Huntingdon

Huntingdon Engineering & Environmental, Inc.

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GEOTECHNICAL EXPLORATION PROGRAM
SITE OVERVIEW

PROPOSED SCHOOL/BLOOMER SCHOOL DISTRICT
BLOOMER, WISCONSIN

HIH #8200-95-0076

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December 9, 1994

Bloomer School District
Attn: Ms. Pauline Roll
1310 17th Avenue
Bloomer, WI 54724

Dear Ms. Roll:

SUBJ: Geotechnical Exploration Program - Site Overview
Proposed School/Bloomer School District
Bloomer, Wisconsin
HIH #8200-95-0076

The purpose of this geotechnical exploration program was to provide preliminary information regarding general foundation conditions for the above referenced project. We understand this information will be used to assist in determining whether the site is favorable for the planned development.

Our work scope for this project is limited to performing soil test borings at the designated locations and providing data concerning foundation types and possible allowable bearing pressures. The geotechnical exploration program was performed per your authorization of Huntingdon Engineering & Environmental, Inc's proposal #95-217, dated August 17, 1994.

It should be noted that our authorized scope of services is intended for geotechnical purposes only and not to document or detect the presence or absence of environmental contaminations at the site, or to perform an environmental assessment of the site.

PROJECT INFORMATION

We understand that the proposed project will include the construction of a new school. Details for the proposed structure are not yet finalized but the school is anticipated to be a one (1) to two (2) story structure with possible basement. Drives, walkways and parking facilities are also planned. Elevational changes on the order of up to seven (7) feet (cut and fill) are anticipated at this site.

The proposed structures are to be constructed at the northwest corner of the intersections of Corporate Avenue (ie. 5th Avenue) and Thompson Street, just east of Lake Como Drive and adjacent to North City Park, in Bloomer, Wisconsin.

Ms. Pauline Roll representing the Bloomer School District provided authorization for Huntingdon Engineering & Environmental, Inc. to perform the subsurface exploration at this site.

TEST BORINGS

On November 16 through November 18, 1994, thirteen (13) standard penetration soil test borings were performed across the proposed site. The borings were drilled in a grid pattern to depths ranging from sixteen (16) to twenty-six (26) feet below the existing ground surface to provide a site overview of the property. The soil borings were performed with a truck mounted, CME 55, rotary drive, drill rig. The locations of the soil borings and the number of borings required were provided through discussions with Ms. Pauline Roll representing the Bloomer School District and are illustrated on the site sketch included in the appendix. The soil borings were located the field by Huntingdon Engineering & Environmental, Inc. personnel using existing site landmarks for reference.

Our design assumptions also include an allowable total settlement of three quarters (3/4) of an inch, a differential settlement of one half (1/2) inch and a minimum safety factor of 3.0 with respect to shearing or base failure of the foundation.

PRELIMINARY FOUNDATION RECOMMENDATIONS

In general, the test borings suggest that the site conditions are favorable for development. In our opinion, conventional spread and continuous foundation members bearing on the undisturbed native soil or on properly placed engineered fill may be utilized for construction. However, We recommend that the elevations of the proposed structures be set above the groundwater table in order to preclude water problems during short term construction practices and long term usage.

Based on our review of the test borings and our site observations, it is our opinion that the subsurface soils will support foundation loads on the order of 3000 to 4000 pounds per square foot (psf) between an elevation of 90 feet and 96 feet, assumed datum. However, some areas may require rework and compactive effort to improve soil bearing and settlement resistances once finished grades and structure locations are established.

Topsoil removal depths of up to one (1) foot will be required in structural areas. To reduce removal quantities, topsoil stripping should be closely monitored. In addition, the underlying 1½ foot layer of sandy clay may require removal in floor slab and parking areas depending on its condition and relative depth at the time of construction.

SITE FILL

On-site materials found in the vicinity of Boring B-6, B-7 and B-8 (ie. earthen mound) should be satisfactory for use as structural fill. However, moisture contents should be adjusted to within plus or minus three (3) percent of optimum prior to compaction.

Fill materials should be placed in lifts not to exceed eight (8) inches in thickness and compacted to 95% of the maximum dry density as determined by ASTM D-1557, Modified Proctor. Off-site fill should consist of a clean (less than 12% passing the #200 sieve), well graded, granular material.

EXCAVATIONS

The presence of sandstone noted in boring B-8 may present difficulties with deep excavations for basements or utilities. Excavation and removal of this material utilizing conventional backhoe and heavy excavating equipment is likely to be effective. Deeper portions of the sandstone formation may require drilling and blasting techniques for removal.

PAVEMENT CONSIDERATIONS

The site surface conditions are generally suitable for the construction and support of pavements and concrete slab-on-grade. However, the site is covered by an organic topsoil mantle of approximately eight (8) inches thick which will require stripping prior to construction of pavements and floor slabs. In addition, a one and one half (1½) foot layer of sandy clay is present directly below the topsoil layer. Due to wetness and the frost action potential of this soil type, undercut and/or grade raising may be necessary to insure the longevity of the pavement. As is good engineering practice, pavement subgrades should be provided with an adequate drainage system.

DISCUSSION

Additional field and laboratory testing and engineering analysis will be required prior to final design of building foundation systems, pavements and/or other structures on this site.

The recommendations given above are for preliminary planning only. It is possible there are soil conditions on this site that were not represented by the borings performed. Consequently, additional recommendations and possibly soil borings will be necessary once specific building plans, locations and elevations are selected.

STANDARD OF CARE

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions regarding this report as the project develops or require more detailed recommendations for the proposed structures, please feel free to contact our office at 715/832-0282.

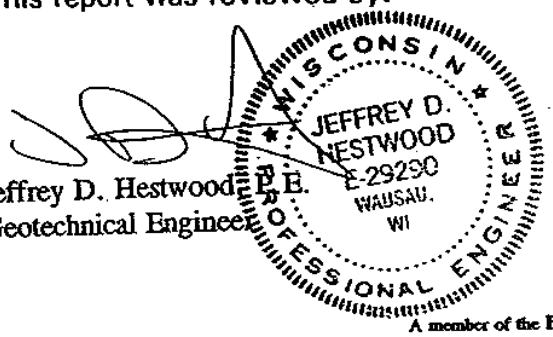
Sincerely,

HUNTINGDON ENGINEERING & ENVIRONMENTAL, INC.

This report was prepared by:

Gregory J. Stelmack
Geotechnical Engineer

This report was reviewed by:



Jeffrey D. Hestwood, P.E.
Geotechnical Engineer

APPENDIX

Field Exploration Procedures

Recommended Soil Properties

Boring Location Plan

Dimensional Graphs

Logs of Test Borings

General Notes

Classification of Soils for Engineering Purposes

Important Information About Your Geotechnical Report

APPENDIX A

FIELD EXPLORATION PROCEDURES

Soil Sampling

Soil sampling was performed in accordance with ASTM:D1586-84. Using this procedure, a 2" O.D. split barrel sampler is driven into the soil by a 140 lb. weight falling 30". After an initial set of 6", the number of blows required to drive the sampler an additional 12" in know as the penetration resistance or N value. The N value is an index of the relative density of cohesionless soils and the consistency of cohesive soils. Thin wall tube samples were obtained according to ASTM:D1578-83 where indicated by appropriate symbol on the boring logs. Rock core samples, if taken, were obtained by rotary drilling in accordance with ASTM:D2113-87. Power auger boring, if performed, were done in general accordance with ASTM:D1452-90.

Soil Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief in accordance with ASTM:D2487. Representative portions of the samples were then returned to the laboratory for further examination and for verification of the field classification. Logs of the borings indicating the depth and identification of the various strata, the N value, water level information and pertinent information regarding the method of maintaining and advancing the drill holes are attached. Charts illustrating the soil classification procedure, the descriptive terminology and the symbols used on the boring logs are also included in the Appendix.

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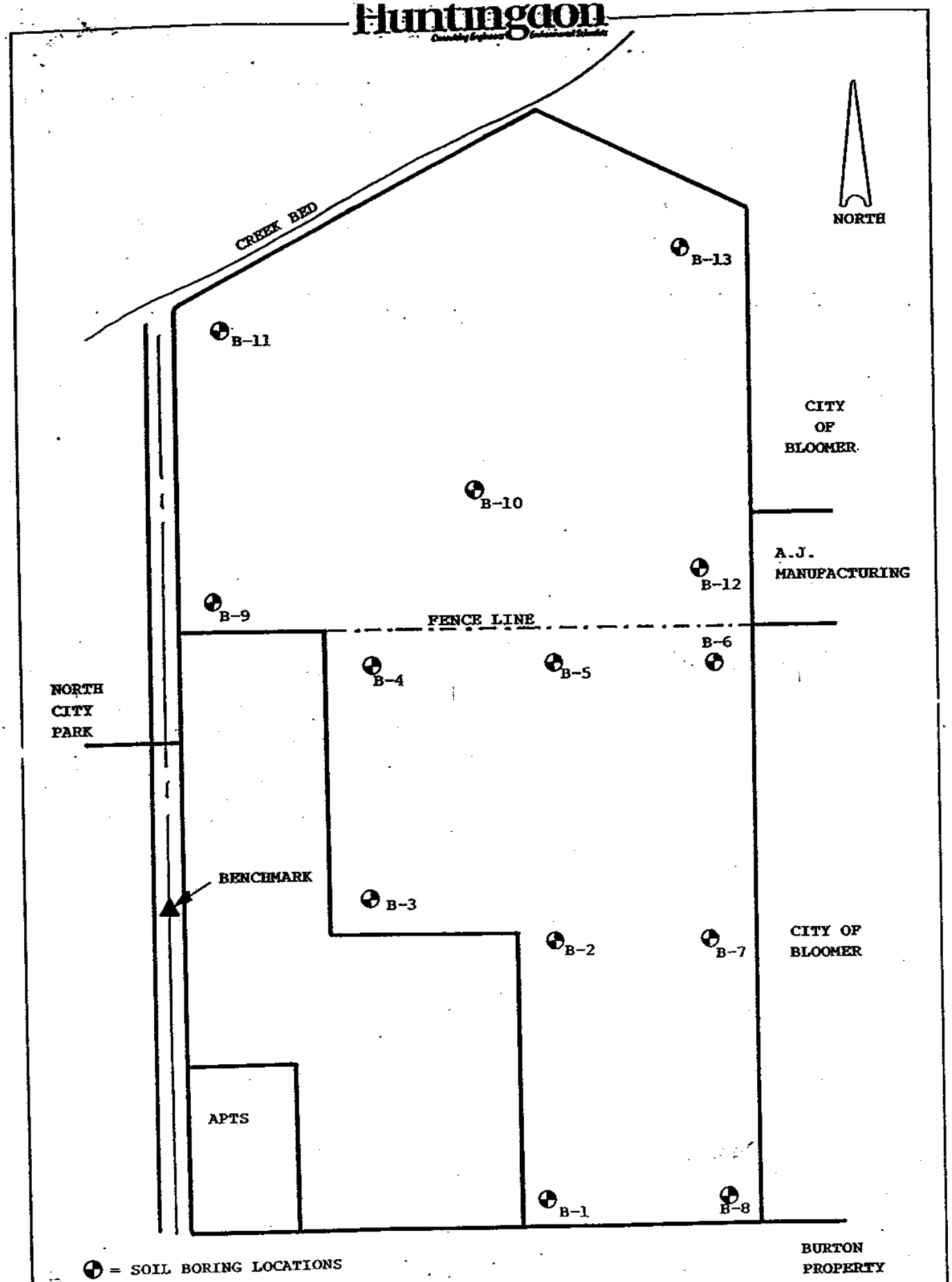
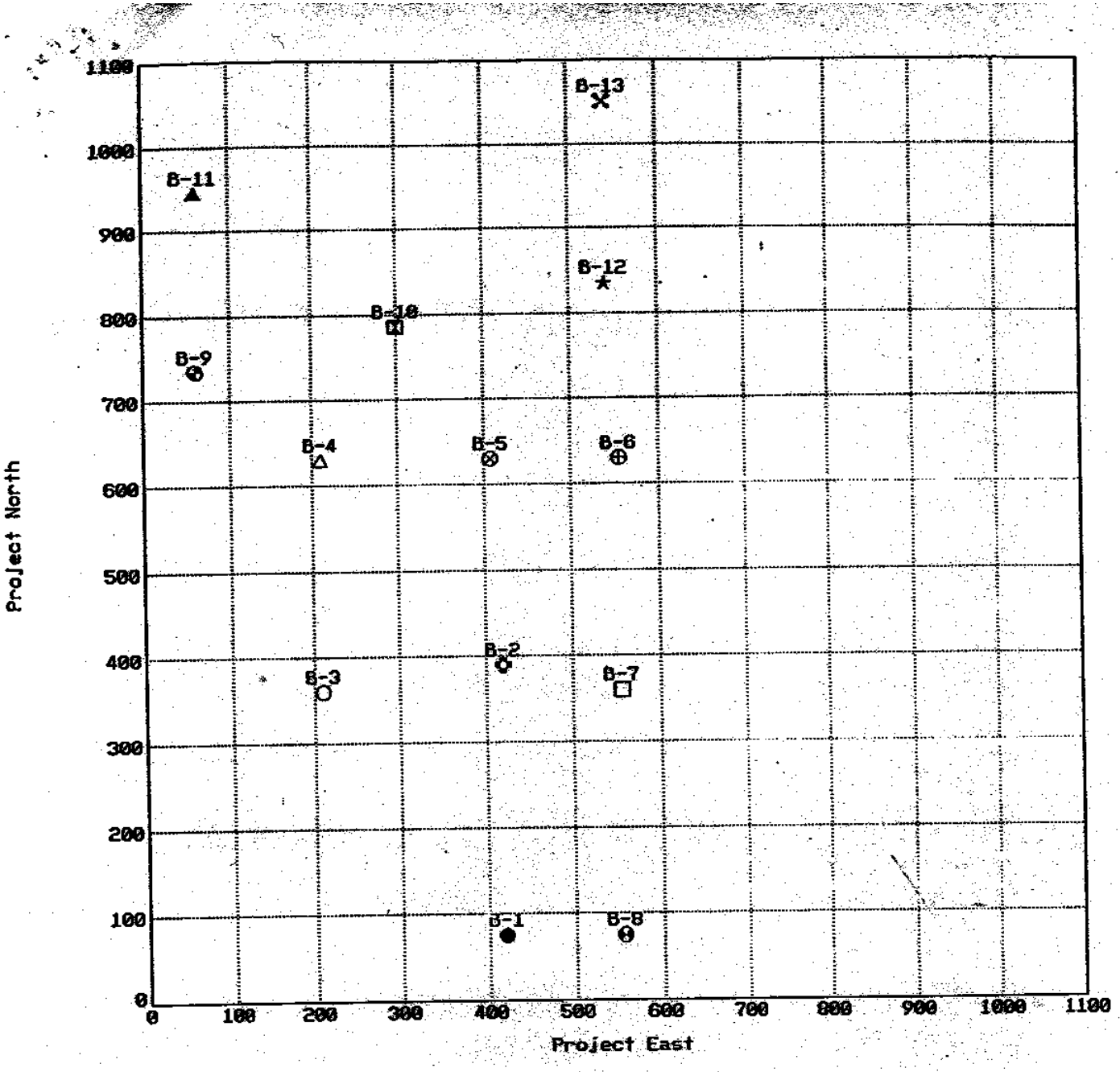
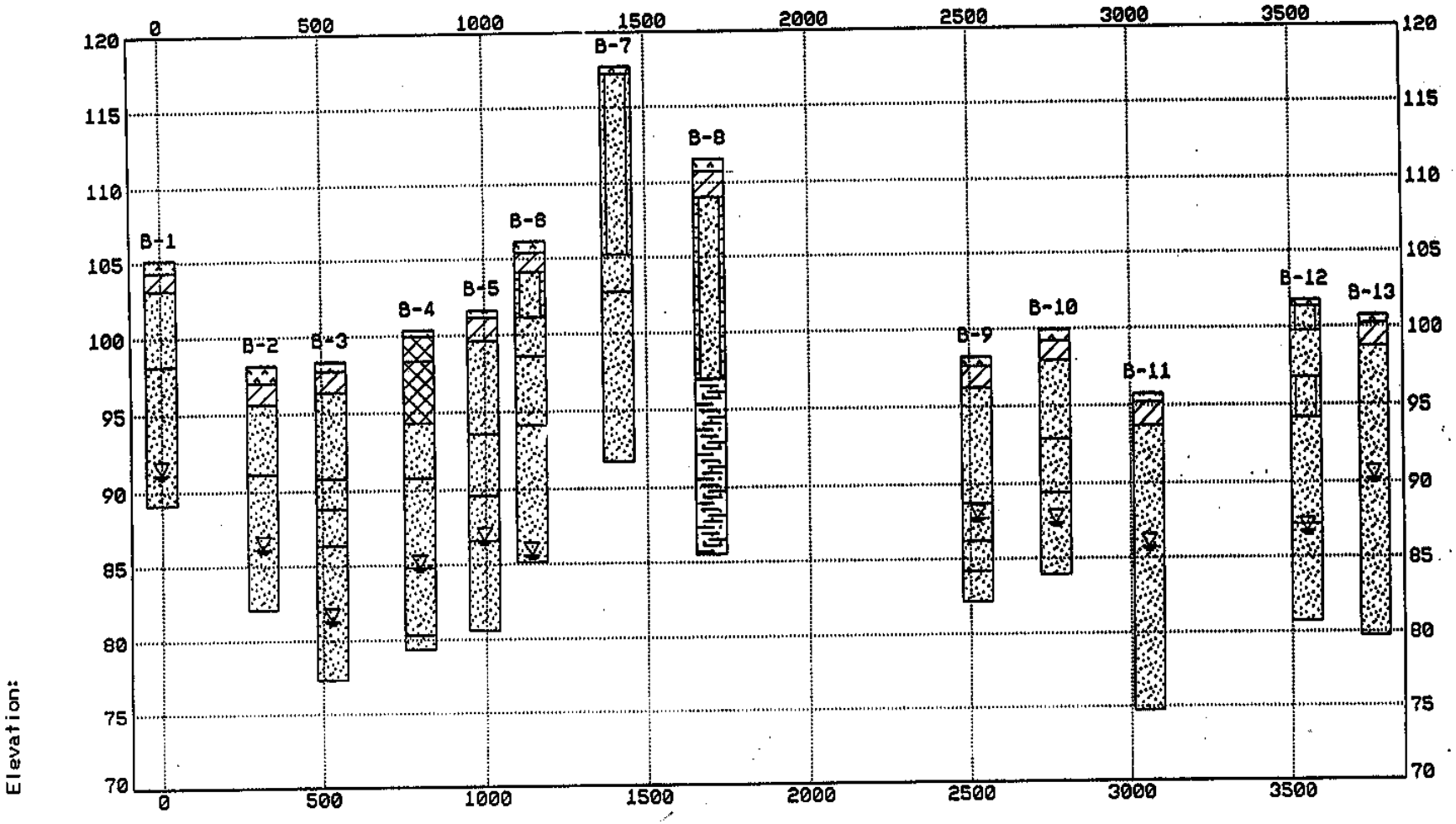


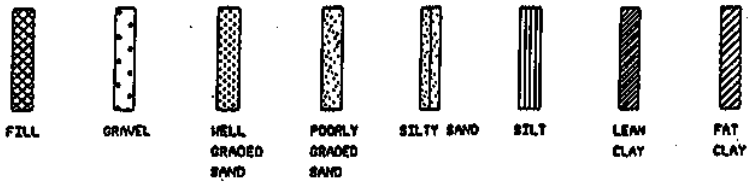
PROPOSED BLOOMER SCHOOL	JOB NO. 8200-95-0076	SCALE: NONE	DRAWN BY JJG	CHECKED BY GIS



Project: PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

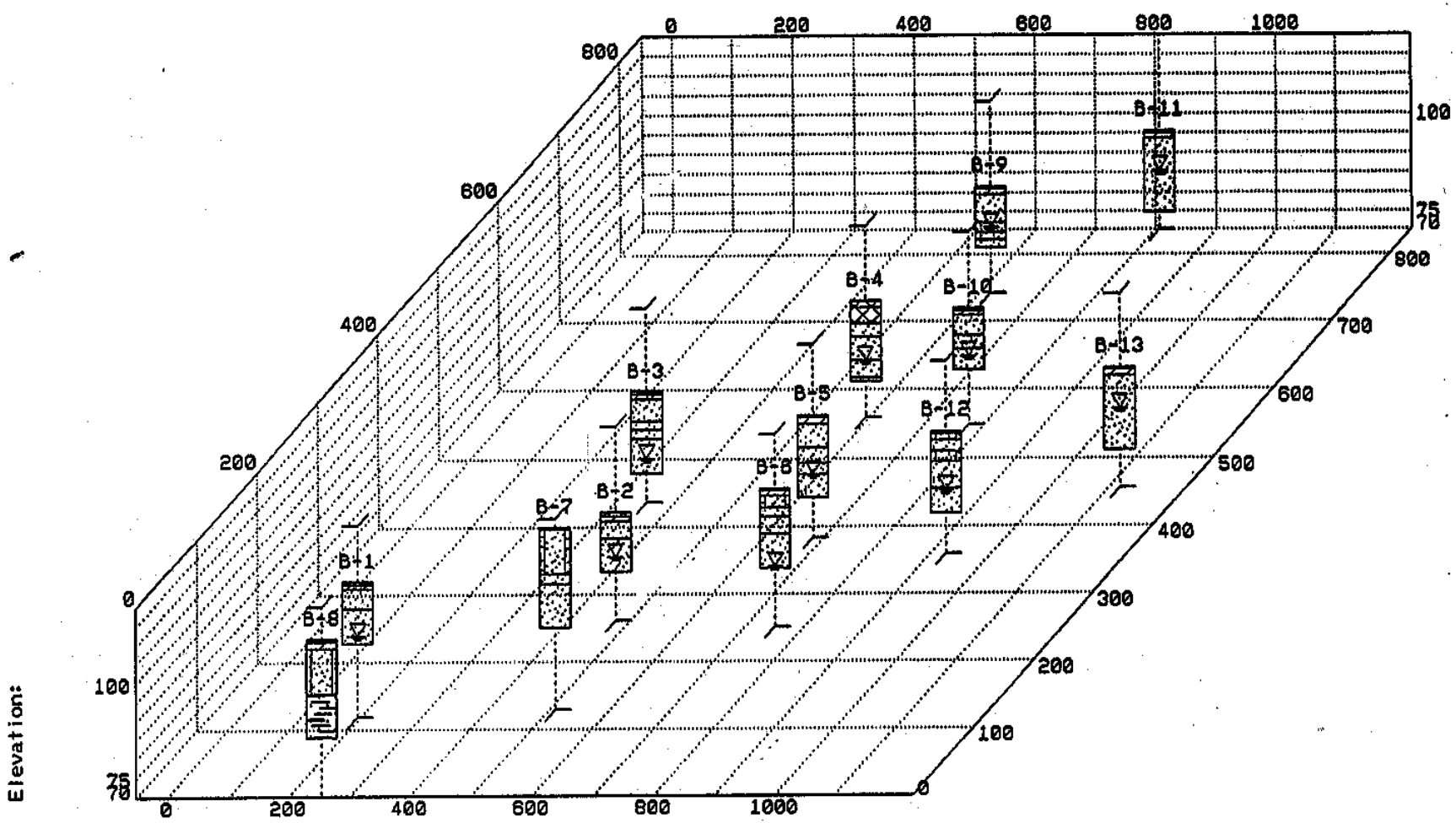
Number: 8200-95-076





Project: PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN,

Number: 8200-95-076



Project: PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN,

Number: 8200-95-076

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-1

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 105.1)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or RQD
0.8	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, dark brown, moist (CL)	Mixed Alluvium	10		2	SB					
	SAND, fine to medium grained, brown to light brown, moist, medium dense (SP)		9		3	SB					
7.0	SAND WITH GRAVEL, fine to coarse grained, brown, moist to wet, loose to dense (SP)		18		4	SB	5				
			15		5	SB	8				
			10		6	SB					
			7	▽	7	SB					
16.0	End of Boring @ 16'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	9:45	16'	14.5'	16'		14'
11-16-94	16:45	16'	NONE	10'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 9:45

METHOD 3.25" HSA 0' to 14.5'

EAST: 420.00 NORTH: 75.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-2

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 98.1)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	TOPSOIL	Topsoil			1	FA					
1.1	SANDY CLAY, trace organics, dark brown, moist (CL)	Mixed Alluvium	22		2	SB	4				
2.5	SAND WITH SOME GRAVEL, fine to coarse grained, brown, moist, loose to dense (SP)		5		3	SB					
7.0	SAND WITH A LITTLE GRAVEL, fine to medium grained, brown, moist, medium dense to loose (SP)		10		4	SB	3				
			10		5	SB					
			7	▽	6	SB					
			8		7	SB					
16.0	End of Boring @ 16'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	10:30	16'	14.5'	16'		12'
11-16-94	16:50	16'	NONE	8'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 10:30

METHOD 3.25" HSA 0' to 14.5'

EAST: 420.00 NORTH: 390.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-3

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 98.3)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or RQD
0.6	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, dark brown, moist (CL)	Mixed Alluvium	9		2	SB					
	SAND WITH A LITTLE GRAVEL, fine to medium grained, light brown, moist, medium dense to dense (SP)		21		3	SB	6				
7.5			17		4	SB					
	SAND WITH SOME GRAVEL, fine to coarse grained, brown, moist, dense (SP)										
9.5			15		5	SB	4				
	SAND, fine to medium grained, light brown, moist, medium dense (SP)										
12.0			8		6	SB					
	SAND WITH SOME GRAVEL, fine to coarse grained, brown, wet to waterbearing, loose to dense (SP)		7	▽	7	SB					
			21		8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	11:55	21'	19.5'	21'		17'
11-16-94	16:50	21'	NONE	8'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 12:05

METHOD 3.25" HSA 0' to 19.5'

EAST: 210.00 NORTH: 360.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-4

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

SURFACE ELEVATION 100.3

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or ROD
0.4	TOPSOIL	Topsoil			1	FA					
	FILL, mostly silty sand, brown, moist (SM)	Fill									
2.0	FILL, mostly sand, fine to medium grained, light brown, moist		3		2	SB	4				
			2		3	SB					
6.0	lens of sandy clay at 5.5'										
	SAND WITH GRAVEL, fine to coarse grained, brown, moist, very dense (SP)	Mixed Alluvium	36		4	SB	6				
9.5	SAND WITH A LITTLE GRAVEL, fine to medium grained, brown, moist, dense to medium dense (SP)		20		5	SB					
			13		6	SB					
			8	▽	7	SB					
15.5	SAND WITH GRAVEL, medium to coarse grained, brown, waterbearing, loose (SP)										
20.0			6		8	SB					
21.0	SAND, fine to medium grained, brown, waterbearing, loose (SP)										
	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	12:40	21'	19.5'	21'		15.5'
11-16-94	12:55	21'	NONE	11.6'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 13:00

METHOD 3.25" HSA 0' to 19.5'

EAST: 210.00 NORTH: 630.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-5

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

SURFACE ELEVATION 101.6

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
0.5	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, brown, moist (CL)	Mixed Alluvium	8		2	SB					
	SAND, fine to medium grained, lenses of silty sand, reddish brown, moist, loose (SP)		6		3	SB	8				
			14		4	SB					
8.0	SAND WITH GRAVEL, fine to coarse grained, brown, moist, medium dense (SP)		15		5	SB	8				
12.0	SAND, fine to medium grained, brown, moist, dense (SP)		20		6	SB					
15.0	SAND WITH GRAVEL, fine to medium grained, brown, waterbearing, medium dense to dense (SP)		10	▽	7	SB					
			16		8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	13:45	21'	19.5'	21'		15'
11-16-94	14:00	21'	NONE	10'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 13:50

METHOD 3.25" HSA 0' to 19.5'

EAST: 408.00 NORTH: 630.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-6

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 106.1)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or RQD
0.7	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, brown, moist (CL)	Mixed Alluvium	20		2	SB	6				
	SILTY SAND WITH SOME GRAVEL, a few cobbles, brown, moist, dense (SM)										
5.0			18		3	SB					
	SAND, fine to medium grained, reddish brown, moist, dense (SP)										
7.5			16		4	SB	11				
	SAND WITH GRAVEL, fine to medium grained, brown, moist, dense to medium dense (SP)										
			12		5	SB					
12.0											
	SAND WITH SOME GRAVEL, fine grained, brown, moist to waterbearing, medium dense (SP)		11		6	SB					
			13		7	SB					
			11	▽	8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	14:40	21'	19.5'	21'		20.5'
11-16-94	14:45	21'	NONE	14'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 14:40

METHOD 3.25" HSA 0' to 19.5'

EAST: 555.00 NORTH: 630.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-7

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 117.7)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
0.5	TOPSOIL	Topsoil			1	FA					
	SILTY SAND WITH A LITTLE GRAVEL, brown, moist, loose to medium dense (SM)	Mixed Alluvium	15		2	SB					
			16		3	SB	8				
			7		4	SB					
			19		5	SB	14				
12.5			17		6	SB					
	SAND WITH SOME GRAVEL, fine to medium grained, light brown, moist, dense (SP)		22		7	SB					
15.0	SAND WITH A LITTLE GRAVEL, fine to medium grained, brown, moist, dense to medium dense (SP)										
			24		8	SB					
			14		9	SB					
26.0	End of Boring @ 26'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	15:30	26'	24.5'	26'		NONE
11-16-94	15:40	26'	NONE	13'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 15:30

METHOD 3.25" HSA 0' to 24.5'

EAST: 555.00 NORTH: 360.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-8

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 111.5)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or ROD
0.8	TOPSOIL	Topsoil			1	FA					
2.5	SANDY CLAY WITH GRAVEL, trace organics, brown, moist (CL)	Mixed Alluvium	10		2	SB	10				
	SILTY SAND WITH GRAVEL, reddish brown, moist to wet, loose to medium dense (SM)		12		3	SB					
			8		4	SB	9				
			16		5	SB					
			20		6	SB					
14.5	SANDSTONE, yellowish brown and white, moist, very dense	Sandstone	50/.2		7	SB					
			50/.2		8	SB					
			50/.2		9	SB					
26.0	End of Boring @ 26'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-16-94	16:30	26'	24.5'	26'		NONE
11-16-94	16:40	26'	NONE	18.5'		NONE

START 11-16-94 COMPLETE 11-16-94 @ 16:30

METHOD 3.25" HSA 0' to 24.5'

EAST: 555.00 NORTH: 75.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-9

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 98.2)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
0.6	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, brown, moist (CL)	Mixed Alluvium	49		2	SB	8				
	SAND WITH GRAVEL, fine to medium grained, brown, moist, very dense to dense (SP)		43		3	SB					
			29		4	SB					
9.5	SAND WITH GRAVEL, medium to coarse grained, brown, moist to waterbearing, loose (SP)		8	▽	5	SB	16				
12.0	SAND WITH SOME GRAVEL, fine to medium grained, brown, waterbearing, dense (SP)		21		6	SB					
14.0	SAND WITH GRAVEL, medium to coarse grained, brown, waterbearing, medium dense (SP)		14		7	SB					
16.0	End of Boring @ 16'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-17-94	16:00	16'	14.5'	16'		10.5'
11-17-94	16:10	16'	NONE	6.4'		NONE

START 11-17-94 COMPLETE 11-17-94 @ 16:05

METHOD 3.25" HSA 0' to 14.5'

EAST: 60.00 NORTH: 735.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-10

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 99.9)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	W	D	LL	PL	Qu or RQD
0.7	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, brown, moist (CL)	Mixed Alluvium	19		2	SB					
	SAND WITH SOME GRAVEL, fine to medium grained, brown, moist, medium dense to dense (SP)		15		3	SB	7				
7.0	SAND WITH GRAVEL, medium to coarse grained, brown, moist, dense (SP)		24		4	SB					
			13		5	SB					
10.5	SAND WITH SOME GRAVEL, fine to medium grained, light brown, moist to waterbearing, medium dense to very loose (SP)		7	▽	6	SB	20				
			4		7	SB					
16.0	End of Boring @ 16'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-17-94	16:40	16'	14.5'	16'		12.5'
11-17-94	16:55	16'	NONE	7.2'		NONE

START 11-17-94 COMPLETE 11-17-94 @ 16:50

METHOD 3.25" HSA 0' to 14.5'

EAST: 300.00 NORTH: 785.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-11

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 95.7)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
0.5	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY, trace organics, brown, moist (CL)	Mixed Alluvium	4		2	SB					
	SAND WITH SOME GRAVEL, fine to medium grained, brown, moist, medium dense to dense (SP)		11		3	SB	9				
			10		4	SB					
			17	▽	5	SB					
			21		6	SB					
			24		7	SB	15				
			26		8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-18-94	9:10	21'	19.5'	21'		10'
11-18-94	9:30	21'	NONE	6.7'		NONE

START 11-18-94 COMPLETE 11-18-94 @ 9:25

METHOD 3.25" HSA 0' to 19.5'

EAST: 60.00 NORTH: 945.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-12

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 101.7)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LAB TESTS W	D	LL	PL	Qu or RQD
0.4	TOPSOIL	Topsoil			1	FA					
2.0	SILTY SAND, trace organics, brown, moist (SM)	Mixed Alluvium									
	SAND, fine to medium grained, light brown, moist, medium dense (SP)		10		2	SB	4				
5.0			15		3	SB					
	SILTY SAND WITH SOME GRAVEL, brown, moist, medium dense (SM)										
7.5			15		4	SB	4				
	SAND WITH SOME GRAVEL, fine to coarse grained, brown, moist, medium dense (SP)		15		5	SB					
			15		6	SB					
14.5											
	SAND, fine to medium grained, brown, waterbearing, medium dense (SP)		14	▽	7	SB					
			14		8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-18-94	10:20	21'	19.5'	21'		15'
11-18-94	10:40	21'	NONE	8.6'		NONE

START 11-18-94 COMPLETE 11-18-94 @ 10:35

METHOD 3.25" HSA 0' to 19.5'

EAST: 540.00 NORTH: 835.00

CREW CHIEF Fields

Huntingdon

LOG OF TEST BORING

JOB NO. 8200-95-076 VERTICAL SCALE 1" = 4' BORING NO. B-13

PROJECT PROPOSED BLOOMER SCHOOL; BLOOMER WISCONSIN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 100.7)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
0.5	TOPSOIL	Topsoil			1	FA					
2.0	SANDY CLAY WITH A LITTLE GRAVEL, trace organics, dark brown, moist (CL)	Mixed Alluvium									
	SAND WITH SOME GRAVEL, fine to medium grained, brown, moist to waterbearing, loose to very dense (SP)		35		2	SB					
			16		3	SB	5				
			20		4	SB					
			18	▽	5	SB					
			20		6	SB	13				
			8		7	SB					
			16		8	SB					
21.0	End of Boring @ 21'										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
11-18-94	11:20	21'	19.5'	21'		10.5'
11-18-94	11:35	21'	NONE	8'		NONE

START 11-18-94 COMPLETE 11-18-94 @ 11:30

METHOD 3.25" HSA 0' to 19.5'

EAST: 540.00 NORTH: 1050.00

CREW CHIEF Fields

Huntingdon

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

DESCRIPTIVE TERMINOLOGY

DENSITY TERM	"N" VALUE	CONSISTENCY TERM
Very Loose	0-4	Soft
Loose	5-8	Medium
Medium Dense	9-15	Rather Stiff
Dense	16-30	Stiff
Very Dense	Over 30	Very Stiff

Standard "N" Penetration: Blows Per Foot of a 140 Pound Hammer Falling 30 inches on a 2 inch OD Split Barrel Sampler

Lamination	Up to 1/2" thick stratum
Layer	1/2" to 6" thick stratum
Lens	1/2" to 6" discontinuous stratum, pocket
Varved	Alternating laminations of clay, silt and/or fine grained sand, or colors thereof
Dry	Powdery, no noticeable water
Moist	Below Saturation
Wet	Saturated, above liquid limit
Waterbearing	Pervious soil below water

TERMS FOR GRAVEL PROPORTIONS

Term	Gravel Percent
A little gravel	1 - 14
With gravel	15 - 50

RELATIVE SIZES

Boulder	Over 12"
Cobble	3" - 12"
Gravel	
Coarse	3/4" - 3"
Fine	#4 - 3/4"
Sand	
Coarse	#4 - #10
Medium	#10 - #40
Fine	#40 - #200
Silt & Clay	-#200, Based on Plasticity

KEY TO DRILLING SYMBOLS

SB - Split spoon sampler

FA - Flight auger

NMR - No measurement recorded

3T - 3" Thin wall

Water level

NSR - No sample recovered

HSA - Hollow stem auger

3L - 3½" SB Liner Sample

KEY TO WELL SYMBOLS

PIPE: Solid Pipe packed in granular material

SANDW/SP: Sand backfill with slotted pipe

RISER: Riser

SLOTPIPE: Slotted pipe packed in granular material

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES
ASTM Designation: D 2487 - 83
(Based on Unified Soil Classification System)

SOIL ENGINEERING

			Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]	Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$C_u \geq 4$ and $1 \leq C_c \leq 3$[E]	GW	Well graded gravel[F]
			$C_u < 4$ and/or $1 > C_c > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$C_u \geq 6$ and $1 \leq C_c \leq 3$[E]	SW	Well-graded sand[I]
			$C_u < 6$ and/or $1 > C_c > 3$[E]	SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes 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	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay[K,L,M,N] 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	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay[K,L,M,P]
					Organic silt[K,L,M,Q]
Highly organic soils		Primarily organic matter, dark in color, and organic odor		PT	Peat
Fibric Peat >67% Fibers		Hemic Peat 33%-67% Fibers		Sapric Peat <33% Fibers	

[A] Based on the material passing the 3-in. (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] 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

[D] 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

[E] $C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

[K] If soil contains 15 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 to group name.

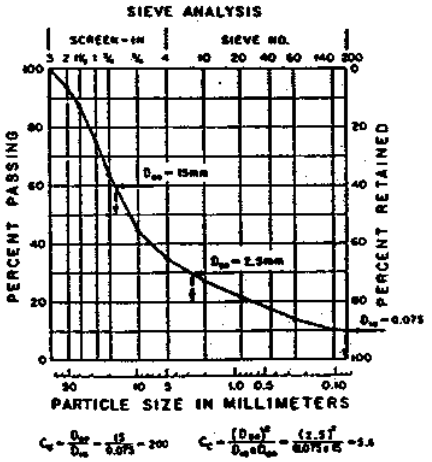
[M] If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.

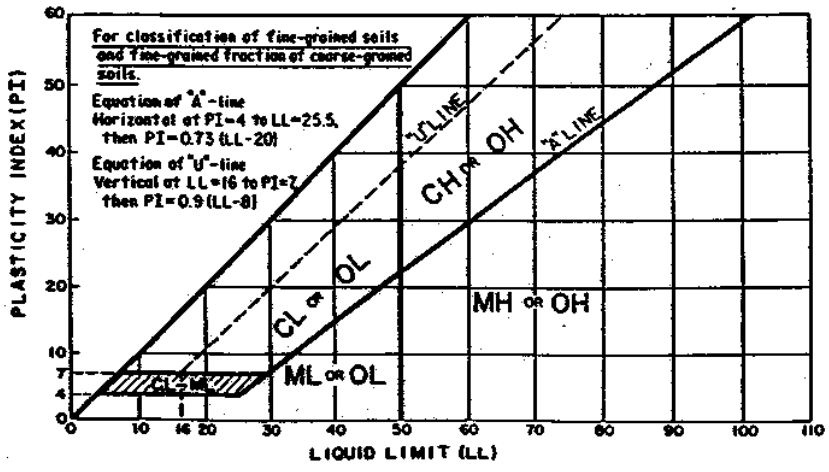
[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.





IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years due in large measure to programs and publications of ASFE/The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and it's orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used:*

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage,* to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of the subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final borings logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* to inclusion in architectural or other design drawings because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed under the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

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THE ASSOCIATION OF ENGINEERING FIRMS
PRACTICING IN THE GEOSCIENCES

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