IBM B952/982 SITE
Reclassification Petition

Volume 1
Text, Tables and Figures
Appendices A, B and C

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1 SUMMARY INTRODUCTION

This petition to reclassify the IBM B952/982 leased property from a Class 2a to a Class 4 on the New York State Registry has been prepared by Groundwater Sciences Corporation (GSC) at the request of the IBM Corporation's Poughkeepsie, New York, Plant Site (IBM Poughkeepsie). As shown on Figure 1-1, the B952/982 site is located in Dutchess County, New York, in the town of Poughkeepsie. A copy of the current Inactive Hazardous Waste Disposal Report, as it appears in the April 1992 version of the New York State Registry, is reproduced herein in Appendix A.

1.1 Summary Conclusions and Recommendations

The following subsections present a summary of the technical history of the B952/982 site; conclusions that have been drawn following site characterization, remediation and eight years of post-remedial monitoring; and recommendations for future monitoring.

1.1.1 Summary

Figure 1-2 shows the B952/982 site boundaries, the locations of two buildings that have been constructed on this site and have been referred to by IBM as B952 and B982, the location of other current and former IBM leased buildings on adjacent properties, and the locations of on-site and off-site monitoring wells. Subsurface investigations performed beneath and around these buildings in 1981 and 1982 identified volatile organic, base neutral and acid extractable compounds in the soils beneath B952 and a small portion of B982, as well as in the area between these two buildings. Furthermore, analyses of groundwater samples recovered from the monitoring wells shown on Figure 1-2 indicated the presence of volatile organic and base neutral compounds at concentrations which in some cases exceeded New York State Groundwater Standards (NYSGWS), particularly in the wells located between these two buildings.

Figure 1-3 shows the area within which a soil remediation project was implemented in 1984, which entailed the excavation and disposal, in a secure landfill, of approximately 5,300 cubic yards of soil. The delineation of soil that was removed for off-site disposal was based on the analysis of 662 soil samples, the results of which were compared to soil removal criteria provided by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated July 6, 1984. This letter is reproduced herein in Appendix A. An additional 5,300 cubic yards of soil, some of which contained organic compounds at concentrations lower than the NYSDEC criteria, were either left in place or used as backfill.

From 1985 to 1992, post-remedial monitoring was performed at on-site and off-site monitoring wells for the constituents which had previously been detected in groundwater and soils beneath this site. In all, a total of 143 groundwater samples were collected and analyzed during this post-remedial monitoring program. The last sampling round in this post-remedial monitoring program was conducted during November and December 1992. During this sampling round, all existing on-site and off-site monitoring wells were sampled. The results of this sampling round showed that none of the off-site wells exhibited concentrations of any constituent greater than NYSGWS. For the on-site monitoring wells, this sampling round showed that NYSGWS were exceeded in only two monitoring wells (952-10RA and 952-11R, on Figure 1-2), which are within or immediately adjacent to the 1984 soil excavation area (Figure 1-3), in which, as noted above, some soil still contained organic compounds at concentrations lower than the NYSDEC criteria.

Resampling of soils beneath B952 in 1992 has also shown that volatile organic compounds (VOCs) previously detected beneath this building have dissipated since the original sampling in 1982. This sampling, as well as the 1982 sampling results, also indicate that other organic compounds detected beneath this building and a small portion of B982 are at concentrations that do not exceed proposed EPA Action Levels for corrective action under RCRA, or soil/sediment action levels published in NYSDEC's draft "contained-in" criteria guidance or NYSDEC's draft cleanup policy.

1.1.2 Conclusions

Based on the technical history of this site over the past 12 years, the following conclusions have been drawn:

- The soil remediation performed in 1984 has been effective in diminishing organic chemical concentrations in the groundwater plume beneath this site to levels that do not exceed NYSGWS in all portions of the site except the original source area.

- Elevated chlorinated benzene concentrations in the groundwater within the source area following remediation in 1984 have not spread downgradient during the intervening eight years.

- Organic chemical concentrations exceeding NYSGWS are limited to two wells within an area immediately adjacent to the source area.

- Organic chemical concentrations in soil beneath B952 and a small portion of B982 are consistently below proposed Federal and New York State cleanup action levels.

1.1.3 Recommendations

On the basis of these conclusions and the technical history of this site, the following recommendations are made:

- No further remedial action is necessary at this site. In particular, remediation of soils beneath B952 and a small portion of B982 is not necessary because recent sampling shows VOCs have dissipated and the concentration of remaining organic compounds do not exceed proposed federal and state soil cleanup action levels.

- This site should be reclassified as a Class 4 site, and groundwater monitoring should be performed at 11 existing on-site wells.

- This site should be reclassified from a Class 2a to a Class 4 site. A Class 2a designation suggests that not enough is known about the site to finalize its classification. However, the site has been fully characterized and remediated, and eight years of post-remedial monitoring indicates substantial improvement in groundwater quality as a result of site remediation. Therefore, all that remains to be done is continued monitoring, which places the site in the Class 4 designation.

1.2 Purpose and Organization

As noted in the introduction, this report has been prepared as a petition to reclassify the B952/982 site from Class 2a to Class 4. As such, it is intended to present all technical information necessary for the review of this petition and to justify changing the classification.

The remainder of this report is divided into five sections. Section 2 presents a summary of the hydrogeology of this site, Section 3 describes the site chemical characterization, Section 4 summarizes the remedial activities that have been performed at this site, Section 5 discusses the results of post-remedial monitoring, and Section 6 presents the proposed groundwater monitoring program. Volume 1 contains text, tables, figures, and Appendices A, B and C. Volume 2 contains Appendices D, E and F.

2 HYDROGEOLOGY

The B952/982 site, as shown on Figure 2-1, lies topographically in a broad upland approximately 135 feet above mean sea level (amsl) between Casper Creek, 2,000 feet to the southeast, and a small unnamed stream, 3,500 feet to the northwest. The site is flanked on the northeast and southwest by two prominent hills with elevations greater than 200 ft amsl. Surface water drainage from the site is primarily to the southeast toward Casper Creek.

2.1 Geologic Setting

Also illustrated on Figure 2-1 is the location of the site in a one-mile-wide strip of land oriented northeast-southwest and underlain by dolostone of the Wappinger Formation (OCw). The formation boundary on the northwest side of this band is a thrust fault contact with the shaley Normanskill Formation. The formation boundary on the southeast side of this band is a normal stratigraphic contact with the Normanskill Formation.

The dolostone bedrock of the Wappinger Formation is overlain by a variable thickness of unconsolidated sediments, including till, outwash, and lacustrine deposits. These unconsolidated sediments are of glacial origin and are the result of erosion and sedimentation by continental glaciers which smoothed bedrock topography, rounded off hilltops, and filled valleys with sediments during the last million years. These sediments have since been reworked by recent streams and now almost completely blanket the bedrock in the area of the site.

2.2 Site Geology

Figure 2-2 shows 28 locations (952-1 to 952-28) at which borings have been drilled to characterize the geology of the B952/982 site and adjacent properties also formerly leased by IBM. Geologic logs for these borings are presented in Appendix B. The following sections describe the unconsolidated sediments and bedrock encountered in these borings.

2.2.1 Unconsolidated Sediments

Figure 2-2 also shows the locations of two cross sections drawn to describe the subsurface geology. As shown on these cross sections (Figures 2-3 and 2-4), the primary unconsolidated sediments found under the B952/982 site are, from oldest to youngest:

1. Glacial till, a poorly sorted mixture of boulders, gravel, sand, silt, and clay deposited directly by contact with ice;

2. Generally poorly sorted outwash material consisting of gravels, sands, and silts which is the result of re-working of till and other materials by glacial meltwater;

3. Alluvial silts and clays which are the results of deposition in a low-energy environment such as a glacial lake;

4. Man-made fill materials which lack bedding or structure.

The unconsolidated sediments are more than 55 feet thick at boring 952-14R southeast of B982 but are less than ten feet thick along Route 9 on the northeast side.

2.2.2 Bedrock

As previously noted, the bedrock underlying the site is dolostone, a calcium magnesium carbonate rock prone to solution weathering by groundwater, particularly in zones where the rock is highly fractured. Solution features were apparent in some of the borings, particularly 952-11R which contained an open void from 79 to 105 feet below ground surface. The bedrock in the area of the site generally strikes N 25-35° E and dips to the southeast at varying angles greater than 45°. The overlying contact with the unconsolidated sediments is an erosional surface. Figure 2-5 is a top of bedrock topographic contour map.

Total relief of the bedrock surface beneath the site property is approximately 40 feet, ranging from a low of 81 ft amsl at boring 952-14R to a high of 121 ft amsl at boring 952-6R. The bedrock contour map generally reveals a closed depression centered on 952-14R with the surrounding bedrock surface generally rising to the east, north and west.

2.3 Groundwater Flow

Beneath the site, groundwater flow occurs primarily within the dolostone bedrock. In this regard, apart from isolated zones of perched water on top of silt and clay lenses within the unconsolidated sediments, soils are generally unsaturated. However, comparison of the bedrock topographic map (Figure 2-5) and the measured groundwater elevations indicates that saturated soils less than ten feet thick probably occur in the bedrock depression centered on boring 952-14.

Several nested bedrock piezometers have been constructed at this site. Water levels measured in these piezometers indicate a vertical gradient downward in the shallow bedrock and then horizontal flow within the deeper bedrock zone.

Figure 2-6 shows groundwater flow directions in the deeper bedrock zones. As shown on this map, the principal direction of groundwater flow is to the southeast off the B952/982 site in the direction of monitoring well 952-24. Groundwater elevation data measured quarterly over the past two years is presented in Appendix C.

3 SITE CHEMICAL CHARACTERIZATION

In the early 1980's, IBM began to investigate possible releases to the subsurface at the B952/982 site. This eventually lead to the installation and sampling of the monitoring wells shown on Figure 2-2, together with soil sampling from some of these borings and others completed solely for the purpose of soil sampling. The results of this chemical characterization are described in the following chronology of activities.

3.1 Chemical Storage Tank Boring - 1981

The B952/982 site had been used for various manufacturing and related activities which required the use of chemicals in quantities sufficient to be discharged to a central holding tank located in the courtyard between B952 and B982. This tank, which has since been removed, was periodically emptied and the contents were transported to a waste handling facility for proper disposal. The approximate former location of this tank is shown on Figure 3-1.

In October 1981, a single monitoring well, T-71 (later renamed 952-1R) (Figure 3-1), was installed near the old storage tank. The well was screened in the dolostone bedrock since the overlying unconsolidated deposits appeared to be dry. The well was developed and sampled in December 1981 and February 1982. As shown on Table 3-1, VOCs, including 1,1-dichloroethane, 1,2-dichloroethene, 1,1,1-trichloroethane, and trichloroethene, were detected at total concentrations of 203 micrograms per liter (µg/l) in the first sample and at 164 µg/l in the second sample. Based on the results of these groundwater analyses, further investigation was recommended, including the installation of additional monitoring wells screened in both the bedrock and in the unconsolidated sediments for the purpose of determining the local groundwater flow patterns, the extent of saturated soils, and the distribution of chemicals in the groundwater, soil, and bedrock beneath the site.

Table 3-1. Initial Sampling Results T-71 Boring

		Date Sampled	
	Units	12/2/81	2/17/82
Acid/phenolics	µg/l	ND	NA
Base neutrals	µg/l	ND	NA
Volatile organics	µg/l	--	--
Benzene	µg/l	≤10	ND
1,1-Dichloroethane	µg/l	26	10
trans-1,2-Dichloroethylene	µg/l	36	31
1,1,1-Trichloroethane	µg/l	77	71
Trichloroethylene	µg/l	54	52
Pesticides/PCBs	µg/l	--	ND
Aldrin	µg/l	0.02	--
Metals	mg/l	--	--
Soluble chromium	mg/l	0.010	--
Soluble copper	mg/l	0.010	--
Soluble nickel	mg/l	0.05	--
Soluble zinc	mg/l	0.012	0.012
Oil and grease	mg/l	<5	<5
pH	SU	7.6	8.1
Temp	°C	12.7	8.7
TOC	µg/l	44.4	5.4
NH_3-N	µg/l	0.23	0.05
Total cyanide		ND	NA
Total recoverable phenolics		ND	NA

NA Not analyzed
ND None detected

From LMS, 8/82 report

3.2 Expanded Site Characterization - 1982

As part of the expanded investigation begun in September 1982, monitoring wells were installed at the 27 additional locations shown on Figure 2-2. These included four single bedrock piezometers, 16 open-hole bedrock wells, four soil standpipes, and four nested piezometers (each consisting of several isolated screened intervals within the same borehole). Including the original boring 952-1R

and the now abandoned drinking water wells 952-DW-1 and 952-DW-2 (also shown on Figure 2-2), the monitoring network then consisted of 41 discrete monitoring intervals at 30 locations. Details of the well construction at each of these locations are shown on the logs in Appendix B. The following two subsections discuss the results of these expanded investigations.

3.2.1 Soil Chemistry

Borings to collect soil samples were completed both inside and outside the buildings at this site. The following sections describe the results of these sampling programs and Table 3-2 lists the chemicals detected in these soil samples, including the maximum concentrations and the location at which that concentration was observed.

3.2.1.1 Soil Beneath Buildings

As shown on Figure 3-2, soil samples were collected from 20 locations (labeled 952-A through 952-O and 982-A through 982-E) beneath the slab in B952 and B982 during late November and early December 1982. Boring log information is reproduced in Appendix B. Low concentrations of volatile and semi-volatile organic compounds and isolated high oil and grease concentrations were detected in the shallow soils beneath B952 and beneath a small portion of B982. The full soil chemistry database is reproduced in Appendix D, including a more detailed summary table (Table D-1).

3.2.1.2 Soil Outside Buildings

In addition to soil samples collected during the installation of the four soil standpipes (952-1S, -2S, -7S and -8S), soil samples were collected from 16 locations (labeled SS-2 through SS-17) during November 1982 in the alcove between B952 and B982. The locations of these borings are shown on Figure 3-3 and their logs are reproduced in Appendix B. The complete database for these samples is also reproduced in Appendix D, including more detailed summary tables.

Table 3-2. Summary of Maximum Detected Concentrations for 1982 Soil Sampling Activities

Parameter	Sampling Location	1982 Maximum Detected Concentration
Organic Compounds		
1,2-Dichlorobenzene	952-SS-08B	3,200 µg/l
Methylene chloride	952-SS-09B	3,110 µg/l
bis(2-Ethylhexyl) phthalate	952-SS-13	1,230 µg/l
di-n-Butyl phthalate	952-SS-13	1,000 µg/l
Pyrene	952-SS-04A	997 µg/l
Fluoranthene	952-SS-04A	973 µg/l
Butyl benzyl phthalate	952-L	833 µg/l
1,4-Dichlorobenzene	952-SS-08B	798 µg/l
Acrylonitrile	952-E	765 µg/l
Phenanthrene	952-GA	600 µg/l
Toluene	952-GA	428 µg/l
1,3-Dichlorobenzene	952-SS-08B	420 µg/l
Benzo(A)anthracene	952-SS-04A	363 µg/l
1,1-Dichloroethane	952-C	355 µg/l
Trichloroethylene	982-ED	237 µg/l
1,1,1-Trichloroethane	952-SS-04B	184 µg/l
Trichlorofluoromethane	952-GA	179 µg/l
1,1-Dichloroethylene	952-C	167 µg/l
1,1,2,2-Tetrachloroethane	952-E	103 µg/l
1,1,2-Trichloro-1,2,2-trifluoroethane	952-SS-04B	85 µg/l
1,2-Xylene	982-ED	64 µg/l
Bromoform	952-E	64 µg/l
Petroleum Products		
Oil and grease	952-GA	5,618 mg/l

3.2.2 Groundwater Chemistry

Groundwater sampling results from the additional monitoring wells installed in 1982 indicated low concentrations of dichlorobenzenes (DCBs) in or adjacent to the alcove between B952 and B982, but not in the downgradient wells. TCA and TCE were also detected in the source area and TCA was detected near the southern (downgradient) site boundary at 2.5 μg/l in well 952-14R. Those VOCs and base neutrals detected in groundwater are listed in Table 3-3. The full groundwater chemistry database is reproduced in Appendix E.

Table 3-3. VOCs and Base Neutrals Detected in Groundwater

VOCs

1,1-Dichloroethane
1,1-Dichloroethene
1,1,1-Trichloroethane
1,1,2-Trichloro(1,2,2)trifluoroethane
1,1,2,2-Tetrachloroethane
1,2-Dichloroethane
1,2-Dichlorobenzene
1,2-Dichloroethylene (total)
1,2-Xylene
1,2,4-Trichlorobenzene
1,3-Dichlorobenzene
1,3-Xylene
1,4-Dichlorobenzene
Bromodichloromethane
Benzene
Chlorobenzene
Chlorodibromomethane
Dichlorodifluoromethane
Methylene chloride
Ethylbenzene
Tetrachloroethylene
Bromoform
Trichloroethylene
Trichlorofluoromethane
Chloroform
Toluene
Xylenes (total)

Base Neutrals

bis(2-Ethylhexyl) phthalate
di-(n)Butyl phthalate
di-(n)Octyl phthalate
Fluoranthene
Naphthalene
Phenanthrene
Pyrene

4 REMEDIAL ACTION

Based on the results of these soil and groundwater investigations, remedial design and implementation was undertaken to remove soil from the area between B952 and B982 following the soil cleanup criteria specified by NYSDEC. This activity included extensive soil sampling to determine soil that would be removed and soil that would be left in place or used as backfill, and a subsequent program of soil excavation and disposal, both of which are discussed in the next two subsections.

4.1 Soil Sampling - 1984

From February through May 1984, a soil sampling plan was implemented in the courtyard area between and north of B952 and B982 (Figure 4-1). A grid was laid out on roughly 15-foot centers (with some adjustments for utilities (Figure 4-2) and subsurface conditions) and 87 borings, as shown on Figure 4-1, were drilled by hollow-stem augers in four phases. Appendix B contains logs for these soil borings. Samples were collected every three feet from ground surface to bedrock using standard split-spoon samplers. A total of 662 samples were collected to characterize more than 10,570 cubic yards of soil. Each soil sample represented a soil cell measuring 15' x 15' x 3'. Appendix F contains the full results of this soil sampling and analysis program. Tables 4-1 and 4-2 provide chemical compound summaries in terms of prevalence.

Table 4-1. Summary of VOC Data

Chemical Compound	Analysis by GC Number of Samples Containing this Compound
Benzene	104
Trichloroethylene	80
Ethylbenzene	44
Toluene	23
1,1,2,2-Tetrachloroethylene	20
Dichlorobenzenes	11
Bromoform	7
1,1,1-Trichloroethane	4
Chlorobenzene	3
Chlorodibromomethane	3
1,1-Dichloroethane	3
1,2-Dichloroethane	3
1,2-Dichloropropane	3
2-Bromo-1-chloropropane	3
Chloroform	2
cis-1,3-Dichloro-1-propene	2
1,1,2,2-Tetrachloroethane	2
1,1-2-Trichloroethane	2
Carbon tetrachloride	1
1,1-Dichloroethene	--
1,2-trans-Dichloroethylene	--

4.2 Soil Excavation and Disposal - 1984

The results of these chemical analyses were used, together with soil concentration criteria specified by NYSDEC (Appendix A), to determine which soil cells were to be removed for off-site disposal and which could remain on site. Figures 4-2 through 4-13 show those cells which were designated for off-site disposal based on these NYSDEC criteria. As noted previously, these criteria were provided to IBM by NYSDEC in a letter dated July 6, 1984, which is reproduced in Appendix A. As stated in NYSDEC's letter, these criteria are:

1. Total phthalates greater than 20 parts per million (ppm);

2. Total volatile organic compounds greater than 0.5 ppm;

3. Total base/neutral compounds (excluding phthalates) greater than 0.5 ppm;

4. Total acid extractable compounds and phenolics greater than 0.5 ppm.

Table 4-2. Summary of Base Neutral Extractable Data

Chemical Compound	Number of Samples Containing this Compound
bis(2-Ethylhexyl) phthalate	508
di-n-Butyl phthalate	417
di-n-Octyl phthalate	205
Diethyl phthalate	44
2,6-Dinitrotoluene	27
Benzo(A)anthracene	19
Chrysene	19
Pyrene	19
Anthracene	17
Phenanthrene	17
Fluoranthene	16
Benzo(B)fluoranthene	15
Benzo(K)fluoranthene	15
Benzo(A)pyrene	11
Butyl benzyl phthalate	7
1,2-Dichlorobenzene	6
1,3-Dichlorobenzene	6
1,4-Dichlorobenzene	6
1,2,4-Trichlorobenzene	4
Naphthalene	3
1,2-Diphenylhydrazine	2
Isophorone	2
Dibenzo(A,H)anthracene	2
Dimethyl phthalate	1
Acenaphthalene	1
Benzo(G,H,I)perylene	1

Excavation began in August 1984 and continued through November 1984 (see Appendix E for cross section views of excavation). Soil was segregated during excavation according to the NYSDEC criteria such that 5,274 cubic yards of soil were disposed of by secure landfilling and 5,297 cubic yards were stockpiled and reused as backfill material by mixing with 4,999 cubic yards of imported clean soil. Soil was excavated to bedrock only where off-site disposal of a soil cell in contact with bedrock was required.

5 POST-REMEDIAL ACTIVITIES

Activities undertaken since the 1984 remedial action include post-remedial monitoring of groundwater both on-site and off-site and resampling of soils beneath B952. The following subsections summarize the results of those activities.

5.1 Post-Remedial Monitoring - 1985-1992

Table 5-1 lists the well numbers and sampling dates associated with on-site and off-site post-remedial monitoring. In all, 143 groundwater samples were collected and analyzed for various parameters during the eight-year period from 1985 to 1992. The results of this post-remedial monitoring program are presented in Appendix E along with the results of the initial groundwater investigations.

The most recent sampling event in this program was performed during November and December 1992. This sampling round involved the collection and analysis of groundwater samples from ten on-site well locations and 13 off-site locations. Table 5-1 lists the specific wells sampled, which include all on-site and off-site wells in November and December 1992.

The results of this recent round showed no concentrations exceeding NYSGWS in any of the 13 off-site wells. For the ten on-site monitoring wells, the NYSGWS was exceeded for one or more constituents only in two wells immediately within or adjacent to the 1984 soil excavation area. These groundwater concentrations exceeding the NYSGWS are confined to the original source area and result from organic compounds still present in soil used as backfill in the 1984 excavation, at concentrations which did not exceed NYSDEC's soil cleanup criteria.

Table 5-1

GROUNDWATER SAMPLING PROGRAM, 1985-1992

Well ID	SAMPLE DATE FREQUENCY						
ONSITE							
952-006-R							11/21/92
952-008-R							11/21/92
952-009-R							11/21/92
952-010-RA^						04/16/91	02/28/92
						09/19/91	11/18/92
						11/26/91	
952-011-R	04/18/85	03/25/86	03/11/87	03/21/88	03/09/89	04/15/91	02/28/92
	09/23/85	08/07/86	09/28/87	09/15/88	08/04/89	09/19/91	11/03/92
				12/22/88		11/26/91	
						12/13/91	
952-012-R							12/21/92
952-013-R	04/19/85	03/25/86	03/11/87	03/21/88	03/08/89	12/13/91	11/19/92
	09/24/85	08/07/86	09/28/87	09/22/88	08/04/89		
952-014-R							11/18/92
952-015-R(C)							11/19/92
952-016-R							11/17/92
OFFSITE							
952-003-R	04/18/85	03/25/86	03/16/87	03/21/88	03/09/89	04/12/91	11/03/92
	09/23/85	07/31/86	09/28/87	09/22/88	08/04/89		
952-005-R							11/19/92
952-017-R(C)							11/04/92
952-017-RA		05/29/86	09/24/87	03/28/88	03/10/89	04/12/91	
		07/24/86		09/22/88	08/07/89		
952-017-RB		05/29/86	09/24/87	03/28/88	03/10/89		11/04/92
		07/31/86		09/22/88	08/08/89		
952-017-RC		05/29/86	09/24/87	03/28/88	03/10/89		
		07/31/86		09/22/88	08/08/89		
952-018-R							11/21/92
952-019-R							11/18/92
952-020-R	04/17/85	03/27/86	03/13/87	03/21/88	03/08/89	04/11/91	11/21/92
	09/25/85	08/07/86	09/23/87	09/22/88	08/08/89		
952-021-R							11/09/92
952-022-R(C)							11/05/92
952-022-RA		*	*	*	*	04/15/91	
952-022-RB		05/29/86	09/24/87	03/28/88	03/10/89	04/15/91	
		08/01/86		09/22/88	08/07/89		
952-022-RC		05/29/86	09/24/87	03/28/88	03/10/89	04/15/91	
		08/01/86		09/22/88	08/07/89		
952-023-R							11/23/92
952-024-R	04/18/85	03/27/86	09/28/87	03/21/88	03/09/89	04/15/91	02/28/92
	09/23/85	08/11/86		09/15/88	08/09/89	09/19/91	11/03/92
				12/22/88		11/26/91	
952-025-R	04/19/85	03/27/86	03/11/87	03/21/88	03/09/89	04/12/91	11/23/92
	09/23/85	08/11/86	09/28/87	09/15/88	08/08/89	10/28/91	
				12/22/88			
952-027-R(C)							11/20/92
952-028-R							11/18/92

*WELL NEEDED REPAIRS ^REPLACEMENT FOR ORIGINAL WELL (C)COMPOSITE OF NESTED PIEZOMETERS

Furthermore, Figure 5-1 presents a comparison of the initial characterization sampling in 1982 and the final sampling in 1992 for these ten on-site wells. As shown in this figure, the concentrations have declined at nearly all wells for all groups of constituents, with the notable exception of chlorinated benzenes in well 952-10R. In 1990, this well was redrilled in the original source area because it had been destroyed during soil excavation in 1984. The elevated chlorinated benzene concentrations in this redrilled well indicate that some of the soil placed back in the excavation contained sufficient concentrations of these compounds to produce localized, elevated concentrations in groundwater. Data for surrounding wells, however, show that these compounds have not spread downgradient during the eight years since the soil remediation was completed. Therefore, it is highly unlikely that they would spread beyond the immediate area of this well in the future.

5.2 Soil Sampling Inside Buildings - 1992

In March 1992, seven soil samples were collected from five historical sampling locations (Figure 5-2) beneath the concrete slab floor of B952. These samples were collected at locations and depths that had previously been sampled in 1982 to determine what changes had occurred over the intervening ten-year period. Table 5-2 compares the analytical results of the samples collected in 1982 with the results of the samples collected in 1992. This comparison indicates that VOCs in the soil have dissipated and that semi-volatile and oil and grease concentrations in the soil are essentially unchanged after ten years. In addition, the table shows that no proposed state or federal action levels are exceeded.

Table 5-2. B952/982 Soil Sampling Summary
Comparison with Cleanup Action Levels

Parameter	1982 Sampling Range of Detects (mg/kg)	1992 Sampling Range of Detects (mg/kg)	Draft Cleanup Policy NYSDEC 10/91 (mg/kg)	RCRA Concentrations Meeting Criteria for Action Levels (mg/kg)
Trichloroethene	ND - 0.099	ND - 0.0062	64	64
1,2-Dichlorobenzene	NA	ND - 0.0067	7000	No listing
Methylene chloride	ND - 0.332	ND	No listing	93
1,1-Dichloroethene	ND - 0.367	ND	No listing	12
1,1-Dichloroethane	ND - 0.355	ND	No listing	No listing
1,1,1-Trichloroethane	ND - 0.054	ND	No listing	7200
Bromoform	ND - 0.064	ND	No listing	1600
1,1,2,2-Tetrachloroethane	ND - 0.103	ND	No listing	No listing
1,1,2-Trichloro(1,2,2)trifluoroethane	ND - 0.079	NA	No listing	No listing
Ethylbenzene	NA	ND - 0.038	8000	8000
Toluene	ND - 0.428	ND	No listing	24000
Naphthalene	ND	ND - 0.280	300	No listing
Acrylonitrile	ND - 0.079	ND	No listing	1.3
Phenanthrene	ND - 0.600	ND	No listing	No listing
di-n-Butylphthalate	ND - 0.726	ND - 3.3	No listing	8000
bis(2-Ethylhexyl) phthalate	ND - 0.335	ND - 0.360	50	83
Butylbenzylphthalate	ND - 0.586	ND - 1.2	20000	No listing
Oil and grease	ND - 5618	29 - 1800	No listing	No listing

6 PROPOSED FUTURE MONITORING PROGRAM

Based on the results of the eight-year post-remedial monitoring program, no additional remedial action is necessary at this site. However, the continual presence of a few constituents at concentrations above NYSGWS in the source area warrants continued groundwater monitoring in both source area and downgradient wells.

Figure 6-1 shows the locations of all ten existing on-site monitoring wells. These existing wells are distributed around the site in such a way as to monitor the source area (952-10RA, 952-11R and 952-15R), downgradient site boundaries (952-6R, 952-9R, 952-13R and 952-14R) and upgradient or side-gradient site boundaries (952-8R, 952-12R and 952-16R). Table 6-1 lists each of these monitoring wells along with sampling frequency and analytical methods proposed for the 1993 monitoring program. It should be noted in referring to this table that two discrete piezometers at location 952-15R will be sampled and analyzed separately. Therefore, 11 groundwater samples will be collected and analyzed quarterly from ten locations. If five years of additional monitoring in accordance with this sampling and analysis plan confirms the conclusions of the past eight years of monitoring, then no additional monitoring would be performed.

Table 6-1. IBM Poughkeepsie B952/982 Proposed 1993 Groundwater Sampling and Analysis Plan

Well Number	Field Parameters	Base Neutrals	VOCs 8010	VOCs 8020	Oil and Grease	Frequency
952-6R	X	X(2)	X	X	X(2)	4
952-8R	X		X	X	X(2)	4
952-9R	X	X(2)	X	X	X(2)	4
952-10RA	X	X(2)	X	X	X(2)	4
952-11R	X	X(2)	X	X	X(2)	4
952-12R	X		X	X	X(2)	4
952-13R	X	X(2)	X	X	X(2)	4
952-14R	X	X(2)	X	X		4
952-15RA	X		X	X		4
952-15RB	X		X	X		4
952-16R	X		X	X		4

Notes:

8010	SW 846 Method 8010, Freon 113, report 1,2-dichloroethlyene total
8020	SW 846 Method 8020, total xylenes
Base Neutrals	SW 846 Method 8270
O & G	Oil and grease
Field Parameters	pH, temperature and conductivity

Figures

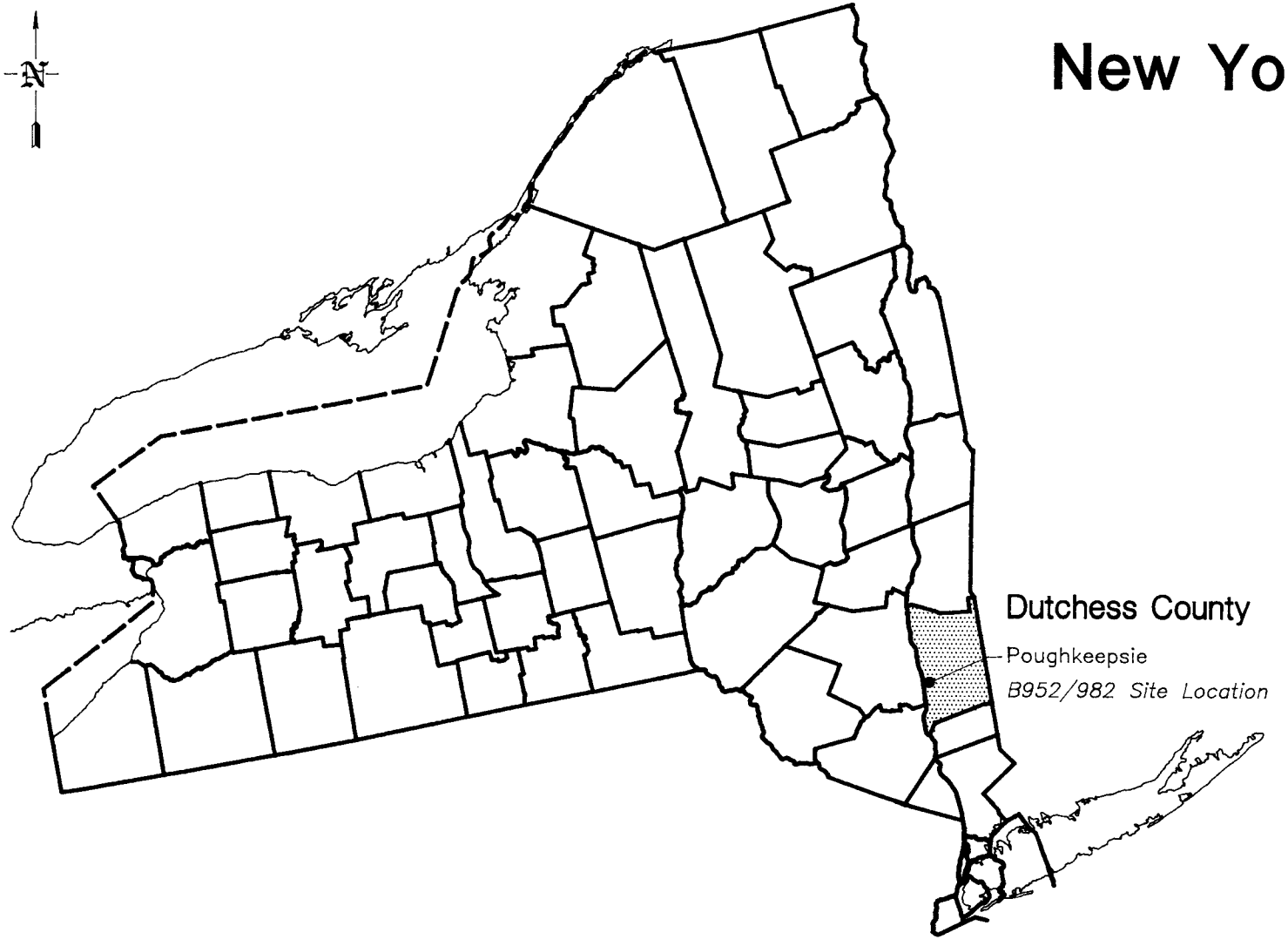


Figure 1–1

Source: USGS DLG Map, New York, Copyright 1989, American Ditigital Cartography, Inc.

Scale (miles)
0 30 60

IBM
Poughkeepsie, New York

B952/982 Site
Location Map

DRAWN BY: MJM	DATE: 3/3/93	DRAWING NO.
CHECKED & APPROVED BY: CGR		92022–015–A

GROUNDWATER SCIENCES CORPORATION

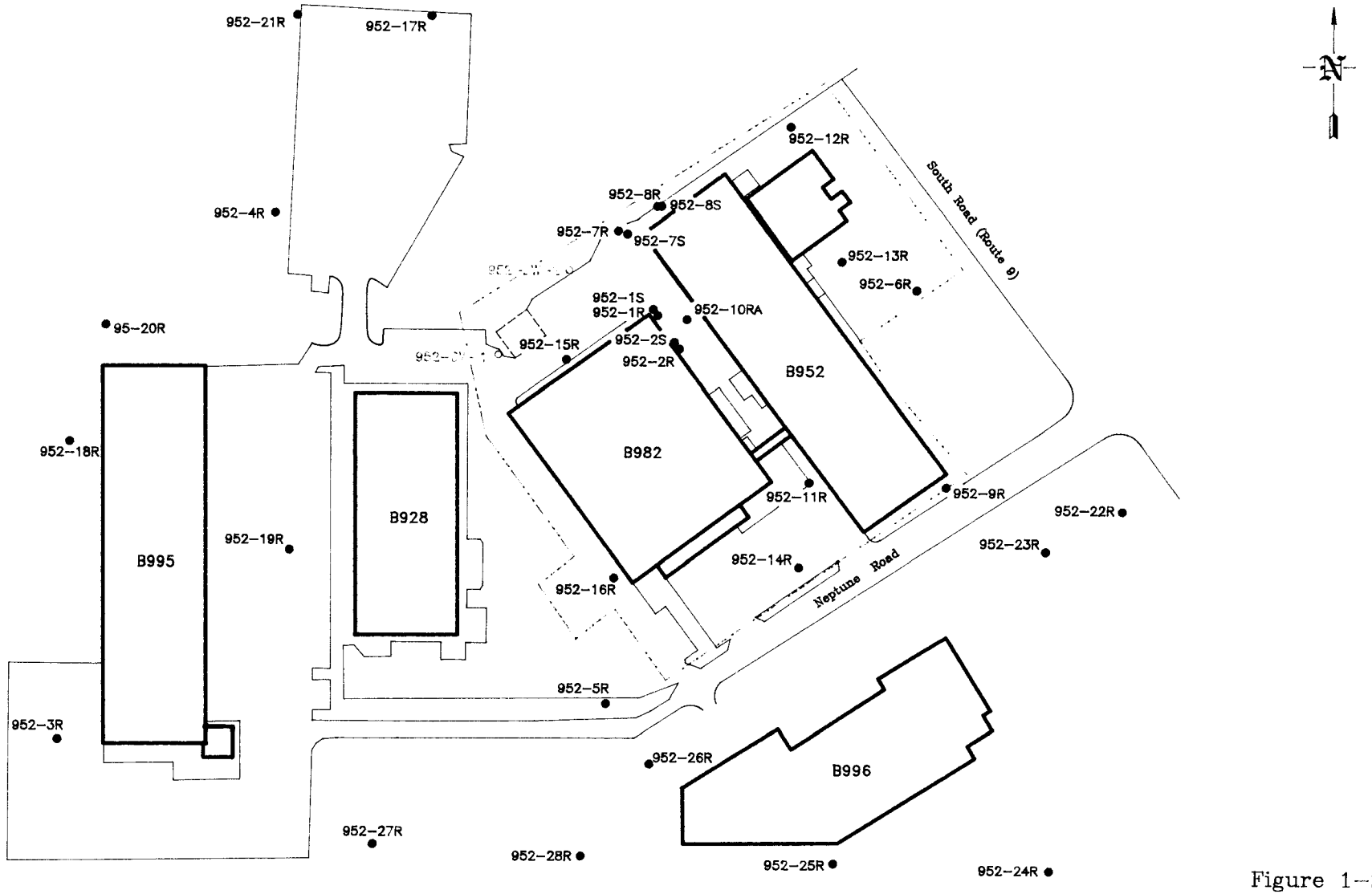


Figure 1-2

952-28R ● – Monitoring Well Location

– Former Drinking Water Well Location

– Site Property Line

Note: Prepared from Chazen Environmental Services, Inc., 8/90 map and Hayward and Pakan Associates maps.

Scale
0 90' 180'

IBM
Poughkeepsie, New York

B952/982 Site
Site Boundary Map

DRAWN BY: MJM DATE: 3/4/93	DRAWING NO.
CHECKED & APPROVED BY: CSR	92022-004-B

GROUNDWATER SCIENCES CORPORATION

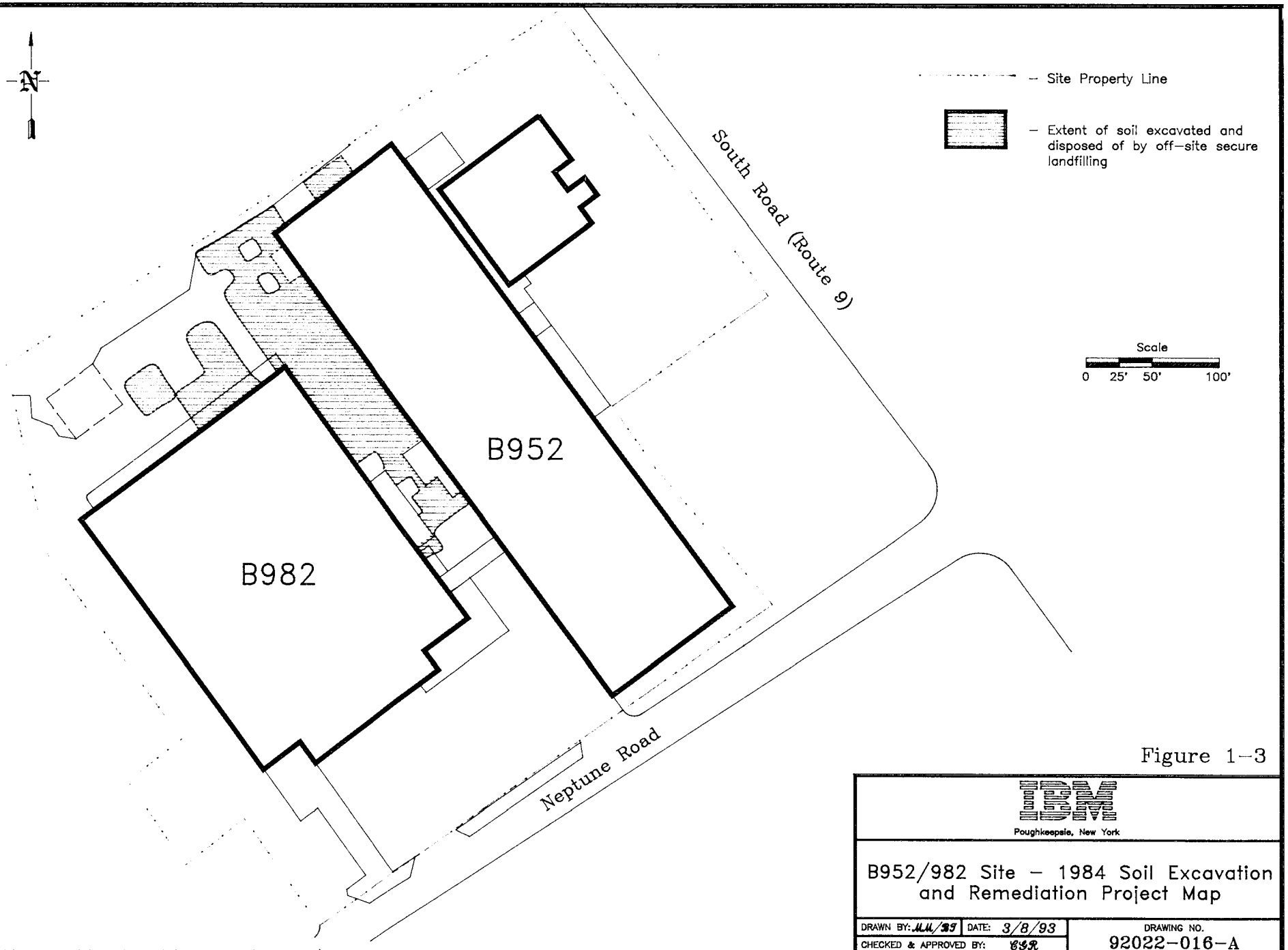


Figure 1-3

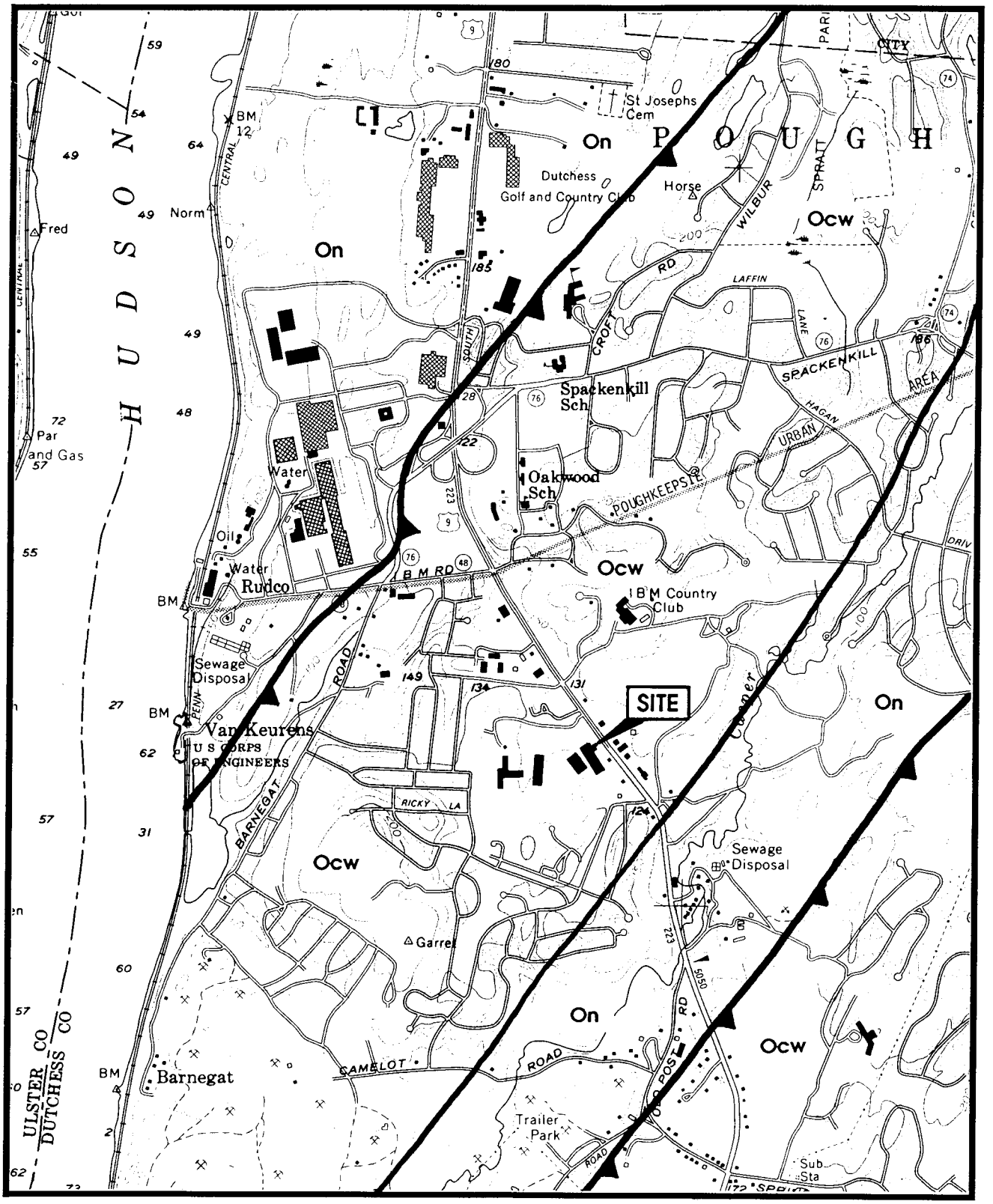
IBM
Poughkeepsie, New York

B952/982 Site – 1984 Soil Excavation and Remediation Project Map

DRAWN BY: MM/SJ	DATE: 3/8/93	DRAWING NO. 92022-016-A
CHECKED & APPROVED BY: CGR		

GROUNDWATER SCIENCES CORPORATION

Note: *Prepared from Chazen Environmental Services, Inc., 8/90 map and Hayward and Pakan associates maps; detail from CRA 2/84 report, Figure 4.*



0 1000 2000

Scale 1 inch = 2,000 feet

On - Normanskill Formation

Ocw - Wappingers Group

- Thrust Fault

- Formation Contact

Figure 2-1

Site Location Map
A Portion of the New York State
Department of Transportation
7 1/2 Minute Poughkeepsie Quadrangle

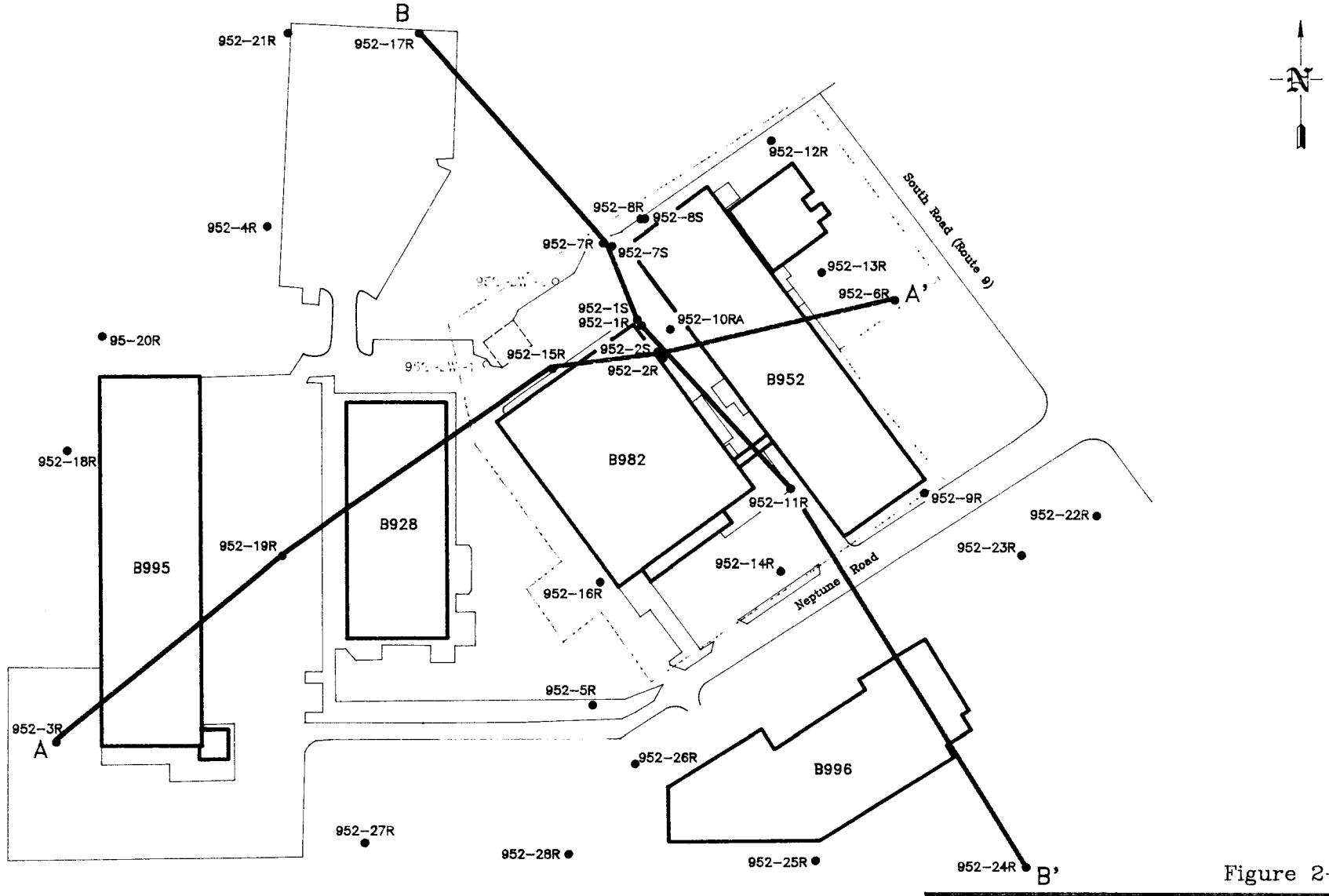


Figure 2-2

952-28R ● – Monitoring Well Location

– Former Drinking Water Well Location

– Site Property Line

Note: Prepared from Chazen Environmental Services, Inc., 8/90 map and Hayward and Pakan Associates maps; cross sections from REWAI 12/82 (as LMS 1/83 report, Plate 1).

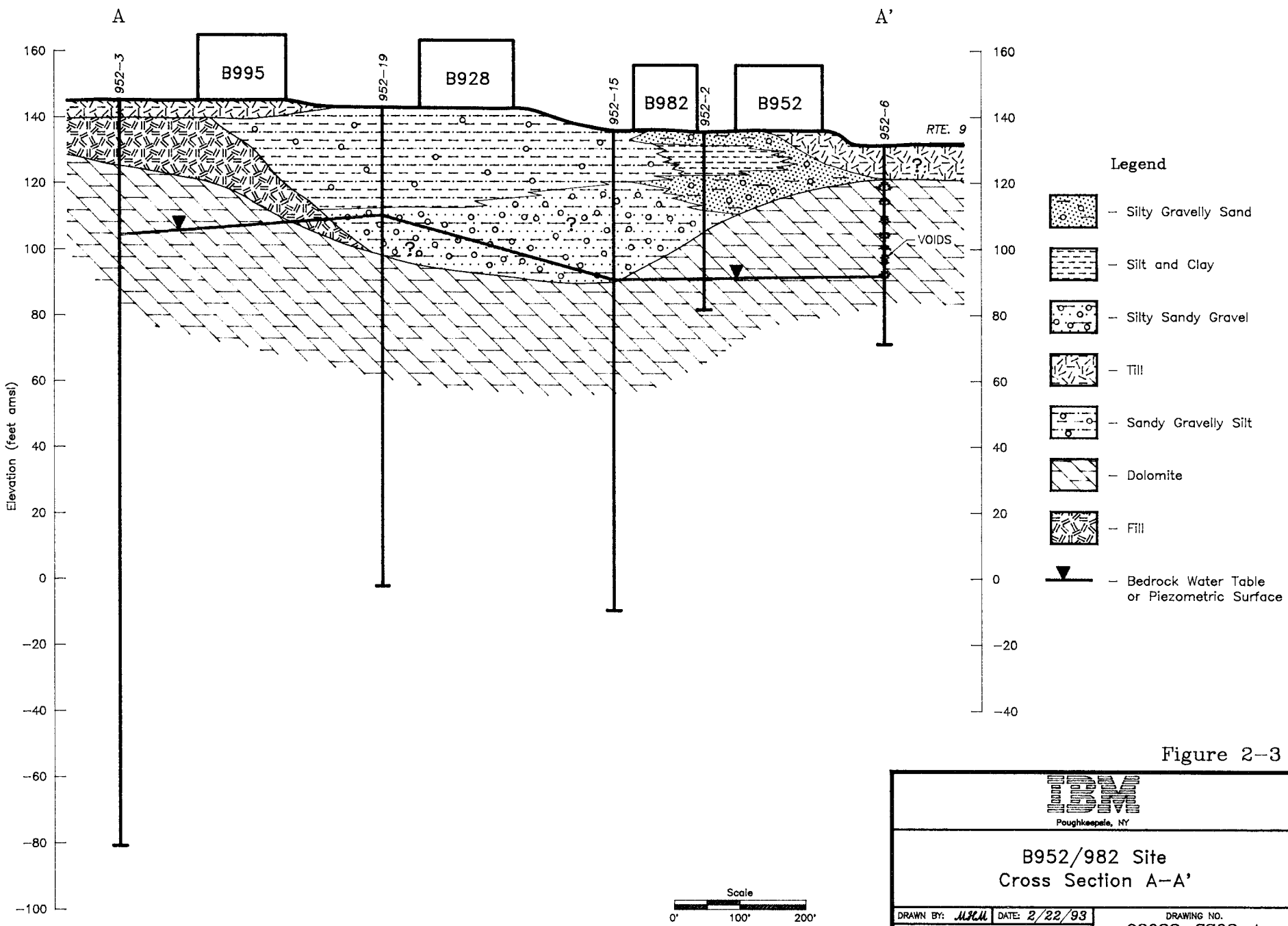
Scale
0 90' 180'

IBM
Poughkeepsie, New York

B952/982 Site
Well and Cross Section Location Map

DRAWN BY: MKM	DATE: 3/4/93	DRAWING NO.
CHECKED & APPROVED BY: DAB/CGR		92022-004-A

GROUNDWATER SCIENCES CORPORATION



Note: Cross section prepared from REWAI 12/82 (from LMS 1/83 report, Plate 3).

Figure 2-3

IBM
Poughkeepsie, NY

B952/982 Site
Cross Section A-A'

DRAWN BY: MHM	DATE: 2/22/93	DRAWING NO.
CHECKED & APPROVED BY: CSR		92022-CS02-A

GROUNDWATER SCIENCES CORPORATION

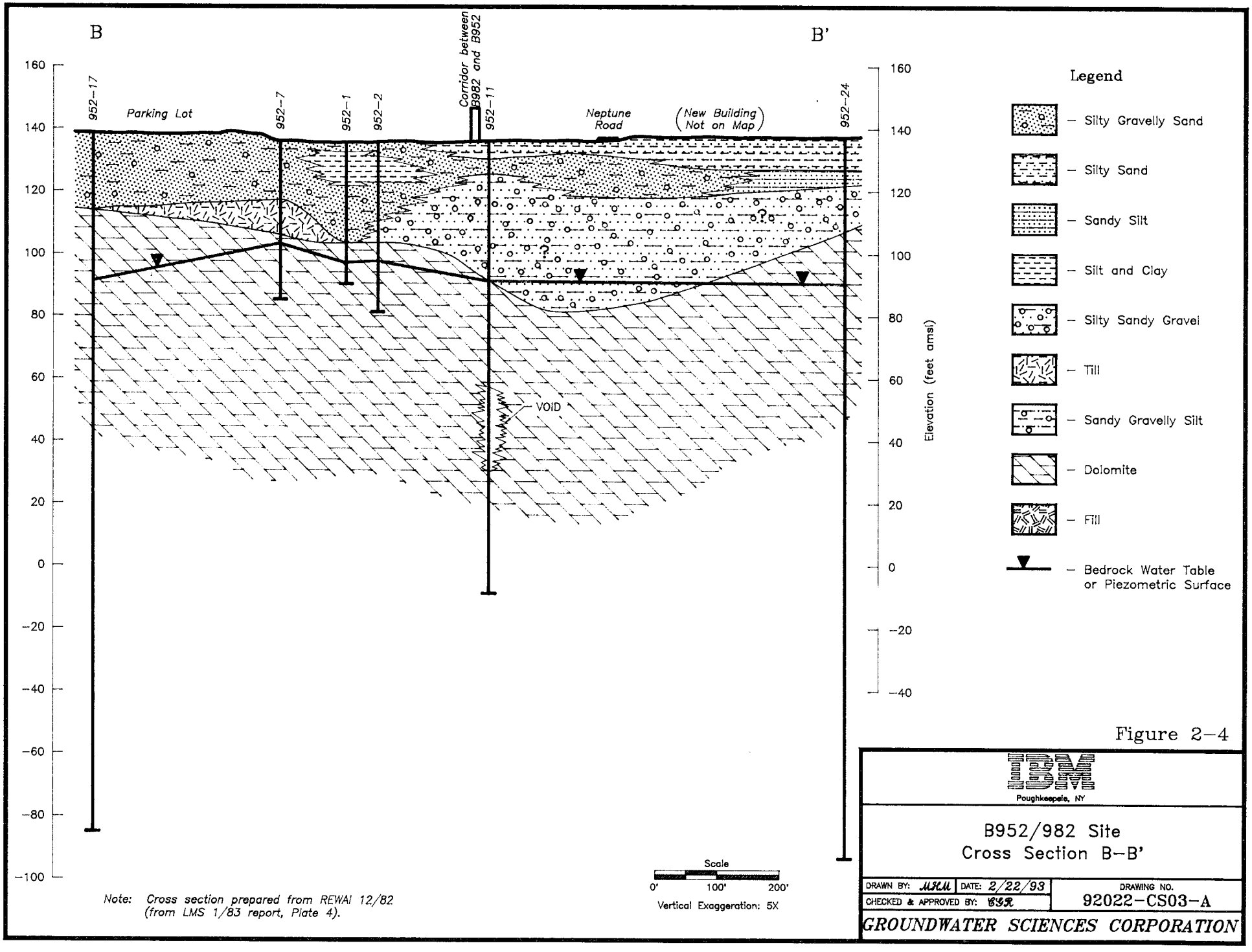

B
B'
Corridor between B982 and B952
952-17
Parking Lot
952-7
952-1
952-2
952-11
Neptune Road
(New Building Not on Map)
952-24
VOID
Elevation (feet amsl)
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
Legend
Silty Gravelly Sand
Silty Sand
Sandy Silt
Silt and Clay
Silty Sandy Gravel
Till
Sandy Gravelly Silt
Dolomite
Fill
Bedrock Water Table or Piezometric Surface
Scale
0'
100'
200'
Vertical Exaggeration: 5X
Note: Cross section prepared from REWAI 12/82 (from LMS 1/83 report, Plate 4).
IBM
Poughkeepsie, NY
B952/982 Site
Cross Section B-B'
DRAWN BY: MJM
DATE: 2/22/93
CHECKED & APPROVED BY: CGR
DRAWING NO.
92022-CS03-A
GROUNDWATER SCIENCES CORPORATION

Figure 2-4

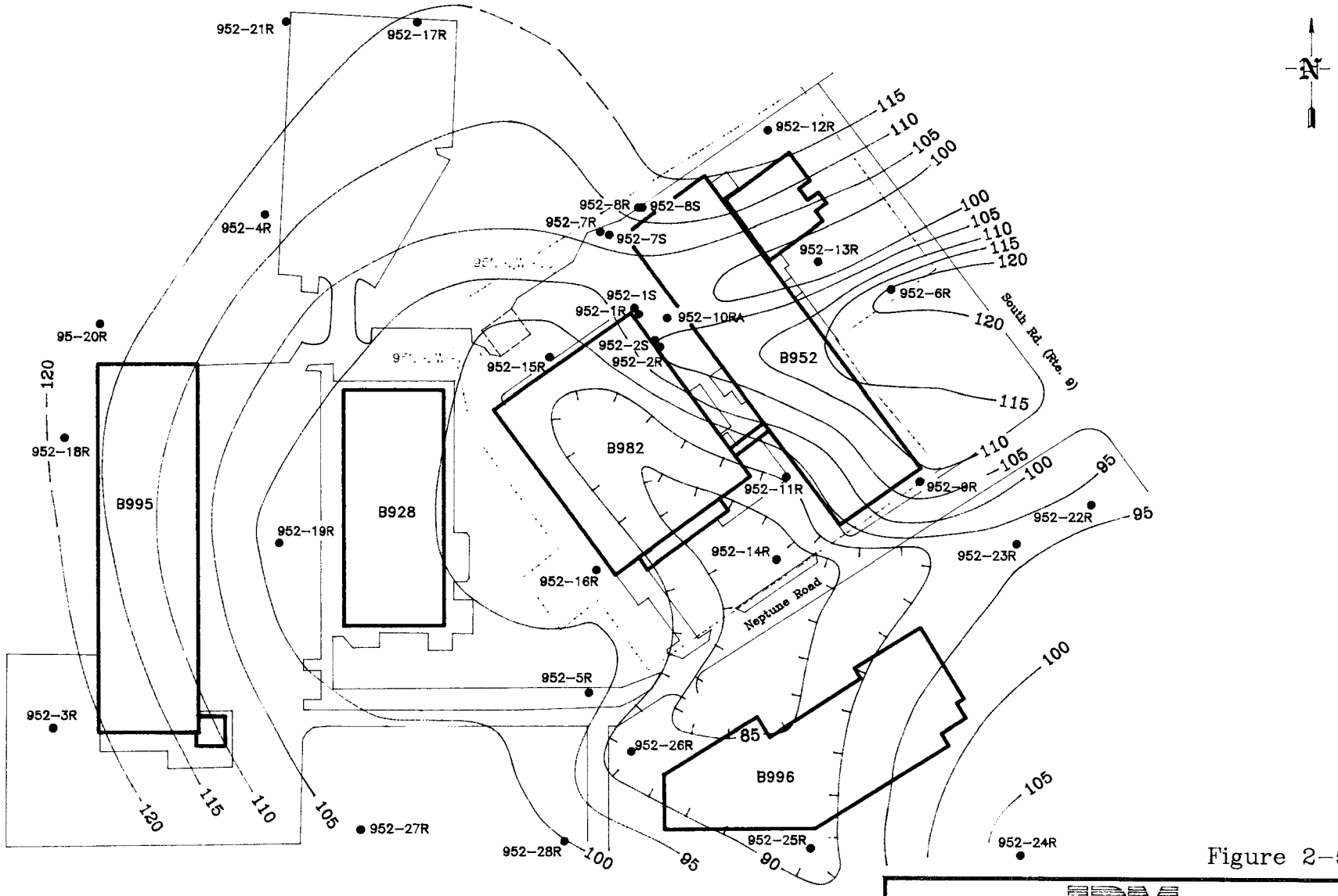


Figure 2-5

952-28R ● – Monitoring Well Location

– Former Drinking Water Well

– Site Property Line

120 – Bedrock Elevation Contour (feet amsl)

Note: Base map prepared from Chazen Environmental Services, Inc., 8/90 map and Hayward and Pakan Associates maps; bedrock contours from REWAI 12/82 (as LMS 1/83 report, Plate 2).

Scale
0 90' 180'

IBM
Poughkeepsie, New York

B952/982 Site – Top of Bedrock Topographic Contour Map

DRAWN BY: MJM DATE: 3/4/93	DRAWING NO.
CHECKED & APPROVED BY: DAB/CGR	92022-011-A

GROUNDWATER SCIENCES CORPORATION

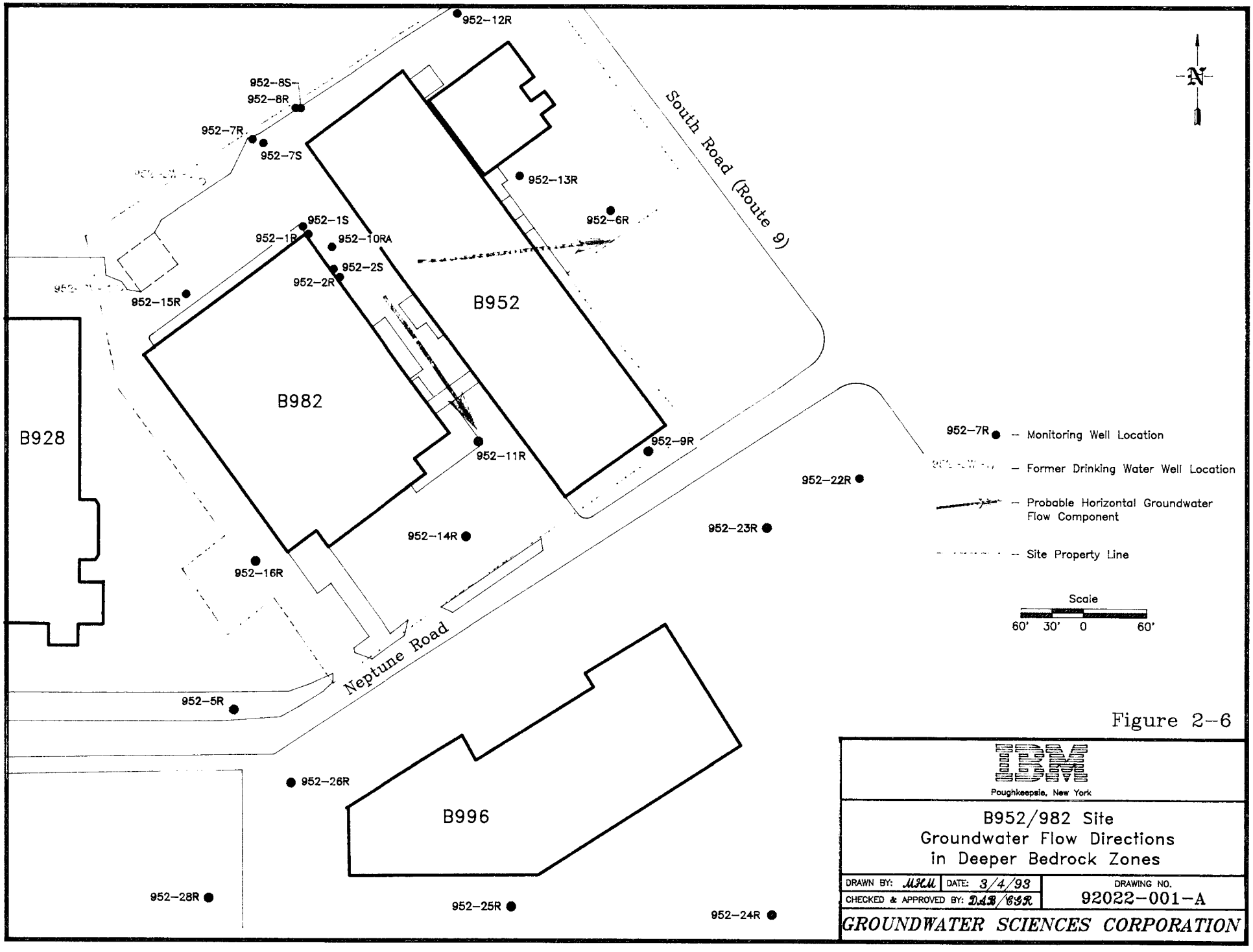

952-12R
952-8S
952-8R
952-7R
952-7S
952-13R
952-6R
952-1S
952-1R
952-10RA
952-2S
952-2R
952-15R
B952
B982
B928
952-9R
952-11R
952-22R
952-23R
952-14R
952-16R
South Road (Route 9)
Neptune Road
952-5R
952-26R
B996
952-28R
952-25R
952-24R
N
952-7R – Monitoring Well Location
– Former Drinking Water Well Location
– Probable Horizontal Groundwater Flow Component
– Site Property Line
Scale
60' 30' 0 60'
IBM
Poughkeepsie, New York
B952/982 Site
Groundwater Flow Directions
in Deeper Bedrock Zones
DRAWN BY: MKM
DATE: 3/4/93
CHECKED & APPROVED BY: DAB/CGR
DRAWING NO.
92022-001-A
GROUNDWATER SCIENCES CORPORATION

Figure 2-6

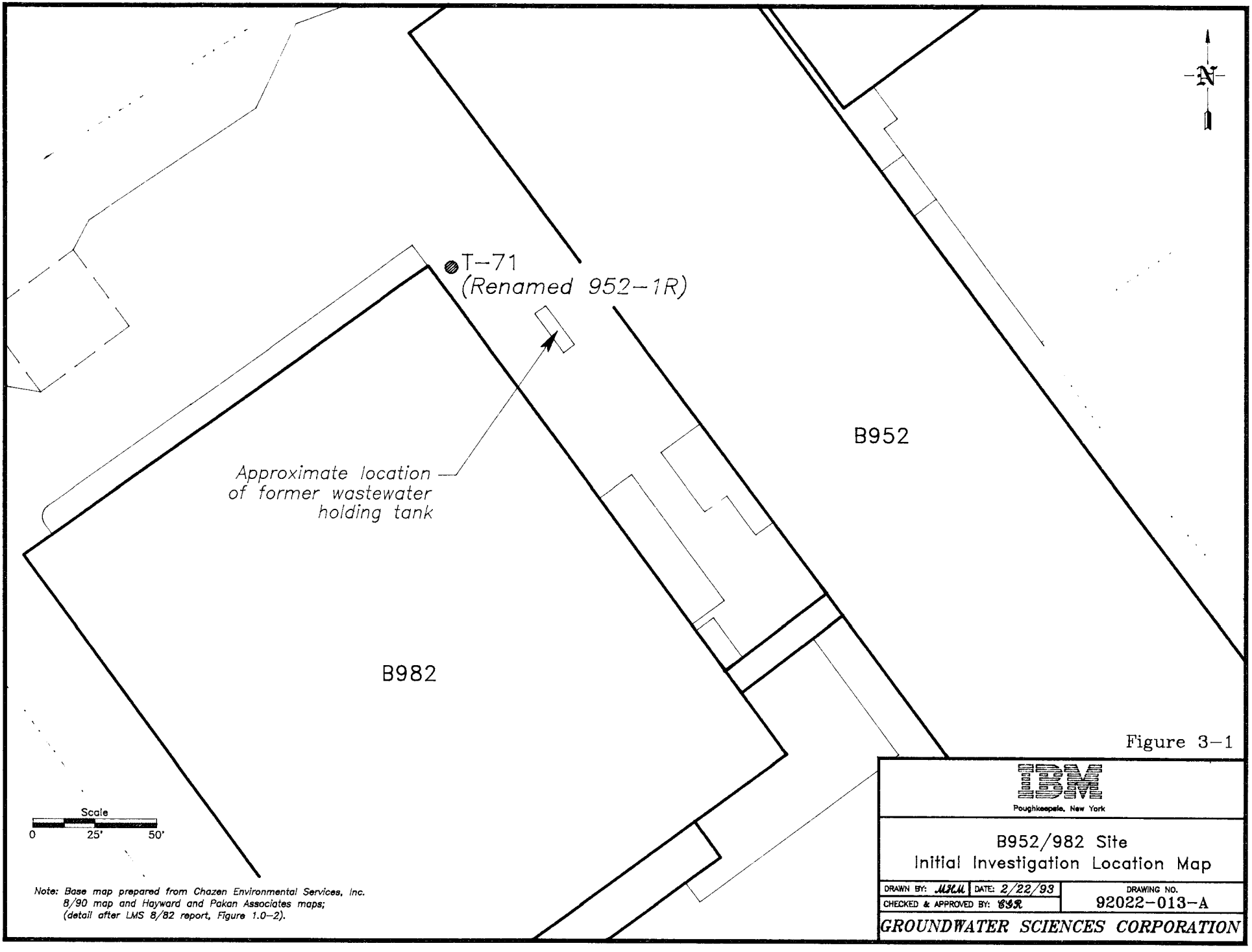

N
T-71
(Renamed 952-1R)
Approximate location of former wastewater holding tank
B952
B982
Scale
0
25'
50'
Note: Base map prepared from Chazen Environmental Services, Inc. 8/90 map and Hayward and Pakan Associates maps; (detail after LMS 8/82 report, Figure 1.0-2).
IBM
Poughkeepsie, New York
B952/982 Site
Initial Investigation Location Map
DRAWN BY: MJM
DATE: 2/22/93
CHECKED & APPROVED BY: CSR
DRAWING NO.
92022-013-A
GROUNDWATER SCIENCES CORPORATION

Figure 3-1

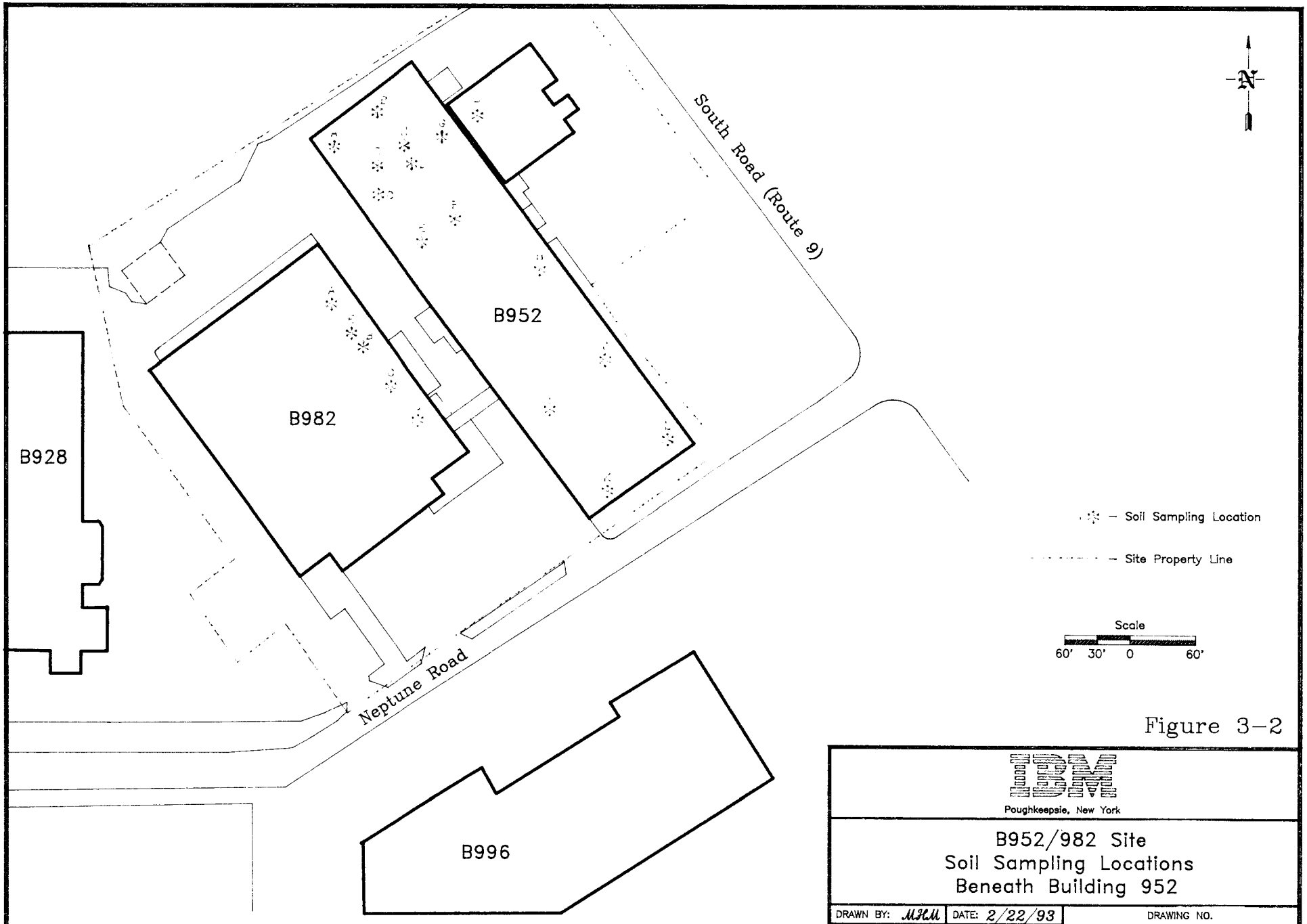


Figure 3–2

IBM
Poughkeepsie, New York

B952/982 Site
Soil Sampling Locations
Beneath Building 952

DRAWN BY: MHM	DATE: 2/22/93	DRAWING NO.
CHECKED & APPROVED BY: CGR		92022–012–B

GROUNDWATER SCIENCES CORPORATION

Note: Base map prepared from Chazen Environmental Services, Inc. 8/90 map and Hayward and Pakan Associates maps; (detail after LMS 2/84 report, Figure 1.0–2).

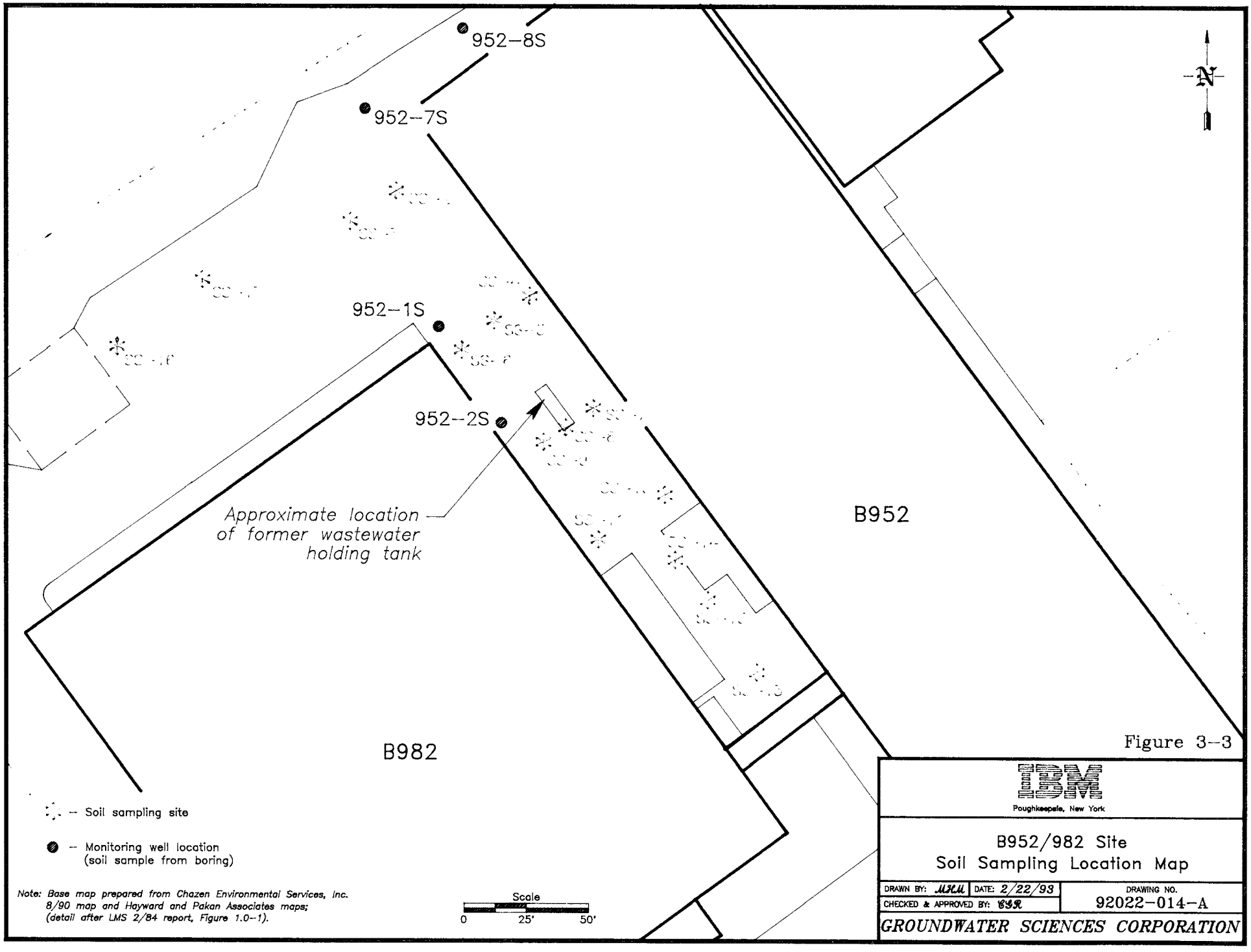

952-8S
952-7S
952-1S
952-2S
Approximate location of former wastewater holding tank
B952
B982
N
Soil sampling site
Monitoring well location (soil sample from boring)
Scale
0
25'
50'
Note: Base map prepared from Chazen Environmental Services, Inc. 8/90 map and Hayward and Pakan Associates maps; (detail after LMS 2/84 report, Figure 1.0-1).
IBM
Poughkeepsie, New York
B952/982 Site
Soil Sampling Location Map
DRAWN BY: MJM
DATE: 2/22/93
CHECKED & APPROVED BY: GSR
DRAWING NO.
92022-014-A
GROUNDWATER SCIENCES CORPORATION

Figure 3-3

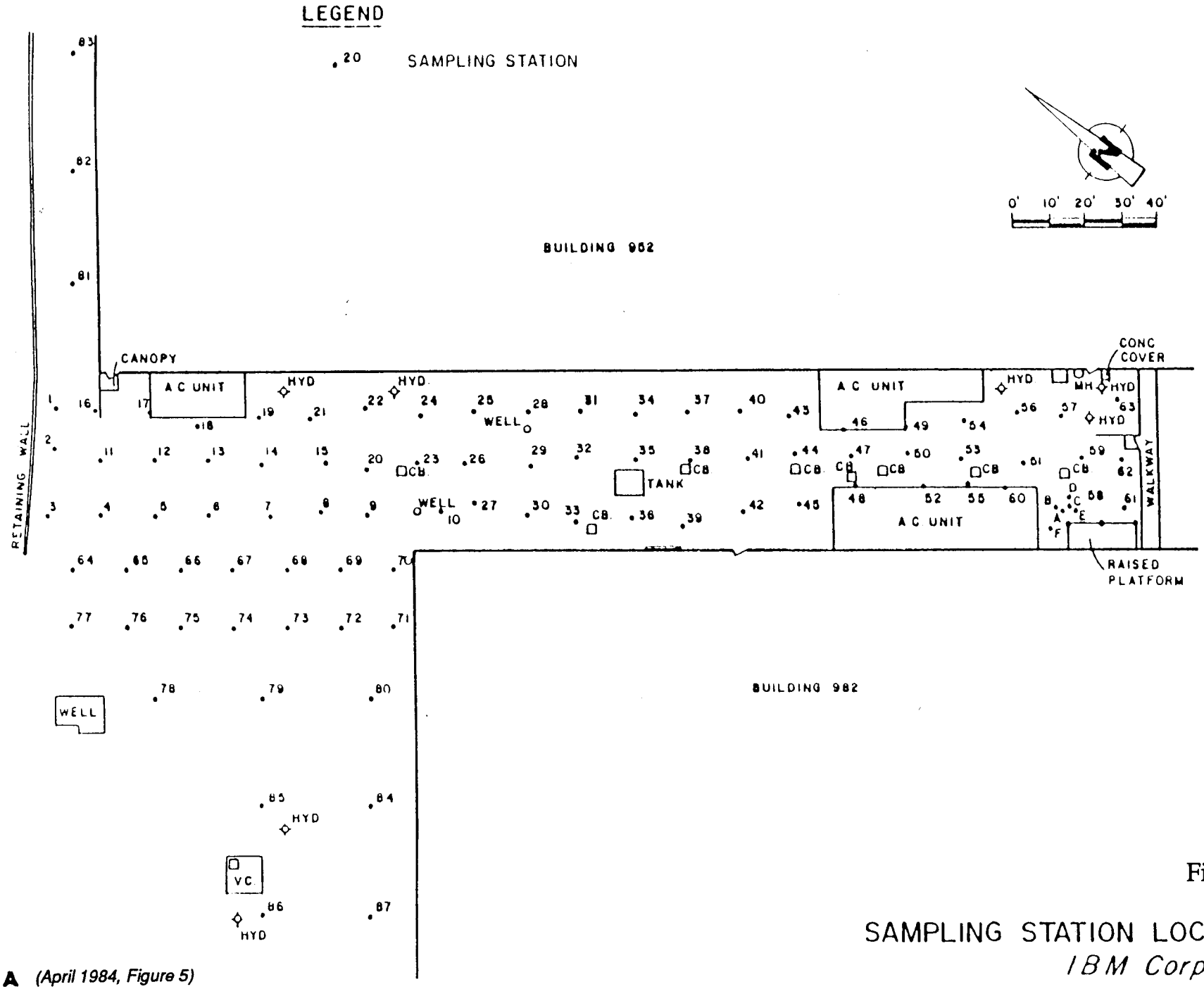


Figure 4-1

SAMPLING STATION LOCATIONS
IBM Corporation

CRA *(April 1984, Figure 5)*

1358 - 2/07/84

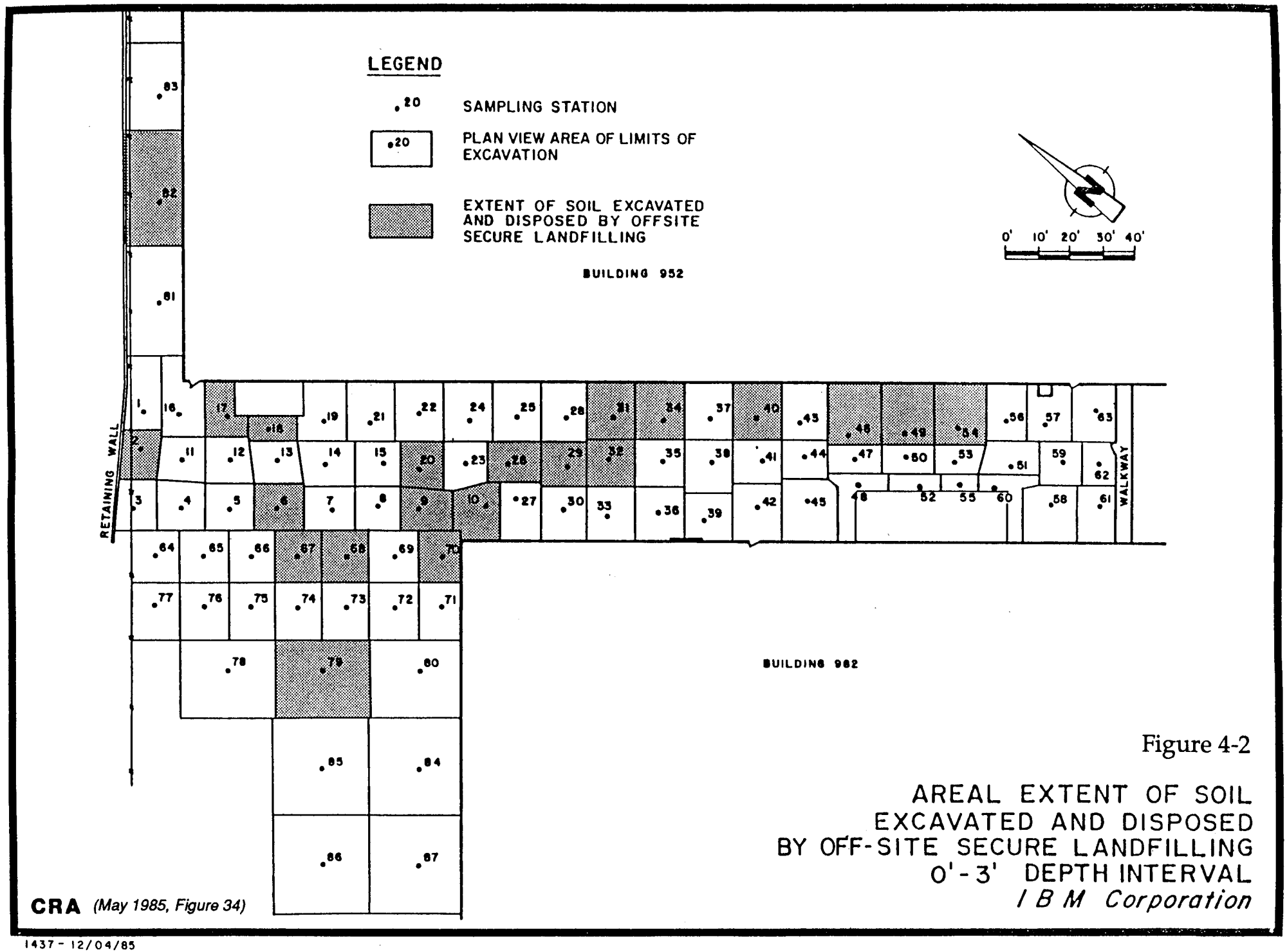


Figure 4-2

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 0'-3' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 34)*

1437 - 12/04/85

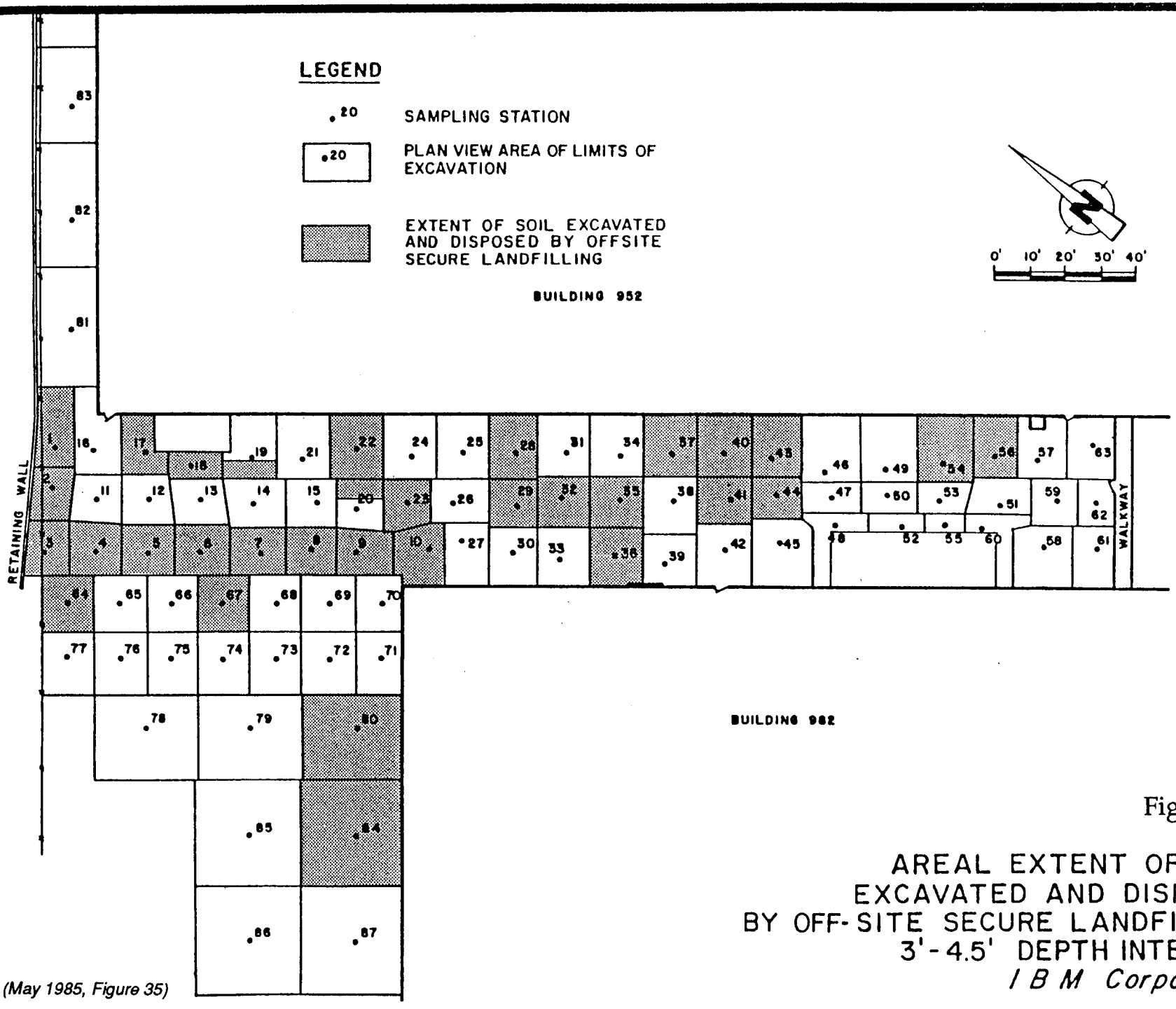


Figure 4-3

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 3'-4.5' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 35)*

1437 - 12/04/85

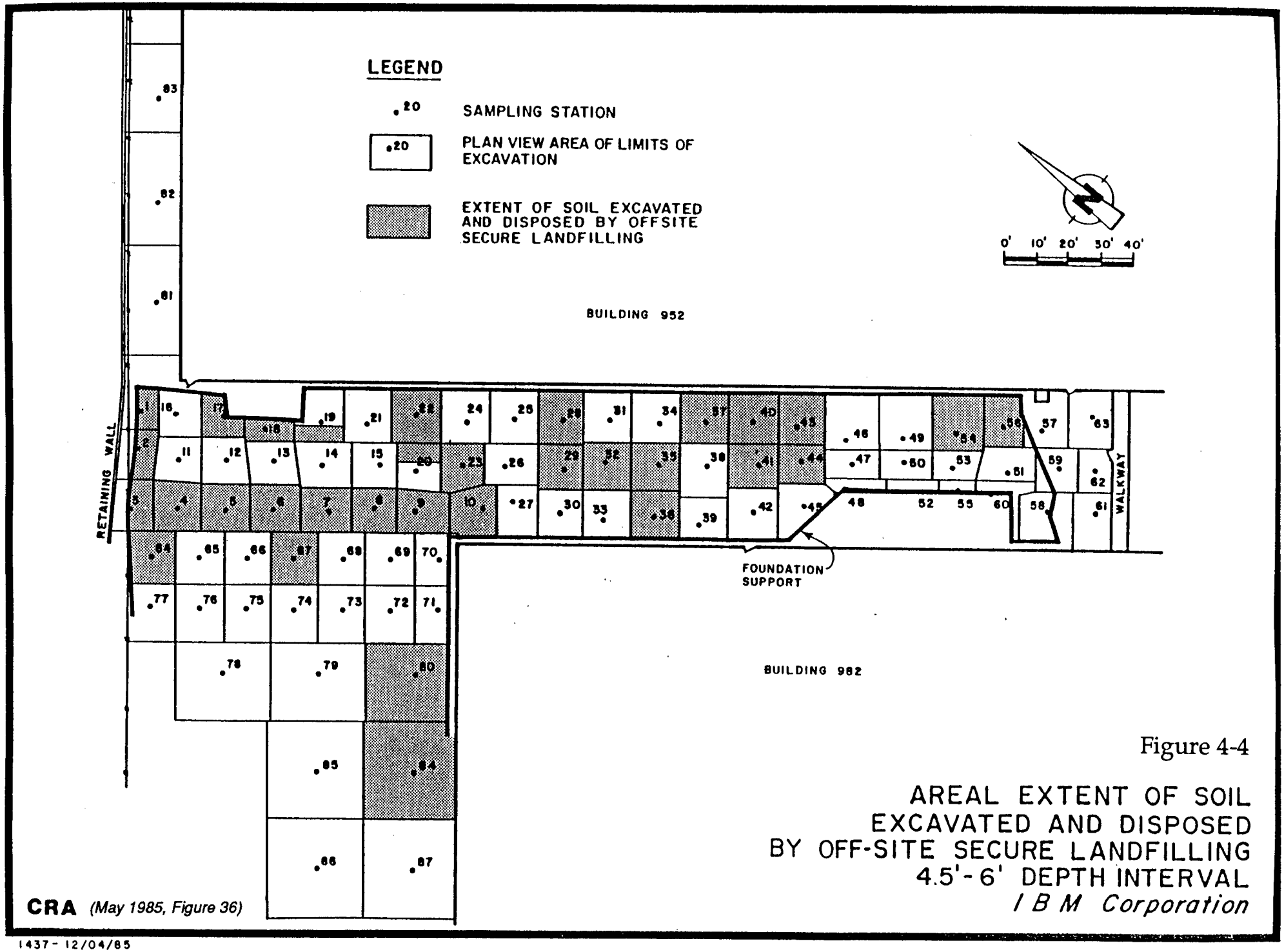


Figure 4-4

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 4.5'-6' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 36)*

1437-12/04/85

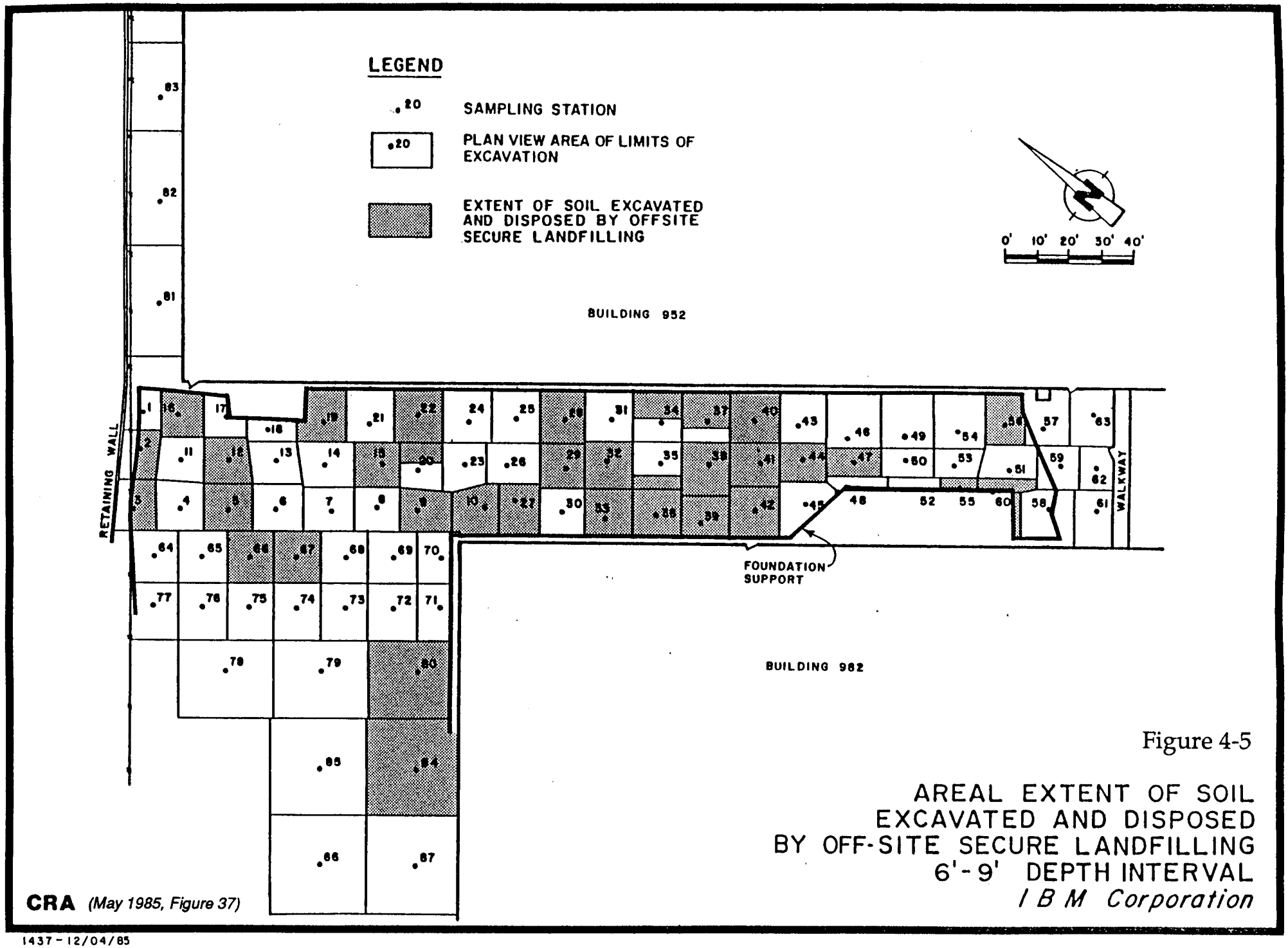


Figure 4-5

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 6'-9' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 37)*

1437 - 12/04/85

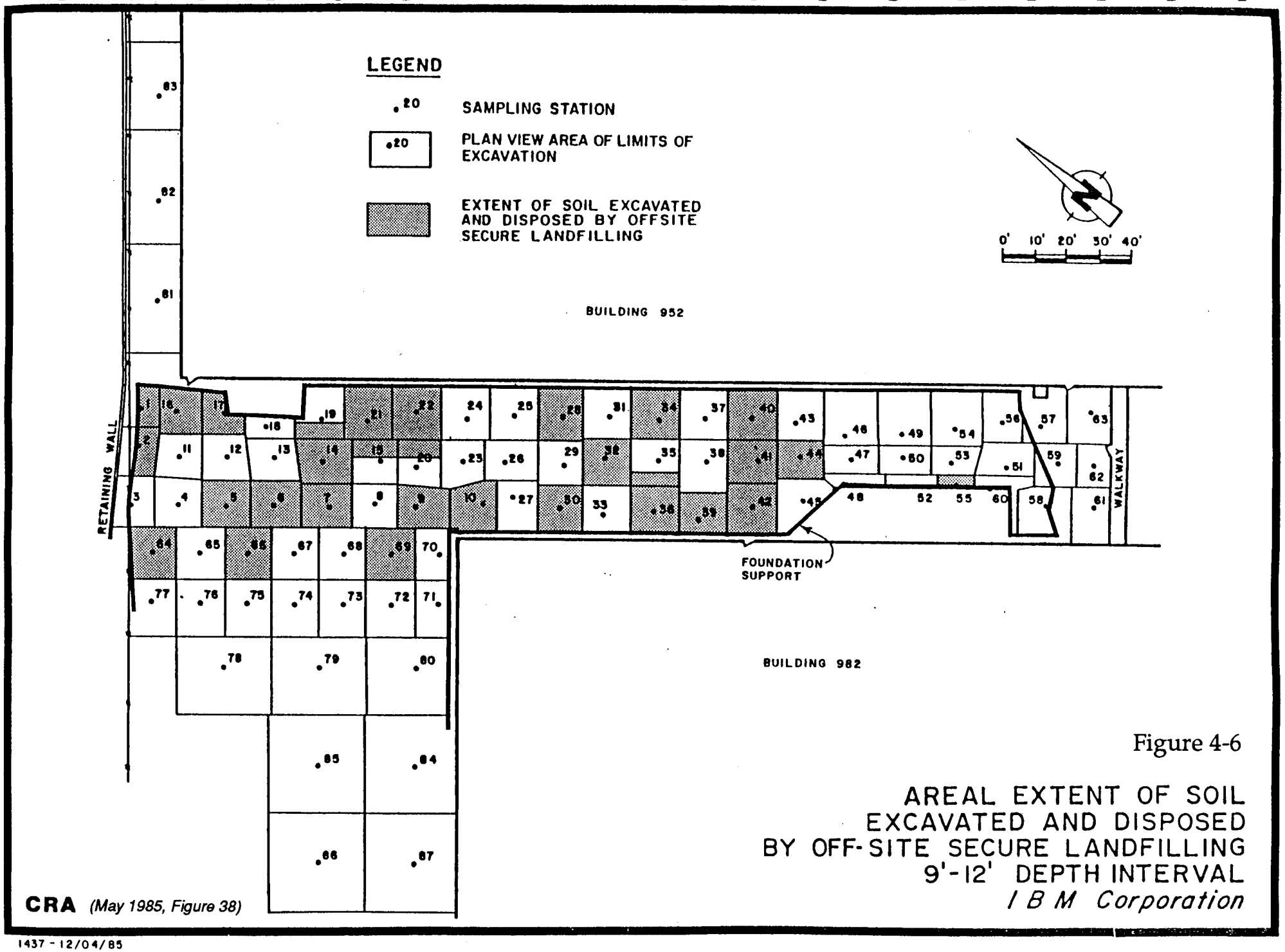


Figure 4-6

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 9'-12' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 38)*

1437 - 12/04/85

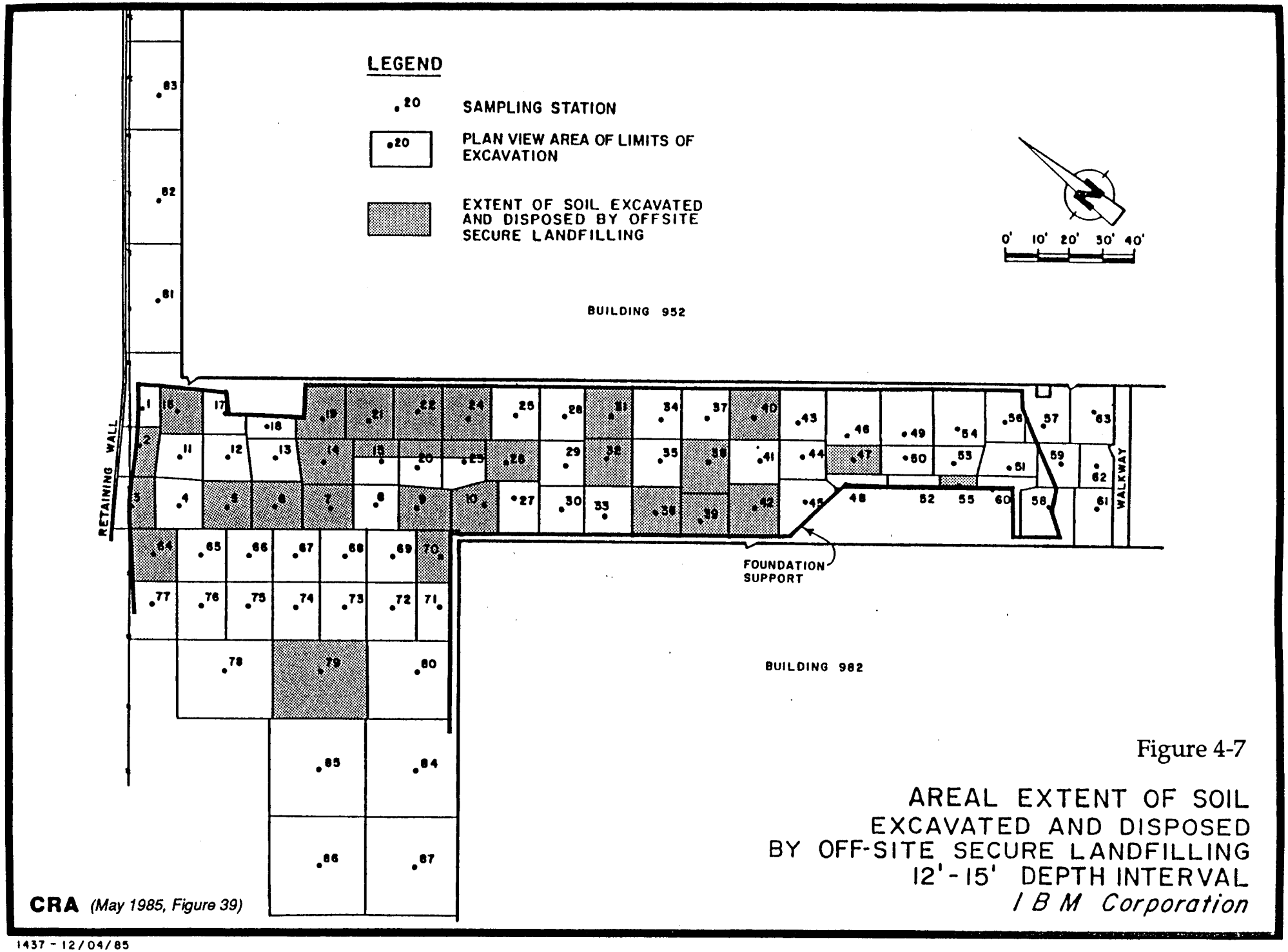


Figure 4-7

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 12'-15' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 39)*

1437 - 12/04/85

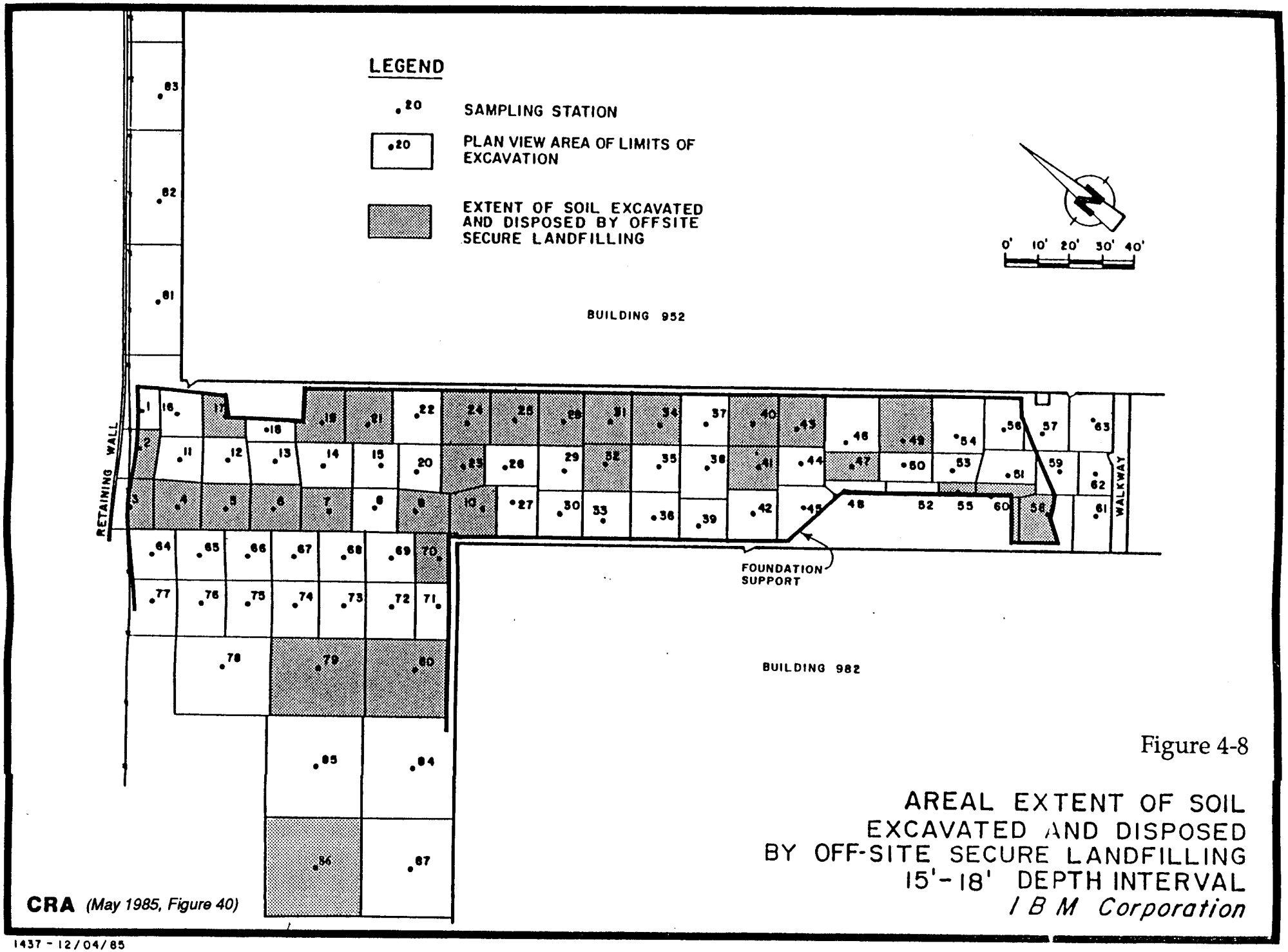


Figure 4-8

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 15'-18' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 40)*

1437 - 12/04/85

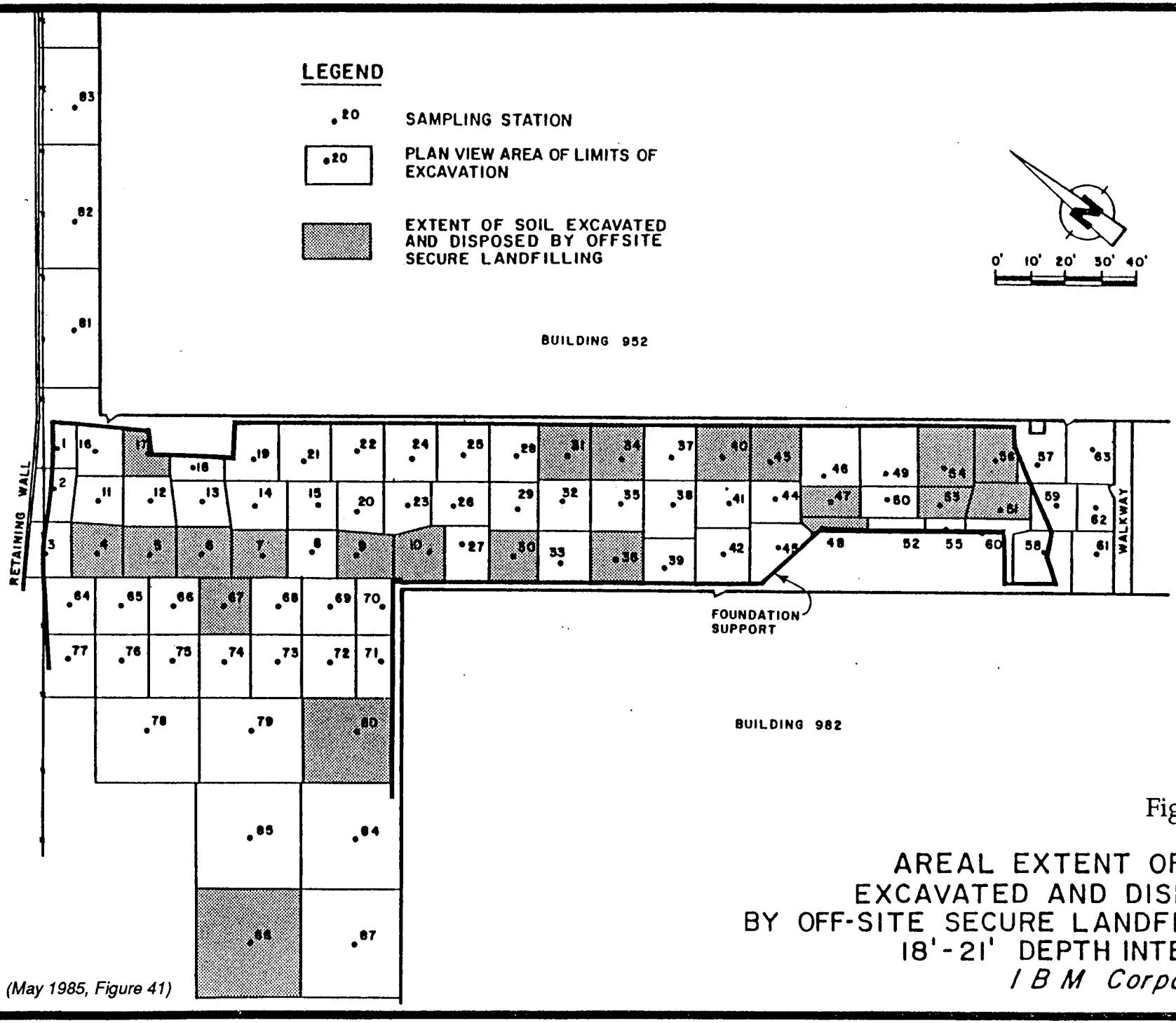


Figure 4-9

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 18'-21' DEPTH INTERVAL

I B M Corporation

CRA *(May 1985, Figure 41)*

1437 - 12/04/85

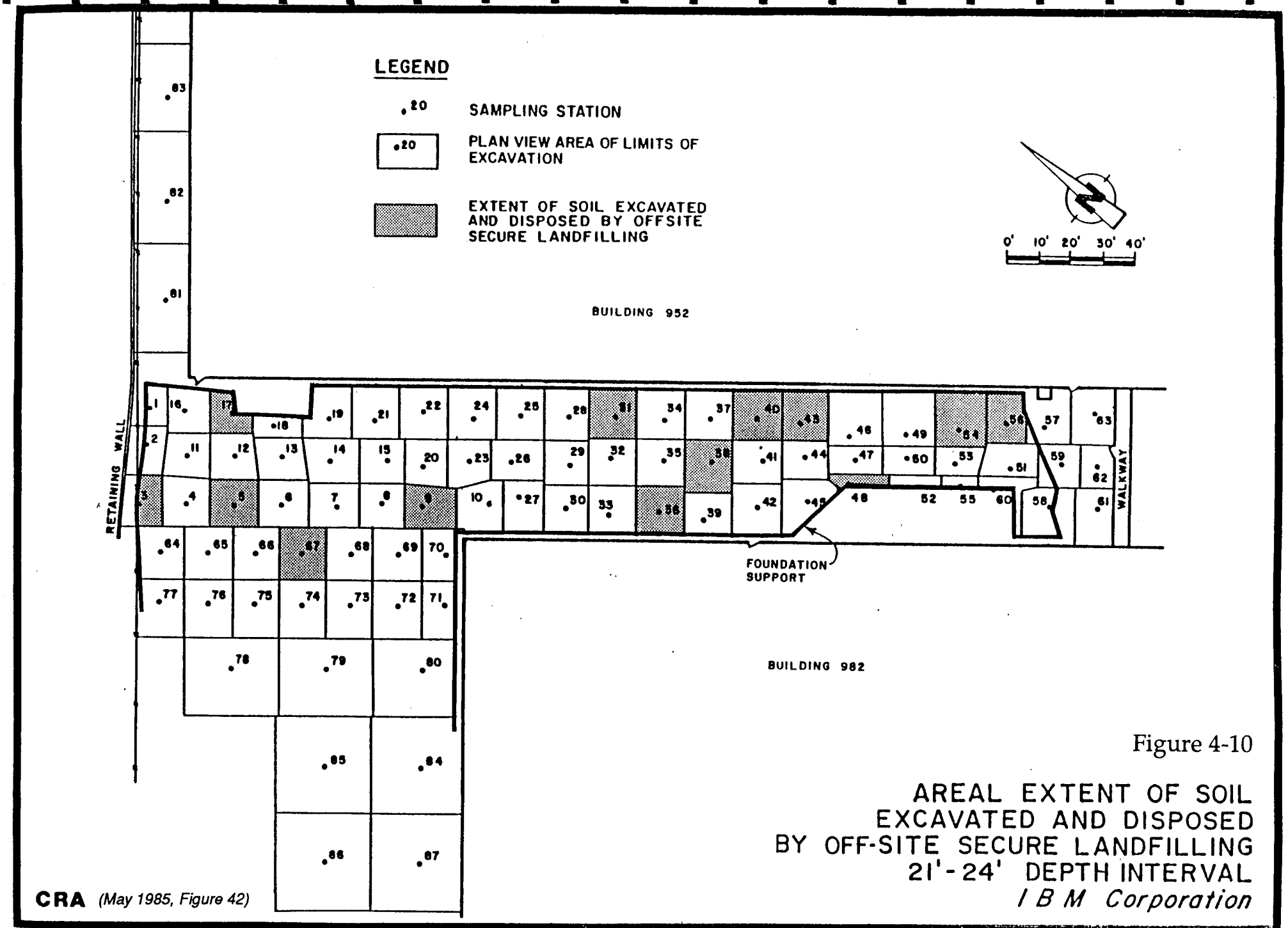


Figure 4-10

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 21'-24' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 42)*

1437 - 12/04/85

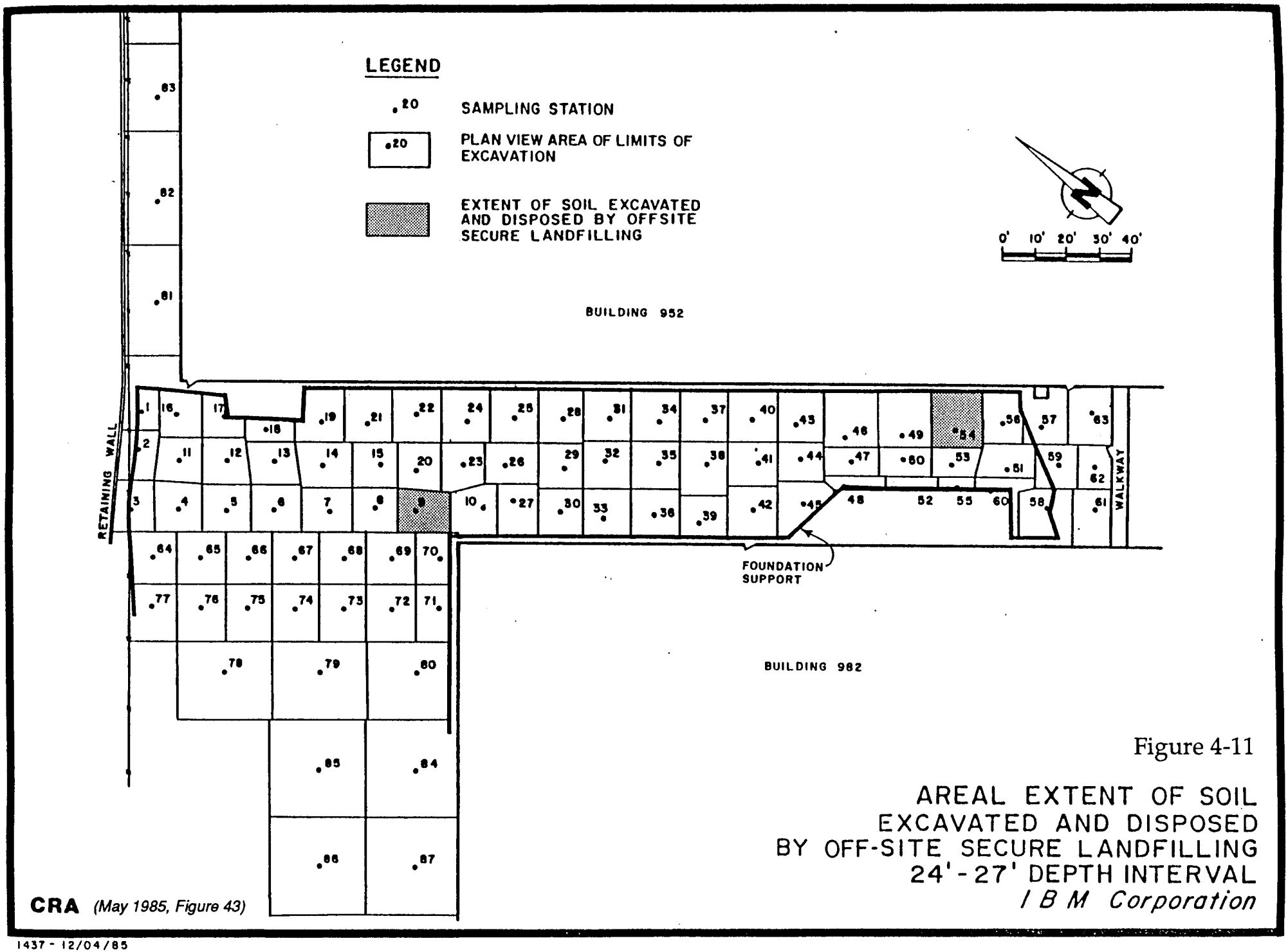


Figure 4-11

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 24'-27' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 43)*

1437 - 12/04/85

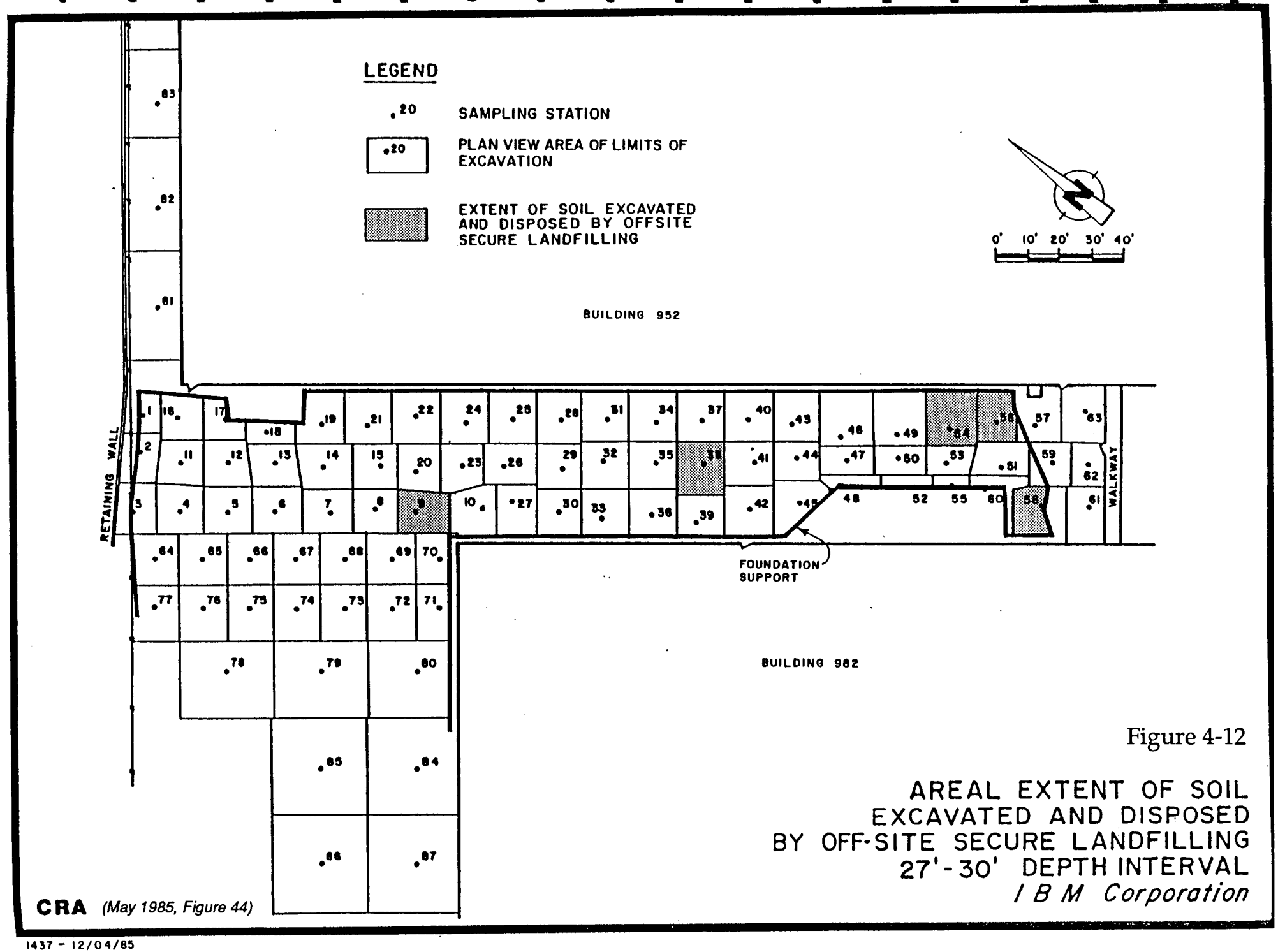


Figure 4-12

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 27'-30' DEPTH INTERVAL

I B M Corporation

CRA *(May 1985, Figure 44)*

1437 - 12/04/85

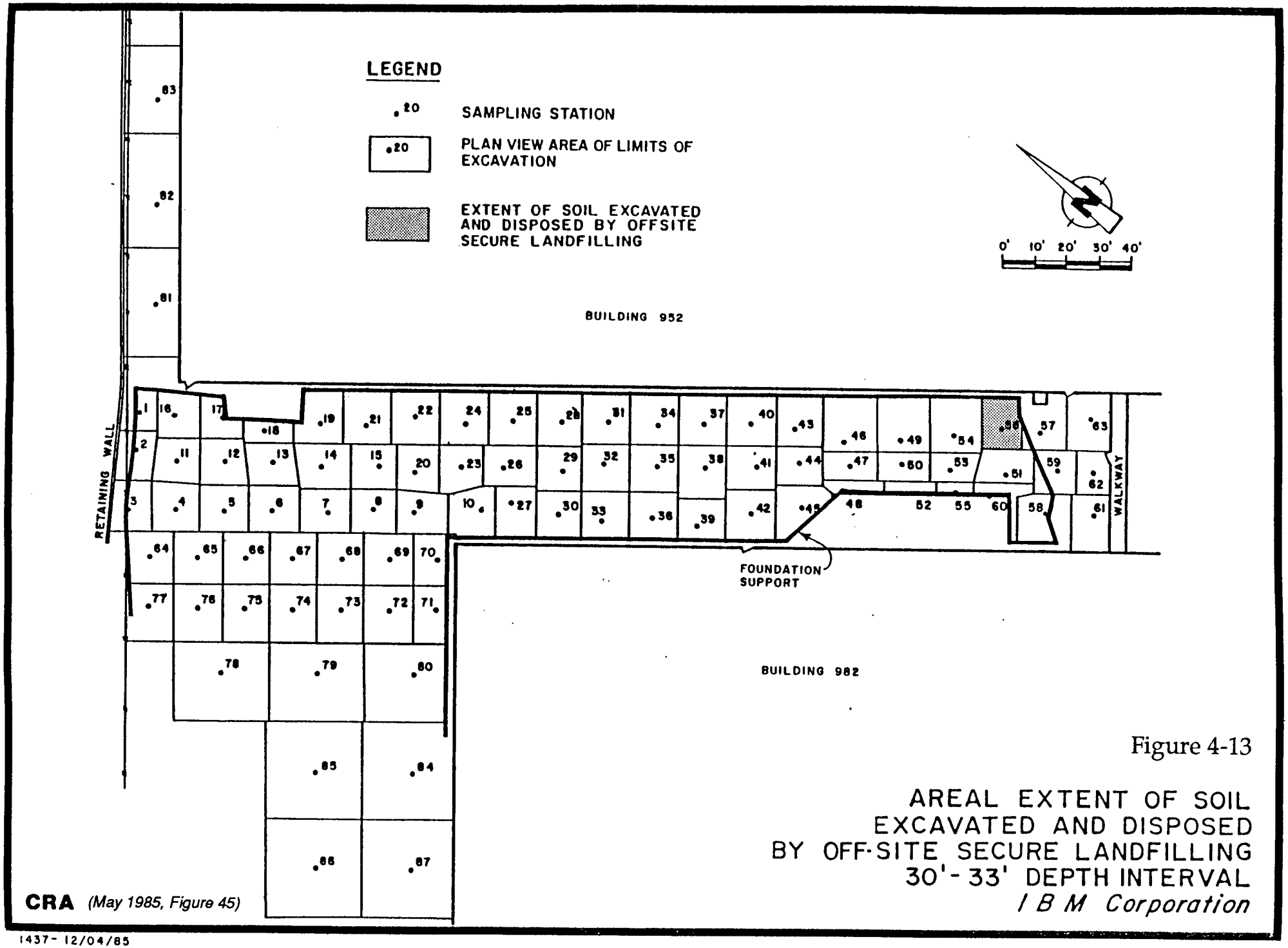


Figure 4-13

AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 30'-33' DEPTH INTERVAL

IBM Corporation

CRA *(May 1985, Figure 45)*

1437- 12/04/85

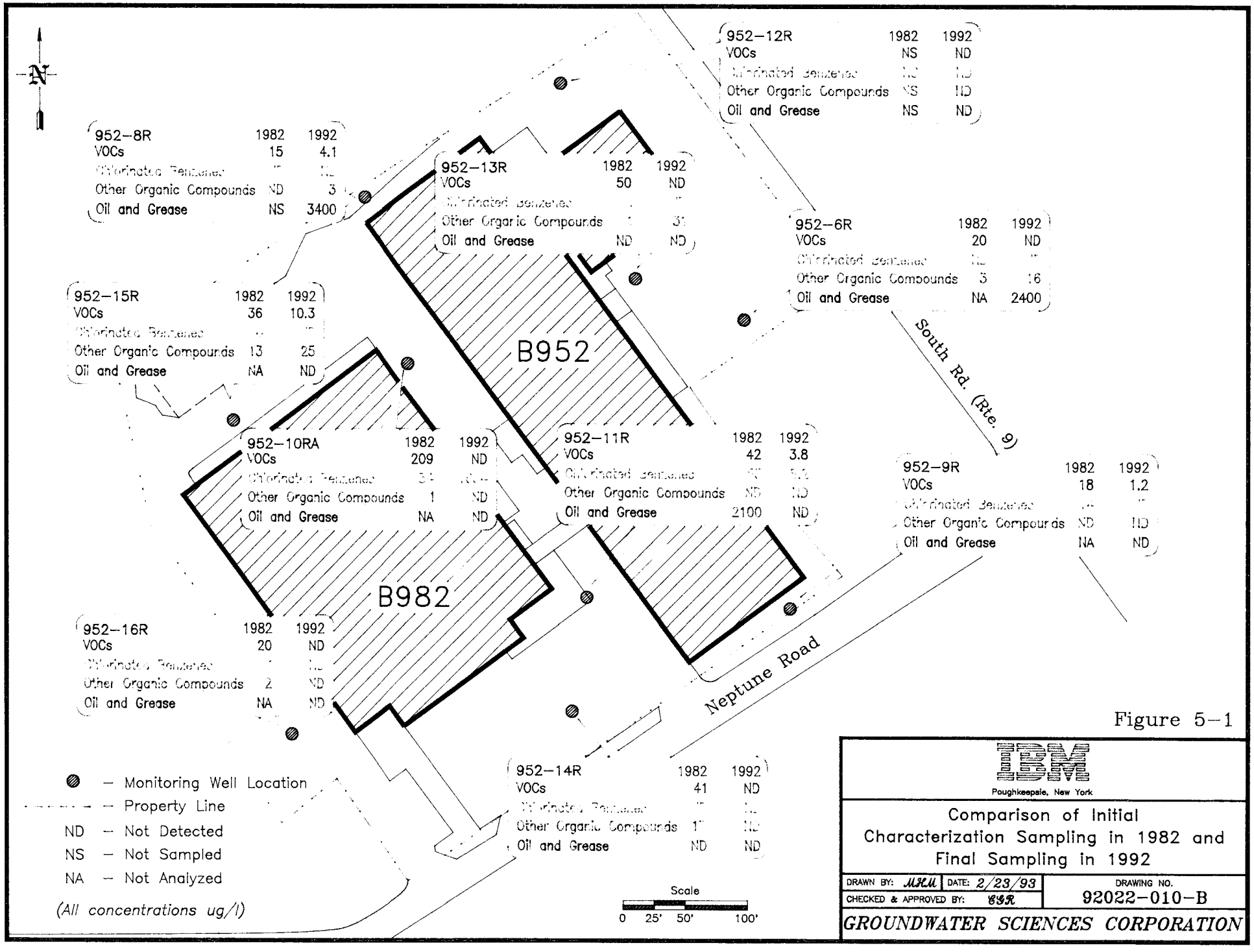


Figure 5-1

IBM
Poughkeepsie, New York

Comparison of Initial Characterization Sampling in 1982 and Final Sampling in 1992

DRAWN BY: MHM	DATE: 2/23/93	DRAWING NO. 92022-010-B
CHECKED & APPROVED BY: CGR		

GROUNDWATER SCIENCES CORPORATION

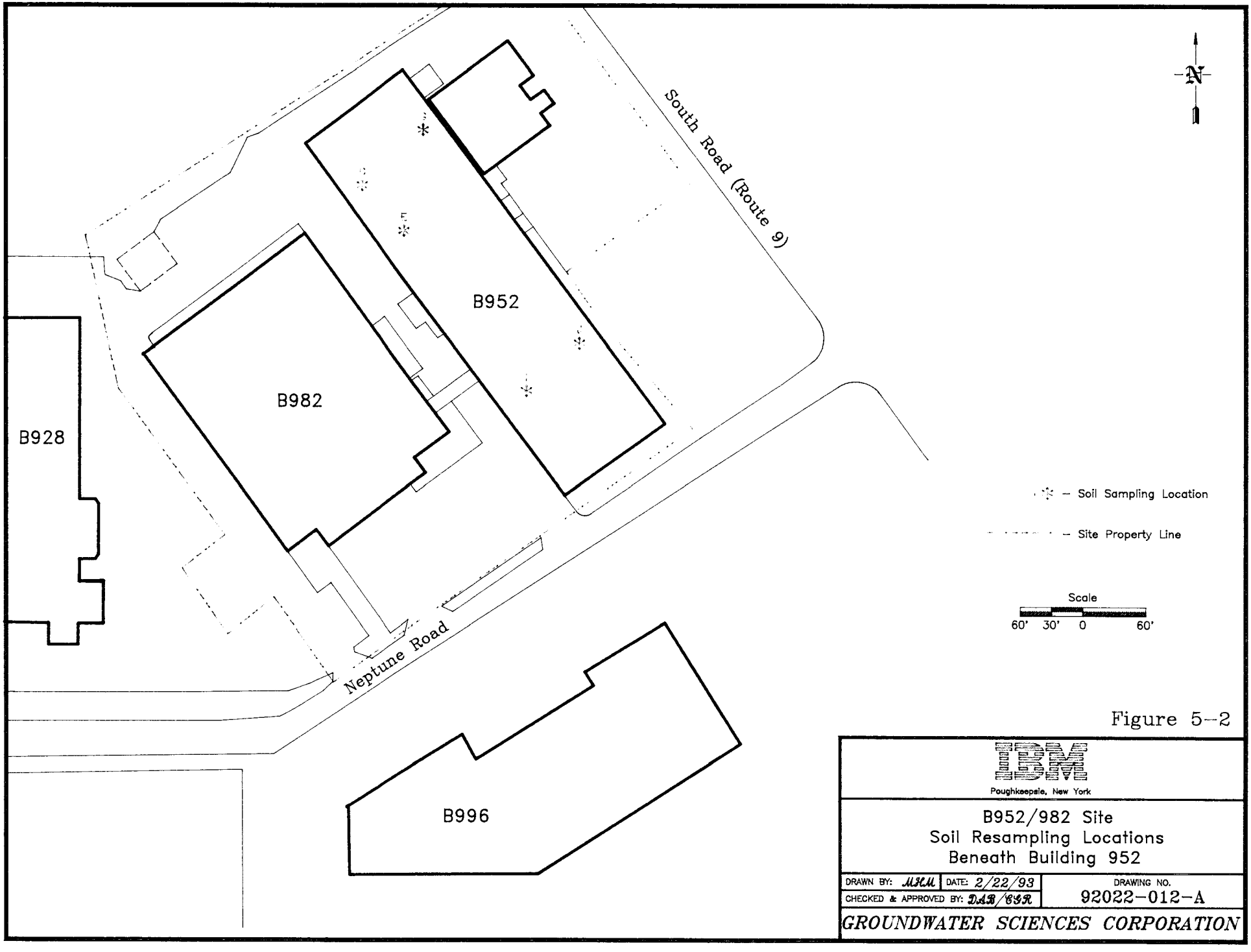

South Road (Route 9)
B952
B982
B928
Neptune Road
B996
N
– Soil Sampling Location
– Site Property Line
Scale
60' 30' 0 60'
IBM
Poughkeepsie, New York
B952/982 Site
Soil Resampling Locations
Beneath Building 952
DRAWN BY: MHM
DATE: 2/22/93
CHECKED & APPROVED BY: DAB/CGR
DRAWING NO.
92022-012-A
GROUNDWATER SCIENCES CORPORATION

Figure 5-2

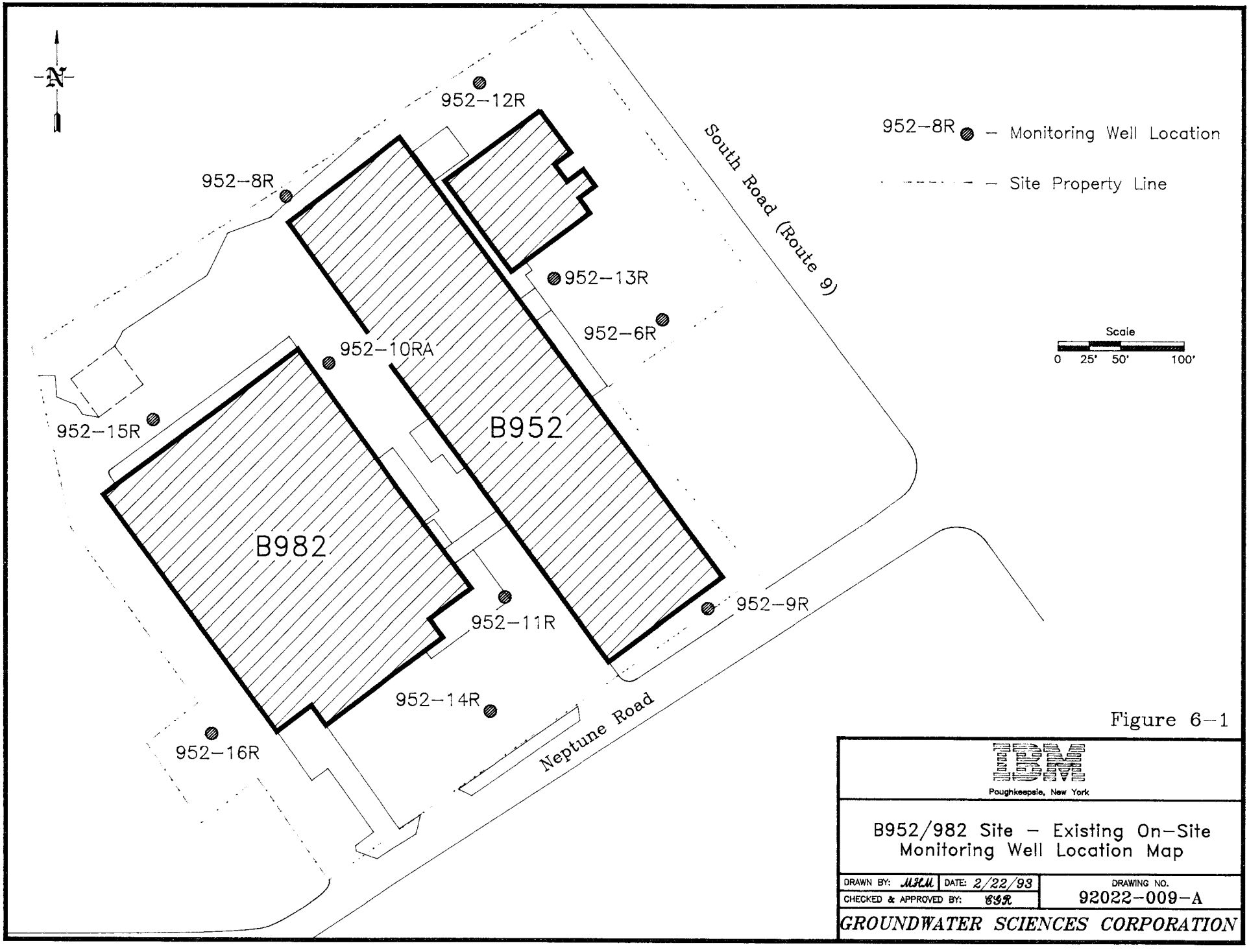

N
952-12R
952-8R
952-13R
952-6R
952-10RA
952-15R
B952
B982
952-11R
952-9R
952-14R
952-16R
South Road (Route 9)
Neptune Road
952-8R – Monitoring Well Location
– Site Property Line
Scale
0 25' 50' 100'
IBM
Poughkeepsie, New York
B952/982 Site – Existing On-Site Monitoring Well Location Map
DRAWN BY: MHM
DATE: 2/22/93
CHECKED & APPROVED BY: CGR
DRAWING NO.
92022-009-A
GROUNDWATER SCIENCES CORPORATION

Figure 6-1

APPENDIX A

Relevant Regulatory Agency Documents

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2a REGION: 3 SITE CODE: 314076
EPA ID: NYD982531881

NAME OF SITE : IBM B952/982
STREET ADDRESS: Neptune Road
TOWN/CITY: Poughkeepsie
COUNTY: Dutchess
ZIP: 12602

SITE TYPE: Open Dump- Structure- Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Leased by IBM
CURRENT OWNER ADDRESS.: ,
OWNER(S) DURING USE...:
OPERATOR DURING USE...: IBM Corporation
OPERATOR ADDRESS.....: P.O. Box 950, Poughkeepsie, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From To

SITE DESCRIPTION:
This facility manufactures printing circuits. The site is located on a broad upland between Casper Creek 2000 feet to the southeast and a small unnamed stream 3500 feet to the northwest. Surface water drainage is to the southeast towards Casper Creek. There are numerous domestic and commercial water supply wells in the immediate vinicity of the B952 site. There are groundwater monitoring wells located on site, which showed levels of 1,1,1 trichloroethane, trichloroethylene, 1,2 dichlorobenzene and other organics. One additional round of groundwater sampling will be conducted by NYSDEC in 1992.

HAZARDOUS WASTE DISPOSED: Confirmed- TYPE	Suspected- QUANTITY (units)
Halogenated solvents (F001, F002) (Sovasol rinse disposal)	unknown

SITE CODE: 314076

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater-X Soil- Sediment-

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water- Surface Water- Air-

LEGAL ACTION:

TYPE..: Consent Order - DEE State- X Federal-
STATUS: Negotiation in Progress- Order Signed-

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
NATURE OF ACTION:

GEOTECHNICAL INFORMATION:
SOIL TYPE: Wappinger formation
GROUNDWATER DEPTH:

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Contravention of groundwater standards. Additional information is necessary to adequately evaluate the site.

ASSESSMENT OF HEALTH PROBLEMS:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561-1696
(914) 255-5453

Henry G. Williams
Commissioner

July 6, 1984

IBM
P.O. Box 950
Dept. 771, Bldg. 928
South Road
Poughkeepsie, New York 12602

Attn: J.J. Everhart

Re: IBM-Poughkeepsie Bldg. 952
Site #314001

Dear Mr. Everhart:

This Department has reviewed the proposed remedial project outlined in the "Summary of Work Plan Building 952/982 Remediation Program" dated June, 1984. The work plan is acceptable, including the removal criteria summarized here:

	GT
Total volatile organics	500 ppb
Total phthalates	20 ppm
Base neutrals (excluding phthalates)	500 ppb
Acid extractables	500 ppb

Some points relating to the sampling program, post-demolition investigation at 952/982, and future groundwater monitoring will require some discussion in the final report, however they need not interfere with the implementation of the remidial plan. The QA/QC report which we discussed should be submitted as soon as possible to:

Anna Wolfe
NYS Department of Environmental Conservation
Room 414
50 Wolf Road
Albany, New York 12233

The Bureau of Remedial Action and the Region will minitor the operation. Please contact me at 914/255-5453 or Anna Wolfe at 518/457-5637 with scheduling details.

Sincerely,

William G. Sullivan
Assistant Sanitary Engineer
Region 3

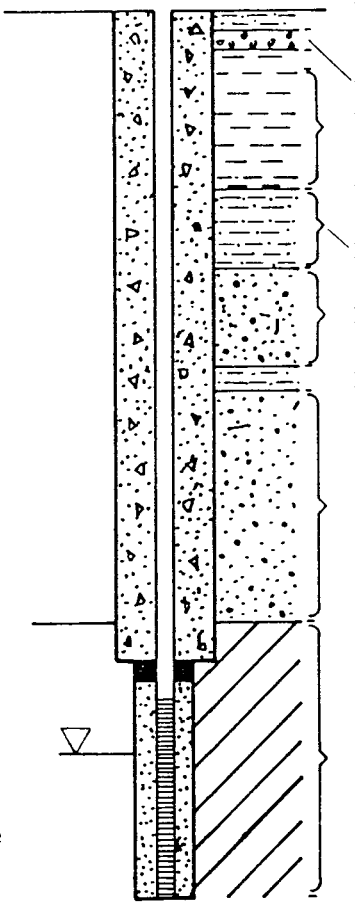
WGS/dl
cc: A. Wolfe
J. Hill, D.C.H.D.

APPENDIX B

Monitoring Well and Soil Boring Logs

BOREHOLE NO. 71/952-1*

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0			
	Hand Augered		
	2-3-2-3	S-1	Dark grayish-brown grading to yellowish-brown gravelly silt
	3-4-4-5	S-2	Dark brown sandy gravel
10	5-11-17-30	S-3	Dark yellowish-brown and gray silty clay with trace of coarse sand. Saturated at 7'.
	16-26-37-100/.4	S-4	
	90-75-58-47	S-5	Light olive brown varied silt with occasional layer of fine sand (moist
	29-46-63-118	S-6	Dark grayish-brown very gravelly fine sand (dry)
	30-60-100/.4	S-7	
20	38-57-78-90	S-8	Light olive brown gravelly silt
	78-60-83-62	S-9	
	59-100/.4	S-10	Dark grayish-brown very gravelly fine sand (dry)
	41-50-77-44	S-11	
	18-25-30-33	S-12	
30	79-100/.4	S-13	
	100/.1	No sample	
	100%	R-1	Bedrock: Light gray dolomite
	100%	R-2	
40	Roller Bit	No sample	
45			



Vertical Scale
1" = 10'

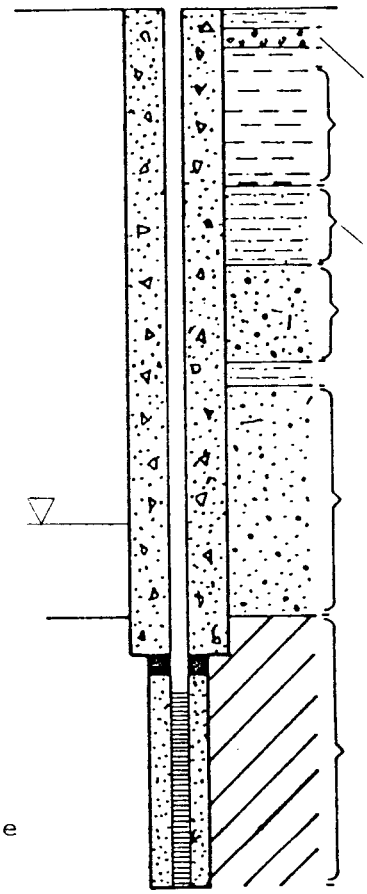
Drilling Began	10/28/81
Drilling Completed	10/29/81
Well Construction Completed	10/29/81
Development Completed	12/2/81
Total Depth	45'
Depth to Refusal	31'

SWL (date)	96.88' (12/2/82)
Screened Interval	45'-35'
Aquifer	Rock
Elevation, Ground Surface	134.98'
Elevation, Top of Casing	134.98'
Hole Dia:	7" Hollow stem/NX core/RB 42'-45'
Monitoring Tube:	1.5" FJ SCH 80 PVC

*This boring was drilled as part of 1981 Program during which it was referred to as T-71. In the 1982 Program, the boring number was changed to 952-1.

BOREHOLE NO. 71/952-1

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0			Dark grayish-brown grading to yellowish-brown gravelly silt
	Hand Augered		Dark brown sandy gravel
	2-3-2-3	S-1	Dark yellowish-brown and gray silty clay with trace of coarse sand. Saturated at 7'.
	3-4-4-5	S-2	
10	5-11-17-30	S-3	
	16-26-37-100/.4	S-4	Light olive brown varied silt with occasional layer of fine sand (mo
	90-75-58-47	S-5	Dark grayish-brown very gravelly fine sand (dry)
	29-46-63-118	S-6	
	30-60-100/.4	S-7	Light olive brown gravelly silt
20	38-57-78-90	S-8	
	78-60-83-62	S-9	
	59-100/.4	S-10	Dark grayish-brown very gravelly fine sand (dry)
	41-50-77-44	S-11	
	18-25-30-33	S-12	
30	79-100/.4	S-13	
	100/.1	No sample	
	100%	R-1	Bedrock: Light gray dolomite
	100%	R-2	
40	Roller Bit	No sample	
45			



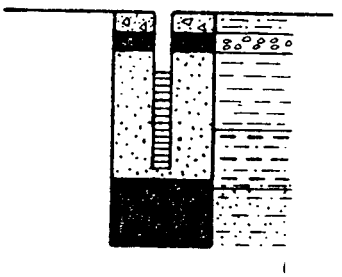
Vertical Scale
1" = 10'

Drilling Began	10/28/81
Drilling Completed	10/29/81
Well Construction Completed	10/29/81
Development Completed	12/2/81
Total Depth	45'
Depth to Refusal	31'

SWL (date) 108.22' (5/12/82)
Screened Interval 45'-35'
Aquifer Rock
Elevation, Ground Surface 134.98'
Elevation, Top of Casing 134.98'
Hole Dia: 7" Hollow stem/NX core/RB 42'-45'
Monitoring Tube: 1.5" FJ SCH 80 PVC

BOREHOLE NO. 952-1S

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0—			
	Hand Augered to 6'		Dark grayish-brown gravelly silt.
	3-4-4-8	S-1A, B	Dark brown sandy gravel.
	3-4-11-18	S-2A, B, C	Gray silty clay with trace of sand.
10—	12-34-50-60	S-3A	Medium gray silty clay, wet.
12—			Medium olive yellow/brown silty, clayey, medium to fine sand; damp.



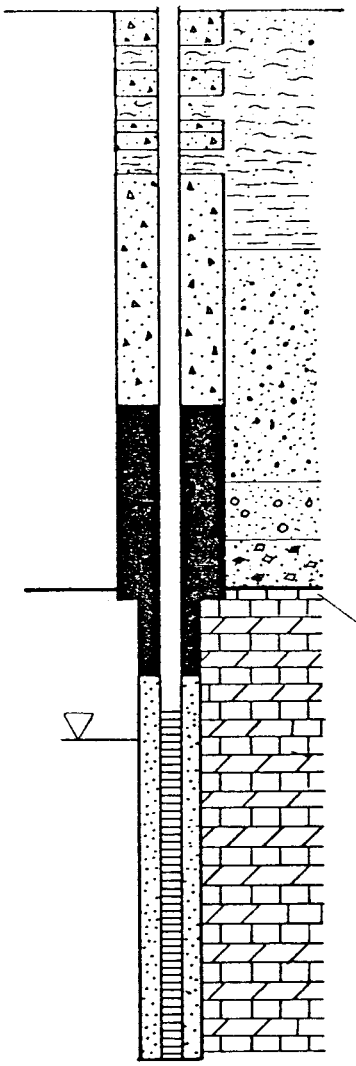
Vertical Scale
1" = 10'

Drilling Began - 11/15/82
Drilling Completed - 11/16/82
Well Construction
Completed - 11/16/82
Development Completed - NA (dry)
Total Depth - 12'
Depth to Refusal - NA

SWL (date) - Dry (12/3/82)
Screened Interval 3' - 8'
Aquifer - Soil
Elevation, Ground Surface - 135.0'
Elevation, Top of Casing
Hole Dia: 7" hollow stem auger
Monitoring Tube - 1-1/4" Sch 40 FJ PVC

BOREHOLE NO. 952-2

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 6.0'		Dark gray to grayish-brown gravelly, sandy loam and gravelly sand, grading to light olive brown sandy silt at 6 ft. and silty clay at 10 ft. Saturated; slight chemical odor between 6 and 8 ft.
	6-7-5-5	S-1	
10	2-3-4-4	S-2	
	7-6-6-5	S-3	
	4-4-6-5	S-4	Dark yellowish-brown to light brownish-gray gravelly fine to coarse grained sand; no odor.
	2-2-2-2	S-5	
	2-1-1-1	S-6	
20	1-1-1-1	S-7	
	2-3-4-16	S-8	
	7-2-2-2	S-9	Dark yellowish-brown silty fine to very fine-grained sand and cobbly gravel.
	1-1-5-20	S-10	
	12-6-11-20	S-11	
	15-26-100/.4	S-12	Brown to gray fine to very fine sandy limestone gravel; moist.
30	Augered 0.6'	N.S.	Fragmented limestone.
	100/.1	N.S.	
	3.0/3.5	Run 1	
	Casing Run 0.9'	N.S.	
	1.0/4.5	Run 2	Dolomitic limestone with clay, sand, and gravel filled solution cavities. Broken and fractured rock throughout.
40			
	4.7/5.0	Run 3	
	5.0/5.0	Run 4	
50			
54	1.5/4.0	Run 5	



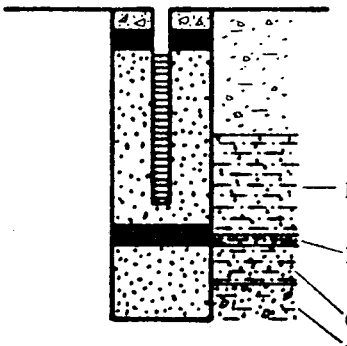
Vertical Scale
1" = 10'

Drilling Began - 10/5/82
Drilling Completed - 10/6/82
Well Construction
Completed - 10/6/82
Development Completed - 10/8/82
Total Depth - 54.0'
Depth to Refusal - 29.4'

SWL (date) - 97.59 (12/2/82)
Screened Interval - 35.9' to 54.0'
Aquifer - Rock
Elevation, Ground Surface - 135.17'
Elevation, Top of Casing -
Hole Dia: 7" H.S./3-3/8" casing/NXM core
Monitoring Tube: 1-1/4" SCH 40 FJ PVC

BOREHOLE NO. 952-2S

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 6'		Dark brown silty, gravelly sand.
	2-3-4-7	S-1	
	4-6-7-7	S-2	
10	5-10-10-15	S-3A,S-3B	Medium yellowish brown slightly sandy, clayey silt; wet
	5-10-13-13	S-4	Dark olive brown silty, gravelly fine to coarse sand
16	10-9-6-6	S-5	Olive brown sandy silt
			Dark brown silty, gravelly, fine to coarse sand



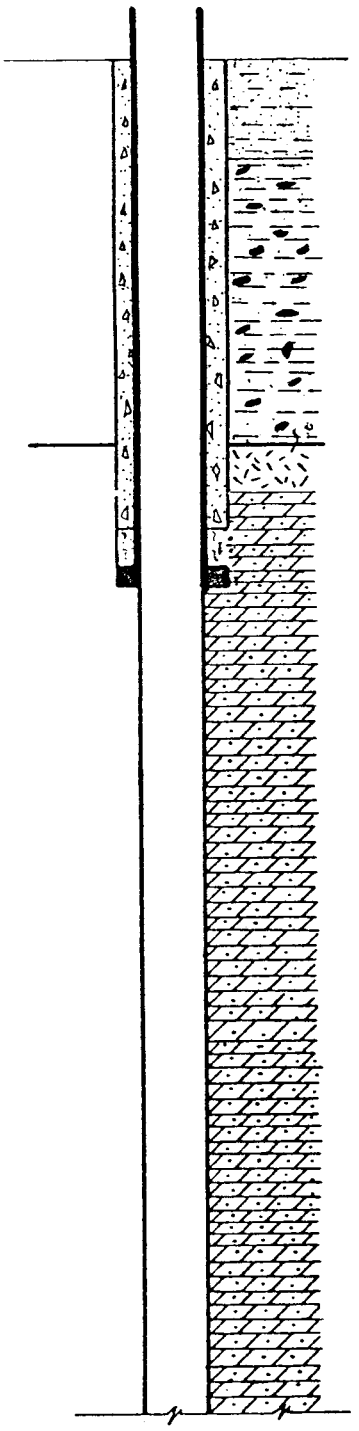
Vertical Scale
1" = 10'

Drilling Began - 11/15/82
Drilling Completed - 11/16/82
Well Construction
Completed - 11/16/82
Development Completed - NA (Dry)
Total Depth - 16'
Depth to Bedrock - NA

SWL (date) - Dry (12/3/82)
Screened Interval 2.5' - 10'
Aquifer - Soil
Elevation, Ground Surface - 135.19
Elevation, Top of Casing
Hole Dia: 7" hollow stem auger
Casing: 1-1/4" Sch 40 FJ PVC

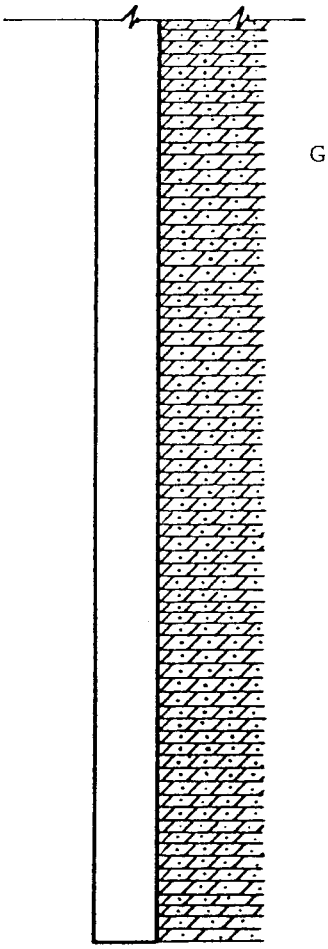
BOREHOLE NO. 952-3

Depth in feet	Blow Ct. Recovery	Sample # Run #	Description
0			
	Air Rotary	AR-1	Medium orange-brown to brownish-gray clayey, silty, sandy fill.
		AR-2	
			Olive gray clayey till; wet at 10'
10			
		AR-3	
		AR-4	
20			Gray weathered dolomitic limestone.
		AR-5	
		AR-6	
30			
		AR-7	Gray shaly and fine-sandy dolostone slightly pyritic.
		AR-8	
40			
		AR-9	
		AR-10	
50			
		AR-11	
		AR-12	
60			
		AR-13	
		AR-14	
70			



BOREHOLE NO. 952-3 (cont.)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
70			
	Air Rotary	AR-15	
		AR-16	Gray shaly and fine-sandy dolostone, slightly pyritic.
80			
		AR-17	
		AR-18	
90			
		AR-19	
		AR-20	
100			
		AR-21	
		AR-22	
110			
		AR-23	
117			



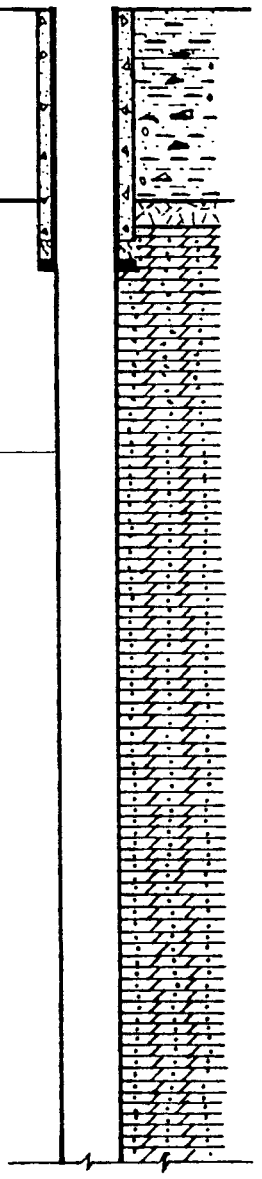
Vertical Scale
1" = 10'

Drilling Began - 9/30/82
Drilling Completed - 9/30/82
Well Construction
Completed - 9/30/82
Development Completed - 9/30/82
Total Depth - 117'
Depth to Refusal - 19.8'

SWL (date) - 103.1' (10/11/82)
Screened Interval - Open rock hole.
Aquifer - Rock
Elevation, Ground Surface - 144.51'
Elevation, Top of Casing -
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" SCH 40 PVC

BOREHOLE NO. 952-3
(Page 1 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0–	Air Rotary 0 - 225'	Sampled every 5' interval to a total depth of 225'.	Medium orange-brown to brownish-gray clayey, silty, sandy fill.
10–			Olive gray clayey till; wet at 10'.
20–			Gray weathered dolomitic limestone.
30–			Gray shaly and fine-sandy dolostone, slightly pyritic.
40–			
50–			Soft rock 50.5' to 52.0'.
60–			Soft rock at 65.5'.
70–			
80–			
90–			Possible water bearing zone at 90.0'; approx. yield <0.1 gpm.
100–			
110–			
120–			



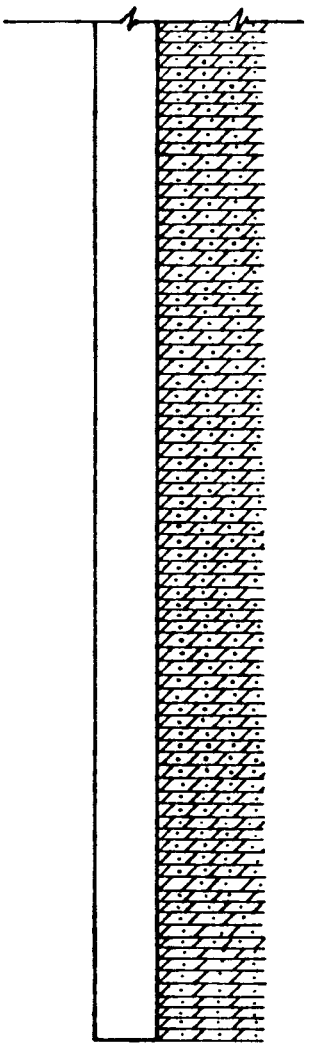
Vertical Scale
1" = 20'

Drilling Began - 9/30/82 *
Drilling Completed - 9/30/82 *
Well Construction
Completed - 9/30/82 *
Development Completed - 9/30/82 *
Total Depth - 225'
Depth to Refusal - 19.8'

SWL (date) - 103.93' (12/2/82)
Screened Interval - Open rock hole.
Aquifer - Rock
Elevation, Ground Surface - 144.51'
Elevation, Top of Casing
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" SCH 40 PVC

BOREHOLE NO. 952-3
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			Gray shaly and fine-sandy dolostone, slightly pyritic. Broken zone at 122'; approx. yield of 1 to 1-1/2 gpm.
130			
140			
150			
160			Broken zone at 158'. Broken zone at 166'.
170			170' to 225' soft zones throughout
180			
190			
200			
210			
220			Estimated Total Blown Yield is 7 gpm.
225			

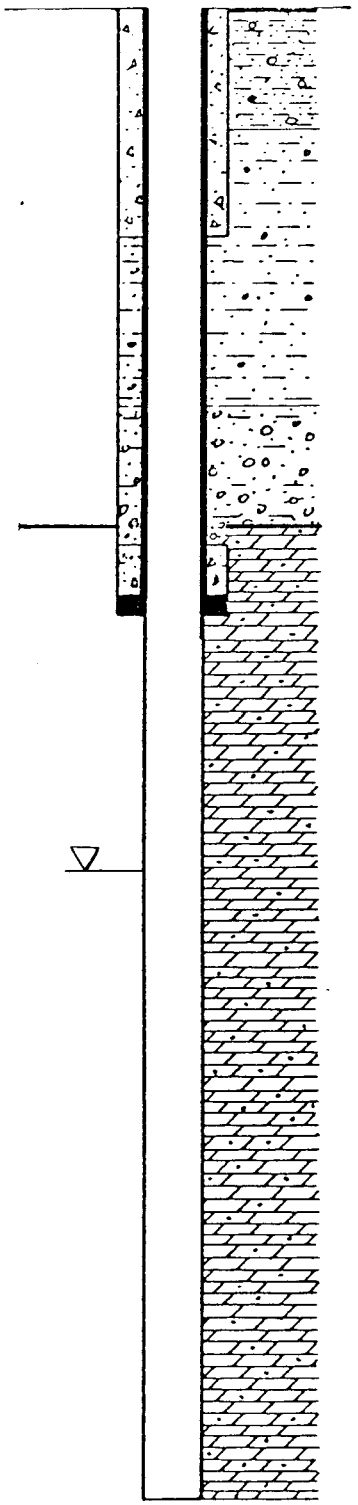


Vertical Scale
1" = 20'

* NOTE: Boring 952-3 was originally drilled to a depth of 117'. On 11/30/82 this hole was deepened to its present depth.

BOREHOLE NO. 952-4

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 2.6'		Macadam
	Air Rotary	AR-1	Yellow brown gravelly sandy loam.
		AR-2	Orange brown, clayey, sandy, gravelly silt, poorly sorted.
10		AR-3	
		N.S. 5.0'	Note: Formation collapsed against casing.
20		AR-4	Gray brown clayey, silty sandy gravel, poorly sorted.
		AR-5	Medium to dark gray; silty to fine sandy dolomite with quartz veins and occasional brown fine-grained calcareous sandstone interbeds; trace of iron staining.
30		AR-6	
		AR-7	
40		AR-8	
		AR-9	
50		AR-10	
		AR-11	Yield is <1/2 gpm at 60'.
60		AR-12	Weathered zone from 60 - 65'.
		AR-13	
70		AR-14	
76		N.S. 1.0'	Estimated total blown zone of 2 gpm.



Vertical Scale
1" = 10'

r.e. wright associates, inc.

BOREHOLE NO. 952-4 (cont.)

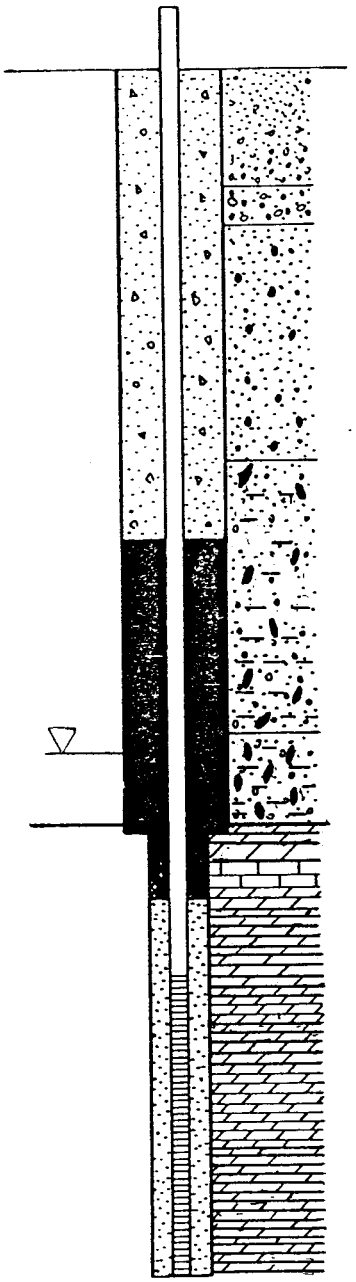
Drilling Began - 9/30/82
Drilling Completed - 10/4/82
Well Construction
Completed - 10/5/82
Development Completed - 10/5/82
Total Depth - 76'
Depth to Refusal - 26'

SWL (date) - 93.6 (12/2/82)*
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 138.33'
Elevation, Top of Casing -
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" SCH 40 PVC

* Water level fluctuates in response to nearby pumping well.

BOREHOLE NO. 952-5

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0			
	Hand Augered to 4.3'		Dark brown very gravelly sandy loam.
	13-18-21-29	N.S.	
	15-18-23-29	S-1	Pebbly quartzitic sandy gravel; moderate to well rounded gravel and medium-grained sand.
	17-18-17-12	S-2	
10	6-8-8-14	S-3	Dark grayish-brown medium to coarse grained sand; some gravel and cobbles; weathered and slightly moist.
	12-10-10-12	S-4	
	9-10-13-13	S-5	
	12-17-22-19	S-6	
	19-22-32-24	S-7	
20	13-35-50-64	S-8	Very dark gray brown to light olive brown till-like material with increasing clay content and variable gravel mineralogy. Occasional thin layers of well sorted sand.
	42-35-27-19	S-9	
	17-35-64-62	S-10	
	44-88-162-84	S-11	
	200/.5	S-12	
30	Augered 1.5'	N.S.	
	25-40-48-39	S-13	
	51-62-41-44	S-14	
	19-22-25-42	S-15	Till; light olive brown clayey fine sand gravel; very moist to saturated.
	25-36-48-73	S-16	
	45-100/.2	S-17	
40	Augered 0.3'	N.S.	Severely broken, mechanically and chemically weathered, sandy dolomite.
	2.8/4.0	Run 1	
	0.5/2.5	Run 2	
	3" casing 0.5'	N.S.	
50	2.1/6.0	Run 3	
	2.9/5.0	Run 4	
	1.3/5.0	Run 5	
60			
62			



Vertical Scale
1" = 10'

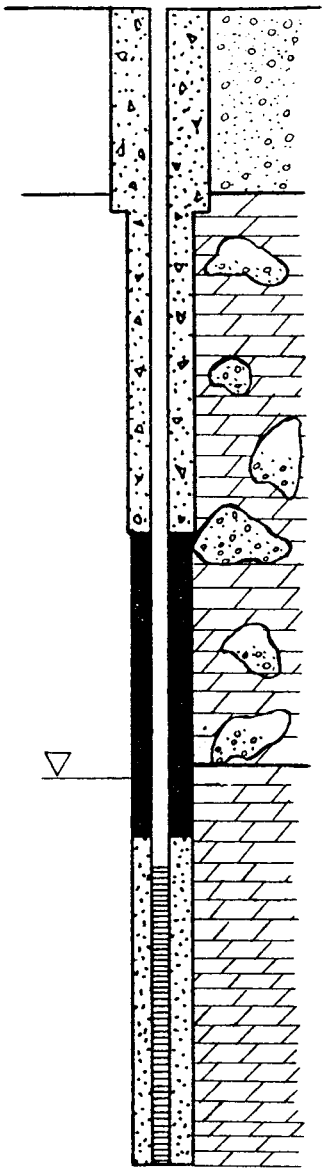
Drilling Began - 9/29/82
Drilling Completed - 9/29/82
Well Construction
Completed - 10/1/82
Development Completed - 10/7/82
Total Depth - 62.0'
Depth to Refusal - 38.7'
N.S. = No Sample

SWL (date) - 101.85 (12/2/82)
Screened Interval - 46.4' to 62'
Aquifer - Rock
Elevation, Ground Surface - 137.04'
Elevation, Top of Casing -
Hole Dia: 7" H.S. Auger/3-3/8" casing/NXM
Monitoring Tube: 1-1/4" SCH 40 FJ PVC

r.e. wright associates, inc.

BOREHOLE NO. 952-6

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Augered		Dark brown to gray gravelly sand, dry to slightly moist, noncohesive, fill.
	36-36-19-24	S-1	
	15-20-23-48	S-2	
	40-43-55-100/.2	S-3	
	Augered		
10	1.7/3.2	R-1	
	0.8/4.7	R-2	Sandy dolomite with voids filled with sand and gravel; weathered fragments of sandstone, granite, limestone, or shale.
20	2.0/4.7	R-3	
	0.7/3.7	R-4	
	Casing Run		
30	2.0/4.0	R-5	
	1.0/3.5	R-6	
	0.6/1.5	R-7	
	0.0/2.0	R-8	
	Roller Bit		
40	2.0/5.0	R-9	
	4.2/5.0	R-10	Gray, sandy, dolomite.
50	3.6/4.2	R-11	
	4.5/5.0	R-12	
	2.0/1.8	R-13	
60			



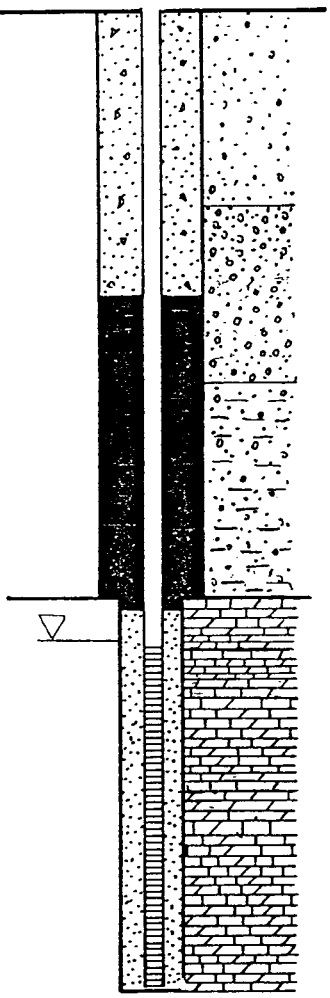
Vertical Scale: 1" = 10'

Drilling Began - 10/19/82
Drilling Completed - 10/22/82
Well Construction
Completed - 10/22/82
Development Completed - 10/26/82
Total Depth - 60.0'
Depth to Refusal - 9.7'

SWL (date)- 91.0' (12/2/82)
Screened Interval - 44.2' to 60.0'
Aquifer - Rock
Elevation, Ground Surface - 130.83'
Elevation, Top of Casing
Hole Dia: 7" Hollow stem/4-4/5" casing/
3" NX core
Monitoring Tube: 1-1/4" FJ PVC

BOREHOLE NO. 952-7

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0			Macadam
	Hand Augered to 5.0'		Dark yellowish-brown gravelly sand dry to moist, poorly cohesive, slight chemical odor at 11 ft.
	6-8-9-10	S-1	
	7-10-10-11	S-2	
	12-15-13-14	S-3	
10	9-12-13-13	S-4	Dark brown to dark grayish-brown gravelly fine- to coarse-grained sand; cohesion improving, occasional slight chemical odor, moist.
	8-9-11-14	S-5	
	9-12-13-13	S-6	
	7-11-12-13	S-7	
	7-35-42-64	S-8	
20	50-35-18-36	S-9	Yellowish-brown silty, clayey, gravelly fine to very fine-grained sand; very tight cohesive, till-like material; saturated at 19 feet, no discharge odors.
	35-40-18-18	S-10	
	31-66-100/.2	S-11	
	Augered 0.8'	N.S.	
	200/.5	S-12	
	Augered 1.5'	N.S.	
30	31-36/.3	S-13	Fragmented limestone 30.1-30.5'
	Augered 0.2'	N.S.	
	100/.1	S-14	Dolomitic limestone, occasional fractures, solution cavities, calcite veins.
	Augered 0.4'	N.S.	
	4.0/4.1	Run 1	
	3.4/4.2	Run 2	
40	Rollerbit 0.2'	N.S.	
	3.7/5.0	Run 3	
	4.7/3.6	Run 4	
	3.5/3.0	Run 5	
50			



Vertical Scale
1" = 10'

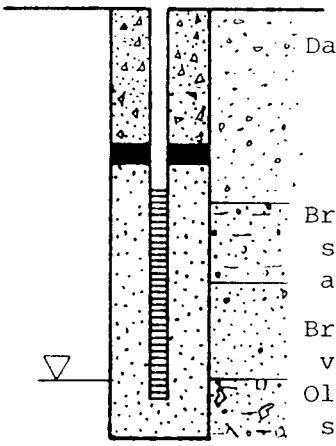
Drilling Began - 10/1/82
Drilling Completed - 10/5/82
Well Construction
Completed - 10/5/82
Development Completed - 10/6/82
Total Depth - 50.6'
Depth to Refusal - 30.1'

SWL (date) - 103.11 (12/2/82)
Screened Interval - 32.4' to 50.5'
Aquifer - Rock
Elevation, Ground Surface - 135.49'
Elevation, Top of Casing -
Hole Diameter: 7" hollow stem/3-3/8" casing/NXM Core
Monitoring Tube: 1-1/4" SCH 40 FJ PVC

N.S. = No sample

BOREHOLE NO. 952-7S

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Augered to 10'		Dark yellowish-brown gravelly sand.
10	32-30-19-14	S-1	Brown silty, pebbly fine and very fine sand, with thin gravel and sand layers at base; dry to moist; some odor.
	14-14-20-17	S-2	
	10-13-12-12	S-3	
	9-10-10-13	S-4	Brownish-gray gravelly very fine to very coarse sand; saturated at base.
20	8-38-40-41	S-5	Olive gray and brownish-gray clayey, silty, pebbly, sand; till; saturated.
22	21-20-40-95	S-6	



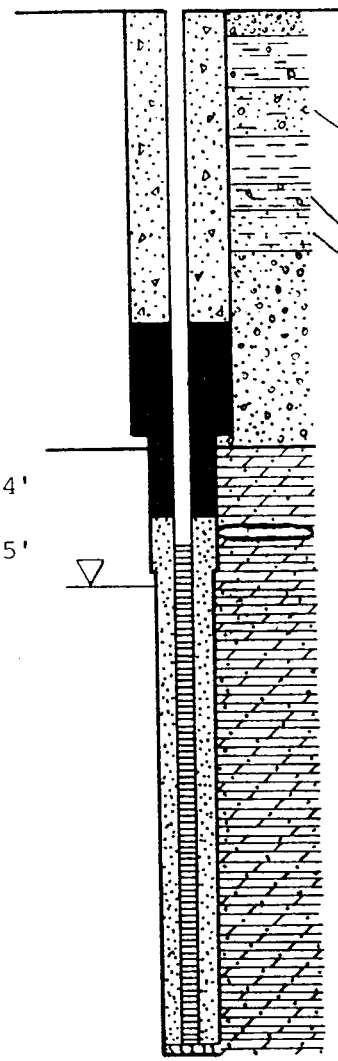
Vertical Scale
1" = 10'

Drilling Began - 11/15/82
Drilling Completed - 11/16/82
Well Construction
Completed - 11/16/82
Development Completed - 12/1/82
Total Depth - 22'
Depth to Refusal - NA

SWL (date) - 116.43' (12/3/82)
Screened Interval 9.5' - 20.0'
Aquifer - Soil
Elevation, Ground Surface - 135.60'
Elevation, Top of Casing
Hole Dia: 7" hollow stem auger
Monitoring Tube: 1-1/4" Sch 40 FJ PVC

BOREHOLE NO. 952-8

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	40-20-17-11	S-1	Gray fine sand and pebbly limestone gravel (road base).
	6-10-5-5	S-2	Yellowish-brown gravelly, clayey silt, moderately moist.
	15-17-28-14	S-3	
	5-5-10-13	S-4	Yellowish-brown silty, gravelly sand.
10	6-14-20-20	S-5	Yellowish-brown gravelly, silty varved clay, moist to very moist.
	7-12-19-29	S-6	Yellowish-brown gravelly sandy silt.
	36-42-49-60	S-7	Yellowish-brown clayey fine sand with some gravel.
	33-31-24-26	S-8	Yellowish-brown gravelly sand, dry to slightly moist.
	21-29-29-23	S-9	
20	20-13-19-26	S-10	
	55-39-78-60	S-11	
	200-100/.1	S-12	
	Casing Run	N.S. 0.4'	
	2.0/3.5	R-1	Medium to dark gray sandy dolomite and dolomitic limestone; fractured, occasional weathered zone.
	Casing Run	N.S. 0.5'	
30	3.2/4.0	R-2	Rock void 26.5-27.0'
	1.4/4.2	R-3	Fractured rock at 27.5', 30.0', and throughout the section from 35.2' to 54.5'.
	4.8/4.8	R-4	
40	5.0/5.0	R-5	
	5.0/5.0	R-6	
50	4.5/4.5	R-7	
54.5			



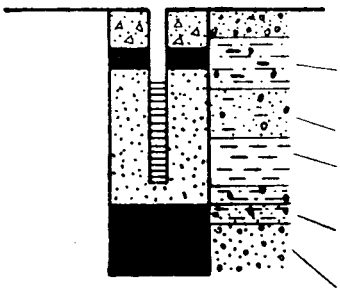
Vertical Scale
1" = 10'

Drilling Began - 10/25/82
Drilling Completed - 10/26/82
Well Construction
Completed - 10/26/82
Development Completed - 10/29/82
Total Depth - 54.5'
Depth to Refusal - 22.6

SWL (date) - 105.58' (12/2/82)
Screened Interval - 27.8 to 53.9'
Aquifer - Rock
Elevation, Ground Surface - 135.5'
Elevation, Top of Casing
Hole Dia: 7" Hollow stem/4" casing/NXM Core
Monitoring Tube: 1-1/4" SCH 40 FJ SS

BOREHOLE NO. 952-8S

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 10'		
10	21-20-24-18	S-1,A,B	
	31-170/.5	S-2	
13.7	Power Augered 0.8'	N.S.	



Gray fine sand and pebbly limestone gravel (road base).
Yellowish-brown gravelly, clayey silt, moderately moist.
Yellowish-brown silty, gravelly sand.
Yellowish-brown gravelly, silty varved clay, moist to very moist.
Yellowish-brown silty, gravelly very fine to very coarse sand, moist.
Light brownish-gray gravelly sand, loose and dry.

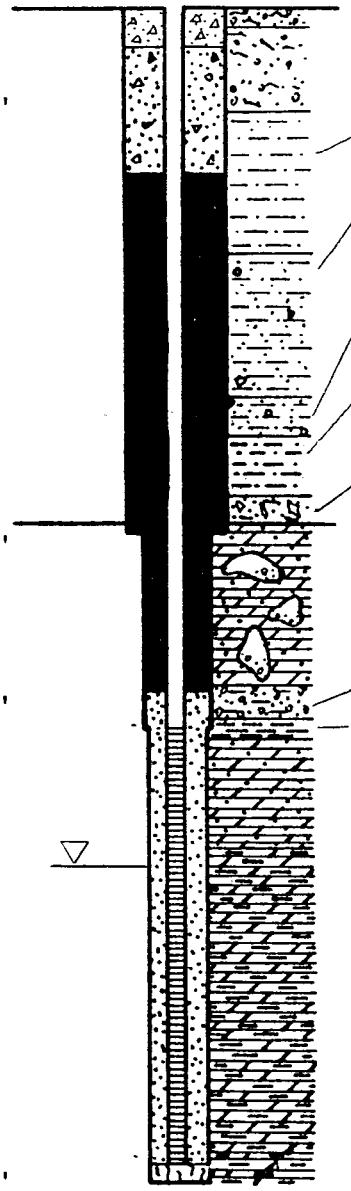
Vertical Scale
1" = 10'

Drilling Began - 11/16/82
Drilling Completed - 11/16/82
Well Construction Completed - 11/16/82
Development Completed - NA
Total Depth - 13.7'
Depth to Refusal - NA

SWL (date) - Dry (12/3/82)
Screened Interval - 3.7' to 9.0'
Aquifer - Soil
Elevation, Ground Surface - 135.71'
Elevation, Top of Casing -
Hole Dia: 7" H.S. Auger
Monitoring Tube: 1-1/4" SCH 40 FJ PVC

BOREHOLE NO. 952-9

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand augered to 5.3'		Dark yellowish brown sandy loam. Yellowish brown gravelly loamy sand to loamy sand.
	Augered	N.S. 2.7'	Brown clayey silt w/fine sand layers, wet at 10'.
	3-4-5-6	S-1	Brown fine sandy silt w/layers of coarse sand and clay laminae throughout.
10	3-3-4-7	S-2	
	3-4-4-5	S-3	Brown silt w/coarse gray sand layer shale fragments and rounded limestone pebbles.
	2-2-3-3	S-4	
	3-3-3-5	S-5	Gray brown silty sand to clayey silt w/coarse sand laminae and small shale pieces; moist.
	4-4-5-14	S-6	
20	6-13-17-30	S-7	Till; dark gray brown gravelly coars sand with shale pieces, limestone and quartz cobbles, dry.
	13-20-25-31	S-8	
	13-17-66-24	S-9	
	10-100/.1	S-10	Interbedded gray sandy dolomite and dolomitic limestone with thin quart veins and voids throughout.
	Augered	N.S. 0.4'	
	1.2/3.0	R-1	
30	2.2/5.0	R-2	Dark and light gray mottled sandy dolomitic limestone with voids.
	32-78-49-100/.2	S-11	Brown and gray clayey sandy silt and gravel.
	4" casing	N.S. 0.3'	
	3.0/3.0	R-3	Calcareous gray shale w/iron and pyrite laminae.
40	3.6/3.5	R-4	Gray sandy dolomite w/few calcite, quartz, and shale lenses and inclusions.
	6.7/7.5	R-5	Gray dolomite with black shale and quartz laminae; calcite inclusions sandy from 44' to 47'.
50	4.7/4.4	R-6	Dark gray dolomite with shale and quartz veins and inclusions throughout.
	4.4/4.4	R-7	
60	Rollerbit	N.S. 1.2'	



Vertical Scale: 1' = 10'

Drilling Began - 11/1/82
Drilling Completed - 11/3/82
Well Construction
Completed - 11/3/82
Development Completed - 11/4/82
Total Depth - 61.0'
Depth to Refusal - 26.6'

SWL (date) - 90.92 (12/2/82)
Screened Interval - 37.3 to 60.2'
Aquifer - Rock
Elevation, Ground Surface - 135.3'
Elevation, Top of Casing
Hole Dia: 7" Hollow Stem auger/
4" casing/NXM Core
Monitoring Tube: 1-1/4" Sch.40 FJ PVC

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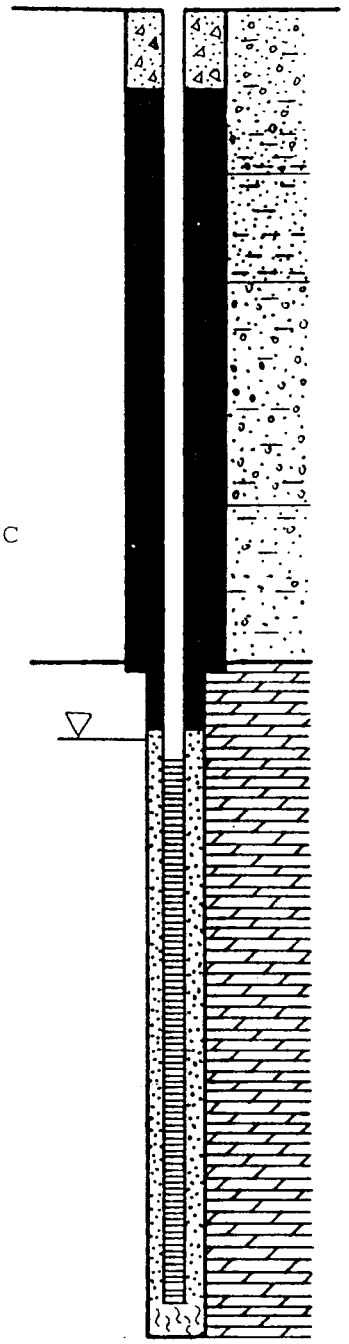
BOREHOLE NO. 952-10

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 6.0'		Dark yellowish-brown silty gravelly fine to coarse sand.
	4-3-3-3	S-1,A,B	
	3-3-4-4	S-2,A,B	Olive yellow clayey silt
10	4-4-5-4	S-3,A,B	
	4-5-5-7	S-4,A,B	Yellow brown clayey, silty, sandy, gravel
	5-4-4-3	S-5,A,B	
	2-2-2-3	S-6	
	1-1-2-1	S-7	
20	2-2-2-1	S-8	
	WR-1-1-1	S-9	
	2-1-1-2	S-10	
	WR-WR-WR-1	S-11,A,B,C	Yellow brown clayey, silty, pebbly sand; saturated, olive brown at base
	1-1-1-1	N.S. 2.0'	
30	WR-WR-WR-1	S-12	
	2-4-4-117	S-13,A,B	
	1.6/4.0	R-1	Light to dark gray fine sandy dolomite and dolomitic sandstone, with some thin shaly partings, weathered and gravelly in upper portions from 33.5' to 40'.
40	1.7/2.7	R-2	
	3.1/2.0	R-3	Weathered zones at 43' and 55'.
	5.0/5.0	R-4	
50	5.0/5.0	R-5	
	10.0/10.0	R-6	
60	3.1/5.0	R-7	
68.8			



Vertical Scale
1" = 20'

Drilling Began - 11/16/82
Drilling Completed - 11/18/82
Well Construction
Completed - 11/18/82
Development Completed - 12/1/82
Total Depth - 68.8'
Depth to Bedrock - 33.5'

SWL (date)- 97.92' (12/3/82)
Screened Interval - 38.4' to 66.8'
Aquifer - Rock
Elevation, Ground Surface - 135.22'
Elevation, Top of Casing
Hole Dia: 7" H.S. Auger/NXM Core
Casing: 1 1/4" Sch 40 FJ PVC

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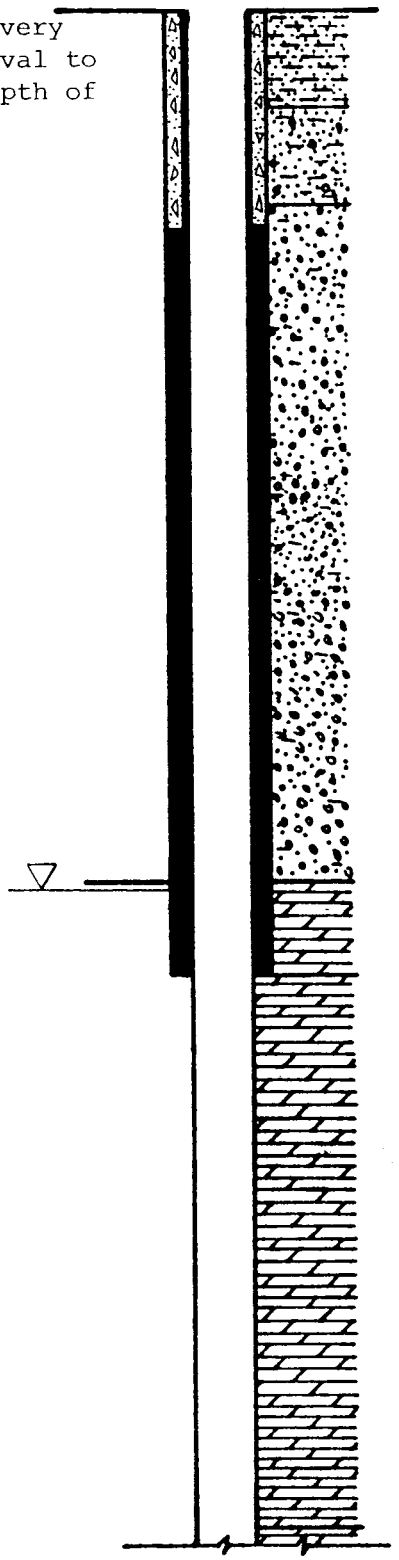
BOREHOLE NO. 952-11
(Page 1 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary - 0 - 145	Sampled every 5' interval to total depth of 145'	Yellowish brown silty sand
			Yellowish brown silty sand; gravelly
10			Brown silty sandy gravel
20			
30			
40			
			Medium gray dolomite, with weathering zones
50			Olive and medium gray dolomite, with weathering zones and quartz veining
60			
70			
80			



Vertical Scale
1" = 10'

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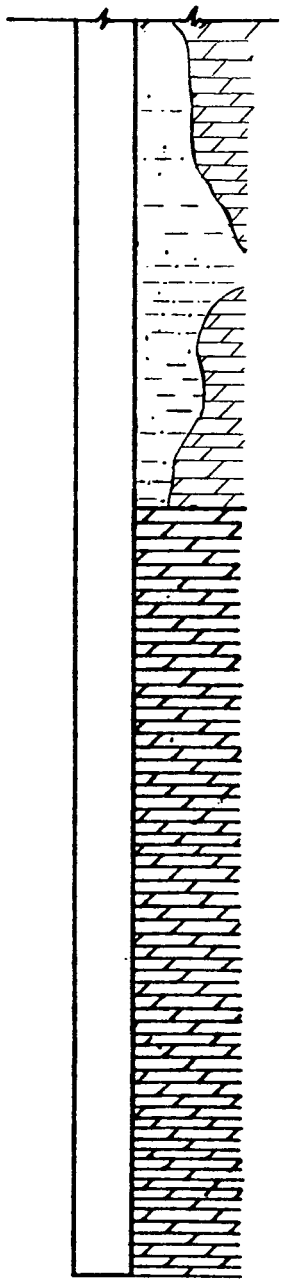
BOREHOLE NO. 952-11
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
80			Rock void from 79' to 105'; approx. yield = 60 gpm.
			Rock void, much water; void looks as if it is filled with loose clay and silt.
90			
100			
			Dark gray dolomite, few chips returned, weathered zones
110			
120			123' to 125' soft rock and water bearing zone.
130			
140			Estimated Total Blown Yield of 100 gpm.
145			



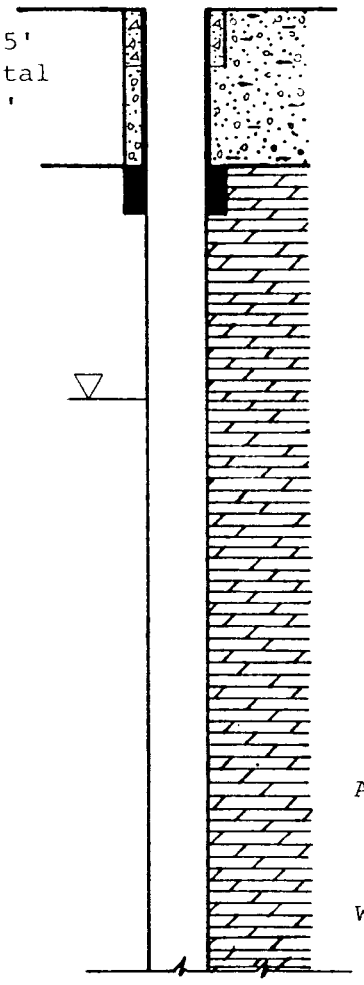
Vertical Scale: 1" = 10'

Drilling Began - 11/20/82
Drilling Completed - 11/20/82
Well Construction Completed - 11/20/82
Development Completed - 11/20/82
Total Depth - 145.0'
Depth to Bedrock - 45'

SWL (date) - 90.93' (12/2/82)
Screened Interval - Open rock hole
Aquifer - rock
Elevation, Ground Surface - 135.68'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-12*
(Page 1 of 2)

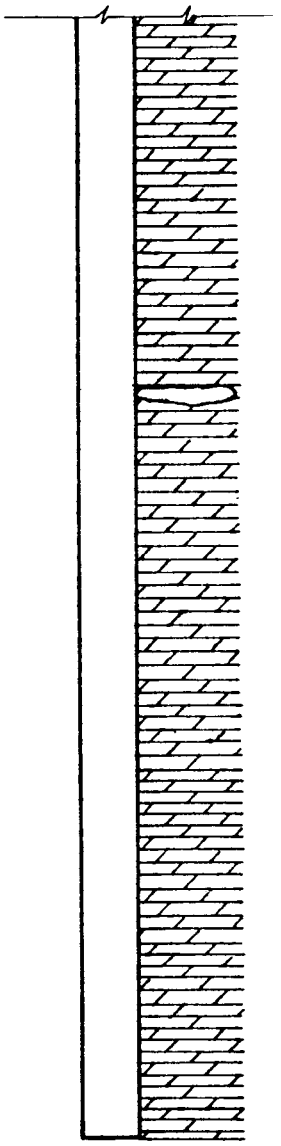
Depth in feet	Blow Ct / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 216	Sampled every 5' interval to total depth of 216.0'	Brown silty, gravelly, sand
10			Note: Formation collapsed against casing.
20			Light to dark gray fine sandy dolomite
30			
40			Cascading water at 40'.
50			
60			
70			
80			Approx. yield of 3/4 gpm at 80'.
90			Weathered zone at 95'.
100			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-12*
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
100			
110			Light to dark gray fine sandy dolomite
120			
130			
140			No cutting or water return; void or fracture zone.
150			
160			
170			
180			
190			
200			
210			
216			



Vertical Scale
1" = 20'

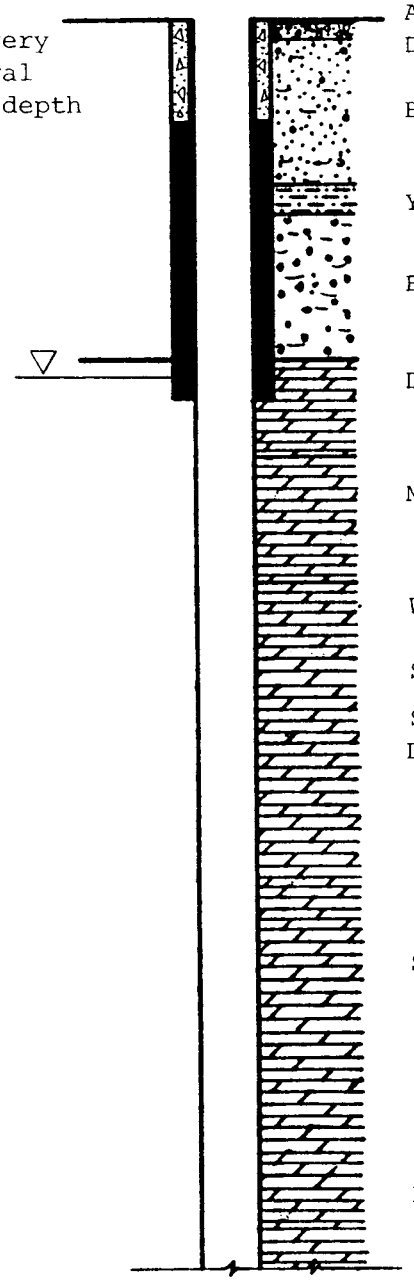
Drilling Began - 11/14/82
Drilling Completed - 11/17/82
Well Construction
Completed - 11/17/82
Development Completed - 11/17/82
Total Depth - 216'
Depth to Bedrock - 16'

SWL (date) - 95.26' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 135.4'
Elevation, Top of Casing
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" steel casing

*Pump stuck in boring on 20 November 1982.

BOREHOLE NO. 952-13
(Page 1 of 2)

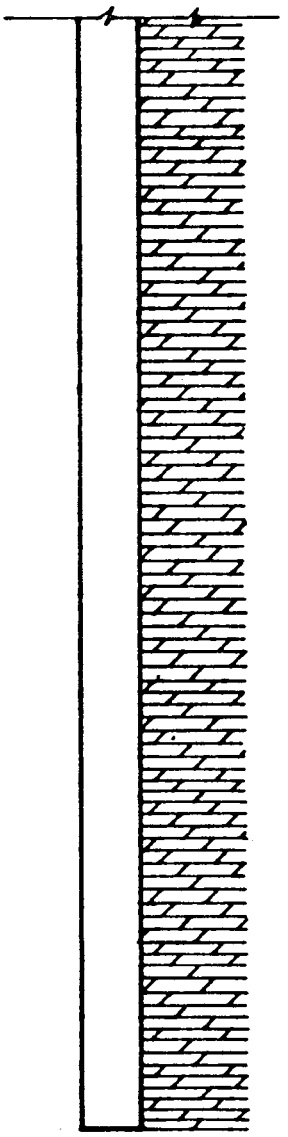
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 245'	Sampled every 5' interval to total depth of 245'	Asphalt
			Deep brown silty gravel; sandy
10			Brown silty sand, gravelly
20			Yellow brown silt; sandy
30			Brown clayey, silty gravel
40			Dark gray fine-grained dolomite with weathering zones
50			Medium gray crystalline dolomite with weathered chips
60			Weathered zone at 60'.
			Soft rock, water bearing zone at 69'.
70			Soft rock, water bearing zone at 74'.
80			Dark and medium gray fine-grained dolomite with weathered chips and quartz and calcite veins
90			
100			Soft rock, water bearing zone at 98'.
110			
120			Blown yield of about 2 gpm at 125'.
130			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-13
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run	Description
130			Soft rock, possible water bearing zone from 132 - 135'.
140			
150			
160			
170			Dark and medium gray fine-grained dolomite with weathered chips and quartz and calcite veins
180			Weathered zone at 186'.
190			
200			Soft rock, water bearing zone 202' to 203'.
210			
220			Water bearing zone at 223'; approx. yield of 10 gpm.
230			
240			Estimated total blown yield of 15 gpm.
245			



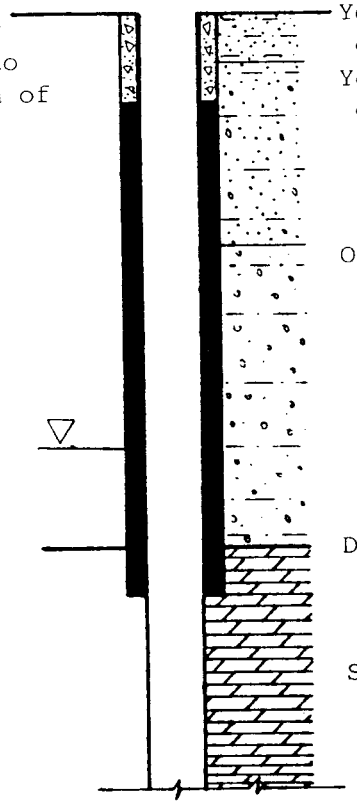
Vertical Scale
1" = 20'

Drilling Began - 11/17/82
Drilling Completed - 11/17/82
Well Construction
Completed - 11/17/82
Development Completed - 11/17/82
Total Depth - 245'
Depth to Bedrock - 35'

SWL (date) - 94.38' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 131.34'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-14
(Page 1 of 2)

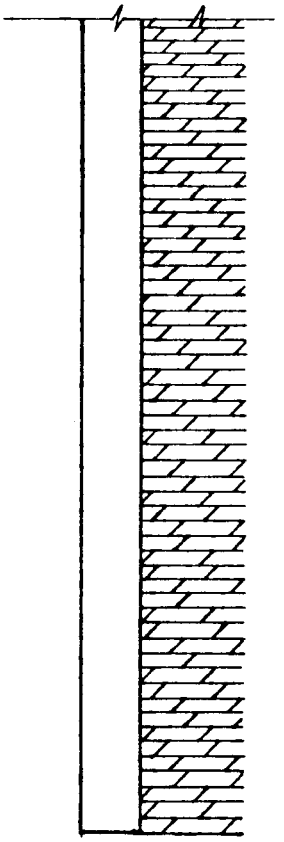
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 162'	Sampled every 5' interval to a total depth of 162'	Yellowish-slightly silty sand; trace gravel.
10			Yellowish-brown silty gravelly sand; olive gray between 15 and 24 feet.
20			
30			Olive brown silty gravel.
40			
50			Dark gray fine grained dolomite with weathering zones and quartz veins; occasional medium gray and olive gray zones. Soft rock at 69'.
60			
70			
80			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-14
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
80			Dark gray fine grained dolomite with weathering zones and quartz veins; occasional medium gray and olive gray zones.
90			
100			
110			
120			Soft rock, water bearing zone from 123' to 126'.
130			
140			Soft rock at 139'.
			Soft rock, water bearing zone from 149' to 160'.
150			
160			
162			



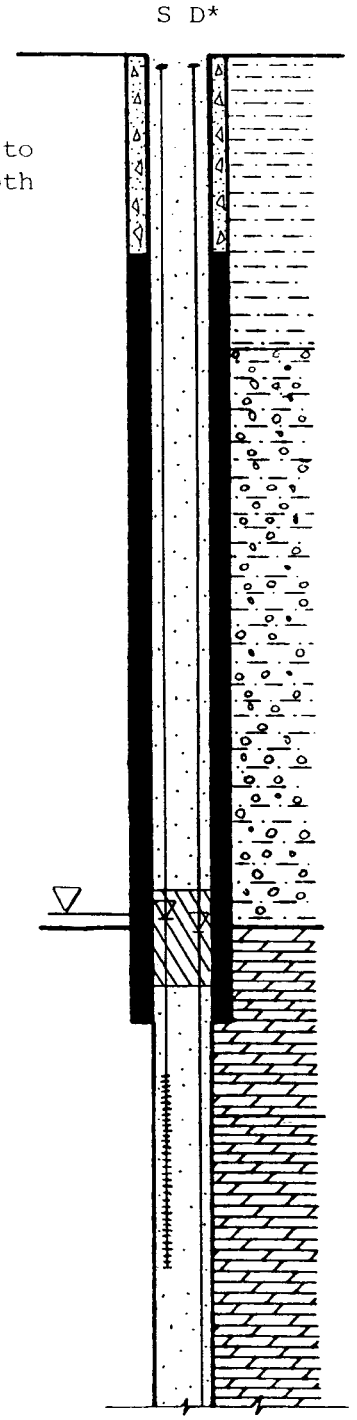
Vertical Scale
1" = 20'

Drilling Began - 11/19/82
Drilling Completed - 11/19/82
Well Construction
Completed - 11/19/82
Development Completed - 11/19/82
Total Depth - 162'
Depth to Bedrock - 55'

SWL (date) - 90.9' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 135.78'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-15

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 145'	Sampled every 5' interval to total depth of 145'	Brown silt; trace clay and gravel.
10			
20			Brown silty gravel.
30			
40			
50			Medium gray fine-grained dolomite with weathered zones.
60			Dark gray to very dark gray fine-grained dolomite with weathered zones and quartz veins.
70			



Vertical Scale
1" = 10'

* The water elevation in each piezometer, S (shallow), and D (deep), is indicated by ▽ ; piezometer construction is shown by sand and bentonite symbols.

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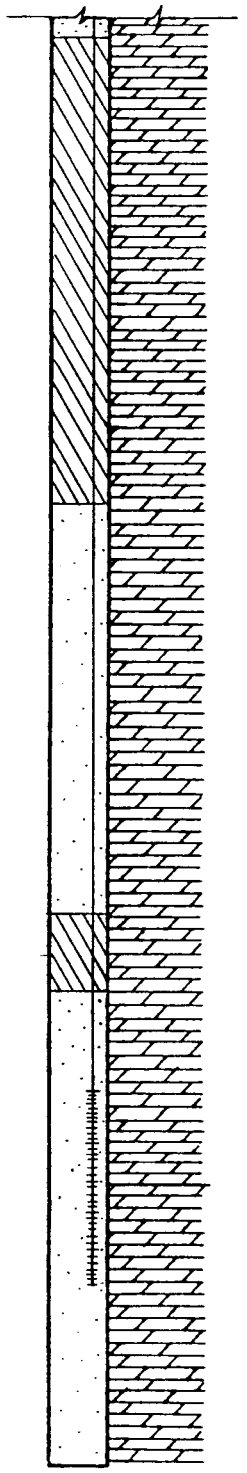
BOREHOLE NO. 952-15

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
70			
80			
90			
100			Dark gray to very dark gray fine-grained dolomite with weathered zones and quartz veins. Weathered zone at 100'.
110			
120			
130			Blown yield of about 5 gpm at 127'.
140			Estimated Total Blown Yield of 10 gpm
145			



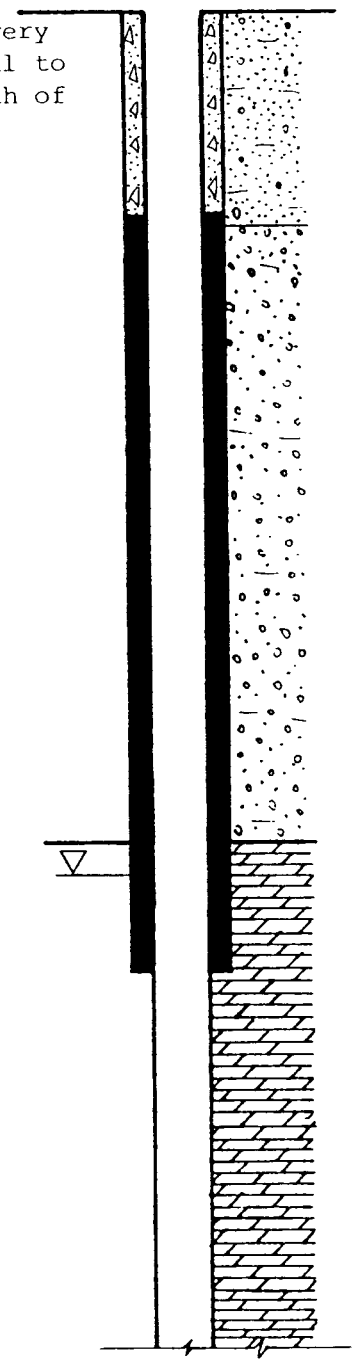
Vertical Scale: 1" = 10'

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Well Construction
Completed - 11/18/82
Development Completed - 11/18/82
Total Depth - 145'
Depth to Bedrock - 45'

SWL (date) - 90.97' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 135.45'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-16
(Page 1 of 2)

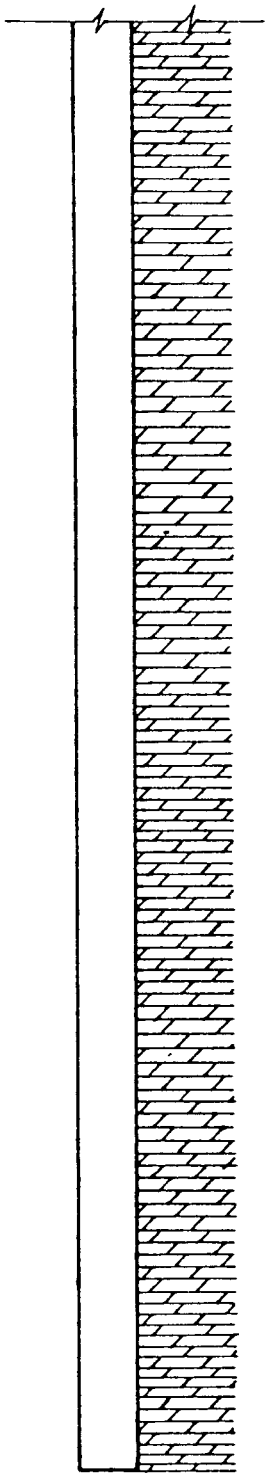
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0—	Air Rotary 0 - 145'	Sampled every 5' interval to total depth of 145'	Brown sand; some gravel; trace silt
10—			Yellowish brown silty sandy gravel
20—			
30—			
40—			Dark grey fine grained dolomite with weathered zones and quartz veins; medium gray from 90-95'
50—			
60—			Soft rock, water bearing zone from 65' to 67'; approx. yield of 1/2 gpm.
70—			



Vertical Scale
1" = 10'

BOREHOLE NO. 952-16
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
70			Dark grey fine grained dolomite with weathered zones and quartz veins; medium gray from 90-95'
80			
			Soft rock at 89'.
90			Soft rock from 92' to 102'; void near 95'.
100			Soft rock from 105' to 109'.
110			Soft rock from 114' to 119'.
120			
130			
140			Estimated Total Blown Yield 2.5 gpm.
145			



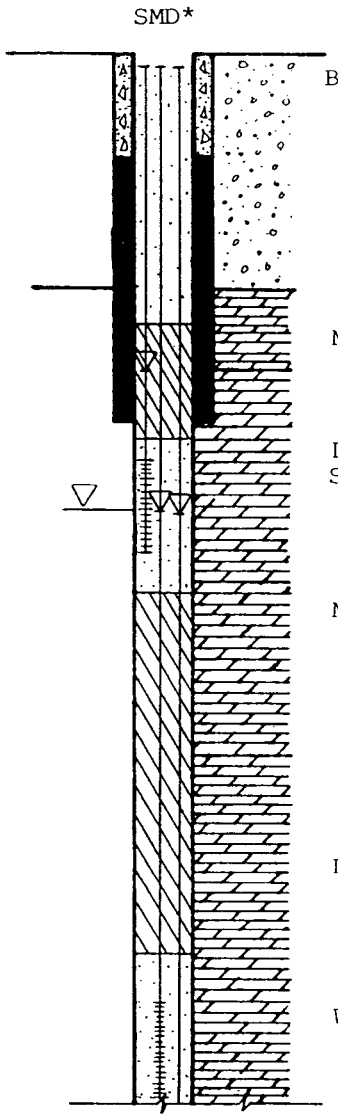
Vertical Scale
1" = 10'

Drilling Began - 11/20/82
Drilling Completed - 11/20/82
Well Construction
Completed - 11/20/82
Development Completed - 11/20/82
Total Depth - 145'
Depth to bedrock - 43'

SWL (date) - 90.96 (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 135.67'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing - 6" steel casing

BOREHOLE NO. 952-17
(Page 1 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 223'	Sampled every 5' interval from 28' to 223'	Brown gravelly sand to sandy gravel.
10			
20			
30			Medium gray crystalline dolomite.
40			Dark gray fine-grained dolomite. Small water bearing zone at 45'.
50			
60			Medium gray crystalline dolomite, with dark gray fine-grained dolomite interbed between 63' and 68'.
70			
80			
90			Dark to medium gray fine-grained dolomite with weathering zones and quartz veins.
100			Weathered zone from 103' to 104'.
110			

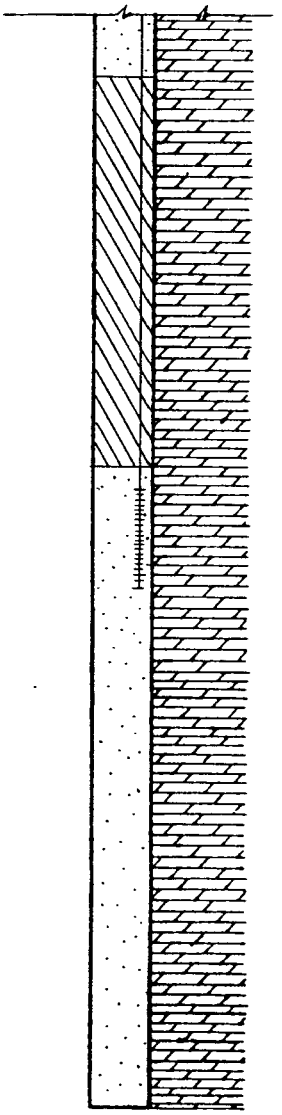


Vertical Scale
1" = 20'

* The water elevation in each piezometer, S (shallow), M (middle) and D (deep), is indicated by ▽ ; piezometer construction is shown by ⊡ sand and ▨ bentonite symbols.

BOREHOLE NO. 952-17
(Page 2 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
110			
120			
130			
140			Soft rock at 140'.
150			
160			Dark to medium gray fine-grained dolomite with weathering zones and quartz veins. Water bearing zone at 168'.
170			
180			
190			
200			
210			Estimated Total Blown Yield of 5 gpm. Light greenish-gray fine-grained dolomite.
220			Medium gray fine-grained dolomite.
223			



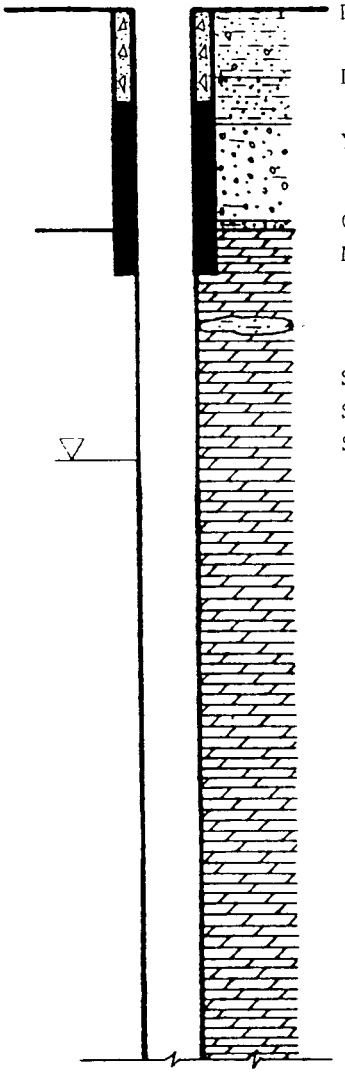
Vertical Scale
1" = 20'

Drilling Began - 11/15/82
Drilling Completed - 11/15/82
Well Construction
Completed - 11/15/82
Development Completed - 11/15/82
Total Depth - 223'
Depth to Bedrock - 24.5'

SWL (date) - 90.76' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 138.1'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-18
(Page 1 of 2)

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 225'	Sampled every 5' interval to total depth of 225'	Dark brown silty sand; some gravel.
10			Dark reddish-brown clayey silty sand.
			Yellowish-brown gravel; some sand and silt.
20			Olive brown silty sand; some gravel.
30			Medium and dark gray fine grained dolomite with weathering zones; quartz and calcite veins also present.
40			Soil filled voids at 32'. Soft rock from 37' to 38'. Soft rock from 39' to 43.0'.
50			
60			
70			
80			
90			
100			
110			



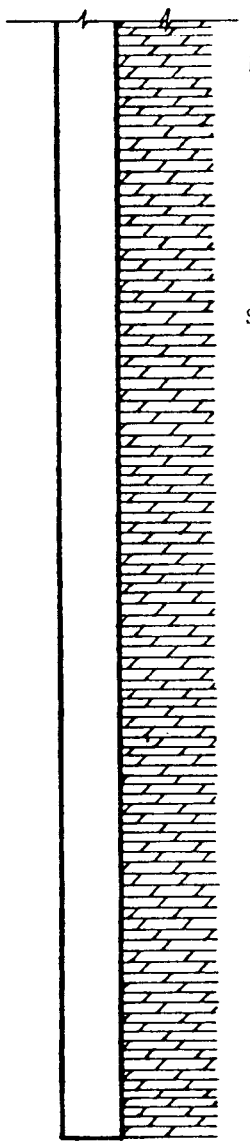
Vertical Scale
1" = 20'

Drilling Began - 11/16/82
Drilling Completed - 11/16/82
Well Construction
Completed - 11/16/82
Development Completed - 11/16/82
Total Depth - 225'
Depth to Bedrock - 23'

SWL (date) 95.79' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 142.46'
Elevation, Top of Casing -
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-18
(Page 2 of 2)

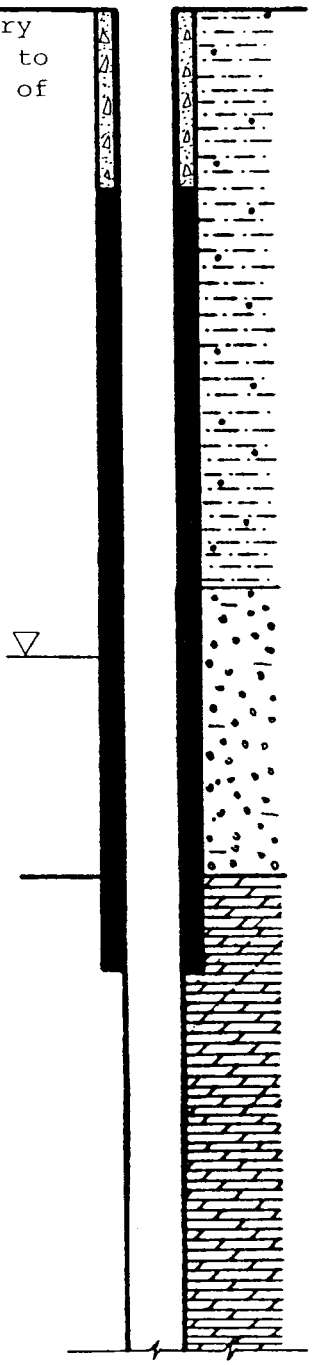
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
110			
120			Medium and dark gray fine grained dolomite with weathering zones; quartz and calcite veins also present.
130			
140			Soft rock, water bearing zone from 145' to 151'; approx. yield of 2 gpm.
150			
160			
170			
180			
190			
200			
210			
220			Estimated Total Blown Yield of 3 gpm.
225			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-19

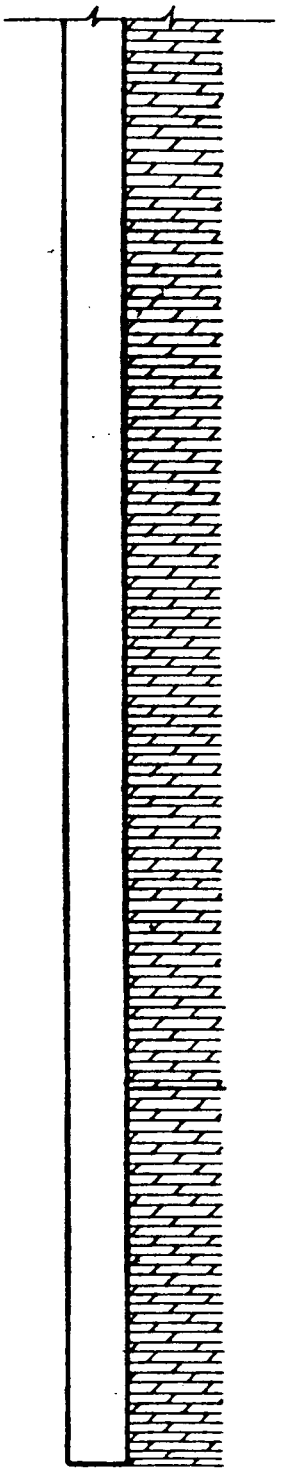
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 145'	Sampled every 5' interval to total depth of 145'	Yellow brown gravelly sandy silt
10			
20			
30			Yellow brown silty gravel
40			
50			Dark grey fine grained dolomite with occasional medium grey zones; quartz veins, and weathering zones throughout Soft rock from 50' to 53'.
60			Soft rock from 63' to 64'.
70			



Vertical Scale
1" = 10'

BOREHOLE NO. 952-19

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
70			Dark grey fine grained dolomite with occasional medium grey zones; quartz veins, and weathering zones throughout
			Soft rock from 72' to 73'.
80			
90			
100			
110			
			Soft rock from 118' to 121'.
120			
			Medium grey fine grained dolomite
130			
140			
145			Estimated Total Blown Yield of <25 gpm.



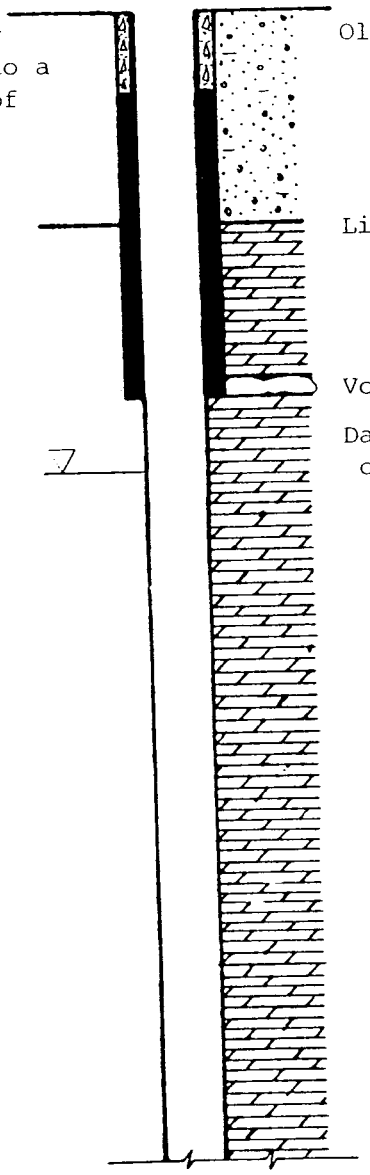
Vertical Scale
1" = 10'

Drilling Began - 11/17/82
Drilling Completed - 11/17/82
Well Construction
Completed - 11/17/82
Development Completed - 11/17/82
Total Depth - 145'
Depth to Bedrock 45'

SWL (date) - 109.21 (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 142.63
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BORING NO. 952-20

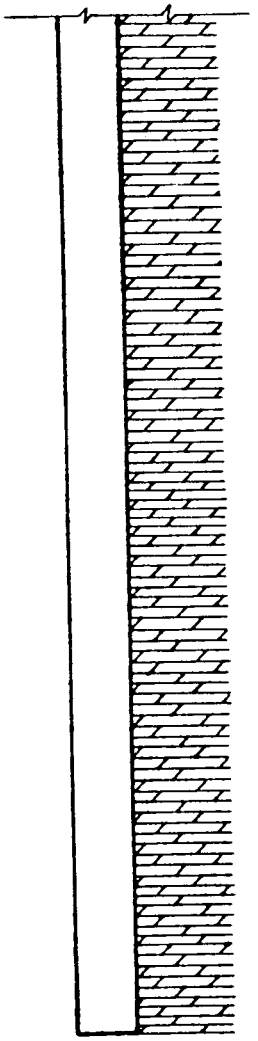
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 225'	Sampled every 5' interval to a total depth of 225'	Olive tan overburden.
10			
20			Light gray weathered dolomite
30			
40			Void.
			Dark to medium gray dolomite; solvent odor in cuttings.
50			
60			
70			
80			
90			
100			
110			
120			



Vertical Scale
1" = 20'

BORING NO. 952-20

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			Dark to medium gray dolomite; solvent odor in cuttings.
130			
140			
150			
160			
170			Water bearing zone at 170'; approx. yield of 2 gpm.
180			
190			Water bearing zone at 195'; approx. yield of 2-5 gpm.
200			
210			Water bearing zone at 215'; approx. yield of 10 gpm.
220			
225			



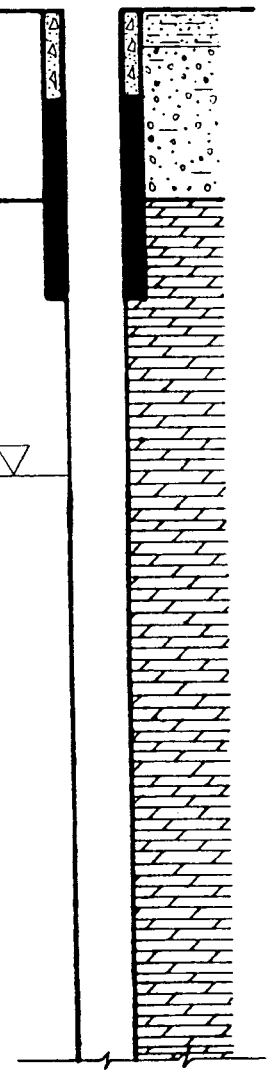
Vertical Scale
1" = 20'

Drilling Began - 11/22/82
Drilling Completed - 11/23/82
Well Construction
Completed - 11/23/82
Development Completed - 11/23/82
Total Depth - 225'
Depth to Bedrock - 22'

SWL (date) 93.77 (12/2/82)
Screened Interval - open rock hole
Aquifer - Rock
Elevation, Ground Surface - 141.23'
Elevation, Top of Casing -
Hole Dia: 10" air rotary/6" air rotary
Monitoring Tube: 6" steel casing

BOREHOLE NO. 952-21

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 5.0' Air Rotary 0 - 225'	Sampled every 5' interval to a total depth of 225'	Dark yellow- and red-brown fine sand and silt. Medium orange-brown silty, sandy, dolomitic gravel and pebbles.
10			
20			Light gray to black mottled very fine sandy petroliferous dolomite and dolomitic very fine sandstone and siltstone, with traces of pyrite; weathered zones at 80,90, 105, and 122'.
30			
40			
50			
60			
70			
80			Water bearing zone at 80'; approx. yield 1/2 gpm.
90			Weathered zone at 95'.
100			Weathered zone from 105' to 106'.
110			



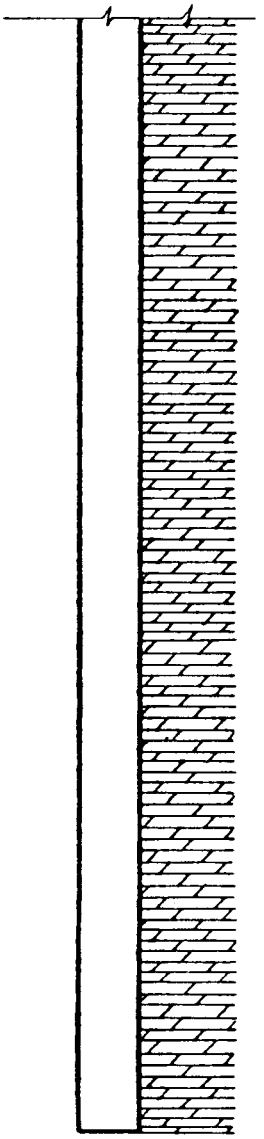
Vertical Scale
1" = 20'

Drilling Began - 11/21/82
Drilling Completed - 11/21/82
Well Construction
Completed - 11/21/82
Development Completed - 11/21/82
Total Depth - 225'
Depth to Bedrock - 20.5'

SWL (date) - 90.60 (12/6/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 138.99'
Elevation, Top of Casing -
Hole Dia: 10" air rotary/6" air rotary
Monitoring tube: 6" steel casing

BOREHOLE NO. 952-21

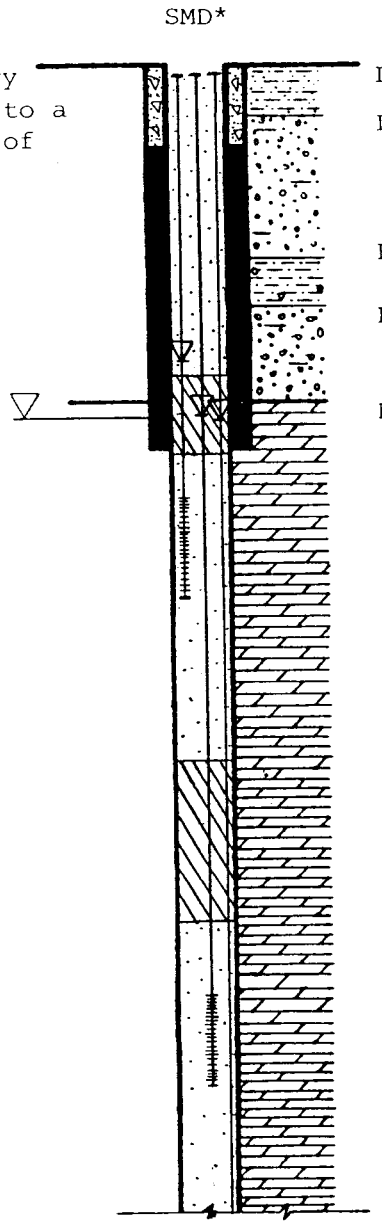
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
110			
120			Light gray to black mottled very fine sandy petroliferous dolomite and dolomitic very fine sandstone and siltstone, with traces of pyrite; weathered zones at 105, and 122'.
130			
140			Soft rock, water bearing zone from 120' to 125'.
150			
160			
170			
180			
190			
200			
210			
220			Estimated Total Blown Yield of 3 gpm.
225			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-22

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 235'	Sampled every 5' interval to a total depth of 235'	Light brown sandy silt.
			Light brown silty, sandy, gravel.
10			
20			Brown silt with some gravel.
			Brown silty, sandy gravel.
30			
40			Dark gray fine grained dolomite with weathered zones and quartz veins
50			
60			
70			
80			
90			
100			
110			
120			



Vertical Scale
1" = 20'

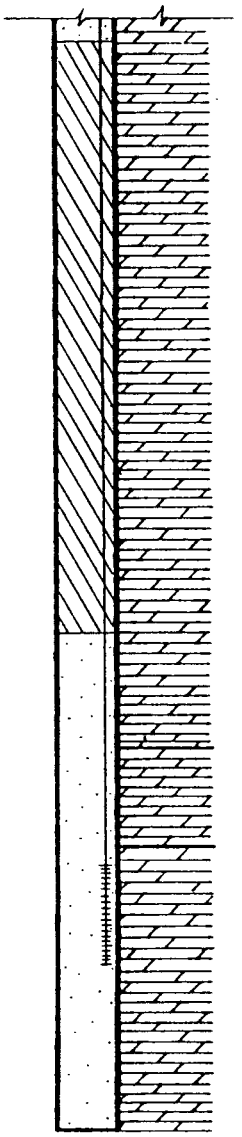
Drilling Began - 11/23/82
Drilling Completed - 11/23/82
Well Construction
Completed - 11/23/82
Development Completed - 11/23/82
Total Depth - 235.0'
Depth to Bedrock - 35.0'

SWL (date) - 91.78 (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 128.18
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Monitoring Tube: 6" steel casing

* See next page.

BOREHOLE NO. 952-22

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			Dark gray fine grained dolomite with weathered zones and quartz veins
130			Soft rock from 132' to 133'.
140			
150			
160			
170			
180			Soft rock, water bearing zone from 185' to 190'; approx. yield of 3 - 4 gpm.
190			
200			Medium gray fine grained dolomite.
210			Dark gray fine grained dolomite with weathering zones Soft rock from 214' to 216'.
220			
230			Estimated Total Blown Yield of 30 to 40 gpm.
235			

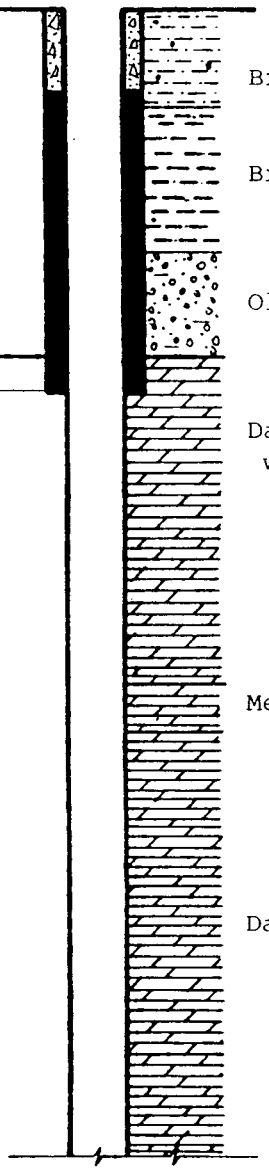


Vertical Scale
1" = 20'

* The water elevation in each piezometer, S (shallow), M (middle), and D (deep), is indicated by ▽ ; piezometer construction is shown by ⊡ sand and ▨ bentonite symbols.

BOREHOLE NO. 952-23

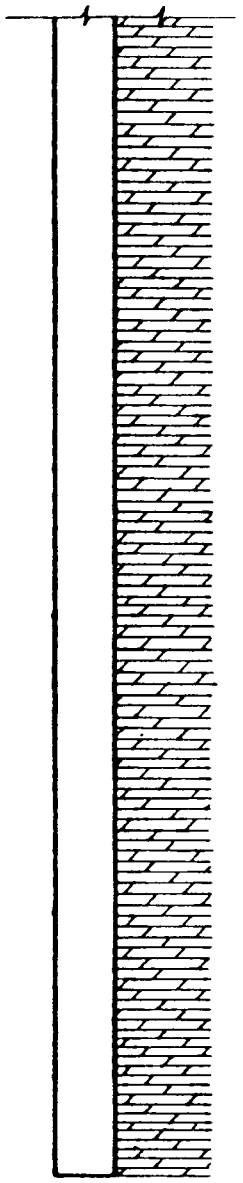
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary - 0 - 240'	Sampled every 5' interval to a total depth of 240'.	Brown clayey silt; some gravel.
10			
			Brown silty clay.
20			
30			Olive brown silty, sandy gravel.
40			Dark gray fine-grained dolomite with weathered zones.
50			
60			
70			Medium gray fine-grained dolomite.
80			
90			Dark gray fine-grained dolomite
100			
110			
120			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-23

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			
130			
140			
150			
160			Soft rock at 165'.
170			Soft rock at 175'.
180			Dark gray fine-grained dolomite; many weathered zones below 165'. Soft rock, water bearing zone at 185'.
190			
200			
210			
220			
230			
240			Estimated Total Blown Yield of 35 - 40 gpm.



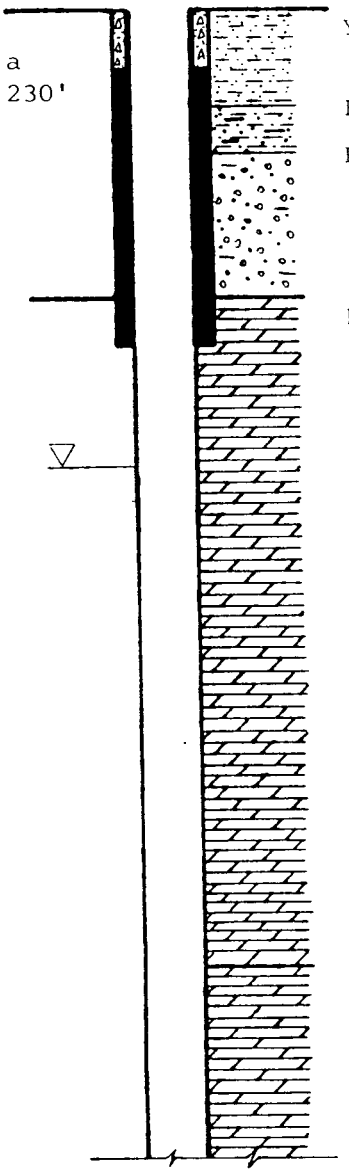
Vertical Scale
1" - 20'

Drilling Began - 11/24/82
Drilling Completed - 11/24/82
Well Construction
Completed - 11/24/82
Development Completed - 11/24/82
Total Depth - 240'
Depth to Bedrock - 36'

SWL (date) - 91.42' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 130.46'
Elevation, Top of Casing
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-24

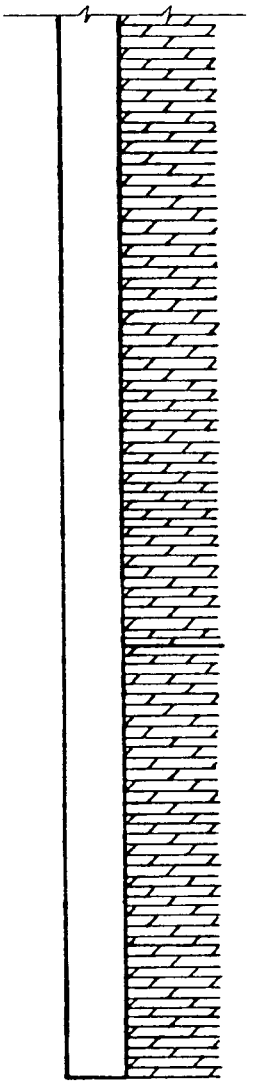
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0 –	Air Rotary 0 - 230'	Sampled every 5' interval to a total depth of 230'	Yellow brown silty sand.
10 –			Brown clayey sandy silt.
20 –			Brown silty sandy gravel; some pebbles.
30 –			Dark gray fine grained dolomite.
40 –			
50 –			
60 –			
70 –			
80 –			
90 –			Soft rock, water bearing zone at 90'; approx. yield of 30 gpm.
100 –			Dark gray dolomite with thin brown sandstone interbeds.
110 –			
120 –			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-24

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			Dark gray dolomite with thin brown sandstone interbeds.
130			
140			
150			
160			
170			Soft rock, water bearing zone from 170' to 173'.
180			Soft rock, water bearing zone from 181' to 185'; approx. yield of 20 gpm Dark gray fine grained dolomite.
190			
200			
210			
220			Estimated Total Blown Yield of 60 gpm.
230			



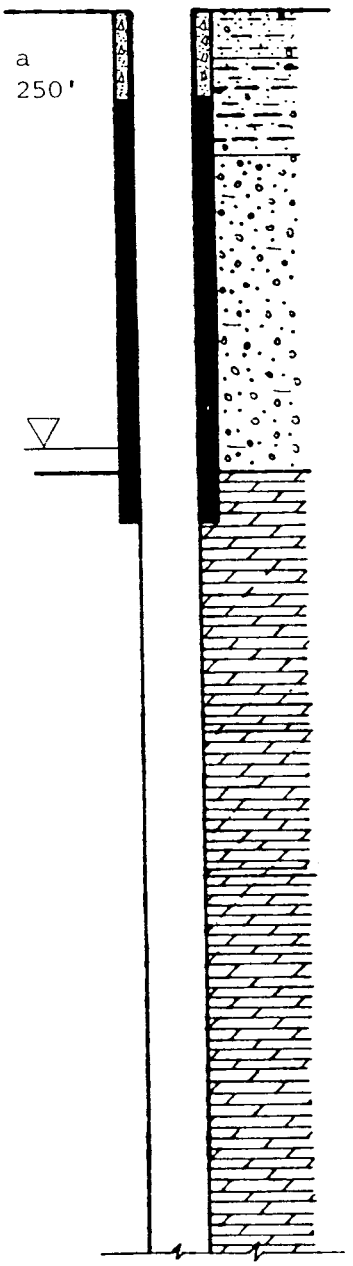
Vertical Scale
1" = 20'

Drilling Began - 11/24/82
Drilling Completed - 11/24/82
Well Construction
Completed - 11/24/82
Development Completed - 11/24/82
Total Depth - 230'
Depth to Bedrock - 30'

SWL (date) - 89.77' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 137.1'
Elevation, Top of Casing -
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" steel casing.

BOREHOLE NO. 952-25

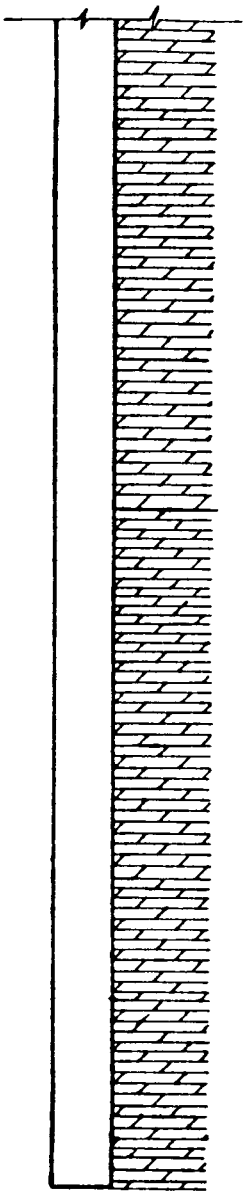
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 250'	Sampled every 5' interval to a total depth of 250'	Brown silty, fine to coarse sand with a trace of gravel.
			Dark brown silty sandy clay; moist.
10			Gravel with some silt, sand, and cobbles.
20			
30			
40			
50			Dark gray fine-grained dolomite; fracture at 61'.
60			
70			Brown clay seam.
			Light gray coarser grained dolomite weathered between 80 and 82'.
80			
90			Dark gray dolomite.
100			
110			
120			
130			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-25

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
130			Dark gray dolomite.
140			
150			
160			
170			
180			Interbedded light and dark gray dolomite; clay seam between 215' and 216'.
190			
200			
210			
220			
230			
240			
250			



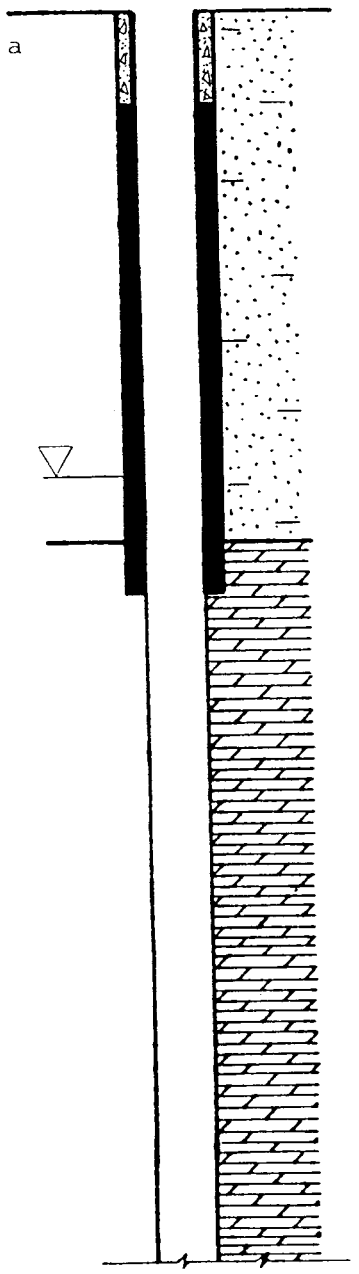
Vertical Scale
1" = 20'

Drilling Began - 11/24/82
Drilling Completed - 11/24/82
Well Construction
Completed - 11/24/82
Development Completed - 11/24/82
Total Depth - 250'
Depth to Bedrock - 48'

SWL (date) 90.62' (12/2/82)
Screened Interval - Open rock hole.
Aquifer - Rock
Elevation, Ground Surface - 136.30'
Elevation, Top of Casing -
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-26

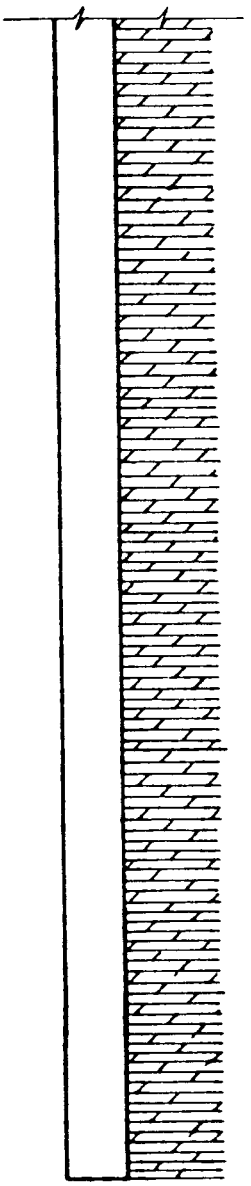
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 250'	Sampled every 5' interval to a total depth of 250'	Yellowish-brown silty sand.
10			
20			
30			
40			
50			Dark gray dolomite.
60			
70			
80			
90			
100			
110			
120			
130			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-26

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
130			
140			Dark gray dolomite.
150			
160			
170			
180			
190			
200			
210			Light gray dolomite.
220			
230			
240			
250			



Vertical Scale
1" = 20'

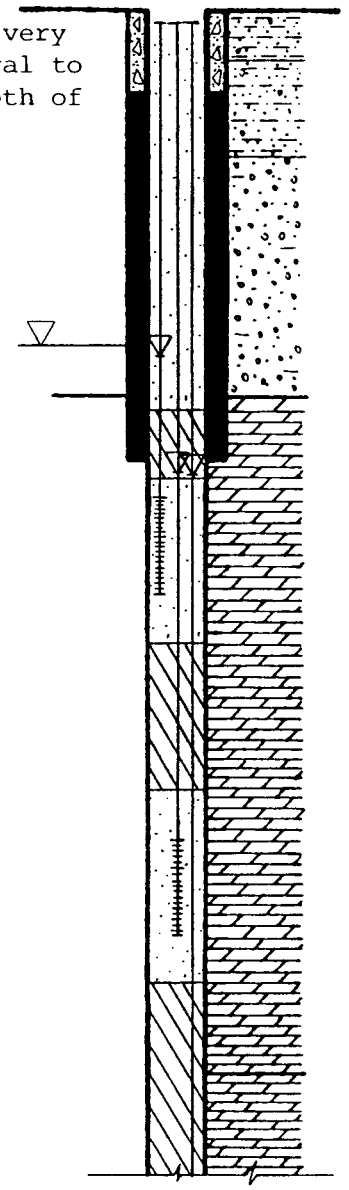
BOREHOLE NO. 952-26

Drilling Began - 11/24/82
Drilling Completed - 11/24/82
Well Construction
Completed - 11/24/82
Development Completed - 11/24/82
Total Depth - 250'
Depth to Bedrock - 55'

SWL (date) - 92.72' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 140.72'
Elevation, Top of Casing -
Hole Dia: 10" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-27

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Air Rotary 0 - 240'	Sampled every 5' interval to total depth of 240'	Brown sandy silt with some clay and gravel
10			Brown silty sand; some gravel
			Brown sandy gravel; some silt
20			
30			
40			Dark grey fine grained dolomite with occasional quartz veins
50			
60			
70			
80			Soft rock, water bearing zone from 85 to 90'; approx. yield 2 gpm.
90			Water bearing zone from 94-98'; approx. yield of 3-4 gpm.
100			Water bearing zone from 100 to 105'; approx. yield of 3 gpm.
110			Medium grey fine grained dolomite
120			

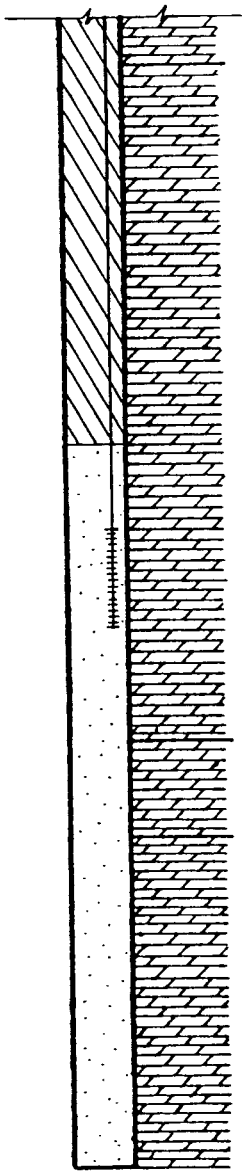


Vertical Scale
1" = 20'

* The water elevation in each piezometer, S (shallow), M (middle), and D (deep), is indicated by ▽ ; piezometer construction is shown by sand and bentonite symbols.

BOREHOLE NO. 952-27

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
120			Medium grey fine grained dolomite
			Dark grey fine grained dolomite
130			
140			
150			
160			
170			Soft rock, water bearing zone from 174' to 180'.
180			
190			Medium grey fine grained dolomite
200			Dark grey fine grained dolomite
210			
220			
230			
240			Estimated Total Blown Yield of 10 gpm.



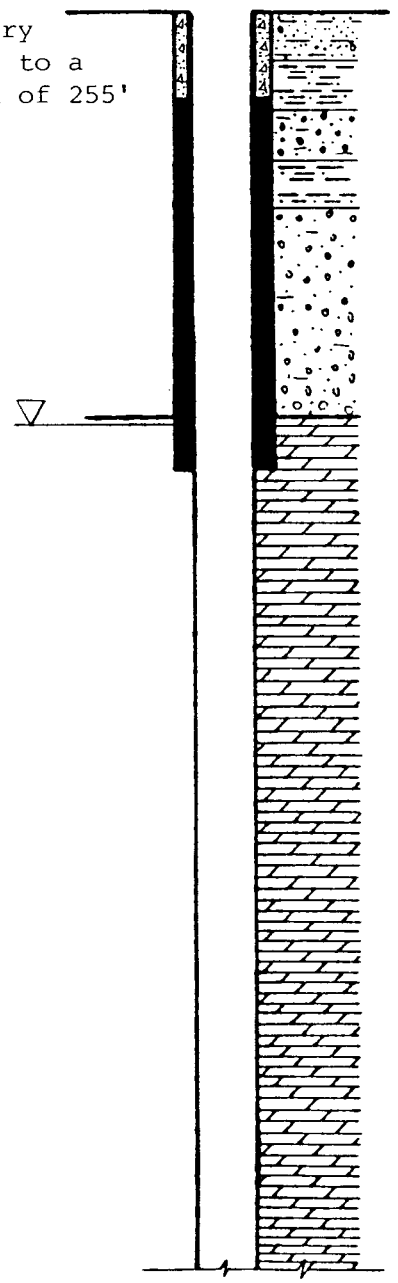
Vertical Scale
1" = 20'

Drilling Began - 11/23/82
Drilling Completed - 11/24/82
Well Construction
Completed - 11/24/82
Development Completed - 11/24/82
Total Depth - 240'
Depth to Bedrock - 41'

SWL (date) - 108.67 (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 143.04
Elevation, Top of Casing - 144.88
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-28

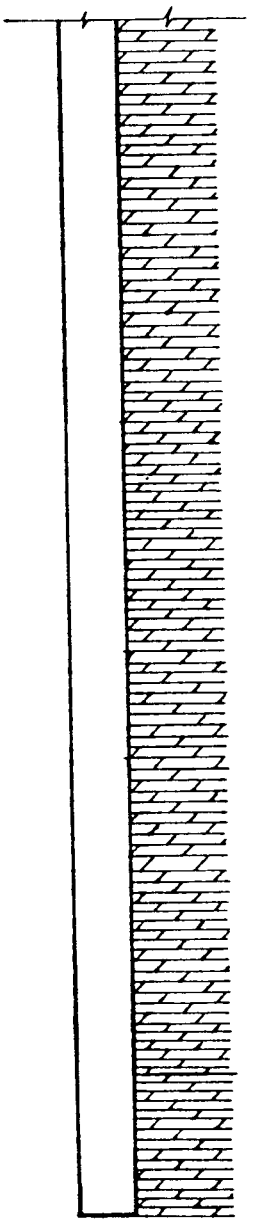
Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0-	Air Rotary 0 - 255'	Sampled every 5' interval to a total depth of 255'	Brown silty sand; some gravel.
			Brown silty clay.
10-			Brown silty sandy gravel.
			Brown silty clay.
20-			Brown silty sandy gravel.
30-			
40-			Dark gray fine grained dolomite with occasional quartz veins.
50-			
60-			
70-			Water bearing zone at 75'; approx. yield of 1 gpm.
80-			
90-			
100-			
110-			
120-			
130-			



Vertical Scale
1" = 20'

BOREHOLE NO. 952-28

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
130			Dark gray fine grained dolomite with occasional quartz veins.
140			
150			
160			
170			
180			
190			
200			
210			
220			
230			
240			Medium gray fine grained dolomite.
250			Estimated Total Blown yield of 1 gpm.
255			



Vertical Scale
1" = 20'

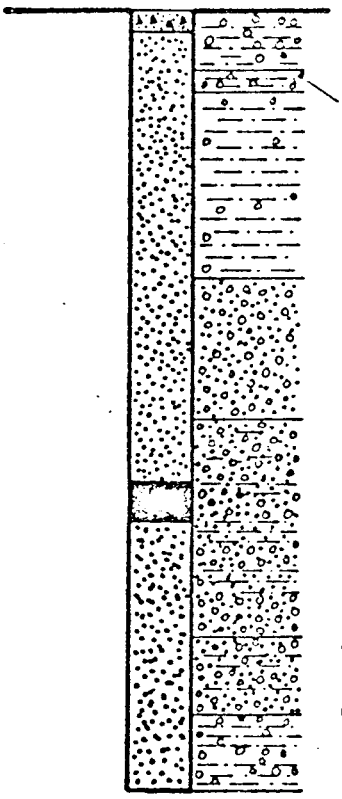
BOREHOLE NO. 952-28

Drilling Began - 11/22/82
Drilling Completed - 11/23/82
Well Construction
Completed - 11/23/82
Development Completed - 11/23/82
Total Depth - 255'
Depth to Bedrock - 42'

SWL (date) - 100.33' (12/2/82)
Screened Interval - Open rock hole
Aquifer - Rock
Elevation, Ground Surface - 142.91
Elevation, Top of Casing - 144.89
Hole Dia: 12" air rotary/6" air rotary
Casing: 6" steel casing

BOREHOLE NO. 952-B *

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 10.5'		Dark yellowish-brown gravelly silt loam; 20% coarse fragments.
			Dark grayish-brown gravelly silt loam; strong odor; 20% coarse fragments.
5			Yellowish-brown silt loam; <5% coarse fragments.
			Dark yellowish-brown gravelly sandy loam; 20% coarse fragments.
10	Ran Casing 1.5'	N.S.	Olive gray silty sandy gravel.
	105-100/0	B-1	
	Ran Casing 1.5'	N.S.	
15	100/.3	B-2	
	Ran Casing 1.7'	N.S.	Olive gray silty gravelly sand.
	20-19-13-14	B-3,A,B	
	18-36-38-100/.4	B-4,A,B	Olive gray gravelly silt.
20			



Vertical Scale
1" = 5'

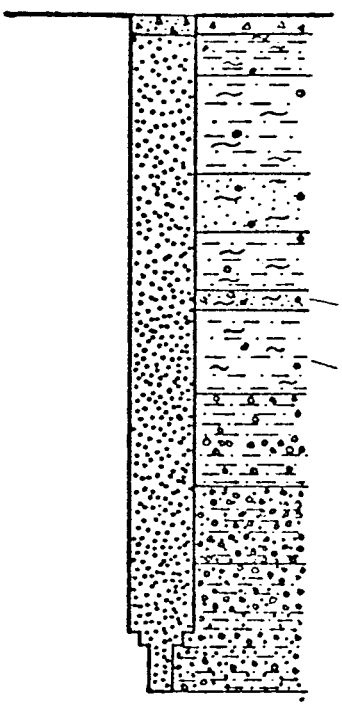
Drilling Began - 11/29/82
Drilling Compl ted - 11/30/82
Well Construction
Completed - NA
Development Completed - NA
Total Depth - 19.9'
Depth to Refusal - 19.9'

SWL (date) - NA
Screened Interval - NA
Aquifer - NA
Elevation, Ground Surface - 135.80'
Elevation, Top of Casing - NA
Hole Dia: 3" casing
Monitoring Tube: NA

*Hand augered then completed with pneumatic drilling machine.

BOREHOLE NO. 952-D*

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Hand Augered to 9.6'		Concrete
			Dark grayish-brown silt loam; odor; 5-10% coarse fragments.
			Yellowish-brown to brownish-yellow silt loam; <5% coarse fragments.
5			Reddish-brown fine sandy loam; <5% coarse fragments.
			Yellowish-brown silt loam to silt; <5% coarse fragments.
			Dark reddish-brown gravelly sandy loam; 20% coarse fragments.
	Ran Casing 0.4'	N.S.	
10			Dark yellowish-brown silt loam; <5% coarse fragments.
	73-37-29-24	D-1,A,B	Dark olive gray gravelly silt.
	18-22-20-18	D-2,A,B	Dark olive brown silty sandy gravel.
15	32-50-70-100/.1	D-3,A,B	Olive gray to gray brown gravelly silt.
	Roller bit 0.5'	N.S.	
	45-54-100/.3	D-4,A,B	
20			



Vertical Scale
1" = 5'

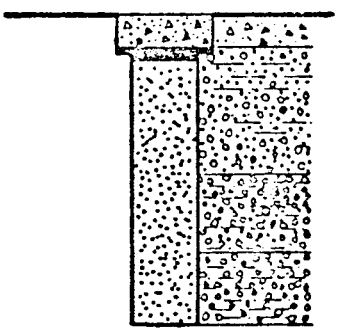
Drilling Began - 12/1/82
Drilling Completed - 12/2/82
Well Construction Completed - NA
Development Completed - NA
Total Depth - 17.4'
Depth to Refusal - 17.4'

SWL (date) - NA
Screened Interval - NA
Aquifer - NA
Elevation, Ground Surface - 135.8'
Elevation, Top of Casing - NA
Hole Dia: 3" casing, 2-5/8" RB, 2" spoon
Monitoring Tube: NA

*Hand augered then completed with pneumatic drilling machine.

BOREHOLE NO. 982-E*

Depth in feet	Blow Ct. / Recovery	Sample # / Run #	Description
0	Concrete core 0.7'		Concrete
	34-39-38/.3	E -1,A,B	Gray-brown gravelly silty sand.
	95-100/.3	E -2,A,B	
5	34-28-36-51	E -3,A,B	Grayish-brown silty gravel with some sand.
	30-44-54-49	E -4,A,B	Olive brown to gray silty gravel.
10			



Vertical Scale
1" = 5'

Drilling Began - 12/7/82
Drilling Completed - 12/8/82
Well Construction
Completed - NA
Development Completed - NA
Total Depth - 8.0'
Depth to Refusal - NA

SWL (date) - NA
Screened Interval - NA
Aquifer - NA
Elevation, Ground Surface - 135.59'
Elevation, Top of Casing - NA
Hole Dia: 3" casing
Monitoring Tube - NA

*Hand augered then completed with pneumatic drilling machine.

Shallow Soil Sample Points Between

Buildings 952 and 982

Depth in feet

Elev.

952-SS12

Depth of manhole below grade.

Medium olive gray to very dark gray medium to coarse sand; wet; strong odor.

No sample taken.

Light to medium brown medium to coarse sand and very large gravel; trace silt; upper 0.25' is wet, lower portion is dry.
No sample taken.

Light to medium olive tan silty and sandy very large gravel; dry.

Medium olive gray; medium to coarse sand and gravel.
No sample taken.

Drilling Began - 11/22/82
Drilling Completed - 11/23/82
Total Depth - 31.0'
Sample Interval (Sample Number)
10 - 12' (B6080)
18 - 20' (B6081)
27 - 28' (B5614 V_1, V_2)

952-SS15

Depth of manhole below grade.

Dark olive gravelly, silty, medium to coarse sand; very wet; strong odor and sheen.

No sample taken.

Medium olive gray medium to coarse sand; moist; no odor.

No sample taken.

Medium olive gray medium to coarse sand; some gravel; moist; sweet odor.

Drilling Began - 11/22/82
Drilling Completed - 11/24/82
Total Depth - 25.1'
Sample Interval (Sample Number)
9.0 - 11.0' (B6079)
18.5 - 20.0' (B5615 V_1, V_2)
24.0 - 25.0' (B5614 V_4)
25.0 - 25.5' (B5615 V_3)

952-SS13

Depth of manhole below grade.

Medium olive gray medium to coarse sand; moist with odor.
Dark gray coarse sand and gravel.

No sample taken.

Medium brown medium to coarse sand; trace gravel.

No sample taken.

Medium dark olive gray silty coarse sand and gravel; wet to moist.
Medium olive tan silty and sandy loose gravel.
No sample taken.

Drilling Began - 11/22/82
Drilling Completed - 11/23/82
Total Depth - 27.2'
Sample Interval (Sample Number)
7.5 - 9.5' (B6078 V_1, E_1)
18.0 - 20.0' (B5615 V_5, V_6)
25.0 - 26.0' (B5614 V_3)
26.0 - 27.0' (B5615 V_4)

952-SS14

Depth of manhole below grade

Medium dark olive gray medium to coarse gravel; some sand and silt; moist to wet.
Medium dark olive gray fine to medium silty sand; wet.
Medium olive gray to tan coarse gravel and silt.
Dolomitic gravel and fragments.
No sample taken.

Drilling Began - 11/22/82
Drilling Completed - 11/23/82
Total Depth - 12.6'
Sample Interval (Sample Number)
8 - 10.0' (B6077)

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Shallow Soil Sample Points Between
Buildings 952 and 982

epth
feet

Ele

0

- 5

- 1

- 15

- 20

- 13

- 12

- 12

- 11

952-SS2

Medium yellow brown silty gravelly fine to coarse sand.

Medium olive gray clay silt and very fine sandy silt; moist to wet.
Olive brown and gray very fine sand and sandy silt.

Light gray silty, gravelly very fine to very coarse sand; dolomite pebbles; loose to dry.

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 17'
Sample Interval (Sample Number)
7.0 - 9.0' (B6086)
13.0 - 17.0' (B6087)

952-SS3

No sample taken.

Medium gray clayey, very fine sandy silt.

No sample taken.

Medium yellow brown sandy silt.

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 11'
Sample Interval (Sample Number)
4.0 - 6.0' (B6088)
9.0 - 11.0' (B6089)

952-SS16

Light to medium yellow brown sand and gravel; trace silt.

Medium yellow brown sand and gravel with very large fragments; trace silt; moist.

Medium yellow brown sand and gravel.
Reddish-brown sandy silt.

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 14.0'
Sample Interval (Sample Number)
10.0 - 11.0' (B6090)
12.0 - 14.0' (B6091)

952-SS17

No sample taken.

Olive tan sandy silt; moist.
Medium yellow brown medium to coarse sand and gravel; moist to dry.

No sample taken.

Medium yellow brown medium to coarse sand and gravel; moist to dry.

Drilling Began - 11/22/82
Drilling Completed - 11/22/82
Total Depth - 13.8'
Sample Interval (Sample Number)
7.0 - 9.0' (B6082)
12.0 - 14.0' (B6083)

Shallow Soil Sample Points Between
Buildings 952 and 982

Depth in feet

Elev

135

130

125

120

952-SS4

Medium yellowish-brown fill and silty sand.

Medium yellowish-brown silty and gravelly sand; wet-moist.

No sample taken.

Tan sandy and clayey silt; moist-wet.

Medium yellowish-brown silty sand and gravel; moist.

Tan sandy silt; moist-dry.

Olive brown sandy and silty gravel; moist.

Drilling Began - 11/22/82
Drilling Completed - 11/22/82
Total Depth - 11.0'
Sample Interval (Sample Number)
4 - 6' (B6084)
9 - 11' (B6085)

952-SS5

No sample taken.

Medium tan clayey and sandy silt; moist-dry.

Drilling Began - 11/22/82
Drilling Completed - 11/22/82
Total Depth - 12.8'
Sample Interval (Sample Number)
7 - 9' (B6076)

952-SS7

No sample taken.

Medium to dark brown medium to coarse sand and gravel.

No sample taken.

Medium to dark brown medium to coarse sand and gravel.

Drilling Began - 11/19/82
Drilling Completed - 11/19/82
Total Depth - 11'
Sample Interval (Sample Number)
4 - 6' (B6101)
9 - 11' (B6096)

952-SS10

No sample taken.

Medium brown, medium to coarse sand and gravel; moist.

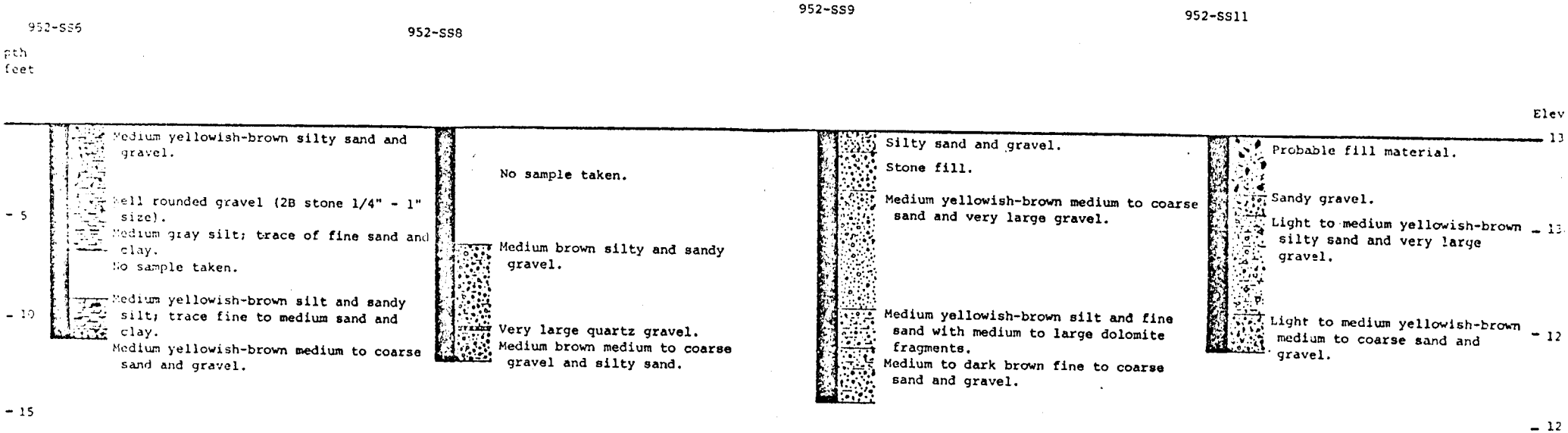
No sample taken.

Medium brown silty coarse sand and fine gravel; shale fragments.

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 14'
Sample Interval (Sample Number)
7 - 9' (B6097)
12 - 14' (B6098)

Shallow Soil Sample Points Between

Buildings 952 and 982



952-SS6

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 11'
Sample Interval (Sample Number)
5.0 - 6.0' (B6092)
9.5 - 10.5' (B6093)

952-SS8

Drilling Began - 11/19/82
Drilling Completed - 11/19/82
Total Depth - 12'
Sample Interval (Sample Number)
6.0 - 7.0' (B6099 V_1, E_1)
11.0 - 12.0' (B6100)

952-SS9

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 14'
Sample Interval (Sample Number)
10.0 - 11.0' (B6094)
13.0 - 14.0' (B6095)

952-SS11

Drilling Began - 11/18/82
Drilling Completed - 11/18/82
Total Depth - 11'
Sample Interval (Sample Number)
4.0 - 6.0' (B6062)
9.0 - 11.0' (B6063)

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STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH1
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 9, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.55
LOCATION: WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
	Asphalt					
135	Light brown wet hard clay		1	SS	58	
					20	
					24	
					21	
					12	
					12	
132			2	SS	23	
					35	
					19	
					29	
					21	
					26	
129	No sample		3	SS	26	
					63	
					130	
	Light brown sand with very large stones or cobbles				--	
					100	
126					--	
					--	
					314	
	Auger refusal at 125.15					
123						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS952 AND 982

HOLE Nº: BH2
DATE COMPLETED: FEBRUARY 9, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 135.46
TOP OF PIPE ELEVATION:

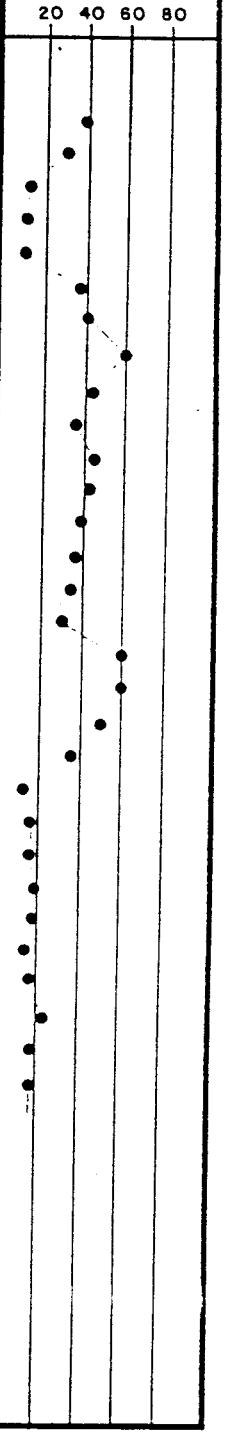
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Medium brown sandy till with large stones		1	SS	75	
					50	
					60	
					46	
					59	
					125	
			2	SS	--	
					--	
132	Light brown sandy clay with shale fragments and moisture				62	
					105	
					92	
					90	
			3	SS	90	
129	Light brown sand with shale fragments and large stones				22	
					17	
					16	
					34	
					34	
			4	SS	57	
126					74	
					190	
					112	
					94	
					82	
			5	SS	59	
123					72	
					50	
					59	
					48	
					45	
			6	SS	18	
120					14	
					15	
					13	
					15	
					75	
					100	
117	Auger refusal at 117.26					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH3
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 8, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Light brown to medium brown gravel		1	SS	38, 27, 13, 11, 10, 38
132	Medium brown gravel with large stones		2	SS	40, 60, 42, 34, 44, 41
	Medium brown clay with large stones				
129	Medium brown gravel with large stones		3	SS	38, 35, 32, 29, 60, 60
126	Dark brown gravel with sand and large stones		4	SS	49, 36, 13, 17, 16, 19
123	Light brown gravel with large stones		5	SS	18, 14, 17, 23, 18, 18
	Gray gravel with large stones				
120					

PENETRATION TEST BLOWS / FOOT



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH3 (cont'd)
DATE COMPLETED: FEBRUARY 8, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 135.30
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
			6	SS	18	
120					18	
					18	
	Light brown gravel with large stones mixed with light brown clay				12	
					12	
					13	
			7	SS	14	
117					29	
					40	
	Large pieces of fractured rock				63	
					55	
					100	
			8	SS	100	
113						
	Auger refusal at 113.2					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH4
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 9, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION: WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
			1	SS	80	
135	Light gray to brown sand with small stones				112	
					84	
					39	
					34	
					50	
			2	SS	50	
132	Light gray to brown sand with large stones				54	
					64	
					64	
					90	
					63	
			3	SS	71	
129	Light gray sand and silt				54	
					19	
					20	
					45	
					50	
			4	SS	40	
126	Light gray sand				50	
					38	
					50	
					55	
					39	
123	Medium brown clay with large stones and shattered rock fragments		5	SS	33	
					59	
					48	
					37	
					35	
					48	
120						

◯ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH4 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 9, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

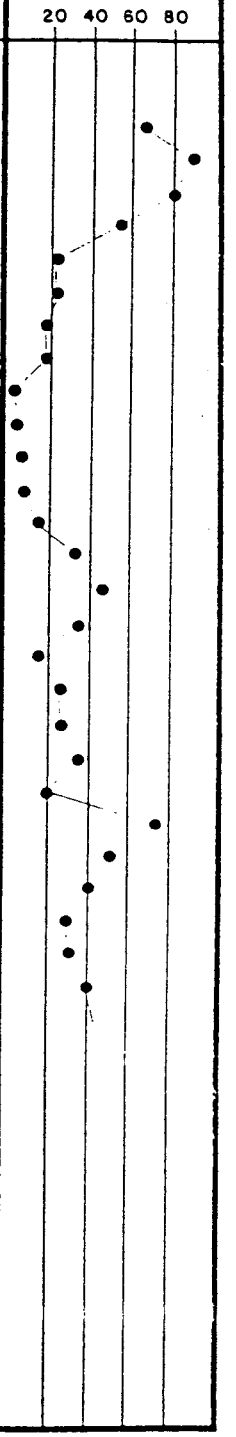
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOO
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			6	SS	35	
120	Light brown silty sand				21	
					25	
					28	
	Light gray sand with clay and cobbles and rock fragments				20	
					24	
			7	SS	28	
117	Light to medium brown clay				29	
					47	
					57	
					63	
	Medium brown sand with stones - noticeable moisture				114	
			8	SS	174	
114					153	
					200	
111	Auger refusal at 112.60					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH5
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 10, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION: WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Light to dark brown clay		1	SS	65, 90, 80, 55
	Light brown sand with small stones and shaley material - noticeable moisture				22, 22
132	Light brown clay		2	SS	18, 18, 4, 5, 6, 8
	Light grey to medium grey clay				
129	Medium brown sand		3	SS	13, 34, 45, 35, 15
126	Medium brown clay with small stones and shale-like material - noticeable moisture		4	SS	25, 25, 34, 20, 74, 51, 40
123	Medium brown sand		5	SS	28, 30, 40
120					

PENETRATION TEST BLOWS / FOOT



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH5 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 10, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI(TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
120	Light brown sandy clay - noticeable moisture				43	
					60	
					130	
			6	SS	198	
					120	
					76	
					48	
					34	
117					40	
			7	SS	63	
					74	
					65	
					80	
					200	
114	Auger refusal at 114.6					
111						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH6
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 11, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
135	Light to medium brown sand		1	SS	200	
					145	
					51	
	Light to medium brown clay				36	
					33	
					25	
132	Light to medium gray clay		2	SS	9	
					7	
					8	
					9	
					10	
					14	
129	Light brown sand		3	SS	12	
					12	
	Gumbo-like gray clay				6	
					9	
					17	
					22	
126	Light brown sandy clay		4	SS	28	
					20	
					16	
					27	
					24	
					24	
123	Light to medium gray sandy clay		5	SS	11	
					15	
	Light brown sandy clay				100	
					150	
	Light brown sand				60	
					40	
120	Light brown gravel with stones		6	SS	55	
					65	
					50	
					65	
					190	
					220	
117	Auger refusal at 116.91		7	SS	300	

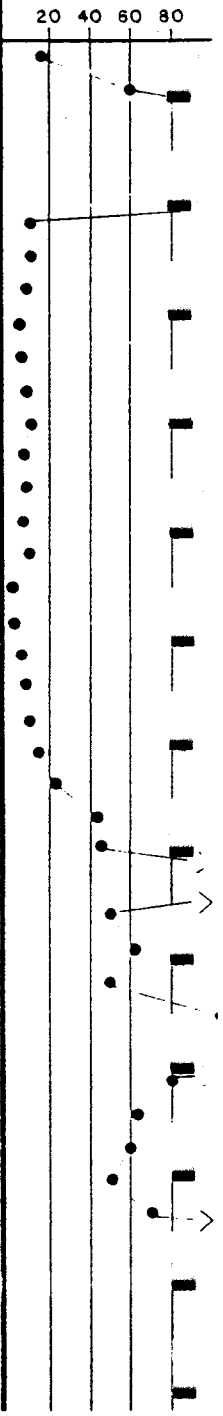
○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH7
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 12, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 134.96
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION :

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Gray brown gravel with clay		1	SS	15
					60
					125
					160
					300
					12
132	Light brown sand		2	SS	13
					9
					6
	Soft gray clay				8
					10
	Fine gray sand				12
129	Soft gray clay		3	SS	9
					10
					9
					13
					5
					5
126			4	SS	8
					10
					12
					15
	Light brown sandy clay				22
					42
123			5	SS	45
	Medium brown gravel with large stones				160
					50
					65
	Wet gray clay				50
					100
120			6	SS	300
	Gray to light brown silty gravel with large stones and cobbles				80
					63
					60
					50
					70
117			7	SS	300
	Auger refusal at 116.06				

PENETRATION TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH8
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 12, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135			1	SS	25	
	Light brown gravel				35	
					165	
	Light gray gravel with large stones				210	
					80	
	Light gray clay				35	
132			2	SS	30	
					32	
	Light brown sand				7	
					6	
	Light gray clay mixed with some granular material				6	
					7	
129			3	SS	7	
	Light brown sandy silt				8	
					13	
	Light gray clay				20	
					10	
	Light brown clay with small stones				11	
126			4	SS	20	
	Medium brown sandy gravel				25	
					20	
	Medium brown clay with large stones - noticeable moisture				145	
					80	
	Light gray to light brown fine sand				60	
123			5	SS	65	
					95	
	Light gray to medium brown sandy gravel				60	
					50	
					55	
					75	
120						

◯ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH8 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 12, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS952 and 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
120			6	SS	85	
					90	
					300	
	Light gray to medium brown sandy gravel with large boulders				--	
					--	
					--	
117			7	SS	110	
					300	
					--	
					--	
					110	
					250	
114			8	SS	--	
					--	
					130	
					140	
	Light gray to medium brown sandy gravel with large stones and shattered rock				110	
					11	
111			9	SS	75	
					60	
					60	
					75	
					150	
					250	
108			10	SS	--	
					15	
					300	
	Auger refusal at 111.78					
105						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH9
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 11, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.80
LOCATION: WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	115	
	Light brown gravel with large stones				400	
					500	
					--	
					50	
					15	
132	Medium brown sand with traces of clay		2	SS	12	
					25	
					15	
					23	
					25	
					24	
129			3	SS	15	
	Light gray clay				15	
					20	
					24	
					20	
					20	
126	Light brown silty sand		4	SS	25	
					45	
					30	
					75	
					150	
					175	
123			5	SS	160	
	Light brown to medium brown gravel with large stones				110	
					55	
					120	
					50	
					45	
120						

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH9 (cont'd)
DATE COMPLETED: FEBRUARY 11, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.80
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
120			6	SS	55	
	Light brown sand				150	
	Light brown clay				40	
					225	
	Medium brown gravel				200	
	Boulder				--	
117			7	SS	150	
	Light gray to brown silty sand				300	
					--	
					--	
	Boulder				--	
					--	
114			8	SS	300	
	Light to medium brown silty sand with large stones				--	
					--	
					--	
	Boulder				--	
					--	
111			9	SS	--	
					--	
	Light to medium brown silty sand with large stones				--	
					--	
					--	
					--	
108			10	SS	--	
					--	
	Gravel and cobbles				--	
					--	
					--	
					--	
105						
	Auger refusal at 105.30					
	NOTES: 1) Augered from 117.50 to 105.30					

STRATIGRAPHIC AND INSTRUMENTATION LOG

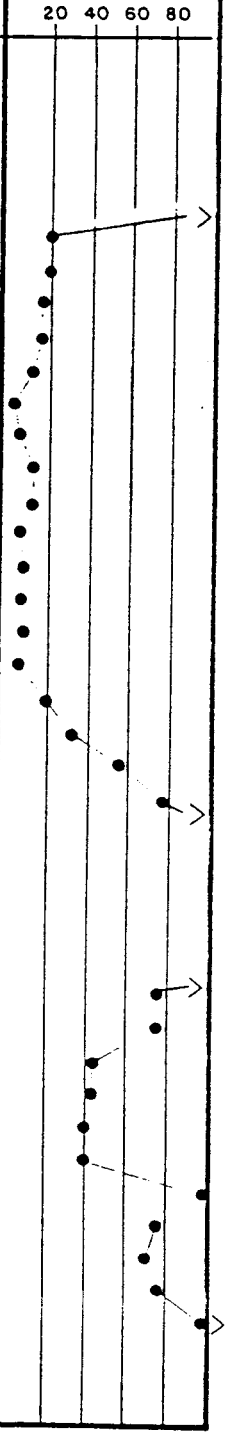
PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH10
DATE COMPLETED: FEBRUARY 10, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.96
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135			1	SS	300
	Light brown gravel with silty sand				300

					325
					120
					20
132			2	SS	20
	Light to medium gray wet clay with gumbo consistency				15
					15
					12
			3	SS	5
					7
129	Stones and gray sand				12
					12
					7
	Wet gray gumbo clay				9
			4	SS	8
					9
126					7
	Hard light brown clay				20
					32
					55
			5	SS	75
					110
123					275
	Light brown gravel with stones				300
	Wet brown sand with stones				110
					170
	Light gray clay with stones		6	SS	75
					75
120					45
	Light gray gravel with stones				45
					40
					40
	Medium brown sand with stones		7	SS	100
					75
117					70
					75
					100
					240
	Auger refusal at 115.06				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH11
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 17, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.46
LOCATION : WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Medium brown gravel		1	SS	12	
					60	
					25	
					25	
					17	
					26	
132	Light brown sandy clay		2	SS	30	
					23	
					21	
					27	
	Firm dark brown wet sand				28	
					40	
129			3	SS	32	
					37	
					27	
	Light brown sandy clay				40	
					40	
					45	
			4	SS	115	
126	Coarse gravel with large stones and shattered rock				150	
	Auger refusal at 125.16					
123						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH12
DATE COMPLETED: FEBRUARY 20, 1984
GEOLOGIST/ENGINEER: C. CULL
GROUND ELEVATION: 135.38
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135	Hard brown clay		1	SS	25	
					23	
					17	
	Light brown gravel				19	
					16	
					29	
			2	SS	25	
132	Light brown sandy clay				18	
					5	
	Stiff gray sandy clay				5	
					12	
					17	
			3	SS	19	
129					21	
	Soft gray wet clay				21	
					33	
					12	
	Stiff gray sandy clay				12	
			4	SS	16	
126	Stiff light brown sandy clay				15	
					14	
					15	
	Soft gray wet sandy stoney clay				22	
					24	
			5	SS	27	
123	Light brown stiff sandy clay				39	
	Soft wet gray sandy clay				200	
	Auger refusal at 122.18					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH13
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 19, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.30
LOCATION : WALKWAY BETWEEN BUILDINGS952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Gravel		1	SS	12	
					35	
					25	
					19	
					20	
	Fine wet gray layered clay				20	
			2	SS	24	
132					20	
	Fine brown sandy clay				10	
					9	
					9	
					16	
			3	SS	17	
129					16	
					18	
					20	
					3	
	Light to medium gray sandy wet clay				5	
			4	SS	9	
126					11	
					7	
					14	
					16	
	Light to medium gray sandy wet clay with shattered rock and brown sandy gravel				17	
			5	SS	40	
123					200	
	Auger refusal at 122.80					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS952 AND 982

HOLE Nº: BH14
DATE COMPLETED: FEBRUARY 20, 1984
GEOLOGIST/ENGINEER: C. CULL
GROUND ELEVATION: 135.05
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135	Gravel with asphalt		1	SS	35	
					28	
					27	
					31	
	Wet gray sandy clay				17	
					50	
132			2	SS	27	
	Light brown sand with stones				20	
	Soft gray wet clay				14	
					12	
					11	
					11	
129	Light brown sandy clay		3	SS	6	
					8	
					17	
					25	
					17	
					31	
126	Light brown stiff sandy clay		4	SS	71	
					108	
					--	
					--	
					--	
					--	
123	Light brown sandy clay		5	SS	--	
					200	
					--	
					--	
					--	
					--	
120	Light brown sandy clay and stiff gray sandy clay		6	SS	100	
					--	
					--	
					--	
	Light brown sandy clay and stiff gray sandy clay				--	
					200	
117	Light brown sandy clay and stiff gray sandy clay		7	SS	--	
					--	
					--	
	Auger refusal at 115.85					

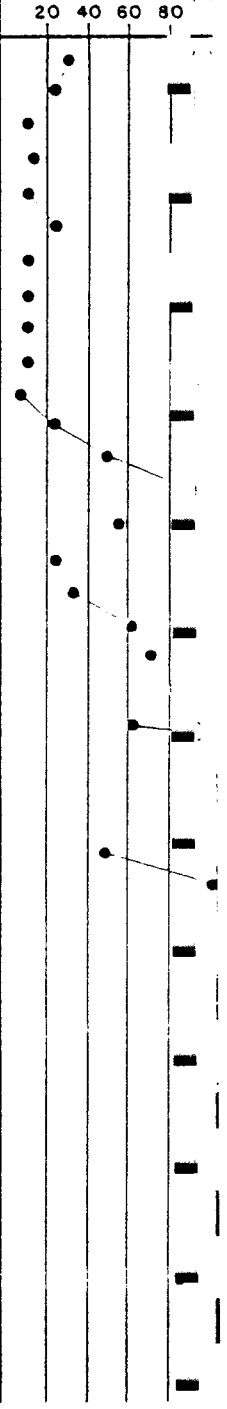
○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH15
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 134.71
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION :

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
			1	SS	30
134	Light gray gravel				25
					12
					14
					12
	Medium brown clay				26
			2	SS	12
131					12
					12
					12
					9
	Medium brown sandy clay				22
			3	SS	49
128					88
					57
					23
					33
					61
			4	SS	70
125	Light brown sandy clay with moisture				82
					61
					200
					--
					--
			5	SS	47
122	Light brown sandy gravel				100
					--
	Light brown and gray sandy clay				--
					--
					--
			6	SS	--
119	Light brown sandy gravel				200
	Auger refusal at 119.31				

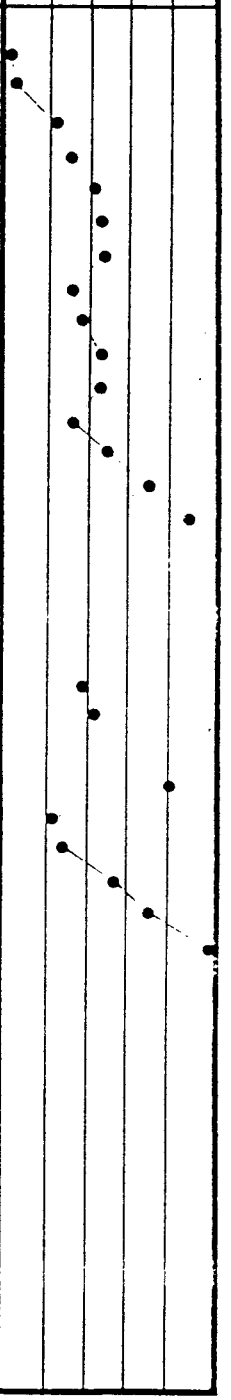
PENETRATION TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH16
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.55
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
135	Gravel		1	SS	--	
					4	
					7	
	Light brown sandy clay				22	
					30	
					41	
			2	SS	45	
132	Medium brown sand				46	
	Light brown sandy clay with stones				32	
					37	
					46	
					44	
			3	SS	34	
129	Wet light brown sandy clay with noticeable moisture				68	
					70	
					90	
					--	
					--	
			4	SS	--	
126					--	
					38	
					42	
					--	
					80	
			5	SS	22	
123	Very wet medium brown sandy clay				27	
					54	
					70	
					100	
					--	
120	Auger refusal at 120.65					



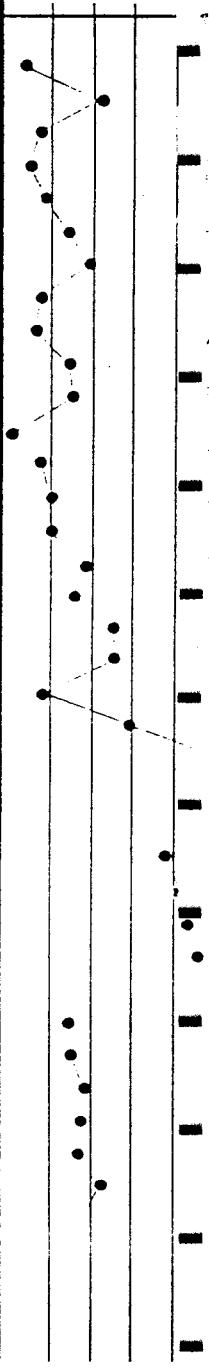
○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH17
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 135.55
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION :

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	No recovery		1	SS	--
					10
					41
					16
	Wet brown sandy clay				12
					17
			2	SS	28
132					39
					15
	Gray sandy clay				12
					29
	Light brown sandy clay				30
			3	SS	4
129					16
	Gray sandy clay				20
					20
					38
	Light brown sandy clay				30
			4	SS	51
126					51
	Gray sandy clay				17
					59
	Light brown sandy clay				100
	No recovery				--
	Sandy gravel		5	SS	--
123					77
	Brown to gray sandy clay				81
					85
					90
	Coarse granular gravel				--
			6	SS	28
120	Coarse granular				30
					37
	Fine sand with large stones				34
					32
					45
117					

PENETRATIC TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH17 (cont'd)
DATE COMPLETED: FEBRUARY 20, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.55
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
117	Fine sand		7	SS	38	
					31	
					50	
					71	
					84	
					153	
114	Fine sand and gravel		8	SS	--	
					--	
					--	
					200	
111	Auger refusal at 112.75					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH18
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.38
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

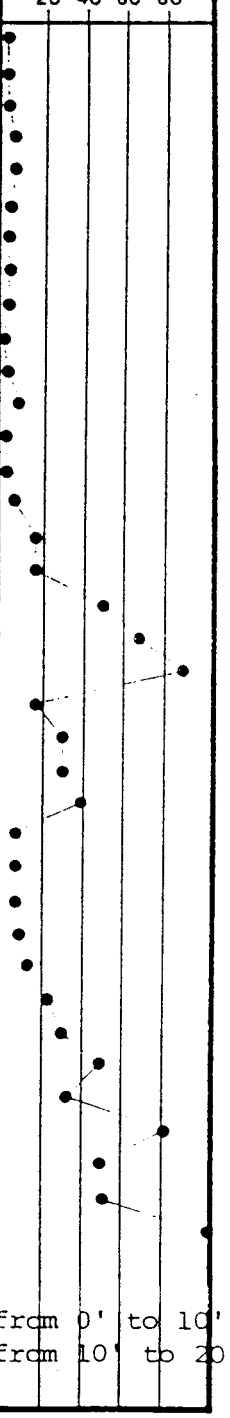
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	10	
135	Gravel				18	
					18	
					18	
					17	
	Stiff gray sandy clay				21	
			2	SS	32	
132					36	
					3	
					3	
	Stiff gray clay				3	
					3	
			3	SS	3	
129					4	
					7	
					7	
					4	
	Stiff light brown sandy clay				4	
			4	SS	5	
126					5	
	Wet soft gray clay				5	
					7	
					12	
	No recovery				100	
	Wet soft gray clay		5	SS	--	
123					--	
	Auger refusal at 122.88 ft.					
	Notes: 1) 140 lb. hammer used from 0' - 4' 2) 300 lb. hammer used from 4' - 12.5'					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH19
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.63
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Sand		1	SS	4, 4, 5, 7
132	Stiff gray clay		2	SS	7, 6, 5, 5, 4, 2, 5, 10
129	Wet stiff gray clay		3	SS	5, 5, 7, 15, 15, 51
126	Brown sandy clay		4	SS	68, 90, 16, 28, 28, 40
	Fine sand				
123	Fine light brown sand		5	SS	8, 8, 8, 9, 12, 23
120	Gravel with large stones		6	SS	28, 49, 32, 81, 50, 53
117	No recovery		7	SS	100
	Auger refusal at 115.63				

PENETRATION TEST BLOWS / FOOT



Note: 1) 300-lb. hammer used from 0' to 10'
2) 140-lb. hammer used from 10' to 20'

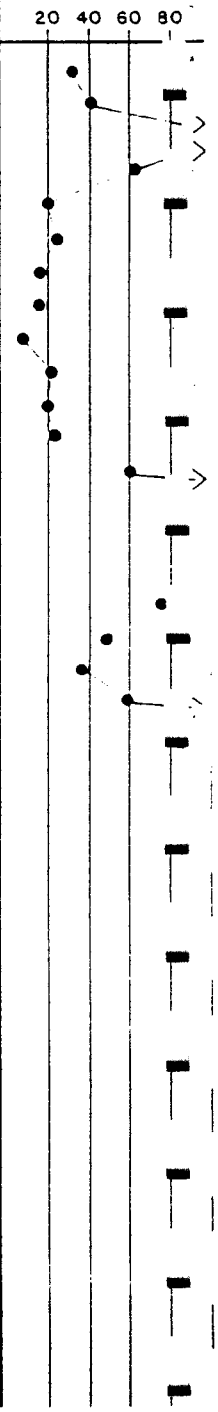
○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH20
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 17, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.46
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Medium brown gravel		1	SS	32
					40
					110
	Light brown sandy clay				62
					20
	Medium brown wet sand				24
			2	SS	18
131	Light brown sandy clay				18
					9
					21
	Medium brown wet sand				20
					22
			3	SS	60
128					200
	Light brown to medium brown clay with gray sandy clay				--
					--
					75
					48
			4	SS	35
125					60
					200
	Brown wet sand				--
					--
					--
			5	SS	--
122					--
					--
	Light brown sandy clay				--
					--
					--
			6	SS	--
119					--
	Light brown sandy clay with pea gravel				--
					--
					--
					--
116					
	Auger refusal at 116.46				

PENETRATI TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH21
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.13
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	2	
	Gray sandy clay				3	
					3	
	Light brown sandy clay				4	
					2	
					2	
132	Wet firm sandy clay		2	SS	3	
					4	
					7	
					7	
					8	
					8	
129	Stiff light brown sandy clay		3	SS	7	
					16	
					41	
					48	
					72	
	Stiff brown clay and sand				100	
126			4	SS	--	
					--	
	Stiff light brown clay				28	
					100	
					--	
					--	
123			5	SS	--	
					28	
					49	
					27	
					50	
	Sandy gravel				--	
120			6	SS	31	
					19	
					57	
					36	
					30	
					52	
117			7	SS	100	
	Auger refusal at 116.83					
	Note: 1) 300-lb. hammer					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH22
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 135.13
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION :

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Light brown clayey sand		1	SS	5	
					7	
					3	
					5	
					1	
					1	
132	Coarse sand		2	SS	2	
					1	
					--	
					--	
					--	
					--	
129	Light brown clayey sand		3	SS	7	
					9	
					11	
					10	
					1	
					2	
126			4	SS	12	
					17	
					--	
					--	
					--	
					--	
123			5	SS	--	
					--	
					--	
					--	
					--	
					--	
120	Stiff gray clay		6	SS	--	
	No recovery				--	
	Auger refusal at 118.83 ft.					
117	Notes: 1) 300 lb. hammer					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH23
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.55
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Medium brown gravel		1	SS	20	
					34	
					36	
					24	
	Gray till with cobbles				10	
					8	
			2	SS	7	
131					6	
					8	
					9	
					10	
					15	
	Gray clayey till		3	SS	20	
128					40	
					60	
					75	
					110	
					50	
			4	SS	200	
125					--	
					40	
					100	
					80	
					62	
	Granular sand and silt		5	SS	40	
122					50	
					60	
					100	
	Dark brown sand and silt				45	
					75	
			6	SS	200	
119					--	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS

JOB Nº : 1358

CLIENT : IBM CORPORATION

HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON

LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH23 (cont'd)

DATE COMPLETED: FEBRUARY 16, 1984

GEOLOGIST/ENGINEER: C. CULL

GROUND ELEVATION: 134.55

TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
119	Dry brown granular				200	
					--	
					--	
					--	
			7	SS	200	
116	Light brown gravel with shattered rock				--	
					--	
					--	
					200	
113	Auger refusal at 114.15 ft.					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH24
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.38
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
135	Silty sand		1	SS	8	
					16	
					21	
					20	
	Medium brown dense clay				4	
					5	
132			2	SS	5	
					5	
	Stiff brown clay with rocks				18	
					12	
					27	
					30	
129	Sand with stones		3	SS	20	
	Gray clay				18	
					27	
					17	
					17	
					10	
126			4	SS	8	
					12	
					5	
					7	
	Coarse sand with stones				10	
					12	
123			5	SS	7	
					10	
					12	
					12	
					7	
					15	
120			6	SS	15	
					16	
					17	
					12	
					18	
					30	
117	Auger refusal at 117.18 ft.					
	Note: 1) 300 lb. hammer					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH25
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 134.55
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION :

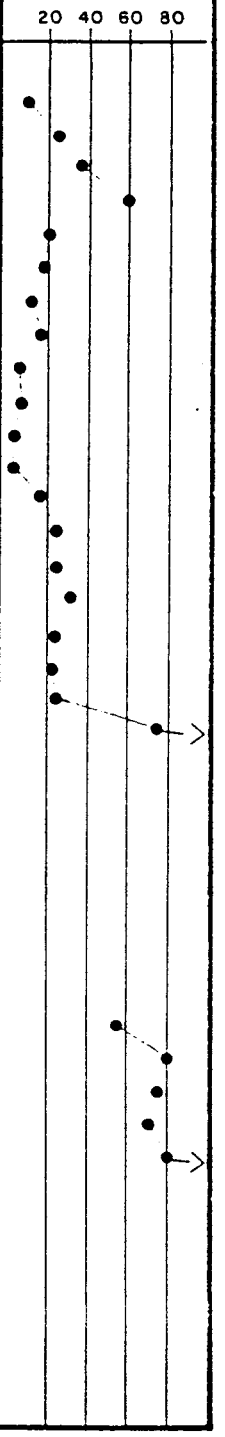
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Light brown sandy stoney clay		1	SS	11	
					18	
					17	
					16	
	Light brown firm sandy clay				7	
					5	
			2	SS	14	
131					17	
	Light brown sandy clay with stones				28	
					29	
					34	
					59	
			3	SS	66	
128	No recovery				35	
					57	
					58	
					80	
	Sandy gravel				39	
			4	SS	28	
125					26	
					10	
					21	
	Till				18	
					18	
			5	SS	13	
122	Medium brown sandy gravel				16	
					18	
					27	
					38	
					40	
			6	SS	42	
119					48	
					56	
					39	
					119	
					200	
			7	SS	200	
116	Auger refusal at 116.05					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH26
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.21
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135					
	Light brown clayey till		1	SS	12
					25
					35
					60
					20
132					19
			2	SS	12
					18
	Extremely dense gray clay				8
					9
					7
129					6
			3	SS	18
					25
					25
					32
					25
126					23
			4	SS	24
					75
	No sample				200
					--
					--
123					--
	Granular till with cobbles		5	SS	210
					200
					--
					--
					55
120					80
			6	SS	75
					70
					80
					200
					--
117					--
			7	SS	200
					--
	Auger refusal at 115.21 feet				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH27
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.80
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

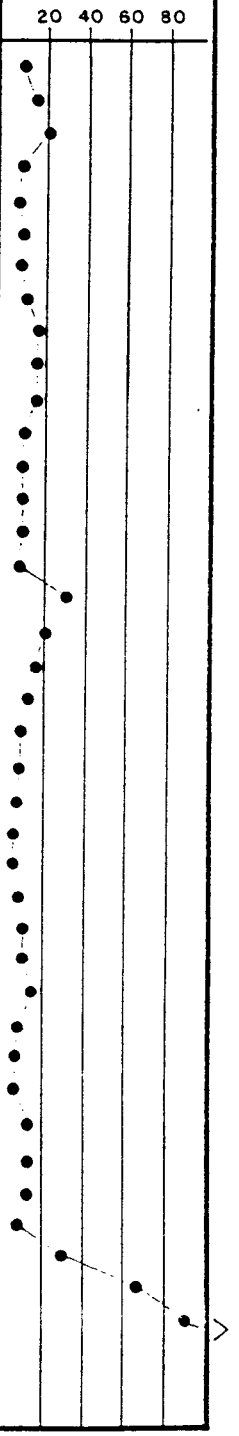
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	15	
					24	
134					28	
					32	
	Light brown gravel				28	
					11	
			2	SS	12	
					12	
131					9	
					6	
	Wet gray sandy clay				5	
					6	
			3	SS	5	
					5	
128					7	
					8	
					3	
	Soft gray sandy				5	
	Wet clay		4	SS	7	
					9	
125					23	
					31	
					43	
					73	
			5	SS	52	
					210	
122						
	Auger refusal at 122.00 feet					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH28
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.55
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Coarse gravel		1	SS	10, 15, 20, 10, 8, 11
131	Silty gravel		2	SS	10, 13, 17, 17, 17, 12
128	Medium brown gravel		3	SS	10, 11, 11, 9, 33, 20
125			4	SS	14, 12, 10, 10, 8, 7
122	Fine gravel		5	SS	7, 10, 13, 12, 16, 10
119	Fine gravel and silt		6	SS	9, 9, 13, 13, 13, 10
116	Gravel		7	SS	30, 66, 90, 200
	Auger refusal at 114.75 feet				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH29
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 15, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.71
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

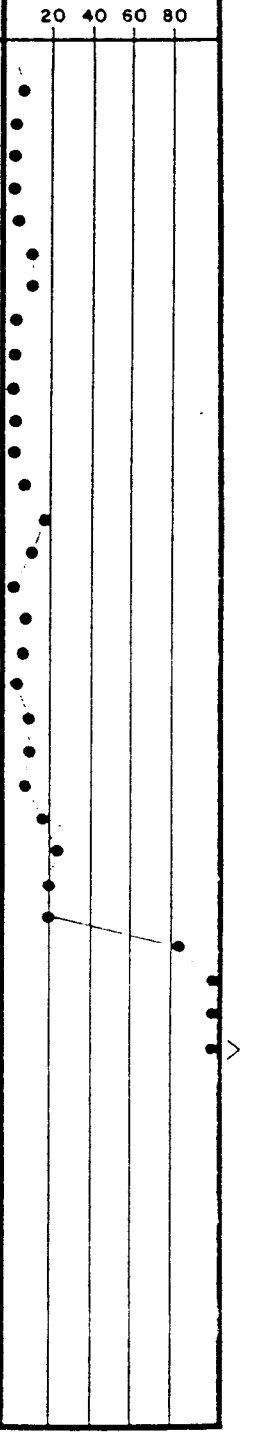
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Light brown sandy wet clay with cobbles		1	SS	30	
					175	
					110	
					28	
					6	
					6	
			2	SS	5	
131					4	
					3	
	Medium brown sandy clay with remains of clay pipe				3	
					2	
					5	
			3	SS	5	
128	Dark brown clay				10	
					8	
					6	
					3	
	No sample				3	
			4	SS	10	
125					10	
					3	
					4	
					5	
					7	
	Light medium brown clay with dark green black material and pebbles		5	SS	5	
122					7	
					8	
					12	
					3	
					4	
			6	SS	7	
119					5	
					5	
	Light medium brown clay with dark green black material and gravel				6	
					7	
					7	
			7	SS	8	
116	Wet brown clayey sand with gravel				6	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH29 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 15, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: C. Cull
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.71
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
116					9
					5
					5
	Wet sand with large cobbles				5
			8	SS	7
113					12
					12
	Wet medium brown sand with cobbles				7
					5
					4
			9	SS	5
110	Wet clayey sand with pebbles				4
					9
					18
					12
					5
	Light brown liquidy clay and light brown sand with pebbles		10	SS	9
107					8
					5
					12
					12
					9
			11	SS	18
104					22
					20
					20
	Wet medium brown sand and till				85
					100
			12	SS	100
101					100
					300
					--
					--
					--
	Light brown liquid with cobbles		13	SS	250
98					--

PENETRATION TEST BLOWS / FOOT



◯ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH29 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 15, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.71
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

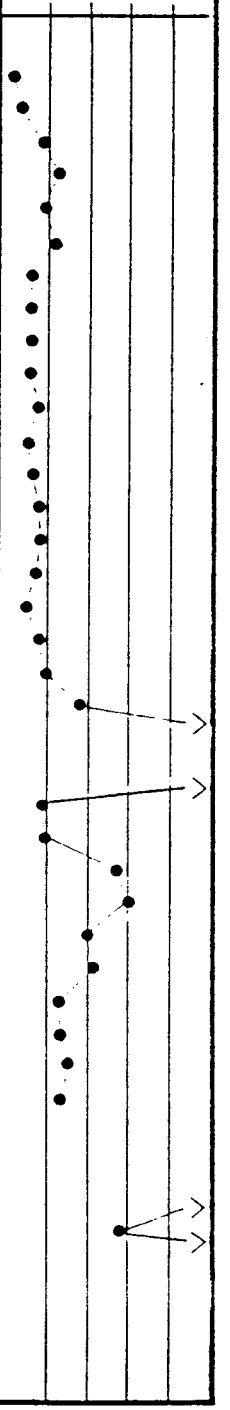
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
98						
	No sample				--	
	Light brown liquid with cobbles				--	
					300	
	No sample				--	
			14	SS	--	
95	Hard packed stoney sand with shattered rock				--	
					150	
					240	
					300	
	Auger refusal at 93.31 feet					
92						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH30
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.05
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Wet gravel		1	SS	5, 9, 19, 24, 19, 22
132	Wet light brown sandy clay with stones		2	SS	13, 13, 14, 13, 16, 11
129	Extremely wet gray sandy clay		3	SS	14, 17, 18, 17, 11, 17
126	Very wet soft sandy clay		4	SS	20, 35, 135, 200, 18, 20
123	No recovery		5	SS	54, 60, 40, 42, 26, 26
120	Light brown sandy clay		6	SS	30, 26, --, --, 106, 58
117	Wet light brown sandy clay		7	SS	185, 180, 200
	Light brown stoney gravel				
	Brown gravel with large stones				
	Auger refusal at 115.95 feet				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH31
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.38
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Silty gravel		1	SS	13	
					19	
					9	
					6	
					8	
					8	
			2	SS	11	
132					13	
					15	
					14	
					15	
					19	
			3	SS	31	
129	Stiff gray clay				31	
					38	
					37	
					78	
					75	
			4	SS	86	
126	Silty gravel				75	
					41	
					55	
					41	
					38	
			5	SS	43	
123	Sandy gravel				36	
					29	
					29	
					28	
					40	
			6	SS	35	
120					38	
					55	
					54	
					80	
					60	
			7	SS	38	
117					36	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH31 (cont'd)
DATE COMPLETED: FEBRUARY 21, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.38
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Sandy gravel				82	
					80	
					76	
					55	
			8	SS	120	
114					200	
					200	
	Auger refusal at 113.08					
111						

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982

HOLE Nº: BH32
DATE COMPLETED: FEBRUARY 14, 1984
GEOLOGIST/ENGINEER: C. CULL
GROUND ELEVATION: 134.88
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134			1	SS	10	
					90	
					140	
					130	
					45	
					32	
131	Light gray to dark brown clay with granular		2	SS	21	
					15	
					20	
					37	
					42	
					42	
128	No sample		3	SS	30	
					28	
					20	
					15	
	Dark brown clay with pebbles				16	
					8	
125			4	SS	4	
					5	
	Dark brown sand				11	
					13	
					28	
					65	
122	No sample		5	SS	75	
					75	
					60	
					75	
					--	
					--	
119	Dark brown sand with large cobbles		6	SS	--	
					--	
					34	
					36	
					30	
					40	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH32 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 14, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
116	Dark brown sand with large cobbles		7	SS	42 26 18 22 200 300	
113	Auger refusal at 113.48 feet					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH33
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 19, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION : WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Gravel		1	SS	12	
					10	
					5	
					6	
					5	
					5	
132			2	SS	5	
					5	
	Fine brown sandy clay				5	
					6	
					10	
					12	
129			3	SS	17	
	Hard brown sandy clay				14	
					12	
					13	
	Very soft brown sandy clay				10	
					14	
126			4	SS	21	
					25	
	Fine brown sandy clay				11	
					20	
					12	
					11	
123			5	SS	14	
	Sandy gravel				10	
					10	
	Light brown sandy clay				10	
					7	
	Sandy gravel				5	
120			6	SS	5	
					4	
					7	
	Sandy gravel with large stones				8	
					10	
					12	
117						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH33 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 19, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION: WALKWAY BETWEEN BUILDINGS 952 AND 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Sandy gravel with large stones		7	SS	5 10 15 25 201	
114	Auger refusal at 114.91					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 34
DATE COMPLETED: FEBRUARY 21, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.38
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Gravel		1	SS	21	
					26	
					20	
					13	
					8	
					8	
132	Sandy gravel		2	SS	10	
					11	
					15	
					15	
					15	
					21	
129	Sandy clay with large stones		3	SS	24	
					31	
					41	
					48	
					45	
					33	
126	Gravel		4	SS	28	
					26	
					39	
					20	
					18	
					16	
123			5	SS	12	
					14	
					15	
					13	
					25	
					24	
120			6	SS	16	
					16	
					32	
					40	
					58	
					72	
117	Light brown stiff sandy clay with rock fragments		7	SS	116	
					200	
					200	
	Auger refusal at 116.28					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 35
DATE COMPLETED: FEBRUARY 14, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 135.13
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	6	
					35	
					150	
					130	
					95	
	Medium brown gravel with clay layers				60	
132			2	SS	23	
					25	
					17	
					18	
					24	
					26	
129			3	SS	30	
					28	
					28	
					30	
					38	
					48	
126			4	SS	50	
					70	
					75	
	Very wet medium brown gravel with clay layers and large stones				55	
					60	
					30	
123			5	SS	35	
					45	
					35	
					30	
					40	
					50	
120			6	SS	60	
					40	
					45	
					50	
					35	
					40	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS

HOLE Nº: BH 35 (cont'd)

JOB Nº : 1358

DATE COMPLETED: FEBRUARY 14, 1984

CLIENT : IBM CORPORATION

GEOLOGIST/ENGINEER: W. ENGLER

HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON

GROUND ELEVATION: 135.13

LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Very wet medium brown gravel with clay layers and large stones		7	SS	110	
					100	
					92	
					85	
					65	
					85	
114			8	SS	75	
					75	
					125	
					115	
					250	

111	Auger refusal at 111.43					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 36
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 19, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
135	Granular clay		1	SS	13	
					30	
					33	
					37	
					25	
					25	
132	Wet granular clay		2	SS	16	
					15	
					14	
					15	
					14	
					16	
129	Moist red sandy clay		3	SS	20	
					20	
					17	
					20	
	Red sand				12	
					12	
126			4	SS	12	
					9	
	Brown sand				9	
	Light brown sandy clay				9	
					10	
					10	
123	Brown sand		5	SS	11	
					11	
	Brown gravel with large stones				16	
					22	
					14	
					16	
120			6	SS	19	
					20	
					23	
					24	
					19	
					18	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 36 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 19, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Sandy gravel with large fragments of fractured rock		7	SS	17	
					19	
					20	
					23	
					40	
					105	
114			8	SS	43	
					88	
					250	
111	Auger refusal at 112.81					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 37
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.21
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Silty gravel		1	SS	21	
					21	
					29	
					38	
					20	
					25	
132			2	SS	15	
					11	
					29	
					30	
					29	
					39	
129	Coarse sand with rock		3	SS	46	
					58	
					85	
					40	
					60	
					58	
126			4	SS	55	
					42	
					44	
					41	
					31	
					25	
123	Sandy gravel		5	SS	23	
					37	
					35	
					35	>
					160	
					58	>
120			6	SS	50	
					68	>
					200	
117	Auger refusal at 118.91					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 38
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 13, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.71
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	10	
					85	
					120	
	Medium brown to gray clay				100	
					100	
					100	
132			2	SS	65	
					50	
					12	
					15	
					13	
					11	
129			3	SS	14	
	Very wet medium brown gravel mixed with clay - also contains black, odorous soil and fractured rock				16	
					18	
					12	
					17	
					15	
126			4	SS	17	
					20	
					20	
					33	
					30	
					30	
123			5	SS	22	
					43	
					35	
					35	
					16	
					16	
120			6	SS	16	
					16	
					28	
					34	
					30	
					25	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 38 (cont'd)
DATE COMPLETED: FEBRUARY 13, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.71
TOP OF PIPE ELEVATION:

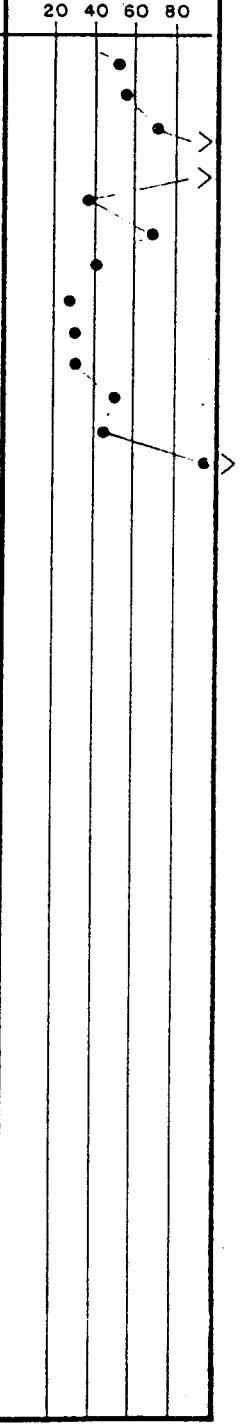
PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
117	Very wet medium brown gravel mixed with clay - also contains black, odorous soil and fractured rock (cont'd)		7	SS	52
					56
					70
					120
					38
					68
114			8	SS	40
					26
					30
					30
					50
					45
111			9	SS	95
	Very wet medium brown gravel mixed with clay - contains black, odorous soil and fractured rock - also contains large stones				180
					185
					190
					300

108	No sample recovered		10	SS	---

	Same as 108.21 to 110.71				300

	No sample recovered				---
105			11	SS	300
	Same as 108.21 to 110.71				
102	Auger refusal at 104.21				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS
▽ STATIC WATER LEVEL

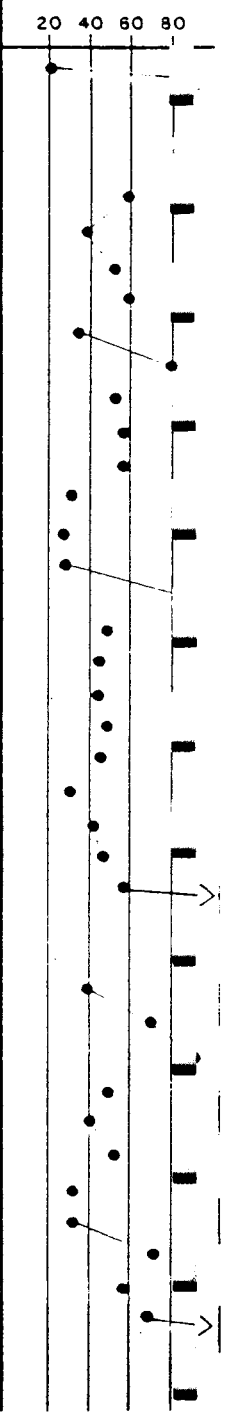
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 39
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.13
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
135	Sandy gravel with large stones		1	SS	21	
					200	

					58	
					37	
			2	SS	52	
132					60	
					33	
					80	
					51	
					56	
			3	SS	57	
129					30	
					26	
					27	
					88	
					47	
	Sandy gravel		4	SS	45	
126					44	
					49	
					44	
					30	
					41	
			5	SS	44	
123					56	
					200	

					39	
					70	
			6	SS	90	
120					48	
					40	
					52	
					30	
					32	
			7	SS	71	
117	Wet sandy gravel with small stones				56	
					66	
					200	
	Auger refusal at 115.53					



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 40
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.46
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135	Silty sand with stones		1	SS	11	
					28	
					40	
					24	
					22	
					19	
132	Fine sand		2	SS	15	
					12	
					19	
					18	
					16	
					17	
129			3	SS	11	
					13	
					12	
					12	
					11	
					12	
126	Granular loose sand		4	SS	14	
					21	
					19	
					19	
					19	
					14	
123			5	SS	15	
					31	
					37	
					37	
					44	
					38	
120			6	SS	42	
					58	
					50	
	Gravel				75	
					61	
					80	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 40 (cont'd)
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.46
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Coarse sand with stones		7	SS	80	
					82	
					87	
					110	
					60	
					44	
114			8	SS	52	
					70	
					72	
					76	
					200	
111	Auger refusal at 112.16					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 41
DATE COMPLETED: FEBRUARY 13, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.80
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135			1	SS	20	
					75	
					100	
					190	
					200	
	Gray to brown gravel mixed with clay				---	
132			2	SS	---	

					14	
					13	
					13	
					12	
129			3	SS	12	
	Black oily-like material on stones				15	
					12	
					7	
					15	
					12	
126	Brown sandy clay mixed with black oily-like material on stones and soil - noticeable moisture		4	SS	12	
					15	
					34	
					34	
					35	
					20	
123			5	SS	22	
					30	
					32	
					38	
					25	
					35	
120			6	SS	50	
	Very wet, runny gray sandy clay with small stones - also fragments of shattered rock				160	
					200	

	Auger refusal at 118.0					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

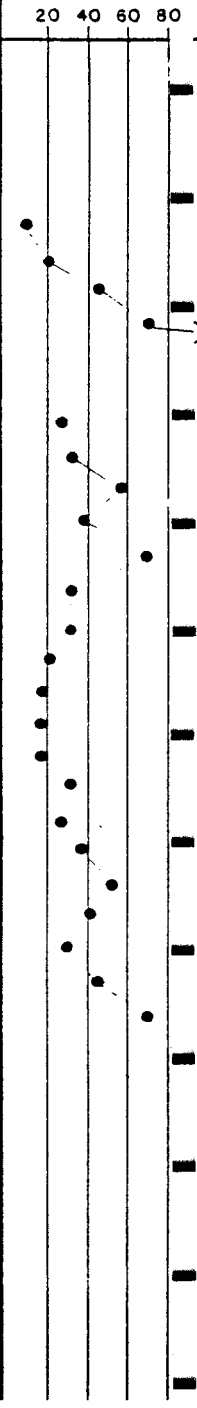
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 42
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 17, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.05
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135			1	SS	12
					20
	Medium brown clayey till				44
					70
					200
	No sample recovered				---
132			2	SS	27
					31
					58
					36
					68
					30
129	Medium brown granular gravel		3	SS	29
					20
					17
					16
					17
					31
126			4	SS	25
					35
					53
					40
					28
					46
123	Cobbles		5	SS	70
					83
					150
	No sample recovered				230
					200

120					
	Auger refusal at 120.25				

PENETRATIC TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 43
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.63
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135	Sandy gravel with some boulders		1	SS	5	
					5	
					5	
					3	
					2	
					2	
132			2	SS	4	
					5	
	No sample recovered				17	
					10	
	Sandy gravel with stones				11	
					12	
129	Medium fine sand		3	SS	7	
					5	
					5	
					8	
					7	
					9	
126			4	SS	9	
					11	
					7	
					9	
					14	
					15	
123			5	SS	30	
					32	
					20	
					25	
					22	
					35	
120	Coarse sand		6	SS	38	
					22	
					14	
					12	
					17	
					22	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 43 (cont'd)
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.63
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Sandy gravel with large stones		7	SS	17	
					17	
					20	
					28	
					39	
					48	
			8	SS	53	
					100	
114	Auger refusal at 113.83 Note: 1) 300 lb. hammer					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 44
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 17, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.55
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
135						
			1	SS	25	
					14	
					12	
					8	
					10	
132	Brown wet sandy gravel				13	
			2	SS	10	
					10	
					6	
					5	
					6	
129					10	
			3	SS	10	
	Coarse wet gravel layered with clay				13	
					13	
	Stony, crushed gravel with black oil-like material - noticeably strong smell				13	
					13	
126					19	
			4	SS	24	
					22	
					19	
					18	
					17	
123					17	
	Wet brown sandy gravel with noticeable odor		5	SS	12	
					16	
					19	
					22	
					25	
120					30	
			6	SS	35	
					35	
					28	
					200	
	Auger refusal at 117.03					

PENETRATION TEST BLOWS / FOOT: 20 40 60 80

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 45
DATE COMPLETED: FEBRUARY 17, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 135.13
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135			1	SS	6	
					18	
					44	
					57	
					36	
					36	
132	Coarse brown gravel		2	SS	36	
					36	
					34	
					33	
					25	
					20	
129			3	SS	24	
					36	
					26	
	Light brown sandy gravel				23	
					14	
					18	
126			4	SS	18	
					31	
					88	
					147	
					117	
					130	
123			5	SS	200	
	No sample recovered				---	
					58	
					52	
					60	
					99	
120						
	Auger refusal at 119.43					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 46
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.13
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
135	Gravel and brown clay		1	SS	3	
					9	
					11	
					16	
					3	
					2	
132			2	SS	2	
					1	
	Gravel				11	
					17	
					19	
					20	
129	Brown clay and coarse sand		3	SS	6	
					4	
					6	
					4	
					11	
					11	
126	Medium fine sand		4	SS	11	
					13	
					7	
					9	
					13	
					12	
123			5	SS	10	
					12	
					11	
					17	
					12	
					11	
120	Sandy gravel with stones		6	SS	21	
					28	
					15	
					8	
					23	

117					100	
	Auger refusal at 116.83					
	Note: 1) 300 lb. hammer					

PENETRATION TEST BLOWS / FOOT: 20 40 60 80

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 47
DATE COMPLETED: FEBRUARY 17, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.80
TOP OF PIPE ELEVATION:

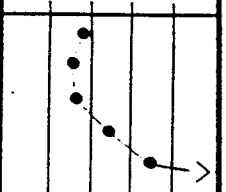
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	12	
					9	
					13	
	Medium brown sandy gravel				26	
					57	
					26	
132			2	SS	23	
					12	
					10	
	Light brown sandy clay				10	
					10	
					8	
129			3	SS	13	
					10	
					8	
	Wet coarse brown gravel				13	
					12	
					12	
126			4	SS	12	
					12	
					13	
	Hard light brown sand				19	
					25	
					25	
123			5	SS	40	
					42	
	Firm wet brown sand				75	
					70	
					25	
	Coarse wet brown gravel				35	
120			6	SS	33	
					60	
					42	
	Wet firm medium brown sand				39	
					30	
					35	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 47 (cont'd)
DATE COMPLETED: FEBRUARY 17, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.80
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
117	Wet firm medium brown sand		7	SS	36	
					30	
					32	
					50	
					70	
					129	
			8	SS	160	
114					200	
	Wet firm medium brown sand with large stones and traces of shattered rock				---	
111	Auger refusal at 112.9					



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 48
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.96
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	8	
					20	
					24	
					30	
					26	
	Silty gravel				28	
132			2	SS	13	
					12	
					9	
					10	
					7	
					7	
129			3	SS	6	
					7	
					7	
	Large stones and wet sand				9	
					12	
					11	
126			4	SS	19	
					18	
					35	
					24	
					24	
					32	
123			5	SS	21	
	Sandy gravel*				27	
					27	
					29	
					21	
					27	
120			6	SS	34	
					40	
					30	
					45	
					47	
					57	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 48 (cont'd)
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 134.96
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
117			7	SS	30	
	Sandy silt and gravel				54	
					59	
					62	
					85	
					86	
114			8	SS	60	
	Wet gravel				200	

Auger refusal at 113.36

NOTES:
1) * at approximately 16' deep, petroleum fuid on drilling stem was observed. However, soil samples in the interval 9'-18' showed no traces of this fluid.

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 49
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.46
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRAT N TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	8	
					10	
135					11	
	Coarse sand with rock fragments				10	
					6	
					6	
			2	SS	6	
132					6	
					7	
	Gravel				14	
					27	
					30	
			3	SS	20	
129					32	
	Gravel with rock fragments				41	
					39	
					53	
					31	
	No sample recovered		4	SS	31	
126					26	
					10	
					12	
					14	
					17	
			5	SS	17	
123					12	
	Clayey sand				22	
					24	
					10	
					17	
			6	SS	15	
120					19	
					20	
					75	
					75	
					63	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 49 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.46
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Sandy gravel		7	SS	19	
					19	
					30	
					30	
					48	
					75	
			8	SS	111	
114					132	
					140	
					200	
					166	
					200	
111	Auger refusal at 111.86					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 50
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.71
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

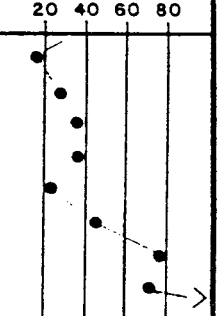
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135						
	Brown till		1	SS	14	
					19	
					16	
					25	
					15	
132	Cobbles				15	
			2	SS	9	
					8	
					7	
	Medium brown till with some cobbles				5	
					5	
129					4	
			3	SS	6	
					3	
	Large gravel and cobbles mixed with wet soil				3	
					3	
					7	
126					7	
			4	SS	14	
					13	
					16	
					16	
					25	
123	Sandy granular soil				32	
			5	SS	21	
					28	
					33	
					38	
					22	
120	Sandy, granular soil with large stones				25	
			6	SS	25	
					26	
					31	
	Sandy granular soil				30	
					36	
117					35	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 50 (cont'd)
DATE COMPLETED: FEBRUARY 16, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.71
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
	Wet sandy gravel		7	SS	17	
					27	
					37	
					35	
					22	
114					46	
	Light to medium brown gravel with some traces of clay and large stones		8	SS	78	
					73	
					146	
					157	
					123	
					150	
111			9	SS	101	
					260	
					200	
	Auger refusal at 109.61				--	



○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 51
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	14	
					18	
					52	
	Wet gravelly sand				51	
					30	
					20	
132			2	SS	10	
					10	
					10	
					11	
	Medium brown till with large cobbles				8	
					8	
129			3	SS	8	
					7	
					6	
	Predominately large cobbles with some dark brown till				8	
					13	
					13	
126			4	SS	14	
					41	
					13	
					13	
	No sample description recorded				18	
					22	
123			5	SS	14	
					19	
					20	
					24	
					12	
					16	
120	Sand mixed with some darker streaks of soil and some pebbles		6	SS	29	
					19	
					16	
					17	
					17	
					20	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 51 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117			7	SS	17	
					27	
					21	
					19	
	Wet brown sandy gravel				14	
					21	
114			8	SS	29	
					33	
					20	
					30	
					30	
					37	
111			9	SS	200	
					--	
	Wet brown sandy gravel with large stones and traces of fractured rock				195	
					124	
					64	
					68	
108			10	SS	74	
	No sample recovered				80	
					60	
					95	
	Dark grayish brown sand with some large cobbles				70	
					65	
105			11	SS	180	
	Large cobbles mixed with silty sand				200	
					--	
102	Auger refusal at 103.88					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 52
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 23, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	13	
					14	
					14	
					3	
					8	
	Coarse sand with stones				9	
132			2	SS	10	
					9	
					13	
					9	
					9	
					7	
129			3	SS	9	
					8	
					9	
	Gravel and large stones				7	
					8	
					9	
126	Stones		4	SS	6	
					17	
					18	
					20	
					24	
					32	
123			5	SS	24	
					30	
	Medium fine sand				33	
					42	
					30	
					34	
120			6	SS	41	
					45	
					28	
					30	
					39	
					56	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 52 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 23, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Medium fine sand		7	SS	39	
					49	
					55	
					20	
					120	
	Wet fine gravel				200	
114						
	Auger refusal at 114.08					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº : BH 53
JOB Nº : 1358
DATE COMPLETED : FEBRUARY 16, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER : C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION : 134.80
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION :

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	13	
					14	
					13	
					31	
					40	
	Dark brown sand				91	
132			2	SS	30	
					30	
					8	
					8	
	Dark brown granular till				13	
					10	
129			3	SS	7	
					6	
	Large cobbles				4	
					7	
					8	
					7	
126			4	SS	12	
					12	
					15	
					41	
					203	
					75	
123	Medium brown sand		5	SS	22	
					15	
					20	
					23	
					16	
					17	
120			6	SS	16	
					22	
					14	
					21	
					28	
					35	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 53 (cont'd)
DATE COMPLETED: FEBRUARY 16, 1984
GEOLOGIST/ENGINEER: C. CULL
GROUND ELEVATION: 134.80
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117			7	SS	19	
					24	
					26	
					32	
					23	
					29	
114	Medium brown sand		8	SS	35	
					40	
					56	
					165	
					200	
	No sample recovered				--	
111			9	SS	200	
	Medium brown sand				--	
					234	
					200	
					--	
108						
	Auger refusal at 108.90					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 54
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.80
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Coarse gravel and traces of asphalt		1	SS	40	
					23	
					24	
					30	
					30	
					26	
			2	SS	17	
132					19	
	Silty gravel				9	
					8	
					7	
					7	
129	Coarse gravel		3	SS	7	
					9	
					6	
					6	
					5	
					5	
126			4	SS	8	
					23	
					25	
					26	
					42	
					73	
123	Silty gravel		5	SS	30	
					83	
					36	
					38	
					60	
					46	
120			6	SS	46	
					42	
					46	
					74	
					100	
					70	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 54 (cont'd)
DATE COMPLETED: FEBRUARY 21, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.80
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
117	Gravel		7	SS	30	
					50	
					25	
					29	
					33	
					29	
114			8	SS	30	
					30	
					35	
					36	
					39	
					41	
111			9	SS	40	
					95	
					90	
					55	
					185	
					200	
108	Auger refusal at 108.40					

PENETRATION TEST BLOWS / FOOT: 20 40 60 80

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 55
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135			1	SS	7	
					4	
					6	
	Sandy gravel				5	
					2	
					2	
132			2	SS	2	
					2	
					2	
	Sandy gravel with stones				2	
					2	
					3	
129			3	SS	3	
					3	
					3	
					4	
	Cobbles				7	
					5	
126			4	SS	8	
					3	
					8	
					10	
					10	
	Wet densely packed sand				11	
123			5	SS	8	
					12	
					17	
	Coarse sand with small stones				19	
					12	
					12	
120			6	SS	10	
					11	
					13	
	Coarse sand				13	
					15	
					16	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 55 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.88
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117			7	SS	31	
					47	
					51	
					55	
					15	
					10	
114	Medium fine sand		8	SS	17	
					21	
					12	
					29	
					56	
					100	
111						
	Auger refusal at 111.08					
	NOTE: 1) 300 lb. hammer					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 56
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.55
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	10	
135					18	
					20	
					20	
	Gravel and asphalt				17	
					18	
			2	SS	14	
132					14	
					26	
					54	
					72	
	No sample description recorded				22	
			3	SS	28	
129					42	
					36	
					30	
					53	
	Sandy gravel				45	
			4	SS	70	
126					44	
					25	
					30	
					24	
					24	
			5	SS	24	
123	Light brown sandy gravel				33	
					30	
					24	
					24	
					25	
			6	SS	26	
120					29	
					32	
					40	
					36	
					30	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 56 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 20, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.58
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Sandy gravel		7	SS	56	
					61	
					48	
					52	
					22	
					28	
			8	SS	28	
114					28	
					24	
					124	
					42	
					86	
			9	SS	84	
111	Light brown sandy gravel				38	
					36	
					33	
					30	
					35	
			10	SS	35	
108	Medium brown sand and gravel				43	
					29	
					56	
					50	
					50	
			11	SS	122	
105	Medium brown gravel				130	
					200	
	No sample recovered				---	

103	Auger refusal at 103.65					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

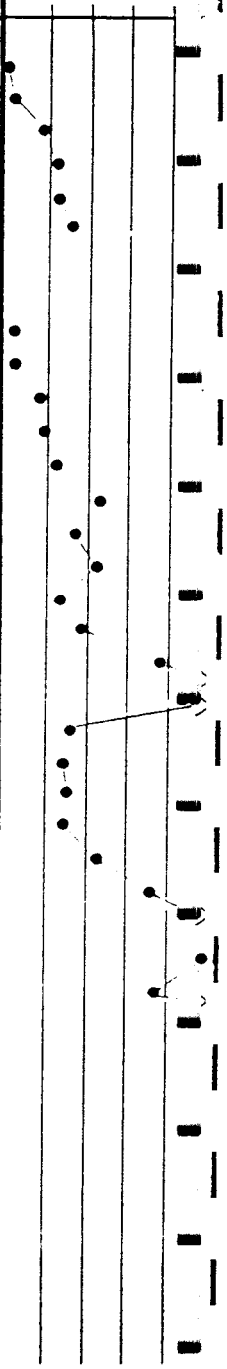
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 57
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 22, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.80
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
			1	SS	2
					5
135	Wet medium brown gravelly sand				17
					22
					22
					30
			2	SS	--
					--
132					7
	No sample description recorded				7
					18
					19
			3	SS	23
					46
129	Large cobbles and silty sand				33
					44
					25
					37
			4	SS	74
	Small cobbles and silty sand				111
126					32
					27
					29
					26
	Sandy gravel with small rocks		5	SS	45
					72
123					101
					94
					73
					200
			6	SS	---
	No sample recorded				---
120					189
	Silty sand and large rocks				221
					200

117	Auger refusal at 118.80				

PENETRATIC TEST BLOWS / FOOT



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 58
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.38
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135			1	SS	17	
					17	
					19	
					62	
					51	
	Light brown gravel with small stones				51	
			2	SS	84	
132					79	
					60	
					168	
					176	
					200	
			3	SS	52	
129					73	
	Glacial till with large pieces of shale				70	
					78	
					200	
	No sample				---	
			4	SS	---	
126					---	
					34	
	Fine sand with large rocks				26	
					25	
					22	
			5	SS	30	
123					31	
					29	
					31	
					17	
	Fine sand				21	
			6	SS	25	
120					25	
					25	
					31	
					31	
					30	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 58 (cont'd)
DATE COMPLETED: FEBRUARY 22, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 135.38
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Fine sand		7	SS	34	
					30	
					30	
					33	
					24	
					25	
			8	SS	30	
114					35	
					25	
					60	
					90	
					76	
			9	SS	57	
111	Sandy gravel with small stones				77	
					90	
					52	
					76	
					82	
			10	SS	95	
108	Sandy gravel with large stones				90	
					55	
					120	
					112	
	No sample recovered				200	
			11	SS	133	
105	Sandy gravel with small stones				175	
					200	

103	Auger refusal at 103.98					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 59
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 14, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.96
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135			1	SS	12	
	Hard Dark brown clay				10	
					24	
					36	
					46	
	Wet dark brown sand with large cobbles				28	
132			2	SS	20	
					13	
					12	
	No sample recovered				10	
					9	
					7	
129			3	SS	8	
	Cobbles mixed with gravel				8	
					7	
					6	
					12	
	No sample recovered				26	
126			4	SS	36	
					53	
					72	
	Cobbles mixed with gravel				89	
					115	
					202	
123			5	SS	31	
	Dark brown gravelly till				32	
					30	
					24	
					60	
					54	
120	One large cobble		6	SS	45	
					35	
					18	
	Pebbles				18	
					41	
					23	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 59 - cont'd
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 14, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: C. CULL
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.96
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117			7	SS	31	
					60	
	Medium brown clay				155	
					100	
					160	
	Medium gray-brown clay				88	
114	Mixed with gray fluid		8	SS	205	
					115	
					88	
	Gray-brown fluidy clay with large gravel				200	
					--	
					--	
111						
	Auger refusal at 112.06					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 60
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 23, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.05
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
135	Gravel with small stones		1	SS	5, 10, 12, 12, 17, 20	
132	Gravel with cobbles		2	SS	15, 20, 45, 25, 25, 50	
129	Gravel with large cobbles		3	SS	25, 17, 15, 12, 6, 8	
126	No sample recovered		4	SS	10, 10, 9, 12, 15, 18	
123	Silty sand with black petroleum compound and noticeable odor		5	SS	18, 23, 25, 29, 14, 19	
120	Medium fine sand		6	SS	23, 33, 19, 23, 23, 30	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS

HOLE Nº: BH 60 (cont'd)

JOB Nº : 1358

DATE COMPLETED: FEBRUARY 23, 1984

CLIENT : IBM CORPORATION

GEOLOGIST/ENGINEER: K. BRICKNELL

HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON

GROUND ELEVATION: 135.08

LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

TOP OF PIPE ELEVATION:

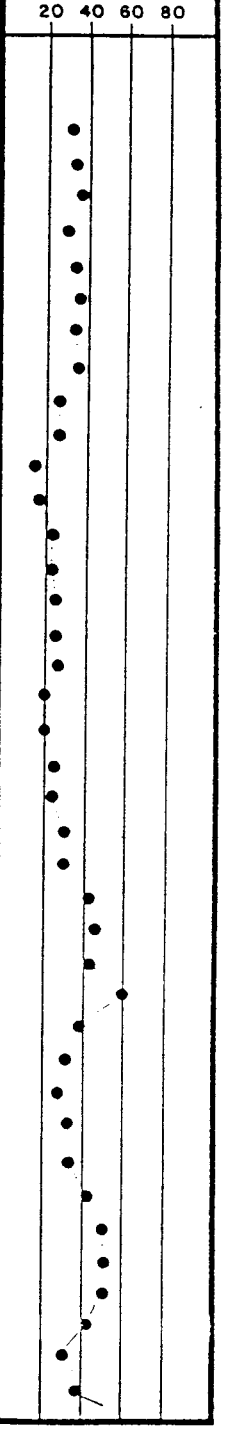
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIO TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Sandy gravel with small stones		7	SS	17 20 40 106 111 200	
114	Auger refusal at 114.05					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 61
DATE COMPLETED: FEBRUARY 13, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 135.55
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
135	Light brown sandy soil		1	SS	32	
					34	
					36	
					29	
					34	
					37	
			2	SS	34	
132					35	
	Dark brown sandy clay				26	
					27	
					15	
					18	
			3	SS	22	
129					22	
	Medium brown fine gravel				24	
					24	
					26	
					20	
			4	SS	20	
126					25	
					23	
					30	
					30	
					41	
			5	SS	46	
123					44	
					60	
					39	
					32	
					28	
			6	SS	33	
120					33	
					41	
					49	
					50	
					50	
			7	SS	41	
117					31	
					37	

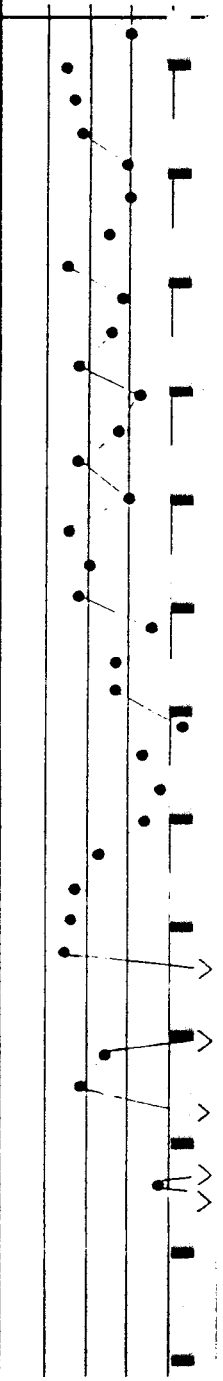


○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 61 (cont'd)
JOB Nº : 1358
DATE COMPLETED: FEBRUARY 13, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.55
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	
					60	
					27	
					31	
			8	SS	37	
114	Fine light brown dense sand				59	
					60	
					48	
					28	
					57	
			9	SS	50	
111					35	
	Till with large stones				65	
					56	
					36	
					60	
			10	SS	29	
108					40	
					35	
					70	
					54	
					54	
			11	SS	84	
105					66	
	Light brown silty sand with large stones				77	
					68	
					44	
					34	
			12	SS	33	
102					29	
					137	
					208	
					48	
					39	
			13	SS	110	
99					216	
					76	
					200	
					--	
					--	
96	Auger refusal at 98.05					



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 62
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 14, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.38
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
			1	SS	4	
135					5	
					5	
					8	
	Light brown gravel				12	
					11	
			2	SS	17	
132					24	
					36	
	Light brown gravel with some gray clay				54	
					68	
					65	
			3	SS	72	
129					42	
					46	
	Light brown sand with large stones				52	
					42	
					40	
			4	SS	36	
126					24	
					17	
					63	
					41	
					49	
			5	SS	37	
123	Light brown layered clay				47	
					85	
					67	
					48	
					48	
			6	SS	84	
120					96	
					45	
					56	
					51	
					69	

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 62 (cont'd)
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 14, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.38
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Light brown sand layered with gravel		7	SS	45	
					45	
					65	
					39	
					20	
					20	
			8	SS	20	
114					16	
					17	
					21	
					25	
					40	
			9	SS	38	
111					54	
					56	
					61	
					80	
					90	
			10	SS	111	
108					150	
	Auger refusal at 107.78					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 63
JOB Nº: 1358
DATE COMPLETED: FEBRUARY 21, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: K. BRICKNELL
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.88
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
			1	SS	4	
					9	
135	Fine sand				28	
					22	
					27	
					40	
			2	SS	44	
					30	
132					30	
	Brown clay				100	
	Gravel				100	>
	Brown clay				120	
			3	SS	203	
					76	>
129	Sandy clay				200	>
					--	
	No sample recovered				64	
					45	
			4	SS	75	
					80	>
126	Gravelly brown clay				155	
					125	
					200	
					160	
			5	SS	200	
	Stiff light brown clay with stone fragments				--	
123						
	Auger refusal at 123.58					

○ GRAIN SIZE ANALYSIS ▼ WATER FOUND ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 64
JOB Nº : 1358
DATE COMPLETED: MARCH 13, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: D. ROBINSON
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.42
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Brown sandy clay with gravel		1	SS	26	
					57	
					32	
					30	
					27	
					20	
131			2	SS	16	
					13	
					20	
					20	
					24	
					28	
128	Medium brown sand with gravel		3	SS	22	
					20	
					18	
					19	
					20	
					18	
125			4	SS	16	
					14	
					11	
					10	
					10	
					11	
122			5	SS	16	
					14	
					13	
					11	
					12	
					11	
119			6	SS	10	
					10	
					15	
					11	
					10	
					11	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 64 (cont'd)
DATE COMPLETED: MARCH 13, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.42
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
118			7	SS	21	
					25	
					20	
					52	
					102	
					53	
			8	SS	76	
113	Brown sandy clay				100	
					190	
					200	
					--	
					--	
			9	SS	115	
110	Dry brown sandy clay with stones				60	
					60	
					70	
					165	
					63	
			10	SS	23	
107	Dry brown fine to medium sand with stones and gravel				26	
					34	
					36	
	Dry brown sandy clay with stones				57	
					81	
			11	SS	200	
104	No recovery					
	Auger refusal at 102.62					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 65
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.58
TOP OF PIPE ELEVATION:

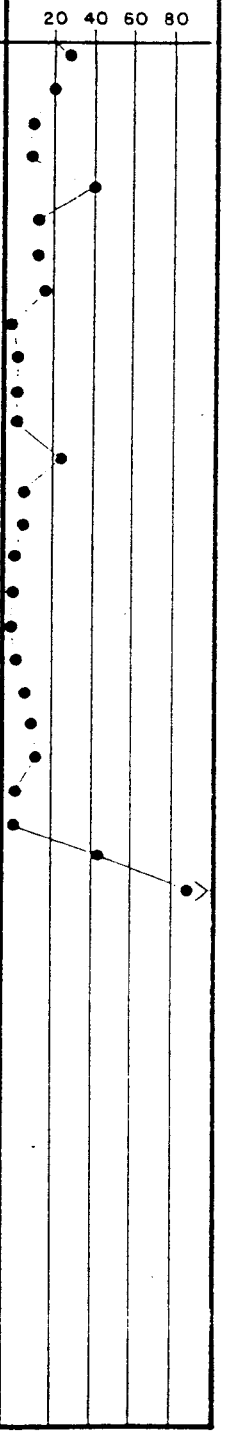
PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI(TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	200	
134					--	
					25	
					20	
					20	
					18	
			2	SS	10	
131	Brown silty sand with gravel				10	
					21	
					18	
					17	
					18	
			3	SS	38	
128					45	
					30	
					26	
					25	
					27	
			4	SS	18	
125	Brown silty clay				12	
					21	
	Brown silty clay with sand and gravel pockets				21	
					25	
					20	
			5	SS	7	
122	Moist brown silt with sand and gravel				10	
					60	
					26	
					15	
					21	
			6	SS	17	
119	Brown sand and gravel with clay and silt				17	
					15	
					17	
					15	
					12	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 65 (cont'd)
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.58
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
116	Sandy brown clay with stones		7	SS	27	
					20	
					12	
					12	
					40	
					14	
			8	SS	14	
113					18	
					3	
					6	
					4	
					5	
			9	SS	23	
110	Wet brown silty clay with gravel				8	
					8	
					5	
					4	
					3	
			10	SS	4	
107					8	
					12	
					14	
					6	
					4	
			11	SS	42	
104	Moist sand brown clay with gravel				88	
					200	
					--	
					200	
101	Auger refusal at 101.68					



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 66
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.42
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIC TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
			1	SS	55	
134	Medium brown coarse gravel				70	
					58	
					45	
					34	
					38	
			2	SS	25	
131	Light brown silty clay				27	
					10	
					17	
					14	
					14	
			3	SS	14	
128					14	
					30	
					52	
	Gray sandy clay				7	
					9	
			4	SS	11	
125	Light brown silty clay				15	
					15	
					17	
					17	
	Medium brown coarse sand				20	
			5	SS	15	
122	Light brown sandy clay				20	
					21	
					31	
					18	
					25	
			6	SS	25	
119	Wet gray sandy clay				33	
					40	
					34	
					27	
	Light brown sandy clay				50	

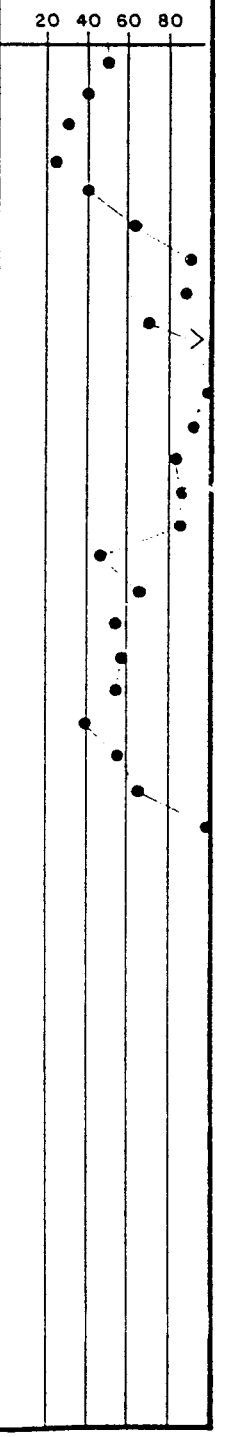
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 66 (cont'd)
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.42
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
116	Dry medium-coarse brown sand with gravel		7	SS	50
					40
					30
					24
					40
	Medium-coarse brown sand with stones				64
			8	SS	90
113					86
	Sandy silty brown clay with stones				70
					115
					100
					91
			9	SS	82
110					85
					84
					47
	Dry brown silty clay with stones				66
					55
			10	SS	57
107					55
					40
					55
					65
					100
	Brown sandy clay with stones		11	SS	160
104					200
					200
	Auger refusal at 103.02				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 67
JOB Nº : 1358
DATE COMPLETED: MARCH 8, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.17
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134			1	SS	60	
	Medium brown gravel				40	
					25	
					20	
					17	
131	Medium gray silty clay		2	SS	20	
					23	
					23	
	Wet medium gray silty clay				8	
					7	
					8	
					10	
128	Medium brown hard sand		3	SS	9	
	Medium gray wet silty clay				11	
					14	
					18	
					4	
					4	
125			4	SS	10	
					10	
					8	
					12	
	Light brown silty sand				20	
					20	
122			5	SS	20	
					22	
					20	
					20	
					3	
					5	
119			6	SS	99	
	Light to medium brown gravel with large stones				81	
					50	
					36	
					43	
					54	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 67 (cont'd)
DATE COMPLETED: MARCH 8, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.17
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	Medium brown coarse gravel with large stones		7	SS	70	
					54	
					44	
					35	
					48	
					54	
113			8	SS	56	
					73	
					137	
					200	
110	Auger refusal at 110.37					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 68
DATE COMPLETED: MARCH 8, 1984
GEOLOGIST/ENGINEER: W. ENGLER
GROUND ELEVATION: 134.17
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Light brown gravel		1	SS	70	
					54	
					40	
	Medium brown gravel				27	
					24	
					17	
131	Light gray sandy clay		2	SS	17	
					17	
	Light gray soft wet silty clay				9	
					9	
					9	
					9	
128	Light brown silty sand		3	SS	8	
	Light gray wet silty clay				11	
					12	
					11	
					5	
					6	
125	Light brown hard sand		4	SS	8	
					7	
	Light gray wet silty clay				8	
					8	
					10	
					17	
122			5	SS	10	
					11	
	Light brown gravel with large stones				18	
					81	
	Light gray wet sandy clay				54	
					60	
119	Light brown gravel with large stones		6	SS	86	
					144	
	Light brown silty sand				92	
	Light brown gravel with large stones				57	
					60	
					100	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 68 (cont'd)
JOB Nº : 1358
DATE COMPLETED: MARCH 8, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.17
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
116	Light brown gravel with large stones		7	SS	77	
					85	
					85	
					85	
					70	
					202	
113	Light brown silty sand with large stones and cobbles		8	SS	200	
					--	
					200	
					--	
					200	
					200	
110	Dry light brown gravel with large stones				--	
					--	
					110	
					117	
					195	
					85	
107					--	
					--	
					36	
					200	
104	Auger refusal at 105.47					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 69
DATE COMPLETED: MARCH 13, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.33
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRAT TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
			1	SS	12	
134	Brown and gray sandy clay				7	
					5	
					6	
					7	
					7	
			2	SS	8	
131	Moist brown silty clay				5	
	Wet gray silty clay				4	
					4	
					4	
					5	
			3	SS	5	
128					6	
					7	
					5	
					4	
					4	
			4	SS	4	
125	Gray silty clay with very fine sand				4	
					5	
	Gray silty clay with brown silty sand				6	
					4	
					6	
			5	SS	12	
122	Very wet silty gray clay				30	
					100	
					--	
					35	
					40	
			6	SS	50	
119	Medium-fine brown sand with gravel				48	
					100	
					--	
					--	
	Dry fine medium brown sand with cobbles				--	
		Note: 1) 300 lb. hammer	7	SS	100	
116	Auger refusal at 115.83					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 70
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.75
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Dry brown sandy clay with stones		1	SS	7	
					15	
					12	
					10	
					15	
					17	
131			2	SS	8	
					5	
					5	
					5	
					4	
					4	
128	Wet gray silty clay		3	SS	4	
					4	
					4	
					4	
					3	
					3	
125			4	SS	4	
					6	
					5	
					6	
					6	
	Moist brown silty clay				10	
122			5	SS	100	
	Medium-fine sand with cobbles				--	
					--	
					--	
	Cobbles - No recovery				23	
					30	
119	Silty sand with cobbles		6	SS	55	
					71	
					100	
					--	
					--	
					--	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS
▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 70 (cont'd)
DATE COMPLETED: MARCH 12, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.75
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
	Gray silt with sand					
116	Dry brown silty sand with stones		7	SS	73	•
					100	
					--	
					--	
					88	•
	Brown silty sand with stones				100	
113			8	SS	--	
					--	
					--	
					--	
	No recovery				--	
			9	SS	93	•
110					100	
	Auger refusal at 109.75					
	Notes: 1) 300 lb. hammer 2) Initial auger refusal at 120.55 with 100 blow counts. Shifted hole, augered to 120.75 and continued drilling.					
104						

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 71
DATE COMPLETED: MARCH 13, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.50
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS/FOOT (20 40 60 80)
134	Brown sandy clay with gravel		1	SS	2, 7, 6, 6, 5, 5	
131	Moist gray silty clay		2	SS	5, 5, 5, 4, 4, 4	
128	Wet gray silty clay		3	SS	4, 4, 4, 4, 5, 4	
	No recovery		4	SS	7, 10, 8, 12, 100, --	
	Gray silty clay					
	Brown silty clay					
122	Medium brown sand with gravel and cobbles		5	SS	55, 31, 20, 80, 61, 43	
119			6	SS	55, 42, 75, 100, --, 100	
	Gray silty clay with stones and cobbles					
116	Auger refusal at 116.40 Note: 1) 300 lb. hammer					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 72
JOB Nº : 1358
DATE COMPLETED: MARCH 13, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: D. ROBINSON
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.33
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
134	Dark brown silty sandy clay		1	SS	15	
					14	
					12	
					5	
					6	
					5	
131	Gray silty clay		2	SS	5	
					5	
					2	
					2	
					2	
					2	
128			3	SS	2	
					5	
					4	
					5	
					5	
					5	
125	Brown silty clay		4	SS	7	
					6	
					7	
					15	
					100	
					--	
	Medium-coarse sand		5	SS	20	
122	Wet gray silty clay				66	
					77	
					50	
					100	
					--	
			6	SS	--	
119	Brown sandy clay with stones				--	
					84	
	Brown sandy clay with stones				67	
					100	
					--	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 72 (cont'd)
DATE COMPLETED: MARCH 13, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.33
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	Sandy clay with stones		7	SS	51	
					90	
					73	
					80	
					--	
					93	
113			8	SS	100	
	Auger refusal at 112.73					
	Note: 1) 300 lb. hammer					

▼ WATER FOUND
▽ STATIC WATER LEVEL
◯ GRAIN SIZE ANALYSIS

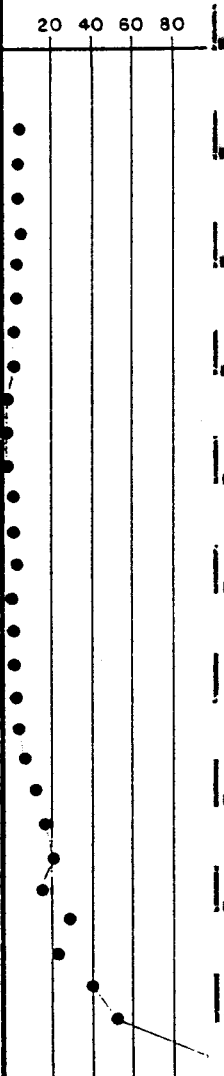
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 73
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.08
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Silty clay fill with some organic film on spoon		1	SS	7, 5, 5, 8, 5, 5
131	Brown silty clay fill		2	SS	4, 4, 2, 2, 2, 3
128	Gray silty clay		3	SS	3, 4, 2, 3, 3, 4
125			4	SS	6, 9, 13, 17, 20, 15
122	Brown silty clay with coarse sand and gravel		5	SS	30, 22, 40, 53, 100, --
119	Brown silty clay with gravel and stones				
	Auger refusal at 118.58 Note: 1) 300 lb. hammer				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 74
JOB Nº: 1358
DATE COMPLETED: MARCH 14, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: D. ROBINSON
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.25
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
134	Brown silty clay fill with stones		1	SS	7, 10, 8, 7	
131	Stiff gray silty clay		2	SS	8, 6, 5, 6	
128	Stiff gray silty clay with strong odor		3	SS	2, 2, 2, 3	
125	Moist gray silty clay		4	SS	3, 2, 4, 4	
122	Gray and brown silty clay		5	SS	6, 7, 6, 6	
119	Wet brown silty clay		6	SS	8, 7, 12, 15, 17, 14, 20, 44, 61, 70, 40, 72, 53, 47, 52, 60	
	Brown sandy clay with gravel					
	Medium fine sand with gravel and stones					

▼ WATER FOUND ○ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 74 (cont'd)
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.25
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	Wet brown silty clay		7	SS	--	
					100	
					--	
					--	
	Cobbles with medium fine sand				100	
					--	
113	Fine to medium brown sand		8	SS	--	
					--	
					39	
					77	
	No recovery				100	
					--	
110			9	SS	100	
	Auger refusal at 109.95					
	Note: 1) 300 lb. hammer					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

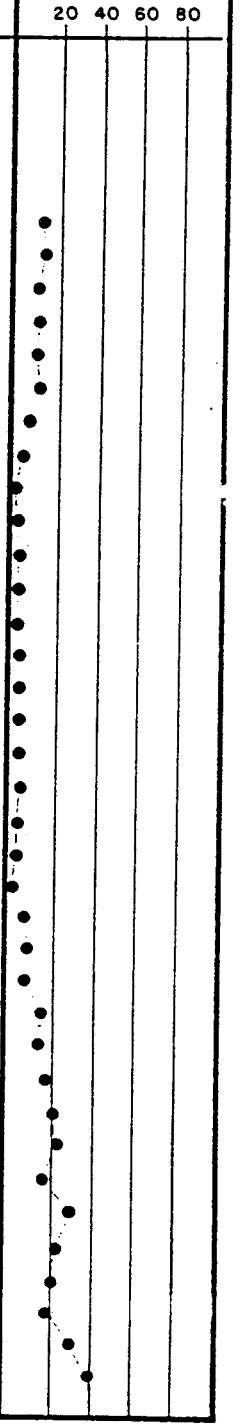
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 75
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.42
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Brown silty clay		1	SS	13, 14, 10, 11, 10, 12
131	Silty sand with rocks		2	SS	7, 5, 2, 3, 4, 3
128	Fine brown silt		3	SS	3, 4, 4, 5, 5, 6
125	Brown sandy silt		4	SS	5, 5, 2, 8, 10, 8
122	Brown silty clay with small rocks		5	SS	15, 14, 18, 20, 22, 15
119	Brown silty sand		6	SS	30, 21, 20, 18, 30, 39
	Brown silty sand with silty brown clay				
	Coarse sand with stones				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 75 (cont'd)
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.42
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	Brown wet silt with rocks		7	SS	40	
					28	
					50	
					42	
					20	
					35	
			8	SS	31	
113	Coarse sandy silt with rocks				40	
					53	
					100	
					100	
					--	
110	Auger refusal at 110.62 Note: 1) 300 lb. hammer					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 76
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.50
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
134	Medium brown sand with gravel		1	SS	107	
					73	
					20	
					15	
					9	
					9	
131	Brown silty clay		2	SS	9	
					15	
					21	
					68	
					130	
					95	
128	Medium coarse brown sand with gravel		3	SS	36	
					73	
					75	
					75	
					200	
					--	
125			4	SS	21	
					38	
					40	
					32	
					30	
					51	
122			5	SS	54	
					45	
					34	
					35	
					33	
					20	
119	Coarse sand and gravel		6	SS	16	
					14	
					16	
					18	
					9	
					12	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

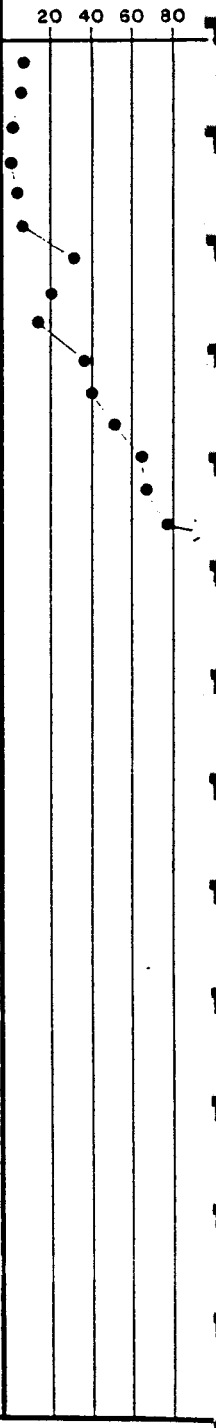
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 76 (cont'd)
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.50
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
116	Medium brown sand		7	SS	9, 7, 4, 4, 7, 8
	Sandy brown clay with stones		8	SS	32, 20, 15, 38, 40, 53
113	Brown sand with stones		9	SS	65, 67, 78, 200
110	Sandy brown clay with stones - also an oil film on spoon				
107	Auger refusal at 107.50 Note: 1) 300 lb. hammer				

PENETRATION TEST BLOWS / FOOT



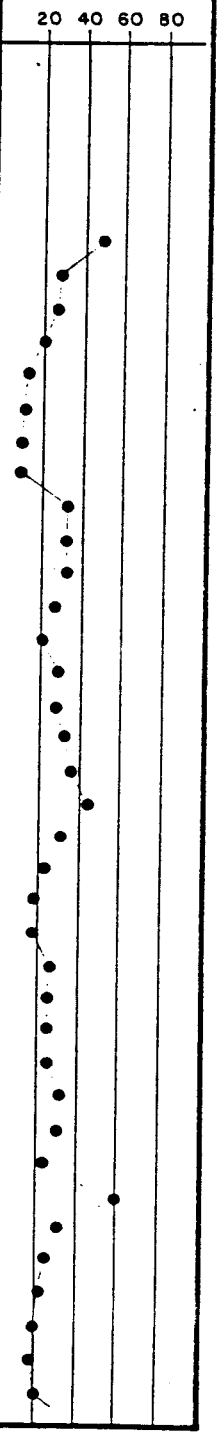
STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 77
DATE COMPLETED: MARCH 13, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.50
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Brown silty sand with stones		1	SS	48, 28, 27, 20, 13, 12
131	Medium brown silty sand with stones		2	SS	11, 10, 34, 32, 32, 26
	Damp medium brown silty sand with stones		3	SS	20, 29, 26, 31, 36, 42
128	Damp medium brown sand with gravel		4	SS	30, 21, 19, 19, 26, 25
125			5	SS	25, 25, 34, 32, 21, 60
122	Damp coarse brown sand and gravel		6	SS	30, 23, 21, 20, 19, 20
119	Fine-medium brown sand with gravel				
	Coarse brown sand and gravel				

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 77 (cont'd)
JOB Nº: 1358
DATE COMPLETED: MARCH 13, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: D. ROBINSON
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.50
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	No recovery		7	SS	35	
					78	
					116	
					140	
					43	
					58	
113	Brown sandy clay with stones		8	SS	74	
					83	
					116	
					200	
110	Auger refusal at 111.10					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 78
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 134.25
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
134			1	SS	27	
					47	
					37	
					22	
	Brown silty clay fill				24	
					24	
131			2	SS	30	
					33	
					27	
					19	
					19	
					20	
128			3	SS	16	
	Brown silty clay				13	
					13	
					12	
					16	
					13	
125			4	SS	14	
					14	
					16	
					12	
					14	
	Brown silty clay with gravel				13	
122			5	SS	9	
					13	
					20	
					13	
					10	
					11	
119			6	SS	18	
					23	
					25	
					25	
					24	
					21	

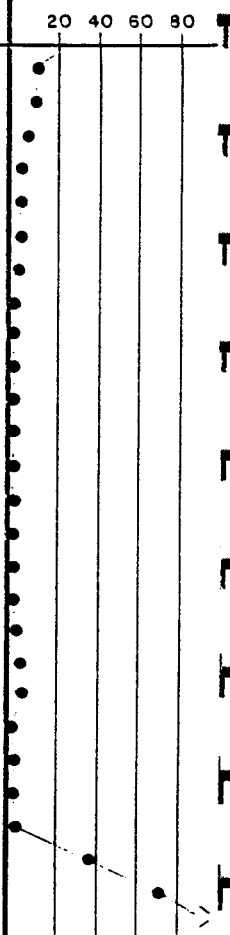
▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
JOB Nº: 1358
CLIENT: IBM CORPORATION
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 78 (cont'd)
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: K. BRICKNELL
GROUND ELEVATION: 134.25
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT
116	Wet brown silty clay with gravel		7	SS	12	
					10	
					8	
					4	
					4	
	Wet brown silty gravel				4	
113			8	SS	3	
					1	
					1	
	Wet brown silt				1	
					1	
					1	
110			9	SS	1	
					1	
					1	
					1	
	Wet brown silty clay				1	
					2	
107			10	SS	4	
					5	
					1	
					2	
					1	
					2	
104			11	SS	37	
					73	
					148	
					118	
					95	
	Wet brown silty clay with gravel				188	
101			12	SS	200	
					--	
					122	
					200	
98	Auger refusal at 98.75					



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

HOLE Nº: BH 79
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON
GROUND ELEVATION: 134.08
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134			1	SS	100	
					53	
					28	
	Brown sandy silt with stones				23	
					12	
					20	
131			2	SS	23	
					19	
					4	
					5	
					9	
					10	
128			3	SS	8	
	Stiff gray clay				8	
					8	
					8	
					3	
					5	
125			4	SS	6	
					10	
					14	
	Coarse sand with rocks				20	
					17	
	Fine brown silt				16	
122			5	SS	16	
					14	
	Stiff gray clay				12	
					15	
					60	
	Fine brown silt				58	
119			6	SS	52	
	Silty sand with rocks				105	
					104	
					60	
	Silty sand with large rocks				58	
					62	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 79 (cont'd)
JOB Nº: 1358
DATE COMPLETED: MARCH 14, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: D. ROBINSON
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.08
LOCATION: WALKWAY BETWEEN BUILDINGS 952 & 982
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
116	Wet gray clay		7	SS	45	
					62	
					54	
					39	
					65	
	Brown silty sand with large stones and shattered rock				35	
113			8	SS	39	
					48	
					64	
					200	
	Auger refusal at 111.18					
110						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
JOB Nº : 1358
CLIENT : IBM CORPORATION
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
LOCATION : WALKWAY BETWEEN BUILDINGS 952 & 982

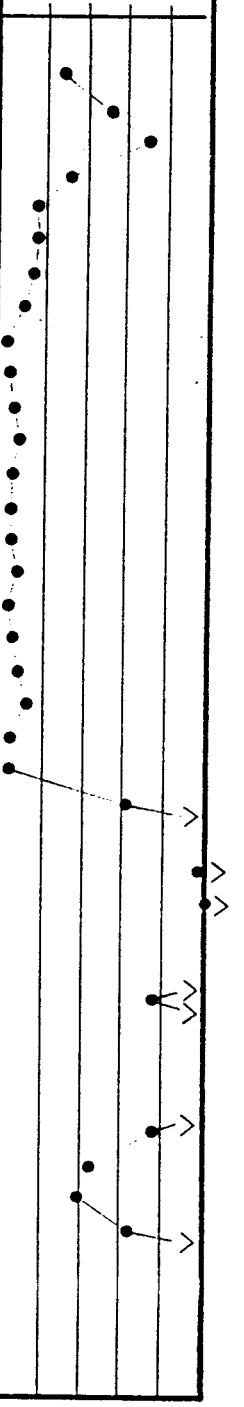
HOLE Nº: BH 80
DATE COMPLETED: MARCH 14, 1984
GEOLOGIST/ENGINEER: D. ROBINSON/K. BRICKNE
GROUND ELEVATION: 134.33
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS
134	Brown sandy clay with gravel
131	Wet gray silty clay
128	
125	
	Brown silty clay
122	Medium sand with stones
119	Silty sand with large stones
116	Silty sand with large stones sand shattered rock
	Auger refusal at 115.23

MONITOR INSTALLATION

SAMPLE: NUMBER	TYPE	BLOWS / FOOT
1	SS	27
		53
		71
		33
		15
		17
2	SS	14
		11
		3
		5
		6
		9
3	SS	6
		6
		6
		9
		5
		7
4	SS	9
		13
		7
		7
		61
		134
5	SS	98
		100
		131
		135
		76
		114
6	SS	116
		134
		76
		43
		39
		65
7	SS	134
		229

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 81
JOB Nº: 1358
DATE COMPLETED: APRIL 5, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.15
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
135	Asphalt		1	SS	25	
					10	
					10	
					10	
					20	
					20	
132	Light to medium brown gravel		2	SS	28	
					23	
					20	
					18	
					18	
					24	
129			3	SS	22	
					22	
					18	
					22	
					31	
					36	
126	Light brown sandy clay		4	SS	38	
					24	
					16	
					20	
					20	
					22	
123	Wet light brown sandy clay with large stones		5	SS	10	
					10	
					31	
					33	
					14	
					19	
120	Wet medium brown coarse sand		6	SS	31	
					47	
					25	
					20	
					16	
					16	

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 81 (cont'd)
JOB Nº: 1358
DATE COMPLETED: APRIL 5, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.15
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Wet medium brown coarse sand		7	SS	11	
					11	
					14	
					20	
					40	
					55	
114	Light gray and brown sandy clay with fractured rock fragments		8	SS	200	
	Auger refusal at 113.55					

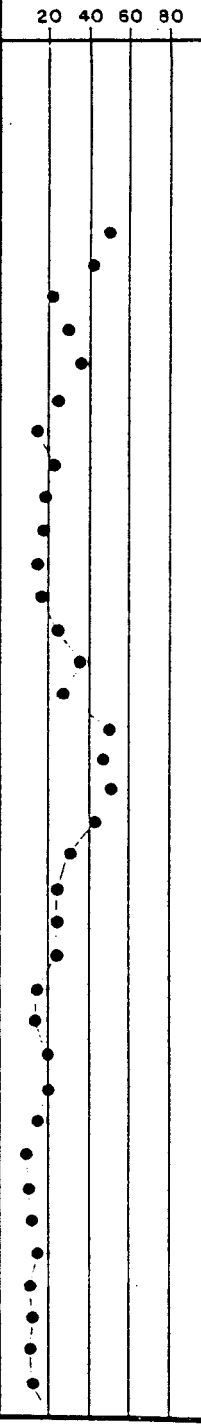
▼ WATER FOUND
◯ GRAIN SIZE ANALYSIS
▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 82
JOB Nº: 1358
DATE COMPLETED: APRIL 4, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.25
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
135	Asphalt		1	SS	49
					41
					21
	Light brown sand with stones				29
					36
					23
132			2	SS	14
					22
	Light to medium brown gravel with silty sand				19
					18
					15
					17
129			3	SS	23
	Light brown silty sand				36
					26
					50
					47
					51
126			4	SS	41
					31
					23
	Medium brown coarse clayey gravel with large shattered rock fragments				23
					23
					16
123			5	SS	15
					20
					20
					17
					10
					12
120			6	SS	13
					16
					12
					13
					12
					13

PENETRATION TEST BLOWS / FOOT



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 82 (cont'd)
JOB Nº: 1358
DATE COMPLETED: APRIL 4, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.25
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
117	Medium brown coarse clayey gravel with large shattered rock fragments		7	SS	16	
					22	
					44	
					38	
					110	
					52	
114			8	SS	200	
					--	
					98	
					152	
					200	
111	Auger refusal at 110.65					

▼ WATER FOUND
◯ GRAIN SIZE ANALYSIS
▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 83
JOB Nº: 1358
DATE COMPLETED: APRIL 4, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.85
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT	PENETRATION TEST BLOWS / FOOT (20 40 60 80)
	Asphalt		1	SS	28	
					18	
135					14	
	Light brown moist sand				10	
					6	
	Light brown moist sandy clay				5	
			2	SS	6	
					5	
132	Light brown moist sand				6	
					12	
					13	
	Medium brown coarse wet sand				15	
			3	SS	15	
					23	
129					27	
					34	
					34	
	Light brown wet sand				19	
			4	SS	18	
	Medium brown wet sand w/roots				35	
126	Black shale				48	
					54	
	Medium brown coarse wet gravel with roots and large shattered rock				54	
					48	
			5	SS	72	
					104	
123					126	
					111	
	Medium brown gravel with large shattered stone fragments				50	
					165	
			6	SS	116	
					110	
120					68	
					64	
					55	
					129	

WATER FOUND GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 83 (cont'd)
JOB Nº: 1358
DATE COMPLETED: APRIL 4, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 135.85
LOCATION: NORTHWEST OF BUILDING 952
TOP OF PIPE ELEVATION:

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
117	Medium brown gravel with large shattered stone fragments		7	SS	60	
					85	
					22	
					71	
					64	
					170	
			8	SS	200	
114	Auger refusal at 113.95					

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 84
JOB Nº: 1358
DATE COMPLETED: APRIL 30, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.33
LOCATION: NORTHWEST OF BUILDING 982
TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Light brown silty sandy gravel		1	SS	26	
					47	
					34	
					23	
					12	
					11	
			2	SS	11	
					12	
130					5	
					7	
					6	
					7	
	Light gray moist clay		3	SS	7	
					7	
					7	
					5	
					7	
					12	
125			4	SS	11	
					5	
					6	
					7	
					7	
					5	
			5	SS	12	
					43	
					110	
					21	
120	Light brown sandy clay				41	
					47	
	Light gray wet clay		6	SS	51	
					45	
					40	
	Gray to light brown sand with large stones				37	
					48	
			7	SS	150	
115	Auger refusal @ elevation 115.93 feet					

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS

JOB Nº : 1358

CLIENT : IBM CORPORATION

HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON

LOCATION : NORTHWEST OF BUILDING 982

HOLE Nº: BH 85

DATE COMPLETED: APRIL 30, 1984

GEOLOGIST/ENGINEER: W. ENGLER

GROUND ELEVATION: 134.43

TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
134	Gray colored gravel		1	SS	26	
					37	
					15	
					9	
					6	
					7	
			2	SS	11	
					10	
130	Light brown moist silty sand				15	
					12	
					11	
					12	
			3	SS	21	
					20	
					23	
	Till and shattered rock				41	
					21	
					200	
125			4	SS	--	
					--	
					19	
	Clayey till with shattered rock				18	
					17	
					36	
			5	SS	22	
					53	
					200	
					--	
120					43	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

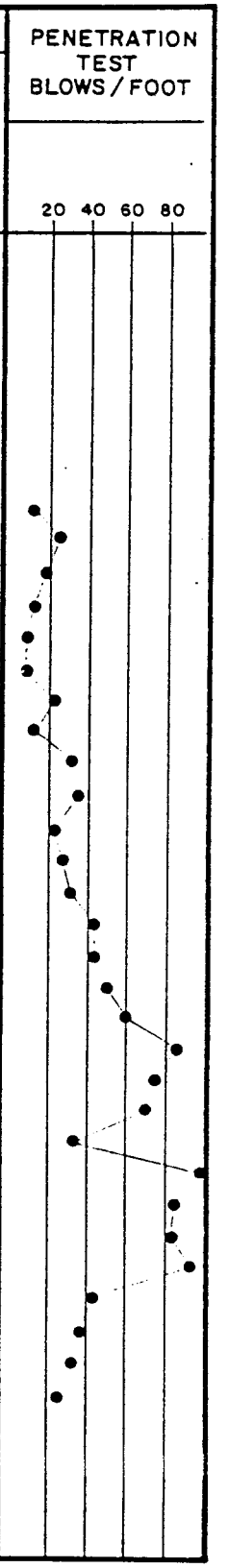
PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 85 Page 2 of 2
JOB Nº: 1358
DATE COMPLETED: APRIL 30, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.43
LOCATION: NORTHWEST OF BUILDING 982
TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
120	Sandy till with large pieces of shattered rock				43	
					78	
			6	SS	88	
					48	
					43	
					57	
					57	
					28	
			7	SS	40	
					20	
115					25	
					70	>
					200	
					200	
			8	SS	200	>
	Spoon refusal @ elevation 112.83 feet					
110						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 86 Page 1 of 2
JOB Nº : 1358
DATE COMPLETED: MAY 1, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.23
LOCATION : NORTHWEST OF BUILDING 982
TOP OF PIPE ELEVATION: N/A

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	MONITOR INSTALLATION	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS / FOOT
134	Medium brown gravel		1	SS	13
					23
					19
					13
	Light brown sandy clay				10
					10
			2	SS	21
					13
130	Light brown sandy clay with large stones				31
					34
					21
					27
			3	SS	30
					42
					42
					50
	Gray to brown till with shattered rock				60
					85
125			4	SS	75
					70
					33
					98
					85
					81
			5	SS	92
	Medium brown sand and gravel				42
					38
					33
120					25



▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS

HOLE Nº: BH 86 Page 2 of 2

JOB Nº : 1358

DATE COMPLETED: MAY 1, 1984

CLIENT : IBM CORPORATION

GEOLOGIST/ENGINEER: W. ENGLER

HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON

GROUND ELEVATION: 134.23

LOCATION : NORTHWEST OF BUILDING 982

TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
120	Medium brown sand and gravel				25	
					25	
			6	SS	20	
					19	
					26	
					26	
					36	
					30	
	Stoney silty clay		7	SS	19	
					37	
115					31	
					171	
					75	
	Refusal at Elevation 114.23					
110						

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 87 Page 1 of 2
JOB Nº: 1358
DATE COMPLETED: APRIL 30, 1984
CLIENT: IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE: HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.03
LOCATION: NORTHWEST OF BUILDING 982
TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FOOT	20 40 60 80
134	Brown silty gravel		1	SS	4	
					7	
					7	
					7	
	Light brown silty sand				5	
					6	
	Gray moist sandy clay		2	SS	6	
130	Light brown silty sand				6	
					4	
					6	
					6	
					9	
	Light brown sandy clay (dry)		3	SS	24	
					20	
					25	
					13	
					26	
					11	
125			4	SS	23	
					75	
					27	
					38	
					49	
					62	
	Light to medium brown sand		5	SS	28	
					200	
					--	
	Gray to brown with large pieces of fractured stone				--	
120					104	
					42	

▼ WATER FOUND ◯ GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : SOIL SAMPLING AND ANALYSIS
HOLE Nº: BH 87 Page 2 of 2
JOB Nº : 1358
DATE COMPLETED: APRIL 30, 1984
CLIENT : IBM CORPORATION
GEOLOGIST/ENGINEER: W. ENGLER
HOLE TYPE : HOLLOW STEM AUGER WITH SPLIT SPOON
GROUND ELEVATION: 134.03
LOCATION : NORTHWEST OF BUILDING 982
TOP OF PIPE ELEVATION: N/A

PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATIOI TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	20 40 60 80
					--	
120					104	
					42	
	Gray to brown with large pieces of fractured stone		6	SS	20	
					24	
					36	
					31	
					32	
					38	
			7	SS	16	
					19	
115					44	
					60	
	Brown moist sandy clay				200	
					--	
	Light brown silty sand		8	SS	200	
	Spoon refusal at elevation 112.33 ft					
110						

APPENDIX C

Groundwater Elevation Data

IBM Poughkeepsie Buildings 952/982
Water Level Data

Well No.	Elevation TOC	*1st Qtr. '91* DTW	GWE	*2nd Qtr. '91* DTW	GWE	*3rd Qtr. '91* DTW	GWE	*4th Qtr. '91* DTW	GWE
952-3R	144.05	Inaccess.		Inaccess.		36.65	107.40	35.44	108.61
952-4R	140.63	41.25	99.38	37.16	103.47	41.96	98.67	35.75	
952-5R	139.67	36.09	103.58	35.75	103.92	37.82	101.85	36.20	103.47
952-6R	130.68	35.12	95.56	38.88	91.80	43.65	87.03	44.00	86.68
952-8R	135.42	28.02	107.40	28.09	107.33	41.97	93.45	29.40	106.02
952-8S	135.28	MH Frozen		MH Flooded		Dry		Dry	
952-9R	137.80	45.38	92.42	44.35	93.45	44.95	92.85	44.70	93.10
952-10R	134.35			41.31	93.04	41.40	92.95	40.76	93.59
952-11R	135.57	43.81	91.76	44.27	91.30	45.77	89.80	44.38	91.19
952-12R	135.07	38.71	96.36	38.67	96.40	41.95	93.12	41.95	93.12
952-13R	131.07	Not found		Not found		Not found		Not found	
952-15R Up	134.92							42.75	92.17
952-15R Low	134.92							43.15	91.77
952-16R	135.44	43.54	91.90	43.84	91.60	45.50	89.94	44.20	91.24
952-17RA	137.76	29.10	108.66	28.24	109.52			28.85	108.91
952-17RB	137.76			43.51	94.25			43.67	94.09
952-17RC	137.76			42.34	95.42			42.55	95.21
952-18R	144.24	37.57	106.67	37.99	106.25	45.62	98.62	38.35	105.89
952-20R	142.78	45.36	97.42	45.53	97.25	49.10	93.68	45.90	96.88
952-21R	138.37	43.07	95.30	43.16	95.21	48.15	90.22	43.45	94.92
952-22RA	128.06			31.42	96.64			34.15	93.91
952-22RB	128.06	34.71	93.35	34.82	93.24			34.85	93.21
952-22RC	128.06			35.56	92.50				
952-22RD	128.06							31.75	96.31
952-23R	130.06	37.41	92.65	37.50	92.56	39.35	90.71	37.58	92.48
952-24R	136.89			41.61	95.28	43.75	93.14	46.15	90.74
952-25R	135.74	44.39	91.35	44.37	91.37	45.87	89.87	44.54	91.20
952-26R	140.43	Dry		Dry		Dry		Dry	
952-27RA	141.97							35.15	106.82
952-27RB	141.97							46.15	95.82
952-27RC	141.97							48.65	93.32
952-28R	142.41					42.17	100.24	40.12	102.29

IBM Poughkeepsie Buildings 952/982
Water Level Data

Well No.	Elevation TOC	*1st Qtr. '92* DTW	GWE	*2nd Qtr. '92* DTW	GWE	*3rd Qtr. '92* DTW	GWE	*4th Qtr. '92* DTW	GWE
952-3R	144.05	36.41	107.64	34.55	109.50	35.69	108.36	38.38	105.67
952-4R	140.63	Dry		35.47	105.16	Dry		Dry	
952-5R	139.67	37.25	102.42	35.63	104.04	36.63	103.04	38.80	100.87
952-6R	130.68	44.82	85.86	38.41	92.27	40.02	90.66	44.38	86.30
952-8R	135.42	28.25	107.17	28.73	106.69	29.20	106.22	28.53	106.89
952-8S	135.28	Dry		Dry		Dry		Dry	
952-9R	137.80	44.81	92.99	43.73	94.07	44.69	93.11	46.84	90.96
952-10R	134.35	41.00	93.35	40.50	93.85	40.55	93.80		
952-11R	135.57	45.45	90.12	43.71	91.86	44.88	90.69	46.06	89.51
952-12R	135.07	41.38	93.69	Inaccess.		39.65	95.42	42.98	92.09
952-13R	131.07	38.02	93.05	35.43	95.64	36.04	95.03	39.64	91.43
952-15R Up	134.92	44.60	90.32	42.60	92.32	50.15	84.77	50.29	84.63
952-15R Low	134.92	44.63	90.29	42.78	92.14	44.55	90.37	62.75	72.17
952-16R	135.44	45.38	90.06	43.49	91.95	44.67	90.77	45.87	89.57
952-17RA	137.76	29.85	107.91	28.50	109.26	29.28	108.48	31.07	106.69
952-17RB	137.76	45.64	92.12	43.23	94.53	44.87	92.89	46.82	90.94
952-17RC	137.76	44.75	93.01	41.90	95.86	43.81	93.95	46.34	91.42
952-18R	144.24	42.49	101.75	37.15	107.09	40.50	103.74	47.13	97.11
952-20R	142.78	47.65	95.13	44.64	98.14	46.65	96.13	49.76	93.02
952-21R	138.37	45.30	93.07	42.34	96.03	44.35	94.02	48.86	89.51
952-22RA	128.06	36.96	91.10	34.95	93.11	35.75	92.31	33.67	96.99
952-22RB	128.06	36.21	91.85	34.19	93.87	35.20	92.86	37.13	81.24
952-22RC	128.06	Dry		30.73	97.33	31.40	96.66	37.72	81.72
952-22RD	128.06	32.64	95.42						
952-23R	130.06	38.94	91.12	37.00	93.06	38.34	91.72	39.77	90.29
952-24R	136.89	MH Frozen		45.61		46.71	90.18	47.57	89.32
952-25R	135.74	Inaccess.		44.17		45.13	90.61	46.24	89.50
952-26R	140.43	Dry		Dry		Dry		Dry	
952-27RA	141.97	Not found		Inaccess.		31.95	110.02	35.25	106.72
952-27RB	141.97	Not found		Inaccess.		47.94	94.03	50.84	91.13
952-27RC	141.97	Not found		Inaccess.		49.65	92.32	52.51	89.46
952-28R	142.41	41.19	101.22	39.11	103.30	40.76	101.65	43.26	99.15