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Chosen Valley Testing

Design Phase Geotechnical Report:

Proposed Temple Building and Future Worship Hall
Hindu Samaj of Minnesota
Celebration Court NE and Hadley Creek Drive NE
Rochester, Minnesota

Prepared for:

Hindu Samaj of Minnesota
Attn: Santhi Subramaniam

May 27, 2016
9183.16.MNR

Chosen Valley Testing, Inc.

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Hindu Samaj of Minnesota
Attn: Santhi Subramaniam
911 11th Avenue NW
Rochester, MN 55901
santhisubbu@yahoo.com

May 27, 2016

cc: Mr. Tom Barbeau
Barbeau Architects, Inc.
1000 Blue Gentian Road Suite 135
Eagan, MN 55121-1664
tom@barbeauarchitects.com

Re: Design Phase Geotechnical Report
Proposed Temple Building and Future Worship Hall
Hindu Samaj of Minnesota
Celebration Ct NE and Hadley Creek Dr NE
Rochester, Minnesota
CVT Project Number: 9183.16.MNR

Dear Hindu Samaj of Minnesota:

We have completed the geotechnical evaluation authorized for the proposed Temple Building and Worship Hall in northeast Rochester, Minnesota. This letter briefly summarizes the findings and analysis detailed in the attached report.

Summary of Results

At the surface, the borings encountered about ½ to 5 feet of topsoil. The deeper topsoil was met in the southeast boring for the proposed Temple Building and was considered possible fill material from prior grading of the site. Clayey/silty fill material was met following the topsoil in the Future Worship Hall boring to a depth of approximately 6½ feet.

Beneath the topsoil and fill, the borings met clean sands to depths of about 6½ to 9 feet, over weathered dolomite and sandstone on the west end of the site and clayey sand on the east end of the site. The western borings terminated in the weathered bedrock around 9½ to 10½ feet, while the eastern borings extended through the clayey sand to about 11 to 12 feet, followed by silty sand and gravel to approximately 17½ to 18 feet, over weathered bedrock.

Water was encountered in Borings B-3 and B-4 around 9 to 14½ feet below the surface at the time of our exploration. The depths correspond near elevations 987 ½ to 992 ½ feet. Groundwater levels at the site are expected to fluctuate seasonally, similar to water levels in nearby creeks and rivers, as well as with

local weather patterns.

Summary of Analysis

Topsoil and some fill were encountered over natural sands and shallow bedrock at the locations explored on site. The topsoil and fill materials are unsuitable for support and should be completely removed from below the buildings and oversize areas, along with any organics, debris, or otherwise deleterious materials that may be encountered during construction. The topsoil was ½ to 5 feet thick and the fill was met to a depth of about 6½ feet.

We recommend that geotechnical personnel from Chosen Valley Testing be retained to evaluate excavation subgrades during construction. Subject to that review, additional soil corrections may be warranted, but are not anticipated.

With the assumed foundation loads and implementation of the earthwork recommendations, we are of the opinion that foundations may be designed to exert bearing pressures up to 4,000 psf. Total settlement is expected to be on the order of 1 inch or less and differential settlement is expected to be on the order of ½ inch or less.

Remarks

We appreciate the opportunity to serve you. The attached report provides further details of our recommendations for the buildings and paved areas. If you have any questions about our report, please feel free to contact us at (507) 281-0968.

Sincerely,
Chosen Valley Testing, Inc.

Devin M. Ehler, PE
Geotechnical Engineer

Colby T. Verdegan, PE
Sr. Geotechnical/Materials Engineer

TABLE OF CONTENTS

Design Phase Geotechnical Report
Proposed Temple Building and Future Worship Hall
Hindu Samaj of Minnesota
Celebration Court NE and Hadley Creek Drive NE
Rochester, Minnesota

CVT Project Number: 9183.16.MNR
Date: May 27, 2016

A. Introduction

The intent of this report is to present our findings and describe the means used to collect the data. The data was collected for a specific purpose and may not be suitable for other purposes. We should be consulted before attempting to use the data for other uses. A complete and thorough review of the entire document, including its assumptions and its appendices, should be undertaken immediately upon receipt.

A.1. Purpose

This geotechnical report was prepared to assist planning for the proposed Temple Building and Future Worship Hall in northeast Rochester, Minnesota. Our services were authorized by Santhi Subramaniam, President of the Hindu Samaj of Minnesota.

A.2. Scope

To provide data for analysis, a total of five penetration test borings were authorized at the site. The borings were drilled to depths of about 10 to 20 feet. Our engineering scope consisted of providing geotechnical recommendations for the proposed buildings and pavements.

A.3. Boring Locations

The desired boring locations were indicated to Chosen Valley Testing on a site plan provided by the Barbeau Architects, Inc. A couple of the temple building borings had to be offset due to utilities and a steep mound. The Boring Location Sketch in the Appendix shows the approximate boring locations as drilled.

Ground surface elevations were estimated at the borings using a laser level. The manhole cover north of the proposed Temple Building on Celebration Court NE was used as a benchmark. The benchmark was assigned elevation 100.0 feet.

A.4. Geologic Background

A geotechnical report is based on subsurface data collected for the specific structure or problem. Available geologic data from the region can help interpretation of the data and is briefly summarized in this section.

Geologic maps indicate dominant soils at the site consist of alluvial (water deposited) sands and gravels. Bedrock is commonly within 50 feet of the surface and typically consists of dolomite and sandstone with minor amounts of shale of the Prairie Du Chien Group.

B. Subsurface Data

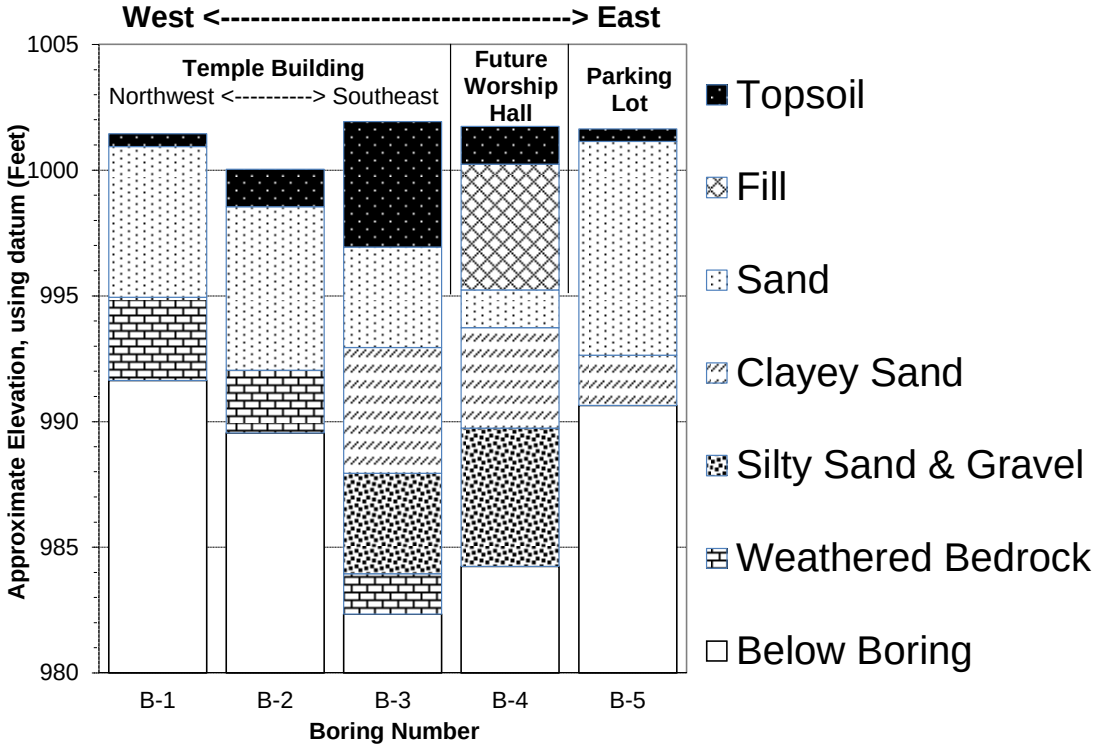
The borings were performed using penetration test procedures (Method of Test D1586 of the American Society for Testing and Materials). This procedure allows for the extraction of intact soil specimen from deep in the ground. With this method, a hollow-stem auger is drilled to the desired sampling depth. A 2-inch OD sampling tube is then screwed onto the end of a sampling rod, inserted through the hole in the auger's tip, and then driven into the soil with a 140-pound hammer dropped repeatedly from a height of 30 inches above the sampling rod. The sampler is driven 18 inches into the soil, unless the material is too hard. The samples are generally taken at 2½ to 5-foot intervals. The core of soil obtained was classified and logged by our drilling personnel at the site and a representative portion was then sealed and delivered to our laboratory for further review.

B.1. Strata

At the surface, the borings encountered about ½ to 5 feet of topsoil. The deeper topsoil was met in the southeast boring (B-3) for the proposed Temple Building and was considered possible fill material from prior grading of the site. Clayey/silty fill material was met following the topsoil in the Future Worship Hall boring (B-4) to a depth of approximately 6½ feet.

Beneath the topsoil and fill, the borings met clean sands to depths of about 6½ to 9 feet, over weathered dolomite and sandstone on the west end of the site and clayey sand on the east end of the site. The western borings terminated in the weathered bedrock around 9½ to 10½ feet, while the eastern borings extended through the clayey sand to about 11 to 12 feet, followed by silty sand and gravel to approximately 17½ to 18 feet, over weathered bedrock.

The boring data has been summarized in the following cross-section and has been labeled by general location. For more detailed information, please refer to the Log of Boring sheets in the Appendix.



B.2. Penetration Test Results

Penetration Test Results: The number of blows needed for the hammer to advance the penetration test sampler is an indicator of soil characteristics. The results tend to be more meaningful for natural mineral soils, than for fill soils. In fill soils, density tests are more meaningful.

Penetration resistance values ("N" Values) of 11 to 31 blows per foot (BPF) were recorded in the fill materials, indicating they were somewhat variable.

The natural sands returned N-values of 13 to 38 BPF, indicating they were medium dense to dense. A value of 7 BPF was recorded in the silty gravel, indicating it was loose, but was likely low due to encountering groundwater within this deposit. Resistance values of 50 blows for 1 to 5 inches of sampler advancement were recorded in the weathered bedrock, indicating it was very dense.

A key to descriptors used to qualify the relative density of soil (such as *soft, stiff, loose*, and *dense*) can be found on the Legend to Soil Description in the Appendix.

B.3. Groundwater Data

During drilling, the drillers may note the presence of moisture on the sampler, in the cuttings, or in the borehole itself. These findings are reported on the Logs of Boring. Because water levels vary with weather, time of year, and other factors, the presence or lack of water during exploration is subject to interpretation and is not always conclusive.

Water was encountered in Borings B-3 and B-4 around 9 to 14 ½ feet below the surface at the time of our exploration. The depths correspond near elevations 987 ½ to 992 ½ feet. Groundwater levels at the site are expected to fluctuate seasonally, similar to water levels in nearby creeks and rivers, as well as with local weather patterns.

C. Design Data

Because each structure has a different loading configuration and intensity, different grades, and different structural or performance tolerances, the results of a geotechnical exploration will mean different things for different facilities. If the design of the facility changes, the soils engineer should be contacted to discuss the possible implications of the changes. Without a chance to review such changes, the recommendations of the soils engineer may no longer be valid or appropriate.

The project is understood to consist of the construction of a Temple Building and paved areas, along with a future Worship Hall. The proposed Temple Building is assumed to be a single-story, wood and/or metal-framed building supported by spread footings and columns. For purposes of our analysis, we have estimated that maximum wall loads would be on the order of 3,000 to 6,000 pounds per linear foot and maximum column loads would be on the order of 100,000 pounds or less. The finished floor elevation for the Temple Building is understood to be near elevation 1002 ½ feet and the finished floor elevation for the Future Worship Building is understood to be near elevation 1004 feet. This is expected to required 1 to 3 feet of fill in the building areas.

Traffic volume information for the planned pavements was not provided. We have assumed that paved areas will most experience standard automobile traffic with occasional heavy trucks. Planned grades in the paved areas appear to require on the order of 2 feet of cut and fill.

D. Analysis

Topsoil and some fill were encountered over natural sands and shallow bedrock at the locations explored on site. The topsoil and fill materials are unsuitable for support and should be completely removed from below the buildings and oversize areas, along with any organics, debris, or otherwise deleterious materials that may be encountered during construction. The topsoil was ½ to 5 feet thick and the fill was met to a depth of about 6½ feet.

We recommend that geotechnical personnel from Chosen Valley Testing be retained to evaluate excavation subgrades during construction. Subject to that review, additional soil corrections may be warranted, but are not anticipated.

With the assumed foundation loads and implementation of the earthwork recommendations, we are of the opinion that foundations may be designed to exert bearing pressures up to 4,000 psf. Total settlement is expected to be on the order of 1 inch or less and differential settlement is expected to be on the order of ½ inch or less.

The remainder of the report provides further details of our recommendations for the buildings and paved areas.

E. Building Recommendations

E.1. General Grading Recommendations

E.1.a. Removals: As previously mentioned, the topsoil and fill materials are unsuitable for support and should be completely removed from below the buildings and oversize areas, along with any organics, debris, or otherwise deleterious materials that may be encountered during construction. The following tables shows the apparent depths and elevations of the unsuitable materials at each building boring location, along with the assumed bottom of footing elevation.

Temple Building

Boring Locations	Approx. Ground Surface Elevation (Feet)	Approx. Depth of Unsuitable Materials (Feet)	Approx. Elevation to Bottom of Unsuitable Materials (Feet)	Assumed Bottom of Footing Elevation (Feet)
B-1	1001 ½	½	1001	998 ½
B-2	1000	1½	998 ½	998 ½
B-3	1002	5	997	998 ½

Future Worship Building

Boring Locations	Approx. Ground Surface Elevation (Feet)	Approx. Depth of Unsuitable Materials (Feet)	Approx. Elevation to Bottom of Unsuitable Materials (Feet)	Assumed Bottom of Footing Elevation (Feet)
B-4	1001 ½	6½	995	1000

E.1.b. Excavation Review: We recommend that geotechnical personnel from Chosen Valley Testing be retained to evaluate excavation subgrades during construction. Subject to that review, additional soil corrections may be warranted, but are not anticipated.

E.1.c. Oversizing: Any corrective excavations should be oversized at least 1-foot horizontally beyond the edge of foundations for each foot of fill needed below footing grade. This oversizing can be reduced by up to 50% if rather precise staking is present during grading and the excavation limits can be rather precisely confirmed relative to the foundations. However, a few extra feet of oversizing provides a nominal safety factor against stakes getting moved, knocked down, or against repositioning of buildings on site.

E.1.d. Filling and Compaction: For ease in compaction, we recommend using sand or gravel having less than 12% particles passing a number 200 sieve as engineered fill. The poorly-graded sands on site would likely meet the specification upon evaluation. Aggregate base, crushed sandstone, or similar materials could also be considered for use as engineered fill, but will require more stringent moisture control and greater compactive effort.

The upper to 4 to 6 inches of fill directly below slabs should consist of clean sands having less than 5% particles passing a number 200 sieve.

All fill should be compacted to a minimum of 95% of its maximum standard Proctor density (ASTM D 698).

E.2. Building Design

E.2.a. Foundation Depth: For frost protection, we recommend that exterior foundations for heated structures bear on soils at least 42 inches below the exposed ground surface. Interior footings for heated structures can be placed directly below slabs. Footings for unheated structures should be placed at least 60 inches below the surface.

E.2.b. Bearing Capacity: With the assumed foundation loads and implementation of the earthwork recommendations, we are of the opinion that foundations may be designed to exert bearing pressures up to 4,000 psf. This allowable bearing capacity includes a safety factor of at least 3 against shear failure.

E.2.c. Settlement: Based on the recommended bearing pressure, total settlement of footings is expected to be on the order of 1 inch or less. Differential settlement is expected to be on the order of ½ inch or less between similarly loaded footings.

E.2.d. Vapor Barrier: If the slab will receive coverings that are less permeable than concrete, a vapor barrier should be placed below the slab. Any partial sections of vapor barrier should be taped together for the entire length of the seam, to reduce the risk of moisture collecting above the vapor barrier. Some contractors prefer to place this barrier below a layer of sand, to limit the potential for curling.

E.2.e. Slab Design: The completed slab subgrade is assumed to consist of clean sand. For this material, a modulus of subgrade reaction value of up to 200 pounds per cubic inch (pci) can be used.

F. Paved Area Recommendations

F.1. Grading

F.1.a. Stripping of Paved Areas: We recommend stripping and removing all topsoil, vegetation and root zones from below all paved areas. The topsoil was about ½-foot thick at the one parking area boring that was drilled on site but the building area borings met topsoil to depths up to 1½ to 5 feet deep.

F.1.b. Scarification, Filling, and Compaction: We assume that pavements will be near existing grades. If fill is needed for grading in paved areas, it should consist of a uniform soil type similar to the near-surface soils already present – which were primarily clean sands.

Fill placed within the upper 3 feet of the subgrade should be compacted to at least 100% of its maximum standard Proctor density. Below 3 feet of subgrade, compaction to at least 95% is recommended. The completed pavement subgrade should be able to pass a test roll using a loaded tandem axle truck. Areas not passing the test roll should be reworked and stabilized, or corrected with additional aggregate base, breaker run, and/or geosynthetic fabric, as needed to pass the test roll.

F.1.c. Pavement Design: After surface stripping and grading, the soils present at subgrade elevation are expected to be primarily poorly-graded sands. This soil typically has an R-value ranging from 50 to 70. We suggest using an R-value of 50 for pavement design.

In the absence of traffic loading data, we suggest a flexible pavement section consisting of at least 3 inches of asphalt over 6 inches of MnDOT Class 5 aggregate base. If a rigid pavement section is preferred, we recommend a section consisting of at least 5 inches of concrete (4,000 psi compressive strength) over at least 4 inches of aggregate base.

The above pavement sections assume that the subgrade has been sufficiently moistened and compacted to pass a test roll. Observation of the test roll should be documented by qualified geotechnical personnel. The necessity of scarifying and compacting the subgrade would be determined by the test roll.

The pavement sections should be considered preliminary, subject to review by the civil engineering consultant, and subject to their experience with pavement design and performance in the area of the project.

G. Construction Recommendations

G.1. Dewatering

As mentioned, water was encountered in a couple of borings around 9 to 14½ feet below the surface or near elevations 987 ½ to 992 ½ feet. Based on this information, footing excavations are not expected to encounter water.

Any excavations that extend in to the groundwater table will require aggressive water removal techniques, such as well-points, to keep the bottoms dry.

G.2. Stripping / Excavation

Tracked equipment appears to be capable of performed stripping and excavation operations. Standard vehicles with tires may have difficulty traversing the site if the sands are overly dry and loose. A backhoe is recommended for excavations.

G.3. Sideslopes

The contractor will be required to slope or shore the excavations as needed to meet OSHA requirements for safety and to limit disturbance to surrounding structures. The sands are expected to classify as Type C soils as defined by OSHA.

G.4. Cold Weather

If the excavation occurs during freezing temperatures, good winter construction practices should be used. No frozen fill should be used, nor should structural filling take place on frozen ground. Slab areas should be completely thawed before placing of concrete.

G.5. Construction Testing and Documentation

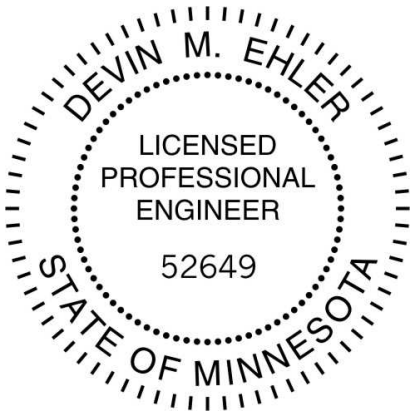
All excavations and subgrades should be evaluated and documented by geotechnical personnel before placing any fill, concrete, or pavements. Fill placed below building and paved areas should be evaluated for conformance to the project gradation recommendations and should be tested for compaction. If the filling proceeds during periods of freezing weather, full-time testing should be considered to help confirm that imported fill is thawed prior to and during compaction, and that all snow has been removed before placement of the fill.

Although our firm offers testing services relating to civil and structural components of the building (such as concrete testing, reinforcement observations, etc.) specification of such services is beyond our work scope and the designer should be consulted as to such requirements.

H. Level of Care

The services provided for this project have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area, under similar budget and time constraints. This is our professional responsibility. No other warranty, expressed or implied, is made.

I. Certification



I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly registered engineer under the laws of the State of Minnesota.

Devin Ehler

Devin M. Ehler, PE
Geotechnical Engineer
Registration Number 52649
Date: May 27, 2016

Appendix

Boring Location Sketch

Log of Boring # 1-5

Legend to Soil Description

C V T

Chosen Valley Testing, Inc.

Legend

- Boring Locations
- Benchmark

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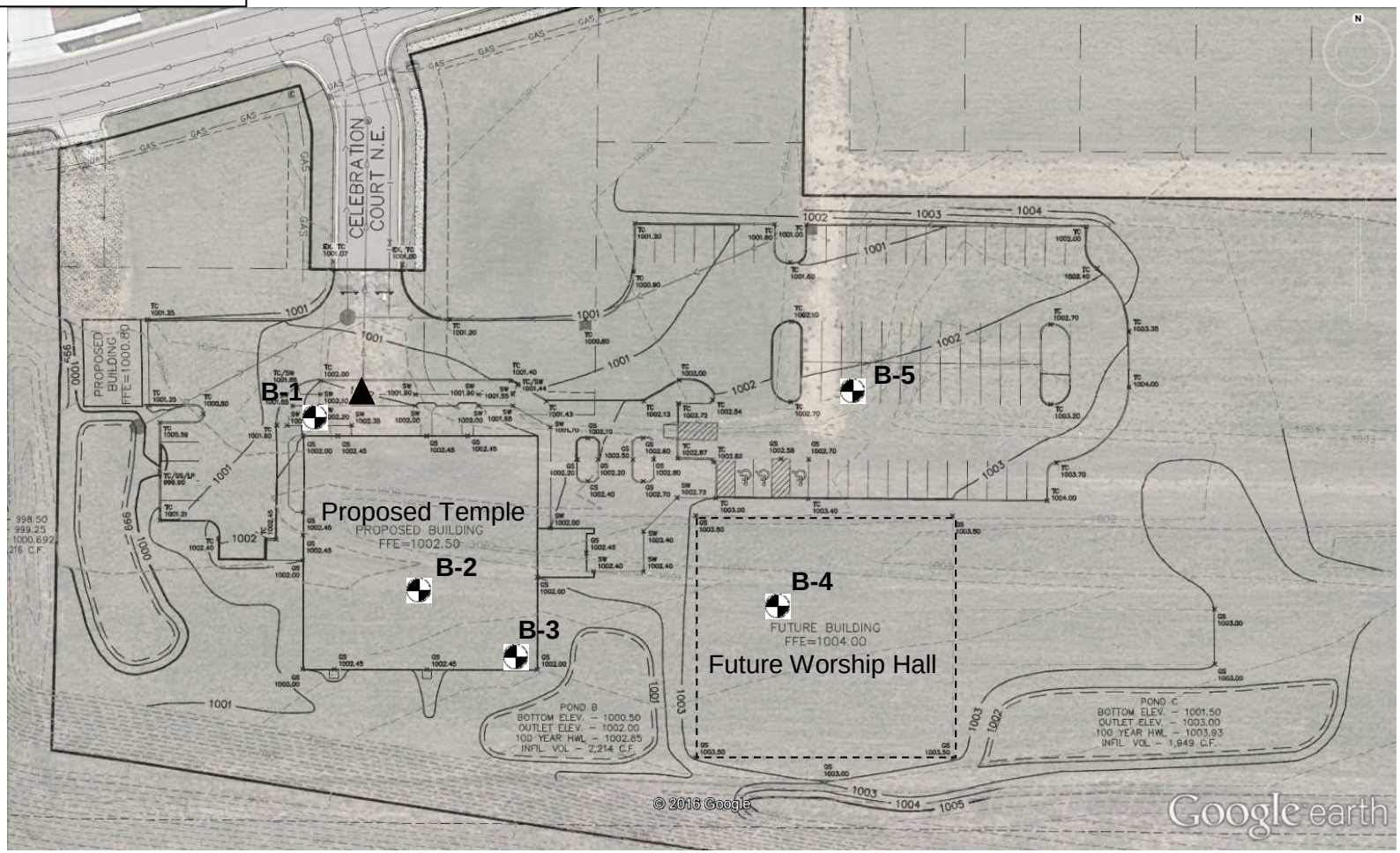
Boring Location Sketch

Proposed Temple Building and Future Worship Hall
Hindu Samaj of Minnesota
Celebration Ct NE and Hadley Creek Dr NE
Rochester, Minnesota
9183.16.MNR



LOG OF BORING

CHOSEN VALLEY TESTING CVT

PROJECT: 9183.16.MNR Design Phase Geotechnical Evaluation Proposed Hindu Temple Hadley Creek Drive NE Rochester, Minnesota	BORING: **B-1** LOCATION: See attached sketch DATE: 4/29/2016 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1001.4	0.0					
1000.9	0.5	SM	**Slightly Organic SILTY SAND** trace roots, black to dark brown.			Benchmark: Manhole cover, north of proposed Temple Building on Celebration Ct NE, understood elevation 1000.84 feet.
		SP SM	(Topsoil) **POORLY-GRADED SAND with SILT** fine to medium grained, trace seams of silt, brown, moist, medium dense. (Alluvium)	14		
997.4	4.0	SP	**POORLY-GRADED SAND** fine to medium grained, trace gravel, light brown, moist, medium dense. (Alluvium)	19		
994.9	6.5		**WEATHERED DOLOMITE and SANDSTONE** light brown to light gray, moist, very dense. (Weathered Bedrock)	*		* 27 / 50 = 5"
991.6	9.8		End of boring. Boring terminated due to auger refusal around 9.5 feet, presumably on bedrock. Boring sealed upon completion.	*		* 50 = 4" (set)

CVT STANDARD 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ LOG A GNNN06.GDT 5/25/16

LOG OF BORING

CHOSEN VALLEY TESTING CVT

PROJECT: 9183.16.MNR Design Phase Geotechnical Evaluation Proposed Hindu Temple Hadley Creek Drive NE Rochester, Minnesota	BORING: **B-2** LOCATION: See attached sketch DATE: 4/29/2016 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1000.0	0.0	CL OL	**Slightly Organic LEAN CLAY** black. (Topsoil)			
998.5	1.5	SP SM	**POORLY-GRADED SAND with SILT** fine to medium grained, trace seams of silt, trace gravel, brown, moist, dense. (Alluvium)	33		
996.0	4.0	SP	**POORLY-GRADED SAND** fine to medium grained, trace gravel, light brown, moist, medium dense. (Alluvium)	29		
992.0	8.0			55		
989.5	10.5		**WEATHERED DOLOMITE and SANDSTONE** light brown to light gray, moist, very dense.	*		* 9 / 50 = 5"
			End of boring. Boring terminated due to auger refusal around 10.5 feet, presumably on bedrock. Boring sealed upon completion.			

CVT STANDARD 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ LOG A GNNN06.GDT 5/25/16

LOG OF BORING

CHOSEN VALLEY TESTING CVT

PROJECT: 9183.16.MNR Design Phase Geotechnical Evaluation Proposed Hindu Temple Hadley Creek Drive NE Rochester, Minnesota	BORING: **B-3** LOCATION: See attached sketch DATE: 4/29/2016 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1001.9	0.0	CL OL	**Slightly Organic LEAN CLAY** with seams of sand, black, wet, rather stiff. (Topsoil / Possible Fill)	11		
996.9	5.0	SP SM	**POORLY-GRADED SAND with SILT** fine to medium grained, trace seams of silt, gray, wet, medium dense. (Alluvium)	15		
995.4	6.5	SP	**POORLY-GRADED SAND** fine to medium grained, light brown, moist, medium dense. (Alluvium)	22		
992.9	9.0	SC	**CLAYEY SAND** fine grained, dark brown to dark gray, moist, medium dense. (Alluvium)	14		
990.4	11.5	SM	**SILTY SAND with GRAVEL** fine to medium grained, brown, moist, dense. (Residuum)	35		
987.9	14.0	GM	**SILTY GRAVEL with SAND** fine to medium grained, light brown, water bearing, loose. (Residuum)	7	▽	Water encountered below 14.5 feet during drilling.
983.9	18.0		**WEATHERED DOLOMITE and SANDSTONE** white to light gray, moist, very dense.	*		
982.3	19.6		End of boring. Boring terminated due to auger refusal around 19.5 feet, presumably on bedrock. Boring sealed upon completion.			* 50 = 1" (set)

CVT STANDARD 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ LOG A GNNN06.GDT 5/25/16

LOG OF BORING

CHOSEN VALLEY TESTING **CVT**

PROJECT: 9183.16.MNR Design Phase Geotechnical Evaluation Proposed Hindu Temple Hadley Creek Drive NE Rochester, Minnesota	BORING: **B-4** LOCATION: See attached sketch DATE: 4/29/2016 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1001.7	0.0	CL OL	**Slightly Organic LEAN CLAY** trace roots, black. (Topsoil)			
1000.2	1.5	SM CL	**SILTY SAND and LEAN CLAY** black and brown mix, moist to wet, medium dense to dense. (Fill)	13		
				31		
995.2	6.5	SP	**POORLY-GRADED SAND** fine to medium grained, light brown, moist, medium dense. (Alluvium)			
993.7	8.0			34		
		SC	**CLAYEY SAND** fine grained, brown to gray, slight mottling, wet to water bearing, medium dense. (Alluvium)		▽	Water encountered below 9 feet during drilling.
				13		
989.7	12.0	SM	**SILTY SAND with GRAVEL** fine grained, light brown, water bearing, medium dense. (Residuum)	22		
				29		
984.2	17.5		End of boring. Boring terminated due to auger refusal around 17.5 feet, presumably on bedrock. Boring sealed upon completion.			

CVT STANDARD 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ LOG A GNNN06.GDT 5/25/16

LOG OF BORING

CHOSEN VALLEY TESTING CVT

PROJECT: 9183.16.MNR Design Phase Geotechnical Evaluation Proposed Hindu Temple Hadley Creek Drive NE Rochester, Minnesota	BORING: **B-5** LOCATION: See attached sketch DATE: 4/29/2016 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1001.6	0.0					
1001.1	0.5	CL OL	**Slightly Organic LEAN CLAY** trace roots, black. (Topsoil)			
		SP	**POORLY-GRADED SAND** fine to medium grained, trace gravel, light brown, moist, medium dense to dense. (Alluvium)	14 32 38		
992.6	9.0	SC	**CLAYEY SAND** fine to medium grained, brown to gray, slight mottling, wet, medium dense. (Alluvium)	13		
990.6	11.0		End of boring. Boring sealed upon completion.			

CVT STANDARD 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ LOG A GNNN06.GDT 5/25/16

UNIFIED SOIL CLASSIFICATION (ASTM D-2487/2488)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

Relative Proportions of Sand and Gravel

TERM	PERCENT
Trace	< 15
With	15 - 29
Modifier	> 30

Relative Proportions of Fines

TERM	PERCENT
Trace	< 5
With	5 - 12
Modifier	> 12

Grain Size Terminology

TERM	SIZE
Boulder	< 12 in.
Cobble	3 in. - 12 in.
Gravel	#4 sieve to 3 in.
Sand	#200 sieve to #4 sieve
Silt or Clay	Passing #200 sieve

SAMPLE TYPES

Hollow Stem

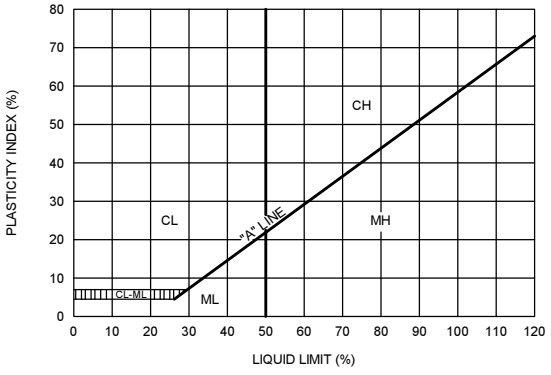
Standard Penetration Test

TEST SYMBOLS

MC	-	MOISTURE CONTENT	LL	-	LIQUID LIMIT
OC	-	ORGANIC CONTENT	PI	-	PLASTISITY INDEX
CN	-	CONSOLIDATION	SW	-	SWELL TEST
DD	-	DRY DENSITY	UU		Unconsolidated Undrained triaxial
PP	-	POCKET PENETROMETER			
RV	-	R-VALUE			
SA	-	SIEVE ANALYSIS			
P200	-	% PASSING #200 SIEVE			

- WATER LEVEL (WITH TIME OF) MEASUREMENT

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS / 0.5 FT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	COMPRESSIVE STRENGTH (TSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 1	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 3	0.25 - 0.50
MEDIUM DENSE	10 - 30	RATHER SOFT	4 - 5	0.50 - 1.0
DENSE	30 - 50	MEDIUM	6 - 8	
VERY DENSE	OVER 50	RATHER STIFF	9 - 12	1.0 - 2.0
		STIFF	13 - 16	
		VERY STIFF	17 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

Chosen Valley Testing, Inc.

Job No. 9183.16.MNR

LEGEND TO SOIL DESCRIPTIONS

CVT

CVT 9183.16.MNR (ROCHESTER HINDU TEMPLE).GPJ 5/27/16