

**IBM**

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**REMEDIAL ACTION PLAN  
CONSTRUCTION IMPLEMENTATION  
Buildings 952 & 982  
Poughkeepsie , New York**

**VOLUME II**

6/7/6  
Box

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## 1.0 INTRODUCTION

The remedial investigation and remedial design for the Buildings 952/982 project was completed during the spring and summer of 1984. Details of the remedial investigation are contained in the final report "Buildings 952 and 1982 - Remedial Investigation - Soil Sampling and Analysis - Poughkeepsie, New York - Volume I". The location of Buildings 952 and 982 are illustrated on Figures 1 and 2.

Following competitive bidding, IBM contracted with SCA Chemical Services Inc. (SCA) in early August 1984, for the remedial action construction program at Buildings 952 and 982. Severson Construction Corporation (SCC) subcontracted with SCA to perform the earth moving and civil portions of the remedial construction. Schnabel Foundation Company (SFC) in turn subcontracted with SCC to provide engineering and construction services for the building foundation support system.

This report details the Buildings 952 and 982 remedial action construction. A photographic log of on-site construction activities is presented in Appendix A. All figures referenced in the report are contained in Attachment 1.

## 2.0 MOBILIZATION

### 2.1 INITIAL MOBILIZATION

SCA/SCC commenced mobilization for the remedial action project at Buildings 952 and 982 on August 13, 1984. The following work items were completed during the mobilization phase of this project.

- a) Construction equipment was transported to site.
- b) The equipment storage trailer, which housed consumable equipment, potable water, emergency eyewash, portable shower, hand wash basin, fire extinguishers, overpack drums, and other miscellaneous equipment was transported to site. This facility is illustrated as photograph 1.
- c) The security fence, which had previously been installed by IBM during the soil sampling and analytical phase of the project was inspected for integrity. All existing locks were replaced by the Contractor to ensure all locks on-site were keyed alike. Keys were distributed to Contractor administrative personnel as well as IBM emergency control and administrative personnel. Fences around the air conditioning pads were removed inside of the outer fence area. Remediation efforts around this area are discussed further in Section 5.0.

- d) The windows adjacent to the excavation on Buildings 952 and 982 were covered with plywood sheeting and the plywood in turn was covered with insulated blankets. These window coverings are illustrated in Photograph 2.
- e) The site office and command post were sited including installation of telephone, electrical, potable water and sanitary services. These facilities are illustrated in Photographs 3 and 4.
- f) All doors from Buildings 952 and 982 adjacent to active work areas were closed to pedestrian access and warning signs were posted.
- g) Parking facilities were made available north of Building 928.
- h) Contact was made with local emergency response authorities and IBM emergency control personnel, and emergency response telephone numbers were displayed adjacent to on-site telephones.
- i) Project signs and notices were posted in accordance with the IBM on-site representative's instructions.
- j) The equipment storage trailer was modified and equipped to act as the Emergency Medical Facility.

- k) The decontamination facility was constructed. This facility is illustrated in Photograph 5.
- l) The catwalk at the corner of Building 982 and the walkway from Building 982 to 952 was reduced to half width to facilitate pile driving for the building foundation support. The catwalk and walkway were temporarily supported until completion of construction. This item is illustrated in Photograph 6.
- m) The excavated clean soil storage area was located in the most northerly parking area north of Building 928 and perimeter fencing installed. Hay bales were placed around the perimeter of the fence to act as sedimentation traps to prevent soils from washing into adjacent catchbasins during heavy rainfalls. This is illustrated in Photograph 8 and further described in Section 4.
- n) The interim contaminated soil storage area was constructed and a tarpaulin supplied to cover the soil pile during non-working hours and periods of rainfall. This is illustrated in Photograph 9 and further discussed in Section 4.
- o) All door canopies and handrails were removed.

## 2.2 SUBCONTRACTOR MOBILIZATION

SFC commenced mobilization for the Buildings 952 and 982 foundation support portion of the project on August 28, 1985. The following work items were completed during this mobilization phase of the project.

- a) Construction equipment was transported to the site.
- b) Materials for the foundation support system were transported to the site.
- c) The pile driver was erected and associated equipment was attached.

## 2.3 ADDITIONAL MOBILIZATION

During the project, IBM negotiated a contract with Waterman Demolition to remove the water tower located at the northwest corner of Building 982. The location of the water tower is illustrated on Figure 3 and in Photograph 7.

Waterman Demolition removed the water tower during the period September 20 to September 28, 1984. For safety reasons, SCA/SCC ceased site operations for the period September 21 to September 23, 1984.

During the water tower removal phase of the project, additional parking areas north of Building 928 were secured. This is further discussed in Section 4. When the water tower removal was completed, an additional trailer was moved on-site as a lunch room area for site personnel. Also, the fenced area of the water enclosures was removed to the inside of the site to allow for additional storage.

### 3.0 SOIL EXCAVATION AND BACKFILL

#### 3.1 GENERAL

Excavation of site soils commenced on August 21 and was completed on November 30, 1984. A total of 5,274 cubic yards of soil was excavated and disposed by secure landfilling at SCA's Model City, New York, USEPA approved facility. An additional 5,297 cubic yards of soil were excavated, stockpiled and reused as backfill following the completion of excavation.

A total of 4,999 cubic yards of bank run granular material was imported to complete the backfill excavated areas. A total of 275 cubic yards of stone was also used to complete the roadway base restoration through the site.

#### 3.2 SITE CONDITIONS

Obstructions, including outside pad-mounted air conditioners, canopies and handrails, raised platform and a network of underground utilities such as wet wells, concrete vaults, storm sewers, fire mains, hydrants and valves, congested the site and posed numerous construction related problems. Figure 4 and Photographs 10 and 11 illustrate the existing site conditions.



On October 25, 1984, IBM retained the services of Fairway Testing Services to conduct in-place soil density and moisture determinations. A Troxler 3400 moisture-density gauge was employed. Appendix F summarizes field test data and Figure 5 illustrates the location of the test locations.

### 3.3 CLEAN SOIL STOCKPILE

The areal and vertical distribution of contaminants at the site was such that areas of soil designated for excavation and off-site disposal underlaid soils identified to be clean. Therefore, the excavation of clean soil was initially required to facilitate the excavation of soil designated for secure off-site landfill disposal. Since room was limited within the actual work site, a clean soil stockpile area was prepared in the most northerly parking area north of Building 928. This area was secured with temporary snow fence and sedimentation traps during the remedial construction program. Figure 6 illustrates the location of the clean soil stockpile.

### 3.4 DISPOSAL BIN STAGING AREA

Excavated soil designated for secure off-site landfill disposal was temporarily stored in secure storage bins pending final disposal. These bins measured approximately 40 feet by 40 feet and had an open side. The location and design of the storage bins are illustrated on Figures 7 and 8.

### 3.5 FOUNDATION SUPPORTS

During the period September 20 to November 30, 1984, SFC installed a total of 12,398 square feet of 3-inch wooden planking shoring, 99 10-inch H beam piles, 51 whalers, 51 concrete piers and 51 tiebacks. Locations of the shoring are detailed on Figures 9 and 10, and are illustrated on Photographs 12 through 16.

The construction sequence of the foundation support installation was as follows:

1. Excavate soil to top of building footing
2. Drive bracket pile or H pile to bedrock or refusal
3. Hand excavate pit at bracket location and install brackets. Dry pack and backfill with concrete
4. Excavate and lag with 3-inch wooden planking to two feet below tieback elevation

5. Install tiebacks, let cure and test
6. Excavate and log to bedrock or bottom of proposed soil excavation

Toe ties were originally proposed in the SFC design. These ties were eliminated by the SFC design engineer on the basis of field conditions encountered. A typical foundation support section is illustrated in Figure 11.

### 3.6 VIBRATION TESTS

On September 14, 1984, SCA/SCC contracted with Vibra Tech Engineers Incorporated (VTE) for ground vibration monitoring during the pile driving operation. A Vibra-Tape instrument, Instrument Number GMS 4-2459 was utilized. It was set on the concrete floor inside the building directly opposite the pile driving operation at the outside footing. Recordings for the September 14, 1984 monitoring are included as Appendix B. Subsequent readings were visually taken during the driving of each pile to ensure acceptable vibration limits. Two incidents occurred during this operation where the pile was incorrectly driven and touched the building footing. This caused excessive vibrations and the mortar between the concrete blocks in the building wall loosened. The pile driving operation was

halted and the pile was removed and relocated away from the footing. The mortar between the concrete blocks was immediately repaired.

### 3.7 EARTH EXCAVATION QUANTITIES

Figure 12 details the locations of 21 cross-section orientated at right angles to Buildings 952 and 982 starting at the walkway. Figures 13 through 33 inclusive detail the limit of soil excavated and disposed by secure landfill. Figures 34 through 45, inclusive, detail the areal limits of the soil excavation for secure landfill disposal.

Appendix C provides a summary of the final volume of soil excavation at incremental depths for each borehole area. Both soil that was stockpiled on site for backfill and soil disposed off site at a secure landfill facility, are included on Table 2.

Figure 46 illustrates the plan view of the clean soil stockpile after completion of excavation and prior to the return of these soils as backfill. Figures 47 through 49 detail cross-sections through the "clean" soil stockpile illustrated in Figure 46.

Appendix C summarizes the end area calculations used to determine the "clean" soil stockpile excavation quantity.

### 3.8 EXCAVATION AND BACKFILLING

Prior to the commencement of excavation, the areal limits of the soil excavation were laid out by placing spray paint lines on the surficial soils. The areal limits of excavation for each borehole were defined as the mid-points between adjacent boreholes. A plan view of these limits is provided on Figures 34 through 45 inclusive, for each 3-foot incremental depth of soil excavation. Ground elevations were then surveyed along predetermined cross-section lines.

Following the layout of the excavation limits, a PC 200 LC track backhoe equipped with a wide ditch bucket excavated each unit. The soils designated for off-site disposal were loaded into the bucket of a four cubic yard rubber tire loader and the loader in turn transported this soil to the on-site storage bins. This soil was staged in the bins for interim storage pending loading, transport and disposal at the off-site secure disposal facility. Excavated soil that would subsequently be used for backfill was loaded onto a 12 cubic yard site-dedicated tandem dump truck.

This soil was transported to the clean soil stockpile in the parking lot north of Building 928, pending reuse as backfill for the excavated area.

Air monitoring was conducted throughout the duration of the excavation activity for explosivity and organic vapor concentrations. The air monitoring program for personnel protection is discussed further in Section 4.2. Soil indicating an organic vapor concentration greater than five parts per million in the delineated clean areas were excavated and hauled to the off-site disposal storage bins. In addition, soils within clean areas that were visually disclosed were also removed for off-site disposal.

Following excavation of soil designated for off-site disposal, the backhoe bucket was decontaminated prior to handling clean soil that was to be reused as backfill. Decontamination was accomplished with a high pressure, hot water washer. Wash fluids were collected in an 80-gallon drum in the decontamination facility. Wash water was pumped daily into the soil storage bin and absorbed by the soil prior to shipping to the secure landfill site. Wash water collected in a 55-gallon drum from the hand wash sink was also disposed of daily in the soil storage bins. Figures 50 and 51 illustrate the decontamination facility.

As the excavation proceeded downward adjacent to the buildings in 3-foot increments, the foundation support logging and tiebacks were installed as discussed in Section 3.5.

In some areas, the excavation depths of borehole units exceeded 25 feet which made excavation of each individual unit impossible without the risk of cross-contamination of units of clean soil. The Contractor recommended the removal of soil to elevations where individual borehole units could subsequently be excavated by the backhoe. This generally involved excavating all soil to a 12 foot depth over most of the site and to 21 feet in other areas of the site. When this was accomplished, the backhoe then excavated individual borehole units. Figure 52 illustrates the areas of soil removal for the 12 to 21 foot increments.

Field surveys were conducted throughout the duration of the excavation and elevations taken at each excavation interface and at the bottom of the excavation.

During the excavation, a number of large boulders were encountered. These were not removed and were temporarily stored on site for disposal at the base of the excavation after completion. Photograph 17 illustrates one such boulder.

The soil stored in the storage bins prior to off-site shipment was loaded onto licenced waste haulers equipped with watertight tailgates. The loading of haulage units was scheduled to ensure same day delivery of the soil to the SCA secure landfill disposal facility at Model City, New York. The trailer boxes were lined with polyethylene prior to loading and were tarped for over the road transport. Appendix C includes a tabulation of off-site soil shipment.

Each trailer entered the site over sheets of polyethylene laid on the ground to prevent the contact of truck tires with potentially contaminated site soil. A side curtain was also placed on the trailer to preclude contamination of the outside of each unit's box. This procedure was approved by State of New York on-site representative. Photographs 18 and 19 illustrate the truck loading operation.

Following completion of the excavation, the entire site was scanned with the air monitoring equipment to verify that all potentially contaminated soil had been excavated. Soil samples were also collected and chemically analyzed as discussed in Section 3.11.

All foundation support which was constructed during the excavation was left in place. In areas where the lagging and piles were at grade, they were cut off at a



minimum of one foot below the ground surface. The portions of the lagging and piles which were cut off were disposed of at the SCA secure landfill facility in Model City, New York.

The material stored in the clean soil stockpile was mixed with off-site granular material to backfill all excavation areas. The clean soil stockpile was too wet for placement on its own based on moisture-density curve analysis and field observation. Therefore, the two materials were mixed to provide a suitable backfill. Appendix E includes the moisture-density curve analysis for a sample extracted from the "clean" soil stockpile as well as for a sample at the bottom of the excavation.

Backfill was placed in 1-foot lifts with a KOMATZU D14A track dozer and compacted with a self propelled 6-foot diameter vibratory sheeps-foot roller. Photograph 20 illustrates in-place material compaction. Compaction tests were conducted throughout the backfilling operation utilizing both a Tractor 3400 moisture-density gauge and a sand cone. Results are contained in Appendix F.

### 3.9 WATERMAIN RELOCATION

An 8-inch diameter fireline existed through the excavation area. Supporting of this service in place

during the excavation was determined to be impractical. Therefore, a new 8-inch diameter fireline was constructed around the outside perimeter of the site away from all excavation areas. The new service was suspended from the foundation support system installed by SFC. Installation of the new service was completed in one day to ensure that fire protection for adjacent buildings was maintained at all times. Upon completion of the installation the entire fireline was insulated to provide protection against freezing. Figure 53 and Photographs 21 and 22 illustrate the location of the new fireline.

### 3.10 ALTERATION TO ORIGINAL DESIGN

On September 12, 1984, IBM formally requested approval for an alteration in the original design from the New York State Department of Environmental Conservation (DEC). Approval was received not to excavate soil at BH82 from 12 to 15 feet in depth (Area A).

The extremely limited access to this area and the resulting small volume of soil which could be excavated, the small mass of contaminants identified in the soil, the high cost of building foundation support and the special excavation techniques required, were the reasons for the design revision request.

In lieu of the excavation at BH82, IBM agreed to remove the air conditioner and pad in Area B as illustrated on Figure 54 and excavate the underlying soil. Area A is noted in Figure 54 as the area at BH82 not to be excavated from 12 to 15 feet.

Table 1 compares the deleted (Area A) and the added (Area B) excavation areas. In total, 2.713 pounds of contaminant mass were removed from Area B versus 0.134 pounds of contaminant mass left in place in Area A. Also 130 cubic yards of soil were removed in Area B versus 20.7 cubic yards of design excavation left in Area A.

### 3.11 SPLIT SOIL SAMPLES

#### 3.11.1 General

As an additional quality control measure to verify the completeness of the soil excavation program, selected soil samples were split in the field by IBM and the DEC. Two samples were taken from the clean soil storage pile. Six samples were randomly collected from the excavation area upon completion of the soil excavation program. Figure 55 illustrates the location of the sampling points.

TABLE 1

COMPARISON OF DESIGN EXCAVATION AREA DELETION AND ADDITION

<u>Borehole Number</u>	<u>Depth Interval (FT.)</u>	<u>Soil Area (S.F.)</u>	<u>Soil Volume (C.F.)</u>	<u>Soil Mass (LB.)</u>	<u>Base/Neutral Concentration (PPB)</u>	<u>Base/Neutral Mass (LB.)</u>
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Assume Weight of Soil = 100 pcf

Area A (BH82)

82	12 - 15	186	558	55,800	2,400	0.134
Total Area A						0.134

Area B (BH's 46, 49, 54)

46	0 - 3	259	777	77,700	1,100	0.085
49	0 - 3	212	636	63,600	1,200	0.076
	15 - 18	212	636	63,600	2,200	0.140
54	0 - 3	119	357	35,700	3,600	0.129
	18 - 21	119	357	35,700	17,000	0.607
	21 - 24	119	357	35,700	28,000	1.000
	24 - 27	119	357	35,700	18,000	0.643
	27 - 27.4	119	48	4,800	6,900	0.033
Total Area B						2.713

### 3.11.2 Analytical Protocol

All split samples were analyzed for priority pollutant volatiles by GC/MS EPA Method 624 and priority pollutant base/neutrals by GC/MS EPA Method 625. Each sample split was analyzed concurrently by the IBM laboratory, Velsicol Chemical Corporation Analytical Laboratory (VCC), and the New York State Department of Environmental Conservation Laboratory, Erco laboratory.

### 3.11.3 Soil Sample Preparation and Handling

A stainless steel sampling spoon was utilized to collect and transfer the soil samples from the insitu location to the sampling vials and jars at agreed locations. Sampling tools were cleaned between sampling locations with an acetone-hexane-acetone-distilled water rinse. Upon completion of the final distilled water rinse the sampling spoon was allowed to air dry. Samples were stored in a cooler on ice packs pending final off-site shipment to the designated laboratories. A Chain of Custody was utilized and copies of the Chain of Custody are included as Appendix B.

#### 3.11.4 Analytical Results

Data reported by VCC's and Erco's laboratories for priority pollutant volatile organic (VOC) analysis of split samples are contained in Table 2. A comparison of VOC data indicates good correlation between the two laboratories.

Data reported by both laboratories for priority pollutant base/neutral analysis of split samples are contained in Table 3. A comparison of base/neutral analytical data indicates good correlation between the two laboratories.

#### 3.12 VAULT AND TANK REMOVALS

During the remedial construction a number of tanks and vaults were removed and disposed of at either the SCA Model City secure facility or at a local landfill. The work completed for the tank and vault removals is described below. Locations are illustrated on Figure 56.

##### a) Concrete Tank A

During the excavation of soil in the area between BH35 and BH36, a concrete tank was encountered.

**TABLE 2**  
**SUMMARY OF SPLIT SOIL SAMPLE ANALYSIS**  
**VOLATILE ORGANIC ANALYSIS BY EPA METHOD 624**

[illegible]

TABLE 2 (continued)

SUMMARY OF SPLIT SOIL SAMPLE ANALYSIS  
VOLATILE ORGANIC ANALYSIS BY EPA METHOD 624

Compound	Laboratory ID #	VCC 841641 CRA 801*	ERCO 11435 01**	VCC 841642 CRA 802*	ERCO 11436 02**	VCC 841643 CRA 803*	ERCO 11437 03**	VCC 841649 CRA 804*	ERCO 11647 04***	VCC 841650 CRA 805*	ERCO 11645 05***	VCC 841651 CRA 806*	ERCO 11646 06***
Trans-1,3-dichloro-1-propene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethylene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTALS		ND	18	ND	9	ND	ND	ND	ND	ND	ND	ND	40

## NOTES:

VCC - Velsicol Chemical Corporation (Environmental Analytical Laboratory)

ERCO - Erco Laboratory

Results given as ppb (ng/g)

ND - None Detected at Stated Limit of Detection

\* - Limit of Detection = 100 ppb

\*\* - Minimum Reporting Limit = 3 ppb

\*\*\* - Minimum Reporting Limit = 2 ppb





TABLE 3 (continued)  
SUMMARY OF SPLIT SOIL SAMPLE ANALYSIS  
BASE NEUTRAL EXTRACTABLES BY EPA METHOD 624

Compound	Laboratory ID #	VCC	ERCO	VCC	ERCO	VCC	ERCO	VCC	ERCO	VCC	ERCO	VCC	ERCO	VCC	ERCO
	841641	841642	11435	841643	11436	841644	11437	841645	11438	841646	11439	841647	11440	841648	11441
	CRA 801	CRA 802	01	CRA 803	02	CRA 804	03	CRA 805	04	CRA 806	05	CRA 807	06	CRA 808	07
	( )	( )	(400)	( )	(420)	( )	(400)	( )	(390)	( )	(430)	( )	( )	( )	(420)
Fluorene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
1,2-Diphenyl hydrazine	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
N-nitrosodiphenyl amine	ND (400)	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND
4-Bromophenyl phenyl ether	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Hexachlorobenzene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Phenanthrene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
d-10 Phenanthrene	ND (---)	ND (---)	ND	ND (---)	ND	ND (---)	ND	ND (---)	ND	ND (---)	ND	ND (---)	ND	ND (---)	ND
Anthracene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Di-n-butyl phthalate	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Fluoranthene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Benzidine	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Pyrene	ND (200)	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND	ND (200)	ND
Butyl benzyl phthalate	ND (300)	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	ND
3,3'-Dichlorobenzidine	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Benzo(a)anthracene	ND (400)	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND
Chrysene	ND (400)	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND	ND (400)	ND
Bis(2-ethylhexyl)phthalate	ND (300)	ND (300)	ND	ND (300)	*	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	ND	ND (300)	D
Di-n-octyl phthalate	ND (500)	ND (500)	ND	ND (500)	ND	ND (500)	ND	ND (500)	ND	ND (500)	ND	ND (500)	ND	ND (500)	ND
Benzo(b)fluoranthene	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Benzo(k)fluoranthene	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Benzo(a)pyrene	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Indeno (1,2,3-c,d)pyrene	ND (800)	ND (800)	ND	ND (800)	*ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Dibenzo(a,h)anthracene	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND
Benzo(g,h,i)perylene	ND (800)	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND	ND (800)	ND

NOTES: VCC - Veliscol Chemical Corporation (Environmental Analytical Laboratory)

ERCO - Erco Laboratory

Residue given in mg (m/g)

ND - None Detected at Stated Limit of Detection

D - Trace Possible but Less Than Limit of Detection

\* - Estimated Limit of Detection

The tank measured approximately eight feet by eight feet by ten feet deep and was filled with sand. The tank was broken into manageable sized pieces with a steel wrecking ball and disposed at SCA's secure landfill facility at Model City, New York. This tank is illustrated in Photograph 23.

b) Concrete Vault B - water line

During the eight inch diameter watermain relocation a concrete vault approximately ten feet by ten feet by ten feet deep containing cast iron watermain, valves and fittings was encountered. The watermain, valves and fittings were removed from the structure, and transported and disposed at IBM's salvage yard at Building 095. The vault was broken into manageable sized pieces with a steel wrecking ball and disposed of at a local landfill facility. This vault is illustrated in Photograph 24.

c) 5,000 Gallon Steel Tank C

A 5,000 gallon steel fuel oil tank which was originally used for supplying fuel oil to heaters in the building under the water tower was uncovered. IBM's chemical control facility, under separate contract, sampled, analyzed, removed and disposed of the tank

contents. Approximately 1,500 gallons of liquids and sludge was disposed by Jones Chemical, contracted by IBM, to a secure facility in New Jersey. The tank structure was excavated, loaded, transported and disposed at SCA's secure landfill facility in Model City, New York. Photograph 25 illustrates the loading of the tank.

d) Concrete Vault D - under water tower

Following completion of the soil excavation program and the water tower removal, IBM requested that SCA/SCC remove the concrete vault which was originally located under the water tower. This concrete vault contained, piping, an altitude valve and miscellaneous fittings. The piping, altitude valve and miscellaneous fittings were removed from the structure, and transported and disposed at IBM's salvage yard at Building 095. The vault was broken into manageable sized pieces with a steel wrecking ball and disposed at a local landfill facility. This vault is illustrated in Photograph 26.

3.13 SITE STRATIGRAPHY

The site stratigraphy, as inferred by the remedial investigation and as confirmed by the soil excavation program is presented on Figure 57.

### 3.14 DISPOSAL

#### 3.14.1 General

All transportation and disposal of soils by off-site secure landfilling occurred during the period October 16 to November 30, 1984. A total of 10,205.19 tons of soil were disposed at SCA's Model City, New York permitted facility during this period. Appendix D provides a chronology of soil shipments from the site.

#### 3.14.2 Transportation

All soils excavated for off-site disposal were transported by tractor/trailer units with polyethylene lined boxes and sealed tailgates. All trucks were securely tarped prior to leaving site. As an extra measure of safety, each tailgate had a double locking system for closure. During transport of soils, each truck adhered to the routes previously approved by IBM. All tractor/trailer units were weighed locally with an IBM representative present prior to leaving for Model City, New York.

### 3.14.3 Hazardous Waste Manifests and Straight Bills of Lading

IBM was designated as the generator for this project and thus was responsible for completion of the Hazardous Waste Manifests and Straight Bills of Lading.

#### 4.0 HEALTH AND SAFETY

##### 4.1 HEALTH AND SAFETY PLAN

A Health and Safety Plan was designed and implemented throughout the duration of this project. A copy of the Health and Safety Plan is contained in Appendix H.

##### 4.2 AMBIENT AIR MONITORING AND HEALTH AND SAFETY LOG

Explositivity and organic vapor concentrations were monitored throughout the excavation phase, and the backfilling phase when material previously excavated was replaced. In addition, site perimeter ambient monitoring was done daily as was monitoring of the clean soil stock pile. Figure 58 illustrates the air monitoring sampling grid.

The majority of organic vapor concentration readings ranged between non-detect to 5 ppm. The highest recorded reading was 500 ppm for a single reading at a soil crack at BH24 at approximately 9 feet below original ground surface on November 6, 1984. Ambient air readings within 2 feet of the soil crack were 10 ppm. Subsequent measurements in the air produce readings in the non-detect to 5 ppm range.

Organic vapor concentrations readings at the clean soil stockpile were non-detect except for one instance when a reading of 3 ppm was recorded. This soil area was immediately excavated and placed in the storage bin on site pending final off-site disposal.

No positive explositivity readings of significance were detected over the course of the project.

A Health and Safety Log was maintained by the on-site Safety Officer and submitted daily to IBM/CRA/SCA. This log included personnel on site, activities occurring on site, type of air monitoring performed, equipment on site, personnel protective gear, air monitoring log, weather conditions, statement of decontamination and details of related health and safety incidents including safety meetings, safety infractions and major incidents which might hamper the project.

The only significant safety incident occurring during the remedial action project was related to the storage of clean excavated soils in the north parking lot north of Building 928. A neighbor, to the north-west of the soil stockpile expressed concern about the potential for being adversely impacted by the stockpile. This incident was immediately reported to the IBM site representative. IBM is currently dealing with this incident.



The daily Air Monitoring and Health and Safety Logs are presented in Appendix I.

#### 4.3 DECONTAMINATION

Prior to commencing any soil excavation the site was segregated into a "dirty", "buffer", and "clean" work zone as detailed on Figure 59. All personnel leaving the "dirty" work zone were required to remove soiled consumable clothing and dispose of them in a drum provided for that purpose at the entrance to the equipment trailer. All overboots were washed and rinsed at the boot wash in the "buffer" zone prior to entering the "clean" zone. A handwash sink was provided in the equipment trailer.

Protocols for site equipment movement were implemented and stringently monitored by the Safety Officer and the on-site State and IBM representatives. Transport vehicle movement routes within the "dirty" work zone were designed so that vehicles contacted only clean fill. Where this was not possible, polyethylene sheets were placed over site soil in the area of vehicular travel. During the excavation of soil designated for disposal, the backhoe attempted to operate only on clean fill with only the bucket contacting soil that was to be disposed. When this was not possible the backhoe tracks were decontaminated with a high

pressure hot water detergent rinse as was the bucket when moving from "dirty" soil to "clean" soil excavations. The rinsewater was collected in an 80-gallon drum in the decontamination pad, pumped daily to and absorbed by the soils in the soil storage bin and co-disposed in the lined trailers with the soils designated for off-site disposal.

All equipment was decontaminated prior to leaving the site and was inspected by the site Safety Officer. Records of the Statement of Decontamination are included in Appendix I.

## 5.0 SECURITY

An IBM on-site representative was responsible for security and was assisted by the on-site Safety Officer on an as-required basis.

All on-site personnel and visitors directly related with the remedial work were logged into the Daily Health and Safety report by the site Safety Officer. In addition, IBM maintained an additional sign-in sheet for their own records which is on file with IBM Security.

The prime work site was secured with chain link fence fitted with access and egress gates as illustrated on Figure 60. In addition to the prime work area, a secondary security zone was maintained as shown in Figure 60. Access and egress gates to this area were secured by movable stanchions and chain.

The two gates for the primary work site were locked during non-working hours as were the security chains for the secondary work area. Keys were given to on-site representatives of IBM, CRA, SCA, SCC and SFC.

During active working hours, the access and egress gates and mangate were kept closed except when authorized vehicles entered or left the site. These gates were monitored at all times to prevent entry to the work site by unauthorized vehicles or personnel.

## 6.0 RESTORATION AND DEMOBILIZATION

SCA/SCC/SFC commenced restoration and demobilization simultaneously during the period November 30 to December 20, 1985.

The following work items were completed during the restoration and demobilization phase of the project.

- a) The roadway and catchbasins (wet wells) were reinstated as illustrated in Figure 61.
- b) The entire site was graded and compacted.
- c) Window coverings were removed.
- d) The perimeter chain link fence was removed.
- e) The air conditioner fences were reinstated.
- f) Doorway canopies and handrails were reinstated.
- g) The catwalk was reinstated.
- h) The site trailers and utilities were removed.
- i) Soils underlying the temporary soil storage bin, the loading area and the decontamination pad were removed and transported off-site to the SCA secure landfill facility. The storage bin was removed.

## 7.0 EFFECTIVENESS OF REMEDIAL ACTION

### 7.1 PERFORMANCE GOALS

The remedial construction design specified the removal and off-site secure landfill disposal of 4918 cubic yards of soil. Analytical data developed from the remedial investigation soil sampling and analysis program indicated that the mass of priority pollutant volatile organics (VOC) and base/neutral extractable organics (B/N) contained in the 4918 cubic yards of soil specified for disposal was 26.6236 pounds and 130.7530 pounds, respectively.

### 7.2 EXCAVATION EFFECTIVENESS - BULK SOIL REMOVAL

As discussed in Section 3.7, a total of 5273.6 cubic yards of soil were excavated and disposed by off-site secure landfilling. The effectiveness of the remedial program in terms of bulk soil removal is calculated to be 107.2 percent.

Effectiveness of Remedial Action (Bulk Soil Removal)

$$= \frac{\text{Volume of Soil Actually Disposed}}{\text{Volume of Soil Designed to be Disposed}} \times 100$$

$$= \frac{5237.6}{4918.0} \times 100$$

$$= 107.2\%$$

As discussed earlier in Section 3.7, figures 34 and 45 detail the extent of excavated soils.

### 7.3 EXCAVATION EFFECTIVENESS - VOC & B/N REMOVAL

The mass of VOC and B/N removal from the site in 5273.6 cubic yards actually excavated and disposed by secure landfilling is calculated to be 27.5236 pounds and 140.4561 pounds respectively. VOC and B/N removal calculations are contained in Appendix J.

The effectiveness of the remedial program in terms of VOC removal is calculated to be 103.4 percent, as follows:

Effectiveness of Remedial Action (VOC Removal)

$$\begin{aligned} &= \frac{\text{Mass of VOC's Actually Disposed}}{\text{Mass of VOC's Proposed for Disposal}} \times 100 \\ &= \frac{27.5236}{26.6236} \times 100 \\ &= 103.4\% \end{aligned}$$

The effectiveness of the remedial program in terms of B/N removal is calculated to be 107.4 percent, as follows:

## Effectiveness of Remedial Action (B/N Removal)

$$\begin{aligned} &= \frac{\text{Mass of B/N's Actually Disposal}}{\text{Mass of B/N's Proposed for Disposal}} \times 100 \\ &= \frac{140.4561}{130.7530} \times 100 \\ &= 107.4\% \end{aligned}$$

### 7.4 GENERAL REMEDIAL ACTION EFFECTIVENESS

The remedial action program as implemented was effective in the following non-quantitative aspects:

- i) Impacts upon on-site personnel and adjacent IBM facilities and staff were negligible during the remedial construction program as confirmed by ambient air monitoring conducted throughout the project. One complaint was received from an adjacent landowner and was believed to be non-project related. The remedial action program was completed essentially without incident notwithstanding congested and constricted work areas.
- ii) Migration of organic chemicals from the remediation site was eliminated by the protocols established in the site Health and Safety Plan. Decontamination of both site personnel and equipment was completed prior to egress

from site. All decontamination liquids and discarded soiled safety apparel and equipment resulting from excavation or sampling activities were disposed at a secure permitted off-site facility.

- iii) The transport of 10,205 tons of soil from the Buildings 952/982 site to the SCA Model City facility was completed in an expeditious and efficient manner with no significant enroute incidents reported.
- iv) The remedial construction was completed in a manner which caused minimal disruption or inconvenience to IBM operations within and adjacent to Buildings 952/982 and 928.



## 8.0 CONCLUSIONS

- a) A remedial action program designed to remove and dispose of soils containing organic compounds was completed by IBM on property immediately adjacent to Buildings 952 and 982. The scope of the remedial action as implemented encompassed approximately 1.75 times the area originally proposed by IBM for remedial construction.
- b) In terms of criteria agreed to by the State of New York and IBM, the remedial action resulted in removal and disposal by off-site secure landfilling of 103.4 percent of the volatile organic compounds, 107.4 percent of base/neutral extractable compounds and 107.2 percent of the bulk soil originally stipulated for removal and disposal. During the course of remedial construction, a total of 10,205 tons of soil were excavated, transported and disposed at the SCA Model City secure landfill facility.
- c) The remedial action was conducted in an efficient, expeditious and professional manner which resulted in a negligible adverse impact upon site personnel, adjacent IBM facilities and staff, the general public, and surrounding environment.

All of which is respectfully submitted,  
CONESTOGA-ROVERS & ASSOCIATES LIMITED

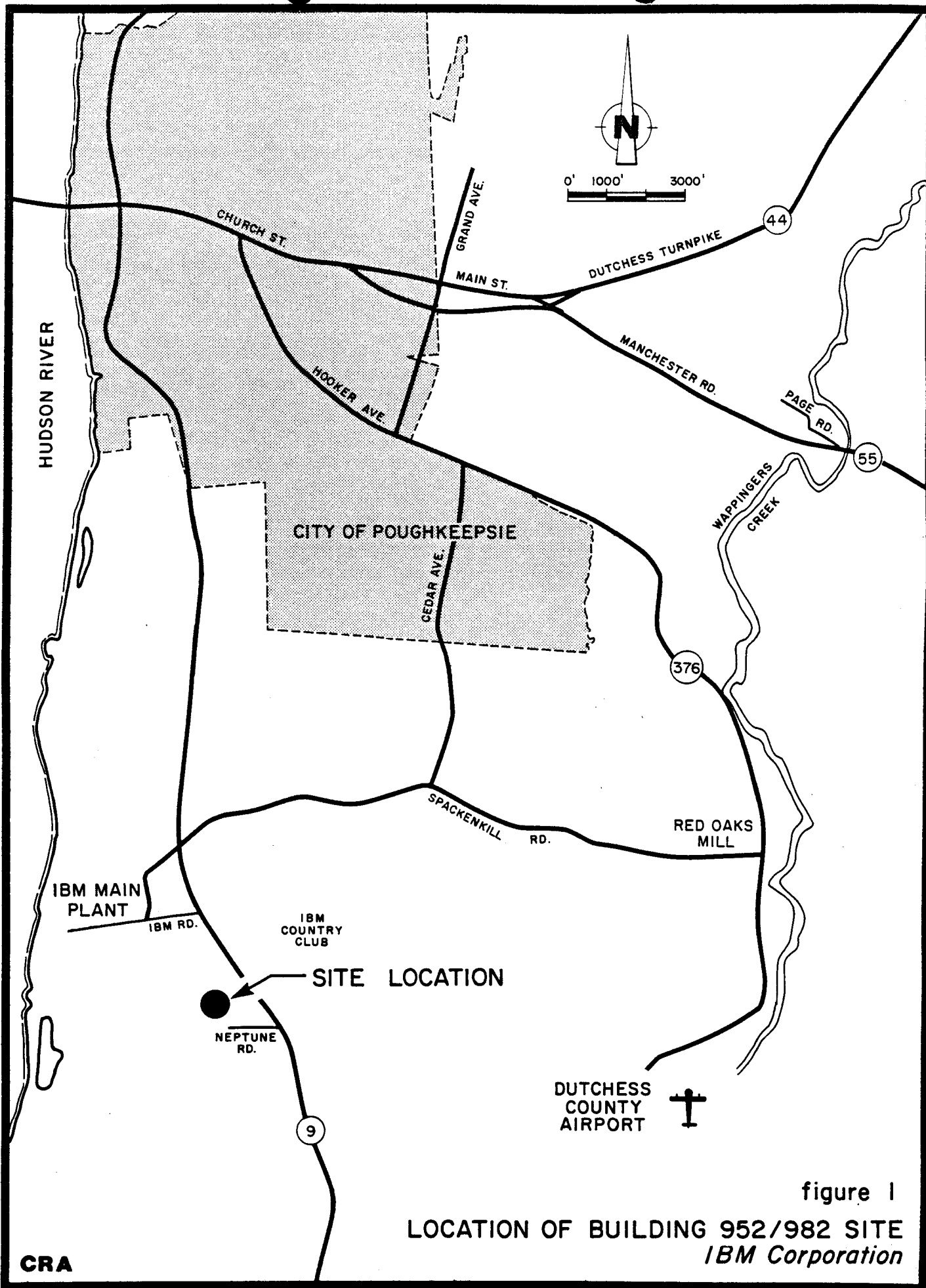
Richard G. Shepherd, P. Eng.

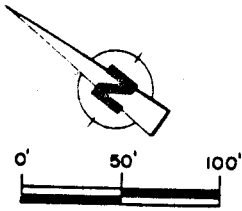
Wolfe K. Engler, C.E.T.

ATTACHMENT I

AS-BUILT FIGURES 1 THROUGH 61

BUILDING 952 AND 982 REMEDIAL CONSTRUCTION





ALBANY POST ROAD (ROUTE 9)

DODGE  
WORLD

BUILDING 952

AREA OF  
SOIL EXCAVATION

BUILDING 982

NEPTUNE  
ROAD

BUILDING  
928

**LEGEND**

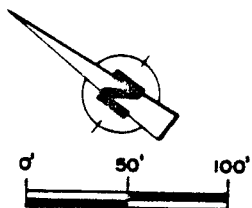
- PROPERTY BOUNDARY
- PAVED ROADWAY/PARKING LOT

figure 2

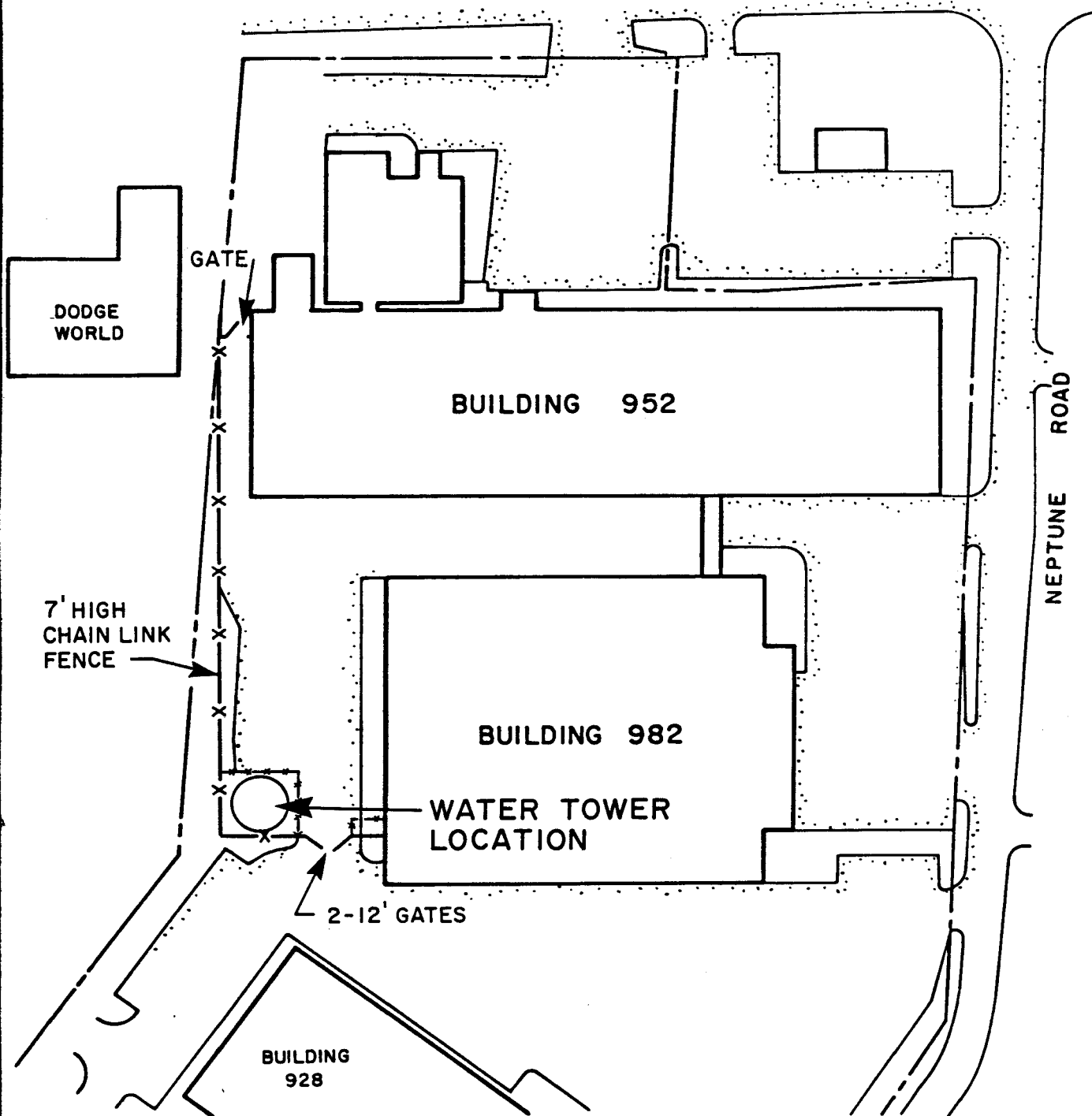
SITE PLAN

*I B M Corporation*

**CRA**



ALBANY POST ROAD (ROUTE 9)



**LEGEND**

- PROPERTY BOUNDARY
- == PAVED ROADWAY/PARKING LOT

figure 3

**WATER TOWER LOCATION**  
*IBM Corporation*

**CRA**

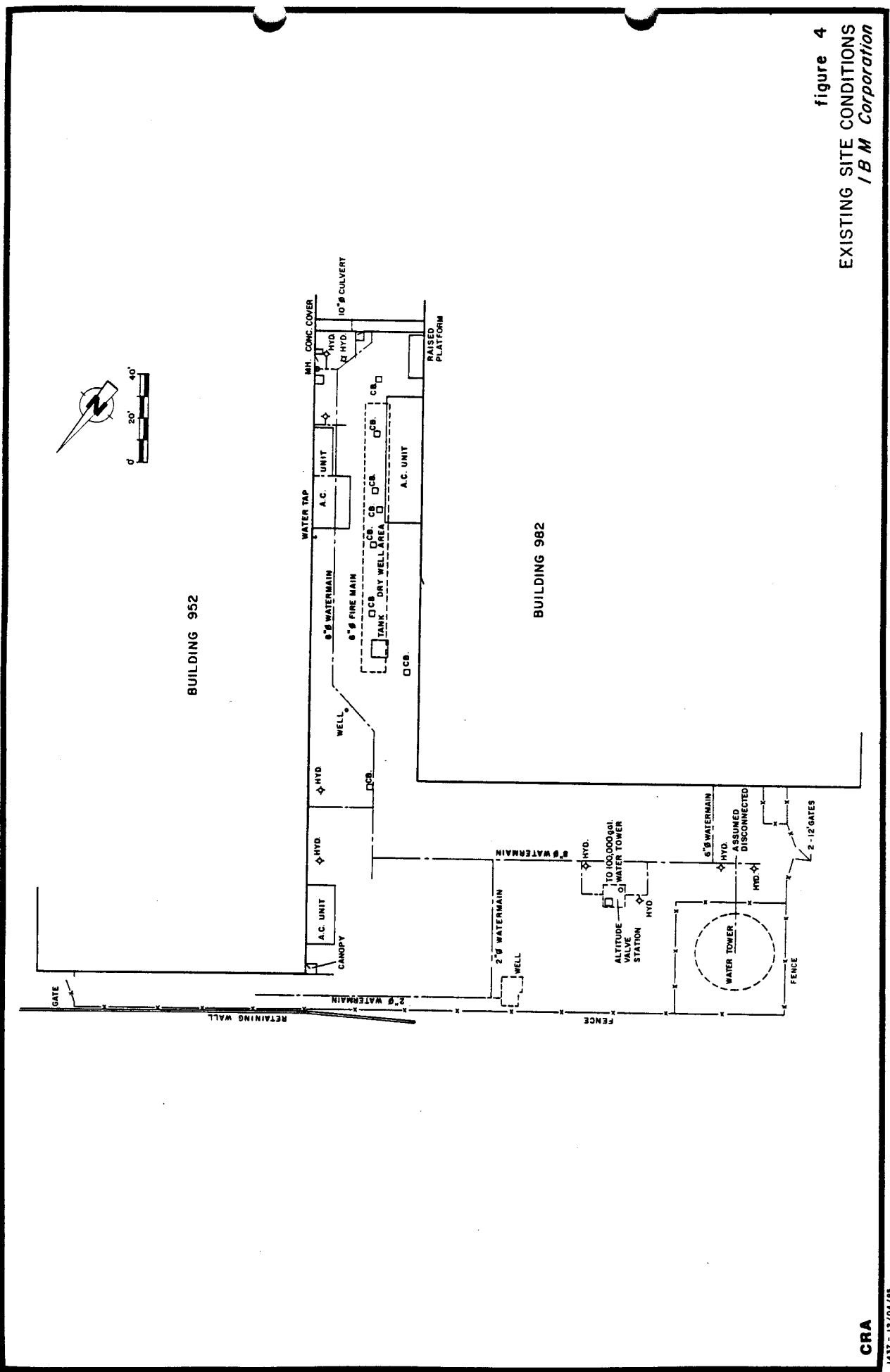


figure 4  
EXISTING SITE CONDITIONS  
I B M Corporation

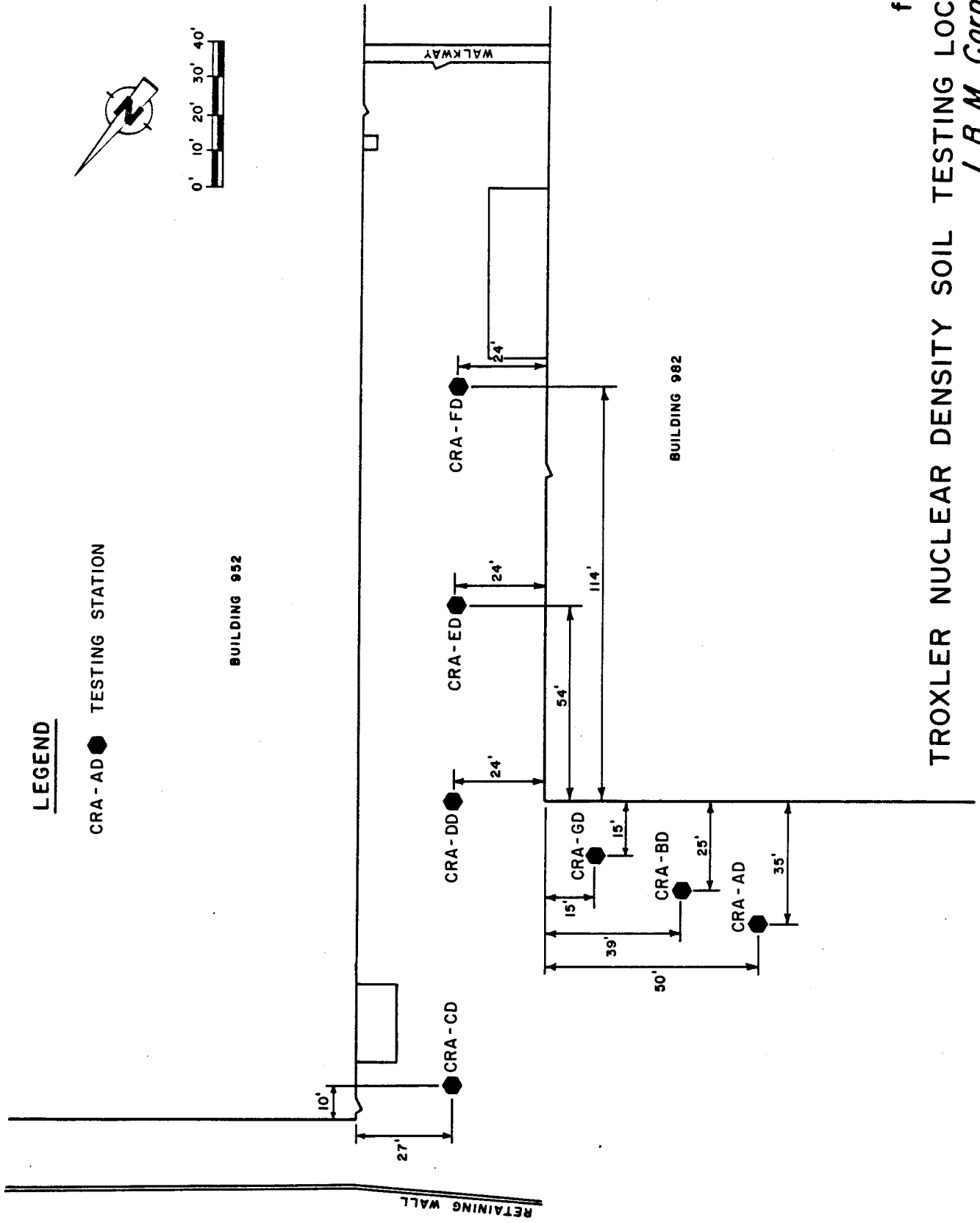
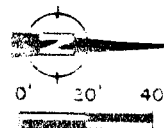


figure 5  
TROXLER NUCLEAR DENSITY SOIL TESTING LOCATIONS  
/ B M Corporation

**CRA**



ACCESS & EGRESS FOR TRUCK  
TO SECURE LANDFILL FACILITY



BLDG. 928

CHRYSLER GARAGE  
PARKING LOT

CLEAN SOIL  
STOCKPILE AREA

MAIN SITE  
ACCESS

'CLEAN' ZONE

TEMPORARY STORAGE BIN FOR SOILS  
TO BE DISPOSED OFF SITE

OFFICE  
TRAILER

TOOL & STORAGE  
TRAILER

DECONTAMINATION  
FACILITY

'BUFFER' OR  
'DECONTAMINATION' ZONE

BLDG. 982

WORKING AREA

LEGEND

← ← ROUTE FOR CLEAN  
MATERIAL STOCKPILING

EMERGENCY  
ACCESS GATE

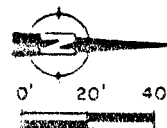
BLDG. 952

figure 6

CLEAN SOIL STOCKPILE AREA  
IBM Corporation

CRA

ACCESS & EGRESS FOR TRUCK  
TO SECURE LANDFILL FACILITY



BLDG. 928

CHRYSLER GARAGE  
PARKING LOT

CLEAN SOIL  
STORAGE AREA

MAIN SITE  
ACCESS

'CLEAN' ZONE

OFFICE  
TRAILER

TEMPORARY STORAGE BIN  
FOR SOILS TO BE DISPOSED  
OFF SITE

TOOL & STORAGE  
TRAILER

DECONTAMINATION  
FACILITY

'BUFFER' OR  
'DECONTAMINATION' ZONE

BLDG. 982

WORKING AREA

LEGEND

← ROUTE FOR CLEAN  
MATERIAL STOCKPILING

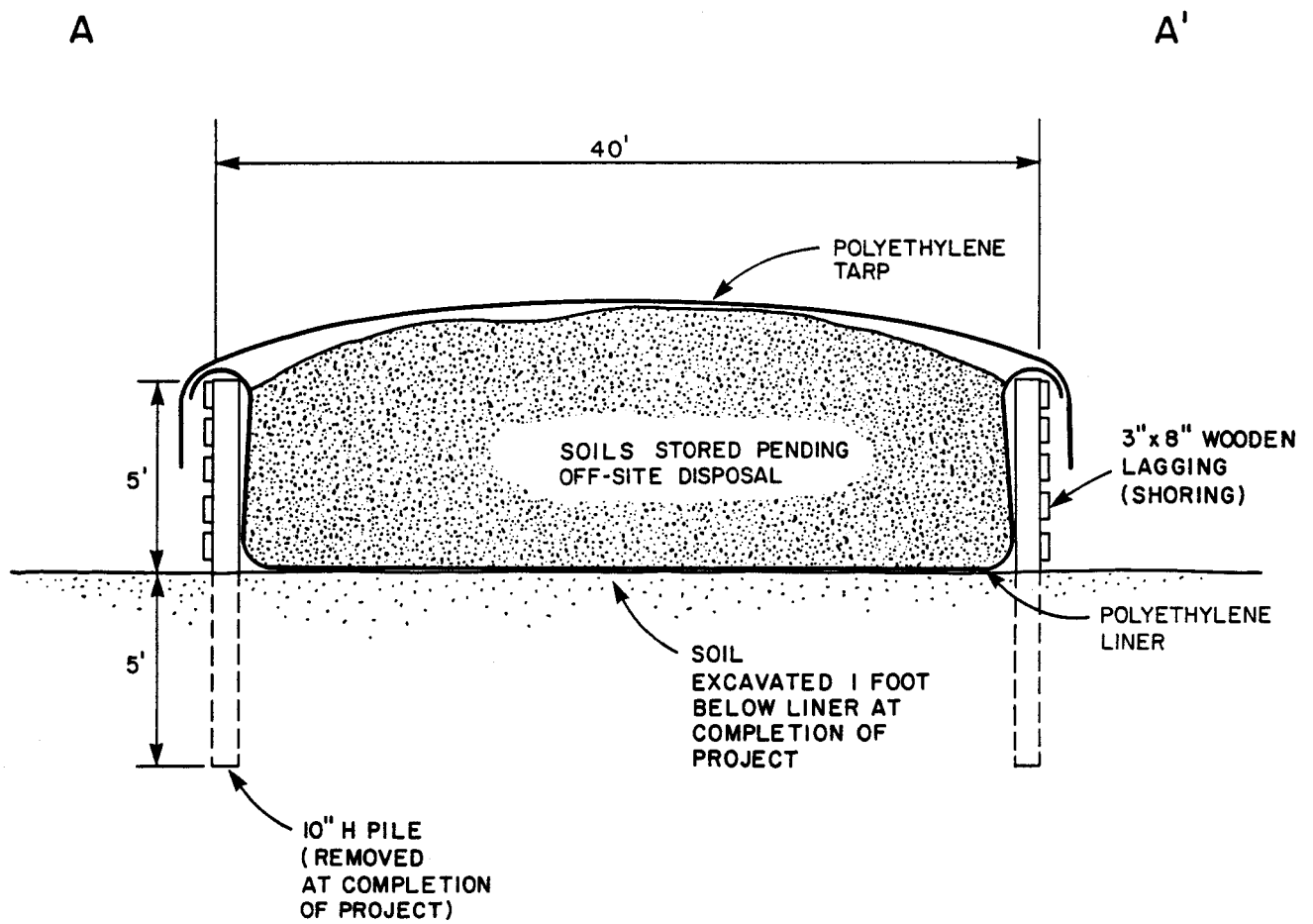
EMERGENCY  
ACCESS GATE

BLDG. 932

figure 7

TEMPORARY STORAGE BIN AREA  
*I B M Corporation*

CRA



SECTION A - A'

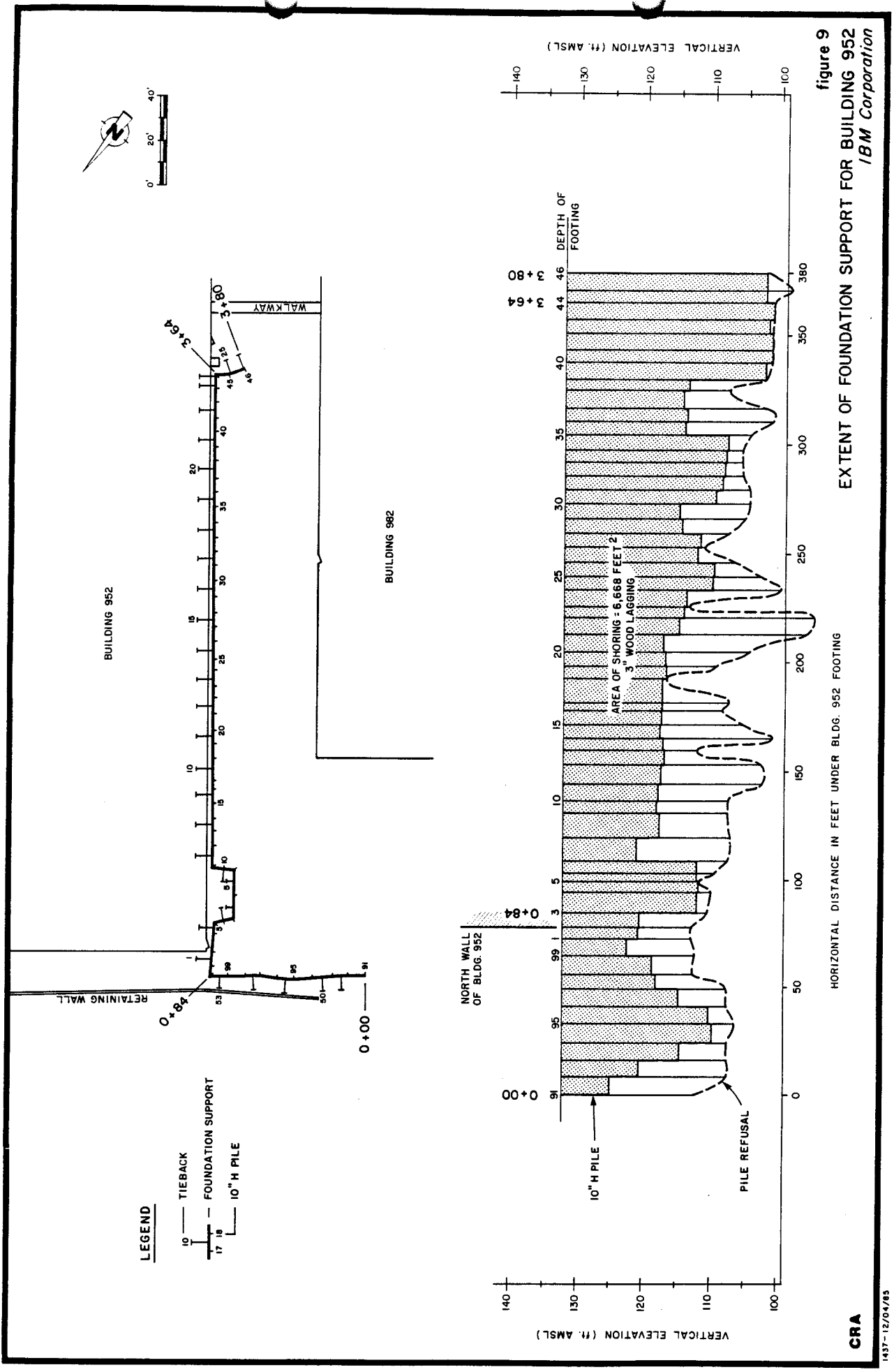
NTS

figure 8

SECTION A - A'  
TEMPORARY  
STORAGE BIN

I B M Corporation

CRA



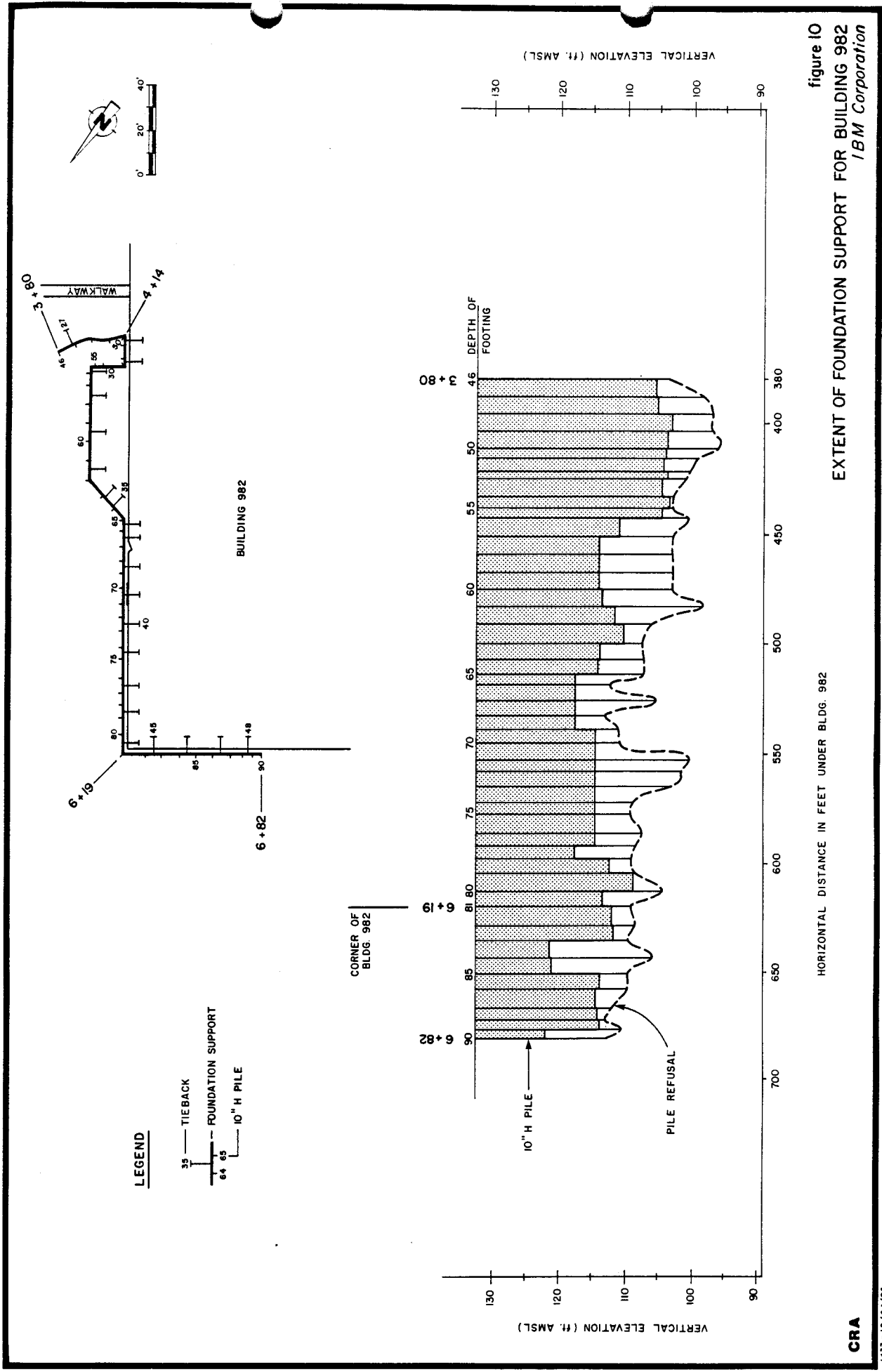


figure 10  
EXTENT OF FOUNDATION SUPPORT FOR BUILDING 982  
IBM Corporation

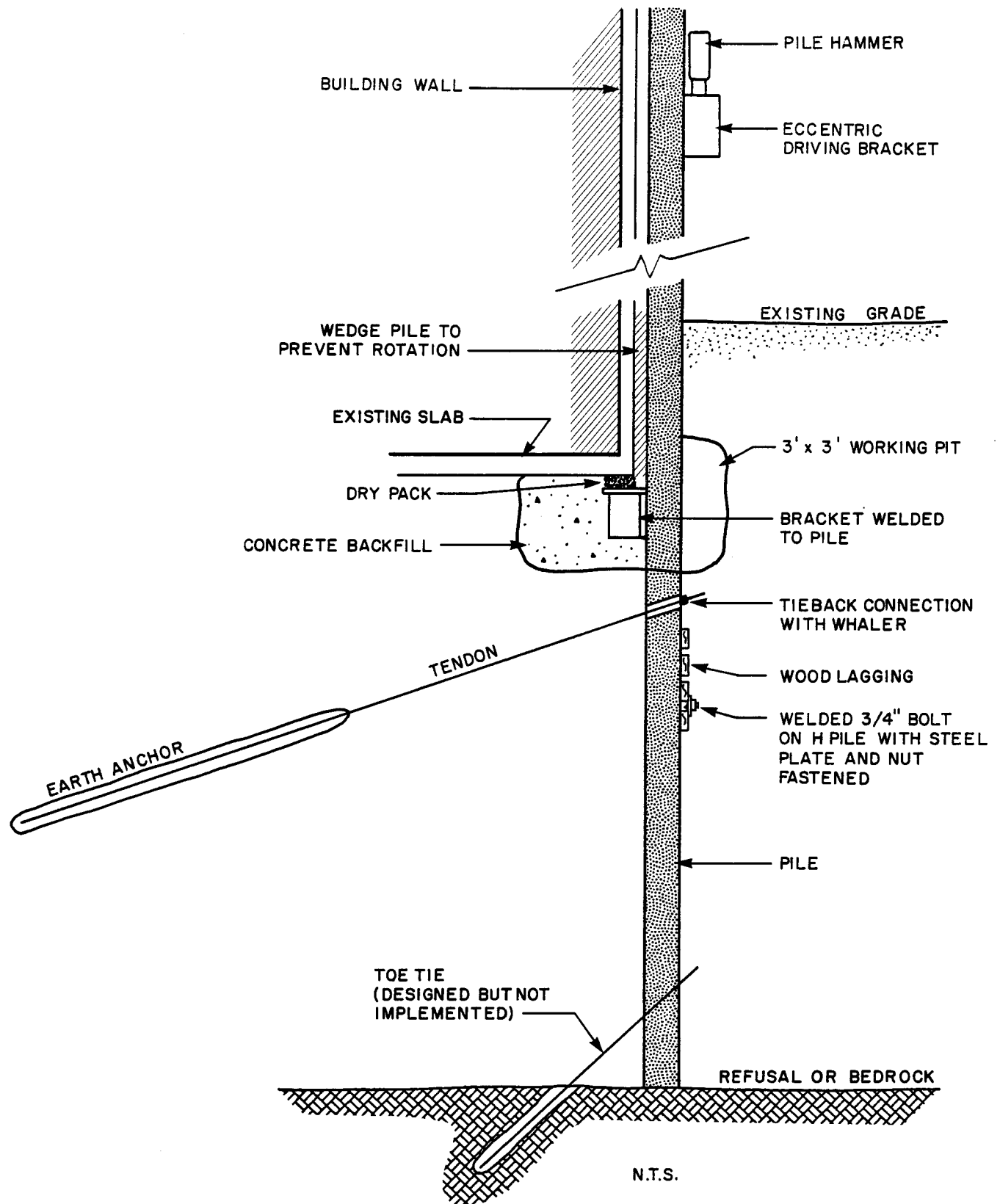


figure 11

TYPICAL FOUNDATION SUPPORT SECTION  
IBM Corporation

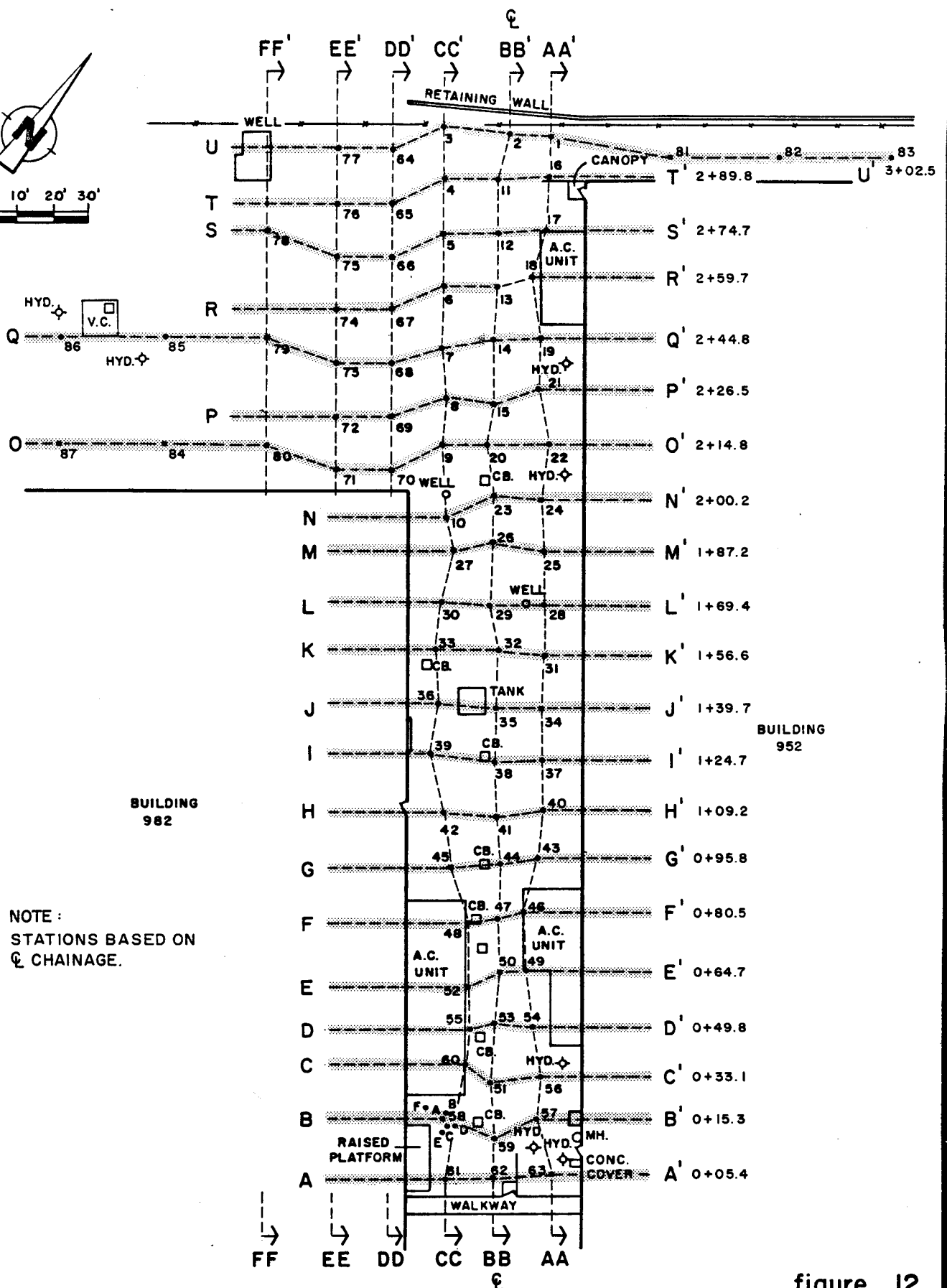
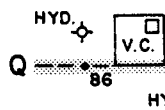
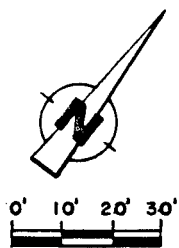
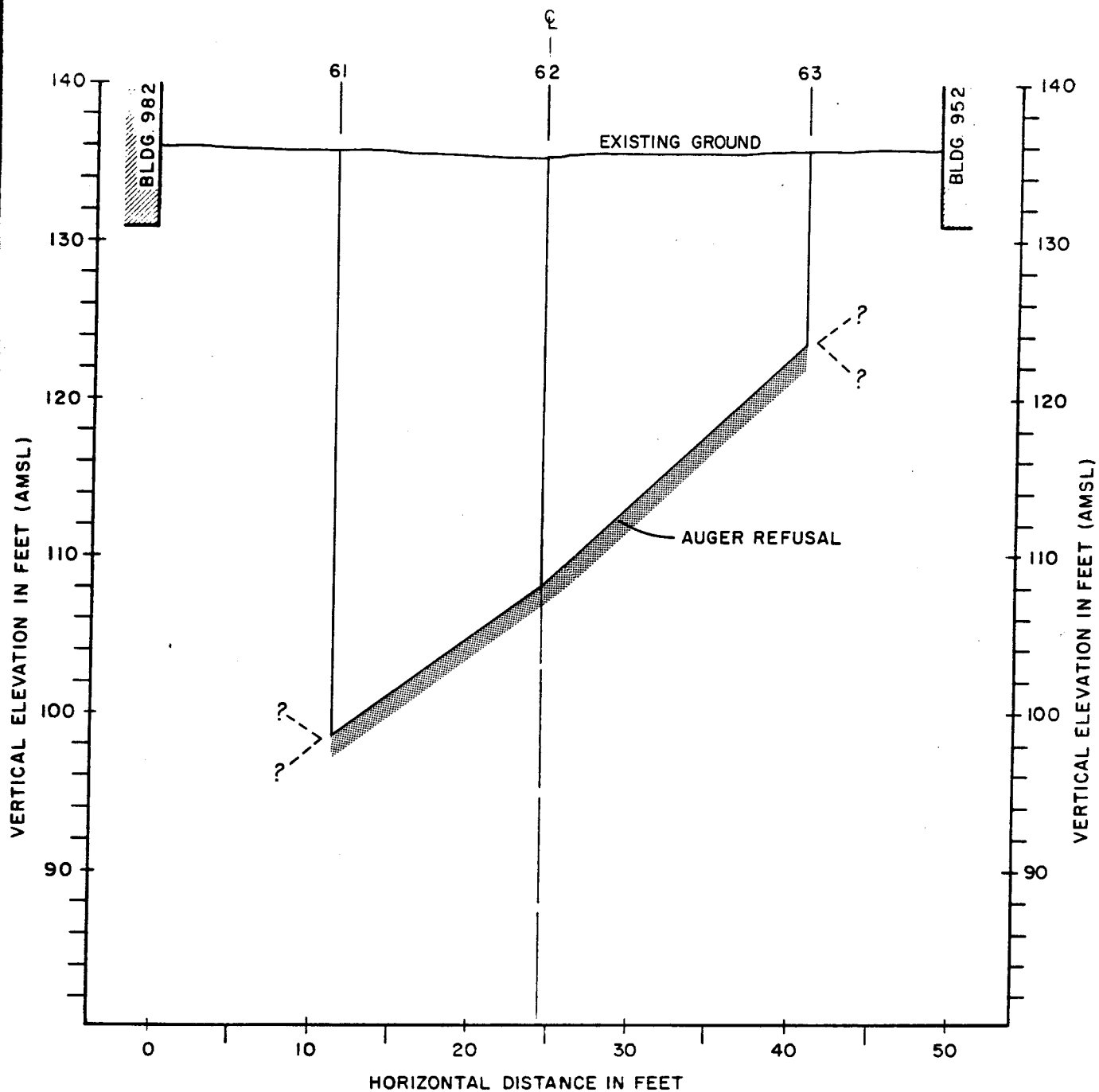


figure 12  
LOCATION OF CROSS-SECTIONS  
IBM Corporation



# **LEGEND**

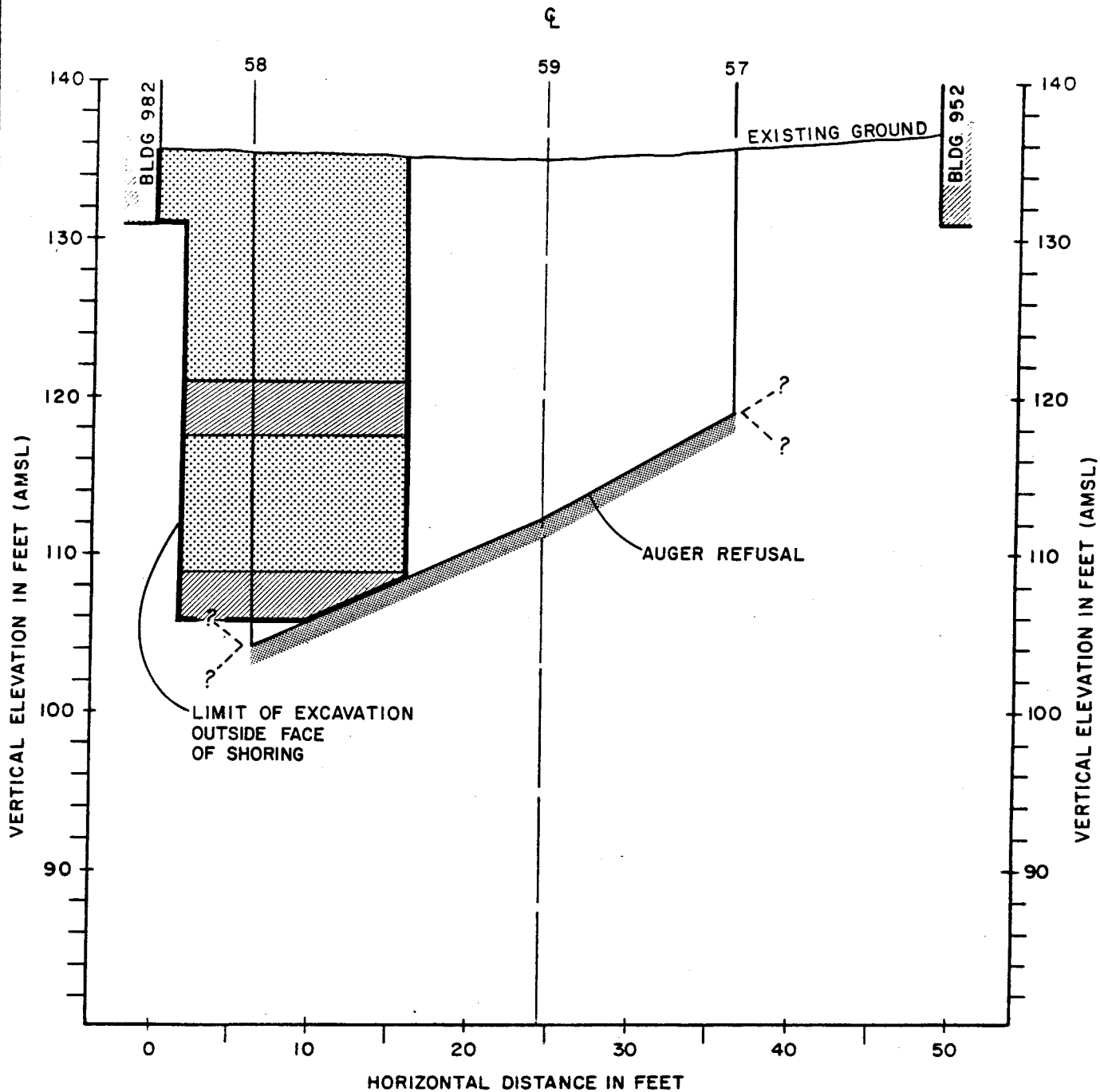
- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 13

STATION 0+05.4  
CROSS-SECTION A-A'  
IBM Corporation

CRA



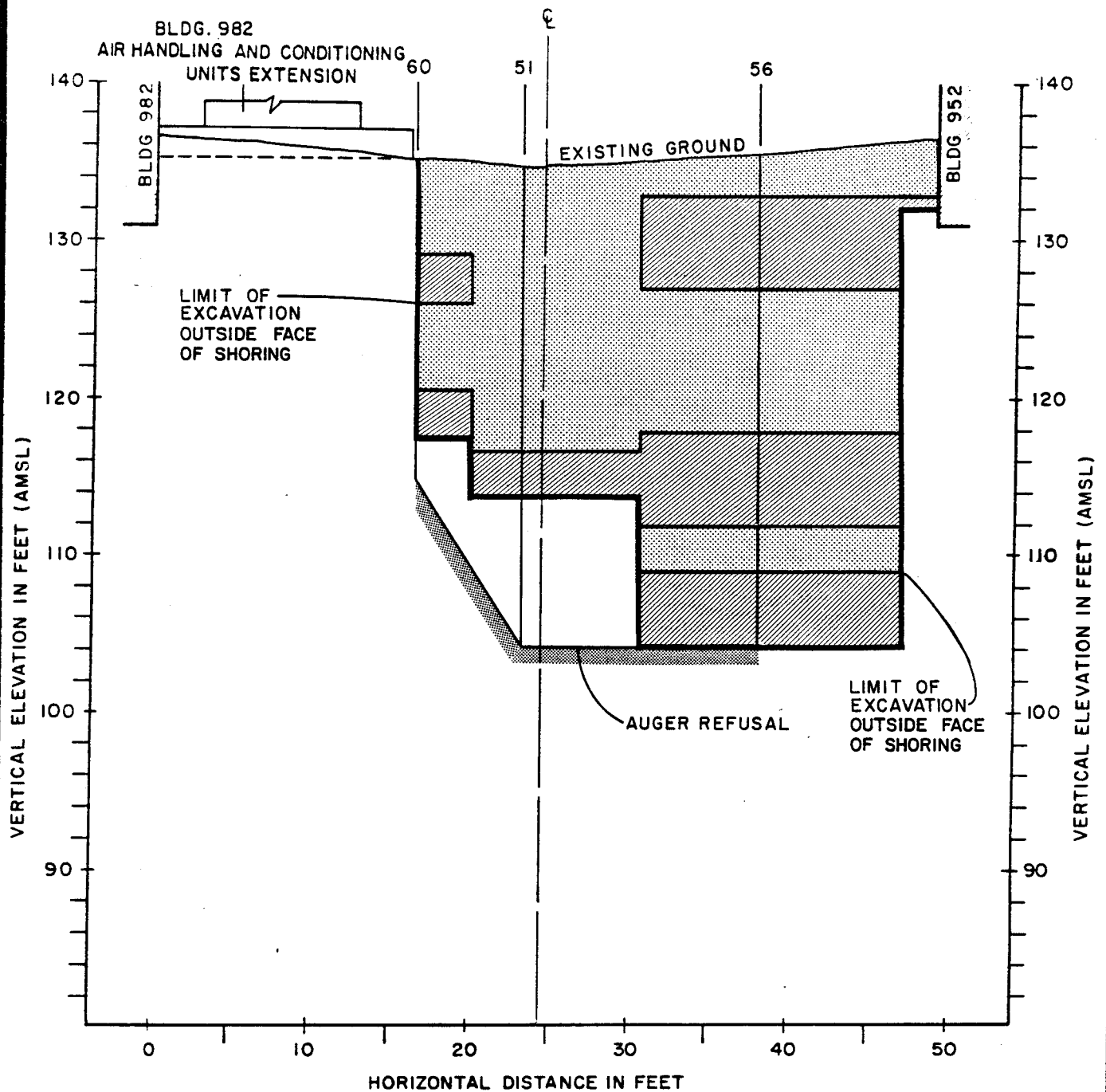


# **LEGEND**

- 10 — BOREHOLE
- [Hatched Box] — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- [Dotted Box] — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 14

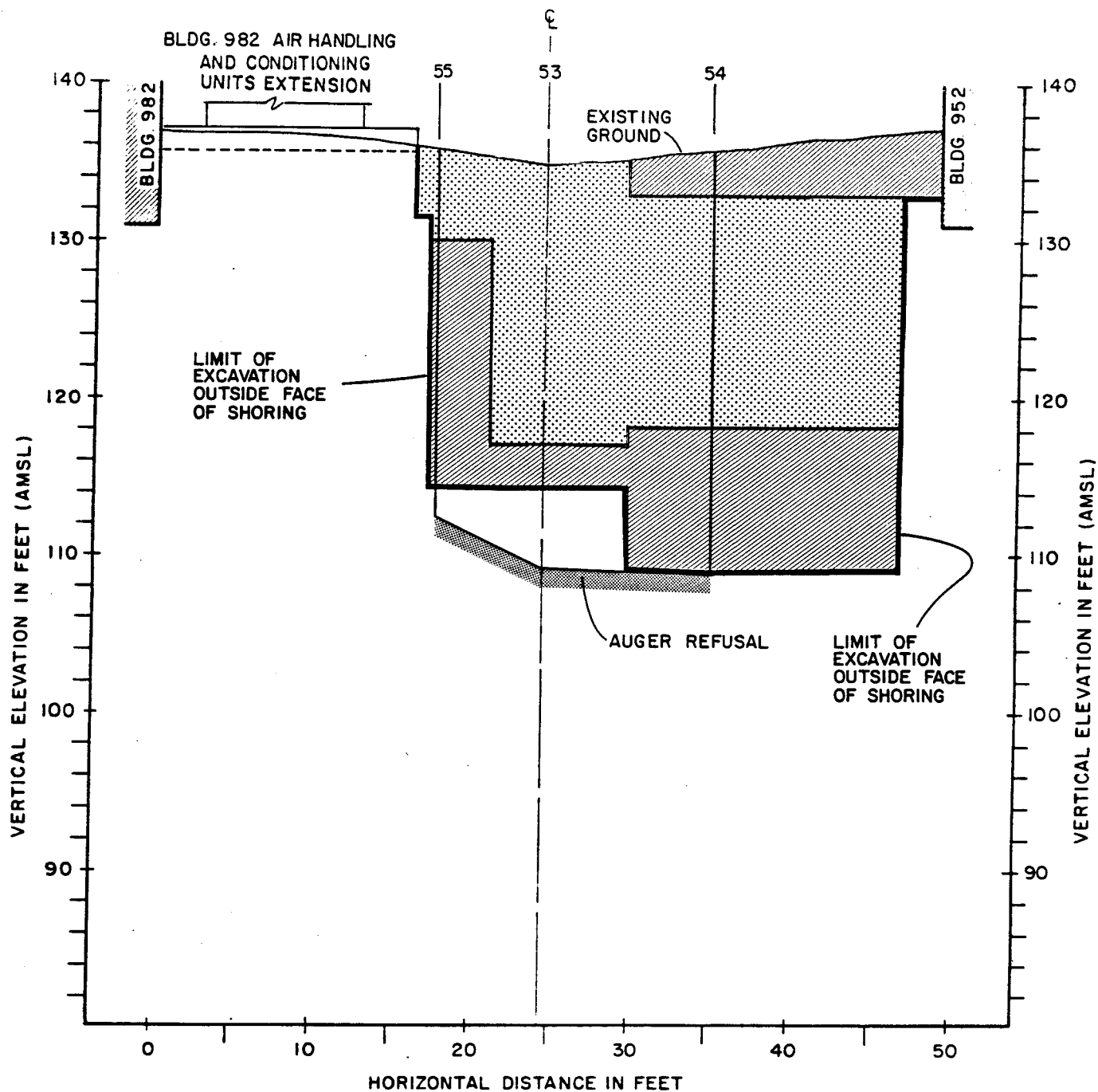
STATION 0+15.3  
CROSS-SECTION B-B'  
IBM Corporation



# **LEGEND**

- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 15  
STATION 0 + 33.1  
CROSS-SECTION C-C'  
IBM Corporation



# **LEGEND**

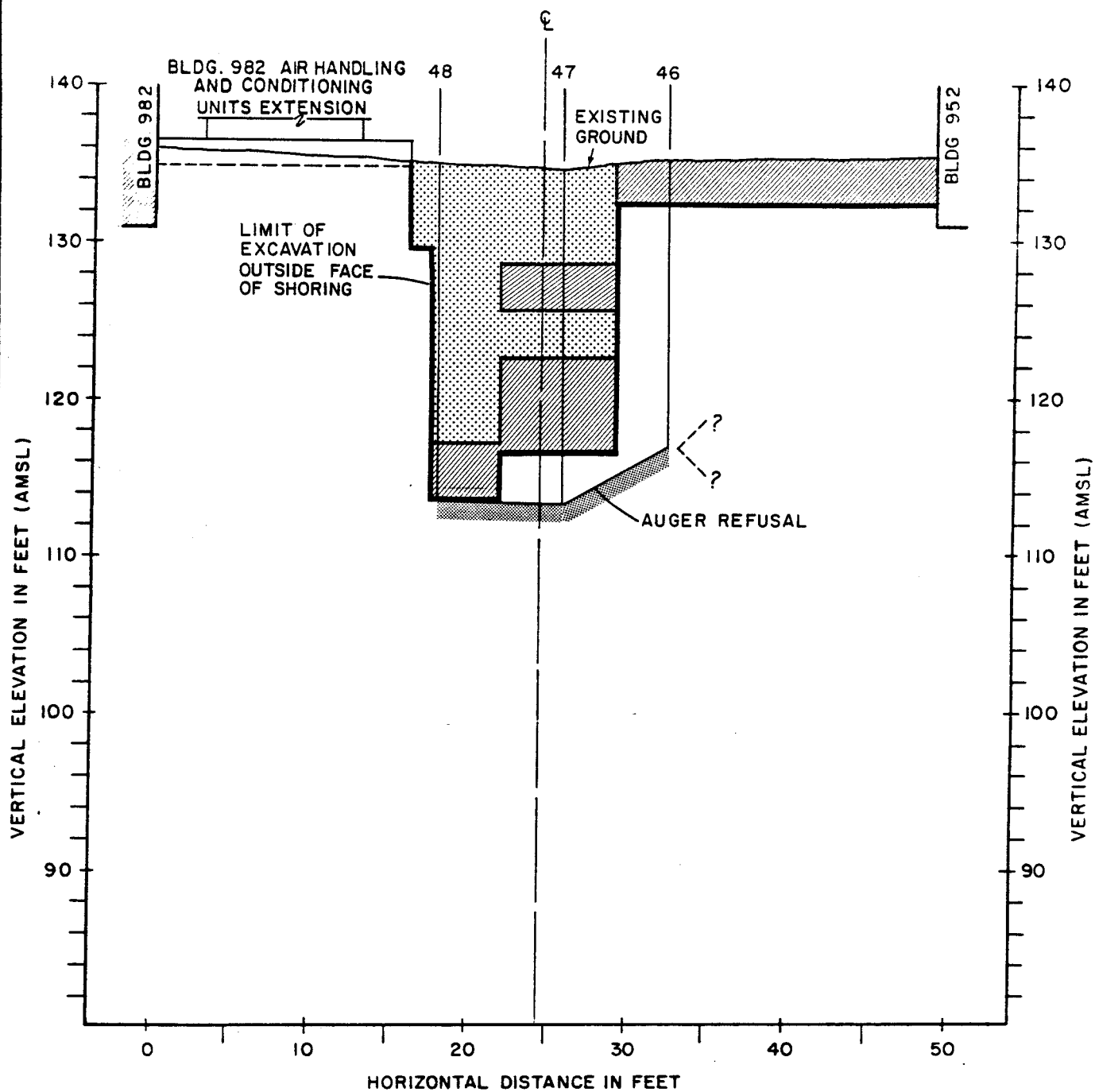
- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 16

STATION 0+49.8  
CROSS-SECTION D-D'  
IBM Corporation

CRA





#### LEGEND



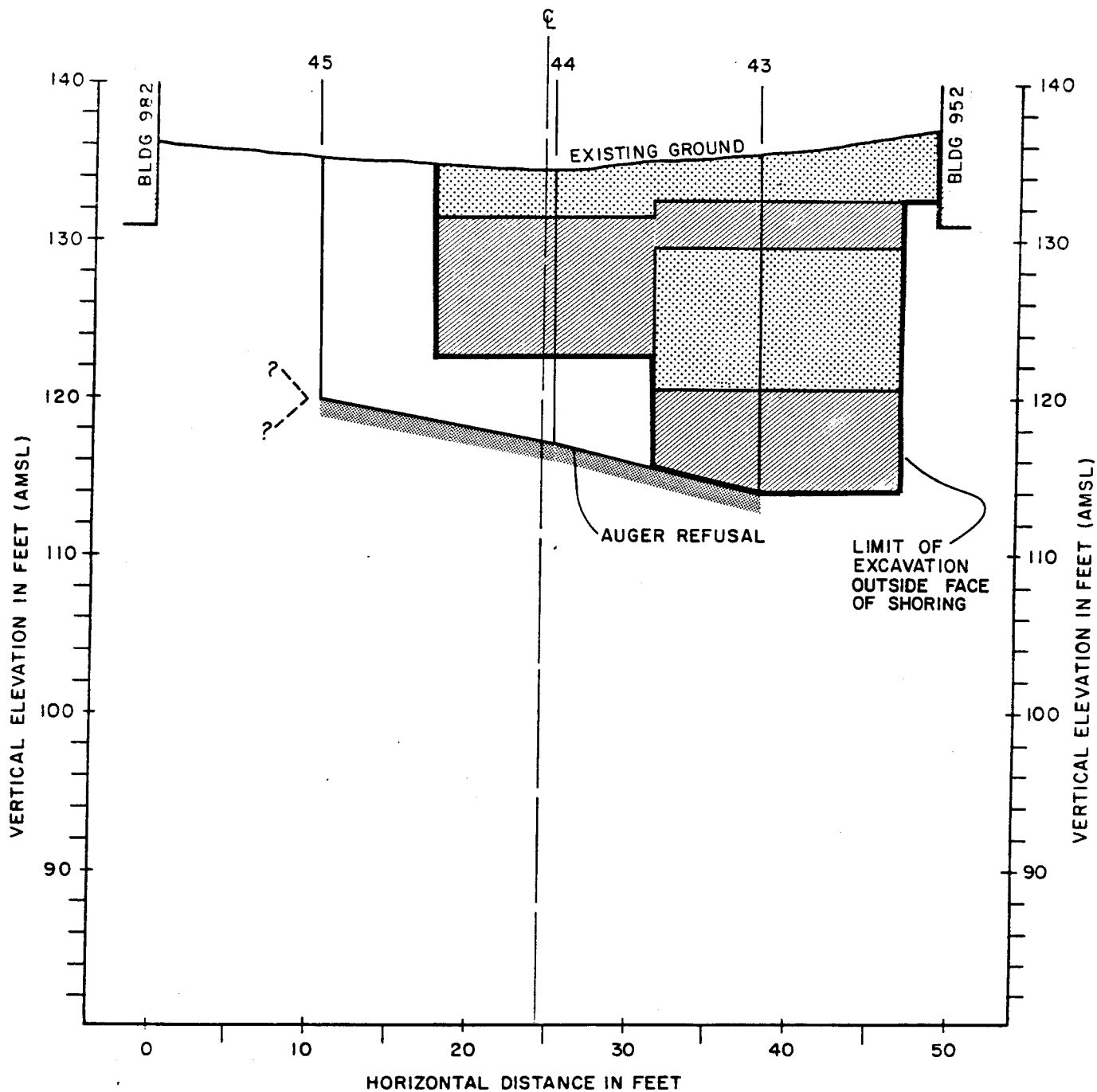
- 10 — BOREHOLE
-  — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
-  — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

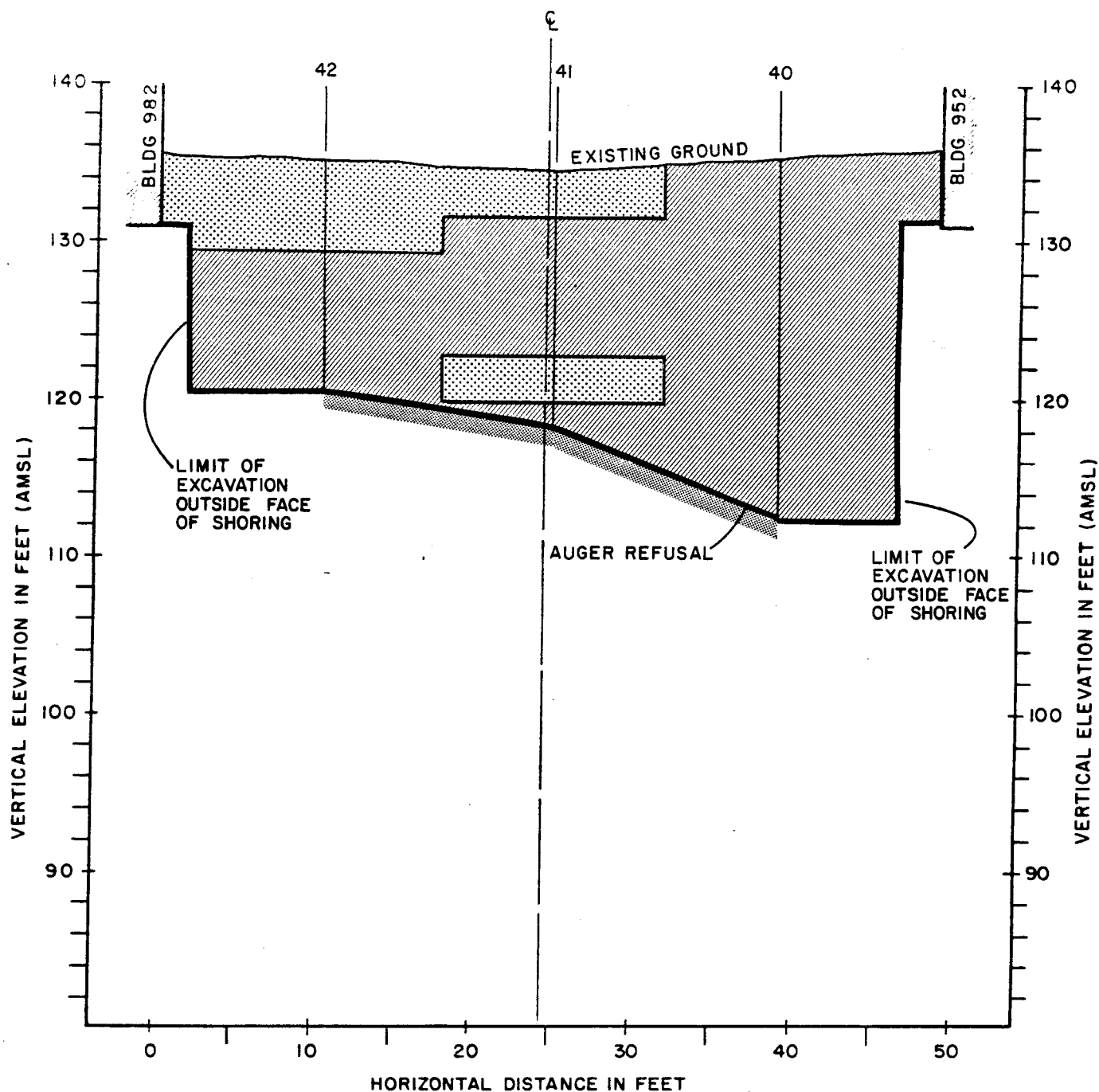
figure 18  
STATION 0+80.5  
CROSS-SECTION F - F'  
IBM Corporation



# **LEGEND**

- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 19  
STATION 0+95.8  
CROSS-SECTION G-G'  
IBM Corporation



### LEGEND



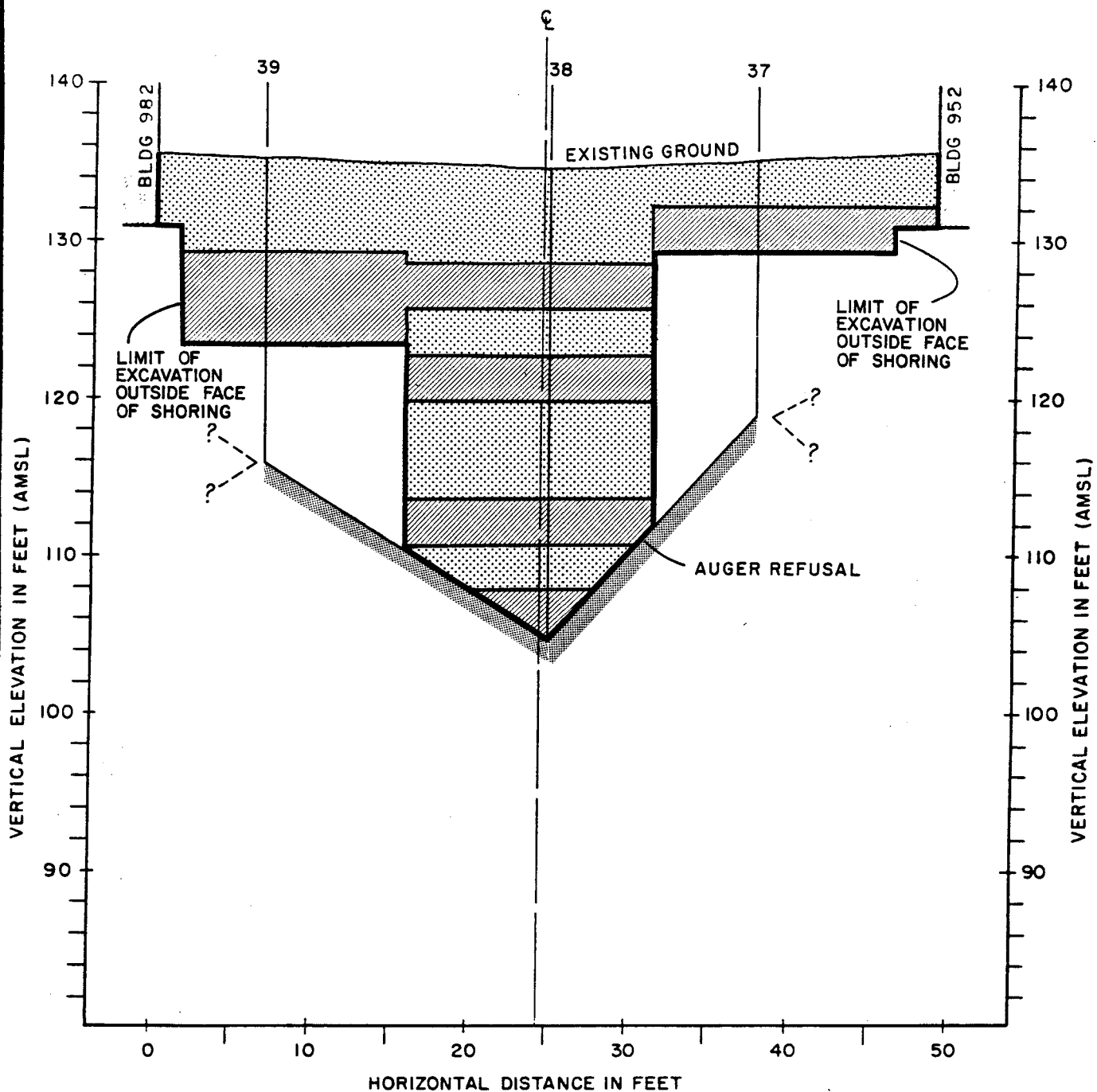
- 10 — BOREHOLE
-  — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
-  — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 20  
STATION 1+09.2  
CROSS-SECTION H-H'  
IBM Corporation



#### LEGEND

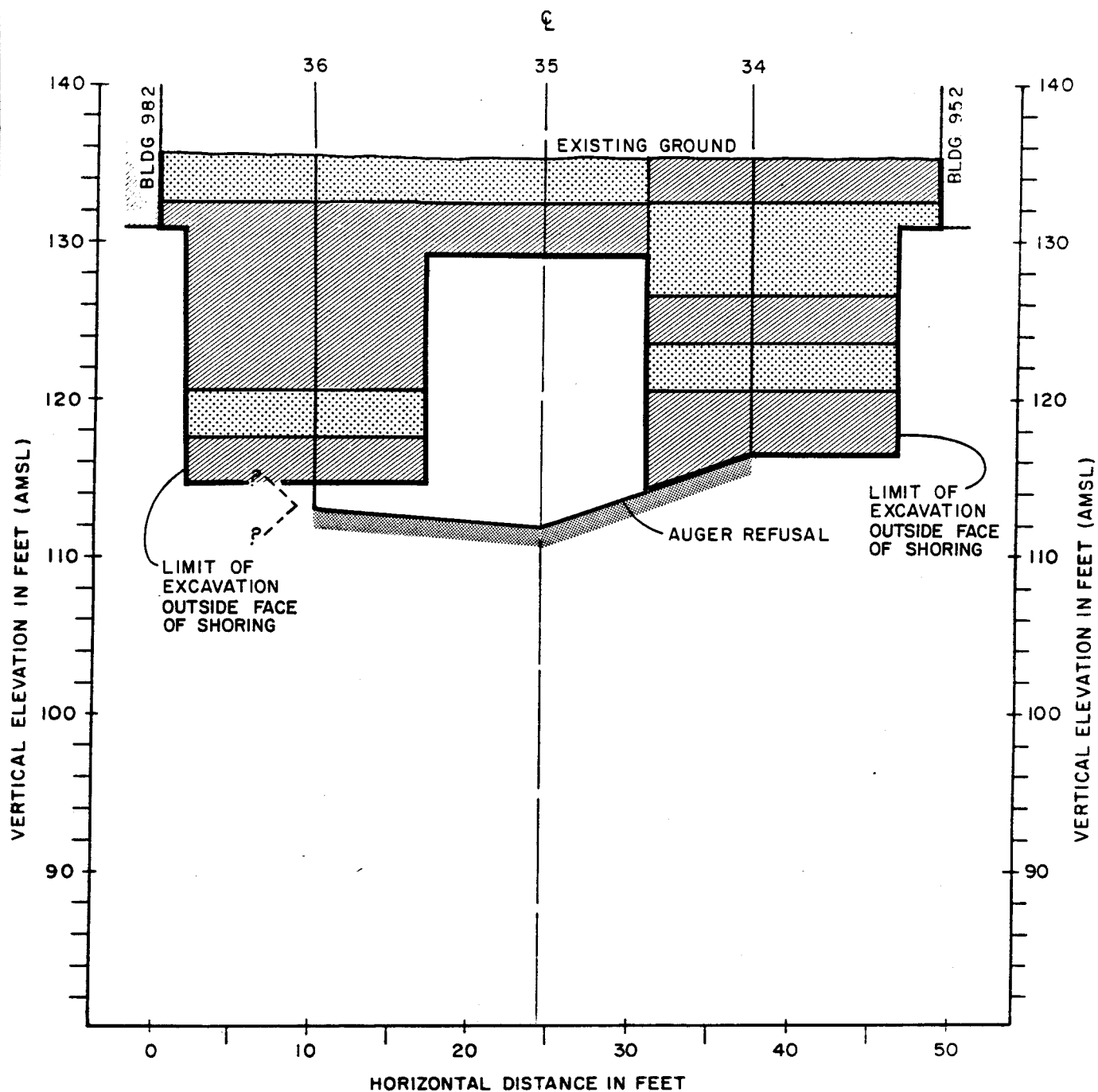
- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 21

STATION 1+24.7  
CROSS-SECTION 1-1'  
IBM Corporation

CRA

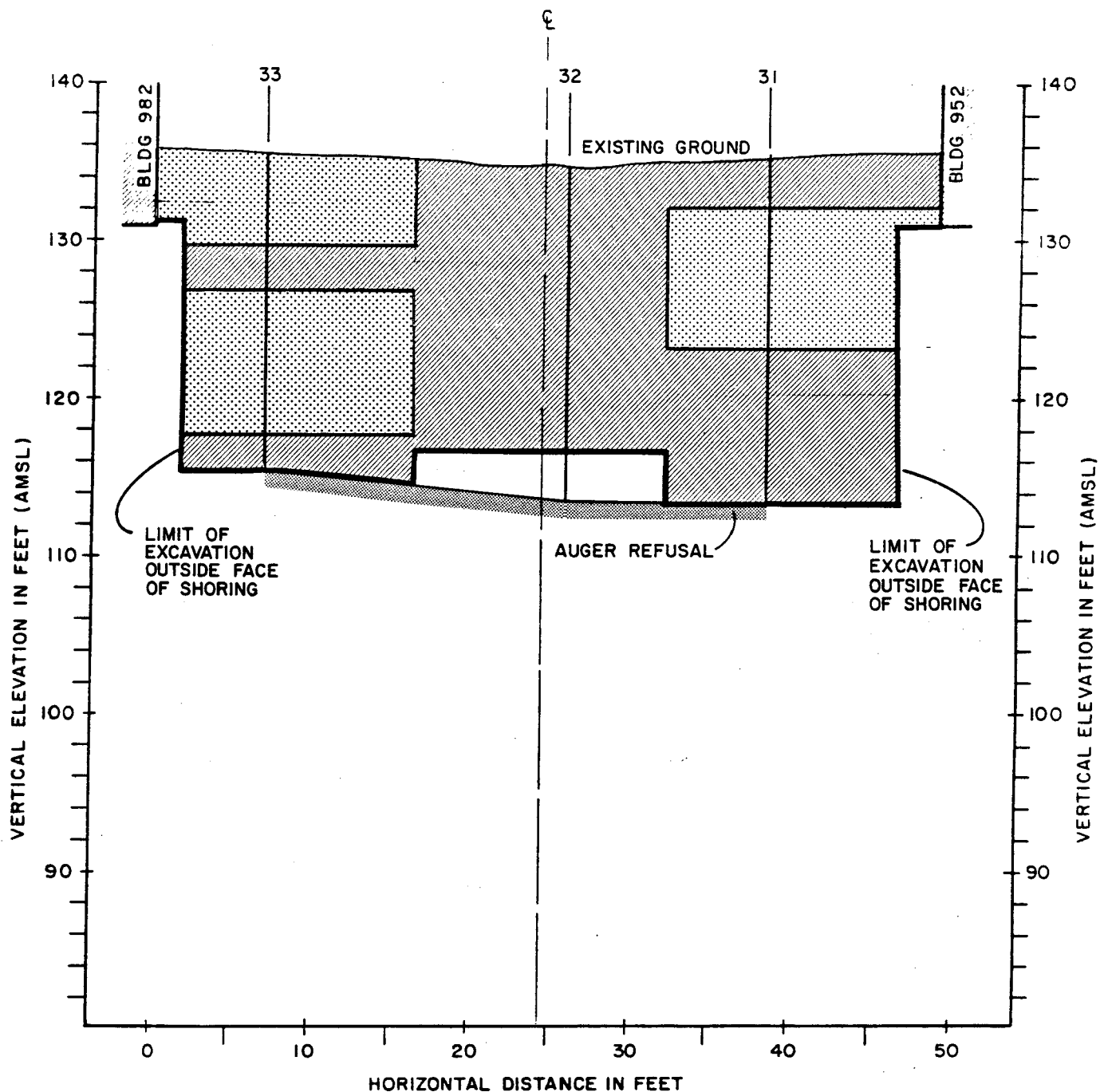




# **LEGEND**

- 10' — BOREHOLE
- [Hatched Box] — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- [Stippled Box] — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 22  
STATION 1+39.7  
CROSS-SECTION J-J'  
IBM Corporation



#### LEGEND



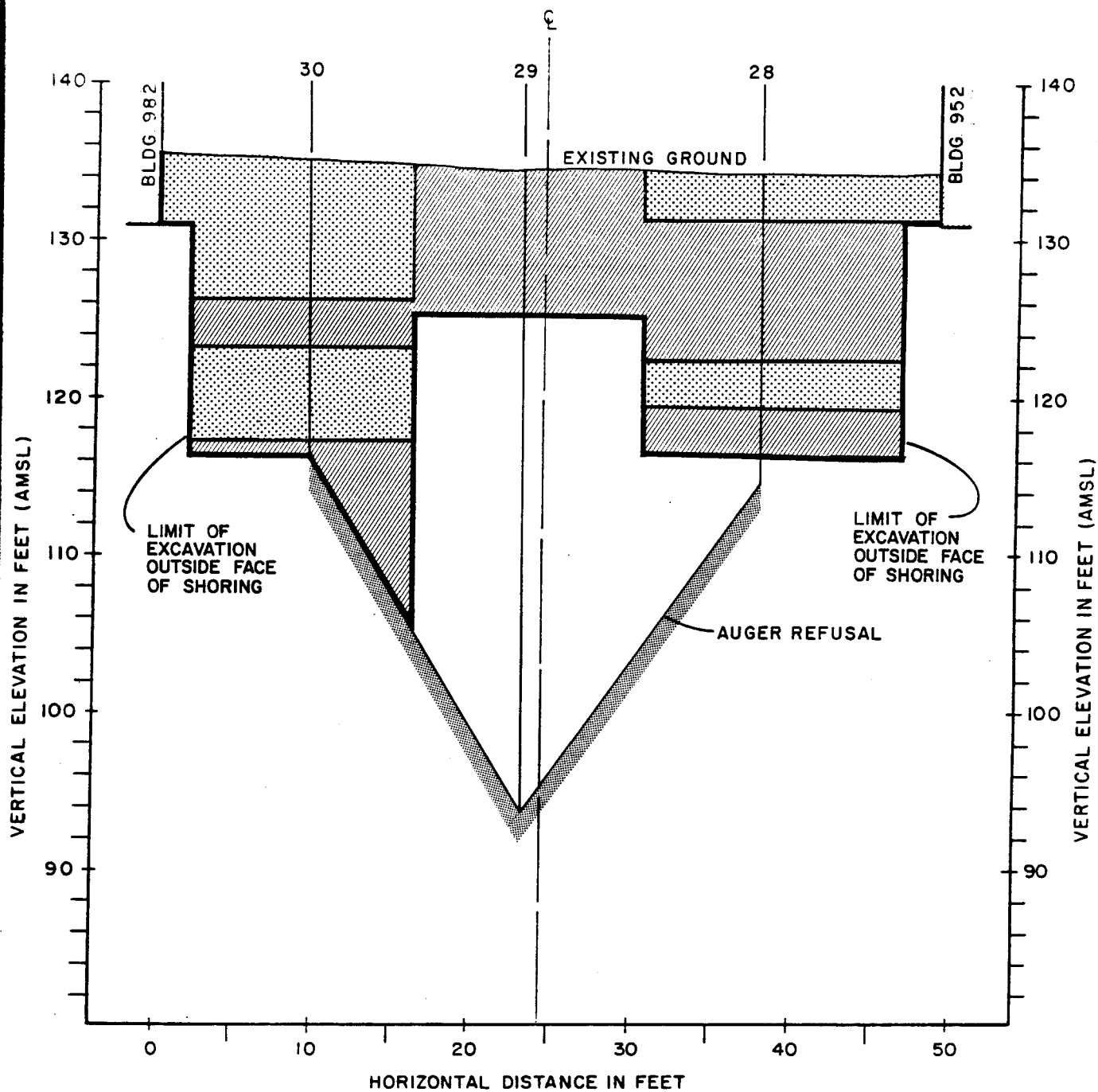
- 10 — BOREHOLE
-  — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
-  — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 23  
STATION I + 56.6  
CROSS-SECTION K-K'  
IBM Corporation

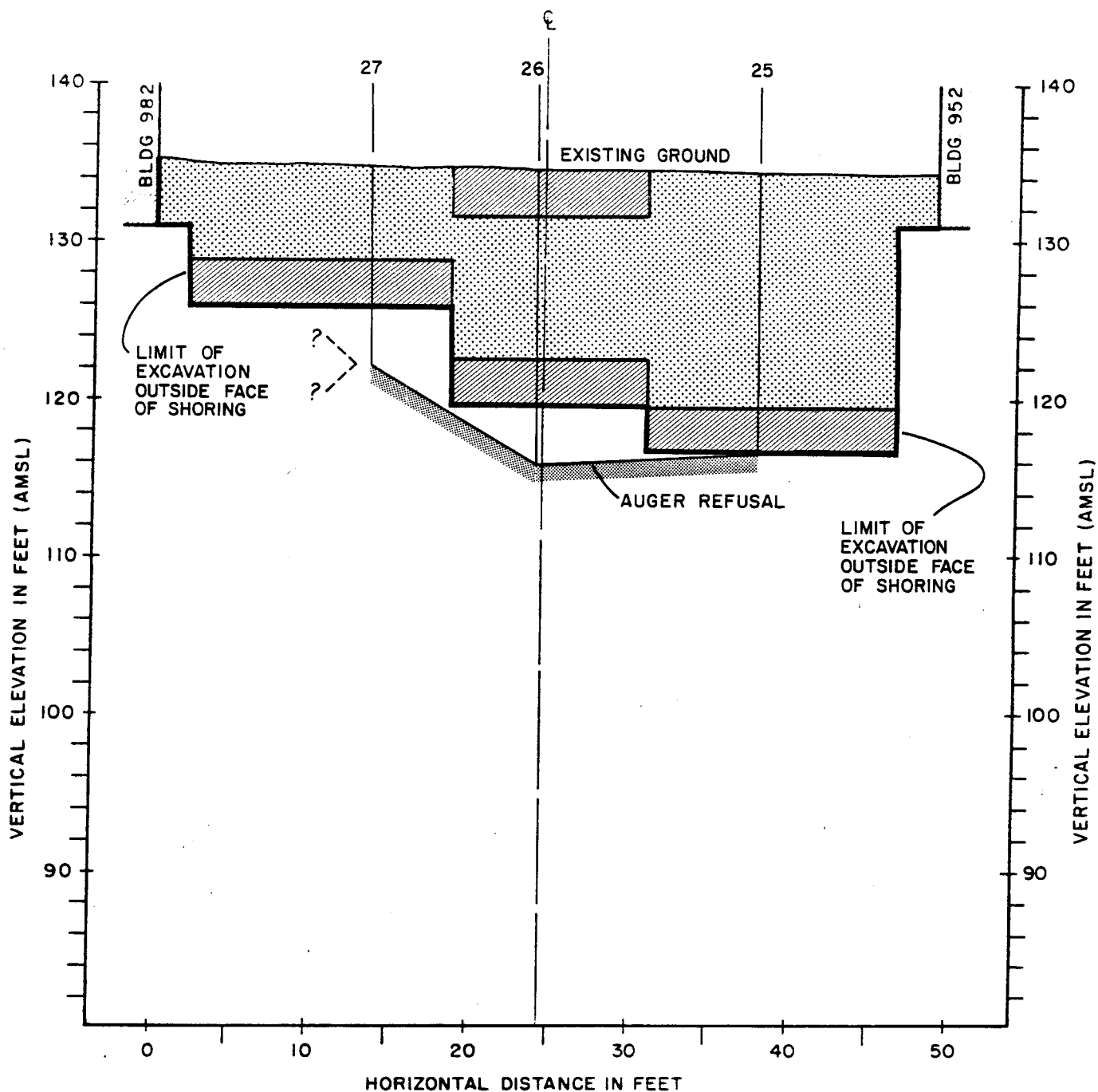


#### LEGEND

- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 24

STATION 1+69.4  
CROSS-SECTION L-L'  
IBM Corporation



# **LEGEND**



- 10 — BOREHOLE
-  — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
-  — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 25  
STATION 1+87.2  
CROSS-SECTION M-M'  
IBM Corporation

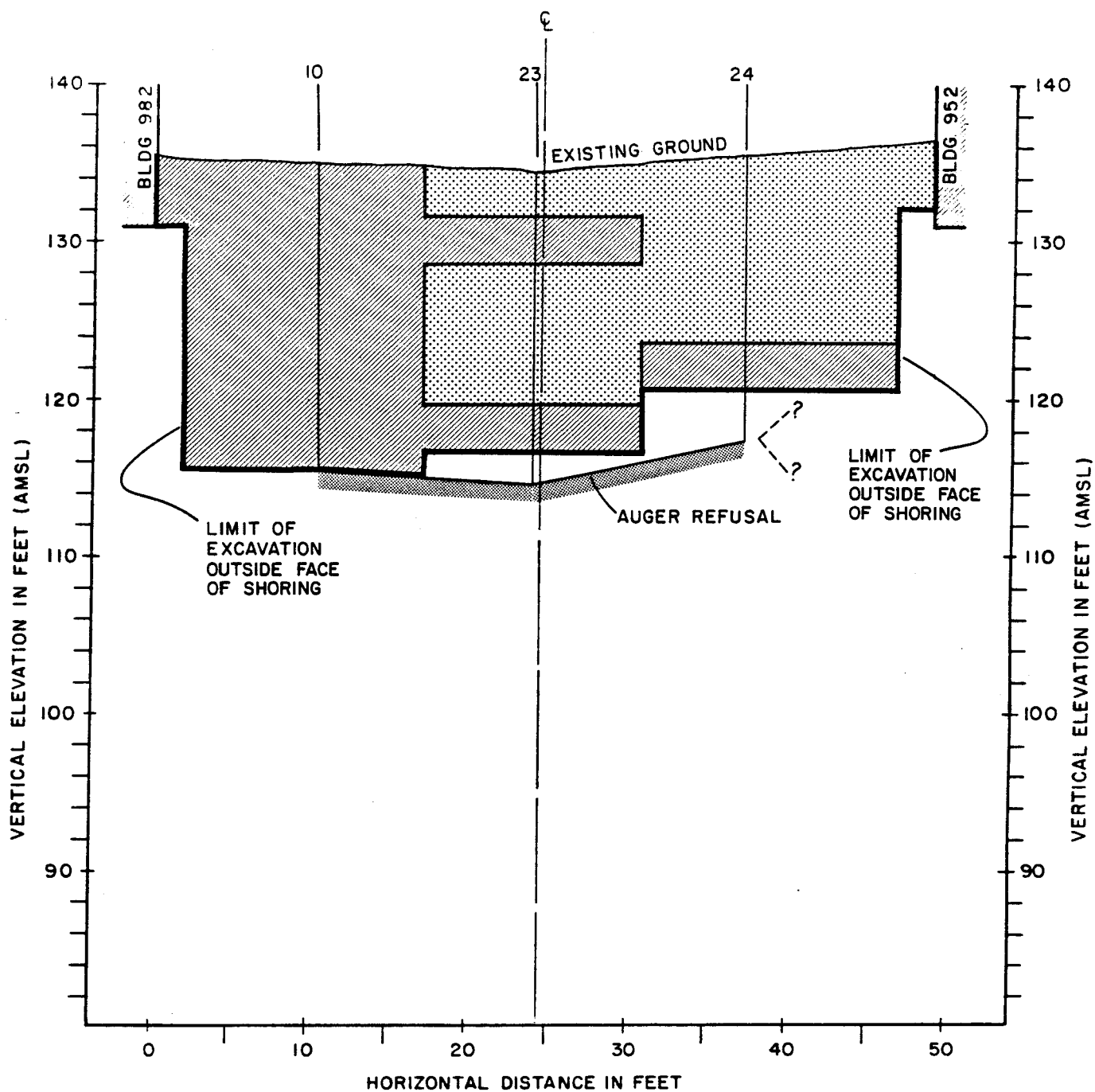


figure 26  
STATION 2+00.2  
CROSS-SECTION N-N'  
IBM Corporation

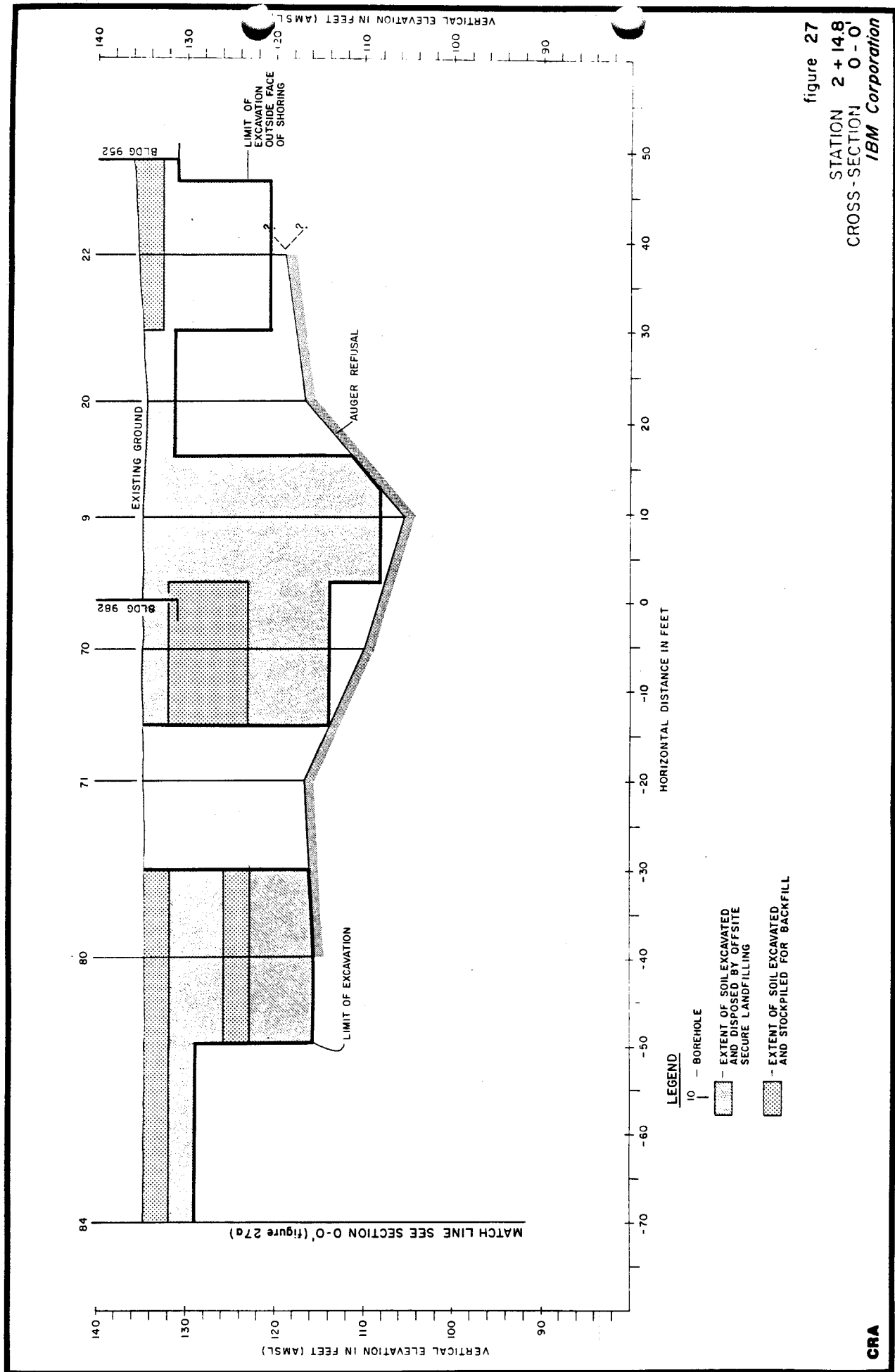
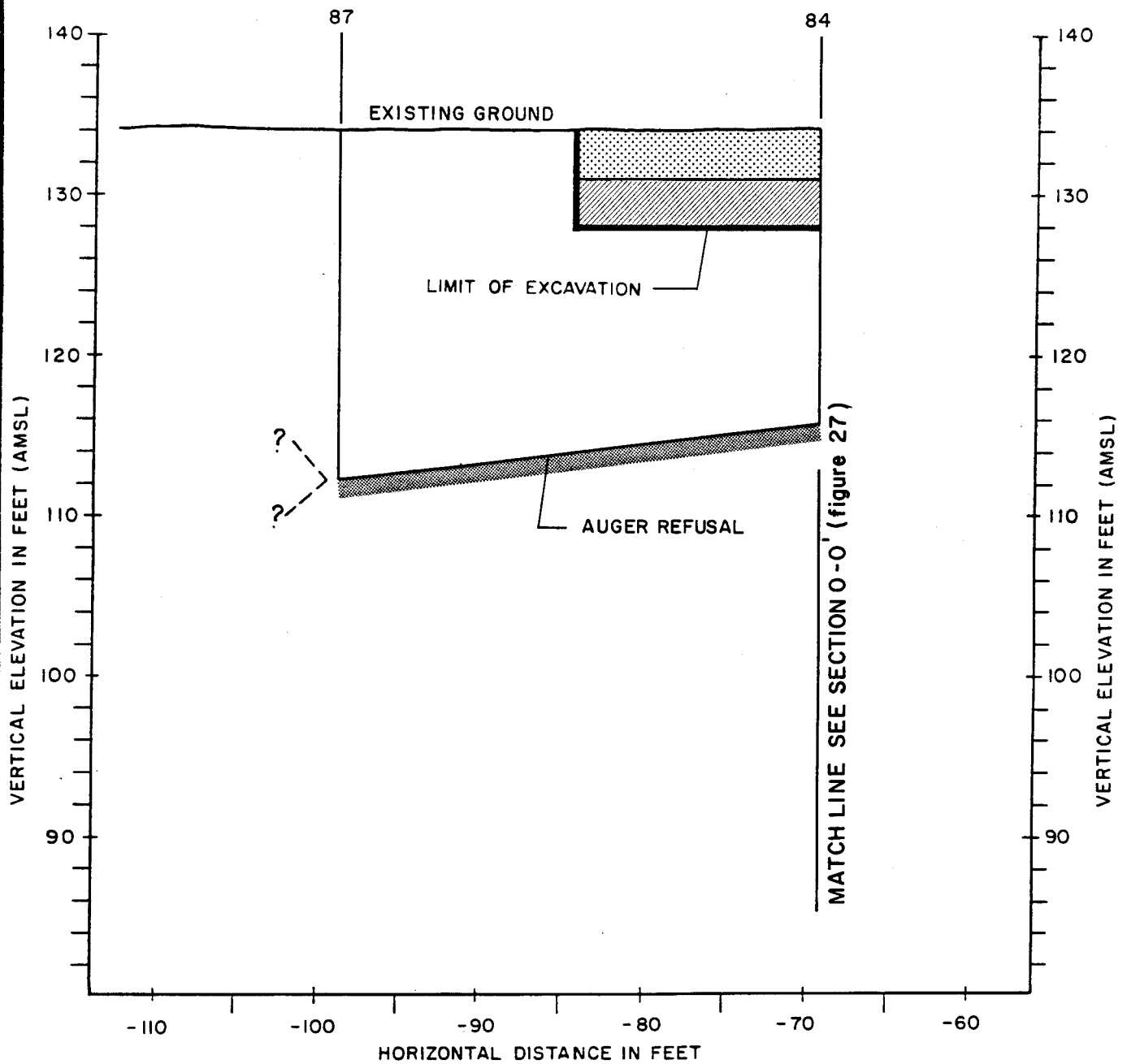


figure 27

STATION 2 + 14.8  
CROSS-SECTION 0 - 0'  
IBM Corporation



**LEGEND**

- 10' — BOREHOLE
- [Hatched Box] — EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- [Dotted Box] — EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

figure 27a  
STATION 2+14.8  
CROSS-SECTION 0-0'  
I B M Corporation

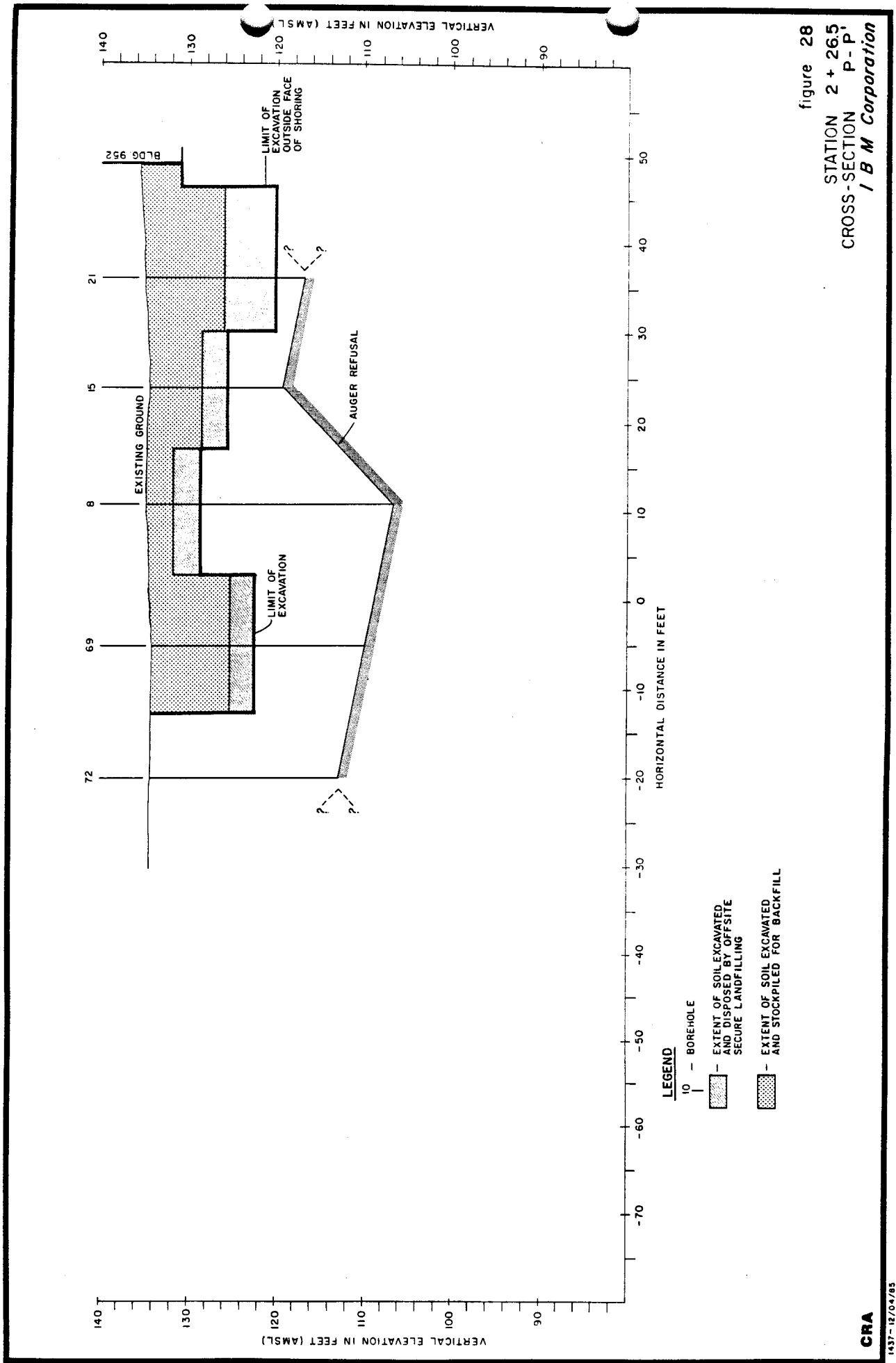


figure 28  
STATION 2 + 26.5  
CROSS-SECTION P-P'  
I B M Corporation



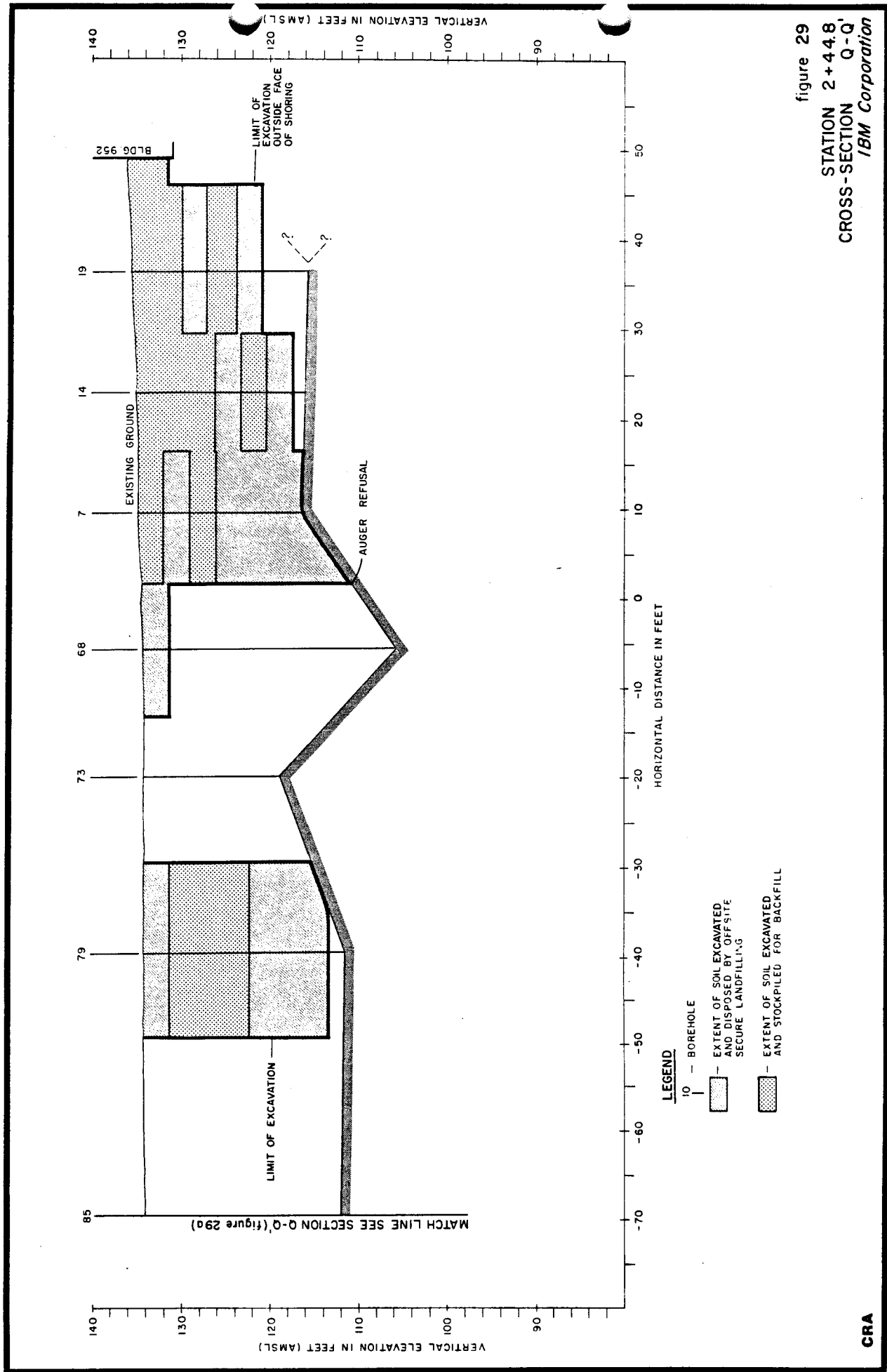
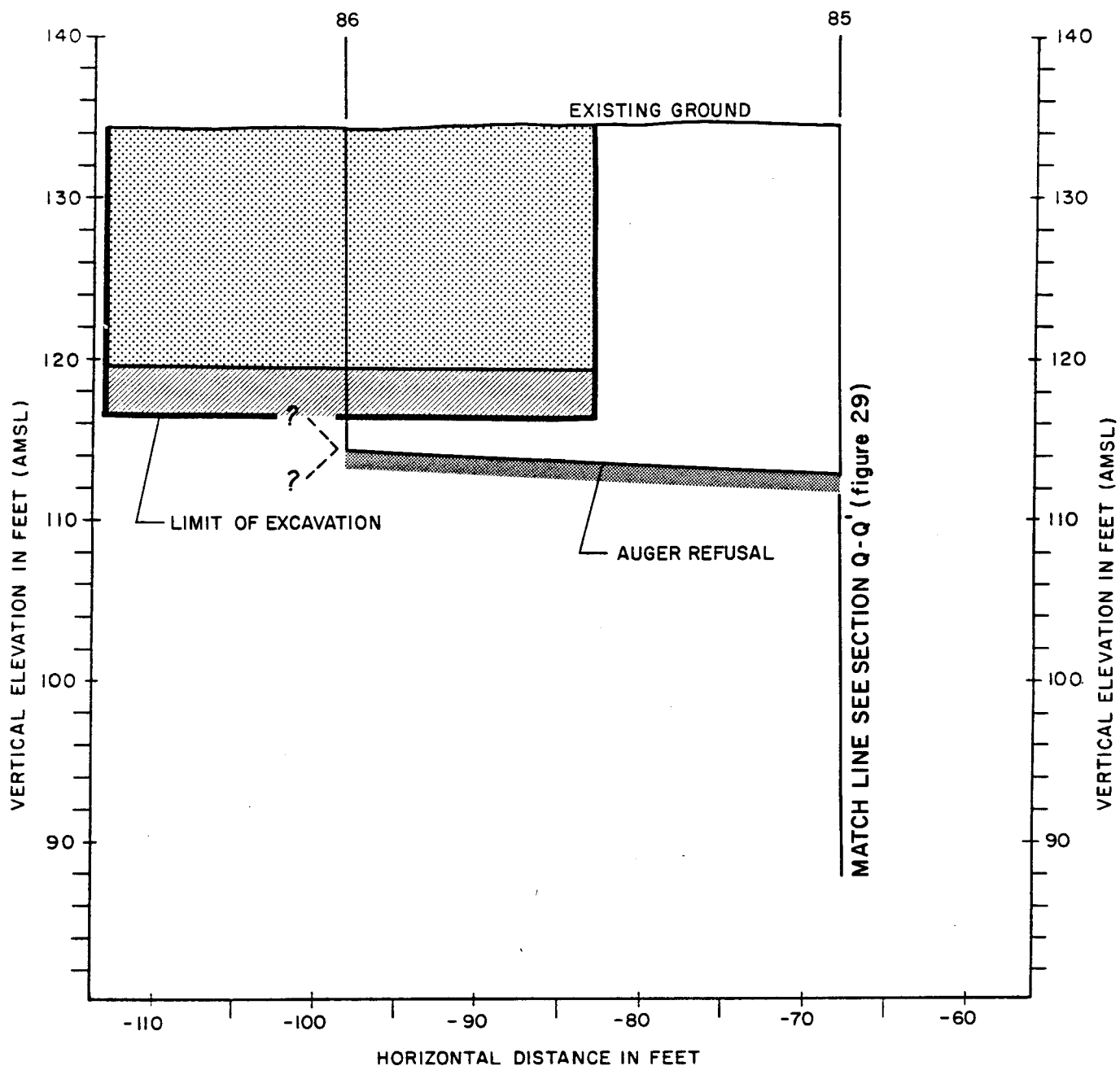


figure 29  
STATION 2+44.8  
CROSS-SECTION Q-Q  
IBM Corporation



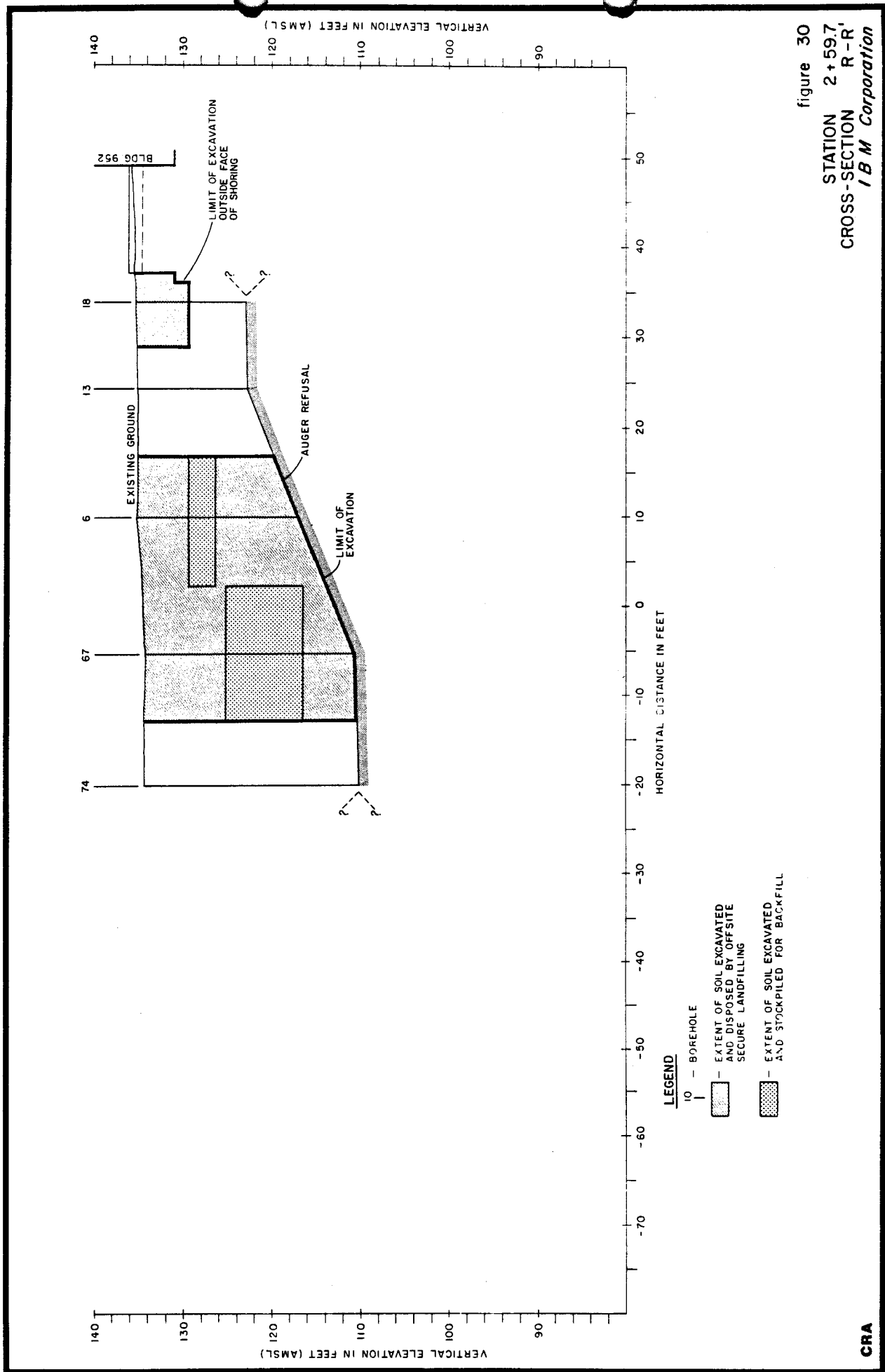
**LEGEND**

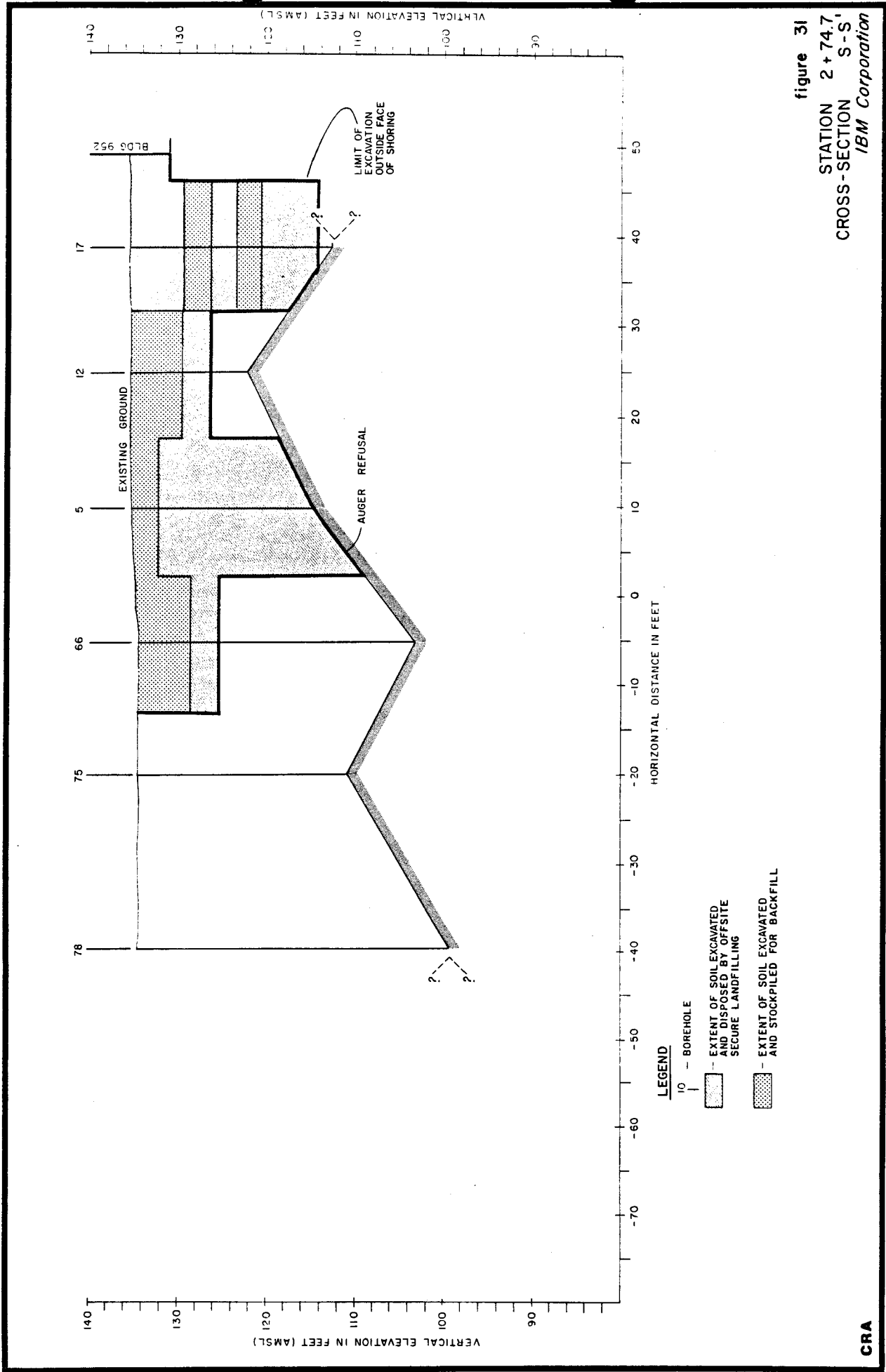
- 10 — BOREHOLE
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING
- EXTENT OF SOIL EXCAVATED AND STOCKPILED FOR BACKFILL

**figure 29a**

**STATION 2+44.8**  
**CROSS-SECTION Q-Q'**  
**I B M Corporation**

**CRA**





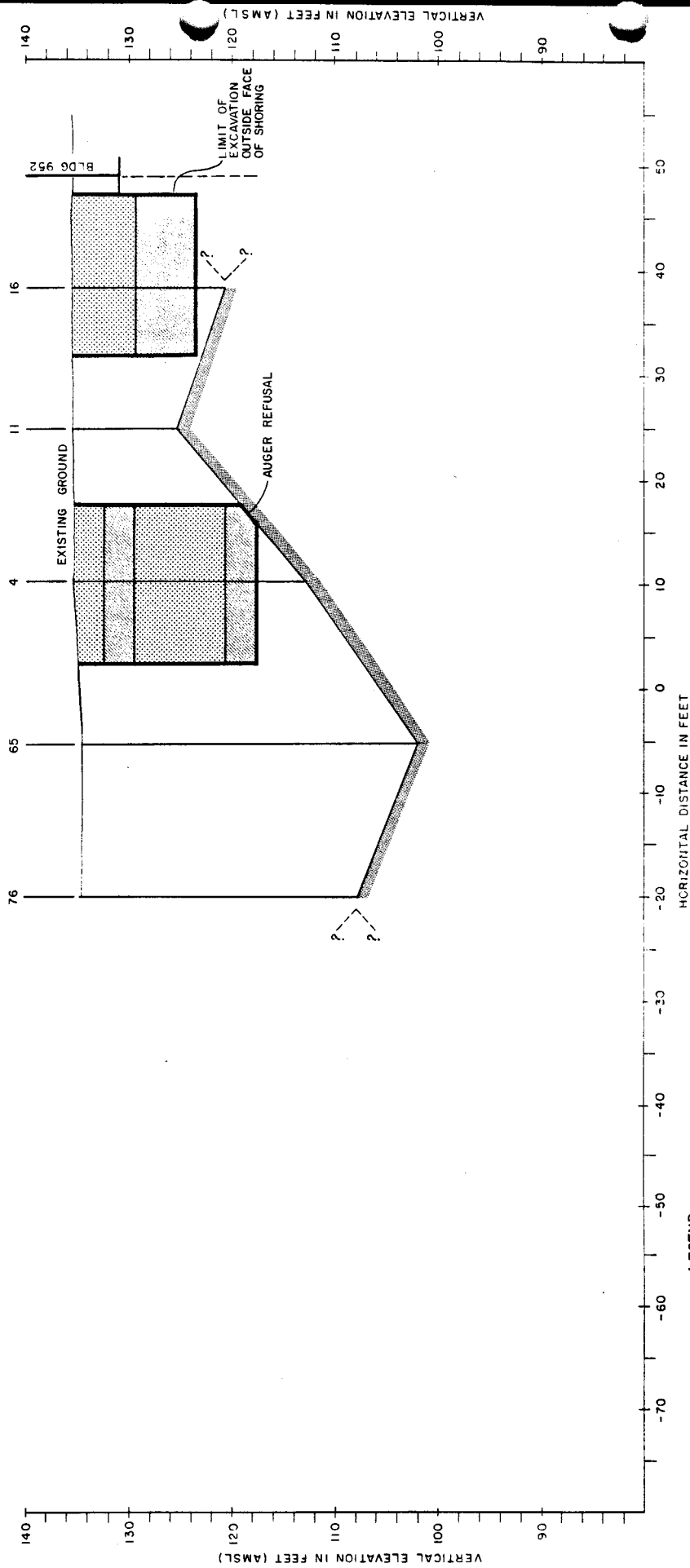


figure 32  
STATION 2 + 89.8  
CROSS-SECTION T-T'  
IBM Corporation

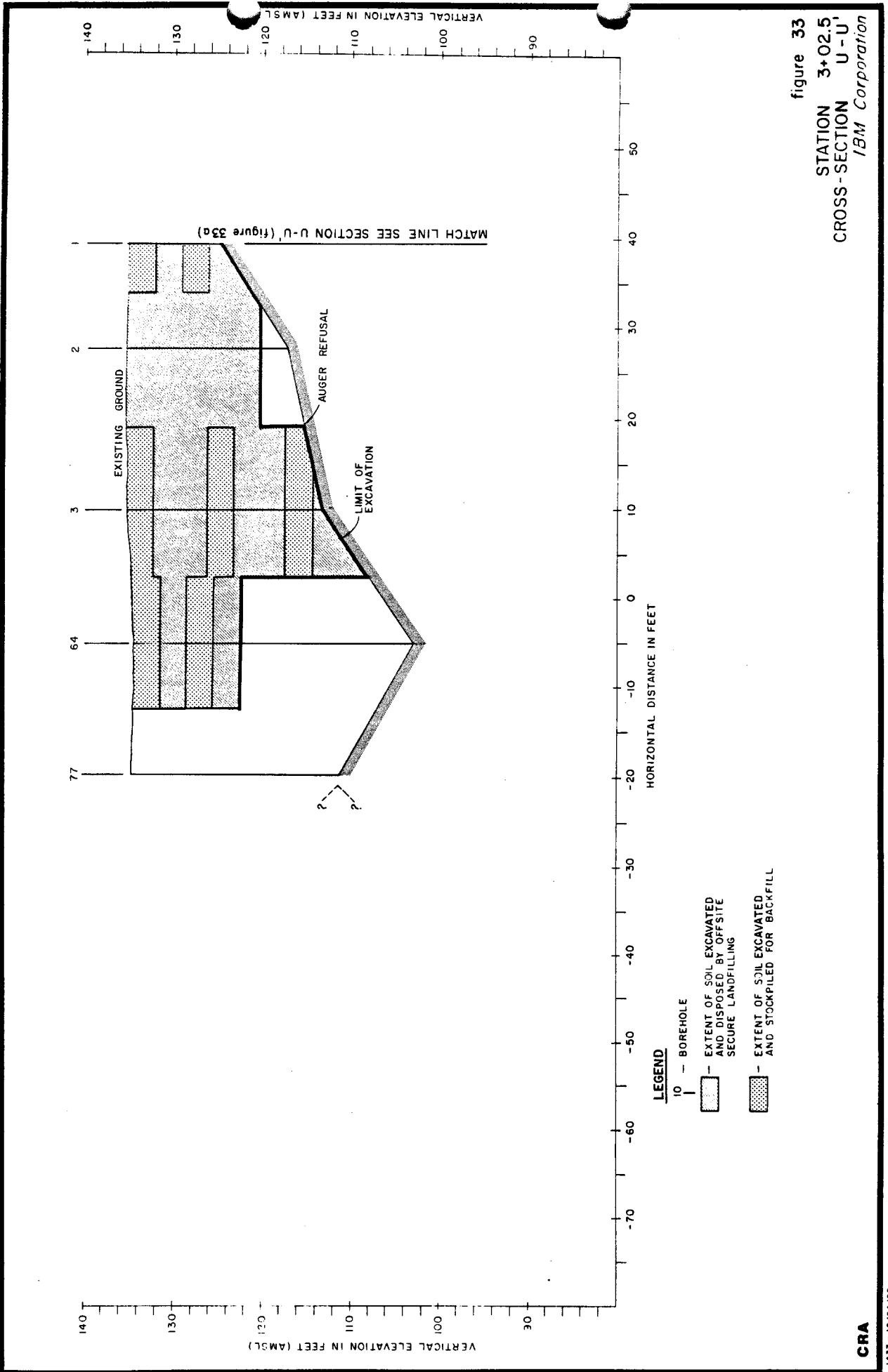
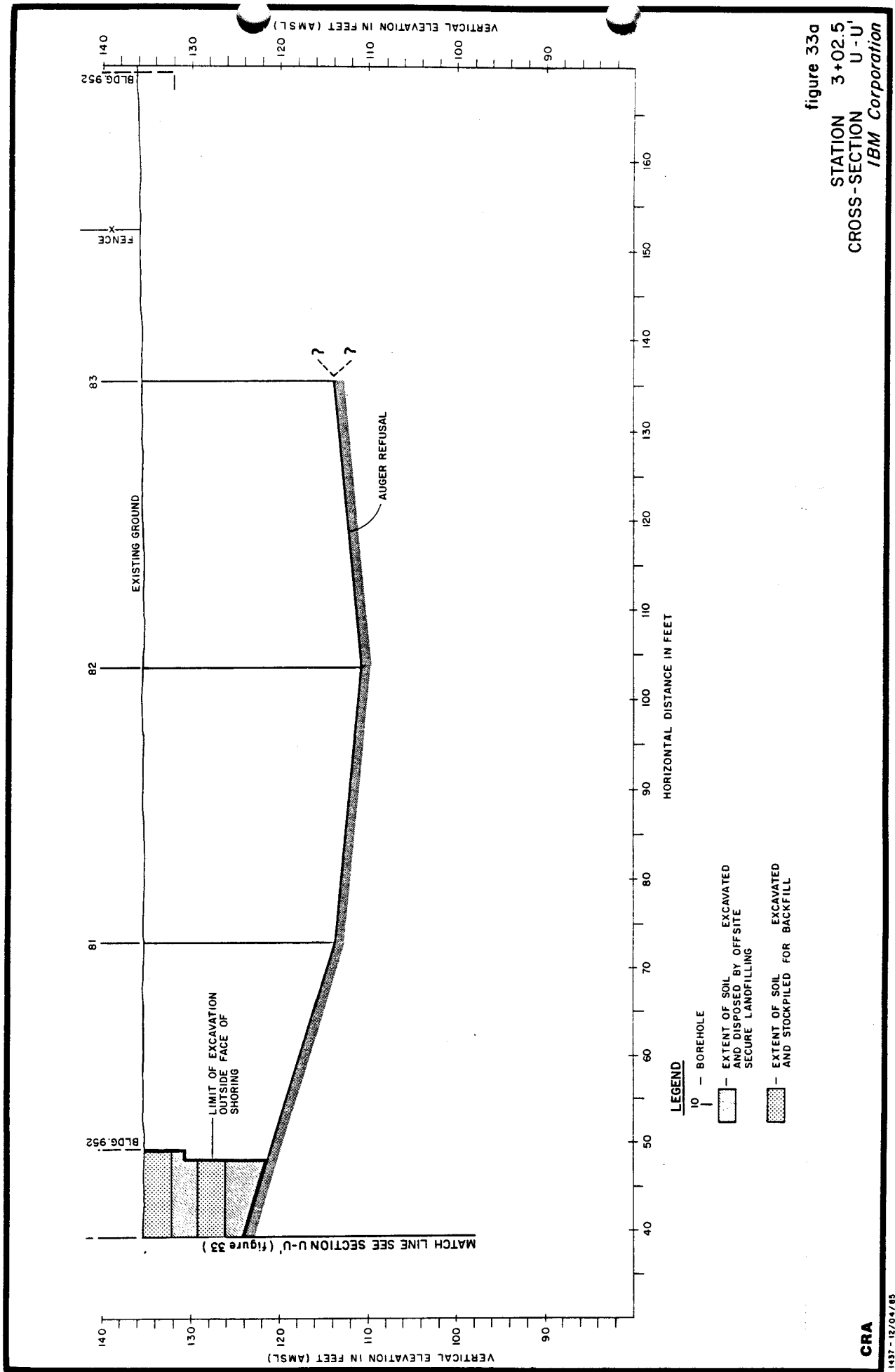


figure 33



# LEGEND

• 20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING

BUILDING 952

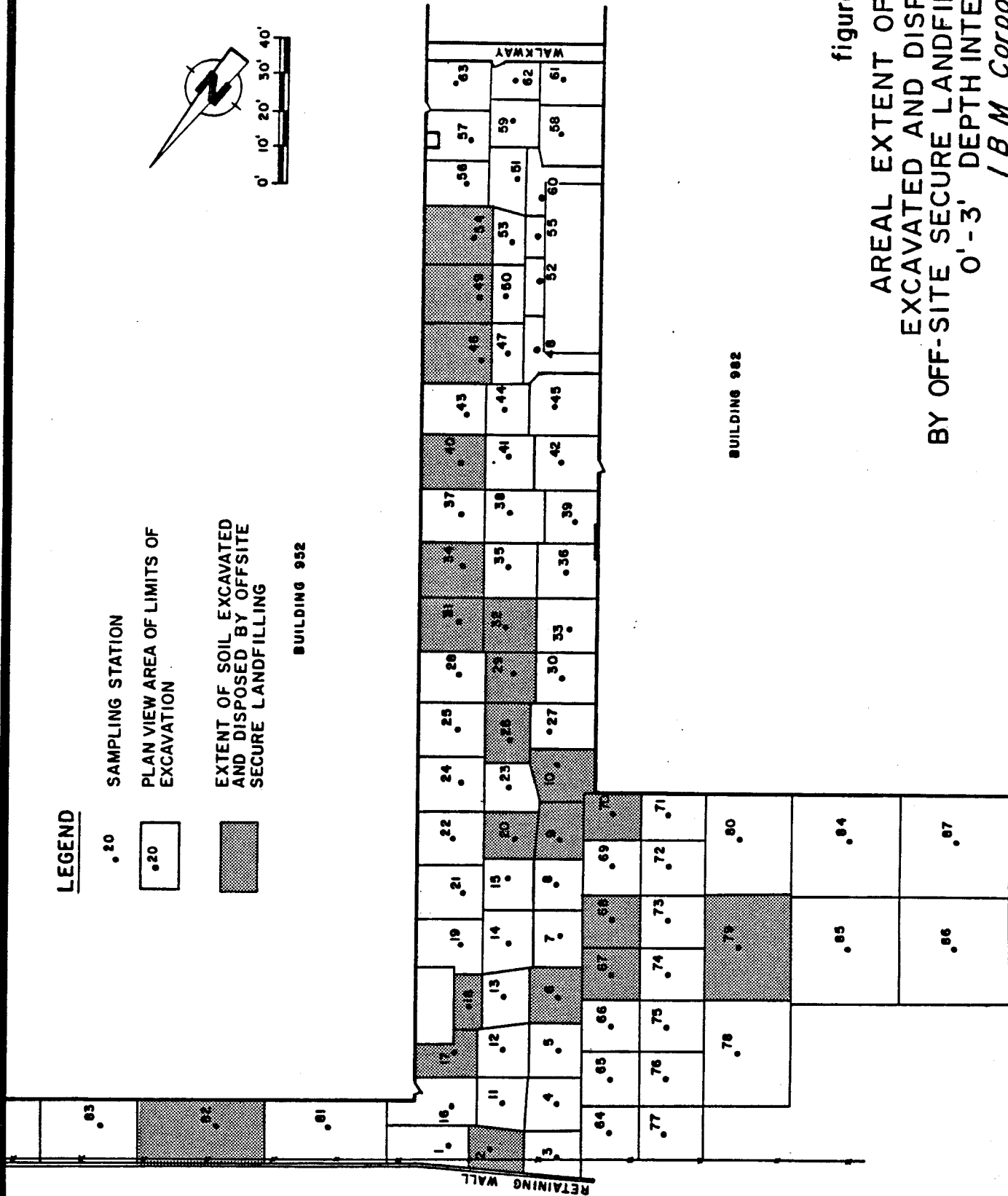
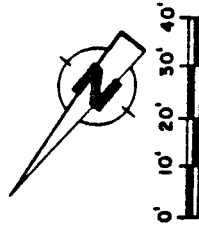


figure 34  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
0'-3' DEPTH INTERVAL  
IBM Corporation



# LEGEND

•20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING

BUILDING 952

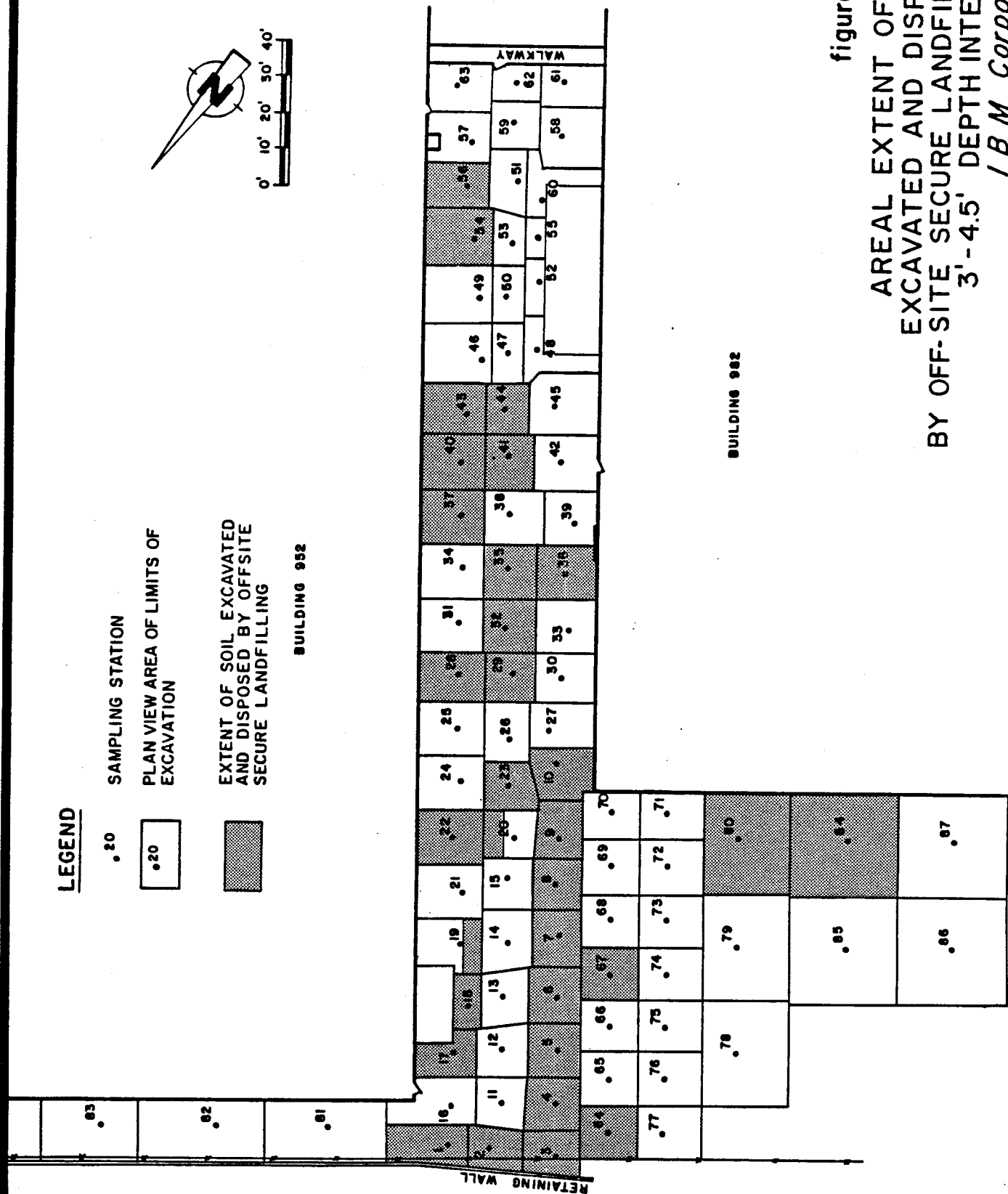
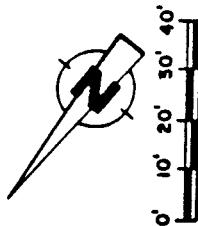


figure 35  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
3'-4.5' DEPTH INTERVAL  
IBM Corporation

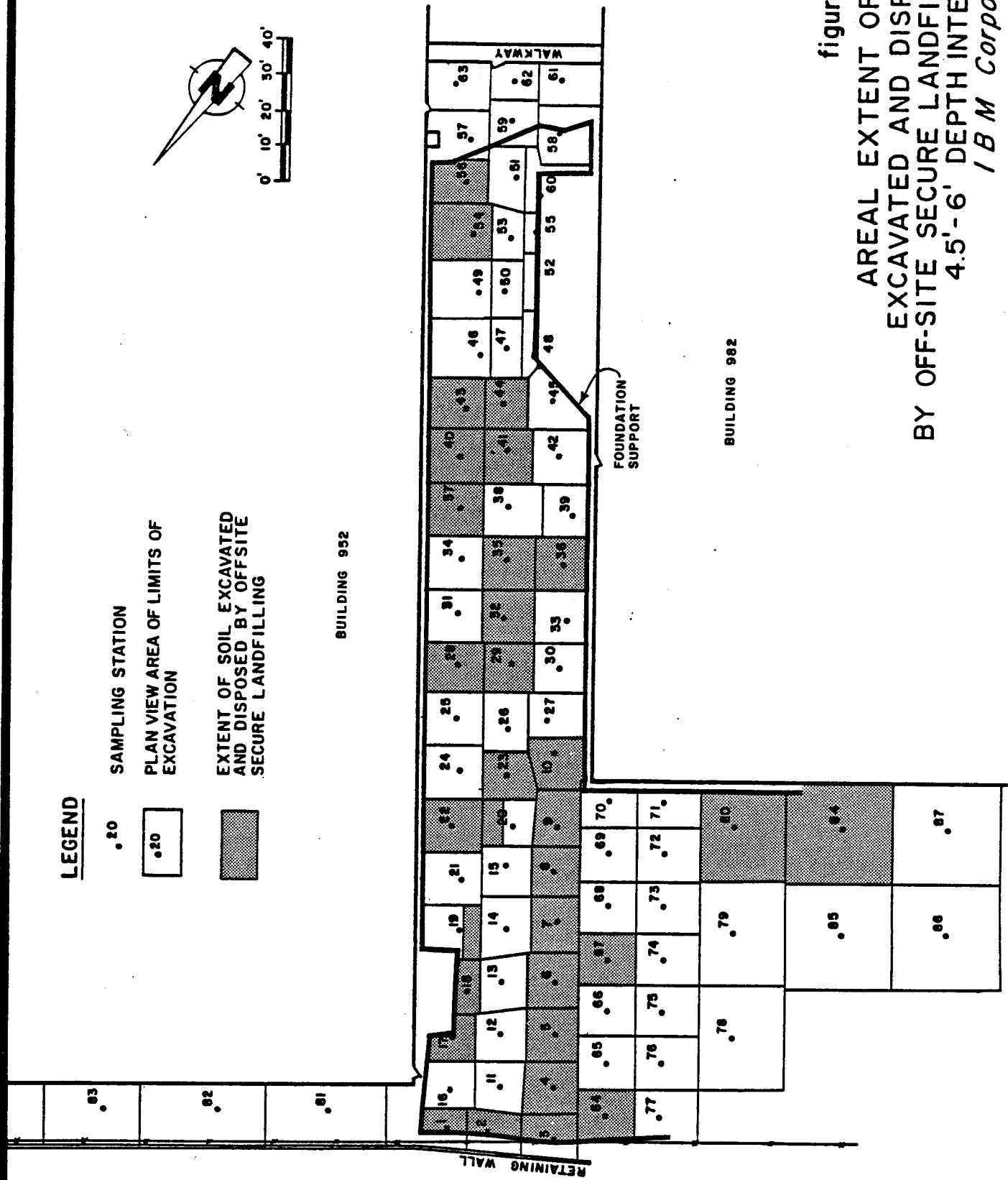


figure 36

AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
4.5'-6' DEPTH INTERVAL  
*I B M Corporation*

**CRA**

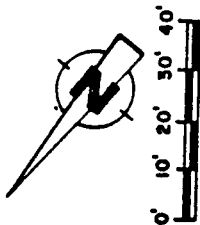
1437-12/04/85

# LEGEND

.20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

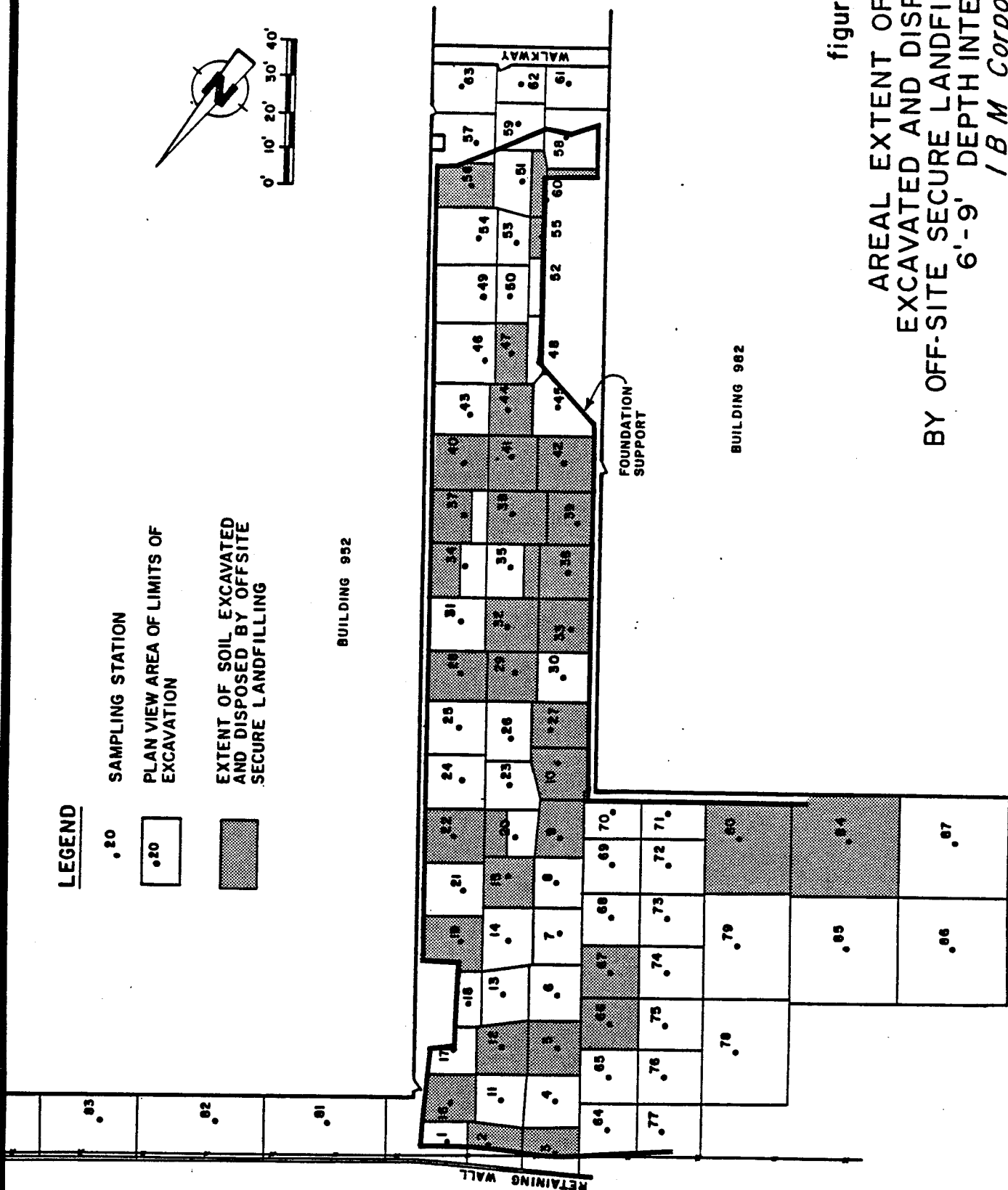


figure 37  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
6'-9' DEPTH INTERVAL  
IBM Corporation

# LEGEND

- .20
- .20
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING

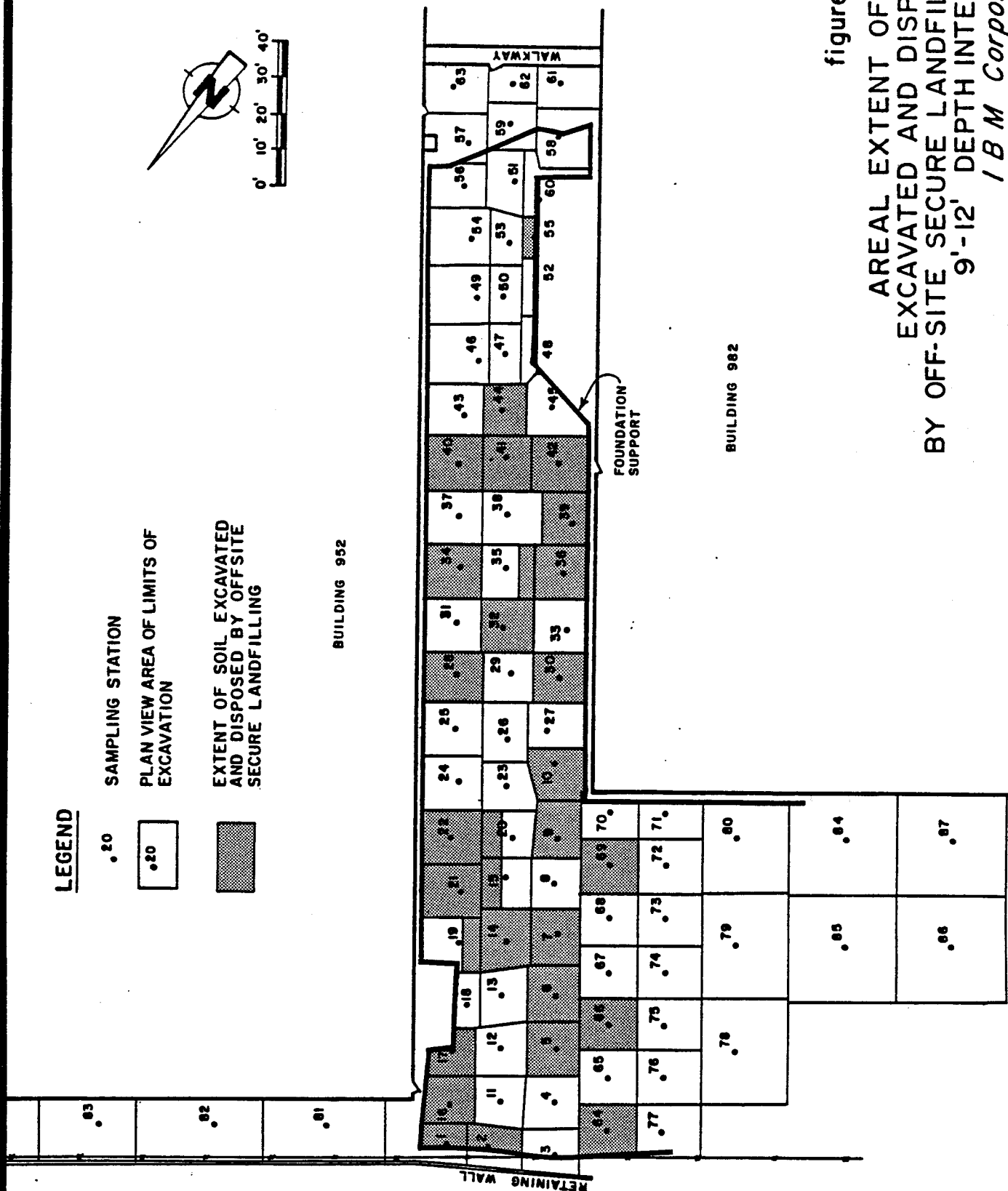
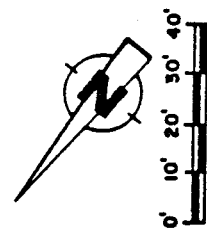


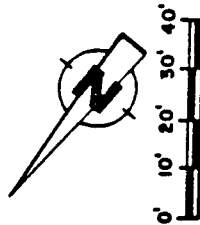
figure 38  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
9'-12' DEPTH INTERVAL  
I B M Corporation

# LEGEND

•20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

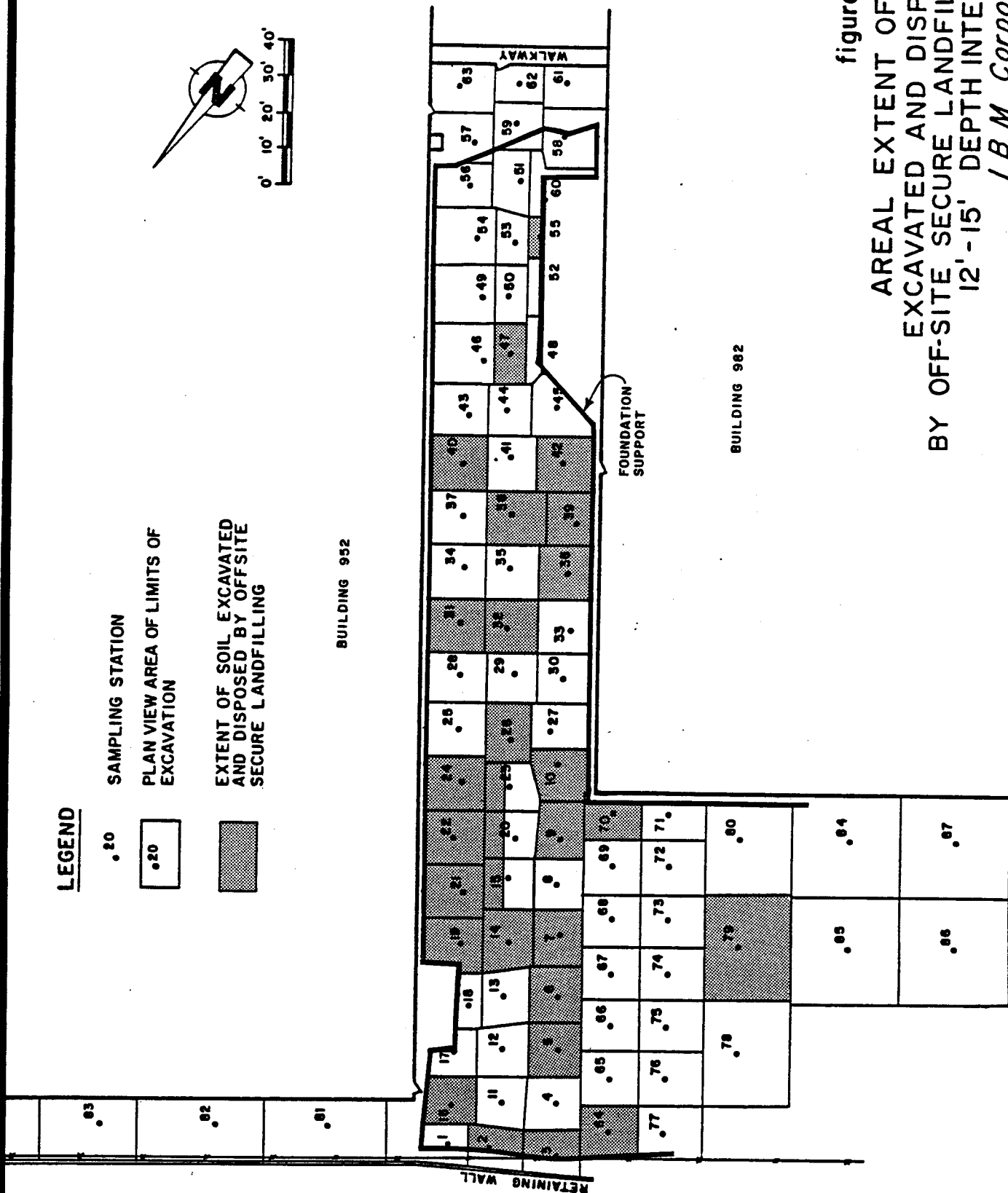


figure 39  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
12'-15' DEPTH INTERVAL  
I B M Corporation

# LEGEND

• 20

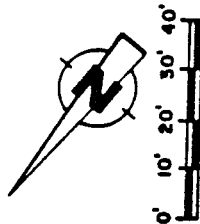
SAMPLING STATION

• 20

PLAN VIEW AREA OF LIMITS OF  
EXCAVATION



EXTENT OF SOIL EXCAVATED  
AND DISPOSED BY OFFSITE  
SECURE LANDFILLING



BUILDING 952

BUILDING 982

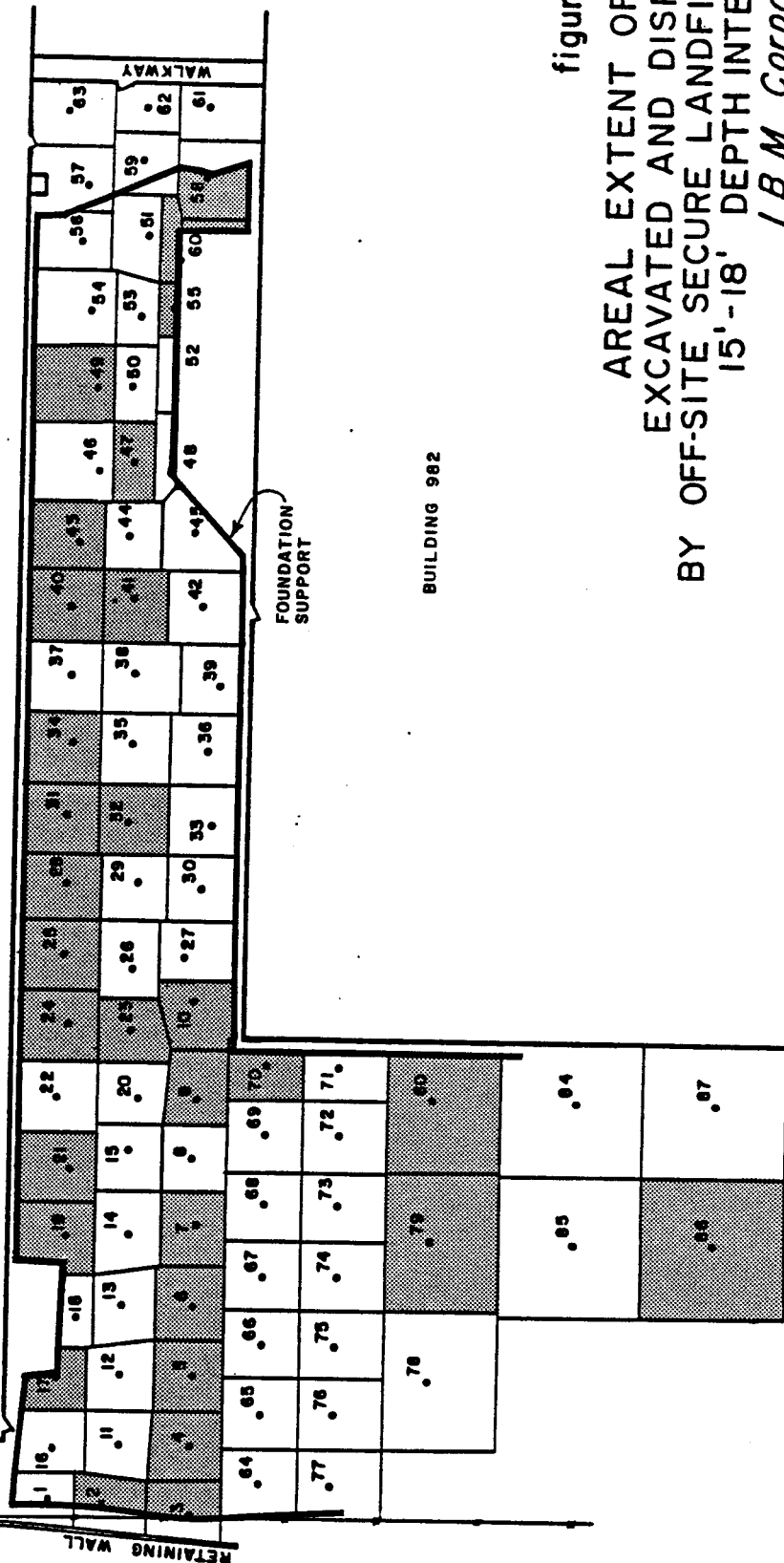
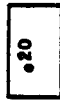


figure 40  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
15'-18' DEPTH INTERVAL  
I B M Corporation

# LEGEND

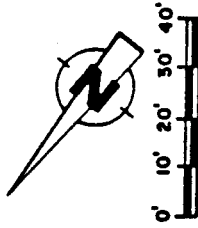
• 20 SAMPLING STATION



PLAN VIEW AREA OF LIMITS OF EXCAVATION



EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

RETAINING WALL

FOUNDATION SUPPORT

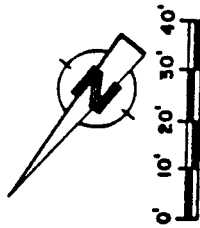
WALKWAY

figure 41  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
18'-21' DEPTH INTERVAL  
I B M Corporation

CRA

# LEGEND

- 20 SAMPLING STATION
- 20 PLAN VIEW AREA OF LIMITS OF EXCAVATION
- EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

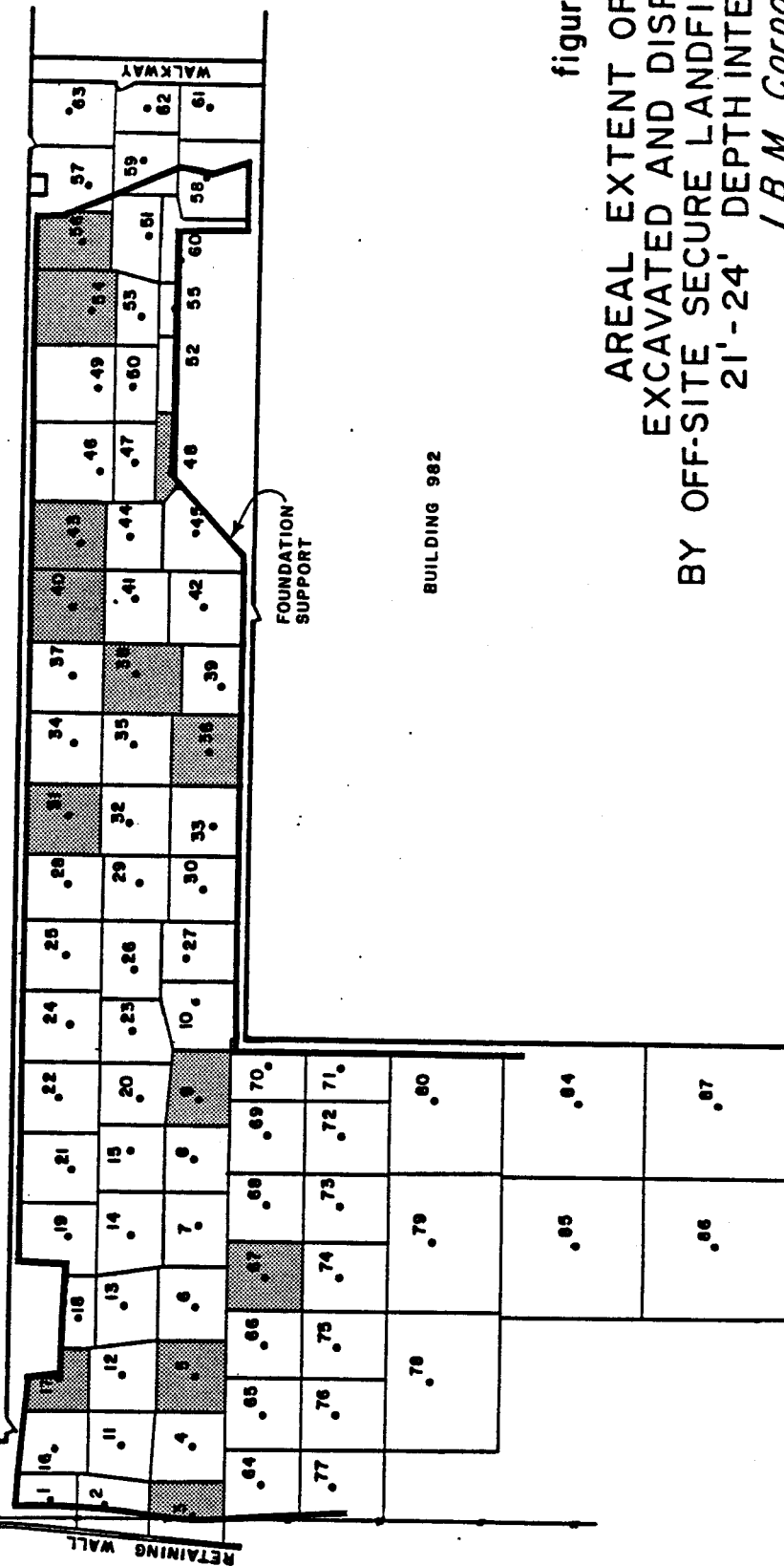


figure 42  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
21'-24' DEPTH INTERVAL  
I B M Corporation

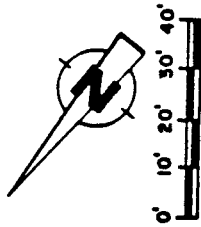
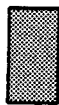


# LEGEND

.20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

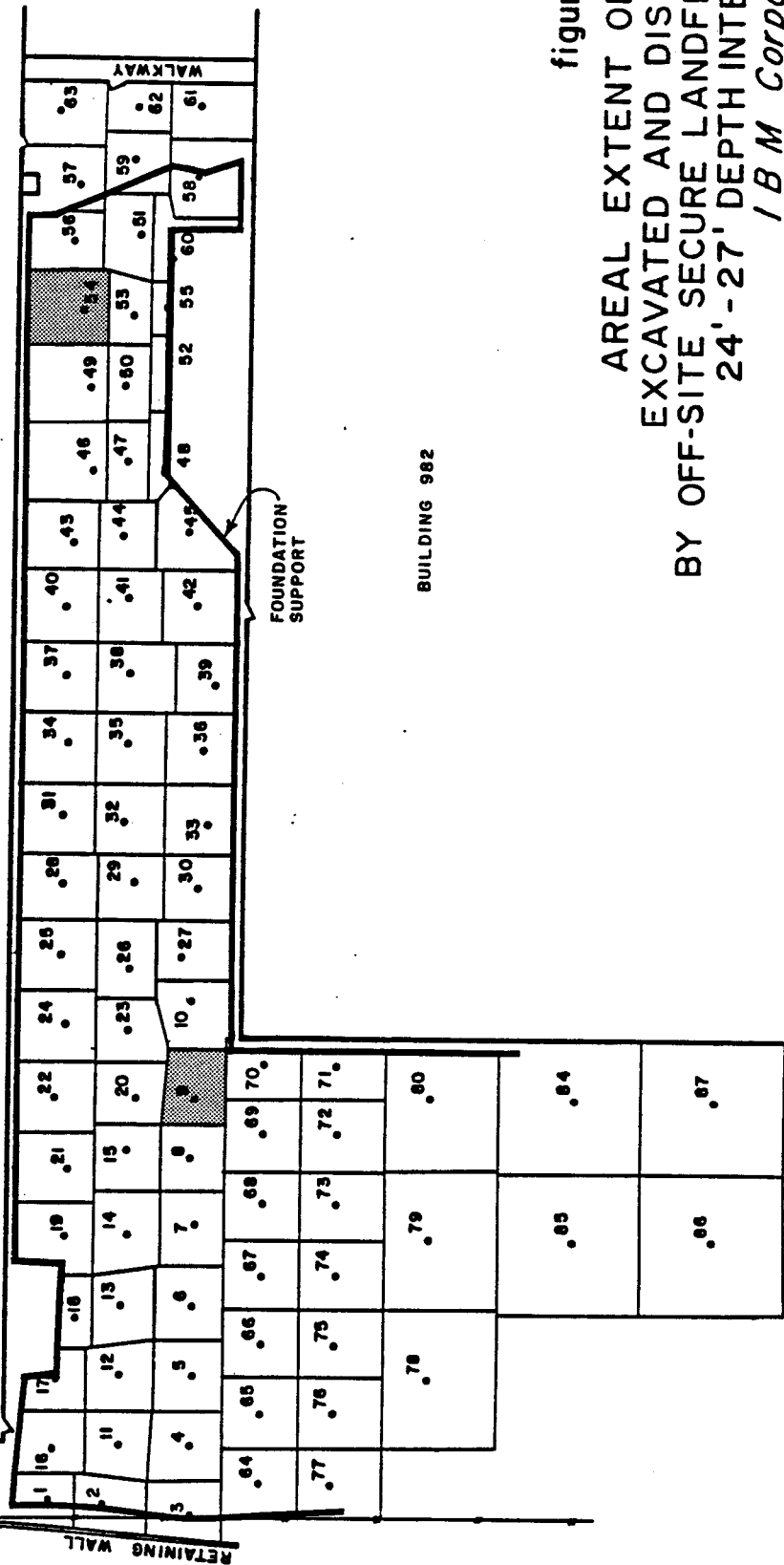


figure 43  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
24'-27' DEPTH INTERVAL  
I B M Corporation

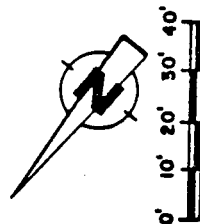
CRA

# LEGEND

• 20 SAMPLING STATION

PLAN VIEW AREA OF LIMITS OF EXCAVATION

EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 952

BUILDING 982

RETAINING WALL

FOUNDATION SUPPORT

WALKWAY

figure 44  
AREAL EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFF-SITE SECURE LANDFILLING 27'-30' DEPTH INTERVAL I B M Corporation

CRA

# **LEGEND**

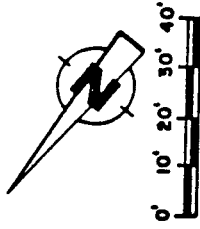
SAMPLING STATION

.20

PLAN VIEW AREA OF LIMITS OF EXCAVATION



EXTENT OF SOIL EXCAVATED AND DISPOSED BY OFFSITE SECURE LANDFILLING



BUILDING 932

BUILDING 982

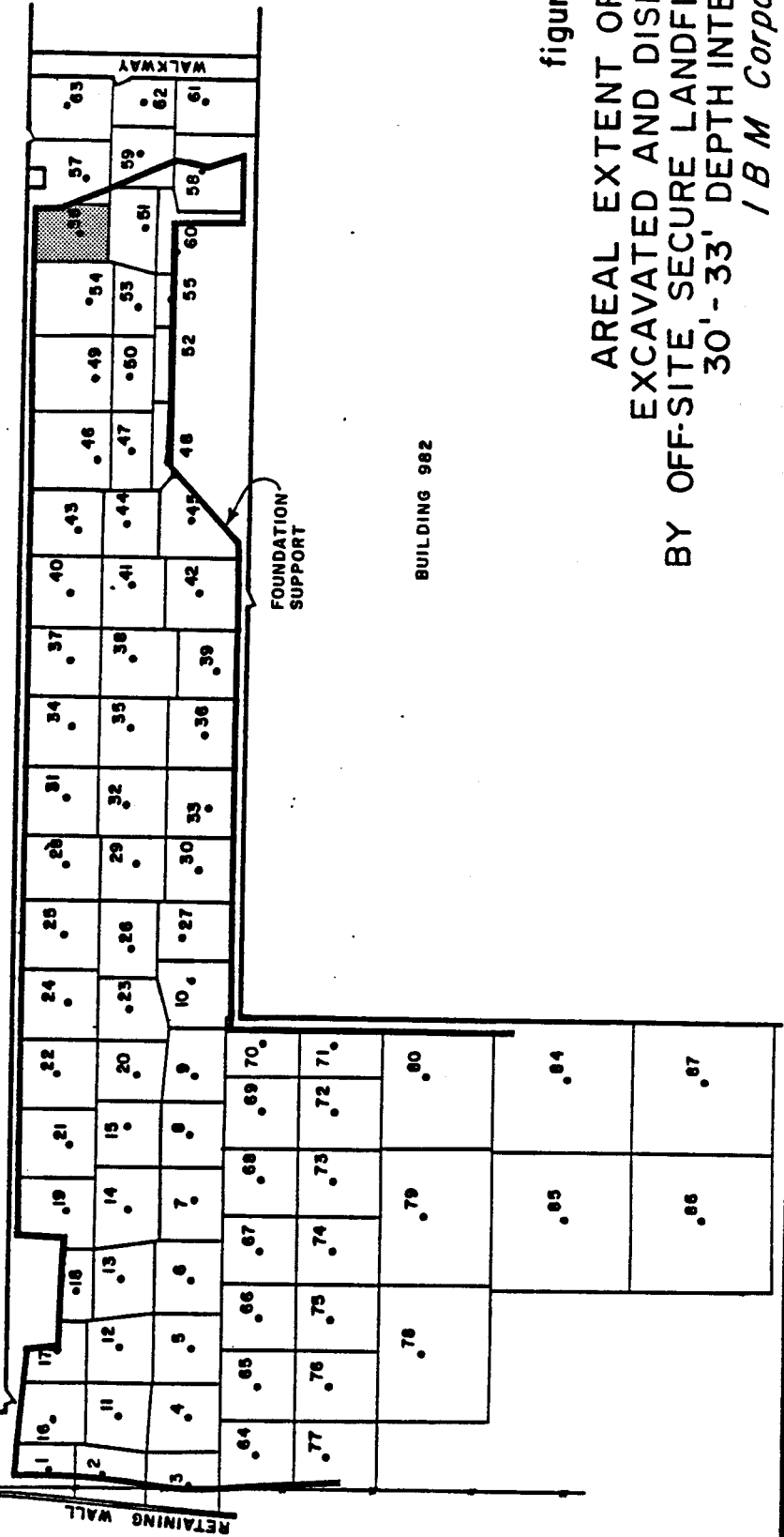


figure 45  
AREAL EXTENT OF SOIL  
EXCAVATED AND DISPOSED  
BY OFF-SITE SECURE LANDFILLING  
30'-33' DEPTH INTERVAL  
I B M Corporation

CRA

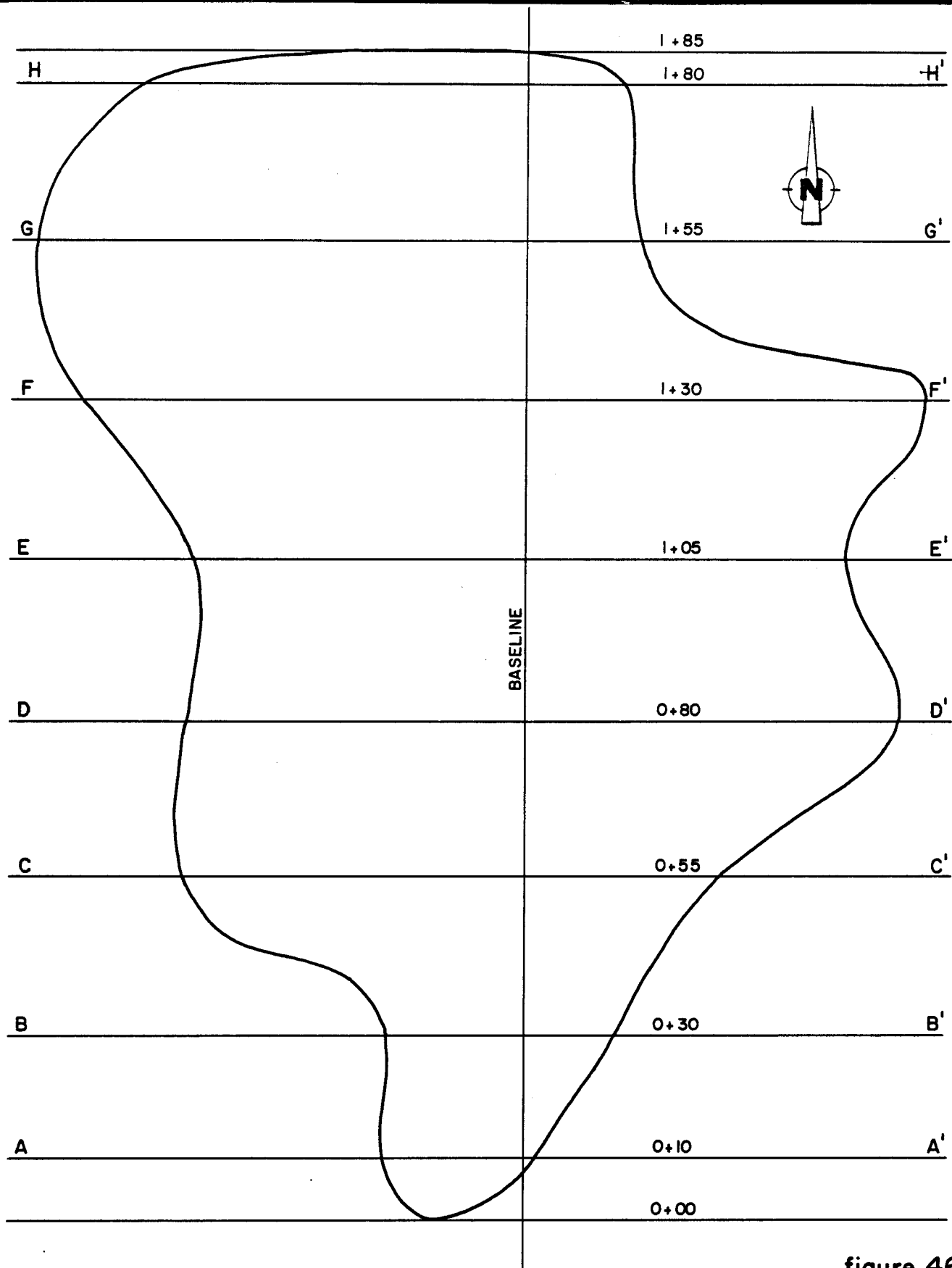


figure 46

CLEAN SOIL STOCKPILE IN  
PARKING LOT NORTH OF BUILDING 928  
*IBM Corporation*

**CRA**

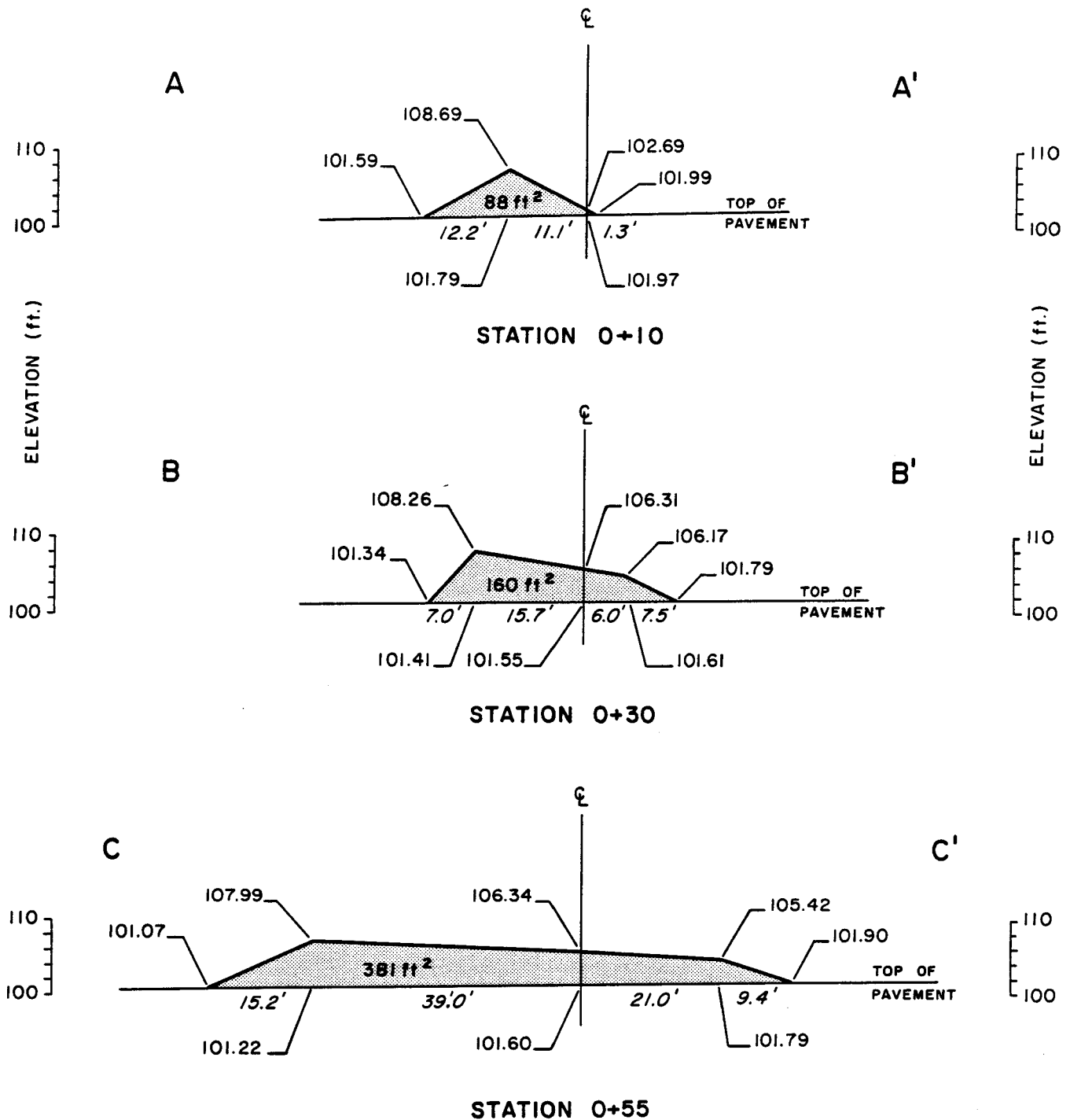


figure 47  
 CLEAN SOIL STOCKPILE  
 CROSS-SECTIONS A-A', B-B', C-C'  
 I B M Corporation

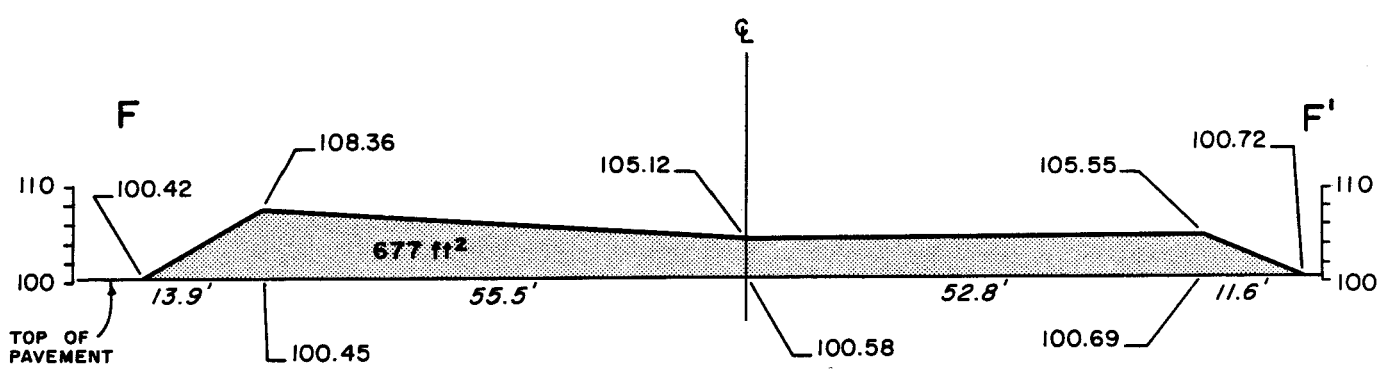
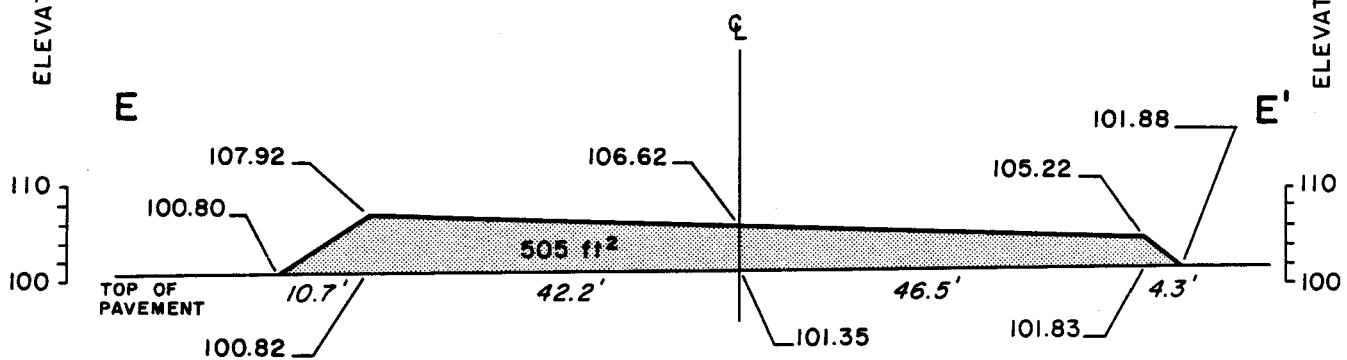
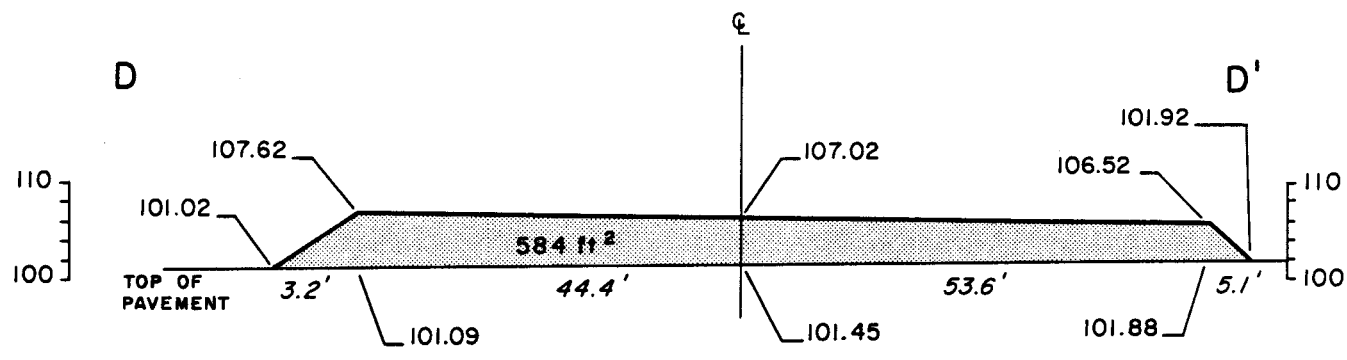
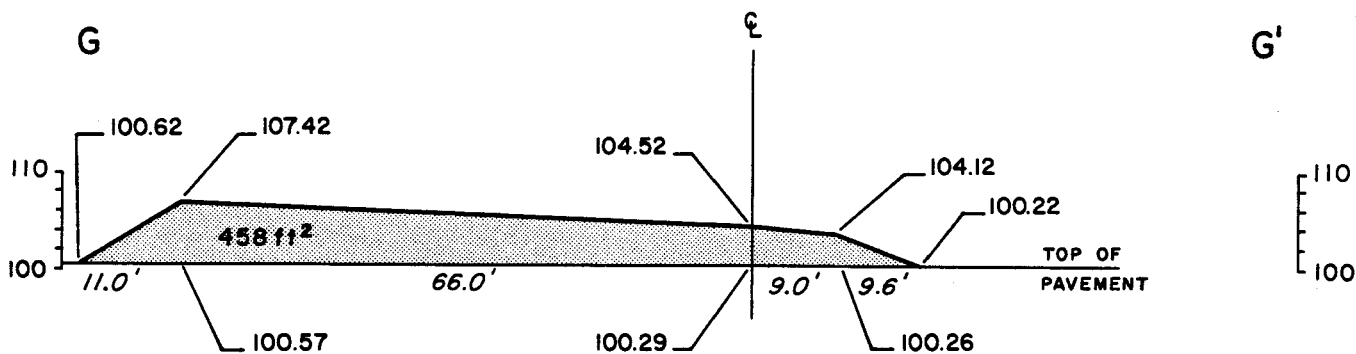
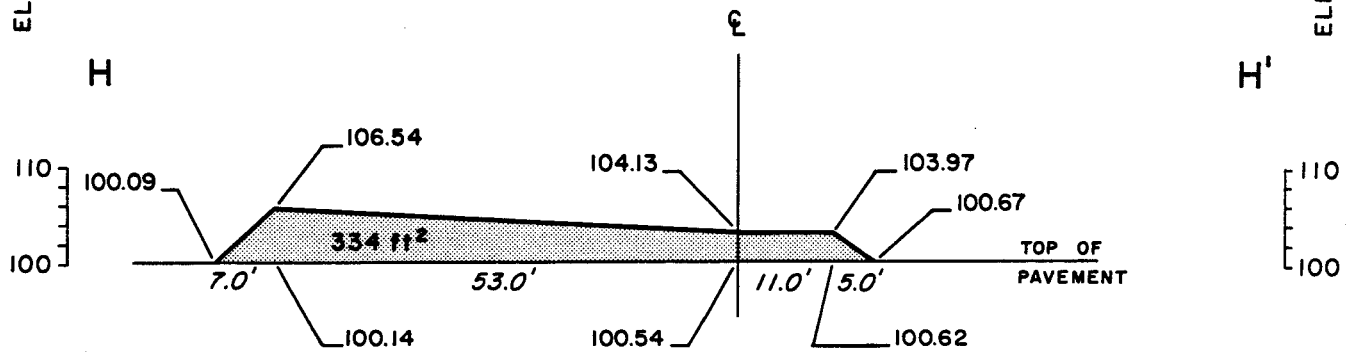


figure 48  
 CLEAN SOIL STOCKPILE  
 CROSS-SECTIONS D-D', E-E', F-F'  
 I B M Corporation



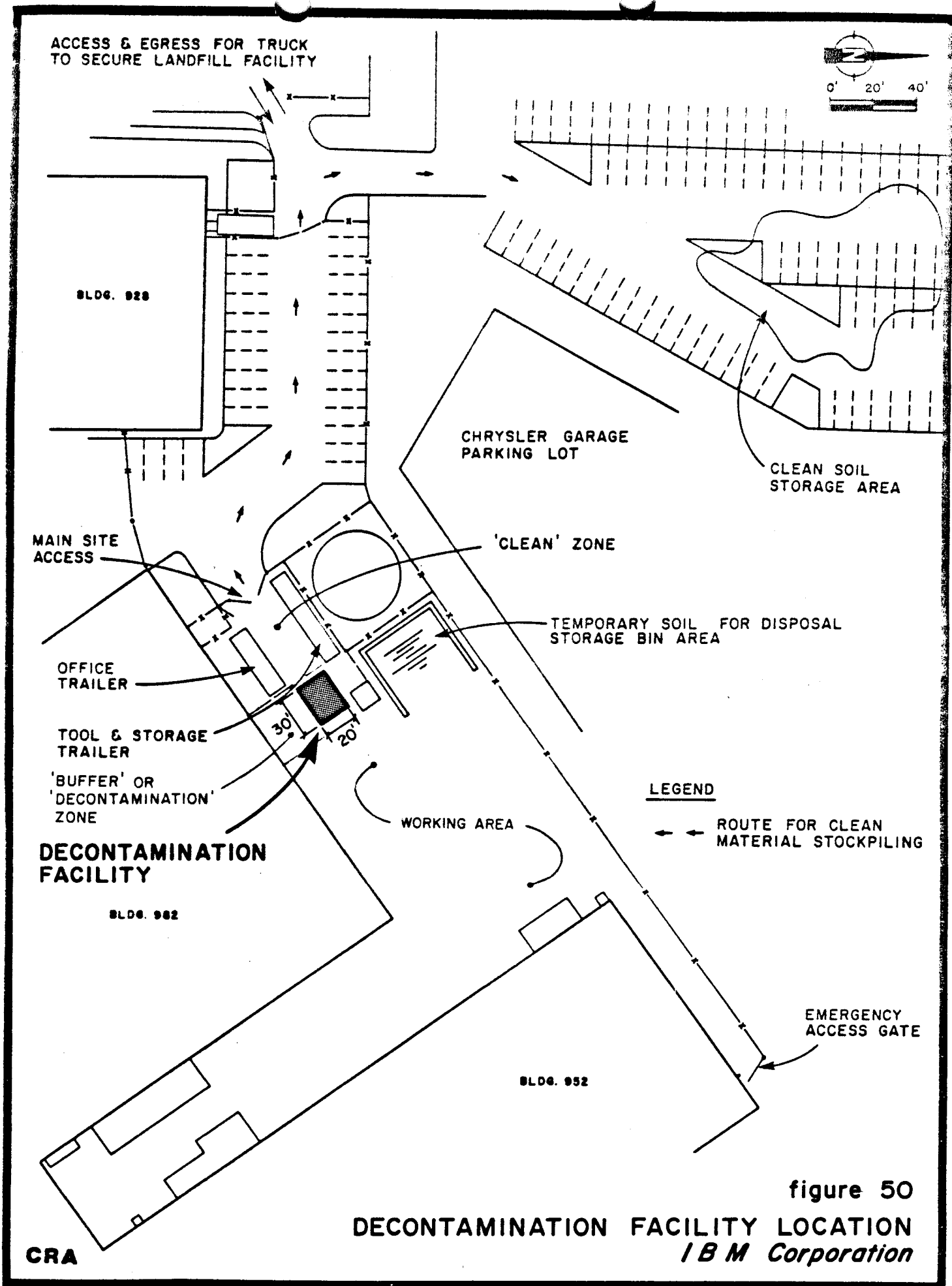
ELEVATION (ft)

ELEVATION (ft)

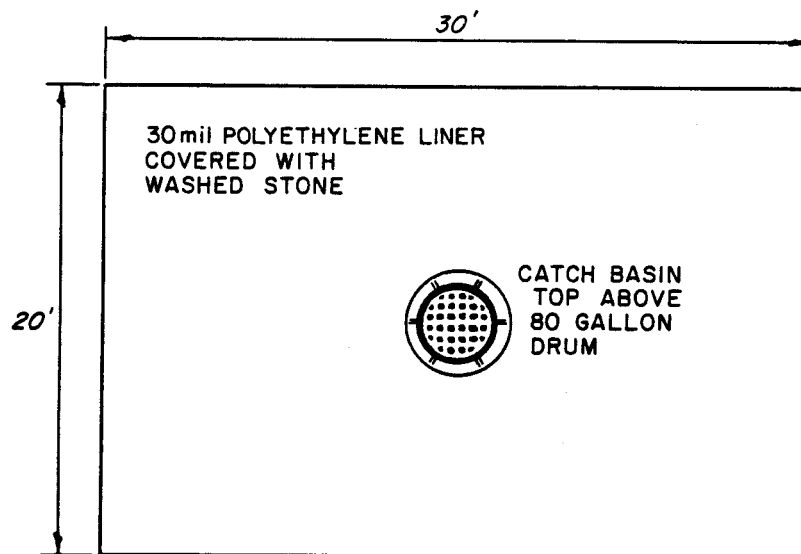


CRA

figure 49  
CLEAN SOIL STOCKPILE  
CROSS-SECTIONS G-G', H-H'  
IBM Corporation

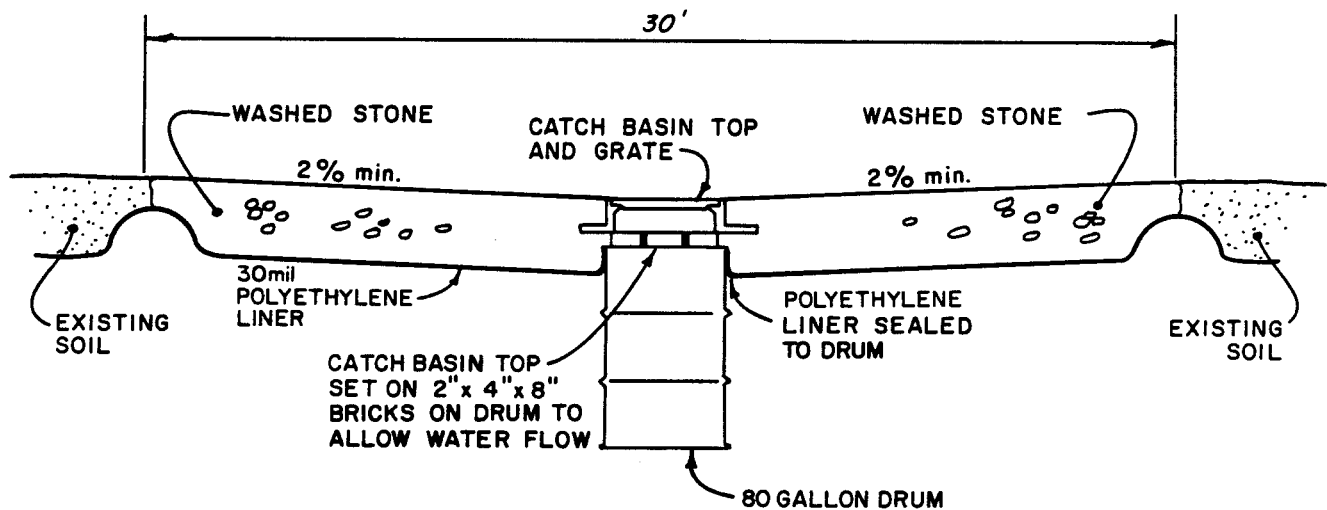






PLAN VIEW

N.T.S.



PROFILE VIEW

N.T.S.

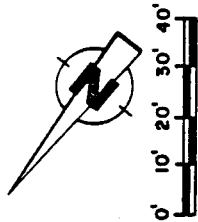
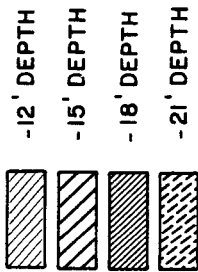
figure 5I

DECONTAMINATION FACILITY  
IBM Corporation

CRA

# LEGEND

SAMPLING STATION



BUILDING 952

BUILDING 982

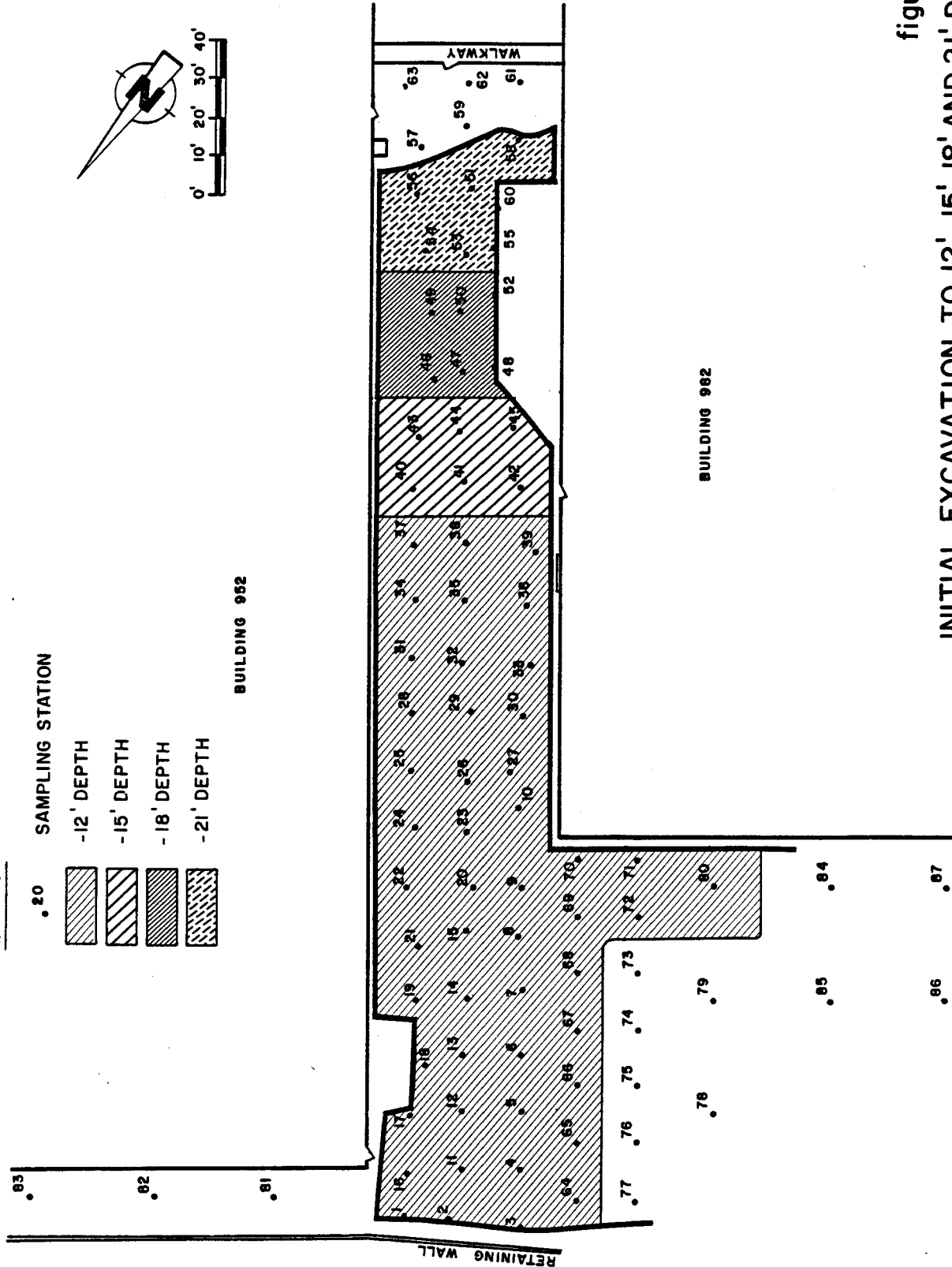
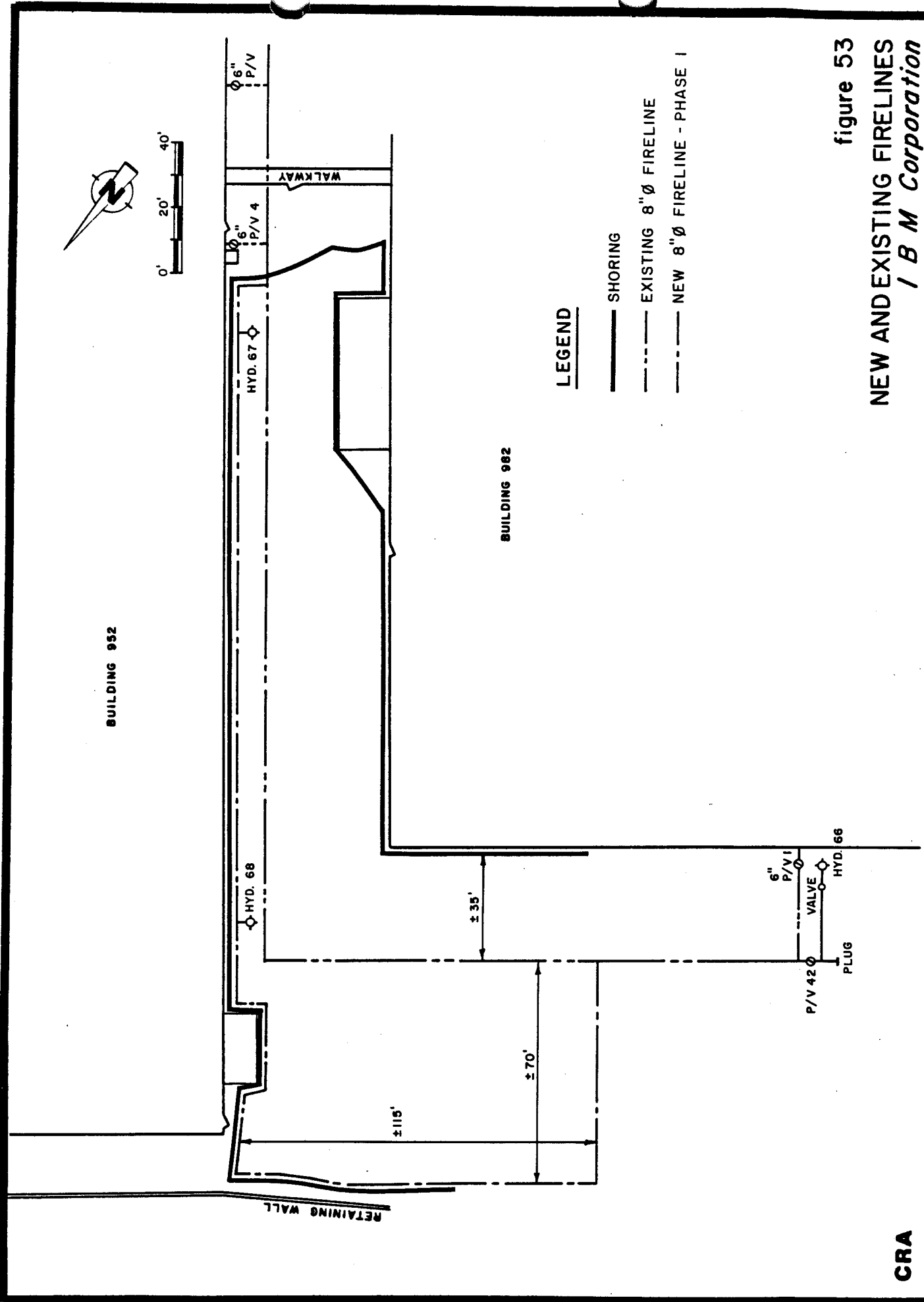


figure 52  
INITIAL EXCAVATION TO 12', 15', 18' AND 21' DEPTHS  
/ B M Corporation



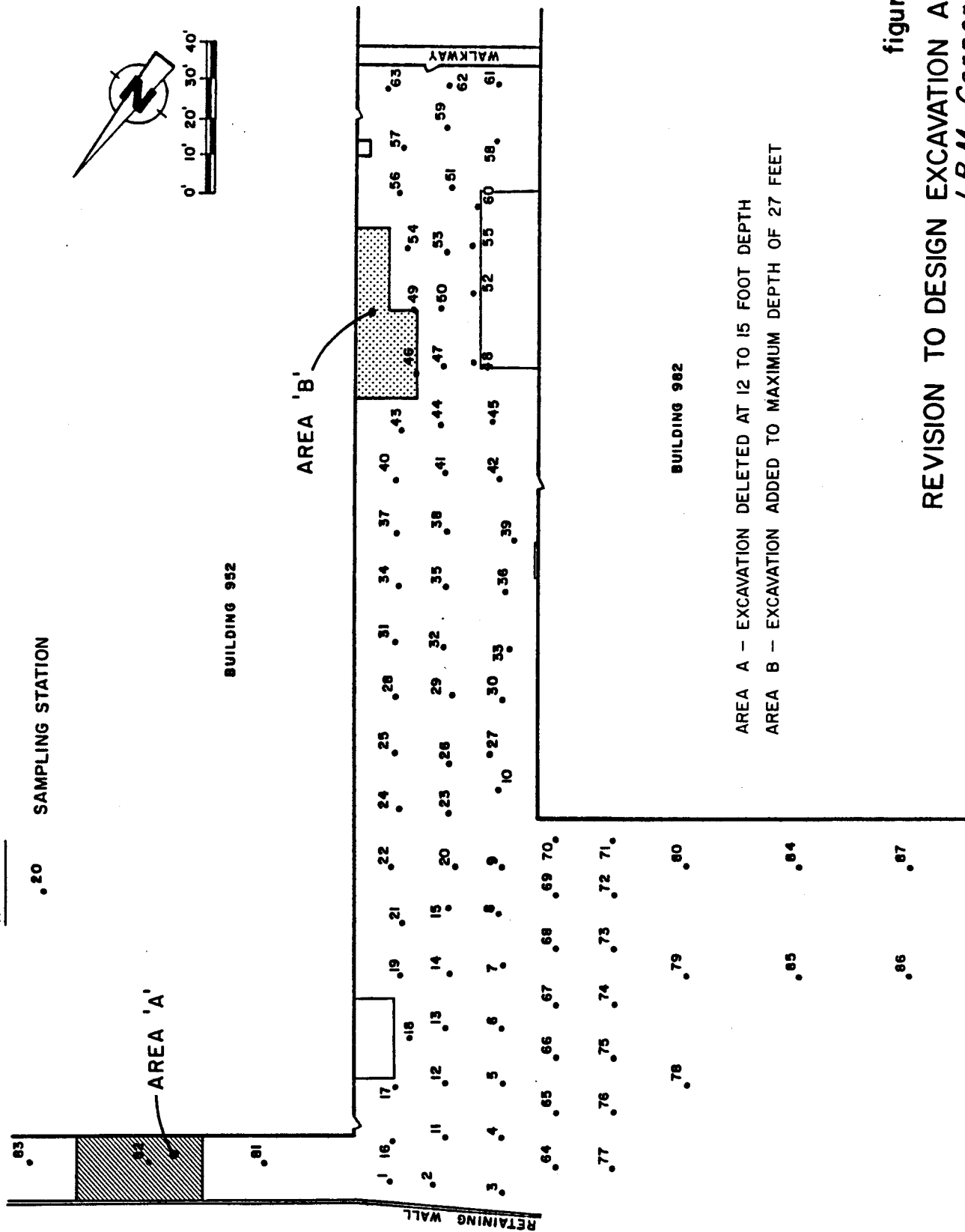
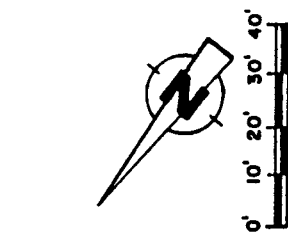
**LEGEND**

- SHORING
- - - EXISTING 8" Ø FIRELINE
- · - · NEW 8" Ø FIRELINE - PHASE I

figure 53  
NEW AND EXISTING FIRELINES  
I B M Corporation

# **LEGEND**

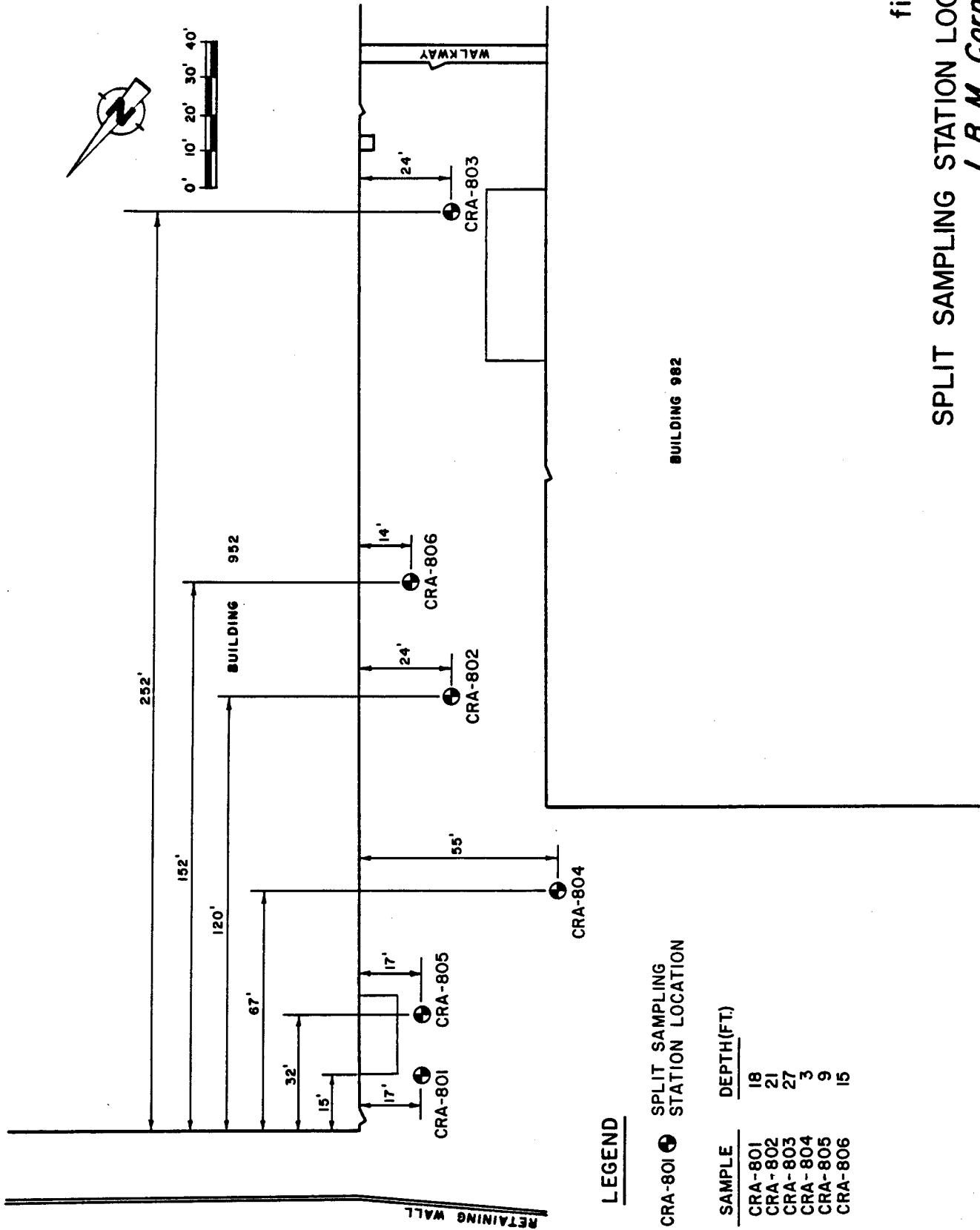
.20 SAMPLING STATION



AREA A - EXCAVATION DELETED AT 12 TO 15 FOOT DEPTH  
 AREA B - EXCAVATION ADDED TO MAXIMUM DEPTH OF 27 FEET

figure 54  
 REVISION TO DESIGN EXCAVATION AREAS  
 IBM Corporation

**CRA**



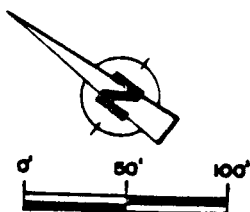
**LEGEND**

CRA-801 SPLIT SAMPLING STATION LOCATION

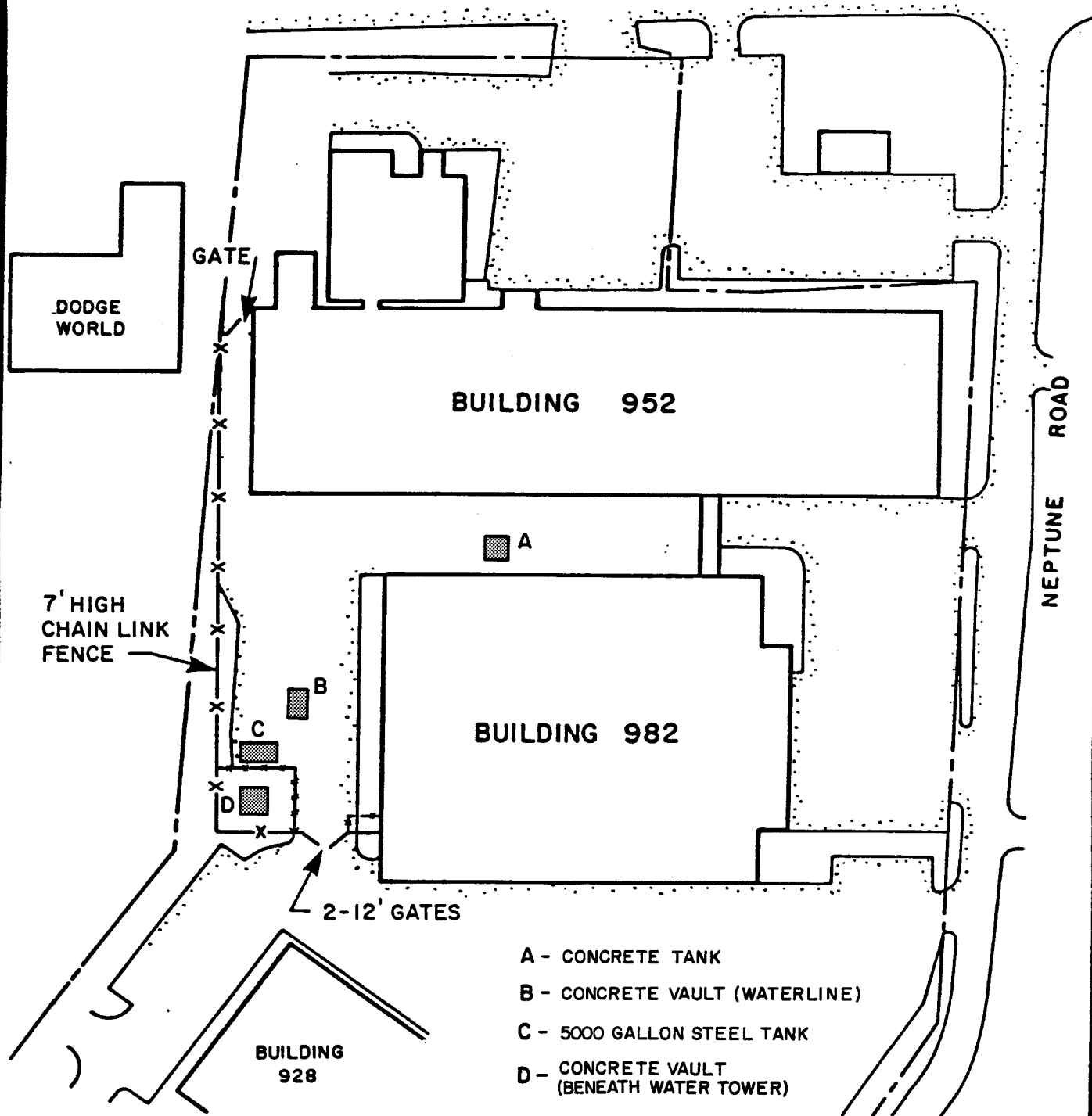
SAMPLE	DEPTH(FT.)
CRA-801	18
CRA-802	21
CRA-803	27
CRA-804	3
CRA-805	9
CRA-806	15

**CRA**

figure 55  
SPLIT SAMPLING STATION LOCATIONS  
*I B M Corporation*



ALBANY POST ROAD (ROUTE 9)



- A - CONCRETE TANK
- B - CONCRETE VAULT (WATERLINE)
- C - 5000 GALLON STEEL TANK
- D - CONCRETE VAULT (BENEATH WATER TOWER)

**LEGEND**

- PROPERTY BOUNDARY
- == PAVED ROADWAY/PARKING LOT

figure 56

**TANK AND VAULT REMOVALS**  
IBM Corporation

**CRA**

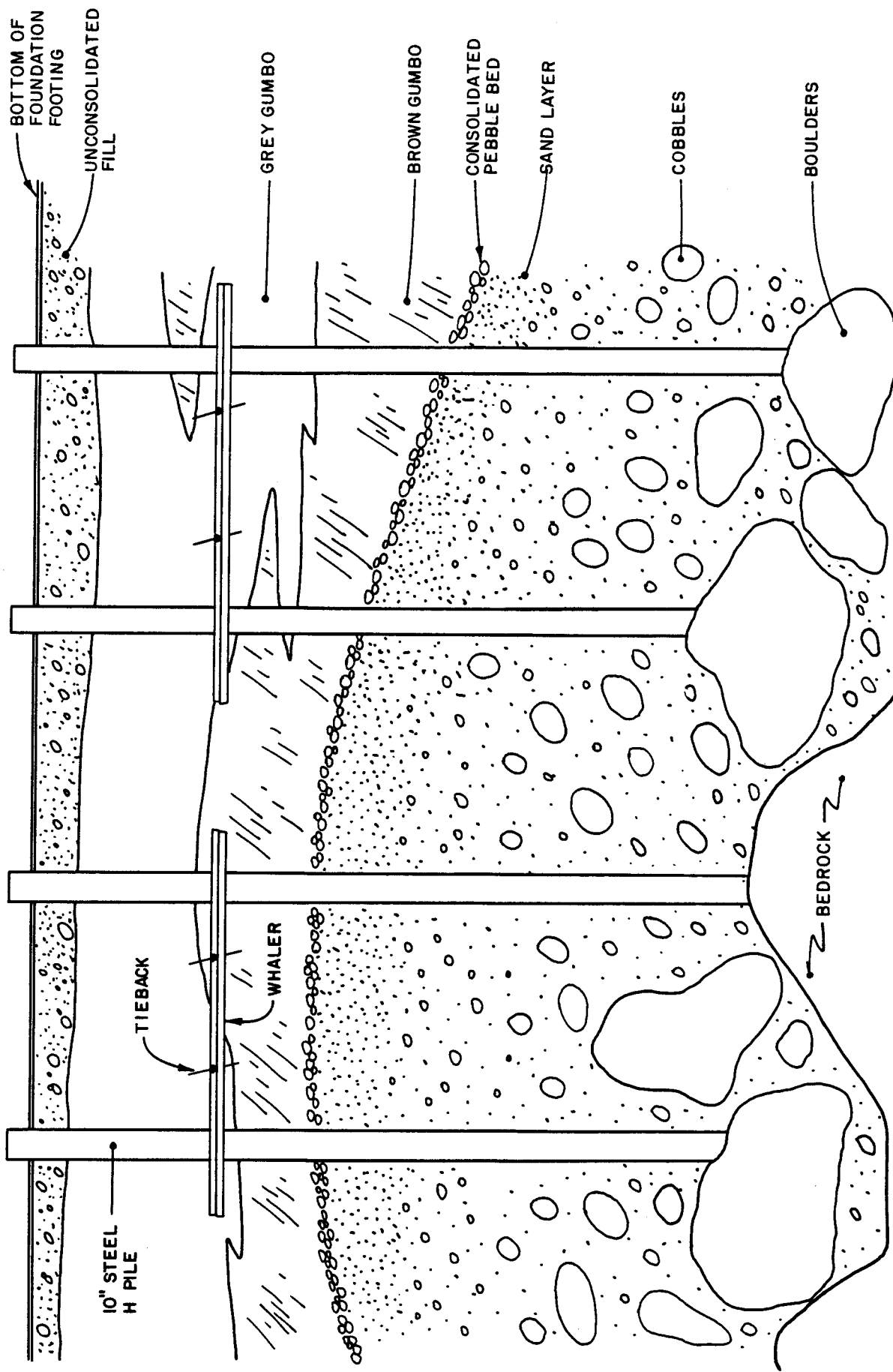
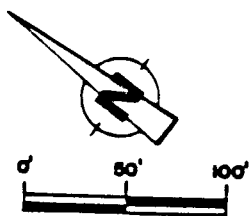


figure 57

CROSS-SECTION BETWEEN PILINGS 71 AND 74 (TYPICAL)  
IBM Corporation



ALBANY POST ROAD (ROUTE 9)

DODGE  
WORLD

GATE

BUILDING 952

7' HIGH  
CHAIN LINK  
FENCE

A3 B3 C3 D3 E3 F3

A4 B4

A5 B5

A6 B6

B7

BUILDING 982

2-12' GATES

BUILDING  
928

NEPTUNE  
ROAD

LEGEND

- PROPERTY BOUNDARY
- == PAVED ROADWAY/PARKING LOT

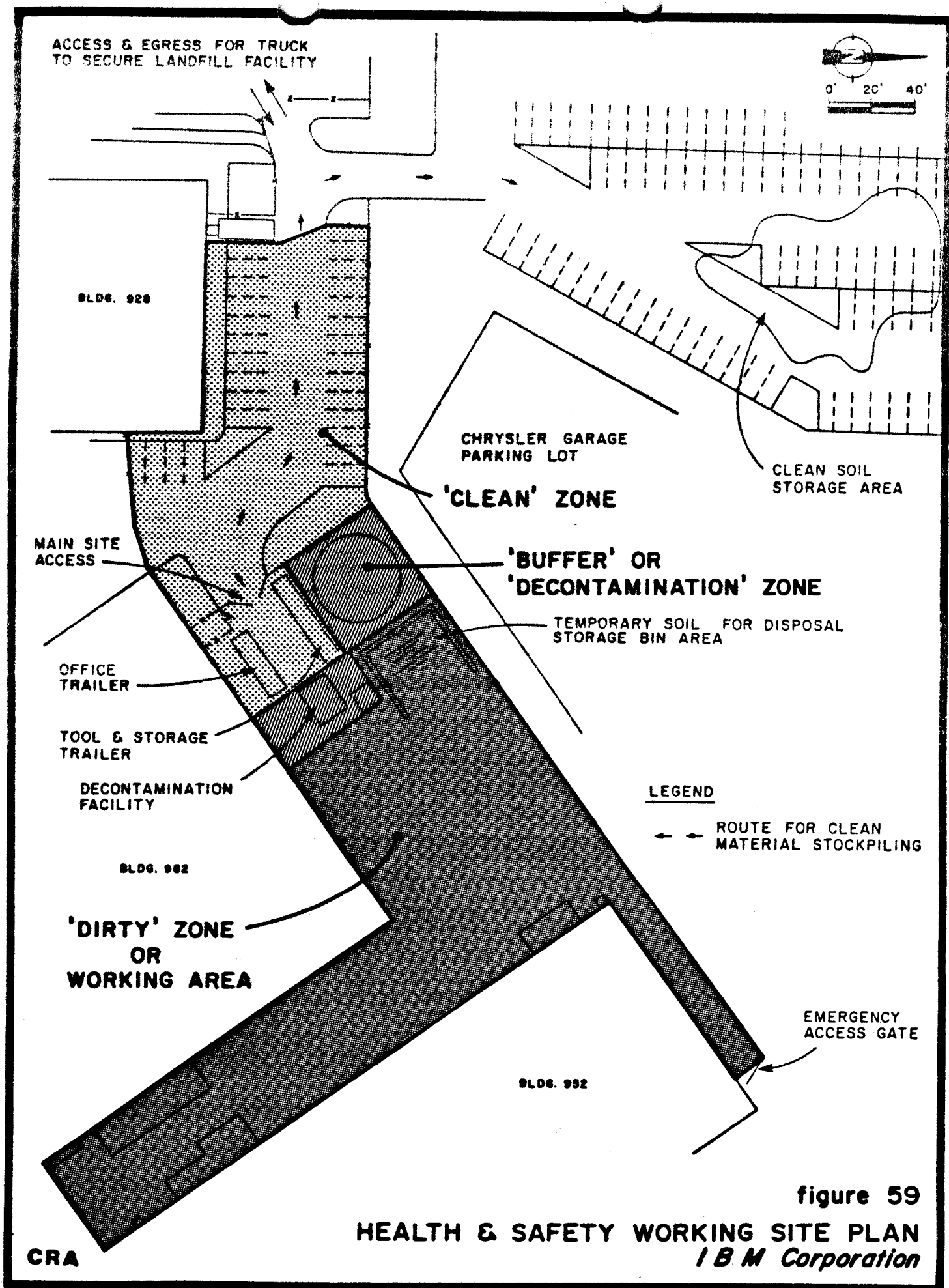
CRA

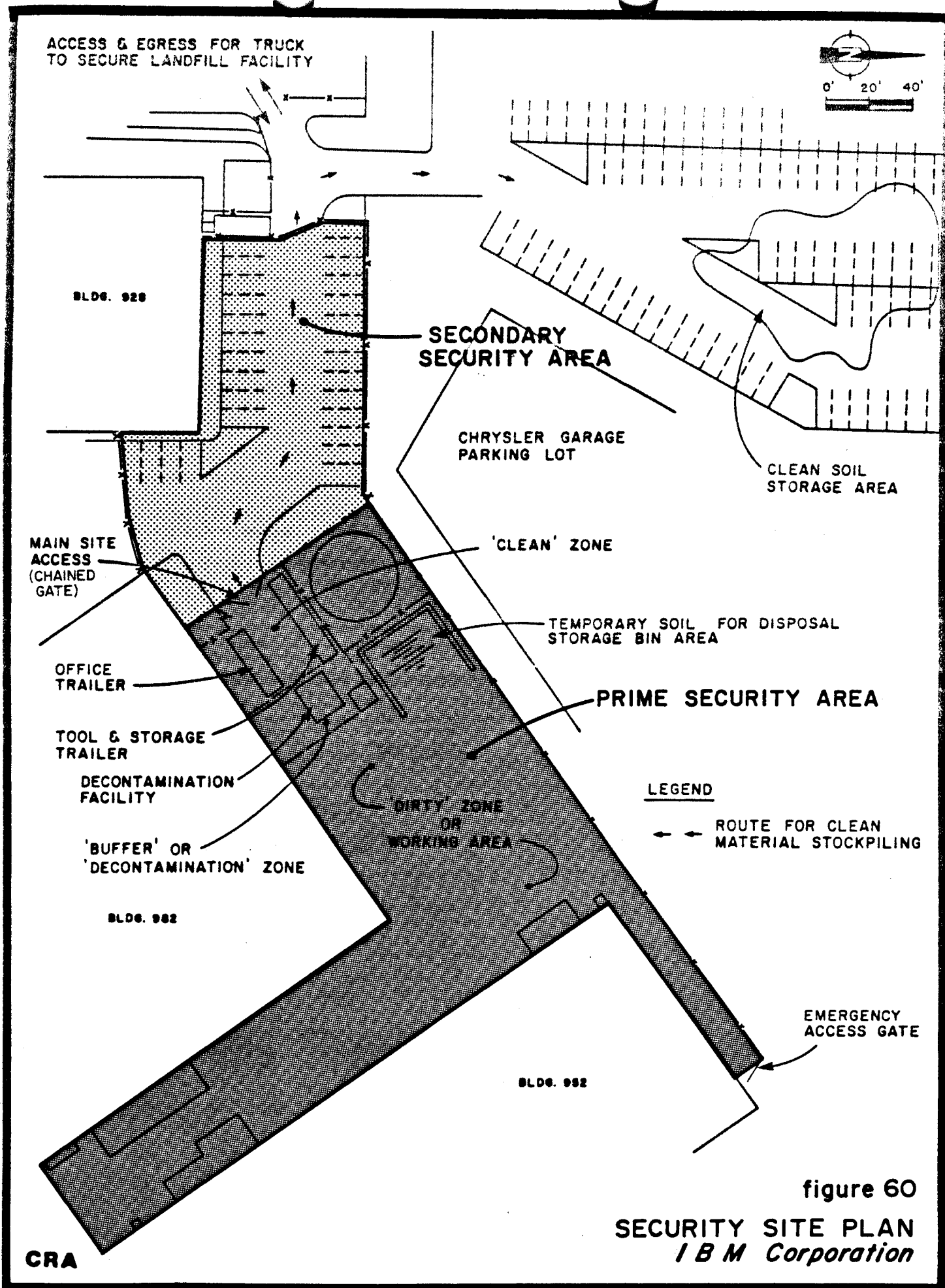
figure 58

AIR MONITORING  
SAMPLING GRID

IBM Corporation







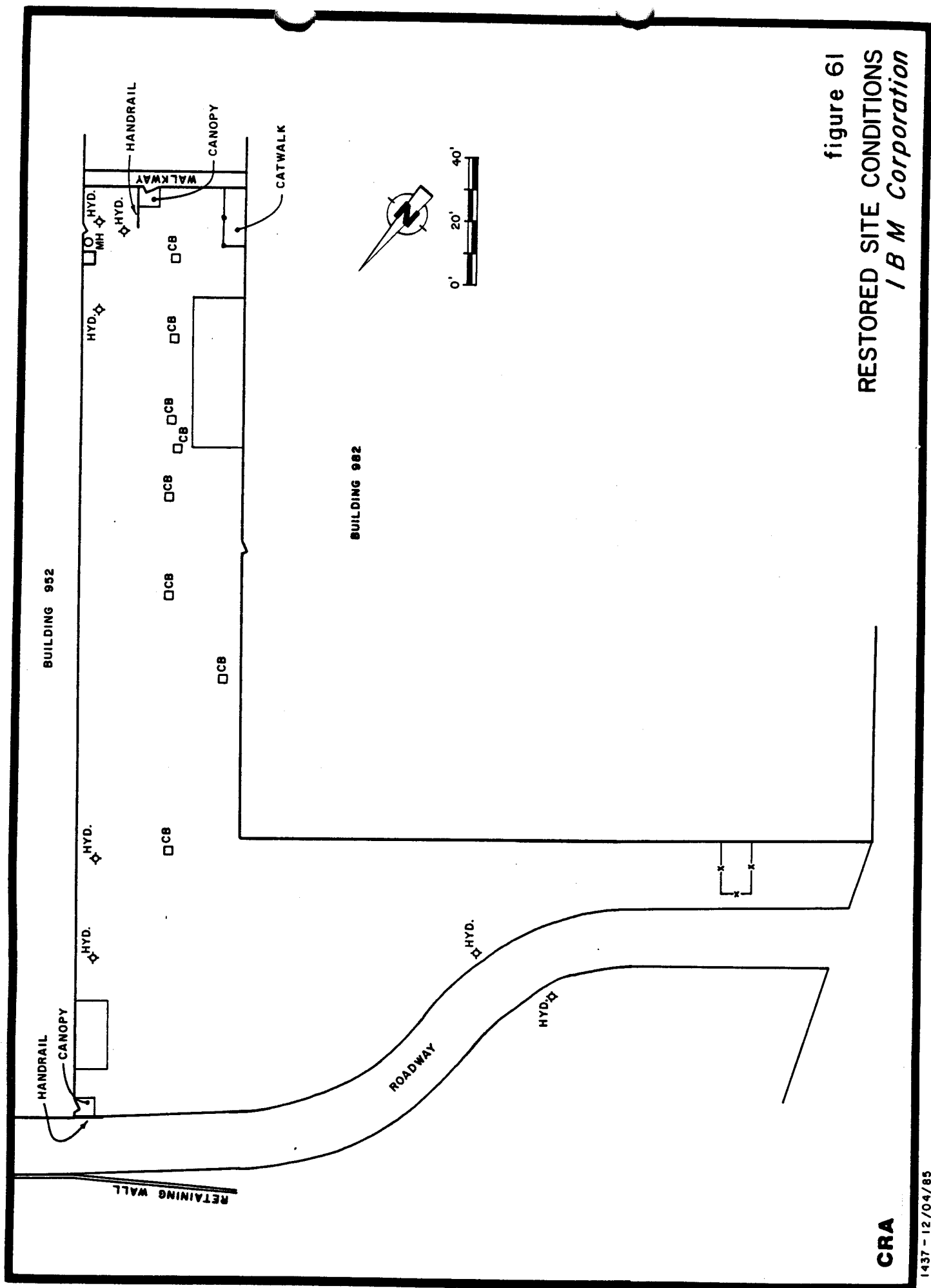
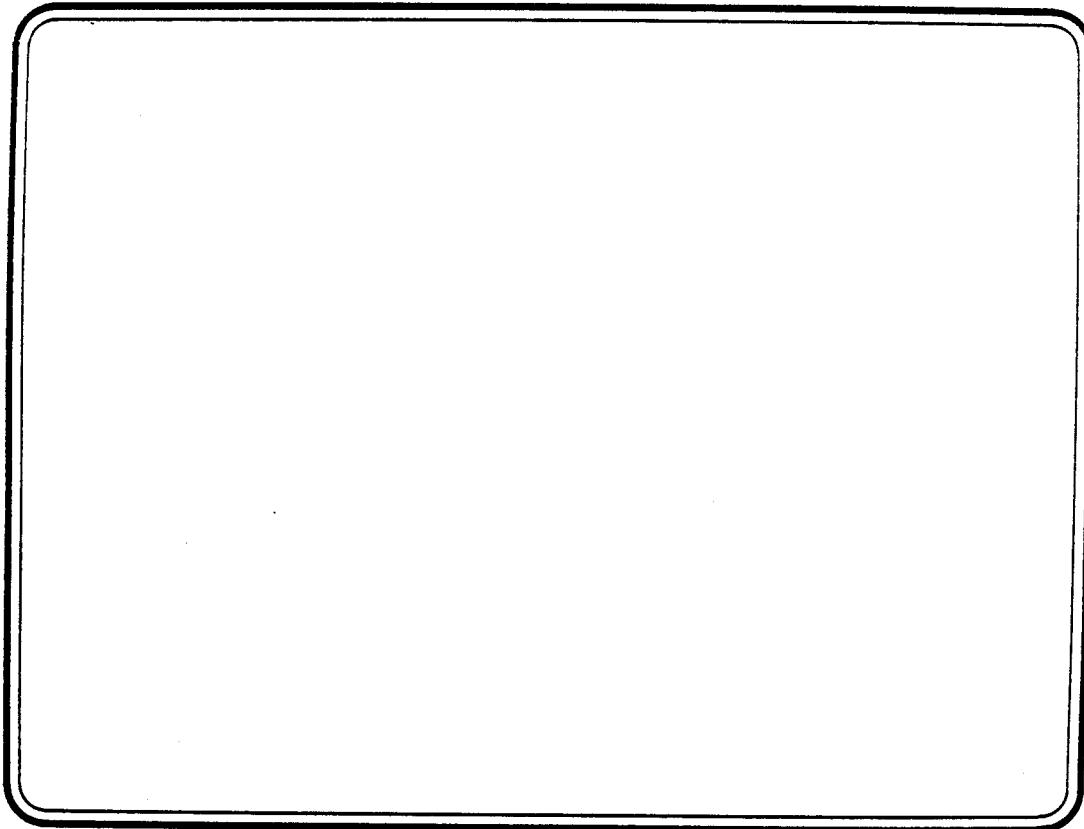


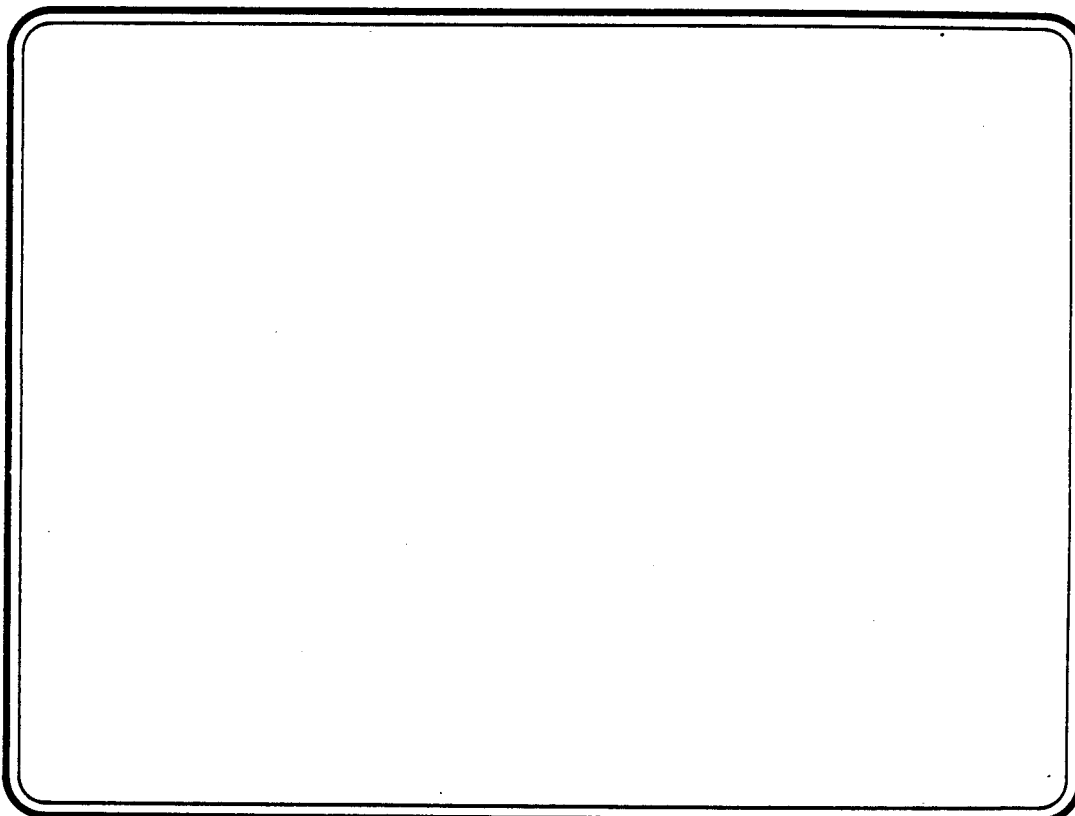
figure 61  
RESTORED SITE CONDITIONS  
I B M Corporation

CRA

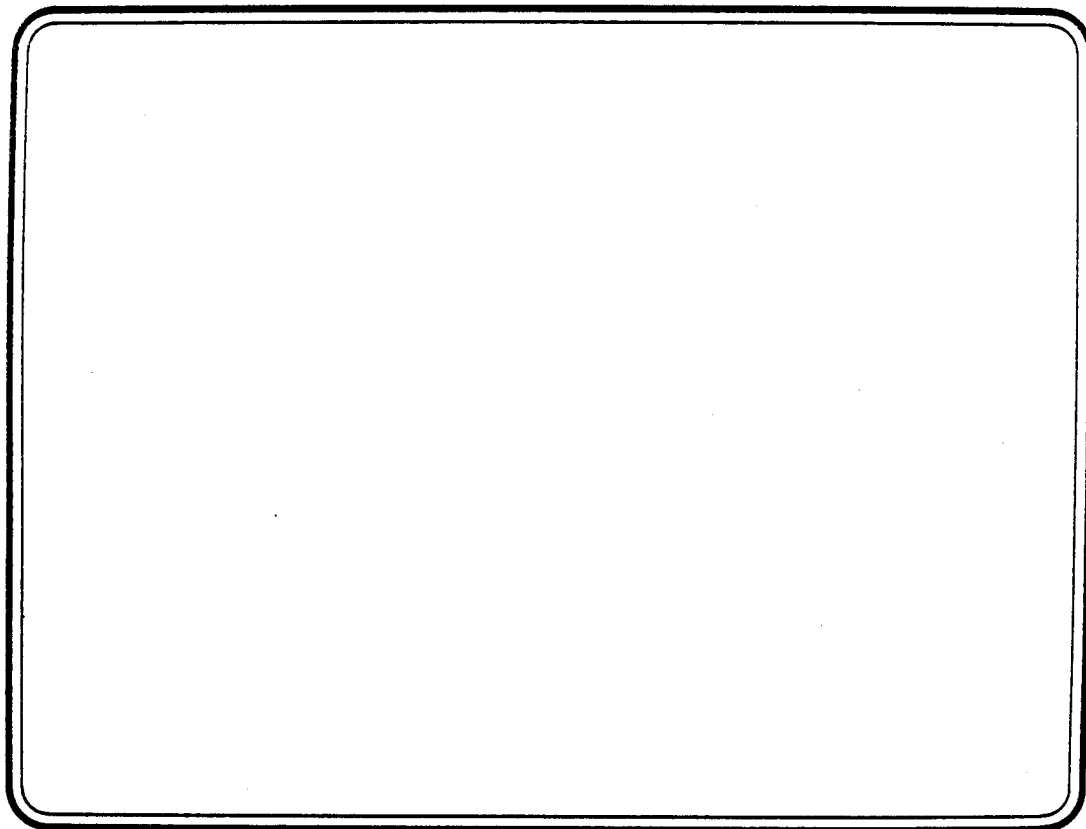
APPENDIX A  
PHOTOGRAPHIC LOG



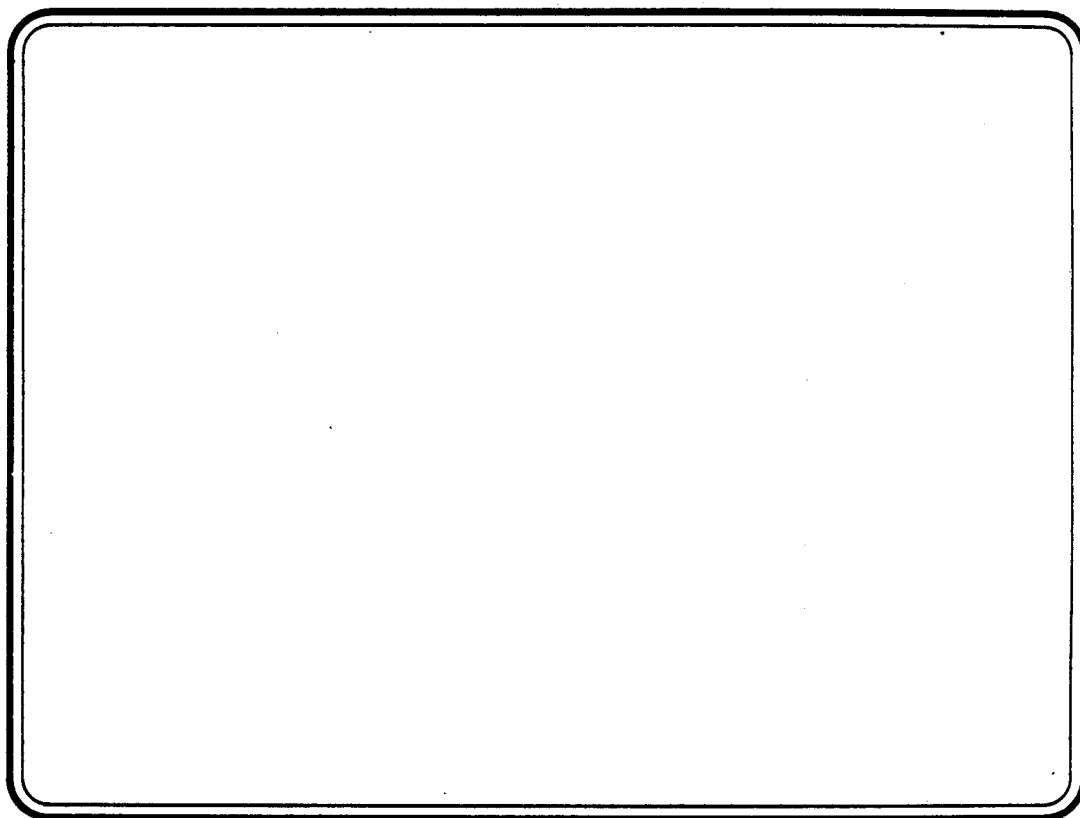
PHOTOGRAPH 1: EQUIPMENT STORAGE TRAILER - BLUE TRAILER ON RIGHT  
OF PHOTOGRAPH



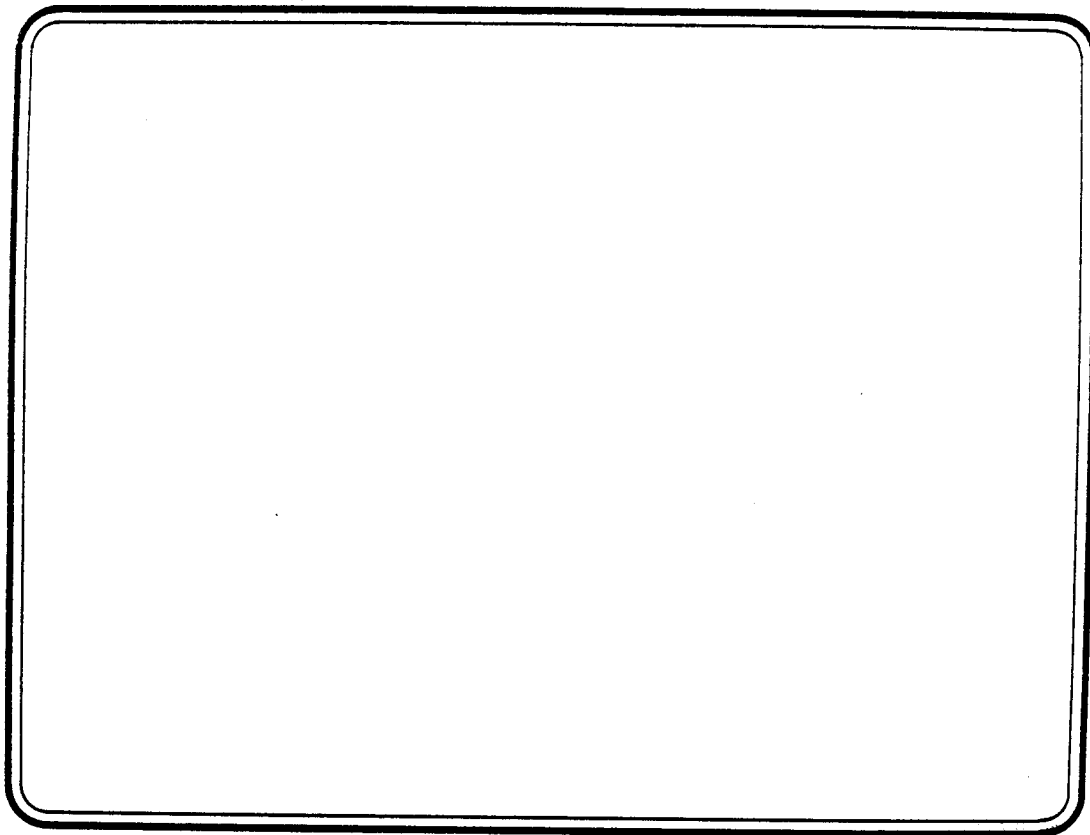
PHOTOGRAPH 2: WINDOWS COVERED WITH PLYWOOD SHEETING AND INSULATED  
BLANKETS TO REDUCE CONSTRUCTION NOISE FOR IBM  
PERSONNEL WORKING IN BUILDINGS



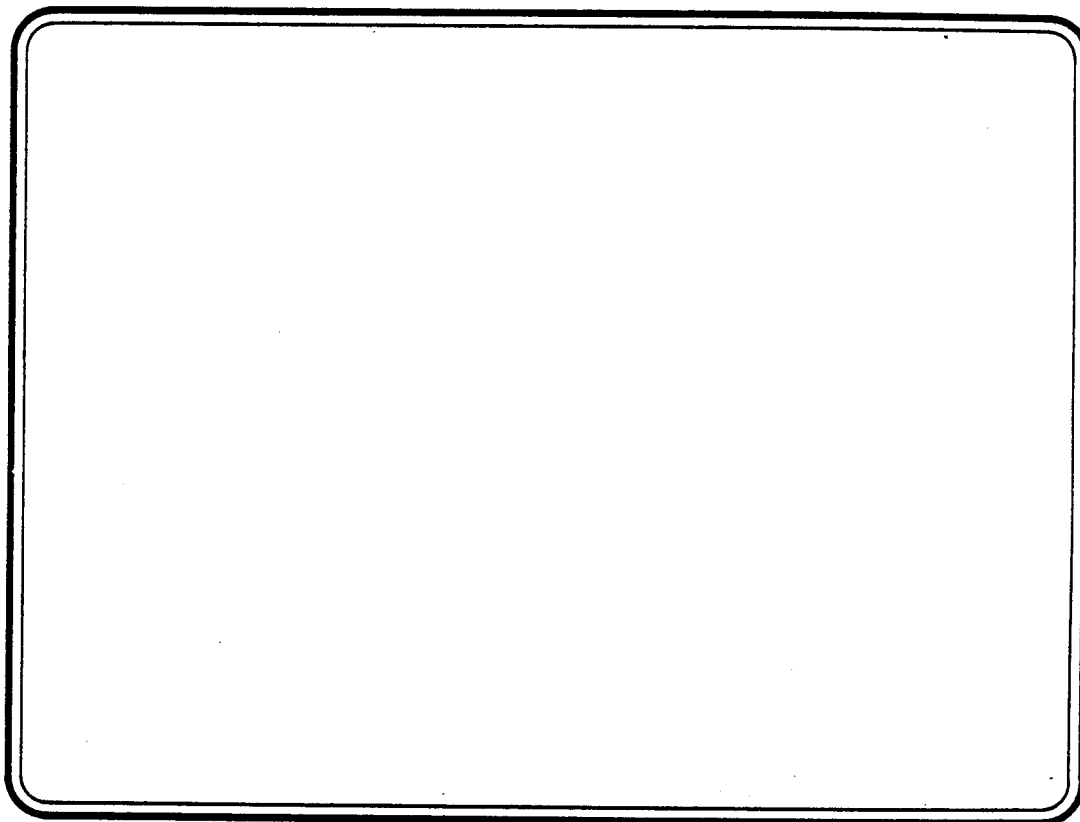
PHOTOGRAPH 3: COMMAND POST - GREEN OFFICE TRAILER



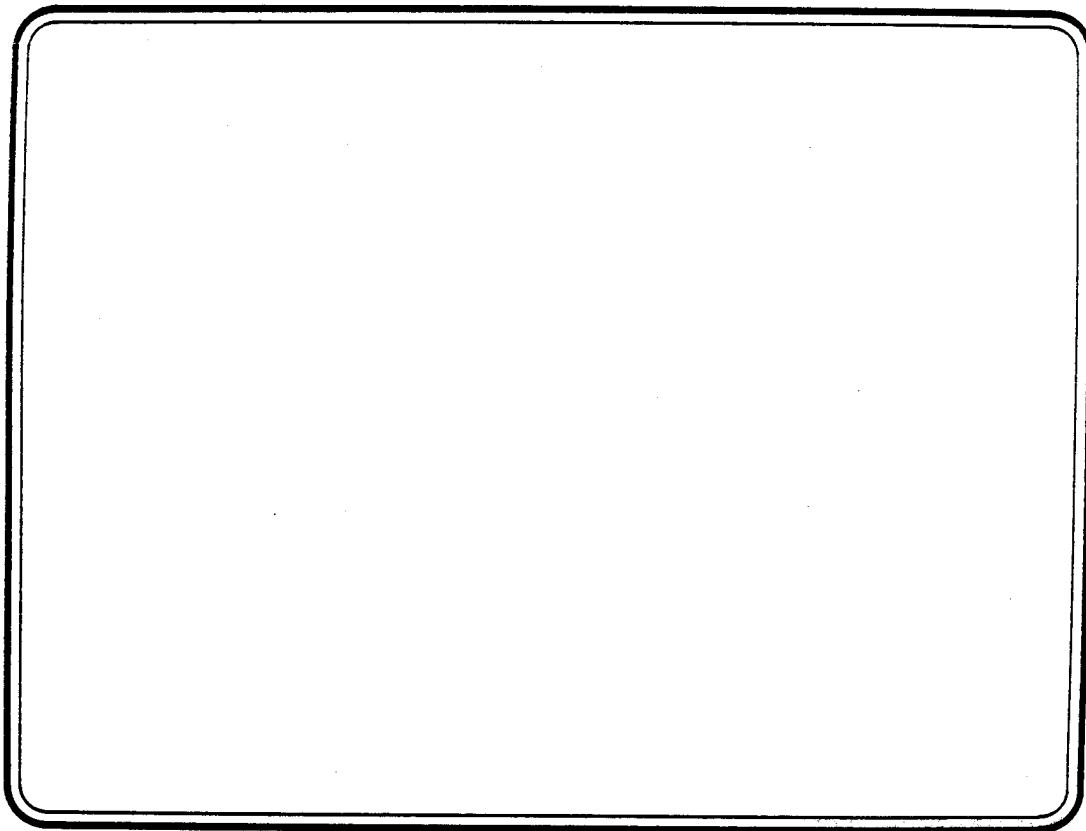
PHOTOGRAPH 4: LOCATION OF SANITARY SEWER HOLDING TANK, LOCATED  
BEHIND GREEN TRAILER DIRECTLY UNDER TEMPORARY  
WOODEN TABLE



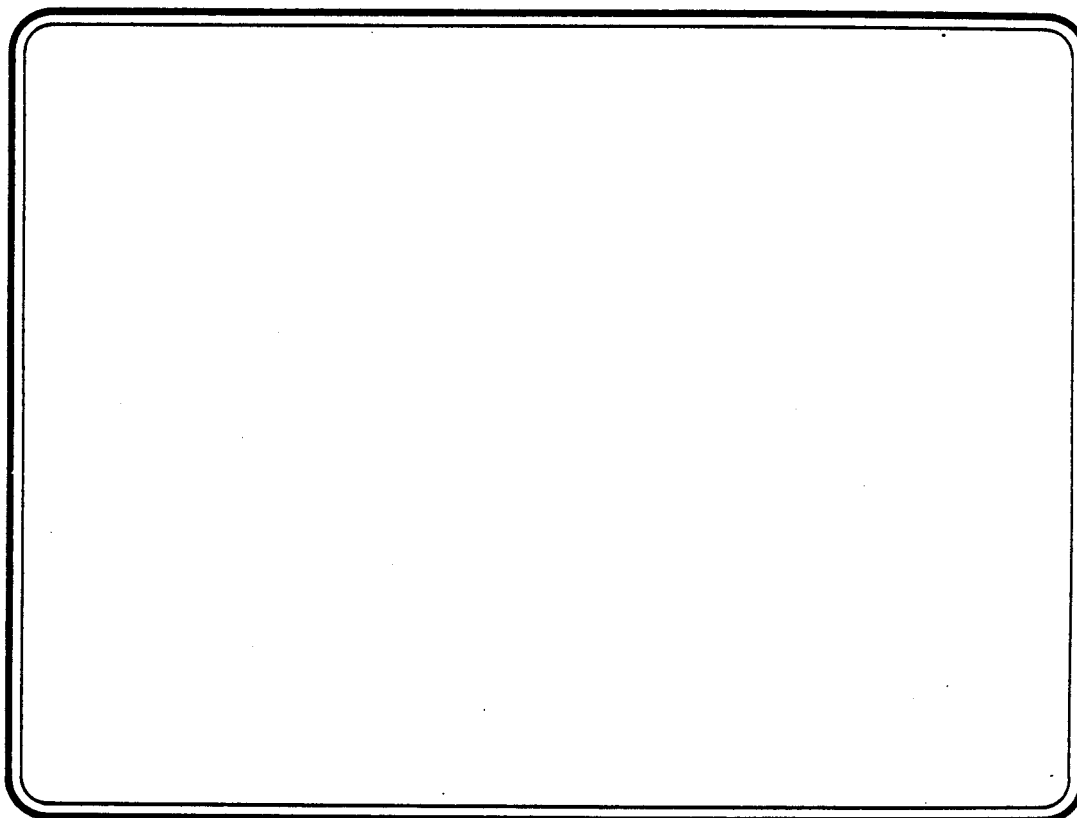
PHOTOGRAPH 5: DECONTAMINATION PAD



PHOTOGRAPH 6: CATWALK SUPPORT MOTORIZED EXHAUST VENTS

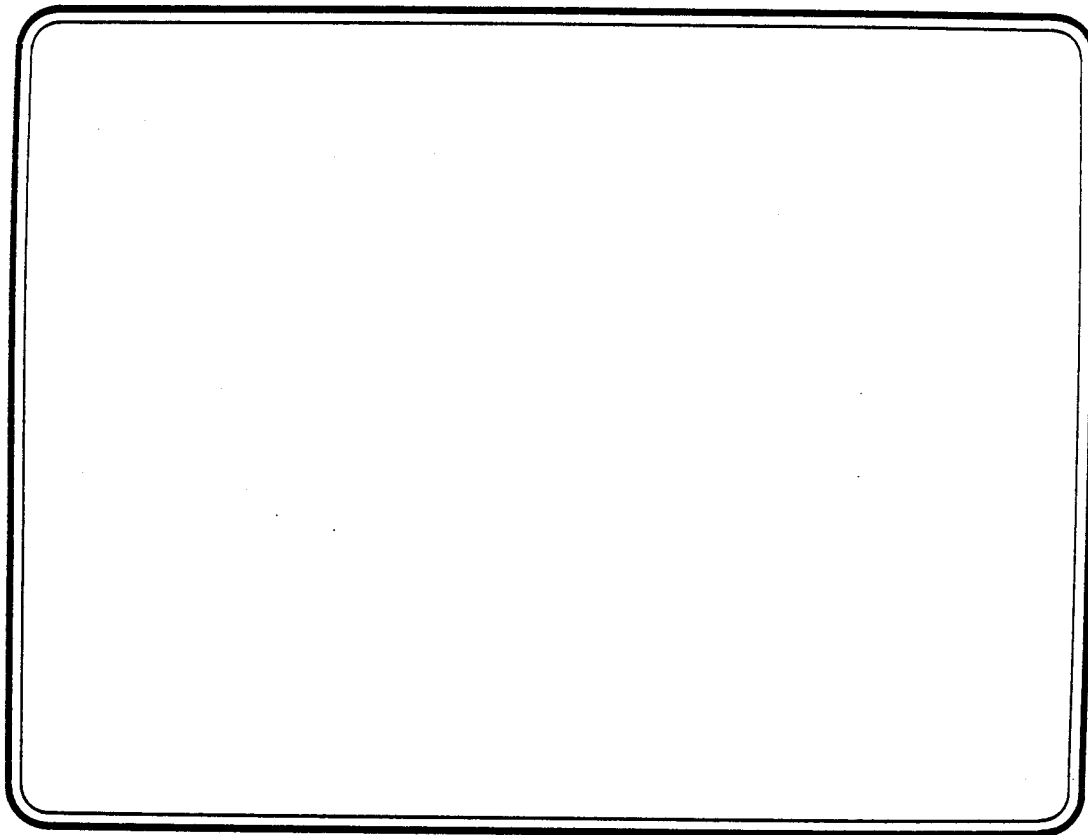


PH TOGRAPH 7: WATER TOWER ON-SITE BEING REMOVED

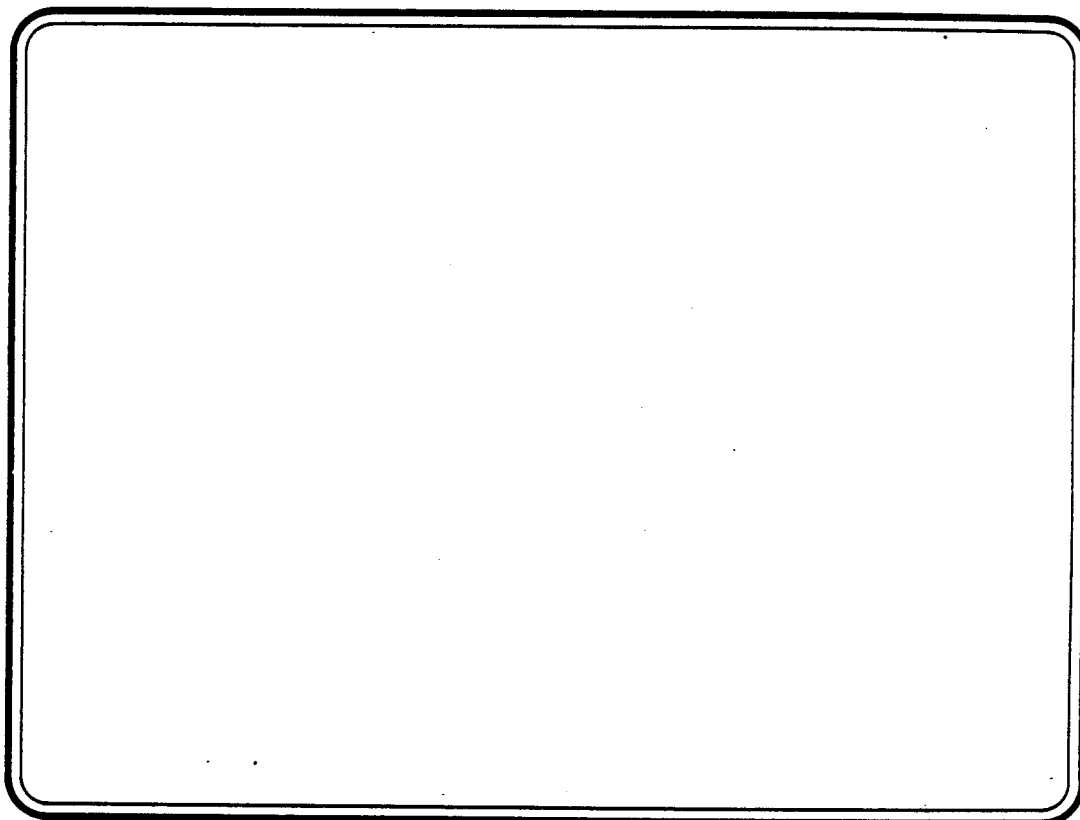


PH TOGRAPH 8: CLEAN SOIL STORAGE PILE IN THE NORTH PARKING LOT  
NORTH OF BUILDING 928

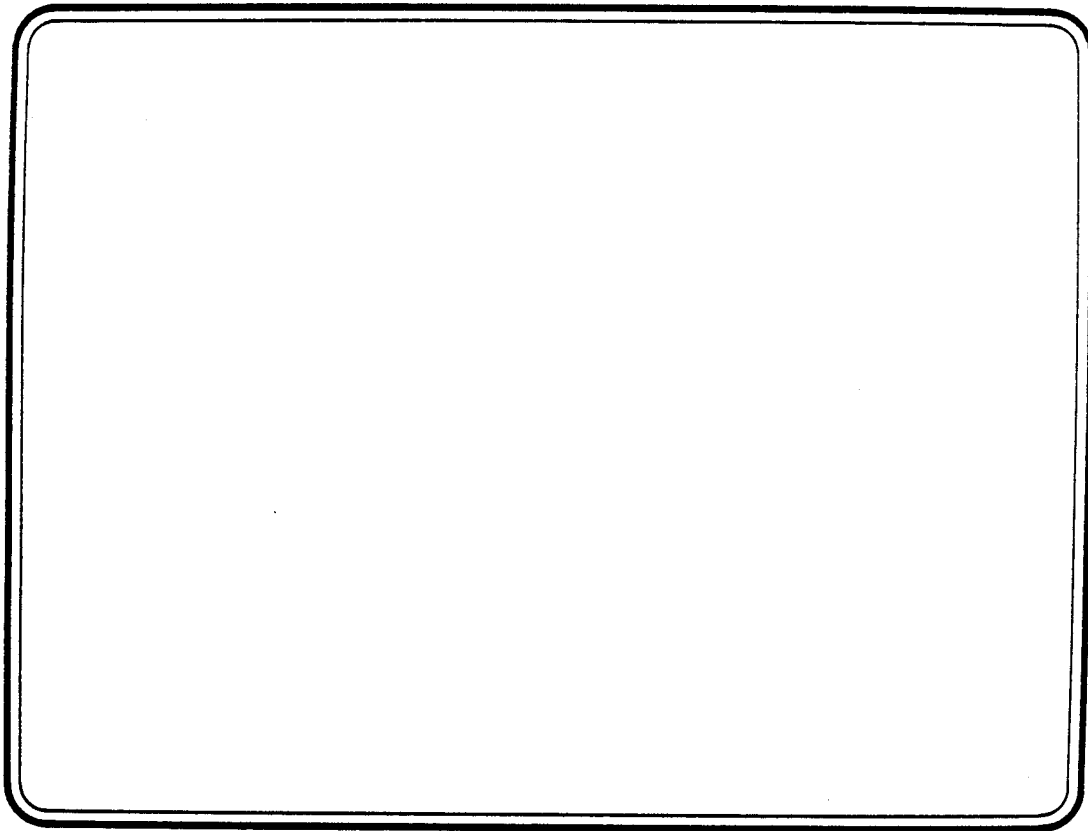




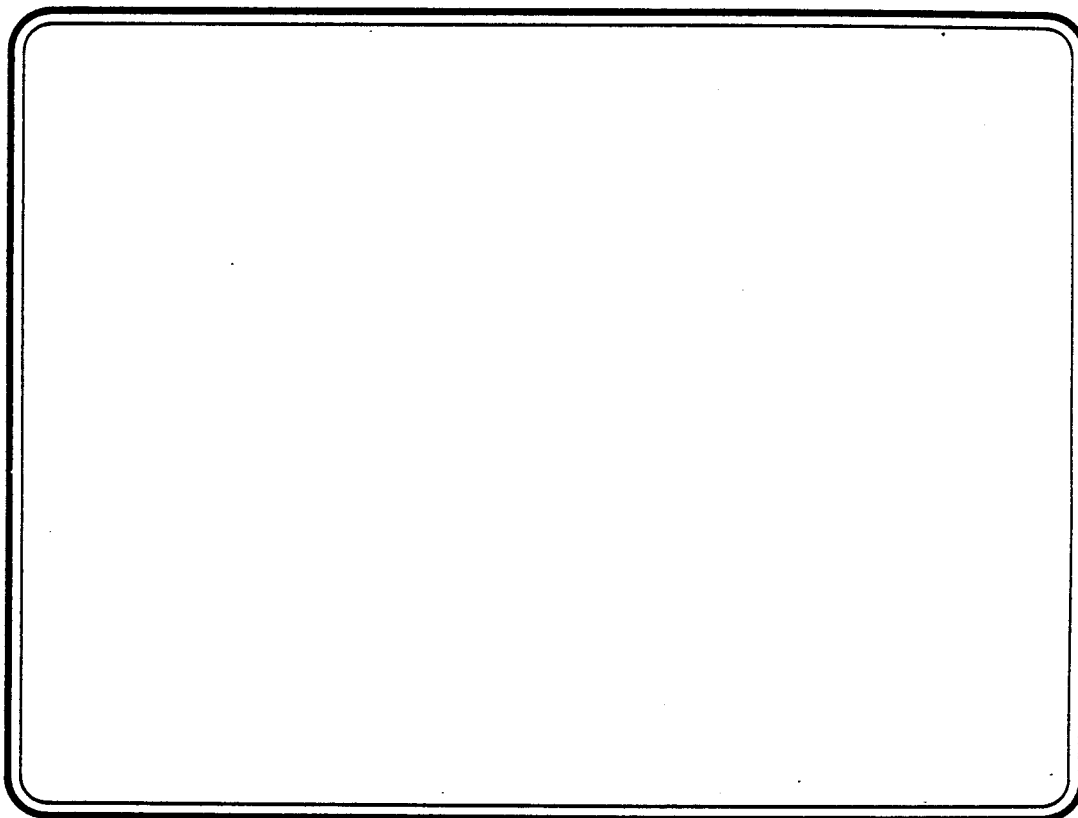
PH TOGRAPH 9: DIRTY SOIL STORAGE BOX



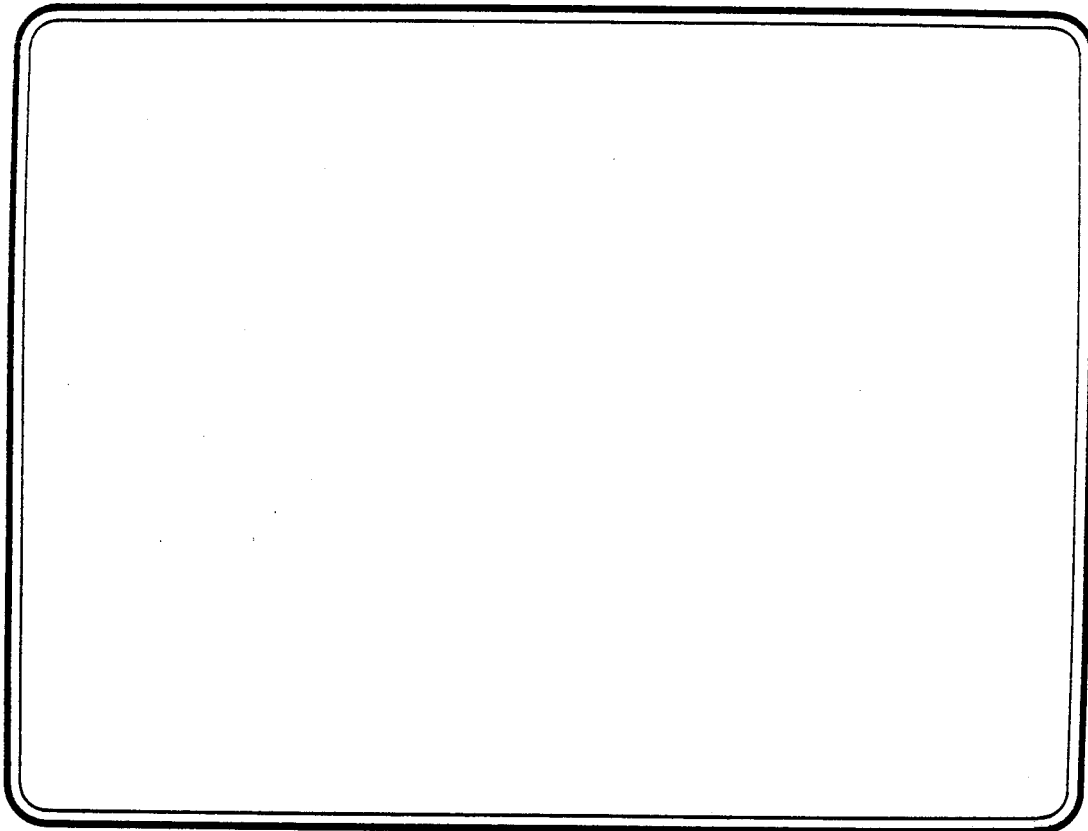
PH TOGRAPH 10: EXISTING SITE CONDITIONS



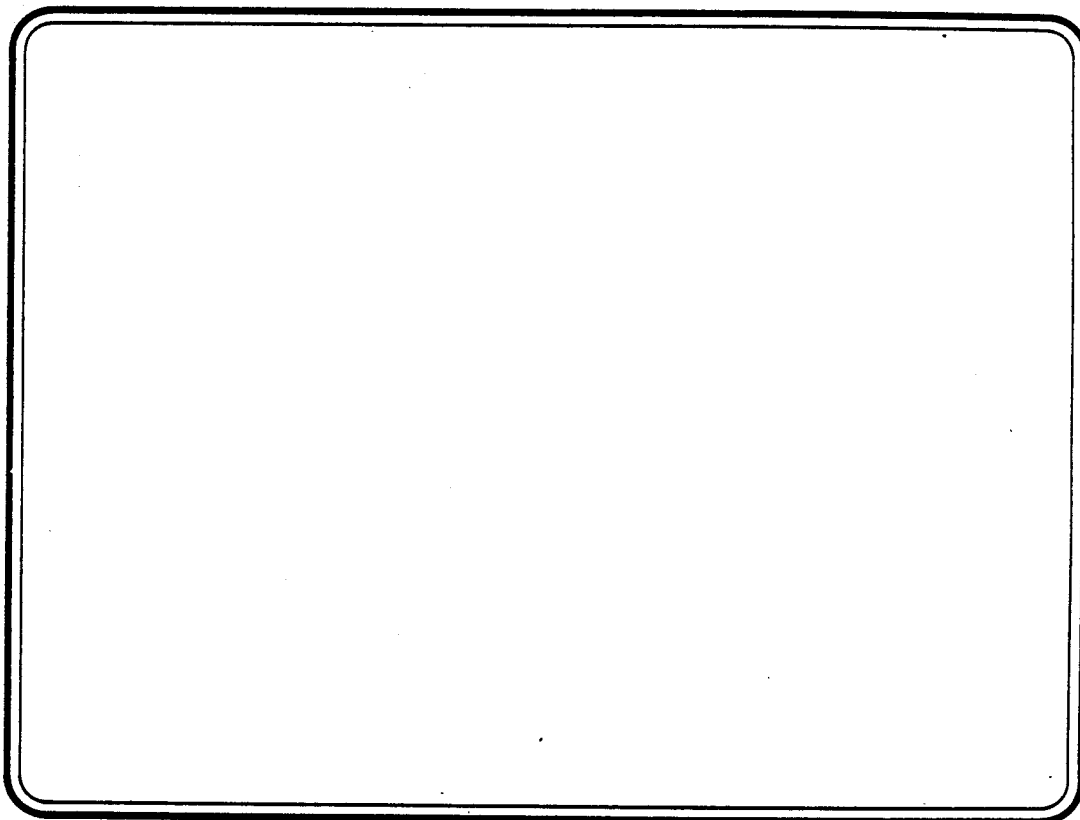
PH TOGRAPH 11: EXISTING SITE CONDITIONS



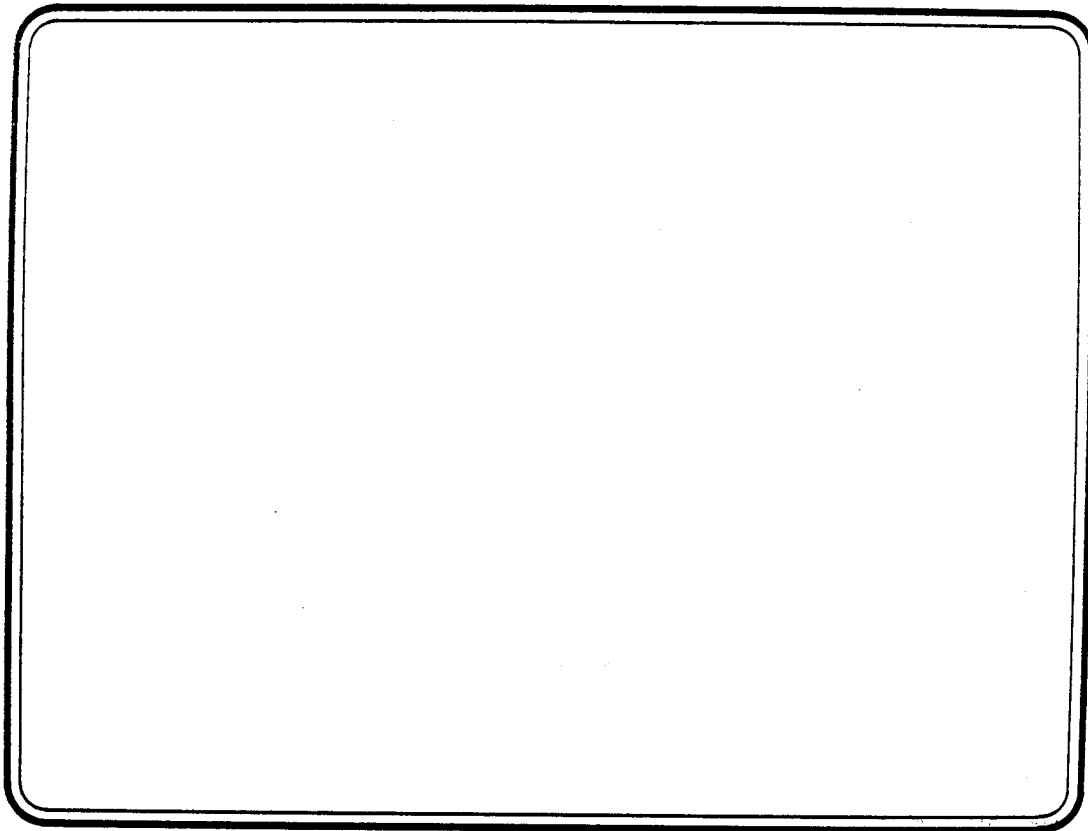
PH TOGRAPH 12: VIEW OF SHORING IN PLACE



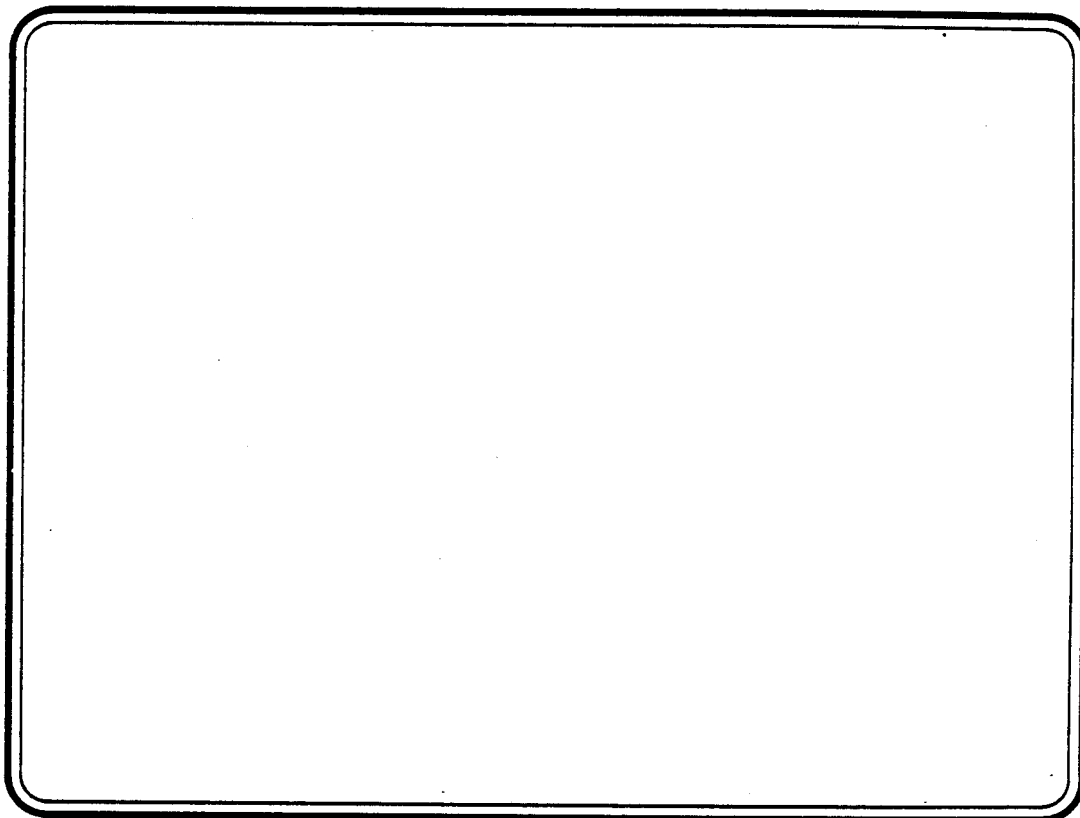
PH TOGRAPH 13: H BEAMS IN PLACE - NOTE H BEAM IN FOREGROUND READY TO BE DRIVEN



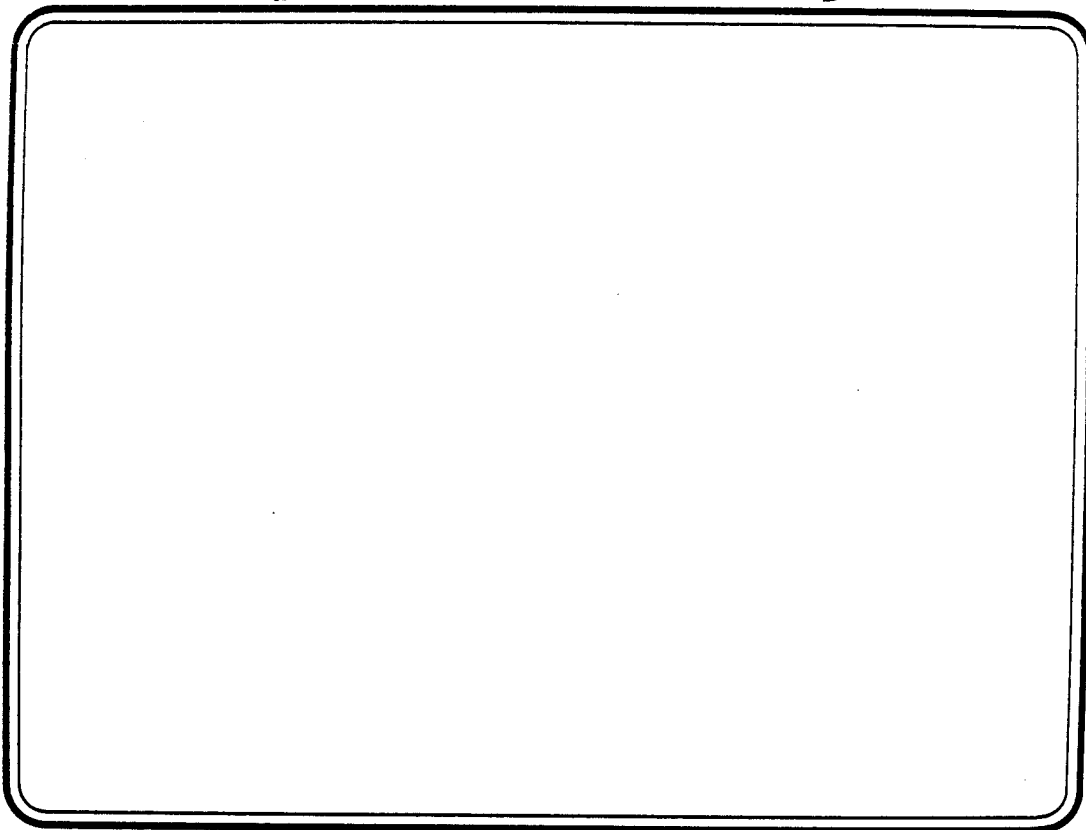
PH TOGRAPH 14: WHALER IN PLACE



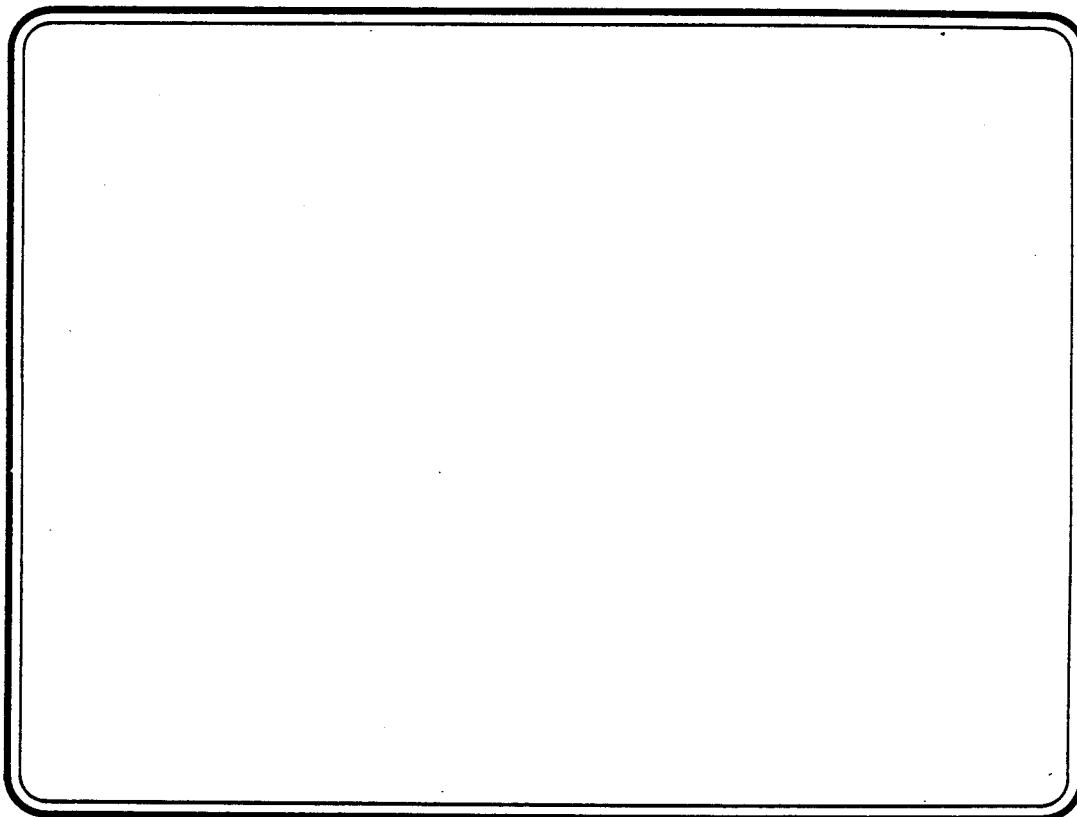
PH TOGRAPH 15: TYPICAL CONCRETE PIER FOR FOOTING SUPPORT



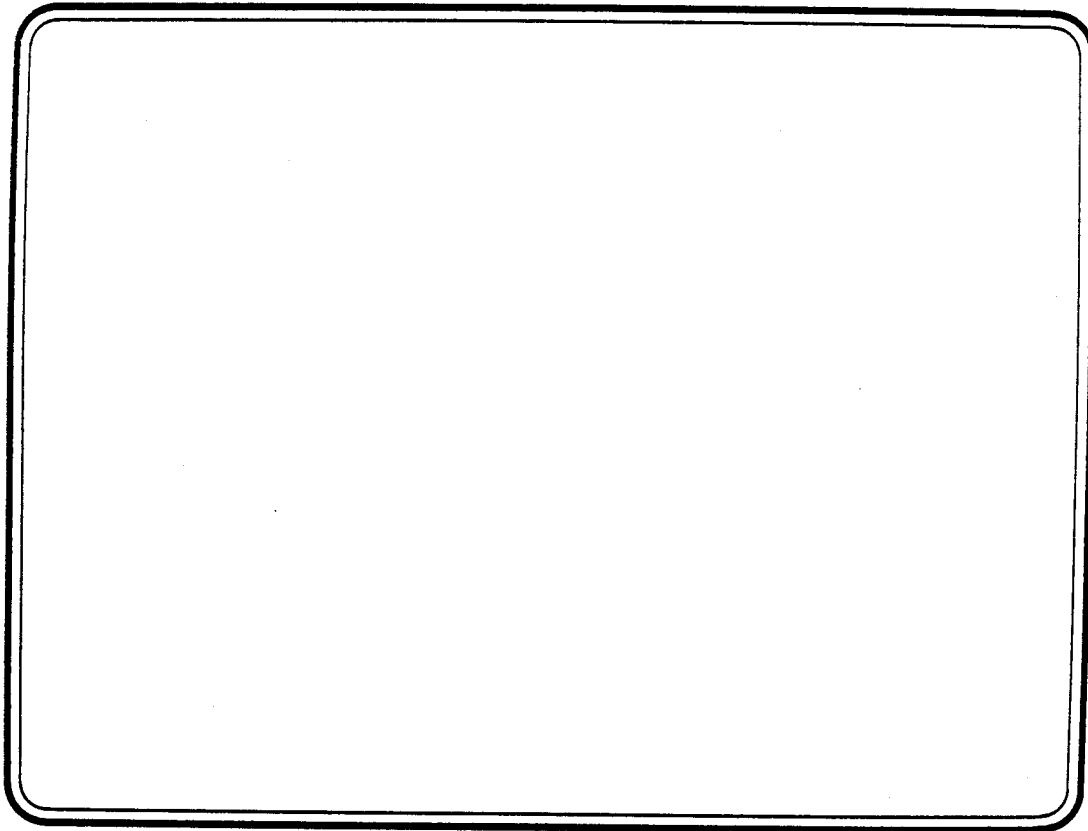
PH TOGRAPH 16: TYPICAL EQUIPMENT USED FOR TIE-BACK TESTING



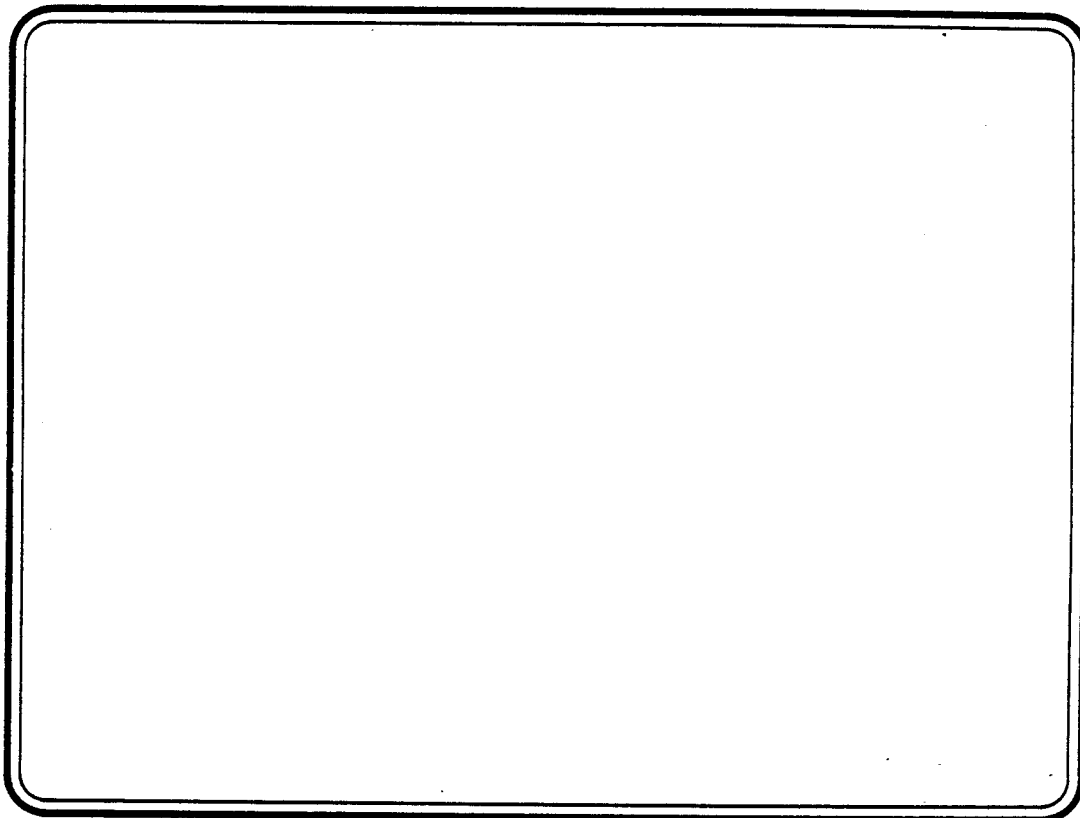
PH TOGRAPH 17: TYPICAL SIZE OF BOULDERS ENCOUNTERED DURING  
EXCAVATION



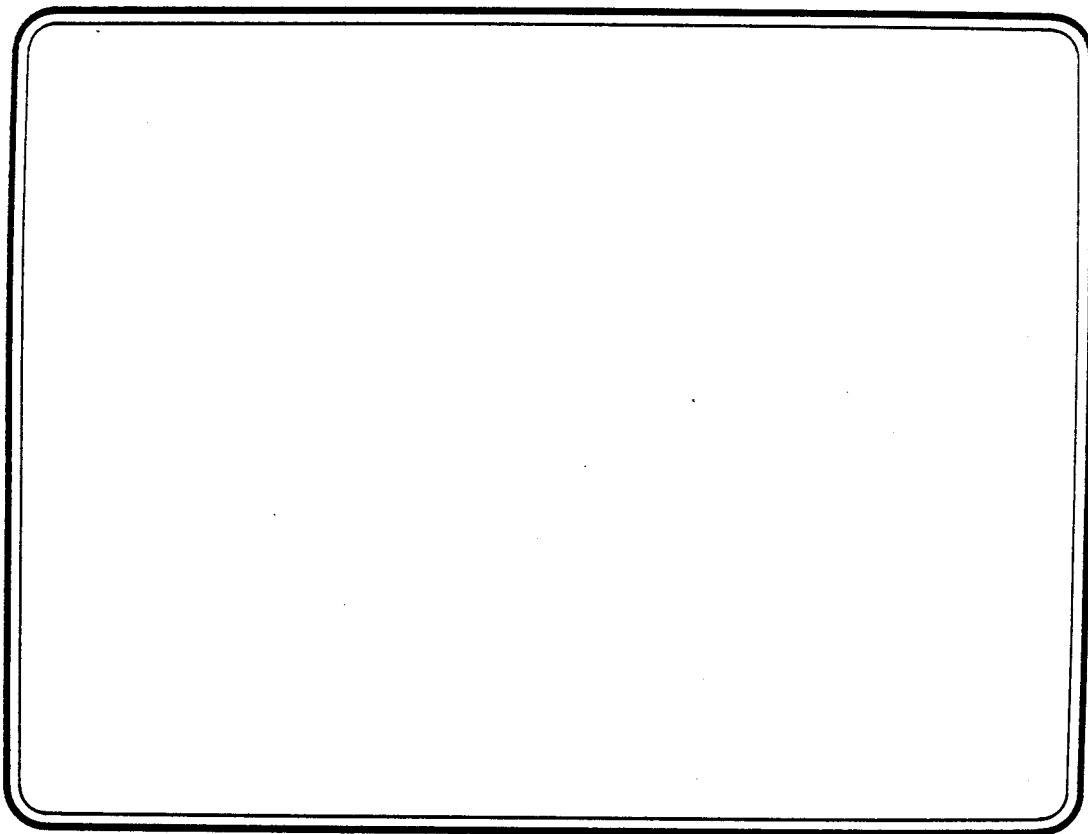
PH TOGRAPH 18: TYPICAL TRUCK LOADING OPERATION OF OFF-SITE  
SHIPMENT TO SECURE LANDFILL FACILITY IN LICENCED  
WASTE HAULERS



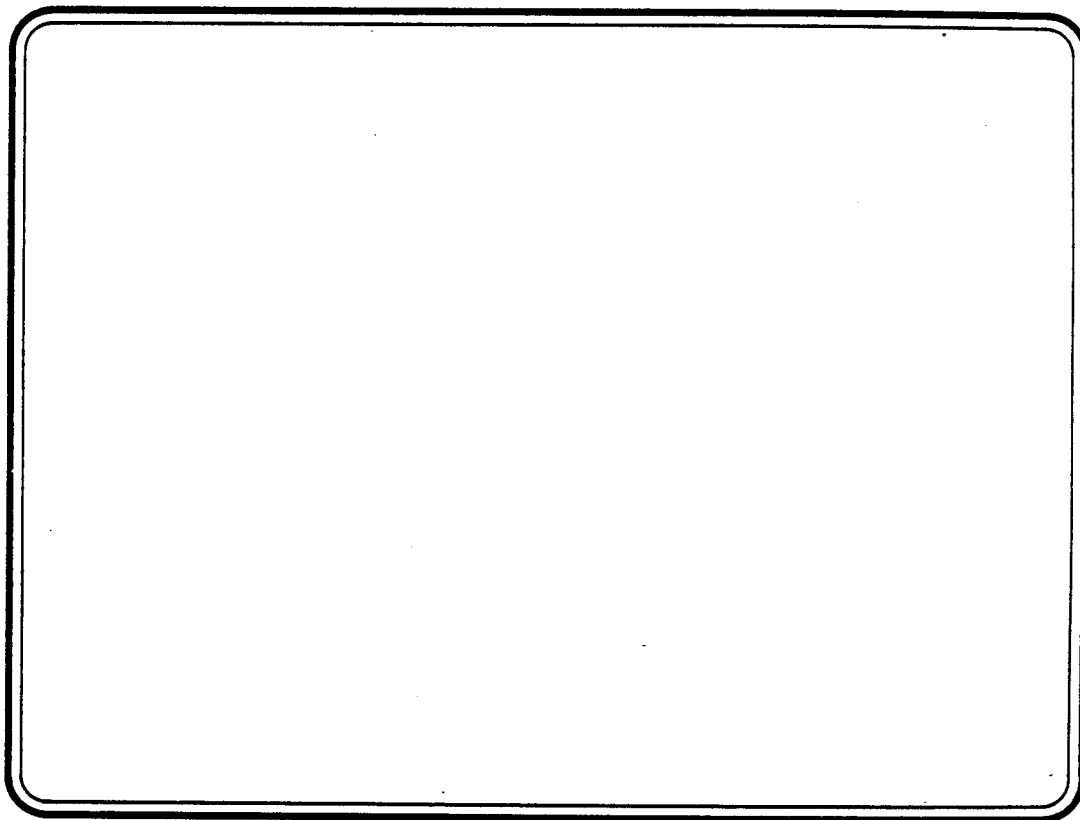
PE TOGRAPH 19: TYPICAL TRUCK LOADING OPERATION OF OFF-SITE  
SHIPMENT TO SECURE LANDFILL FACILITY IN LICENCED  
WASTE HAULERS



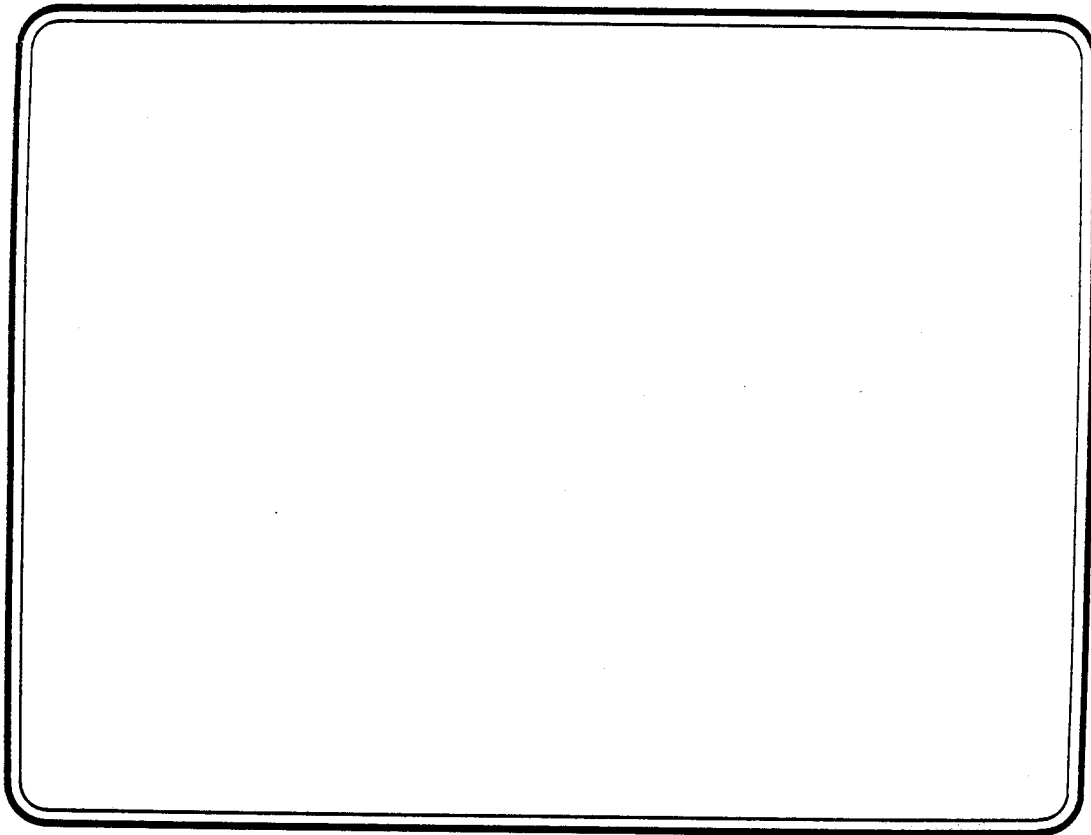
PE TOGRAPH 20: COMPACTION WITH A SELF PROPELLED VIBRATING  
SHEEPSFOOT ROLLER



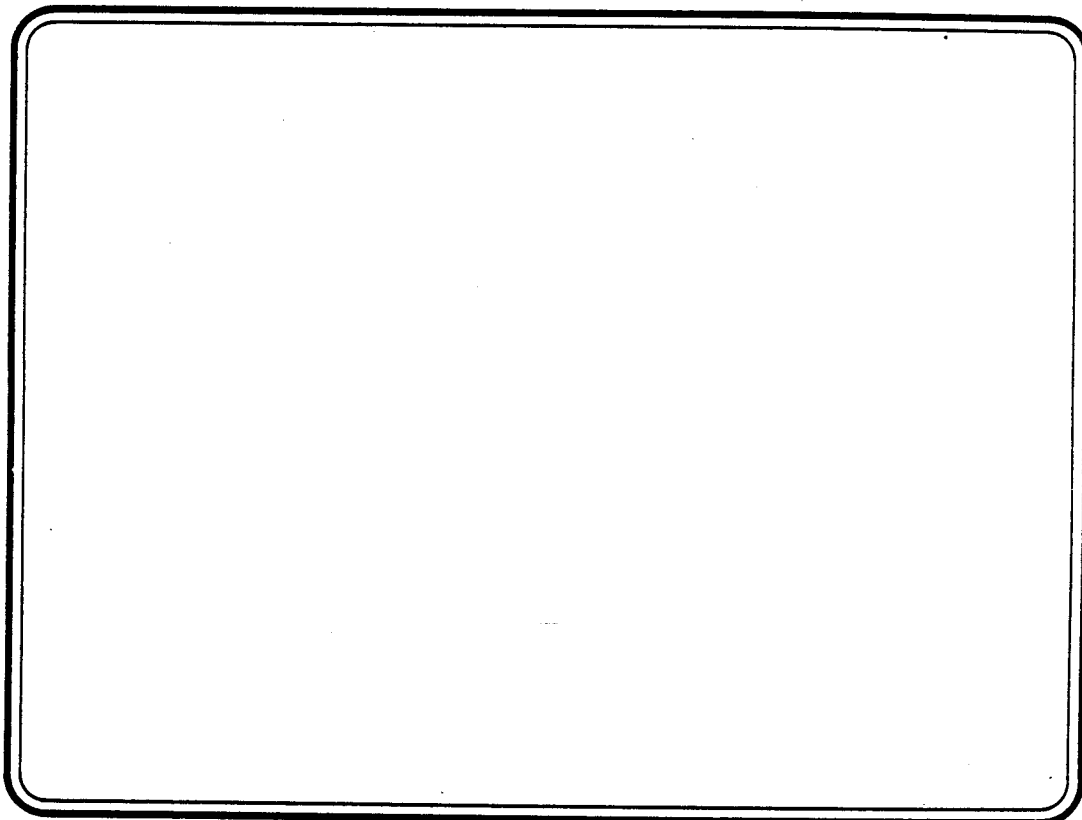
PHOTOGRAPH 21: NEW FIRE LINE INSULATED



PHOTOGRAPH 22: NEW FIRE LINE SUPPORTED ON PILINGS

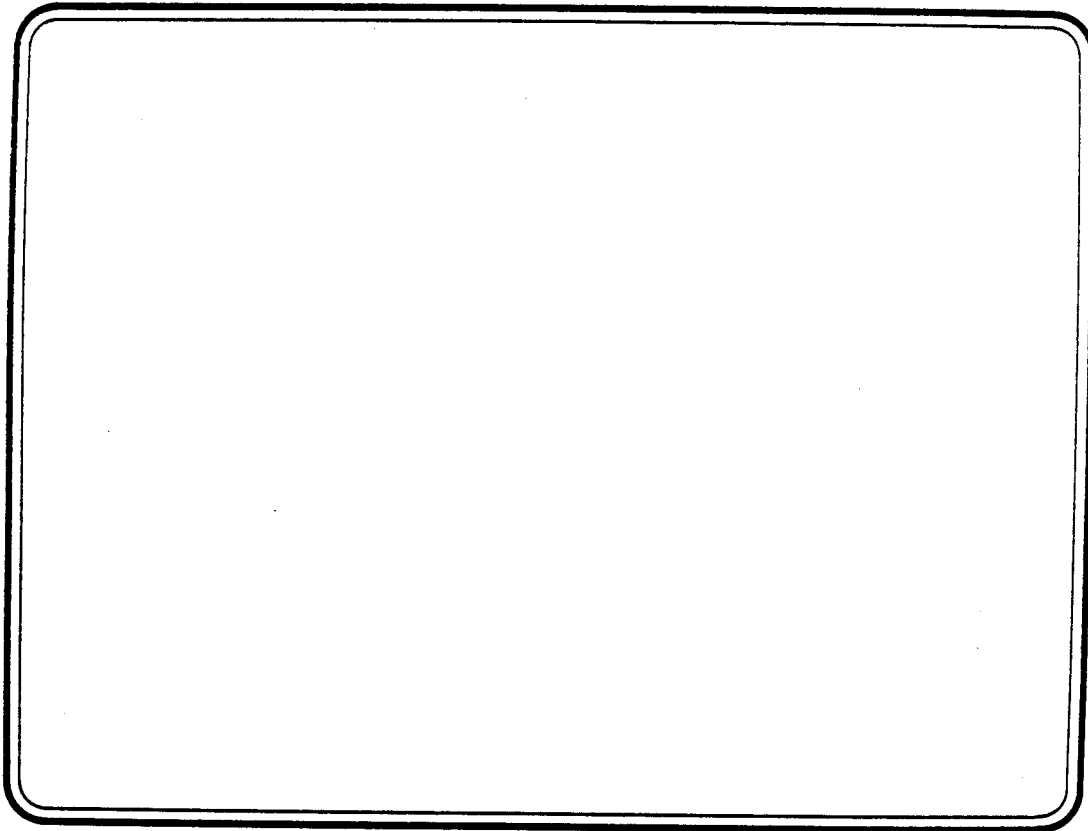


PHOTOGRAPH 23: REMOVAL OF STORAGE VAULT A

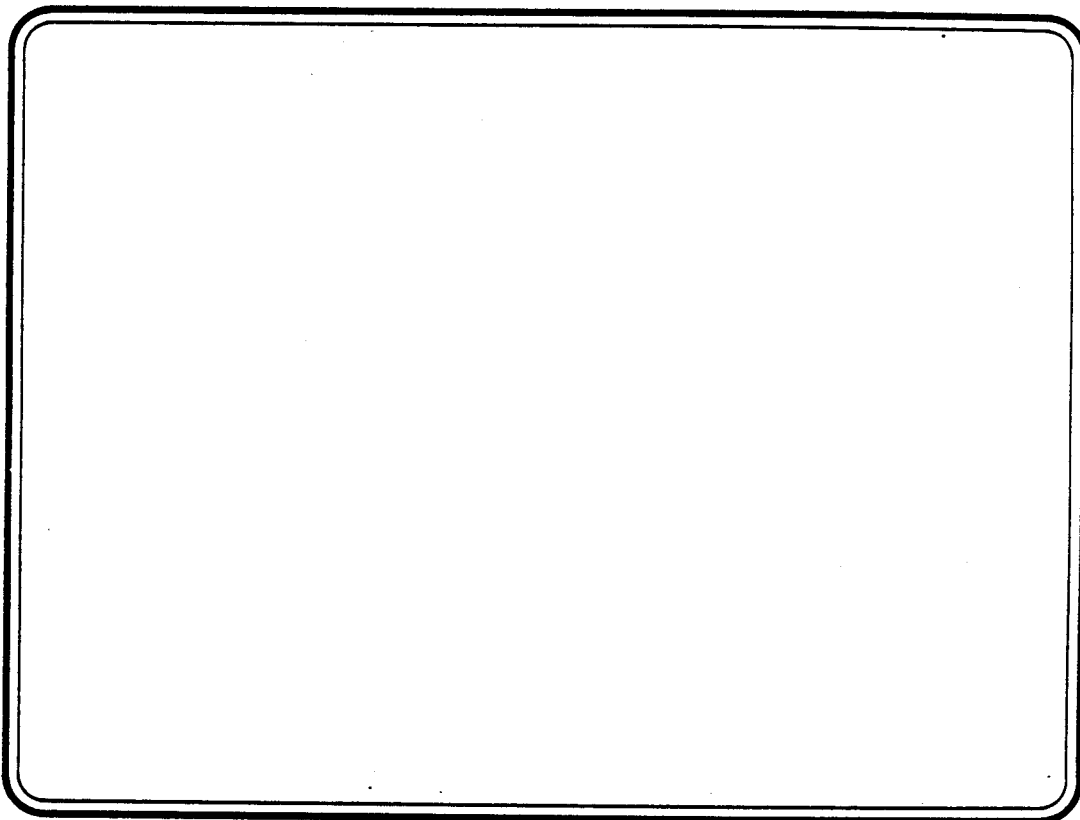


PHOTOGRAPH 24: VALVE CHAMBER, VAULT B





PHOTOGRAPH 25: LOADING 5000 GALLON TANK C INTO LINED TRAILER FOR  
OFF-SITE DISPOSAL AT SECURE LANDFILL FACILITY



PHOTOGRAPH 26: TOWER VAULT D EXCAVATION

APPENDIX B

GROUND VIBRATION MONITORING

VIBR-TECH ENGINEERS INCORPORATED

11-18-84 123-HG	93112	NYA 102376-8	40300	20.15
11-18-84 123-HG	93113	NYA 102377-7	39420	19.71
11-18-84 123-HG	93114	NYA 102378-5	39200	19.60
11-18-84 123-HG	93115	NYA 102380-4	42970	21.49
11-18-84 123-HG	93116	NYA 102381-3	40180	20.09
11-18-84 123-HG	93117	NYA 102382-2	41070	20.54
11-18-84 123-HG	93118	NYA 102383-1	40750	20.38
11-19-84 123-HG	93119	NYA 102384-9	39370	19.69
11-19-84 123-HG	93120	NYA 102385-8	39920	19.96
11-19-84 123-HG	93121	NYA 102386-7	41510	20.76
11-19-84 123-HG	93122	NYA 102387-6	40710	20.36
11-19-84 123-HG	93123	NYA 102389-4	39770	19.89
11-19-84 123-HG	93124	NYA 102390-3	46440	23.22
11-19-84 123-HG	93125	NYA 102391-2	42290	21.15
11-19-84 123-HG	93126	NYA 102392-1	42530	21.27
11-19-84 123-HG	93127	NYA 102393-9	39650	19.83
11-20-84 123-HG	93128	NYA 102394-8	40040	20.02
11-20-84 123-HG	93129	NYA 102395-7	41010	20.51
11-20-84 123-HG	93130	NYA 102396-6	40030	20.02
11-20-84 123-HG	93131	NYA 102397-5	40720	20.36
11-20-84 123-HG	93132	NYA 102398-4	43030	21.52
11-20-84 123-HG	93133	NYA 102399-3	45130	22.57
11-20-84 123-HG	93134	NYA 102439-6	42520	21.26
11-20-84 123-HG	93135	NYA 102440-5	42170	21.09
11-20-84 123-HG	93136	NYA 102441-4	41200	20.60
11-20-84 123-HG	93137	NYA 102442-3	44650	22.33
11-20-84 123-HG	93138	NYA 117101-7	38540	19.27
11-20-84 123-HG	93139	NYA 117102-6	42220	21.11
11-20-84 123-HG	93140	NYA 117103-5	43280	21.64
11-20-84 123-HG	93141	NYA 117104-4	40170	20.09
11-20-84 123-HG	93142	NYA 117105-3	36950	18.48
11-20-84 123-HG	93143	NYA 117106-2	40890	20.45
11-20-84 123-HG	93144	NYA 117107-1	40070	20.04
11-20-84 123-HG	93145	NYA 117108-9	40970	20.49
11-20-84 123-HG	93146	NYA 117109-8	39070	19.54
11-20-84 123-HG	93147	NYA 117110-7	41880	20.94
11-20-84 123-HG	93148	NYA 117111-6	40540	20.27
11-20-84 123-HG	93149	NYA 117112-5	38210	19.11
11-20-84 123-HG	93295	NYA 117113-4	39550	19.78
11-20-84 123-HG	93296	NYA 117114-3	40600	20.30
11-20-84 123-HG	93297	NYA 117115-2	39100	19.55

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TOTAL DISPOSAL WEEK ENDING 11-24-84	2227970	1113.99
ACCUM. DISP. W/E 11-9,11-16,11-24-84	3850060	3950.12

11-27-84 123-HG	93298	NYA 117116-1	42720	21.36
11-28-84 123-HG	93299	NYA 117118-8	39590	19.80
11-26-84 123-HG	93300	NYA 117119-7	41080	20.54
11-26-84 123-HG	93301	NYA 117120-6	40820	20.41
11-26-84 123-HG	93302	NYA 117121-5	39360	19.68
11-26-84 123-HG	93303	NYA 117122-4	42750	21.38
11-26-84 123-HG	93304	NYA 117123-3	41500	20.75
11-26-84 123-HG	93305	NYA 117124-2	36320	18.16
11-26-84 123-HG	93306	NYA 117125-1	39750	19.88
11-26-84 123-HG	93307	NYA 117126-9	41170	20.59
11-26-84 123-HG	93308	NYA 117127-8	39550	19.78



314076

## VIBRA-TECH ENGINEERS INCORPORATED

### REPORT

TO    Sevenson Construction Co.  
      P.O. Box 1908  
      Poughkeepsie, New York 12601  
  
      Attn: Mr. Robert Wallace, P.E.

DATE   October 25, 1984

SUBJECT   GROUND VIBRATION MONITORING FOR SEVENSON CONST. CO.  
          IBM - Poughkeepsie, N. Y.  
          Pile Driving  
          4 Recordings  
          September 14, 1984

WKE  
11/8/84



717-455-5881  
TOLL FREE PA 800-582-6374  
TOLL FREE USA 800-233-6181

## **vibra-tech engineers incorporated**

CONSULTANTS TO THE MINING, QUARRYING, CONSTRUCTION AND EXPLOSIVE USING INDUSTRIES

FIRST & NORTH CHURCH STS. P.O. BOX 577 HAZLETON, PENNSYLVANIA 18201-0577

October 25, 1984

Mr. Robert Wallace, P.,E.  
Sevenson Construction Co.  
P.O. Box 1908  
Poughkeepsie, NY 12601

Dear Mr. Wallace:

Attached you will find the results of the vibrations produced by the pile driving activities being conducted on September 14, 1984 at your IBM project in Poughkeepsie, New York.

The report contains the original seismograph records representing the maximum vibration intensities during the test period.

The recorded vibrations satisfy the Variable Particle Velocity vs. Frequency Limits recommended by the U.S.B.M. Report RI-8507 (Nov., 1980).

If we may be of further assistance in this matter, please advise.

Very truly yours,

VIBRA-TECH ENGINEERS, INC.

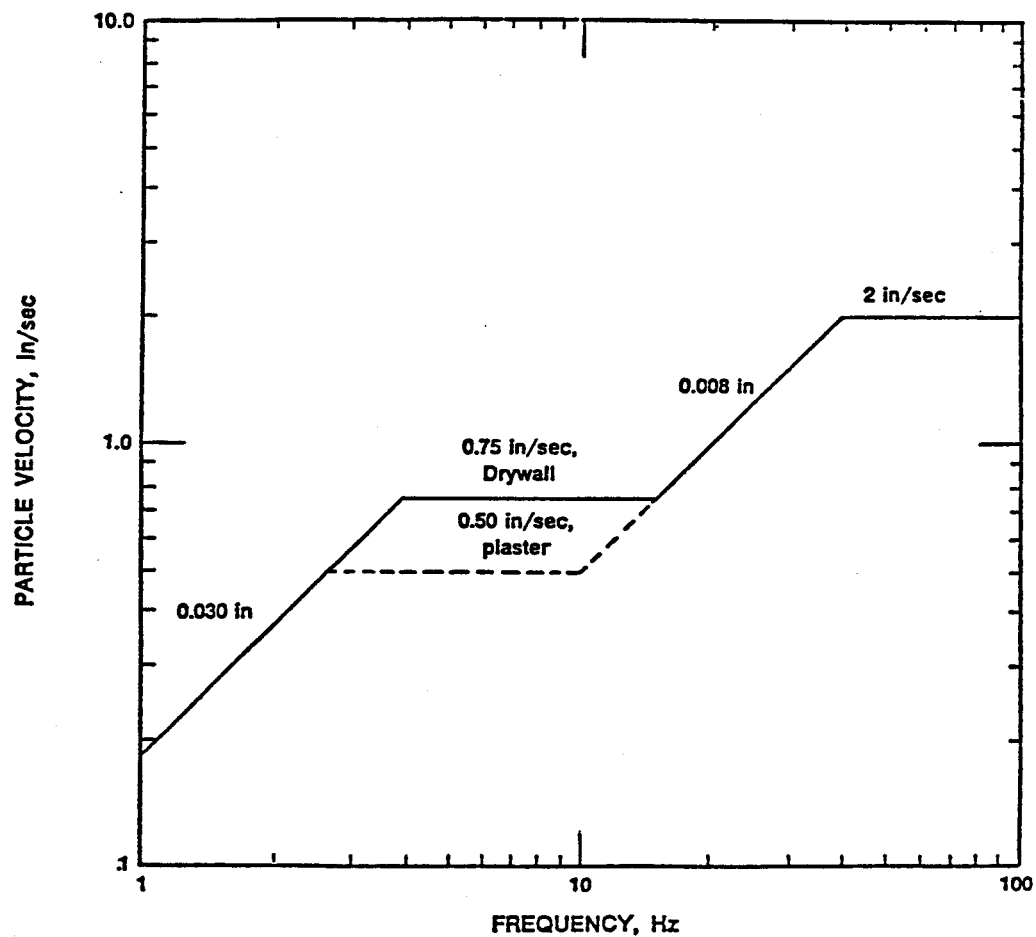
Joseph W. Lozosky  
Vice President

Anthony J. Petro, P.E.  
President

JWL:ab

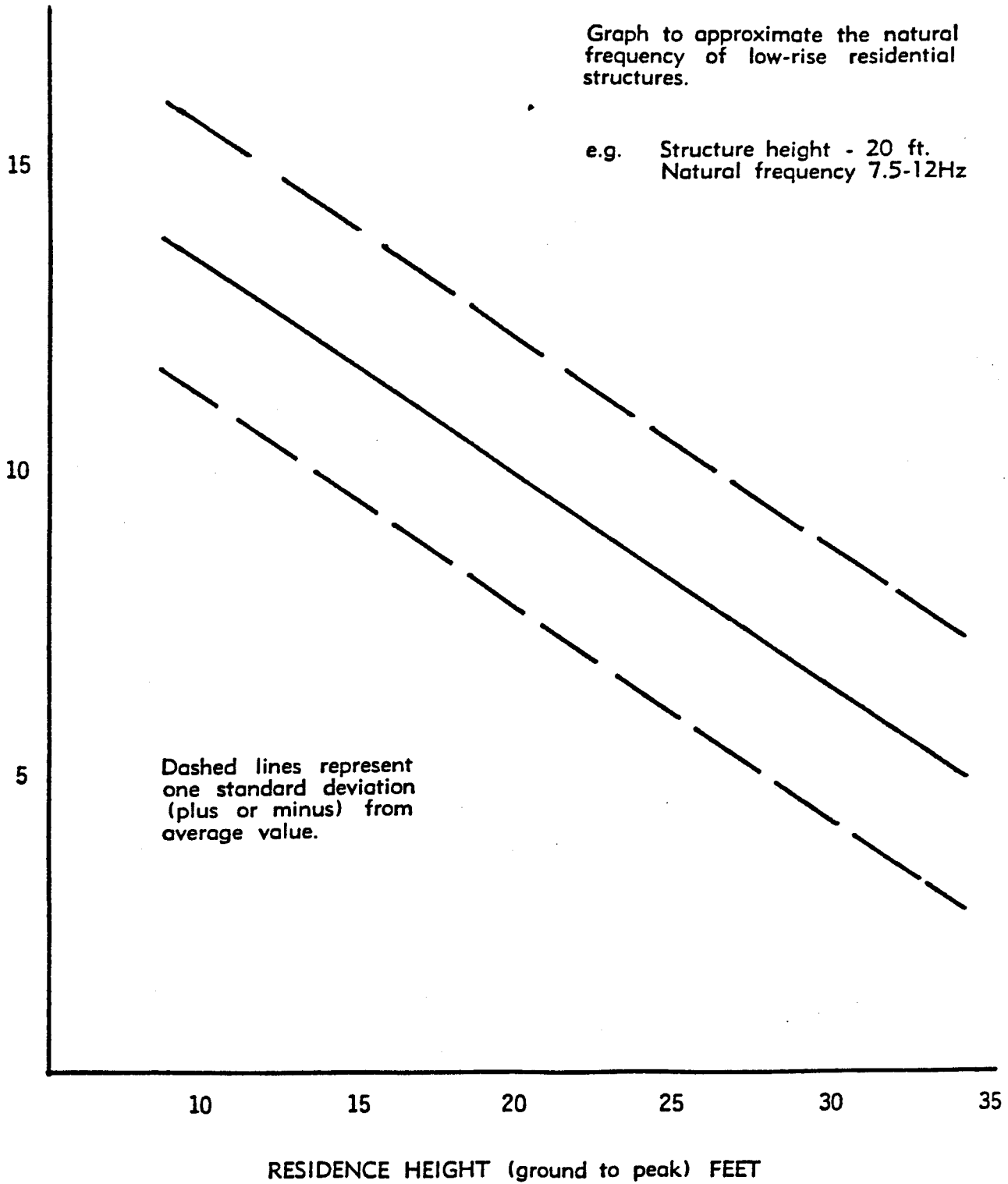
# NEW U. S. BUREAU OF MINES CRITERIA

From Report RI-8507 ( November, 1980 )



Graph to approximate the natural frequency of low-rise residential structures.

e.g. Structure height - 20 ft.  
Natural frequency 7.5-12Hz

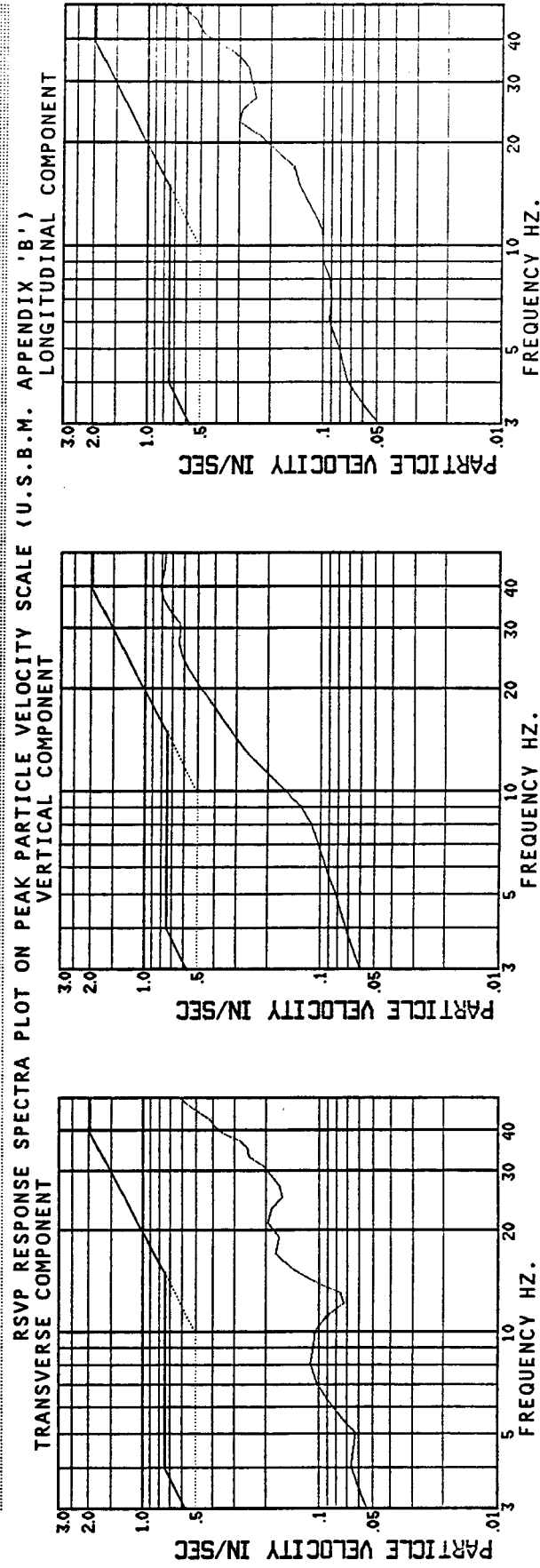


TRANSVERSE = 0.64 in/sec

VERTICAL = 0.81 in/sec

LONGITUDINAL = 0.70 in/sec

TIMING INTERVAL 0.1 SEC.



The vibrations satisfy the Variable Particle Velocity vs. Frequency Limits recommended by the U.S.B.M. Report RI-8507 (Nov 1980)

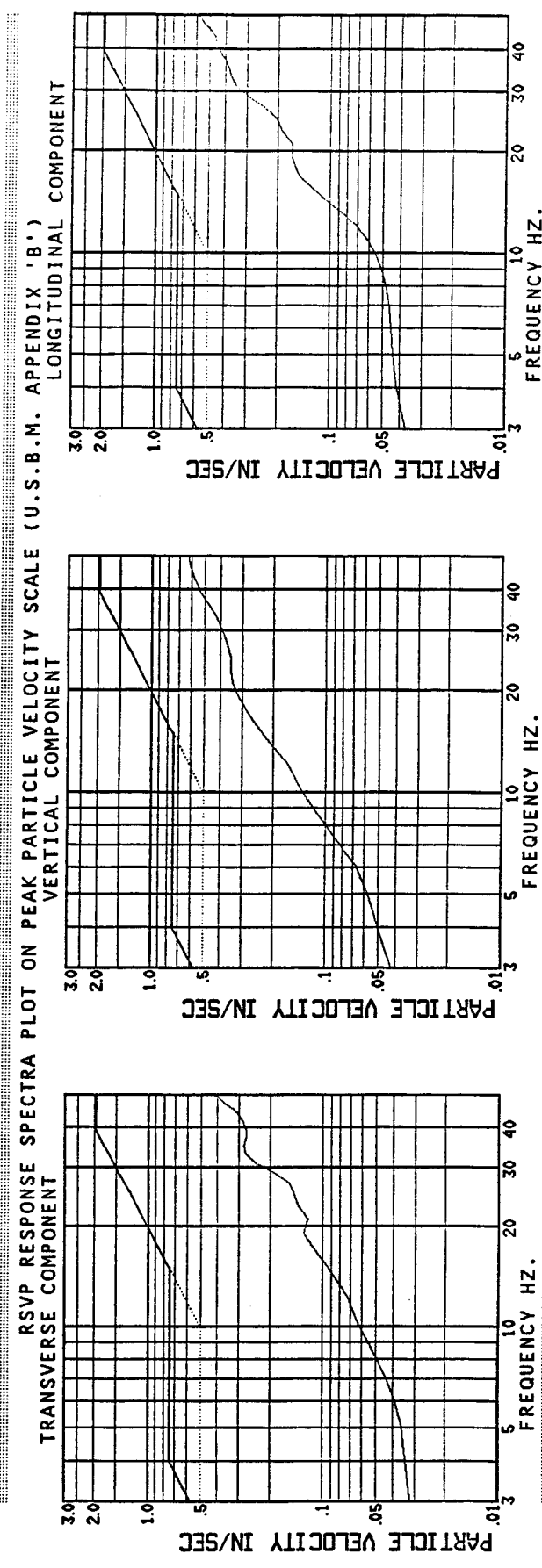


TRANSVERSE = 0.43 in/sec

VERTICAL = 0.62 in/sec

LONGITUDINAL = 0.61 in/sec

TIMING INTERVAL 0.1 SEC.



The vibrations satisfy the Variable Particle Velocity vs. Frequency Limits recommended by the U.S.B.M. Report RI-8507 (Nov 1980)

APPENDIX C  
EARTH EXCAVATION QUANTITIES

TABLE C-1

## SUMMARY OF FINAL SOIL EXCAVATION VOLUMES

DEPTH BH NO.	0 - 3		3 - 4.5		4.5 - 6.0		6 - 9		9 - 12		12 - 15		15 - 18	
	CLEAN*	DISPOSED†	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED
1	18.4			9.2	4.8		9.5			7.6				
2		14.9		7.5	4.4			8.8		8.8		11.2		
3	10.7			5.4	3.8			7.6	6.4			7.3	7.3	
4	23.8			11.9	11.1		22.2		23.8		23.8		26.2	
5	23.5			11.8	12.2			24.3		24.3		24.3	24.3	
6		25.6		12.8	10.7		21.3			28.1		25.6	35.0	
7	25.4			12.7	11.9		23.7			27.1		25.4	25.4	
8	21.9			11.0	9.8		19.7		23.4					
9		27.3		13.7	13.7			27.3		27.3		27.3	27.3	
10		27.2		13.6	13.4			26.7		23.4		23.4	23.4	
11	22.7		11.4				22.7		11.3					
12	25.3		12.7		14.8			29.6	23.6					
13	21.8		10.9		10.9		21.8		20.4					
14	23.5		11.8		11.4		22.8			25.9	25.0		25.0	
15	22.1		11.1		11.8			23.6	8.3	12.3		12.3		
16	27.7		13.9		13.0			26.0		26.5				
17		23.6		11.8		9.4	18.8			20.7	18.1		19.4	
18		13.3		6.7		5.4	10.7		11.4					
19	31.9		11.9	4.1	10.2			28.4	22.5	7.5		29.0		
20		20.0	4.5	5.5	4.4	5.5	7.8	11.0	8.4	11.0		11.0		
21	32.5		16.3		15.4		30.7			28.5		30.4		
22	34.0			17.0	16.6			33.1		29.8		29.8		
23	19.1			9.6	9.3		18.5		19.8		8.1	11.7	19.8	
24	33.2		16.6		15.9		31.7		29.5			30.5		

continued....

TABLE C-1

## SUMMARY OF FINAL SOIL EXCAVATION VOLUMES

DEPTH BH NO.	0 - 3		3 - 4.5		4.5 - 6.0		6 - 9		9 - 12		12 - 15		15 - 18	
	CLEAN*	DISPOSED†	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED
49		36.0	18.0		16.9		33.8		31.6		31.6		31.6	
50	13.7		6.9		6.9		13.7		13.7		13.7			
51	20.5		10.3		9.0		17.9		17.9		17.9		17.9	
52	9.3		4.7		3.5		6.9		6.9		6.9		6.9	
53	14.1		7.1		7.1		14.1		14.1		14.1		14.1	
54		35.3	17.7		15.8		31.6		31.6		31.6		31.6	
55	6.4		3.2		2.5			5.0		5.0		5.0		5.0
56	35.8			17.9		14.9		29.7		27.5		27.5		27.5
57														
58	37.6		18.8		16.3		32.5		32.5		32.5		31.1	
59														
60	5.7		2.9		2.3			4.5		4.5		4.5		4.5
61														
62														
63														
64	20.6			10.3		9.7	19.4				20.8			
65														
66	26.2		13.1		13.6			27.1						
67		25.9		13.0		13.0		25.9		25.9		25.9		25.9
68		25.7	12.9		12.9		25.7		25.7					
69	25.7		12.9		12.9		25.7				25.7			
70		23.0	11.5		10.2		20.4		20.4					19.6
71														
72														

continued....

TABLE C-1

SUMMARY OF FINAL SOIL EXCAVATION VOLUMES

DEPTH BH NO.	18 - 21		21 - 24		24 - 27		27 - 30		30 - 33		TOTAL	
	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN*	DISPOSED†
1											27.9	21.6
2											--	55.6
3				4.5							23.5	35.9
4	6.4										93.6	49.2
5		24.3		19.5							23.5	165.0
6											21.3	137.8
7		17.8									49.1	120.3
8											65.0	20.8
9		27.3		27.3		27.3					--	245.8
10		21.0									--	172.1
11											79.5	--
12											76.4	29.6
13											85.8	--
14											94.5	50.9
15											53.3	48.2
16											54.6	52.5
17											36.9	105.0
18		20.1									22.1	25.4
19											76.5	73.0
20											25.1	64.0
21											94.9	58.9
22											34.0	126.3
23											65.5	50.4
24											126.9	30.5

continued....

TABLE C-1

## SUMMARY OF FINAL SOIL EXCAVATION VOLUMES

DEPTH BH NO.	18 - 21		21 - 24		24 - 27		27 - 30		30 - 33		TOTAL	
	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN	DISPOSED	CLEAN*	DISPOSED*
49											131.9	67.6
50											68.6	--
51		17.9									111.4	17.9
52											45.1	--
53		14.0									84.7	14.0
54		33.9	33.9			33.9					159.9	137.0
55		5.0									12.1	25.0
56		27.5	27.5			27.5		27.5	18.3		145.8	163.3
57											--	--
58	31.1		31.1		31.1		31.1				263.5	62.2
59											--	--
60	4.5										24.4	9.0
61											--	--
62											--	--
63											--	--
64											40.0	40.8
65											--	--
66											52.9	27.1
67		25.9		25.9							77.7	129.6
68											77.2	25.7
69											77.2	25.7
70		19.6									62.5	81.8
71											--	--
72											--	--

continued....

### CLEAN SOIL PILE END AREA CALCULATIONS

<u>Section</u>	<u>Station</u>	<u>Distance</u>	<u>Double Distance</u>	<u>Mean Distance</u>	(ft <sup>2</sup> ) <u>End Area</u>	(ft <sup>3</sup> ) <u>Volume</u>	(ft <sup>3</sup> ) <u>Volume</u>
	0+00	0	10	5	0	0	0
A-A'	0+10	10	30	15	88	1,320	49
B-B'	0+30	20	45	22.5	160	3,600	133
C-C'	0+55	25	50	25	381	9,525	353
D-D'	0+80	25	50	25	584	14,600	541
E-E'	1+05	25	50	25	505	12,625	468
F-F'	1+30	25	50	25	677	16,925	627
G-G'	1+55	25	50	25	458	11,450	424
H-H'	1+80	25	30	15	334	5,010	186
	1+85	5	5	2.5	0	0	0
						TOTAL	2,781 c.y.

APPENDIX D  
AND DISPOSAL VOLUME RECORD



11-26-84 123-H6	93309	NYA 117128-7	25850	12.93
11-26-84 123-H6	93310	NYA 117129-6	39760	19.8
11-26-84 123-H6	93311	NYA 117130-5	42450	21.23
11-26-84 123-H6	93312	NYA 117131-4	41390	20.70
11-26-84 123-H6	93313	NYA 117132-3	37110	18.56
11-26-84 123-H6	93314	NYA 117133-2	39900	19.95
11-26-84 123-H6	93315	NYA 117134-1	40480	20.24
11-26-84 123-H6	93316	NYA 117135-9	41830	20.92
11-26-84 123-H6	93317	NYA 117136-8	43660	21.83
11-26-84 123-H6	93318	NYA 117137-7	41450	20.73
11-26-84 123-H6	93319	NYA 117138-6	43160	21.58
11-26-84 123-H6	93320	NYA 117139-5	39780	19.89
11-26-84 123-H6	93321	NYA 117140-4	39400	19.70
11-26-84 123-H6	93322	NYA 117141-3	37050	18.53
11-26-84 123-H6	93323	NYA 117142-1	38900	19.45
11-27-84 123-H6	93324	NYA 117143-1	40110	20.06
11-27-84 123-H6	93325	NYA 117144-9	39850	19.93
11-27-84 123-H6	93326	NYA 117145-8	37420	18.71
11-27-84 123-H6	93327	NYA 117146-7	38750	19.38
11-27-84 123-H6	93328	NYA 117147-6	38540	19.27
11-27-84 123-H6	93329	NYA 117148-5	39800	19.90
11-27-84 123-H6	93330	NYA 117149-4	38320	19.16
11-27-84 123-H6	93331	NYA 117150-3	42350	21.18
11-27-84 123-H6	93332	NYA 117151-2	37650	18.83
11-27-84 123-H6	93333	NYA 117152-1	40030	20.02
11-28-84 123-H6	93334	NYA 117153-9	35740	17.87
11-28-84 123-H6	93335	NYA 117154-8	41910	20.96
11-28-84 123-H6	93336	NYA 117155-7	35800	17.90
11-28-84 123-H6	93337	NYA 117156-6	23280	11.64
11-28-84 123-H6	93338	NYA 117157-5	38500	19.25
11-28-84 123-H6	93339	NYA 117158-4	33720	16.86
11-28-84 123-H6	93340	NYA 117159-3	31270	15.64
11-30-84 123-H6	93341	NYA 117160-2	42380	21.19
11-30-84 123-H6	93342	NYA 117161-1	41320	20.66
11-30-84 123-H6	93343	NYA 117162-9	34530	17.27
11-30-84 123-H6	93344	NYA 117163-8	36060	18.03
11-30-84 123-H6	93560	NYA 117164-7	40790	20.40
11-30-84 123-H6	93561	NYA 117165-6	42410	21.21
11-30-84 123-H6	93562	NYA 117166-5	41800	20.90
11-30-84 123-H6	93563	NYA 117167-4	33370	16.69
11-30-84 123-H6	93564	NYA 117168-3	35410	17.71
11-30-84 123-H6	93565	NYA 117169-2	35440	17.72
11-30-84 123-H6	93566	NYA 117169-2	35600	17.80
11-30-84 123-H6	93567	NYA 117171-9	26740	13.37

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TOTAL DISPOSAL WEEK ENDING 12-01-84	1057.84
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ACCUM DISP 11-9,11-16,11-23,12-01-84	5007.95
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TOTAL DISPOSAL SEPT & OCTOBER	5190.20
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TOTAL DISPOSAL FOR JOB 5705-014	10198.15	+ 7.04 = 10205.19 Ton.
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IBM, POUCE PSIE PROJECT  
BUILDING 952,982 EXCAVATION  
PROJECT NUMBER 5705-14  
FILENAME: MANI014NDV

MANIFEST RECORD

DATE	PRODUCT CODE	W.O. NUMBER	MANIFEST NUMBER	GROSS WEIGHT	TONS WEIGHT
11-02-84	123-HG	92684	NYA 167495-4	53790	26.90
11-02-84	123-HG	92685	NYA 167496-3	39800	19.90
11-02-84	123-HG	92686	NYA 167497-2	49580	24.79
11-02-84	123-HG	92687	NYA 167498-1	49380	24.69
11-02-84	123-HG	92688	NYA 167499-9	46100	23.05
11-02-84	123-HG	92689	NYA 141672-6	48010	24.01
11-02-84	123-HG	92690	NYA 141673-5	41980	20.99
11-02-84	123-HG	92691	NYA 141674-4	42110	21.06
11-02-84	123-HG	92692	NYA 141675-3	40940	20.47
11-02-84	123-HG	92693	NYA 141676-2	45830	22.92
11-02-84	123-HG	92694	NYA 141677-1	41180	20.59
11-02-84	123-HG	92695	NYA 141678-9	37410	18.71
11-02-84	123-HG	92696	NYA 141679-8	37960	18.98
11-02-84	123-HG	92697	NYA 141680-7	37440	18.72
11-02-84	123-HG	92698	NYA 141681-6	44980	22.49
11-02-84	123-HG	92699	NYA 141682-5	44510	22.26
11-02-84	123-HG	92700	NYA 141683-4	44020	22.01
11-02-84	123-HG	92701	NYA 141684-3	43500	21.75
11-02-84	123-HG	92702	NYA 141685-2	46230	23.12
11-05-84	123-HG	92703	NYA 141686-1	43300	21.65
11-05-84	123-HG	92704	NYA 141687-9	39200	19.60
11-05-84	123-HG	92705	NYA 141688-8	42600	21.30
11-05-84	123-HG	92706	NYA 141689-7	38360	19.18
11-05-84	123-HG	92707	NYA 141690-6	34950	17.48
11-05-84	123-HG	92708	NYA 141691-5	38430	19.22
11-05-84	123-HG	92709	NYA 141692-4	36890	18.45
11-05-84	123-HG	92710	NYA 141806-7	41360	20.68
11-05-84	123-HG	92711	NYA 141694-2	40100	20.05
11-05-84	123-HG	92712	NYA 141695-1	42030	21.02
11-05-84	123-HG	92713	NYA 141696-9	38770	19.39
11-05-84	123-HG	92714	NYA 141697-8	40400	20.20
11-05-84	123-HG	92715	NYA 141698-7	39980	19.99
11-05-84	123-HG	92716	NYA 141699-6	39420	19.71
11-05-84	123-HG	92717	NYA 141700-5	36280	18.14
11-05-84	123-HG	92718	NYA 141805-8	38100	19.05
11-05-84	123-HG	92719	NYA 141807-6	39580	19.79
11-05-84	123-HG	92720	NYA 141808-5	42350	21.18
11-05-84	123-HG	92721	NYA 141809-4	38260	19.13
11-06-84	123-HG	92722	NYA 141810-3	39530	19.77
11-06-84	123-HG	92723	NYA 141822-2	38330	19.17
11-06-84	123-HG	92724	NYA 141812-1	42970	21.49
11-06-84	123-HG	92725	NYA 169901-1	41940	20.97
11-06-84	123-HG	92726	NYA 169902-9	38880	19.44
11-06-84	123-HG	92727	NYA 169903-8	37470	18.74
11-06-84	123-HG	92728	NYA 169904-7	40700	20.35
11-06-84	123-HG	92729	NYA 169905-6	41820	20.91

11-06-84 123-HG	92730	NYA 169906-5	44430	22.2
11-06-84 123-HG	92731	NYA 169907-4	43530	21.77
11-06-84 123-HG	92732	NYA 169908-3	44320	22.16
11-06-84 123-HG	92733	NYA 169909-2	43050	21.53
11-06-84 123-HG	93734	NYA 169910-1	38670	19.34
11-06-84 123-HG	92735	NYA 126170-1	44960	22.48
11-06-84 123-HG	92736	NYA 126171-9	36450	18.23
11-07-84 123-HG	92737	NYA 126172-8	37330	18.67
11-07-84 123-HG	92738	NYA 126173-7	39700	19.85
11-07-84 123-HG	92739	NYA 126174-6	37340	18.67
11-07-84 123-HG	92740	NYA 126175-5	40160	20.08
11-07-84 123-HG	92741	NYA 126176-4	43220	21.61
11-07-84 123-HG	92742	NYA 126177-3	41930	20.97
11-07-84 123-HG	92743	NYA 126178-2	42920	21.46
11-07-84 123-HG	92744	NYA 126179-1	42870	21.44
11-07-84 123-HG	92745	NYA 126180-9	36850	18.43
11-07-84 123-HG	92746	NYA 126181-8	43710	21.86
11-07-84 123-HG	92747	NYA 126182-7	43100	21.55
11-07-84 123-HG	92748	NYA 126183-6	39800	19.90
11-07-84 123-HG	92749	NYA 126184-5	42230	21.12
11-07-84 123-HG	92750	NYA 126185-4	39840	19.92
11-07-84 123-HG	92751	NYA 126186-3	46010	23.01
11-07-84 123-HG	92752	NYA 126187-2	39600	19.80
11-07-84 123-HG	92753	NYA 126188-1	43480	21.74
11-08-84 123-HG	92754	NYA 126189-9	39710	19.86
11-08-84 123-HG	92755	NYA 126190-8	34400	17.20
11-08-84 123-HG	92756	NYA 126191-7	43090	21.55
11-08-84 123-HG	92757	NYA 126192-6	37690	18.85
11-08-84 123-HG	92758	NYA 126193-5	37270	18.64
11-08-84 123-HG	92759	NYA 126194-4	40320	20.16
11-08-84 123-HG	92760	NYA 126195-3	40010	20.01
11-08-84 123-HG	92761	NYA 126196-2	40480	20.24
11-08-84 123-HG	92762	NYA 126197-1	39700	19.85
11-08-84 123-HG	92763	NYA 126198-9	40650	20.33
11-08-84 123-HG	92764	NYA 126199-8	38600	19.30
11-08-84 123-HG	92765	NYA 126200-7	39620	19.81
11-08-84 123-HG	92766	NYA 102301-2	43640	21.82
11-08-84 123-HG	92767	NYA 102302-1	43900	21.95
11-09-84 123-HG	92768	NYA 102303-9	38380	19.19
11-09-84 123-HG	92769	NYA 102304-8	39970	19.99
11-09-84 123-HG	92770	NYA 102305-7	39830	19.92
11-09-84 123-HG	92771	NYA 102306-6	45880	22.94
11-09-84 123-HG	92772	NYA 102307-5	36640	18.32
11-09-84 123-HG	92773	NYA 102308-4	36750	18.38
11-09-84 123-HG	92774	NYA 102309-3	42860	21.43
11-09-84 123-HG	92775	NYA 102310-2	40140	20.07
11-09-84 123-HG	92776	NYA 102311-1	42030	21.02
11-09-84 123-HG	93050	NYA 102312-9	41070	20.54
11-09-84 123-HG	93051	NYA 102313-8	34670	17.34
11-09-84 123-HG	93052	NYA 102314-7	34910	17.46
11-09-84 123-HG	93053	NYA 102315-6	39220	19.61
11-09-84 123-HG	93054	NYA 102316-5	40760	20.38
11-09-84 123-HG	93056	NYA 102318-3	35730	17.87

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TOTAL DISPOSAL WEEK ENDING 11-09-84

2025.09

11-13-84 123-HG 93055 NYA 102317-4 39780 19.89

11-13-84 123-H6	93057	NYA 102319-2	39810	19.91
11-13-84 123-H6	93058	NYA 102320-1	38440	19.22
11-13-84 123-H6	93059	NYA 102321-9	43480	21.74
11-13-84 123-H6	93060	NYA 102322-8	41890	20.95
11-13-84 123-H6	93061	NYA 102323-7	40150	20.08
11-13-84 123-H6	93062	NYA 102324-6	40690	20.35
11-13-84 123-H6	93063	NYA 102325-5	38600	19.30
11-13-84 123-H6	93064	NYA 102326-4	40130	20.07
11-13-84 123-H6	93065	NYA 102327-3	39710	19.86
11-13-84 123-H6	93066	NYA 102328-2	39000	19.50
11-13-84 123-H6	93067	NYA 102329-1	38740	19.37
11-14-84 123-H6	93068	NYA 102330-9	38260	19.13
11-14-84 123-H6	93069	NYA 102331-9	42100	21.05
11-14-84 123-H6	93070	NYA 102332-7	40140	20.07
11-14-84 123-H6	93071	NYA 102333-6	39130	19.57
11-14-84 123-H6	93072	NYA 102334-5	38320	19.16
11-14-84 123-H6	93073	NYA 102335-4	40930	20.47
11-14-84 123-H6	93074	NYA 102336-3	38580	19.29
11-14-84 123-H6	93075	NYA 102338-1	41370	20.69
11-14-84 123-H6	93076	NYA 102339-9	39500	19.75
11-14-84 123-H6	93077	NYA 102340-8	40540	20.27
11-14-84 123-H6	93078	NYA 102341-7	43000	21.50
11-14-84 123-H6	93079	NYA 102342-6	39630	19.82
11-15-84 123-H6	93080	NYA 102343-5	41020	20.51
11-15-84 123-H6	93081	NYA 102344-4	34710	17.36
11-15-84 123-H6	93082	NYA 102345-3	37890	18.95
11-15-84 123-H6	93083	NYA 102346-2	33620	16.81
11-15-84 123-H6	93084	NYA 102347-1	42370	21.19
11-15-84 123-H6	93085	NYA 102348-9	37560	18.78
11-15-84 123-H6	93086	NYA 102349-8	38520	19.26
11-15-84 123-H6	93087	NYA 102350-7	40080	20.04
11-15-84 123-H6	93088	NYA 102351-6	41160	20.58
11-15-84 123-H6	93089	NYA 102352-5	38790	19.40
11-15-84 123-H6	93090	NYA 102353-4	38530	19.27
11-15-84 123-H6	93091	NYA 102354-2	41040	20.52
11-16-84 123-H6	93092	NYA 102356-1	40540	20.27
11-16-84 123-H6	93093	NYA 102357-9	40310	20.16
11-16-84 123-H6	93095	NYA 102358-8	41220	20.61
11-16-84 123-H6	93096	NYA 102359-7	36110	18.06
11-16-84 123-H6	93097	NYA 102360-6	36700	18.35

TOTAL DISPOSAL WEEK ENDING 11-16-84	1622090	811.05
ACCUM. DISP W/E 11-09 & 11-16-84	1622090	2836.13

11-18-84 123-H6	93098	NYA 102362-4	38480	19.24
11-18-84 123-H6	93099	NYA 102363-3	40280	20.14
11-18-84 123-H6	93100	NYA 102364-2	43420	21.71
11-18-84 123-H6	93101	NYA 102365-1	39240	19.62
11-18-84 123-H6	93102	NYA 102366-9	37420	18.71
11-18-84 123-H6	93103	NYA 102367-8	30550	15.28
11-18-84 123-H6	93104	NYA 102368-7	39900	19.95
11-18-84 123-H6	93105	NYA 102369-6	39250	19.63
11-18-84 123-H6	93106	NYA 102370-5	40480	20.24
11-18-84 123-H6	93107	NYA 102371-4	39420	19.71
11-18-84 123-H6	93108	NYA 102372-3	39410	19.71
11-18-84 123-H6	93109	NYA 102373-2	42390	21.20
11-18-84 123-H6	93110	NYA 102374-1	39750	19.88
11-18-84 123-H6	93111	NYA 102375-9	39360	19.68