STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

VOLUME V – COMBINED DESIGN REPORT
APPENDIX G
PROJECT REPORTS

FAP ROUTE 318 (IL 29)
SECTION 1, 2, 3, 4, 5, 20, 21, & 6, 8, 9, 10
PEORIA, MARSHALL, PUTNAM & BUREAU COUNTIES
P–94–009–01 & P–94–019–02

June 2010
Catalog No. 032469-00P

Illinois Department of Transportation
CH2MHILL

$PLOTDATE
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

VOLUME V – COMBINED DESIGN REPORT
APPENDIX G1 – LOCATION DRAINAGE REPORT
APPROVAL SHEET
PROJECT REPORTS

FAP ROUTE 318 (IL 29)
SECTION 1, 2, 3, 4, 5, 20, 21, & 6, 8, 9, 10
PEORIA, MARSHALL, PUTNAM & BUREAU COUNTIES
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Illinois Department of Transportation
Division of Highways / Region 3 / District 4
401 Main Street / Peoria, Illinois / 61602-1111
Telephone 309/671-3333

April 15, 2010

BUREAU OF PROGRAM DEVELOPMENT
STUDIES & PLANS – PHASE I
FAP Route 318 (IL 29)
Section: 1,2,3,4,5,20,21 & 6,8,9,10
Peoria, Marshall, Putnam & Bureau Counties
Job Nos. P-94-009-01 & P-94-019-02
Catalog No. 032469-00P
PTB/Item No. 118/056

Mr. Jim Jodie
CH2M Hill, Inc.
135 South 84th Street, Suite 325
Milwaukee, Wisconsin 53214

Dear Mr. Jodie:

A Location Drainage Study (LDS) for the above-referenced job was prepared by Hutchison Engineering, Inc. and Lin Engineering, Ltd., as sub-consultants to CH2M Hill, Inc. It was written according to the format jointly established by IDOT and the American Council of Engineering Companies of Illinois. The scope of the job is to study an upgrade of existing IL Route 29 to a four-lane facility from the termination of IL Route 6 near Mossville in Peoria County to Interstate 180 in Bureau County. The improved roadway will include both freeway and expressway segments.

The LDS was undertaken to establish and investigate existing drainage patterns, as well as, to provide preliminary proposed drainage systems for the corridor study area. Proposed drainage items have been designed in accordance with the criteria set forth within the *IDOT Drainage* and *Design & Environment Manuals*, as well as, the accepted district and general design policies. Design variances have been documented and are included within the report. Further drainage designs shall be performed during the Phase II engineering portion of this project.

For the purposes of this study, the corridor was divided into the following three study areas: the South Section, which runs from IL Route 6 to Benedict Street just north of Chillicothe; the Central Section, which continues from this point north of Chillicothe to south of Henry; and the North Section, which runs from south of Henry to the northern project limits just south of Interstate 180.

The project will require the construction of several new bridges and culverts. For structures on larger drainage areas, an individual Hydraulic Report was developed for each stream crossing. All of the Hydraulic Reports are approved, with the exception of the three (3) proposed bridges over Thenius Creek for the Sparland interchange. The bridges needing hydraulic approval in Phase II are for an IL Route 29 mainline, a ramp, and an access road. The Hydraulic Report for the widening of the structure on existing IL Route 29 has been reviewed and approved. The requirements for proposed culverts on smaller drainage areas are developed within the LDS.

Storm water run-off will be contained in both storm sewer systems and in roadway ditches. In the more urban areas of the project, new storm sewers with drainage collection structures are proposed. Rural areas will have ditches established on both sides of the road and in the median. Both the storm sewers and roadside ditches have been sized according to the applicable requirements of the *IDOT Drainage Manual.*

The right-of-way requirements for drainage were coordinated with the other portions of the project study and incorporated into the LDS. The proposed right-of-way for construction purposes is sufficient to accommodate the proposed drainage system.

All work proposed in the LDS will require some sort of permit for the construction of the project. The United States Army Corps of Engineers (USACE) will require a permit under Section 404 of the Clean Water Act for construction in waters of the United States.

The Illinois Environmental Protection Agency will require two permits to be issued for this work. They will issue Section 401 Water Quality Certification Conditions concurrently with the USACE 404 permit, as well as, a Section 402 National Pollutant Discharge Elimination System (NPDES) permit. The NPDES applies to projects that will involve clearing, grading, and excavation activities that result in the disturbance of one acre or more total land area. It requires the implementation of a Storm Water Pollution Prevention Plan (SWPPP) for the construction site.

An Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR) Floodway Construction permit is required for all construction activities in the floodway of streams draining more than one square mile in an urban area or ten square miles in a rural area. The work must be permitted by the division prior to construction. Floodways are defined for many of these streams and appear on the federal flood insurance program's flood hazard boundary maps.

The final version of the LDS meets the requirements outlined in the *Drainage Manual* and is satisfactory for the completion of the Phase I study. If you have any questions, please contact Mr. Jim Miller, Hydraulics Engineer, at (309) 671-3451.

Very truly yours,

Joseph E. Crowe, P.E.
Deputy Director of Highways,
Region Three Engineer

JPM:tdp

cc: Project File (M. Lewis)
Hydraulics File (J. Miller)

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

VOLUME V – COMBINED DESIGN REPORT
APPENDIX G2 – EROSION CONTROL REPORT
PROJECT REPORTS

FAP ROUTE 318 (IL 29)
SECTION 1, 2, 3, 4, 5, 20, 21, & 6, 8, 9, 10
PEORIA, MARSHALL, PUTNAM & BUREAU COUNTIES
P–94–009–01 & P–94–019–02

Illinois Department of Transportation
CH2MHILL

June 2010
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VOLUME V

APPENDIX G2

EROSION CONTROL PLAN

EROSION CONTROL PLAN

FAP ROUTE 318 (IL 29) BETWEEN ILLINOIS ROUTE 6 AND I-180

Peoria, Marshall, Putnam & Bureau Counties
Job No's. P-94-009-01 & P-94-019-02
PTB No's. 890/138 & 118/56

Prepared for

ILLINOIS DEPARTMENT OF TRANSPORTATION

District 4

April, 2009

Prepared by
Hutchison Engineering, Inc.

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SECTION 1

Introduction

1.1 Location and Description of the Project

The Illinois Department of Transportation (IDOT) is currently preparing a Phase I study to upgrade existing IL Route 29 to a four-lane facility from the termination of IL Route 6 near Mossville in Peoria County to Interstate 180 in Bureau County. The improved roadway will include both freeway and expressway segments. The proposed IL Route 29 improvements will provide a major link in the Central Illinois highway system and provide a highway connection between IL Route 6 and Interstate 180.

For the purpose of the Phase I Study, the corridor was divided into the following three study areas: the South Section, which runs from IL Route 6 to Benedict Street just north of Chillicothe; the Central Section, which continues from this point north of Chillicothe to south of Henry; and the North Section, which runs from south of Henry to the northern project limits just south of Interstate 180. This study examines the preferred alternative as presented in the Location/Design Report.

1.2 Purpose of Study

This Erosion Control Plan is one of the support documents to the Combined Design Report and was developed to outline a stormwater pollution prevention plan during the planning phase of the project. Areas prone to erosion and sedimentation were identified and appropriate measures to minimize or eliminate their effects were provided for implementation during the construction phase. Costs associated with installing the recommended measures have been calculated and are included in the overall cost opinion of the preferred alternative presented in the Combined Design Report. Erosion control measures specified herein have been developed in close adherence to the policies and principles established in the IDOT BDE Manual, IDOT Standard Specifications for Road and Bridge Construction, and the IDOT Drainage Manual. Further refinements to the erosion control plan will be completed during the Phase II engineering portion of this project.

1.3 Design Considerations

The design considerations for erosion and sedimentation control during construction adhere to the following basic principles as outlined in the sources mentioned above:

- Design slopes consistent with soil properties, or protect slopes appropriately
- Stage construction activities to limit the area of unprotected soil exposure

- Minimize the duration of unprotected soil exposure
- Protect soil with vegetative cover, mulch, or erosion resistant material
- Control the concentrations of runoff
- Retard runoff with planned engineering works
- Trap sediment with temporary or permanent barriers, basins, or other measures

The soil types for the given study areas were determined from the various counties' Soil Surveys, as provided by the United States Department of Agriculture. The properties of the soil types were then considered to determine the proper measures to be taken for the different drainage features (i.e., ditches, culverts, bridges, etc.) Both temporary and permanent erosion control measures were considered for this report using the appropriate hydraulic information as determined in the Location Drainage Study.

SECTION 2

Erosion Control Measures

2.1 Ditches

All proposed roadside ditches were examined for steep grades, unusually high flows, and high flow velocities. The necessary temporary and permanent erosion control measures for ditches are located in **Exhibit B.** To determine the need for temporary erosion control measures, the bare earth condition was analyzed using the 10-year storm event. The need for permanent erosion control measures was determined by analyzing the grass-lined earth condition, also using the 10-year storm event.

2.1.1 Ditch Checks

When the 10-year storm event resulted in flows through the bare earth ditch with velocities less than 8 ft/sec., temporary ditch checks comprised of straw bales, rolled excelsior, or urethane foam/geotextile are proposed, with the specific type of temporary ditch check to be defined during Phase II. Where the 10-year storm resulted in flows through the grass-lined ditch with velocities greater than 8 ft./sec., aggregate ditch checks are proposed. During Phase II engineering, it will be specified whether the aggregate ditch checks are to be removed after the project is complete, to be left in place, or to be distributed as part of the ditch lining.

2.1.2 Ditch Lining

If the 10-year storm event resulted in water velocities in bare earth ditches greater than 3 ft./sec. and less than 6 ft./sec. in the grass-lined ditch, a temporary ditch lining such as excelsior blanket is being proposed. Where 10-year velocities in the grass-lined ditch exceeded 6 ft./sec., permanent linings such as riprap are proposed.

2.2 Culverts

All proposed culverts were analyzed to determine the need for inlets and outlet protection. A summary of erosion control measures associated with culverts is located in **Exhibit C.**

2.2.1 Inlet and Pipe Protection

This system is used to prevent water borne silt and sediment from entering storm sewer systems and culverts. Protection is to be placed at each proposed inlet location, as well as at the inlet side of all culverts. Inlet and pipe protection should be installed immediately after the drainage structures are constructed, and shall remain

in place until the surfaces that drain into them are revegetated or paved. The locations of inlet and pipe protection to be used on this project are shown in **Exhibit G.**

2.2.2 Outlet Protection

All proposed culverts were analyzed to determine the need for outlet protection. If the 10-year storm resulted in an outlet velocity in excess of 7 ft./sec., an energy dissipater basin is proposed.

2.3 Bridges

Exhibit F summarizes the proposed erosion control features at the proposed bridge locations. The erosion control features were taken from the hydraulic reports that were prepared as part of the drainage study.

2.4 Slopes

Roadway front slopes and backslopes were reviewed for the need of erosion control measures. In accordance with the B.D.E. criteria, erosion control blanket should be provided on slope 1V:3H or steeper. Perimeter erosion barrier should be provided where sheet flow will run off the construction area into the adjacent area. **Exhibit D** contains a list of areas where perimeter erosion barrier would be appropriate. **Exhibit E** contains a list of permanent erosion control features, riprap and/or revetment mat, to be provided at the proposed bridges on the sloping abutments and embankment areas.

Special attention should be given to the steep bluff slopes adjacent to the roadway south of Hopewell and south of Sparland. The soils along the bluff are susceptible to erosion and sliding. Possible protective measures include tree planting or other vegetative cover, revetment mats, riprap, or other methods. The choice of treatment will be determined in Phase II of the project.

2.5 Areas of Special Concern

The Miller-Anderson Woods Nature Preserve in Putnam and Bureau Counties is of special concern. The proposed roadway construction activities will not affect the source of the ground water for the preserve because water enters the preserve from the west. Standard erosion control features, temporary ditch checks, perimeter erosion barriers, etc. will be provided to minimize erosion and sedimentation. Care should be used not to excavate below the water table to prevent lowering the water level in the preserve.

In the Miller-Anderson Nature Preserve and other sensitive resource areas, the construction operations should be staged to minimize the amount of area exposed at any given time and to maximize the vegetative area left in the construction area.

Another area of concern is the upstream bank stabilization at the IL 29 Connector (existing IL 29) bridge over Senachwine Creek. In 2002, the Illinois Department of Transportation, with input from the United States Department of Agriculture Natural Resources Conservation Service, constructed streambank stabilization items west (upstream) of existing IL 29 on Senachwine Creek. The stabilization included rock riprap streambank protection along the banks near existing IL 29, a rock riffle in the channel approximately 250' upstream of IL 29, and rock veins along the outside of the upstream channel.

The proposed roadway and bridge construction will not affect the streambank stabilization other then the riprap at the bridge site. The riprap will be replaced.

2.6 Other Erosion Control Measures

There are numerous culvert locations throughout the project that outlet into broad swales, as opposed to well-defined channels and streams. Under existing conditions, storm waters around the swales exhibit a mixture of sheet flows and shallow concentrated flows. Under proposed conditions, the storm water flow is proposed to be directed to the culverts, which will in turn outlet into the swales. This culvert outlet flow will be more concentrated than that of the natural conditions, so measures may need to be taken to disperse this flow to avoid creating an erosion problem. Options to disperse this flow, as outlined in Chapter 9 of the IDOT Drainage Manual and as suggested by the USDA Soil Conservation Service include:

- Energy dissipater basin
- Level concrete weir
- Dense vegetation
- Earth levee with frequent small pipe or trough outlets
- A dam built of hay or straw bales that will last until silt accumulation creates a level well-vegetated berm
- Aggregate or earthen structures to disperse flows

The final decision on which of these measures may apply to specific locations in the project area will be made during the Phase II portion of this project.

All areas disturbed by construction activities should be treated with temporary erosion control seeding within a week of being disturbed. Additionally, erosion control blanket should be specified for use with temporary erosion control seeding and for exposed areas adjacent to water.

During construction, temporary ditches may be necessary to divert or intercept water borne silt at select locations and to direct clean water around areas disturbed by construction. Temporary sedimentation basins may also be useful in controlling sediment from the construction area.

2.7 Permits

The project will be subject to the National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Site Activities. During the Phase II portion of the project, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared.

SECTION 3

Erosion Control Design Criteria

Topic	Criteria	Source*
Ditch Lining		
Design Year	10 Year	D.M., Table 1-304
Methodology	Manning's Equation	D.M., 9-004
Roughness Coefficient	Bare earth – 0.018 Grass – 0.030	D.M., 9-503
Max. Permissible Velocities	Bare earth – 2.0 – 8.0 ft./sec. Grass – 4.0 – 6.0 ft./sec. Depending on soil type	D.M., Table 9-503a
Transitional Lining	25'-100', depending on slope	D.M., Table 9-503b
Erosion Control Items		
Temporary Ditch Checks (straw bales, rolled excelsior, or urethane foam/geotextile	Velocity less than 8 ft./sec.	B.D.E., 59-8.05
Temporary Ditch Checks (Aggregate)	Velocity 8 ft./sec. or more	B.D.E., 59-8.05
Ditch Check Spacing	Aggregate – one for each 1' drop in ditch. For others, refer to Figure 59-8C.	B.D.E., 59-8.05
Perimeter Erosion Barrier	Around perimeter of disturbed area where sheet flow will run off project	B.D.E., 59-8.05
Inlet and Pipe Protection	Use on all inlets and pipes	B.D.E., 59-8.05
Sedimentation Basins	Max depth = 2.5' Max Drainage Area = 5 acre	B.D.E., 59-8.05
Temporary Ditches	To intercept runoff	B.D.E., 59-8.05
Erosion Control Blanket	Areas adjacent to bodies of Water, for lining ditches, Slopes 1V:3H or steeper	B.D.E., 59-8.05

* D.M. – IDOT Drainage Manual

B.D.E. – IDOT Bureau of Design and Environmental Manual

SECTION 4

References

CH2M HILL. "Location/Design Report, FAP Route 318 (IL 29) Between Illinois Route 6 and I-180." April, 2009.

Hutchison Engineering, Inc. and Lin Engineering, Ltd. "Location Drainage Study, FAP 318 (IL 29) Between Illinois Route 6 and I-180." April, 2009.

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Illinois Department of Transportation. "Plans for Proposed Federal Aid Highway, FAP Route 318 (IL29), Section D4 Bank Stabilization 2002, Peoria County," May, 2001.

Illinois Department of Transportation. "Standard Specifications for Road and Bridge Construction." January, 2007.

Illinois State Geological Survey, Wetlands Geology Section, "Final Project Report, Hydrogeology of Miller-Anderson Woods Nature Preserve, Illinois Route 29, Putnam and Bureau Counties, Illinois," January, 2005.

United States Department of Agriculture, Natural Resources Conservation Service. "Soil Survey of Marshall County, Illinois." 2002.

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Bureau County, Illinois." June, 1992.

United States Department of Agriculture, Natural Resources Conservation Service. "Illinois Urban Manual." 1999.

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Peoria County, Illinois." March, 1992.

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Putnam County, Illinois." May, 1992.

SECTION 5

BDE Form 2394

Illinois Department of Transportation

Erosion and Sediment Control Analysis

1. a. Phase I & II NPDES Storm Water Permit Requirements (Applicable to all projects involving soil disturbance of 1 acre (0.4 hectares) or more.

Will the project involve soil disturbance of 1 acre (0.4 hectares) or more?

☒ Yes The project must comply with the Phase II NPDES Storm Water Permit Requirements.

☐ No

2. Identify, by station, the known location of bridges and culverts. Indicate the anticipated size of each and the nature of the soil disturbance activity(ies) that each will involve (e.g., slope grading, channel shaping, watercourse

COMPLETE – Shown on Phase I roadway plans.

3. Indicate the type and identify the location, by station, of any resources requiring special consideration for protection from sedimentation, such as wetlands, endangered and threatened species locations, or other resources involving special commitments for protection.

COMPLETE – Shown on Phase I roadway plans.

4. When possible, graphically indicate on a map or plan drawing the drainage areas, and soil types (via. County Soils Maps) in locations of the project to be affected by clearing and grubbing, excavation or placement of embankment. Also describe or indicate any locations in which known soil disturbance by others (e.g., for agricultural crop production) could introduce additional sediment within the project limits. Highly erodible soils will affect the complexity needed in the ESC plan.

COMPLETE – Shown in Drainage Report.

5. When possible, graphically indicate on a map or plan drawing the locations in which routine practices such as ditch checks and perimeter silt fence will be used and indicate the type and location of other, non-routine practices recommended to use.

COMPLETE – Shown on Erosion Control Plans.

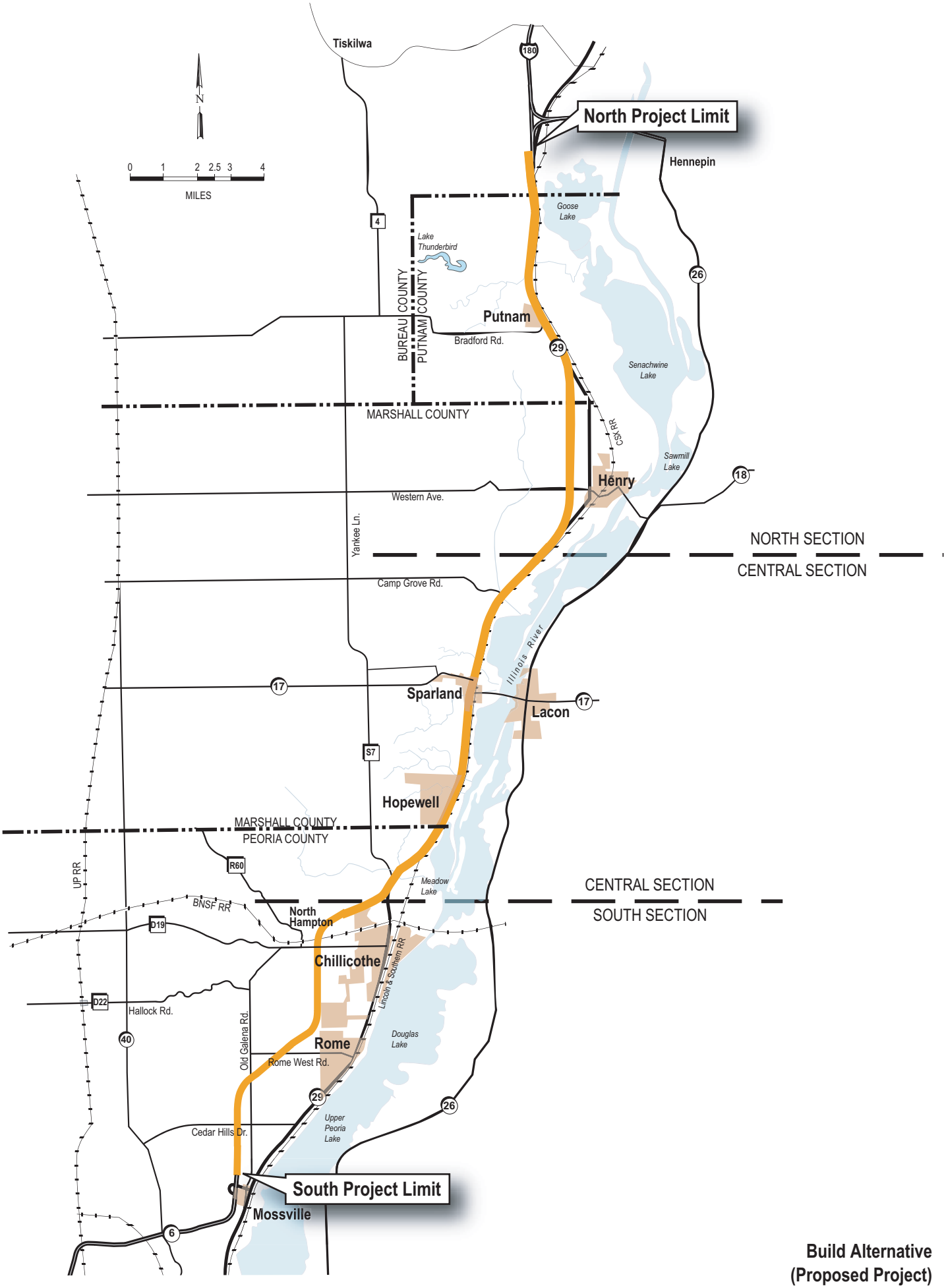
*Note: This form is NOT to take the place of the SWPPP, but is to provide information to go into the project report for the benefit of the R.E.

SECTION 6

Exhibits

Exhibit A

LOCATION MAP BUILD ALTERNATIVE (PROPOSED PROJECT)



Build Alternative
(Proposed Project)

T112004002MKE Exh 2-1_Build Alt 6-15-05tll

Exhibit B

EROSION CONTROL CALCULATIONS - DITCHES

DITCH EROSION CONTROL CALCULATION- SOUTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			TEMPORARY DITCH CHECKS				DITCH LINING							
							10 YR BARE EARTH	10 YR GRASS	50 YR GRASS	STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC	EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
2692+00	2701+00	RT	Backstation	0.0015	0.622	8.43	2.48	1.70	1.86	1	900										
2701+00	2713+00	RT	Backstation	0.0104	0.678	27.29	4.44	3.13	3.43	12	100			676	9			2701+00	2713+00		
2713+00	2725+00	RT	Backstation	0.0066	0.519	11.52	3.50	2.45	2.68	8	150			667	9			2713+00	2725+00		
2725+00	2731+79	RT	Upstation	0.0030	0.434	5.18	2.30	1.61	1.74	2	340										
2732+36	2742+73	RT	Backstation	0.0035	1.110	54.09	2.56	1.80	1.97	4	259										
2743+27	2751+63	RT	Backstation	0.0040	2.436	450.13	4.15	2.85	3.12	3	279			947	14			2743+27	2751+63		
0+00	19+50	Ramp B RT	Backstation	0.0030	1.815	179.45	3.72	2.59	2.80	6	325			2358	14			0+00	19+50		
0+37	5+00	Ramp C RT	Backstation	0.0072	1.130	81.27	2.55	1.81	1.99	3	154										
5+00	16+00	Ramp C RT	Upstation	0.0057	0.409	6.26	3.85	2.67	2.94	6	183			813	10			5+00	16+00		
16+00	28+39	Ramp C RT	Upstation	0.0030	1.795	174.42	3.63	2.52	2.75	4	310			1438	14			16+00	28+39		
2800+90	2805+73	RT	Upstation	0.0021	0.249	1.32	3.30	2.26	2.47	1	483			639	15			2800+90	2805+73		
2805+73	2826+43	RT	Backstation	0.0057	1.441	135.38	4.44	3.06	3.34	12	173			1921	12			2805+73	2826+43		
2826+43	2840+00	RT	Upstation	0.0043	1.191	71.83	4.02	2.77	3.02	6	226			1365	13			2826+43	2840+00		
2840+00	2841+82	RT	Upstation	0.0033	1.191	62.93	3.64	2.53	2.76	1	182			195	13			2840+00	2841+82		
2842+54	2843+00	RT	Upstation	0.0550	0.190	3.94	3.64	2.45	2.87	3	15			6	5			2842+54	2843+00		
2843+00	2845+00	RT	Upstation	0.0138	0.298	4.91	3.20	2.28	2.54	3	67			54	6			2843+00	2845+00		
2845+00	2849+00	RT	Upstation	0.0032	0.776	21.06	2.46	1.73	1.89	1	400										
2849+00	2864+00	RT	Backstation	0.0043	2.117	322.02	5.33	3.64	3.95	6	250			2436	18			2849+00	2864+00		
2864+00	2878+00	RT	Backstation	0.0125	1.629	275.84	7.23	5.00	5.44	18	78			1555	13			2864+00	2878+00		
2878+00	2906+00	RT	Backstation	0.0056	2.479	558.09	5.47	3.77	4.07	16	175			3798	16			2878+00	2906+00		
2906+00	2909+30	RT	Backstation	0.0037	2.479	453.64	2.92	2.02	2.12	1	330										
0+00	15+00	Ramp B RT	Backstation	0.0040	1.771	194.29	2.99	2.06	2.28	6	250										
15+00	17+84	Ramp B RT	Upstation	0.0030	0.861	26.40	1.69	1.24	1.34	1	284										
17+84	22+00	Ramp B RT	Backstation	0.0060	1.054	62.03	2.35	1.67	1.83	2	208										
1+00	27+42	Ramp C RT	Upstation	0.0037	0.422	5.39	4.42	3.03	3.30	10	264			3528	15			1+00	27+42		
2957+30	2962+00	RT	Upstation	0.0028	4.055	1458.54	3.96	2.72	2.97	1	470			668	16			2957+30	2962+00		
2962+00	2973+00	RT	Backstation	0.0100	2.243	572.00	5.20	3.62	3.93	11	100			828	10			2962+00	2973+00		
2973+00	2988+00	RT	Upstation	0.0141	1.059	96.27	4.13	2.92	3.17	21	71			570	7			2973+00	2988+00		
2988+00	3001+63	RT	Upstation	0.0053	2.262	425.99	5.01	3.45	3.75	7	195			1667	14			2988+00	3001+63		
0+00	3+00	Ramp B RT	Upstation	0.0056	1.570	167.64	5.63	3.86	4.18	2	150			429	16			0+00	3+00		
3+00	15+00	Ramp B RT	Backstation	0.0089	1.545	202.78	7.75	5.29	5.75	11	109			1983	18			3+00	15+00		
15+00	20+09	Ramp B RT	Backstation	0.0052	0.689	20.07	4.03	2.80	3.05	3	170			444	11			15+00	20+09		
0+44	6+00	Ramp C RT	Upstation	0.0007	0.332	1.39	1.76	1.22	1.32	0	0										
6+00	25+87	Ramp C RT	Upstation	0.0030	0.422	4.85	3.91	2.71	2.94	6	331			2626	15			6+00	25+87		
3079+78	3096+11	RT	Upstation	0.0017	1.141	40.40	3.20	2.19	2.37	3	544			2445	17			3079+78	3096+11		
3096+11	3101+00	RT	Backstation	0.0029	0.084	0.20	2.66	1.83	2.01	1	489										
3101+00	3103+00	RT	Upstation	0.0093	1.262	122.50	2.47	1.75	1.95	2	100										
3103+00	3111+97	RT	Upstation	0.0032	0.678	15.14	3.62	2.48	2.72	3	299			965	13			3103+00	3111+97		
0+00	7+15	Ramp B RT	Upstation	0.0055	0.945	45.12	4.90	3.39	3.70	4	179			830	14			0+00	7+15		
7+15	13+00	Ramp B RT	Backstation	0.0030	0.787	21.09	2.74	1.90	2.08	2	293										
13+00	24+00	Ramp B RT	Upstation	0.0036	0.678	16.06	3.61	2.49	2.70	4	275			1068	12			13+00	24+00		
3152+90	3161+38	RT	Upstation	0.0030	3.386	934.50	3.15	2.19	2.40	3	283			770	12			3152+90	3161+38		
3161+38	3164+50	RT	Upstation	0.0817	2.252	1653.67	10.56	7.60	8.26			25	12			275	8			3161+38	3164+50
3164+50	3175+50	RT	Upstation	0.0060	1.033	59.01	5.05	3.50	3.80	7	157			1222	13			3164+50	3175+50		
3176+85	3190+00	RT	Backstation	0.0038	1.226	72.80	2.87	1.99	2.19	5	263										
3190+00	3196+00	RT	Upstation	0.0075	2.392	587.71	3.26	2.29	2.66	5	120			292	8			3190+00	3196+00		
3196+00	3214+00	RT	Upstation	0.0032	0.867	27.68	3.20	2.23	2.43	6	300			1569	11			3196+00	3214+00		
3214+00	3218+00	RT	Backstation	0.0102	1.176	107.06	2.53	1.79	2.00	4	100										
3218+00	3226+50	RT	Upstation	0.0056	0.700	21.64	2.56	1.81	2.02	5	170										
3226+50	3230+00	RT	Backstation	0.0030	0.819	23.28	2.14	1.50	1.65	1	350										
3230+00	3236+14	RT	Backstation	0.0131	0.819	48.65	3.13	2.21	2.44	8	77			161	6			3230+00	3236+14		
2692+04	2699+00	LT	Backstation	0.0030	0.039	0.05	2.69	1.89	2.05	2	348										
2699+00	2707+00	LT	Backstation	0.0059	0.205	1.50	3.55	2.45	2.71	5	160			490	9			2699+00	2707+00		
2707+00	2713+00	LT	Backstation	0.0120	1.466	205.33	2.20	1.60	1.79	7	86										
2713+00	2725+00	LT	Backstation	0.0058	0.792	29.82	3.11	2.15	2.35	7	171			600	8			2713+00	2725+00		

DITCH EROSION CONTROL CALCULATION- SOUTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			TEMPORARY DITCH CHECKS				DITCH LINING							
							10 YR BARE EARTH	10 YR GRASS	50 YR GRASS	STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC	EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
2725+00	2731+79	LT	Upstation	0.0037	1.033	46.34	2.01	1.46	1.61	3	226										
2732+36	2742+73	LT	Backstation	0.0035	1.956	236.08	2.17	1.54	1.67	4	259										
2743+27	2746+22	LT	Backstation	0.0040	2.436	450.13	4.56	3.15	3.43	1	295			393	15			2743+27	2746+22		
14+00	29+78	RAMP A LT	Upstation	0.0030	2.686	505.19	4.14	2.84	3.07	5	316			2252	16			14+00	29+78		
9+00	14+00	RAMP A LT	Upstation	0.0159	2.816	1318.06	4.95	3.46	3.82	8	63			236	8			9+00	14+00		
0+13	9+00	RAMP A LT	Upstation	0.0030	1.644	138.36	2.51	1.72	1.90	3	296										
2777+00	2780+00	LT	Upstation	0.0056	2.638	657.94	2.88	2.06	2.27	2	150										
2780+00	2805+73	LT	Upstation	0.0015	0.312	1.78	3.44	2.36	2.57	4	643			4883	20			2780+00	2805+73		
2805+73	2826+43	LT	Backstation	0.0052	0.678	19.30	4.13	2.85	3.11	11	188			1834	12			2805+73	2826+43		
2826+43	2841+82	LT	Upstation	0.0034	1.883	210.52	3.71	2.58	2.79	5	308			1666	13			2826+43	2841+82		
2842+54	2845+00	LT	Upstation	0.0153	1.049	97.84	5.06	3.52	3.86	4	62			125	8			2842+54	2845+00		
2845+00	2849+00	LT	Upstation	0.0091	1.565	211.95	4.70	3.25	3.58	4	100			276	10			2845+00	2849+00		
2849+00	2864+00	LT	Backstation	0.0049	2.083	329.40	3.76	2.59	2.86	7	214			1192	11			2849+00	2864+00		
2864+00	2878+00	LT	Backstation	0.0125	1.800	358.59	5.00	3.49	3.81	18	78			827	9			2864+00	2878+00		
2878+00	2900+66	LT	Backstation	0.0056	2.126	371.94	3.63	2.52	2.76	13	174			1498	10			2878+00	2900+66		
24+68	1+00	RAMP A LT	Upstation	0.0083	0.695	25.85	3.80	2.69	2.94	20	118			1266	9			24+68	1+00		
21+25	0+00	RAMP D LT	Backstation	0.0027	0.695	14.74	4.37	3.01	3.27	6	354			3704	19			21+25	0+00		
2945+40	2962+00	LT	Upstation	0.0030	3.108	744.39	4.28	2.94	3.17	5	332			2521	17			2945+40	2962+00		
2962+00	2973+00	LT	Backstation	0.0105	1.893	375.01	4.08	2.88	3.14	12	92			542	8			2962+00	2973+00		
2973+00	2988+00	LT	Upstation	0.0141	1.367	185.48	5.30	3.72	4.11	21	71			886	9			2973+00	2988+00		
2988+00	2994+41	LT	Upstation	0.0053	4.313	2364.34	3.89	2.72	2.95	3	214			514	11			2988+00	2994+41		
26+71	24+00	RAMP A LT	Backstation	0.0086	1.698	254.94	4.71	3.26	3.58	2	136			199	10			26+71	24+00		
24+00	16+69	RAMP A LT	Backstation	0.0075	1.698	238.08	5.21	3.58	3.90	5	146			700	12			24+00	16+69		
16+69	13+00	RAMP A LT	Upstation	0.0030	1.698	150.57	3.56	2.47	2.67	1	369			416	14			16+69	13+00		
13+00	6+00	RAMP A LT	Upstation	0.0244	1.402	260.47	7.26	5.04	5.52	17	41			434	9			13+00	6+00		
6+00	1+25	RAMP A LT	Upstation	0.0052	1.302	99.31	2.69	1.89	2.12	2	238										
20+34	14+00	RAMP D LT	Backstation	0.0031	1.844	190.25	2.69	1.88	2.03	2	317										
14+00	0+00	RAMP D LT	Backstation	0.0021	0.997	31.90	3.89	2.65	2.88	3	467			2441	19			14+00	0+00		
3073+88	3096+11	LT	Upstation	0.0020	1.436	79.47	3.93	2.70	2.93	4	556			4156	20			3073+88	3096+11		
3096+11	3101+00	LT	Backstation	0.0035	0.305	2.59	3.82	2.64	2.87	2	245			540	13			3096+11	3101+00		
3101+00	3103+00	LT	Upstation	0.0074	1.555	188.00	1.77	1.29	1.43	1	200										
3103+00	3110+55	LT	Upstation	0.0032	0.594	11.02	2.55	1.79	1.97	2	378										
23+90	15+17	RAMP A LT	Backstation	0.0038	0.622	13.42	2.97	2.07	2.27	3	291										
15+17	0+57	RAMP A LT	Upstation	0.0030	0.787	21.09	3.27	2.28	2.46	4	365			1406	12			15+17	0+57		
16+19	14+50	RAMP A LT	Backstation	0.0472	2.039	966.77	4.00	3.03	3.32	8	21			27	5			16+19	14+50		
14+50	11+69	RAMP D LT	Backstation	0.0199	1.100	125.97	4.14	2.88	3.22	6	47			80	6			14+50	11+69		
11+69	2+19	RAMP D LT	Upstation	0.0020	0.678	11.97	1.97	1.40	1.53	2	475										
3158+90	3161+50	LT	Upstation	0.0302	0.678	46.50	3.57	2.59	2.90	8	33			45	5			3158+90	3161+50		
3161+50	3164+50	LT	Upstation	0.0817	1.397	472.24	6.52	4.64	5.07	25	12			60	6			3161+50	3164+50		
3164+50	3175+50	LT	Upstation	0.0058	0.459	8.15	3.34	2.36	2.59	6	183			635	9			3164+50	3175+50		
3176+85	3190+00	LT	Backstation	0.0061	1.932	301.57	4.90	3.37	3.66	8	164			1378	13			3176+85	3190+00		
3190+00	3196+00	LT	Upstation	0.0083	2.349	589.00	4.97	3.45	3.77	5	120			494	11			3190+00	3196+00		
3196+00	3198+00	LT	Upstation	0.0121	3.850	2640.43	6.19	4.31	4.70	2	100			175	11			3196+00	3198+00		
3198+00	3214+00	LT	Upstation	0.0030	1.604	129.86	4.92	3.36	3.63	5	320			3070	20			3198+00	3214+00		
3214+00	3218+00	LT	Backstation	0.0162	4.389	4331.27	7.03	4.82	5.29	6	67			335	11			3214+00	3218+00		
3218+00	3220+00	LT	Upstation	0.0239	5.056	7669.83	3.40	2.37	2.69	5	40			37	6			3218+00	3220+00		
3220+00	3226+50	LT	Upstation	0.0046	1.937	263.62	3.98	2.74	2.98	3	217			604	12			3220+00	3226+50		
3226+50	3230+00	LT	Backstation	0.0034	3.563	1139.19	3.74	2.56	2.80	1	350			377	13			3226+50	3230+00		
3230+00	3236+14	LT	Backstation	0.0120	3.563	2140.16	5.38	3.78	4.10	7	88			424	10			3230+00	3236+14		

DITCH EROSION CONTROL CALCULATION- SOUTH SECTION FRONTAGE ROAD

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			TEMPORARY DITCH CHECKS				DITCH LINING							
							10 YR BARE EARTH	10 YR GRASS	50 YR GRASS	STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC	EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
1+00	9+00	RT	Upstation	0.0087	0.639	21.64	4.24	2.99	3.30	7	114			501	9			1+00	9+00		
9+00	11+00	RT	Upstation	0.0149	1.146	120.99	5.23	3.63	4.03	3	67			111	9			9+00	11+00		
11+00	16+00	RT	Backstation	0.0030	0.925	31.50	2.50	1.77	1.97	2	250										
16+00	23+00	RT	Backstation	0.0047	0.582	12.76	2.85	1.99	2.23	3	233										
23+00	29+00	RT	Backstation	0.0108	0.465	11.46	3.40	2.45	2.75	6	100			216	7			23+00	29+00		
29+00	34+00	RT	Backstation	0.0030	0.548	8.82	1.81	1.31	1.44	2	250										
34+00	35+50	RT	Upstation	0.0114	1.668	280.38	1.95	1.43	1.55	2	75										
35+50	38+00	RT	Upstation	0.0297	1.668	452.55	3.39	2.46	2.79	7	36			43	5			35+50	38+00		
38+00	39+00	RT	Upstation	0.0400	1.668	525.20	4.21	3.11	3.39	4	25			19	6			38+00	39+00		
122+00	125+00	RT	Backstation	0.0076	1.038	67.25	3.31	2.34	2.61	2	150			140	8			122+00	125+00		
125+00	131+50	RT	Backstation	0.0067	0.872	40.67	3.06	2.13	2.44	4	163			293	8			125+00	131+50		
1+78	4+00	LT	Upstation	0.0057	0.706	22.25	2.71	1.93	2.12	1	222										
4+00	6+00	LT	Upstation	0.0195	0.830	61.29	3.26	2.38	2.68	4	50			43	6			4+00	6+00		
6+00	8+00	LT	Upstation	0.0111	0.867	51.56	2.42	1.77	2.00	2	100										
8+00	11+00	LT	Upstation	0.0196	0.867	68.51	4.45	3.15	3.50	6	50			102	7			8+00	11+00		
11+00	16+00	LT	Backstation	0.0056	1.971	304.52	3.27	2.30	2.53	3	167			289	9			11+00	16+00		
16+00	23+00	LT	Backstation	0.0047	1.211	78.42	3.25	2.24	2.51	3	233			458	10			16+00	23+00		
23+00	29+00	LT	Backstation	0.0108	1.211	118.87	4.11	2.91	3.22	6	100			296	8			23+00	29+00		
40+00	45+50	LT	Backstation	0.0030	1.156	55.53	1.93	1.40	1.52	2	275										
45+50	46+00	LT	Upstation	0.0137	3.108	1590.75	7.36	5.09	5.64	1	50			55	13			45+50	46+00		
46+39	56+20	LT	Backstation	0.0030	1.411	93.02	3.69	2.54	2.79	3	327			1187	14			46+39	56+20		
56+20	65+00	LT	Backstation	0.0129	1.402	189.39	3.95	2.82	3.08	11	80			347	7			56+20	65+00		
65+00	67+20	LT	Backstation	0.0129	1.639	284.66	5.88	4.09	4.45	3	73			166	10			65+00	67+20		
67+20	73+00	LT	Backstation	0.0059	1.023	57.04	5.09	3.52	3.84	3	193			673	14			67+20	73+00		
73+00	81+00	LT	Backstation	0.0039	1.282	82.62	3.26	2.29	2.49	3	267			625	11			73+00	81+00		
81+00	84+00	LT	Backstation	0.0083	0.787	35.08	3.49	2.47	2.74	2	150			138	8			81+00	84+00		
84+00	85+86	LT	Upstation	0.0031	0.787	21.44	4.08	2.78	3.05	1	186			257	16			84+00	85+86		
86+53	93+00	LT	Backstation	0.0030	1.342	81.57	3.65	2.53	2.75	2	324			760	14			86+53	93+00		
93+00	97+79	LT	Upstation	0.0014	1.059	30.34	1.87	1.30	1.42	1	479										
98+37	107+00	LT	Backstation	0.0030	1.221	64.00	2.53	1.77	1.99	3	288										
107+00	113+00	LT	Backstation	0.0100	1.501	199.20	3.76	2.64	2.97	6	100			271	8			107+00	113+00		
113+00	119+00	LT	Backstation	0.0030	1.501	109.10	2.52	1.75	1.94	2	300										
119+00	125+00	LT	Backstation	0.0010	1.120	29.59	1.38	0.97	1.06	1	600										
125+00	126+50	LT	Backstation	0.0199	1.038	108.82	4.16	2.96	3.34	3	50			47	7			125+00	126+50		
126+50	129+00	LT	Backstation	0.0030	1.441	98.21	2.50	1.76	1.94	1	250										
129+00	131+50	LT	Backstation	0.0067	1.282	108.30	2.14	1.55	1.72	2	125										

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3245+90	3260+00	LT	Backstation	0.0030	1.698	112.93	4.36	2.43	2.62	MODERATE	5	282			3163	19			3245+90	3260+00		
3260+00	3266+00	LT	Upstation	0.0095	1.426	127.70	6.86	3.82	4.12	LOW	6	100			1135	16			3260+00	3266+00		
3266+00	3269+50	LT	Upstation	0.0117	2.189	435.77	7.71	4.32	4.66	LOW	5	70			672	17			3266+00	3269+50		
3269+50	3276+00	LT	Backstation	0.0033	1.883	156.33	5.42	3.00	3.23	LOW	3	217			1810	24			3269+50	3276+00		
3284+18	3286+00	LT	Backstation	0.0196	1.565	233.04	6.66	3.76	4.08	LOW	4	46			214	10			3284+18	3286+00		
3290+00	3293+50	LT	Upstation	0.0030	1.023	30.51	2.00	1.14	1.26	LOW	2	175										
3293+50	3299+00	LT	Backstation	0.0064	1.590	138.86	3.46	1.99	2.16	LOW	4	138			604	10			3293+50	3299+00		
3305+92	3309+00	LT	Backstation	0.0068	1.367	96.28	2.63	1.50	1.63	LOW	3	103										
3311+04	3311+50	LT	Backstation	0.0256	2.753	1182.58	1.93	1.19	1.33	LOW	2	23										
3311+50	3321+80	LT	Upstation	0.0060	1.668	152.19	3.44	1.94	2.13	LOW	7	147			1131	10			3311+50	3321+80		
3327+50	3331+00	LT	Backstation	0.0147	4.370	3057.23	8.85	4.91	5.29	LOW			5	70	687	17			3327+50	3331+00		
3330+50	3336+00	LT	Backstation	0.0159	2.358	617.56	8.92	4.96	5.39	LOW			9	61	1045	16			3330+50	3336+00		
3336+00	3338+50	LT	Backstation	0.0200	2.619	914.61	9.52	5.35	5.77	LOW			5	50	447	15			3336+00	3338+50		
3344+23	3345+00	LT	Backstation	0.0547	1.781	546.57	3.38	2.18	2.37	SEVERE	5	15					44	5			3344+23	3345+00
3358+00	3360+00	LT	Upstation	0.0273	0.678	33.16	5.47	3.15	3.47	SEVERE	6	33					170	7			3358+00	3360+00
3360+00	3366+70	LT	Upstation	0.0040	1.524	98.15	3.40	1.91	2.09	SEVERE	3	223					910	12			3360+00	3366+70
3368+90	3372+00	LT	Upstation	0.0050	1.407	89.34	2.11	1.26	1.39	SEVERE	2	155					247	7			3368+90	3372+00
3372+00	3373+25	LT	Backstation	0.0030	0.959	25.93	2.20	1.27	1.38	SEVERE	1	125					126	9			3372+00	3373+25
3373+25	3379+00	LT	Upstation	0.0075	1.067	53.71	4.57	2.57	2.80	SEVERE	5	115					773	12			3373+25	3379+00
3379+00	3384+33	LT	Upstation	0.0150	2.313	570.73	7.63	4.29	4.60	SEVERE	9	59					862	14			3379+00	3384+33
3384+33	3388+00	LT	Backstation	0.0100	1.856	260.18	4.83	2.74	2.95	SEVERE	4	92					444	11			3384+33	3388+00
3388+00	3391+50	LT	Upstation	0.0175	1.248	122.48	4.62	2.72	2.97	SEVERE	7	50					313	8			3388+00	3391+50
3391+50	3394+75	LT	Backstation	0.0030	2.599	347.10	2.16	1.25	1.36	SEVERE	1	325					320	9			3391+50	3394+75
3394+75	3396+00	LT	Upstation	0.0043	2.926	569.16	2.02	1.18	1.31	SEVERE	1	125					101	7			3394+75	3396+00
3396+00	3399+00	LT	Backstation	0.0069	2.895	700.62	3.91	2.19	2.41	SEVERE	3	100					348	10			3396+00	3399+00
3399+00	3400+75	LT	Backstation	0.0200	1.919	402.46	4.35	2.55	2.83	SEVERE	4	44					142	7			3399+00	3400+75
3603+00	3604+00	LT	Upstation	0.0349	1.201	156.85	4.28	2.63	2.90	LOW	4	25			68	6			3603+00	3604+00		
3604+00	3605+00	LT	Upstation	0.0254	1.201	133.81	4.33	2.51	2.76	LOW	3	33			73	6			3604+00	3605+00		
3605+00	3605+50	LT	Upstation	0.0368	1.201	161.07	5.04	3.03	3.31	LOW	2	25			36	6			3605+00	3605+50		
3605+50	3606+50	LT	Upstation	0.0536	1.201	194.39	6.54	3.91	4.27	LOW	6	17			77	7			3605+50	3606+50		
3609+00	3618+50	LT	Upstation	0.0030	1.698	112.93	3.65	2.04	2.21	LOW	3	317			1671	15			3609+00	3618+50		
3618+50	3623+00	LT	Backstation	0.0030	2.272	243.09	3.27	1.84	2.00	LOW	2	225			693	13			3618+50	3623+00		
3623+00	3625+00	LT	Backstation	0.0050	2.474	393.47	2.89	1.66	1.82	LOW	1	200										
3633+00	3638+00	LT	Upstation	0.0107	1.698	213.67	5.09	2.86	3.09	LOW	6	83			612	11			3633+00	3638+00		
3638+00	3646+00	LT	Backstation	0.0065	1.252	74.95	4.64	2.59	2.79	LOW	6	133			1176	13			3638+00	3646+00		
3646+00	3650+00	LT	Backstation	0.0062	3.357	985.02	3.35	1.90	2.06	LOW	3	133			420	9			3646+00	3650+00		
3650+00	3652+00	LT	Backstation	0.0244	1.698	322.39	3.35	1.98	2.20	LOW	5	40			128	6			3650+00	3652+00		
3658+00	3659+00	LT	Backstation	0.0850	5.322	9350.47	8.60	4.79	5.10	LOW			9	11	53	5			3658+00	3659+00		
3659+00	3660+00	LT	Backstation	0.1087	3.354	3087.52	8.90	4.95	5.27	LOW			11	9	46	4			3659+00	3660+00		
3660+00	3661+00	LT	Backstation	0.0211	0.318	7.58	3.17	1.78	1.98	LOW	3	33			66	6			3660+00	3661+00		
3661+00	3663+00	LT	Backstation	0.0030	0.318	2.86	1.48	0.86	0.93	SEVERE	1	200					151	7			3661+00	3663+00
3663+00	3664+00	LT	Backstation	0.0200	0.656	26.19	1.99	1.24	1.42	SEVERE	2	50					56	5			3663+00	3664+00
3664+00	3665+00	LT	Backstation	0.0100	0.695	21.28	1.02	0.66	0.71	SEVERE	1	100					52	5			3664+00	3665+00
3665+00	3666+00	LT	Upstation	0.0300	0.956	81.23	1.55	0.87	1.00	SEVERE	3	33					50	4			3665+00	3666+00
3666+00	3670+00	LT	Upstation	0.0200	1.426	185.12	2.44	1.47	1.66	SEVERE	8	50					240	5			3666+00	3670+00
3670+00	3671+00	LT	Upstation	0.0100	1.451	136.90	2.14	1.29	1.39	SEVERE	1	100					66	6			3670+00	3671+00
3671+00	3672+00	LT	Upstation	0.0400	1.074	126.16	3.41	2.06	2.32	SEVERE	4	25					60	5			3671+00	3672+00
3690+00	3691+00	LT	Upstation	0.0422	1.096	97.38	5.37	3.05	3.32	SEVERE	5	20					51	4			3690+00	3691+00

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3691+00	3692+00	LT	Upstation	0.0108	1.096	49.26	6.46	3.60	3.90	SEVERE	2	50					151	13			3691+00	3692+00
3692+00	3693+00	LT	Upstation	0.0268	1.096	77.60	9.59	5.31	5.72	SEVERE			3	33			135	12			3692+00	3693+00
3693+00	3694+00	LT	Backstation	0.0509	1.096	106.95	7.15	4.09	4.43	SEVERE	6	17					62	5			3693+00	3694+00
3694+00	3695+00	LT	Backstation	0.0826	1.096	136.24	7.14	4.21	4.56	SEVERE	9	11					50	4			3694+00	3695+00
3698+00	3698+50	LT	Upstation	0.1188	1.096	163.38	4.87	3.00	3.20	SEVERE	6	8					17	3			3698+00	3698+50
3698+50	3699+50	LT	Backstation	0.0104	1.096	48.34	2.25	1.33	1.45	SEVERE	2	50					45	4			3698+50	3699+50
3700+50	3701+00	LT	Upstation	0.0030	1.096	25.96	2.26	1.28	1.39	SEVERE	1	50					43	7			3700+50	3701+00
3701+00	3702+04	LT	Upstation	0.0634	1.096	119.32	11.31	6.39	6.88	SEVERE			7	15			100	8			3701+00	3702+04
3702+04	3704+00	LT	Backstation	0.0415	1.096	96.54	9.83	5.42	5.85	SEVERE			8	25			203	9			3702+04	3704+00
3704+00	3706+00	LT	Backstation	0.0167	1.096	61.26	3.97	2.30	2.50	SEVERE	4	50					125	5			3704+00	3706+00
3706+00	3707+00	LT	Upstation	0.0119	1.096	51.71	2.26	1.37	1.53	SEVERE	2	50					43	4			3706+00	3707+00
3707+00	3709+00	LT	Upstation	0.0760	1.236	188.79	8.25	4.91	5.43	SEVERE			15	13			156	7			3707+00	3709+00
3709+00	3709+75	LT	Upstation	0.1717	4.022	6230.13	11.38	6.87	7.45	SEVERE			13	6			56	7			3709+00	3709+75
3742+00	3743+00	LT	Upstation	0.0747	2.782	2075.47	9.04	5.22	5.74	SEVERE			7	14			85	7			3742+00	3743+00
3743+00	3744+90	LT	Upstation	0.0134	2.782	879.73	9.62	5.37	5.78	SEVERE			3	63			448	20			3743+00	3744+90
3744+90	3751+50	LT	Backstation	0.0060	2.782	585.98	6.79	3.77	4.06	SEVERE	4	165					1689	22			3744+90	3751+50
3757+00	3758+54	LT	Upstation	0.0149	2.503	700.61	3.25	1.92	2.12	SEVERE	3	51					114	7			3757+00	3758+54
3758+62	3761+00	LT	Backstation	0.0150	1.995	386.30	3.13	1.82	2.03	SEVERE	4	59					167	6			3758+62	3761+00
3761+00	3772+00	LT	Upstation	0.0033	2.010	183.82	3.73	2.08	2.26	SEVERE	4	275					1888	15			3761+00	3772+00
3772+00	3778+00	LT	Upstation	0.0066	1.377	96.62	6.12	3.39	3.69	LOW	4	150			1249	18			3772+00	3778+00		
3778+00	3785+00	LT	Backstation	0.0046	1.815	166.40	5.20	2.88	3.12	MODERATE	4	175			1477	18			3778+00	3785+00		
3785+00	3794+00	LT	Upstation	0.0068	1.545	132.72	6.52	3.62	3.90	MODERATE	7	129			1981	19			3785+00	3794+00		
3797+00	3822+00	LT	Backstation	0.0031	2.720	399.37	3.99	2.23	2.40	MODERATE	8	313			4836	17			3797+00	3822+00		
3824+00	3833+50	LT	Upstation	0.0052	3.252	827.98	2.88	1.64	1.81	LOW	5	190										
3245+90	3254+00	RT	Backstation	0.0042	1.698	133.19	3.11	1.76	1.93	MODERATE	4	203			980	11			3245+90	3254+00		
3254+00	3260+00	RT	Backstation	0.0030	1.461	76.32	2.20	1.27	1.37	LOW	2	300										
3260+00	3265+30	RT	Upstation	0.0132	2.209	473.41	3.64	2.13	2.33	LOW	7	76			444	7			3260+00	3265+30		
3277+00	3280+00	RT	Upstation	0.0072	0.971	41.36	4.41	2.50	2.72	LOW	3	100			395	11			3277+00	3280+00		
3280+00	3280+79	RT	Upstation	0.0124	1.825	277.57	5.48	3.10	3.36	LOW	1	79			97	11			3280+00	3280+79		
3283+43	3285+00	RT	Backstation	0.0030	2.494	310.34	3.75	2.09	2.25	LOW	1	157			288	16			3283+43	3285+00		
3287+00	3288+00	RT	Backstation	0.0400	2.854	1625.34	7.23	4.24	4.58	LOW	4	25			92	8			3287+00	3288+00		
3306+00	3309+00	RT	Backstation	0.0109	0.678	20.92	3.42	2.00	2.14	LOW	4	75			253	7			3306+00	3309+00		
3309+00	3311+50	RT	Backstation	0.0048	1.201	57.93	1.99	1.17	1.27	LOW	2	125										
3311+50	3321+80	RT	Upstation	0.0060	0.945	35.26	3.10	1.77	1.95	LOW	7	147			1030	9			3311+50	3321+80		
3323+50	3326+50	RT	Upstation	0.0058	0.803	23.12	2.66	1.53	1.66	LOW	2	150										
3326+50	3326+80	RT	Backstation	0.0033	1.201	48.52	1.25	0.74	0.79	LOW	1	30										
3329+00	3336+00	RT	Backstation	0.0150	1.387	148.97	5.25	2.99	3.28	LOW	11	64			754	9			3329+00	3336+00		
3336+00	3339+00	RT	Backstation	0.0180	0.872	49.99	3.67	2.20	2.37	LOW	6	50			226	7			3336+00	3339+00		
3339+00	3343+70	RT	Upstation	0.0034	2.088	207.30	2.11	1.21	1.32	SEVERE	2	235					426	8			3339+00	3343+70
3343+88	3348+00	RT	Backstation	0.0038	1.698	127.60	2.06	1.21	1.33	LOW	2	206										
3352+50	3361+55	RT	Upstation	0.0030	0.872	20.28	2.42	1.37	1.48	LOW	3	302										
3352+50	3361+55	RT	Upstation	0.0030	0.872	20.28	2.42	1.37	1.48	LOW	3	302										
3361+50	3362+90	RT	Backstation	0.0381	0.951	90.35	3.67	2.22	2.55	LOW	6	23			87	6			3361+50	3362+90		
3362+90	3367+00	RT	Upstation	0.0040	1.053	37.91	3.74	2.08	2.26	LOW	2	205			623	13			3362+90	3367+00		
3369+00	3372+85	RT	Upstation	0.0050	2.410	366.91	2.68	1.55	1.70	LOW	2	193										
3374+00	3378+00	RT	Upstation	0.0030	1.581	93.78	1.95	1.12	1.23	LOW	2	200										
3378+00	3382+00	RT	Upstation	0.0030	1.321	58.78	2.43	1.39	1.52	LOW	2	200										

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3382+00	3384+42	RT	Upstation	0.0270	0.706	36.34	5.77	3.36	3.59	LOW	7	35			216	8			3382+00	3384+42		
3384+42	3385+00	RT	Backstation	0.1045	0.483	29.17	5.45	3.39	3.56	LOW	7	8			34	5			3384+42	3385+00		
3385+00	3387+00	RT	Backstation	0.0173	0.787	37.93	2.68	1.70	1.82	LOW	4	50										
3387+00	3389+00	RT	Upstation	0.0077	0.565	11.37	2.15	1.27	1.36	LOW	2	100										
3389+00	3390+00	RT	Upstation	0.0778	2.667	1893.08	5.24	3.07	3.52	LOW	8	13			61	5			3389+00	3390+00		
3390+00	3392+00	RT	Backstation	0.0446	0.384	11.40	3.60	2.17	2.45	LOW	9	22			120	5			3390+00	3392+00		
3393+00	3398+00	RT	Upstation	0.0175	1.698	273.06	3.96	2.33	2.56	LOW	9	56			394	7			3393+00	3398+00		
3398+00	3398+54	RT	Upstation	0.0469	2.184	866.42	5.62	3.38	3.70	LOW	3	18			39	6			3398+00	3398+54		
3398+54	3399+00	RT	Backstation	0.0522	2.184	914.31	4.61	2.85	3.16	LOW	3	15			29	6			3398+54	3399+00		
3399+00	3402+00	RT	Backstation	0.0110	1.201	88.06	2.72	1.61	1.75	LOW	4	75										
3402+00	3403+00	RT	Upstation	0.0193	1.698	286.43	2.35	1.41	1.55	LOW	2	50										
3403+00	3405+00	RT	Upstation	0.0063	1.737	173.74	2.30	1.36	1.47	LOW	2	100										
3405+00	3409+00	RT	Upstation	0.0090	1.698	195.60	3.29	1.90	2.06	LOW	4	100			352	8			3405+00	3409+00		
3409+00	3409+32	RT	Upstation	0.0831	1.698	594.45	6.93	4.10	4.54	LOW	3	11			22	6			3409+00	3409+32		
3409+32	3410+00	RT	Backstation	0.0659	1.698	529.21	4.60	2.77	3.13	LOW	5	14			41	5			3409+32	3410+00		
3410+00	3412+00	RT	Backstation	0.0156	1.201	104.87	2.50	1.55	1.72	LOW	4	50										
3413+00	3417+00	RT	Upstation	0.0035	1.201	49.49	1.92	1.13	1.25	LOW	2	200										
3417+00	3418+50	RT	Upstation	0.0597	2.184	978.30	5.61	3.31	3.61	LOW	9	17			100	6			3417+00	3418+50		
3418+50	3419+00	RT	Backstation	0.0706	1.698	547.83	4.95	3.07	3.32	LOW	4	13			31	5			3418+50	3419+00		
3419+00	3422+00	RT	Backstation	0.0101	1.698	207.55	2.59	1.50	1.63	LOW	4	75										
3422+00	3425+00	RT	Upstation	0.0052	1.698	149.15	2.12	1.21	1.32	LOW	2	150										
3425+00	3428+00	RT	Upstation	0.0152	2.667	837.68	3.77	2.18	2.42	LOW	5	60			241	7			3425+00	3428+00		
3428+00	3432+00	RT	Backstation	0.0152	1.698	254.20	4.57	2.62	2.84	LOW	7	57			372	8			3428+00	3432+00		
3432+00	3439+00	RT	Backstation	0.0086	0.787	26.78	3.12	1.84	2.03	LOW	7	100			611	8			3432+00	3439+00		
3441+00	3443+67	RT	Upstation	0.0112	2.228	447.01	9.78	5.42	5.82	LOW			3	89	727	23			3441+00	3443+67		
3443+67	3444+00	RT	Backstation	0.0770	1.201	232.94	4.68	2.90	3.05	LOW	3	11			20	5			3443+67	3444+00		
3444+00	3446+00	RT	Backstation	0.0075	0.945	39.51	2.12	1.25	1.39	LOW	2	100										
3446+00	3447+00	RT	Upstation	0.0320	1.201	150.20	2.35	1.58	1.68	LOW	4	25										
3447+00	3450+00	RT	Backstation	0.0139	0.945	53.86	3.47	2.04	2.24	LOW	5	60			237	7			3447+00	3450+00		
3450+00	3452+00	RT	Backstation	0.0097	0.678	19.72	2.18	1.32	1.50	LOW	2	100										
3452+00	3453+00	RT	Upstation	0.0170	0.733	31.62	2.01	1.16	1.34	LOW	2	50										
3453+00	3461+00	RT	Backstation	0.0041	0.787	18.58	2.48	1.43	1.57	LOW	4	200										
3461+00	3462+00	RT	Upstation	0.0097	1.201	82.69	1.79	1.08	1.16	LOW	1	100										
3462+00	3462+50	RT	Upstation	0.0548	2.184	937.03	3.48	2.16	2.33	LOW	3	17			28	5			3462+00	3462+50		
3462+50	3463+00	RT	Backstation	0.0498	2.184	893.26	4.75	2.80	3.12	LOW	3	17			32	6			3462+50	3463+00		
3463+00	3466+00	RT	Backstation	0.0132	0.787	33.22	2.92	1.70	1.90	LOW	4	75										
3466+00	3468+00	RT	Upstation	0.0044	1.201	56.01	1.74	1.05	1.14	LOW	1	200										
3468+00	3468+50	RT	Upstation	0.0592	2.184	973.92	4.24	2.56	2.89	LOW	3	17			30	5			3468+00	3468+50		
3468+50	3469+00	RT	Backstation	0.0654	1.201	214.72	4.32	2.77	2.94	LOW	4	13			30	5			3468+50	3469+00		
3469+00	3470+00	RT	Backstation	0.0166	0.840	43.77	2.71	1.60	1.78	LOW	2	50										
3470+00	3471+00	RT	Backstation	0.0040	0.678	12.69	1.30	0.79	0.88	LOW	1	100										
3471+00	3472+00	RT	Upstation	0.0047	0.733	16.62	1.35	0.81	0.89	LOW	1	100										
3472+00	3472+88	RT	Upstation	0.0698	1.201	221.78	4.08	2.35	2.73	LOW	7	13			50	5			3472+00	3472+88		
3472+88	3474+00	RT	Backstation	0.0696	0.384	14.24	3.88	2.50	2.72	LOW	8	14			64	5			3472+88	3474+00		
3475+00	3476+00	RT	Upstation	0.0174	0.446	9.96	2.02	1.25	1.48	LOW	2	50										
3476+00	3478+00	RT	Upstation	0.0013	0.565	4.60	1.32	0.77	0.82	LOW	1	200										
3478+00	3478+64	RT	Upstation	0.1103	1.201	278.86	5.79	3.59	4.09	LOW	8	8			39	5			3478+00	3478+64		
3478+64	3480+00	RT	Backstation	0.0446	2.667	1433.85	3.72	2.17	2.43	LOW	7	19			81	5			3478+64	3480+00		

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3480+00	3488+00	RT	Upstation	0.0060	1.161	59.56	3.33	1.87	2.05	LOW	5	160			850	9			3480+00	3488+00		
3490+00	3491+00	RT	Backstation	0.0212	1.201	122.25	4.38	2.61	2.81	LOW	3	33			80	7			3490+00	3491+00		
3491+00	3493+00	RT	Backstation	0.0015	1.201	32.52	1.64	0.94	1.02	LOW	1	200										
3493+00	3494+00	RT	Backstation	0.0050	0.945	32.26	1.69	1.00	1.11	LOW	1	100										
3494+00	3498+00	RT	Upstation	0.0057	1.201	63.67	2.82	1.62	1.76	LOW	3	133										
3498+00	3502+00	RT	Upstation	0.0112	2.184	423.62	4.21	2.40	2.61	LOW	5	80			400	9			3498+00	3502+00		
3502+00	3507+00	RT	Upstation	0.0063	2.667	539.56	4.03	2.28	2.46	LOW	4	125			637	11			3502+00	3507+00		
3507+00	3507+70	RT	Upstation	0.0247	2.667	1066.97	6.61	3.78	4.11	LOW	2	35			74	9			3507+00	3507+70		
3507+70	3508+00	RT	Backstation	0.0580	2.667	1634.53	7.38	4.33	4.80	LOW	2	15			24	7			3507+70	3508+00		
3508+00	3510+00	RT	Backstation	0.0027	2.184	207.99	2.57	1.46	1.59	LOW	1	200										
3510+00	3512+00	RT	Backstation	0.0008	1.698	56.46	1.41	0.81	0.87	LOW	1	200										
3512+00	3514+00	RT	Backstation	0.0141	0.678	23.83	3.17	1.84	2.02	LOW	3	67			147	6			3512+00	3514+00		
3516+00	3526+35	RT	Upstation	0.0108	1.649	198.62	7.07	3.94	4.26	LOW	12	86			1864	16			3516+00	3526+35		
3526+35	3527+00	RT	Backstation	0.0523	2.184	915.48	10.44	5.96	6.42	LOW			3	22	74	10			3526+35	3527+00		
3527+00	3530+00	RT	Backstation	0.0078	1.201	74.15	5.30	2.94	3.18	LOW	3	100			460	13			3527+00	3530+00		
3530+00	3532+00	RT	Upstation	0.0053	1.698	149.39	4.63	2.60	2.81	LOW	2	100			333	14			3530+00	3532+00		
3532+00	3534+00	RT	Upstation	0.0001	1.942	35.94	1.17	0.65	0.70	LOW	1	200										
3534+00	3536+00	RT	Upstation	0.0157	2.184	501.55	7.40	4.14	4.45	LOW	4	50			300	13			3534+00	3536+00		
3536+00	3536+87	RT	Upstation	0.0397	2.184	797.10	10.40	5.83	6.34	LOW			3	29	113	11			3536+00	3536+87		
3536+87	3537+00	RT	Backstation	0.1438	2.184	1518.15	14.85	8.63	9.37	LOW			2	7			13	9			3536+87	3537+00
3537+00	3538+00	RT	Backstation	0.0221	2.184	595.06	7.77	4.39	4.77	LOW	3	33			131	11			3537+00	3538+00		
3538+00	3545+00	RT	Backstation	0.0082	1.201	76.16	5.02	2.83	3.06	LOW	6	117			980	12			3538+00	3545+00		
3545+00	3546+00	RT	Upstation	0.0051	0.384	3.85	1.46	0.84	0.93	LOW	1	100										
3546+00	3546+60	RT	Upstation	0.0313	1.698	364.96	3.15	1.83	2.06	LOW	2	30			36	5			3546+00	3546+60		
3546+60	3550+00	RT	Backstation	0.0074	2.049	289.79	3.76	2.15	2.31	LOW	3	113			369	9			3546+60	3550+00		
3550+00	3551+16	RT	Upstation	0.0359	1.698	390.92	3.79	2.29	2.52	LOW	5	23			73	6			3550+00	3551+16		
3551+16	3553+00	RT	Backstation	0.0212	1.201	122.24	4.77	2.85	3.07	LOW	4	46			158	8			3551+16	3553+00		
3553+00	3554+13	RT	Upstation	0.0338	1.698	379.09	5.01	3.00	3.23	LOW	4	28			85	7			3553+00	3554+13		
3554+13	3555+00	RT	Backstation	0.0745	2.184	1092.43	6.64	3.92	4.35	LOW	7	12			60	6			3554+13	3555+00		
3555+00	3556+00	RT	Backstation	0.0174	1.698	271.97	3.89	2.26	2.47	LOW	2	50			78	7			3555+00	3556+00		
3556+00	3558+00	RT	Backstation	0.0046	1.201	56.95	2.29	1.35	1.47	LOW	1	200										
3558+00	3560+00	RT	Backstation	0.0119	0.787	31.50	2.45	1.48	1.62	LOW	3	67										
3560+00	3560+69	RT	Upstation	0.0765	2.184	1107.28	2.50	1.53	1.80	LOW	6	12										
3560+69	3561+00	RT	Backstation	0.0758	2.184	1102.09	9.86	5.73	6.17	LOW			2	16	28	8			3560+69	3561+00		
3561+00	3563+00	RT	Backstation	0.0184	0.787	39.17	6.04	3.46	3.76	LOW	4	50			222	10			3561+00	3563+00		
3563+00	3566+00	RT	Backstation	0.0057	0.733	18.25	3.42	1.93	2.09	LOW	2	150			336	10			3563+00	3566+00		
3566+00	3567+00	RT	Upstation	0.0092	1.698	197.76	1.77	1.06	1.14	LOW	1	100										
3567+00	3567+70	RT	Upstation	0.0637	1.698	520.43	3.66	2.27	2.45	LOW	5	14			39	5			3567+00	3567+70		
3567+70	3568+00	RT	Backstation	0.0833	1.698	595.19	6.90	4.15	4.63	LOW	3	10			21	6			3567+70	3568+00		
3568+00	3569+00	RT	Backstation	0.0250	0.945	72.14	4.73	2.74	3.00	LOW	3	33			78	7			3568+00	3569+00		
3569+00	3570+00	RT	Backstation	0.0092	1.201	80.53	3.12	1.85	1.98	LOW	1	100			85	7			3569+00	3570+00		
3570+00	3573+00	RT	Upstation	0.0101	1.201	84.38	2.74	1.64	1.77	LOW	4	75										
3573+00	3574+00	RT	Backstation	0.0277	0.945	75.94	2.55	1.53	1.79	LOW	3	33										
3574+00	3576+00	RT	Upstation	0.0152	1.201	103.34	4.04	2.33	2.57	LOW	4	50			170	7			3574+00	3576+00		
3576+00	3580+00	RT	Upstation	0.0033	0.945	26.11	3.33	1.85	2.03	LOW	2	200			594	13			3576+00	3580+00		
3580+00	3583+00	RT	Upstation	0.0148	1.698	250.83	6.26	3.56	3.86	LOW	5	60			388	11			3580+00	3583+00		
3583+00	3583+80	RT	Upstation	0.0546	2.184	935.54	9.94	5.72	6.23	LOW			4	20	85	9			3583+00	3583+80		
3583+80	3585+00	RT	Backstation	0.0396	1.201	167.05	4.07	2.40	2.67	LOW	5	24			77	6			3583+80	3585+00		

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3585+00	3588+00	RT	Upstation	0.0131	1.698	235.98	4.26	2.47	2.68	LOW	4	75			281	8			3585+00	3588+00		
3588+00	3589+15	RT	Upstation	0.0475	1.698	449.26	7.94	4.51	4.97	LOW	6	19			105	8			3588+00	3589+15		
3589+15	3590+00	RT	Backstation	0.0559	2.184	946.24	8.46	4.86	5.33	LOW			5	17	77	8			3589+15	3590+00		
3590+00	3593+00	RT	Backstation	0.0079	2.184	356.53	3.99	2.29	2.48	LOW	3	100			334	10			3590+00	3593+00		
3594+00	3595+00	RT	Upstation	0.0219	0.404	13.69	2.65	1.59	1.68	LOW	3	33										
3595+00	3596+00	RT	Upstation	0.0415	0.347	13.08	3.85	2.29	2.49	LOW	5	20			63	6			3595+00	3596+00		
3596+00	3597+00	RT	Upstation	0.0404	0.369	11.53	4.40	2.61	2.95	LOW	5	20			67	6			3596+00	3597+00		
3597+00	3598+00	RT	Upstation	0.0388	0.369	11.30	4.93	2.80	3.11	LOW	4	25			70	6			3597+00	3598+00		
3598+00	3599+00	RT	Upstation	0.0326	0.417	8.69	5.86	3.33	3.53	LOW	4	25			58	5			3598+00	3599+00		
3599+00	3600+00	RT	Upstation	0.0239	0.465	9.93	5.39	2.99	3.25	LOW	3	33			65	6			3599+00	3600+00		
3600+00	3601+00	RT	Upstation	0.0144	0.513	10.00	4.71	2.55	2.78	LOW	2	50			74	6			3600+00	3601+00		
3601+00	3602+00	RT	Upstation	0.0865	0.417	14.16	9.15	5.21	5.58	LOW			9	11	55	5			3601+00	3602+00		
3602+00	3604+00	RT	Backstation	0.0133	1.698	238.22	2.56	1.51	1.71	LOW	3	67										
3613+00	3618+50	RT	Upstation	0.0038	1.125	43.88	2.44	1.39	1.52	LOW	3	183										
3618+50	3628+50	RT	Backstation	0.0047	1.815	168.64	3.01	1.73	1.86	LOW	5	200			1098	10			3618+50	3628+50		
3633+00	3638+00	RT	Upstation	0.0090	1.698	195.16	3.25	1.85	2.01	LOW	5	100			437	8			3633+00	3638+00		
3638+00	3646+00	RT	Backstation	0.0065	1.247	74.18	3.82	2.17	2.35	LOW	6	133			951	10			3638+00	3646+00		
3646+00	3650+00	RT	Backstation	0.0062	1.297	80.52	3.08	1.76	1.90	LOW	3	133			391	9			3646+00	3650+00		
3650+00	3652+00	RT	Backstation	0.0244	1.698	322.39	3.50	2.07	2.34	LOW	5	40			132	6			3650+00	3652+00		
3652+00	3653+60	RT	Upstation	0.0065	1.698	166.23	1.88	1.15	1.27	LOW	2	80										
3654+06	3655+00	RT	Backstation	0.0083	1.201	76.48	2.04	1.18	1.33	LOW	1	94										
3660+50	3664+00	RT	Upstation	0.0347	3.434	2475.80	4.16	2.40	2.71	LOW	13	27			229	6			3660+50	3664+00		
3664+00	3665+00	RT	Backstation	0.0138	1.698	242.21	3.64	2.11	2.28	LOW	2	50			81	7			3664+00	3665+00		
3665+00	3666+00	RT	Backstation	0.0206	2.184	574.51	3.74	2.21	2.40	LOW	3	33			72	6			3665+00	3666+00		
3666+00	3667+00	RT	Backstation	0.0231	2.378	761.25	3.28	1.98	2.13	LOW	3	33			66	6			3666+00	3667+00		
3667+00	3668+00	RT	Backstation	0.0467	1.501	322.85	3.22	2.00	2.15	LOW	5	20			56	5			3667+00	3668+00		
3668+00	3668+50	RT	Backstation	0.0018	0.195	0.73	0.70	0.44	0.45	LOW	1	50										
3669+00	3670+00	RT	Upstation	0.0016	1.201	33.58	1.04	0.63	0.70	LOW	1	100										
3670+00	3672+00	RT	Upstation	0.0077	1.451	120.52	2.54	1.49	1.62	LOW	2	100										
3672+00	3672+60	RT	Upstation	0.0293	1.201	143.80	4.24	2.50	2.68	LOW	2	30			42	6			3672+00	3672+60		
3672+60	3681+00	RT	Backstation	0.0068	2.184	330.31	3.15	1.82	1.97	SEVERE	6	140					810	8			3672+60	3681+00
3681+00	3682+00	RT	Upstation	0.0450	1.698	437.37	2.61	1.61	1.80	SEVERE	5	20					54	5			3681+00	3682+00
3682+00	3684+00	RT	Backstation	0.0144	1.449	159.56	4.93	2.73	2.91	SEVERE	3	67					160	7			3682+00	3684+00
3684+00	3685+30	RT	Upstation	0.0166	1.938	372.20	5.06	2.79	2.98	SEVERE	3	43					96	6			3684+00	3685+30
3685+30	3686+00	RT	Backstation	0.0473	0.565	28.27	7.38	4.40	4.79	SEVERE	4	18					62	8			3685+30	3686+00
3686+00	3688+00	RT	Backstation	0.0063	0.945	36.21	3.26	1.87	2.05	SEVERE	2	100					206	9			3686+00	3688+00
3688+00	3689+00	RT	Upstation	0.0023	0.733	11.63	1.76	1.00	1.10	SEVERE	1	100					92	8			3688+00	3689+00
3689+00	3689+40	RT	Upstation	0.1243	0.945	160.82	6.36	3.95	4.27	SEVERE	5	8					25	5			3689+00	3689+40
3689+40	3690+00	RT	Backstation	0.0870	0.733	71.52	2.70	1.76	2.10	SEVERE	6	10					31	5			3689+40	3690+00
3690+00	3690+80	RT	Upstation	0.0653	0.565	33.21	6.09	3.52	3.89	SEVERE	6	13					55	6			3690+00	3690+80
3690+80	3691+00	RT	Backstation	0.2830	0.622	86.85	14.67	8.79	9.46	SEVERE			6	3			15	7			3690+80	3691+00
3691+00	3693+00	RT	Backstation	0.0016	1.049	24.10	2.46	1.38	1.48	SEVERE	1	200					312	14			3691+00	3693+00
3693+00	3694+00	RT	Upstation	0.0349	0.945	85.23	3.54	2.14	2.46	SEVERE	4	25					62	6			3693+00	3694+00
3694+00	3695+00	RT	Backstation	0.0325	0.945	82.25	5.56	3.30	3.59	SEVERE	4	25					82	7			3694+00	3695+00
3695+00	3697+00	RT	Backstation	0.0049	0.787	20.11	2.87	1.63	1.79	SEVERE	1	200					204	9			3695+00	3697+00
3697+00	3699+00	RT	Upstation	0.0099	1.100	66.64	3.65	2.12	2.30	SEVERE	2	100					187	8			3697+00	3699+00
3699+00	3700+00	RT	Backstation	0.0175	0.787	38.20	3.70	2.11	2.34	SEVERE	2	50					75	7			3699+00	3700+00
3700+00	3701+00	RT	Backstation	0.0133	0.446	8.71	2.59	1.53	1.67	SEVERE	2	50					67	6			3700+00	3701+00

DITCH EROSION CONTROL CALCULATION - CENTRAL SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
3701+00	3702+00	RT	Upstation	0.0323	0.733	43.58	2.84	1.70	1.87	SEVERE	4	25					58	5			3701+00	3702+00
3702+00	3707+00	RT	Backstation	0.0129	1.898	313.86	4.61	2.67	2.87	SEVERE	7	71					510	9			3702+00	3707+00
3707+00	3708+00	RT	Upstation	0.0195	0.678	28.03	3.51	2.07	2.33	SEVERE	2	50					71	6			3707+00	3708+00
3708+00	3708+52	RT	Upstation	0.0869	1.698	607.87	6.26	3.69	4.11	SEVERE	5	10					33	6			3708+00	3708+52
3709+00	3713+00	RT	Backstation	0.0183	2.029	445.83	5.03	2.91	3.17	SEVERE	8	50					375	8			3709+00	3713+00
3713+00	3713+66	RT	Upstation	0.0968	0.384	16.79	2.76	1.69	1.99	SEVERE	7	9					34	5			3713+00	3713+66
3713+66	3714+00	RT	Backstation	0.1585	0.733	96.55	3.19	2.10	2.38	SEVERE	6	6					17	4			3713+66	3714+00
3714+00	3717+00	RT	Upstation	0.0074	0.787	24.90	3.41	1.95	2.10	SEVERE	3	100					294	9			3714+00	3717+00
3717+00	3717+38	RT	Upstation	0.0979	1.451	428.34	8.10	4.78	5.21	SEVERE			4	10			27	6			3717+00	3717+38
3717+38	3720+00	RT	Backstation	0.0184	1.981	419.36	4.90	2.82	3.03	SEVERE	5	52					238	8			3717+38	3720+00
3720+00	3721+00	RT	Upstation	0.0167	2.339	619.82	3.03	1.86	1.99	SEVERE	2	50					69	6			3720+00	3721+00
3721+00	3723+00	RT	Upstation	0.0035	2.170	232.67	3.79	2.12	2.29	SEVERE	1	200					332	14			3721+00	3723+00
3723+00	3723+27	RT	Upstation	0.1900	0.945	198.87	15.06	8.87	9.69	SEVERE			5	5			24	8			3723+00	3723+27
3723+27	3724+00	RT	Backstation	0.0852	0.384	15.75	2.20	1.45	1.64	SEVERE	7	10					36	4			3723+27	3724+00
3727+00	3732+00	RT	Upstation	0.0178	2.310	619.16	6.86	3.90	4.23	SEVERE	9	56					647	11			3727+00	3732+00
3732+00	3733+00	RT	Backstation	0.0790	0.787	81.17	4.94	2.88	3.23	SEVERE	8	13					59	5			3732+00	3733+00
3733+00	3734+00	RT	Backstation	0.0072	0.787	24.50	1.74	1.02	1.14	SEVERE	1	100					64	6			3733+00	3734+00
3734+00	3735+00	RT	Upstation	0.0072	0.787	24.50	2.52	1.46	1.60	SEVERE	1	100					78	7			3734+00	3735+00
3735+00	3736+00	RT	Upstation	0.0181	0.565	17.49	3.68	2.20	2.37	SEVERE	2	50					75	7			3735+00	3736+00
3736+00	3737+62	RT	Backstation	0.0181	0.565	17.49	2.33	1.41	1.59	SEVERE	3	54					97	5			3736+00	3737+62
3737+62	3739+00	RT	Upstation	0.0296	0.565	22.36	2.85	1.71	1.88	SEVERE	5	28					80	5			3737+62	3739+00
3739+00	3740+00	RT	Backstation	0.0377	1.201	163.02	2.59	1.54	1.75	SEVERE	4	25					55	5			3739+00	3740+00
3740+00	3742+00	RT	Upstation	0.0119	1.201	91.40	3.23	1.93	2.13	SEVERE	3	67					159	7			3740+00	3742+00
3742+00	3742+20	RT	Upstation	0.2920	1.698	1114.13	9.21	5.55	6.27	SEVERE			6	3			12	5			3742+00	3742+20
3743+00	3744+00	RT	Backstation	0.0328	1.352	206.21	11.18	6.26	6.77	SEVERE			3	33			160	14			3743+00	3744+00
3744+00	3746+00	RT	Backstation	0.0100	1.673	198.47	6.72	3.77	4.06	SEVERE	2	100					356	15			3744+00	3746+00
3747+00	3753+00	RT	Upstation	0.0037	1.698	124.85	2.61	1.50	1.63	SEVERE	3	200					655	10			3747+00	3753+00
3753+00	3754+00	RT	Backstation	0.0620	1.201	209.06	3.05	1.97	2.23	SEVERE	7	14					54	5			3753+00	3754+00
3754+00	3758+60	RT	Upstation	0.0174	3.147	1388.71	3.86	2.27	2.49	SEVERE	8	58					363	7			3754+00	3758+60
3759+14	3761+00	RT	Backstation	0.0116	2.184	430.36	2.45	1.48	1.62	SEVERE	3	62					126	6			3759+14	3761+00
3761+00	3762+00	RT	Upstation	0.0091	0.519	10.14	1.69	1.05	1.19	SEVERE	1	100					61	5			3761+00	3762+00
3762+00	3764+00	RT	Upstation	0.0030	0.594	8.00	1.83	1.05	1.16	SEVERE	1	200					170	7			3762+00	3764+00
3769+00	3771+00	RT	Upstation	0.0032	0.513	4.71	1.73	0.95	1.03	MODERATE	1	200										
3772+00	3778+00	RT	Upstation	0.0066	2.667	549.29	3.00	1.72	1.86	MODERATE	4	150										
3778+00	3785+00	RT	Backstation	0.0046	1.698	139.62	2.73	1.56	1.68	MODERATE	4	175										
3785+00	3794+00	RT	Upstation	0.0068	2.184	329.54	3.64	2.06	2.25	MODERATE	7	129			988	10			3785+00	3794+00		
3799+00	3817+00	RT	Backstation	0.0041	1.751	143.87	3.64	2.03	2.20	MODERATE	8	225			2596	13			3799+00	3817+00		
3817+00	3822+00	RT	Backstation	0.0023	1.815	117.33	2.33	1.33	1.43	MODERATE	2	250										
3824+00	3843+00	RT	Upstation	0.0028	2.160	206.44	2.81	1.58	1.72	MODERATE	6	317										
3843+00	3844+00	RT	Upstation	0.0084	0.971	44.77	5.30	2.99	3.24	MODERATE	1	100			148	13			3843+00	3844+00		
3845+00	3846+00	RT	Upstation	0.0474	3.147	2292.64	3.71	2.24	2.53	MODERATE	5	20			60	5			3845+00	3846+00		
3846+00	3847+00	RT	Upstation	0.0257	4.103	3418.97	4.08	2.41	2.63	MODERATE	3	33			72	6			3846+00	3847+00		
3847+00	3848+00	RT	Upstation	0.0101	5.056	3739.46	3.39	1.98	2.14	MODERATE	2	50			87	8			3847+00	3848+00		
3848+00	3851+50	RT	Upstation	0.0022	4.580	1340.70	2.42	1.36	1.48	MODERATE	1	350										
3851+50	3854+00	RT	Backstation	0.0036	4.103	1279.62	2.63	1.51	1.63	MODERATE	1	250										

DITCH EROSION CONTROL CALCULATION - NORTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
5026+50	5028+00	LT	backstation	0.0200	3.984	2788.17	9.16	5.13	5.57	MODERATE			3	50	256	15			5026+50	5028+00		
5028+00	5037+00	LT	backstation	0.0061	3.238	887.99	5.34	2.97	3.22	MODERATE	6	150			1633	16			5028+00	5037+00		
5037+00	5080+00	LT	backstation	0.0030	2.494	311.11	3.77	2.11	2.30	LOW	13	331			7955	16			5037+00	5080+00		
5080+00	5088+00	LT	upstation	0.0071	0.738	20.84	3.39	1.96	2.16	LOW	6	133			817	9			5080+00	5088+00		
5091+00	5114+00	LT	backstation	0.0030	1.917	156.60	2.36	1.35	1.46	LOW	7	329										
5119+00	5120+00	LT	upstation	0.0380	1.859	510.06	5.23	3.08	3.41	LOW	4	25			75	7			5119+00	5120+00		
5120+00	5124+00	LT	backstation	0.0030	1.859	143.32	4.26	2.38	2.56	LOW	2	200			866	19			5120+00	5124+00		
5130+50	5137+00	LT	backstation	0.0183	2.426	715.30	9.91	5.48	5.98	MODERATE			12	54	1294	17			5130+50	5137+00		
5137+00	5140+00	LT	backstation	0.0534	1.698	476.60	15.62	8.67	9.45	LOW			16	19			540	16			5137+00	5140+00
5147+00	5149+00	LT	backstation	0.0050	3.711	1154.71	5.51	3.06	3.35	MODERATE	1	200			437	19			5147+00	5149+00		
5158+00	5168+00	LT	upstation	0.0055	1.747	164.75	3.80	2.14	2.33	MODERATE	6	167			1288	11			5158+00	5168+00		
5168+00	5174+00	LT	backstation	0.0030	1.307	57.14	2.22	1.28	1.39	LOW	2	300										
5174+00	5177+00	LT	backstation	0.0190	1.382	166.11	3.29	1.90	2.17	LOW	6	50			205	6			5174+00	5177+00		
5199+00	5211+00	LT	upstation	0.0077	1.451	120.07	4.35	2.49	2.71	LOW	10	120			1512	11			5199+00	5211+00		
5212+00	5221+00	LT	backstation	0.0056	1.059	45.32	2.95	1.72	1.88	LOW	5	180										
5221+00	5223+00	LT	upstation	0.0035	1.201	49.67	1.61	0.93	1.03	LOW	1	200										
5223+00	5231+00	LT	upstation	0.0120	1.201	91.98	3.94	2.31	2.52	LOW	10	80			743	8			5223+00	5231+00		
5231+00	5231+69	LT	upstation	0.0247	0.819	50.13	5.20	3.03	3.38	LOW	2	34			60	8			5231+00	5231+69		
5231+69	5232+00	LT	backstation	0.0160	1.002	66.90	3.64	2.17	2.39	LOW	1	31			24	7			5231+69	5232+00		
5232+00	5237+00	LT	backstation	0.0040	0.738	15.62	2.22	1.31	1.41	LOW	2	250										
5237+00	5250+00	LT	upstation	0.0069	1.629	153.96	3.39	1.94	2.15	LOW	9	144			1345	9			5237+00	5250+00		
5250+00	5258+00	LT	upstation	0.0052	1.599	127.81	3.20	1.82	1.99	LOW	5	160			890	10			5250+00	5258+00		
5258+00	5264+39	LT	upstation	0.0033	1.516	87.86	2.76	1.55	1.68	LOW	3	213										
5264+39	5285+75	LT	upstation	0.0031	2.310	259.92	3.03	1.71	1.87	LOW	7	305			2946	12			5264+39	5285+75		
5288+00	5342+92	LT	backstation	0.0020	3.013	419.75	3.03	1.68	1.83	MODERATE	11	499			9851	16			5288+00	5342+92		
6004+00	6023+00	LT	upstation	0.0030	1.491	80.43	4.33	2.40	2.60	MODERATE	6	317			4196	19			6004+00	6023+00		
6023+00	6033+00	LT	backstation	0.0080	1.663	174.80	5.50	3.08	3.36	MODERATE	8	125			1618	14			6023+00	6033+00		
6033+00	6039+00	LT	upstation	0.0050	2.131	265.18	4.10	2.31	2.53	MODERATE	3	200			908	13			6033+00	6039+00		
6039+00	6050+25	LT	backstation	0.0030	1.451	74.98	4.07	2.27	2.48	MODERATE	4	281			2334	18			6039+00	6050+25		
6050+25	6062+00	LT	backstation	0.0036	1.347	67.63	4.47	2.48	2.69	MODERATE	5	235			2397	18			6050+25	6062+00		
6062+00	6068+00	LT	backstation	0.0009	1.357	35.12	1.33	0.75	0.82	MODERATE	1	600										
6069+00	6071+00	LT	upstation	0.0050	1.540	113.05	1.83	1.10	1.21	MODERATE	1	200										
6071+00	6073+00	LT	upstation	0.0338	2.320	862.02	4.32	2.55	2.94	MODERATE	7	29			138	6			6071+00	6073+00		
6073+00	6078+00	LT	upstation	0.0033	3.223	644.87	2.39	1.37	1.50	MODERATE	2	250										
6078+00	6082+00	LT	upstation	0.0063	4.785	2539.27	4.27	2.42	2.67	MODERATE	3	133			557	12			6078+00	6082+00		
6082+00	6082+92	LT	upstation	0.0219	4.151	3257.74	7.57	4.28	4.75	MODERATE	3	31			121	11			6082+00	6082+92		
6084+40	6087+25	LT	upstation	0.0312	3.338	2176.85	7.71	4.46	4.90	MODERATE	9	32			319	10			6084+40	6087+25		
6088+05	6090+00	LT	backstation	0.0646	4.103	5421.22	8.34	4.87	5.48	MODERATE			13	15	169	8			6088+05	6090+00		
6090+00	6093+34	LT	upstation	0.0339	1.854	478.57	7.38	4.20	4.60	MODERATE	12	28			338	9			6090+00	6093+34		
6093+34	6097+71	LT	upstation	0.0366	4.246	4468.81	9.71	5.54	5.99	MODERATE			16	27	566	11			6093+34	6097+71		
6098+44	6098+69	LT	upstation	0.0566	4.341	5896.01	6.11	3.54	3.99	MODERATE	2	12			18	6			6098+44	6098+69		
6098+69	6101+50	LT	upstation	0.0356	2.010	605.97	10.97	6.18	6.69	MODERATE			10	28			423	13			6098+69	6101+50
6101+50	6104+00	LT	upstation	0.0104	1.747	226.54	6.66	3.71	4.06	MODERATE	3	83			434	15			6101+50	6104+00		
6104+00	6108+00	LT	upstation	0.0060	1.161	59.56	5.19	2.88	3.15	MODERATE	3	133			712	15			6104+00	6108+00		
6108+00	6118+00	LT	upstation	0.0030	1.141	40.26	3.59	2.00	2.15	MODERATE	3	333			1716	15			6108+00	6118+00		
6119+00	6124+50	LT	backstation	0.0049	1.594	122.60	3.24	1.82	2.00	MODERATE	3	183			639	10			6119+00	6124+50		
6124+50	6131+50	LT	upstation	0.0030	1.186	44.51	2.72	1.55	1.70	MODERATE	3	233										

DITCH EROSION CONTROL CALCULATION - NORTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
6133+00	6159+30	LT	upstation	0.0030	1.575	92.84	4.10	2.27	2.45	MODERATE	8	329			5309	17			6133+00	6159+30		
6159+30	6167+00	LT	backstation	0.0032	1.307	59.08	4.11	2.28	2.50	MODERATE	3	257			1527	17			6159+30	6167+00		
6167+00	6168+00	LT	backstation	0.0068	1.698	170.02	5.11	2.85	3.12	MODERATE	1	100			163	14			6167+00	6168+00		
6168+00	6174+00	LT	backstation	0.0222	3.142	1560.90	7.57	4.26	4.68	MODERATE	14	43			777	11			6168+00	6174+00		
6176+00	6178+00	LT	upstation	0.0120	1.337	121.18	5.25	2.98	3.30	MODERATE	3	67			243	11			6176+00	6178+00		
6178+00	6179+80	LT	upstation	0.0350	2.993	1725.17	9.01	5.04	5.57	MODERATE			6	30	217	10			6178+00	6179+80		
6179+80	6182+00	LT	backstation	0.0205	2.729	1032.18	9.38	5.26	5.78	MODERATE			5	44	387	15			6179+80	6182+00		
6182+00	6192+00	LT	backstation	0.0034	1.481	84.15	4.22	2.35	2.55	MODERATE	4	250			1983	17			6182+00	6192+00		
6192+00	6193+00	LT	backstation	0.0030	0.982	27.48	2.25	1.28	1.41	MODERATE	1	100										
6199+75	6201+30	LT	upstation	0.0173	2.676	901.00	5.75	3.30	3.60	MODERATE	3	52			171	10			6199+75	6201+30		
6201+30	6202+50	LT	backstation	0.0030	2.571	337.24	4.00	2.23	2.43	MODERATE	1	120			241	17			6201+30	6202+50		
6202+50	6204+00	LT	backstation	0.0395	2.170	781.32	10.71	5.98	6.59	MODERATE			6	25	205	12			6202+50	6204+00		
6204+00	6206+00	LT	backstation	0.0040	1.756	142.57	4.35	2.42	2.66	MODERATE	1	200			371	16			6204+00	6206+00		
6208+00	6209+50	LT	backstation	0.0040	0.940	28.46	3.36	1.91	2.08	MODERATE	1	150			206	12			6208+00	6209+50		
6209+50	6213+00	LT	upstation	0.0044	1.201	55.51	2.32	1.33	1.46	MODERATE	2	175										
6213+00	6213+16	LT	upstation	0.1231	1.201	294.61	8.78	4.99	5.59	MODERATE			2	8	11	6			6213+00	6213+16		
6256+00	6257+00	LT	backstation	0.0609	1.815	606.39	2.26	1.48	1.83	MODERATE	7	14										
6276+00	6278+00	LT	backstation	0.0100	1.698	206.18	5.54	3.12	3.39	MODERATE	2	100			281	12			6276+00	6278+00		
6278+00	6280+00	LT	backstation	0.0470	1.698	446.99	10.64	5.98	6.62	MODERATE			9	22	248	11			6278+00	6280+00		
6280+00	6282+00	LT	backstation	0.0030	1.698	112.93	2.97	1.68	1.83	MODERATE	1	200										
6282+00	6282+50	LT	backstation	0.0712	1.201	224.04	10.99	6.30	6.99	MODERATE			4	13			52	9			6282+00	6282+50
6284+56	6286+00	LT	backstation	0.0287	1.201	142.36	11.71	6.51	7.11	MODERATE			4	36			266	16			6284+56	6286+00
6286+00	6288+00	LT	backstation	0.0240	0.787	44.74	7.39	4.20	4.59	MODERATE	5	40			242	11			6286+00	6288+00		
6288+00	6290+00	LT	backstation	0.0280	0.678	33.58	7.62	4.33	4.74	MODERATE	6	33			229	10			6288+00	6290+00		
6290+00	6292+00	LT	backstation	0.0330	0.678	36.46	7.61	4.35	4.85	MODERATE	7	29			213	9			6290+00	6292+00		
6292+00	6296+00	LT	backstation	0.0363	0.678	38.21	7.43	4.25	4.69	MODERATE	15	27			394	9			6292+00	6296+00		
6296+00	6298+00	LT	backstation	0.0400	0.678	40.14	6.00	3.53	3.84	MODERATE	8	25			161	7			6296+00	6298+00		
6298+00	6299+00	LT	backstation	0.0306	0.678	35.11	3.75	2.32	2.61	MODERATE	4	25			66	6			6298+00	6299+00		
6299+00	6300+00	LT	upstation	0.0633	0.678	50.49	4.43	2.75	3.10	MODERATE	7	14			61	5			6299+00	6300+00		
6304+50	6305+00	LT	backstation	0.0520	0.787	65.85	10.86	6.17	6.77	MODERATE			3	17			61	11			6304+50	6305+00
6305+00	6312+00	LT	backstation	0.0310	0.840	59.82	9.04	5.11	5.60	MODERATE			22	32	921	11			6305+00	6312+00		
5001+00	5002+00	RT	upstation	0.0030	0.672	10.78	0.99	0.60	0.66	LOW	1	100										
5002+00	5004+00	RT	backstation	0.0050	0.945	32.26	2.11	1.26	1.39	LOW	1	200										
5010+00	5016+50	RT	upstation	0.0100	0.945	45.62	2.75	1.67	1.81	LOW	7	93										
5026+75	5037+00	RT	backstation	0.0088	2.054	318.66	3.97	2.29	2.52	MODERATE	9	114			1097	9			5026+75	5037+00		
5037+00	5073+00	RT	backstation	0.0027	1.535	83.14	2.26	1.30	1.42	LOW	10	360										
5073+00	5089+00	RT	upstation	0.0042	1.698	133.02	2.81	1.59	1.73	LOW	7	229										
5089+00	5092+00	RT	upstation	0.0061	1.942	229.81	3.98	2.26	2.45	LOW	2	150			384	11			5089+00	5092+00		
5092+00	5110+00	RT	backstation	0.0044	2.296	302.37	3.28	1.86	2.03	LOW	8	225			2255	11			5092+00	5110+00		
5120+00	5122+00	RT	upstation	0.0256	1.698	329.57	3.30	1.99	2.22	LOW	6	33			131	6			5120+00	5122+00		
5122+00	5129+50	RT	backstation	0.0030	1.594	95.84	3.40	1.91	2.08	LOW	3	250			1219	14			5122+00	5129+50		
5130+50	5135+00	RT	backstation	0.0114	1.688	217.25	5.77	3.24	3.53	MODERATE	6	75			617	12			5130+50	5135+00		
5135+00	5142+00	RT	backstation	0.0335	2.204	749.59	8.89	5.07	5.54	LOW			23	30	857	11			5135+00	5142+00		
5144+00	5149+00	RT	backstation	0.0058	1.658	147.44	3.73	2.12	2.33	LOW	3	167			623	11			5144+00	5149+00		
5149+00	5152+50	RT	backstation	0.0499	1.668	439.76	7.89	4.49	4.97	MODERATE	18	19			315	8			5149+00	5152+50		
5152+50	5158+00	RT	backstation	0.0250	1.585	272.23	5.68	3.27	3.55	LOW	14	39			503	8			5152+50	5158+00		
5158+00	5167+50	RT	upstation	0.0040	1.673	125.52	3.35	1.89	2.06	LOW	4	238			1277	12			5158+00	5167+50		

DITCH EROSION CONTROL CALCULATION - NORTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
5167+50	5168+00	RT	upstation	0.0240	1.201	130.07	6.91	3.99	4.35	LOW	2	25			57	10			5167+50	5168+00		
5169+00	5177+00	RT	backstation	0.0075	0.977	42.88	4.13	2.36	2.57	LOW	6	133			963	10			5169+00	5177+00		
5177+00	5199+00	RT	upstation	0.0050	2.010	227.21	5.34	2.97	3.22	LOW	11	200			4549	18			5177+00	5199+00		
5199+00	5211+00	RT	upstation	0.0092	2.088	341.22	6.72	3.74	4.05	LOW	12	100			2245	16			5199+00	5211+00		
5211+00	5212+00	RT	upstation	0.0067	2.068	283.59	5.94	3.30	3.59	LOW	1	100			197	17			5211+00	5212+00		
5212+00	5222+00	RT	backstation	0.0030	1.693	112.08	3.66	2.04	2.22	LOW	3	333			1787	15			5212+00	5222+00		
5222+00	5231+41	RT	upstation	0.0104	1.844	260.86	5.80	3.28	3.55	LOW	10	94			1384	13			5222+00	5231+41		
5231+41	5237+00	RT	backstation	0.0030	0.982	27.51	3.16	1.77	1.92	LOW	2	279			830	13			5231+41	5237+00		
5237+00	5263+00	RT	upstation	0.0057	1.781	176.95	5.69	3.16	3.43	LOW	15	173			5376	18			5237+00	5263+00		
5263+00	5285+75	RT	upstation	0.0034	2.571	357.74	4.90	2.72	2.94	LOW	8	284			5487	21			5263+00	5285+75		
5288+00	5300+00	RT	backstation	0.0070	1.937	243.90	4.78	2.70	2.93	LOW	9	133			1765	13			5288+00	5300+00		
5300+00	5305+00	RT	backstation	0.0030	1.614	98.97	2.77	1.56	1.70	LOW	2	250										
6039+00	6050+25	RT	backstation	0.0030	2.609	353.38	2.66	1.52	1.67	MODERATE	4	281										
6050+25	6060+00	RT	backstation	0.0050	0.949	30.43	3.34	1.84	1.99	MODERATE	5	195			966	8			6050+25	6060+00		
6060+00	6086+00	RT	upstation	0.0030	2.315	254.38	2.85	1.58	1.68	MODERATE	8	325										
6086+00	6090+00	RT	upstation	0.0293	3.544	2470.38	7.39	4.18	4.64	MODERATE	12	33			434	9			6086+00	6090+00		
6090+00	6101+50	RT	upstation	0.0222	1.722	318.77	7.53	4.27	4.64	MODERATE	26	44			1473	11			6090+00	6101+50		
6101+50	6115+00	RT	upstation	0.0033	1.825	143.88	3.17	1.79	1.99	MODERATE	5	270			1938	12			6101+50	6115+00		
6120+00	6124+50	RT	backstation	0.0030	0.678	10.99	1.99	1.15	1.27	MODERATE	2	225										
6124+50	6131+50	RT	upstation	0.0030	0.678	10.99	2.08	1.19	1.32	MODERATE	3	233										
6149+16	6150+00	RT	upstation	0.0118	0.678	21.83	3.62	2.09	2.31	MODERATE	1	85			73	8			6149+16	6150+00		
6170+00	6173+50	RT	backstation	0.0150	2.460	671.02	3.23	1.88	2.15	MODERATE	6	58			256	6			6170+00	6173+50		
6175+50	6177+50	RT	upstation	0.0050	0.749	18.09	1.80	1.04	1.18	MODERATE	1	200										
6177+50	6178+50	RT	upstation	0.0375	2.189	779.68	4.30	2.48	2.80	MODERATE	4	25			66	6			6177+50	6178+50		
6181+00	6193+00	RT	backstation	0.0030	1.272	53.26	2.32	1.32	1.46	MODERATE	4	300										
6193+50	6196+00	RT	upstation	0.0030	1.451	74.98	1.53	0.89	1.00	MODERATE	1	250										
6200+00	6201+30	RT	upstation	0.0059	1.201	64.62	1.36	0.84	0.95	MODERATE	1	130										
6201+30	6205+00	RT	backstation	0.0086	1.201	77.84	2.46	1.42	1.61	MODERATE	4	93										
6210+00	6213+00	RT	upstation	0.0017	0.678	8.19	1.19	0.69	0.77	MODERATE	1	300										
6213+00	6213+50	RT	backstation	0.0050	0.384	3.82	0.87	0.57	0.62	MODERATE	1	50										
6213+50	6218+00	RT	upstation	0.0150	0.750	28.82	3.45	2.00	2.18	MODERATE	7	64			258	5			6213+50	6218+00		
6218+00	6220+00	RT	upstation	0.0250	0.436	9.28	4.70	2.60	2.86	MODERATE	5	40			119	5			6218+00	6220+00		
6220+00	6224+50	RT	upstation	0.0050	1.092	44.58	2.90	1.62	1.79	MODERATE	3	150										
6225+50	6237+00	RT	backstation	0.0030	1.333	58.55	2.38	1.33	1.44	MODERATE	4	288										
6242+00	6248+10	RT	upstation	0.0010	1.333	33.80	1.26	0.71	0.77	MODERATE	1	610										
6248+10	6248+33	RT	backstation	0.0214	1.333	156.48	5.54	3.12	3.41	MODERATE	1	23			19	7			6248+10	6248+33		
6248+33	6255+00	RT	backstation	0.0030	1.333	58.55	2.57	1.45	1.57	MODERATE	2	333										
6255+00	6264+00	RT	backstation	0.0020	0.976	20.94	1.79	1.00	1.09	MODERATE	2	450										
6269+00	6270+00	RT	upstation	0.0305	0.849	56.71	2.83	1.70	1.82	MODERATE	4	25										
6270+00	6273+00	RT	upstation	0.0100	0.945	45.62	2.72	1.63	1.78	MODERATE	3	100										
6275+00	6276+00	RT	backstation	0.0300	0.909	71.57	5.65	3.31	3.60	MODERATE	3	33			85	7			6275+00	6276+00		
6276+00	6278+00	RT	backstation	0.0200	0.851	49.57	4.71	2.75	3.03	MODERATE	4	50			175	8			6276+00	6278+00		
6278+00	6280+00	RT	backstation	0.0050	1.023	39.39	2.67	1.53	1.69	MODERATE	1	200										
6280+00	6282+00	RT	backstation	0.0550	1.486	341.41	4.79	2.82	3.28	MODERATE	11	18			128	6			6280+00	6282+00		
6282+00	6282+50	RT	backstation	0.0040	2.024	207.13	1.25	0.75	0.83	MODERATE	1	50										
6285+00	6286+00	RT	backstation	0.1400	1.590	649.47	10.12	6.07	6.80	MODERATE			14	7			75	7			6285+00	6286+00
6286+00	6287+00	RT	backstation	0.0400	2.008	635.09	7.12	4.11	4.43	MODERATE	4	25			78	7			6286+00	6287+00		

DITCH EROSION CONTROL CALCULATION - NORTH SECTION

STATION		SIDE	DIRECTION OF FLOW	DITCH SLOPE	HYDRAULIC RADIUS	AVAILABLE Q	VELOCITY			EROSION POTENTIAL	TEMPORARY DITCH CHECKS				DITCH LINING							
							10-YR BARE EARTH	10-YR GRASS	50-YR GRASS		STRAW BALES	SPACING	AGGREGATE	SPACING	TEMPORARY LINING		PERMANENT LINING		TEMPORARY LINING LIMITS		PERMANENT LINING LIMITS	
FROM	TO			FT/FT		CFS	FT/SEC	FT/SEC	FT/SEC		EACH	FT	EACH	FT	SQ YD	PLAN WIDTH	SQ YD	PLAN WIDTH	STA TO STA		STA TO STA	
6287+00	6288+00	RT	backstation	0.0182	1.135	93.54	5.41	3.03	3.30	MODERATE	2	50			81	7			6287+00	6288+00		
6288+00	6289+00	RT	backstation	0.0600	2.054	827.02	8.46	4.72	5.04	MODERATE			6	17	63	5			6288+00	6289+00		
6289+00	6290+00	RT	backstation	0.0419	2.184	819.35	6.10	3.54	3.93	MODERATE	5	20			79	7			6289+00	6290+00		
6290+00	6291+00	RT	backstation	0.0505	2.184	899.52	6.08	3.59	4.00	MODERATE	6	17			75	7			6290+00	6291+00		
6291+00	6292+00	RT	backstation	0.0571	2.184	956.49	5.96	3.46	3.90	MODERATE	6	17			71	6			6291+00	6292+00		
6292+00	6294+00	RT	backstation	0.0363	2.184	763.16	4.78	2.77	3.13	MODERATE	8	25			142	6			6292+00	6294+00		
6294+00	6295+00	RT	backstation	0.0345	2.184	743.49	4.06	2.45	2.64	MODERATE	4	25			66	6			6294+00	6295+00		
6295+00	6296+00	RT	backstation	0.0508	2.184	902.19	4.03	2.50	2.82	MODERATE	6	17			61	5			6295+00	6296+00		
6296+00	6297+00	RT	backstation	0.0448	2.184	847.23	3.44	2.06	2.36	MODERATE	5	20			58	5			6296+00	6297+00		
6297+00	6298+00	RT	backstation	0.0238	2.184	617.52	2.07	1.16	1.37	MODERATE	3	33										
6305+00	6306+00	RT	backstation	0.1403	2.120	1377.95	10.29	5.93	6.64	MODERATE			14	7	66	6			6305+00	6306+00		
6306+00	6307+00	RT	backstation	0.0294	2.184	686.34	5.52	3.27	3.62	MODERATE	3	33			86	8			6306+00	6307+00		
6307+00	6308+00	RT	backstation	0.0084	2.184	366.86	3.39	1.95	2.14	MODERATE	1	100			94	8			6307+00	6308+00		
6308+00	6309+00	RT	backstation	0.0200	2.184	566.08	4.58	2.71	3.01	MODERATE	2	50			86	8			6308+00	6309+00		
6309+00	6313+00	RT	backstation	0.0050	2.184	283.04	2.58	1.49	1.67	MODERATE	2	200										
6313+00	6315+00	RT	backstation	0.0160	2.368	626.77	3.47	2.08	2.26	MODERATE	4	50			152	7			6313+00	6315+00		
6315+00	6317+00	RT	backstation	0.0050	2.272	313.83	2.09	1.21	1.36	MODERATE	1	200										
6317+00	6319+00	RT	backstation	0.0080	1.942	262.47	1.82	1.15	1.28	MODERATE	2	100										

Exhibit C

EROSION CONTROL CALCULATIONS - CULVERTS

CULVERT OUTLET EROSION CONTROL

CHAIN	COUNTY	DISCHARGE			PROPOSED ALIGNMENT STATION AND OFFSET	PROPOSED SIZE	DRAINAGE AREA	PROPOSED LENGTH	SKEW	SLOPE	VELOCITY		PROPOSED FREEBOARD (50 YR)	OUTLET PROTECTION
		Q_{10}	Q_{50}	Q_{100}							10 YR	50 YR		
		CFS				WIDTH X HEIGHT	SQ MI	FT		%	FT/S		FT	
SOUTH SECTION - AR CULVERTS														
West Frontage Rd	PEORIA	73.6	105.2	121.2	11+00	5'x4' RCBC	0.059	300.0	none	0.30%	7.8	8.8	3.1	DISSIPATOR BASIN
IL 29 Main	PEORIA	193.9	290.5	341.2	2692+08	2 - 7' x 5' RCBC	0.245	210.0	4º RT	0.50%	9.8	10.2	3.3	DISSIPATOR BASIN
West Frontage Rd	PEORIA	190.0	284.1	333.5	46+30	2 - 7' x 6' RCBC	0.238	60.0	2º LT	0.37%	3.8	9.5	3.0	RIPRAP
IL 29 Main	PEORIA	103.1	152.2	180.1	2713+13	2-5' x 5' RCBC	0.144	170.0	none	0.30%	6.9	7.9	7.2	RIPRAP
West Frontage Rd	PEORIA	101.6	151.2	178.7	67+34	2 - 4' x 4' RCBC	0.123	70.0	none	0.30%	3.4	4.9	4.4	RIPRAP
IL 29 Main	PEORIA	754.0	1223.0	1428.0	2732+10	2 - 12' x 8' RCBC	1.155	160.0	9º LT	1.12%	6.4	8.0	4.1	RIPRAP
West Frontage Rd	PEORIA	754.0	1223.0	1428.0	86+13	2 - 12' x 8' RCBC	1.150	60.0	11º LT	0.87%	6.0	7.9	3.4	RIPRAP
Ramp A (Cedar Hills)	PEORIA	30.3	42.4	48.4	13+60	3-24" RCP	0.020	70.0	none	0.50%	3.2	4.5	3.4	RIPRAP
Ramp B (Cedar Hills)	PEORIA	27.3	40.9	48.2	12+00	3-24" RCP	0.030	70.0	none	0.30%	3.5	4.5	3.0	RIPRAP
Ramp D (Cedar Hills)	PEORIA	18.9	26.3	29.9	10+30	36" RCP	0.009	60.0	3º LT	0.50%	7.3	7.8	3.4	DISSIPATOR BASIN
Cedar Hills Drive	PEORIA	23.9	34.6	40.3	50+88	30" RCP	0.019	260.0	none	0.77%	8.8	9.8	5.0	DISSIPATOR BASIN
Cedar Hills Drive	PEORIA		682.5	860.2	59+17	2 - 7' x 6' RCBC	1.240	120.0	18º RT	0.23%		11.6	9.7	RIPRAP
Cedar Hills Drive	PEORIA	24.6	35.5	41.1	74+48	8' x 2' RCBC	0.097	110.0	none	0.48%	6.6	6.8	3.0	RIPRAP
IL 29 Main	PEORIA	14.2	20.5	24.0	2774+00	24" RCP	0.014	190.0	none	0.50%	5.9	7.5	4.3	RIPRAP
Ramp C (Cedar Hills)	PEORIA	6.3	8.7	9.9	8+10	24" RCP	0.005	100.0	none	0.30%	4.7	5.2	4.4	RIPRAP
IL 29 Main	PEORIA		463.1	596.6	2805+73	14' x 7' RCBC	0.930	170.0	none	0.50%		12.4	4.4	RIPRAP
IL 29 Main	PEORIA	74.6	107.1	123.8	2849+00	48" RCP	0.200	250.0	none	0.34%	8.6	10.2	4.8	DISSIPATOR BASIN
Krause Road	PEORIA	16.2	23.3	27.3	16+00	30" RCP	0.022	60.0	none	0.30%	6.0	6.9	3.3	RIPRAP
Ramp A (Rome West)	PEORIA	10.6	15.3	17.8	6+60	30" RCP	0.009	70.0	39º RT	0.30%	3.1	3.6	3.0	RIPRAP
Ramp B (Rome West)	PEORIA	11.1	16.2	19.1	13+30	24" RCP	0.009	80.0	none	0.50%	6.3	6.6	5.7	RIPRAP
Krause Road	PEORIA	5.9	8.9	10.5	48+00	24" RCP	0.016	60.0	none	0.50%	4.8	5.2	3.0	RIPRAP
Rome West Road	PEORIA	6.6	9.7	11.4	66+47	24" RCP	0.011	80.0	2º RT	0.32%	4.8	5.4	5.3	RIPRAP
Rome West Road	PEORIA	13.3	19.2	22.3	67+13	24" RCP	0.027	70.0	2º RT	0.36%	6.1	7.3	3.5	RIPRAP
Ramp C (Rome West)	PEORIA	8.7	12.6	14.6	6+30	30" RCP	0.008	50.0	none	0.50%	6.7	6.6	3.0	RIPRAP
Ramp D (Rome West)	PEORIA	9.4	13.6	15.8	9+90	36" RCP	0.011	90.0	none	0.50%	6.6	6.9	3.0	RIPRAP
Krause Road	PEORIA	24.8	36.2	42.2	69+68	36" RCP	0.052	210.0	53º RT	0.16%	6.5	7.5	4.3	RIPRAP
Krause Road	PEORIA	53.0	75.0	86.1	73+00	42" RCP	0.139	220.0	53º RT	0.30%	8.0	9.4	3.9	DISSIPATOR BASIN
Krause Road	PEORIA	10.2	14.7	17.0	77+00	24" RCP	0.028	100.0	none	0.56%	7.0	6.9	3.0	RIPRAP
IL 29 Main	PEORIA	33.4	49.2	57.8	2962+00	36" RCP	0.080	230.0	none	0.50%	8.3	8.6	4.0	DISSIPATOR BASIN
IL 29 Main	PEORIA	101.0	145.0	167.7	3004+50	6' x 3' RCBC	0.234	200.0	none	0.30%	8.1	9.2	4.8	DISSIPATOR BASIN
McGrath Road	PEORIA	8.8	12.6	14.7	22+22	30" RCP	0.022	60.0	none	0.35%	4.9	5.5	2.2	RIPRAP
Ramp A (McGrath)	PEORIA	13.3	19.2	22.4	10+40	30" RCP	0.013	80.0	none	0.50%	7.0	7.6	2.1	RIPRAP
Ramp B (McGrath)	PEORIA	13.3	19.3	22.4	13+70	2-24" RCP	0.013	40.0	none	0.50%	5.2	6.1	1.5	RIPRAP
Ramp C (McGrath)	PEORIA	14.4	21.0	24.5	9+70	30" RCP	0.014	60.0	none	0.50%	7.1	6.9	3.5	DISSIPATOR BASIN
Ramp D (McGrath)	PEORIA	11.2	16.4	19.1	10+30	3-30" RCP	0.011	50.0	none	0.50%	6.6	6.9	3.1	RIPRAP
Cloverdale Road	PEORIA	37.9	55.8	65.0	49+13	2-30" RCP	0.114	150.0	8º RT	0.33%	5.1	6.4	3.1	RIPRAP
Cloverdale Road	PEORIA	17.1	24.6	28.4	50+95	36" RCP	0.072	250.0	8º RT	0.20%	5.7	6.5	3.1	RIPRAP
IL 29 Main	PEORIA	47.7	69.0	79.9	3096+11	42" RCP	0.208	180.0	none	0.36%	7.7	9.1	3.3	DISSIPATOR BASIN
Sycamore Street	PEORIA	14.2	20.7	24.1	49+02	24" RCP	0.025	200.0	none	0.32%	6.3	7.6	5.7	RIPRAP
Sycamore Street	PEORIA	10.3	15.4	18.2	50+89	24" RCP	0.022	200.0	none	0.28%	5.5	6.5	6.7	RIPRAP
IL 29 Main	PEORIA	20.3	29.0	33.5	3119+17	30" RCP	0.084	240.0	2º LT	0.30%	6.5	7.6	4.2	RIPRAP
Ramp C (Truitt)	PEORIA	13.0	18.2	20.9	11+40	30" RCP	0.013	110.0	53º RT	0.50%	5.5	6.2	3.2	RIPRAP
Truitt Road	PEORIA	9.6	13.5	15.5	49+16	24" RCP	0.008	220.0	4º LT	0.30%	5.4	6.2	3.5	RIPRAP
Truitt Road	PEORIA	31.4	43.9	50.4	51+16	42" RCP	0.025	260.0	3º LT	0.30%	7.0	8.1	4.7	RIPRAP
Truitt Road	PEORIA	20.8	30.1	35.6	60+00	30" RCP	0.080	130.0	none	0.30%	6.5	7.7	8.7	RIPRAP
Ramp D (Truitt)	PEORIA	9.8	13.9	16.2	12+50	24" RCP	0.011	210.0	none	0.50%	6.1	6.2	15.3	RIPRAP
IL 29 Main	PEORIA	27.0	38.0	43.7	3139+00	30" RCP	0.025	250.0	none	0.50%	7.3	8.8	3.4	DISSIPATOR BASIN
Ratliff Road	PEORIA	20.9	29.8	34.3	55+00	2-36" RCP	0.020	28.0	none	0.50%	5.5	6.9	2.4	RIPRAP
Ratliff Road	PEORIA	24.2	34.9	40.5	70+54	2-42" RCP	0.025	28.0	none	0.50%	6.6	7.1	2.3	RIPRAP
IL 29 Main	PEORIA	88.3	129.1	150.3	3214+00	10' x 10' RCBC	0.094	170.0	none	0.35%	8.4	9.0	9.3	DISSIPATOR BASIN
IL 29 Main	PEORIA	44.2	64.9	75.8	3226+55	36" RCP	0.048	190.0	none	0.24%	8.1	10.1	6.1	DISSIPATOR BASIN

IL 29 Main	PEORIA	188.1	272.7	317.1	3236+50	10' x 10' RCBC	0.231	180.0	22º LT	0.33%	9.1	10.7	6.3	DISSIPATOR BASIN
IL 29 Main	PEORIA	30.3	43.7	50.5	3246+00	36" RCP	0.052	200.0	9º RT	0.49%	8.0	8.1	5.9	DISSIPATOR BASIN
CENTRAL SECTION - AR CULVERTS & ENTRANCE CULVERTS														
IL 29 Main	PEORIA	30.0	41.4	47.1	3269+50	10' x 8' RCBC (WC)	0.081	182.0	none	1.21%	10.41	8.74	10.5	DISSIPATOR BASIN
IL 29 Main	PEORIA	14.7	20.2	23.0	3284+00	30" RCP	0.012	190.0	15˚ LT	0.70%	7.15	7.73	4.4	DISSIPATOR BASIN
IL 29 Connector	PEORIA	6.3	8.7	9.9	66+75 RT.	24" RCP	0.005	50.0	none	1.68%	7.85	8.94	5.8	DISSIPATOR BASIN
IL 29 Connector	PEORIA	41.9	57.4	65.1	67+05 LT	48" RCP	0.016	50.0	none	0.40%	7.53	8.14	7.2	DISSIPATOR BASIN
IL 29 Connector	PEORIA	17.9	24.7	28.1	98+66	36" RCP	0.022	260.0	23˚ RT	0.62%	7.12	7.73	5.4	DISSIPATOR BASIN
Ramp B (IL 29 Conn.)	PEORIA	29.3	40.4	45.9	16+66	42" RCP	0.036	130.0	10˚ RT	0.38%	6.75	7.34	14.9	RIPRAP
Ramp D (IL 29 Conn.)	PEORIA	20.4	28.0	31.9	15+23	38" x 24" Elliptical RCP	0.025	64.0	none	0.78%	7.53	8.37	4.3	DISSIPATOR BASIN
IL 29 Main	PEORIA	28.6	39.1	44.3	3293+50	42" RCP	0.038	175.0	none	0.37%	6.66	7.17	4.7	RIPRAP
IL 29 Connector	PEORIA	40.6	55.4	63.2	80+00	4' x 3' RCBC	0.066	180.0	none	0.66%	8.34	9.11	12.9	DISSIPATOR BASIN
Service Road	PEORIA	1.8	2.5	2.8	219+60 (RT)	15" CMP	0.002	90.0	none	0.56%	3.64	4.01	3.9	RIPRAP
West Frontage Rd	PEORIA	23.0	31.7	36.1	304+50 (LT)	36" CMP	0.028	115.0	none	1.46%	6.29	7.04	3.1	RIPRAP
West Frontage Rd	PEORIA	26.7	36.8	41.8	307+00 (LT)	42" RCP	0.033	115.0	none	0.46%	6.94	7.51	3.2	RIPRAP
West Frontage Rd	PEORIA	28.0	38.5	43.8	309+00 (LT)	42" RCP	0.034	115.0	none	0.43%	7.62	8.18	3.1	DISSIPATOR BASIN
West Frontage Rd	PEORIA	31.9	44.0	50.0	310+50 (LT)	42" RCP	0.039	55.0	none	0.91%	8.74	9.46	3.4	DISSIPATOR BASIN
West Frontage Rd	PEORIA	38.2	52.3	59.3	320+20 (LT)	48" RCP	0.051	125.0	none	0.40%	5.95	6.82	6.3	RIPRAP
West Frontage Rd	PEORIA	2.8	3.9	4.4	304+50 (RT)	15" RCP	0.003	110.0	none	2.88%	7.84	8.57	4.2	DISSIPATOR BASIN
West Frontage Rd	PEORIA	5.3	7.4	8.4	320+20 (RT)	15" RCP	0.007	100.0	none	0.30%	4.45	4.70	8.0	RIPRAP
West Frontage Rd	PEORIA	5.3	7.4	8.4	335+28 (LT)	18" RCP	0.007	102.0	none	1.55%	7.47	8.11	4.3	DISSIPATOR BASIN
West Frontage Rd	PEORIA	9.0	12.4	14.1	331+85 (LT)	24" RCP	0.011	91.0	none	0.85%	6.76	7.33	10.7	RIPRAP
West Frontage Rd	PEORIA	1.0	1.4	1.6	331+85 (RT)	18" RCP	0.001	100.0	none	0.30%	2.97	3.21	13.7	RIPRAP
West Frontage Rd	PEORIA	19.2	24.61	41.11	340+50	4' x 3' RCBC	0.080	58.0	4˚ LT	1.24%	7.81	8.83	4.4	DISSIPATOR BASIN
West Frontage Rd	PEORIA	0.3	0.4	0.4	341+50 (LT)	15" RCP	0.001	73.0	none	4.03%	4.71	6.40	3.9	RIPRAP
West Frontage Rd	PEORIA	4.1	5.6	6.4	344+50 (LT) (SS)	18" SS	0.005	123.3	none	0.58%	4.83	5.19	3.9	RIPRAP
West Frontage Rd	PEORIA	5.1	7.0	8.0	345+50 (SS)	24" SS	0.006	57.4	none	0.87%	5.87	6.41	7.4	RIPRAP
IL 29 Main	PEORIA	37.7	48.6	55.3	3330+00	9' x 7' RCBC (WC)	0.095	200.0	30˚ LT	2.16%	10.57	11.56	13.7	DISSIPATOR BASIN
IL 29 Main	PEORIA	3.3	4.6	5.2	3326+50	24" RCP	0.004	240.0	none	0.24%	1.05	1.46	17.8	RIPRAP
IL 29 Main	PEORIA	38.7	52.9	60.0	3328+00 (RT)	4' x 4' RCBC	0.103	210.0	none	0.67%	8.27	9.05	15.5	DISSIPATOR BASIN
East Frontage Rd	PEORIA	40.2	55.0	62.4	409+68	4' x 4' RCBC	0.107	115.0	none	0.43%	7.20	7.83	15.4	DISSIPATOR BASIN
West Frontage Rd	PEORIA	0.8	1.1	1.2	350+00 (SS)	18" SS	0.001	62.0	none	0.32%	2.84	3.04	6.2	RIPRAP
West Frontage Rd	PEORIA	2.8	3.9	4.4	349+20 (RT)	18" RCP	0.003	51.0	15˚ RT	4.94%	9.79	10.32	3.7	DISSIPATOR BASIN
West Frontage Rd	PEORIA	0.4	0.5	0.6	348+50 (SS)	18" SS	0.001	66.0	none	0.76%	4.51	5.44	6.2	RIPRAP
IL 29 Main	PEORIA	68.4	94.2	107.1	3344+00	10' x 5' RCBC (WC)	0.140	180.0	15˚ LT	0.44%	5.94	6.71	10.4	RIPRAP
IL 29 Main	PEORIA	1.4	1.9	2.2	3348+00	18" RCP	0.002	160.0	none	0.56%	3.54	3.88	5.0	RIPRAP
IL 29 Main	~~PEORIA~~	~~3.2~~	~~4.4~~	~~5.0~~	~~3345+00 (RT)~~	~~18" RCP~~	~~0.004~~	~~94.0~~	~~none~~	~~0.32%~~	~~4.13~~	~~4.58~~	~~5.9~~	
IL 29 Main	PEORIA	1.5	2.1	2.4	3350+00 (SS)	18" RCP	0.002	54.0	none	0.44%	4.59	4.82	3.2	RIPRAP
IL 29 Main	PEORIA	11.1	15.2	17.3	3353+00 (SS)	30" RCP	0.014	289.0	none	0.09%	5.27	5.83	29.3	RIPRAP
Service Road	PEORIA	8.4	11.6	13.1	48+34	4' x 4' RCBC	0.010	94.0	25˚ LT	0.32%	2.45	2.87	4.1	RIPRAP
IL 29 Main	PEORIA	3.2	6.9	9.0	3366+70	24" RCP	0.004	195.0	none	0.36%	3.84	4.83	5.4	RIPRAP
IL 29 Main	PEORIA	5.7	7.9	9.0	3367+50 (RT)	24" RCP	0.007	83.0	none	0.60%	6.46	6.63	4.7	RIPRAP
IL 29 Main	PEORIA	7.6	10.5	12.0	3371+00 (RT)	24" RCP	0.009	33.0	none	0.30%	4.98	5.57	7.1	RIPRAP
IL 29 Main	PEORIA	44.5	61.4	69.9	3372+36	12' x 4' RCBC	0.100	217.0	22˚ RT	0.49%	6.69	8.05	5.4	RIPRAP
IL 29 Main	PEORIA	25.6	35.3	40.1	3384+35	3' x 3' RCBC	0.037	230.0	none	0.30%	5.71	6.76	10.4	RIPRAP
IL 29 Main	PEORIA	95.4	130.3	148.6	3391+00	2 - 8' x 6' RCBC	0.220	185.0	49˚ LT	0.32%	6.37	7.58	6.9	RIPRAP
IL 29 Main	PEORIA	0.5	0.7	0.8	3396+00	18" RCP	0.001	138.0	none	0.46%	5.44	4.53	6.8	RIPRAP
IL 29 Main	PEORIA	15.2	21.0	23.9	3400+00 (SS)	24" SS	0.022	185.0	45˚ LT	0.53%	6.45	7.63	13.0	RIPRAP
IL 29 Main	PEORIA	0.8	1.1	1.2	3401+50 (SS)	18" SS	0.001	112.0	none	0.45%	4.58	4.67	13.3	RIPRAP
IL 29 Main	PEORIA	13.0	17.9	20.4	3406+20 (SS)	36" SS	0.020	155.0	none	0.16%	5.26	5.82	7.8	RIPRAP
IL 29 Main	PEORIA	4.3	6.0	6.8	3409+00 (SS)	24" SS	0.005	128.0	none	0.39%	4.19	4.63	17.0	RIPRAP
IL 29 Main	PEORIA	2.0	2.8	3.2	3411+50 (SS)	18" SS	0.003	128.0	none	0.39%	3.59	3.96	11.3	RIPRAP
IL 29 Main	PEORIA	20.9	28.7	32.7	3413+35 (SS)	36" SS	0.032	150.0	none	0.37%	6.67	6.81	3.9	RIPRAP
IL 29 Main	PEORIA	6.2	7.1	8.1	3416+25 (SS)	24" SS	0.008	125.0	none	0.32%	4.68	4.88	6.3	RIPRAP
IL 29 Main	PEORIA	6.9	9.5	10.8	3418+50 (SS)	36" SS	0.010	140.0	none	0.36%	5.28	5.60	9.1	RIPRAP
IL 29 Main	MARSHALL	6.5	8.9	10.2	3421+50 (SS)	24" SS	0.008	113.0	none	0.44%	5.56	5.96	8.1	RIPRAP

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IL 29 Main	MARSHALL	16.6	22.8	25.9	3424+60 (SS)	36" SS	0.029	150.0	none	0.50%	7.09	7.50	5.8	DISSIPATOR BASIN
IL 29 Main	MARSHALL	6.9	9.5	10.8	3428+25 (SS)	36" SS	0.007	150.0	none	0.50%	6.64	6.60	8.2	RIPRAP
IL 29 Main	MARSHALL	6.9	9.5	10.8	3430+93 (SS)	36" SS	0.007	150.0	none	0.17%	4.41	4.81	8.2	RIPRAP
IL 29 Main	MARSHALL	2.7	3.7	4.2	3433+76 (SS)	18" SS	0.003	112.0	none	0.45%	3.91	4.31	8.2	RIPRAP
IL 29 Main	MARSHALL	4.3	6.0	6.8	3437+00 (SS)	24" SS	0.005	113.0	none	0.44%	5.17	5.45	7.1	RIPRAP
IL 29 Main	MARSHALL	99.5	120.6	158.8	3440+20	10' x 4' RCBC	0.130	170.0	45° RT	0.33%	7.91	8.28	5.4	DISSIPATOR BASIN
IL 29 Main	MARSHALL	5.2	7.2	8.2	3443+33 (SS)	24" SS	0.006	113.0	none	0.44%	5.25	5.68	12.0	RIPRAP
IL 29 Main	MARSHALL	7.7	10.6	11.7	3444+85 (SS)	36" RCP	0.009	150.0	none	0.30%	4.52	4.98	10.4	RIPRAP
IL 29 Main	MARSHALL	4.2	5.8	6.6	3452+00 (SS)	24" SS	0.005	114.0	none	0.44%	5.15	5.41	11.5	RIPRAP
IL 29 Main	MARSHALL	1.9	2.6	3.0	3455+00 (SS)	18" SS	0.002	140.0	none	0.36%	3.53	3.85	13.6	RIPRAP
IL 29 Main	MARSHALL	4.1	5.6	6.4	3458+00 (SS)	24" SS	0.005	126.0	none	0.40%	5.13	5.36	16.9	RIPRAP
IL 29 Main	MARSHALL	18.2	25.0	28.4	3462+50 (SS)	36" SS	0.016	170.0	none	0.65%	8.14	8.45	10.5	DISSIPATOR BASIN
IL 29 Main	MARSHALL	14.8	20.4	23.1	3468+50 (SS)	36" SS	0.013	150.0	none	0.55%	6.93	7.12	13.2	RIPRAP
IL 29 Main	MARSHALL	2.5	3.5	4.0	3471+50 (SS)	18" SS	0.003	131.0	none	0.38%	3.80	4.24	17.0	RIPRAP
IL 29 Main	MARSHALL	9.7	13.4	15.2	3472+90 (SS)	36" SS	0.008	150.0	none	0.25%	4.84	5.30	14.0	RIPRAP
IL 29 Main	MARSHALL	11.0	15.1	17.2	3476+00 (SS)	36" SS	0.015	150.0	none	0.23%	5.03	5.51	15.0	RIPRAP
IL 29 Main	MARSHALL	3.8	5.3	6.0	3478+50 (SS)	18" SS	0.005	131.0	none	0.38%	4.34	4.88	17.6	RIPRAP
IL 29 Main	MARSHALL	3.9	5.4	6.2	3480+50 (SS)	18" SS	0.005	140.0	none	0.36%	4.38	4.91	13.5	RIPRAP
IL 29 Main	MARSHALL	0.9	1.2	1.4	3483+75 (SS)	18" SS	0.001	136.0	none	0.37%	2.98	3.11	15.5	RIPRAP
IL 29 Main	MARSHALL	0.4	0.5	0.6	3487+50 (SS)	18" SS	0.001	143.0	none	0.70%	4.51	5.44	16.6	RIPRAP
IL 29 Main	MARSHALL	0.8	1.1	1.2	3490+50 (SS)	18" SS	0.001	146.0	none	0.34%	2.84	3.04	14.3	RIPRAP
IL 29 Main	MARSHALL	2.2	3.0	3.4	3492+71 (SS)	18" SS	0.003	148.0	none	0.50%	4.84	5.04	11.8	RIPRAP
IL 29 Main	MARSHALL	2.9	4.0	4.6	3495+00 (SS)	18" SS	0.004	155.0	none	0.35%	4.01	4.42	12.5	RIPRAP
IL 29 Main	MARSHALL	4.2	5.3	6.0	3496+50 (SS)	18" SS	0.005	153.0	none	0.46%	4.50	4.88	13.0	RIPRAP
IL 29 Main	MARSHALL	9.2	12.6	14.3	3499+45 (SS)	36" SS	0.014	160.0	none	0.44%	6.57	6.86	16.9	RIPRAP
IL 29 Main	MARSHALL	2.7	3.7	4.2	3501+50 (SS)	18" SS	0.003	136.0	none	0.40%	3.91	4.31	17.1	RIPRAP
IL 29 Main	MARSHALL	3.2	4.4	5.0	3503+45 (SS)	18" SS	0.004	139.0	none	0.42%	4.13	4.58	16.5	RIPRAP
IL 29 Main	MARSHALL	1.3	1.8	2.0	3506+00 (SS)	18" SS	0.002	135.0	none	0.70%	3.90	7.14	14.8	RIPRAP
IL 29 Main	MARSHALL	2.8	3.9	4.4	3508+64 (SS)	18" SS	0.003	134.0	none	0.37%	3.96	4.38	12.8	RIPRAP
IL 29 Main	MARSHALL	0.9	1.2	1.4	3511+00 (SS)	18" SS	0.001	134.0	none	0.63%	4.61	4.69	14.4	RIPRAP
IL 29 Main	MARSHALL	0.7	0.9	1.1	3511+64.5 (SS)	18" SS	0.001	135.0	none	0.56%	4.53	4.61	14.7	RIPRAP
IL 29 Main	MARSHALL	5.7	7.8	8.8	3516+50 (LT)	36" RCP	0.008	124.0	none	0.40%	5.27	5.33	14.7	RIPRAP
IL 29 Main	MARSHALL	19.8	27.0	30.6	3519+50	3' x 3' RCBC	0.026	148.0	none	0.74%	8.16	8.47	9.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	3.3	4.6	5.2	3522+50 (SS)	18" SS	0.004	136.0	none	0.72%	6.66	6.68	10.5	RIPRAP
IL 29 Main	MARSHALL	6.1	8.4	9.6	3525+00 (SS)	24" SS	0.008	136.0	none	0.71%	6.60	6.82	12.8	RIPRAP
IL 29 Main	MARSHALL	0.6	0.9	1.0	3526+37 (SS)	18" SS	0.001	143.0	none	0.38%	2.56	2.98	15.1	RIPRAP
IL 29 Main	MARSHALL	0.6	0.8	0.9	3528+40 (SS)	18" SS	0.001	144.0	none	0.38%	2.56	2.84	13.8	RIPRAP
IL 29 Main	MARSHALL	25.6	35.1	39.7	3529+94 (SS)	36" SS	0.038	160.0	none	0.70%	8.15	8.81	9.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	1.0	1.4	1.6	3533+35.7 (SS)	18" SS	0.001	156.0	none	0.69%	4.64	7.36	12.9	RIPRAP
IL 29 Main	MARSHALL	2.9	4.0	4.6	3536+06 (SS)	18" SS	0.003	126.0	none	0.49%	5.00	5.29	14.6	RIPRAP
IL 29 Main	MARSHALL	11.8	16.2	18.5	3538+06.6 (SS)	36" SS	0.017	135.0	none	0.70%	8.00	8.06	12.3	DISSIPATOR BASIN
IL 29 Main	MARSHALL	0.9	1.2	1.4	3540+00 (SS)	18" SS	0.001	134.0	none	0.45%	4.61	4.69	12.7	RIPRAP
IL 29 Main	MARSHALL	2.9	4.0	4.6	3542+50 (SS)	18" SS	0.003	129.0	none	0.25%	4.01	4.42	12.4	RIPRAP
IL 29 Main	MARSHALL	1.0	1.4	1.6	3543+00 (RT)	18" RCP	0.001	68.0	none	0.59%	4.64	4.72	4.0	RIPRAP
IL 29 Main	MARSHALL	69.1	93.3	106.0	3545+64	6' x 5' RCBC	0.120	159.0	42° RT	0.49%	8.82	9.11	12.0	DISSIPATOR BASIN
IL 29 Main	MARSHALL	69.1	93.3	106.0	3546+75 (RR)	6' x 5' RCBC	0.120	67.0	42° RT	0.30%	7.17	7.92	3.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	2.3	3.2	3.6	3547+80 (SS)	18" SS	0.003	135.0	none	0.37%	3.72	4.13	14.5	RIPRAP
IL 29 Main	MARSHALL	3.1	4.2	4.8	3550+25 (SS)	18" SS	0.004	128.0	none	0.39%	4.09	4.50	18.1	RIPRAP
IL 29 Main	MARSHALL	1.0	1.4	1.6	3552+30 (SS)	18" SS	0.001	127.0	none	0.63%	4.64	4.72	23.0	RIPRAP
IL 29 Main	MARSHALL	5.5	7.6	8.6	3554+40 (SS)	24" SS	0.008	150.0	15° LT	1.57%	6.58	6.71	10.4	RIPRAP
IL 29 Main	MARSHALL	13.8	19.1	21.7	3560+40 (SS)	36" SS	0.020	150.0	15° RT	0.43%	6.86	7.28	12.8	RIPRAP
IL 29 Main	MARSHALL	0.5	0.7	0.8	3563+00 (SS)	18" SS	0.001	136.0	none	0.34%	2.49	2.68	17.6	RIPRAP
IL 29 Main	MARSHALL	3.8	5.3	6.0	3565+50 (SS)	18" SS	0.005	133.0	none	0.68%	6.54	6.73	13.0	RIPRAP
IL 29 Main	MARSHALL	26.1	35.9	40.8	3567+35 (SS)	42" SS	0.040	150.0	none	0.33%	5.93	6.60	14.7	RIPRAP
IL 29 Main	MARSHALL	3.3	4.6	5.2	3570+00 (SS)	18" SS	0.004	132.0	none	0.82%	6.66	6.68	11.1	RIPRAP
IL 29 Main	MARSHALL	14.4	19.8	22.6	3573+15 (SS)	36" SS	0.021	150.0	15° LT	0.37%	6.06	6.59	8.2	RIPRAP

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IL 29 Main	MARSHALL	5.0	6.8	7.8	3575+50 (SS)	24" SS	0.006	110.0	none	0.57%	5.04	5.45	8.3	RIPRAP
IL 29 Main	MARSHALL	3.4	4.7	5.4	3578+00 (SS)	18" SS	0.004	110.0	none	0.77%	5.12	5.58	8.9	RIPRAP
IL 29 Main	MARSHALL	1.0	1.4	1.6	3580+00 (SS)	18" SS	0.001	132.0	none	0.69%	3.58	3.79	10.5	RIPRAP
IL 29 Main	MARSHALL	1.0	1.4	1.6	3582+00 (SS)	18" SS	0.001	152.0	none	0.69%	3.58	3.99	12.9	RIPRAP
IL 29 Main	MARSHALL	79.0	108.1	122.6	3583+40	12' x 10' RCBC (WC)	0.120	206.0	25° RT	0.37%	8.07	8.92	17.4	DISSIPATOR BASIN
IL 29 Main	MARSHALL	2.0	2.8	3.2	3585+00 (SS)	18" SS	0.003	204.0	none	0.66%	4.20	4.59	20.7	RIPRAP
IL 29 Main	MARSHALL	2.5	3.5	4.0	3587+00 (SS)	18" SS	0.003	237.5	none	0.61%	4.34	4.76	28.7	RIPRAP
IL 29 Main	MARSHALL	3.6	4.9	5.6	3589+50 (SS)	18" SS	0.004	285.5	none	0.60%	5.14	5.30	35.5	RIPRAP
IL 29 Main	MARSHALL	4.6	6.3	7.2	3592+00 (SS)	24" SS	0.006	329.0	none	0.57%	4.88	5.33	36.7	RIPRAP
IL 29 Main	MARSHALL	25.2	34.4	39.0	3593+26.4 (SS)	42" SS	0.033	264.0	10° LT	0.48%	7.08	7.67	28.7	DISSIPATOR BASIN
IL 29 Main	MARSHALL	1.7	2.3	2.6	3601+00 (SS)	18" SS	0.002	288.5	none	0.79%	4.24	4.63	35.9	RIPRAP
IL 29 Main	MARSHALL	5.3	7.4	8.4	3602+20 (RT)	24" RCP	0.007	63.0	5° RT	0.63%	5.29	5.78	4.4	RIPRAP
IL 29 Main	MARSHALL	34.7	47.8	54.4	3607+00 (LT)	6' x 6' RCBC	0.024	179.0	20° RT	3.91%	13.94	17.45	5.9	DISSIPATOR BASIN
Old IL 29	MARSHALL	12.3	17.5	19.6	35+30	36" RCP	0.023	88.0	none	0.63%	6.37	7.16	3.6	RIPRAP
Old IL 29	MARSHALL	8.9	12.2	13.9	40+50 (LT)	36" RCP	0.012	40.0	45° RT	0.75%	6.04	6.64	4.0	RIPRAP
Old IL 29	MARSHALL	18.1	24.8	28.3	41+69	3' x 3' RCBC	0.030	125.0	none	0.56%	7.15	7.60	4.9	DISSIPATOR BASIN
IL 29 Main	MARSHALL	39.8	54.4	62.1	3618+50	4' x 3' RCBC	0.065	286.0	none	0.47%	7.34	8.03	33.1	DISSIPATOR BASIN
IL 29 Main	MARSHALL	0.4	0.5	0.6	3625+00 (SS)	18" SS	0.001	226.0	none	0.53%	2.54	2.65	41.3	RIPRAP
IL 29 Main	MARSHALL	0.5	0.7	0.8	3627+50 (SS)	18" SS	0.001	219.0	none	0.44%	2.50	2.69	40.5	RIPRAP
IL 29 Main	MARSHALL	Detention Pipe			3638+00	36" RCP		275.0	none	0.00%				
IL 29 Main	MARSHALL	1.0	1.3	1.5	3653+00 (RT)	24" RCP	0.002	55.0	none	0.53%	2.98	3.32	8.6	RIPRAP
Thenius Rd	MARSHALL	2.4	3.3	3.8	47+10 (LT)	18" RCP	0.003	52.0	none	0.19%	3.76	4.17	7.1	RIPRAP
Thenius Rd	MARSHALL	29.6	40.7	46.3	49+50	3' x 3' RCBC	0.015	152.0	none	0.33%	6.81	7.57	9.9	RIPRAP
IL 29 Main	MARSHALL	7.6	10.5	12.0	3665+60 (RT)	24" SS	0.004	147.0	none	2.63%	9.94	10.78	28.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	11.6	16.1	18.3	3676+60 (SS)	36" SS	0.005	159.0	none	0.63%	8.00	8.03	20.8	DISSIPATOR BASIN
IL 29 Main	MARSHALL	8.0	11.0	12.5	3679+00 (SS)	24" SS	0.010	134.0	none	0.75%	6.27	6.82	14.1	RIPRAP
IL 29 Main	MARSHALL	2.5	3.5	4.0	3682+00 (SS)	18" SS	0.001	127.0	none	0.39%	3.80	4.24	14.2	RIPRAP
IL 29 Main	MARSHALL	8.0	11.0	12.5	3684+00 (SS)	24" SS	0.010	133.0	none	0.71%	6.14	6.68	12.1	RIPRAP
IL 29 Main	MARSHALL	5.2	7.2	8.2	3686+50 (SS)	24" SS	0.006	137.0	none	0.63%	5.26	5.74	14.0	RIPRAP
IL 29 Main	MARSHALL	3.9	5.4	6.2	3689+00 (SS)	18" SS	0.005	131.0	none	0.73%	5.21	5.67	13.2	RIPRAP
IL 29 Main	MARSHALL	0.6	0.9	1.0	3691+00 (SS)	18" SS	0.001	131.0	none	0.74%	3.13	3.49	12.9	RIPRAP
IL 29 Main	MARSHALL	9.8	13.5	15.3	3693+00 (SS)	24" SS	0.015	126.0	none	0.68%	6.40	6.90	11.3	RIPRAP
IL 29 Main	MARSHALL	6.0	8.2	9.4	3696+00 (SS)	24" SS	0.007	134.0	none	0.46%	4.86	5.26	13.6	RIPRAP
IL 29 Main	MARSHALL	1.1	1.6	1.8	3698+50 (SS)	18" SS	0.001	134.5	none	0.46%	3.05	3.46	15.6	RIPRAP
IL 29 Main	MARSHALL	17.3	23.8	27.1	3702+03.8 (SS)	36" SS	0.025	126.0	5° LT	0.40%	6.06	6.57	15.5	RIPRAP
IL 29 Main	MARSHALL	3.3	4.6	5.2	3707+00 (SS)	18" SS	0.004	118.0	none	0.61%	4.68	5.08	12.6	RIPRAP
IL 29 Main	MARSHALL	115.2	140.2	180.5	3709+40	12' x 8' RCBC (WC)	0.150	150.0	35° LT	1.17%	11.23	11.90	16.5	DISSIPATOR BASIN
IL 29 Main	MARSHALL	3.4	4.7	5.4	3712+00 (SS)	18" SS	0.004	123.0	none	0.60%	4.70	5.08	15.4	RIPRAP
IL 29 Main	MARSHALL	3.7	5.1	5.8	3714+50 (SS)	18" SS	0.004	141.0	none	0.40%	4.31	4.82	14.9	RIPRAP
IL 29 Main	MARSHALL	4.6	6.3	7.2	3717+25 (SS)	24" SS	0.008	140.0	5° RT	0.71%	5.34	5.81	16.5	RIPRAP
IL 29 Main	MARSHALL	3.1	4.2	4.8	3719+50 (SS)	18" SS	0.004	123.0	none	0.29%	4.09	4.50	15.6	RIPRAP
IL 29 Main	MARSHALL	0.8	1.1	1.2	3726+35 (SS)	18" SS	0.001	135.0	none	0.74%	3.51	3.81	4.8	RIPRAP
IL 29 Main	MARSHALL	0.5	0.7	0.8	3729+86 (SS)	18" SS	0.001	132.0	none	0.67%	2.80	3.07	14.6	RIPRAP
IL 29 Main	MARSHALL	3.4	4.7	5.4	3732+00 (SS)	18" SS	0.004	133.0	none	0.66%	4.85	5.26	20.1	RIPRAP
IL 29 Main	MARSHALL	1.8	2.5	2.8	3735+00 (SS)	18" SS	0.002	143.0	none	0.57%	3.72	4.07	14.9	RIPRAP
IL 29 Main	MARSHALL	15.9	21.9	24.9	3738+23.3 (SS)	36" SS	0.023	161.0	30° RT	0.31%	5.60	6.17	13.7	RIPRAP
IL 29 Main	MARSHALL	4.5	6.1	7.0	3741+00 (SS)	18" SS	0.005	162.5	none	0.41%	4.62	5.17	15.2	RIPRAP
IL 29 Main	MARSHALL	31.0	42.5	48.2	3744+90	4' x 4' RCBC	0.041	176.0	8° RT	0.57%	7.36	8.04	8.4	DISSIPATOR BASIN
IL 29 Main	MARSHALL	24.9	34.3	38.9	3753+11.4	8' x 5' RCBC (WC)	0.036	128.0	5° LT	0.78%	6.88	7.86	7.3	RIPRAP
IL 29 Main	MARSHALL	14.2	60.8	89.5	3758+00 (RT)	8' x 6' RCBC	0.065	50.0	45° RT	0.40%	4.91	7.12	6.6	RIPRAP
IL 29 Main	MARSHALL	41.2	55.3	62.8	3758+58.4	10' x 6' RCBC (WC)	0.062	200.0	none	1.79%	9.73	11.10	8.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	41.2	55.3	62.8	3760+21 (LT)	6' x 4' RCBC	0.062	92.0	40° LT	0.33%	6.20	6.76	9.9	RIPRAP
IL 29 Main	MARSHALL	89.6	122.5	138.9	3778+00	12' x 10' RCBC (WC)	0.170	200.0	none	1.44%	11.27	12.58	11.8	DISSIPATOR BASIN
IL 29 Main	MARSHALL	20.6	28.4	32.3	3788+50 (LT)	3' x 3' RCBC	0.025	137.0	none	0.67%	7.64	8.36	9.2	DISSIPATOR BASIN
IL 29 Main	MARSHALL	8.0	11.0	12.5	3807+22 (LT)	24" RCP	0.010	200.0	none	0.30%	5.05	5.66	6.5	RIPRAP
~~IL 29 Main~~	~~MARSHALL~~	~~0.6~~	~~1.1~~	~~1.2~~	~~3823+10 (RT)~~	~~18" RCP~~	~~0.001~~	~~51.0~~	~~none~~	~~0.59%~~	~~4.58~~	~~4.67~~	~~6.4~~	

CULVERT OUTLET EROSION CONTROL

IL 29 Main	MARSHALL	EXCLUSIVE WC			3833+50	4' x 4' RCBC (WC)		176.0	none	-0.09%				
IL 29 Main	MARSHALL	4.2	5.8	6.6	3836+70 (RT)	18" RCP	0.005	112.0	none	0.54%	4.73	5.10	5.4	RIPRAP
IL 29 Main	MARSHALL	11.8	16.1	18.2	3851+50	24" RCP	0.016	198.0	none	1.01%	7.77	8.36	16.1	DISSIPATOR BASIN
NORTH SECTION - AR CULVERTS & ENTRANCE CULVERTS														
IL 29 Main	MARSHALL	7374	11222	12851	5020+26	8' x 6' RCBC	1.600	335.0	none	2.43%	2.41	3.22	10.5	RIPRAP
IL 29 Main	MARSHALL	WL Crossing Only			5020+50	3' x 3' RCBC		190.0	none	0.00%				
IL 29 Main	MARSHALL	23.7	33.0	38.5	5032+20 LT	42" RCP	0.086	240.0	none	0.61%	7.56	8.26	6.3	DISSIPATOR BASIN
IL 29 Main	MARSHALL	13.7	19.6	21.9	5032+20 RT	30" RCP	0.024	200.0	none	0.87%	7.58	8.32	5.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	6.2	8.9	9.9	5062+50 LT	24" RCP	0.016	115.0	none	0.29%	4.68	5.26	4.5	RIPRAP
IL 29 Main	MARSHALL	4.4	6.1	6.5	5062+50 RT	24" RCP	0.007	120.0	none	0.23%	4.22	4.60	3.0	RIPRAP
IL 29 Main	MARSHALL	2.0	2.8	2.9	5088+20 LT	24" RCP	0.003	160.0	none	0.88%	3.40	3.69	4.8	RIPRAP
IL 29 Main	MARSHALL	14.5	20.5	21.6	5088+20 RT	30" RCP	0.009	160.0	none	0.39%	5.74	6.48	4.7	RIPRAP
IL 29 Main	MARSHALL	284	444	513	5091+50	2 - 8' x 8' RCBC	0.650	190.0	30° RT	0.29%	8.69	9.61	3.6	DISSIPATOR BASIN
IL 29 Main	MARSHALL	22.2	80.5	125.8	CH6-SW-RAMP	4' x 3' RCBC	0.310	190.0	54° RT	0.45%	6.08	8.68	7.5	RIPRAP
IL 29 Main	MARSHALL	39.9	56.2	63.6	CH6-NW-RAMP	42" RCP	0.150	170.0	45° LT	0.50%	8.09	8.75	8.4	DISSIPATOR BASIN
IL 29 Main	MARSHALL	34.5	47.3	57.6	CH6-SE-RAMP	48" RCP	0.047	240.0	66° LT	1.10%	10.35	11.30	10.5	DISSIPATOR BASIN
IL 29 Main	MARSHALL	21.4	29.2	35.6	CH6-NE-RAMP	36" RCP	0.017	270.0	38° RT	0.68%	7.73	8.37	4.7	DISSIPATOR BASIN
West Frontage Rd	MARSHALL	24.7	34.7	36.6	58+70 (WFR)	36" RCP	0.039	50.0	8° RT	0.40%	7.01	7.33	3.9	DISSIPATOR BASIN
County Hwy 6	MARSHALL	28.9	40.7	42.9	44+65 CH6	42" RCP	0.046	360.0	6.5° RT	0.76%	8.67	9.51	8.5	DISSIPATOR BASIN
IL 29 Main	MARSHALL	49.4	68.0	69.5	5130+00 LT	48" RCP	0.160	100.0	none	0.40%	7.85	8.46	4.2	DISSIPATOR BASIN
IL 29 Main	MARSHALL	29.6	40.5	49.6	5130+00 RT	42" RCP	0.030	100.0	none	0.40%	6.88	7.44	4.5	RIPRAP
IL 29 Main	MARSHALL	5.2	7.0	8.5	5168+00	24" RCP	0.004	170.0	none	0.29%	4.41	4.86	7.6	RIPRAP
IL 29 Main	MARSHALL	5.5	7.8	8.2	5171+00 LT	24" RCP	0.003	215.0	none	0.30%	5.01	5.10	7.1	RIPRAP
IL 29 Main	MARSHALL	4.5	6.3	6.7	5171+00 RT	24" RCP	0.003	215.0	none	0.75%	6.62	6.65	4.8	RIPRAP
IL 29 Main	MARSHALL	6.1	8.6	9.0	5183+55 LT	24" RCP	0.004	150.0	none	0.59%	5.35	5.83	4.5	RIPRAP
IL 29 Main	MARSHALL	12.4	17.5	18.4	5183+55 RT	30" RCP	0.007	150.0	none	0.50%	5.98	6.56	3.3	RIPRAP
IL 29 Main	MARSHALL	12.7	17.6	19.7	5210+00 LT	30" RCP	0.016	165.0	none	0.77%	7.09	7.73	4.2	DISSIPATOR BASIN
IL 29 Main	MARSHALL	17.8	24.5	27.5	5210+00 RT	36" RCP	0.022	165.0	none	0.92%	8.23	8.99	3.5	DISSIPATOR BASIN
IL 29 Main	MARSHALL	26.3	35.7	40.8	5212+00	42" RCP	0.098	180.0	none	0.42%	7.52	8.02	3.0	DISSIPATOR BASIN
IL 29 Main	MARSHALL	34.9	40.3	45.7	5231+55	36" RCP	0.150	180.0	10° LT	0.56%	8.12	8.74	3.5	DISSIPATOR BASIN
IL 29 Main	PUTNAM	15.4	22.0	24.8	5263+70 LT	36" RCP	0.010	140.0	none	0.33%	5.55	6.18	6.1	RIPRAP
IL 29 Main	PUTNAM	30.4	43.6	49.2	5263+70 RT	42" RCP	0.080	140.0	none	0.91%	9.19	10.38	5.3	DISSIPATOR BASIN
IL 29 Main	PUTNAM	11.4	15.8	18.5	5303+23 RT	30" RCP	0.028	102.0	none	0.29%	5.23	5.91	3.1	RIPRAP
IL 29 Main	PUTNAM	31.6	44.0	51.4	5303+50 LT	48" RCP	0.057	50.0	none	0.20%	4.88	5.64	10.1	RIPRAP
IL 29 Main	PUTNAM	26.9	37.9	40.0	5331+90 LT	36" RCP	0.043	80.0	none	0.20%	5.71	6.76	3.3	RIPRAP
IL 29 Main	PUTNAM	4.5	6.3	6.6	5331+90 RT	24" RCP	0.007	80.0	none	0.38%	4.24	4.70	5.1	RIPRAP
IL 29 Main	PUTNAM	20.2	28.5	30.0	6021+40 LT	36" RCP	0.024	130.0	none	0.30%	5.68	6.55	4.7	RIPRAP
IL 29 Main	PUTNAM	Detention Pipe			6023+00	36" RCP		100.0	none	0.00%				
IL 29 Main	PUTNAM	Detention Pipe			6039+00	36" RCP		180.0	none	0.00%				
Center Street	PUTNAM	12.3	17.3	18.2	Center St.	30" RCP	0.014	85.0	34° RT	0.59%	6.40	6.97	4.9	RIPRAP
IL 29 Main	PUTNAM	22.3	32.0	35.7	6049+50 LT	48" RCP	0.090	125.0	none	0.30%	5.79	6.42	3.2	RIPRAP
IL 29 Main	PUTNAM	6.6	9.3	9.8	6049+50 RT	24" RCP	0.003	175.0	none	0.31%	4.77	5.35	4.0	RIPRAP
Access Road	PUTNAM	15.3	21.6	22.7	Weigh Scale Access DS	36" RCP	0.036	90.0	none	0.33%	5.53	6.15	5.4	RIPRAP
Access Road	PUTNAM	15.0	21.2	22.3	Weigh Scale Access Road	36" RCP	0.036	150.0	30° LT	0.33%	5.49	6.11	4.6	RIPRAP
Access Road	PUTNAM	15.0	21.2	22.3	61+08 LT	36" RCP	0.036	85.0	none	0.59%	7.38	7.46	4.8	DISSIPATOR BASIN
Access Road	PUTNAM	15.0	21.2	22.3	61+08 RT	36" RCP	0.036	85.0	none	0.59%	7.38	7.46	4.8	DISSIPATOR BASIN
Senachwine Lake Rd	PUTNAM	11.9	16.8	17.7	Senachwine Lake Road	30" RCP	0.028	90.0	none	0.56%	6.93	7.36	3.9	RIPRAP
IL 29 Main	PUTNAM	7.5	10.6	11.2	6066+28 RT	24" RCP	0.003	120.0	none	0.30%	4.96	5.59	4.2	RIPRAP
IL 29 Main	PUTNAM	34.3	49.2	54.9	6074+00 LT	48" RCP	0.022	135.0	none	0.33%	6.62	7.28	5.2	RIPRAP
IL 29 Main	PUTNAM	18.8	26.5	27.9	6082+85 RT	36" RCP	0.015	130.0	none	0.31%	5.52	6.34	11.6	RIPRAP
IL 29 Main	PUTNAM	48.3	69.3	77.3	6083+50 LT	48" RCP	0.084	150.0	none	0.39%	7.70	8.37	11.0	DISSIPATOR BASIN
IL 29 Main	PUTNAM	160	217.9	255.4	6088+80	2 - 8' x 6' RCBC (WC)	0.560	280.0	40° RT	0.32%	7.98	5.63	14.6	DISSIPATOR BASIN
IL 29 Main	PUTNAM	1.7	2.4	2.5	6093+00 LT	18" RCP	0.003	75.0	none	3.28%	7.08	8.06	4.4	DISSIPATOR BASIN
IL 29 Main	PUTNAM	26.2	37.0	39.0	6098+00 LT	36" RCP	0.041	75.0	none	0.40%	6.70	7.52	8.1	RIPRAP
IL 29 Main	PUTNAM	26.8	37.1	42.2	6099+05	36" RCP	0.044	180.0	25° RT	0.56%	7.61	8.22	7.5	DISSIPATOR BASIN
IL 29 Main	PUTNAM	4.5	6.3	6.7	6128+70 LT	24" RCP	0.005	105.0	none	0.30%	4.24	4.70	7.6	RIPRAP
IL 29 Main	PUTNAM	2.1	3.0	3.1	6128+75 RT	24" RCP	0.002	70.0	none	0.59%	3.90	4.42	5.0	RIPRAP
IL 29 Main	PUTNAM	7.4	10.4	11.0	6148+65 RT	24" RCP	0.009	100.0	none	0.25%	4.94	5.55	7.8	RIPRAP
IL 29 Main	PUTNAM	7.7	10.8	11.4	6148+77 LT	24" RCP	0.009	100.0	none	0.30%	4.99	5.62	8.9	RIPRAP

CULVERT OUTLET EROSION CONTROL

IL 29 Main	PUTNAM	91.4	124.7	146.2	6159+30	12' x 10' RCBC (WC)	0.240	220.0	none	0.16%	6.64	7.36	15.8	RIPRAP
Cabin Hill Road	PUTNAM	17.8	25.5	28.5	CABIN HILL RD PE	42" RCP	0.031	45.0	none	0.44%	7.08	7.47	9.8	DISSIPATOR BASIN
IL 29 Main	PUTNAM	21.9	31.4	35.1	6178+00 (SS)	42" SS	0.034	185.0	5° RT	0.12%	5.92	6.62	8.1	RIPRAP
IL 29 Main	PUTNAM	8.1	11.4	12.0	6179+63 RT	24" RCP	0.008	200.0	none	0.55%	5.62	6.10	3.8	RIPRAP
IL 29 Main	PUTNAM	5.1	7.3	7.6	6182+65 LT	24" RCP	0.008	80.0	none	0.34%	4.38	4.92	4.0	RIPRAP
IL 29 Main	PUTNAM	4.4	6.1	6.5	6190+47 LT	24" RCP	0.002	80.0	none	0.34%	4.22	4.65	3.3	RIPRAP
IL 29 Main	PUTNAM	334	506	578	6179+20	2 - 9' x 7' RCBC (WC)	0.620	200.0	40° LT	0.30%	6.02	7.49	5.8	RIPRAP
IL 29 Main	PUTNAM	28.2	38.3	45	6201+30 (SS)	36" SS	0.075	180.0	none	0.61%	8.61	9.22	8.1	DISSIPATOR BASIN
IL 29 Main	PUTNAM	9.4	13.3	14.0	6204+00 LT	36" RCP	0.022	50.0	none	0.40%	5.12	5.59	3.1	RIPRAP
IL 29 Main	PUTNAM	28.4	39.3	43.0	6213+15	8' x 6' RCBC (WC)	0.042	138.0	20° LT	0.36%	6.01	6.53	6.2	RIPRAP
IL 29 Main	PUTNAM	145.2	197	217.7	6225+35	9' x 6' RCBC (WC)	0.540	130.0	none	0.38%	9.43	9.84	12.9	DISSIPATOR BASIN
IL 29 Main	BUREAU	40.7	56.1	63.7	6248+10	10' x 5' RCBC (WC)	0.100	120.0	3° LT	0.42%	6.95	7.35	9.3	RIPRAP
IL 29 Main	BUREAU	138.0	197.1	226.7	6255+50	10' x 8' RCBC (WC)	0.550	130.0	38° LT	0.23%	7.28	8.58	5.9	DISSIPATOR BASIN
IL 29 Main	BUREAU	49.2	66.6	75.8	6273+33	4' x 4' RCBC (WC)	0.160	120.0	6° LT	0.42%	7.79	8.52	13.6	DISSIPATOR BASIN
Kentville Road	BUREAU	37.6	53.0	55.9	KENTVILLE RD	48" SS	0.059	200.0	none	0.50%	7.06	7.91	10.4	DISSIPATOR BASIN
Old IL 29	BUREAU	21	29.2	33.3	54+85	36" RCP	0.024	150.0	none	0.33%	6.10	6.84	14.6	RIPRAP

Exhibit D

PERIMETER EROSION BARRIER

IL 29 PHASE 1 STUDY
EROSION CONTROL PLAN - NORTH SECTION
INLET AND PIPE PROTECTION

STATION	SIDE	DRAINAGE STRUCTURE	INLET AND PIPE PROTECTION EACH
MAINLINE			
5002+00	CL	MEDIAN INLET	1
5002+00	RT	24" RCP	1
5010+00	CL	MEDIAN INLET	1
5018+00	CL	MEDIAN INLET	1
5020+26	LT	8' x 6' RCBC	1
5020+50	RT	3' x 3' RCBC	1
5026+00	CL	MEDIAN INLET	1
5032+30	RT	30" RCP	1
5032+30	LT	42" RCP	1
5033+00	CL	MEDIAN INLET	1
5049+00	CL	MEDIAN INLET	1
5055+00	CL	MEDIAN INLET	1
5061+50	CL	MEDIAN INLET	1
5062+50	RT	24" RCP	1
5062+50	LT	24" RCP	1
5063+50	CL	MEDIAN INLET	1
5071+00	CL	MEDIAN INLET	1
5087+00	CL	MEDIAN INLET	1
5088+25	LT	24" RCP	1
5088+25	RT	30" RCP	1
5091+50	LT	2 - 7' x 6' RCBC	1
5097+00	CL	MEDIAN INLET	1
5104+00	CL	MEDIAN INLET	1
5112+00	CL	MEDIAN INLET	1
5120+00	CL	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
5130+00	LT	48" RCP	1
5130+00	RT	24" RCP	1
5131+00	CL	MEDIAN INLET	1
5138+00	CL	MEDIAN INLET	1
5142+50	CL	MEDIAN INLET	1
5147+00	CL	MEDIAN INLET	1
5154+00	CL	MEDIAN INLET	1
5168+00	RT	24" RCP	1
5168+00	CL	MEDIAN INLET	1
5170+97	LT	24" RCP	1
5170+97	RT	24" RCP	1
5172+00	CL	MEDIAN INLET	1
5183+55	LT	24" RCP	1
5183+55	RT	30" RCP	1
5185+00	CL	MEDIAN INLET	1
5193+00	CL	MEDIAN INLET	1
5201+00	CL	MEDIAN INLET	1
5209+00	CL	MEDIAN INLET	1
5210+15	LT	30" RCP	1
5210+15	RT	36" RCP	1
5212+00	RT	42" RCP	1
5212+00	CL	MEDIAN INLET	1
5231+55	RT	36" RCP	1
5231+55	CL	MEDIAN INLET	1
5239+00	CL	MEDIAN INLET	1
5247+00	CL	MEDIAN INLET	1
5255+00	CL	MEDIAN INLET	1
5263+00	CL	MEDIAN INLET	1
5263+70	LT	36" RCP	1
5263+70	RT	42" RCP	1
5272+00	CL	MEDIAN INLET	1
5280+00	CL	MEDIAN INLET	1
5295+00	CL	MEDIAN INLET	1
5302+00	CL	MEDIAN INLET	1
5303+50	RT	30" RCP	1
5303+50	LT	48" RCP	1
5307+00	CL	MEDIAN INLET	1
5322+00	CL	MEDIAN INLET	1
5331+00	CL	MEDIAN INLET	1
5331+90	LT	36" RCP	1
5331+90	RT	24" RCP	1
5336+00	CL	MEDIAN INLET	1
5341+00	CL	MEDIAN INLET	1
6009+50	CL	MEDIAN INLET	1
6015+25	CL	MEDIAN INLET	1
6021+40	LT	36" RCP	1
6022+75	RT	36" RCP	1
6022+75	CL	MEDIAN INLET	1
6031+00	CL	MEDIAN INLET	1
6039+00	LT	36" RCP	1
6039+00	CL	MEDIAN INLET	1
6049+47	LT	48" RCP	1
6049+47	RT	24" RCP	1
6051+00	CL	MEDIAN INLET	1
6060+00	CL	MEDIAN INLET	1
6066+00	RT	24" RCP	1
6067+00	CL	MEDIAN INLET	1
6068+38	LT	INLET	1
6070+50	LT	INLET	1
6074+44	LT	48" RCP	1
6075+00	CL	MEDIAN INLET	1
6082+85	RT	36" RCP	1

STATION	SIDE	DRAINAGE STRUCTURE	INLET AND PIPE PROTECTION EACH
MAINLINE (CONT.)			
6083+35	LT	48" RCP	1
6088+80	LT	2 - 6' x 6' RCBC	1
6093+00	LT	18" RCP	1
6097+33	CL	MEDIAN INLET	1
6098+00	LT	36" RCP	1
6099+05	LT	36" RCP	1
6104+00	CL	MEDIAN INLET	1
6111+00	CL	MEDIAN INLET	1
6122+00	CL	MEDIAN INLET	1
6128+65	LT	24" RCP	1
6128+65	RT	24" RCP	1
6130+00	CL	MEDIAN INLET	1
6140+00	CL	MEDIAN INLET	1
6148+00	CL	MEDIAN INLET	1
6148+70	RT	24" RCP	1
6148+70	LT	24" RCP	1
6151+00	CL	MEDIAN INLET	1
6159+30	LT	10' x 10' RCBC	1
6159+38	RT	EXISTING RAILROAD CULVERT	1
6161+22	RT	EXISTING RAILROAD CULVERT	1
6166+00	CL	MEDIAN INLET	1
6177+93	LT	CATCH BASIN TYPE B WITH TYPE 7 FRAME & GRATE	1
6178+00	RT	EXISTING RAILROAD CULVERT	1
6179+20	LT	2 - 7' x 7' RCBC	1
6179+63	RT	24" RCP	1
6182+65	LT	24" RCP	1
6183+00	CL	MEDIAN INLET	1
6190+47	LT	24" RCP	1
6198+60	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6198+60	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6198+85	LT	MANHOLE TYPE A 4' DIA. WITH TYPE 1 FRAME & GRATE	1
6198+85	CL	MANHOLE TYPE A 4' DIA. WITH TYPE 1 FRAME & GRATE	1
6198+85	RT	MANHOLE TYPE A 4' DIA. WITH TYPE 1 FRAME & GRATE	1
6199+10	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6199+10	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6201+30	LT	36" SS	1
6201+30	CL	CATCH BASIN TYPE B WITH TYPE 7 FRAME & GRATE	1
6201+30	RT	MANHOLE TYPE A 4' DIA. WITH TYPE 1 FRAME & GRATE	1
6201+30	RT	EXISTING RAILROAD CULVERT	1
6204+00	LT	36" RCP	1
6205+00	CL	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6205+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6207+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6211+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6211+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6212+93	RT	EXISTING RAILROAD CULVERT	1
6213+15	LT	6' x 6' RCBC	1
6214+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6214+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6217+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6217+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6220+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6220+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6223+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6226+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6229+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6232+20	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6235+25	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6235+50	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6235+75	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6237+80	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6242+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6244+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6246+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6248+10	LT	8' x 5' RCBC	1
6250+50	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6253+50	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6255+50	LT	8' x 8' RCBC	1
6256+50	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6257+90	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6262+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6262+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6264+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6264+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6265+50	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6268+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6268+75	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6268+75	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6269+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6269+25	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6272+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6272+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6272+70	RT	EXISTING RAILROAD CULVERT	1
6275+00	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6275+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6277+00	CL	MEDIAN INLET	1
6284+50	CL	MEDIAN INLET	1

STATION	SIDE	DRAINAGE STRUCTURE	INLET AND PIPE PROTECTION EACH
MAINLINE (CONT.)			
6288+00	CL	MEDIAN INLET	1
6288+10	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6290+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6292+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6294+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6296+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6298+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6300+15	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6300+50	CL	MEDIAN INLET	1
6302+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6304+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6306+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6308+50	CL	MEDIAN INLET	1
6308+50	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6311+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
6316+50	CL	MEDIAN INLET	1
WEST FRONTAGE ROAD			
58+70		36" RCP	1
COUNTY HIGHWAY 6			
44+65	LT	42" RCP	1
55+65	LT	CATCH BASIN	1
56+90	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
58+93	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
60+95	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
63+00	RT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
COUNTY HIGHWAY 6 INTERCHANGE			
RAMP A 12+25	LT	4' x 3' RCBC	1
RAMP B 9+28	LT	INLET TYPE B WITH TYPE 1 FRAME & GRATE	1
RAMP C 7+25	LT	PIPE CULVERT	1
RAMP D 11+07	RT	42" RCP	1
CENTER STREET			
5+35	LT	30" RCP	1
RELOCATED SENACHWINE LAKE ROAD			
52+30	LT	36" RCP	1
57+38	LT	PIPE CULVERT	1
61+08	LT	PIPE CULVERT	1
61+08	RT	PIPE CULVERT	1
65+38	LT	PIPE CULVERT	1
CABIN HILL ROAD			
47+60 PE	LT	42" RCP	1
EXISTING IL 29			
35+00 (cul de sac)	RT	36" RCP	1
54+85	LT	36" RCP	1

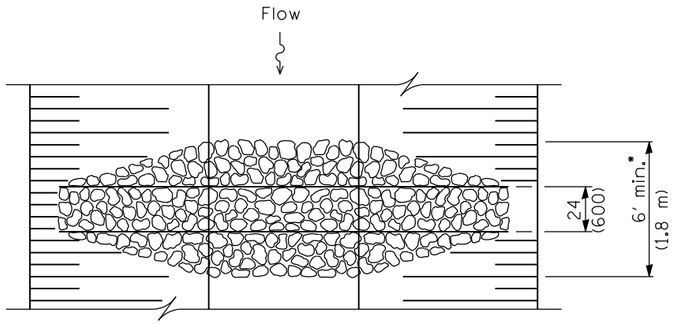
Exhibit E

EROSION CONTROL AT BRIDGES

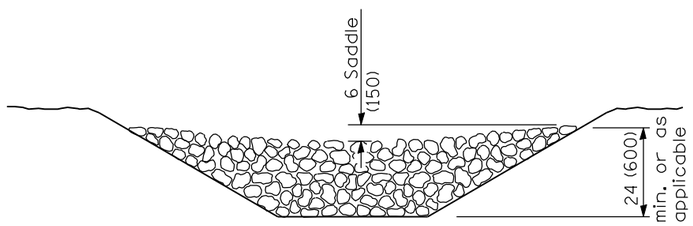
EROSION CONTROL AT BRIDGES		
STATION	LOCATION	EROSION CONTROL
2743+22	Proposed IL 29 over Dickenson Run (Peoria Co.)	Proposed riprap along the sloping abutments and embankment cones to the toe of slope, riprap channel under bridges and in between the two mainline bridges.
98+02 Frontage Road	Proposed Frontage Road over Dickenson Run (Peoria Co.)	Proposed riprap along the sloping abutments and embankment cones to the toe of slope, riprap channel under bridge
3176+56	Proposed IL 29 over Senachwine Creek (Peoria Co.)	Proposed riprap along the sloping abutments and embankment cones to the toe of slope, riprap channel under bridges and in between the two mainline bridges.
40+00 Benedict Street	Proposed Benedict Street over Senachwine Creek (Peoria Co.)	Proposed revetment mat along the sloping abutments and the upstream embankment cones to the toe of slope; proposed riprap on the downstream embankment cones and channel under bridge.
72+45 IL 29 Connector	Proposed IL 29 Connector over Senachwine Creek (Peoria Co.)	Proposed revetment mat along the sloping abutments and embankment cones to the toe of slope; existing riprap at the upstream channel shall be replaced in kind.
3322+00	Proposed IL 29 over Coon Creek (Peoria Co.)	Proposed revetment mat along the sloping abutments and embankment cones to the toe of slope; riprap channel under bridges and in between the two mainline bridges.
3452+86	Proposed IL 29 over Unnamed stream (Marshall Co.)	Proposed riprap along the sloping abutments and the downstream embankment cones to the toe of slope; riprap channel to the R.O.W. line and under the bridge.
3488+31	Proposed IL 29 over Rattlesnake Hollow (Marshall Co.)	Proposed riprap along the sloping abutments and the downstream embankment cones to the toe of slope; riprap channel to the R.O.W. line and under the bridge.
3515+30	Proposed IL 29 over Barville Creek (Marshall Co.)	Proposed riprap along the sloping abutments and the downstream embankment cones to the toe of slope; riprap channel to the R.O.W. line and under the bridge.
3630+00	Proposed IL 29 over Gimlet Creek (Marshall Co.)	Proposed riprap along the upstream and downstream channel up to the R.O.W. line.
3654+00	Proposed IL 29 over Thenius Creek (Marshall Co.)	Proposed riprap along the upstream and downstream channel up to the R.O.W. line.
3795+45	Proposed IL 29 over Crow Creek (Marshall Co.)	Proposed revetment mat along the sloping abutments and embankment cones to the toe of slope. Riprap channel under bridges and in between the two mainline bridges.
5287+10	Proposed IL 29 over Dry Hollow Creek (Marshall Co.)	Proposed riprap along the upstream and downstream channel up to the R.O.W. line.
6118+50	Proposed IL 29 over Senachwine Creek Overflow (Putnam Co.)	Proposed riprap along the upstream and downstream channel up to the R.O.W. line.
6132+35	Proposed IL 29 over Senachwine Creek (Putnam Co.)	Proposed revetment mat along the sloping abutments and embankment cones to the toe of slope. Riprap channel under bridge.

Exhibit F

EROSION CONTROL DETAILS



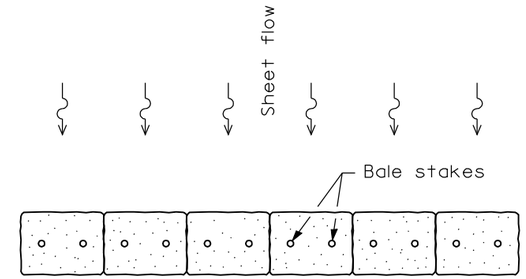
PLAN



ELEVATION

AGGREGATE DITCH CHECK

* When the ditch check is within the clear zone and the road is open to traffic, the traffic approach slope of the aggregate shall be 1:4 (V:H).



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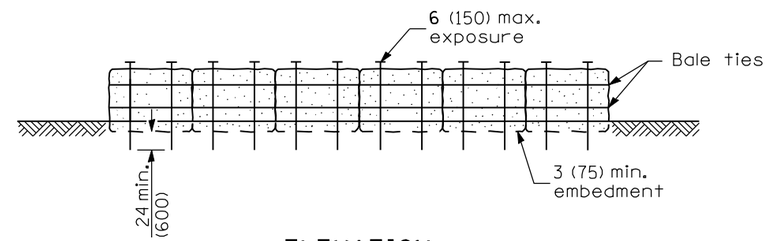
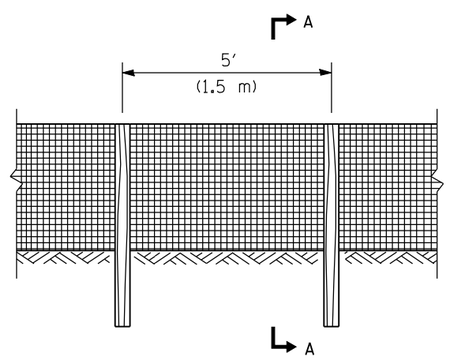
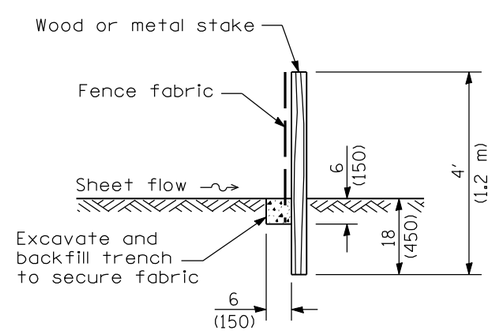


ELEVATION

HAY OR STRAW BALES AS A
PERIMETER EROSION BARRIER



ELEVATION



SECTION A-A

SILT FILTER FENCE AS A
PERIMETER EROSION BARRIER

GENERAL NOTES

The installation details and dimensions shown for perimeter erosion barriers shall also apply for inlet and pipe protection.

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

Illinois Department of Transportation

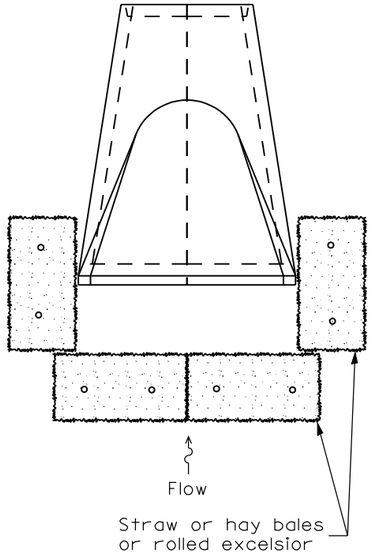
PASSED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

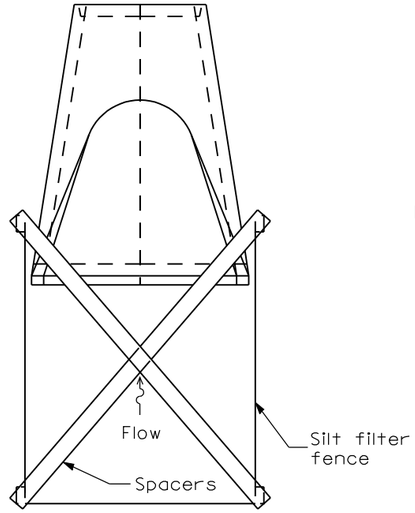
ISSUED 1-1-97

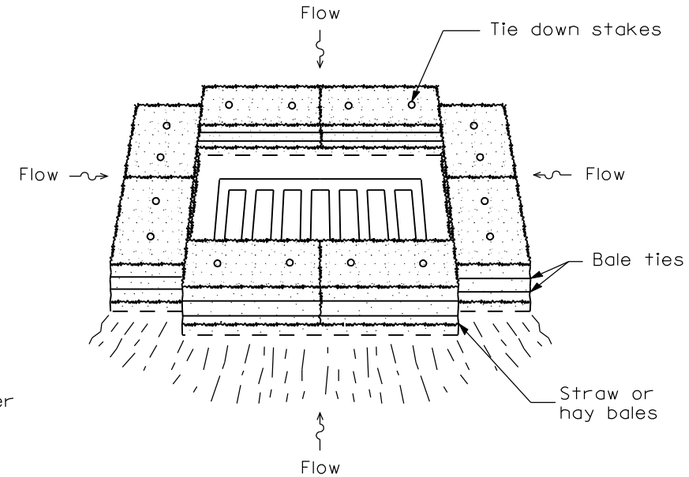
DATE	REVISIONS
1-1-08	Switched units to
	English (metric) and
	rev. silt filter fence.
1-1-07	Removed 2 ditch check
	details and added 1 for
	perim. erosion barrier.

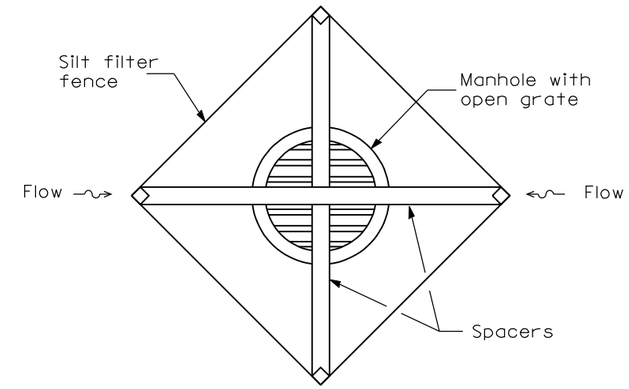
TEMPORARY EROSION CONTROL SYSTEMS
(Sheet 1 of 2)

STANDARD 280001-04

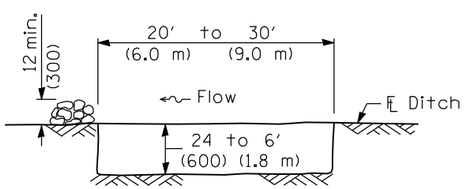






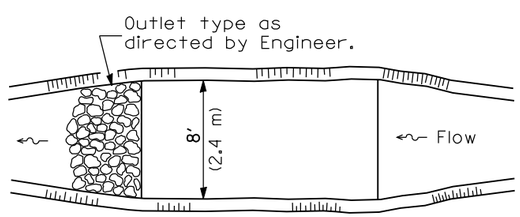


INLET AND PIPE PROTECTION



The performance of the basin will improve if put into a series.

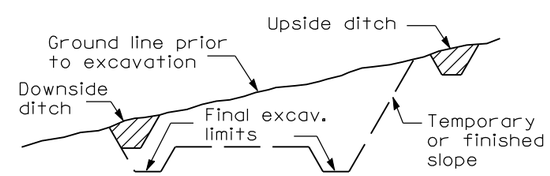
ELEVATION



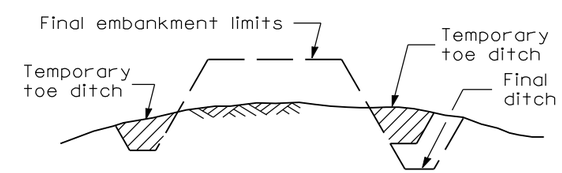
The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

PLAN

SEDIMENT BASIN



TYPICAL CUT CROSS-SECTION



TYPICAL FILL CROSS-SECTION

TEMPORARY DITCHES FOR CUT & FILL SECTIONS

Illinois Department of Transportation

PASSED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

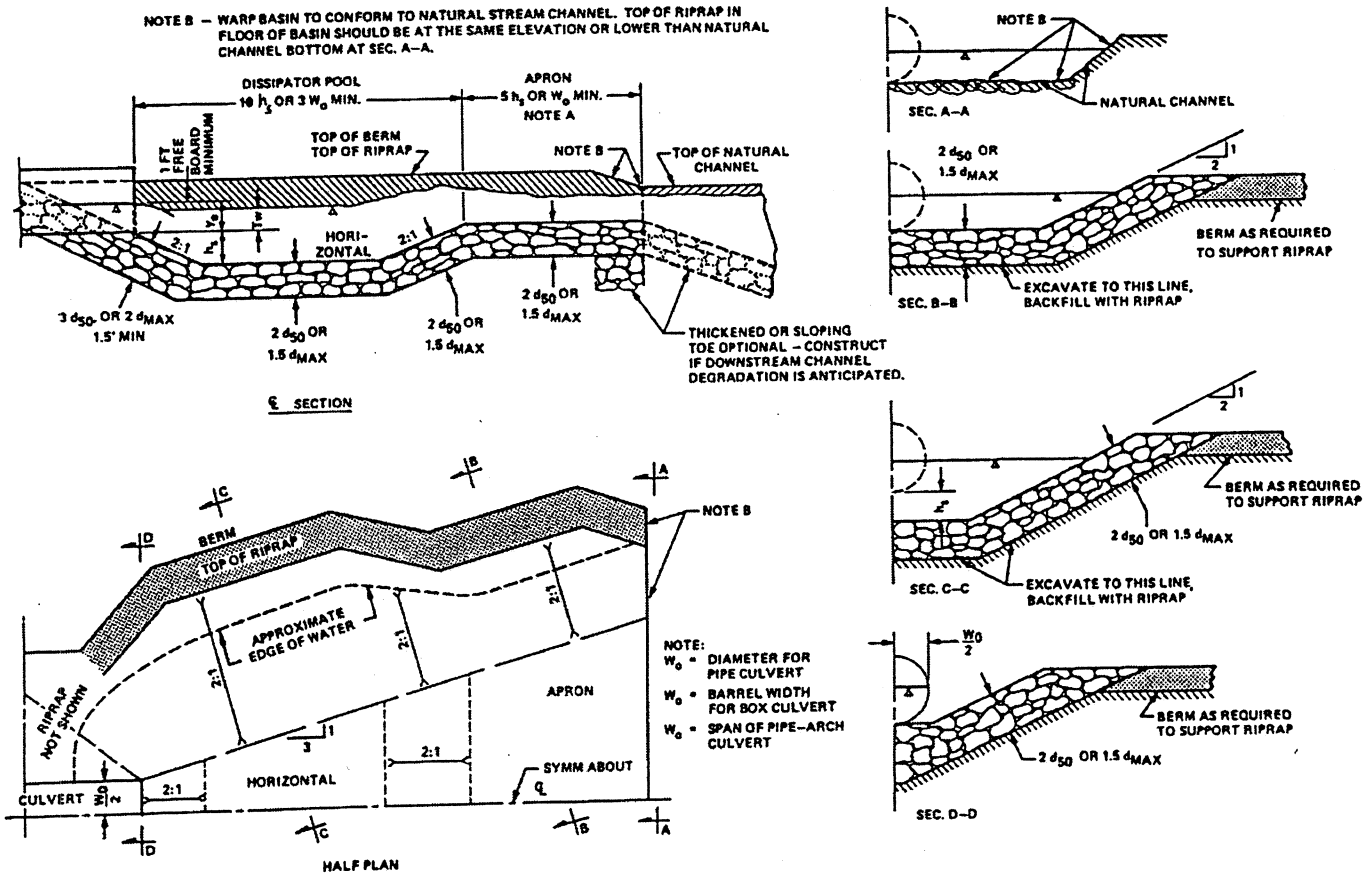
TEMPORARY EROSION CONTROL SYSTEMS

(Sheet 2 of 2)

STANDARD 280001–04

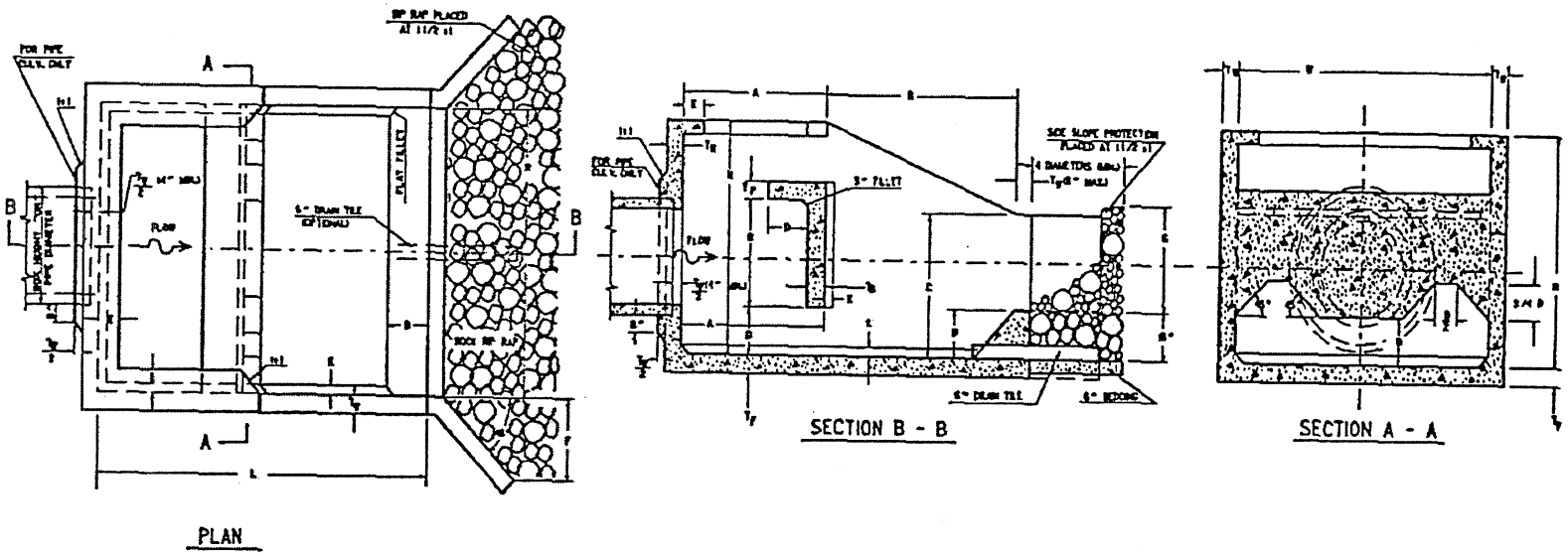
NOTE A – IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS-SECTIONAL AREA AT SECTION A–A SUCH THAT Q_{des}/(CROSS SECTION AREA AT SEC. A–A) = SPECIFIED EXIT VELOCITY.

NOTE B – WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT THE SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A.



DETAILS OF RIPRAPPED CULVERT ENERGY BASIN

Figure 6-203

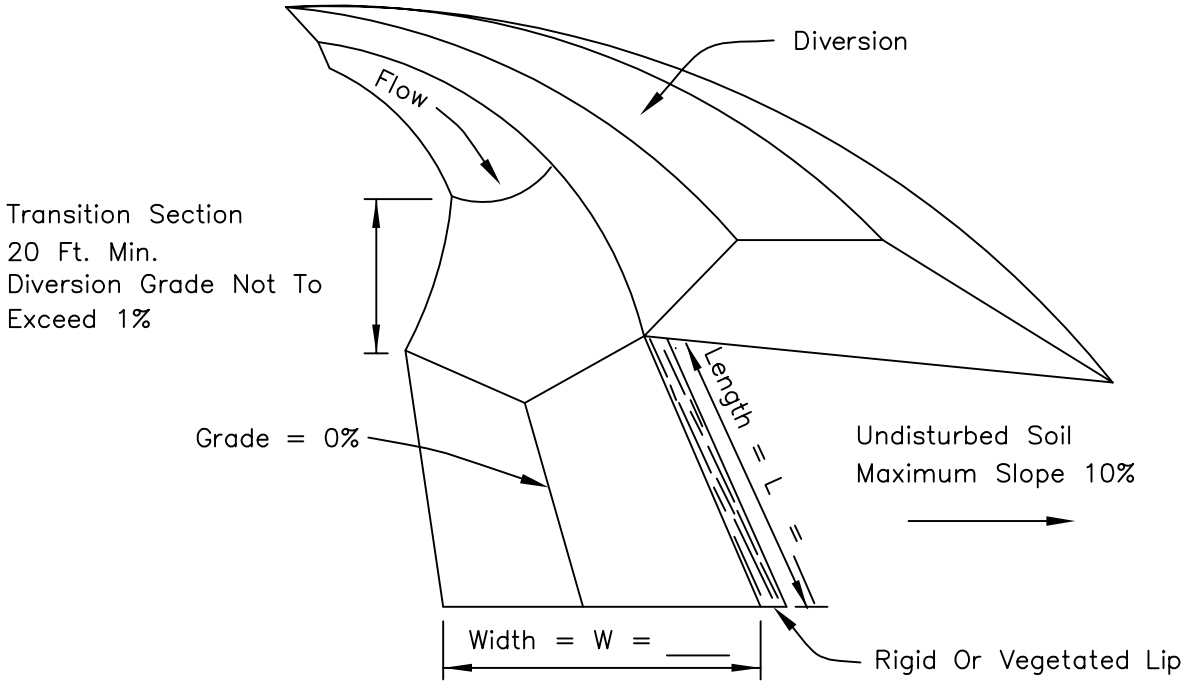


STILLING BASIN DIMENSIONS

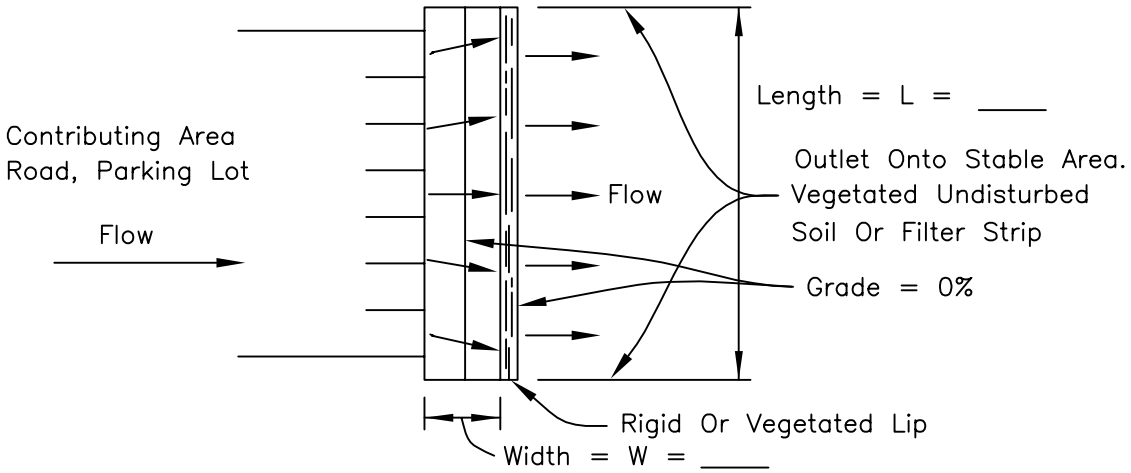
DIAMETER "DR" HEIGHT OF BOX	SQ. FT. AREA	MAXIMUM DISCHARGE (CFS)	FEET AND INCHES										INCHES					ROCK FILL SIZES
			W	H	L	A	B	C	D	E	F	G	T_R	T_F	T_B	T_P	K	
18"	1.7672	20	5'-6"	4'-3"	7'-1"	3'-3"	4'-1"	2'-4"	0'-11"	0'-6"	1'-6"	2'-1"	6"	6 1/2"	6"	6"	3"	4.0"
24"	3.1416	38	8'-3"	5'-3"	9'-6"	3'-11"	5'-1"	2'-10"	1'-2"	0'-8"	2'-0"	2'-8"	6"	6 1/2"	8"	6"	3"	5.0"
30"	4.9087	60	9'-0"	6'-3"	10'-3"	4'-3"	6'-1"	3'-1"	1'-4"	0'-9"	2'-6"	3'-0"	6"	6 1/2"	7"	7"	3"	6.5"
36"	7.0686	86	9'-3"	7'-3"	12'-1"	5'-3"	7'-1"	3'-10"	1'-7"	0'-9"	3'-0"	3'-6"	7"	7 1/2"	8"	8"	3"	8.0"
42"	9.62 ft	115	10'-6"	8'-0"	14'-0"	6'-0"	8'-0"	4'-5"	1'-9"	0'-10"	3'-0"	3'-11"	8"	8 1/2"	9"	8"	4"	8.5"
48"	12.5664	131	11'-3"	9'-0"	16'-0"	6'-9"	9'-1"	4'-11"	2'-0"	0'-10"	3'-0"	4'-5"	9"	9 1/2"	10"	8"	4"	9.5"
54"	15.9043	131	12'-0"	9'-9"	17'-1"	7'-1"	10'-0"	5'-5"	2'-2"	1'-0"	3'-0"	4'-11"	10"	10 1/2"	10"	8"	4"	10.5"
66"	23.7583	276	14'-3"	12'-9"	19'-0"	8'-0"	11'-0"	6'-11"	2'-6"	1'-0"	3'-0"	5'-4"	11"	11 1/2"	11"	8"	5"	12.0"
72"	28.2743	320	15'-4"	13'-3"	22'-0"	9'-3"	12'-0"	8'-11"	2'-9"	1'-3"	3'-0"	5'-2"	12"	12 1/2"	12"	8"	5"	13.0"

Stilling Basin Impact - Type Energy
Dissipater for Box and Pipe Culverts
Figure 6-204a

LEVEL SPREADER



LEVEL SPREADER FOR DIVERSION OUTLET



LEVEL SPREADER FOR IMPERVIOUS AREAS

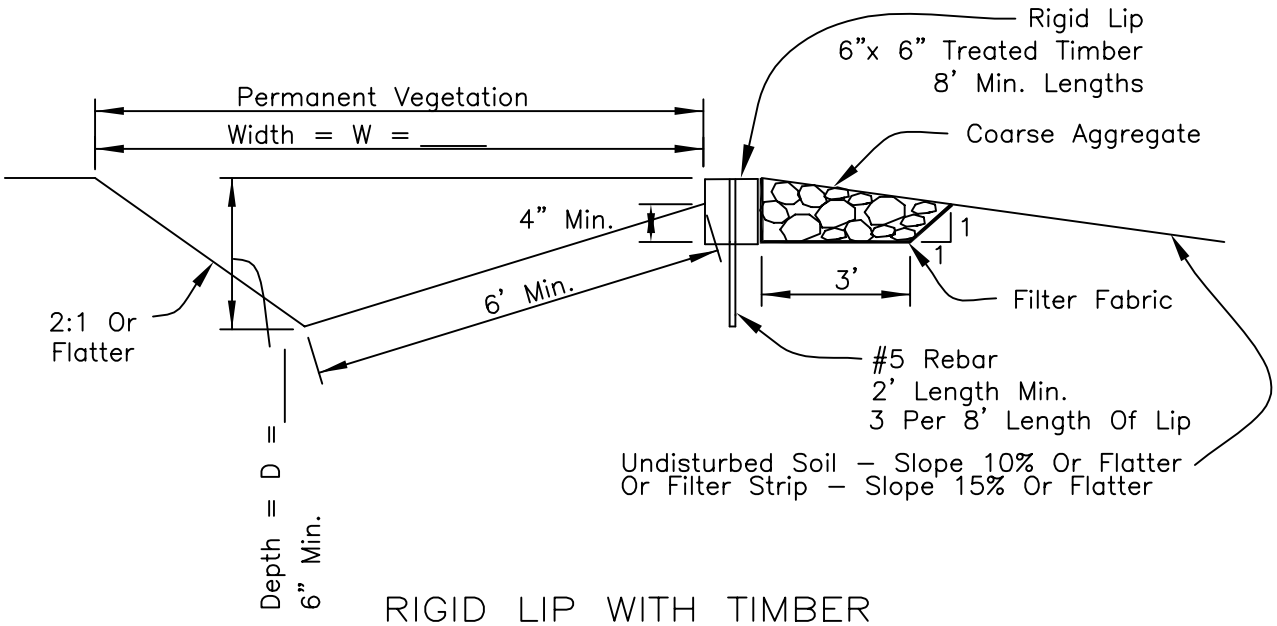
NOTES:
1. Ends of spreader shall be tied into higher ground to prevent flow around the level spreader.
2. See plans for L and W dimensions.

REFERENCE				
Project				
Designed		Date		
Checked		Date		
Approved		Date		

NRCS
Natural Resources Conservation Service

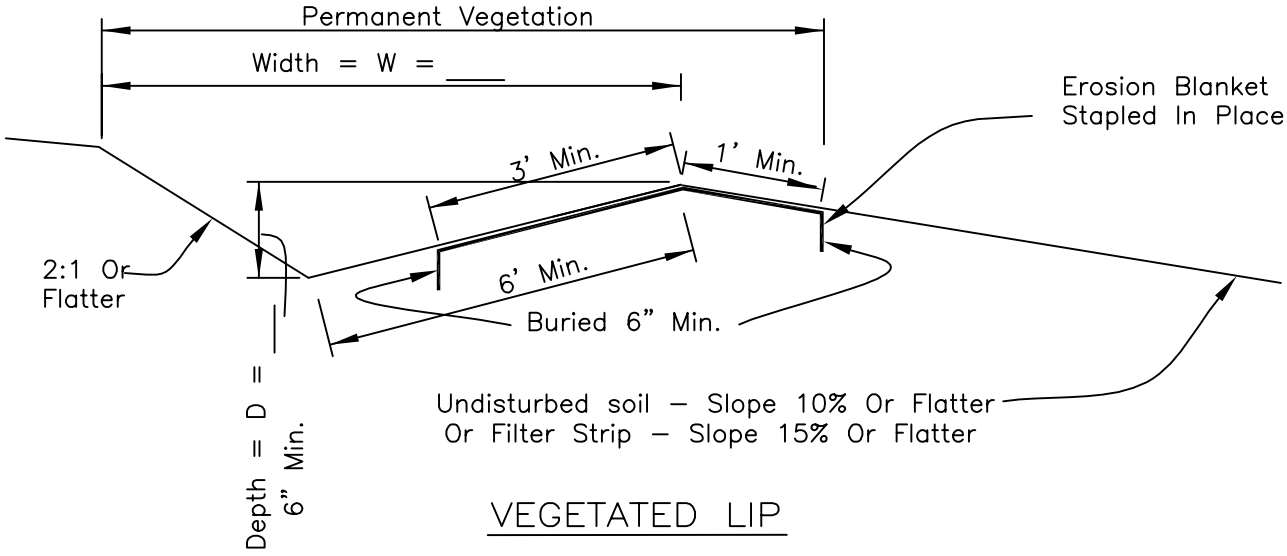
STANDARD DWG. NO.
IL-570
SHEET 1 OF 2
DATE 1-29-99

LEVEL SPREADER



RIGID LIP WITH TIMBER

(DESIGN FLOWS 4 C.F.S. TO 30 C.F.S.)



VEGETATED LIP

(DESIGN FLOWS 4 C.F.S. OR LESS)

NOTES:

1. Coarse aggregate shall meet one of the following IDOT gradations: CA–1, or CA–3.
2. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table 1 or 2, Class I, II, or IV.
3. See sheet FILTER STRIP–GRASSED IL–535 for filter strip requirements.
4. See sheet EROSION BLANKET IL–530 for blanket material and installation requirements.
5. See plans for permanent seeding requirements.
6. See plans for D and W dimensions.

REFERENCE			
Project			
Designed		Date	
Checked		Date	
Approved		Date	

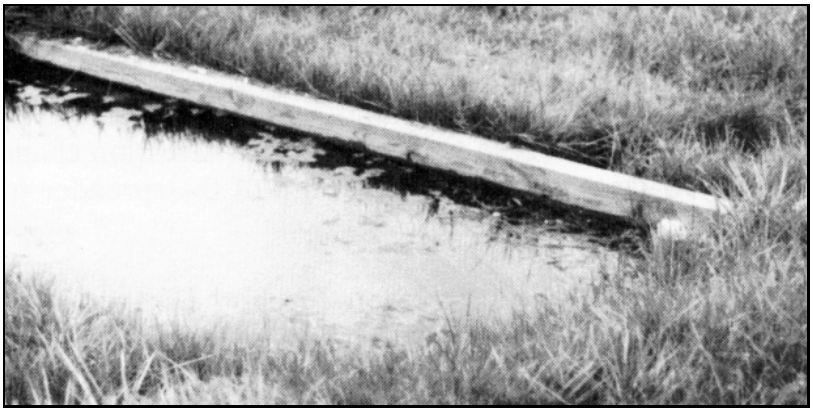
NRCS
Natural Resources Conservation Service

STANDARD DWG. NO.
IL-570
SHEET 2 OF 2
DATE 1–29–99

NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS URBAN MANUAL
PRACTICE STANDARD

LEVEL SPREADER

(no.)
CODE 870



(Source: VA Erosion and Sediment Control Handbook)

DEFINITION

A device used to disperse concentrated runoff uniformly over the ground surface as sheet flow.

PURPOSE

The purpose of this practice is to convert concentrated, potentially erosive flow to sheet flow and release it uniformly over a stabilized area or filter strip. The resultant sheet flow enhances pollutant filtering and runoff infiltration and reduces the potential for erosion.

CONDITIONS WHERE PRACTICE APPLIES

The principal application of a level spreader is to convey runoff from impervious surfaces, such as parking lots or roadways, uniformly onto vegetated filter strips. Level spreaders can also be applied as outlets for diversion structures. Level spreaders are appropriate and/or necessary under the following conditions:

1. Where runoff from an impervious surface is uneven and/or runoff is released as concentrated flow, such as through curb cuts or roof downspouts
2. At the ends of diversions
3. Where the runoff water will not re-concentrate after release from the level spreader until it reaches an outlet designed for concentrated flow
4. Where sediment-free storm runoff can be released in sheet flow down a stabilized slope without causing erosion
5. Where the lip of the level spreader can be constructed in undisturbed soil
6. Where there will be no traffic over the spreader

CRITERIA

Criteria for level spreader design can vary greatly depending on the application. For this reason, two sets of criteria are specified for several of the factors that follow.

For impervious surface runoff applications:

The capacity for the level spreader is determined in the design of the filter strip to which it discharges (see practice standard FILTER STRIP 835).

The spreader shall run linearly along the entire width of the filter strip to which it discharges. In most cases, the spreader will be the same width as the contributing impervious surface. The ends of the spreader shall be tied into higher ground to prevent flow around the spreader.

The minimum depth shall be 6 inches and the minimum width shall be 6 feet for the lower side slope. Side slopes shall be 2:1 (horizontal to vertical) or flatter.

The grade of the spreader shall be 0%.

The discharge area shall meet the requirements of practice standard FILTER STRIP 835.

For diversion outlet applications:

The capacity of the spreader shall be determined using the peak flow from the 10-year frequency, 24-hour duration storm. The drainage area shall be restricted so that maximum flows into the spreader will not exceed 30 cfs.

Spreader dimensions: Select the length and depth of the spreader from the table below. The length dimension is parallel to the diversion.

Design Flow (cfs)	Minimum Depth (ft)	Minimum Length (ft)
0-10	0.5	10
10-20	0.6	20
20-30	0.7	30

The minimum width of the spreader shall be 6 feet for the lower side slope. Side slopes shall be 2:1 (horizontal to vertical) or flatter.

Construct a 20 foot transition section in the diversion channel so the width of the channel will smoothly meet the width of the spreader to ensure uniform outflow.

The last 20 feet of the diversion channel shall provide a smooth transition from the channel grade to the level spreader and where possible, shall be less than or equal to 1%. The grade of the level spreader shall be 0%.

The outlet discharge area must be generally smooth and well vegetated with a maximum slope of 10%.

For all applications:

The spreader lip shall be constructed to a uniform height and zero grade over the length of the spreader. For design flows of 4 cfs or greater, a rigid lip of non-erodible material, such as pressure-treated timbers or concrete curbing, shall be used. For flows less than 4 cfs, a vegetated lip may be used. The spreader lip shall be constructed on undisturbed soil.

When using a vegetated lip it shall be protected with an erosion control blanket to prevent erosion and allow the vegetation to become established. The erosion control blanket for a vegetated lip shall meet the requirements of

practice standard EROSION BLANKET 830. The blanket shall be a minimum of 4 feet wide extending a minimum of 1 foot downstream over the level lip. The blanket shall be secured with heavy duty staples and the downstream and upstream edges shall be buried at least 6 inches deep in a vertical trench.

When using a rigid lip it shall be entrenched at least 4 inches below existing ground and securely anchored to prevent displacement. An apron of coarse aggregate meeting IDOT CA-1 or CA-3 gradation shall be placed to the top of the rigid lip and extend downslope at least 3 feet. A filter fabric shall be placed under the coarse aggregate. The filter fabric shall meet the requirements of material specification 592 GEOTEXTILE Table 1 or 2, Class I, II, or IV.

Immediately after level spreader construction, seed and mulch the entire disturbed area of the spreader. Seeding shall meet the requirements of practice standard PERMANENT VEGETATION 880 and mulching shall meet the requirements of practice standard MULCHING 875.

CONSIDERATIONS

The level spreader is a relatively low-cost structure to:

1. Disperse impervious surface runoff uniformly to a filter strip or
2. Release small volumes of concentrated flow from diversions when conditions are suitable

To accomplish these purposes, particular care must be taken to construct the spreader lip completely level. Any depressions in the lip will concentrate the flow, resulting in a loss of pollutant filtering effectiveness and/or erosion. Evaluate the outlet system to be sure that flow does not concentrate below the outlet.

For filter strip applications, the determination of whether a level spreader is needed should be based on how the runoff is entering the filter strip. If the runoff is concentrated by curb cuts, and particularly if a large area of impervious surface drains to one point, a level spreader is essential to achieve effective pollutant removal in the filter strip. A level spreader also is important if the filter strip is relatively steep in order to avoid erosion from concentrated runoff discharge. If the runoff is evenly distributed over the width of the impervious surface (e.g., a curbless, even-sloped road or parking lot), a level spreader may not be necessary.

When the level spreader is used as an outlet for temporary or permanent diversions and diversion dikes, runoff containing high sediment loads must be treated in a sediment trapping device such as practice standard TEMPORARY SEDIMENT TRAP 960 or IMPOUNDMENT STRUCTURE-ROUTED 842 before release into a level spreader.

PLANS AND SPECIFICATIONS

Plans and specifications for installing a level spreader shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

1. The spreader location
2. The length and width

3. For filter strip applications, plans for both the adjacent impervious surface and the filter strip, for diversion outlets, plans detailing the diversion structure and the adjacent outlet area
4. Lip details: vegetated or rigid
5. Stone gradation
6. Filter fabric specifications if used
7. Rigid lip material specifications if used
8. Erosion control blanket specifications if used
9. Seeding and mulching requirements

All plans shall include installation, inspection, and maintenance schedules with the responsible party identified.

Standard drawing LEVEL SPREADER IL-570 may be used as the plan sheet.

OPERATION AND MAINTENANCE

Inspect level spreaders after every rainfall until vegetation is established, and promptly make needed repairs. After the area has been stabilized, make periodic inspections and maintain vegetation in a healthy, vigorous condition.

Verify that the level spreader is distributing flow evenly. If problems are noted, make appropriate modifications to ensure even flow distribution.

REFERENCES

Illinois Department of Transportation, 1997. Standard Specifications for Road and Bridge Construction. IL

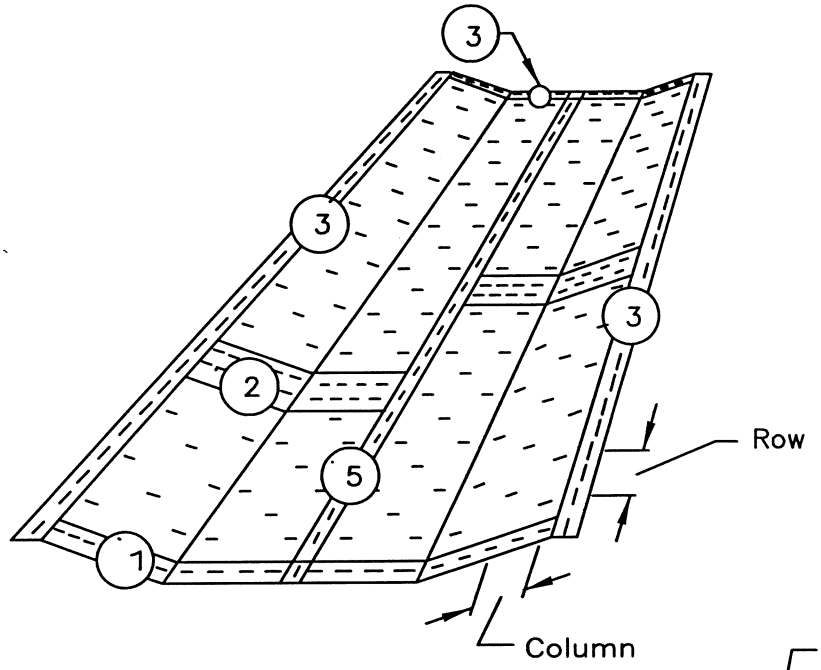
North Carolina Sedimentation Control Commission, 1988. Erosion and Sediment Control Planning and Design Manual. NC

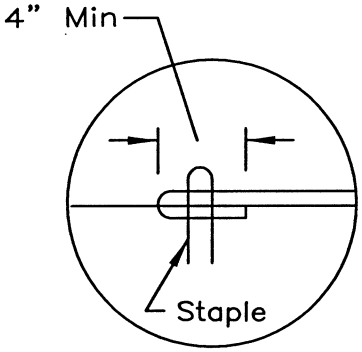
Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992. Virginia Erosion and Sediment Control Handbook, 3rd ed., VA

NRCS IL January 1999

urbst870.doc

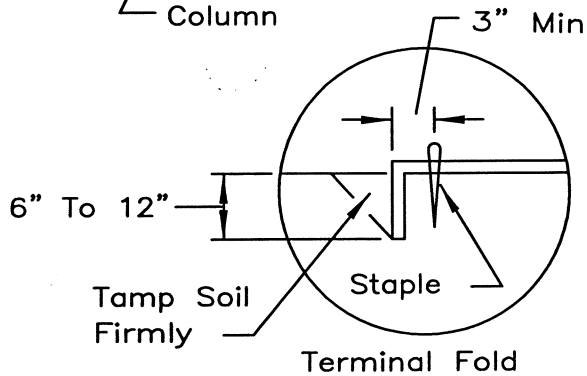
EROSION BLANKET PLAN





Terminal Fold

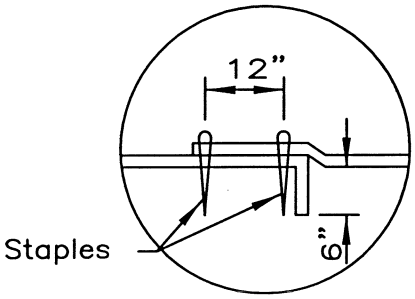
Jute Mesh Only



Terminal Fold

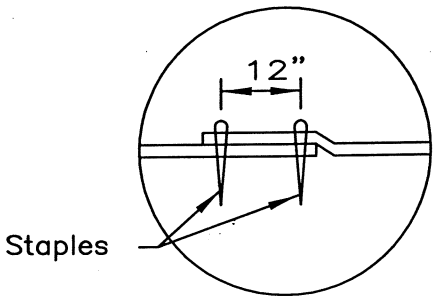
Excelsior Blanket
Erosion Control Paper

DETAIL 1



Junction Slot

Jute Mesh
Erosion Control Paper



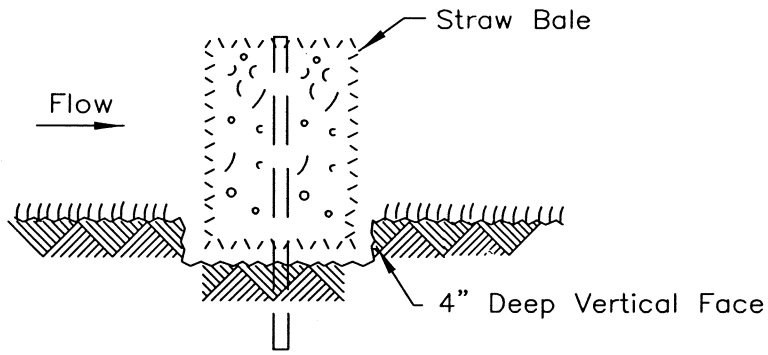
Junction Slot

Excelsior Blanket

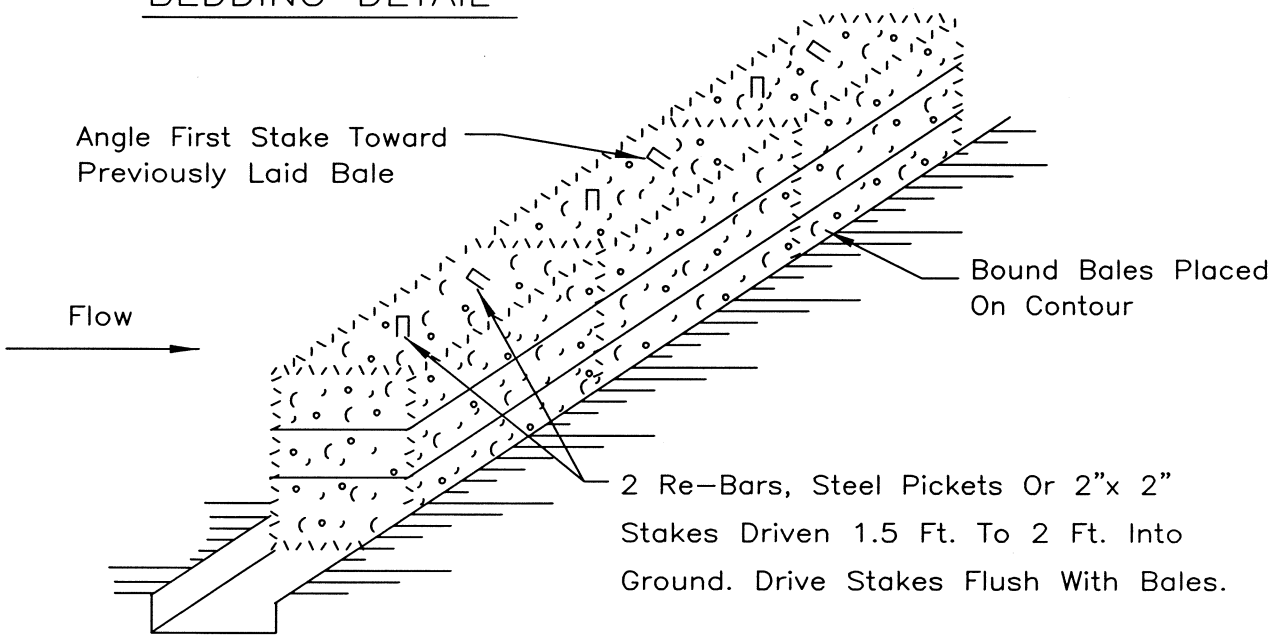
DETAIL 2

REFFERENCE Project Designed ____ Date ____ Checked ____ Date ____ Approved ____ Date ____	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ILLINOIS	STANDARD DWG. NO. IL-530 SEEET 1 OF 2 DATE 5-24-94

STRAW BALE BARRIER PLAN



BEDDING DETAIL



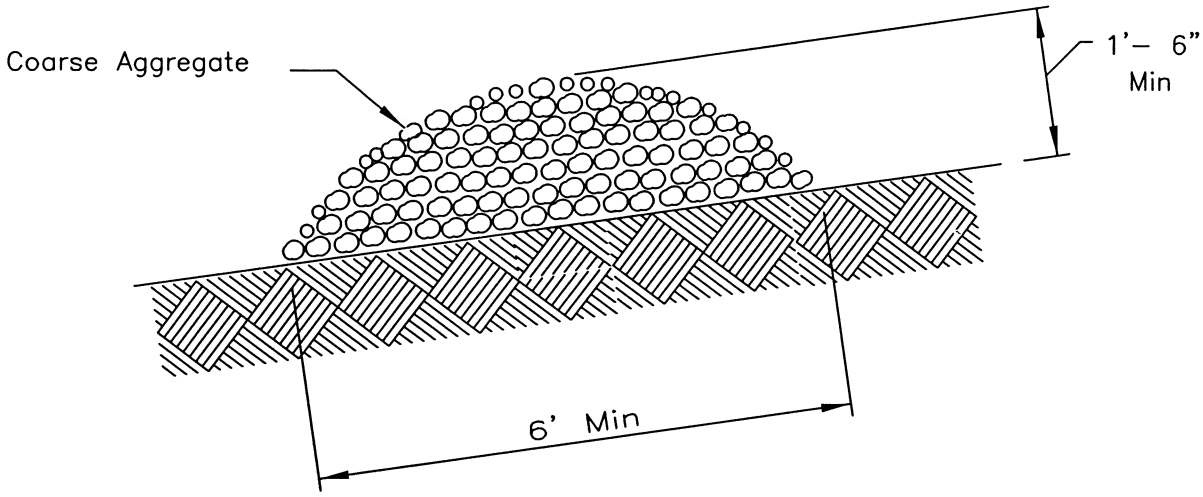
ANCHORING DETAIL

NOTES

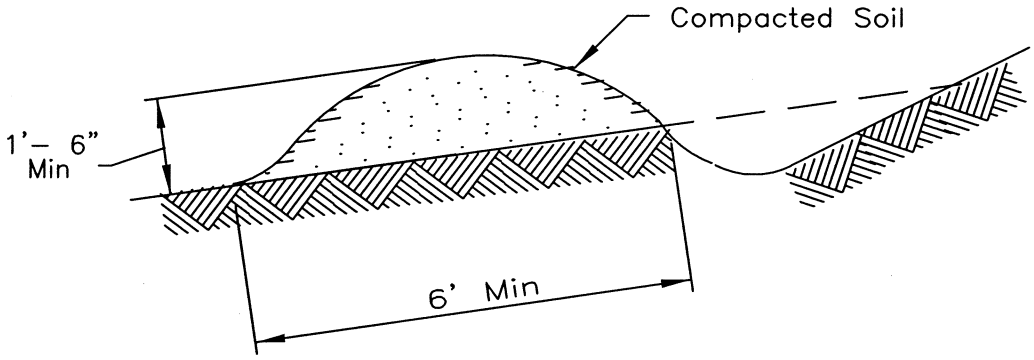
1. Bales shall be placed at the top of slope or on the contour and in a row with ends tightly abutting the adjacent bales.
2. Each bale shall be embedded in the soil a minimum of 4", and placed so that bindings are horizontal.
3. Bales shall be securely anchored in place by either two stakes or re-bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the bale.
4. Inspection shall be frequent and repair replacement shall be made promptly as needed.
5. Bales shall be removed when they have served their usefulness so as not to block or impede storm flow or drainage.

REFERENCE Project _____ Designed _____ Date _____ Checked _____ Date _____ Approved _____ Date _____	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ILLINOIS	STANDARD DWG. NO. IL-635 SHEET 1 OF 1 DATE 8-18-94

RIGHT OF WAY DIVERSION PLAN



TYPICAL GRAVEL STRUCTURE



TYPICAL EARTHEN STRUCTURE

NOTES:

1. Install the diversion as soon as right–of–way has been cleared and graded.
2. Disk the base for the constructed ridge before placing fill.
3. Track the ridge to compact it to the design cross section.
4. Locate the outlet on an undisturbed area. Adjust field spacing of the diversion to use the most stable outlet areas. When natural areas are not deemed satisfactory, provide outlet protection.
5. Immediately seed and mulch the portions of the diversions not subject to construction traffic. Stablize with gravel areas to be crossed by vehicles.
6. Coarse aggregate, if used, shall meet one of the following IDOT gradations: CA–I,CA–2 CA–3, OR CA–4.

REFERENCE Project _____ Designed _____ Date _____ Checked _____ Date _____ Approved _____ Date _____	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ILLINOIS	STANDARD DWG. NO. IL–600 SHEET 1 OF 1 DATE 3–3–95

Exhibit G

PLAN SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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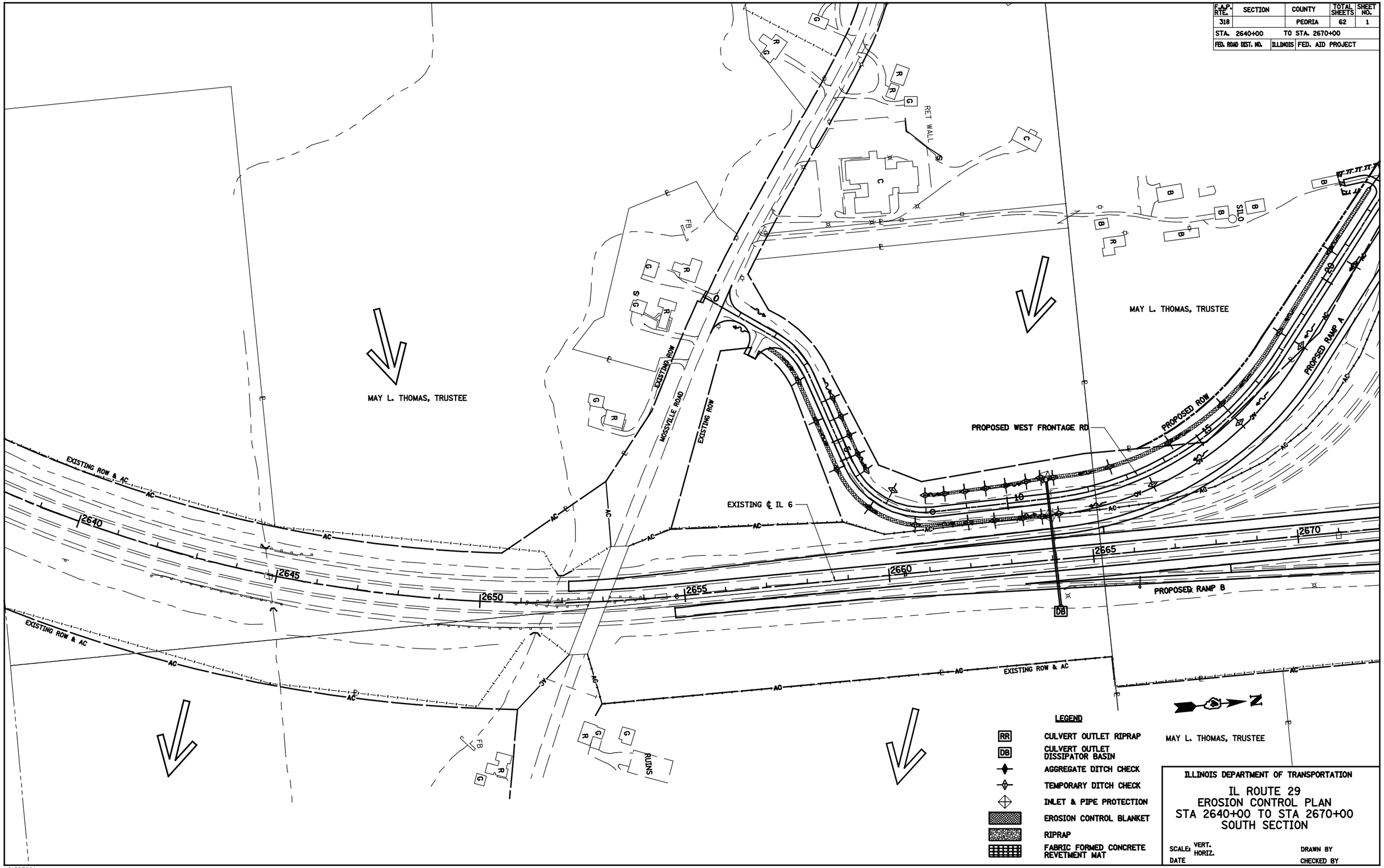

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2640+00 TO STA 2670+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE

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CHECKED BY

2159E001

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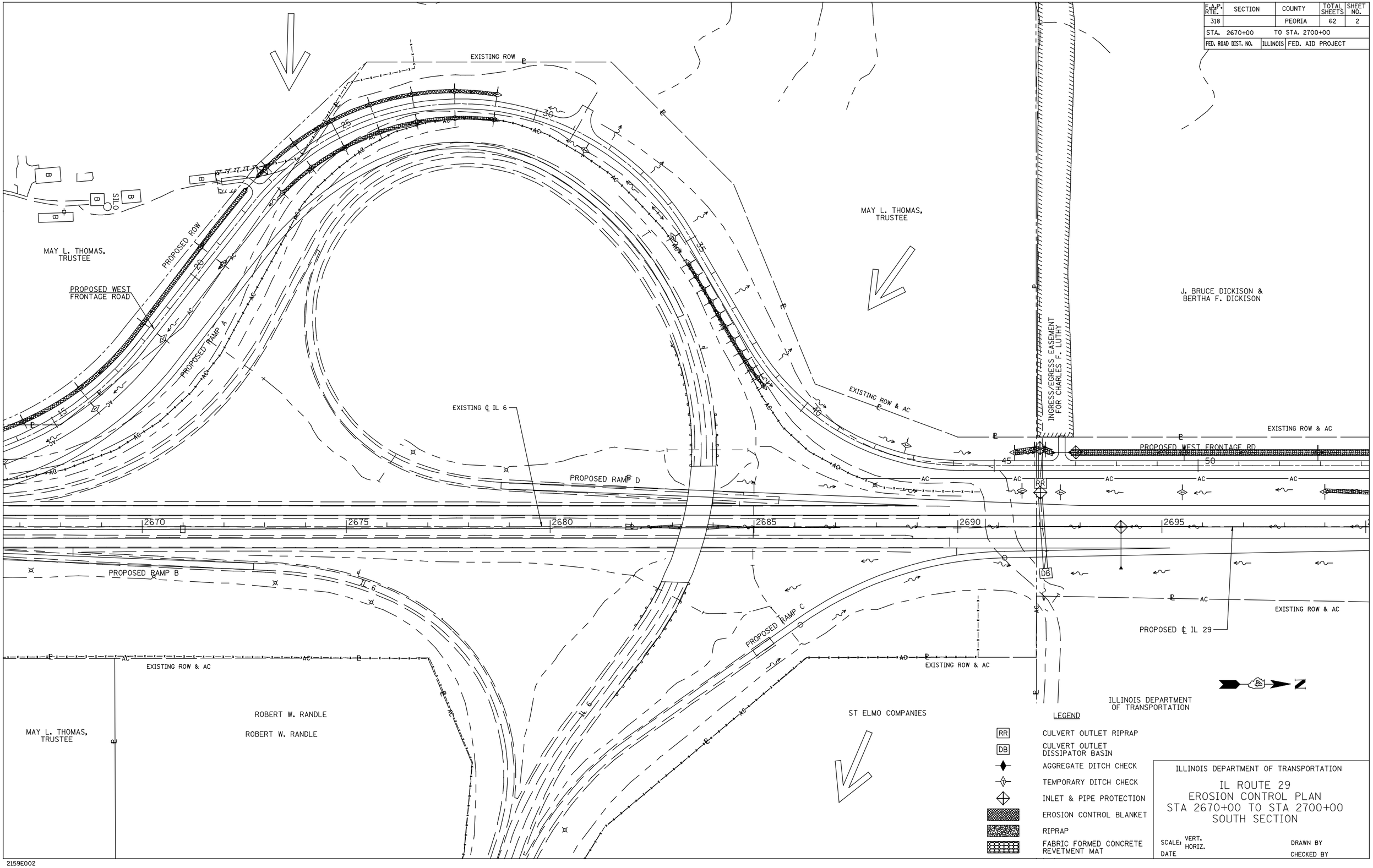

LEGEND

RR	CULVERT OUTLET RIPRAP
DB	CULVERT OUTLET DISSIPATOR BASIN
	AGGREGATE DITCH CHECK
	TEMPORARY DITCH CHECK
	INLET & PIPE PROTECTION
	EROSION CONTROL BLANKET
	RIPRAP
	FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2670+00 TO STA 2700+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE
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2159E002

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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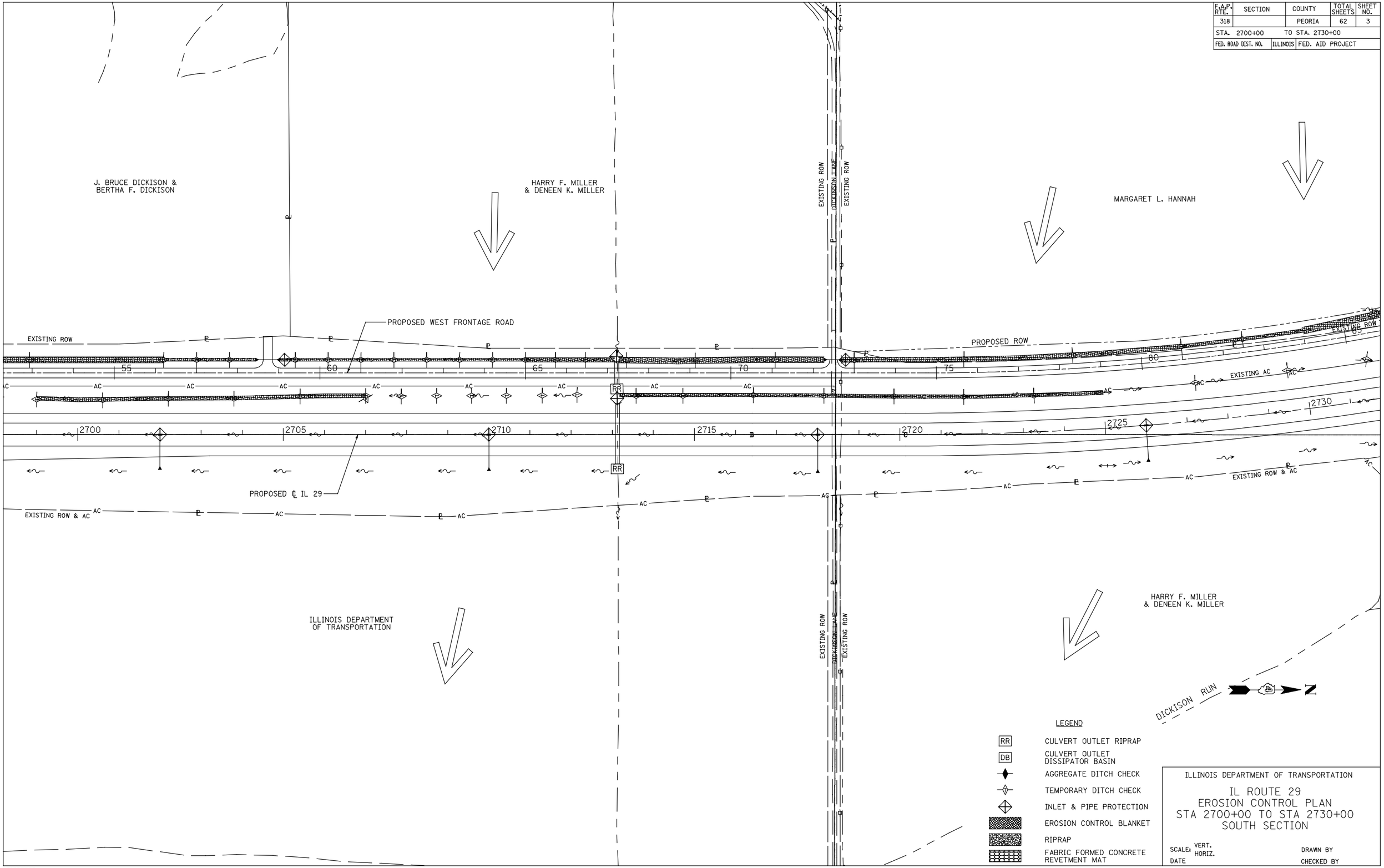

LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2700+00 TO STA 2730+00
SOUTH SECTION

SCALE: VERT. HORIZ.

DATE

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2159E003

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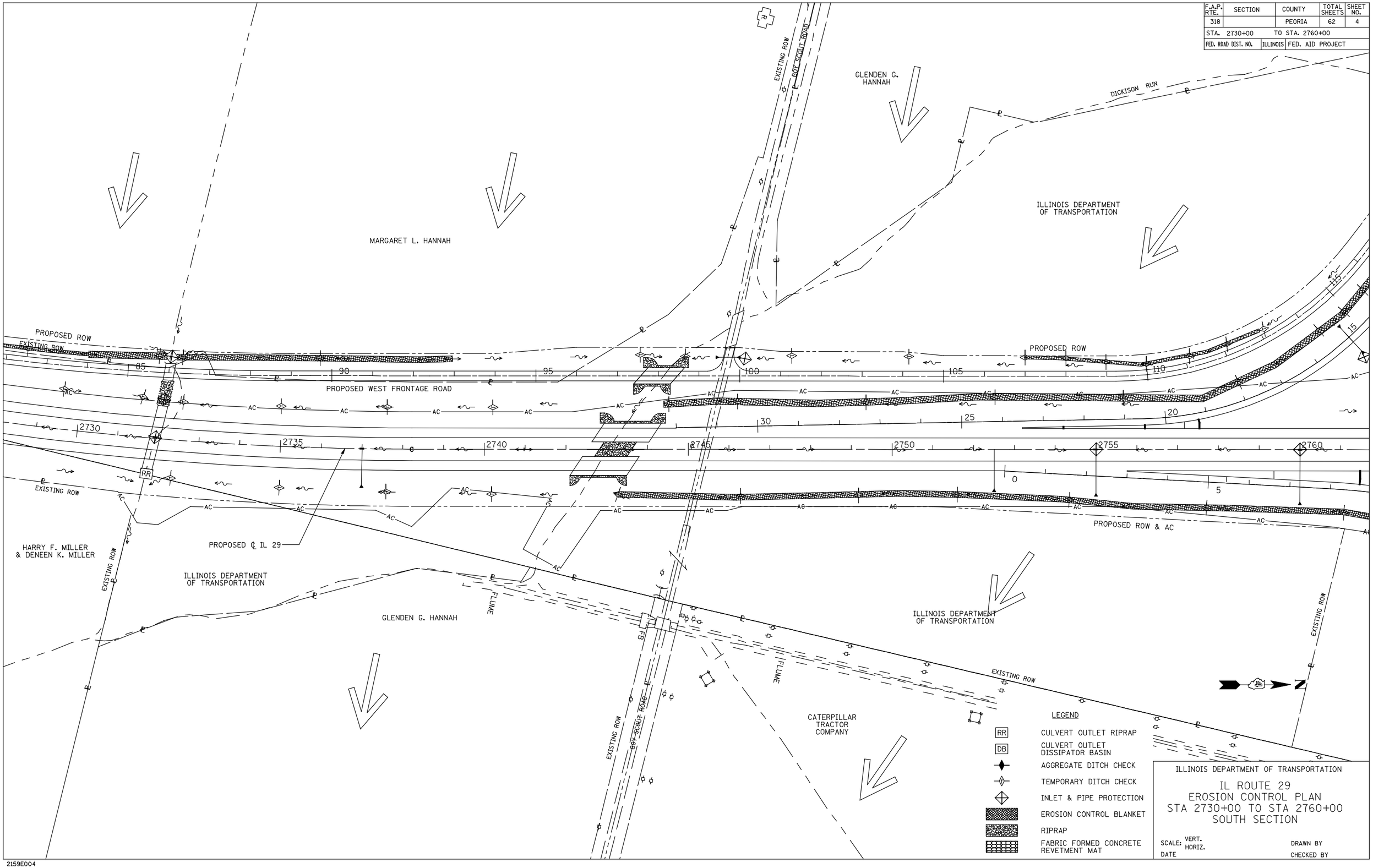

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2730+00 TO STA 2760+00
SOUTH SECTION

SCALE: VERT. HORIZ.
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2159E004

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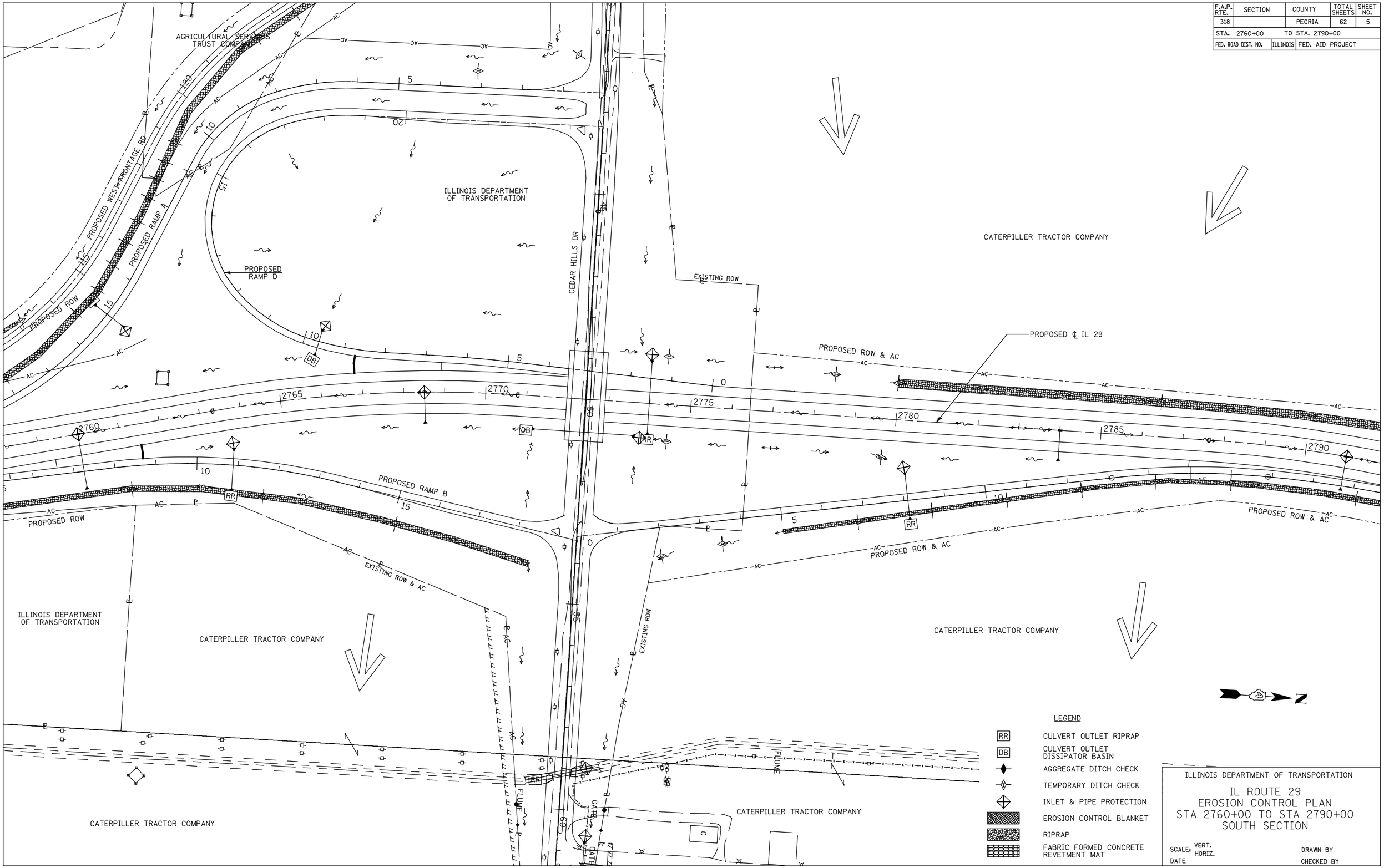

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
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SOUTH SECTION

SCALE: VERT. HORIZ.
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2159E005

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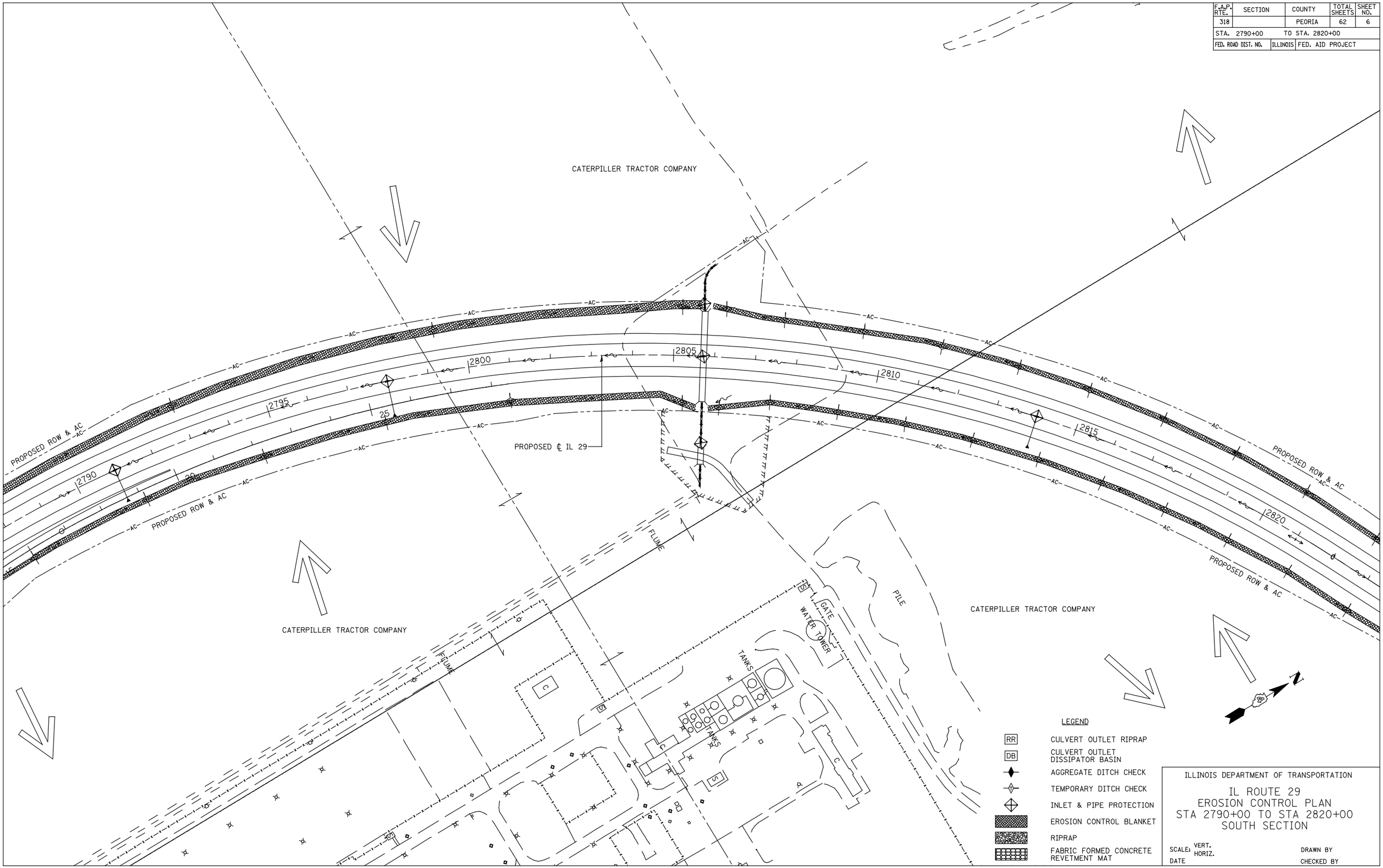

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2790+00 TO STA 2820+00
SOUTH SECTION

SCALE: VERT.
HORIZ.
DATE

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2159E006

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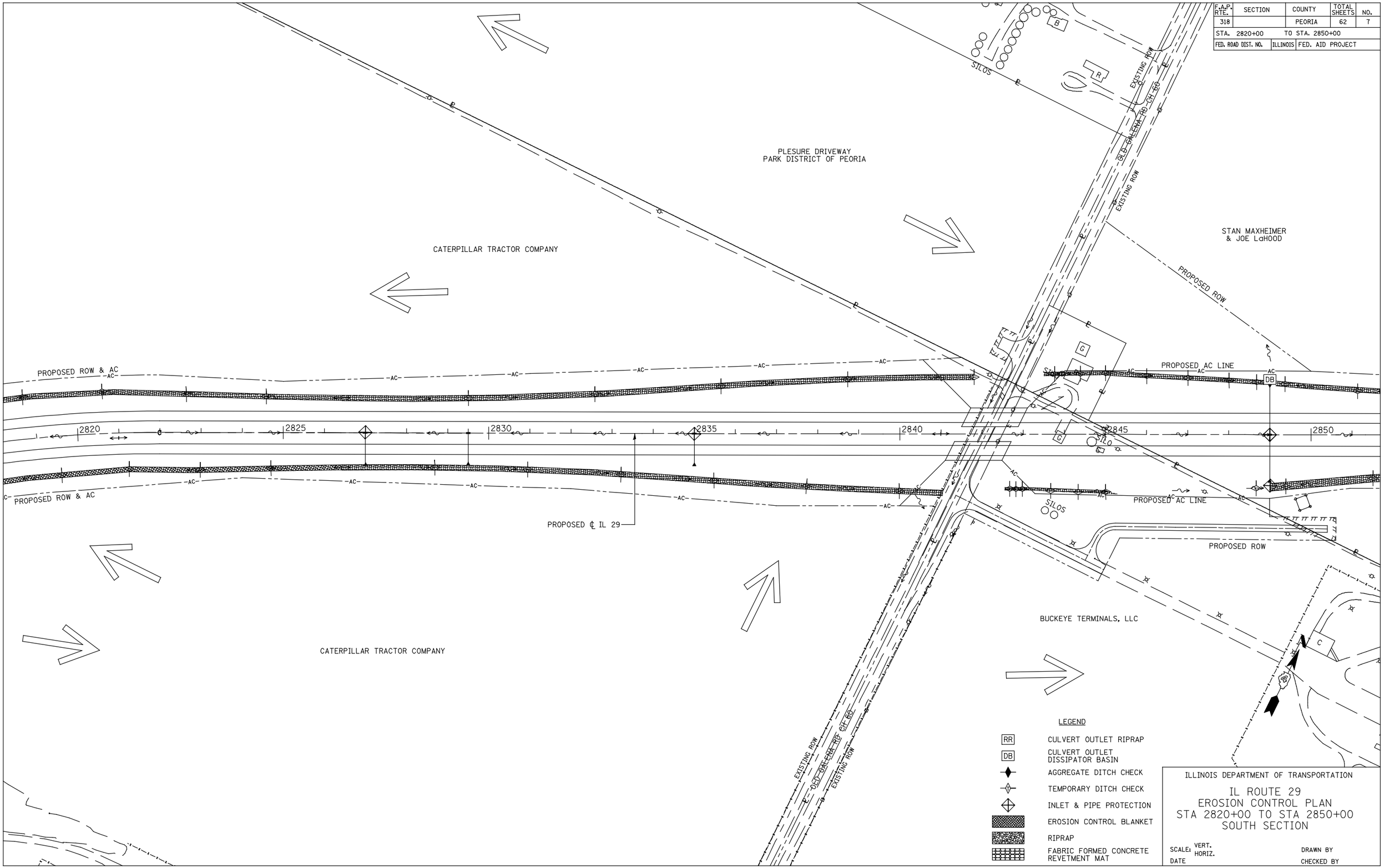

2159E007

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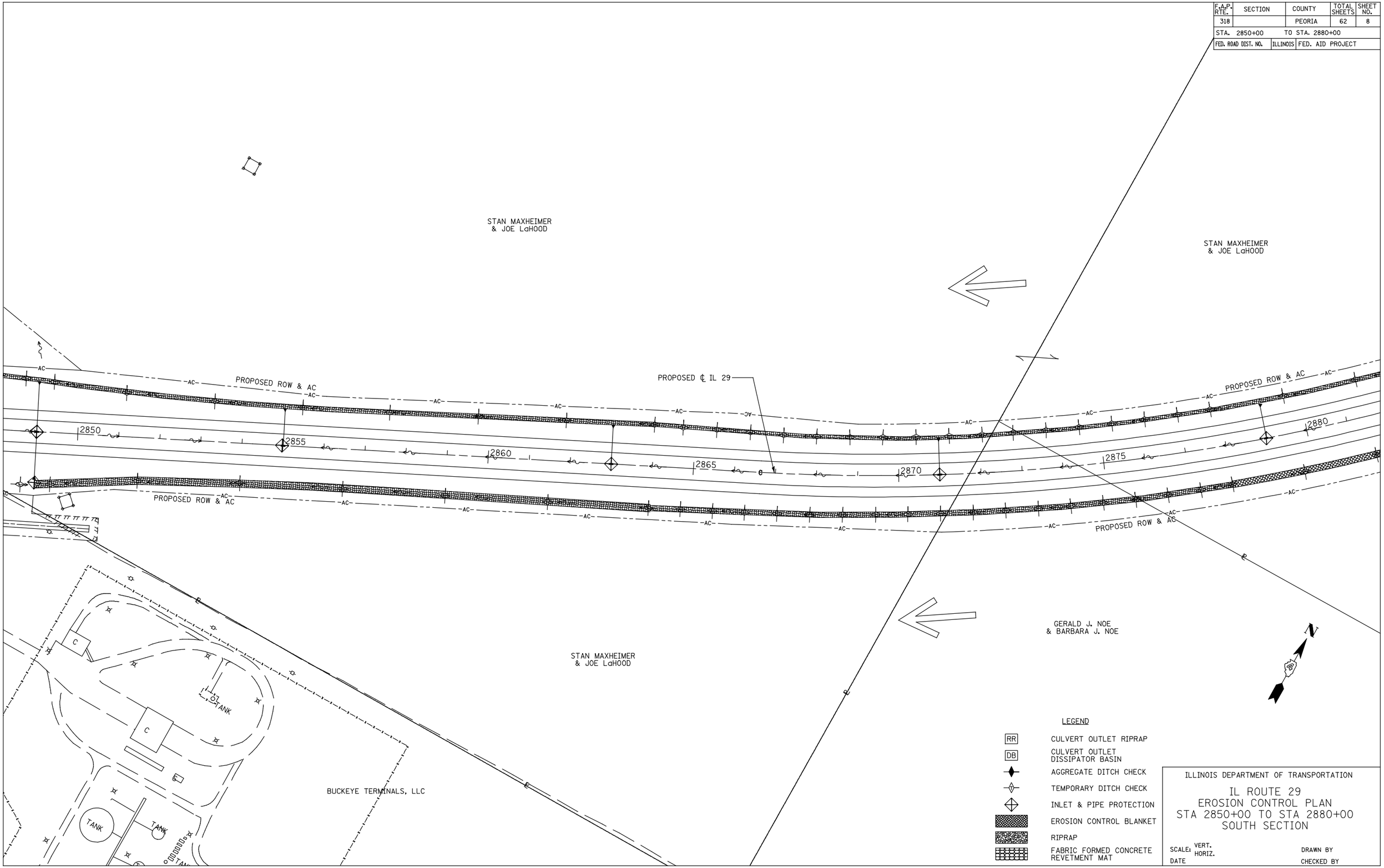

2159E008

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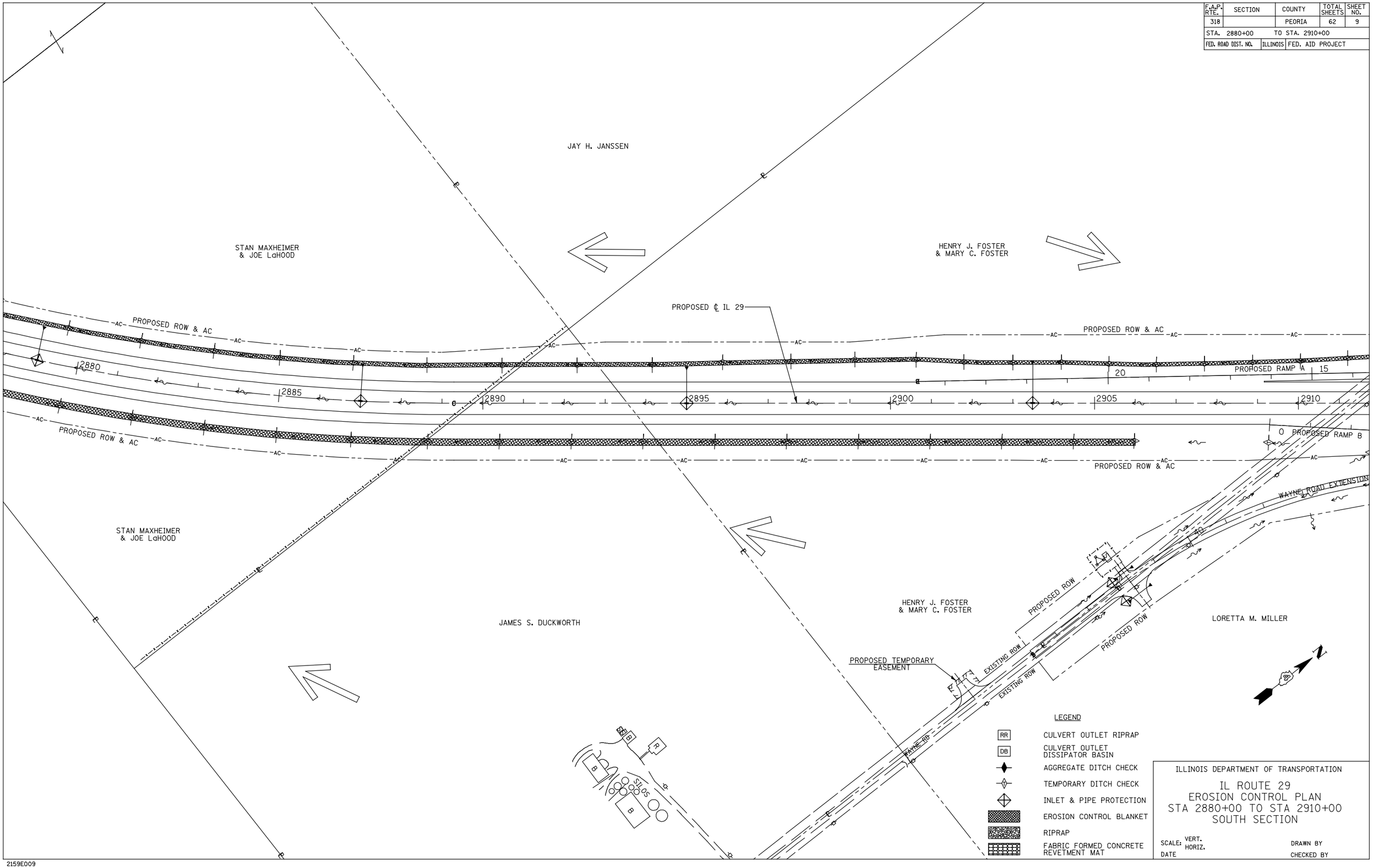

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2880+00 TO STA 2910+00
SOUTH SECTION

SCALE: VERT. HORIZ.
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2159E009

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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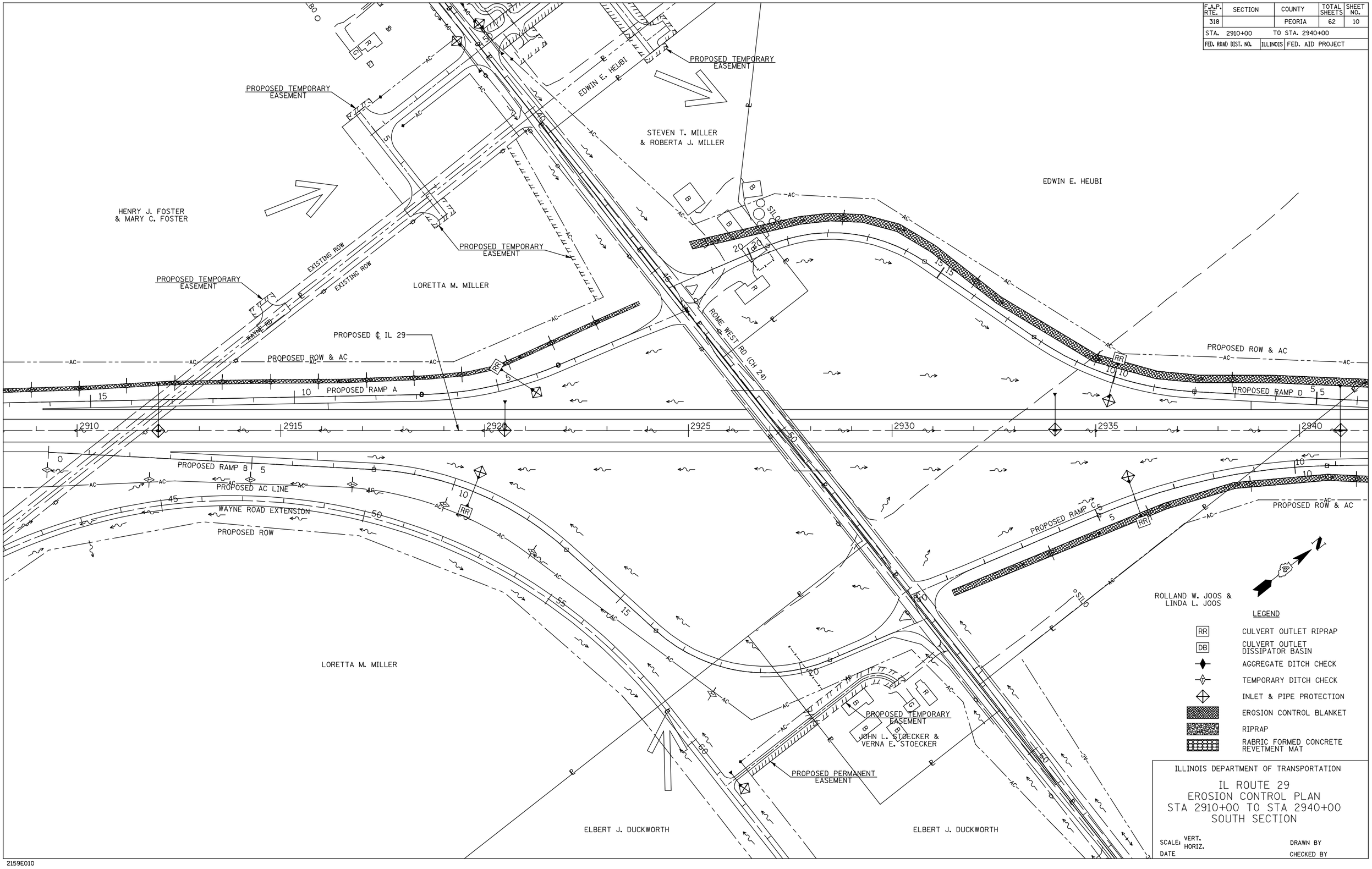

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2910+00 TO STA 2940+00
SOUTH SECTION

SCALE: VERT. HORIZ.

DATE

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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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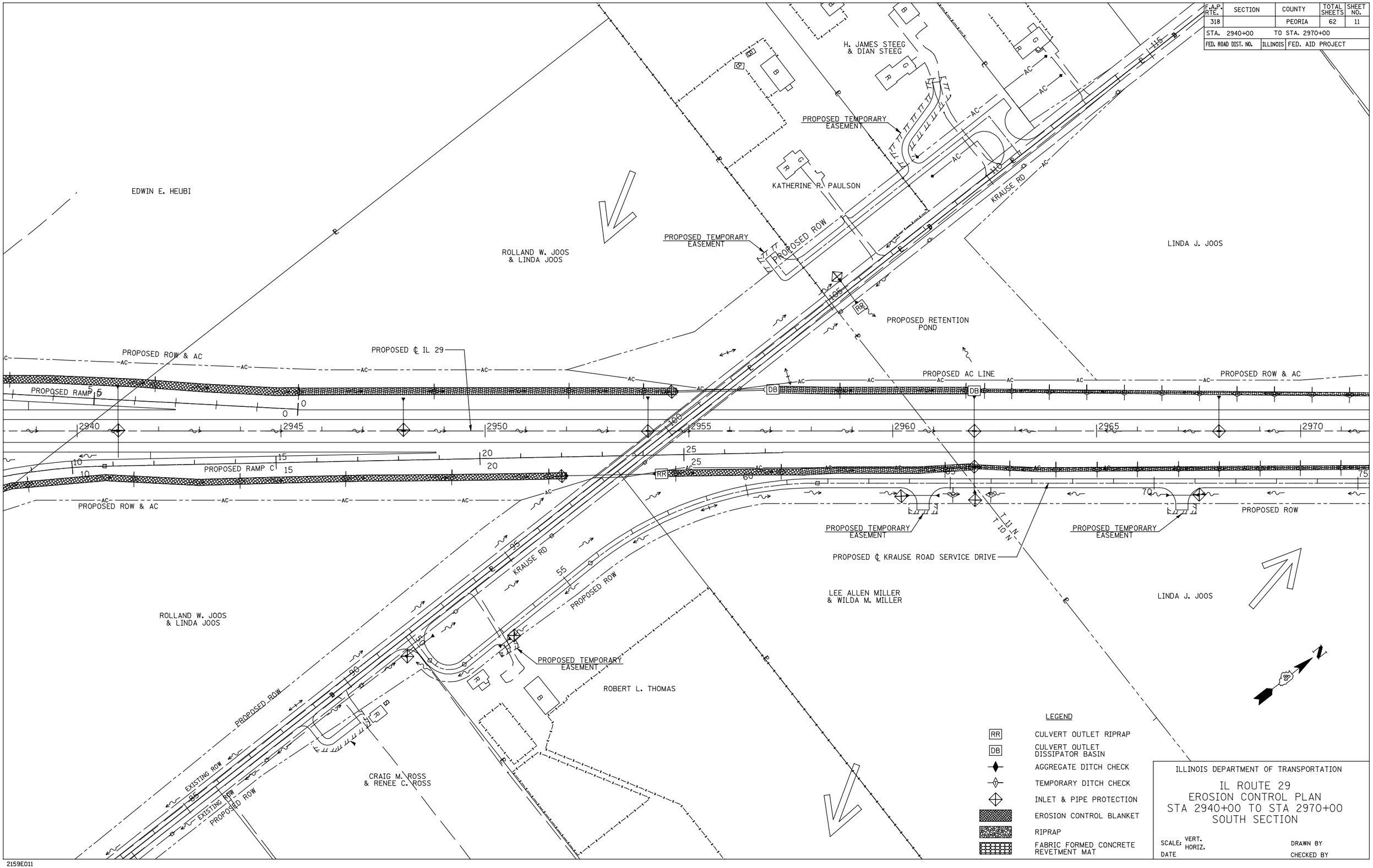

2159E011

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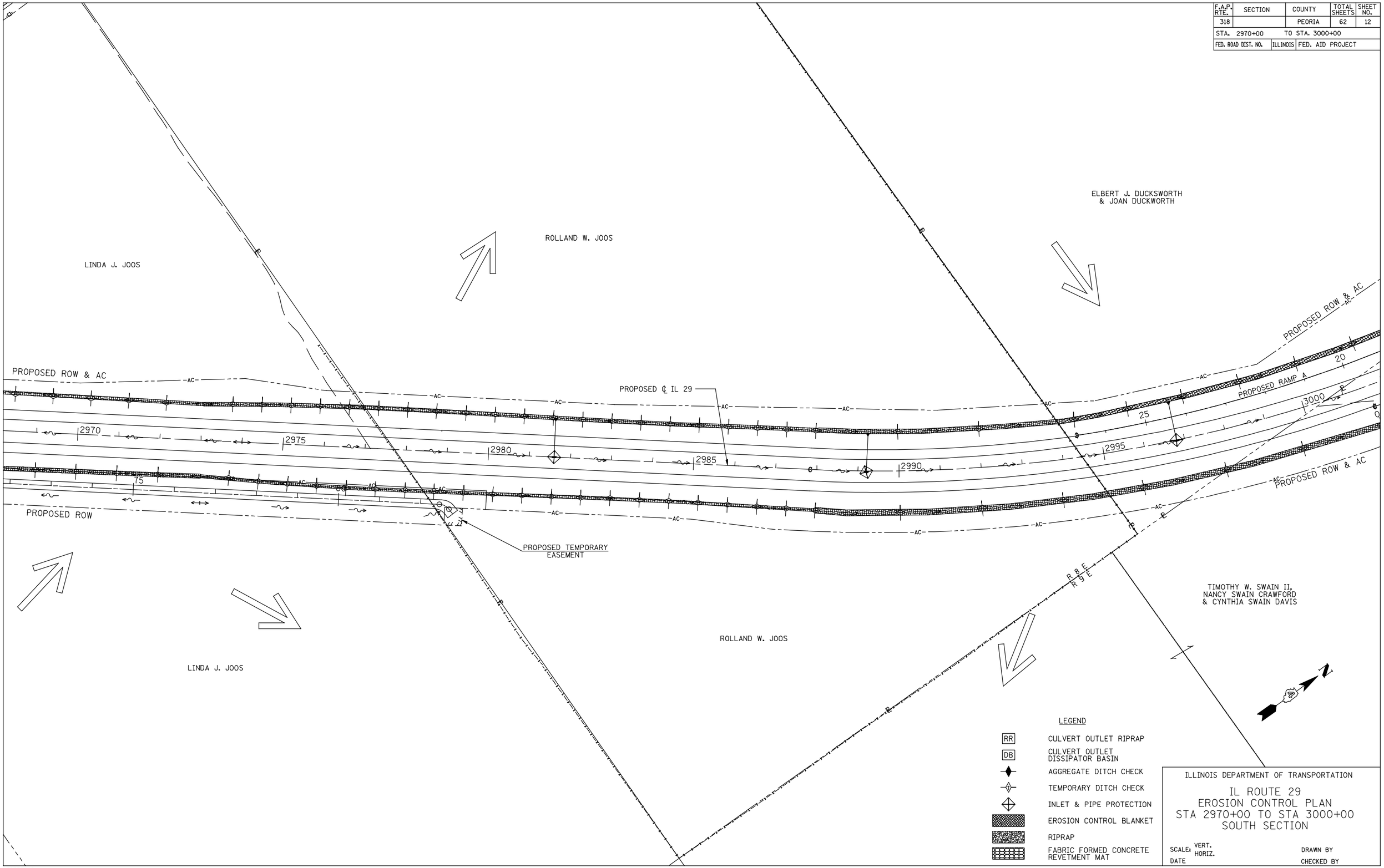

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 2970+00 TO STA 3000+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE
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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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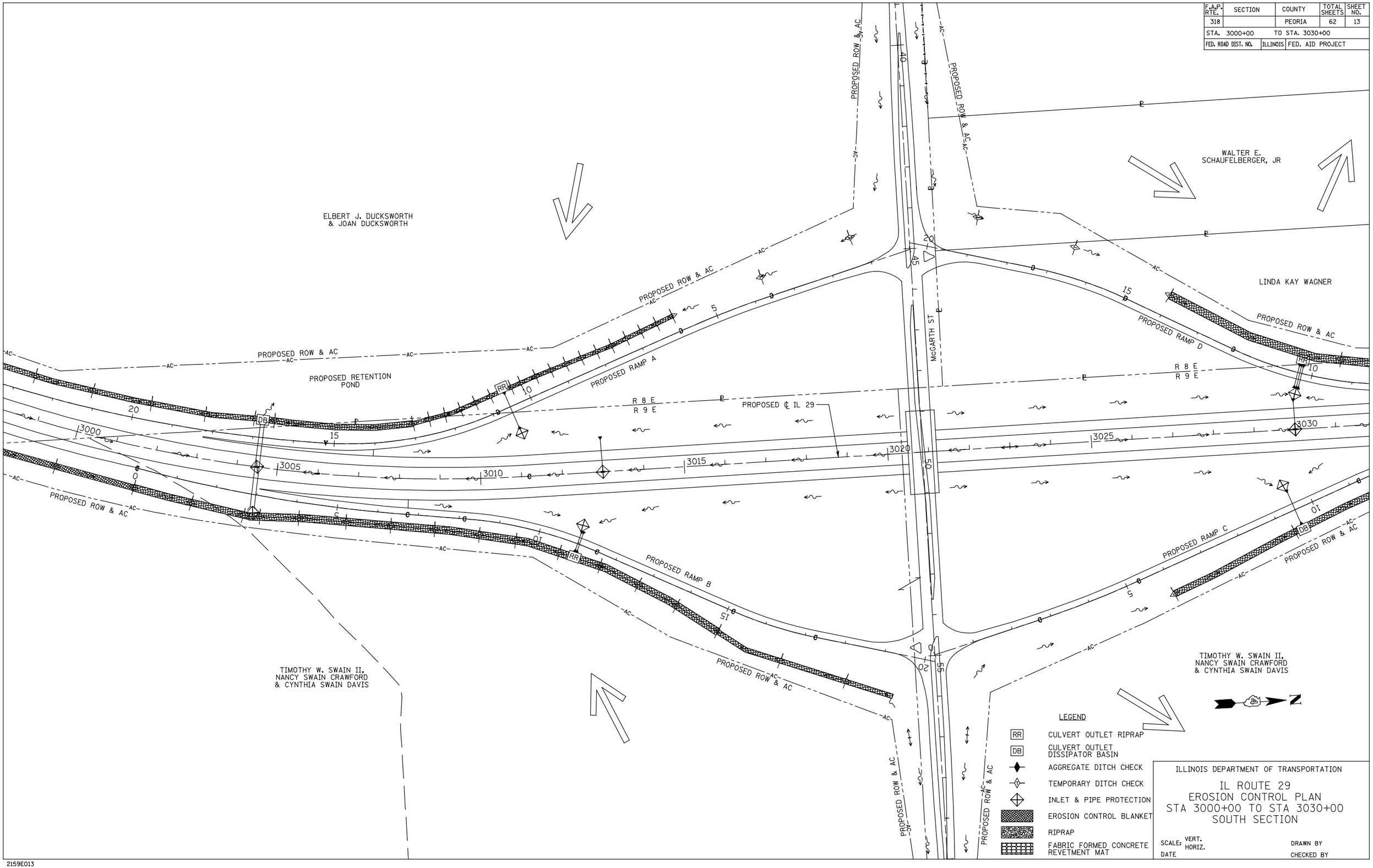

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3000+00 TO STA 3030+00
SOUTH SECTION

SCALE: VERT.
HORIZ.
DATE

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2159E013

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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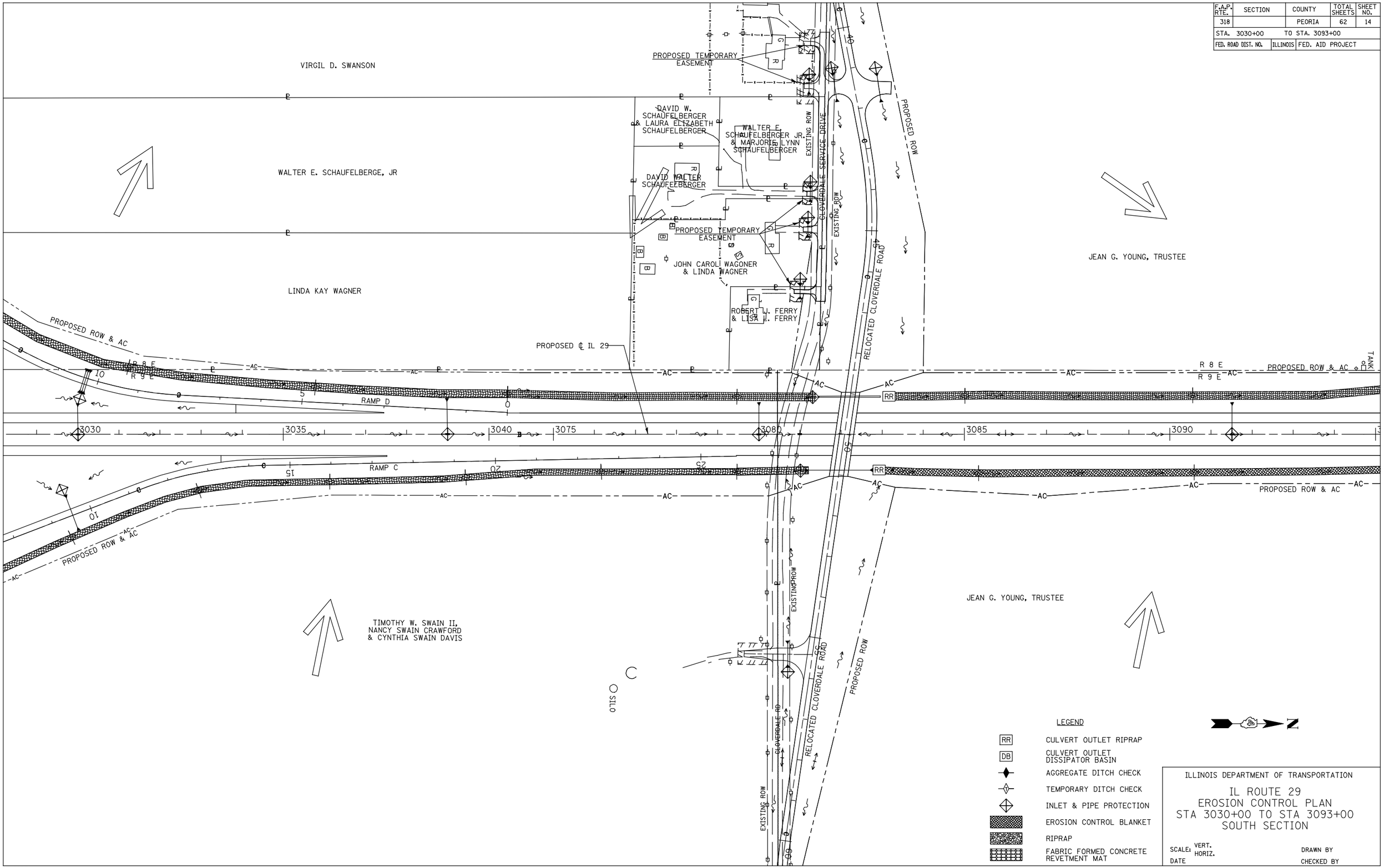
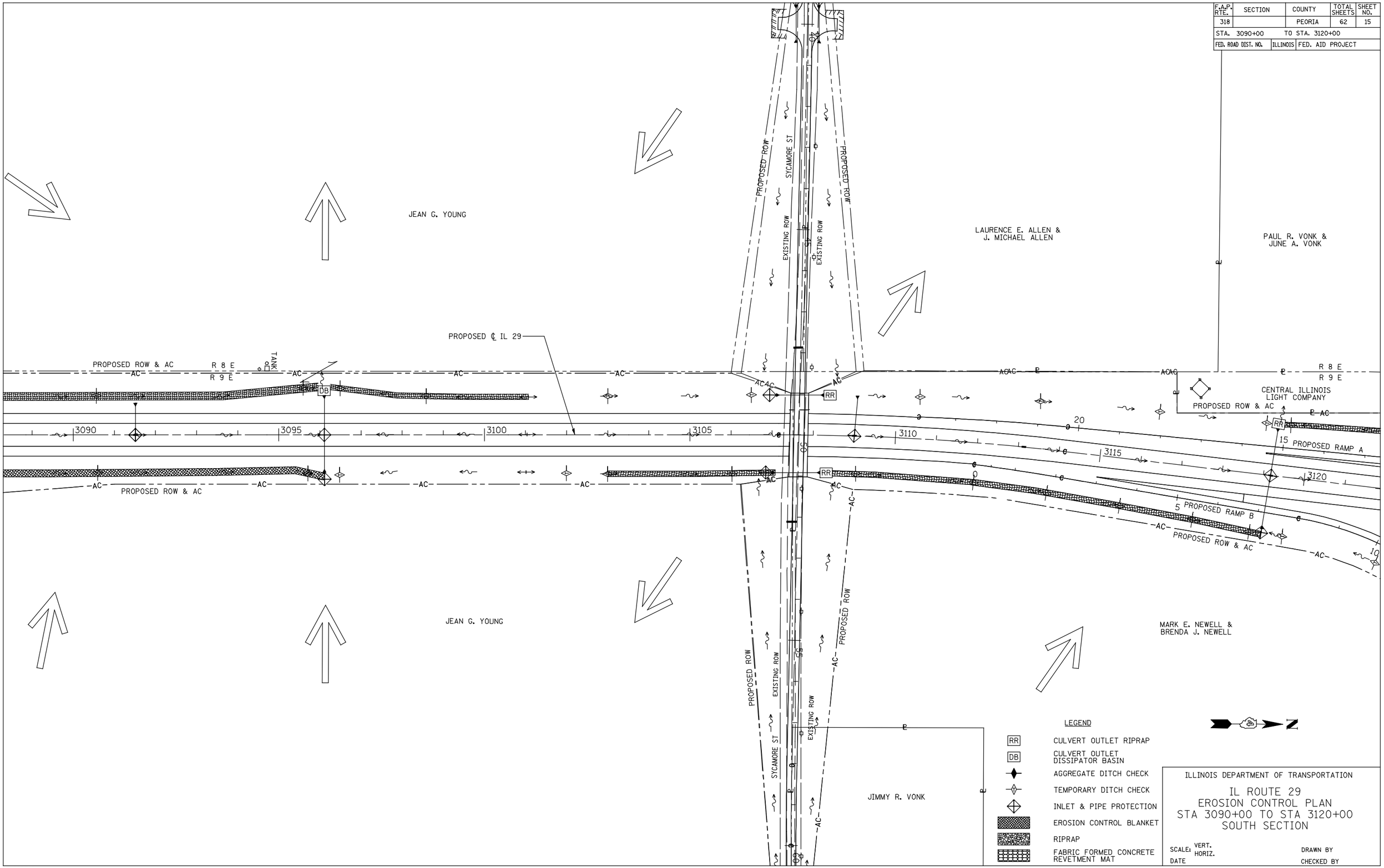
STA. 3030+00		TO STA. 3093+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



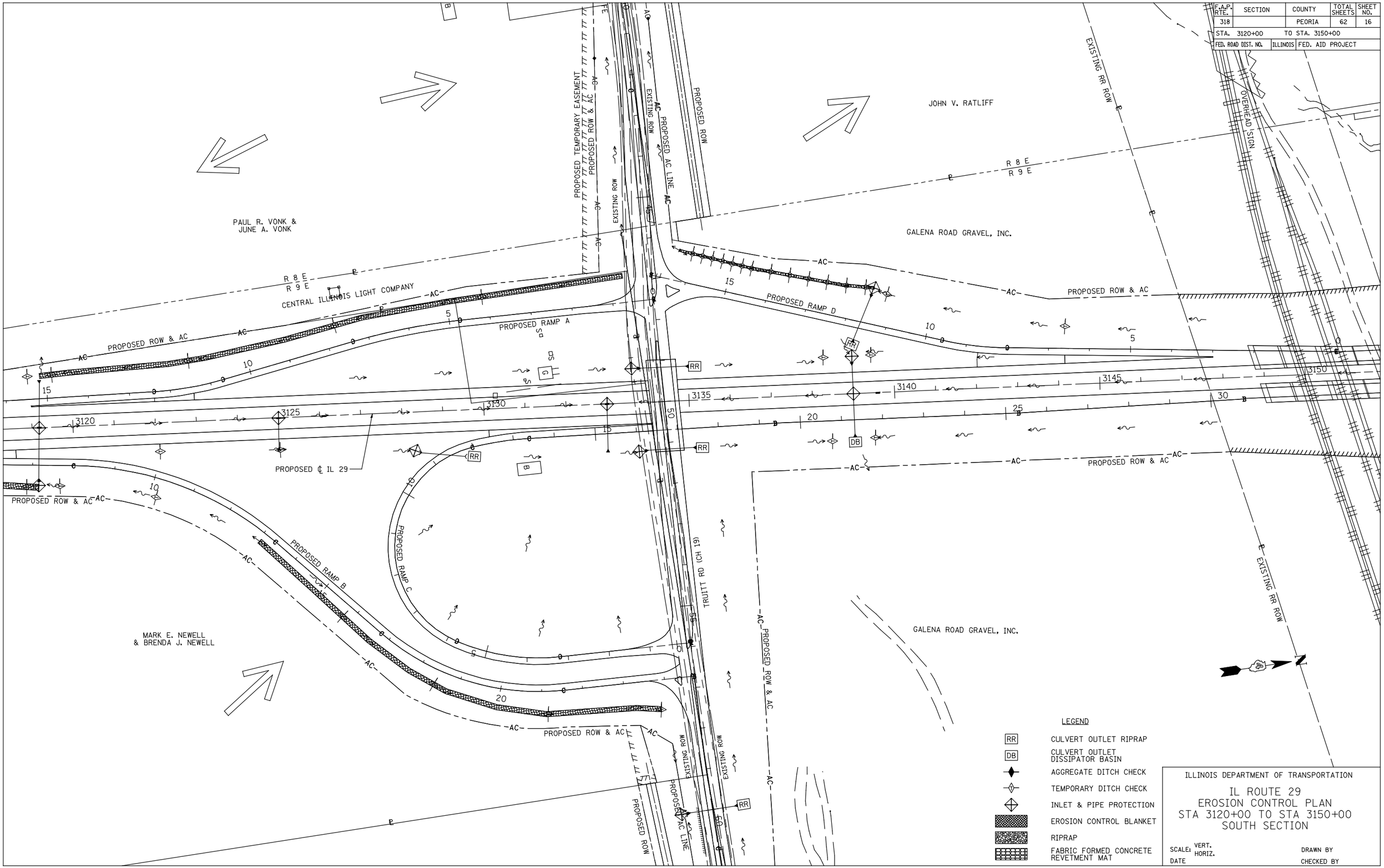
2159E014

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	15
STA. 3090+00		TO STA. 3120+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2159E015

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	16
STA. 3120+00		TO STA. 3150+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3120+00 TO STA 3150+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
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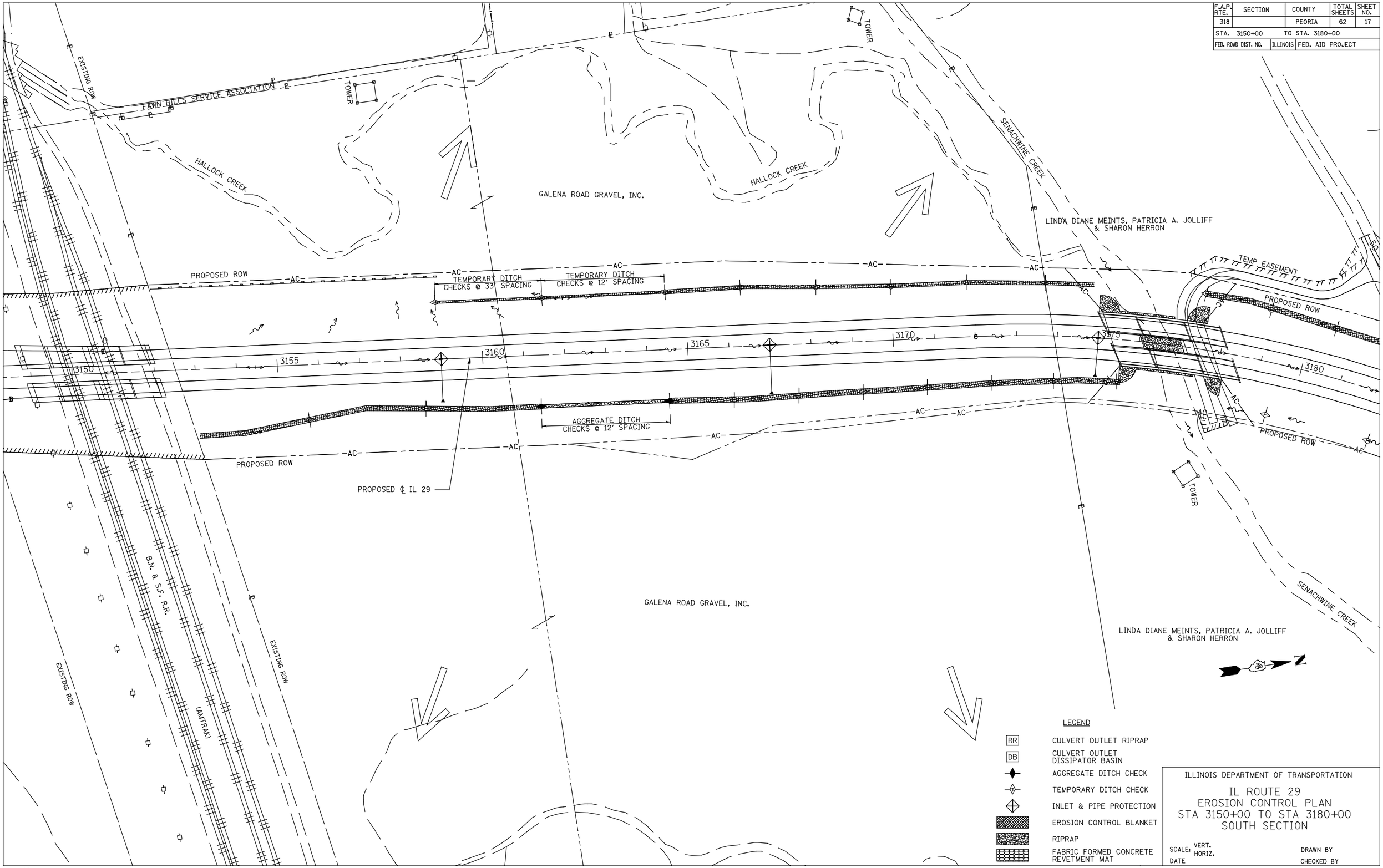
2159E016

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	17
STA. 3150+00		TO STA. 3180+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

RR	CULVERT OUTLET RIPRAP
DB	CULVERT OUTLET DISSIPATOR BASIN
	AGGREGATE DITCH CHECK
	TEMPORARY DITCH CHECK
	INLET & PIPE PROTECTION
	EROSION CONTROL BLANKET
	RIPRAP
	FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3150+00 TO STA 3180+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
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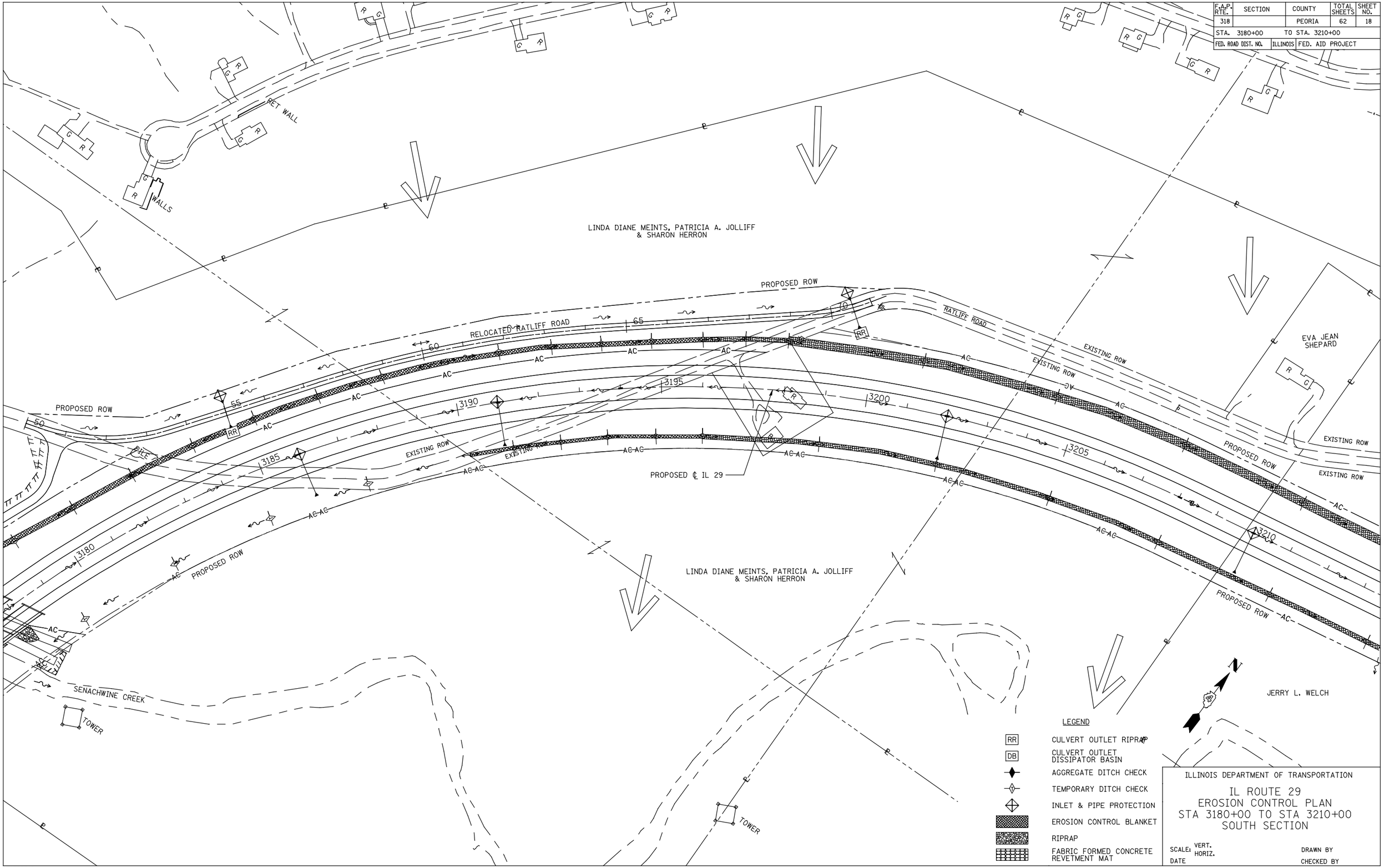
2159E017

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	18
STA. 3180+00		TO STA. 3210+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

RR	CULVERT OUTLET RIPRAP
DB	CULVERT OUTLET DISSIPATOR BASIN
	AGGREGATE DITCH CHECK
	TEMPORARY DITCH CHECK
	INLET & PIPE PROTECTION
	EROSION CONTROL BLANKET
	RIPRAP
	FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3180+00 TO STA 3210+00
SOUTH SECTION

SCALE: VERT. HORIZ.

DATE

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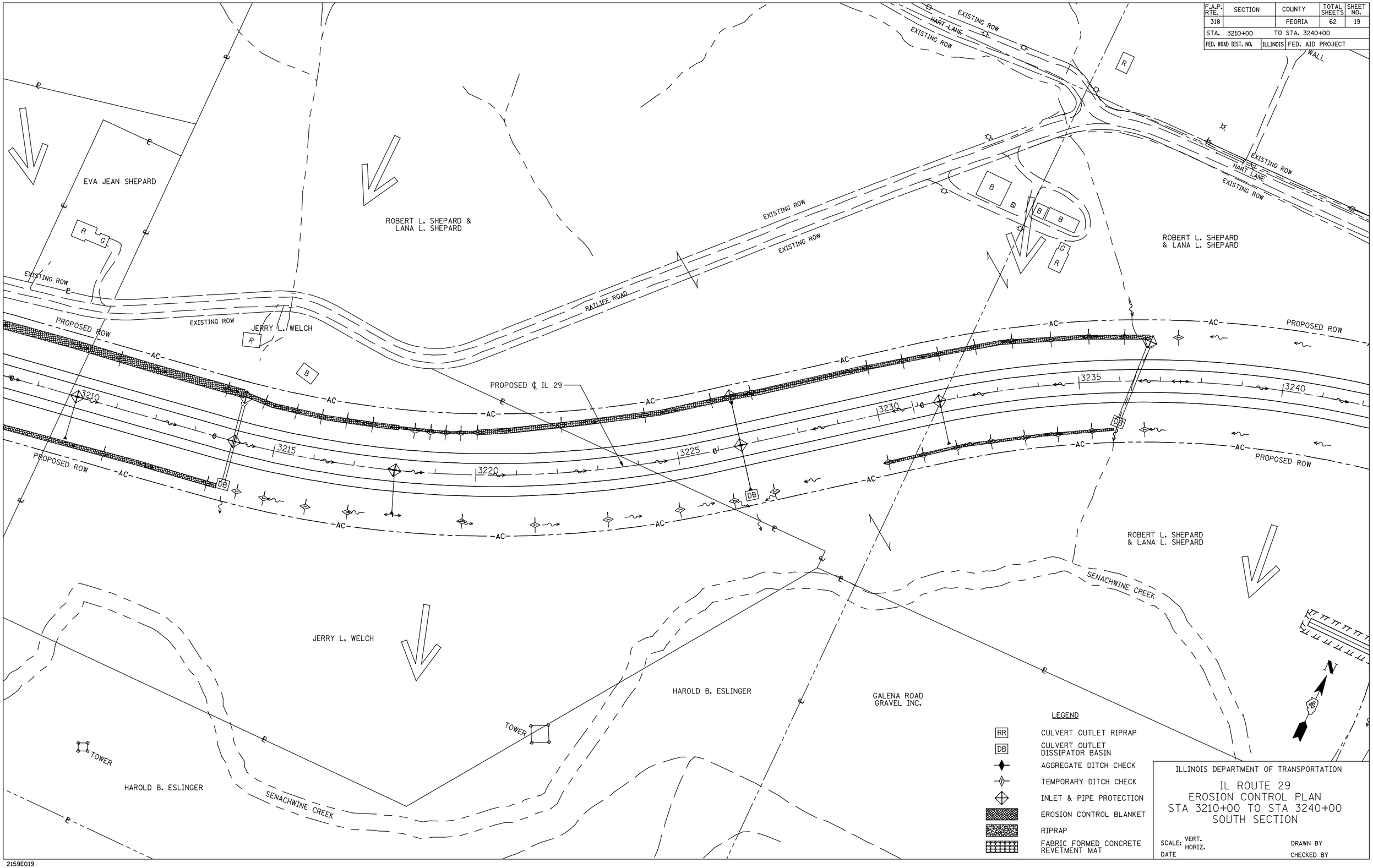
2159E018

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	19
STA. 3210+00		TO STA. 3240+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3210+00 TO STA 3240+00
SOUTH SECTION

SCALE: VERT. HORIZ.
DATE
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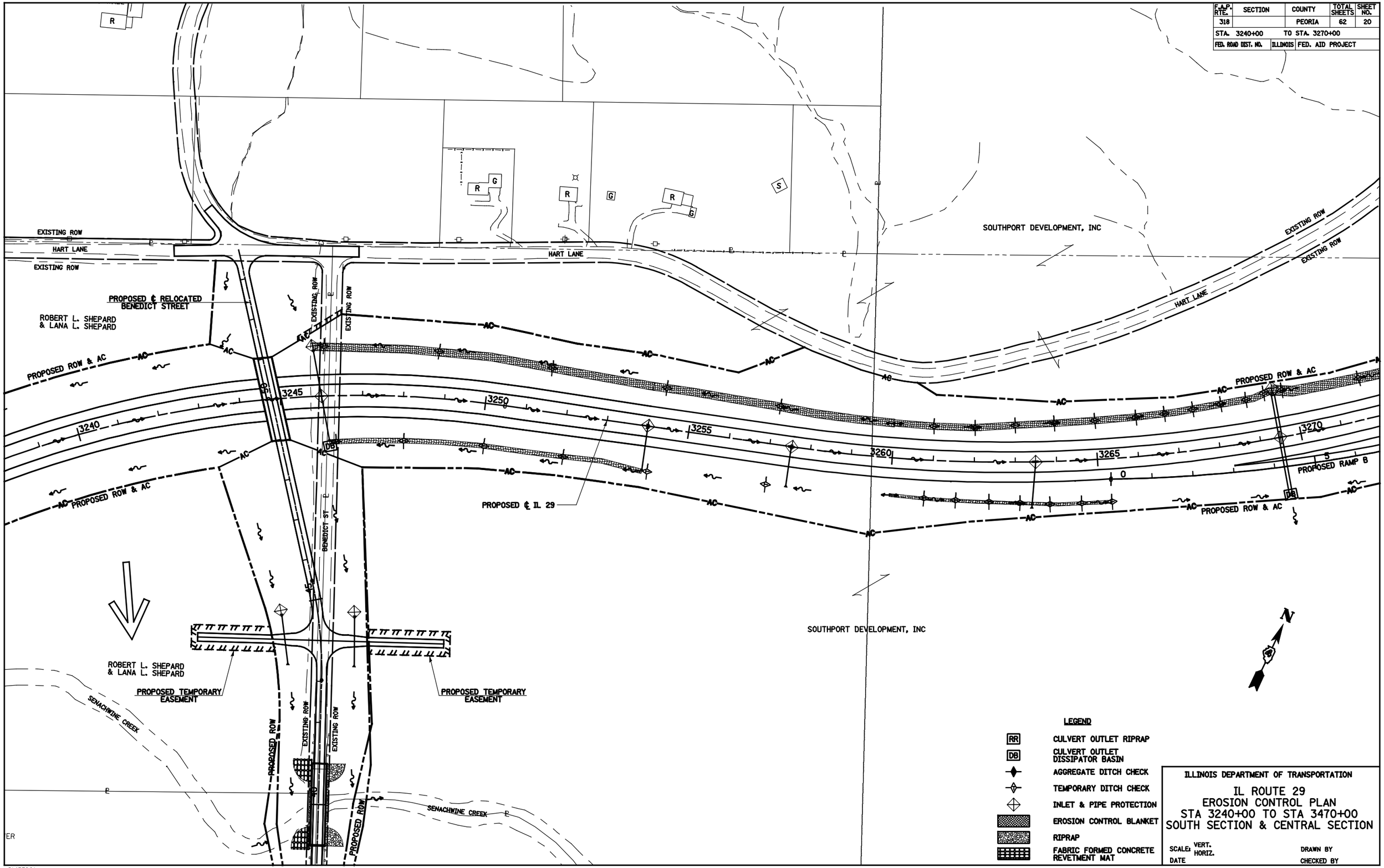
2159E019

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	20
STA. 3240+00		TO STA. 3270+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3240+00 TO STA 3470+00
SOUTH SECTION & CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
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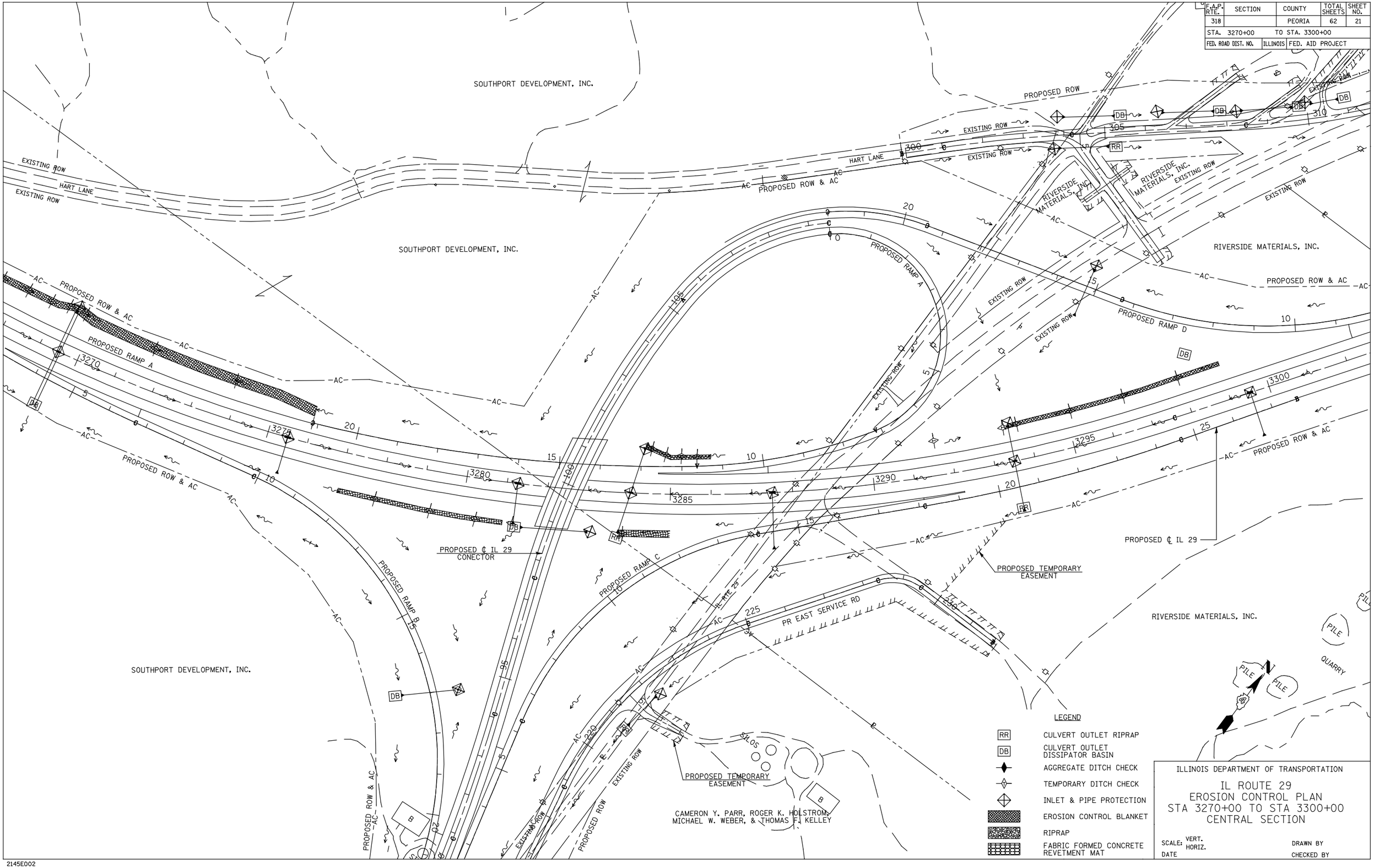
2145E001

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	21
STA. 3270+00		TO STA. 3300+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3270+00 TO STA 3300+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
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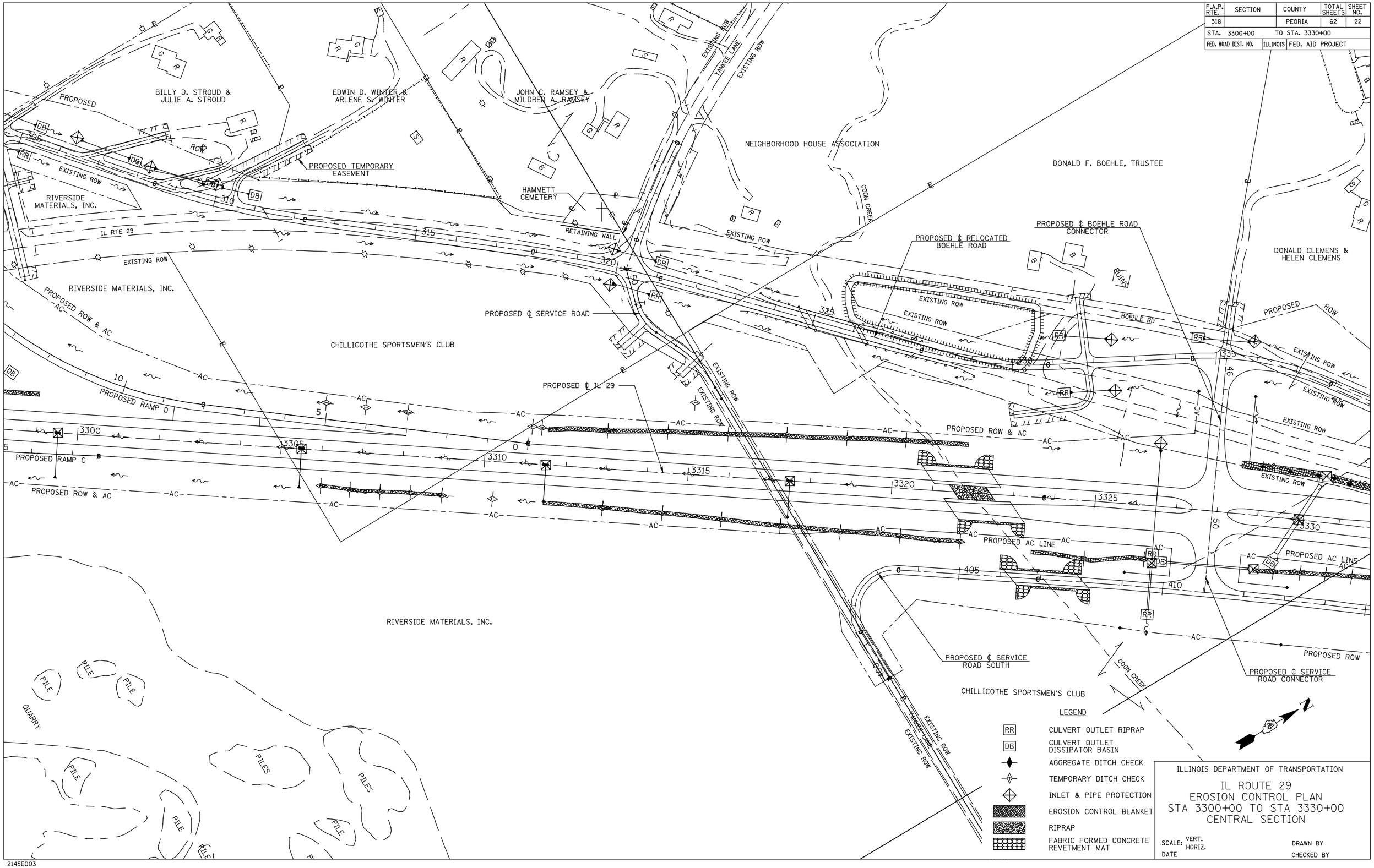
2145E002

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	22
STA. 3300+00		TO STA. 3330+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



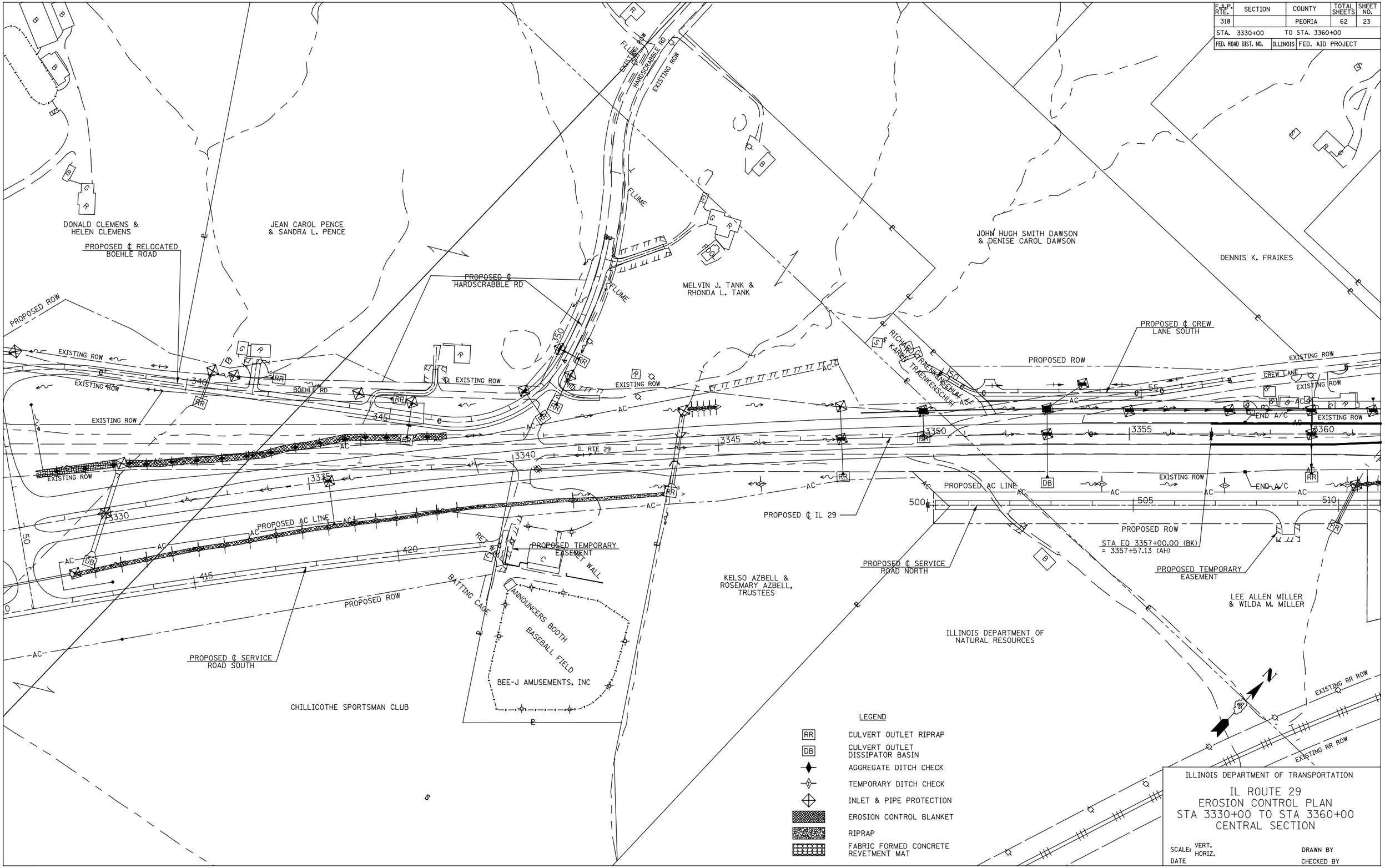
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3300+00 TO STA 3330+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

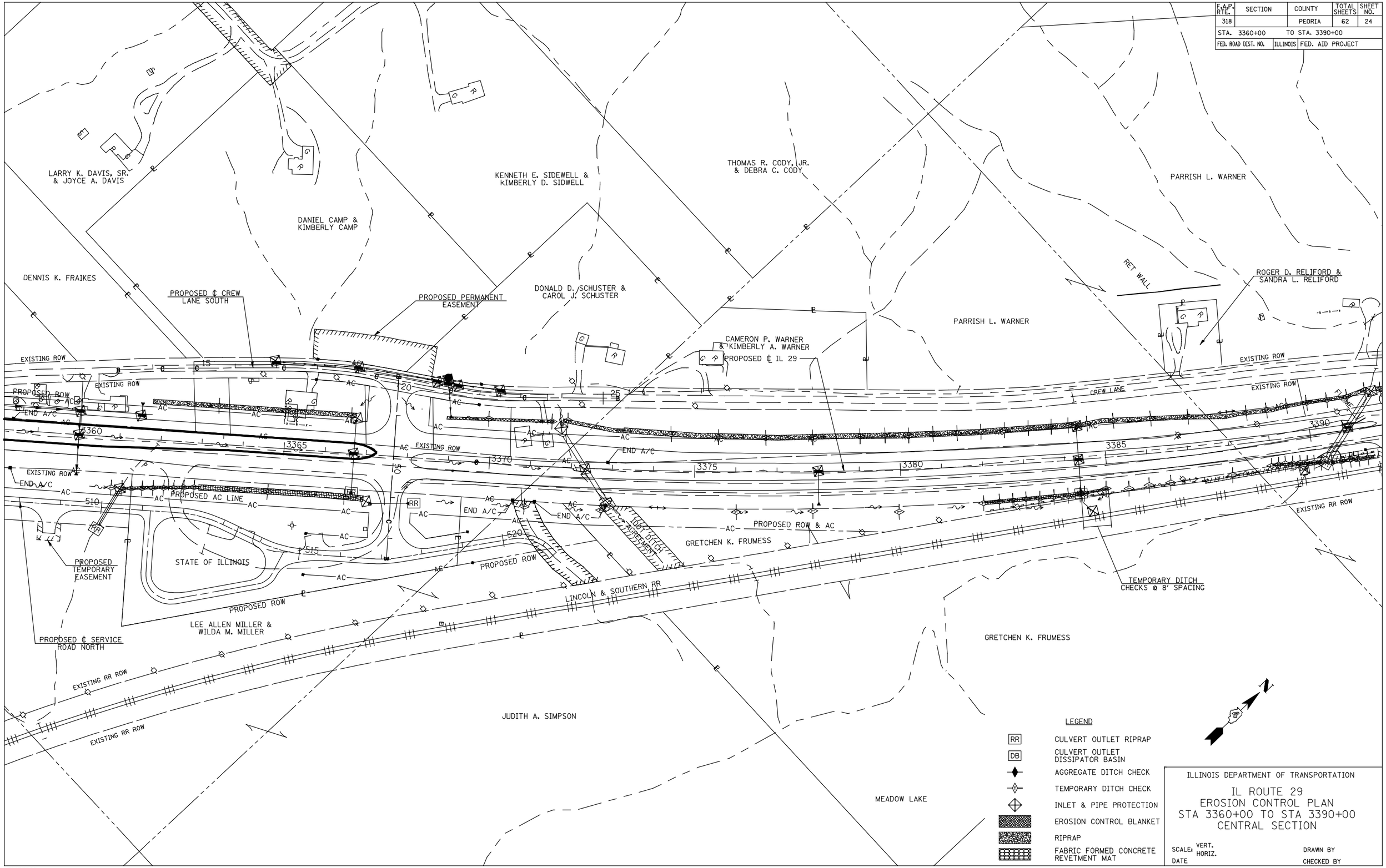
2145E003

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	23
STA. 3330+00		TO STA. 3360+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E004

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	24
STA. 3360+00		TO STA. 3390+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



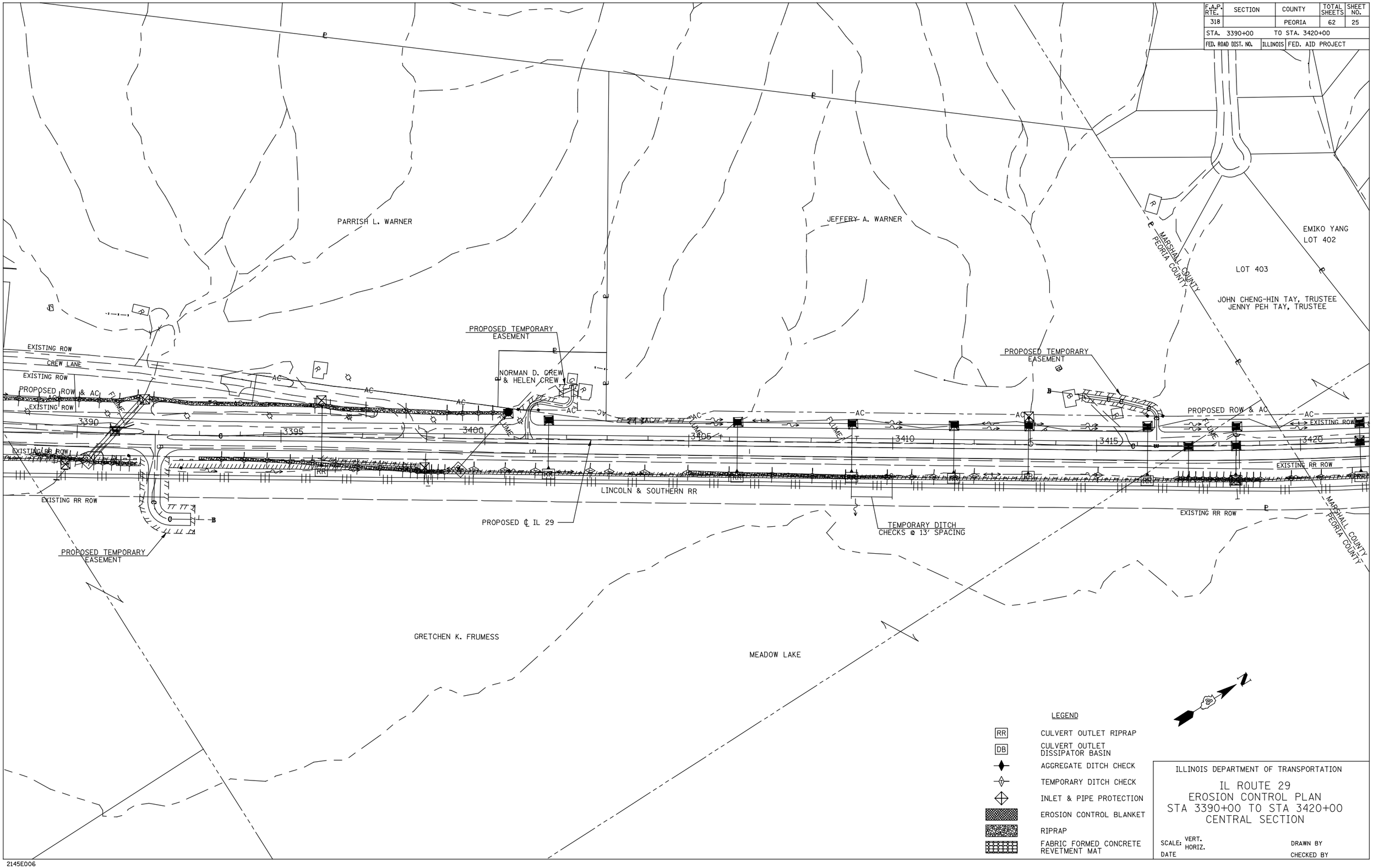
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3360+00 TO STA 3390+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E005

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PEORIA	62	25
STA. 3390+00		TO STA. 3420+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



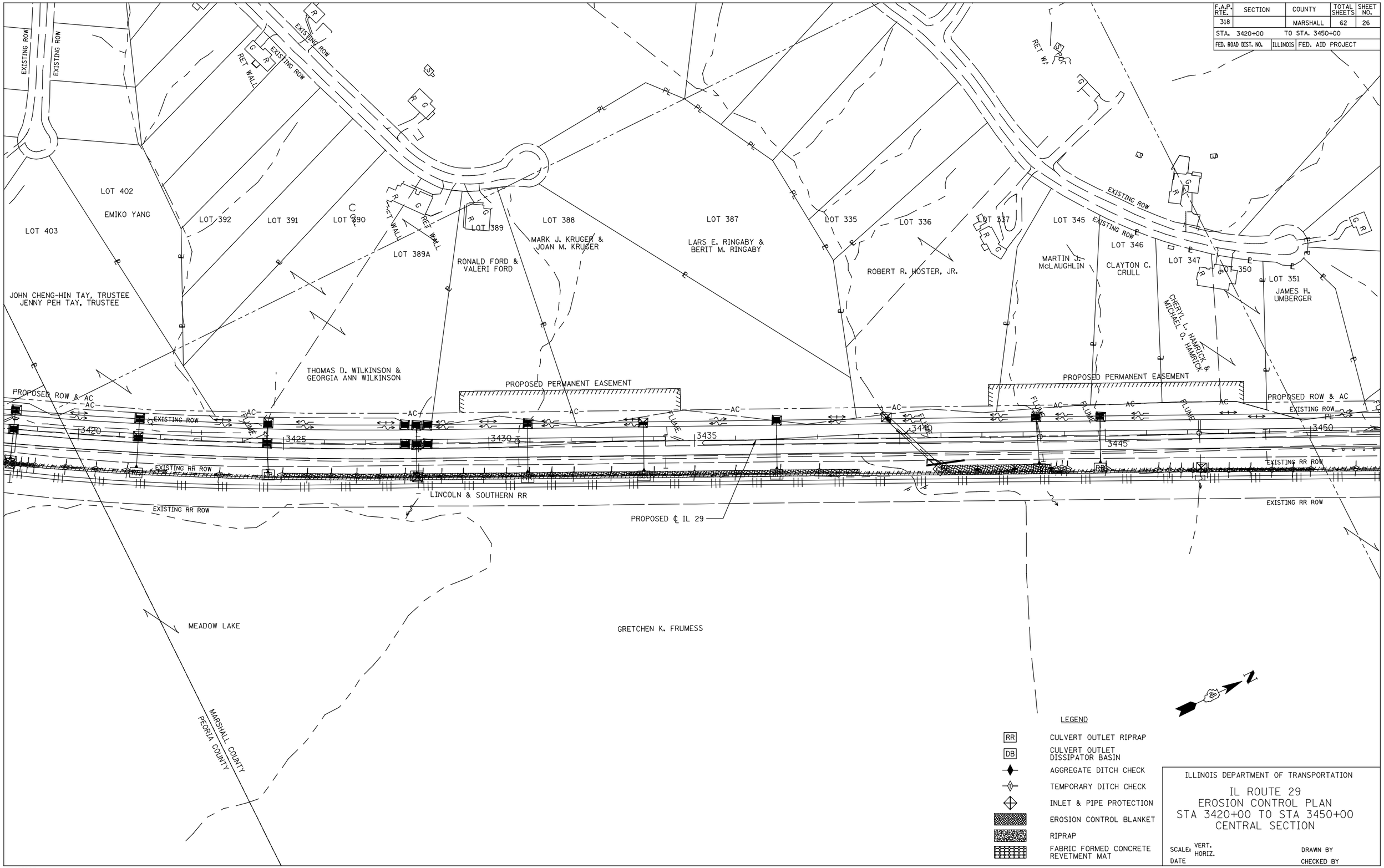
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3390+00 TO STA 3420+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E006

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	26
STA. 3420+00		TO STA. 3450+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

RR	CULVERT OUTLET RIPRAP
DB	CULVERT OUTLET DISSIPATOR BASIN
	AGGREGATE DITCH CHECK
	TEMPORARY DITCH CHECK
	INLET & PIPE PROTECTION
	EROSION CONTROL BLANKET
	RIPRAP
	FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3420+00 TO STA 3450+00
CENTRAL SECTION

SCALE: VERT. HORIZ.

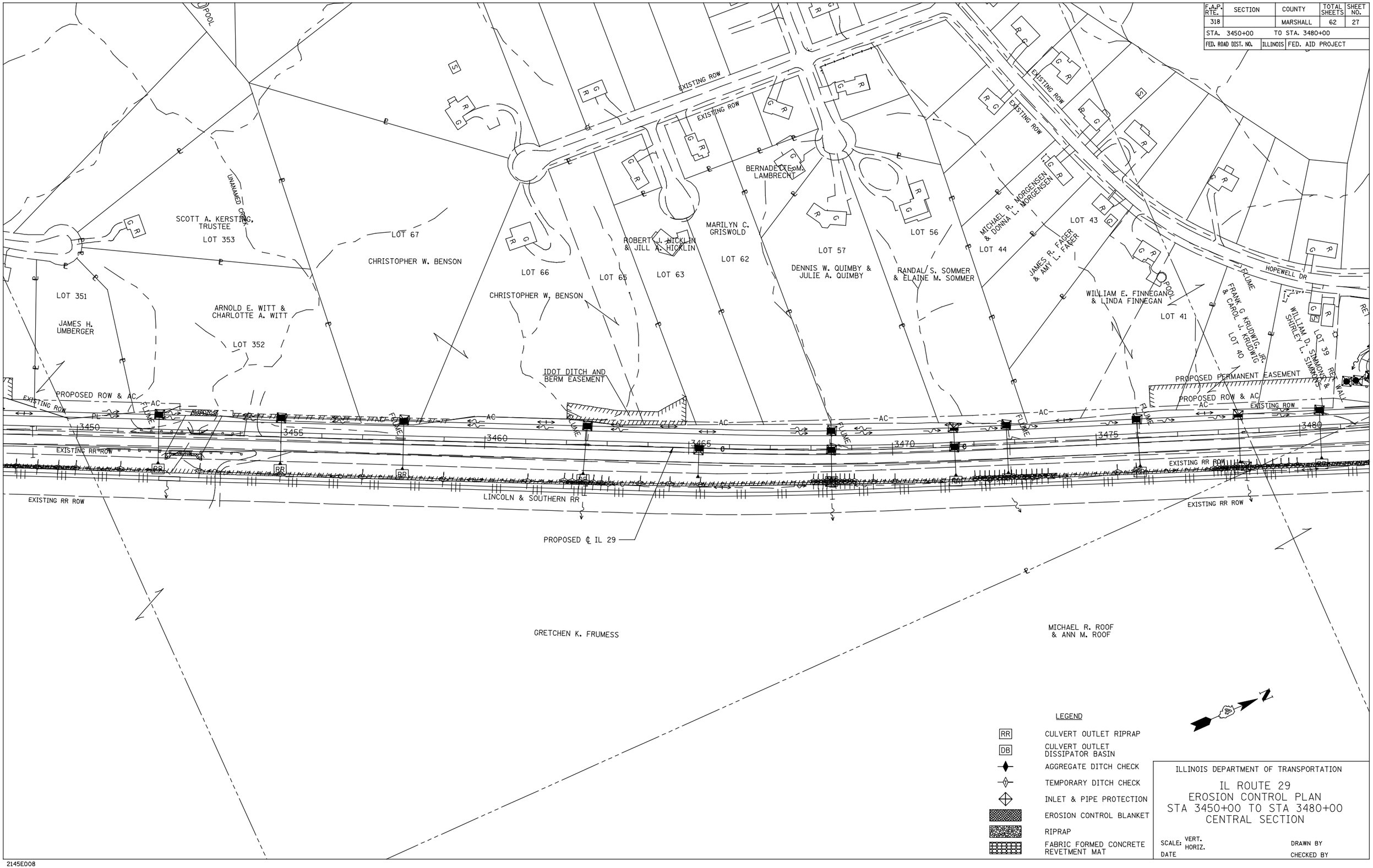
DRAWN BY

DATE

CHECKED BY

2145E007

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	27
STA. 3450+00		TO STA. 3480+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



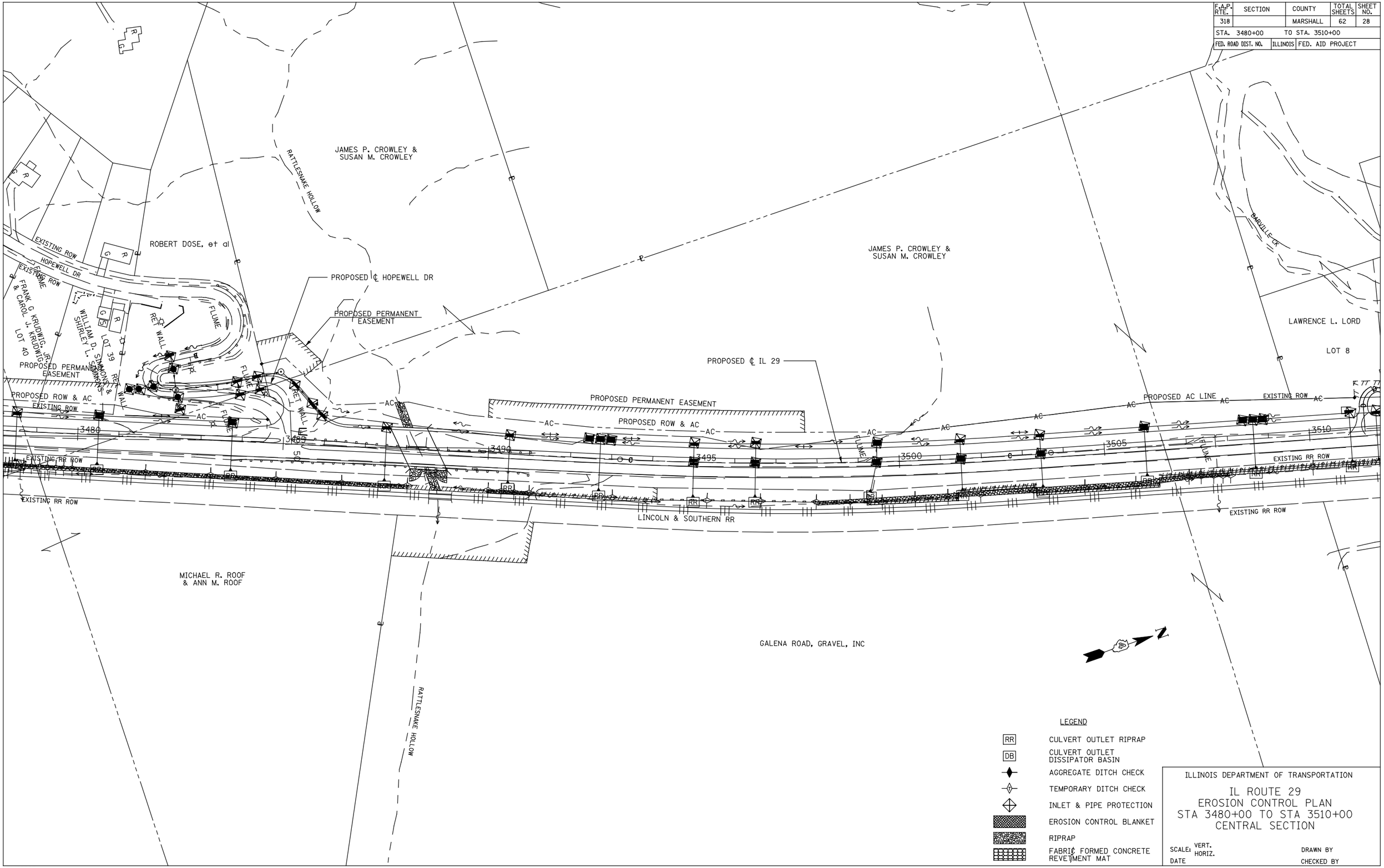
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3450+00 TO STA 3480+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DRAWN BY
DATE
CHECKED BY

2145E008

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	28
STA. 3480+00		TO STA. 3510+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



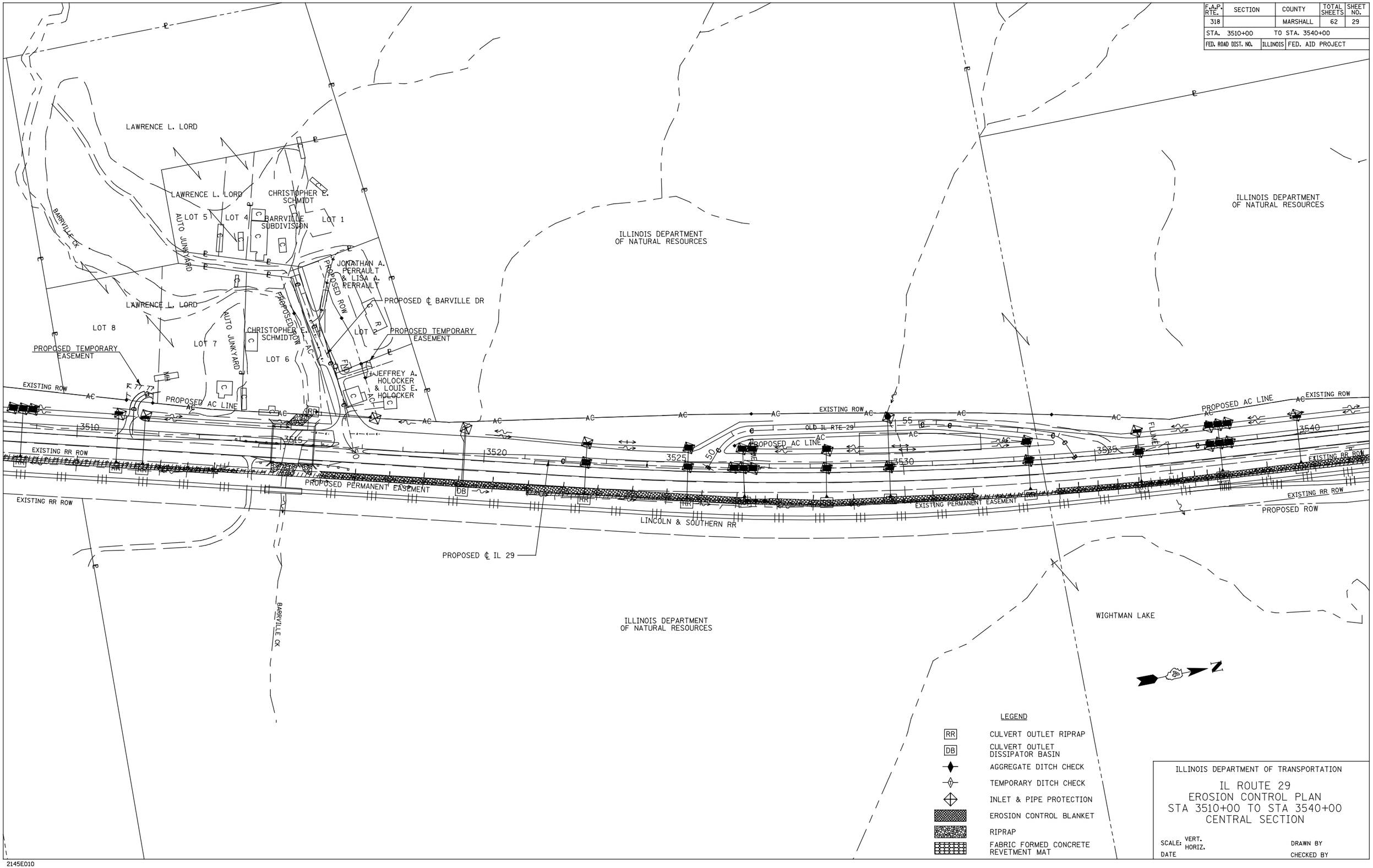
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3480+00 TO STA 3510+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E009

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	29
STA. 3510+00		TO STA. 3540+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



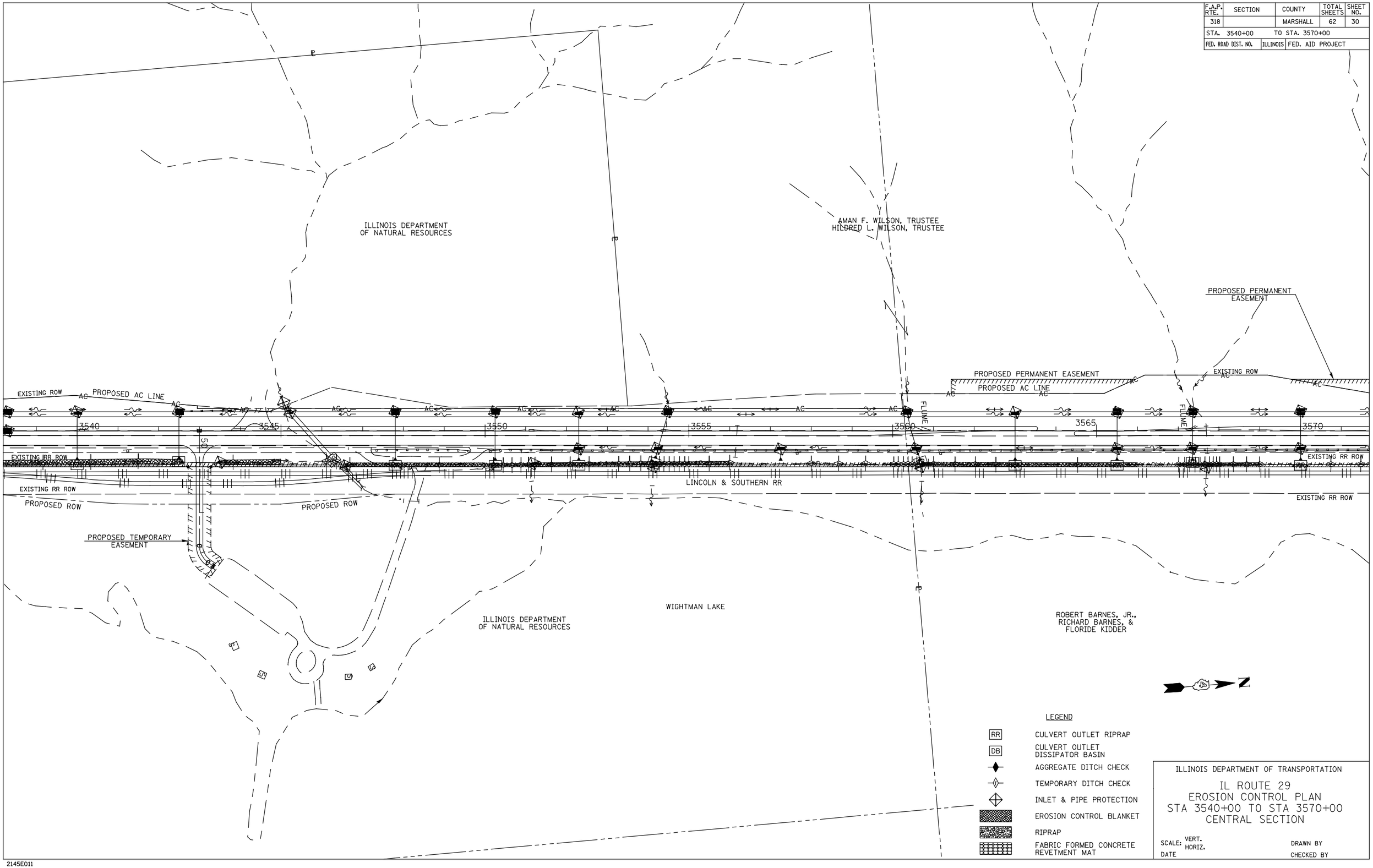
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3510+00 TO STA 3540+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E010

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	30
STA. 3540+00		TO STA. 3570+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



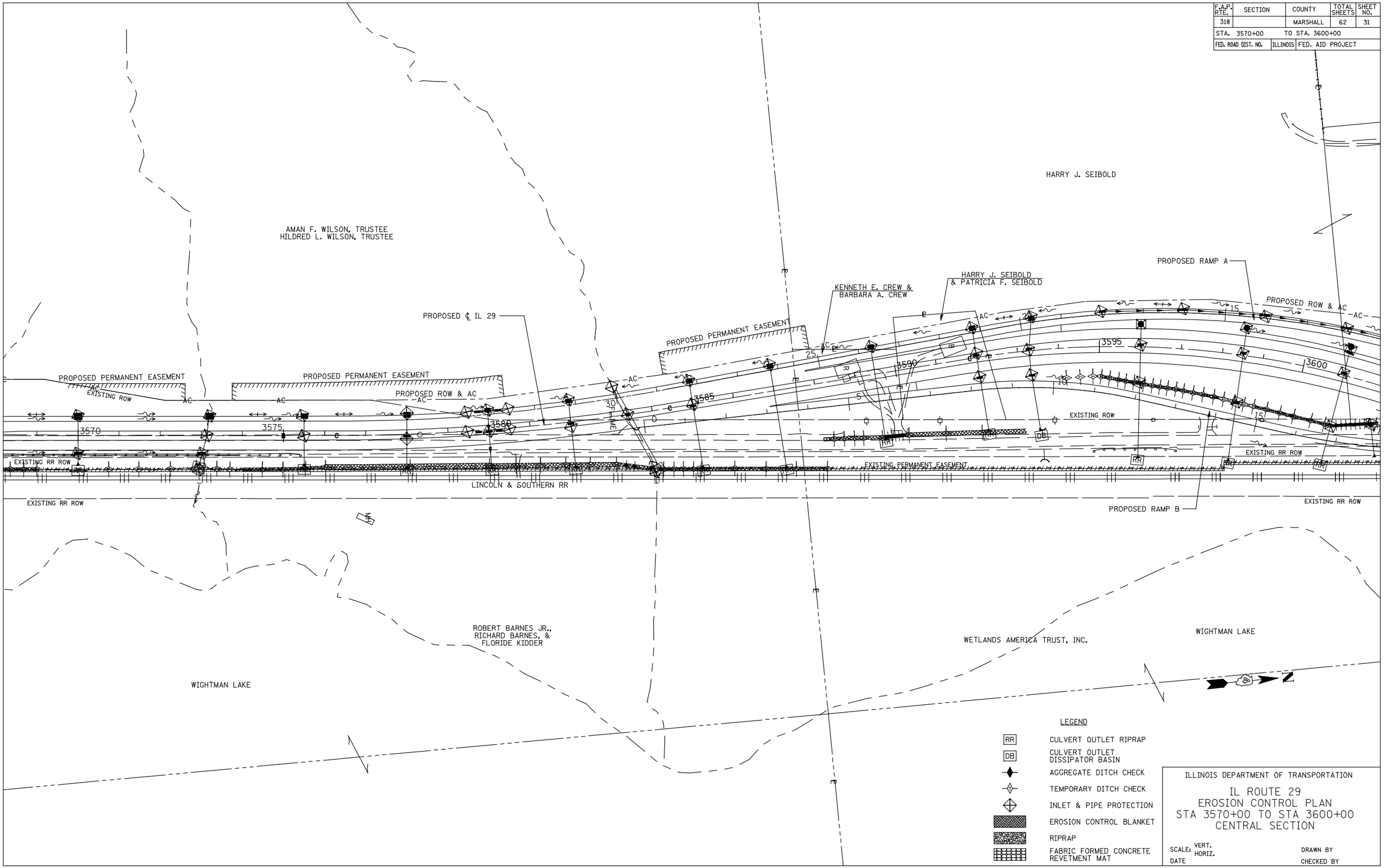
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3540+00 TO STA 3570+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DRAWN BY
DATE
CHECKED BY

2145E011

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	31
STA. 3570+00		TO STA. 3600+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3570+00 TO STA 3600+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DRAWN BY
DATE
CHECKED BY

2145E012

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	32
STA. 3600+00		TO STA. 3630+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3600+00 TO STA 3630+00
CENTRAL SCETION

SCALE: VERT. HORIZ.

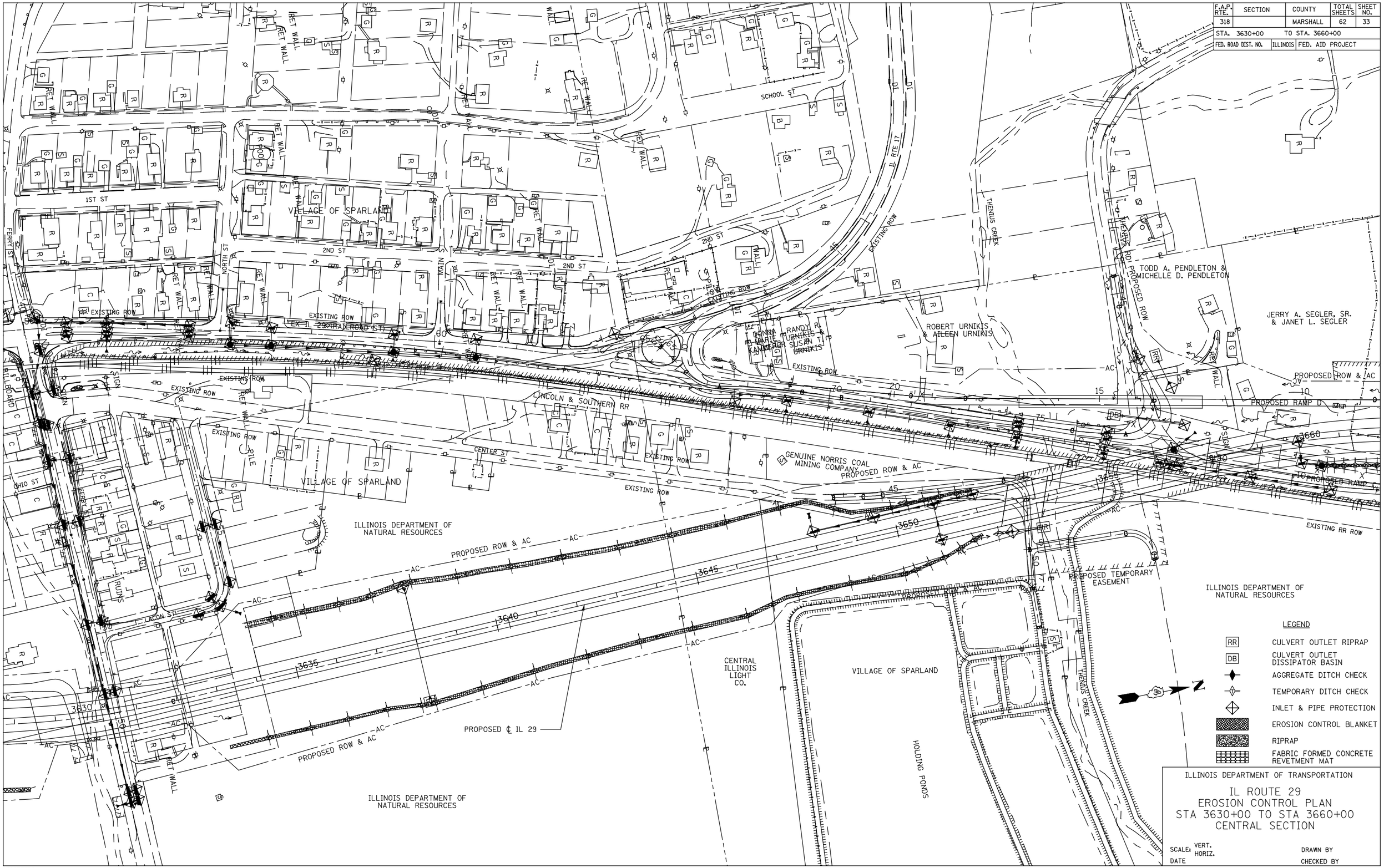
DATE

DRAWN BY

CHECKED BY

2145E013

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	33
STA. 3630+00		TO STA. 3660+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3630+00 TO STA 3660+00
CENTRAL SECTION

SCALE: VERT. HORIZ.

DATE

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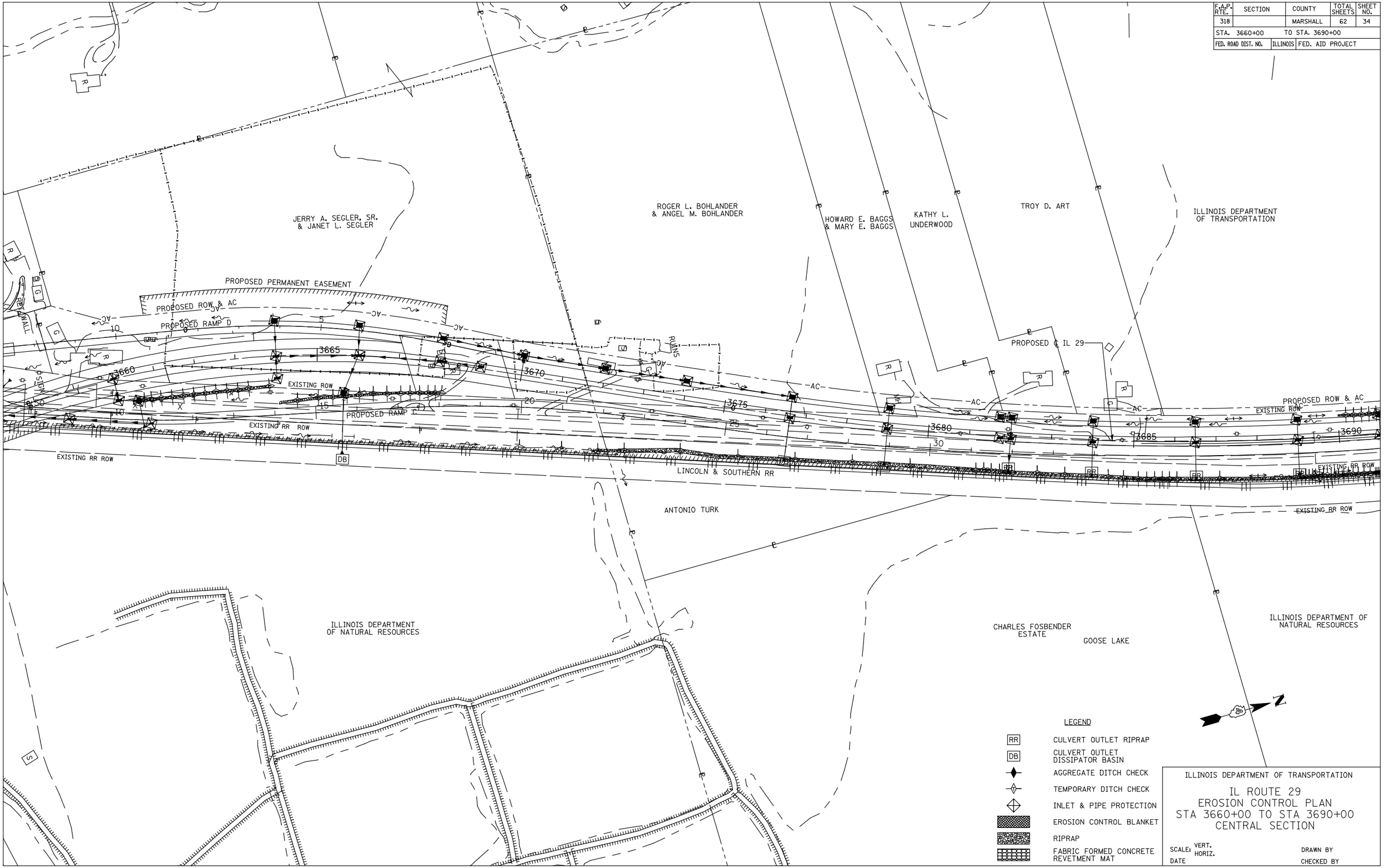
2145E014

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	34
STA. 3660+00		TO STA. 3690+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3660+00 TO STA 3690+00
CENTRAL SECTION

SCALE: VERT.
HORIZ.

DATE

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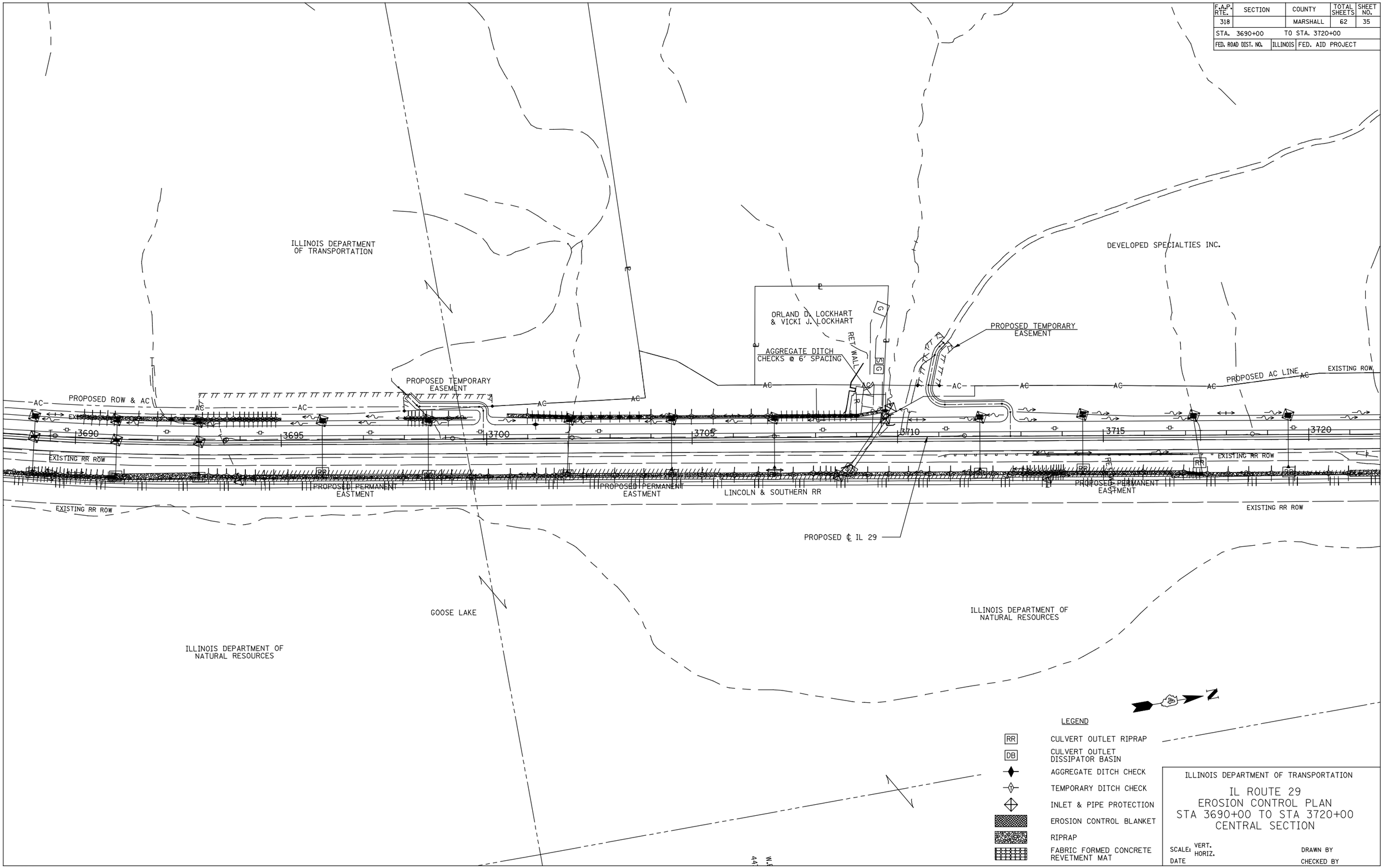
2145E015

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	35
STA. 3690+00		TO STA. 3720+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3690+00 TO STA 3720+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
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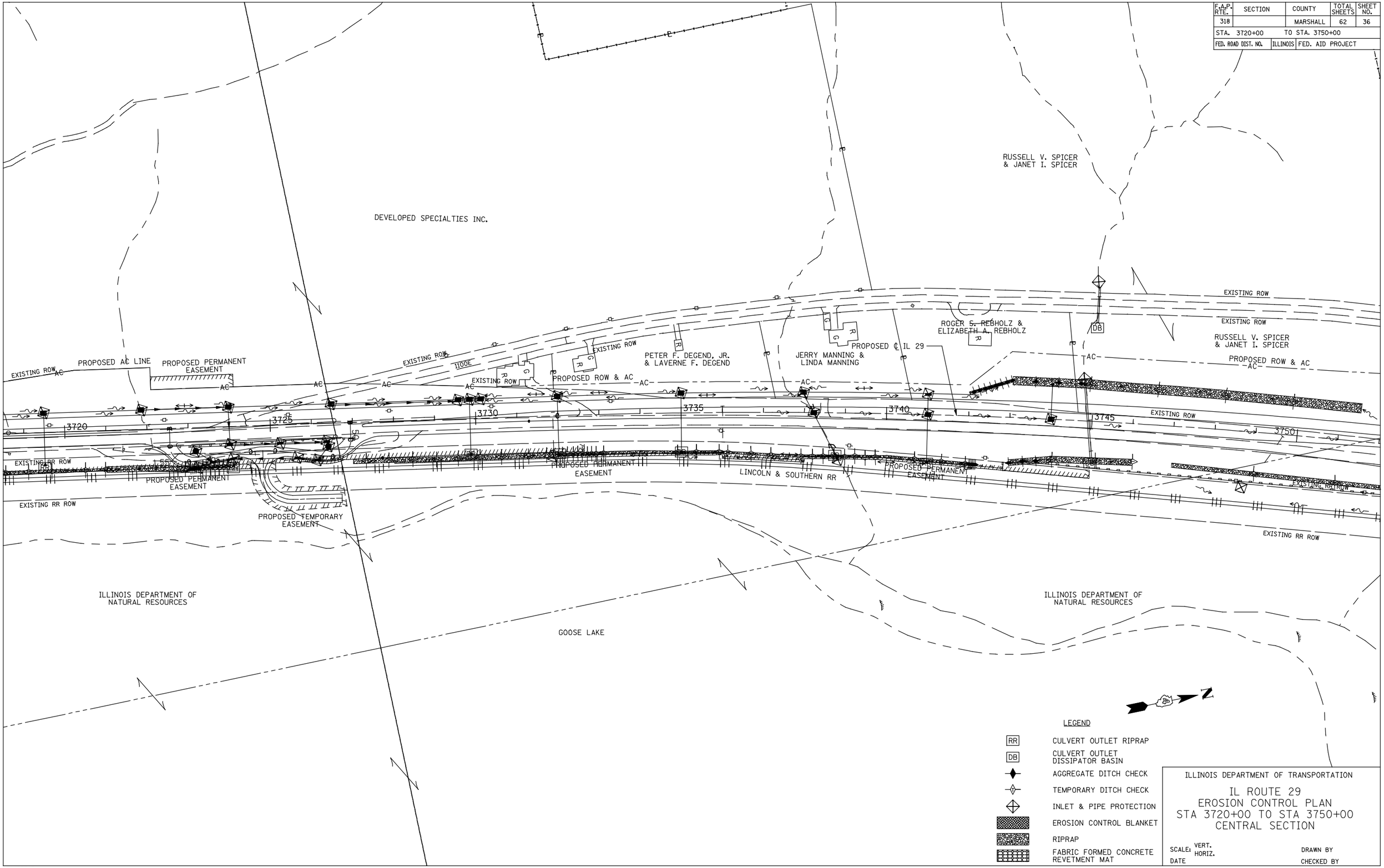
2145E016

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	36
STA. 3720+00		TO STA. 3750+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

RR	CULVERT OUTLET RIPRAP
DB	CULVERT OUTLET DISSIPATOR BASIN
	AGGREGATE DITCH CHECK
	TEMPORARY DITCH CHECK
	INLET & PIPE PROTECTION
	EROSION CONTROL BLANKET
	RIPRAP
	FABRIC FORMED CONCRETE REVETMENT MAT

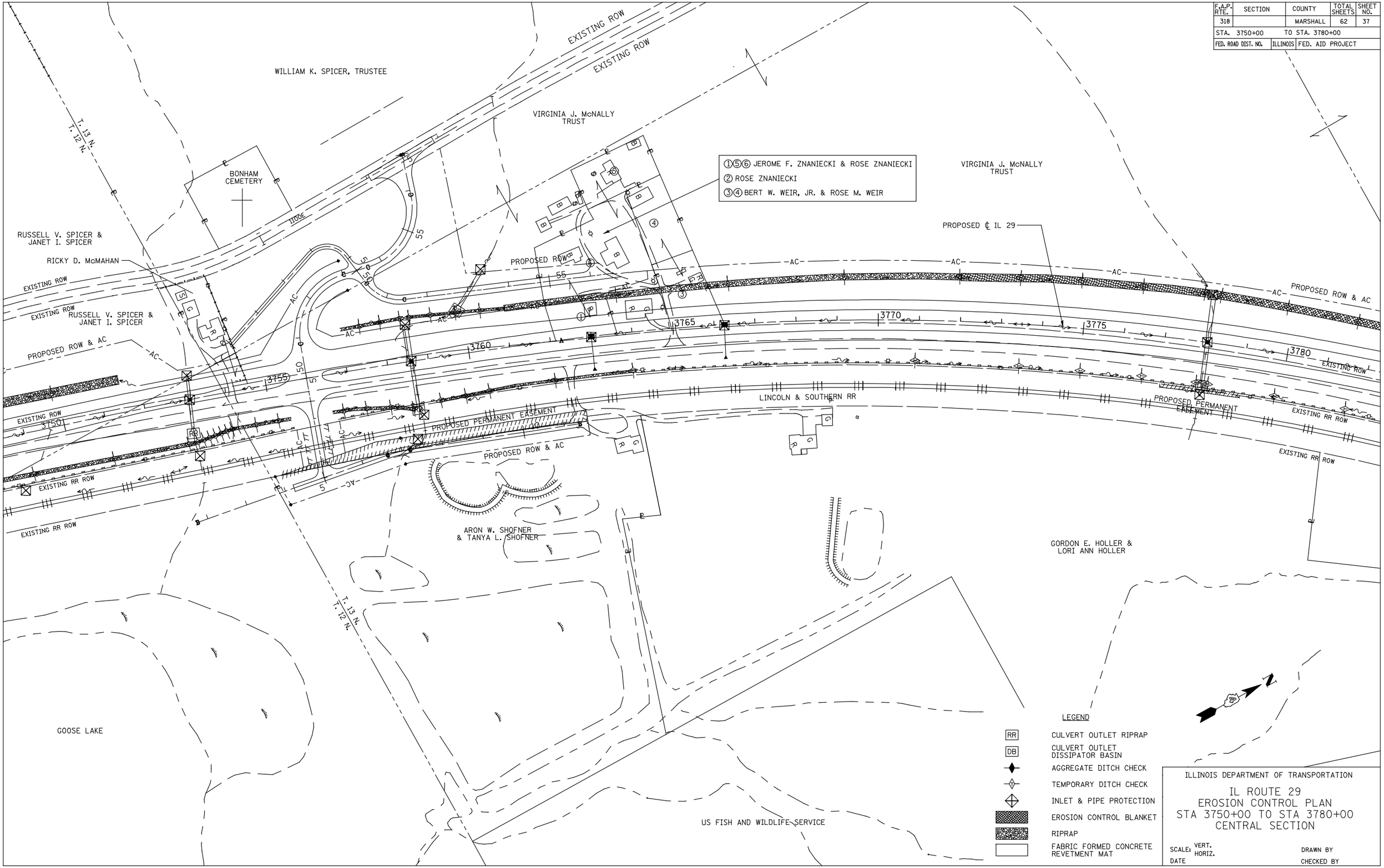
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3720+00 TO STA 3750+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E017

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	37
STA. 3750+00		TO STA. 3780+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



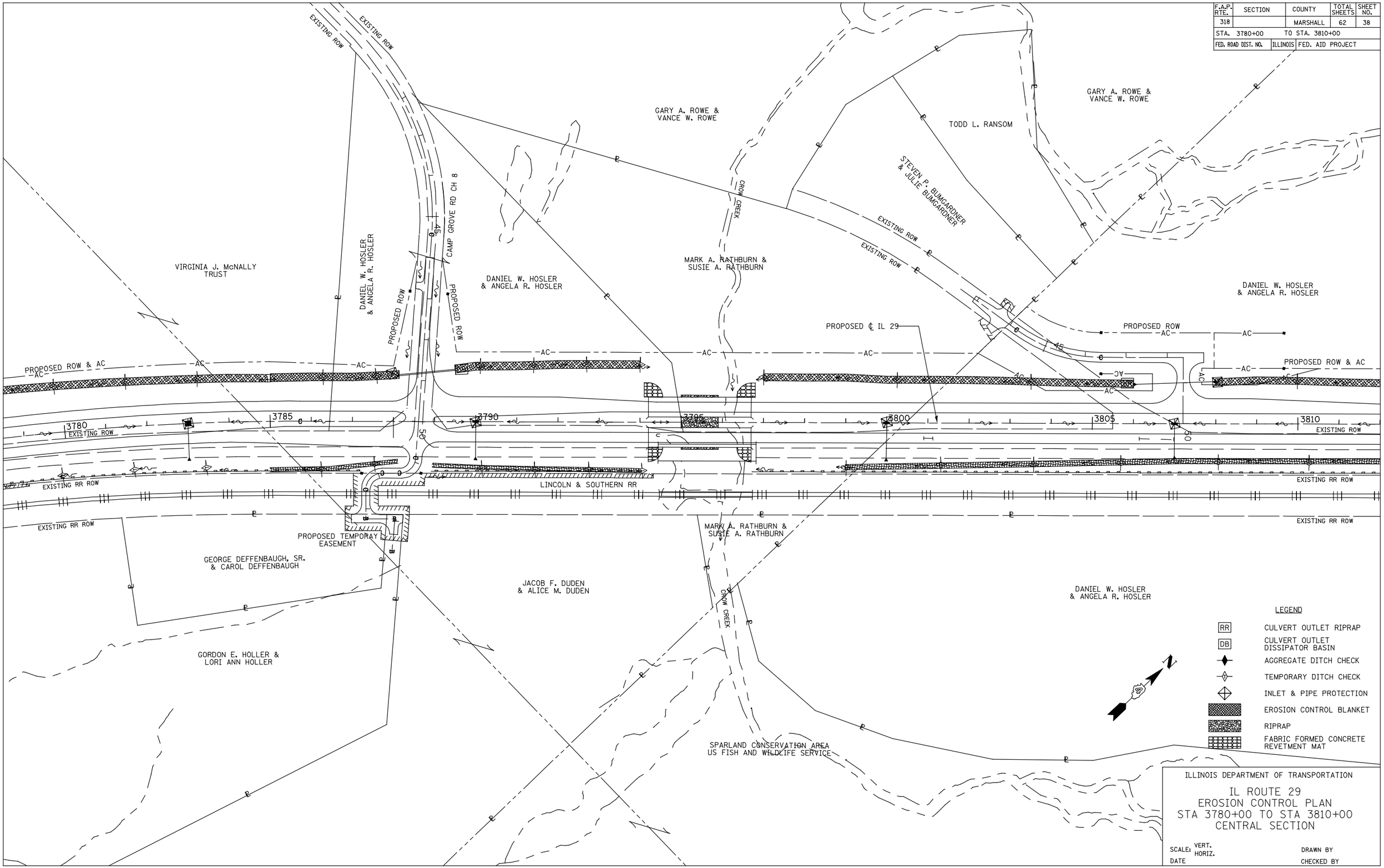
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3750+00 TO STA 3780+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

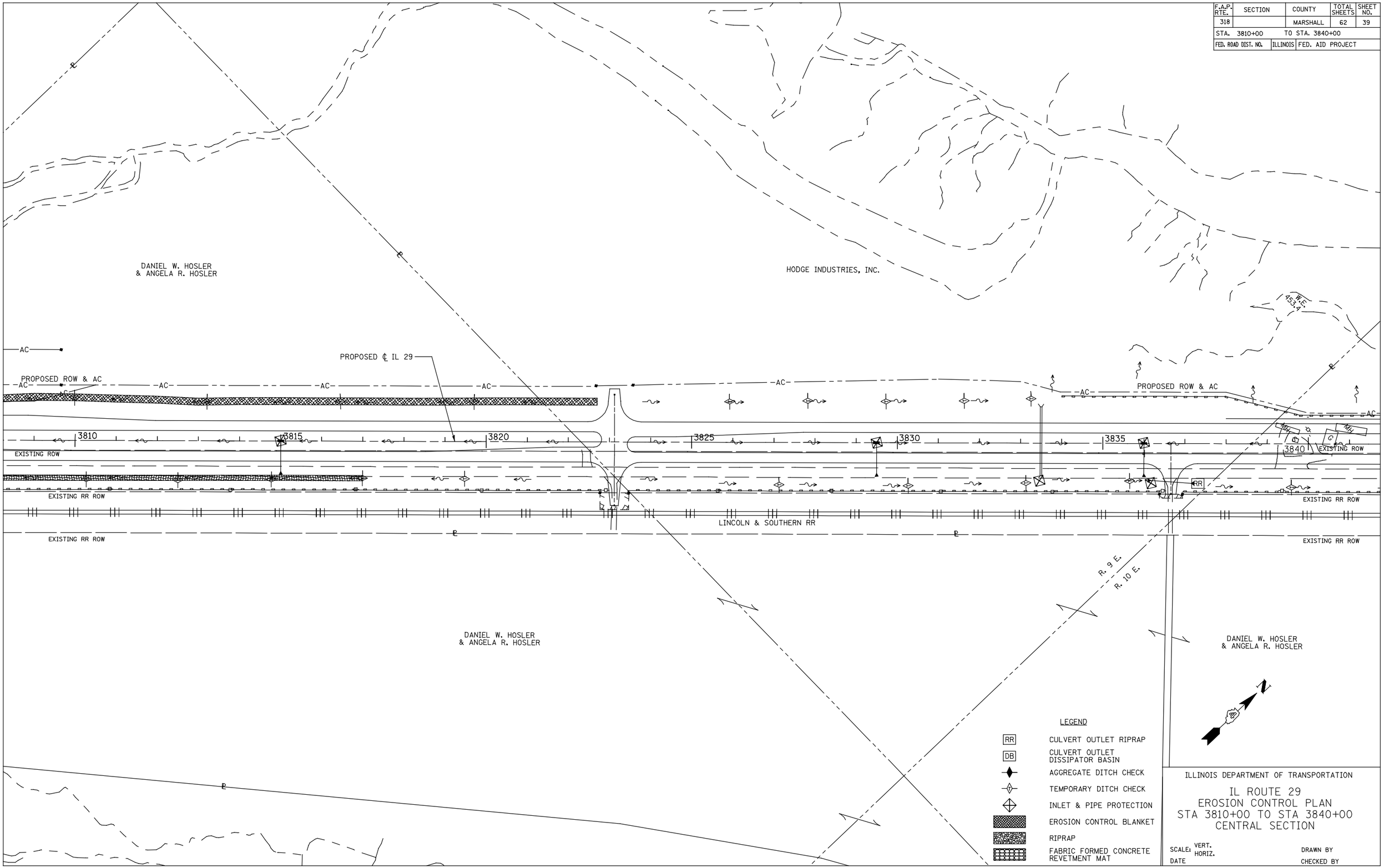
2145E018

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	38
STA. 3780+00		TO STA. 3810+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



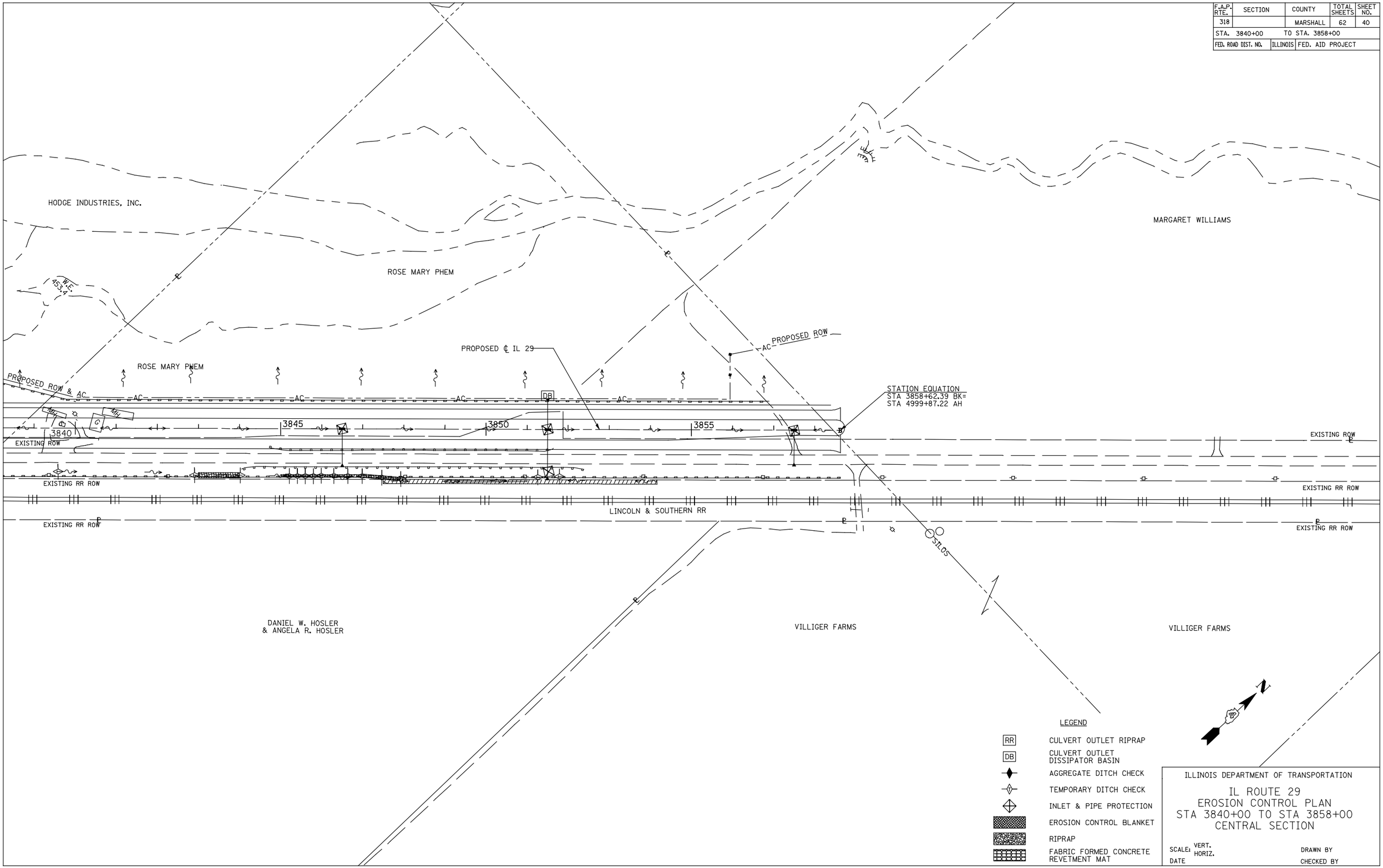
2145E019

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	39
STA. 3810+00		TO STA. 3840+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E020

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	40
STA. 3840+00		TO STA. 3858+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



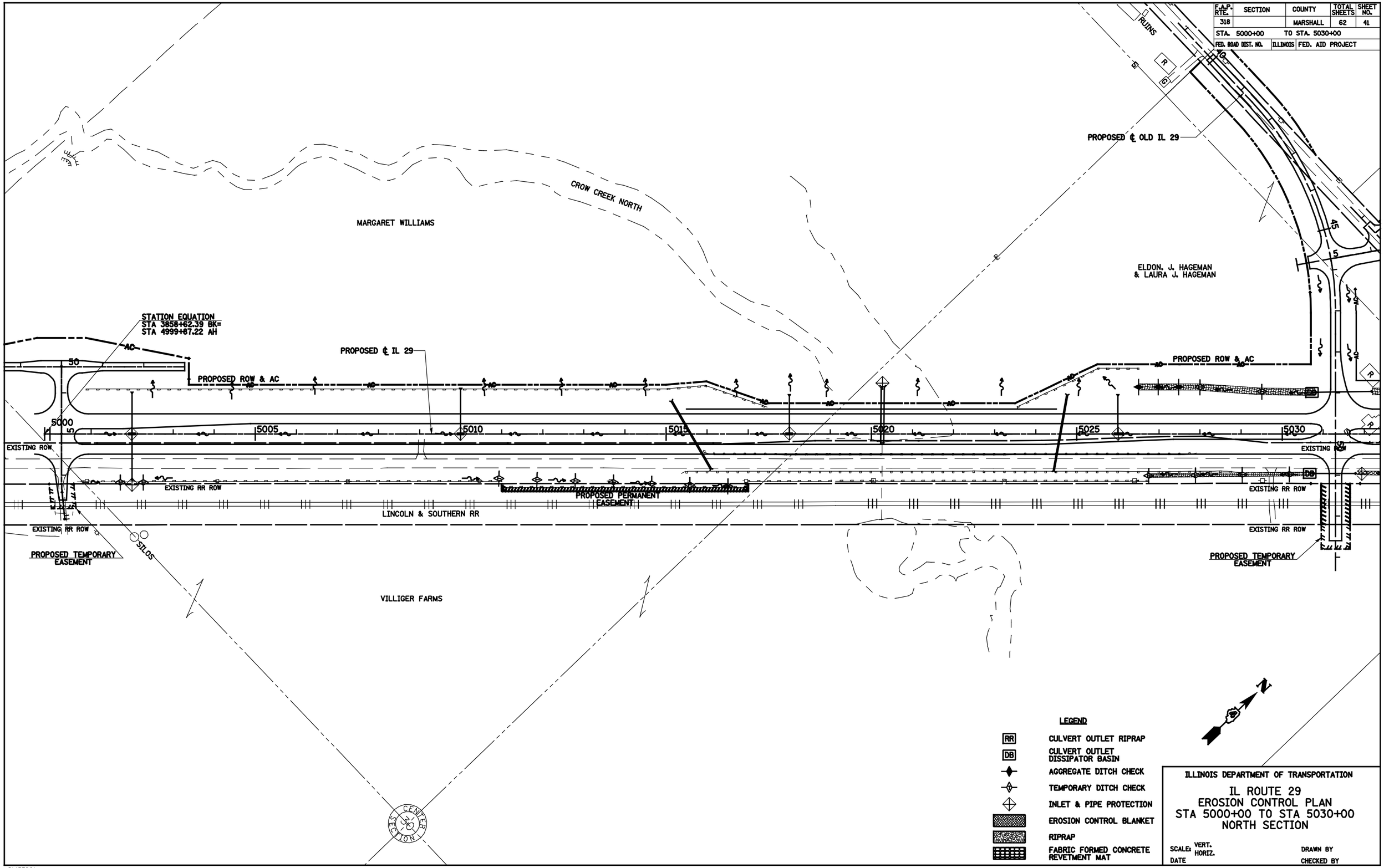
ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 3840+00 TO STA 3858+00
CENTRAL SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E021

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	41
STA. 5000+00		TO STA. 5030+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5000+00 TO STA 5030+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE

DRAWN BY
CHECKED BY

2145E001

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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STA. 5030+00		TO STA. 5060+00		
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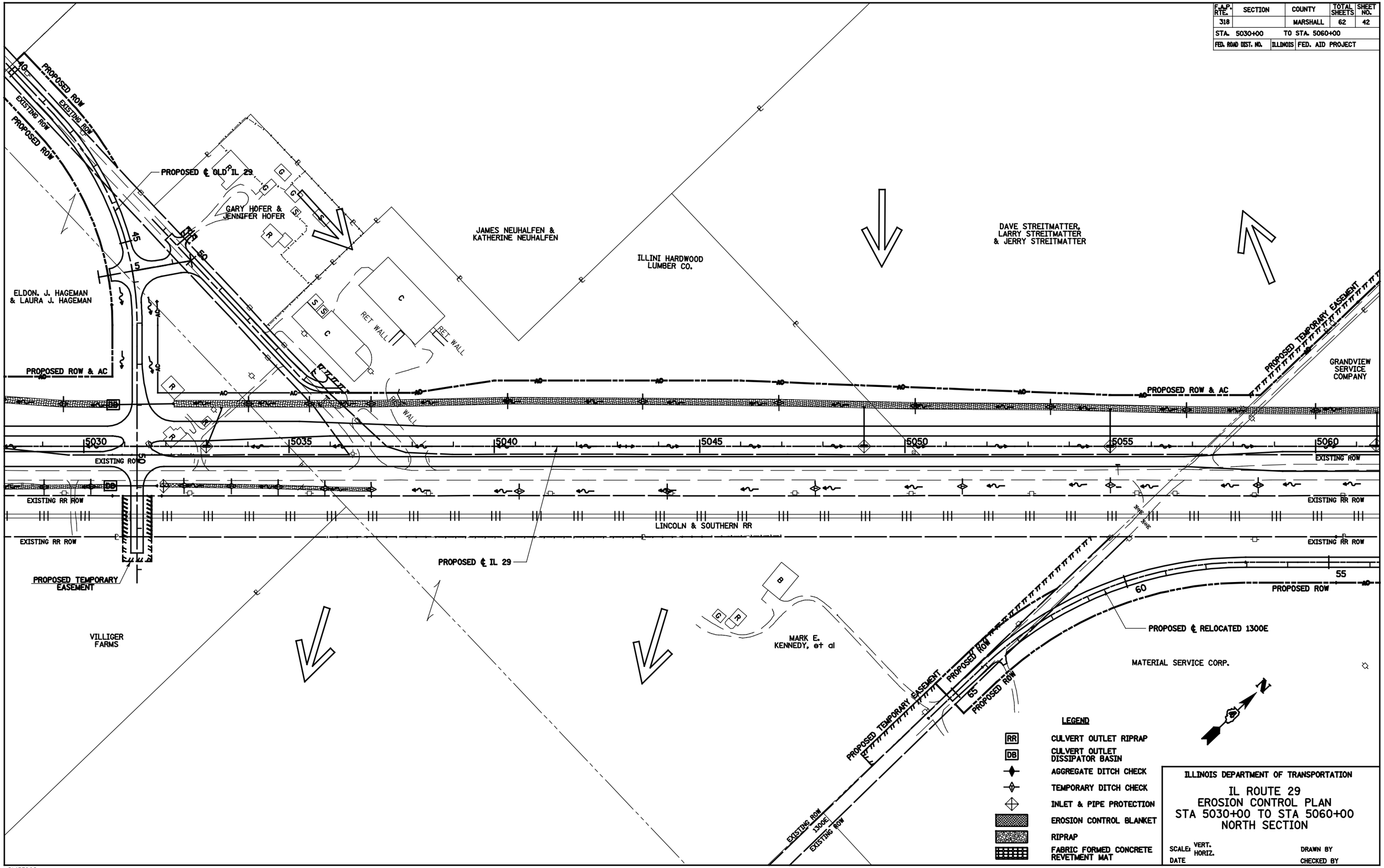

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5030+00 TO STA 5060+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E002

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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STA. 5060+00		TO STA. 5090+00		
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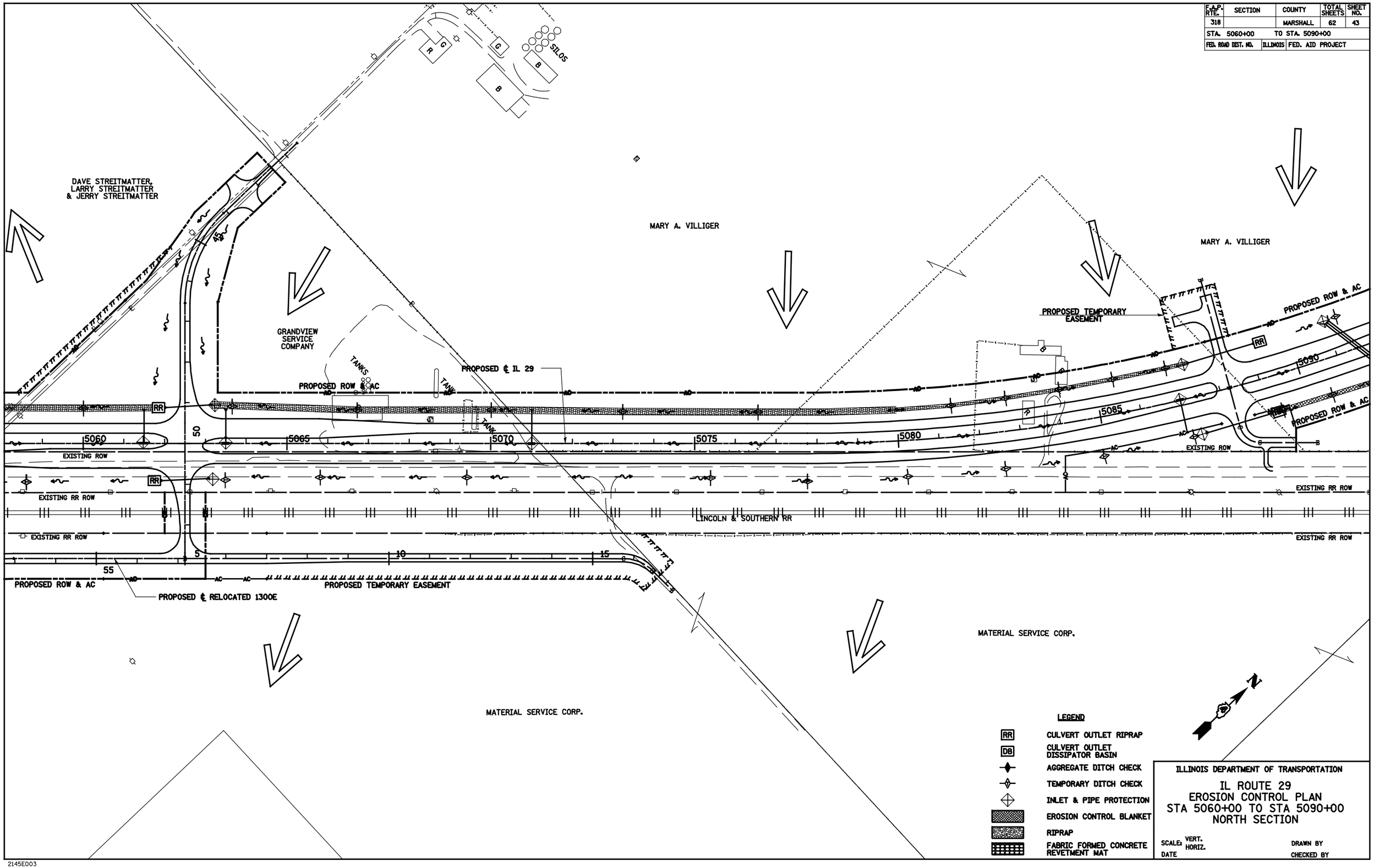

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5060+00 TO STA 5090+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE
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2145E003

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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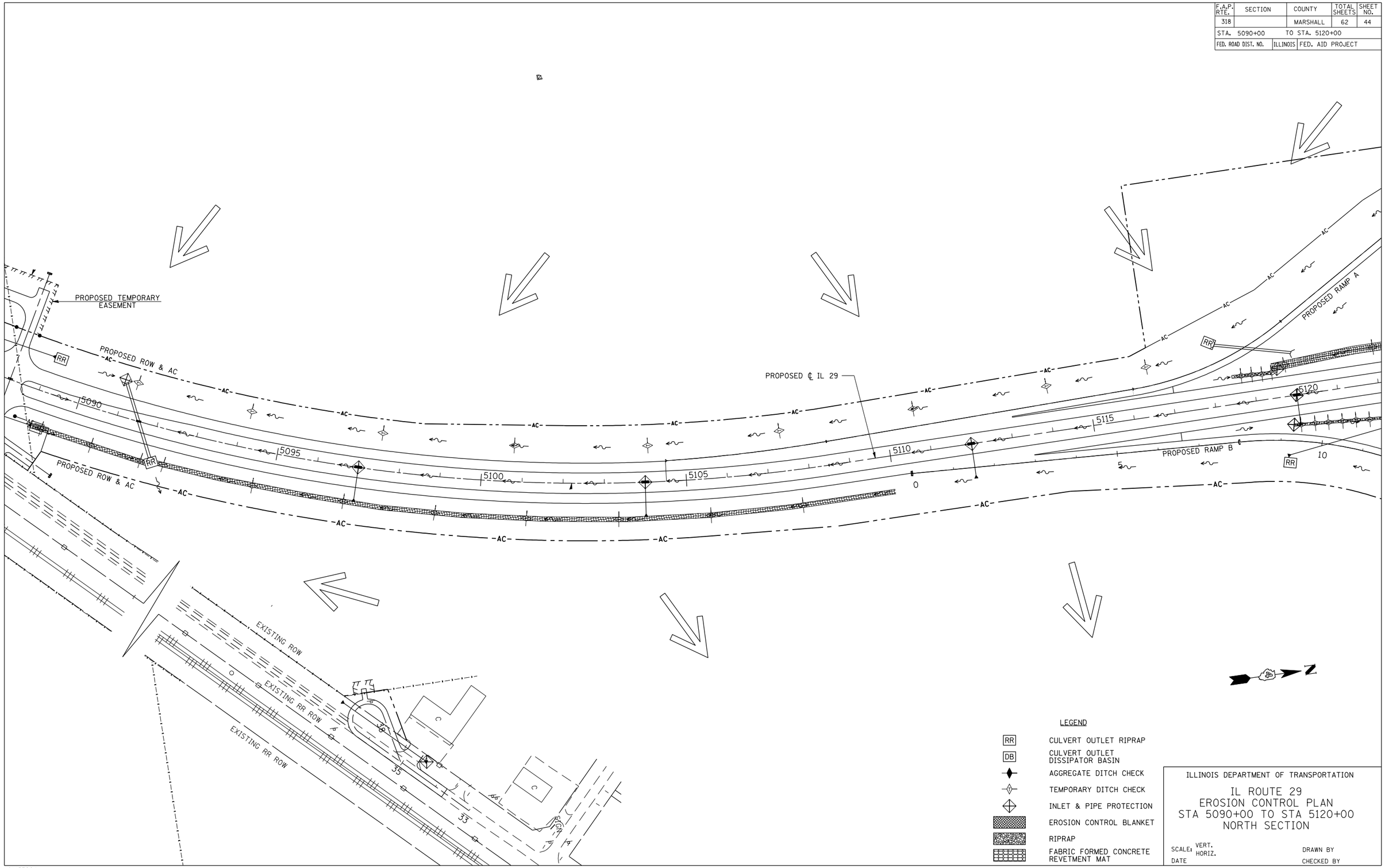
STA. 5090+00		TO STA. 5120+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5090+00 TO STA 5120+00
NORTH SECTION

SCALE: VERT. HORIZ.
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DRAWN BY
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2145E004

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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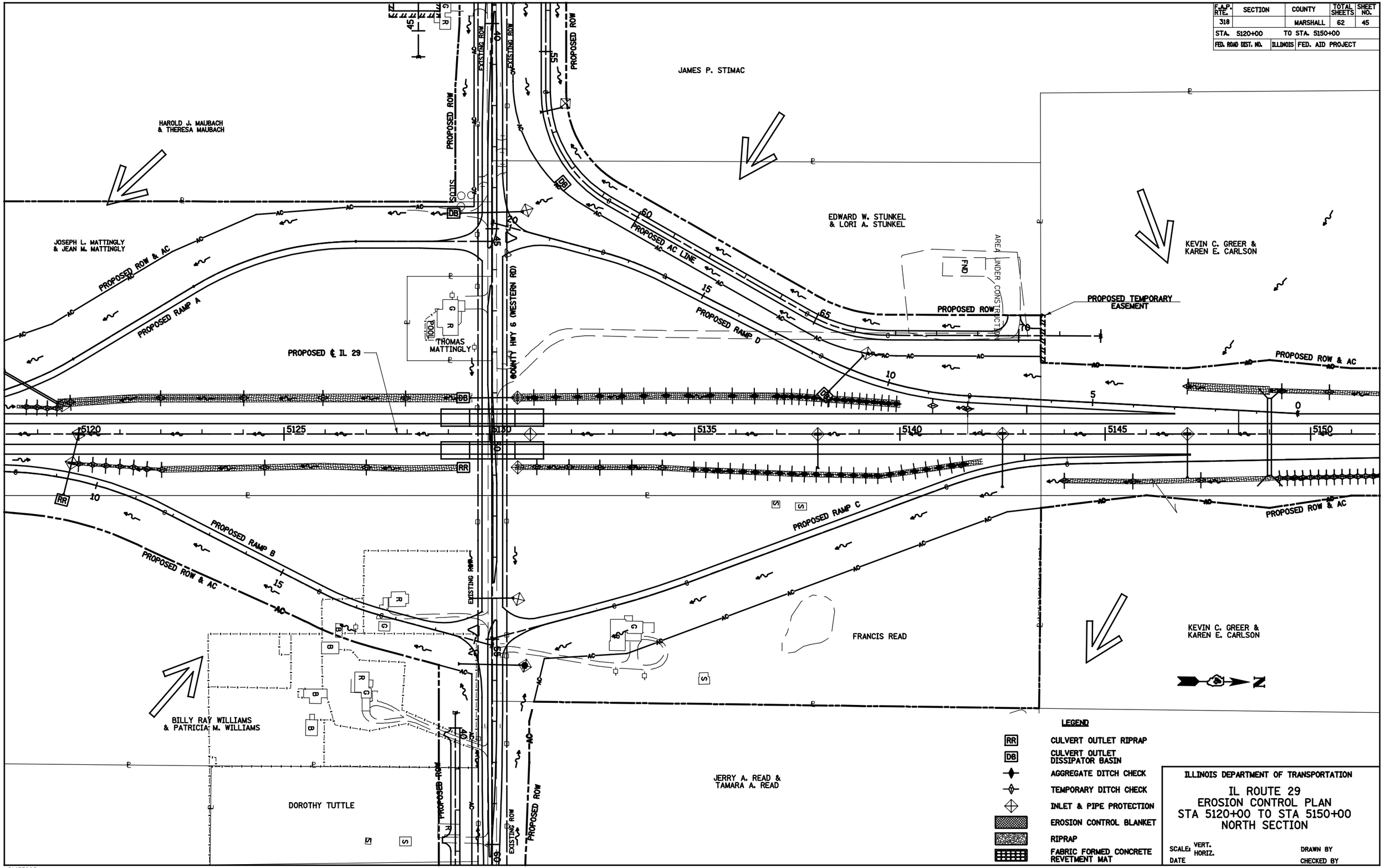

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5120+00 TO STA 5150+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE
DRAWN BY
CHECKED BY

2145E005

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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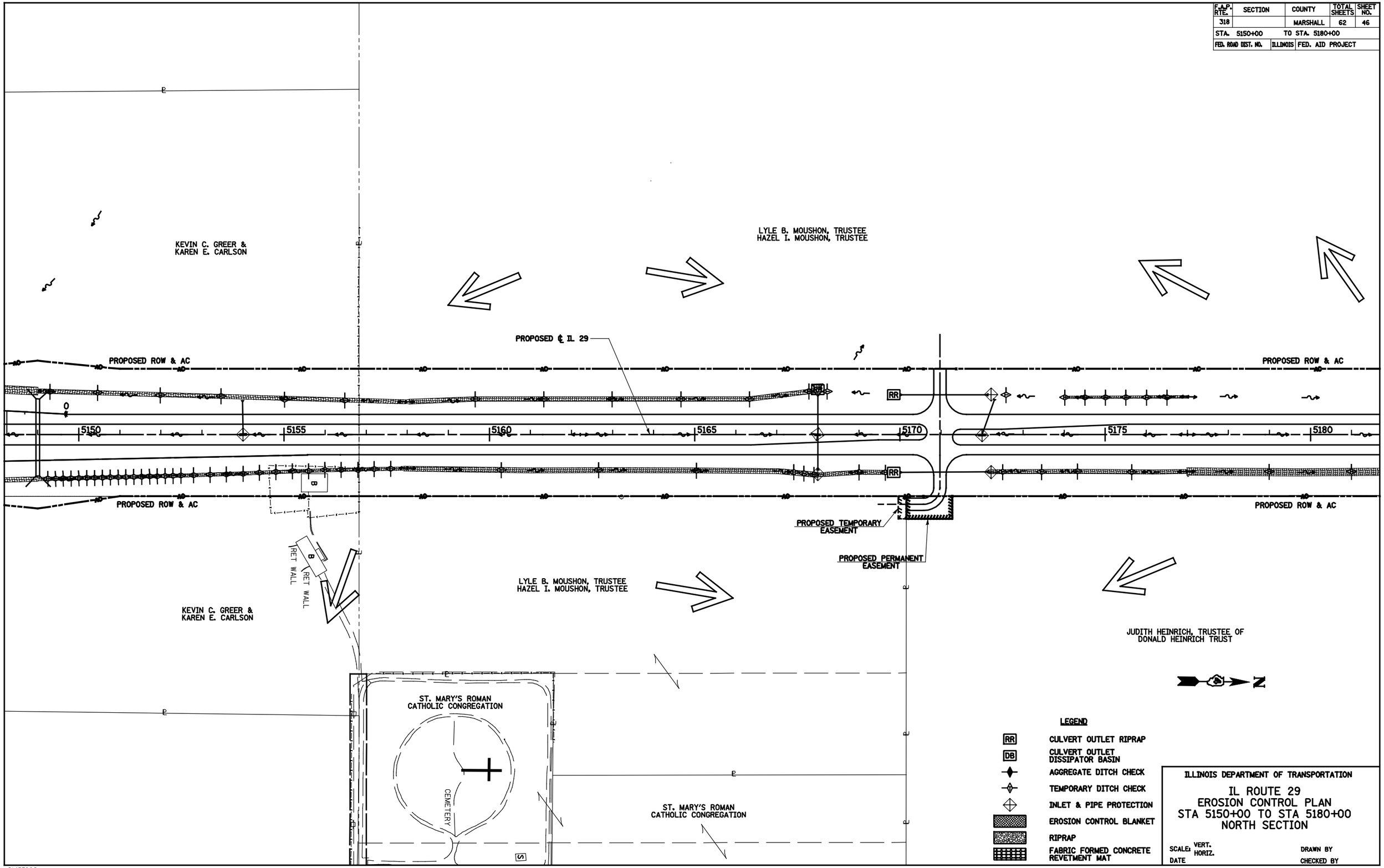

2145E006

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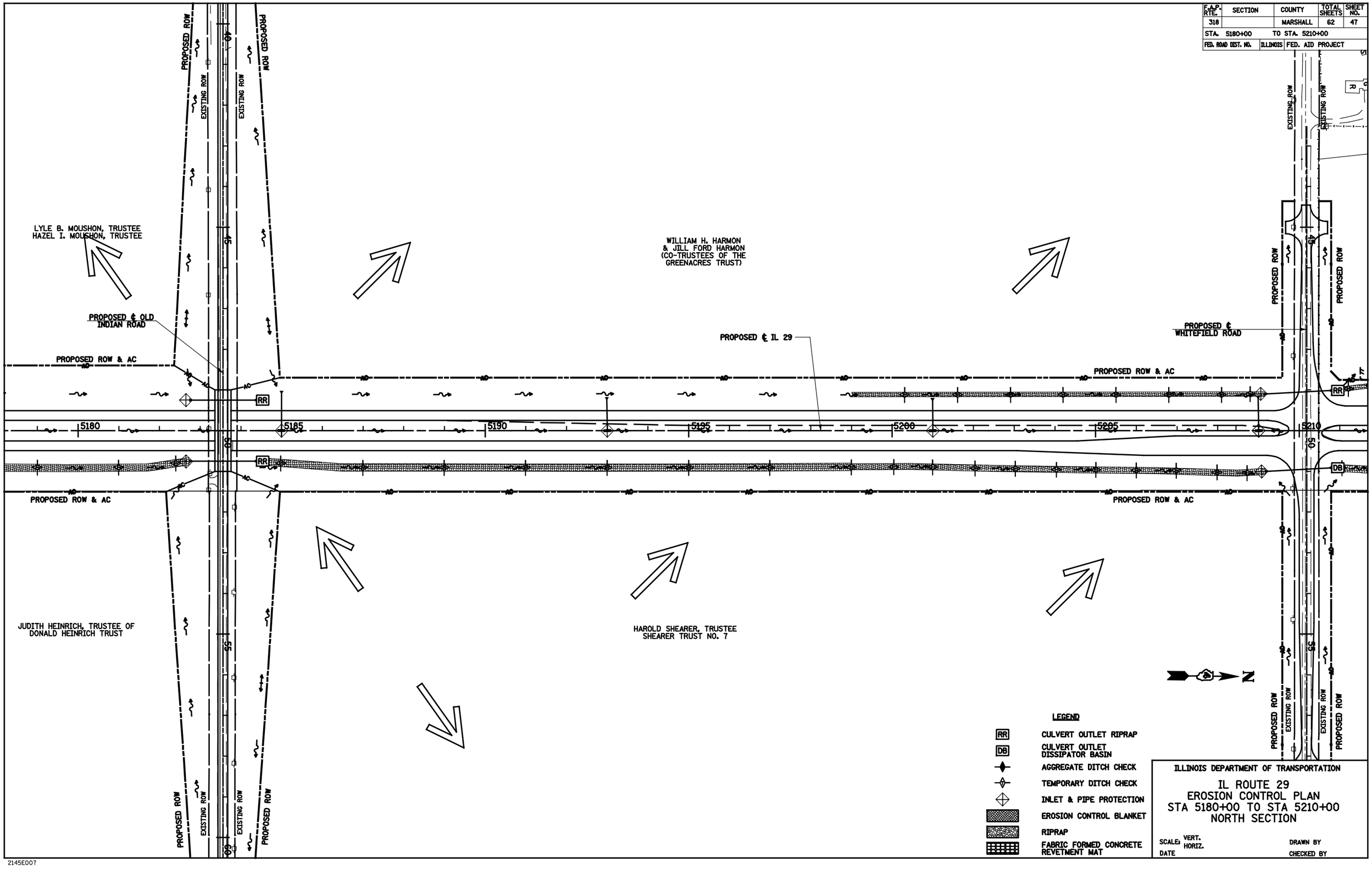
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5180+00 TO STA 5210+00
NORTH SECTION

SCALE: VERT.
HORIZ.
DATE

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2145E007

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	48
STA. 5210+00		TO STA. 5240+00		
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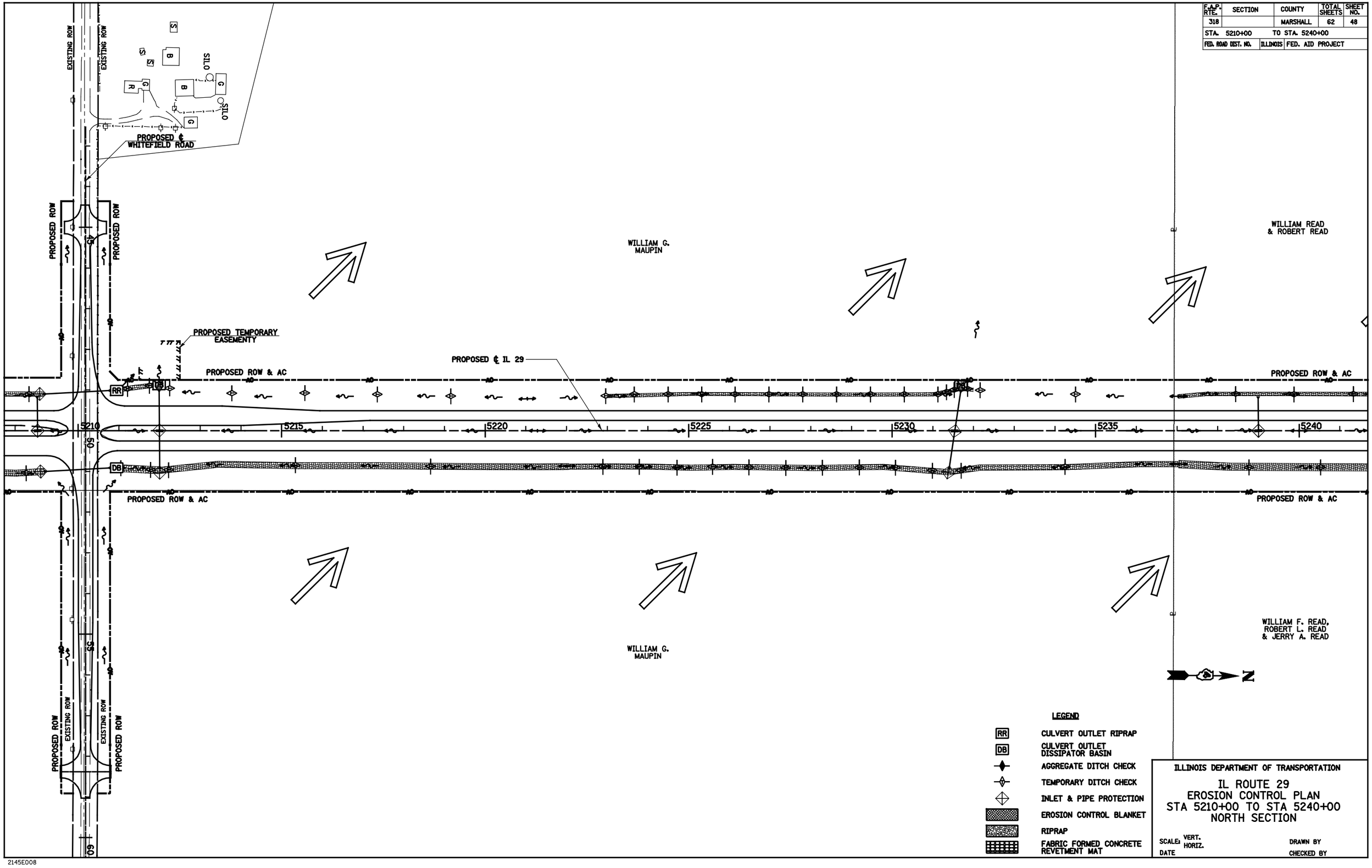

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5210+00 TO STA 5240+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE
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2145E008

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		MARSHALL	62	49
STA. 5240+00		TO STA. 5270+00		
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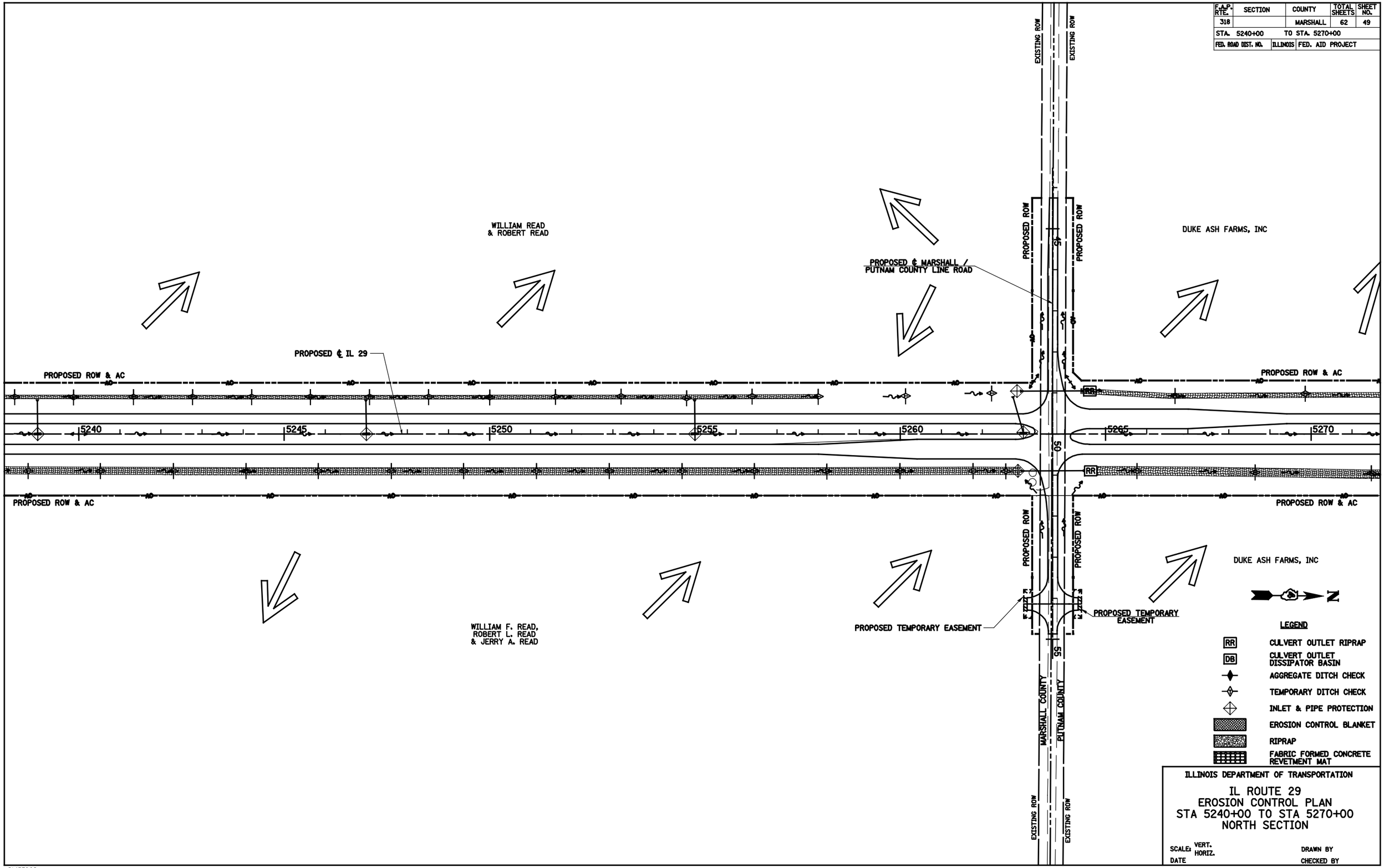

2145E009

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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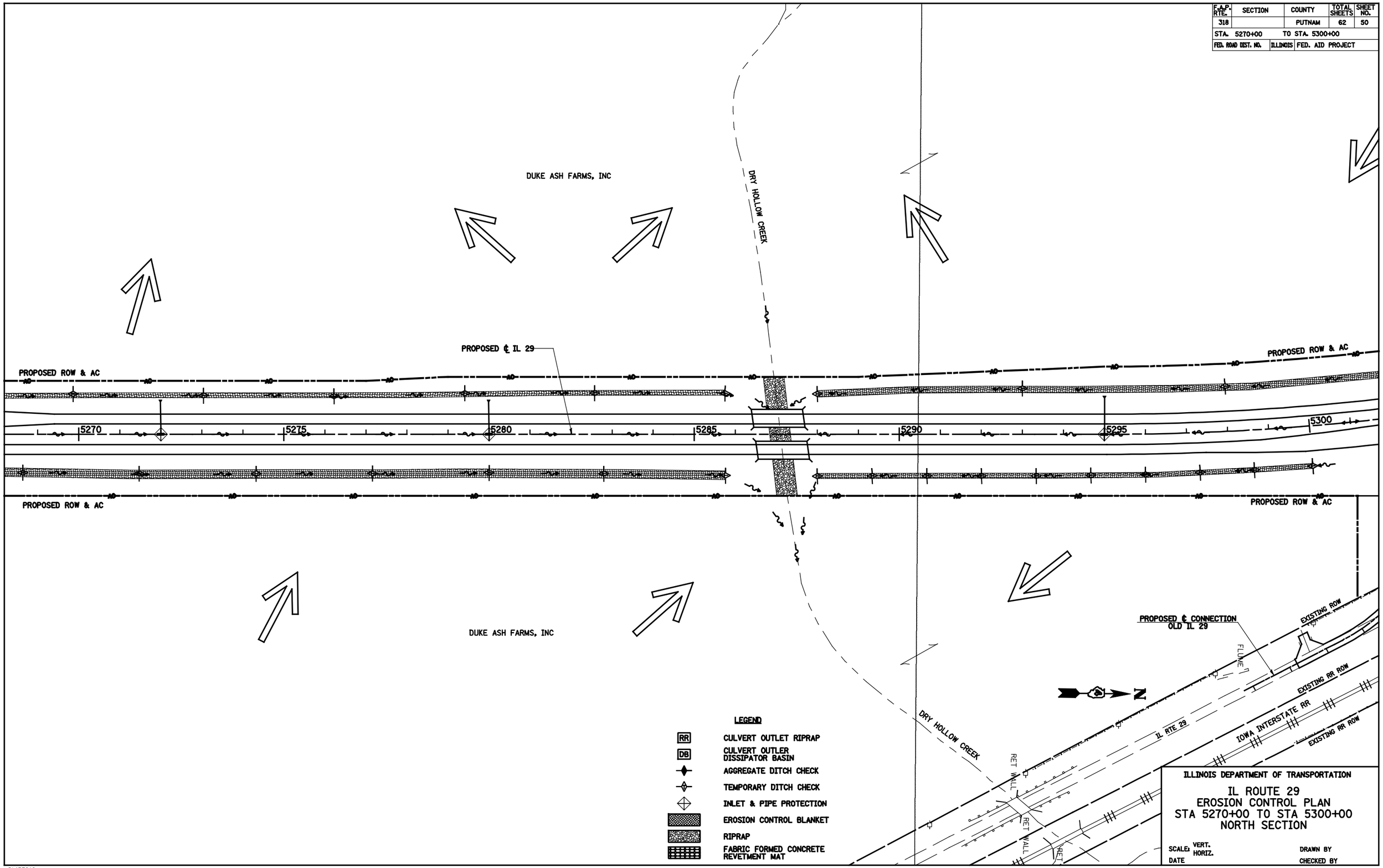
STA. 5270+00		TO STA. 5300+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 5270+00 TO STA 5300+00
NORTH SECTION

SCALE: VERT. HORIZ.
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2145E010

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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STA. 5300+00		TO STA. 5330+00		
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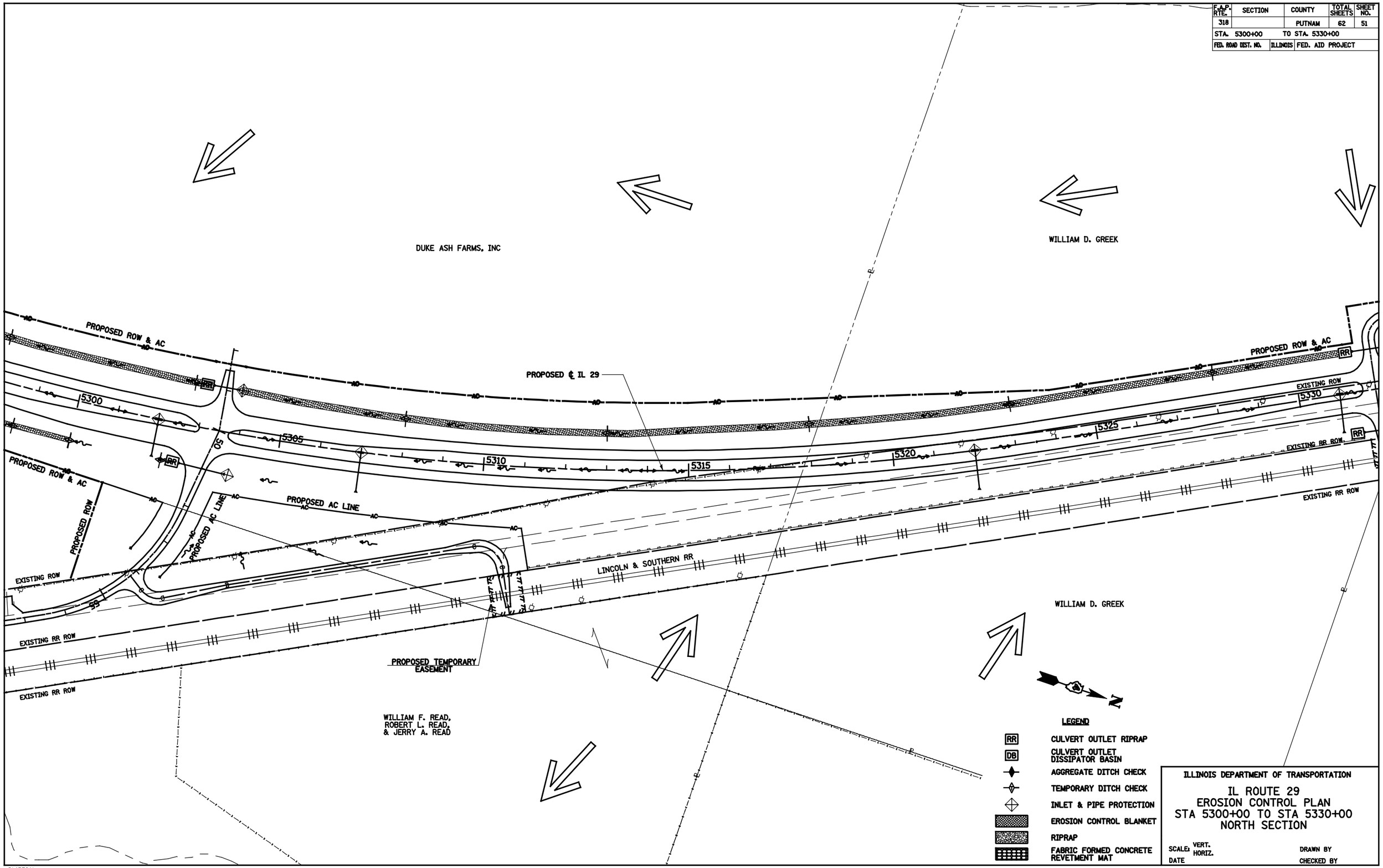

2145E011

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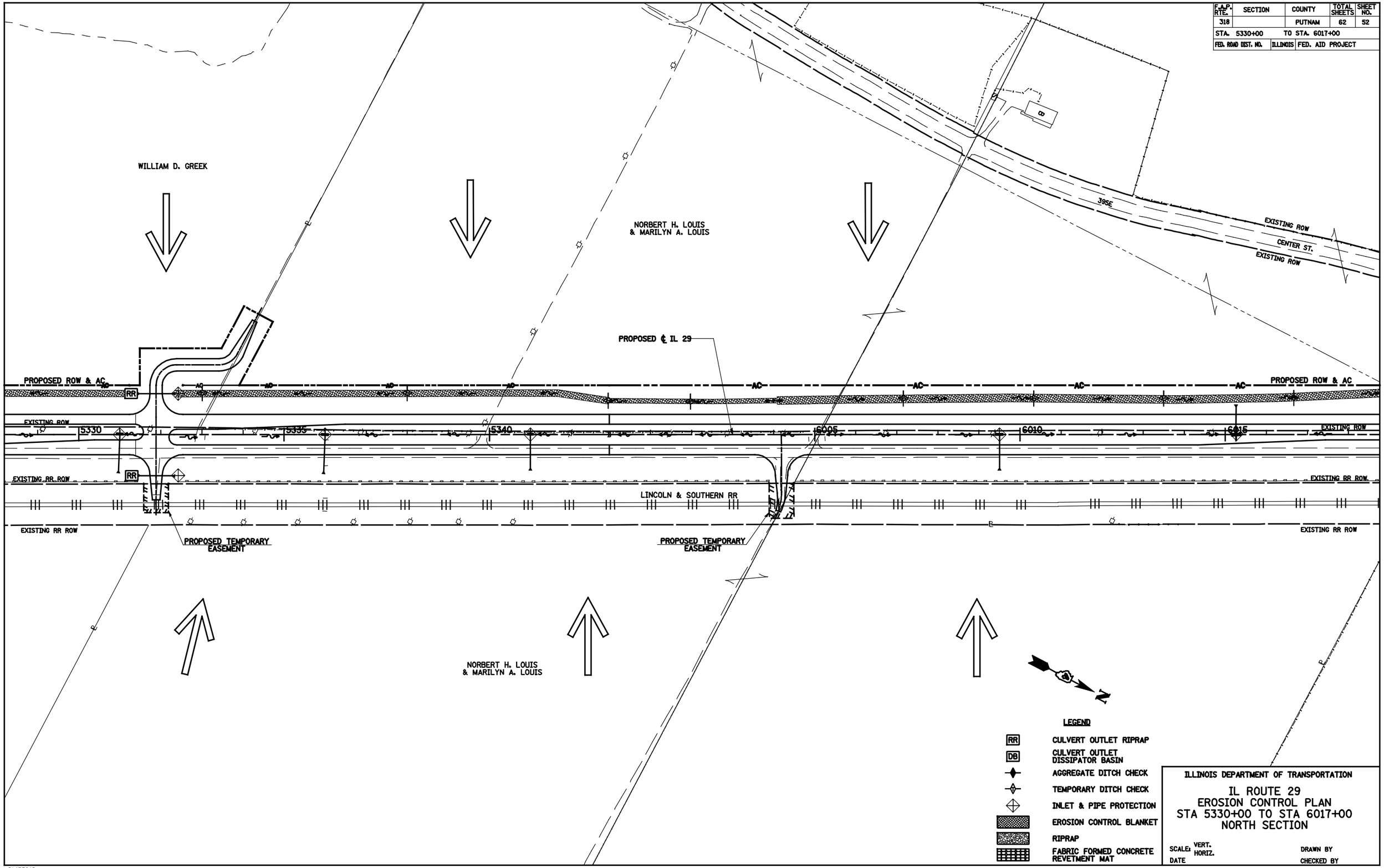
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E012

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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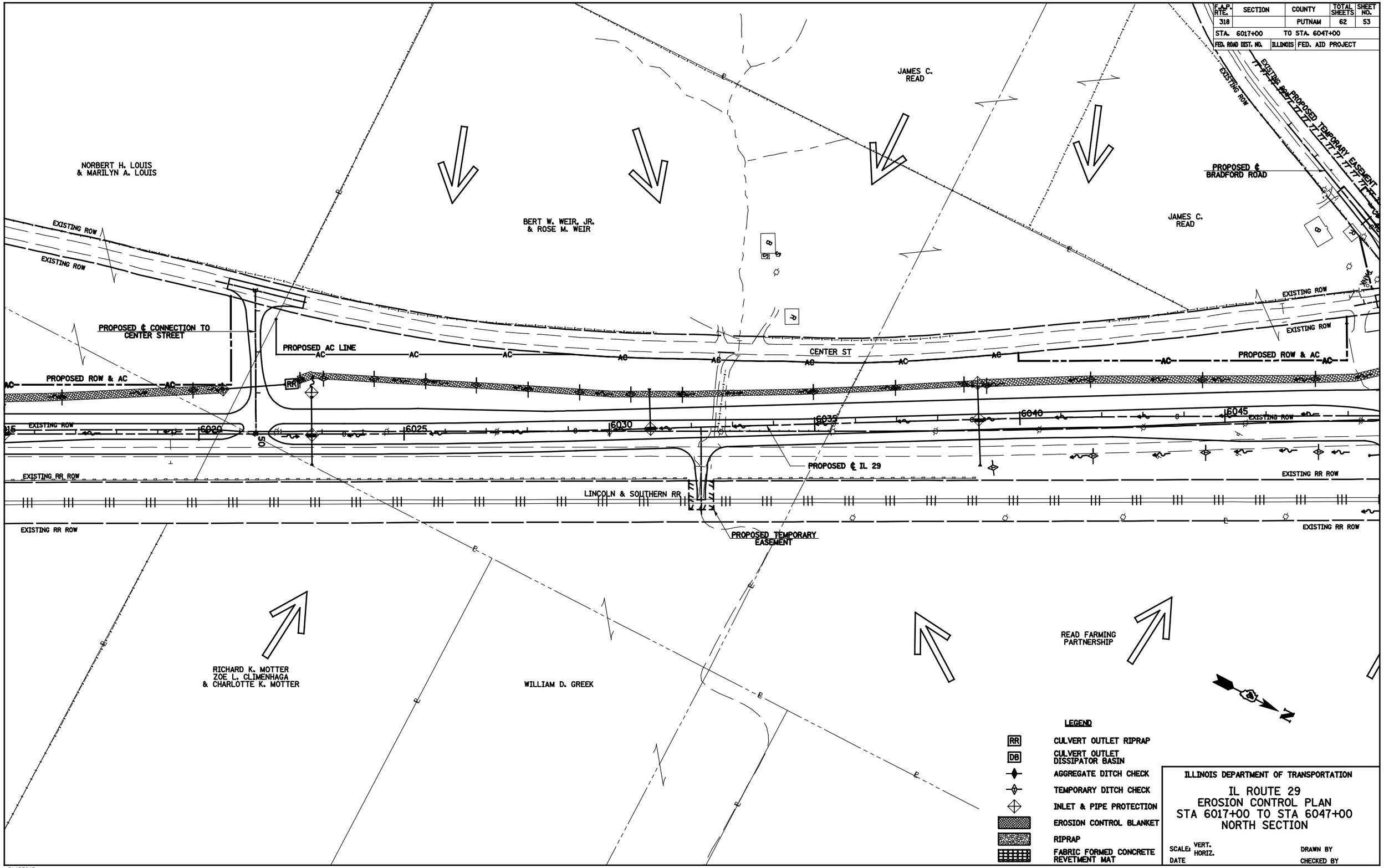
STA. 6017+00		TO STA. 6047+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6017+00 TO STA 6047+00
NORTH SECTION

SCALE: VERT. HORIZ.
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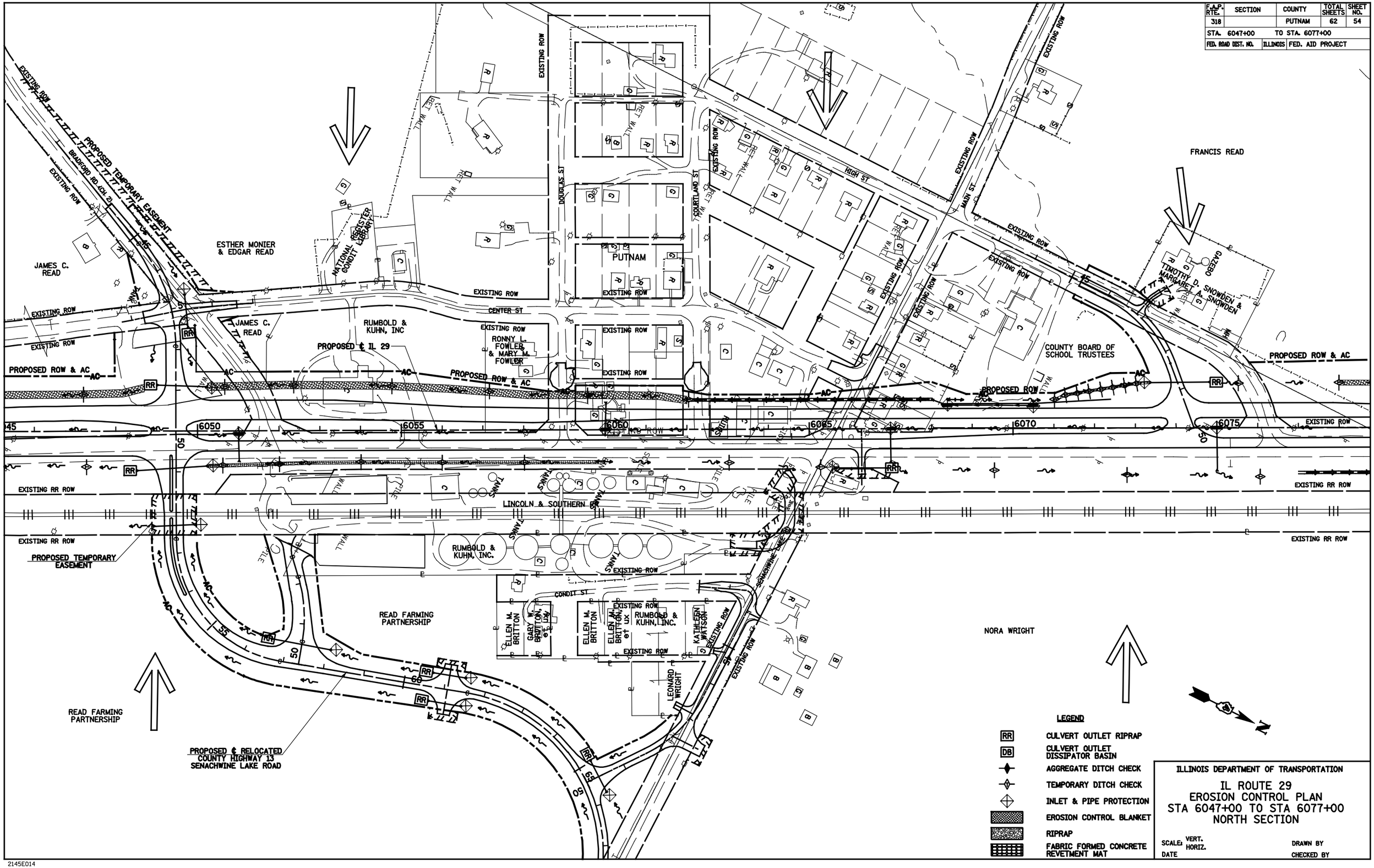
2145E013

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PUTNAM	62	54
STA. 6047+00		TO STA. 6077+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6047+00 TO STA 6077+00
NORTH SECTION

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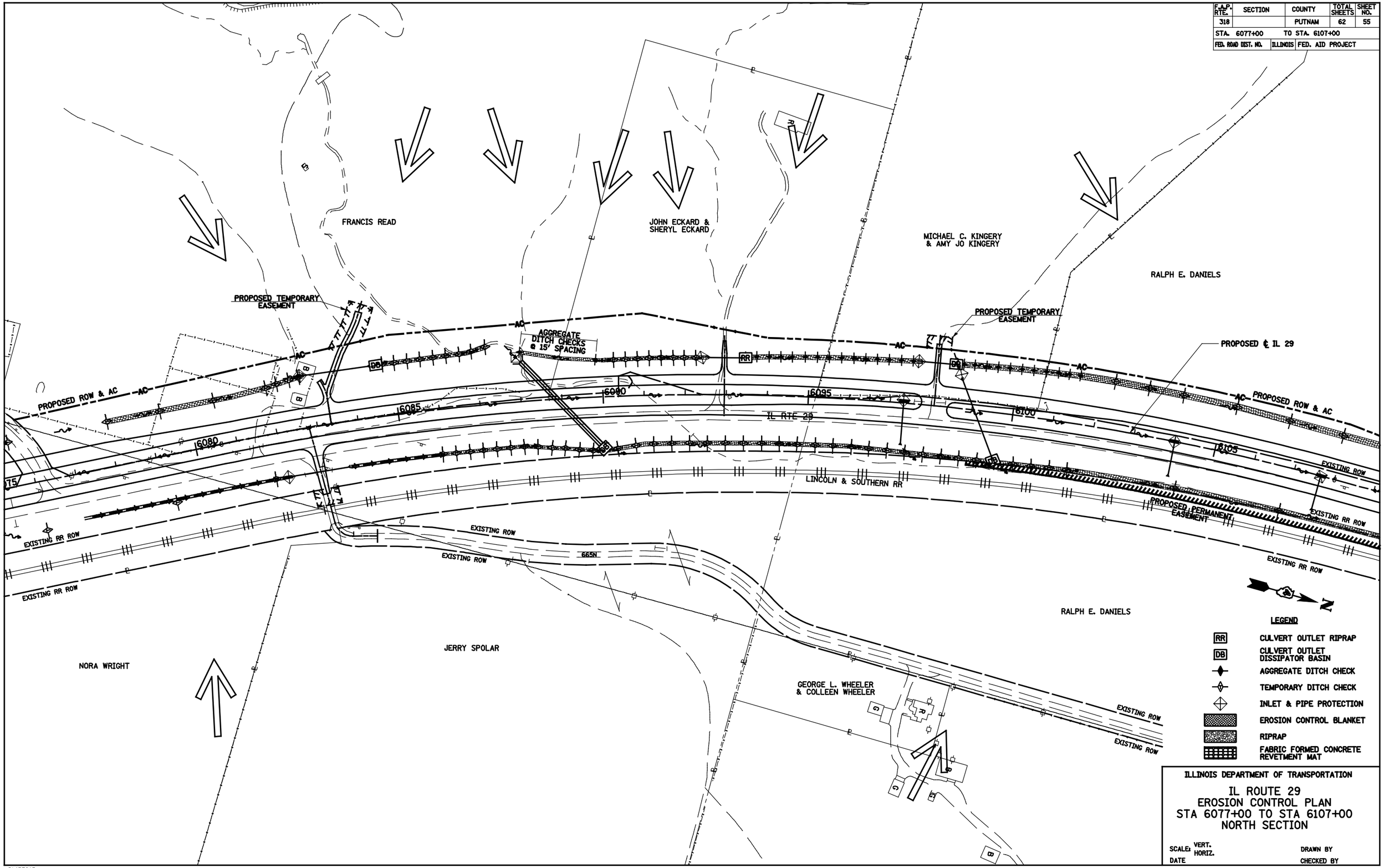
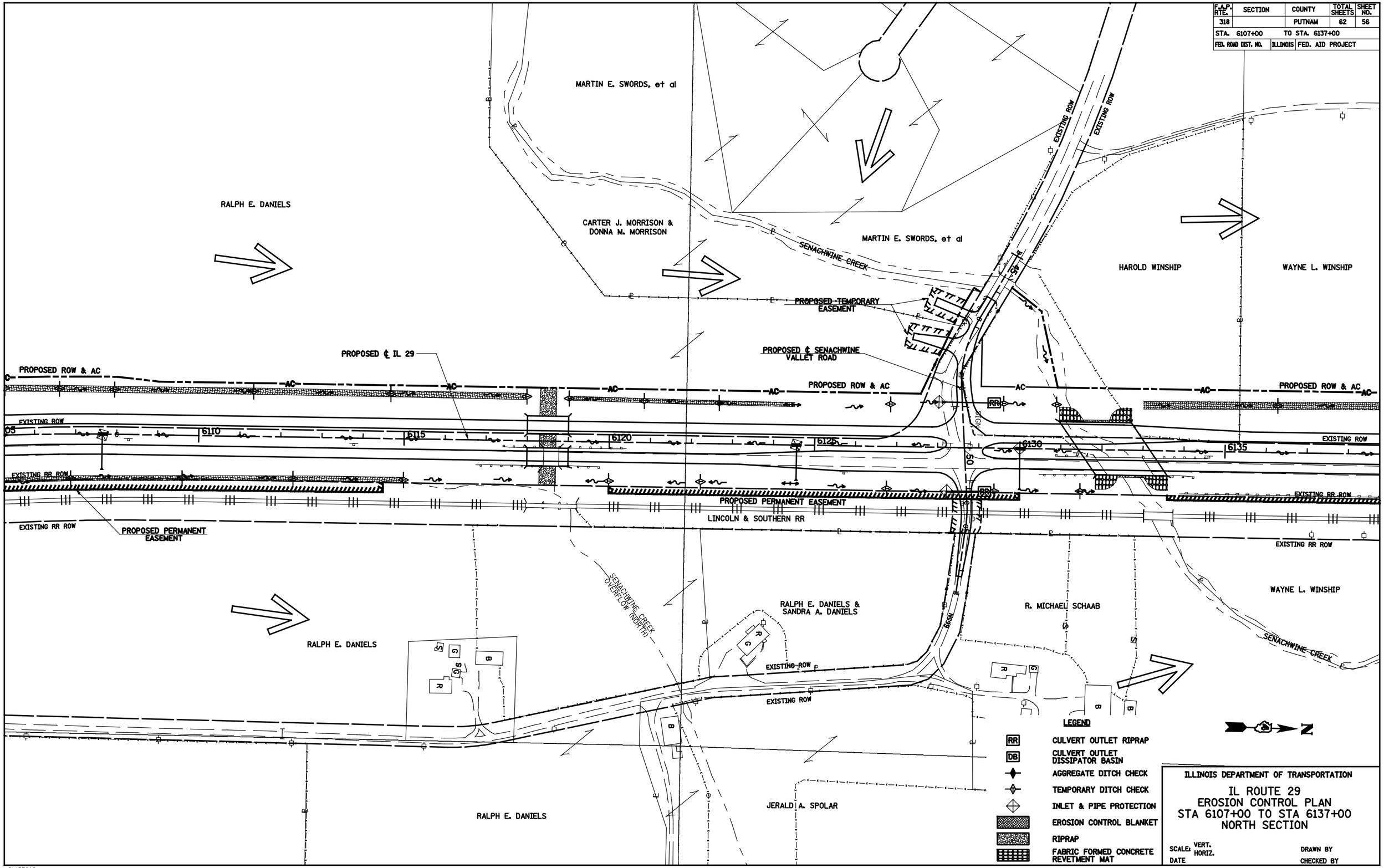
2145E014

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PUTNAM	62	55
STA. 6077+00		TO STA. 6107+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E015

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PUTNAM	62	56
STA. 6107+00		TO STA. 6137+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6107+00 TO STA 6137+00
NORTH SECTION

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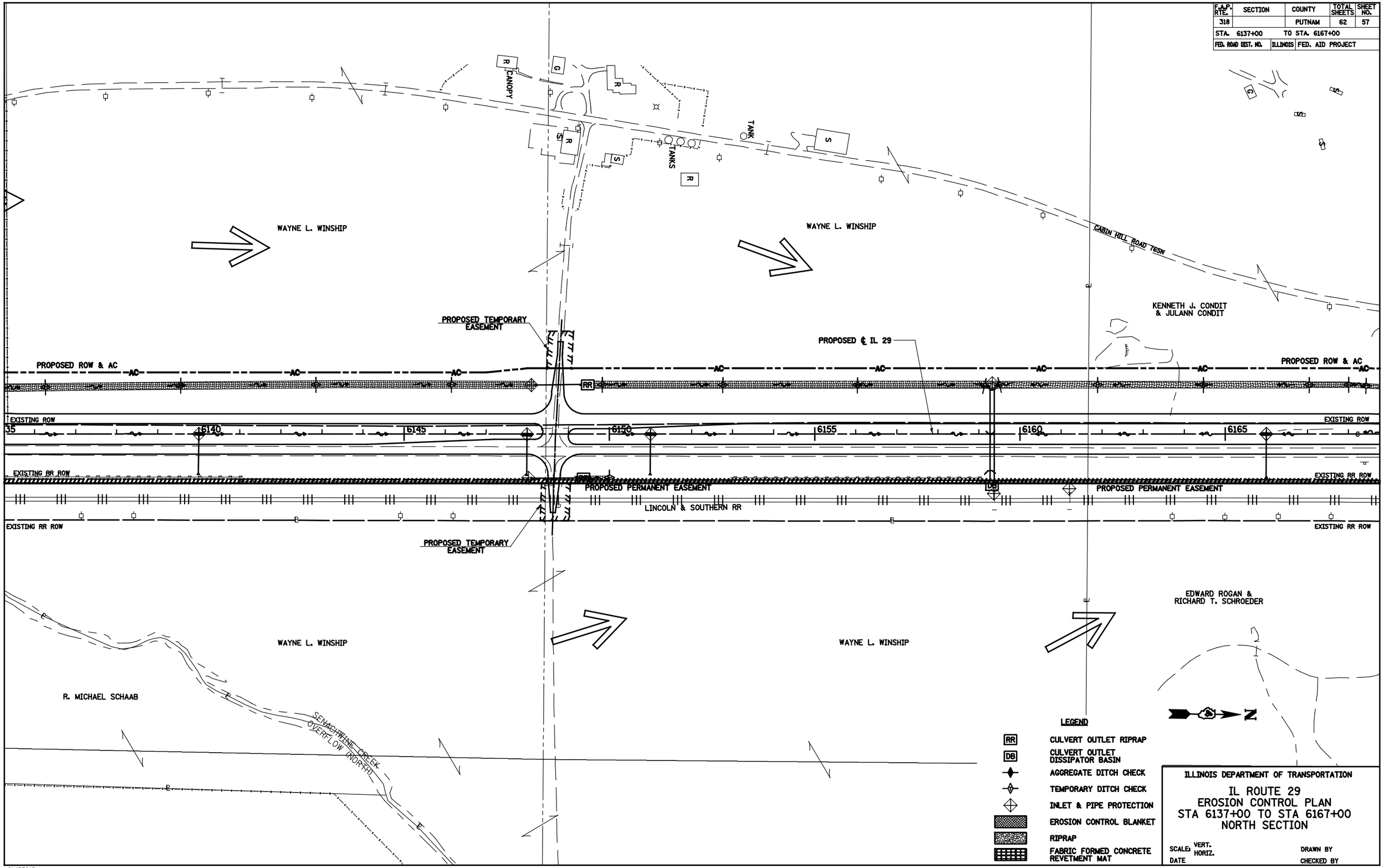
2145E016

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PUTNAM	62	57
STA. 6137+00		TO STA. 6167+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E017

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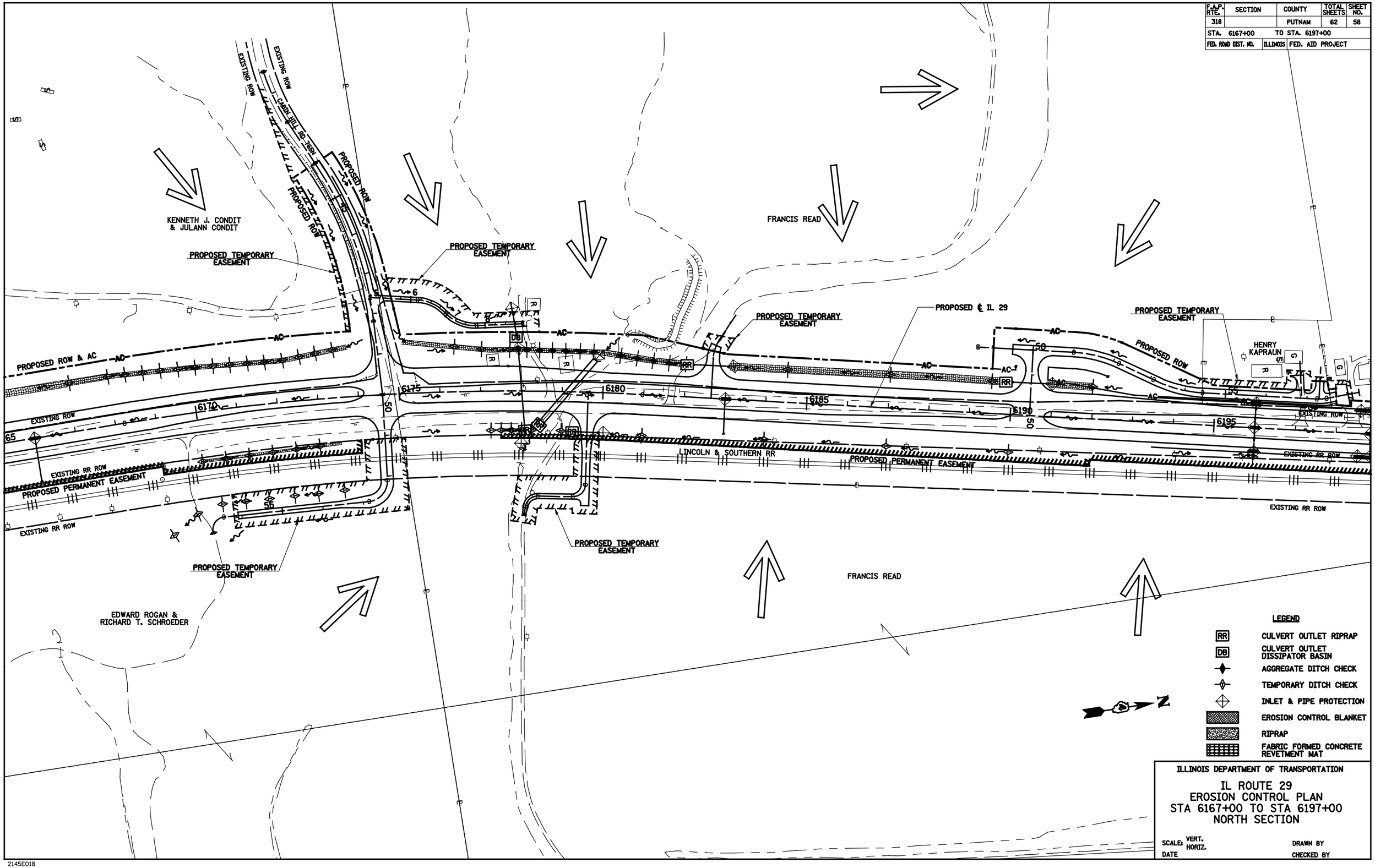
STA. 6167+00		TO STA. 6197+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6167+00 TO STA 6197+00
NORTH SECTION

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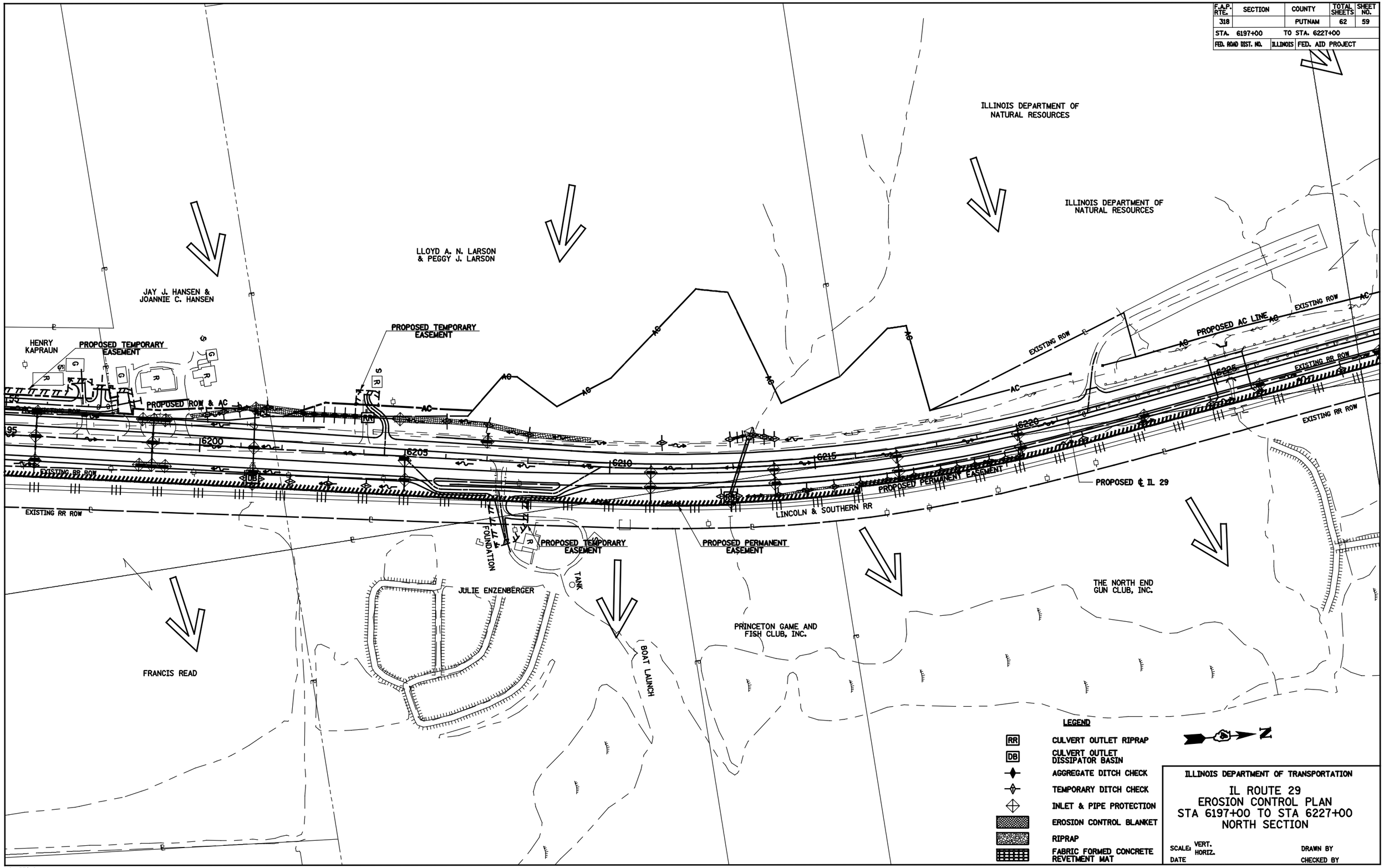
2145E018

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		PUTNAM	62	59
STA. 6197+00		TO STA. 6227+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



2145E019

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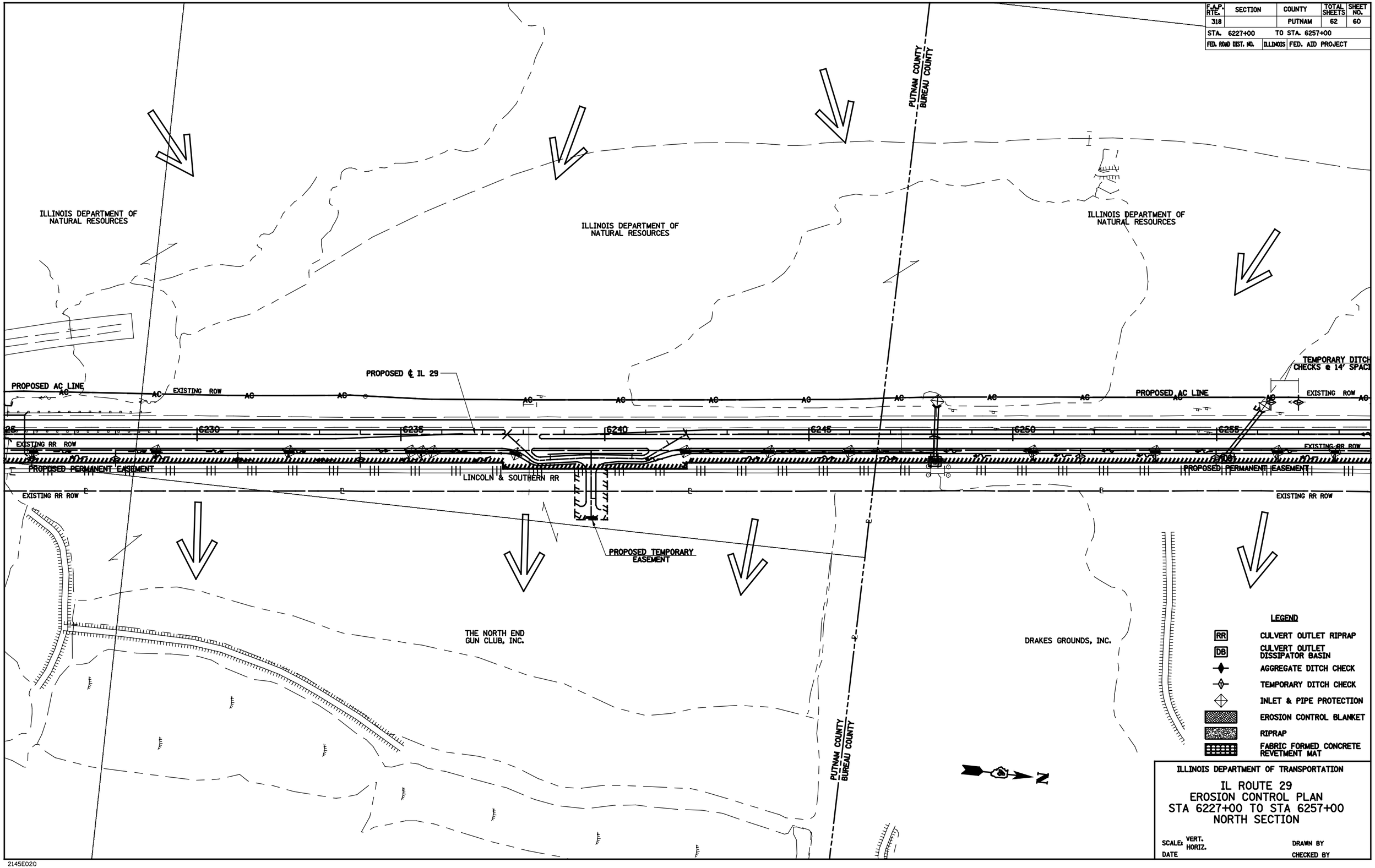
318		PUTNAM	62	60
STA. 6227+00		TO STA. 6257+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



LEGEND

- RR — CULVERT OUTLET RIPRAP
- DB — CULVERT OUTLET DISSIPATOR BASIN
- AGGREGATE DITCH CHECK
- TEMPORARY DITCH CHECK
- INLET & PIPE PROTECTION
- EROSION CONTROL BLANKET
- RIPRAP
- FABRIC FORMED CONCRETE REVETMENT MAT

ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6227+00 TO STA 6257+00
NORTH SECTION

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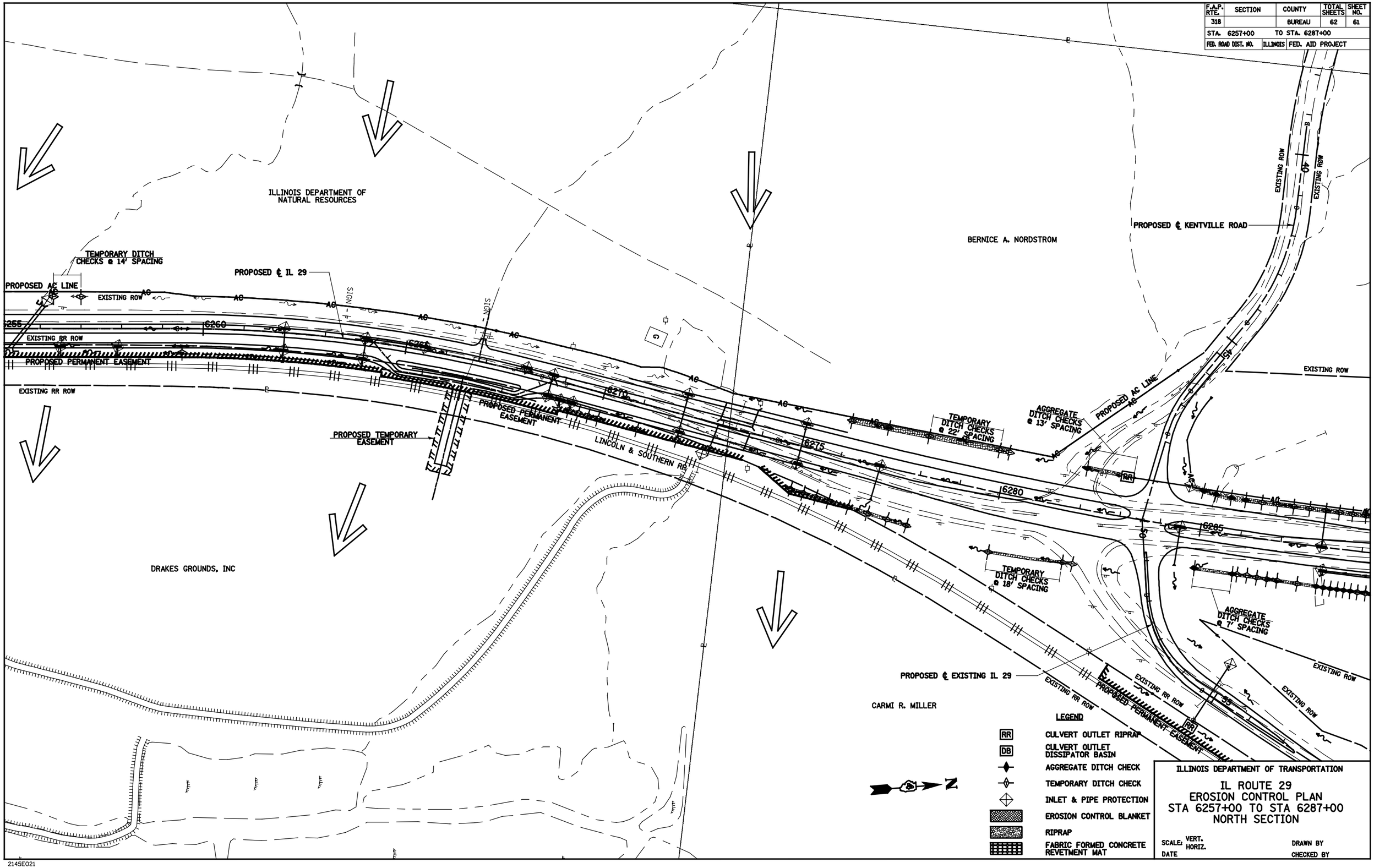
2145E020

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		BUREAU	62	61
STA. 6257+00		TO STA. 6287+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6257+00 TO STA 6287+00
NORTH SECTION

SCALE: VERT. HORIZ.
DATE
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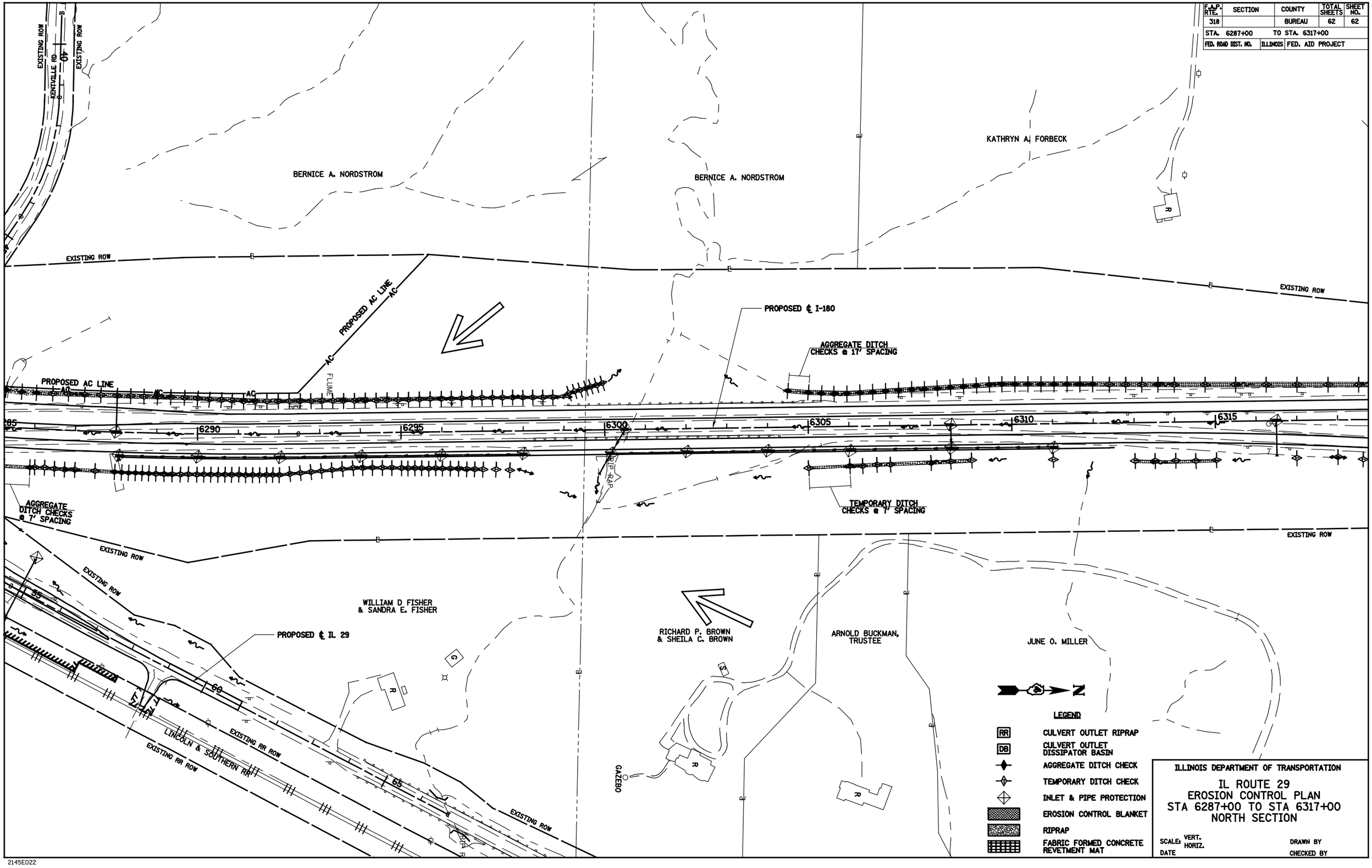
2145E021

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
318		BUREAU	62	62
STA. 6287+00		TO STA. 6317+00		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



ILLINOIS DEPARTMENT OF TRANSPORTATION

IL ROUTE 29
EROSION CONTROL PLAN
STA 6287+00 TO STA 6317+00
NORTH SECTION

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

VOLUME V – COMBINED DESIGN REPORT
APPENDIX G3 – FRONTAGE ROAD/SERVICE DRIVE AND ACCESS ROAD JUSTIFICATION REPORT
PROJECT REPORTS

FAP ROUTE 318 (IL 29)
SECTION 1, 2, 3, 4, 5, 20, 21, & 6, 8, 9, 10
PEORIA, MARSHALL, PUTNAM & BUREAU COUNTIES
P–94–009–01 & P–94–019–02

Illinois Department of Transportation
CH2MHILL

June 2010
Catalog No. 032469-00P

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VOLUME V

APPENDIX G3

FRONTAGE ROAD/SERVICE DRIVE
AND
ACCESS ROAD JUSTIFICATION REPORT

TECHNICAL REPORT
FRONTAGE ROAD/
SERVICE DRIVE AND ACCESS ROAD
JUSTIFICATION REPORT

FAP ROUTE 318 (IL 29)
BETWEEN ILLINOIS
ROUTE 6 AND I-180

Peoria, Marshall, Putnam & Bureau Counties
Job No's. P-94-009-01 & P-94-019-02
PTB No's. 890/138 & 118/56

Prepared for

ILLINOIS DEPARTMENT OF TRANSPORTATION
District 4

April, 2009

Prepared by
Hutchison Engineering, Inc.

S:\Jobs\2145\Justification-Cvr&toc

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- 1.2 Purpose of Study…….

2 Discussion
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- 2.4 Service Drives and Access Roads…….……
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- D Technical Memorandum No. 7 – Grade Separation Study Illinois Route 29/Boy Scout Road……
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SECTION 1

Introduction

1.1 Location and Description of the Project

The Illinois Department of Transportation has initiated a Phase I study to examine alternatives to improve existing IL Route 29 to a four-lane facility from the termination of IL Route 6 near Mossville in Peoria County to Interstate 180 in Bureau County. The proposed IL Route 29 improvements will provide a major link in the central Illinois highway system and a high-type highway connection between IL Route 6 and Interstate 180. This highway system will play a vital role in the economic development of the region.

For the purposes of the study, the corridor is divided into the following three areas: the South Section which runs from IL Route 6 to Benedict Street just north of Chillicothe; the Central Section, which continues from this point north of Chillicothe to south of Henry; and the North Section, which runs from south of Henry to the northern project limits just south of Interstate 180. This study examines the preferred alternative as presented in the Environmental Impact Statement and Combined Design Report.

The proposed highway will be constructed as a freeway from the IL Route 6 interchange near Mossville to east of Benedict Street north of Chillicothe. From east of Benedict Street north of Chillicothe to the Interstate 180 interchange at the north terminus of the project the proposed highway will be constructed as an expressway.

The freeway portion will have full access control. Access to the freeway will be provided at interchanges with selected public roads. Other intersecting roads will be either terminated at the right-of-way, perpetuated with grade separations, or interconnected with other roads. Access to properties abutting the freeway will be provided by frontage roads, service drives, or the existing public roads.

The expressway portion will have partial access control. Access to the expressway will be provided at interchanges with selected public roads, at grade intersections with selected public roads, frontage roads, service drives, and one point of direct access from abutting properties which is used solely for farming purposes and/or one point of access for a single family residence. Such points of access will meet the spacing requirements set forth by the Bureau of Design and Environment. There will be no direct commercial access to the expressway.

1.2 Purpose of Study

This Frontage Road/Service Drive and Access Road Justification Report is one of the support documents to the Combined Design Report for FAP Route 318 (IL 29) in Peoria, Marshall, Putnam, and Bureau Counties.

The Combined Design Report provides a detailed description and analysis of the preferred alternative. The roadway plan sheets included as Appendix A to the Combined Design Report shows the proposed access control plan along the proposed highway.

This report discusses the locations of the proposed frontage roads, service drives, and access roads along the project as well as the disposition of sideroads and private access points intersected by the proposed highway system.

SECTION 2

Discussion

2.1 Analysis

The Combined Design Report presents the design criteria for the various highway types included in the project. The design criteria were established to conform to current IDOT policy. Also included in the Combined Design Report is a list of the proposed design exceptions for the recommended alternative, including the access control design exceptions. The access control design criteria are part of the overall criteria. Exhibit B contains a list of the proposed access control design criteria for the project.

Alternatives for access to the proposed highway system were developed for the appropriate options for the highway type and proposed access control design criteria. The alternatives developed depended on engineering factors such as geometrics and sight distance; physical restraints such as the Illinois River and bluffs; environmental concerns such as sensitive areas, residential areas, development potential, and economic impacts; specific stakeholder concerns such as the railroad's concern for crossing safety; public input; and cost.

The following sections discuss the proposed access provided by sideroads, frontage roads, service drives and access roads, and entrances. Design exceptions to the access control design criteria are noted.

2.2 Side Roads

In the freeway portion of the project with full access control, intersecting sideroads will be terminated at the right-of-way, rerouted, perpetuated with a grade separation, or provided with an interchange. As stated in the BDE Manual, the importance of the sideroad continuity, the feasibility of an alternate route, traffic volumes, construction costs, and environmental impacts are factors that must be evaluated to determine the recommended treatment of the sideroad.

In the expressway portion of the project with partial access control, intersecting sideroads will be provided with an interchange, an intersection, or perpetuated with a grade separation. Interchanges will be provided at US and state marked routes, where justified by cross traffic volume, and at other major sideroads where traffic signals would be warranted within nine years after initial construction. One grade separation will be provided at a sideroad that is located too close to an interchange for an at-grade intersection, but provides critical access that should not be terminated.

Table A contains a list of the sideroads intersected by the proposed highway and the disposition of each. Discussion of the disposition of the sideroads is also provided along with any access control design exceptions that will be necessary to construct the sideroads as proposed.

2.3 Frontage Roads

A frontage road is a public road, adjacent to, and normally parallel to a freeway or expressway and connected to a public road at both ends. Frontage roads are provided to control access, provide access to properties, and maintain local road continuity.

Table B contains a list of the proposed frontage roads that are proposed along the proposed highway. Justification for the frontage road is also provided along with the access control design exceptions that will be necessary to construct the roads as proposed.

2.4 Service Drives and Access Roads

A service drive is a road connected to a public road at one end only and normally is constructed to properties which would otherwise be landlocked or denied access. An access road is a road connected to a public road at one end only and is normally constructed across a property to an adjacent property that would otherwise be landlocked or denied access.

Table C contains a list of the proposed service drives and access roads that will be provided with the proposed highway system. Justification of the service drive and access roads is also provided along with the access control design exceptions that will be necessary to construct the road as proposed.

2.5 Entrances

Entrances will be provided along frontage roads and sideroads in the freeway portions of the project in accordance with BDE policy and the design exceptions noted. Entrances will be provided along the mainline and sideroads in the expressway portion of the project in accordance with BDE policy and the design exceptions noted.

Options for entrances include: provide access to a property at the same location as the existing access, provide access to a property at a new location off a highway or service road, close the access and purchase the property or pay damages, and provide a new access where none currently exist for a property that would otherwise be landlocked. Another variation of access is to provide right-in/right-out only access to a property where full access cannot be provided.

Table D contains a list of the entrances along the proposed highway system and the disposition of each. Justification of the disposition of the entrances is provided along with any access control design exceptions that will be necessary to construct the entrances as proposed.

SECTION 3

References

Bureau of Design and Environmental Manual, Illinois Department of Transportation, latest.

Handbook for the Policy on Permits for Access Driveways to State Highways, Illinois Department of Transportation, latest.

Administration Policies for Local Roads and Streets, Bureau of Local Roads and Streets, Illinois Department of Transportation, latest.

A policy on Geometric Design of Highways and Streets, AASHTO, 2004.

Combined Design Report

Environmental Impact Statement.

SECTION 4

Tables

SECTION 4

Table A Side Roads

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
FREEWAY - SOUTH SECTION								
IL ROUTE 6	STATE					X		COMPLETION OF EXISTING PARTIAL INTERCHANGE.
DICKINSON LN	LOCAL			X				LOW VOLUME ROAD. 2032 AADT=20. IT WILL BE CLOSED EAST OF THE NEW FREEWAY AND CONNECTED TO A FRONTAGE ROAD WEST OF THE NEW FREEWAY.
BOY SCOUT RD	CH 29			X				LOW VOLUME ROAD. 2032 AADT=30 EAST OF THE FREEWAY AND 160 WEST OF THE FREEWAY. IT WILL BE CLOSED EAST OF THE NEW FREEWAY AND CONNECTED TO A FRONTAGE ROAD WEST OF THE NEW FREEWAY. SEE TECHNICAL MEMORANDUM 7 IN EXHIBIT D.
CEDAR HILLS DR	CH 28					X		2032 AADT=9500 EAST OF THE FREEWAY AND 6100 WEST OF THE FREEWAY. PROPOSED INTERCHANGE BASED ON TRAFFIC, INTERCHANGE SPACING, NEEDS OF COMMUNITY, AND ACCOMMODATION OF CATERPILLAR TRAFFIC
OLD GALENA RD	CH 60				X			2032 AADT=6600 SOUTH OF THE FREEWAY AND 4200 NORTH OF THE FREEWAY. PROPOSED GRADE SEPARATION BASED ON TRAFFIC AND NEEDS OF COMMUNITY AND INTERCHANGE SPACING.
WAYNE RD	LOCAL		X					2032 AADT=500. EXISTING INTERSECTION WITH ROME WEST ROAD DOES NOT PROVIDE ADEQUATE SPACING FROM THE RAMP INTERSECTIONS. WAYNE ROAD WILL BE REALIGNED TO TIE TO KRAUSE ROAD EAST OF THE ROME WEST INTERCHANGE TO MAINTAIN SIDEROAD CONTINUITY.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
ROME WEST RD	CH 24					X		2032 AADT=1750. PROPOSED INTERCHANGE BASED ON TRAFFIC, INTERCHANGE SPACING, NEEDS OF COMMUNITY
ROME WEST RD/KNOX ST	ROME STREET		X					PROPOSED RE-ALIGNMENT TO CONNECT ROME WEST ROAD WITH KNOX STREET
SEVENTH ROAD	ROME STREET	X						
SIXTH STREET	ROME STREET	X						
VON ACHEN DRIVE	ROME STREET	X						
IL RTE 29	STATE	X						
THIRD STREET	ROME STREET	X						
RIVER BEACH DRIVE	ROME STREET	X						
KRAUSE RD	LOCAL				X			2032 AADT=800. PROPOSED GRADE SEPARATION BASED ON TRAFFIC, NEEDS OF COMMUNITY.
MCGRATH ST	LOCAL					X		2032 AADT=260. PROPOSED INTERCHANGE BASED ON INTERCHANGE SPACING, NEEDS OF COMMUNITY. SEE CHILLICOTHE RESOLUTION IN EXHIBIT C.
CLOVERDALE RD	LOCAL				X			2032 AADT=5900 EAST OF THE FREEWAY AND 1950 WEST OF THE FREEWAY. PROPOSED GRADE SEPARATION BASED ON TRAFFIC, NEEDS OF COMMUNITY. SEE CHILLICOTHE RESOLUTION AND SUMMARY OF MEETING WITH CITY OFFICIALS IN EXHIBITS C AND E.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
SYCAMORE ST	LOCAL				X			2032 AADT=450. PROPOSED GRADE SEPARATION BASED ON NEEDS OF COMMUNITY. SEE CHILLICOTHE RESOLUTION AND SUMMARY OF MEETING WITH CITY OFFICIALS IN EXHIBITS C AND E.
TRUITT RD	CH 19					X		2032 AADT=9200 EAST OF THE FREEWAY AND 5400 WEST OF THE FREEWAY. PROPOSED INTERCHANGE BASED ON TRAFFIC, INTERCHANGE SPACING, NEEDS OF COMMUNITY. SEE CHILLICOTHE RESOLUTION AND SUMMARY OF MEETING WITH CITY OFFICIALS IN EXHIBITS C AND E.
RATLIFF RD	LOCAL		X					PROPOSED ALIGNMENT PARALLEL TO FREEWAY TO MAINTAIN CONTINUITY OF ROAD
BENEDICT ST	LOCAL		X		X			2032 AADT=550. PROPOSED GRADE SEPARATION BASED ON TRAFFIC, NEEDS OF COMMUNITY. RELOCATION PROVIDES CONTINUITY WITH THE NORTH LEG OF BENEDICT STREET. SEE CHILLICOTHE RESOLUTION AND SUMMARY OF MEETING WITH CITY OFFICIALS IN EXHIBITS C AND E.
EXPRESSWAY - CENTRAL AND NORTH SECTIONS								
EXISTING IL ROUTE 29	STATE					X		PROPOSED INTERCHANGE WITH STATE ROUTE
HILDA COURT	CHILLICOTHE STREET	X						
MCDOWELL STREET	CHILLICOTHE STREET	X						
MOFFITT STREET	CHILLICOTHE STREET		X					EAST LEG OF MOFFITT REALIGNED TO MATCH WEST LEG

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
THIRD STREET	CHILLICOTHE STREET	X						
WILMOT STREET	CHILLICOTHE STREET	X						
GAIL AVENUE	CHILLICOTHE STREET	X						
YANKEE LN, HART LN, BOEHLE RD, & HARDSCRABBLE RD	LOCAL		X					PROPOSED RELOCATED AT-GRADE INTERSECTION CONNECTING HART LN, BOEHLE RD, HARDSCRABBLE RD, & YANKEE LN, LOCATED 1500' FROM IL 29 CONNECTOR INTERCHANGE. MINIMUM DISTANCE BETWEEN MEDIAN OPENINGS ALONG EXPRESSWAY IS 0.5 MILE. DESIGN EXCEPTION: CROSSROAD AT THE PROPOSED SERVICE ROAD CONNECTOR, SOUTH LOCATED 139' FROM THE EDGE OF IL 29 DOES NOT MEET THE IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: INCREASING THE SPACING WOULD CAUSE MORE IMPACT TO THE CHILLICOTHE SPORTMEN'S CLUB PROPERTY. LITTLE TRAFFIC, 2032 AADT=25, IS ANTICIPATED ON THE SERVICE ROAD, SOUTH.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
CREW LN (NORTH & SOUTH ACCESS)	LOCAL		X					2032 AADT=75. ACCESS CONTROL DESIGN EXCEPTION: CROSSROAD AT THE PROPOSED CREW LANE CONNECTOR LOCATED 126' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: CREW LANE IS PROPOSED TO BE LOCATED HORIZONTALLY ON ITS EXISTING ALIGNMENT. INCREASING THE SPACING WOULD PUSH CREW LANE INTO THE BLUFF. PROPOSED RELOCATED AT-GRADE INTERSECTION CONNECTING CREW LN & ACCESS TO IDOT REST AREA AND SERVICE ROAD, NORTH. THE PROPOSED INTERSECTION COMBINES EXISTING CREW LANE NORTH AND SOUTH ACCESS POINTS.
HOPEWELL DR	LOCAL	X						2032 AADT=1200. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER SIGHT DISTANCE AND BETTER PROFILE GRADE.
BARRVILLE DR	LOCAL	X						2032 AADT=50. PROPOSED AT-GRADE INTERSECTION.
OAK ST	SPARLAND ST						X	2032 AADT=125. CONFLICT WITH PROPOSED INTERCHANGE RAMP

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
MAPLE ST	SPARLAND ST						X	2032 AADT=225. CONFLICT WITH PROPOSED INTERCHANGE RAMP AN EXISTING ALLEY WILL BE IMPROVED TO PROVIDE A CONNECTOR STREET FROM MAPLE STREET TO WILLOW ROAD.
WILLOW RD	SPARLAND ST	X						2032 AADT=300. PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL-29
WATER ST	SPARLAND ST	X						PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL-29 RIGHT-IN/RIGHT-OUT ONLY, SERVES ONE RESIDENCE
ELM ST	SPARLAND ST		X					2032 AADT=275 ELM STREET CONNECTION TO WILLOW ROAD REALIGNED DUE TO PROFILE.
FERRY ST/IL ROUTE 17 (EAST)	SPARLAND ST /STATE	X						2032 AADT=13,800. PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL-29.
CENTER STREET	SPARLAND ST	X						PROPOSED AT-GRADE INTERSECTION WITH IL ROUTE 17 (EAST) RIGHT-IN/RIGHT-OUT ONLY
LACON STREET	SPARLAND ST	X						PROPOSED AT-GRADE INTERSECTION WITH IL ROUTE 17 (EAST)
VINE STREET	SPARLAND ST	X						PROVIDES ACCESS FROM CENTER STREET TO LACON STREET
EXISTING IL ROUTE 29	STATE					X		2032 AADT=8400. PROPOSED INTERCHANGE WITH STATE ROUTE.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
NORTH ST	SPARLAND ST	X						2032 AADT=550. PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL 29.
MAIN ST	SPARLAND ST	X						2032 AADT=200. PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL 29.
IL ROUTE 17 (WEST)	STATE	X						2032 AADT=3400. PROPOSED ROUNDABOUT INTERSECTION WITH EXISTING IL 29.
THENIUS ST	SPARLAND ST	X						2032 AADT=550. PROPOSED AT-GRADE INTERSECTION WITH EXISTING IL 29 AND RAMP C.
1100 E (SOUTH)	LOCAL		X					PROPOSED CONNECTOR ROAD & AT-GRADE INTERSECTION RELOCATED 3000' NORTH TO PROVIDE ADEQUATE INTERSECTION SPACING AND ADEQUATE PROFILE.
CAMP GROVE RD	CH 8	X						2032 AADT=150. PROPOSED AT-GRADE INTERSECTION
SBI 29	LOCAL		X					2032 AADT=75 PROPOSED AT GRADE INTERSECTION WITH EXISTING IL29 RELOCATED 200' NORTH TO IMPROVE INTERSECTION SIGHT DISTANCE.
OLD ROUTE 29 (1150 N)	LOCAL		X					2032 AADT=600. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER GEOMETRICS TO INCREASE THE SIGHT DISTANCE.
1300 E	LOCAL		X					2032 AADT=75 EAST OF EXPRESSWAY AND 50 WEST OF EXPRESSWAY. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER GEOMETRICS TO INCREASE THE SIGHT DISTANCE.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
WESTERN RD	CH 6					X		2032 AADT=8500 EAST OF EXPRESSWAY AND 1600 WEST OF EXPRESSWAY. PROPOSED INTERCHANGE BASED ON TRAFFIC, NEEDS OF COMMUNITY (HENRY).
OLD INDIAN RD (1400 N)	LOCAL				X			2032 AADT=125. PROPOSED GRADE SEPARATION BASED ON 1 MILE SPACING CRITERIA FOR MEDIAN OPENINGS.
WHITEFIELD RD	LOCAL	X						2032 AADT=1600 EAST OF THE EXPRESSWAY AND 375 WEST OF THE EXPRESSWAY. PROPOSED AT-GRADE INTERSECTION.
COUNTY LINE RD	LOCAL	X						2032 AADT=325 EAST OF THE EXPRESSWAY AND 75 WEST OF THE EXPRESSWAY. PROPOSED AT-GRADE INTERSECTION.
EXISTING IL ROUTE 29	STATE		X					2032 AADT=300. PROPOSED AT-GRADE INTERSECTION AND CONNECTING ROAD.
CENTER ST (SOUTH)	LOCAL		X					PROPOSED AT-GRADE INTERSECTION AND CONNECTING ROAD RELOCATED 1100' SOUTH.

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
BRADFORD RD	CH 2		X					2032 AADT=1750. PROPOSED AT-GRADE INTERSECTION REALIGNED IN PUTNAM FOR BETTER GEOMETRICS. DESIGN EXCEPTION: CROSSROAD AT THE PROPOSED BRADFORD ROAD (WEST LEG) LOCATED 200' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: REALIGNING CENTER STREET TO INCREASE THIS SPACING WOULD IMPACT EXISTING DEVELOPMENT AND INCREASE CONSTRUCTION COSTS.
DOUGLAS ST	PUTNAM ST						X	INADEQUATE MEDIAN OPENING SPACING.
COURTLAND ST	PUTNAM ST						X	INADEQUATE MEDIAN OPENING SPACING.
MAIN ST	PUTNAM ST						X	INADEQUATE MEDIAN OPENING SPACING.
SENACHWINE LAKE RD	LOCAL						X	2032 AADT=200. PROPOSED AT-GRADE INTERSECTION WITH REALIGNED BRADFORD RD.
CONDIT ST	PUTNAM ST	X						PROPOSED AT-GRADE INTERSECTION WITH SENACHWINE LAKE ROAD.
HIGH ST	PUTNAM ST		X					2032 AADT=50. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER GEOMETRICS TO INCREASE THE SIGHT DISTANCE.
665N (SOUTH)	LOCAL	X						2032 AADT=125. PROPOSED AT-GRADE INTERSECTION RT IN/RT OUT ONLY DUE TO PROXIMITY TO HIGH STREET INTERSECTION

TABLE A
SIDE ROADS

NAME	TYPE	AT GRADE INTERSECTION			GRADE SEPARATION	INTERCHANGE	CLOSE	COMMENTS
		SAME LOCATION	RELOCATED	FRONTAGE ROAD				
SENACHWINE VALLEY RD/665 N	LOCAL		X					2032 AADT=800. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER GEOMETRICS.
CABIN HILL RD/765 N	LOCAL	X						2032 AADT=150. PROPOSED AT-GRADE INTERSECTION.
KENTVILLE RD/ EXISTING IL ROUTE 29	CH 16/ STATE		X					2032 AADT=1800 EAST OF THE EXPRESSWAY AND 1000 WEST OF THE EXPRESSWAY. PROPOSED AT-GRADE INTERSECTION REALIGNED FOR BETTER GEOMETRICS TO INCREASE THE SIGHT DISTANCE AND IMPROVE SAFETY OF TURNING MOVEMENTS.
I-180	STATE					X		EXISTING INTERCHANGE.

SECTION 4

Table B Frontage Roads

TABLE B
FRONTAGE ROADS

LOCATION	COMMENTS
FREEWAY - SOUTH SECTION	
LT STA 2653+00 TO STA 2772+00 ALONG WEST SIDE OF FREEWAY	EXTENSION/RECONSTRUCTION OF AN EXISTING FRONTAGE ROAD AT THE EXISTING IL ROUTE 6 INTERCHANGE. MAINTAINS LOCAL ROAD CONTINUITY. CONNECTS MOSSVILLE ROAD, DICKINSON LANE, BOY SCOUT ROAD, AND CEDAR HILLS DRIVE. PROVIDES ACCESS TO PROPERTIES WEST OF THE FREEWAY. NEW ACCESS POINTS ARE PROVIDED AT THE INGRESS/EGRESS EASEMENT ALONG THE DICKINSON PROPERTY AND TO THE CILCO ELECTRIC EASEMENT.
RT STA 2905+00 TO STA 2930+00 ALONG EAST SIDE OF ROME WEST INTERCHANGE RAMP	MAINTAINS LOCAL ROAD CONTINUITY. EXISTING INTERSECTION WITH ROME WEST ROAD DOES NOT PROVIDE ADEQUATE SPACING FROM THE RAMP INTERSECTIONS. WAYNE ROAD WILL BE REALIGNED TO TIE TO KRAUSE ROAD EAST OF THE ROME WEST INTERCHANGE.
LT STA 3180+00 TO STA 3200+00 ALONG WEST SIDE OF FREEWAY	MAINTAINS LOCAL ROAD CONTINUITY. RELOCATES PORTION OF RATLIFF ROAD THAT WAS SEVERED BY THE FREEWAY.

SECTION 4

Table C Service Drives and Access Roads

TABLE C
SERVICE DRIVES AND ACCESS ROADS

LOCATION	COMMENTS	PROPERTIES SERVED
FREEWAY - SOUTH SECTION		
RT STA 2805+00 TO STA 2808+00	WILL PROVIDE ACCESS TO CATERPILLAR TO CROSS A CHANNEL. THE EXISTING ACCESS ACROSS THE CHANNEL WILL BE CUT OFF BY THE FREEWAY. THERE IS NO OTHER VIABLE OPTION.	CATERPILLAR TRACTOR CO.
RT STA2841+00 TO STA 2850+00	WILL PROVIDE ACCESS TO TWO PROPERTIES THAT WILL BE CUT OFF BY FREEWAY. LESS EXPENSIVE THAN PURCHASING PROPERTIES.	MAXHEIMER & LAHOOD 24.2 ACRES
RT STA 38+08 ROME WEST RD	WILL PROVIDE ACCESS TO WAYNE ROAD. THE EXISTING ACCESS TO WAYNE ROAD FROM ROME WEST ROAD HAS TO BE RELOCATED DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION.	NA
LT STA 38+08 ROME WEST RD	WILL PROVIDE ACCESS TO TWO PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION.	MILLER 3.6 ACRES HEUBI 80.8 ACRES
RT STA 91+92 KRAUSE RD	WILL PROVIDE ACCESS TO FOUR PROPERTIES THAT WILL BE CUT OFF BY THE FREEWAY. LESS EXPENSIVE THAN PURCHASING THE PROPERTIES.	R. JOOS 16.2 ACRES L. JOOS 45.7 ACRES MILLER 14.3 ACRES THOMAS 17.2 ACRES
LT STA 110+95 KRAUSE RD	WILL PROVIDE ACCESS TO THREE PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE KRAUSE ROAD GRADE SEPARATION AND TO ACCESS PROPERTIES THAT WILL BE CUT OFF BY THE FREEWAY.	STEEG 9.8 ACRES PAULSON 9.5 ACRES JOOS 15.7 ACRES
RT STA 40+20 TO STA 46+90 CLOVERDALE ROAD	WILL PROVIDE ACCESS TO FIVE PROPERTIES. ACCESS RELOCATIONS ARE DUE TO REALIGNED CLOVERDALE ROAD FOR GRADE SEPARATION.	FERRY 0.8 ACRE WAGONER 19.8 ACRES SCHAUFELBERGER 19.4 ACRES SWANSON 37.5 ACRES PHILLIPS 2.8 ACRES
LT STA 37+80 TRUITT RD	WILL PROVIDE ACCESS TO GALENA ROAD GRAVEL PROPERTY AND TO THE CILCO EASEMENT. ACCESS RELOCATIONS ARE DUE TO THE ACCESS THAT WILL BE CUT OFF BY THE FREEWAY AND FOR THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION.	GALENA ROAD GRAVEL 5.9 ACRES CILCO EASEMENT
RT STA 65+90 TRUITT RD	WILL PROVIDE ACCESS TO TWO PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION.	NEWELL 35.2 ACRES VONK 152.5 ACRES

TABLE C
SERVICE DRIVES AND ACCESS ROADS

LOCATION	COMMENTS	PROPERTIES SERVED
RT STA 50+80 RATLIFF RD	WILL PROVIDE ACCESS TO THE EAST SIDE OF THE FREEWAY BY CONSTRUCTING AN ACCESS ROAD UNDER THE TWIN BRIDGES AT SENACHWINE CREEK. LESS EXPENSIVE THAN PURCHASING THE PROPERTY.	MEINTS, JOLLIF, & HERRON 61.4 ACRES
EXPRESSWAY - CENTRAL AND NORTH SECTIONS		
RT STA 76+60 IL 29 CONNECTOR	WILL PROVIDE ACCESS TO TWO PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE ACCESS THAT WILL BE CUT OFF BY THE EXPRESSWAY AND THE REQUIRED MINIMUM DISTANCE FROM THE INTERCHANGE.	RIVERSIDE MATERIALS 136.4 ACRES MILLER, PARR, HOLSTROM, WEBER, & KELLEY 166.3 ACRES
RT STA 3319+50 TO STA 3339+50	WILL PROVIDE ACCESS TO YANKEE LANE TO THE EAST THAT WILL BE CUT OFF BY THE EXPRESSWAY AND WILL PROVIDE ACCESS TO THE BEE-J AMUSEMENTS PROPERTY. ACCESS TO YANKEE LANE IS RELOCATED DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE INTERCHANGE. ACCESS TO BEE-J AMUSEMENTS IS RELOCATED TO MINIMIZE THE NUMBER OF ACCESS POINTS OFF IL 29. COMMERCIAL ACCESS IS NOT ALLOWED OFF AN EXPRESSWAY. ACCESS CONTROL DESIGN EXCEPTION:CROSSROAD AT THE PROPOSED SERVICE ROAD CONNECTOR SOUTH LOCATED 139' FROM THE EDGE OF IL 29 DOES NOT MEET THE IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: INCREASING THE SPACING WOULD CAUSE MORE IMPACT TO THE CHILLICOTHE SPORTSMEN'S CLUB PROPERTY. LITTLE TRAFFIC IS ANTICIPATED ON THE SERVICE ROAD, SOUTH.	BEE-J AMUSEMENTS 4.6 ACRES CHILLICOTHE SPORTMEN'S CLUB 44.2 ACRES

TABLE C
SERVICE DRIVES AND ACCESS ROADS

LOCATION	COMMENTS	PROPERTIES SERVED
RT STA 3350+00 TO STA 3371+73	WILL PROVIDE ACCESS TO SEVERAL PROPERTIES, INCLUDING THE IDOT REST AREA, WITH ONE ACCESS POINT OFF THE EXPRESSWAY. ACCESS CONTROL DESIGN EXCEPTION: CROSSROAD AT THE PROPOSED SERVICE ROAD CONNECTOR, NORTH LOCATED 189' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: INCREASING THE SPACING WOULD CAUSE THE CROSSROAD TO BE LOCATED ON THE MILLER PROPERTY ON THE SE END OF THE REST AREA AND INTO THE LINCOLN & SOUTHERN WALLS.	MILLER 9.3 ACRES AZBELL 7.9 ACRES SIMPSON 45 ACRES IDNR 26.5 ACRES
LT STA 3516+78	WILL PROVIDE ACCESS TO THE BARRVILLE SUBDIVISION WITH ONE ACCESS POINT OFF OF THE EXPRESSWAY.	HOLOCKER 0.6 ACRE PERRAULT 1.1 ACRES SCHMIDT 1.8 ACRES LORD 8.9 ACRES
LT STA 3626+50 TO STA 3629+50	WILL PROVIDE ACCESS TO THE EAST SIDE OF THE EXPRESSWAY FOR WETLAND AMERICA TRUST, INC. THROUGH DAVID SMITH'S PROPERTY BY PROVIDING THE ACCESS ROAD UNDER THE DUAL BRIDGES AT GIMLET CREEK AND IL ROUTE 17. LESS EXPENSIVE THAN CONSTRUCTING A SEPARATE BRIDGE OVER GIMLET CREEK FOR THE ACCESS.	WETLANDS AMERICA TRUST 345 ACRES
LT & RT STA 3648+70 TO STA 3653+25	WILL PROVIDE ACCESS TO THE SPARLAND SEWER TREATMENT SITE BY PROVIDING AN ACCESS ROAD FROM CENTER STREET UNDER THE DUAL BRIDGES AT THENIUS CREEK.	SPARLAND SEWER PLANT
RT STA 3653+00 TO STA 3656+00	WILL PROVIDE ACCESS TO THE IDNR PROPERTY. THE EXISTING ACCESS WILL BE CUT OFF BY THE EXPRESSWAY.	IDNR 90.7 ACRES
RT STA 3755+50 TO STA 3762+50	WILL RELOCATE THE ACCESS FOR TWO PROPERTIES TO THE LOCATION OF THE AT-GRADE INTERSECTION FOR THE PROPOSED CONNECTOR ROAD TO 1100E ROAD.	HOLLER 32.1 ACRES SHOFNER 13.5 ACRES
LT & RT STA 53+35 1100E CONNECTOR RD	WILL PROVIDE ACCESS TO THREE PROPERTIES OFF OF THE 1100E CONNECTOR ROAD INSTEAD OF FROM THE EXPRESSWAY.	MCMAHAN 0.4 ACRE WEIR 0.5 ACRE ZNANIECKI 1.2 ACRES
RT STA 3788+60	WILL PROVIDE ACCESS TO THREE PROPERTIES WITH ONE ACCESS OFF OF THE EXPRESSWAY.	DEFFFENBAUGH 3.2 ACRES HOLLER 32.2 ACRES DUDEN 21.5 ACRES

TABLE C
SERVICE DRIVES AND ACCESS ROADS

LOCATION	COMMENTS	PROPERTIES SERVED
LT STA 5000+28	WILL PROVIDE ACCESS TO TWO PROPERTIES WITH ONE ACCESS POINT OFF OF THE EXPRESSWAY.	PHEM 17.3 ACRES WILLIAMS 128.9 ACRES
RT STA 5051+00 TO STA 5074+00	WILL PROVIDE ACCESS TO RD 1300E AT STA. 5057+50 AND TO FIELD ENTRANCE AT STA. 5073+00 WITH ONE ACCESS POINT AT STA. 5062+50 OFF OF IL 29 EXPRESSWAY.	KENNEDY 18.1 ACRES MATERIAL SERVICE CORP. 65.8 ACRES
LT STA 5062+50	WILL PROVIDE ACCESS TO FOUR PROPERTIES WITH ONE ACCESS OFF OF THE EXPRESSWAY.	NEUHALFEN 164.1 ACRES VILLIGER 111.1 ACRES STREITMATTER 41.9 ACRES GRANDVIEW SERVICE CO. 4.8 ACRES
RT STA 37+00 WESTERN RD.	WILL PROVIDE ACCESS TO TWO RESIDENCES. ACCESS RELOCATIONS ARE DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION.	MAUBACH 23.0 ACRES
LT STA 37+00 WESTERN RD.	WILL PROVIDE ACCESS TO FOUR PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION AND TO PROVIDE ACCESS TO THE WEST SIDE OF GREER/CARLSON PROPERTY THAT WILL BE SPLIT BY THE PROPOSED EXPRESSWAY.	CARLSON & GREER 20.7 ACRES STUNKEL 6.1 ACRES KNUCKEY 0.9 ACRE STIMAC 77.7 ACRES
RT STA 56+90 TO STA 64+90 WESTERN ROAD	WILL PROVIDE ACCESS TO FOUR PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE REQUIRED MINIMUM DISTANCE FROM THE RAMP INTERSECTION AND THE ACCESS CONTROL ALONG MAPLE STREET.	WILLIAMS 13.2 ACRES TUTLLE 3.1 ACRES M. NIGHSONGER 2.9 ACRES B. NIGHSONGER 2.2
RT STA 35+82 1400N RD.	WILL PROVIDE ACCESS TO TWO PROPERTIES. ACCESS RELOCATIONS ARE DUE TO THE PROPOSED GRADE SEPARATION FOR 1400N.	MOUSHON 59.3 ACRES MOUSHON, TRUSTEE 82.3 ACRES
LT STA. 6190+47	WILL PROVIDE ACCESS TO THREE PROPERTIES WITH ONE ACCESS OFF OF THE EXPRESSWAY.	HANSEN 17.7 ACRES KAPRAUN 1.0 ACRE READ 98.4 ACRES

SECTION 4

Table D Entrances

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
FREEWAY - SOUTH SECTION					
RT STA 1+70 FRONTAGE ROAD	X				
LT STA 22+63 FRONTAGE ROAD	X				ACCESS REALIGNED FOR IMPROVED GEOMETRICS
LT STA 31+05 FRONTAGE ROAD	X				
LT STA 46+77 FRONTAGE ROAD				X	ACCESS FOR INGRESS/EGRESS EASEMENT
LT STA 58+85 FRONTAGE ROAD				X	ACCESS TO DICKINSON PROPERTY
LT STA 54+45 IVY LAKE ROAD		X			ACCESS RELOCATED FROM CEDAR HILLS DRIVE
RT STA 30+63 CEDAR HILLS DRIVE	X				
LT STA 60+10 CEDAR HILLS DRIVE			X		ACCESS PROVIDED AT STA 61+10
LT STA 61+10 CEDAR HILLS DRIVE	X				
RT STA 2841+50 OFF OLD GALENA ROAD	X				ACCESS OFF SERVICE DRIVE
LT STA 2842+50 OFF OLD GALENA ROAD		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
LT STA 2842+70 OFF OLD GALENA ROAD			X		PROPERTY TO BE PURCHASED FOR FREEWAY
LT STA 2844+50 OFF OLD GALENA ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 2914+58 OFF WAYNE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 33+45 WAYNE/KRAUSE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 38+22 WAYNE/KRAUSE ROAD	X				ACCESS FOR TOWER
RT STA 38+22 WAYNE/KRAUSE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 61+36 WAYNE/KRAUSE ROAD		X			ACCESS RELOCATED FROM ROME WEST ROAD
LT STA 68+83 WAYNE/KRAUSE ROAD		X			ACCESS RELOCATED FROM ROME WEST ROAD

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 68+83 WAYNE/KRAUSE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
RT STA 72+12 WAYNE/KRAUSE ROAD		X			ACCESS RELOCATED FROM ROME WEST ROAD
LT STA 34+68 ROME WEST ROAD	X				
RT STA 34+68 ROME WEST ROAD	X				
STA 4+35 WAYNE ROAD ACCESS CONNECTOR				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
STA 7+67 WAYNE ROAD ACCESS CONNECTOR				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT & RT STA 51+02 SERVICE DRIVE		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
STA 4+35 SERVICE DRIVE		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
LT STA 7+35 SERVICE DRIVE		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
STA 7+65 SERVICE DRIVE		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
LT STA 46+33 ROME WEST ROAD			X		PROPERTY TO BE PURCHASED FOR FREEWAY
RT STA 53+30 ROME WEST ROAD			X		PROPERTY TO BE PURCHASED FOR FREEWAY
RT STA 56+60 ROME WEST ROAD		X			ACCESS RELOCATED OFF WAYNE/KRAUSE ROAD
LT STA 57+60 ROME WEST ROAD		X			ACCESS RELOCATED OFF KRAUSE ROAD
RT STA 63+10 ROME WEST ROAD		X			ACCESS RELOCATED OFF WAYNE/KRAUSE ROAD
LT STA 14+87 ROME WEST ROAD/KNOX STREET	X				
LT STA 15+75 ROME WEST ROAD/KNOX STREET	X				
LT STA 45+20 SEVENTH RD.	X				
RT STA 47+04 LAWRENCE AVE.	X				
RT STA 47+42 LAWRENCE AVE.	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 48+62 LAWRENCE AVE.	X				
RT STA 49+41 LAWRENCE AVE.	X				
RT STA 50+41 LAWRENCE AVE.	X				
LT STA 30+20 KNOX STREET RE-ALIGNMENT				X	ACCESS FOR PROPERTY SEVERED BY KNOX ST. RE-ALIGNMENT
RT STA 37+00 KNOX STREET RE-ALIGNMENT				X	ACCESS FOR PROPERTY SEVERED BY KNOX ST. RE-ALIGNMENT
LT STA 43+35 KNOX STREET	X				
RT STA 43+64 KNOX STREET	X				
LT STA 45+14 KNOX STREET	X				
RT STA 46+17 KNOX STREET	X				
RT STA 48+05 KNOX STREET	X				
LT STA 48+41 KNOX STREET	X				
RT STA 48+85 KNOX STREET	X				
RT STA 52+27 KNOX STREET	X				
LT STA 54+35 KNOX STREET	X				
RT STA 54+88 KNOX STREET	X				
RT STA 48+04 SIXTH STREET	X				
LT STA 48+09 SIXTH STREET	X				
LT STA 48+47 SIXTH STREET	X				
RT STA 49+07 SIXTH STREET	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 51+09 SIXTH STREET	X				
LT STA 51+29 SIXTH STREET	X				
LT STA 81+85 KRAUSE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 88+65 KRAUSE ROAD		X			ACCESS RELOCATED FOR BETTER PROFILE
RT STA 93+82 KRAUSE ROAD		X			ACCESS RELOCATED TO SERVICE DRIVE
RT STA 52+86 SERVICE DRIVE		X			ACCESS RELOCATED FROM KRAUSE ROAD
LT STA 64+33 SERVICE DRIVE				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 70+68 SERVICE DRIVE				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 104+87 OFF KRAUSE ROAD		X			ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 106+64 OFF KRAUSE ROAD		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
LT STA 108+72 OFF KRAUSE ROAD		X			ACCESS RELOCATED OUTSIDE PROPOSED ACCESS CONTROL
LT STA 113+10 KRAUSE ROAD	X				
RT STA 2978+70 OFF SERVICE DRIVE				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
RT STA 22+00 OFF MCGRATH ROAD		X			ACCESS RELOCATED AWAY FROM INTERSECTION
LT & RT STA 62+15 MCGRATH ROAD				X	ACCESS FOR PROPERTY SEVERED BY MCGRATH ROAD
LT & RT STA 81+60 MCGRATH ROAD				X	ACCESS FOR PROPERTY SEVERED BY MCGRATH ROAD
LT STA 122+40 MCGRATH ROAD				X	ACCESS FOR PROPERTY SEVERED BY MCGRATH ROAD
RT STA 37+30 CLOVERDALE ROAD	X				
RT STA 37+80 CLOVERDALE ROAD			X		ACCESS PROVIDED AT STA 37+30
RT STA 40+30 CLOVERDALE ROAD	X				ACCESS PROVIDED OFF SERVICE DRIVE

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 41+40 OF CLOVERDALE ROAD				X	PROVIDES ADDITIONAL ACCESS FOR SWANSON PROPERTY
LT STA 41+50 CLOVERDALE ROAD				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
RT STA 44+10 CLOVERDALE ROAD	X				ACCESS PROVIDED OFF SERVICE DRIVE
RT STA 45+00 CLOVERDALE ROAD	X				ACCESS PROVIDED OFF SERVICE DRIVE
RT STA 46+50 CLOVERDALE ROAD	X				ACCESS PROVIDED OFF SERVICE DRIVE
RT STA 55+40 CLOVERDALE ROAD			X		ACCESS MOVED TO STA 61+90
RT STA 61+90 CLOVERDALE ROAD	X				
LT STA 62+20 CLOVERDALE ROAD				X	PROVIDES NEEDED ACCESS TO PROPERTY
LT STA 40+00 SYCAMORE STREET				X	PROVIDES NEEDED ACCESS TO PROPERTY
RT STA 40+00 SYCAMORE STREET				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
RT STA 61+10 SYCAMORE STREET				X	ACCESS FOR PROPERTY SEVERED BY FREEWAY
LT STA 61+10 SYCAMORE STREET				X	PROVIDES NEEDED ACCESS TO PROPERTY
RT STA 33+50 TRUITT ROAD		X			RELOCATED TO PROVIDE SPACING FROM RAMP INTERSECTION
LT STA 37+80 TRUITT ROAD				X	ACCESS TO CILCO ELECTRIC EASEMENT
RT STA 37+80 TRUITT ROAD		X			RELOCATED TO PROVIDE SPACING FROM RAMP INTERSECTION
RT STA 40+30 TRUITT ROAD			X		RELOCATED WEST ON TRUITT ROAD AT STA 33+50
RT STA 49+20 TRUITT ROAD			X		PROPERTY TO BE PURCHASED
RT STA 63+00 TRUITT ROAD	X				ACCESS RELOCATED OFF OF SERVICE ROAD
RT STA 50+90 RATLIFF ROAD				X	ACCESS TO PROPERTY SEVERED BY FREEWAY

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 44+00 BENEDICT STREET				X	ACCESS TO PROPERTY SEVERED BY FREEWAY
RT STA 44+00 BENEDICT STREET				X	ACCESS TO PROPERTY SEVERED BY FREEWAY
EXPRESSWAY - CENTRAL AND NORTH SECTIONS					
RT STA 20+85 IL 29 CONNECTOR	X				
RT STA 22+15 IL 29 CONNECTOR	X				
LT STA 24+55 IL 29 CONNECTOR	X				
RT STA 25+00 IL 29 CONNECTOR	X				
LT STA 26+00 IL 29 CONNECTOR	X				
RT STA 26+00 IL 29 CONNECTOR	X				
RT STA 26+30 IL 29 CONNECTOR	X				
RT STA 26+90 IL 29 CONNECTOR	X				
LT STA 27+60 IL 29 CONNECTOR	X				
LT & RT STA 28+80 IL 29 CONNECTOR	X				
LT STA 29+60 IL 29 CONNECTOR	X				
LT STA 30+40 IL 29 CONNECTOR	X				
LT & RT STA 32+40 IL 29 CONNECTOR	X				
RT STA 32+70 IL 29 CONNECTOR	X				
RT STA 33+50 IL 29 CONNECTOR	X				
LT STA 147+20 MOFFITT STREET	X				
RT STA 147+40 MOFFITT STREET	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 148+40 MOFFITT STREET	X				
RT STA 153+10 MOFFITT STREET	X				THREE ENTRANCES OFF EXISTING MOFFITT STREET
LT STA 40+80 IL 29 CONNECTOR	X				TWO ENTRANCES OFF WILMOT STREET
LT STA 42+00 IL 29 CONNECTOR	X				
LT STA 43+90 IL 29 CONNECTOR	X				TWO ENTRANCES OFF GAIL AVENUE
RT STA 45+30 IL 29 CONNECTOR	X				
LT STA 46+10 IL 29 CONNECTOR	X				
RT STA 46+40 IL 29 CONNECTOR	X				
LT STA 58+50 IL 29 CONNECTOR	X				
RT STA 62+40 IL 29 CONNECTOR	X				
RT STA 66+70 IL 29 CONNECTOR	X				
LT STA 67+10 IL 29 CONNECTOR	X				
RT STA 84+40 IL 29 CONNECTOR		X			ACCESS PROVIDED OFF SERVICE ROAD DUE TO PROXIMITY TO INTERCHANGE
RT STA 88+00 IL 29 CONNECTOR			X		ACCESS CLOSED DUE TO LOCATION BY INTERCHANGE, ACCESS PROVIDED OFF BENEDICT STREET
RT STA 221+61 SERVICE ROAD	X				PROVIDES ACCESS FROM EXISTING IL 29
RT STA 3288+50 OFF EXISTING ROUTE 29		X			ACCESS PROVIDED OFF SERVICE ROAD DUE TO PROXIMITY TO INTERCHANGE
LT STA 3291+00 OFF EXISTING ROUTE 29			X		ACCESS CLOSED DUE TO LOCATION BY INTERCHANGE
LT & RT STA 6+44 OLD HART LANE				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 304+40 HART LANE	X				
LT STA 306+70 HART LANE	X				
LT STA 308+60 HART LANE	X				
LT STA 309+20 HART LANE		X			ACCESS RELOCATED FOR BETTER ALIGNMENT
LT STA 310+42 HART LANE				X	RELOCATED FROM RT STA 309+20 HART LANE FOR BETTER ALIGNMENT
LT STA 49+40 YANKEE LANE			X		ACCESS TO OLD IL 29. DOES NOT PROVIDE ACCESS TO SURROUNDING PROPERTIES
RT STA 51+50 YANKEE LANE				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
LT & RT STA 52+90 YANKEE LANE				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
LT STA 330+60 RELOCATED BOEHLE ROAD		X			ACCESS PROVIDED AT LT STA 331+80
LT STA 331+80 RELOCATED BOEHLE ROAD				X	PROVIDES ACCESS FOR LT STA 330+60
RT STA 331+80 RELOCATED BOEHLE ROAD				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
LT STA 335+20 RELOCATED BOEHLE ROAD		X			ACCESS PROVIDED OFF RELOCATED BOEHLE ROAD
LT STA 341+70 RELOCATED BOEHLE ROAD	X				
LT STA 344+50 RELOCATED BOEHLE ROAD				X	PROVIDES ACCESS TO LT STA 346+00
LT STA 346+00 RELOCATED BOEHLE ROAD		X			ACCESS PROVIDED AT LT STA 344+50
RT STA 3340+30		X			ACCESS PROVIDED OFF SERVICE ROAD, SOUTH. COMMERCIAL ACCESS NOT ALLOWED FROM EXPRESSWAY
RT&LT STA 422+55 SERVICE ROAD, SOUTH				X	PROVIDES ACCESS TO RT STA 3340+30
RT STA 349+10 HARDSCRABBLE ROAD	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 352+50 HARDSCRABBLE ROAD	X				
RT STA 3350+00		X			ACCESS PROVIDED OFF SERVICE ROAD, NORTH TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY
LT STA 50+25 CREW LANE	X				ACCESS PROVIDED OFF RELOCATED CREW LANE TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY
LT STA 51+30 CREW LANE				X	ACCESS PROVIDED OFF RELOCATED CREW LANE TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY
RT STA 500+20 SERVICE ROAD, NORTH				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
RT STA 501+84 SERVICE ROAD, NORTH				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
RT STA 508+75 SERVICE ROAD, NORTH				X	ACCESS PROVIDED TO LANDLOCKED PROPERTY
BACKUS, MATUSZEWSKI, ARONHALT, AESCHLIMAN, FRUMES AND WARNER PROPERTIES ON RIGHT SIDE OF CREW LANE			X		PROPERTIES TO BE PURCHASED
RT STA 3367+70	X				
RT STA 3370+80		X			ACCESS PROVIDED OFF SERVICE ROAD, NORTH
RT STA 3391+90	X				
LT STA 3401+00	X				RT IN / RT OUT ONLY
LT STA 3415+70		X			RT IN / RT OUT ONLY AT LT STA 3416+50 FOR BETTER PROFILE
RT STA 3416+50			X		SAFETY CONCERNS WITH THE RAILROAD CROSSING
LT STA 3416+50				X	PROVIDES RT IN / RT OUT ACCESS TO LT STA 3415+70
LT STA 3422+85			X		HAS ACCESS TO PROPERTY FROM BRIAR CT
RT STA 3439+00			X		SAFETY CONCERNS WITH THE RAILROAD CROSSING

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 3454+65			X		SAFETY CONCERNS WITH THE RAILROAD CROSSING
LT STA 3454+30			X		ACCESS ALREADY PROVIDED FROM HOPEWELL NEIGHBORHOOD
RT STA 3492+70			X		SAFETY CONCERNS WITH THE RAILROAD CROSSING
LT STA 3511+37	X				RT IN / RT OUT ONLY
RT STA 3514+30			X		SAFETY CONCERNS WITH THE RAILROAD CROSSING
LT STA 46+75 BARRVILLE ROAD				X	RELOCATED FROM LT STA 47+00 BARRVILLE ROAD
LT STA 47+00 BARRVILLE ROAD		X			ACCESS RELOCATED TO LT STA 46+75 FOR BETTER ALIGNMENT
RT STA 47+70 BARRVILLE ROAD				X	ACCESS RELOCATED FROM LT STA 3511+37, OLD IL 29 TO BE CLOSED ACCESS CONTROL DESIGN EXCEPTION: PROPOSED ENTRANCE LOCATED 193.7' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: AN ACCESS DRIVE HAS TO BE PROVIDED IN ORDER NOT TO LANDLOCK THE SCHMIDT PROPERTY.
LT STA 48+27 BARRVILLE ROAD				X	ACCESS RELOCATED FROM LT STA 49+00 BARRVILLE ROAD
LT STA 49+00 BARRVILLE ROAD		X			ACCESS RELOCATED AWAY FROM INTERSECTION ACCESS CONTROL DESIGN EXCEPTION: PROPOSED PE LOCATED 134.4' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: AN ACCESS DRIVE HAS TO BE PROVIDED IN ORDER NOT TO LANDLOCK THE HOLOCKER PROPERTY.
LT STA 3525+50				X	EXIT FROM IDNR PROPERTY

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 3534+50	X				RT IN / RT OUT ONLY
RT STA 3543+00				X	REPLACES "Y" DRIVE AT RT STA 3547+00
LT STA 3544+20			X		ACCESS PROVIDED AT LT STA 3534+50
RT STA 3547+00 AND STA 3550+00		X			REPLACED WITH DRIVE AT RT STA 3543+00
RT STA 3580+70			X		DUE TO PROXIMITY TO INTERCHANGE RAMPS
RT STA 3589+70			X		PROPERTY TO BE PURCHASED
RT STA 3597+75			X		ACCESS PROVIDED FROM STREETS IN SPARLAND
RT STA 3602+30			X		ACCESS PROVIDED FROM STREETS IN SPARLAND
LT STA 2+10 PINE STREET	X				
LT STA 47+20 MAPLE STREET	X				
RT STA 47+40 MAPLE STREET	X				
LT STA 48+50 MAPLE STREET	X				
RT STA 50+00 MAPLE STREET	X				3 ENTRANCES OFF OF ALLEY
RT STA 50+70 MAPLE STREET	X				
LT STA 48+10 SPARLAND ALLEY	X				
RT STA 48+30 SPARLAND ALLEY	X				
LT STA 48+47 SPARLAND ALLEY	X				
LT STA 47+37 WILLOW ROAD	X				
LT STA 47+66 WILLOW ROAD	X				
LT STA 39+00 FERRY STREET	X				ALLEY

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 39+74 FERRY STREET			X		PROPERTY TO BE PURCHASED
LT STA 39+90 FERRY STREET			X		ACCESS AT LT STA 51+00 ON EXISTING IL ROUTE 29
RT STA 43+00 IL ROUTE 17 EAST	X				
LT STA 44+00 IL ROUTE 17 EAST	X				
RT STA 44+10 IL ROUTE 17 EAST	X				
RT STA 45+35 IL ROUTE 17 EAST	X				
RT STA 46+00 IL ROUTE 17 EAST	X				
LT STA 51+40 IL ROUTE 17 EAST	X				
RT STA 55+40 VINE STREET	X				
RT STA 56+10 VINE STREET	X				
LT STA 51+00 EXISTING ROUTE 29	X				RT IN / RT OUT ONLY
LT STA 51+80 EXISTING ROUTE 29	X				RT IN / RT OUT ONLY
LT STA 54+78 EXISTING ROUTE 29	X				ENTRANCES OFF NORTH STREET
LT STA 56+20 EXISTING ROUTE 29	X				
LT STA 58+00 EXISTING ROUTE 29	X				
LT STA 59+10 EXISTING ROUTE 29	X				
LT STA 61+70 EXISTING ROUTE 29	X				
LT STA 62+30 EXISTING ROUTE 29	X				
LT STA 62+60 EXISTING ROUTE 29	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 63+10 EXISTING ROUTE 29	X				
LT STA 47+30 IL ROUTE 17 WEST	X				2 ENTRANCES
LT STA 68+55 EXISTING ROUTE 29			X		ACCESS OFF OF IL ROUTE 17 WEST
LT STA 72+20 EXISTING ROUTE 29			X		ACCESS OFF OF IL ROUTE 17 WEST
LT STA 47+15 OFF THENUIS STREET	X				
LT STA 3658+90			X		PROPERTY TO BE PURCHASED
LT STA 3656+00			X		ACCESS PROVIDED FROM CONNECTION TO CENTER STREET
RT STA 3667+50			X		PROPERTY TO BE PURCHASED
RT STA 3670+60			X		PROPERTY TO BE PURCHASED
LT STA 3684+20			X		PROPERTY TO BE PURCHASED
LT STA 3685+20			X		PROPERTY TO BE PURCHASED
LT STA 3699+90		X			ACCESS RELOCATED FOR BETTER PROFILE
LT STA 3709+50			X		PROPERTY TO BE PURCHASED
LT STA 3710+10		X			ACCESS LOCATED FOR BETTER PROFILE
LT STA 3712+74				X	RELOCATED FROM LT STA 3710+10
RT STA 3724+80	X				
LT STA 3732+66			X		PROPERTY HAS OTHER ACCESS OFF 1100 E
LT STA 3738+40			X		PROPERTY HAS OTHER ACCESS OFF 1100 E
LT STA 3754+10		X			ACCESS RELOCATED OFF 100 E CONNECTOR
RT STA 3754+10		X			ACCESS RELOCATED OFF SERVICE ROAD

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 3762+30		X			ACCESS RELOCATED OFF SERVICE ROAD
STA 11+58 SERVICE ROAD				X	RELOCATED FROM RT STA 3762+30
LT STA 3765+00		X			ACCESS RELOCATED OFF 1100 E CONNECTOR
RT STA 3788+30		X			ACCESS RELOCATED FOR BETTER PROFILE
RT STA 46+70 CAMP GROVE ROAD	X				
RT STA 47+60 CAMP GROVE ROAD			X		ACCESS IS WITHIN ACCESS CONTROL LIMITS
LT & RT STA 49+00 CAMP GROVE ROAD			X		ACCESS IS WITHIN ACCESS CONTROL LIMITS
LT STA 3801+00			X		ACCESS PROVIDED OFF SBI 29
RT STA 43+64 OFF SERVICE ROAD	X				ACCESS CONTROL DESIGN EXCEPTION: SERVICE DRIVE FOR ACCESS IS NOT LOCATED AT A MEDIAN OPENING, AND DOES NOT MEET IDOT POLICY. JUSTIFICATION: MEDIAN OPENINGS ARE LOCATED IN CLOSE PROXIMITY AT STATION 3788+00 AND STATION 3823+00. THESE OPENINGS WILL ACCOMMODATE RESIDENT MOVEMENTS TO/FROM THE SERVICE DRIVE.
LT STA 43+70 OFF SERVICE ROAD	X				ACCESS CONTROL DESIGN EXCEPTION: SERVICE DRIVE FOR ACCESS IS NOT LOCATED AT A MEDIAN OPENING, AND DOES NOT MEET IDOT POLICY. JUSTIFICATION: MEDIAN OPENINGS ARE LOCATED IN CLOSE PROXIMITY AT STATION 3788+00 AND STATION 3823+00. THESE OPENINGS WILL ACCOMMODATE RESIDENT MOVEMENTS TO/FROM THE SERVICE DRIVE.
RT STA 44+80 SERVICE ROAD			X		PROPERTY TO BE PURCHASED
LT STA 3823+10				X	ACCESS PROVIDED AT MEDIAN OPENING

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 3823+10	X				
RT STA 3836+70	X				RT IN / RT OUT ONLY
LT STA 3839+30			X		PROPERTY TO BE PURCHASED
LT STA 3857+30		X			ACCESS RELOCATED AT PROPOSED CROSSOVER
RT STA 5000+30	X				
RT STA 5029+80		X			ACCESS RELOCATED AT PROPOSED CROSSOVER AT RT STA 5032+30
RT STA 45+40 OLD ROUTE 29				X	RELOCATED OFF IL 29 TO MINIMIZE ACCESS POINTS
LT STA 45+30 OLD ROUTE 29	X				
LT STA 5032+80			X		ACCESS PROVIDED OFF OLD 29
LT STA 5038+20		X			ACCESS OFF OLD 29
LT STA 63+60 SERVICE ROAD	X				
LT STA 5070+90		X			ACCESS OFF SIDE ROAD
LT STA 43+39 SIDE ROAD				X	PROVIDES ACCESS TO LT STA 5070+90
RT STA 43+39 SIDE ROAD				X	PROVIDES ACCESS TO STREITMATTER PROPERTY
RT STA 5072+90		X			ACCESS RELOCATED OFF SERVICE ROAD
RT STA 16+55 SERVICE ROAD				X	RELOCATED ACCESS FROM RT STA 5072+90
RT STA 5083+70		X			ACCESS RELOCATED OFF ACCESS ROAD
LT STA 5088+24				X	ACCESS TO BE PROVIDED AT MEDIAN CROSSOVER
RT STA 5088+24				X	ACCESS TO BE PROVIDED AT MEDIAN CROSSOVER

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 32+60 WESTERN ROAD	X				
LT STA 33+60 WESTERN ROAD				X	PROVIDES ACCESS FOR LT STA 34+30 WESTERN ROAD
LT STA 34+30 WESTERN ROAD		X			300' MINIMUM DISTANCE REQUIRED FROM INTERCHANGE ACCESS RELOCATED OFF SERVICE ROAD
LT STA 37+00 WESTERN ROAD		X			ACCESS RELOCATED OFF NORTH SERVICE ROAD
LT STA 51+30 NORTH SERVICE ROAD				X	PROVIDES ACCESS FOR LT STA 37+10 WESTERN ROAD
LT STA 69+90 NORTH SERVICE ROAD				X	PROVIDES ACCESS FOR LT STA 48+40 WESTERN ROAD
LT STA 70+50 NORTH SERVICE ROAD				X	PROVIDES ACCESS TO LANDLOCKED PROPERTY
RT STA 45+58 SOUTH SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 39+60 WESTERN ROAD
LT STA 45+62 SOUTH SERVICE ROAD				X	PROVIDES ACCESS TO LANDLOCKED PROPERTY
RT STA 46+60 SOUTH SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 38+52 WESTERN ROAD
LT STA 48+20 SOUTH SERVICE ROAD				X	PROVIDES ACCESS OFF SERVICE ROAD
RT STA 38+52 WESTERN ROAD		X			ACCESS RELOCATED OFF SOUTH SERVICE ROAD
RT STA 39+60 WESTERN ROAD		X			ACCESS RELOCATED OFF SOUTH SERVICE ROAD
LT STA 42+90 WESTERN ROAD			X		ACCESS RELOCATED OFF NORTH SERVICE ROAD
LT STA 43+60 WESTERN ROAD			X		ACCESS RELOCATED OFF NORTH SERVICE ROAD
RT STA 44+60 WESTERN ROAD			X		DUE TO PROXIMITY TO INTERCHANGE RAMPS. ACCESS PROVIDED FROM SERVICE ROAD
RT STA 46+50 WESTERN ROAD			X		DUE TO LOCATION WITHIN INTERCHANGE
LT STA 48+40 WESTERN ROAD		X			ACCESS RELOCATED OFF NORTH SERVICE ROAD
RT STA 54+50 WESTERN ROAD			X		DUE TO LOCATION WITHIN INTERCHANGE

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 55+20 WESTERN ROAD			X		DUE TO PROXIMITY TO INTERCHANGE
RT STA 57+70 WESTERN ROAD		X			ACCESS RELOCATED OFF SERVICE ROAD
RT STA 59+90 WESTERN ROAD		X			ACCESS RELOCATED OFF SERVICE ROAD
RT STA 61+00 WESTERN ROAD		X			ACCESS RELOCATED OFF SERVICE ROAD
RT STA 62+60 WESTERN ROAD		X			ACCESS RELOCATED OFF SERVICE ROAD
RT STA 40+15 SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 57+70 WESTERN ROAD
RT STA 42+70 SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 59+90 WESTERN ROAD
RT STA 43+80 SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 61+00 WESTERN ROAD
RT STA 45+70 SERVICE ROAD				X	PROVIDES ACCESS FOR RT STA 62+60 WESTERN ROAD
LT & RT 5171+00				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
RT STA 35+80 OLD INDIAN ROAD				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
LT & RT STA 64+10 OLD INDIAN ROAD				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
LT & RT STA 45+00 WHITEFIELD ROAD				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
LT & RT STA 58+40 WHITEFIELD ROAD				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
LT & RT STA 54+15 COUNTY LINE ROAD				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
LT STA 5303+50				X	ACCESS TO PROPERTY SEVERED BY EXPRESSWAY
RT STA 5310+60	X			X	ACCESS FROM SERVICE DRIVE
LT STA 5331+90				X	REALIGNED FOR BETTER SIGHT DISTANCE
RT STA 5331+90	X				

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
RT STA 6004+20	X				
RT STA 6032+ 20	X				
LT STA 6032+50			X		ACCESS RELOCATED AT PROPOSED CROSSOVER AT LT STA 6021+39 AS A PUBLIC ROAD
LT STA 57+50 BRADFORD ROAD				X	COMMERCIAL ACCESS IS NOT ALLOWED OFF EXPRESSWAY
LT & RT STA 61+10 BRADFORD ROAD				X	ACCESS TO PROPERTY SEVERED BY BRADFORD ROAD
LT STA 47+60 OFF SENACHWINE LAKE ROAD				X	
RT STA 46+86 OFF SENACHWINE LAKE ROAD				X	
RT STA 45+15 OFF SENACHWINE LAKE ROAD	X				
LT STA 44+03 OFF SENACHWINE LAKE ROAD	X				
RT STA 43+54 OFF SENACHWINE LAKE ROAD	X				
RT STA 6051+70		X			ACCESS RELOCATED OFF BRADFORD ROAD. COMMERCIAL ACCESS IS NOT ALLOWED OFF EXPRESSWAY
LT STA 6055+30			X		ANOTHER EXISTING ACCESS OFF CENTER STREET
RT STA 6055+40			X		ACCESS RELOCATED OFF BRADFORD ROAD. COMMERCIAL ACCESS IS NOT ALLOWED OFF EXPRESSWAY
LT STA 6066+30 OFF MAIN STREET	X				
RT STA 6066+30	X				RT IN / RT OUT ACCESS ONLY
LT STA 46+80 HIGH STREET	X				
LT STA 6081+40			X		ACCESS RELOCATED AT STA 6083+30
LT STA 6083+30	X				RT IN / RT OUT ACCESS ONLY

TABLE D
ENTRANCES

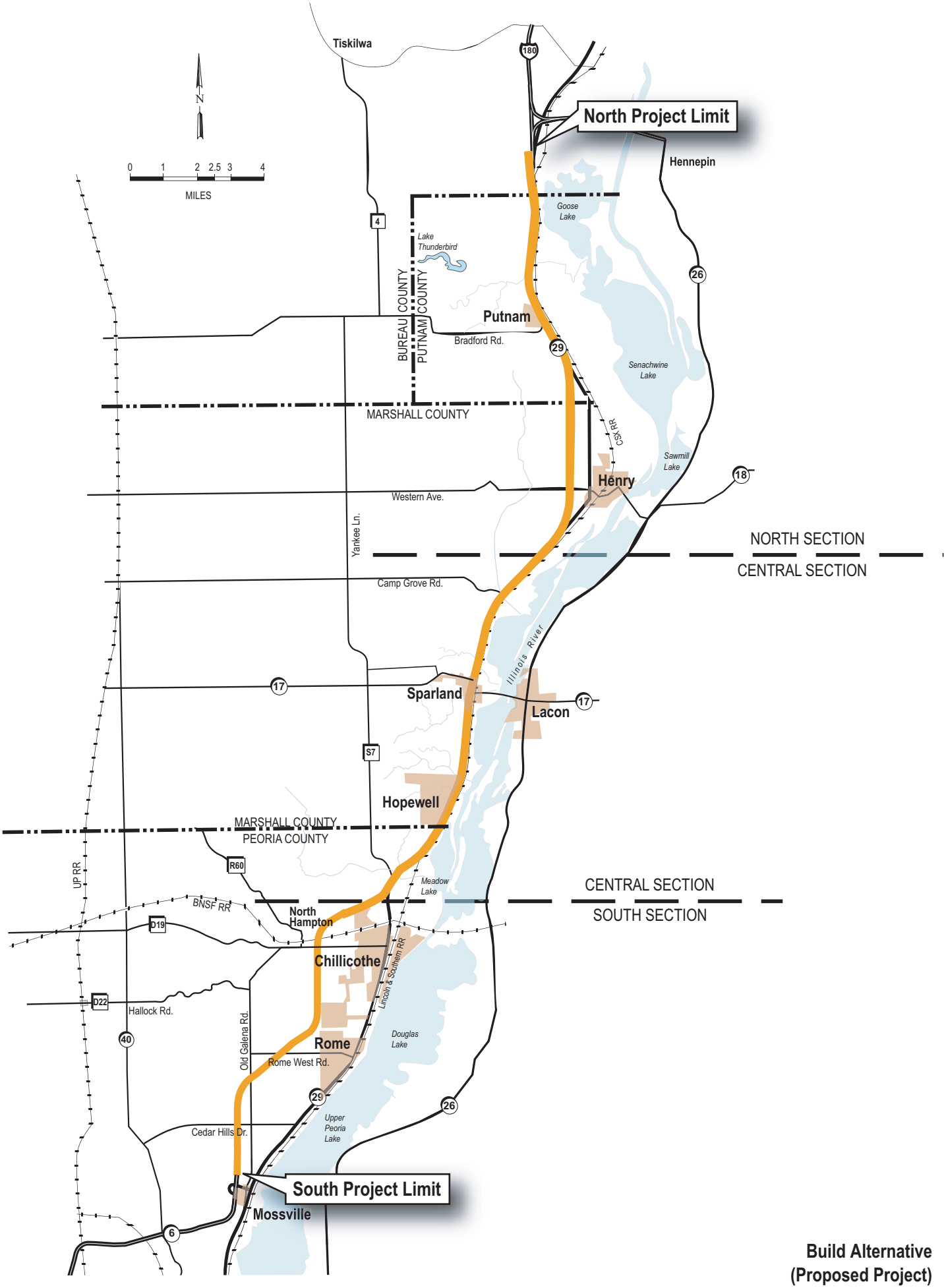
LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
LT STA 6092+95	X				RT IN / RT OUT ACCESS ONLY
LT STA 6098+00	X				
RT STA 46+80 SENACHWINE VALLEY ROAD	X				
RT STA 47+54 SENACHWINE VALLEY ROAD		X			ACCESS MOVED OUTSICE ACCESS CONTROL LIMITS
LT & RT 6148+70	X				
RT STA 6169+70		X			ACCESS RELOCATED ACROSS FROM CABIN HILL ROAD. TO BE PROVIDED AT MEDIAN OPENING
LT STA 6178+70		X			ACCESS RELOCATED OFF CABIN HILL ROAD TO MINIMIZE ACCESS POINTS OFF IL 29 ACCESS CONTROL DESIGN EXCEPTION: PROPOSED RE LOCATED 190' FROM THE EDGE OF IL 29 DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: IT WOULD BE VERY EXPENSIVE TO PROVIDE GREATER SPACING DUE TO THE PROXIMITY OF A STEEP BLUFF.
LT STA 47+61 CABIN HILL ROAD				X	ACCESS RELOCATED FROM LT STA 6178+70
RT STA 6179+63		X			ACCESS RELOCATED, RT IN / RT OUT ONLY. 500' MINIMUM DISTANCE REQUIRED BETWEEN ENTRANCES. PROVIDES 90 DEGREE CROSSING WITH RAILROAD
LT STA 6182-66		X			ACCESS RELOCATED, RT IN / RT OUT ONLY. PROVIDES 90 DEGREE INTERSECTION WITH IL 29 FOR BETTER SIGHT DISTANCE.
LT STA 56+86 SERVICE ROAD					ACCESS PROVIDED OFF SERVICE ROAD TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY
LT STA 57+31 SERVICE ROAD					ACCESS PROVIDED OFF SERVICE ROAD TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY

TABLE D
ENTRANCES

LOCATION	REPLACE AT SAME LOCATION	REPLACE AT NEW LOCATION	CLOSE	NEW ACCESS	COMMENTS
STA 58+02 SERVICE ROAD					ACCESS PROVIDED OFF SERVICE ROAD TO MINIMIZE ACCESS POINTS OFF EXPRESSWAY
LT STA 6204+50	X				RT IN / RT OUT ACCESS ONLY
RT STA 6207+30	X				RT IN / RT OUT ACCESS ONLY. SPLITS TO TWO DRIVES
LT STA 6221+70	X				RT IN / RT OUT ACCESS ONLY
RT STA 6239+79	X				ACCESS CONTROL DESIGN EXCEPTION: FE LOCATED 150' FROM A MEDIAN CROSSOVER DOES NOT MEET IDOT POLICY OF A MINIMUM 300' SPACING. JUSTIFICATION: ONE LEG OF "Y" DRIVE IS SERVED BY A MEDIAN CROSSOVER. THE DISTANCE BETWEEN LEGS ISS LESS THAN 300'.
RT STA 6266+50	X				RT IN / RT OUT ACCESS ONLY
LT STA 6266+80	X				RT IN / RT OUT ACCESS ONLY
RT STA 58+90 EXISTING IL 29	X				

SECTION 5

Exhibits



Build Alternative
(Proposed Project)

T112004002MKE Exh 2-1_Build Alt 6-15-05tll

Access Control Design Criteria

The access control design criteria used in the development of the proposed highway is as follows:

Freeway Mainline

Topic	Criteria	Source
Along Facility	Full Control	BDE,Figure 44-55A

Expressway Mainline

Topic	Criteria	Source
Along Facility	Partial	BDE,Figure 45-4A
Minimum Distance from End of Ramp Merging Taper to Nearest Point of Access or to Median Crossover[1]	1500 ft.	BDE, Figure 35-2J
Distance from Residential/Agricultural Entrance to Median Opening	0 ft. or ≥ 300 ft.	BDE,Sec.45-2.09(a)
Minimum Distance Between 2 Residential Entrances on Same Side of Expressway	500 ft.	BDE,Sec.45-2.09(a)
Desirable Average Maximum Number of Residential/Agricultural Entrances on Same Side of Expressway per ¼ Mile, as Measured Between Adjacent Crossroad Intersections or Interchanges	1	BDE,Sec.45-2.09(a)
Average Spacing Between Median Openings		
New Roadway is Parallel & Adjacent to Existing Roadway	0.5 mi.	BDE,Sec.45-2.06(b)
New Roadway Alignment is Independent of Existing Alignment[2]	1 mi.	BDE,Sec.45-2.06(b)

EXHIBIT B

Minimum Distance from Median Crossover:		
To Overhead Bridge Structure	750 ft.	BDE,Sec.45-2.06(b)
To End of Mainline Bridge	750 ft.	BDE,Sec.45-2.06(b)

State and U.S. Highways[3] – Two-Lane Principal Arterials

Topic	**Criteria**	**Source**
Access Control		
Along Arterial	Partial or None	
Adjacent to Controlled Ramp Terminals:[4]		
Approaching On-Ramp Terminal, Min. dist. From End of Radius Flare of Access connection to Ramp Intersection P.I.	600 Ft.	BDE, Fig. 35-2B
Beyond Off-Ramp Terminal, Min. Dist. from End of Radius Flare of Ramp to End of Radius Flare of Access Connect.		
Arterial Design Speed = 70 mph	600 ft.	BDE,Fig.35-2A,2B
Arterial Design Speed = 60 mph	550 ft.	BDE,Fig.35-2A,2B
Adjacent to Expressway Intersection[4]		
Along 2-Lane Divided Crossroad, Min. distance from Expressway to Access Connection	To end of Channelization	BDE,Sec.35-2.03(a)
Along Undivided Crossroad, Min. Distance from Edge of Expressway to Radius return of Access Connection	300 ft.	BDE,Fig.35-2B
Along Crossroad, Min. Distance from Edge of Expressway to Radius Return of:		
Existing Single Family Private Entrance or One Existing Field Entrance	100 ft.	BDE,Sec.35-2.03(a)
Existing Low-Volume Commercial Entrance[5]	200 ft.	BDE,Sec.35-2.03(a)
Railroad: Minimum Distance from Proposed Arterial Stop Bar to Closest Rail (Desirable)	81 ft.	BDE,Sec.36-8

State and U,S, Highways[3] - Two-Lane Minor Arterials and Two-Lane Collectors

Topic	Criteria	Source
Access Control		
Along Crossroad	Partial or None	
Adjacent to Controlled Ramp Terminals:[4] Approaching On-Ramp Terminals, Min. dist. From End of Radius Flare of Access connection to Ramp Intersection P.I.	600 ft.	BDE,Fig.35-2B
Beyond Off-Ramp Terminal, Min. Dist. from End of Radius Flare of Ramp to End of Radius Flare of Access Connect. (Crossroad Design Speed = 60 mph)	550 ft.	BDE,Fig.35-2A,2B
Adjacent to Expressway Intersection[4] Along 2-Lane Divided Crossroad, Min. Distance from Expressway to Access Connection	To end of Channelization	BDE,Sec.35-2.03(a)
Along Undivided Crossroad, Min. Distance from Edge of Expressway to Radius Return of Access Connection	300 ft.	BDE,Fig.35-2B
Along Crossroad, Min. Distance from Edge of Expressway to Radius Return of: Existing Single Family Private Entrance or One Existing Field Entrance	100 ft.	BDE,Sec.35-2.03(a)
Existing Low-Volume Commercial Entrance[5]	200 ft.	BDE,Sec.35-2.03(a)
Railroad: Minimum Distance from Proposed Arterial Stop Bar to Closest Rail (Desirable)	81 ft.	BDE,Sec.36-8

Local, Township, and County Highways [6]

Topic	Criteria	Source
Along Crossroad	None	
Adjacent to Expressway Intersection[4]		
Along 2-Lane Div. Crossroad, Minimum Distance From Expressway to Access Connection	To end of Channelization	BDE,Sec.35-2.03(a)
Along Undivided Crossroad, Minimum Distance From Edge of Expressway to Radius Return of Access Connection	300 ft.	BDE,Figure 35-2B
Along Crossroad, Minimum Distance From Edge of Expressway to Radius Return of:		
Existing Single Family Private Entrance or One Existing Field Entrance	100 ft.	BDE,Sec.35-2.03(a)
Existing Low-Volume Commercial Entrance[5]	200 ft.	BDE,Sec.35-2.03(a)
Railroad: Minimum Distance From Proposed Arterial Stop Bar to Closest Rail (Desirable)	81 ft.	BDE,Sec.36-8

NOTES

1. Applies to both sides of expressway.

2. Closer spacing may be provided for severed farm tracts.

3. Applies to Rural State Highway System arterials, not including freeways and expressways

4. See BDE, Section 35-2 for further information and for required spacing between other ramp terminals and access connections.

5. See BDE Section 35-2.03(a) for further qualifications.

6. Highways under the jurisdiction of local governmental agencies.

RESOLUTION NO. 03-09-10

A RESOLUTION OF THE CITY OF CHILLICOTHE, PEORIA COUNTY, ILLINOIS SUPPORTING IMPROVEMENTS OF ROUTE 29 CONNECTING ILLINOIS ROUTE 6 TO INTERSTATE I-180.

WHEREAS, a high-speed, four-lane, limited access highway linking Illinois Route 6 to Interstate I-180 has been proposed; and

WHEREAS, a two-lane highway, known as Illinois Route 29, presently connects Illinois Route 6 to Interstate I-180; and

WHEREAS, the improvement of Illinois Route 29 to a high-speed, four-lane, limited access highway, in addition to keeping prime farmland in production, will have a beneficial effect, if planned well, on the communities along the Route, including Chillicothe; and

WHEREAS, Chillicothe's current Comprehensive Plan points out that our community's future growth will be to the West; and

WHEREAS, the proposed highway Corridors under consideration bypass Chillicothe to the West; and

WHEREAS, the City of Chillicothe wishes to express its support for the proposed highway, and have input to the design of the highway as it bypasses Chillicothe.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF CHILLICOTHE, PEORIA COUNTY, ILLINOIS, as follows:

The City of Chillicothe hereby expresses its support for the construction of a high-speed, four-lane, limited access highway linking Illinois Route 6 to Interstate I-180, and bypassing the City of Chillicothe along proposed Corridor Alignment S-4, approximately one-half mile west of Chillicothe's current Corporate Limits, as long as the Illinois Department of Transportation allows City input, and provides full consideration of:

A) a frontage road along the highway
B) exits from the highway at Truitt Avenue and McGrath Street (extended),
C) an underpass/overpass at Cloverdale Road, Benedict Road and Sycamore Street;

thereby allowing farm access, future development along the highway, future housing growth to the West, and police and fire access to the West.

PASSED BY THE COUNCIL OF THE CITY OF CHILLICOTHE, PEORIA COUNTY, ILLINOIS, THIS 8th DAY OF September, 2003.

Donald Z. White, Mayor

ATTEST:

Sharon A. Crabel, City Clerk

EXHIBIT C

Grade Separation Study
Illinois Route 29/Boy Scout Road

PREPARED FOR: Illinois DOT District 4

PREPARED BY: CH2M HILL

DATE: September 15, 2004

Alternative options were investigated at the intersection of Proposed IL 29 and existing Boy Scout Rd. An assessment of the options considered and the Consultant's recommendation is presented in this Technical Memorandum.

Existing Conditions

Boy Scout Rd. is a mile long, rural, two lane roadway located northwest of Mossville, Illinois. In the west, Boy Scout Rd. effectively ends at the west Medina Township limits, near Camp Waconda. The eastern limit of Boy Scout Rd. is Old Galena Rd., west of the Caterpillar Tractor Company's Mossville plant.

The surrounding area is mainly agricultural and there are few residential buildings along the roadway.

Existing traffic volumes for this roadway are minimal, including less than 20 vehicles in the peak hour.

Proposed Alternatives

Potential alternatives studied for the intersection of proposed IL 29 and Boy Scout Rd. are as follows:

- Grade separation, including a bridge structure on Boy Scout Rd. overpassing proposed IL 29
- Re-route traffic on Boy Scout Rd. west of proposed IL 29 via a frontage road running north to Cedar Hills Dr. and south to Mossville Rd. Traffic on Boy Scout Rd. east of proposed IL 29 would not be allowed a re-routing movement, effectively dead-ending this portion of Boy Scout Rd.

In the BDE, the justification for grade separations can be described as follows; for each crossroad, not being designed as an interchange, a decision should be made as to whether this road should be closed, re-routed, or provided grade separation based on multiple

EXHIBIT D

factors. These include Cost, Rural/Urban operations, and local considerations. Important factors under local considerations include, school bus routes, emergency personnel routing and access, mail routes and future land use among others. Two options were analyzed using these criteria and the results are described below.

Grade Separation

The grade separation cost of Boy Scout Rd. is greater than the cost of ending the through route and re-routing traffic to the north or south through the use of a frontage road.

The existing traffic demand for Boy Scout Rd. is minimal, as described above. Projected traffic growth is minimal, resulting in a peak hour growth from less than 20 vph today to around 25 vph in the 2032 peak hour. The traffic demand therefore does not provide a justification for an overpass at Boy Scout Rd.

There are very few residential/commercial buildings located around existing Boy Scout Rd. The only apparent advantage of providing grade separation at Boy Scout Rd. is the continued direct routing of this traffic from Old Galena Rd to the west.

Re-routing Traffic

Re-routing traffic is a more economical solution than providing grade separation, which was described above. Though the frontage road does require additional cost, its functional value is greater because of the access it provides properties to the east of proposed IL 29 as well as serving to re-route traffic from Boy Scout Rd.

Traffic operations are maintained through this option , providing East/West bound traffic on Boy Scout Rd. an alternative route ½ mile to the North (Cedar Hills Dr.) and 2 miles to the South (Mossville Rd.) Also, because expected traffic growth is minimal for this area (25 vph in 2032), the re-direction of traffic will affect few motorists.

Many of the following local considerations were researched in this investigation. School bus routes will see minimal affect from the re-direction of traffic. The main bus route is located on Cedar Hills Dr. to the north. There are no current bus routes on Boy Scout Rd. If desired, the proposed frontage road may provide a direct bus route in the future to the properties west of proposed IL 29.

Fire protection and police services, traveling from Mossville Station #5, on Moss St., will be able to travel west on Mossville Rd. reaching the proposed west Frontage Rd. and continuing north to Boy Scout Rd. This will not result in adverse travel in the event of an emergency. Because Boy Scout Rd. is not a major through route, the closing will not affect emergency service provision to other nearby areas.

Businesses and farms will still maintain access via the frontage road. This will keep slow moving farm equipment off busy roads.

Future land use/development may gain access to the east and west via Cedar Hills Dr.

Recommendation

There does not appear to be a compelling reason to consider any course of action other than the re-routing of traffic on Boy Scout Rd. west of proposed IL 29 via a frontage road running north to Cedar Hills Dr. and south to Mossville Rd. Clearly, economy and traffic demand do not warrant a grade separated crossing at this location. The traffic re-direction will not cause incredibly adverse travel for current residents living along Boy Scout Rd., and all emergency personnel routes are maintained, if not improved.

It is recommended, therefore, that we re-route traffic on Boy Scout Rd. west of proposed IL 29 via a frontage road running north to Cedar Hills Dr. and south to Mossville Rd. Traffic on Boy Scout Rd. east of proposed IL 29 would not be allowed a re-routing movement, effectively dead-ending this portion of Boy Scout Rd.

Illinois Route 29 – Field Review and Meeting with Mayor of Chillicothe

ATTENDEES: Don White/Mayor, Syd/Public Works Director, Dick Stafford/CHI, Kim Kolody/CHI

FROM: CH2M HILL

DATE: July 7, 2003

On Wednesday, July 3rd, 2003 CH2M HILL were involved in a field review to investigate various conditions as they relate to alternative alignments developed for the Illinois Route 29 Phase I Study. In addition to the field review, a meeting was also held with Mayor Don White of Chillicothe and the Chillicothe Public Works Director.

Gravel Pit Issues

The existing gravel pit area was investigated. CH2M HILL met with operators of the **Galena Road Gravel Inc.** to get a reasonable understanding of activities, future plans, etc. The following information was uncovered:

- The gravel pit has a depth of approximately 70 to 75 feet.
- The gravel pit will be excavating areas further to the west then was seen in the field review. It was stated that they will excavate an area up to their property line. Their property line extends west through the S-5 (furthest east) alignment. Currently there is some operation in the area near the S-5 alignment, however, the depth of the excavation is relatively small compared to other areas of the gravel pit.
- The right-of-way line for the S-4 mainline alignment (west of S-5) has its eastern right-of-way line located where the gravel pit's property line is located. All of the S-4 mainline right-of-way would not encroach upon the gravel pit. This alignment would have less of an impact on the gravel pit then would S-5. Note that an interchange at Truitt would still have some encroachment upon the gravel pit. At this time this does not appear to be a problem.

North of Gravel Pit and Railroad Tracks

This area is the area north of the gravel pit and north of the railroad tracks, where the Illinois Route 29 bypass of Chillicothe travels further to the east to tie into existing Illinois Route 29. The following are some field observations and information received from the Gravel Pit owner.

- Galena Road Gravel Inc. owns property north of the railroad tracks, and is planning on excavating that area in the future.

EXHIBIT E

- Alternative alignments north of the railroad tracks travels through some of the Galena Road Gravel Inc. property. Specifically, alternative alignment S-4b and S-5b encroach upon the site.
- Field investigations identified potential concerns over the alignments S-4b and S-5b. These alignments travel parallel to the Senachwine Creek, and travels between the Senachwine Creek and the major ponds/waterways associated with the Galena Road Gravel Inc's property. Major soil stability, impacts to the future excavation of the Galena Road Gravel Inc's property, and other potential environmental issues could arise.
- Alignments S-4a and S-5a would have limited, if not any impact, to the Galena Road Gravel Inc's property north of the railroad tracks.
- The terrain of this area was also investigated in the field review. It appeared that the alignments S-4/5a would be able to "fit better" within the existing terrain then would alignments S-4/5b.

Meeting with Mayor Don White

A meeting was also held on July 2nd, 2003 with Don White Mayor of Chillicothe, and the Chillcothe's Public Works Director. The objective of this meeting was to:

- Understand the city's overall comprehensive plan.
- The city's concerns, preference, and/or impacts regarding the potential Illinois Route 29 bypass alignments to be carried forward.

The following documents key points that were brought up during the discussion:

- S-5 alignment is less politically desirable for some of the city's council members.
- S-5 alignment may impact the gravel pit. It was pointed out to the Mayor that this would may be very costly if a long spanned bridge would be necessary to travel over Truitt, over the railroad, and then span over the gravel pit.
- Mayor White stated that alignment S-5 is approximately ¼ mile west of the city limits, and that this alignment would enable more development to the west without hitting the S-5 alignment. The mayor went on to state that in the future growth would expand even further then ¼ mile, and that the S-5 alignment may develop into a boundary/barrier for future expansion. The mayor then stated that the S-4 alignments would enable more area for future development then would S-5. The Mayor stated that this would be a desirable factor.

The Mayor's overall vision for the Chillicothe network would be to:

- Extend McGrath Street to the west to S-4. McGrath Street is just north of Three Sisters Park and runs parallel, south of Cloverdale Rd.
- Consider interchanges at McGrath Street and Truit Road.
- Grade separate Cloverdale Road and Sycamore Street at the Illinois Route 29 Bypass to maintain roadway continuity, and to ensure that access is not cut off.

- An at-grade crossing or grade separation at Benedict to provide access to newly developing high-end housing as well as a possible golf course.
- An interchange at either Cedar Hills Drive or Old Galena Road for access to Caterpillar would be beneficial.

The Chillicothe Public Works Director made some comments regarding utility issues.

- There is a lift station located along the south side of Sycamore Street, east of S-5. The lift is used for sewer and could be maintained if either alignment were selected.
- Caissons, existing and future, would be a concern if there were at-grade intersections at Cloverdale or Sycamore with either of the two bypass alignments. The Public Works Director stated if Cloverdale and Sycamore were to become at-grade intersection with the bypass alignments that the current and future function of the lift station would be difficult to maintain or expand. It was pointed out to the Director that these roadways are currently under study, and that they would probably be grade separated. The Director stated that this would avoid any problems.

The Mayor expressed that they will meet with the city council in order to pass a resolution in support of S-4. He seemed confident that they could get a majority of the votes, but it is unlikely to be unanimous.

The Mayor would like to set up a meeting with IDOT and the project team to present to the city council the issues associated with the two remaining alignments. The Mayor would like to have this meeting before the council resolution meeting.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

VOLUME V – COMBINED DESIGN REPORT
APPENDIX G4 – RETAINING WALL REPORT
PROJECT REPORTS

FAP ROUTE 318 (IL 29)
SECTION 1, 2, 3, 4, 5, 20, 21, & 6, 8, 9, 10
PEORIA, MARSHALL, PUTNAM & BUREAU COUNTIES
P–94–009–01 & P–94–019–02

Illinois Department of Transportation
CH2MHILL

June 2010
Catalog No. 032469-00P

$PLOTDATE
$FILENAME

VOLUME V

APPENDIX G4

RETAINING WALL REPORT

RETAINING WALL
REPORT

FAP ROUTE 318 (IL 29)
BETWEEN ILLINOIS
ROUTE 6 AND I-180

Peoria, Marshall, Putnam & Bureau Counties
Job No's. P-94-009-01 & P-94-019-02
PTB No's. 890/138 & 118/56

Prepared for

ILLINOIS DEPARTMENT OF TRANSPORTATION
District 4

April, 2009

Prepared by
Hutchison Engineering, Inc.

S:\Jobs\2145\Retaining Wall-Cvr&toc

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5 Exhibits
A Retaining Wall Studies, Details, and Correspondence
- Letter Transmitting Cross Sections Work Prints With Walls – November, 2002
- Conceptual Alternatives for Constructing Proposed IL 29 Along the Existing Retaining Wall South of Sparland – December, 2002
- Letter Transmitting A Copy of the Plans for The Existing Retaining Wall South of Sparland – March, 2003
- Letter Transmitting Copy of the Preliminary Soil Survey for FAP 405 Planning for Marshall And Peoria Counties – March, 2003
- Conceptual Retaining Wall Report/ Retaining Wall Costs – October, 2003
- Memorandum Retaining Walls/Geotechnical Concerns in Central Section – January, 2004
- Examples of Paved Swales Behind Retaining Walls – March, 2004
- Retaining Wall Details for the Miller Anderson Woods Area – March, 2004
- E-mail Concerning Use of Concrete Cantilevered Wall – March, 2004
- Retaining Wall Typical Section for the IL 29 Central and North Sections – May, 2004
- Telephone Memo Concerning Existing Pike County Tie-Back Walls – May, 2004
- Preliminary Retaining Wall Details and Wall Location Schedule – June, 2004

- E-mail Concerning Retaining Wall Cost Estimates – July, 2004
- E-mail Concerning Retaining Wall Cost Estimates – August, 2004
- Letter Transmitting Design Calculations for Existing Retaining Wall – October, 2004
- Alan Goodfield (IDOT Geotechnical Engineer) Memo – August, 2004
- E-mail Discussing Wall Types for Wall Heights – August, 2004
- E-mail Discussing Soil Nail Walls – August, 2004
- E-mails Discussing Elevated Bridge Structures – August, 2004
- Typical Sections for Cantilever Type Retaining Walls – September, 2004
- Discussions of Miller Anderson Woods Area Retaining Walls – February, 2005
- E-mail Discussing Retaining Walls Types North of Sparland – February, 2005
- E-mail Discussing Retaining Wall Types – June, 2005
- E-mail Discussing Existing Retaining Walls in the Central Section – March, 2006
- E-mail Regarding Retaining Walls in Crow Creek Area – December, 2006
- E-mails Discussing Retaining Walls Near Crow Creek and Length of Walls Throughout Project – January, 2007 and February, 2007
- E-mail Discussing Retaining Walls Near Ramp D and at the Sparland Roundabout – June, 2007
- E-mail Discussing Existing Retaining Wall Near Hopewell – October, 2007

B Proposed Typical Sections with Retaining Walls

C Sparland Interchange – Bridge/Tunnel Studies

- Cost Estimate and Typical Section for Tunnel Carrying IL 29 over Railroad over Ramps Near Sparland – October, 2004
- E-mail Concerning Tunnel Costs – January, 2005
- Cost Estimate and Sketches for Bridges and Tunnel Options for North and South Railroad Crossings in Sparland – January, 2005

- Memorandum Concerning Bridge and Roadway Impact From Additional Railroad Track – November, 2005
- Memorandum Concerning Bridge Carrying IL 29 Mainline Over Thenius Creek, Railroad, Ramp C, And Service Road – December, 2005

SECTION 1

Introduction

1.1 Location and Description of the Project

The Illinois Department of Transportation has initiated a Phase I study to examine alternatives to improve existing IL Route 29 to a four-lane facility from the termination of IL Route 6 near Mossville in Peoria County to Interstate 180 in Bureau County. The proposed IL Route 29 improvements will provide a major link in the central Illinois highway system and a high-type highway connection between IL Route 6 and Interstate 180. This highway system will play a vital role in the economic development of the region.

For the purposes of the study, the corridor was divided into the following three areas: the South Section which runs from IL Route 6 to Benedict Street just north of Chillicothe; the Central Section, which continues from this point north of Chillicothe to south of Henry; and the North Section, which runs from south of Henry to the northern project limits just south of Interstate 180.

The proposed highway will be constructed as a freeway from the IL Route 6 interchange near Mossville to east of Benedict Street north of Chillicothe. From east of Benedict Street north of Chillicothe to the Interstate 180 interchange at the north terminus of the project the proposed highway will be constructed as an expressway.

1.2 Purpose of Report

This Retaining Wall Report is one of the support documents to the Combined Design Report for FAP Route 318 (IL 29) in Peoria, Marshall, Putnam, and Bureau Counties.

The Combined Design Report provides a detailed description and analysis of the preferred alternative. The roadway plan sheets and associated roadway cross-sections provided in the Combined Design Report show the locations of the proposed retaining walls throughout the project. This Retaining Wall Report contains background information on the development of the locations of the proposed retaining walls.

SECTION 2

Discussion

2.1 Reasons For Retaining Walls

The project corridor from IL Route 6 in Peoria County to I-180 in Bureau County contains a number of constraints that make the construction of a four-lane roadway a challenging endeavor, especially in the Central and North Sections. The constraints include sensitive environmental resources such as wetlands, parks or natural areas, habitats of threatened and endangered species, historical/archaeological sites, the Illinois River bluff, railroads, cemeteries, public utilities, schools, and developments. The locations and descriptions of the constraints are provided in the Combined Design Report.

As the proposed roadway alignment was developed, it was determined that selective use of retaining walls would be necessary to allow the construction of the roadway within the constraints and to minimize or eliminate adverse impacts to sensitive areas.

2.2 Development of Wall Locations and Wall Types

Early in the project, a preliminary retaining wall report was prepared to investigate wall types and associated costs for the project in general. The report discussed reinforced concrete cantilever walls, mechanically stabilized earth (MSE) walls, permanent anchored soldier pile walls (tie-back walls), and soil nail walls. The applicability and estimated unit cost for each type was presented. As the proposed roadway alignment was developed and refined, other studies and analysis were completed to evaluate specific locations. See Exhibit A.

For the purposes of this study, in-depth design of the retaining walls was not performed. Instead, assumptions of wall types were made based on wall height, and whether the wall was located in a cut section or a fill section. The retaining wall types used for the Combined Design Report cost opinions were based on the following criteria:

- In cut sections for wall heights <4′ use concrete cantilever walls assuming a 4′ depth below the ground surface.
- In cut sections for wall heights from 4′ to 10′, use soldier pile walls with lagging assuming a 4′ depth below the ground surface.
- In cut sections for wall heights >10′ use soldier pile walls with lagging and tie anchors assuming a 4′ depth below the ground surface.

- In fill sections, use MSE walls assuming a 4′ depth below the ground surface.

See Exhibit B for the proposed roadway typical sections with retaining walls.

In the South Section of the project, there is only a limited need for retaining walls. At the south end of the project, the alignment is located near the foot of the Illinois River Bluff, and there is a need for retaining walls near the Cedar Hills Road interchange and along Ivy Lake Road to avoid substantial excavation into the bluff. Also, there is a need for retaining walls near the Rome West Road interchange to minimize the limits of construction.

In the Central Section of the project, existing IL 29 generally follows the foot of the Illinois River bluff adjacent to the existing railroad. In the areas where the existing roadway was constructed between the bluff and the railroad, there is little space for additional roadway width. For example, there is an existing 2,300-foot long retaining wall south of Sparland between the roadway and the railroad that was constructed in 1992 as part of a widening and resurfacing project on IL 29. Therefore, when the scope of work was developed for the study to provide a four-lane roadway for IL 29, it was recognized that retaining walls would be necessary in some areas of the project, particularly where the proposed alignment would be at the foot of the Illinois River bluff, and in sensitive areas throughout its project where it would be beneficial to minimize the limits of construction.

To reduce the depth of cut in the sideslope, a split profile concept was investigated in the areas where the proposed roadway would be constrained by the Illinois River bluff and the existing railroad. With the split-profile concept, the bluff-side wall height would be reduced and a centerline wall provided to accommodate the elevation differences between the northbound and southbound lanes. The project area has a history of slides and slope creep. Reducing the depth of cut would reduce potential stability impacts and would reduce the amount of rock excavation required. As stated in the Technical Memorandum "Geotechnical Comparison of Split- and Same-Elevation Profile Concepts, IL 29 Station 3678 to 3730" a split-elevation profile could be preferred based on geotechnical concerns. In the final design, the use of a split-profile would be based on geotechnical exploration and analysis of the wall locations and cost considerations.

The layout of the proposed IL 29/IL 17 interchange in Sparland is governed by a number of constraints that include the existing IL 29, the offset IL 17 intersection, a railroad, stream crossings, access to the local roads and streets, the residences and development in Sparland, and a sewage treatment plant. A split diamond interchange was chosen as the best alternative to accommodate the constraints. The proposed interchange layout results in a north and south crossing of the railroad at a large skew angle. The south railroad crossing would also involve the IL 29 mainline crossing an interchange ramp. The north railroad crossing would also involve the IL 29 mainline crossing a service drive, a stream, and an interchange ramp. Bridge and railroad tunnel alternatives were developed for the crossings. In both the bridge and tunnel alternatives, MSE retaining walls are proposed to minimize the roadway footprint. See Exhibit C.

In the North Section, there is need for retaining walls along the Miller-Anderson Woods Nature Preserve/Natural Area. This area is very environmentally sensitive, and therefore it was necessary to propose MSE retaining walls along the west side of the mainline to minimize the impact that the roadway project would have on the area. There is also need for retaining walls along the east side of the mainline to avoid impacting the existing railroad in various locations.

2.3 Study Limitations

The scope of work for the IL 29 Phase I Study included the review of available geotechnical information for the project area. No geotechnical exploration work was performed as part of the study. The proposed retaining wall locations and types were developed based on the reviewed information. Section 4 contains a list of references.

In the Phase II design, a field exploration and laboratory testing program should be conducted to determine the final location, type, and details of the proposed retaining walls as well as to evaluate slope stability concerns.

SECTION 3

Proposed Retaining Wall Locations

PROPOSED RETAINING WALL LOCATIONS

ROADWAY	SIDE	STATION TO STATION		TOTAL LENGTH	RETAINING WALL TYPE								TOTAL ESTIMATED WALL COST
					SPA		SP		CC		MSE		
				FOOT	FOOT	COST	FOOT	COST	FOOT	COST	FOOT	COST	
SOUTH SECTION													
CEDAR HILLS DRIVE	LT	24+00	37+11	1,311							1,311	$348,695	$348,695
CEDAR HILLS DRIVE	RT	24+00	26+00	200							200	$40,000	$40,000
IVY LAKE ROAD	LT	50+67	57+00	633	234	$345,056	154	$108,368	245	$81,168			$534,592
ROME WEST ROAD - RAMP B	RT	19+00	22+96	396							396	$193,670	$193,670
ROME WEST ROAD	RT	56+25	59+00	275							275	$153,160	$153,160
CENTRAL SECTION													
IL 29 CONNECTOR	LT	45+25	45+97	72					72	$19,333			$19,333
	LT	46+50	50+34	384	237	$411,569	131	$106,170	16	$8,333			$526,072
	RT	46+50	50+50	400	13	$19,452	324	$248,736	63	$29,665			$297,854
	LT	51+27	56+00	473	449	$1,012,026	10	$8,008	14	$3,763			$1,023,798
	RT	51+43	61+75	1,032	482	$929,294	550	$413,418					$1,342,712
	LT	59+13	63+75	462			327	$200,080	135	$30,525			$230,605
	LT	107+00	109+50	250	223	$323,357	27	$26,831					$350,188
IL 29 CONNECTOR - RAMP D	RT	19+42	22+00	258	55	$69,888	110	$76,440	93	$33,600			$179,928
WEST FRONTAGE ROAD	LT	318+49	319+91	142					142	$30,059			$30,059
	RT	344+00	348+50	450							450	$219,661	$219,661
	LT	348+50	351+00	250					250	$56,052			$56,052
CREW LANE	LT	15+00	23+29	829	289	$391,761	432	$356,889	108	$45,117			$793,768
HOPEWELL DRIVE	LT	45+82	49+23	341	149	$273,866	109	$82,462	83	$36,383			$392,711
SPARLAND - RAMP A	RT	1+53	33+86	3,233	428	$821,783	386	$277,590	284	$74,268	1,979	$539,601	$1,713,242
SPARLAND - RAMP B	RT	16+50	29+00	1,250							1,250	$783,300	$783,300
RAILROAD STREET	RT	36+38	43+00	662							662	$503,163	$503,163
	LT	41+75	42+50	75							75	$27,651	$27,651
	RT	53+50	64+13	1,063							1,063	$1,034,158	$1,034,158
	RT	66+75	74+50	775							775	$288,250	$288,250
SPARLAND - RAMP C	RT	2+91	3+28	37							37	$18,623	$18,623
	RT	4+63	13+00	837							837	$464,044	$464,044
SPARLAND - RAMP D	RT	0+00	6+70	670	370	$443,408	300	$179,956					$623,364
MAINLINE	LT	3348+50	3361+75	1,325	383	$515,451	891	$778,695	51	$13,760			$1,307,906
	LT	3401+50	3416+26	1,476			125	$70,564	1,351	$273,576			$344,140
	LT	3416+61	3483+75	6,714	1,505	$2,007,508	1,995	$1,441,671	1,115	$353,103	1,324	$448,560	$4,250,842
	CL	3413+64	3415+90	226							226	$130,793	$130,793
	CL	3445+85	3448+70	285							285	$105,725	$105,725
	CL	3455+00	3472+50	1,750							1,750	$939,688	$939,688
	LT	3488+50	3511+00	2,250	762	$989,684	749	$510,559	260	$77,100	79	$58,266	$1,635,609
	LT	3511+60	3514+80	320							320	$175,625	$175,625
	CL	3536+25	3561+00	2,475							2,475	$1,424,395	$1,424,395
	LT	3520+00	3525+00	500					500	$163,500			$163,500
	RT	3551+40	3573+90	2,250							2,250	$642,610	$642,610
	RT	3602+00	3604+13	213							213	$367,313	$367,313

SPA = Soldier Pile, Anchored
SP = Soldier Pile
CC = Concrete Cantilever
MSE = Mechanically Stabilized Earth

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PROPOSED RETAINING WALL LOCATIONS

ROADWAY	SIDE	STATION TO STATION		TOTAL LENGTH	RETAINING WALL TYPE								TOTAL ESTIMATED WALL COST
					SPA		SP		CC		MSE		
				FOOT	FOOT	COST	FOOT	COST	FOOT	COST	FOOT	COST	
MAINLINE	RT	3607+58	3608+18	60							60	$333,170	$333,170
	LT	3526+53	3533+00	647			55	$29,315	592	$250,806			$280,121
	LT	3534+00	3582+30	4,830	1,668	$2,454,808	1,257	$903,897	1,508	$562,812	397	$130,138	$4,051,655
	RT	3630+91	3633+50	259							259	$519,372	$519,372
	LT	3598+49	3605+79	730							730	$871,685	$871,685
	LT	3608+67	3610+00	133							133	$274,323	$274,323
	RT	3651+00	3652+50	150							150	$374,180	$374,180
	RT	3659+40	3664+00	460							460	$942,500	$942,500
	LT	3625+00	3628+40	340							340	$551,208	$551,208
	LT	3630+91	3633+50	259							259	$488,382	$488,382
	CL	3680+15	3721+75	4,160							4,160	$2,770,813	$2,770,813
	LT	3648+00	3652+87	487							487	$652,223	$652,223
	RT	3713+00	3717+50	450							450	$255,987	$255,987
	LT	3680+64	3699+73	1,909	16	$18,560	484	$357,520	466	$180,567	943	$318,625	$875,272
	LT	3700+50	3712+00	1,150							1,150	$682,220	$682,220
	LT	3712+90	3742+23	2,933	578	$737,068	1,519	$1,112,651	593	$222,381	243	$54,268	$2,126,368
	RT	3723+00	3726+44	344							344	$266,170	$266,170
	LT	3752+00	3755+00	300			199	$176,362	101	$27,149			$203,511
	LT	3838+00	3858+00	2,000							2,000	$2,610,720	$2,610,720
NORTH SECTION													
CABIN HILL ROAD	LT	44+50	47+40	290					290	$121,800			$121,800
MAINLINE	LT	5015+50	5025+50	1,000							1,000	$1,376,750	$1,376,750
	LT	6068+25	6072+00	375					375	$137,700			$137,700
	LT	6193+50	6201+00	750							750	$273,250	$273,250
	RT	6193+50	6207+00	1,350							1,350	$783,000	$783,000
	LT	6205+75	6209+50	375							375	$199,875	$199,875
	RT	6206+14	6208+62	248							248	$74,640	$74,640
	RT	6207+75	6224+93	1,718					250	$100,200	1,478	$979,775	$1,079,975
	RT	6225+77	6239+28	1,351							1,351	$898,425	$898,425
	RT	6238+61	6240+90	229							229	$142,490	$142,490
	RT	6240+00	6266+16	2,616							2,616	$1,348,140	$1,348,140
	RT	6265+24	6267+79	255							255	$93,933	$93,933
	RT	6266+85	6272+85	600							600	$346,888	$346,888
	LT	6271+00	6272+95	195							195	$80,563	$80,563
	RT	6273+65	6275+00	135							135	$60,950	$60,950
	LT	6273+76	6276+00	224							224	$177,690	$177,690
	RT	6288+00	6312+40	2,440					752	$271,008	1,712	$777,680	$1,048,688
TOTAL				**72,296**	**7,841**	**11,764,540**	**10,134**	**7,466,182**	**9,709**	**3,203,728**	**43,315**	**28,616,984**	**51,051,434**

SPA = Soldier Pile, Anchored
SP = Soldier Pile
CC = Concrete Cantilever
MSE = Mechanically Stabilized Earth

S:\Jobs\2145\RetainingWallRptLimits(final).xls

SECTION 4

References

Casler, Houser & Hutchison, Inc. "Plans for Proposed Federal Aid Highway, F.A. Route 318 (Old F.A. 63) (IL 29) Section (3,4,5) W&RS-1, Peoria and Marshall Counties." March, 1991.

CH2M HILL, "Geotechnical Comparison of Split- and Same- Elevation Profile Concepts IL 29 Station 3678 to 3730." December, 2004.

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Goodfield, Alan. "Geotechnical Study of the F-5 Corridors Between Peoria and FAI Route 180 in Bureau County, Illinois." Bureau of Design, Illinois Division of Highways. Springfield, Illinois. May, 1971.

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United States Department of Agriculture, Natural Resources Conservation Service. "Soil Survey of Marshall County, Illinois." 2002.

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Peoria County, Illinois." March, 1992.

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Putnam County, Illinois." May, 1992.

SECTION 5

Exhibits

Exhibit A

RETAINING WALL STUDIES, DETAILS, AND CORRESPONDENCE

Hutchison Engineering, Inc.

Since 1945 (formerly Casler, Houser and Hutchison, Inc.) **Jacksonville**
Joliet

November 18, 2002

CH2MHILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631-2801

ATTN: Mr. Richard W. Stafford, P.E.

Subject: Illinois Route 29
Phase I Study

Dear Mr. Stafford:

As requested, transmitted herewith is one (1) copy of 11" x 17" work prints of the cross sections for the Central Segment areas where the railroad closely parallels the highway. A rough proposed template has been penciled on the sections to determine the approximate length and height of retaining walls. Also included is a copy of the proposed template used to mark the sections and a copy of the corresponding plan and profile sheets from the plans for the existing roadway.

If you have any questions please feel free to contact this office at any time.

Very truly yours,

HUTCHISON ENGINEERING, INC.

MVM

Michael V. Meier
Project Manager

MVM:cm
Encl.

1801 West Lafayette Ave. • P.O. Box 820 • Jacksonville, Illinois 62651-0820
Phone: (217) 245-7164 • FAX: (217) 243-0468

James O. Hamilton, PE, SE
Vice President
Lenny L. Chaudoin
Vice President

Gary L. Hutchison, PE, PLS
President
Michael V. Meier, PE
Executive Vice President

H. James Twyford, PE
Vice President
Roger W. Wright, PE
Vice President

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Brian Borgman

From: Brian Borgman [bborgman@hutchisoneng.com]
Sent: Tuesday, December 03, 2002 10:06 AM
To: LewisML@nt.dot.state.il.us
Subject: IL 29 Retaining Wall

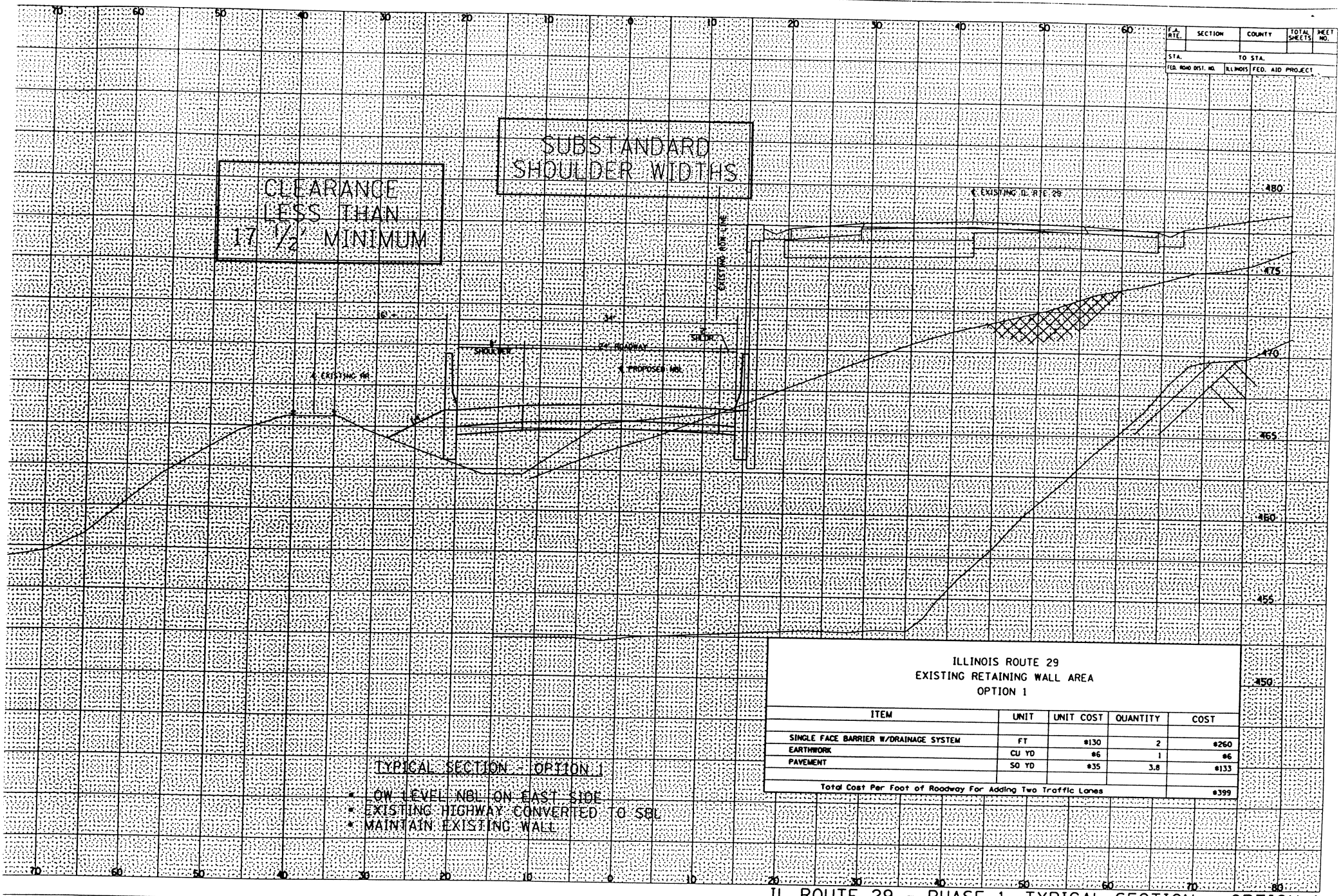
2145t001.dgn

On behalf of Michael Meier of this office, attached is the MicroStation drawing, containing the 6 options for the proposed IL 29 along the existing retaining wall, that you requested during last Tuesday's meeting. If you have any questions, do not hesitate to contact this office.

Brian Borgman, E.I.
Hutchison Engineering, Inc
bborgman@hutchisoneng.com <mailto:bborgman@hutchisoneng.com>
Phone: (217) 245-7164
Fax: (217) 243-0468

cc Bo Dick Stafford

2145
MVM MA
GLH GLS



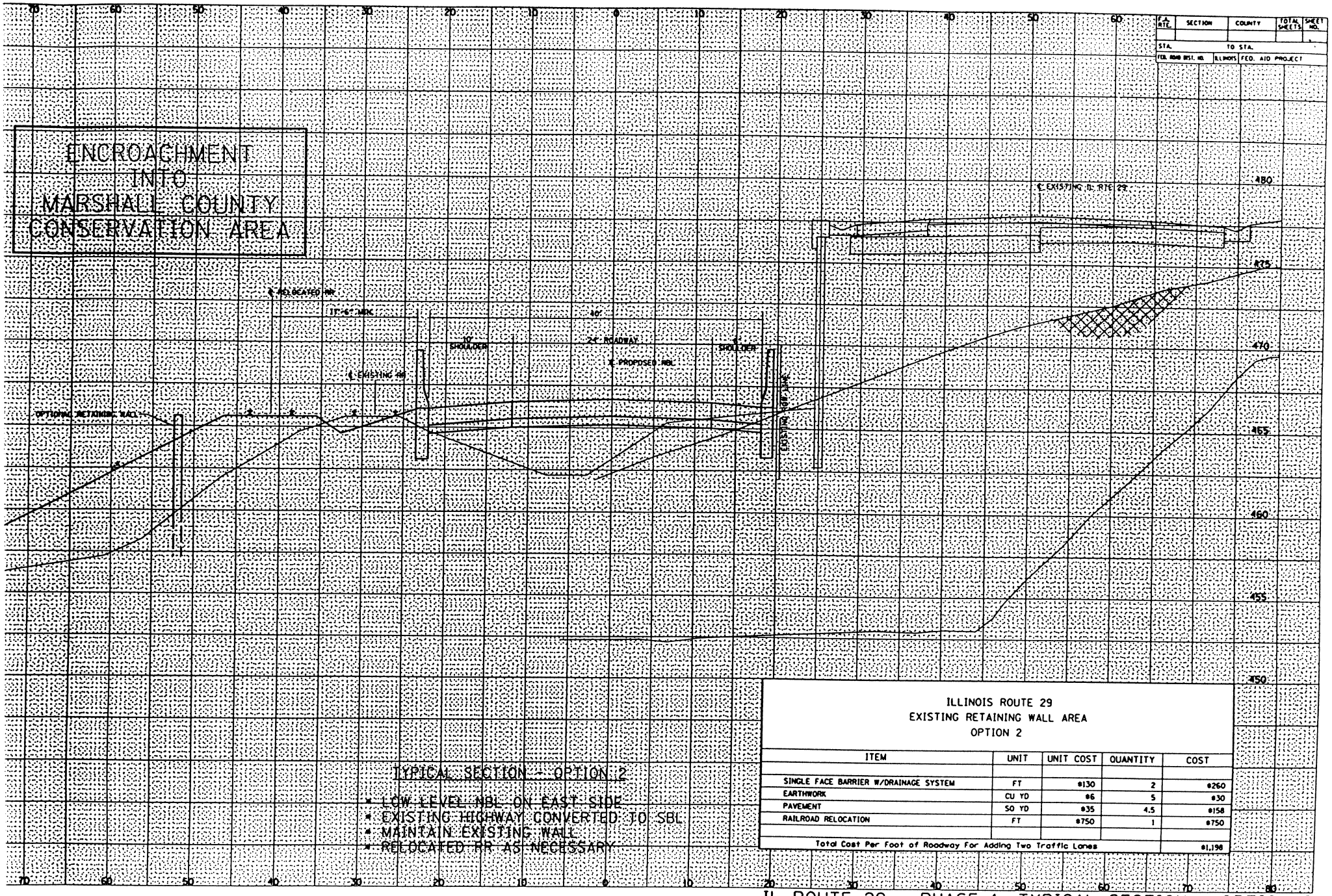
ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 1

ITEM	UNIT	UNIT COST	QUANTITY	COST
SINGLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$130	2	$260
EARTHWORK	CU YD	$6	1	$6
PAVEMENT	SQ YD	$35	3.8	$133
Total Cost Per Foot of Roadway For Adding Two Traffic Lanes				$399

TYPICAL SECTION - OPTION 1

- LOW LEVEL NBL ON EAST SIDE
- EXISTING HIGHWAY CONVERTED TO SBL
- MAINTAIN EXISTING WALL

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 1



F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

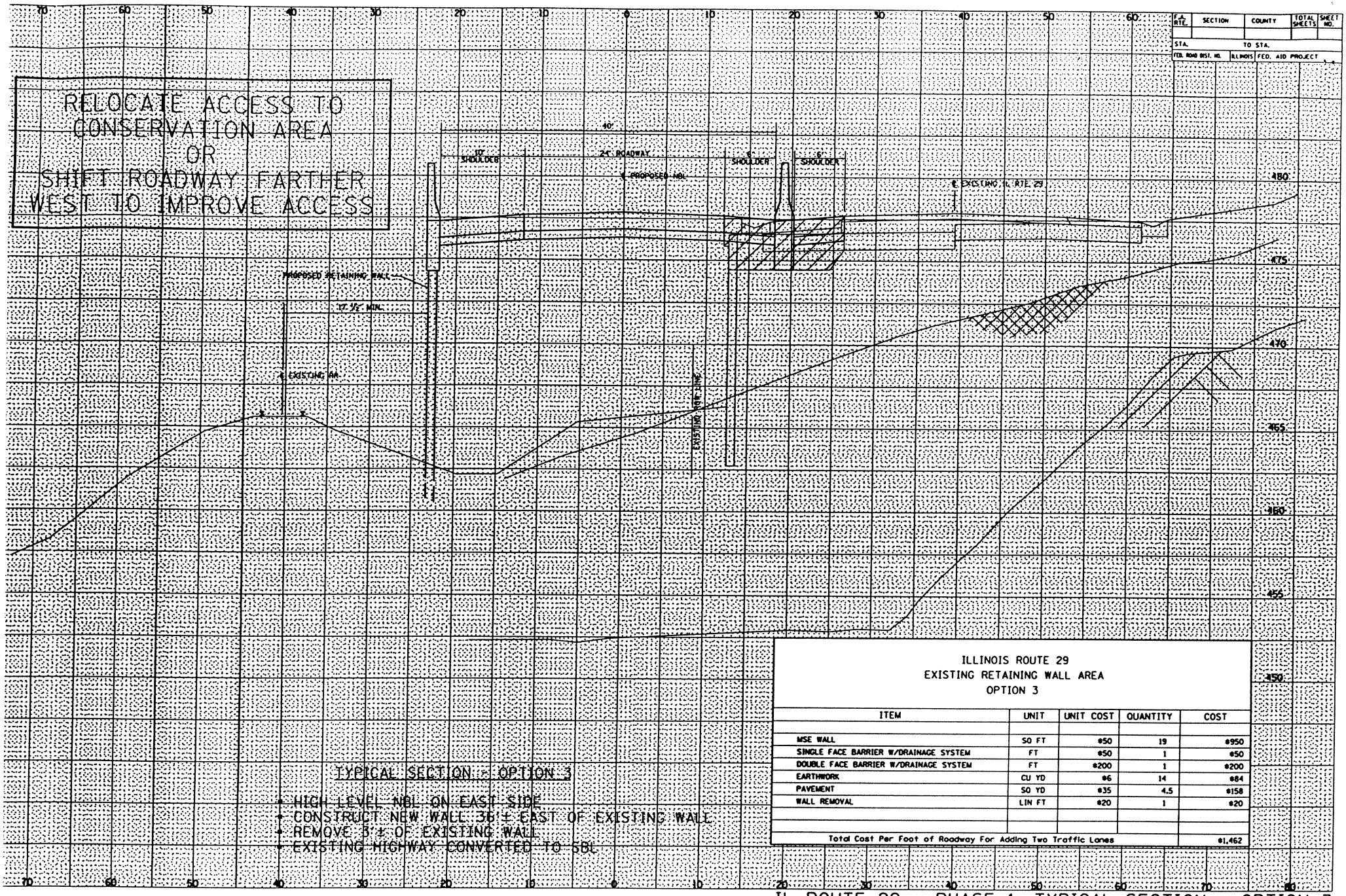
TYPICAL SECTION - OPTION 2

- LOW LEVEL NBL ON EAST SIDE
- EXISTING HIGHWAY CONVERTED TO SBL
- MAINTAIN EXISTING WALL
- RELOCATED RR AS NECESSARY

ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 2

ITEM	UNIT	UNIT COST	QUANTITY	COST
SINGLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$130	2	$260
EARTHWORK	CU YD	$6	5	$30
PAVEMENT	SQ YD	$35	4.5	$158
RAILROAD RELOCATION	FT	$750	1	$750
Total Cost Per Foot of Roadway For Adding Two Traffic Lanes				$1,198

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 2



F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

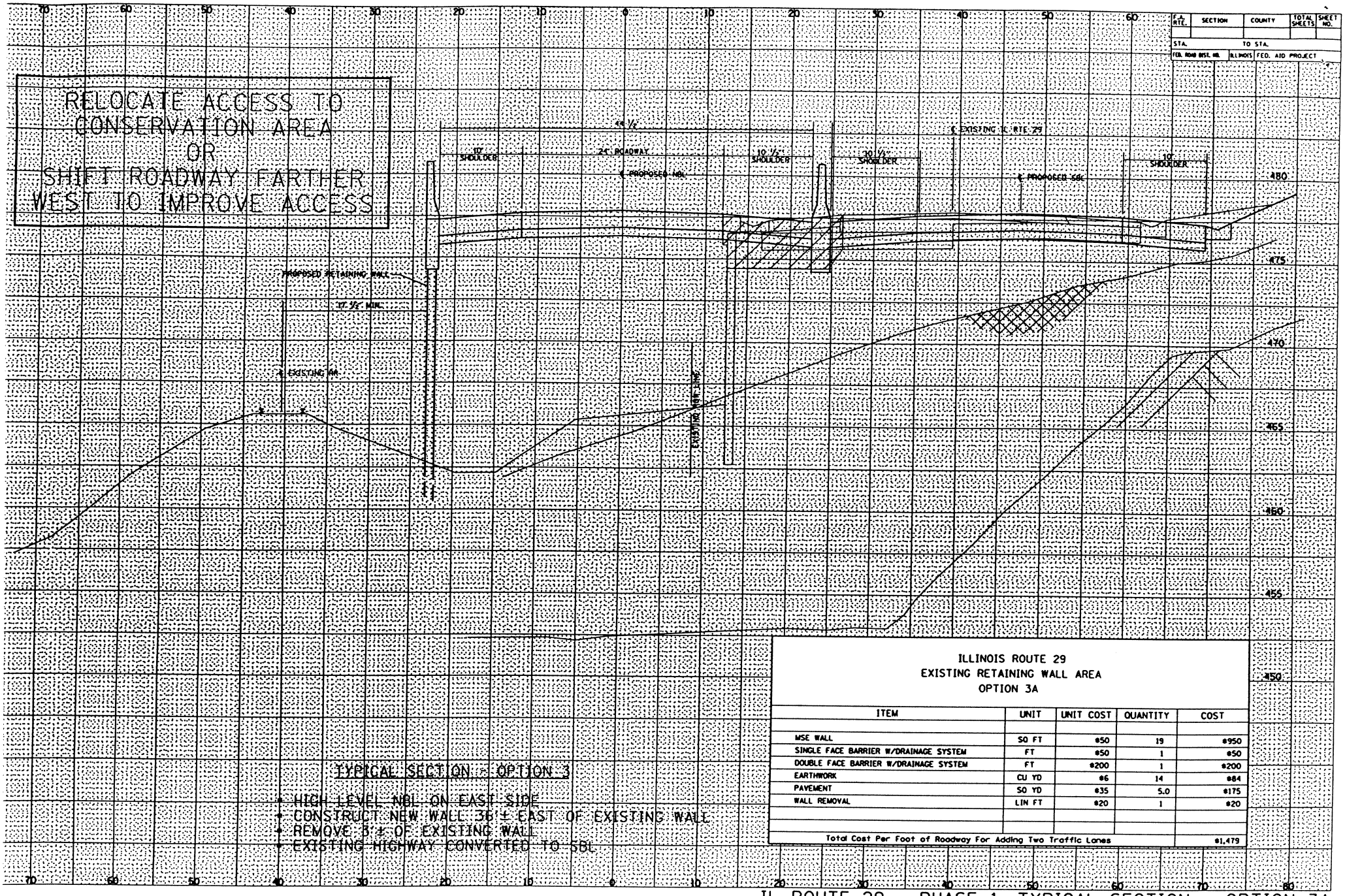
ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 3

ITEM	UNIT	UNIT COST	QUANTITY	COST
MSE WALL	SQ FT	$50	19	$950
SINGLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$50	1	$50
DOUBLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$200	1	$200
EARTHWORK	CU YD	$6	14	$84
PAVEMENT	SQ YD	$35	4.5	$158
WALL REMOVAL	LIN FT	$20	1	$20
Total Cost Per Foot of Roadway For Adding Two Traffic Lanes				$1,462

TYPICAL SECTION - OPTION 3

- HIGH LEVEL NBL ON EAST SIDE
- CONSTRUCT NEW WALL 36'± EAST OF EXISTING WALL
- REMOVE 3'± OF EXISTING WALL
- EXISTING HIGHWAY CONVERTED TO SBL

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 3



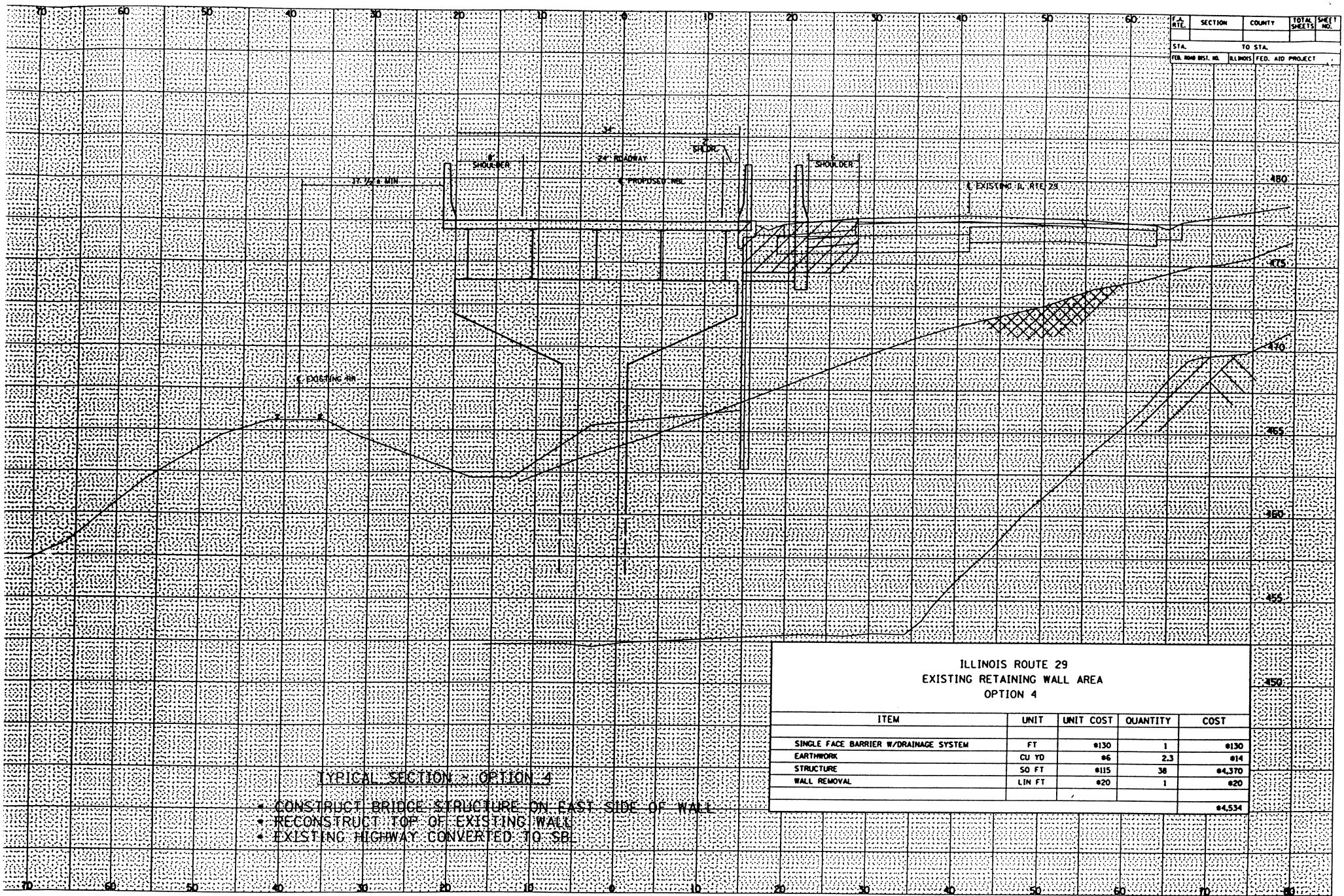
ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 3A

ITEM	UNIT	UNIT COST	QUANTITY	COST
MSE WALL	SQ FT	$50	19	$950
SINGLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$50	1	$50
DOUBLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$200	1	$200
EARTHWORK	CU YD	$6	14	$84
PAVEMENT	SQ YD	$35	5.0	$175
WALL REMOVAL	LIN FT	$20	1	$20
Total Cost Per Foot of Roadway For Adding Two Traffic Lanes				$1,479

TYPICAL SECTION - OPTION 3

- HIGH LEVEL NBL ON EAST SIDE
- CONSTRUCT NEW WALL 36'± EAST OF EXISTING WALL
- REMOVE 3'± OF EXISTING WALL
- EXISTING HIGHWAY CONVERTED TO SBL

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 3A



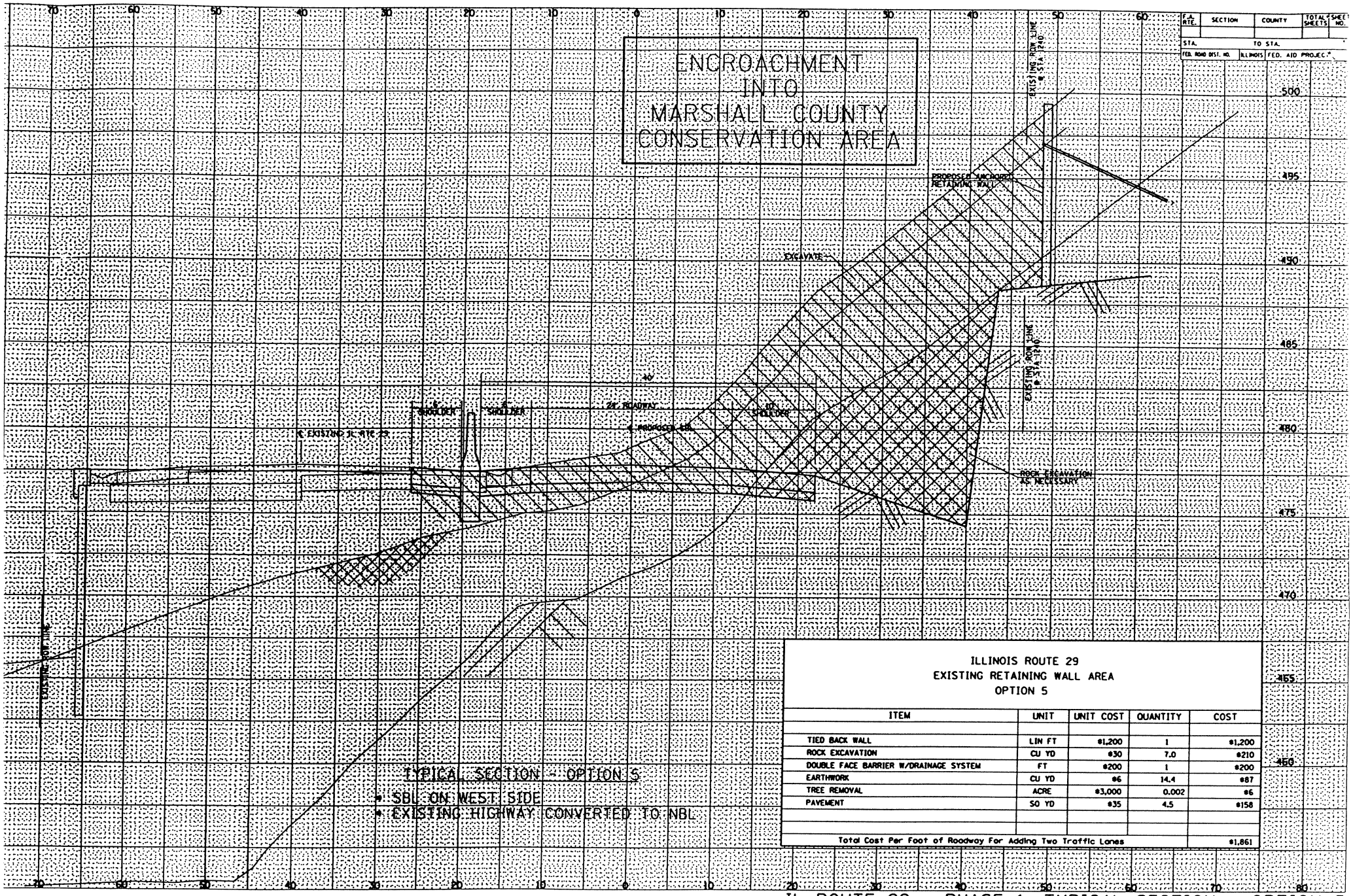
ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 4

ITEM	UNIT	UNIT COST	QUANTITY	COST
SINGLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$130	1	$130
EARTHWORK	CU YD	$6	2.3	$14
STRUCTURE	SQ FT	$115	38	$4,370
WALL REMOVAL	LIN FT	$20	1	$20
				$4,534

TYPICAL SECTION : OPTION 4

- CONSTRUCT BRIDGE STRUCTURE ON EAST SIDE OF WALL
- RECONSTRUCT TOP OF EXISTING WALL
- EXISTING HIGHWAY CONVERTED TO SB

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 4



ILLINOIS ROUTE 29
EXISTING RETAINING WALL AREA
OPTION 5

ITEM	UNIT	UNIT COST	QUANTITY	COST
TIED BACK WALL	LIN FT	$1,200	1	$1,200
ROCK EXCAVATION	CU YD	$30	7.0	$210
DOUBLE FACE BARRIER W/DRAINAGE SYSTEM	FT	$200	1	$200
EARTHWORK	CU YD	$6	14.4	$87
TREE REMOVAL	ACRE	$3,000	0.002	$6
PAVEMENT	SQ YD	$35	4.5	$158
Total Cost Per Foot of Roadway For Adding Two Traffic Lanes				$1,861

TYPICAL SECTION - OPTION 5

- SBL ON WEST SIDE
- EXISTING HIGHWAY CONVERTED TO NBL

IL ROUTE 29 - PHASE 1: TYPICAL SECTION - OPTION 5

Hutchison Engineering, Inc.

Since 1945 (formerly Casler, Houser and Hutchison, Inc.) **Jacksonville**
Joliet

March 27, 2003

CH2MHILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631-2801

ATTN: Mr. Richard W. Stafford, P.E.

Subject: Illinois Route 29
Phase I Study

Dear Mr. Stafford:

As requested, transmitted herewith is one (1) 11" x 17" copy of the plans for the existing retaining wall south of Sparland and one (1) copy of the retaining wall soil boring logs 1 through 31.

If you have any questions please feel free to contact this office at any time.

Very truly yours,

HUTCHISON ENGINEERING, INC.

MVM

Michael V. Meier
Project Manager

MVM:cm
Encls.

1801 West Lafayette Ave. • P.O. Box 820 • Jacksonville, Illinois 62651-0820
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Hutchison Engineering, Inc.

Since 1945 (formerly Casler, Houser and Hutchison, Inc.) **Jacksonville**
Joliet

March 27, 2003

CH2MHILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631-2801

ATTN: Mr. Richard W. Stafford, P.E.

Subject: Illinois Route 29
Phase I Study

Dear Mr. Stafford:

For your information, transmitted herewith is one (1) copy of the Preliminary Soil Survey for FAP 405 Planning for Marshall and Peoria Counties with Appendix A Soil Survey for Improvements to IL Route 29. Also enclosed is one (1) set of prints of the associated soils plan and profile sheets 1 through 20.

The information was prepared in 1986 as part of a previous IL 29 project.

If you have any questions please feel free to contact this office at any time.

Very truly yours,

HUTCHISON ENGINEERING, INC.

MVM

Michael V. Meier
Project Manager

MVM:cm
Encls.

cut

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Hutchison Engineering, Inc.

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Joliet

November 3, 2003

CH2MHILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631-2801

ATTN: Mr. James B. Jodie

Subject: Illinois Route 29
Phase I Study
RETAINING WALL INFORMATION

Dear Mr. Jodie:

Transmitted herewith for your information is a copy of a memorandum prepared by Jim Hamilton of this office concerning retaining wall types and costs.

If you have any questions please feel free to contact this office at any time.

Very truly yours,

HUTCHISON ENGINEERING, INC.

MVM

Michael V. Meier
Project Manager

MVM:cm
Encl.

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Vice President

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Hutchison Engineering, Inc.

Since 1945

Jacksonville
Joliet

October 31, 2003

MEMORANDUM

TO: The Record

FROM: Jim Hamilton

Jim Hamilton

SUBJECT: Job No. 2145
Retaining Walls
IL Route 29

The attached report was prepared to aid in the study of retaining walls in connection with the widening of IL Route 29. CH2M Hill has requested cost information and general information about wall types, etc.

This information can be used as a guide in wall selection, preliminary cost estimates and evaluation of walls at the various locations on IL Route 29.

The report may be distributed to the appropriate individuals. If there are any questions about the report please contact me.

JOH:cm
Attachment

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Vice President

S:\Jobs\2145\Memo-10-31-03

FAP ROUTE 318 (IL 29)
PHASE I
CHILLICOTHE TO I-80

RETAINING WALL REPORT
RETAINING WALL COSTS

JOB #2145

October 31, 2003

In order to reduce the roadway right of way, retaining walls may be necessary in some areas of the project. There is a possibility of one mile of wall on each side in the Miller Anderson Woods area according to CH2M Hill project engineer Jim Jodie. The types of walls considered feasible include the following:

- Reinforced Concrete Cantilever Walls – For economic reasons, the limit of maximum height is 18 to 20 ft.
- Mechanically Stabilized Embankments (MSE) Walls – This type of wall has been used for heights up to 70 ft.
- Permanent Anchored Soldier Pile Walls (Tieback Walls) – Most tieback walls are 50 ft. in height or less.
- Soil Nail Walls – Soil nail walls have been constructed up to 40 ft. height for U.S. transportation projects. Nicholsen Construction of Pittsburgh, Pennsylvania has used soil nail walls up to 50 ft. in height and Schnabel of Virginia indicates a practical height limit of about 50 to 70 ft. for soil nail walls.

Attached Figures 5.2A, 5.2B and 5.2C on page 1 through 4 show various retaining wall types taken from the AASHTO Standard Specifications for Highway Bridges.

Most retaining walls are constructed from the bottom up and are over excavated to allow wall construction. Backfill is then placed behind the wall. Backfilling is very important to MSE construction. Retaining walls constructed from the bottom up are suited for retaining fills and are less feasible in cuts or where right of way is limited. The type of wall typically used in IDOT projects for bottom up construction are the reinforced concrete cantilever wall and MSE wall.

Walls constructed from the "top down" are ideally suited for cuts and areas where construction areas are limited. The most common types of walls built from the top down are soldier pile tieback walls and soil nail walls. Several of the anchored tieback walls have been constructed by IDOT including one on Illinois Route 29. The anchors and tiebacks may extend beyond the right of way limits and will require permanent easements. For soil nail walls the length of anchors are typically 0.6H to 0.8H where H is the total wall height. Typical soil nail wall construction is shown in Figure 1 (sheet 7 of the attachments).

The estimated square foot cost for concrete cantilever walls and MSE walls is shown in sheet 9 of the attachments. These costs are based on average conditions where suitable soils are present. Costs are the total in-place cost per square foot of wall area measured to bottom of the footing.

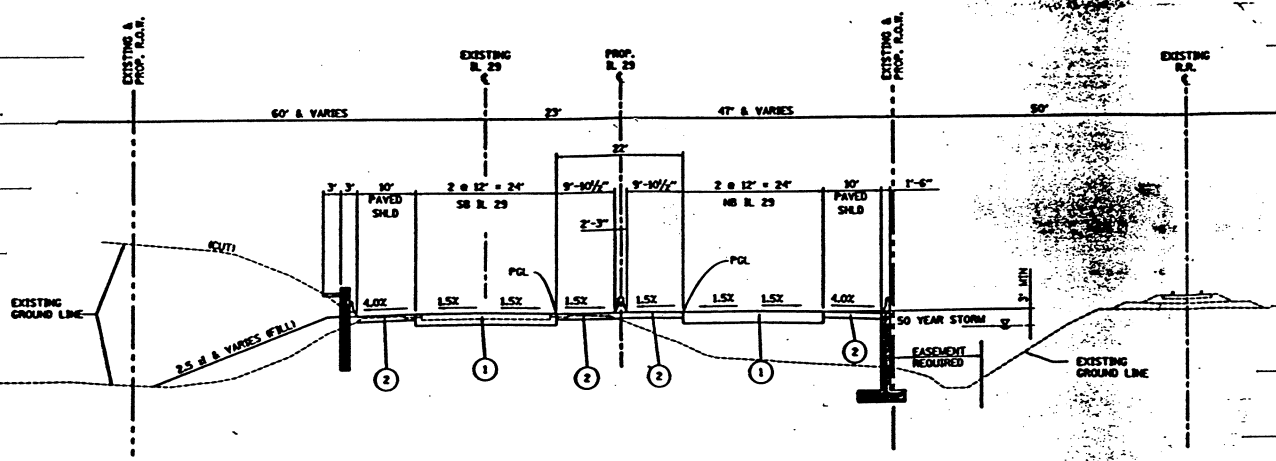
The IDOT Bridge Office does not have any published costs for soil nail walls or tieback walls. FHWA publication demonstration Project 103 Design and Construction Monitoring of Soil Nail Walls, 1999 has considerable cost data for walls constructed from 1987 to 1995. Typical costs ranged from $41 to $54 per square foot adjusted to 2003 prices using the ENR Construction Cost Index Factors. One soil nail wall included in Project 103 was located on Route 2, Dixon, Illinois. The 1993 project cost $40/ft.^{2} according to the FHWA report. The cost is approximately $52/ft.^{2} adjusted to current prices.

According to FHWA information, tieback walls are 30% more expensive than soil nail walls. Therefore, tieback walls are expected to cost in the range of $53 to $70 per square foot. The addition of cast-in-place or precast facing represents a significant cost increase for both the soil nail wall and the tieback type walls. FHWA reports the addition of cast-in-place facings may add 40 to 50 percent to the total wall cost.

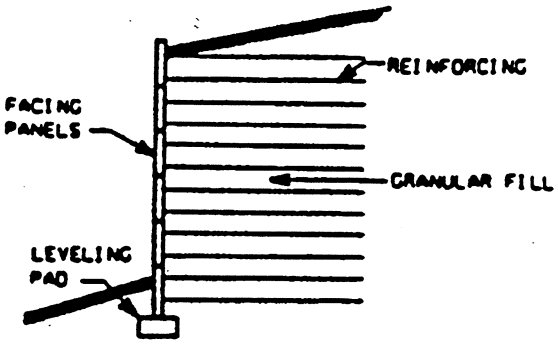
The expected wall costs for soil nail walls and tieback walls are summarized below.

Permanent Wall Type	Shotcrete Face	Cast-in-Place Face
• Soil Nail Wall	\$40-\$53 ft.^{2}	\$56-\$74/ft.^{2}
• Tieback Wall	\$52-\$69/ft.^{2}	\$73-\$97/ft.^{2}

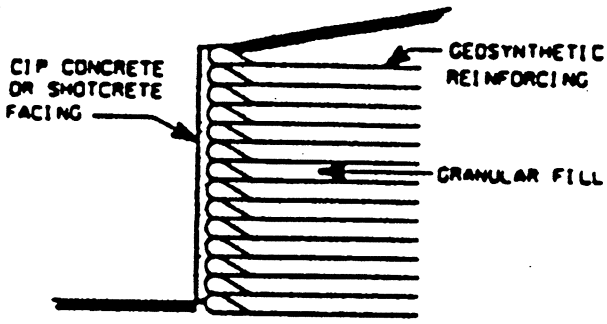
Costs for either soil nail wall or tieback walls depend on numerous factors including soil conditions, wall size, type of facing and availability of skilled contractors familiar with this specialized construction.



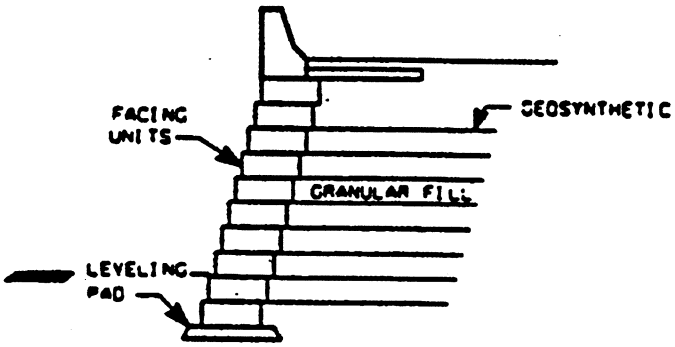
IL 29 MAINLINE
TANGENT SECTION AT MILLER-ANDERSON WOODS - EXISTING R. O. W. ALTERNATIVE
(22 FT MEDIAN)



MSE WALL WITH MODULAR PRECAST CONCRETE FACING PANELS



MSE WALL WITH GEOSYNTHETIC REINFORCEMENT AND CIP CONCRETE OR SHOTCRETE FACING



MSE WALL WITH SEGMENTAL CONCRETE BLOCK FACING

FIGURE 5.2A Typical Mechanically Stabilized Earth Gravity Walls

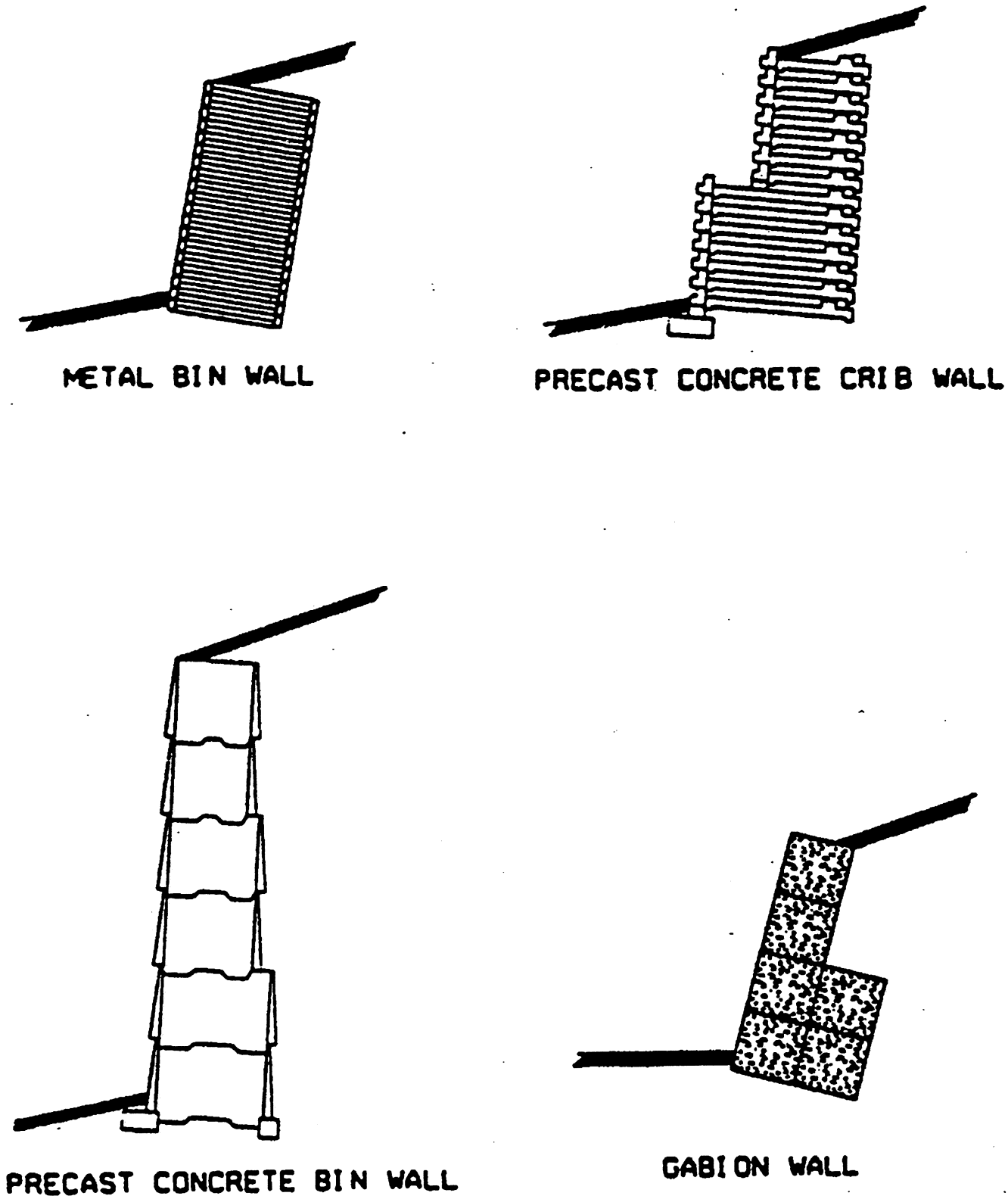
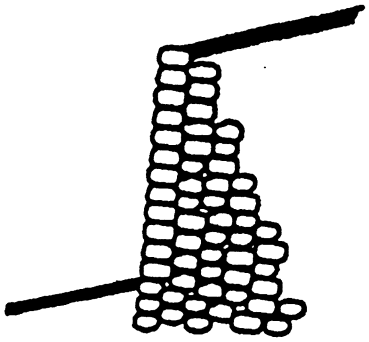
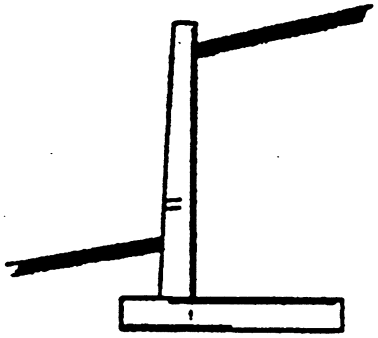


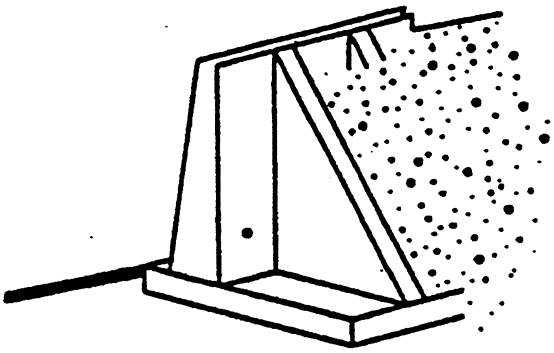
FIGURE 5.2B Typical Prefabricated Modular Gravity Walls



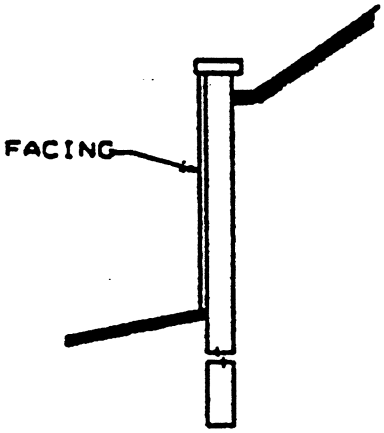
Mortar Rubble Masonry
Rigid Gravity Wall



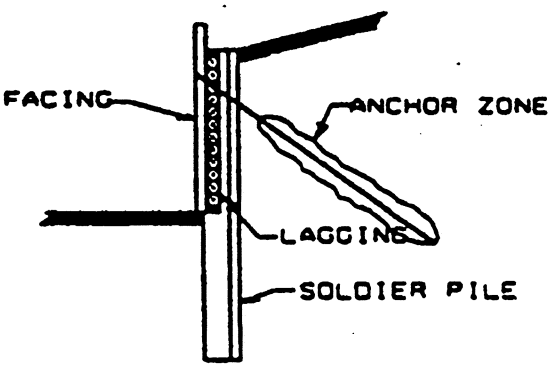
Reinforced Concrete Cantilever
Semi-Gravity Wall



Reinforced Concrete Counterfort
Semi-Gravity Wall



Slurry or Cylinder Pile
Non-gravity Cantilever Wall



Soldier Pile Tieback Wall

FIGURE 5.2C Typical Rigid Gravity, Semi-Gravity Cantilever, Non-gravity Cantilever, and Anchored Walls

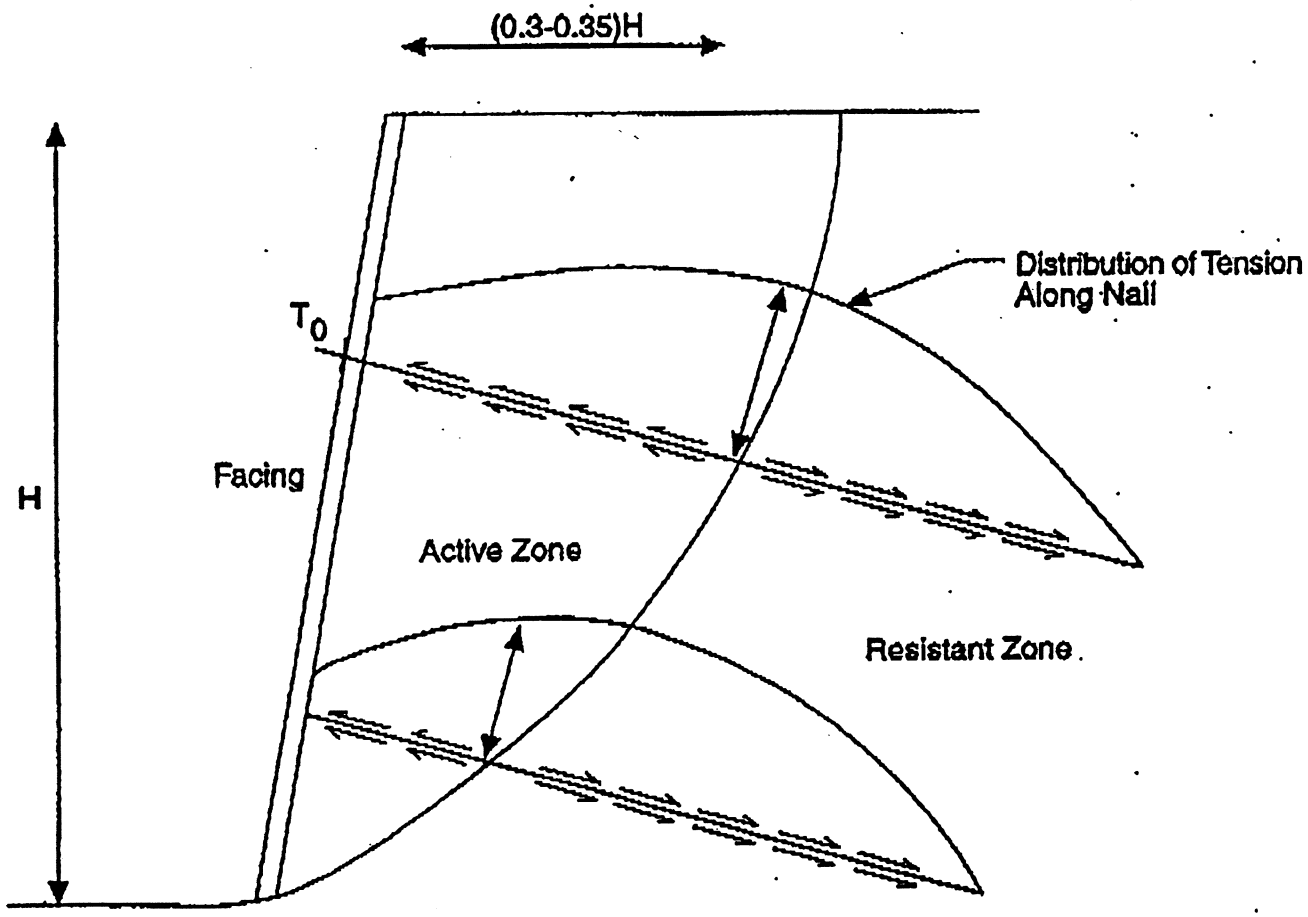
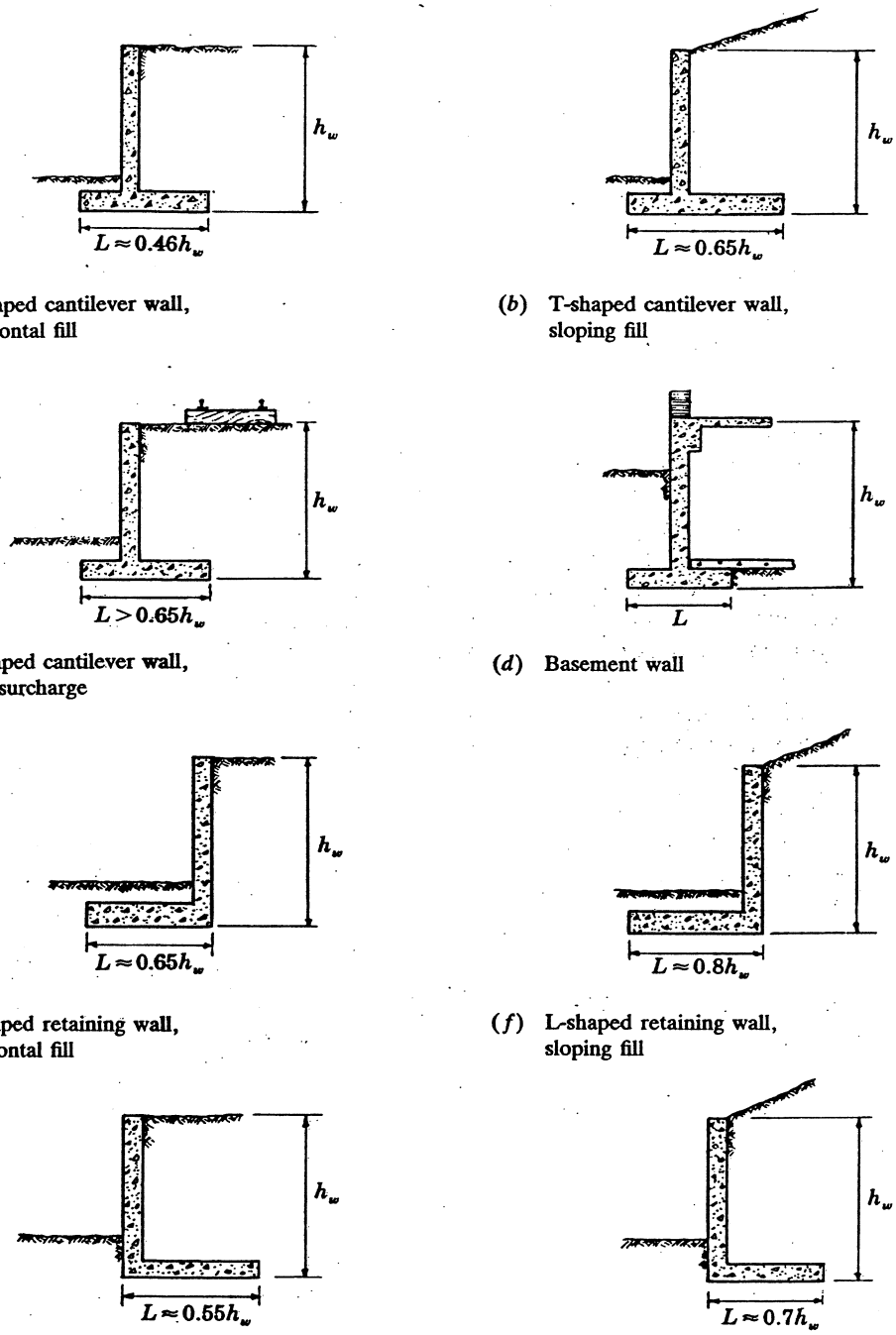


Figure 2.4 Conceptual Soil Nail Behavior

USES OF RETAINING WALLS

Very often in the construction of buildings or bridges it is necessary to retain earth in a relatively vertical position. Whenever embankments are involved in the construction, retaining walls are usually necessary. In the construction of buildings having basements, retaining walls are mandatory. Fig. 15-1 indicates some of the various types of retaining walls which are commonly utilized.



(*a*) T-shaped cantilever wall, horizontal fill

(*b*) T-shaped cantilever wall, sloping fill

(*c*) T-shaped cantilever wall, with surcharge

(*d*) Basement wall

(*e*) L-shaped retaining wall, horizontal fill

(*f*) L-shaped retaining wall, sloping fill

(*g*) Reversed L-shaped retaining wall, horizontal fill

(*h*) Reversed L-shaped retaining wall, sloping fill

Fig. 15-1

CONCRETE CANTILEVER WALL CONFIGURATIONS

6

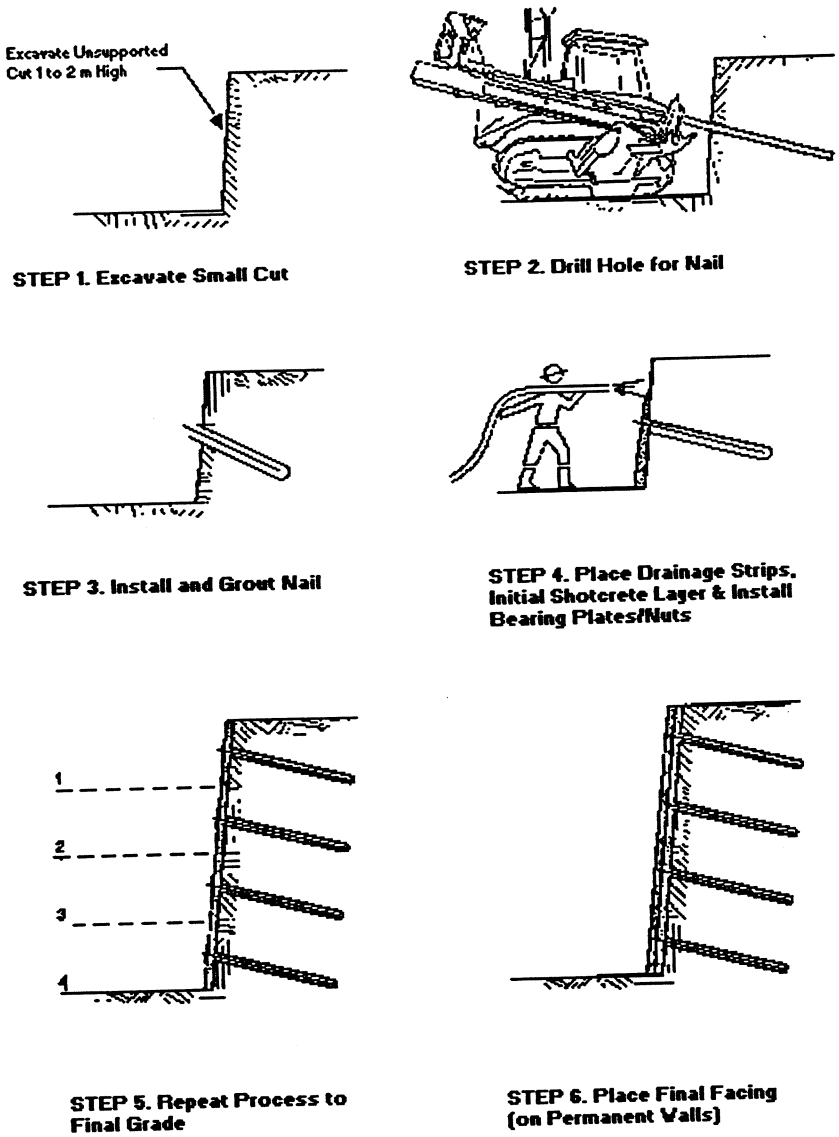


Figure 1. Typical Soil Nail Wall Construction Sequence

7

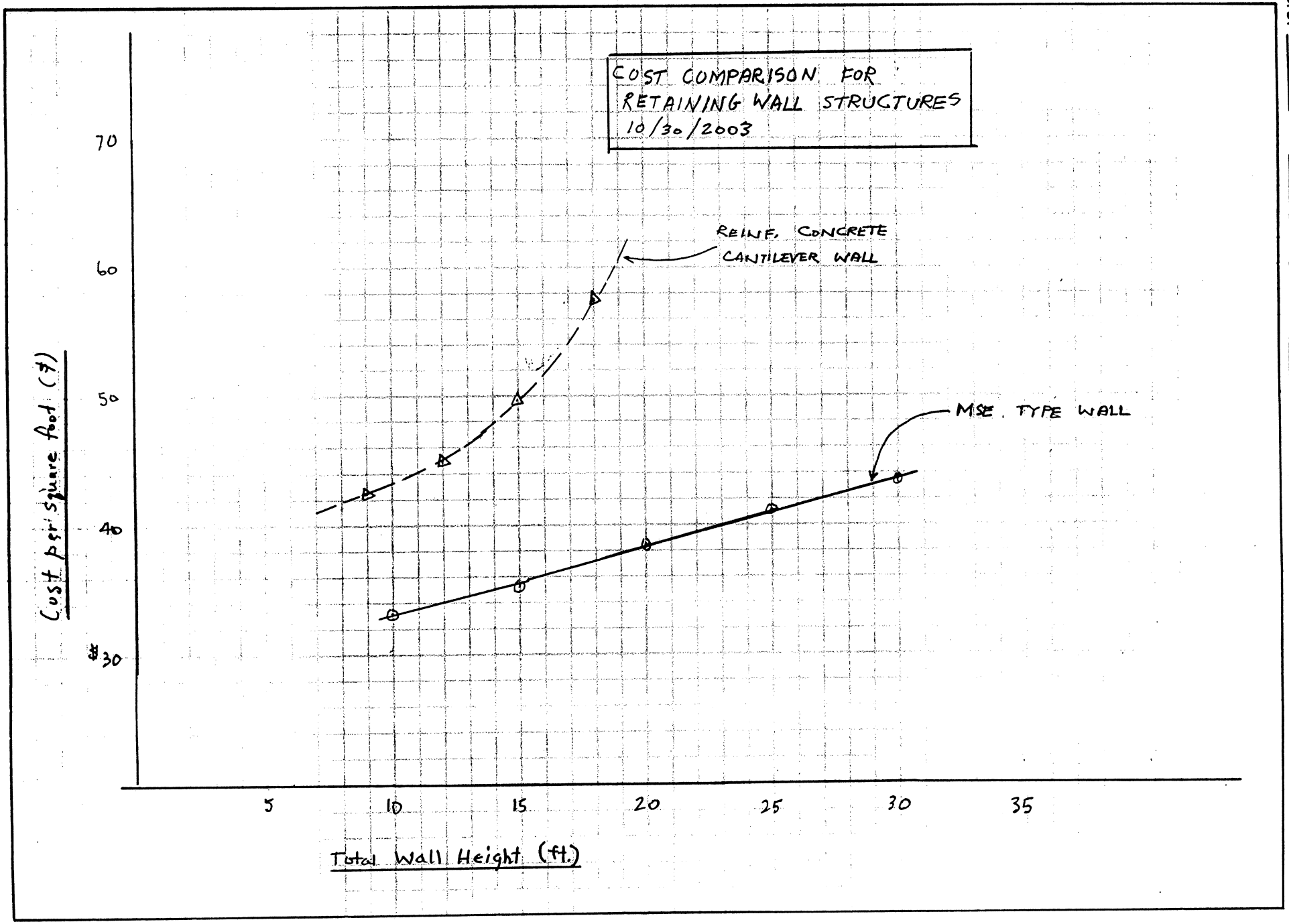
TABLE 1.1 (Cont.) COST DATA FOR SOIL NAIL WALLS ON U.S. TRANSPORTATION PROJECTS

Project	Quioccasin Road Richmond, VA	Route 2 Dixon IL	Interstate 80 Elmswood Park, NJ	Route 217 Cedar Hills Interchange Portland, OR
Bid	1992	1993	1993	1993
Wall Application	Temporary cut retention for road widening.	Cut retention – freeway widening.	Widening under existing bridge abutment on piles.	Cut slope retention for light rail.
Soil/Rock Type	Silty sand weathered granite.	Sand, highly fractured and sound sandstone.	Silty, gravelly sand	Clayey silt (Portland Hills Silt) over cobbly gravel.
Field SPT (blowcounts)	6 to refusal	7 to 80	6 to 75	4 to 49
Max. Wall H (m)	7.0	7.6	4.6	8.1
Wall Length (m)	335 (2 walls)	84	78	335
Nail Spacing (m)	1.5H x 1.5V	1.5H x 1.5V	1.2H x 1.5V	1.8H x 1.8V
Nail Length (m)	3.0 to 6.1	5.5	6.4	3.7 to 7.0
Nail Design Load (kN)	90 to 180	156	53	12 to 23 (Portland Hills Silt) 42 to 81 (Rubble basalt)
Estimated Ground-Grout Bond (Adhesion) (kN/m^2)	60 Design	69 ult.* 345 ult.**	48 Design	14.6 Design (Portland Hills Silt) 51.1 Design (Rubble basalt)
Corrosion Protection	None	Epoxy coated bar	Galvanized	Fully encapsulated epoxy coated bars
Shotcrete Thickness (mm)	100	100	76	102
Permanent Facing	None	200mm CIP with texture.	305mm CIP	203mm CIP with random board finish.
Face Batter	Vertical	Vertical	Vertical	1:12
Total Area (m^2) Nail Wall Face (bid)	1285	446	316	1958
Cost/m^2	$234	$431 ($40/ft^2)	$1242	$411
Remarks	Temporary cut for permanent CIP wall.	* Weakly cemented highly fractured sandstone. ** Sound sandstone.		

NP = Not Provided in Information Made Available

$52/ft^2 adjusted to 2003 prices.

BY JOH DATE 10/31/03 SUBJECT Retaining Wall Costs SHEET NO. ____ OF ____
CHKD. BY ____ DATE ____ JOB NO. ____



FAX TRANSMITTAL

TO: Jim Jodie / Kim Kolody

CH2M Hill

FAX NO. 773-693-3823

FROM: Michael Meier

Hutchison Engineering, Inc.

DATE: **1/8/2004** File No.2145

RE: IL 29 Phase I Study

Total number of pages 4 including cover letter.

Please Do / Do Not call to confirm this letter.

If you do not receive all the pages, please contact us
Immediately at (217) 245-7164.

COMMENTS:
In accordance with my phone conversation with Jim Jodie and Cheng Soong on December 24, 2003 I asked Jim Hamilton, our chief structural engineer, to review the geotechnical concerns for the retaining walls in the central segment.
Attached is a memorandum from Jim H. addressing this issue.

If you have any questions, please contact us.
Thank you.

Mike

Hutchison Engineering, Inc.

Since 1945 (formerly Casler, Houser and Hutchison, Inc.) **Jacksonville Joliet**

January 6, 2004

MEMORANDUM

TO: The Record

FROM: Jim Hamilton

SUBJECT: HEI Job # 2145
IL Route 29 Widening in Central Segment
Retaining Walls/Geotechnical Concerns

The widening of IL Route 29 to a four-lane highway in the central bluff region between Chillicothe and Sparland restricts the width of construction due to the steep bluff area to the west and the existing railroad just east of the highway. Environmental issues also limit the amount of right-of-way that can be obtained for new construction. Retaining walls will be required in this area to construct the new four-lane highway.

Geotechnical studies have been completed in this area during the past 30 years including those prepared by engineering consultants and IDOT geotechnical engineers. The bluff section of existing IL Route 29 is about eight miles in length in the central section from north of Chillicothe to about two miles north of Sparland. The existing railroad embankment parallels IL Route 29 with an estimated 3 to 10 feet high embankment below the highway. Existing IL Route 29 is supported on side hill fill material placed between the base of the bluffs and the railroad.

This area has a history of drainage, slope stability and sliding problems going back to the 1950's. A relatively shallow depth of shale slopes about 10° to the horizontal under the highway. Above this shale is a layer of weathered shale and glacial till plus the cohesive highway embankment. The shale parallels the bluff slope and the sliding/slope stability problems have been attributed to movement at the weathered shale level according to past studies and observations.

A 2,350 ft. long retaining wall south of Sparland was designed to correct slope stability problems and to protect the existing railroad from potential movements due to sliding in the bluff area. Wall types considered for this

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Vice President
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Vice President

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location were (1) soldier pile wall with tieback anchors into rock, (2) sheet-pile wall with anchors and (3) soil nail wall. The drilled soldier pile wall with tiebacks anchored in rock was constructed about 14 years ago. In addition, improvements to the subgrade roadway drainage were completed during the IL Rte. 29 resurfacing project.

Construction of a new four-lane facility could have some problems because of the potential slope stability, sliding problems, limited right-of-way, and environmental issues. As illustrated in the attached sketch of the typical section, a split alignment would be possible so as to minimize the amount of fill and embankment for the new four-lane roadway. The new lanes would be added on the west between the existing roadway and the bluffs.

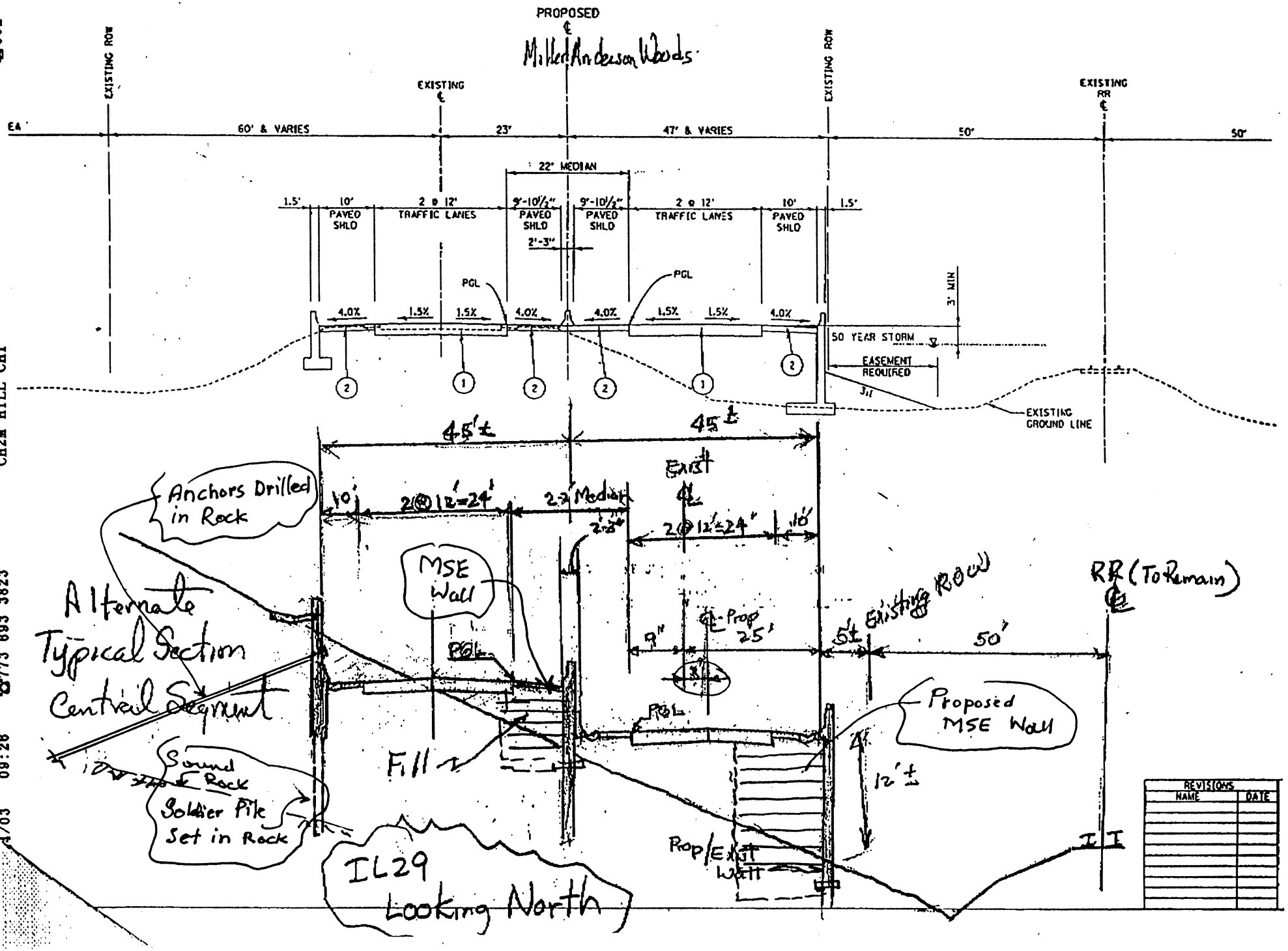
Some locations may permit adding additional lanes east of the existing roadway. This would require retaining walls at locations where the railroad is close to the roadway. This would avoid excavation in the bluff side of the roadway. The additional earth mass at the toe of the bluff slope would improve slope stability.

Preliminary analysis indicates that a soldier pile wall with tiebacks could be used in those areas having the greatest potential for sliding based on historical data and earlier geo-technical studies. A tieback wall would be suitable for the cut areas on the bluff side that would help stabilize the long term creep or sliding along the weathered rock surface. The roadway constructed on new embankment would require a retaining structure such as an MSE type with vertical face at the median and the railroad side. The final selection of wall type and lengths would require further studies after the alignment and grades are set.

The alternative with the split alignment should be acceptable in terms of constructability and for slope stability/landslide concerns. The cost of the walls will be considerable, however, the construction of a four-lane roadway between the bluff and railroad has no other choice. An elevated bridge structure would be prohibitively expensive compared to embankment and retaining structures.

Accessibility would have to be worked out with the split vertical alignment with grade changes as needed for vehicle entry and turning movements at required intervals.

JOH:cm


PROPOSED ℄
Miller Anderson Woods
EXISTING ROW
EXISTING ℄
EXISTING ROW
EXISTING RR ℄
EA
60' & VARIES
23'
47' & VARIES
50'
50'
22' MEDIAN
1.5'
10' PAVED SHLD
2 @ 12' TRAFFIC LANES
9'-10½" PAVED SHLD
2'-3"
9'-10½" PAVED SHLD
2 @ 12' TRAFFIC LANES
10' PAVED SHLD
1.5'
PGL
PGL
4.0%
1.5%
1.5%
4.0%
4.0%
1.5%
1.5%
4.0%
3' MIN
50 YEAR STORM
EASEMENT REQUIRED
3:1
EXISTING GROUND LINE
45'±
45'±
Exist ℄
Anchors Drilled in Rock
10'
2@12'=24'
2' Median
2'-3"
2@12'=24'
10'
MSE Wall
Alternate Typical Section Central Segment
PGL
℄ Prop
25'
9"
5'±
Existing ROW
50'
RR (To Remain) ℄
Proposed MSE Wall
Fill
Sound Rock
Soldier Pile Set in Rock
12'±
Prop/Exist Wall
IL29 Looking North
REVISIONS
NAME
DATE

Mike Meier

From: Jim.Jodie@ch2m.com
Sent: Monday, March 01, 2004 2:48 PM
To: mmeier@hutchisoneng.com
Subject: Retaining Walls at Bluff

Hi Mike,
We are looking for a detail that shows a ditch on the top of a retaining wall along the bluff for IL 29. This ditch will catch the runoff water from the bluff rather than allowing the water to flow over the wall. I need a detail showing what IDOT uses for these installations. Your help is appreciated. Thank you.

Jim Jodie, P.E.
Senior Transportation Engineer
CH2M HILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631
773-693-3800, x214
773-693-3823 (Fax)

2145
MM

FAX TRANSMITTAL

TO: Jim Jodie / Kim Kolody
CH2M Hill

FAX NO. 773 693 3823

FROM: Michael Meier
Hutchison Engineering, Inc

DATE: **3/2/2004** File No.2145

RE: IL 29 Phase I Study

Total number of pages 4 including cover letter.

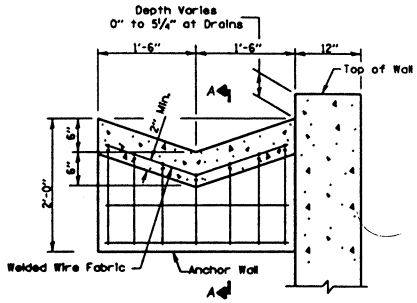
Please Do / Do Not call to confirm this letter.

If you do not receive all the pages, please contact us
Immediately at (217) 245-7164.

COMMENTS:

Attached are some examples of paved swales behind retaining walls.

Mike



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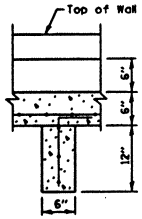
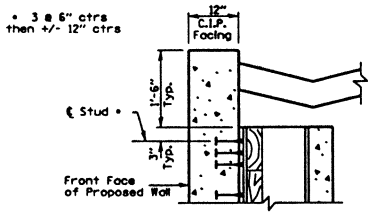


SECTION A-A



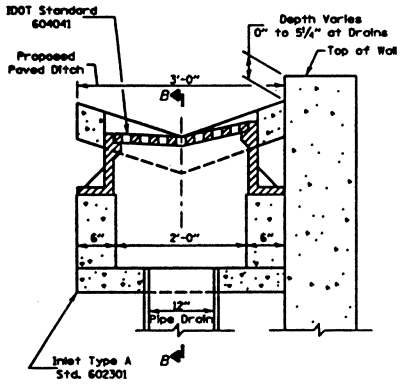
DETAIL "A"

WELDED WIRE FABRIC SHALL BE 6"X6" MESH #4 GAGE, 58 LBS. PER 100 SQ. FT., CONFORMING TO THE REQUIREMENTS OF AASHTO M-55.

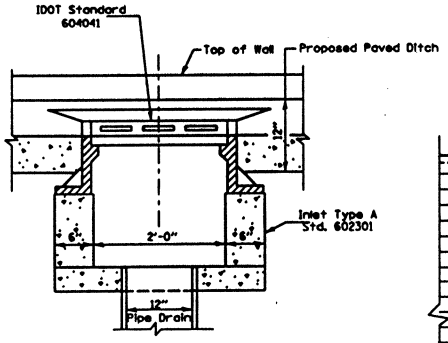
ANCHOR WALLS SHALL BE CONSTRUCTED AT THE ENDS OF THE PAVED DITCH AND AT NOT MORE THAN 50 FOOT INTERVALS.

ANCHOR WALLS SHALL BE POURED MONOLITHICALLY.

DETAIL OF PAVED DITCH (SPECIAL)

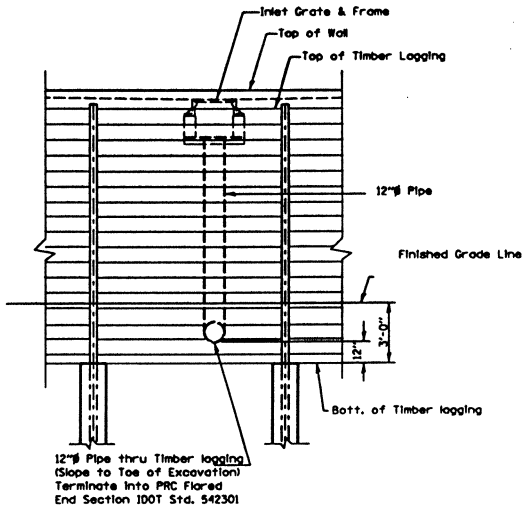


CROSS SECTION

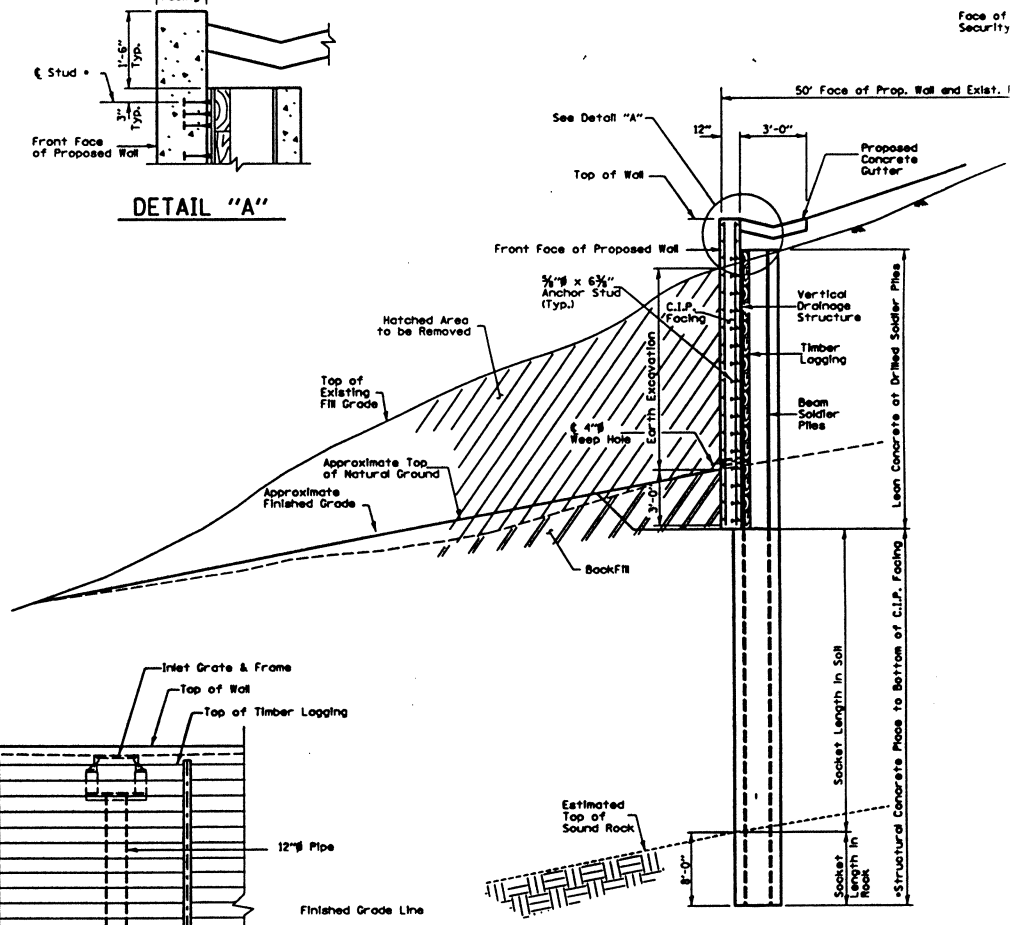


SECTION B-B

DETAIL OF PAVED DITCH AT INLET



PIPE DRAIN DETAIL



WALL SECTION

• Meets requirements of IDOT Spec. Class SI Concrete.

IL Route 29
South of Sparland

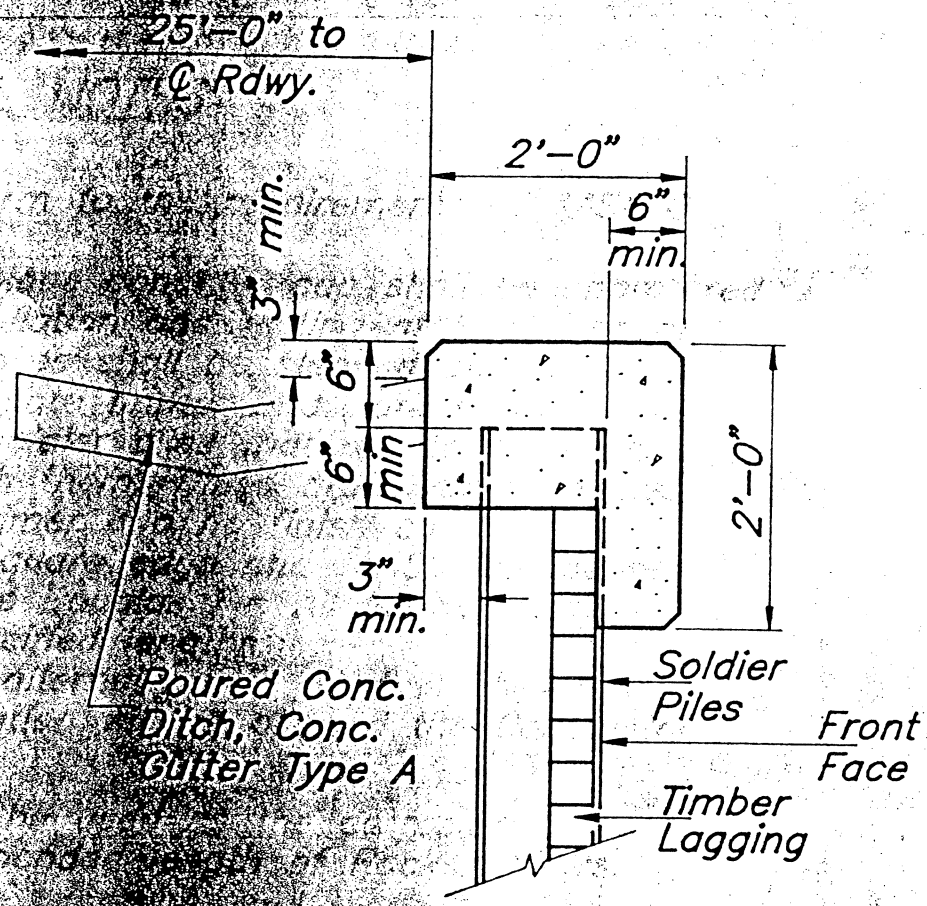
480

470

460

450

1. 1241+73



SECTION THRU RETAINING WALL CAP

Prop. Drain Spacing

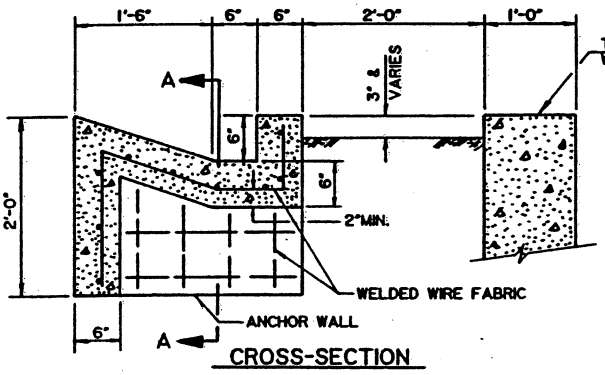
Sta. 1241+98.50

Exist 24"ø

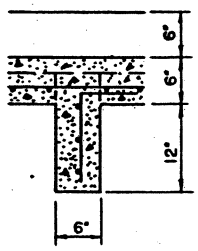
FA 408
Pike County, Illinois

DRAWING NO.	SECT.	COUNTY	TOTAL SHEETS	SHEET NO.
FA.408	*	PIKE	511	44
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

* 75-6-2A



CROSS-SECTION



SECTION A-A

NOTES

CLASS X CONCRETE SHALL BE USED THROUGHOUT.

WELDED WIRE FABRIC SHALL BE 6"x6" MESH, #4 GAGE, 58 LBS. PER 100 SQ.FT., CONFORMING TO THE REQUIREMENTS OF A.A.S.H.O. M-55.

ANCHOR WALLS SHALL BE CONSTRUCTED AT THE ENDS OF THE PAVED DITCH AND AT NOT MORE THAN 50 FOOT INTERVALS.

ANCHOR WALLS SHALL BE CONSTRUCTED MONOLITHICALLY WITH THE PAVED DITCH.

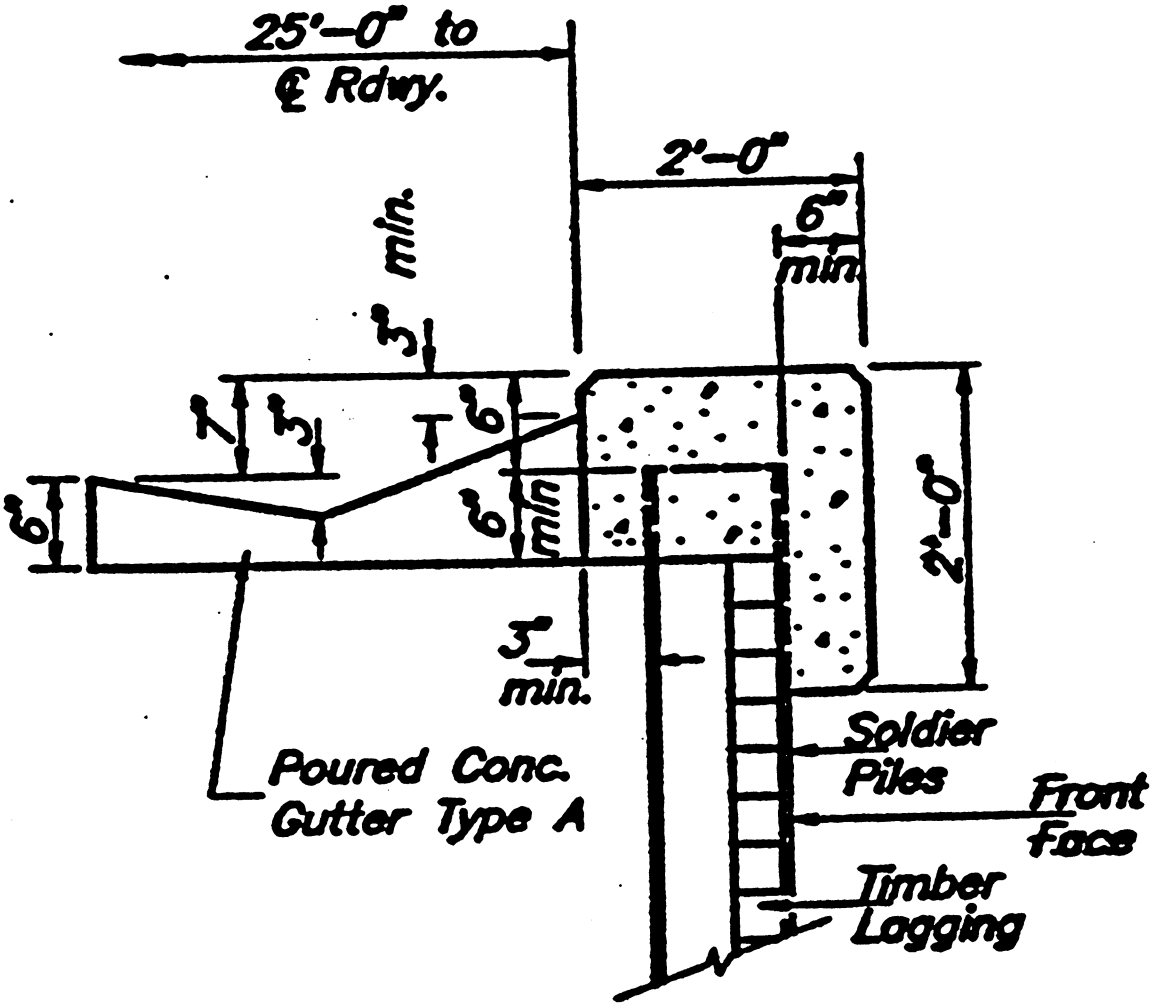
THE COST OF FURNISHING AND PLACING THE WELDED WIRE FABRIC WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE PAVED DITCH.

STANDARD DITCH FLOW LINE IS 6" BELOW TOP OF WALL. FOR SPECIAL DITCH GRADES, SEE SCHEDULE THIS SHEET.

PROVIDE FIBER MAT WHERE PAVED DITCH OUTLETS ONTO EARTH SLOPE OR DITCH. FOR LOCATIONS AND AMOUNTS OF FIBER MAT SEE SCHEDULES OF QUANTITIES.

THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAL FOOT FOR PAVED DITCH (SPECIAL).

DETAIL OF PAVED DITCH (SPECIAL)



SECTION THRU RETAINING WALL CAP

Hutchison Engineering, Inc.

TELEPHONE MEMO

By:	JIM HAMILTON				
Date:	3/10/2004	**Time** 9:30	**(am)**☒ **(pm)**☐	**Job No.**	2145
Individual:	Kim Kolody	**Title**	Project Engineer		
Company:	CH2M-Hill				
Phone No.:					
Subject:	March 12, 2004 Meeting at Peoria IDOT/IDNR--Groundwater Study/Retaining Walls, Miller-Anderson Woods in North Section				

Items Discussed: ☐ **I placed call** ☒ **Party called**

Kim called to discuss the agenda for the meeting on Friday. She is going to forward some exhibits to IDOT this afternoon for review and comments.

I said I would have some information and handouts that would show some typical retaining wall details including MSE type walls and reinforced concrete retaining walls both with and without piling.

I also have some details addressing the drainage behind a wall particularly with a high groundwater table as may exist in some areas of the wall construction.

I further mentioned to Kim that MSE type walls may be suitable for this location subject to sufficient strength of existing soil. I estimated a total wall length of some 6200' from Sta.6213+00 to Sta. 6275+00 which encompasses the Miller-Anderson Woods area and the area of groundwater study under consideration by IDNR.

Comments or Action Required:

Kim will prepare a meeting agenda and forward to me. I said I would have some copies of retaining wall details/drainage details to distribute at the meeting as required. Kim said she would try to locate soil borings in this area and send to me.

MM

Hutchison Engineering, Inc.

Since 1945

(formerly Casler, Houser and Hutchison, Inc.)

Jacksonville
Joliet

FAX TRANSMITTAL

TO: Kim Kolody
CH2M Hill

FAX NO. 773-693-3823

FROM: Jim Hamilton
Hutchison Engineering, Inc.

DATE: 3/11/2004 File No. 2143

RE: IL 29 Phase I Study
Miller-Anderson Woods, Groundwater/Retaining Walls

Total number of pages 8 including cover letter.

Please ~~call~~/Do Not call to confirm this letter.

If you do not receive all of the pages, please contact us immediately at 217/245-7164.

COMMENTS: Kim,

Attached are retaining wall details for the Miller-Anderson Woods area. They illustrate some typical wall types and drainage details through the walls. Let me know if you think these may be appropriate for the meeting with IDOT & IDNR on March 12 regarding wall/drainage issues.

Jim H.

GH
MM
JOH

1801 West Lafayette Ave. • P.O. Box 820 • Jacksonville, Illinois 62651-0820
Phone: (217) 245-7164 • FAX: (217) 243-0468

James O. Hamilton, PE, SE
Vice President
Lenny L. Chaudoin
Vice President
Fax

Gary L. Hutchison, PE, PLS
President
Michael V. Meier, PE
Executive Vice President

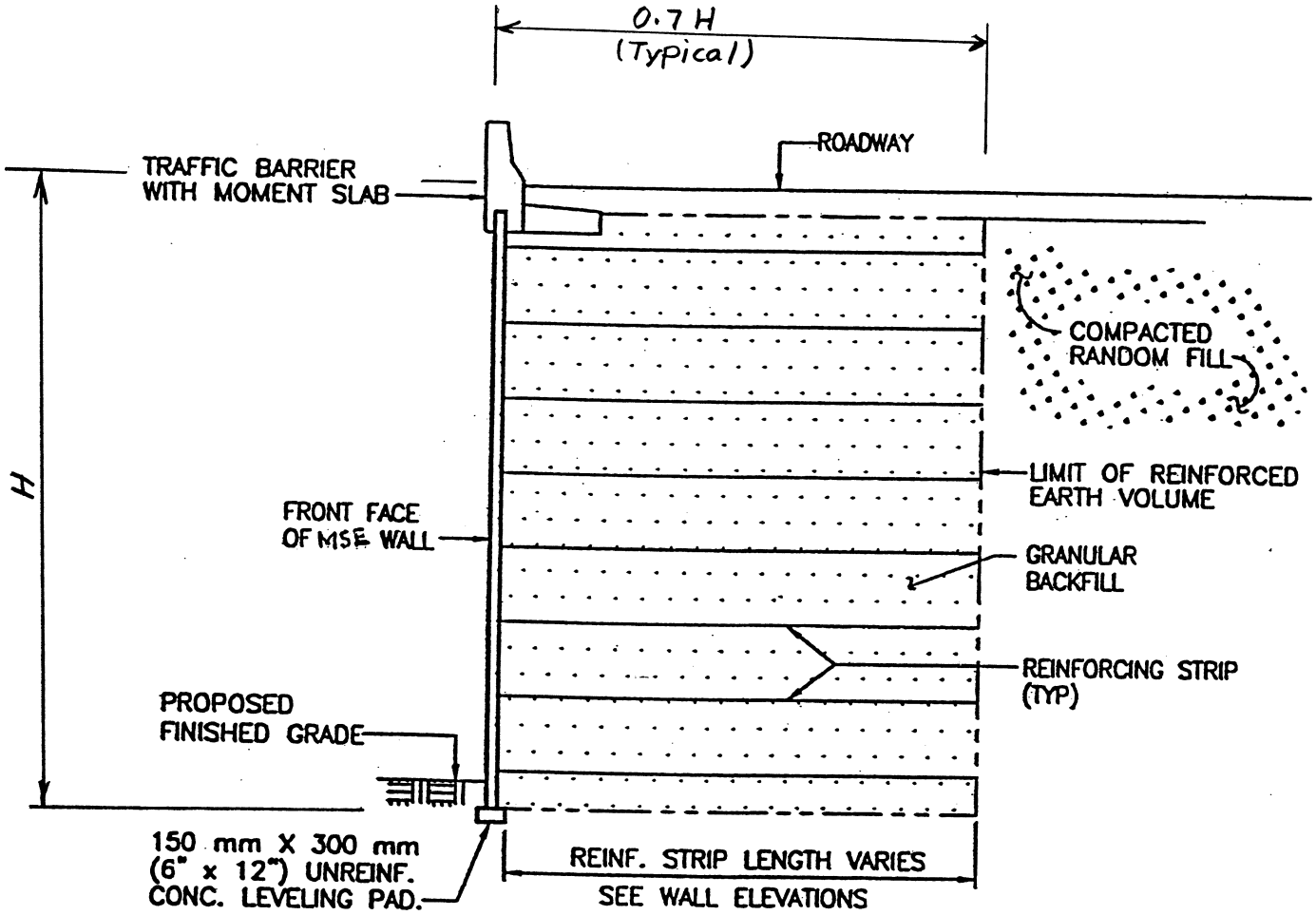
H. James Twyford, PE
Vice President
Roger W. Wright, PE
Vice President
E:\Forms

RETAINING WALL TYPES

MSE WALL (Mechanically Stabilized earth)

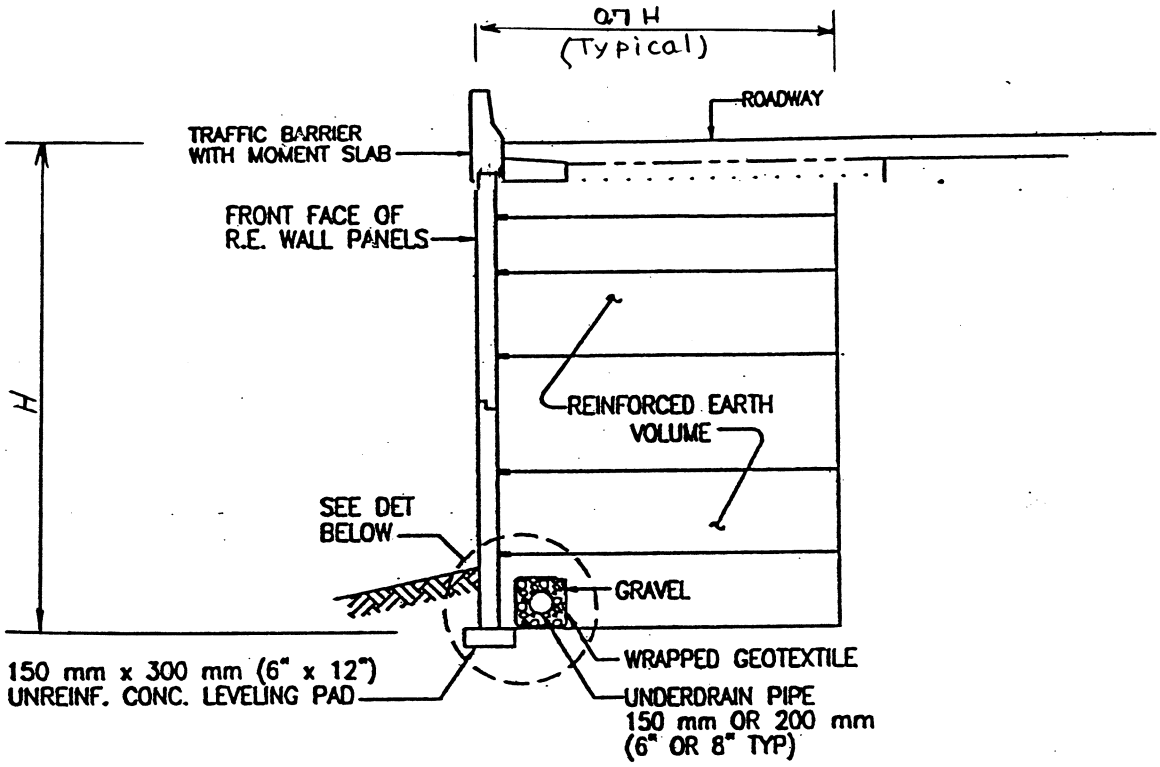
REINFORCED CONCRETE (with or without piling)

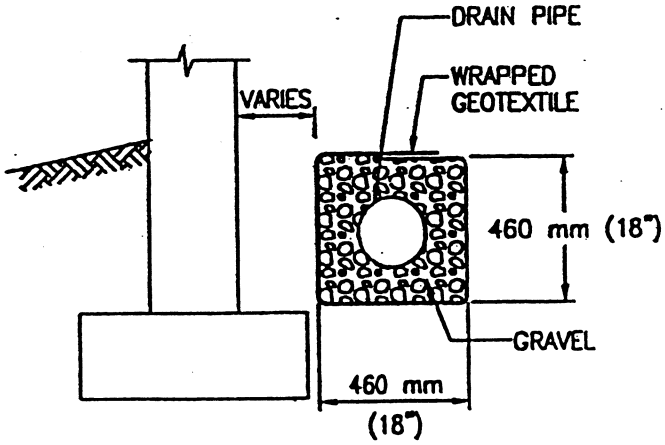
MSE WALL



TYPICAL SECTION

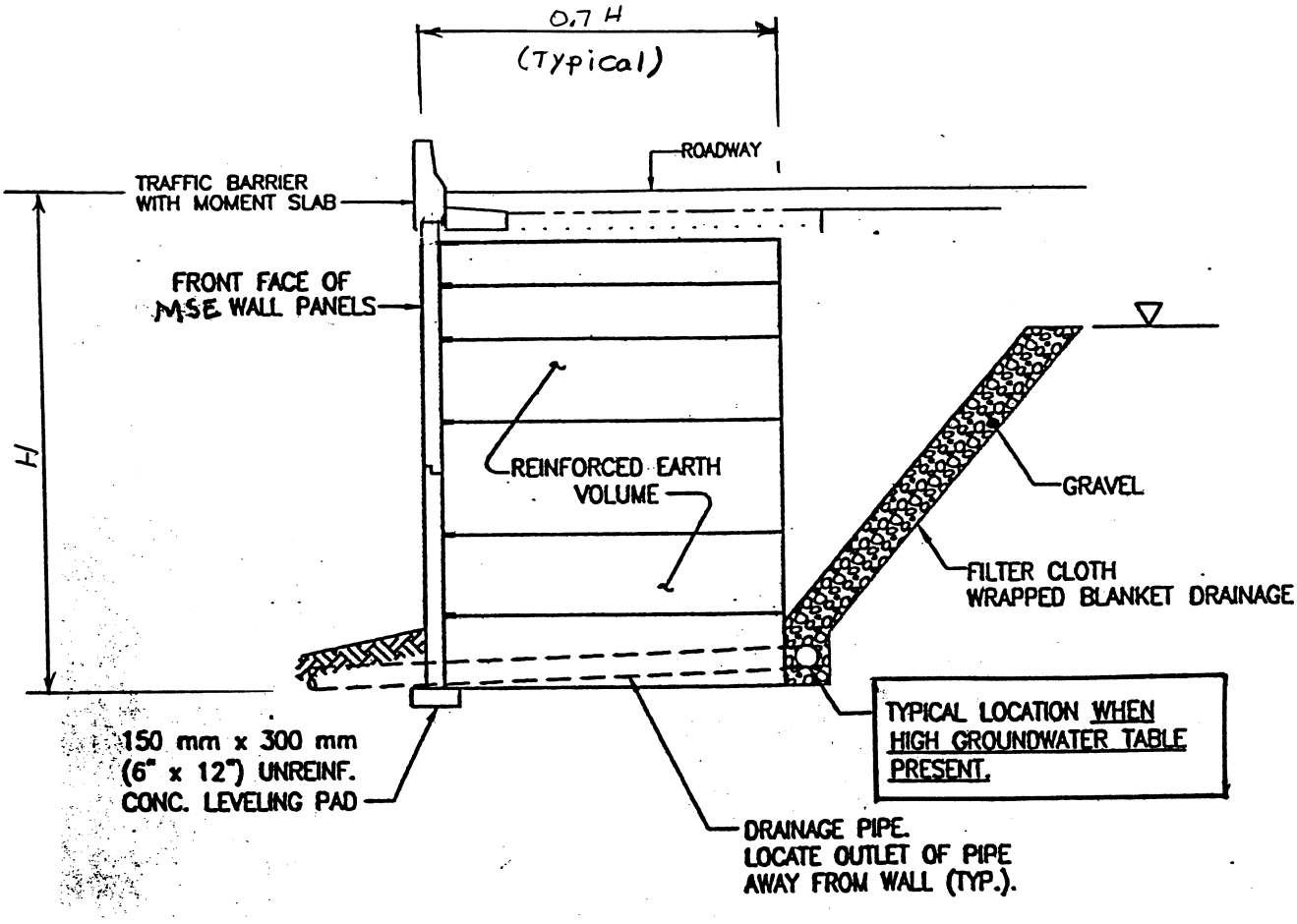
MSE WALL





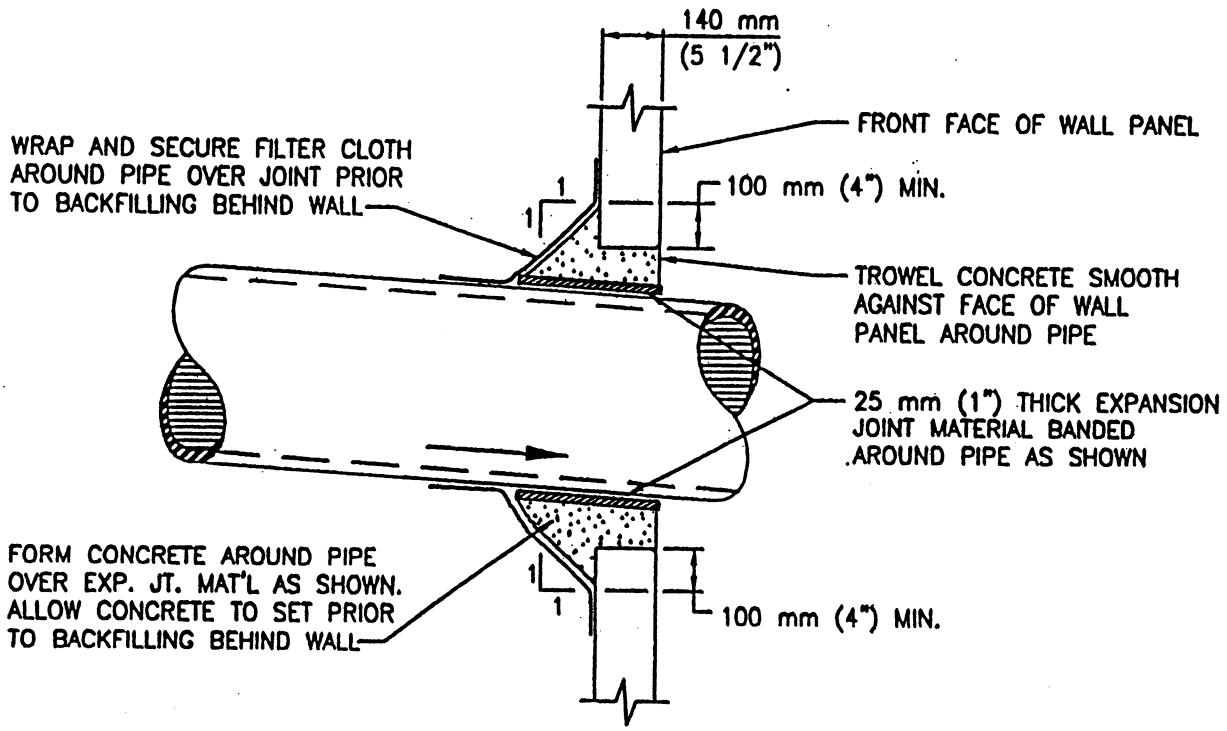
TYPICAL DRAIN

MSE WALL



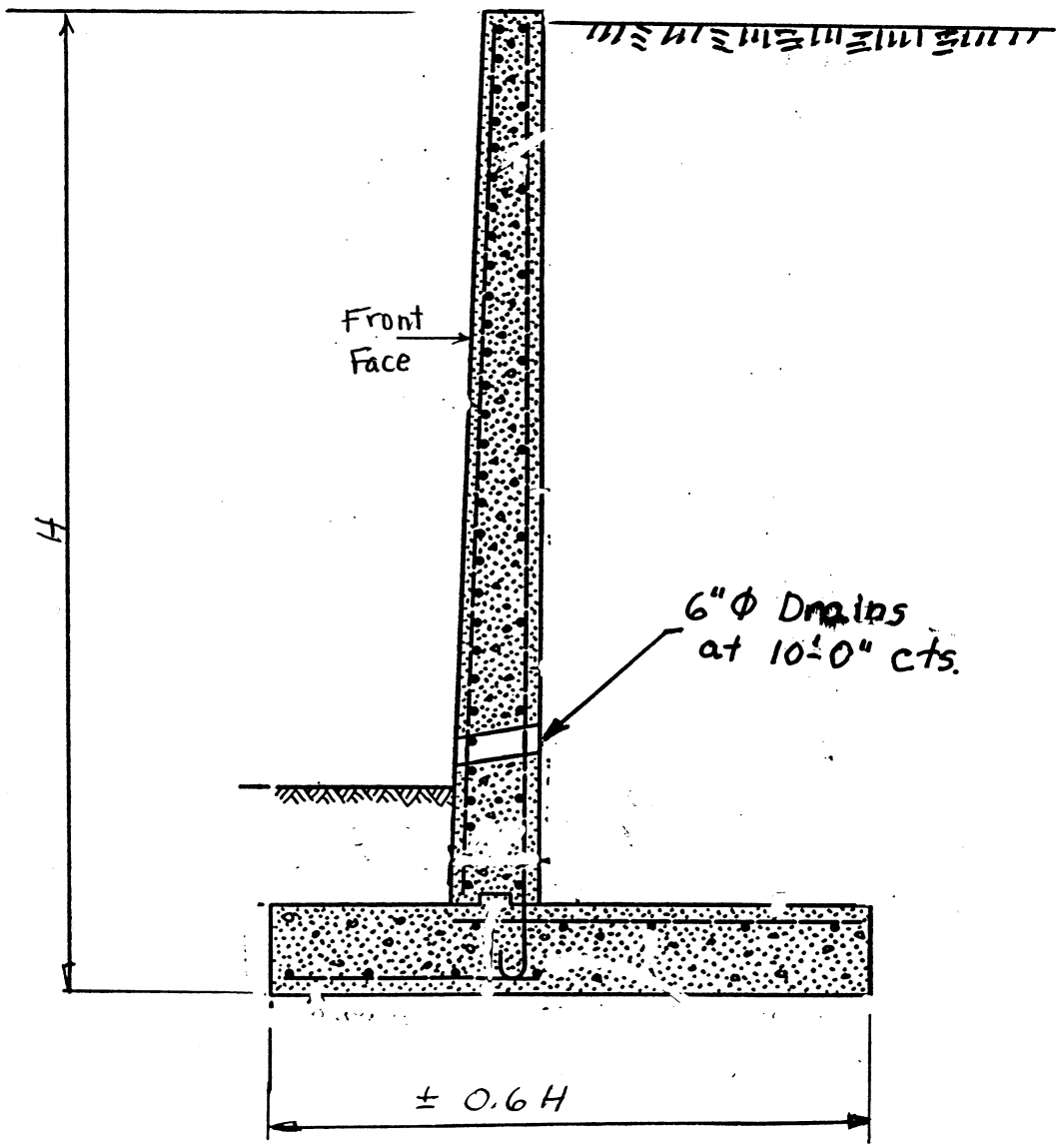
TYPICAL DRAIN WITH HIGH WATER TABLE (Chimney Drain)

MSE WALL

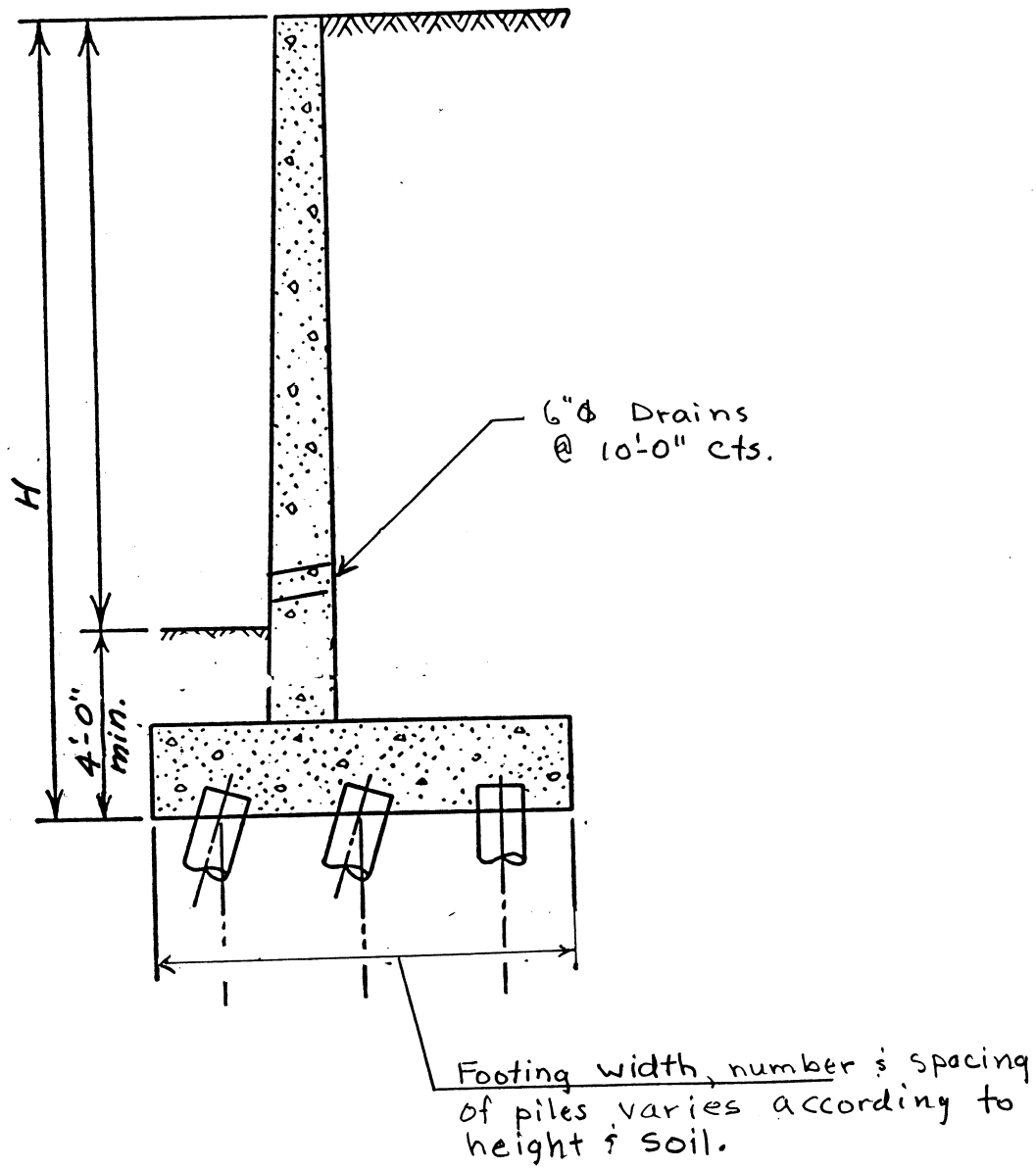


TYPICAL PIPE OPENING AT WALL FACE

CAST-IN-PLACE REINFORCED CONCRETE RETAINING WALL



TYPICAL SECTION



PILE-SUPPORTED RETAINING WALL

Brian Borgman

From: Brian Borgman [bborgman@hutchisoneng.com]
Sent: Wednesday, March 31, 2004 5:35 PM
To: Jim Jodie
Cc: Cheng Soong
Subject: IL29 Unit Costs

Jim,

Just thought I would run some of the reworked unit costs by you to see if they sound alright:

Pavement: Our costs were indeed low. We will plan on using $50/SY for mainline & ramps and $40/SY for other pavements

Earthwork: Will use $6/CY as discussed with you. We will not vary the cost according to the balance. We will continue to use the higher of the cut or fill as the earthwork amount in the summaries

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Ret. Walls: I also discussed this with Jim Hamilton. He informed me that there may in fact be some locations where a third wall type (he mentioned a concrete cantilevered wall), may be utilized in place of either MSE or Tieback walls. I will be adding this Line Item to the Cost Opinions.

As discussed, we will be looking into the unit cost for Compensatory Storage/Floodplain Encroachment and adjusting as necessary.

All of the above unit cost changes will be carried through to ALL Cost Opinions currently in the works.

Hopefully this takes care of your concerns (with the unit costs at least). If you want us to change anything, please let me know.

Thanks,

Brian

Brian Borgman, E.I.
Hutchison Engineering, Inc
bborgman@hutchisoneng.com
Phone: (217) 245-7164
Fax: (217) 243-0468

Tracking:

Recipient	Read
Jim Jodie	Read: 3/31/2004 5:42 PM
Cheng Soong	Read: 3/31/2004 5:47 PM

Z145 BMB
MVM
GLH

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Friday, May 21, 2004 11:26 AM
To: Kim Kolody
Cc: Mike Meier
Subject: Retaining Wall Typical Sections

2145wallsec1.dgn

Kim,

Attached are three typical retaining wall sections (*.dgn format) for the IL 29 Central and North Sections.

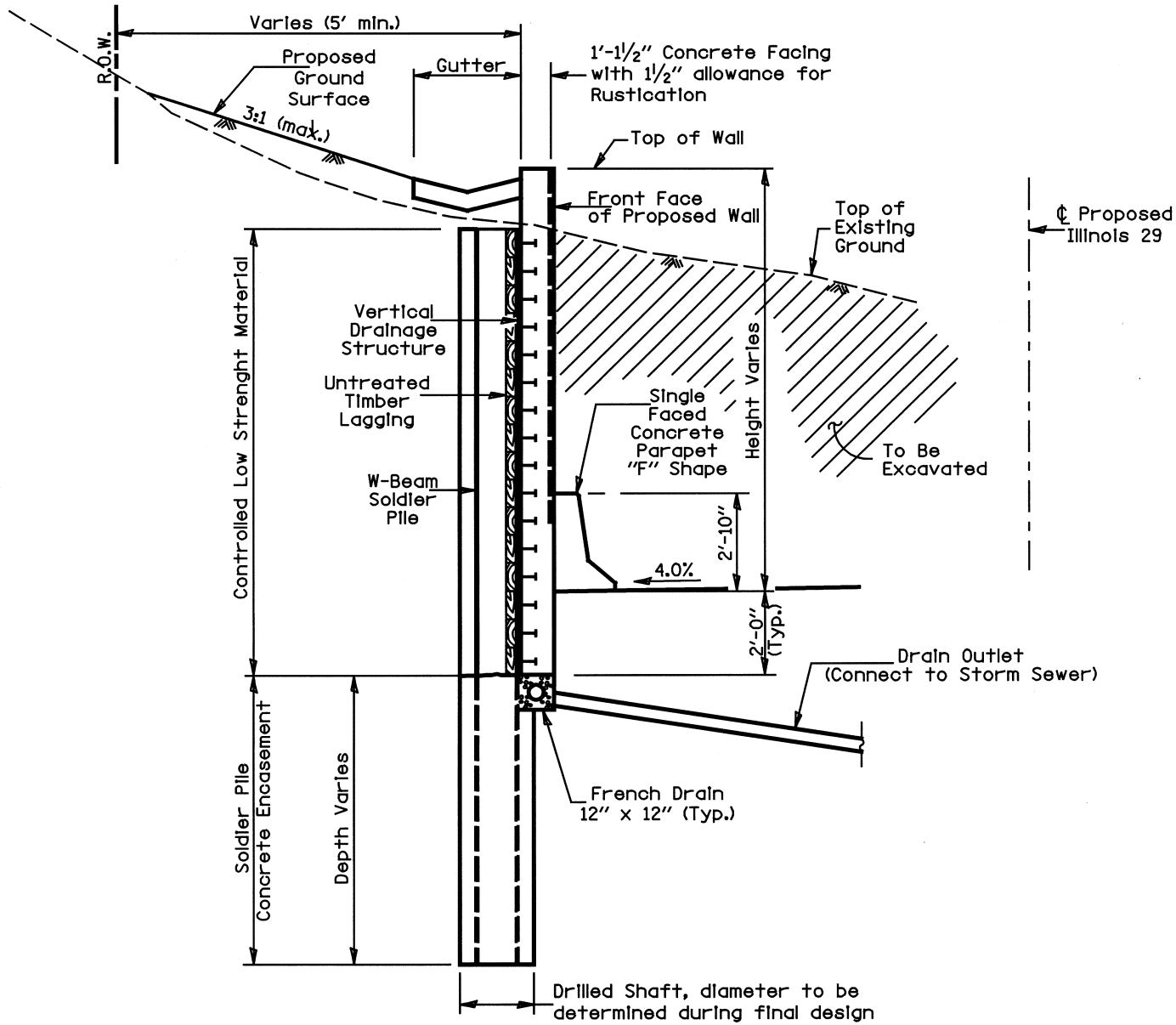
The typicals include (1) Cantilever Soldier Pile Wall, (2) Soldier Pile Wall with Tie-Back Anchor, and (3) MSE type wall. These three types should be suitable for most locations currently under consideration on the mainline Route 29.

Construction of MSE type walls is done mostly from the back side of wall. Access on the front side should be provided for a truck and crane and should require less than 25 ft. width. from the front face of wall.

If any questions, please call.

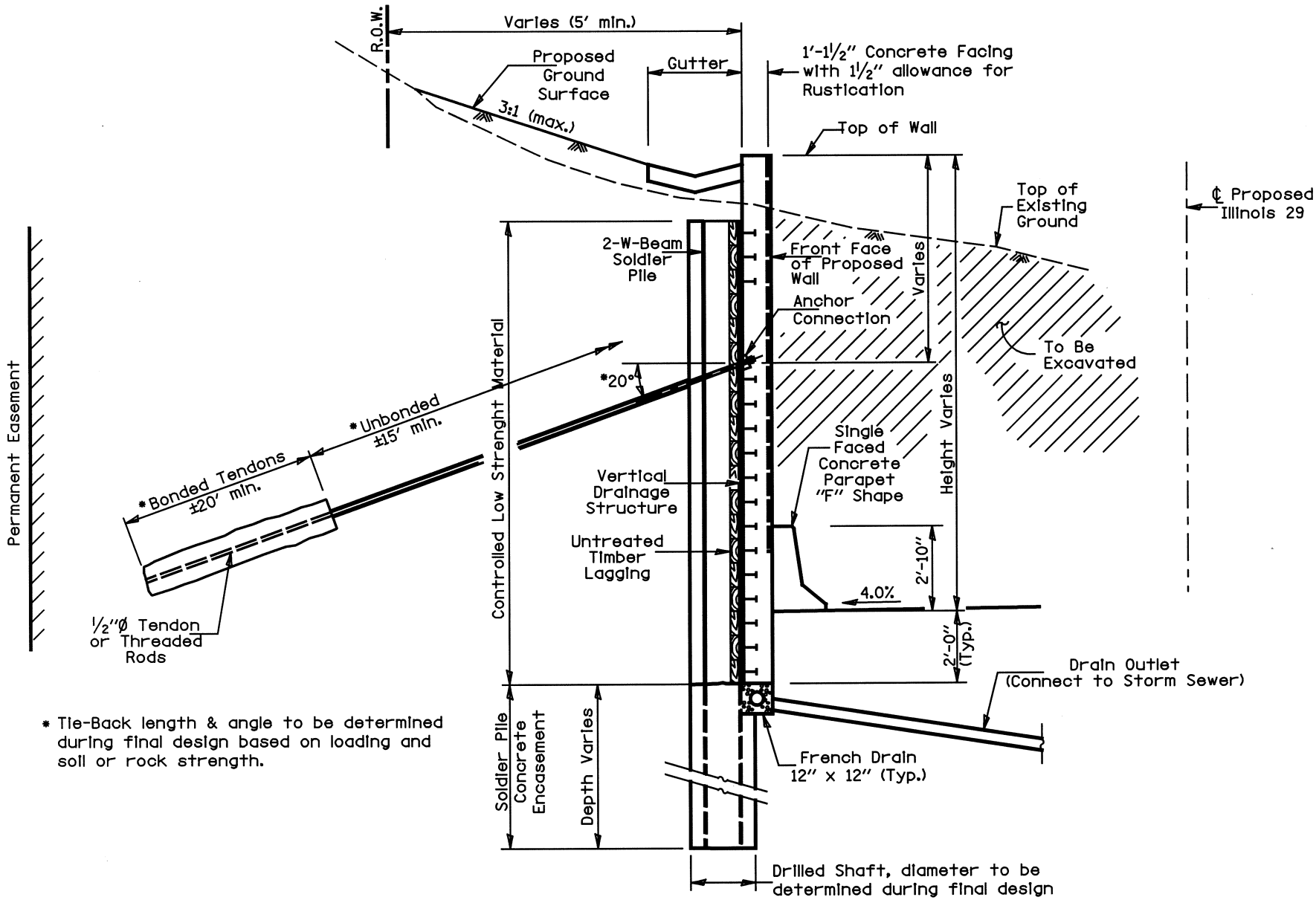
Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

2145 MM



TYPICAL SECTION THROUGH CANTILEVER SOLDIER PILE WALL

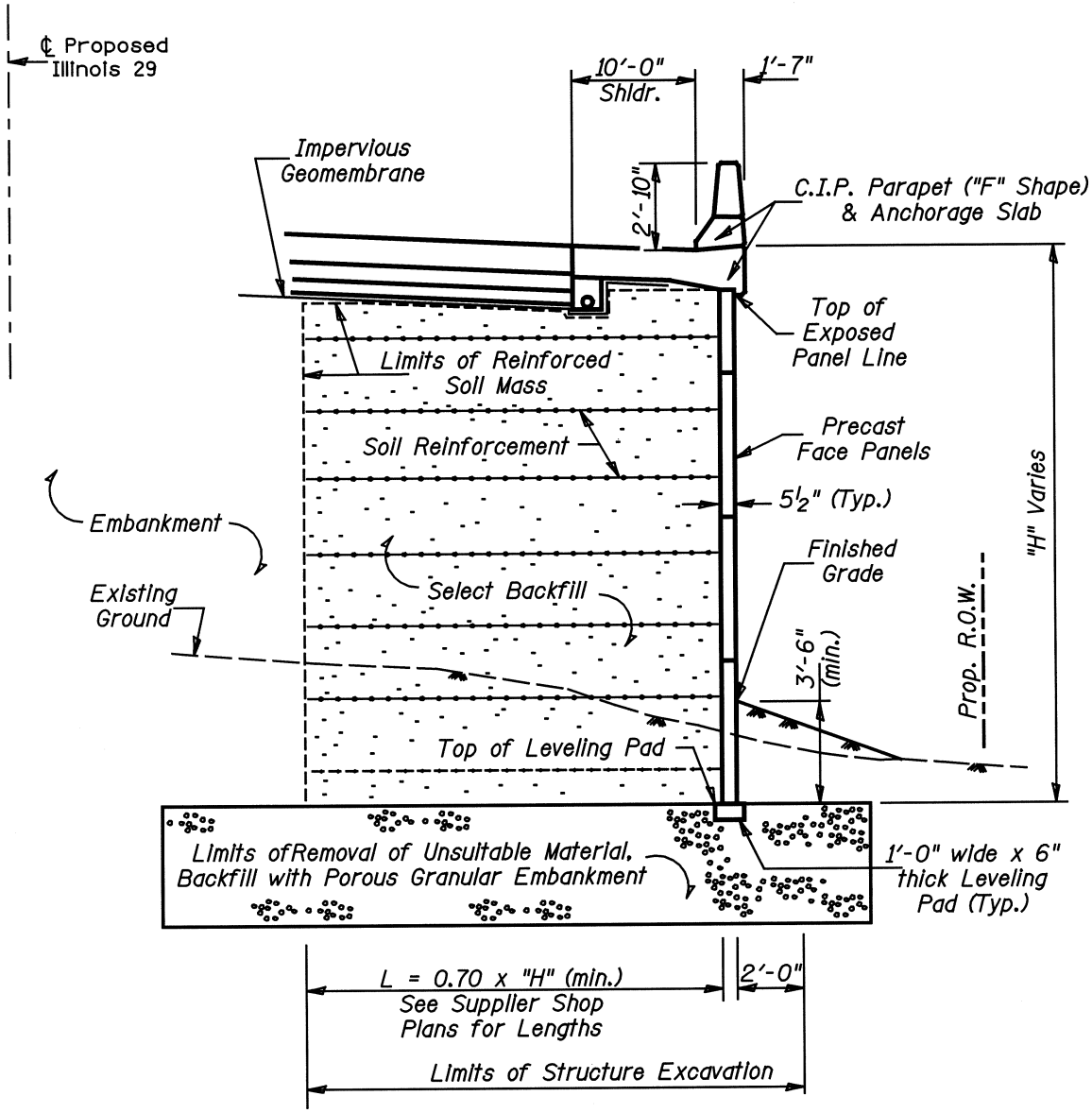
ILLINOIS RTE. 29



* Tie-Back length & angle to be determined during final design based on loading and soil or rock strength.

TYPICAL SECTION THROUGH SOLDIER PILE WALL WITH TIE-BACK ANCHOR

ILLINOIS RTE. 29



TYPICAL M.S.E.
WALL SECTION

ILLINOIS RTE. 29

Hutchison Engineering, Inc.

TELEPHONE MEMO

By:	JIM HAMILTON			
Date:	5/27/04	**Time** 2:20	**(am)**☐ **(pm)**☒	**Job No.** 2145
Person Contacted:	Dave Copenbarger	**Title**		
Company:	IDOT District 6			
Phone No.:	217-785-5306			
Subject:	I-72, Pike County, Tie-Back Retaining Walls			

Items Discussed: ☐ **I placed call** ☒ **Party called**

I asked Dave if there have been any reported problems with the tie-back walls along on I-72 in Pike County. Dave checked with the Pittsfield maintenance yard. There have been no problems at all with the retaining walls. The only item mentioned by maintenance involved landscaping--dead tree removal.

Comments or Action Required:

Post-it® Fax Note 7671		Date 6/8/04	# of pages ▶ 1
To Tim Fodie		From M. Meier	
Co./Dept. CH2M Hill		Co. HEI	
Phone #		Phone #	
Fax # 773 693-3823		Fax #	

MM

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Tuesday, June 22, 2004 3:08 PM
To: Kim Kolody
Cc: Mike Meier
Subject: Retaining Walls--Central & North Section--IL 29 Phase I Study

IL 29 Wall Summary.xls 2145wallsec1.dgn

Kim,

Here as requested are some preliminary typical wall section details and wall location schedule with offsets, wall types, lengths and maximum wall heights for those locations on the existing alignment in the central and north sections where retaining walls are most probable. I arbitrarily assigned numbers to the wall for identification.

Since there are several alternatives still under consideration for the Sparland interchange, retaining walls in this area were omitted from the listing.

It is anticipated that Soldier Pile Walls exceeding 10 ft. in height will require anchors that extend behind the walls. The length, spacing and anchor capacity would be determined during final design based on wall loadings and geotechnical requirements. Since the noted soldier pile walls could have varying heights, both cantilever and anchored wall are possible at each wall location to conform to the natural terrain.

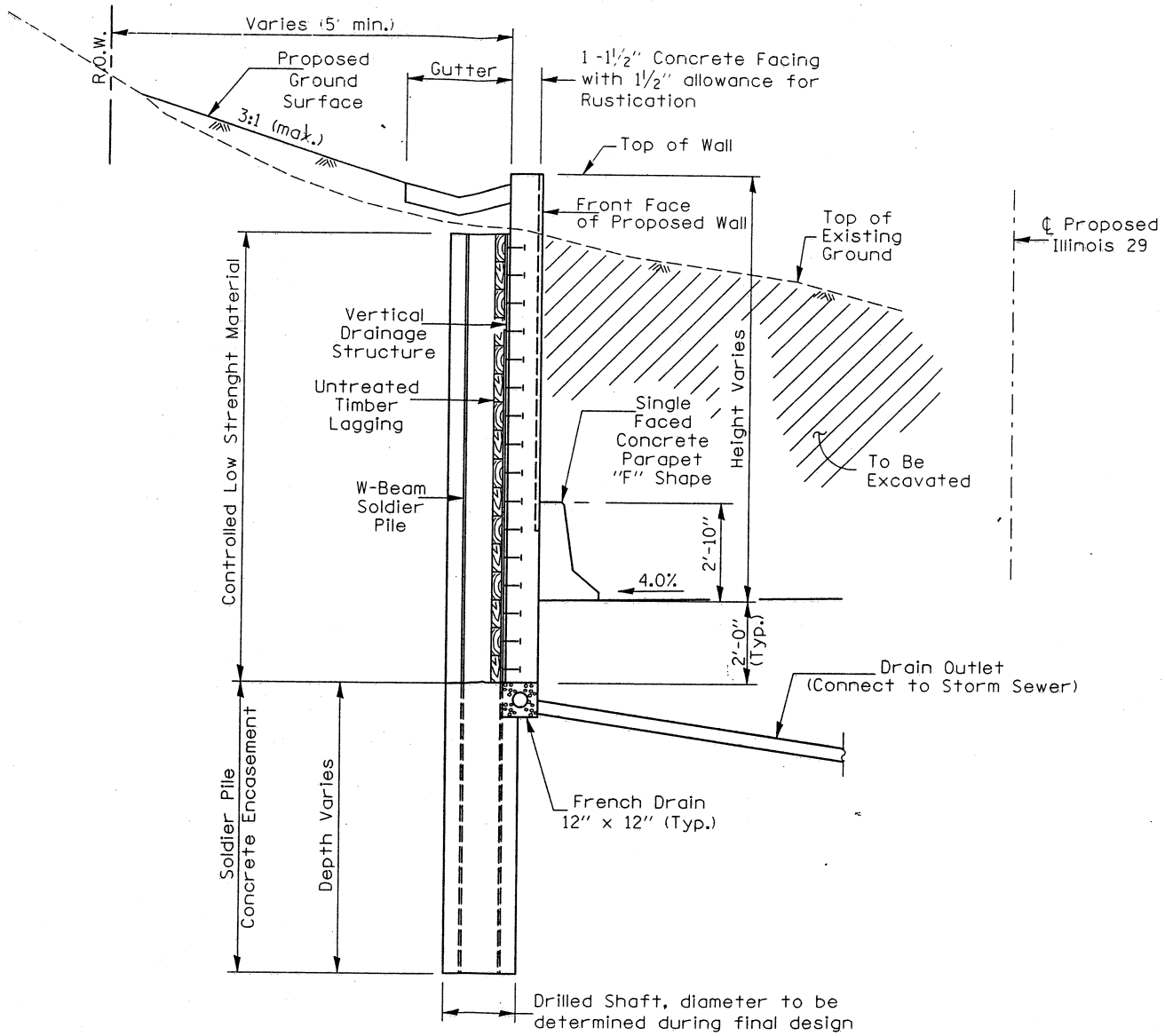
An existing soldier pile retaining wall south of Sparland (Wall No. 12C), constructed about 13 years ago, had tie-back anchors with varying lengths to 55 ft. maximum. (The final constructed lengths may have varied from the plan lengths. At this stage of the IL 29 project a realistic estimate for permanent easement would be about 75 ft. allowance behind the wall for anchor installation.

If you have any questions please feel free to call at any time.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

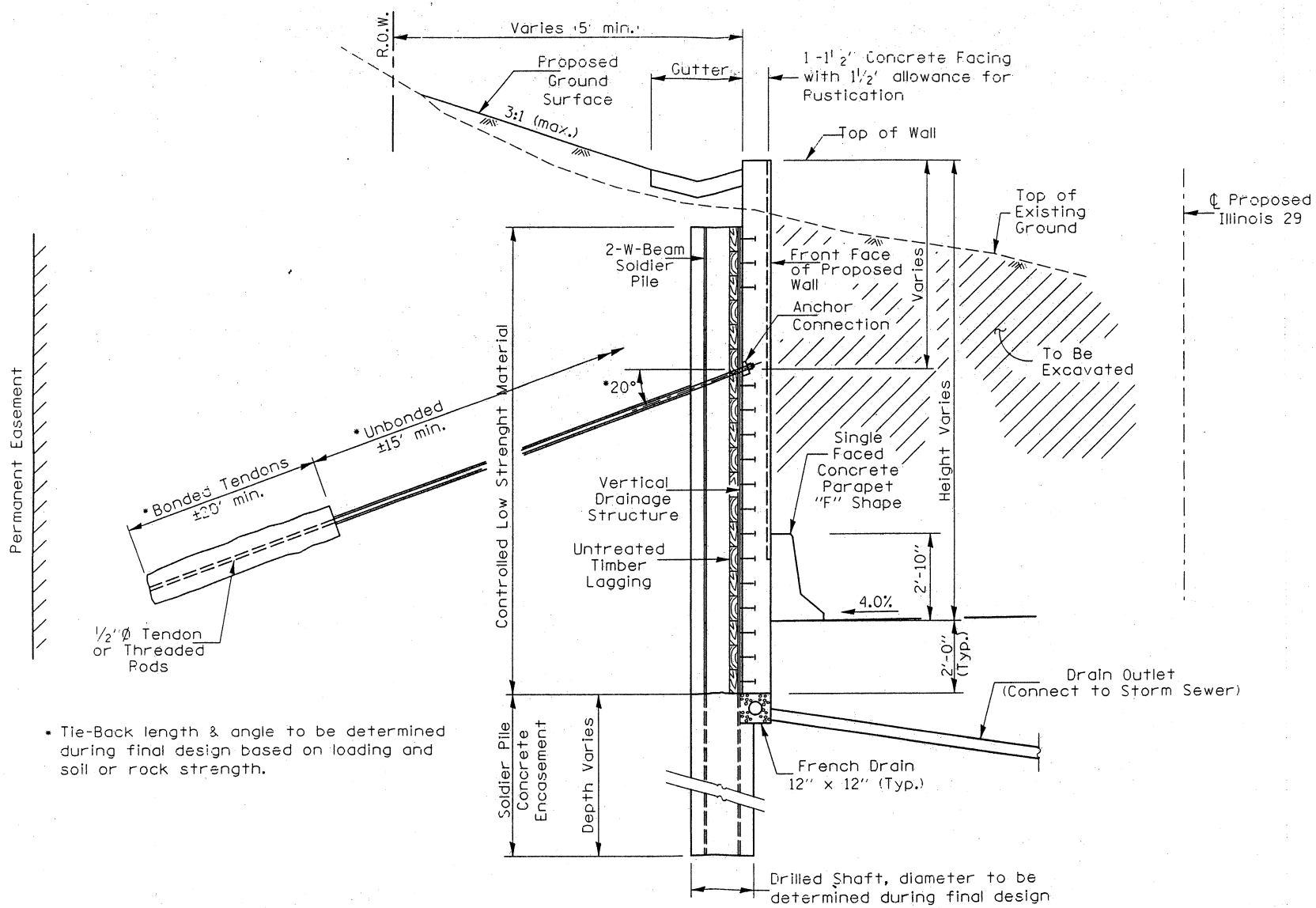
2145

MM



TYPICAL SECTION THROUGH CANTILEVER SOLDIER PILE WALL

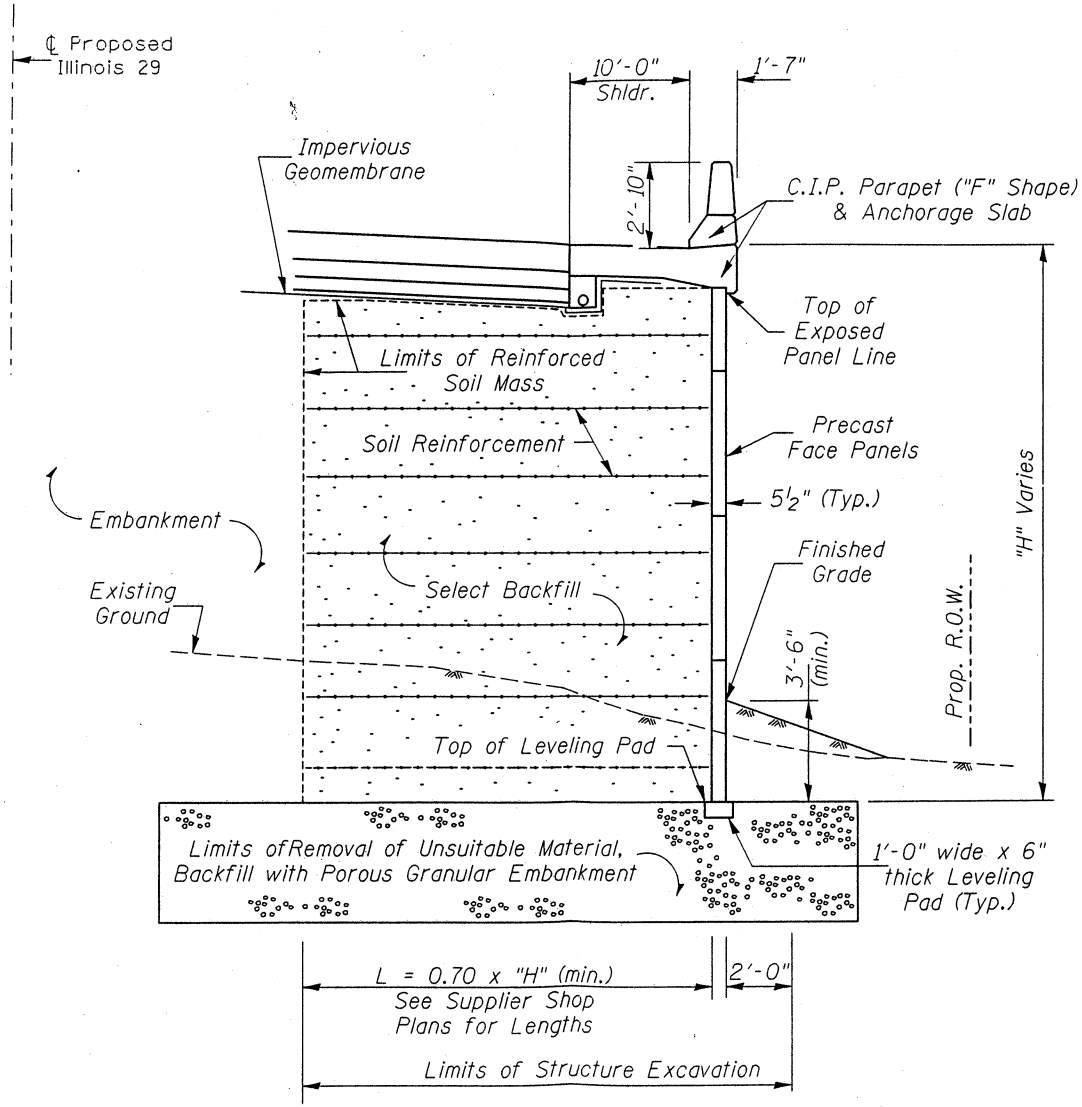
ILLINOIS RTE. 29



* Tie-Back length & angle to be determined during final design based on loading and soil or rock strength.

TYPICAL SECTION THROUGH SOLDIER PILE WALL WITH TIE-BACK ANCHOR

ILLINOIS RTE. 29



TYPICAL M.S.E.
WALL SECTION

ILLINOIS RTE. 29

CENTRAL SECTION--EXISTING ALIGNMENT, IL 29 PHASE I STUDY

RETAINING WALLS

WALL NUMBER	APPROX. WALL OFFSET FROM IL 29 (FT.)	BEGIN STATION	END STATION	APPROX. WALL LENGTH (FT.)	ESTIMATED MAX. WALL HEIGHT (FT.)	RECOMMENDED WALL TYPE
1C	61 LT.	3329+50	3340+50	1100	11	SOLDIER PILE
2C	61 LT.	3342+50	3366+80	2430	18	SOLDIER PILE
3C	60.5 RT.	3388+00	3391+90	390	11	MSE
4C	47 LT.	3393+00	3400+80	780	7	SOLDIER PILE
5C	47 LT.	3401+30	3415+00	1370	9	SOLDIER PILE
6C	47 LT.	3415+50	3454+00	3850	16	SOLDIER PILE
7C	47 LT.	3457+00	3484+44	2744	18	SOLDIER PILE
8C	60-175 LT.	45+80 (Hopewell Dr.)	3484+54	550	15 (Est.)	SOLDIER PILE
9C	47 LT.	3488+45	3510+90	2245	14	SOLDIER PILE
10C	47 LT.	3511+60	3514+80	320	14	MSE
11C	47 LT.	3520+00	3583+00	6300	16	SOLDIER PILE
12C (Existing)	49.5 RT.	3551+00	3574+50	2350	15	SOLDIER PILE
13C	47 RT.	3583+40	3585+00	160	8	MSE
14C	50-60 LT.	3594+10	3600+10	600	10	MSE
15C	47-65 LT.	3664+00	3686+40	2240	14	SOLDIER PILE
16C	50-60 RT.	3663+50	3667+50	400	11	MSE
17C	50-60 LT.	3688+00	3696+30	830	13	SOLDIER PILE
18C	47 LT.	3697+00	3706+20	920	17	SOLDIER PILE
19C	47 LT.	3707+20	3739+00	3180	21	SOLDIER PILE
20C	47 RT.	3710+00	3714+00	400	14	MSE

NORTH SECTION--EXISTING ALIGNMENT, IL 29 PHASE I STUDY

RETAINING WALLS

WALL NUMBER	APPROX. WALL OFFSET FROM IL 29 (FT.)	BEGIN STATION	END STATION	APPROX. WALL LENGTH (FT.)	MAX. WALL HEIGHT (FT.)	RECOMMENDED WALL TYPE
1N	61 RT.	6193+50	6202+50	900	13	MSE
2N	61 LT.	6194+00	6200+50	650	10	MSE
3N	47 RT.	6204+20	6276+00	7180	22	MSE
4N	47 LT.	6205+75	6209+50	375	8	MSE

RETAINING WALL NOTES

1. MSE type retaining wall are Mechanically Stabilized Earth walls and designed according to AASHTO Standard Specifications and IDOT Guide Specifications (GBSP No. 38). MSE walls are gravity type walls and the reinforced soil mass normally extends a minimum length of 0.7H behind the wall. Removal of unsuitable material may be necessary for construction and stability of the wall.

2. Soldier Pile type retaining walls shall be designed according to AASHTO Standard Specifications and according to IDOT Guide Specifications (GBSP 43 & GBSP 44) as applicable. Soldier Pile walls may consist of both cantilever and anchored walls depending on the wall height and geotechnical requirements. Total length of anchors are estimated at 35 ft. minimum, however, the final determination of anchor capacity and length will be done during final design. The wall contractor shall be responsible for determining the final anchor length.

3. The estimated wall lengths and heights are subject to change during final design.

4. Subsurface conditions determined by core borings at several locations at each wall will be required to make final geotechnical recommendations concerning wall types and configuration for final design.

2145

Brian Borgman

From: Brian Borgman [bborgman@hutchisoneng.com]
Sent: Tuesday, July 06, 2004 5:00 PM
To: Srikanth.Panguluri@CH2M.com
Subject: RE: IL29 Unit Costs

50%COST.xls

Srikanth,

1. As for the retaining walls, for a while Jim Hamilton was using four wall types (MSE, concrete cantilevered, soldier pile, and anchored). He has since dropped the concrete cantilever wall because he doesn't want to give the impression that the wall types are known at this time. As he has said, the wall types are impossible to know until later in the design process. Where he was using the concrete cantilever walls we are now using soldier pile walls.

2. I do have the east shift quantity costs from Fred Lin (sent 6/9/04). However, I spoke with Kim Kolody on 6/17/04 and she instructed me to hold off on working on those estimates because changes were going to be made due to the LWR property. I can send you the most up-to-date costs we have generated, but they may not have changed from what we have previously sent you. Also, if the plans have changed, please send them to us so that we can ensure our estimates are based on the most recent plans. If changes have yet to be made, please send the files as soon as the plans are finished.

3. The costs for the south section have been combined as you requested and the spreadsheet is attached. Please notice that the quantities for wetland mitigation and floodplain encroachment will need to be entered, as usual.

Let me know if you need anything else.

Brian

-----Original Message-----
From: Srikanth.Panguluri@CH2M.com [mailto:Srikanth.Panguluri@CH2M.com]
Sent: Tuesday, July 06, 2004 3:31 PM
To: bborgman@hutchisoneng.com
Cc: Kim.Kolody@CH2M.com
Subject: FW: IL29 Unit Costs

Hi,

Few quick things, not on a rush..

1. Is the retaining wall, "Soldier Pile walls" called out in the costs estimates same as the "Concrete Cantilevered wall" in the e-mail below?

2. Do you have the east shift costs, with the drainage quantity updates we received from Fred Lin? Please let me know if you do not have the most updated quantities e-mail I fwd you sometime ago.

3. Please combine the South Sections costs of Alternatives 24 with Alternatives 11, 14, 15, and 18.

Thanks,
Srikanth.

2145

MA

-----Original Message-----
From: Brian Borgman [mailto:bborgman@hutchisoneng.com]
Sent: Wednesday, March 31, 2004 5:35 PM
To: Jodie, Jim/MKE
Cc: Soong, Cheng/CHI
Subject: IL29 Unit Costs

Jim,

Just thought I would run some of the reworked unit costs by you to see if they sound alright:

Pavement: Our costs were indeed low. We will plan on using $50/SY for mainline & ramps and $40/SY for other pavements

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Thanks,

Brian

Brian Borgman, E.I.
Hutchison Engineering, Inc
bborgman@hutchisoneng.com
Phone: (217) 245-7164
Fax: (217) 243-0468

Tracking:	**Recipient**	**Read**
	Srikanth.Panguluri@CH2M.com	Read: 7/7/2004 8:18 AM

IL ROUTE 29 PHASE I STUDY
CENTRAL SECTION
EXISTING ALIGNMENT
COST OPINION

ITEM	UNIT	UNIT COST	QUANTITY	COST
1. Pavement				
Mainline	SY	$50	639,300	$31,965,000
Local Roads[1]	SY	$40	119,500	$4,780,000
2. Earthwork				
Mainline	CY	$6	2,054,400	$12,326,000
Local Roads[1]	CY	$6	414,500	$2,487,000
3. Pavement Removal	SY	$5	204,100	$1,021,000
4. Drainage	L SUM	$6,319,000	1	$6,319,000
5. Concrete Barrier Wall	FT	$50	65,900	$3,295,000
6. Other Roadway Items[2]				$9,329,000
7. Bridges				
IL 29 Connector over IL 29	EACH	$1,830,000	1	$1,830,000
IL 29 over Coon Creek	EACH	$1,390,000	1	$1,390,000
Boehle Road over Coon Creek	EACH	$566,000	1	$566,000
IL 29 over Unnamed Creek	EACH	$858,000	1	$858,000
IL 29 over Rattlesnake Hollow	EACH	$858,000	1	$858,000
IL 29 over Barville Creek	EACH	$1,072,000	1	$1,072,000
Ramp A over Gimlet Creek	EACH	$268,000	1	$268,000
IL 29 over Gimlet Creek	EACH	$857,000	1	$857,000
Ramp B over Gimlet Creek	EACH	$268,000	1	$268,000
Water Street Access over Gimlet Creek	EACH	$250,000	1	$250,000
IL 17 over Railroad	EACH	$2,263,000	1	$2,263,000
IL 17 over IL 29	EACH	$1,822,000	1	$1,822,000
IL 17 over Railroad Street	EACH	$2,368,000	1	$2,368,000
Railroad Street over Thenius Creek	EACH	$607,000	1	$607,000
Ramp D over Thenius Creek	EACH	$725,000	1	$725,000
IL 29 over Thenius Creek	EACH	$1,607,000	1	$1,607,000
Ramp C over Thenius Creek	EACH	$503,000	1	$503,000
Service Drive over Thenius Creek	EACH	$518,000	1	$518,000
IL 29 over Crow Creek	EACH	$2,466,000	1	$2,466,000
8. Retaining Walls				
MSE Walls	SF	$50	415,600	$20,780,000
Cantilevered Concrete Walls	SF	$60	142,300	$8,538,000
Soldier Pile Walls	SF	$55	40,300	$2,217,000
Soldier Pile Walls (Anchored)	SF	$80	153,800	$12,304,000
9. Bridge Removal	SY	$90	2,600	$234,000
10. Additional Roadway Items (10% of Items 7-9)[3]				$6,517,000
11. Utility Relocation				$7,160,000
12. Gas Pipeline Adjustment				$0
13. Construction Incidentals				$15,037,000
14. Total Construction Cost				$165,405,000
15. Design Engineering and Construction Supervision				$24,811,000
16. SUBTOTAL				$190,216,000
17. Real Estate				
Undeveloped Land	ACRE	$5,000	165	$825,000
Developed Land	ACRE	$12,000	38	$456,000
Relocations - Commercial	EACH	$300,000	8	$2,400,000
Relocations - Residential	EACH	$100,000	25	$2,500,000
18. Wetland Mitigation	ACRE	$20,000		$0
19. Compensatory Storage/Flood Plain Encroachment	ACRE	$60,000		$0
20 Railroad Relocation	L SUM	$12,427,000	1	$12,427,000
21. Sub-Total				$208,824,000
22. Contingencies				$31,324,000
TOTAL				**$240,148,000**

Assumptions:
- 3% Erosion Control (percent of roadway costs)
- 6% Traffic Control During Construction (percent of roadway costs)
- 4% Lighting (percent of roadway costs)
- 2% Signing and Pavement Marking (percent of roadway costs)
- 5% Utility Relocation (percent of roadway and structure costs)

- 10% Incidental Items (percent of all construction items)
- 15% Design Engineering and Construction Supervision (percent of total construction cost)
- 15% Contingencies (percent of total project cost)

Notes:

[1] Local Roads includes all other roadways, including paved shoulders (cross roads, frontage roads, new access roads, etc.)

[2] Other Roadway Items includes erosion control, traffic control during construction, lighting, and signing and pavement marking items in the percentage of roadway costs as shown above.

[3] Additional Roadway Items are added to the structural costs to account for special roadway work, including sequence of construction, maintenance of traffic, drainage, erosion control, lighting, pavement markings, and other items incidental to the structures.

BMB

Brian Borgman

From: Brian Borgman [bborgman@hutchisoneng.com]

Sent: Thursday, August 19, 2004 9:28 AM

To: Srikanth.Panguluri@CH2M.com

Subject: RE: unit costs..

Tracking: **Recipient`** **Read**

Srikanth.Panguluri@CH2M.com Read: 8/19/2004 9:28 AM

Srikanth,

We have been adding 4' to the exposed height for the retaining walls to account for the area not exposed, and then using that area to determine the costs. This goes for all types of wall. As far as the permanent concrete facing on the retaining walls, I spoke with Jim Hamilton, and he indicated that the facing is included in the costs we have been using.

If you need anything else, please let me know.

Brian

-----Original Message-----
From: Srikanth.Panguluri@CH2M.com [mailto:Srikanth.Panguluri@CH2M.com]
Sent: Thursday, August 19, 2004 8:09 AM
To: bborgman@hutchisoneng.com
Subject: RE: unit costs..

Brian,

Below are few questions from our QC reviewer, regarding the unit costs of retaining walls.

Is the cost of the the Soldier piles and lagging based on exposed height or the entire area?
Does the Soldier Pile and Lagging include permanent Concrete Facing?

Thanks,
Srikanth.

2145 MM

Hutchison Engineering, Inc.

Since 1945

Jacksonville
Joliet

October 29, 2004

CH2MHILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631-2801

ATTN: Mr. Matt Gavin

Subject: IL Route 29
Retaining Wall South of Sparland
DESIGN COMPUTATIONS

Dear Sir:

Enclosed for your information is a copy of our design calculations for a 2,347' long tied-back retaining wall on Illinois Route 29 south of Sparland.

The wall was designed by Hutchison Engineering, Inc. for the Illinois Department of Transportation in conjunction with widening and improvements on IL 29 and to minimize potential sliding problems at this location.

Geotechnical studies have also been completed for this area including reports by the Illinois Department of Transportation (Alan Goodfield) in 1971 and Engineers International in 1987.

If you have any questions, please feel free to call me at any time.

Very truly yours,

HUTCHISON ENGINEERING, INC.

JOH

James O. Hamilton
Chief Structural Engineer

JOH:cm
Encls.

1801 West Lafayette Ave. •P.O. Box 820 •Jacksonville, Illinois 62651-0820
Phone: (217) 245-7164 •FAX: (217) 243-0468

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S:\Jobs\2145\CH2M-Gavin

Hutchison Engineering, Inc.

Since 1945

(formerly Casler, Houser and Hutchison, Inc.)

Jacksonville
Joliet

FAX TRANSMITTAL

TO: Jim Jodie
CH2M Hill

FAX NO. 773-693-3823

FROM: Jim Hamilton

DATE: 8/25/04 File No. 2145

RE: IL 29
RETAINING WALL TYPES & STUDIES

Total number of pages 2 including cover letter.

Please ~~Do~~/Do Not call to confirm this letter.

If you do not receive all of the pages, please contact us immediately at 217/245-7164.

COMMENTS: Attached memo from Alan Goodfield (IDOT geotechnical engineer) to Alex Siudyla (IDOT planning engineer) dated 8/20/2001 discussed likely wall types along IL 29. I received copy of this during Scope of Work/manhour meeting in Peoria.

Alan, now retired, did not see need for "extensive wall studies" I thought this information might be of some use for justifying wall recommendations in Phase I.

Jim Hamilton

#2145
for ~~#~~
BB BMB
MVM AA

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Roger W. Wright, PE
Vice President
E:\Forms

Siudyla, Alexande

From: Goodfield, Alan G.
Sent: Monday, August 20, 2001 3:24 PM
To: Siudyla, Alexander S.
Subject: CH2M HILL'S PROPOSAL Re. IL-29 (CHILLICOTHE TO I-180) PROJECT

Alex, the following comments are applicable to CH2M HILLS proposal:

1. I have, in the distant past, prepared a Geotechnical Report for this proposed corridor so I am well-informed, geotechnically, regarding geotechnical issues in the corridor.

2. The IDOT Br. Off. Foundations Unit has had extensive experience with retaining walls along the corridor. *All of these walls are tied-back soldier-pile walls.*
   a. Two(2) of these walls are along IL-29 itself, both north and south of Spartland; both of these walls are long walls and were basically designed by our unit.
   b. Another wall, at the east entrance to Hopewell estates, is a relatively new wall designed by Bill Kramer.
   c. Another wall, also designed by Bill Kramer, is along IL-17 just west of the intersection with IL-29.

3. It is a reasonably safe statement to say that *(a) virtually all 'cut' walls will be soldier-pile walls (w/ & w/out tie-backs) and (b) most 'fill' walls would be M.S.E. walls. EXTENSIVE "WALL STUDIES" WOULD APPEAR TO BE SUPERFLUOUS! CH2M HILL's indicated 1480 hrs to conduct such a study is EXCESSIVE!*

4. Task No. 10.0 ("Geotechnical Study")(1162 hrs.(155 days @ 7.5 hr/dy)): IDOT currently has a contract underway (funded separately) with the State Geological Survey to prepare a *"Baseline Geological Data Report"* for the corridor; this study will include preparation of an up-to-date *Mined-out Map. It would appear that most of CH2M HILL's items outlined for their study would be done/are being done either (a) by the I.S.G.S. or (b) standard IDOT geotechnical studies for structures and roadways. The latter studies would be done ONLY after an alignment has been selected.*

   In view of the present I.S.G.S., separately-funded, study it is appropriate to request that the CH2M HILL proposed geotechnical study be clarified.

5. BNSF RR Bridge At Chillicothe: *If we are staying with the same alignment as the existing route, 294 hrs to prepare boring locations and conduct the geotechnical investigation is EXCESSIVE! A recommended structure boring layout can (and has been available for years!) be prepared in less than one hour. Analyzing the resulting geotechnical data for proposed foundations can be easily accomplished in less than two days (<15 hrs.).*

It appears than future face-to-face meetings with CH2M HILL would be advisable to discuss this proposal!

Brian Borgman

From: Jim.Jodie@CH2M.com

Sent: Tuesday, August 24, 2004 6:05 PM

To: jhamilton@hutchisoneng.com

Cc: Srikanth.Panguluri@CH2M.com; Kim.Kolody@CH2M.com; bborgman@hutchisoneng.com

Subject: IL 29 Retaining Walls for Split Profile.

Hi Jim,
Thank you for the information regarding retaining wall types. Based on our discussion, I have developed a cursory list of wall types for wall heights. Please review.

1. For wall height <2', use concrete barrier anchored to a 6' footing.
2. For wall height >2' to <4', use cantilever wall with 4' depth below surface.
3. For wall height 4' to10', use soldier pile w/lagging (assumes 4' depth below surface for wall area estimates).
4. For wall height >10', use soldier pile w/lagging and tie bars (assumes 4' depth below surface for wall area estimates).
5. For wall in fill sections, use MSE wall (assumes 4' depth below surface for wall area estimates). Slope stability will be investigated during Phase II .

Thank you.

Jim Jodie, P.E.
Senior Transportation Engineer
CH2M HILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631
773-693-3800, x214
773-693-3823 (Fax)

3/4/5
cc MM

8/25/2004

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Thursday, August 26, 2004 3:20 PM
To: Jim Jodie
Cc: Mike Meier
Subject: IL 29 Retaining Walls/Structures

Hello Jim,

Your e-mail of 8/25/04 inquired about use of soil nail walls in lieu of tied-back walls because of possible cost savings. Your estimate of $85 to $95 per square ft. for tied-back walls seems reasonable to me. I did some earlier wall investigations and estimated about $73 to $97 per square ft. for tied-back walls. According to reports and studies on soil nail walls, the soil nail walls are expected to be about 10-30% less than tied-back walls. Therefore the $80 per square ft. for soil nail walls is a fair estimate for planning purposes. Both of these cost estimates would include a finished face wall.

Soil nail walls are constructed from the top down similar to tied-back walls, however soldier piles and timber lagging are not required. The soil nails (steel rods) are not tensioned after installation and typically extend in back of the wall a distance of 60 to 100 percent of wall height. Both wall types may have applications on this project for retaining steep slopes lanes through cut areas. Because of recurrent sliding problems, drainage problems, and potential slope stability concerns in some locations on IL Route 29, a soil nail wall may be inappropriate. In some instances a tied-back wall might be preferred because of existing soil type, strength and drainage conditions. Where elimination of sliding is a main objective, a tied-back wall may also have additional advantages over a soil nail wall. The amount of resisting force against sliding can be controlled by the length and tension in the tie-back anchor rods, and all tie-back rods are test loaded during construction.

Final selection of wall types, i.e. tied-back vs. soil nail, would have to be deferred until Phase II of the project based on final geotechnical recommendations. Soil nail type walls have been used throughout the country and reports are favorable including the economy and ease of construction. In answer to your question, soil nail walls are usually cheaper than tied-back walls where ground conditions are suitable for soil nail walls. Specific locations would have to be evaluated on an individual basis for suitability of soil nail walls versus tied-back soldier pile type.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

U 2145
MM

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Wednesday, August 25, 2004 11:31 AM
To: Jim Jodie
Cc: Mike Meier
Subject: Il 29 Retaining Walls/Structures

Jim,

Another alternative that may be feasible is the construction of elevated bridge structures in some locations on IL 29 along the bluff area where right-of-way is limited. This option has generally been "shot down" by IDOT engineers is the past because structure costs ($90-$120 per square ft.) are considerably more expensive than retaining wall and expressway roadway cost estimates. I do not propose replacing all the thousands of feet of retaining walls with elevated structures, but only in few selected areas where the height of wall is high, along with severe sliding or stability problems.

For example, a 500 ft. long tied-back retaining wall with roadway and drainage improvements could cost around $2.0 million versus $3.6 million for a 500 ft. long bridge (500' x 80' x $90/ sq. ft.). An elevated bridge structure would have less impact to the conservation areas, allow wildlife access under the road, and avoid some potential geotechnical problems associated with roadway cuts in the bluff area. The elevated structures would work with "split" profile grades also.

I realize that it is not possible to identify the locations where elevated structures are suitable at this stage. This option may be worth considering in the future when specific geotechnical studies and alignment recommendations are complete.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

2145
MM

Jim Hamilton

From: Jim.Jodie@CH2M.com
Sent: Wednesday, August 25, 2004 12:55 PM
To: jhamilton@hutchisoneng.com
Cc: Srikanth.Panguluri@CH2M.com; Kim.Kolody@CH2M.com
Subject: RE: Il 29 Retaining Walls/Structures

Hi Jim,
Thank you for the suggestion about an elevated structure. We will look at using this for the Land & Water Reserve area.

I feel we are getting good information from you to help us in our decision of what to recommend for the Phase I design. You have provided us some logical retaining wall solutions, and we have gotten feed-back from our CH2 M HILL QC people to recommend a split profile. They suggested possibly using a soil/rock nailing retaining wall. Do you think this would be cheaper than a soldier pile with tie backs? They estimate $80 per sq. ft. for soil/rock nailing wall versus their estimate of $ 85 to $95 per sq. ft. for soldier pile with tie backs.

Jim Jodie, P.E.
Senior Transportation Engineer
CH2M HILL
8501 W. Higgins Road
Suite 300
Chicago, IL 60631
773-693-3800, x214
773-693-3823 (Fax)

-----Original Message-----
From: Jim Hamilton [mailto:jhamilton@hutchisoneng.com]
Sent: Wednesday, August 25, 2004 11:31 AM
To: Jodie, Jim/MKE
Cc: Mike Meier
Subject: Il 29 Retaining Walls/Structures

Jim,

Another alternative that may be feasible is the construction of elevated bridge structures in some locations on IL 29 along the bluff area where right-of-way is limited. This option has generally been "shot down" by IDOT engineers is the past because structure costs ($90-$120 per square ft.) are considerably more expensive than retaining wall and expressway roadway cost estimates. I do not propose replacing all the thousands of feet of retaining walls with elevated structures, but only in few selected areas where the height of wall is high, along with severe sliding or stability problems.

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I realize that it is not possible to identify the locations where elevated structures are suitable at this stage. This option may be worth considering in the future when specific geotechnical studies and alignment recommendations are complete.

#2145
Jos
MM

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Friday, September 10, 2004 11:32 AM
To: Kim Kolody
Cc: Jim Jodie; Mike Meier
Subject: Retaining Walls--Il 29 Phase I Study, Central and North Section

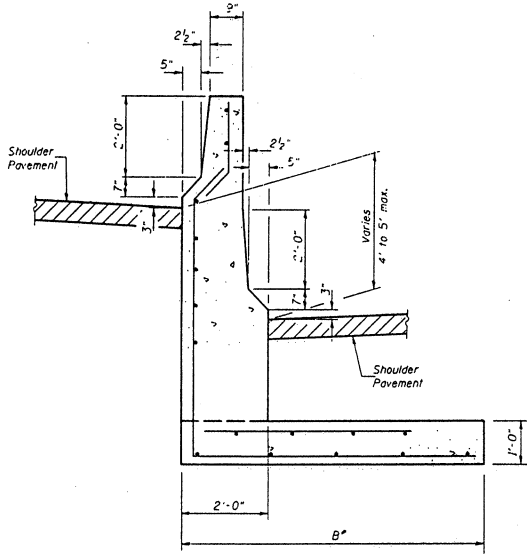
2145typsec2.dgn 2145typsec3.dgn 2145typsec4.dgn

Kim,

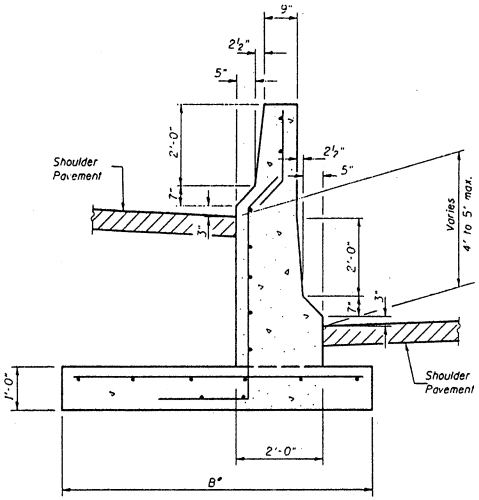
Attached are dgn files of typical sections for cantilever type retaining walls. These wall details may be applicable in areas of split profile or locations of low height cut and fill. The conventional concrete cantilever walls may also be possible where suitable foundation material provides adequate strength and there is sufficient room for construction. Please call if you have any questions.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

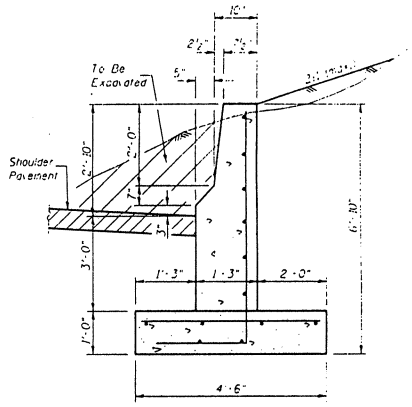
WM
2145
MM



"L" TYPE WALL



CANTILEVER "T" WALL



REINFORCED CONCRETE BARRIER RETAINING WALL
(Cut Section Footing)

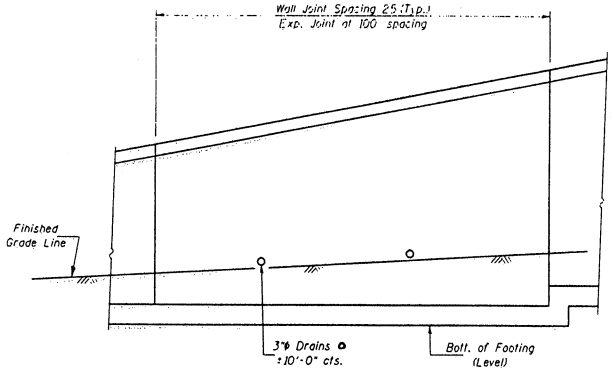
MEDIAN BARRIER WALL FOR VARIABLE ROADWAY PROFILES
Note: * Footing width "B" to be determined in final design.

The typical applications shown are subject to change after geotechnical review during final design phase.

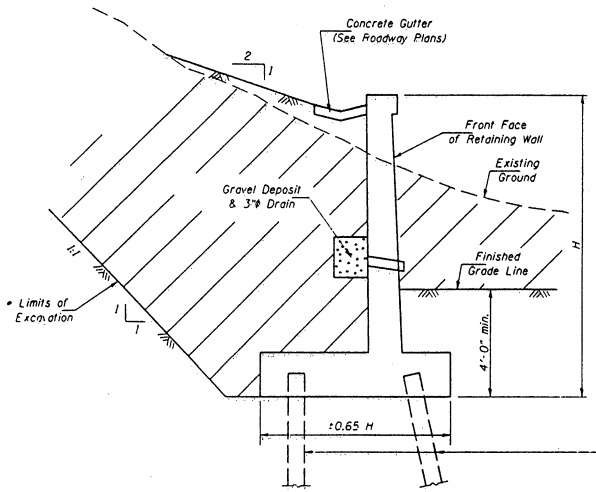
CONCRETE RETAINING WALL BARRIER
CONCRETE MEDIAN BARRIER

C.I.P. CONCRETE WALLS
TYPICAL DETAIL
EXISTING ALIGNMENT - CENTRAL SECTION
ILLINOIS ROUTE 29
PHASE I ENGINEERING SERVICE
RETAINING WALL SECTIONS

FIGURE 3



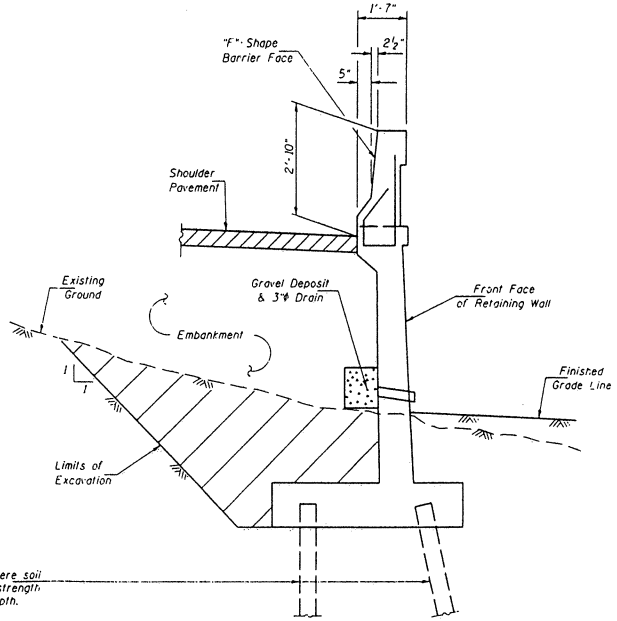
FRONT WALL ELEVATION



TYPICAL CANTILEVER WALL BACKFILL DETAIL

* Where excavation is restricted temporary shoring may be required to retain earth during construction and placement of backfill.

Optional piling where soil has insufficient strength at footing depth.

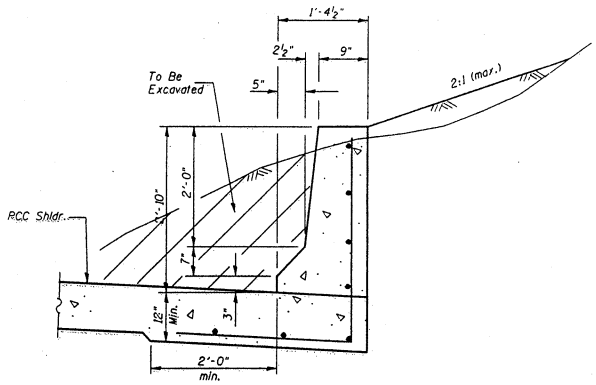


TYPICAL CANTILEVER WALL EMBANKMENT DETAIL & BARRIER ON WALL

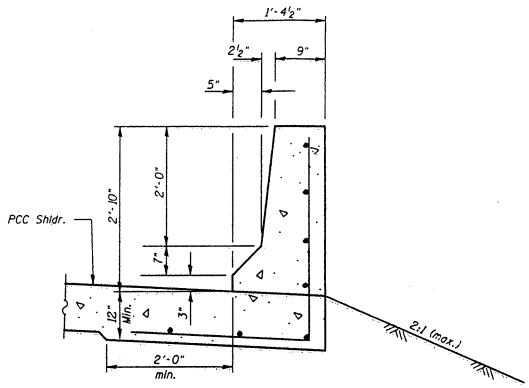
The typical applications shown are subject to change after geotechnical review during final design phase.

CANTILEVER TYPE RETAINING WALLS
TYPICAL DETAIL
EXISTING ALIGNMENT - CENTRAL SECTION
ILLINOIS ROUTE 29
PHASE I ENGINEERING SERVICE
RETAINING WALL SECTIONS
SPLIT ALIGNMENT

FIGURE 4



CONCRETE BARRIER, SINGLE FACE
CUT SECTION



CONCRETE BARRIER, SINGLE FACE
FILL SECTION

OPTIONAL SHOULDER MOUNTED
CONCRETE BARRIER

SHOULDER MOUNTED BARRIER DETAIL

C.I.P. CONCRETE WALLS
TYPICAL DETAIL
EXISTING ALIGNMENT - CENTRAL SECTION
ILLINOIS ROUTE 29
PHASE I ENGINEERING SERVICE
RETAINING WALL SECTIONS

EMSbypass4

FIGURE 5

Hutchison Engineering, Inc.

Since 1945

(formerly Casler, Houser and Hutchison, Inc.)

Jacksonville
Joliet

FAX TRANSMITTAL

TO: Jim Jodie
CH2M-Hill

FAX NO. 773-693-3823

FROM: Jim Hamilton

DATE: 2-7-2005 File No. 2145

RE: HYDROGEOLOGY REPORT
MILLER-ANDERSON WOODS
RETAINING WALLS-FOOTINGS-DRAINAGE

Total number of pages 10 including cover letter.

Please ~~Do~~/Do Not call to confirm this letter.

If you do not receive all of the pages, please contact us immediately at 217/245-7164.

COMMENTS: Attached are some retaining wall details prior to Groundwater meeting in March 2004. Construction of wall footings for MSE type walls should have little or no impact on natural ground water. Drains shown are intended for roadway/embankment drainage.

1801 West Lafayette Ave. • P.O. Box 820 • Jacksonville, Illinois 62651-0820
Phone: (217) 245-7164 • FAX: (217) 243-0468

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Fax

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Hutchison Engineering, Inc.

Since 1945

Jacksonville
Joliet

February 7, 2005

MEMORANDUM

TO: The Record

FROM: Jim Hamilton

SUBJECT: Job #2145
IL 29 Groundwater Study in Miller Anderson
Jim Jodie E-mail (2/1/05)

I recall the groundwater meeting in March 2004. Prior to the meeting, I forwarded some typical retaining wall details to Kim Kolody via fax (copy attached). I don't know if this information was given to Jim Miner. The retainage wall details are generic in nature and illustrate how drainage of backfill material can be handled under various conditions and wall types.

During the meeting, there was some discussion about retaining wall types. I believe it was mentioned that MSE wall types would likely be the recommended alternative at Miller-Anderson Woods. There was some discussion about maintaining existing water levels on the west side and measuring water levels by placing some monitoring wells.

It is my opinion that MSE walls could be constructed here with negligible impact to existing ground water. The MSE walls have porous granular backfill that would drain the roadway embankment but would not impact the existing ground water.

Some of the drain details shown on the exhibits for the various wall types are those that may apply in some applications. Specific drainage details would be worked out in Phase II.

Page 4 of the report "Hydrogeology of Miller-Anderson Woods Nature Preserve" discusses proposed footings for retaining walls. An MSE wall type will have minimal footing (6" x 12") leveling pad placed 3' to 4' below the outside finished grade line. This should have minimal impact on water levels in the nature preserve. Any wall drains would likely be installed for draining roadway runoff getting into the proposed embankment.

Please call if you have any questions.

JOH:cm
Attachment

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Vice President
Roger W. Wright, PE
Vice President

S:\Jobs\2145\Memo-2-2-05

Jim Hamilton

From: Matt.Gavin@CH2M.com
Sent: Thursday, February 10, 2005 9:35 AM
To: jhamilton@hutchisoneng.com
Cc: Emad.Farouz@CH2M.com; Jim.Jodie@CH2M.com
Subject: Suggested cost estimate revisions

Hello Jim,

Thanks for discussing the cost estimates for the walls north of Sparland with me. Just to confirm, our suggestions to revise the cost estimates include the following:

1) Retaining wall types: Include costs only for anchored SPL walls. Since slope creep is of concern (based on inclinometers in the segment and documented landslides/pavement movement), plus relatively steep slopes are adjacent to the roadway throughout the segment, it is possible that the entire wall segment N. of Sparland will require tiebacks (even short walls). If so, MSE walls would not be appropriate. At this point, we don't know what fraction of the segment length (if any) could be constructed without anchors - won't know this until additional boreholes are advanced to support detailed design. Therefore, our recommendation is to include anchors for all wall segments in the cost estimate.

2) Rock excavation: Add separate line items for rock excavation, common soil excavation, and backfill. Current estimate only includes an earthwork unit cost of $6/CY. Suggested rock excavation cost (for hard rock) may be closer to $20/CY. Volume of rock excavation could be estimated based on top of rock grades that you prepared last year - again, to be finalized during detailed design.

3) Upslope soil stabilization: Include a line item to stabilize soils upslope (west) of the retaining walls. It is possible that anchored retaining walls will provide roadway stability, but with continued slope creep west of the retaining walls, possibly impinging on the roadway. Again, we don't know at this time if it will be necessary, or what amount of stabilization will be required. For now, we suggest using a placeholder area of 25% of the retaining wall area, and a unit cost of $65/SF. This should be roughly the same total cost for either the split- or same-elevation configurations.

Please provide a modified cost estimate to include these items, or alternate assumptions you determine to be appropriate. Thanks for your time - please give me a call to discuss any questions.

Thanks,
Matt Gavin

Matthew D. Gavin, P.E.
Geotechnical Engineer
CH2M HILL
8501 W. Higgins Road, Suite 300
Chicago, Illinois 60631
Phone: (773) 693-3800, ext. 250
Fax: (773) 693-3823

#2145
JOHS
BMB
MM
COST

Brian Borgman BWB

From: Jim.Jodie@CH2M.com
Sent: Thursday, June 09, 2005 1:01 PM
To: bborgman@hutchisoneng.com; jhamilton@hutchisoneng.com
Cc: Dan.Nowak@CH2M.com; Jason.Moller@CH2M.com; Kim.Kolody@CH2M.com
Subject: RE: Tieback Retaining Wall Typical Sections

Hi Brian,
Thank you for the information about retaining walls. We will proceed with the method of detailing the walls in the plan set as you have suggested.

For the June 21 meeting, the IDOT has not responded regarding attendance by either you or Jim Hamilton, so assume both of you will be attending. Start time is 8:30 AM in the 6th floor training room at IDOT;lunch will be provided.

Please be prepared to discuss wall types and the bridge versus tunnel at the Sparland interchange plus the cost estimating information and method used to determine costs. Dan Nowak will provide you the cost of the viaduct, but we are still waiting for the cost of railroad relocation from Rick Conrath of Benesch. Hopefully, we will have all costs from them by today or tomorrow.

I will call Jim Hamilton to discuss the alternates for Ramp D of the Sparland interchange.

Jim

-----Original Message-----
From: Brian Borgman [mailto:bborgman@hutchisoneng.com]
Sent: Thursday, June 09, 2005 7:38 AM
To: Jodie, Jim/MKE
Subject: RE: Tieback Retaining Wall Typical Sections

Jim,

For the other types of retaining walls, we are at this time only considering the following wall types:

1. For walls in fill sections, we are assuming MSE walls, including the walls in the median in the split profile. If we have an anchored wall on the bluff side of the roadway, it should be safe to assume that we can use MSE walls in the median in this case.

2. For walls in cut sections less than 4' above grade, we assumed a concrete cantilevered wall.

3. For walls in cut sections between 4' and 10' in height above grade, we assumed a soldier pile wall.

4. For walls in cut sections over 10' in height above grade, we assumed an anchored wall.

At this point in the study, with the limited information available, it is unnecessary to investigate every possible retaining wall option. The breakdown above should be sufficient for a Phase I study, and is really all the further you can analyze it at this time. The costs associated with the various wall types is not significant beyond the four situations described above (i.e., the possible wall types for a given situation will not vary greatly).

For the typical sections, it would probably be better to show the above wall types and list the situation under which they are applicable, rather than listing an actual station range. Even though, for cost estimating purposes, we have broken the walls down along the alignment, it impossible, at this point, to delineate where one wall type might stop and another might begin.

Hopefully this is sufficient for the typical sections for the 90% plans for the Central Section.

2145

If you need anything else, or wish to discuss this further, feel free to contact either myself or Jim Hamilton.

Brian

-----Original Message-----
From: Jim.Jodie@CH2M.com [mailto:Jim.Jodie@CH2M.com]
Sent: Wednesday, June 08, 2005 12:32 PM
To: bborgman@hutchisoneng.com
Cc: Dan.Nowak@CH2M.com
Subject: FW: Tieback Retaining Wall Typical Sections

Hi Brian,
Thank you for the retaining wall and tie back locations. I assume the wall type is a soldier pile wall with tieback anchors into rock. Regarding the note to include with the typical sections, I will use the note shown on the attachment. We will assume an 80' permanent easement for the anchor lengths (60' anchor plus 20' work area).

What other type of retaining wall typical section(s) should we include in the plans (pile supported retaining wall, cast in place reinforced concrete retaining wall, sheet pile wall with anchors, soil nail wall, etc.) and what stations will each wall type be proposed? Based on the uncertainty of the subgrade shale's, I assume we will not be using MSE walls, both on the west side of proposed IL 29 or in the median (where we use a split profile. Is that correct?

Jim

-----Original Message-----
From: Brian Borgman [mailto:bborgman@hutchisoneng.com]
Sent: Wednesday, June 08, 2005 12:00 PM
To: Jodie, Jim/MKE
Cc: Jim Hamilton
Subject: Tieback Retaining Wall Typical Sections

Jim,

Attached is a spreadsheet containing the approximate limits of the retaining walls with tie backs for the Central Section, as you requested this morning from Jim Hamilton of this office. Please note that the 40'-60' assumed for the anchor lengths is an estimate, and you should allow at least an additional 20' beyond this to the permanent easement line. The anchors are typically installed at approximately 30° to the horizontal. At this time, assume the lengths are horizontal from the face of the wall.

Some of the higher tie-back walls (20'-30' high) would have at least two rows of anchors. Anchor lengths could vary considerably from wall to wall, depending on the height of the wall, soil/rock strength, and estimated wall loading.

If you have any further questions regarding the retaining walls, please don't hesitate to contact either myself or Jim Hamilton at this office.

Brian Borgman
Hutchison Engineering, Inc
bborgman@hutchisoneng.com
Phone: (217) 245-7164
Fax: (217) 243-0468

2145 BB BMB MVM AA

Jim Hamilton Jody

From: Jim.Jodie@CH2M.com
Sent: Thursday, March 02, 2006 9:38 AM
To: jhamilton@hutchisoneng.com
Cc: jason.moller@CH2M.com
Subject: RE: Existing Ret Walls on IL 29

Hi Jim,
I meant to e-mail you regarding my earlier message about the location of the proposed east retaining wall. Looking at the cross sections, it appears that we are proposing a short retaining wall that will be on the west side of the existing retaining wall. Sorry for the mis-information.

Jim

From: Jim Hamilton [mailto:jhamilton@hutchisoneng.com]
Sent: Thursday, March 02, 2006 9:29 AM
To: Jodie, Jim/MKE
Subject: RE: Existing Ret Walls on IL 29

Hi Jim,

I want to make sure that the proposed wall south of Sparland is east of the existing retaining wall, i.e. between the existing wall and the railroad tracks. It appears that an anchored soldier pile type wall could be constructed here with the existing wall left in place with some modification/reconstruction to the existing drainage system and reconstruction of the upper concrete cap.

The wall north of Sparland is similar but much shorter, and it should be possible to add a new wall to the east.

If my assumptions are not correct, please let me know. I will get you a sketch of a possible wall configuration.

Jim H.

-----Original Message-----
From: Jim.Jodie@CH2M.com [mailto:Jim.Jodie@CH2M.com]
Sent: Tuesday, February 28, 2006 10:39 AM
To: jhamilton@hutchisoneng.com
Cc: bryan.gannis@CH2M.com; dan.nowak@CH2M.com; kim.kolody@CH2M.com
Subject: Existing Ret Walls on IL 29

Hi Jim,

We are updating the IL 29 Central Section plans and I have a question regarding the existing retaining walls along IL 29 both south of Sparland (approximate Sta 3551+19 to 3574+66)and north of Sparland (approximate Sta 3713+29 to 3717+09). A new retaining wall is proposed to be built adjacent to and on the east side of the existing retaining wall. I understand you briefly discussed this with Dan Nowak.
In anticipation of a question from IDOT, please take a look at the cross sections (both north and south of Sparland) and provide me a sketch regarding construction methods for the new wall. The existing wall south of Sparland has manholes attached to an extensive underdrain system and it is important that the existing walls remain in place. Is there a footing on this wall that would be impacted by construction of a new footing? The same question apply to the wall north of Sparland. Your thoughts on this issue are appreciated.
Thank you.

Jim Jodie

Mike Meier

From: Jim.Jodie@CH2M.com
Sent: Thursday, December 28, 2006 12:39 PM
To: mmeier@hutchisoneng.com
Subject: FW: IL29 - Wetland Minimization Exhibit at Crow Creek

Hi Mike,
As we discussed, the attached file shows the proposed two locations of retaining walls in the Crow Creek area. The purpose of these walls is to minimize wetland impacts at wetland locations with a high FQI.

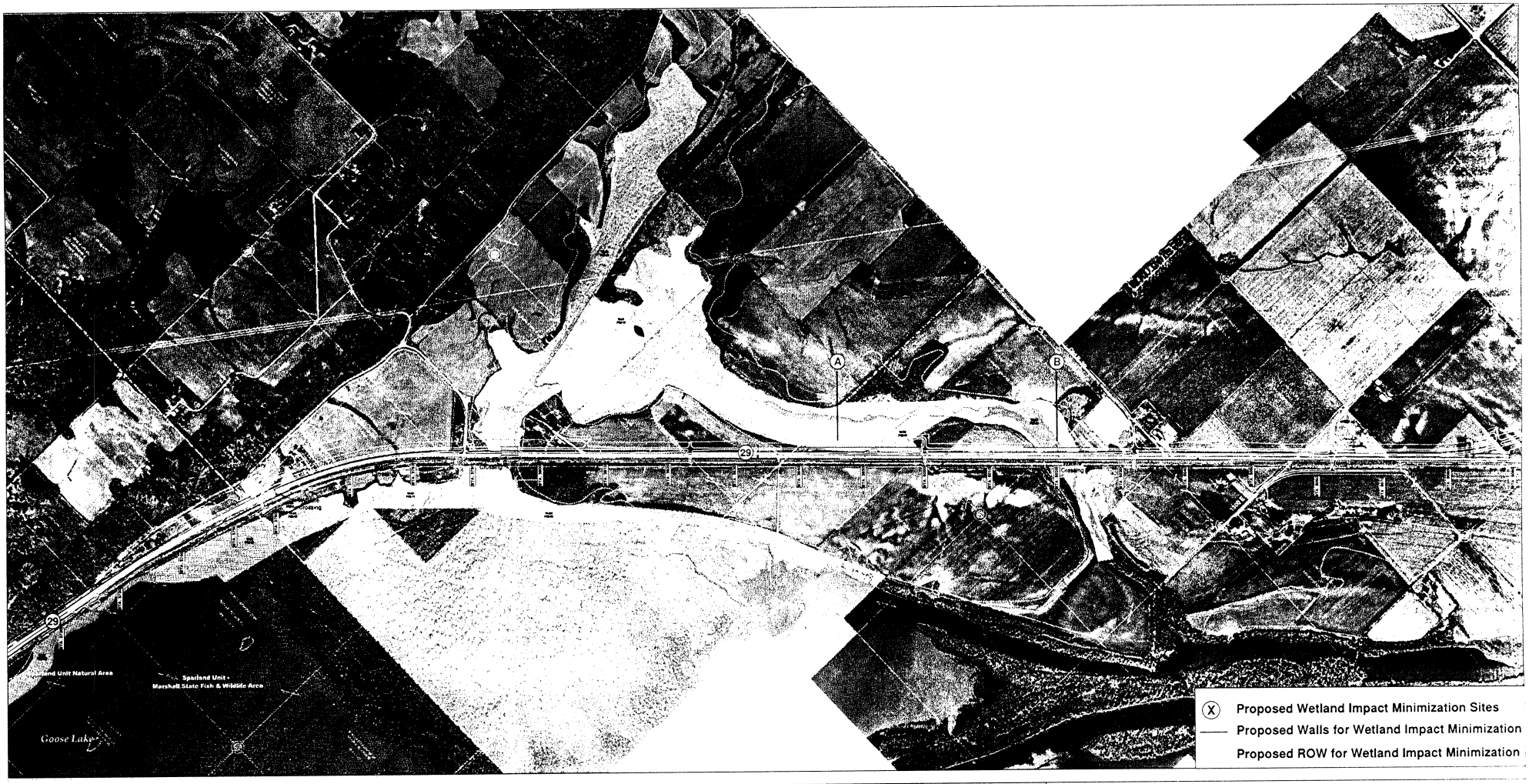
Jim

From: King, Aimee/CHI
Sent: Wednesday, December 20, 2006 8:28 AM
To: 'Green, Paula A'
Cc: Jodie, Jim/MKE; Gannis, Bryan/CHI; Dupies, Dan/MKE
Subject: IL29 - Wetland Minimization Exhibit at Crow Creek

Hi, Paula. Please find attached the revised exhibit for you to send on to EPA. I elected to change "Potential" to "Proposed" since you mentioned in your email that you have decided to ultimately make this design change. It will be easy to change it back to "Potential" if "Proposed" isn't appropriate.

Thanks,
Aimee King
Environmental Planner
CH2MHILL | 8501 W. Higgins Rd., Suite 300 | Chicago, IL 60631
Phone: 1-773-693-3800 ext. 261
Fax: 1-773-693-4777
Email: Aimee.King@ch2m.com
Tuesdays, Wednesdays and Fridays

COPY



Illinois Department of Transportation

CH2MHILL

Legend

- Proposed ROW
- Existing ROW
- Proposed Permanent Easement
- Proposed Temporary Easement
- Edge of Pavement
- Structures
- Landlocked Properties

Displacements
- Residence
- Business
- Outbuilding

- Other IDNR Managed Lands
- State Natural Areas
- Nature Preserves
- Land & Water Reserves
- Federal Managed Lands
- Other Park Property
- INHS Surveyed Wetlands
- 100-Year Floodplain Boundary

- Protected Agricultural Lands
- Potentially Historic Sites/Historic Bridges
- Public Land Survey System Township Boundaries
- County Boundaries

Land Use Constraints
- Cemetery
- School

IL 29 Preliminary Engineering Study

PROPOSED RETAINING WALL USE FOR WETLAND IMPACT MINIMIZATION

DECEMBER 2006

Brian Borgman

From: Bryan.Gannis@CH2M.com
Sent: Wednesday, January 24, 2007 3:24 PM
To: bborgman@hutchisoneng.com
Subject: IL 29 - Length of Retaining Wall

Brian,

The e-mail below from Mike Lewis requesting the length of retaining wall on the IL 29 project is the one I mentioned to you a little earlier on the phone. Thank you for indicating that you are able to provide the requested information. Please contact me with any questions.

We have added two segments of retaining walls near Crow Creek at IDOT's request to minimize the acquisition of wetlands. I will send you the updated CTP38 and CTP51 files in the next day or so.

Bryan

From: Lewis, Mike [mailto:Michael.L.Lewis2@illinois.gov]
Sent: Thursday, January 11, 2007 1:25 PM
To: Dupies, Dan/MKE
Cc: Kolody, Kim/CHI; Jodie, Jim/MKE; Green, Paula A; Addis, Maureen M
Subject: Length of medians & walls

Dan –

I'm looking for some info....and, we'd like it by tomorrow afternoon, if possible. Hopefully, you'll have the right personnel available to find it. Here goes:

- How many feet of split profile do we have for the proposed IL 29? How many locations? And, how high does the wall between NB and SB get?

- How many feet of narrow median do we have? How many locations?

These are the questions we're looking to answer by tomorrow afternoon. On a longer timeframe, we're also interested in knowing where we stand with retaining walls:

- How many feet of retaining walls do we have along mainline?

- How many feet of retaining walls do we have elsewhere (interchange ramps, sideroads, entrances, etc.)?

- Of these lengths of wall, what % will probably be tie-backs vs. MSE vs. other types of walls?

This second set of questions does not have the quick timeline as the first. I was just thinking that while you have the files open, it might be a good time to measure the walls, too. We'll want the measurement eventually anyway. If you can't spare someone right now, don't worry about the second set for tomorrow. Sometime in the next couple of weeks would be fine for the second set.

Please note the questions are for measurements in feet, not square feet. We'll probably end up converting the 2145

MVM
LLW

numbers into miles when we're done, but I wanted to start out with feet.

Please give me a call with any questions you may have. Thanks.

Mike Lewis

Team Leader

Illinois Department of Transportation

Region 3 / District 4

401 Main Street

Peoria, IL 61602-1111

309-671-3474

Please note my email address has changed to Michael.L.Lewis2@illinois.gov

Bryan Gannis
CH2M HILL
8501 West Higgins Road
Suite 300
Chicago, IL 60631
(773) 693-3800 x-212
CH2M HILL Fax: (773) 693-3823
Direct Fax: (773) 693-4750

BWB

Brian Borgman

From: Bryan.Gannis@CH2M.com
Sent: Wednesday, February 28, 2007 3:38 PM
To: Michael.L.Lewis2@illinois.gov
Cc: bborgman@hutchisoneng.com; jim.jodie@ch2m.com; kim.kolody@ch2m.com
Subject: IL 29 Retaining Wall Summary

Mike,

With much help from Hutchison Engineering, attached is a summary of proposed retaining wall lengths for the IL Route 29 corridor, as requested in the e-mail below. Please contact me if you have any questions.

Bryan

From: Lewis, Mike [mailto:Michael.L.Lewis2@illinois.gov]
Sent: Thursday, January 11, 2007 1:25 PM
To: Dupies, Dan/MKE
Cc: Kolody, Kim/CHI; Jodie, Jim/MKE; Green, Paula A; Addis, Maureen M
Subject: Length of medians & walls

Dan –
I'm looking for some info....and, we'd like it by tomorrow afternoon, if possible. Hopefully, you'll have the right personnel available to find it. Here goes:

- How many feet of split profile do we have for the proposed IL 29? How many locations? And, how high does the wall between NB and SB get?
- How many feet of narrow median do we have? How many locations?

These are the questions we're looking to answer by tomorrow afternoon. On a longer timeframe, we're also interested in knowing where we stand with retaining walls:

- How many feet of retaining walls do we have along mainline?
- How many feet of retaining walls do we have elsewhere (interchange ramps, sideroads, entrances, etc.)?
- Of these lengths of wall, what % will probably be tie-backs vs. MSE vs. other types of walls?

This second set of questions does not have the quick timeline as the first. I was just thinking that while you have the files open, it might be a good time to measure the walls, too. We'll want the measurement eventually anyway. If you can't spare someone right now, don't worry about the second set for tomorrow. Sometime in the next couple of weeks would be fine for the second set.
Please note the questions are for measurements in feet, not square feet. We'll probably end up converting the numbers into miles when we're done, but I wanted to start out with feet.
Please give me a call with any questions you may have. Thanks.
Mike Lewis
Team Leader
Illinois Department of Transportation
Region 3 / District 4
401 Main Street
Peoria, IL 61602-1111
309-671-3474
Please note my email address has changed to Michael.L.Lewis2@illinois.gov

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MM
GLL

Bryan Gannis
CH2M HILL
8501 West Higgins Road
Suite 300
Chicago, IL 60631
(773) 693-3800 x-212
CH2M HILL Fax: (773) 693-3823
Direct Fax: (773) 693-4750

BMB

Brian Borgman

From: Jim.Jodie@CH2M.com
Sent: Wednesday, June 06, 2007 5:08 PM
To: bborgman@hutchisoneng.com
Subject: RE: IL 29 - Sparland Cost Estimate

Hi, thank you for the information. I know it took a lot of effort to prepare because you worked from some pretty sketchy information that I provided. As usual, I have a couple of questions; Looking at the profile of Ramp D from Station 68+00 to Station 73+00, will the cut slope or fill slope (with a ditch)from Ramp D require the taking of the house at Station 68+00, Station 69+00 or Station 72+50?

Also, please determine the height of retaining wall required at the roundabout (at Station 65+50 or Station 66+00) that would cut into the hillside
near the abandoned electric company substation. Use the profile that IDOT provide for existing IL 29 at the roundabout.

Also, I am considering an old design for Ramp D that requires two retaining walls and a bench into the bluff. This design lowers the Ramp D profile to around 4%. I will discuss that tomorrow with you.
Thank you.

Jim Jodie
CH2M HILL
Senior Transportation Engineer
135 South 84th Street
Suite 325
Milwaukee, WI 53214

Tel 414-272-2426
Direct 414-847-0317
Fax 414-272-4408

From: Brian Borgman [mailto:bborgman@hutchisoneng.com]
Sent: Wednesday, June 06, 2007 4:57 PM
To: Jodie, Jim/MKE
Subject: RE: IL 29 - Sparland Cost Estimate

Jim,

I've attached the cost opinions for the conventional and roundabout/flyover designs in Sparland. In response to your requests below:

1. Using the existing contour lines, the slope of the drive would be approximately -14%. This assumes that the work being proposed on IL 17 will not necessitate a significant rise in the profile to Marshall Street.
2. The assumptions I previously made match your comments pretty closely and the cost estimate reflects these assumptions.
3. It appears to me that even if we do include a retaining wall on Ramp D through this area, there will be so little of that property left that it isn't worth saving anyway. Looking at the marked-up PDF you sent me of the plan view, once you show the ROW lines from Ramp D and relocated Thenius Street, the portion of the property that is left over is small (maybe .2 acres) and, for the most part, unusable. The cost opinion for the roundabout/flyover alternative includes costs for the retaining wall and for the purchase of the entire

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property (which doesn't currently have a residence on it). I left the retaining wall in along that segment because we are proposing retaining walls for the portion of Ramp D that is on the property to the north (Segler), so I assumed that the retaining wall would continue through the Hanson property until the bridge over Thenius Street began. I don't see the need to propose a break in the retaining wall for that short of a length, and the fill slope might have spilled over onto the Pendleton property that we are not proposing to take at this time.

4. This reduced cost is figured in on the retaining wall costs of the cost opinion. It looked to me like the walls would only be about 5 feet shorter, which only amounts to a difference of about $100,000-$150,000.
5. The cost of the fill for this area is included in the cost of the earthwork for the roundabout/flyover alternative. The cost of the mainline retaining wall that is no longer needed is about $586,000. This is explained on the summary page of the attached cost opinions.

Hopefully this covers everything you need for your meeting. If not, please let me know.

Brian

-----Original Message-----
From: Jim.Jodie@CH2M.com [mailto:Jim.Jodie@CH2M.com]
Sent: Tuesday, June 05, 2007 4:01 PM
To: bborgman@hutchisoneng.com
Subject: RE: IL 29 - Sparland Cost Estimate

Hi Brian,
Thank you for the heads-up. I did not receive anything from you so it must have gotten lost.

Jim Jodie
CH2M HILL
Senior Transportation Engineer
135 South 84th Street
Suite 325
Milwaukee, WI 53214

Tel 414-272-2426
Direct 414-847-0317
Fax 414-272-4408

From: Brian Borgman [mailto:bborgman@hutchisoneng.com]
Sent: Tuesday, June 05, 2007 3:58 PM
To: Jodie, Jim/MKE
Subject: RE: IL 29 - Sparland Cost Estimate

Jim,

I sent you my first stab at the cost opinions last night; it must have gotten lost in cyberspace somewhere. Anyway, if you do receive it, disregard for the time being as I make any adjustments that may be necessary due to the items you discuss in the email below.

I will attempt to thoroughly address all of your comments below, but it may be right up to the end of the week before I get anything to you.

I'll let you know if I have any questions regarding the cost estimates.

Brian

-----Original Message-----
From: Jim.Jodie@CH2M.com [mailto:Jim.Jodie@CH2M.com]
Sent: Tuesday, June 05, 2007 3:03 PM
To: bborgman@hutchisoneng.com
Subject: FW: IL 29 - Sparland Cost Estimate

Hi Brian,

When you develop the cost estimate for the Ramp D flyover with the roundabout, please try to determine

1. Will the Ramp D fill slope with a ditch impact the three houses located on the west side of Ramp D (south of Thenius Creek). I believe the IDOT will not allow the driveways to two of these houses on Ramp D (located at Station 68+20 and Station 71+90), but the driveways can be connected on the west side of the property along Marshal Street. Please try to determine the driveway profile from Marshall to the house at Station 68+20. The other two houses are already connected to Marshall Street.

2. For the flyover, I assumed a retaining wall for the flyover along the west side of Ramp D (north of realigned Thenius Street) from Station 23+00 to Station 19+00. , it appears from the IDOT revised profile, that the height will vary from 10' at Station 19+00 to 30' at Station 23+00 and that the wall is in cut between Station 19+00 to about Station 21+00 and in fill from Station 21+00 to Station 23+00.

3. If a retaining wall is not placed on the west side of Ramp D between Station 23 and Station 19, the land owned by Colleen and Kenneth Hanson (located south of Segler's) will need to be acquired because the fill slope will most likely take their land to the Pendleton driveway. Please provide a separate cost for the retaining wall and a cost to acquire the Hanson property (plus the cost of the fill on the Hanson property). Please verify.

4. The height of the retaining wall on Ramp D between Station 10+00 and Station 19+00 should be shorter than the previous design because the profile was raised (see IDOT revised profile). Please check the cross sections for Ramp D to verify the wall height. And determine the reduced cost of a shorter wall height.

5. Jim Hamilton confirmed that a retaining wall will not be required between Ramp D and the mainline of IL 29 if the flyover is used; this area would be filled? . Please calculate the cost of fill between the Ramp and the mainline and deduct the cost of the retaining wall from Station 3658 and 3662 on the mainline.

Thank you.

Jim Jodie

CH2M HILL

Senior Transportation Engineer

135 South 84th Street

Jim Hamilton

From: Dan.Nowak@CH2M.com
Sent: Monday, October 29, 2007 4:57 PM
To: jhamilton@hutchisoneng.com
Cc: jim.jodie@ch2m.com
Subject: FW: Digital Send from CHI FOX HP9040 mfp

Job #2145
MVM
BB
JOH

Document.pdf

Hi Jim,
Please see the attached pdf of a cross-section of the proposed IL 29 near the Hopewell entrance. There is an existing tie-back wall at this location (marked on the attached cross-section) which looks to conflict with our proposed retaining wall designs along the west side of IL 29 and the east side of the Hopewell driveway. Is there any way we can save this existing wall??? IDOT has spent "over a million dollars" on this wall and would like to save it if at all possible. I'm guessing the best alternative is to replace the existing wall with the proposed ones. What do you recommend?

Thanks,
Dan

-----Original Message-----
From: Nowak, Dan/CHI
Sent: Monday, October 29, 2007 4:42 PM
To: Jodie, Jim/MKE
Subject: FW: Digital Send from CHI FOX HP9040 mfp

Hi Jim,
See the attached pdf for a cross-section of proposed IL 29 near Hopewell.

Dan

-----Original Message-----
From: CHI FOX Digital Sender [mailto:MFDDigitalSender@ch2m.com]
Sent: Monday, October 29, 2007 4:40 PM
To: Nowak, Dan/CHI
Subject: Digital Send from CHI FOX HP9040 mfp

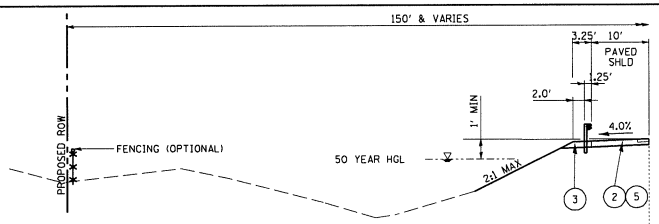
This document was digitally sent to you using an HP Digital Sending device.

The late Sen. Everitt McKinley Dirksen once remarked to his Senate colleagues, during budget deliberations, "a few million here, a few million there, and pretty soon we're talking real money."

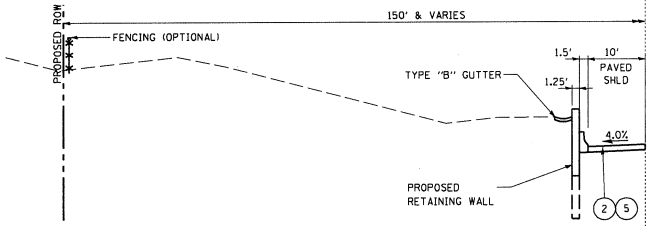
Exhibit B

PROPOSED TYPICAL SECTIONS WITH RETAINING WALLS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	7
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



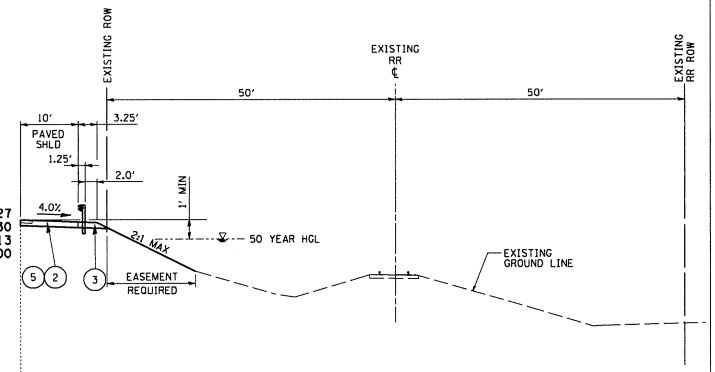
STA 3361+75 TO STA 3365+80
STA 3392+00 TO STA 3394+13
STA 3796+70 TO STA 3800+00
STA 3834+00 TO STA 3838+00



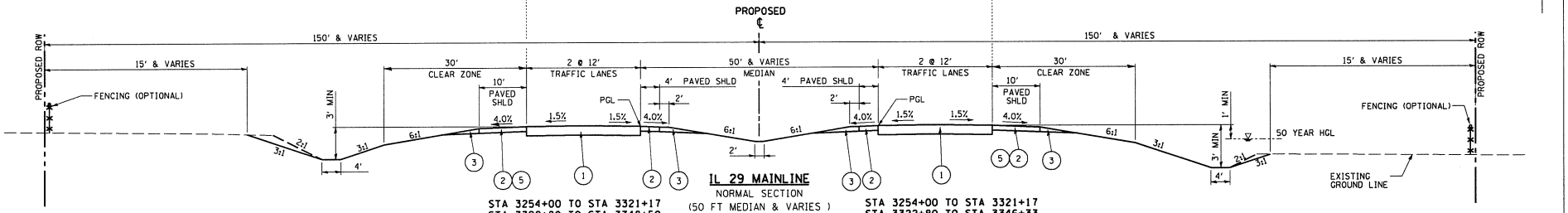
STA 3348+50 TO STA 3361+75
STA 3731+29 TO STA 3742+23
STA 3752+00 TO STA 3755+00
STA 3838+00 TO STA 3858+62

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G



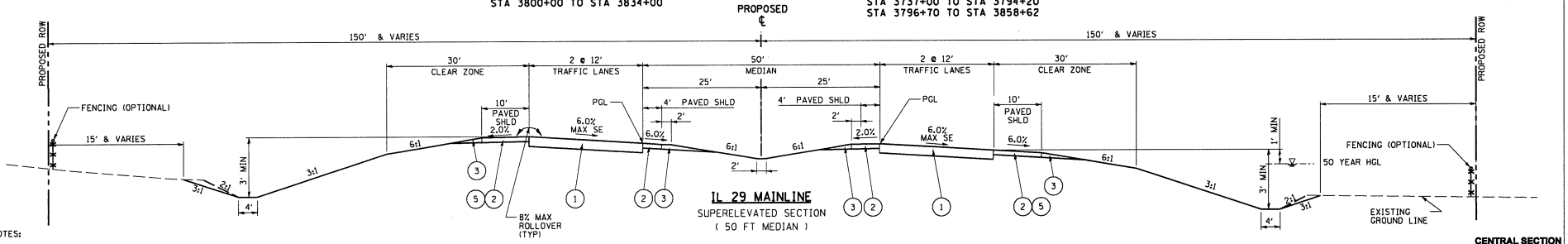
STA 3346+33 TO STA 3352+27
STA 3382+00 TO STA 3391+30
STA 3392+60 TO STA 3394+13
STA 3731+29 TO STA 3737+00



IL 29 MAINLINE
NORMAL SECTION
(50 FT MEDIAN & VARIES)

STA 3254+00 TO STA 3321+17
STA 3322+80 TO STA 3348+50
STA 3365+80 TO STA 3392+00
STA 3742+23 TO STA 3794+20
STA 3800+00 TO STA 3834+00

STA 3254+00 TO STA 3321+17
STA 3322+80 TO STA 3346+33
STA 3352+27 TO STA 3382+00
STA 3391+30 TO STA 3392+00
STA 3737+00 TO STA 3794+20
STA 3796+70 TO STA 3858+62



IL 29 MAINLINE
SUPERELEVATED SECTION
(50 FT MEDIAN)

CENTRAL SECTION

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. BENCHES WILL BE USED IN FILL HEIGHTS GREATER THAN 30'.
3. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
4. SEE PLAN SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
5. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
6. FIBER OPTIC INFORMATION AND OTHER UTILITY RELOCATION TO BE DETERMINED DURING PHASE II DESIGN.

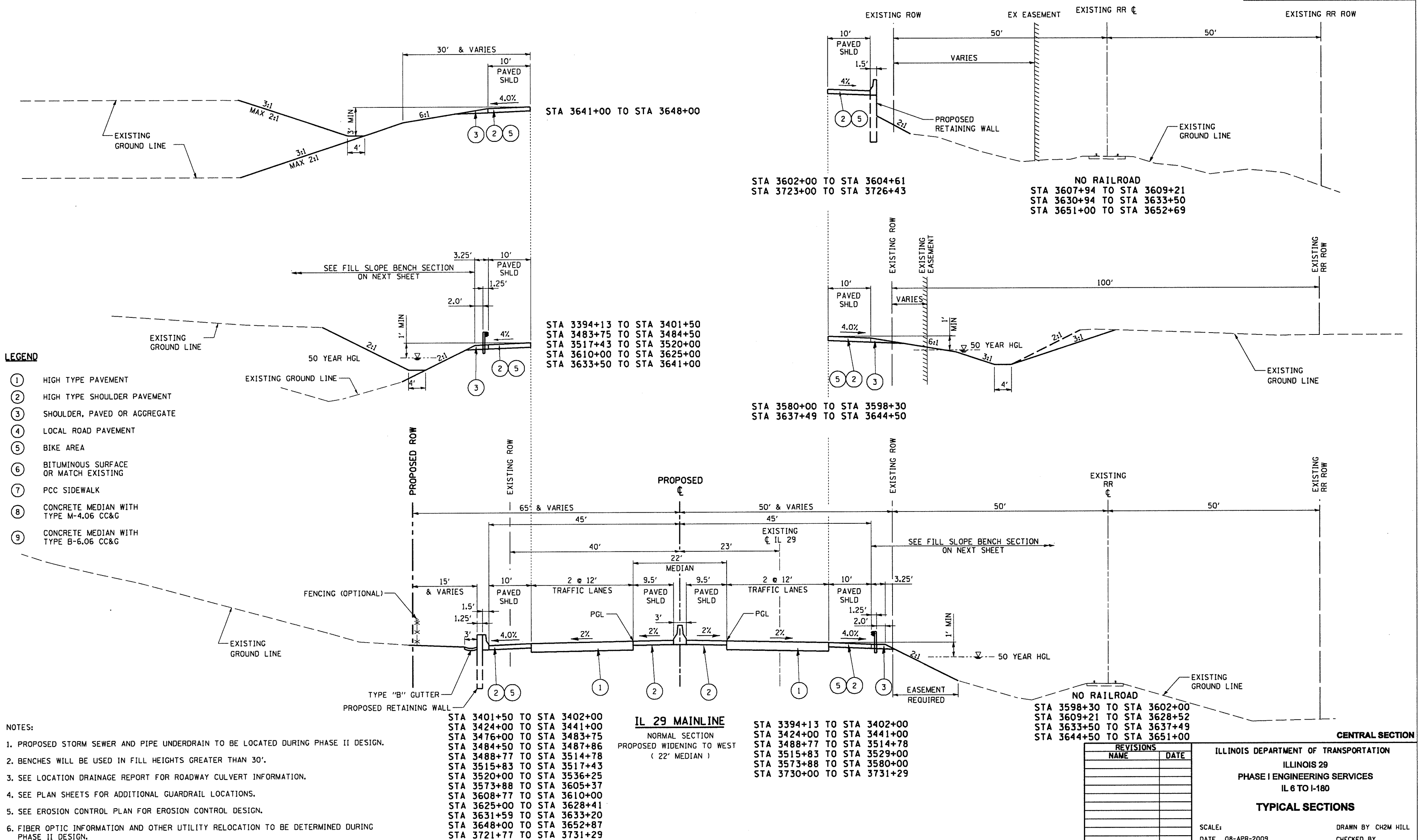
REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	8
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. BENCHES WILL BE USED IN FILL HEIGHTS GREATER THAN 30'.
3. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
4. SEE PLAN SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
5. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
6. FIBER OPTIC INFORMATION AND OTHER UTILITY RELOCATION TO BE DETERMINED DURING PHASE II DESIGN.

CENTRAL SECTION

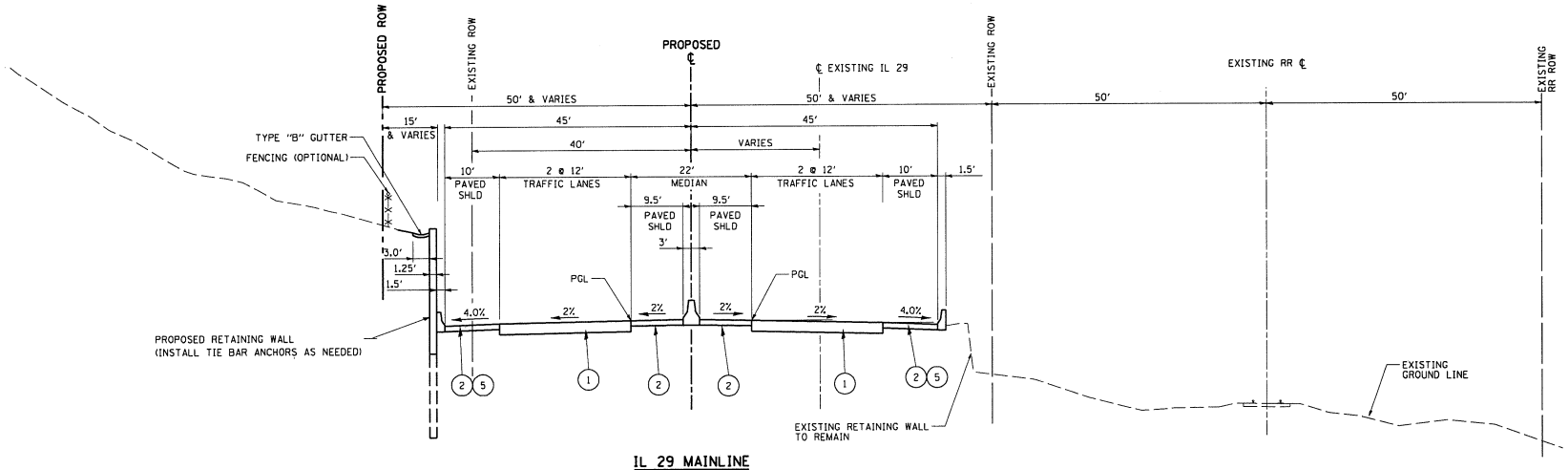
REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

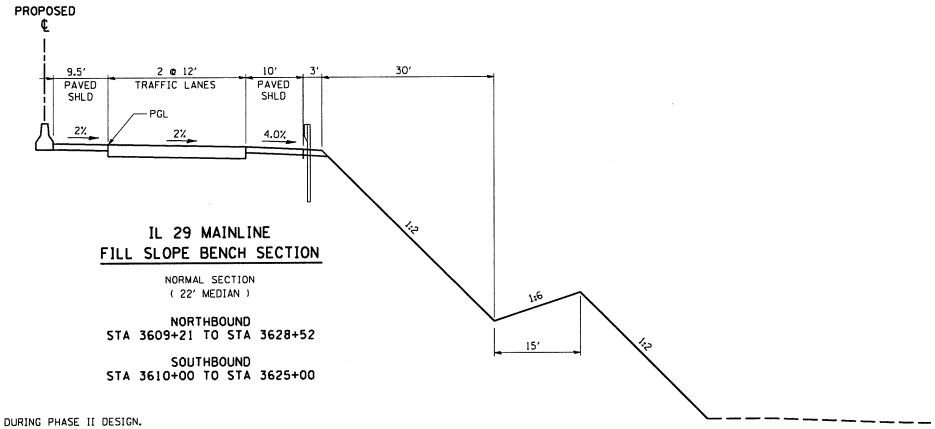
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	9
STA.	TO STA.			
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



IL 29 MAINLINE

NORMAL SECTION
(22' MEDIAN)

STA 3565+00 TO STA 3573+88



IL 29 MAINLINE
FILL SLOPE BENCH SECTION

NORMAL SECTION
(22' MEDIAN)

NORTHBOUND
STA 3609+21 TO STA 3628+52

SOUTHBOUND
STA 3610+00 TO STA 3625+00

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. BENCHES WILL BE USED IN FILL HEIGHTS GREATER THAN 30'.
3. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
4. SEE PLAN SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
5. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
6. FIBER OPTIC INFORMATION AND OTHER UTILITY RELOCATION TO BE DETERMINED DURING PHASE II DESIGN.

CENTRAL SECTION

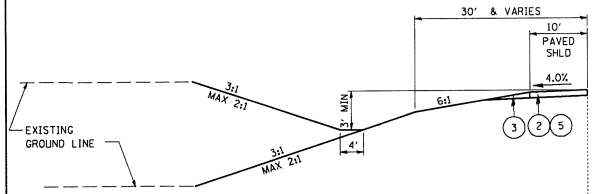
REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

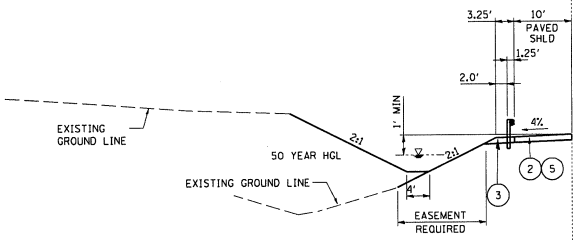
TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

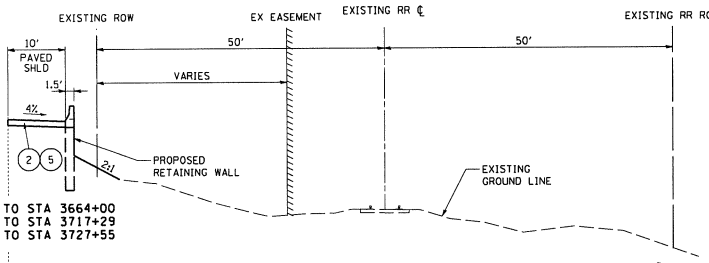
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	10
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



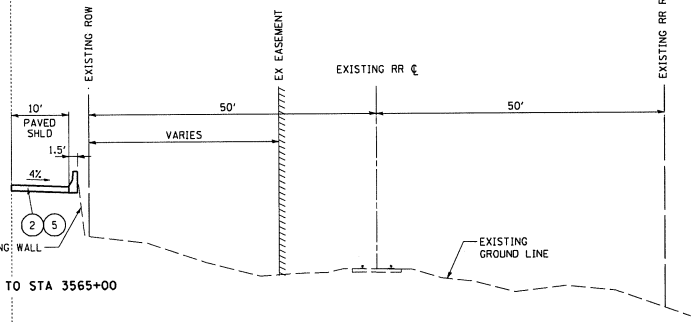
STA 3665+00 TO STA 3677+44



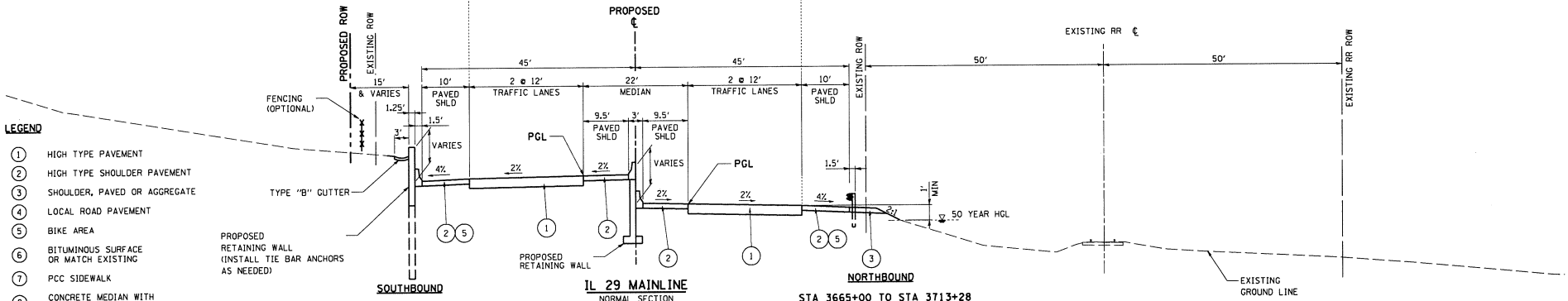
STA 3657+74 TO STA 3661+00



STA 3659+58 TO STA 3664+00
STA 3713+28 TO STA 3717+29
STA 3721+95 TO STA 3727+55



STA 3551+40 TO STA 3565+00



SOUTHBOUND

STA 3551+40 TO STA 3565+00
STA 3661+00 TO STA 3664+00
STA 3677+44 TO STA 3717+29
STA 3721+95 TO STA 3727+55

IL 29 MAINLINE

NORMAL SECTION
SPLIT PROFILE
(22' MEDIAN)

STA 3402+00 TO STA 3424+00
STA 3441+00 TO STA 3452+41
STA 3453+31 TO STA 3476+00
STA 3529+00 TO STA 3551+40
STA 3664+00 TO STA 3665+00
STA 3717+29 TO STA 3721+95
STA 3727+55 TO STA 3730+00

NORTHBOUND

STA 3665+00 TO STA 3713+28

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTE:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. BENCHES WILL BE USED IN FILL HEIGHTS GREATER THAN 30'.
3. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
4. SEE PLAN SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
5. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
6. FIBER OPTIC INFORMATION AND OTHER UTILITY RELOCATION TO BE DETERMINED DURING PHASE II DESIGN.

CENTRAL SECTION

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

rdbx
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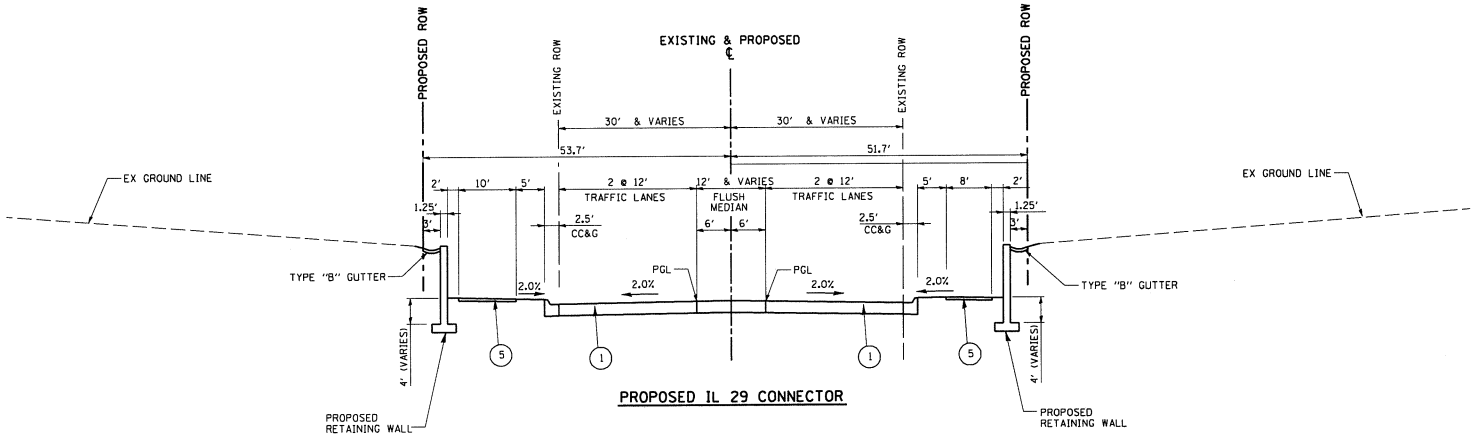
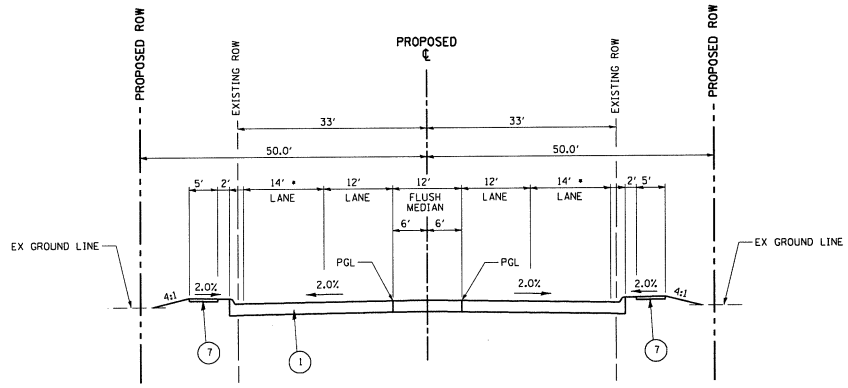
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	12
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



PROPOSED IL 29 CONNECTOR

SOUTHBOUND
STA 45+09 TO STA 48+00

NORTHBOUND
STA 46+50 TO STA 48+00



PROPOSED IL 29 CONNECTOR

* THIS LANE IS TO BE SHARED USE FOR BIKES

SOUTHBOUND
STA 19+40 TO STA 45+09

NORTHBOUND
STA 19+40 TO STA 46+50

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTES:

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CENTRAL SECTION

REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

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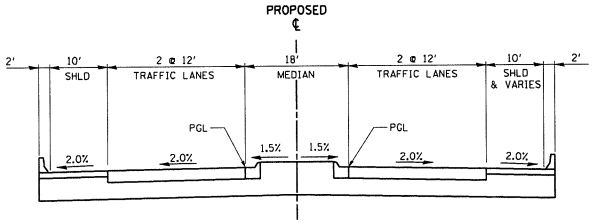
08-APR-2009

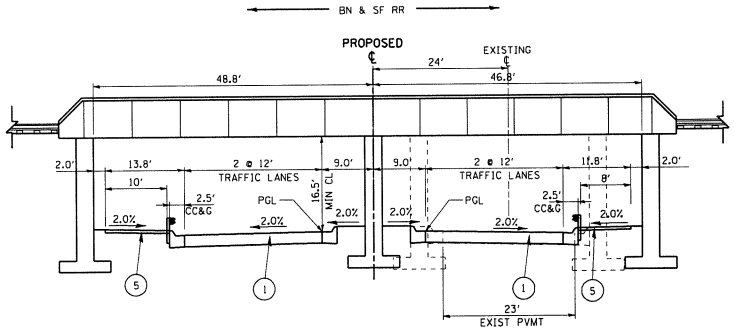
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	13
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



PROPOSED IL 29 CONNECTOR OVER SENACHWINE CREEK

BRIDGE SECTION

STA 71+33 TO STA 73+57



PROPOSED IL 29 CONNECTOR

EXISTING IL 29 AT VIADUCT IN CHILLICOTHE
(SOUTH STRUCTURE)

STA 50+42 TO STA 51+35

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
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CENTRAL SECTION

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

ILLINOIS 29

PHASE I ENGINEERING SERVICES

IL 6 TO I-180

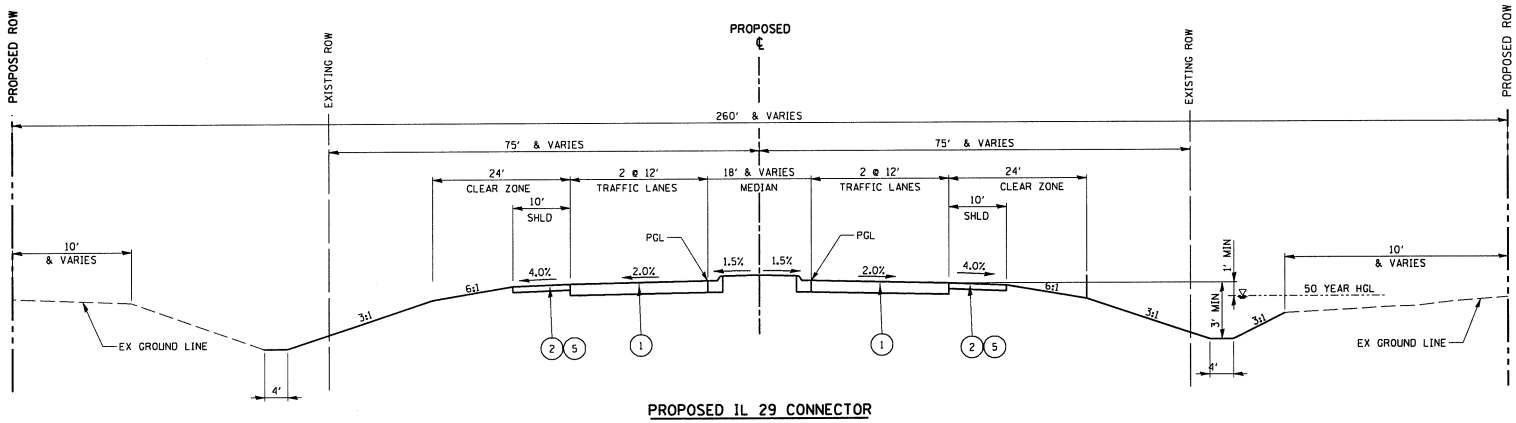
TYPICAL SECTIONS

SCALE: DRAWN BY CH2M HILL

DATE 08-APR-2009 CHECKED BY

file: \\dfs\root\data\159972_IL29\0972\NEW\DRAWINGS\0972SCS001.dgn
08-APR-2009

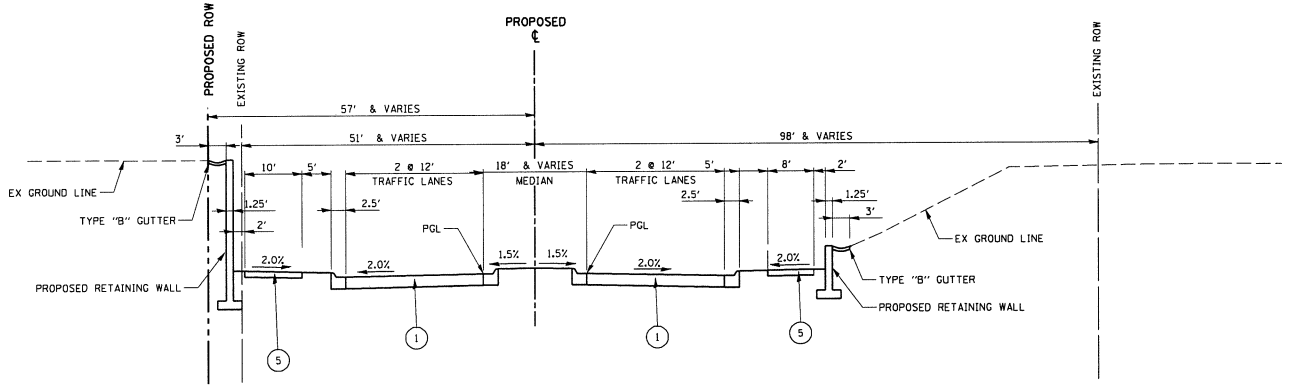
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	14
STA.	TO STA.			
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



PROPOSED IL 29 CONNECTOR

SOUTHBOUND
STA 63+75 TO STA 71+33
STA 73+57 TO STA 87+86

NORTHBOUND
STA 61+75 TO STA 71+33
STA 73+57 TO STA 87+86



PROPOSED IL 29 CONNECTOR

STA 48+00 TO STA 50+42

SOUTHBOUND
STA 51+35 TO STA 63+75

NORTHBOUND
STA 51+35 TO STA 61+75

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTE:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. BENCHES WILL BE USED IN FILL HEIGHTS GREATER THAN 30'.
3. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
4. SEE PLAN SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
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CENTRAL SECTION

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

mdw
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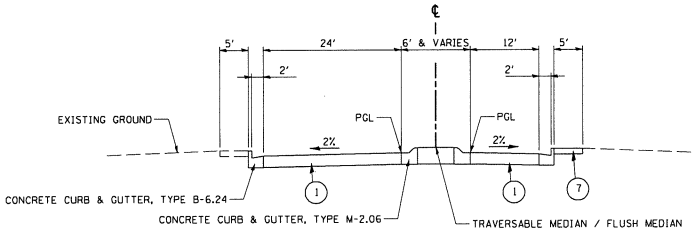
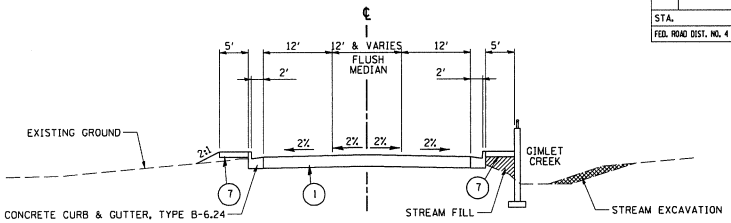
08-APR-2009

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			76	16
STA.	TO STA.			
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



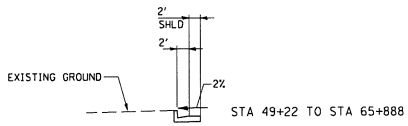
PROPOSED IL 17

STA 38+76 TO STA 47+50

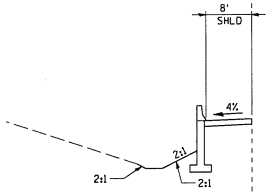


PROPOSED IL 17

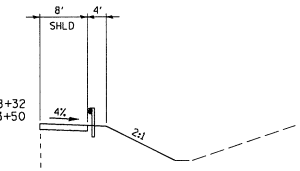
STA 47+50 TO STA 52+27



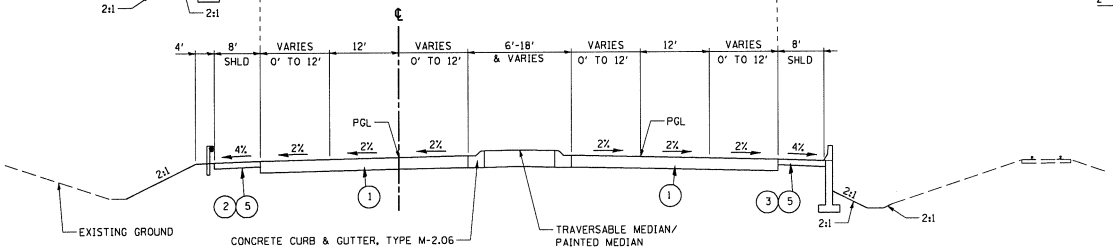
STA 49+22 TO STA 65+888



STA 41+75 TO STA 42+50
STA 45+50 TO STA 48+32



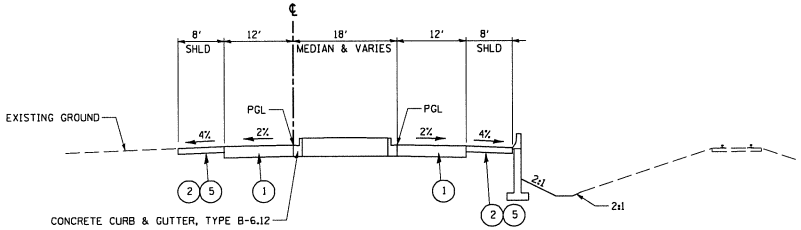
STA 43+00 TO STA 48+32
STA 49+22 TO STA 53+50



PROPOSED RAILROAD ST (EXISTING IL 29)

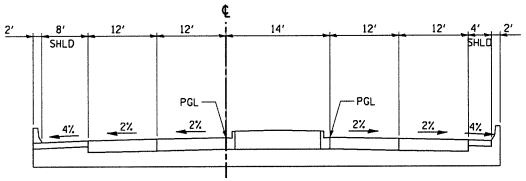
SOUTHBOUND
STA 35+00 TO STA 41+75
STA 42+00 TO STA 45+50

NORTHBOUND
STA 35+00 TO STA 43+00
STA 53+50 TO STA 65+88



PROPOSED RAILROAD ST (EXISTING IL 29)

STA 65+88 TO STA 78+26



PROPOSED RAILROAD ST (EXISTING IL 29)

BRIDGE SECTION

STA 48+32 TO STA 49+22

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE B-6.06 CC&G

NOTES:

1. PROPOSED STORM SEWER TO BE LOCATED DURING PHASE II DESIGN
2. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
3. STATION RANGES OF SIDE TREATMENTS MAY VARY. SEE PLAN SHEETS.

CENTRAL SECTION

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

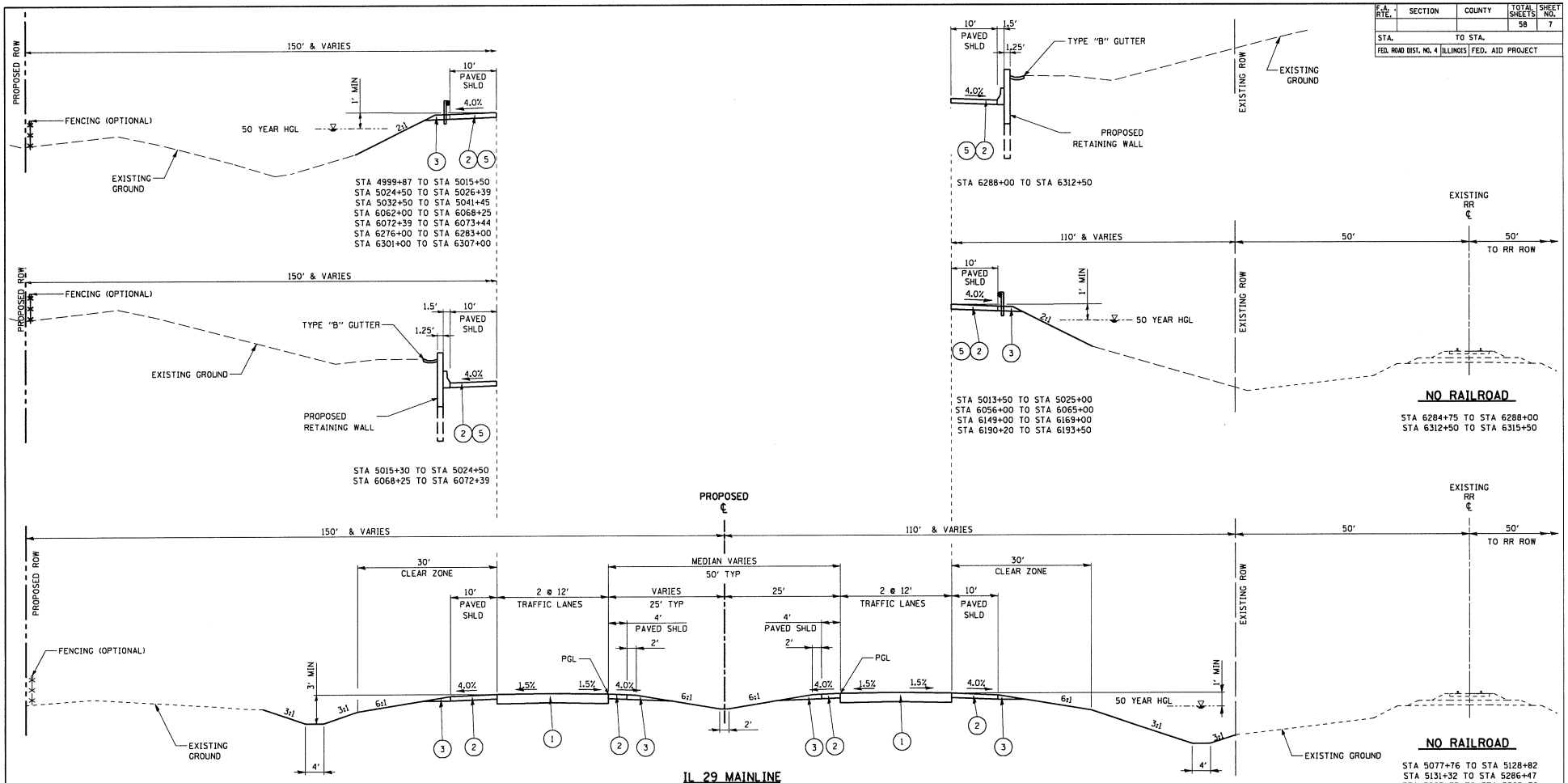
TYPICAL SECTION

PROPOSED IL 17 & RAILROAD ST (EXISTING IL 29)

SCALE: NONE — DRAWN BY CH2M HILL
DATE 08-APR-2009 — CHECKED BY DN

mdix
\\ellwood\d\69972_IL29\DATA\CH2M\DRAWINGS\PDF\CAD\PDF\
08-APR-2009

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			58	7
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



IL 29 MAINLINE

NORMAL SECTION WITH RAILROAD
(50 FT MEDIAN)

SOUTHBOUND

STA 5026+39 TO STA 5032+50
STA 5041+45 TO STA 5128+82
STA 5131+32 TO STA 5286+47
STA 5287+73 TO STA 5342+92
STA 6000+00 TO STA 6062+00
STA 6073+44 TO STA 6131+42
STA 6133+17 TO STA 6193+50
STA 6283+00 TO STA 6301+00
STA 6307+00 TO STA 6320+00

NORTHBOUND

STA 4999+87 TO STA 5013+50
STA 5025+00 TO STA 5077+76
STA 5323+52 TO STA 5342+92
STA 6000+00 TO STA 6056+00
STA 6065+00 TO STA 6118+00
STA 6119+00 TO STA 6131+42
STA 6133+17 TO STA 6149+00
STA 6169+00 TO STA 6190+20

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE M-6.06 CC&G

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
4. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
5. FIBER OPTIC INFORMATION AND RELOCATION OF OTHER UTILITIES TO BE DETERMINED DURING PHASE II.

NORTH SECTION

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

ILLINOIS 29

PHASE I ENGINEERING SERVICES

IL 6 TO I-180

TYPICAL SECTIONS

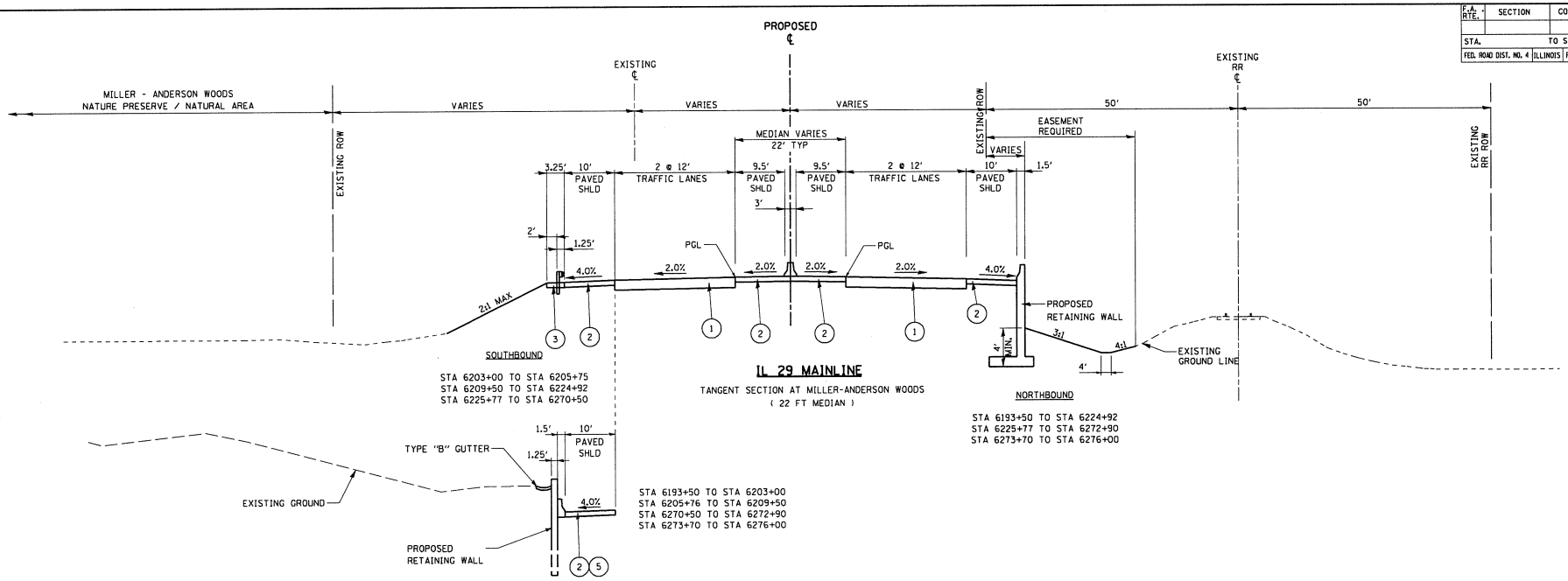
SCALE:

DATE 08-APR-2009

DRAWN BY CH2M HILL

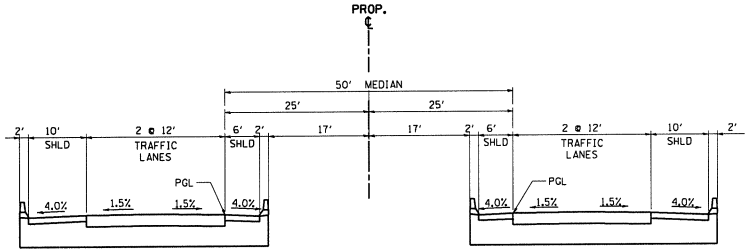
CHECKED BY

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			58	8
STA.		TO STA.		
FED. ROAD DIST. NO. 4	ILLINOIS	FED. AID PROJECT		



IL 29 MAINLINE

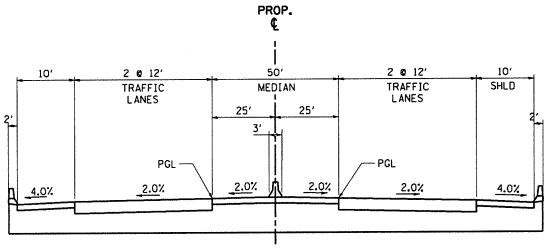
TANGENT SECTION AT MILLER-ANDERSON WOODS
(22 FT MEDIAN)



IL 29 MAINLINE

BRIDGE SECTION
(50 FT MEDIAN)

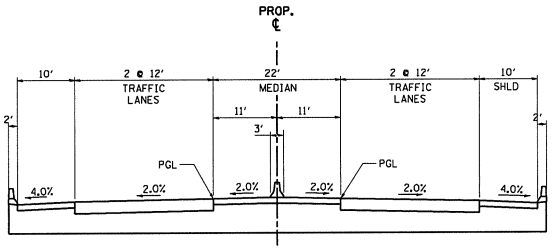
STA 5128+82 TO STA 5131+32
STA 5286+47 TO STA 5287+73
STA 6118+00 TO STA 6119+00
STA 6272+90 TO STA 6273+70



IL 29 MAINLINE

BRIDGE SECTION
(50 FT MEDIAN)

STA 6131+42 TO STA 6133+17



IL 29 MAINLINE

BRIDGE SECTION
(22 FT MEDIAN, MILLER-ANDERSON WOODS)

STA 6224+92 TO STA 6225+77

NOTES:

1. PROPOSED STORM SEWER AND PIPE UNDERDRAIN TO BE LOCATED DURING PHASE II DESIGN.
2. SEE LOCATION DRAINAGE REPORT FOR ROADWAY CULVERT INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR ADDITIONAL GUARDRAIL LOCATIONS.
4. SEE EROSION CONTROL PLAN FOR EROSION CONTROL DESIGN.
5. FIBER OPTIC INFORMATION AND RELOCATION OF OTHER UTILITIES TO BE DETERMINED DURING PHASE II.

NORTH SECTION

LEGEND

1. HIGH TYPE PAVEMENT
2. HIGH TYPE SHOULDER PAVEMENT
3. SHOULDER, PAVED OR AGGREGATE
4. LOCAL ROAD PAVEMENT
5. BIKE AREA
6. BITUMINOUS SURFACE OR MATCH EXISTING
7. PCC SIDEWALK
8. CONCRETE MEDIAN WITH TYPE M-4.06 CC&G
9. CONCRETE MEDIAN WITH TYPE M-6.06 CC&G

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS 29
PHASE I ENGINEERING SERVICES
IL 6 TO I-180

TYPICAL SECTIONS

SCALE:
DATE 08-APR-2009
DRAWN BY CH2M HILL
CHECKED BY

mfix
\\ahnas\cad\68892_IL29\R2\NEW DRAWINGS\IR\15A707.SIT
08-APR-2009

Exhibit C

SPARLAND INTERCHANGE – BRIDGE/TUNNEL STUDIES

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Thursday, October 28, 2004 4:32 PM
To: Jim Jodie
Cc: Mike Meier
Subject: Sparland Split Diamond Interchange; Highway/Railroad Tunnel--Cost Estimate

TunnelCostEst.doc 2145typsec5.dgn

Jim,

Attached is a preliminary cost estimate for the construction of a concrete tunnel structure carrying IL 29 over the Lincoln Southern RR and the proposed northbound ramp lanes onto IL 29 near Sparland and north of Thenius Creek. I have also attached a preliminary tunnel cross section used for preparing the cost estimate. This estimate is a "ballpark" number for planning purposes.

The elevations and dimensions shown on the cross section are estimated from preliminary grades, plans views, and cross sections. We have some borings from the nearby structure carrying existing IL 29 over Thenius Creek (SN 062-0056). These borings show rock is relatively close to existing ground. Therefore I assumed the tunnel structure would be supported on 40 ft. long steel piling.

If you have any questions please feel free to call at any time.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

Job #2145
FAP 318 (IL 29)
Existing Alignment
Central Section
Phase I Engineering

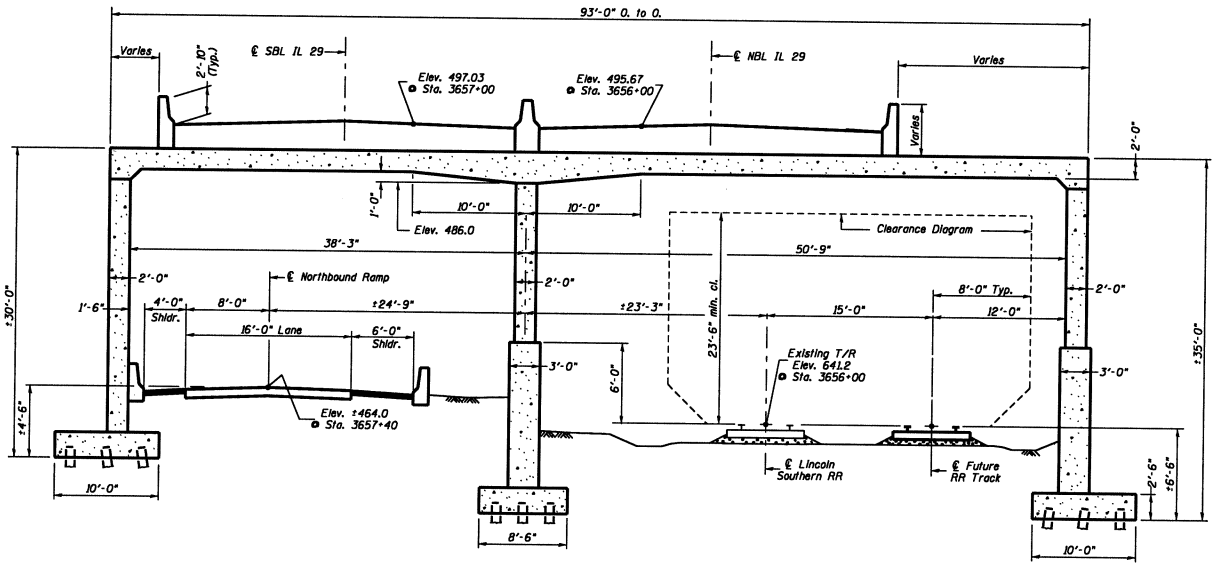
SUBJECT: Concrete Culvert (Tunnel)
Sparland Split Diamond Alternate, 3A
TUNNEL COST ESTIMATE

DESCRIPTION

Construction of a concrete tunnel structure for a railroad overpass carrying proposed IL 29 over the existing Lincoln Southern RR and the proposed northbound ramp lane at Sparland north of Thenius Creek. The length of tunnel is relatively short and natural ventilation should be adequate. Lighting for the highway tunnel will be required. Attached is a preliminary tunnel cross section.

Cost Estimate – Tunnel Structure, ± 350' Long

Concrete Structures:	5980 CY @ $550		=	$3,289,000
Reinforcement Bars:	1,440,000 lbs. @ 0.80		=	$1,152,000
Steel Piling:	20,800 ft. @ 30.00		=	$ 624,000
		Total	=	$5,065,000
20% Miscellaneous & Incidental Items			=	$1,013,000
		Total	=	$6,078,000
		USE	=	$6,100,000



PROPOSED TUNNEL CROSS SECTION
(@ Rt. L's to RR)

Dimensions shown above are subject to refinement in final plans.

TUNNEL ALTERNATE
SPARLAND SPLIT DIAMOND INTERCHANGE

EXISTING ALIGNMENT - CENTRAL SECTION
ILLINOIS ROUTE 29
PHASE I ENGINEERING SERVICE

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Tuesday, January 18, 2005 2:50 PM
To: Jim.Jodie@CH2M.com
Cc: Kim Kolody; Mike Meier
Subject: RE: Tunnel at Sparland for RR Crossing

Hello Jim,

I am working on some cost estimates for bridge and tunnel options at the two Sparland railroad crossings. I did some rough estimates for tunnels using the plans you sent form the State of Wisconsin. I figured a tunnel for two sets of railroad tracks would cost approximately $14,000 per lineal foot. A similar highway tunnel with a 30'-0" clear width is estimated at $10,500 per foot. I believe the tunnel option will be more costly than a comparable bridge structure. Some of the factors you mentioned such as future maintenance, drainage issues, etc. could be more of a problem with a tunnel.

Tunnels are rarely used here in Illinois in lieu of a bridge, and the cost and other problems may explain why they are not used unless there is no other reasonable option.

I should get some more information to you in the near future for the bridge versus tunnel option at the two Sparland railway locations.

Please let me know if you have any questions.

-----Original Message-----
From: Jim.Jodie@CH2M.com [mailto:Jim.Jodie@CH2M.com]
Sent: Tuesday, January 18, 2005 11:56 AM
To: lewisml@nt.dot.state.il.us
Cc: jhamilton@hutchisoneng.com; Kim.Kolody@CH2M.com
Subject: Tunnel at Sparland for RR Crossing

Hi Mike,
Previously, we discussed using a tunnel versus a bridge for the two railroad crossings proposed in Sparland for the split diamond interchange. At that time, we were unsure about anticipated maintenance issues with a tunnel.

John Bolka of WisDOT Maintenance Section returned my call regarding maintenance problems with the tunnel structure over the double set of railroad tracks in Milwaukee, WI. The tunnel typical section was discussed at the railroad meeting on November 10, 2004.

Per John, they have not had any problems since the tunnel was constructed in 1970. However, they are noticing leaking water at joints in the ceiling and they expect delamination to occur in the concrete. No maintenance is scheduled at this tim. Whenever maintenance is scheduled, WisDOT may consider an asphaltic membrane overlay on the top of the tunnel. Maintenance of traffic will be difficult.

At this time, we are doing a comparison of tunnel design versus bridge design for the two railroad crossings proposed in Sparland (split diamond interchange). We can discuss this with you at a later meeting or at a meeting with the railroad.

Please call me if you have any questions.

Jim Jodie, P.E.

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Wednesday, January 19, 2005 4:39 PM
To: Kim. Kolody@ch2m. com
Cc: Mike Meier
Subject: Structures at Sparland for Railroad Crossings

Sparland Alernate 3A Structure... 2145ALT3.dgn

Attached information concerning the proposed bridge and tunnel alternatives for the IL 29/Railroad crossing at Sparland for the split diamond interchange. I have included some preliminary bridge sketches for bridge and tunnel options. The cost estimates use square foot costs for the bridges. I was not able to find any cost data for similar type tunnels so I did some rough estimates to arrive at cost per foot for tunnels. My estimates indicate tunnel options are significantly more costly than bridges here but I cannot predict this with absolute certainty.

Please call if you have any questions.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

To: The Record

From: Jim Hamilton

Date: January 19, 2005

Subject: HEI Job No. 2145
Interchange at Sparland, Railroad Crossings
(Alt 3A, Split Diamond
STRUCTURE OPTIONS AND COST ESTIMATE

Alternate 3A at Sparland is a split diamond type interchange in which mainline IL 29 will intersect the Lincoln & Southern RR at the south and north ends at relative high intersection angles. A bridge type structures carrying the mainline Il 29 over the railroad appears to be a reasonable alternative here. Another alternative is a three-sided tunnel for the railroad overpass instead of a bridge or combination bridge and tunnel structure as necessary to carry the railroad and ramp lanes under IL 29. (Plans provided by CH2M Hill for a project in Wisconsin illustrate a 709 ft. long cast-in-place tunnel structure that accommodates two sets of railroad tracks.) The choice of either a bridge option or a bridge/tunnel combination will depend on both structural considerations and economic evaluation. Final structure selection will be done during the TSL Plan study in Phase II of this project.

Factors affecting the structure selection include foundation requirements, railroad requirements concerning future tracks & maintenance roads, right of way and economics. Generally speaking tunnel type structures are more expensive than bridges. This explains the limited number of tunnel structures constructed at rail/highway intersections. Typical solutions are to construct highway bridges over the railroad tracks. Other things to consider for a tunnel structure are lighting, ventilation, future reconstruction, maintenance, drainage and aesthetics

For economic comparison of a bridge structure to a tunnel, the bridge cost estimate is considered more reliable due to large database of bridge square foot costs compiled by IDOT. There is limited information for a tunnel structure here in Illinois.

Future railroad needs and railroad coordination will have to be considered in planning the structure configuration. The final structure selection would have to consider railroad plans for future tracks, clearance requirements and maintenance roads adjacent to their tracks.

A reasonable approach here is to assume a bridge structure carrying the mainline Route IL 29 over the railroad. This is the most typical solution and

would give a reasonable structure cost estimate. Later, for example during the TSL Plan stage, other solutions may offer other structure options and alternative recommendations can be made with appropriate justification. The bridge structures assume dual parallel structures 43'-2" o. -to-o. deck with estimated spans and skew angles as noted.

Attached are preliminary drawings of bridge options at each location and cost estimates for the various configurations.

Cost Estimate for Bridges: The cost estimate for bridges for Phase I will be based on square foot unit cost of the estimated total superstructure deck area. Welded plate girder structures with girder depths ranging form 48" to 63" are expected to cost $100 to $160 per sq. ft. depending on the complexity of the structure such as skew angle, curvature, height of piers and other factors that may increase the cost. This is a fairly reliable way of estimating bridge costs for planning purposes without figuring individual quantities. IDOT as well as other state transportation departments provide bridge square foot costs to the FHWA and for public distribution annually.

Cost Estimate for Tunnel Structures: The tunnel structures for this project are assumed to be cast-in-place concrete, three-sided type structure with reinforced slab, walls and pile-supported footing. Using the plans from the State of Wisconsin as a reference for a 709' long tunnel structure carrying two sets of tracks, cost per lineal foot was computed using the quantity per foot for major structural items concrete, reinforcement bars and piling. An additional 30% was added for incidental items. Based on this procedure the cost per lineal foot for a two-track railway tunnel is estimated at $14,000 per ft. By similar means a highway tunnel providing 30' clear width is estimated at $10,500 per foot.

Con-Span Company has details for railway and highway tunnels using precast three sided units supported on cast-in-place walls and footing. This type of structure may expedite the construction but little difference in structure cost is expected for planning purposes. Example details are attached for information.

Please keep in mind that these structure estimates for Phase I are not in any way as reliable as a contract estimate based on computed individual pay quantities. It is not uncommon for a contractor bid to differ considerably from the Engineer's Estimate. Therefore engineering judgment should be used before selecting an alternate based solely on the estimated construction cost. Final structure recommendation should include all relevant information including structural requirements, foundation and geotechnical requirements, maintenance, aesthetics, and economics.

Sparland Interchange
Revised Structure Cost Estimates (1/19/2005)
Railroad Crossings

1. South Crossing, Station 3606+85

A. Bridge Description: Two-span continuous welded plate girder with concrete deck slab, RC column piers, closed concrete abutments with MSE wall at bridge ends.

Bridge skew = 55°
Bridge Length = 270' Bk. – Bk. Abutments
Bridge width = 2 @ 43'-2"
Pier Type: RC multi-column
Estimated construction depth: 5.5 ft.

ESTIMATE STRUCTURE COST:

Bridge: 23,310 sq. ft. x $150.00/sq. ft.	=	$3,496,500
MSE Walls:		
S. Abut. 22' x 165' x $50.00/sq. ft.	=	181,500
N. Abut. 34' x 165' x $50.00/sq. ft.	=	280,500
Total Bridge Estimate	=	$3,958,500
Use		$3,960,000

B. Tunnel Description: Reinforced concrete tunnel carrying two sets of RR Tracks approximately 40' to 44' clear width and 250' long. Highway tunnel 30' clear width and 232' long carrying ramp lane under IL 29 mainline.

Railway tunnel	250' x $14,000/ft.	=	$3,500,000
Highway tunnel	232' x $ 10,500/ft.	=	$2,436,000
Total Tunnel Estimate		=	$5,936,000

2. North Crossing Station, Station 3656+00
   Bridge over Service Road, Stream, L&S RR and Ramp Lane

   A. Bridge Description: Multi-span welded Plate Girder with concrete deck slab, dual structures 570' long (NBL), and 530' long (SBL), Reinforced Concrete column piers, concrete abutments with MSE retaining walls at abutment ends.

      Bridge Skew: 60° and varies
      Bridge Length: 570' (NBL), 530' (SBL)
      Bridge Width: 2@ 43'-2"
      Estimated construction depth: 6.5'

      ESTIMATED BRIDGE COST:

Bridge: 47483 sq. ft. x $150.00/sq. ft.		=	$7,122,450
MSE Walls			
S. Abut. 93.2 ' x 14'	= 1305 sq. ft.	=	65,250
N. Abut. 186' x 18'	= 3348 sq. ft.	=	167,400
Total Bridge Estimate		=	$7,355,100

Use $7,400,000

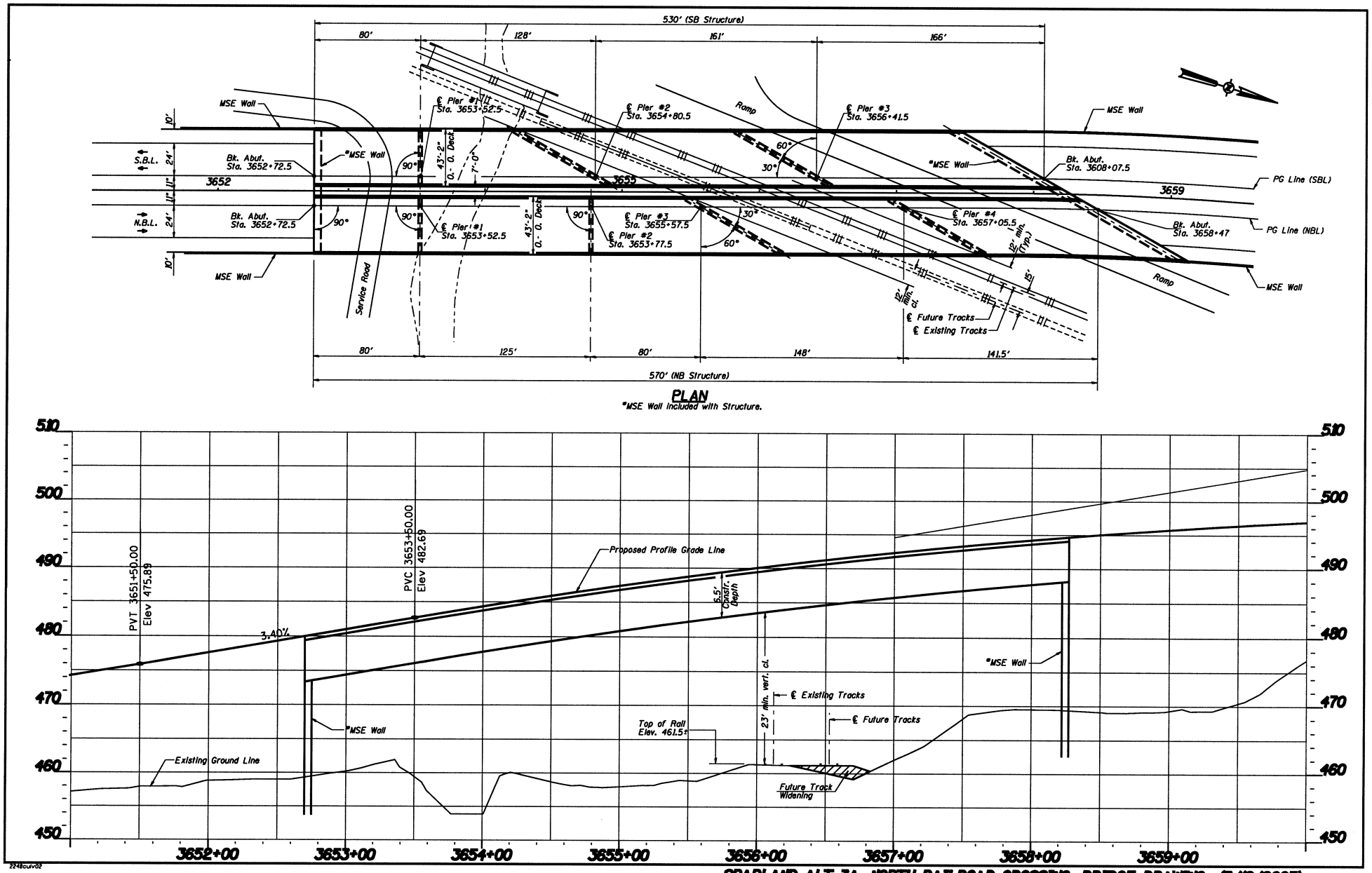
   B. Tunnel Description: Combination tunnel and bridge structure carrying two sets railroad tracks and highway ramp lane under mainline IL 29 with bridge structure over service road and creek just south of tunnel

      ESTIMATED STRUCTURE COST

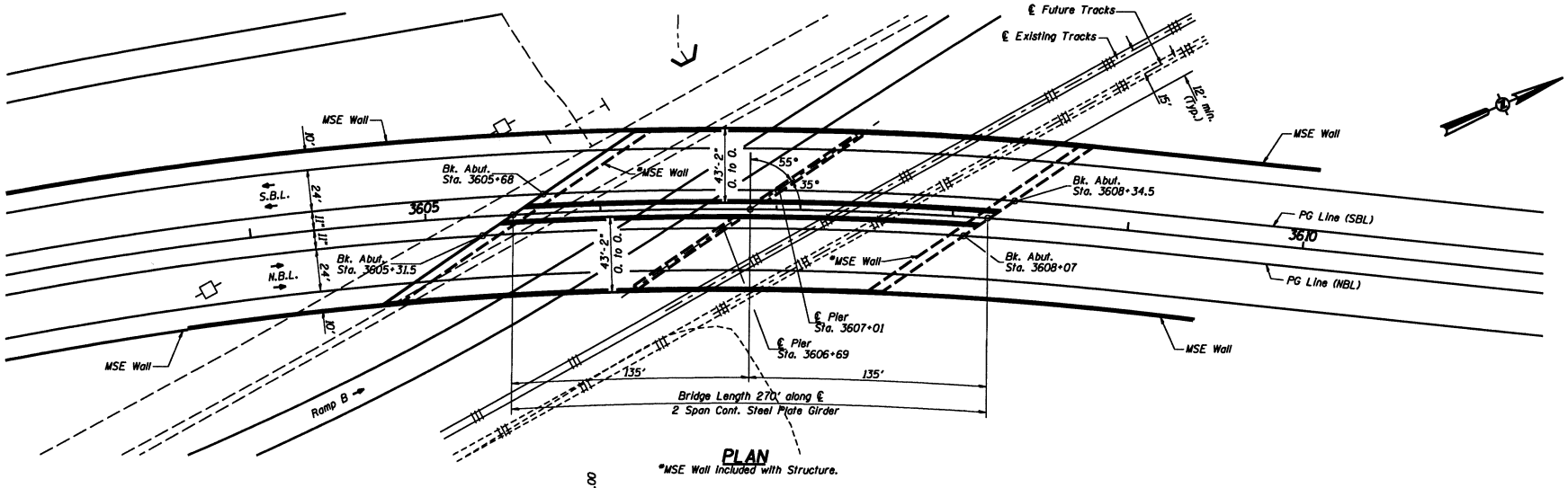
Bridge	13,813 sq. ft. x $115.00/sq. ft.	=	$4,928,000
Tunnels	(Railroad) 352' x $14,000/ft.	=	3,549,000
	(Highway) 338' x $10,500/ft.	=	1,588,495
MSE Walls	20' x 93' x $50.00/sq. ft.	=	93,000
	25' x 93' x $50.00/sq. ft.	=	116,250
	28' x 250' x $50.00/sq. ft.	=	350,000
	Total		$10,624,745

Use $10,625,000

Attachments
   Bridge drawings
   Tunnel drawings and details

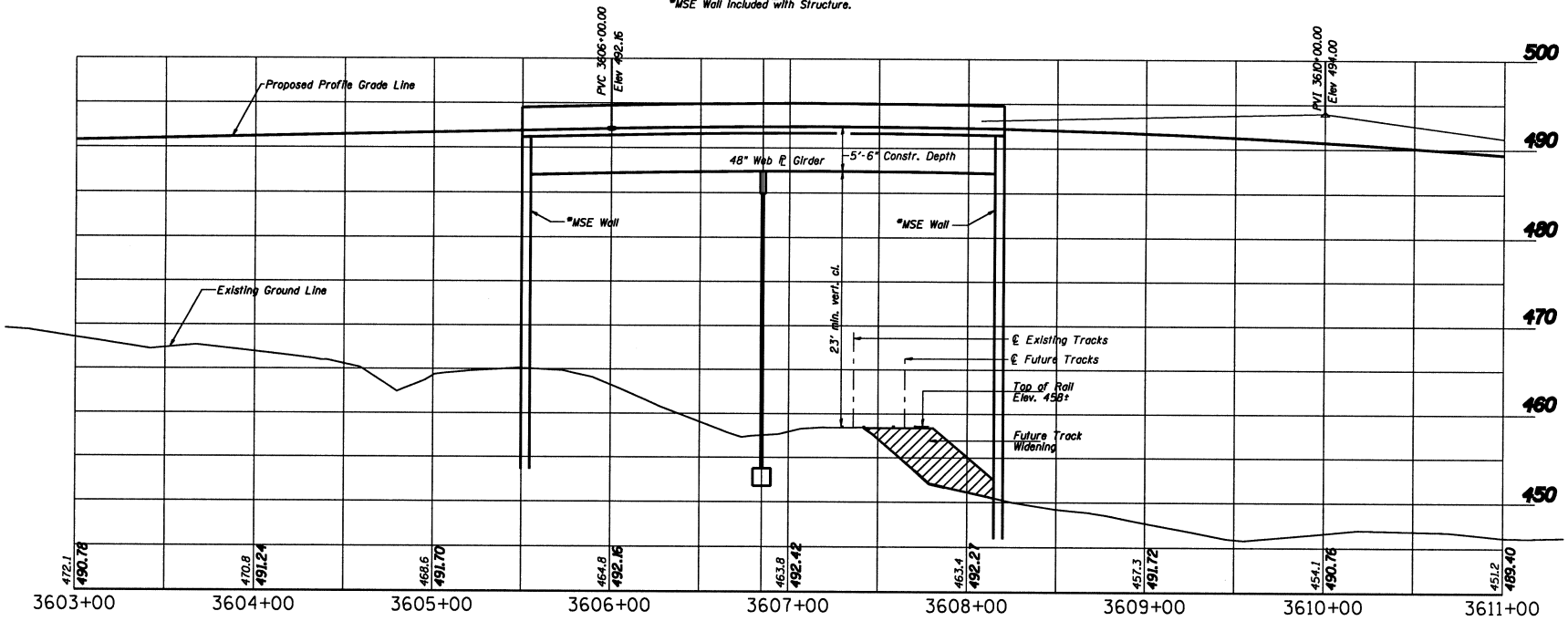


SPARLAND ALT 3A, NORTH RAILROAD CROSSING, BRIDGE DRAWING (3/19/2005)

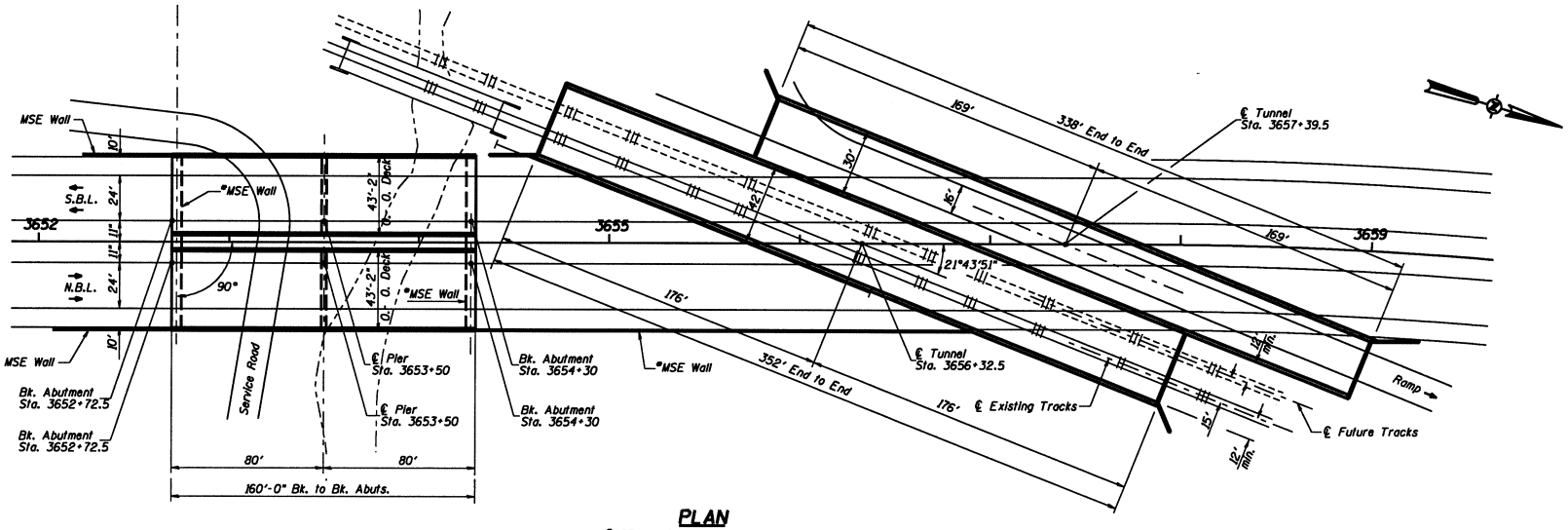


PLAN

*MSE Wall Included with Structure.

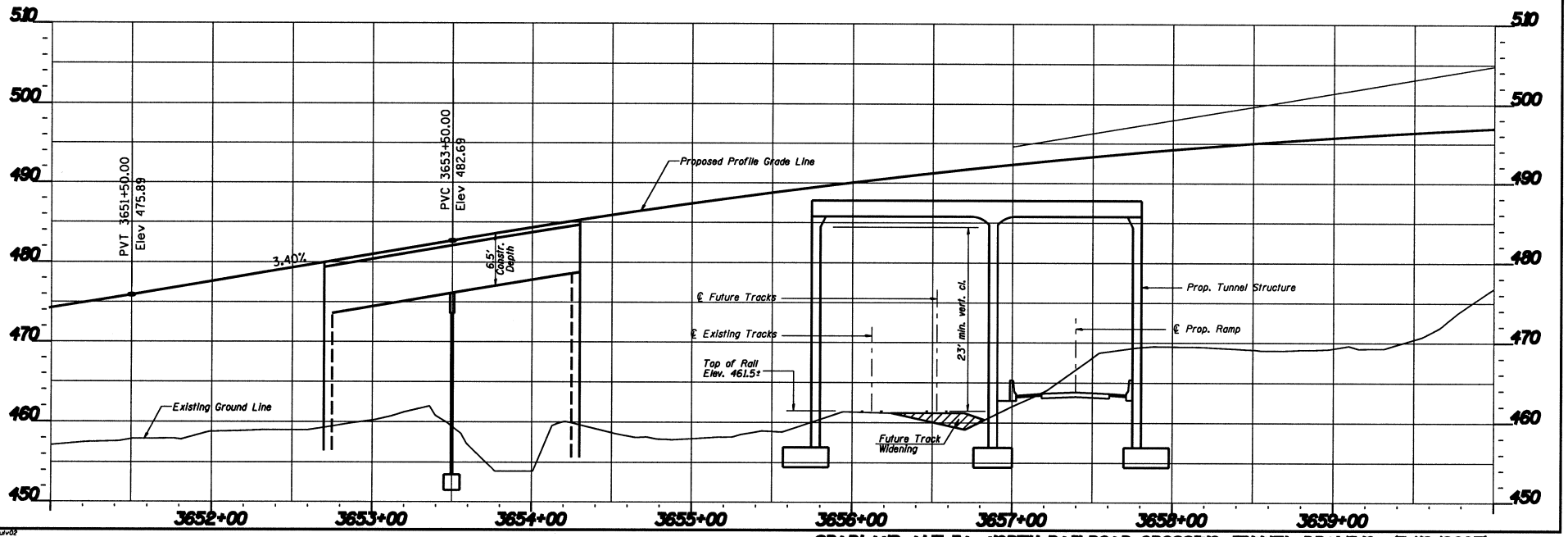


SPARLAND ALT 3A, SOUTH RAILROAD CROSSING, BRIDGE DRAWING (3/19/2005)



PLAN

*MSE Wall Included with Structure.



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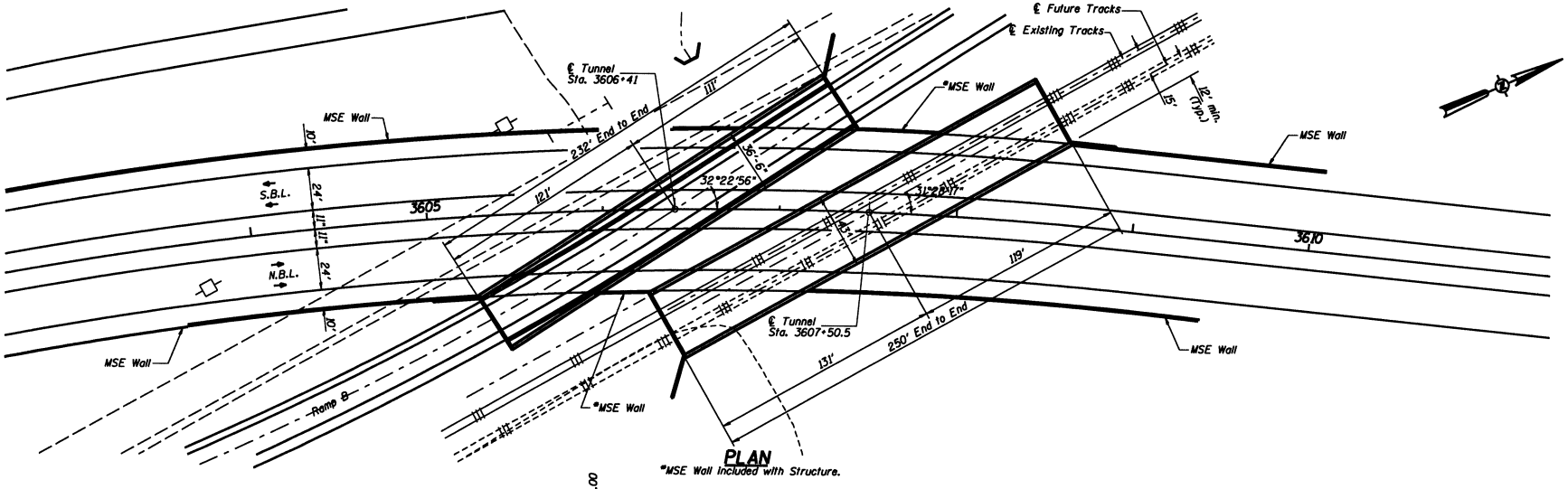
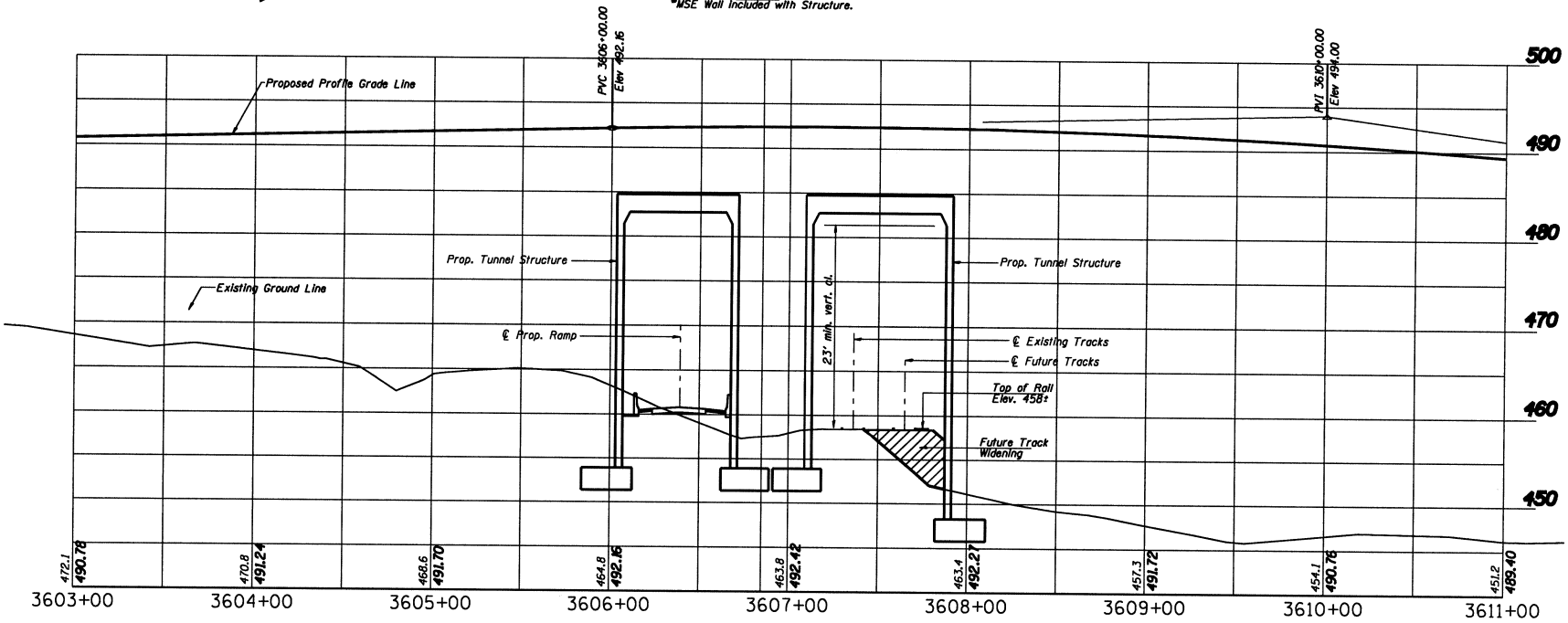
SPARLAND ALT 3A, NORTH RAILROAD CROSSING, TUNNEL DRAWING (3/19/2005)



PLAN

*MSE Wall included with Structure.



SPARLAND ALT 3A, SOUTH RAILROAD CROSSING, TUNNEL DRAWING (3/19/2005)

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Wednesday, November 23, 2005 3:38 PM
To: Jim Jodie
Cc: Brian Borgman; Mike Meier
Subject: IL Route 29--Sparland Structures, additional railroad track, bridge clearances

Memo-Jodie.doc

Hello Jim,

Attached is a brief report addressing some of the consequences of a second railroad track. In view of the complexity of the structures in Sparland the bridge configurations such as spans, construction depth, clearances, etc. are estimated at this time. A more detailed study would be done during the TSL plan preparation. It should be OK to proceed with the bridge and grades as shown.

I hope the attached information will be of some help in completing the Phase I report. If any questions please call. Have a happy thanksgiving.

Jim Hamilton
Hutchison Engineering, Inc
jhamilton@hutchisoneng.com
Ph: (217) 245-7164
Fax: (217) 243-0468

November 23, 2005

MEMORANDUM

To: Jim Jodie

From: Jim Hamilton

Subject: Bridge Clearances – L&S RR – Parallel Track
Bridge & Roadway Impact from Additional RR Track

I did a cursory study of the Central Section from Station 3365+00 to Station 3858+62.39 or about 9.4 miles from the rest area to the end of the central section. This includes the bridge structures in Sparland which could be impacted by the addition of a new RR track.

The following comments, observations and conclusions are based on "preliminary" analysis of future RR track construction and its impact to the IL 29 road and bridge construction.

1. L&S RR has approximately 100' of ROW (50' either side of the existing track). IDOT may have easements both temporary and permanent for construction and maintenance purposes.

2. As you said, adding a track to the west would be difficult or impossible unless the proposed IL 29 alignment is modified. There are obvious reasons including drainage ditches, clearances and access road construction that would require re-designing and/or shifting IL 29 to the west if a new track were to be built west of the existing.

3. Construction of a track on the east would have less impact to the proposed IL 29 improvement.

4. From the Rest Area to the end of the central section, the existing tracks are fairly close to the centerline of IL 29 and the rail elevation ranges from approximately 456' to 473' – several feet lower than the proposed IL 29 profile grade. The average top of rail is about 464.0 ft. The existing rail elevations in some areas are below the Illinois River 100-year HW Elevation. For example, from Station 367500. to Station 370000 or about 0.5 mile, the top of rail is about 458.5 ft. This is near River Mile 190 on the Illinois River where the 100-year HWE is 460.9' or about 2.5' above

the rail. If the railroad were to build a new track, would they construct at the same elevation as the existing?

5. There may be some locations where the railroad could build siding or storage tracks on either side of the existing with minimal impact to the proposed roadway.

6. In the central section, there are some locations that will require new RR bridge structures and these are adjacent to IL 29 Structures, SN 062-0010 (Unnamed Tributary), SN 062-0009 (Rattlesnake Hollow), SN 062-0008 (Barrville Creek), SN 062-0004 (Crow Creek). Also, in Sparland, there are two locations, one at Gimlet Creek and one at Thenius Creek, both having railroad structures. Should the railroad add a second set of tracks through Sparland both locations will require new bridges to be constructed. Both the railroad structures in Sparland (Thenius & Gimlet) are too low and inadequate for hydraulics. Photos of the railroad bridges are attached and illustrate their condition and hydraulic deficiency. If the railroad ever adds a second track, new bridge structures will be required to carry the new track at all the above locations.

7. Construction depth of the bridges in Sparland should not change significantly.

8. Detail planning of the bridges would be part of the TSL phase. Because of the complexity of the bridges in Sparland – high skew angle, future tracks, clearances, etc., you will have to be somewhat flexible in setting roadway profile grades, spans, etc. unless a more in-depth bridge study is done. The general bridge concept for these locations should not change dramatically by adding a second track. It does not appear realistic to build a second track at the same grade as the existing and obtain waterway permits.

PHOTO 1

Gimlet Creek RR Bridge

Looking Downstream (East)

PHOTO 2

Gimlet Creek RR Bridge

Looking Downstream (East)
from Underneath IL 29 Bridge

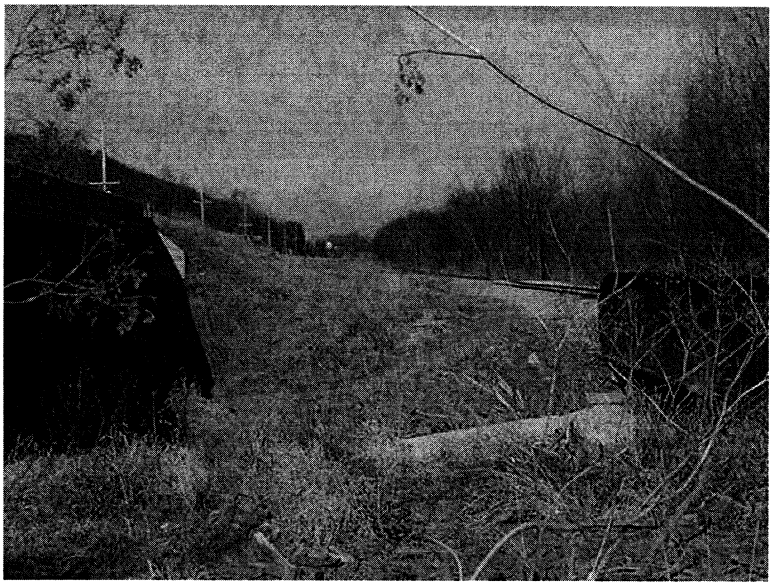


PHOTO 3

Thenius Creek RR Bridge

Looking North –
RR Bridge Way Lower
Than IL 29 Bridge

PHOTO 4

Thenius Creek RR Bridge

Obviously Too Low From Debris
on Bottom of Girder

Mike Meier

From: Jim Hamilton [jhamilton@hutchisoneng.com]
Sent: Wednesday, December 07, 2005 9:26 AM
To: Kim.Kolody@CH2M.com
Cc: Jim Jodie; Mike Meier; Brian Borgman
Subject: RE: Bridge sketch Sparland north crossing

Kim,

Attached is a memorandum with some comments about the Sparland north crossing carrying IL 29 mainline over Thenius Creek, L&S RR, Ramp C, and a service road. Also attached is a sketch of a possible bridge layout showing a plan, elevation and bridge pier sketch. I allowed for a future railroad track 15' east of the existing.

This would be a high cost structure at least $6.5 to 8.0 million not including the retaining walls.

Some refinement of the bridge layout, profile grade and other structural details would be necessary in Phase II. If you have any questions please call.

-----Original Message-----
From: Kim.Kolody@CH2M.com [mailto:Kim.Kolody@CH2M.com]
Sent: Wednesday, November 30, 2005 2:25 PM
To: jhamilton@hutchisoneng.com
Subject: RE: Bridge sketch Sparland north crossing

ok thanks

From: Jim Hamilton [mailto:jhamilton@hutchisoneng.com]
Sent: Wednesday, November 30, 2005 2:23 PM
To: Kolody, Kim/CHI
Subject: RE: Bridge sketch Sparland north crossing

Kim,

I was working on the north bridge at this time. I should have a sketch ready in a few days.

-----Original Message-----
From: Kim.Kolody@CH2M.com [mailto:Kim.Kolody@CH2M.com]
Sent: Wednesday, November 30, 2005 11:53 AM
To: jhamilton@hutchisoneng.com
Subject: Bridge sketch Sparland north crossing

Jim - do you have a bridge sketch for the north crossing of IL 29 in Sparland (over Thenius and ramp C)?
thank you - Kim

December 5, 2005

MEMORANDUM

To: Kim Kolody

From: Jim Hamilton

Subject: IL 29 in Sparland
North Crossing
IL 29 Mainline Over Thenius, L&S RR, and Ramp C

The north bridge crossing in Sparland is more complex than most of the other structures on this project. The proposed profile grade on IL 29 will be governed by furnishing the minimum required vertical clearance above the L&S RR tracks. The recommended vertical clearance as shown in the BDE Manual is 23'-0" unless the ICC permits a lesser clearance based on operational or other conditions.

The angle of crossing of 69° ± between the railroad and IL 29 will result in a much longer than normal bridge as well as some special pier arrangement and structural design to avoid prohibitive high bridge skew angle. The most reasonable arrangement is to construct the piers at near right angle to the railroad tracks and Ramp "C". The bridge skew of 21°± is acceptable and the span lengths would be held to a fairly reasonable length. The railroad tracks and Ramp "C" would pass between the pier columns and beneath a structural pier cap that supports the proposed bridge superstructure. In addition to spanning the L&S RR and Ramp "C", the bridge also must span a service road and Thenius Creek to the south.

The minimum bridge layout is shown in the attached bridge drawing. The SBL structure will consist of four spans with lengths of 100', 150', 150', and 100', whereas the NBL structure will require five spans of 100', 150', 150', 140' and 100'. The approaches will require MSE type retaining walls at all four quadrants as well as at the abutments. The walls are necessary because of roadway and/or ROW restrictions that preclude the construction of conventional roadway embankment.

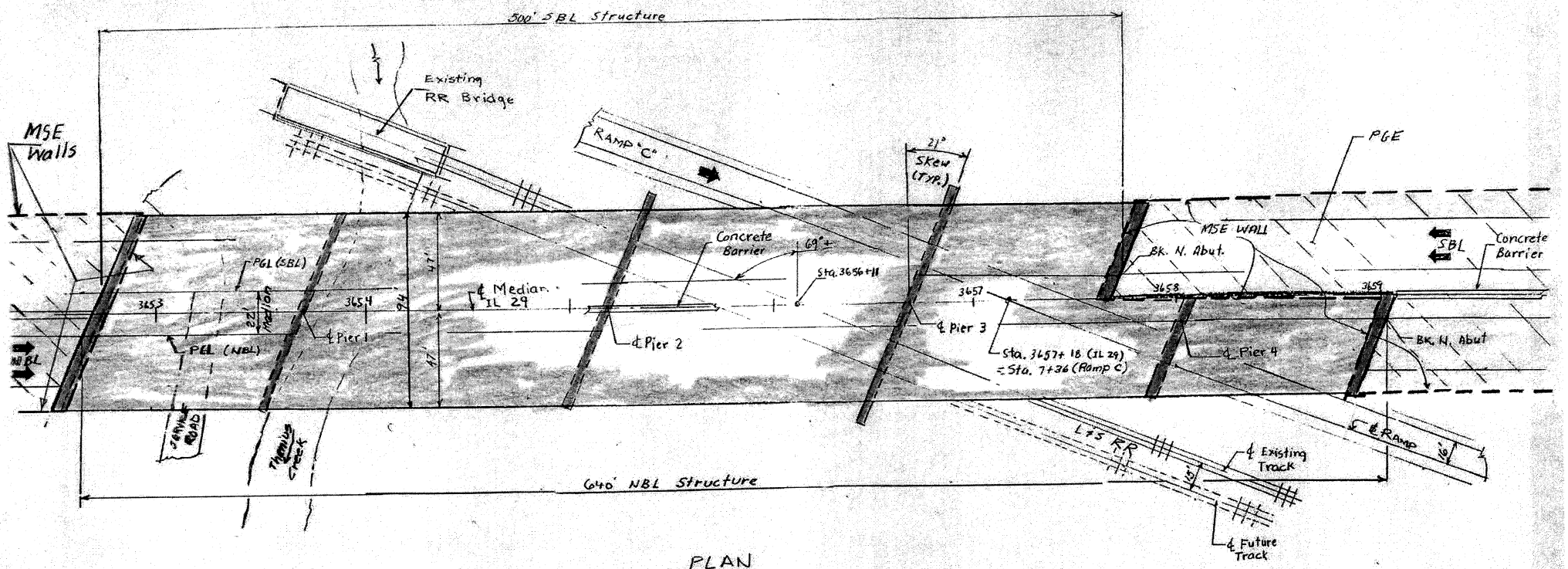
Another complicating issue is the remote possibility of a future set of RR tracks constructed approximately 15' to the east and parallel to the existing tracks. It remains to be determined whether the railroad could construct another bridge over Thenius Creek for the future track or if they would build a new bridge for two tracks without any change in alignment of either the railroad or IL 29.

The estimated height from top of rail to IL 29 profile grade is 30.8' at pier 2 and 33.9' at pier 3. After deduction of 23.0 vertical clearance, this leaves 7.8' and 10.9' total construction depth available for the superstructure and for the structural pier beam cap. The available construction depth at pier 2 is probably marginal or unacceptable depending on the type of pier cap design finally recommended. An integral type pier would require the least construction depth because the pier cap – either steel or concrete could be built with the superstructure framing, thereby lowering the roadway profile.

Integral type piers are used infrequently by IDOT and would require further investigation of structural, geometric, and economic considerations. At this preliminary planning phase it would be unrealistic to determine all grades, construction depth requirements, clearances, etc. in view of the uncertainties regarding the future railroad and other design criteria.

The plan as proposed should be adequate for preliminary cost estimates and roadway alignments and profiles. Some refinement will be required in Phase II as is expected for most projects of this magnitude. If you have any questions, please call.

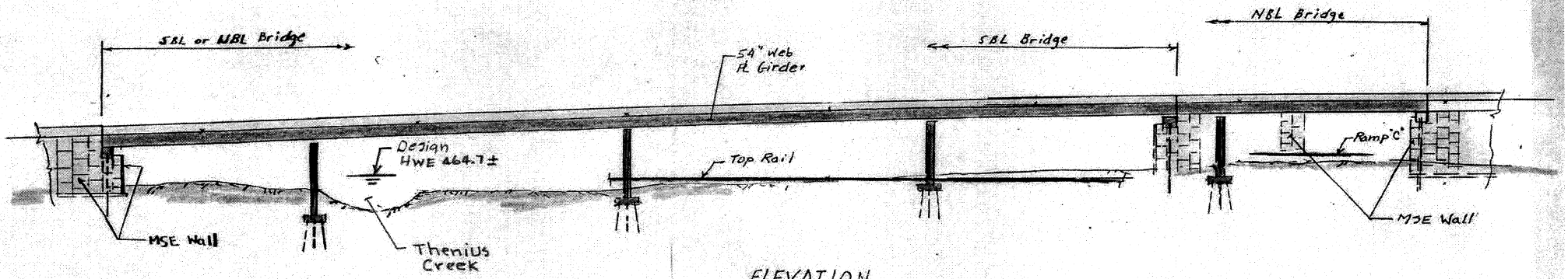
JOH:cm



PLAN

NORTH SPARLAND BRIDGE
IL 29 MAINLINE OVER
THENIUS CR, L&S RR AND RAMP "C"

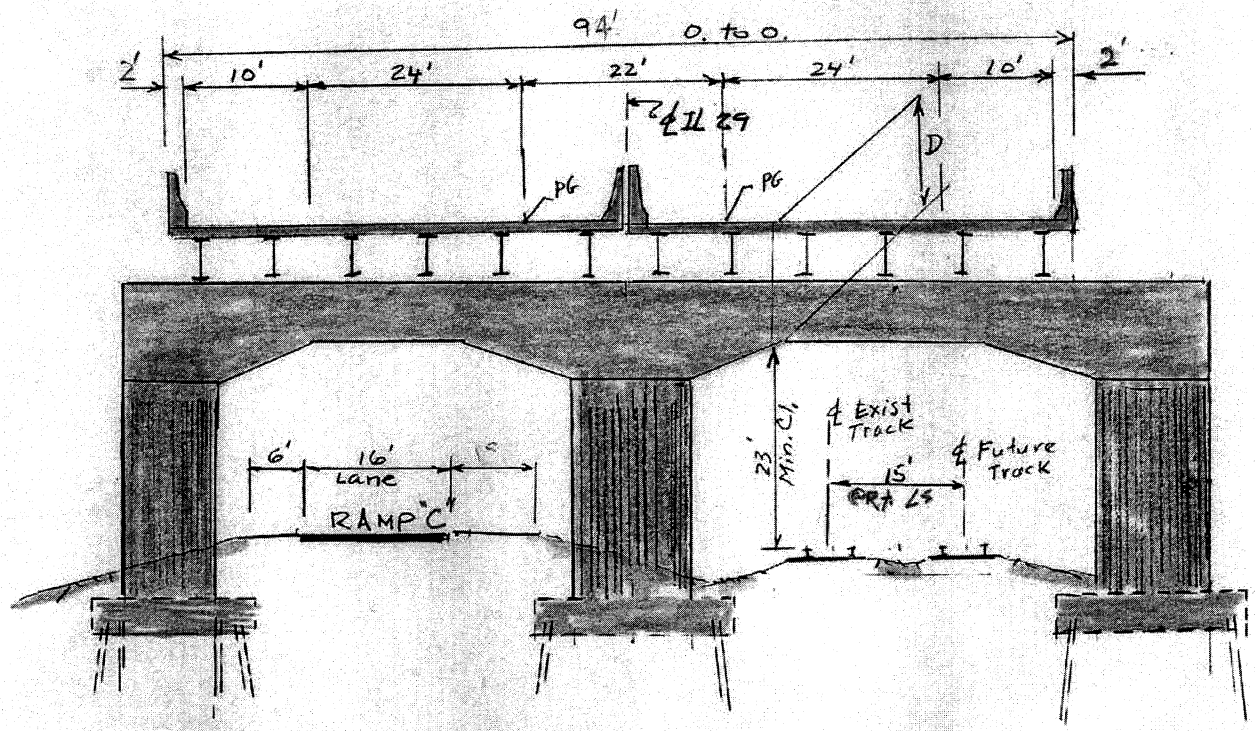
12/2/2005



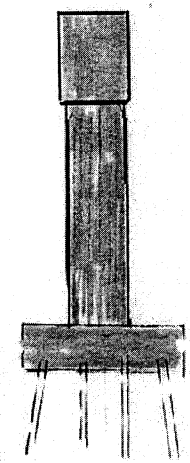
ELEVATION

NORTH SPARLAND BRIDGE
IL 29 MAINLINE OVER
THENIUS CR., L&S RR AND RAMP "C"

12/2/2005



PIER SKETCH (LOOKING NORTH)



END VIEW

NOTES:

1. Pier sketch shown above illustrates a conventional cap with bearings and beams on top of the cap.
2. Dimension "D" is estimated at 10.5' to 11' for the Superstructure and pier cap shown.
3. An optional "integral pier cap" would reduce the construction depth with special structural design and framing requirements.

NORTH SPARLAND BRIDGE
IL 29 MAINLINE OVER
THENIUS CREEK, L&S RR and RAMP "C"

12/2/2005