PL202300158

Geotechnical Evaluation Report

Field Reconstruction
Bloomington Jefferson High School
4001 W. 102nd Street
Bloomington, Minnesota

Prepared for

Independent School District 271, Bloomington Public Schools

Professional Certification:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Loren W. Braun
Senior Engineer
License Number: 014969
October 15, 2008

LOREN W. BRAUN
LICENSED PROFESSIONAL ENGINEER
14969
STATE OF MINNESOTA

Project SP-08-03782

Braun Intertec Corporation

PL202300158

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October 15, 2008

Project SP-08-03782

Mr. Jay Pomeroy, LLA
Anderson-Johnson Associates, Inc.
Suite 200
7575 Golden Valley Road
Minneapolis, MN 55427

Re: Geotechnical Evaluation
Proposed Field Reconstruction
Bloomington Jefferson High School
4001 W. 102nd St
Bloomington, Minnesota

Dear Mr. Pomeroy:

We are pleased to present this Geotechnical Evaluation Report for the proposed field reconstruction at Jefferson High School in Bloomington, Minnesota. A summary of our results and recommendations are presented below. More detailed information and recommendations are provided in the attached report.

Summary of Results

The soil borings initially encountered about 6 to 8 inches of topsoil. With the exception of one boring, fill consisting of lean clay was encountered below the topsoil. The underlying soils consisted of lean clays and clayey sands with the exceptions of one boring where poorly graded sand was encountered and peat encountered in two other borings located in the north and northeast corner of the field.

Summary of Recommendations

The two primary concerns in conjunction with the field reconstruction are the lack of available sand to serve as NFS (non-frost susceptible) material and the presence of peat at two of the boring locations; in the north and northeast corner of the field. Although sand was encountered in one boring, it was 4 feet below the surface and the lateral extent of it is unknown. The presence of the peat below the field will likely cause settlement of several inches over time. We anticipate that the settlement will encompass this entire area of the field (assuming its present everywhere in the north and northeast corner of the field). Thus, with time, this portion of the field will be somewhat lower. Long-term drainage of the field should take this into consideration.

Peat was encountered beneath the proposed bleachers. Consequently, it will be necessary to extend footings (drilled piers) through the fill and peat and into the underlying glacial till soils. Based on the soil borings, the bleachers on the west side of the field can be constructed with shallow spread footings.

Remarks

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report please contact Loren Braun at 651.487.7011 or by e-mail at LBraun@braunintertec.com.

Sincerely,

BRAUN INTERTEC CORPORATION

Mr. Loren W. Braun, PE
Senior Engineer

for

Mr. Gregg R. Jandro, PE
Vice President

Geo Report

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Description **Page**

BRAUN INTERTEC

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A. Introduction

A.1. Project Description

This Geotechnical Evaluation Report addresses reconstruction of the stadium field as a synthetic turf field. Field lighting and bleachers will also be constructed.

A.2. Purpose

The purpose of this geotechnical evaluation is to provide information and recommendations regarding the geotechnical aspects of the project for design and construction of the project.

A.3. Background Information and Reference Documents

Mr. Jay Pomeroy with Anderson Johnson Associates, Inc., provided us with a site plan showing the field and the requested soil boring locations. Existing site features and surface contours were also shown on the plan.

A.4. Site Conditions

The site is currently developed has a grass playfield with a bituminous track surrounding it. The field area is bounded by Johnson Avenue South to the west, Heritage Hills Drive to the south, bituminous parking to the north and grass area to the east. Grades adjacent to the field slope up to approximately 1710 to 1712 on the north, east and west side and down to approximately 1695 in the southwest corner. The elevation of the field is approximately 1700.

A.5. Scope of Services

In a letter dated August 14, 2008, Mr. Pomeroy requested a proposal for Geotechnical Services. Our scope of services for this project was submitted as a Proposal to Mr. Pomeroy on August 20, 2008. Tasks performed in accordance with our authorized scope of services included:

- Performing a reconnaissance of the site to evaluate equipment access to exploration locations.
- Staking and clearing exploration locations of underground utilities.

- Performing 15 penetration test borings to depths varying from 15 to 20 feet.
- Performing laboratory tests on selected penetration test samples.
- Preparing this report containing a CAD sketch, exploration logs, a summary of the geologic materials encountered, results of laboratory tests, and recommendations for design and construction of the proposed running track, synthetic field and other site improvements.

We staked exploration locations by measuring dimensions from nearby site features with a tape or surveyor's wheel at approximate right angles from those references. Surface elevations were interpolated from the site contours. Our scope of services was performed under the terms of our June 15, 2006, General Conditions.

B. Results

B.1. Exploration Logs

B.1.a. Log of Boring Sheets

Log of Boring sheets for our penetration test borings are included in the Appendix. The logs identify and describe the geologic materials that were penetrated, and present the results of penetration resistance and other in-situ tests performed within them, organic vapor screening, laboratory tests performed on penetration test samples retrieved from them, and groundwater measurements.

Strata boundaries were inferred from changes in the penetration test samples and the auger cuttings. Because sampling was not performed continuously, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may also occur as gradual rather than abrupt transitions.

B.1.b. Geologic Origins

Geologic origins assigned to the materials shown on the logs and referenced within this report were based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance and other in-situ testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

B.2. Geologic Profile

B.2.a. Geologic Materials

The soil borings initially encountered about 6 to 8 inches of topsoil. With the exception of one boring, fill consisting of lean clay was encountered below the topsoil. The underlying soils consisted of lean clays and clayey sands with the exceptions of one boring where poorly graded sand was encountered and peat was encountered in two other borings located in the north and northeast corner of the field. A more detailed description of the soils is provided below.

B.2.a.1. Topsoil

An organic soil layer (topsoil) was encountered in each of the borings extending to depths varying from 6 to 8 inches and consisting of black moist lean clay.

B.2.a.2. Lean Clay Fill

With the exception of one boring, lean clay fill was encountered beneath the topsoil extending to depths varying from 4 to 13 feet. Penetration resistances within the fill varied from 5 to 46 blows per foot although the higher values were generally attributed to gravel within the fill. Generally, penetration resistances varied from 5 to 10 blows per foot. This suggests that the fill may have had some compaction effort when it was placed. The fill varied from brown to gray and was moist to wet.

B.2.a.3. Peat

Peat was encountered below the fill in Borings ST-16 and-ST-21 located at the north end and northeast corner of the field. The thickness of the peat varied from 4 1/2 to 5 feet and was initially encountered 9 to 13 feet below the ground surface. The peat varied from slightly the highly decomposed, was black and wet. Penetration resistances within the peat varied from 6 to 8 blows per foot suggesting that it had been somewhat compressed by the overlying fill.

B.2.a.4. Poorly Grained Sand with Silt

Poorly grained sand with silt was only encountered in one location, Boring ST-20 at a depth of 4 to 10 1/2 feet. The sand was fine to medium graded, brown, moist and loose with penetration resistances of 8 to 9 blows per foot.

B.2.a.5. Lean Clay and Clayey Sand

All of the borings terminated in lean clay or clayey sand. This material varied from brown to gray and was moist to wet. Penetration resistances varied from 4 to 28 blows per foot but we are typically less than 10 blows per foot.

B.2.b. Groundwater

Groundwater was not observed as our soil borings were advanced. Since groundwater was not observed within the relatively permeable sands encountered at the termination depths of the borings, it appears that the groundwater level lies beneath the explored depths.

C. Basis for Recommendations

C.1. Design Details

C.1.a. Synthetic Turf Stadium Field

The existing stadium field will be reconstructed with synthetic turf. The proposed synthetic field is sensitive to frost movement. Consequently, a drainage layer of NFS (non-frost susceptible) material will also be placed beneath the field. New field lighting and bleaches will also be constructed in conjunction with the new field.

C.1.b. Anticipated Grade Changes

We anticipate that grade changes of less than 1 foot will be required in conjunction with the reconstruction.

C.1.c. Precautions Regarding Changed Information

We have attempted to describe our understanding of the proposed construction to the extent it was reported to us by others. Depending on the extent of available information, assumptions may have been made based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, we should be notified. New or changed information could require additional evaluation, analyses and/or recommendations.

C.2. Design and Construction Considerations

The two primary concerns in conjunction with the field reconstruction are the lack of available sand to serve as a NFS material and the present of peat at two of the boring locations; in the north and northeast corner of the field. Although sand was encountered in one boring, it was 4 feet below the surface and the lateral extent of it is unknown.

The presence of the peat below the field will likely cause settlement of several inches over time. We anticipate that the settlement will encompass this entire area of the field (assuming its present throughout the north and northeast corner). Thus, with time, this portion of the field will be somewhat lower. Drainage of the field should take this into consideration in the field design.

Peat was encountered beneath the proposed bleachers, however. Consequently, it will be necessary to extend footings (drilled piers) through the fill and peat and into the underlying glacial till soils. Based on the soil borings, the bleachers on the west side of the field can be constructed with shallow spread footings.

D. Recommendations

D.1. Field Subgrade Preparation

D.1.a. Excavations

Frost heave is a significant concern for synthetic fields. To reduce the potential for frost heave, we recommend a partial subcut of frost-susceptible soils beneath the new synthetic playfield. We recommend that the removal depth within the synthetic fields be to a depth of 2 feet below finished subgrade elevation.

D.1.b. Nonfrost-Susceptible Backfill

The required material for backfilling the excavations should consist of NFS (nonfrost-susceptible) sand or sand and gravel with less than an average of 5 percent of its particles by weight passing a 200 sieve. Material with up to 7 percent fines may be used as long as it is offset by an equal amount of coarser material such that the average does not exceed 5 percent. It may be feasible to mine sand encountered in the vicinity of Boring ST-20 for use beneath field area. We are not aware of the lateral extent of the sand, however. The NFS fill should be placed and compacted as specified in Section D.1.c below.

D.1.c. Placement and Compaction of Backfill and Fill

We recommend spreading backfill and fill in 8-inch loose lifts. We recommend compacting backfill and fill in accordance with the criteria presented below in Table 1. The relative compaction of utility backfill should be evaluated based on the location where it is installed, and vertical proximity to that structure.

Table 1. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D 698 – standard Proctor)	Moisture Content Variance from Optimum, percentage points
Below synthetic turf field	98	3
Below bleacher foundations and site flat work	95	3
Below landscaped surfaces	90	4

D.2. Bleacher Footings

D.2.a. Embedment Depth

For frost protection, we recommend embedding bleacher footings a minimum of 60 inches below the lowest adjacent grade.

D.2.b. Foundation Support

We recommend extending the foundations down to the natural poorly graded sands or clayey till soils. In the vicinity of Borings ST-20 and ST-22, the use of shallow spread footings would be feasible. Because of the depth of fill and organic soils in the vicinity of Borings ST-19 and ST-21, however drilled piers will be required at these locations. For uniformity of support, however, we recommend that drilled piers be used for the entire bleacher structures.

D.2.c. Net Allowable Bearing Pressure

We recommend sizing spread footings to exert a net allowable bearing pressure of 2,500 pounds per square foot (psf), including all transient loads. For drilled piers, we recommend a net allowable bearing pressure of 3,000 pounds per square foot for the footings bearing a minimum of 5 feet into the poorly graded sands or glacial till clay soils. These values include a safety factor of at least 3.0 with regard to bearing capacity failure.

D.2.d. Settlement

We estimate that total and differential settlements among the footings will amount to less than 1 inch and 1/2 inch, respectively, based on the proposed bleacher loading.

D.3. Utilities

D.3.a. Subgrade Stabilization

We anticipate that utilities will consist primarily of storms sewer lines that will be placed within the sand layer. If utilities will be placed with the invert in the clay soils, the utility trench excavation should be over excavated at least 6 inches and the over excavation backfilled with a relatively clean (less than 10 percent fines) sand backfill. This will provide uniform support for the utility line.

D.3.b. Corrosion

In our opinion, the on-site soils anticipated to be present at invert depth should not be corrosive such that corrosion protection will be required for copper or steel pipe. The exception would be utilities bearing within the peat layer where corrosive protection would be required. Organic soils should not be allowed to make contact with the utility lines during trench backfilling.

D.4. Construction Quality Control

D.4.a. Excavation Observations

We recommend having a geotechnical engineer observe all excavations related to subgrade preparation for the synthetic field, and foundations for the bleachers. The purpose of the observations is to evaluate the competence of the geologic materials exposed in the excavations, and the adequacy of any required excavation oversizing.

D.4.b. Materials Testing

We recommend density tests be taken in excavation backfill and additional required fill placed below the proposed improvements. On test should be completed for each 2-foot lift on a 200-foot grid in the field and for 150 feet in utility trenches or with at least two tests for shorter utility runs.

E. Procedures

E.1. Penetration Test Borings

The penetration test borings were drilled with a truck-mounted core and auger drill equipped with hollow-stem auger. The borings were performed in accordance with ASTM D 1586. Penetration test samples were taken at 2 1/2- or 5-foot intervals. Actual sample intervals and corresponding depths are shown on the boring logs.

E.2. Material Classification and Testing

E.2.a. Visual and Manual Classification

The geologic materials encountered were visually and manually classified in accordance with ASTM Test Method D 2488. A chart explaining the classification system is attached. Samples were sealed in jars or bags and returned to our facility for review and storage.

E.2.b. Laboratory Testing

The results of the laboratory tests performed on geologic material samples are noted on or follow the appropriate attached exploration logs. The tests were performed in accordance with ASTM procedures.

E.3. Groundwater Measurements

The drillers checked for groundwater as the penetration test borings were advanced, and again after auger withdrawal. The boreholes were then backfilled or allowed to remain open for an extended period of observation as noted on the boring logs.

F. Qualifications

F.1. Variations in Subsurface Conditions

F.1.a. Material Strata

Our evaluation, analyses and recommendations were developed from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth, and therefore strata boundaries and thicknesses must be inferred to some extent. Strata boundaries may also be gradual transitions, and can be expected to vary in depth, elevation and thickness away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until additional exploration work is completed, or construction commences. If any such variations are revealed, our recommendations should be re-evaluated. Such variations could increase construction costs, and a contingency should be provided to accommodate them.

F.1.b. Groundwater Levels

Groundwater measurements were made under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. It should be noted that the observation period was relatively short, and groundwater can be expected to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

F.2. Continuity of Professional Responsibility

F.2.a. Plan Review

This report is based on a limited amount of information, and a number of assumptions were necessary to help us develop our recommendations. It is recommended that our firm review the geotechnical aspects of the designs and specifications, and evaluate whether the design is as expected, if any design changes have affected the validity of our recommendations, and if our recommendations have been correctly interpreted and implemented in the designs and specifications.

F.2.b. Construction Observations and Testing

It is recommended that we be retained to perform observations and tests during construction. This will allow correlation of the subsurface conditions encountered during construction with those encountered by the borings, and provide continuity of professional responsibility.

F.3. Use of Report

This report is for the exclusive use of ISD #271 and their consultants. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

F.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix

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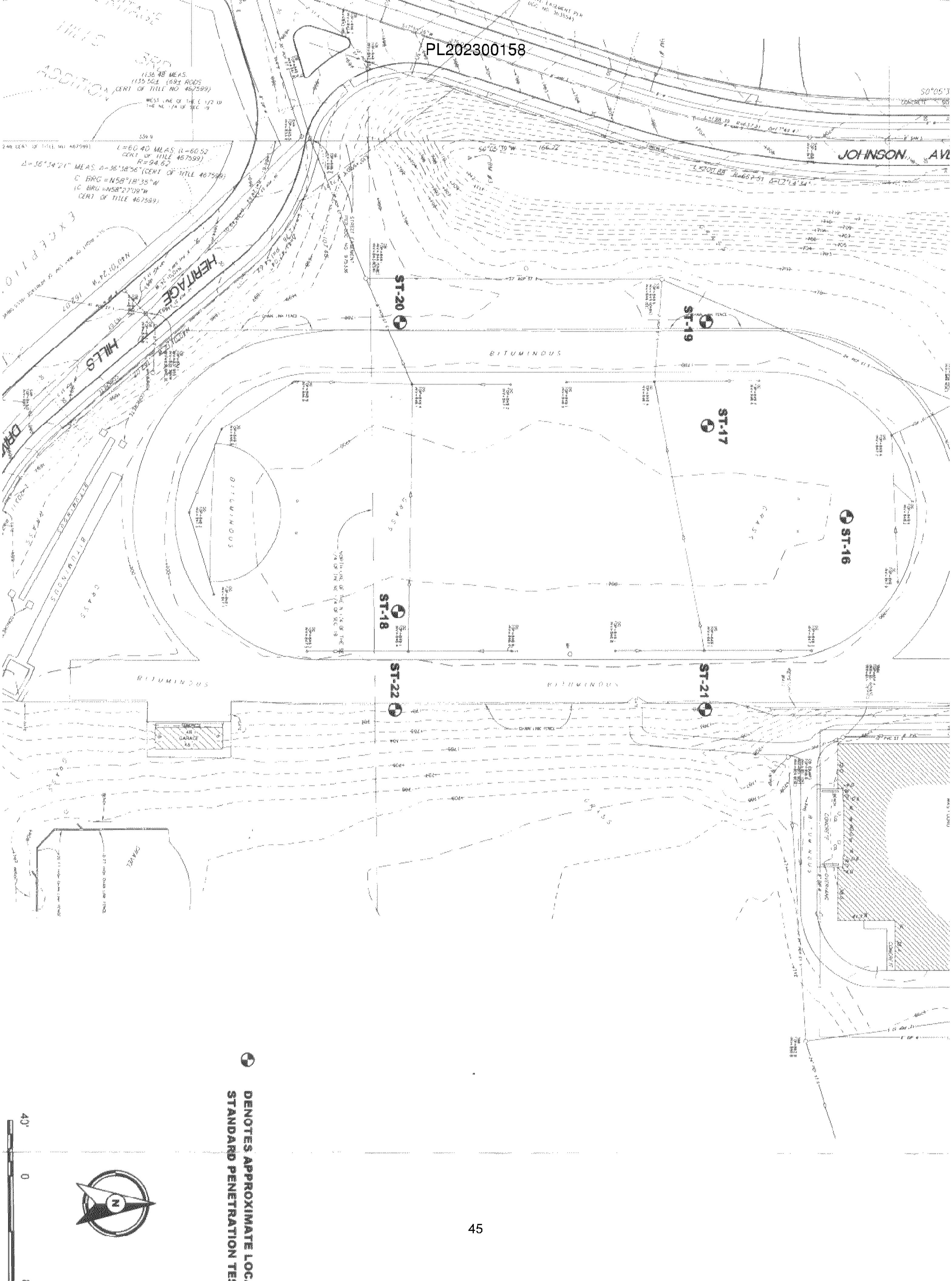

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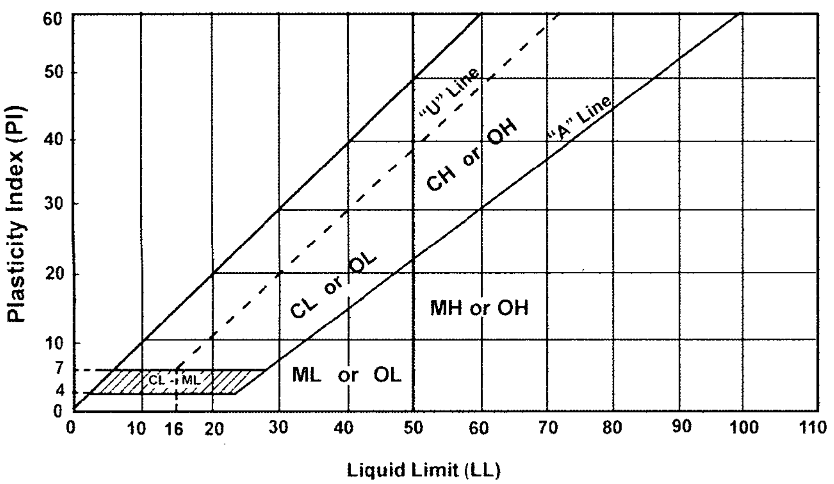
Descriptive Terminology of Soil

Standard D 2487 - 00
Classification of Soils for Engineering Purposes
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [a]				Soils Classification: Group Symbol	Soils Classification: Group Name [b]
Coarse-grained Soils more than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels 5% or less fines [e]	$C_u \geq 4$ and $1 \leq C_c \leq 3$ [c]	GW	Well-graded gravel [d]
			$C_u < 4$ and/or $1 > C_c > 3$ [c]	GP	Poorly graded gravel [d]
		Gravels with Fines More than 12% fines [e]	Fines classify as ML or MH	GM	Silty gravel [d f g]
			Fines classify as CL or CH	GC	Clayey gravel [d f g]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands 5% or less fines [i]	$C_u \geq 6$ and $1 \leq C_c \leq 3$ [c]	SW	Well-graded sand [h]
			$C_u < 6$ and/or $1 > C_c > 3$ [c]	SP	Poorly graded sand [h]
		Sands with Fines More than 12% [i]	Fines classify as ML or MH	SM	Silty sand [f g h]
			Fines classify as CL or CH	SC	Clayey sand [f g h]
Fine-grained Soils 50% or more passed the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line [j]	CL	Lean clay [k l m]
			PI < 4 or plots below "A" line [j]	ML	Silt [k l m]
		Organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OL	Organic clay [k l m n]
				OL	Organic silt [k l m o]
	Silts and clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay [k l m]
			PI plots below "A" line	MH	Elastic silt [k l m]
		Organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OH	Organic clay [k l m p]
				OH	Organic silt [k l m q]
Highly Organic Soils		Primarily organic matter, dark in color and organic odor		PT	Peat

a. Based on the material passing the 3-in (75mm) sieve.
b. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
c. $C_u = D_{60} / D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
d. If soil contains ≥15% sand, add "with sand" to group name.
e. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
f. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
g. If fines are organic, add "with organic fines" to group name.
h. If soil contains ≥ 15% gravel, add "with gravel" to group name.
i. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
j. If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
k. If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
l. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
m. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
n. PI ≥ 4 and plots on or above "A" line.
o. PI < 4 or plots below "A" line.
p. PI plots on or above "A" line.
q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	S	Percent of saturation, %
MC	Natural moisture content, %	SG	Specific gravity
LL	Liqiuid limit, %	C	Cohesion, psf
PL	Plastic limit, %	Ø	Angle of internal friction
PI	Plasticity index, %	qu	Unconfined compressive strength, psf
P200	% passing 200 sieve	qp	Pocket penetrometer strength, tsf

Particle Size Identification

Boulders .... over 12"
Cobbles .... 3" to 12"
Gravel
  Coarse .... 3/4" to 3"
  Fine .... No. 4 to 3/4"
Sand
  Coarse .... No. 4 to No. 10
  Medium .... No. 10 to No. 40
  Fine .... No. 40 to No. 200
Silt .... < No. 200, PI < 4 or below "A" line
Clay .... < No. 200, PI ≥ 4 and on or above "A" line

Relative Density of Cohesionless Soils

Very loose .... 0 to 4 BPF
Loose .... 5 to 10 BPF
Medium dense .... 11 to 30 BPF
Dense .... 31 to 50 BPF
Very dense .... over 50 BPF

Consistency of Cohesive Soils

Very soft .... 0 to 1 BPF
Soft .... 2 to 3 BPF
Rather soft .... 4 to 5 BPF
Medium .... 6 to 8 BPF
Rather stiff .... 9 to 12 BPF
Stiff .... 13 to 16 BPF
Very stiff .... 17 to 30 BPF
Hard .... over 30 BPF

Drilling Notes

Standard penetration test borings were advanced by 3 1/4" or 6 1/4" ID hollow-stem augers unless noted otherwise, Jetting water was used to clean out auger prior to sampling only where indicated on logs. Standard penetration test borings are designated by the prefix "ST" (Split Tube). All samples were taken with the standard 2" OD split-tube sampler, except where noted.

Power auger borings were advanced by 4" or 6" diameter continuous-flight, solid-stem augers. Soil classifications and strata depths were inferred from disturbed samples augered to the surface and are, therefore, somewhat approximate. Power auger borings are designated by the prefix "B."

Hand auger borings were advanced manually with a 1 1/2" or 3 1/4" diameter auger and were limited to the depth from which the auger could be manually withdrawn. Hand auger borings are indicated by the prefix "H."

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they are reported in the following form: 2/12 for the second and third 6" increments, respectively.

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

TW indicates thin-walled (undisturbed) tube sample.

Note: All tests were run in general accordance with applicable ASTM standards.

Rev. 7/07

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LOG OF BORING

Braun Project SP-08-03782 **Geotechnical Evaluation** **Bloomington High School Tracks** **Kennedy/Jefferson High Schools** **Bloomington, Minnesota**	BORING: **ST-16** LOCATION: See attached sketch.

DRILLER: B. Oldenberg	METHOD: 3 1/4" HSA, Autohammer	DATE: **9/18/08**	SCALE: **1" = 4'**

Elev. feet 850.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
849.5	0.5	CL	LEAN CLAY, black, moist. (Topsoil)			
		FILL	FILL: Lean Clay, brown to gray, moist.	10		
				7		
841.0	9.0			8		
		PT	PEAT, moderately decomposed, black, wet. (Swamp Deposit)	6		
836.5	13.5			6		
		CL	LEAN CLAY, light gray, wet, rather soft. (Glacial Till)			
834.0	16.0			4		
			END OF BORING. Water not observed with 15 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 13 feet immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 03782.GPJ BRAUN_08.GDT 10/16/08 13:44

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LOG OF BORING

Braun Project SP-08-03782 **Geotechnical Evaluation** **Bloomington High School Tracks** **Kennedy/Jefferson High Schools** **Bloomington, Minnesota**	BORING: **ST-17** LOCATION: See attached sketch.

DRILLER: B. Oldenberg	METHOD: 3 1/4" HSA, Autohammer	DATE: 9/18/08	SCALE: 1" = 4'

Elev. feet 850.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
849.5	0.5	CL	LEAN CLAY, black, moist.			
		FILL	FILL: Lean Clay, gray, moist to wet.	5		
				7		
				10		
839.0	11.0			12		
		SC	CLAYEY SAND, brown, wet, medium to rather soft. (Glacial Till)	6		
834.0	16.0			5		
			END OF BORING. Water not observed with 15 feet of hollow-stem auger in the ground. Water not observed immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 03782.GPJ BRAUN_08.GDT 10/16/08 13:44

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LOG OF BORING

Braun Project SP-08-03782 **Geotechnical Evaluation** **Bloomington High School Tracks** **Kennedy/Jefferson High Schools** **Bloomington, Minnesota**	BORING: **ST-18** LOCATION: See attached sketch.
DRILLER: B. Oldenberg — METHOD: 3 1/4" HSA, Autohammer	DATE: **9/18/08** — SCALE: **1" = 4'**

Elev. feet 850.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
849.5	0.5	CL	LEAN CLAY, black. (Topsoil)			
		FILL	FILL: Lean Clay, gray and brown, moist to wet.	9		
				7		
				6		
839.0	11.0			6		
		CL	LEAN CLAY, gray, wet, medium to rather stiff. (Glacial Till)	7		
834.0	16.0			9		
			END OF BORING. Water not observed with 15 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 13 feet immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 03782.GPJ BRAUN_08.GDT 10/16/08 13:44

BRAUN INTERTEC

LOG OF BORING

Braun Project SP-08-03782 **Geotechnical Evaluation** **Bloomington High School Tracks** **Kennedy/Jefferson High Schools** **Bloomington, Minnesota**	BORING: **ST-19** LOCATION: See attached sketch.

DRILLER: B. Oldenberg	METHOD: 3 1/4" HSA, Autohammer	DATE: 9/18/08	SCALE: 1" = 4'

Elev. feet 850.5	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
850.0	0.5	CL	LEAN CLAY, black, moist. (Topsoil)			
		FILL	FILL: Lean Clay, with some Gravel, brown, moist.	6		
				9		
				23		
				46		
837.5	13.0	CL	LEAN CLAY, brown, moist, very stiff. (Glacial Till)	25		
				25		
829.5	21.0		END OF BORING. Water not observed with 20 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 8 1/2 feet immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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Braun Project SP-08-03782
Geotechnical Evaluation
Bloomington High School Tracks
Kennedy/Jefferson High Schools
Bloomington, Minnesota

BORING: **ST-20**

LOCATION: See attached sketch.

DRILLER: B. Oldenberg | METHOD: 3 1/4" HSA, Autohammer | DATE: **9/18/08** | SCALE: **1" = 4'**

Elev. feet 850.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
849.5	0.5	CL	LEAN CLAY, black, moist. (Topsoil)					
846.0	4.0	FILL	FILL: Lean Clay, brown, moist.	14				
839.5	10.5	SP-SM	POORLY GRADED SAND with SILT, fine- to medium-grained, brown, moist, loose. (Alluvium)	9		3	7	
				8				
				6				
835.0	15.0	CL	LEAN CLAY, gray, wet, medium. (Glacial Till)	6				
829.0	21.0	CL	LEAN CLAY, with little Gravel, brown, medium to stiff. (Glacial Till)	6				
				13				

END OF BORING.

Water not observed with 20 feet of hollow-stem auger in the ground.

Water not observed to cave-in depth of 5 feet immediately after withdrawal of auger.

Boring then backfilled.

(See Descriptive Terminology sheet for explanation of abbreviations)

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Braun Project SP-08-03782 **Geotechnical Evaluation** **Bloomington High School Tracks** **Kennedy/Jefferson High Schools** **Bloomington, Minnesota**	BORING: **ST-21** LOCATION: See attached sketch.

DRILLER: B. Oldenberg	METHOD: 3 1/4" HSA, Autohammer	DATE: **9/18/08**	SCALE: **1" = 4'**

Elev. feet 851.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
850.2	0.8	CL	LEAN CLAY, black, moist. (Topsoil)			
		FILL	FILL: Lean Clay, brown to gray, moist.	7		
				6		
				9		
841.0	10.0					
		PT	PEAT, moderately decomposed, trace of fibers, black, wet. (Swamp Deposit)	7		
				8		
836.0	15.0					
		CL	LEAN CLAY, light gray, wet, rather soft to medium. (Glacial Till)	5		
				6		
830.0	21.0					
			END OF BORING. Water not observed with 20 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 4 feet immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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Braun Project SP-08-03782
Geotechnical Evaluation
Bloomington High School Tracks
Kennedy/Jefferson High Schools
Bloomington, Minnesota

BORING: **ST-22**

LOCATION: See attached sketch.

DRILLER: B. Oldenberg	METHOD: 3 1/4" HSA, Autohammer	DATE: **9/18/08**	SCALE: **1" = 4'**

Elev. feet 851.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
850.5	0.5	CL	LEAN CLAY, black, moist. (Topsoil)			
		CL	LEAN CLAY, a trace of Gravel, brown, moist, medium to very stiff. (Alluvium)	8		
				12		
				13		
				11		
				12		
834.0	17.0			21		
		SC	CLAYEY SAND, brown, moist, very stiff. (Glacial Till)			
830.0	21.0			28		
			END OF BORING. Water not observed with 20 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 8 feet immediately after withdrawal of auger. Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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