

DAVID EVANS, P.E.
REPORT



Construction Materials Laboratory, Inc.

DAVID M. EVANS, P.E.

June 20, 2007

Mr. Austin Bateman
Tennessee Asphalt Company
P.O. Box 1327
Paris, TN 38242

Re: Excavation Pit & Subgrade Data
Northwest Tennessee Motor Sports
Gleason, Tennessee

Dear Mr. Bateman:

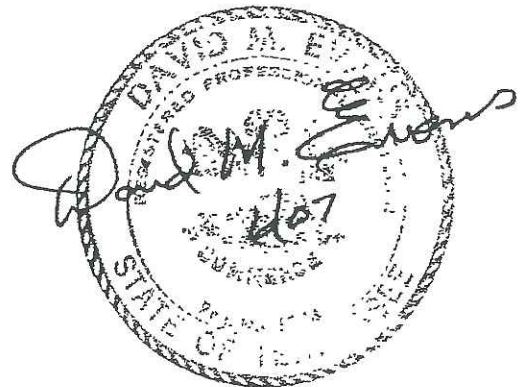
Enclosed are the results of excavation and subgrade data relative to the Northwest Tennessee Motor Sports, Gleason, Tennessee. This data was obtained in a site visit June 8, 2007 and a follow up visit by this writer on June 18, 2007. The summary comments concerning pavement and subgrade evaluation were prepared by our Consulting Engineer, Arun Wagh.

We appreciate the opportunity of performing the testing requirements on this project. If you have any questions concerning this report, please do not hesitate to call.

Yours truly,

David M. Evans, P.E.
CONSTRUCTION MATERIALS LABORATORY, INC.

DME: wd



CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
Date: GLEASON, TN 6/08/07
Lab No: 21429

Analysis of SUBGRADE INSPECTION
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

Arthur Armstrong and Chase Hartle of Construction Materials Laboratory visited the site and inspected the subgrade where the drag strip was being repaved. The paving contractor, Tennessee Asphalt Company, had milled two inches of asphalt and was in the process of repaving the drag strip.

The drag strip pavement is approximately 50 feet in width with little or no slope from the center to each side. The drag strip drainage would be considered fair with slight grassy swales along each side extending northward to an existing ditch.

The lab was advised that the paving machine and trucks began falling through the base. The lab observed the proof-rolling of the subgrade areas that were not paved and the areas that were paved.

The lab asked the contractor to excavate test pits in the subgrade. The lab obtained density tests, moisture samples, shelby tube samples, probings, and pocket penetrometer readings on the test holes.

The contractor had a tandem axle dump truck on site loaded with 21.98 tons. The lab observed as the truck rolled the northern lane of the track in areas that were not paved.

At the west end, the base was removed on most of the area. This area pumped and rutted under the load. At the east end, open area, we were advised that a geo-net layer and a fabric layer were in place with approximately six inches of base. This area pumped under the load with slight rutting.

The lab also had the truck to make one pass down the south side lane of the paved area. There was slight movement under the truck the full length of the pass, but the last 175 feet of the west end rolled and rutted under the load.

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CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

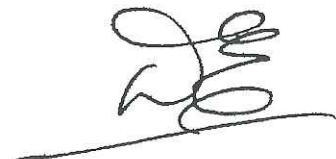
Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No: 21429

Analysis of SUBGRADE INSPECTION
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

As requested by the lab, the contractor excavated four test holes in the unpaved area on the west end. Test holes #1 and #3 were obtained in somewhat undisturbed areas where the base was in place and the old asphalt was in place at hole #3. The test holes indicated the moisture content ranged from 17 - 31 percent.

The test holes showed the upper 0 - 3 feet to be soft, wet, and unstable except for test hole #4. The soil under the gravel was a dark gray silty clay, as the depth increases the soil becomes a lighter gray silty clay. It appears that the upper dark and light gray silty clays have probably been wet for several years.

At the 2.5 to 3.0 foot depth, the soil was a light brown and gray silty clay that is stable and satisfactory. The moisture content was also high in this layer. The density tests on the upper soils were 85 - 95 percent of an ASTM D-698 (standard) proctor. The probing and pocket penetrometer readings show the upper soils to be soft. All of the test hole information is enclosed on the attached sheets.



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ARUN WAGH, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

June 20, 2007

Mr. David Evans, P. E.
Construction Materials Laboratory
41 Heritage Square
Jackson, Tennessee 38305

RE: Northwest Tennessee Motor Sports
Gleason, Tennessee
AWI Project No.: GEC-4901

Dear Mr. Evans:

CML's representatives had visited the referenced site on June 8, 2007, to observe the subgrade conditions where the drag strip was being repaved. The salient points of their field report are as follows:

- Proof rolling with a loaded dump truck caused slight to severe rutting. The more severe rutting, as to be expected, was in the area where the limestone base had been removed.
- The upper approximate 3 feet of soils were generally indicated to be soft, wet, and unstable. These soils were gray colored, which is indicative of prolonged contact with water.
- The soils below about 2.5 to 3 feet were brown, of stiff to very stiff consistency (based on hand probing and PPR values), and stable. However, even these soils were found to be very moist.

Based on the information obtained from the observations made by CML's representatives, we present following comments regarding the probable causes of distress:

- The existing pavement consisting of 2 inches of asphalt and 6 inches of limestone base is barely satisfactory for automobile or other such light traffic. Repeated passes of heavy equipment, such as for milling the pavement, could be the cause of distress in the pavement as well as in the subgrade. This factor would be especially critical if pumping of the subgrade into the limestone base were to have already taken place. We note that such pumping action generally causes the fines to push into the limestone base and reduce its structural efficiency.
- The subgrade is soft and wet in several areas. This, apparently, has happened over a period of time. In any case, soft subgrade (foundation) conditions are conducive to

June 20, 2007

causing distress in the pavement, even with light traffic.

- The present drainage conditions can be best described as fair to poor. The swale provided for drainage is not deep enough, and there does not appear to be any outlet for any water trapped in the limestone base.
- Distress usually compounds with the passage of time. For example, small cracks in pavements cause water infiltration into the base and, if the base were to be porous, as limestone is, then the water infiltration continues into the subgrade. Variable weather conditions over a period of time and even occasional freeze and thaw act to further exacerbate the distress.

In light of the above discussion, we give following recommendations for corrective actions:

- It is important that the subgrade conditions and the existing drainage conditions are improved. In this regard, we note that the drainage conditions are at least partially responsible for the poor subgrade condition. The drainage swale should be deep enough to collect water from the base course and dispose of it. The only way to improve the subgrade conditions would be to undercut the soft and wet soils and replace them with engineered fill. We recognize that this will involve removing the existing pavement completely and undercutting 2.5 to 3 feet of soft and wet soils. However, there is no easy recourse to improving of the subgrade.
- Heavy traffic should be controlled, especially when the area is not covered in pavement. As stated above, even with the "light-duty" pavement that was present over the area repeated passes of heavy traffic would cause distress; but with pavement removed the distress would be compounded. Control of heavy traffic (possibly) could be achieved by working over the pavement in sections.

If you have any questions, please feel free to call the undersigned at (901) 755-3230.

Very truly yours,



Arun Wagh, P.E.
(Reg. No. 11833)

EXCAVATION PIT LOCATIONS
NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN

CONCRETE

This area had geo-net
& fabric in place with
approximately 6" of
base.

Unpaved
area

Beginning of pavement

Slight movement under the
truck

TH#4

TH#3

Unpaved area; No base
on most of the area.

Pavement pumped under
the truck with slight
rutting

TH#1

TH#2

End of paved area

NOT TO SCALE

LOGS OF EXCAVATION PITS

APPENDIX A

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No.: 21429

Analysis of EXCAVATION PITS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

LOCATION: Hole #1

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1		Limestone base	Soft - 5 1/4" thick			
2	Subgrade	Dark gray clayey silt	Soft	23	2" - 3"	1.0; 0.5
3	1'	Light gray silty clay	Soft	22	3" - 4"	0.5; 1.0
4	2'	Light gray with a trace of tan silty clay	Soft	25	3" - 4"	0.6; 1.5
5	3'	Brown & gray lean clay	Hard/stable	27	1/4" - 1/2"	4.5+

LOCATION: Hole #2

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1	Subgrade	Dark gray silty clay	Soft	18	1" - 2"	1.5; 2.0
2	1.5'	Light gray silty clay	Soft	24	3" - 4"	1.0; 0.5
3	2'	Light gray silty clay	Soft	25	3" - 4"	1.0; 0.5
4	3'	Brown & gray lean clay	Stable/hard	31	0" - 1/4"	4.5+

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David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No.: 21429

Analysis of EXCAVATION PITS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

LOCATION: Hole #3 - 1" of old asphalt; 6 1/4" of gravel

SAMPLE NUMBER	DEPTH	CHARACTERISTICS	CONDITION	IN-PLACE %MOISTURE	PROBING	PPR'S
1	Subgrade	Dark & light gray lean clay	Satisfactory/ stable	19	1/2" - 1"	3.5; 4.0
2	1'	Light gray & tan lean clay	Satisfactory/ stable	24	1/2" - 1"	3.5; 4.0
3	2.5'	Light gray & tan lean clay	Stable/hard		1/4" - 1/2"	4.0; 4.5

LOCATION: Hole #4

SAMPLE NUMBER	DEPTH	CHARACTERISTICS	CONDITION	IN-PLACE %MOISTURE	PROBING	PPR'S
1	Subgrade	Brown & gray lean clay	Stable	17	1/4" - 1/2"	4.5; 4.0
2	1'	Brown & gray lean clay	Satisfactory/ stable	22	1" - 2"	2.0; 2.5

SHELBY TUBE SAMPLES & LOCATIONS:

- 1) Tube #1 - Test hole #1 - below the gravel
- 2) Tube #2 - Test hole #3 - 1' below the gravel
- 3) Tube #3 - Test hole #3 - 2.5' below the gravel

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LABORATORY TEST RESULTS

APPENDIX B

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CONSTRUCTION MATERIALS LABORATORY, INC.

ANALYSES OF MOISTURE DENSITY TEST OF COMPACTED FILL NUCLEAR COMPACTION TEST DATA

NORTHWEST TENNESSEE MOTOR

Contractor Tennessee Asphalt Company Project SPORTS - GLEASON, TN

Date 6/08/07

Reported To Tennessee Asphalt Company Lab No. 21429

TEST #	1	2	3	4	5	6
MODE & DEPTH	8"	8"	8"	8"	8"	8"
DENS. CNT.	1729	1862	2004	1689	2097	1575
WET DENS.	124.7	122.0	118.9	125.7	117.1	128.8
MSTRE. CNT.	312	242	300	282	306	216
MOISTURE	23.9	18.1	22.9	21.4	23.4	16.0
DRY DENS.	100.8	103.9	96.0	104.3	93.7	112.8
% MOISTURE	23.7	17.5	23.9	20.6	25.0	14.2
STD. DENS.	109.8	109.8	109.8	109.8	109.8	109.8
OPT. MSTRE.	15.6	15.6	15.6	15.6	15.6	15.6
% COMP.	91.8	94.6	87.4	95.0	85.3	102.7
MSTRE. CORR.						

Location of Tests

Density Std. 2717
Moisture Std. 709

- 1) Test hole #1 - below gravel
- 2) Test hole #2 - 6" below gravel
- 3) Test hole #2 - 1.5' below gravel
- 4) Test hole #3 - below gravel
- 5) Test hole #3 - 1' below gravel
- 6) Test hole #4 - below gravel

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CONSTRUCTION MATERIALS LABORATORY, INC.

Analysis of: MOISTURE DENSITY TEST (Proctor)

From:

Contractor: Tennessee Asphalt Company

Producer:

Report To: Tennessee Asphalt Company

NORTHWEST TENNESSEE MOTOR

Project: SPORTS - GLEASON, TN

Date: 6/11/07

Lab. No.: 21470

Test No.	1	2	3				
Weight of Mold	4.46	4.46	4.46				
Weight of Mold & Wet Soil	8.44	8.69	8.63				
Weight Wet Soil	3.98	4.23	4.17				
Density Wet Soil lbs. /cu.ft.	119.4	126.9	125.1				
Weight Pan & Wet Soil	174.0	181.9	173.9				
Weight Pan & Dry Soil	156.1	159.5	149.4				
Weight of Water	17.9	22.4	24.5				
Weight of Pan	15.4	15.5	13.1				
Weight of Dry Soil	140.7	144.0	136.3				
Moisture Content % Dry Soil	12.7	15.6	18.0				
Density Dry Soil lbs./cu.ft.	105.9	109.8	106.0				

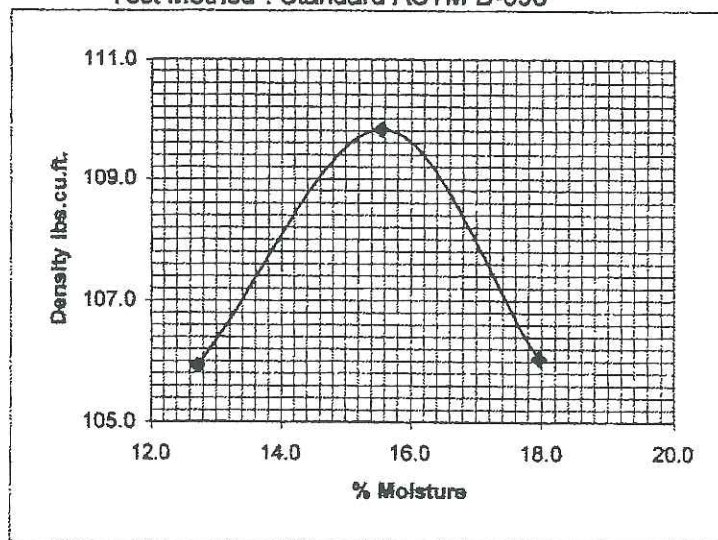
Sample Description: Brown and Gray Silty Clay

Test Method : Standard ASTM D-698

Maximum Density, Dry soil (Lbs./cu.ft.) 109.8

Optimum Moisture Content (% of Dry Weight) 15.6

Location: Taken from top two feet



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CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR
PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166)
POCKET PENETROMETER AND MINI-TORVANE
MOISTURE CONTENT (ASTM D 2216)
UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21495

TEST HOLE NUMBER 1 SAMPLE DEPTH Below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE - KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Light gray silty clay
SAMPLE WEIGHT (GRAMS & POUNDS) 1198.7 grams; 2.64 lbs.
SAMPLE HEIGHT 5.6 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 34.48 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 132.33
DRY UNIT WEIGHT (LB/FT³) 109.4

MOISTURE:

PAN AND WET SOIL 225.5
PAN AND DRY SOIL 189.2
PAN #/WEIGHT 14/15.5
DRY SOIL WEIGHT 173.7
WATER WEIGHT 36.3
% MOISTURE 20.9

PEAK DEFLECTION (IN) 0.278
LOAD (LBS) 326
STRAIN (E) 0.0496
A₀ (IN²) (AREA/1-E) 6.48
PEAK UNCONFINED COMPRESSION (PSF) 7244

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166) POCKET PENETROMETER AND MINI-TORVANE MOISTURE CONTENT (ASTM D 2216) UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21494

TEST HOLE NUMBER 3 SAMPLE DEPTH 1' below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE - KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Light gray with a trace of tan lean clay
SAMPLE WEIGHT (GRAMS & POUNDS) 1137.5 grams; 2.51 lbs.
SAMPLE HEIGHT 5.6 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 34.48 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 125.7
DRY UNIT WEIGHT (LB/FT³) 103.7

MOISTURE:

PAN AND WET SOIL 171.8
PAN AND DRY SOIL 141.7
PAN #/WEIGHT 28/15.6
DRY SOIL WEIGHT 126.1
WATER WEIGHT 30.1
% MOISTURE 21.2

PEAK DEFLECTION (IN) 0.387
LOAD (LBS) 117
STRAIN (E) 0.0691
A₀ (IN²) (AREA/1-E) 6.62
PEAK UNCONFINED COMPRESSION (PSF) 2546

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166) POCKET PENETROMETER AND MINI-TORVANE MOISTURE CONTENT (ASTM D 2216) UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21496

TEST HOLE NUMBER 3 SAMPLE DEPTH 2.5' below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE -- KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Brown & gray lean clay
SAMPLE WEIGHT (GRAMS & POUNDS) 830.0 grams; 1.83 lbs.
SAMPLE HEIGHT 4.03 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 24.82 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 127.1
DRY UNIT WEIGHT (LB/FT³) 100.9

MOISTURE:

PAN AND WET SOIL 194.8
PAN AND DRY SOIL 158.0
PAN #/WEIGHT 43/15.8
DRY SOIL WEIGHT 142.2
WATER WEIGHT 36.8
% MOISTURE 25.9

PEAK DEFLECTION (IN) 0.201
LOAD (LBS) 65
STRAIN (E) 0.0499
A₀ (IN²) (AREA/1-E) 6.48
PEAK UNCONFINED COMPRESSION (PSF) 1444

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/14/07
Lab No.: 21543

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 1 SAMPLE # U.C. sample #1 DEPTH Below gravel

VISUAL DESCRIPTION OF SAMPLE: Gray & tan lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.3	Coarse Sand
No. 40	No. 200	2.7	Fine Sand
No. 200	Pan	94.0	Combined Silt & Clay

LIQUID LIMIT: 28

PLASTIC LIMIT: 20

PLASTICITY INDEX: 8

UNIFIED CLASSIFICATION: CL

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CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/13/07
Lab No.: 21532

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 3 SAMPLE # U.C. sample #2 DEPTH 1' below gravel

VISUAL DESCRIPTION OF SAMPLE: Gray lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.6	Coarse Sand
No. 40	No. 200	1.8	Fine Sand
No. 200	Pan	94.6	Combined Silt & Clay

LIQUID LIMIT: 35

PLASTIC LIMIT: 20

PLASTICITY INDEX: 15

UNIFIED CLASSIFICATION: CL

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CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/14/07
Lab No.: 21542

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 3 SAMPLE # U.C. sample #3 DEPTH 2.5' below gravel

VISUAL DESCRIPTION OF SAMPLE: Light tan lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.6	Coarse Sand
No. 40	No. 200	3.7	Fine Sand
No. 200	Pan	92.7	Combined Silt & Clay

LIQUID LIMIT: 41

PLASTIC LIMIT: 22

PLASTICITY INDEX: 19

UNIFIED CLASSIFICATION: CL

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LEGE

(TO BE USED ONLY WHEN GRAPHICAL LOGS ARE INCLUDED IN REPORT)

	CHEERT OR CRUSHED ROCK
	GRAVEL
	SAND
	SILT
	CLAY
	SHALE
	LIMESTONE
	SANDSTONE
	TOP SOIL OR ORGANIC MATTER

NOTE: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS.

NOTES

W - WATER CONTENTS IN PERCENT DRY WEIGHT.

N - DRIVING RESISTANCES IN BLOWS PER FOOT DETERMINED WITH A STANDARD SPLIT SPOON SAMPLER (1-3/8" I.D., 2" O.D.) AND A 140 LB. DRIVING HAMMER WITH A 30" DROP.

PPR - POCKET PENETROMETER READINGS IN TONS PER SQUARE FOOT. (THESE READINGS ARE NOT ALLOWABLE BEARING VALUES)

GROUND-WATER LEVEL AT TIME INDICATED ON BORING LOG.

Qu - UNCONFINED COMPRESSIVE STRENGTH IN LBS. PER SQ. FT.

ANGLE OF INTERNAL FRICTION IN DEGREES.

C - COHESION IN LBS. PER SQ. FT.

GENERAL NOTES

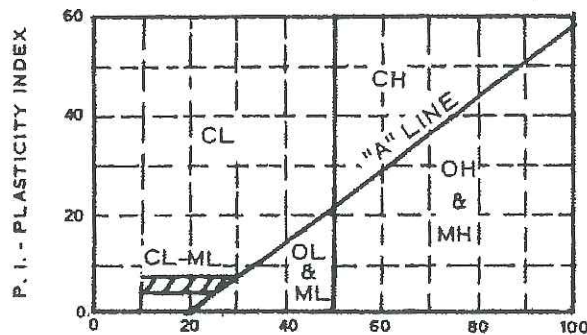
While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region may be encountered.

Consistency of cohesive soils shown on the boring logs is based on driller's log and visual examination and is approximate, except within those vertical reaches of the borings where shear strengths from compression tests are shown.

Ground-water elevations shown on the boring logs represent ground-water surfaces encountered at the times shown. Absence of water surface data on certain borings implies that no ground-water data is available, but does not necessarily mean that ground-water will not be encountered at the locations or within the vertical reaches of these borings.

DESCRIPTIVE SYMBOLS

COLOR		CONSISTENCY			MODIFICATIONS	
COLOR	SYMBOL	FOR COHESIVE SOILS			MODIFICATION	SYMBOL
TAN	T	CONSISTENCY	COHESION IN LBS./SQ. FT. FROM UNCONFINED COMPRESSION TEST	SYMBOL	TRACES	TR
YELLOW	Y				FINE	F
RED	R	VERY SOFT	< 250	VSO	MEDIUM	M
BLACK	BK	SOFT	250 - 500	SO	COARSE	C
GRAY	GR	MEDIUM	500 - 1000	M	CONCRETIONS	CC
LIGHT GRAY	LGR	STIFF	1000 - 2000	ST	ROOTLETS	RT
DARK GRAY	DGR	VERY STIFF	2000 - 4000	VST	LIGNITE FRAGMENTS	LG
BROWN	BR	HARD	> 4000	H	SHALE FRAGMENTS	SH
LIGHT BROWN	LBR				SANDSTONE FRAGMENTS	SDS
DARK BROWN	DBR				SHELL FRAGMENTS	SLF
BROWNISH-GRAY	BRGR				ORGANIC MATTER	O
GRAYISH-BROWN	GYBR				CLAY STRATA OR LENSES	CS
GREENISH-GRAY	GNGR				SILT STRATA OR LENSES	SIS
GRAYISH-GREEN	GYGN				SAND STRATA OR LENSES	SS
GREEN	GN				SANDY	S
BLUE	BL				GRAVELLY	G
BLUE-GREEN	BLGN				BOULDERS	B
WHITE	WH				SLICKENSIDES	SL
MOTTLED	MOT				WOOD	WD
					OXIDIZED	OX



L. L. - LIQUID LIMIT
PLASTICITY CHART

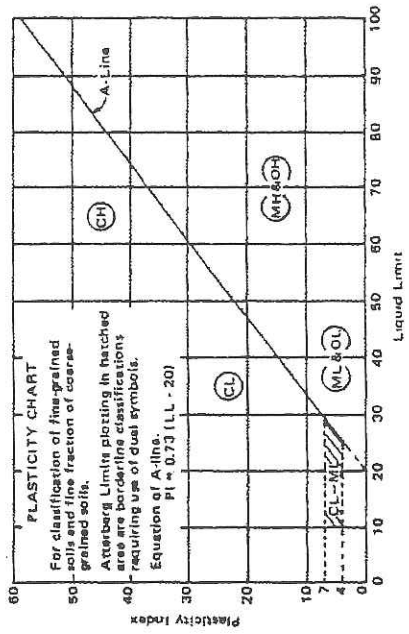
FOR CLASSIFICATION OF FINE - GRAINED SOILS

STANDARD LEGEND

Table 4. ASTM Soil Classification System (Unified)

Major Divisions		Group Symbols	Typical Names	Classification Criteria			
Coarse-Grained Soils More than 50% retained on No. 200 sieve*	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	Well-graded gravels and gravel-sand mixtures, little or no fines	GW	$C_u = D_{60}/D_{10}$ Greater than 4 $C_z = \frac{D_{30}^2}{D_{10} \times D_{60}}$ Between 1 and 3		
			Poorly graded gravels and gravel-sand mixtures, little or no fines				
		Gravels with Fines	Silty gravels, gravel-sand-silt mixtures	GM	Not meeting both criteria for GW		
			Clayey gravels, gravel-sand-clay mixtures				
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	Well-graded sands and gravelly sands, little or no fines	SW	$C_u = D_{60}/D_{10}$ Greater than 6 $C_z = \frac{D_{30}^2}{D_{10} \times D_{60}}$ Between 1 and 3		
			Poorly graded sands and gravelly sands, little or no fines				
		Sands with Fines	Silty sands, sand-silt mixtures	SM	Not meeting both criteria for SW		
			Clayey sands, sand-clay mixtures				
		Fine-Grained Soils 50% or more passes No. 200 sieve*	Silt and Clays Liquid limit 50% or less	Silt and Clays	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	ML	PLASTICITY CHART For classification of fine-grained soils, plot the fraction of coarse-grained soils. Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: $PI = 0.73 (LL - 20)$
					Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
Organic silts and organic silty clays of low plasticity							
Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts							
Silt and Clays Liquid limit greater than 50%	Silt and Clays		Inorganic clays of high plasticity, fat clays	MH			
			Inorganic clays of medium to high plasticity				
			Organic clays of medium to high plasticity	CH			
			Peat, muck, and other highly organic soils		PT		

Visual-Manual Identification, see ASTM Designation D 2488.



Visual-Manual Identification, see ASTM Designation D 2488.

*Based on the material passing the 3-in. (75-mm.) sieve.



Construction Materials Laboratory, Inc.

DAVID M. EVANS, P.E.

June 20, 2007

Mr. Austin Bateman
Tennessee Asphalt Company
P.O. Box 1327
Paris, TN 38242

Re: Excavation Pit & Subgrade Data
Northwest Tennessee Motor Sports
Gleason, Tennessee

Dear Mr. Bateman:

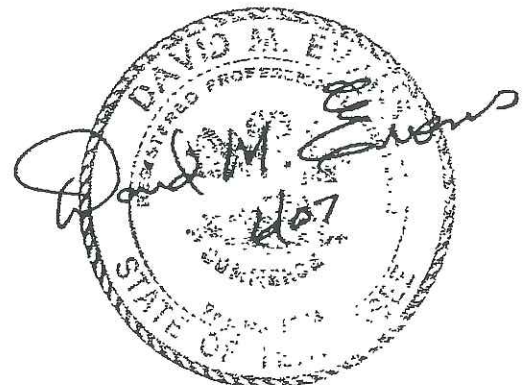
Enclosed are the results of excavation and subgrade data relative to the Northwest Tennessee Motor Sports, Gleason, Tennessee. This data was obtained in a site visit June 8, 2007 and a follow up visit by this writer on June 18, 2007. The summary comments concerning pavement and subgrade evaluation were prepared by our Consulting Engineer, Arun Wagh.

We appreciate the opportunity of performing the testing requirements on this project. If you have any questions concerning this report, please do not hesitate to call.

Yours truly,

David M. Evans, P.E.
CONSTRUCTION MATERIALS LABORATORY, INC.

DME: wd



CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No: 21429

Analysis of SUBGRADE INSPECTION
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

Arthur Armstrong and Chase Hartle of Construction Materials Laboratory visited the site and inspected the subgrade where the drag strip was being repaved. The paving contractor, Tennessee Asphalt Company, had milled two inches of asphalt and was in the process of repaving the drag strip.

The drag strip pavement is approximately 50 feet in width with little or no slope from the center to each side. The drag strip drainage would be considered fair with slight grassy swales along each side extending northward to an existing ditch.

The lab was advised that the paving machine and trucks began falling through the base. The lab observed the proof-rolling of the subgrade areas that were not paved and the areas that were paved.

The lab asked the contractor to excavate test pits in the subgrade. The lab obtained density tests, moisture samples, shelby tube samples, probings, and pocket penetrometer readings on the test holes.

The contractor had a tandem axle dump truck on site loaded with 21.98 tons. The lab observed as the truck rolled the northern lane of the track in areas that were not paved.

At the west end, the base was removed on most of the area. This area pumped and rutted under the load. At the east end, open area, we were advised that a geo-net layer and a fabric layer were in place with approximately six inches of base. This area pumped under the load with slight rutting.

The lab also had the truck to make one pass down the south side lane of the paved area. There was slight movement under the truck the full length of the pass, but the last 175 feet of the west end rolled and rutted under the load.

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

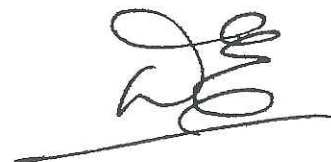
Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No: 21429

Analysis of SUBGRADE INSPECTION
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

As requested by the lab, the contractor excavated four test holes in the unpaved area on the west end. Test holes #1 and #3 were obtained in somewhat undisturbed areas where the base was in place and the old asphalt was in place at hole #3. The test holes indicated the moisture content ranged from 17 - 31 percent.

The test holes showed the upper 0 - 3 feet to be soft, wet, and unstable except for test hole #4. The soil under the gravel was a dark gray silty clay, as the depth increases the soil becomes a lighter gray silty clay. It appears that the upper dark and light gray silty clays have probably been wet for several years.

At the 2.5 to 3.0 foot depth, the soil was a light brown and gray silty clay that is stable and satisfactory. The moisture content was also high in this layer. The density tests on the upper soils were 85 - 95 percent of an ASTM D-698 (standard) proctor. The probing and pocket penetrometer readings show the upper soils to be soft. All of the test hole information is enclosed on the attached sheets.



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Jackson, Tennessee 38305

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ARUN WAGH, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

June 20, 2007

Mr. David Evans, P. E.
Construction Materials Laboratory
41 Heritage Square
Jackson, Tennessee 38305

RE: Northwest Tennessee Motor Sports
Gleason, Tennessee
AWI Project No.: GEC-4901

Dear Mr. Evans:

CML's representatives had visited the referenced site on June 8, 2007, to observe the subgrade conditions where the drag strip was being repaved. The salient points of their field report are as follows:

- Proof rolling with a loaded dump truck caused slight to severe rutting. The more severe rutting, as to be expected, was in the area where the limestone base had been removed.
- The upper approximate 3 feet of soils were generally indicated to be soft, wet, and unstable. These soils were gray colored, which is indicative of prolonged contact with water.
- The soils below about 2.5 to 3 feet were brown, of stiff to very stiff consistency (based on hand probing and PPR values), and stable. However, even these soils were found to be very moist.

Based on the information obtained from the observations made by CML's representatives, we present following comments regarding the probable causes of distress:

- The existing pavement consisting of 2 inches of asphalt and 6 inches of limestone base is barely satisfactory for automobile or other such light traffic. Repeated passes of heavy equipment, such as for milling the pavement, could be the cause of distress in the pavement as well as in the subgrade. This factor would be especially critical if pumping of the subgrade into the limestone base were to have already taken place. We note that such pumping action generally causes the fines to push into the limestone base and reduce its structural efficiency.
- The subgrade is soft and wet in several areas. This, apparently, has happened over a period of time. In any case, soft subgrade (foundation) conditions are conducive to

June 20, 2007

causing distress in the pavement, even with light traffic.

- The present drainage conditions can be best described as fair to poor. The swale provided for drainage is not deep enough, and there does not appear to be any outlet for any water trapped in the limestone base.
- Distress usually compounds with the passage of time. For example, small cracks in pavements cause water infiltration into the base and, if the base were to be porous, as limestone is, then the water infiltration continues into the subgrade. Variable weather conditions over a period of time and even occasional freeze and thaw act to further exacerbate the distress.

In light of the above discussion, we give following recommendations for corrective actions:

- It is important that the subgrade conditions and the existing drainage conditions are improved. In this regard, we note that the drainage conditions are at least partially responsible for the poor subgrade condition. The drainage swale should be deep enough to collect water from the base course and dispose of it. The only way to improve the subgrade conditions would be to undercut the soft and wet soils and replace them with engineered fill. We recognize that this will involve removing the existing pavement completely and undercutting 2.5 to 3 feet of soft and wet soils. However, there is no easy recourse to improving of the subgrade.
- Heavy traffic should be controlled, especially when the area is not covered in pavement. As stated above, even with the "light-duty" pavement that was present over the area repeated passes of heavy traffic would cause distress; but with pavement removed the distress would be compounded. Control of heavy traffic (possibly) could be achieved by working over the pavement in sections.

If you have any questions, please feel free to call the undersigned at (901) 755-3230.

Very truly yours,



Arun Wagh, P.E.
(Reg. No. 11833)

EXCAVATION PIT LOCATIONS
NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN

CONCRETE

This area had geo-net
& fabric in place with
approximately 6" of
base.

Unpaved
area

Beginning of pavement

Slight movement under the
truck

TH#4

TH#3

Unpaved area; No base
on most of the area.

Pavement pumped under
the truck with slight
rutting

TH#1

TH#2

End of paved area

NOT TO SCALE

LOGS OF EXCAVATION PITS

APPENDIX A

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No.: 21429

Analysis of EXCAVATION PITS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

LOCATION: Hole #1

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1		Limestone base	Soft - 5 1/4" thick			
2	Subgrade	Dark gray clayey silt	Soft	23	2" - 3"	1.0; 0.5
3	1'	Light gray silty clay	Soft	22	3" - 4"	0.5; 1.0
4	2'	Light gray with a trace of tan silty clay	Soft	25	3" - 4"	0.6; 1.5
5	3'	Brown & gray lean clay	Hard/stable	27	1/4" - 1/2"	4.5+

LOCATION: Hole #2

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1	Subgrade	Dark gray silty clay	Soft	18	1" - 2"	1.5; 2.0
2	1.5'	Light gray silty clay	Soft	24	3" - 4"	1.0; 0.5
3	2'	Light gray silty clay	Soft	25	3" - 4"	1.0; 0.5
4	3'	Brown & gray lean clay	Stable/hard	31	0" - 1/4"	4.5+

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CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/08/07
Lab No.: 21429

Analysis of EXCAVATION PITS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

LOCATION: Hole #3 - 1" of old asphalt; 6 1/4" of gravel

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1	Subgrade	Dark & light gray lean clay	Satisfactory/ stable	19	1/2" - 1"	3.5; 4.0
2	1'	Light gray & tan lean clay	Satisfactory/ stable	24	1/2" - 1"	3.5; 4.0
3	2.5'	Light gray & tan lean clay	Stable/hard		1/4" - 1/2"	4.0; 4.5

LOCATION: Hole #4

<u>SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>CHARACTERISTICS</u>	<u>CONDITION</u>	<u>IN-PLACE %MOISTURE</u>	<u>PROBING</u>	<u>PPR'S</u>
1	Subgrade	Brown & gray lean clay	Stable	17	1/4" - 1/2"	4.5; 4.0
2	1'	Brown & gray lean clay	Satisfactory/ stable	22	1" - 2"	2.0; 2.5

SHELBY TUBE SAMPLES & LOCATIONS:

- 1) Tube #1 - Test hole #1 - below the gravel
- 2) Tube #2 - Test hole #3 - 1' below the gravel
- 3) Tube #3 - Test hole #3 - 2.5' below the gravel

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LABORATORY TEST RESULTS

APPENDIX B

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

ANALYSES OF MOISTURE DENSITY TEST OF COMPACTED FILL

NUCLEAR COMPACTION TEST DATA

NORTHWEST TENNESSEE MOTOR

Contractor Tennessee Asphalt Company Project SPORTS - GLEASON, TN

Date 6/08/07

Reported To Tennessee Asphalt Company Lab No. 21429

TEST #	1	2	3	4	5	6
MODE & DEPTH	8"	8"	8"	8"	8"	8"
DENS. CNT.	1729	1862	2004	1689	2097	1575
WET DENS.	124.7	122.0	118.9	125.7	117.1	128.8
MSTRE. CNT.	312	242	300	282	306	216
MOISTURE	23.9	18.1	22.9	21.4	23.4	16.0
DRY DENS.	100.8	103.9	96.0	104.3	93.7	112.8
% MOISTURE	23.7	17.5	23.9	20.6	25.0	14.2
STD. DENS.	109.8	109.8	109.8	109.8	109.8	109.8
OPT. MSTRE.	15.6	15.6	15.6	15.6	15.6	15.6
% COMP.	91.8	94.6	87.4	95.0	85.3	102.7
MSTRE. CORR.						

Location of Tests

Density Std. 2717
Moisture Std. 709

- 1) Test hole #1 - below gravel
- 2) Test hole #2 - 6" below gravel
- 3) Test hole #2 - 1.5' below gravel
- 4) Test hole #3 - below gravel
- 5) Test hole #3 - 1' below gravel
- 6) Test hole #4 - below gravel

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

Analysis of: MOISTURE DENSITY TEST (Proctor)

From:

Contractor: Tennessee Asphalt Company

Producer:

Report To: Tennessee Asphalt Company

NORTHWEST TENNESSEE MOTOR

Project: SPORTS - GLEASON, TN

Date: 6/11/07

Lab. No.: 21470

Test No.	1	2	3				
Weight of Mold	4.46	4.46	4.46				
Weight of Mold & Wet Soil	8.44	8.69	8.63				
Weight Wet Soil	3.98	4.23	4.17				
Density Wet Soil lbs. /cu.ft.	119.4	126.9	125.1				
Weight Pan & Wet Soil	174.0	181.9	173.9				
Weight Pan & Dry Soil	156.1	159.5	149.4				
Weight of Water	17.9	22.4	24.5				
Weight of Pan	15.4	15.5	13.1				
Weight of Dry Soil	140.7	144.0	136.3				
Moisture Content % Dry Soil	12.7	15.6	18.0				
Density Dry Soil lbs./cu.ft.	105.9	109.8	106.0				

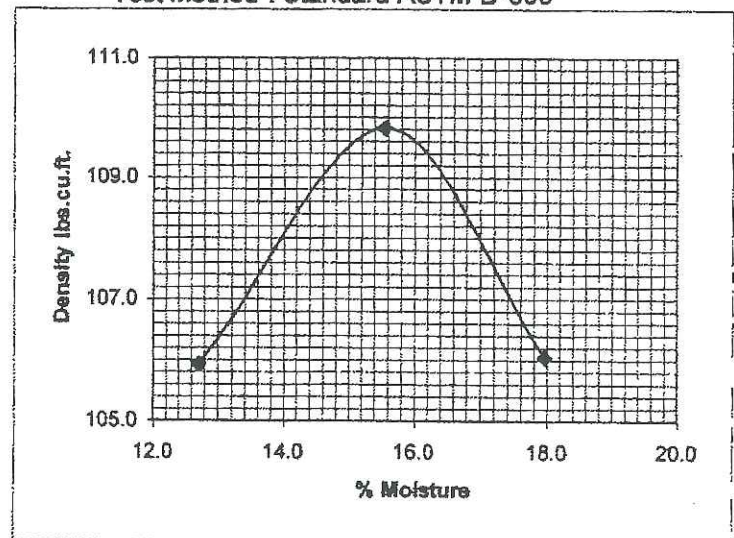
Sample Description: Brown and Gray Silty Clay

Test Method : Standard ASTM D-698

Maximum Density, Dry soil (Lbs./cu.ft.) 109.8

Optimum Moisture Content (% of Dry Weight) 15.6

Location: Taken from top two feet



CML

CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166) POCKET PENETROMETER AND MINI-TORVANE MOISTURE CONTENT (ASTM D 2216) UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21495

TEST HOLE NUMBER 1 SAMPLE DEPTH Below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE - KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Light gray silty clay
SAMPLE WEIGHT (GRAMS & POUNDS) 1198.7 grams; 2.64 lbs.
SAMPLE HEIGHT 5.6 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 34.48 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 132.33
DRY UNIT WEIGHT (LB/FT³) 109.4

MOISTURE:

PAN AND WET SOIL 225.5
PAN AND DRY SOIL 189.2
PAN #/WEIGHT 14/15.5
DRY SOIL WEIGHT 173.7
WATER WEIGHT 36.3
% MOISTURE 20.9

PEAK DEFLECTION (IN) 0.278
LOAD (LBS) 326
STRAIN (E) 0.0496
A₀ (IN²) (AREA/1-E) 6.48
PEAK UNCONFINED COMPRESSION (PSF) 7244

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166) POCKET PENETROMETER AND MINI-TORVANE MOISTURE CONTENT (ASTM D 2216) UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21494

TEST HOLE NUMBER 3 SAMPLE DEPTH 1' below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE - KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Light gray with a trace of tan lean clay
SAMPLE WEIGHT (GRAMS & POUNDS) 1137.5 grams; 2.51 lbs.
SAMPLE HEIGHT 5.6 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 34.48 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 125.7
DRY UNIT WEIGHT (LB/FT³) 103.7

MOISTURE:

PAN AND WET SOIL 171.8
PAN AND DRY SOIL 141.7
PAN #/WEIGHT 28/15.6
DRY SOIL WEIGHT 126.1
WATER WEIGHT 30.1
% MOISTURE 21.2

PEAK DEFLECTION (IN) 0.387
LOAD (LBS) 117
STRAIN (E) 0.0691
A₀ (IN²) (AREA/1-E) 6.62
PEAK UNCONFINED COMPRESSION (PSF) 2546

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

DATA SHEET FOR PEAK UNCONFINED COMPRESSION TEST (ASTM D 2166) POCKET PENETROMETER AND MINI-TORVANE MOISTURE CONTENT (ASTM D 2216) UNIT WEIGHT

JOB NAME: NORTHWEST TENNESSEE MOTOR SPORTS - GLEASON, TN
DATE: 6/12/07
LAB NO.: 21496

TEST HOLE NUMBER 3 SAMPLE DEPTH 2.5' below gravel
POCKET PENETROMETER (PPR) _____ TSF
MINI-TORVANE -- KG/CM²

SAMPLE CHARACTERISTICS:

VISUAL DESCRIPTION: Brown & gray lean clay
SAMPLE WEIGHT (GRAMS & POUNDS) 830.0 grams; 1.83 lbs.
SAMPLE HEIGHT 4.03 SAMPLE DIAMETER 2.8
RADIUS (IN.) 1.4 VOLUME (IN.³) 24.82 AREA (IN²) 6.16
WET UNIT WEIGHT (LB/FT³) 127.1
DRY UNIT WEIGHT (LB/FT³) 100.9

MOISTURE:

PAN AND WET SOIL 194.8
PAN AND DRY SOIL 158.0
PAN #/WEIGHT 43/15.8
DRY SOIL WEIGHT 142.2
WATER WEIGHT 36.8
% MOISTURE 25.9

PEAK DEFLECTION (IN) 0.201
LOAD (LBS) 65
STRAIN (E) 0.0499
A_o (IN²) (AREA/1-E) 6.48
PEAK UNCONFINED COMPRESSION (PSF) 1444

CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/14/07
Lab No.: 21543

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 1 SAMPLE # U.C. sample #1 DEPTH Below gravel

VISUAL DESCRIPTION OF SAMPLE: Gray & tan lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.3	Coarse Sand
No. 40	No. 200	2.7	Fine Sand
No. 200	Pan	94.0	Combined Silt & Clay

LIQUID LIMIT: 28

PLASTIC LIMIT: 20

PLASTICITY INDEX: 8

UNIFIED CLASSIFICATION: CL

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CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/13/07
Lab No.: 21532

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 3 SAMPLE # U.C. sample #2 DEPTH 1' below gravel

VISUAL DESCRIPTION OF SAMPLE: Gray lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.6	Coarse Sand
No. 40	No. 200	1.8	Fine Sand
No. 200	Pan	94.6	Combined Silt & Clay

LIQUID LIMIT: 35

PLASTIC LIMIT: 20

PLASTICITY INDEX: 15

UNIFIED CLASSIFICATION: CL

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CML

CONSTRUCTION MATERIALS LABORATORY, INC.

David M. Evans, P.E.

Project: NORTHWEST TENNESSEE MOTOR SPORTS
GLEASON, TN
Date: 6/14/07
Lab No.: 21542

Analysis of SOIL CLASSIFICATION & PHYSICAL TEST CONSTANTS
Contractor Tennessee Asphalt Company
Producer
Reported To Tennessee Asphalt Company

TEST HOLE # 3 SAMPLE # U.C. sample #3 DEPTH 2.5' below gravel

VISUAL DESCRIPTION OF SAMPLE: Light tan lean clay

SIEVE ANALYSIS

<u>PASSING</u>	<u>RETAINED ON</u>	<u>PERCENT</u>	<u>CHARACTERISTICS</u>
3"	No. 10	0.0	Gravel
No. 10	No. 40	3.6	Coarse Sand
No. 40	No. 200	3.7	Fine Sand
No. 200	Pan	92.7	Combined Silt & Clay

LIQUID LIMIT: 41

PLASTIC LIMIT: 22

PLASTICITY INDEX: 19

UNIFIED CLASSIFICATION: CL

41 Heritage Square

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LEGEN

(TO BE USED ONLY WHEN GRAPHICAL LOGS ARE INCLUDED IN REPORT)



CHERT OR CRUSHED ROCK

GRAVEL

SAND

SILT

CLAY

SHALE

LIMESTONE

SANDSTONE

TOP SOIL OR ORGANIC MATTER

NOTE: SOILS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE DESIGNATED BY COMBINATIONS OF GROUP SYMBOLS.

NOTES

W - WATER CONTENTS IN PERCENT DRY WEIGHT.

N - DRIVING RESISTANCES IN BLOWS PER FOOT DETERMINED WITH A STANDARD SPLIT SPOON SAMPLER (1-3/8" I.D., 2" O.D.) AND A 140 LB. DRIVING HAMMER WITH A 30" DROP.

PPR - POCKET PENETROMETER READINGS IN TONS PER SQUARE FOOT. (THESE READINGS ARE NOT ALLOWABLE BEARING VALUES)



GROUND-WATER LEVEL AT TIME INDICATED ON BORING LOG.



QU - UNCONFINED COMPRESSIVE STRENGTH IN LBS. PER SQ. FT.



ANGLE OF INTERNAL FRICTION IN DEGREES.



C - COHESION IN LBS. PER SQ. FT.

GENERAL NOTES

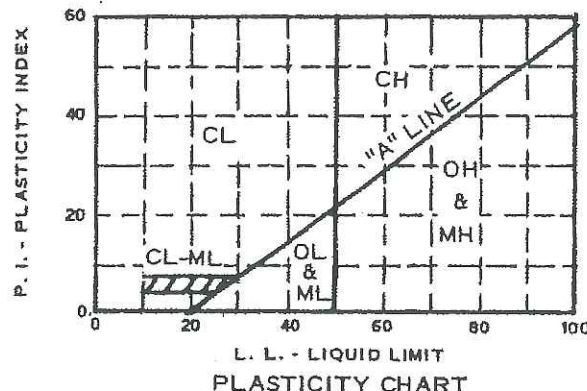
While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region may be encountered.

Consistency of cohesive soils shown on the boring logs is based on driller's log and visual examination and is approximate, except within those vertical reaches of the borings where shear strengths from compression tests are shown.

Ground-water elevations shown on the boring logs represent ground-water surfaces encountered at the times shown. Absence of water surface data on certain borings implies that no ground-water data is available, but does not necessarily mean that ground-water will not be encountered at the locations or within the vertical reaches of these borings.

DESCRIPTIVE SYMBOLS

COLOR		CONSISTENCY			MODIFICATIONS	
COLOR	SYMBOL	CONSISTENCY	COHESION IN LBS./SQ. FT. FROM UNCONFINED COMPRESSION TEST	SYMBOL	MODIFICATION	SYMBOL
TAN	T	VERY SOFT	< 250	VSO	TRACES	TR-
YELLOW	Y	SOFT	250 - 500	SO	FINE	F
RED	R	MEDIUM	500 - 1000	M	MEDIUM	M
BLACK	BK	STIFF	1000 - 2000	ST	COARSE	C
GRAY	GR	VERY STIFF	2000 - 4000	VST	CONCRETIONS	CC
LIGHT GRAY	LGR	HARD	> 4000	H	ROOTLETS	RT
DARK GRAY	DGR				LIGNITE FRAGMENTS	LG
BROWN	BR				SHALE FRAGMENTS	SH
LIGHT BROWN	LBR				SANDSTONE FRAGMENTS	SDS
DARK BROWN	DBR				SHELL FRAGMENTS	SLF
BROWNISH-GRAY	BRGR				ORGANIC MATTER	O
GRAYISH-BROWN	GYBR				CLAY STRATA OR LENSES	CS
GREENISH-GRAY	GNGR				SILT STRATA OR LENSES	SIS
GRAYISH-GREEN	GYGN				SAND STRATA OR LENSES	SS
GREEN	GN				SANDY	S
BLUE	BL				GRAVELLY	G
BLUE-GREEN	BLGN				BOULDERS	B
WHITE	WH				SLICKENSIDES	SL
MOTTLED	MOT				WOOD	WD
					OXIDIZED	OX



STANDARD LEGEND

Table 4. ASTM Soil Classification System (Unified)

Major Divisions		Group Symbols	Typical Names	Classification Criteria	
Coarse-Grained Soils More than 50% retained on No. 200 sieve*	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve GM, GP, SM, SP More than 12% pass No. 200 sieve GM, GC, SM, SC 5% to 12% pass No. 200 sieve Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW
		Gravels With Fines	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4
			Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	Well-graded sands and gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 6 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			Poorly graded sands and gravelly sands, little or no fines		Atterberg limits plot below "A" line or plasticity index less than 4
		Sands With Fines	Silty sands, sand-silt mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7
			Clayey sands, sand-clay mixtures		Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
Fine-Grained Soils 50% or more passes No. 200 sieve*	Silt and Clays Liquid limit greater than 50%	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	PLASTICITY CHART For classification of fine-grained soils and fine fraction of coarse-grained soils. Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: $PI = 0.73 (LL - 20)$	
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
		OL	Organic silts and organic silty clays of low plasticity		
			Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		
	Silt and Clays Liquid limit greater than 50%	MH	Inorganic clays of high plasticity, fat clays		
			Organic clays of medium to high plasticity		
		CH	Organic clays of medium to high plasticity		
			Peat, muck, and other highly organic soils		

Visual-Manual Identification, see ASTM Designation D 2488.

*Based on the material passing the 3-in. (75-mm.) sieve.