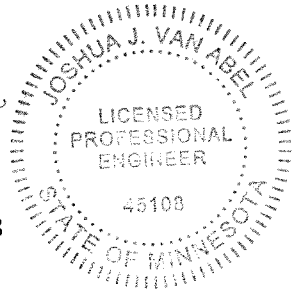
Summary of Soils Observations and Testing

Future Building
700 American Boulevard West
Bloomington, Minnesota

Prepared for

Frauenshuh Companies

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



Joshua J. Van Abel, PE
Project Engineer
License Number: 45108
November 20, 2009

Project BL-07-04393D

Braun Intertec Corporation

BRAUN
INTERTEC

Braun Intertec Corporation
11001 Hampshire Avenue S
Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: brauninterteC.com

November 20, 2009

Project BL-07-04393D

Mr. Dean Williamson
Frauenshuh Companies
7101 West 78th Street
Minneapolis, MN 55439-2504

Re: Summary of Soils Observations and Testing
Future Building
700 American Boulevard West
Bloomington, Minnesota

Dear Mr. Williamson:

This report summarizes the results of the excavation observations and material testing we provided during the site grading and soil corrections for the future building proposed for 700 American Boulevard West in Bloomington, Minnesota.

Project Information

The site located at 700 American Boulevard in Bloomington, Minnesota is proposed for future development by Frauenshuh Companies. The preliminary development plan consists of a one to two story, slab on grade structure located on the east side of the site as shown on the attached sketch. The remaining portion of the site will primarily be utilized for paved parking and drive areas. The building is currently proposed for a footprint of approximately 15,000 square feet and a ground or main level finished floor elevation of 854.9.

As part of future development, the site was graded and the future building pad was soil corrected by Arnt Construction in 2008 and 2009 in conjunction with the Lyndale Avenue reconstruction project.

Project Documents

The following documents and plans were provided or used during our field observations and testing services for the site work.

- Geotechnical Evaluation. We performed soil borings and a geotechnical evaluation for the 700 American Boulevard site under Braun Intertec project number BL-07-04393. The borings and evaluation were submitted in a report dated February 8, 2008.

- Addendum to Geotechnical Evaluation. We also performed test pit observations and an addendum report to the geotechnical evaluation under Braun Intertec project number BL-07-04393C. The test pit observations and addendum were submitted in a report dated July 16, 2008.

- Preliminary Development Plans. Pope Associates, Inc. provided us with preliminary development plans, denoted as Sheets C1 and C2, which included the preliminary proposed building location and proposed site grades. The plans were prepared by Pope Associates and Sunde Engineering and were dated May 15, 2008. The layout included in the plan was used for reference during soil correction excavations and is shown on the attached Excavation Observation Sketch.

Geologic Conditions

The soil borings and test pits performed for the project encountered a variable layer of previously placed fill overlying native alluvial sands. The fill soils primarily consisted of silty sand and poorly graded sand with silt and were encountered to depths of approximately 4 to 11 feet below grade. Some of the fill soils, primarily in the upper 2 to 4 feet, contained variable amounts of building debris. The underlying native alluvial soils generally consisted of poorly graded sand and poorly graded sand with silt and were anticipated to be suitable for fill and future building support.

For subgrade preparation for building support, the geotechnical evaluation for the project recommended removal of all topsoil and previously placed fill to expose the underlying alluvial sands and then reattain building grades with engineered backfill. Engineered fill/backfill within the building pad and oversize area was recommended to be compacted to a minimum of 98 percent of standard Proctor density. Assuming the soil corrections were completed as recommended, the future building foundations could be designed for a soil bearing capacity of 4,000 pounds per square foot.

Scope of Services

For this project, the services we provided included:

- Observe and evaluate the suitability of geologic materials exposed in the bottoms of the future building excavation for backfill/fill and/or future structure support.

- Measure the in-place dry density, moisture content and relative compaction of backfill/fill placed for the future building pad.

- Observe pavement subgrades to evaluate subgrade strength and the ability of the subgrades to support pavement materials

These services were provided on a full-time or periodic basis, depending on the construction schedule and as scheduled by Arnt Construction.

Procedures

A geotechnical engineer or engineering technician, working under the direction of a licensed professional engineer, conducted the required excavation observations for the building pad subgrades. Excavation observation tasks performed included visual observations and hand auger borings (HAB).

Soils exposed at structure subgrade elevations and in excavations were visually evaluated, while those below subgrade elevations and excavation bottoms were evaluated using hand auger borings. These tasks were performed to determine if the observed and tested soils were consistent with those encountered by the geotechnical borings performed for the project, and suitable for support of the design structural loads. Visual observations included documentation of soil type, estimated consistency, approximate excavation depths and approximate excavation oversizing.

The hand auger borings were drilled with a 1 1/2-inch-diameter hand auger. The borings were advanced in 2- to 4-inch increments to depths of 2 to 4 feet below subgrade elevations or excavation bottoms. The auger was then withdrawn from the borehole to obtain cuttings. The soils encountered in the borings were classified in general accordance with ASTM D 2488, "Description and Identification of Soils (Visual/Manual Procedures)." Preliminary estimates of soil consistency and density were also evaluated based on resistance to penetration of the hand auger, and the turning resistance.

Engineering technicians, also working under the direction of a licensed professional engineer, performed density testing of fill and backfill to evaluate compliance with the specified compaction levels. Density testing for the project was performed using a nuclear density gauge in accordance with ASTM D 6938.

Locations and Elevations

The surface elevations, test locations and excavation limits shown in this report and its attachments were acquired with GPS technology through the use of the State of Minnesota's permanent GPS base station network

Excavation Observation Results

For grading of the future building pad, Arnt Construction stripped and removed all topsoil and previously placed fill down to the underlying native alluvial sands. Based on visual observations and hand auger probes, the exposed native soils generally consisted of poorly graded sand and poorly graded sand with silt in a medium dense to dense condition and were judged suitable for fill and future design loads. Excavation bottom elevations ranged from approximately 850 to 839. The observed soils were consistent with the Geotechnical Evaluation and Addendum to the Geotechnical Evaluation performed for the project.

The excavation to remove the unsuitable material was also extended at least 1 foot laterally for each foot of fill required below proposed footing grades (1:1 oversizing). Based on a FFE of 854.9, a perimeter bottom foundation grade of 851 was assumed.

The approximate limits of the excavation and excavation bottom elevations are shown on the attached Excavation Observation Summary Sketch.

Compaction Test Results

Engineered fill placed to establish the proposed building pad subgrade consisted of onsite brown and dark brown, non-organic, silty sand and poorly graded sand and similar material from the adjacent

Lyndale Avenue project. Reused onsite material was screened of debris. During the site grading, fill was typically placed in 6- to 12-inch-thick lifts and compacted using a large sheepsfoot compactor.

A total of 14 compaction tests were performed in the engineered backfill placed in the building pad area during grading. All tests met or exceeded 98 percent of the soils standard Proctor density (ASTM Test Method D 698). All compaction test results are attached with this report.

Pavement Areas

For construction of the future pavement area located to the west of the building, the topsoil was stripped and the site was cut to the proposed subgrade elevations and the subgrade was then surface compacted. The exposed subgrade in the future pavement areas generally consisted of poorly graded sand, poorly graded sand with silt and silty sand (primarily alluvial soils and some previously placed fill).

Based on observations of the pavement subgrades during grading, the subgrade appears suitable for future pavement support. However, final subgrade preparation procedures, which may include drying and recompaction, or even limited subcutting and replacement, may be required depending on the condition of the subgrade when future development proceeds. Final subgrade preparation procedures should include proofroll observations of the pavement subgrades.

Soils-Related Conclusions

Based on the results of the soil borings, excavation observations, and hand auger probes, it is our opinion the soils encountered in the observed excavation bottoms for the future building are suitable for fill and future structure support. Based on the GPS recorded locations and elevations and the preliminary provided project plans, it appears the observed excavations were oversized at 1 to 1 horizontal to vertical oversizing.

Based on the results of the compaction tests, it can be concluded the compaction procedures used by the contractor were effective in compacting the fill and backfill to relative densities that met or exceeded the project requirements.

As the building pad is constructed on, we recommend that the footing subgrades be observed by the builder, contractor, and the city inspector. If questionable or poor soil conditions are encountered, we recommend that a geotechnical engineer perform observations to further evaluate the soil conditions.

During the delay from when the grading is completed and buildings are constructed, it is likely the building pad will remain vacant through at least one winter. As a result, the upper 2 to 4 feet of soils in the prepared building pad will likely freeze at least once. When frozen, the silty soils will expand, and when thawed, will have lost some of their density. Any soils exposed to a freeze thaw cycle will likely need to at least be surface compacted prior to construction.

General

The building pad location as shown on the attached sketch is per the provided preliminary plans referenced in this report. The exact location and preparation of the graded building pad is the responsibility of the excavating contractor and surveyor.

We caution you to carefully evaluate the location of the proposed building with respect to the corrected pad. A building or structure that is not located within the corrected pad location may not be founded on suitable soil or have adequate oversizing for lateral support of the fill or foundation loads. If you are unsure as to the location of the corrected pad, or if you are suspicious as to the suitability of the foundation soils, it is recommended we be contacted to assist in locating the building pad and suitable foundation soils.

No established national standards exist for excavation observations. We have used the methods and procedures described in this report. Other firms may use different procedures to evaluate bottoms of excavations.

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement, or certification of the product or material tests.

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.

We appreciate the opportunity to be of service to you on this project. After review of these documents, if you have any questions or require additional information, please call Josh Van Abel at 952.995.2310 or Gregg Jandro at 952.995.2270.

Sincerely,

BRAUN INTERTEC CORPORATION

Joshua J. Van Abel, PE
Project Engineer

Gregg R. Jandro, PE, PG
Vice President – Principal Engineer

Attachment:
Excavation Observation Summary Sketch
Compaction Test Reports (2 Sheets)
Proctor Test Results (2 sheets)

LYNDALE AVENUE

LIMITS OF EXCAVATION OVERSIZING

PRELIMINARY BUILDING OUTLINE

CONTROL POINT (FOR COMPACTION TESTS)

AMERICAN BOULEVARD

×850.3 EXCAVATION BOTTOM ELEVATION

10' 0 20'

SCALE: 1" = 20'

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BRAUN INTERTEC

11001 Hampshire Avenue So.
Minneapolis, MN 55438
PH. (952) 995-2000
FAX (952) 995-2020

Base Dwg Provided By:
POPE ARCHITECTS

EXCAVATION OBSERVATION SKETCH
FUTURE BUILDING
700 AMERICAN BOULEVARD WEST
BLOOMINGTON, MINNESOTA

Project No:	BL0704393D
Drawing No:	BL0704393A
Scale:	1" = 20'
Drawn By:	BJB
Date Drawn:	
Checked By:	JJV
Last Modified:	11/13/09

Sheet: of | Fig:

BRAUN INTERTEC

Field Compaction Tests

Test Method: ASTM D 6938

Report Date: 12/16/08

Client:

Frauenshuh Companies
7101 West 78th Street
Suite 100
Minneapolis, MN 55439-2504

Project:

BL-07-04393D
Future Building
700 American Boulevard West
Bloomington, MN

General			*Proctor Data*				*Field Test Data*			*Specifications/Results*		
Test ID	Retest Of	Test Date	Soil ID	Soil Classification	Optimum Moisture (%)	Maximum Density (pcf)	In Place Moisture %	In Place Dry Density (pcf)	Probe Depth (in)	Relative Compaction (%)	Min. Spec. Compaction (%)	Comments (see key)
1		12/2/08	P-01	SM	10.4	119.4	8.5	117.1	12	98	98	A
2		12/2/08	P-01	SM	10.4	119.4	9.4	117.3	12	98	98	A
3		12/2/08	P-01	SM	10.4	119.4	8.4	116.7	12	98	98	A
4		12/3/08	P-02	SP	14.7	106.6	8.9	105.9	12	99	98	A
5		12/3/08	P-02	SP	14.7	106.6	9.1	108.0	12	101	98	A
6		12/3/08	P-02	SP	14.7	106.6	9.1	105.6	12	99	98	A
7		12/3/08	P-02	SP	14.7	106.6	8.9	106.0	12	99	98	A
8		12/3/08	P-02	SP	14.7	106.6	11.8	104.3	12	98	98	A

ID	Test Location	Elevation	Reference	Gauge SN	Field Technician
1	Structural Fill: Building Pad, 145'N, 42'W of Control point	852		37557	Johnson, Erik C
2	Structural Fill: Building Pad, 155'N, 19'W of Control point	852		37557	Johnson, Erik C
3	Structural Fill: Building Pad, 157'N, 72'W of Control point	854		37557	Johnson, Erik C
4	Structural Fill: Building Pad, 85'N, 23'W of Control point	841		37557	Johnson, Erik C
5	Structural Fill: Building Pad, 60'N, 28'W of Control point	843		37557	Johnson, Erik C
6	Structural Fill: Building Pad, 73'N, 13'W of Control point	845		37557	Johnson, Erik C
7	Structural Fill: Building Pad, 65'N, 5'W of Control point	847		37557	Johnson, Erik C
8	Structural Fill: Building Pad, 37'N, 17'W of Control point	845		37557	Johnson, Erik C

Key: A = Test results comply with specifications
B = Test results do not comply with specifications
C = Test results comply with air-voids specifications

* Tests are "Direct Transmission" (Method A) unless probe depth noted as "BS"

BRAUN INTERTEC

Field Compaction Tests

Test Method: ASTM D 6938

Report Date: 12/16/08

Client:

Frauenshuh Companies
7101 West 78th Street
Suite 100
Minneapolis, MN 55439-2504

Project:

BL-07-04393D
Future Building
700 American Boulevard West
Bloomington, MN

General			*Proctor Data*				*Field Test Data*			*Specifications/Results*		
Test ID	Retest Of	Test Date	Soil ID	Soil Classification	Optimum Moisture (%)	Maximum Density (pcf)	In Place Moisture %	In Place Dry Density (pcf)	Probe Depth (in)	Relative Compaction (%)	Min. Spec. Compaction (%)	Comments (see key)
9		12/3/08	P-02	SP	14.7	106.6	8.3	107.7	12	101	98	A
10		12/3/08	P-02	SP	14.7	106.6	7.0	107.5	12	101	98	A
11		12/3/08	P-02	SP	14.7	106.6	6.7	107.2	12	101	98	A
12		12/3/08	P-02	SP	14.7	106.6	7.4	106.9	12	100	98	A
13		12/4/08	P-02	SP	14.7	106.6	6.9	104.8	12	98	98	A
14		12/4/08	P-02	SP	14.7	106.6	5.8	104.6	12	98	98	A

ID	Test Location	Elevation	Reference	Gauge SN	Field Technician
9	Structural Fill: Building Pad, 54'N, 14'W of Control point	848		37557	Johnson, Erik C
10	Structural Fill: Building Pad, 10'N, 33'W of Control point	847		37557	Johnson, Erik C
11	Structural Fill: Building Pad, 41'N, 38'W of Control point	848		37557	Johnson, Erik C
12	Structural Fill: Building Pad, 72'N, 27'W of Control point	848		37557	Johnson, Erik C
13	Structural Fill: Building Pad, 59'N, 7'W of Control point	850		37557	Johnson, Erik C
14	Structural Fill: Building Pad, 17'S, 32'W of Control point	850		37557	Johnson, Erik C

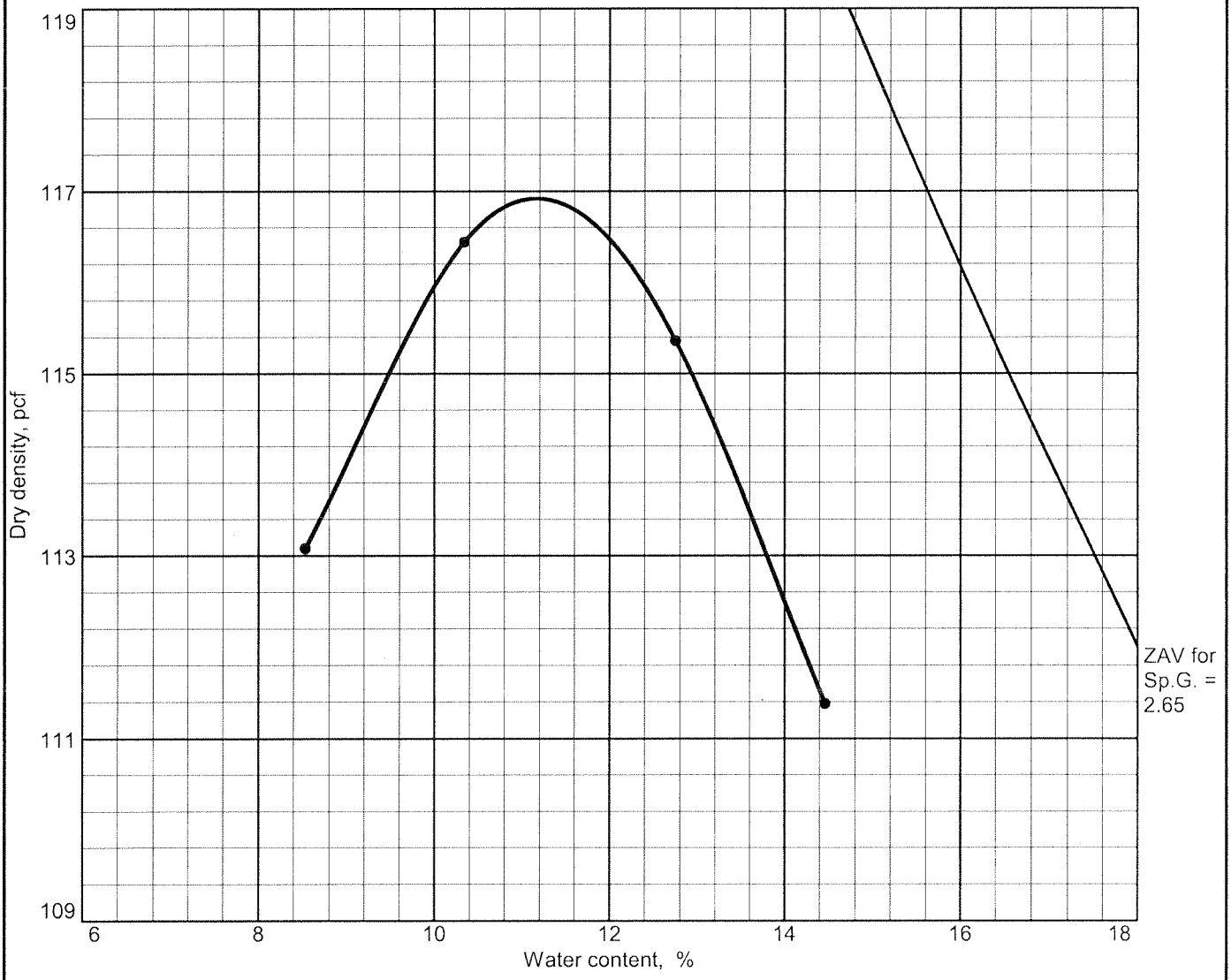
Key: A = Test results comply with specifications
B = Test results do not comply with specifications
C = Test results comply with air-voids specifications

* Tests are "Direct Transmission" (Method A) unless probe depth noted as "BS"

AVah

Van Abel, Josh
I approve the document Dec 16 2008

Moisture-Density Relationship



Test specification: ASTM D 698-07e1 Method B Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SM			2.65				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 119.4 pcf Optimum moisture = 10.4 %	Silty Sand, fine grained, brown

Project No.: BL-07-04393D **Client:** Frauenshuh Companies
Project: Future Building Bloomington, MN
JVA
● **Source:** **Sample No.:** P-01

Remarks:
Specific Gravity was assumed.
Bldg pad
12/2/08

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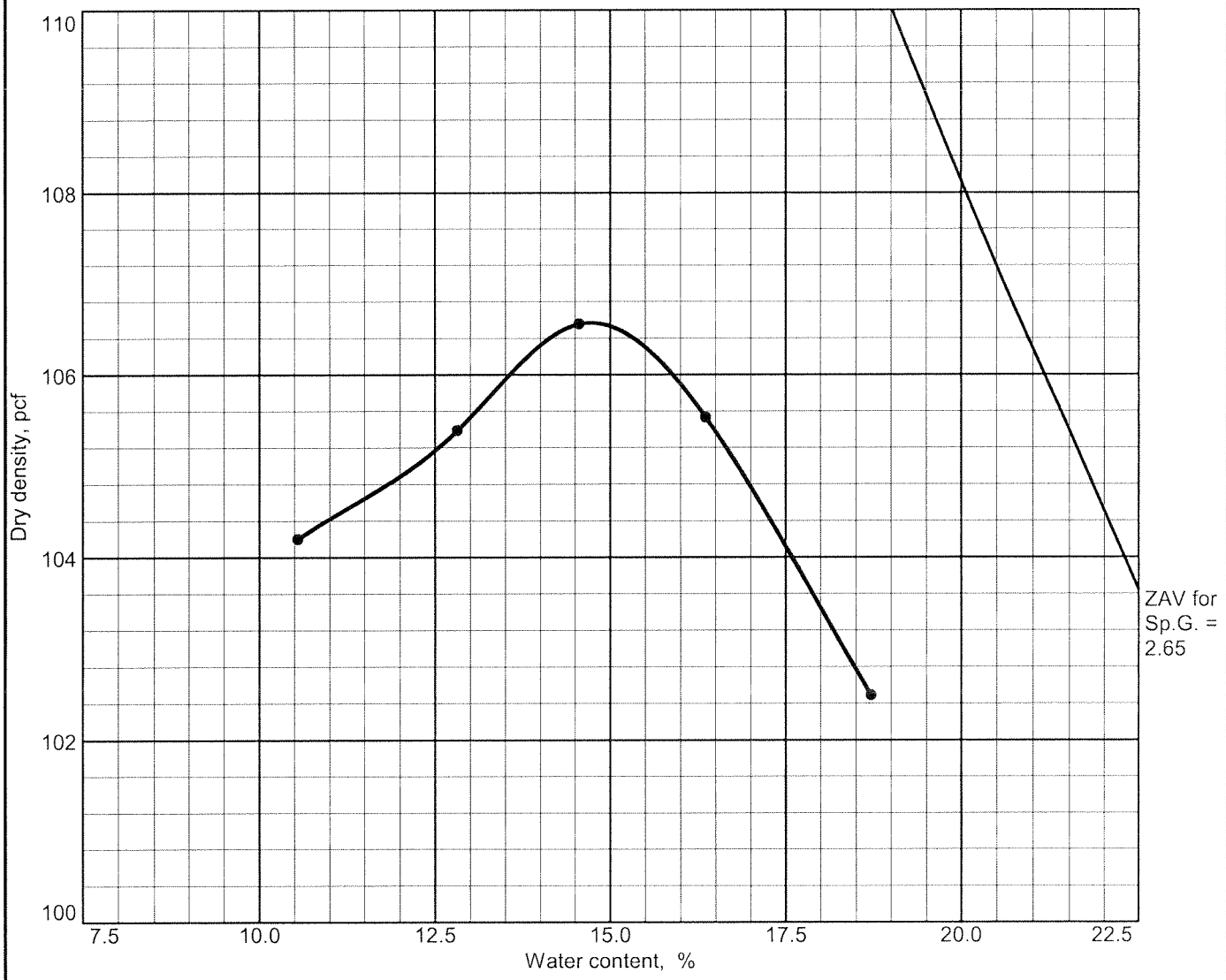

Test specification: ASTM D 698-07e1 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SP			2.65			3.0	

TEST RESULTS

Maximum dry density = 106.6 pcf

Optimum moisture = 14.7 %

MATERIAL DESCRIPTION

Poorly Graded Sand, fine grained, brown

Project No.: BL-07-04393D **Client:** Frauenshuh Companies

Project: Future Building Bloomington, MN

JVA

● **Source:** **Sample No.:** P-02

Remarks:

Specific Gravity was assumed.
Building Pad
12/5/08

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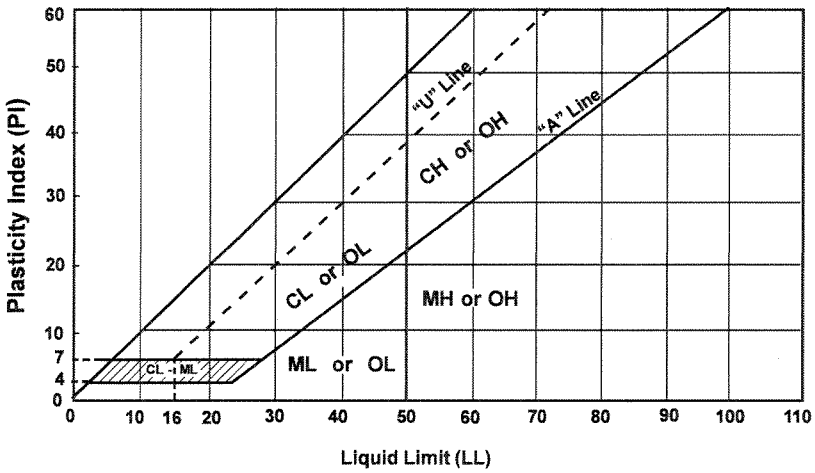
Descriptive Terminology of Soil

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	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, %	**∅**	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.