BACCHI ENGINEERING, PC
1 Triangle Drive, Suite 200
Durham, NC 27709

August 2, 2021

Mr. Steve Peters
Ground Supervisor II
State of North Carolina Department of Administration
431 N. Salisbury St
Raleigh, NC 27603

Re.: Pavement Evaluation for ABC Warehouse Loading Dock
400 East Tryon Road
Raleigh, NC
Trimat Project 21-1633
Report # 21-1633.001

Mr. Peters,

As per your request, Trimat Materials Testing and Bacchi Engineering have visited the above referenced project and have performed a field evaluation of the pavement as described in our proposal number 21-1507A dated June 23rd, 2021. The onsite evaluation and sampling was conducted on July 22nd, 2021 and consisted of drilling into the concrete pavement at six locations, retrieving samples of the underlying subgrade, and estimating the strength of the subgrade soils. These services were performed at the request of the NCDOA and your verbal authorization to proceed.

The purpose of the exploration was to evaluate the general subsurface conditions within the existing lot and to recommend a pavement design to replace the failing pavement. This report presents our understanding of the project, description of the exploration procedures, findings, conclusions and recommendations, as well as construction considerations for the proposed project site.

We appreciates the opportunity to assist you during this phase of the project. Please contact the undersigned if you should have any questions concerning this report or if we may be of further assistance.

Sincerely,

BEPC/Trimat Materials Testing, Inc.

Christopher Bacchi, PE
Senior Engineer
NC PE License #026883

Project Information

The loading area and access roadway at the ABC Commission building consist of concrete pavement which was originally placed in the 1980's and has had multiple repairs over the last 40 years. The original pavement design called for a 4" thick unreinforced concrete pavement placed on an untreated soil subgrade. The subsequent repairs have required a much thicker slab over ABC stone. The depths of these repairs were not confirmed but it is believed they consisted of 8" of ABC stone and 12" of reinforced concrete. The primary use of this lot is for loading and unloading of large delivery trucks with varying axle arrangements with the majority being 5 axle dual unit trucks. The original pavement sections still in place are in poor condition with major faulting and cracking present (see Figure 1).

Figure 1 – Existing Loading Area and Entrance photos

Onsite Investigation

The onsite evaluation took place on July 22nd, 2021 and involved drilling through the existing concrete pavement at six locations using a 2.5" solid stem auger at the approximate locations shown in Figure 2, Boring Locations. The borings were located in the field by our project engineer. Ground surface elevations were estimated from online USGS maps. The soil test borings were extended to a depth of approximately 10 feet below the existing pavement surface using a Simco 2800 HS drill rig.

Standard Penetration Tests were performed at designated intervals in the soil test borings in general accordance with ASTM D 1586 in order to obtain data for estimating soil strength and consistency. In

conjunction with the penetration testing, split-spoon soil samples were recovered for soil classification and potential laboratory testing. No ground water was encountered during the drilling.

While in the field, the geotechnical engineer representative visually examined each sample to evaluate the type of soil encountered, soil plasticity, moisture condition, organic content, presence of lenses and seams, colors and apparent geological origin. The results of the visual soil classifications for the borings, as well as field test results, are presented on the individual borings logs included in the Appendix. Similar soils were grouped into strata on the logs. The strata lines represent approximate boundaries between the soil types; however, the actual transition between soil types in the field may be gradual in both the horizontal and vertical directions.

Figure 2 - Boring locations

Subsurface Conditions

Average concrete pavement thickness for the entrance and loading area was approximately 4.5”. No ABC stone was present in any of the bore locations and the underlying soil consisted of silty and clayey sands at or slightly above optimum moisture content. Deleterious or organic matter were not observed in

and of the borings. N-values (penetrations) in the soils ranged from 2 blows per foot to 32 blows per foot.

Select samples of the on-site soils obtained during the field-testing program were tested in the laboratory. Tests performed included natural moisture contents, Atterberg limits, and grain size distribution. The limited testing program was designed to determine selected engineering properties of the on-site soils relative to their use for the project. Laboratory testing was performed in accordance with applicable ASTM and AASHTO Standards. The results of the soil tests performed for this study are presented in Table 1 below and the in the Appendix.

Table 1 - Laboratory Test Results

Boring	Sample Type	Sample Depth (ft)	USCS Classification	Natural Moisture Content	Fines Content	Atterberg limits		
						LL	PL	PI
B1-S1	SS	1-2.5	CH	29.2	66.6	66	32	34
B2-S2	SS	3.5-5	SM	10.8	15.9	13	NP	NA
B2-S3	SS	6-7.5	SM	14.5	21.8	21	NP	NA
B3-S1	SS	1-2.5	ML	21.3	51.3	48	28	20
B3-S2	SS	3.5-5	SM	14.6	24.9	19	NP	NA
B4-S4	SS	8.5-10	SM	19.0	21.9	23	NP	NA
B5-S2	SS	3.5-5	MH	28.9	62.4	51	34	17
B5-S4	SS	8.5-10	SM	25.9	44.9	41	29	12
B6-S1	SS	1-2.5	SC	19.1	43.0	48	25	23
B6-S4	SS	8.5-10	SM	19.0	33.8	35	25	10

Conclusions and Recommendations

The following recommendations are based upon review of the exploration data, our understanding of the proposed construction, our engineering analyses, and past experience with similar projects and subsurface conditions. If subsurface conditions adverse to those indicated by this report are encountered during construction, those differences should be reported to us for review and comment.

The current concrete pavement in this loading area and entrance/exit roadways has failed due to under-design and will need to be replaced. Distresses present include cracked slabs and faulting which is causing water infiltration into the underlying subgrade soils which will in time weaken the subgrade. Based on our findings and the anticipated traffic loads we performed a pavement designed using the following methods.

AASHTO 1993 design guide was followed to do the rigid pavement design. The subbase and concrete slab thicknesses were designed for a plain jointed concrete pavement with dowel bars for load transfer. Standard Penetration test information from the field testing was used to estimate the subgrade resilient modulus. Current traffic at the site is 20 - 5 axle trucks per hour and an annual growth rate of 4% was used to estimate the design traffic. The proposed concrete was estimated to have a compressive strength of 5000 psi and flexural strength of 650 psi.
The concrete pavement was designed to have an eight-inch granular subbase (ABC stone). A recommended resilient modulus (M_r) value of 20,000 psi was used as per the AASHTO 1993 design guide.
Following design parameters were also used –
Load transfer coefficient - 3.2
Drainage coefficient -1.0
Design serviceability loss - 2.0
95% reliability
0.35% overall standard deviation

Estimating Subgrade Modulus
Standard Penetration test results were used to estimate the subgrade modulus. To estimate the subgrade resilient modulus (M_r), the location with the least number of blows was used. For every 1.5-foot depth, the number of blows for the first 6 inches was ignored and the blow count for the next one foot was used. Standard Penetration test was done on each location 4 times down to 10 foot depth. Location B5 had a total of 37 blows for 4 feet of penetration. This was converted into N-value i.e., number of blows required per foot. N-value for location B5 is 9.25. The N-value was then converted into DCP value which is the penetration depth in mm per blow. The DCP value for B5 was 33. The CBR for that location was estimated using this DCP value and the following equation developed by Kleyn and Harden:

$$\log CBR = 2.628 – 1.273 \log (DCP)$$

Using this equation, the CBR value for B5 was estimated to be 5. This CBR value was converted into resilient modulus (M_r) values using the equation in AASHTO 1993 design guide developed by Heukelom and Klomp.

$$M_r (psi) = 1500 (CBR) \text{ for CBR values less than } 20$$

A subgrade resilient modulus of 7500 psi was used for this design.

Estimating Design Traffic –

Current traffic is 20 - 5 axle trucks/hour which is 175,200 20 - 5 axle trucks per year. From AASHTO 1993 design guide, the growth factor for a 20-year design period and 4% growth is 29.78, and the ESAL factor for 5 axle truck is 2.3719. Using these the design traffic is 12,375,300 ESAL's. The slab thickness estimated from the design charts for rigid pavements from the AASHTO 1993 design guide was 11.2 inches. So, the recommended slab thickness for the concrete pavement is 12" with an 8" ABC subgrade. Joint spacing for the doweled concrete shall be a maximum of 12 feet in all directions and 1.5" dowel bars shall be placed at 12" spacing on center, 6" from the top of the slab. It is recommended that dowel bars be used on all sides of the slabs for load transfer since traffic direction is varied. Construction joints shall be cut ¼" wide to a depth equal to ¼ the depth of the concrete slab.

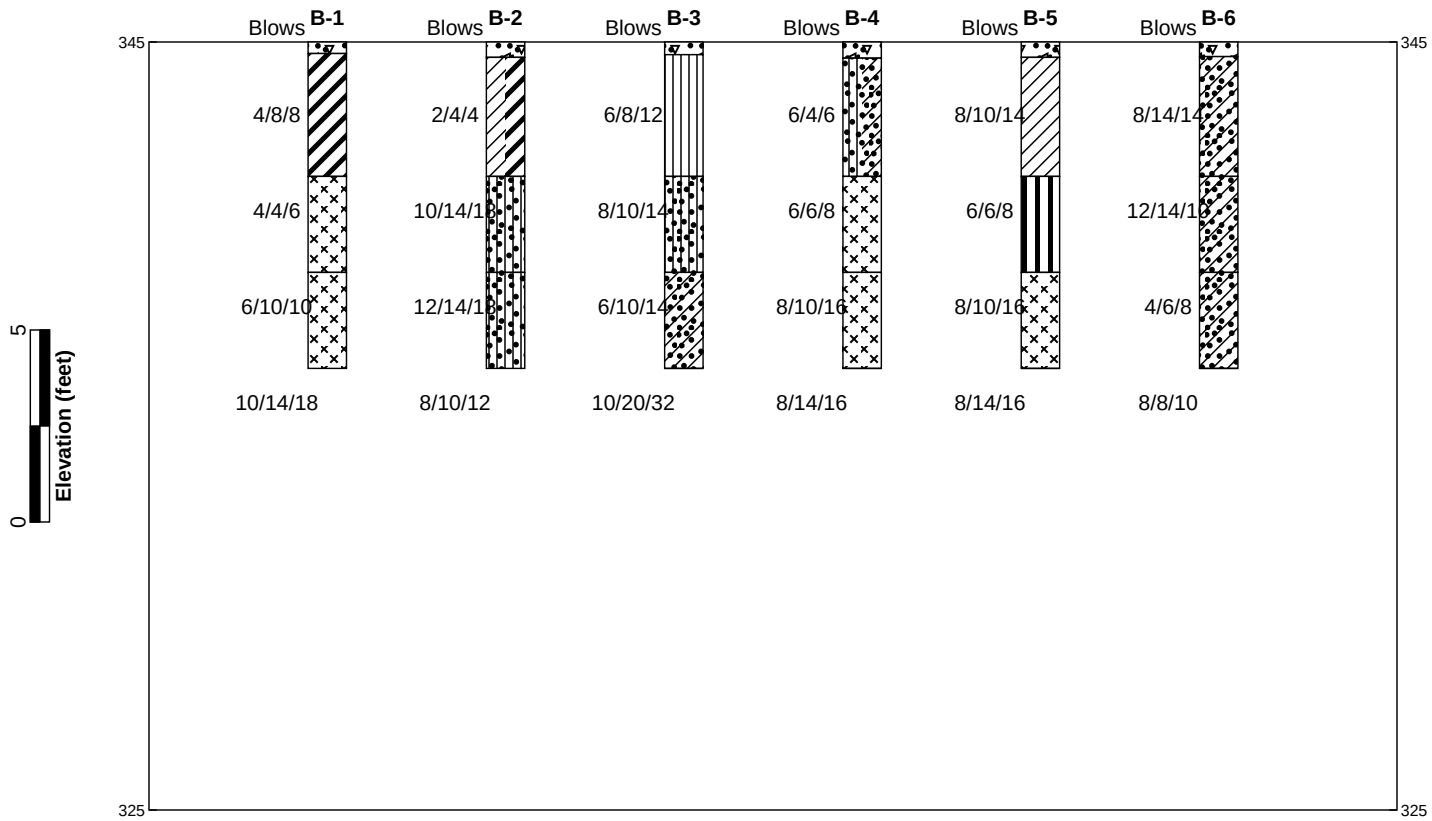
Material Type	Thickness, in.
ABC Stone	8"
5000 psi air entrained concrete pavement	12"

Limitations

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on data from a field exploration and laboratory testing program. Subsurface conditions can vary widely outside the explored area. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.



MATERIAL GRAPHIC SYMBOLS

- Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- Lean-Fat CLAY, CLAY w/SAND, SANDY CLAY (CL-CH)
- Portland Cement Concrete
- SILT, SILT w/SAND, SANDY SILT (MH)
- SILT, SILT w/SAND, SANDY SILT (ML)
- Clayey SAND (SC)
- Silt
- Silty SAND (SM)
- Silty to Clayey SAND (SM-SC)

Trimat Materials Testing, Inc
Durham, NC 27709

Project No.	Figure No.
21-1633	C-1

Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-1 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **345**
Groundwater Level and Date Measured **na**	Sampling Method(s) **Auger**	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
345	0				Concrete		3.5" Concrete Pavement	
					CH		Sandy Fat Clay	
			B1-S1	4/8/8				
			B1-S2	4/4/6			Micaceous Silt	
340	5							
			B1-S3	6/10/10			Sandy Silt	
			B1-S4	10/14/18				
335	10							
330	15							
325	20							
320	25							
315	30							

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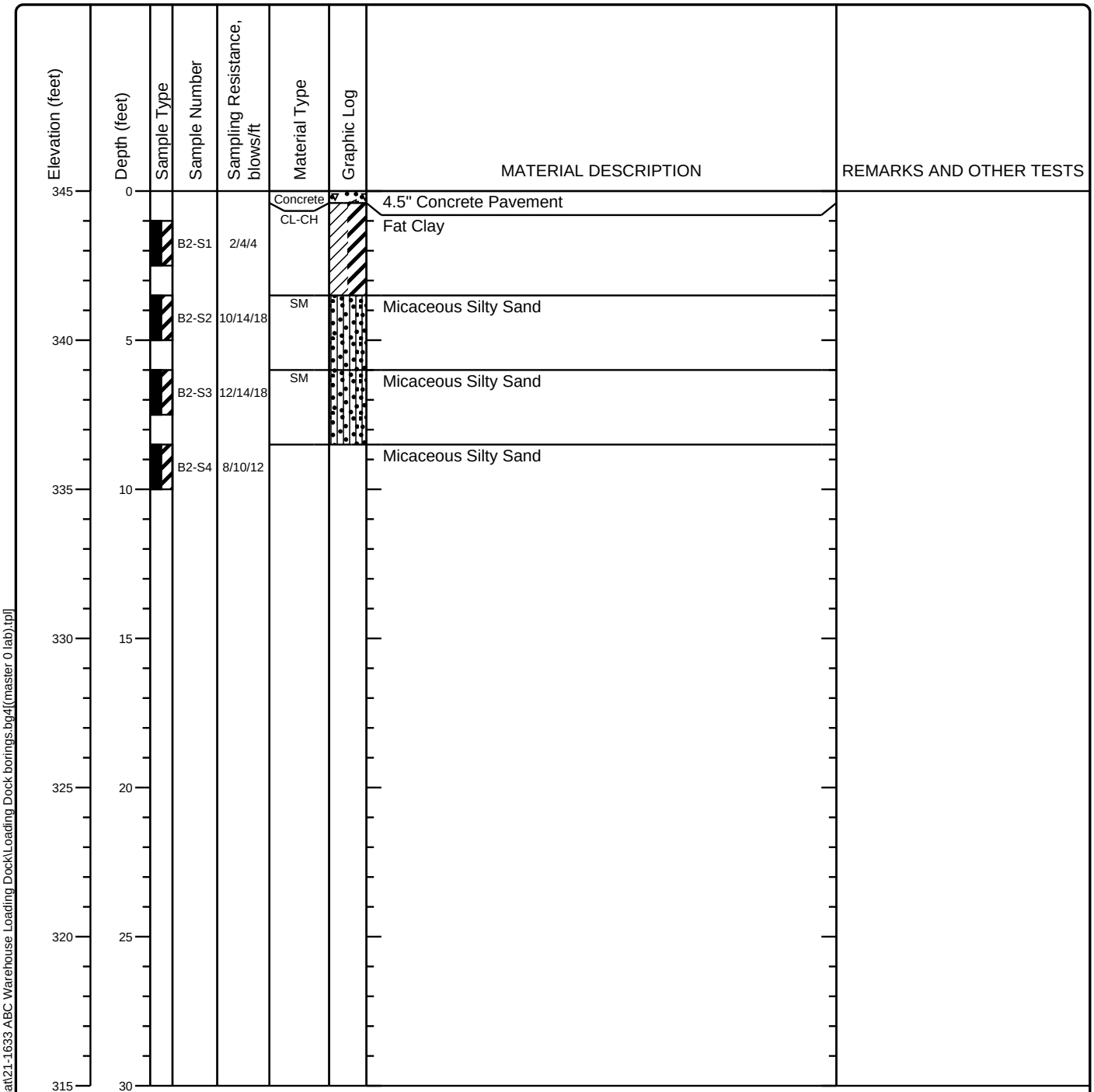
Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-2 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **345**
Groundwater Level and Date Measured **na**	Sampling Method(s) **Auger**	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	



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Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-3 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **345**
Groundwater Level and Date Measured **na**	Sampling Method(s)	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
345	0				Concrete		4" Concrete Pavement	
					ML		Sandy Silt	
			B3-S1	6/8/12				
					SM		Micaceous Silty Sand	
			B3-S2	8/10/14				
340	5							
			B3-S3	6/10/14	SC		Sandy Clay	
					SM		Silt with Mica	
			B3-S4	10/20/32				
335	10							
330	15							
325	20							
320	25							
315	30							

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Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-4 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **345**
Groundwater Level and Date Measured **na**	Sampling Method(s)	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
345	0				Concrete		5" Concrete Pavement	
					SM-SC		Silty Sand	
			B4-S1	6/4/6				
			B4-S2	6/6/8			Silt with Mica	
340	5							
			B4-S3	8/10/16			Micaceous Silt	
			B4-S4	8/14/16	SM		Micaceous Silty Sand	
335	10							
330	15							
325	20							
320	25							
315	30							

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Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-5 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **345**
Groundwater Level and Date Measured **na**	Sampling Method(s)	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
345	0				Concrete		4.75" Concrete Pavement	
					CL		Clay	
			B5-S1	8/10/14				
			B5-S2	6/6/8	MH		Sandy Elastic Silt	
340	5							
			B5-S3	8/10/16			Silty Clay	
			B5-S4	8/14/16	SM		Silty Sand	
335	10							
330	15							
325	20							
320	25							
315	30							

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Project: **ABC Warehouse Loading Dock** Project Location: **Garner, NC** Project Number: **21-1633**	Log of Boring B-6 **Sheet 1 of 1**

Date(s) Drilled **7-22-21**	Logged By **Darrell West**	Checked By **C Bacchi**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **2.5"**	Total Depth of Borehole **10 feet**
Drill Rig Type **Simco HS 2800**	Drilling Contractor **CSI, Inc**	Approximate Surface Elevation **370**
Groundwater Level and Date Measured **na**	Sampling Method(s)	Hammer Data **140 lbs, 30" drop**
Borehole Backfill **cutting/concrete mix**	Location **Warehouse concrete lot**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
370	0				Concrete		4.5" Concrete Pavement	
					SC		Clayey Sand with Mica	
			B6-S1	8/14/14				
					SC		Clayey Sand	
365	5		B6-S2	12/14/10				
					SC		Clayey Sand	
			B6-S3	4/6/8				
					SM		Silty Sand	
			B6-S4	8/8/10				
360	10							
355	15							
350	20							
345	25							
340	30							

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Project: **ABC Warehouse Loading Dock**
Project Location: **Garner, NC**
Project Number: **21-1633**

Key to Log of Boring
Sheet 1 of 1

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9

COLUMN DESCRIPTIONS

1 Elevation (feet): Elevation (MSL, feet).
2 Depth (feet): Depth in feet below the ground surface.
3 Sample Type: Type of soil sample collected at the depth interval shown.
4 Sample Number: Sample identification number.
5 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6 Material Type: Type of material encountered.
7 Graphic Log: Graphic depiction of the subsurface material encountered.
8 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

- Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- Lean-Fat CLAY, CLAY w/SAND, SANDY CLAY (CL-CH)
- Portland Cement Concrete
- SILT, SILT w/SAND, SANDY SILT (MH)
- SILT, SILT w/SAND, SANDY SILT (ML)
- Clayey SAND (SC)
- Silt
- Silty SAND (SM)
- Silty to Clayey SAND (SM-SC)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- 2.5-inch-OD Modified California w/ brass liners
- Pitcher Sample
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

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Figure B-1

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

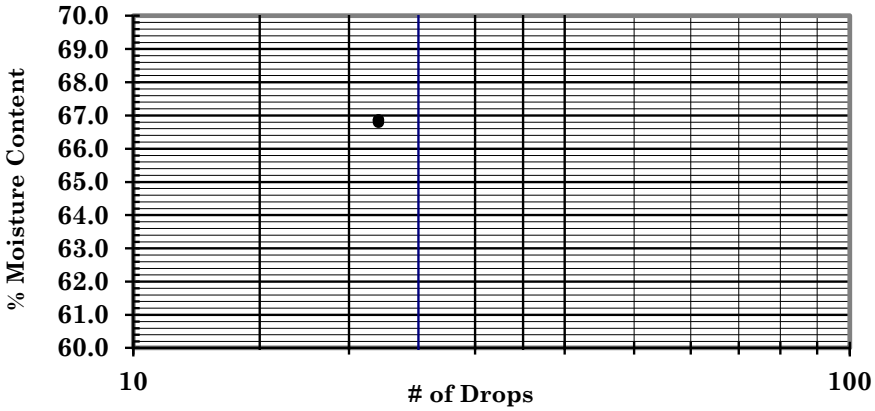
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9608	Material:	Yellowish Red Sandy Fat Clay	Sample Date:	23-Jul
Source:		Sample #:	B1-S1	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	8	13					E	J	
A	Tare Weight	13.57	12.20					20.15	20.78	
B	Wet Soil Weight + A	30.94	29.73					29.09	29.67	
C	Dry Soil Weight + A	23.98	22.71					26.93	27.51	
D	Water Weight (B-C)	6.96	7.02	0.00	0.00	0.00	0.00	2.16	2.16	
E	Dry Soil Weight (C-A)	10.41	10.51	0.00	0.00	0.00	0.00	6.78	6.73	
F	%Moisture Content(D/E)*100	67%	67%					31.9%	32.1%	
N	# OF DROPS	22	22							
LL	LL = F * FACTOR	**66.0%**	66.0%							
Ave.	Average	66.0%						32.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	66
Plastic Limit	32
Plastic Index	34
Group Symbol	CH

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
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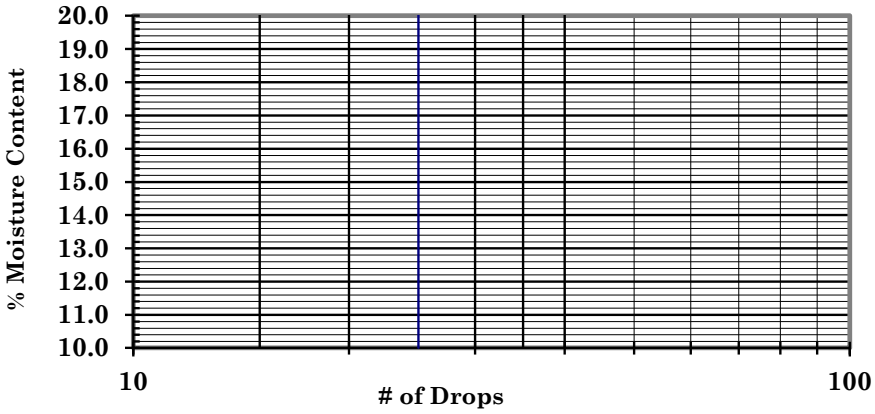
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9609	Material:	Pale Brown Micaceous Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B2-S2	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	4	23							
A	Tare Weight	30.16	29.79							
B	Wet Soil Weight + A	51.20	45.78							
C	Dry Soil Weight + A	48.76	43.93							
D	Water Weight (B-C)	2.44	1.85	0.00	0.00	0.00	0.00			
E	Dry Soil Weight (C-A)	18.60	14.14	0.00	0.00	0.00	0.00			
F	%Moisture Content(D/E)*100	13%	13%							
N	# OF DROPS							NP		
LL	LL = F * FACTOR									
Ave.	Average	13.0%								



One Point Liquid Limit			
N	Factor	N	Factor
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21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	13
Plastic Limit	NP
Plastic Index	
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

Project #:	21-1633	Report Date:	8/3/2021
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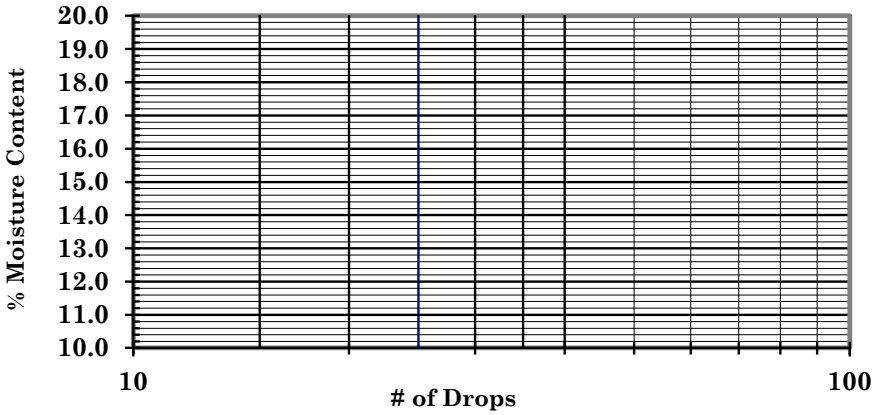
References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9609	Material:	Grey Micaceous Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B2-S3	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	3	5							
A	Tare Weight	13.47	13.31							
B	Wet Soil Weight + A	30.46	32.25							
C	Dry Soil Weight + A	27.54	28.91							
D	Water Weight (B-C)	2.92	3.34	0.00	0.00	0.00	0.00			
E	Dry Soil Weight (C-A)	14.07	15.60	0.00	0.00	0.00	0.00			
F	%Moisture Content(D/E)*100	21%	21%							
N	# OF DROPS							NP		
LL	LL = F * FACTOR									
Ave.	Average	21.0%								



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	21
Plastic Limit	NP
Plastic Index	
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

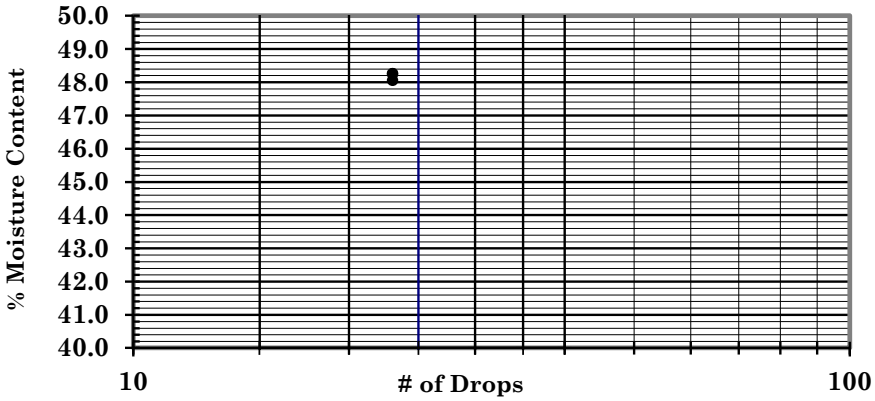
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9610	Material:	Red Sandy Silt	Sample Date:	23-Jul
Source:		Sample #:	B3-S1	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	11	15					B	I	
A	Tare Weight	12.21	12.19					20.39	21.00	
B	Wet Soil Weight + A	29.23	33.08					33.24	34.66	
C	Dry Soil Weight + A	23.69	26.30					30.47	31.71	
D	Water Weight (B-C)	5.54	6.78	0.00	0.00	0.00	0.00	2.77	2.95	
E	Dry Soil Weight (C-A)	11.48	14.11	0.00	0.00	0.00	0.00	10.08	10.71	
F	%Moisture Content(D/E)*100	48%	48%					27.5%	27.5%	
N	# OF DROPS	23	23							
LL	LL = F * FACTOR	**47.5%**	47.5%							
Ave.	Average	47.5%						27.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	48
Plastic Limit	28
Plastic Index	20
Group Symbol	ML

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

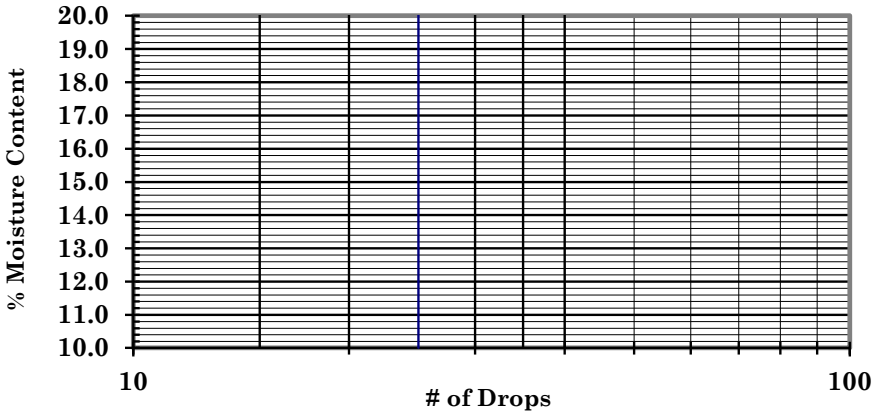
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9610	Material:	Greyish Brown Micaceous Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B3-S2	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	12	17							
A	Tare Weight	12.14	12.31							
B	Wet Soil Weight + A	37.55	32.10							
C	Dry Soil Weight + A	33.44	28.89							
D	Water Weight (B-C)	4.11	3.21	0.00	0.00	0.00	0.00			
E	Dry Soil Weight (C-A)	21.30	16.58	0.00	0.00	0.00	0.00			
F	%Moisture Content(D/E)*100	19%	19%							
N	# OF DROPS							NP		
LL	LL = F * FACTOR									
Ave.	Average	19.0%								



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	19
Plastic Limit	NP
Plastic Index	
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

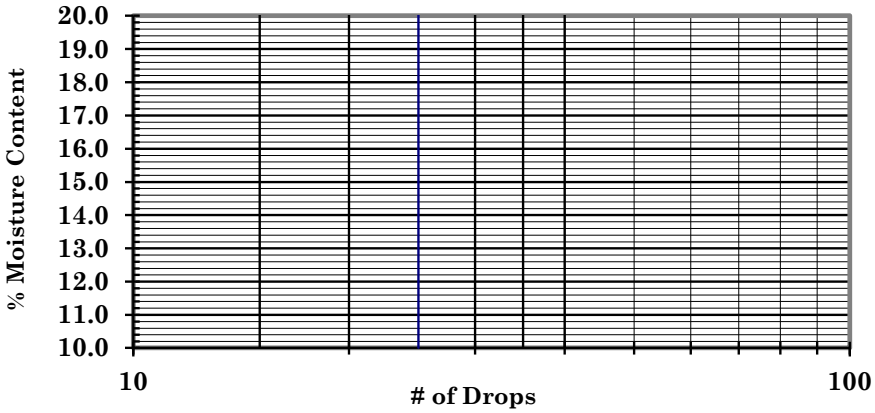
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9611	Material:	Brownish Grey Micaceous Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B4-S4	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	M	N							
A	Tare Weight	13.42	13.38							
B	Wet Soil Weight + A	33.71	32.58							
C	Dry Soil Weight + A	29.98	29.03							
D	Water Weight (B-C)	3.73	3.55	0.00	0.00	0.00	0.00			
E	Dry Soil Weight (C-A)	16.56	15.65	0.00	0.00	0.00	0.00			
F	%Moisture Content(D/E)*100	23%	23%							
N	# OF DROPS							NP		
LL	LL = F * FACTOR									
Ave.	Average	23.0%								



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	23
Plastic Limit	NP
Plastic Index	
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

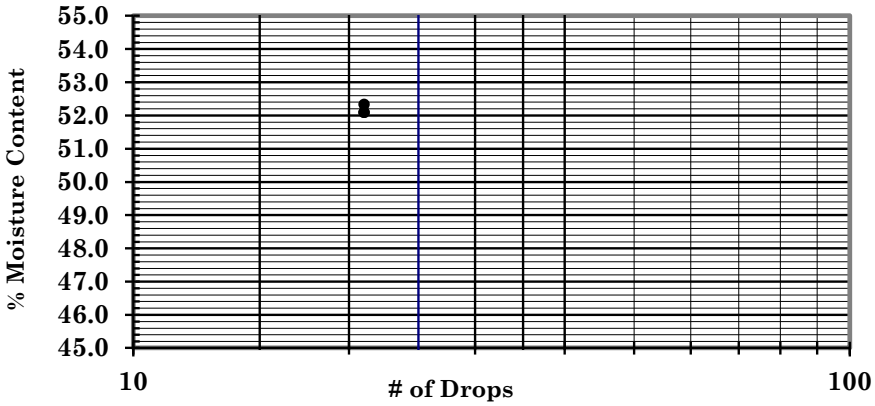
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9612	Material:	Yellowish Red Sandy Elastic Silt	Sample Date:	23-Jul
Source:		Sample #:	B5-S2	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	10	20					D	H	
A	Tare Weight	30.28	29.93					20.93	20.39	
B	Wet Soil Weight + A	47.77	49.87					34.96	32.00	
C	Dry Soil Weight + A	41.78	43.02					31.39	29.05	
D	Water Weight (B-C)	5.99	6.85	0.00	0.00	0.00	0.00	3.57	2.95	
E	Dry Soil Weight (C-A)	11.50	13.09	0.00	0.00	0.00	0.00	10.46	8.66	
F	%Moisture Content(D/E)*100	52%	52%					34.1%	34.1%	
N	# OF DROPS	21	21							
LL	LL = F * FACTOR	**50.9%**	50.9%							
Ave.	Average	50.9%						34.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	51
Plastic Limit	34
Plastic Index	17
Group Symbol	MH

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

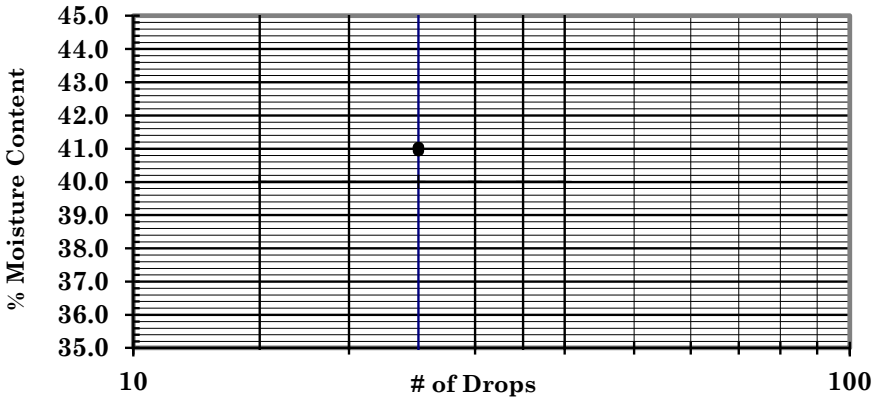
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9612	Material:	Reddish Yellow Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B5-S4	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	6	Y					19	22	
A	Tare Weight	13.22	14.18					30.04	30.38	
B	Wet Soil Weight + A	34.36	33.84					41.06	42.61	
C	Dry Soil Weight + A	28.21	28.13					38.61	39.90	
D	Water Weight (B-C)	6.15	5.71	0.00	0.00	0.00	0.00	2.45	2.71	
E	Dry Soil Weight (C-A)	14.99	13.95	0.00	0.00	0.00	0.00	8.57	9.52	
F	%Moisture Content(D/E)*100	41%	41%					28.6%	28.5%	
N	# OF DROPS	25	25							
LL	LL = F * FACTOR	**41.0%**	41.0%							
Ave.	Average	41.0%						28.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	41
Plastic Limit	29
Plastic Index	12
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

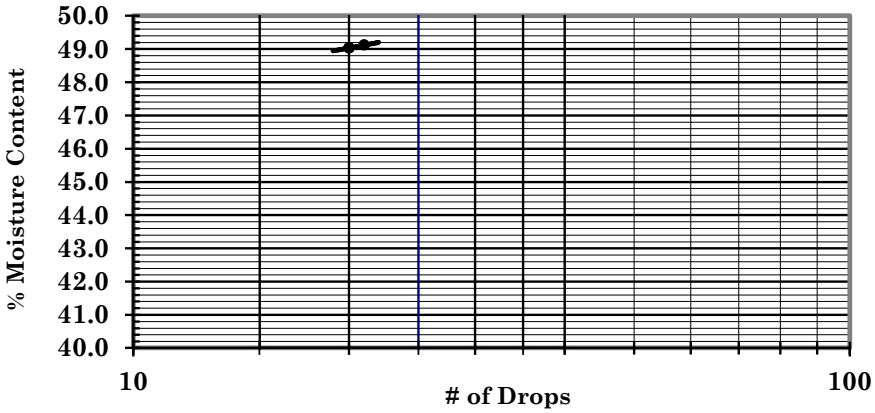
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9613	Material:	Red Micaceous Clayey Sand	Sample Date:	23-Jul
Source:		Sample #:	B6-S1	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	1	Z					2	21	
A	Tare Weight	13.44	13.39					29.80	30.14	
B	Wet Soil Weight + A	31.92	32.82					43.41	44.13	
C	Dry Soil Weight + A	25.84	26.42					40.70	41.31	
D	Water Weight (B-C)	6.08	6.40	0.00	0.00	0.00	0.00	2.71	2.82	
E	Dry Soil Weight (C-A)	12.40	13.03	0.00	0.00	0.00	0.00	10.90	11.17	
F	%Moisture Content(D/E)*100	49%	49%					24.9%	25.2%	
N	# OF DROPS	20	21							
LL	LL = F * FACTOR	**47.7%**	48.0%							
Ave.	Average	47.9%						25.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	48
Plastic Limit	25
Plastic Index	23
Group Symbol	SC

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT 203 Revised: 07/2016

Trimat Materials Testing, Inc.

Liquid Limit, Plastic Limit, and Plastic Index

AASHTO T89/90

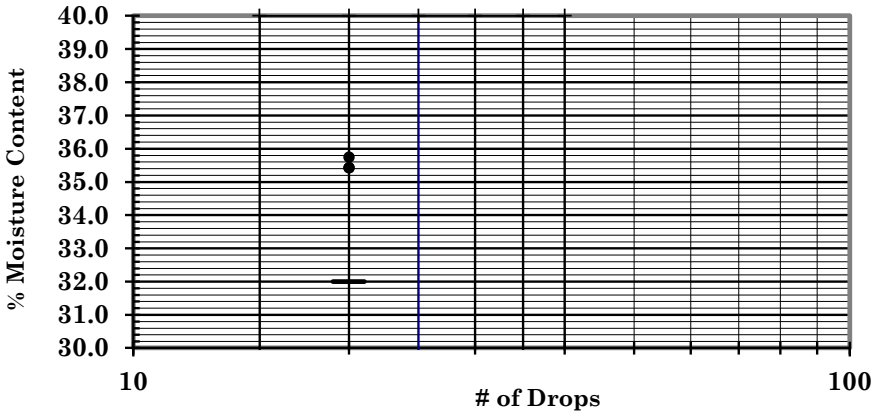
Project #:	21-1633	Report Date:	8/3/2021
Project Name:	ABC Warehouse	Test Date(s):	8/2/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			

References:

AASHTO M231, Weighing Devices Used in the Testing of Materials
AASHTO R58, Dry Preparation of Disturbed Soil and Soil-Aggregate samples
AASHTO T89, Determining the Liquid Limit of Soils
AASHTO T146, Wet Preparation of Disturbed Soil Samples for Test
AASHTO T265, Laboratory Determination of Moisture Content of Soils

Lab #:	9613	Material:	Reddish Yellow Silty Sand	Sample Date:	23-Jul
Source:		Sample #:	B6-S4	Sampled By:	DW

		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	14	X					F	P	
A	Tare Weight	12.23	14.16					21.30	20.86	
B	Wet Soil Weight + A	31.92	35.43					37.38	35.66	
C	Dry Soil Weight + A	26.77	29.83					34.13	32.68	
D	Water Weight (B-C)	5.15	5.60	0.00	0.00	0.00	0.00	3.25	2.98	
E	Dry Soil Weight (C-A)	14.54	15.67	0.00	0.00	0.00	0.00	12.83	11.82	
F	%Moisture Content(D/E)*100	35%	36%					25.3%	25.2%	
N	# OF DROPS	20	20							
LL	LL = F * FACTOR	**34.1%**	35.1%							
Ave.	Average	34.6%						25.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic

Liquid Limit	35
Plastic Limit	25
Plastic Index	10
Group Symbol	SM

Notes:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certification #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9608	Sampled By: DW	Depth (ft):
Location:	B1-S1		
Sample Description:	Yellowish Red Sandy Fat Clay		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	B		Tare #	B
A	Tare Weight	136.7	A	Tare Weight	136.70
B	Total Sample Dry Wt. + Tare Wt.	325.6	B	Wet Weight + Tare Wt.	380.70
C	Total Sample Dry Weight (B-A)	188.9	C	Dry Weight + Tare Wt.	325.60
D	After Wash Weight + Tare	199.7	D	Water Wt. (B-C)	55.10
E	Total Sample Wt. After #200 Wash	63.0	E	Dry Wt.(C-A)	188.90
	Percent Passing #200 (1-E/C)x100	66.6%		Moisture Content (100 x D/E) (%)	29.2%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	0.7	0%	**100%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9609	Sampled By: DW	Depth (ft):
Location:	B2-S2		
Sample Description:	Pale Brown Micaceous Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	G		Tare #	G
A	Tare Weight	136.6	A	Tare Weight	136.60
B	Total Sample Dry Wt. + Tare Wt.	427.0	B	Wet Weight + Tare Wt.	458.50
C	Total Sample Dry Weight (B-A)	290.4	C	Dry Weight + Tare Wt.	427.00
D	After Wash Weight + Tare	380.8	D	Water Wt. (B-C)	31.50
E	Total Sample Wt. After #200 Wash	244.2	E	Dry Wt.(C-A)	290.40
	Percent Passing #200 (1-E/C)x100	15.9%		Moisture Content (100 x D/E) (%)	10.8%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	2.0	1%	**99%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9609	Sampled By: DW	Depth (ft):
Location:	B2-S3		
Sample Description:	Grey Micaceous Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

	Particle Size Analysis / Without Hydrometer Analysis			Moisture Content	Natural
	Tare Number	WW		Tare #	WW
A	Tare Weight	155.4	A	Tare Weight	155.40
B	Total Sample Dry Wt. + Tare Wt.	509.3	B	Wet Weight + Tare Wt.	560.60
C	Total Sample Dry Weight (B-A)	353.9	C	Dry Weight + Tare Wt.	509.30
D	After Wash Weight + Tare	432.2	D	Water Wt. (B-C)	51.30
E	Total Sample Wt. After #200 Wash	276.8	E	Dry Wt.(C-A)	353.90
	Percent Passing #200 (1-E/C)x100	21.8%		Moisture Content (100 x D/E) (%)	14.5%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	16.3	5%	**95%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9610	Sampled By: DW	Depth (ft):
Location:	B3-S1		
Sample Description:	Red Sandy Silt		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	HH		Tare #	HH
A	Tare Weight	152.4	A	Tare Weight	152.40
B	Total Sample Dry Wt. + Tare Wt.	436.5	B	Wet Weight + Tare Wt.	497.00
C	Total Sample Dry Weight (B-A)	284.1	C	Dry Weight + Tare Wt.	436.50
D	After Wash Weight + Tare	290.7	D	Water Wt. (B-C)	60.50
E	Total Sample Wt. After #200 Wash	138.3	E	Dry Wt.(C-A)	284.10
	Percent Passing #200 (1-E/C)x100	51.3%		Moisture Content (100 x D/E) (%)	21.3%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	3.2	1%	**99%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9610	Sampled By: DW	Depth (ft):
Location:	B3-S2		
Sample Description:	Greyish Brown Micaceous Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	MM		Tare #	MM
A	Tare Weight	155.8	A	Tare Weight	155.80
B	Total Sample Dry Wt. + Tare Wt.	448.1	B	Wet Weight + Tare Wt.	490.80
C	Total Sample Dry Weight (B-A)	292.3	C	Dry Weight + Tare Wt.	448.10
D	After Wash Weight + Tare	375.3	D	Water Wt. (B-C)	42.70
E	Total Sample Wt. After #200 Wash	219.5	E	Dry Wt.(C-A)	292.30
	Percent Passing #200 (1-E/C)x100	24.9%		Moisture Content (100 x D/E) (%)	14.6%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	0.5	0%	**100%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9611	Sampled By: DW	Depth (ft):
Location:	B4-S4		
Sample Description:	Brownish Grey Micaceous Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis					Moisture Content	Natural
	Tare Number	Z		Tare #	Z	
A	Tare Weight	151.1	A	Tare Weight	151.10	
B	Total Sample Dry Wt. + Tare Wt.	518.1	B	Wet Weight + Tare Wt.	587.90	
C	Total Sample Dry Weight (B-A)	367.0	C	Dry Weight + Tare Wt.	518.10	
D	After Wash Weight + Tare	437.6	D	Water Wt. (B-C)	69.80	
E	Total Sample Wt. After #200 Wash	286.5	E	Dry Wt.(C-A)	367.00	
	Percent Passing #200 (1-E/C)x100	21.9%		Moisture Content (100 x D/E) (%)	19.0%	

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	0.0	0%	**100%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9612	Sampled By: DW	Depth (ft):
Location:	B5-S2		
Sample Description:	Yellowish Red Sandy Elastic Silt		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	OO		Tare #	OO
A	Tare Weight	152.0	A	Tare Weight	152.00
B	Total Sample Dry Wt. + Tare Wt.	489.7	B	Wet Weight + Tare Wt.	587.40
C	Total Sample Dry Weight (B-A)	337.7	C	Dry Weight + Tare Wt.	489.70
D	After Wash Weight + Tare	279.1	D	Water Wt. (B-C)	97.70
E	Total Sample Wt. After #200 Wash	127.1	E	Dry Wt.(C-A)	337.70
	Percent Passing #200 (1-E/C)x100	62.4%		Moisture Content (100 x D/E) (%)	28.9%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	100%
37.50	1.5"		0%	100%
25.00	1.0"		0%	100%
19.00	3/4"		0%	100%
12.50	1/2"		0%	100%
9.50	3/8"		0%	100%
4.75	#4	1.5	0%	100%
2.36	#8		0%	100%
1.18	#16		0%	100%
0.60	#30		0%	100%
0.30	#50		0%	100%
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.
Particle Size Analysis of Soils
AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9612	Sampled By: DW	Depth (ft):
Location:	B5-S4		
Sample Description:	Reddish Yellow Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	BB		Tare #	BB
A	Tare Weight	150.5	A	Tare Weight	150.50
B	Total Sample Dry Wt. + Tare Wt.	421.5	B	Wet Weight + Tare Wt.	491.80
C	Total Sample Dry Weight (B-A)	271.0	C	Dry Weight + Tare Wt.	421.50
D	After Wash Weight + Tare	299.7	D	Water Wt. (B-C)	70.30
E	Total Sample Wt. After #200 Wash	149.2	E	Dry Wt.(C-A)	271.00
	Percent Passing #200 (1-E/C)x100	44.9%		Moisture Content (100 x D/E) (%)	25.9%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	100%
37.50	1.5"		0%	100%
25.00	1.0"		0%	100%
19.00	3/4"		0%	100%
12.50	1/2"		0%	100%
9.50	3/8"		0%	100%
4.75	#4	0.0	0%	100%
2.36	#8		0%	100%
1.18	#16		0%	100%
0.60	#30		0%	100%
0.30	#50		0%	100%
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9613	Sampled By: DW	Depth (ft):
Location:	B6-S1		
Sample Description:	Red Micaceous Clayey Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

Particle Size Analysis / Without Hydrometer Analysis				Moisture Content	Natural
	Tare Number	CC		Tare #	CC
A	Tare Weight	150.4	A	Tare Weight	150.40
B	Total Sample Dry Wt. + Tare Wt.	466.8	B	Wet Weight + Tare Wt.	527.10
C	Total Sample Dry Weight (B-A)	316.4	C	Dry Weight + Tare Wt.	466.80
D	After Wash Weight + Tare	330.6	D	Water Wt. (B-C)	60.30
E	Total Sample Wt. After #200 Wash	180.2	E	Dry Wt.(C-A)	316.40
	Percent Passing #200 (1-E/C)x100	43.0%		Moisture Content (100 x D/E) (%)	19.1%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	0.9	0%	**100%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)

TMT206 Jul-16

Trimat Materials Testing, Inc.

Particle Size Analysis of Soils

AASHTO T11

Project #:	21-1633	Report Date:	8/1/2021
Project Name:	ABC Warehouse	Test Date(s):	7/30/2021
Client Name:	NC Department of Administration	Received Date:	7/23/2021
Client Address:			
Sample #:	9613	Sampled By: DW	Depth (ft):
Location:	B6-S4		
Sample Description:	Reddish Yellow Silty Sand		

References: AASHTO Standards:

M92 Wire-Cloth Sieves for Testing Purposes
M231 Weighing Devices Used in the Testing of Materials
T2 Sampling of Aggregates
T27 Sieve Analysis of Fine and Course Aggregates
T248 Reducing Samples of Aggregate to Testing Size

	Particle Size Analysis / Without Hydrometer Analysis			Moisture Content	Natural
	Tare Number	EE		Tare #	EE
A	Tare Weight	151.4	A	Tare Weight	151.40
B	Total Sample Dry Wt. + Tare Wt.	612.2	B	Wet Weight + Tare Wt.	699.90
C	Total Sample Dry Weight (B-A)	460.8	C	Dry Weight + Tare Wt.	612.20
D	After Wash Weight + Tare	456.3	D	Water Wt. (B-C)	87.70
E	Total Sample Wt. After #200 Wash	304.9	E	Dry Wt.(C-A)	460.80
	Percent Passing #200 (1-E/C)x100	33.8%		Moisture Content (100 x D/E) (%)	19.0%

Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	**Percent Passing Total Sample**
50.00	2.0"		0%	**100%**
37.50	1.5"		0%	**100%**
25.00	1.0"		0%	**100%**
19.00	3/4"		0%	**100%**
12.50	1/2"		0%	**100%**
9.50	3/8"		0%	**100%**
4.75	#4	27.9	6%	**94%**
2.36	#8		0%	**100%**
1.18	#16		0%	**100%**
0.60	#30		0%	**100%**
0.30	#50		0%	**100%**
0.15	#100		0.0%	**100.0%**
0.075	#200		0.0%	**100.0%**

Notes:

Reviewed by:

Technician: Brett S Junker (*Printed Name*) 50740 (*Certificate #*) (*Signature*)