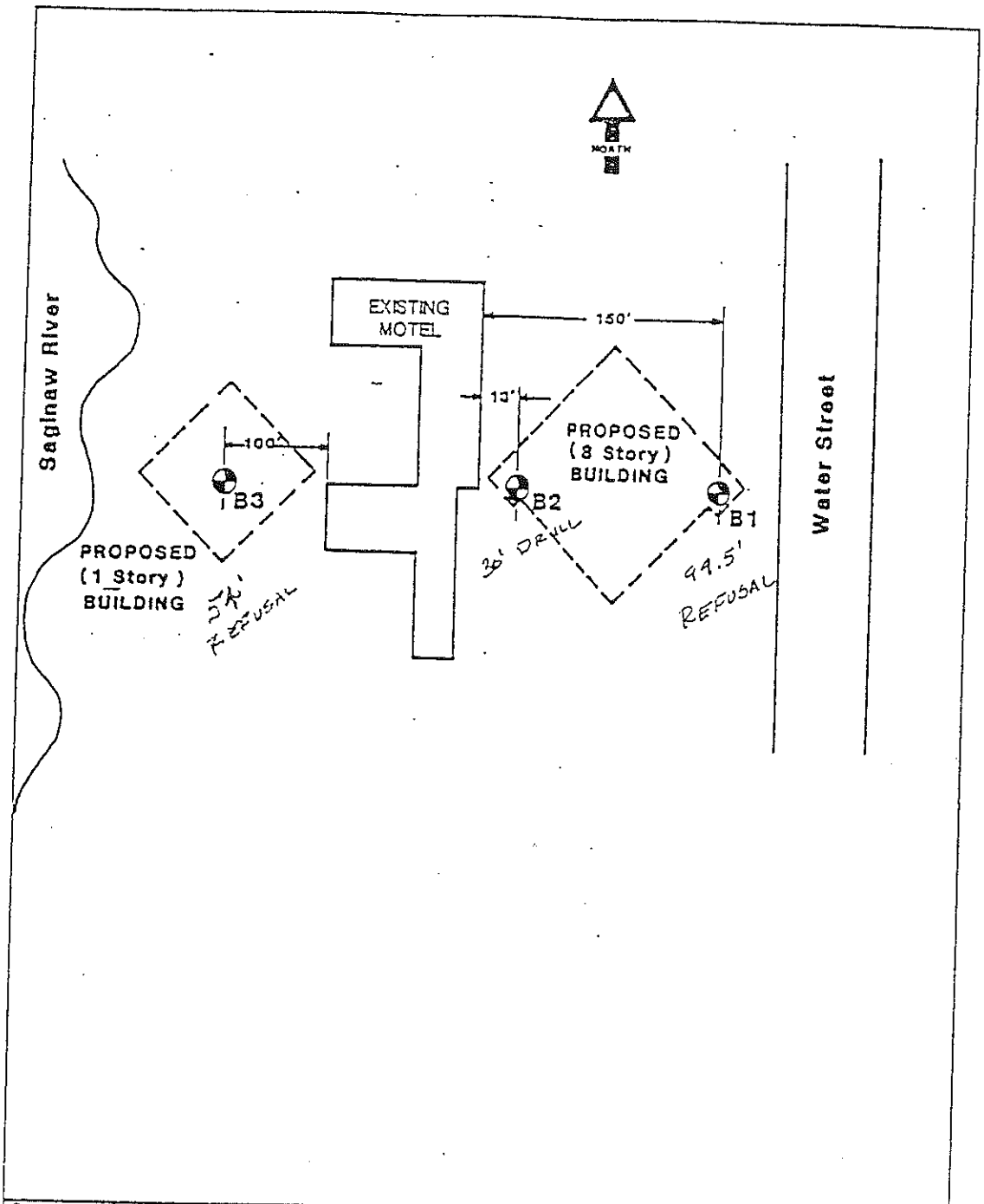
APPENDIX A

SME 1987 SOIL BORING LOCATION MAP AND SOIL BORING DESCRIPTIONS,

RC 1995 PHASE II SAMPLE LOCATION MAPS, SAMPLE ANALYSIS, SOIL BORING DESCRIPTIONS AND ASBESTOS ANALYSIS



Date 10-28-87	ANN ARBOR	soil and materials engineers, inc	SOIL BORING LOCATION DIAGRAM
Drawn by CB	BATTLE CREEK		MUTUAL CENTER
Scale NTS	BAY CITY		BAY CITY, MICHIGAN
Job 811119	LANSING		
	LIVONIA		

1-17-95	BAY CITY	soil and materials engineers, inc.	1987 SOIL BORING LOCATION DIAGRAM
Drawn By DAO	KALAMAZOO		PROPOSED CONFERENCE CENTER ESA I
Scale None	LANSING		612 N WATER STREET & 50 6TH STREET
Job BE22675	PLYMOUTH		BAY CITY, MICHIGAN
	TOLEDO		

NAME: MUTUAL CENTER
LOCATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: WD/JG DATE: 10-16-87 BORING B-1
JOB NUMBER: B-11119 SHEET: 1/3

DRILLER: GW | RIG: GLD-55B

SYMBOLIC PRO.

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SAMPLE TYPE, NUMBER & INTERVAL

STANDARD PENETRATION - ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % - ■
LIMITS - ⊢—⊣ 0 10 20 30

LEGEND
▽ -PENETROMETER TEST
⊗ -TORVANE SHEAR TEST
⊙ -UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KSF/SQ. FT.) 0 1 2 3 4 5

SS1
SS2
SS3
SS4
SS5
SS6
SS7
SS8
SS9
SS10

MIXED FILL WITH SAND, CLAY, WOOD, SAWDUST, ASPHALT, CONCRETE AND STEEL, BROWN & DARK BROWN, MOIST (FILL)

SILTY CLAY, W/ OCC. THIN WET SAND SEAMS, TRACE GRAVEL & SAND, BROWN CHANGING TO GRAY AT 80', VERY STIFF TO MEDIUM (CL)

WATER LEVEL OBSERVATIONS

MINERAL WELL PERMIT NUMBER:

: MUTUAL CENTER
ATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: WD/JG DATE: 10-16-87 BORING B-1
JOB NUMBER: B-11119 SHEET: 2/3

DRILLER: GW | RIG: CME-55B

SYMBOLIC PRO

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SAMPLE TYPE, NUMBER & RECOVERY

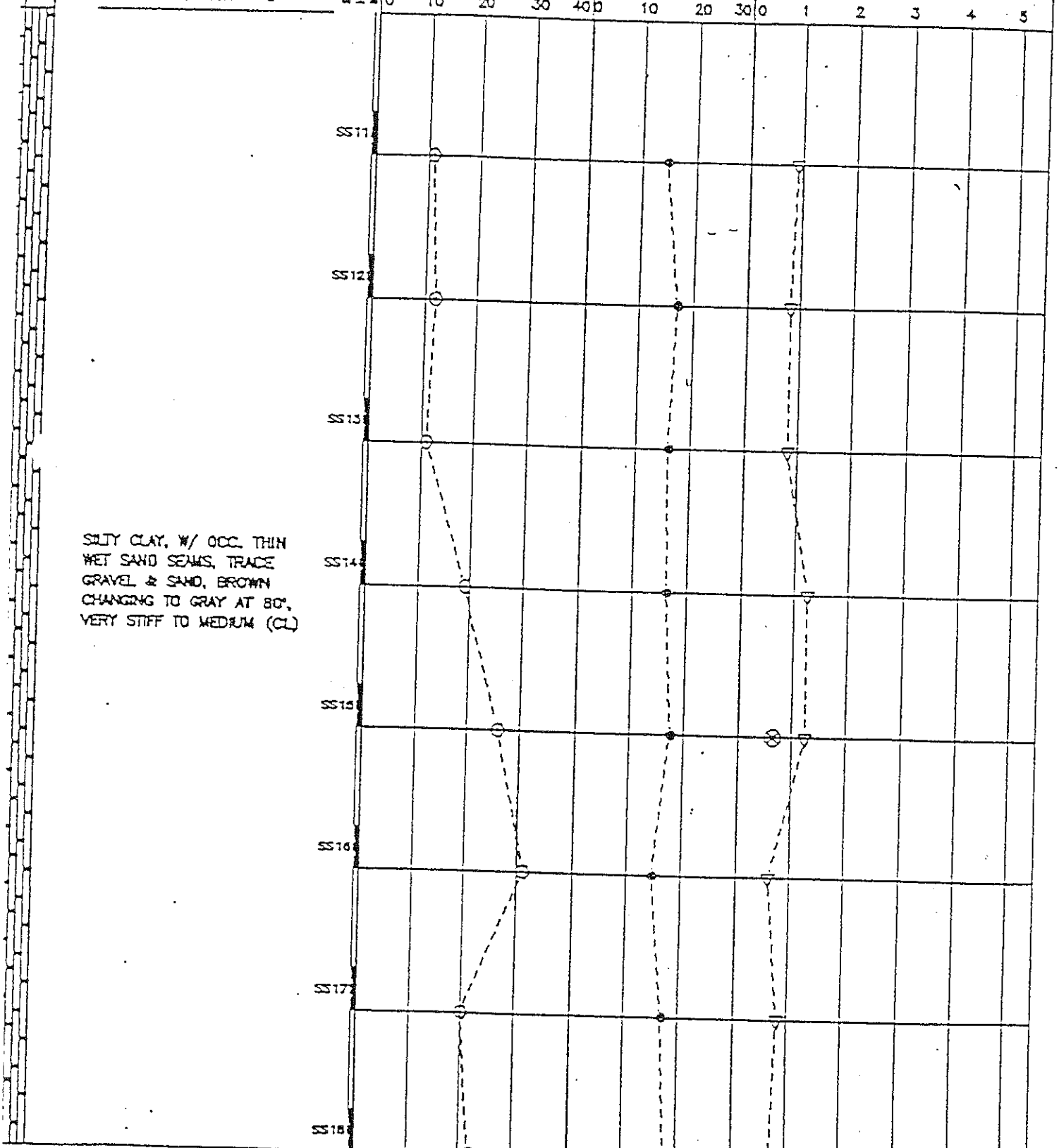
STANDARD PENETRATION - ⊙ (BLOWS/FOOT)

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.)

MOISTURE % - ● LIMITS - ⊢⊣

LEGEND
▽ -PENETROMETER TEST
⊗ -TORVANE SHEAR TEST
⊙ -UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (TSF)



SILTY CLAY, W/ OCC. THIN WET SAND SEAMS, TRACE GRAVEL & SAND, BROWN CHANGING TO GRAY AT 80', VERY STIFF TO MEDIUM (CL)

WATER LEVEL OBSERVATIONS

MINERAL WELL PERMIT NUMBER:

NOTES: 1. THE MOISTURE STRATIFICATION ...

Soil and Materials Engineers, Inc.

ME: MUTUAL CENTER
CATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: WD/JG DATE: 10-16-87 BORING B-1
JOB NUMBER: B-11119 SHEET: 3/3

DRILLER: GW | RIG: GLD-55B

SYMBOLIC PROFILE

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SAMPLE TYPE & NUMBER & INTERVAL

STANDARD PENETRATION – ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY – ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % – ● LIMITS – |—|

LEGEND
▽ –PENETROMETER TEST
⊗ –TORVANE SHEAR TEST
⊙ –UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KSF/SQ. FT.) 0 1 2 3 4 5

SS19

SILTY CLAY, W/ OCC. THIN WET SAND SEAMS, TRACE GRAVEL & SAND, BROWN CHANGING TO GRAY AT 80', VERY STIFF TO MEDIUM (CL)

SS20

33.6%

SILTY CLAY, GRAY, HARD (CL) (WEATHERED SHALE)

SS21

146

4.5+

NOTE(S):
1. DRILLER USED HOLLOW STEM AUGERS TO A DEPTH OF 80 FEET AND ROTARY DRILLING TECHNIQUES BELOW 80 FEET.
2. DRILLER REPORTED REFUSAL AT 99.4'.

WATER LEVEL OBSERVATIONS

soil and materials engineers, inc.

1E: MUTUAL CENTER
CATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: WD/JG DATE: 10-16-87 BORING B-2
JOB NUMBER: B-11119 SHEET: 1/1

DRILLER: GW | RIG: GLD-55B

SYMBOLIC PROFILE

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SAND AND CLAY-SEE NOTE 1

MIXED FILL W/ SAND, CLAY, SAWDUST, WOOD, BRICK, GRAVEL, DARK BROWN & BROWN, MOIST (FILL)

SAMPLE TYPE, NUMBER & INTERVAL

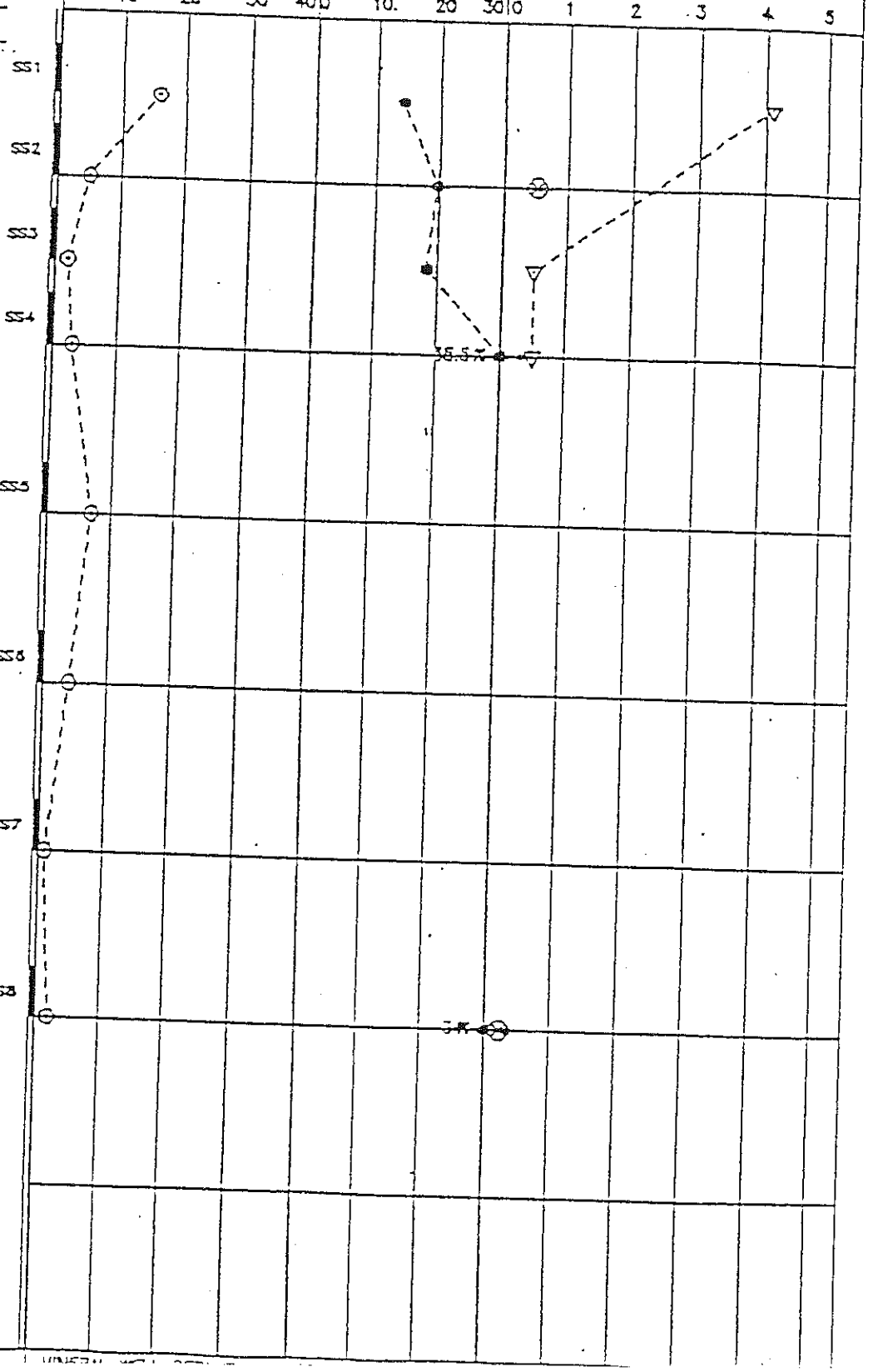
STANDARD PENETRATION - ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % - ● UNITS - ⊢⊣

LEGEND
▽ -PENETROMETER TEST
⊗ -TORVANE SHEAR TEST
⊙ -UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KIPS/SQ. FT.) 0 1 2 3 4 5



NOTE(S):
1. DRILLER REPORTED 12 INCHES OF CRUSHED ROCK, SAND AND CLAY. (PARKING LOT).
DRILLER REPORTED DRY CAVE IN AT 8.5' DEPTH.
2. DRILLER USED HOLLOW STEM AUGERS FROM 0' TO 28.5'.

WATER LEVEL OBSERVATIONS

soil and materials engineers, inc.

: MUTUAL CENTER
TION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: TSC/JG DATE: 10-21-87 BORING B-3
JOB NUMBER: B-11119 SHEET: 1/3

DRILLER: GW | RIG: GLD-55B

SYMBOLIC PROFILE

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0'

SAND & GRAVEL-SEE NOTE 1

MIXED GRAVEL, SAND, CONCRETE, TOPSOIL, BRICK, WARE, WOOD, CLAY, GRAY, WET (FILL)

MIXED SAND, CLAY AND SILT, TRACE TO SOME GRAVEL & BLACK PEAT, BROWN & BLACK, VERY SOFT OR VERY LOOSE (FILL)

SILTY CLAY TO CLAYEY SILT, TRACE SAND, TRACE SHELLS, GRAY, SOFT (CL/ML) (MARL)

MEDIUM TO COARSE SAND, TRACE SILT & GRAVEL, BROWN, WET, VERY LOOSE TO MED. DENSE (SP)

SAMPLE TYPE & NUMBER & INTERVAL

STANDARD PENETRATION - ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % - ● LIMITS - ⊢—⊣ 0 10 20 30

LEGEND
▽ - PENETROMETER TEST
⊗ - TORVANE SHEAR TEST
⊙ - UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KIPS/SQ. FT.) 0 1 2 3 4 5

SS1
SS2
SS3
SS4 33.3%
SS5 39.2%
SS6 12.7%
SS7
SS8

soil and materials engineers, inc.

NAME: MUTUAL CENTER
LOCATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: TSC/JG DATE: 10-21-87 BORING B-3
JOB NUMBER: B-11119 SHEET: 2/3

DRILLER: GW | RIG: GLD-55B

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SYMBOLIC PROFILE (FEET)

SAMPLE TYPE, NUMBER & INTERVAL

STANDARD PENETRATION - ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % - ● LIMITS - ⊢⊣ 0 10 20 30

LEGEND
▽ -PENETROMETER TEST
⊗ -TORVANE SHEAR TEST
⊙ -UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KSF/SQ. FT.) 0 1 2 3 4 5

MEDIUM TO COARSE SAND, TRACE SILT & GRAVEL, BROWN, WET, VERY LOOSE TO MED. DENSE (SP)

SS9

FINE TO MEDIUM SAND, TRACE SILT & SHELL, BROWN, WET, MED. DENSE (SP/SM)

SS10

SILTY SAND, TRACE GRAVEL, TRACE SHELL, BROWN, WET, DENSE (SM)

SS11

SS12

SILTY CLAY, TRACE SAND & GRAVEL, GRAY, MEDIUM (CL)

soil and materials engineers, inc.

NAME: MUTUAL CENTER
LOCATION: BAY CITY, MICHIGAN

A/E: A.V. BOGAERTS/LEFKOFSKY-BOBISH
BY: TSC/JG DATE: 10-21-87 BORING B-3
JOB NUMBER: B-11119 SHEET: 3/3

DRILLER: GW RIG: GLD-558

SYMBOLIC PROFILE

PROFILE DESCRIPTION

GROUND SURFACE ELEVATION = 0

SILTY CLAY, TRACE SAND & GRAVEL, GRAY, MEDIUM (CL)

SILTY CLAY, GRAY, HARD (CL) (WEATHERED SHALE)

SAMPLE TYPE & NUMBER & INTERVAL

SS13

STANDARD PENETRATION - ⊙ (BLOWS/FOOT) 0 10 20 30 40

NATURAL DRY DENSITY - ⊡ (LBS/CU. FT.) 100 110 120 130

MOISTURE % - ● LIMITS - ⊢—⊣ 0 10 20 30

LEGEND
▽ -PENETROMETER TEST
⊗ -TORVANE SHEAR TEST
⊙ -UNCONFINED COMPRESSION TEST

SHEAR STRENGTH (KSF/SQ. FT.) 0 1 2 3 4 5

160 ⊙—●

4.5* ▽—

NOTE(S):
1. DRILLER REPORTED 12 INCHES OF GRAY TO BROWN SAND, GRAVEL & CLAY (PARKING LOT).
2. DRILLER USED HOLLOW STEM AUGERS TO 30' AND ROTARY DRILLING TECHNIQUES BELOW 30'.
3. DRILLER REPORTED REFUSAL AT 54.5'.