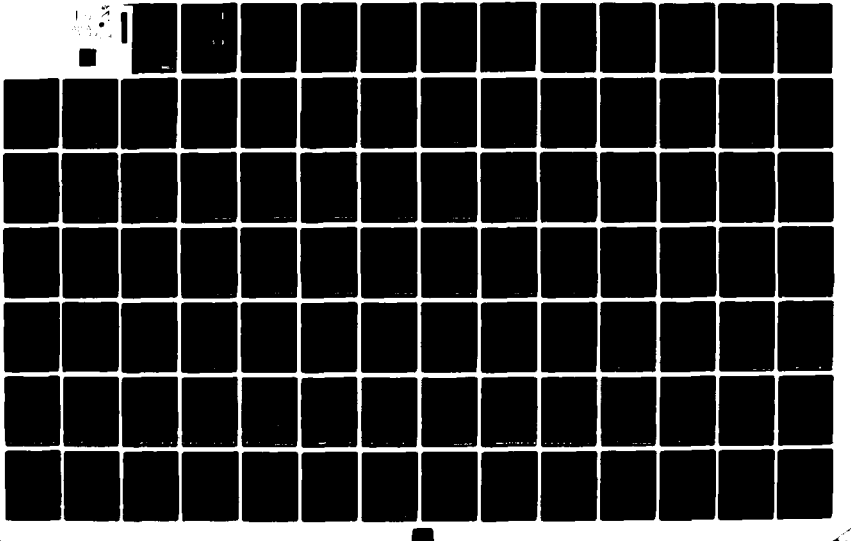
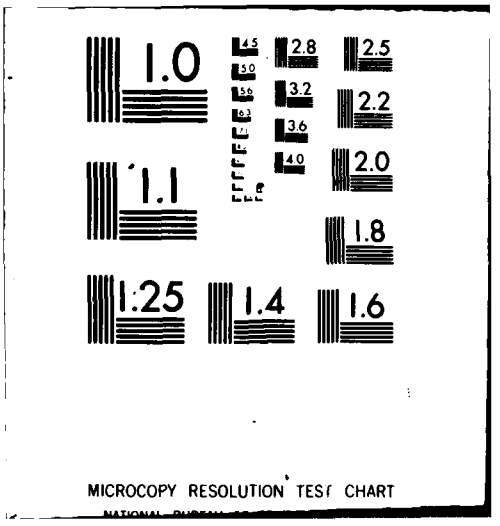
AD-A113 329 FUGRO NATIONAL INC LONG BEACH CA F/G 8/13
MX SITING INVESTIGATION. GEOTECHNICAL EVALUATION. VOLUME VII. N--ETC(U)
AUG 79 F04704-80-C-0006
UNCLASSIFIED FN-TR-27-7 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART

MX SITING INVESTIGATION GEOTECHNICAL EVALUATION

VOLUME VII NEVADA-UTAH VERIFICATION STUDIES, FY 79 GEOTECHNICAL DATA, REVEILLE-RAILROAD CDP, NEVADA

PREPARED FOR
SPACE AND MISSILE SYSTEMS ORGANIZATION (SAMSO)
NORTON AIR FORCE BASE, CALIFORNIA

TERRA TEK, INC.

PHOTOGRAPH THIS SHEET

AD-A113 329

DTIC ACCESSION NUMBER

LEVEL

INVENTORY

FN-TR-27, Vol. VII Final

DOCUMENT IDENTIFICATION

Contract F04704-80-C-0006 24 Aug. 79

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

DISTRIBUTION STATEMENT

ACCESSION FOR	
NTIS	GRA&I
DTIC	TAB
UNANNOUNCED	
JUSTIFICATION	
BY	
DISTRIBUTION /	
AVAILABILITY CODES	
DIST	AVAIL AND/OR SPECIAL
A	

DISTRIBUTION STAMP

DTIC COPY INSPECTED 2

DTIC
ELECTE
S D
APR 12 1982
D

DATE ACCESSIONED

82 03 18 101

DATE RECEIVED IN DTIC

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-DDA-2

DTIC FORM 70A OCT 79

DOCUMENT PROCESSING SHEET

FN-TR-27-VII

MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION
VOLUME VII, NEVADA-UTAH
VERIFICATION STUDIES, FY 79
GEOTECHNICAL DATA
REVEILLE-RAILROAD CDP, NEVADA

Prepared for:

U. S. Department of the Air Force
Space and Missile Systems Organization (SAMSO)
Norton Air Force Base, California 92409

Prepared by:

Fugro National, Inc.
3777 Long Beach Boulevard
Long Beach, California 90807

24 August 1979

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: FN-TR-27-VII AD-A113 329
2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle): Volume VII Nevada-Utah verification studies, FY 79 Geotechnical Data, Reveille-Railroad COP, Nevada
5. TYPE OF REPORT & PERIOD COVERED: Final
6. PERFORMING ORG. REPORT NUMBER: FN-TR-27-VII

7. AUTHOR(s): Fugro National, Inc
8. CONTRACT OR GRANT NUMBER(s): F04704-80-C-0006

9. PERFORMING ORGANIZATION NAME AND ADDRESS: Ertec Western Inc. (formerly Fugro National) P.O. Box 7765 Long Beach Ca 90807
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 64312 F

11. CONTROLLING OFFICE NAME AND ADDRESS: U.S. Department of the Air Force Space and Missile Systems Organization Norton AFB Ca 92409 (SAMSO)
12. REPORT DATE: 24 Aug 79
13. NUMBER OF PAGES: 270

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
15. SECURITY CLASS. (of this report)
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report): Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report): Distribution Unlimited

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number): Geologic, Groundwater, seismic, Gravity, boring logs, compaction, cone penetrometer, electrical resistivity, sieve analysis

20. ABSTRACT (Continue on reverse side if necessary and identify by block number): The objectives of this report are to verify suitable area for MX system + to provide pre-physical + engineering characteristics of the soils included are basic data consisting of trenched boring logs, sieve analyses, compression tests, and seismic refraction surveys.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

VOLUME VII
GEOTECHNICAL DATA, REVEILLE-RAILROAD CDP

TABLE OF CONTENTS

DRAWINGS IN POCKET

FOREWORD

This report was prepared for the Department of the Air Force, Space and Missile Systems Organization (SAMSO), in compliance with Contract No. F04704-78-C-0027, CDRL Item 005A2. It presents geological, geophysical, and geotechnical data and evaluates the suitability of portions of Nevada and Utah for siting the MX Land Mobile Advanced ICBM System.

This report is the first of several Verification reports which will be prepared. The objectives are to verify sufficient suitable area for deployment of the MX System and to provide preliminary physical and engineering characteristics of the soils. The Verification Studies are the final phase of a site-selection process which was begun in 1977. Previous studies have been termed Screening, Characterization, and Ranking. In preparing this report, it has been assumed that the reader is familiar with these previous studies.

Results of the FY 79 Verification studies are contained in 11 volumes as follows:

Geotechnical Results

Volume 1A - Sections 1.0, 2.0, and 3.0 contain Introduction, Results and Conclusions, and Recommendations for Future Studies. Sections 4.0 through 6.0 contain summary geotechnical data for Whirlwind, Snake East, and Hamlin CDP's.

Volume 1B - Sections 7.0 through 10.0 contain summary geotechnical data for White River North, Garden-Coal, Reveille-Railroad and Big Smoky CDP's.

Geotechnical Data Volumes

Volume II - Whirlwind CDP
Volume III - Snake East CDP
Volume IV - Hamlin CDP
Volume V - White River North CDP
Volume VI - Garden-Coal CDP
* Volume VII - Reveille-Railroad CDP
Volume VIII - Big Smoky CDP
Volume IX - Dry Lake CDP
Volume X - Ralston CDP

* This volume is presented herein.

SECTION 1.0

GEOLOGIC STATION DATA

EXPLANATIONS OF GEOLOGIC STATION DATA

Geologic stations were established at selected locations throughout the CDP at which detailed descriptions of surficial basin-fill deposits or rock were recorded. Locations of all geologic stations are shown in Drawing 1, Activity Location Map. All data taken on surficial basin-fill units at these stations are listed in Table 1-1 and an explanation of the column headings in the table is given below. At stations where rock descriptions were made, only geologic unit designations are listed. A general explanation of all geologic unit symbols used in Verification Studies is included at the end of this section.

Column Heading Table 1-1	Explanation
Station Number	Geologic stations are numbered sequentially. Where more than one geologic field team worked in a CDP, stations made by each team are differentiated with a letter (A, B, or C) following the station number.
Geologic Unit	Generic geologic unit only, i.e. the grain-size designation (f, s, g, c) is omitted from surficial basin-fill units. The letter B in the unit designation indicates a buried deposit not exposed at the surface.
MPS MM	Average maximum particle size in millimeters.
Grain Size (%B, %C, %G, %S, %F)	Estimated particle size distribution using the Unified Soil Classification System. Percentages of boulders (%B) and cobbles (%C) are based on the entire deposit, whereas percentages of gravel (%G), sand (%S) and fines (%F) are taken only on the fraction composed of particles less than 3 inches (76 mm) in diameter.
USCS	Soil class according to the Unified Soil Classification System.

Munsell Color	Soil color based on Munsell Soil Color Chart.
Source Rock Types(s)	Rock types of coarse clasts listed in order of abundance.
* Physical Properties	Data listed in columns 6 through 15 address specific soil properties. These are listed below in parentheses following the column heading number and are also listed at the bottom of Table 1-1. Data are coded with each numerical entry referring to a specific soil condition as listed below.
6 (Grain Shape)	1) Angular, 2) Subangular, 3) Subrounded, 4) Rounded, 5) Well rounded
7 (Moisture Content)	1) Dry, 2) Moist, 3) Wet
8 (Plasticity of Fines)	1) None, 2) Low, 3) Medium, 4) High
9 (Consistency)	Coarse grained: 1) Very Loose, 2) Loose, 3) Medium Dense, 4) Dense, 5) Very Dense, Fine grained: 1)Soft, 2) Firm, 3) Stiff, 4) Hard
10 (Structure)	1) Stratified Tabular, 2) Stratified Other (lensed, cross bedded, discontinuous beds), 3) Nonstratified
11 (Cementation Induration)	1) None, 2) Weak, 3) Moderate, 4) Strong
12 (Depth to Cemented Layers)	Depth to layer (in centimeters) exhibiting cementation induration described in Column 11 (above)
13 (Weathering of clasts)	1) Fresh, 2) Slight, 3) Moderate, 4) Very
14 (Soil Profile Development)	1) None (A-C profile), 2) Poor (incipient B-horizon), 3) Well (prominant B-horizon)
15 (Caliche Development)	1) Stage I, 2) Stage II, 3) Stage III, 4) Stage IV, 5) None

Drainage

DP (M)	Average depth of drainages (in meters)
WD (M)	Average width of drainages (in meters)
Slope (%)	Average slope of ground surface (in percent grade)
Sample	Number of samples taken

GENERALIZED GEOLOGIC UNITS

Explanation

Surficial Basin-fill Units

A1 Younger Fluvial Deposits - Major modern stream channel and flood-plain deposits.

A2 Older Fluvial Deposits - Older incised stream channel and flood-plain deposits in elevated terraces bordering major modern drainages.

A3 Eolian Deposits - Wind-blown deposits of sand occurring as either thin sheets (A3s) or dunes (A3d).

A4 Playa and Lacustrine Deposits - Deposits occurring in modern, active playas (A4) or in either inactive playas or older lake beds and abandoned shorelines associated with extinct lakes (A4o).

A5 Alluvial Fan Deposits - Alluvial deposits consisting of debris flow and water-laid alluvium near mountain fronts, grading into predominantly water-laid alluvium deposited in shifting distributary channels near the basin center. Younger (A5y), intermediate (A5i), and older (A5o) alluvial fans are differentiated by surface soil development, terrain conditions, and present depositional/erosional environment.

Grain sizes of these deposits (except A3 deposits, which are exclusively sandy) are indicated by a single letter (f, s, g, or c) following the geologic unit symbol. These letters indicate the predominant grain size and range of soil types according to the Unified Soil Classification System:

f - fine-grained (ML, CL, MH, CH)

s - sands (SP, SW, SM, SC)

g - gravels (GP, GW, GM, GC)

c - coarse grained with greater than 30 percent boulders and cobbles (generally GP, GW, GM, GC)

ROCK UNITS

I Igneous (undifferentiated). Rocks formed by solidification of a molten or partially molten mass.

- I1 Intrusive - Plutonic rocks formed by solidification of molten material beneath the surface (e.g., granite, granodiorite, diorite, gabbro).
- I2 Extrusive (intermediate and acidic) - Volcanic rocks of intermediate and acidic compositon formed by solidification of molten material at or near the surface, (e.g., rhyolite, latite, dacite, andesite).
- I3 Extrusive (basic) - Volcanic rocks of basic composition, generally formed by solidification of molten materials at or near the surface (e.g., basalt).
- I4 Extrusive (pyroclistic) - Rocks formed by accumulation of volcanic ejecta (e.g., ash, tuff, welded tuff, agglomerate).

S Sedimentary (undifferentiated) - Rocks formed by accumulation of clastic solids, organic solids and/or chemically precipitated minerals.

- S1 Arenaceous and/or Siliceous Rocks - Composed of sand size particles (e.g., sandstone, orthoquartzite) or of cryptocrystalline silica (e.g., opal, chert).
- S2 Carbonate Rocks - Composed predominantly of calcium carbonate detritus or chemical precipitates (e.g., limestone, dolomite, chalk).
- S3 Argillaceous Rocks - Composed of clay and silt-sized particles (e.g., siltstone, shale, claystone).
- S4 Evaporite Rocks - Precipitated from solution as a result of evaporation (e.g., halite, gypsum, anhydrite, sylvite).
- S5 Coarse Clastic Rocks - Composed of gravel sized or larger clasts (e.g., conglomerate, breccia).

M Metamorphic (undifferentiated) - Rocks formed through recrystallization in the solid state of preexisting rocks by heat and pressure (e.g., gneiss, schist, hornfels, metaquartzite).

STATION NUMBER	GEOL UNIT	MPS MM	MPS PH	GRAIN SIZE SC	GRAIN SIZE SC	GRAIN SIZE SE	GRAIN SIZE SF	USCS	MUNSELL COLOR	SOURCE ROCK TYPE(S)	SOURCE ROCK TYPE(S)	SOURCE ROCK TYPE(S)	*PHYSICAL PROPERTIES 6	7	8	9	10	11	12	13	14	15	DRAINAGE CM/H	DRAINAGE M/DAY	SLOPE %	SAMPLE
NRR6718	ASY	119	06	CT	25	C62	C1C	SP-SM	10.0YR6/4	I2			1	2	1	2	3	1		1	1	1	.1	001	0.	C
NRR671M	AEY	1C0	00	.9	50	C49	C0F	SP-SC*	10.0YR6/4	I2	I4		1	2	1	2	3	1		1	1	1	1.0	C04	1.	C
NRR671C	ASI	140	0T	05	30	045	12F	SC	C7.5YR5/4	I3	S3	I2 *1	2	2	1	1	3	1		1	1	2	1.C	CC3	C7	C
NRR6U2A	ASI	54C	0T	0T	20	06C	C20	SM	10.0YR6/4	I2			2	1	2	3	3	2	052	1	1	2	.3	093	C4	C
NRR6U2B	A1	C2C	00	00	0T	C70	C5C	SC	10.0YR5/4	I2			3	2	2	2	3	1		1	1	1	.0	00C	01	C
NRR602C	A2	04C	0R	C0	10	069	C25	SM	10.0YR4/4	I2	I3		1	2	2	1	3	2	037	1	1	1	2.0	42U	01	1
NRR603A	ASY	06%	00	PT	10	173	C17	SM	10.0YR4/4	I2			1	2	1	3	3	1		1	1	1	.1	007	.1	1
NRR603B	AEI	G30	C0	0C	05	093	002	SP	10.0YR4/4	I2			1	2	1	1	2	3	02%	2	1		6.2	220	02	1
NRR6U3C	ASY	050	00	C0	0T	060	02C	SM	10.0YR5/6	I2			1	1	1	2	3	1		1	1	1	.2	0C2	01	1
NRR6044	ASY	C57	00	0T	20	055	02F	SM	10.0YR4/4	I2			1	2	2	1	3	2		1	2	1	.1	003	0%	1
NRR604B	AEI	045	00	00	05	095	110	SM-SP	10.0YR4/4	I2			1	2	2	2	3	2	035	2	1	5	2.C	140	0.	1
NRR604C	ASY	070	0T	0T	05	06C	C15	SM	10.0YR4/4	I2			1	1	1	3	3	1		1	2	1	.5	001	1%	1
NRR605A	ASI	086	00	0T	10	072	C15	SM	10.0YR4/4	I2			1	2	1	1	3	2	037	1	2	2	.0		2.	1
NRR6P5B	ASY	150	0C	C2	25	078	F2%	SP-SM	10.0YR5/2	I2			1	2	1	2	3	1		1	1	1	.5	001	0.	1
NRR669C	ASY	090	00	0R	03	077	C20	SM	10.0YR4/4	I2			1	2	1	2	3	1		1	1	1	.1	000	0%	1
NRR66AA	AEY	082	00	CT	15	07E	C1E	SM	10.0YR7/6	I2	*1		1	2	1	1	3	1		1	1	5	.2	005	01	C
NRR66AB	A1	120	00	0T	05	C40	00%	SP-SM	10.0YR4/3	I2			1	2	1	2	2	1		2	1	5	.0	000	.	1
NRR66AC	ASI	052	00	0%	05	06C	C3C	SM	07.5YR4/4	I2			1	1	2	4	3	2	02*	1	3	2	1P.C	170	4C	C
NRR6U7A	ASY	220	00	15	1R	073	C12	SM-SP	10.0YR4/E	I2	S1		1	2	1	2	3	1		1	1	1	.1		2.	1
NRR607F	ASY	055	00	C0	05	040	015	SP	10.0YR4/3	I2			1	2	2	2	2	1		1	1	5	1.4	C1%	C.	1
NRR67C	A2	062	00	C0	00	075	025	SM	07.5YR4/4				1	2	1	1	1	1		1	1	5	.0	00C	3C	1
NRR608A	AAO	C15	20	00	0T	067	100	CL	10.0YR6/6	I2			5	3	5	3	3	1		2	1	5	.0		.	
NRR6P8B	AEI	150	00	C3	20	066	015	SM	10.0YR4/3	I2			2	2	2	2	3	3	040	2	1	3	1.0	04C	1.	1
NRR60AC	ASI	053	00	C0	0T	075	025	SM	10.0YR5/4	I2			2	2	1	3	3	2	015	2	1	1	3.C	02*	4%	1
NRR609A	ASY	145	0T	CT	15	073	015	SM	07.5YR6/6	I2			1	2	1	1	3	1		1	2	1	.C		1.	1
NRR609B	A2	040	00	C0	05	070	02C	SC	10.0YR4/4	I2			1	2	2	2	2	2	05C	2	1	1			1.	1
NRR609C	ASI	060	00	C0	10	065	025	SM	07.5YR5/4	I2			2	2	1	3	3	2	02C	2	1	2	2.C	020	0%	C
NRR610A	ASI	110	00	01	15	07A	007	SP-SM	07.5YR5/4	I2			2	2	1	2	3	1		1	1	1	.3	053	2%	C
NRR610B	ASY	035	00	00	0T	09A	C02	SP	07.5YR4/4	I2			1	2	1	2	3	1		1	1	5			1.	1
NRR610C	I2																									
NRR611A	AAO	081	00	C0	00	010	090	CL	10.0YR4/6					2	2	3	2	1		2	1	5	.0		7C	
NRR611B	ASI	290	0T	1U	40	048	12C	SC-GC	10.0YR4/3	I2			3	2	3	3	3	1		3	3	1	1.5	01C	4.	C
NRR611C	ASY	52%	00	00	0T	075	02%	SM	10.0YR4/4	I2			1	2	1	1	3	2	042	2	1	1	.3	2C0	1%	1
NRR612A	ASY	115	0T	02	2C	07C	010	SP-SM	10.0YR4/4	I2			3	2	1	2	3	1		2	2	1	.7	C92	3%	1
NRR612B	ASY	029	00	00	0T	098	010	SC-SM	10.0YR4/4	I2			2	2	3	2	3	2	048	3	1	5		C1C	2.	C
NRR612C	I3																									
NRR613A	ASI	092	00	0T	15	072	012	SM	07.5YR5/6	I2			1	2	1	3	3	1		1	2	1	1.%	03C	0.	C
NRR613B	AEI	075	00	0T	05	0AC	115	SM	10.0YR4/4	I2	S%		1	2	2	2	3	2	066	3	2	2	1.5	17C	1%	1
NRR613C	I2																									
NRR614A	ASY	075	00	30	25	065	110	SP-SM	10.0YR5/6	I2			1	2	1	3	2	1		1	2	1	.5	00C	01	2
NRR614B	ASY	050	00	02	05	087	007	SP-SM	10.0YR6/4	S%	I2		1	2	2	2	2	1		1	1	1	.3	00A	0.	1
NRR614C	A1	060	00	CT	05	085	010	SP-SM	10.0YR4/3	I2			1	2	1	2	3	1		1	1	5	2.	11C	01	1
NRR615A	AAO	065	A0	0T	32	073	02%	SM	10.0YR7/6	I2			1	2	1	1	3	1		1	1	5	.3		1.	
NRR615B	ASI	120	00	01	15	070	C15	SM	10.0YR4/4	S2	I.		2	2	2	2	2	2	024	2	1	2	1.C	00A	3%	1
NRR615C	ASI	073	C0	0T	3C	055	C15	SM	07.5YR4/6	I2			1	2	1	2	2	2	026	2	2	1	5.U	C92		1
NRR616A	ASY	188	00	CT	2C	065	015	SM	C7.5YR5/6	I2			2	2	1	3	3	1		3	2	1	.7	22C	2.	1
NRR616B	ASI	125	00	03	35	060	2C%	SP-SM	10.0YR4/4	S2	I2		1	2	1	2	3	1		3	1	5	1.C	02C	0%	1
NRR616C	I4	010	00	0C	00	010	0%L	ML	10.0YR4/2	I2			2	2	1	3	3	2	036		1	5	.%	C01	0%	1
NRR617A	ASI	103	0C	CT	2C	06A	012	SM-SP	10.0YR5/6	I2			2	2	1	3	3	2	042	3	2	2	1.2	C04	07	1
NRR617B	A2	040	0C	0T	0T	097	003	SM	10.0YR4/4	I2			1	2	1	2	2	1		3	1	5			01	1
NRR617C	AFI	150	0T	0T	05	055	040	SC	C7.5YR5/4	I2			1	2	2	3	3	1		2	2	5	7.C	07%	3%	1
NRR618A	ASI	22%	00	C3	3C	0P0	423	SC	07.5YR5/4	I2			2	2	2	2	3	1	02%	3	3	3	2.C	2C2	0%	C
NRR618B	A1	020	00	00	0T	09A	002	SP	10.0YR4/3	I2			2	2	1	2	3	1		2	1	5	4.0	40C	01	1
NRR618C	I4																									
NRR619A	ASY	09%	00	CT	4C	035	02%	SP	10.0YR4/4	I2	S1		5	2	2	3	2	1		1	1	5	.0	C3C	0%	C
NRR619B	A2	060	00	0T	1C	07%	21C	SP-SM	10.0YR4/3	I2			5	2	2	2	2	1		3	2	1	.5		1.	C
NRR619C	I4																									
NRR627A	ASY	130	00	CC	1U	060	35U	SC	10.0YR6/4	I2	S1		1	2	2	4	3	1		2	1	5	.0	00%	0C	C
NRR6298	ASY	1C0	00	07	40	030	03C	SM-GP	10.0YR4/4	I2			2	2	2	3	3	1		1	C	1	1.5	3A0	0%	C
NRR62CC	ASY	C30	00	00	0T	C7C	030	SM	07.5YR4/4	I3	I2		1	2	1	2	3	1			1	*	.0	090	2.	1
NRR6214	A40	081	00	00	00	04C	C6C	ML	10.0YR5/6	I2	S1		5	2	2	3	3	1		2	1	5	.3	3C0	03	1
NRR6210	ASI	100	00	C3	35	045	22U	SC	10.0YR4/4	I2			2	2	3	3	2	4	C5%	3	3	3	.3	00%	3%	1
NRR621C	ASI	13%	00	0T	0T	C40	22U	SM	10.0YR5/2	I2			1	1	1	2	3	1			1	5	2.0	003	3%	C
NRR622A	ASY	170	0C	03	03	C07	C10	SP-SM	10.0YR4/4	I2			1	2	1	1	3	1		1	1	5	.5	C04	1%	C
NRR622B	ASY	0P0	00	1T	3C	06C	012	SM-SC	10.0YR4/4	I2			1	2	2	2	2	1		2	1	1	.1	CC5	0%	C
NRR623C	ARC	120	00	0T	1U	065	02%	SC	07.5YR6/4	I2			1	2	2	3	3	1		2	2	1	25.C		1.	C
NRR6236	ASY	060	0C	C0	12	06%	223	SC	07.5YR4/4	I2			3	2	2	3	2	1		2	2	1	.3	03C	0%	C
NRR623B	ASY	045	00	00	0T	080	02F	SM	10.0YR4/4	I2			2	2	2	2	3	1		3	1	5	.5	02C	01	2
NRR623C	I4																									
NRR624A	ASY	20C	00	01	15	065	22F	SM	10.0YR4/4	I2			2	2	1	3	3	2		2	1	1	.2	035	1C	1
NRR6240	A2	068	00	0T	1U	0A0	21U	SM-SP	10.0YR4/4	I2			2	2	2	2	2	1		1	2	1	.2	010	01	1
NRR624C	ASI	063	00	31	3R	005	22F	SC	07.5YR4/4	I2			1	2	2	3	3	2	C6F	3	3	2	2.C	1F0	1C	C
NRR625A	ASY	050	00	00	20	062	C1E	SM	10.0YR5/4	I2			1	2	1	2	3	1		2	1	1	.0	00C	0%	C
NRR625B	A2	130	00	CT	10	065	22F	SP-SM	10.0YR4/4	I2			2	2	2	2	3	2	04F	3	2	2	.3		1.	1
NRR625C	I3																									
NRR626A	ASI	075	00	CT	12	065	C21	SM	10.0YR4/E	I2			2	2	1	3	3	3	027	2	2	3	1.4	C04	0%	C
NRR626P	A2		00	0T	10	0A0	010	SM-SP	10.0YR4/3	I2			1	2	2	2	2	2	04F	3	1	1	.0		1.	1
NRR626C	ASI	100	00	CC	2R	055	02%	SC	07.5YR4/4	I2			1	2	2	3	3	2	C2F	2	2	2	1.5	04C	0%	1
NRR627A	ASI	059	00	00	15	060	025	SM	07.5YR5/6	I2			2	2	1	3	3	3	C22	3	3	2	.5	00A	0%	C
NRR627B	ASY	32%	00	F0	05	C0F	C1F	SM	10.0YR5/E	I2			2	2	2	2	3	2	04C	3	2	1	.5	C10	0%	C
NRR627C	AAO	132	0T	0T	15	075	01C	SP-SM	07.5YR5/6	I2	I3		4	1	1	4	2	2		2			10.0	1EC		C
NRR628A	ASY	110	00	0T	4C	049	015	SM	07.5YR4/4	I2	S1		2	2	1	2	2	1		1	1	1	.5	00%	0%	1
NRR6280	ASI	050	00	C3	1U	07C	02C	SC	07.5YR4/4	I2			1	2	2	3	3	2	027	3	2	2	1.0	30F	2C	C
NRR628C	ASI	072	00	0T	05	060	F3%	SP	07.5YR6/4	I2	I2		2	1	1	3	2	2	021	2	3	2	.5	002	0%	1
NRR629A	ASY	120	00	01	45	037	C1P	SM	10.0YR3/3	I2	S1		2	3	1	3	3	1		2	1	1	.4	C04	0%	C
NRR629B	ASY	030	00	C0	05	07%	02%	SC	07.5YR4/4	I2			1	2	3	2	3	2	040	3	2	2	.5	00F	0%	C
NRR629C	ASY	0F0	00	00	0T	07A	22C	SM	10.0YR6/4	I3	I2		1	2	1	2	3	1		2	1	5	.3	00U	01	1

*PHYSICAL PROPERTIES :
6 = GRAIN SHAPE
7 = MOISTURE CONTENT
8 = PLASTICITY FINES
9 = CONSISTENCY
10 = STRUCTURE
11 = CEMENTATION-INDURATION
12 = DEPTH TO CEMENTED LAYER(CM)
13 = WEATHERING OF CLASTS
14 = SOIL PROFILE DEVELOPMENT
15 = CALICHE DEVELOPMENT

GEOLOGIC STATION DATA
VERIFICATION SITE, REVEILLE-RAILROAD, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 1-1
1 OF 2

FUGRO NATIONAL, INC.

STATION NUMBER	GEOL UNIT	HRS AM	HRS SM	CHAIN SIZE LC	CHAIN SIZE SC	CHAIN SIZE SE	CHAIN SIZE VF	USCS	MUNSELL COLOR	PEDOCAL RANK	PEDOCAL TYPE(S)	PHYSICAL PROPERTIES 6	7	8	9	10	11	12	13	14	15	DARCY/DAY PERMEABILITY	TILT %	SAMPLE
NRR638A	A4Y		00	00	00	07E	03E	SC	07.5YR5/4	I2		2	2	1	1	3	2	042	2	2	1	.01	007	04
NRR639B	A5I	345	00	L0	20	065	010	SP-SF	10.0YR4/3	I2		2	2	1	2	3	2	226	3	1	1	.01	003	01
NRR637C	A5I	072	00	0T	05	065	030	GC	07.5YR4/4	I2	S1 I2	2	2	3	3	3	2	027	2	3	2	1+0	005	04
NRR631A	A5I	217	00	CH	02	233	015	GC	10.0YR4/4	I2		2	2	2	3	3	1		2	2	1	1+0	004	04
NRR631B	A5I	078	00	00	25	055	020	SC	10.0YR4/4	I2		2	2	1	3	3	2	027	2	3	1	6+0	025	12
NRR631C	A5Y	034	00	00	01	064	035	SM	07.5YR4/4	I2	I2	1	1	1	3	3	1		2	1	5	.5	004	01
NRR632A	A5Y	042	00	00	20	060	020	SM	10.0YR5/4	I2		2	2	1	3	3	1		2	1	1	.01		01
NRR632C	A5I	145	0T	05	15	065	020	SM	10.0YR4/4	I2		2	2	2	2	3	2	032	2	2	2	1+0	003	01
NRR673A	A5Y	012	00	00	0T	090	010	SP-SM	10.0YR5/4	I2	S1	2	2	1	2	3	1		2	1	5	.0	008	01
NRR634A	A5Y	052	00	00	01	040	019	SM	10.0YR4/4	I2		2	2	1	3	3	2	031	2	1	1	.0	360	0.
NRR635A	A5Y	260	0T	0T	0R	075	017	SM	10.0YR5/6	I2		2	2	1	3	3	2	045	2	2	1	.5	004	05
NRR636A	A5Y	144	00	0T	1C	075	015	SM	10.0YR5/4	I2		2	2	1	3	3	1		2	1	1	.0	004	01
NRR637A	A5Y	138	00	00	0R	077	01E	SM	10.0YR5/6	I2		2	2	1	3	3	2	054	2	2	1	.2	004	01
NRR637B	A5Y	102	00	0T	15	075	010	SP-SM	10.0YR5/4	I2		2	2	1	3	3	1		2	1	1	.01	001	01
NRR639A	A5I	29F	0T	01	20	067	02C	SM	10.0YR5/6	I2		2	1	1	3	3	2	022	3	2	2	.7	034	07
NRR644A	A5I	365	0T	01	55	035	010	SW-SM	07.5YR5/4	I2		2	1	1	2	2	2	025	3	2	2	.0	007	07
NRR641A	A5I	105	00	01	20	065	01E	SM	10.0YR5/6	I2		2	2	1	3	3	2	019	2	2	2	1+7	005	00
NRR642A	A5Y	053	00	C0	32	058	010	SM	10.0YR5/4	I2		2	2	1	3	2	1		2	2	1	.3	005	05
NRR643A	A4C	01C	00	CG	01	055	040	SC-SM	10.0YR4/6	I2	S1	2	2	1	4	3	1		2	1	5	.0	000	01
NRR644A	A2S	010	00	C0	0T	093	307	SP-SM	10.0YR5/4	I2		2	2	1	2	2	2	042	2	1	1	.1	004	01
NRR645A	A3S	02C	00	00	0T	040	010	SP-SM	10.0YR4/3	I2	S1	2	2	1	3	2	1		2	1	5	.0	000	00
NRR646A	A4C	022	00	00	0T	015	005	CL	10.0YR5/6	I2	S1	2	2	2	3	2	1		2	1	5	.0	001	00
NRR647A	A5I	275	0T	L1	25	065	010	SP-SM	10.0YR4/6	I2		2	2	1	3	3	2	041	3	1	1	1+1	001	04
NRR648A	A4D	011	00	00	0T	020	04C	CL	10.0YR5/6	I2		2	2	2	4	2	1		2	1	5	.1	003	00
NRR649A	A5Y	065	00	0T	12	075	013	SM	10.0YR4/6	I2		2	2	1	2	3	1		2	1	5	.0	000	01
NRR650A	A5Y	08F	00	00	07	068	025	SM	10.0YR5/4	I2	S1	2	2	1	3	3	1		2	1	5	.0	000	01
NRR651A	A5Y	130	00	03	30	062	00M	SW-SM	10.0YR4/4	I2		2	2	1	1	3	1		2	1	5	.2	002	02
NRR652A	A5I	365	0T	0T	0A	672	02C	SC	07.5YR5/4	I2		2	2	2	3	3	2	013	2	2	2	1+0	012	04
NRR653A	A5Y	038	00	00	01	060	01M	SM	10.0YR5/4	I2		2	2	1	3	3	1		2	1	5	.0	001	00
NRR654A	A5Y	310	0T	04	15	079	006	SP-SM	10.0YR4/4	I2		2	2	1	2	3	1		2	1	1	.0	004	01
NRR655A	A5Y	04C	01	04	20	064	01E	SM	10.0YR4/4	I2		2	2	1	3	3	1		2	1	1	.5	003	04
NRR656A	A4E	072	0T	C4	12	065	029	GC	07.5YR5/4	I2	S1	2	2	2	3	3	2	026	3	3	1	1+0	010	03
NRR657A	A5Y	108	00	0T	04	076	02C	SP	10.0YR4/4	I2		2	2	1	3	3	1		2	3	1	.1	001	05
NRR658A	A2I	222	00	0T	1C	077	01E	SM	07.5YR5/4	I2		2	2	1	3	3	2	030	3	2	1	1+3	010	07
NRR659A	A5Y	0R2	C0	0T	27	063	01C	SP-SM	10.0YR4/4	I2		2	2	2	3	2	1		2	2	1	.5	004	05
NRR660A	A5I	128	C0	0T	2C	060	020	SM	10.0YR5/6	I2		2	2	1	3	3	2	022	3	3	2	.4	007	07
NRR661A	A3D	01F	00	C0	0T	092	00A	SP-SM	10.0YR5/3	I2		2	2	1	1	3	1		2	1	5	.0	000	00
NRR662A	A5Y	022	30	00	0	048	040	CL	10.0YR5/6	I2			2	2	3	3	1			1	5	.7	002	01
NRR663A	A5Y	040	00	00	0T	0P8	012	SP-SM	10.0YR5/4	I2		2	2	1	1	3	1		2	1	5	.6	000	00
NRR664A	A5Y	191	00	01	30	095	01E	SM	10.0YR5/6	I2		2	2	1	3	3	1		2	2	5	.0	002	04
NRR665A	A3S	035	40	00	0T	085	015	SP-SM	07.5YR5/4	I2		2	2	1	1	2	1		2	1	5	.0	000	01
NRR646A	A3S	09F	00	C0	0T	07C	03C	SM	10.0YR5/4	I2		2	2	1	3	3	1		2	1	5	.0	000	01
NPR667A	A5Y	019	00	00	09	CAC	01E	SM	10.0YR5/6	I2		2	2	1	3	3	1		2	1	5	.1	002	00
NRR668A	A5Y	035	00	U1	05	065	030	SP	10.0YR5/4	I2	S1	2	2	1	2	3	1		2	1	5	.1	002	02
NRR669A	A5Y	050	00	00	10	070	020	SM	10.0YR5/4	I2	S1	2	2	1	3	2	1		2	1	5	.0	000	01

*PHYSICAL PROPERTIES :

6 = GRAIN SHAPE
7 = MOISTURE CONTENT
8 = PLASTICITY FINES
9 = CONSISTENCY
10 = STRUCTURE
11 = CEMENTATION-INDURATION
12 = DEPTH TO CEMENTED LAYER(S)
13 = FRACTURING OF CLASTS
14 = SOIL PROFILE DEVELOPMENT
15 = CALICHE DEVELOPMENT

GEOLOGIC STATION DATA
VERIFICATION SITE, REVEILLE-RAILROAD, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 1-1
2 OF 2

FUGRO NATIONAL, INC.

SECTION 2.0

GROUND-WATER DATA

EXPLANATIONS OF GROUND-WATER DATA

Existing ground-water data were collected from all available sources. These data were updated where possible from measurements taken during Fugro field operations, and all data are shown on Table 2-1. Locations of water wells and boreholes in which water-level measurements were available are shown in Drawing 1. Well numbers listed in Column 1 (Table 2-1) refer to well locations in Drawing 1. Actual well numbers giving location according to the Bureau of Land Management Land Survey System are shown in Column 2.

Water levels generally refer to the static ground-water table in the unconfined basin-fill aquifer. Perched conditions or levels in artesian aquifers are noted where known.

WELL NO.	WELL LOCATION NUMBER*	ELEVATION OF GROUND SURFACE - FEET (METERS) ABOVE M.S.L.	DEPTH OF WELL - FEET (METERS)	WATER LEVEL			REFERENCES**/ REMARKS
				DEPTH BELOW GROUND SURFACE - FEET (METERS)	DATE MEASURED	ELEVATION - FEET (METERS) ABOVE M.S.L.	
W1	4N/51E-13d1	5120 (1561)	300 (91)	3 (1)	1959	5117 (1560)	2
W2	4N/54E-18dc	4911 (1497)	150 (46)	137 (42)	1967	4774 (1455)	1
W3	4N/55-19da	5000 (1524)	255 (78)	214 (65)	1971	4786 (1456)	1
W4	3N/51E-19c1	5450 (1661)	320 (98)	280 (85)	1964	5170 (1576)	2
W5	3N/55E-35bac	4942 (1506)	204 (62)	165 (50)	1972	4777 (1456)	1
W6	3N/54E-5bc	5040 (1536)	325 (99)	265 (81)	1948	4775 (1455	1
W7	2N/53E-23cbc	4892 (1491)	180 (55)	113 (34)	1972	4779 (1457	1
W8	1N/53E-3dac	4851 (1479)	120 (37)	69 (21)	1972	4782 (1458	1
W9	1N/53E-7adc	4856 (1480)	136 (41)	78 (24)	1972	4778 (1456)	1
W10	1N/53E-27bba	4969 (1515)	200 (61)	172 (52)	1972	4797 (1462)	1
W11	1N/53E-31dcc	5024 (1531)	272 (83)	205 (62)	1951	4819 (1469)	1
W12	1N/53-32db	5004 (1525)	292 (89)	225 (69)	1957	4779 (1457)	1
W13	1S/51½E-23bc	5930 (1807)	370 (113)	335 (102)	1959	5595 (1705)	1
W14	1S/53E-28bda	5205 (1586)	465 (142)	415 (126)	1972	4790 (1460)	1

* Mt. Diablo Baseline and Meridian

** References:

1. Rush and Everett (1966)
2. Van Denburgh and Rush (1974)

NOTE: All wells tap unconfined alluvial aquifers except where noted. Where published data are lacking or inaccurate, ground surface elevations are taken from topographic maps.

GROUND-WATER DATA
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 2-1

FUGRO NATIONAL, INC.

SECTION 3.0

SEISMIC REFRACTION DATA

EXPLANATIONS OF SEISMIC REFRACTION DATA

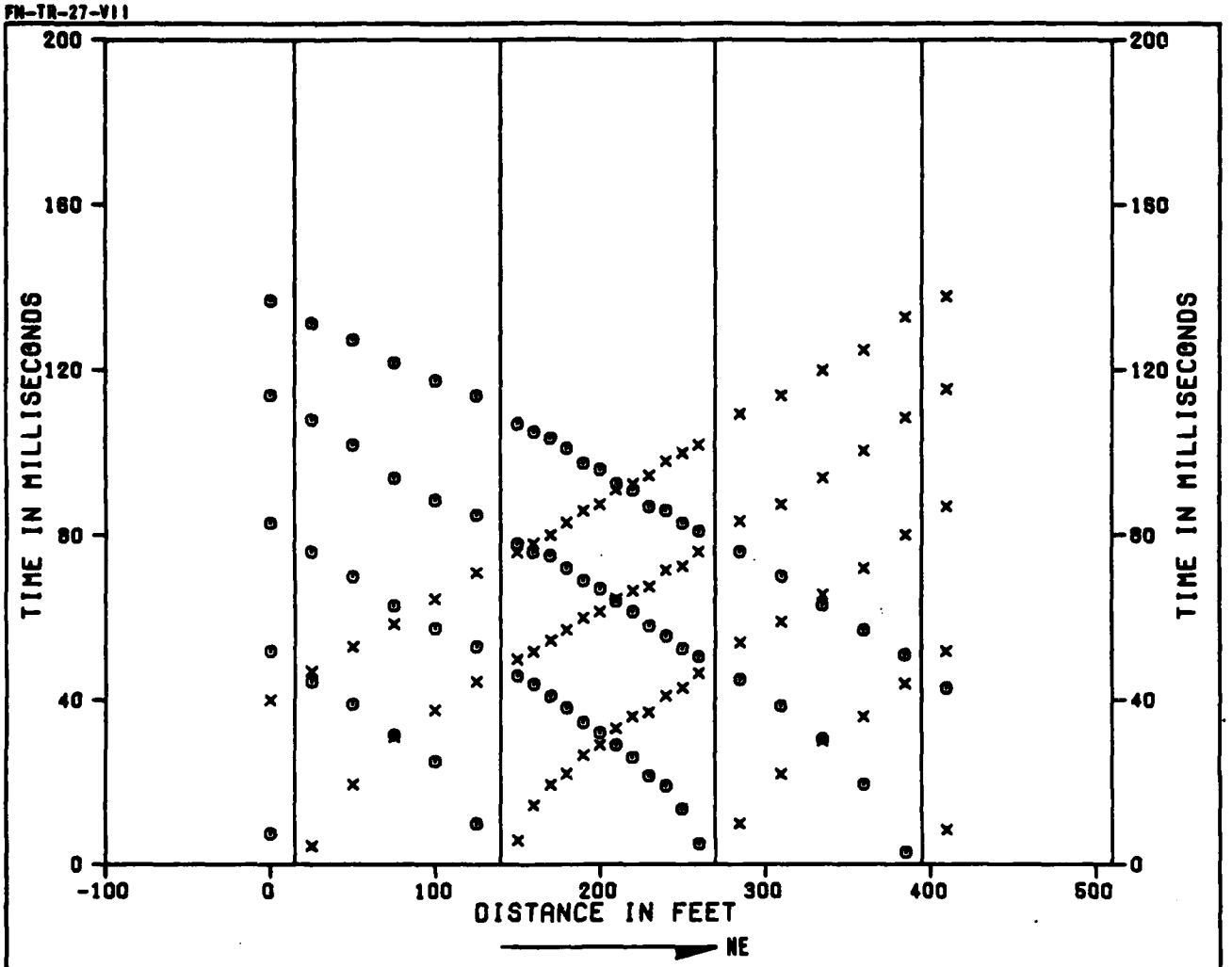
Each figure shows seismic wave travel times plotted versus surface distance between the energy source (shot) and the detector (geophone) for a single seismic line. Distances are measured along the line from geophone number 1 which is designated as zero distance. Distances to the right (on the paper) of geophone 1 are positive. The direction arrow gives the approximate direction of the geophone array from geophone 1 to geophone 24.

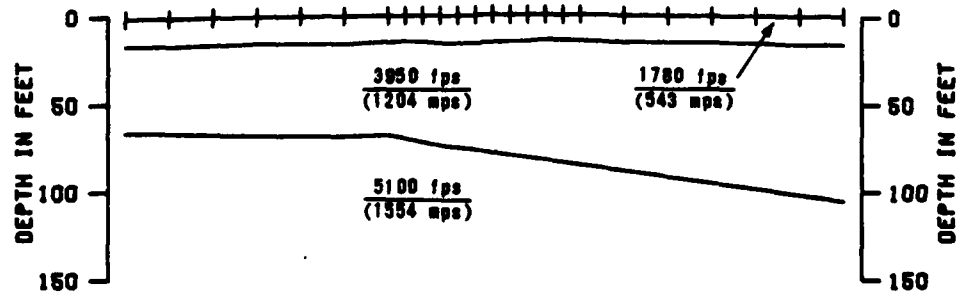
Travel Time Versus Distance Graph (Upper Half of Figure)

This is a travel time versus distance graph. The abscissa represents distance; the ordinate, time. The six vertical lines represent the locations of shots (designated as F, G, H, I, J, and K). The symbol, X, denotes travel times at geophones that were located to the right of a shot. The symbol, ⊖, denotes travel times that were located to the left of shots.

Velocity Cross Section (Lower Half of Figure)

This is an interpreted velocity cross section beneath the seismic line. The top line represents the ground-surface profile. The short vertical lines crossing the top line mark the geophone positions. The depth scale is plotted relative to a point on the line which was arbitrarily chosen as "zero elevation" at the time the line was surveyed. The additional lines across the cross section represent the interpreted boundaries between layers of material with different compressional wave velocities. These boundaries are commonly called "refractors". The velocity interpreted to be representative of each layer is shown.





× TIMES TO RIGHT OF SHOTS
⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-1
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

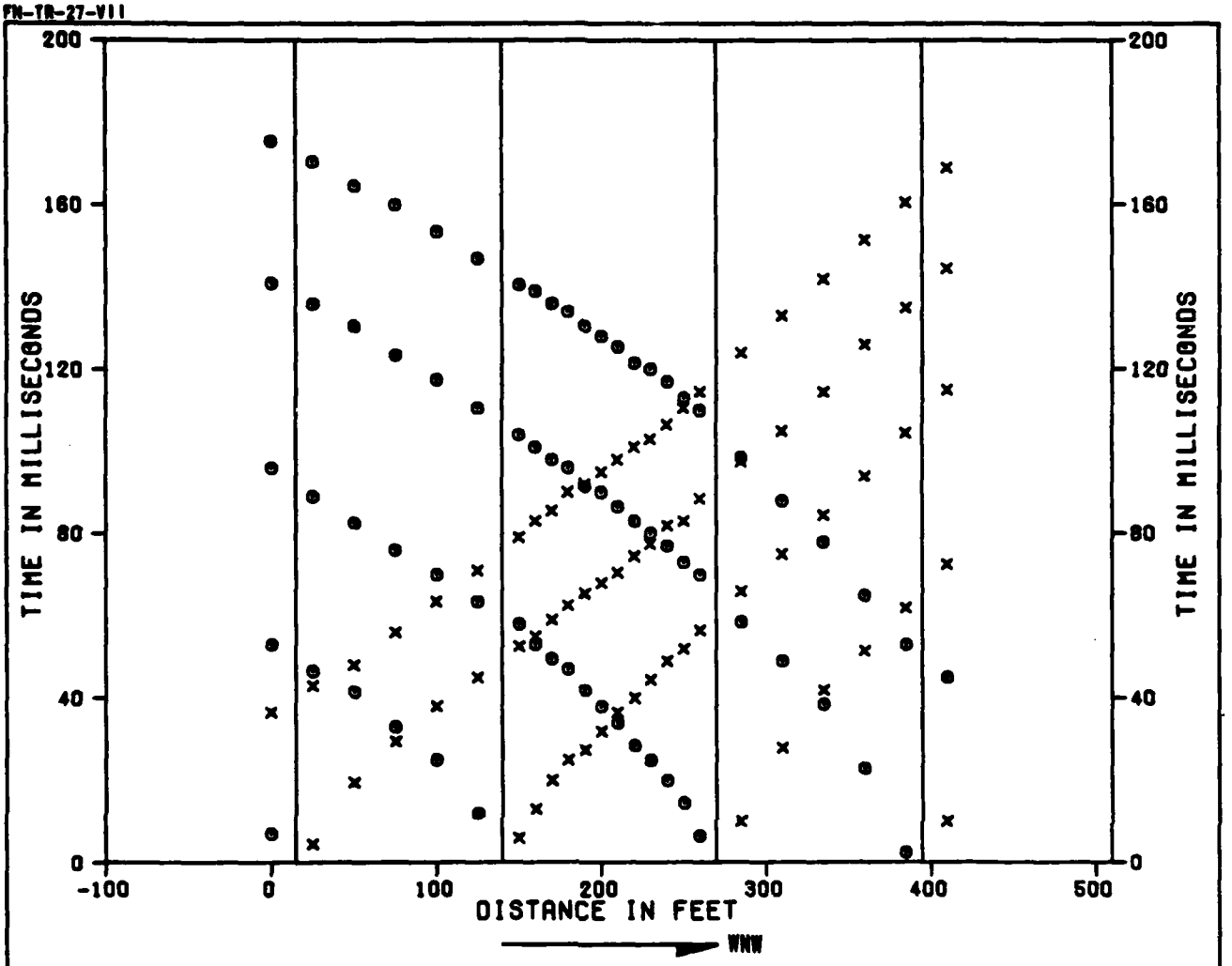
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

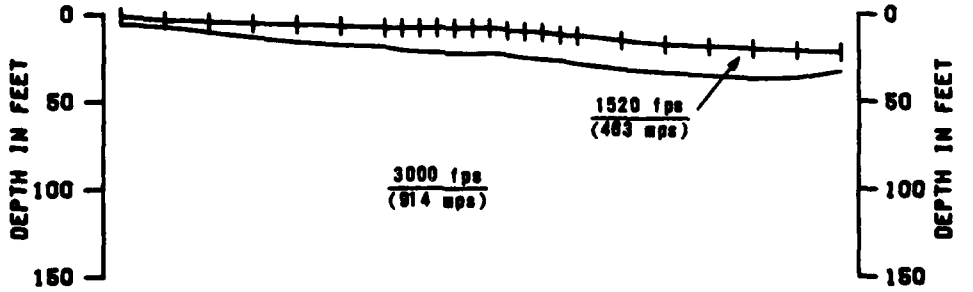
FIGURE
3-1

FUGRO NATIONAL, INC.

2 JUL 78

FN-TR-27-VII





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

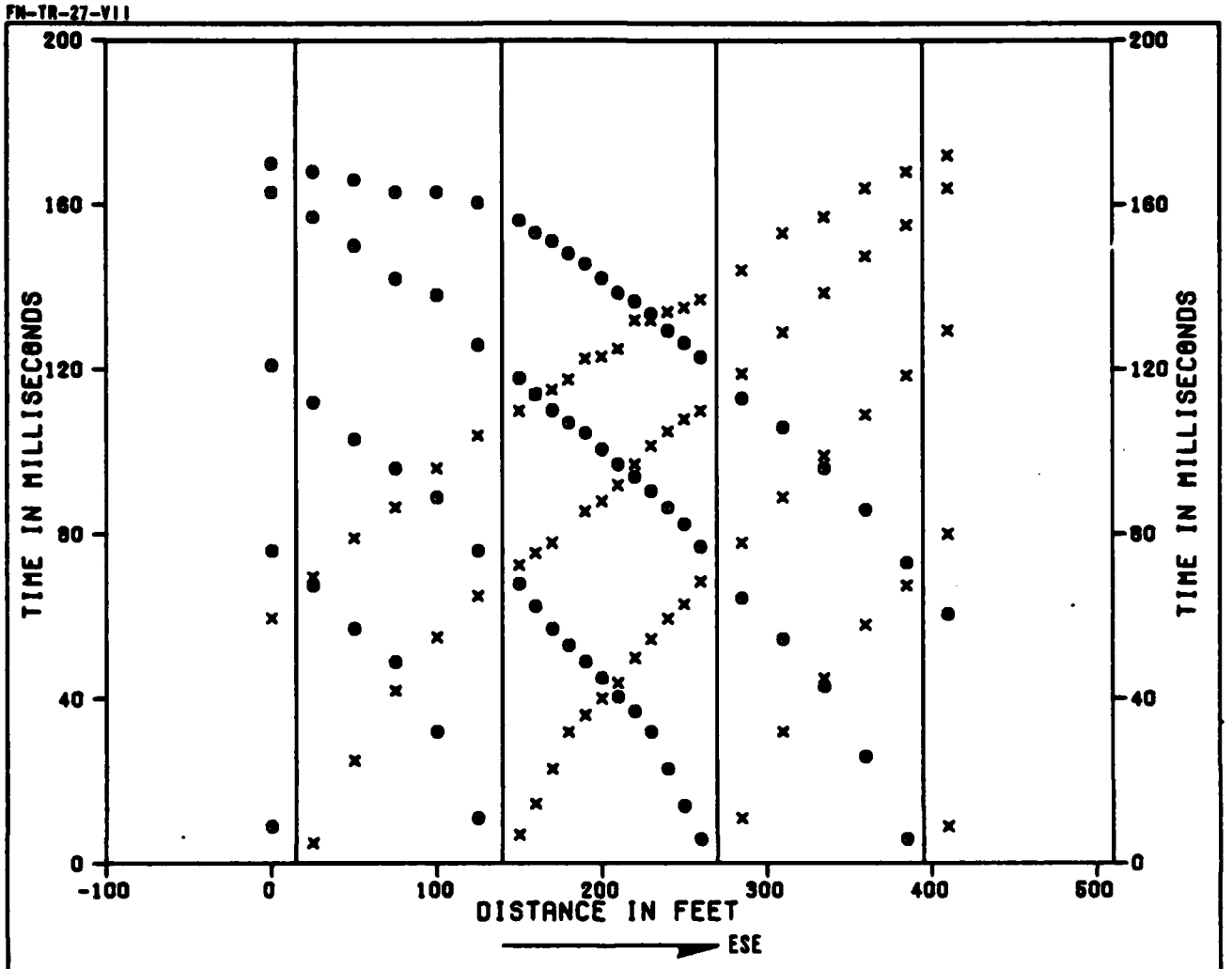
⊙ TIMES TO LEFT OF SHOTS

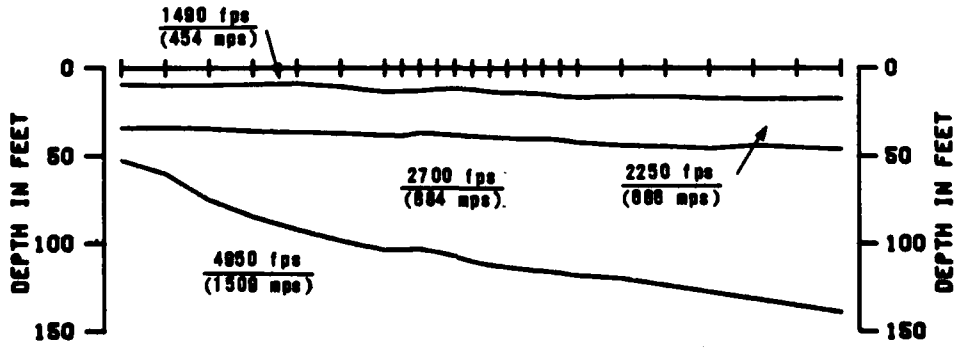
SEISMIC REFRACTION LINE RR-S-2
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-2

FM-TR-27-VII





× TIMES TO RIGHT OF SHOTS
● TIMES TO LEFT OF SHOTS

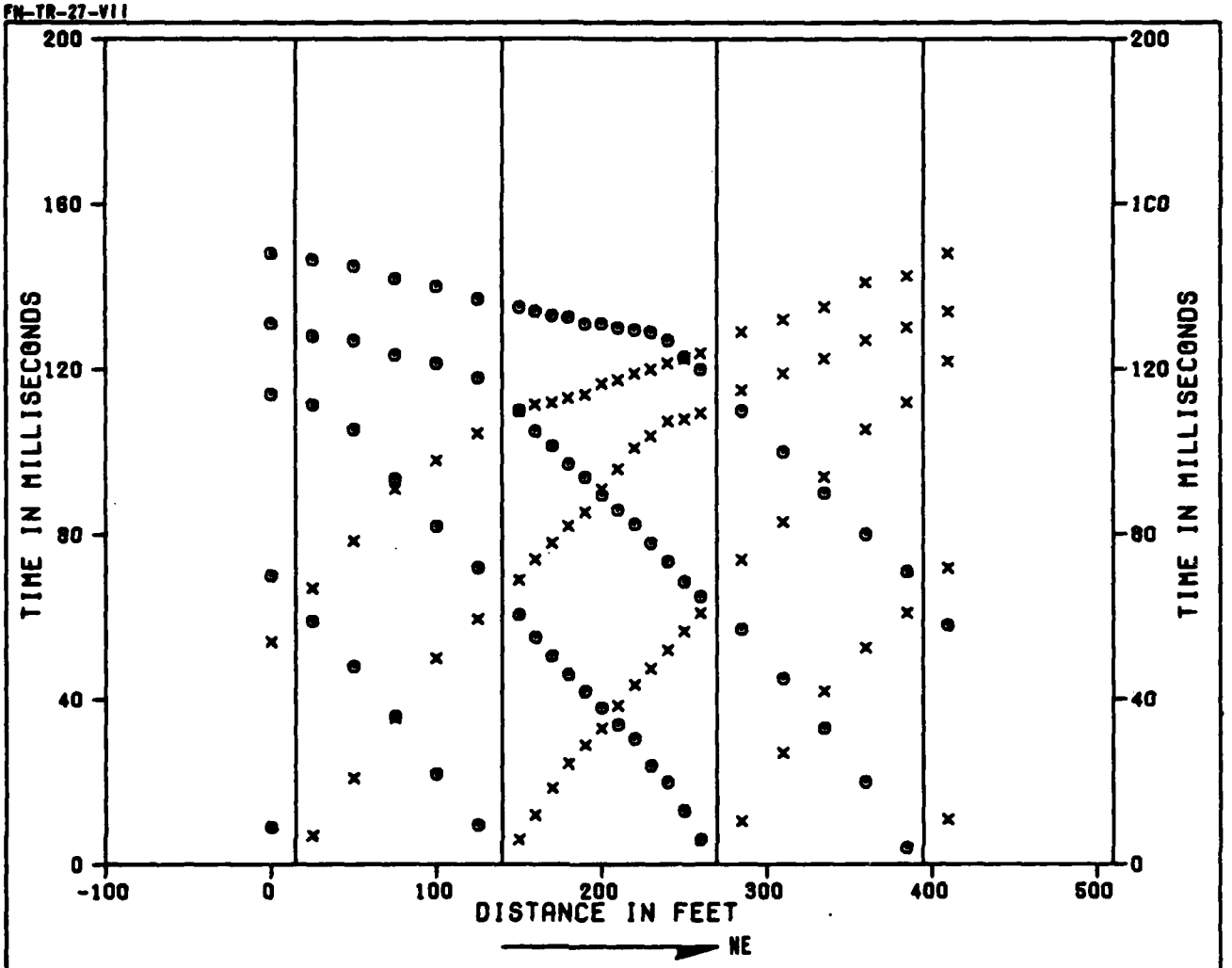
SEISMIC REFRACTION LINE RR-S-3
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

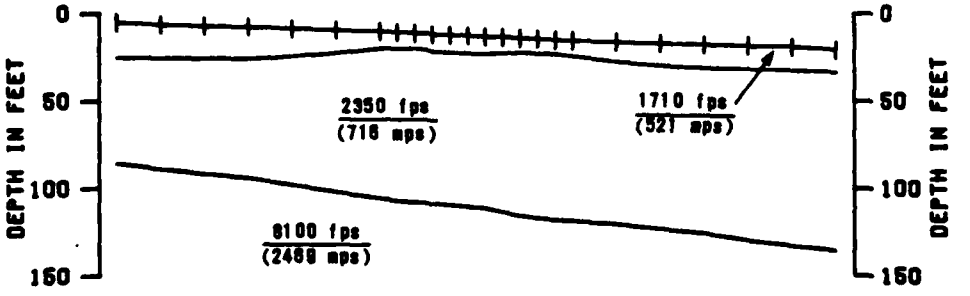
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

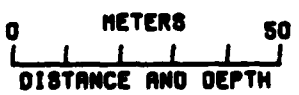
FIGURE
3-3

FUGRO NATIONAL, INC.

2 JUL 79







× TIMES TO RIGHT OF SHOTS
⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-4
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

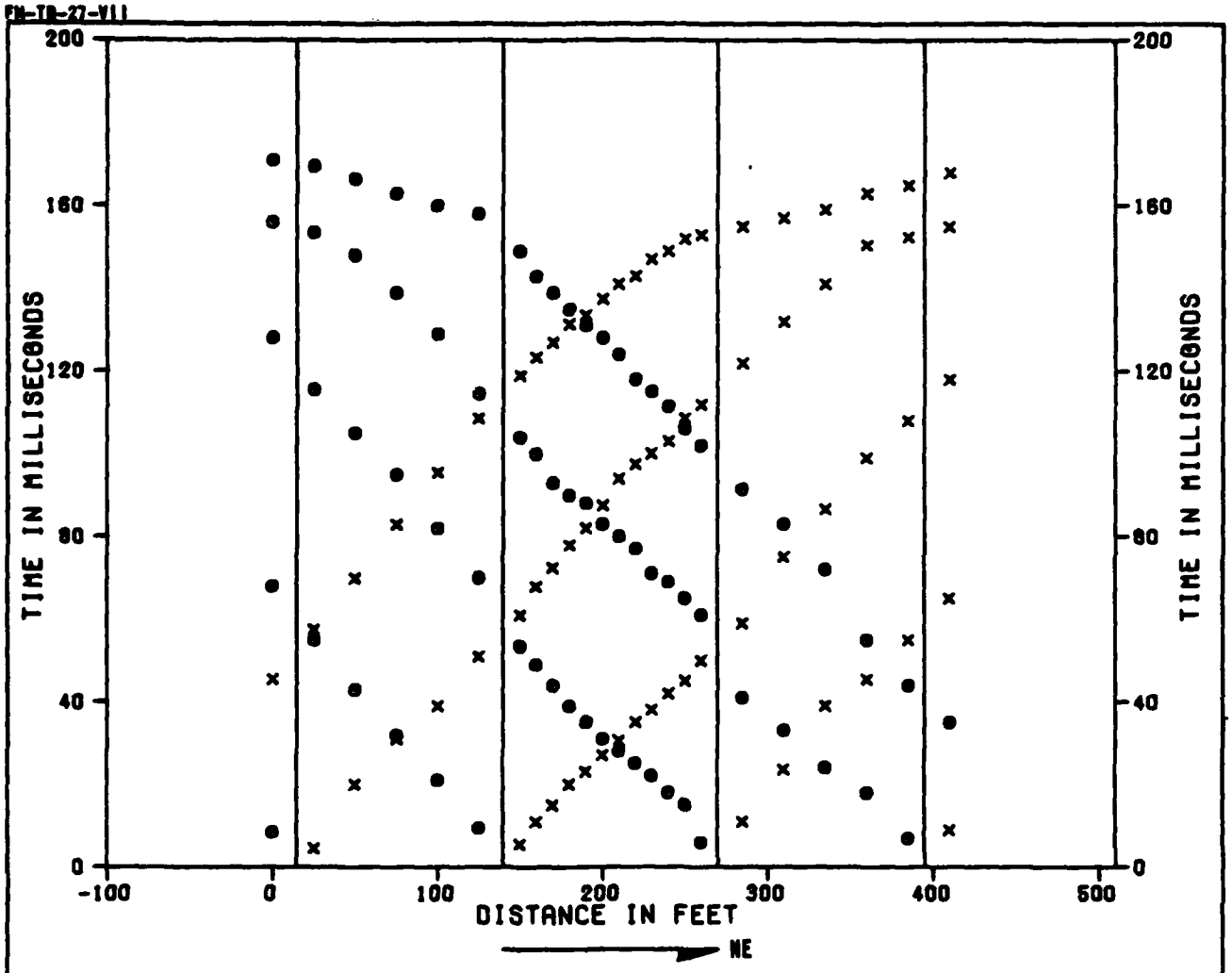
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

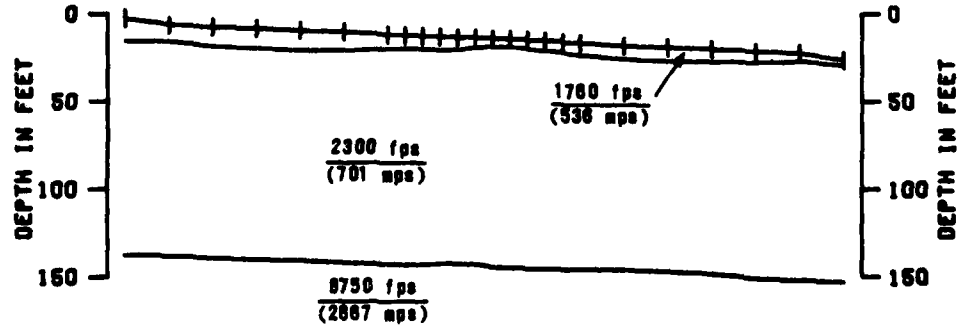
FIGURE
3-4

FUGRO NATIONAL, INC.

2 JUL 79

FN-TR-27-VII





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

⊙ TIMES TO LEFT OF SHOTS

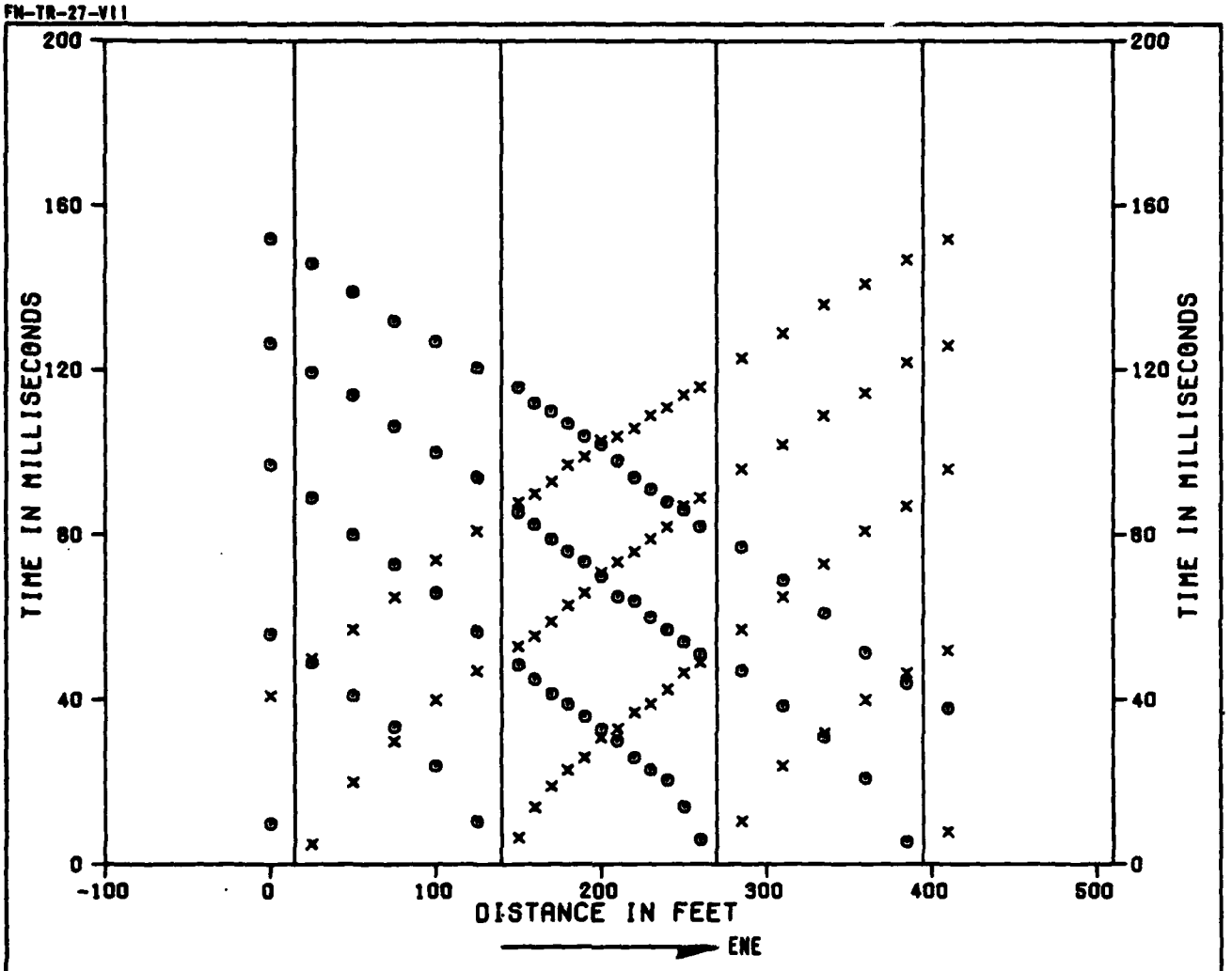
SEISMIC REFRACTION LINE RR-S-5
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

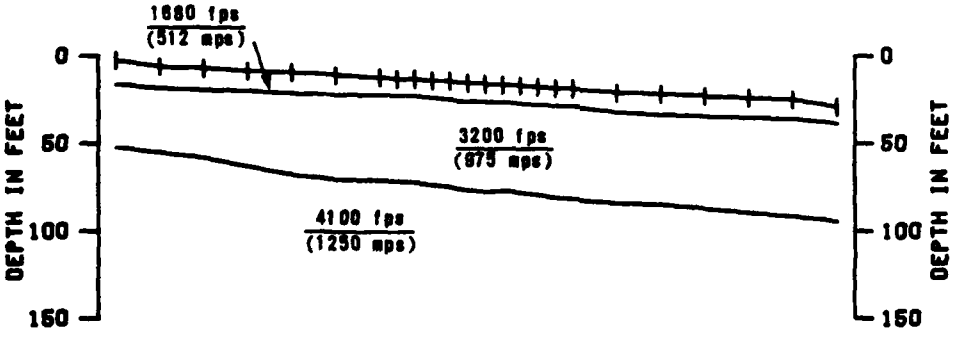
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-5

FUGRO NATIONAL, INC.

2 JUL 79





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-8
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

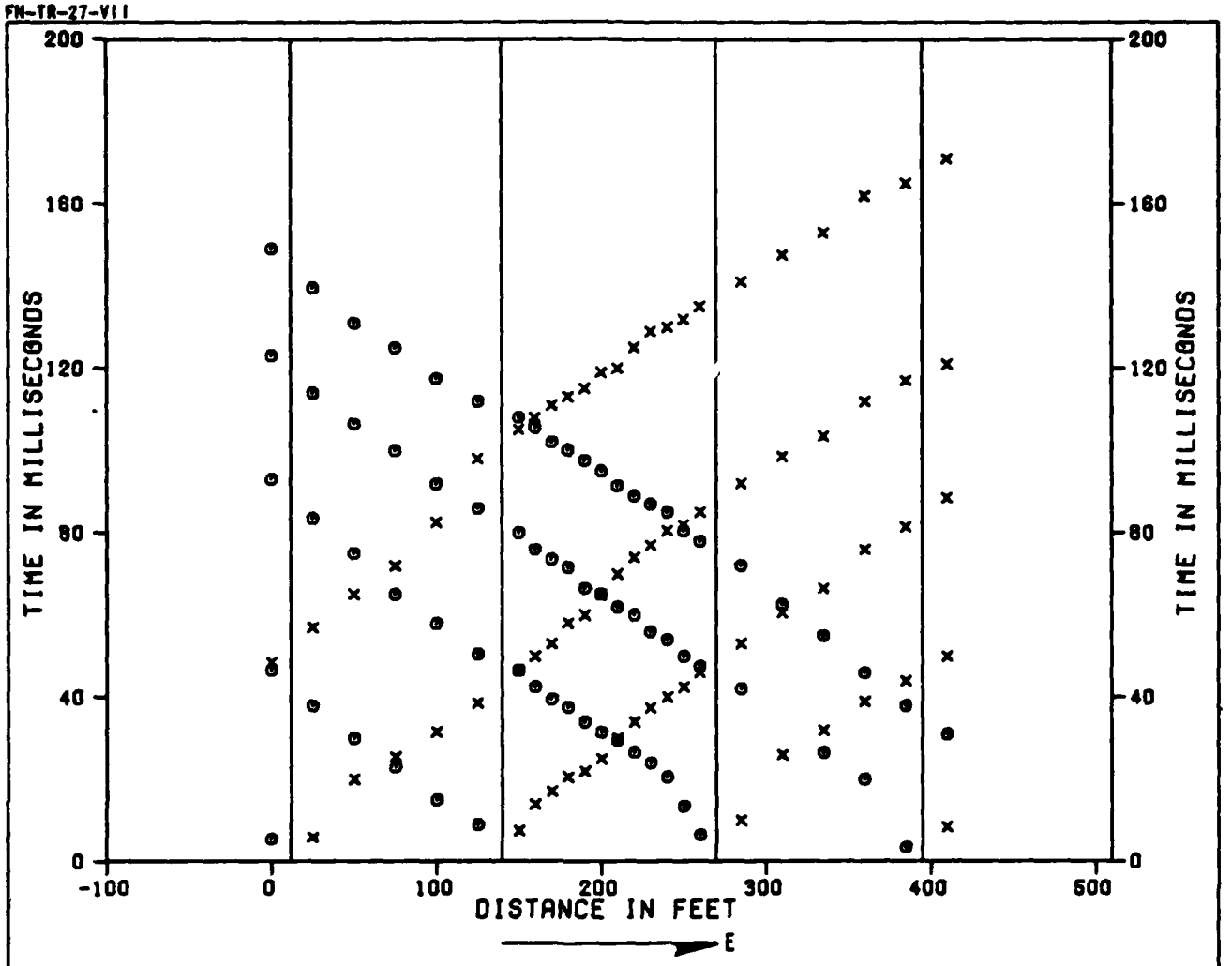
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

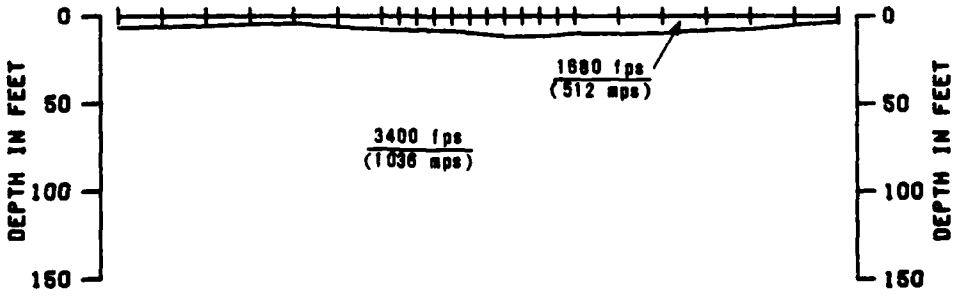
FIGURE 3-6

FUGRO NATIONAL, INC.

2 JUL 79

FN-TR-27-VII





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

⊙ TIMES TO LEFT OF SHOTS

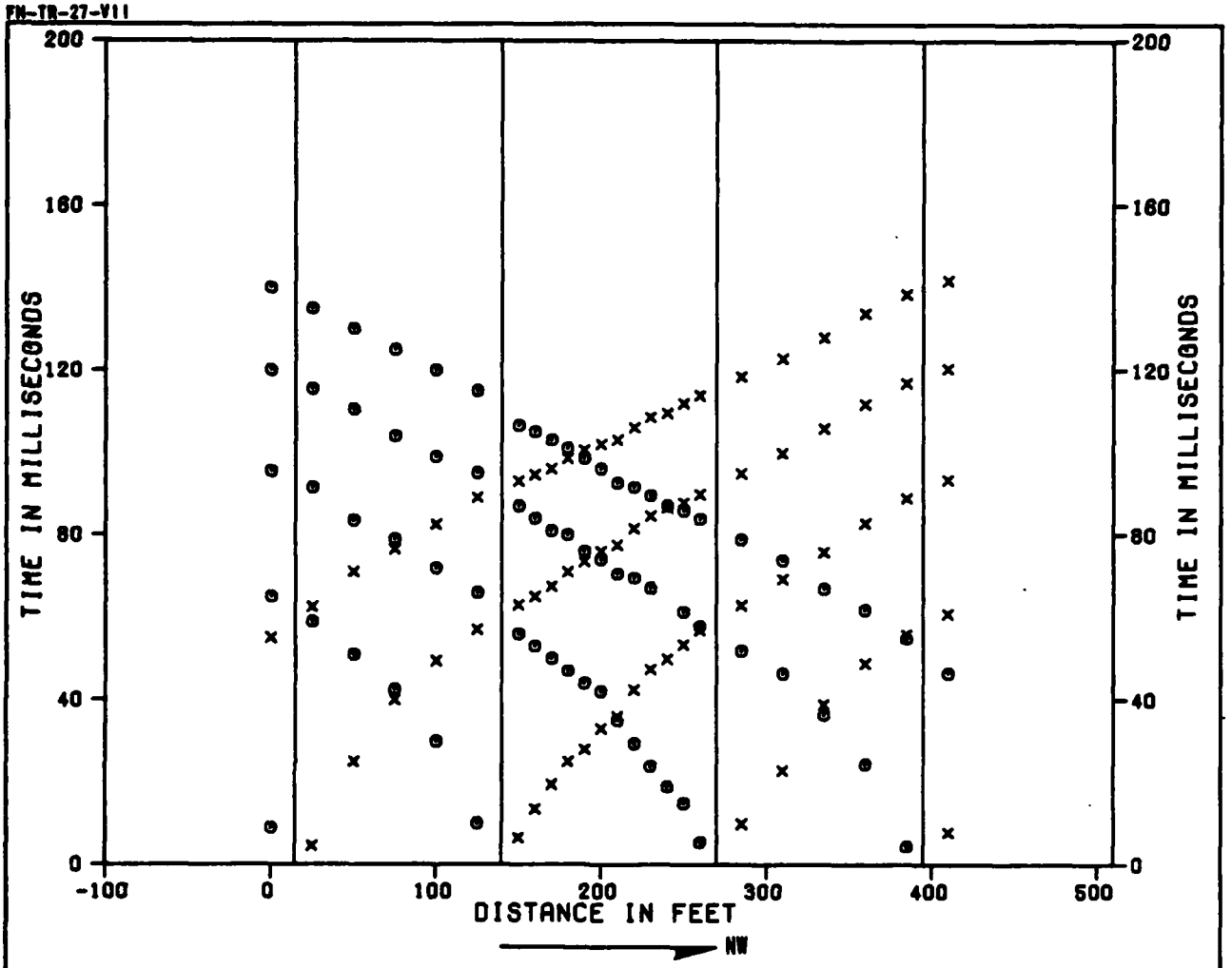
SEISMIC REFRACTION LINE RR-S-7
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

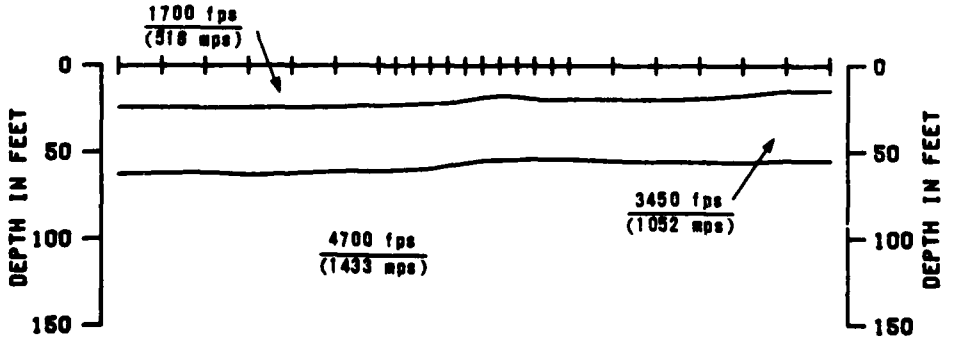
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-7

FUGRO NATIONAL, INC.

2 JUL 79





× TIMES TO RIGHT OF SHOTS
⊙ TIMES TO LEFT OF SHOTS

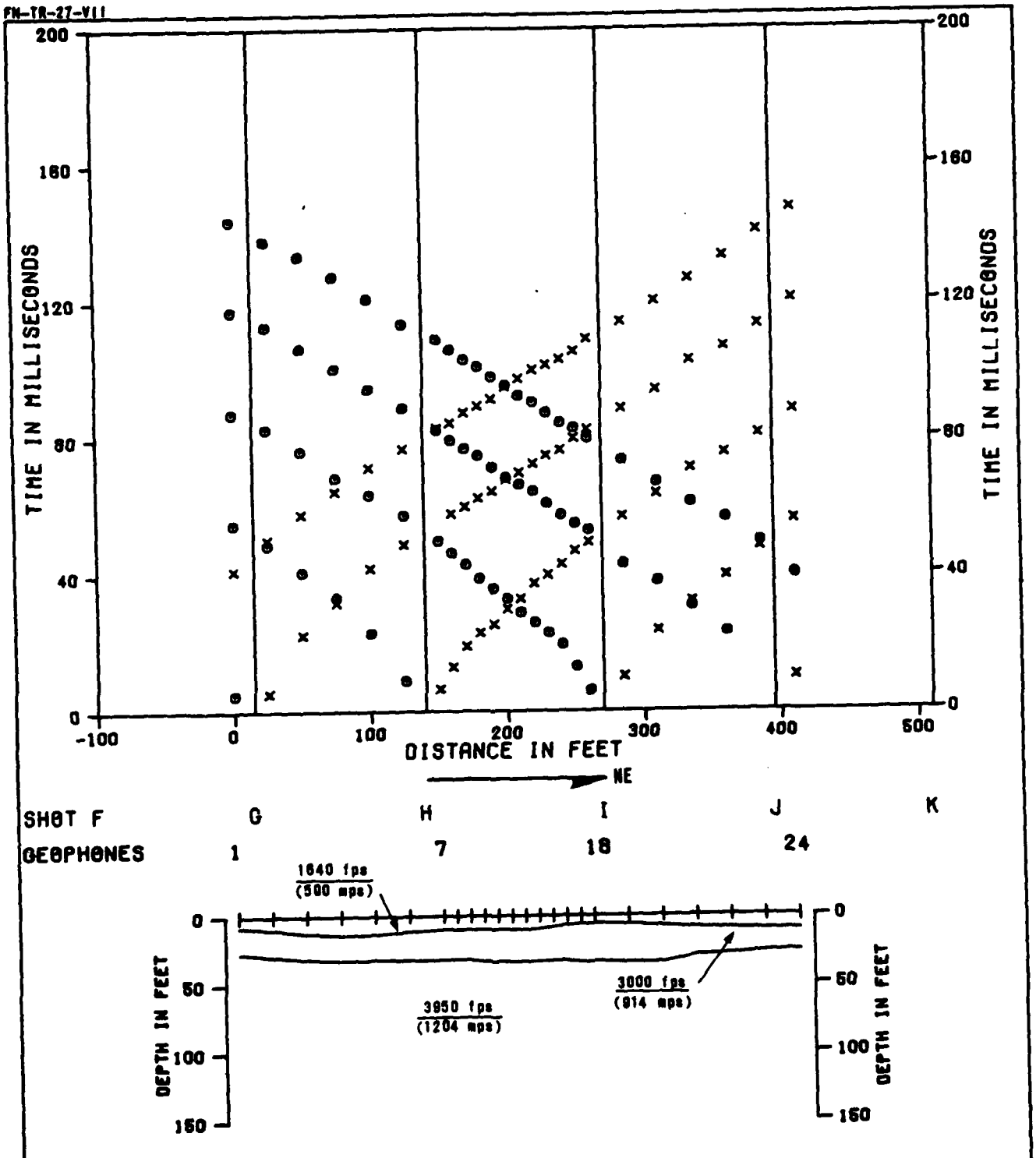
SEISMIC REFRACTION LINE RR-S-8
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
3-8

UGRO NATIONAL, INC.

2 JUL 78



SEISMIC REFRACTION LINE RR-S-9
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

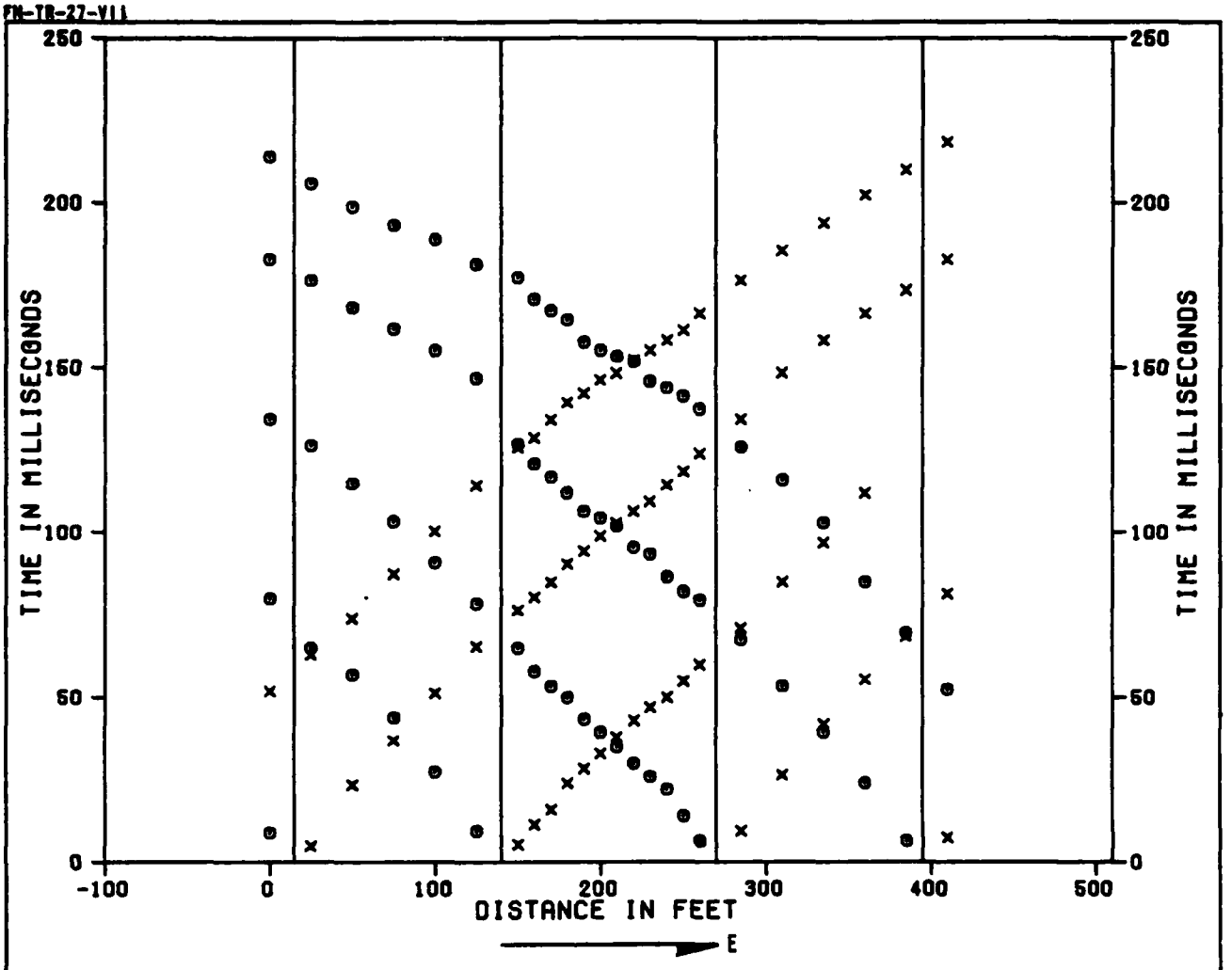
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

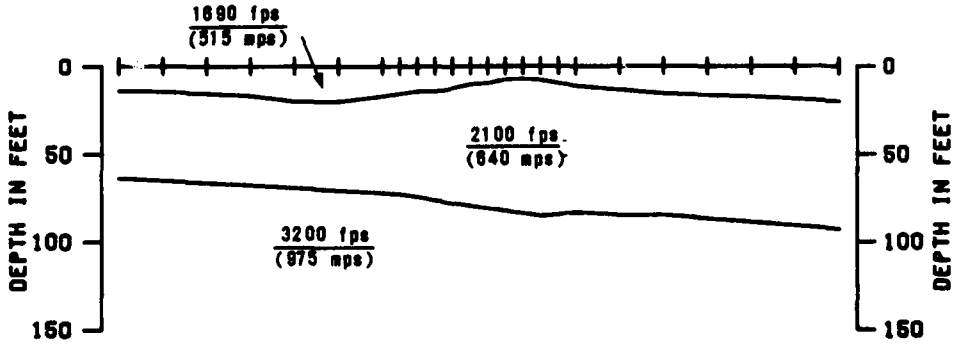
FIGURE 3-9

FUGRO NATIONAL, INC.

2 JUL 79

FN-TR-27-VII





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-10
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

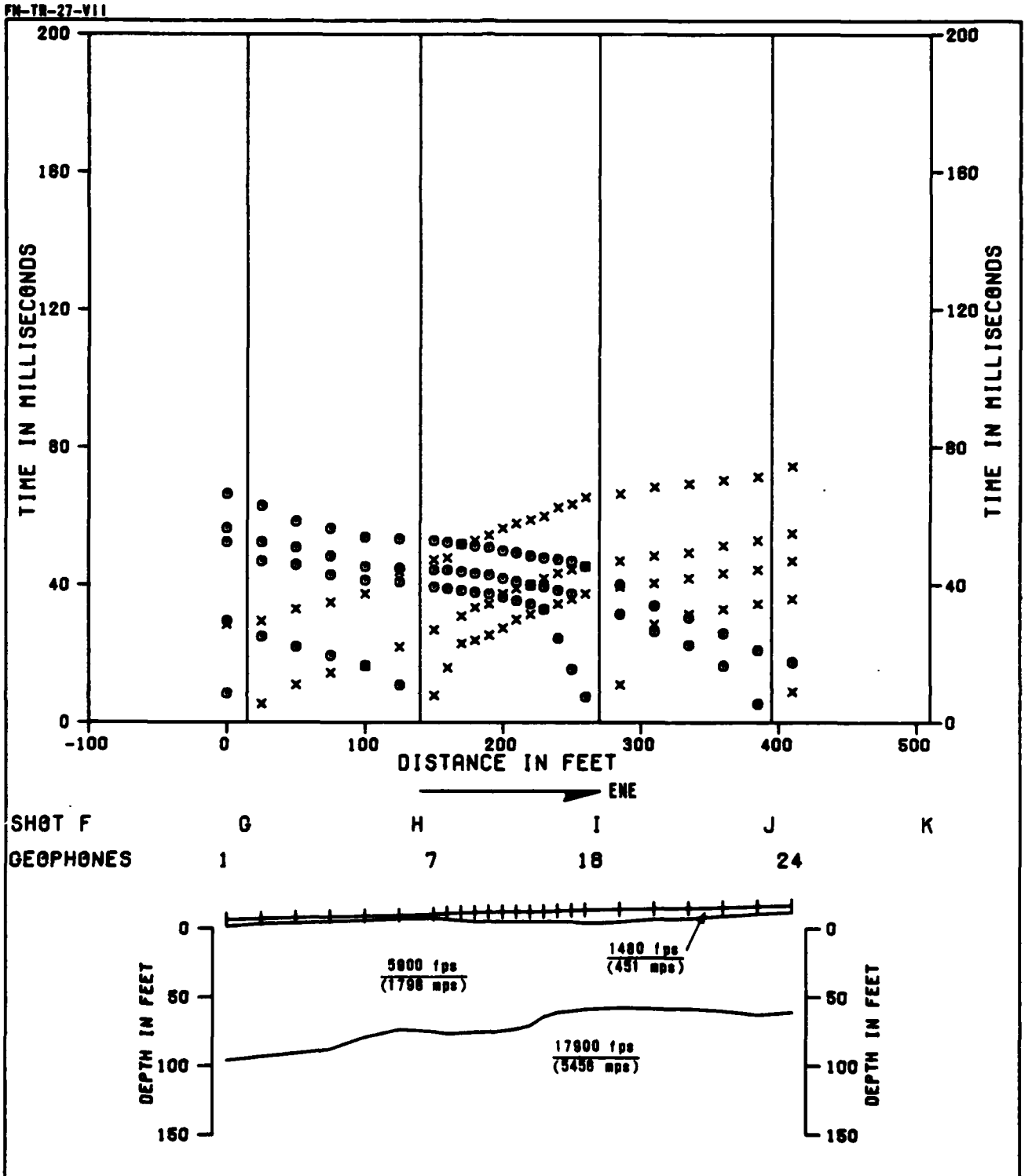
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-10

FUGRO NATIONAL, INC.

2 JUL 78

FN-TR-27-VII



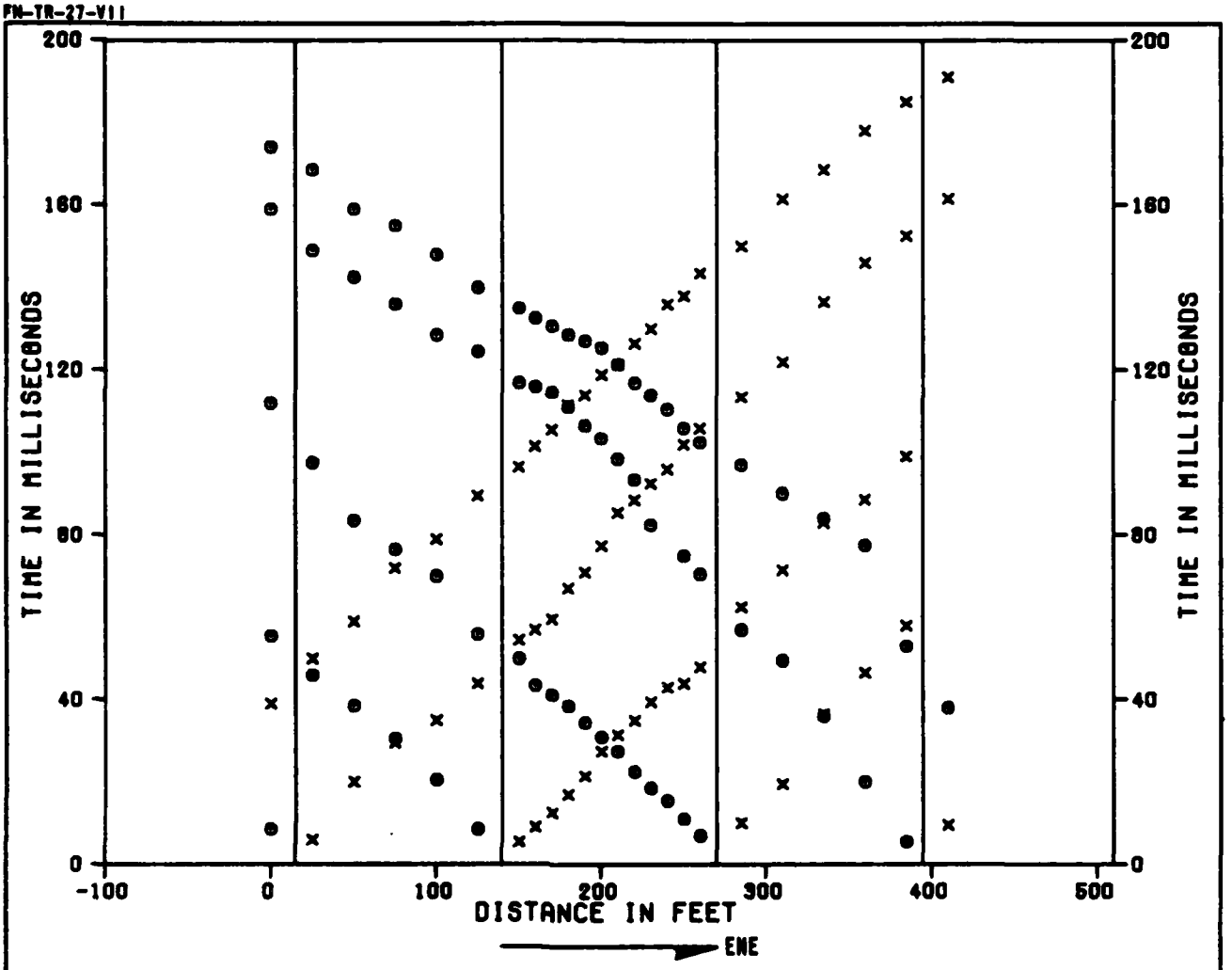
SEISMIC REFRACTION LINE RR-S-11
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
3-11

FUGRO NATIONAL, INC.

2 JUL 79



0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-12
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

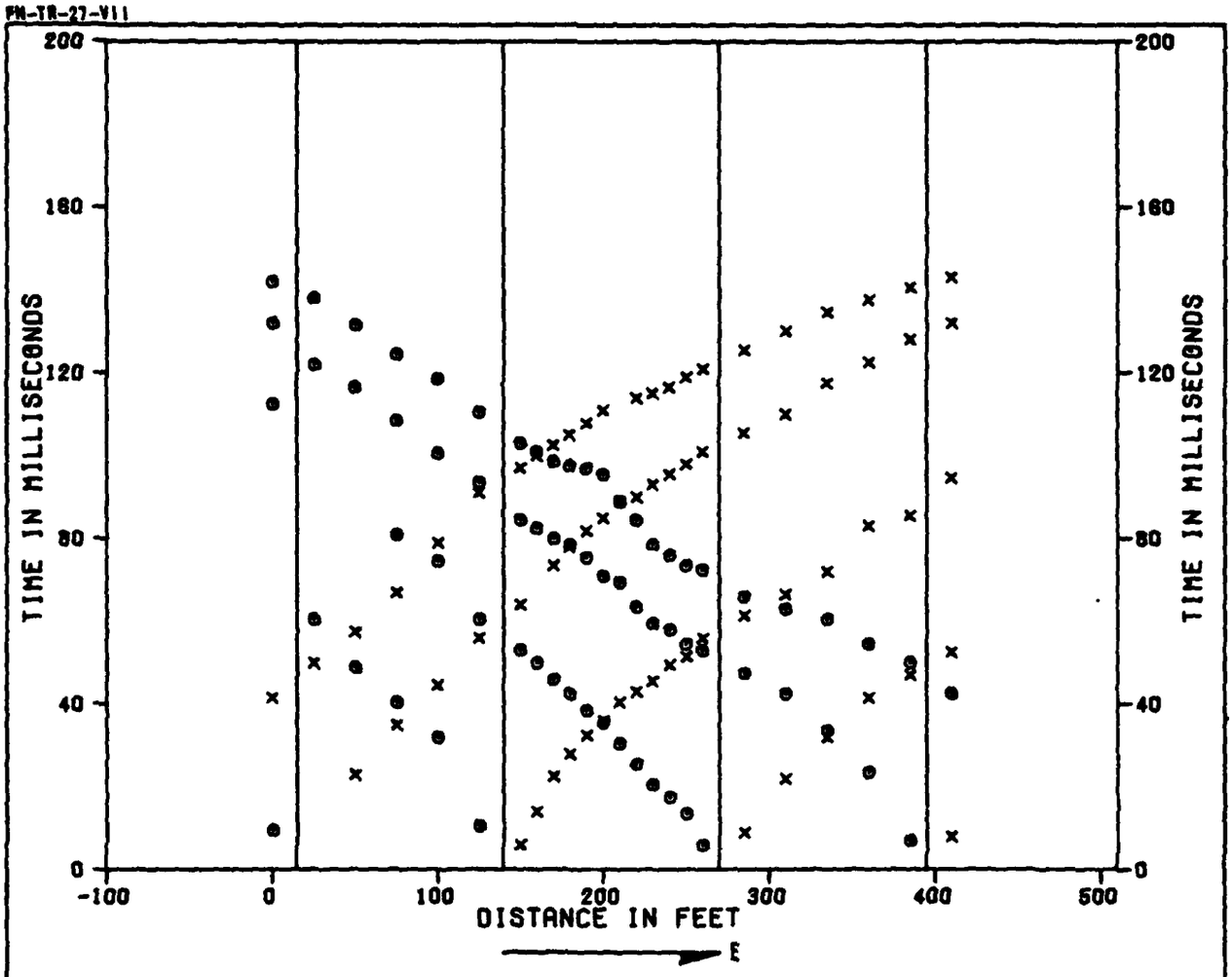
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

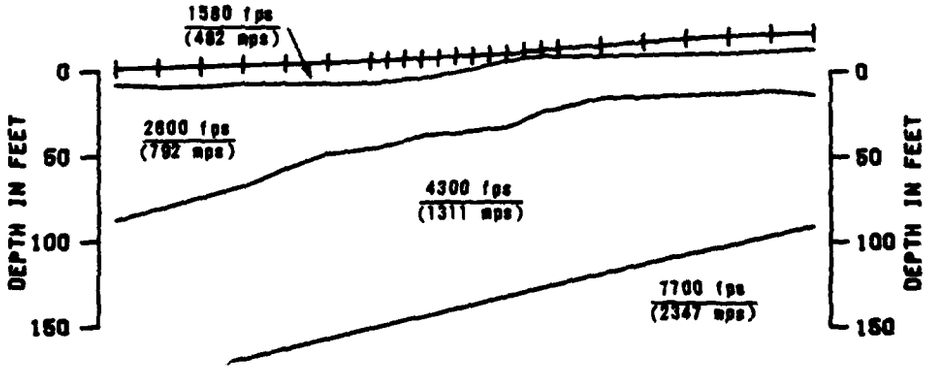
FIGURE 3-12

WOODWARD-CLYDE CONSULTANTS

2 JUL 78

PN-TR-27-VII





0 METERS 50
DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS
⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-13
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

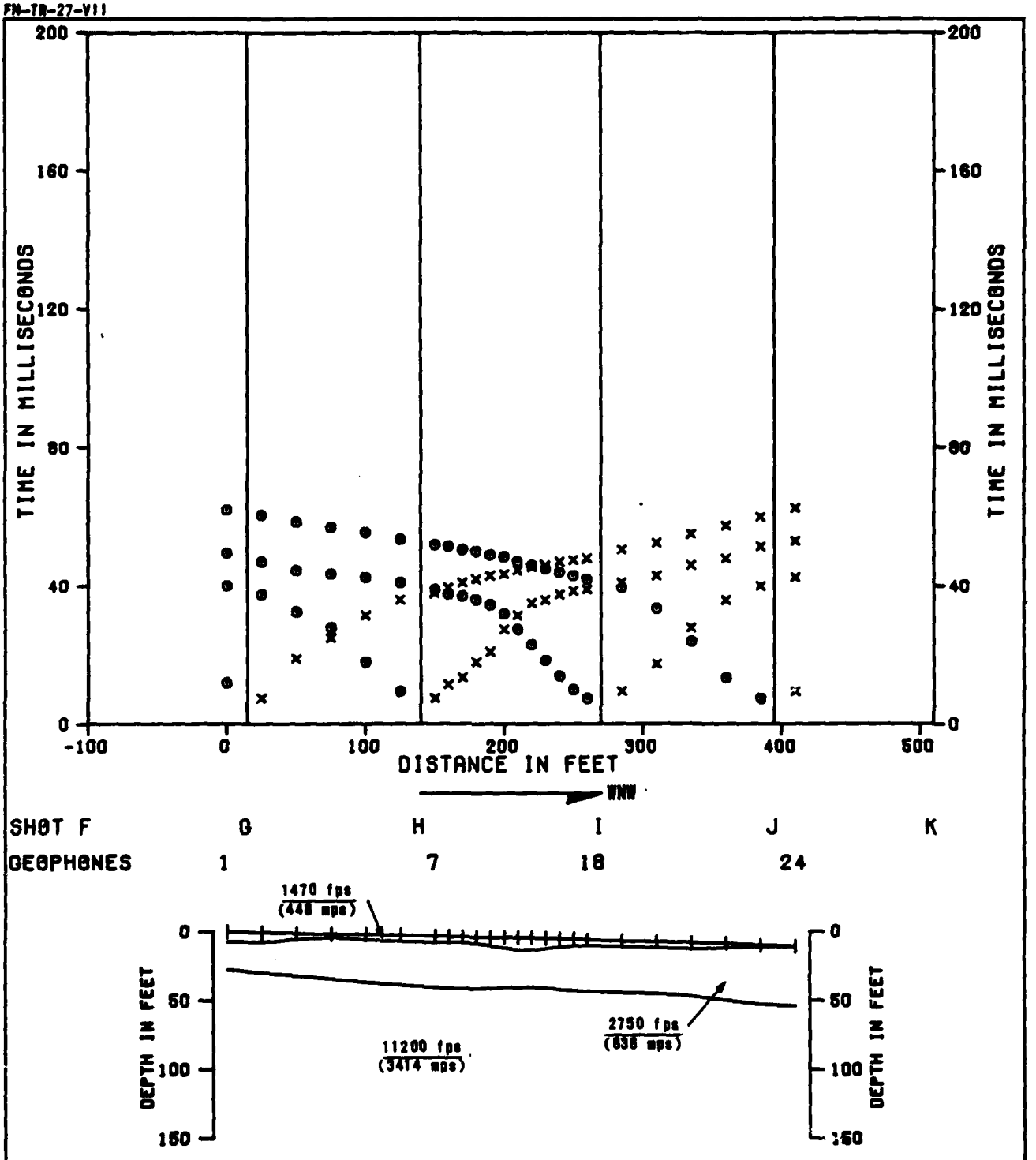
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

PLATE 3-13

FUGRO NATIONAL, INC.

2 JUL 78

FN-TR-27-VII



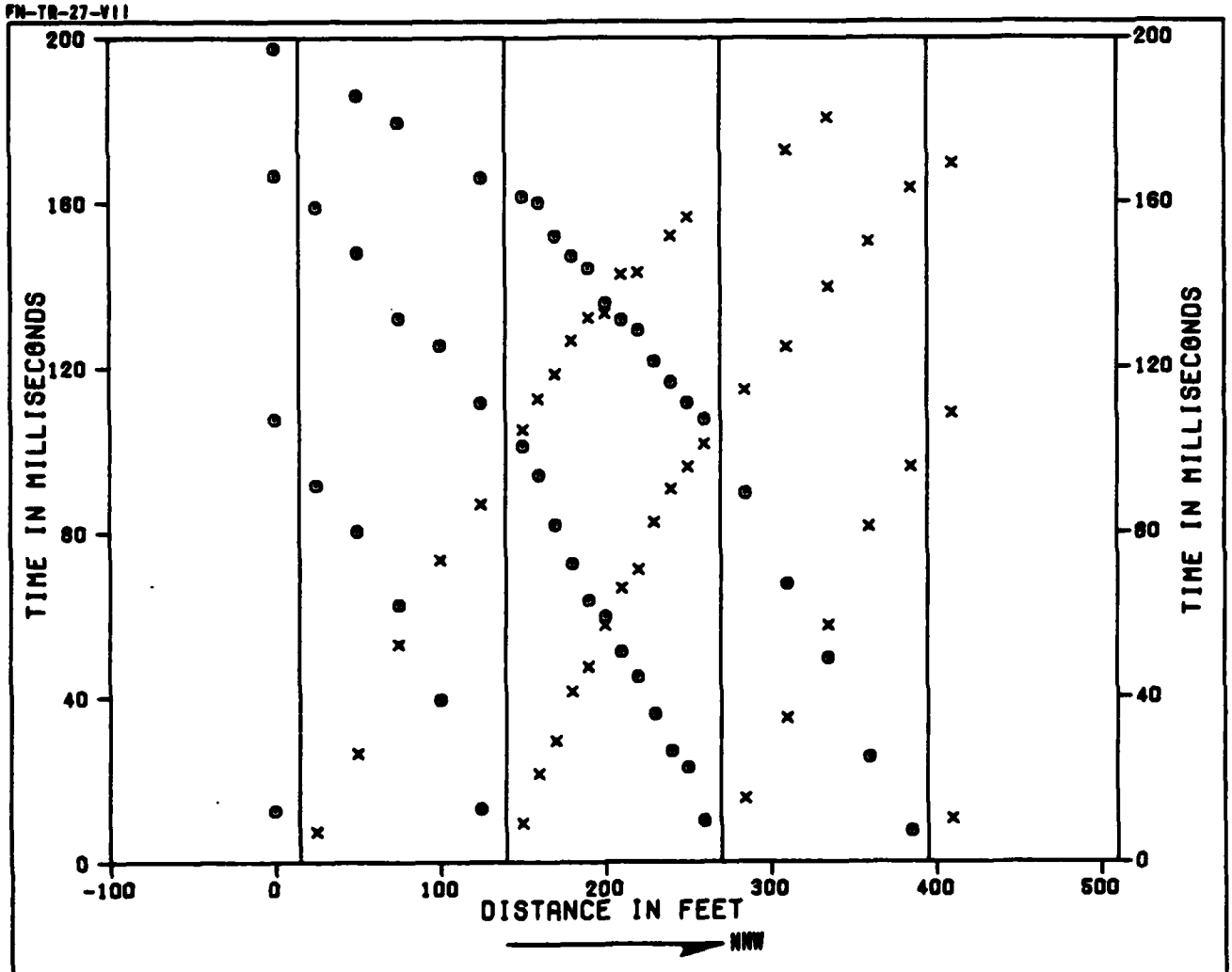
SEISMIC REFRACTION LINE RR-S-14
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

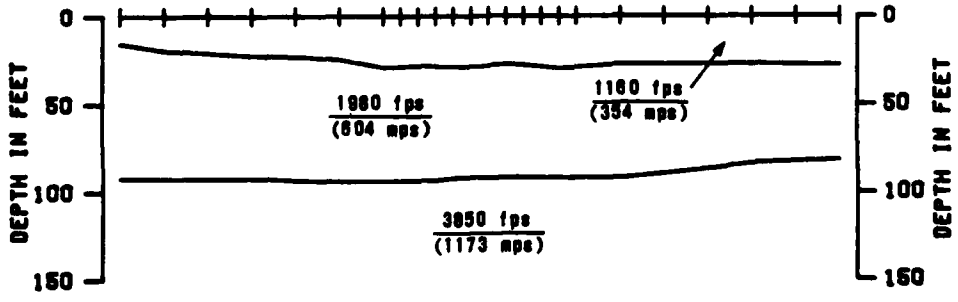
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-14

FUGRO NATIONAL, INC.

2 JUL 79





0 METERS 50

DISTANCE AND DEPTH

× TIMES TO RIGHT OF SHOTS

○ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-15
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

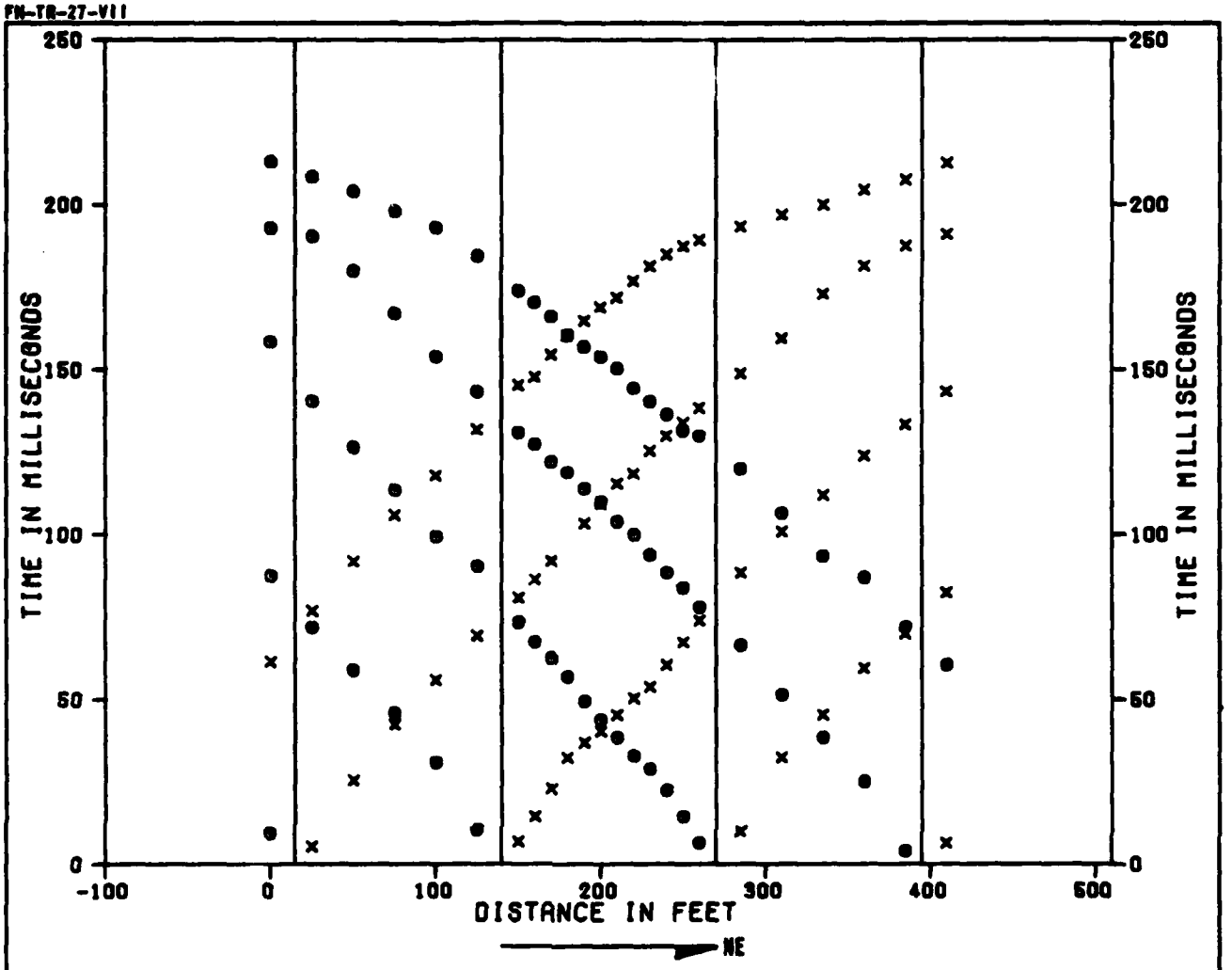
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

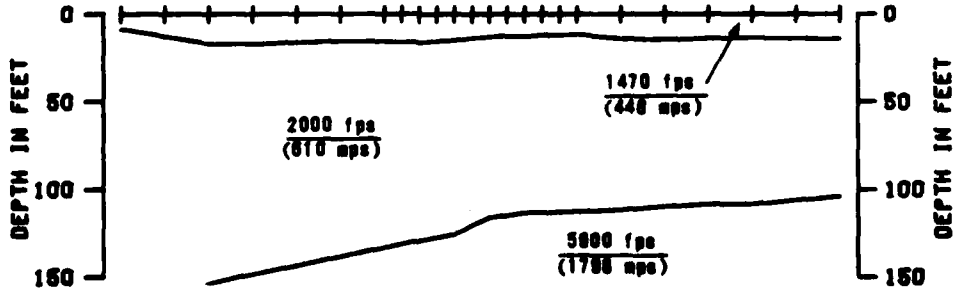
FIGURE 3-15

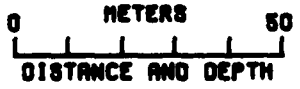
FUGRO NATIONAL, INC.

2 JUL 79

FN-TR-27-VII







× TIMES TO RIGHT OF SHOTS
⊙ TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE RR-S-18
TIME DISTANCE DATA AND VELOCITY PROFILE
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 3-18

WOODWARD-CLYDE CONSULTANTS

2 JUL 78

SECTION 4.0

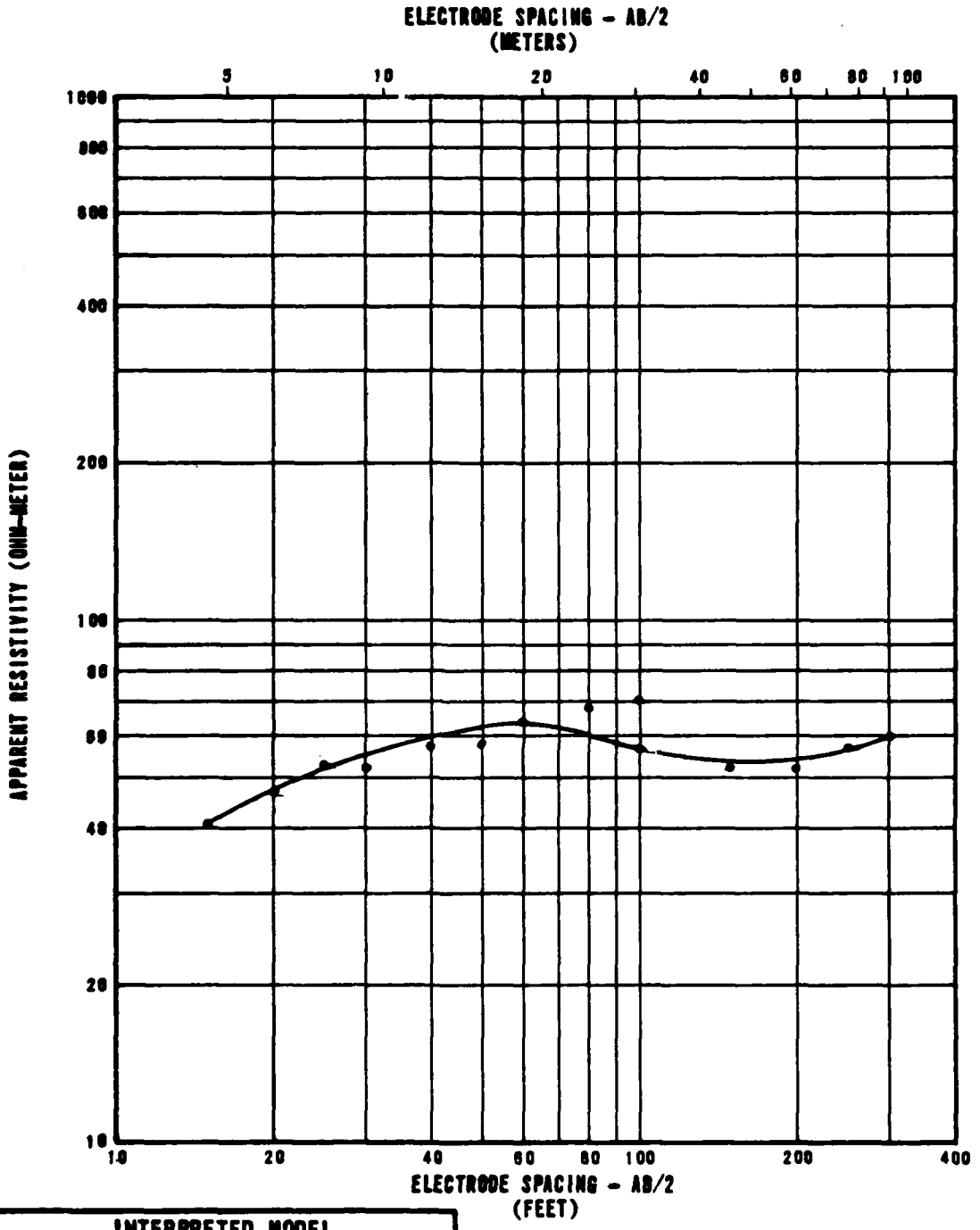
ELECTRICAL RESISTIVITY DATA

EXPLANATIONS OF ELECTRICAL RESISTIVITY DATA

Each figure in this section presents the data obtained from a resistivity sounding and a tabulated model of resistivity layers that would produce a curve similar to the observed curve.

The upper portion of the figures is a graph in which measured apparent resistivity values in ohm-meters are plotted versus one-half the distance between the current electrodes.

The interpreted model tabulated at the bottom of the page shows a combination of true resistivity layers and thicknesses obtained by matching theoretical curves to the field curve.



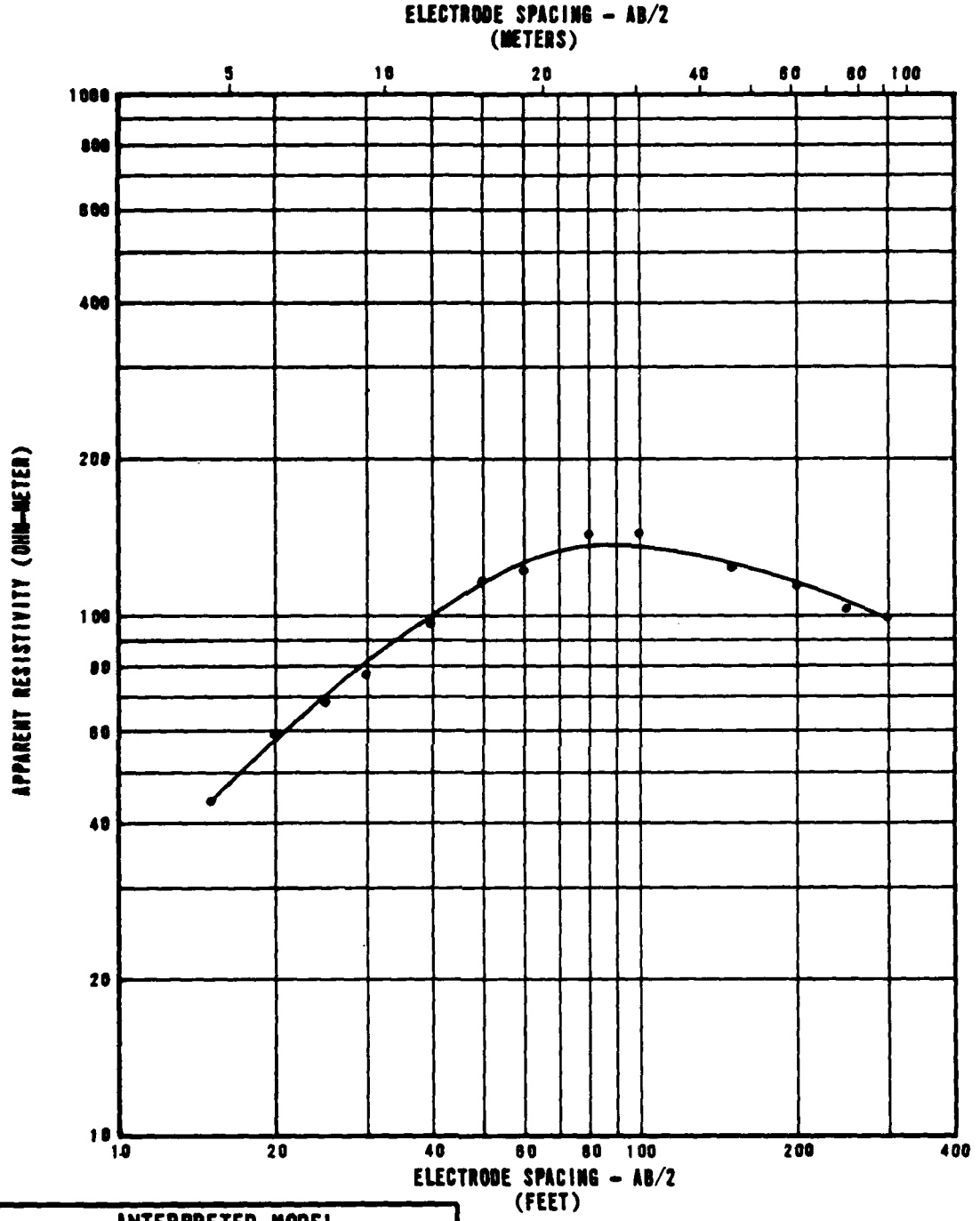
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
5	2	70
51	16	30
104	32	100

RESISTIVITY SOUNDING RR-R-1
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 4-1

FUGRO NATIONAL, INC.



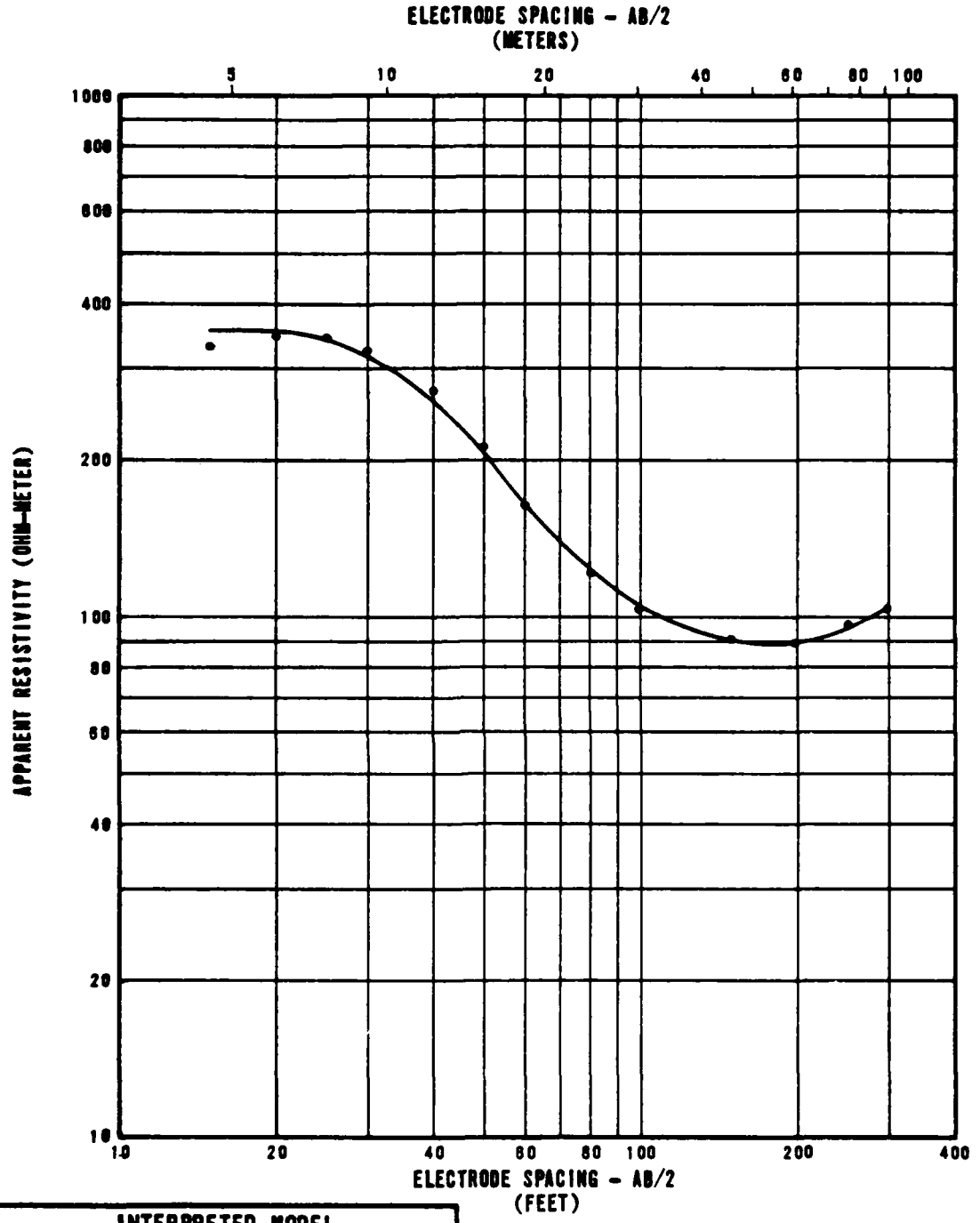
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	25
6	2	110
11	3	500
23	7	160
68	21	75

RESISTIVITY SOUNDING RR-R-2
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-2

FUGRO NATIONAL, INC.



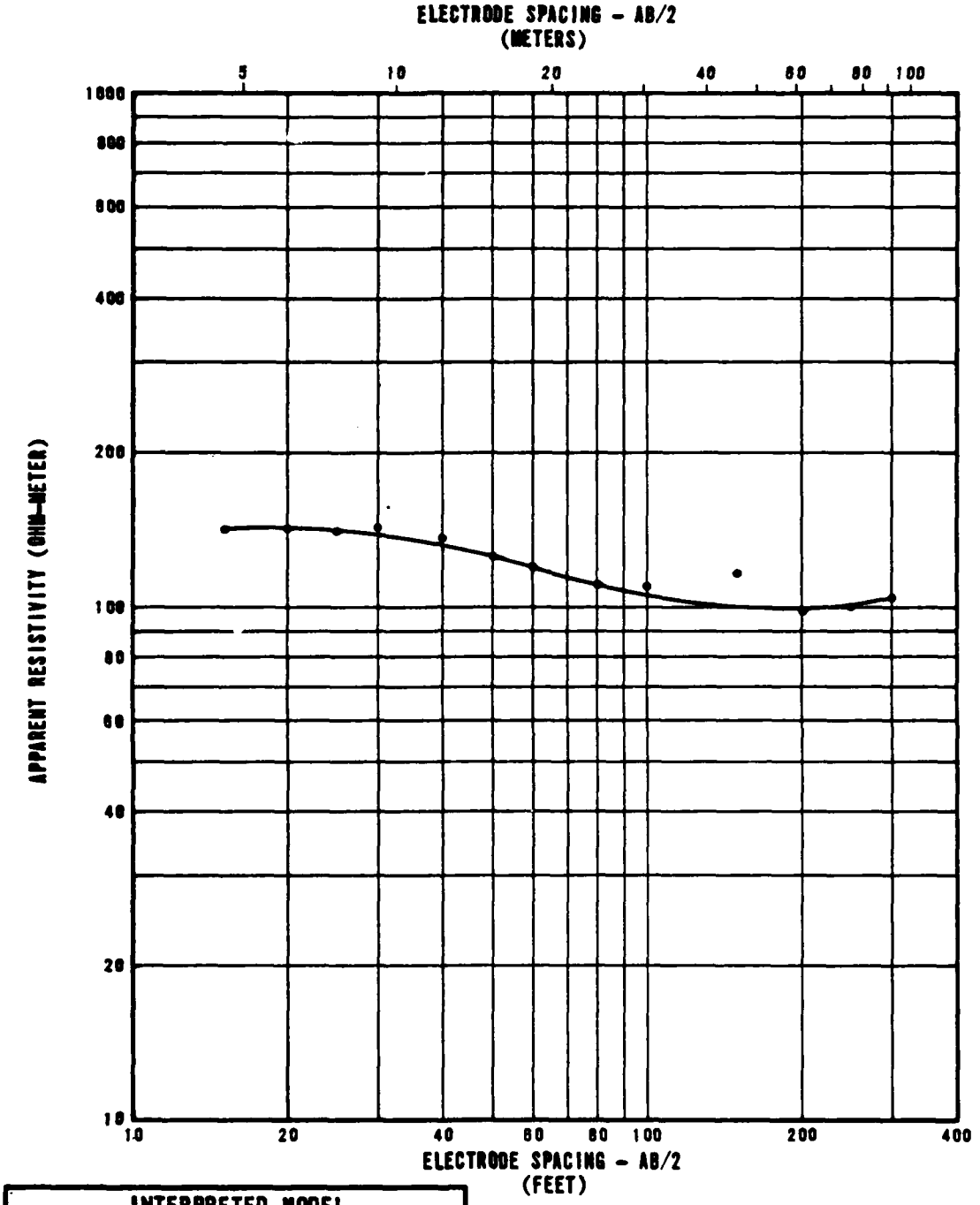
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	420
19	6	75

RESISTIVITY SOUNDING RR-R-3
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-3

FUGRO NATIONAL, INC.



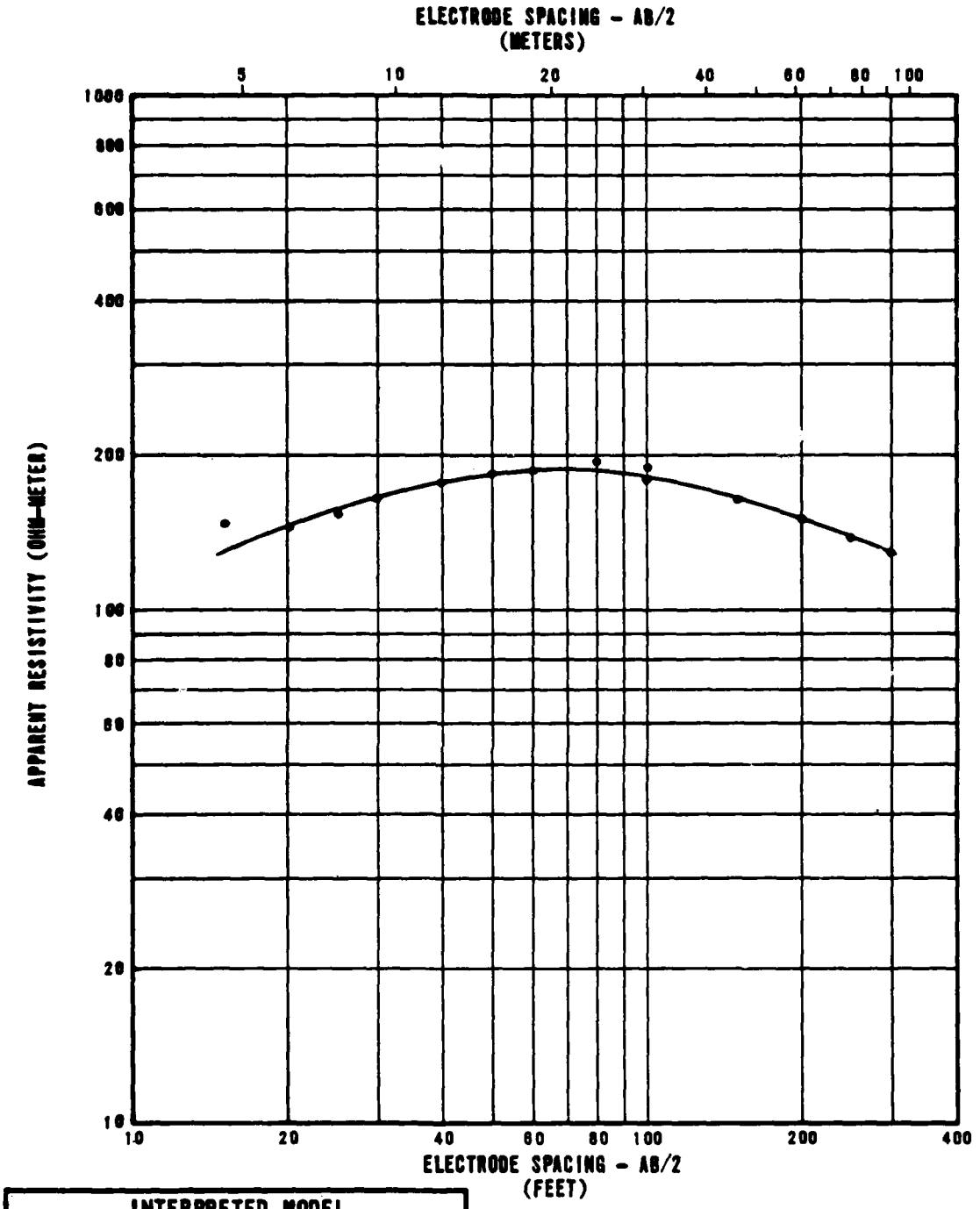
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	140
30	9	90
142	43	130

RESISTIVITY SOUNDING RR-R-4
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-4

FUGRO NATIONAL, INC.



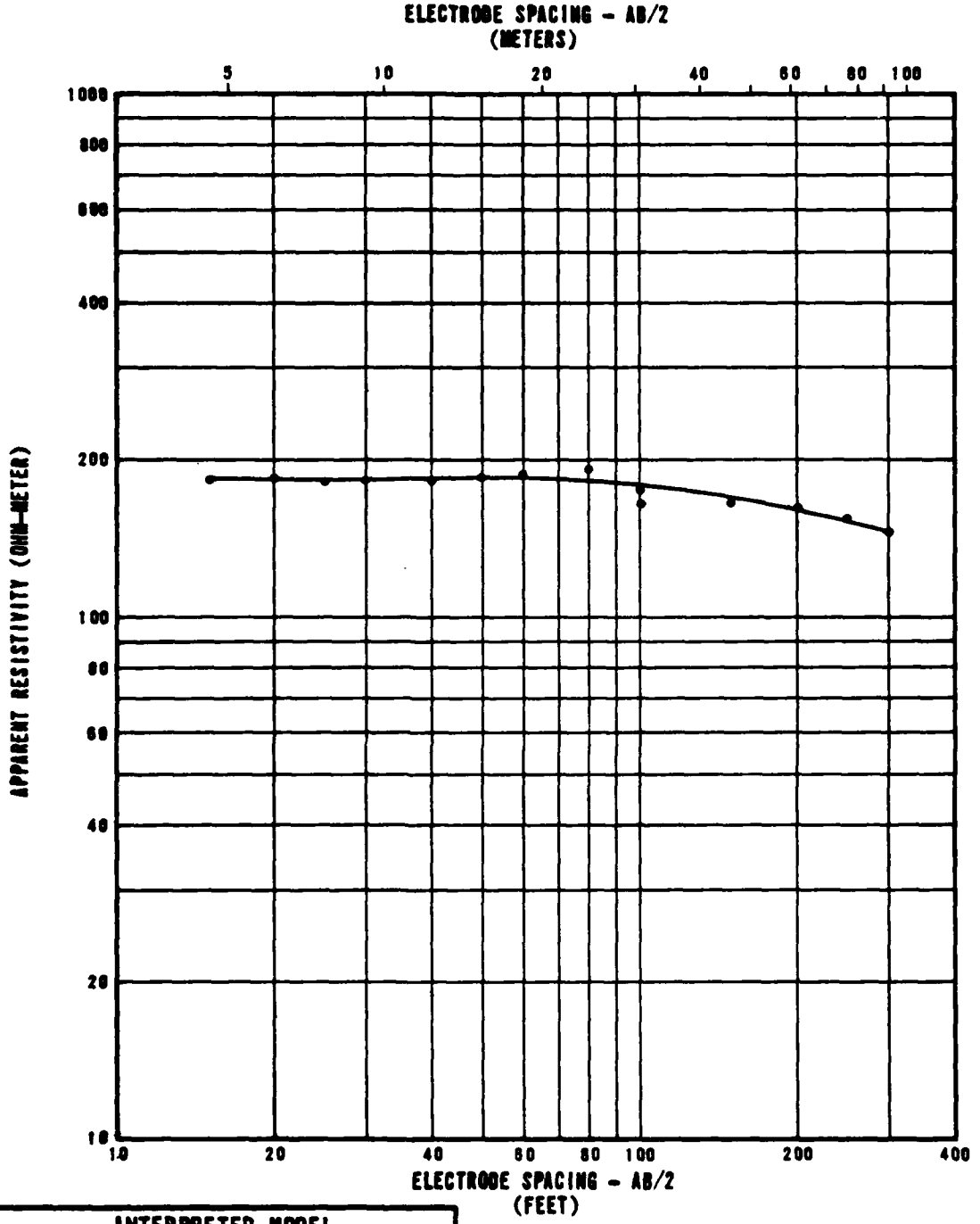
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	140
14	4	230
62	19	110

RESISTIVITY SOUNDING RR-R-5
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-5

FUGRO NATIONAL, INC.



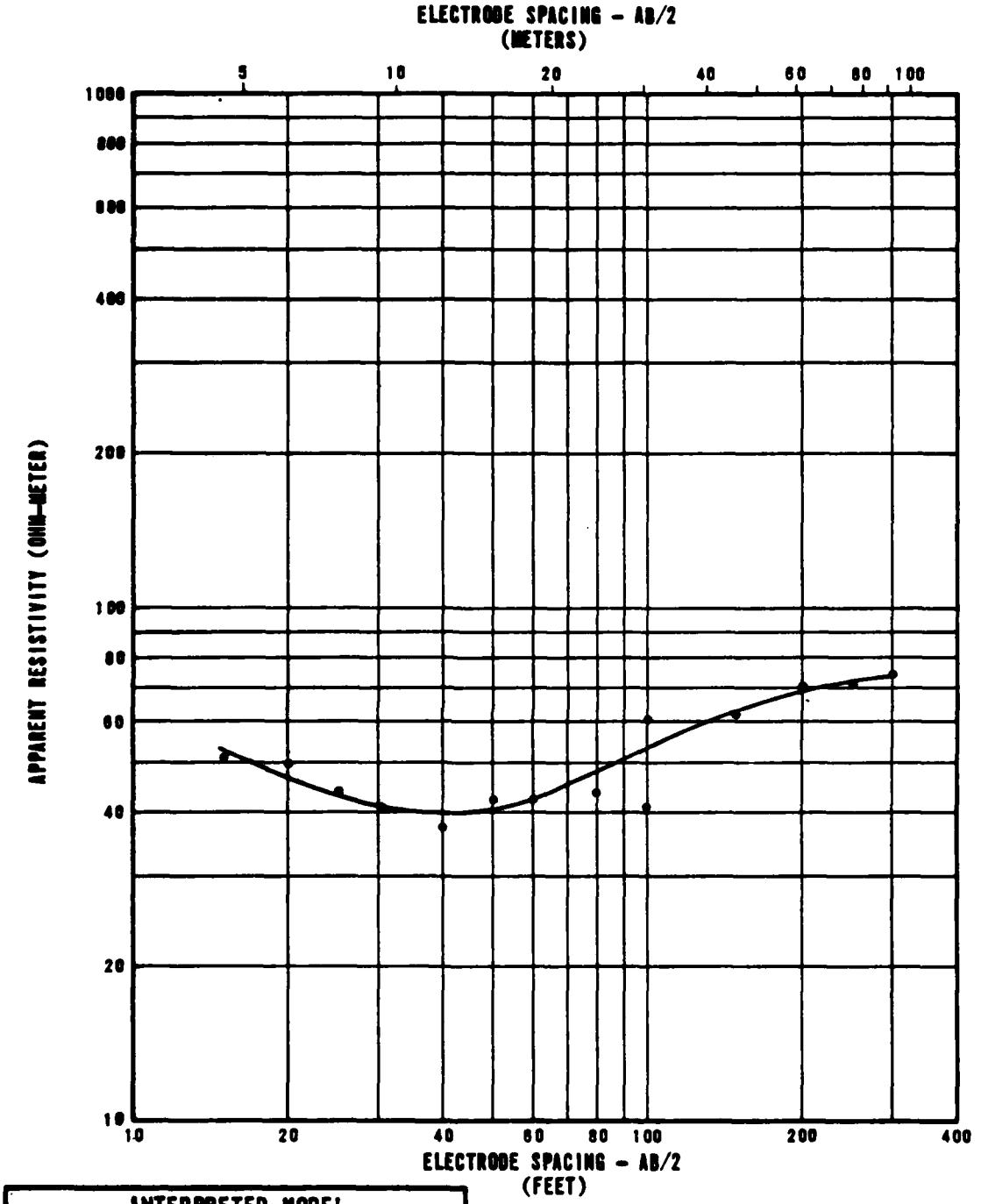
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	180
130	40	110

RESISTIVITY SOUNDING RR-R-6
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 4-6

FUGRO NATIONAL, INC.



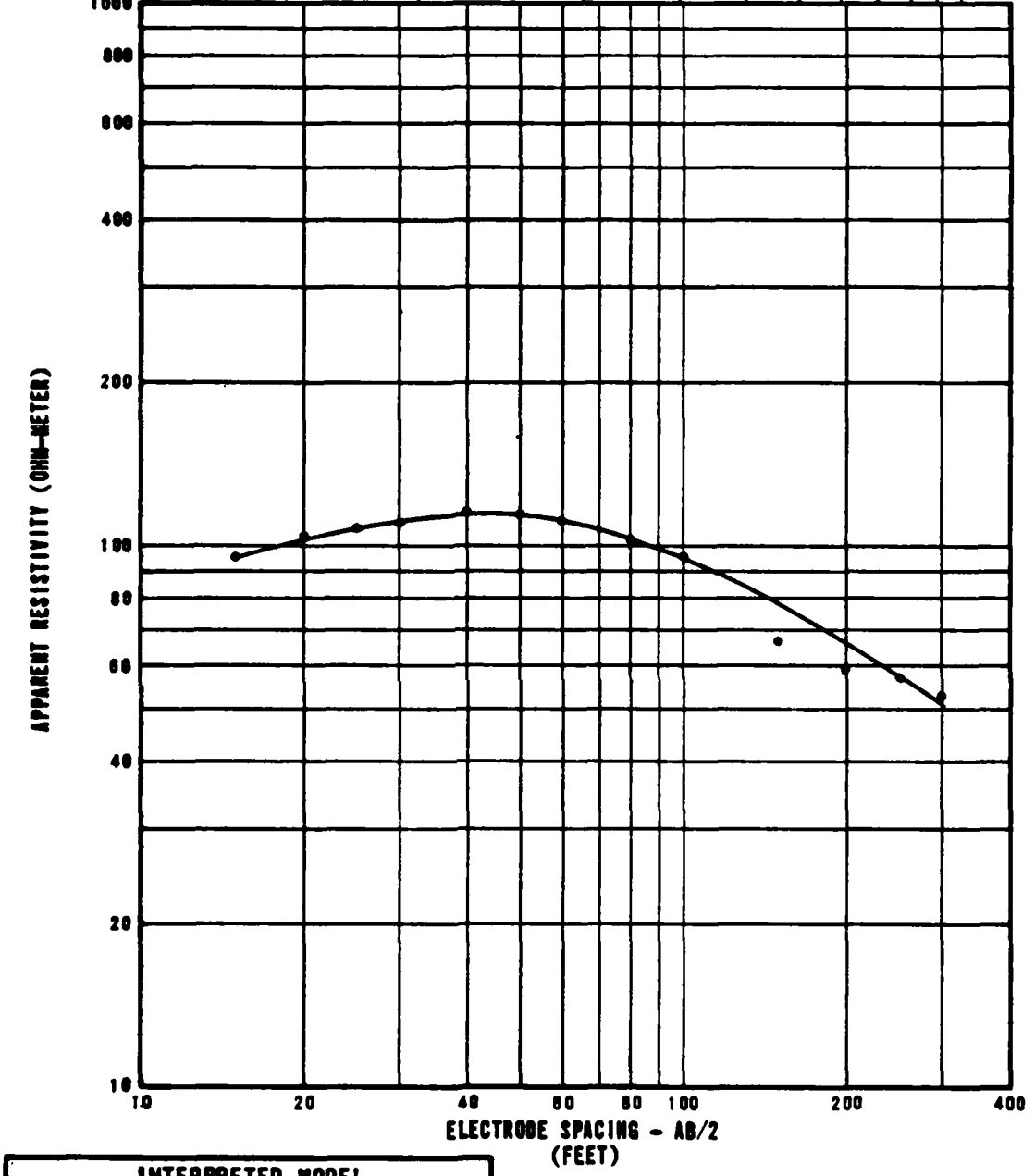
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	60
8	2	35
44	13	110
103	31	75

RESISTIVITY SOUNDING RR-R-7
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-7

FUGRO NATIONAL, INC.



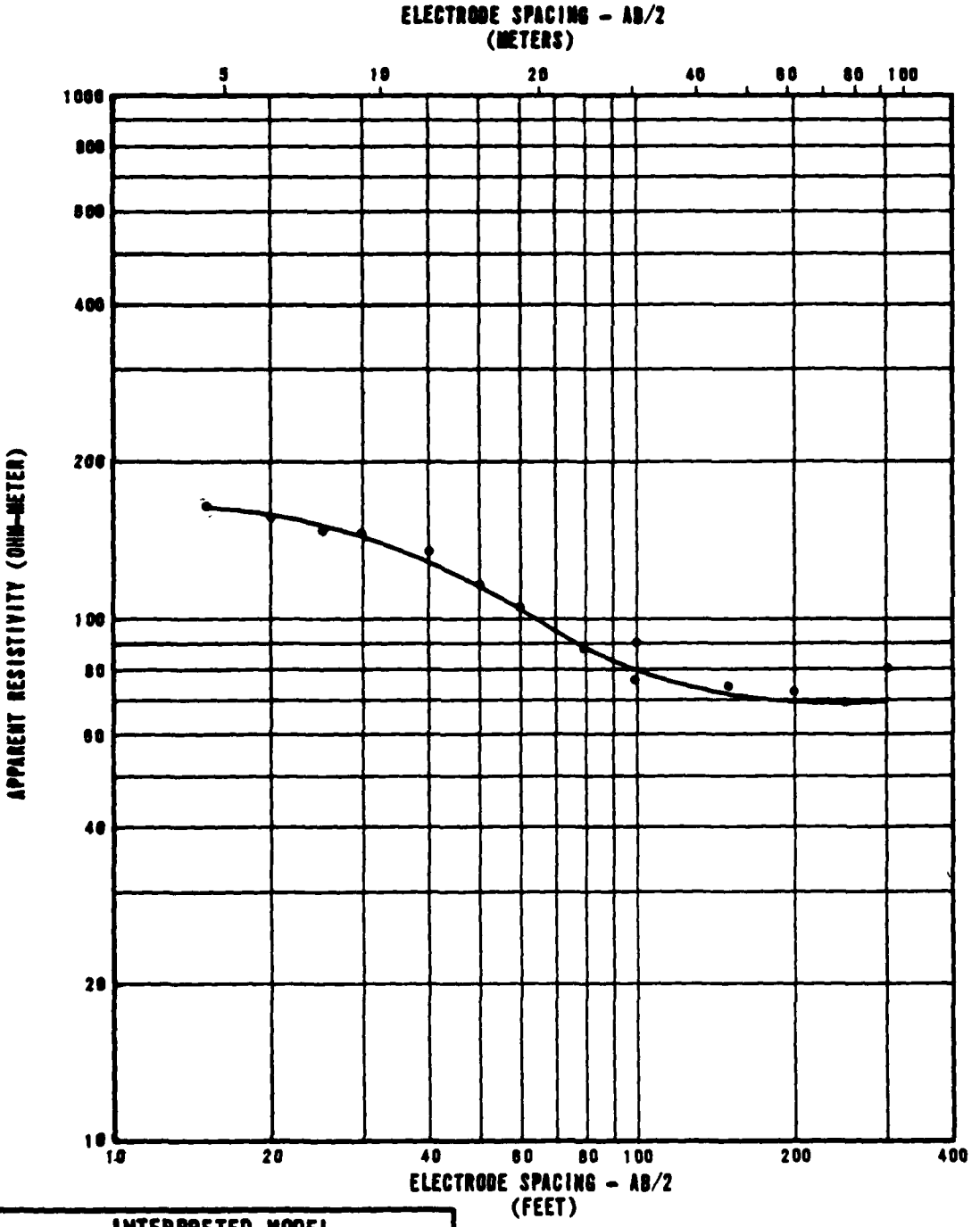
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	90
11	3	150
48	15	50

RESISTIVITY SOUNDING RR-R-8
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-8

FUGRO NATIONAL, INC.

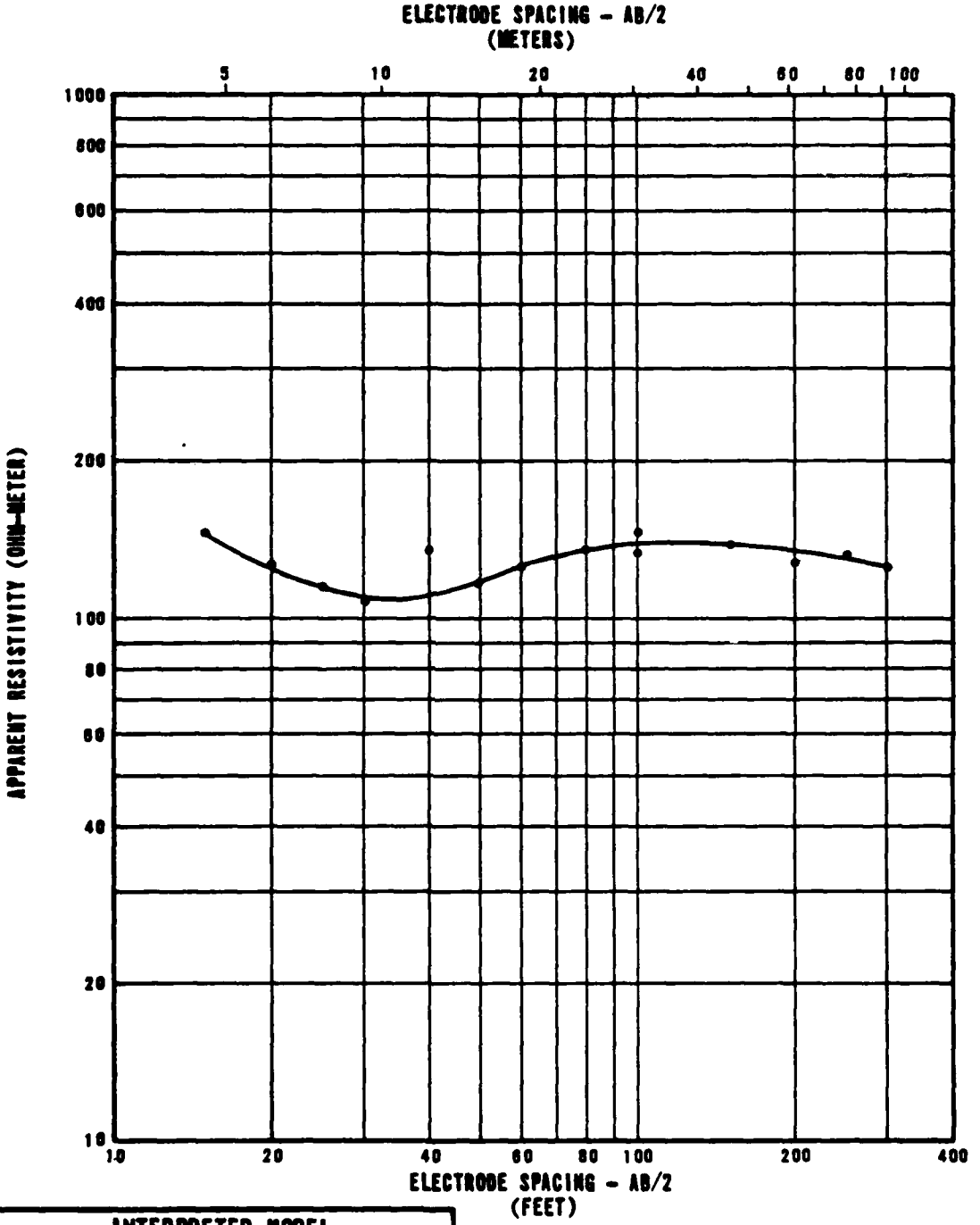


INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	170
20	6	70

RESISTIVITY SOUNDING RR-R-9
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-9



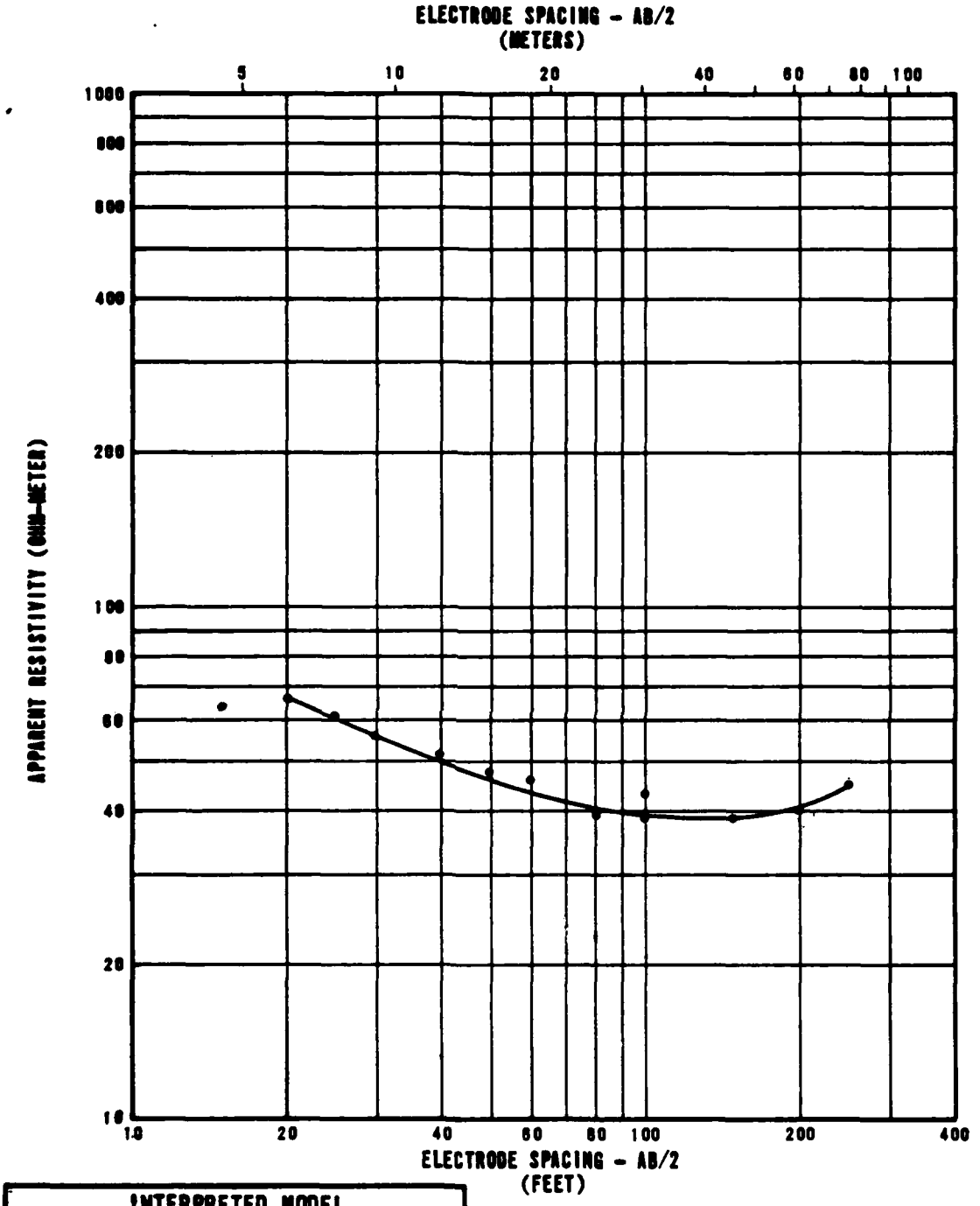
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	170
9	3	75
30	9	330
55	17	100

RESISTIVITY SOUNDING RR-R-10
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-10

FUGRO NATIONAL, INC.



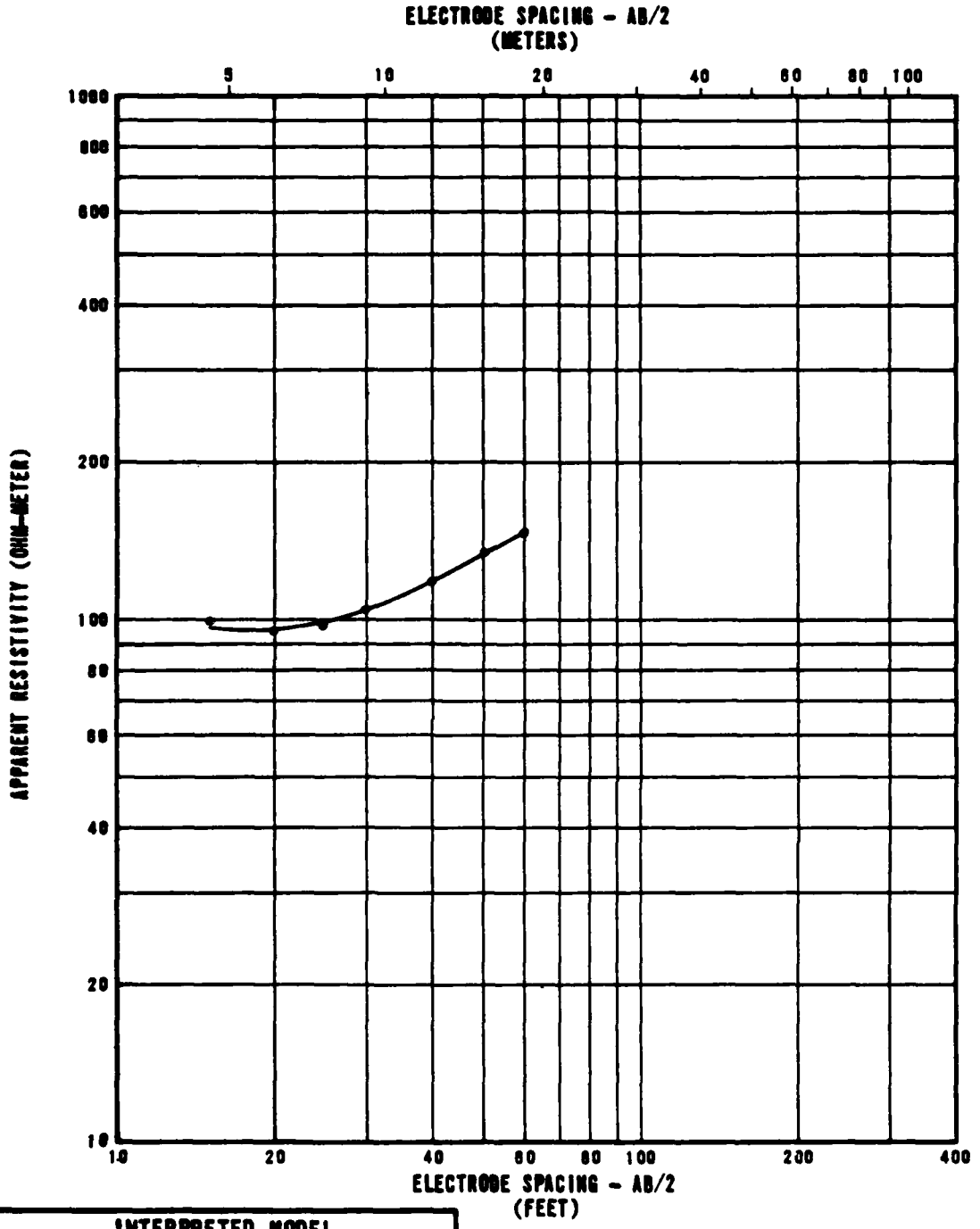
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	75
16	5	25
151	46	55

RESISTIVITY SOUNDING RR-R-11
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-11

FUGRO NATIONAL, INC.



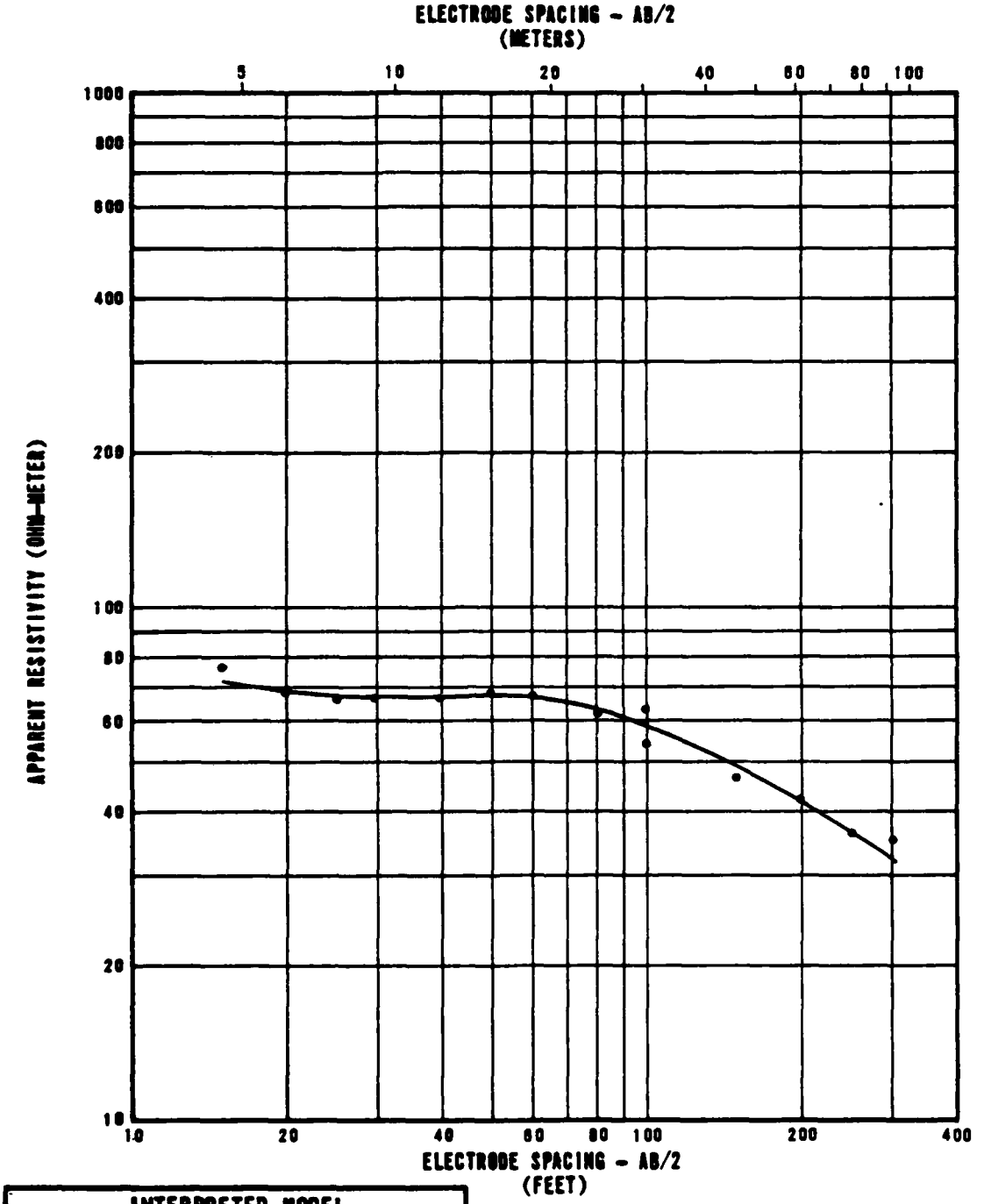
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	95
26	9	290

RESISTIVITY SOUNDING RR-R-12
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-12

FUGRO NATIONAL, INC.



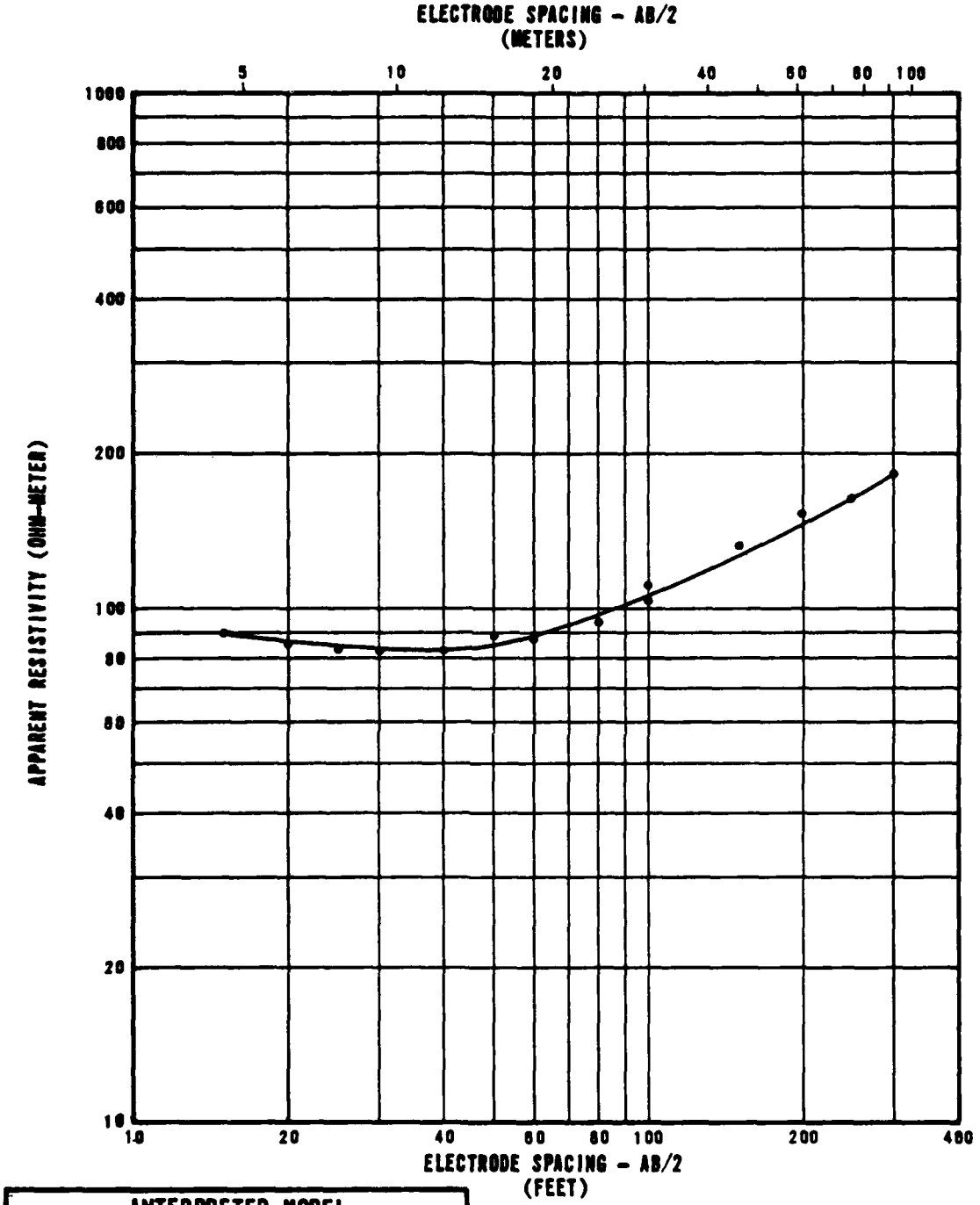
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	70
70	23	25

RESISTIVITY SOUNDING RR-R-13
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-13

USRO NATIONAL, INC.

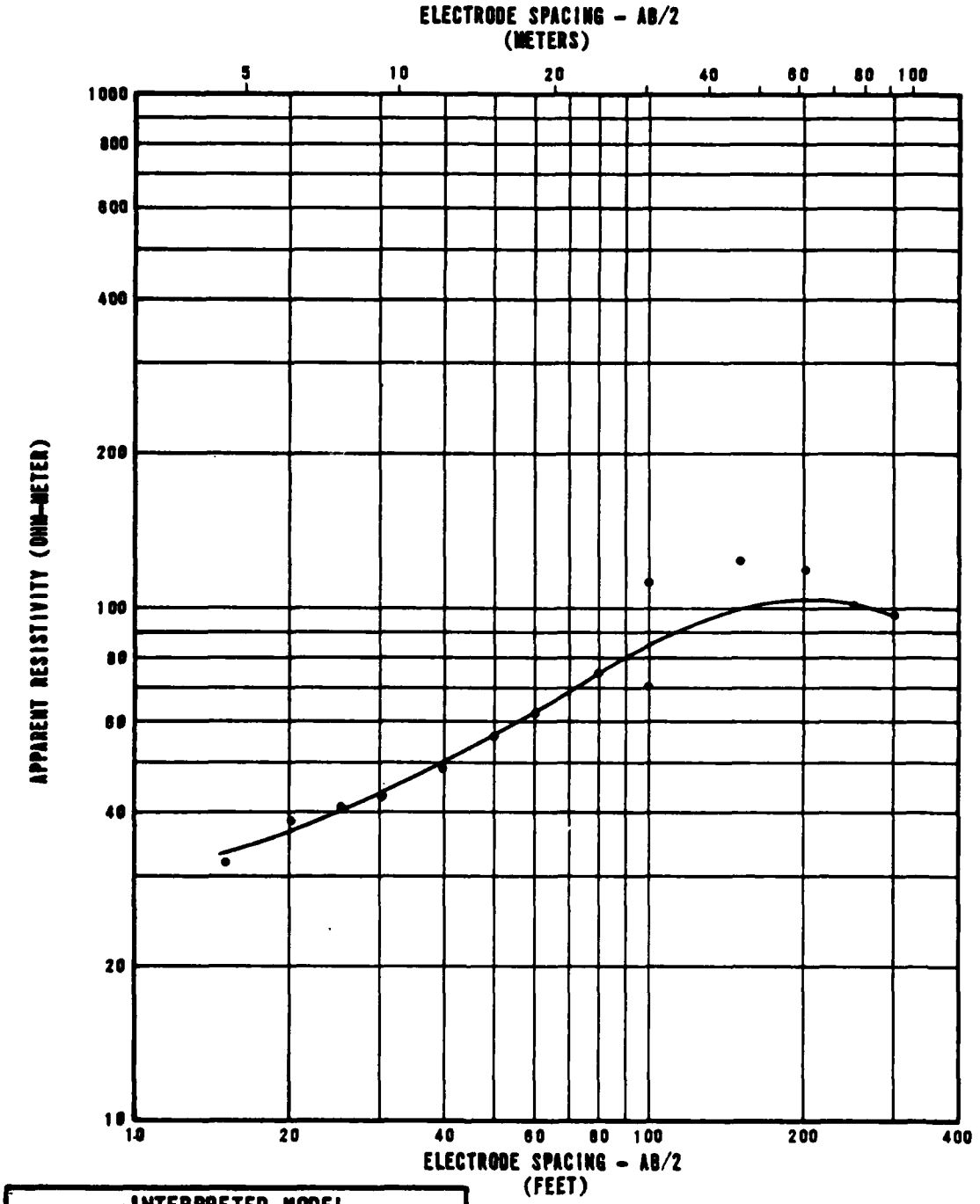


INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	90
18	5	70
34	10	90
67	20	280

RESISTIVITY SOUNDING RR-R-14
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-14



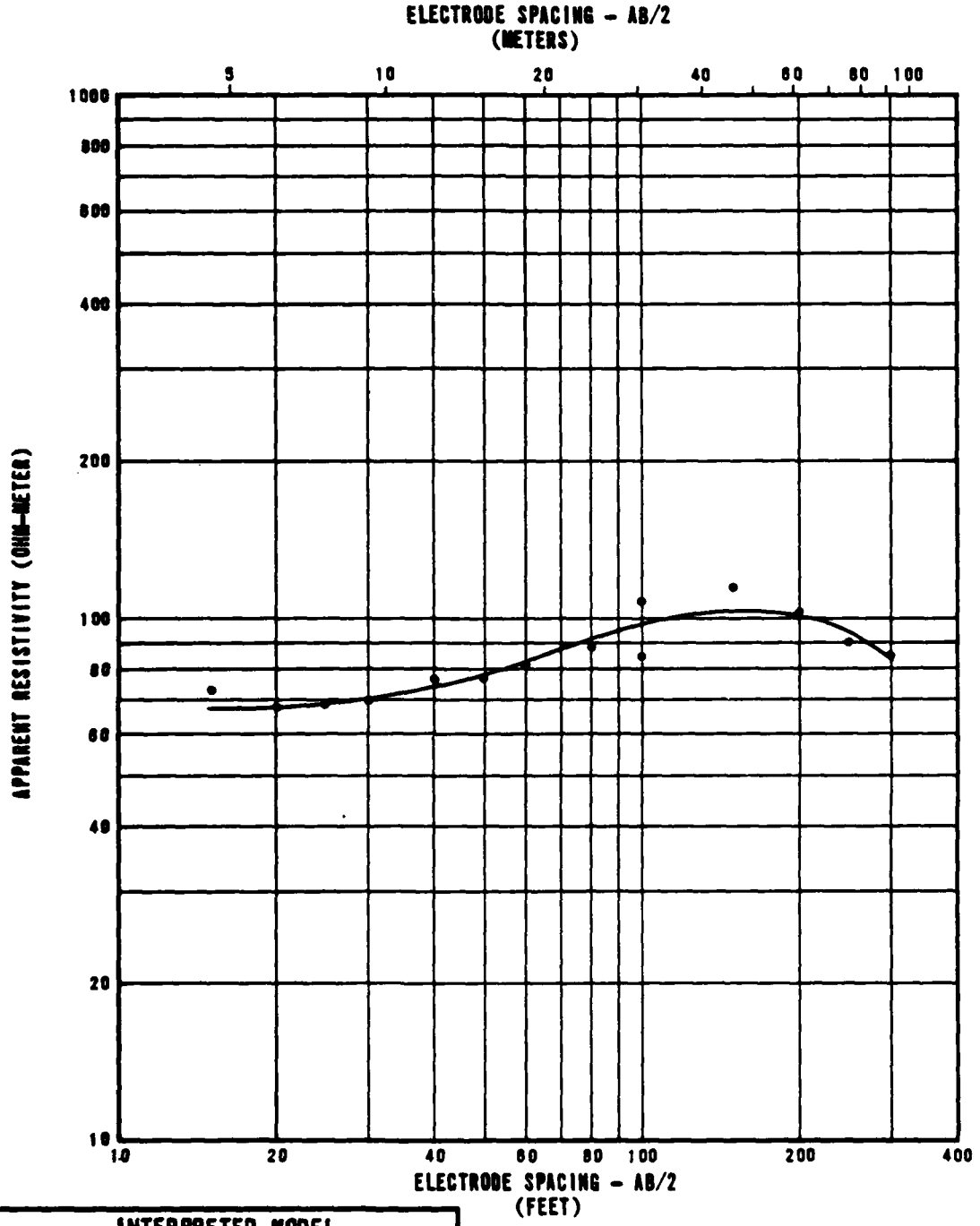
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
15	5	130
198	60	45

RESISTIVITY SOUNDING RR-R-15
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 4-15

FUGRO NATIONAL, INC.



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	65
26	8	120
186	57	25

RESISTIVITY SOUNDING RR-R-18
SOUNDING CURVE AND INTERPRETATION
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE
4-16

FUGRO NATIONAL, INC.

SECTION 5.0

GRAVITY DATA

EXPLANATIONS OF GRAVITY DATA

Gravity data were not available in time (prior to June 1979) for incorporation into this report. A supplemental report containing gravity data and results will be issued at a later date.

SECTION 6.0

BORING LOGS

EXPLANATIONS OF BORING, TRENCH, AND TEST PIT LOGS

All data from borings, trenches, and test pits are presented on standard Fugro National logs in Sections 6.0 and 7.0. The following explanations are provided as a key to the logs.

A. Designations - Borings, trenches, and test pits are identified as follows:

WW-B-1
WW - abbreviation for the site (e.g., WW-Whirlwind)
B - abbreviation for activity (e.g., B-boring, T-trench, P-test pit)
1 - number of activity

B. Sample Type - Different sampling techniques were used and the symbols are explained at the bottom of the boring logs. For details of sampling techniques, see Section A5.0 of Appendix in Volume I. Horizontal lines, to scale, indicate the depth where sampling was attempted.

C. Percent Recovery - The numbers shown represent the ratio (in percent) of the soil sample recovered in the sampler to the full penetration of the sampler.

D. N Value - Corresponds to standard penetration resistance, which is number of blows required to drive a standard split-spoon sampler for the second and third of three 6-inch (15 cm) increments with a 140-pound (63.5 kg) hammer falling 30 inches (76 cm) (ASTM D 1586-67).

E. Depth - Corresponds to depth below ground surface in meters and feet.

F. Lithology - Graphic representation of the soil and rock types.

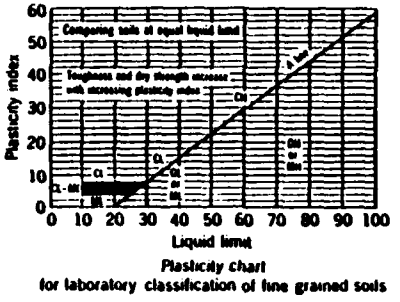
UNIFIED SOIL CLASSIFICATION SYSTEM

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE B-1

TUDRO NATIONAL, INC.

Field Identification Procedures (Excluding particles larger than 3 in. and basing fractions on estimated weights)						Group Symbols	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils: More than half of material is larger than No. 200 sieve size[b] (For visual classification, the 3 in. size may be used as equivalent to the No. 4 sieve size)	Gravels: More than half of coarse fraction is larger than No. 4 sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			GW	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand, gravelly*; about 20% hard, angular gravel particles ½-in. maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse grained soils are classified as follows: Less than 5%: *GW, GP, SW, SP* More than 12%: *GM, GC, SM, SC* 5% to 12%: *Borderline cases requiring use of dual symbols*	$C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			Predominantly one size or a range of sizes with some intermediate sizes missing			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for *GW*
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			GM	Silty gravels, poorly graded gravel-sand-silt mixtures		Atterberg limits below "A" line, or *PI* less than 4 / Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
			Plastic fines (for identification procedures, see *CL* below)			GC	Clayey gravels, poorly graded gravel-sand-clay mixtures		Atterberg limits above "A" line, with *PI* greater than 7
	Sands: More than half of coarse fraction is smaller than No. 4 sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			SW	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			Predominantly one size or a range of sizes with some *intermediate sizes missing*			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for *SW*
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			SM	Silty sands, poorly graded sand-silt mixtures		Atterberg limits below "A" line or *PI* less than 4 / Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
			Plastic fines (for identification procedures, see *CL* below)			SC	Clayey sands, poorly graded sand-clay mixtures		Atterberg limits below "A" line with *PI* greater than 7
Fine-grained soils: More than half of material is smaller than No. 200 sieve size (The No. 200 sieve size is about the smallest particle visible to naked eye)	Identification Procedures on Fraction Smaller than No. 40 Sieve Size								Use grain size curve in identifying the fractions as given under field identification
		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)					
	Silts and clays: liquid limit less than 50	None to slight	Quick to slow	None		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	*Give typical name; indicate degree* and character of plasticity, amount and maximum size of *coarse grains*; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	Plasticity chart for laboratory classification of fine grained soils
		Medium to high	None to very slow	Medium		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
		Slight to medium	Slow	Slight		OL	Organic silts and organic silt-clays of low plasticity		
	Silts and clays: liquid limit greater than 50	Slight to medium	Slow to none	Slight to medium		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
		High to very high	None	High		CH	Inorganic clays of high plasticity, fat clays		
		Medium to high	None to very slow	Slight to medium		OH	Organic clays of medium to high plasticity		
Highly Organic Soils		Readily identified by colour, odour, spongy feel and frequently by fibrous texture				Pt	Peat and other highly organic soils		



From Wagner, 1957.

[a] *Boundary classifications.* Soils possessing characteristics of two groups are designated by combinations of group symbols. For example *GW-GC*, well graded gravel-sand mixture with clay binder.

[b] All sieve sizes on this chart are U.S. standard.

Field Identification Procedure for Fine Grained Soils or Fractions

These procedures are to be performed on the minus No. 40 sieve size particles, approximately ½₆ in. For field classification purposes, screening is not intended, simply remove by hand the coarse particles that interfere with the tests.

Dilatancy (Reaction to shaking):

After removing particles larger than No. 40 sieve size, prepare a pat of moist soil with a volume of about one-half cubic inch. Add enough water if necessary to make the soil soft but not sticky.

Place the pat in the open palm of one hand and shake it horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens and finally it cracks or crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil.

Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has *no reaction*. Inorganic silts, such as a typical rock flour, show a moderately quick reaction.

Dry Strength (Crushing characteristics):

After removing particles larger than No. 40 sieve size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity.

High dry strength is characteristic for clays of the CH group. A typical inorganic silt possesses only very slight dry strength. Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

Toughness (Consistency near plastic limit):

After removing particles larger than the No. 40 sieve size, a specimen of soil about one-half inch cube in size, is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled out by hand on a smooth surface or between the palms into a thread about one-eight inch in diameter. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.

After the thread crumbles, the pieces should be lumped together and a slight kneading action continued until the lump crumbles.

The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay of low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line.

Highly organic clays have a very weak and spongy feel at the plastic limit.

G. USCS - Unified Soil Classification System (see Table 6-1 for complete details) symbols.

H. Soil Description - Except in cases where samples were classified based on laboratory test data, the descriptions are based on visual classification. The procedures outlined in ASTM D 2487-69, Classification of Soils for Engineering Purposes, and D 2488-69, Description of Soils (Visual-Manual Procedure) were followed. Solid lines across the column indicate known change in strata at the depth shown.

Definitions of some of the terms and criteria to describe soils and conditions encountered during the exploration follow.

Gradation : A coarse-grained soil is well graded if it has a wide range in grain size and substantial amounts of most intermediate particle sizes.

Poorly graded indicates that the soil consists predominantly of one size (uniformly graded) or has a wide range of sizes with some intermediate sizes obviously missing (gap-graded).

Moisture :

Dry	- no feel of moisture
Slightly Moist	- much less than normal moisture
Moist	- normal moisture for soil
Very Moist	- much greater than normal moisture
Wet	- for soils below the water table (if known)

Consistency: Consistency descriptions of coarse-grained soils (GW, GP, GM, GC, SW, SP, SM, SC) are as follows.

Consistency	N Value (ASTM D 1586-67)
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Consistency descriptions of fine-grained soils (ML, CL, MH, CH,) are as follows:

Consistency	Shear Strength (ksf)	Shear Strength (kn/m^2)	Field Guide
Very Soft	0.25	12	Sample with height equal to twice the diameter, sags under own weight
Soft	0.25-0.50	12 - 24	Can be squeezed between thumb and forefinger
Firm	0.50-1.00	24-48	Can be molded easily with fingers
Stiff	1.00-2.00	48-96	Can be imprinted with slight pressure from fingers
Very Stiff	2.00-4.00	96-192	Can be imprinted with considerable pressure from fingers
Hard	over 4.00	over 192	Cannot be imprinted by fingers

Grain Shape: Angular - particles have sharp edges and relatively plane sides with unpolished surfaces.

Subangular - particles are similar to angular but have somewhat rounded edges.

Subrounded - particles exhibit nearly plane sides but have well-rounded corners and edges.

Rounded - particles have smoothly curved sides and no edges.

Calcareous : Containing calcium carbonate; presence of calcium carbonate is commonly identified on the basis of reaction with dilute hydrochloric acid.

Caliche : Soils cemented by porous calcium carbonate and/or other soluble minerals by upward-moving solutions.

Degree of Cementation: (Stages of development of caliche profile)

Stage	Gravelly Soils	Nongravelly Soils
I	Thin, discontinuous pebble coatings	Few filaments or faint coatings
II	Continuous pebble coatings, some interpebble fillings	Few to abundant nodules, flakes, filaments
III	Many interpebble fillings	Many nodules and internodular fillings
IV	Laminar horizon overlying plugged horizon	Increasing carbonate impregnation

Secondary Material : Example - Sand with trace to some silt

Trace - 5-12% (by dry weight)
Little - 13-20% (by dry weight)
Some - >21% (by dry weight)

Plasticity : Plasticity index is the range of water content, expressed as a percentage of the weight of the oven-dried soil, through which the soil is plastic. It is defined as the liquid limit minus the plastic limit. Descriptive ranges used on the logs include:

Nonplastic	(PI, 0 - 4)
Slightly Plastic	(PI, 4 - 15)
Medium Plastic	(PI, 15 - 30)
Highly Plastic	(PI, >31)

Cobbles and Boulders : A cobble is a rock fragment, usually rounded by weathering or abrasion, with an average diameter ranging between 3 and 12 inches (8 and 30 cm).

A boulder is a rock fragment, usually rounded by weathering or abrasion, with an average diameter of 12 inches (30 cm) or more.

I. Remarks - This column was provided on boring and trench logs for comments regarding drilling difficulty, number and size of cobbles or boulders encountered, trench wall stability, loss of drilling fluid in the boring, and other conditions encountered during drilling and excavations.

J. Dry Density and Moisture Content - The boring logs include a graphical display of laboratory test results for dry density (ASTM D 2937-71) in pounds per cubic foot and kilograms per cubic meter and moisture content (ASTM D 2216-71) in percent from representative samples taken during drilling. The symbols are explained at the bottom of the boring logs.

K. Seive Analysis - The numbers represent the percentage by dry weight (ASTM D 422-63) of each of the following soil components:

GR - Gravel, rock particles that will pass a 3-inch (76 mm) sieve and are retained on No. 4 (4.75 mm) sieve.

SA - Sand, soil particles passing No. 4 sieve and retained on No. 200 (0.075 mm) sieve.

FI - Fines, silt or clay, soil particles passing No. 200 sieve.

L. Atterberg Limits (LL and PI) -

LL - Liquid Limit, the water content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).

PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).

PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.

NP - Nonplastic.

M. Miscellaneous Information -

Elevations - indicated elevations on the logs are estimated from topographic maps of the study area, within an accuracy of half the contour interval.

Surficial Geologic Unit - indicates the surficial geologic unit in which the activity is located.

Date Drilled - indicates the period from beginning to completion of the activity.

Drilling Method - signifies the type of drilling procedure used such as rotary wash.

Hole Diameter - nominal size of boring drilled.

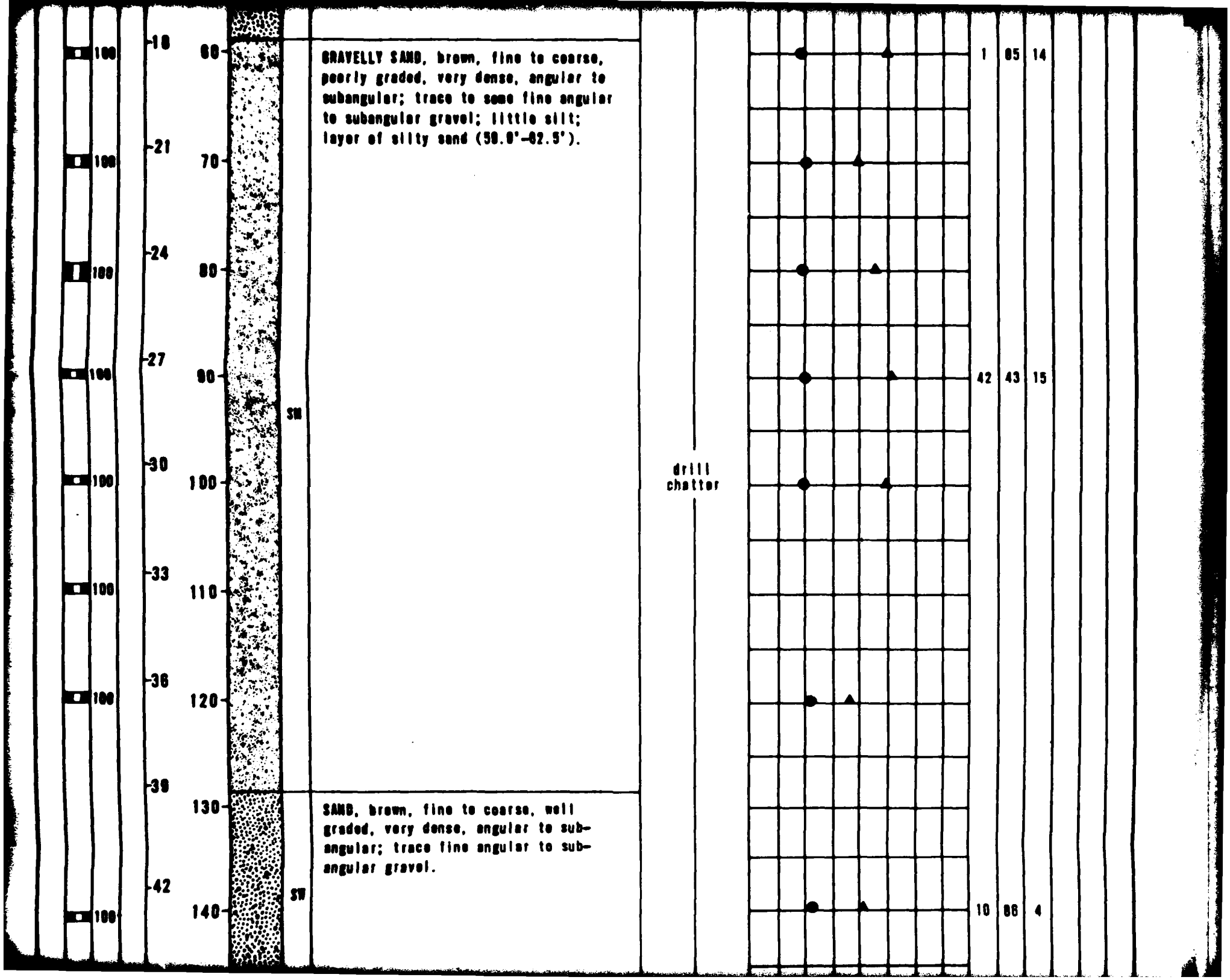
Water Level - indicates depth from ground surface to water table where encountered.

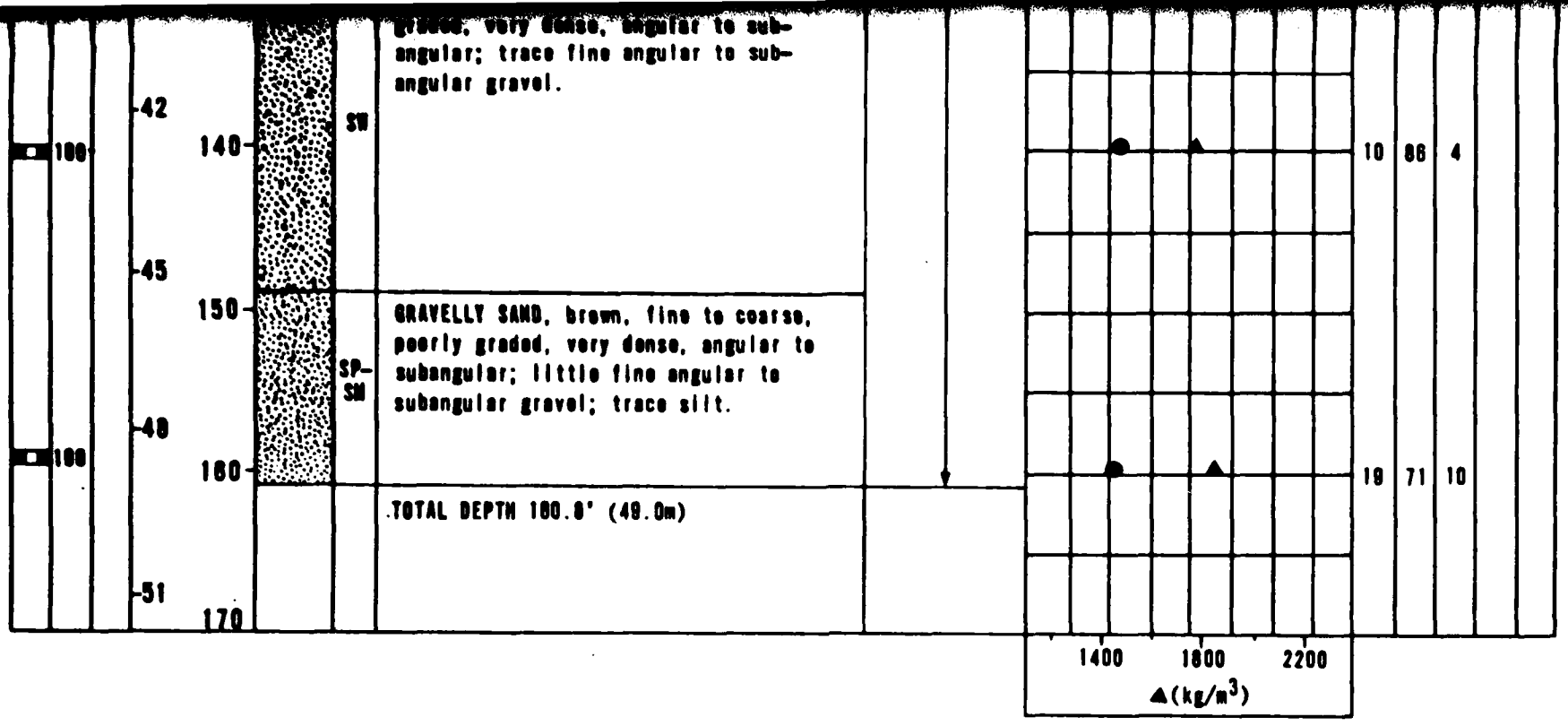
Trench Length - length at ground surface of final trench excavation.

Trench Orientation - bearing of longitudinal trench centerline.

CHECKED BY _____ APPROVED BY _____

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf) 80 90 100 110 120 130 140 / ●(%) 5 10 15 20 25 30 35	SIEVE ANALYSIS GR	SA	FI	LL	PI
	100		0	0		SM	SILTY SAND, light brown, fine to coarse, poorly graded, loose to dense, angular to subangular, calcareous; little to some silt; trace to little fine angular to-sub-angular gravel; lense of sandy clay (0.5'-1.2').	drill chatter						
	47													
	80					SP				13	85	2		
	100		3	10		SM				37	43	20		
	100					SP	GRAVELLY SAND, brown, fine to coarse, poorly to well graded, very dense, angular to subangular, calcareous; some fine to coarse angular to sub-angular gravel; layer of silty sand (9.0'-10.5').			26	71	3		
	100		6	20										
	100					SW				33	64	3		
	100		9	30										
	100					SM	SILTY SAND, light brown, fine to coarse, poorly graded, very dense, angular to subangular, calcareous; little silt; little fine subangular gravel.							
	100		12	40		SW-SM	SAND, light brown, fine to coarse, well graded, very dense, angular to sub-angular; trace fine angular to subrounded gravel; trace silt.			11	81	8		
	100		15	50										
	100		18	60			GRAVELLY SAND, brown, fine to coarse,			1	85	14		


100
100
100
100
100
100
100
100
18
21
24
27
30
33
36
39
42
60
70
80
90
100
110
120
130
140
GRAVELLY SAND, brown, fine to coarse, poorly graded, very dense, angular to subangular; trace to some fine angular to subangular gravel; little silt; layer of silty sand (59.0'-62.5').
SW
SAND, brown, fine to coarse, well graded, very dense, angular to subangular; trace fine angular to subangular gravel.
SW
drill chatter
1 85 14
42 43 15
10 86 4



gravel, very dense, angular to sub-angular; trace fine angular to sub-angular gravel.

EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT	: A2
DATE DRILLED	: 20-21 MARCH 1979
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

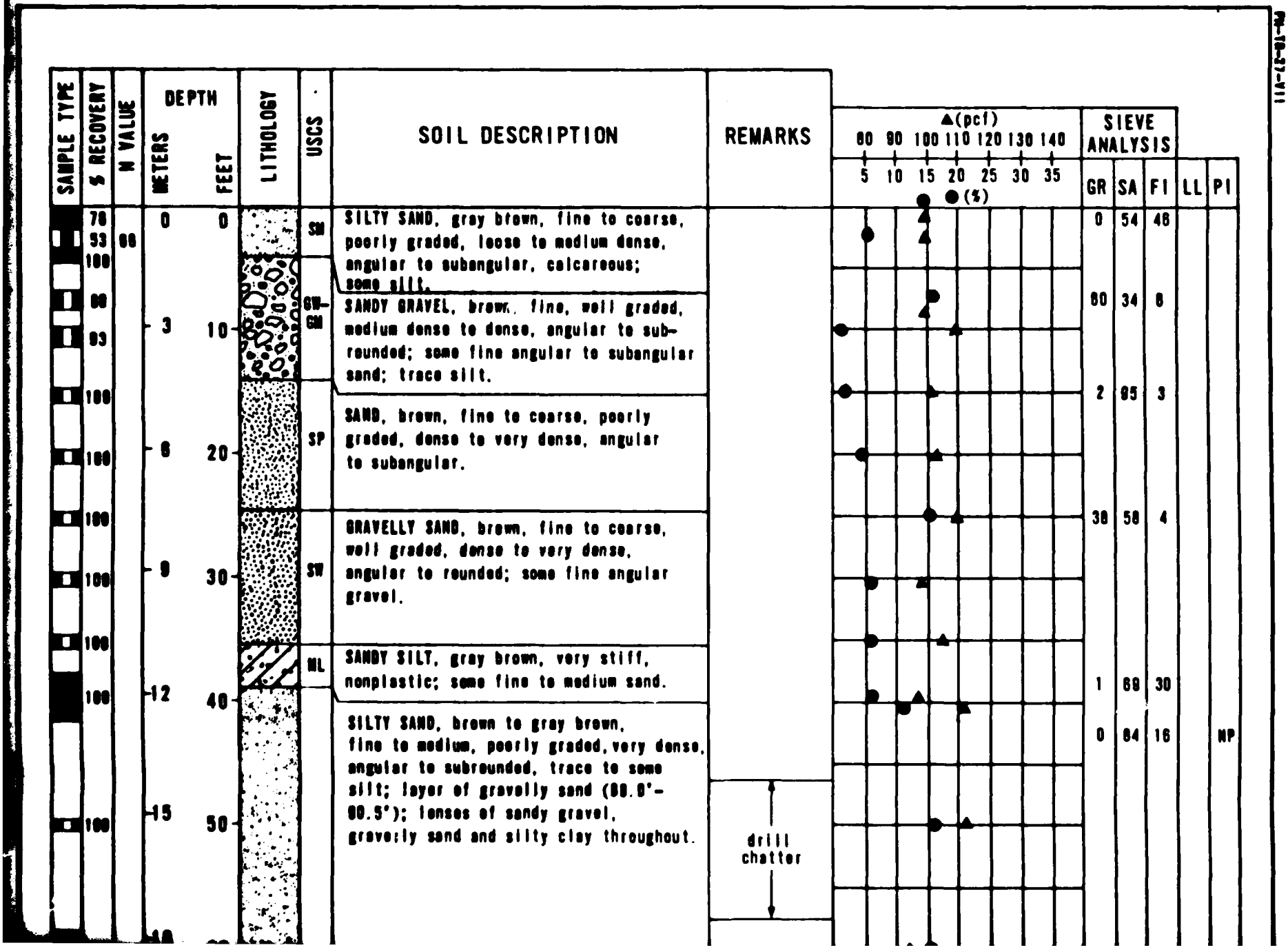
FUGRO NATIONAL INC.

LOG OF BORING RB-4-1
VERIFICATION SITE
REVEILLE-PAHUTE CAMP, NEVADA

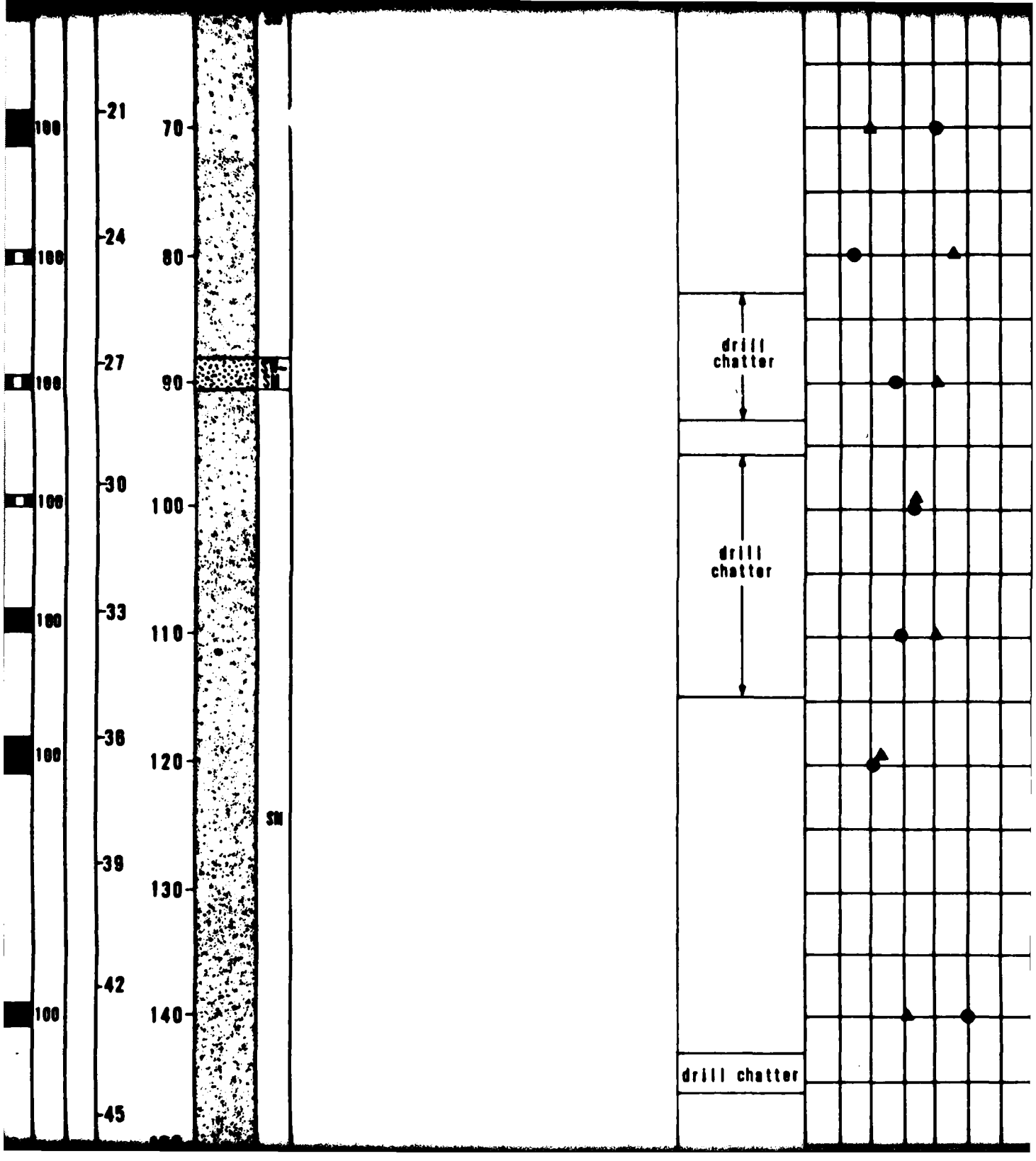
NTS SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

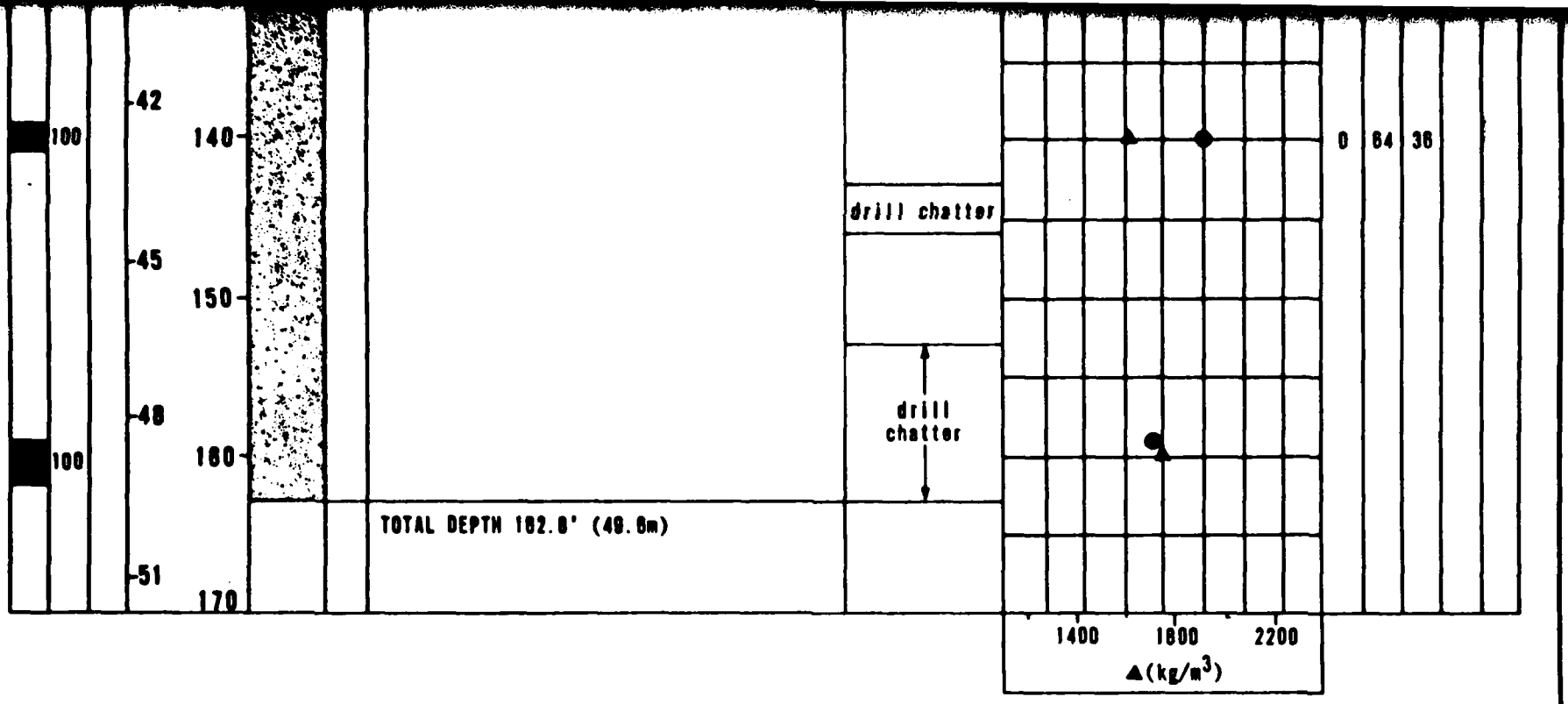
FIGURE
B-1

CHECKED BY _____ APPROVED BY _____



FM-18-37-111


100
100
100
100
100
100
100
21
24
27
30
33
36
39
42
45
70
80
90
100
110
120
130
140
SM
drill chatter
drill chatter
drill chatter



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 4930' (1503m)
SURFICIAL GEOLOGIC UNIT	: A4o
DATE DRILLED	: 21-22 March 1979
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

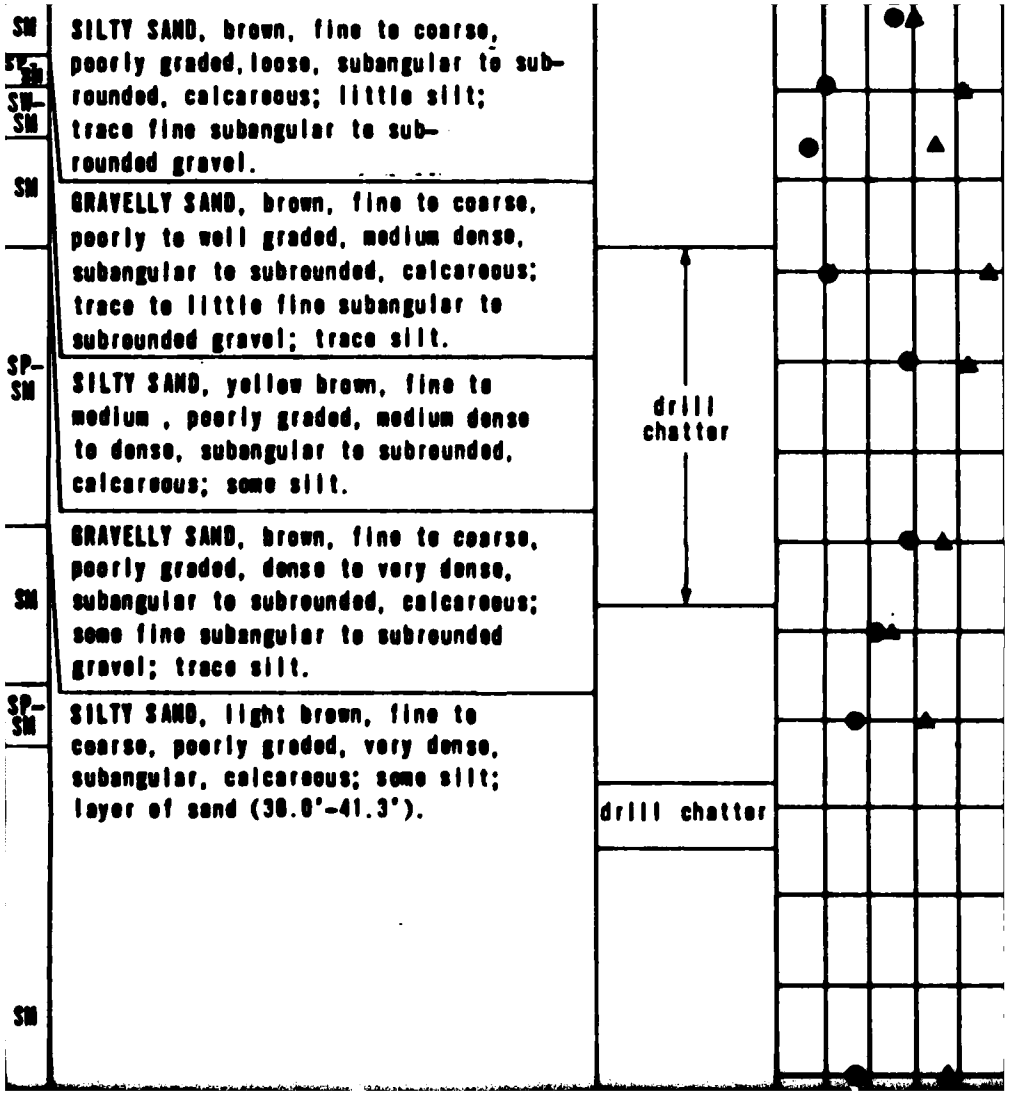
FUGRO NATIONAL, INC.

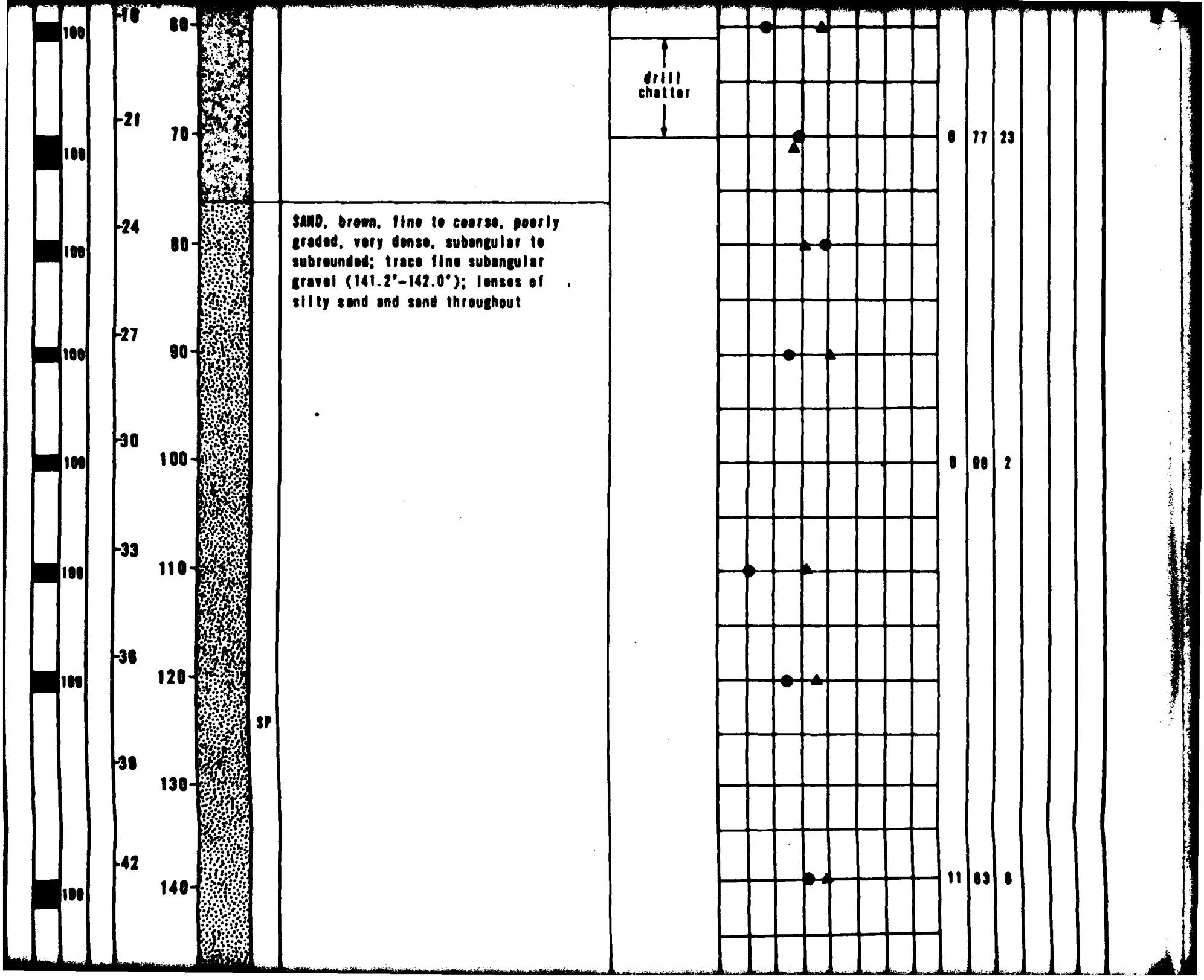
LOG OF BORING RR-B-2
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

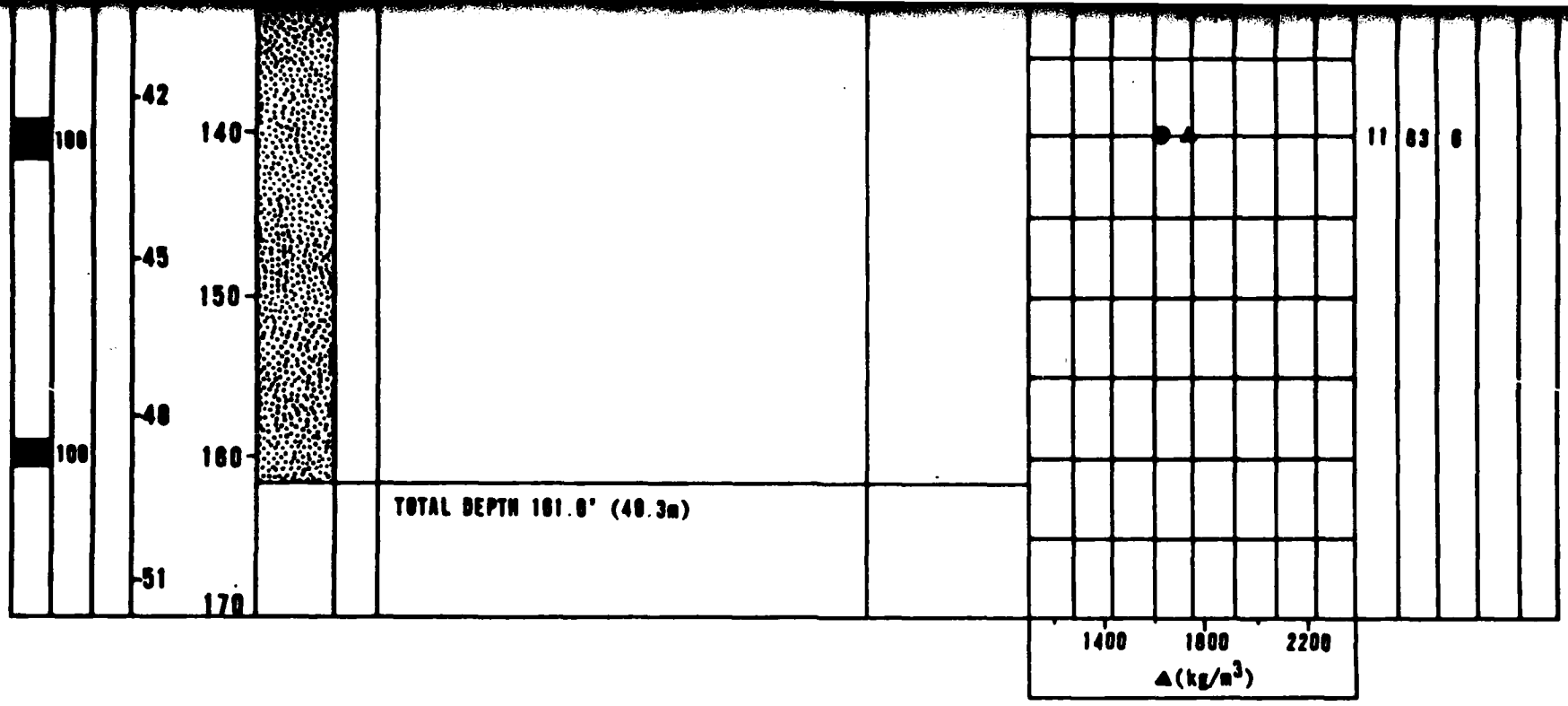
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE B-2

AFS-88


SM
SP-SM
SM-SM
SM
SP-SM
SM
SP-SM
SM
SILTY SAND, brown, fine to coarse, poorly graded, loose, subangular to subrounded, calcareous; little silt; trace fine subangular to subrounded gravel.
GRAVELLY SAND, brown, fine to coarse, poorly to well graded, medium dense, subangular to subrounded, calcareous; trace to little fine subangular to subrounded gravel; trace silt.
SILTY SAND, yellow brown, fine to medium , poorly graded, medium dense to dense, subangular to subrounded, calcareous; some silt.
GRAVELLY SAND, brown, fine to coarse, poorly graded, dense to very dense, subangular to subrounded, calcareous; some fine subangular to subrounded gravel; trace silt.
SILTY SAND, light brown, fine to coarse, poorly graded, very dense, subangular, calcareous; some silt; layer of sand (38.0'-41.3').
drill chatter
drill chatter


drill chatter
SAND, brown, fine to coarse, poorly graded, very dense, subangular to subrounded; trace fine subangular gravel (141.2'-142.0'); lenses of silty sand and sand throughout
SP
0 77 23
0 98 2
11 83 6



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 4965' (1513m)
SURFICIAL GEOLOGIC UNIT	: 23 March 1979
DATE DRILLED	: A5y
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

FUGRO NATIONAL, INC.

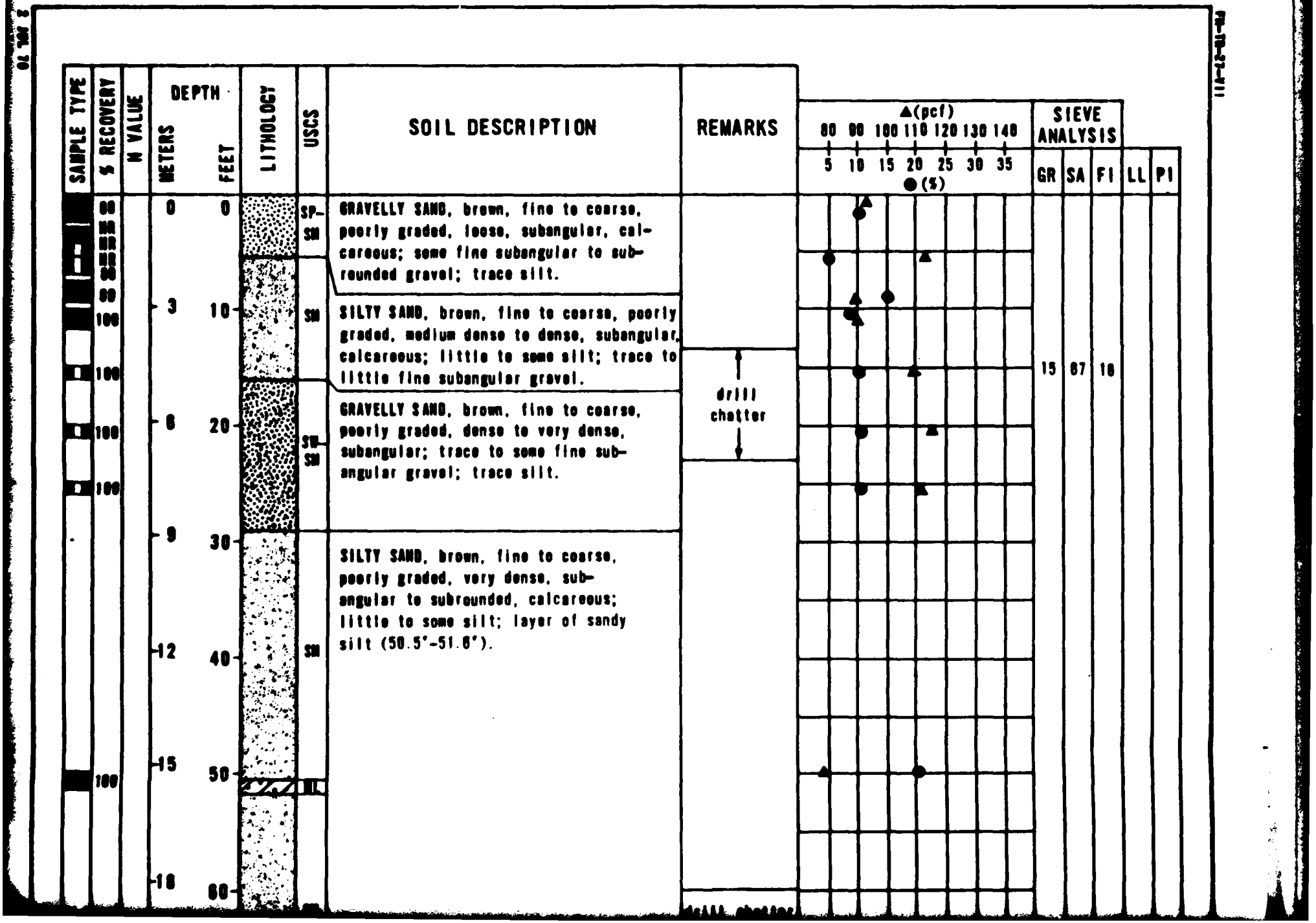
LOG OF BORING BH-B-3
VERIFICATION SITE
REVEILLE-RAILROAD CORR. NEVADA

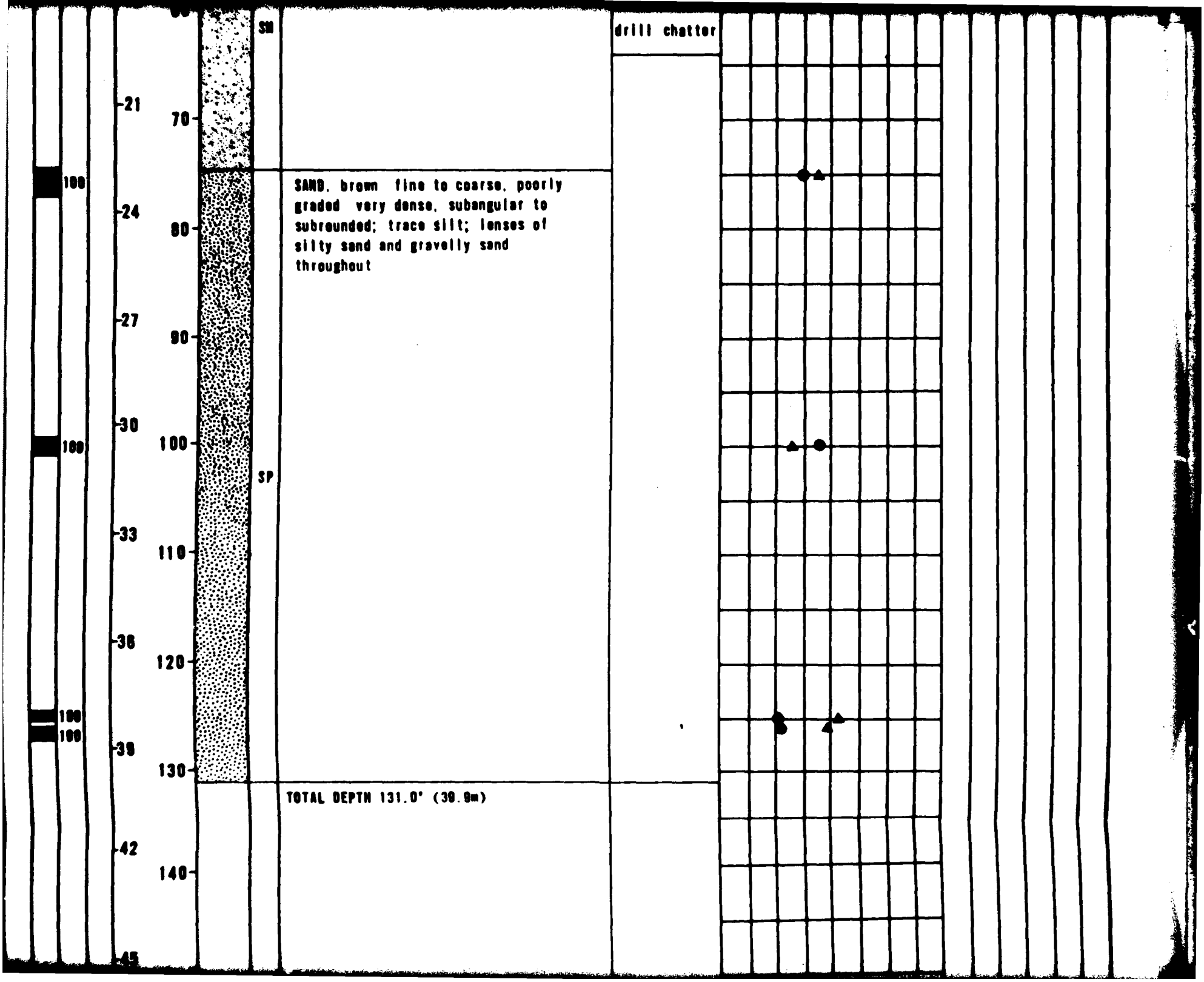
BE SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

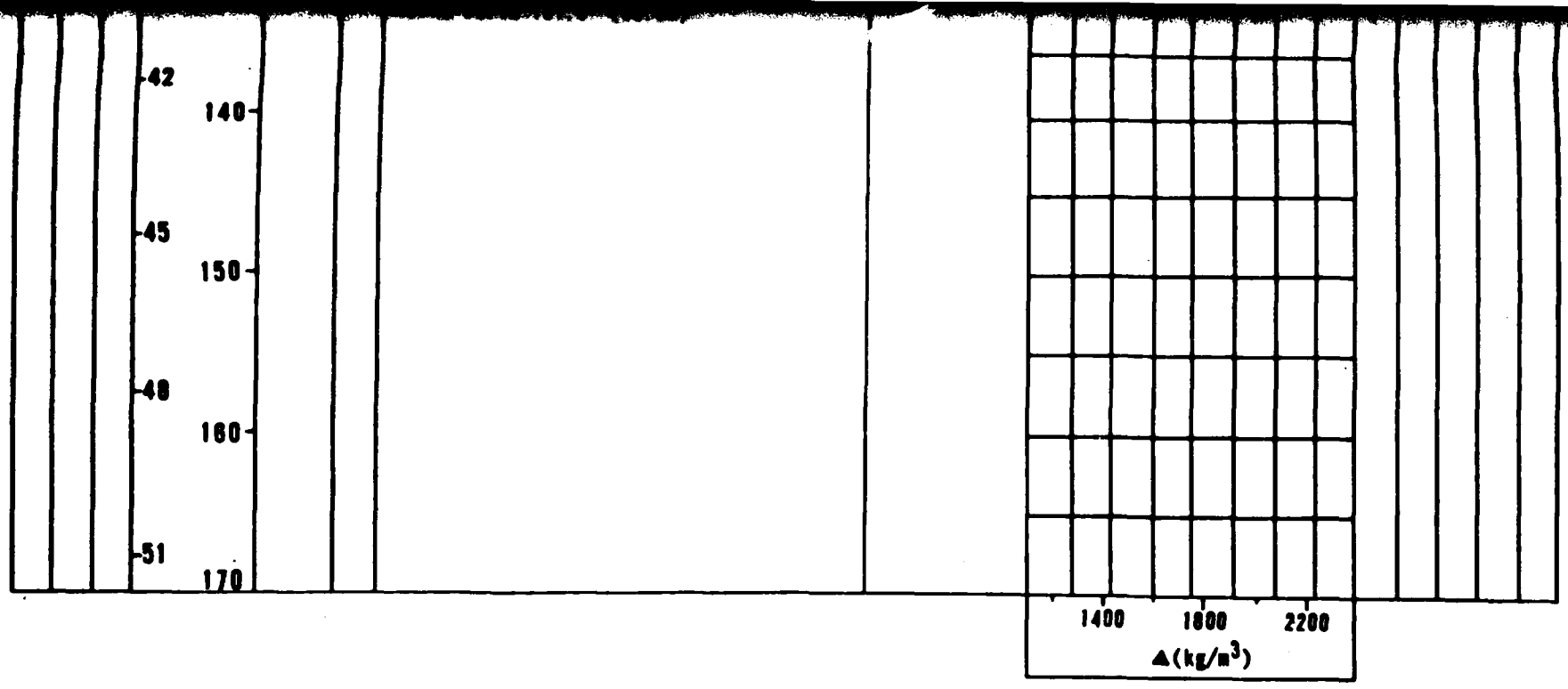
FIGURE B-3

AFS-03

CHECKED BY _____ APPROVED BY _____




drill chatter
SM
SAND, brown fine to coarse, poorly graded very dense, subangular to subrounded; trace silt; lenses of silty sand and gravelly sand throughout
SP
TOTAL DEPTH 131.0' (39.9m)
100
100
100
100
100
100
21
24
27
30
33
36
39
42
45
70
80
90
100
110
120
130
140



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 4985' (1513m)
SURFICIAL GEOLOGIC UNIT	: A5y
DATE DRILLED	: 2-3 April 1979
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

FUGRO NATIONAL, INC.

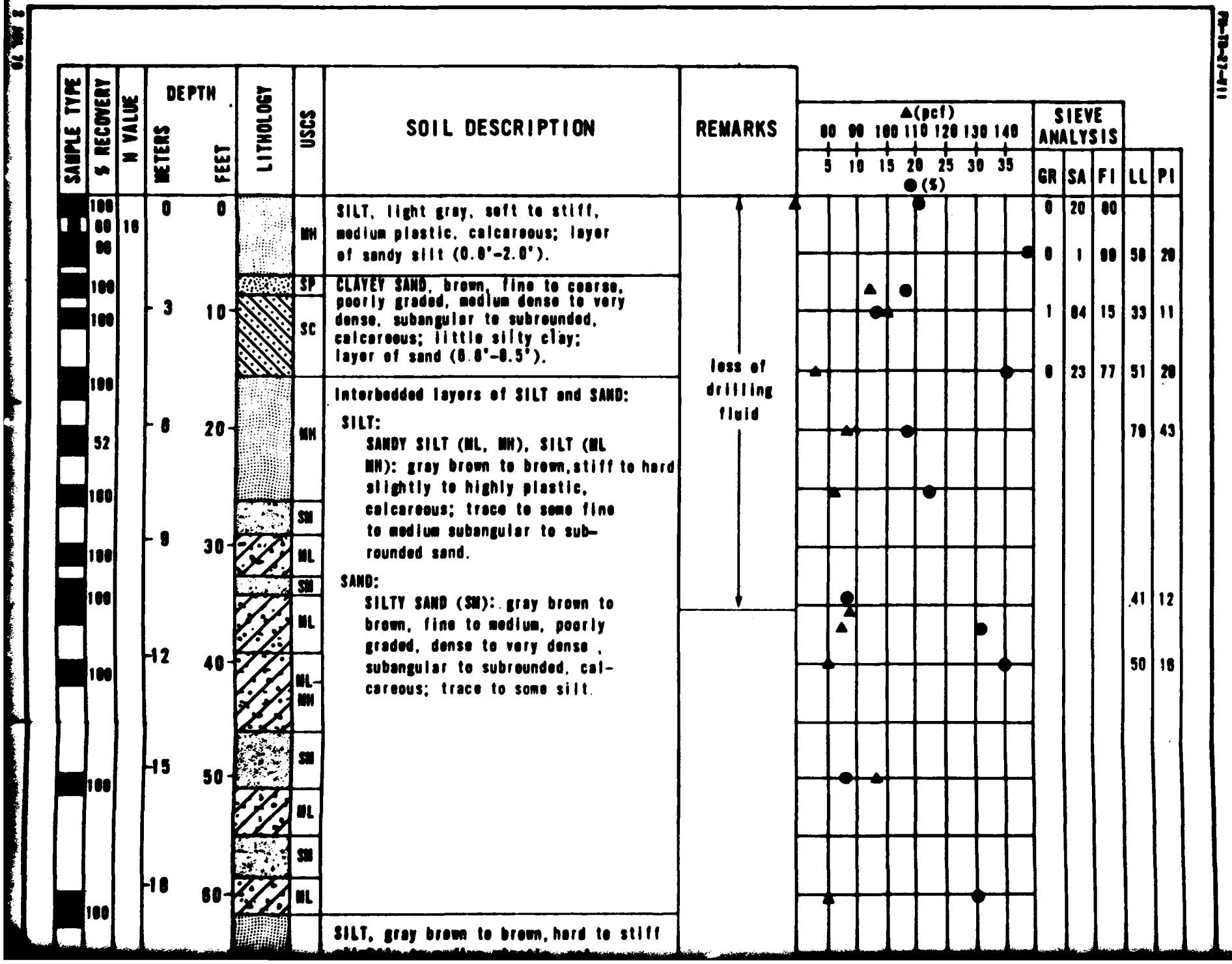
LOG OF BORING RR-B-3A
VERIFICATION SITE
RETEILLE-RAILROAD CUT, NEVADA

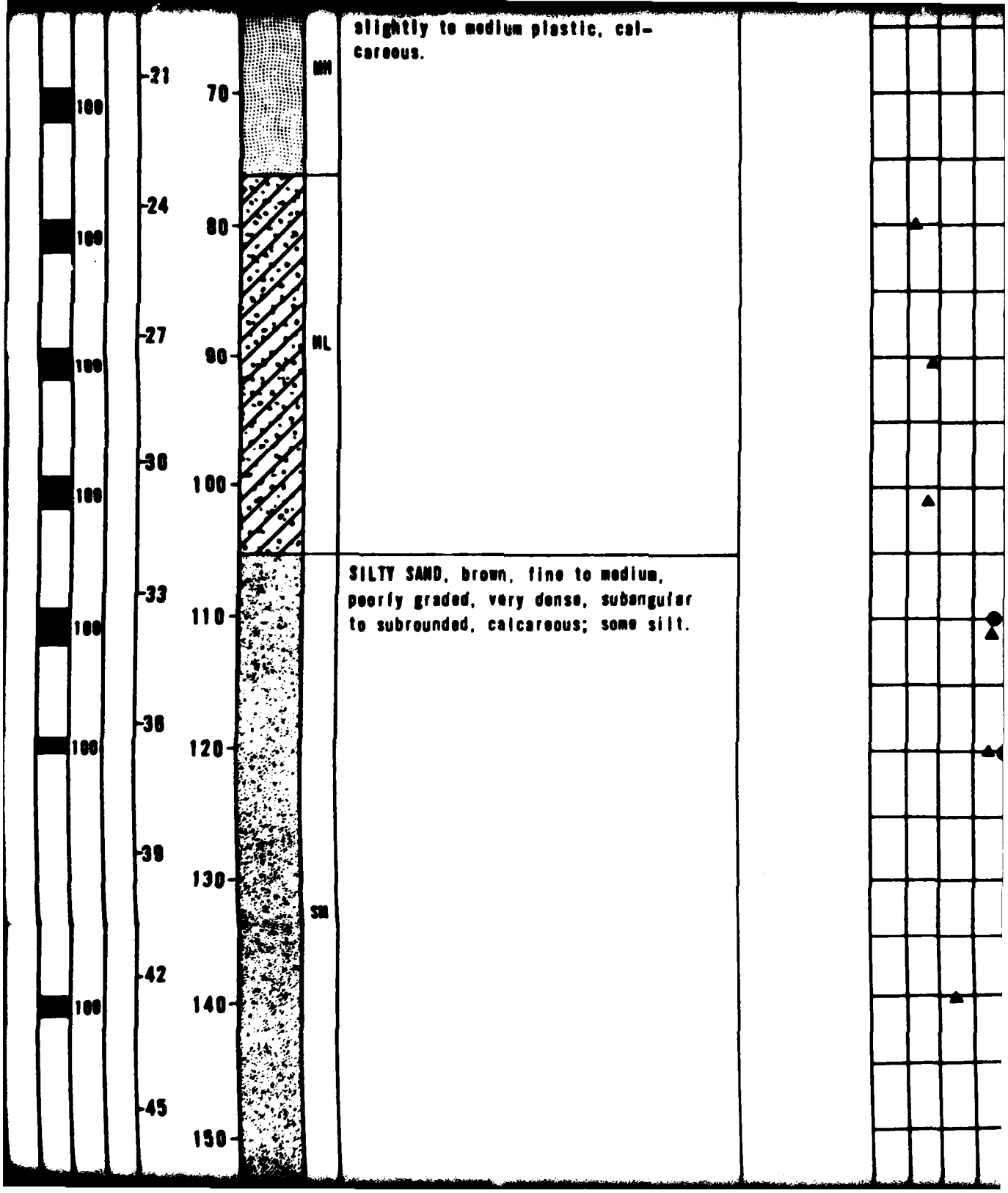
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

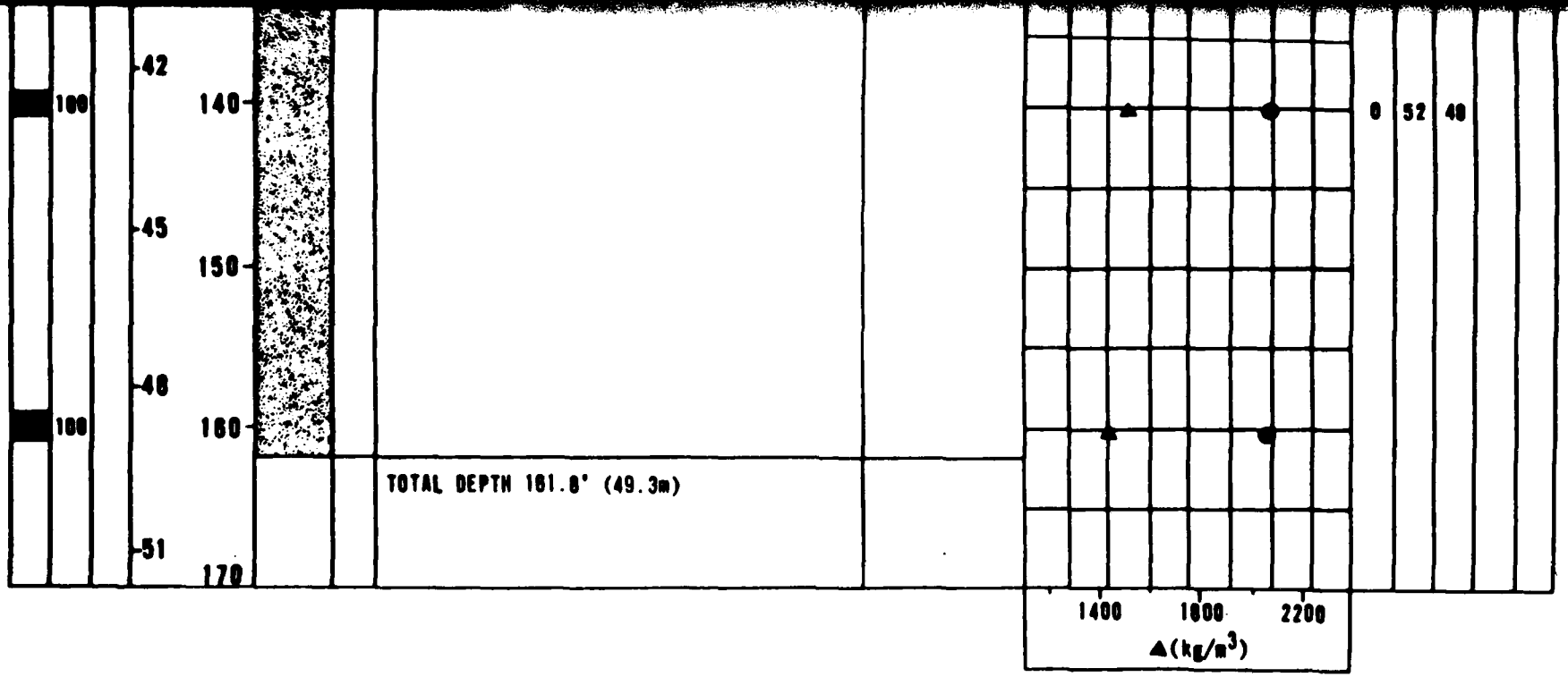
FIGURE B-4

APP-B

CHECKED BY _____ APPROVED BY _____




slightly to medium plastic, calcareous.
SILTY SAND, brown, fine to medium, poorly graded, very dense, subangular to subrounded, calcareous; some silt.
ML
SM
100
100
100
100
100
100
21
24
27
30
33
36
39
42
45
70
80
90
100
110
120
130
140
150



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	:	4855' (1480m)
SURFICIAL GEOLOGIC UNIT	:	A4o
DATE DRILLED	:	24-25 March 1979
DRILLING METHOD	:	Rotary Wash
HOLE DIAMETER	:	4 7/8" (124mm)
WATER LEVEL	:	79' (24.1m)

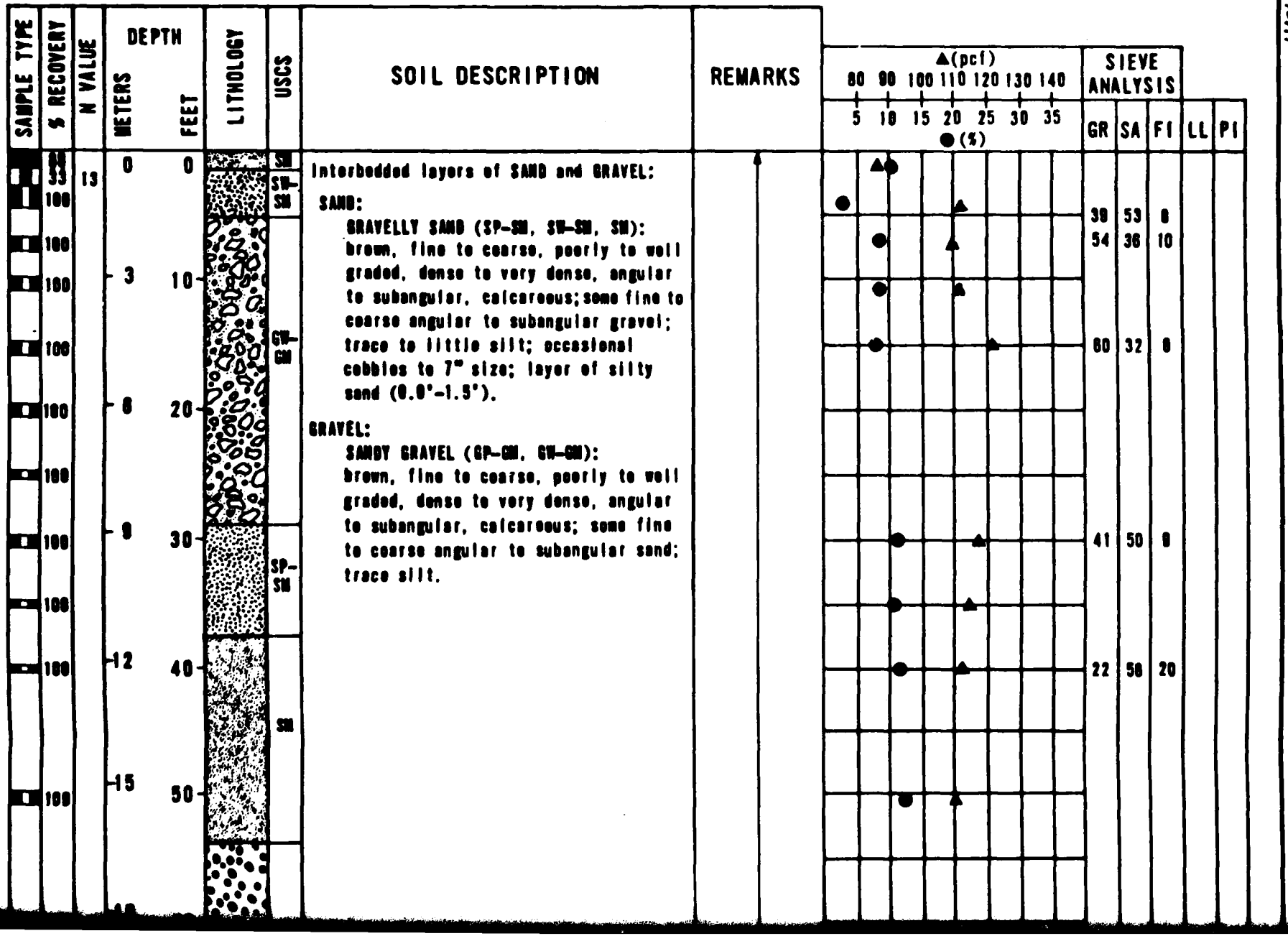
FUGRO NATIONAL, INC.

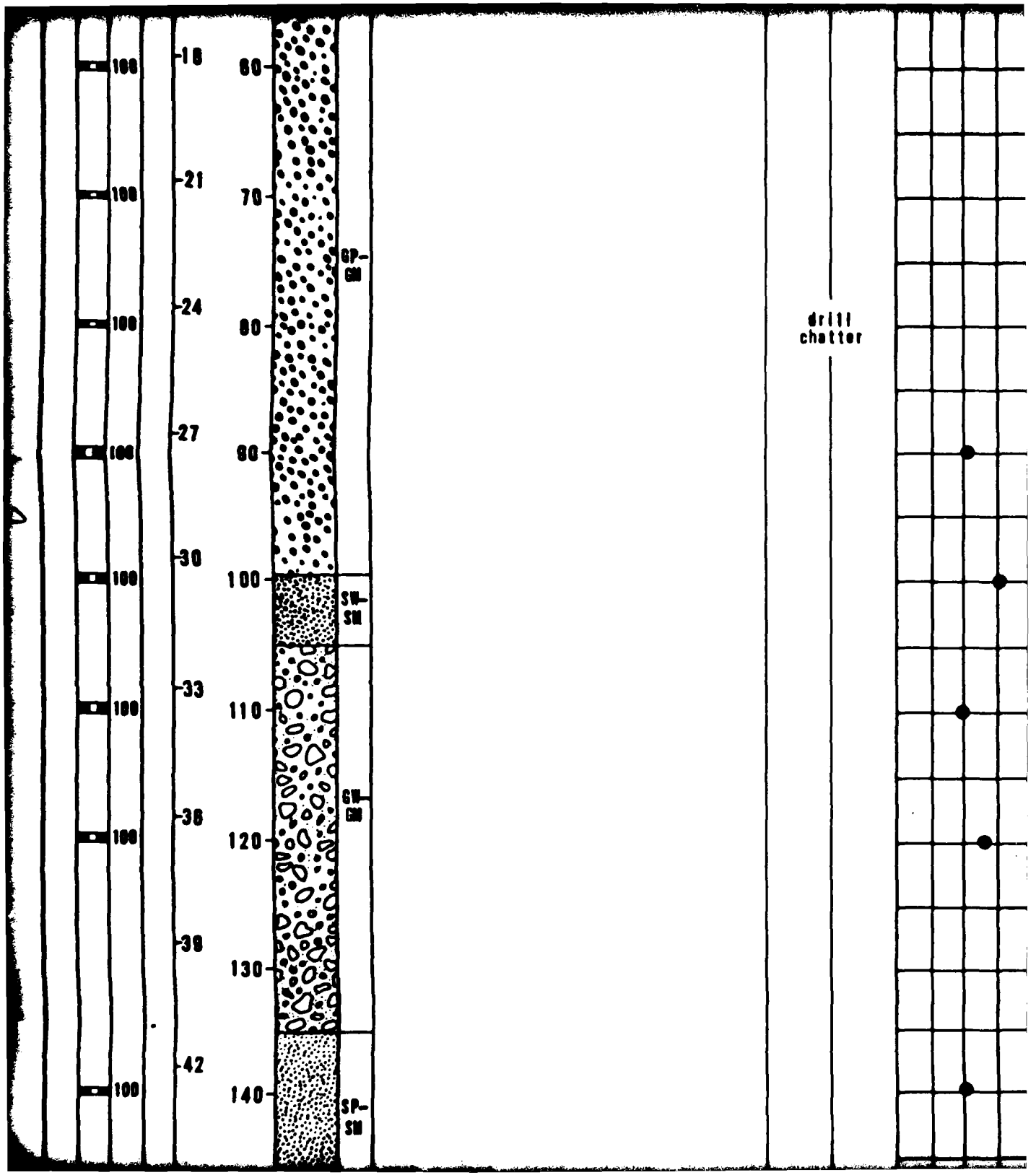
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

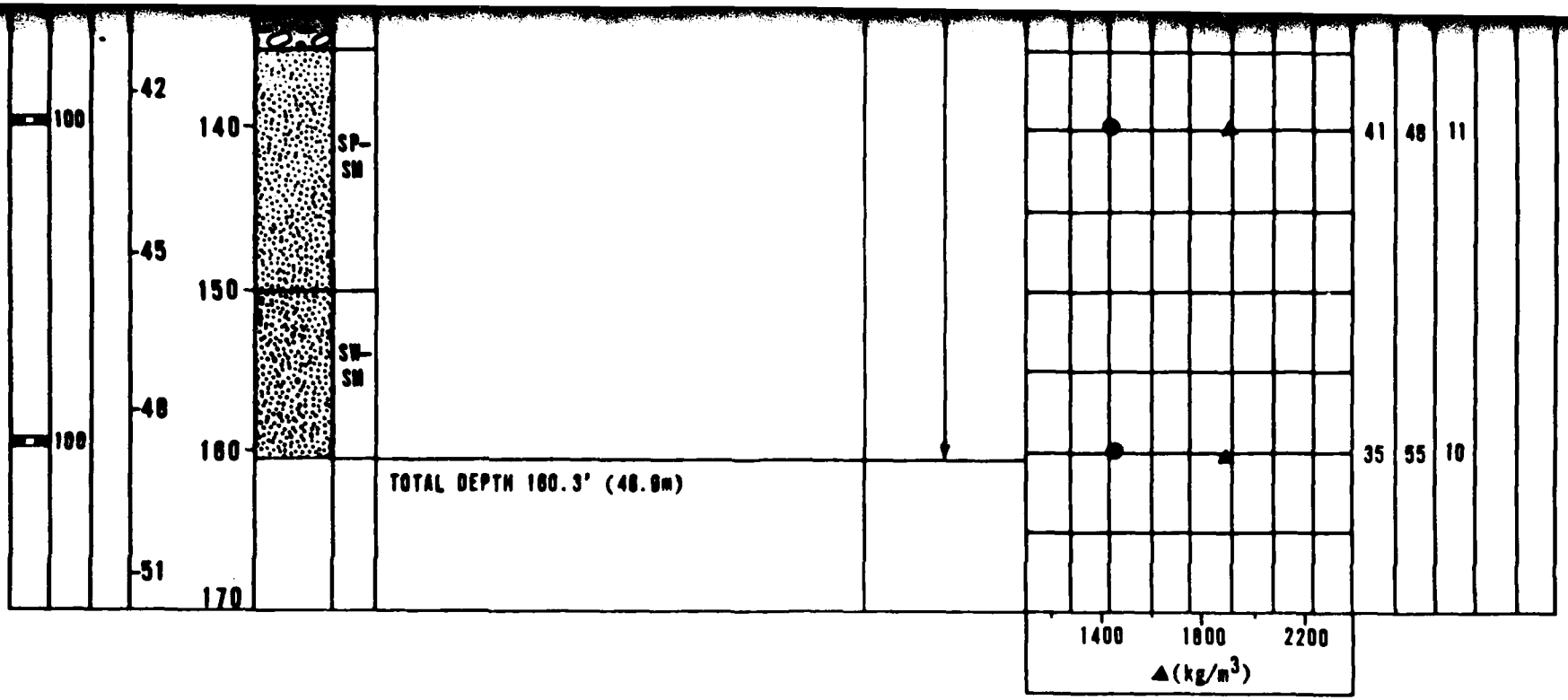
FIGURE 8-5

LOG OF BORING BR-B-4
VERIFICATION SITE
REVEILLE-RAILROAD VAL., NEVADA

CHECKED BY _____ APPROVED BY _____




100
100
100
100
100
100
100
18
21
24
27
30
33
36
39
42
60
70
80
90
100
110
120
130
140
GP-GM
SW-SM
GW-GM
SP-SM
drill chatter



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 5500' (1676m)
SURFICIAL GEOLOGIC UNIT	: A5I
DATE DRILLED	: 25-26 March 1979
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

FUGRO NATIONAL, INC.

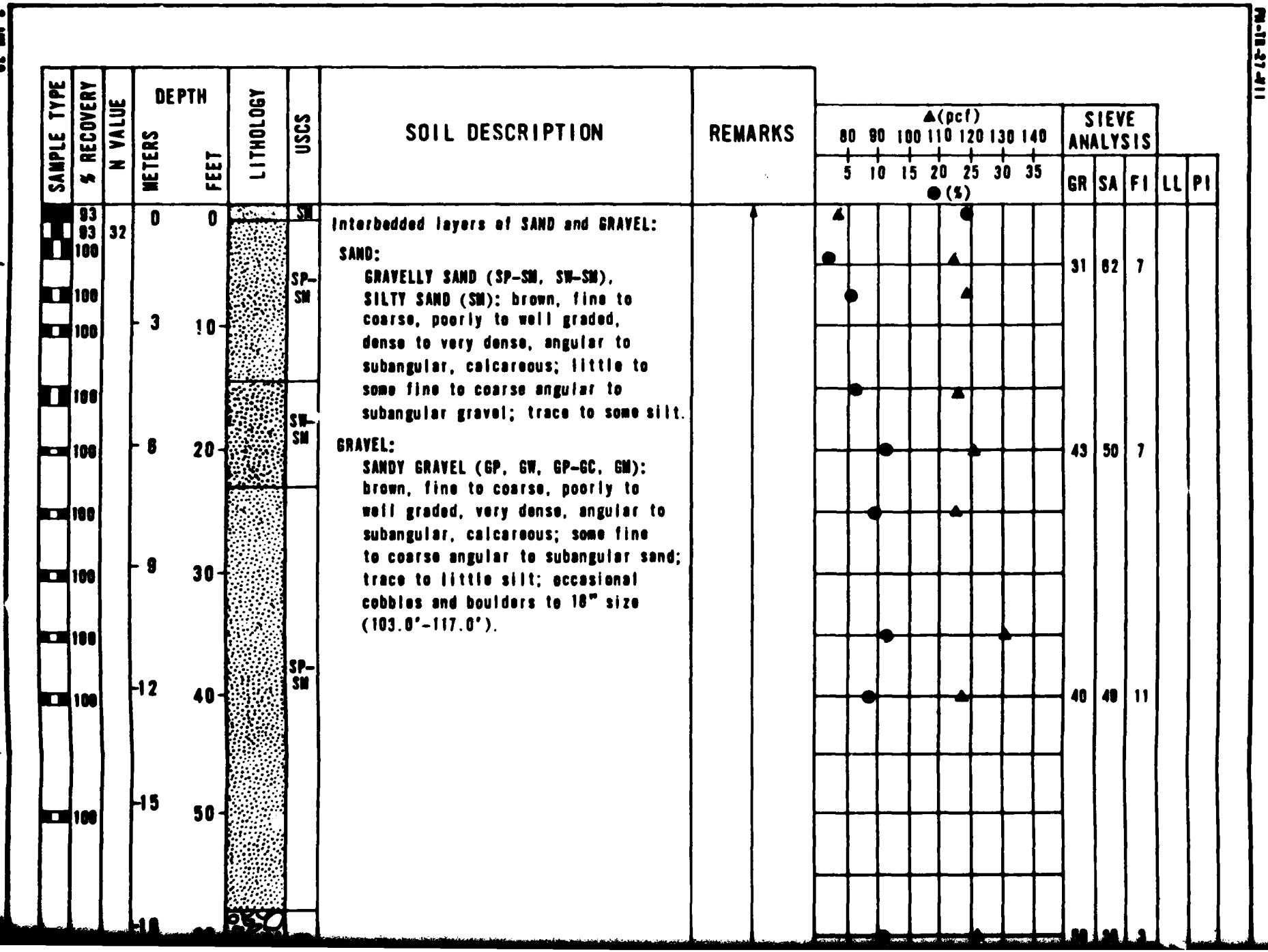
LOG OF BORING NR-6-5
VERIFICATION SITE
REVEILLE-RAILROAD VOR, NEVADA

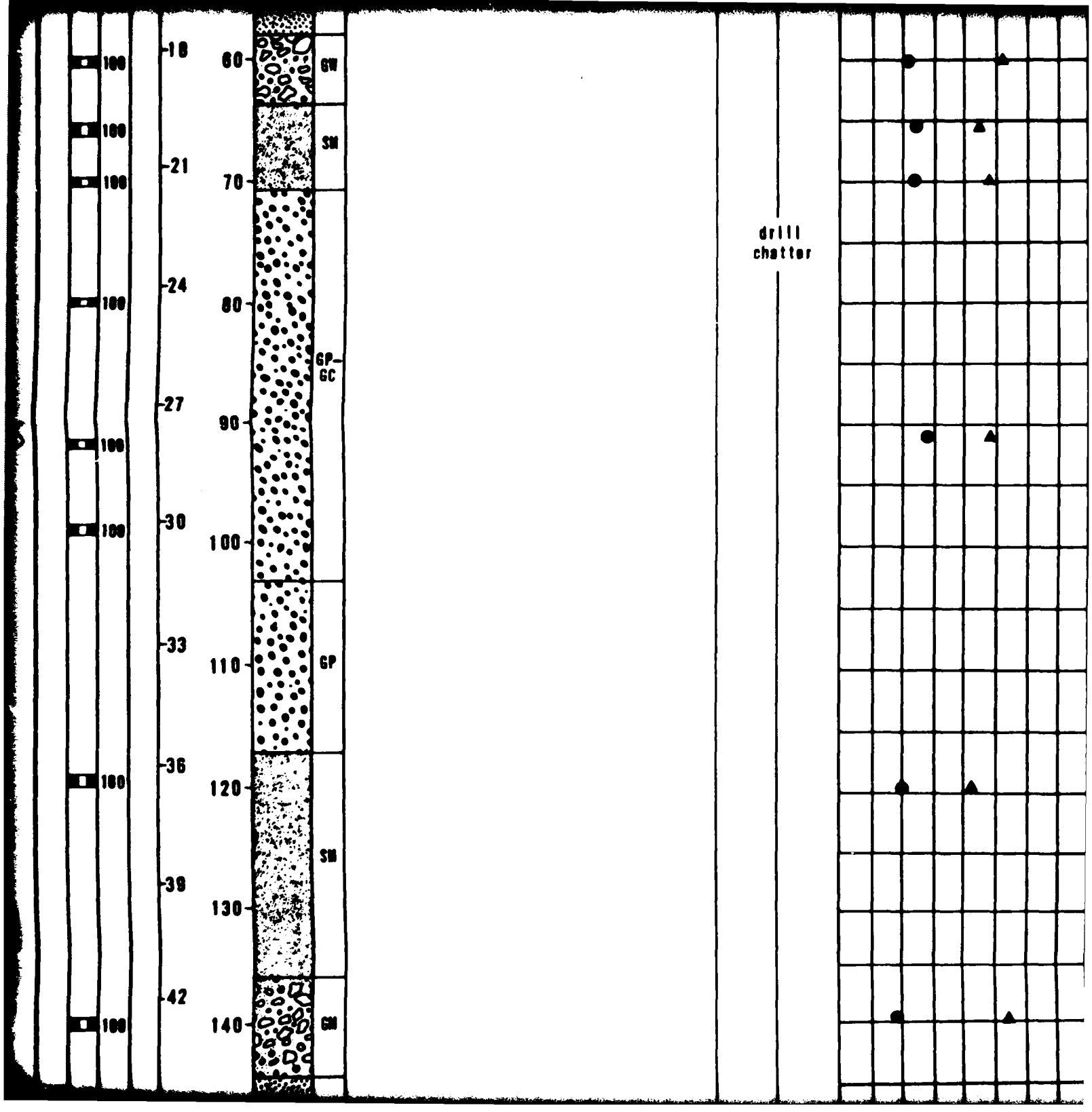
NE SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

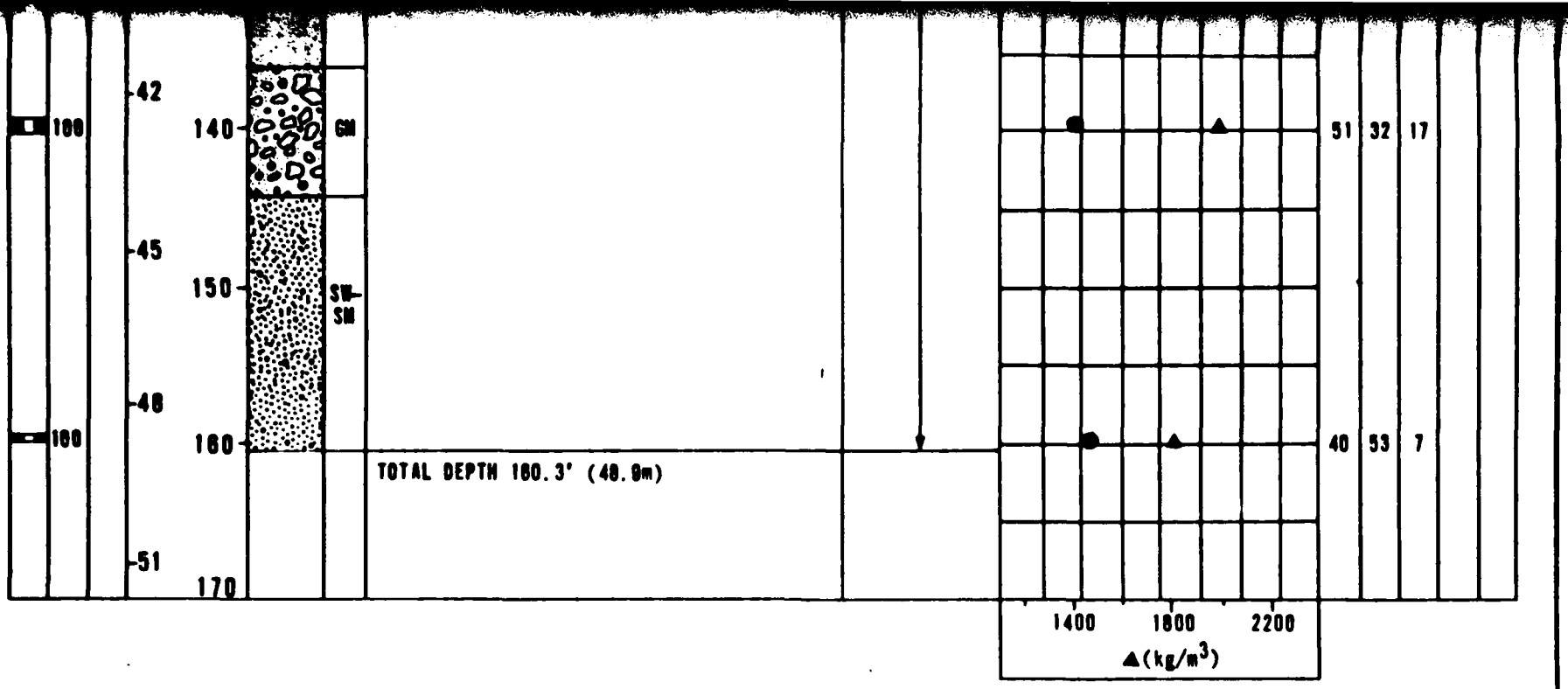
PLATE
B-6

APT-00

CHECKED BY _____ APPROVED BY _____




100
100
100
100
100
100
100
100
18
21
24
27
30
33
36
39
42
60
70
80
90
100
110
120
130
140
GW
SM
GP-GC
GP
SM
GM
drill chatter



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- ● - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION	: 5030' (1533m)
SURFICIAL GEOLOGIC UNIT	: A5i
DATE DRILLED	: 27-28 March 1979
DRILLING METHOD	: Rotary Wash
HOLE DIAMETER	: 4 7/8" (124mm)
WATER LEVEL	: Not Encountered

FUGRO NATIONAL, INC.

LOG OF BORING NR-S-6
VERIFICATION SITE
REVEILLE-RAILROAD VOR, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE SAMSO

FIGURE 8-7

AFW-80

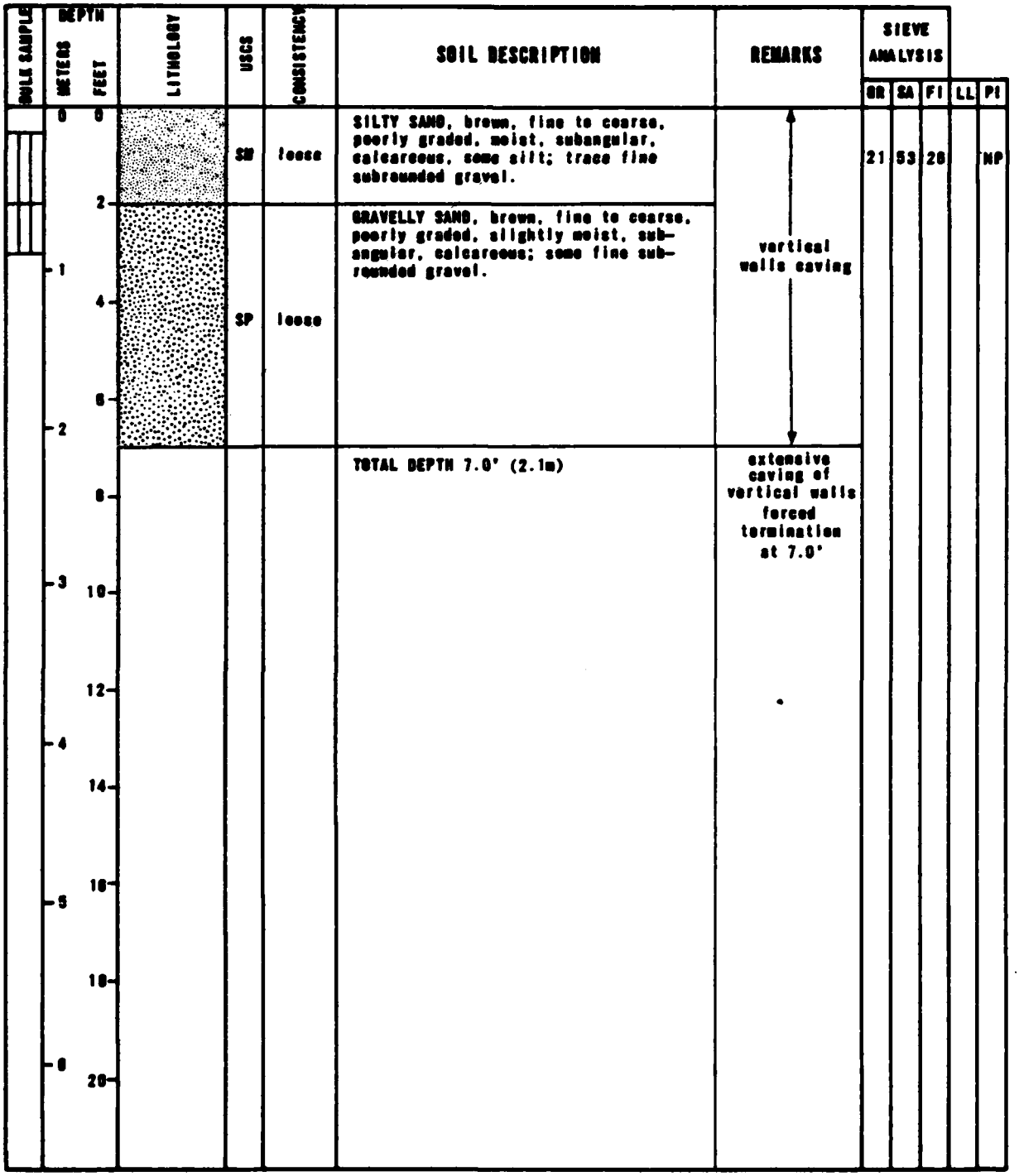
SECTION 7.0

TRENCH AND TEST PIT LOGS

EXPLANATIONS OF TRENCH AND TEST PIT LOGS

See Section 6.0, "Boring Logs", for explanations.

FN-TD-27-VII



BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	loose	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous, some silt; trace fine subrounded gravel.	vertical walls caving	21	53	26		NP
		2										
	1	4		SP	loose	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; some fine subrounded gravel.						
		6										
	2											
		8				TOTAL DEPTH 7.0' (2.1m)	extensive caving of vertical walls forced termination at 7.0'					
	3	10										
		12										
	4											
		14										
	5	16										
		18										
	6	20										

CHECKED BY _____ APPROVED BY _____

TRENCH DETAILS

SURFACE ELEVATION : 5000' (1524m)
DATE EXCAVATED : 22 MARCH 1979
SURFICIAL GEOLOGIC UNIT : A6y
TRENCH LENGTH : 12.0' (4m)
TRENCH ORIENTATION : E - W

LOG OF TRENCH RR-T-1
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

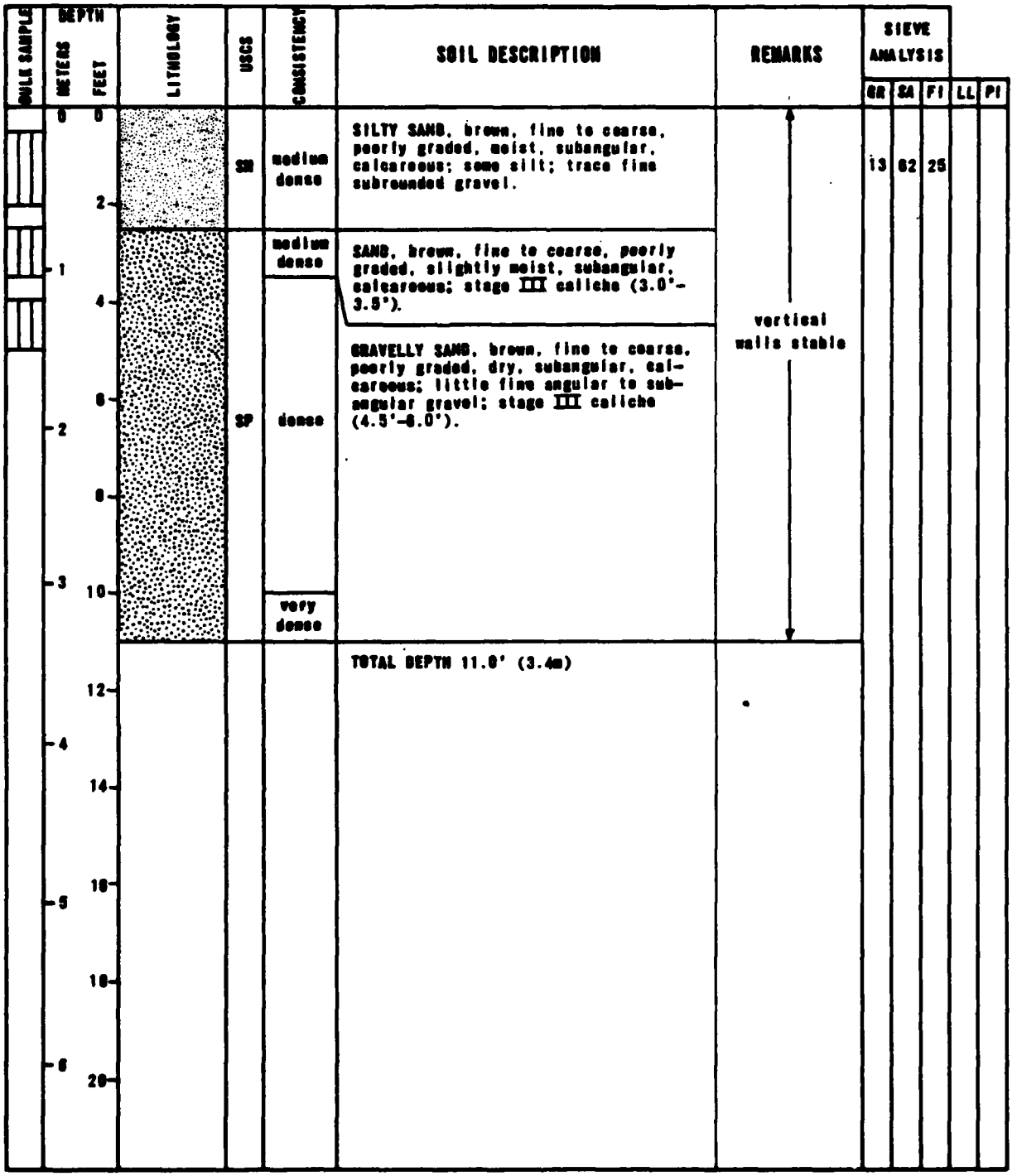
FIGURE 7-1

FUGRO NATIONAL, INC.

2 JUL 79

AFV-04

FW-TB-87-VII



TRENCH DETAILS

SURFACE ELEVATION : 5600' (1707m)
DATE EXCAVATED : 24 MARCH 1979
SURFICIAL GEOLOGIC UNIT : A5y
TRENCH LENGTH : 18.0' (5m)
TRENCH ORIENTATION : E - W

CHECKED BY _____ APPROVED BY _____

LOG OF TRENCH RR-T-2
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

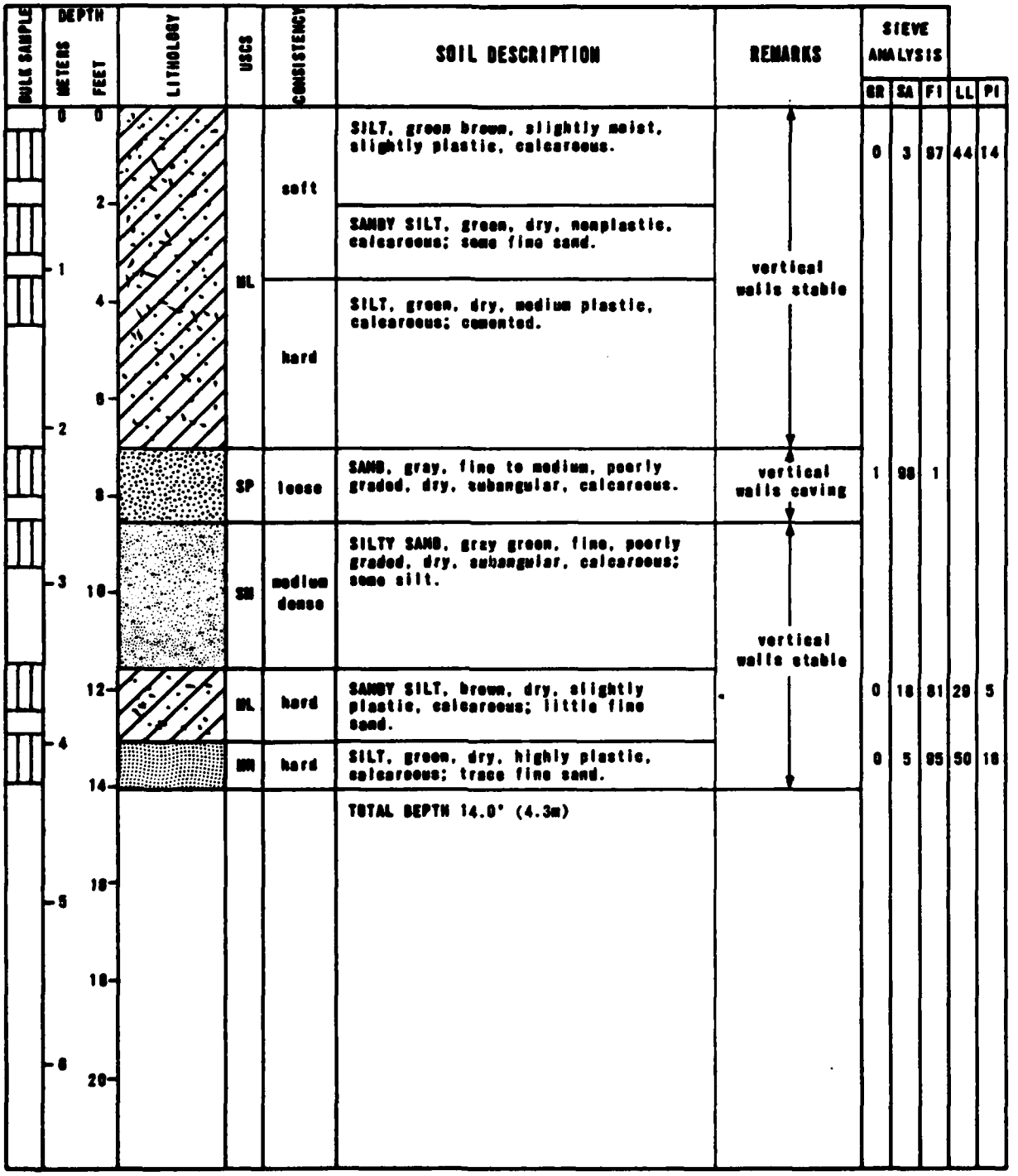
FIGURE 7-2

WOODWARD-CLYDE CONSULTANTS

2 JUL 79

AFV-84

FN-TR-27-VII



TRENCH DETAILS

SURFACE ELEVATION : 4855' (1480m)
DATE EXCAVATED : 28 MARCH 1979
SURFICIAL GEOLOGIC UNIT: A4e
TRENCH LENGTH : 16.0' (5m)
TRENCH ORIENTATION : N - S

LOG OF TRENCH RR-T-3
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-3

FUGRO NATIONAL, INC.

CHECKED BY _____ APPROVED BY _____

2 JUL 79

AFV-04

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		CL	stiff	SANDY CLAY, brown, moist, slightly plastic, calcareous; some fine sub-angular sand.	vertical walls stable	0	37	63	30	11
		2		SM	medium dense	SILTY SAND, light brown, fine, poorly graded, dry, subangular, calcareous; some silt						
	1	4		SP-SM	medium dense	SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, trace silt; trace fine subrounded gravel.		7	82	11		
	2	6										
		8		SP	loose	GRAVELLY SAND, gray, medium to coarse, poorly graded, dry, subangular, some fine subangular gravel.	vertical walls caving	31	67	2		
	3	10			loose	SAND, dark brown, fine to coarse, poorly graded, dry, subangular.						
		12			medium dense	GRAVELLY SAND, dark brown, medium to coarse, poorly graded, dry, subangular; some fine subangular gravel.	vertical walls stable					
	4	14				TOTAL DEPTH 14.0' (4.3m)						
	5	16										
		18										
	6	20										

CHECKED BY _____ APPROVED BY _____

TRENCH DETAILS

SURFACE ELEVATION : 4830' (1503m)
DATE EXCAVATED : 26 MARCH 1979
SURFICIAL GEOLOGIC UNIT : A4e
TRENCH LENGTH : 16.0' (5m)
TRENCH ORIENTATION : N - S

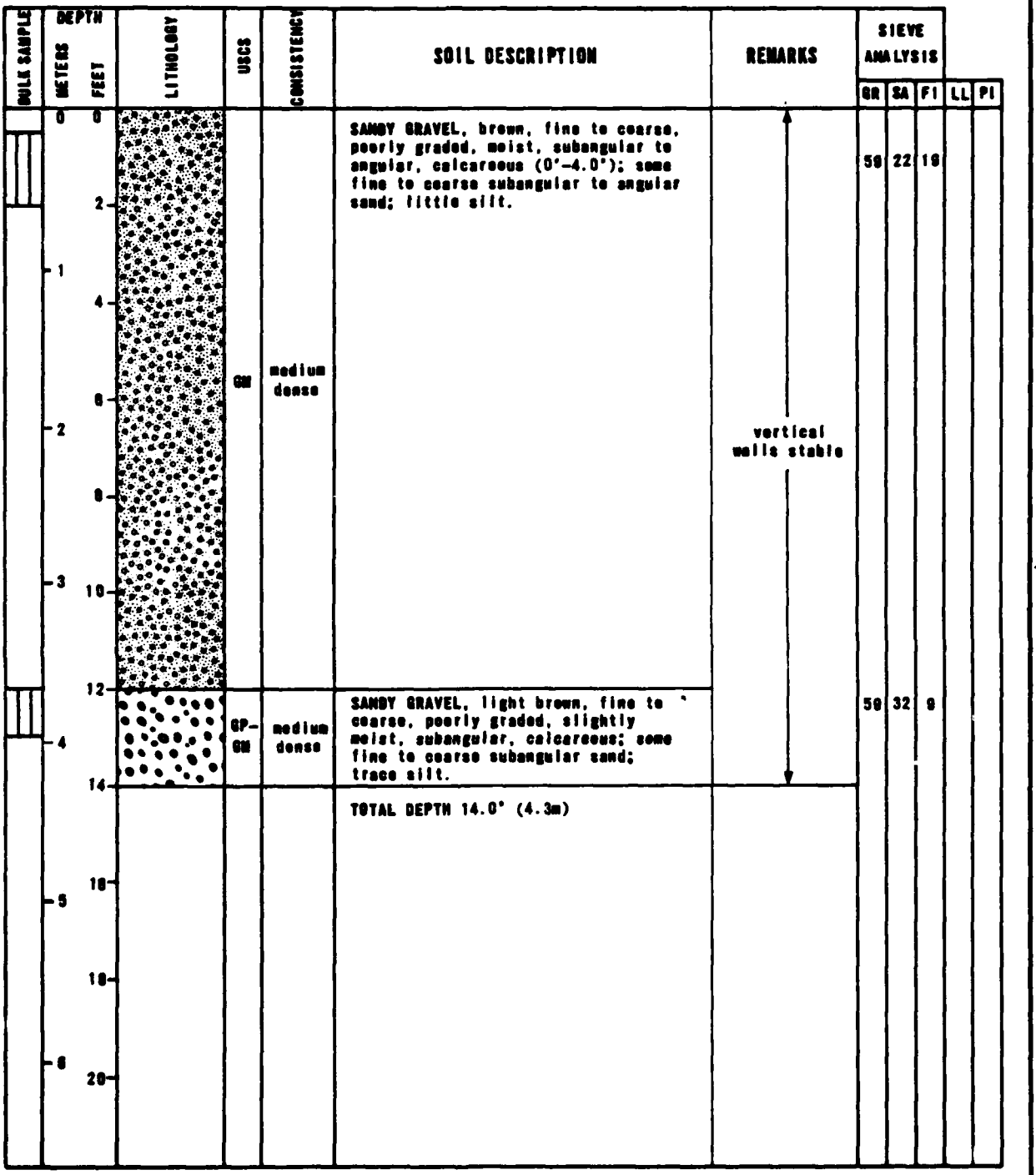
LOG OF TRENCH RR-T-4
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-4

FUGRO NATIONAL, INC.

FN-TR-27-VII



TRENCH DETAILS

SURFACE ELEVATION	: 5200' (1585m)
DATE EXCAVATED	: 27 March 1979
SURFICIAL GEOLOGIC UNIT	: A5y
TRENCH LENGTH	: 16.0' (5m)
TRENCH ORIENTATION	: E - W

LOG OF TRENCH RR-T-5
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-5

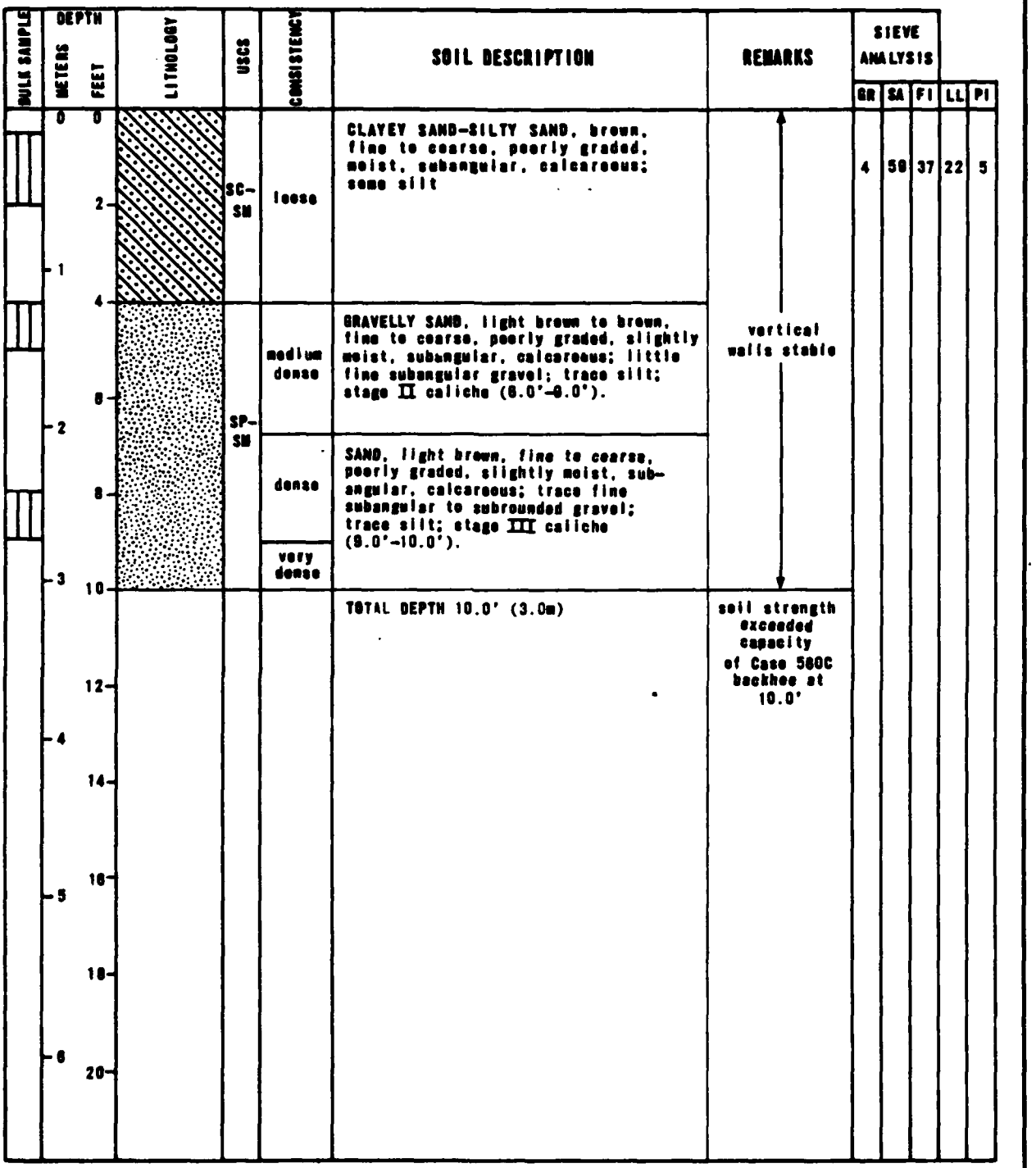
WOODWARD-CLYDE CONSULTANTS

CHECKED BY _____ APPROVED BY _____

2 JUL 79

APV-84

FN-7R-27-VII



TRENCH DETAILS

SURFACE ELEVATION	: 5160' (1573m)
DATE EXCAVATED	: 3 APRIL 1979
SURFICIAL GEOLOGIC UNIT	: Als
TRENCH LENGTH	: 16.0' (5m)
TRENCH ORIENTATION	: N - S

LOG OF TRENCH RR-T-6
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-6

USBR NATIONAL, INC.

CHECKED BY _____ APPROVED BY _____

2 JUL 79

AFV-04

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, well graded, slightly moist, subangular, calcareous; some slightly plastic silt; little fine subangular gravel.	vertical walls stable	11	64	25	42	18
		2										
	1	4		SP	medium dense	SAND, light brown, fine to coarse, poorly graded, dry, angular, calcareous; trace fine subangular to angular gravel; stage III caliche (5.0'-7.0').						
		6										
	2				dense							
		8										
					dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, dry, subangular, calcareous; little fine subangular gravel.						
	3	10				SAND, light brown, fine to coarse, poorly graded, dry, angular, calcareous, trace fine subangular to angular gravel.						
					dense							
		12				TOTAL DEPTH 12.0' (3.7m)						
	4	14										
	5	16										
		18										
	6	20										

CHECKED BY _____ APPROVED BY _____

TRENCH DETAILS

SURFACE ELEVATION : 5560' (1695m)
DATE EXCAVATED : 4 APRIL 1979
SURFICIAL GEOLOGIC UNIT : ASI
TRENCH LENGTH : 16.0' (5m)
TRENCH ORIENTATION : E - W

LOG OF TRENCH RR-T-7
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

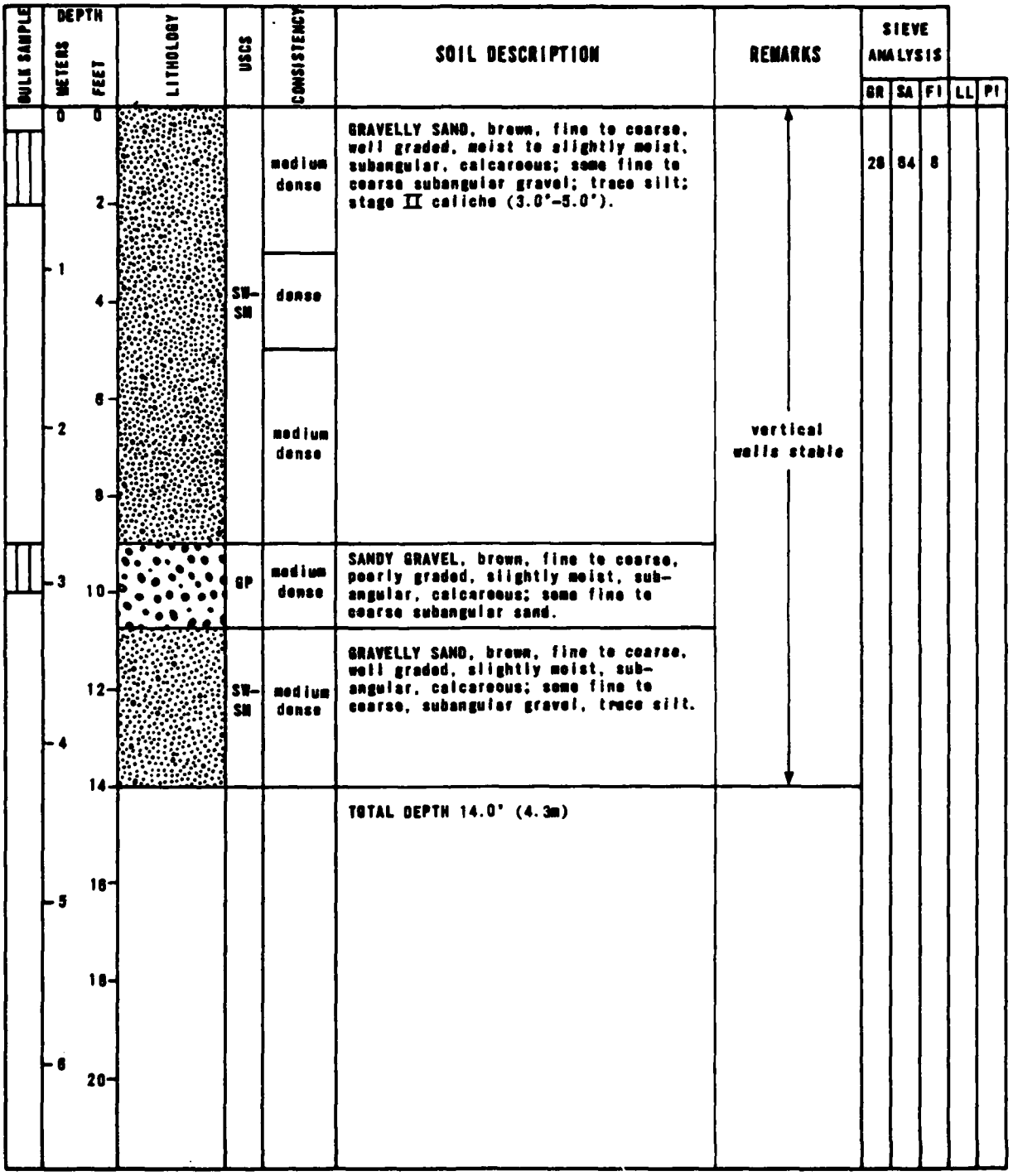
FIGURE 7-7

FUGRO NATIONAL, INC.

2 JUL 79

APV-84

FN-TR-27-VII



TRENCH DETAILS

SURFACE ELEVATION	: 3300' (1615m)
DATE EXCAVATED	: 5 APRIL 1979
SURFICIAL GEOLOGIC UNIT	: Als
TRENCH LENGTH	: 16.0' (5m)
TRENCH ORIENTATION	: NE - SW

LOG OF TRENCH RR-T-8
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-8

USRO NATIONAL, INC.

CHECKED BY _____ APPROVED BY _____

2 JUL 79

AFV-84

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; little fine to coarse subrounded gravel; little silt; occasional cobbles and boulders to 14" size.		19	65	16		
	1	1										
	2	2										
	3	3		CL	hard	SILTY CLAY, light brown, slightly moist, nonplastic, calcareous; trace fine subangular sand.						
	4	4										
	5	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5025'(1532m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-1

	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular; some silt; trace fine subangular gravel.						
	1	1										
	2	2		GP	dense	SANDY GRAVEL, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; some fine to coarse subangular sand; little silt; moderately cemented.						
	3	3										
	4	4										
	5	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5010'(1527m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-2

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-1 AND RR-P-2
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

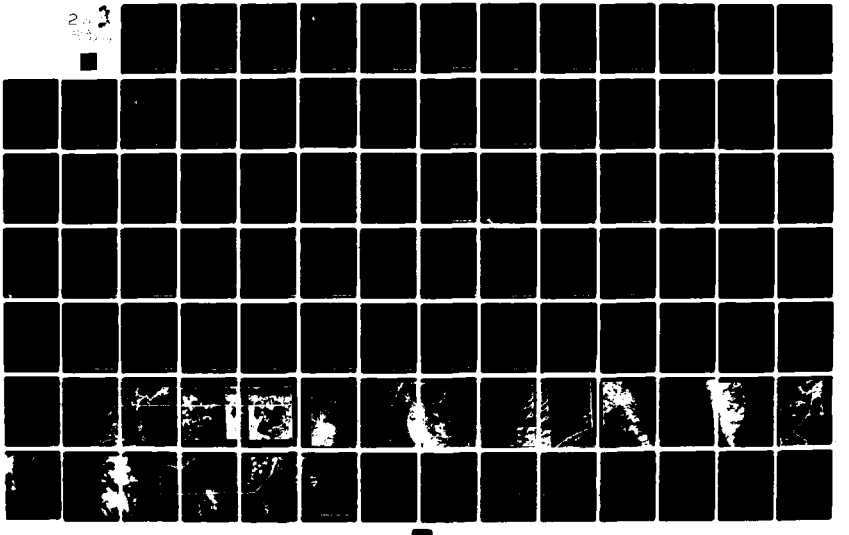
FIGURE 7-9

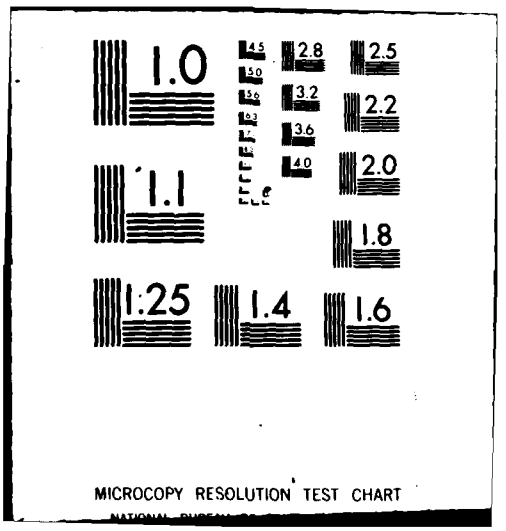
TERRA NATIONAL, INC.

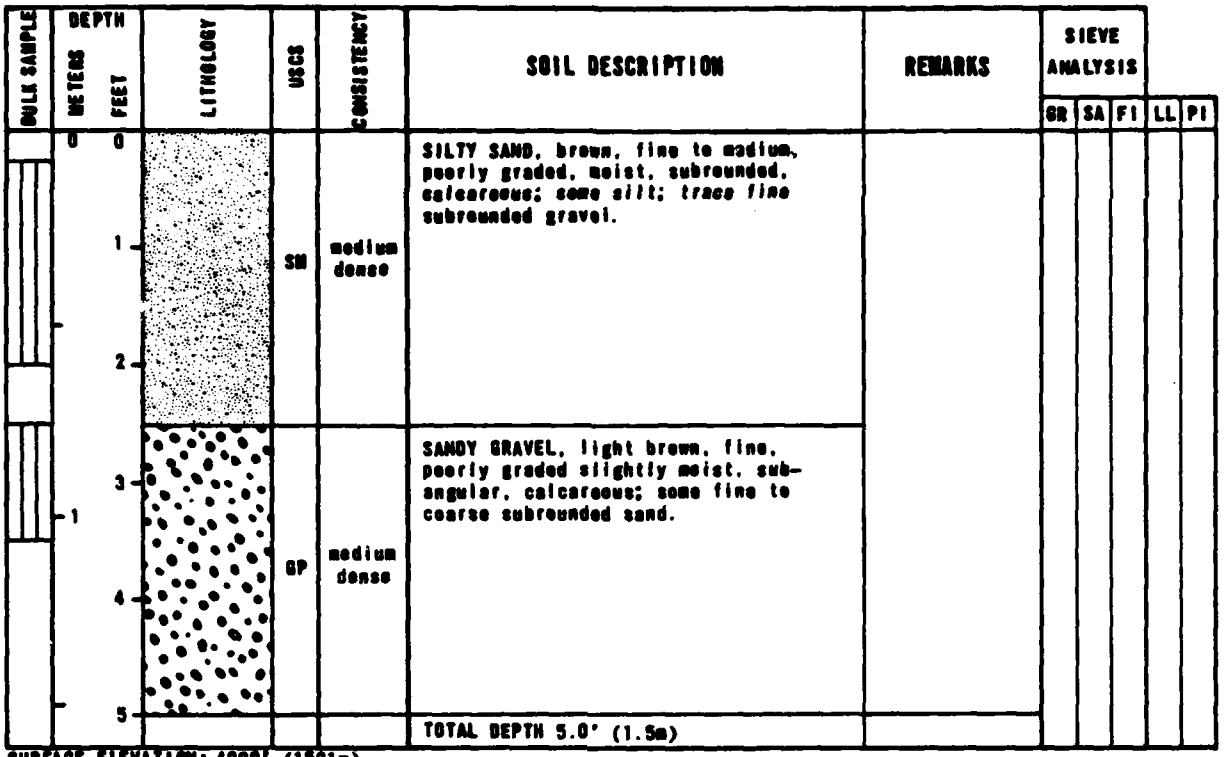
2 JUL 79

AFV-83

AD-A113 329 FUGRO NATIONAL INC LONG BEACH CA F/G 8/13
MX SITING INVESTIGATION. GEOTECHNICAL EVALUATION. VOLUME VII. N--ETC(U)
AUG 79 F04704-80-C-0006
UNCLASSIFIED FN-TR-27-7 NL

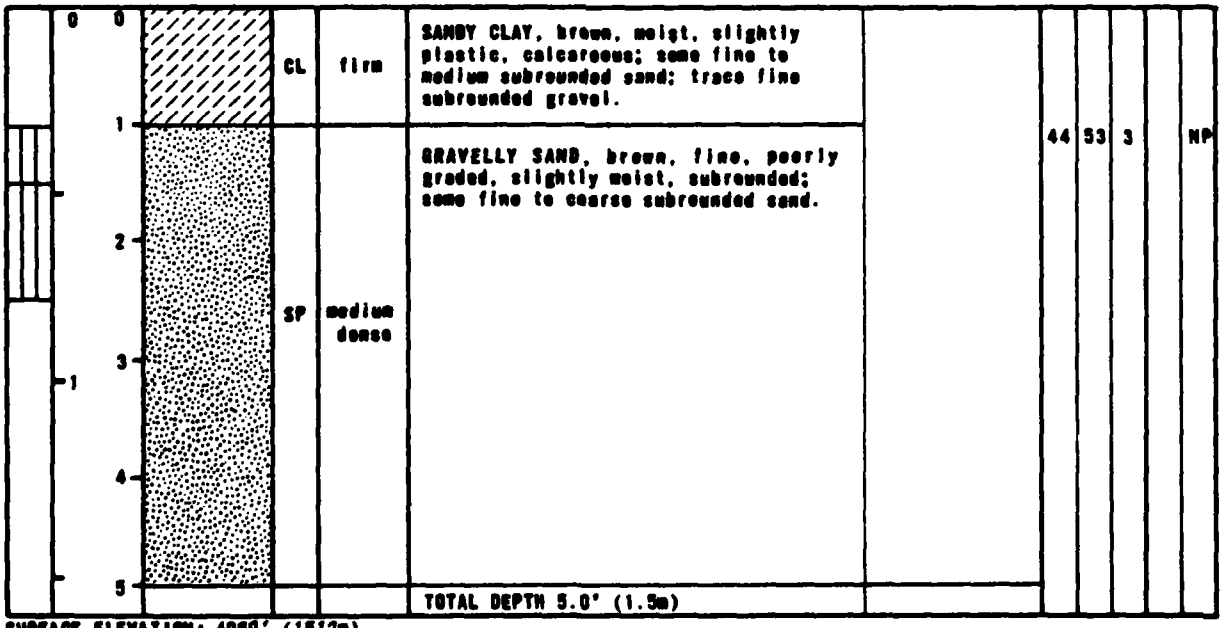



1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART



SURFACE ELEVATION: 4990' (1521m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-3



SURFACE ELEVATION: 4960' (1512m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-4

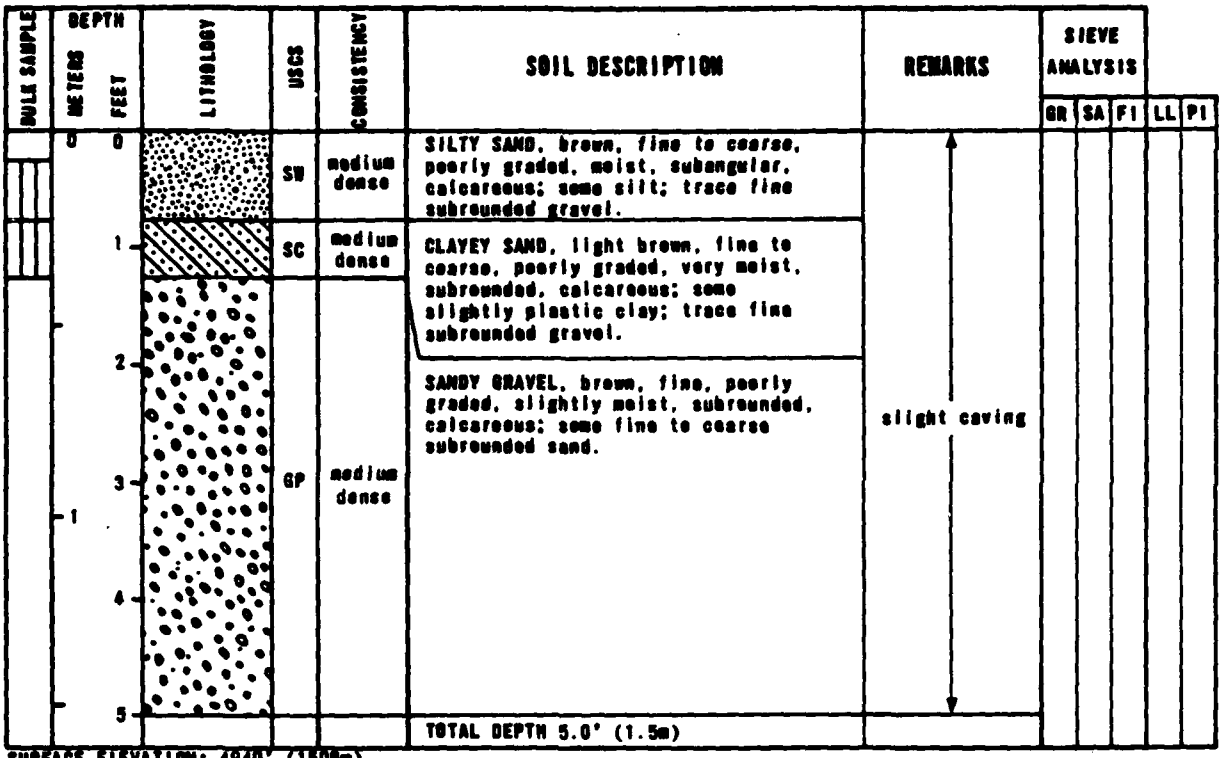
CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-3 AND RR-P-4
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

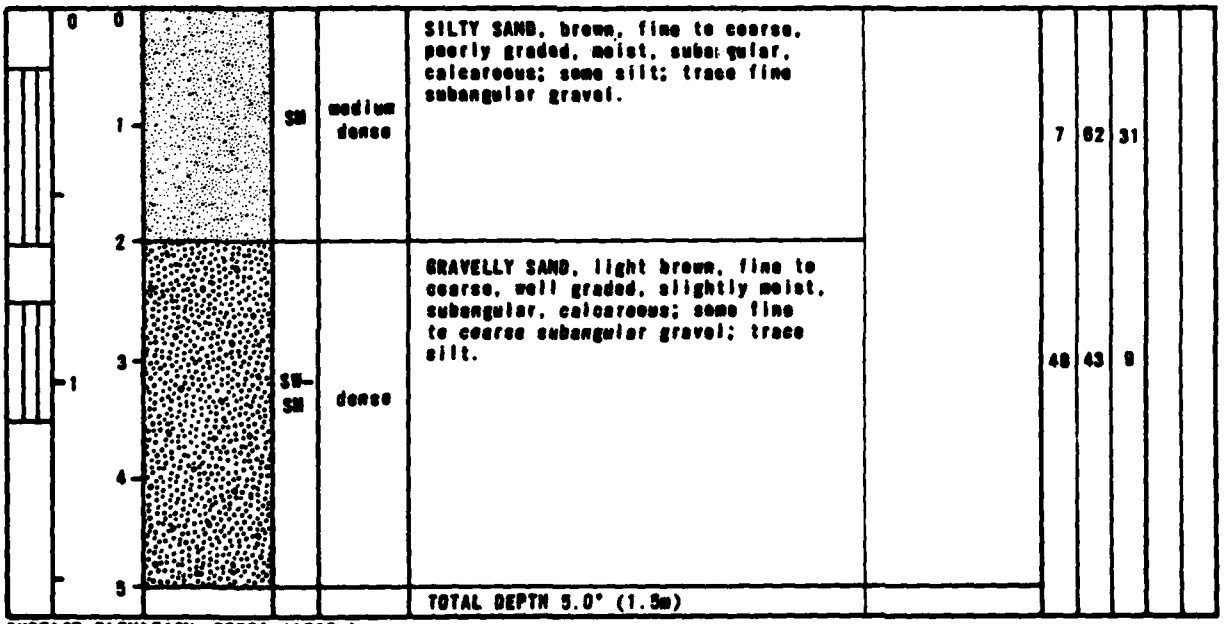
FIGURE 7-10

FW-TR-27-VII



SURFACE ELEVATION: 4940' (1506m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-5



SURFACE ELEVATION: 5050' (1539m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-6

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-5 AND RR-P-6
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-11

FUGRO NATIONAL, INC.

2 JUL 79

AFV-83

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to medium, poorly graded, moist, subangular, calcareous; some silt; trace fine subangular to subrounded gravel.						
		1										
		2										
		3		SW-SM	dense	GRAVELLY SAND, light brown, fine to coarse, well graded, slightly moist, subangular, calcareous; some fine to coarse subangular gravel; trace silt.						
	1	4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5040' (1536m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-7

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some silt; trace fine subangular gravel.		8	74	20		
		1										
		2										
		3										
	1	4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5155' (1571m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT RR-P-8

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-7 AND RR-P-8
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-12

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		GC	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, moist, sub-rounded to subangular, calcareous; some fine to coarse subrounded sand; little slightly plastic clay.		81	23	18	29	11
		1										
		2		GP-GM	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse subangular sand; trace silt; stage II caliche (2.0'-5.0').						
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5140' (1567m)
SURFICIAL GEOLOGIC UNIT: ASI

LOG OF TEST PIT RR-P-9

	0	0		SC-SM	medium dense	CLAYEY SAND-SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some slightly plastic clay; trace fine subangular gravel.		12	55	33	22	7
		1										
		2		GP	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse subangular sand; stage III caliche (1.5'-3.0').						
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5060' (1685m)
SURFICIAL GEOLOGIC UNIT: ASI

LOG OF TEST PIT RR-P-10

ENTERED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-9 AND RR-P-10
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

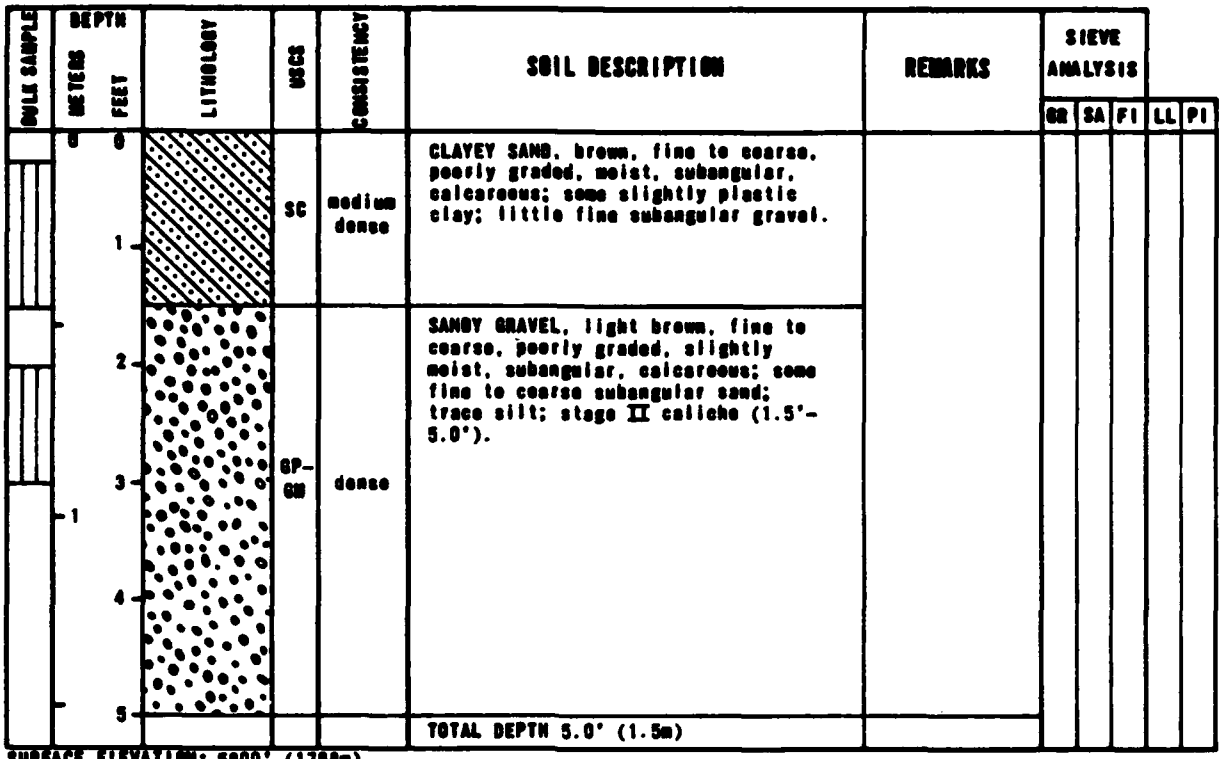
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-13

WOODWARD-CLYDE CONSULTANTS

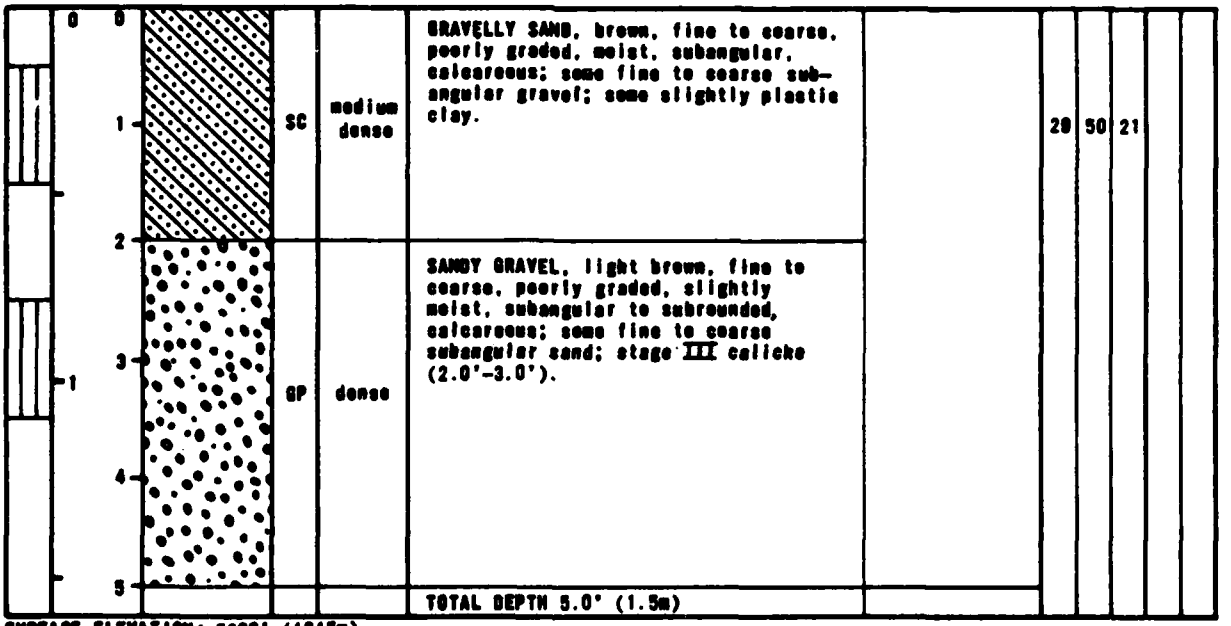
2 JUL 79

AFV-63



SURFACE ELEVATION: 5800' (1768m)
SURFICIAL GEOLOGIC UNIT: ASi

LOG OF TEST PIT RR-P-11



SURFACE ELEVATION: 5300' (1615m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-12

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-11 AND RR-P-12
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-14

WOODWARD-NATIONAL INC.

2 JUL 79

AFV-09

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SW-SM	medium dense	SAND, brown, fine to coarse, well graded, moist, subangular to subrounded, calcareous; little fine subrounded gravel; trace silt.		16	74	10		
	1	2										
				SP-SM	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine subangular gravel; trace silt; stage III caliche (3.0'-3.5').		24	69	7		
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5500' (1676m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-13

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SW-SM	medium dense	SAND, light brown, fine to coarse, well graded, slightly moist, subangular, calcareous; little fine subangular gravel; trace silt.		18	72	10		
	1	2					occasional cobbles to 8" size					
				GP	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular sand, stage I caliche (1.5'-2.5').						
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5280' (1609m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-14

CHECKED BY ___ APPROVED BY ___

LOGS OF TEST PITS RR-P-13 AND RR-P-14
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-15

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; little silt; trace fine subrounded gravel.						
	1	2										
	1	3		SP	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some fine subangular to subrounded gravel.						
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5000' (1524m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-15

	0	0		SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subrounded, calcareous; some fine subrounded gravel; some silt.		27	57	16		
	1	2										
	1	3		GP	medium dense	SANDY GRAVEL, light brown, fine, poorly graded, slightly moist, subrounded, calcareous; some fine to coarse subrounded sand.	slight caving					
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4990' (1521m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-16

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-15 AND RR-P-16
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-16

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SP-SM	loose	SAND, brown, fine to coarse, poorly graded, moist, subrounded, calcareous; trace silt; trace fine subrounded to rounded gravel.	slight caving					
		1										
		2										
		3										
	1											
		4		GP	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; some fine to coarse subrounded sand.						
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5020' (1530m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-17

	0	0		SM	loose	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some silt.		2	57	41		
		1										
		2										
		3		SP-SM	loose	SAND, light brown, fine to coarse, poorly graded, dry, subangular to angular, calcareous; little fine subangular gravel; trace silt, stage I caliche (3.0'-5.0').						
	1											
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4960' (1512m)
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT RR-P-18

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-17 AND RR-P-18
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-17

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0										
	1			SM	loose	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some silt; trace fine subangular gravel.	slight caving	5	66	29		
	2											
	3	1		SP	loose	SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded; trace fine subrounded gravel.						
	4											
	5					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5060' (1542m)
SURFICIAL GEOLOGIC UNIT: A2s

LOG OF TEST PIT RR-P-19

	0	0										
	1			SP-SM	loose	SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; trace silt; trace fine subangular to angular gravel.	slight caving					
	2											
	3	1										
	4											
	5					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5100' (1554m)
SURFICIAL GEOLOGIC UNIT: A2s

LOG OF TEST PIT RR-P-20

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-19 AND RR-P-20
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-18

WOODWARD-CLYDE CONSULTANTS

PB-TR-27-VII

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, dark brown, fine to coarse, poorly graded, moist, sub-angular, calcareous; some fine to coarse subangular gravel; trace silt; occasional cobbles to 10" size.		27	66	7		
		1		SP-SM	loose							
	1	2										
		3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5215' (1590m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-21

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; some fine to coarse subangular to angular gravel; stage III caliche (4.5'-5.0'); occasional cobbles to 8" size.						
		1										
		2		SP	medium dense							
	1	3										
		4										
		5			dense							
						TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A5T

LOG OF TEST PIT RR-P-22

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-21 AND RR-P-22
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-19

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, some silt.						
		1										
		2		SC	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some fine subangular gravel; little slightly plastic clay.						
	1	3		SP	medium dense	GRAVELLY SAND, brown to gray, fine to coarse, poorly graded, moist to slightly moist, subangular, calcareous (3.5'-4.0'); little fine subangular gravel; stage III caliche (3.5'-4.0').						
		4			dense							
					medium dense		slight caving					
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5240' (1597m)
SURFICIAL GEOLOGIC UNIT: Asy

LOG OF TEST PIT RR-P-23

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some slightly plastic clay; trace fine subangular gravel; stage III caliche (3.5'-5.0').		9	68	23	30	11
		1										
		2										
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5320' (1622m)
SURFICIAL GEOLOGIC UNIT: Asy

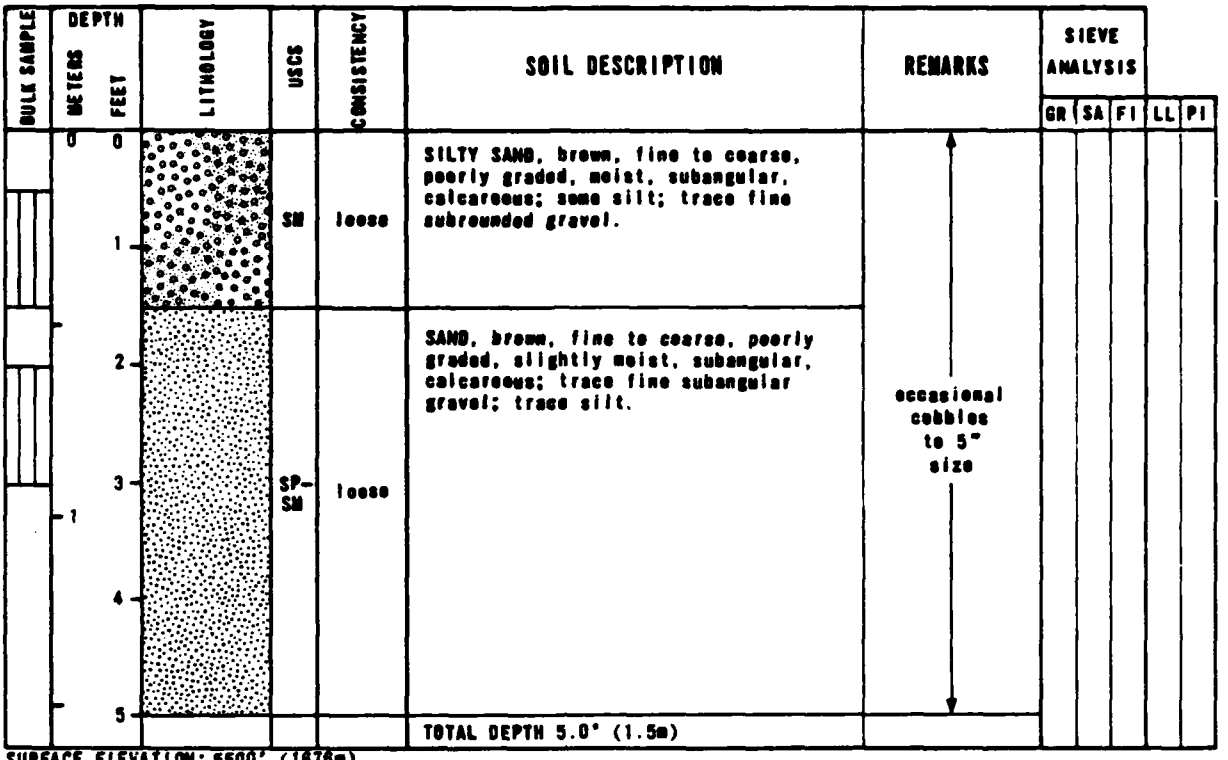
LOG OF TEST PIT RR-P-24

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-23 AND RR-P-24
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-20



BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	loose	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some silt; trace fine subrounded gravel.	occasional cobbles to 5" size					
		1										
		2		SP-SM	loose	SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; trace fine subangular gravel; trace silt.						
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5500' (1676m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-25

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some slightly plastic clay; trace fine subangular gravel.						
		1										
		2		SP-SM	medium dense	SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; trace fine subangular gravel; trace silt; stage III caliche (3.5'-5.0').						
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-26

APPROVED BY _____

CHECKED BY _____

LOGS OF TEST PITS RR-P-25 AND RR-P-26
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-21

USRO NATIONAL, INC.

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, angular, calcareous; some fine to coarse angular to subangular gravel; some silt.						
		1										
		2										
		3		GM	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, angular to subangular, calcareous; some fine to coarse angular sand, little silt; stage III caliche (4.5'-5.0').						
	1	4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT RR-P-27

	0	0		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, moist, subangular, calcareous; some slightly plastic clay; trace fine subangular gravel.						
		1										
		2										
		3		SP	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular; calcareous; some fine to coarse subangular gravel.						
	1	4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5580' (1701m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT RR-P-28

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-27 AND RR-P-28
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-22

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SC-SM	loose	CLAYEY SAND-SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular; some silt.		2	71	27	20	4
		1										
		2		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; some slightly plastic clay.						
	1	3		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular; some silt.						
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5480' (1670m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-29

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0		SM	loose	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; little silt; trace fine subangular gravel.		8	73	19		
		1										
		2										
	1	3										
		4		GP	medium dense	SANDY GRAVEL, light brown, fine, poorly graded, dry, subangular, calcareous; some fine to coarse, subangular sand, stage II caliche (4.5'-5.0').						
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5485' (1672m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-30

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-29 AND RR-P-30
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-23

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
		0		GM	medium dense	SANDY GRAVEL, brown, fine, poorly graded, slightly moist, subangular, calcareous; some fine to coarse subangular sand; little silt.						
		1		GC	dense	SANDY GRAVEL, red brown, fine, poorly graded, slightly moist, subangular, calcareous; some fine to coarse subangular sand; little slightly plastic clay; stage IV caliche (3.25'-3.5').						
	1	3			very dense	TOTAL DEPTH 3.5' (1.1m)	cementation exceeded capacity of Case 580C backhoe at 3.5'					
		4										
		5										

SURFACE ELEVATION: 5520' (1682m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT RR-P-31

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
		0		SP-SM	loose	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous, some fine subangular gravel; trace silt.						
	1	3										
		4		SP	medium dense	SANDY GRAVEL, gray brown, fine, poorly graded, dry, subangular, calcareous; some fine to coarse subangular sand.						
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-32

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-31 AND RR-P-32
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

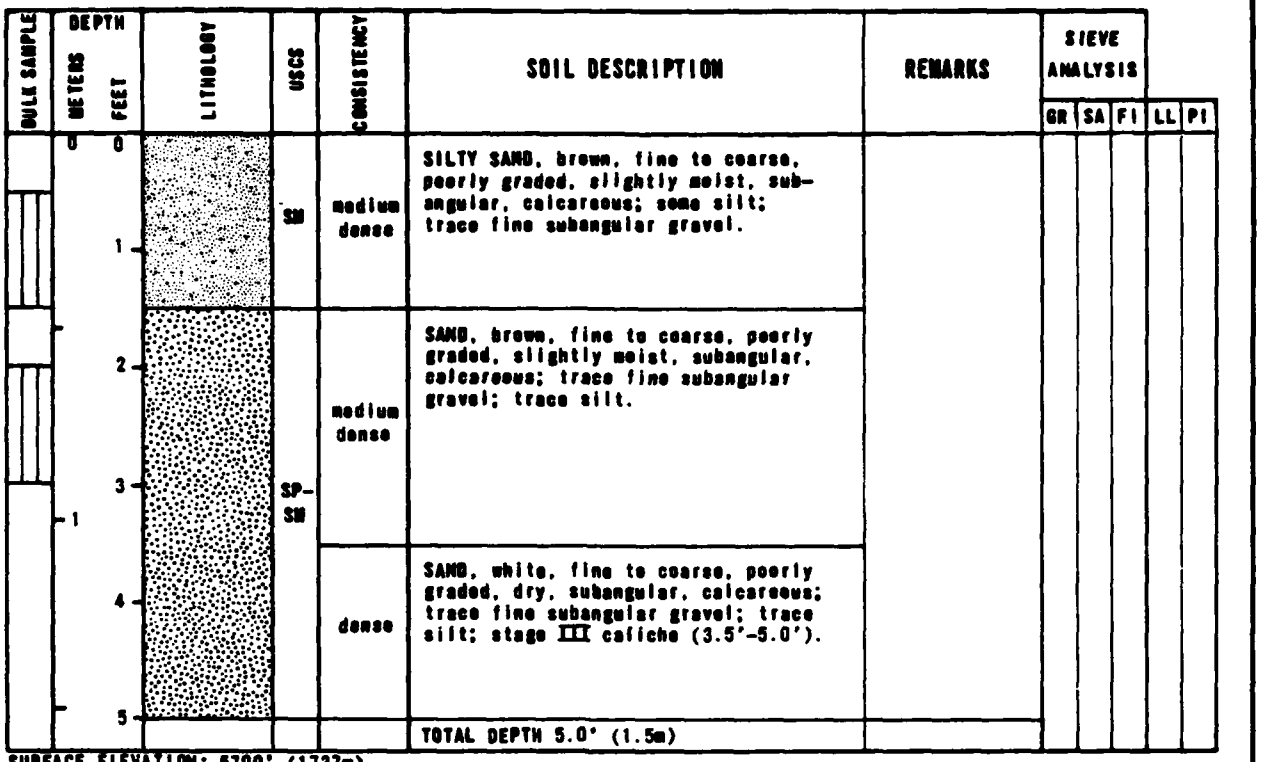
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-24

FUGRO NATIONAL, INC.

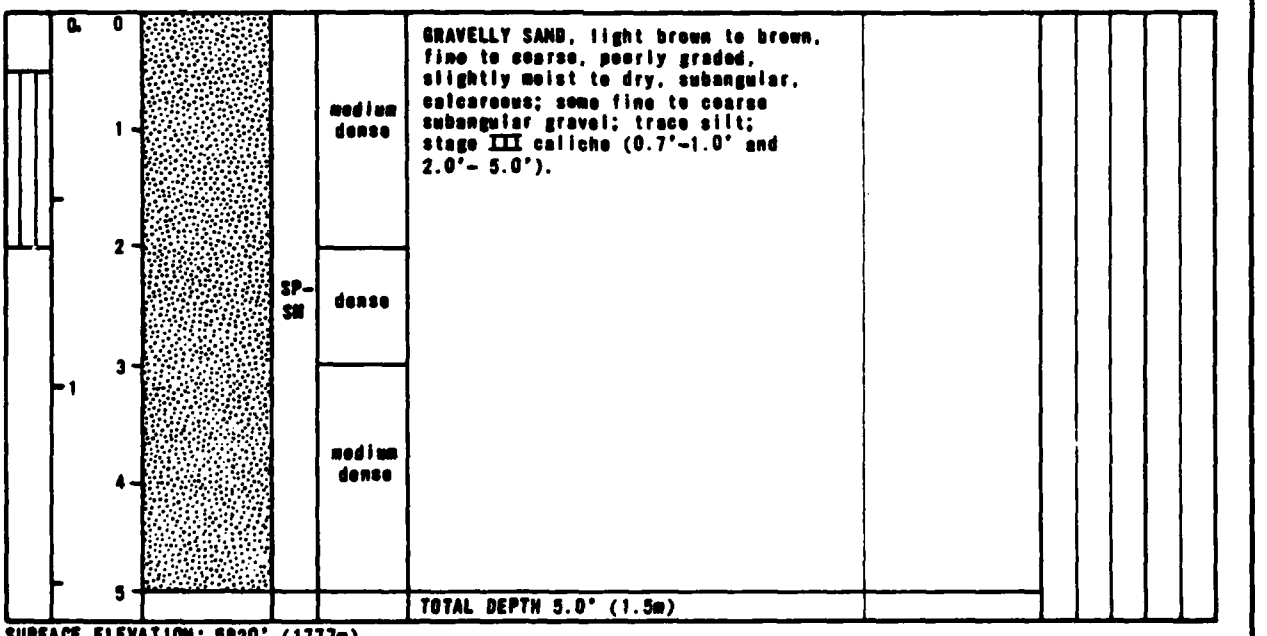
2 JUL 79

AFV-03



SURFACE ELEVATION: 5700' (1737m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT RR-P-33



SURFACE ELEVATION: 5830' (1777m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT RR-P-34

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-33 AND RR-P-34
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-25

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-angular, calcareous; some fine to coarse subangular gravel; stage II caliche (1.0'-2.0'); occasional cobbles to 8" size.						
		1										
		2		SP	medium dense							
	1	3										
		4										
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 6040' (1841m)
SURFICIAL GEOLOGIC UNIT: ASi

LOG OF TEST PIT RR-P-35

BULK SAMPLE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS GR	SA	FI	LL	PI
	0	0				SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-angular, calcareous; little silt; trace fine subangular gravel.						
		1										
		2		SM	loose							
		3										
	1					GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-angular, calcareous; some fine sub-angular gravel.						
		4		SP	loose							
		5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5500' (1676m)
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT RR-P-36

CHECKED BY _____ APPROVED BY _____

LOGS OF TEST PITS RR-P-35 AND RR-P-36
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 7-26

FUGRO NATIONAL, INC.

SECTION 8.0

SURFICIAL SAMPLE LOGS

EXPLANATIONS OF SURFICIAL SAMPLE LOGS

Finalized logs of the surficial samples are presented in this section. The explanations provided here are to serve as general guidelines to reading the logs.

A. Designations - Surficial samples are identified as follows:

SE-CS-1

SE - abbreviation for the site (e.g., SE - Snake East)
CS - abbreviation for surficial sample
1 - number of activity

B. Ground Surface Elevation - Indicated elevations on the logs are estimated from topographic maps of the study area within an accuracy of half the contour interval.

C. Surficial Geologic Unit - Indicates the surficial geologic unit in which the activity is located.

D. Depth - Indicates depth interval for which soil description is given.

E. USCS - Unified Soil Classification Symbol; see Table 6-1 of Section 6.0, "Boring Logs", for details of USCS.

F. Soil Description - Soil is described based on field visual descriptions and/or laboratory test results. See Section 6.0, "Boring Logs", for procedures of soil description.

G. Sieve Analysis, LL and PI - These are from results of laboratory tests. See Section 6.0, "Boring Logs", for explanation.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
RR-CS-5	4970 (1515)	A5y	0.0-1.25 (0.0-0.4)	SM	SILTY SAND, brown, fine to medium, poorly graded, subangular, calcareous; some silt; trace fine gravel.					
			1.25-2.0 (0.4-0.8)	GP	SANDY GRAVEL, light brown, fine, poorly graded, subrounded, calcareous; some fine to coarse sand.					
RR-CS-7	4985 (1519)	A5y	0.0-2.0 (0.0-0.8)	SM	SILTY SAND, brown, fine to medium, poorly graded, subangular, calcareous; some silt; trace fine gravel.					
RR-CS-8	4950 (1508)	A5y	0.0-1.5 (0.0-0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; some silt; trace fine to coarse gravel.	8	62	30		
			1.5-2.0 (0.5-0.8)	GP	SANDY GRAVEL, light brown, fine to coarse, poorly graded, subrounded, calcareous; some fine to coarse sand.	54	43	3		
RR-CS-10	4930 (1503)	A4e/A5y	0.0-2.0 (0.0-0.8)	CL-ML	SANDY CLAY-SANDY SILT, light brown, slightly plastic, calcareous; some fine to medium sand.	1	37	62	24	5
RR-CS-11	4940 (1506)	A5y	0.0-2.0 (0.0-0.8)	SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; some fine to coarse gravel; some silt.	25	53	22	20	3
RR-CS-13	5050 (1539)	A5y	0.0-2.0 (0.0-0.8)	SM	SILTY SAND, brown to light brown, fine to medium, poorly graded, subangular, calcareous; some silt.					
RR-CS-15	5030 (1533)	A5i	0.0-2.0 (0.0-0.8)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; little silt; trace fine gravel.	20	62	18		NP
RR-CS-17	5500 (1676)	A5i	0.0-1.75 (0.0-0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some silt; little fine gravel.					
			1.75-2.0 (0.5-0.8)	GP-GM	SANDY GRAVEL, white to light brown, fine to coarse, poorly graded, subangular, calcareous; some fine to coarse sand; trace silt; stage III caliche.					
RR-CS-18	5100 (1554)	A5y	0.0-2.0 (0.0-0.8)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some silt; trace fine gravel.					
RR-CS-20	5900 (1798)	A5i	0.0-2.0 (0.0-0.8)	CL	SANDY CLAY, brown, slightly plastic, calcareous; some fine to coarse sand, little fine gravel; stage III caliche (1.9'-2.0').					

LOGS OF SURFICIAL SOIL SAMPLES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 8-1
1 OF 5

FUGRO NATIONAL, INC.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
RR-CS-25	5005 (1526)	A5y	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; some silt; trace fine gravel.					
RR-CS-27	4975 (1516)	A5y	0.0-1.75 (0.0-0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; some slightly plastic silt; trace fine gravel.					
			1.75-2.0 (0.5-0.6)	SP	GRAVELLY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; some fine gravel.					
RR-CS-28	4965 (1513)	A5y	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; some silt; trace fine gravel.					
RR-CS-29	4950 (1508)	A3/A5y	0.0-2.0 (0.0-0.6)	SM	SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; little silt.	2	84	14		
RR-CS-30	4963 (1513)	A3/A5y	0.0-0.75 (0.0-0.2)	CL	SANDY CLAY, brown, slightly plastic, calcareous; some fine to medium sand.					
			0.75-2.0 (0.2-0.6)	SP-SM	SAND, light brown, fine to coarse, poorly graded, subrounded; trace silt; trace fine gravel.					
RR-CS-32	5120 (1560)	A5y	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; some silt; trace fine gravel.					
RR-CS-34	5380 (1640)	A5y/A5i	0.0-2.0 (0.0-0.6)	SW-SM	SAND, brown, fine to coarse, well graded, subangular, calcareous; trace silt; little fine gravel.	11	83	6		
RR-CS-37	5010 (1527)	A5i	0.0-1.5 (0.0-0.5)	SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; little fine gravel; little silt.					
			1.5-2.0 (0.5-0.6)	GP	SANDY GRAVEL, light brown, fine, poorly graded, subrounded, calcareous; little fine to coarse sand.					
RR-CS-38	5010 (1527)	A5y	0.0-1.5 (0.0-0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some silt; trace fine gravel.					
			1.5-2.0 (0.5-0.6)	SP-SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; trace fine gravel; trace silt.					

LOGS OF SURFICIAL SOIL SAMPLES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 6-1 2 OF 5

FUGRO NATIONAL, INC.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
RR-CS-38	5000 (1524)	A5y	0.0–2.0 (0.0–0.6)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some silt; trace fine gravel.	7	67	26		
RR-CS-41	4960 (1512)	A5y	0.0–2.0 (0.0–0.6)	SM	SILTY SAND, brown, fine to medium, poorly graded, subangular to subrounded, calcareous; little silt; trace fine gravel.					
RR-CS-42	4940 (1506)	A5y	0.0–2.0 (0.0–0.6)	SP-SM	SAND, brown, fine to medium, poorly graded, subangular; trace silt.					
RR-CS-44	4890 (1490)	A5y	0.0–1.0 (0.0–0.3)	SC	CLAYEY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.					
			1.0–2.0 (0.3–0.6)	SP-SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular; some fine gravel; trace silt.					
RR-CS-45	4900 (1494)	A5y	0.0–1.0 (0.0–0.3)	SC-SM	CLAYEY SAND-SILTY SAND, brown, fine to coarse, poorly graded, subangular; some slightly plastic silt and clay.	0	50	50	25	5
			1.0–2.0 (0.3–0.6)	SM	SILTY SAND, white, fine, poorly graded, subangular, calcareous; some silt; stage III caliche.					
RR-CS-47	5060 (1542)	A5y	0.0–1.5 (0.0–0.5)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; little silt; trace gravel.					
			1.5–2.9 (0.5–0.8)	SP	SANDY GRAVEL, white, fine, poorly graded, subangular, some fine to coarse sand.					
RR-CS-48	5060 (1542)	A1	0.0–0.75 (0.0–0.2)	SM	SILTY SAND, dark brown, fine to coarse, poorly graded, subangular, calcareous; little silt; trace fine gravel.					
			0.75–2.0 (0.2–0.6)	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular; little slightly plastic clay; trace fine gravel.					
RR-CS-51	5120 (1561)	A5y	0.0–2.0 (0.0–0.6)	SP-SM	SAND, dark brown, fine to coarse, poorly graded, subangular, calcareous; trace fine gravel; trace silt.					
RR-CS-53	5355 (1632)	A5i	0.0–2.0 (0.0–0.6)	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.	7	58	35		

LOGS OF SURFICIAL SOIL SAMPLES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE B-1
3 OF 5

USRO NATIONAL, INC.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
RR-CS-57	5580 (1701)	A2	0.0-1.0 (0.0-0.3)	SC	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; little fine gravel; little slightly plastic clay.					
			1.0-2.0 (0.3-0.6)	GP	SANDY GRAVEL, brown, fine, poorly graded, subangular, calcareous; some fine to coarse sand.					
RR-CS-58	5640 (1719)	A5y	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, little silt; trace fine gravel.					
RR-CS-61	5730 (1747)	A5i	0.0-1.5 (0.0-0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; little silt; little fine gravel.					
			1.5-2.0 (0.5-0.6)	SC	CLAYEY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.					
RR-CS-63	5920 (1804)	A5i	0.0-2.0 (0.0-0.6)	SC	CLAYEY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel; stage I caliche (1.0'-2.0').					
RR-CS-65	5600 (1707)	A2	0.0-2.0 (0.0-0.6)	CL	SANDY CLAY, light brown, medium plastic, calcareous; some fine to coarse sand; stage I caliche (0.25'-1.0'); stage II caliche (1.0'-2.0').					
RR-CS-67	5585 (1696)	A5i	0.0-2.0 (0.0-0.6)	SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some fine gravel; little silt.					
RR-CS-69	5510 (1679)	A5i	0.0-2.0 (0.0-0.6)	SP-SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; little fine gravel; trace silt.					
RR-CS-71	5480 (1670)	A5y	0.0-2.0 (0.0-0.6)	SP	SAND, brown, fine to coarse, poorly graded, subangular, calcareous; trace fine gravel.					
RR-CS-73	5520 (1682)	A5y	0.0-2.0 (0.0-0.6)	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.					
RR-CS-79	5425 (1654)	A5y	0.0-2.0 (0.0-0.6)	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.					
RR-CS-80	5415 (1650)	A5i	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, brown, fine to coarse poorly graded, subangular, calcareous; little silt; trace fine gravel.					

LOGS OF SURFICIAL SOIL SAMPLES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 8-1
4 OF 5

FUGRO NATIONAL, INC.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
RR-CS-82	5280 (1609)	ASy	0.0-2.0 (0.0-0.6)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; little silt; trace fine gravel.					

LOGS OF SURFICIAL SOIL SAMPLES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE B-1
3 OF 3

FUGRO NATIONAL, INC.

SECTION 9.0

LABORATORY TEST RESULTS

EXPLANATIONS OF LABORATORY TEST RESULTS

Laboratory test results are presented in this section. Table 9-1 contains a summary of laboratory test results. This table contains results of sieve analysis; plasticity data; in-situ dry unit weight, moisture content, degree of saturation, and void ratio for drive and Pitcher samples; results of compaction tests; and specific gravity of solids. Other tests such as triaxial compression, unconfined compression, direct shear, consolidation, chemical, and California Bearing Ratio (CBR) are indicated on the table. Tables 9-2 through 9-6 and Figures 9-1 through 9-3 present results of triaxial compression, unconfined compression, direct shear, consolidation, chemical, and CBR tests.

All tests were performed in general accordance with the American Society for Testing and Materials (ASTM) procedures. The following table presents the ASTM designations for the tests performed during the investigation.

Type of Test	ASTM Designations
Particle Size Analysis	D 422-63
Liquid Limit	D 423-66
Plastic Limit	D 424-59
Unit Weight	D 2937-71
Moisture Content	D 2216-71
Compaction	D 1557-70
Specific Gravity of Solids	D 854-58
Triaxial	D 2850-70
Unconfined Compression	D 2166-66
Direct Shear	D 3080-72
Consolidation	D 2435-70
Test for Alkalinity (pH)	D 1067-70
Water Soluble Sodium	D 1428-64
Water Soluble Chloride	D 512-67
Water Soluble Sulphate	D 516-68
Water Soluble Calcium	D 511-72
Calcium Carbonate	D 1126-67
California Bearing Ratio (CBR)	D 1883-73

Explanation for the tables and figures presented in this section are as follows.

A. Activity Number - Boring, trench, test pit, or surficial sample designation.

B. Sample Number - Prefix indicates the type of sample; explanation is at the bottom of the table.

C. Sample Interval - This is the depth range measured from ground surface over which the sample was obtained.

D. Percent Finer by Weight - Presents the results of laboratory particle size analysis (ASTM D 422-63) performed on representative soil samples at the depth indicated. The numbers represent the percent (by dry weight) of the total sample weight passing through each sieve size indicated.

E. Atterberg Limits (ASTM D 423-66 and D 424-59)

LL - Liquid Limit, the water content (as percent of soil dry weight) corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).

PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).

PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.

NP - Nonplastic.

F. USCS - Unified Soil Classification Symbols are given here; see Table 6.1 in Section 6.0, "Boring Logs", for complete details of USCS system.

G. In Situ - Presents results of tests on drive and Pitcher samples.

Dry Unit Weight - indicates dry unit weight of soil determined as per ASTM D 2937-71

Moisture Content - weight of water reported in percent of dry weight of soil sample (ASTM D 2216-71)

Saturation - the degree of saturation in a soil sample is defined as the ratio (in percent) of the volume of water to the volume of all voids in the soil

Void Ratio - the numerical ratio of the volume of voids to the volume of solids in a soil specimen

H. Compacted - Indicates results of laboratory maximum dry density and optimum moisture content test as per ASTM D 1557-70.

I. Specific Gravity of Solids (ASTM D 854-58) - Indicates the ratio of (1) the weight in air of a given volume of soil solids at a stated temperature, to (2) the weight in air of an equal volume of distilled water at a stated temperature.

J. Triaxial - The triaxial compression tests were performed in accordance with the procedures of ASTM D 2850-70. The following explanations and definitions apply.

Triaxial Compression Test - a cylindrical specimen of soil is surrounded by a fluid in a pressure chamber and subjected to an isotropic pressure. An additional compressive load is then applied, directed along the axis of the specimen called the axial load.

Consolidated-Drained (CD) Test - a triaxial compression test in which the soil was first consolidated under an all-around confining stress (test chamber pressure), and was then compressed (and hence sheared) by increasing the

vertical stress. Drained indicates that excess pore water pressure generated by strains are permitted to dissipate by the free movement of pore water during consolidation and compression.

Consolidated-Undrained (CU) Test - a triaxial compression test in which essentially complete consolidation under the confining (chamber) pressure is followed by a shear test at constant water content.

Confining Pressure (σ_3) - the isotropic chamber pressure applied to the soil specimen during consolidation and compression.

Maximum Deviator Stress ($\sigma_1-\sigma_3$) - the difference between the major and minor principal stresses in the specimen at failure. The major principal stress on the specimen is equal to the unit axial load plus the chamber pressure and the minor principal stress on the specimen is equal to the chamber pressure.

Strain Rate - axial strain, ε, at a given stress level is defined as the ratio of the change in length (ΔL) of the specimen to the original length of the specimen (L_o). The rate of strain was controlled during the test so that this ratio increased at equal increments for each minute of testing.

Back Pressure - pressure in excess of atmospheric applied to the pore water of a soil sample. Back pressure is usually applied to (1) increase saturation of the sample, or (2) simulate the actual in-situ pressure regime.

K. Unconfined Compression - Test procedures were as described in ASTM D 2166-66. Unconfined compressive strength is defined as the load per unit area at which an unconfined prismatic or cylindrical specimen of soil will fail in a simple compression test. In these methods, unconfined compressive strength is taken as the maximum load attained per unit area or the load per unit area at 20 percent axial strain, whichever occurred first during the performance of a test.

L. Direct Shear - The procedures of ASTM D 3080-72 were followed for direct shear testing. In this test, soil under an applied normal load is stressed to failure by moving one section of the soil container (shear box) relative to the other section. Normal stress is the value of load per unit area acting perpendicular to the plane of shearing. Maximum shear strength is defined as the maximum resistance (ksf) of a soil to shearing (tangential) stresses.

M. Consolidation (ASTM D 2435-70) - A consolidation test is a test in which a cylindrical soil specimen is laterally confined in a ring and compressed between porous plates. The term "consolidation", as used here, indicates the gradual reduction in volume of the soil mass resulting from an increase in compressive stress (axial load per unit area).

N. Chemical - The chemical tests performed on soil samples included: pH; water soluble sodium, chloride, sulphate, calcium; and calcium carbonate content. pH is an index of the acidity or alkalinity of a soil in terms of the logarithm of the reciprocal of the hydrogen ion concentration. ASTM test procedure designations for these chemical tests are included in the table at the beginning of the "Explanation of Laboratory Test Results".

O. CBR - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a subgrade soil to that developed by a standard crushed-rock

base material. The procedures for conducting a CBR test were as outlined in ASTM D 1883-73. The materials tested for CBR were also analyzed for particle size distribution (ASTM D 422-63) and compaction characteristics (ASTM D 1557-70). The term "percentage of maximum density" indicates the ratio (as a percentage) of the compacted sample dry unit weight to maximum dry density obtained in the laboratory from ASTM D 1557-70, "Moisture-Density Relations of Soils Using 10-pound (4.5 kg) Hammer and 18-inch (457 mm) Drop".

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEI								
				STANDARD SIEVE OPENING							U S S	
				BLDRS.	COBBLES		GRAVEL					
		FEET	METERS	24"	12"	8"	3"	1½"	3/4"	3/8"	4	1
RR-B-1	P-1	0.8-1.6	0.24-0.49									
	D-3	7.2-7.7	2.19-2.35						100	98	87	6
	D-4	10.0-10.4	3.05-3.17					100	85	74	63	5
	D-4	10.4-10.9	3.17-3.32									
	D-5	15.4-15.9	4.69-4.85						100	91	74	4
	D-6	20.0-20.9	6.10-6.37									
	D-7	25.2-25.7	7.68-7.83					100	96	77	57	4
	D-8	30.2-30.7	9.20-9.36									
	D-9	35.1-35.6	10.70-10.85									
	D-10	40.1-40.6	12.22-12.37						100	99	89	7
	D-11	50.4-50.9	15.36-15.51									
	D-12	60.2-60.7	18.35-18.50							100	99	8
	D-13	70.5-70.9	21.49-21.61									
	D-14	80.9-81.4	24.66-24.81									
	D-15	90.1-90.6	27.46-27.61						100	85	58	4
	D-16	100.1-100.6	30.51-30.66									
	D-17	110.1-110.6	33.56-33.71									
	D-18	120.1-170.6	36.61-36.76									
	D-19	141.1-141.6	43.01-43.16						100	98	90	7
	D-20	160.2-160.7	48.83-48.98						100	94	81	5
RR-B-2	P-1	0.9-1.8	0.27-0.55									1
	P-2	3.0-3.9	0.91-1.19									
	D-3	7.0-8.2	2.13-2.50						100	65	40	3
	D-4	10.8-11.3	3.29-3.44									
	D-5	15.4-15.9	4.69-4.85							100	98	9
	D-6	20.4-20.9	6.22-6.37									
	D-7	25.4-25.9	7.74-7.89						100	82	62	3
	D-8	30.4-30.9	9.27-9.42									
	D-9	35.3-35.9	10.76-10.94									
	P-10	38.8-39.6	11.83-12.07							100	99	9
	P-11	40.4-41.1	12.31-12.53								100	9
	D-12	50.2-50.7	15.30-15.45									
	P-13	59.0-61.8	17.98-18.84									
	P-14	69.0-71.8	21.03-21.88								100	9
	D-15	80.2-80.9	24.44-24.66									
	D-16	90.2-90.9	27.49-27.71						100	99	89	6
	D-17	100.1-100.6	30.51-30.66									
	P-18	109.0-110.8	33.22-33.77									
	P-19	119.0-120.2	36.27-36.64									
	P-19	120.0-121.1	36.58-36.91								100	9
	P-20	140.0-140.9	42.67-42.95									1
	P-21	161.0-162.0	49.07-49.38									

NOTES:

(a) Sample types
- SS - Standard split spoon
- P - Pitcher
- D - Fugro Drive
- B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

CHECKED BY _____ APPROVED BY _____

			SM	120.4	1929	6.5	43.6
			SM				
			SP	112.5	1802	8.1	44.0
			SW	116.6	1788	9.6	50.8
			SW	121.5	1946	9.8	68.3
			SW	111.6	1788	12.2	64.8
			SM				
			SW-SM	111.3	1783	11.7	61.7
			SW-SM	114.1	1828	10.5	59.3
			SM	118.3	1895	8.5	54.4
			SM	109.6	1756	10.8	59.2
			SM	116.0	1858	9.7	57.0
			SM	121.7	1949	10.7	75.0
			SM	118.4	1897	9.7	61.8
			SM				
			SM	107.1	1716	12.0	56.8
			SW	111.3	1783	13.3	69.8
			SP-SM	114.5	1834	10.7	61.5
			SM	98.8	1583	14.6	56.0
			SM	100.3	1607	6.6	26.2
			GW-GM	102.7	1645	15.5	65.4
			GW-GM	109.4	1752	2.9	14.5
			SP	102.2	1637	3.5	14.7
			SP	104.9	1680	4.3	19.0
			SW	110.1	1764	15.5	78.9
			SW	98.7	1581	6.2	23.7
			ML	105.6	1692	6.9	31.2

SW	111.6	1788	12.2	64.8	0.51										*	
SM																
SW-SM	111.3	1783	11.7	61.7	0.51								*			
SW-SM	114.1	1828	10.5	59.3	0.48											
SM	116.3	1895	8.5	54.4	0.42											
SM	109.6	1756	10.8	59.2	0.54											
SM	116.0	1858	9.7	57.0	0.45											
SM	121.7	1949	10.7	75.0	0.39											
SM	118.4	1897	9.7	61.8	0.42											
SM																
SM	107.1	1716	12.0	56.8	0.57											
SW	111.3	1783	13.3	69.8	0.51											
SP-SM	114.5	1834	10.7	61.5	0.47											
SM	98.8	1583	14.6	56.0	0.71											
SM	100.3	1607	6.6	26.2	0.68											
GW-GM	102.7	1645	15.5	65.4	0.64											
GW-GM	109.4	1752	2.9	14.5	0.54											
SP	102.2	1637	3.5	14.7	0.65											
SP	104.9	1680	4.3	19.0	0.61											
SW	110.1	1764	15.5	78.9	0.53											
SW	98.7	1581	6.2	23.7	0.71											
ML	105.6	1692	6.9	31.2	0.60											
SM	98.4	1576	5.1	19.4	0.71						*				*	
SM	111.4	1784	11.2	59.3	0.51						*					
SM	113.6	1820	16.3	91.3	0.48											
SM	95.2	1525	15.1	53.0	0.77											
SM	90.3	1446	21.9	68.4	0.87											
SM	116.0	1858	7.4	44.2	0.45											
SW-SM	111.8	1791	13.6	72.4	0.51											
SM	105.3	1687	16.5	74.2	0.60											
SM	110.2	1765	14.4	73.5	0.53											
SM																
SM	104.1	1668	10.4	45.5	0.62											
SM	101.3	1623	24.4	99.3	0.66											

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIG								
				STANDARD SIEVE OPENING							U S ST	
				BLDRS	COBBLES		GRAVEL					
		FEET	METERS	24"	12"	8"	3"	1½"	3/4"	3/8"	4	10
RR-B-3	P-1	0.0-2.2	0.00-0.67							100	92	79
	SS-2	2.5-2.9	0.76-0.88						100	94	84	67
	SS-2	2.9-3.4	0.88-1.04									
	D-3	4.2-4.9	1.28-1.49						100	98	91	77
	D-4	7.2-7.9	2.19-2.41									
	P-5	10.0-10.8	3.05-3.29									10
	D-6	15.2-15.9	4.63-4.85									
	D-7	20.0-20.6	6.10-6.28						100	88	69	45
	D-8	25.2-25.9	7.68-7.89									
	D-9	30.2-30.9	9.20-9.42									
	P-10	35.0-35.6	10.67-10.85							100	99	98
	P-11	40.0-41.4	12.19-12.62									
	P-12	49.0-51.7	14.94-15.76									
	P-13	60.0-61.5	18.29-18.75									
	P-14	70.5-73.3	21.49-22.34									10
	P-15	80.0-81.8	24.38-24.93									
	P-16	90.0-91.3	27.43-27.83									
	P-17	100.0-101.3	30.48-30.88									10
	P-18	110.0-111.6	33.53-34.02									
	P-19	120.0-121.6	36.58-37.06									
	P-20	140.0-142.4	42.67-43.40						100	98	89	75
	P-21	160.0-161.6	48.77-49.26									
RR-B-3A	P-1	0.0-2.0	0.00-0.61									
	D-2	5.9-6.6	1.80-2.01									
	P-3	7.5-9.1	2.29-2.77									
	P-4	10.0-11.8	3.05-3.60									
	D-5	15.2-15.9	4.63-4.85						100	95	85	7
	D-6	20.2-20.9	6.16-6.37									
	D-7	25.2-25.9	7.68-7.89									
	P-8	50.0-51.7	15.24-15.76									
	P-9	75.0-77.7	22.86-23.68									
	P-10	100.0-101.5	30.48-30.94									
	P-11	125.0-125.8	38.10-38.34									
	P-12	126.5-127.6	38.56-38.89									
RR-B-4	P-1	0.0-1.95	0.00-0.59									10
	P-3	3.5-6.2	1.07-1.89									
	P-4	7.0-8.9	2.13-2.71									
	P-5	10.0-11.7	3.05-3.57							100	99	9
	P-6	16.9-17.8	5.15-5.43									10
	P-7	20.5-21.2	6.25-6.46									
	P-8	25.0-26.7	7.62-8.14									

NOTES:

(a) Sample types
- SS - Standard split spoon
- P - Pitcher
- D - Fugro Drive
- B,b - Bulk

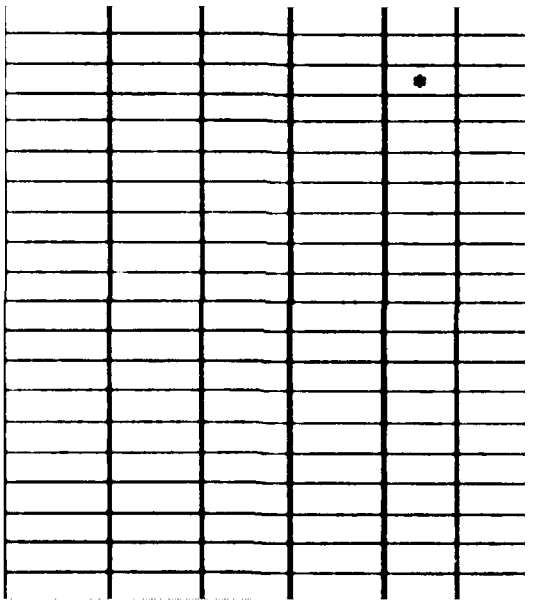
(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

CHECKED BY _____ APPROVED BY _____

67	26	8	5						SP-SM										
									SP-SM										
77	30	13	7						SW-SM	113.5	1818	6.1	34.3	0.48					
									SM	107.1	1716	4.0	19.1	0.57					
100	81	57	33					NP	SM	85.5	1370	15.3	42.6	0.97					
									SP-SM	117.0	1874	6.9	42.5	0.44					
45	16	6	5						SP-SM	113.9	1825	14.0	78.9	0.48					
									SP-SM										
									SM	107.9	1728	14.3	68.6	0.56					
98	88	66	49						SM	98.8	1583	11.4	43.4	0.71					
									SP-SM	103.2	1653	8.5	36.3	0.63					
									SM										
									SM	108.6	1740	8.7	42.6	0.55					
100	77	40	23						SM	97.2	1557	14.0	51.8	0.73					
									SP	102.5	1642	19.2	80.7	0.64					
									SP	111.4	1784	13.0	68.6	0.51					
100	94	8	2						SP										
									SP	103.9	1664	5.5	24.0	0.62					
									SP	106.5	1706	12.5	57.7	0.58					
75	40	13	6						SP-SM	108.4	1736	16.8	81.7	0.55					
									SP										
									SP-SM	94.2	1509	11.2	38.3	0.79					
									SM	114.3	1831	5.1	28.8	0.48					
									SM	89.6	1435	15.7	48.2	0.88					
									SM	90.8	1454	9.1	28.7	0.86					
78	58	32	18						SM	110.5	1770	11.9	61.3	0.53					
									SW-SM	116.8	1871	11.6	70.5	0.44					
									SW-SM	112.7	1805	11.1	60.5	0.50					
									ML	78.2	1253	21.7	50.9	1.15					
									SP	105.6	1692	14.5	65.7	0.60					
									SP	96.7	1549	17.7	64.6	0.74					
									SP	113.3	1815	11.2	62.4	0.49					
									SP	109.4	1752	11.8	59.1	0.54					
100	99	91	80						MH	70.9	1136	21.1	41.4	1.38					2.62
			99			58	38	20	MH	68.1	1091	39.4	72.0	1.48					
									SP	95.1	1523	18.9	66.2	0.77					
96	67	30	15			33	22	11	SC	100.9	1616	13.3	53.7	0.67					
100	99	91	77			51	31	20	MH	77.5	1241	35.4	81.4	1.17					
						79	36	43	MH	87.8	1406	18.1	53.0	0.89					2.66
									MH	81.8	1310	22.6	57.7	1.06					



ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT									
				STANDARD SIEVE OPENING							U S STANDA		
				BLDRS.	COBBLES		GRAVEL				SAND		
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	
RR-B-4	P-9	30.1-30.5	9.17-9.30										
	P-10	33.0-35.0	10.06-10.67										
	P-11	35.0-36.9	10.67-11.25										
	P-12	40.0-40.7	12.19-12.41										
	P-13	50.0-51.7	15.24-15.76										
	P-14	60.0-62.8	18.29-19.14										
	P-15	70.0-72.8	21.34-22.19										
	P-16	80.8-81.6	24.63-24.87										
	P-17	90.0-92.1	27.43-28.07							100	98	97	
	P-18	100.0-102.4	30.48-31.21										
	P-19	110.0-112.8	33.53-34.38								100	98	
	P-20	120.0-121.1	36.58-36.91										
	P-21	140.0-141.6	42.67-43.16								100	99	
	P-22	160.0-161.8	48.77-49.32										
RR-B-5	P-1	0.0-1.2	0.00-0.37										
	D-3	3.6-4.3	1.10-1.31					100	95	79	61	44	
	D-4	7.2-7.9	2.19-2.41					100	87	62	46	34	
	D-5	10.2-10.8	3.11-3.29										
	D-6	15.0-15.6	4.57-4.75				100	81	62	49	40	34	
	D-7	20.0-20.5	6.10-6.25										
	D-9	30.0-30.6	9.14-9.33					100	81	74	59	37	
	D-10	35.0-35.5	10.67-10.82										
	D-11	40.0-40.4	12.19-12.31						100	88	78	67	
	D-12	50.2-50.9	15.30-15.51										
	D-14	70.0-70.3	21.34-21.43					100	81	60	45	37	
	D-16	90.0-90.7	27.43-27.65										
	D-17	100.0-100.6	30.48-30.66					100	96	83	56	32	
	D-18	110.0-110.5	33.53-33.68				100	70	61	48	37	26	
	D-19	120.0-120.2	36.58-36.64										
	D-20	140.0-140.2	42.67-42.73					100	85	71	59	46	
	D-21	160.0-160.2	48.77-48.83					100	96	77	65	48	
RR-B-6	P-1	0.0-1.4	0.00-0.43										
	D-3	3.7-4.4	1.13-1.34					100	96	86	69	49	
	D-4	7.2-7.9	2.19-2.41										
	D-5	10.3-10.9	3.14-3.32										
	D-6	15.2-15.9	4.63-4.85										
	D-7	20.0-20.4	6.10-6.22					100	92	75	57	41	
	D-8	25.0-25.6	7.62-7.80										
	D-9	30.0-30.7	9.14-9.36										
	D-10	35.0-35.5	10.07-10.82										
	D-11	40.2-40.9	12.25-12.47					100	82	72	60	41	

NOTES:

(a) Sample types
- SS - Standard split spoon
- P - Pitcher
- B - Fugro Drive
- B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

CHECKED BY _____ APPROVED BY _____

WEIGHT						ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	
% STANDARD SIEVE NO.				PARTICLE SIZE (mm)						DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)		
SAND			SILT OR CLAY																
10	40	100	200	.005	.001	LL	PL	PI		(pcf)	(kg/m³)				(pcf)	(kg/m³)			
									ML										
						41	29	12	ML	87.6	1403	8.3	24.3	0.92					
									ML	85.7	1373	31.0	86.6	0.97					
						50	34	16	ML-MH	79.8	1278	34.5	83.7	1.11					
									SM	97.7	1565	7.9	29.5	0.72					
									ML	80.9	1296	30.0	74.9	1.08					
						52	34	18	MH										
						44	32	12	ML	81.7	1309	36.6	93.2	1.06					
97	96	96	95			36	29	7	ML	89.4	1432	30.9	94.3	0.89					
									ML	88.4	1416	31.9	95.3	0.91					
98	71	41	27						SM	105.5	1690	18.3	82.9	0.60					
									SM	105.6	1690	20.5	93.2	0.60					
99	88	68	48						SM	94.4	1512	28.4	97.6	0.79					
									SM	90.7	1453	29.6	93.2	0.86					
									SM	86.6	1387	10.1	28.9	0.95					
44	20	11	8						SW-SM	113.2	1813	3.8	21.3	0.49				2.56	
34	19	12	10						GW-GM	112.6	1804	8.6	47.0	0.50					
									GW-GM	113.6	1820	8.6	47.9	0.48					
34	19	11	9						GW-GM	122.0	1954	8.4	59.9	0.38					
									GW-GM	110.2	1765	12.9	65.9	0.53					
37	18	12	9						SP-SM	118.7	1901	11.9	76.9	0.42					
									SP-SM	115.7	1853	11.6	68.6	0.46					
67	45	28	20						SM	113.8	1823	12.0	67.4	0.48					
									SM	110.2	1765	12.8	65.7	0.53					
37	25	16	11						GP-GM										
									GP-GM	117.2	1877	10.5	64.8	0.44					
32	11	7	6						SW-SM	113.8	1823	15.2	85.2	0.48					
26	10	6	5						GW-GM	123.1	1972	9.9	72.2	0.37					
									GW-GM	116.9	1873	13.1	80.5	0.44					
46	23	14	11						SP-SM	119.4	1913	10.0	65.6	0.41					
48	21	12	10						SW-SM	119.2	1909	11.7	76.2	0.41					
									SM	77.1	1235	24.7	56.2	1.19					

USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
	DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
	(pcf)	(kg/m³)				(pcf)	(kg/m³)								
ML															
ML	87.6	1403	8.3	24.3	0.92										
ML	85.7	1373	31.0	86.6	0.97										
ML-MH	79.8	1278	34.5	83.7	1.11						*				
SM	97.7	1565	7.9	29.5	0.72										
ML	80.9	1296	30.0	74.9	1.08										
MH														*	
ML	81.7	1309	36.6	93.2	1.06						*				
ML	89.4	1432	30.9	94.3	0.89										
ML	88.4	1416	31.9	95.3	0.91										
SM	105.5	1690	18.3	82.9	0.60										
SM	105.6	1690	20.5	93.2	0.60										
SM	94.4	1512	28.4	97.6	0.79										
SM	90.7	1453	29.6	93.2	0.86										
SM	86.6	1387	10.1	28.9	0.95										
SW-SM	113.2	1813	3.8	21.3	0.49				2.56						
GW-GM	112.6	1804	8.6	47.0	0.50										
GW-GM	113.6	1820	8.6	47.9	0.48										
GW-GM	122.0	1954	8.4	59.9	0.38										
GW-GM	110.2	1765	12.9	65.9	0.53										
SP-SM	118.7	1901	11.9	76.9	0.42										
SP-SM	115.7	1853	11.6	68.6	0.46									*	
SM	113.8	1823	12.0	67.4	0.48									*	
SM	110.2	1765	12.8	65.7	0.53										
GP-GM															
GP-GM	117.2	1877	10.5	64.8	0.44										
SW-SM	113.8	1823	15.2	85.2	0.48										
GW-GM	123.1	1972	9.9	72.2	0.37										
GW-GM	116.9	1873	13.1	80.5	0.44										
SP-SM	119.4	1913	10.0	65.6	0.41										
SW-SM	119.2	1909	11.7	76.2	0.41										
SM	77.1	1235	24.7	56.2	1.19										
SP-SM	116.3	1863	2.5	15.0	0.45										
SP-SM	119.8	1919	5.9	39.3	0.41										
SP-SM															
SW-SM	116.5	1866	6.2	37.6	0.45										
SW-SM	121.1	1940	11.5	79.1	0.39										
SP-SM	115.7	1853	9.7	57.7	0.46										
SP-SM															
SP-SM	131.3	2103	11.9	100.0	0.28										
SP-SM	117.5	1882	8.0	49.7	0.43										

SUMMARY OF LABORATORY TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-1
3 OF 8

FUGRO NATIONAL, INC.

APV-01

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT								
				STANDARD SIEVE OPENING							U S STAN	
				BLDRS	COBBLES		GRAVEL				SAN	
		FEET	METERS	24"	12"	8"	3"	1½"	3/4"	3/8"	4	10
RR-B-6	D-12	50.5-50.9	15.39-15.51									
	D-13	60.0-60.7	18.29-18.50					100	83	56	41	30
	D-14	65.7-66.4	20.03-20.24									
	D-15	70.0-70.6	21.34-21.52									
	D-17	92.0-92.6	28.04-28.22									
	D-18	99.5-99.6	30.33-30.36									
	D-21	119.2-119.9	36.33-36.55					100	94	89	82	72
	D-22	140.1-140.6	42.70-42.85				100	85	74	61	49	38
	D-23	160.0-160.2	48.77-48.83					100	98	79	60	43
RR-T-1	B-1	0.5-2.0	0.15-0.61					100	95	87	79	71
RR-T-2	B-1	0.5-2.0	0.15-0.61						100	97	87	71
RR-T-3	B-1	0.5-1.5	0.15-0.46									
	b-4	7.0-8.0	2.13-2.44							100	99	95
	b-6	11.5-12.5	3.51-3.81									
	b-7	13.0-14.0	3.96-4.27									
RR-T-4	B-1	0.25-1.5	0.08-0.46									100
	b-3	3.0-4.0	0.91-1.22						100	98	93	84
	b-4	7.0-8.0	2.13-2.44						100	87	68	45
RR-T-5	B-1	0.5-2.0	0.15-0.61				100	81	59	49	41	34
	b-2	12.0-13.0	3.66-3.96					100	79	54	41	32
RR-T-6	B-1	0.5-2.0	0.15-0.61						100	99	96	90
RR-T-7	B-1	0.5-2.0	0.15-0.61				100	99	98	96	89	78
RR-T-8	B-1	0.5-2.0	0.15-0.61					100	97	85	72	50
	b-2	9.0-10.0	2.74-3.05									
RR-P-1	B-1	0.5-2.0	0.15-0.61					100	95	90	81	67
	b-2	2.5-3.5	0.76-1.07									
RR-P-4	B-1	1.0-1.5	0.30-0.40					100	88	74	56	46
RR-P-6	b-1	0.5-2.0	0.15-0.61						100	98	93	85
	b-2	2.5-3.5	0.76-1.07					100	89	68	52	40
RR-P-8	B-1	0.5-2.0	0.15-0.61						100	99	94	89

NOTES:

(a) Sample types
- SS - Standard split spoon
- P - Pitcher
- D - Fugro Drive
- B,b - Bulk

(b) NP - Non Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

CHECKED BY _____ APPROVED BY _____

...T										IN-SITU					COMPACTED					
...TANDARD SIEVE NO.				PARTICLE SIZE (mm)		ATTERBERG LIMITS (b)			USCS (c)	DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)
SAND			SILT OR CLAY																
	40	100	200	.005	.001	LL	PL	PI		(pcf)	(kg/m³)				(pcf)	(kg/m³)			
									SP-SM			8.4							
0	11	5	3						GW	122.3	1959	11.0	78.6	0.38					
									SM	115.9	1857	12.2	72.8	0.45					
									SM	117.4	1881	12.0	74.8	0.44					
									GP-GC	117.2	1878	14.4	88.8	0.44					
									GP-GC										
2	53	40	33						SM	113.2	1813	10.5	58.3	0.49					
3	27	20	17						GM	124.4	1993	9.5	72.7	0.35					
3	22	11	7						SW-SM	114.1	1828	11.4	64.7	0.48					
1	52	35	26					NP	SM						127.1	2036	8.9		
1	46	31	25						SM										
	100	99	97			44	30	14	ML						84.6	1355	33.0		
5	33	2	1						SP										
			81			29	24	5	ML										
			95			50	34	16	MH										
0	91	74	63			30	19	11	CL						109.3	1751	17.5		
4	60	26	11						SP-SM										
5	7	3	2						SP										
4	28	24	19						GM										
2	23	16	9						GP-GM										
0	71	49	37	17	6	22	17	5	SC-SM						127.0	2034	9.0		
8	50	31	25	9	5	42	24	18	SC						124.0	1986	11.5		
0	17	10	8						SW-SM										
									GC										
7	47	30	16						SM										
									CL										
6	21	6	3					NP	SP										
5	64	42	31						SM										
0	21	12	9						SW-SM										
9	78	42	20						SM										

SE

DEPAR

f5

	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m^3)				(pcf)	(kg/m^3)								
	SP-SM			8.4												
	GW	122.3	1959	11.0	78.6	0.38										
	SM	115.9	1857	12.2	72.8	0.45										
	SM	117.4	1881	12.0	74.8	0.44										
	GP-GC	117.2	1878	14.4	88.8	0.44										
	GP-GC															
	SM	113.2	1813	10.5	58.3	0.49									*	
	GM	124.4	1993	9.5	72.7	0.35										
	SW-SM	114.1	1828	11.4	64.7	0.48										
P	SM						127.1	2036	8.9							*
	SM															
4	ML						84.6	1355	33.0							*
	SP															
5	ML															
16	MH															
11	CL						109.3	1751	17.5							*
	SP-SM															
	SP															
	GM														*	
	GP-GM															
5	SC-SM						127.0	2034	9.0							*
18	SC						124.0	1986	11.5							*
	SW-SM															
	GC														*	
	SM															
	CL														*	
NP	SP															
	SM															
	SW-SM															
	SM															

SUMMARY OF LABORATORY TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-1 4 OF 9

USBR NATIONAL, INC.

APV-81

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT									
				STANDARD SIEVE OPENING							U S STANDARD		
				BLDRS.	COBBLES		GRAVEL				SAND		
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40
RR-P-9	B-1	0.5-1.5	0.15-0.46					100	60	48	39	34	26
RR-P-10	B-1	0.25-1.5	0.08-0.46						100	95	88	80	58
RR-P-12	b-1	0.5-1.5	0.15-0.46					100	94	83	71	59	40
RR-P-13	b-1	0.5-2.0	0.15-0.61						100	94	84	68	30
	b-2	2.0-3.0	0.61-0.91						100	95	76	47	17
RR-P-14	b-1	0.5-1.5	0.15-0.46						100	94	82	64	32
RR-P-16	B-1	0.5-2.0	0.15-0.61					100	97	84	73	65	40
RR-P-18	B-1	0.5-2.0	0.15-0.61							100	98	91	73
RR-P-19	b-1	0.5-2.0	0.15-0.61						100	99	95	85	55
RR-P-21	B-1	0.5-2.0	0.15-0.61					100	93	82	73	58	27
RR-P-24	B-1	0.5-2.0	0.15-0.61						100	98	91	81	50
RR-P-29	B-1	0.5-2.0	0.15-0.61							100	98	91	57
RR-P-30	B-1	0.5-2.0	0.15-0.61						100	96	92	83	58
RR-CS-8	b-1	0.25-1.5	0.08-0.46						100	95	92	86	66
	b-2	1.5-2.0	0.46-0.61					100	97	66	46	35	17
RR-CS-10	B-1	0.25-2.0	0.08-0.61							100	99	96	80
RR-CS-11	B-1	0.5-2.0	0.15-0.61					100	98	84	75	64	45
RR-CS-15	B-1	0.5-2.0	0.15-0.61					100	98	91	80	71	52
RR-CS-29	B-1	0.5-2.0	0.15-0.61							100	98	92	68
RR-CS-34	B-1	0.5-2.0	0.15-0.61						100	93	89	61	18
RR-CS-39	b-1	0.5-2.0	0.15-0.61						100	98	93	86	70
RR-CS-45	b-1	0.25-1.0	0.08-0.30								100	96	88
RR-CS-53	b-1	0.5-2.0	0.15-0.61						100	97	93	84	62

NOTES:

(a) Sample types
- SS - Standard split spoon
- P - Pitcher
- D - Fugro Drive
- B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

CHECKED BY _____ APPROVED BY _____

% SIEVE NO			PARTICLE SIZE (mm)		ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED
		SILT OR CLAY							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)			
40	100	200	.005	.001	LL	PL	PI		(pcf)	(kg/m³)				(pcf)	(kg/m³)				
26	20	16			29	18	11	GC						128.6	2060	8.6			
58	41	33			22	15	7	SC-SM											
40	28	21						SC											
30	14	10						SW-SM											
17	9	7						SP-SM											
32	16	10						SW-SM											
40	23	16						SM											
73	56	41						SM											
55	37	29						SM											
27	12	7						SP-SM											
50	29	23			30	19	11	SC						120.9	1937	11.4			
57	34	27			20	16	4	SC-SM						131.1	2100	6.5			
58	28	19						SM											
66	42	30						SM											
17	5	3						GP											
80	69	62			24	19	5	CL-ML						113.5	1818	15.0	2.56		
45	30	22			20	17	3	SM						129.0	2066	9.0			
52	29	18					NP	SM						112.2	1797	15.5			
68	32	14						SM											
18	9	6						SW-SM											
70	46	26						SM											
88	65	50			25	20	5	SC-SM											
62	44	35						SC											

SUMMARY

REVE

DEPARTMENT

USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
	DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
	(pcf)	(kg/m^3)				(pcf)	(kg/m^3)								
GC						128.6	2060	8.6							*
SC-SM															
SC															
SW-SM															
SP-SM															
SW-SM															
SM															
SM															
SM															
SP-SM															
SC						120.9	1937	11.4							*
SC-SM						131.1	2100	6.5							*
SM															
SM															
GP															
CL-ML						113.5	1818	15.0	2.56						*
SM						129.0	2066	9.0							*
SM					•	112.2	1797	15.5							*
SM															
SW-SM															
SM															
SC-SM															
SC															

SUMMARY OF LABORATORY TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD COP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-1
3 OF 8

FUGRO NATIONAL, INC.

AFV-01

3

	b-2	2.2-2.5	0.67-0.76					
RR-F-3	b-1	0.5-0.8	0.15-0.24					
	B-2	0.5-1.6	0.15-0.49					
RR-F-4	b-1	0.7-1.0	0.21-0.30					
	b-2	1.7-2.2	0.52-0.67					
RR-F-5	b-1	1.0-1.4	0.30-0.43					100
	b-2	2.0-2.3	0.61-0.70					100
RR-F-6	b-1	1.5-1.8	0.46-0.55					100
RR-F-7	b-1	0.1-0.5	0.03-0.15					
	b-2	0.7-0.8	0.21-0.24					
	b-3	1.8-2.2	0.55-0.67					
RR-F-8	b-1	1.0-1.3	0.30-0.40					100
	b-2	2.0-2.3	0.61-0.70					100
RR-F-9	b-1	1.0-1.3	0.30-0.40					
	b-2	2.0-2.3	0.61-0.70					
RR-F-10	b-1	1.0-1.3	0.30-0.40					
	b-2	2.0-2.3	0.61-0.70					100
RR-F-11	b-1	1.0-1.3	0.30-0.40					
	b-2	2.0-2.3	0.61-0.70					

IGHT																				
STANDARD SIEVE NO.				PARTICLE SIZE (mm)		ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED					
SAND			SILT OR CLAY							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)
10	40	100	200	.005	.001	LL	PL	PI		(pcf)	(kg/m³)				(pcf)	(kg/m³)			
83	51	25	18						SM										
86	53	26	20						SM										
97	85	68	63			53	32	21	MH			33.0							
91	75	58	53			46	29	15	ML						103.8	1663	21.0		
81	54	38	30			38	18	20	SC										
80	52	32	25			37	21	16	SC										
52	38	24	19						GM										
18	4	2	1						GP										
37	12	2	1						GP										
			85			27	22	5	CL-ML										
			72			25	19	6	CL-ML										
76	45	25	22			22	15	7	SC										
56	31	21	17						SM										
59	45	35	29						SM										
87	71	50	39			37	21	16	SC										
67	46	24	14					NP	SM										
73	52	39	31						SM										
42	19	11	7						SW-SM										
94	68	50	35						SM										
68	50	37	28						SM										
100	97	83	79			28	22	6	ML										
100	95	89	82			45	30	15	ML										

USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
	DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
	(pcf)	(kg/m^3)				(pcf)	(kg/m^3)								
SM															
SM															
MH			33.0												
ML						103.8	1663	21.0							*
SC															
SC															
GM															
GP															
GP															
CL-ML															
CL-ML															
SC															
SM															
SM															
SC															
SM															
SM															
SW-SM															
SM															
SM															
ML															
ML															

CHECKED BY_____ APPROVED BY_____

BORING NO.	SAMPLE NO.	SAMPLE INTERVAL FEET	SAMPLE INTERVAL METERS	SOIL TYPE	TYPE OF TEST	DRY DENSITY pcf	DRY DENSITY kg/m³	MOISTURE CONTENT (%)	CONFINING PRESSURE (σ_3) ksf	CONFINING PRESSURE (σ_3) kN/m²	MAXIMUM DEVIATOR STRESS ($\sigma_1-\sigma_3$) ksf	MAXIMUM DEVIATOR STRESS ($\sigma_1-\sigma_3$) kN/m²	STRAIN RATE (%/min)	BACK PRESSURE ksf	BACK PRESSURE kN/m²
RR-8-2	P-10	30.0-30.6	11.83-12.07	SM	CD	98.4	1576	5.1	4.0	192	10.0	940	.006	0	0
	P-10	30.6-40.4	12.07-12.31	SM	CD	100.0	1602	8.2	8.0	383	38.0	1782	.006	0	0
	P-11	40.4-41.1	12.31-12.53	SM	CD	111.4	1784	11.2	12.0	575	56.4	2700	.006	0	0
RR-8-3	P-10	35.0-35.6	10.67-10.85	SM	CD	98.8	1583	11.4	4.0	192	15.1	723	.006	0	0
	P-10	35.0-36.1	10.85-11.00	SM	CD	92.0	1474	19.7	8.0	383	27.0	1293	.006	0	0
	P-10	36.1-37.0	11.00-11.28	SM	CD	95.3	1527	12.6	12.0	575	40.9	1958	.006	0	0

SUMMARY OF TRIAXIAL COMPRESSION TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-2

FUGRO NATIONAL, INC.

BORING NO.	SAMPLE NO.	SAMPLE INTERVAL FEET	SAMPLE INTERVAL METERS	SOIL TYPE	UNCONFINED COMP. STRENGTH ksf	UNCONFINED COMP. STRENGTH kN/m²	DRY DENSITY pcf	DRY DENSITY kg/m³	MOISTURE CONTENT (%)	DEGREE OF SATURATION (%)	WEIGHT/ DIAMETER
RR-B-3	P-5	10.0-18.0	3.05-3.20	SW	1.0	86	85.5	1370	15.3	42.6	2.1
RR-B-4	P-6	18.0-17.0	5.15-5.43	MH	2.3	108	77.5	1241	35.4	81.4	2.4
	P-7	20.5-21.2	6.25-6.46	MH	1.5	73	87.8	1406	18.1	53.8	2.0
	P-12	40.0-40.7	12.19-12.41	ML-MH	2.6	125	79.8	1278	34.5	83.7	2.1
	P-16	80.0-81.6	24.63-24.87	ML	8.9	332	81.7	1308	36.6	83.2	2.1

SUMMARY OF UNCONFINED COMPRESSION TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-3

CHECKED BY _____ APPROVED BY _____

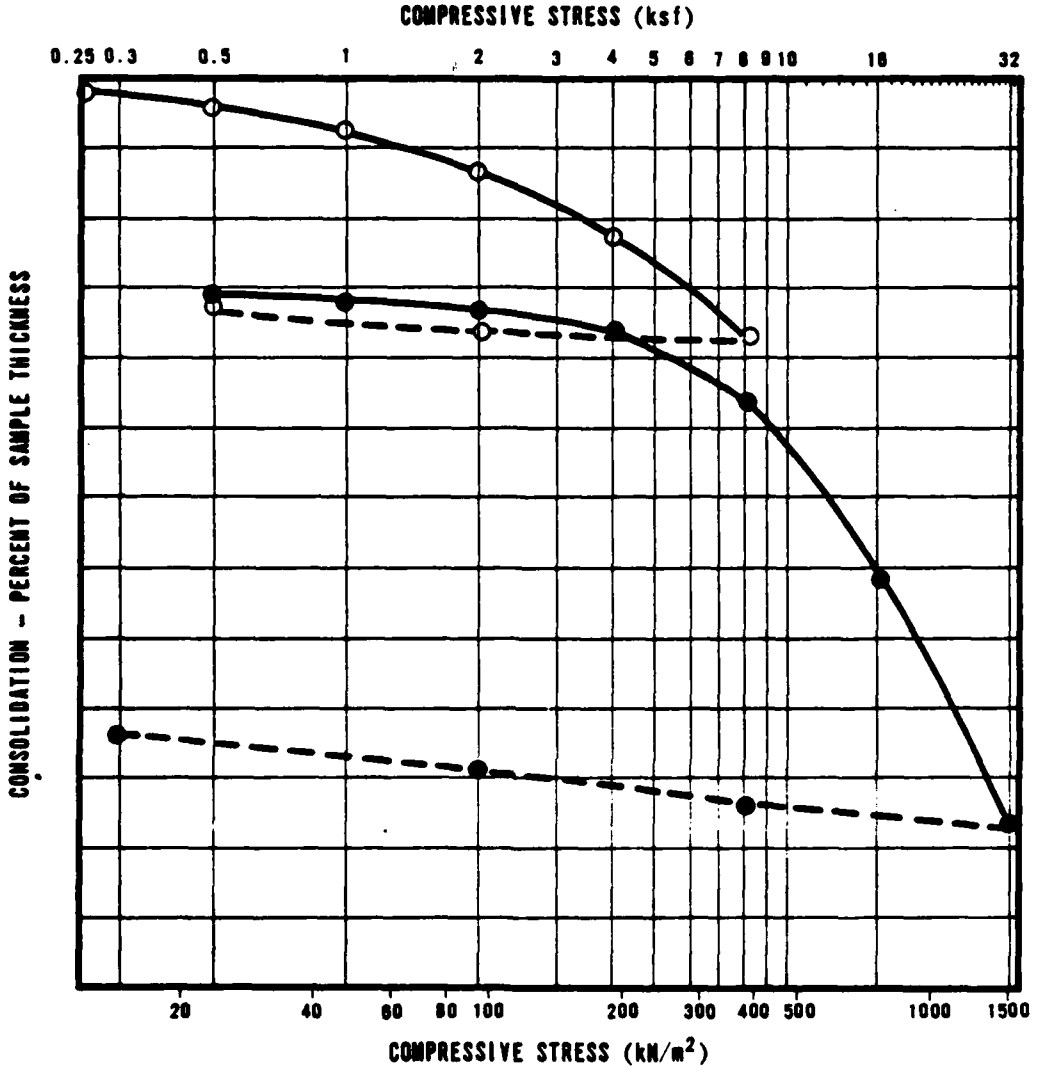
BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	NORMAL STRESS		MAXIMUM SHEAR STRENGTH	
		FEET	METERS		ksf	kN/m^2	ksf	kN/m^2
RR-B-1	D-10	40.1-40.6	12.22-12.37	SW-SM	4.0	192	5.4	259
				SW-SM	8.0	383	10.4	498
				SW-SM	12.0	575	11.4	546
RR-B-3	P-14	71.4-72.3	21.76-22.04	SM	7.0	335	4.9	235
				SM	11.0	527	7.1	340
				SM	15.0	718	9.2	440

CHECKED BY _____ APPROVED BY _____

SUMMARY OF DIRECT SHEAR TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-4



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m³			
○	RR-B-4	P-7	20.5-21.2	6.25-6.46	MH	83.8	1342	20.4	0 98	55.4

○ AT FIELD MOISTURE

● AFTER ADDITION OF WATER

——— COMPRESSION

– – – REBOUND

CONSOLIDATION TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 9-1

UGRO NATIONAL, INC.

CHECKED BY _____ APPROVED BY _____

2 JUL 79

AFV-02

CHECKED BY _____ APPROVED BY _____

ACTIVITY NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	pH	WATER SOLUBLE				CALCIUM CARBONATE
		FEET	METERS			SODIUM	CHLORIDE	SULPHATE	CALCIUM	
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RR-B-1	D-4	10.0-10.4	3.05-3.17	SM	7.6	346	180	153	40	178
	D-6	30.2-30.7	9.20-9.36	SW	7.5	113	43	37	39	198
RR-B-2	P-10	38.0-40.4	11.58-12.31	SM	7.0	59	56	34	58	264
RR-B-3	P-14	70.5-73.3	21.49-22.34	SM	7.1	55	46	68	35	202
RR-B-4	P-7	20.3-21.2	6.19-6.46	MH	7.2	775	231	8540	2790	8190
	P-15	70.0-72.8	21.34-22.19	MH	7.4	100	52	55	54	245
RR-B-5	D-10	35.0-35.5	10.67-10.82	SP-SM	7.3	87	54	48	47	221
	D-11	40.0-40.4	12.19-12.31	SM	7.3	57	36	<1	76	260
RR-B-6	D-21	119.2-119.9	36.33-36.55	SM	7.1	80	160	35	17	109
RR-T-5	B-1	0.5-2.0	0.15-0.61	GM	7.1	107	22	18	107	274
RR-T-8	b-2	9.0-10.0	2.74-3.05	GC	7.1	55	31	23	65	269
RR-P-1	b-2	2.5-3.5	0.76-1.07	CL	7.8	1200	576	531	47	187

SUMMARY OF CHEMICAL TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

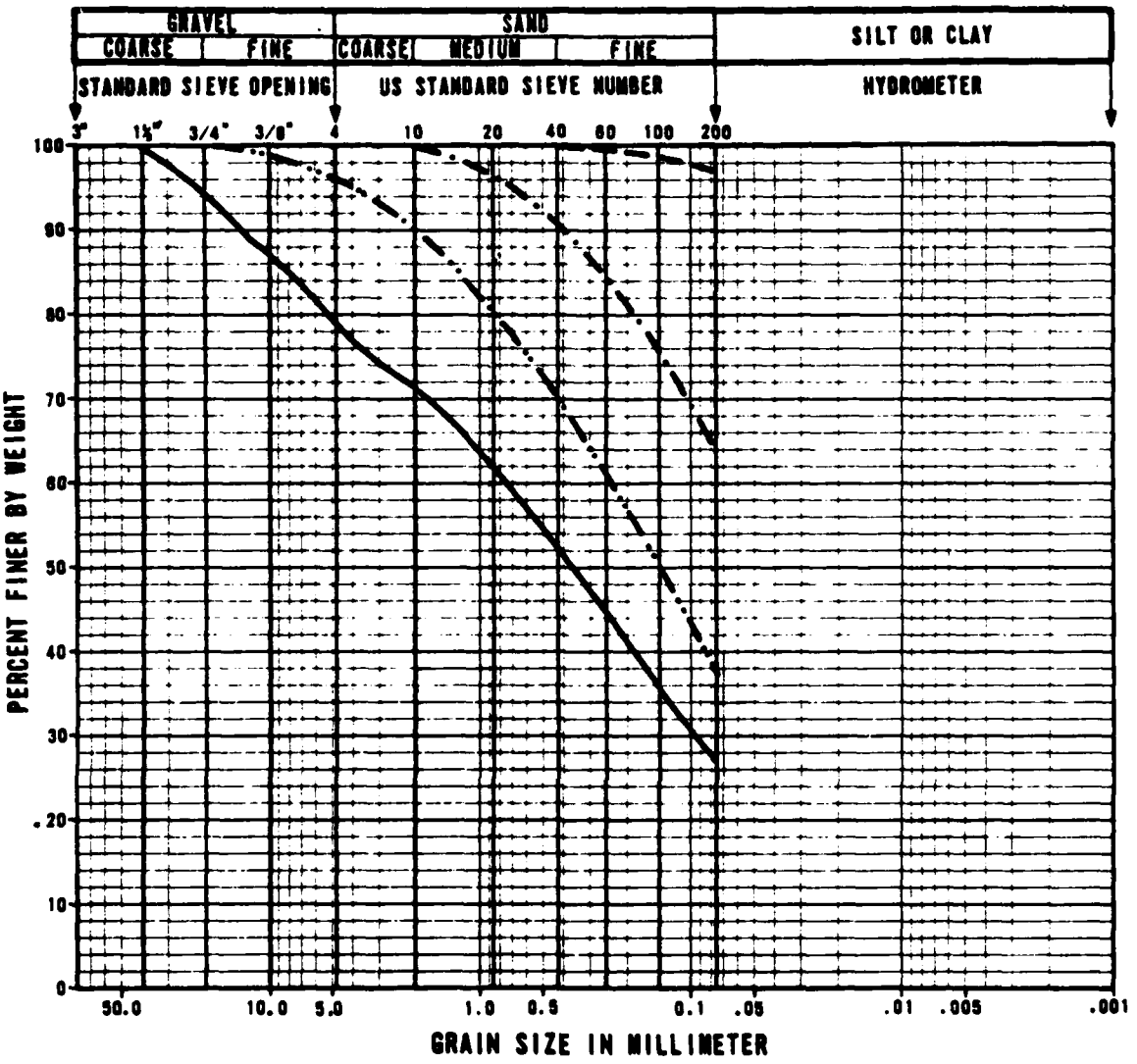
TABLE 9-5

FUGRO NATIONAL, INC.

2 JUL 79

AFV-07

FN-TR-27-V11



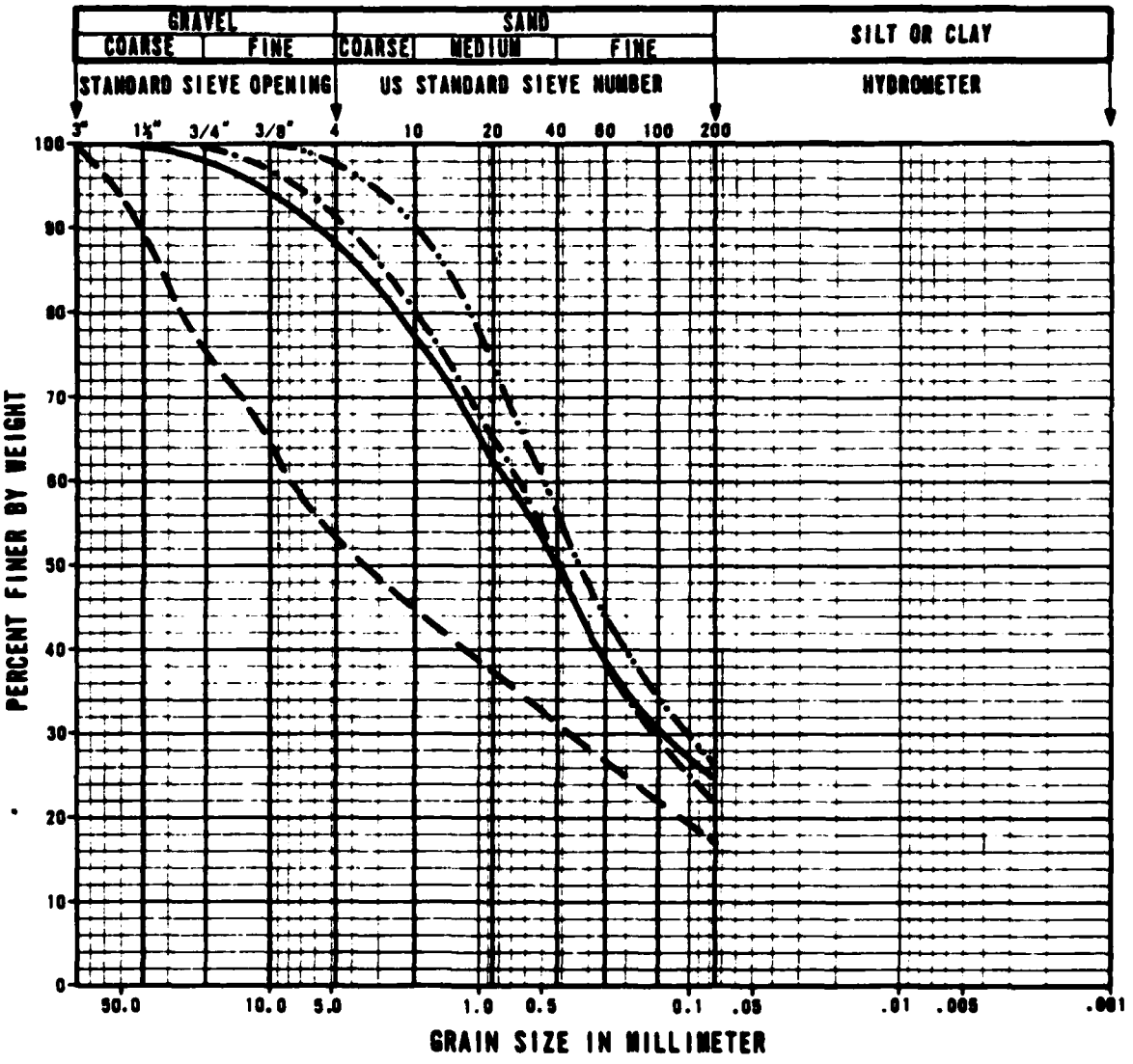
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
———	A	RR-T-1	0.5-2.0	0.15-0.61	SM
— — —	B	RR-T-3	0.5-1.5	0.15-0.46	ML
— · —	C	RR-T-4	0.25-1.5	0.08-0.46	CL
— ·· —	D	RR-T-6	0.5-2.0	0.15-0.61	SC-SM

GRAIN SIZE CURVES, CBR TESTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 9-2 1 OF 3

CHECKED BY _____ APPROVED BY _____



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
———	E	RR-T-7	0.5-2.0	0.15-0.61	SC
– – –	F	RR-P-9	0.5-1.5	0.15-0.46	GC
—·—	G	RR-P-24	0.5-2.0	0.15-0.61	SC
—··—	H	RR-P-29	0.5-2.0	0.15-0.61	SC-SM

GRAIN SIZE CURVES, CBR TESTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

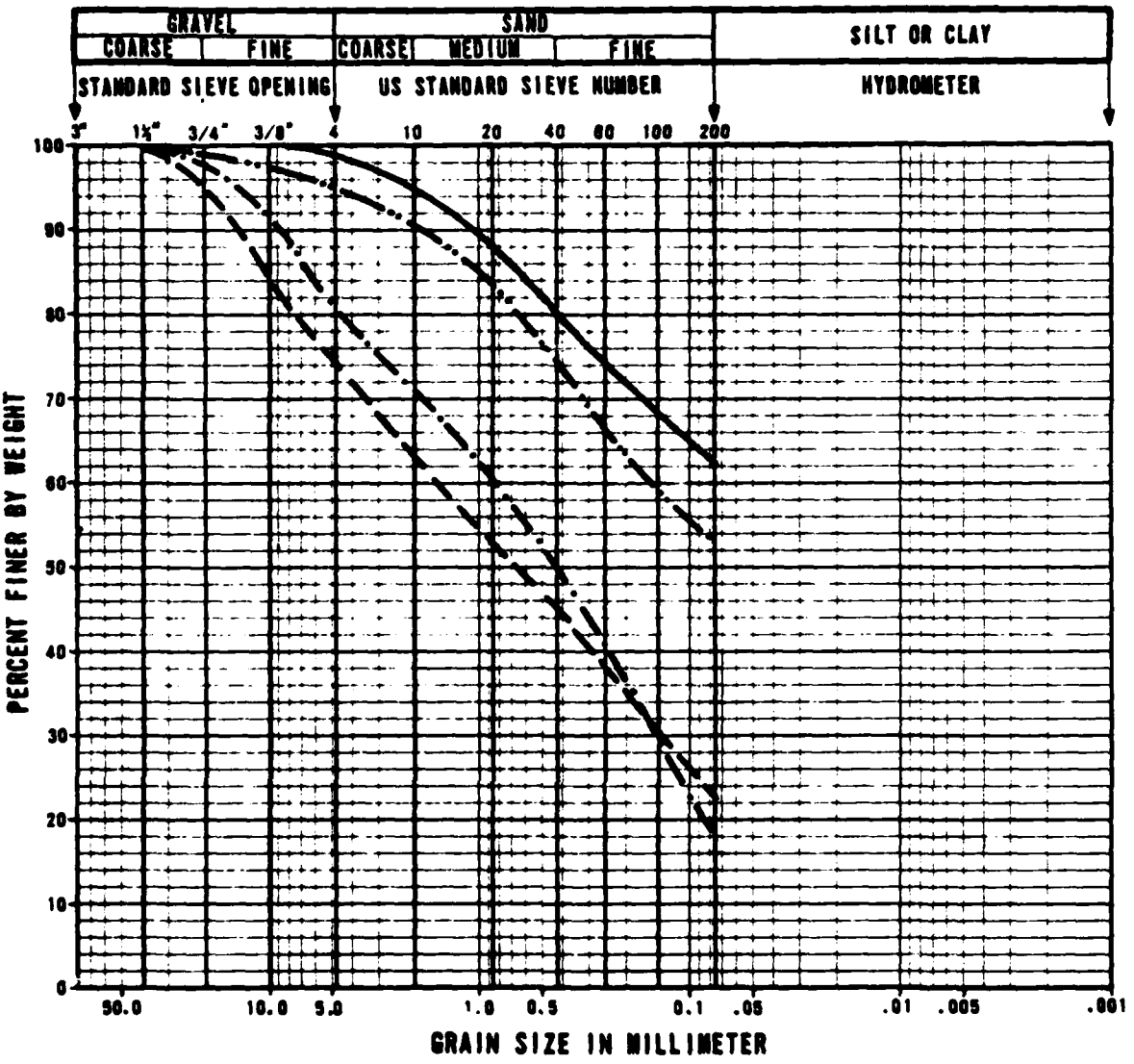
FIGURE 9-2 2 OF 3

WOODWARD-NATIONAL, INC.

CHECKED BY _____ APPROVED BY _____

2 JUL 79

AFV-12



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
———	I	RR-CS-10	0.25-2.0	0.08-0.61	CL-ML
— — —	J	RR-CS-11	0.5-2.0	0.15-0.61	SM
—·—	K	RR-CS-15	0.5-2.0	0.15-0.61	SM
—··—	L	RR-F-3	0.5-1.5	0.15-0.46	ML

GRAIN SIZE CURVES, CBR TESTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 9-2
3 OF 3

WOODWARD-CLYDE CONSULTANTS

CHECKED BY _____ APPROV. BY _____

CHECKED BY _____ / _____ APPROVED BY _____ / _____

2 JUL 79

FM-TR-27-V11

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m³		pcf	kg/m³			
A	SM	26		NP		127.1	2036	8.9	126.4	2025	9.7	99.4	43
									124.8	1999	9.4	98.2	27
									117.2	1877	9.4	92.2	10
B	ML	97	44	14		84.6	1355	33.0	83.0	1330	33.2	98.1	24
									78.2	1253	33.4	92.4	17
C	CL	63	30	11		109.3	1751	17.5	104.2	1669	16.9	95.4	6
									95.7	1533	17.0	87.6	2
									87.8	1406	17.0	80.3	1
D	SC-SM	37	22	5		127.0	2034	9.0	124.2	1989	8.6	97.8	67
									117.5	1882	8.8	92.6	21
									108.6	1740	8.6	85.5	3

CALIFORNIA BEARING RATIO (CBR) TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-6
1 OF 3

WOODWARD-CLYDE CONSULTANTS

AFV-13

CHECKED BY _____ / _____ APPROVED BY _____ / _____

2 JUL 70

FW-TR-27-V11

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m³		pcf	kg/m³			
E	SC	25	42	18		124.0	1986	11.5	117.7	1885	10.3	94.9	18
									116.9	1873	11.3	94.3	14
									103.8	1663	10.8	83.7	2
F	GC	16	29	11		128.6	2060	8.6	127.6	2044	7.7	99.2	99
									121.6	1948	7.4	94.5	28
									116.1	1860	6.7	90.3	7
G	SC	23	30	11		120.9	1937	11.4	120.9	1937	8.7	100.0	58
									112.6	1804	7.8	93.1	14
									105.2	1685	8.0	87.0	4
H	SC-SM	27	20	4		131.1	2100	8.5	126.3	2023	7.6	96.3	76
									119.5	1914	7.8	91.2	33
									110.7	1773	7.8	84.4	6

CALIFORNIA BEARING RATIO (CBR) TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-6 2 OF 3

FLUOR NATIONAL, INC.

AFV-13

CHECKED BY_____ / _____ APPROVED BY_____ / _____

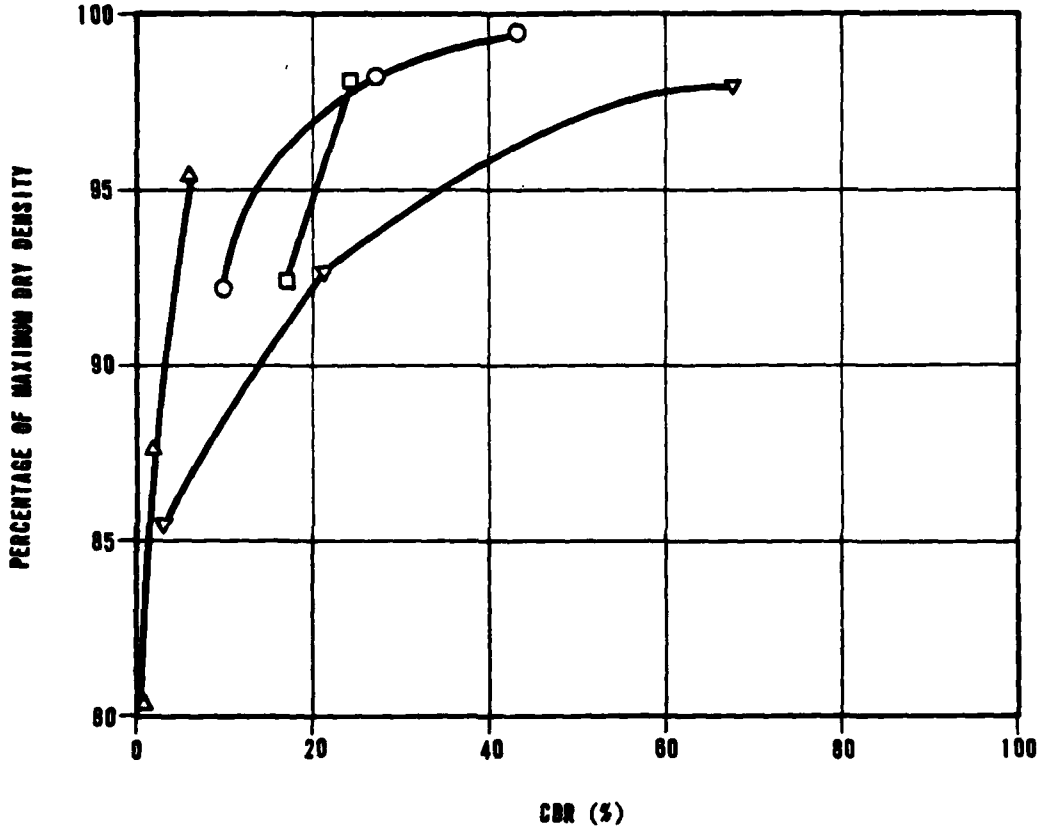
COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m³		pcf	kg/m³			
I	CL-ML	62	24	5	2.56	113.5	1818	15.0	111.8	1791	14.6	98.5	9
									105.6	1692	14.6	93.0	5
									97.6	1563	14.9	86.0	2
J	SM	22	20	3		129.0	2066	9.0	120.2	2054	9.2	98.4	83
									123.2	1973	8.8	95.5	56
K	SM	18		NP		112.2	1797	15.5	105.0	1682	15.3	93.6	31
									100.7	1613	16.0	89.8	19
L	ML	53	46	15		103.8	1663	21.0	104.8	1680	20.2	101.1	7
									97.5	1562	20.2	93.9	4
									90.6	1451	19.6	87.2	2

CALIFORNIA BEARING RATIO (CBR) TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE 9-6
3 OF 3

FUGRO NATIONAL, INC.



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	A	SM
□	B	ML
△	C	CL
▽	D	SC-SM

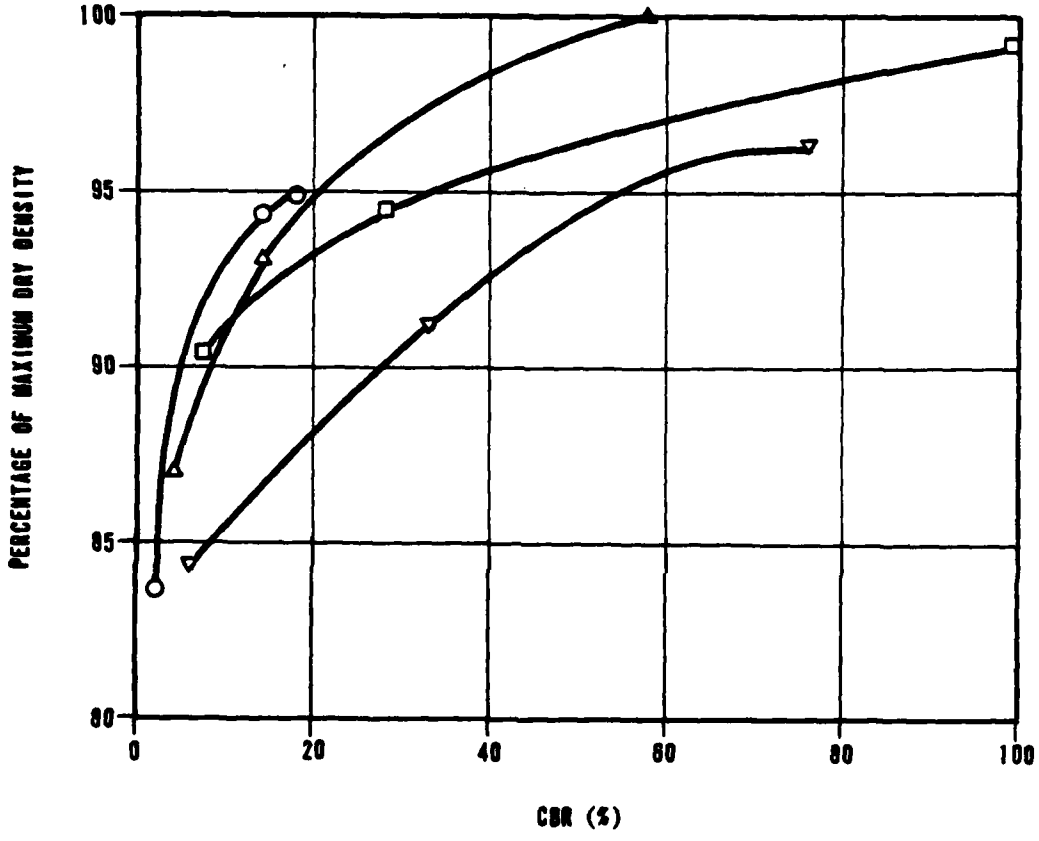
CHECKED BY _____ APPROVED BY _____

CALIFORNIA BEARING RATIO (CBR) CURVES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 9-3 1 OF 3

FUGRO NATIONAL, INC.



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	E	SC
□	F	GC
△	H	SC
▽	G	SC-SM

CALIFORNIA BEARING RATIO (CBR) CURVES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

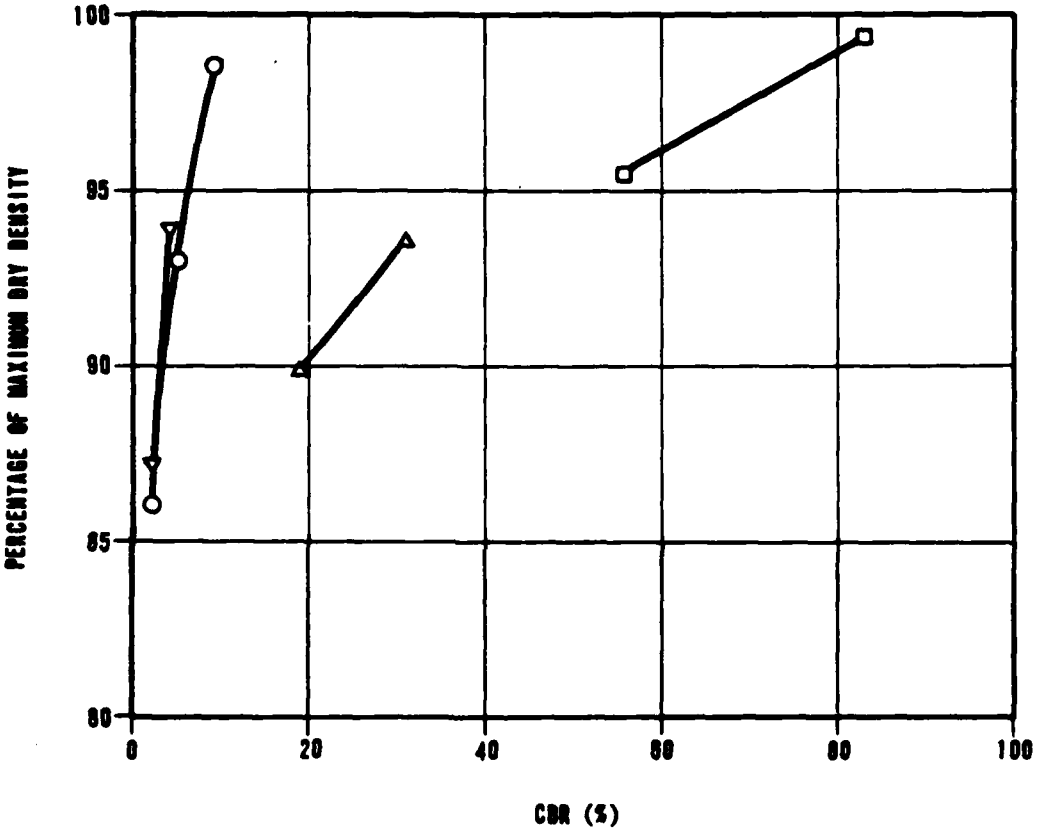
FIGURE 9-3
2 OF 3

FUGRO NATIONAL, INC.

2 JUL 78

AFV-14

CHECKED BY _____ APPROVED BY _____



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	I	CL-ML
□	J	SM
△	K	SM
▽	L	ML

CHECKED BY _____ APPROVED BY _____

CALIFORNIA BEARING RATIO (CBR) CURVES
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE 9-3
3 OF 3

FUGRO NATIONAL, INC.

SECTION 10.0

FIELD CBR TEST RESULTS

EXPLANATIONS OF FIELD CBR TEST RESULTS

The results of field CBR tests and related field density, moisture content, and laboratory soil classification tests are presented on the summary table included in this section. The following explanations will aid in reviewing the data included in the table.

A. Definition of California Bearing Ratio (CBR) - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a soil to that developed by a specimen of standard crushed-rock base material and is the basis for many empirical road design methods used in this country.

B. Activity Number - Field CBR tests are identified as follows:

BS-F-1

BS - abbreviation for the site (e.g., BS-Big Smoky)
F - abbreviation for field CBR test
1 - number of activity

C. Ground Surface Elevation - Indicated elevations (in feet and meters) are estimated from topographic maps of the study area within an accuracy of half the contour interval.

D. Surficial Geologic Units - Indicates the surficial geologic unit in which the activity is located.

E. USCS - The symbols used are from the Unified Soil Classification System; see Table 6-1 of Section 6.0, "Boring Logs", for details of USCS.

F. Grain-Size Distribution and Plasticity - These are from results of laboratory tests. See Section 6.0, "Boring Logs", for explanations.

G. In-Situ Dry Unit Weight - Indicated dry unit weights are from field density tests conducted at each CBR test site in accordance with ASTM D 1556-64, "Test for Density of Soil in Place by the Sand-Cone Method".

H. Moisture Content - Moisture contents as determined in the field by the "Speedy Moisture Tester".

I. Estimated Percent of Maximum Dry Density - Indicates the ratio (as a percentage) of in-situ dry unit weight to the maximum dry density obtained in the laboratory from ASTM D 1557-70, "Moisture Density Relations of Soils Using 10-pound (4.5 kg) Hammer and 18-inch (457 mm) Drop".

J. Average Field CBR - Average of three field CBR tests performed at each level.

K. Remarks - These include comments about the in-situ soil conditions which may have had significant influence on the CBR test (cementation, cobbles, gravel, and/or unusual moisture content). See Section 6.0, "Boring Logs", for explanation of terms used to describe cementation and cobbles. Indurated indicates soil or rock hardened by heat, pressure and/or cementation. Disseminated caliche indicates a scattered distribution of calcium carbonate in the soil profile.

ACTIVITY NUMBER	GROUND SURFACE ELEVATION		SURFICIAL GEOLOGIC UNIT	DEPTH		USCS	GRAIN SIZE DISTRIBUTION AND PLASTICITY					IN SITU DRY UNIT WEIGHT		MOISTURE CONTENT	ESTIMATED PERCENT OF MAXIMUM DRY DENSITY	AVG FIE
	FEET	METERS		FEET	METERS		GR	SA	FI	LL	PI	(pcf)	(kg/m³)	(%)		
RR-F-1	5480	1670	A5y	0.75	0.23	SM						95.3	1527	8.3	78	
				2.2	0.67	SC-SM		77	23	20	4	114.3	1831	9.5	87	
RR-F-2	5485	1672	A5y	1.0	0.30	SM	5	77	18			108.8	1740	8.8	83	
				2.2	0.67	SM	5	75	20			115.0	1842	9.8	88	
RR-F-3	5600	1707	A2	0.5	0.15	MH	1	37	62	53	21	86.8	1387	33.8	83	
				1.5	0.46	ML	5	42	53	46	15	90.2	1445	21.8	87	
RR-F-4	5560	1695	A5i	0.7	0.21	SC	9	61	30	38	20	94.7	1517	15.2	75	
				1.7	0.52	SC	9	66	25	37	18	92.4	1480	15.0	73	
RR-F-5	5000	1524	A5y	1.0	0.30	GM	42	39	19			114.3	1831	12.1	89	
				2.0	0.61	GP	51	48	1							
RR-F-6	4960	1512	A5y	1.7	0.52	GP	52	47	1			108.7	1741	4.1	84	
				2.5	0.76	GP										
RR-F-7	4930	1503	A4o/A5y	0.1	0.03	CL-ML			85	27	5	84.8	1360	16.5	75	
				0.7	0.21	CL-ML			72	25	6	81.3	1302	9.5	72	
				1.8	0.55	SC	14	64	22	22	7	98.8	1583	5.8	78	
RR-F-8	5050	1539	A5y	1.0	0.30	SM	29	54	17			99.2	1589	8.8	77	
				2.0	0.61	SM	30	41	29			92.2	1477	12.3	72	
RR-F-9	5030	1533	A5i	1.0	0.30	SC	6	55	39	37	18	79 8	1265	18.8	88	
				2.0	0.61	SM	22	64	14		NP	95.0	1522	8.0	74	
RR-F-10	4990	1521	A5y	1.0	0.30	SM	18	51	31			102.8	1647	12.8	81	
				2.0	0.61	SW-SM	44	49	7			105.8	1686	7.0	82	
RR-F-11	4960	1512	A5y	1.0	0.30	SM	2	63	35			92.0	1474	11.1	72	
				2.0	0.61	SM	18	54	28			91.0	1458	11.3	72	
RR-F-12	4855	1480	A4o	0.5	0.15	ML	0	21	79	28	6	76.5	1225	12.2	70	
				1.5	0.46	ML	0	18	82	45	15	62.3	998	23.0	74	
RR-F-13	4930	1503	A4o	2.5	0.76	SM	7	82	11			100.3	1607	8.8	83	

YED T OF OM TY	AVERAGE FIELD CBR (%)	REMARKS
	2	
	7	Stage I-II caliche, weak
	2	
	4	
	2	
	7	Stage II caliche, soft to moderately hard, CBR soft = 4; CBR hard = 14
	2	
	2	
	5	
	11	Field density not obtained due to soil caving
	8	
	8	Field density not obtained due to soil caving
	14	Desiccated
	8	Desiccated
	22	Stage I caliche, slightly indurated
	7	
	7	
	3	
	9	Stage I caliche, variable cementation, weak
	2	
	4	
	3	
	5	
	8	
	7	Desiccated and fissured in situ
	21	Stage I-II caliche, slightly indurated

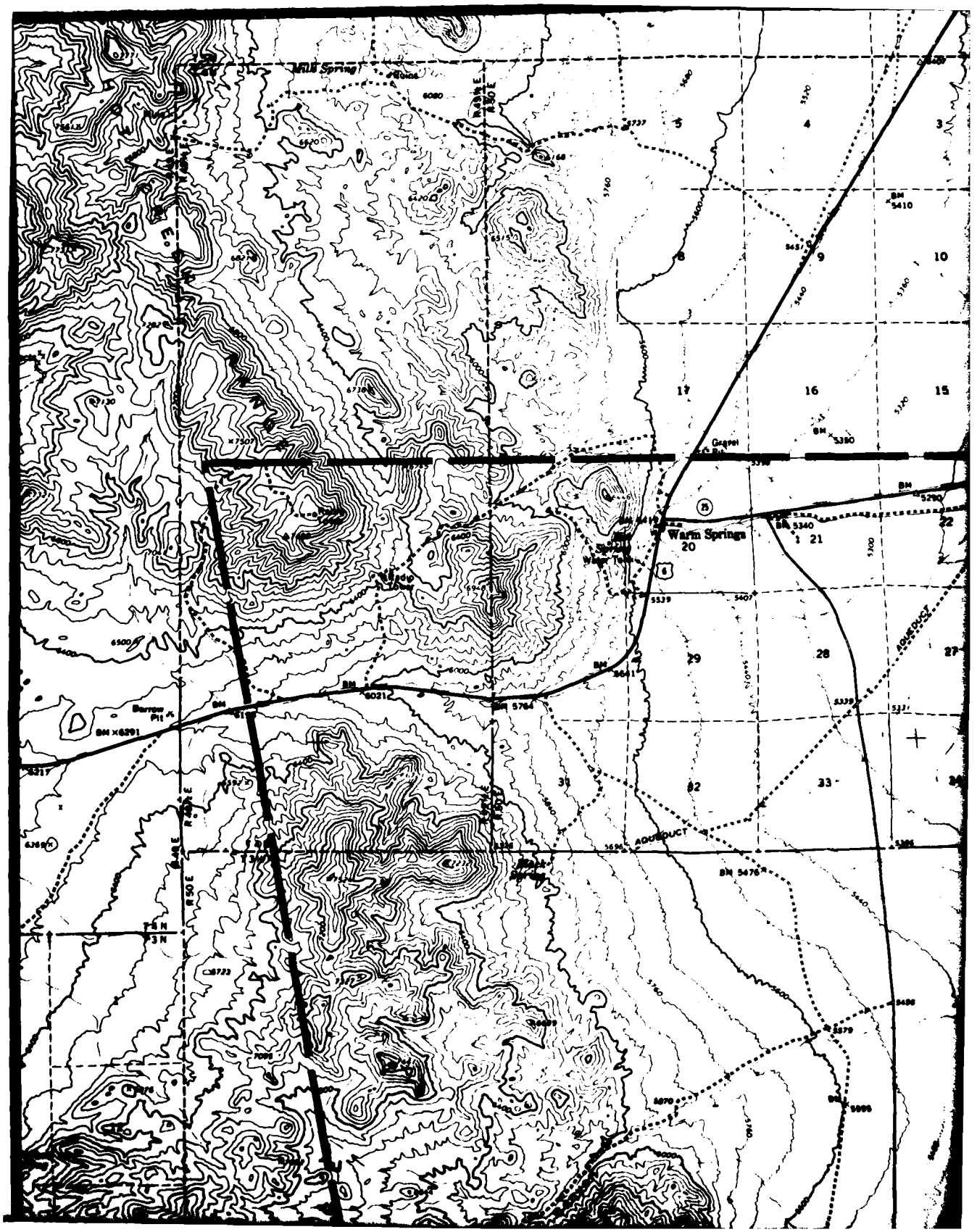
FIELD CBR TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD CDP, NEVADA

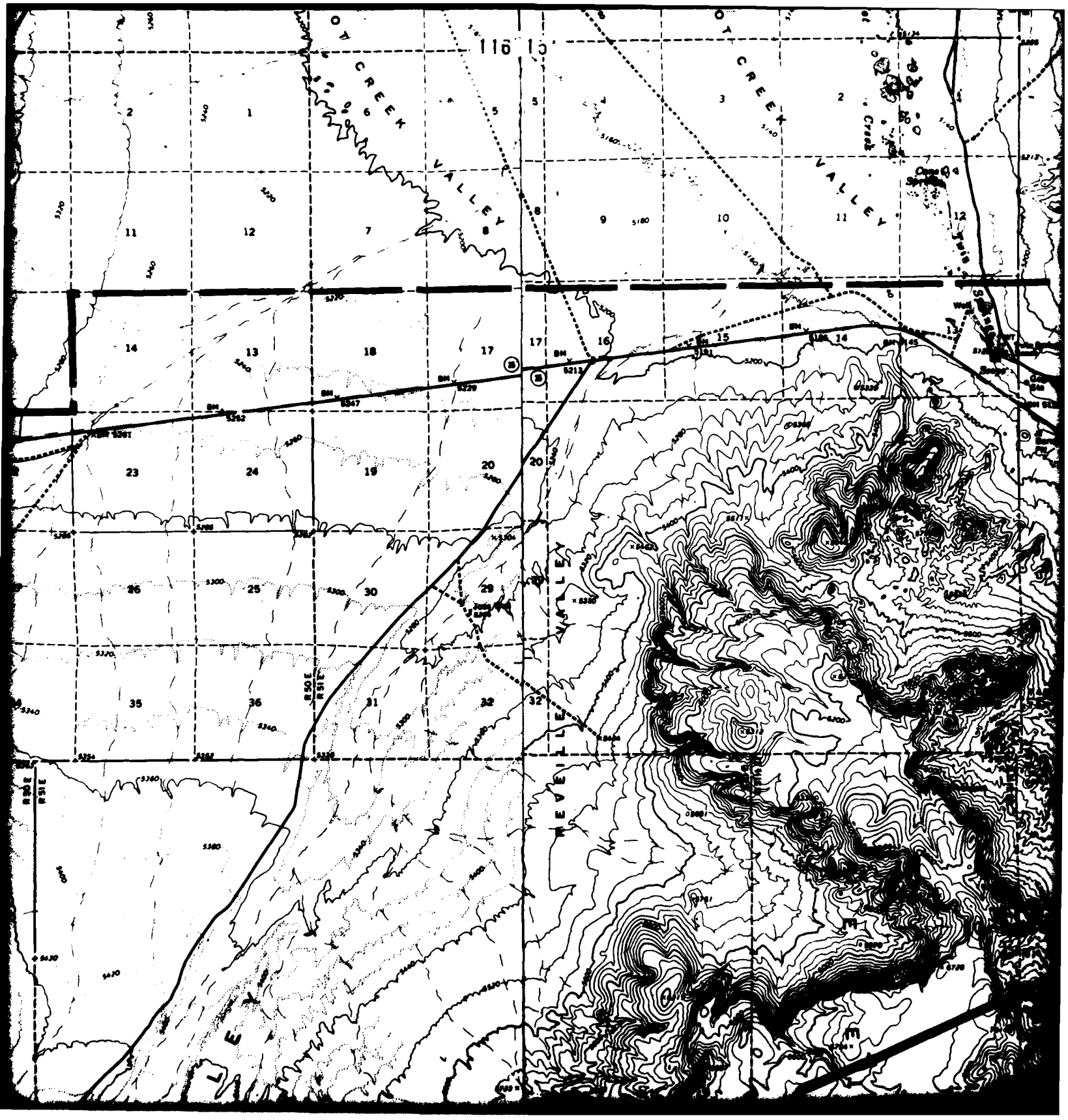
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

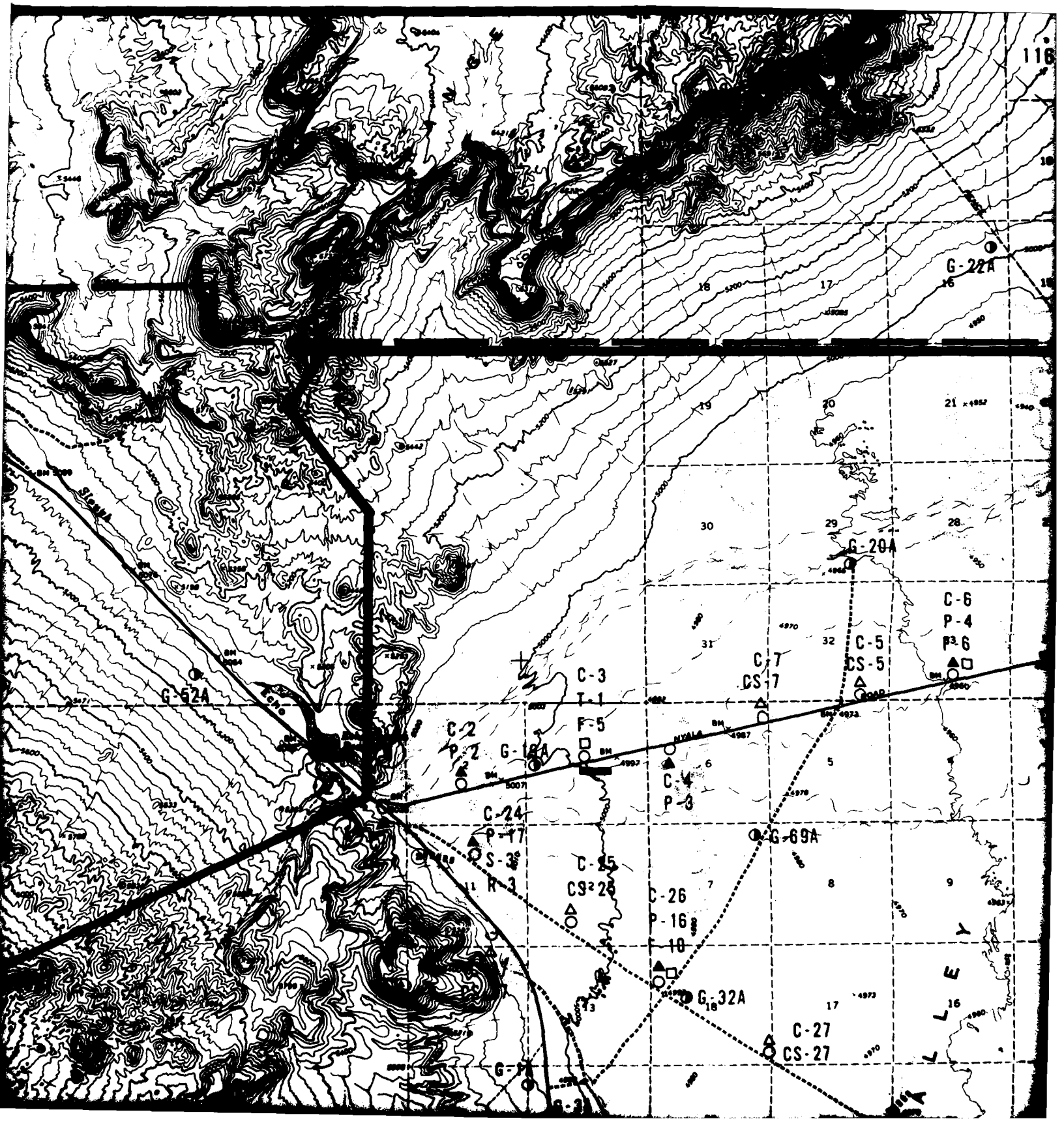
TABLE
10-1

FUGRO NATIONAL, INC.

AFV-22

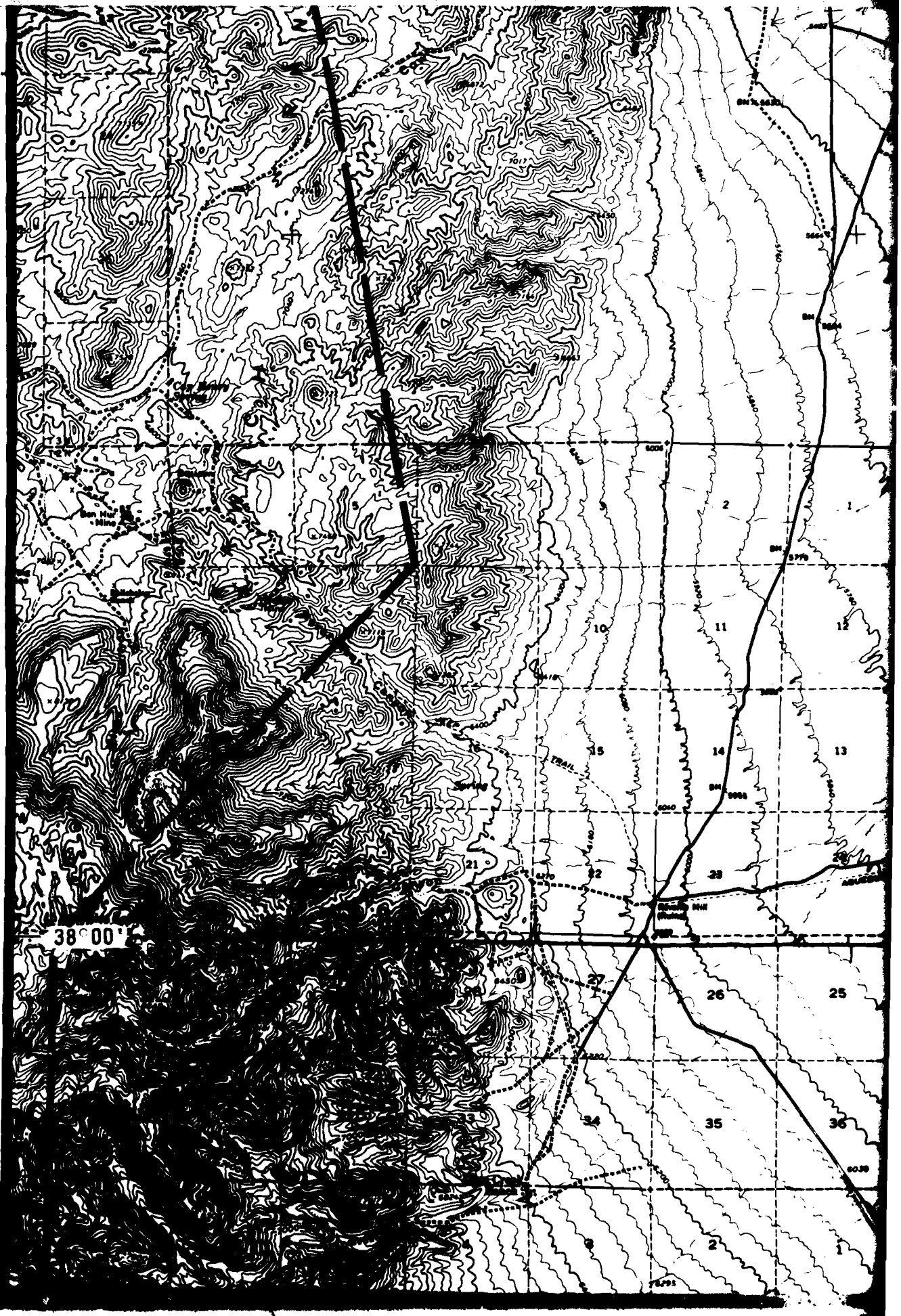

Warm Springs
AQUEDUCT
AQUEDUCT
R 8 E
R 9 E
R 10 E
T 4 N
T 3 N
Gravel Pit
Borrow Pit
Spring
Ruins
Radio Tower
Water Tank
BM 5410
BM 5340
BM 5290
BM 5350
BM 5764
BM 5476
BM 5021
BM 5641
BM X6291
BM 5339
BM 5379
BM 5070
BM 5096
BM 5400
BM 5439
BM 5539
BM 5317
BM 5337
BM 5296
BM 5360
BM 5440
BM 5460
BM 5480
BM 5500
BM 5520
BM 5540
BM 5560
BM 5580
BM 5600
BM 5620
BM 5640
BM 5660
BM 5680
BM 5700
BM 5720
BM 5740
BM 5760
BM 5780
BM 5800
BM 5820
BM 5840
BM 5860
BM 5880
BM 5900
BM 5920
BM 5940
BM 5960
BM 5980
BM 6000
BM 6020
BM 6040
BM 6060
BM 6080
BM 6100
BM 6120
BM 6140
BM 6160
BM 6180
BM 6200
BM 6220
BM 6240
BM 6260
BM 6280
BM 6300
BM 6320
BM 6340
BM 6360
BM 6380
BM 6400
BM 6420
BM 6440
BM 6460
BM 6480
BM 6500
BM 6520
BM 6540
BM 6560
BM 6580
BM 6600
BM 6620
BM 6640
BM 6660
BM 6680
BM 6700
BM 6720
BM 6740
BM 6760
BM 6780
BM 6800
BM 6820
BM 6840
BM 6860
BM 6880
BM 6900
BM 6920
BM 6940
BM 6960
BM 6980
BM 7000
BM 7020
BM 7040
BM 7060
BM 7080
BM 7100
BM 7120
BM 7140
BM 7160
BM 7180
BM 7200
BM 7220
BM 7240
BM 7260
BM 7280
BM 7300
BM 7320
BM 7340
BM 7360
BM 7380
BM 7400
BM 7420
BM 7440
BM 7460
BM 7480
BM 7500
BM 7520
BM 7540
BM 7560
BM 7580
BM 7600
BM 7620
BM 7640
BM 7660
BM 7680
BM 7700
BM 7720
BM 7740
BM 7760
BM 7780
BM 7800
BM 7820
BM 7840
BM 7860
BM 7880
BM 7900
BM 7920
BM 7940
BM 7960
BM 7980
BM 8000
BM 8020
BM 8040
BM 8060
BM 8080
BM 8100
BM 8120
BM 8140
BM 8160
BM 8180
BM 8200
BM 8220
BM 8240
BM 8260
BM 8280
BM 8300
BM 8320
BM 8340
BM 8360
BM 8380
BM 8400
BM 8420
BM 8440
BM 8460
BM 8480
BM 8500
BM 8520
BM 8540
BM 8560
BM 8580
BM 8600
BM 8620
BM 8640
BM 8660
BM 8680
BM 8700
BM 8720
BM 8740
BM 8760
BM 8780
BM 8800
BM 8820
BM 8840
BM 8860
BM 8880
BM 8900
BM 8920
BM 8940
BM 8960
BM 8980
BM 9000
BM 9020
BM 9040
BM 9060
BM 9080
BM 9100
BM 9120
BM 9140
BM 9160
BM 9180
BM 9200
BM 9220
BM 9240
BM 9260
BM 9280
BM 9300
BM 9320
BM 9340
BM 9360
BM 9380
BM 9400
BM 9420
BM 9440
BM 9460
BM 9480
BM 9500
BM 9520
BM 9540
BM 9560
BM 9580
BM 9600
BM 9620
BM 9640
BM 9660
BM 9680
BM 9700
BM 9720
BM 9740
BM 9760
BM 9780
BM 9800
BM 9820
BM 9840
BM 9860
BM 9880
BM 9900
BM 9920
BM 9940
BM 9960
BM 9980
BM 10000

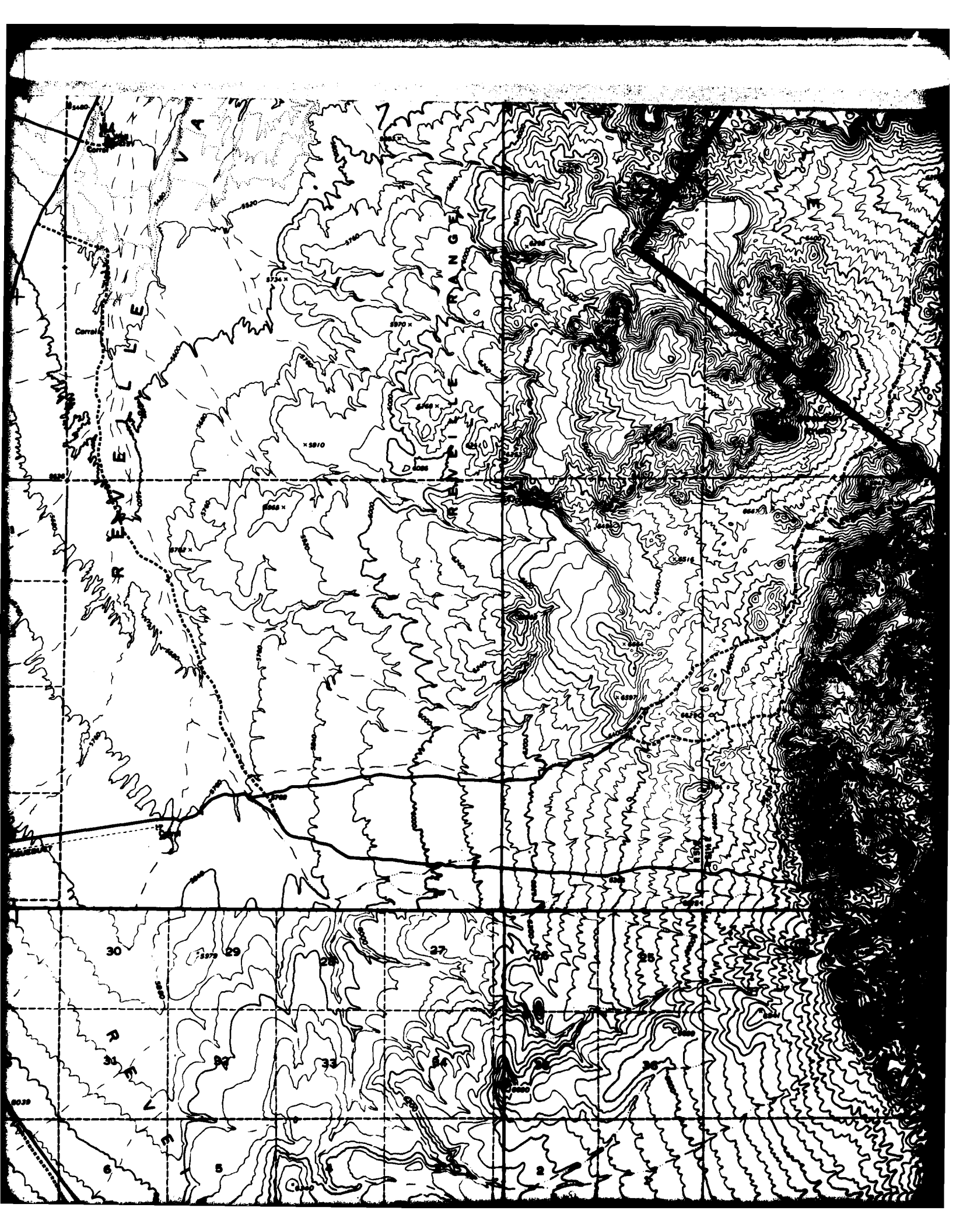

OT CREEK VALLEY
OT CREEK VALLEY
WEAVER VALLEY
LEY
RSOE
RSIE

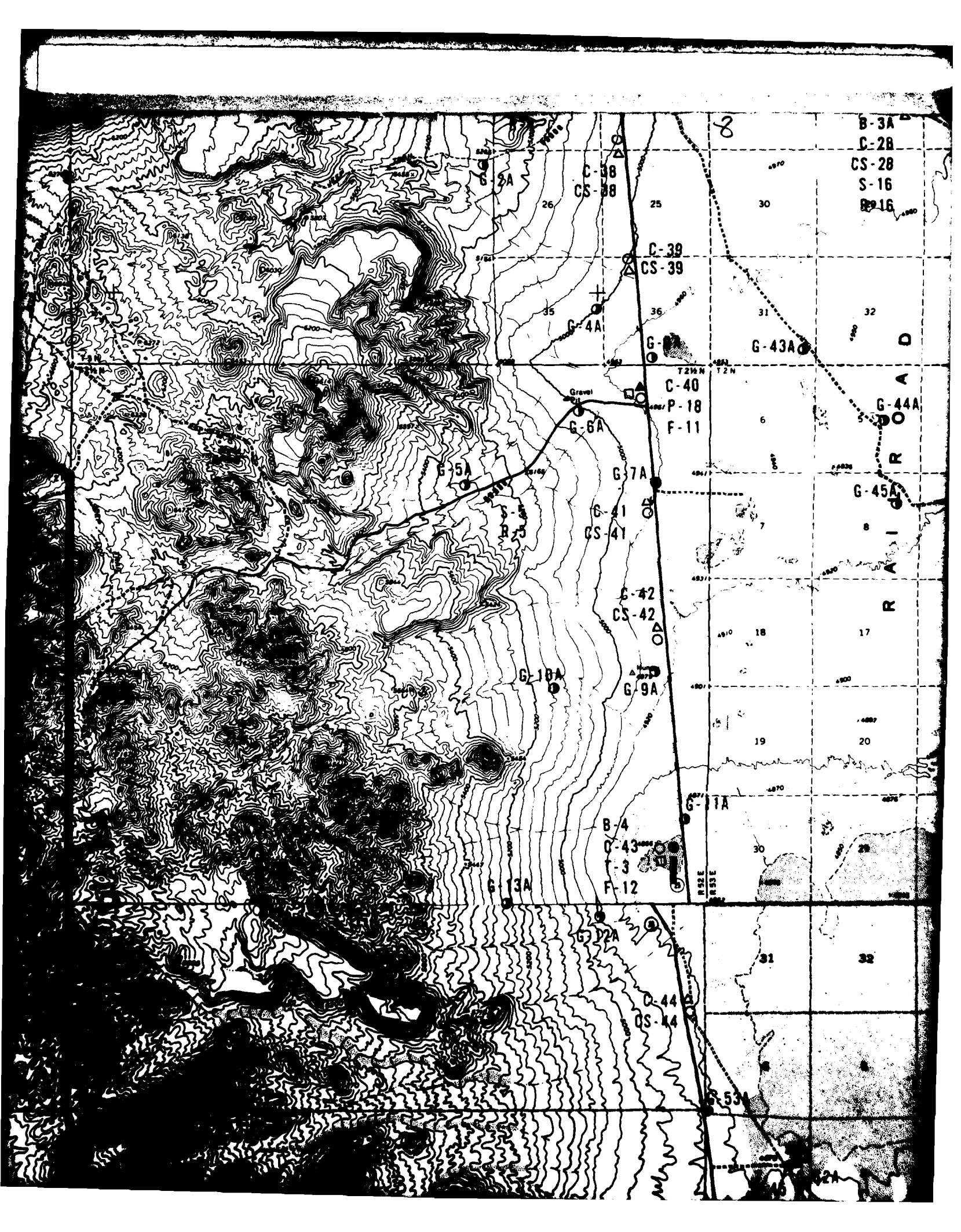

116
G-22A
G-20A
C-6
P-4
P-6
C-5
CS-5
C-7
CS-7
C-3
T-1
F-5
C-2
P-2
G-16A
C-4
P-3
G-52A
C-24
P-17
S-3
R-3
G-69A
C-25
CS-26
C-26
P-16
T-18
G-32A
C-27
CS-27
G-P1
NYALA
ECHO
SIERRA
17
16
18
19
20
21
30
29
28
31
32
5
6
7
8
9
11
13

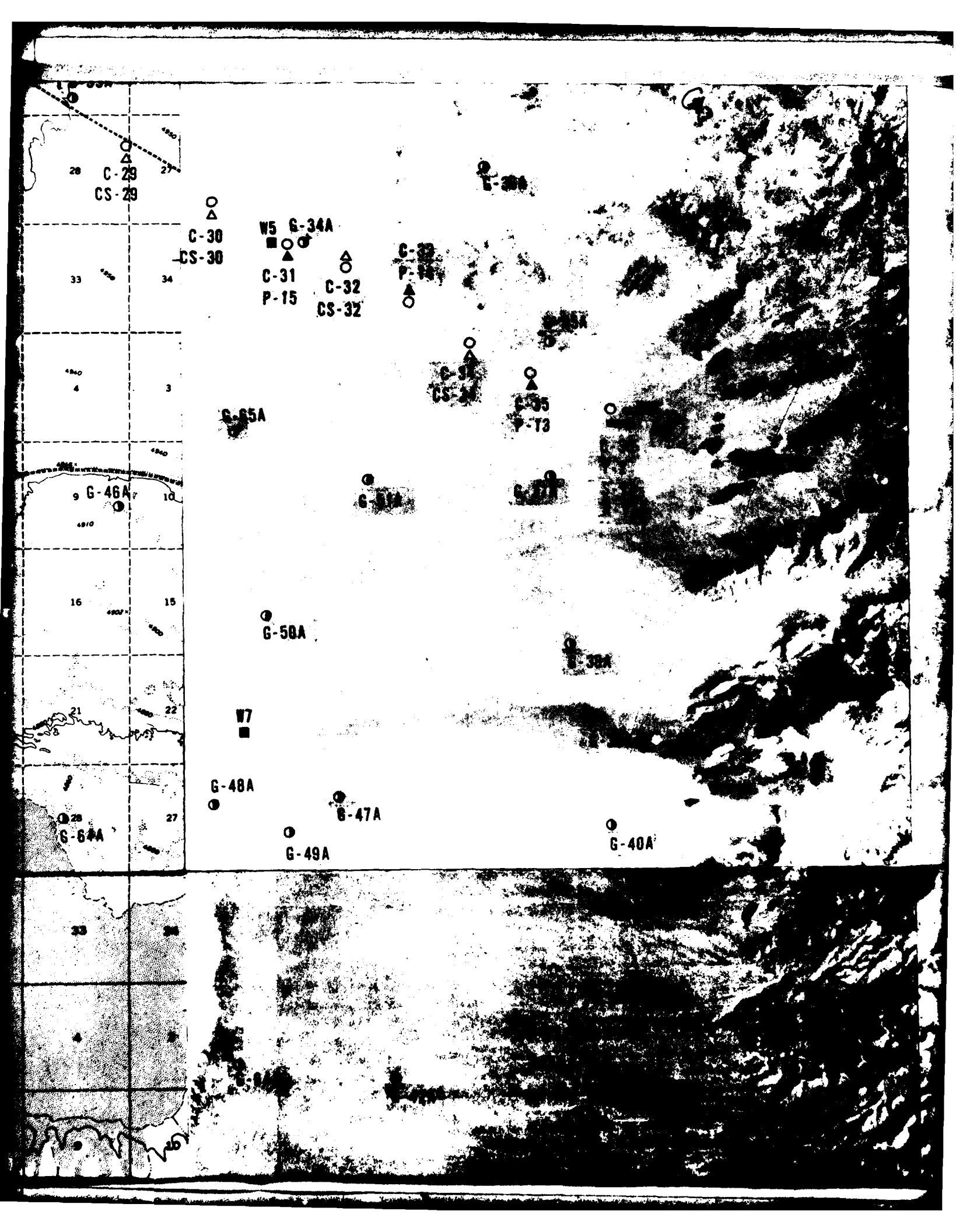

C-20
CS-20
G-66A


C-20
CS-20

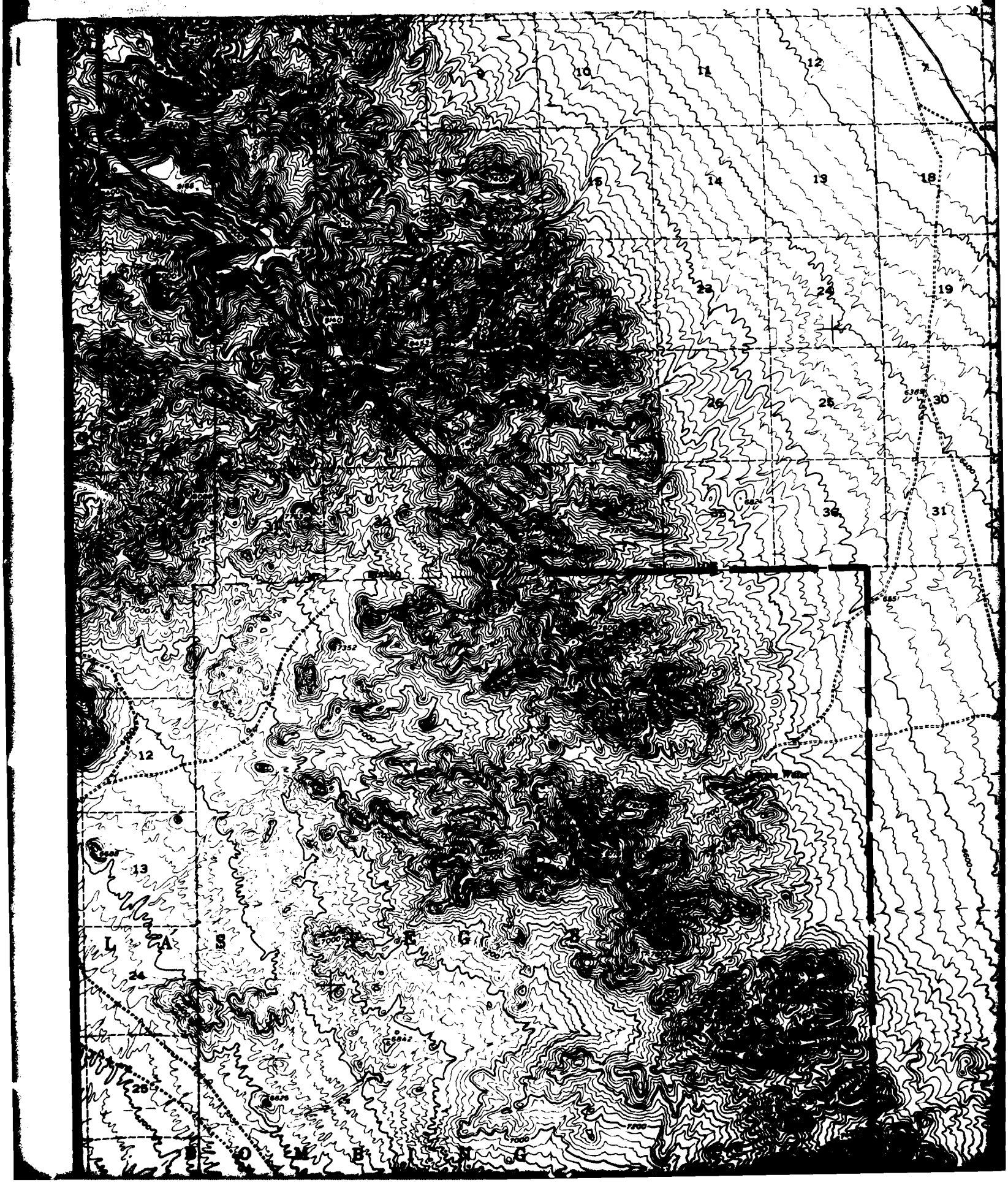

38°00'
Ben Hur Mine
Cow Camp
Spring
TRAIL
Spring
Black Mountain
1
2
10
11
12
13
14
15
21
22
23
25
26
27
34
35
36

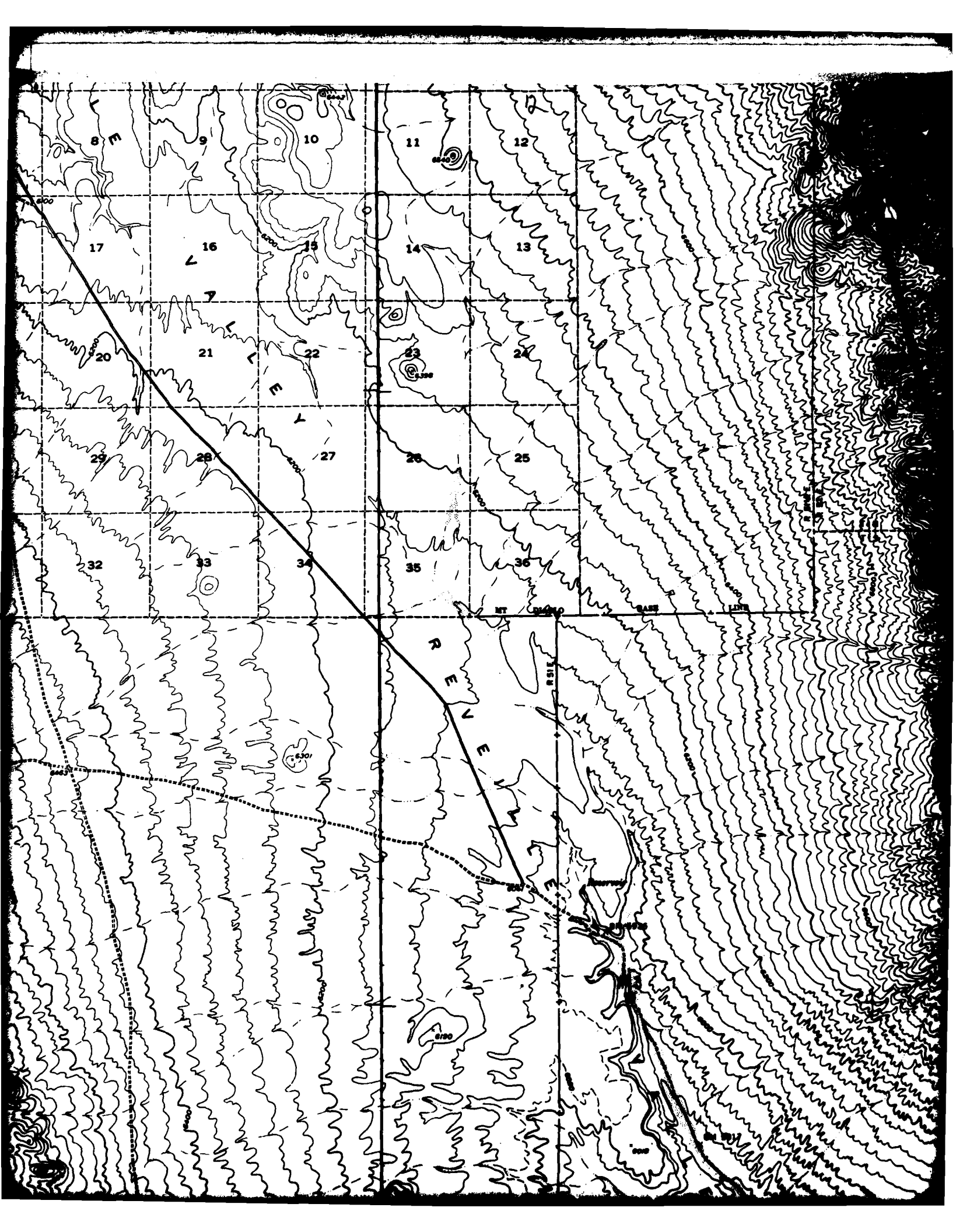

VALLEY
RUBY MOUNTAIN RANGE
Corral
5734
5970
5910
5866
5762
5516
5597
5979
30
29
28
27
26
25
31
32
33
34
35
36
6
5
4
3
2
1

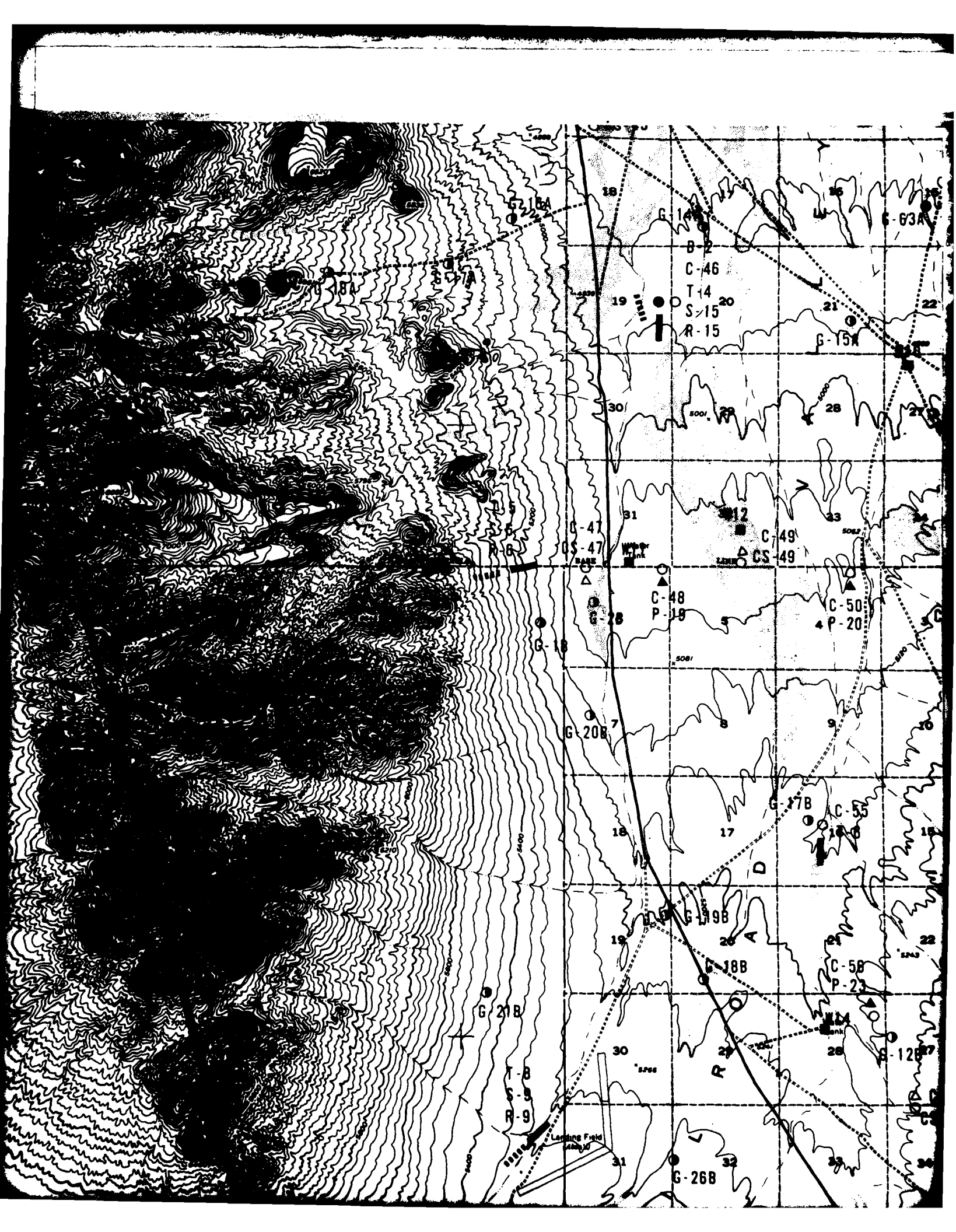

B-3A
C-28
CS-28
S-16
P-16
C-38
CS-38
G-2A
C-39
CS-39
G-4A
G-43A
C-40
P-18
F-11
G-44A
G-6A
G-5A
G-7A
G-45A
C-41
CS-41
C-42
CS-42
G-10A
G-9A
G-11A
B-4
C-43
T-3
F-12
G-13A
G-12A
C-44
CS-44
G-53
Gravel Pit
T2N
T2½N
R5
R52E
R53E
25
26
30
31
32
35
36
6
7
8
17
18
19
20


C-29
CS-29
C-30
CS-30
W5
G-34A
C-31
P-15
C-32
CS-32
G-65A
P-T3
G-46A
G-50A
W7
G-48A
G-47A
G-49A
G-40A
G-64A


38°00'


LAS VEGAS

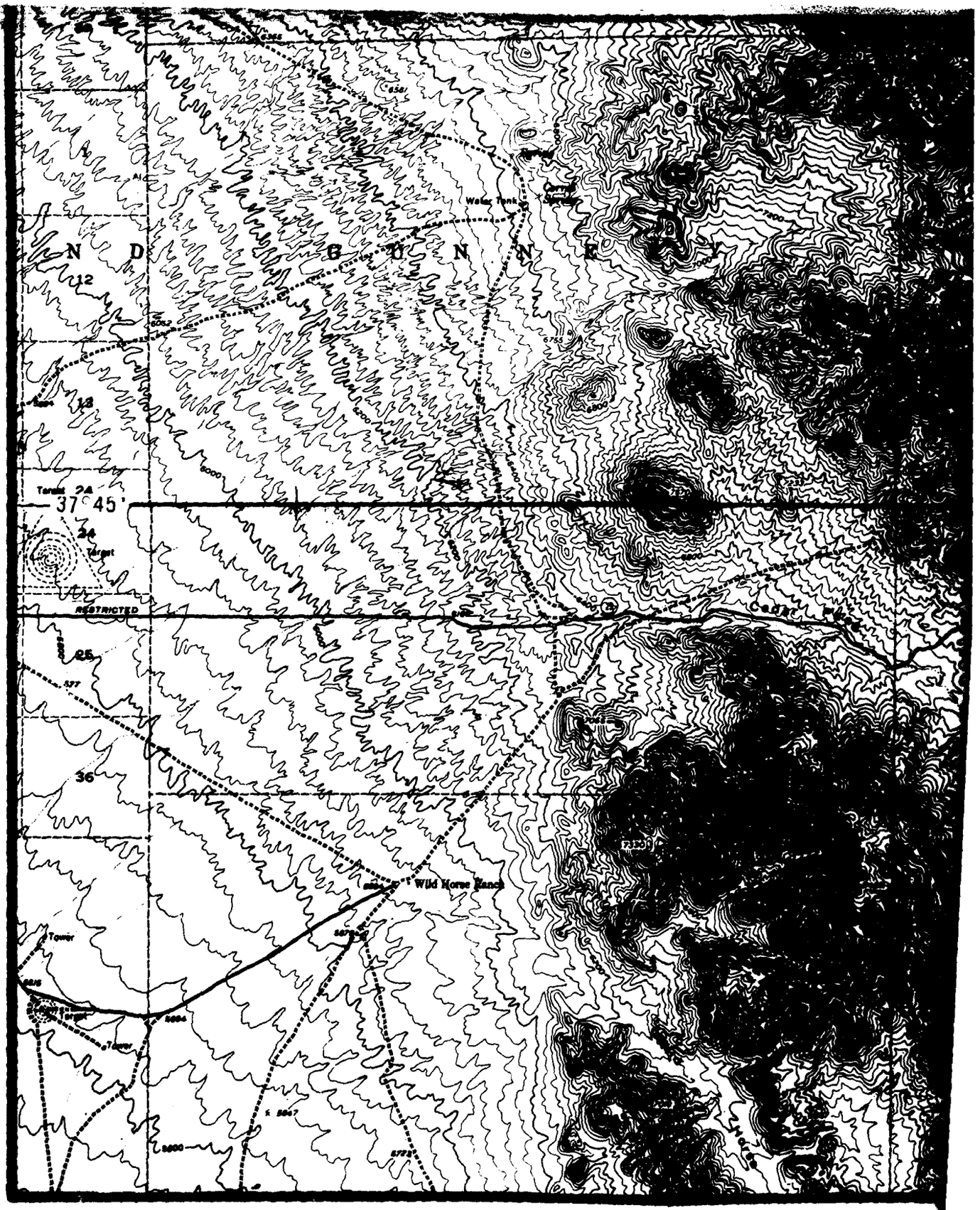

LEVELLE
LEVELLE
LEVELLE
8
9
10
11
12
17
16
15
14
13
20
21
22
23
24
29
28
27
26
25
32
33
34
35
36
MT DIABLO BASE LINE
RISE
6301


G-14
B-2
C-46
T-14
S-15
R-15
G-15A
G-13A
G-18A
G-16A
C-47
CS-47
R-6
C-48
P-19
G-18
C-49
CS-49
C-50
P-20
G-20B
G-17B
C-5
G-19B
G-18B
C-5B
P-23
G-21B
T-8
S-9
R-9
G-12B
G-26B
Landing Field


G-58A
G-56A
G-11B

EXPLANATION

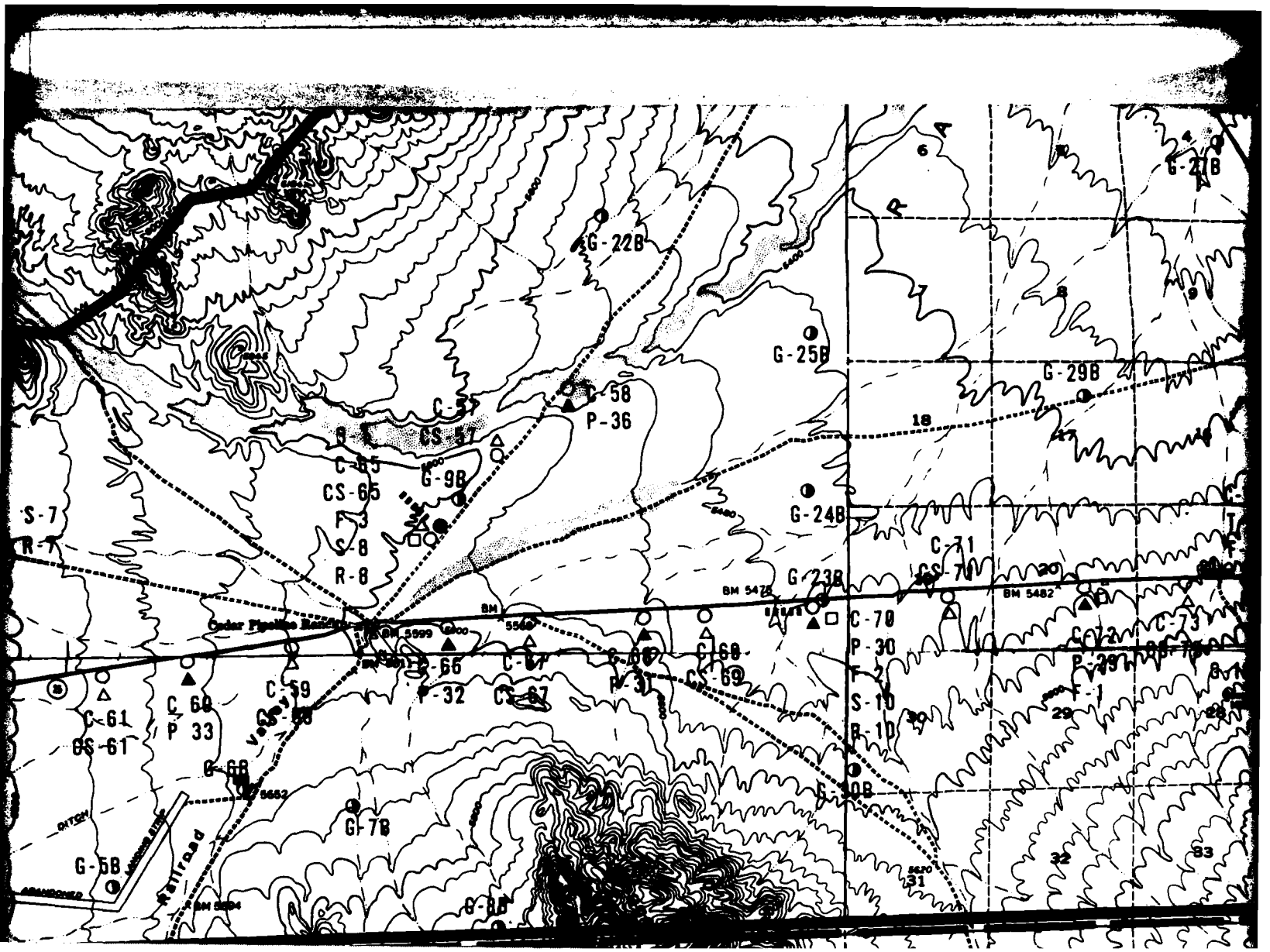
- ◑ G-1A GEOLOGIC STATION
- ■ W1 GROUND WATER LEVEL MEASUREMENT
- ● B-1 BORING
- ○ C-1 CONE PENETROMETER TEST (CPT)
- △ CS-1 SURFACE SAMPLE AT CPT LOCATION
- ▬ T-1 TRENCH
- ▲ P-1 TEST PIT
- ▪▪▪▪▪ S-1 SEISMIC REFRACTION LINE
- R-1 ELECTRICAL RESISTIVITY LINE

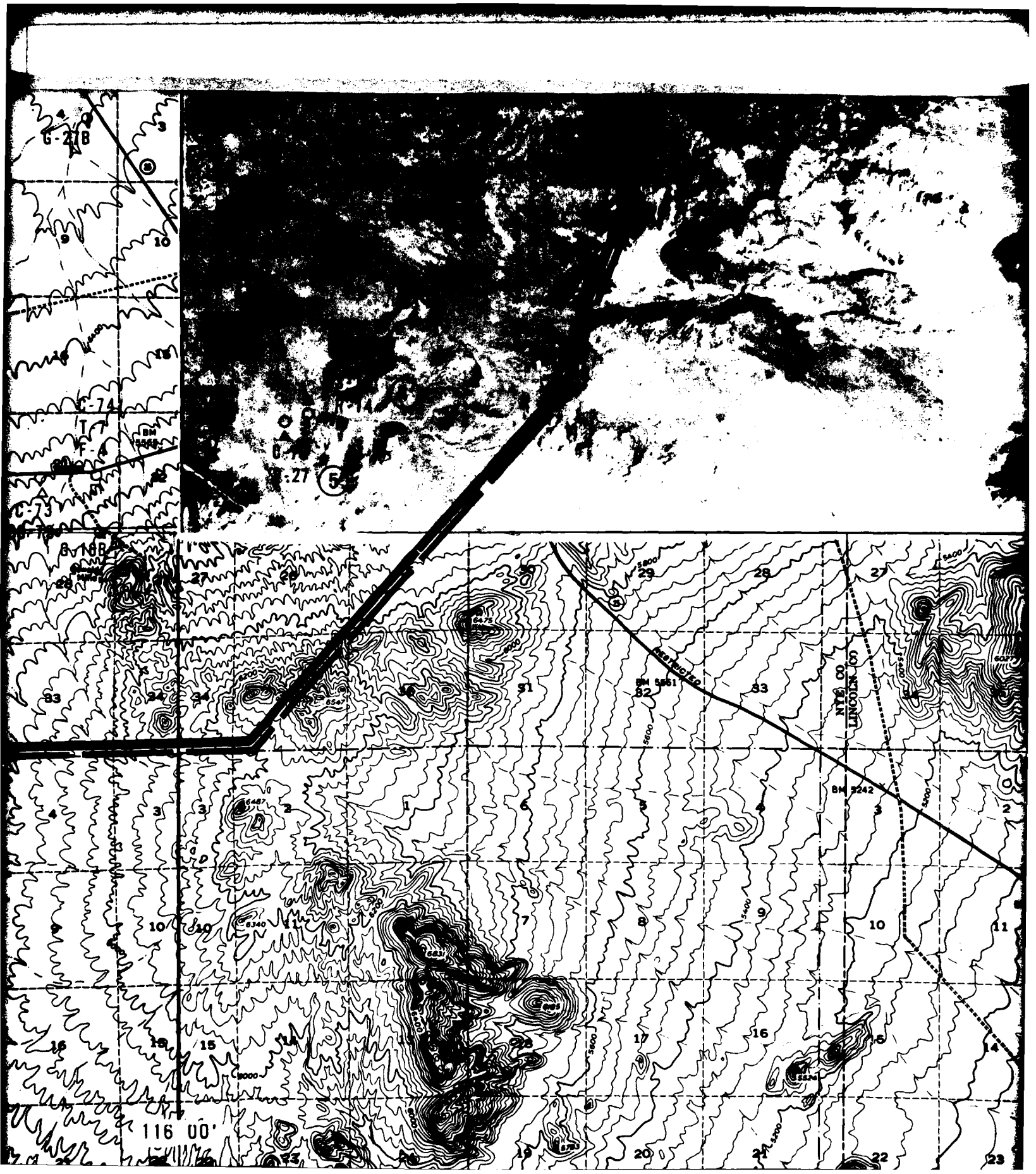

N D
Water Tank
12
13
24
37° 45'
Airpt
RESTRICTED
25
36
Wild Horse Ranch
Tower

2 JUL 79

16

BOMBING
GUNNERY
G-64
P-35
G-31
P-63
C-83
G-62
P-34
G-28
S-7
BM 6757
BM 6230
116° 15'


G-22B
G-25B
G-29B
G-24B
G-23B
C-58
P-36
CS-57
C-65
CS-65
G-9B
S-7
R-7
F-3
C-8
R-8
C-71
CS-70
C-70
P-30
F-2
S-10
R-10
G-10B
C-66
P-32
CS-67
C-68
C-69
P-31
C-61
CS-61
C-60
P-33
G-6B
G-7B
G-5B
C-59
CS-59
Railroad
BM 5482
BM 5499
BM 5560
BM 5504
BM 5552
6
18
20
30
29
28
32
33
31


G-21B
C-74
T-7
F-4
C-73
G-18B
BM 5861
BM 5242
NTS
LINCOLN CO
116 00'

FIELD CALIFORNIA BEARING RATIO (CBR) TEST

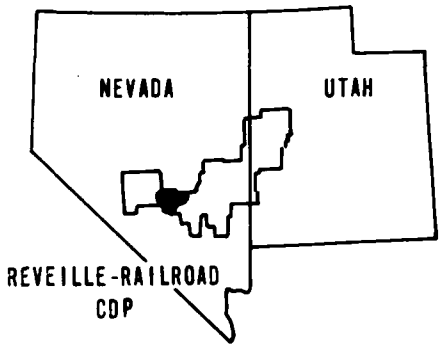
1 — 1' ACTIVITY LINE

VERIFICATION SITE BOUNDARY

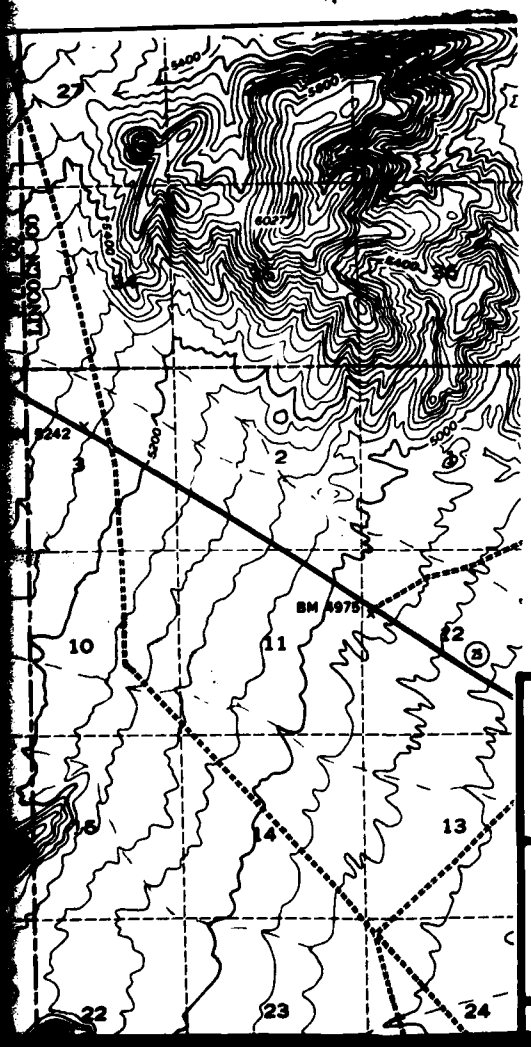
CANDIDATE DEPLOYMENT PARCEL (CDP) BOUNDARY

NOTE: Where muliple activities were performed at the same location, the correct location is designated by either (1) the boring symbol or (2) the CPT symbol, if no boring was drilled

LOCATION MAP



37°45'



0 1 2 3
STATUTE MILES

0 1 2 3
NAUTICAL MILES

0 5,000 10,000
FEET

0 1 2 3
KILOMETERS

ACTIVITY LOCATION MAP
REVEILLE-RAILROAD CDP, NEVADA

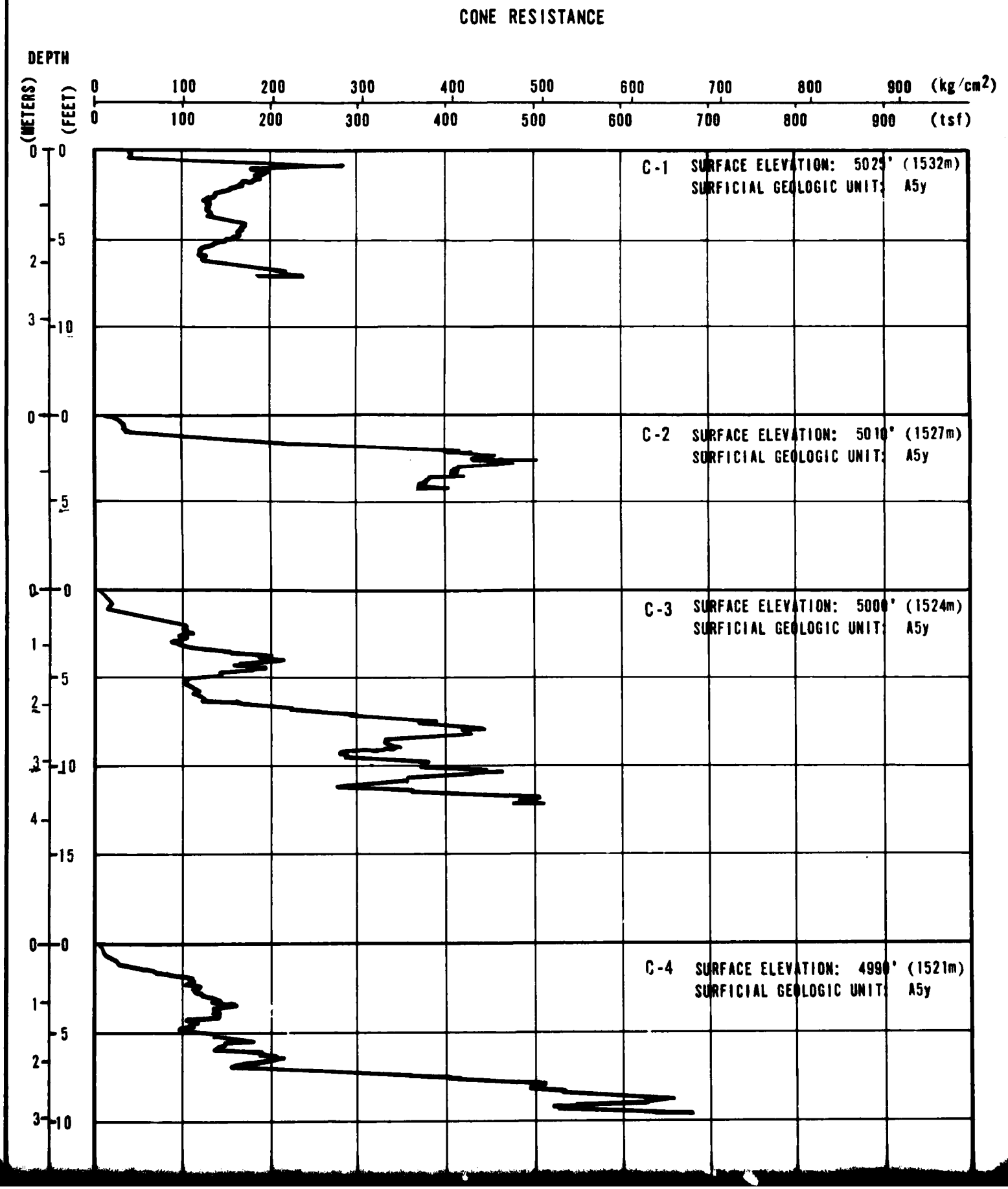
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

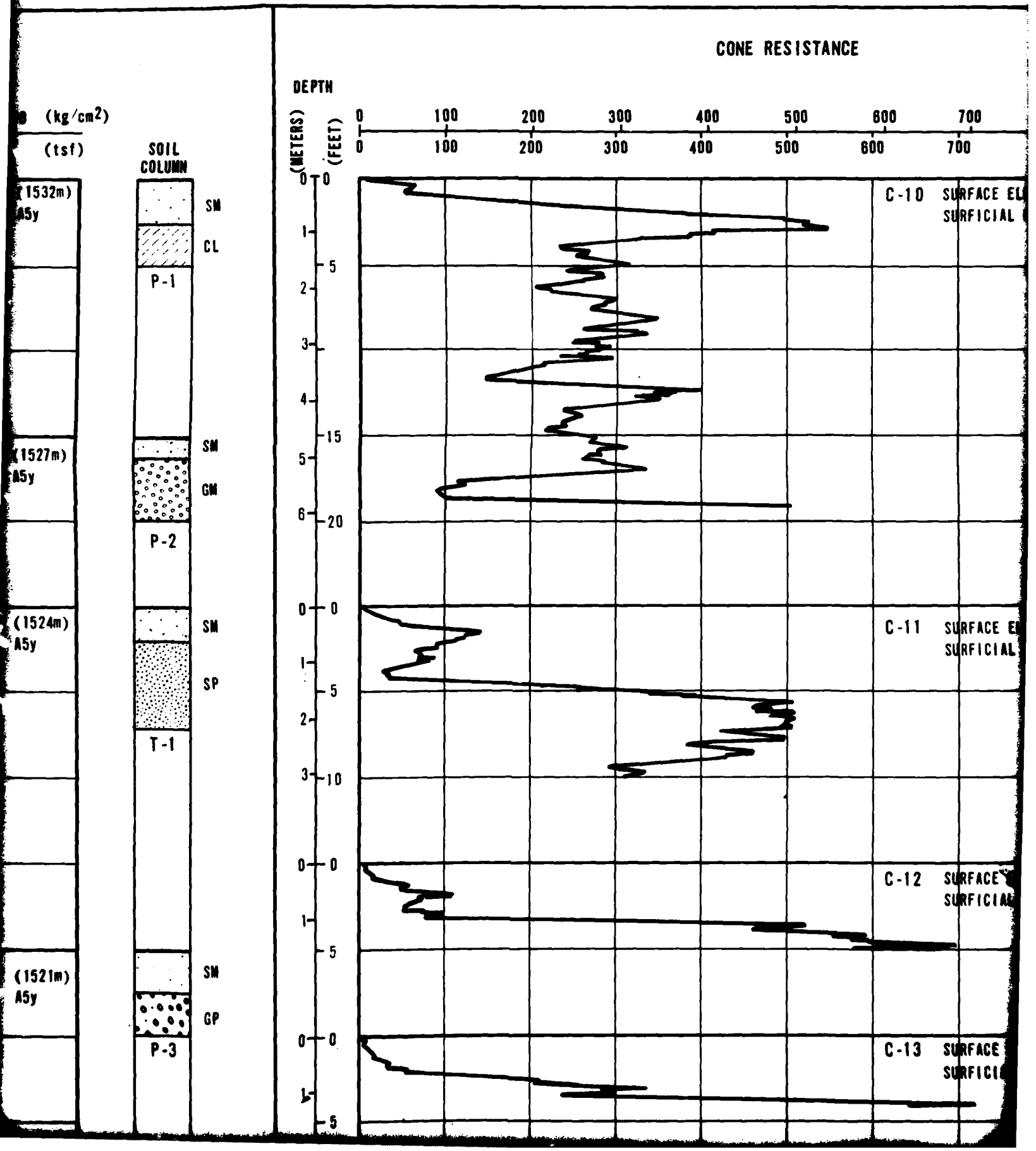
DRAWING
1

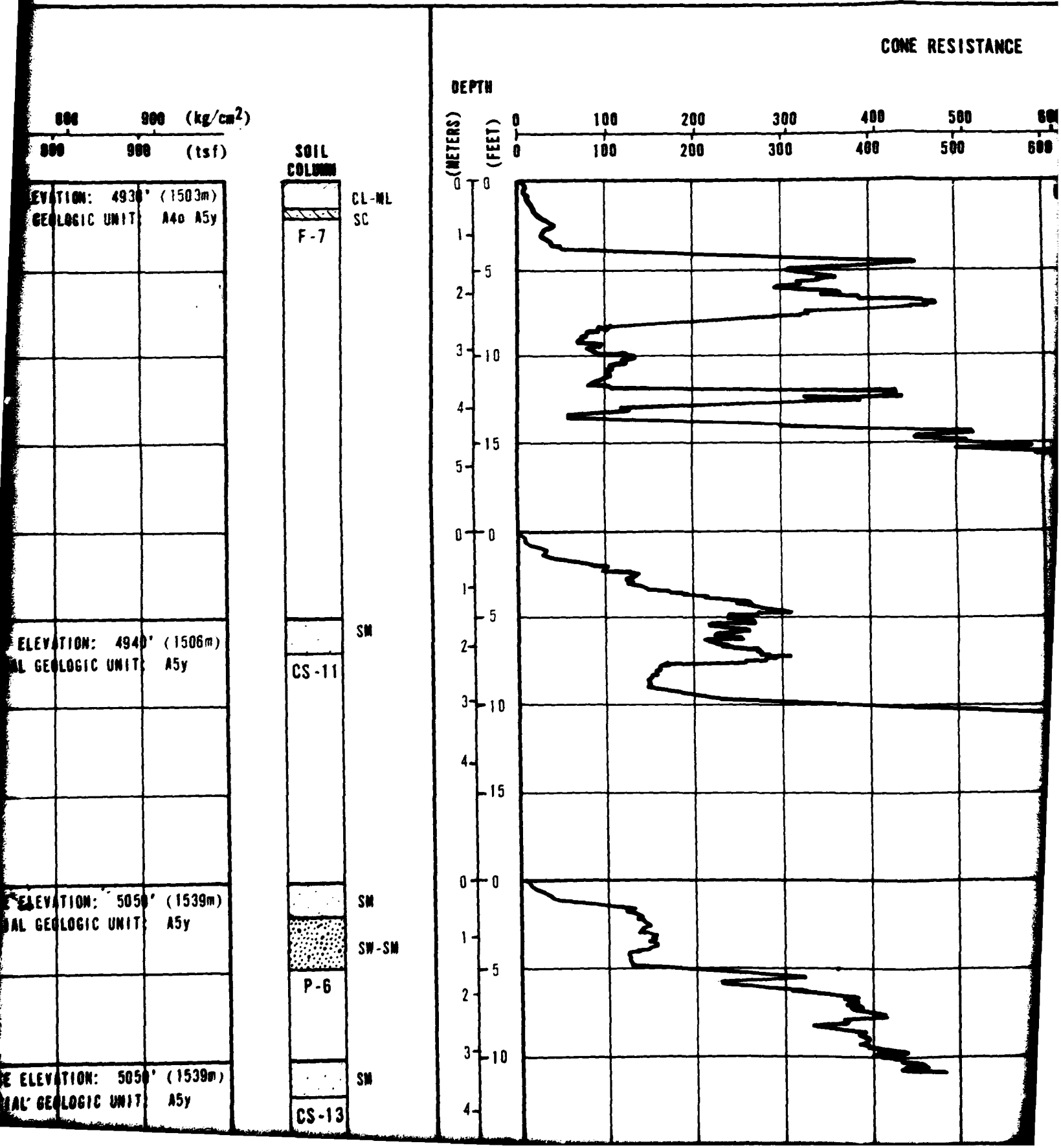
FUGRO NATIONAL, INC.

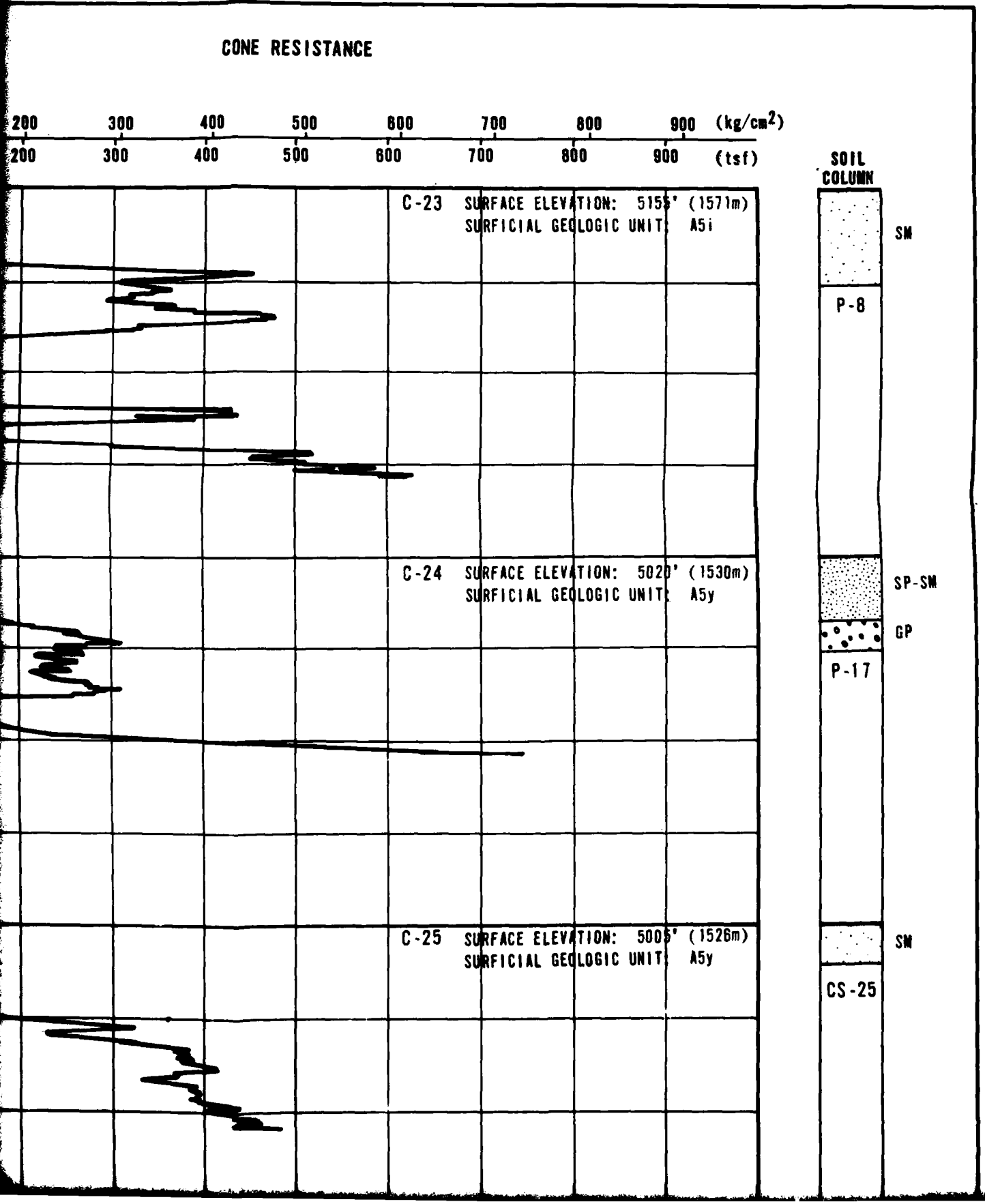
20

FN-TR-27-VII

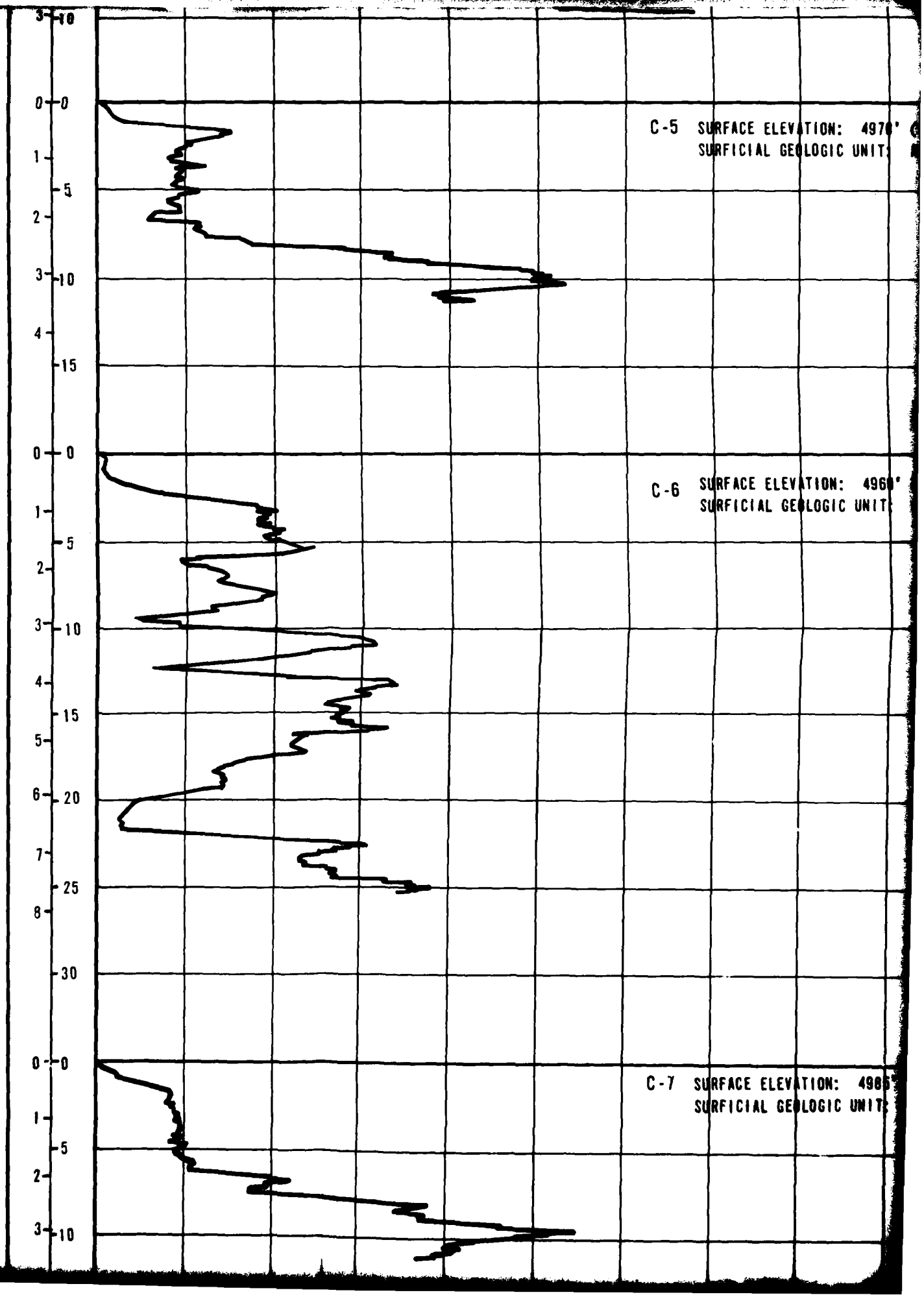

CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0 100 200 300 400 500 600 700 800 900 (kg/cm2)
0 100 200 300 400 500 600 700 800 900 (tsf)
C-1 SURFACE ELEVATION: 5025' (1532m)
SURFICIAL GEOLOGIC UNIT: A5y
C-2 SURFACE ELEVATION: 5010' (1527m)
SURFICIAL GEOLOGIC UNIT: A5y
C-3 SURFACE ELEVATION: 5000' (1524m)
SURFICIAL GEOLOGIC UNIT: A5y
C-4 SURFACE ELEVATION: 4990' (1521m)
SURFICIAL GEOLOGIC UNIT: A5y

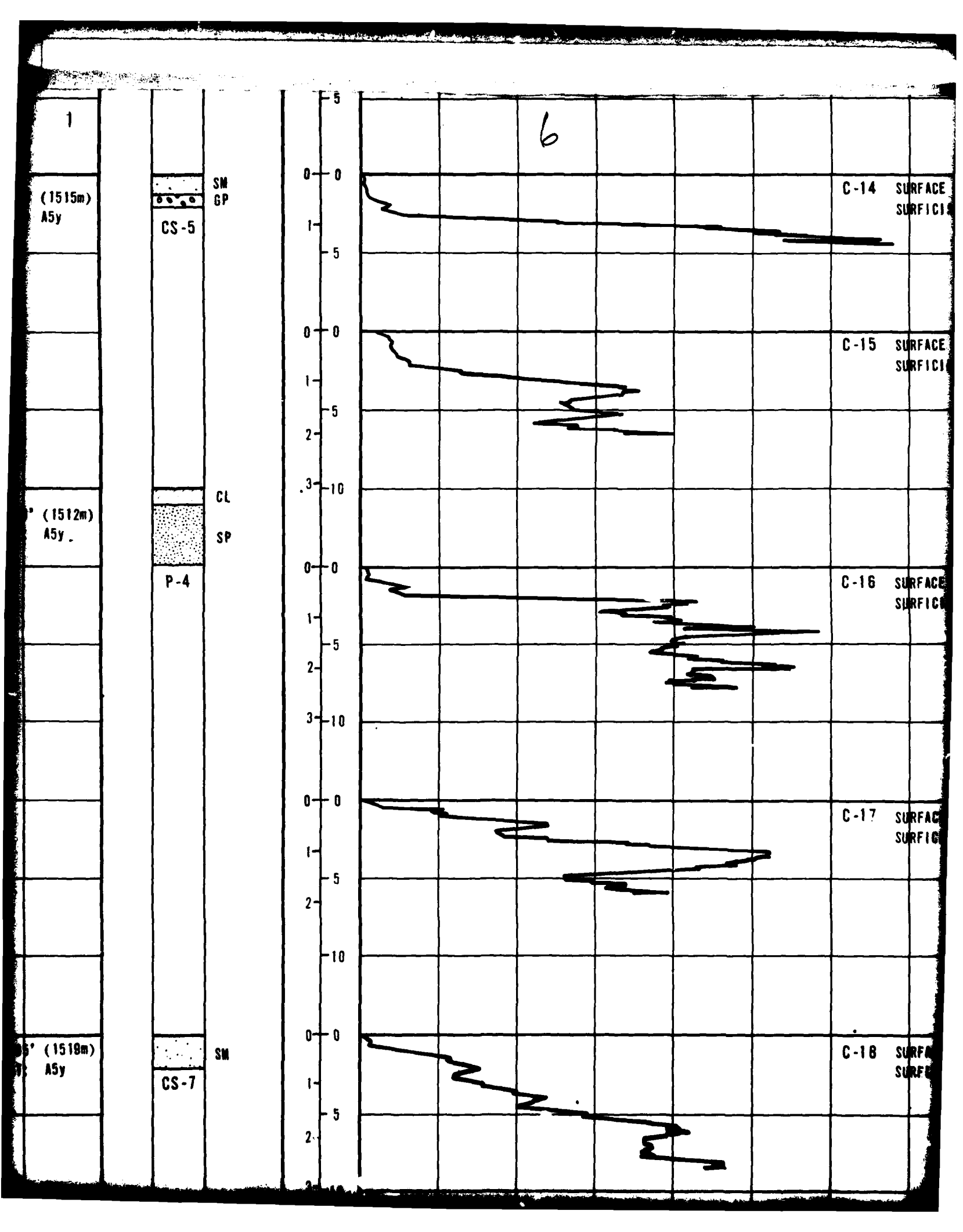

(kg/cm2)
(tsf)
SOIL COLUMN
(1532m)
A5y
(1527m)
A5y
(1524m)
A5y
(1521m)
A5y
SM
CL
P-1
SM
GM
P-2
SM
SP
T-1
SM
GP
P-3
CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
600
700
C-10 SURFACE EL
SURFICIAL
C-11 SURFACE E
SURFICIAL
C-12 SURFACE
SURFICIA
C-13 SURFACE
SURFICI

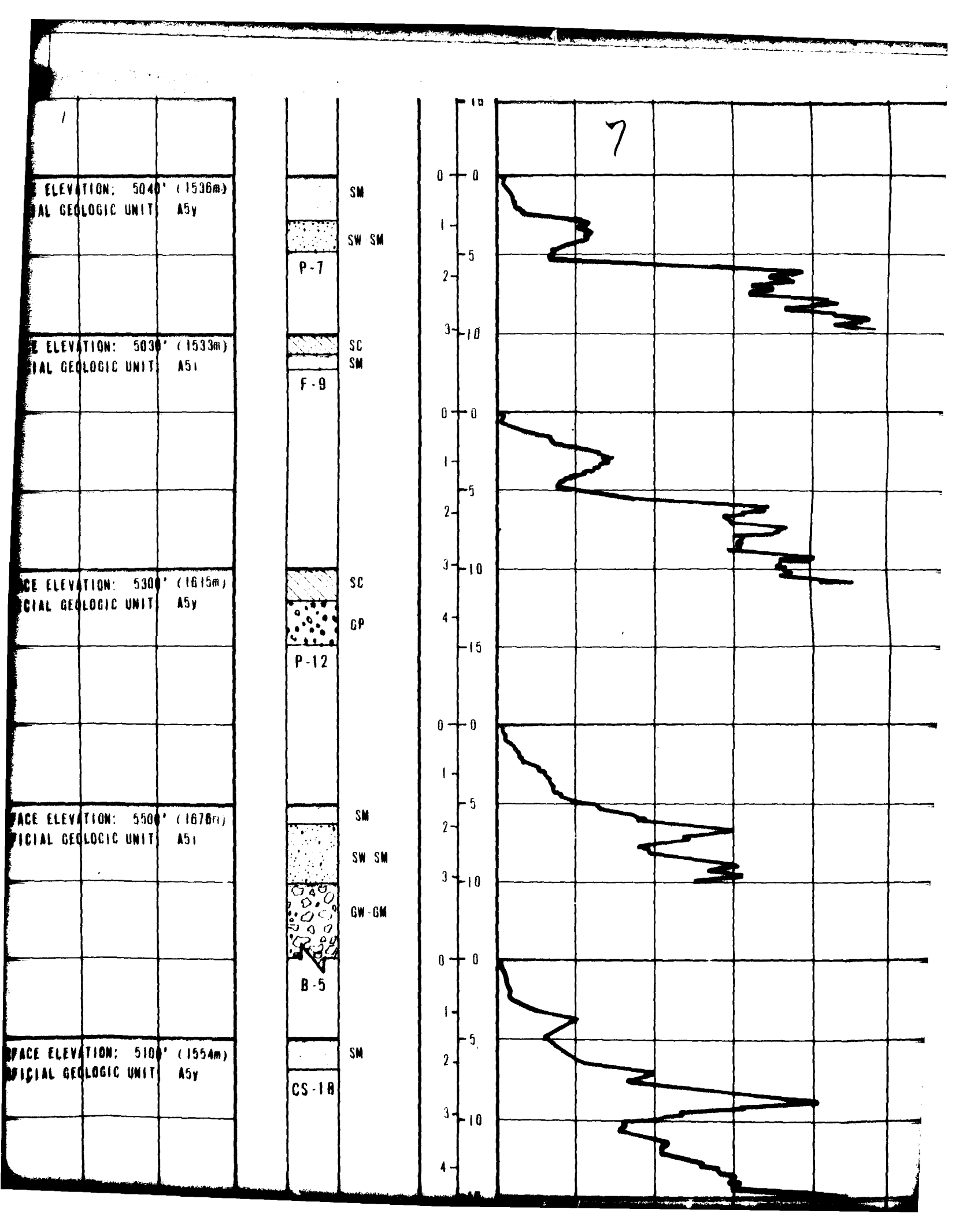

CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
(kg/cm²)
(tsf)
SOIL COLUMN
CL-ML
SC
F-7
SM
CS-11
SM
SW-SM
P-6
SM
CS-13
ELEVATION: 4938' (1503m)
GEOLOGIC UNIT: A4o A5y
ELEVATION: 4940' (1506m)
GEOLOGIC UNIT: A5y
ELEVATION: 5050' (1539m)
GEOLOGIC UNIT: A5y
ELEVATION: 5050' (1539m)
GEOLOGIC UNIT: A5y

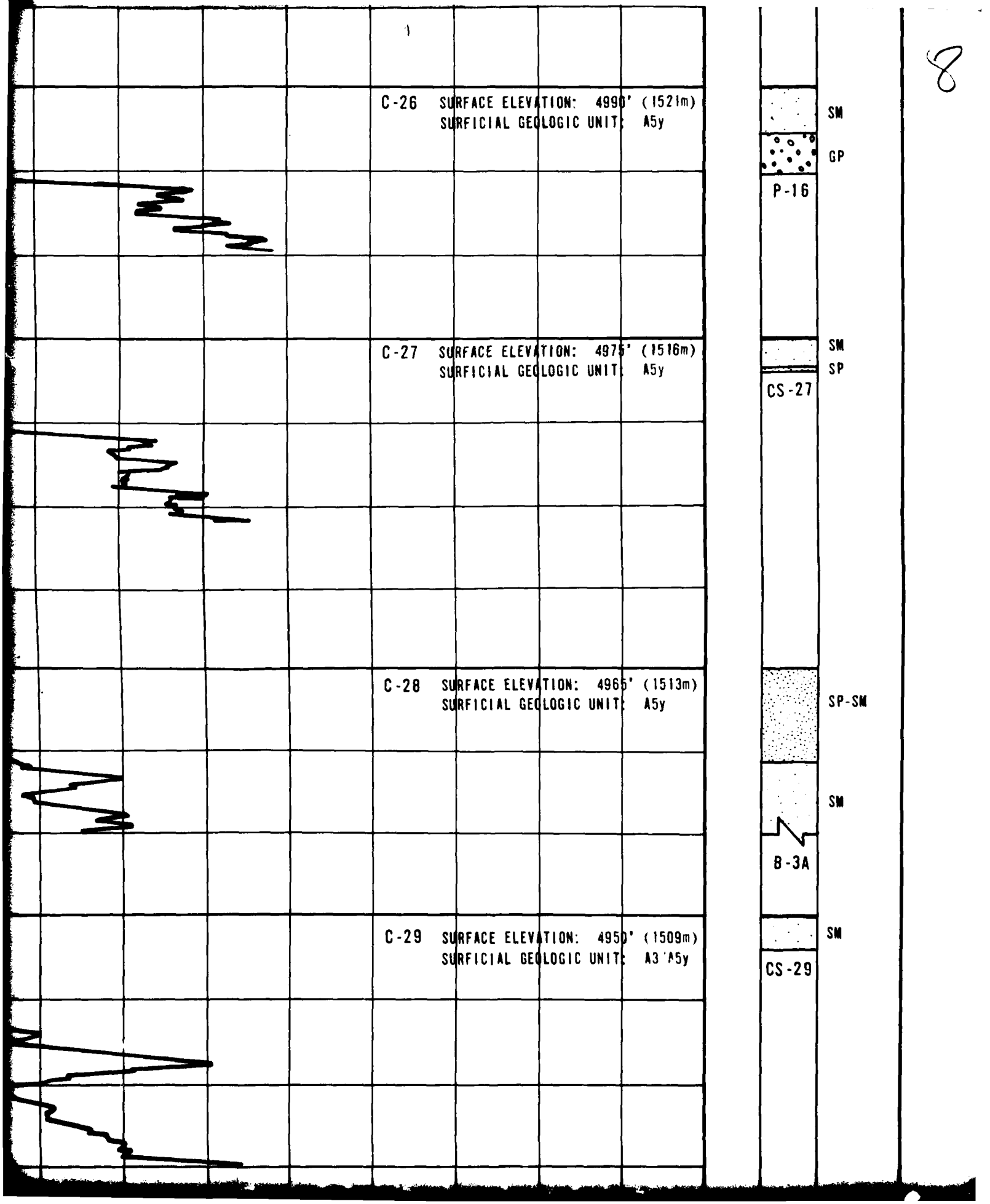

CONE RESISTANCE
200 300 400 500 600 700 800 900 (kg/cm²)
200 300 400 500 600 700 800 900 (tsf)
C-23 SURFACE ELEVATION: 5155' (1571m)
SURFICIAL GEOLOGIC UNIT: A5i
C-24 SURFACE ELEVATION: 5020' (1530m)
SURFICIAL GEOLOGIC UNIT: A5y
C-25 SURFACE ELEVATION: 5005' (1526m)
SURFICIAL GEOLOGIC UNIT: A5y
SOIL COLUMN
SM
P-8
SP-SM
GP
P-17
SM
CS-25

-5

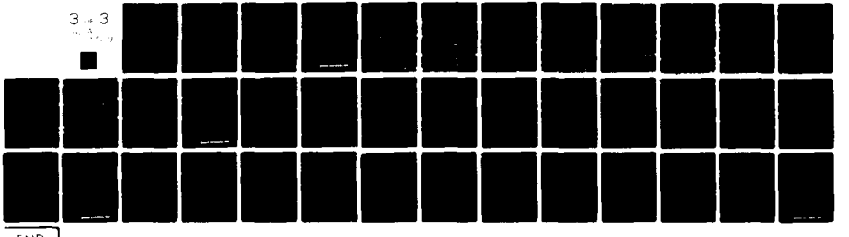

C-5 SURFACE ELEVATION: 4970'
SURFICIAL GEOLOGIC UNIT:
C-6 SURFACE ELEVATION: 4960'
SURFICIAL GEOLOGIC UNIT:
C-7 SURFACE ELEVATION: 4965'
SURFICIAL GEOLOGIC UNIT:


1
6
(1515m)
A5y
SM
GP
CS-5
CL
(1512m)
A5y
SP
P-4
(1519m)
A5y
SM
CS-7
C-14 SURFACE
C-15 SURFACE
C-16 SURFACE
C-17 SURFAC
C-18 SURF

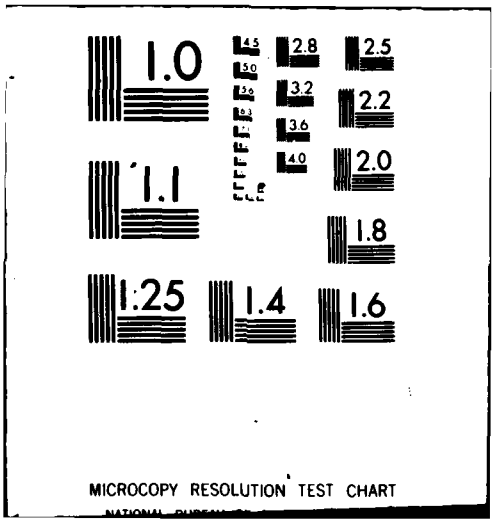

7
ELEVATION: 5040' (1536m)
AL GEOLOGIC UNIT A5y
SM
SW SM
P-7
ELEVATION: 5030' (1533m)
IAL GEOLOGIC UNIT A5i
SC
SM
F-9
CE ELEVATION: 5300' (1615m)
CIAL GEOLOGIC UNIT A5y
SC
GP
P-12
FACE ELEVATION: 5500' (1676m)
FICIAL GEOLOGIC UNIT A5i
SM
SW SM
GW-GM
B-5
FACE ELEVATION: 5100' (1554m)
FICIAL GEOLOGIC UNIT A5y
SM
CS-18
0 0
1 5
2 10
3
0 0
1 5
2 10
3
0 0
1 5
2 10
4 15
0 0
1 5
2 10
3
0 0
1 5
2 10
3
4

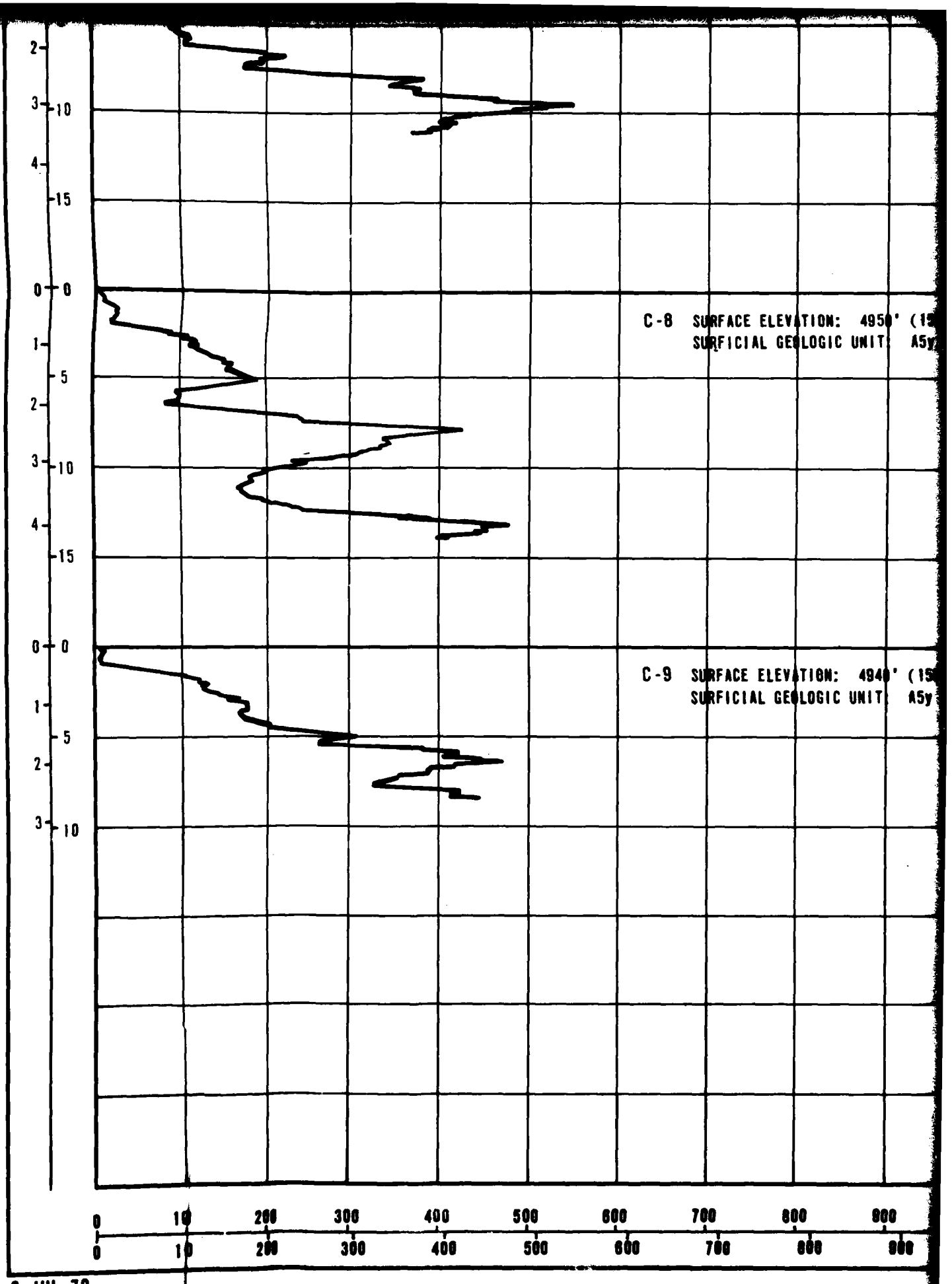

C-26 SURFACE ELEVATION: 4990' (1521m)
SURFICIAL GEOLOGIC UNIT: A5y
SM
GP
P-16
C-27 SURFACE ELEVATION: 4975' (1516m)
SURFICIAL GEOLOGIC UNIT: A5y
SM
SP
CS-27
C-28 SURFACE ELEVATION: 4965' (1513m)
SURFICIAL GEOLOGIC UNIT: A5y
SP-SM
SM
B-3A
C-29 SURFACE ELEVATION: 4950' (1509m)
SURFICIAL GEOLOGIC UNIT: A3 'A5y
SM
CS-29

AD-A113 329 FUGRO NATIONAL INC LONG BEACH CA F/G 8/13
MX SITING INVESTIGATION. GEOTECHNICAL EVALUATION. VOLUME VII. N--ETC(U)
AUG 79 F04704-80-C-0006
UNCLASSIFIED FN-TR-27-7 NL



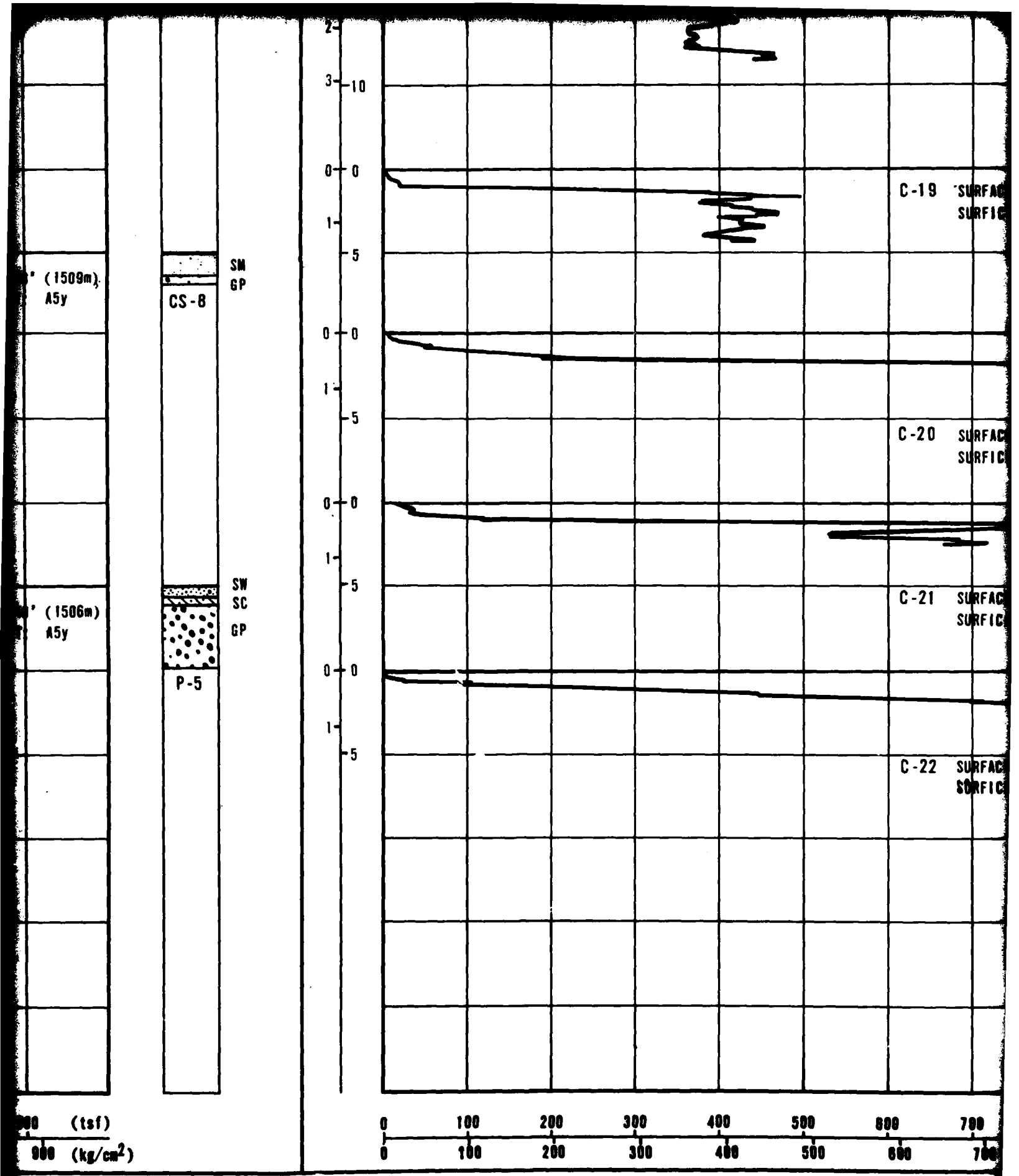
END
DATE FILMED
4-82
DTIC

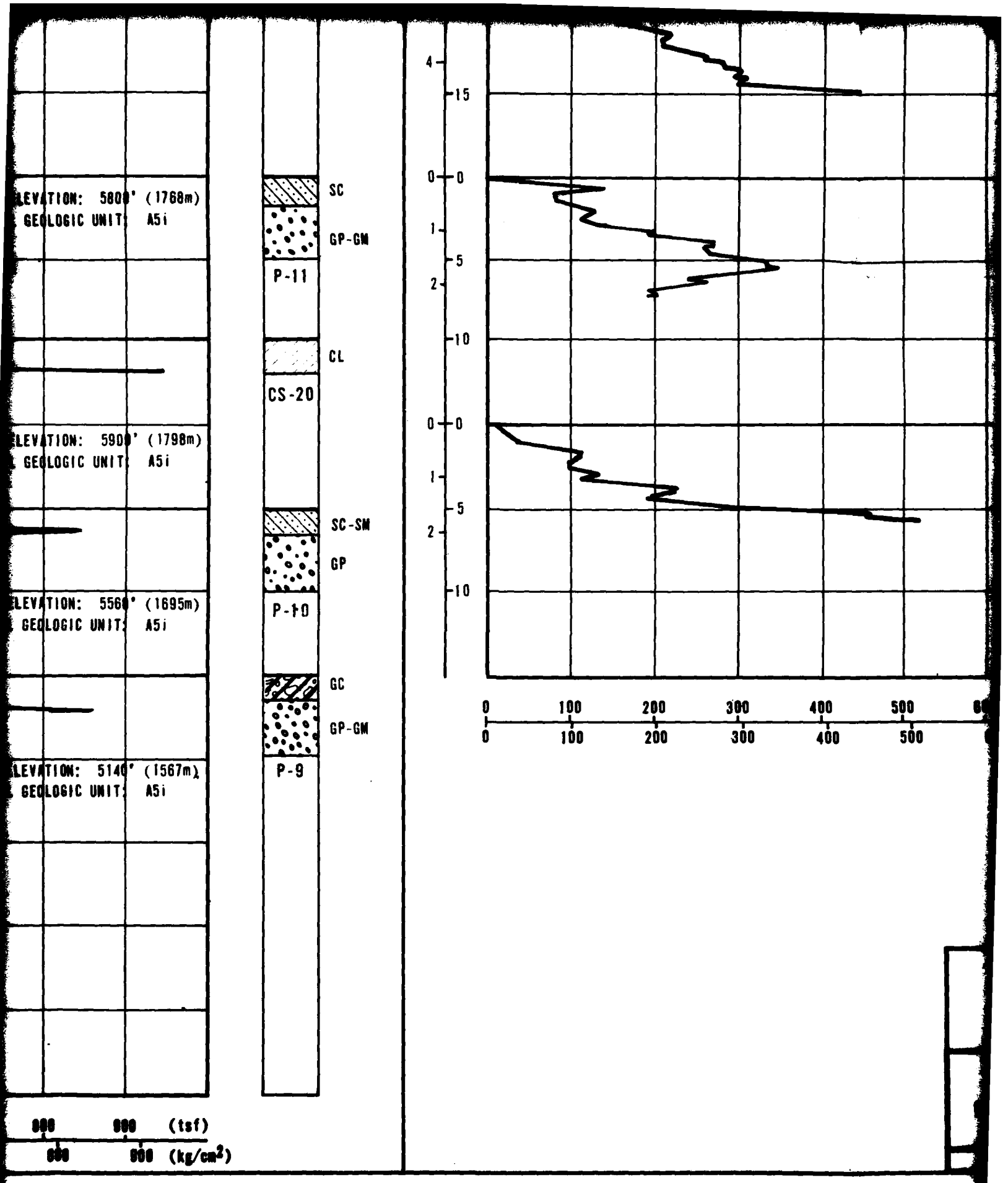

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART

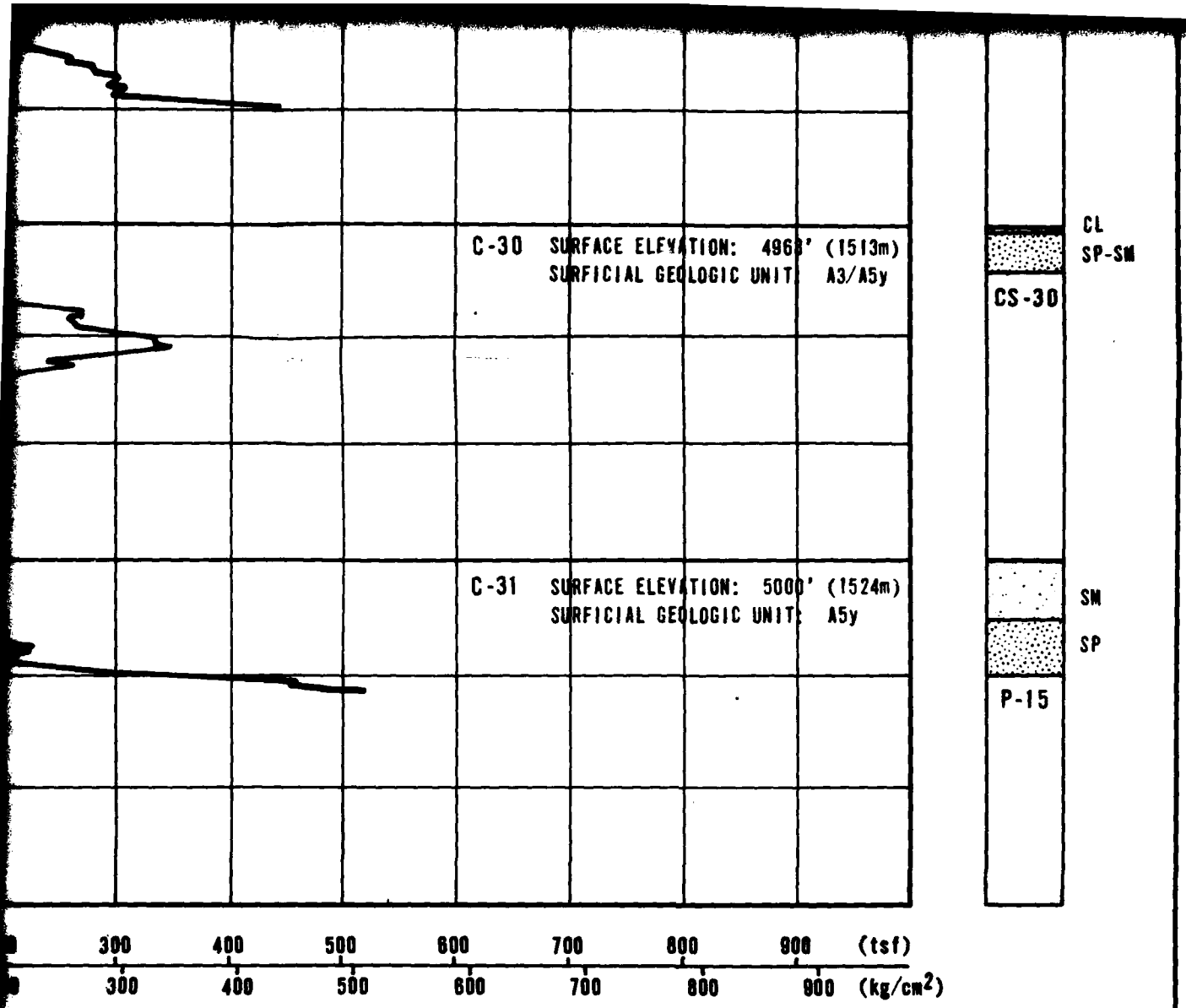


CHECKED BY _____ APPROVED BY _____

2 JUL 79


(1509m)
A5y
SM
GP
CS-8
(1506m)
A5y
SW
SC
GP
P-5
C-19
C-20
C-21
C-22
(tsf)
(kg/cm²)
0
100
200
300
400
500
600
700


ELEVATION: 5800' (1768m)
GEOLOGIC UNIT: A5i
ELEVATION: 5900' (1798m)
GEOLOGIC UNIT: A5i
ELEVATION: 5560' (1695m)
GEOLOGIC UNIT: A5i
ELEVATION: 5140' (1567m)
GEOLOGIC UNIT: A5i
SC
GP-GM
P-11
CL
CS-20
SC-SM
GP
P-10
GC
GP-GM
P-9
4
15
0
0
1
5
2
10
0
0
1
5
2
10
0
100
200
300
400
500
0
100
200
300
400
500
(tsf)
(kg/cm²)



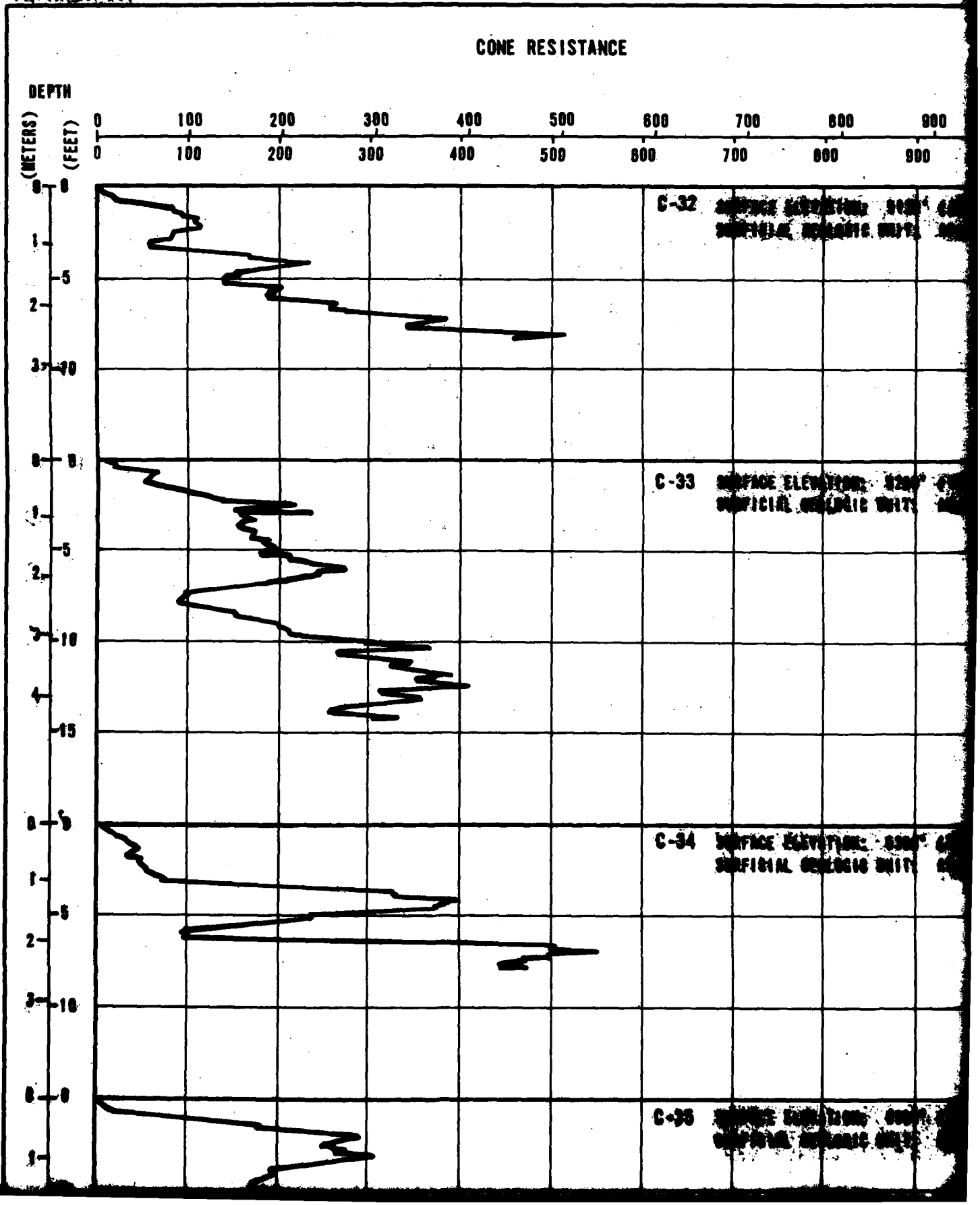
CONE PENETROMETER TEST RESULTS
VERIFICATION SITE
REVEILLE RAILROAD CDP, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

DRAWING
2
1 OF 4

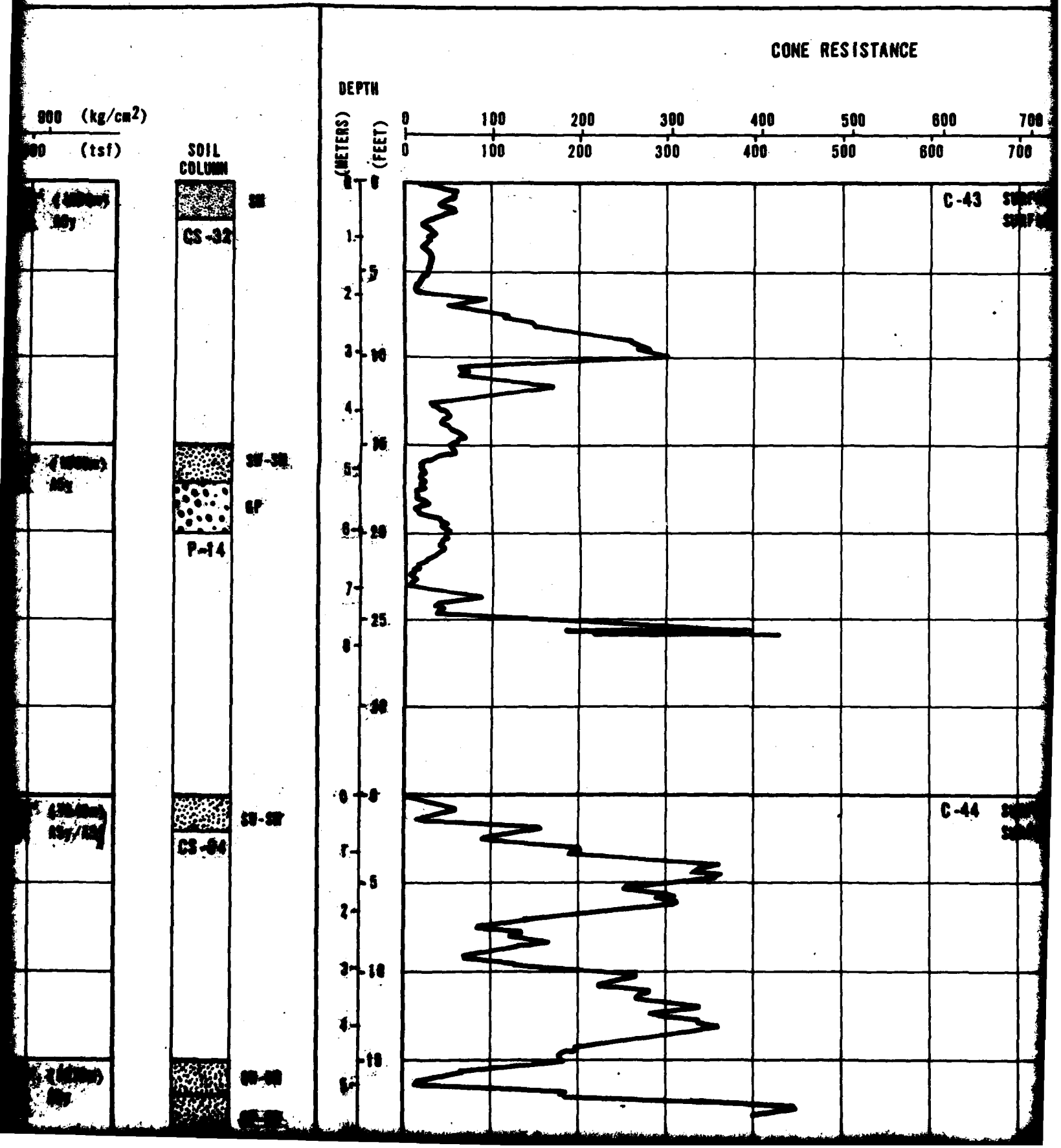
FUGRO NATIONAL, INC.

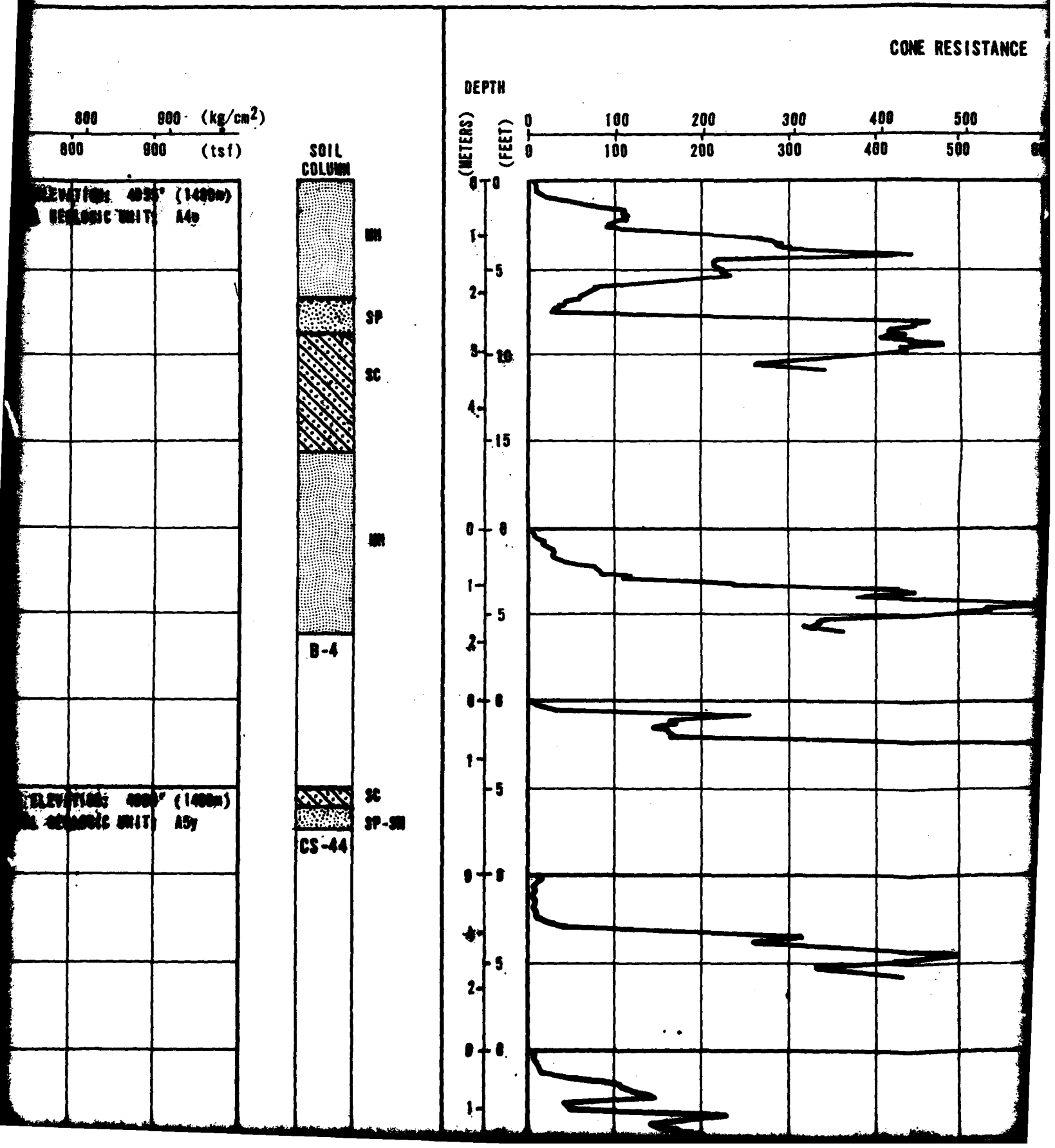
FN-TR-27-111


CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
600
700
800
900
C-32
C-33
C-34
C-35

1

2


CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
600
700
900 (kg/cm2)
(tsf)
SOIL COLUMN
CS -32
P-14
C-43
C-44


CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
800
900
(kg/cm²)
(tsf)
SOIL COLUMN
SM
SP
SC
SM
B-4
SC
SP-SM
CS-44

CONE RESISTANCE

200 300 400 500 600 700 800 900 (kg/cm^2)

200 300 400 500 600 700 800 900 (tsf)

C-52 SURFACE ELEVATION: 5215' (1590m)
SURFICIAL GEOLOGIC UNIT: A5y

C-53 SURFACE ELEVATION: 5395' (1632m)
SURFICIAL GEOLOGIC UNIT: A5i

C-54 SURFACE ELEVATION: 5800' (1787m)
SURFICIAL GEOLOGIC UNIT: A5i

C-55 SURFACE ELEVATION: 5169' (1572m)
SURFICIAL GEOLOGIC UNIT: A1

C-56 SURFACE ELEVATION: 5240' (1597m)
SURFICIAL GEOLOGIC UNIT: A5y

SOIL COLUMN

SP-SM

P-21

SC

CS-53

SP

P-22

SC-SM

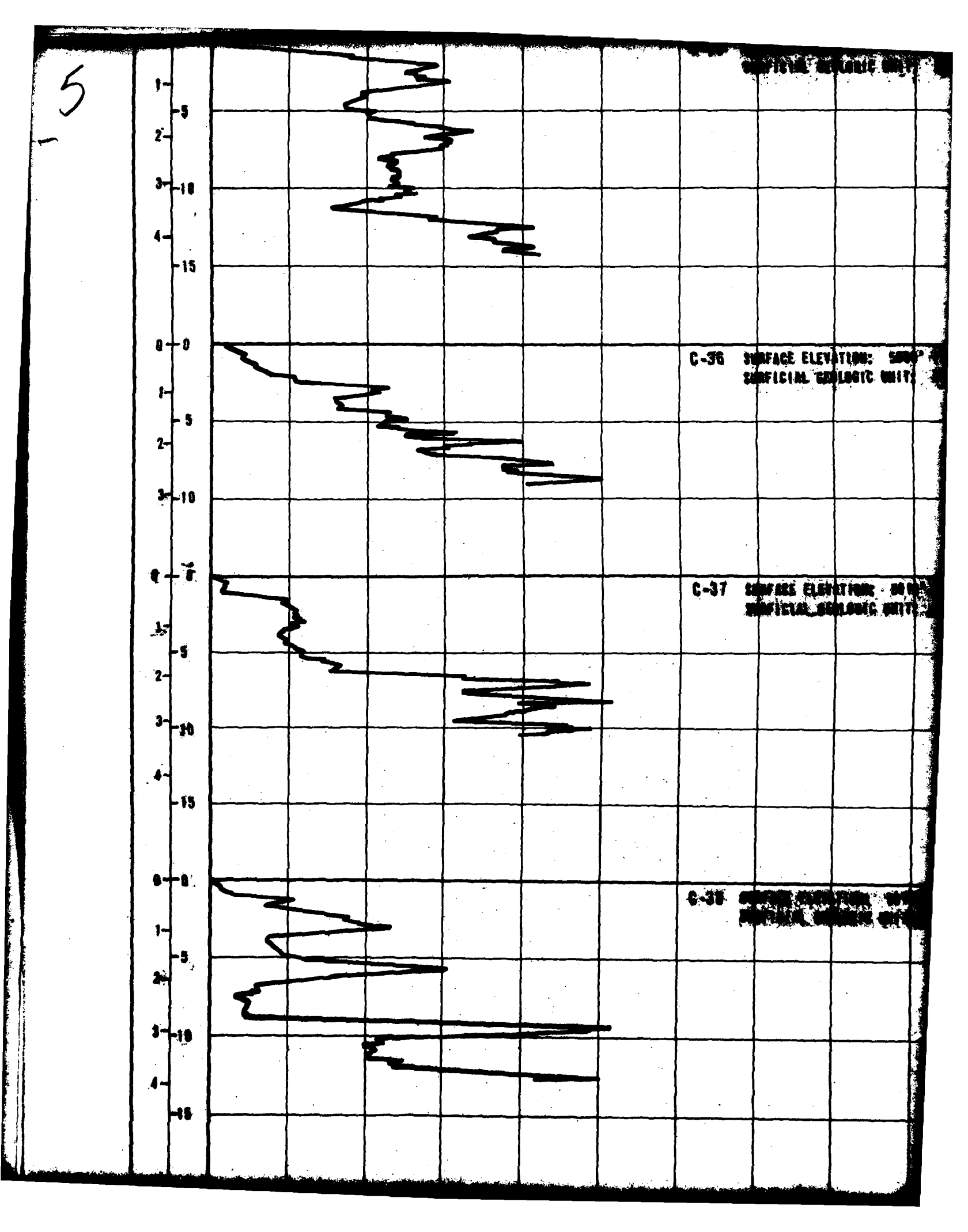
SP-SM

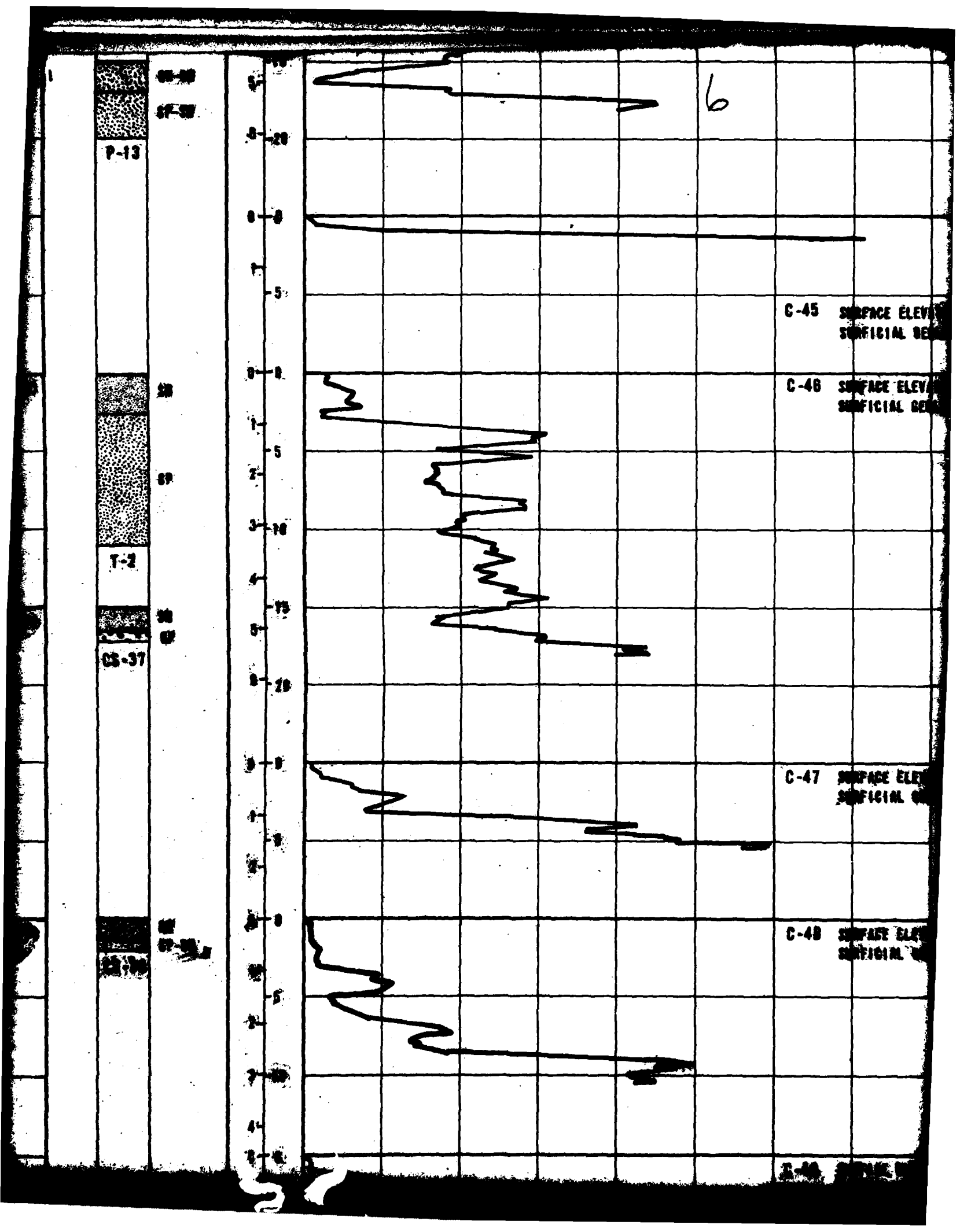
T-6

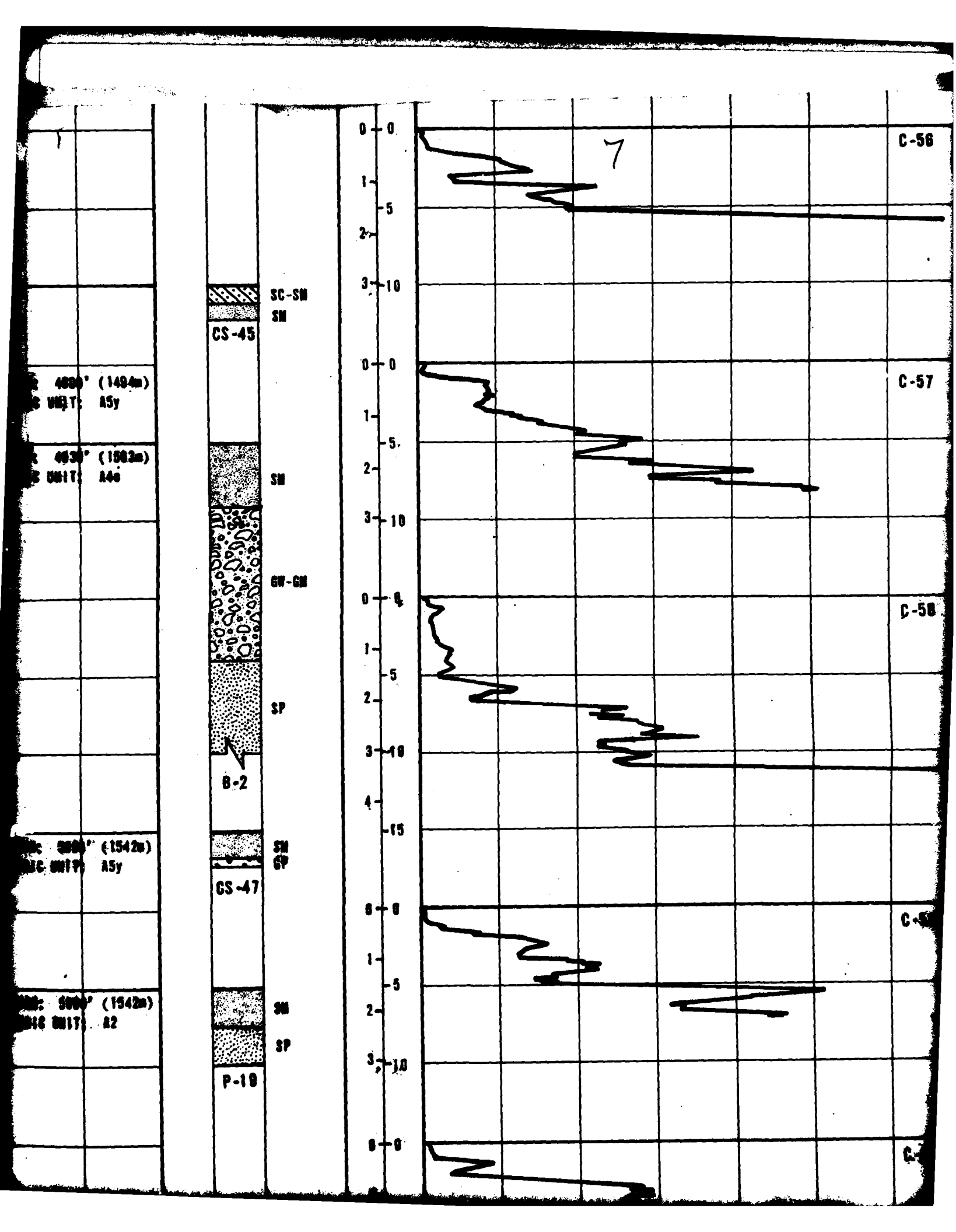
SM

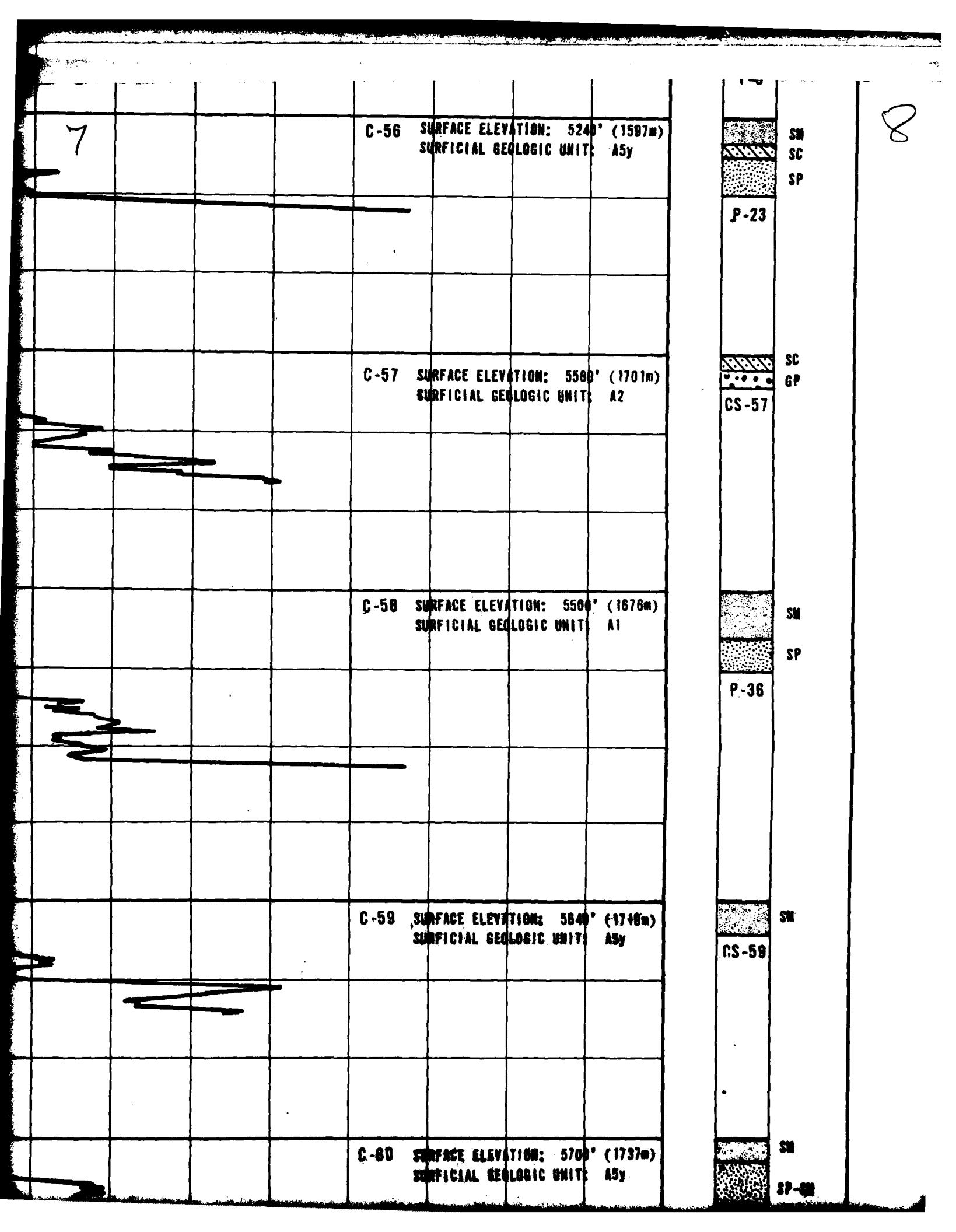
SC

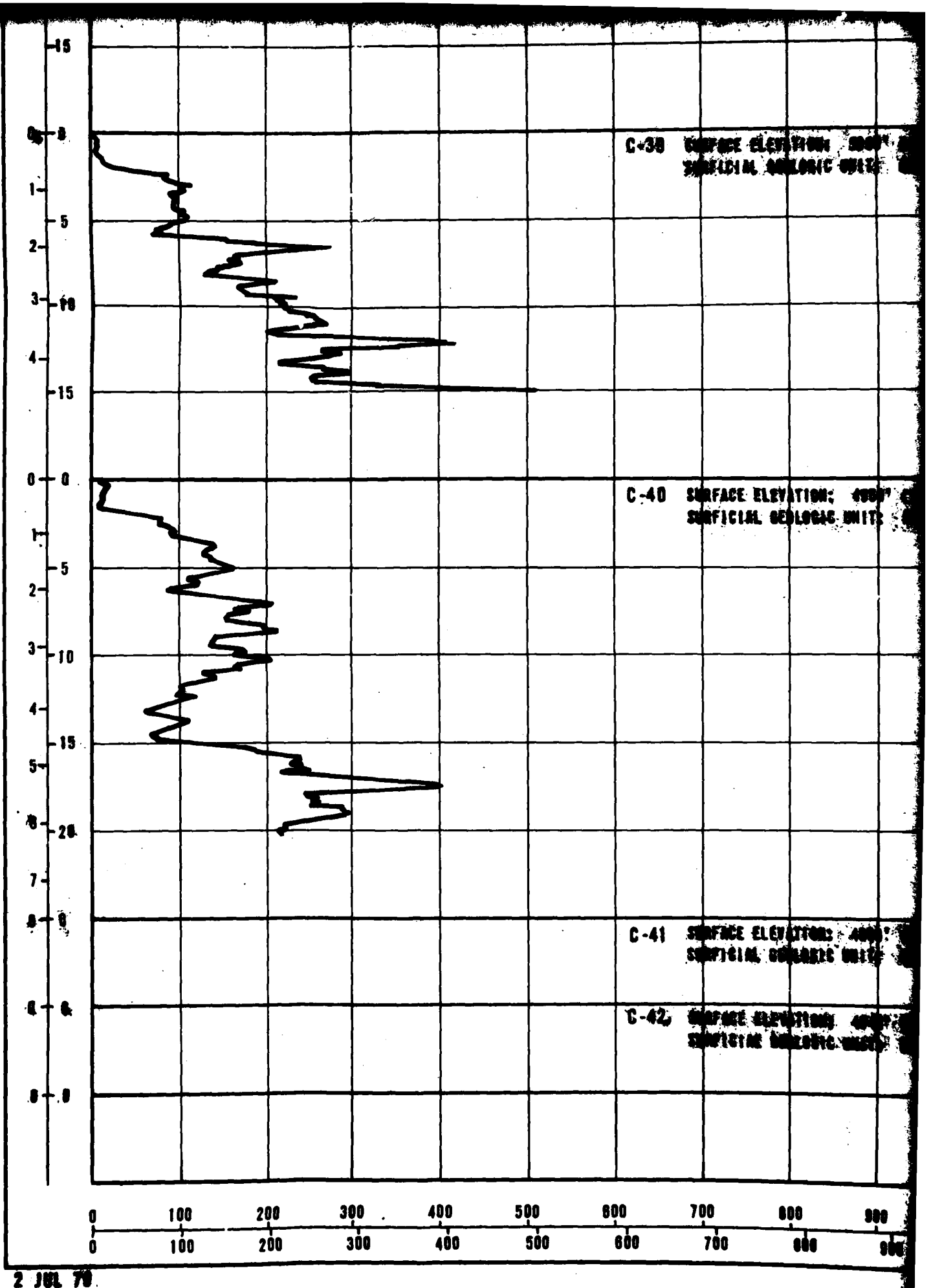
SP


C-36
C-37


6
P-13
T-2
CS-37
C-45
C-46
C-47
C-48

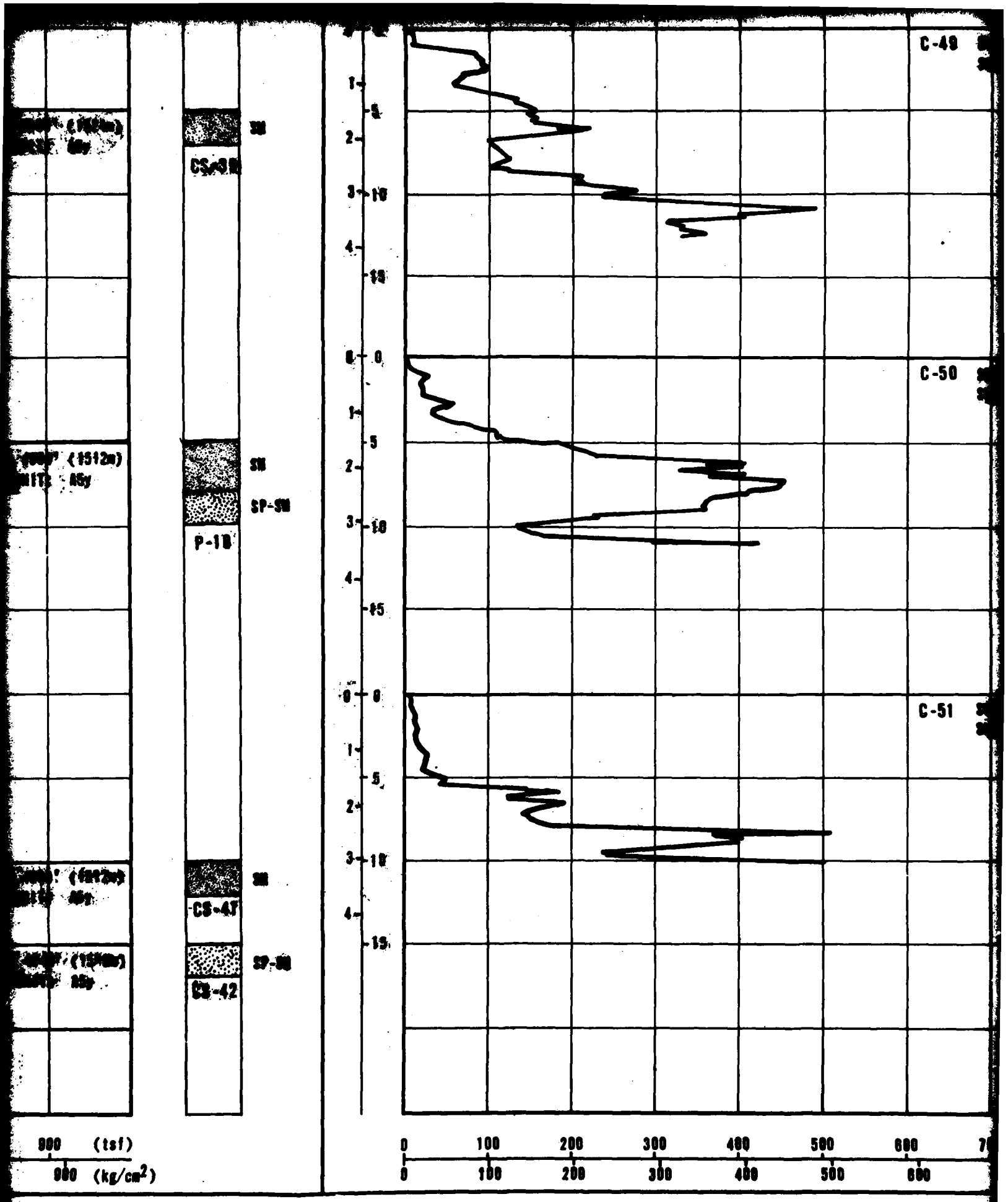

SC-SM
SM
CS-45
SM
GW-GM
SP
B-2
SM
GP
CS-47
SM
SP
P-19
C-56
C-57
C-58

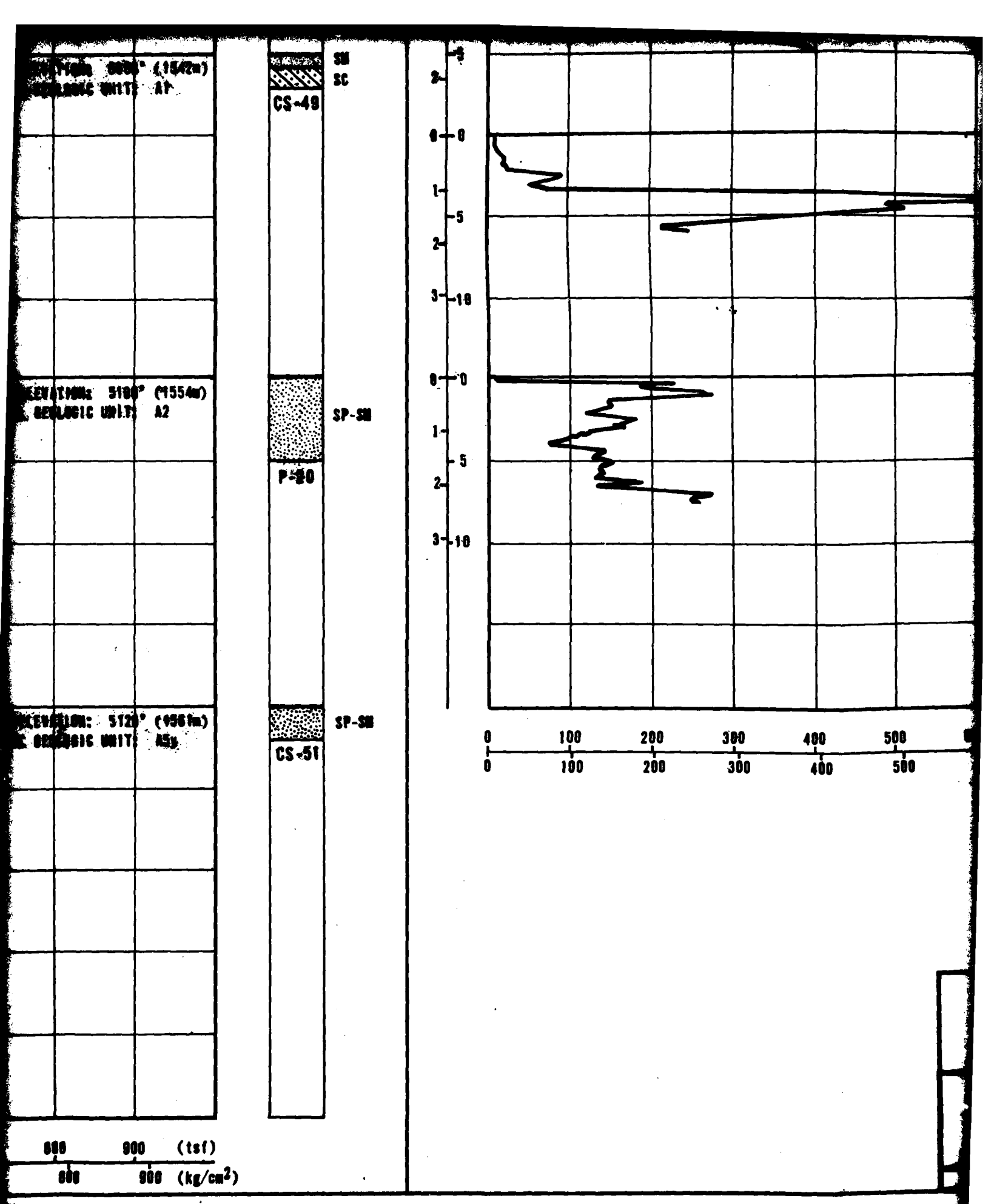

7
C-56 SURFACE ELEVATION: 5240' (1597m)
SURFICIAL GEOLOGIC UNIT: A5y
SM
SC
SP
P-23
C-57 SURFACE ELEVATION: 5588' (1701m)
SURFICIAL GEOLOGIC UNIT: A2
SC
GP
CS-57
C-58 SURFACE ELEVATION: 5500' (1676m)
SURFICIAL GEOLOGIC UNIT: A1
SM
SP
P-36
C-59 SURFACE ELEVATION: 5840' (1748m)
SURFICIAL GEOLOGIC UNIT: A5y
SM
CS-59
C-60 SURFACE ELEVATION: 5700' (1737m)
SURFICIAL GEOLOGIC UNIT: A5y
SM
SP-SM
8

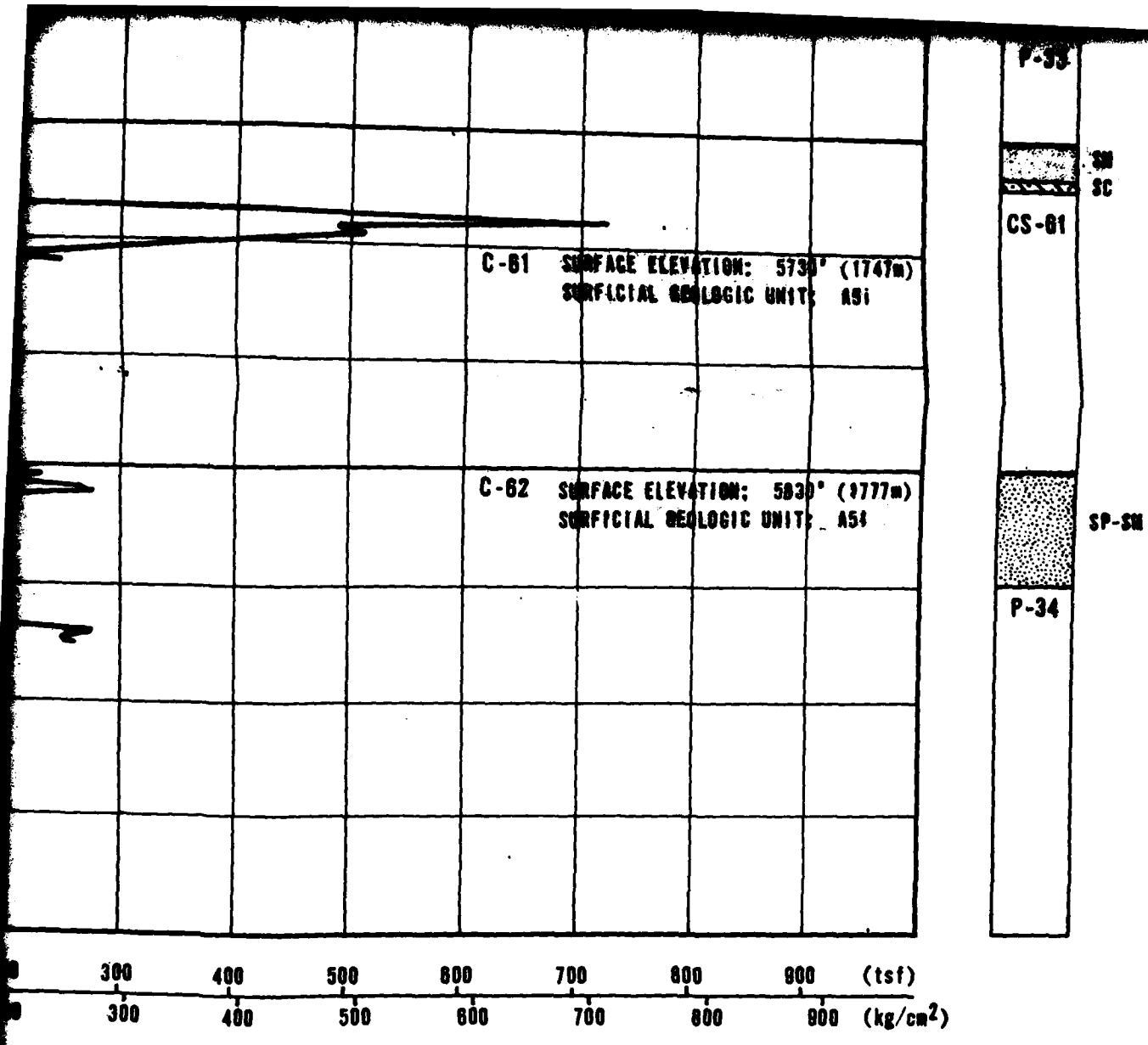


CHECKED BY _____ APPROVED BY _____

2 JUL 70


C-49
C-50
C-51
SM
CS-43
SP-SM
P-18
CS-42
900 (tsf)
900 (kg/cm²)
0 100 200 300 400 500 600
0 100 200 300 400 500 600


SM
SC
CS-48
SP-SM
P-50
SP-SM
CS-51
0
100
200
300
400
500
(tsf)
(kg/cm²)



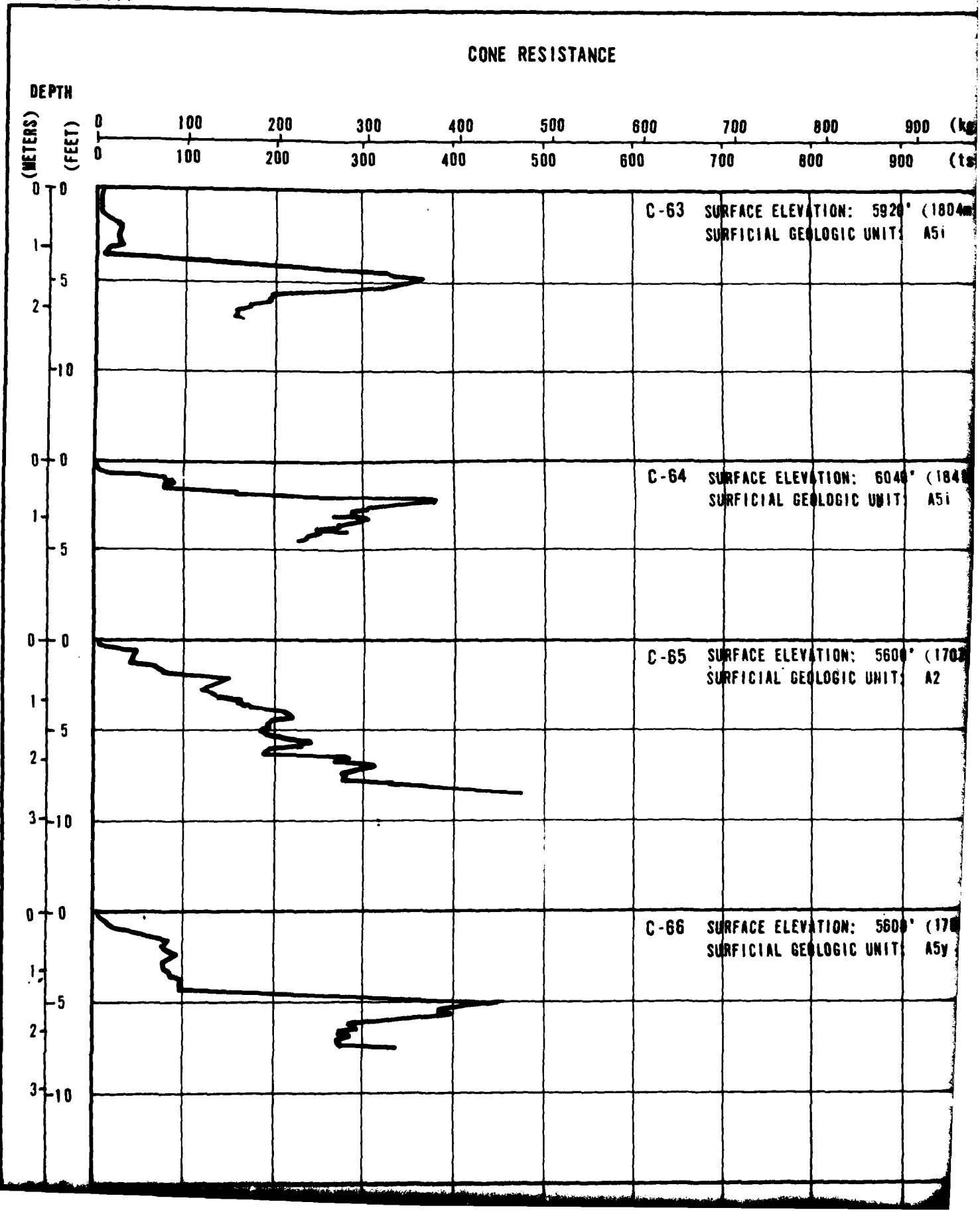
CONE PENETROMETER TEST RESULTS
VERIFICATION SITE
REVEILLE RAILROAD COR, NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

DRAWING 2 OF 4

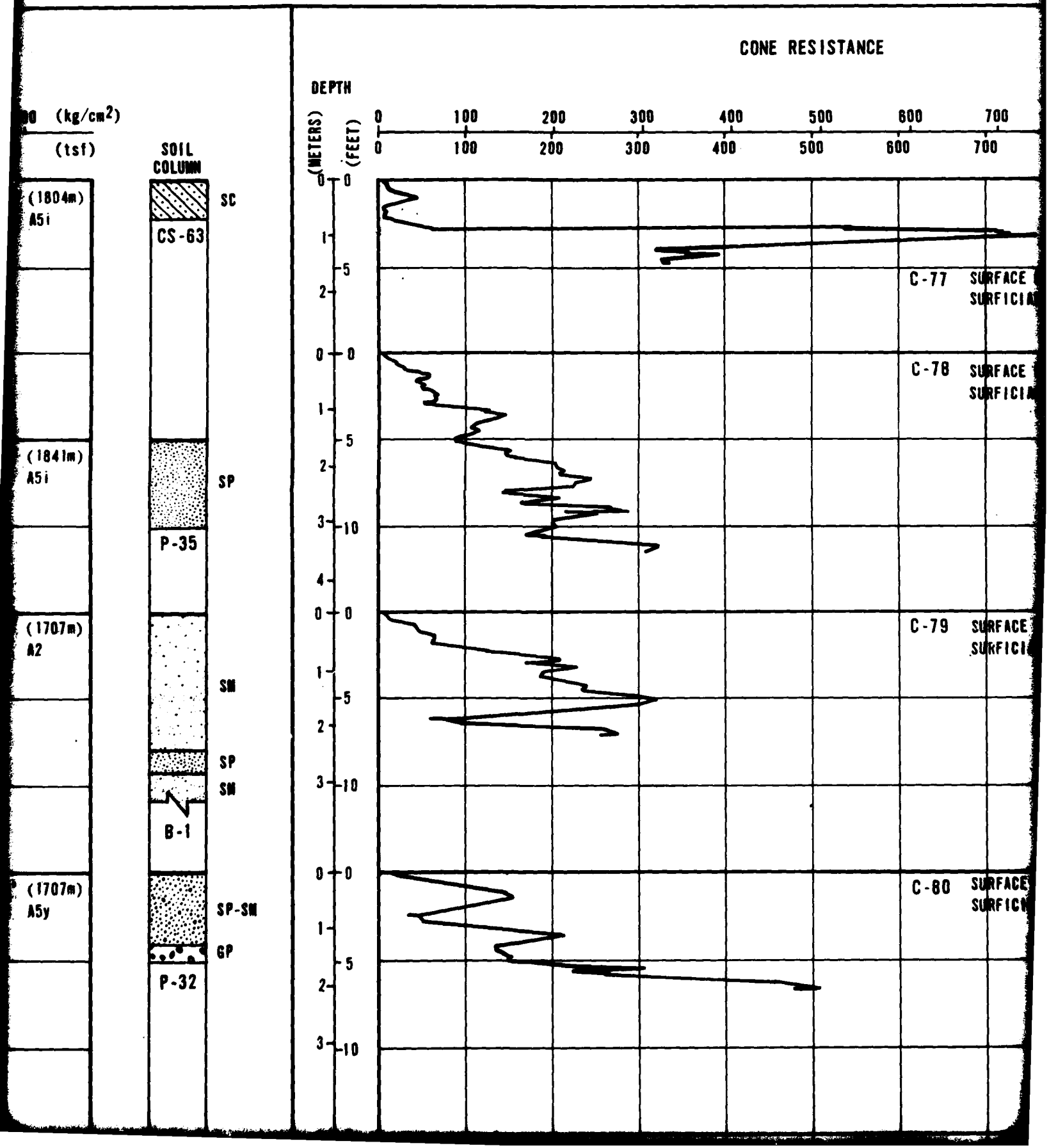
FUGRO NATIONAL, INC.

FN-TR-27-VII

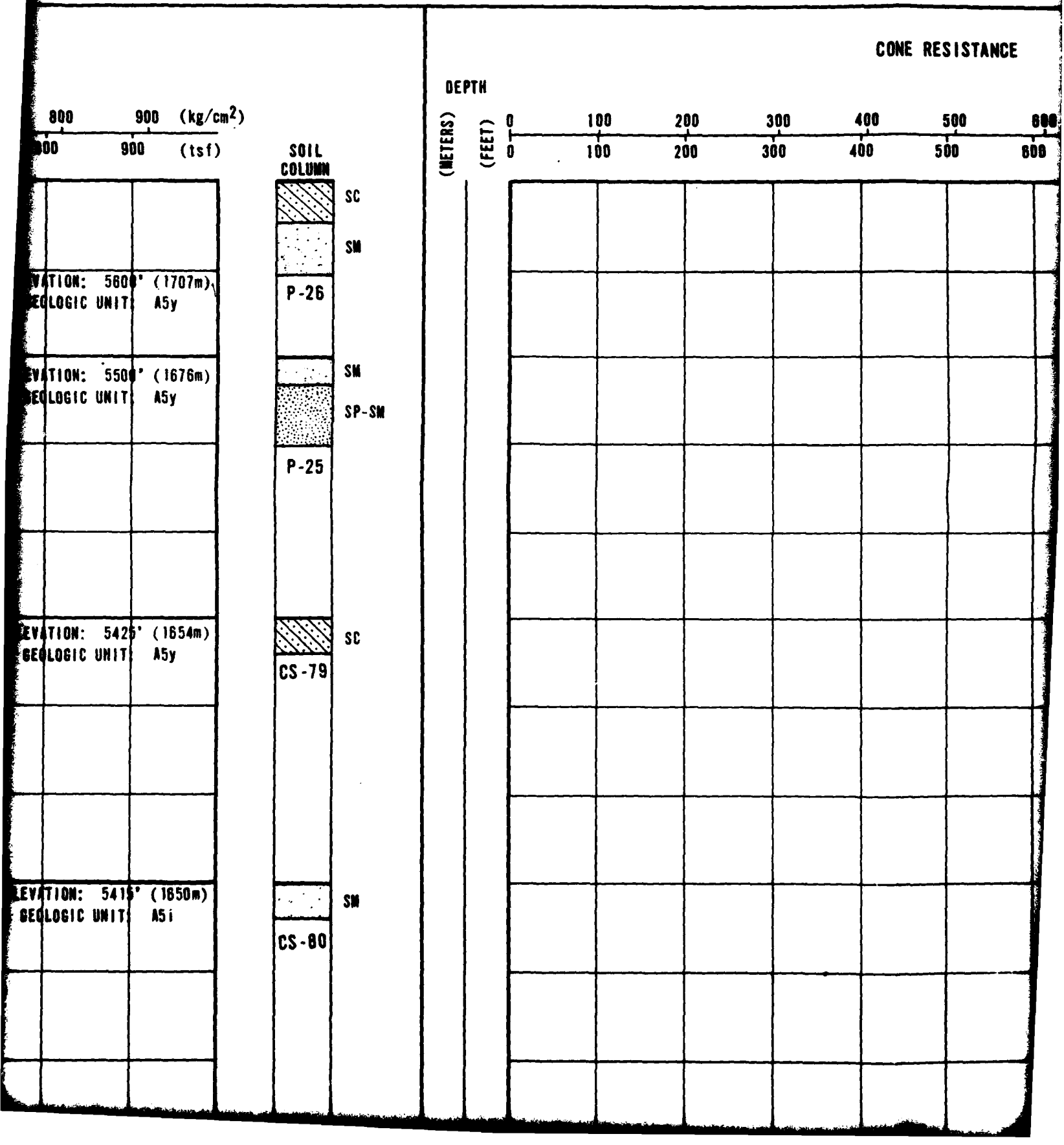

CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0 100 200 300 400 500 600 700 800 900 (kg
0 100 200 300 400 500 600 700 800 900 (ts
C-63 SURFACE ELEVATION: 5920' (1804m
SURFICIAL GEOLOGIC UNIT: A5i
C-64 SURFACE ELEVATION: 6040' (184
SURFICIAL GEOLOGIC UNIT: A5i
C-65 SURFACE ELEVATION: 5600' (170
SURFICIAL GEOLOGIC UNIT: A2
C-66 SURFACE ELEVATION: 5600' (17
SURFICIAL GEOLOGIC UNIT: A5y

1

2


CONE RESISTANCE
DEPTH
(METERS)
(FEET)
0
100
200
300
400
500
600
700
(kg/cm2)
(tsf)
SOIL COLUMN
(1804m)
A5i
SC
CS-63
(1841m)
A5i
SP
P-35
(1707m)
A2
SM
SP
SM
B-1
(1707m)
A5y
SP-SM
GP
P-32
C-77
C-78
C-79
C-80

3

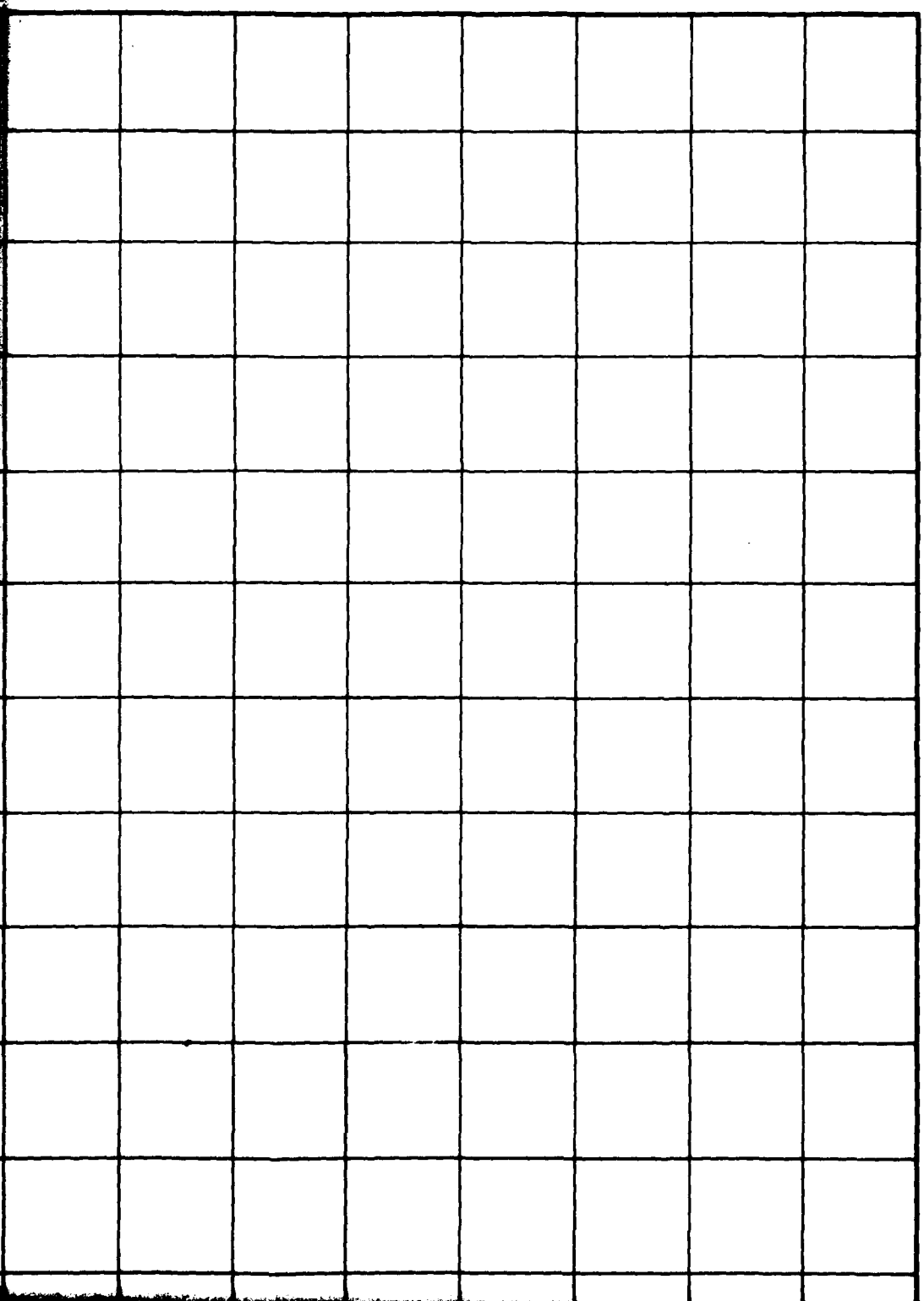

800 900 (kg/cm²)
900 (tsf)
SOIL COLUMN
SC
SM
P-26
SM
SP-SM
P-25
SC
CS-79
SM
CS-80
ELEVATION: 5600' (1707m)
GEOLOGIC UNIT: A5y
ELEVATION: 5500' (1676m)
GEOLOGIC UNIT: A5y
ELEVATION: 5425' (1654m)
GEOLOGIC UNIT: A5y
ELEVATION: 5415' (1650m)
GEOLOGIC UNIT: A5i
DEPTH
(METERS)
(FEET)
CONE RESISTANCE
0 100 200 300 400 500 600
0 100 200 300 400 500 600

CONE RESISTANCE

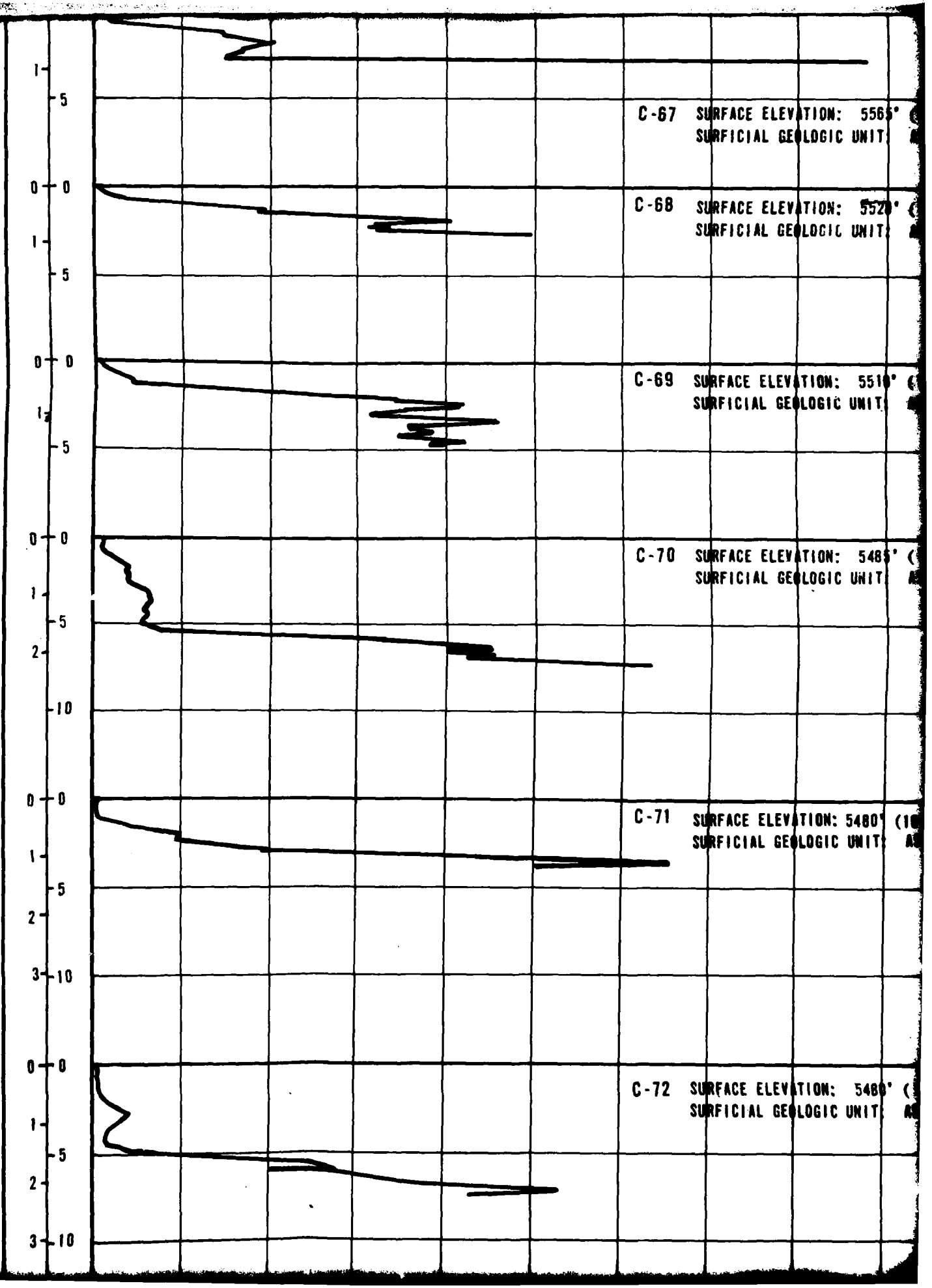
0 300 400 500 600 700 800 900 (kg/cm^2)

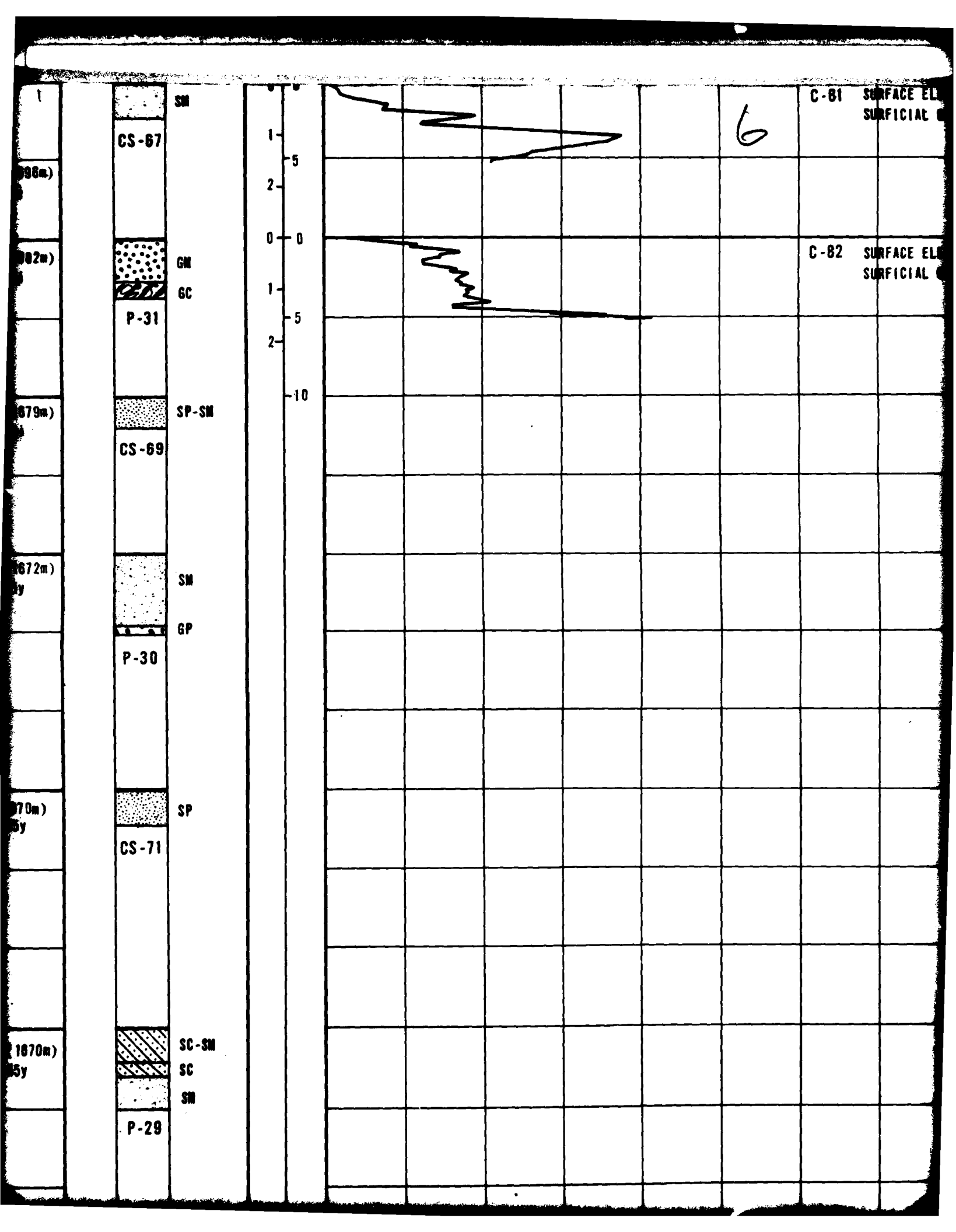
0 300 400 500 600 700 800 900 (tsf)

SOIL COLUMN



5


C-67 SURFACE ELEVATION: 5565'
SURFICIAL GEOLOGIC UNIT:
C-68 SURFACE ELEVATION: 5520'
SURFICIAL GEOLOGIC UNIT:
C-69 SURFACE ELEVATION: 5510'
SURFICIAL GEOLOGIC UNIT:
C-70 SURFACE ELEVATION: 5485'
SURFICIAL GEOLOGIC UNIT:
C-71 SURFACE ELEVATION: 5480'
SURFICIAL GEOLOGIC UNIT:
C-72 SURFACE ELEVATION: 5480'
SURFICIAL GEOLOGIC UNIT:


SM
CS-67
GM
GC
P-31
SP-SM
CS-69
SM
GP
P-30
SP
CS-71
SC-SM
SC
SM
P-29
C-81 SURFACE EL
SURFICIAL
C-82 SURFACE EL
SURFICIAL
6

ION: 5320' (1622m)
GIC UNIT: A5y

SC

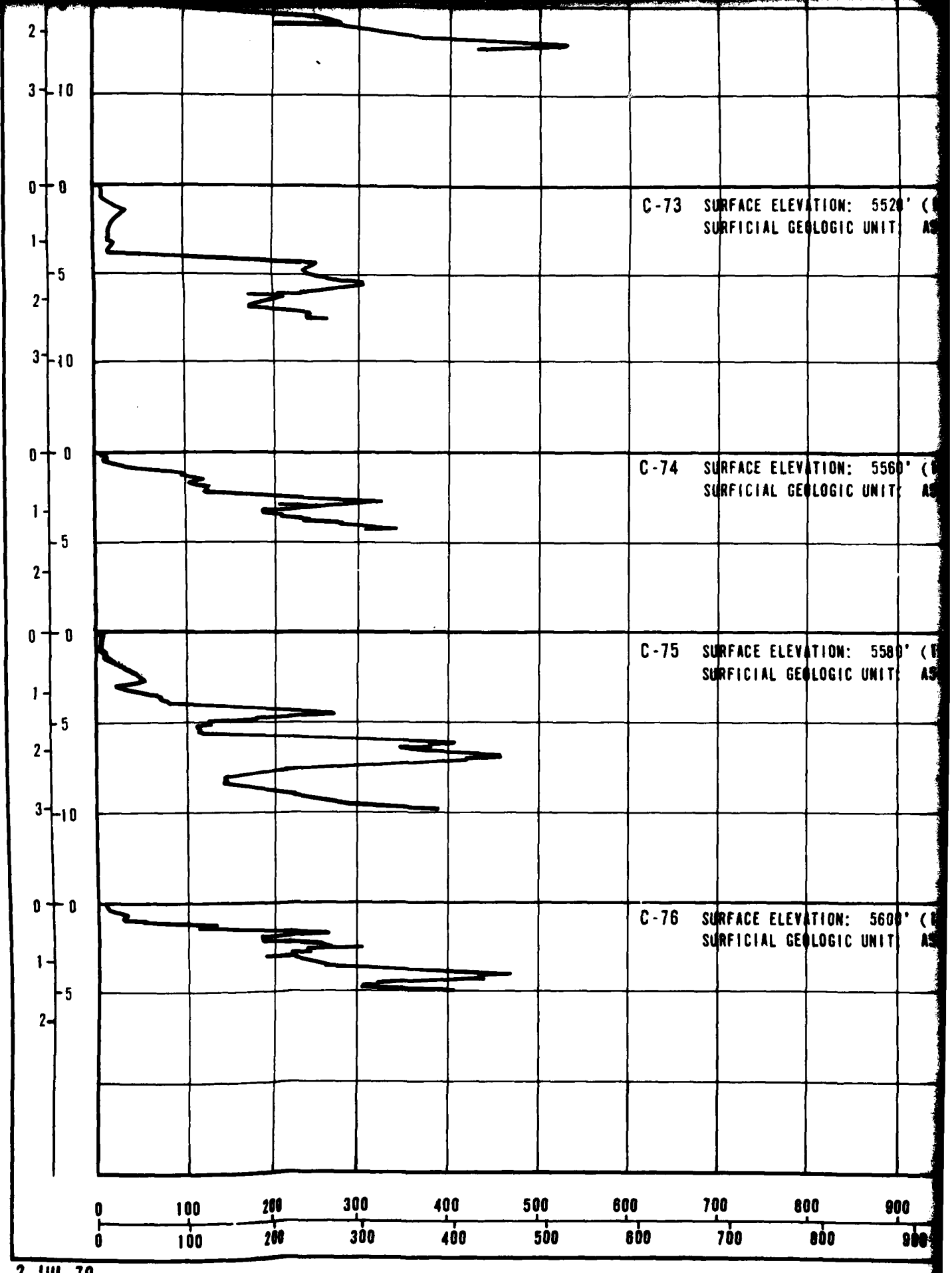
P-24

ION: 5280' (1609m)
GIC UNIT: A5y

SM

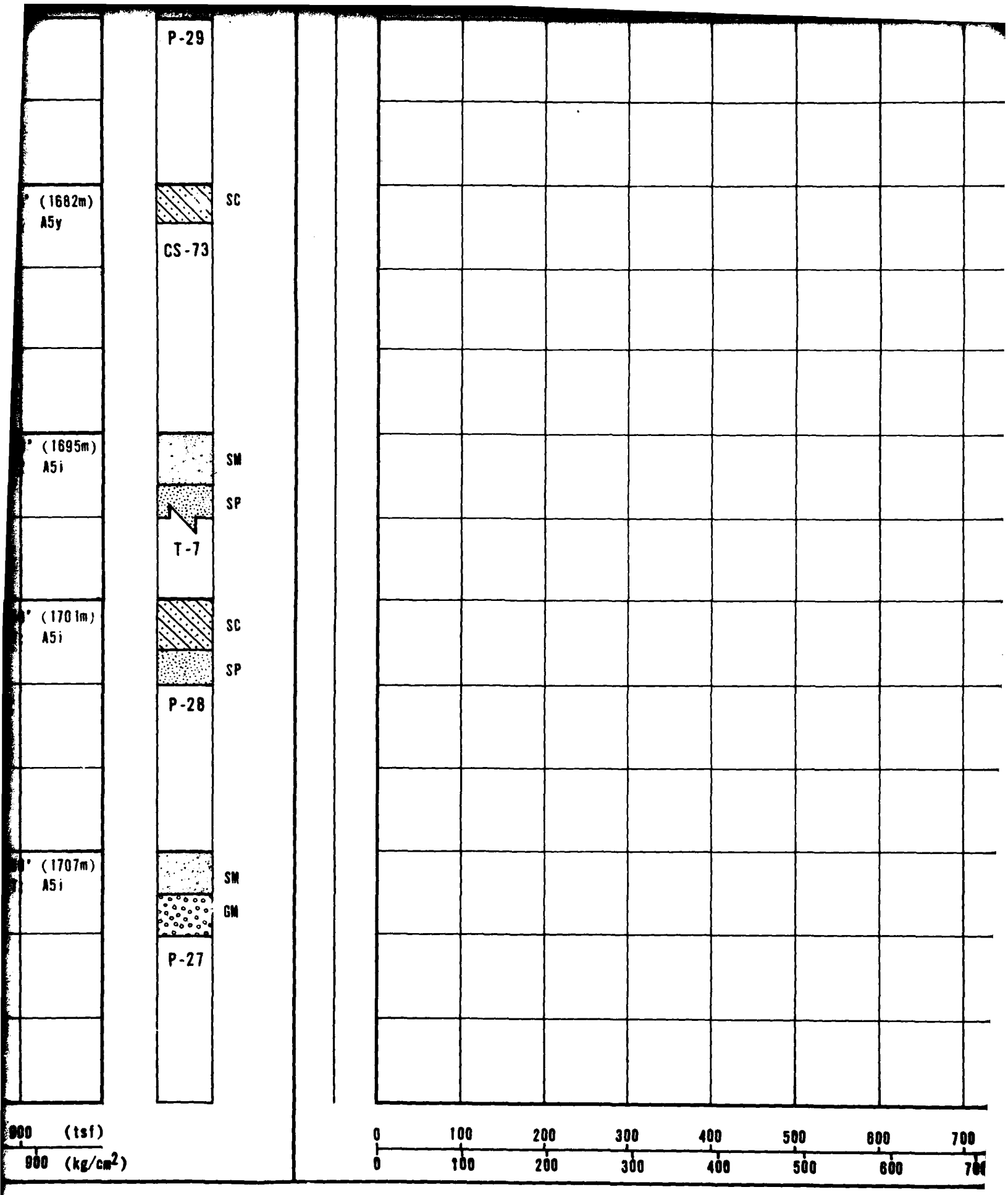
CS-82

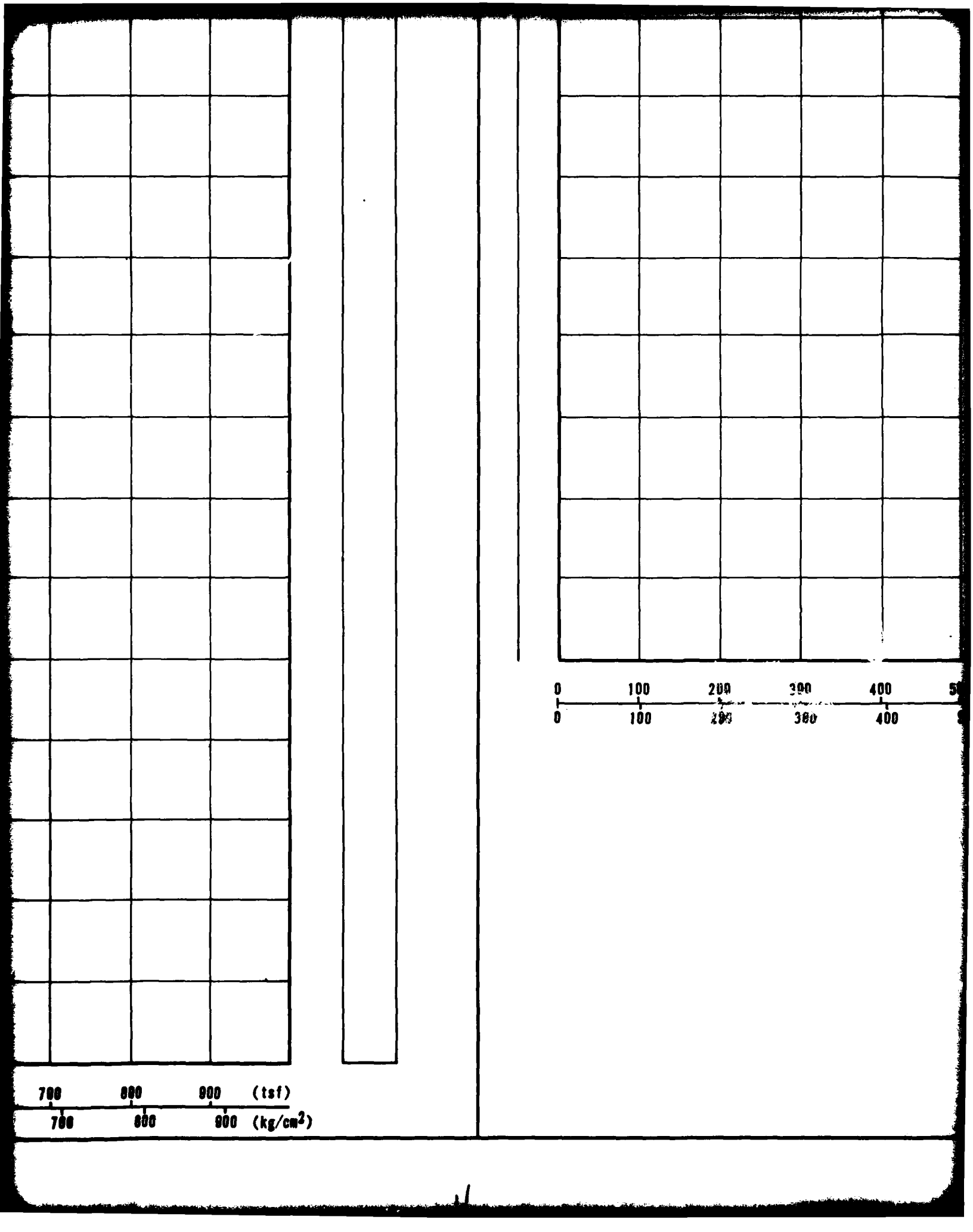
7

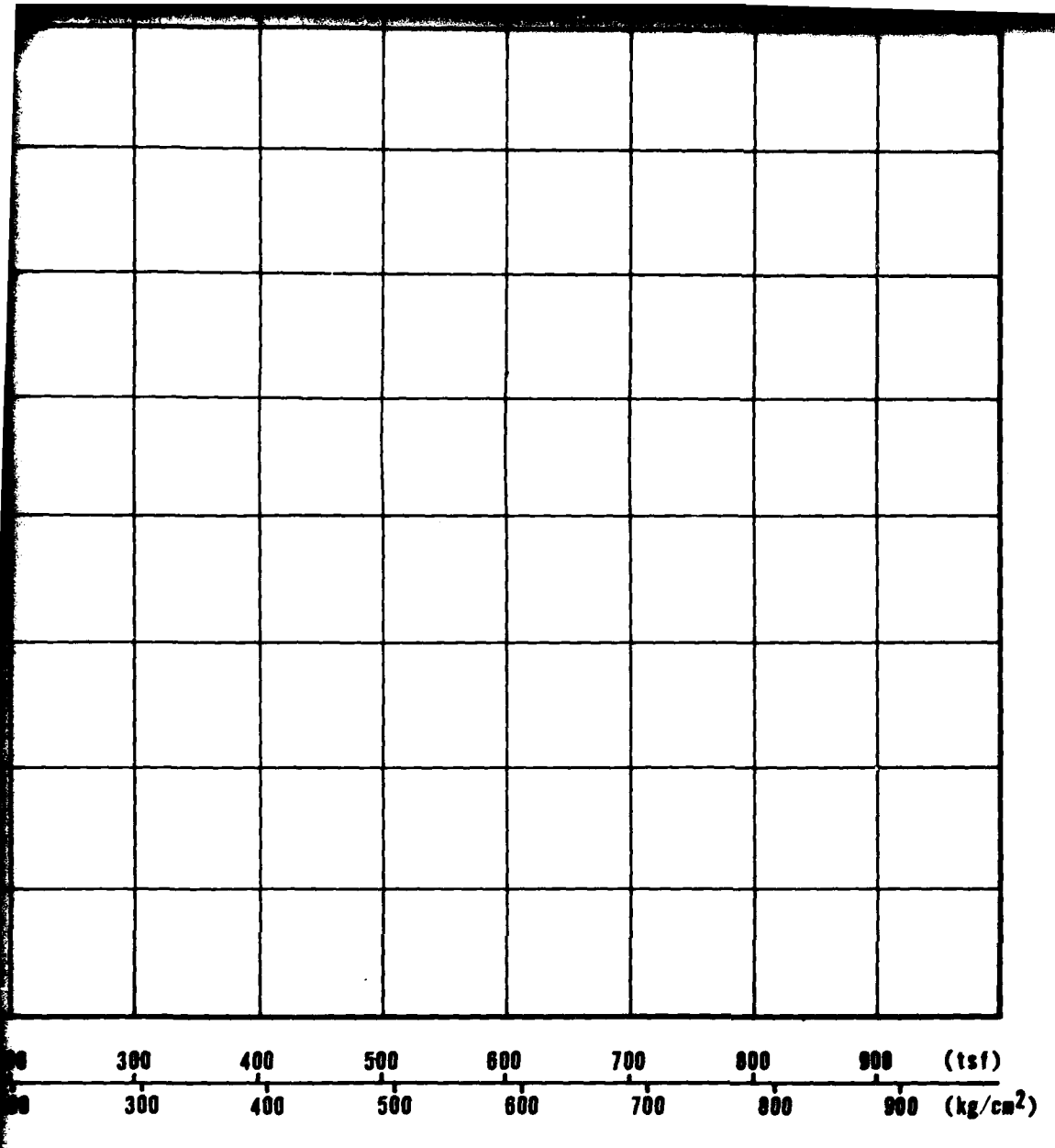


CHECKED BY _____ APPROVED BY _____

2 JUL 79


P-29
SC
CS-73
SM
SP
T-7
SC
SP
P-28
SM
GM
P-27
(1682m)
A5y
(1695m)
A5i
(1701m)
A5i
(1707m)
A5i
900 (tsf)
900 (kg/cm²)
0 100 200 300 400 500 600 700
0 100 200 300 400 500 600


0
100
200
300
400
0
100
300
400
700
800
900
(tsf)
700
800
900
(kg/cm²)



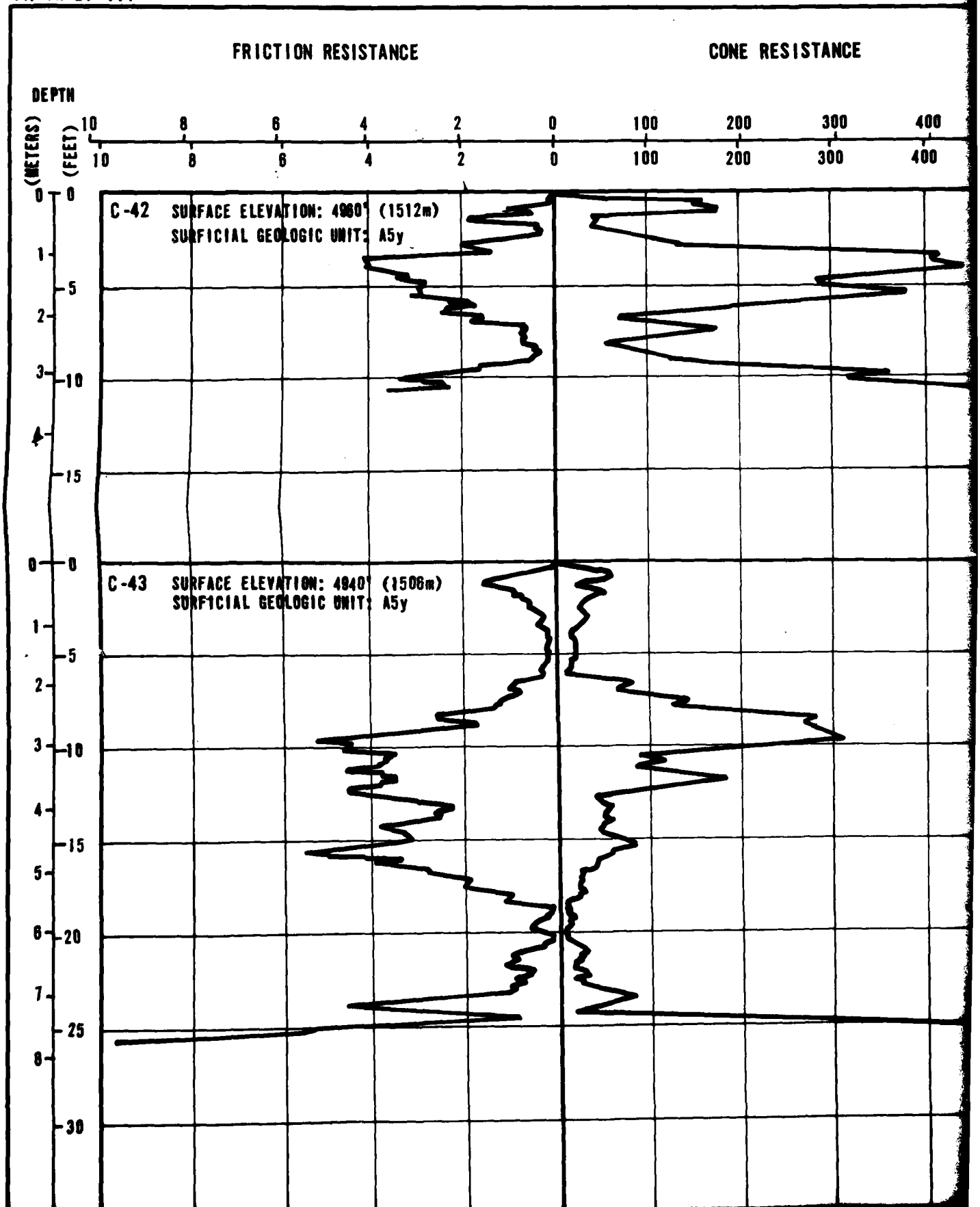
CONE PENETROMETER TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD COP. NEVADA

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

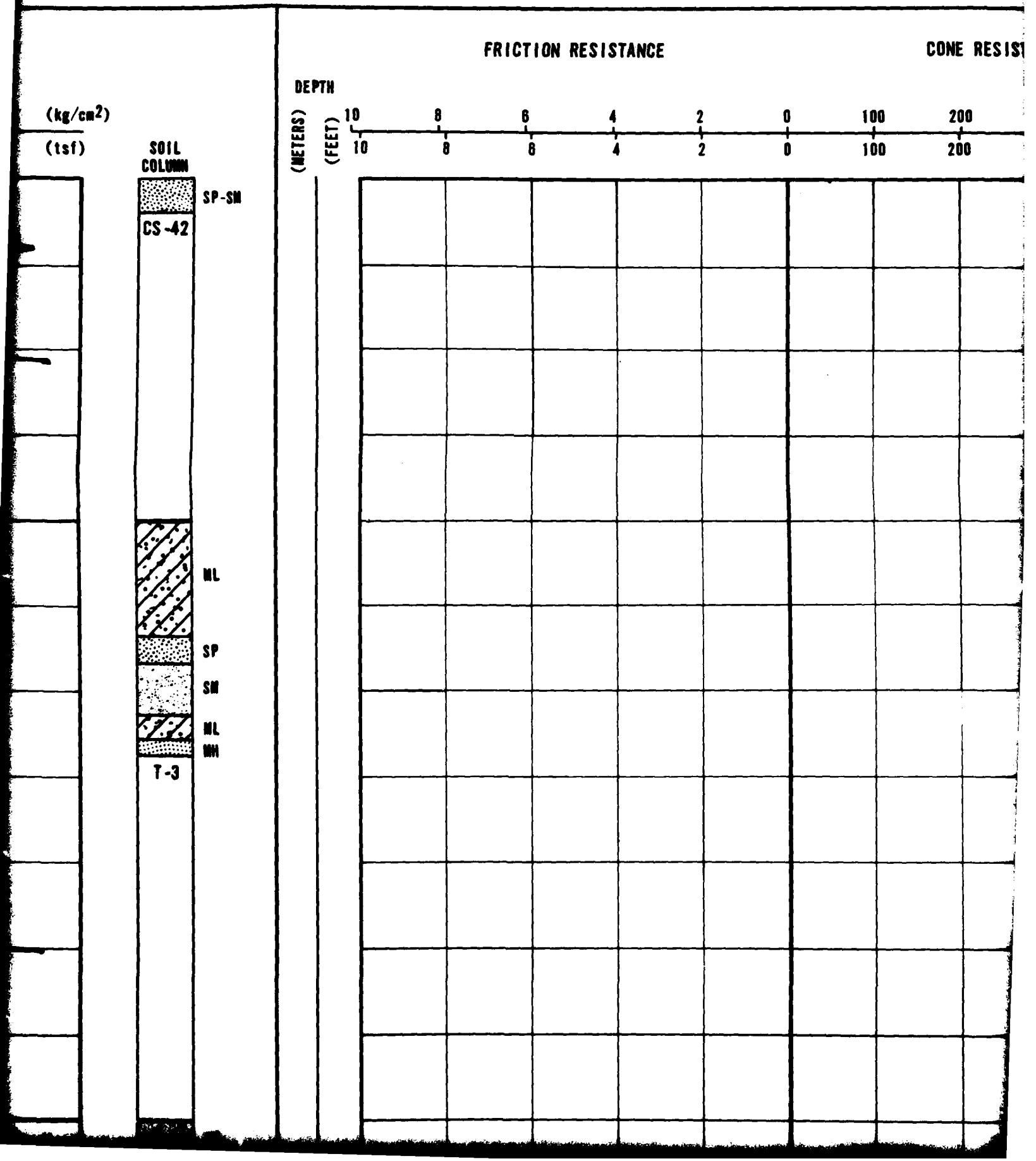
DRAWING
2
3 OF 4

FUGRO NATIONAL, INC.

FN-TR-27-VII


FRICTION RESISTANCE
CONE RESISTANCE
DEPTH
(METERS)
(FEET)
10 8 6 4 2 0
100 200 300 400
C-42 SURFACE ELEVATION: 4980' (1512m)
SURFICIAL GEOLOGIC UNIT: A5y
C-43 SURFACE ELEVATION: 4940' (1506m)
SURFICIAL GEOLOGIC UNIT: A5y

2


FRICTION RESISTANCE
CONE RESIST
DEPTH
(METERS)
(FEET)
10 8 6 4 2 0 100 200
10 8 6 4 2 0 100 200
(kg/cm2)
(tsf)
SOIL COLUMN
SP-SM
CS-42
ML
SP
SM
ML
MH
T-3

ANCE

300 400 (kg/cm²)

300 400 (tsf)

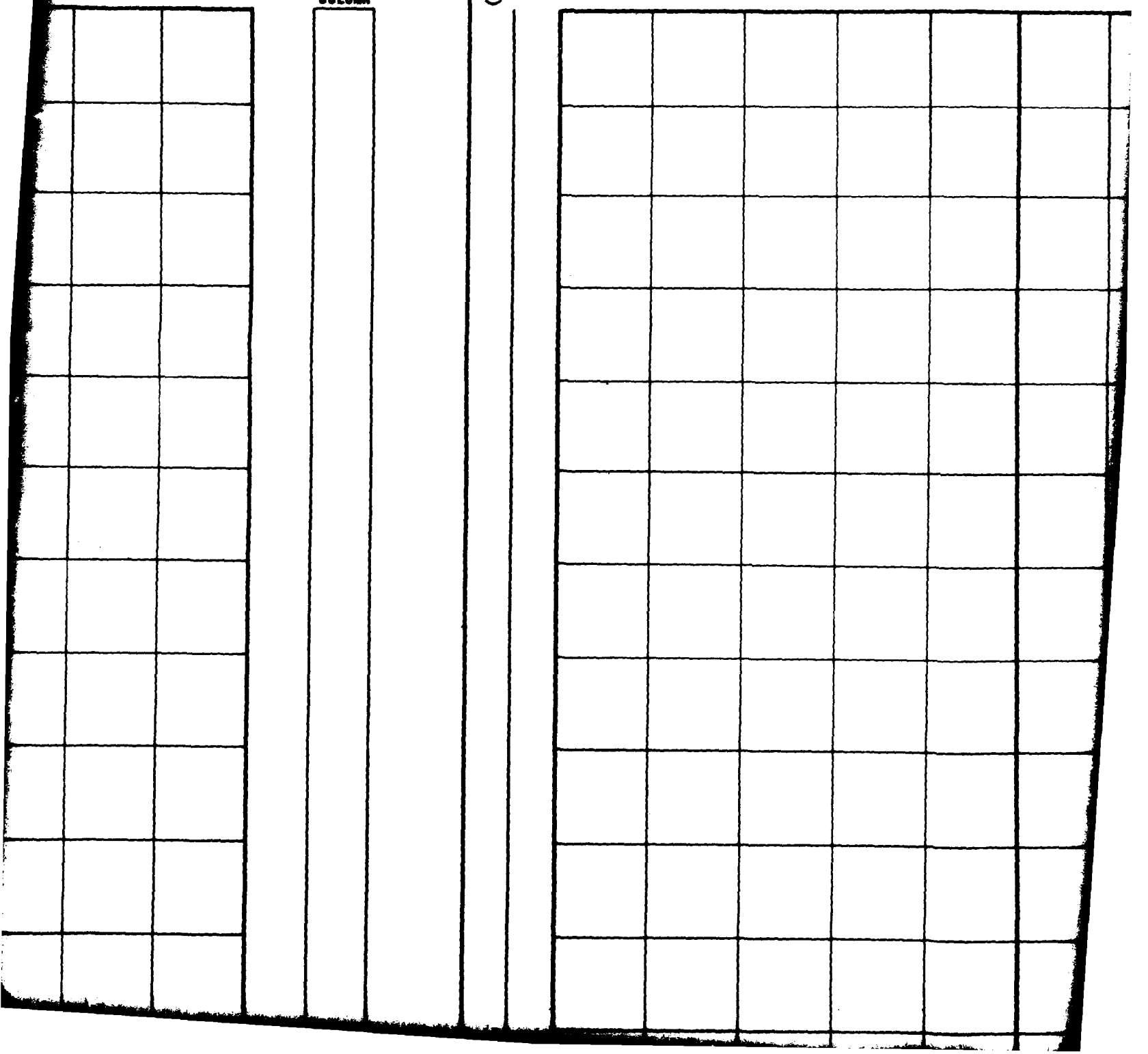
SOIL COLUMN

FRICTION RESISTANCE

DEPTH

(METERS) (FEET) 10 8 6 4 2 0 100

10 8 6 4 2 0 100



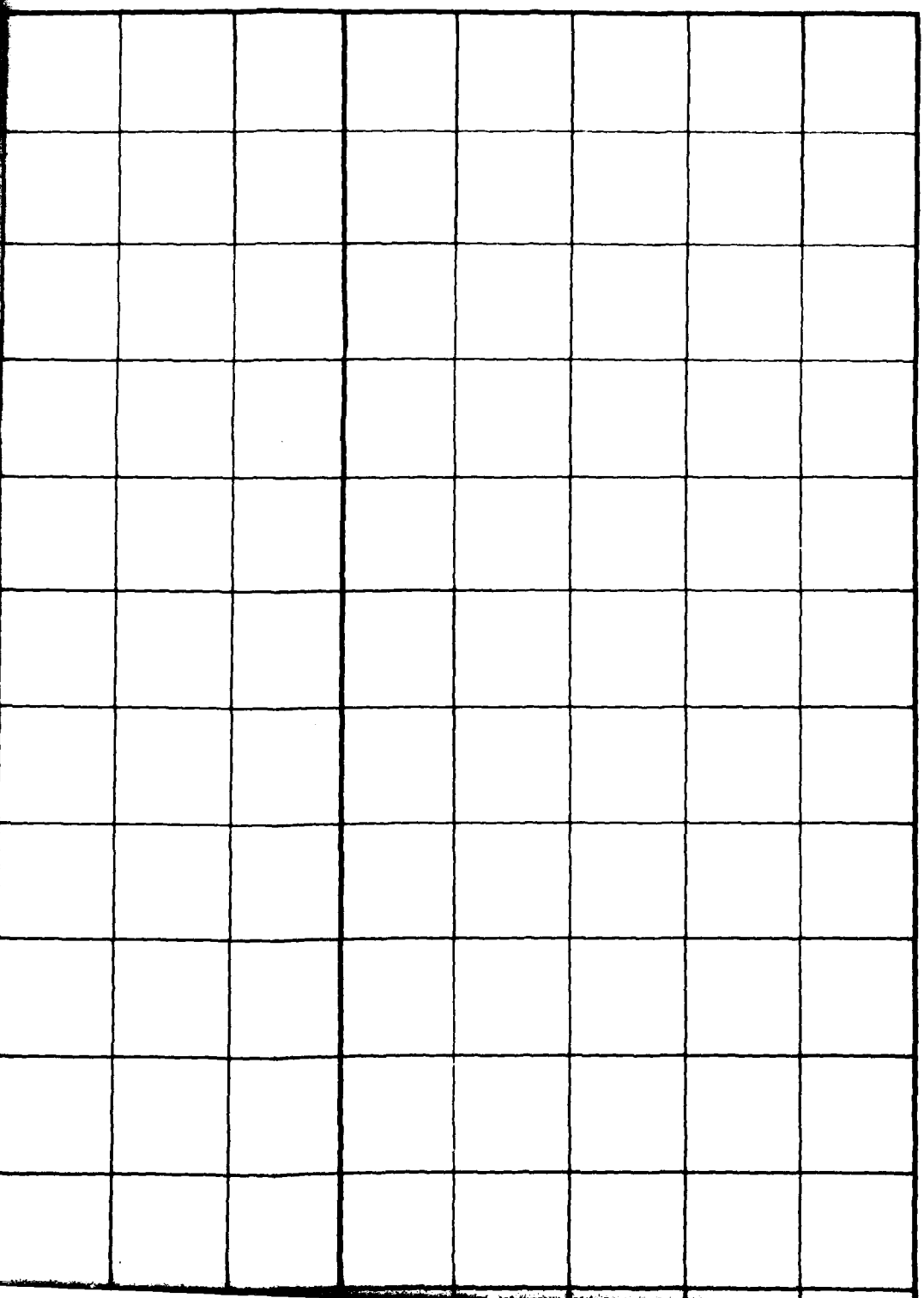
ION RESISTANCE

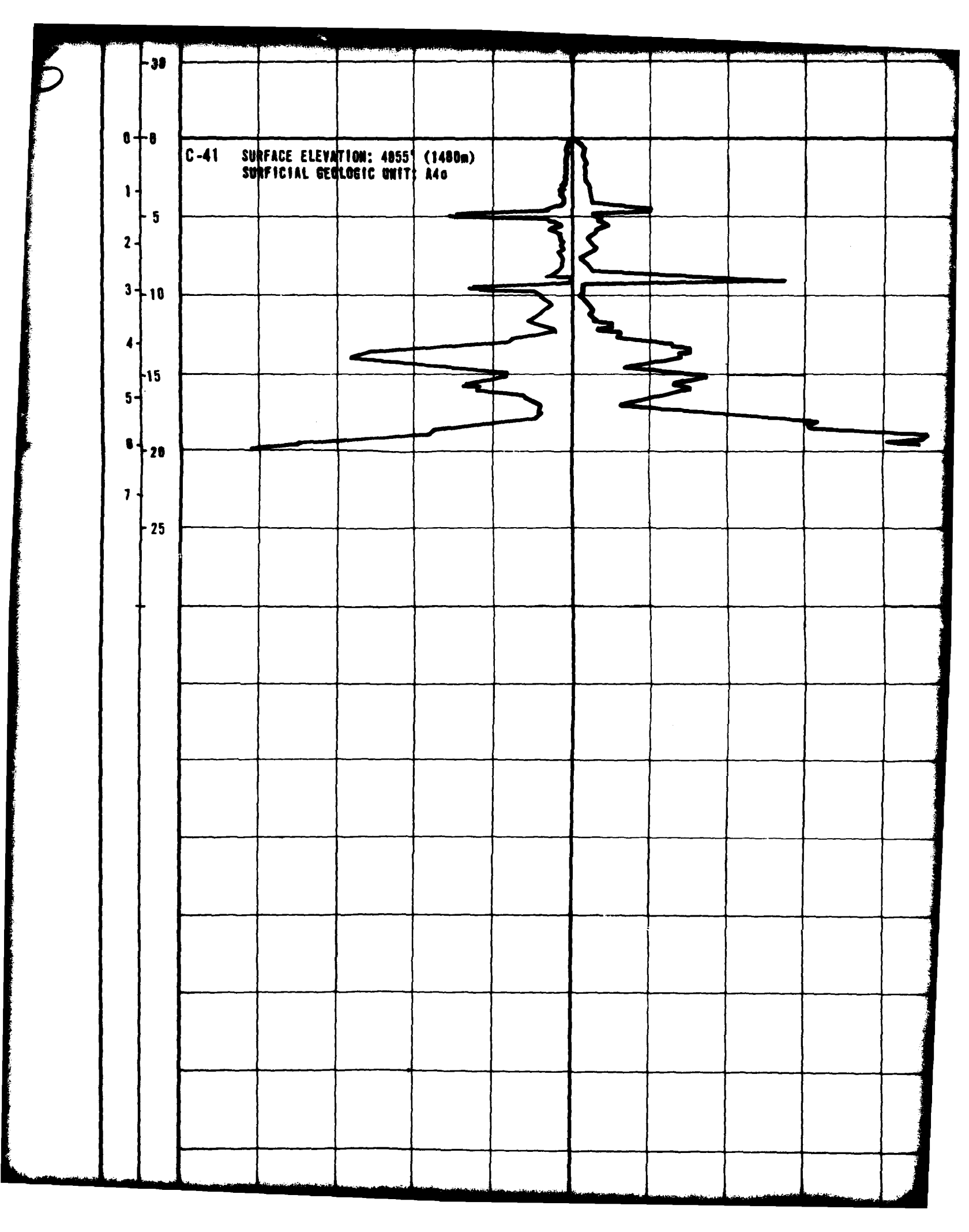
CONE RESISTANCE

4 2 0 100 200 300 400 (kg/cm^2)

4 2 0 100 200 300 400 (tsf)

SOIL COLUMN

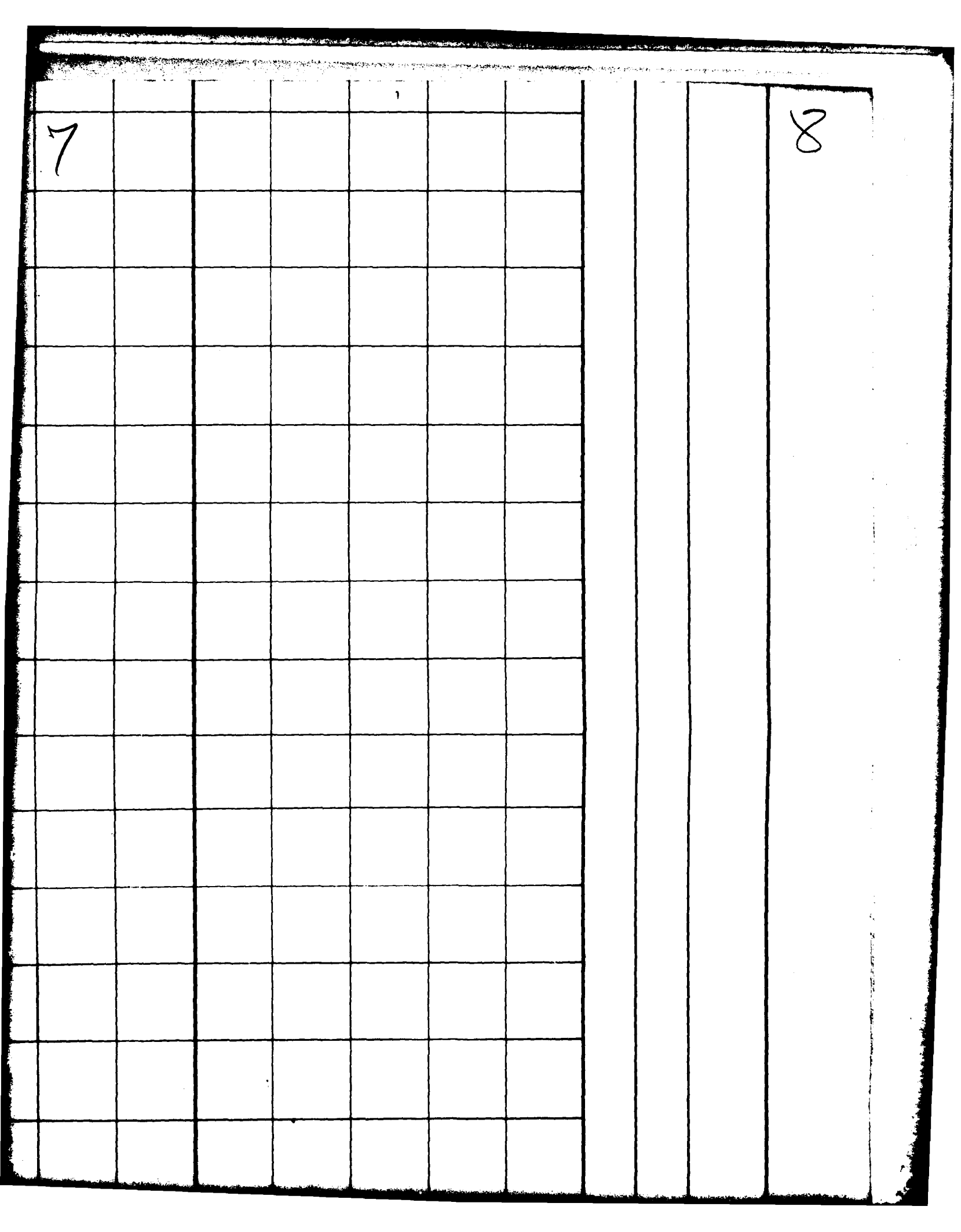


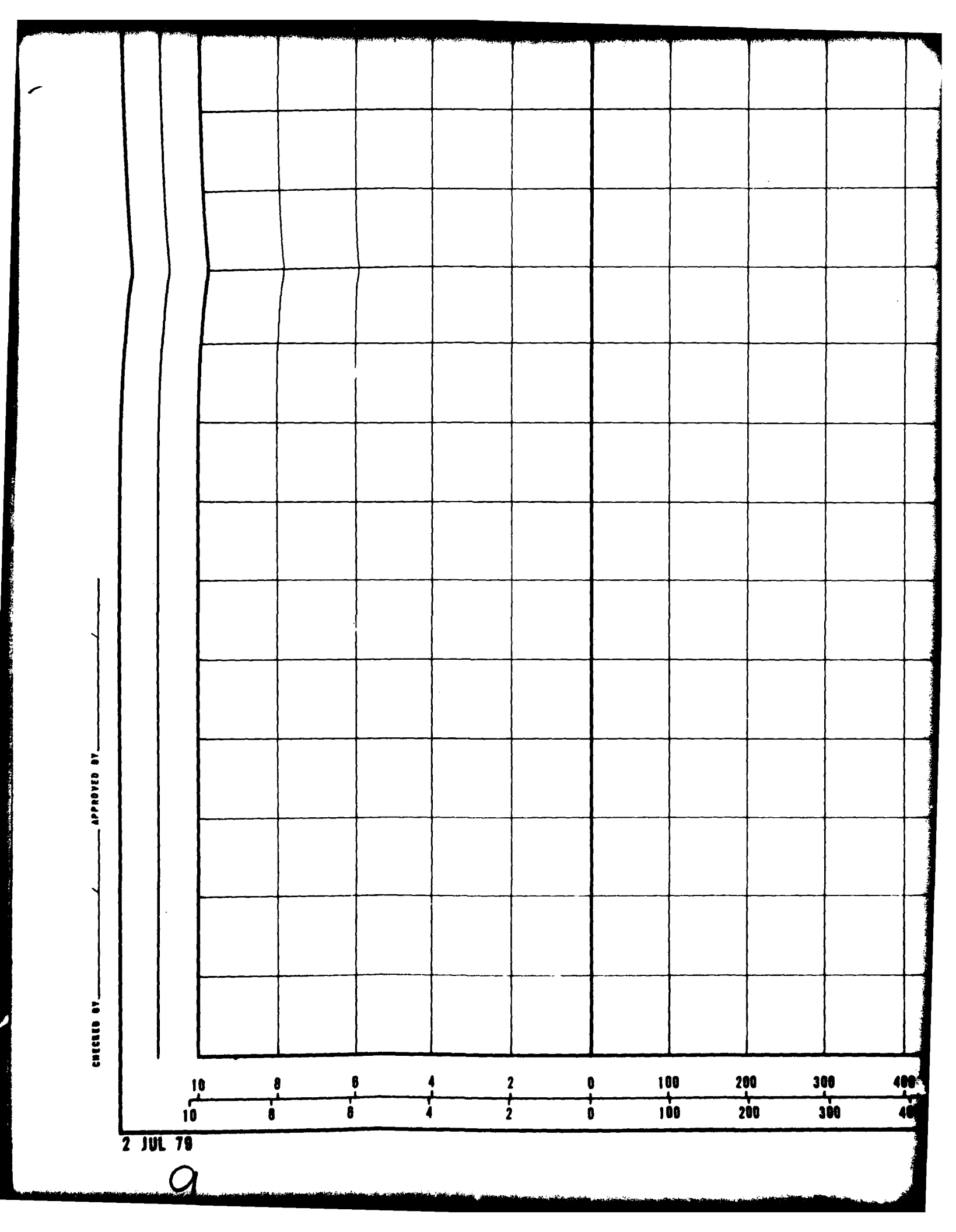

C-41 SURFACE ELEVATION: 4855' (1480m)
SURFICIAL GEOLOGIC UNIT: A4o
30
0
8
1
5
2
3
10
4
15
5
6
20
7
25

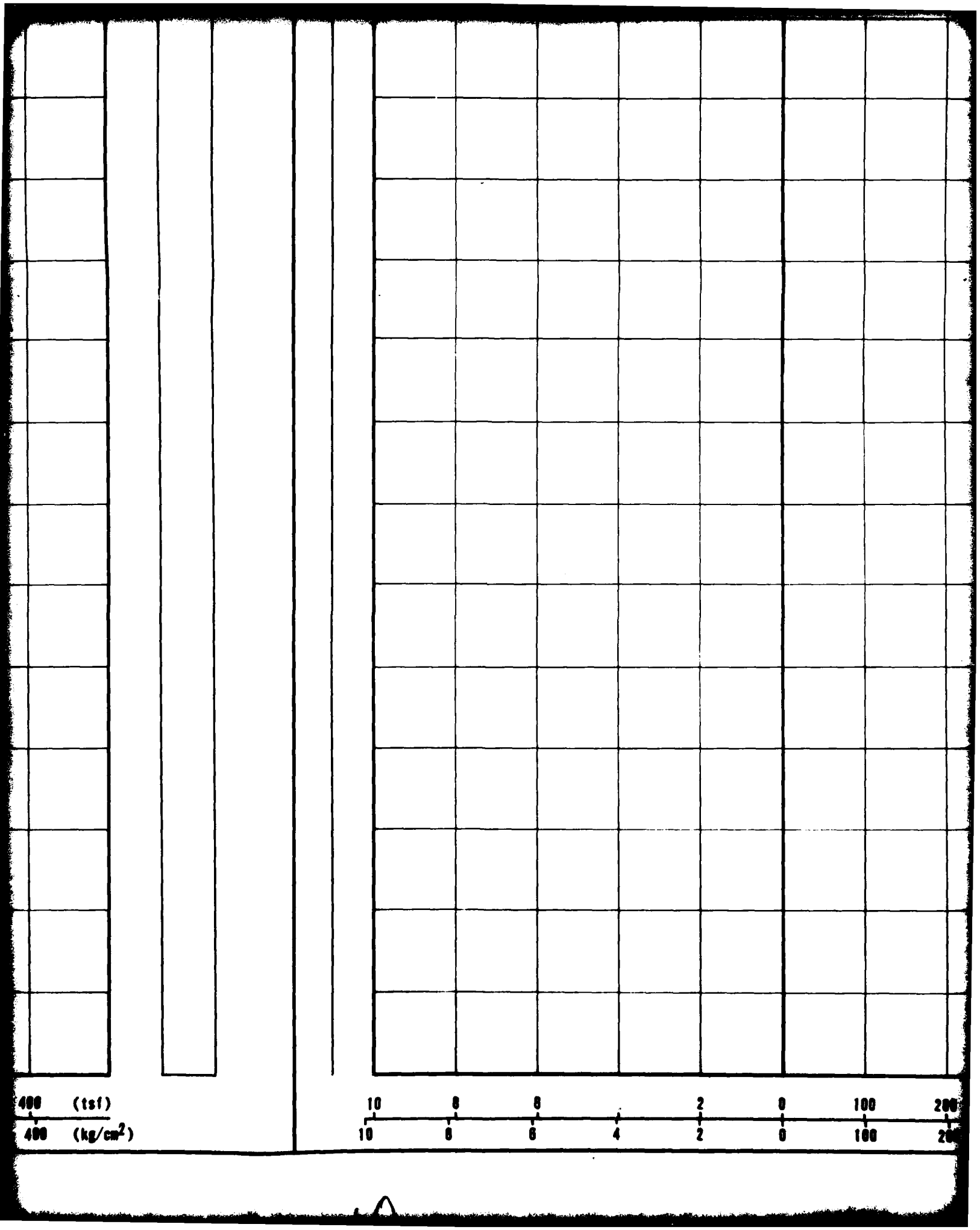
SM

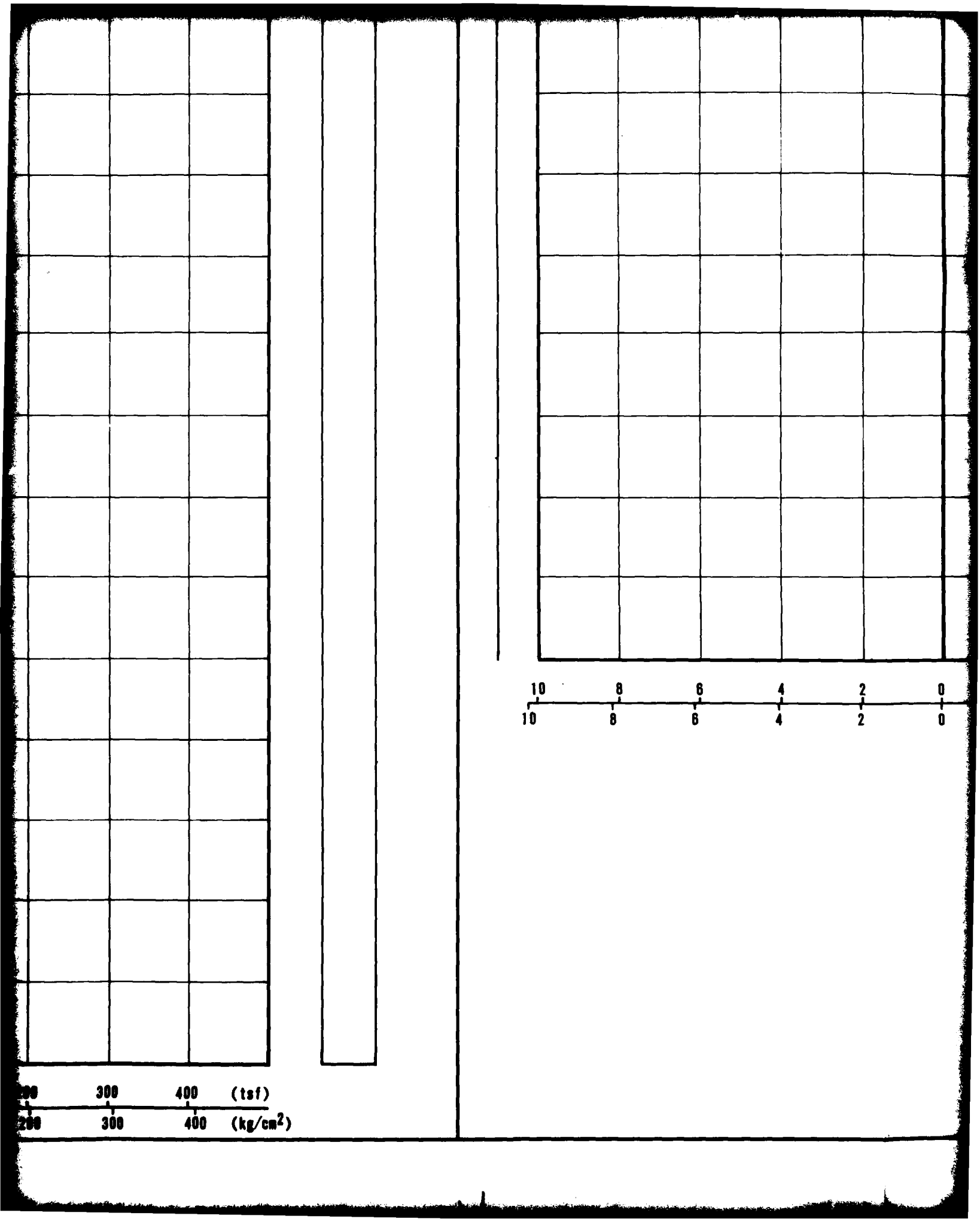
CS-41

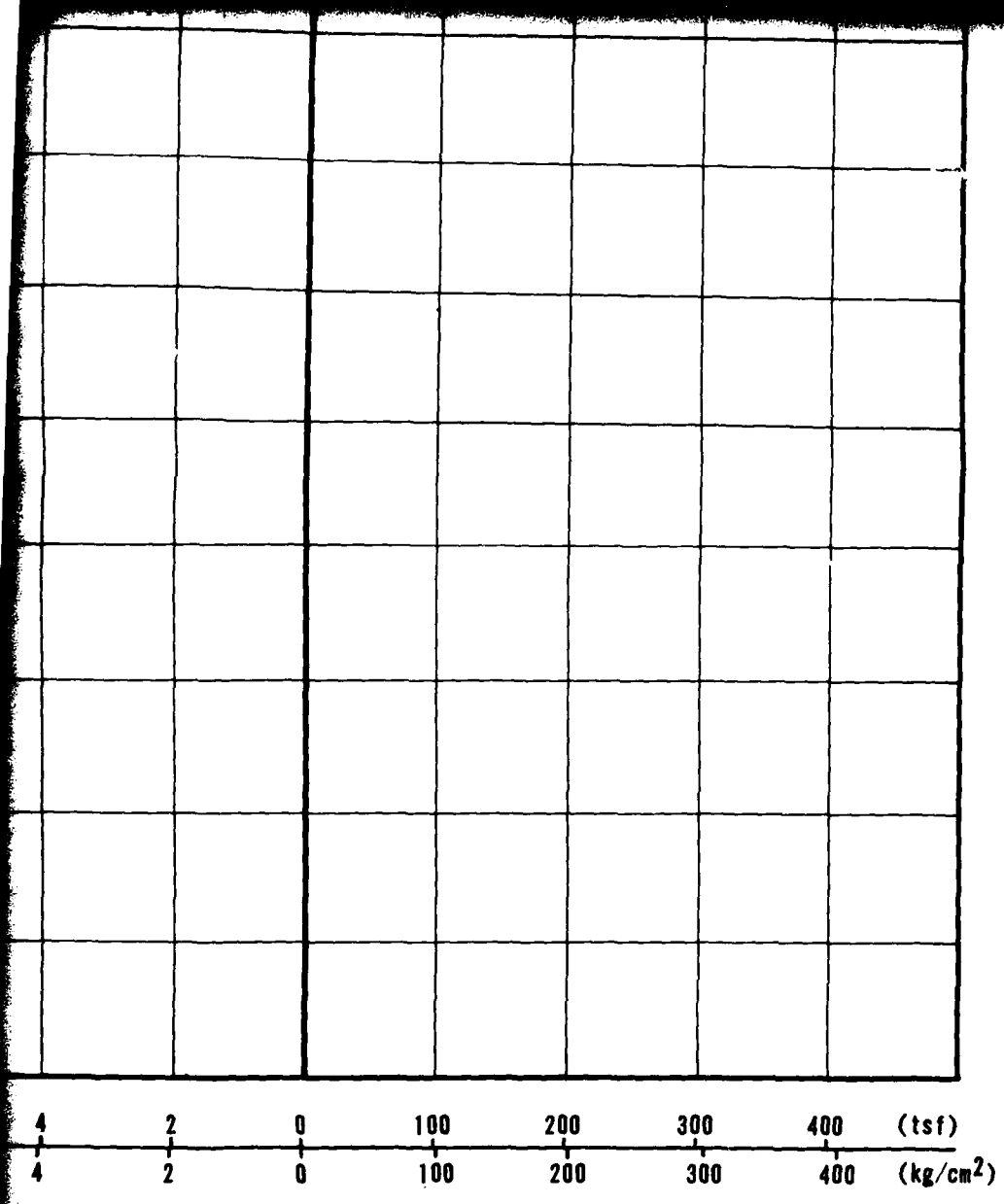
b


7
8


CHECKED BY
APPROVED BY
10 8 6 4 2 0 100 200 300
10 8 6 4 2 0 100 200 300
2 JUL 79
9


400 (tsf)
400 (kg/cm²)
10 8 6 2 0 100
10 8 6 4 2 0 100


10 8 6 4 2 0
10 8 6 4 2 0
300 400 (tsf)
300 400 (kg/cm²)



FRICTION RESISTANCE TEST RESULTS
VERIFICATION SITE
REVEILLE-RAILROAD

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SAMSO

DRAWING
2
4 OF 4

FUGRO NATIONAL, INC.


ATE
LME