Olsson Associates
601 P Street, Suite 200
Lincoln, Nebraska
August 17, 2018

ADDENDUM NO. 1
Reconstruct Apron and Taxiway
Trenton Municipal Airport
Trenton, Missouri
Bid Date: Friday, August 24, 2018 – 2:00 pm
MoDOT# 18-011A-1
OA Project No. 018-1755

TO ALL WHO HAVE RECEIVED PLANS AND SPECIFICATIONS FOR THE REFERENCED PROJECT.

Note: Prospective bidders must obtain a copy of the project manual and project drawings from either www.questcdn.com or Olsson Associates at the address identified within the Notice to Bidders. Any other sources utilized will not be acceptable for consideration.

Note: As per Section 2 – Instructions to Bidders, Page ITB-1, Item 1:
THE EXECUTED PROPOSAL FORM MUST BE SUBMITTED IN THE ORIGINAL BOUND PROECT MANUAL. NO INDIVIDUAL ELEMENTS OF THE PROJECT MANUAL MAY BE REMOVED OR DETACHED.

Specification Book

1. Section 5 - Refer to Technical Specifications, Specification L-125, Page 3, Line 15:

   Delete Line 15 (a.) and replace with the following:

   a. L-858R(L) Mandatory Sign: Size 1, Style 2, Class 1, Mode 1, LED

      i. Base bid sign legend is ’18-36’. Alternate bid sign legend is ‘36’.

2. Refer to the Appendix:

   Add the attached Geotechnical Report and Geotechnical Report Addendum No. 1.

Plans

3. Sheet 12: Sheet Notes, Note No. 1:

   Delete Note No. 1 in its entirety and replace with the following:

   1. If unsuitable soil is encountered, the contractor shall remove as directed by the engineer and replace with borrow excavation. This work shall be considered subsidiary to unclassified excavation and borrow excavation. The bid quantities include a factor of 10% to account for this.

4. Sheet 13: Sheet Notes, Note No. 1:

   Delete Note No. 1 in its entirety and replace with the following:

   1. If unsuitable soil is encountered, the contractor shall remove as directed by the engineer and replace with suitable fill. This work shall be considered subsidiary to unclassified excavation. The bid quantities include a factor of 10% to account for this.

Attach this addendum to the inside COVER of the Specification Book.

Each Bidder must acknowledge receipt of all addenda in the space provided on the Proposal Form.

OLSSON ASSOCIATES

July 13, 2018

City of Trenton, Missouri
Attn: Donnie Vandevender
1100 Main Street
Trenton, Missouri 64683

Re: Geotechnical Engineering Report Addendum No. 1
Trenton Airport
Trenton, Missouri
Olsson Project No. 013-0549

Dear Mr. Vandevender:

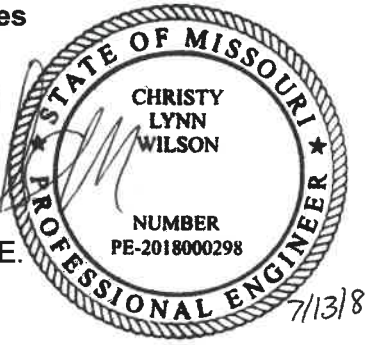
In our geotechnical report dated May 3, 2013 (OA Report #013-0549), we provided pavement subgrade recommendations including chemical stabilization options. We included recommendations for Class "C" flyash or hydrated lime in our report. As an alternative, lime kiln dust (LKD) may be used to stabilize the subgrade soils beneath the new pavements. In our opinion, approximately 6 percent LKD (based on dry unit weights) would be required to stabilize the soils.

This letter and the recommendations contained herein are considered part of, and should be attached to, our geotechnical report for the project. All recommendations, opinions and limitations contained in the original geotechnical report and subsequent addenda that are not specifically addressed in this addendum remain valid.

Olsson appreciates the opportunity to provide our services on this project and look forward to continuing working with you during construction and on future projects. Should you have any questions, please do not hesitate to contact us.

Sincerely,
Olsson Associates

Christy Wilson, P.E.



Curt Mader, P.E.

1700 East 123rd Street
Olathe, KS 66061

TEL 913.829.0078
FAX 913.829.0258

www.olssonassociates.com

GEOTECHNICAL ENGINEERING REPORT

TRENTON AIRPORT
TRENTON, MISSOURI

PREPARED FOR
CITY OF TRENTON, MISSOURI

PREPARED BY
OLSSON ASSOCIATES

MAY 03, 2013

OA PROJECT NO. 013-0549

1802 East 123rd Street · Olathe, KS 66061 · (913) 829-0078 · FAX (913) 829-0258

OLSSON ®
ASSOCIATES

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A. PROJECT UNDERSTANDING

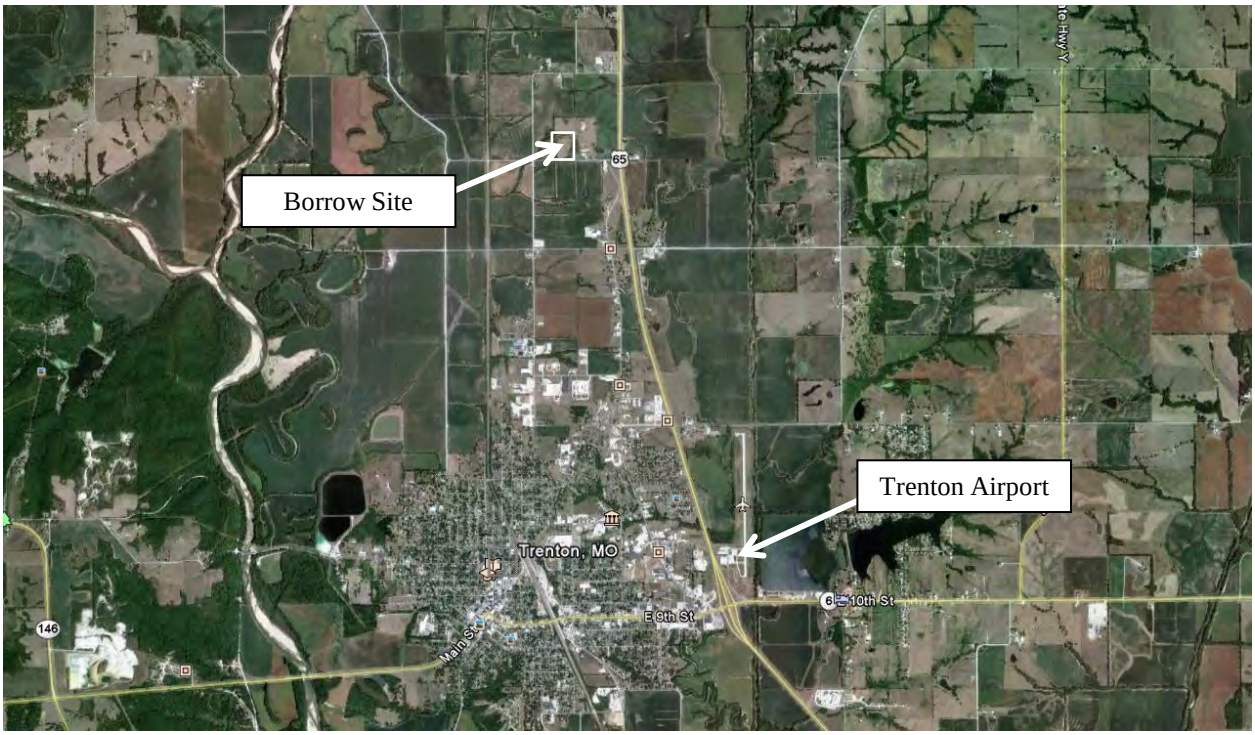
A.1. GEOTECHNICAL SCOPE

This Geotechnical Engineering Report presents the results of the subsurface exploration completed for the apron and taxiway rehabilitation project at the Trenton Airport in Trenton, Missouri. Ten (10) borings were drilled on the apron and taxiway and one (1) boring was drilled at the proposed borrow site. The locations of the borings are shown on the Boring Location Plans in Appendix A. Copies of the Boring Logs are provided in Appendix B. As a part of this exploration, Olsson Associates (***Olsson)*** performed a visual reconnaissance to document the condition of the existing pavement. This report discusses our visual reconnaissance of the site, the pavement and subsurface soil conditions encountered at the borings, and our recommendations for new pavement.

A.2. PROJECT INFORMATION

Trenton, Missouri is located approximately 85 miles northeast of Kansas City, Missouri. The Trenton Airport is located on the east side of the City of Trenton, northeast of the intersection of Highway 65 and East 10th Street. The proposed borrow site for the project is located 2.5 miles northwest of the Trenton Airport on NW 27th Street between NW 10th Avenue and Highway 65. The locations of both the airport and the borrow site are shown in Figure 1.

Figure 1: Site Locations



B. Exploratory and Test Procedures

B.1. Visual Reconnaissance

As part of this study, we visually observed the condition of the existing apron and taxiway. These areas included sections of both Asphaltic Concrete (AC) and Portland Cement Concrete (PCC). The distress we observed included transverse, longitudinal, severe fatigue (alligator), potholes and block cracking in the AC sections, linear cracking and joint spalling were observed in the PCC pavement section.

Block cracking is typically caused by shrinkage of the asphaltic concrete and freeze-thaw cycling. This type of distress is indicative of the natural hardening of asphaltic concrete over time. We observed this type of distress across large areas throughout the apron. Figures 2 and 3 show typical sections displaying block cracking.

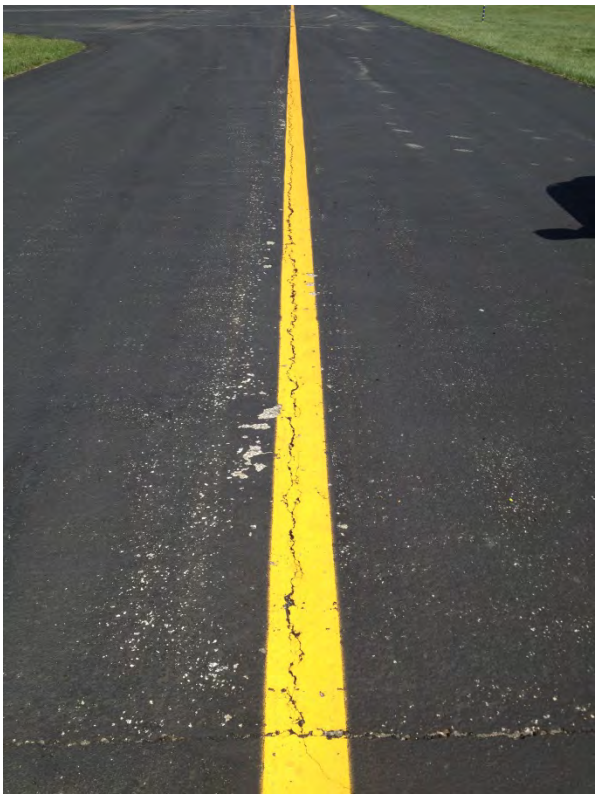
Figures 2 and 3: Block Cracking

Transverse cracking, as with block cracking, is typically casued by shrinkage of the pavement and freeze-thaw cycling. We observed this type of cracking throughout the asphaltic concrete on both the apron and taxiway. Some cracks show evidence of deterioration and breaking along the edges, examples are shown in Figure 4 and 5.

Figures 4 and 5: Transverse Cracking w/ Related Deterioration

We also observed longitudinal cracks that run parallel to the pavement's centerline and along joints. These are typically caused by a poorly constructed paving joint, shrinkage of the asphaltic concrete, freeze thaw cycling, or hardening of the asphaltic concrete. We observed longitudinal cracks along both the aprons and taxiways. Representative photos of the longitudinal cracking are shown in Figures 6 and 7.

Figures 6 and 7: Longitudinal Cracking



Fatigue (alligator) cracking occurs in areas with repeated traffic loading and is typically an indication of pavement subgrade deterioration. We observed alligator cracking in multiple areas throughout the apron, especially near the hangars to the northwest. Examples of the distress are shown in Figures 8 and 9.

Figures 8 and 9: Fatigue Cracking

Potholes were also noted in areas and are usually a result of severe fatigue cracking and subgrade deterioration. As fatigue cracking worsens, potholes begin forming. We observed potholes in the apron area with the majority of the deterioration in the northwest sections as shown in Figures 10 and 11.

Figures 10 and 11: Potholes

Portland cement concrete pavement were located around the terminal building. In the areas, we observed linear cracking and some spalling, as shown in Figures 12 and 13.

Figures 12 and 13: Linear Cracking

B.2. FIELD EXPLORATION

The drill crew used a truck mounted drill rig to advance eleven (11) borings for this project. The approximate locations of the borings are shown on the Boring Location Plans in Appendix A. Soil stratification, as shown on the boring logs in Appendix B, represents soil, asphaltic concrete and Portland cement concrete conditions at the specific boring locations; however, variations may occur between or beyond the borings. The stratification lines represent the approximate boundary between material types but the actual transition between layers may be gradual.

Borings B-2 through B-7 and B-10 were drilled in the apron and taxiway areas and core samples of the pavement were obtained at each of these boring locations. Upon completion of coring the pavement, the borings were advanced to a depth of 5 feet below the existing pavement surface using continuous flight solid stem augers. Borings B-1, B-8, B-9 and B-11 were located in grass covered areas and were also drilled to 5 feet below the ground surface. Soil samples were obtained at selected intervals in the borings. Soil samples designated as "U" samples on the Boring Logs (Appendix B) were obtained using thin walled tubes hydraulically pushed into the ground. Soil samples designated as “SS” samples were obtained with a split barrel sampler. A bulk sample (designated GB on the boring logs) was taken from boring B-11 at the proposed borrow site. Recovered samples were sealed and transported to our laboratory.

The asphaltic concrete varied in thickness from approximately 1.5 inches to 12 inches. The asphaltic concrete cores from borings B-3 and B-10 showed signs of deterioration beneath the surface of the pavement. Beneath the base of the pavement, poorly graded gravel was noted in borings B-2 through B-6 and B-10 and varied in depth from approximately 3 to 7 inches. Fill material was encountered beneath the gravel and continued to the base of the borings. Borings B-1, B-8, B-9 and B-11 encountered a developed zone at the surface. The developed zone was underlain by fill material which continued to the base of the borings. The fill consisted of lean to fat clay soils with varying amounts of silt, sand and gravel and was soft to very stiff.

Pavement core thicknesses are summarized in Table 1. Photographs of each core are provided in Appendix D.

Table 1 – Summary of Pavement Thicknesses

Boring Number	Asphaltic Concrete Pavement Thickness (inches)	Portland Cement Concrete Pavement Thickness (inches)	Depth of Gravel Below Pavement (inches)
B-2	7.25		4.75
B-3	12		3
B-4	1.5		5.5
B-5	8.5		3.5
B-6		6.25	5.75
B-7		5	7
B-10	8.5		3.5

B.3. LABORATORY TESTING

The soil samples obtained from the borings were returned to our laboratory for testing and visual classification using the Unified Soil Classification System (USCS). Moisture content and dry density tests were performed on sample`s obtained from the thin-walled tubes. Unconfined compressive strength tests were performed on selected thin-walled samples and moisture content tests were performed on split-barrel samples. In addition, Atterberg limit tests were performed on three samples obtained from borings B-2, B-7 and B-9 to aid in the classification of soils. A standard Proctor test of the proposed borrow material was also obtained. The test results are presented on the boring logs and a summary of the laboratory test results is presented in Appendix C.

B.4. GROUNDWATER OBSERVATION

Water level observations were made at the boring during drilling and immediately upon completion. During these times, water was not observed at the bore holes. The lack of groundwater in the boreholes during the exploration program should not be construed to represent an absolute or permanent condition. Long term monitoring in cased holes would be required to further evaluate water table evaluations.

C. PAVEMENT

C.1 PAVEMENT CONSIDERATIONS

Both the Asphaltic Concrete (AC) and Portland Cement Concrete (PCC) showed varying degrees of cracking and deterioration including alligator cracking, block cracking, potholing and transverse cracking. Although some of the existing asphaltic concrete pavement could be a candidate for mill and overlay operations, we understand that a majority of these pavements will be removed to improve drainage, with new pavements added as part of this project. To provide improved subgrade support, we recommend that the subgrade soils beneath the new pavements be improved with the incorporation Class “C” flyash or hydrated lime.

We understand the site experiences occasional flooding and drainage issues. The new pavements should be constructed with a granular drainage layer so water is not allowed to pool beneath the pavements. In addition, we recommend that supplemental underdrains be installed to facilitate drainage beneath the pavements. The underdrains should be installed in accordance with MoDOT MO-706 and sloped to a suitable discharge point.

C.2. PAVEMENT SUBGRADE PREPARATION

Relatively minor regrading is anticipated for this project. In existing non-pavement areas, vegetation, topsoil, and other loose, soft or unsuitable material should be removed from the construction area and borrow source areas. Following site stripping and removal of the existing pavement sections, the subgrade should be undercut to allow for the design depths of new pavements and baserock. We recommend the prepared subgrade extend a minimum of 2-feet beyond the pavement edges, where feasible.

Following site stripping and cutting operations, but prior to the placement of new fill, the exposed subgrade should be proofrolled with a loaded dump truck or similar rubber-tired equipment with a total weight of at least 20-tons, immediately prior to placement of new pavements. Unstable or unsuitable soils revealed by proofrolling should be reworked or removed to provide a stable subgrade. Proofrolling operations should be observed and documented by ***Olsson***.

Upon completion of proofrolling and removal of unsuitable material, the upper 8 inches of subgrade should be scarified, moisture conditioned and recompacted to a minimum of 95 percent of the standard Proctor value at a moisture content between 1 percent below and 3 percent above optimum. In areas that require fill, the fill should consist of approved materials

free of organic material and debris placed in loose lifts of 6 inches or less. The on-site soils as well as the borrow source soils we tested are suitable for use as fill. Cohesive fills beneath new pavements should compact to at least 95 percent of the standard Procter value at a moisture value between 1 percent below optimum and 3 percent above optimum.

Olsson should be present during subgrade preparation to observe, document, and test compaction of the materials at the time of placement.

C.3. PAVEMENT DESIGN PARAMETERS

In our opinion, all new, full-depth pavements should be supported on a minimum 4 inches subgrade of MoDOT MO-209 baserock underlain by 8 inches of prepared subgrade (MoDOT MO-152). We recommend that the 8 inches of prepared subgrade soils beneath the new pavement be stabilized using Class “C” flyash (MoDOT-155) or hydrated lime (FAA P-155). The estimated required quantities are 5 percent hydrated lime or 15 percent Class “C” flyash. Baserock material placed beneath pavements should be placed in loose lifts of 6 inches or less and compacted to at least 95 percent of the materials maximum dry density as determined by ASTM D 698 at a workable moisture content.

Based on our experience with soil types encountered at this site, a CBR value of 3 is estimated for design of the taxiway and apron pavement section. A modulus of subgrade reaction (k) of 100 psi/in can be used to design grade support concrete slabs.

D. PROJECT LIMITATIONS

The conclusions and recommendations presented in this report are based on the information available regarding the proposed construction, the results obtained from our soil borings and sampling procedures, the results of the laboratory testing program, and our experience with similar projects. The soil borings represent a very small statistical sampling of subsurface soils and it is possible that conditions may be encountered during construction that are substantially different from those indicated by the soil borings. In these instances, adjustments to design and construction may be necessary. This geotechnical report is based on the site plan and information provided to ***Olsson*** and our understanding of the project as noted in this report. Changes in the location or design of new pavements could significantly affect the conclusions and recommendations presented in this geotechnical report. ***Olsson*** should be contacted in the event of such changes to determine if the recommendations of this report remain appropriate for the revised site design.

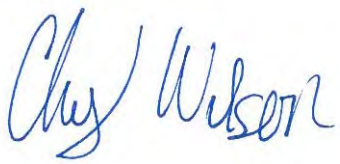
This report was prepared under the direction and supervision of a Professional Engineer registered in the State of Missouri with the firm of Olsson Associates. The conclusions and recommendations contained herein are based on generally accepted, professional geotechnical engineering practices at the time of this report, within this geographic area. No other warranty is expressed or implied. This report has been prepared for the exclusive use of the City of Trenton, Missouri, and their authorized representatives for specific application to the proposed project.

E. CLOSING

Olsson Associates appreciates the opportunity to provide our services on this project and look forward to working with you during construction. Should you have any questions, please do not hesitate to contact us.

Respectfully submitted,

Olsson Associates

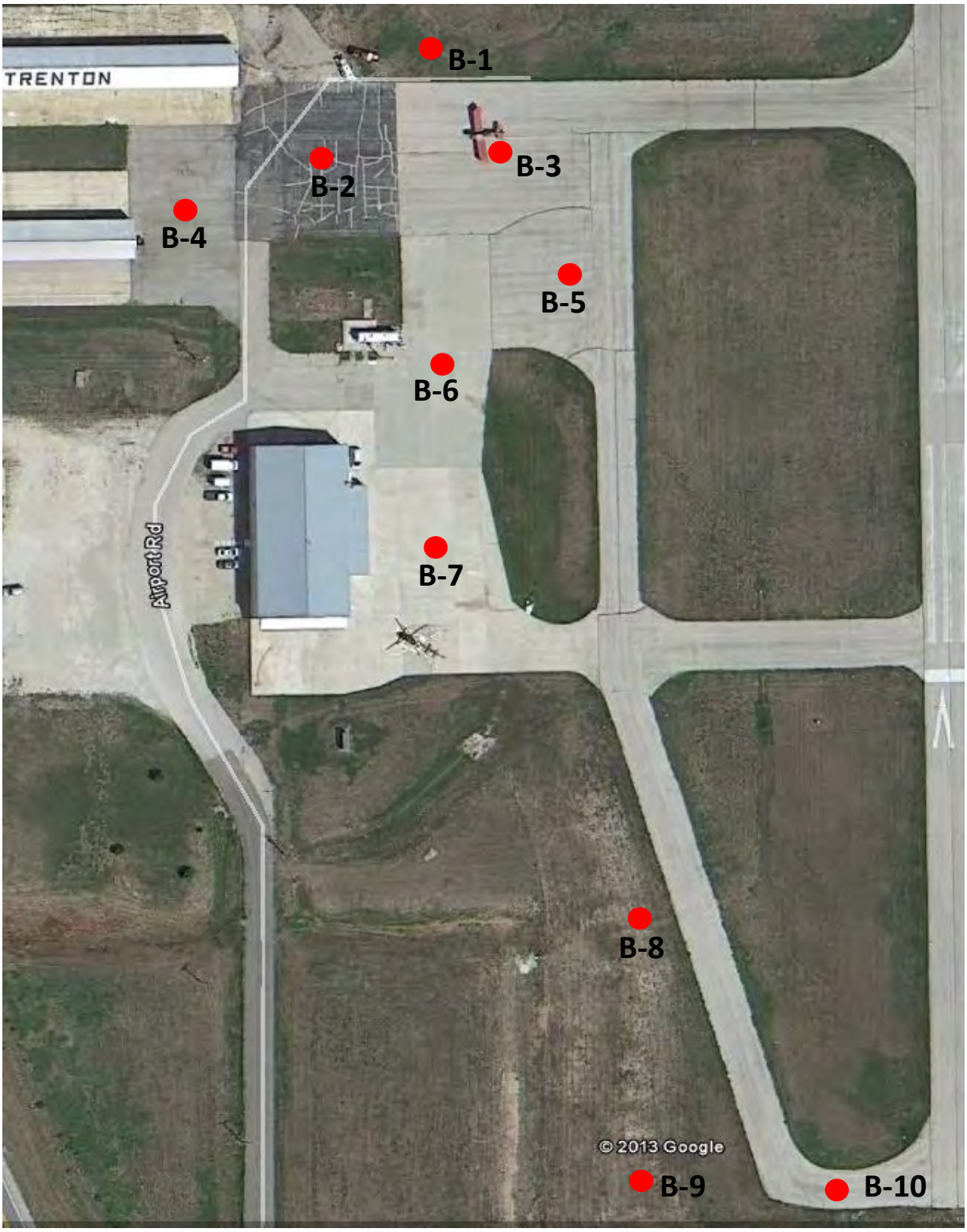


Christy Wilson, EI

James M. Landrum, PE

APPENDIX A

Boring Location Plan
Boring Location Plan – Borrow Site



NORTH

OLSSON ASSOCIATES

Boring Location Plan

Scale: nts	**Trenton Airport** **Trenton, Missouri**
Project No. 013-0549	
Approved by: CLW	
Date: 4/24/2013	

North

Boring Location Plan - Borrow Site

Scale: n.t.s.	**Trenton Airport** **Trenton, Missouri**
Project No. 013-0549	
Approved by: CLW	
Date: 4/24/2013	

OLSSON ASSOCIATES

APPENDIX B

Symbols and Nomenclature
Soil Test Boring Logs

SYMBOLS AND NOMENCLATURE

DRILLING NOTES

DRILLING AND SAMPLING SYMBOLS

SS:	Split-Spoon Sample
ST:	Thin-walled Tube Sample
GB:	Grab Sample
PP:	Pocket Penetrometer
% Rec:	Percentage of Thin-walled Tube sample recovered
SPT Blow Counts:	Standard Penetration Test blows per 6" penetration
HSA:	Hollow Stem Auger
CFA:	Continuous Flight Auger
N.E.:	Not Encountered
N.A.:	Not Available
N.P.:	Not Performed

DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in accordance with ASTM D 1586. The standard penetration resistance (SPT) N value is the number of blows of a 140 pound hammer falling 30 inches to drive a 2 inch O.D., 1.4 inch I.D. split-spoon sampler one foot. The thin-walled tube sampling procedure is described by ASTM specification D 1587.

WATER LEVEL MEASUREMENTS

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In relatively high permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observations.

SOIL PROPERTIES & DESCRIPTIONS

Soil descriptions are based on the Unified Soil Classification System (USCS) as outlined in ASTM Designations D-2487 and D-2488. The USCS group symbol shown on the boring logs correspond to the group names listed below.

Group Symbol	***Group Name***	***Group Symbol***	***Group Name***
GW	Well Graded Gravel	CL	Lean Clay
GP	Poorly Graded Gravel	ML	Silt
GM	Silty Gravel	OL	Organic Clay or Silt
GC	Clayey Gravel	CH	Fat Clay
SW	Well Graded Sand	MH	Elastic Silt
SP	Poorly Graded Sand	OH	Organic Clay or Silt
SM	Silty Sand	PT	Peat
SC	Clayey Sand		

PARTICLE SIZE

Boulders	12 in. +	Coarse Sand	4.75mm-2.0mm	Silt	0.075mm-0.005mm
Cobbles	12 in.-3 in.	Medium Sand	2.0mm-0.425mm	Clay	<0.005mm
Gravel	3 in.-4.75mm	Fine Sand	0.425mm-0.075mm		

COHESIVE SOILS

Consistency	**Unconfined Compressive Strength (Qu) (psf)**
Very Soft	<500
Soft	500 - 1000
Firm	1001 - 2000
Stiff	2001 - 4000
Very Stiff	4001 - 8000
Hard	> 8000

COHESIONLESS SOILS

Relative Density	**Blows per Foot**
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	$\geq$ 50

LOG OF BOREHOLE NO. B-1

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
4" DEVELOPED ZONE *0.3'*										
FILL										
Fat clay with silt, sand and gravel, trace organics, brownish gray *1.0'*										
Fat clay, very stiff, with silt, trace organics, moist, dark grayish brown to very dark gray			ST 1			3.4	19.9	106.1		
		2.5								
3.0'										
Fat clay, with silt, trace organics, very moist, very dark gray			ST 2			1.0	28.4	92.9		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	Not Encountered
AB	Not Encountered
AD	Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-2

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
7.25" ASPHALTIC CONCRETE ***0.6'***										
GRAVEL ***1.0'***										
FILL *Fat clay, with silt, very moist, very dark gray*			ST 1	CH		0.9	28.2	91.9	56/38	
		2.5								
			ST 2			1.0	27.0	93.8		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

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Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-3

CLIENT: City of Trenton, Missouri

PROJECT NO.: 013-0549

LOCATION: Trenton, Missouri

PROJECT NAME: Trenton Airport

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
ASPHALTIC CONCRETE										
1.0'										
1.3'										
3" GRAVEL FILL										
Fat clay, with silt, very moist, very dark gray		2.5	ST 1			1.1	27.8	94.5		
			ST 2			1.0	29.9	92.7		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
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Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-4

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
1.5" HIGHLY WEATHERED ASPHALT *0.1'*										
5.5 " GRAVEL *0.6'*										
FILL										
Fat clay, with silt, very moist, very dark gray			ST 1			2.3	26.4	97.2		
		2.5								
			ST 2			0.9	27.4	96.3		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-5

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
8.5" ASPHALTIC CONCRETE										
0.7'										
3.5" GRAVEL										
1.0'										
FILL										
Fat clay with silt, gravel and sand, very moist, very dark gray			SS 1			(1.5)	28.2			
		2.5								
			ST 2			0.7	30.2	91.2		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
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Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-6

CLIENT: City of Trenton, Missouri

PROJECT NO.: 013-0549

LOCATION: Trenton, Missouri

PROJECT NAME: Trenton Airport

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
6.25" CONCRETE ***0.5'***										
5.75" GRAVEL ***1.0'***										
FILL *Fat clay, with silt, very moist, very dark gray*			SS 1		5-5-5 N=10	(1.75)	28.2			
3.0'		2.5								
Gravel, with clay, dry, dark gray			ST 2			(1.5)	7.8			
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-7

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
5" CONCRETE ***0.4'***										
FILL										
Clay with sand and gravel, orange brown trace grayish brown ***1.0'***										
Fat clay, firm, trace gravel fragments, very moist, brown with dark gray and yellowish brown			ST 1	CH		(2.0)	31.9	91.9	57/41	
		2.5								
			ST 2			0.4	31.5	93.2		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-8

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
5" DEVELOPED ZONE ***0.4'***										
FILL										
Fat clay with silt and gravel, brown with dark grayish brown ***1.0'***										
Fat clay, with gravel fragments, moist to very moist, brown to yellowish brown			ST 1			2.1	16.7	115.5		
		2.5								
4.0'			ST 2			1.5	25.2	102.5		
Fat clay, trace organics, very moist, very dark grayish brown										
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-9

CLIENT: **City of Trenton, Missouri**

PROJECT NO.: **013-0549**

LOCATION: **Trenton, Missouri**

PROJECT NAME: **Trenton Airport**

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
5" DEVELOPED ZONE ***0.4'***										
FILL										
Lean to fat clay, stiff, trace sand and gravel fragments, dry to moist, brown to yellowish brown with dark grayish brown			ST 1	CL-CH		(2.75)	14.3	115.6	43/31	
		2.5								
			ST 2			1.9	17.6	112.6		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-10

CLIENT: City of Trenton, Missouri

PROJECT NO.: 013-0549

LOCATION: Trenton, Missouri

PROJECT NAME: Trenton Airport

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
8.5" ASPHALT										
0.7'										
1.0'										
3.5" GRAVEL										
FILL										
Gravel, with clay, dry to moist, gray			ST 1			(4.5+)	10.1			
		2.5								
3.0'										
Fat clay, stiff, trace gravel, dry to moist, grayish brown with gray			ST 2			1.1	25.5	100.9		
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
AB	▼ Not Encountered
AD	▼ Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

LOG OF BOREHOLE NO. B-11

CLIENT: City of Trenton, Missouri

PROJECT NO.: 013-0549

LOCATION: Trenton, Missouri

PROJECT NAME: Trenton Airport

MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (PP) (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
		0.0								
4" DEVELOPED ZONE 0.3'										
FILL										
Clay with silt and gravel, dark brown 1.0'										
Fat clay, trace sand and gravel fragments, brown			GB 1	CH					53/36	
		2.5								
5.0'		5.0								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	Not Encountered
AB	Not Encountered
AD	Not Performed

OLSSON ASSOCIATES
1802 East 123rd Street
Olathe, Kansas 66061
Telephone: 913-829-0078
Fax: 913-829-0258

STARTED	3/28/13	FINISHED	3/28/13
DRILL CO.	RC Drilling	DRILL RIG	RC-B53
DRILLER	Zach D	LOGGED BY	CW
METHOD	Power Auger		

APPENDIX C
Summary of Laboratory Data

Olsson Associates
1802 E. 123rd St.
Olathe, KS 66061
ph: 913-829-0078
fax: 913-829-0258

SUMMARY OF LABORATORY RESULTS

CLIENT City of Trenton, Missouri

PROJECT NAME Trenton Airport

PROJECT NUMBER 013-0549

PROJECT LOCATION Trenton, Missouri

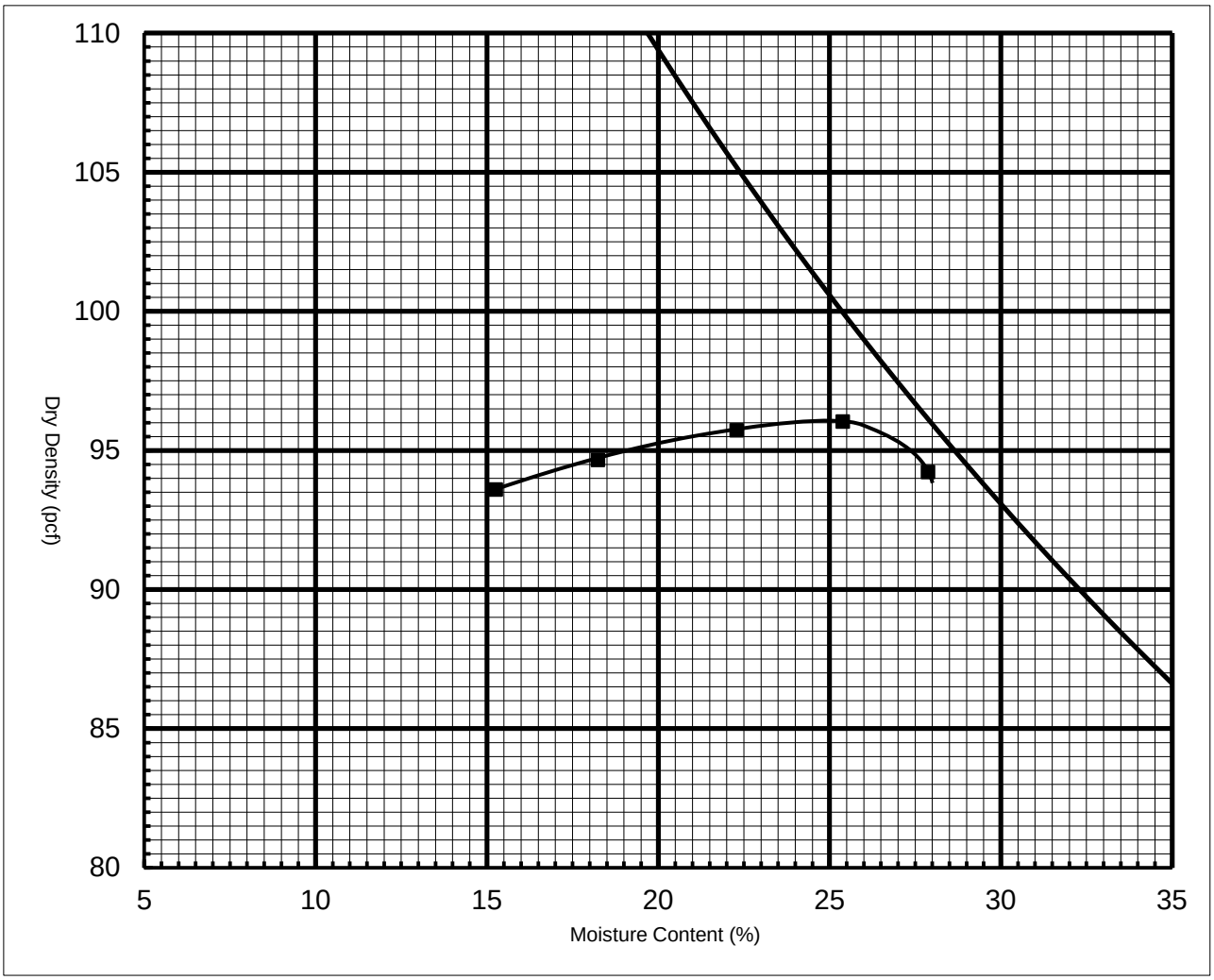
BORING NUMBER	SAMPLE I.D.	SAMPLE DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	SATURATION (%)	UNCONFINED STRENGTH (tsf)	ATTERBERG LIMITS			P-200	USCS CLASS.
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
B-1	ST-1	1.0 - 3.0	19.9	106.1	0.589	91.2	3.4					
B-1	ST-2	3.0 - 5.0	28.4	92.9	0.814	94.1	1.0					
B-2	ST-1	1.0 - 3.0	28.2	91.9	0.835	91.3	0.9	56	18	38		CH
B-2	ST-2	3.0 - 5.0	27.0	93.8	0.797	91.5	1.0					
B-3	ST-1	1.3 - 3.3	27.8	94.5	0.783	95.7	1.1					
B-3	ST-2	3.3 - 5.0	29.9	92.7	0.818	98.7	1.0					
B-4	ST-1	1.0 - 3.0	26.4	97.2	0.734	97.0	2.3					
B-4	ST-2	3.0 - 5.0	27.4	96.3	0.750	98.6	0.9					
B-5	SS-1	1.0 - 2.5	28.2									
B-5	ST-2	3.0 - 5.0	30.2	91.2	0.849	95.9	0.7					
B-6	SS-1	1.0 - 2.5	28.2									
B-6	ST-2	3.0 - 5.0	7.8									
B-7	ST-1	1.0 - 3.0	31.9	91.9	0.835	100.0		57	16	41		CH
B-7	ST-2	3.0 - 5.0	31.5	93.2	0.808	100.0	0.4					
B-8	ST-1	1.0 - 3.0	16.7	115.5	0.459	98.4	2.1					
B-8	ST-2	3.0 - 5.0	25.2	102.5	0.645	100.0	1.5					
B-9	ST-1	1.0 - 3.0	14.3	115.6	0.458	84.3		43	12	31		CL-CH
B-9	ST-2	3.0 - 5.0	17.6	112.6	0.497	95.5	1.9					
B-10	ST-1	1.0 - 3.0	10.1									
B-10	ST-2	3.0 - 5.0	25.5	100.9	0.670	100.0	1.1					
B-11	GB-1	1.0 - 3.0						53	17	36		CH

MOISTURE - DENSITY RELATIONSHIP

Sample ID/Proctor #: B11 (1'-3')
Sample Location: B11 (1'-3')
Sample Description: Brown CH, trace gravel fractions

Type of Test:	ASTM D698	Liquid Limit:	
Method Used:	A	Plastic Limit:	
Preparation Method:	Dry	Plasticity Index:	
Rammer Type:	Manual	Classification:	
Specific Gravity:	2.7	Maximum Dry Density:	96.0 pcf
Gs Determination:	Estimated	Optimum Mositure Content	25.0%

Sieve Size	Percent Retained
3/4"	N/A
3/8"	N/A
No. 4	<5



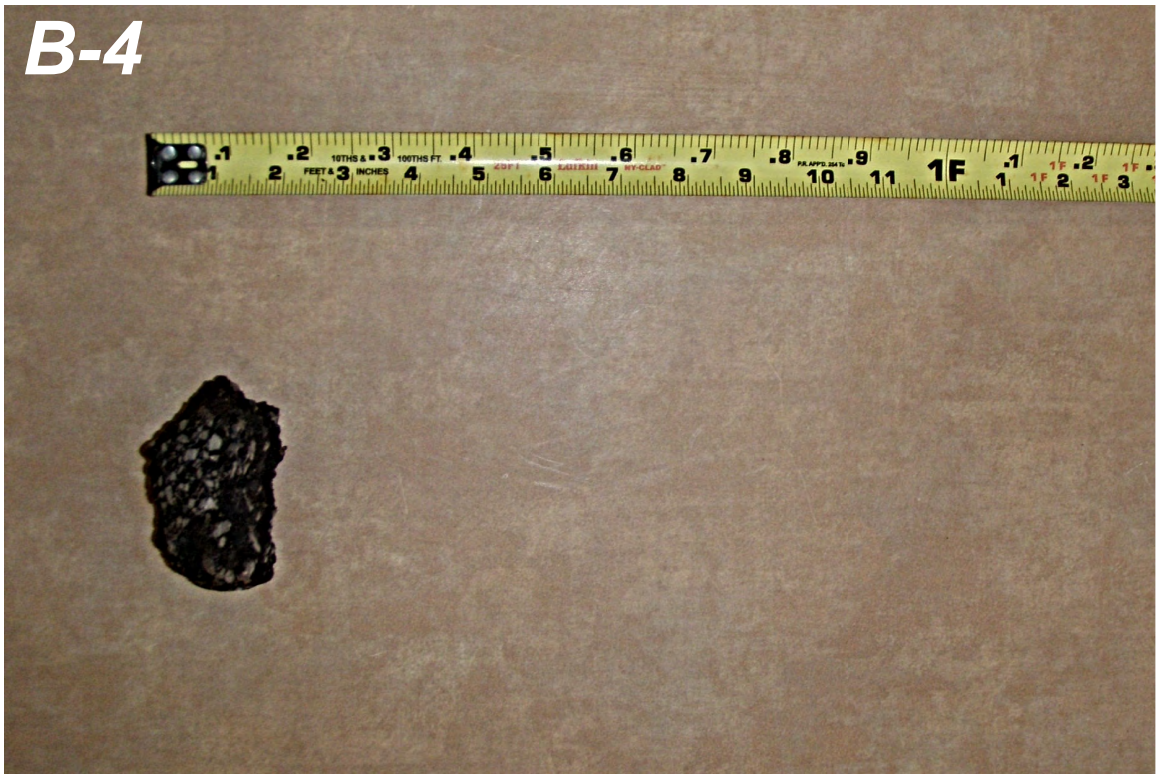
OLSSON ASSOCIATES

Project: Trenton Airport Taxiway and Apron
Location: Trenton, MO
Project Number: 013-0549
Date: 4/4/2013

APPENDIX D
Pavement Core Photographs

Pavement Core Photographs

Pavement Core Photographs



Pavement Core Photographs

B-6

B-7

Pavement Core Photographs