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STRUCTURE GEOTECHNICAL REPORT

EXISTING S.N. 052-0040
PROPOSED S.N. 052-0076

Melugins Grove Road (TR 238) over Drainage Ditch
Section (114-1)BR-1
Lee County

P-92-102-05
Contract No. 64B39
PTB NO. 136 ITEM 8

Prepared By: Kristen Fields
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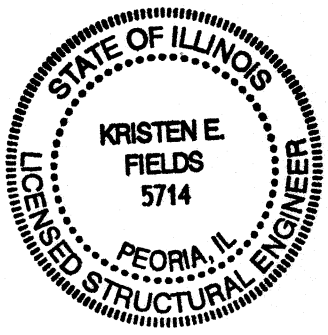
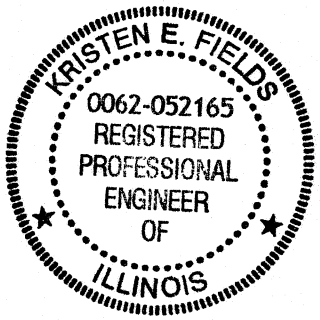
Kristen Fields, PE, SE
S.E. No.: 5714
Exp.: 11/08
P.E. No.: 062-052165
Exp.: 11/09

Date: September 13, 2007
Rev. Date: September 29, 2008





Attachments to Report :
- Preliminary General Plan and Profile
- Topographic Plan
- Soil Profile
- Location Map
- Geotechnical Data: Soil Borings

Note:

This SGR, previously approved on January 2008, has been updated by the BBS Foundations and Geotechnical Unit due to significant changes to the proposed structure and scour depths, as well as updating some aspects to comply with current policy.

Summary of changes:

- Updated scour information.
- Updated seismic data.
- Pile Design Tables were updated from ASD to LRFD; in addition, only metal shells need be considered.
- Single span bridge option was removed.
- Type 2 Cofferdam with sealcoat shall be considered if footings are to be cast-in-place, due to presence of sand under the water table.
- Included most up to date TSL.

Revised by: Doris Gonzalez / Bradly Hessing, FGU

Rev. Date: December 15, 2023

PROJECT DESCRIPTION

This project is to design a total replacement structure for S.N. 052-0040. The current structure is located on Melugins Grove Road (TR 238) over the south drainage ditch of US Route 30, 1.0 miles west of IL 251 in Lee County, Illinois. The reasons for the proposed structure replacement are the age of structure, that the concrete deck slab was rated in poor condition and substructure was rated in fair condition with both needing repairs, the curbs and rails are in an advanced state of deterioration, and the existing bridge rail configuration creates a potential hazard for the traffic on US Route 30. Additionally, the existing structure has a capacity for only an H-15 Live Load as defined by AASHTO specification. The Bridge Condition Report has recommended complete replacement of the structure.

The existing structure was constructed in 1938 and is a single span reinforced concrete slab superstructure 14" thick with no bituminous concrete overlay. The abutments are reinforced concrete closed construction on untreated timber piles. The structure length is 28'-0" back-to-back of abutments. The out-to-out deck slab width is 33'-0". The structure is constructed perpendicular to US Route 30 on a 0% grade.

The proposed structure type that is being considered for replacement is a three-sided precast concrete structure. This structure is located in an area that is known to be very swampy. A pile supported structure will be recommended due to the poor soil conditions. The plan layout of the proposed structure, R.O.W., and utilities are shown in the attached Preliminary Plan and Profile. The existing ground contours are shown on the attached Topographic Plan. The proposed structure is planned to be constructed under road closure.

The existing structure is located just adjacent to US Route 30. The existing rails on the structure result in a potential hazard for traffic on US Route 30. The proposed structure will need to be relocated approximately 24 feet south and further away from US Route 30 to be outside the clear zone requirements for US Route 30. The wingwalls of a 3-sided precast structure and the rails for a single span bridge both are potential hazards for US Route 30 traffic.

GENERAL SUBSURFACE CONDITIONS

Based on the USDA "Soil Survey of Lee County, Illinois", the mapped soil association within the bridge site is designated "Hartsburg." This association for soil is described as a silt loam and silty clay loam to a depth of 5 feet. The Soil Survey further defines the soil as being subject to severe ponding and flooding.

Two soil borings were made available to Maurer-Stutz, Inc. for use in preparing this report. The borings were taken in August, 2005 and were completed by IDOT drilling crews. The approximate locations of the borings are shown on the attached Preliminary Plans and Profile sheet. The soil strata encountered at each boring location is shown in the attached Boring Logs and Soil Profile sheet.

The streambed elevation is approximately 757, and the ground surface is at approximately 767 in elevation. From the two boring logs, there is a great deal of consistency between the two borings below elevation 755.

Boring B-1b indicates that the soil between elevation 760 and 767 is a medium to stiff silty clay loam/ loam mixture. N-values from the standard penetrometer test vary from 6 to 7 blows per foot, and unconfined compressive strength test results range from 0.8 to 2.1 tons per square foot (tsf). Moisture contents range from 16 to 29 percent. Boring B-1b indicates at elevation 760 begins the medium sand soil that is described below.

Boring B-2b indicates that the soil between elevations 755 and 767 is a loam/ sandy loam with a 5-foot-thick layer of loose sand. The loose sand layer has N-values from a standard penetrometer test of 7

blows per foot. The loam/ sandy loam soil has N-values from the standard penetrometer test ranging from 2 to 6 blows per foot, unconfined compressive strength test results ranging from 0.3 to 1.1 tsf, and moisture contents ranging from 16 to 18 percent.

Both soil borings indicate that the soil between elevations 727 and 755 for Boring B-2b, or 760 for Boring B-1b, is primarily a medium, fine sand. The medium sand layer has N-values from the standard penetrometer test ranging from 12 to 28 blows per foot.

Both soil borings indicate that between approximately elevation 714 and 727 lies medium to very stiff silty clay loam till. N-values from the standard penetrometer test vary from 6 to 14 blows per foot, and the unconfined compressive strength test results range from 0.7 to 2.7 tsf. Moisture contents range from 10 to 19 percent.

Both soil borings indicate that between elevations 705 and 714 the soil is a soft to very stiff silt with unconfined compressive strength tests ranging from 0.3 to 2.2 tsf, and moisture contents ranging from 26 to 76 percent. N-values from the standard penetrometer test vary from 4 to 16 blows per foot.

Both soil borings indicate that below elevation 705 the soil is a soft to very stiff silty clay loam till with unconfined compressive strength tests ranging from 0.4 to 3.7 tsf, and moisture contents ranging from 11 to 23 percent. N-values from the standard penetrometer test vary from 8 to 35 blows per foot.

Groundwater was first encountered during drilling at an elevation of 754.6 on Boring B-1b, and an elevation of 754.4 on Boring B-2b. The groundwater elevation after 24 hours after drilling was recorded at elevation 755.1 on Boring B-1b, and elevation 753.9 on Boring B-2b. The stream bed elevation is approximately 757. Based on the information provided in the soil borings, it is estimated that the groundwater table is approximately between elevation 754 and 755. The groundwater level at the site may fluctuate due to the slope of the natural ground, seasonal variations, and other considerations that may not have been evident at the time the borings were drilled.
The water elevation in the drainage ditch may fluctuate with the seasons and with recent amounts of rainfall or melting snow.

GEOTECHNICAL EVALUATIONS

Settlement.

The existing structure is a 28’-0” long single-span bridge on timber pile-supported abutments. The proposed structure will be a pile-supported, 3-sided precast concrete structure with a span approximately the same as existing. A pile-supported structure is planned for this location due to the swampy conditions, the presence of a high water table, and the presence of a thick layer of saturated sand which has significant settlement potential for supporting spread footings. The profile grade of the roadway is planned to be raised approximately 0.5 feet, and the drainage ditch will need to be regraded and relocated for the new structure to be located 24 feet south of its current location.

The new piles supporting the proposed structure will be driven into the very stiff silty clay loam till layer, which will result in a minimal settlement of the proposed structure. Therefore, settlement of the piles will be insignificant and not a factor in the design or performance of the new pile-supported structure.

The embankment on either side of the drainage ditch will be filled in on the north side and cut back on the south side at 2:1 slopes for the relocation of the structure 24 feet to the south for either proposed structure option. Settlement within the new embankment is expected to be minimal, if it is constructed according to the proper compaction requirements as given in the Standard Specifications. The discussion on settlement for the embankment will be regarding the compressibility of the existing natural soils.

An additional surcharge on the existing ground surface will result from the placement of new embankment on the north side of the drainage ditch and behind the wingwalls. Approximately the top 20 feet of soil below the streambed elevation is the limited depth of soil that will have a significant increase in vertical pressure over the existing overburden due to the placement of the new embankment. The soil from approximately the streambed elevation to 30 feet below the streambed elevation is a medium, fine sand. The potential settlement in this sand layer will occur primarily as the embankment is placed and should not be of concern for the long-term performance of the embankment. An adequate safety factor was found for the allowable bearing pressure of the sand layer below the streambed to support the new embankment fill.

The FGU recommends that the new embankment fill on the North side of the drainage ditch be placed as soon as possible (prior to construction of the new structure) to allow soils to settle and ensure that the majority of the settlement occurs during construction. Even though settlement within the new embankment is expected to be minimal if construction is performed in accordance with IDOT specifications, settlement as small as 0.4" can create downdrag forces on the piles. For the proposed structure, the tops of the piles are below the streambed elevation and new embankment soil, so the piles will not have any downdrag forces to be applied for design.

Slope Stability.

The embankment on either side of the drainage ditch will be filled in on the north side and cut back on the south side at minimum 3:1 slopes for the relocation of the structure 24 feet to the south. Also new embankment will be placed behind the proposed wingwalls. The existing soil in this embankment area varies from a loose sand to a soft to medium sandy loam to a very stiff silty clay loam mixture. The vertical height between the ground surface and the streambed elevation is approximately 10 feet, which is relatively small. Slope stability problems were not noted in the existing site conditions. Slope stability is not expected to be a factor in the design or performance of the new pile-supported structure.

The rule of thumb analysis given in the IDOT Geotechnical Manual (1999) was performed for the new fill slopes within the existing drainage ditch using the Terzaghi's bearing capacity equation to determine base stability. The results of the base stability analysis had acceptable safety factors greater than 3.0, provided that the loose sand that exists above the streambed elevation is not used to form the new embankment. The height of the new fill embankment will be placed at a steepest slope of approximately a 2:1 for the bridge option, and with flatter slopes for the 3-sided culvert option. The XStabl program was also run for a slope stability analysis of the new embankment slopes for both the bridge and the three-sided culvert options. The minimum factor of safety result from the XStabl analyses is 3.3. The new embankment slopes are considered safe for slope stability.

Seismic Considerations.

The project site is located in western Lee County, Illinois. In accordance with IDOT procedures, the project Seismic Site Class corresponds to C and its spectral accelerations, SD1 and SDS are 0.063g and 0.117g, respectively. These values lead to a Seismic Performance Zone 1 in accordance with the AASHTO Standard Specifications procedure.

Both of the soil borings indicate that a 28- to 33-foot-thick layer of sand with the lower bound at approximately elevation 727 exists below the streambed at the proposed structure location. This layer of sand is very likely below the groundwater table elevation. The potential for liquefaction to occur exists within this sand layer. The potential for liquefaction to occur decreases with an increase in depth of the layer and with an increase in the density of the layer.

Despite the liquefaction potential of the thick layer of sand that exists below the proposed structure, there is a very low probability that a seismic event will occur at the location of the structure. The safety risk to

the traveling public at this pile-supported proposed structure is low in the unlikely event of a seismic occurrence. Therefore, the potential for liquefaction to occur is considered small, and liquefaction should not be a factor in the design of the pile foundations for either structure option.

Scour.

No evidence of scour or channel migration was visible at the site of the structure. The drainage ditch forming the waterway channel and its protection were rated in good condition with minor problems on the IDOT Master Structure Report.

A scour analysis for the proposed structure provided by the District on November 2023 reflected a total scour depth equal to 17.8 ft. According to this analysis, a flood frequency of 81 years will be utilized to calculate the Design and Check Scour Elevations. Riprap will be used for slope and channel protection in the area of the new structure. Design scour elevations are provided in the Table below indicating the elevation for tolerable soil loss while maintaining the structural integrity of either structure.

Table 1: Design Scour Elevations

Event/Limit State	Design Scour Elevations (ft.)		Item 113
	N. Abut.	S. Abut.	
Q100	738.4	738.4	5
Q200	738.4	738.4	
Design	738.4	738.4	
Check	738.4	738.4	

Mining Activity.

According to ISGS records, Lee County has no record of mining that has occurred.

FOUNDATION EVALUATIONS AND DESIGN RECOMMENDATIONS

It is recommended that the stream banks within the channel realignment locations on the upstream side of the proposed structure be armored with riprap to reduce potential erosion on the newly formed stream bank surfaces. It is also recommended that the remainder of the stream banks be armored with an appropriate turf reinforcement mat.

Due to the high water table elevation and the presence of loose granular soils at the location of the proposed structure, it is recommended that construction of any new hard road surface not occur until the new embankment on the north side of the structure has been in place for a minimum of three months to allow for the majority of potential new settlement to occur. It is also recommended that a two-foot-thick layer of breaker run rock be provided as a working platform for construction of the new embankment within the existing channel.

The proposed three-sided precast concrete culvert, if chosen, is planned to be supported on two lines of piles for each concrete pile cap below each wall and wingwall to resist horizontal loadings. Drilled shafts are not seen as necessary and would be less economical than driven piles. Spread footings are not as desirable and have the potential for significant settlement on saturated sand soil in a swampy area with a high water table elevation.

Based on the loads, the subsurface data, and the type of pile cap below the three-sided culvert walls planned for use, driven piling appears to be the appropriate foundation to support the proposed structure. Given the loads and the subsurface data Metal Shell piles appear to be the most appropriate pile type for the structure foundation. Friction piles should be used due to the fact that the borings do not indicate a soil layer with sufficient stiffness to provide significant end bearing for the piles. Based on the information provided in the soil borings, some layers of soil were described as dense or very stiff and could cause some damage to the metal shell piles. Below approximately elevation 680 the soil becomes a very stiff silty clay loam till, which may be too stiff to drive the metal shell piles through without damage. It is recommended that pile shoes be used for the metal shell piles.

The three-sided precast concrete culvert option had preliminary service load estimates of 11 kips per foot of culvert of vertical force and 3 kips per foot of culvert of horizontal outward thrust force due to gravity loads.

Table 2 shows estimated pile lengths for metal shell piles with and without scour losses. The estimated pile lengths are given for each pile size for various values of LRFD Factored Resistance Available and their corresponding Nominal Required Bearings. The vertical load capacity for the metal shell piles may limited by the depth it can be driven until very stiff soil is encountered.

Table 2: Pile Design Table

Pile Section	Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Length (ft.)
Metal Shell 12” dia. w/.25” walls	223	123	41
	267	147	51
	323	178	61
	392	216	71
Metal Shell 14” dia. w/.25” walls	264	145	41
	314	173	51
	382	210	61
	459	252	71
Metal Shell 14” dia. w/.312” walls	264	145	41
	314	173	51
	382	210	61
	462	254	71
	570	313	90
Metal Shell 16” dia. w/.312” walls	305	168	41
	361	198	51
	442	243	61
	533	293	71
	654	360	89

It is recommended that a total of two test piles be driven, one at each abutment or one below each wall of the three-sided precast culvert. All test piles are to be driven to 110 percent of the NRB value that is provided on the bridge plans for the pile design used, in accordance with IDOT policy.

The pile group capacity may be designed as the sum of the Factored Resistance Available for individual piles as long as a spacing of at least three pile widths is maintained between piles, measured center to center.

The three-sided precast culvert option will have significant lateral loads applied to the piles in addition to the vertical loads. Lateral load resistance and resulting lateral deflection are typically assessed using computer models based on the lateral modulus of subgrade reaction and considering pile-soil interaction. Common types of soil between the two borings were grouped together, with average test results within each layer used to obtain design values for the soil strata.

According to the AllPile, Version 7 program, pile fixity for the 12" diameter metal shell piles occurs at approximately 7 feet below the top of pile, and at approximately 9 feet below the top of steel H-Piles using a lateral load of 11 kips per pile. Therefore, pile fixity for lateral loads will not control the embedment depth for the piles. According to the AllPile, Version 7 program, the design values in the following Table 3 are recommended. The modulus of subgrade reaction value k describes the increase in the modulus of elasticity of the soil with depth and is not the same as the coefficient of lateral subgrade reaction. The soil strain e50 is the strain at which 50% of the undrained shear strength is developed in a compression test.

Table 3: Lateral Loading Analysis Parameters

Elevation Boundaries of Soil Layers	Soil Type	Modulus of Subgrade Reaction k (psi)	E50	Relative Density Dr
727 to 755	Medium, Fine Sand	80	N/A	47%
714 to 727	Med. To Very Stiff Silty Clay Loam Till	200	0.0104	N/A
705 to 714	Soft to Very Stiff Silt	130	0.0121	N/A
Below 705	Soft to Very Stiff Silty Clay Loam Till	440	0.0075	N/A

The pile group capacity may be designed as the sum of the available lateral resistances for individual piles as long as a spacing of at least three pile widths is maintained between piles, measured center to center.

The typical recommended lateral soil pressures given in the IDOT Culvert Manual (2000) appear to be appropriate for the design of the wingwalls and the side walls of the culvert. The typical design for wingwalls uses an equivalent fluid pressure of 40 pounds per cubic foot for level fills and an increased equivalent fluid pressure with an increase in fill backslope, given that the backfill around the wingwalls will be placed in accordance with IDOT Standard Specifications. Weep holes in accordance with IDOT standards shall be used to relieve hydrostatic pressure behind the walls. The typical design for the culvert side walls uses an equivalent fluid pressure of 40 pounds per cubic foot for the fill above the culvert and 50 pounds per cubic foot for the height of the culvert walls.

CONSTRUCTION CONSIDERATIONS

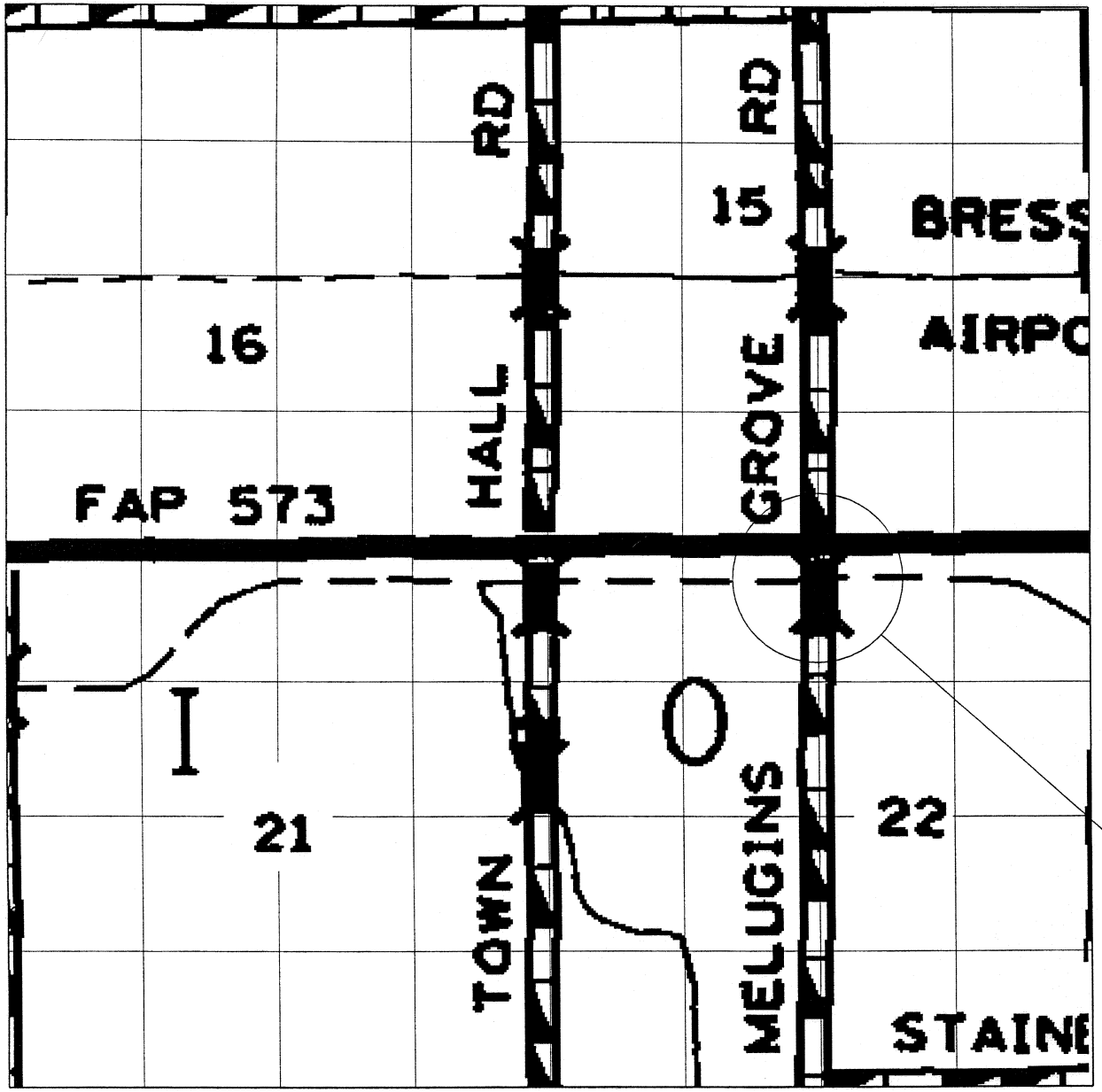
The proposed culvert will be constructed under road closure and traffic detour conditions. The proposed structure will be located approximately 24 feet south of the existing structure and will require placement of new embankment to reshape and relocate the drainage ditch. Temporary sheet piling does not appear to be necessary for the construction of the proposed structure.

Due to the presence of sand under the water table in the area of the proposed structure, the use of a Type 2 Cofferdam may be required for the construction of cast-in-place pile caps for the three-sided structure walls and cast-in-place footings for the wingwalls.

There are power lines running parallel to and on the west side of TR 238. A power pole is located near the southwest corner of the existing structure. Nothing overhead was observed that would potentially impact the driving of the piling for the proposed structure. The proposed three-sided precast culvert will extend under the existing power lines just west of TR 238 road location. The power pole and power lines may need to be relocated temporarily during construction. The proposed piling will be located approximately 24 feet south of the existing abutments, so the proposed piles under the north wall of the culvert will be located very close to the existing south abutment pile locations. The designer of the proposed structure should make sure that the proposed piles the north wall of the culvert are far enough north of the existing piles for the south abutment of the existing bridge to not cause interference.

R 1 E - 3rd P.M.

T 38 N



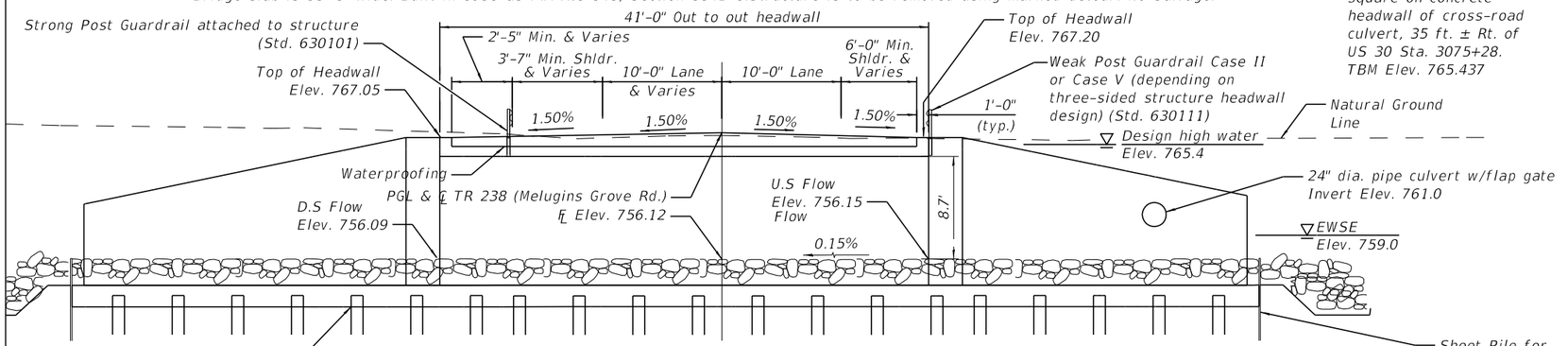
N

Proposed Structure

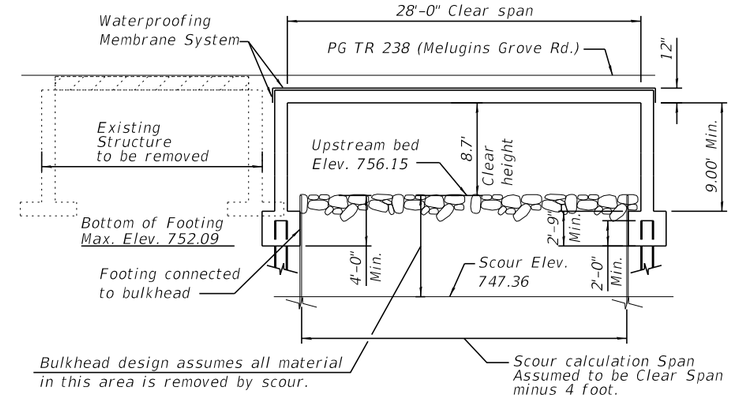
LOCATION SKETCH

EXISTING STRUCTURE: SN 052-0040 single span R.C. slab bridge, 28 ft. back to back of closed R.C. abutments supported on timber piles. Bridge slab is 33'-1" wide. Built in 1938 as F.A Rte 141, Section 114B-1.Structure is to be removed using marked detour. No Salvage.

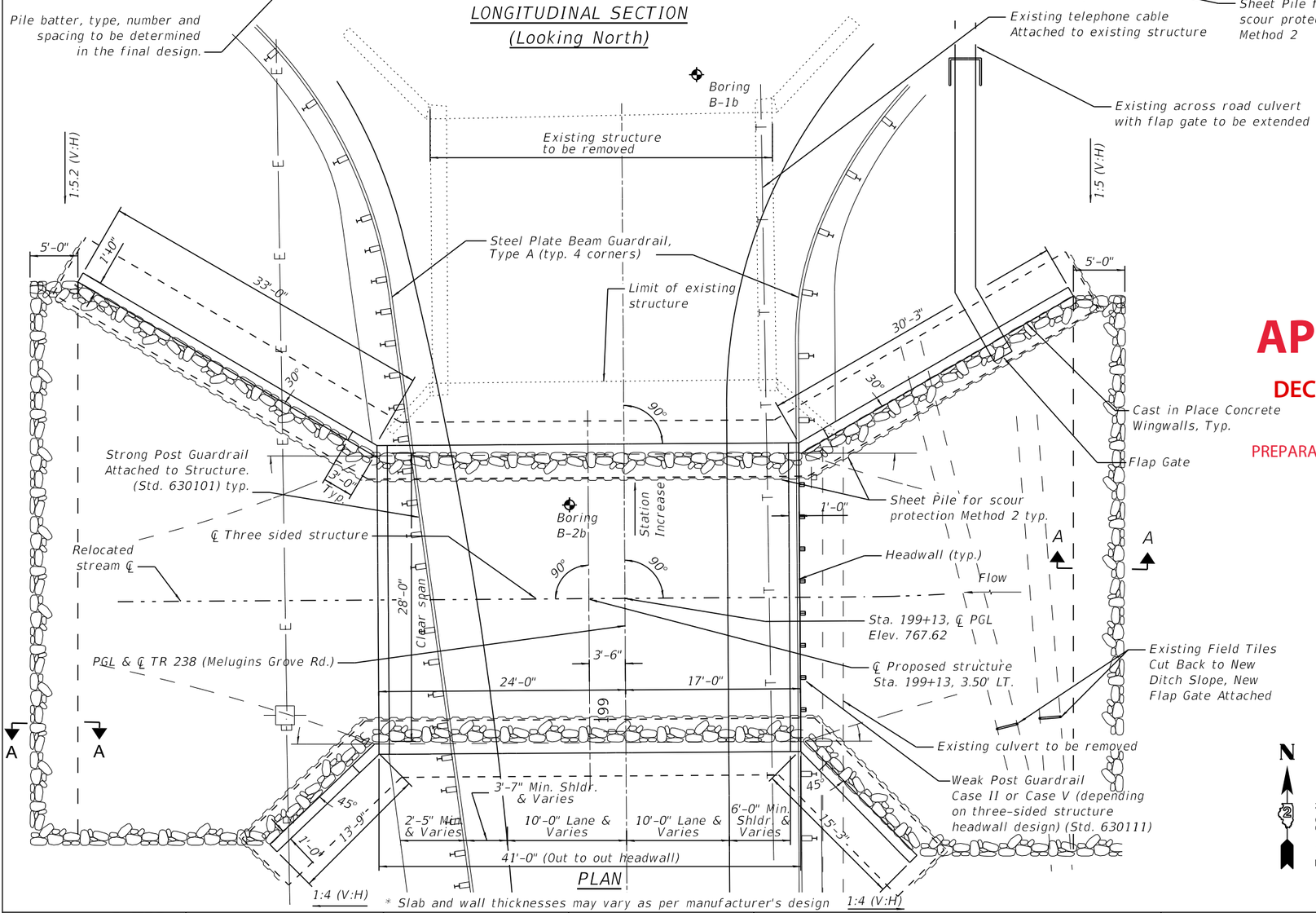
BENCHMARK: BM 401 chiseled square on concrete headwall of cross-road culvert, 35 ft. ± Rt. of US 30 Sta. 3075+28. TBM Elev. 765.437



LONGITUDINAL SECTION
(Looking North)



SECTION THROUGH STRUCTURE
(Looking East)



PLAN

NOTES:

1. A closed bottom structure is not allowed.
2. Sheet pile for scour protection Method 2 is shown.
3. Slab & wall thickness, shape, cofferdam, wingwall type and foundations may vary as per manufacturer.
4. A Type-2 cofferdam will be required for the construction of a cast-in-place footing.
5. The existing overhead utility on west side will be relocated by others.
6. Existing telephone cable attached to structure is to be relocated by others.

HIGHWAY CLASSIFICATION

F.A.P. 573, TR 238 (Melugins Grove Road)
Functional Class : Local Road
ADT: 50 (2024); 75 (2044)
ADTt: 7 (2024); 10 (2044)
DHV: 10 (2044)
Design Speed: 35 m.p.h
Posted Speed: none
Two-Way Traffic Directional Distribution = 50/50

APPROVED

DECEMBER 06, 2023

AS A BASIS FOR PREPARATION OF DETAILED PLANS

DESIGN SPECIFICATION

2020 AASHTO LRFD Bridge Design Specifications, 9th Edition

LOADING HL-93

Allow 50#/sq.ft. future wearing surface

DESIGN STRESS

FIELD UNITS

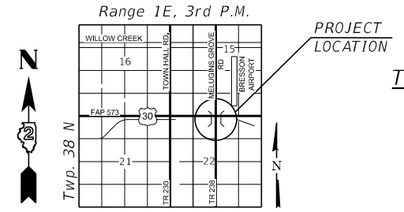
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi (Minimum)
fy = 60,000 psi (Reinforcement)

SEISMIC DATA

Seismic Site Class C
SPZ = 1
SDS = 0.117g
SD1 = 0.063g



LOCATION SKETCH

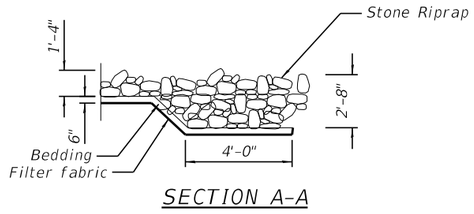
GENERAL PLAN AND ELEVATION
TR 238 (MELUGINS GROVE ROAD) OVER UNNAMED DRAINAGE DITCH
TR 230/238, SECTION (114-1) BR-1
LEE COUNTY
STA. 199+13
STRUCTURE NUMBER 052-0076

MW Midwest Engineering Associates, Inc. DESIGN FIRM No. 184-005896	USER NAME =	DESIGNED - PJL	REVISED -
		CHECKED -	REVISED -
	PLOT SCALE =	DRAWN - FUH	REVISED -
	PLOT DATE = 12/6/2023	CHECKED - PJL	REVISED -

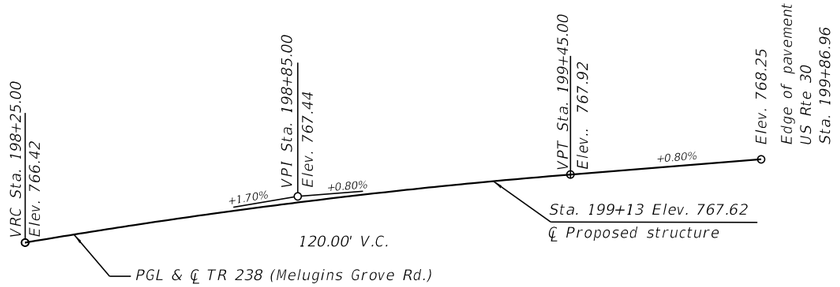
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN
STRUCTURE NO. 052-0076
SHEET NO. 1 OF 2 SHEETS

TR RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
230/238	(114-1) BR-1	LEE	151	55
STRUCTURE NO. 052-0076		CONTRACT NO. 64B39		
ILLINOIS FED. AID PROJECT				



SECTION A-A



PROFILE GRADE

WATERWAY INFORMATION TABLE

Existing Low EOP Elevation: 767.55 ft. @ Sta. 199+37.6

Drainage Area = 2.41 sq. mi. Proposed Low EOP Elevation:767.19 ft. @ Sta. 198+88.92

Flood	Frequency Year	Discharge cfs	Waterway Opening (sq ft)		Natural H.W.E.	Head (ft)		Headwater Elev. (ft)	
			Exist	Prop		Exist	Prop	Exist	Prop
Ten-Year	10	355	131	196	763.5	0.0	0.0	763.5	763.5
Design	50	593	197	215	765.4	0.1	0.0	765.5	765.4
Channel Full	54	622	197	215	765.7	0.1	0.0	765.8	765.7
Max	81	685	197	215	766.2	0.1	0.0	766.3	766.2
100-Year	100	706	197	215	766.2	0.1	0.0	766.3	766.2
200-Year	200	778	197	215	766.2	0.1	0.0	766.3	766.2

10-Year Velocity through Existing Structure = 2.7 fps

10-Year Velocity through Existing Structure = 1.9 fps

DESIGN SCOUR ELEVATION TABLE

Event / Limit State	Design Scour Elevations (ft.)		Item 113
	N. Abut.	S. Abut.	
Q100	738.4	738.4	5
Q200	738.4	738.4	
Design	738.4	738.4	
Check	738.4	738.4	

APPROVED

DECEMBER 06, 2023

AS A BASIS FOR
PREPARATION OF DETAILED PLANS

DETAILS
TR 238 (MELUGINS GROVE ROAD) OVER
UNNAMED DRAINAGE DITCH
F.A.P. 573, SECTION (114-1) BR-1
LEE COUNTY
STA. 199+13
STRUCTURE NUMBER 052-0076

FILE NAME =	MW Midwest Engineering Associates, Inc. DESIGN FIRM No. 184-005896	USER NAME =	DESIGNED - PJL	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
			CHECKED -	REVISED -	
		PLOT SCALE =	DRAWN - FUH	REVISED -	
		PLOT DATE = 12/6/2023	CHECKED - PJL	REVISED -	

GENERAL PLAN
STRUCTURE NO. 052-0076
SHEET NO. 2 OF 2 SHEETS

TR RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
230/238	(114-1) BR-1	LEE	151	56
STRUCTURE NO. 052-0076		CONTRACT NO. 64B39		
ILLINOIS	FED. AID PROJECT			

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/9/05

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 LOGGED BY W. Garza

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-1b
Station 52+73
Offset 26.00ft Lt US 30 CL
Ground Surface Elev. 100.2 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft
757
Groundwater Elev.:
First Encounter 87.7 ft ▼
Upon Completion Wash ft
After 24 Hrs. 88.2 ft ▽

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
		1.1 P	16	STIFF brown SILTY CLAY LOAM
97.70				
	3 3 4	2.1 P	25	VERY STIFF brown SILTY CLAY LOAM
96.20				
-5				
	1 2 4	0.8 B	29	MEDIUM gray tan LOAM 115.0 pcf
93.20				
	1 5 12			MEDIUM tan medium dry SAND
91.20				
-10				
	8 7 7			MEDIUM tan/gray fine SAND
88.70				
▽ ▼				
	6 7 8			MEDIUM gray clean medium SAND
86.20				
-15				
	4 6 8			MEDIUM gray fine SAND
83.70				
	5 8 9			MEDIUM gray fine SAND
81.20				
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5 8 9			MEDIUM gray fine SAND
78.70				
	6 8 9			Wash MEDIUM gray fine SAND
76.20				
-25				
	5 6 9			Wash MEDIUM gray fine SAND
73.70				
	6 8 12			MEDIUM gray fine SAND
71.20				
-30				
	6 9 11			MEDIUM gray clean medium coarse SAND
68.70				
	4 9 13			Wash MEDIUM gray SAND
66.20				
-35				
	8 14 17			Wash DENSE gray clean medium coarse SAND
63.70				
	6 8 9			MEDIUM gray fine SAND with SILTY CLAY LOAM
61.20				
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 Date 8/9/05

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E LOGGED BY W. Garza

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-1b
Station 52+73
Offset 26.00ft Lt US 30 CL
Ground Surface Elev. 100.2 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft

Groundwater Elev.:
First Encounter 87.7 ft ▼
Upon Completion Wash ft
After 24 Hrs. 88.2 ft ▽

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
	Wash MEDIUM gray SILTY LOAM TILL 143.8 pcf	1 3 6	0.7 B	19
58.70				
	VERY STIFF gray SILTY CLAY LOAM TILL 170.4 pcf	2 5 7	2.7 B	12
56.20				
-45	Wash STIFF gray SILTY CLAY LOAM TILL 153.4 pcf	2 3 5	1.9 B	13
53.70				
	STIFF gray SILTY CLAY LOAM TILL 177.8 pcf	1 2 4	1.1 B	14
51.20				
-50	Wash STIFF gray SILTY CLAY LOAM TILL 157.6 pcf	2 6 8	1.0 B	13
48.70				
	SOFT gray SILT	1 2 3	0.3 P	22
46.20				
-55	SOFT gray SILT 145.9 pcf	1 3 4	0.3 B	25
43.70				
	MEDIUM brown SILT with 16% ORGANICS 113.9 pcf	1 1 5	0.6 S	67
41.20				
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
	MEDIUM brown SILT with 20% ORGANICS	4 8 8	0.8 P	57
38.70				
	Wash STIFF gray SILTY CLAY LOAM TILL 132.1 pcf	5 6 6	1.7 B	21
36.20				
-65	STIFF gray SILTY CLAY LOAM TILL 159.7 pcf	4 6 8	1.9 B	20
33.70				
	MEDIUM gray SILTY CLAY LOAM TILL 180.0 pcf	2 4 4	0.5 B	15
31.20				
-70	MEDIUM gray SILTY CLAY LOAM TILL 170.4 pcf	2 4 6	0.5 B	12
28.70				
	SOFT gray SILTY CLAY LOAM TILL 158.7 pcf	1 4 6	0.4 B	12
26.20				
-75	MEDIUM gray SILTY CLAY LOAM TILL 169.3 pcf	5 8 10	0.6 B	12
23.70				
	Wash VERY STIFF gray SILTY CLAY LOAM TILL	4 7 9	3.3 P	23
21.20				
-80				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/9/05

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 LOGGED BY W. Garza

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-1b
Station 52+73
Offset 26.00ft Lt US 30 CL
Ground Surface Elev. 100.2 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft

Groundwater Elev.:
First Encounter 87.7 ft ▼
Upon Completion Wash ft
After 24 Hrs. 88.2 ft ▽

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	3 5 6	1.3	12	STIFF gray SILTY CLAY LOAM TILL 191.7 pcf
18.70				
	2 6 7	1.7	14	8/10/05 STIFF gray SILTY CLAY LOAM TILL 168.3 pcf
16.20				
-85				
	6 11 12	3.3	12	VERY STIFF gray SILTY CLAY LOAM TILL 166.1 pcf
13.70				
	13 15 20	3.7	19	VERY STIFF gray SILTY CLAY TILL 158.7 pcf
11.20		S		
-90				
	2 10 14	3.3	14	VERY STIFF gray SILTY CLAY LOAM TILL 157.6 pcf
8.70		S		
	4 7 16	3.7	11	Wash VERY STIFF gray SILTY CLAY LOAM TILL with SAND lens 182.1 pcf
6.20		B		
-95				
	6 8 10	2.3	15	VERY STIFF gray SILTY CLAY LOAM TILL 176.8 pcf
3.20		B		
	3 4 7			MEDIUM gray dirty fine SAND
0.70				
-100				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5 9 12	2.9 B	12	VERY STIFF gray SILTY CLAY LOAM TILL
-1.30				End of Boring
-105				
-110				
-115				
-120				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/15/05

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 LOGGED BY W. Garza

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-2b
Station 52+90
Offset 70.00ft Lt US 30 CL
Ground Surface Elev. 100.0 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft

Groundwater Elev.:
First Encounter 87.5 ft ▼
Upon Completion Wash ft
After 24 Hrs. 87.0 ft ▽

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
		0.8 P	18	MEDIUM brown LOAM
98.00				
	3 3 4		11	LOOSE tan dirty SAND
96.00				
-5				
	2 3 4			LOOSE tan dry fine SAND
93.00				
	1 3 3	1.1 P	16	STIFF brown SANDY LOAM
91.00				
-10				
	1 1 1	0.3 P	16	SOFT gray SANDY LOAM
88.00				
	1 5 7			MEDIUM tan fine SAND ▼ ▽
86.00				
-15				
	3 6 7			MEDIUM gray fine SAND
83.50				
	4 6 9			MEDIUM gray clean medium coarse SAND
81.00				
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5 7 9			MEDIUM gray fine SAND
78.50				
	6 7 9			MEDIUM gray fine SAND
76.00				
-25				
	5 8 12			Wash MEDIUM gray fine SAND with GRAVEL
73.50				
				5' Run
71.00				
-30				
	9 11 11			Wash MEDIUM gray fine SAND
68.50				
				5' Run
66.00				
-35				
	7 11 11			Wash MEDIUM gray fine SAND
63.50				
	9 10 15			MEDIUM gray fine SAND with medium GRAVEL and SILT lens
61.00				
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 Date 8/15/05

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E LOGGED BY W. Garza

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-2b
Station 52+90
Offset 70.00ft Lt US 30 CL
Ground Surface Elev. 100.0 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft

Groundwater Elev.:
First Encounter 87.5 ft ▼
Upon Completion Wash ft
After 24 Hrs. 87.0 ft ▽

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	2 5 10	2.5 P	12	VERY STIFF gray SILTY CLAY LOAM TILL
58.50				
	4 6 6	2.1 B	13	VERY STIFF gray SILTY CLAY LOAM TILL 174.7 pcf
56.00				
-45				
	3 4 7	2.1 B	10	VERY STIFF gray SILTY CLAY LOAM TILL 155.5 pcf
53.50				
	4 5 6	1.9 B	12	STIFF gray SILTY CLAY LOAM TILL 147.0 pcf
51.00				
-50				
	3 5 7	1.6 B	12	Wash STIFF gray SILTY CLAY LOAM TILL 149.1 pcf
48.50				
	3 3 4	0.8 B	13	MEDIUM gray SILTY CLAY LOAM TILL 177.8 pcf
46.00				
-55				
	2 2 2	0.3 P	26	SOFT gray SILT
43.50				
	4 5 8	1.8 P	66	STIFF brown SILT with 17% ORGANICS
41.00				
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5 6 7	2.2 P	76	VERY STIFF brown SILT with 28% ORGANICS
38.50				
	8 8 9	1.2 B	22	STIFF gray SILTY CLAY LOAM TILL 157.6 pcf
36.00				
-65				
	2 6 7	1.4 B	21	STIFF gray SILTY CLAY LOAM TILL 164.0 pcf
33.50				
	1 4 5	1.1 B	23	STIFF gray SILTY CLAY LOAM TILL 164.0 pcf
31.00				
-70				
	3 4 7	0.7 B	12	MEDIUM gray SILTY CLAY LOAM TILL 158.7 pcf
28.50				
	3 5 7	1.0 B	11	STIFF gray SILTY CLAY LOAM TILL 170.4 pcf
26.00				
-75				
	3 7 10	2.3 B	10	VERY STIFF gray SILTY CLAY LOAM TILL 160.8 pcf
23.50				
	7 10 18	2.9 B	11	VERY STIFF gray SILTY CLAY LOAM TILL with medium GRAVEL 181.0 pcf
21.00				
-80				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/15/05

ROUTE US 30 DESCRIPTION P92-102-05 Bridge - US 30 at Melugins Road, 1.0 m. W. of IL 251 LOGGED BY W. Garza

SECTION _____ LOCATION Viola Twp. - 22 NW, SEC. , TWP. 38N, RNG. 1E

COUNTY Lee DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. _____
Station 52+84 - 53' Lt.

BORING NO. B-2b
Station 52+90
Offset 70.00ft Lt US 30 CL
Ground Surface Elev. 100.0 ft

Surface Water Elev. Dry ft
Stream Bed Elev. 90.0 ft

Groundwater Elev.:
First Encounter 87.5 ft
Upon Completion Wash ft
After 24 Hrs. 87.0 ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	9 8 12	2.9	11	VERY STIFF gray SILTY CLAY LOAM TILL with medium GRAVEL 173.6 pcf
18.50				
	6 9 10	2.9	9	VERY STIFF gray SILTY CLAY LOAM TILL 165.1 pcf
16.00				
-85				
	5 8 12	2.3	13	VERY STIFF gray SILTY CLAY LOAM TILL 155.5 pcf
13.50				
	6 11 14	2.7	12	VERY STIFF gray SILTY CLAY LOAM TILL with SILTY CLAY lens 177.8 pcf
11.00				
-90				
	12 12 17	2.1	23	VERY STIFF gray SILTY CLAY with fine SAND lens 151.2 pcf
8.50				
	2 5 5	1.1	17	STIFF gray SILTY CLAY TILL 142.7 pcf
5.50				
-95				
	1 2 6			LOOSE gray dirty fine SAND, very moist
3.00				
	2 6 10	1.2	13	STIFF gray SILTY CLAY LOAM TILL 165.1 pcf
1.00				
-100				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5 7 9	1.8	12	STIFF gray SILTY CLAY LOAM TILL 177.8 pcf
-1.50				
	6 10 12	3.1	11	VERY STIFF gray SILTY CLAY LOAM TILL 184.2 pcf
-4.00				
-105				
	7 12 16	3.3	11	VERY STIFF gray SILTY CLAY LOAM TILL 177.8 pcf
-6.50				
	14 21 24	5.4	9	HARD gray SANDY LOAM TILL 184.2 pcf
-9.00				
				End of Boring
-110				
-115				
-120				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

CONTRACT NO. 64B39

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
573	(114-1)BR-2	LEE		
STA.	TO STA.			
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

RUSH CREEK FARMS CORP.

EXISTING APPARENT RIGHT OF WAY

STA 199+47
℄ EXISTING S.N. 052-0040

PROPOSED TEMP DITCH CHECK

STA 199+23.00
℄ PROPOSED S.N. 052-0076

PROPOSED TEMP DITCH CHECK

PROPOSED HOT MIX ASPHALT PAVEMENT
(THICKNESS TO BE DETERMINED IN PHASE II)

EXISTING APPARENT RIGHT OF WAY

T.E.

PR. ROW

PROPOSED ℄ DITCH REALIGNMENT

90'

90'

3074

FAP 573 (US 30)

EXISTING ROW

STA 3074+95.00 FAP 573 (US 30) =
STA 200+00 TR 238 (MELUGINS GROVE ROAD)

ROBERT L. & CHARLOTTE M. BRESSON

SECTION 15 T38N R1E 3RD PM

29'

15'

29'

197+00

198+00

199+00

20'

2'

2'

TR 238 (MELUGINS GROVE ROAD)

B-2b

B-1b

EX 24" RCP
TO BE REMOVED

3075+00

IMPROVEMENTS BEGIN
STA 197+00.00

PROPOSED 2' AGGREGATE SHOULDER
(THICKNESS TO BE DETERMINED IN PHASE II)

50.0'
TRANSITION TO
EXISTING WIDTH

T.E.

PROPOSED INLET
AND PIPE PROTECTION

12' F.E.

EX 24" RCP W/FLAPGATE

PROPOSED 24" RCP CULVERT

EXTEND CULVERT AND REBUILD
FLAP GATE INTO WINGWALL

PROPOSED RIPRAP, CLASS A4

PROPOSED TEMP DITCH CHECK

EX 14" CMP TO BE REMOVED

EXISTING APPARENT RIGHT OF WAY

70'

90'

0 20' 40'

WENDELL SWOPE

ex = 0.31'
K = 58
120.00' V.C.

+40.00 EL. 765.50

765.49

+0.01%

+2.08%

VPI STA. 198+00.00
ELEVATION 765.50

VPI STA. 199+20.00
ELEVATION 768.00

+2.08%

+0.18%

768.12

+60.00 EL. 766.75

+80.00 EL. 768.11

PROPOSED SPECIAL DITCH PROFILE

ex = -0.29'
K = 63
120.00' V.C.

℄ STRUCTURE

775 770 765 760 755 750 745

765.04 765.16 765.27 765.38 765.42 765.45 765.47 765.49 765.49 765.46 765.50 765.43 765.51 765.40 765.60 765.39 765.81 765.80 766.13 766.23 766.55 766.66 767.04 767.03 767.46 767.37 767.77 767.83 756.99 767.98 767.74 768.10 768.32

196+00 197+00 198+00 199+00 200+00

TR 238 (MELUGINS GROVE ROAD)

CONTRACT NO.

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

RUSH CREEK FARMS CORP.

EXISTING APPARENT RIGHT OF WAY

T.E.

STA 199+23
℄ PR. S.N. 052-0076

PROPOSED ℄ CHANNEL REALIGNMENT

EXISTING APPARENT RIGHT OF WAY

T.E.

29'

15'

29'

197+00

198+00

199+00

TR 238 (MELUGINS GROVE ROAD)

FAP 573 (US 30)

STA 3074+95.00 FAP 573 (US 30) =
STA 200+00 TR 238 (MELUGINS GROVE ROAD)

ROBERT L. & CHARLOTTE M. BRESSON

B-1b

3073

3074

3075+00

3076

SECTION 15 T38N R1E 3RD PM

IMPROVEMENTS BEGIN
STA 197+00.00

EXISTING APPARENT RIGHT OF WAY

T.E.

12' F.E.

T.E.

WENDELL SWOPE

0 20' 40'
SCALE: 1" = 20'

REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

TOPOGRAPHIC PLAN

SCALE: VERT. HORIZ.
DATE

DRAWN BY
CHECKED BY

TR 238 (MELUGINS GROVE ROAD)

FILE NAME = S:\237\2005\23708002\CADD\s10205SGR.dgn
USER NAME = $USER$
PLOT SCALE = 40.6549 ' / IN.
PLOT DATE = 9/30/2008

DESIGNED -
DRAWN -
CHECKED -
DATE -

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL PROFILE

SCALE:
SHEET NO. OF SHEETS STA. TO STA.

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

T.R. 238 | SECTION (114-1)BR-1 | COUNTY LEE | TOTAL SHEETS | SHEET NO.

CONTRACT NO. 64B39

Sta 3074+89 70' Rt.

PROPOSED STRUCTURE NUMBER 052-0076
PROPOSED ROADWAY PROFILE
MELUGINS GROVE ROAD
EXISTING ROAD PROFILE

B-2b
B-1b

753.9
755.1

	MOIST (%)	Qu (tsf)	BLOWS (/12")	
765	18	0.8 P		MEDIUM brown LOAM
	11		7	LOOSE tan dirty SAND
760			7	LOOSE tan dry fine SAND
	16	1.1 P	6	STIFF brown SANDY LOAM
755	16	0.3 P	2	SOFT gray SANDY LOAM
			12	MEDIUM tan fine SAND
			13	MEDIUM gray fine SAND
750			15	MEDIUM gray clean medium coarse SAND
			16	MEDIUM gray fine SAND
745			16	MEDIUM gray fine SAND
			20	Wash MEDIUM gray fine SAND with GRAVEL
740				5' Run
			22	Wash MEDIUM gray fine SAND
735				5' Run
			22	Wash MEDIUM gray fine SAND
730			15	MEDIUM gray fine SAND with medium GRAVEL and Silt lens
	12	2.5 P	15	VERY STIFF gray SILTY CLAY LOAM TILL
725	13	2.1 B	12	VERY STIFF gray SILTY CLAY LOAM TILL 174.7 pcf
	10	2.1 B	11	VERY STIFF gray SILTY CLAY LOAM TILL 155.5 pcf
720	12	1.9 B	11	STIFF gray SILTY CLAY LOAM TILL 147.0 pcf
	12	1.6 B	12	Wash STIFF gray SILTY CLAY LOAM TILL 149.1 pcf
715	13	0.8 B	7	MEDIUM gray SILTY CLAY LOAM TILL 177.8 pcf
	26	0.3 P	4	SOFT gray SILT
710	66	1.8 P	13	STIFF brown SILT with 17% ORGANICS
	76	2.2 P	13	STIFF brown SILT with 17% ORGANICS
705	22	1.2 B	17	STIFF gray SILTY CLAY LOAM TILL 157.6 pcf
	21	1.4 B	13	STIFF gray SILTY CLAY LOAM TILL 164.0 pcf
700	23	1.1 B	9	STIFF gray SILTY CLAY LOAM TILL 164.0 pcf
	12	0.7 B	11	MEDIUM gray SILTY CLAY LOAM TILL 158.7 pcf
695	11	1.0 B	12	STIFF gray SILTY CLAY LOAM TILL 170.4 pcf
	10	2.3 B	17	VERY STIFF gray SILTY CLAY LOAM TILL 160.8 pcf
690	11	2.9 B	28	VERY STIFF gray SILTY CLAY LOAM TILL with medium GRAVEL 181.0 pcf
	11	2.9 B	20	VERY STIFF gray SILTY CLAY LOAM TILL with medium GRAVEL 173.6 pcf
685	9	2.9 B	19	VERY STIFF gray SILTY CLAY LOAM TILL 165.1 pcf
	13	2.3 B	20	VERY STIFF gray SILTY CLAY LOAM TILL 155.5 pcf
680	12	2.7 S	25	VERY STIFF gray SILTY CLAY LOAM TILL with SILTY CLAY lens 177.8 pcf
	23	2.1 B	29	VERY STIFF gray SILTY CLAY LOAM TILL 155.5 pcf
675	17	1.1 B	10	STIFF gray SILTY CLAY TILL 142.7 pcf
			8	LOOSE gray dirty fine SAND, very moist
670	13	1.2 B	16	STIFF gray SILTY CLAY LOAM TILL 165.1 pcf
	12	1.8 B	16	STIFF gray SILTY CLAY LOAM TILL 177.8 pcf
665	11	3.1 B	22	VERY STIFF gray SILTY CLAY LOAM TILL 184.2 pcf
	11	3.3 B	28	VERY STIFF gray SILTY CLAY LOAM TILL 177.8 pcf
660	9	5.4 S	45	HARD gray SANDY LOAM TILL 184.2 pcf

End of Boring

Sta 3075+06 26' Rt.

	BLOWS (/12")	Qu (tsf)	MOIST (%)	
765		1.1 P	16	STIFF brown SILTY CLAY LOAM
	7	2.1 P	25	VERY STIFF brown SILTY CLAY LOAM
760	6	0.8 B	29	MEDIUM gray tan LOAM 115.0 pcf
	17			MEDIUM tan medium dry SAND
755	14			MEDIUM tan/gray fine SAND
	15			MEDIUM gray clean medium SAND
750	14			MEDIUM gray fine SAND
	17			MEDIUM gray fine SAND
745	17			MEDIUM gray fine SAND
	17			Wash MEDIUM gray fine SAND
740	15			Wash MEDIUM gray fine SAND
	20			MEDIUM gray fine SAND
735	20			MEDIUM gray clean medium coarse SAND
	22			Wash MEDIUM gray SAND
730	31			Wash DENSE gray clean medium coarse SAND
	17			MEDIUM gray fine SAND with SILTY CLAY LOAM
725	9	0.7 B	19	Wash MEDIUM gray SILTY LOAM TILL 143.8 pcf
	12	2.7 B	12	VERY STIFF gray SILTY CLAY LOAM TILL 170.4 pcf
720	8	1.9 B	13	Wash STIFF gray SILTY CLAY LOAM TILL 153.4 pcf
	6	1.1 B	14	STIFF gray SILTY CLAY LOAM TILL 177.8 pcf
715	14	1.0 B	13	Wash STIFF gray SILTY CLAY LOAM TILL 157.6 pcf
	5	0.3 P	22	SOFT gray SILT
710	7	0.3 B	25	SOFT gray SILT 145.9 pcf
	6	0.6 S	67	MEDUIM brown SILT with 16% ORGANICS 113.9 pcf
705	16	0.8 P	57	MEDUIM brown SILT with 20% ORGANICS
	12	1.7 B	21	Wash STIFF gray SILTY CLAY LOAM TILL 132.1 pcf
700	14	1.9 B	20	STIFF gray SILTY CLAY LOAM TILL 159.7 pcf
	8	0.5 B	15	MEDIUM gray SILTY CLAY LOAM TILL 180.0 pcf
695	10	0.5 B	12	MEDIUM gray SILTY CLAY LOAM TILL 170.4 pcf
	10	0.4 B	12	SOFT gray SILTY CLAY LOAM TILL 158.7 pcf
690	18	0.6 B	12	MEDIUM gray SILTY CLAY LOAM TILL 169.3 pcf
	16	3.3 B	23	Wash VERY STIFF gray SILTY CLAY LOAM TILL
685	11	1.3 B	12	STIFF gray SILTY CLAY LOAM TILL 191.7 pcf
	13	1.7 B	14	8/10/05 STIFF gray SILTY CLAY LOAM TILL 168.3 pcf
680	23	3.3 B	12	VERY STIFF gray SILTY CLAY LOAM TILL 166.1 pcf
	35	3.7 S	19	VERY STIFF gray SILTY CLAY TILL 158.7 pcf
675	24	3.3 S	14	VERY STIFF gray SILTY CLAY LOAM TILL 157.6 pcf
	23	3.7 B	11	Wash VERY STIFF gray SILTY CLAY LOAM TILL with SAND lens 182.1 pcf
670	18	2.3 B	15	VERY STIFF gray SILTY CLAY LOAM TILL 176.8 pcf
	11			MEDIUM gray dirty fine SAND
665	21	2.9 B	12	VERY STIFF gray SILTY CLAY LOAM TILL

End of Boring

Note: The Unconfined Compression Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer).
The SPT (N-value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

7.19.23 D_{50}=0.2mm

Flood Frequency	Proposed Melugins Road					
	Thalweg Elevation	Clear-Water Contraction Scour	Clear-water wing wallScour	Pressure Scour	Total Scour	Scour Elevation
		Ft.	Ft.	Ft.	Ft.	Ft.
81	756.15	4.61	4.39	8.79	17.79	**738.36**
86					0.00	**0.00**
91					0.00	**0.00**
100	756.15	4.61	4.39	8.79	17.79	**738.36**
200	756.15	4.61	4.39	8.79	17.79	**738.36**

Flood Frequency	Proposed Town Hall Road					
	Thalweg Elevation	Clear-Water Contraction Scour	Clear-water wing wallScour	Pressure Scour	Total Scour	Scour Elevation
		Ft.	Ft.	Ft.	Ft.	Ft.
81					0.00	**0.00**
86	752.88	3.65	3.16	8.99	15.80	**737.08**
91					0.00	**0.00**
100	752.88	3.65	3.16	8.99	15.80	**737.08**
200	752.88	3.65	3.16	8.99	15.80	**737.08**