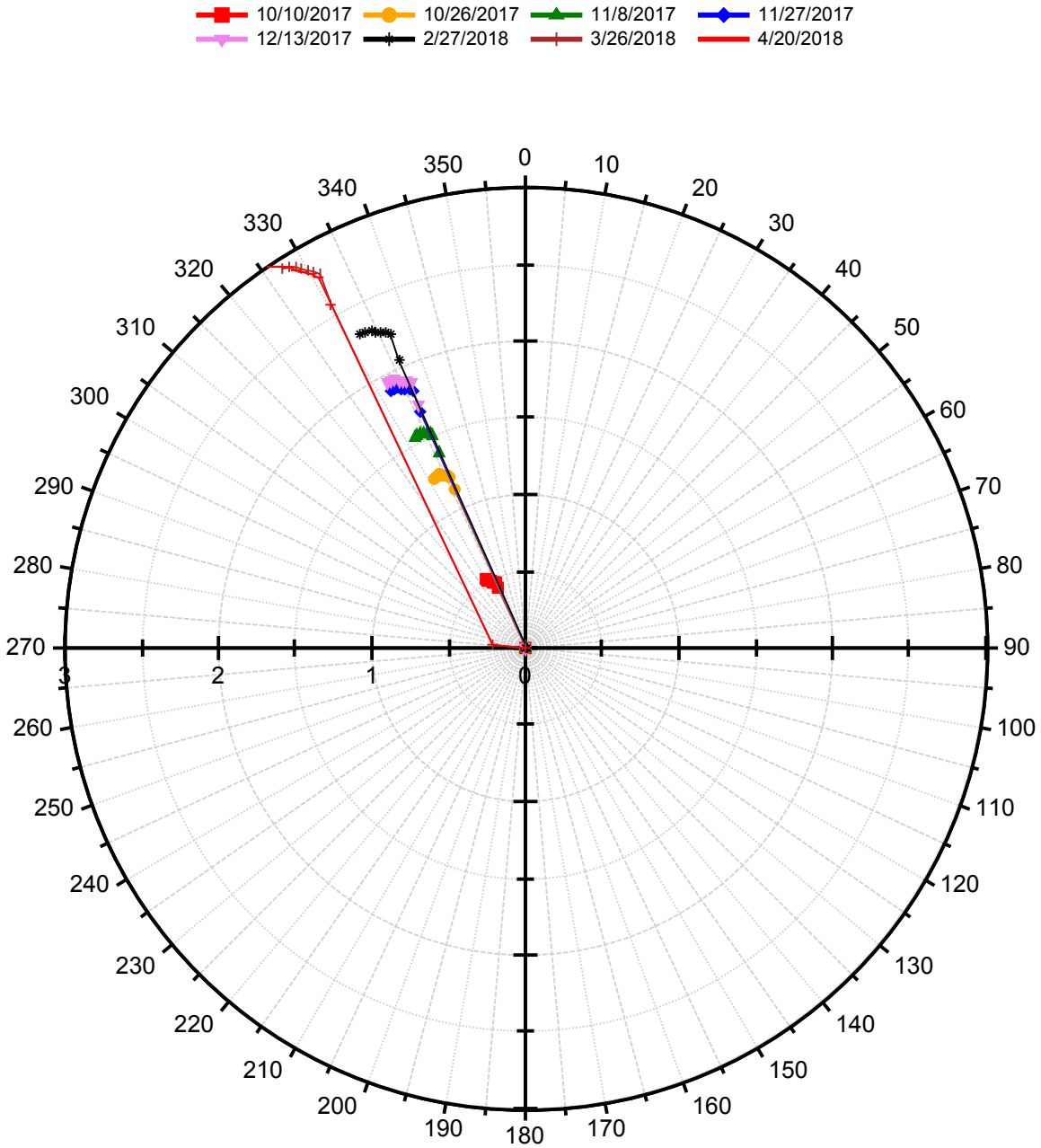
IL_251 1 B



Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 1 Top View

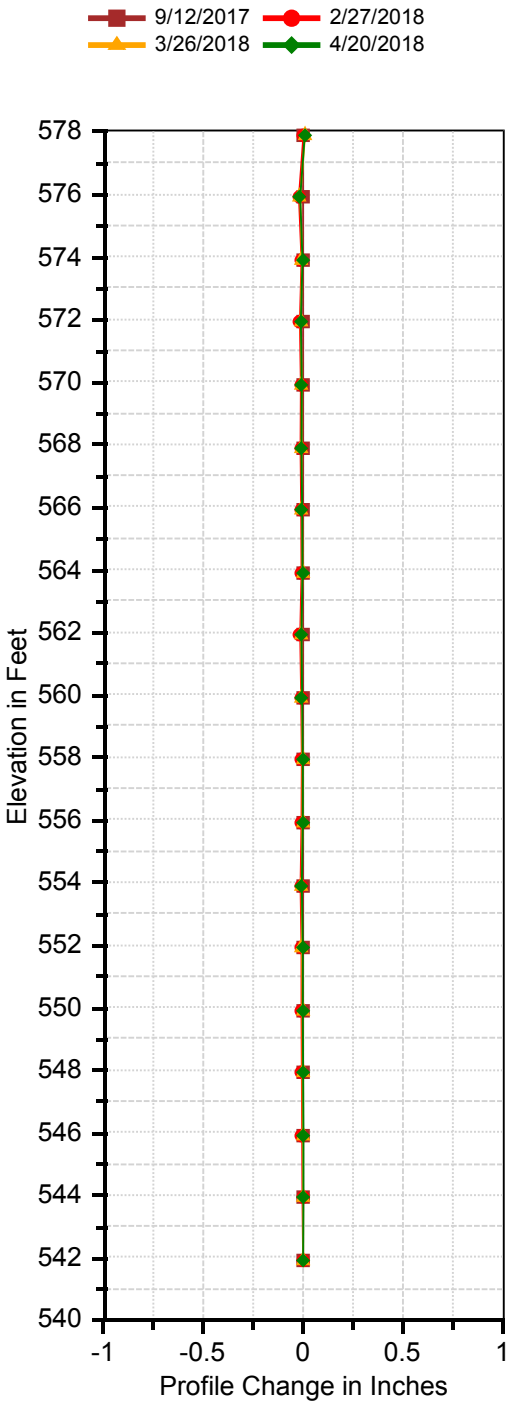


Resultant Profile_Change in Inches

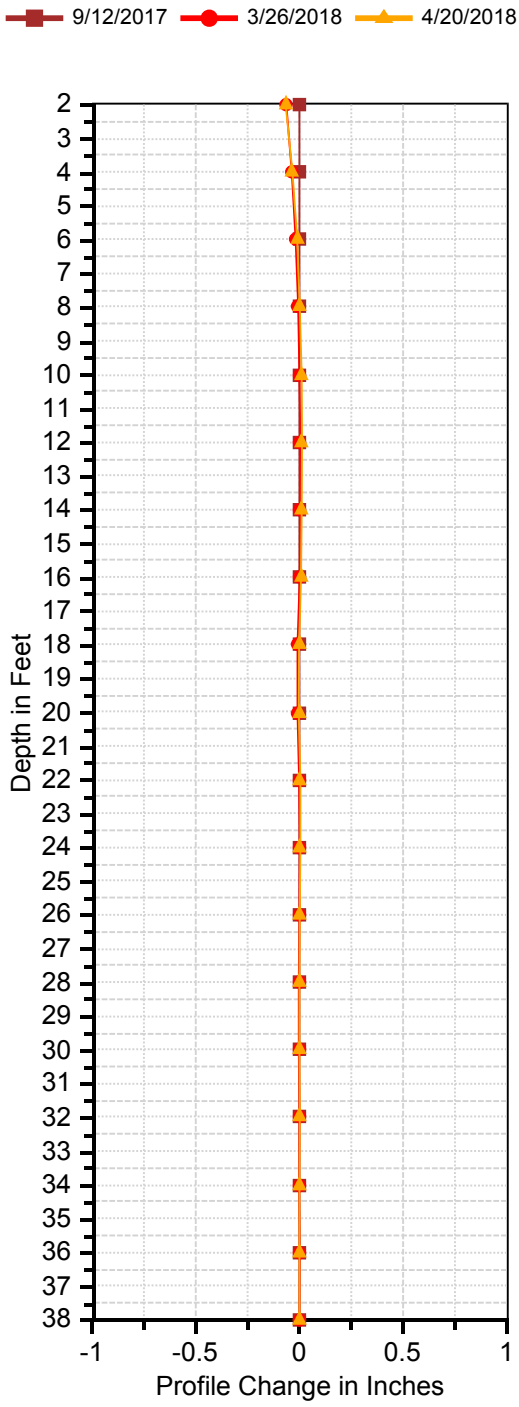
Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 2 A



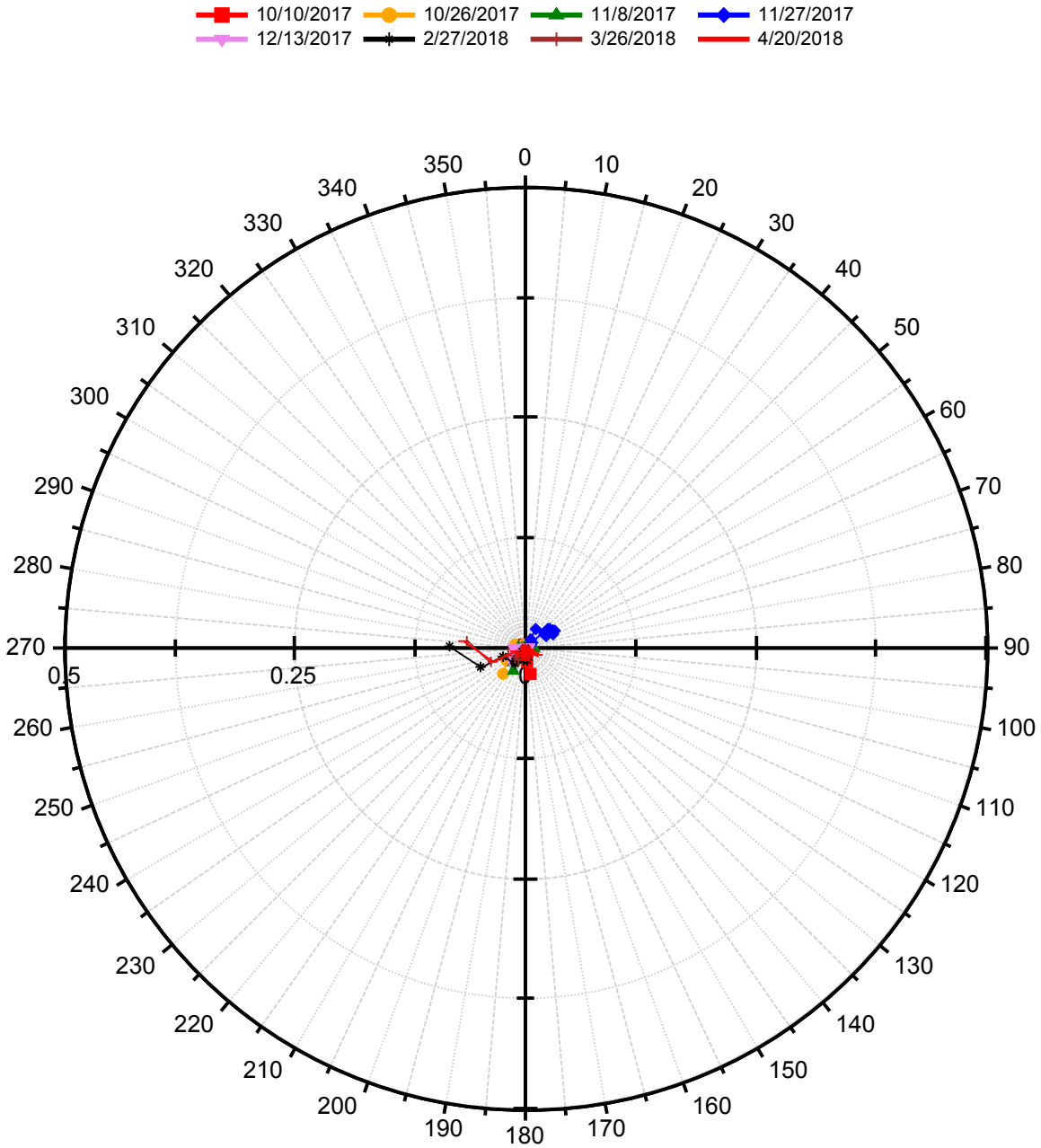
IL_251 2 B



Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 2 Top View

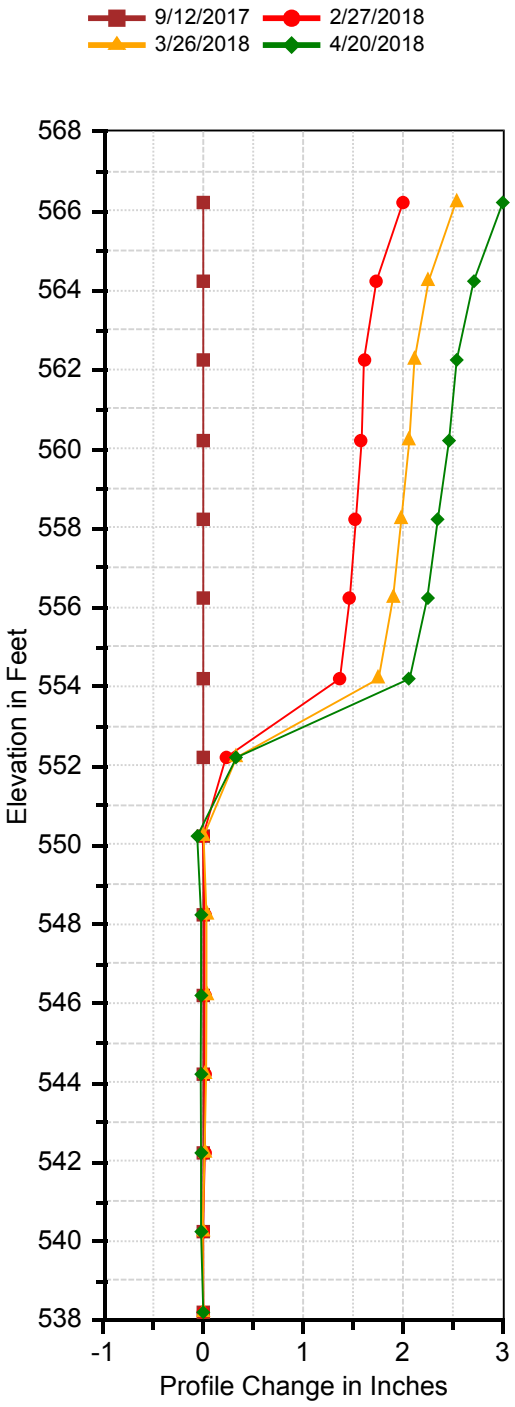


Resultant Profile_Change in Inches

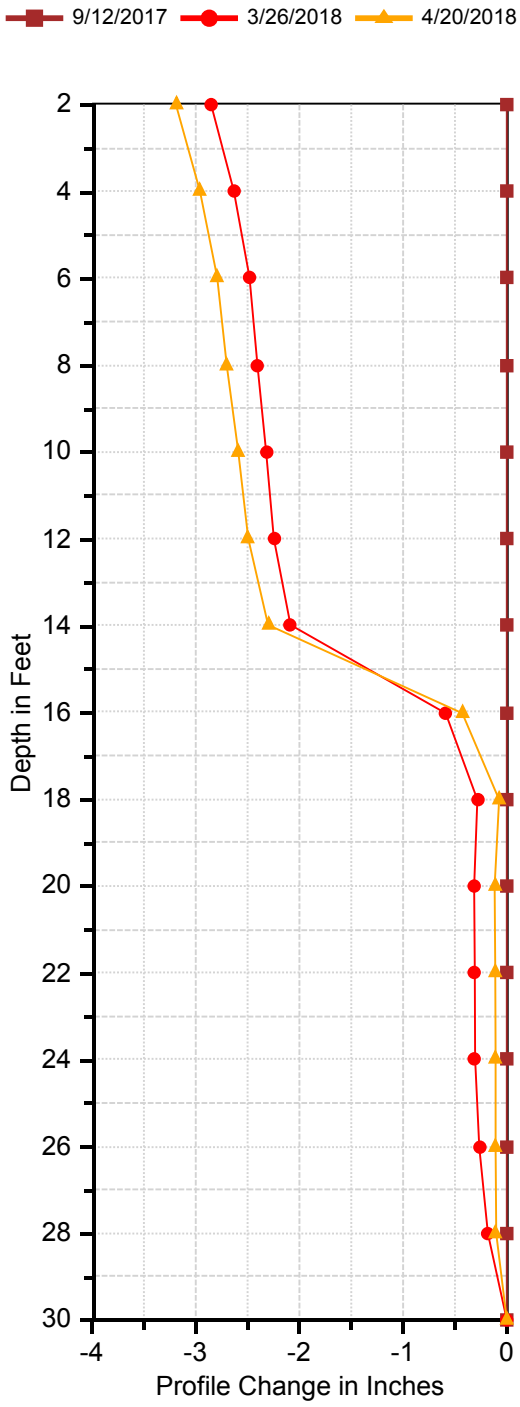
Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 3 A



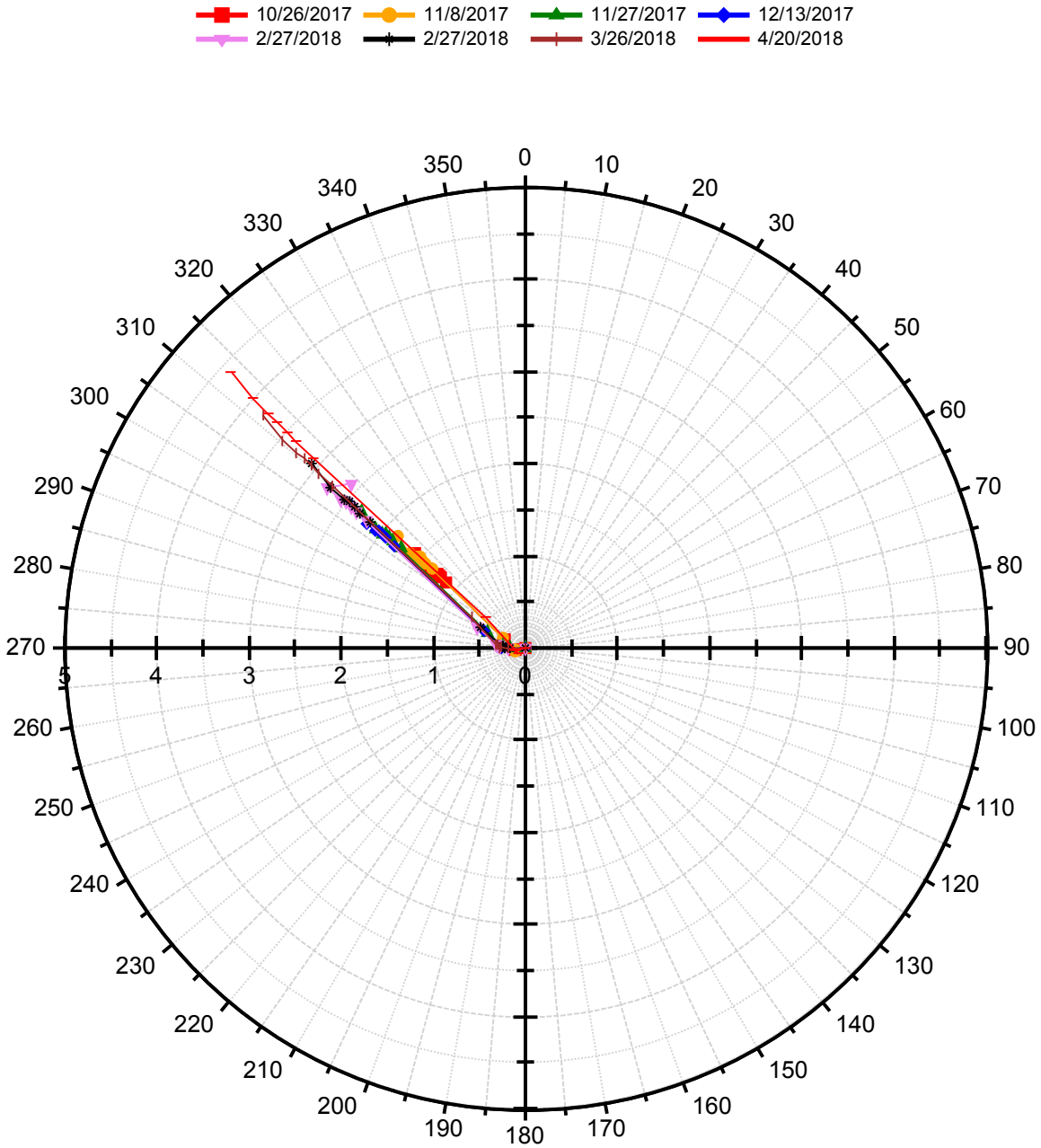
IL_251 3 B



Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 3 Top View

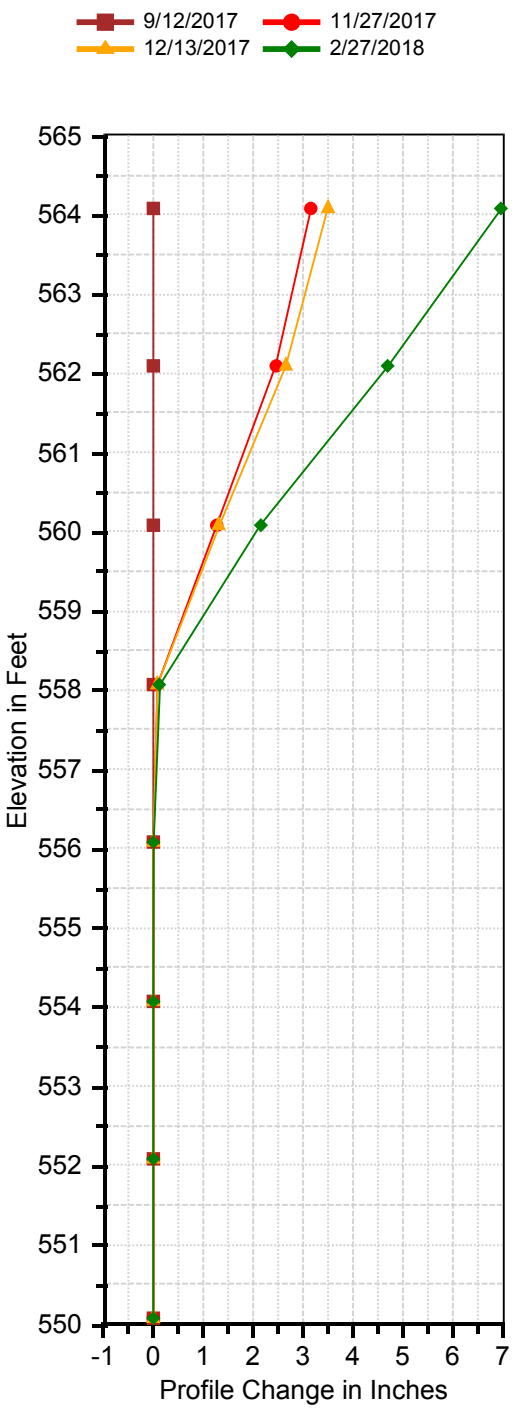


Resultant Profile_Change in Inches

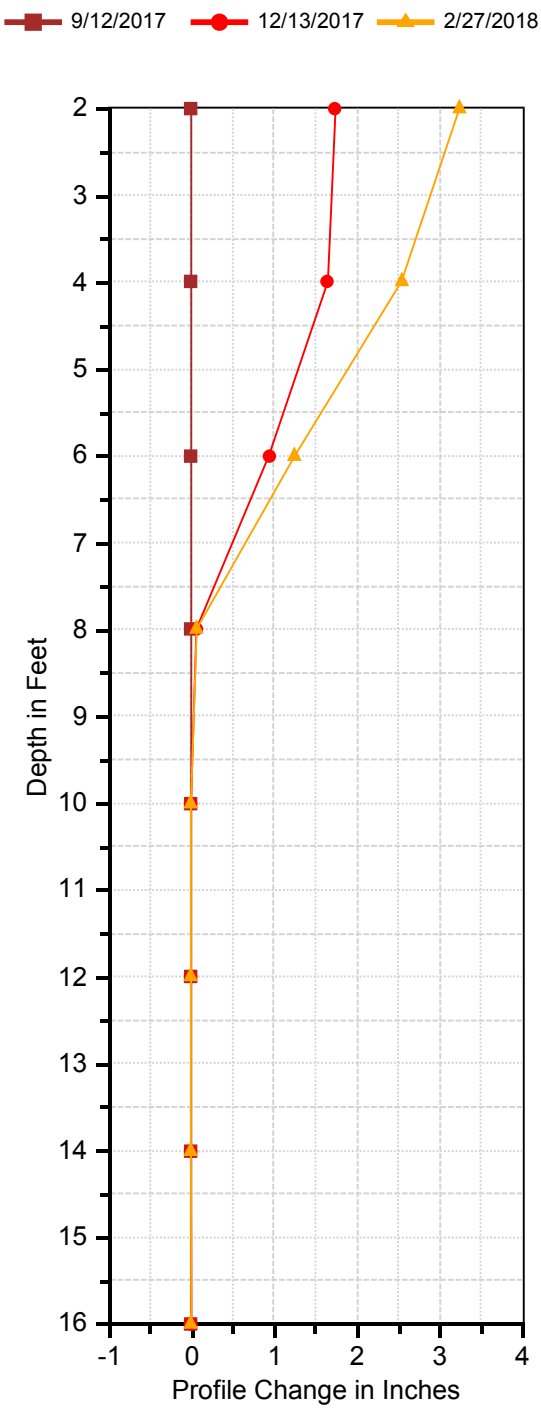
Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 4 A



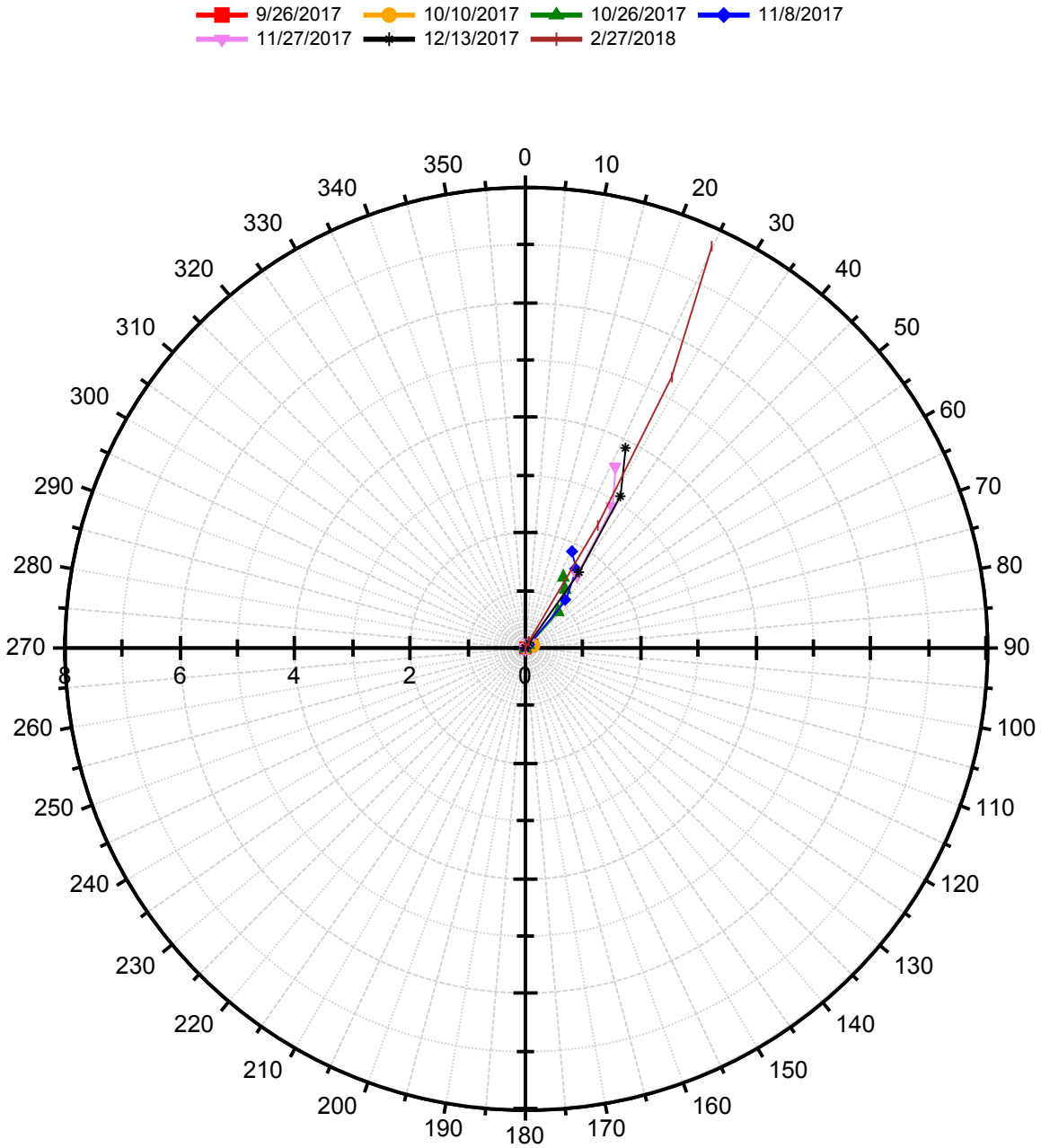
IL_251 4 B



Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 4 Top View



Resultant Profile_Change in Inches

Illinois Department of Transportation

700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

IL_251 1 A

Elevation in Feet; Profile: Profile in Inches

Elevation	9/12/2017	9/26/2017	10/10/2017	10/26/2017	11/8/2017	11/27/2017	12/13/2017	2/27/2018	3/26/2018	4/20/2018
580.6	1.1976	1.4328	1.6432	2.2993	2.5739	2.8700	2.9251	3.2419	3.6686	3.6842
578.6	0.9228	1.1610	1.3622	2.0382	2.3080	2.6041	2.6618	2.9804	3.4038	3.4090
576.6	0.7022	0.9425	1.1382	1.8318	2.1001	2.3945	2.4511	2.7656	3.1843	3.1822
574.6	0.5552	0.7932	0.9869	1.6784	1.9488	2.2410	2.2987	2.6095	3.0236	3.0161
572.6	0.4867	0.7230	0.9178	1.6091	1.8810	2.1707	2.2294	2.5380	2.9462	2.9334
570.6	0.4540	0.6880	0.8821	1.5734	1.8462	2.1361	2.1941	2.5056	2.9076	2.8907
568.6	0.3838	0.6157	0.8084	1.4947	1.7662	2.0561	2.1142	2.4250	2.8193	2.7943
566.6	0.2720	0.4898	0.6670	1.3002	1.5434	1.8126	1.8616	2.1444	2.5135	2.5135
564.6	0.0862	0.0888	0.0877	0.0880	0.0865	0.0875	0.0862	0.0846	0.1069	0.1069
562.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IL_251 1 B

Depth in Feet; Profile_Change: Profile Change in Inches

Depth	9/12/2017	3/26/2018	4/20/2018
2.0	0.0000	-1.5896	-1.6487
4.0	0.0000	-1.5361	-1.5892
6.0	0.0000	-1.4932	-1.5382
8.0	0.0000	-1.4555	-1.4950
10.0	0.0000	-1.4182	-1.4446
12.0	0.0000	-1.3794	-1.3968
14.0	0.0000	-1.3380	-1.3468
16.0	0.0000	-1.2667	-1.2667
18.0	0.0000	-0.2148	-0.2148
20.0	0.0000	0.0000	0.0000

IL_251 2 A Elevation in Feet; Profile: Profile in Inches										
Elevation	9/12/2017	9/26/2017	10/10/2017	10/26/2017	11/8/2017	11/27/2017	12/13/2017	2/27/2018	3/26/2018	4/20/2018
577.9	-10.0484	-10.0790	-10.0770	-10.0771	-10.0732	-10.0430	-10.0573	-10.0475	-10.0402	-10.0410
575.9	-9.6037	-9.6176	-9.6190	-9.6167	-9.6188	-9.5952	-9.6158	-9.6247	-9.6194	-9.6186
573.9	-9.1742	-9.1746	-9.1757	-9.1706	-9.1747	-9.1531	-9.1741	-9.1828	-9.1802	-9.1786
571.9	-8.6099	-8.6117	-8.6124	-8.6113	-8.6159	-8.5967	-8.6165	-8.6268	-8.6236	-8.6221
569.9	-8.0774	-8.0755	-8.0748	-8.0734	-8.0768	-8.0585	-8.0773	-8.0902	-8.0850	-8.0844
567.9	-7.5007	-7.4990	-7.4969	-7.4974	-7.5002	-7.4825	-7.5016	-7.5146	-7.5100	-7.5091
565.9	-6.8754	-6.8742	-6.8718	-6.8711	-6.8736	-6.8562	-6.8753	-6.8857	-6.8813	-6.8808
563.9	-6.2376	-6.2363	-6.2332	-6.2333	-6.2352	-6.2167	-6.2370	-6.2465	-6.2422	-6.2416
561.9	-5.6197	-5.6213	-5.6200	-5.6207	-5.6228	-5.6044	-5.6258	-5.6342	-5.6304	-5.6292
559.9	-4.9790	-4.9802	-4.9789	-4.9794	-4.9812	-4.9618	-4.9832	-4.9895	-4.9858	-4.9840
557.9	-4.3382	-4.3373	-4.3355	-4.3360	-4.3380	-4.3182	-4.3400	-4.3460	-4.3422	-4.3403
555.9	-3.7243	-3.7229	-3.7220	-3.7226	-3.7249	-3.7055	-3.7277	-3.7331	-3.7290	-3.7272
553.9	-3.1303	-3.1316	-3.1312	-3.1326	-3.1346	-3.1159	-3.1386	-3.1435	-3.1393	-3.1375
551.9	-2.5194	-2.5196	-2.5182	-2.5204	-2.5214	-2.5018	-2.5246	-2.5285	-2.5246	-2.5222
549.9	-1.9708	-1.9714	-1.9700	-1.9718	-1.9729	-1.9526	-1.9756	-1.9795	-1.9754	-1.9732
547.9	-1.4974	-1.4987	-1.4972	-1.4984	-1.4996	-1.4786	-1.5011	-1.5049	-1.5006	-1.4987
545.9	-1.0048	-1.0060	-1.0044	-1.0046	-1.0064	-0.9853	-1.0076	-1.0102	-1.0067	-1.0046
543.9	-0.5140	-0.5143	-0.5136	-0.5131	-0.5152	-0.4926	-0.5156	-0.5174	-0.5142	-0.5129
541.9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IL_251 2 B			
Depth in Feet;	Profile_Change: Profile Change in Inches		
Depth	9/12/2017	3/26/2018	4/20/2018
2.0	0.0000	-0.0636	-0.0673
4.0	0.0000	-0.0378	-0.0349
6.0	0.0000	-0.0188	-0.0121
8.0	0.0000	-0.0073	0.0004
10.0	0.0000	0.0000	0.0094
12.0	0.0000	0.0036	0.0124
14.0	0.0000	0.0026	0.0101
16.0	0.0000	0.0006	0.0062
18.0	0.0000	-0.0104	-0.0030
20.0	0.0000	-0.0095	-0.0038
22.0	0.0000	-0.0019	0.0035
24.0	0.0000	0.0008	0.0038
26.0	0.0000	-0.0004	0.0014
28.0	0.0000	-0.0031	-0.0004
30.0	0.0000	-0.0031	-0.0004
32.0	0.0000	-0.0011	0.0010
34.0	0.0000	-0.0024	-0.0004
36.0	0.0000	0.0005	-0.0004
38.0	0.0000	0.0000	0.0000

IL_251 3 A Elevation in Feet; Profile: Profile in Inches											
Elevation	9/12/2017	9/26/2017	10/10/2017	10/26/2017	11/8/2017	11/27/2017	12/13/2017	2/27/2018	2/27/2018	3/26/2018	4/20/2018
566.2	1.5023	1.6504	1.7686	2.5396	2.7120	2.9738	3.0491	3.2879	3.5005	4.0312	4.5017
564.2	1.4785	1.6096	1.7147	2.3320	2.5110	2.7734	2.8182	3.2209	3.2110	3.7331	4.1845
562.2	1.4812	1.6247	1.7254	2.2876	2.4660	2.7217	2.7595	3.0990	3.0890	3.5947	4.0192
560.2	1.4170	1.5738	1.6765	2.2309	2.4048	2.6509	2.6908	3.0122	3.0017	3.4802	3.8756
558.2	1.3709	1.5224	1.6247	2.1613	2.3314	2.5687	2.6071	2.9090	2.8987	3.3526	3.7194
556.2	1.3507	1.4958	1.5954	2.1109	2.2757	2.5043	2.5412	2.8291	2.8182	3.2495	3.5914
554.2	1.2428	1.3751	1.4671	1.9499	2.1029	2.3213	2.3532	2.6206	2.6102	2.9980	3.3078
552.2	1.0492	1.0522	1.0610	1.1354	1.1562	1.2235	1.2293	1.2826	1.2739	1.3800	1.3816
550.2	0.9043	0.8846	0.8806	0.8789	0.8753	0.9092	0.9054	0.9139	0.8983	0.9072	0.8434
548.2	0.7546	0.7355	0.7316	0.7337	0.7322	0.7676	0.7660	0.7838	0.7674	0.7846	0.7295
546.2	0.5950	0.5738	0.5718	0.5731	0.5720	0.6079	0.6059	0.6244	0.6077	0.6247	0.5705
544.2	0.4141	0.3923	0.3898	0.3911	0.3900	0.4262	0.4240	0.4428	0.4252	0.4423	0.3880
542.2	0.2460	0.2232	0.2216	0.2221	0.2219	0.2586	0.2564	0.2574	0.2593	0.2574	0.2225
540.2	0.1350	0.1116	0.1108	0.1111	0.1110	0.1292	0.1282	0.1288	0.1296	0.1286	0.1112
538.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IL_251 3 B			
Depth in Feet;	Profile_Change: Profile Change in Inches		
Depth	9/12/2017	3/26/2018	4/20/2018
2.0	0.0000	-2.8544	-3.1936
4.0	0.0000	-2.6328	-2.9611
6.0	0.0000	-2.4818	-2.7946
8.0	0.0000	-2.4059	-2.7006
10.0	0.0000	-2.3215	-2.5925
12.0	0.0000	-2.2474	-2.4944
14.0	0.0000	-2.0890	-2.3053
16.0	0.0000	-0.5898	-0.4312
18.0	0.0000	-0.2842	-0.0758
20.0	0.0000	-0.3168	-0.1196
22.0	0.0000	-0.3108	-0.1134
24.0	0.0000	-0.3076	-0.1108
26.0	0.0000	-0.2672	-0.1081
28.0	0.0000	-0.1837	-0.1040
30.0	0.0000	0.0000	0.0000

IL_251 4 A

Elevation in Feet; Profile: Profile in Inches

Elevation	9/12/2017	9/26/2017	10/10/2017	10/26/2017	11/8/2017	11/27/2017	12/13/2017	2/27/2018
564.1	4.5178	4.5724	4.5624	5.7440	6.2036	7.6781	8.0052	11.4917
562.1	3.9445	3.9996	4.0006	4.9603	5.3227	6.3887	6.5932	8.6472
560.1	3.3521	3.3946	3.4003	3.9929	4.1815	4.6165	4.6774	5.4881
558.1	2.6827	2.6840	2.6831	2.7346	2.7476	2.7628	2.7658	2.8136
556.1	1.9931	1.9903	1.9883	1.9910	1.9906	1.9922	1.9932	1.9944
554.1	1.3114	1.3104	1.3097	1.3110	1.3104	1.3110	1.3114	1.3112
552.1	0.6518	0.6515	0.6511	0.6517	0.6514	0.6518	0.6520	0.6516
550.1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IL_251 4 B

Depth in Feet; Profile_Change: Profile Change in Inches

Depth	9/12/2017	12/13/2017	2/27/2018
2.0	0.0000	1.7425	3.2340
4.0	0.0000	1.6500	2.5354
6.0	0.0000	0.9343	1.2491
8.0	0.0000	0.0641	0.0671
10.0	0.0000	-0.0007	-0.0044
12.0	0.0000	-0.0023	-0.0029
14.0	0.0000	-0.0024	-0.0030
16.0	0.0000	0.0000	0.0000

APPENDIX

F-6

McCleary Engineering

"Specializing in Geotechnical Solutions"

March 7, 2017

Mr. Michael Short
Illinois Department of Transportation
700 E. Norris Drive
Ottawa, IL 61350

PTB 153/36
Various Geotechnical Reports, Various Routes, Various Counties
Region 2/District 3
P-93-024-09
WO#21 and WO#22
DCP Testing of IL 251 Slope in Peru, IL

Dear Mr. Short:

As requested by your office, McCleary Engineering has completed 22 DCP's split between 3 downhill rows on the failing slope along the east side of IL 251, south of Shooting Park Road in Peru. Attached, please find six sheets showing the results of our testing.

In general, there are soft soils above stiffer to very hard soil layers. Please keep in mind, to reach the desired depths multiple metal rods connected with metal unions that are a larger diameter than the rods themselves. These unions are likely creating additional resistance not seen in a DCP rod without them.

Should you have any questions please contact me at your convenience.

Respectfully submitted,

Terrence L. McCleary

Terrence L. McCleary

3705 Progress Blvd., Suite 2, Peru, Illinois 61354
(815) 780-8486 – www.mcclearyengineering.com

IL 71 AT DIMMICK HILL

DCP DATA

DECEMBER 2015 AND JANUARY 2016

Measurement Method: Blows Per 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	101				102				103				104			
STATION	11+25.84				11+23.34				11+19.93				11+20.46			
OFFSET	-40.71				-59.32				-81.81				-96.75			
ELEVATION	594.12				586.59				580.77				578.17			
INTERVAL	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV
1	0.00	1	6.25	0.7	0.00	5	1.15	5.8	0.00	1	4.50	1.0	0.00	2	3.25	1.6
2	6.25	1	5.25	0.9	5.75	3	2.75	1.9	4.50	1	5.75	0.8	6.50	2	3.00	1.7
3	11.50	1	5.00	0.9	14.00	2	2.63	2.1	10.25	1	8.25	0.5	12.50	2	2.63	2.1
4	16.50	1	7.50	0.5	19.25	4	1.31	4.9	18.50	1	8.50	0.5	17.75	3	1.83	3.2
5	24.00	2	3.00	1.7	24.50	7	0.79	9.4	27.00	3	2.83	1.9	23.25	4	1.50	4.2
6	30.00	3	1.83	3.2	30.00	7	0.89	8.0	35.50	4	1.75	3.4	29.25	5	1.30	5.0
7	35.50	6	1.04	6.6	36.25	9	0.64	12.2	42.50	4	1.38	4.6	35.75	7	0.89	8.0
8	41.75	6	0.96	7.3	42.00	10	0.65	11.9	48.00	6	1.08	6.3	42.00	11	0.59	13.4
9	47.50	10	0.65	11.9	48.50	16	0.34	26.6	54.50	7	0.82	8.9	48.50	14	0.41	21.2
10	54.00	8	0.78	9.4	54.00	24	0.15	78.3	60.25	9	0.61	12.9	54.25	15	0.39	22.5
11	60.25	9	0.69	11.0	57.50	10	0.60	13.2	65.75	13	0.46	18.3	60.13	15	0.39	22.5
12	66.50	17	0.32	28.7	63.50	20	0.30	31.5	71.75	16	0.39	22.6	66.00	19	0.31	30.9
13	72.00	14	0.45	19.1	69.50	22	0.27	35.6	78.00	13	0.46	18.3	71.80	19	0.26	37.2
14	78.25	13	0.46	18.3	75.50	24	0.25	39.7	84.00	14	0.43	20.1	76.80	26.0	0.23	43.9
15	84.25	9	0.47	17.8	81.50	20	0.30	31.5	90.00	20	0.30	31.5	82.80	30.0	0.20	52.6
16	88.50	14	0.43	20.1	87.50	23.0	0.26	37.6	96.00	23	0.26	37.6	88.80	31.0	0.19	54.8
17	94.50	14	0.43	20.1	93.50	30.0			102.00	26	0.23	43.9	94.80	30.0	0.20	52.6
18	100.50	13	0.46	18.3					108.00	30	0.20	52.6	100.80	28.0	0.21	48.2
19	106.50	15	0.40	21.9					114.00	34	0.18	61.5	106.80	23.0	0.26	37.6
20	112.50	21	0.17	66.1					120.00	40	0.15	75.5	112.80	24.0	0.25	39.7
21	116.00								126.00	43	0.14	82.7	118.80	21.0	0.29	33.5
22									132.00				124.80	30.0	0.20	52.6
23													130.80	31.0	0.19	54.8
24													136.80	30.0	0.20	52.6
25													142.80			
26																
27																
28																
29																
30																
31																
32																
33	182.1															

LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

Printed on 5/14/2018 8:18 PM
C:\Users\User\AppData\Local\Packages\Microsoft.MicrosoftEdge_8wekyb3d8bbwe\TempState\Downloads\IL 251 DCP RESULTS Spreadsheet 101-106 4-24-2018

IL 71 AT DIMMICK HILL

DCP DATA

DECEMBER 2015 AND JANUARY 2016

Measurement Method: Blows Per 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	105				106											
STATION	11+19.15				11+18.81											
OFFSET	-119.26				-139.91											
ELEVATION	572.49				568.34											
INTERVAL	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV
1	0.00	5	1.70	3.5	0.00	4	1.13	6.0								
2	8.50	1	3.50	1.4	4.50	1	14.50	0.2								
3	12.00	3	2.42	2.3	19.00	1	11.25	0.3								
4	19.25	3	1.83	3.2	30.25	1	5.00	0.9								
5	24.75	5	1.00	6.9	35.25	2	3.00	1.7								
6	29.75	10	0.63	12.5	41.25	7	0.93	7.6								
7	36.00	9	0.69	11.0	47.75	12	0.52	15.7								
8	42.25	10	0.63	12.5	54.00	12	0.50	16.6								
9	48.50	11	0.52	15.7	60.00	17	0.37	24.4								
10	54.25	14	0.41	21.2	66.25	20	0.29	33.3								
11	60.00	16	0.38	23.8	72.00	24	0.22	47.0								
12	66.00	14	0.45	19.1	77.25	44	0.14	85.2								
13	72.25	13	0.44	19.3	83.25	63	0.10	133.9								
14	78.00	18	0.33	27.6	89.25	71	0.08	155.6								
15	84.00	17	0.37	24.4	95.25											
16	90.25	11	0.52	15.7												
17	96.00	13	0.38	23.1												
18	101.00	24	0.25	39.7												
19	107.00	31	0.19	54.8												
20	113.00	33	0.18	59.3												
21	119.00	31	0.19	54.8												
22	125.00	40	0.15	75.5												
23	131.00															
24																
25																
26																
27																
28																
29																
30																
31																
32																
33																

LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

Printed on 5/14/2018 8:18 PM

C:\Users\User\AppData\Local\Packages\Microsoft.MicrosoftEdge_8wekyb3d8bbwe\TempState\Downloads\IL 251 DCP RESULTS Spreadsheet 101-106 4-24-2018

IL 71 AT DIMMICK HILL

DCP DATA

DECEMBER 2015 AND JANUARY 2016

Measurement Method: Blows Per 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	201				202				203				204			
STATION	10+86.23				10+86.18				10+85.15				10+84.11			
OFFSET	-40.62				-60.67				-80.59				-107.04			
ELEVATION	593.80				587.63				582.51				573.88			
INTERVAL	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV
1	0.00	4	2.00	2.9	0.00	10	0.59	13.5	0.00	8	0.81	9.0	0.00	2	2.50	2.2
2	8.00	2	2.50	2.2	5.88	4	1.47	4.3	6.50	4	1.31	4.9	5.00	4	1.81	3.3
3	13.00	6	0.88	8.2	11.75	2	3.00	1.7	11.75	4	1.63	3.8	12.25	5	1.05	6.5
4	18.25	8	0.78	9.4	17.75	3	2.25	2.5	18.25	5	1.30	5.0	17.50	4	1.75	3.4
5	24.50	10	0.60	13.2	24.50	2	6.38	0.7	24.75	8	0.75	9.9	24.50	6	0.96	7.3
6	30.50	16	0.38	23.8	37.25	3	2.08	2.7	30.75	6	0.96	7.3	30.25	6	0.96	7.3
7	36.50	11	0.50	16.6	43.50	4	1.44	4.4	36.50	7	0.86	8.4	36.00	14	0.38	23.1
8	42.00	15	0.40	21.9	49.25	8	0.75	9.9	42.50	6	0.92	7.7	41.38	24	0.25	39.7
9	48.00	24	0.26	37.7	55.25	7	0.86	8.4	48.00	17	0.57	13.9	47.38	18	0.33	27.6
10	54.25	8	0.75	9.9	61.25	5	0.95	7.4	57.75	5	0.45	18.9	53.38	14	0.43	20.1
11	60.25	7	0.82	8.9	66.00	8	0.77	9.7	60.00	8	0.17	63.6	59.38	13	0.46	18.3
12	66.00	9	0.69	11.0	72.13	6	0.92	7.7	61.38	43	0.14	82.7	65.38	16	0.42	20.5
13	72.25	9	0.64	12.2	77.63	5	1.10	6.1	67.38	20	0.30	32.0	72.13	19	0.32	28.8
14	78.00	12	0.50	16.6	83.13	7	0.82	8.9	73.30	8	0.24	41.0	78.25	21.0	0.28	34.4
15	84.00	10	0.65	11.9	88.88	6	0.88	8.2	75.25	22	0.27	35.6	84.13	24.0	0.21	49.9
16	90.50	8	0.69	11.1	94.13	19.0	0.42	20.6	81.25	23	0.26	37.6	89.13	20.0	0.30	31.5
17	96.00	15	0.43	19.8	102.13	13.0	0.48	17.4	87.25	22	0.27	35.6	95.13	20.0	0.30	31.5
18	102.50	13	0.44	19.3	108.38	11.0	0.56	14.5	93.25	19	0.32	29.6	101.13	18.0	0.33	27.6
19	108.25	10	0.58	13.9	114.50	15.0	0.37	24.5	99.25	20	0.30	31.5	107.13	18.0	0.33	27.6
20	114.00	9	0.72	10.4	120.00	17.0	0.35	25.7	105.25	38	0.16	70.8	113.13	29.0	0.21	50.4
21	120.50	14	0.54	15.2	126.00	16.0	0.38	23.8	111.25	28	0.21	48.2	119.13	30.0	0.20	52.6
22	128.00	20	0.30	31.5	132.00	16.0	0.28	34.2	117.25	24	0.25	39.7	125.13	45.0	0.13	87.6
23	134.00	6	0.29	32.7	136.50	22.0	0.27	35.6	123.25	27	0.22	46.0	131.13			
24	135.75	16	0.38	23.8	142.50	24.0	0.25	39.7	129.25	40	0.15	75.5				
25	141.75	15	0.40	21.9	148.50	30.0	0.20	52.6	135.25							
26	147.75	19	0.32	29.6	154.50	31.0	0.19	54.8								
27	153.75	14	0.43	20.1	160.50	36.0	0.17	66.1								
28	159.75	14	0.43	20.1	166.50	33.0	0.18	59.3								
29	165.75	17	0.35	25.7	172.50	30.0	0.20	52.6								
30	171.75	21	0.29	33.5	178.50	36.0	0.17	66.1								
31	177.75	26	0.22	45.6	184.50	30.0	0.20	52.6								
32	183.58	36	0.17	63.8	190.50	37.0	0.16	68.5								
33	189.75	34.0	0.18	61.5	196.50	50.0	0.12	100.1								
	195.75				202.50											

LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

Printed on 5/14/2018 8:19 PM

C:\Users\User\AppData\Local\Packages\Microsoft.MicrosoftEdge_8wekyb3d8bbwe\TempState\Downloads\IL 251 DCP RESULTS Spreadsheet 201-208 4-24-2018

IL 71 AT DIMMICK HILL

DCP DATA

DECEMBER 2015 AND JANUARY 2016

Measurement Method: Blows Per 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	205				206				207				208			
STATION	10+87.64				10+90.72				10+91.98				10+90.85			
OFFSET	-121.50				-131.50				-152.43				-171.62			
ELEVATION	571.65				569.81				561.6				558.5			
INTERVAL	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / 6 INCH	RATE (IN / BLOW)	IBV
1	0.00	2	3.13	1.6	0.00	4	1.63	3.8	0.00	1	4.25	1.1	0.0	6	0.92	7.7
2	6.25	4	1.63	3.8	6.50	2	2.50	2.2	4.25	1	9.50	0.4	5.5	1	18.25	0.2
3	12.75	3	1.75	3.4	11.50	2	3.00	1.7	13.75	1	3.75	1.3	23.8	4	1.63	3.8
4	18.00	5	1.25	5.2	17.50	3	2.58	2.1	17.50	3	2.33	2.4	30.3	7	0.86	8.4
5	24.25	9	0.67	11.4	25.25	2	2.63	2.1	24.50	2	2.75	1.9	36.25	10	0.58	13.9
6	30.30	8	0.78	9.5	30.50	4	1.56	3.9	30.00	4	1.63	3.8	42.00	13	0.48	17.4
7	36.50	8	0.69	11.1	36.75	5	1.20	5.5	36.50	8	0.72	10.5	48.25	18	0.33	27.6
8	42.00	10	0.68	11.4	42.75	7	0.86	8.4	42.25	11	0.52	15.7	54.25	20	0.29	33.3
9	48.75	7.0	0.79	9.4	48.75	6	0.92	7.7	48.00	15	0.42	20.8	60.00	21	0.23	45.0
10	54.25	6.0	0.96	7.3	54.25	6	1.04	6.6	54.25	13	0.48	17.4	64.75	20	0.30	31.5
11	60.00	11.0	0.59	13.4	60.50	6	1.00	6.9	60.50	11	0.50	16.6	70.75	19	0.32	29.6
12	66.50	7.0	0.79	9.4	66.50	9	0.67	11.5	66.00	13	0.46	18.3	76.75	20	0.30	31.5
13	72.00	10.0	0.60	13.2	72.50	24	0.23	44.3	72.00	15	0.42	20.8	82.75	29	0.21	50.4
14	78.00	9.0	0.69	11.0	78.00	73	0.09	145.7	78.25	10	0.28	35.2	88.75	39	0.15	73.2
15	84.25	9.0	0.69	11.0	84.50				81.00	31	0.19	54.8	94.75	45	0.13	87.6
16	90.50	10.0	0.55	14.7					87.00	55	0.11	112.8	100.75	55	0.11	112.8
17	96.00	16.0	0.38	23.8					93.00				106.75			
18	102.00	17.0	0.35	25.7												
19	108.00	14.0	0.27	36.4												
20	111.75	23.0	0.26	37.6												
21	117.75	26.0	0.23	43.9												
22	123.75	32.0	0.19	57.0												
23	129.75	44.0	0.14	85.2												
24	135.75	47.0	0.13	92.5												
25	141.75															
26																
27																
28																
29																
30																
31																
32																
33																

LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

Printed on 5/14/2018 8:19 PM

C:\Users\User\AppData\Local\Packages\Microsoft.MicrosoftEdge_8wekyb3d8bbwe\TempState\Downloads\IL 251 DCP RESULTS Spreadsheet 201-208 4-24-2018

IL 251

DCP DATA

DECEMBER 2016 AND FEBRUARY 2017

Measurement Method: Blows Per Approximate 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	301				302				303				304			
STATION	10+46.44				10+47.97				10+51.02				10+52.45			
OFFSET	-40.32				-58.68				-74.40				-97.92			
ELEVATION	596.18				588.54				581.54				575.48			
INTERVAL	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV
1	0.0	3	2.00	2.9	0.00	2	3.00	1.7	0.00	2	2.63	2.1	0.00	2	2.75	1.9
2	6.00	2	3.63	1.4	6.00	2	3.25	1.6	5.25	3	2.42	2.3	5.50	3	2.17	2.6
3	13.3	1	4.00	1.2	12.50	2	2.25	2.5	12.50	2	2.50	2.2	12.00	3	1.92	3.0
4	17.3	1	6.50	0.7	17.00	3	2.25	2.5	17.50	4	1.75	3.4	17.75	4	1.44	4.4
5	23.8	2	4.13	1.2	23.75	3	2.25	2.5	24.50	5	1.10	6.1	23.50	4	1.88	3.1
6	32.0	2	2.13	2.7	30.50	2	2.63	2.1	30.00	5	1.25	5.2	31.00	4	1.44	4.4
7	36.3	3	2.08	2.7	35.75	3	2.67	2.0	36.25	5	1.15	5.8	36.75	4	1.31	4.9
8	42.5	4	1.38	4.6	43.75	10	0.28	35.2	42.00	5	1.20	5.5	42.00	7	0.93	7.6
9	48.0	5	1.30	5.0	46.50	16	0.38	23.8	48.00	5	1.30	5.0	48.50	6	0.96	7.3
10	54.5	5	1.25	5.2	52.50	10	0.60	13.2	54.50	3	1.92	3.0	54.25	9	0.67	11.5
11	60.8	5	1.10	6.1	58.50	10	0.60	13.2	60.25	4	1.75	3.4	60.25	10	0.58	13.9
12	66.3	8	0.72	10.5	64.50	11	0.55	14.8	67.25	5	1.10	6.1	66.00	8	0.75	9.9
13	72.0	10	0.63	12.5	70.50	3	0.67	11.5	72.75	7	0.79	9.4	72.00	11	0.57	14.1
14	78.3	10	0.60	13.2	72.50	14	0.41	21.2	78.25	9	0.64	12.2	78.25	10.0	0.58	13.9
15	84.3	11	0.55	14.8	78.25	14	0.43	20.1	84.00	12	0.50	16.6	84.00	12.0	0.52	15.7
16	90.25	12	0.50	16.6	84.25	11.0	0.55	14.8	90.00	13	0.46	18.3	90.25	11.0	0.52	15.7
17	96.25	13	0.46	18.3	90.25	19.0	0.30	31.2	96.00	13	0.52	15.8	96.00	11.0	0.57	14.1
18	102.25	14	0.43	20.1	96.00	19.0	0.33	28.1	102.75	13	0.46	18.3	102.25	12.0	0.48	17.5
19	108.25	11	0.52	15.7	102.25	8.0	0.34	26.6	108.75	12	0.50	16.6	108.00	17.0	0.35	25.7
20	114.00	13	0.46	18.3	105.00	16.0	0.38	23.8	114.75	10	0.53	15.6	114.00	17.0	0.37	24.4
21	120.00	13	0.46	18.3	111.00	16.0	0.38	23.8	120.00	12	0.54	15.0	120.25	18.0	0.32	29.1
22	126.00	13	0.46	18.3	117.00	14.0	0.43	20.1	126.50	11	0.52	15.7	126.00	5.0	0.15	75.5
23	132.00	14	0.43	20.1	123.00	30.0	0.20	52.6	132.25	9	0.67	11.5	126.75			
24	138.00	17	0.37	24.4	129.00	28.0	0.21	48.2	138.25	17	0.38	23.8				
25	144.25	20	0.30	31.5	135.00	27.0	0.22	46.0	144.63	22	0.27	35.6				
26	150.25	18	0.33	27.6	141.00	22.0	0.27	35.6	150.63	25.0	0.24	41.8				
27	156.25	17	0.34	27.1	147.00	28.0	0.21	48.2	156.63	30.0	0.20	52.6				
28	162.00	8	0.38	23.8	153.00	20.0	0.03	722.1	162.63	28.0	0.21	48.2				
29	165.00	19	0.32	29.6	153.50				168.63	28.0	0.21	48.2				
30	171.00	18	0.33	27.6					174.63	40.0	0.15	75.5				
31	177.00	19	0.32	29.6					180.63	36.0	0.17	66.1				
32	183.00	34	0.18	61.5					186.63	35.0	0.17	63.8				
33	189.00	50.0	0.05	301.5					192.63	42.0	0.14	80.3				
	191.50								198.63							

LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

IL 251

DCP DATA

DECEMBER 2016 AND FEBRUARY 2017

Measurement Method: Blows Per Approximate 6 Inches of Penetration

IL 251 Slope Failure DCP																
DCP NUMBER	305				306				307				308			
STATION	10+54.17				10+55.43				10+57.87				10+59.08			
OFFSET	-116.59				-136.63				-156.86				-176.13			
ELEVATION	571.30				564.08				553.73				551.11			
INTERVAL	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV	DEPTH (IN)	BLOWS / INTERVAL	RATE (IN / BLOW)	IBV
1	0.00	2	2.63	2.1	0.00	16	0.39	22.6	0.00	21	0.31	30.3	0.00	9	0.64	12.2
2	5.25	3	2.08	2.7	6.25	5	1.25	5.2	6.50	8	0.84	8.6	5.75	11	0.55	14.8
3	11.50	2	2.75	1.9	12.50	4	1.31	4.9	13.25	2	3.13	1.6	11.75	4	1.56	3.9
4	17.00	2	2.75	1.9	17.75	13	0.48	17.4	19.50	2	3.25	1.6	18.00	4	1.69	3.6
5	22.50	3	2.50	2.2	24.00	15	0.43	19.8	26.00	1	3.50	1.4	24.75	4	1.44	4.4
6	30.00	4	1.50	4.2	30.50	9	0.61	12.9	29.50	2	3.50	1.4	30.50	7	0.82	8.9
7	36.00	4	1.56	3.9	36.00	8	0.75	9.9	36.50	4	1.44	4.4	36.25	8	0.75	9.9
8	42.25	5	1.20	5.5	42.00	11	0.55	14.8	42.25	9	0.64	12.2	42.25	6	1.04	6.6
9	48.25	6.0	0.96	7.3	48.00	16	0.33	28.2	48.00	13	0.46	18.3	48.50	5	1.15	5.8
10	54.00	8.0	0.81	9.0	53.25	17	0.35	25.7	54.00	16	0.39	22.6	54.25	7	0.86	8.4
11	60.50	6.0	1.00	6.9	59.25	10	0.60	13.2	60.25	15	0.40	21.9	60.25	7	0.86	8.4
12	66.50	5.0	1.10	6.1	65.25	9	0.67	11.5	66.25	16	0.38	23.8	66.25	8	0.72	10.5
13	72.00	8.0	0.78	9.4	71.25	17	0.40	22.2	72.25	24	0.22	47.0	72.00	13	0.46	18.3
14	78.25	9.0	0.67	11.5	78.00	16	0.39	22.6	77.50	37	0.16	68.5	78.00	19	0.32	29.6
15	84.25	10.0	0.58	13.9	84.25	14	0.43	20.1	83.50	38	0.16	70.8	84.00	9	0.28	34.7
16	90.00	14.0	0.43	20.1	90.25	10	0.58	13.9	89.50	60	0.10	125.9	86.50	22	0.27	35.6
17	96.00	18.0	0.35	26.2	96.00	16	0.31	30.0	95.50				92.50	18	0.33	27.6
18	102.25	13.0	0.27	36.1	101.00	16	0.38	23.8					98.50	17	0.35	25.7
19	105.75	24.0	0.25	39.7	107.00	22	0.27	35.6					104.50	20	0.30	31.5
20	111.75	37.0	0.16	68.5	113.00	28	0.21	48.2					110.50	18	0.33	27.6
21	117.75	36.0	0.17	66.1	119.00	36	0.17	66.1					116.50	56	0.11	115.4
22	123.75	34.0	0.18	61.5	125.00	38	0.16	70.8					122.50	50	0.12	100.1
23	129.75	41.0	0.15	77.9	131.00								128.50			
24	135.75	44.0	0.14	85.2												
25	141.75															
26																
27																
28																
29																
30																
31																
32																
33																

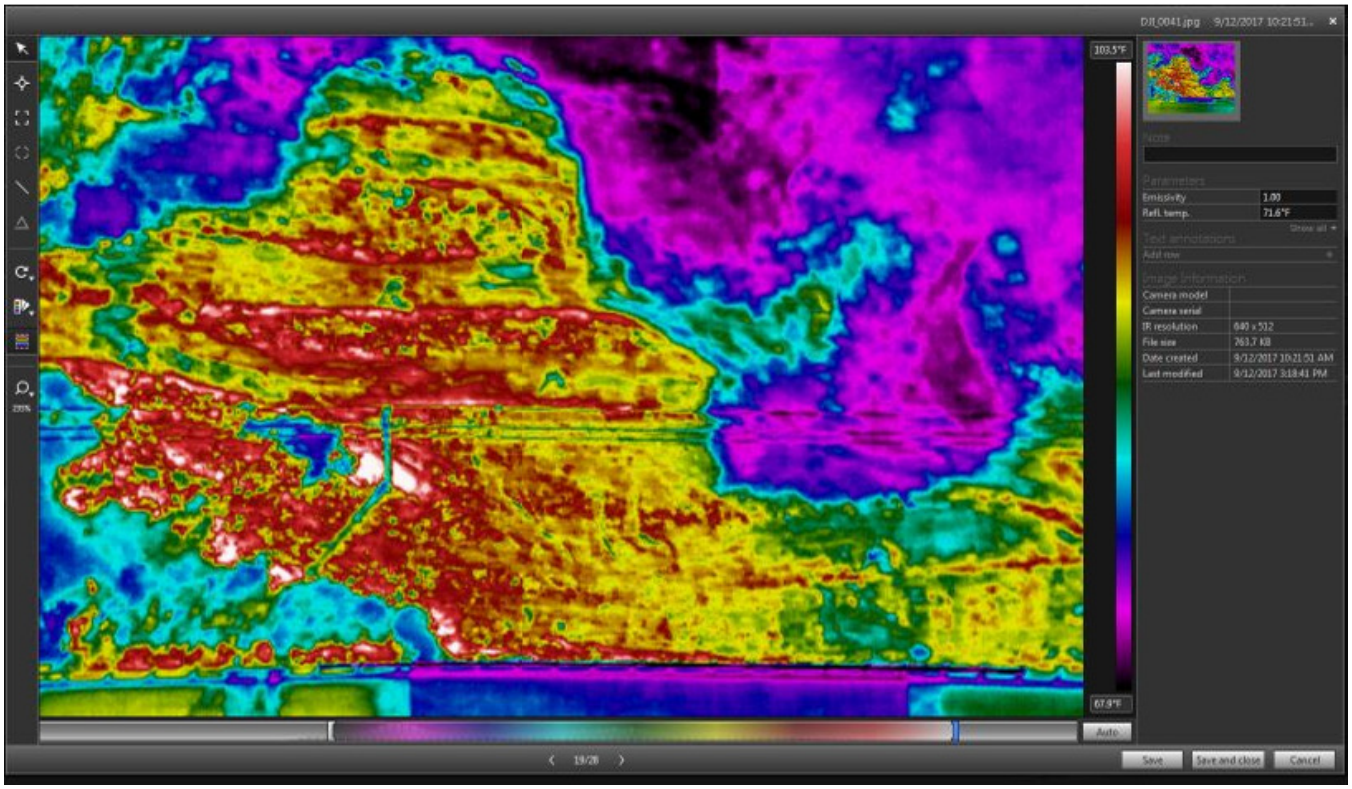
LEGEND:	
	IBV <1
	1 < IBV < 2
	2 < IBV < 3
	IBV > 3

APPENDIX

G-1

APPENDIX

G-2


DJI_0041.jpg 9/12/2017 10:21:51...
103.5°F
67.9°F
Auto
Parameters
Emissivity 1.00
Refl. temp. 71.6°F
Text annotations
Add new
Image information
Camera model
Camera serial
IR resolution 640 x 512
File size 763.7 KB
Date created 9/12/2017 10:21:51 AM
Last modified 9/12/2017 3:18:41 PM
19/28
Save
Save and close
Cancel



APPENDIX

H


07/22/2015


09/04/2015




05/03/2016


08/08/2016


08/22/2016


SPEED LIMIT 45

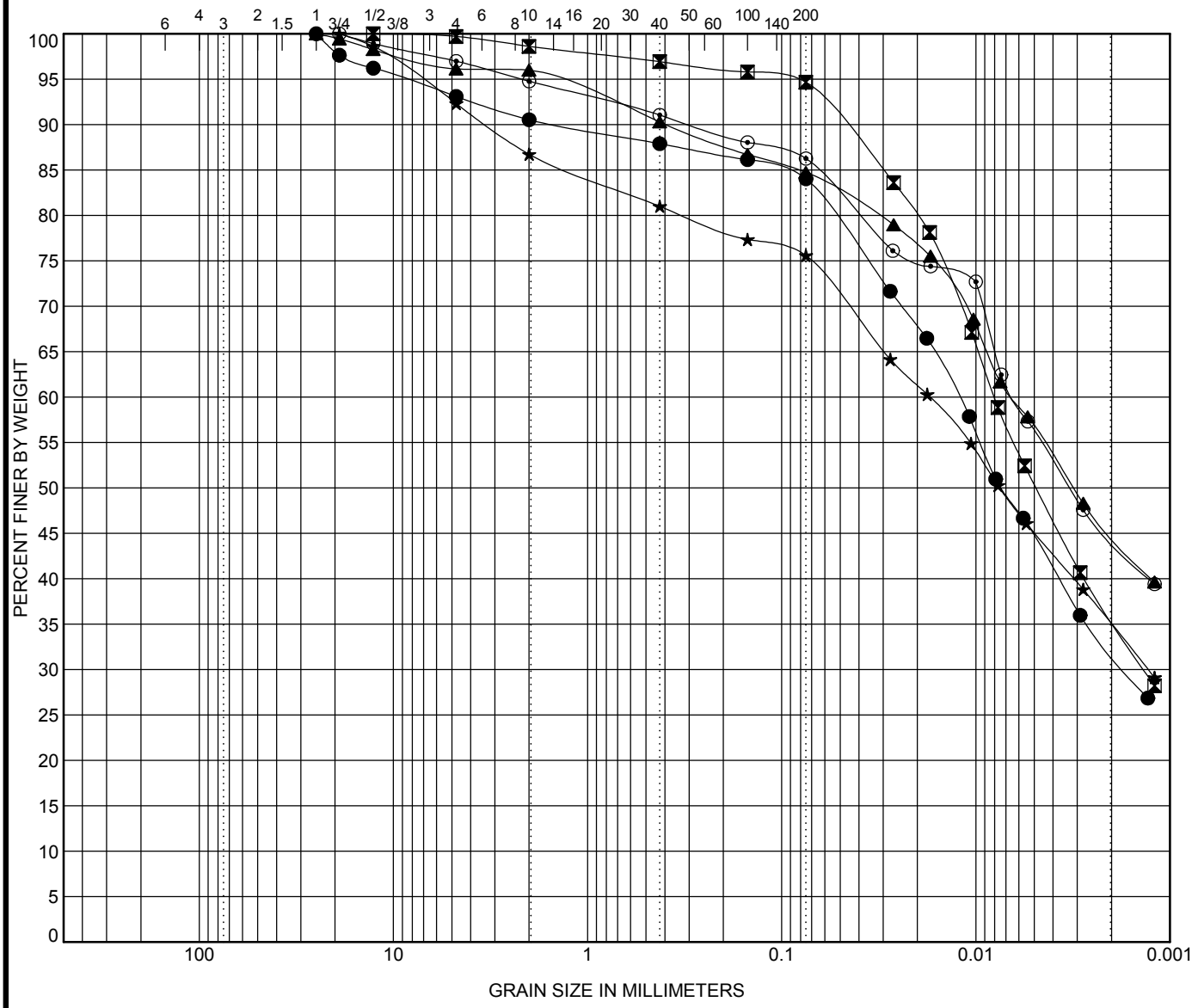



05/17/2017


07/31/2017

APPENDIX

I-1



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	24	2.50	**A-6 (17) SILTY CLAY**	**37.1**	**15.8**	**21.3**		
⊠	24	7.50	**A-7-6 (23) SILTY CLAY**	**41.5**	**18.8**	**22.7**		
▲	25	7.50	**A-7-6 (25) CLAY**	**46.6**	**17.9**	**28.7**		
★	25	8.00	**A-7-6 (19) CLAY**	**45.3**	**19.5**	**25.8**		
⊙	25	12.50	**A-7-6 (28) CLAY**	**49.8**	**19.2**	**30.6**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	24	2.50	**25**	**0.012**	**0.002**		**9.5**	**6.5**	**52.3**	**31.7**
⊠	24	7.50	**12.7**	**0.008**	**0.001**		**1.4**	**3.9**	**59.3**	**35.4**
▲	25	7.50	**25**	**0.007**			**4.0**	**11.3**	**39.9**	**44.9**
★	25	8.00	**19**	**0.017**	**0.001**		**13.3**	**11.1**	**40.6**	**35.0**
⊙	25	12.50	**19**	**0.006**			**5.2**	**8.5**	**41.9**	**44.3**

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

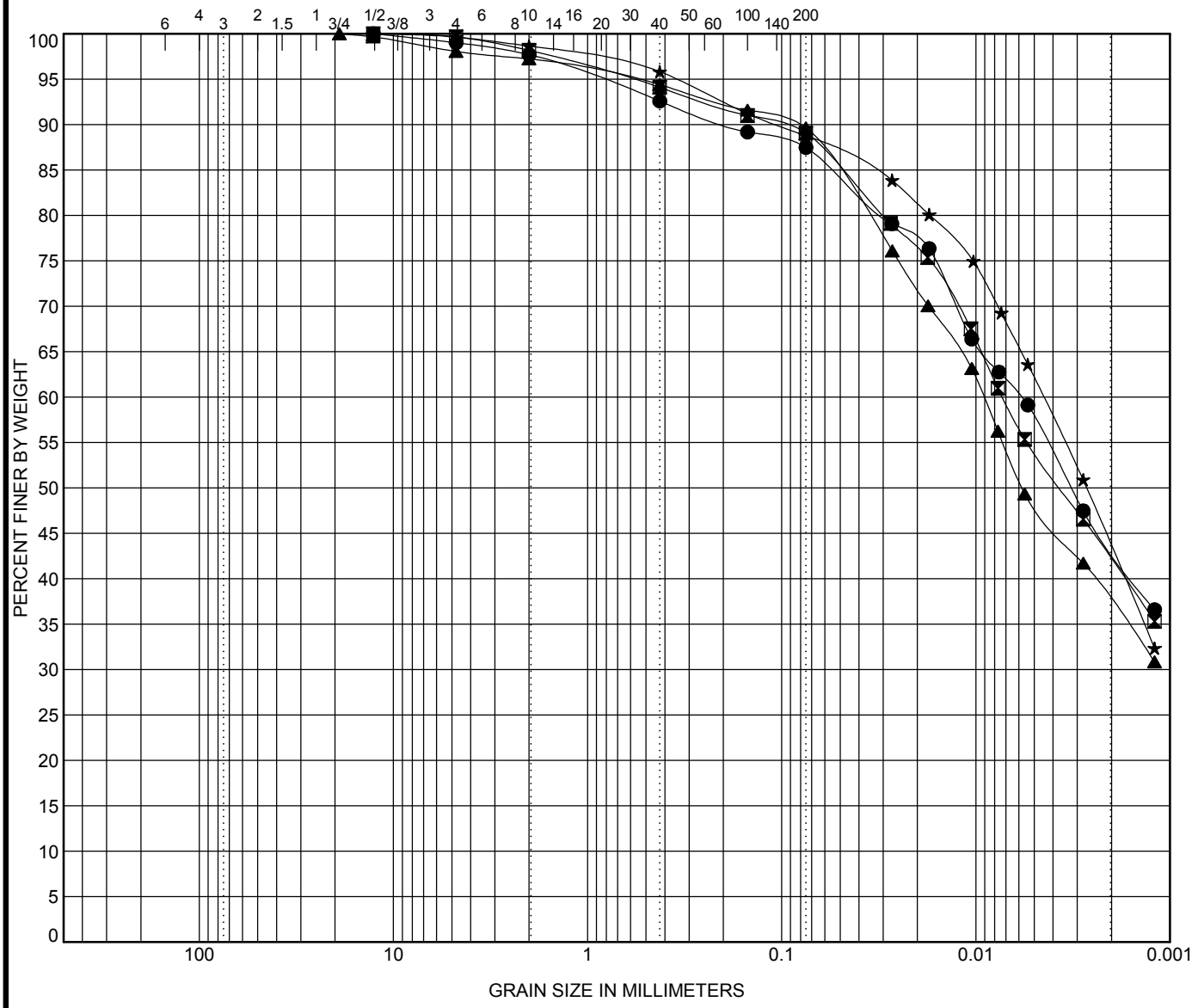
IDH GRAIN SIZE DISTRIBUTION

Route: FA 46 (IL 251)

Section: (1)I

County: LaSalle

GRAIN SIZE IDH 3-18-11 IL 251 NBL SLIDE.GPJ IL_DOT.GDT 4/2/18



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	25	12.51	**A-7-6 (23) CLAY**	**44.9**	**18.7**	**26.2**		
⊠	25	15.50	**A-7-6 (21) CLAY**	**43.2**	**19.8**	**23.4**		
▲	25	23.00	**A-6 (15) SILTY CLAY**	**35.3**	**18.4**	**16.9**		
★	25	26.00	**A-7-6 (24) CLAY**	**51.2**	**27.1**	**24.1**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	25	12.51	**12.7**	**0.006**			**2.3**	**10.2**	**44.3**	**43.2**
⊠	25	15.50	**12.7**	**0.007**			**1.8**	**9.1**	**47.0**	**42.1**
▲	25	23.00	**19**	**0.009**			**2.8**	**7.6**	**52.2**	**37.4**
★	25	26.00	**12.7**	**0.004**			**1.4**	**9.9**	**45.2**	**43.5**

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

IDH GRAIN SIZE DISTRIBUTION

Route: FA 46 (IL 251)

Section: (1)I

County: LaSalle

GRAIN_SIZE_IDH_3-18-11_IL_251_NBL_SLIDE.GPJ_IL_DOT.GDT_4/2/18

Source of Material	**25 7.50**
Description of Material	**Medium Brown**
	A-7-6 (25) CLAY
Test Method	**ASTM D1557 Method A**

TEST RESULTS

Standard Dry Density	**107.2 pcf**
Optimum Water Content	**16.7 %**

ATTERBERG LIMITS

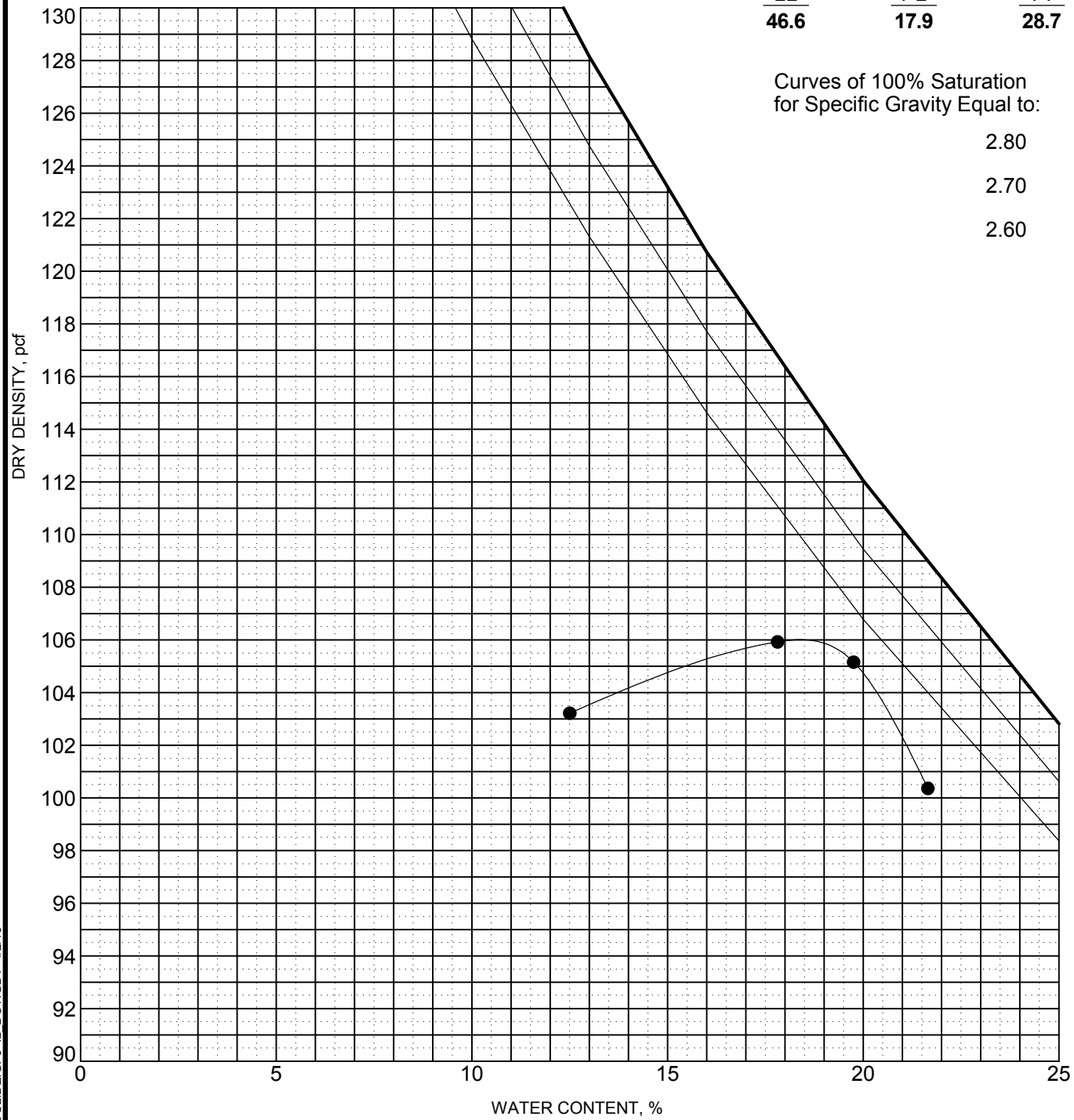
LL	PL	PI
46.6	**17.9**	**28.7**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60



Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

MOISTURE-DENSITY RELATIONSHIP

Route: FA 46 (IL 251)

Section: (1)I

County: LaSalle

COMPACTION IL 251 NBL SLIDE.GPJ IL_DOT.GDT 4/2/18

Source of Material	**25 12.50**
Description of Material	**Medium Gray**
	A-7-6 (28) CLAY
Test Method	**ASTM D1557 Method A**

TEST RESULTS

Standard Dry Density	**100.1 pcf**
Optimum Water Content	**18.3 %**

ATTERBERG LIMITS

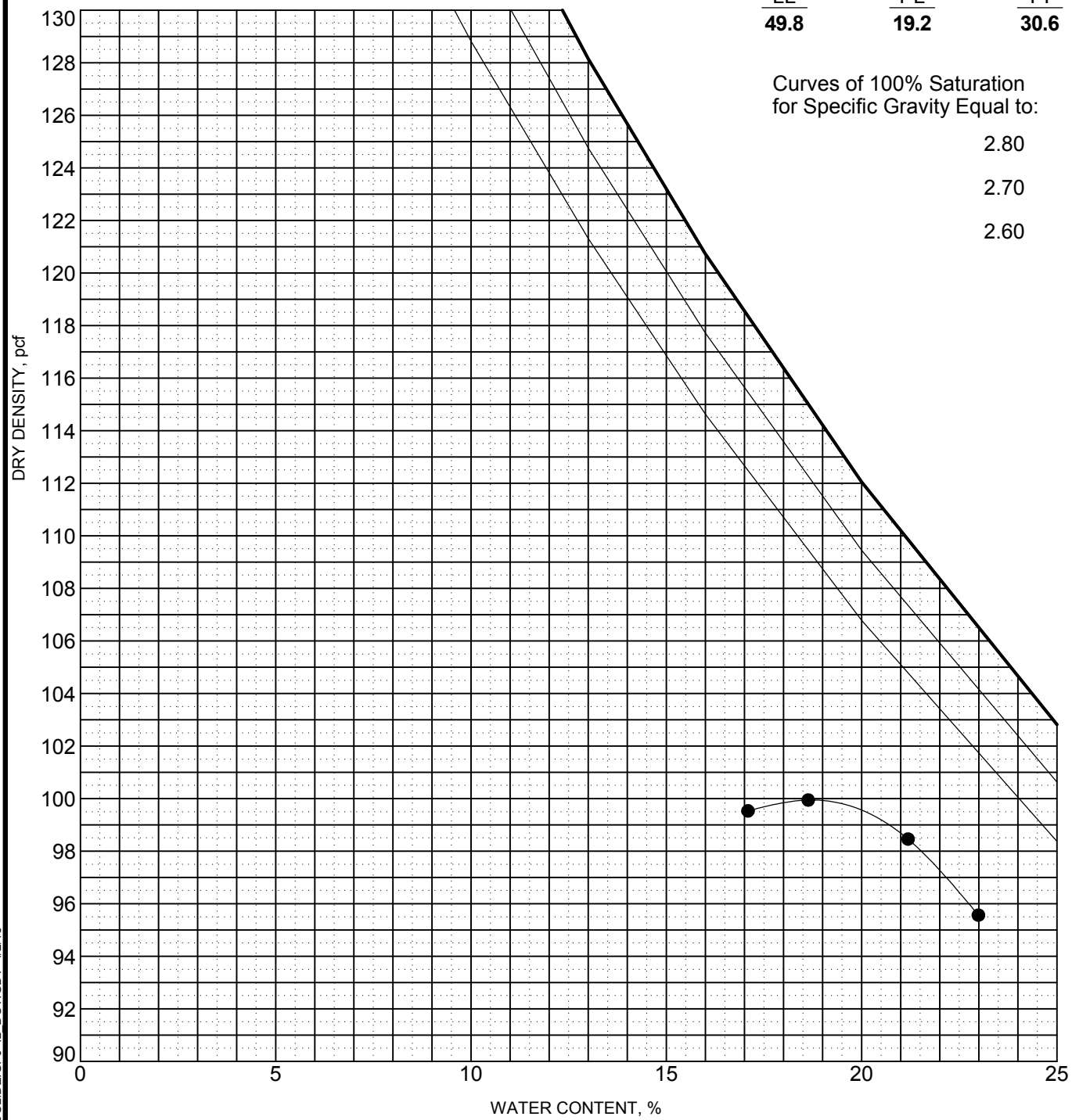
LL	PL	PI
49.8	**19.2**	**30.6**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60



Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

MOISTURE-DENSITY RELATIONSHIP

Route: FA 46 (IL 251)

Section: (1)I

County: LaSalle

COMPACTION IL 251 NBL SLIDE.GPJ IL_DOT.GDT 4/2/18

APPENDIX

I-2

Illinois Department of Transportation

Memorandum

To:	Kevin Marchek	Attn: Michael Short
From:	Brian A. Pfeifer	By: Daniel Tobias
Subject:	Shelby Tube Test Results	
Date:	May 16, 2018	

Route: FA 46 (IL 251)
Section: (1)I
County: LaSalle
Job No.: D-93-020-16
BMPR Lab No.: 17003
SN: N/A

The Central Bureau of Materials (CBM) Geotechnical Sub-unit has conducted laboratory testing, as requested by District 3 for the above referenced project around Station 162+90, 30.5 ft. LT. The laboratory test results for Boring ST-01 are presented in Attachment A on the Shelby Tube Test Results forms.

If you have any questions or need further assistance, please contact Heather Shoup at (217)785-9972 or Kurt Schmuck at (217)782-0870 of the CBM Geotechnical Sub-Unit.

cc: Heather Shoup
Kurt Shmuck

Attachments

Illinois Department of Transportation

Shelby Tube Test Results

Boring No.:	ST-01	Route:	FA 46 (IL 251)	Tube Length/Diameter:	30-in. / 3-in.	Page:	1	of	3
Station:	162+90	Section:	(1) I	Ground Surface Elev.:	596.0	Date:	6/27/2017		
Offset:	30.5 ft. Lt.	County:	LaSalle	Begin Sampling Depth:	591.0	Job No.:	D-93-020-16		
Latitude:	41.334514	Structure No.:	n/a	Ground Water Elev.:	571.0	Soils Lab Project No.:	17003		
Longitude:	-89.119934	Contract No.:	66F12	Drilled by:	L. Myers	Prepared by:	Kurt Schmuck		

Sample No.	Depth (ft)	Elev. (ft)	Qu (tsf)	Moist. (%)	Unit Wt. (pcf)	c (psf)	Φ (deg)	c' (psf)	Φ' (deg)	Soil Type, Description and Observations
	0.0	596.0								NOT SAMPLED
		---								↓
		---								↓
	5.0	591.0								↓
1-1	5.6	590.4	0.57	31.6	122.4	---	---	---	---	Gray-Brown & Black Silty-Clay w/ Silty-Loam pockets
1-2	6.2	589.8	UUTx	30.9	119.6	772	0.8	779	1.2	Gray Silty-Clay w/ Silty-Loam pockets & small stones, top ¾, to Brown Silty-Clay
1-3	6.9	589.1	---	---	---	---	---	---	---	NO RECOVERY
1-4	7.5	588.5	---	---	---	---	---	---	---	NO RECOVERY
2-1	8.1	587.9	1.04	23.3	123.4	---	---	---	---	Black Silty-Clay to Gray & Brown Silty-Clay
2-2	8.8	587.2	UUTx	21.6	128.5	1130	3.9	1146	5.8	Gray Silty-Clay w/ SiL pockets to Red-Brown shaley SiC – large rock bottom ½
2-3	9.4	586.6	---	---	---	---	---	---	---	NO RECOVERY
2-4	10.0	586.0	---	---	---	---	---	---	---	NO RECOVERY
3-1	10.3	585.7	---	18.5	119.5	---	---	---	---	Gray & Brown Silty-Clay w/ Silty-Loam pockets & small stones
3-2	10.9	585.1	UUTx	17.0	131.7	1430	5.5	1469	6.9	Gray shaley Silty-Clay w/Silty-Loam pockets & small stones - large rock, center
3-3	11.2	584.8	---	---	---	---	---	---	---	NO RECOVERY
3-4	12.5	583.5	---	---	---	---	---	---	---	NO RECOVERY
4-1	13.1	582.9	---	23.4	---	---	---	---	---	Gray Silty-Clay w/ small stones - coal pockets & debris – large rock
4-2	13.8	582.2	UUTx	22.0	125.0	1584	3.6	1627	4.2	Gray Silty-Clay w/ small stones & coal debris
4-3	14.4	581.6	1.55	25.1	120.5	---	---	---	---	Gray Silty-Clay w/ Silty-Loam pockets – small stones & coal debris
4-4	15.0	581.0	---	---	---	---	---	---	---	NO RECOVERY
5-1	15.2	580.8	---	15.8	115.3	---	---	---	---	Gray shaley Silty-Clay w/ small stones – Silty-Loam pockets & coal debris
5-2	15.9	580.1	UUTx	17.9	129.2	1829	3.9	1872	4.6	Gray Silty-Clay w/ numerous stones & isolated coal debris
5-3	16.5	579.5	---	---	---	---	---	---	---	NO RECOVERY

The Unit Wt. column represents the Moist Unit Weight.
The Qu column represents the Unconfined Compressive Strength using AASHTO T 208.
The c and Φ column represents cohesion and friction angle for total stress using AASHTO T 296 (unconsolidated-undrained triaxial testing).
The c' and Φ' column represents cohesion and friction angle for effective stress using either AASHTO T 297 (consolidated-undrained triaxial testing), or AASHTO T 296 with pore pressure measurement.

Illinois Department of Transportation

Shelby Tube Test Results

Boring No.:	ST-01	Route:	FA 46 (IL 251)	Tube Length/Diameter:	30-in. / 3-in.	Page:	2	of	3
Station:	162+90	Section:	(1) I	Ground Surface Elev.:	596.0	Date:	6/27/2017		
Offset:	30.5 ft. Lt.	County:	LaSalle	Begin Sampling Depth:	591.0	Job No.:	D-93-020-16		
Latitude:	41.334514	Structure No.:	n/a	Ground Water Elev.:	571.0	Soils Lab Project No.:	17003		
Longitude:	-89.119934	Contract No.:	66F12	Drilled by:	L. Myers	Prepared by:	Kurt Schmuck		

Sample No.	Depth (ft)	Elev. (ft)	Qu (tsf)	Moist. (%)	Unit Wt. (pcf)	c (psf)	Φ (deg)	c' (psf)	Φ' (deg)	Soil Type, Description and Observations
5-4	17.5	578.5	---	---	---	---	---	---	---	NO RECOVERY
↓	18.1	577.9								NOT SAMPLED - ROCKS
↓	18.8	577.2								↓
↓	19.4	576.6								↓
↓	20.0	576.0								↓
6-1	20.6	575.4	---	24.8	---	---	---	---	---	Gray Silty-Clay w/ Silty-Loam pockets & oxidized areas – sheet metal debris
6-2	21.2	574.8	UUTx	24.6	122.9	1356	3.0	1359	4.8	Gray Silty-Clay w/ Silty-Loam pockets & small stones
6-3	21.9	574.1	---	---	---	---	---	---	---	NO RECOVERY
6-4	22.5	573.5	---	---	---	---	---	---	---	NO RECOVERY
7-1	23.1	572.9	1.09	23.3	126.9	---	---	---	---	Gray-Brown Silty-Clay w/ small & large stones – tile, shale & coal debris
7-2	23.8	572.2	UUTx	22.2	128.9	1192	2.0	1192	3.5	Reddish-Gray Silty-Clay w/ Silty-Loam pockets & small stones
7-3	24.4	571.6	---	21.3	132.5	---	---	---	---	Gray Silty-Clay w/ large rock
7-4	25.0	571.0	---	---	---	---	---	---	---	NO RECOVERY
8-1	25.4	570.6	---	26.6	120.7	---	---	---	---	Gray Silty-Clay w/ Silty-Loam pockets & coal debris
8-2	26.0	570.0	UUTx	21.8	131.5	719	3.3	629	12.3	Gray Silty-Clay – soft, w/ Sandy-Loam pockets – organic seam bottom
8-3	26.7	569.3	---	---	---	---	---	---	---	NO RECOVERY
8-4	27.5	568.5	---	---	---	---	---	---	---	NO RECOVERY
9-1	28.1	567.9	0.65	26.7	115.1	---	---	---	---	Gray Silty-Clay w/ SiL pockets & quartz crystals – organic layer w/ coal, top ¼
9-2	28.8	567.2	UUTx	22.0	124.7	1944	7.5	2030	7.7	Gray Silty-Clay w/ SiL pockets & quartz crystals – crumbly & slickensided
9-3	29.4	566.6	0.94	24.7	123.7	---	---	---	---	Same
9-4	30.0	566.0	---	---	---	---	---	---	---	NO RECOVERY
10-1	30.6	565.4	0.76	26.8	120.9	---	---	---	---	Gray Silty-Clay w/ isolated quartz crystals – crumbly & slickensided
10-2	31.2	564.8	UUTx	23.1	123.3	1584	0.0	1584	0.0	Same

The Unit Wt. column represents the Moist Unit Weight.
The Qu column represents the Unconfined Compressive Strength using AASHTO T 208.
The c and Φ column represents cohesion and friction angle for total stress using AASHTO T 296 (unconsolidated-undrained triaxial testing).
The c' and Φ' column represents cohesion and friction angle for effective stress using either AASHTO T 297 (consolidated-undrained triaxial testing), or AASHTO T 296 with pore pressure measurement.

Illinois Department of Transportation

Shelby Tube Test Results

Boring No.:	ST-01	Route:	FA 46 (IL 251)	Tube Length/Diameter:	30-in. / 3-in.	Page:	3 of 3
Station:	162+90	Section:	(1) I	Ground Surface Elev.:	596.0	Date:	6/27/2017
Offset:	30.5 ft. Lt.	County:	LaSalle	Begin Sampling Depth:	591.0	Job No.:	D-93-020-16
Latitude:	41.334514	Structure No.:	n/a	Ground Water Elev.:	571.0	Soils Lab Project No.:	17003
Longitude:	-89.119934	Contract No.:	66F12	Drilled by:	L. Myers	Prepared by:	Kurt Schmuck

Sample No.	Depth (ft)	Elev. (ft)	Qu (tsf)	Moist. (%)	Unit Wt. (pcf)	c (psf)	Φ (deg)	c' (psf)	Φ' (deg)	Soil Type, Description and Observations
10-3	31.9	564.1	1.34	22.8	126.4	---	---	---	---	Gray Silty-Clay w/ SiL pockets – isolated rocks – crumbly w/ slickensided areas
10-4	32.5	563.5	---	---	---	---	---	---	---	NO RECOVERY
										END OF BORING

The Unit Wt. column represents the Moist Unit Weight.
The Qu column represents the Unconfined Compressive Strength using AASHTO T 208.
The c and Φ column represents cohesion and friction angle for total stress using AASHTO T 296 (unconsolidated-undrained triaxial testing).
The c' and Φ' column represents cohesion and friction angle for effective stress using either AASHTO T 297 (consolidated-undrained triaxial testing), or AASHTO T 296 with pore pressure measurement.

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-1, ST#1, 8 to 10 feet**	**Test date:**	**October 18, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	6.01 in	Tare mass:	13.91 g
Initial sample diameter:	2.86 in	Measured sample mass w/out Tare:	1284.36 g
Initial sample mass:	1284.36 g	Tare and final sample mass:	1302.98 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	1050.29 g
Dry sample mass:	1036.38 g		
Final sample mass:	1289.07 g	Saturation (B) coefficient:	99%
Initial water content:	23.93% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	126.89 pcf	Volume change during consolidation:	0.96 in^3
Initial dry unit weight:	102.39 pcf	Void ratio after consolidation:	0.652
Initial void ratio:	0.694	Dry unit weight after consolidation:	105.01 pcf
Initial saturation:	95.8%	Height after consolidation:	5.96 in
Final water content:	24.38% (specimen)	Volume after consolidation:	37.60 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.31 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	34.24 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	13.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	2016.52 psi
		Strain @ 50%:	0.40 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	13.0	13.0	13.00	0.00	13.00	13.00	1.00
0.01	21.838	1.3	0.10	3.5	16.5	15.1	11.67	1.73	13.39	14.73	1.30
0.01	36.365	2.6	0.20	5.7	18.7	16.1	10.38	2.87	13.25	15.87	1.55
0.02	44.686	3.4	0.30	7.1	20.1	16.7	9.63	3.53	13.16	16.53	1.73
0.02	51.093	3.9	0.40	8.1	21.1	17.2	9.12	4.03	13.15	17.03	1.88
0.03	56.080	4.3	0.50	8.8	21.8	17.6	8.74	4.42	13.16	17.42	2.01
0.04	60.179	4.5	0.60	9.5	22.5	17.9	8.46	4.74	13.20	17.74	2.12
0.04	63.795	4.8	0.70	10.0	23.0	18.3	8.23	5.02	13.25	18.02	2.22
0.05	67.142	4.9	0.80	10.6	23.6	18.6	8.06	5.28	13.34	18.28	2.31
0.05	69.881	5.1	0.90	11.0	24.0	18.9	7.90	5.49	13.38	18.49	2.39
0.06	72.599	5.2	1.00	11.4	24.4	19.2	7.78	5.69	13.47	18.69	2.46
0.09	82.605	5.5	1.50	12.9	25.9	20.4	7.51	6.45	13.95	19.45	2.72
0.12	89.667	5.5	2.00	13.9	26.9	21.4	7.47	6.96	14.43	19.96	2.86
0.15	95.029	5.5	2.50	14.7	27.7	22.2	7.55	7.34	14.89	20.34	2.94
0.18	99.376	5.3	3.00	15.3	28.3	22.9	7.65	7.64	15.29	20.64	3.00
0.21	102.776	5.2	3.50	15.7	28.7	23.5	7.80	7.86	15.66	20.86	3.01
0.24	105.579	5.0	4.00	16.1	29.1	24.0	7.97	8.03	16.00	21.03	3.02
0.27	107.828	4.8	4.50	16.3	29.3	24.5	8.16	8.16	16.32	21.16	3.00
0.30	109.634	4.6	5.00	16.5	29.5	24.9	8.37	8.25	16.62	21.25	2.97
0.33	110.869	4.5	5.50	16.6	29.6	25.1	8.51	8.30	16.81	21.30	2.95
0.36	111.869	4.3	6.00	16.7	29.7	25.3	8.65	8.33	16.98	21.33	2.92
0.39	112.580	4.2	6.50	16.7	29.7	25.5	8.85	8.34	17.19	21.34	2.88
0.42	113.256	4.0	7.00	16.7	29.7	25.7	9.00	8.34	17.34	21.34	2.85
0.45	113.668	3.8	7.50	16.7	29.7	25.8	9.15	8.33	17.48	21.33	2.82
0.48	114.155	3.7	8.00	16.6	29.6	25.9	9.28	8.32	17.60	21.32	2.79
0.51	114.793	3.6	8.50	16.6	29.6	26.0	9.41	8.32	17.73	21.32	2.77
0.54	115.925	3.5	9.00	16.7	29.7	26.2	9.49	8.36	17.85	21.36	2.76
0.57	118.169	3.4	9.50	16.9	29.9	26.5	9.57	8.47	18.04	21.47	2.77
0.60	120.253	3.3	10.00	17.1	30.1	26.8	9.66	8.57	18.23	21.57	2.78
0.66	120.608	3.2	11.00	17.0	30.0	26.8	9.77	8.50	18.27	21.50	2.74
0.72	117.262	3.1	12.00	16.3	29.3	26.3	9.94	8.17	18.11	21.17	2.65
0.78	115.479	2.9	13.00	15.9	28.9	26.0	10.10	7.96	18.06	20.96	2.58
0.84	117.992	2.8	14.00	16.1	29.1	26.3	10.19	8.04	18.23	21.04	2.58
0.87	119.257	2.8	14.50	16.2	29.2	26.3	10.15	8.08	18.23	21.08	2.59

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

Prepared by: _____ Date: _____

Checked by: _____ Date: _____

AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-1, ST#1, 8 to 10 feet**	**Test date:**	**October 18, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	5.94 in	Tare mass:	14.12 g
Initial sample diameter:	2.86 in	Measured sample mass w/out Tare:	1261.24 g
Initial sample mass:	1261.24 g	Tare and final sample mass:	1267.15 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	1038.06 g
Dry sample mass:	1023.94 g		
Final sample mass:	1253.03 g	Saturation (B) coefficient:	99%
Initial water content:	23.18% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	125.58 pcf	Volume change during consolidation:	1.83 in^3
Initial dry unit weight:	101.96 pcf	Void ratio after consolidation:	0.620
Initial void ratio:	0.701	Dry unit weight after consolidation:	107.08 pcf
Initial saturation:	91.9%	Height after consolidation:	5.85 in
Final water content:	22.37% (specimen)	Volume after consolidation:	36.43 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.23 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	40.01 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	26.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	2722.82 psi
		Strain @ 50%:	0.50 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	26.0	26.0	26.00	0.00	26.00	26.00	1.00
0.01	37.697	2.7	0.10	6.0	32.0	29.4	23.32	3.02	26.34	29.02	1.26
0.01	59.109	5.0	0.20	9.5	35.5	30.5	20.99	4.74	25.72	30.74	1.45
0.02	70.598	6.5	0.30	11.3	37.3	30.8	19.52	5.65	25.17	31.65	1.58
0.02	78.554	7.5	0.40	12.6	38.6	31.1	18.51	6.28	24.79	32.28	1.68
0.03	85.258	8.4	0.50	13.6	39.6	31.3	17.64	6.81	24.45	32.81	1.77
0.04	91.400	9.1	0.60	14.6	40.6	31.5	16.91	7.29	24.20	33.29	1.86
0.04	96.667	9.7	0.70	15.4	41.4	31.7	16.26	7.71	23.97	33.71	1.95
0.05	101.226	10.2	0.80	16.1	42.1	31.9	15.77	8.06	23.83	34.06	2.02
0.05	105.235	10.7	0.90	16.7	42.7	32.1	15.31	8.37	23.68	34.37	2.09
0.06	108.764	11.0	1.00	17.3	43.3	32.2	14.96	8.64	23.60	34.64	2.16
0.09	122.961	12.3	1.50	19.4	45.4	33.1	13.65	9.72	23.37	35.72	2.42
0.12	132.657	13.0	2.00	20.9	46.9	33.9	12.98	10.44	23.42	36.44	2.61
0.15	140.216	13.3	2.50	21.9	47.9	34.6	12.68	10.97	23.66	36.97	2.73
0.18	146.104	13.5	3.00	22.8	48.8	35.3	12.53	11.38	23.90	37.38	2.82
0.21	150.867	13.5	3.50	23.4	49.4	35.9	12.49	11.69	24.18	37.69	2.87
0.24	154.867	13.4	4.00	23.9	49.9	36.4	12.57	11.93	24.50	37.93	2.90
0.27	158.146	13.4	4.50	24.2	50.2	36.9	12.65	12.12	24.77	38.12	2.92
0.30	161.500	13.3	5.00	24.6	50.6	37.4	12.73	12.32	25.05	38.32	2.93
0.33	164.265	13.1	5.50	24.9	50.9	37.8	12.90	12.46	25.36	38.46	2.93
0.36	166.991	13.0	6.00	25.2	51.2	38.2	13.04	12.60	25.64	38.60	2.93
0.39	169.293	12.8	6.50	25.4	51.4	38.6	13.16	12.71	25.87	38.71	2.93
0.42	171.460	12.7	7.00	25.6	51.6	38.9	13.31	12.80	26.11	38.80	2.92
0.45	173.280	12.6	7.50	25.7	51.7	39.1	13.40	12.87	26.26	38.87	2.92
0.48	175.273	12.4	8.00	25.9	51.9	39.5	13.57	12.94	26.52	38.94	2.91
0.51	177.061	12.3	8.50	26.0	52.0	39.7	13.67	13.00	26.68	39.00	2.90
0.53	178.451	12.2	9.00	26.1	52.1	39.9	13.79	13.04	26.83	39.04	2.89
0.56	181.083	12.0	9.50	26.3	52.3	40.3	14.01	13.15	27.16	39.15	2.88
0.59	182.847	11.9	10.00	26.4	52.4	40.5	14.10	13.21	27.31	39.21	2.87
0.65	185.356	11.7	11.00	26.5	52.5	40.7	14.26	13.24	27.50	39.24	2.86
0.71	187.347	11.5	12.00	26.5	52.5	40.9	14.46	13.23	27.69	39.23	2.83
0.77	190.377	11.4	13.00	26.6	52.6	41.2	14.57	13.29	27.86	39.29	2.82
0.83	191.816	11.3	14.00	26.5	52.5	41.2	14.74	13.24	27.98	39.24	2.80
0.86	193.601	11.2	14.50	26.6	52.6	41.4	14.81	13.29	28.10	39.29	2.79

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

Prepared by: _____ Date: _____

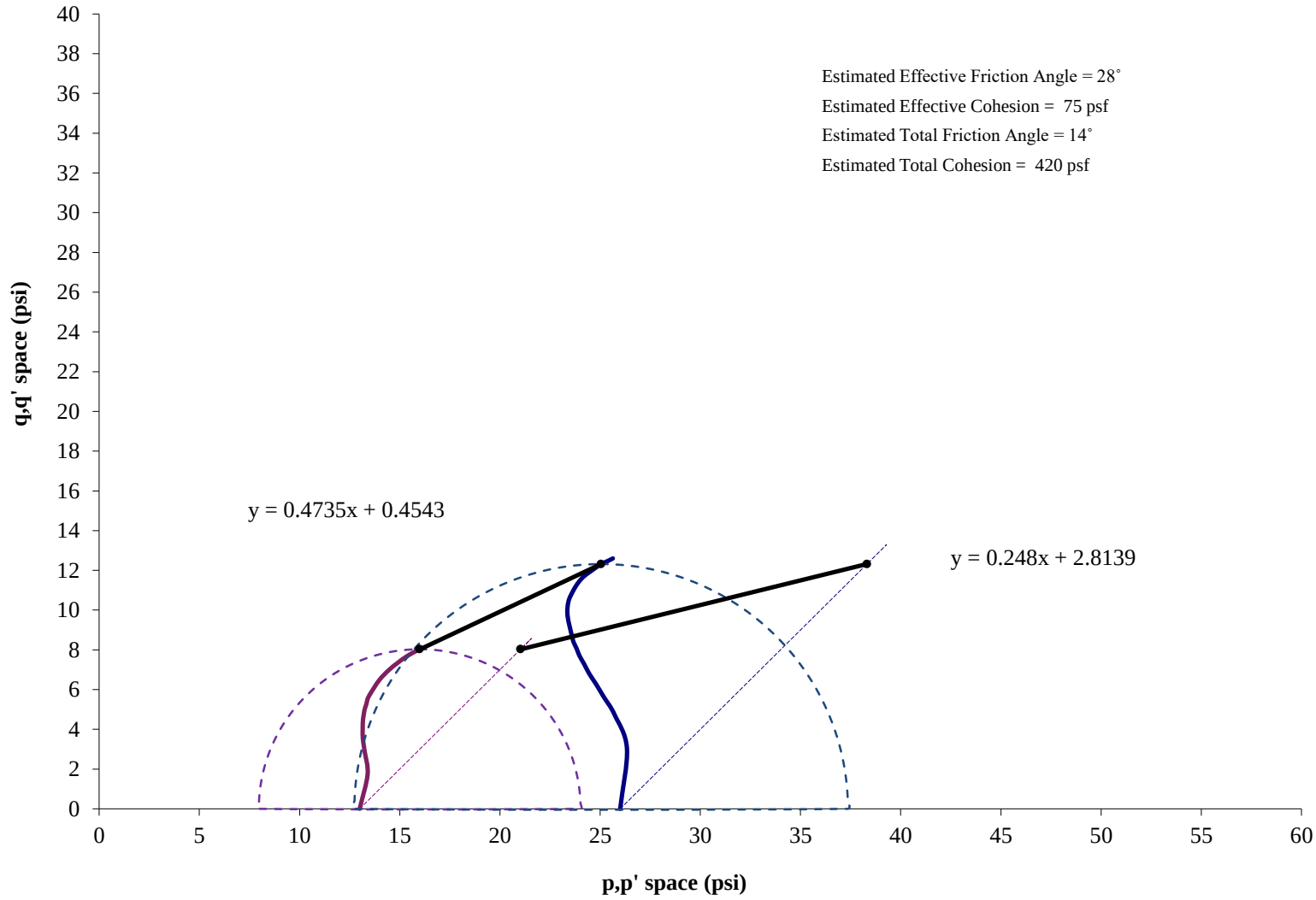
Checked by: _____ Date: _____

AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

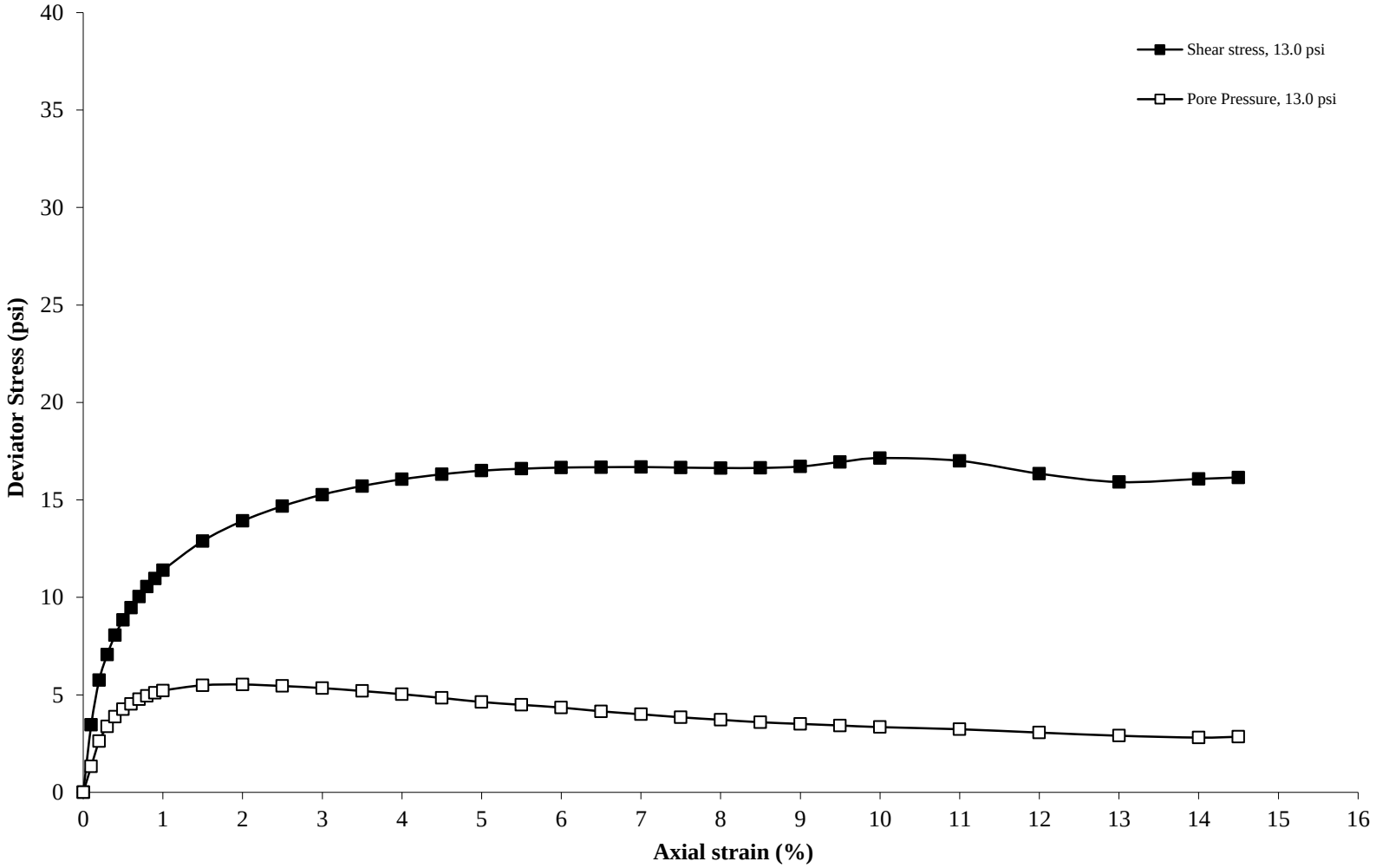
Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)
Max Effective Stress Ratio, Sample I-1, ST#1, 8' to 10'



AASHTO R18

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#1, 8' to 10': Stress v. Strain and Pore Pressure v. Strain Curves
13.0 psi Confining Pressure

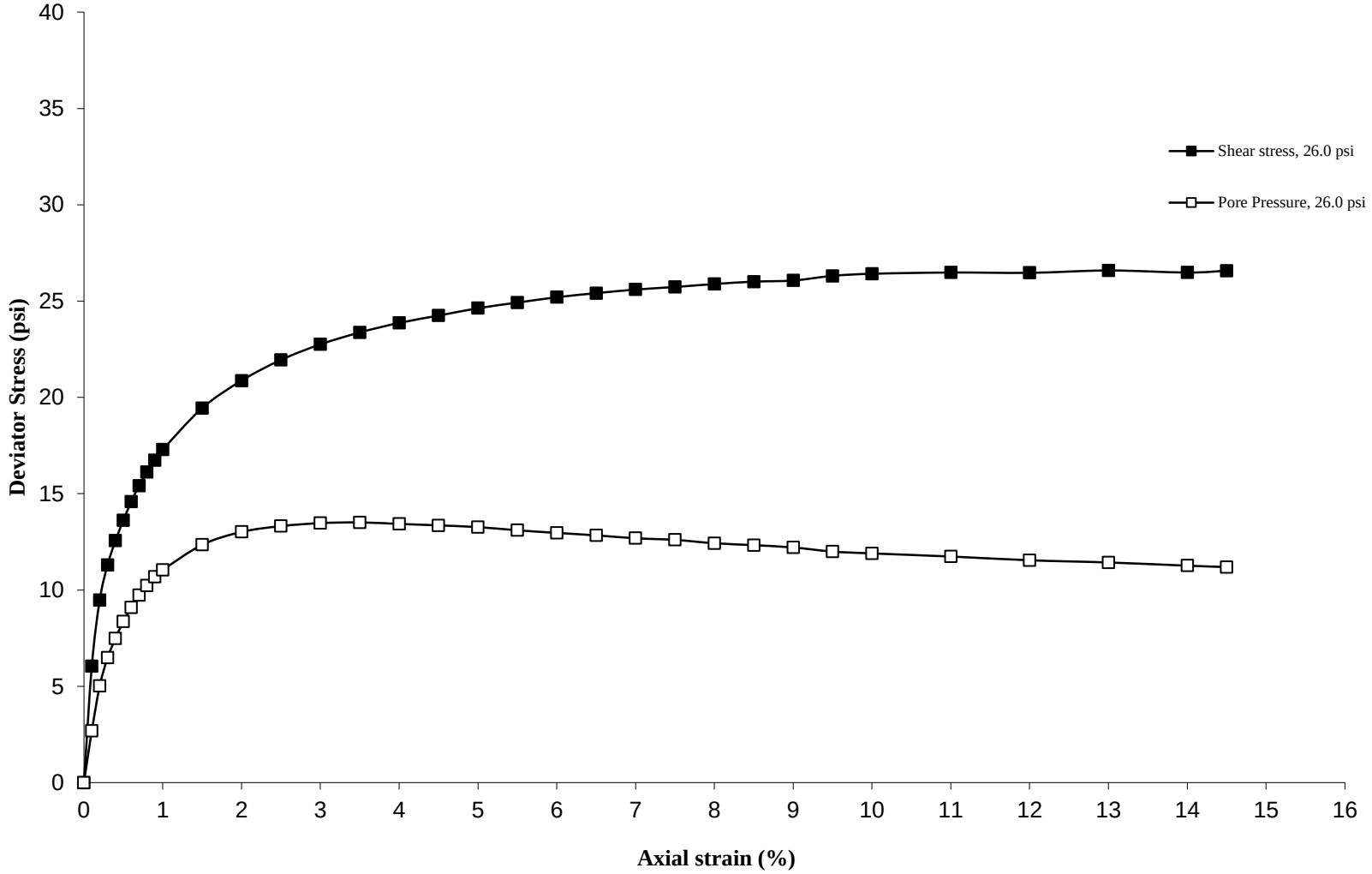


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#1, 8' to 10': Stress v. Strain and Pore Pressure v. Strain Curves
26.0 psi Confining Pressure

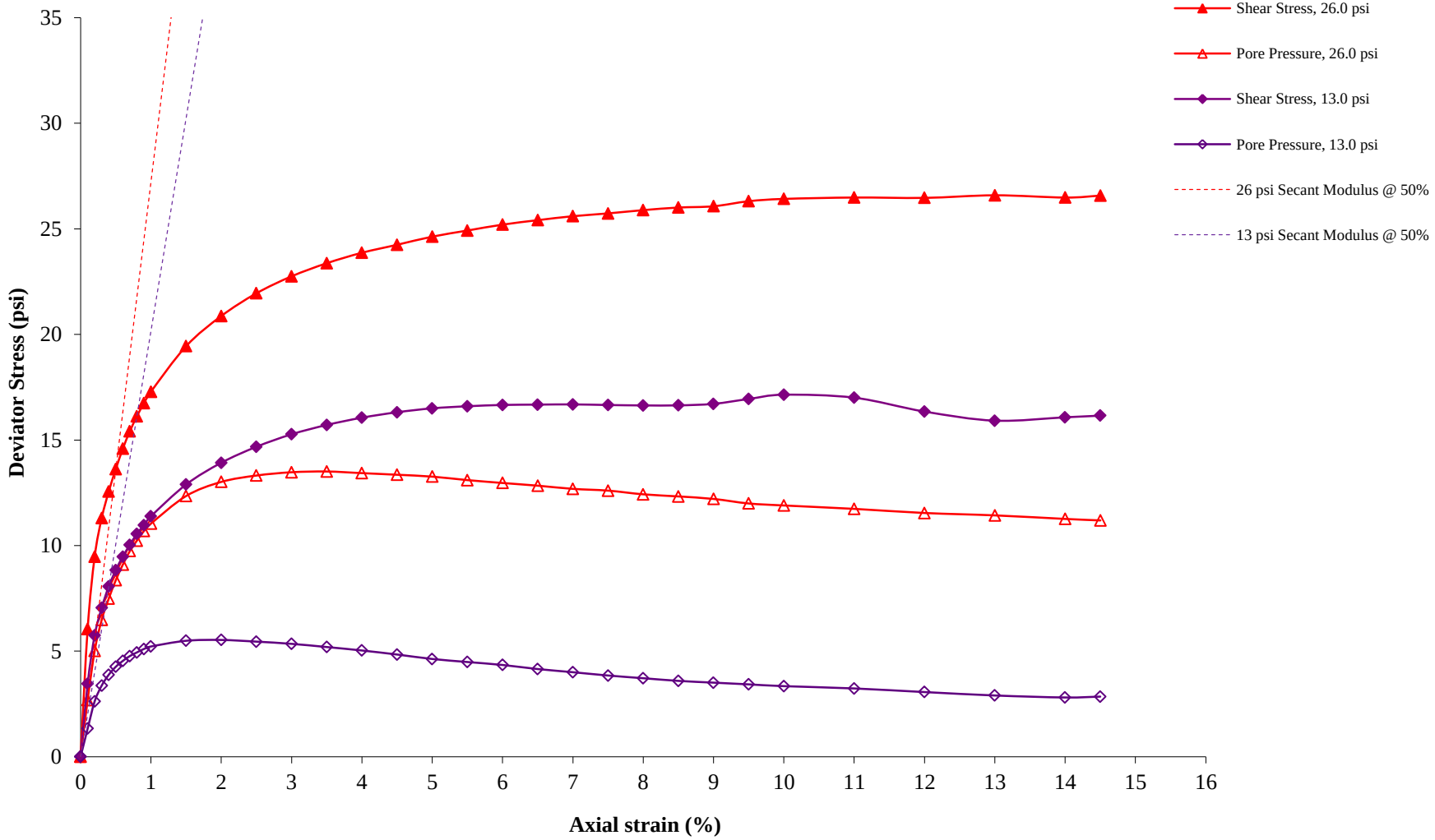


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#1, 8' to 10': Stress v. Strain and Pore Pressure v. Strain Curves
All Confining Pressures

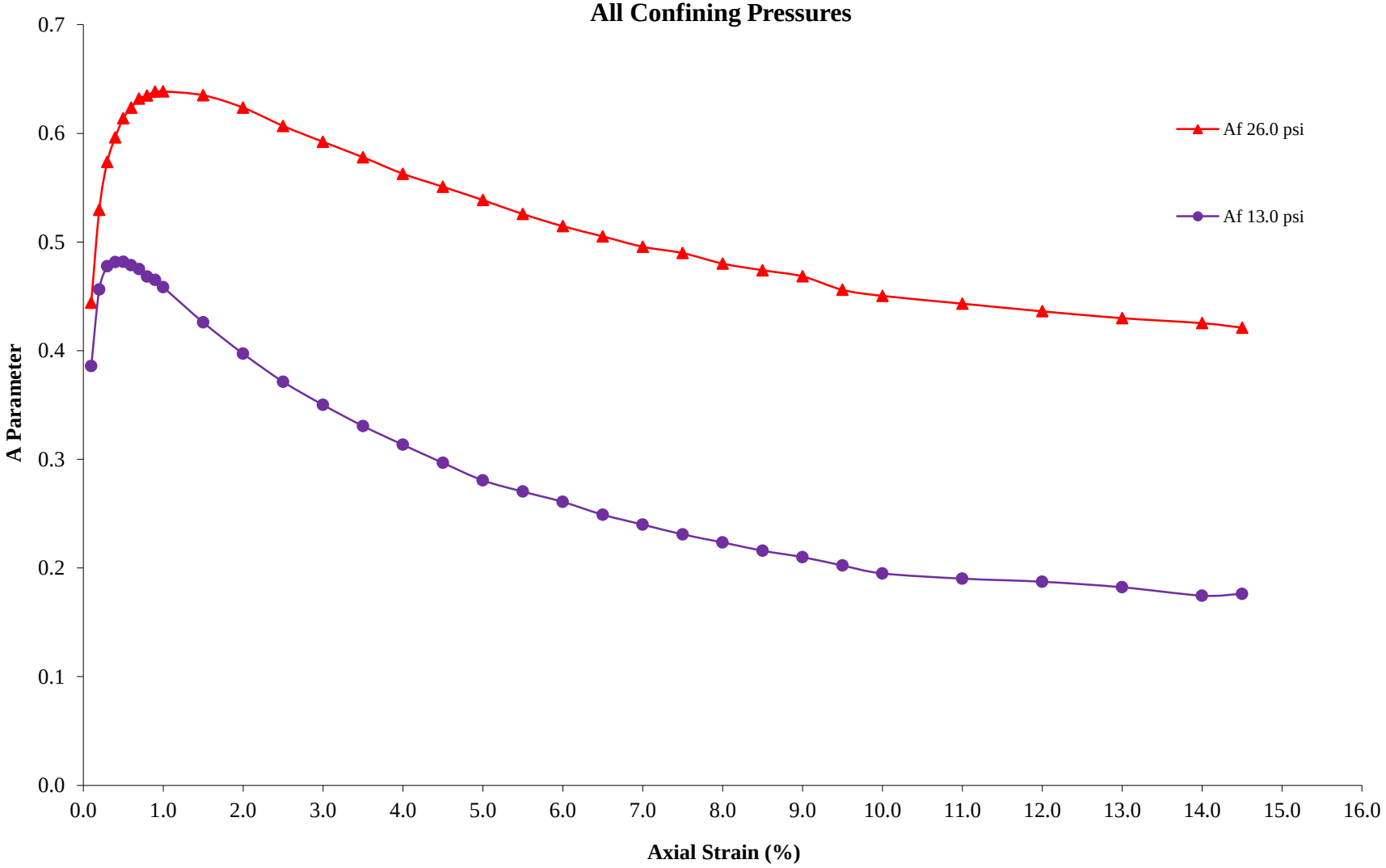


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#1, 8' to 10': A-Parameter During Shearing
All Confining Pressures



AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-1, ST#2, 10 to 12 feet**	**Test date:**	**November 10, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	5.78 in	Tare mass:	13.40 g
Initial sample diameter:	2.86 in	Measured sample mass w/out Tare:	1316.24 g
Initial sample mass:	1316.24 g	Tare and final sample mass:	1347.52 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	1143.48 g
Dry sample mass:	1130.08 g		
Final sample mass:	1334.12 g	Saturation (B) coefficient:	99%
Initial water content:	16.47% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	134.73 pcf	Volume change during consolidation:	0.38 in^3
Initial dry unit weight:	115.67 pcf	Void ratio after consolidation:	0.484
Initial void ratio:	0.500	Dry unit weight after consolidation:	116.88 pcf
Initial saturation:	91.6%	Height after consolidation:	5.76 in
Final water content:	18.06% (specimen)	Volume after consolidation:	36.84 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.40 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	18.15 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	7.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	990.22 psi
		Strain @ 50%:	1.00 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	7.0	7.0	7.00	0.00	7.00	7.00	1.00
0.01	25.055	1.3	0.10	3.9	10.9	9.6	5.72	1.96	7.68	8.96	1.68
0.01	33.558	1.9	0.20	5.2	12.2	10.3	5.09	2.62	7.71	9.62	2.03
0.02	39.608	2.3	0.30	6.2	13.2	10.9	4.75	3.09	7.83	10.09	2.30
0.02	44.454	2.5	0.40	6.9	13.9	11.4	4.47	3.46	7.93	10.46	2.55
0.03	48.403	2.7	0.50	7.5	14.5	11.9	4.32	3.76	8.09	10.76	2.74
0.03	52.049	2.8	0.60	8.1	15.1	12.3	4.18	4.04	8.22	11.04	2.93
0.04	55.569	2.9	0.70	8.6	15.6	12.7	4.11	4.31	8.43	11.31	3.10
0.05	58.706	3.0	0.80	9.1	16.1	13.1	4.02	4.55	8.57	11.55	3.27
0.05	61.448	3.1	0.90	9.5	16.5	13.5	3.95	4.76	8.70	11.76	3.41
0.06	64.015	3.0	1.00	9.9	16.9	13.9	3.95	4.95	8.90	11.95	3.51
0.09	75.237	3.0	1.50	11.6	18.6	15.5	3.96	5.79	9.76	12.79	3.92
0.12	84.080	2.9	2.00	12.9	19.9	17.0	4.13	6.44	10.57	13.44	4.12
0.14	91.502	2.6	2.50	13.9	20.9	18.4	4.41	6.97	11.38	13.97	4.16
0.17	97.374	2.3	3.00	14.8	21.8	19.4	4.67	7.38	12.05	14.38	4.16
0.20	102.061	2.0	3.50	15.4	22.4	20.4	4.97	7.70	12.66	14.70	4.10
0.23	106.092	1.8	4.00	15.9	22.9	21.1	5.17	7.96	13.13	14.96	4.08
0.26	109.800	1.6	4.50	16.4	23.4	21.8	5.42	8.19	13.61	15.19	4.02
0.29	113.560	1.4	5.00	16.9	23.9	22.5	5.61	8.43	14.04	15.43	4.00
0.32	116.702	1.1	5.50	17.2	24.2	23.1	5.86	8.62	14.48	15.62	3.94
0.35	119.768	1.0	6.00	17.6	24.6	23.6	6.03	8.80	14.83	15.80	3.92
0.38	122.275	0.8	6.50	17.9	24.9	24.1	6.20	8.93	15.13	15.93	3.88
0.40	124.962	0.6	7.00	18.2	25.2	24.5	6.39	9.08	15.47	16.08	3.84
0.43	127.382	0.4	7.50	18.4	25.4	25.0	6.58	9.21	15.79	16.21	3.80
0.46	129.823	0.3	8.00	18.7	25.7	25.3	6.68	9.33	16.01	16.33	3.80
0.49	132.177	0.2	8.50	18.9	25.9	25.7	6.83	9.45	16.28	16.45	3.77
0.52	134.467	0.1	9.00	19.1	26.1	26.0	6.93	9.56	16.49	16.56	3.76
0.55	136.591	-0.1	9.50	19.3	26.3	26.4	7.10	9.66	16.76	16.66	3.72
0.58	138.989	-0.2	10.00	19.5	26.5	26.7	7.19	9.77	16.97	16.77	3.72
0.64	143.855	-0.5	11.00	20.0	27.0	27.5	7.48	10.00	17.48	17.00	3.68
0.69	148.680	-0.7	12.00	20.4	27.4	28.2	7.73	10.22	17.95	17.22	3.65
0.75	154.414	-1.0	13.00	21.0	28.0	29.0	7.98	10.50	18.48	17.50	3.63
0.81	157.254	-1.3	14.00	21.1	28.1	29.4	8.30	10.57	18.87	17.57	3.54
0.84	161.846	-1.4	14.50	21.6	28.6	30.0	8.39	10.81	19.20	17.81	3.58

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

Prepared by: _____ Date: _____

Checked by: _____ Date: _____

AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-1, ST#2, 10 to 12 feet**	**Test date:**	**November 10, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	5.77 in	Tare mass:	12.06 g
Initial sample diameter:	2.84 in	Measured sample mass w/out Tare:	1174.57 g
Initial sample mass:	1174.57 g	Tare and final sample mass:	1201.66 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	978.82 g
Dry sample mass:	966.76 g		
Final sample mass:	1189.60 g	Saturation (B) coefficient:	99%
Initial water content:	21.50% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	122.53 pcf	Volume change during consolidation:	1.41 in^3
Initial dry unit weight:	100.85 pcf	Void ratio after consolidation:	0.654
Initial void ratio:	0.720	Dry unit weight after consolidation:	104.90 pcf
Initial saturation:	83.0%	Height after consolidation:	5.70 in
Final water content:	23.05% (specimen)	Volume after consolidation:	35.11 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.16 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	20.13 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	14.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	1109.44 psi
		Strain @ 50%:	0.70 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	14.0	14.0	14.00	0.00	14.00	14.00	1.00
0.01	19.880	1.4	0.10	3.2	17.2	15.9	12.63	1.61	14.24	15.61	1.26
0.01	28.776	2.4	0.20	4.7	18.7	16.3	11.62	2.33	13.95	16.33	1.40
0.02	34.362	3.1	0.30	5.6	19.6	16.4	10.87	2.78	13.65	16.78	1.51
0.02	38.574	3.7	0.40	6.2	20.2	16.5	10.30	3.12	13.42	17.12	1.61
0.03	41.891	4.1	0.50	6.8	20.8	16.6	9.86	3.38	13.24	17.38	1.69
0.03	45.052	4.5	0.60	7.3	21.3	16.7	9.46	3.63	13.09	17.63	1.77
0.04	48.180	4.9	0.70	7.8	21.8	16.9	9.15	3.88	13.03	17.88	1.85
0.05	50.946	5.1	0.80	8.2	22.2	17.1	8.88	4.10	12.98	18.10	1.92
0.05	52.967	5.4	0.90	8.5	22.5	17.2	8.64	4.26	12.90	18.26	1.99
0.06	54.216	5.5	1.00	8.7	22.7	17.2	8.46	4.36	12.81	18.36	2.03
0.09	61.833	6.3	1.50	9.9	23.9	17.6	7.72	4.94	12.66	18.94	2.28
0.12	68.190	6.7	2.00	10.8	24.8	18.1	7.27	5.42	12.69	19.42	2.49
0.14	72.282	7.0	2.50	11.4	25.4	18.5	7.04	5.72	12.76	19.72	2.63
0.17	76.102	7.1	3.00	12.0	26.0	18.9	6.91	5.99	12.90	19.99	2.73
0.20	79.434	7.1	3.50	12.4	26.4	19.3	6.85	6.22	13.07	20.22	2.82
0.23	82.014	7.2	4.00	12.8	26.8	19.6	6.83	6.39	13.22	20.39	2.87
0.26	85.656	7.2	4.50	13.3	27.3	20.1	6.78	6.64	13.42	20.64	2.96
0.29	87.626	7.2	5.00	13.5	27.5	20.3	6.80	6.76	13.55	20.76	2.99
0.32	89.812	7.2	5.50	13.8	27.8	20.6	6.83	6.89	13.72	20.89	3.02
0.35	91.069	7.1	6.00	13.9	27.9	20.8	6.89	6.95	13.83	20.95	3.02
0.38	91.159	7.1	6.50	13.8	27.8	20.8	6.93	6.92	13.85	20.92	3.00
0.40	92.087	7.0	7.00	13.9	27.9	20.9	6.99	6.95	13.94	20.95	2.99
0.43	93.618	7.0	7.50	14.1	28.1	21.1	7.03	7.03	14.06	21.03	3.00
0.46	96.158	6.9	8.00	14.4	28.4	21.4	7.09	7.18	14.27	21.18	3.03
0.49	97.032	6.9	8.50	14.4	28.4	21.5	7.10	7.21	14.31	21.21	3.03
0.52	99.295	6.8	9.00	14.7	28.7	21.8	7.16	7.33	14.50	21.33	3.05
0.55	99.217	6.8	9.50	14.6	28.6	21.8	7.25	7.29	14.53	21.29	3.01
0.58	98.441	6.7	10.00	14.4	28.4	21.6	7.26	7.19	14.45	21.19	2.98
0.64	101.431	6.7	11.00	14.7	28.7	21.9	7.29	7.33	14.62	21.33	3.01
0.69	104.192	6.7	12.00	14.9	28.9	22.2	7.34	7.44	14.78	21.44	3.03
0.75	106.071	6.6	13.00	15.0	29.0	22.4	7.41	7.49	14.90	21.49	3.02
0.81	108.188	6.5	14.00	15.1	29.1	22.6	7.48	7.55	15.04	21.55	3.02
0.84	110.580	6.4	14.50	15.3	29.3	22.9	7.56	7.67	15.24	21.67	3.03

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

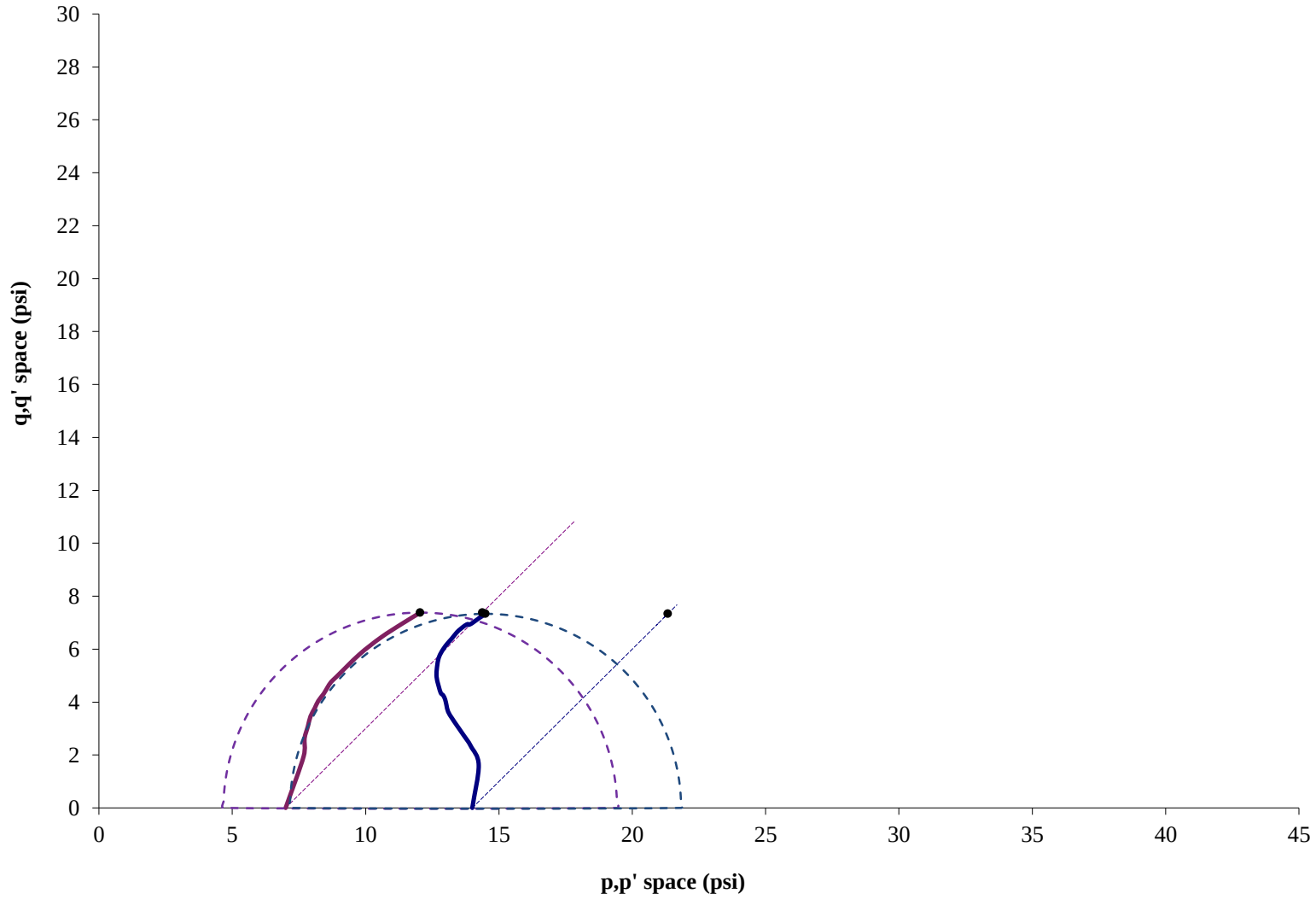
Prepared by: _____ Date: _____

Checked by: _____ Date: _____

AASHTO R18

Wang Engineering
1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

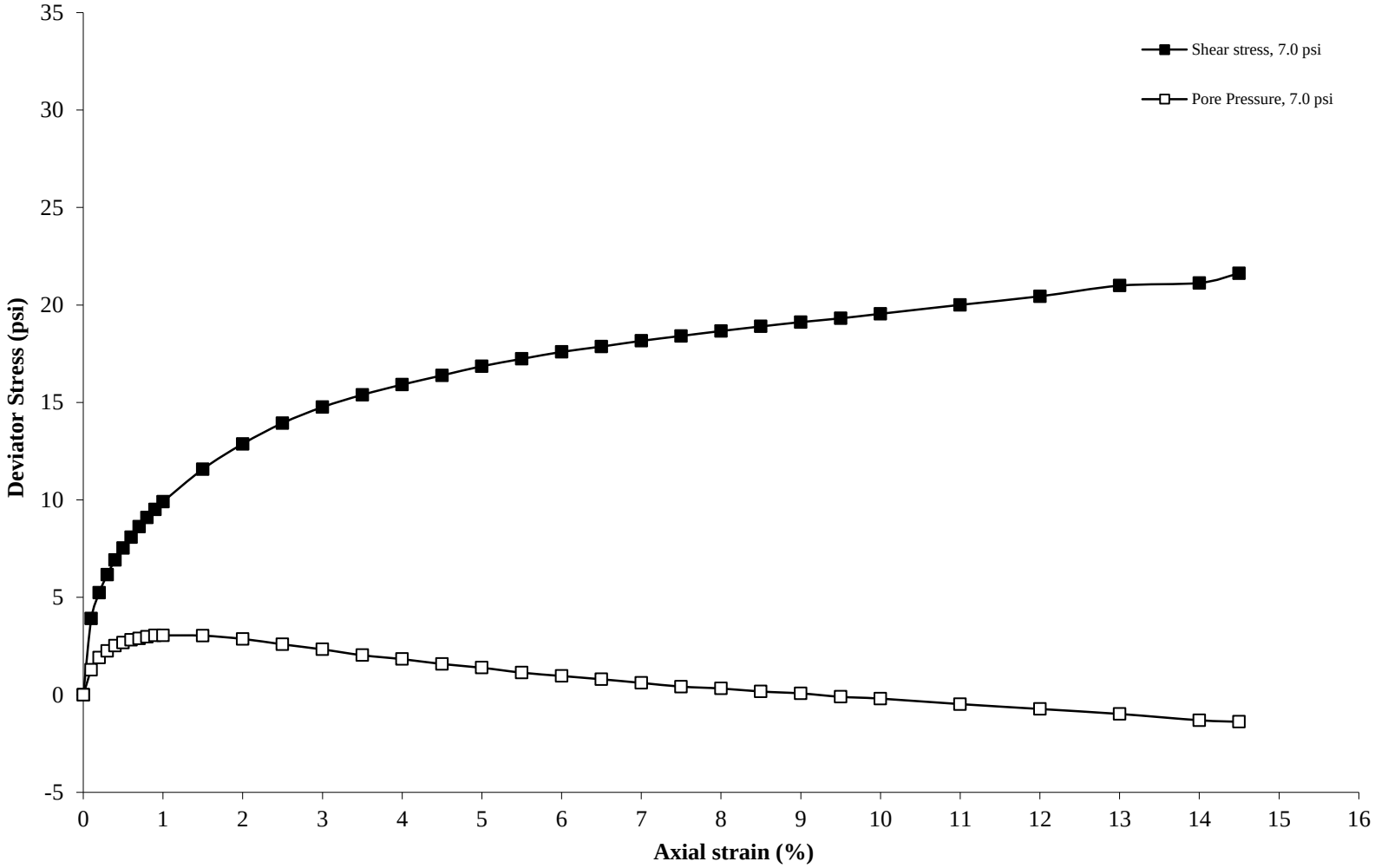
Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)
Max Effective Stress Ratio, Sample I-1, ST#2, 10' to 12'



AASHTO R18

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#2, 10' to 12': Stress v. Strain and Pore Pressure v. Strain Curves
7.0 psi Confining Pressure

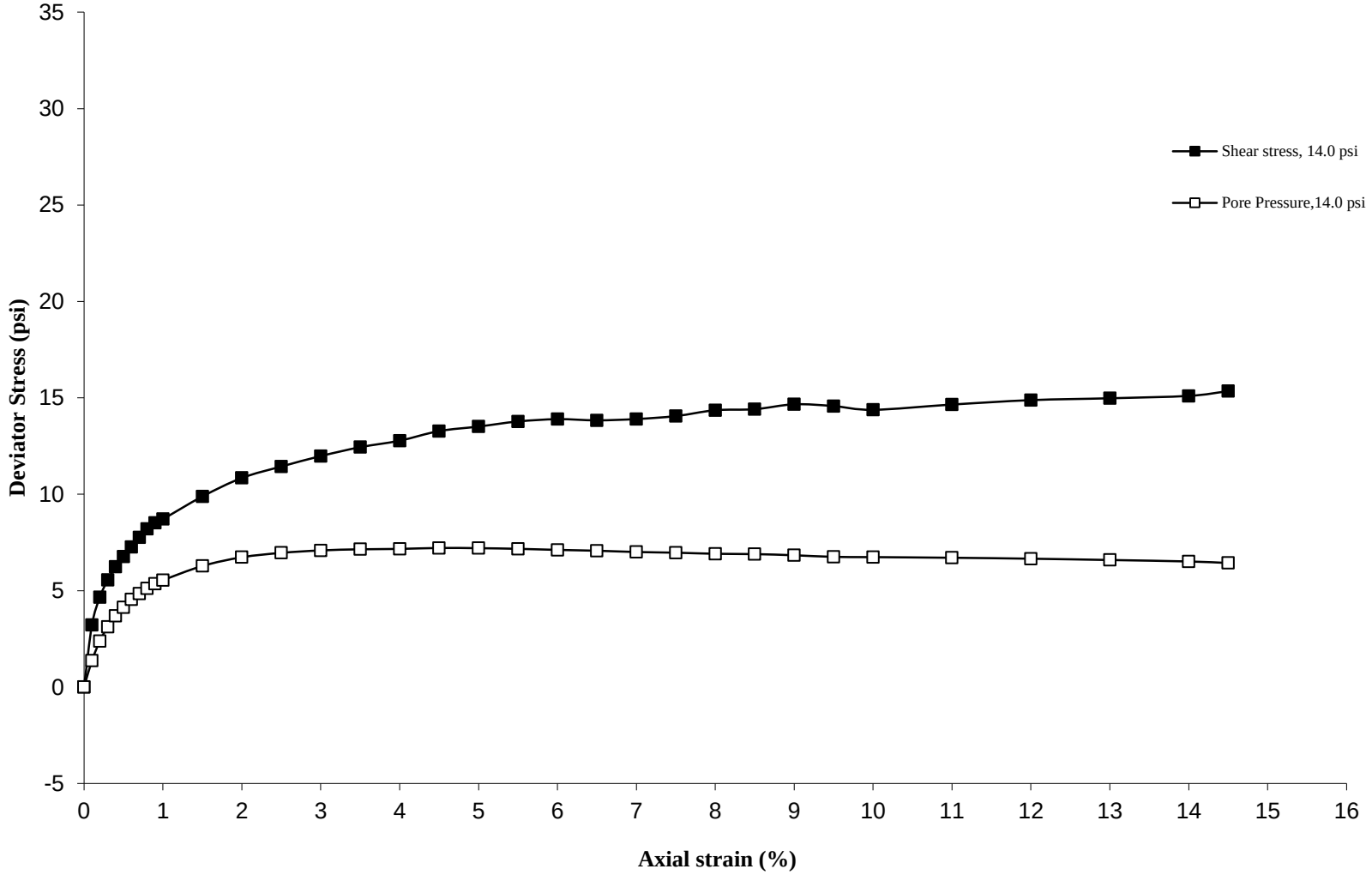


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#2, 10' to 12': Stress v. Strain and Pore Pressure v. Strain Curves
14.0 psi Confining Pressure

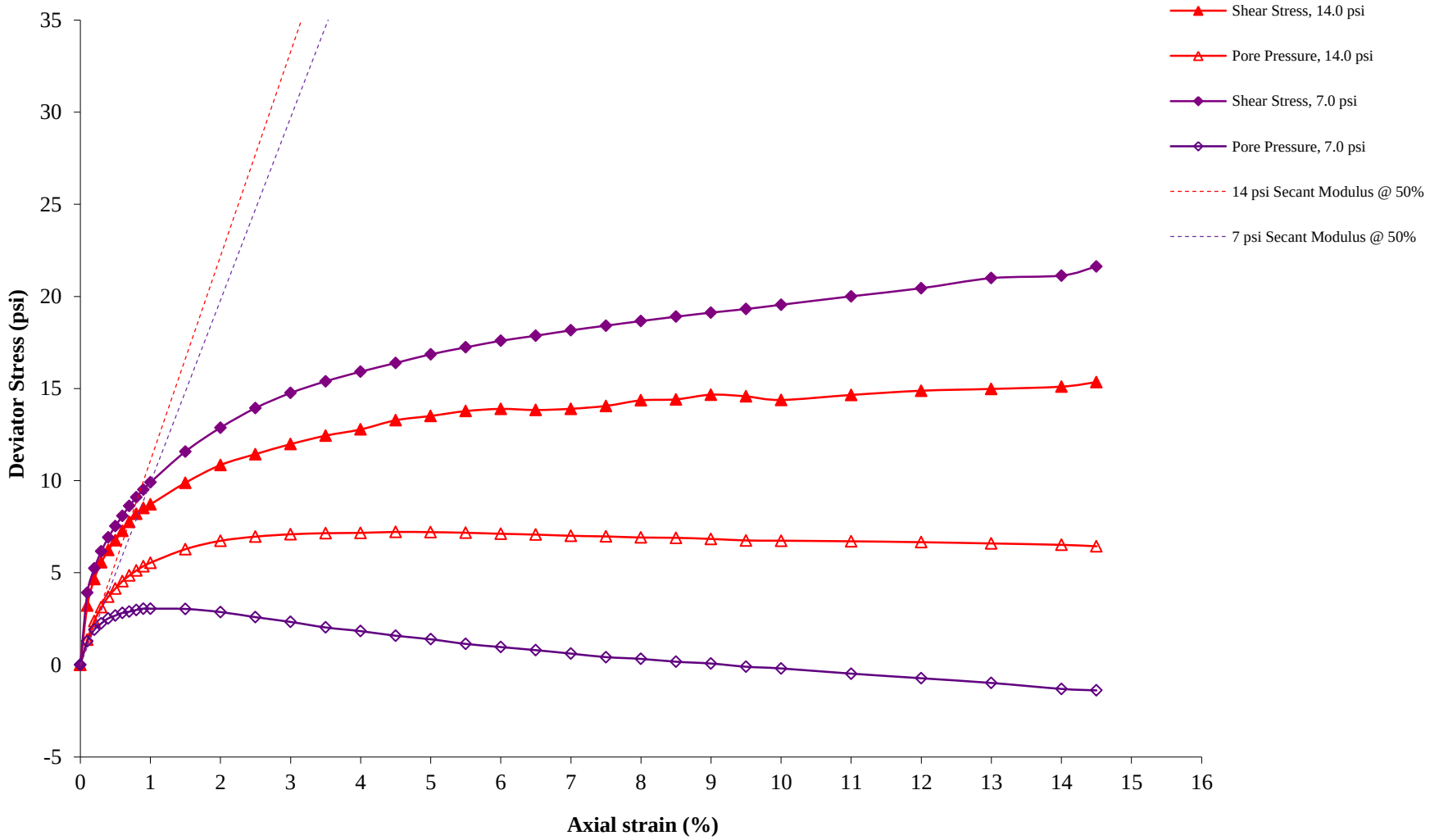


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#2, 10' to 12': Stress v. Strain and Pore Pressure v. Strain Curves
All Confining Pressures

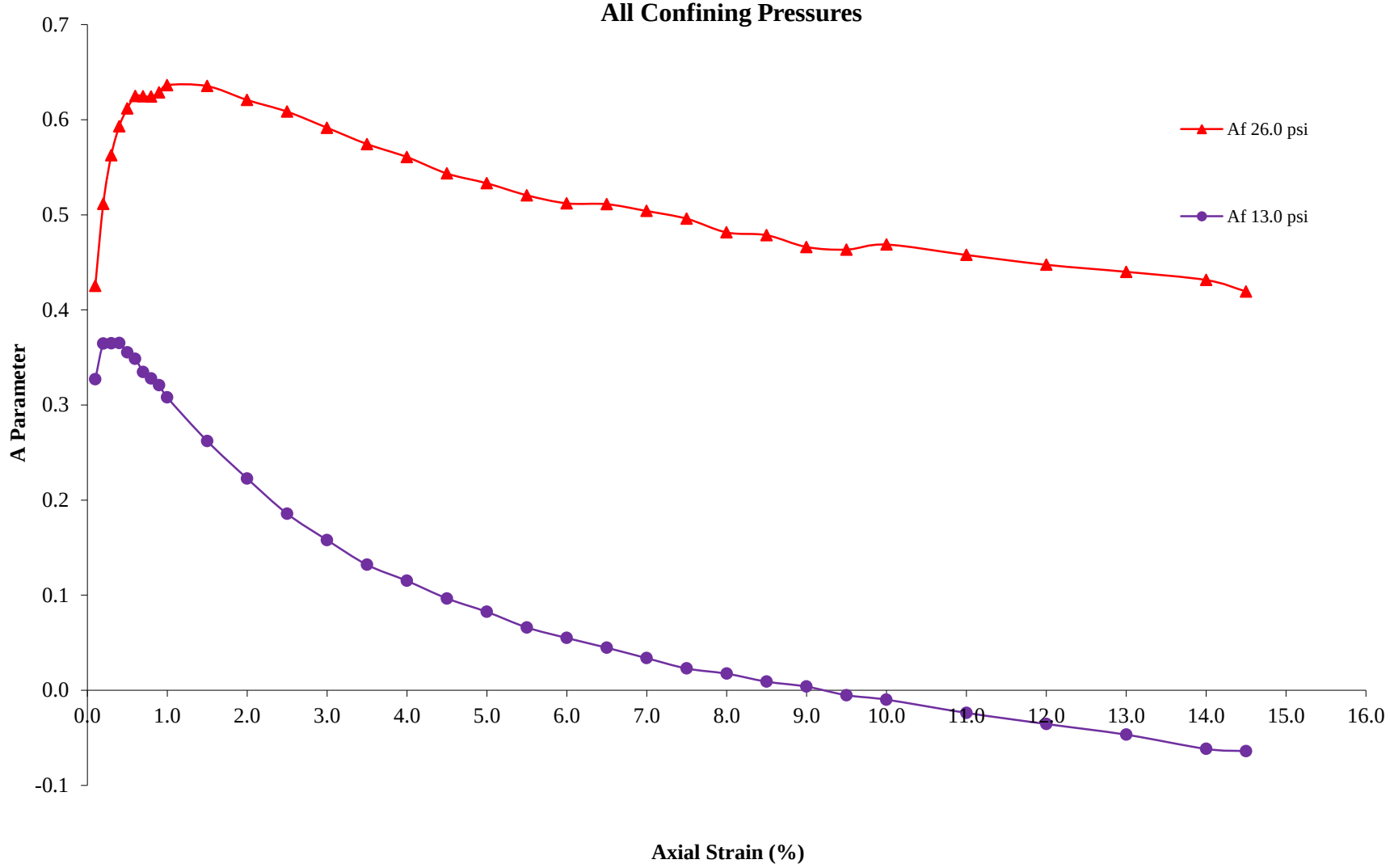


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-1, ST#2, 10' to 12': A-Parameter During Shearing
All Confining Pressures



AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-4, ST#1, 23.5 to 25 feet**	**Test date:**	**October 18, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	5.82 in	Tare mass:	13.54 g
Initial sample diameter:	2.87 in	Measured sample mass w/out Tare:	1270.95 g
Initial sample mass:	1270.95 g	Tare and final sample mass:	1288.09 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	1065.25 g
Dry sample mass:	1051.71 g		
Final sample mass:	1274.55 g	Saturation (B) coefficient:	99%
Initial water content:	20.85% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	128.97 pcf	Volume change during consolidation:	0.65 in^3
Initial dry unit weight:	106.72 pcf	Void ratio after consolidation:	0.597
Initial void ratio:	0.625	Dry unit weight after consolidation:	108.59 pcf
Initial saturation:	92.7%	Height after consolidation:	5.78 in
Final water content:	21.19% (specimen)	Volume after consolidation:	36.90 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.38 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	216.81 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	13.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	1542.26 psi
		Strain @ 50%:	0.80 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	13.0	13.0	13.00	0.00	13.00	13.00	1.00
0.01	26.471	1.7	0.10	4.1	17.1	15.4	11.29	2.07	13.36	15.07	1.37
0.01	41.231	3.1	0.20	6.4	19.4	16.4	9.94	3.22	13.17	16.22	1.65
0.02	50.616	3.8	0.30	7.9	20.9	17.1	9.19	3.96	13.15	16.96	1.86
0.02	57.990	4.4	0.40	9.1	22.1	17.7	8.63	4.53	13.16	17.53	2.05
0.03	64.383	4.7	0.50	10.0	23.0	18.3	8.26	5.02	13.28	18.02	2.22
0.03	70.049	5.1	0.60	10.9	23.9	18.8	7.91	5.46	13.37	18.46	2.38
0.04	74.928	5.3	0.70	11.7	24.7	19.4	7.69	5.83	13.53	18.83	2.52
0.05	79.360	5.5	0.80	12.3	25.3	19.8	7.45	6.17	13.62	19.17	2.66
0.05	83.842	5.7	0.90	13.0	26.0	20.3	7.32	6.51	13.84	19.51	2.78
0.06	87.991	5.9	1.00	13.7	26.7	20.8	7.15	6.83	13.98	19.83	2.91
0.09	103.880	6.2	1.50	16.0	29.0	22.9	6.82	8.02	14.84	21.02	3.35
0.12	114.854	6.0	2.00	17.6	30.6	24.6	6.96	8.82	15.78	21.82	3.53
0.15	122.113	5.8	2.50	18.7	31.7	25.9	7.20	9.33	16.53	22.33	3.59
0.17	127.771	5.5	3.00	19.4	32.4	27.0	7.53	9.71	17.25	22.71	3.58
0.20	132.780	5.1	3.50	20.1	33.1	28.0	7.90	10.04	17.95	23.04	3.54
0.23	137.924	4.8	4.00	20.8	33.8	28.9	8.19	10.38	18.57	23.38	3.53
0.26	140.807	4.5	4.50	21.1	34.1	29.6	8.54	10.54	19.07	23.54	3.47
0.29	144.308	4.1	5.00	21.5	34.5	30.4	8.90	10.74	19.65	23.74	3.41
0.32	146.292	3.8	5.50	21.7	34.7	30.9	9.22	10.83	20.05	23.83	3.35
0.35	149.968	3.4	6.00	22.1	35.1	31.7	9.57	11.05	20.62	24.05	3.31
0.38	153.240	3.2	6.50	22.5	35.5	32.3	9.84	11.23	21.07	24.23	3.28
0.41	155.667	2.8	7.00	22.7	35.7	32.8	10.16	11.35	21.50	24.35	3.23
0.44	158.814	2.6	7.50	23.0	36.0	33.4	10.41	11.51	21.93	24.51	3.21
0.47	159.746	2.3	8.00	23.0	36.0	33.7	10.69	11.52	22.21	24.52	3.16
0.49	161.010	2.1	8.50	23.1	36.1	34.0	10.91	11.55	22.45	24.55	3.12
0.52	161.950	1.9	9.00	23.1	36.1	34.2	11.13	11.55	22.68	24.55	3.07
0.55	164.616	1.6	9.50	23.4	36.4	34.8	11.42	11.68	23.10	24.68	3.04
0.58	166.708	1.4	10.00	23.5	36.5	35.1	11.63	11.76	23.39	24.76	3.02
0.64	169.053	0.9	11.00	23.6	36.6	35.7	12.10	11.79	23.89	24.79	2.95
0.70	169.392	0.5	12.00	23.4	36.4	35.9	12.53	11.68	24.21	24.68	2.86
0.76	172.586	0.1	13.00	23.5	36.5	36.5	12.94	11.77	24.71	24.77	2.82
0.81	182.053	-0.1	14.00	24.5	37.5	37.6	13.06	12.27	25.33	25.27	2.88
0.83	183.500	-0.1	14.25	24.7	37.7	37.8	13.12	12.33	25.45	25.33	2.88

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

Prepared by: _____ Date: _____

Checked by: _____ Date: _____

AASHTO R18

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

AASHTO T 297 / ASTM D 4767

Project:	**IL 251 Slope**	**Tested by:**	**Wang Engineering, Inc.**
Client:	**McCleary Engineering, Inc.**	**Prepared by:**	**M. Snider**
Soil Sample ID:	**Boring I-4, ST#1, 23.5 to 25 feet**	**Test date:**	**October 18, 2017**
Sample description:	**Brown/Gray LEAN CLAY (CL)**	**WEI Job No.:**	**613-16-01**
Initial sample height:	5.93 in	Tare mass:	13.37 g
Initial sample diameter:	2.88 in	Measured sample mass w/out Tare:	1364.61 g
Initial sample mass:	1364.61 g	Tare and final sample mass:	1378.14 g
Soil specific gravity:	2.78 (estimated)	Tare and dry sample mass:	1186.22 g
Dry sample mass:	1172.85 g		
Final sample mass:	1364.77 g	Saturation (B) coefficient:	99%
Initial water content:	16.35% (specimen)	Rate of loading:	1.0E-02 %/min
Initial unit weight:	135.11 pcf	Volume change during consolidation:	1.18 in^3
Initial dry unit weight:	116.12 pcf	Void ratio after consolidation:	0.448
Initial void ratio:	0.494	Dry unit weight after consolidation:	119.80 pcf
Initial saturation:	92.0%	Height after consolidation:	5.87 in
Final water content:	16.36% (specimen)	Volume after consolidation:	37.29 in^3
Liquid Limit, %:	n.a.	Area after consolidation:	6.36 in^2
Plastic Limit, %:	n.a.	Time at 50% Consolidation:	156.67 min
% Sand:	n.a.		
% Silt:	n.a.	Effective consolidation stress:	26.0 psi
% Clay:	n.a.	Secant modulus @ 50%:	1918.99 psi
		Strain @ 50%:	1.00 %

Axial displacement (Dh)	Axial force (F)	Pore pressure (u)	Axial strain (eps)	Deviator stress	Total vertical stress	Effective vertical stress	Effective horizontal stress	Shear stress, q=q'	Effective spherical stress, p'	Total spherical stress, p	Effective Principal Stress Ratio
in	pound	psi	%	psi	psi	psi	psi	psi	psi	psi	psi
0.00	0.000	0.0	0.00	0.0	26.0	26.0	26.00	0.00	26.00	26.00	1.00
0.01	35.528	2.4	0.10	5.6	31.6	29.1	23.55	2.79	26.34	28.79	1.24
0.01	56.512	4.7	0.20	8.9	34.9	30.2	21.30	4.44	25.74	30.44	1.42
0.02	69.342	6.3	0.30	10.9	36.9	30.6	19.72	5.44	25.16	31.44	1.55
0.02	79.071	7.4	0.40	12.4	38.4	31.0	18.59	6.19	24.78	32.19	1.67
0.03	88.115	8.4	0.50	13.8	39.8	31.4	17.58	6.90	24.48	32.90	1.78
0.04	96.507	9.2	0.60	15.1	41.1	31.9	16.79	7.54	24.33	33.54	1.90
0.04	104.780	9.9	0.70	16.4	42.4	32.4	16.06	8.18	24.25	34.18	2.02
0.05	112.299	10.5	0.80	17.5	43.5	33.0	15.49	8.76	24.25	34.76	2.13
0.05	118.141	11.0	0.90	18.4	44.4	33.4	14.98	9.21	24.19	35.21	2.23
0.06	123.233	11.4	1.00	19.2	45.2	33.8	14.61	9.60	24.21	35.60	2.31
0.09	145.957	12.5	1.50	22.6	48.6	36.1	13.45	11.31	24.76	37.31	2.68
0.12	162.309	12.8	2.00	25.0	51.0	38.2	13.19	12.51	25.70	38.51	2.90
0.15	175.743	12.7	2.50	27.0	53.0	40.3	13.34	13.48	26.82	39.48	3.02
0.18	186.232	12.4	3.00	28.4	54.4	42.0	13.60	14.21	27.81	40.21	3.09
0.21	195.428	12.1	3.50	29.7	55.7	43.6	13.93	14.83	28.76	40.83	3.13
0.24	203.683	11.6	4.00	30.8	56.8	45.1	14.36	15.38	29.74	41.38	3.14
0.27	213.200	11.3	4.50	32.0	58.0	46.8	14.74	16.01	30.75	42.01	3.17
0.30	221.217	10.8	5.00	33.1	59.1	48.3	15.20	16.53	31.73	42.53	3.18
0.33	228.647	10.4	5.50	34.0	60.0	49.6	15.61	16.99	32.60	42.99	3.18
0.36	231.961	9.9	6.00	34.3	60.3	50.4	16.06	17.15	33.21	43.15	3.14
0.39	234.712	9.5	6.50	34.5	60.5	51.0	16.50	17.26	33.76	43.26	3.09
0.41	239.232	9.1	7.00	35.0	61.0	51.9	16.87	17.50	34.37	43.50	3.07
0.44	245.325	8.7	7.50	35.7	61.7	53.0	17.28	17.85	35.13	43.85	3.07
0.47	249.524	8.4	8.00	36.1	62.1	53.7	17.64	18.05	35.69	44.05	3.05
0.50	253.127	8.0	8.50	36.4	62.4	54.4	18.01	18.22	36.23	44.22	3.02
0.53	256.952	7.6	9.00	36.8	62.8	55.1	18.36	18.39	36.75	44.39	3.00
0.56	256.838	7.3	9.50	36.6	62.6	55.3	18.73	18.28	37.01	44.28	2.95
0.59	258.299	7.0	10.00	36.6	62.6	55.6	19.02	18.28	37.31	44.28	2.92
0.65	270.884	6.4	11.00	37.9	63.9	57.5	19.57	18.96	38.53	44.96	2.94
0.71	282.527	6.0	12.00	39.1	65.1	59.2	20.04	19.55	39.60	45.55	2.95
0.77	286.000	5.4	13.00	39.1	65.1	59.8	20.62	19.57	40.18	45.57	2.90
0.83	294.703	4.9	14.00	39.9	65.9	61.0	21.11	19.93	41.04	45.93	2.89
0.88	300.920	4.4	14.90	40.3	66.3	61.8	21.55	20.14	41.69	46.14	2.87

Notes:

$p=\sigma_1+\sigma_3/2$ $q=\sigma_1-\sigma_3/2$

$p'=\sigma_1'+\sigma_3'/2$ $q'=\sigma_1'-\sigma_3'/2$

Wet Method Saturation

Prepared by: _____ Date: _____

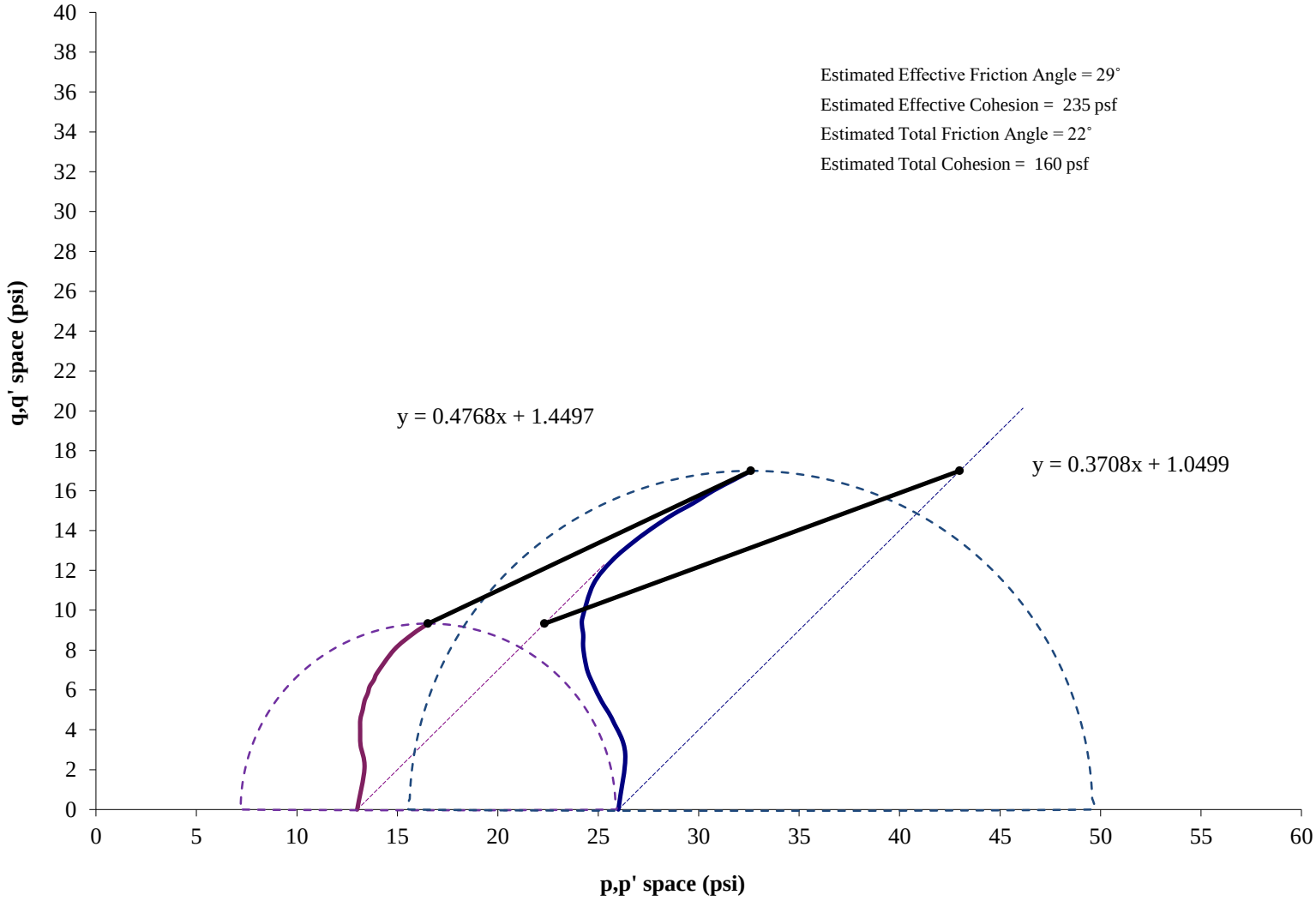
Checked by: _____ Date: _____

AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

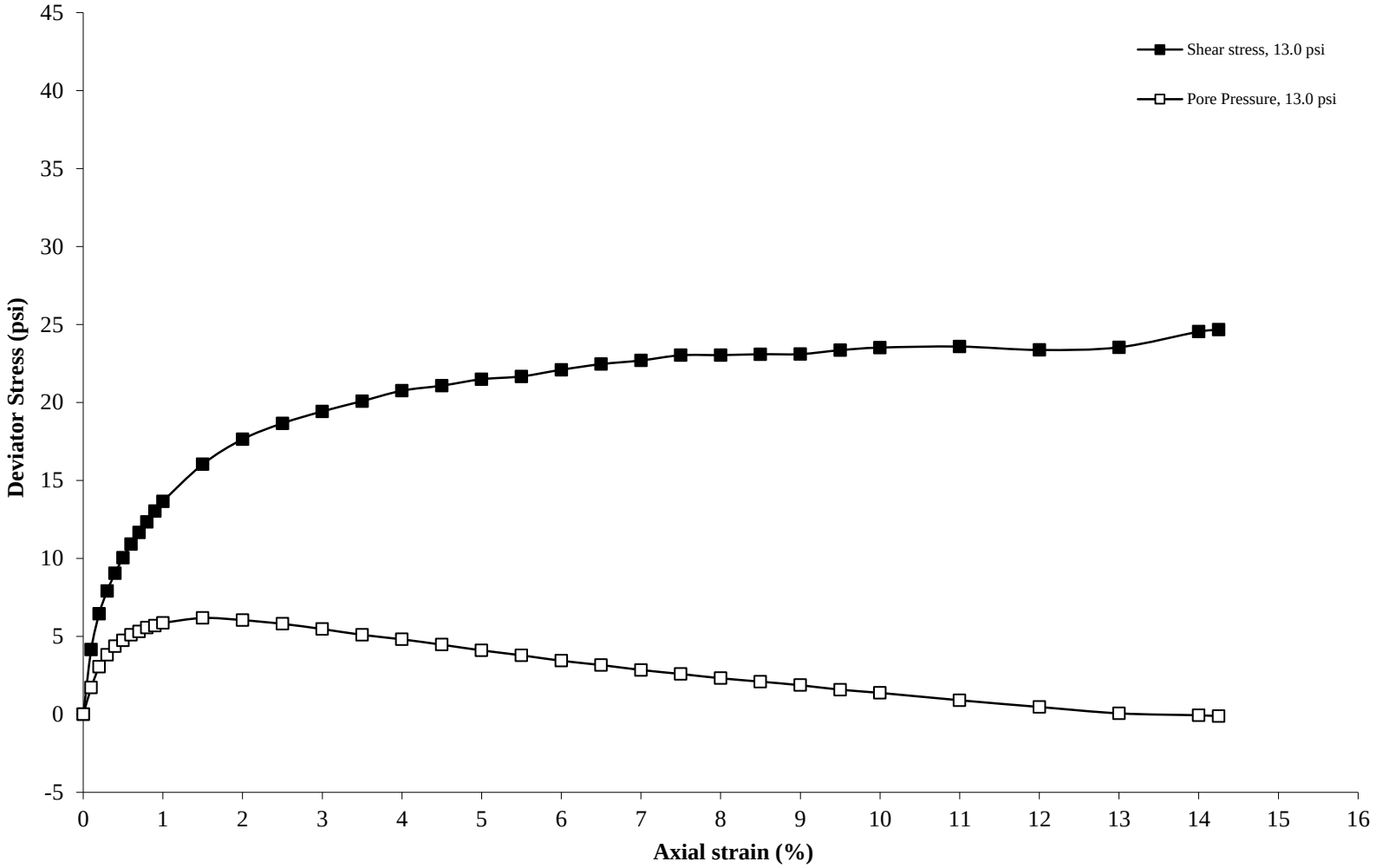
Triaxial Compression Total and Effective Stress Paths at Failure (p-q Space)
Max Effective Stress Ratio, Sample I-4, ST#1, 23.5' to 25'



AASHTO R18

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-4, ST#1, 23.5' to 25': Stress v. Strain and Pore Pressure v. Strain Curves
13.0 psi Confining Pressure

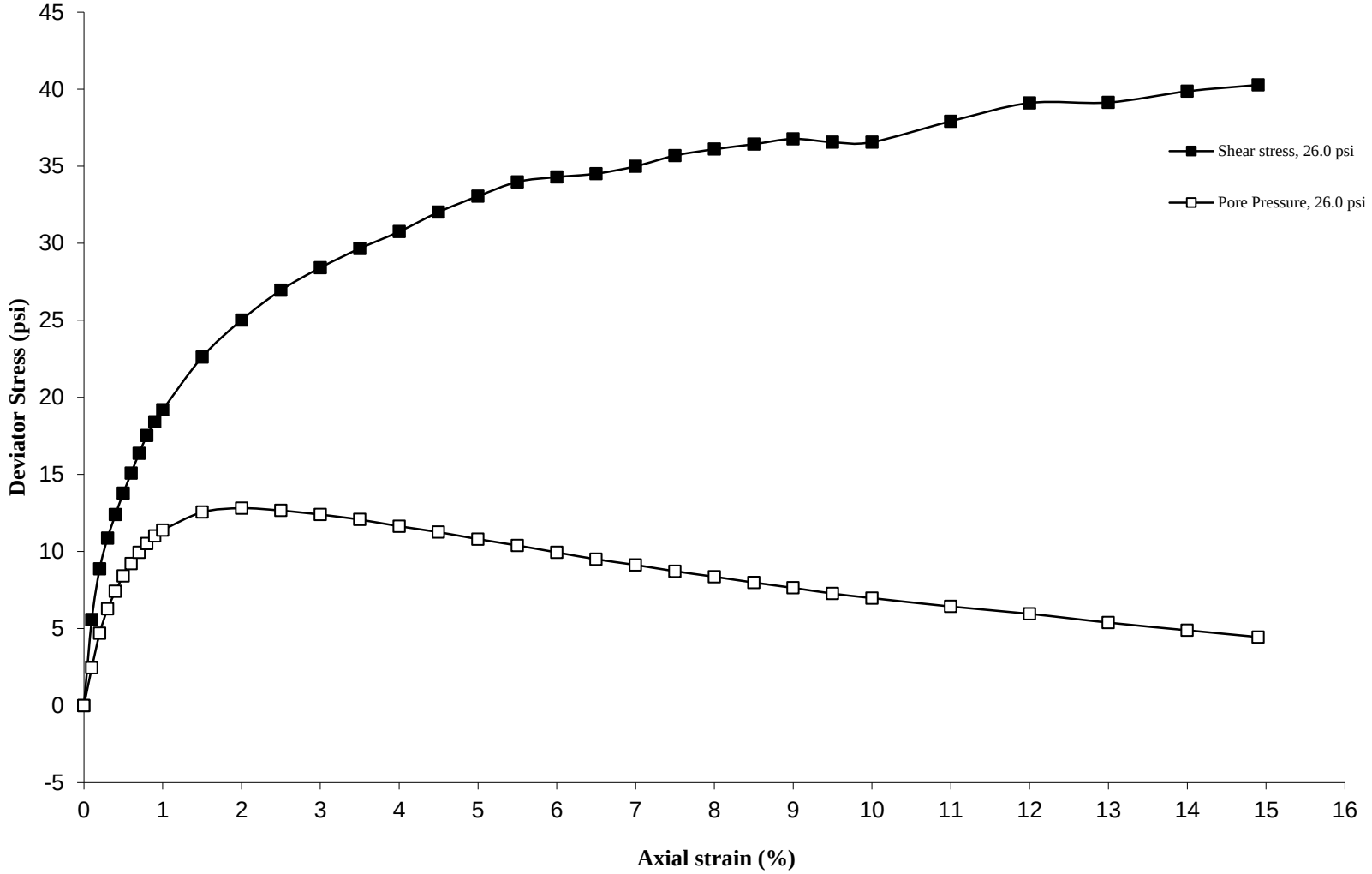


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-4, ST#1, 23.5' to 25': Stress v. Strain and Pore Pressure v. Strain Curves
26.0 psi Confining Pressure

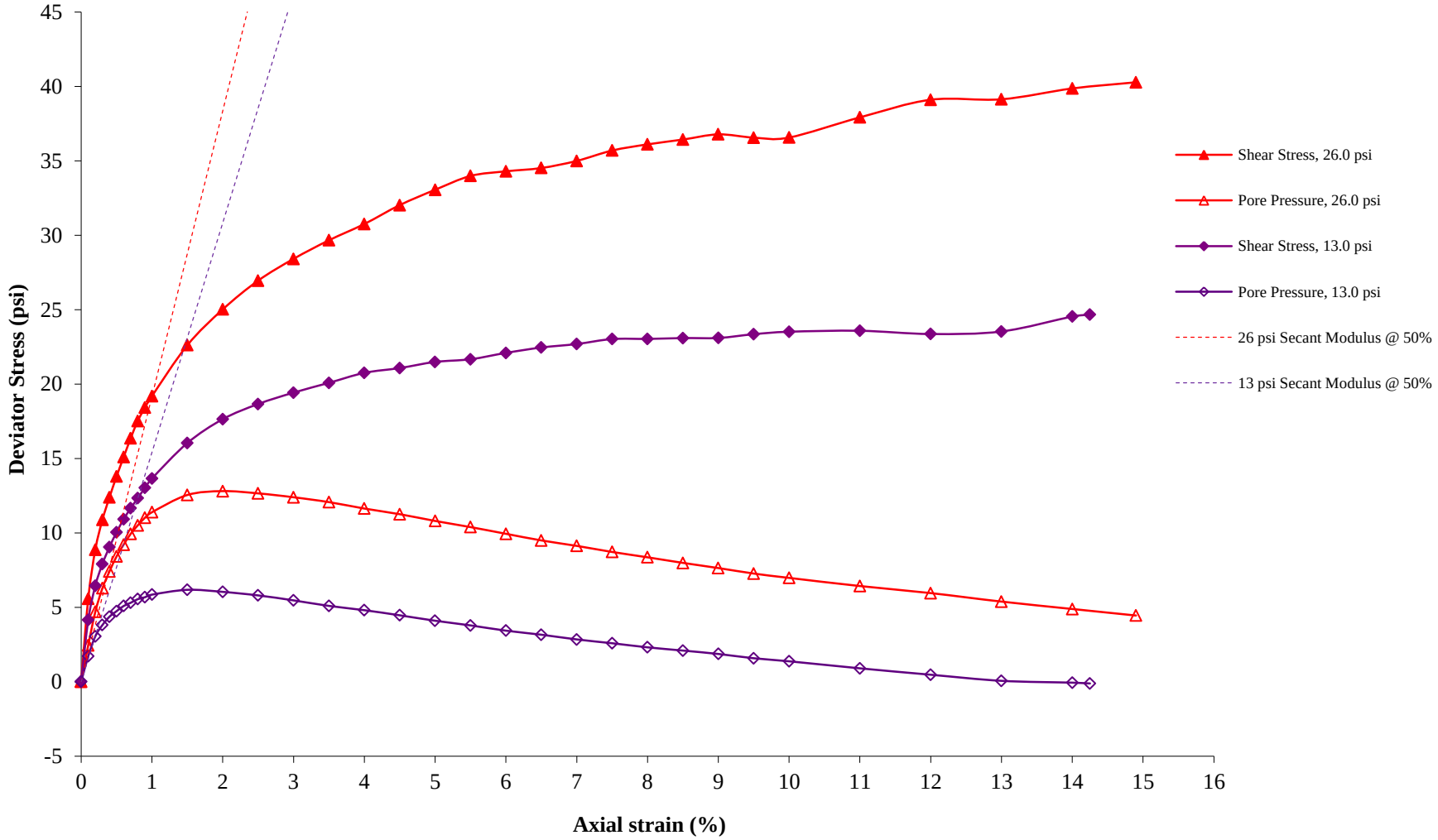


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-4, ST#1, 23.5' to 25': Stress v. Strain and Pore Pressure v. Strain Curves
All Confining Pressures

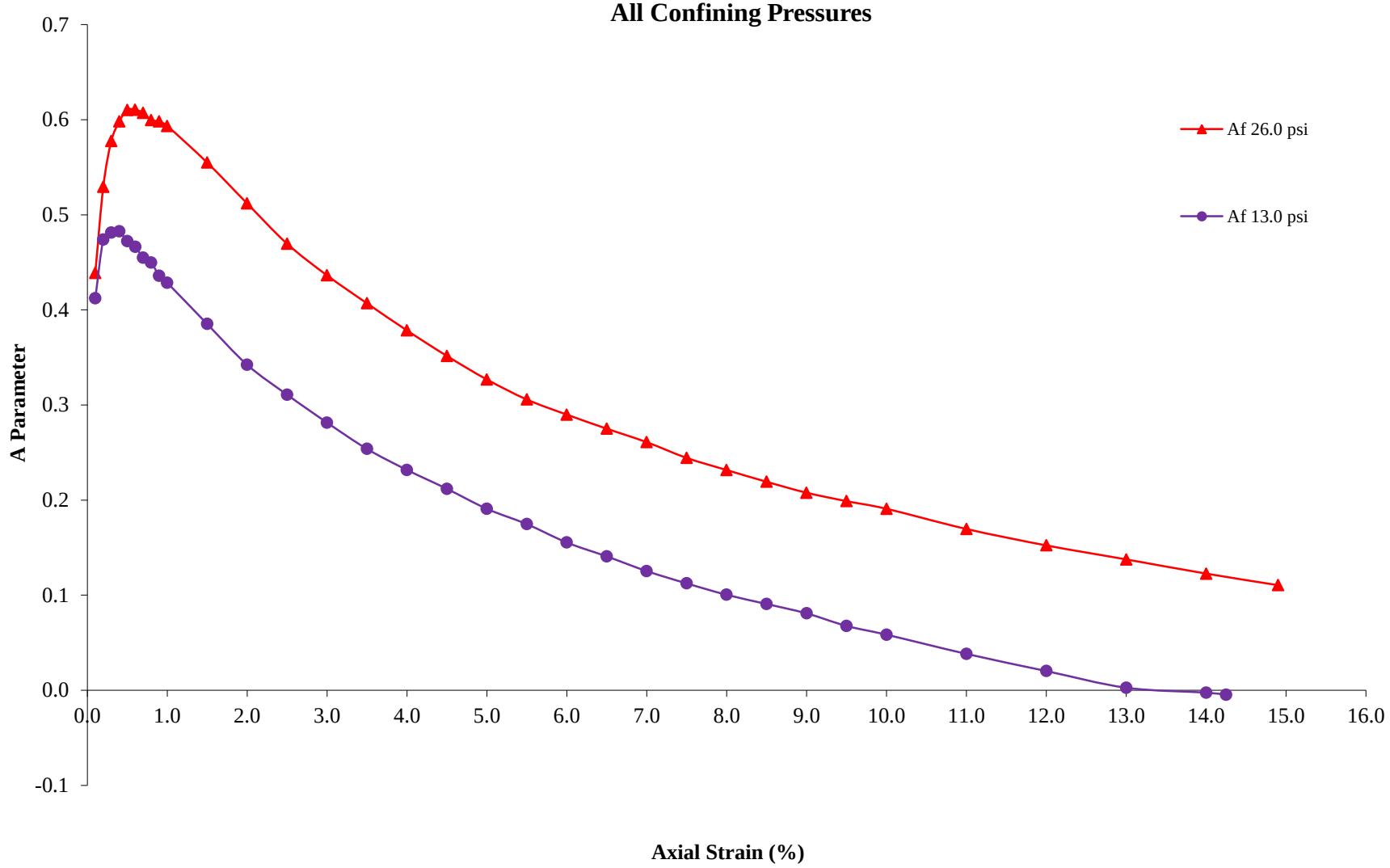


AASHTO R18

Wang Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

Sample I-4, ST#1, 23.5' to 25': A-Parameter During Shearing
All Confining Pressures



AASHTO R18

APPENDIX

J

F.A. RT. 178 SEC. 1-2 & SEC. 1Z LASALLE COUNTY

178 1-2 LASALLE 227 32
FU-2784(9)

P.O.T. STA. 163+70 IRON PIN 3" DEEP
P.O.T. STA. 165+09.79 IRON PIN 2" DEEP
P.O.T. STA. 170+42.7 IRON PIN 4" DEEP
P.O.T. STA. 173+87 X IN CONC. PAVT.
P.O.T. STA. 179+00 IRON PIN 2" DEEP
P.O.T. 184+99.35 X IN S.W. JOINT (WITH A NAIL)

160 165 170 175 180 185 190

P.I. STA. 4+82.28 CHAN. CH.
Δ = 158°
D = 22°
D = 37°-07'
R = 154.34
T = 30'
L = 59.26
E = 2.89

CONSTRUCT MANHOLE TYPE A 4' DIA. WITH TYPE 1 FRAME & CLOSED LID 190' LT. STA. 161+44 ELEV. TOP OF LID = 549.00 FL INLET = 536.44, FL OUTLET = 536.34

RIGID FRAME BOX CULVERT (10'X 8'X 375'-7") 130.37' RT. OF STA. 160+84.99 TO 182.58' LT. OF STA. 162+13.46

CHANNEL CHANGE: STA 1+68.37 CH. CHAN. = STA. 168+12.4 F.A. RTE. 178. Δ = 75°

CHANNEL CHANGE: STA. 2+58.28 CH. CHAN. = STA. 161+47 & F.A. RTE. 178. Δ = 70°

EXISTING SEWER TO BE ABANDONED

P.I. STA. 0+38 CH. CH. Δ = 144° A = 36° D = 48°-58' R = 116.75 T = 38' L = 75.48 E = 6.02

1-MANHOLE TO BE FILLED 80' RT. STA. 160+77

EXISTING 18" SANITARY SEWER

CONSTRUCT MANHOLE TYPE A (4' DIA) WITH TYPE 1 FRAME & CLOSED LID 170' RT. STA. 160+64 ELEV. TOP LID = 566.80 FL. INLET = 541.00, FL. OUTLET = 540.90 CONSTRUCT 366 LINEAL FEET CAST IRON SOIL PIPE 15" 168' RT. STA. 160+64 TO 188' LT. STA. 161+44

CONSTRUCT MANHOLE TYPE A (4' DIA) WITH TYPE 1 FRAME & CLOSED LID 104' RT. STA. 168+95.32 ELEV. TOP OF LID = 577.5 CONSTRUCT 236 LINEAL FEET CAST IRON SOIL PIPE 12" 126' LT. STA. 168+82 TO 102' RT. STA. 168+95.32

B.M. NO. 17 A SPIKE VER. IN LOCUST 30 LT. STA. 165+65 ELEV. 593.09

PAVED DITCH 204' RT. STA. 160+60 TO 48' RT. 163+37

PAVED DITCH 47'RT. STA. 165+68 TO 117' RT. STA. 168+35.52

P.I. STA. 0+27 CHAN. CHANGE Δ = 135° 35' D = 44°-25' D = 89°-48' R = 64.87 T = 27.91' L = 53.0' E = 5.48'

P.I. STA. 9+65 CHANNEL CHANGE Δ = 169° Δ = 11° D = 187°-23' R = 31.56 T = 30' L = 59.62 E = 1.44

RETAINING WALL 36' LT. STA 170+00 TO 40' LT. STA. 171+14.96 (SEE DETAIL SHEET)

PAVED DITCH 119' RT. STA. 168+46.76 TO 56' RT. STA. 167+15

LINCOLN AVE.

PIPE CULVERT TY. 3A 24" x 282', FL LT. 539.59, FL RT. 559.01 171' LT. STA. 167+66.19 TO 109' RT. STA. 168+41.2 STD. 251 DS-24-2 HDWLLS. 3.1 CU. YDS. CLASS X CONC. 100 LBS. REINFORCEMENT BARS.

CONSTRUCT 24 LINEAL FEET TYPE 6 CURB & GUTTER 119' RT. STA. 173+79 TO 119' RT. STA. 173+99
CONSTRUCT CATCH BASIN TYPE A 5' DIA. WITH SPECIAL FRAME & GRATE 119' RT. STA. 173+96
CONSTRUCT 19 LINEAL FEET 12" STORM SEWER TYPE 1 120' RT. STA. 173+77.6 TO 120' RT. STA. 173+96.6
FL 173+77.6 = 597.45, FL 173+96.6 = 597.00

B.M. NO 18. □ IN SIDEWALK S.E. COR. LINCOLN & 8TH STS. 95' LT STA. 174+02. ELEV. 598.48

1 EACH - PLUGGING STREET SEWERS AND HOUSE CONNECTIONS 4" TO 12" 80' LT. STA. 173+87

1 EACH PLUGGING STREET SEWERS AND HOUSE CONNECTIONS 4" TO 12" 250' RT. STA. 173+87

CONSTRUCT CATCH BASIN TYPE A 5' DIA. (NO TRAP) WITH SPECIAL FRAME & GRATE 119' RT. STA. 173+96
CONSTRUCT SPECIAL SLOPE HEADWALL TYPE D 12-2 48' RT. STA. 173+98
.34 CU. YDS. CLASS X CONC.
CONSTRUCT 92 LINEAL FEET 12" C.M.P.

NOTE: FOR CONTROL DATA & CONSTRUCTION DETAILS STA. 175+49.35 TO STA 193+08.17 SEE SHEET NOS. 39 TO 55

REMOVAL OF HOUSE AND ITS APPURTENANCES 125' LT. STA. 182+25 SHALL BE INCIDENTAL TO THE CONTRACT AND THE COST OF SUCH REMOVAL INCLUDED IN THE CONTRACT UNIT PRICE PER CUBIC YARD FOR EARTH EXCAVATION

CHAIN LINK FENCE 4' HIGH SEE SHEET NO. 86

2.3 ACRES TREE REMOVAL STA. 158+76 TO STA. 193+08.17

EXISTING DETOUR ROAD

EXISTING STRUCTURE PREVIOUS EXCAVATION

F.A. RTE. 178

CHAIN LINK FENCE 4' HIGH SEE SHEET NO. 86

2 CATCH BASINS TO BE FILLED 217.6' RT STA 184+92.8 & 217.6 RT STA 184+68.8

CONSTRUCT 28 LIN FT TYPE 6 CURB 232.6' RT. STA 184+66.8 TO 232.6' RT. STA 184+94.8

CONSTRUCT 96 SQ FT P.C.C. SIDEWALK (5") 228' RT STA 184+68.3 TO 228' RT 184+93.3

RETAINING WALL, 10 RT. STA. 3+23 TO 10' RT. STA. 6+53 SEE DETAIL SHEET NO. 79

154 LIN. FT. WOOD GUARD RAIL REMOVAL

ADAMS ST.
EXISTING STRUCTURE
M.H. #15
STA. 188+55.90 F.A. RT 178 STA. 0+00 E & W. FOURTH ST.
PLAIN ST.
FOURTH ST.
SEVENTH ST.
EIGHTH
PLAIN STREET
FIFTH

M.H. #7 M.H. #8 M.H. #9 M.H. #10 M.H. #11 M.H. #12 M.H. #13 M.H. #14

B.M. NO. 20 □ IN S.W. S.E. CORNER LINCOLN & 5TH STS. 110' LT STA. 184+99.5. ELEV. 575.77

SPECIAL CUT = 97,149
SPECIAL FILL = 77,719
OVERHAUL = 296,048

PROFILE EXISTING GROUND LINE ON ℄

PROFILE PROPOSED IMPROVEMENT

R. PROPOSED SEWER

INCLINOMETER 162+50

INCLINOMETER 162+90

Rt. STA. 166+00 1200' V.C. ELEV. = 589.97

Rt. STA. 175+00 800' V.C. ELEV. = 581.01

Rt. STA. 186+00 400' V.C. ELEV. = 542.84

+56 +51.65 +26.42 +35.90

CUT = 35,568 CU. YDS.
FILL = 30,682 CU. YDS.
OVERHAUL = 178 STA.-YDS.
2765 CU. YDS. EARTH TO BE OBTAINED FROM EXCESS CUT ON O-NE. RAMP

CUT = 49,208 CU. YDS.
FILL = 556 CU. YDS.
7,682 CU. YDS. EXCESS EARTH TO BE USED ON O-SW RAMP (WITHIN FREEHAUL DISTANCE)
40,204 CU. YDS. EXCESS EARTH CUT TO BE USED BETWEEN STAS. 67+00 TO 142+00 (F.A. RTE. 178)
OVERHAUL = 2,548,305 STA.-YDS.
WASTE = 628 CU. YDS.

610 600 590 580 570 560 550 540

-2.57% -1.3% -1.4% -0.836% -1.4% -1.8% -2.0% -3.4% -3.47% -3.4% -3.0% -2.0% -2.0%

160 (602.82) 602.89
1 (600.25) 600.53
2 (597.68) 598.31
3 (595.11) 595.23
4 (592.54) 594.18
165 (589.97) 592.46
6 (587.40) 590.82
7 (584.83) 589.
8 (582.26) 587.21
9 (579.69) 584.47
170 (577.12) 582.36
1 (574.55) 580.09
2 (571.98) 577.59
3 (569.41) 574.81
4 (566.84) 571.69
175 (564.27) 568.44
6 (561.70) 564.84
7 (559.13) 561.13
180 (556.56) 557.16
1 (553.99) 553.15
2 (551.42) 548.98
3 (548.85) 544.52
4 (546.28) 539.78
185 (543.71) 534.82
6 (541.14) 529.68
7 (538.57) 524.25
8 (535.99) 518.58
9 (533.42) 512.74
190 (530.85) 506.64

F.A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

178	1-E 1-Z	LA SALLE	227	35	

WEATHERED SOIL

SEE NOTE

DESIGN FROST DEPTH 42"

SHALE

WEATHERED SOIL

SEE NOTE

SLOPE MOVEMENT ELEV. 584

ROCK

SLOPE MOVEMENT ELEV 567

SHALE HARD

SHALE HARD

INCLINOMETER 162+90

INCLINOMETER 162+50

GRAY SHALE

RED SHALE

GRAY SHALE

BRIDGE BORING

FILL

SILT CLAY

TILL STIFF

SHALE HARD

STOP AUGER TUBE

GRAY SHALE

RED SHALE

GRAY SHALE

DESIGN FROST DEPTH 42"

NOTE: ~~~~ INDICATES ELEVATION OF SHALE / ELEVATION OF SPECIAL CASING

——— INDICATES BOUNDARY OF DIFFERENT COLORED SHALE

SH SHALE

W 50 BLOW COUNT RECOVERED DRILL [illegible] SPLIT SPOON SAMPLER 12" USING A DROP HAMMER OPERATING 250 STAPS PER MIN.

STA 180+00 - STA 182+50 - BASING CONDITIONS REQUIRED TO BE EXCAVATED WITHIN LIMITS

——— & GRADE OF UNWEATHERED SHALE IN EXCAVATION

STA. 157+50 - STA. 163+20
GOOD DRAINAGE
4 IN. SUB-BASE

STA. 163+20 - STA. 165+80
POOR DRAINAGE
6 IN. SUB-BASE

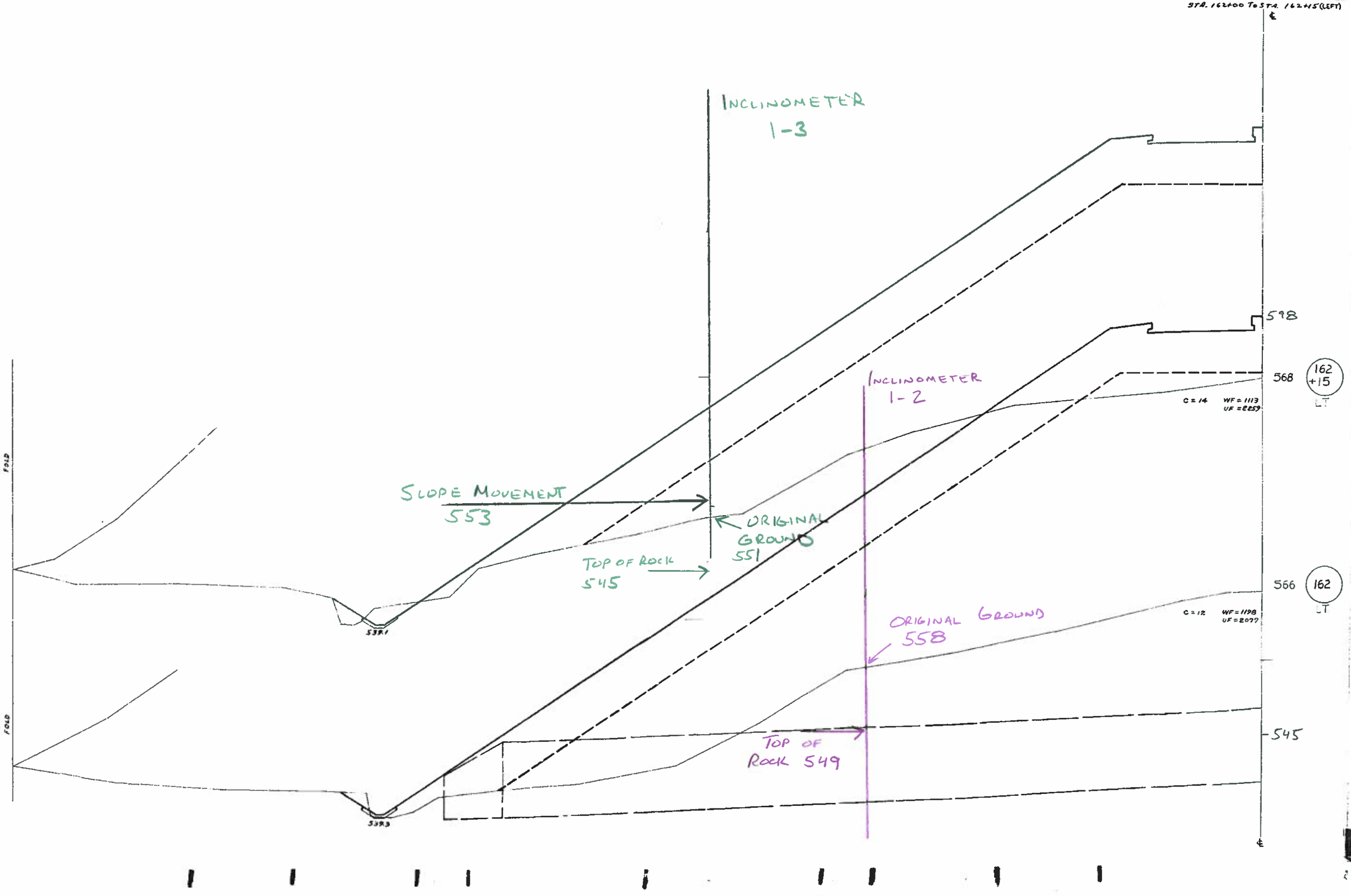
STA. 165+80 - STA. 169+00
GOOD DRAINAGE
7 IN. SUB-BASE

STA. 169+00 - STA. 193+62
POOR DRAINAGE
6 IN. SUB BASE

F. A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

PLT
178 1-2 LASALLE 227 122

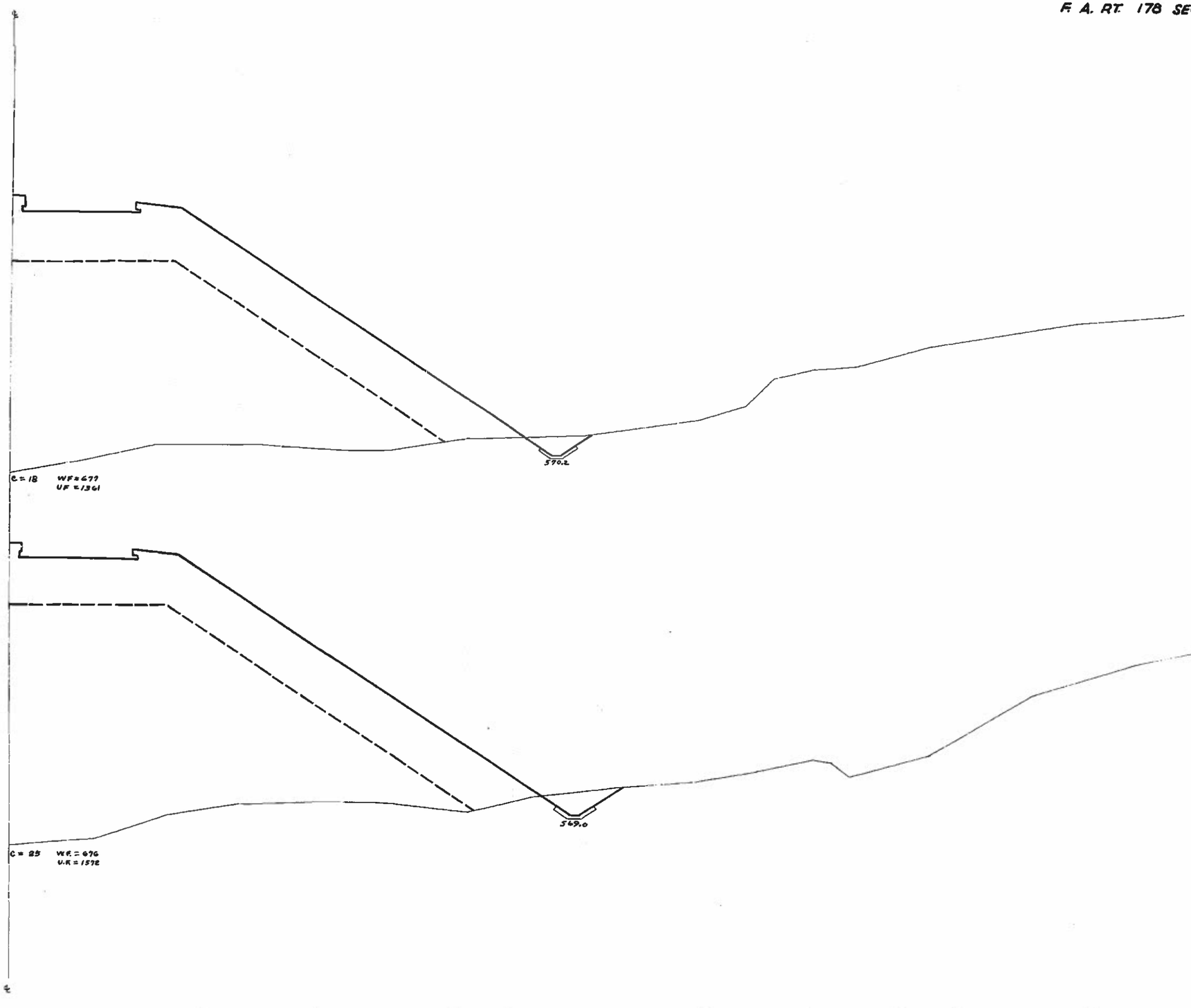
STA. 162+00 TO STA. 162+15 (LEFT)



F. A. RT. 178 SEC. 1-2 & SEC. 1 Z LaSalle County

178 1-Z LaSalle 227 123

STA. 162+00 To STA. 162+15 (RIGHT)

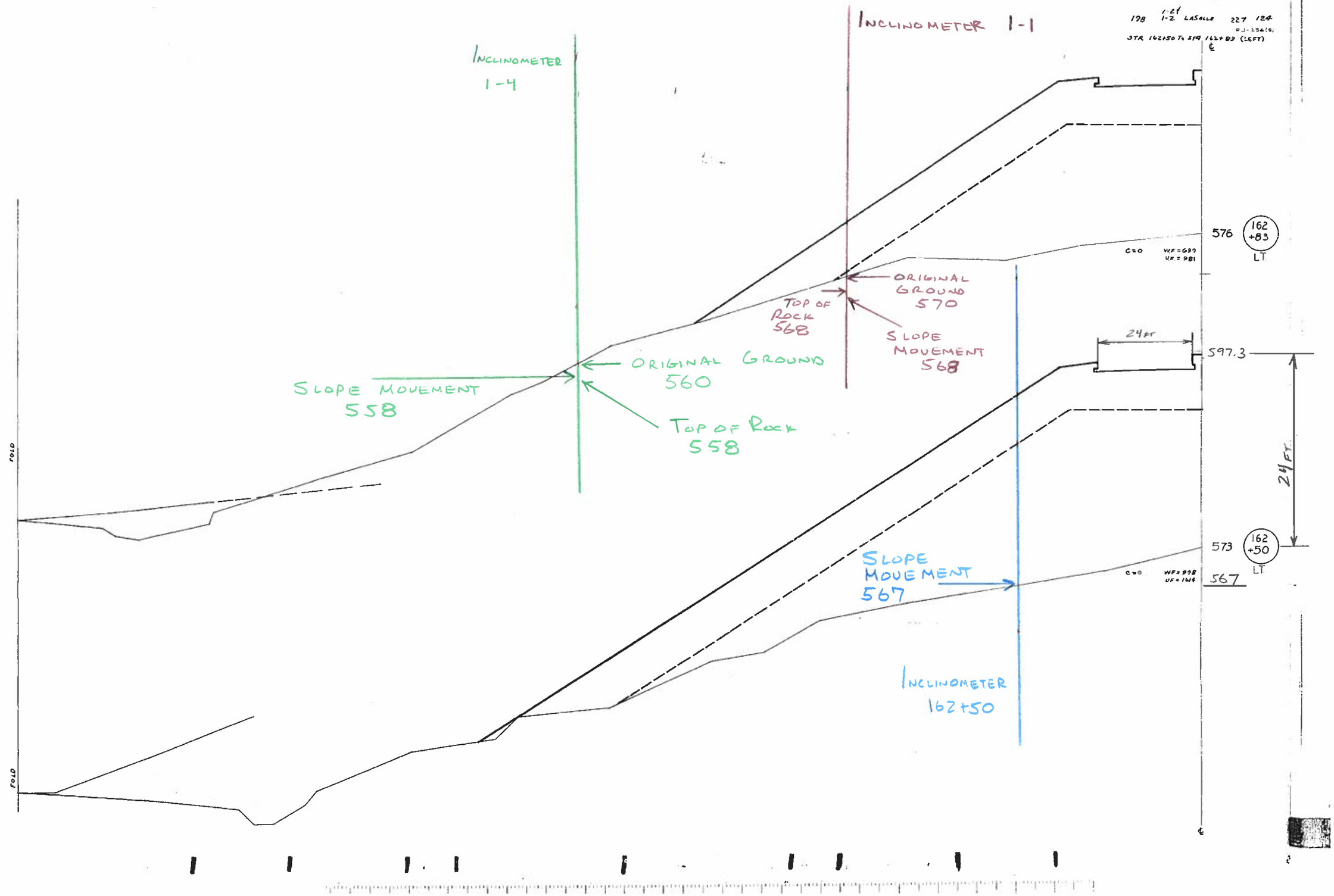


568 (162 +15 RT.)

566 (162 RT.)

F. A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

178 1-2f 1-Z LASALLE 227 124
P.J.-134(5)
STR. 162+50 TO STR 162+83 (LEFT)



F. A. RT. 178 SEC. 1-2 & SEC 1 Z La Salle County

1-2f
178 1-2 La Salle 227 125
FU-254(9)
STA. 1624+50 To STA. 1634+83 (RIGHT)

581.5

C=64 WF=619
UF=468

576 162 +83 RT.

MANHOLE #7
CONSTRUCT MANHOLE TY.A 5' DIA. WITH
TY. 1 FR. & CLOSED LID TOP OF LID EL. 596.57
35.2' RT STA. 162+50 FL. INLET 589.2
FL. OUTLET 589.10
CONSTRUCT 500' LIN. FT STORM SEWER TY. 2
CLAY SEWER PIPE 24"
35.2' RT. STA. 162+50 TO 33' RT. STA 167+50

596.57

589.20

595.6

C=69 WF=529
UF=1031

573 162 +50 RT.

F. A. RT. 178 SEC. 1-2 & SEC. 1 Z LA SALLE COUNTY

178 1-2 LA SALLE 227 126

FU-254(9)

STA. 163+00 TO STA 163+37 (LEFT)

℄

593 163 +37 LT

C=0 WF=4.77 UF=0

596.2

12 FT

584 163 LT

C=0 WF=0.13 UF=0.52

SLOPE

ORIGINAL GROUND 578

MOVEMENT 584

INCLINOMETER 162+90

FOLD

FOLD

F. A. RT. 178 SEC. 1-2 & SEC. 1Z LA SALLE COUNTY

178 1-2 LaSalle 227 127
1-2Y
OU-2548(9)
STA. 162+00 TO STA. 163+27 (RIGHT)

593 163 +37 RT

584 163 RT

c = 80 F = 43
FILL TOP SOIL = 0

591.0

c = 19 WF = 289
VF = 212

584.5

APPENDIX

K

McCleary Engineering

"Specializing in Geotechnical Solutions"

March 30, 2018

Mr. Kevin Marchek
Illinois Department of Transportation
Attn: Mike Short
700 East Norris Drive
Ottawa, IL 61350

PTB 153/36
Various Geotechnical Reports, Various Routes, Various Counties
Region 2/District 3
P-93-024-09
WO#31

Mr. Short:

Last Fall, per your request, McCleary Engineering performed a slope stability analysis on the slope conditions as they were prior to the placement of the inclinometers and piezometers in September of 2017. The analysis for the undrained conditions resulted in a factor of safety, FS = 1.008. The analysis for the drained conditions resulted in an estimated FS = 0.991.

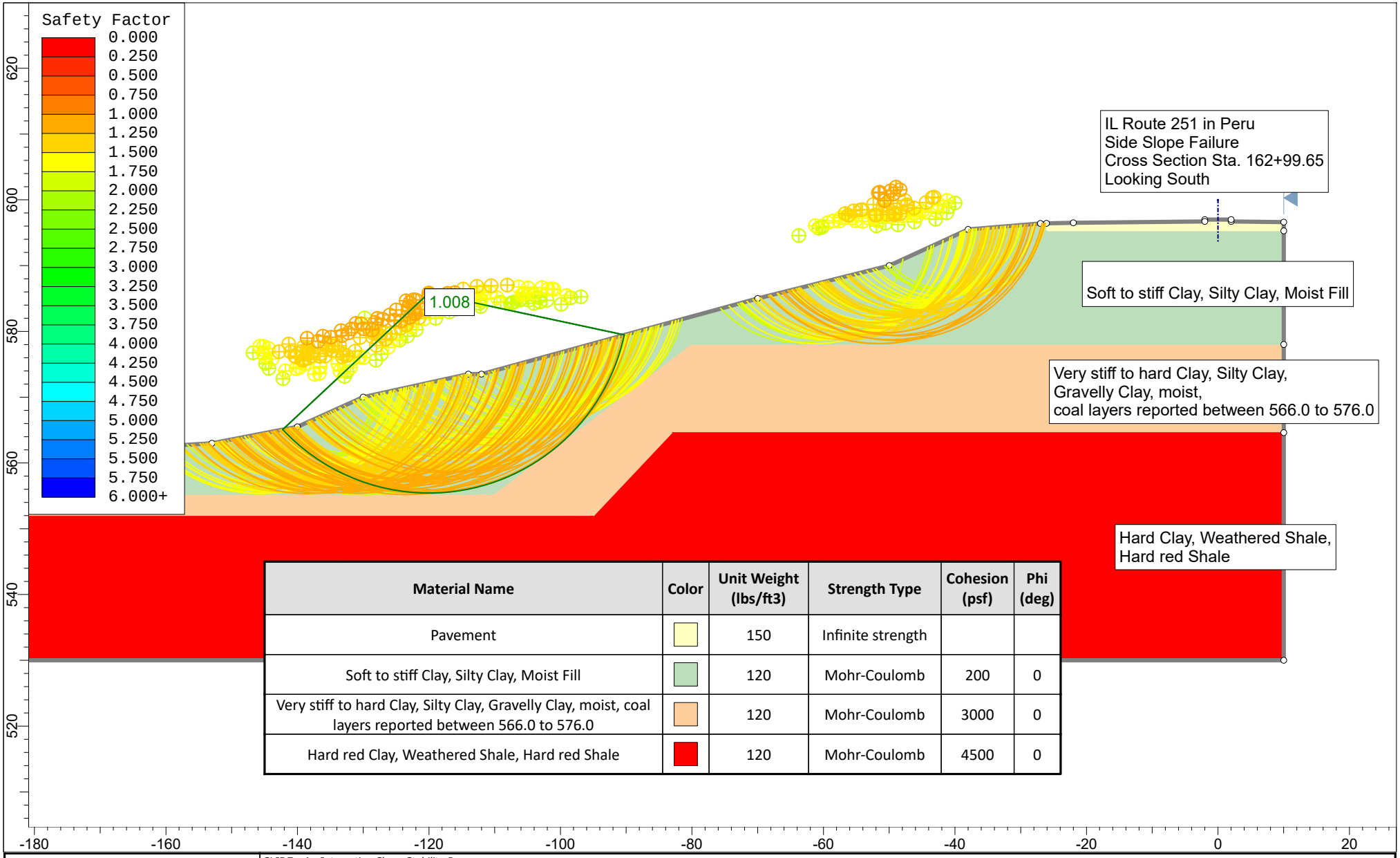
If you have any questions, please don't hesitate to contact me at your convenience.

Respectfully submitted,

Terrence L. McCleary

Terrence L. McCleary, P.E.

3705 Progress Blvd., Suite 2, Peru, Illinois 61354
(815) 780-8486 – www.mcclearyengineering.com



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Pavement		150	Infinite strength		
Soft to stiff Clay, Silty Clay, Moist Fill		120	Mohr-Coulomb	200	0
Very stiff to hard Clay, Silty Clay, Gravelly Clay, moist, coal layers reported between 566.0 to 576.0		120	Mohr-Coulomb	3000	0
Hard red Clay, Weathered Shale, Hard red Shale		120	Mohr-Coulomb	4500	0

McCleary Engineering

SLIDEINTERPRET 6.039

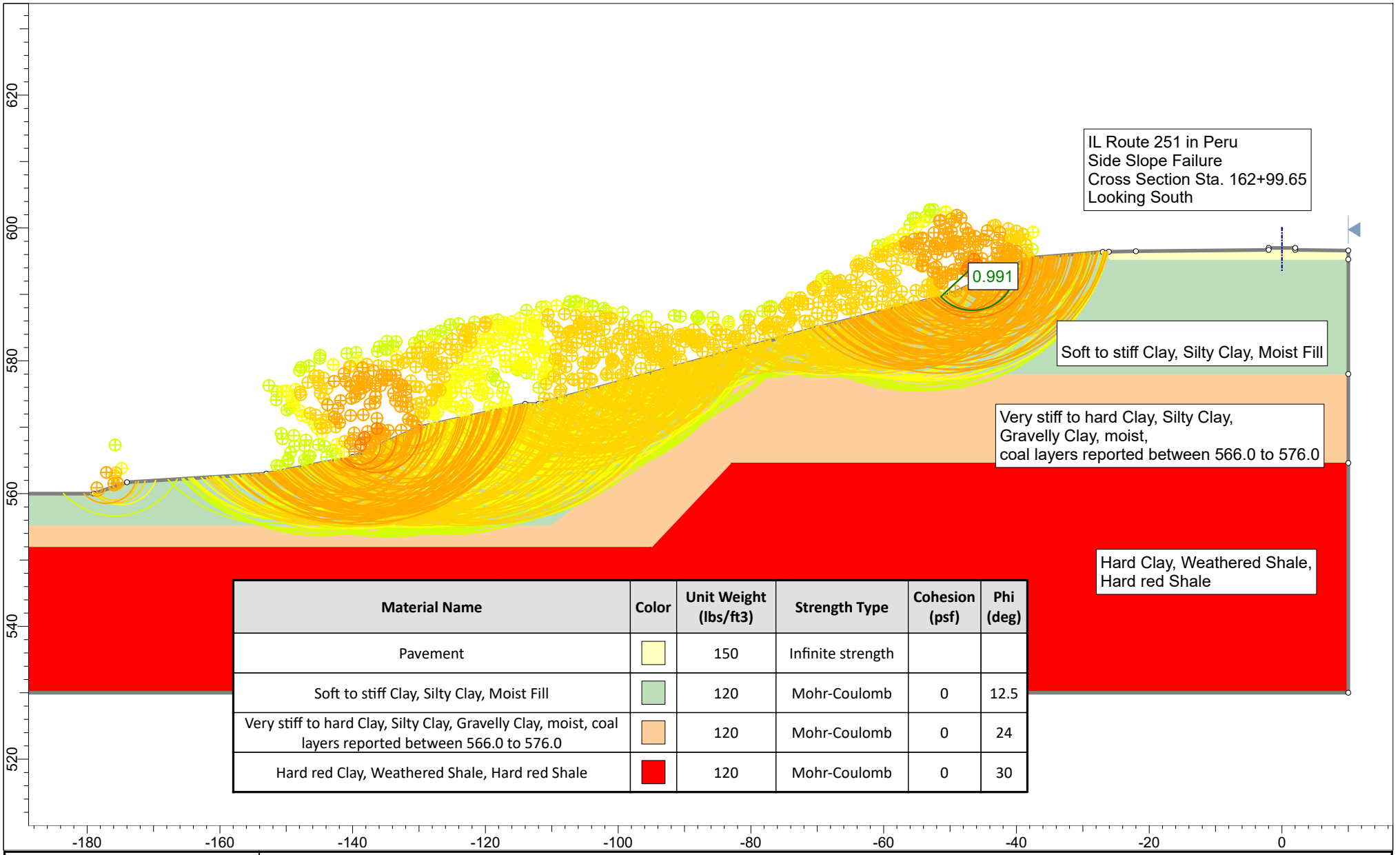
SLIDE - An Interactive Slope Stability Program

Slope Stabilty Analysis -- IL 251 in Peru - Slope Stability Analysis - Sta. 163+05

Analysis Description: IL 251 existing conditions - UnDrained - dwg (1).slim Slope Analysis

Drawn By: MJ | *Scale*: 1:242 | *Company*: McCleary Engineering

Date: 11/10/2017, 1:32:14 PM | *File Name*: IL 251 existing conditions - UnDrained - dwg (1).slim



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Pavement		150	Infinite strength		
Soft to stiff Clay, Silty Clay, Moist Fill		120	Mohr-Coulomb	0	12.5
Very stiff to hard Clay, Silty Clay, Gravelly Clay, moist, coal layers reported between 566.0 to 576.0		120	Mohr-Coulomb	0	24
Hard red Clay, Weathered Shale, Hard red Shale		120	Mohr-Coulomb	0	30

McCleary Engineering

SLIDEINTERPRET 6.039

SLIDE - An Interactive Slope Stability Program

Slope Stabilty Analysis -- IL 251 in Peru - Slope Stability Analysis - Sta. 163+05

Analysis Description: IL 251 existing conditions - Drained - dwg.slim Slope Analysis

Drawn By: MJ | *Scale*: 1:239 | *Company*: McCleary Engineering

Date: 11/10/2017, 1:32:14 PM | *File Name*: IL 251 existing conditions - Drained - dwg.slim

APPENDIX

L-1

IL 251 SLOPE REPAIR

REPAIR OPTION SELECTION MEETING
NOVEMBER 30, 2017

2.1 Miles South of I-80
Section (1)I-2
Contract 66F12
LaSalle County, Illinois

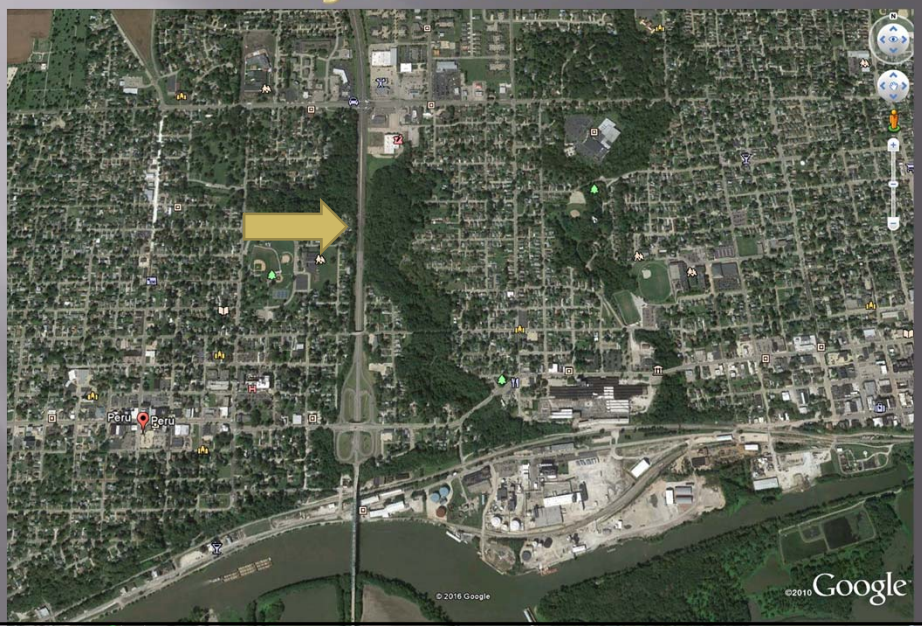
What are the Goals of this Meeting?

- Present the history of the site
- Discuss the geotechnical investigations completed so far
- Discuss a list of repair options
- Choose a few options for further study and more refined cost estimates

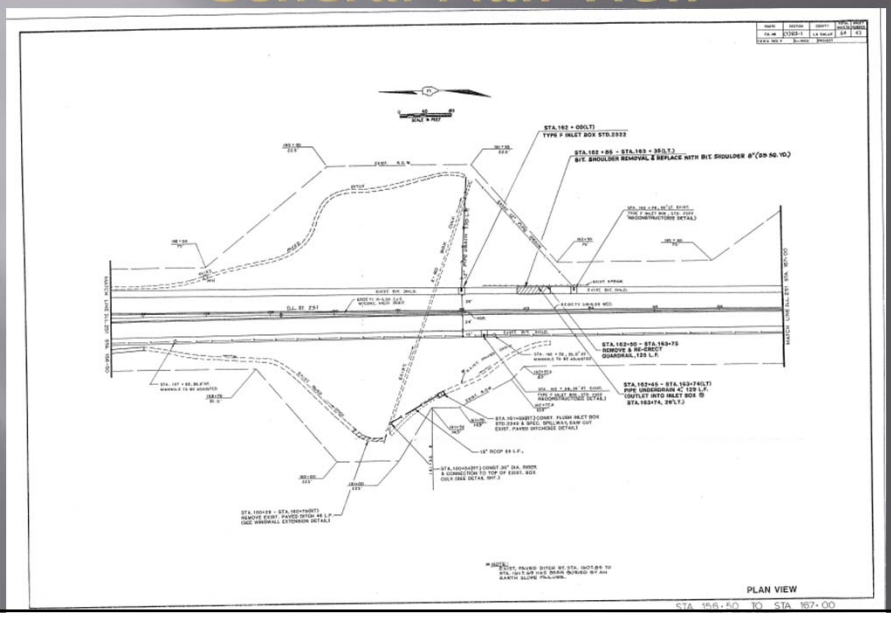
What Decisions are Needed Today?

- Which options should be considered further study and more refined cost estimates?
- What failure is acceptable for the slope away from the roadway?
- What can we tolerate for future roadway cracking?

Project Location



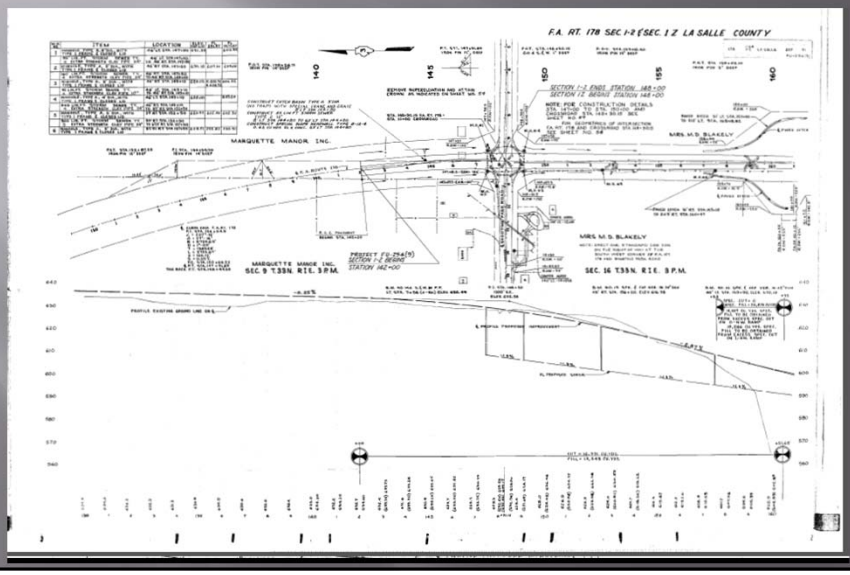
General Plan View



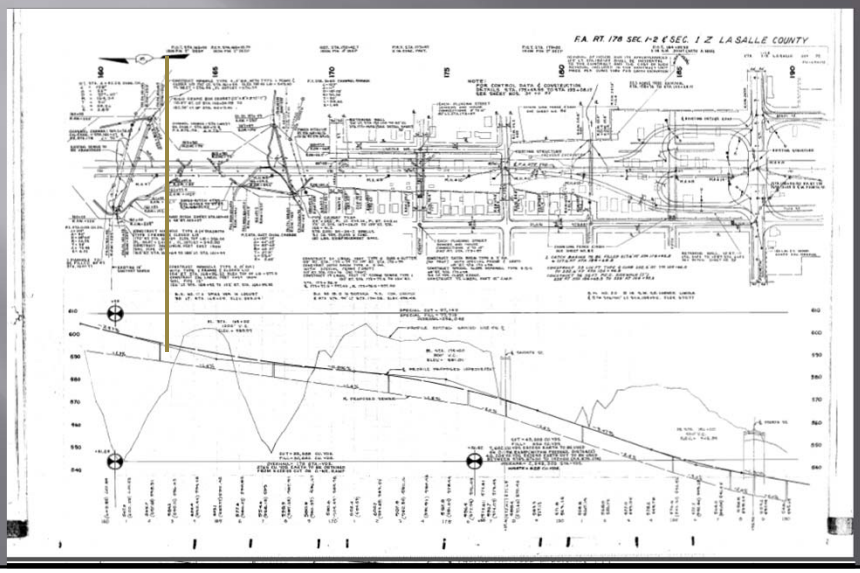
Construction and Recommendation History

- 1961: Original Construction
  - Wingwall failed
- 1984: Repairs
  - Sheet Pile Wall
  - Chimney Drain
  - Shoulder Repair
- 1988: Replace 10 feet of embankment with porous stone and drain pipes (not sure if ever built)
- 1989: Install trench drains (not sure if ever built)
- 1992: Shoulder drains
- 1993: Install 24 inch perforated pipe to intercept water – never built
- 1997: Remove pile of soil from behind guardrail
- 2001: Shoulder Repair with HMA
- 2011: Slope shaping
- 2015: Remove Concrete Slab, Install HMA

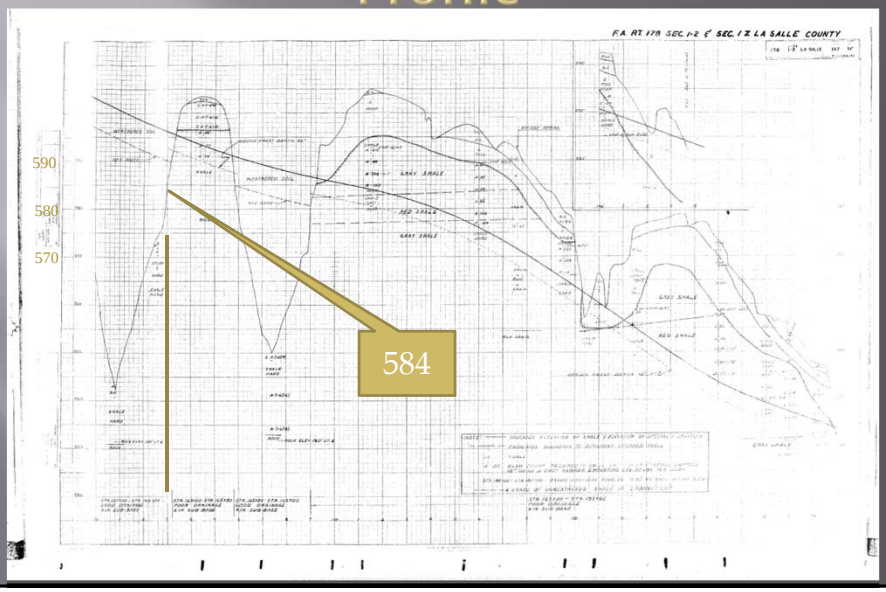
Original Construction – Plan & Profile



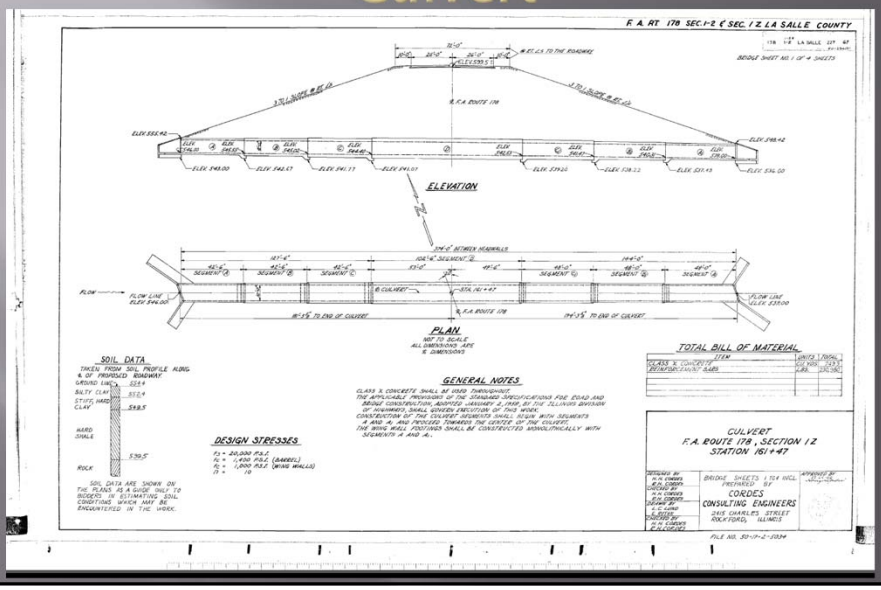
Original Construction – Plan & Profile



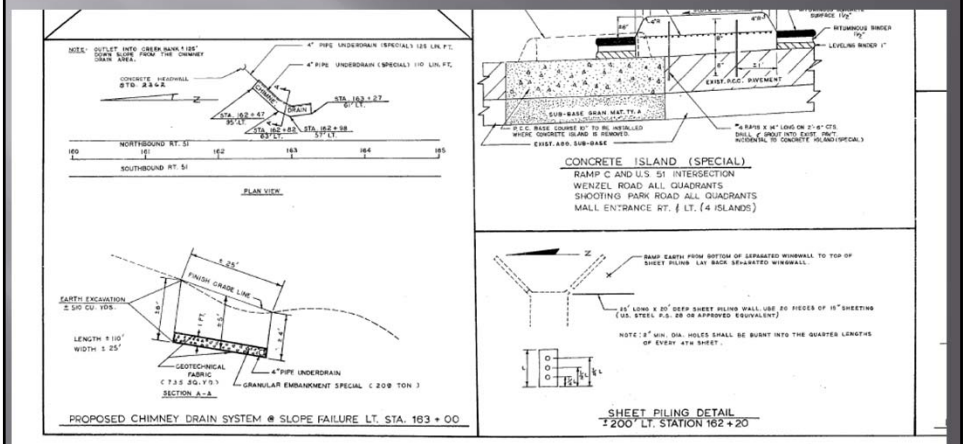
Original Construction – Soil Profile



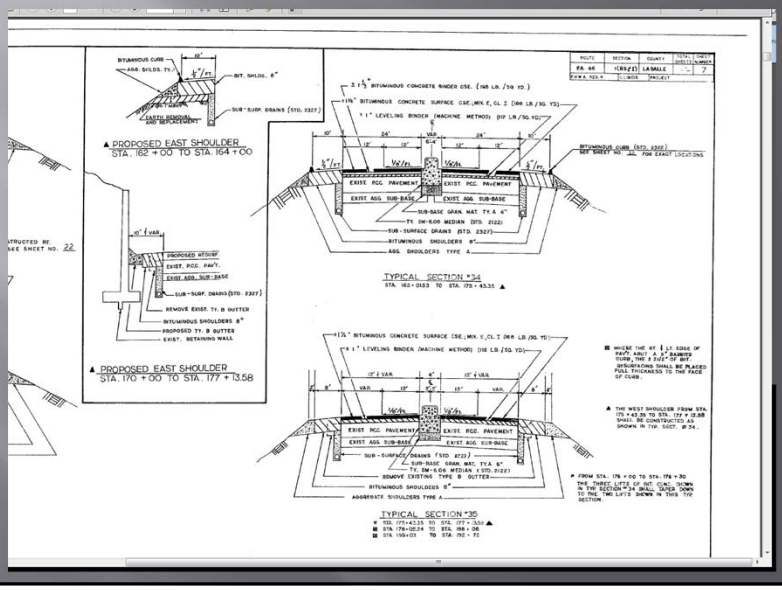
Original Construction – Box Culvert



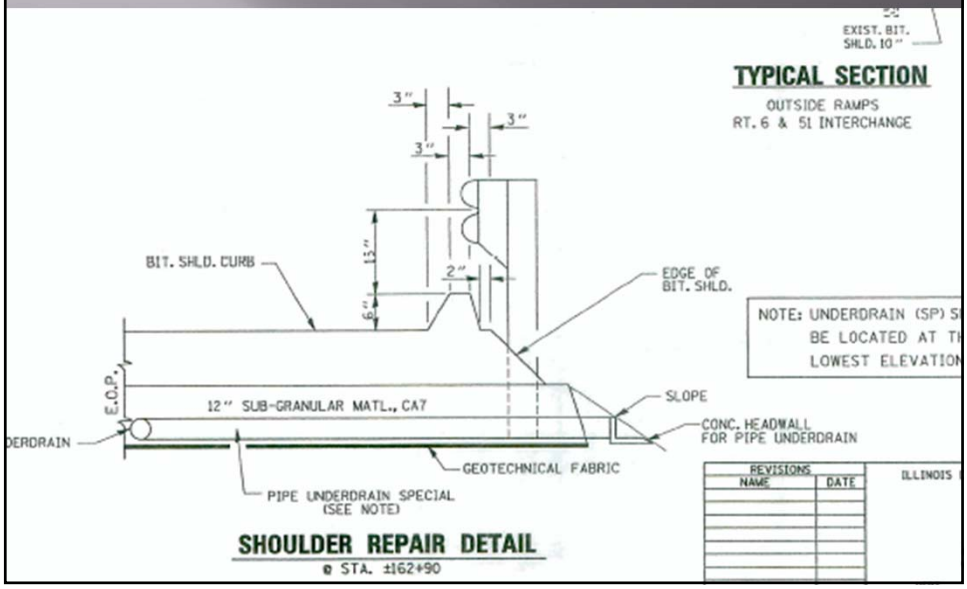
1984 Repairs – Sheet Pile & Chimney Drain



1984 Repairs - Shoulder



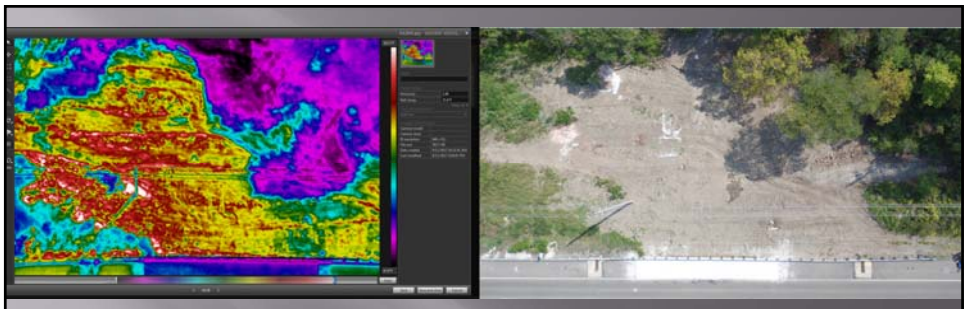
2001 Shoulder Repair

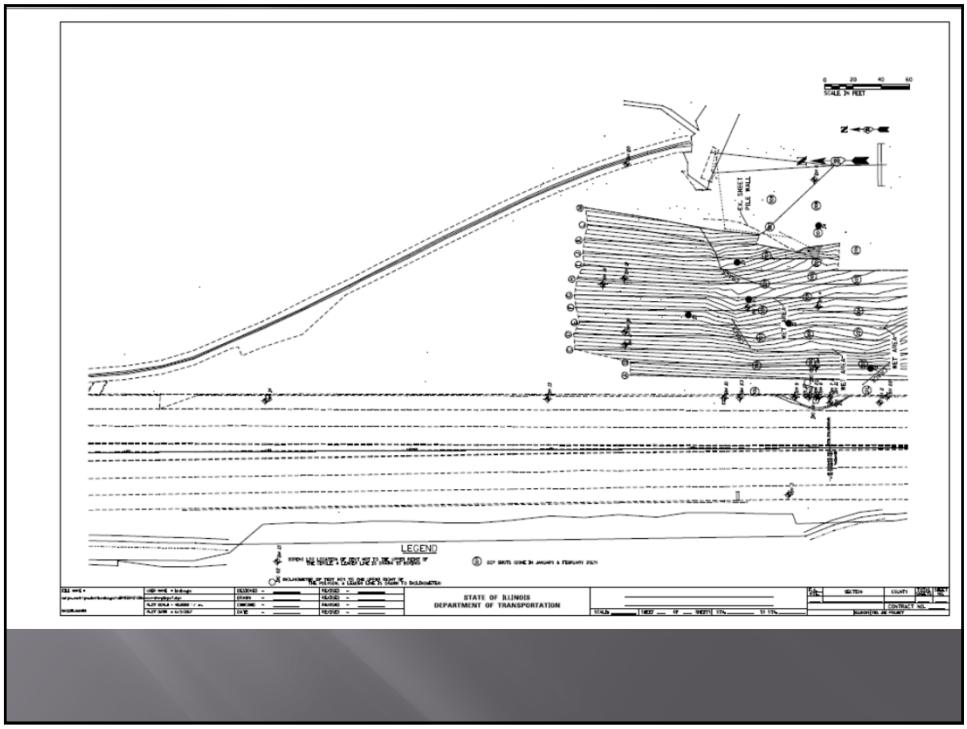


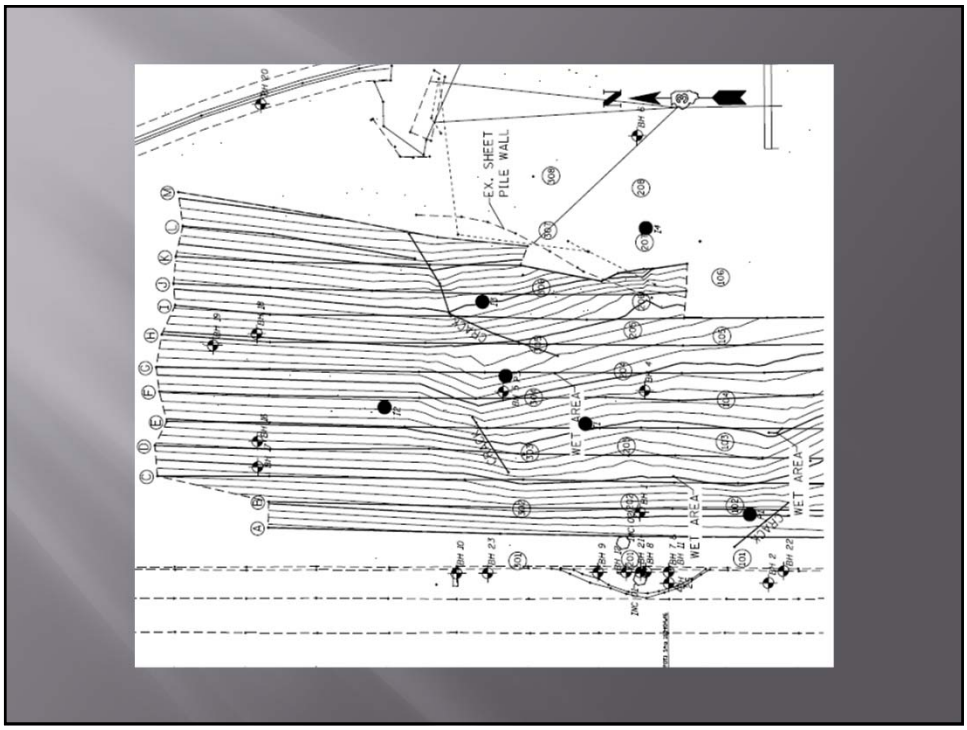
2001 Shoulder Repair

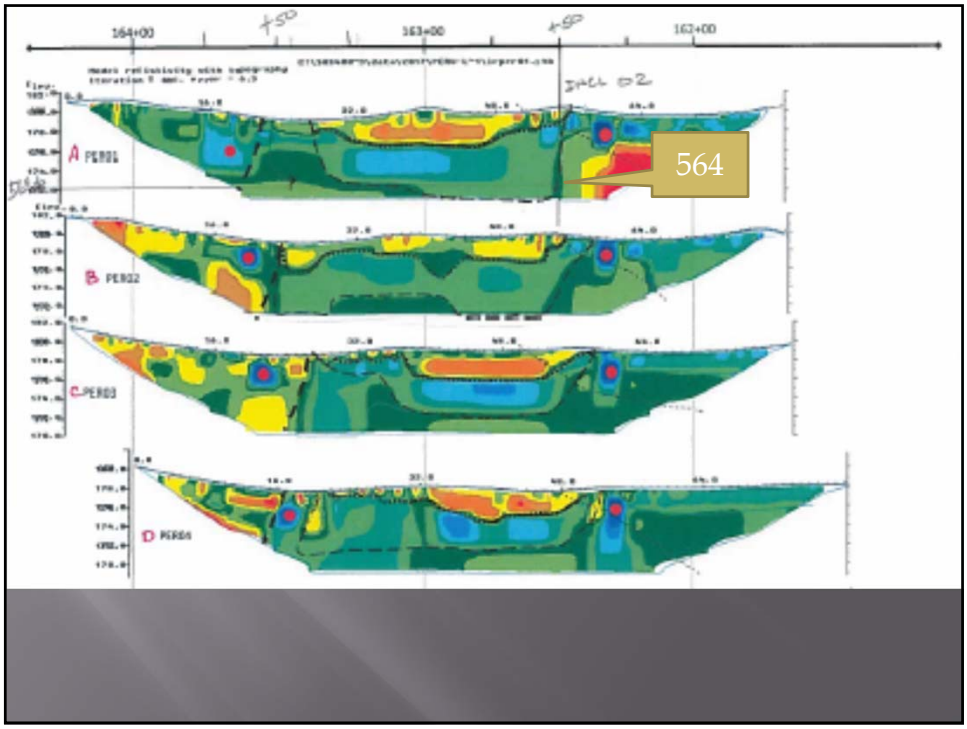


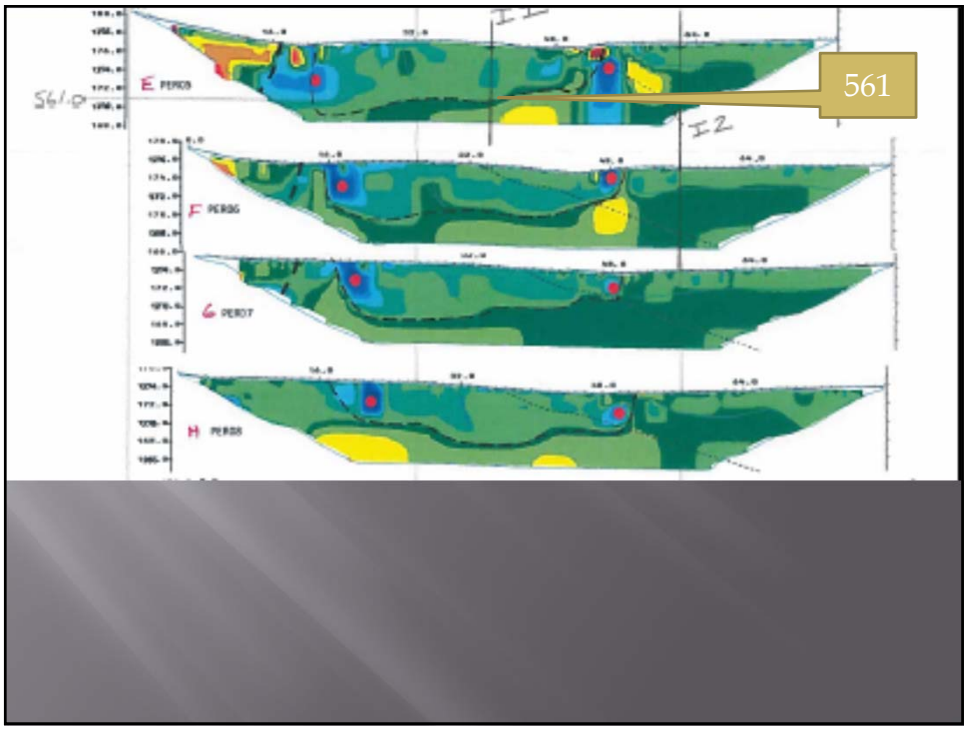
Where are we Now?

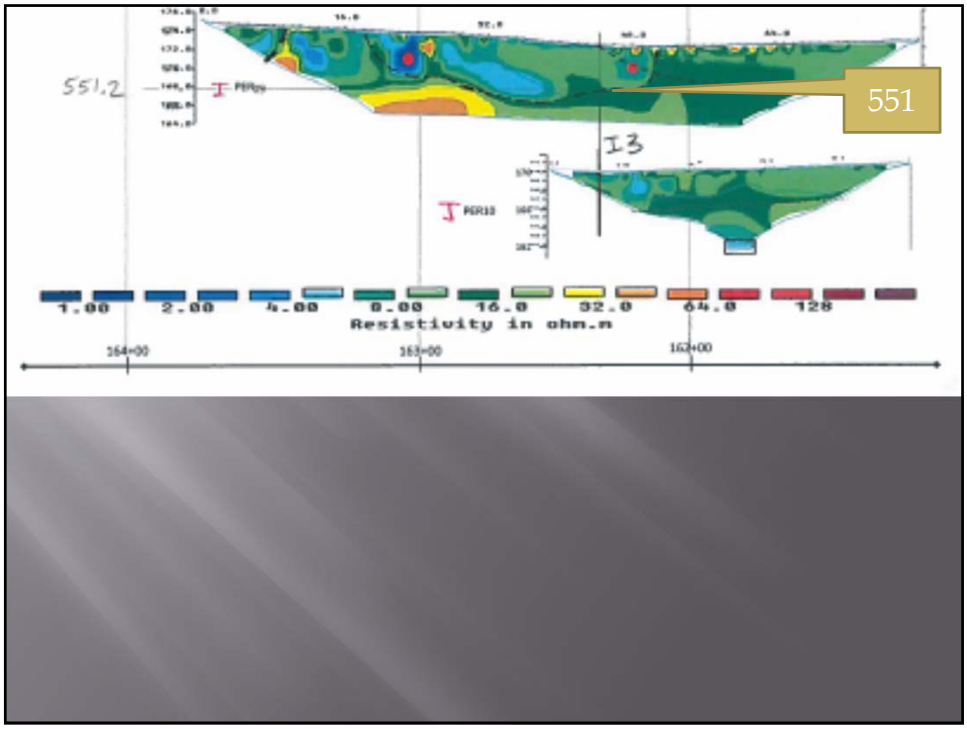


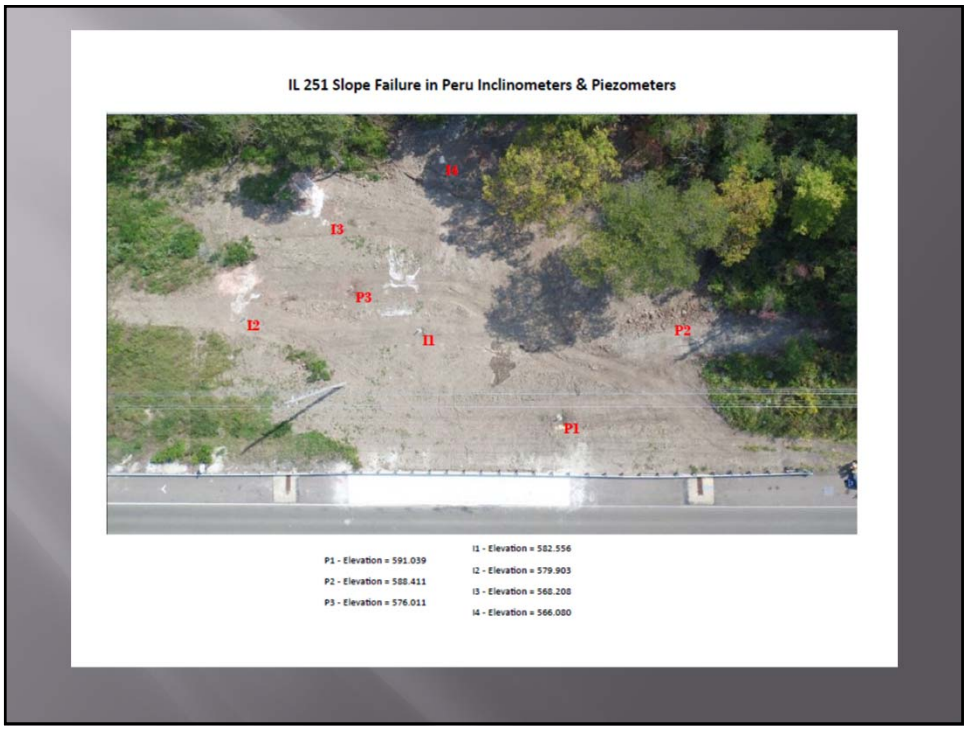

LEGEND
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION


EX. SHEET
PILE WALL
WET AREA
WET AREA
WET AREA

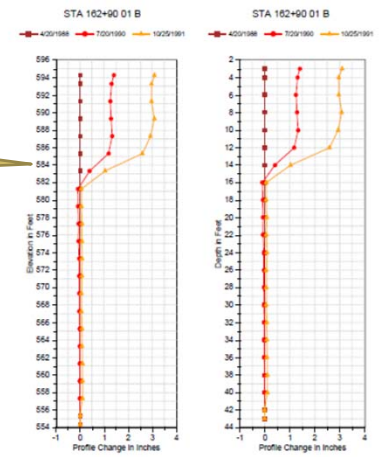

164+00
163+00
162+00
564
A PER01
B PER02
C PER03
D PER04


561
E PER05
F PER06
G PER07
H PER08


551.2
551
I3
1.00
2.00
4.00
8.00
16.0
32.0
64.0
128
Resistivity in ohm.m
164+00
163+00
162+00


IL 251 Slope Failure in Peru Inclinometers & Piezometers
I4
I3
P3
I2
I1
P2
P1
P1 - Elevation = 591.039
P2 - Elevation = 588.411
P3 - Elevation = 576.011
I1 - Elevation = 582.556
I2 - Elevation = 579.903
I3 - Elevation = 568.208
I4 - Elevation = 566.080

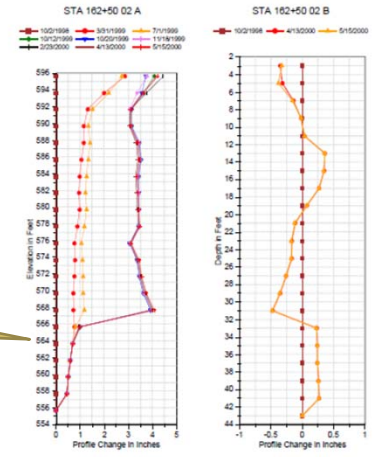
584



Illinois Department of Transportation

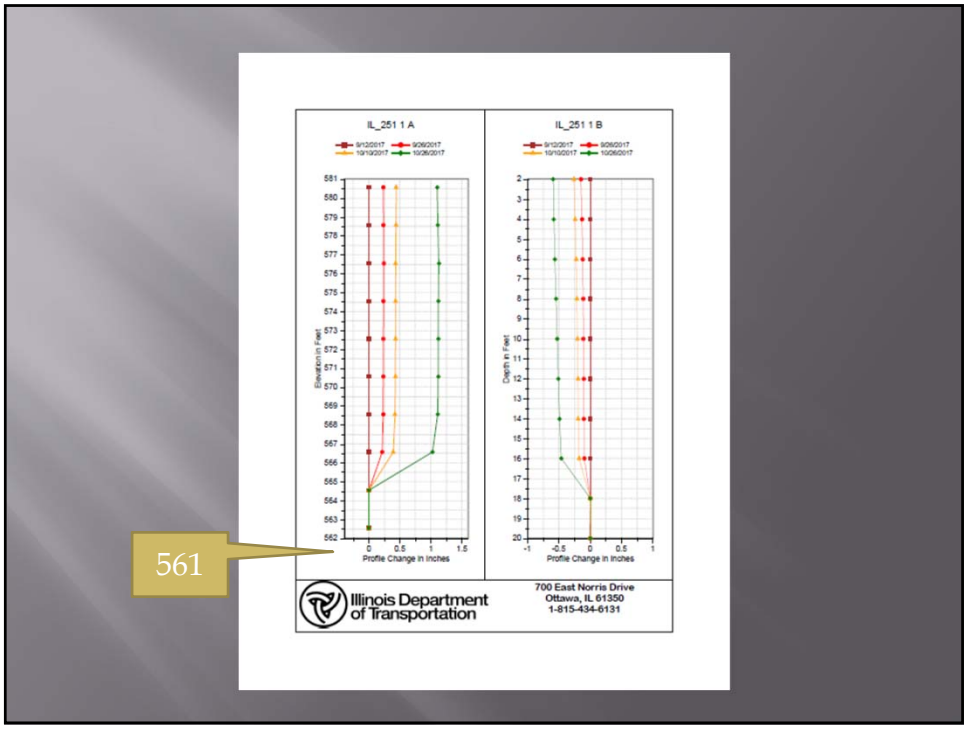
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

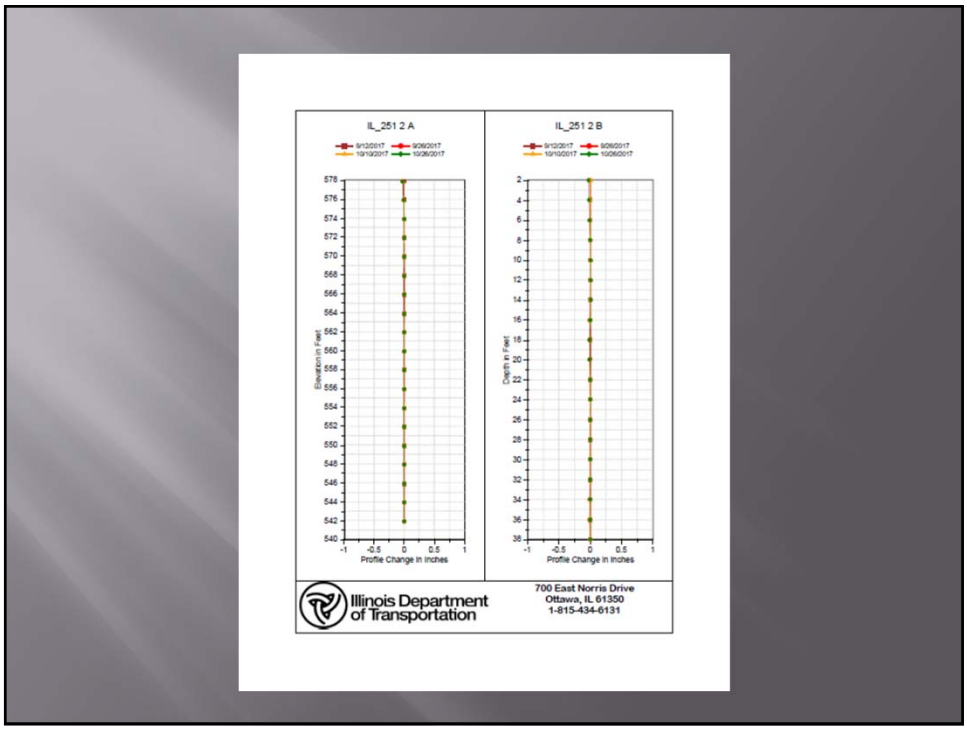
564



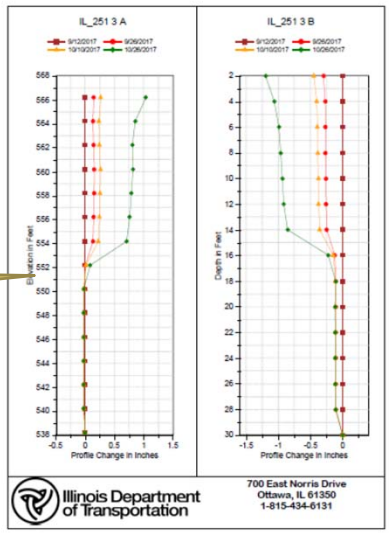
Illinois Department of Transportation

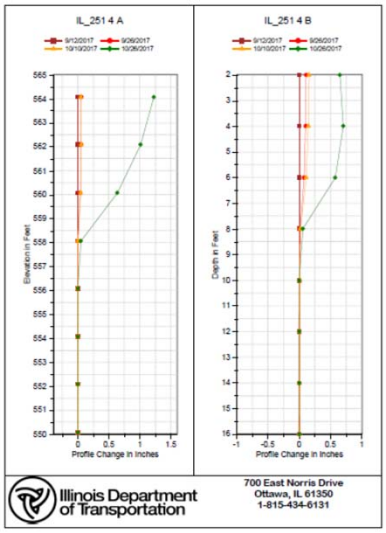
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131


IL_251 1 A
IL_251 1 B
Elevation in Feet
Depth in Feet
Profile Change in Inches
Profile Change in Inches
561
Illinois Department of Transportation
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131


IL_251 2 A
IL_251 2 B
Elevation in Feet
Depth in Feet
Profile Change in Inches
Profile Change in Inches
Illinois Department of Transportation
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

551


IL_251 3 A
IL_251 3 B
Elevation in Feet
Depth in Feet
Profile Change in Inches
Profile Change in Inches
Illinois Department of Transportation
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

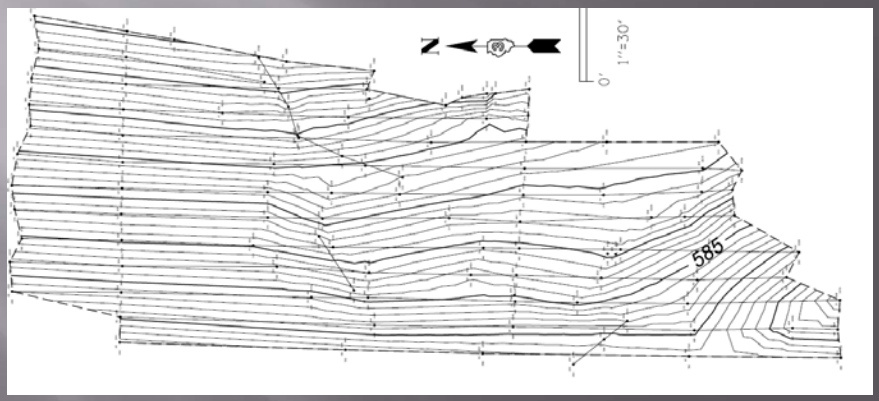

IL_251 4 A
IL_251 4 B
Elevation in Feet
Depth in Feet
Profile Change in Inches
Profile Change in Inches
Illinois Department of Transportation
700 East Norris Drive
Ottawa, IL 61350
1-815-434-6131

Discussion of Repair Options

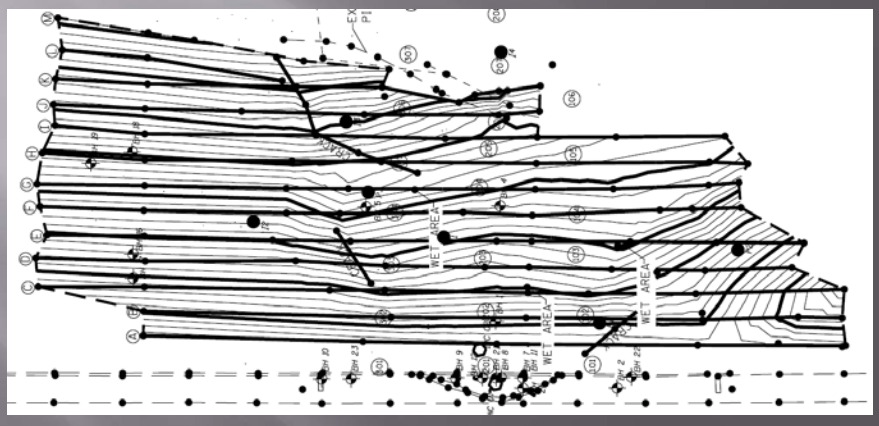
Things to Keep in Mind

- Sketches are conceptual
- Costs are rough estimates
- Costs do not include
  - Temporary Soil Retention Systems
  - Box culvert repairs
  - Drainage repairs
  - Pavement removal and replacement
  - Traffic control
  - Work on the west side

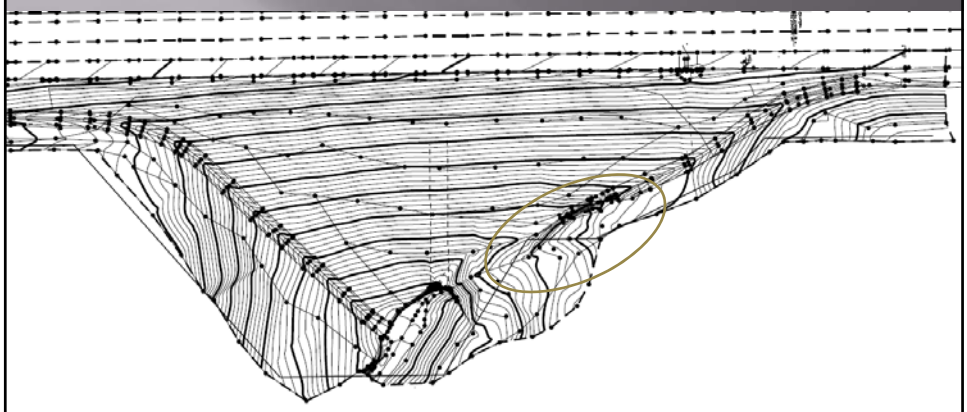
East Side



East Side



West Side



West Side

- Slope issues present
  - Not affecting the roadway
  - Not a priority for correction
- Southwest paved ditch needs work
  - Consider installing a pipe and burying it instead of surface drainage

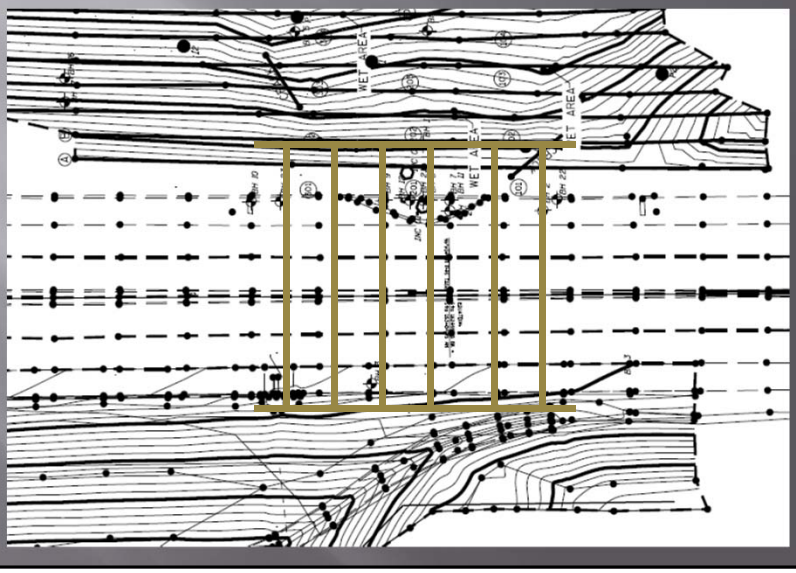
Option 1: Dry Land Bridge

- Long span required
- Not needed for all four lanes (expansion joint at median)
- Expensive
- Routine inspections

Option 2a: Sheet Pile Retaining Wall

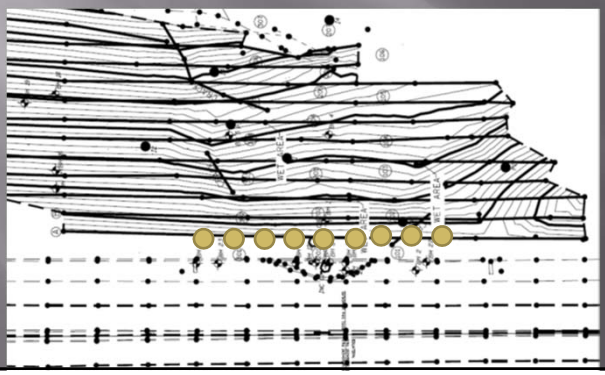
- Tips of sheet piles won't penetrate the good material
  - Tie backs likely – is there good material to tie into?
- Corrosion of steel elements is a concern
- Water retention is a concern
- Routine inspections
- Subsurface exploration to define top of rock required

Option 2a: Sheet Pile Retaining Wall



Option 2b: Drilled Shaft Retaining Wall

- Rock sockets likely
- Routine inspections
- Water retention is a concern
- Makes roadway expansion more complicated



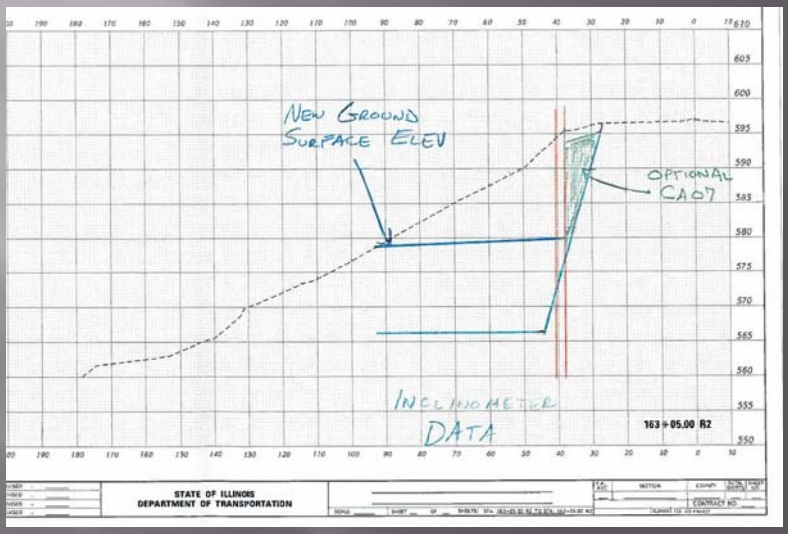
Option 2b: Drilled Shaft Retaining Wall

Shaft Diameter =	3	feet	
Shaft Spacing =	3	feet	
Number of Shafts =	33.33333	each	
Drilled Shaft in Soil =	$ 700	per cubic yard	
Drilled Shaft in Rock =	$ 1,500	per cubic yard	
Drilled Shaft in Soil =	25	feet per shaft =	$ 152,716
Drilled Shaft in Rock =	10	feet per shaft =	$ 130,900
Reinforcing Bars =	1	Lump Sum	$ 25,000
TOTAL COST =			**$ 308,616**

Option 2c: Drilled Soldier Pile Retaining Wall

- Rock sockets likely
- Routine inspections
- Water retention can be mitigated
  - A cosmetic face on the wall is optional
- Minimal excavation on roadway side of the wall
- Excavation required on slope side of the wall
  - This may not need to be replaced
- Makes roadway expansion more complicated
- XXXX INSERT COST HERE XXX

Option 2c: Drilled Soldier Pile Retaining Wall



Option 3a: Remove and Replace to Match Existing Slope

- Replace soil with crushed stone
- Include substantial subsurface drains
- Temporary retaining wall likely needed
- Extensive excavation
- $790,000

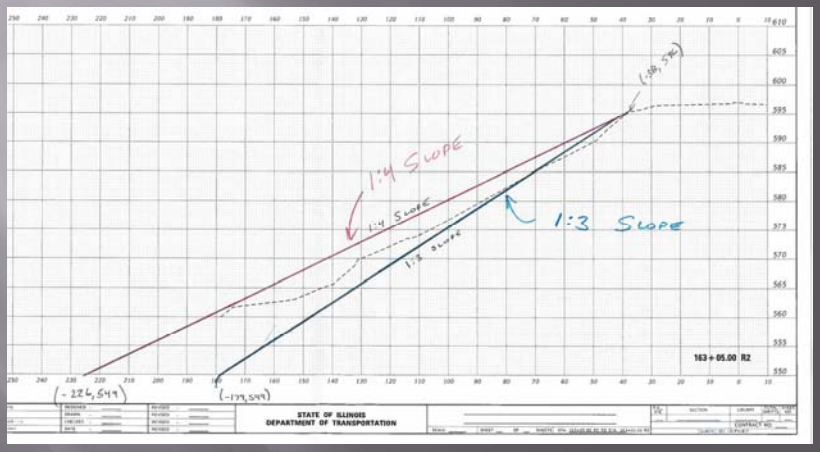
Option 3b: Remove and Replace with 1:3 Slope

- Replace soil with crushed stone
- Include substantial subsurface drains
- Temporary retaining wall likely needed
- Extensive excavation
- $790,000 PLUS

Option 3c: Remove and Replace with 1:4 Slope

- Replace soil with crushed stone
- Include substantial subsurface drains
- Temporary retaining wall likely needed
- Extensive excavation
- Requires purchase of ROW
- May require stream relocation
- Moves letting to January 2019
- $1,000,000 PLUS

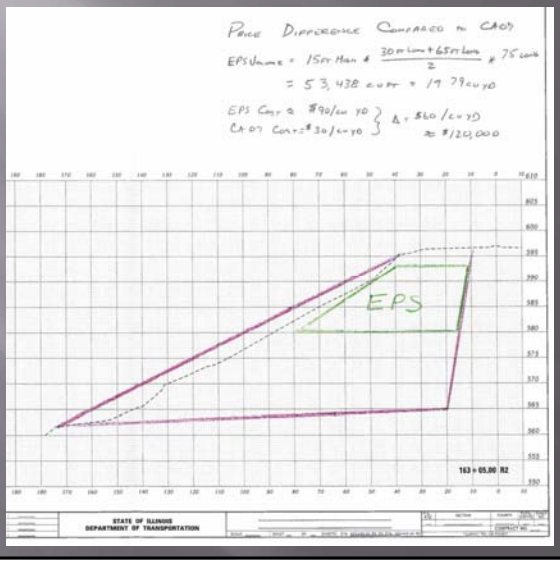
Option 3a, 3b, 3c



Option 4: Remove and Replace with 1:3 Slope and EPS Fill

- Replace soil with crushed stone
- Include substantial subsurface drains
- EPS will reduce risk of future movement
- Temporary retaining wall likely needed
- Extensive excavation

Option 4: Remove and Replace with 1:3 Slope and EPS Fill



Option 4: Remove and Replace with 1:3 Slope and EPS Fill

- Replace soil with crushed stone
- Include substantial subsurface drains
- EPS will reduce risk of future movement
- Temporary retaining wall likely needed
- Extensive excavation
- Cost Premium for this option = $120,000
  - This is the comparison of the price of 1979 cubic yards of EPS compared to the same volume of crushed stone
- Total Cost = $910,000 PLUS
- Do we need to discuss our previous experience with EPS?

Option 5: Deep Patch Repair

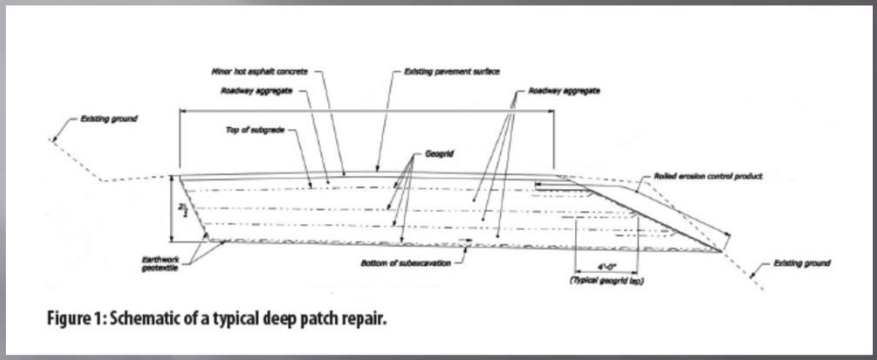
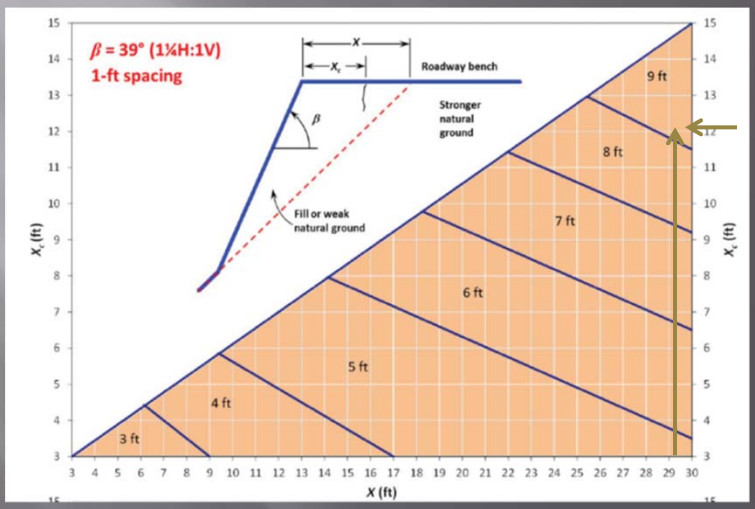


Figure 1: Schematic of a typical deep patch repair.

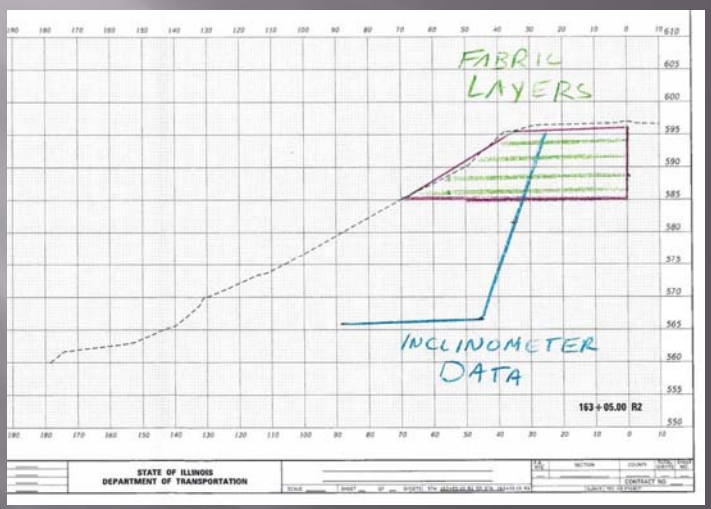
Option 5: Deep Patch Repair

- Less excavation than complete removal and replacement
- Pushes the boundary of this method
  - FHWA involvement necessary to evaluate appropriateness of this method
- Not likely to stop the slide, only bridge it
- Temporary retaining wall likely needed

Option 6: Deep Patch Repair



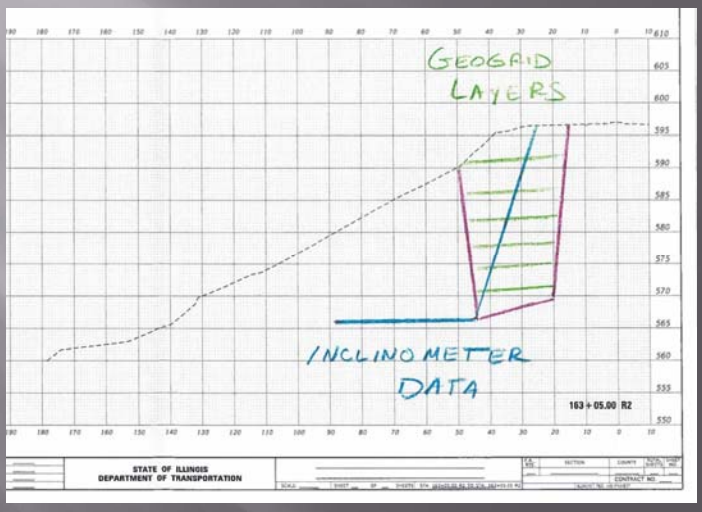
Option 5: Deep Patch Repair



Option 6: Localized Removal and Replacement

- Minimizes amount of removal and replacement
- Focuses our resources close to the road
- Makes future expansion slightly challenging
- $350,000

Option 6: Localized Removal and Replacement



Option 7a: Horizontal Drains

- Relatively inexpensive
- Design guidelines are ambiguous
- Groundwater modeling required
- Routine cleaning and inspections
- May not work
- Cost Estimate
  - 25 drains * 50 feet / drain * $35 per foot = $43,750
  - Mobilization = $50,000
  - Collector system = $50,000
  - Total = $150,000

Option 7b: Horizontal Wick Drains

- Relatively inexpensive
- Somewhat experimental
- Overhead power lines
- Requires earthwork to shape slope for equipment access
- May not work
- Cost Estimate
  - 100 drains * 50 feet / drain * $1.50 per foot = $7,500
  - Earthwork / temporary platforms = $15,000
  - Mobilization = $25,000
  - Collector system = $50,000
  - Total = $100,000

Option 9: Plate Piles

- This slide is too deep for plate piles to work on their own
- Plate piles could be used as part of a multi-faceted approach
- Cost $41 per square foot
  - $1,250,000 for entire slope

Are there Other Options you Want Considered?

Which Options Should be Considered Further?

Evaluation of Options

Number	Title	Eliminate	Study More
1	Dry Land Bridge	X	


Discussion

APPENDIX

L-2

From: Alexander, David S
To: Short, Michael A; Braboy, Patrick C; Broviak, David E; Phillips, Wayne L; Wick, Joseph C
Subject: 66F12, slope failure meeting recap
Date: Friday, December 01, 2017 1:41:59 PM

Good morning,

Please see below items to note from our meeting to discuss contract 66F12 to repair the slope failure on IL 251 south of Shooting Park Road.

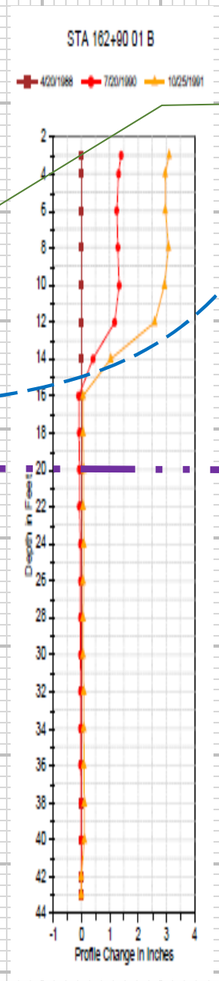
1. Consider investigating existing drainage pipes with the culvert inspection robot "Johnny 5"
2. Agreed that a permanent solution is the intent with permanent meaning something that lasts at least until the culvert needs to be replaced.
3. Options moving forward for further study
    a. Remove failing material and replace with a combination of aggregate and EPS foam blocks.
    b. Soldier pile retaining wall, give strong consideration to aggregate backfill on the roadway side. Mr. Phillips noted that he would prefer the aggregate not to be wrapped in filter fabric.
    c. Horizontal wick drains, do minor follow up to see if they seem very likely to be an adequate solution
4. Development of box culvert repairs can get underway since the slope is not anticipated to change
5. Dave Alexander will make contact with a consultant who can prepare structure repair, soldier pile wall, and roadway plans and specs.
6. Mike short has McCleary Engineering refining options a and b above to get better ideas of the scope and cost.
7. Mike noted that a soldier pile wall may also require an SGR.

Thanks,
Dave A.

David S. Alexander P.E.
Studies & Plans Project Engineer
IDOT District 3
700 East Norris Drive
Ottawa, IL 61350
Phone: 815-434-8468

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

Original Slope



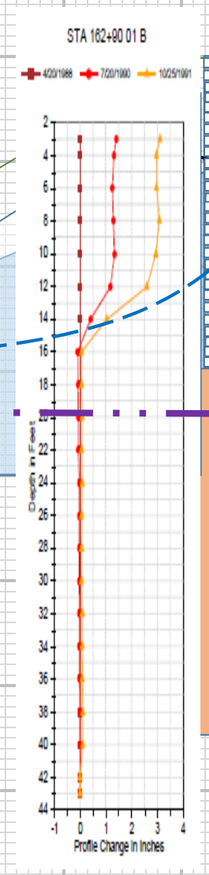
EOP

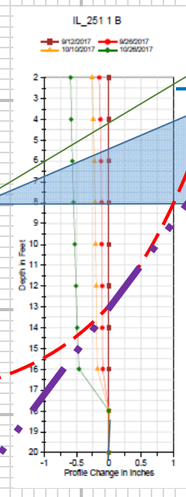
Notes and Observations:
1. Taking into account the older inclinometer data and the location of the stiff to Hard material denoted by the purple dash-dot-dot line, at least two slope failures are present. They are denoted by the blue dashed and red dashed lines.

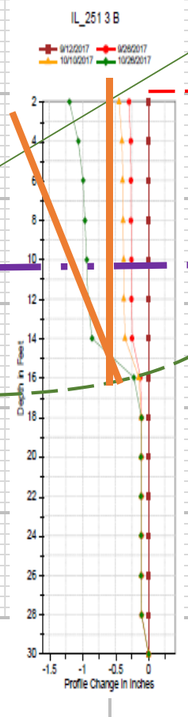
2. The purple dash-dot-dot line is based on borings B-1, I-1, and I-3.

Slope with Soldier Pile Wall - Lagging down to 15.5 ft.

EOP







Notes and Observations:

1. Taking into account the older inclinometer data, the most recent inclinometer data and the location of the stiff to Hard material denoted by the purple dash-dot-dot line, it is possible that three slope failures are present. They are denoted by the blue dashed, red and green dashed lines.

2. The purple dash-dot-dot line is based on borings B-1, I-1, and I-3.

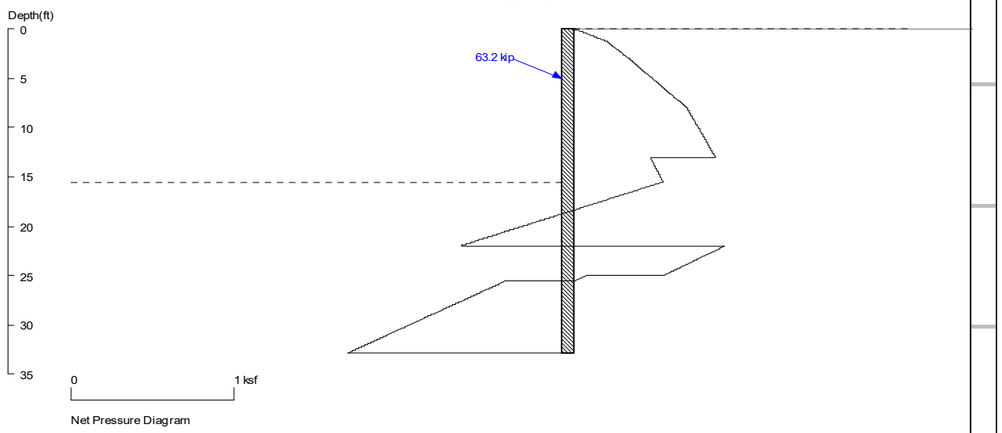
3. See Shoring8 model for Soldier Pile spacing of 8 ft. and a tieback at 5 ft. down at 25 deg. angle with HP14x73. **(0.83 inches of lateral movement near the middle of the wall.)**
   a. The depth of shaft embedment is approximately 17.5 ft.

4. See Shoring8 model for Soldier Pile spacing of 8 ft. and a tieback at 5 ft. down at 25 deg. down angle with HP 16x121 **(0.39 inches of lateral movement near the middle of the wall.)**
   a. The depth of shaft embedment remains at 17.5 ft.

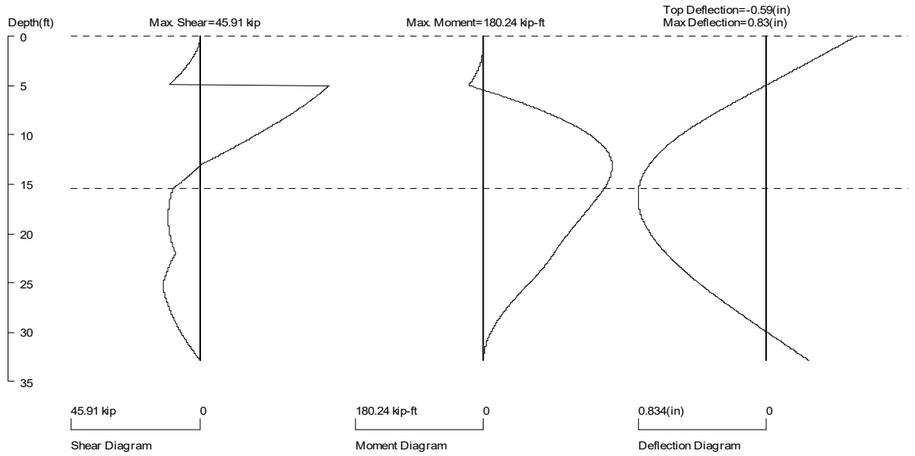
5. Results are preliminary and should not be considered complete.

IL 251 Soldier Pile Wall

15.5 ft. Tall from Bottom of Lagging to Top



Net Pressure Diagram



Shear Diagram | Moment Diagram | Deflection Diagram

PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, HP14X73: E (ksi)=29000.0, I (in4)/pile=729.0

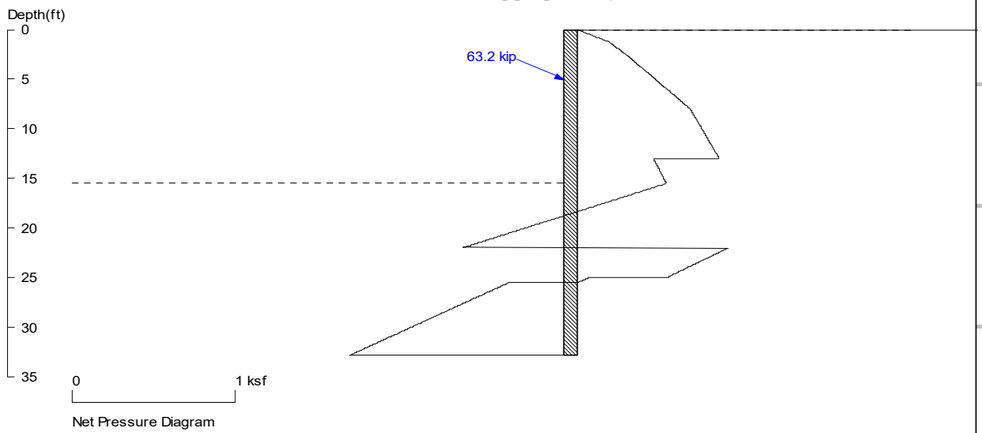
File: C:\Users\User\Downloads\Upload Files to ShareFile (to be deleted)\IL 251 Soldier Pile Wall with one deadman at 5 ft and 8 ft. pile spacing.sh8

<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltech.com

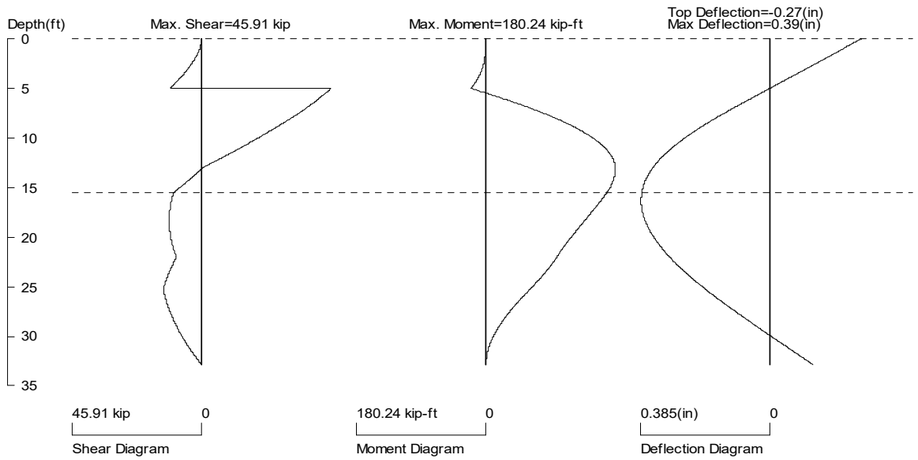
Licensed to 4324324234 3424343

IL 251 Soldier Pile Wall

15.5 ft. Tall from Bottom of Lagging to Top



Net Pressure Diagram



Shear Diagram | Moment Diagram | Deflection Diagram

PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, HP16X121: E (ksi)=29000.0, I (in4)/pile=1578.0

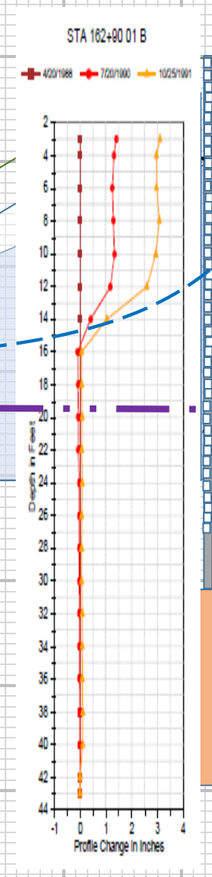
File: C:\Users\User\Downloads\Upload Files to ShareFile (to be deleted)\IL 251 Soldier Pile Wall with one deadman at 5 ft and 8 ft. pile spacing.sh8

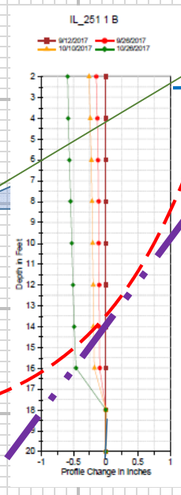
<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltech.com

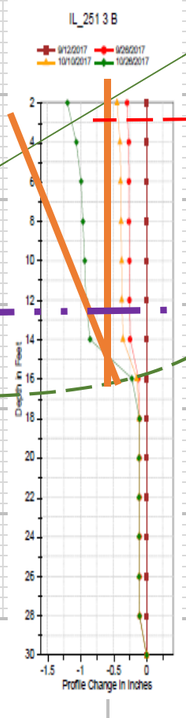
Licensed to 4324324234 3424343

Slope with Soldier Pile Wall - Lagging down to 25.5 ft.

EOP







Notes and Observations:

1. Taking into account the older inclinometer data, the most recent inclinometer data and the location of the stiff to Hard material denoted by the purple dash-dot-dot line, it is possible that three slope failures are present. They are denoted by the blue dashed, red and green dashed lines.

2. The purple dash-dot-dot line is based on borings B-1, I-1, and I-3.

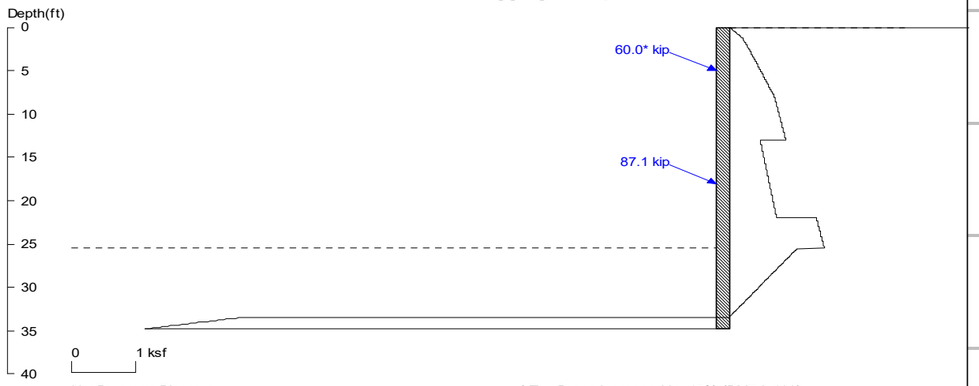
3. See Shoring8 model for Soldier Pile spacing of 8 ft. and a tieback at 5 ft. and 18 ft. down at 25 deg. down angle with HP10x42. **(0.64 inches of lateral movement near the middle of the wall.)**
   a. The depth of shaft embedment is approximately 9.5 ft.

4. See Shoring8 model for Soldier Pile spacing of 8 ft. and a tieback at 5 ft. and 18 ft. down at 25 deg. down angle with HP 14x73 **(0.18 inches of lateral movement near the middle of the wall.)**
   a. The depth of shaft embedment remains at 9.5 ft.

5. Results are preliminary and should not be

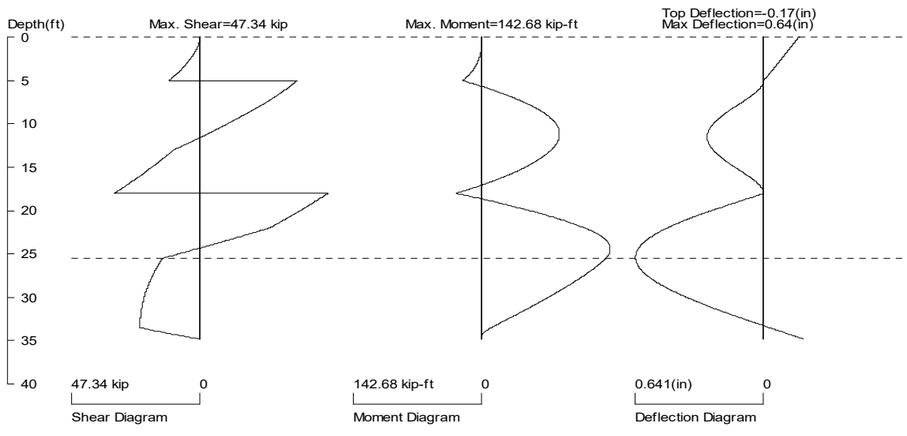
IL 251 Soldier Pile Wall

25.5 ft. Tall from Bottom of Lagging to Top



Net Pressure Diagram

* Top Brace increased by 15% (DM7.2-103)



Shear Diagram | Moment Diagram | Deflection Diagram

PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, HP10X42: E (ksi)=29000.0, I (in4)/pile=210.0

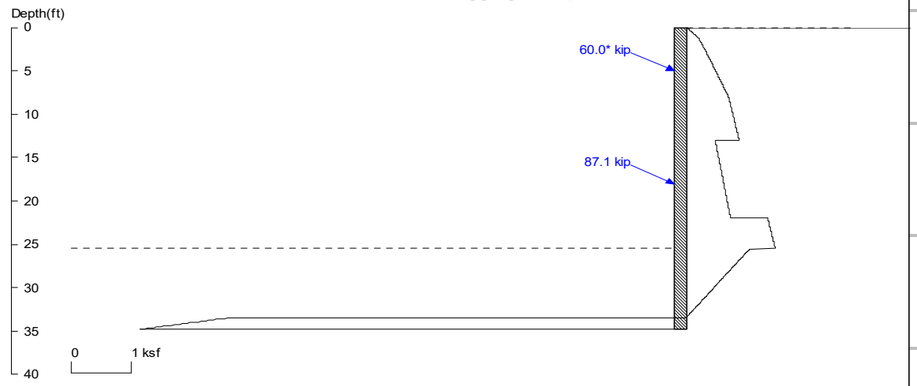
File: C:\Users\User\Downloads\Upload Files to ShareFile (to be deleted)\IL 251 Soldier Pile Wall with two deadman at 5 and 18 ft with 8 ft. pile spacing.sh8

<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltech.com

Licensed to 4324324234 3424343

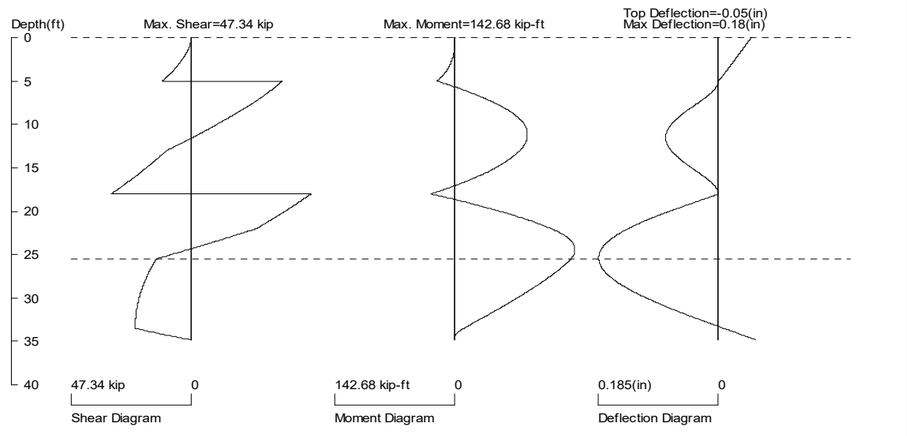
IL 251 Soldier Pile Wall

25.5 ft. Tall from Bottom of Lagging to Top



Net Pressure Diagram

* Top Brace increased by 15% (DM7.2-103)



Shear Diagram | Moment Diagram | Deflection Diagram

PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 8.0 foot or meter

User Input Pile, HP14X73: E (ksi)=29000.0, I (in4)/pile=729.0

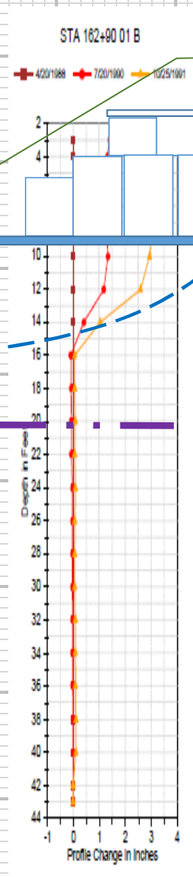
File: C:\Users\User\Downloads\Upload Files to ShareFile (to be deleted)\IL 251 Soldier Pile Wall with two deadman at 5 and 18 ft with 8 ft. pile spacing.sh8

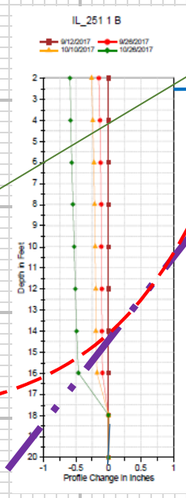
<ShoringSuite> CIVILTECH SOFTWARE USA www.civiltech.com

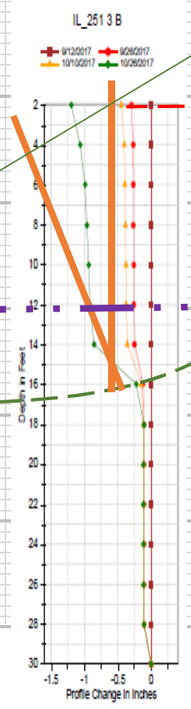
Licensed to 4324324234 3424343

Slope with GPS Foam Blocks

EOP







Notes and Observations:
1. Should install a drainage layer around the EPS Foam. For quantity purposes, assume 1 ft. thick.

2. The slope stability FOS dips below 1.5 when the bottom of the EPS foam is 589.0 ft. When the bottom of the EPS foam is lowered to 586.0 ft. the FOS increases to 1.6.

3. To help prevent cracking in the pavement above, a 4" to 6" concrete slab reincorced with wire mesh.

4. A preliminary settlement analysis was performed using the information from boring B-1 (1992). Approximately 0.25 inch of settlement should be expected if the bottom of the foam rests at 586.0 ft. Lowering the bottom of the foam to 581.0 ft. may reduce the settlement to less than 0.1 inches.

5. This option will require a temporary sheet pile wall or benching into the embankment under the northbound driving lane.

6. Results are preliminary and should not be considered complete.

From: Alexander, David S
To: Broviak, David E; Phillips, Wayne L
Subject: IL 251 slope failure
Date: Friday, January 05, 2018 9:54:00 AM

Gentlemen,

Based on cost we are proposing a soldier pile retaining wall with pre-cast concrete lagging as a remedy to the existing slope failure on 251 south of Shooting Park Road. We are tentatively looking at setting the wall about 3 feet behind the face of guardrail to accommodate design deflection. We will also ask the consultant to look at whether putting the wall at edge of shoulder with a barrier wall on top of it is a better option.

Please let me know if you have any questions or concerns.

Thanks,
Dave A.

David S. Alexander P.E.
Studies & Plans Project Engineer
IDOT District 3
700 East Norris Drive
Ottawa, IL 61350
Phone: 815-434-8468

APPENDIX

M-1

Geotechnical Reports
Revised 3-30-2018

A Roadway Geotechnical Report and a Structure Geotechnical Report have been prepared for this project. Copies can be obtained by contacting Mike Short, District Materials Engineer, at 1-815-433-7085 or Michael.Short@Illinois.gov.

APPENDIX

M-2

Route: FAP 46 (IL 251)
Section: (1)I-2
County: LaSalle
Contract No.: 66F12

GEOTECHNICAL INSTRUMENTATION ADJUSTMENT

DESCRIPTION. This work shall consist of the vertical adjustment of inclinometers and piezometers to accommodate the proposed ground surface elevations.

MATERIALS. Materials shall be according to the following:

Grout……..1024

Sand…….1003[1].

Note 1 – The sand shall be Class B quality, gradation FA1 or FA2.

CONSTRUCTION REQUIREMENTS

The existing inclinometers and piezometers shall be adjusted for vertical elevation. The existing locking riser covers shall be removed, cleaned and reinstalled. The existing inclinometer and piezometer casings shall be cut off to an elevation 24-inches above the proposed ground surface elevation. The existing locking riser covers shall be reinstalled so the locking cover is 30-inches above the proposed ground surface elevation. The annular space between the locking riser cover and the casing shall be filled with sand. The locking riser cover shall be set in a 12-inch diameter excavation and the annular space between the excavation and the locking riser cover filled with grout.

After the casing elevations have been adjusted and the locking riser covers reinstalled, the inclinometers and piezometers will be evaluated for damage. Any damage to the inclinometers or piezometers shall be repaired.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for GEOTECHNICAL INSTRUMENTATION ADJUSTMENT.

APPENDIX

M-3

SLOPE INCLINOMETER CASING

Description. This work shall consist of furnishing and installing slope inclinometer casings. The Engineer will provide the necessary measuring equipment and computer software to conduct measurements of the slope inclinometers.

Materials. Materials shall be according to AASHTO R 45 and as specified herein.

Guide Casing shall be large diameter (3.34 inch, 85 mm) to facilitate long-term monitoring. Couplings shall be sealed to prevent grout intrusion.

Hole covers and/or other protective devices shall be installed to provide long term access to the inclinometer.

Technical data and catalog cuts shall be provided to the Engineer for review and approval no later than 45 days prior to installation of the inclinometer guide casing.

Construction. Slope inclinometers shall be installed according to AASHTO R 45 and as specified herein at the locations and depths as specified in the plans or as determined by the Engineer.

The guide casing shall be attached to the soldier pile flange or other location as directed by the Engineer prior to installation of the soldier pile. The inclinometer guide casing shall extend to the bottom of the soldier pile.

Telescoping sections or couplings shall be installed in the fully extended position. The guide casing groove orientation shall be perpendicular to the direction of potential movement or as specified by the Engineer. After installation, the guide casing groove spiral shall not exceed one degree per 10 feet of length, the orientation of the grooves at the top of the guide casing shall be within 10 degrees of the planned orientation. Correct guide casing groove orientation shall be maintained throughout installation. Once installed, the guide casing shall not be rotated to align the grooves. The guide casing shall be fully plumb and no tilting in any direction shall be allowed, and no part of the guide casing shall deviate from vertical by more than 4 percent of the depth to that part.

After completion of installation, a post-installation acceptance test will be performed to verify that there is no grout or concrete in the inclinometer guide casing, that groove orientation and verticality are correct, and that the inclinometer probe tracks correctly in all four orientations. Groove alignment will be checked with a spiral probe as directed by the Engineer. In the event of any failed post installation acceptance test, the Contractor shall install another inclinometer at a location approved by the Engineer.

Inclinometers shall be protected from damage and maintained so they can continue to be used after completion of this project.

At the completion of the project, the slope inclinometers shall be left in place and capped with a locking cover that allows future access to the inclinometer for long-term monitoring.

Method of Measurement. Slope inclinometer casing will be measured for payment intact from the bottom of the inclinometer casing to the top of the inclinometer casing. Slope inclinometers that fail the post-installation acceptance test will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot for SLOPE INCLINOMETER CASING.