BASF
The Chemical Company

CUSTOMER LOCATION

Superior Material Novi Plant 102

ADMIXTURE	REQUIRED	MEASURED	OVER/UNDER
Micro Air MasterAir AE 200	24 oz	24 oz	—
Pozz 200 N MasterSet Ac 200	40 oz	40 oz	—
Polyheed 997 MASTER	52 oz	52 oz	—
Polyheed Fc 100 MasterPolyheed 100	48 oz	48 oz	—
Rheo 1000 MasterRheobuild 1000	64 oz	64 oz	—
Pozz Nc 534 MasterSetAc 534	128 oz	128 oz	—
P.S. 1481	48 oz	48 oz	—
Delvo	—	—	—
Rheocrete CNI	128 oz	128 oz	—

To Whom It May Concern:

This letter is to certify that Admixture dispensing equipment was tested to meet the requirements for measuring material according to ASTM C-94 the standard specifications for Ready Mixed Concrete.

TESTED AND APPROVED BY: Adam Murphy

DATE: 5/15/14

BASF Admixtures, Inc.
23700 Chagrin Boulevard
Cleveland, Ohio 44122 USA
216 839-7500 ph
www.masterbuilders.com

Master Builders
Admixture Solutions

BOWSER-MORNER, INC.

Delivery Address: 4518 Taylorsville Road Dayton, Ohio 45424 Mailing Address: P.O. Box 51 Dayton, Ohio 45401
AASHTO/ISO 17025 Accredited

LABORATORY REPORT

Report To: Edward C. Levy Co.
Attn: Katie Schroeder
9300 Dix Ave
Dearborn, MI 48120

Report Date: 11/15/13
Job No.: 159985
Report No.: 018041
No. of Pages: 2

Report On: Laboratory Determination of Alkali-Silica Reactivity (ASR)

Procedure: Length Change of Concrete Due to Alkali-Silica Reaction (ASTM C 1293)

Material and Source Information

Sample Identification:	**MDOT 2NS**
Fine Aggregate Source:	**American Aggregates - Buno (#47-16)**
Coarse Aggregate Source:	Lab Standard (#57 crLS MMA - Phillipsburg, OH)
Cement Source:	Cemex - Fairborn, OH
Date Received:	11/01/12
Date Cast:	11/14/12

Preliminary results are summarized below and detailed on the attached data sheet.

Average Length Change, %		ASTM C 1293 Specification, %
56 Days:	0.001	—
90 Days:	0.008	—
180 Days:	0.012	—
270 Days:	0.014	—
365 Days:	0.016	0.040 Max.

Should you have any questions, or if we may be of further service, please contact me at (937) 236-8805, ext. 329.

Respectfully submitted,

BOWSER-MORNER, INC.

Scott D. Rufkamp, Supervisor
Special Projects Section
Construction Materials Laboratory

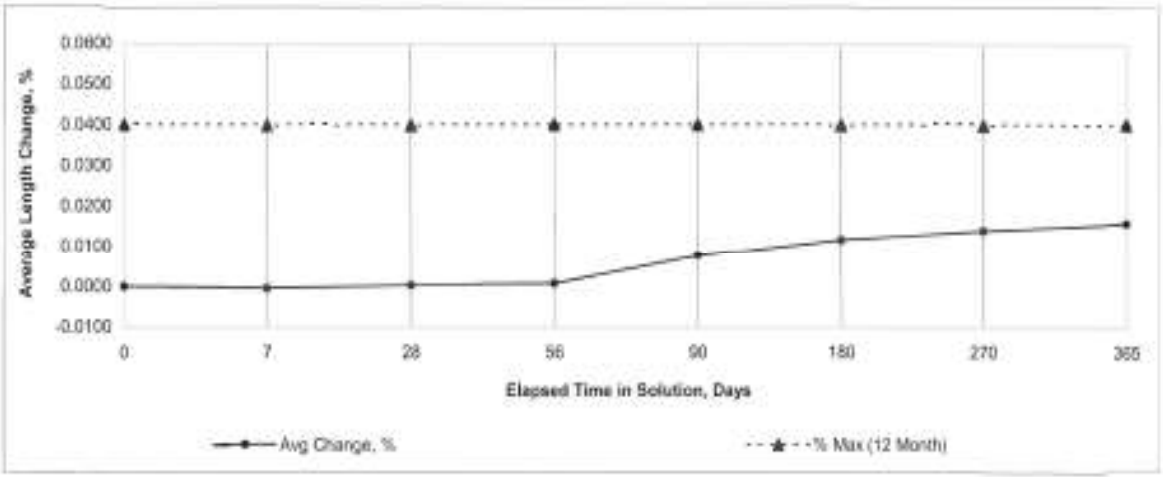
SDR/ksp
018041
1-File

Report To: Edward C. Levy Co.
Sample ID: MDOT 2NS
Source: American Aggregates - Buno (#47-16)
Date Cast: 11/14/12

Job No.: 159985
Report No.: 018041
Date Received: 11/01/12
Ref. Rod Length: 11.622118

Procedure: Length Change of Concrete Due to Alkali-Silica Reaction (ASTM C 1293)

Age in Solution	ID	Reference Rod, inch	Specimen Readings, inch	Expansion, inch	Length Change, %	Avg, %
Initial 11/15/12	1A	0.0000	-0.0422	11.5799	n/a	0.0000
	1B	0.0000	-0.0632	11.5589	n/a	
	1C	0.0000	-0.0380	11.5841	n/a	
7 11/22/12	1A	0.0000	-0.0422	11.5799	0.0000	-0.0003
	1B	0.0000	-0.0633	11.5588	-0.0010	
	1C	0.0000	-0.0380	11.5841	0.0000	
28 12/13/12	1A	0.0000	-0.0422	11.5799	0.0000	0.0003
	1B	0.0000	-0.0632	11.5589	0.0000	
	1C	0.0000	-0.0379	11.5842	0.0010	
56 01/10/13	1A	0.0000	-0.0421	11.5800	0.0010	0.0007
	1B	0.0000	-0.0631	11.5590	0.0010	
	1C	0.0000	-0.0380	11.5841	0.0000	
90 02/13/13	1A	0.0000	-0.0414	11.5807	0.0080	0.0077
	1B	0.0000	-0.0623	11.5598	0.0090	
	1C	0.0000	-0.0374	11.5847	0.0060	
180 05/14/13	1A	0.0000	-0.0413	11.5808	0.0090	0.0117
	1B	0.0000	-0.0619	11.5602	0.0130	
	1C	0.0000	-0.0367	11.5854	0.0130	
270 08/12/13	1A	0.0000	-0.0411	11.5810	0.0110	0.0140
	1B	0.0000	-0.0615	11.5606	0.0170	
	1C	0.0000	-0.0366	11.5855	0.0140	
365 11/15/13	1A	0.0000	-0.0408	11.5813	0.0140	0.0157
	1B	0.0000	-0.0614	11.5607	0.0180	
	1C	0.0000	-0.0365	11.5856	0.0150	



Testing Engineers & Consultants, Inc.
1343 Rochester Road • PO Box 249 • Troy, Michigan 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

TEC Report Number: 55565-006
Date Issued: July 5, 2015

Mr. Paul Shumejko, PE, PTOE
Transportation Engineer
City of Rochester Hills
1000 Rochester Hills Drive
Rochester Hills, Michigan 48309

Re: HMA Mix Design Review
2015 HMA Rehabilitation Program
City File E15-002
City of Rochester Hills, Michigan

Dear Mr. Shumejko:

In accordance with your request, Testing Engineers & Consultants, Inc. (TEC) has completed its review of the HMA mix designs submitted by Florence for the 2015 HMA Rehabilitation Program in the City of Rochester Hills, Michigan. This letter presents our comments on the mix design submittals. The mix designs reviewed were as follows:

Mix ID	Plant	Description
1100L	Cadillac - Troy 60-02	*1100L Leveling Course Asphalt* 48% RAP PG 58-22 Virgin Liquid
4E3	Cadillac - Shelby 115-02	*4E3 Leveling Course Asphalt* 27% RAP PG 58-22 Virgin Liquid
4E3	Cadillac - Troy 60-02	*4E3 Leveling Course Asphalt* 35% RAP PG 58-22 Virgin Liquid
5E3	Cadillac - Shelby 115-02	*5E3 Top Course Asphalt* 29% RAP PG 58-22 Virgin Liquid
5E3	Cadillac - Troy 60-02	*5E3 Top Course Asphalt* 35% RAP PG 58-22 Virgin Liquid

Mr. Paul Shumejko, PE, PTOE
City of Rochester Hills
2015 HMA Rehabilitation Program
TEC Report Number: 55565-006

The 1100L leveling course HMA meets the gradation, binder and crushed particle contents outlined in 1990 MDOT Standard Specification Table 7.10-2.

The 4E3 and 5E3 leveling and top course mixes from the Cadillac plants located in Troy and Shelby Twp. meet the Superpave Final Aggregate Blend Gradation Requirements outlined in 2012 MDOT Standard Specification Table 902-5. RAP usage rates are consistent with MDOT Tier II guidelines.

Recommendations

TEC recommends that the submitted HMA 1100L, 4E3 and 5E3 leveling and top course mixes be approved for the intended uses during the 2015 HMA Rehabilitation Program. QA testing during production is recommended to confirm the material properties.

Copies of the mix submittal for each mix are attached to this letter. We are pleased for the opportunity to provide our services. Should you have any questions or require additional information, please feel free to contact our office.

Respectfully submitted,

TESTING ENGINEERS & CONSULTANTS, INC.

William J. West, PE
Manager, Construction Services

Michigan Department
of Transportation
1820 (08/07)

Cadillac Asphalt LLC

This information is required by the Michigan Department of Transportation for mix design. The CONTRACTOR is responsible for complete and accurate information on this form. Failure to supply this information will result in delay of Bituminous Paving.

The submitted mix design is for the named project only and is not transferable to other projects.

Producer: Cadillac Asphalt LLC	**Project Name:** Rochester Hills
Plant Number: 60-02	**Plant Location:** 2040 Barrett Rd, Troy MI 48084

Bituminous Mixture Type: 1100L

PIT Name		Groveland	Ray Rd.	Pit. 3				Yard		
AGGREGATE TYPE		20AA	3CS	1/2x0				RAP		
		27.0	10.0	15.0				48.0		
BLEND % (10% Minimum)		27.0	10.0	15.0				48.0		COMBINED GRADATION
AVERAGE GRADATION	P 1 1/2 (37.5 mm)									
	P 1 in. (25.0 mm)									
	P 3/4 in. (19.0 mm)	100.0	100.0	100.0				100.0	100	100.0
	P 1/2 in. (12.5 mm)	97.0	100.0	100.0				98.0	90-100	98.2
	P 3/8 in. (9.5 mm)	86.0	100.0	96.6				94.0	65-95	92.8
	P NO. 4 (4.75 mm)	69.0	98.0	71.7				74.0		74.7
	P NO. 8 (2.36 mm)	54.0	82.0	53.4				59.0	45-70	59.1
	P NO. 16 (1.18 mm)	41.0	67.0	39.8				48.0		46.8
	P NO. 30 (600 um)	30.0	51.0	30.0				37.0	20-45	35.5
	P NO. 50 (300 um)	18.0	30.0	21.9				24.0		22.7
	P NO. 100 (150 um)	8.0	8.0	14.1				14.0		11.8
	TOTAL P NO. 200 (75 um)	4.2	1.7	6.0				9.9	3-10	7.0
CRUSH COUNT		62.1		100.0				85.1	60 Min	79.9
L.A. ABRASION Value/Year		22 | 14	16 | 11	17 | 15				N | A		
ANGULARITY INDEX BLENDED		4.1	3.9	4.7				4.5		4.5
SOFTSTONE %		0.1	0.1					0.1		
AWI NOMOGRAPH & QUARRYS										
COARSE AGGREGATE BULK SPECIFIC GRAVITY #4 UP		2.659		2.901				2.661	Combined Gsb	2.692
BULK SPECIFIC GRAVITY # 8										
FINE AGGREGATE BULK SPECIFIC GRAVITY		2.649	2.645					2.661		

ASPHALT SUPPLIER	MPM Oil, Monroe MI	GRADE	PG 58-22	Gb 1.028
SUBMITTED BY: NAME (Print or Type)	Dennis Kotevski	DATE	April 13, 2015	PHONE NUMBER
SIGNATURE		VMA (Gsb):	15.52	FAX NUMBER

Asphalt Content: 5.00	Gmm: 2.473 / 154.3	Gmb: 2.394 / 149.4

Michigan Department of Transportation
1855
(08/07)

CONTRACTOR' S SUPERPAVE BITUMINOUS MIX DESIGN COMMUNICATION

This information is required by the Michigan Department of Transportation for mix design. The CONTRACTOR is responsible for complete and accurate information on this form. Failure to supply this information will result in delay of Bituminous Paving.

Complete and return to Michigan Department of Transportation, Construction & Technology Division, P.O. Box 30049, Lansing, MI 48909

CONTROL SECTION	JOB NO
City of Rochester Hills	City of Rochester Hills
CONTRACTOR	**ROUTE & LOCATION**
Cadillac Asphalt L.L.C.	Rochester Hills Rehabilitation Program 2015
PLANT NO.	**PLANT LOCATION**
115-02	12345 23 mile Rd. Shelby Township, MI 48315
BITUMINOUS MIXTURE	4E3

		AGG A	AGG. B	AGG. C	AGG. D	AGG E	AGG. F	AGG. G	AGG H	CONTROL POINTS		RESTRICTED ZONE		COMBINED GRADATION
	PIT NUMBER	115-02	44-71	44-71	82-21				40-04					
	AGGREGATE TYPE	5/8 rap	3CS	#4 Natt	1/2x0				DEG					
	BLEND % (10% Minimum)	27.0%	26.0%	28.0%	18.0%				1.0%					
		27.0%	26.0%	28.0%	18.0%				0.0%					
AVERAGE GRADATION	P 1 1/2 (37.5 mm)	100.0%	100.0%	100.0%	100.0%				100.0%					
	P 1 in. (25.0 mm)	100.0%	100.0%	100.0%	100.0%				100.0%					100.0
	P 3/4 in. (19.0 mm)	100.0%	100.0%	100.0%	100.0%				100.0%		100			100.0
	P 1/2 in. (12.5 mm)	97.7%	100.0%	97.9%	100.0%				100.0%	90	100			98.8
	P 3/8 in. (9.5 mm)	92.1%	100.0%	42.8%	98.6%				100.0%	90 max				81.6
	P NO. 4 (4.75 mm)	75.4%	97.2%	1.1%	77.2%				100.0%					60.8
	P NO. 8 (2.36 mm)	60.3%	84.1%	0.9%	55.2%				99.7%	28	58		39.1	49.3
	P NO. 16 (1.18 mm)	48.0%	68.7%	0.9%	39.2%				99.5%			25.6	31.6	39.1
	P NO. 30 (600 um)	37.2%	51.8%	0.8	29.4%				99.4%			19.1	23.1	30.0
	P NO. 50 (300 um)	23.8%	23.4%	0.7	22.5%				99.0%				15.5	17.7
	P NO. 100 (150 um)	13.5%	4.3%	0.7	16.5%				92.1%					8.9
	TOTAL P NO. 200 (75 um)	9.3%	1.2%	0.6	9.7%				85.0%	2.0	10.0			5.6
	CRUSH COUNT 1/2 SIDE	~~87.6~~		~~96.9~~	~~100.0~~				NA	75 MIN		~~95.4~~		
	L.A. ABRASION Value/Year	N A	19 11	19 11	20 10				N A	35 MAX		< 35		
	NAA ANGULARITY INDEX (METHOD A)	45.0	31.0		46.2					43 MIN		43.1		
	AWI NOMOGRAPH & QUARRYS													
	COARSE AGGREGATE BULK SPECIFIC GRAVITY #4 UP	2.679		2.670	3.093									
	COARSE AGGREGATE BULK SPECIFIC GRAVITY #8											Combined Gsb - 2.700		
	FINE AGGREGATE BULK SPECIFIC GRAVITY	2.679	2.640		3.093									
	FLAT & ELONGATED %	0.0	0.0	0.0	0.0					10 MAX		< 10		
	SOFTSTONE %	0.0	0.0	0.0	0.0					5 MAX		< 5		

ASPHALT CEMENT SUPPLIER	MPM OIL MONROE 6505	GRADE PG 58-22	SPECIFIC GRAVITY 1.028	
SUBMITTED BY: NAME (Print or Type)	Dennis Kotevski	DATE May 1, 2015	PHONE NUMBER 248-388-1712	
SIGNATURE		LAB NO.	FAX NUMBER 586-932-0176	
DATE REC'D BY LAB	CONTACT Bill West P.E.	ENGINEERING FIRM Testing Engineers Consultants		
P.E. NOTIFIED OF SUBMITTAL	P.E. PHONE NUMBER 248-588-5200	CONTACT FAX NUMBER		

Michigan Department of Transportation 1858 (03/08)

SUBMITTED SUPERPAVE MIX DESIGN SUMMARY SHEET

CONTRACTOR	CONSULTANT
Cadillac Asphalt L.L.C.	

CONTROL SECTION I.D.	JOB NO.	TYPE OF MIXTURE
City of Rochester Hills	City of Rochester Hills	4E3

N_{INT}	N_{DES}	N_{MAX}
7	86	134

MIXING TEMPERTURE RANGE °F	COMPACTION TEMPERTURE RANGE °F
295 °F 307 °F	275 °F 284 °F

SUPERPAVE MIX PROPERTIES AT TESTED & OPTIMUM ASPHALT CONTENT

ITEM	TEST POINTS 4 POINT DESIGN FINAL BLEND				RECOMMENDED OPTIMUM Regression Value at Optimum Asphalt Content	VERIFICATION TEST RESULTS @ N Des
ASPHALT CONTENT (%)	4.5	5.0	5.5	6.0	5.25	5.25
BULK SPECIFIC GRAVITY @ N_{DES}	2.397	2.414	2.434	2.450	2.424	2.431
BULK SPECIFIC GRAVITY @ N_{MAX}						2.432
THEORETICAL MAXIMUM (S.G)	2.554	2.536	2.518	2.500	2.525	2.521
AIR VOIDS (%) @ N_{DES}	6.12	4.80	3.36	1.97	4.00	3.57
VOIDS IN MINERAL AGGREGATE % (VMA) @ N_{DES}	15.21	15.03	14.85	14.68	14.94	14.69
VOIDS FILLED WITH ASPHALT % (VFA) @ N_{DES}	59.09	68.12	77.46	87.13	73.22	
% G_{mm} @ N_{INT}	86 2	88.5	90.1	90.3	91.5	88.2
% G_{mm} @ N_{DES}	93.6	95.0	96.5	97.5	96.0	95.2
% G_{mm} @ N_{MAX}						96.1
FINES/EFF ASPHALT RATIO	1.45	1.28	1.15	1.04	1.18	

The submitted superpave mix design final blend shall have a minimum of 4 test points at 0.5 percent asphalt content increments. At least one full asphalt content (0.5%) above and below optimum asphalt content is required.

ASPHALT CONTENT OF SUBMITTED SUPERPAVE MIX DESIGN 5.25

ASPHALT SPECIFIC GRAVITY 1.028

SPECIFIC GRAVITY OF COMBINED AGGREGATE G_{sb} 2.700

Michigan Department
of Transportation
1820 (08/07)

Cadillac Asphalt LLC

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The submitted mix design is for the named project only and is not transferable to other projects.

Producer:	**Project Name:**
Cadillac Asphalt LLC	Rochester Hills
Plant Number:	**Plant Location:**
60-02	2040 Barrett Rd. Troy MI 48084

Bituminous Mixture Type: 4E3

PIT Name		Pit. 3	Port Inland	Ray Rd.	Plant			Yard		
AGGREGATE TYPE		1/2x0	OH 8	Mfg. Sand	Deg			RAP		
BLEND % (10% Minimum)		20.0	22.0	22.5	0.5			35.0		
		20.0	22.0	23.0				35.0		COMBINED GRADATION
AVERAGE GRADATION	P 1 1/2 (37.5 mm)									
	P 1 in. (25.0 mm)									
	P 3/4 in. (19.0 mm)	100.0	100.0	100.0	100.0			100.0	100.0	100.0
	P 1/2 in. (12.5 mm)	100.0	100.0	100.0	100.0			98.0	90-100	99.3
	P 3/8 in. (9.5 mm)	96.6	62.2	100.0	100.0			94.0	90 Max	88.9
	P NO. 4 (4.75 mm)	71.7	22.9	61.9	100.0			74.0		59.7
	P NO. 8 (2.36 mm)	53.4	6.0	36.7	100.0			59.0	39-69	41.4
	P NO. 16 (1.18 mm)	39.8	4.0	21.1	100.0			48.0		30.9
	P NO. 30 (600 um)	30.0	3.0	12.9	100.0			37.0		23.0
	P NO. 50 (300 um)	21.9	2.0	6.9	99.0			24.0		15.3
	P NO. 100 (150 um)	14.1	1.0	2.8	97.0			14.0		9.1
	TOTAL P NO. 200 (75 um)	6.0	0.3	1.6	87.0			9.9	2-10	5.5
CRUSH COUNT		100.0	100.0	97.5				85.1	90 Min	93.4
L.A. ABRASION Value/Year		17 | 15	27 | 12	16 | 11				N | A	40 Max	< 40
ANGULARITY INDEX BLENDED		4.7		4.7				4.5	4.0 Min	4.7
SOFTSTONE %		0.0	0.0	0.1				0.1	8.0 Max	< 8.0
AWI NOMOGRAPH & QUARRYS		465	170	296				240	260 Min	261
COARSE AGGREGATE BULK SPECIFIC GRAVITY #4 UP		2.901	2.632	2.668				2.661	Combined Gsb	2.690
BULK SPECIFIC GRAVITY # 8										
FINE AGGREGATE BULK SPECIFIC GRAVITY				2.666				2.661		

ASPHALT SUPPLIER	MPM Oil, Monroe MI	GRADE	PG 58-22	Gb 1.028
SUBMITTED BY: NAME (Print or Type)	Kyle Anderson	DATE	May 1, 2015	PHONE NUMBER
SIGNATURE		VMA (Gsb):	14.10	FAX NUMBER

Asphalt Content:	**Gmm:**	**Gmb:**
5.10	2.54	2.438

Michigan Department
of Transportation
1855
(08/07)

CONTRACTOR' S SUPERPAVE BITUMINOUS MIX DESIGN COMMUNICATION

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Complete and return to Michigan Department of Transportation, Construction & Technology Division P.O. Box 30049, Lansing, MI 48909

CONTROL SECTION	City of Rochester Hills	JOB NO.	City of Rochester Hills
CONTRACTOR	Cadillac Asphalt L L C.	ROUTE & LOCATION	Rochester Hills Rehabilitation Program 2015
PLANT NO	115-02	PLANT LOCATION	12345 23 mile Rd, Shelby Township, MI 48315
BITUMINOUS MIXTURE			5E3

	AGG A	AGG. B	AGG C	AGG D	AGG E	AGG. F	AGG G	AGG. H	CONTROL POINTS		RESTRICTED ZONE		COMBINED GRADATION
PIT NUMBER	115-02	47-71	82-21	47-71				40-04					
AGGREGATE TYPE	3/8 Rap	3CS	1/2x0	?SI				DFG					
BLEND % (10% Minimum)	29.0%	24.0%	20.0%	26.5%				0.5%					
	29.0%	24.0%	20.0%	27.0%				0.0%					
AVERAGE GRADATION P 1 1/2 (37.5 mm)	100.0%	100.0%	100.0%	100.0%				100.0%					
P 1 in (25.0 mm)	100.0%	100.0%	100.0%	100.0%				100.0%					100.0
P 3/4 in (19.0 mm)	100.0%	100.0%	100.0%	100.0%				100.0%					100.0
P 1/2 in (12.5 mm)	100.0%	100.0%	100.0%	100.0%				100.0%		100			100.0
P 3/8 in (9.5 mm)	97.6%	100.0%	98.6%	88.8%				100.0%	90	100			95.8
P NO. 4 (4.75 mm)	80.4%	97.2%	77.2%	68.4%				100.0%		90			81.2
P NO. 8 (2.36 mm)	65.0%	84.1%	55.2%	44.0%				100.0%	32	67		47.2	62.8
P NO. 16 (1.18 mm)	50.7%	68.7%	39.2%	28.5%				100.0%			31.6	37.6	47.7
P NO. 30 (600 um)	39.4%	51.8%	29.4	19.5%				100.0%			23.5	27.5	35.7
P NO. 50 (300 um)	25.1%	23.4%	22.5	12.2%				99.0%				18.7	20.7
P NO. 100 (150 um)	14.2%	4.3%	16.4	5.5%				95.0%					9.4
TOTAL P NO. 200 (75 um)	9.7%	1.2%	9.7	3.2%				90.0%	2.0	10.0			5.7
CRUSH COUNT 1/2 SIDE	87.8		100.0	98.9					75 MIN		95.2		
L A ABRASION Value/Year		19 / 11	20 / 10	19 / 11					35 MAX		< 35		
NAA ANGULARITY INDEX (METHOD A)	45.3	31.0	46.2	47.7					43 MIN		44.3		
AWI NOMOGRAPH & QUARRYS	240	221	379	281					260 MIN		279		
COARSE AGGREGATE BULK SPECIFIC GRAVITY #4 UP			3.093	2.669							Combined Gsb - 2.695		
COARSE AGGREGATE BULK SPECIFIC GRAVITY #8													
FINE AGGREGATE BULK SPECIFIC GRAVITY	2.714	2.640	3.093	2.650									
FLAT & ELONGATED %	0.0	0.0	0.0	0.0					10 MAX		< 10		
SOFTSTONE %	0.0	0.0	0.0	0.0					5 MAX		< 5		

ASPHALT CEMENT SUPPLIER	MPM OIL MONROE 6505	GRADE	PG 58-22	SPECIFIC GRAVITY	1.028
SUBMITTED BY: NAME (Print or Type)	Dennis Kotevski	DATE	May 1, 2015	PHONE NUMBER	248-388-1712
SIGNATURE		LAB NO		FAX NUMBER	
DATE REC'D BY LAB	CONTACT	ENGINEERING FIRM			
P.E. NOTIFIED OF SUBMITTAL	P.E. PHONE NUMBER	CONTACT FAX NUMBER			

Michigan Department of Transportation 1858 (03/08)

SUBMITTED SUPERPAVE MIX DESIGN SUMMARY SHEET

CONTRACTOR	CONSULTANT	
Cadillac Asphalt L.L.C		
CONTROL SECTION I.D.	JOB NO.	TYPE OF MIXTURE
City of Rochester Hills	City of Rochester Hills	5E3
N_{INT}	N_{DES}	N_{MAX}
7	86	134
MIXING TEMPERTURE RANGE °F		COMPACTION TEMPERTURE RANGE °F
291 °F	303 °F	274 °F	287 °F

SUPERPAVE MIX PROPERTIES AT TESTED & OPTIMUM ASPHALT CONTENT

ITEM	TEST POINTS 4 POINT DESIGN FINAL BLEND				RECOMMENDED OPTIMUM Regression Value at Optimum Asphalt Content	VERIFICATION TEST RESULTS @ N_{MAX}
ASPHALT CONTENT (%)	5.0	5.5	6.0	6.5	5.95	5.95
BULK SPECIFIC GRAVITY @ N_{DES}	2.359	2.376	2.396	2.412	2.392	2.380
BULK SPECIFIC GRAVITY @ N_{MAX}						2.406
THEORETICAL MAXIMUM (S.G.)	2.528	2.508	2.489	2.470	2.491	2.493
AIR VOIDS (%) @ N_{DES}	6.70	5.28	3.73	2.37	4.00	3.79
VOIDS IN MINERAL AGGREGATE % (VMA) @ N_{DES}	16.86	16.66	16.48	16.32	16.52	16.94
VOIDS FILLED WITH ASPHALT % (VFA) @ N_{DES}	60.38	68.58	76.97	85.51	75.79	
% G_{mm} @ N_{INT}	86.2	87.2	89.1	90.2	89.1	87.3
% G_{mm} @ N_{DES}	93.3	94.5	96.0	97.3	96.0	95.2
% G_{mm} @ N_{MAX}						96.2
FINES/EFF ASPHALT RATIO	1.3	1.2	1.0	1.0	1.0	

The submitted superpave mix design final blend shall have a minimum of 4 test points at 0.5 percent asphalt content increments. At least one full asphalt content (0.5%) above and below optimum asphalt content is required.

ASPHALT CONTENT OF SUBMITTED SUPERPAVE MIX DESIGN 5.9

ASPHALT SPECIFIC GRAVITY 1.028

SPECIFIC GRAVITY OF COMBINED AGGREGATE G_{sb} 2.695

Michigan Department
of Transportation
1820 (08/07)

Cadillac Asphalt LLC

This information is required by the Michigan Department of Transportation for mix design. The CONTRACTOR is responsible for complete and accurate information on this form. Failure to supply this information will result in delay of Bituminous Paving.

The submitted mix design is for the named project only and is not transferable to other projects.

Producer: Cadillac Asphalt LLC	**Project Name:** Rochester Hills
Plant Number: 60-08	**Plant Location:** 2040 Barrett Rd. Troy MI 48084

Bituminous Mixture Type: 5E3

PIT Name		Ray Rd.	Pit. 3	Mid Mich				Yard		
AGGREGATE TYPE		3CS	1/2x0	Mfg. Sand				RAP		
BLEND % (10% Minimum)		20.0	20.0	25.0				35.0		COMBINED GRADATION
		20.0	20.0	25.0				35.0		
AVERAGE GRADATION	P 1 1/2 (37.5 mm)									
	P 1 in. (25.0 mm)									
	P 3/4 in. (19.0 mm)	100.0	100.0	100.0				100.0		100.0
	P 1/2 in. (12.5 mm)	100.0	100.0	100.0				100.0	100.0	100.0
	P 3/8 in. (9.5 mm)	100.0	96.6	100.0				94.0	90-100	97.2
	P NO. 4 (4.75 mm)	98.0	71.7	92.0				74.0	Max 90	82.8
	P NO. 8 (2.36 mm)	82.0	53.4	55.0				59.0	47-75	61.5
	P NO. 16 (1.18 mm)	67.0	39.8	32.3				48.0		46.2
	P NO. 30 (600 um)	51.0	30.0	18.9				37.0		33.9
	P NO. 50 (300 um)	30.0	21.9	10.1				24.0		21.3
	P NO. 100 (150 um)	8.0	14.1	4.2				14.0		10.4
	TOTAL P NO. 200 (75 um)	1.7	6.0	2.5				9.9	2-10	5.6
CRUSH COUNT			100.0	100.0				85.1	60 Min	80.7
L.A. ABRASION Value/Year		16 | 11	17 | 15	16 | 11				N | A	40 Max	< 40.0
ANGULARITY INDEX BLENDED		3.9	4.7					4.5	3.0 Min	4.5
SOFTSTONE %		0.1						0.1	8.0 Max	< 8.0
AWI NOMOGRAPH & QUARRYS		236	465	286				240	220 Min	311
COARSE AGGREGATE BULK SPECIFIC GRAVITY #4 UP			2.901	2.669				2.661	Combined Gsb	2.724
BULK SPECIFIC GRAVITY # 8										
FINE AGGREGATE BULK SPECIFIC GRAVITY		2.645						2.661		

ASPHALT SUPPLIER: MPM Oil, Monroe MI		GRADE: PG 58-22	Gb: 1.028
SUBMITTED BY: NAME (Print or Type): Kyle Anderson		DATE: May 1, 2015	PHONE NUMBER
SIGNATURE		VMA (Gsb): 16.30	FAX NUMBER
Asphalt Content: 5.50	**Gmm:** 2.452	**Gmb:** 2.354	

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FIELD DAILY REPORT

PROJECT: City of Novi 2014 Neighborhood Roads - Asphalt

TEC REPORT NUMBER: 54730-009 AFD

LOCATION: Novi, Michigan

DATE: October 10, 2014

CLIENT: City of Novi
Engineering Department
26300 Lee Begole Drive
Novi, Michigan 48375

WEATHER: Sunny, 65°F - 45°F

BRIEF SUMMARY OF WORK ACCOMPLISHED THIS DATE

Contractor, Pavex Paving & Excavating, placed 494 tons of 5E1 HMA top course over paving geotextile on Kingsley Lane and Paisley Circle Court. HMA was supplied by Cadillac Paving, Wixom Plant. Contractor used 2 smooth drum vibratory rollers for compaction. The average temperature of the HMA measured between 300°F to 320°F. I verified that the mix was properly placed and compacted. I performed density testing at various locations. Areas tested met the specified 92% to 96% compaction.

Site supervisory personnel were notified of test results and observations.

For additional information, including specific test results and locations, please refer to the attached report.

Technician: David Doig/ip

Reviewed by: William J. West, PE

cc: Ben Croy – City of Novi (bcroy@cityofnovi.org)
Aaron Staup – City of Novi (Astaup@cityofnovi.org)
John Becht – Spalding DeDecker Associates, Inc. (jbecht@sda-eng.com)
Paul Swartz – Spalding DeDecker Associates, Inc. (pswartz@sda-eng.com)

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ASPHALT DENSITY TEST REPORT

PROJECT: City of Novi 2014 Neighborhood Roads - Asphalt **TEC REPORT NUMBER:** 54730-009A AD

LOCATION: Novi, Michigan **DATE:** Friday, October 10, 2014

CLIENT: City of Novi
Engineering Department
26300 Lee Begole Drive
Novi, Michigan 48375

WEATHER: Sunny

MATERIAL ID	SUPPLIER	PLANT	TYPE OF MIX	BASE /LEVELING/ TOP	MAX DENSITY (PCF)
A	Cadillac	Wixom	5E1	Top	153.0

NDG MODEL: 3430 **NDG:** 35968 **MS:** 691 **DS:** 2151

TEST NO.	MATERIAL TESTED	TEST LOCATION	BASE/ LEVELING/ TOP	BULK DENSITY (PCF)	PERCENT COMPACTION
1	A	Inside Lane Eyebrow, Address 40928 Kinsley Lane	Top	144.0	94.1%
2	A	Inside Lane Eyebrow, Address 40916 Kinsley Lane	Top	142.7	93.3%
3	A	Inside Lane Eyebrow, Address 40904 Kinsley Lane	Top	146.9	96.0%
4	A	Inside Lane Eyebrow, Address 40892 Kinsley Lane	Top	145.7	95.2%
5	A	Outside Lane Eyebrow, Address 40928 Kinsley Lane	Top	144.5	94.4%
6	A	Outside Lane Eyebrow, Address 40916 Kinsley Lane	Top	143.8	94.0%
7	A	Outside Lane Eyebrow, Address 40904 Kinsley Lane	Top	143.1	93.5%
8	A	Outside Lane Eyebrow, Address 40892 Kinsley Lane	Top	142.9	93.4%
9	A	South Side of Address 40844 Kingsley	Top	144.8	94.6%
10	A	South Side of Address 40857 Kingsley	Top	143.8	94.0%
11	A	South Side of Address 40875 Kingsley	Top	142.7	93.3%
12	A	South Side of Address 40891 Kingsley	Top	144.2	94.2%

REMARKS:

COMPACTION REQUIRED: 92% to 96%

TECHNICIAN: David Doig/ip

REVIEWED BY: William J. West, PE

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ASPHALT DENSITY TEST REPORT

PROJECT: City of Novi 2014 Neighborhood Roads - Asphalt **TEC REPORT NUMBER:** 54730-009A AD

LOCATION: Novi, Michigan **DATE:** Friday, October 10, 2014

CLIENT: City of Novi
Engineering Department
26300 Lee Begole Drive
Novi, Michigan 48375

WEATHER: Sunny

MATERIAL ID	SUPPLIER	PLANT	TYPE OF MIX	BASE /LEVELING/ TOP	MAX DENSITY (PCF)
A	Cadillac	Wixom	5E1	Top	153.0

NDG MODEL: 3430 **NDG:** 35968 **MS:** 691 **DS:** 2151

TEST NO.	MATERIAL TESTED	TEST LOCATION	BASE/ LEVELING/ TOP	BULK DENSITY (PCF)	PERCENT COMPACTION
13	A	South Side of Kingsley at Eyebrow	Top	145.7	95.2%
14	A	South Side of Address 40940 Kingsley	Top	143.6	93.9%
15	A	South Side of Address 40952 Kingsley	Top	142.8	93.3%
16	A	South Side of Address 40963 Kingsley	Top	145.7	95.2%
17	A	North Side of Address 40844 Kingsley	Top	142.4	93.1%
18	A	North Side of Address 40857 Kingsley	Top	142.3	93.0%
19	A	North Side of Address 40875 Kingsley	Top	142.7	93.3%
20	A	North Side of Address 40891 Kingsley	Top	143.6	93.9%
21	A	North Side of Kingsley at Eyebrow	Top	143.9	94.1%
22	A	North Side of Address 40939 Kingsley	Top	144.9	94.7%
23	A	North Side of Address 40963 Kingsley	Top	144.3	94.3%
24	A	Address 40523 Paisley Circle West Side	Top	143.4	93.7%

REMARKS:

COMPACTION REQUIRED: 92% to 96%

TECHNICIAN: David Doig/ip

REVIEWED BY: William J. West, PE

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ASPHALT DENSITY TEST REPORT

PROJECT: City of Novi 2014 Neighborhood Roads - Asphalt **TEC REPORT NUMBER:** 54730-009A AD

LOCATION: Novi, Michigan **DATE:** Friday, October 10, 2014

CLIENT: City of Novi
Engineering Department
26300 Lee Begole Drive
Novi, Michigan 48375

WEATHER: Sunny

MATERIAL ID	SUPPLIER	PLANT	TYPE OF MIX	BASE /LEVELING/ TOP	MAX DENSITY (PCF)
A	Cadillac	Wixom	5E1	Top	153.0

NDG MODEL: 3430 **NDG:** 35968 **MS:** 691 **DS:** 2151

TEST NO.	MATERIAL TESTED	TEST LOCATION	BASE/ LEVELING/ TOP	BULK DENSITY (PCF)	PERCENT COMPACTION
25	A	Address 40531 Paisley Circle West Side	Top	144.7	94.6%
26	A	100 ft. North of Address 40531 Paisley Circle	Top	146.3	95.6%
27	A	200 ft. North of Address 40531Paisley Circle	Top	142.8	93.3%
28	A	300 ft. North of Address 40531Paisley Circle	Top	144.3	94.3%
29	A	Address 40523 Paisley Circle East Side	Top	144.4	94.4%
30	A	Address 40531 Paisley Circle East Side	Top	144.9	94.7%
31	A	100 ft. North of Address 40531 Paisley Circle	Top	144.9	94.7%
32	A	200 ft. North of Address 40531Paisley Circle	Top	145.2	94.9%

REMARKS:

COMPACTION REQUIRED: 92% to 96%

TECHNICIAN: David Doig/ip

REVIEWED BY: William J. West, PE

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CONCRETE REPORT

PROJECT: S. Washington Avenue Resurfacing (2015)
(S. Washington Ave.: Lincoln Avenue to 11 Mile Road)
Contract Number: 63459-126956 MDOT

TEC REPORT NUMBER: 55410-005A CC

LOCATION: Royal Oak, Michigan

OBSERVATION DATE: Tuesday, June 23, 2015

CLIENT: City of Royal Oak
211 Williams St.
P.O. Box #64
Royal Oak, MI 48068-0064

WEATHER: Sunny, 71°F - 75°F

CONCRETE SUPPLIER: McCoig Materials **MIX ID:** P-NCOM

LOCATION OF PLACEMENT: Full Depth Patch Replacement at Eastbound Fourth Street Patch 10 ft. east of Washington

CUBIC YARDS DELIVERED: 10 **REJECTED:** 0 **TOTAL PLACED:** 10

MATERIALS	SOURCE	MIX DESIGN
Cement	Type I Lafarge-Alpena	658
Fine Aggregate	2NS AA Ray Road 63-115	1112
Coarse Aggregate	6AA Limestone Ottawa Lake Stoneco 58-003	1847
Intermediate Aggregate		
Additional		
Additional		
Water	Potable	263
Admixture	AEA BASF MasterAir AE200 1.1 oz/cwt	
Admixture	MRWR Premiere Optiflo MR 5.0 oz/cwt	

Time, Hrs/Min	7:35				
Ticket Number	1124025				
Total Water, lbs	263				
Cementitious, lbs	658				
W/(C+P) Ratio	0.40				
Slump (inches)	4-3/4				
Air Content, (%)	7.5				
Unit Weight, PCF	---				
Yield, CF	---				
Air Temp °F	73				
Concrete Temp °F	82				
Sample Quantity	1 - 4				

Sample ID	Age Days	Date Molded	Date Tested	Location of Concrete Sampling	Diameter (inches)	Total Load	Strength (psi)
5645 1	7	06/23/15	06/30/15	Eastbound Fourth Street Patch 10 ft. East of	4	49,610	**3,950**
2	28	06/23/15	07/21/15	Washington	4	61,140	**4,870**
3	28	06/23/15	07/21/15		4	62,520	**4,980**
4	SP	06/23/15	SP		4		

Prepared by: Dan Lawler/ip

Required 28 Day Strength: 3,500 **PSI**

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FLOOR FLATNESS TEST REPORT

PROJECT:	Ford Livonia Transmission Plant Refurbishment	**TEC REPORT NUMBER:**	54181-013 ENF
LOCATION:	Livonia, MI	**DATE:**	May 5, 2014
CLIENT:	Walbridge 777 Woodward Avenue Suite 300 Detroit, MI 48226	**WEATHER:**	Cloudy

Floor Flatness & Levelness Survey

Pour No. : 2 (slab on grade, Zone #1 – H to L lines, between 104 and 112 lines.

Concrete Placement Date: 5/5/14

On May 5, 2014, Testing Engineers & Consultants, Inc. (TEC) surveyed the floor slab in accordance with ASTM E1155 using a Dipstick Floor Profiler 2000. The data obtained from our survey was processed to determine the local and overall floor flatness (F_F) values and floor levelness (F_L) values.

A summary of the test results for this date are as follows:

RUN NAME	NO. OF READINGS	MEASURED	
		F_F	F_L
1 NS	76	56.88	30.01
2 NS	76	60.11	25.78
3 NS	76	62.75	28.41
4 EW	76	53.21	33.01
5 EW	76	54.67	34.71
6 EW	76	55.01	27.45
7 NS	76	60.31	30.19
8 NS	76	58.80	34.42

Walbridge
May 5, 2014

TEC Report Number: 54181-013 ENF

FLOOR FLATNESS & LEVELNESS SURVEY (cont'd)

RUN NAME	NO. OF READINGS	MEASURED	
		F_F	F_L
9 NS	76	52.11	31.57
10 EW	76	50.37	27.88
11 EW	76	48.78	24.25
12 NS	76	56.62	31.90
13 NS	76	56.33	33.40
14 EW	76	50.17	27.78
TOTAL	**1,064**	**55.44**	**30.05**

TEST NO.	DATE	F_F	F_L
Local Test 1	4-22-14	55.89	32.08
Local Test 2	5-5-14	55.44	30.05
Overall	Through 5-5-14	55.66	31.06

	SPECIFIED MINIMUM F_F	SPECIFIED MINIMUM F_L
LOCAL	20	17
OVERALL	30	25

The total floor areas tested this date **MEET** the minimum local and overall flatness and levelness specification.

We are pleased for the opportunity to provide our services. Should you have any questions or require additional information, please feel free to contact our office.

Tested by: Michael Copeland/aoc

Reviewed by: Ruben E. Ramos, PE

cc: Erick Ozog – Walbridge (eozog@walbridge.com)
Ron Steele – Walbridge (rsteel@walbridge.com)
Cameron Fraser – Walbridge (cfraser@walbridge.com)

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LANE TIE PULL OUT TEST

PROJECT: Washington Avenue Resurfacing
11 Mile Road to Crooks

TEC REPORT NUMBER: 53381-007A ENL

LOCATION: Royal Oak, Michigan

DATE: June 25, 2013

CLIENT: City of Royal Oak
211 Williams Street
PO Box 64
Royal Oak, Michigan 48067

TEST PROCEDURE:

The lane ties were tested in accordance with MDOT Field Inspection Procedure D7 of the Materials Quality Assurance Procedures Manual.

TEST LOCATION:

TEST DATA:

SAMPLE NO.	LOCATION	LOAD AT INITIAL SLIPPAGE	LOAD AT 1/16 INCH EXTRUSION	ULTIMATE LOAD (LBS.)	ULTIMATE EXTRUSION
1	27+40	N/A	N/A	3000	None
2	27+45	N/A	N/A	3000	None
3	27+50	N/A	N/A	3000	None
4	27+55	N/A	N/A	3000	None
5	27+60	N/A	N/A	3000	None

TEST RESULTS: The lane ties tested this date **met** the 2012 MDOT Standard Specifications for Construction Section 602 requirements for minimum average pull-out resistance per Table 602-1.

Tested by: Keith Louchart/ac

Reviewed by: William J. West, PE

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TEC Report:
Date Issued:

Re: Geotechnical Investigation for

Dear:

Please find enclosed the results of a geotechnical investigation performed at the above referenced site. This geotechnical report presents our field and laboratory results; engineering analysis; and our recommendations for design of foundation and slabs, as well as important construction considerations.

As you may know, Testing Engineers & Consultants, Inc. (TEC) has more than forty five years of experience in Quality Control Testing and Construction Inspection. We would be pleased to provide these services on this project.

Should you have any questions regarding this report, please let us know. It has been a pleasure to be of service to you.

Respectfully submitted,

TESTING ENGINEERS & CONSULTANTS, INC.

Carey J. Suhan, P.E.,
Vice President, Geotechnical
& Environmental Services

CJS/ln
Enclosure

TABLE OF CONTENTS

APPENDIX

1.0 INTRODUCTION

This report presents the results of a geotechnical investigation for the proposed hike/bike trail. Authorization to perform this investigation was given by _____ in the form of a signed copy of TEC Proposal No. _____ dated _____.

The purpose of this investigation was to obtain information necessary to determine basic engineering properties of soils at the site through a series of test borings and laboratory tests performed on the soil samples obtained during the field investigation. This information has been evaluated to provide the general recommendations for site development preparations, foundation requirements, designs and other geotechnical information.

2.0 FIELD INVESTIGATION

Nine test borings were drilled on the site at the locations shown on the Boring Location List by station in the appendix. The locations are accurate to within a short distance of the locations shown on the list. The test borings were drilled on December 12 and 13, 2011 with an all-terrain vehicle to depths of 10 to 30 feet. The ATV was required to access the soft, wet and wooded conditions along the proposed path.

Drilling methods and standard penetration tests were performed in general accordance with the current ASTM D-1452 and D-1586 procedures, respectively. These procedures specify that a standard 2-inch O.D. split-barrel sampler be driven by a 140-pound hammer with a free fall of 30 inches. The number of hammer blows required to drive the split-barrel sampler through three successive 6-inch increments is recorded on the Test Boring Log. The first 6-inch increment is used for setting the sampler firmly in the soil and the sum of the hammer blows for the second and third increments is referred to as the "Standard Penetration Index" (N).

From the standard penetration test a soil sample is recovered in the liner sampler tubes that are located inside the split-barrel sampler. Upon recovery of a soil sample, the liner tubes are removed from the split-barrel sampler and placed in a container which is sealed to minimize moisture losses during transportation to the laboratory. Standard penetration tests are usually made at depths of 2 ½, 5, 7 ½ and 10 feet and at 5-foot depth intervals thereafter. These parameters may vary for a given project depending on the nature of the subsoils and the geotechnical information required.

3.0 LABORATORY TESTING

The laboratory testing consisted of determining the unconfined compressive strength, the natural bulk density and the natural moisture content of the soil samples recovered in the liner sampler tubes. In the

3.0 LABORATORY TESTING (Cont'd)

unconfined compression tests, the compressive strength of the soil is determined by axially loading a soil sample until failure is observed or 15% strain, whichever occurs first. The above referenced test data are recorded on the boring logs. Some test results may deviate from the norm because of variations in texture, imperfect samples, presence of pebbles and/or sand streaks, etc. The results are still reported although they may not be relevant.

The particle size distribution of two granular soil samples was also determined. The distribution provides estimates of the permeability and permeability-related behavior of the granular soils. The results are included in the appendix.

Samples taken in the field are retained in our laboratory for 60 days and are then destroyed unless special disposition is requested by the client. Samples retained over a long period of time are subject to moisture loss and are then no longer representative of the conditions initially encountered.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 Subsoil Conditions

The soil conditions encountered in the borings are presented on the individual boring logs. Each log presents the soil types encountered at that location as well as laboratory test data, ground water data, and other pertinent information. Descriptions of the various soil consistencies, relative densities and particle sizes are given in the Appendix. Definitions of the terms and symbols utilized in this report may be found in ASTM D-653.

The ground surface at each of the borings is covered with 2 inches to 1 ½ feet of topsoil. This was underlain by clayey sand in each of the borings except Boring Nos. 4, 6, and 8 where loose to medium compact sand was encountered. This sand or clayey sand extended to the terminal depths of the borings with the exception of Boring Nos. 3, 7, and 9. At these borings stiff to extremely stiff clay was encountered at depths of 9 ¾ feet, 17 feet and 23 feet, respectively. The clays extend to the respective 10 foot, 25 foot and 30 foot terminal depths of the borings. Gravel was also encountered within most of the sand layers. Occasional cobbles were also encountered in the sand layers in many of the borings.

Standard penetration test (SPT) values range from 2 to 80 blows per foot with unconfined compressive strengths of 3,300 to 8,570 pounds per square foot (psf). Bulk densities range from 90 to 150 pounds per cubic foot with moisture contents of 2 to 29 percent of the dry weight of the soil. Some of the SPT results are likely skewed higher due to the presence of gravel and cobbles.

4.2 Ground Water Observations

Water level readings were taken in the bore holes during and after the completion of drilling. These observations are noted on the respective Test Boring Logs.

Groundwater was encountered at deeper depths of 8 and 12 feet during drilling at Boring Nos. 4 and 5, respectively. These borings also experienced cave-ins at completion of drilling at 5 ½ and 8 feet. No ground water was found in Boring Nos. 2 and 3, while at the remainder of the borings ground water was encountered at shallower depths ranging from 1 ½ to 4 feet during and at completion of drilling.

5.0 ANALYSIS AND RECOMMENDATIONS

5.1 Proposed Development

The proposed development is to consist of the construction of the hike/bike trail. This will include three miles of trail located adjacent to the _____ River, two pedestrian bridges, and two boardwalks spanning wetland areas. The bridges will span 40 feet with an estimated 85 psf live load and 50 psf dead load. The bridges will be about 14 feet wide. The boardwalks will span wetlands at select locations.

5.2 Ground Water Conditions

The position of water levels found in test borings may vary somewhat depending on seasonal precipitation. At the level encountered in the borings, it will present some problems for construction of foundations and the trail. The stream flow must be cut off during the bridge foundation excavation. Once the stream flow is cut-off, the ground water should be controllable by direct pumping from properly prepared sumps in the excavation at the southern bridge near station 70+00 to 71+00. At the northern end of the trail, north of station 114+00 or Boring Nos. 6 through 9, the ground water is shallower. Significant pumping from properly prepared sumps or likely well points would be required to adequately control the ground water for shallow foundation construction.

5.3 Recommended Earthwork Operations

Within the limits of areas to be paved, the surface vegetation and topsoil should be removed prior to the site being graded. Obviously organic soils such as those found at Boring No. 8 should preferably be removed beneath any pavements. The site should then be rolled with a vibrating roller to densify the loose sand. The area should then be proofrolled with a heavily loaded rubber tired vehicle. In areas

5.3 Recommended Earthwork Operations (Cont'd)

where ground water is less than about 3 feet below existing grade, the ground water should be lowered prior to compaction or proofroll. The compactor may need to be operated in static mode to avoid worsening the subgrade. The areas with clayey or silty soils at the surface are likely to be unstable. Some of the current moisture contents are above their expected optimum moisture contents which would indicate potentially unstable areas. Soft spots may be stabilized with crushed concrete. Areas which cannot be stabilized may be disked, aerated and recompacted if work occurs in the dry summer months, otherwise the unstable soils should be removed and replaced with compacted engineered fill. A crushed stone surface will likely be required for construction traffic. If may be prudent to place a 1 to 3 inch size crushed stone or concrete first for construction traffic. A Tensar BX 1400 geogrid could be placed directly on the subgrade in any soft or yielding areas followed by the 1 to 3 inch size stone.

This would then provide a good subgrade for placement of the asphalt path cross section. However, prior to placement of the path the construction road should be proofrolled and inspected. Any unstable areas or areas of significantly contaminated with clay should be removed and replaced.

Engineered backfill required for construction excavations or fill required to achieve desired grades should preferably consist of clean and well graded granular soils. Fill should be placed in uniform layers not more than 9 inches in thickness with the soils in each layer compacted to a minimum of 95% of the maximum density as determined by ASTM D-1557. Fill should be at approximately the optimum moisture content during placement and compaction. Furthermore, frozen material must not be used as fill and fill should not be placed on frozen ground.

Since the soils are predominantly sands, lateral support structure or side sloping with a minimum 1H:1V ratio may be required for the anticipated excavations. Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in conditions such as from disturbances, rain or freezing. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, all footing concrete should be placed the same day the excavation is made. If this is not possible, the footing excavations should be adequately protected.

5.4 Bridge Foundation Recommendations

A number of conditions must be considered in the design of a foundation for a bridge, namely achieving adequate bearing, anticipating potential scour depth below the bottom of the waterway, and ensuring constructability of the bridge, while maintaining the flow of water.

The southern bridge at about Station 70+00 may be supported on conventional foundations. Boring Nos. 4 and 5 were drilled in this area. Medium compact sands were encountered at depths of about 3 to

5.4 Foundation Recommendations (Cont'd

4 feet below existing grade. Local building codes and climatic conditions require that exterior foundations be placed at a minimum depth of 3 1/2 feet below finished grade to provide adequate frost protection. Foundations placed on the native medium compact sands may be designed for a net allowable bearing capacity of 4000 psf. Total settlements of about one inch are expected with differential settlements of ¾ inch between adjacent foundations.

For the northern bridge at approximately station 125+00 the soils are not suitable for shallow foundations. The soils encountered in Boring Nos. 7 and 8 were loose to very loose between depths of about 3 to 13 feet below existing grade. Furthermore, the encountered ground water was quite high at 1 ½ feet and 4 feet below existing grade in Boring Nos. 7 and 8, respectively. Accordingly, we recommend that a deep foundation be used to transfer the loads to the lower more competent soils.

With the larger concentrated loads, we recommend the use of piling for support. Treated wood piles could develop capacity through side-shear (friction) and point bearing. Piles with a minimum 8-inch diameter tip and 12-inch diameter butt should develop an estimated allowable design capacity of 8.5 kips when driven to approximately 20 feet below existing ground surface. Additional allowable capacity of about 1 kip/foot of additional penetration could be used.

Driven pile capacities should be verified with a recognized dynamic driving formula. Proper field monitoring is very important since the borings are widely spaced and soil conditions could change.

Screw-in helical piers could also be used. However, cobbles encountered throughout much of the soil profile could be problematic for installation of helical piers. It is estimated that a 12 inch diameter helix at a depth of about 20 feet would achieve an allowable capacity of 10.5 kips. Additional capacity could be achieved if double or triple helix systems are used. The allowable pile and pier capacities are based upon a factor of safety of 3 and assuming soil conditions below 20 feet are constant.

Piles or piers would have an advantage over conventional foundations in that the superstructure could be connected directly to them. This would minimize excavation and attendant ground water control issues.

Piers and piles would provide some lateral resistance in the upper sandy soils. Additional lateral capacity could be obtained by installing them on a batter, or through sufficient superstructure bracing.

Abutments supported on deep foundations must bear below the level to which the stream bottom can be expected to be removed by scour during the designated design flood. The upper sandy soils are susceptible to erosion by flowing water, and for that reason, may require scour protection measures.

5.5 Boardwalk Foundation Recommendations

The required footing excavations may extend below the water level in the stream during construction and adequate provisions must be made and maintained to allow construction to take place in the dry.

The soils for the boardwalk area near station 114+00 are suitable for support of the boardwalk. Boring No. 6 indicated medium compact fine to medium sand beginning at 3 feet below existing grade. Foundations on these soils may be designed for a net allowable bearing capacity of 2500 psf. Ground water was encountered at about 3 feet below existing grade.

The soil at the boardwalk area near station 133+00 were less competent. Boring No. 9 indicated loose soils to 12 feet below existing grade. Shallow foundations designed for a net allowable bearing capacity of 1500 psf could be used here. Ground water was encountered at about 4 feet below existing grade.

Alternatively a deep foundation could be used to achieve higher bearing capacities and minimize ground water issues. Treated wood piles could develop capacity through side-shear (friction) and point bearing. Piles with a minimum 8-inch diameter tip and 12-inch diameter butt should develop an estimated allowable design capacity of 8.5 kips when driven to approximately 20 feet below existing ground surface.

Driven pile capacities should be verified with a recognized dynamic driving formula. Proper field monitoring is very important since the borings are widely spaced and soil conditions could change.

5.6 Asphalt Pedestrian Path

The subgrade resulting from the site preparation, as outlined in the recommended earthwork operations section, will provide a fair to good subgrade for support of pavements. It is recommended that a minimum 3 inches of asphalt be placed over 6 inches of MDOT 21AA. The path should be sloped to promote surface drainage and preferably the aggregate base built up higher than the surrounding area to minimize water entrapment in the aggregate base.

6.0 DESIGN REVIEW AND FIELD MONITORING

The evaluations and recommendations presented in this report relative to site preparation and building foundations have been formulated on the basis of assumed and provided data relating to the location, type and finished grades for the proposed structure and adjacent areas. Any significant change in this data should be brought to our attention for review and evaluation with respect to the prevailing subsoil conditions.

6.0 DESIGN REVIEW AND FIELD MONITORING (Cont'd)

When the building and foundation plans are finalized, a consultation should be arranged with us for a review to verify that the evaluations and recommendations have been properly interpreted.

Soil conditions at the site could vary from those generalized on the basis of test borings made at specific locations. It is therefore recommended that Testing Engineers & Consultants, Inc. be retained to provide soil engineering services during the site preparation, excavation and foundation phases of the proposed project. This is to observe compliance with the design concepts, specifications and recommendations. Also, this provides opportunity for design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Jill M. Inman
Staff Engineer

Carey J. Suhan, P.E.
Vice President, Geotechnical
& Environmental Services

JMI/CJS/ln
I:\gs\Library\redacted pedstrian bike path report.doc

APPENDIX

Boring Location List

Logs Of Test Borings

General Notes For Soil Classification

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-1 Sta. 14+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Solid Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.58				
			1	Moist Brown Sandy TOPSOIL (7")			
	LS	2			16.0	105	
		2					
2.5		3		Moist Brown Fine SAND With Trace Of Gravel (5")			
			3.5				
	LS	4		Loose Moist Brown Oxidized Clayey Fine SAND With Some Gravel	11.0	141	
		6					
5.0		8					
			6	Medium Compact Wet Brown Fine To Medium SAND & Gravel			
	LS	10			6.9	143	
		14					
7.5		20					
			8	Compact Wet Gray Clayey Fine SAND & Gravel With Occasional Clay Layer			
	LS	20			8.3	124	
		23					
10.0		25	10	Compact Wet Brown Gravelly Well Graded SAND With Some Silt			
				Bottom of Borehole at 10'			
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 3'6"

At Completion: 2'10"

Boring No. A-1 Sta. 14+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-2 Sta. 35+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Solid Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.58	Moist Brown Sandy TOPSOIL (7")			
	LS	2			13.6	104	
		3	2				
2.5		3		Loose Moist Brown Oxidized Clayey Fine To Medium SAND With Some Gravel			
	LS	2			15.3	142	
		4		Firm Moist Brown Oxidized Sandy CLAY With Some Gravel			
5.0		8	5				
				Medium Compact Moist Brown Fine SAND			
	LS	6			2.8	108	
		10	7.25				
7.5		15					
			8.5	Medium Compact Moist Brown Fine To Medium SAND With Some Gravel			
	LS	13			2.8	122	
		29					
10.0		12	10	Compact Moist Brown Fine To Medium SAND & Gravel With Occasional Cobble			
				Bottom of Borehole at 10'			
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Boring No. A-2 Sta. 35+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-3 Sta. 48+30 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Solid Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	3 3 4	1.17	Moist Brown Sandy TOPSOIL	12.9	143	3300
2.5			3.5	Plastic Moist Brown Oxidized Sandy CLAY With Trace Of Silt & Gravel			
	LS	2 2 3		Loose Moist Brown Oxidized Clayey Fine SAND With Trace Of Gravel	9.2	117	
5.0			6				
	LS	7 8 9		Stiff Moist Brown Oxidized CLAY With Some Silt, Trace Of Fine Sand & Gravel	12.2	140	4780
7.5							
	LS	7 8 9	9.75		11.7	149	8570
10.0			10	Stiff Moist Gray CLAY With Some Silt, Trace Of Fine Sand & Gravel (3") Bottom of Borehole at 10'			
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Boring No. A-3 Sta. 48+30

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-4 Sta. 69+84 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	3 3 7	1.17	Moist Brown Sandy TOPSOIL	6.4	128	
2.5			3	Medium Compact Moist Brown Medium SAND & Gravel			
	LS	13 13 15		Medium Compact Moist Brown Medium To Coarse SAND & Gravel With Occasional Cobble	4.1	120	
5.0							
	LS	7 10 15			6.5	119	
7.5			8				
	LS	10 10 12		Medium Compact Wet Brown Gravelly Well Graded SAND With Some Silt & Occasional Cobble	11.6	129	
10.0							
12.5							
	LS	7 7 7			11.8	142	
15.0							
			17				
17.5				Medium Compact Wet Brown Medium To Coarse SAND & Gravel`			
	LS	7 8 8			12.7	144	
20.0							
22.5							
	LS	7 8 12	24.5		10.9	142	

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 8'0"

At Completion: Caved At 5'6"

Boring No. A-4 Sta. 69+84

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-4 Sta. 69+84 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
27.5	LS	11 13 15	30	Medium Compact Wet Brown Fine To Medium SAND	13.2	114	
30.0				Bottom of Borehole at 30'			
32.5							
35.0							
37.5							
40.0							
42.5							
45.0							
47.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 8'0"

At Completion: Caved At 5'6"

Boring No. A-4 Sta. 69+84

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-5 Sta. 71+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	2 2 3	1.42	Moist Brown Sandy TOPSOIL	13.2	127	
2.5				Loose Moist Brown Oxidized Clayey Fine To Medium SAND With Trace Of Gravel			
	LS	7 10 10	4		3.9	122	
5.0			6	Medium Compact Moist Light Brown Fine To Medium SAND With Trace Of Gravel			
	LS	5 9 15			5.4	108	
7.5			8	Medium Compact Moist Light Brown Fine To Medium SAND With Some Gravel			
	LS	9 13 18		Compact Moist Light Brown Gravelly Well Graded SAND With Some Silt	2.3	148	
10.0							
			12				
12.5				Medium Compact Wet Brown Gravelly Well Graded SAND With Some Silt			
	LS	7 8 9			13.7	146	
15.0							
			17				
17.5				Loose Wet Brown Coarse SAND & Gravel			
	LS	2 4 5			11.3	117	
20.0							
			22				
22.5				Medium Compact Wet Brown Medium To Coarse SAND & Gravel			
	LS	8 8 8			11.3	129	

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 12'0"

At Completion: Caved At 8'0"

Boring No. A-5 Sta. 71+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
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Fax (248) 588-6232

Boring No.: A-5 Sta. 71+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/12/2011

Intersection: **Completed:** 12/12/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			26				
27.5			28	Medium Compact Wet Brown Medium To Coarse SAND & Gravel			
	LS	9 18 18	30	Compact Wet Brown Medium To Coarse SAND & Gravel	7.9	107	
30.0				Bottom of Borehole at 30'			
32.5							
35.0							
37.5							
40.0							
42.5							
45.0							
47.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 12'0"

At Completion: Caved At 8'0"

Boring No. A-5 Sta. 71+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-6 Sta. 114+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/13/2011

Intersection: **Completed:** 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.5	Moist Brown Sandy TOPSOIL (6")			
	LS	2			13.4	106	
		3					
2.5		3	3	Loose Moist Brown Oxidized Clayey Fine SAND With Trace Of Silt, Gravel & Occasional Clay Layer			
	LS	5		Medium Compact Wet Brown Fine To Medium SAND With Some Gravel & Occasional Cobbles	21.7	135	
		5					
5.0		12					
			6				
	LS	5			11.7	138	
		12		Medium Compact Wet Gray Fine To Medium SAND & Gravel With Occasional Cobble			
7.5		12	8				
	LS	11		Medium Compact Wet Gray Gravelly Well Graded SAND With Some Silt & Occasional Cobble	12.1		
		9					
10.0		7					
12.5							
	LS	3	14		16.8	110	
		7					
15.0		9		Medium Compact Wet Brown Gravelly Well Graded Sand With Some Silt			
			17				
17.5				Dense Wet Brown Coarse SAND & Gravel With Occasional Cobble			
	LS	9			11.5	134	
		23					
20.0		30					
22.5			23				
	LS	7			11.0	114	
		7		Medium Compact Wet Brown Fine To Medium SAND With Some Gravel			
		10					

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 3'0"

At Completion: 1'0"

Boring No. A-6 Sta. 114+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-6 Sta. 114+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/13/2011

Intersection: **Completed:** 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			26				
27.5	LS	5 9 9	30	Medium Compact Wet Brown Medium To Coarse SAND & Gravel With Occasional Cobbles	7.4	110	
30.0				Bottom of Borehole at 30'			
32.5							
35.0							
37.5							
40.0							
42.5							
45.0							
47.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 3'0"

At Completion: 1'0"

Boring No. A-6 Sta. 114+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-7 Sta. 125+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers **Started:** 12/13/2011

Intersection: **Completed:** 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.75	Moist Brown Sandy Topsoil-FILL (9")			
	LS	2 6 8	2	Medium Compact Wet Brown Clayey Fine To Medium SAND With Trace Of Gravel	17.1	116	
2.5							
	LS	16 11 11	5	Medium Compact Wet Brown Medium To Coarse SAND & Gravel With Some Cobbles	11.6	150	
5.0							
	LS	4 3 3	8	Loose Wet Brown Fine To Medium SAND With Some Gravel & Silt	23.8	118	
7.5							
	LS	1 1 2	12	Very Loose Wet Brown Fine SAND	28.9	106	
10.0							
12.5							
	LS	2 5 8	17	Medium Compact Wet Brown Fine To Medium SAND & Gravel	15.2	135	
15.0							
17.5							
	LS	10 16 17	22	Extremely Stiff Moist Gray Sandy CLAY With Trace Of Silt & Gravel	10.1	144	
20.0							
22.5							
	LS	23 40 40	25	Hard Moist Gray CLAY With Trace Of Silt, Fine Sand & Gravel	9.5	105	
				Bottom of Borehole at 25'			

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 1'6"

At Completion: 1'6"

Boring No. A-7 Sta. 125+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-8 Sta. 126+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle

Drilling Method: Hollow Stem Augers **Drilled By:** B. Adams

Intersection:

Started: 12/13/2011

Completed: 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.17	Moist Brown Clayey Topsoil-FILL (2")			
	LS	3 4			17.7	129	
2.5		5		Firm Moist Brown & Black Clay With Some Gravel, Trace Of Fine Sand & Organics-FILL			
	LS	2 2	4		18.9		
5.0		2		Loose Wet Brown Fine To Medium SAND With Some Gravel			
	LS	1	6		18.8	91	
		3		Loose Wet Brown Clayey Fine To Medium SAND With Some Gravel			
7.5		3	8				
	LS	1 1		Very Loose Wet Brown Medium SAND & Gravel	16.4		
10.0		1					
12.5			13.5				
	LS	4 13		Extremely Stiff Wet Gray CLAY With Some Fine Sand, Silt, Trace Of Gravel & Occasional Cobbles	9.5	125	
15.0		23					
			17				
17.5				Dense Wet Gray Clayey Fine To Medium SAND & Gravel With Some Cobbles			
	LS	30/6"			10.1	151	
20.0			20				
				Bottom of Borehole at 20'			
22.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 4'0"

At Completion: 4'0"

Boring No. A-8 Sta. 126+00

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: A-9 Sta. 133+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle **Drilled By:** B. Adams

Drilling Method: Hollow Stem Augers & Water **Started:** 12/13/2011

Intersection: **Completed:** 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.58	Moist Brown Sandy TOPSOIL (7")			
	LS	3 3 4			19.7	140	
2.5			3	Loose Wet Brown Clayey Fine SAND With Some Gravel			
	LS	3 4 5		Loose Wet Brown Medium SAND & Gravel With Occasional Cobble	14.7		
5.0			6				
	LS	3 4 4		Loose Wet Brown Coarse SAND & Gravel	19.1	90	
7.5							
	LS	3 3 4			10.6	136	
10.0				Water Introduced Into Boring At 10'			
			12				
12.5				Medium Compact Wet Brown Gravelly Well Graded Sand With Some Silt			
	LS	5 7 8			19.4		
15.0							
			17				
17.5				Loose Wet Gray Fine SAND With Trace Of Silt			
	LS	3 3 4			12.3	107	
20.0							
22.5			23				
	LS	2 3 4		Plastic Moist Gray CLAY With Some Fine Sand, Trace Of Silt & Gravel	10.9	120	

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 3'0"

At Completion: N/A

Boring No. A-9 Sta. 133+00

Testing Engineers & Consultants, Inc.

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(248) 588-6200 or (313) T-E-S-T-I-N-G
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Boring No.: A-9 Sta. 133+00 **Job No.:** 52035 **Project:** Hike/Bike Trail

Client:

Location:

Type of Rig: All-Terrain Vehicle

Drilling Method: Hollow Stem Augers & Water **Drilled By:** B. Adams

Intersection:

Started: 12/13/2011

Completed: 12/13/2011

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
27.5			28				
	LS	35 28 20	30	Extremely Stiff Moist Gray CLAY With Some Fine Sand, Gravel, Trace Of Silt & Occasional Wet Sand Seam	12.3	117	
30.0				Bottom of Borehole at 30'			
32.5							
35.0							
37.5							
40.0							
42.5							
45.0							
47.5							

"N" - Standard Penetration Resistance
SS - 2").D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 3'0"

At Completion: N/A

Boring No. A-9 Sta. 133+00

SOIL DESCRIPTIONS

In order to provide uniformity throughout our projects, the following nomenclature has been adopted to described soil characteristics:

CONSISTENCY AND RELATIVE DENSITY

COHESIVE SOILS		GRANULAR SOILS	
"N" VALUES	CONSISTENCY	"N" VALUES	RELATIVE DENSITY
0 – 2	Very Soft	0 – 4	Very Loose
2 – 4	Soft	4 – 10	Loose
4 – 8	Plastic	10 – 30	Med. Compact
8 – 15	Firm	30 – 50	Compact
15 – 30	Stiff	50+	Dense
30 – 60	Ex. Stiff		
60+	Hard		

Material Types By Particle Size	ASTM D2487
BOULDERS	Stones Over 12" In Diameter
COBBLES	Stones 3" To 12" In Diameter
GRAVEL	#4 To 3" Diameter
COARSE SAND	#10 To #4 Sieves
MEDIUM SAND	#40 To #10 Sieves

SOIL DESCRIPTIONS (Cont'd)

Material Types By Particle Size	**ASTM D2487**
FINE SAND	#200 To #40 Sieves
SILT	Minus #200 Sieve Material, Fairly Non-Plastic, Falls Below "A"-Line
CLAY	Minus #200 Sieve Material Plastic Material That Has A Tendency To Stick Together, Can Be Rolled Into Fine Rods When Moistened; Falls Above "A"-Line
PEAT	Black Organic Material Containing Partially Decayed Vegetable Matter
MARL	Fresh Water Deposits Of Calcium Carbonate, Often Containing Percentages Of Peat, Clay & Fine Sand
SWAMP BOTTOM DEPOSITS	Mixtures Of Peat, Marl, Vegetation & Fine Sand Containing Large Amounts Of Decayable Organic Material

R 12/16/13

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
Facilities and Business Services Administration
Design & Construction Division

Certification of a Michigan Based Business

(Information Required Prior to Contract Award for Application of State Preference/Reciprocity Provisions)

To qualify as a Michigan business:

Vendor must have, during the 12 months immediately preceding this bid deadline:
or
If the business is newly established, for the period the business has been in existence, it has:

(check all that apply):

- ☐ Filed a Michigan single business tax return showing a portion or all of the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL 208.1 – 208.145; or
- ☒ Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or
- ☐ Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

- ☒ Bidder qualifies as a Michigan business (provide zip code: 48083)
- ☐ Bidder does not qualify as a Michigan business (provide name of State: _____).
- ☐ Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: _____)

Bidder: Testing Engineers & consultants, Inc.

Carey J. Suhan, PE
Authorized Agent Name (print or type)

8-14-19
Authorized Agent Signature & Date

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN $25,000 and subject to debarment under MCL 18.264.

R 12/16/13

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
Facilities and Business Services Administration
Design & Construction Division

Responsibility Certification

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.

(b) Has not had a felony conviction in any state (including the State of Michigan).

(c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid-rigging, or a violation of state or federal anti-trust statutes.

(d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

(e) Has not been terminated for cause by the Owner.

(f) Has not failed to pay any federal, state, or local taxes.

(g) Has not failed to comply with all requirements for foreign corporations.

(h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.

(i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:

i. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.
iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the time period required.
iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
v. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.
vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).

(j) Is NOT an Iran linked business as defined in MCL 129.312.

I understand that a false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

Bidder: Testing Engineers & Consultants, Inc.

Carey J. Suhan, PE
Authorized Agent Name (print or type)

8-14-19
Authorized Agent Signature & Date

☐ I am unable to certify to the above statements. My explanation is attached.

Part II - Fee Proposal

To Provide:

Materials Testing, Construction Quality Control, And Geotechnical Engineering Services

For

2019 Contract #DTMB-430 ISID PSC-AE
Various Locations, Michigan

Submitted to:

State of Michigan
Department of Technology, Management and Budget
Facilities and Business Services Administration,
Design and Construction Division

Submitted by:

Testing Engineers & Consultants, Inc.

TEC Proposal #010-19-270
Submitted: August 15, 2019

"Engineering Client Success"

Testing Engineers & Consultants, Inc.
1343 Rochester Road • PO Box 249 • Troy, Michigan 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G • Fax (248) 588-6232
www.testingengineers.com

August 15, 2019 TEC Proposal #010-19-270

Ms. Anne Watros
State of Michigan
Department of Technology, Management and Budget (DTMB)
State Facilities Administration
Design and Construction Division
General Office Building, 3B
3111 West St. Joseph Street
Lansing, Michigan 48917

Re: Fee Proposal for Materials Testing, Construction Quality Control, and Geotechnical Engineering Services for ISID 2019 Contract

Dear Ms. Watros:

We are pleased to submit the enclosed Fee portion of the referenced proposal for your consideration.

We have reviewed the formal Request for Proposal and subsequent Addenda #1 dated July 17th, 2019, and prepared our enclosed fees accordingly.

Thank you for the opportunity to present our proposal for your review and consideration. We look forward to presenting our capabilities to you in person at your convenience, if required. Should you have any questions or require further information, please do not hesitate to call us at (248) 588-6200.

Respectfully submitted,
TESTING ENGINEERS & CONSULTANTS, INC.

Ruben E. Ramos, PE
Vice President & Principal
Engineering & Construction Services

Carey J. Suhan, PE
Vice President & Principal
Geotechnical and Environmental Services

Enclosure

Testing Engineers & Consultants, Inc.

Fee Schedule for Commonly Requested Services

This table may be requested as an electronic document. Provide this schedule with your proposal. If other types of tests or services are required they will be quoted at the time of project assignment.

SERVICE TYPE/RATE/CHARGE	UNITS	$/TEST
EQUIPMENT CHARGES		
Nuclear Density Gauge	Per day	**$35.00**
Asphalt Extraction Equipment	Per day	**$55.00**
Coring Machine	Per day	**$80.00**
Bit Charge	Per inch	**$2.25**
LABORATORY RATES		
GEOTECHNICAL		
Granular Proctor	Per Test	**$150.00**
Cohesive Proctor	Per Test	**$150.00**
Method 'C' Proctor	Additional Charge Per Test	**$65.00**
Sieve Analysis	Per Test	**$80.00**
Hydrometer Grain Size Distribution	Per Test	**$120.00**
Specific Gravity	Per Test	**$65.00**
Atterberg Limits	Per Test	**$90.00**
Soil Ph	Per Test	**$65.00**
Organic Content/Loss on Ignition	Per Test	**$65.00**
AGGREGATES		
Aggregate Sieve Analysis	Per Test	**$80.00**
Loss by Wash	Per Test	**$65.00**
Deleterious Materials, ASTM	Per Test	**$85.00**
Deleterious Materials, MTM	Per Test	**$85.00**
Percent Crushed	Per Test	**$70.00**
CONCRETE		
6" Cylinder, Concrete Compression	Per Cylinder	**$14.00**
4" Cylinder, Concrete Compression	Per Cylinder	**$14.00**
Core Compression, including saw cut	Per Test	**$40.00**
MASONRY		
Grout Prism Compression	Per Prism	**$14.00**
Hydraulic Cement Cube Compression	Per Cube	**$14.00**
Concrete Masonry Unit Compression	Per Masonry Unit	**$95.00**
Brick Compressive Strength, Absorption, Saturation	Set of 15	**$295.00**
BITUMINOUS		
Bituminous Mix Verification	Per Test	**$550.00**

STEEL		
Steel Fireproofing Density Test	Per Test	**$55.00**
SOIL TESTING		
Mobilization/Demobilization		
Within 50-mile radius	By Equipment	**$4750.00**
Outside 50-mile radius	By Equipment	**$475.00+ 1.50/Mile**
SPT Testing, Normal soil drilling conditions, per linear foot, 5-foot intervals	Per Linear Foot	**$14.00**
SPT Testing, Difficult soil drilling conditions, per linear foot, 5-foot intervals	Per Linear Foot	**$15.00**
Drilling surcharge for 50-100-foot depth	Per Linear Foot	**Add 4.25/Foot**
Drilling surcharge for 100-150-foot depth	Per Linear Foot	**Add 9.50/Foot**
Premium charge for all terrain drill rig	Per Day	**$350.00**
Additional SPT samples	Per Sample	**$15.00**
Shelby Tubes (undisturbed thin-walled soil samples)	Per Attempt	**$60.00**
Drilling through concrete or brick at soil surface	Per Inch	**$13.00**

POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION

2019 Indefinite-Scope Indefinite-Delivery – Request for Proposal
General Materials Testing, Quality Control and Geotechnical Engineering Services
(Architecture, Engineering, Landscape Architecture)

Firm Name	**Testing Engineers & Consultants, Inc.**
Yearly Hourly Billing Rate Increase	**1.5%**
Mark-up for Sub-Consultants (not to exceed 5%)	N/A
Mark-up for Reimbursables (not to exceed 5%)	N/A

Position/Classification	Rate Ranges			
	Year 1	Year 2	Year 3	Year 4
Technician I	$40-50.00	$40.60-50.75	$41.20-51.50	$41.80-57.25
Technician II	$50-60.00	$50.75-60.90	$51.50-61.80	$52.25-62.70
Technician III	$60-70.00	$60.90-71.05	$61.50-72.10	$62.40-73.20
CWI Steel Inspector	$75-85.00	$76.10-86.25	$77.25-87.50	$78.40-88.80
Sr. CWI Steel Inspector	$85-95.00	$86.25-96.40	$87.55-97.85	$88.85-99.30
Senior Inspector	$75-85.00	$76.10-86.25	$77.25-87.50	$78.40-88.80
Project Manager	$95-105.00	$96.40-106.55	$97.85-108.15	$99.30-109.75
Sr. Project Manager	$100-110.00	$101.50-111.65	$107.05-113.25	$108.65-114.75
Project Engineer	$95-105.00	$96.40-106.55	$97.85-108.15	$99.30-109.75
Sr. Project Engineer	$100-110.00	$101.50-111.65	$107.05-113.25	$108.65-114.75
Sr. Consultant	$115-125.00	$116.70-126.85	$118.45-128.75	$120.20-130.65
Roofing Consultant	$100-110.00	$101.50-111.65	$107.05-113.25	$108.65-114.75
Sr. Engineer/Consultant	$115-125.00	$116.70-126.85	$118.45-128.75	$120.20-130.65
Principal/Engineer/Consultant	$150-160.00	$152.35-162.40	$154.50-164.80	$156.80-167.25

*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the attached "Sample Standard Contract for Professional Services," Article 5, Compensation Text.

** Key Project Personnel

APPENDIX III

PROFESSIONAL CERTIFICATION FORMS

R 12/16/13

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
Facilities and Business Services Administration
Design & Construction Division

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or
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I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

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8-14-19
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R 12/16/13

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
Facilities and Business Services Administration
Design & Construction Division

Responsibility Certification

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.

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ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.
iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the time period required.
iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
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vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).

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Bidder: Testing Engineers & Consultants, Inc.

Carey J. Suhan, PE
Authorized Agent Name (print or type)

8-14-19
Authorized Agent Signature & Date

☐ I am unable to certify to the above statements. My explanation is attached.

APPENDIX IV

OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTORS HOURLY BILLING RATE CALCULATION

The following instructions are to be used by the Professional Services Contractor firms to determine the hourly billing rate to use on State of Michigan Projects.

The Professional's Consultant must submit a separate hourly billing rate for the professional Consultant services they will provide for State of Michigan Projects. A moderate mark-up of the Professional's Consultant services hourly billing rates will be allowed.

The Department will reimburse the Professional for the actual cost of printing and reproduction of the Contract Bidding Documents, soil borings, surveys and any required laboratory testing services and use of field equipment. No mark-up of these Project costs will be allowed.

CURRENT YEAR HOURLY BILLING RATE
Based on Prior Year Expenses

OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

SALARIES:
Principals (Not Project Related)
Clerical/Secretarial
Technical (Not Project Related)
Temporary Help
Technical Training
Recruiting Expenses

OFFICE FACILITIES:
Rents and Related Expenses
Utilities
Cleaning and Repair

SUPPLIES:
Postage
Drafting Room Supplies
Documents)
General Office Supplies
Library
Maps and Charts
Magazine Subscriptions

SERVICES (PROFESSIONAL):
Accounting
Legal
Employment Fees
Computer Services
Research

FINANCIAL:
Depreciation

EQUIPMENT RENTALS:
Computers
Typewriter
Bookkeeping
Dictating
Printing
Furniture and Fixtures
Instruments

TRAVEL:
All Project-Related Travel*

MISCELLANEOUS:
Professional Organization Dues
for Principals and Employees
Licensing Fees

SERVICES (NONPROFESSIONAL):
Telephone and Telegram
Messenger Services

TAXES:
Franchise Taxes
Occupancy Tax
Unincorporated Business Tax
Property Tax
Single Business Tax
Income Tax

INSURANCE:
Professional Liability Insurance
Flight and Commercial Vehicle
Valuable Papers
Office Liability
Office Theft
Premises Insurance
Key-Personnel Insurance

EMPLOYEE BENEFITS:
Hospitalization
Employer's F.I.C.A. Tax
Unemployment Insurance
Federal Unemployment Tax
Disability
Worker's Compensation
Vacation
Holidays
Sick Pay
Medical Payments
Pension Funds
Insurance - Life
Retirement Plans

PRINTING AND DUPLICATION:
Specifications (other than Contract Bidding

Drawings (other than Contract Bidding Documents)
Xerox/Reproduction
Photographs

LOSSES:
Bad Debts (net)
Uncollectible Fee
Thefts (not covered by Project/Contract bond)
Forgeries (not covered by Project/Contract bond)

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

VEHICLE AND TRAVEL SERVICES (VTS)
SCHEDULE OF TRAVEL RATES FOR CLASSIFIED AND UNCLASSIFIED EMPLOYEES
Effective January 1, 2019

MICHIGAN SELECT CITIES *

	Individual	Group Meeting pre-arranged and approved
Lodging**	$85.00	$85.00
Breakfast	$10.25	$13.25
Lunch	$10.25	$13.25
Dinner	$24.25	$27.25

MICHIGAN IN-STATE ALL OTHER

	Individual	Group Meeting pre-arranged and approved
Lodging**	$85.00	$85.00
Breakfast	$ 8.50	$11.50
Lunch	$ 8.50	$11.50
Dinner	$19.00	$22.00
Per Diem	**$87.00**	
Lodging	$51.00	
Breakfast	$ 8.50	
Lunch	$ 8.50	
Dinner	$19.00	

OUT-OF-STATE SELECT CITIES *

	Individual	Group Meeting pre-arranged and approved
Lodging**	Contact Conlin Travel	Contact Conlin Travel
Breakfast	$13.00	$16.00
Lunch	$13.00	$16.00
Dinner	$25.25	$28.25

OUT-OF-STATE ALL OTHER

	Individual	Group Meeting pre-arranged and approved
Lodging**	Contact Conlin Travel	Contact Conlin Travel
Breakfast	$10.25	$13.25
Lunch	$10.25	$13.25
Dinner	$23.50	$26.50
Per Diem	**$97.00**	
Lodging	$51.00	
Breakfast	$10.25	
Lunch	$10.25	
Dinner	$23.50	

Incidental Costs (per overnight stay) $5.00

Mileage Rates

Premium Rate	$0.580 per mile
Standard Rate	$0.340 per mile

*See Select High Cost City Listing
**Lodging available at State Rate, or call Conlin Travel at 877-654-2179 or www.somtravel.com

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
VEHICLE AND TRAVEL SERVICES (VTS)
SELECT HIGH COST CITY LIST
TRAVEL RATE REIMBURSEMENT FOR CLASSIFIED and UNCLASSIFIED EMPLOYEES EFFECTIVE
January 1, 2019

Michigan Select Cities / Counties

Cities	Counties
Ann Arbor, Auburn Hills, Detroit, Grand Rapids, Holland, Leland, Mackinac Island, Petoskey, Pontiac, South Haven, Traverse City	Grand Traverse Oakland Wayne

Out of State Select Cities / Counties

State	City / County	State	City / County
Arizona	Phoenix, Scottsdale, Sedona	Maryland	Baltimore City, Ocean City (Counties of Montgomery & Prince Georges)
California	Los Angeles (Counties Los Angeles, Orange, Mendocino & Ventura) Edwards AFB, Arcata, McKinleyville, Mammoth Lakes, Mill Valley, San Rafael, Novato, Monterey, Palm Springs, San Diego, San Francisco, Santa Barbara, Santa Monica, South Lake Tahoe, Truckee, Yosemite National Park	Massachusetts	Boston (Suffolk County), Burlington Cambridge, Woodburn Martha's Vineyard
Colorado	Aspen, Breckenridge, Grand Lake, Silverthorne, Steamboat Springs, Telluride, Vail	Minnesota	Duluth, Minneapolis/St. Paul (Hennepin and Ramsey Counties)
Connecticut	Bridgeport, Danbury	Nevada	Las Vegas
DC	Washington DC, Alexandria, Falls Church, Fairfax (Counties of Arlington & Fairfax in Virginia) (Counties of Montgomery & Prince George's in Maryland)	New Mexico	Santa Fe
Florida	Boca Raton, Delray Beach, Fort Lauderdale, Jupiter, Key West	New York	Lake Placid, Manhattan (boroughs of Manhattan, Brooklyn, Bronx, Queens and Staten Island), Melville, New Rochelle, Riverhead, (Suffolk County), Ronkonkoma, Tarrytown, White Plaines
Georgia	Brunswick, Jekyll Island	Ohio	Cincinnati
Idaho	Ketchum, Sun Valley	Pennsylvania	(Bucks County) Pittsburgh
Illinois	Chicago (Cook & Lake Counties)	Rhode Island	Bristol, Jamestown, Middletown, Newport (Newport County), Providence
Kentucky	Kenton	Texas	Austin, Dallas, Houston, LB Johnson Space Center
Louisiana	New Orleans	Utah	Park City (Summit County)
Maine	Bar Harbor, Kennebunk, Kittery, Rockport, Sanford	Vermont	Manchester, Montpelier, Stowe (Lamoile County)
		Virginia	Alexandria, Falls Church, Fairfax
		Washington	Port Angeles, Port Townsend, Seattle
		Wyoming	Jackson, Pinedale

APPENDIX V

CERTIFICATE OF INSURANCE

TESTI-2 OP ID: JM1

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 09/17/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER 248-335-0000 Cranbrook General Underwriters 21 East Long Lake Road #100 Bloomfield Hills, MI 48304 William J. Platten	CONTACT NAME: PHONE (A/C, No, Ext): 248-335-0000 FAX (A/C, No): 248-335-9850 E-MAIL ADDRESS:
	INSURER(S) AFFORDING COVERAGE — NAIC #
	INSURER A : The Travelers Companies — 25674
INSURED Testing Engineers & Consultants, Inc. 1343 Rochester Road Troy, MI 48099	INSURER B : Navigators Specialty
	INSURER C :
	INSURER D :
	INSURER E :
	INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X Contractual Liability GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:	X		680-9H277332-19-47	03/31/2019	03/31/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG 	$ 1,000,000 $ 1,000,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY SCHEDULED AUTOS HIRED AUTOS ONLY NON-OWNED AUTOS ONLY	X		BA-5B-12-9125	03/31/2019	03/31/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) 	$ 1,000,000 $ $ $ $
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10,000			CUP-5B-133010	03/31/2019	03/31/2020	EACH OCCURRENCE AGGREGATE 	$ 10,000,000 $ 10,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	X	UB-0K937336-19-47-G	03/31/2019	03/31/2020	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 500,000 $ 500,000 $ 500,000
B	Professional Liabi Contrs Pollution			CH19MPL074251NC $25,000 DEDUCTIBLE	03/31/2019	03/31/2020	Aggregate Per Occur	5,000,000 5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Indefinite Scope. Indefinite Delivery Contract #857.
The State of Michigan, its departments, divisions, agencies, offices, commission, officers, employees and agents are additional insureds. Waiver of Subrogation Applies.

CERTIFICATE HOLDER STATE-1

State of Michigan - DTMB/SFA
Design and Construction Division
3111 W. St. Joseph Street
Lansing, MI 48917

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE