



Local Knowledge. Collaborative Approach. Excellent Results

July 15, 2020

Mr. Keith Munter, P.E.  
Fulton County Highway Department  
430 East Oak Street  
Canton, Illinois 61520

Re: Geotechnical Engineering  
Report of Site Investigation  
Fulton County F.A.S. 452 (CH 2)  
Pavement Improvement  
Section #14-00130-12-RS  
Fulton County, Illinois

Dear Mr. Munter:

This geotechnical engineering report presents the results of a pavement and subgrade soils investigation for Fulton County F.A.S. 452 (CH 2) Pavement Improvement in Fulton County, Illinois. Included in this report are the results of our field and laboratory tests as well as a summary of the data that was obtained during the investigation.

The area under investigation generally consists of Fulton County F.A.S. 452 (CH 2) beginning near the intersection with F.A.S. 480 (CH 14) at Station 322+50 and extending in a southerly direction to Station 450+22 at the intersection with Airport Road northeast of Ipava, Illinois. A gross length of pavement improvement of 2.42 miles and net length of improvement of 2.34 miles have been indicated for the project including the bridge omission area at Stations 340+26 to 344+65.

This Geotechnical Engineering Report was prepared in accordance with information provided by personnel from Cummins Engineering Corporation. Sixteen (16) pavement cores in alternating traffic lanes and investigation of the underlying, aggregate base course materials were performed within the limits of the proposed improvement after

which the integrity of the subgrade soils was evaluated by performing Dynamic Cone Penetrometer tests. The results of this investigation have been summarized on the enclosed Pavement Investigation Results which serves as a basis for the following observations and comments. The stratification as indicated on the Pavement Investigation Results represents the pavement conditions in the actual core locations and other variations may occur throughout the site.

### **INVESTIGATION AND TESTING**

The pavement cores were obtained with a diamond tip core barrel powered by an electric core drill. After removal and documentation of the pavement cores, the thickness of the aggregate base course materials was determined and documented. Dynamic cone penetrometer (DCP) tests were subsequently performed on the subgrade soils to evaluate and determine the integrity of the soils at the various test locations. From the dynamic cone penetrometer tests, the Immediate Bearing Value (IBV) and apparent consistency of the subgrade soils could be determined from information published by the Illinois Department of Transportation.

### **EXISTING SITE CONDITIONS**

As may be observed from the enclosed Pavement Investigation Results, some variation in the pavement composition exists within the limits of this investigation. The pavement thickness in this area ranged from 4.75 to 7.00 inches in thickness and typically consisted of a Class "B" Bituminous Mixture ranging in thickness from approximately 2.00 to 6.25 inches. This mixture was frequently overlaid with an Oil and Chip surface treatment which ranged in thickness from approximately 0.50 to 1.75 or a Class "I" Bituminous Concrete mixture which ranged in thickness from 2.00 to 4.75 inches in thickness. The wearing course in this area is underlain with aggregate base course materials generally consisting of fine to coarse-grained Sand and fine Gravel with some Silty Clay Loam which ranged in thickness from 3.00 to 11.75 inches. The thinner



sections of aggregate base course materials were typically noted in the cores taken between Stations 385+00 to 450+00 whereas the thicker aggregate base course sections were recorded for the cores performed between Stations 347+00 to 359+00. Samples of the composite pavement and aggregate base course materials are presently being stored in our construction materials testing laboratory and can be subjected to cement/aggregate mix designs upon further definition of the proposed roadway improvement requirements.

Upon removal of the pavement and aggregate base course materials from the core holes, Dynamic Cone Penetrometer tests were performed on the underlying subgrade soils for a depth of approximately twenty-four (24) inches. The Dynamic Cone Penetrometer tests were initiated at depths ranging from approximately twenty-four (24) to thirty-six (36) inches in those locations between 335+50 to 350+00 whereas the remaining tests were initiated at a depth of approximately twelve (12) to fourteen (14) inches below the existing surface grades. The results of these tests have been summarized on the attached Dynamic Cone Penetration Test Results. As may be observed from these test results, generally favorable readings were obtained for the subgrade soils with the apparent consistency typically classified as stiff to hard. Medium to stiff consistencies (IBV of 3 to 7) were however recorded for those tests performed at Station Locations 385+00, 398+00, 424+00 and 437+00.

### **SUMMARY**

In conclusion, an investigation and evaluation of the pavement and subgrade soil conditions have been conducted for Fulton County F.A.S. 452 (CH 2) Pavement Improvement in Fulton County, Illinois. A summary of the existing site conditions has been presented and discussed in some detail. The exploration and analyses of the subsurface conditions presented in this engineering report are considered of sufficient detail and scope to form a reasonable basis for project evaluation. The

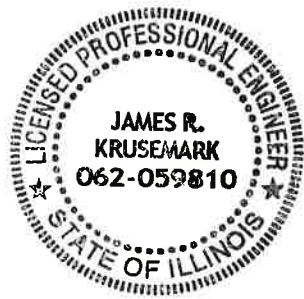


observations and comments submitted within this geotechnical engineering report are based upon the pavement and subsurface soil information which was obtained.

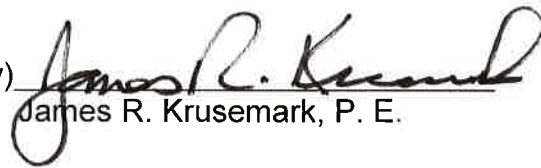
Should additional information be desired in regard to the pavement and subsurface conditions at the referenced site, or if a more comprehensive evaluation of the enclosed data is desired from our geotechnical engineer, please do not hesitate to contact us at your convenience.

Respectfully submitted,

WHITNEY + IMEG



(By)

  
James R. Krusemark, P. E.

JRK: rma

Enclosures

cc: Mr. Phil Koeberlein (Cummins Engineering Corp)





Local Knowledge, Collaborative Approach, Excellent Results

**CLIENT:**

Mr. Keith Munter, P.E.  
Fulton County Highway Department  
430 East Oak Street  
Canton, Illinois 61520

**W&A FILE NO.** 8333001  
**DATE:** 07-15-2020

**PROJECT:**

Fulton County FAS 452 (CH 2)  
Section #14-00130-12-RS  
Fulton County, Illinois

**PAVEMENT INVESTIGATION RESULTS**

PAVEMENT CORE NUMBERS	PAVEMENT TEST LOCATIONS	SAMPLE DEPTH INCHES	PAVEMENT MATERIAL CLASSIFICATION
C-1	Station 324+00 Southbound Lane	0.00 - 1.75	OIL and CHIPS (1.75")
		1.75 - 5.00	Class "B" Mix (3.25")
		5.00 - 11.50	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (6.50")
C-2	Station 332+00 Northbound Lane	0.00 - 4.00	Class "I" Mix (4.00")
		4.00 - 7.00	Class "B" Mix (3.00")
		7.00 - 12.00	Dark Gray, Fine- To Coarse-Grained SAND and GRAVEL With Some Silty Clay Loam (5.00")
C-3	Station 335+50 Southbound Lane	0.00 - 5.75	Class "B" Mix (5.75")
		5.75 - 12.00	Brown, Fine- To Coarse-Grained SAND and GRAVEL With Some Silty Clay Loam (6.25")
C-4	Station 339+25 Northbound Lane	0.00 - 2.50	Class "I" Mix (2.50")
		2.50 - 5.50	Class "B" Mix (3.00")
		5.50 - 12.00	Brown, Fine- To Coarse-Grained SAND and GRAVEL With Some Silty Clay Loam (6.50")
C-5	Station 347+00 Southbound Lane	0.00 - 2.50	Class "I" Mix (2.50")
		2.50 - 6.00	Class "B" Mix (3.50")
		5.50 - 12.00	Brown, Fine- To Coarse-Grained SAND and GRAVEL With Some Silty Clay Loam (10.50")
C-6	Station 351+00 Northbound Lane	0.00 - 1.50	OIL and CHIPS (1.50")
		1.50 - 5.50	Class "B" Mix (4.00")
		5.50 - 17.00	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (11.50")

PAVEMENT CORE NUMBERS	PAVEMENT TEST LOCATIONS	SAMPLE DEPTH INCHES	PAVEMENT MATERIAL CLASSIFICATION
C-7	Station 355+00 Southbound Lane	0.00 - 5.75	Class "B" Mix (5.75")
		5.75 - 17.50	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (11.75")
C-8	Station 359+00 Northbound Lane	0.00 - 2.75	Class "I" Mix (2.75")
		2.75 - 4.75	Class "B" Mix (2.00")
		4.75 - 16.50	Dark Gray, Fine- To Coarse-Grained SAND and GRAVEL With Some Silty Clay Loam (11.75")
C-9	Station 362+00 Southbound Lane	0.00 - 0.75	OIL and CHIPS (0.75")
		0.75 - 6.25	Class "B" Mix (5.50")
		6.25 - 12.00	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (5.75")
C-10	Station 372+00 Northbound Lane	0.00 - 2.00	Class "I" Mix (2.00")
		2.00 - 5.00	Class "B" Mix (3.00")
		5.00 - 13.00	Dark Gray, Fine- To Medium-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (8.00")
C-11	Station 385+00 Southbound Lane	0.00 - 5.75	Class "B" Mix (5.75")
		5.75 - 11.00	Dark Gray, Fine- To Medium-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (5.25")
C-12	Station 398+00 Northbound Lane	0.00 - 5.00	Class "B" Mix (5.00")
		5.00 - 9.00	Dark Gray, Fine- To Medium-Grained SAND with Some Fine Gravel and Silty Clay Loam (4.00")
C-13	Station 411+00 Southbound Lane	0.00 - 0.50	OIL and CHIPS (0.50")
		0.50 - 5.75	Class "B" Mix (5.25")
		5.75 - 11.50	Dark Gray, Fine- To Medium-Grained SAND with Some Fine Gravel and Silty Clay Loam (5.75")
C-14	Station 424+00 Northbound Lane	0.00 - 5.50	Class "B" Mix (5.50")
		5.50 - 12.00	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (6.50")
C-15	Station 437+00 Southbound Lane	0.00 - 6.25	Class "B" Mix (6.25")
		6.25 - 11.00	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (4.75")
C-16	Station 450+00 Northbound Lane	0.00 - 5.00	Class "B" Mix (5.00")
		5.00 - 8.00	Dark Gray, Fine- To Coarse-Grained SAND and Fine GRAVEL With Some Silty Clay Loam (6.50")







Local Knowledge. Collaborative Approach. Excellent Results

**CLIENT:**

Mr. Keith Munter, P.E.  
Fulton County Highway Department  
430 East Oak Street  
Canton, Illinois 61520

**W&A FILE NO.** 8333001  
**DATE:** 07-15-2020

**PROJECT:**

Fulton County FAS 452 (CH 2)  
Section #14-00130-12-RS  
Fulton County, Illinois

**DYNAMIC CONE PENETRATION TEST RESULTS**

TEST LOCATION	SAMPLE DEPTH - INCHES	DCP RATE INCH / BLOW	IMMEDIATE BEARING VALUE	APPARENT CONSISTENCY
C-1 Station 324+00 Southbound Lane (11.5" of Pavement and Base)	13.5	-	-	-
	19.5	0.3	31.5	Hard
	25.5	0.5	16.6	Hard
	31.5	1.2	5.5	Stiff
	38.0	1.6	3.8	Stiff
C-2 Station 332+00 Northbound Lane (12" of Pavement and Base)	13.5	-	-	-
	19.0	0.2	52.6	Hard
	25.0	0.4	21.9	Hard
	30.5	1.3	5.0	Stiff
	36.5	1.0	7.0	Very Stiff
C-3 Station 335+50 Southbound Lane (12" of Pavement and Base)	23.5	-	-	-
	30.0	0.7	11.0	Very Stiff
	36.0	1.0	7.0	Very Stiff
	42.5	1.1	6.0	Stiff
	48.0	0.9	8.0	Very Stiff
C-4 Station 339+25 Northbound Lane (12" of Pavement and Base)	24.0	-	-	-
	31.0	1.8	3.3	Stiff
	37.5	0.9	8.0	Very Stiff
	43.5	0.8	9.2	Very Stiff
	48.0	0.8	9.2	Very Stiff

TEST LOCATION	SAMPLE DEPTH - INCHES	DCP RATE INCH / BLOW	IMMEDIATE BEARING VALUE	APPARENT CONSISTENCY
C-5 Station 347+00 Southbound Lane (12" of Pavement and Base)	28.0	-	-	-
	34.5	1.3	5.0	Stiff
	41.0	0.5	16.6	Hard
	47.1	0.6	13.2	Hard
	53.0	0.3	31.5	Hard
C-6 Station 351+00 Northbound Lane (17" of Pavement and Base)	32.0	-	-	-
	38.5	0.5	16.6	Hard
	45.0	0.3	31.5	Hard
	51.7	0.4	21.9	Hard
	57.9	0.3	31.5	Hard
C-7 Station 355+00 Southbound Lane (17.5" of Pavement and Base)	32.5	-	-	-
	38.9	0.3	31.5	Hard
	45.0	0.2	52.6	Hard
	51.5	0.3	31.5	Hard
	57.0	0.3	31.5	Hard
C-8 Station 359+00 Northbound Lane (16.5" of Pavement and Base)	36.5	-	-	-
	43.0	0.4	21.9	Hard
	49.0	0.4	21.9	Hard
	54.8	1.2	5.5	Stiff
	60.9	1.2	5.5	Stiff
C-9 Station 362+00 Southbound Lane (12" of Pavement and Base)	13.0	-	-	-
	19.0	0.1	125.9	Hard
C-10 Station 372+00 Northbound Lane (13" of Pavement and Base)	13.5	-	-	-
	19.9	1.6	3.8	Stiff
	26.0	0.6	13.2	Hard
	32.0	1.5	4.2	Stiff
	38.0	1.5	4.2	Stiff
C-11 Station 385+00 Southbound Lane (11" of Pavement and Base)	13.5	-	-	-
	19.8	1.3	5.0	Stiff
	26.1	1.3	5.0	Stiff
	30.1	2.0	2.9	Medium
	36.2	2.0	2.9	Medium
C-12 Station 398+00 Northbound Lane (9" of Pavement and Base)	13.0	-	-	-
	19.5	0.8	9.2	Very Stiff
	25.5	2.0	2.9	Medium
	37.1	1.6	3.8	Stiff
	38.0	1.5	4.2	Stiff






TEST LOCATION	SAMPLE DEPTH - INCHES	DCP RATE INCH / BLOW	IMMEDIATE BEARING VALUE	APPARENT CONSISTENCY
C-13 Station 411+00 Southbound Lane (11.5" of Pavement and Base)	13.5	-	-	-
	20.1	1.2	5.5	Stiff
	26.1	1.0	7.0	Very Stiff
	32.1	0.5	16.6	Hard
	38.5	0.6	13.2	Hard
C-14 Station 424+00 Northbound Lane (12" of Pavement and Base)	14.0	-	-	-
	20.5	1.3	5.0	Stiff
	27.5	1.0	7.0	Stiff
	33.4	1.5	4.2	Stiff
	38.5	1.3	5.0	Stiff
C-15 Station 437+00 Southbound Lane (11" of Pavement and Base)	13.1	-	-	-
	19.1	0.6	13.2	Hard
	26.0	2.3	2.4	Medium
	32.5	1.6	3.8	Stiff
	38.0	1.4	4.5	Stiff
C-16 Station 450+00 Northbound Lane (8" of Pavement and Base)	13.0	-	-	-
	19.5	1.6	3.8	Stiff
	25.5	0.7	11.0	Very Stiff
	32.1	0.6	13.2	Hard
	38.0	0.7	11.0	Very Stiff

Should you have any questions or comments in regard to this report, or if any additional information is desired, please do not hesitate to contact us at your convenience.

Respectfully submitted,

WHITNEY + IMEG

(By)   
 James R. Krusemark, P. E.

JRK: rma

