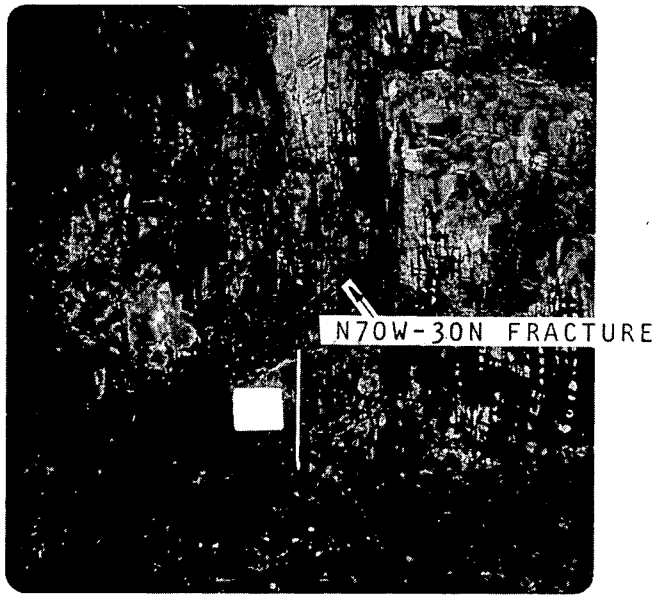



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-19

LOCATION - NORTH END, EAST CORNER OF UNION HILL QUARRY, SUFFERN, N.Y.

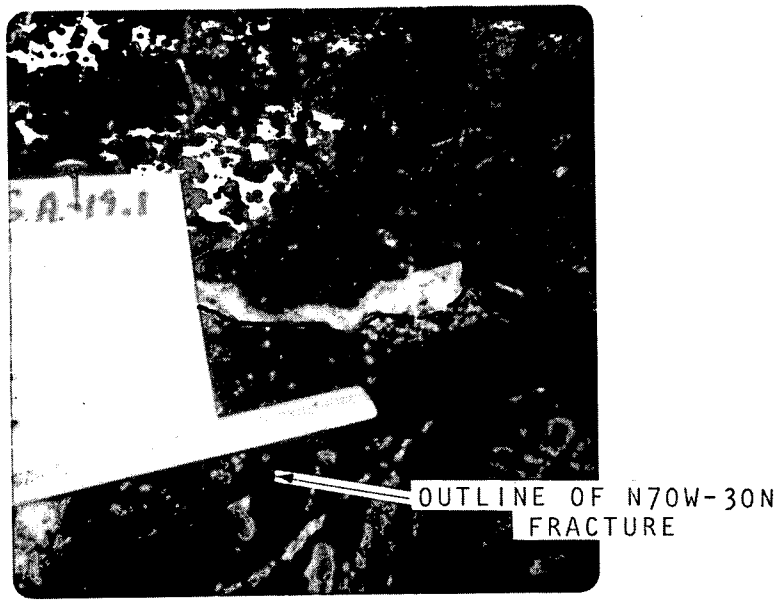
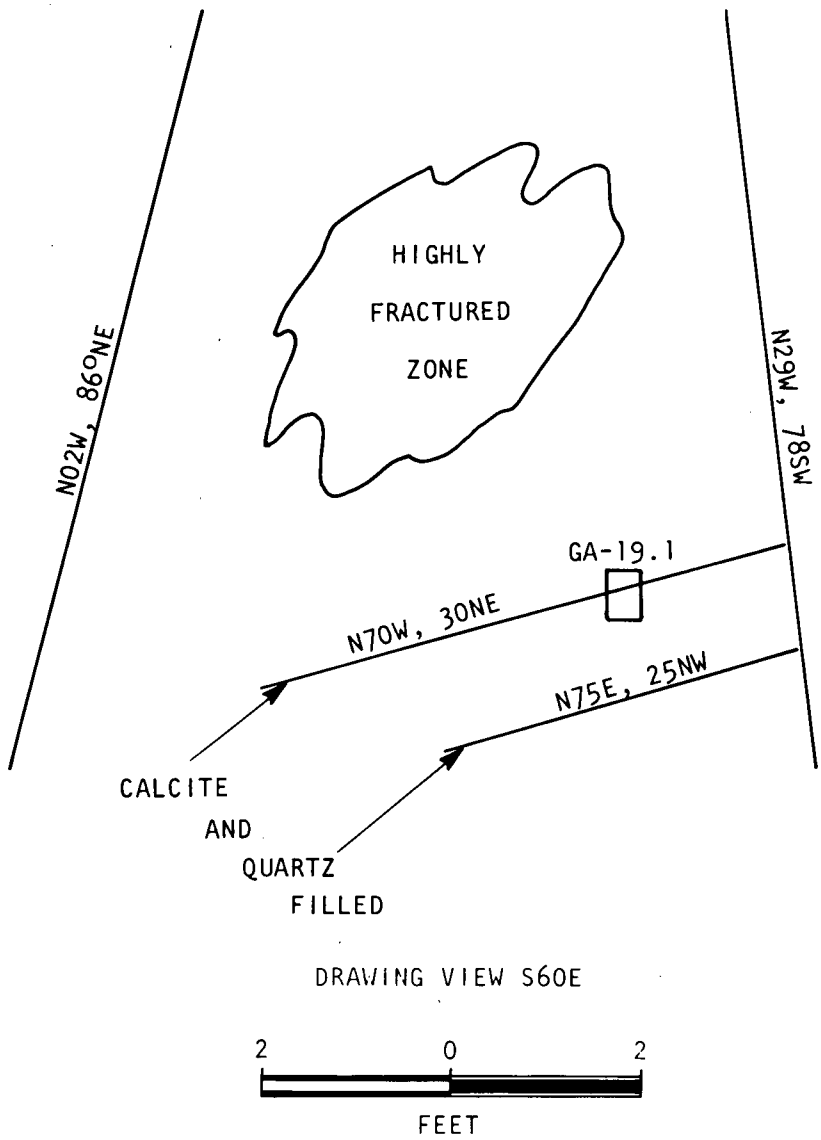



PHOTO B: CLOSEUP OF SAMPLE G.A.-19.1



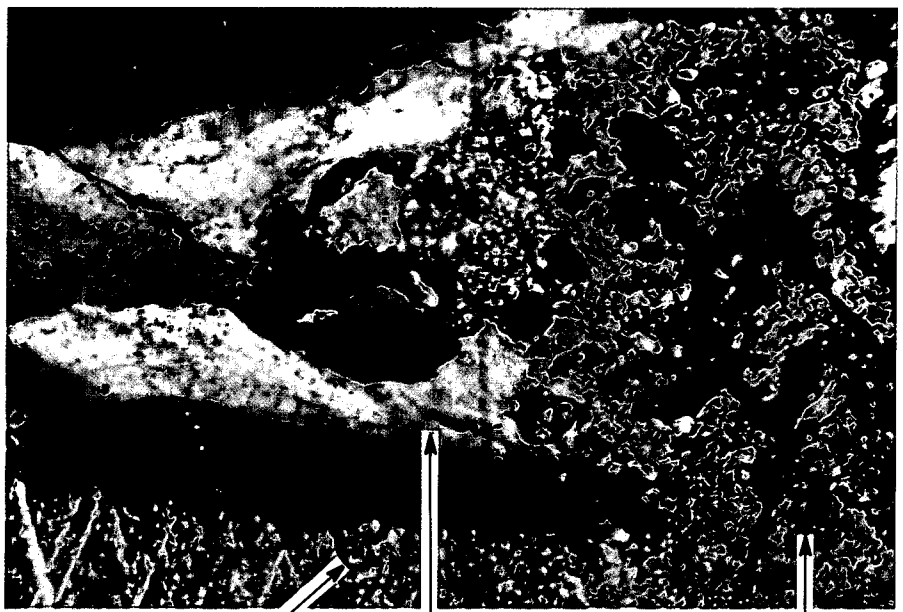

# STATION G.A.-19
# MINERALIZATION SAMPLING

LOCATION: UNION HILL QUARRY (EAST CORNER AT NORTH END)

NOTE: SAMPLE 19.1 EUHEDRAL CALCITE AND QUARTZ

DAMES & MOORE

PLATE E-10B




PHOTOMICROGRAPH OF SAMPLE G.A.-19.1

MAGNIFICATION: 40 X

SAMPLE TAKEN FROM FRACTURE TRENDING N70W,30N

PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-7

LOCATION - MOUNTAIN ROAD, OPPOSITE CONVEYOR IN MARTIN MARIETTA'S LONG CLOVE QUARRY, HAVERSTRAW, N.Y.

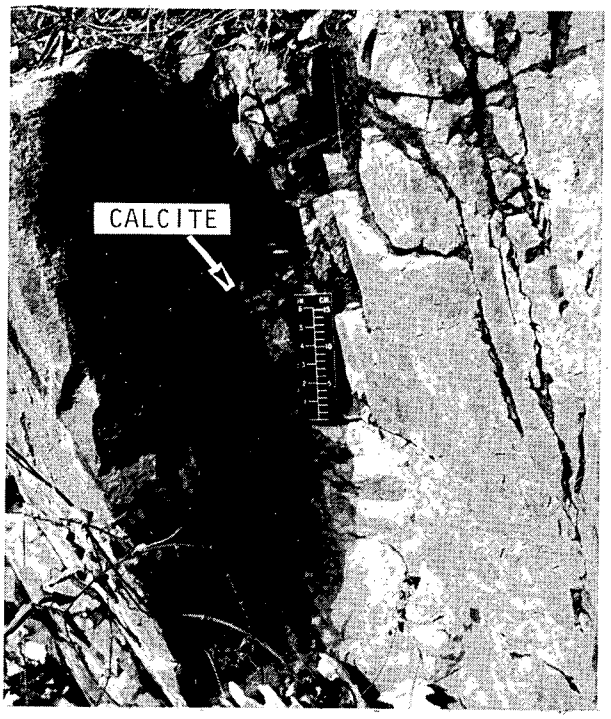
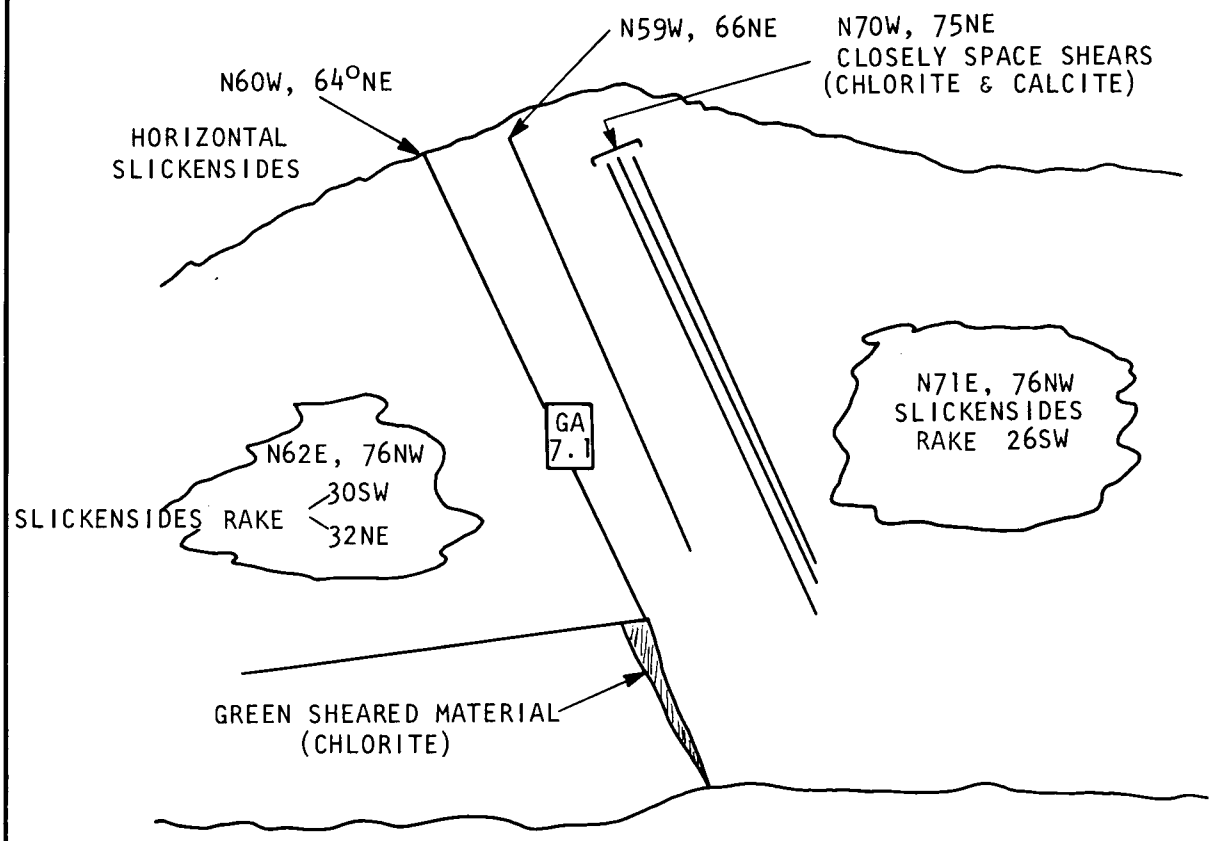
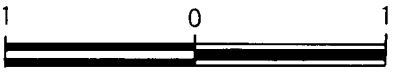



PHOTO B: CLOSEUP OF SAMPLE G.A.-7.1




CROSS SECTION (N45W VIEW)




FEET

# STATION G.A.-7
# MINERALIZATION SAMPLING

LOCATION: MOUNTAIN ROAD TRIASSIC DIABASE NEAR LONG CLOVE QUARRY

NOTE: APPARENTLY UNDEFORMED CALCITE FILLING SHEARED ZONE
STRIKING N60W, DIPPING 64°NE; SLICKENSIDES ARE HORIZONTAL

DAMES & MOORE

PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-7.1
MAGNIFICATION: 4X
X - NICOLS

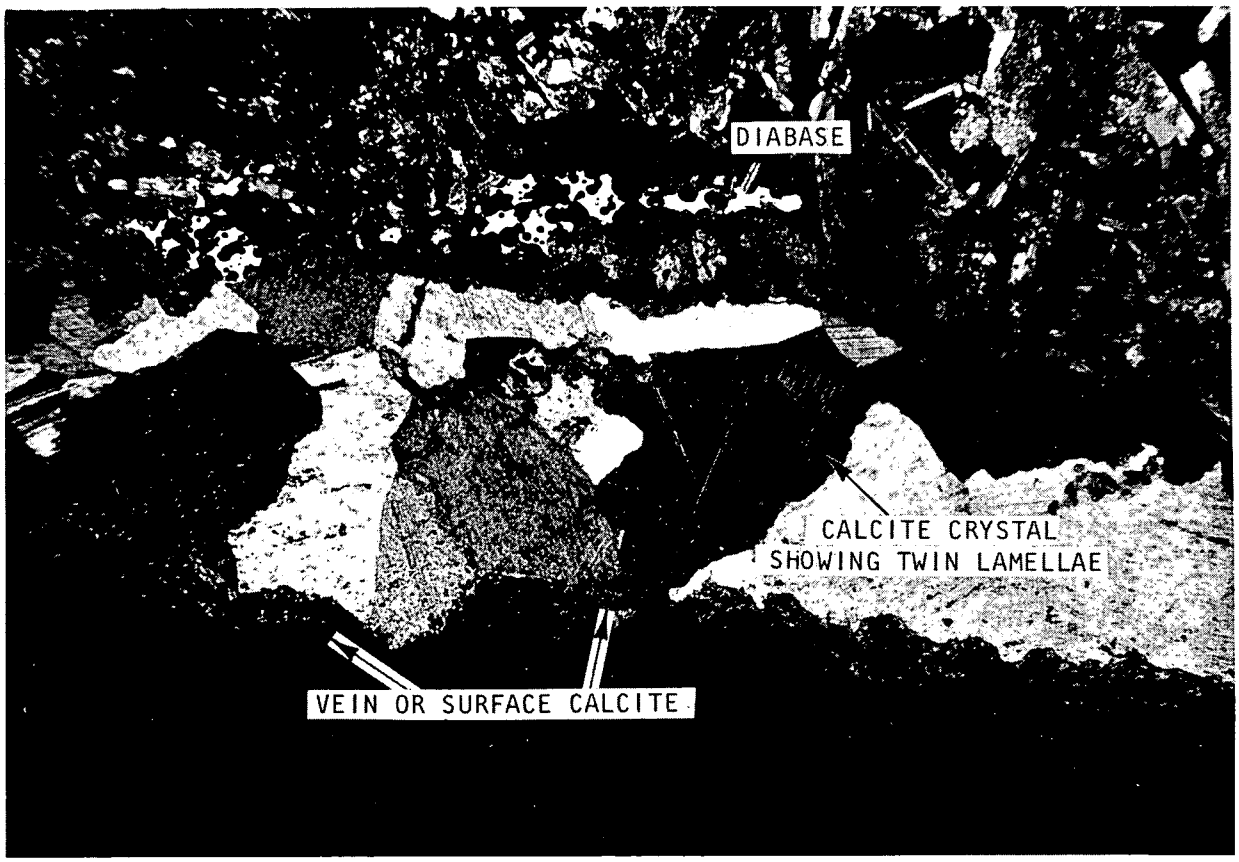



PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-7.1 SHOWING VEIN OR "SURFACE" CALCITE ASSOCIATED WITH DIABASE
MAGNIFICATION: 16X
X - NICOLS

DAMES & MOORE

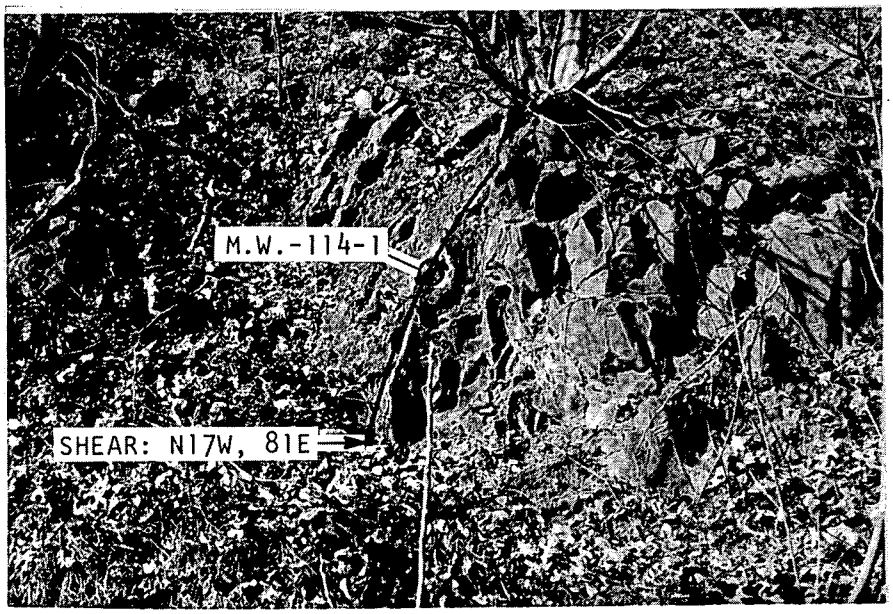



PHOTO A: OUTCROP VIEW OF SAMPLING STATION M.W.-114
LOCATION: RT. 303, 250 FT. NORTH OF CASPER ROAD

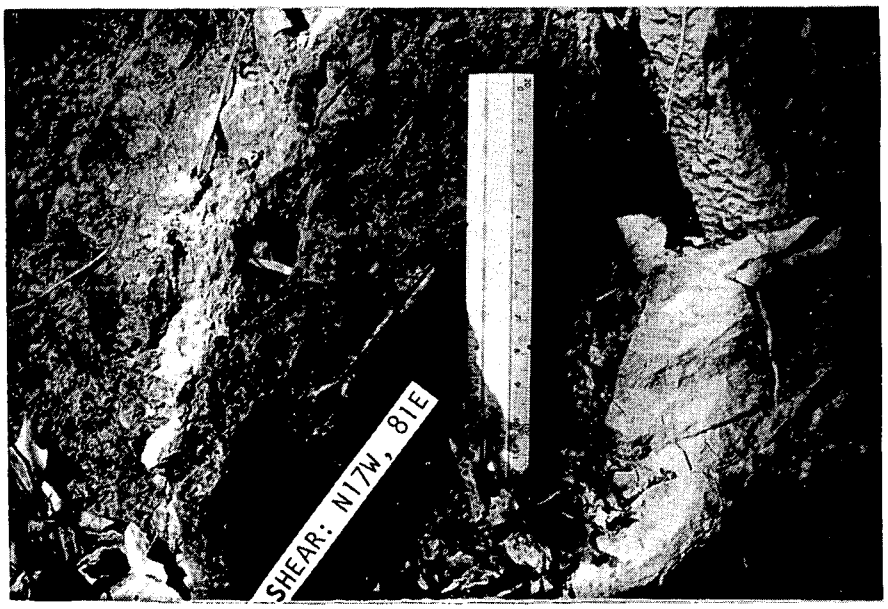
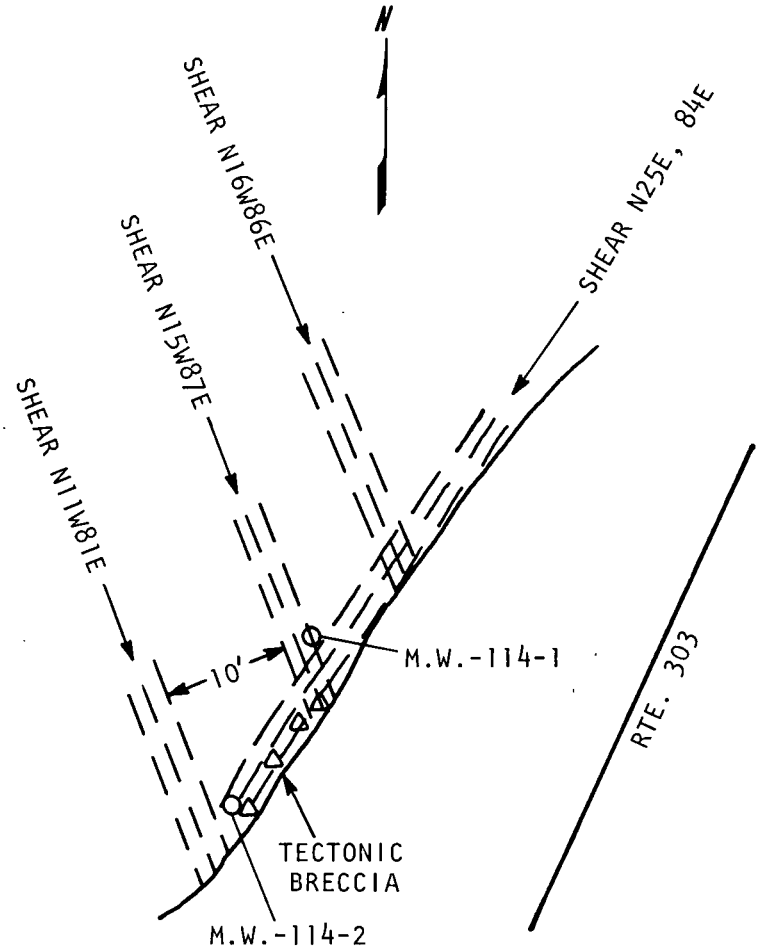



PHOTO B: CLOSEUP OF SAMPLING STATION M.W.-114-1




SKETCH MAP OF STATION M.W.-114

# STATION M.W. -114
# MINERALIZATION SAMPLING

LOCATION: RT. 303, 250 FEET NORTH OF CASPER ROAD

DAMES & MOORE

PLATE E-12B

PHOTOMICROGRAPH OF SAMPLE M.W.-114-1

MAGNIFICATION: 40 X

QUARTZ WITH ABUNDANT INCLUSIONS

SAMPLE TAKEN FROM WITHIN SHEAR ZONE TRENDING N17W,81E

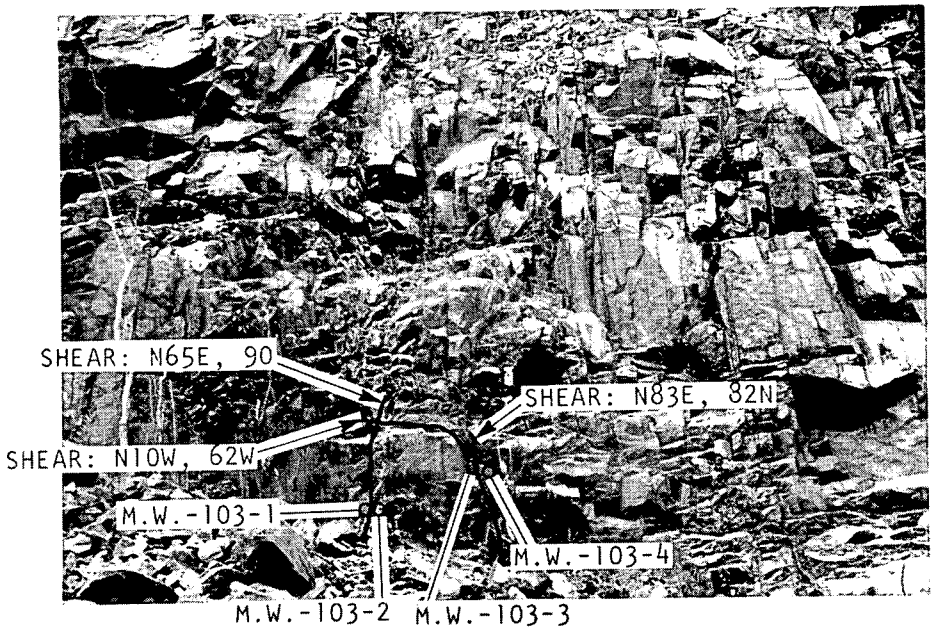



PHOTO A: OUTCROP VIEW OF SAMPLING STATION M.W.-103
LOCATION: VERDRIETEGE HOOK NORTH OF TROUGH HOLLOW

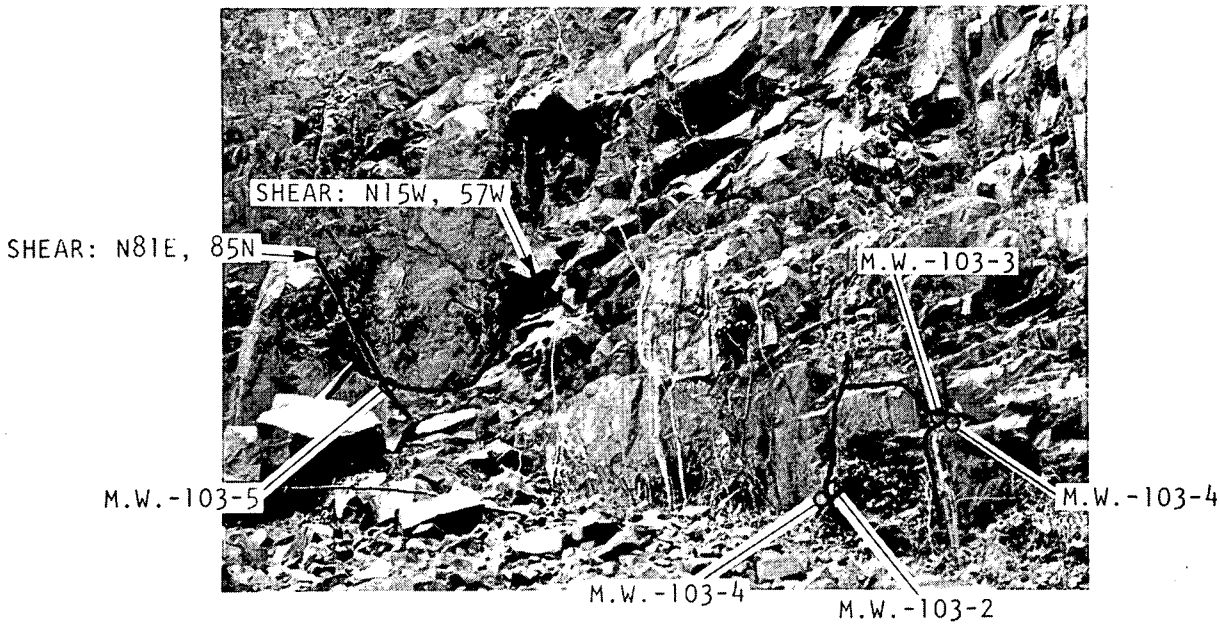
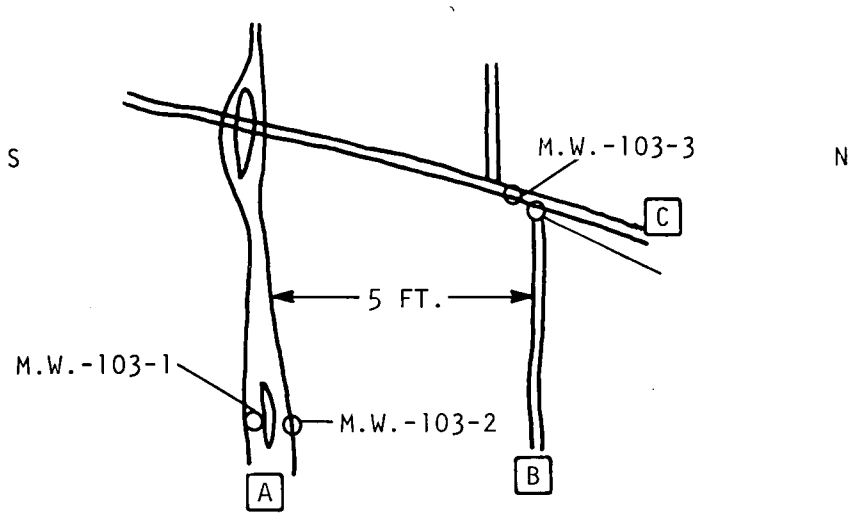



PHOTO B: OUTCROP VIEW OF SAMPLING STATION M.W.-103

LOCATION: SAME

DAMES & MOORE

ELEVATION SKETCH OF SAMPLE LOCATIONS




A = SHEAR N65E VERT.
B = SHEAR N83E82N
C = SHEAR N10W62W

# STATION M.W.-103
# MINERALIZATION SAMPLING

LOCATION: VERDRIETEGE HOOK NORTH OF TROUGH HOLLOW

DAMES & MOORE

PLATE E-13B

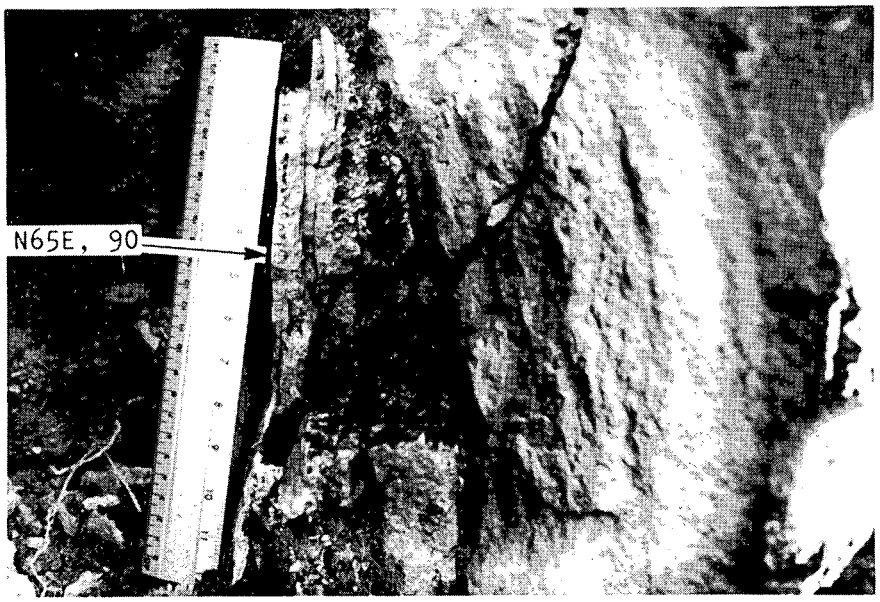



PHOTO A: CLOSEUP OF SAMPLING STATION M.W. 103-2

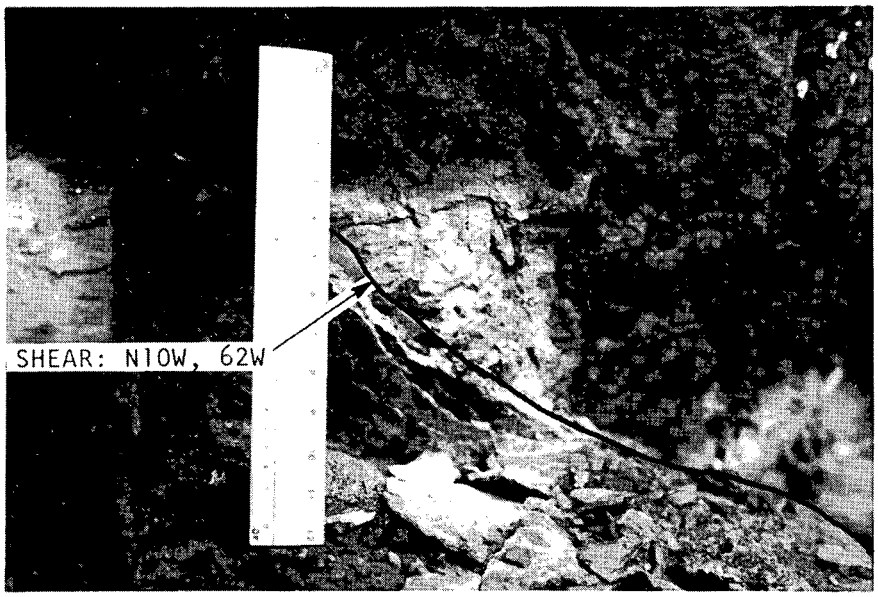



PHOTO B: CLOSEUP OF SAMPLING LOCATION M.W.-103-3

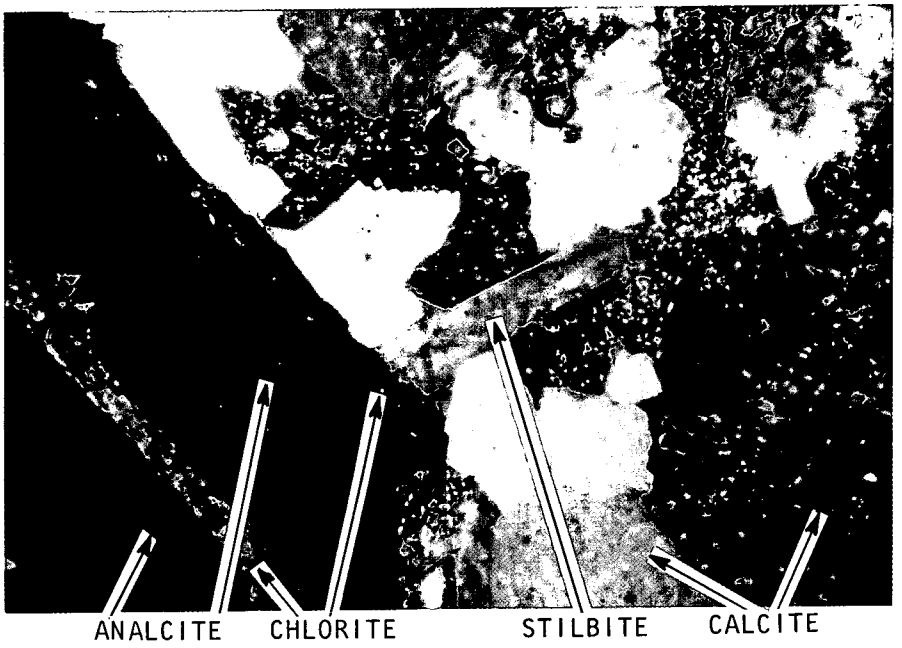



PHOTO A

PHOTOMICROGRAPH OF SAMPLE M.W.-103-2

MAGNIFICATION: 40 X

SAMPLE TAKEN FROM WITHIN SHEAR ZONE TRENDING N65E,90

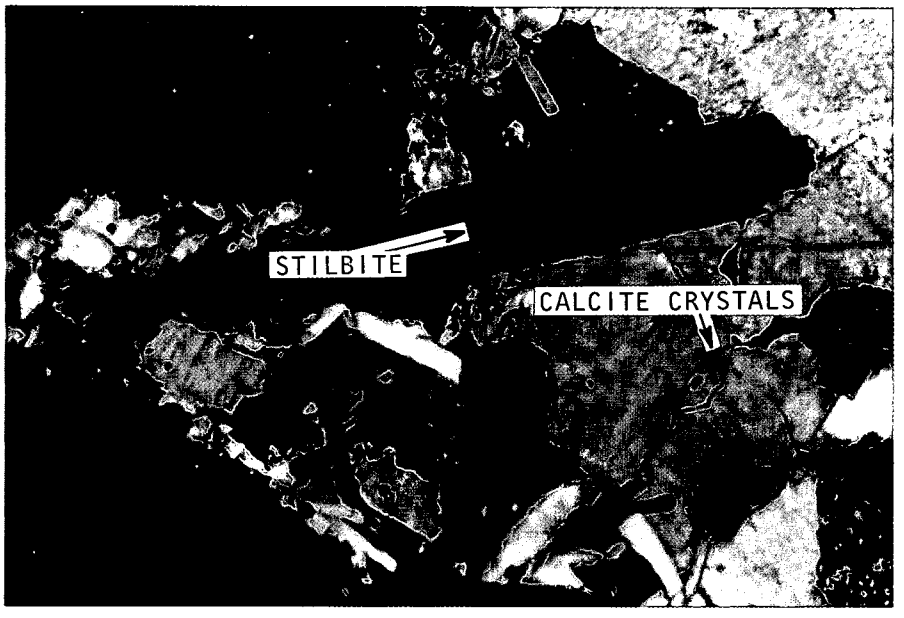
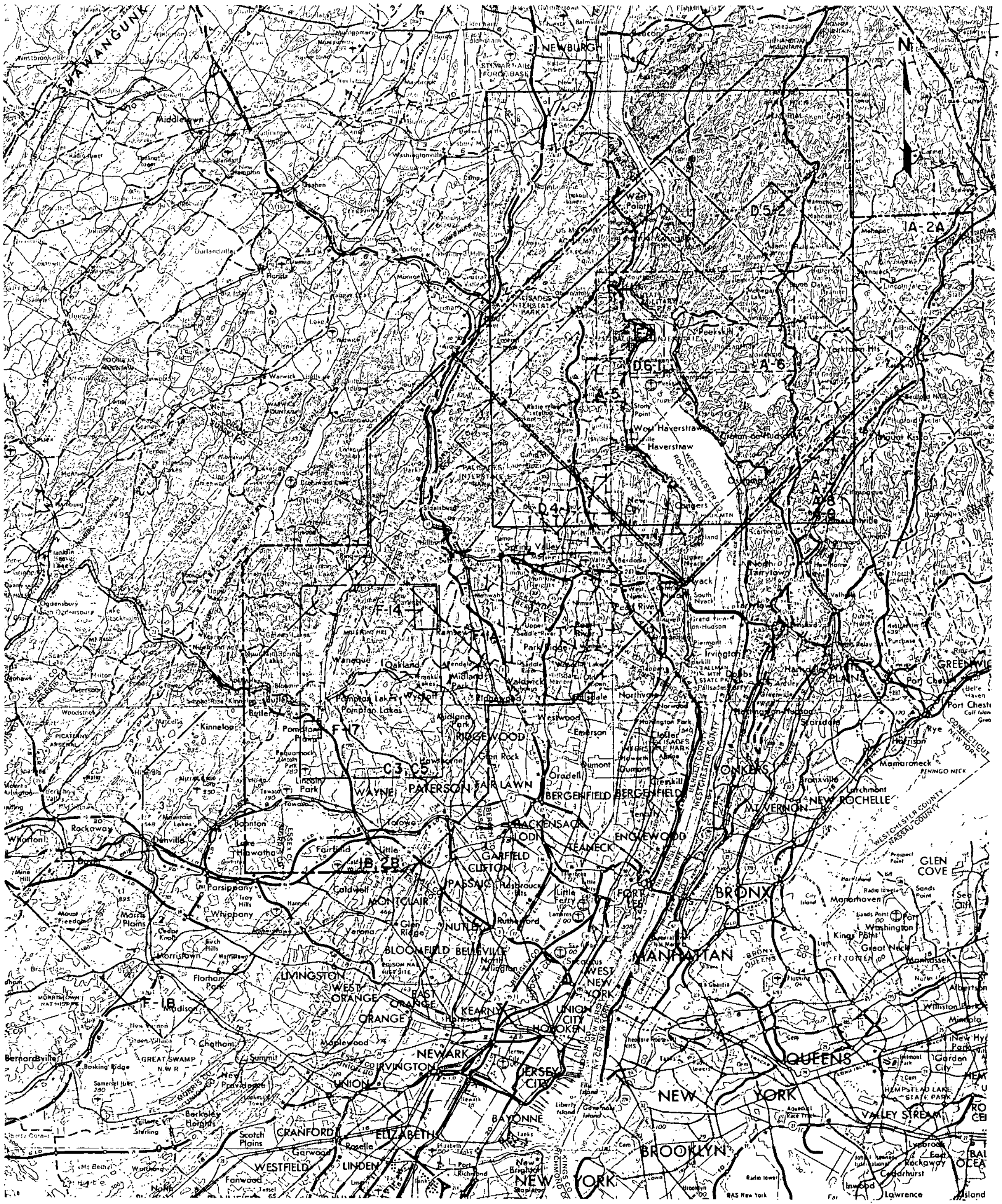



PHOTO B

PHOTOMICROGRAPH OF SAMPLE M.W.-103-3

MAGNIFICATION: 40 X

SAMPLE TAKEN FROM SHEAR ZONE TRENDING N10W,62W

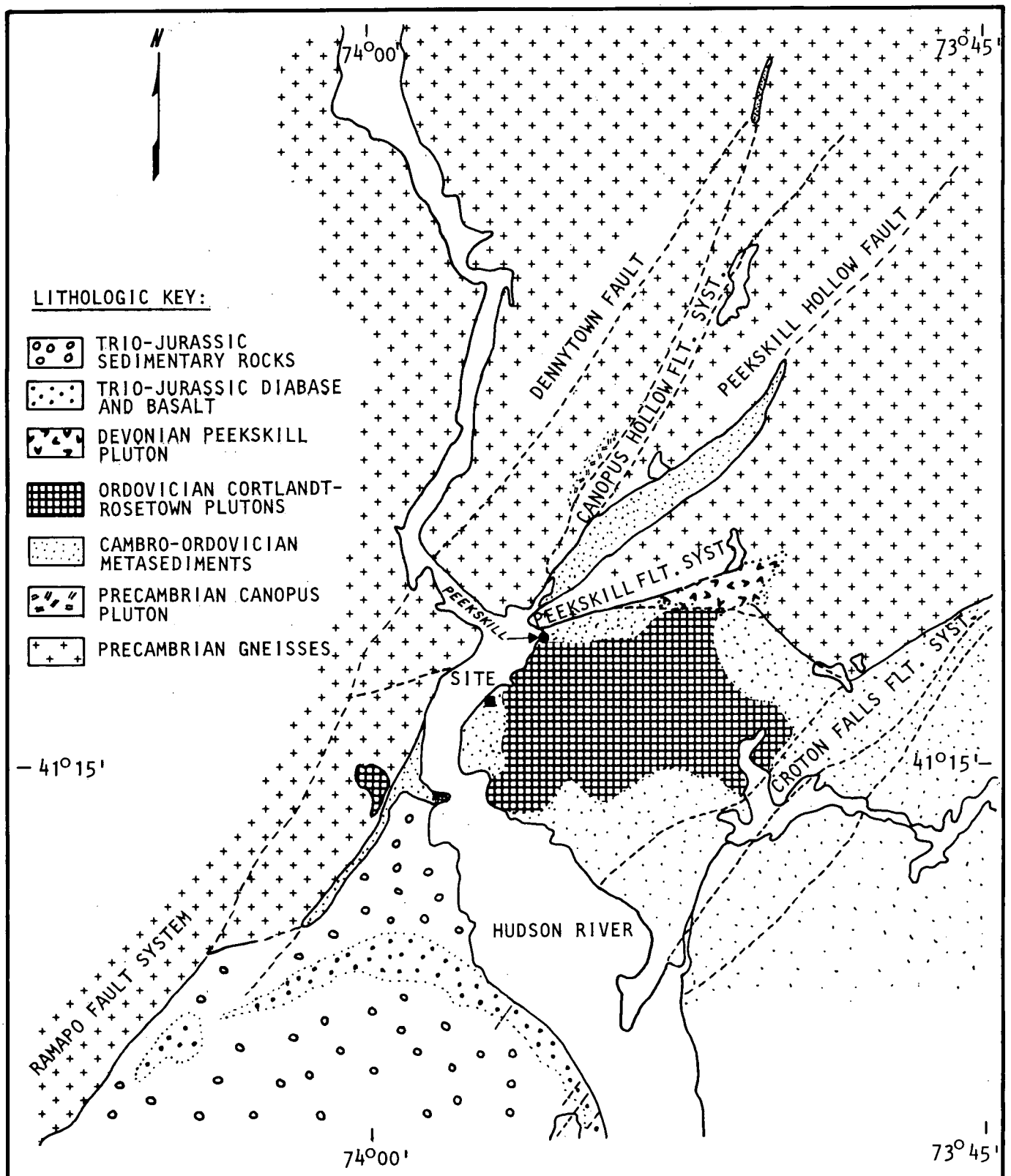



# GEOGRAPHIC LOCATION OF VARIOUS MAP PLATES

5 0 5 10
STATUTE MILES

5 0 10 15
KILOMETERS

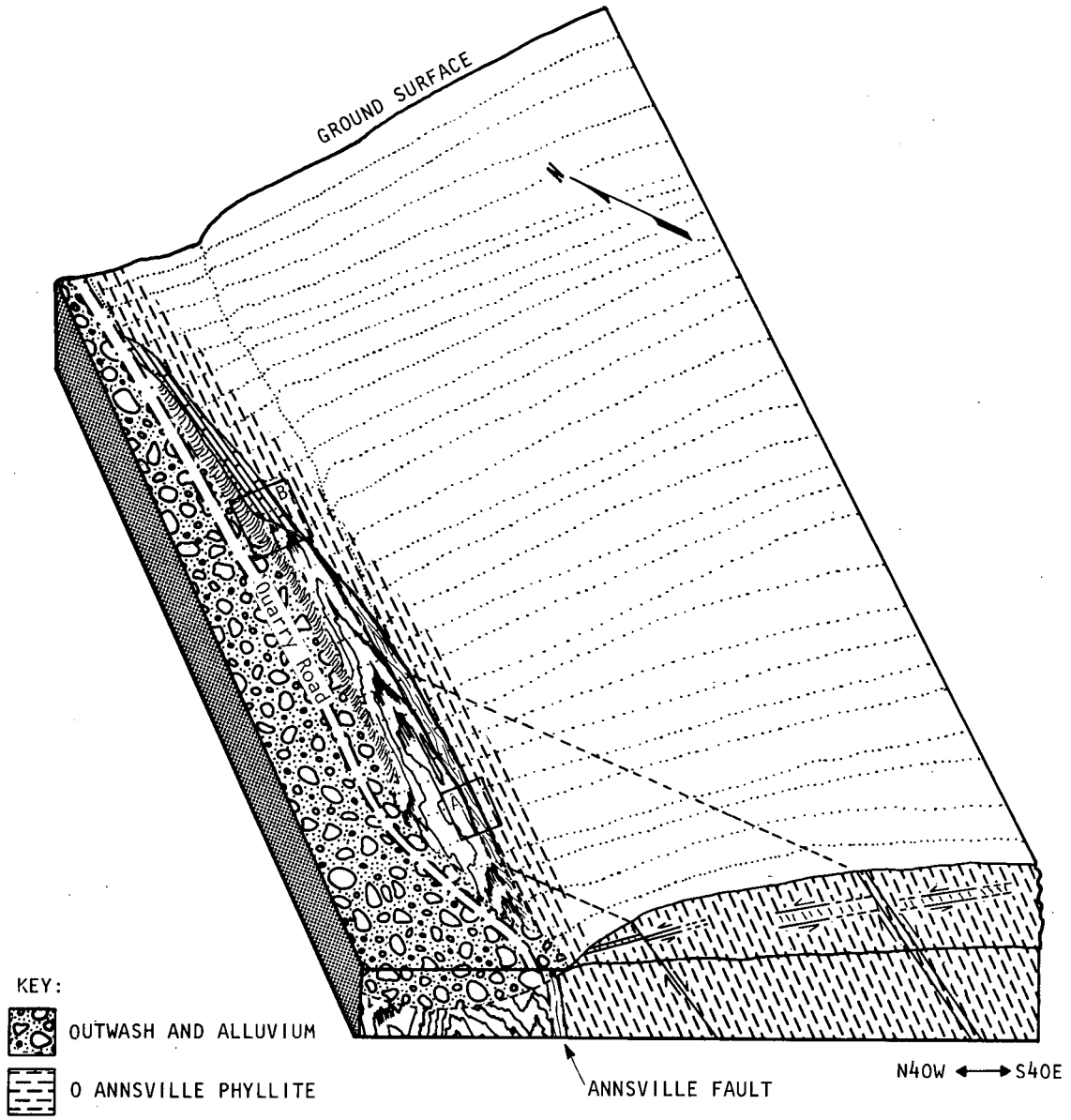
DAMES & MOORE




GEOLOGIC MAP OF PEEKSKILL AREA

0 1 2
MILES

DAMES & MOORE




KEY:

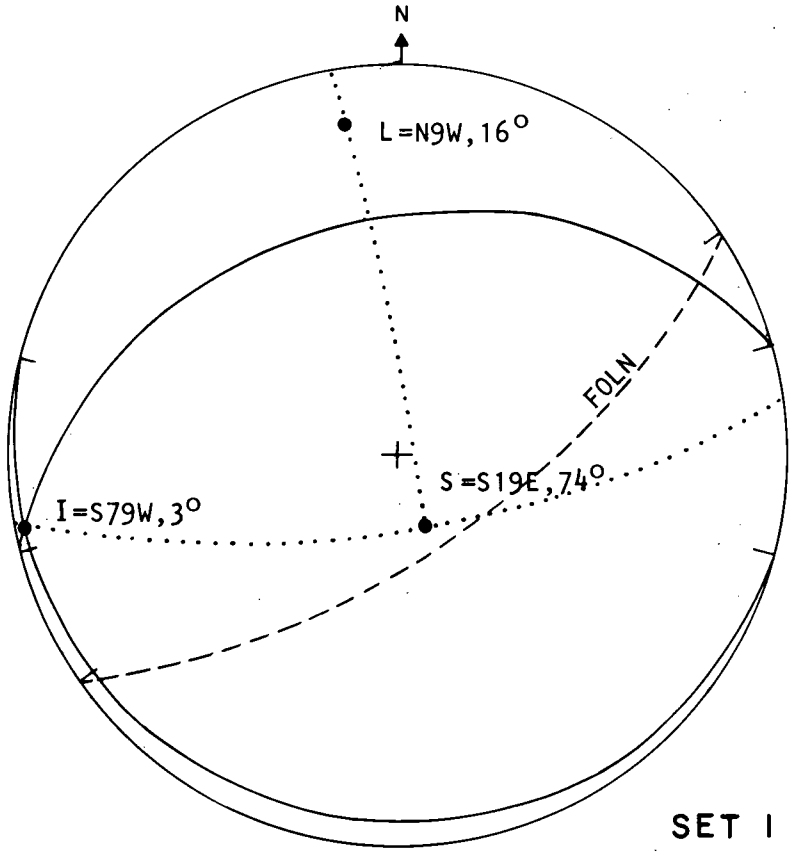
- OUTWASH AND ALLUVIUM
- O ANNSVILLE PHYLLITE
- CO WAPPINGER LIMESTONE
- MYLONITIZED pC GNEISS
- pC MYLONITIC GRANITIC GNEISS
- ROCK SCARP
- FAULT SHOWING MOTION

NOTE: BOXES A,B DISCUSSED IN TEXT.

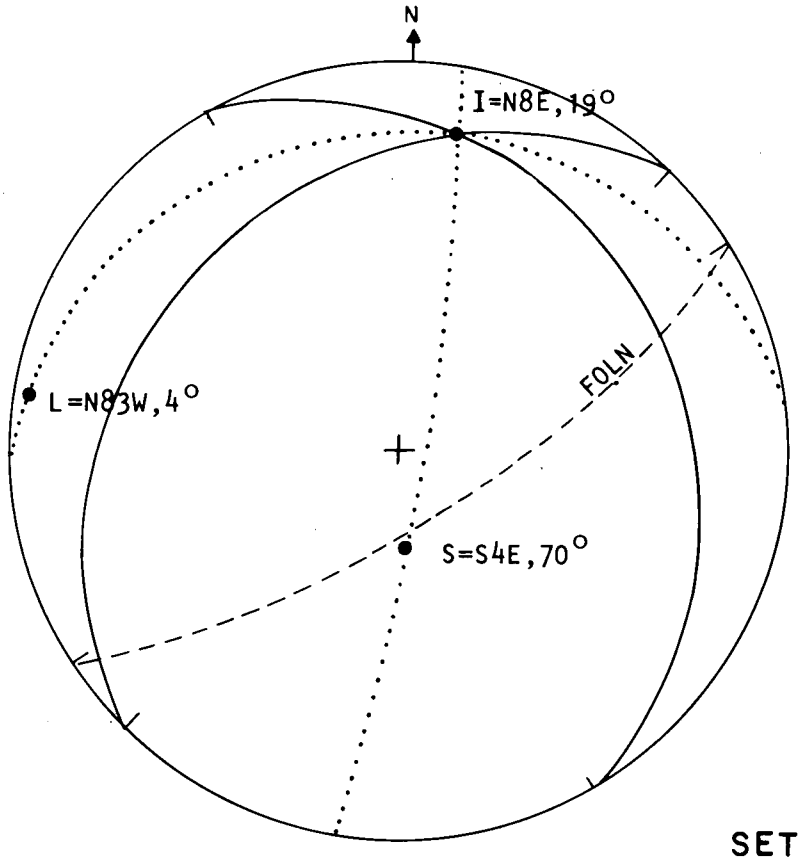
# BLOCK DIAGRAM OF ANNSVILLE FAULT, ANNSVILLE, N.Y.

40 0 40 80 120 FEET

DAMES & MOORE




SET 1

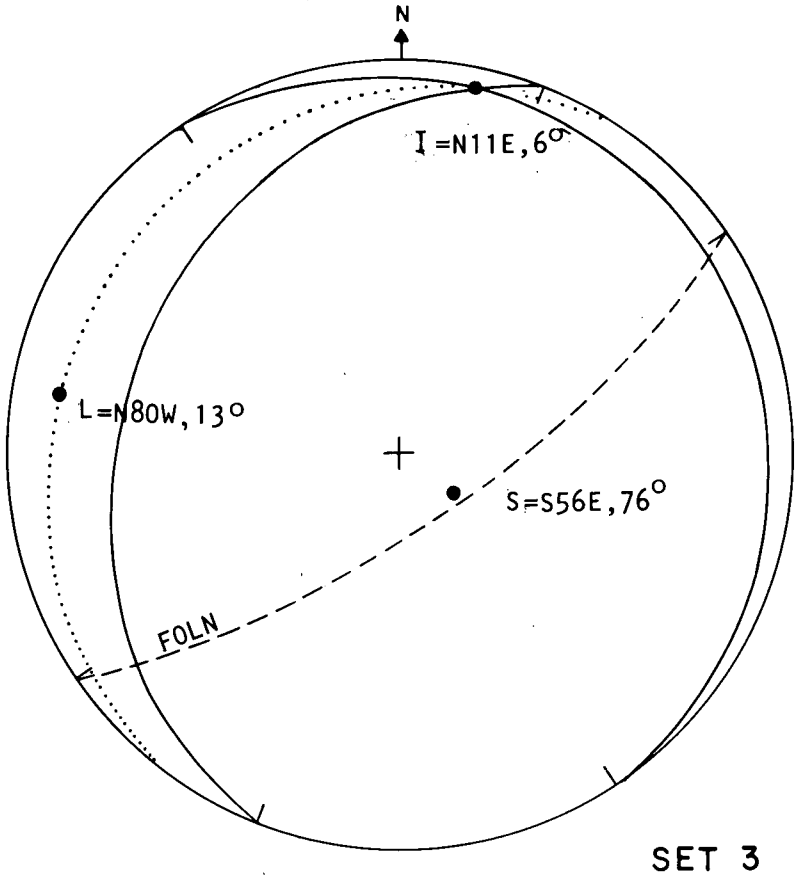



SET 2

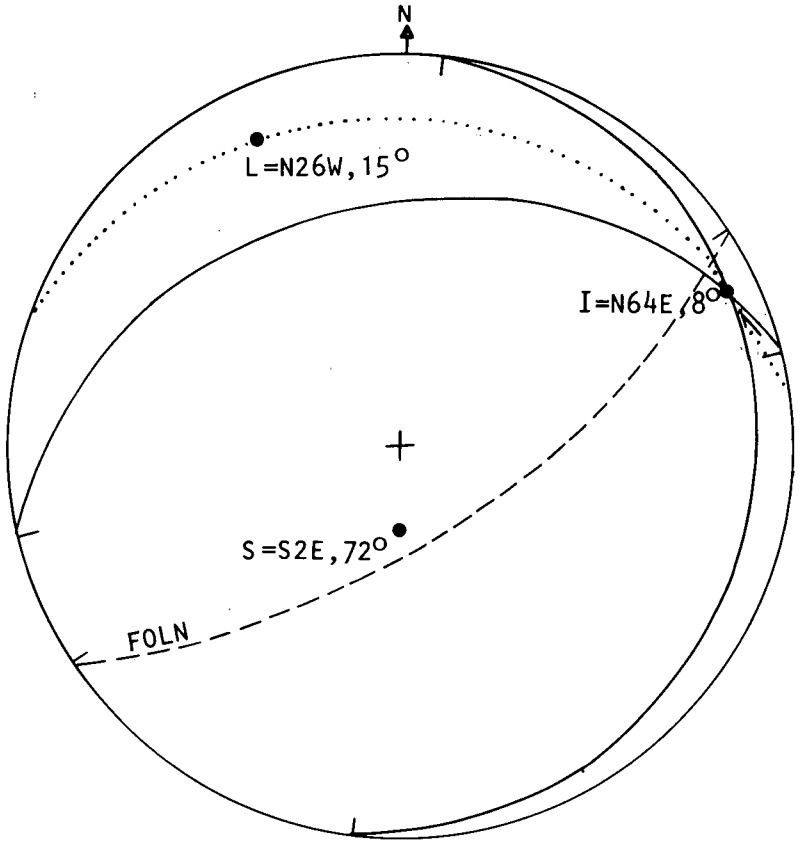
**LOWER HEMISPHERE EQUAL AREA PROJECTIONS OF CON UGATE KINK SETS IN ANNSVILLE FORMATION ANNSVILLE, N.Y.**

S, L AND I ARE SHORTENING, LENGTHENING AND INTERMEDIATE AXES, RESPECTIVELY.

DAMES & MOORE




SET 3

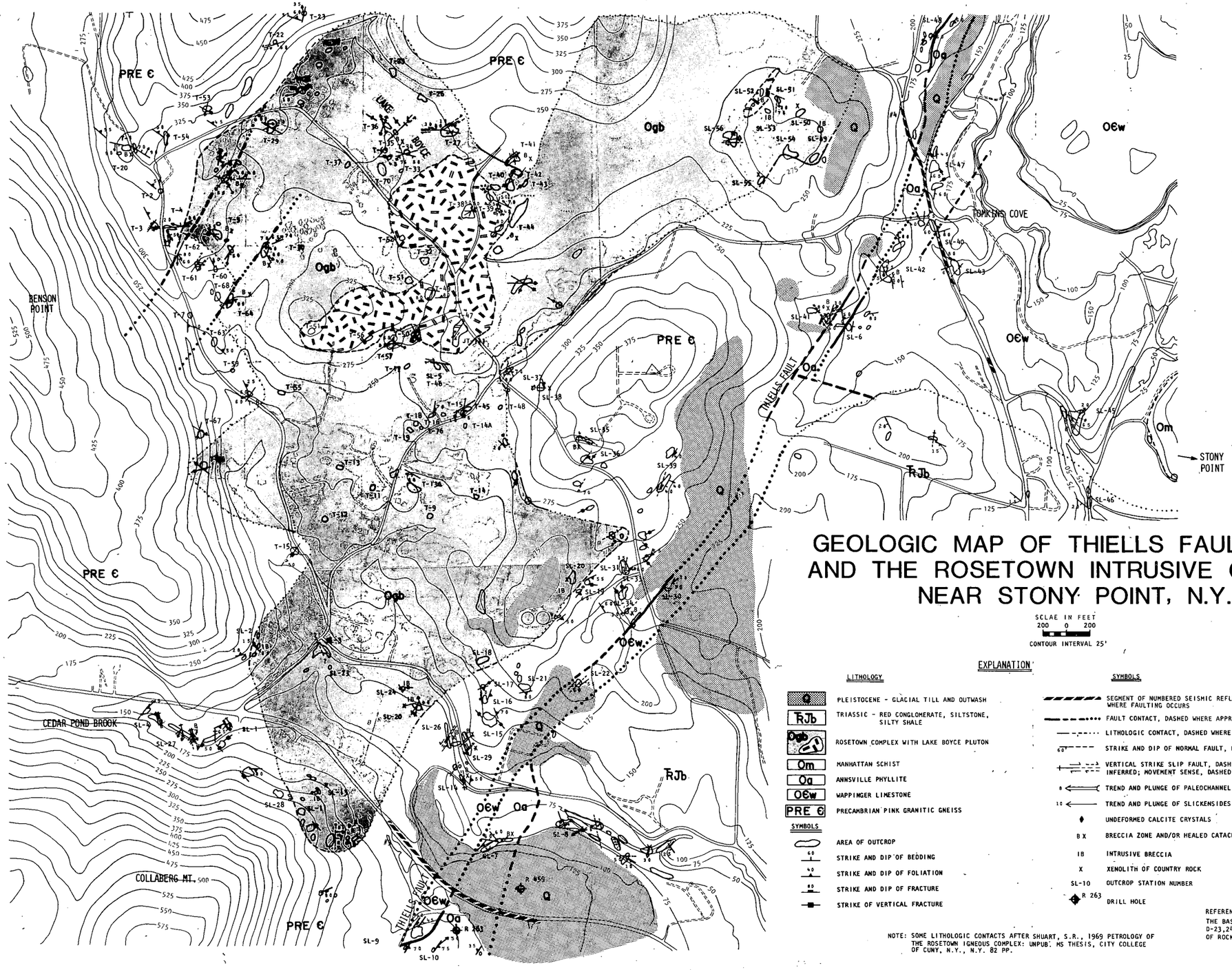



SET 4

**LOWER HEMISPHERE EQUAL AREA PROJECTIONS OF CONJUGATE KINK SETS IN ANNSVILLE FORMATION ANNSVILLE, N.Y.**

S, L AND I ARE SHORTENING, LENGTHENING AND INTERMEDIATE AXES, RESPECTIVELY.

DAMES & MOORE




# GEOLOGIC MAP OF THIELLS FAULT ZONE AND THE ROSETOWN INTRUSIVE COMPLEX NEAR STONY POINT, N.Y.

SCLAE IN FEET
200 0 200
CONTOUR INTERVAL 25'

## EXPLANATION

### LITHOLOGY

- Q — PLEISTOCENE - GLACIAL TILL AND OUTWASH
- ŦJb — TRIASSIC - RED CONGLOMERATE, SILTSTONE, SILTY SHALE
- Ogb — ROSETOWN COMPLEX WITH LAKE BOYCE PLUTON
- Om — MANHATTAN SCHIST
- Oa — ANNSVILLE PHYLLITE
- OЄw — WAPPINGER LIMESTONE
- PRE Є — PRECAMBRIAN PINK GRANITIC GNEISS

### SYMBOLS

- AREA OF OUTCROP
- 60 — STRIKE AND DIP OF BEDDING
- 40 — STRIKE AND DIP OF FOLIATION
- 80 — STRIKE AND DIP OF FRACTURE
- STRIKE OF VERTICAL FRACTURE

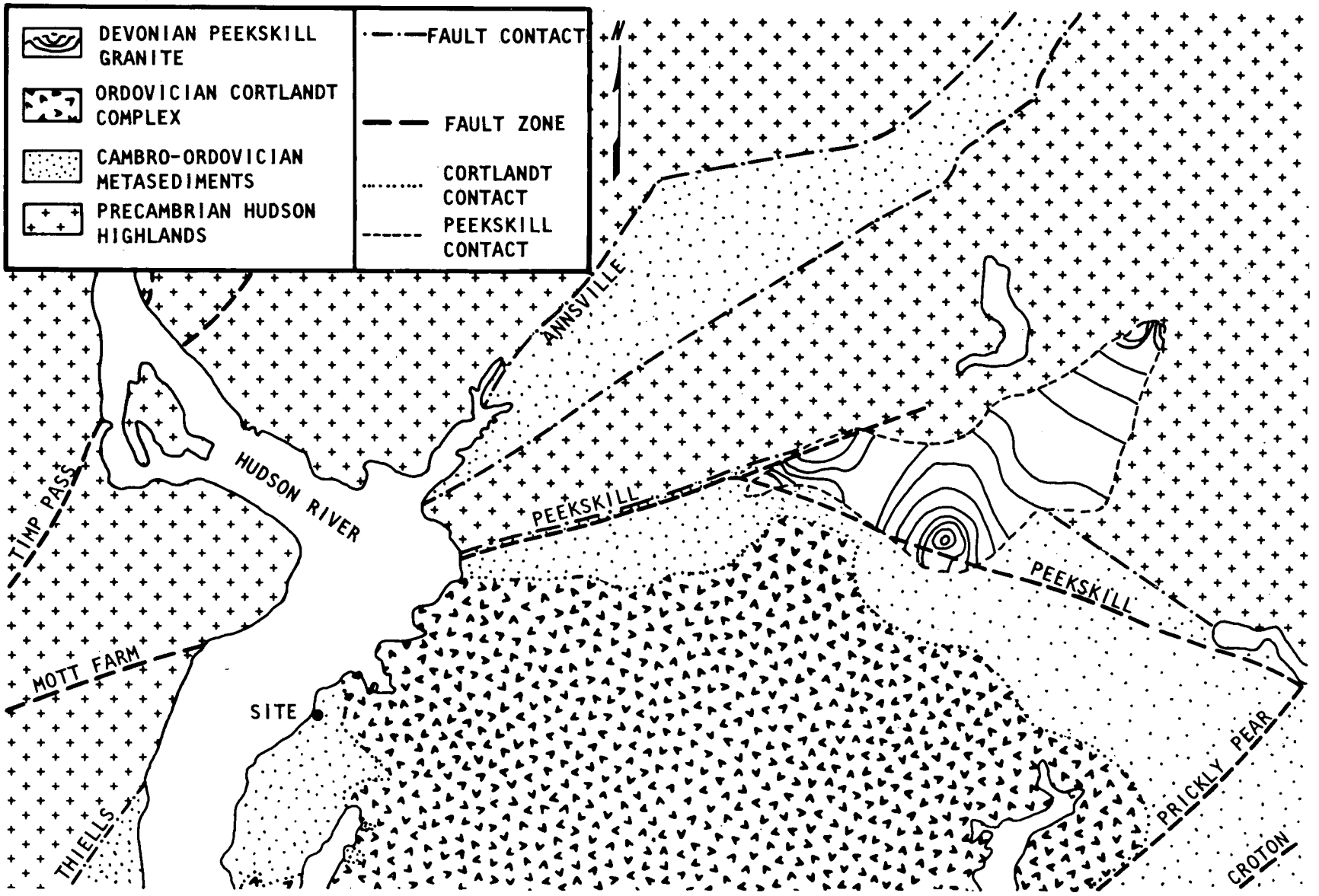
### SYMBOLS

- SEGMENT OF NUMBERED SEISMIC REFLECTION LINE SHOWING WHERE FAULTING OCCURS
- FAULT CONTACT, DASHED WHERE APPROX. DOTTED WHERE INFERRED
- LITHOLOGIC CONTACT, DASHED WHERE APPROXIMATE, DOTTED WHERE INFERRED
- 60° — STRIKE AND DIP OF NORMAL FAULT, DASHED WHERE APPROXIMATE
- VERTICAL STRIKE SLIP FAULT, DASHED WHERE APPROXIMATE DOTTED LINE WHERE INFERRED; MOVEMENT SENSE, DASHED WHERE INTERPRETED
- 8 — TREND AND PLUNGE OF PALEOCHANNEL AXIS
- 10 — TREND AND PLUNGE OF SLICKENSIDES
- UNDEFORMED CALCITE CRYSTALS
- B X — BRECCIA ZONE AND/OR HEALED CATACLASTIC ROCK
- IB — INTRUSIVE BRECCIA
- X — XENOLITH OF COUNTRY ROCK
- SL-10 — OUTCROP STATION NUMBER
- R 263 — DRILL HOLE

NOTE: SOME LITHOLOGIC CONTACTS AFTER SHUART, S.R., 1969 PETROLOGY OF THE ROSETOWN IGNEOUS COMPLEX: UNPUB. MS THESIS, CITY COLLEGE OF CUNY, N.Y., N.Y. 82 PP.

REFERENCE:
THE BASE FOR THIS MAP WAS PREPARED FROM SHEETS D-23,24 AND E-23,24 OF THE PHOTOGRAMMETRIC MAP OF ROCKLAND Co., N.Y., 1958

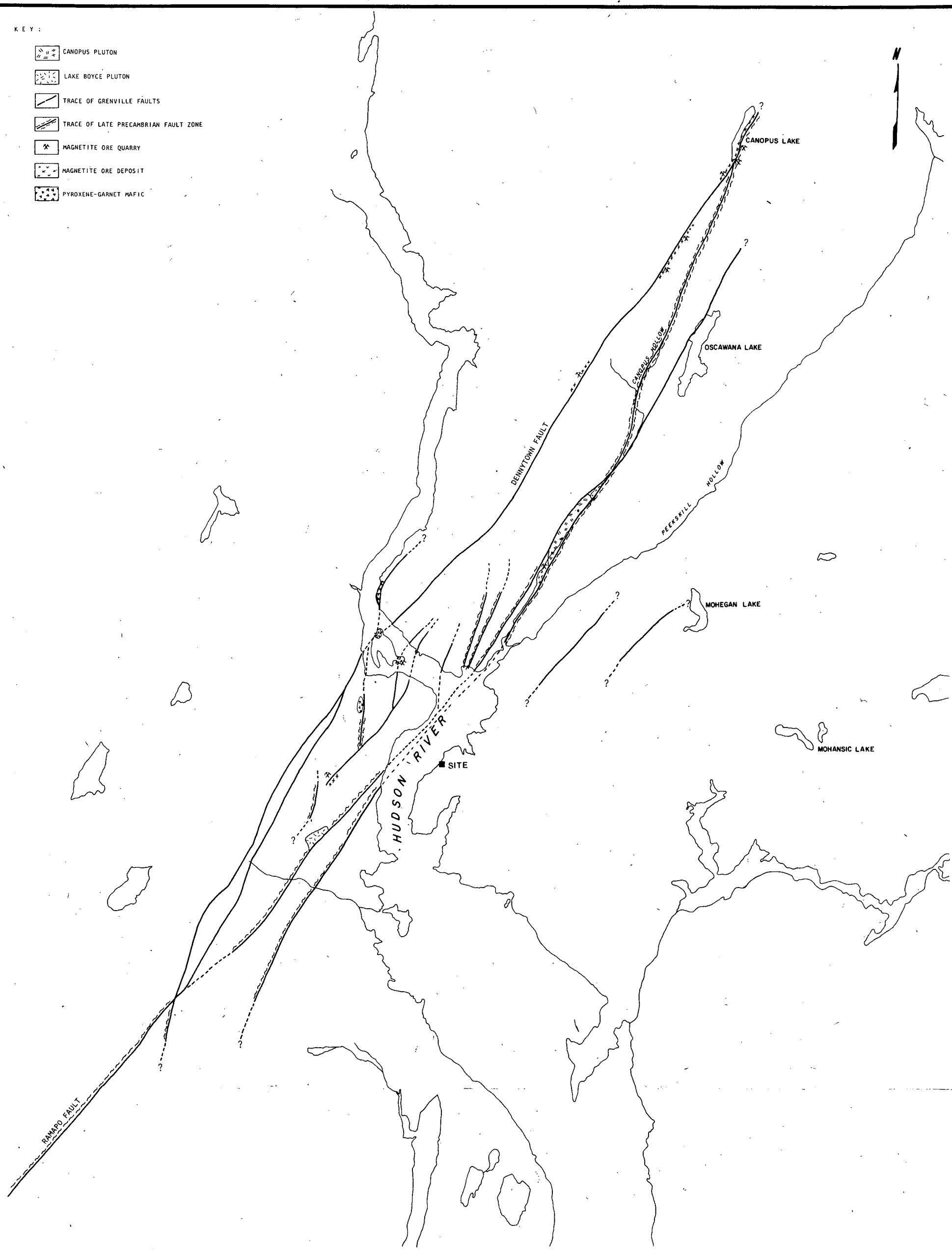
DAMES & MOORE




STRUCTURAL SETTING OF PEEKSKILL PLUTON

0 ½ 1 MILES

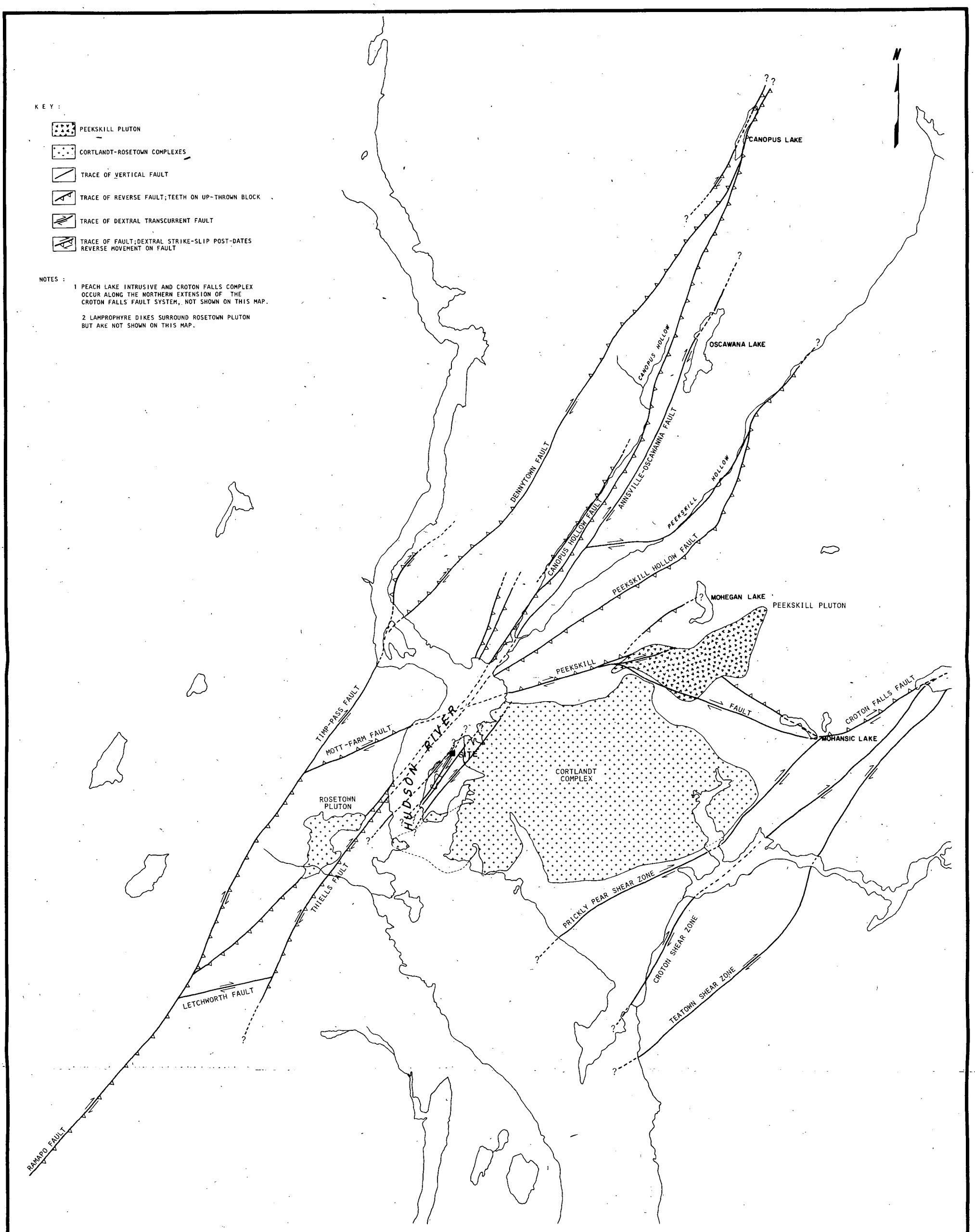
DAMES & MOORE




RAMAPO-CANOPUS FAULT SYSTEMS IN PRECAMBRIAN TIME

FIGURE A-7

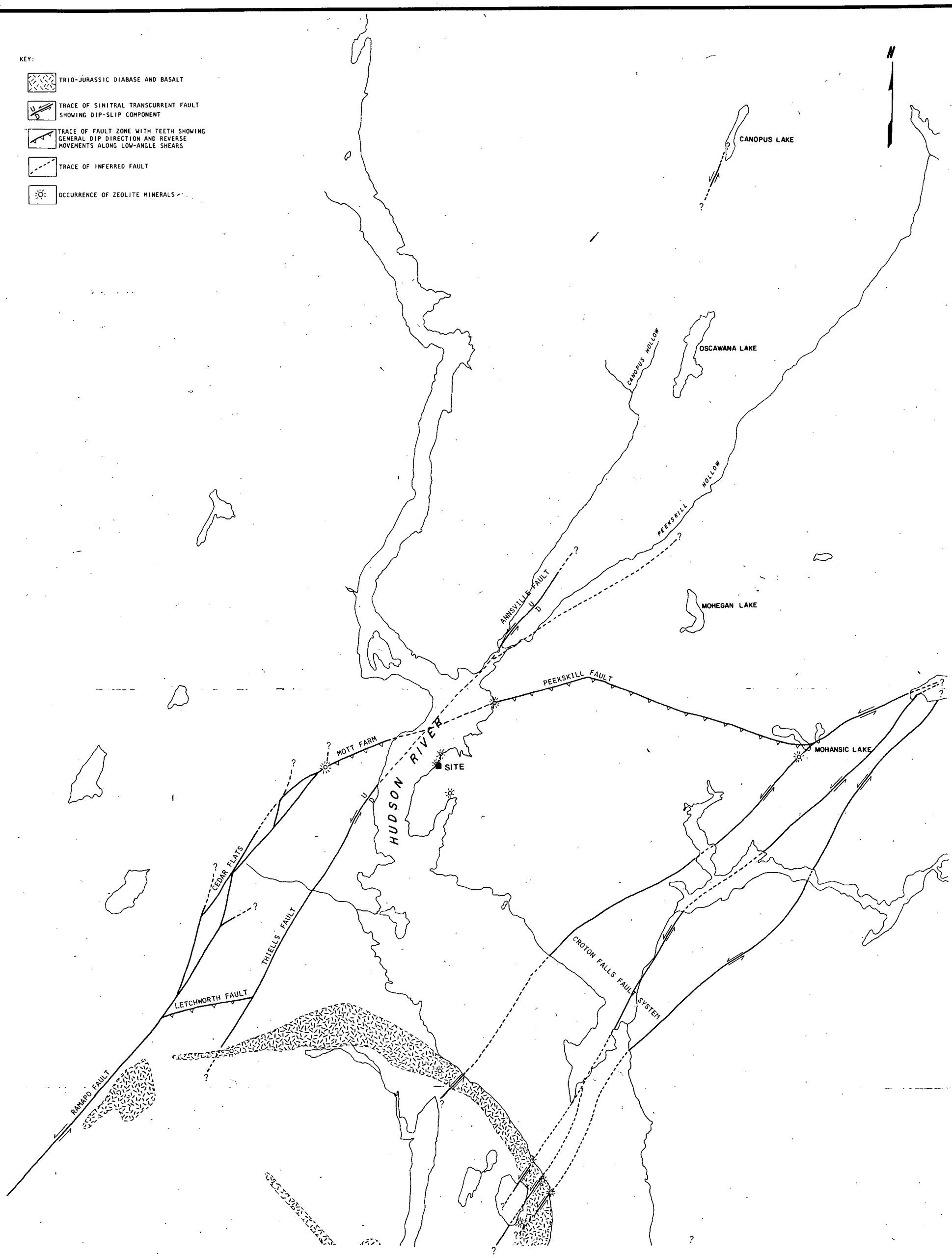
DAMES & MOORE




RAMAPO-CANOPUS AND CROTON FALLS SYSTEMS IN PALEOZOIC TIME

DAMES & MOORE

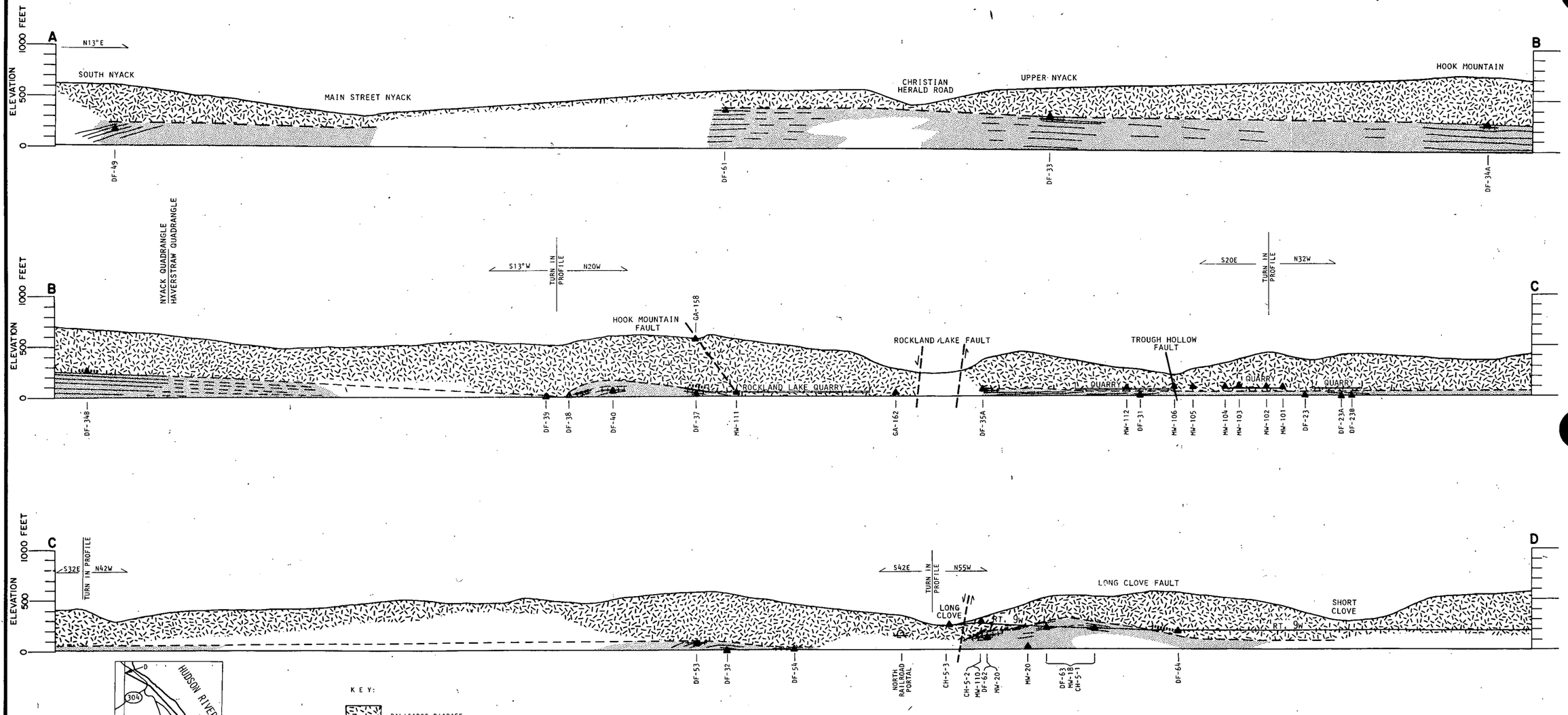
FIGURE A-8

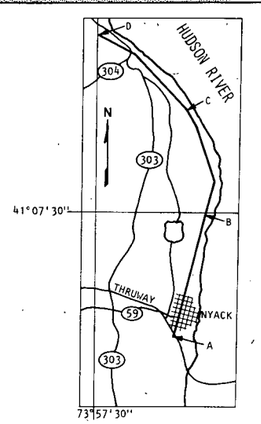



INTERPRETED
RAMAPO-CROTON FALLS FAULT SYSTEM IN MESOZOIC TIME

FIGURE A-9

DAMES & MOORE




LOCATION MAP

K E Y:

- PALISADES DIABASE
- MG-OLIVINE ZONE
- BRUNSWICK FORMATION, APPARENT BEDDING DIP AS SHOWN
- HORNFELS
- CONTACT; OBSERVED, PROBABLE, POSSIBLE
- FAULT
- STATION
- QUARRY FLOOR

0 500 1000 1500 FEET

APPROXIMATE HORIZONTAL SCALE

# PANORAMIC PROFILE OF PALISADES

## SHOWING CONTACT RELATIONSHIPS

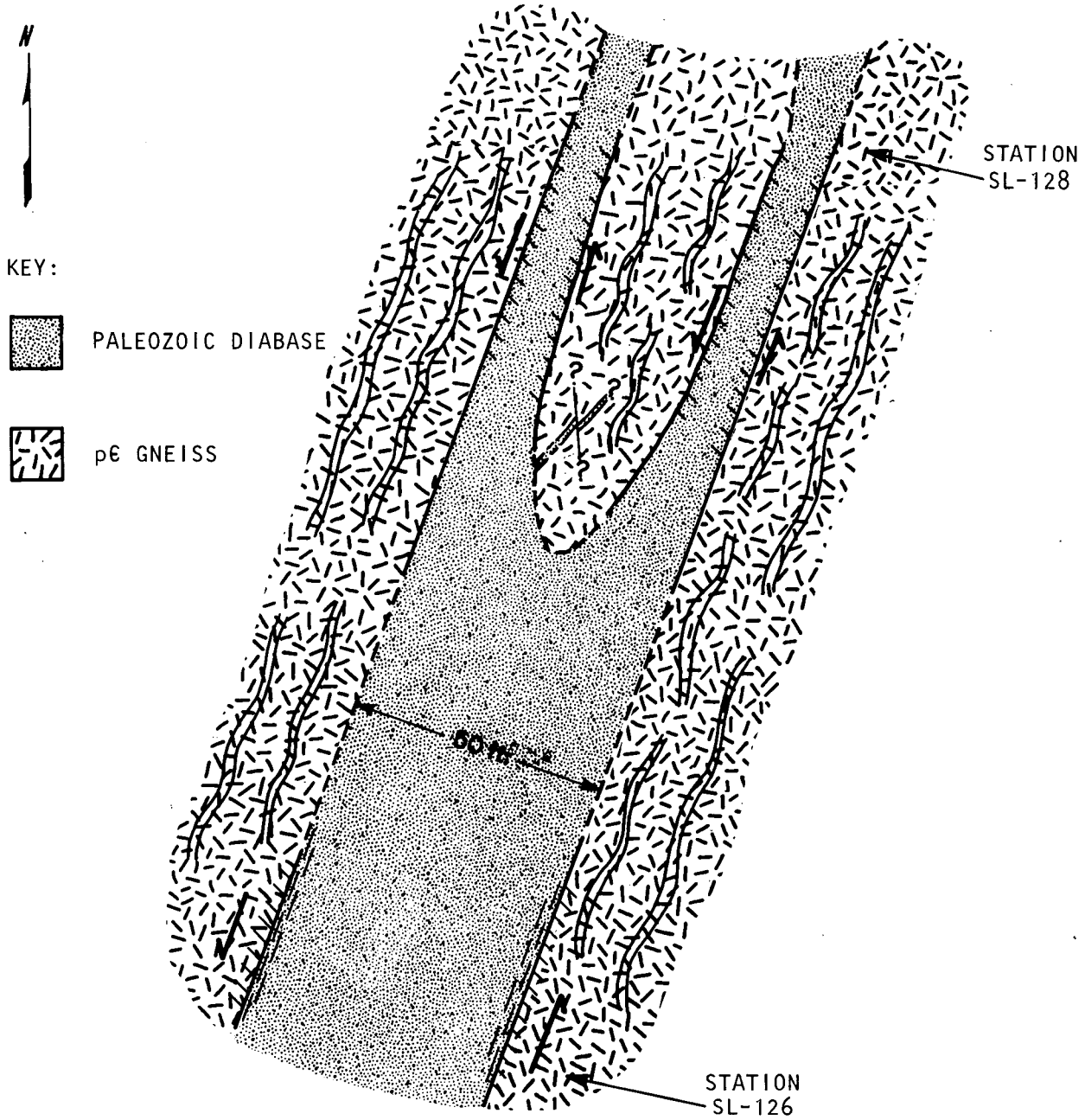
DAMES & MOORE

PLATE B-1

## PHOTOGRAPH

GRANITIC PEGMATITE WHICH HAS BEEN FOLDED DURING INTRUSION ALONG THE REGIONAL LAYERING AND FOLIATION OF PRECAMBRIAN PARAGNEISS. LOCATED ON GAS LINE N OF SL-136, POMPTON LAKES, NEW JERSEY

HAMMER FOR SCALE

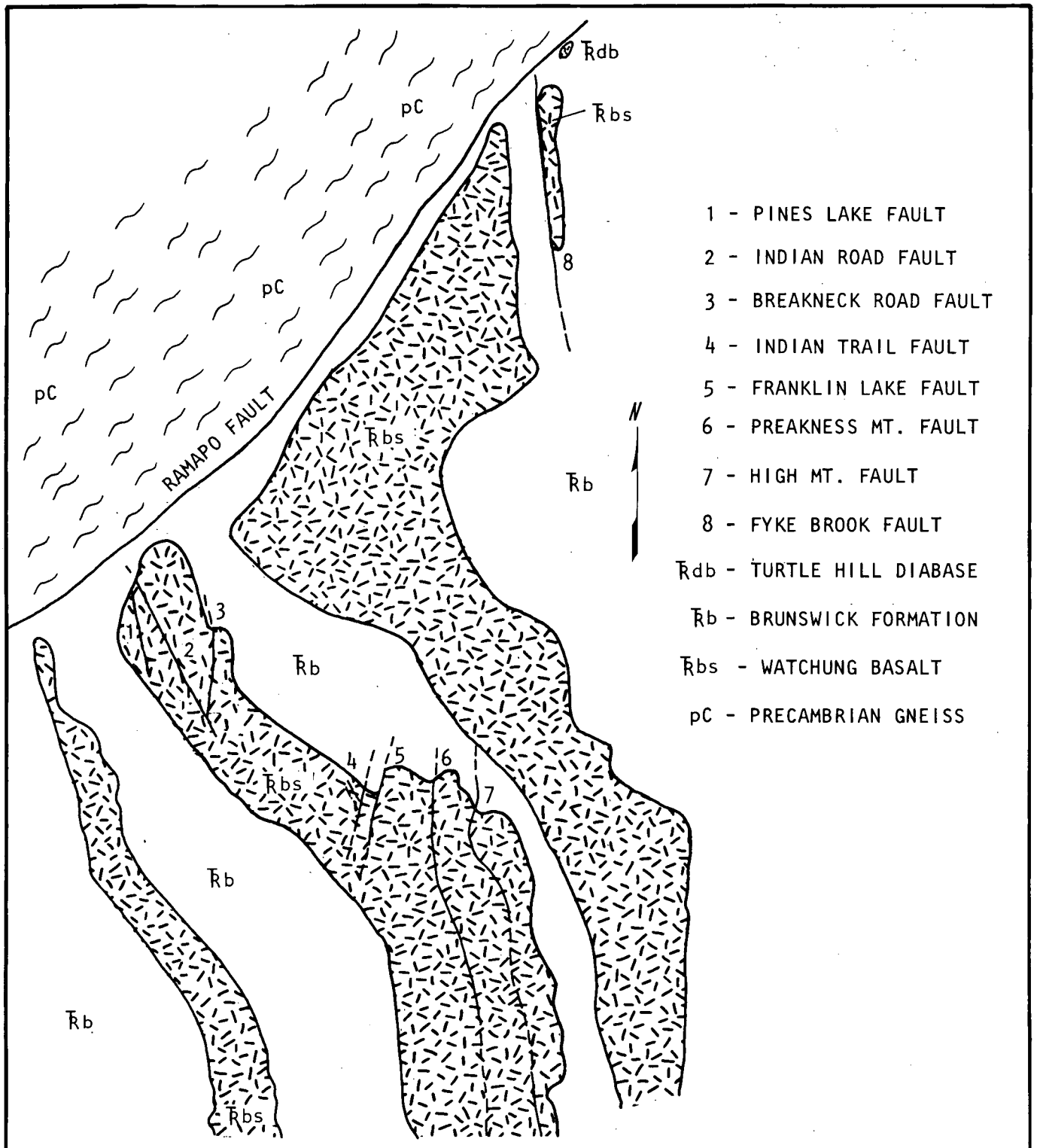



# SCHEMATIC DIAGRAM

OF DIABASE DIKE NEAR LAKE INEZ FAULT, POMPTON LAKES N.J.
SINISTRAL SHEARING POST-DATES INTRUSION.

NOTE: K/Ar whole rock analysis yielded age of 439 ± 18 m.y.

DAMES & MOORE




# GEOLOGIC MAP

## OF POMPTON LAKES AREA, N.J.

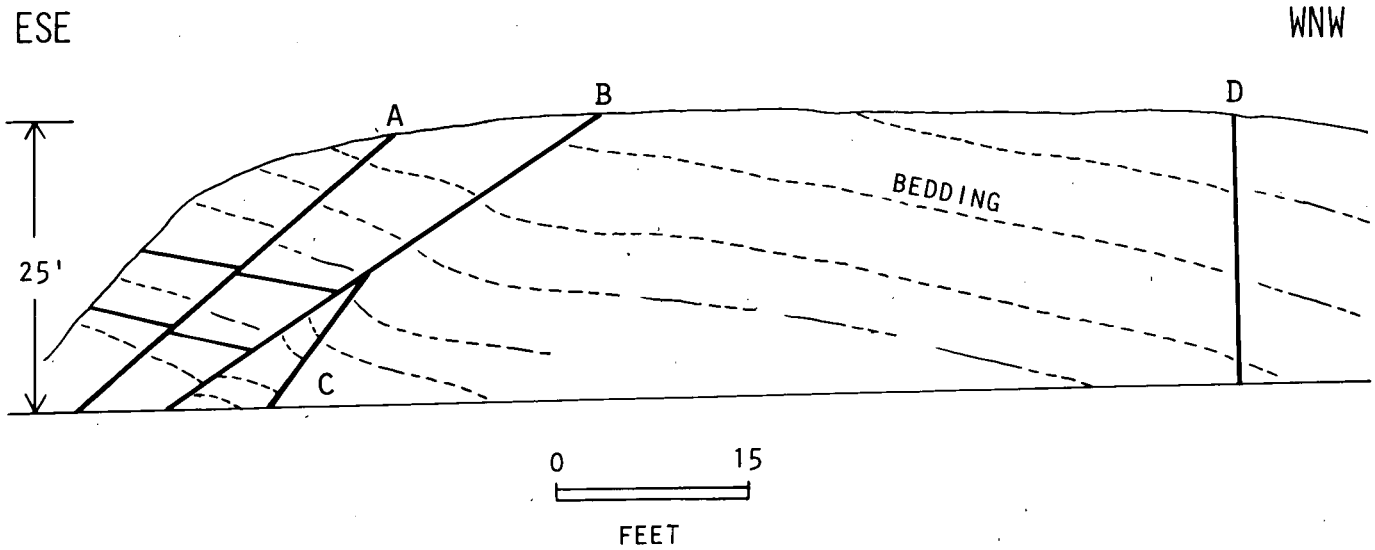
SCALE

1 0 1 2

MILES

REFERENCE: BAYLY, W.S. ET AL, 1914.

DAMES & MOORE




## SCHEMATIC DIAGRAM OF STATION CH-37 (SL-109)

SHOWING CROSS-CUTTING RELATIONSHIPS OF EXPOSED FAULTS IN CONGLOMERATE BELOW SECOND WATCHUNG FLOW.

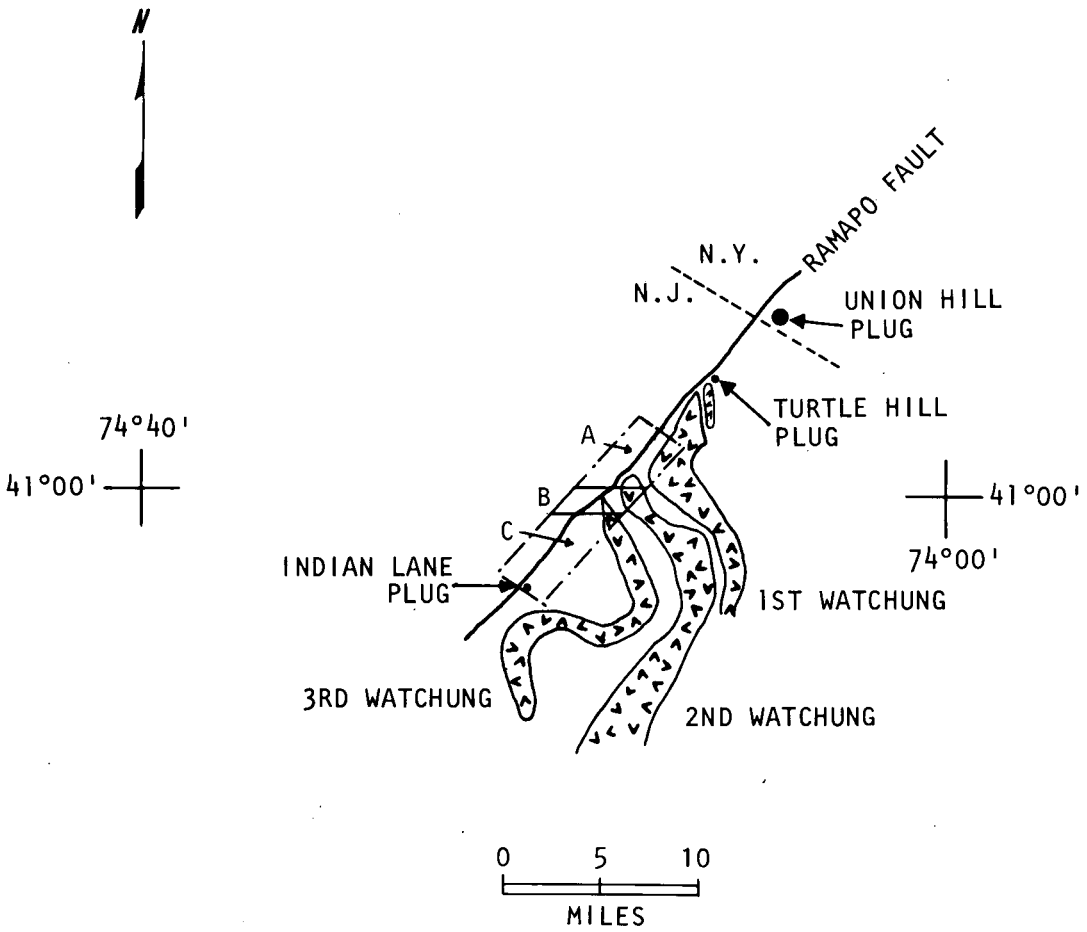
| FAULT | ORIENTATION | SLICKENSIDES (RAKE) | APPARENT MOVEMENT SENSE |
|---|---|---|---|
| A | N40E 40SE | 5° NE | REVERSE |
| B | N55E 35SE | 20° NE | REVERSE |
| | N50E 30SE | 50° NE | REVERSE |
| C | N55E 50SE | 0° | REVERSE |
| D | N60E 90 | — | — |

ROCKS: TRIO-JURASSIC CONGLOMERATE OF BRUNSWICK FORMATION

LOCATION: OAKLAND, N.J.; BEHIND SHOP RITE IN ROUTE 202 LONG HILL MALL

BEDDING: N25°W, 25°SW (AVERAGE)

DAMES & MOORE




ZONE A - DOMAINS ALONG NORTHERN STRAIGHT SEGMENT OF RAMAPO FAULT

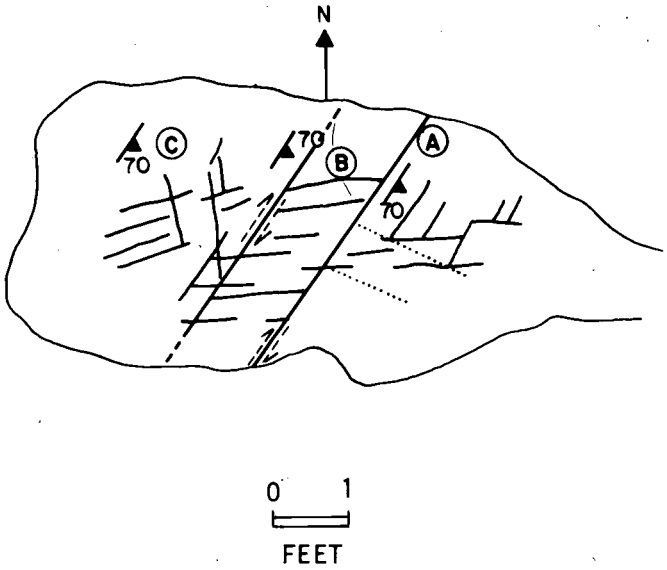
ZONE B - DOMAINS ALONG DEFLECTION OF RAMAPO FAULT TRACE

ZONE C - DOMAINS ALONG SOUTHERN STRAIGHT SEGMENT OF RAMAPO FAULT

# LOCATION MAP OF STRUCTURAL SUBDIVISIONS

## IN THE POMTON LAKES AREA, N.J.

DAMES & MOORE




## LINE DRAWING FROM PHOTOGRAPH

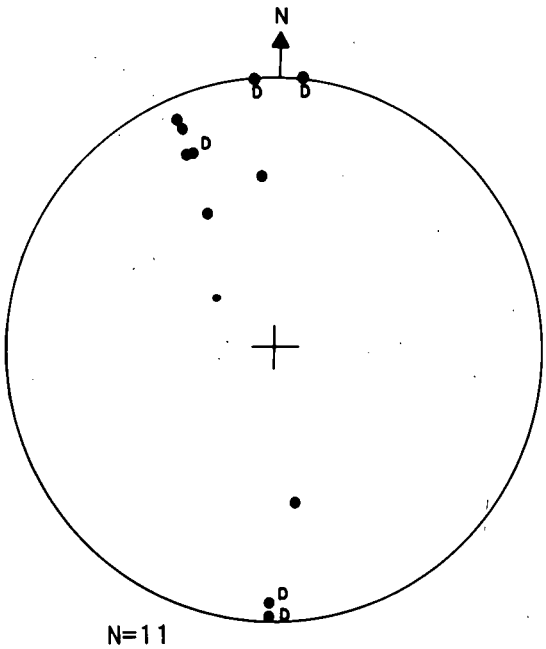
GRANITIC GNEISS IN WESTERN HIGHLANDS EXHIBITING SMALL-SCALE STRIKE-SLIP SHEARS SUB-PARALLEL TO REGIONAL TREND OF RAMAPO FAULT. MOVEMENT SENSE IS INFERRED FROM FRACTURE GEOMETRY AS DEXTRAL.

STATION SL-133

- FOLIATION, N35E, 70SE
- (A) SHEAR N25E, 50-70NW
- (B) SHEAR N85W, 35-45N
- (C) SHEAR N5W, 65W

ROCK: PRECAMBRIAN GNEISS
LOCATION: SKYLINE DRIVE,WANAQUE,N.J.

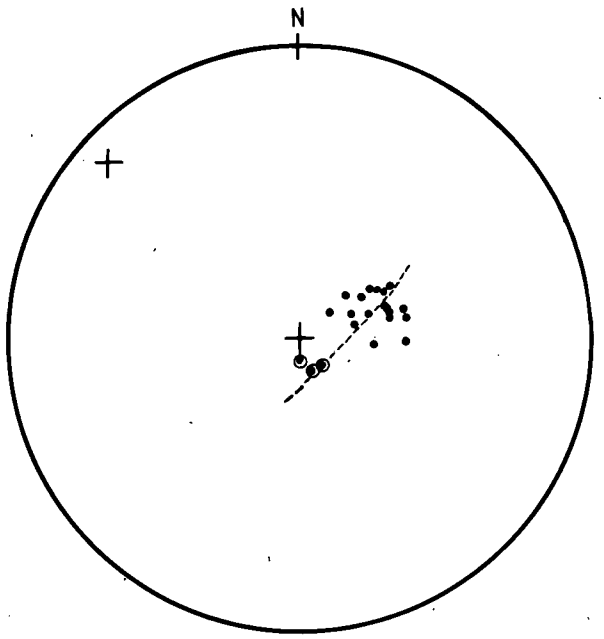
DAMES & MOORE




• POLE TO STRIKE-SLIP OR OBLIQUE-SLIP FAULT
D=DEXTRAL MOVEMENT SENSE INFERRED FROM GEOMETRY

## LOWER HEMISPHERE EQUAL AREA PROJECTION

PLOT OF POLES TO STRIKE-SLIP AND OBLIQUE-SLIP FAULTS. FIVE FAULTS HAVE INFERRED DEXTRAL MOVEMENT SENSES. THE FAULTS STRIKE ENE AND DIP STEEPLY. ALL FAULTS WERE OBSERVED IN PRECAMBRIAN ROCKS WITHIN DEFLECTION ZONE (B) OF RAMAPO FAULT TRACE.




KEY:

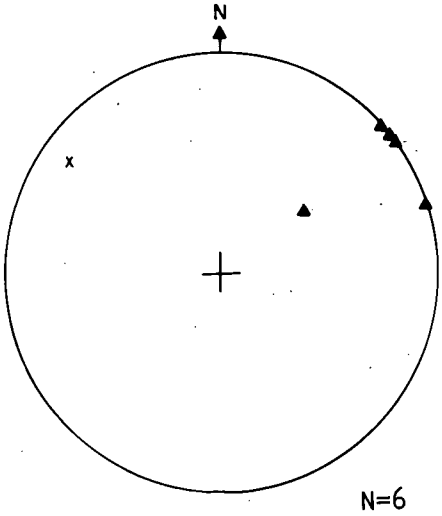
- POLE TO BEDDING AT SL-116
- POLE TO BEDDING PLANE
- POLE TO PLANE CONTAINING POLES TO BEDS (FOLD AXIS) (N 45 W, 9°)
- PLANE OF BEST FIT CONTAINING POLES TO BEDDING

LOWER HEMISPHERE EQUAL AREA PROJECTION OF POLES TO TRIASSIC BEDDING WHICH DEFINE A BROAD FOLD ABOUT AN AXIS ORIENTED (N45W, 9NW) WHICH IS APPROXIMATELY NORMAL TO THE BASIN MARGIN AND THE RAMAPO FAULT.

# LOWER HEMISPHERE EQUAL AREA PROJECTION

DAMES & MOORE

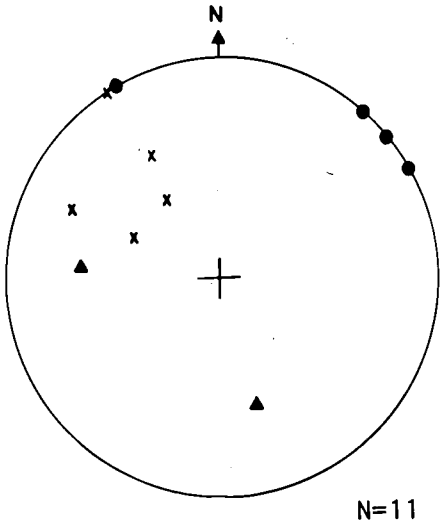
A)




ZONE A - PLOT OF POLES TO FAULTS

▲ DIP-SLIP FAULT
x STRIKE-SLIP FAULT

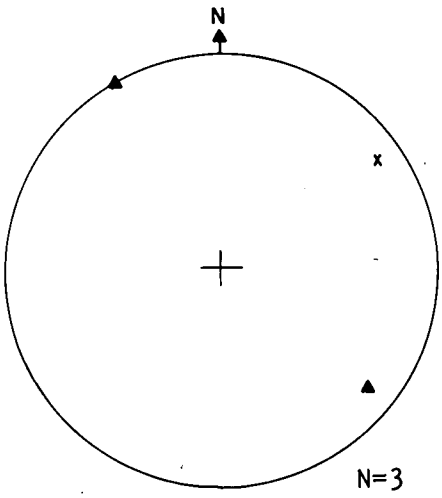
B)




ZONE B - PLOT OF POLES TO FAULTS

▲ DIP-SLIP FAULT
x STRIKE-SLIP FAULT
● MOVEMENT SENSE UNKNOWN

C)




ZONE C - PLOT OF POLES TO FAULTS

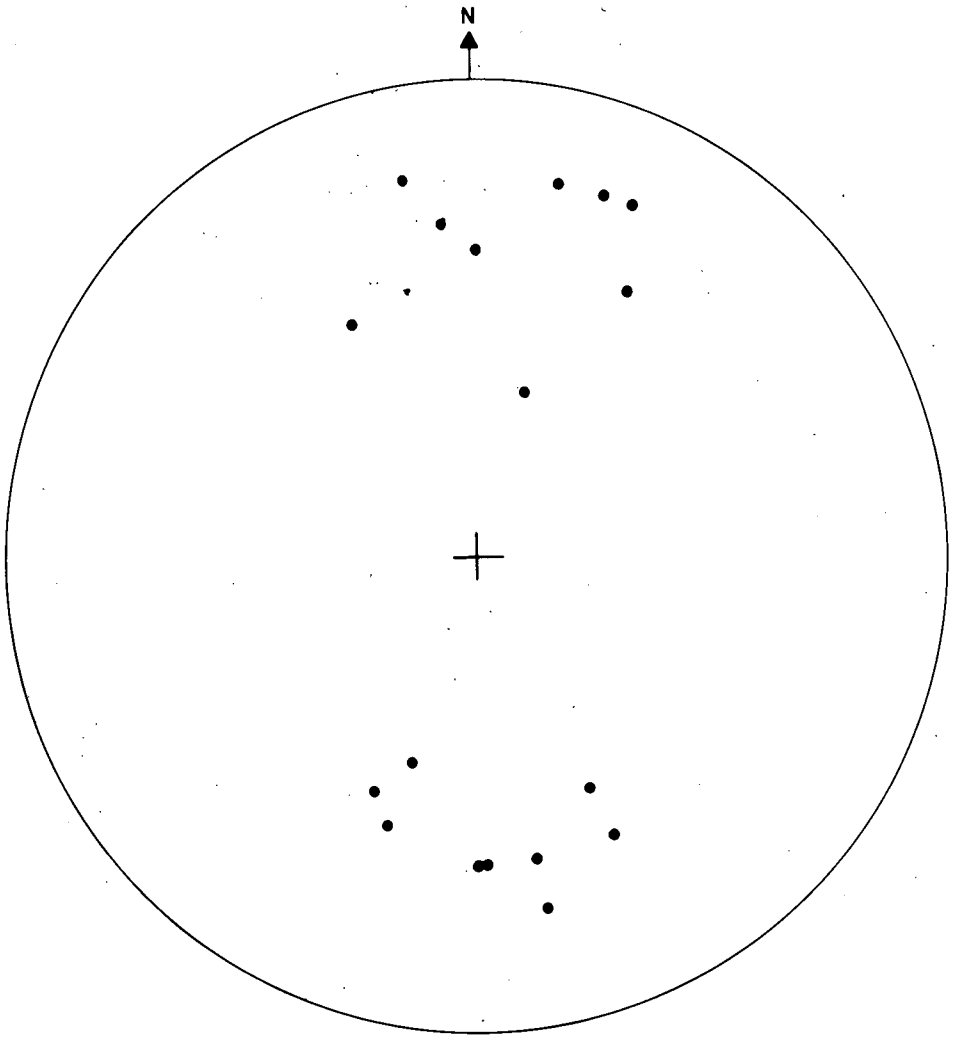
▲ DIP-SLIP FAULT
x STRIKE-SLIP FAULT

NOTE: ZONES A,B AND C SHOWN ON PLATE C-5

## LOWER HEMISPHERE EQUAL AREA PROJECTIONS

FAULTS IN TRIO-JURASSIC DOMAINS OF ZONES A,B,AND C
IN POMPTON LAKES AREA,N.J.

DAMES & MOORE



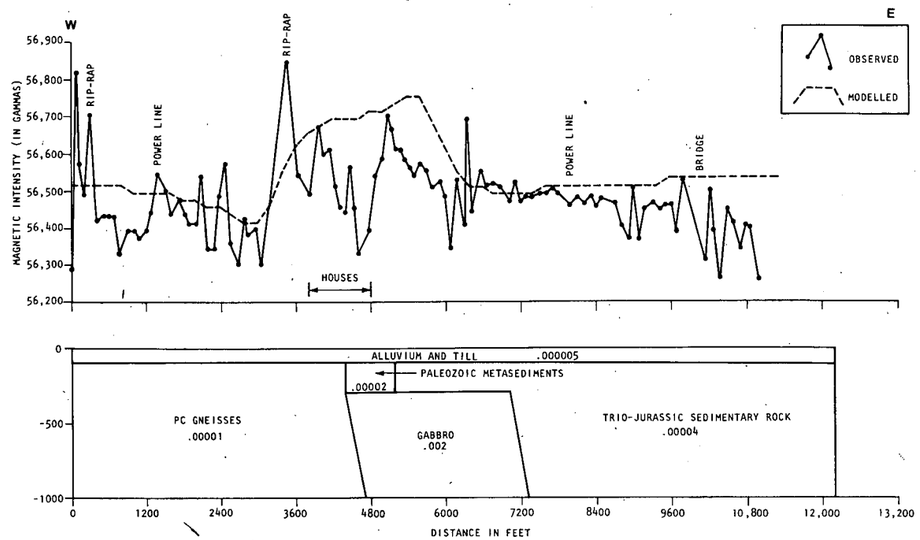

• POLE TO DIP-SLIP FAULT PLANE
N=18

## LOWER HEMISPHERE EQUAL AREA PROJECTION

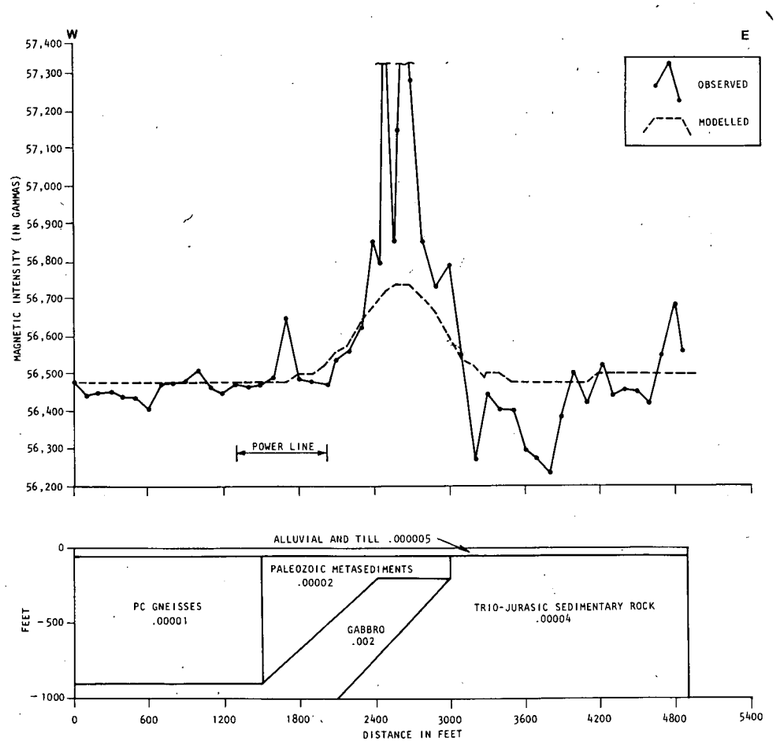
PLOT OF POLES TO DIP-SLIP FAULTS IN PRECAMBRIAN DOMAIN OF DEFLECTION ZONE (B) NEAR POMPTON LAKES, N.J. MOVEMENT SENSES OF FAULTS ARE BOTH NORMAL AND REVERSE.

DAMES & MOORE

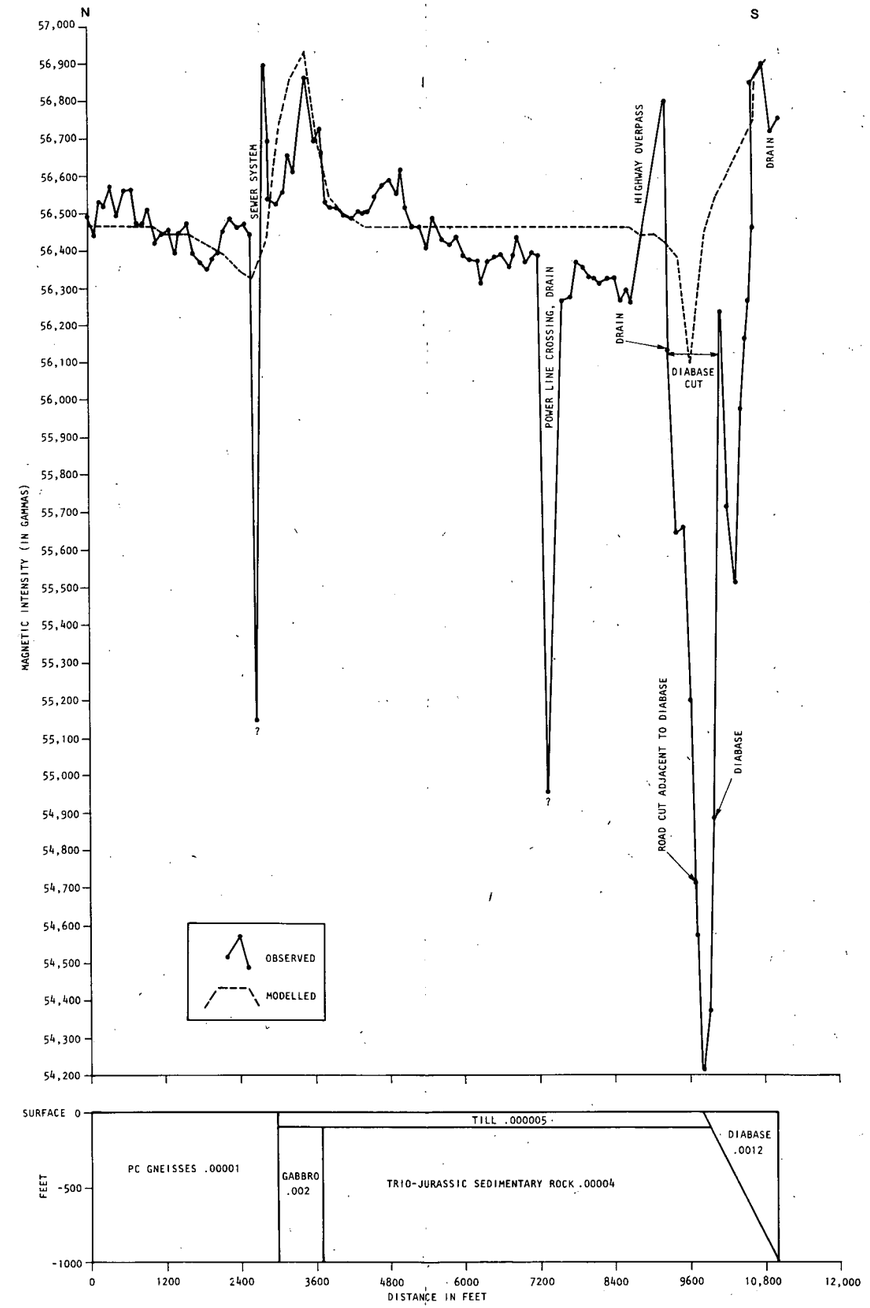
# GROUND MAGNETIC PROFILES




PROFILE 1




PROFILE 2

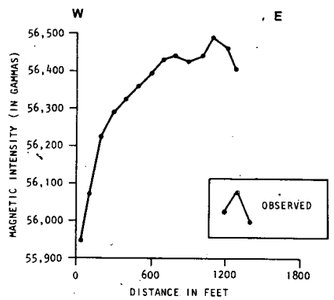



PROFILE 3

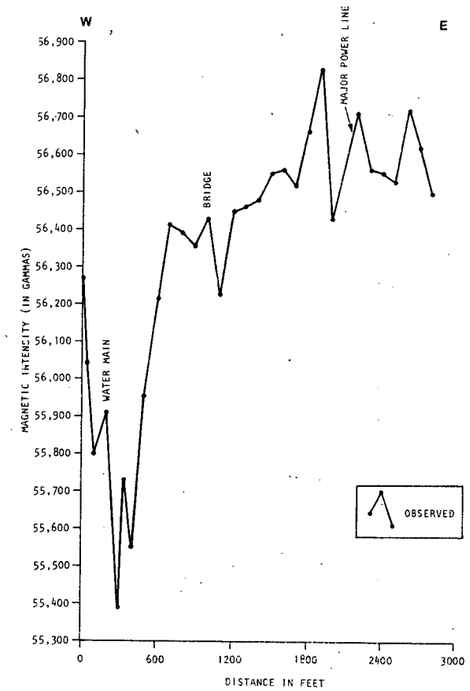
DAMES & MOORE

PLATE D.3-1

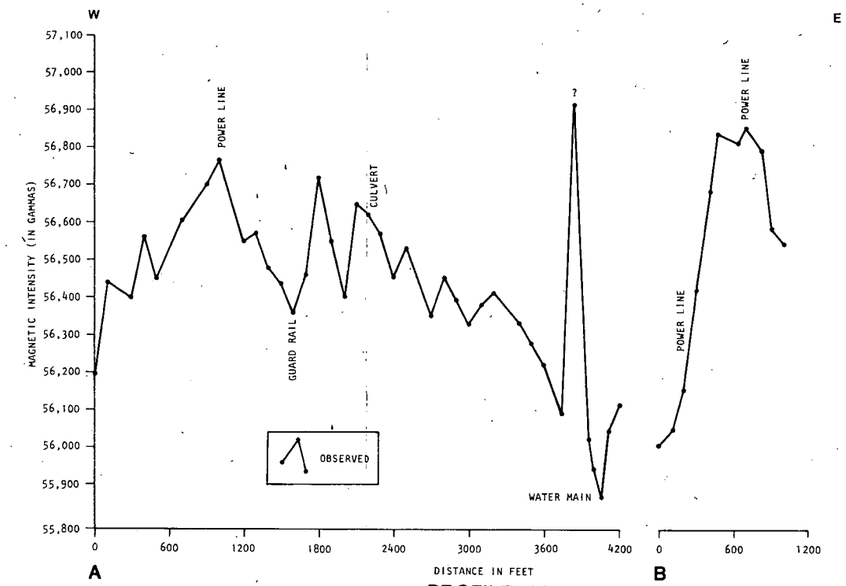
# GROUND MAGNETIC PROFILES



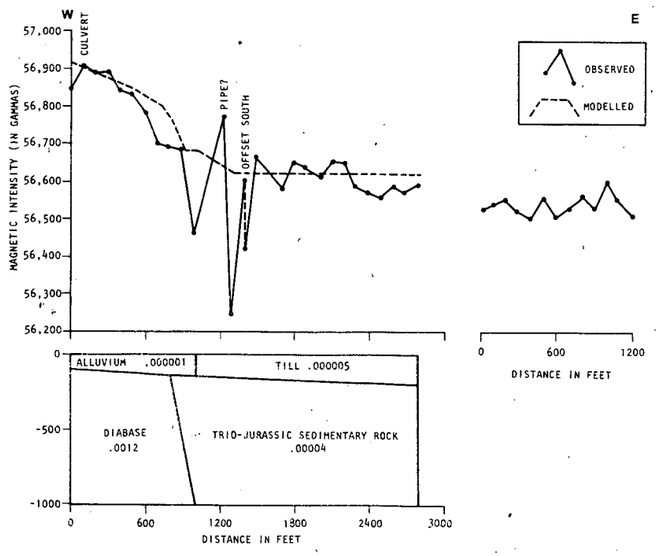

PROFILE 4



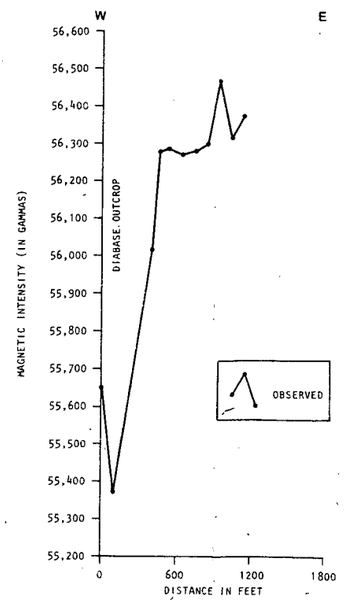

PROFILE 5



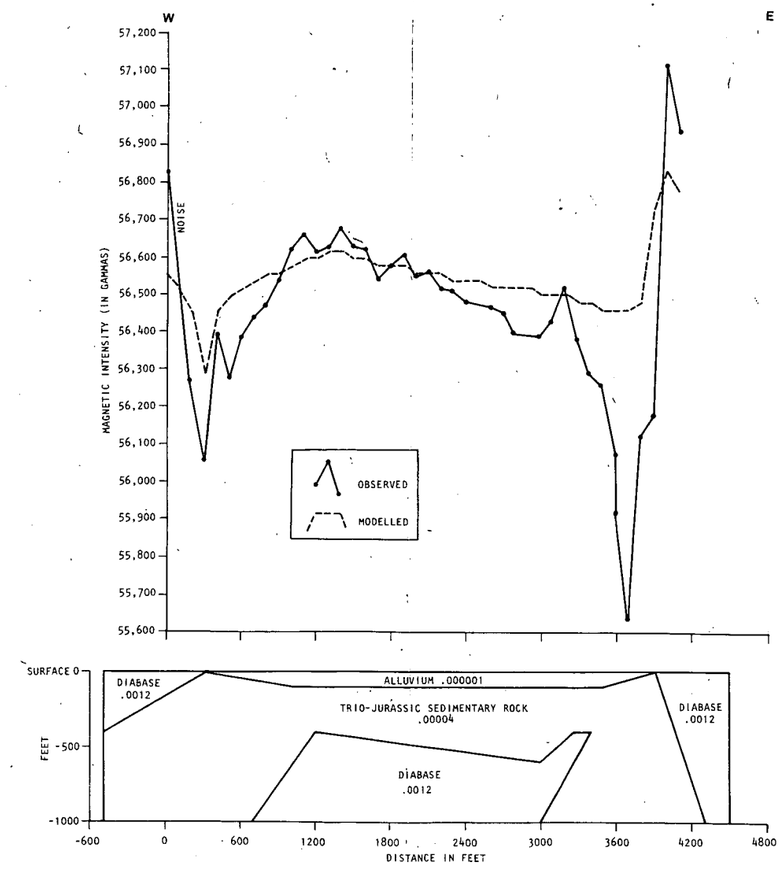

PROFILE 6




PROFILE 7



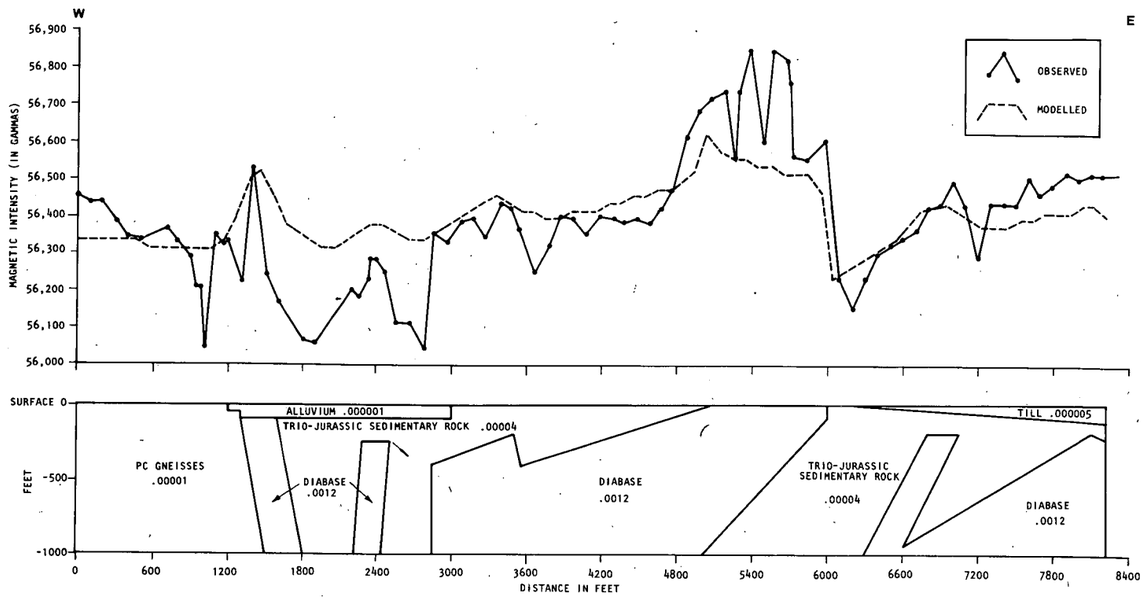

PROFILE 8



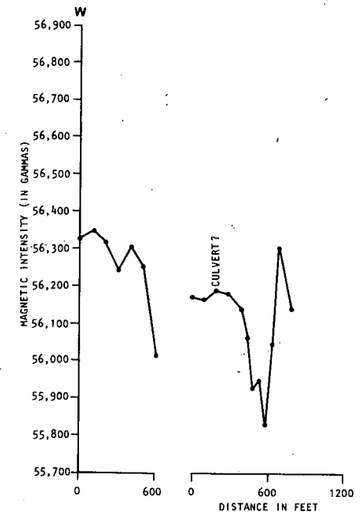

PROFILE 9

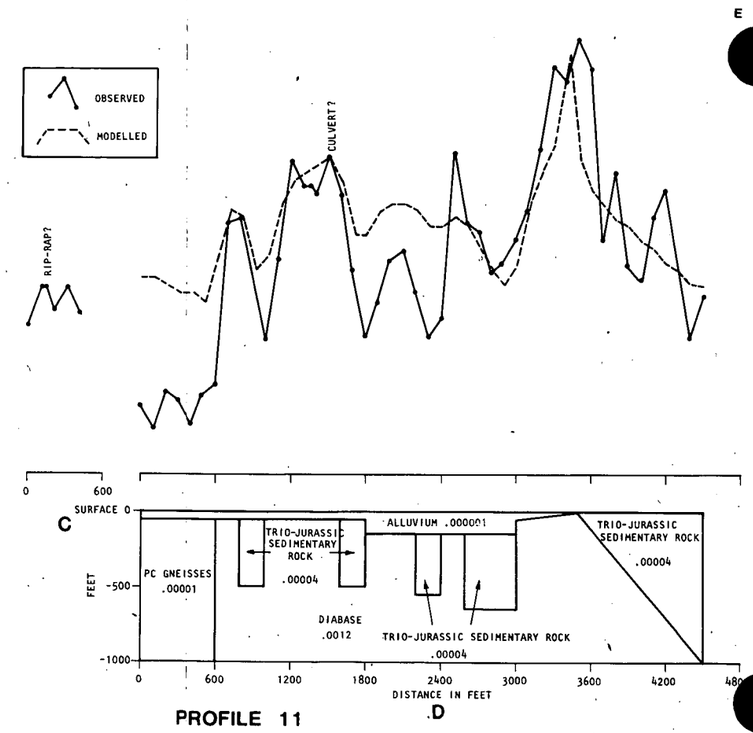
DAMES & MOORE

# GROUND MAGNETIC PROFILES

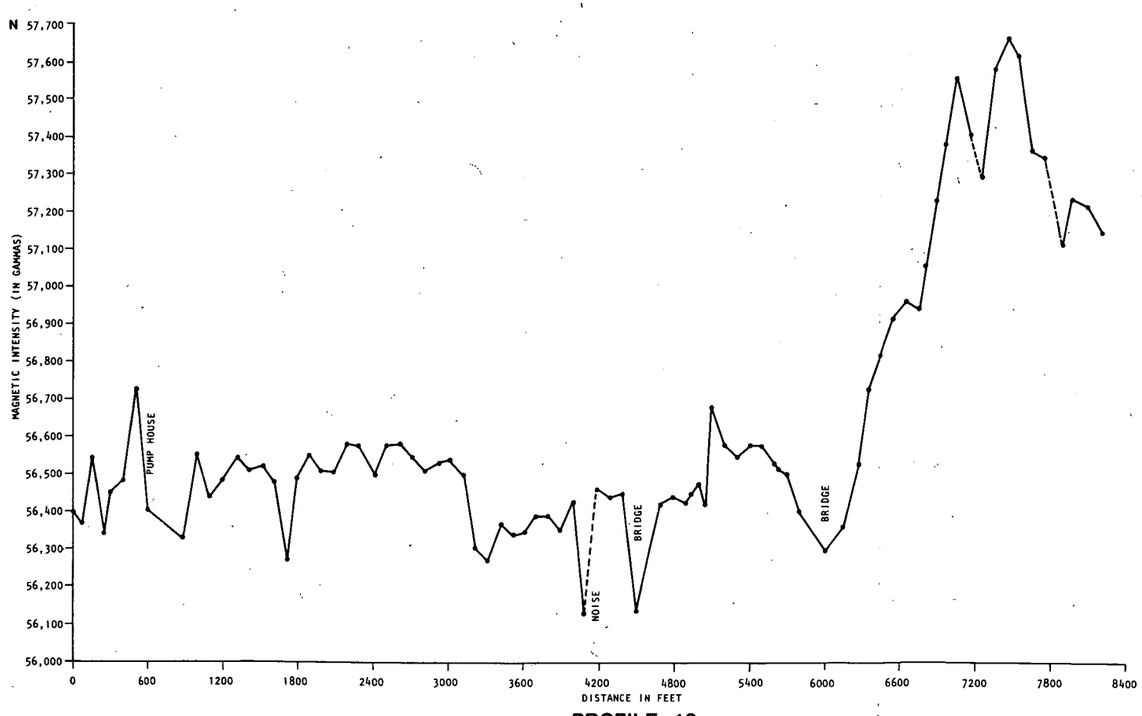



PROFILE 10

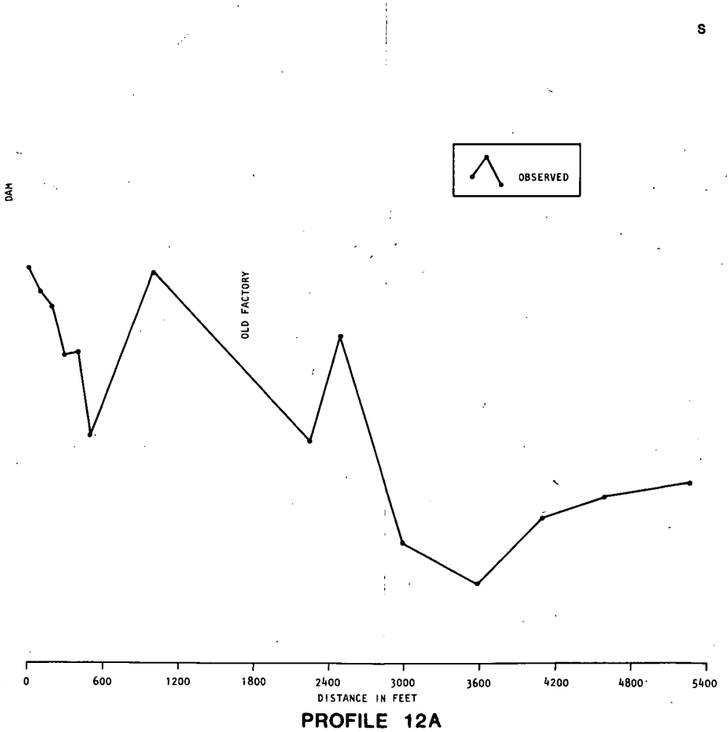



PROFILE 11



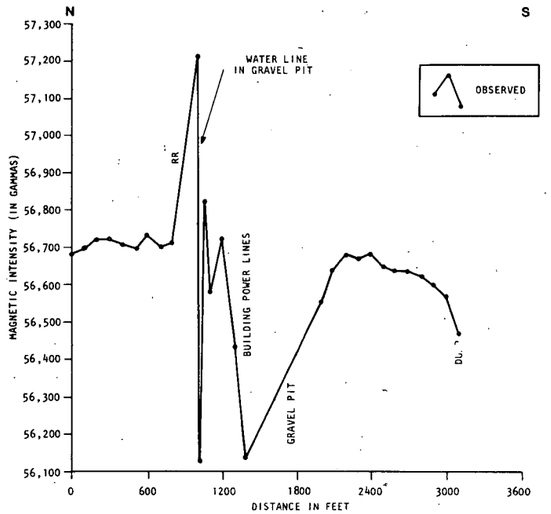

PROFILE 12



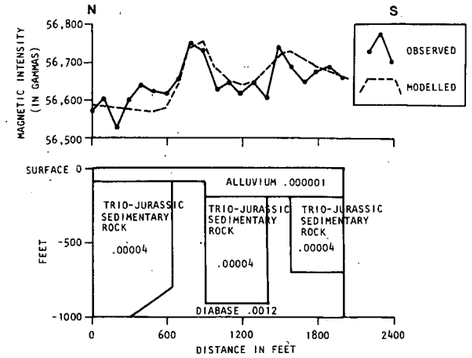

PROFILE 12A

DAMES & MOORE

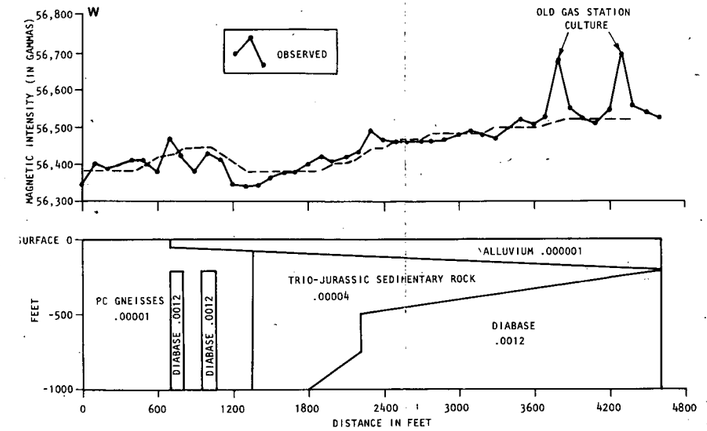
# GROUND MAGNETIC PROFILES



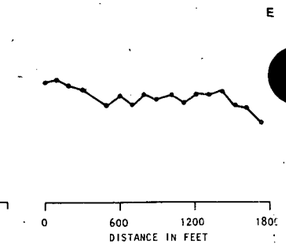

PROFILE 13



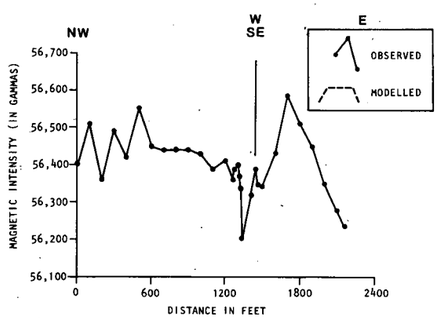

PROFILE 14



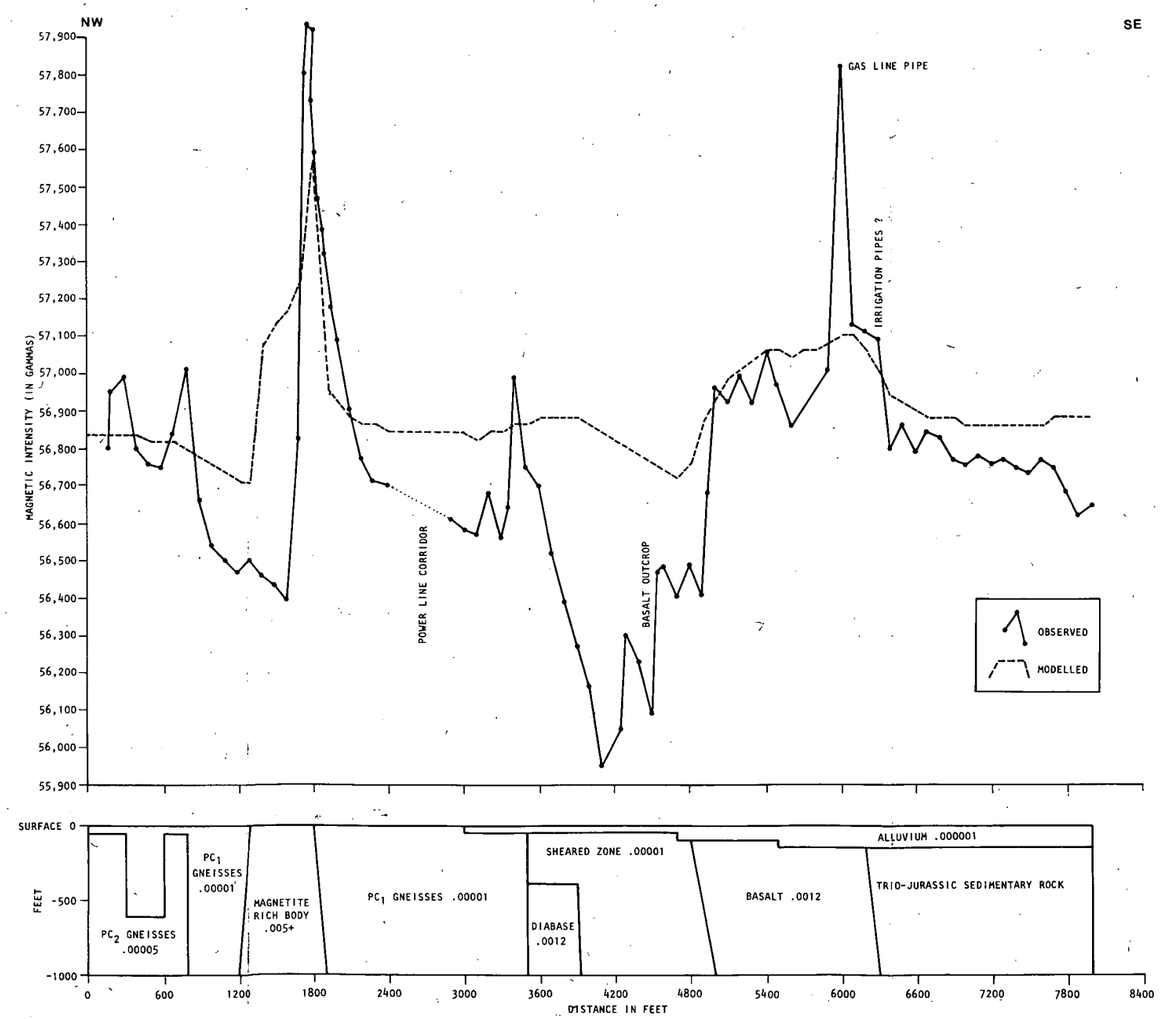

PROFILE 15




PROFILE 16

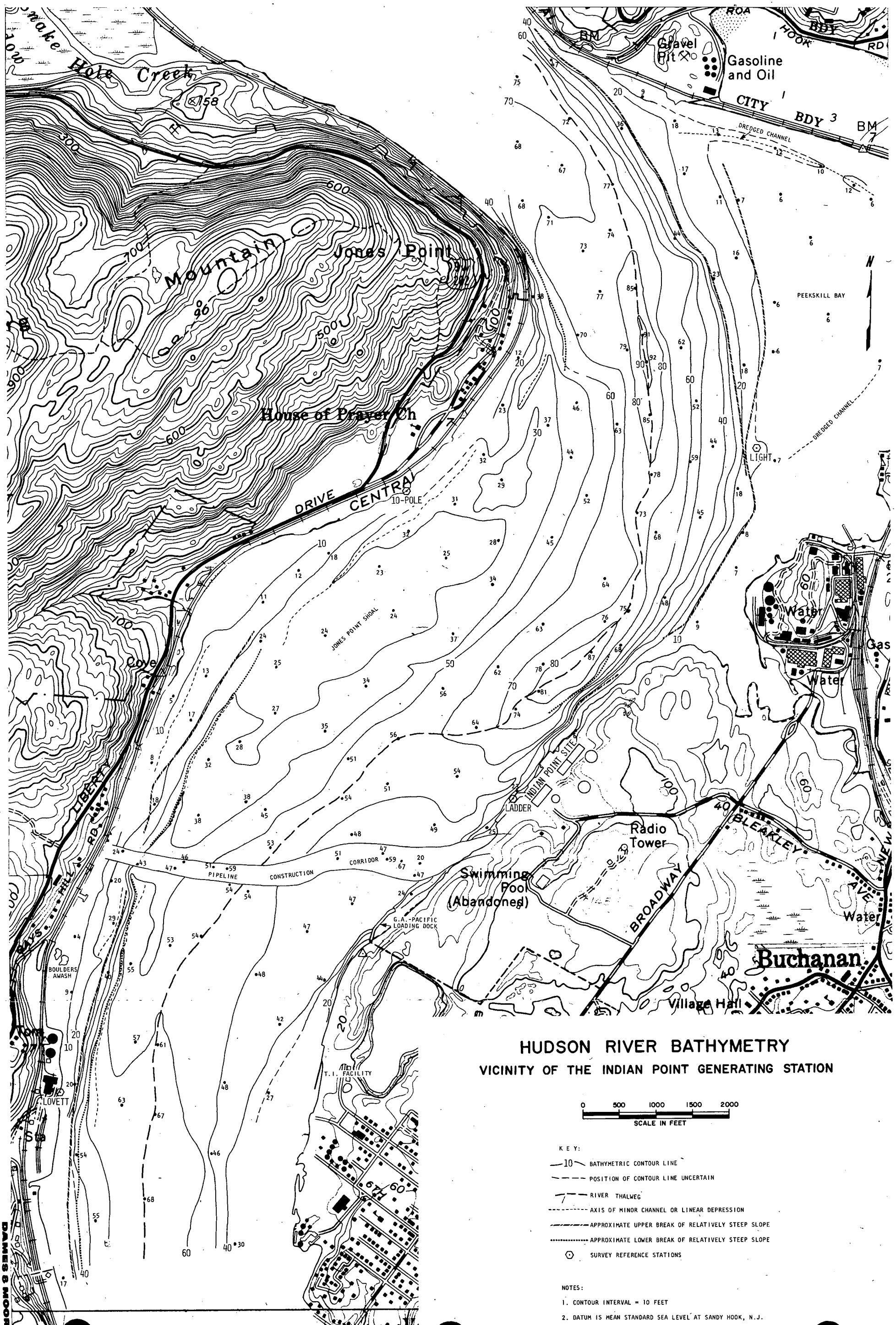



PROFILE 17




PROFILE 18

DAMES & MOORE




# HUDSON RIVER BATHYMETRY

## VICINITY OF THE INDIAN POINT GENERATING STATION

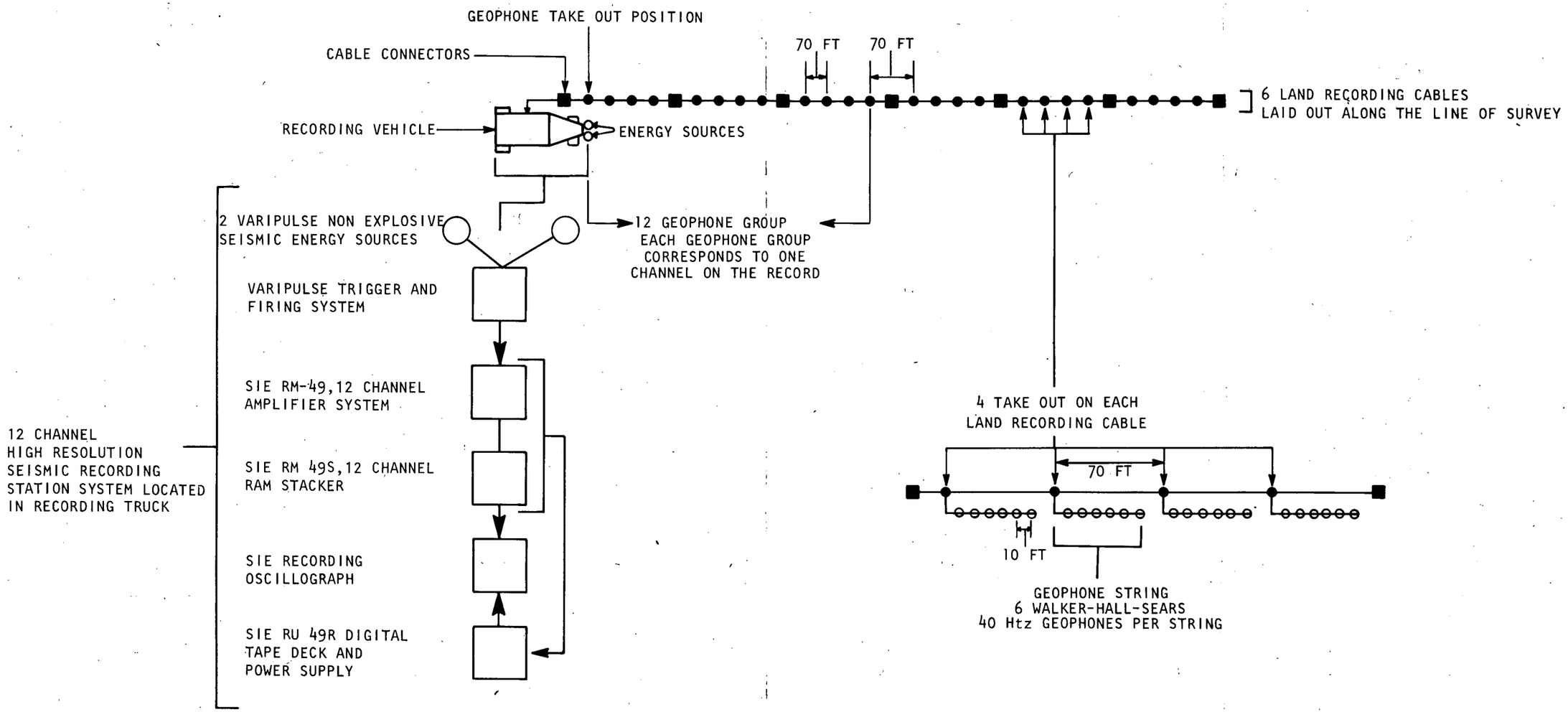
0 500 1000 1500 2000
SCALE IN FEET

KEY:

- 10 BATHYMETRIC CONTOUR LINE
- POSITION OF CONTOUR LINE UNCERTAIN
- RIVER THALWEG
- AXIS OF MINOR CHANNEL OR LINEAR DEPRESSION
- APPROXIMATE UPPER BREAK OF RELATIVELY STEEP SLOPE
- APPROXIMATE LOWER BREAK OF RELATIVELY STEEP SLOPE
- SURVEY REFERENCE STATIONS

NOTES:

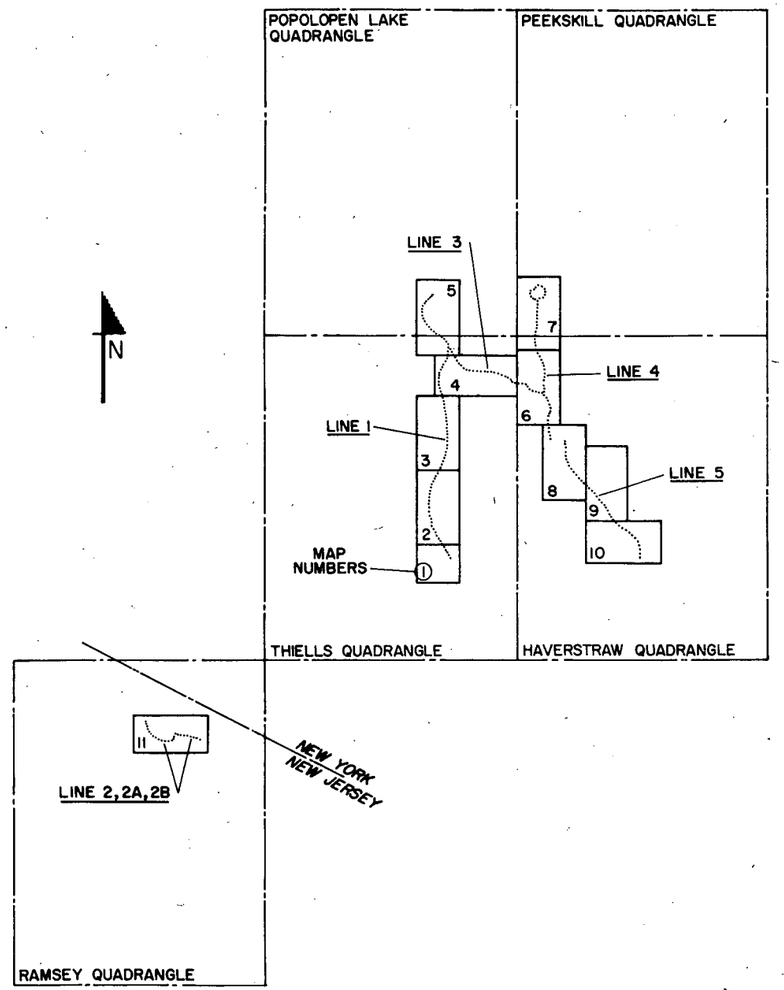
1. CONTOUR INTERVAL = 10 FEET
2. DATUM IS MEAN STANDARD SEA LEVEL AT SANDY HOOK, N.J.
3. SURVEY DONE IN MARCH, 1976.



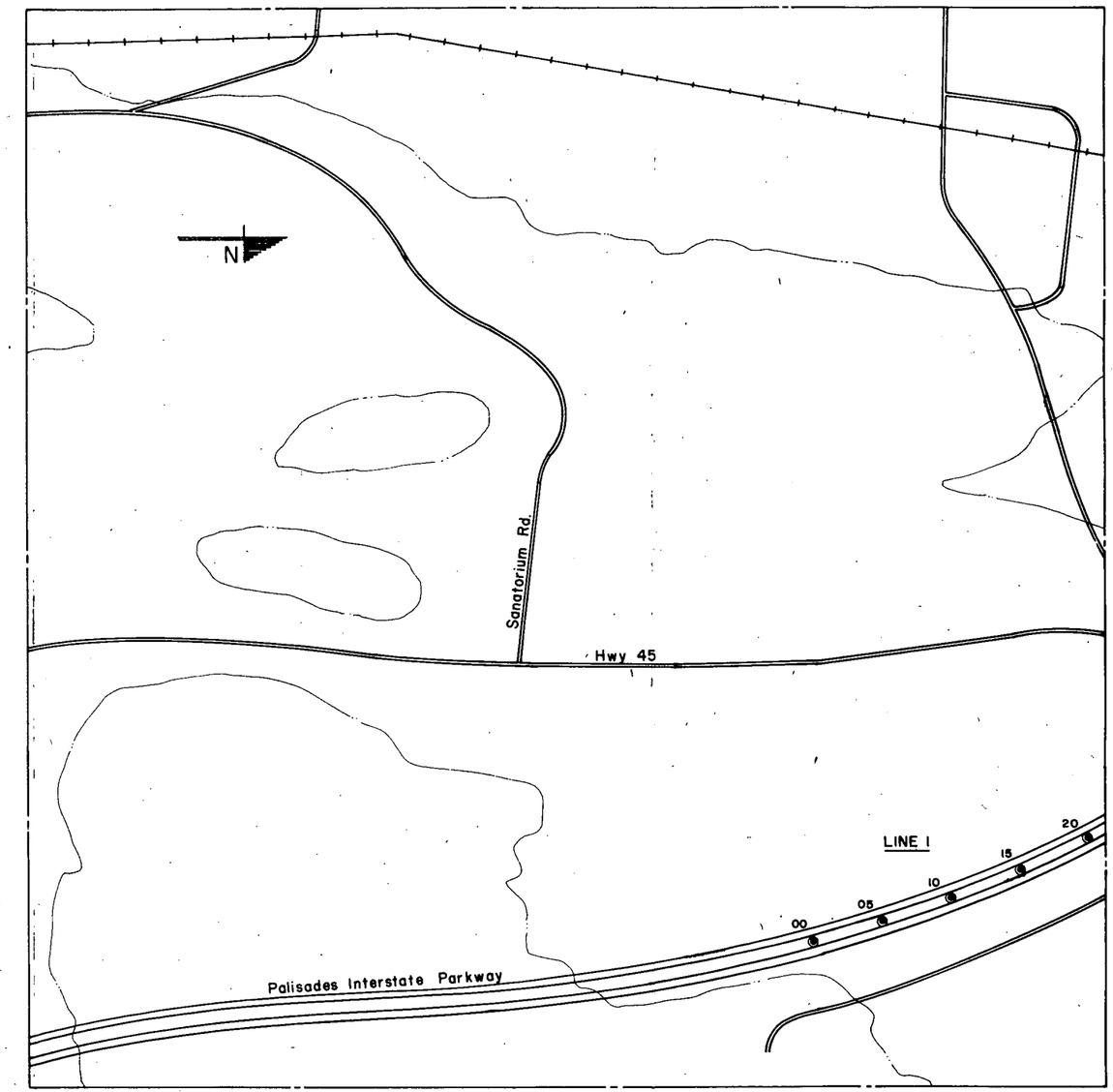

# SEISMIC REFLECTION PROFILING EQUIPMENT

DAMES & MOORE

PLATE D.7-1




KEY PLAN




0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

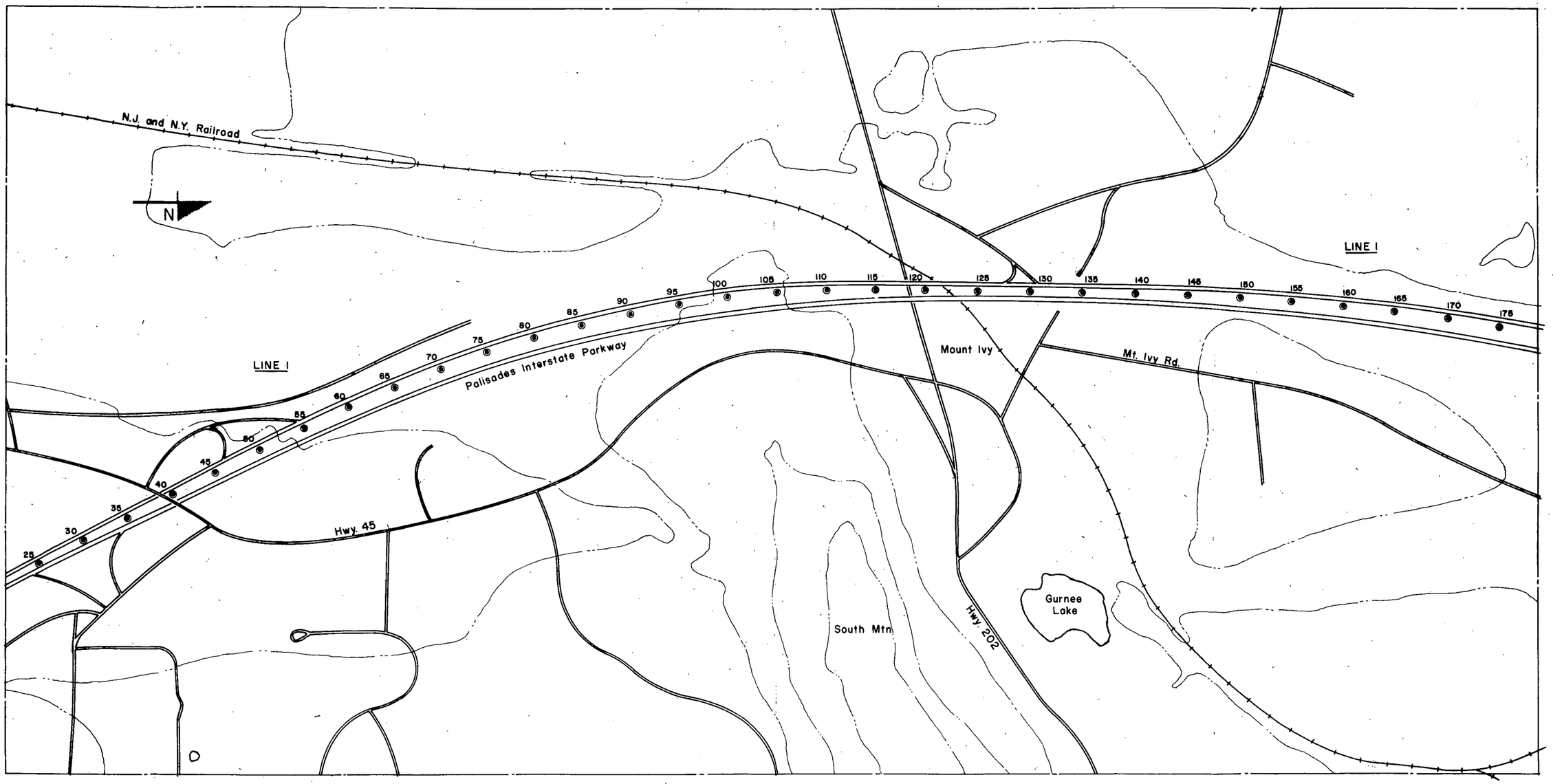
# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 1

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE

PLATE D.7-2




# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 2

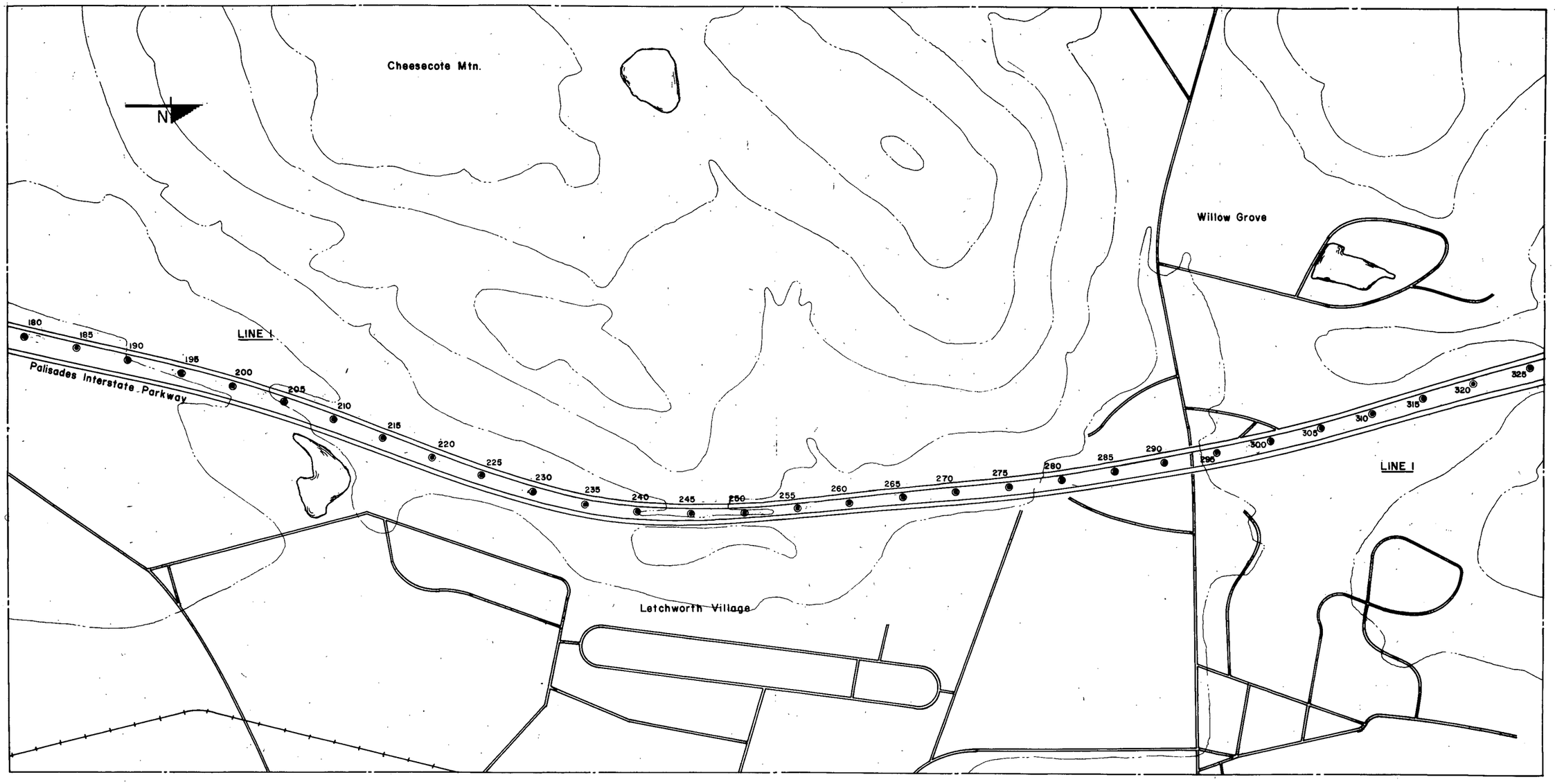
0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

BARNES & MCGUIRE

PLATE D.7-3




0 1/16 1/8 1/4 mile

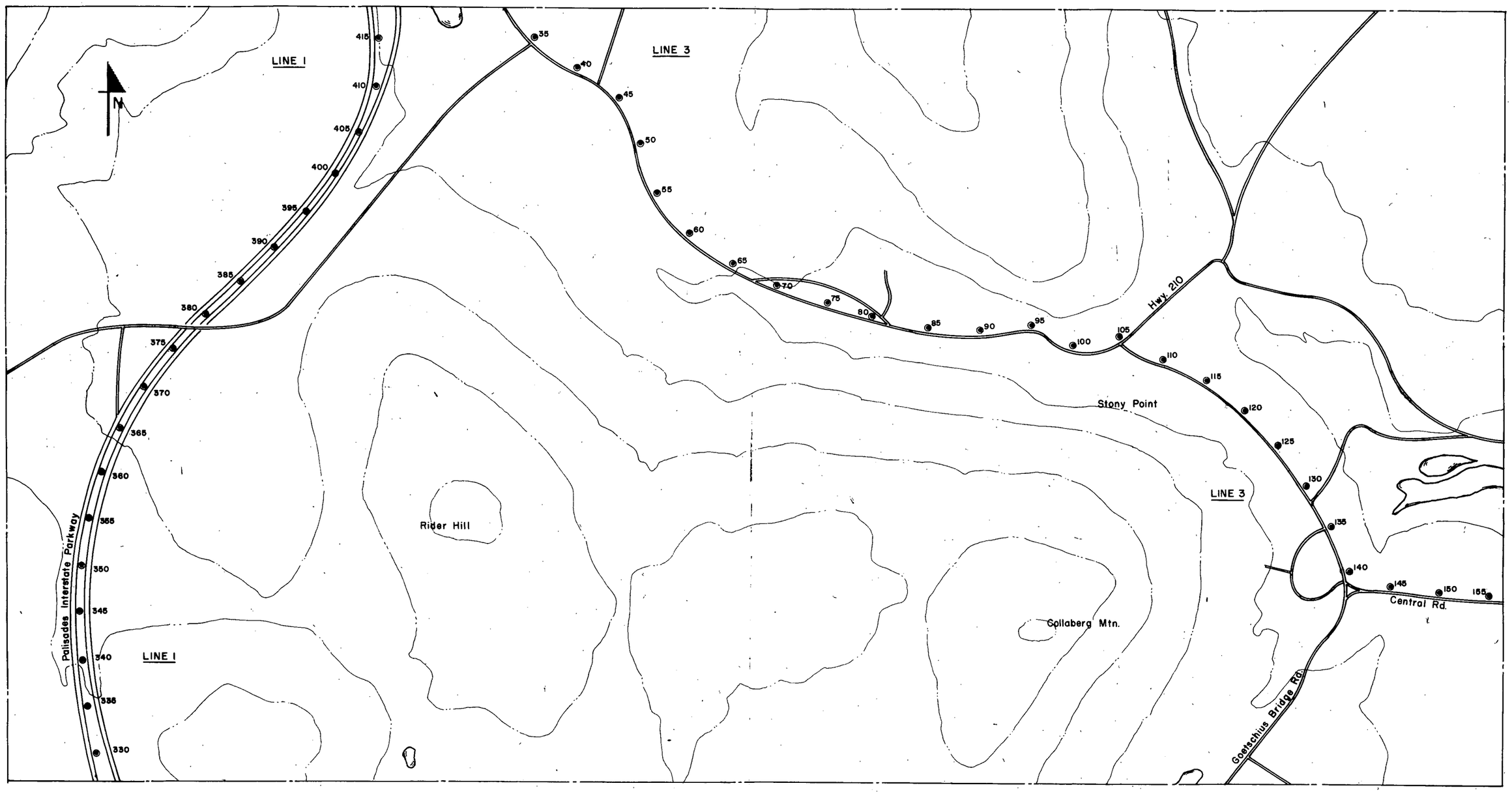
CONTOUR INTERVAL 100 FEET

# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 3

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE




0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

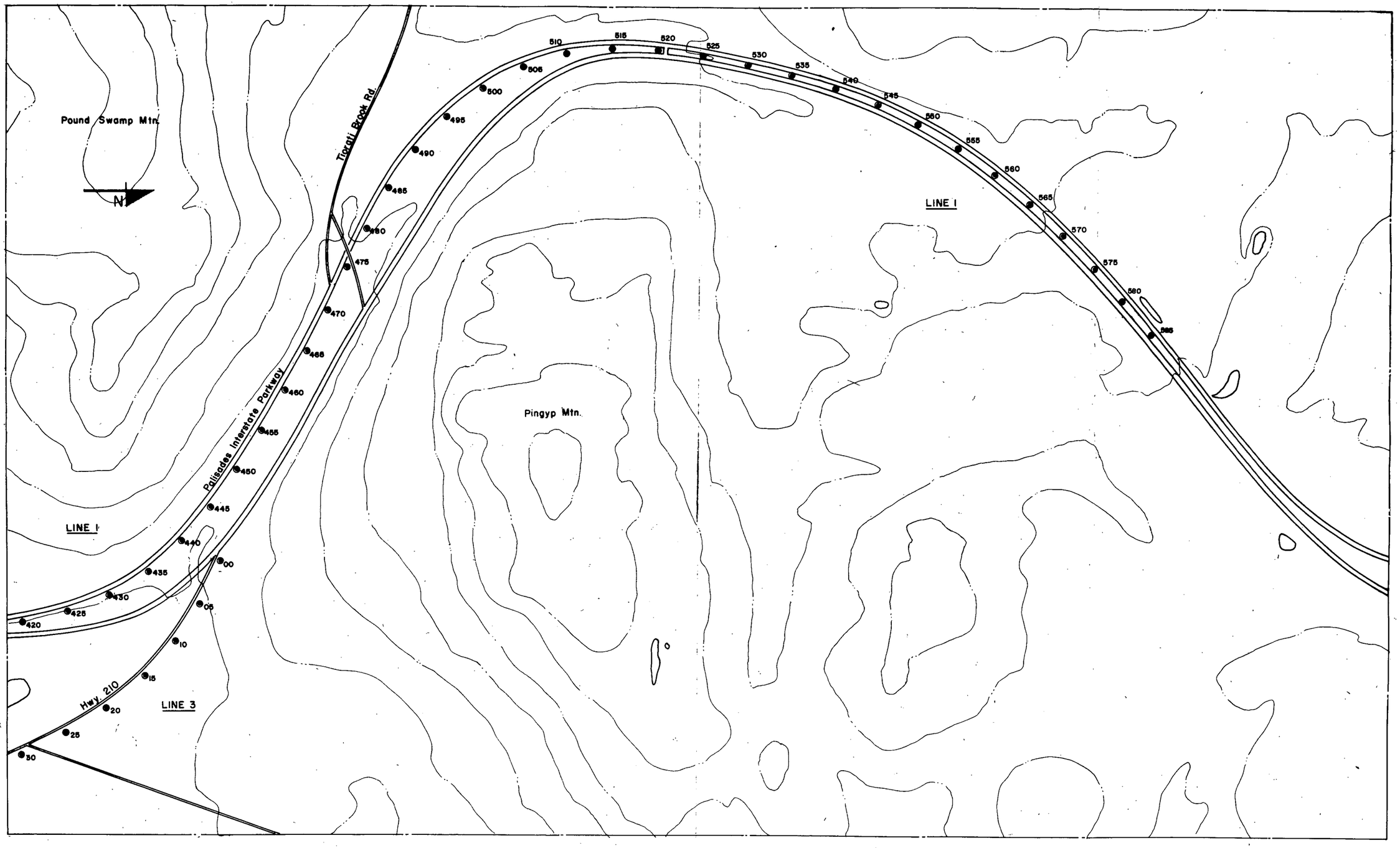
REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 4

DAMES & MOORE

PLATE D.7-5




REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

0 1/16 1/8 1/4 mile

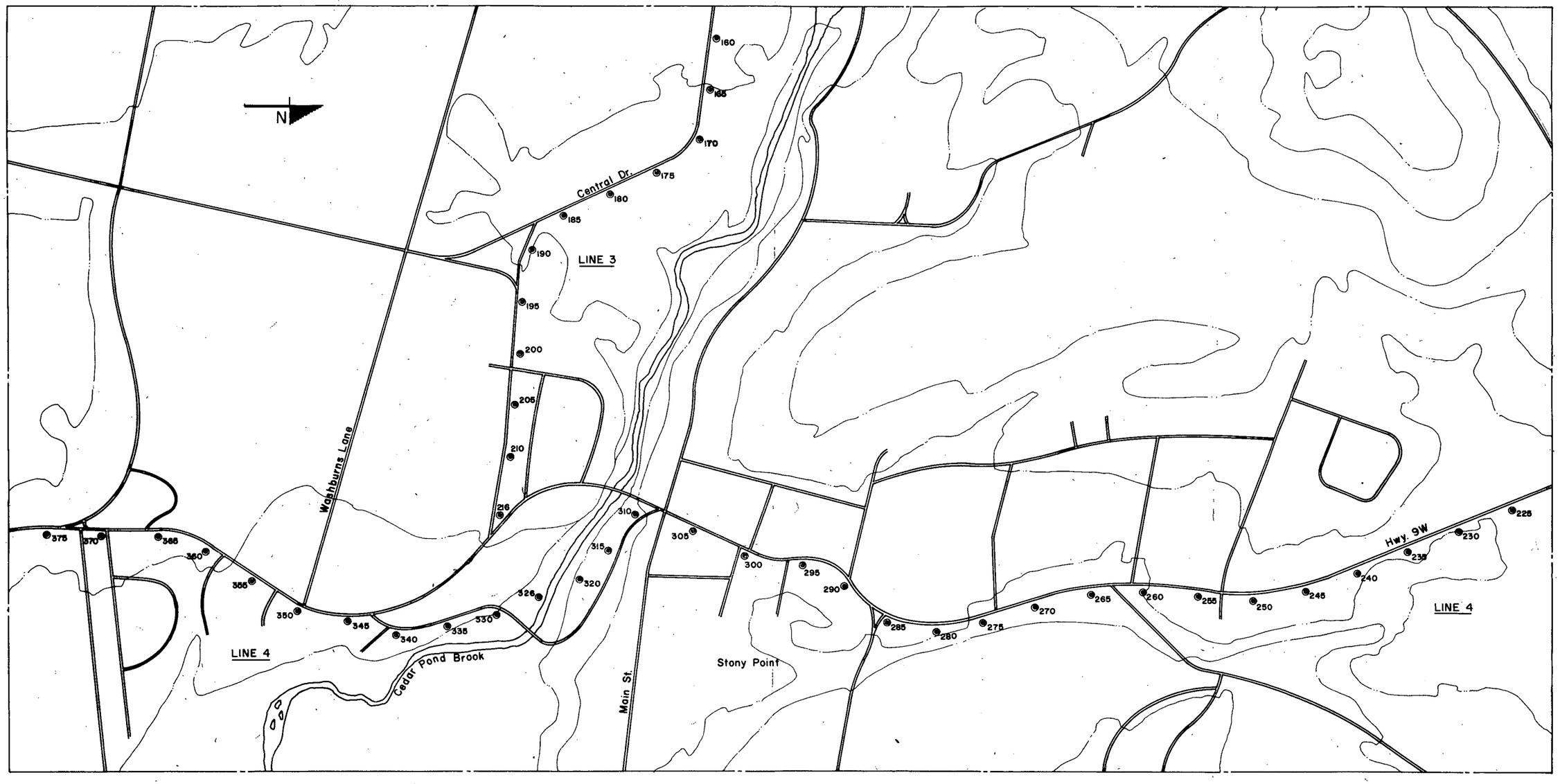
CONTOUR INTERVAL 100 FEET

# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 5

DAMES & MOORE

PLATE D.7-6




0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

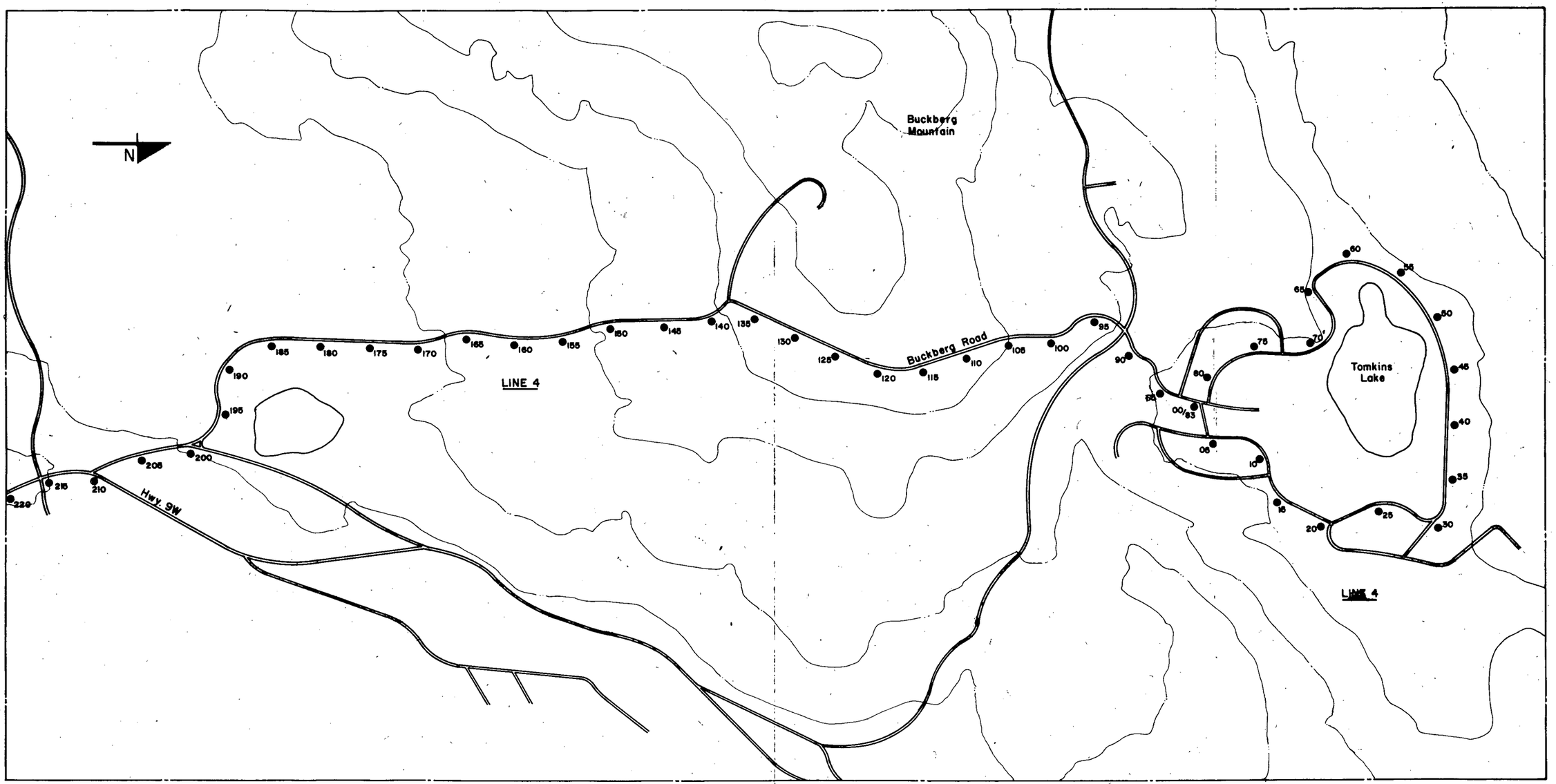
# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 6

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE

PLATE D.7-7




0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

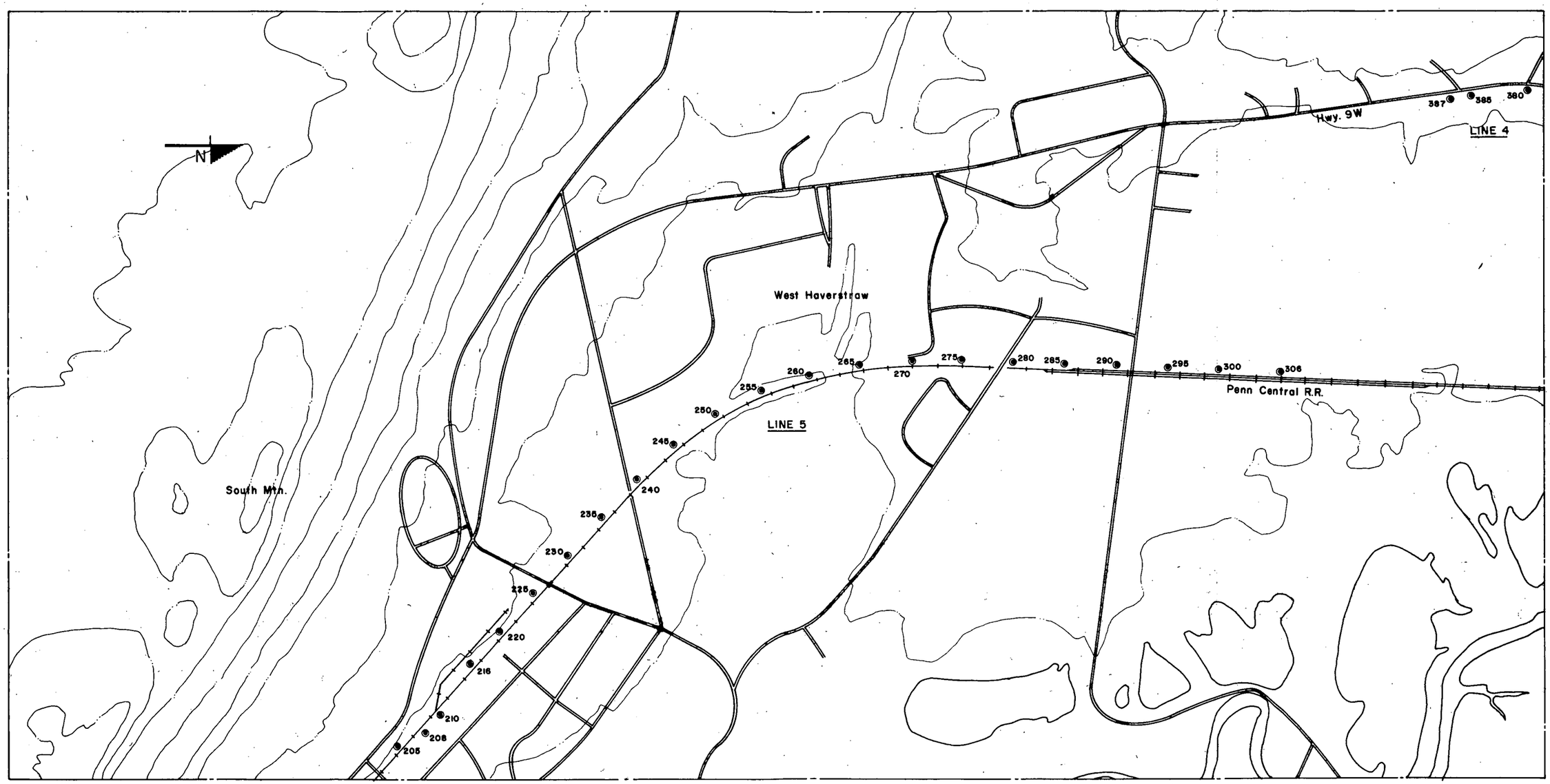
# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 7

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE

PLATE D.7-8




0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

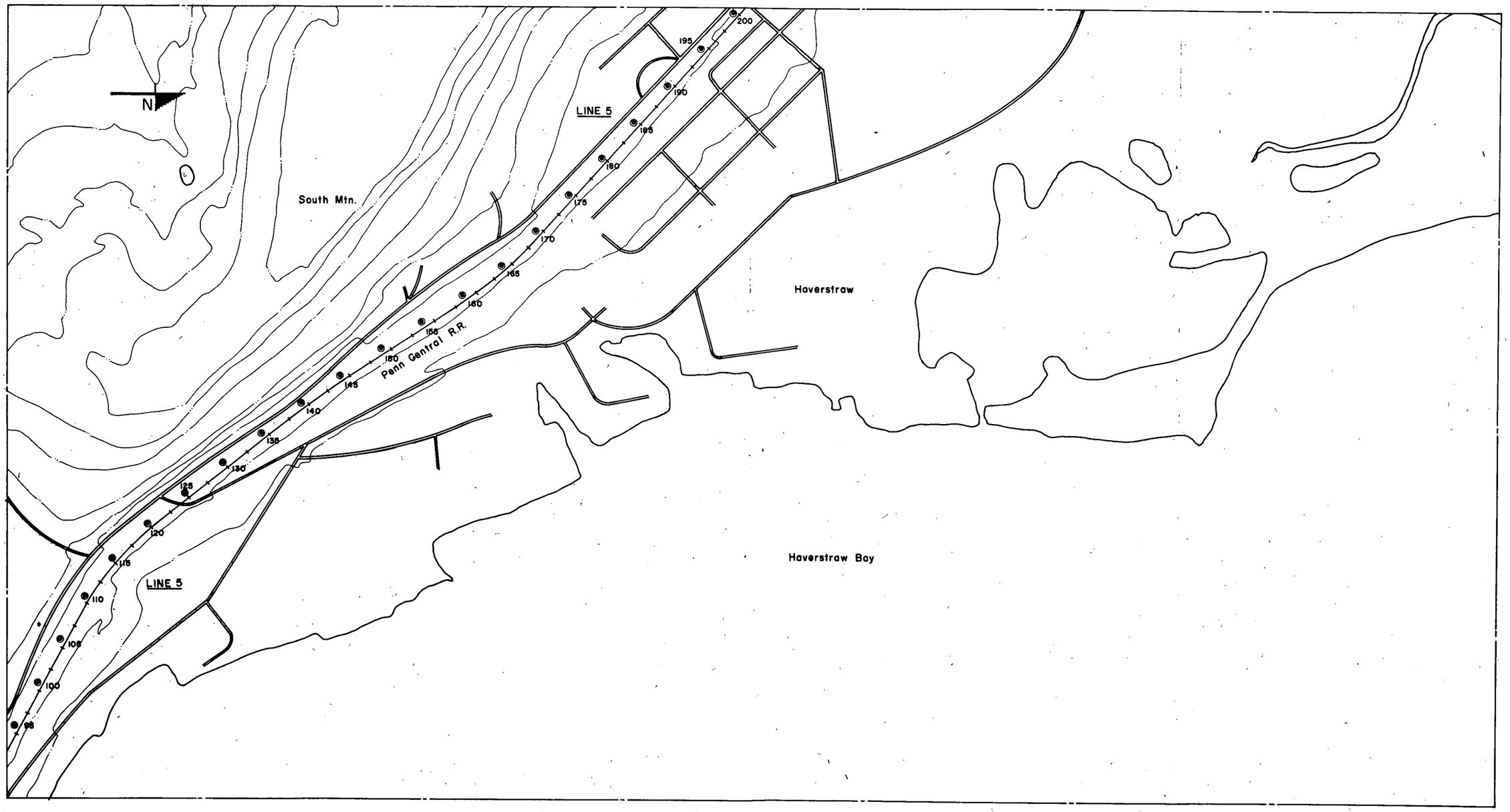
# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 8

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE

PLATE D.7-9




0 1/16 1/8 1/4 mile

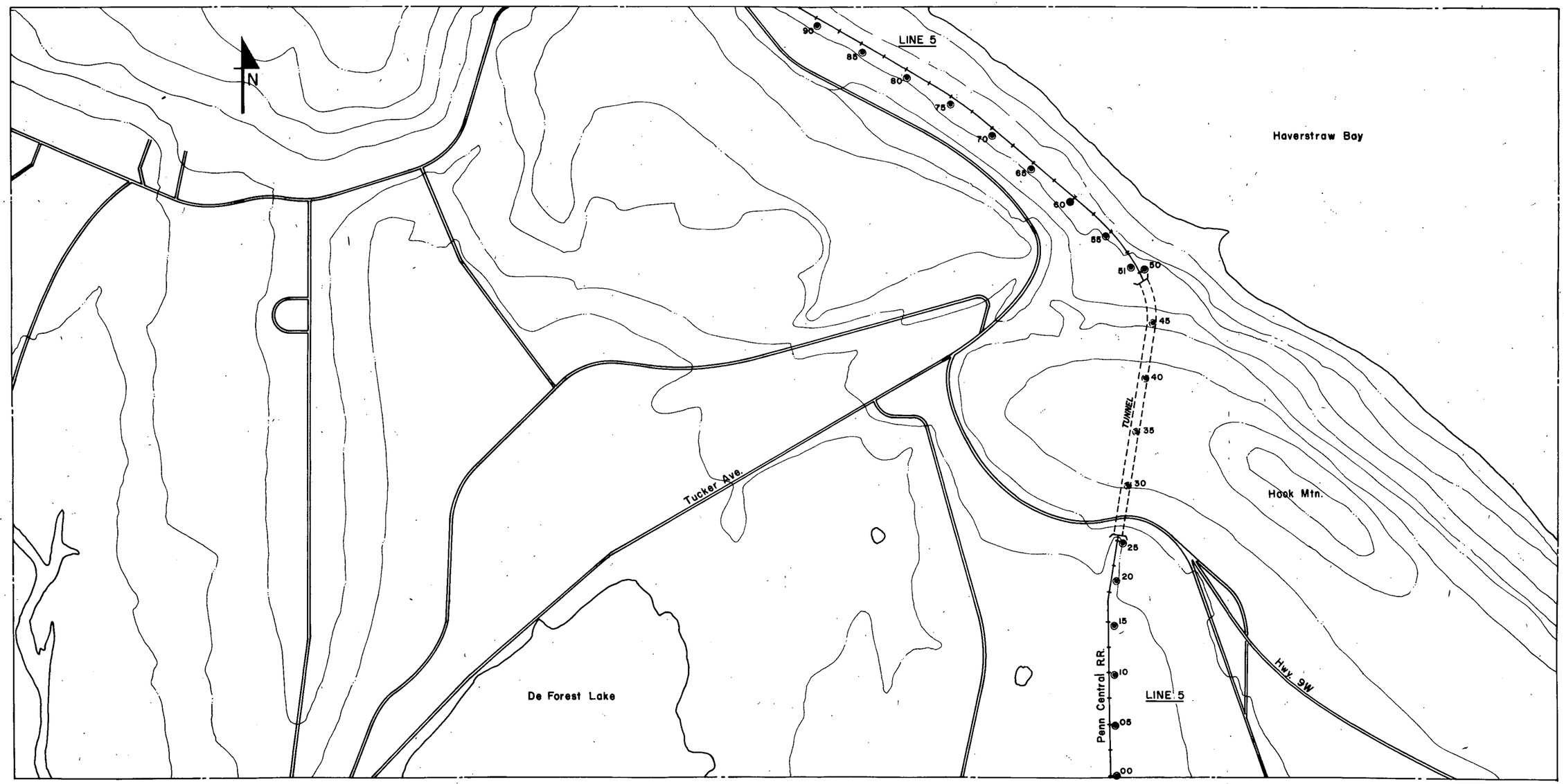
CONTOUR INTERVAL 100 FEET

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 9

DAMES & MOORE




# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 10

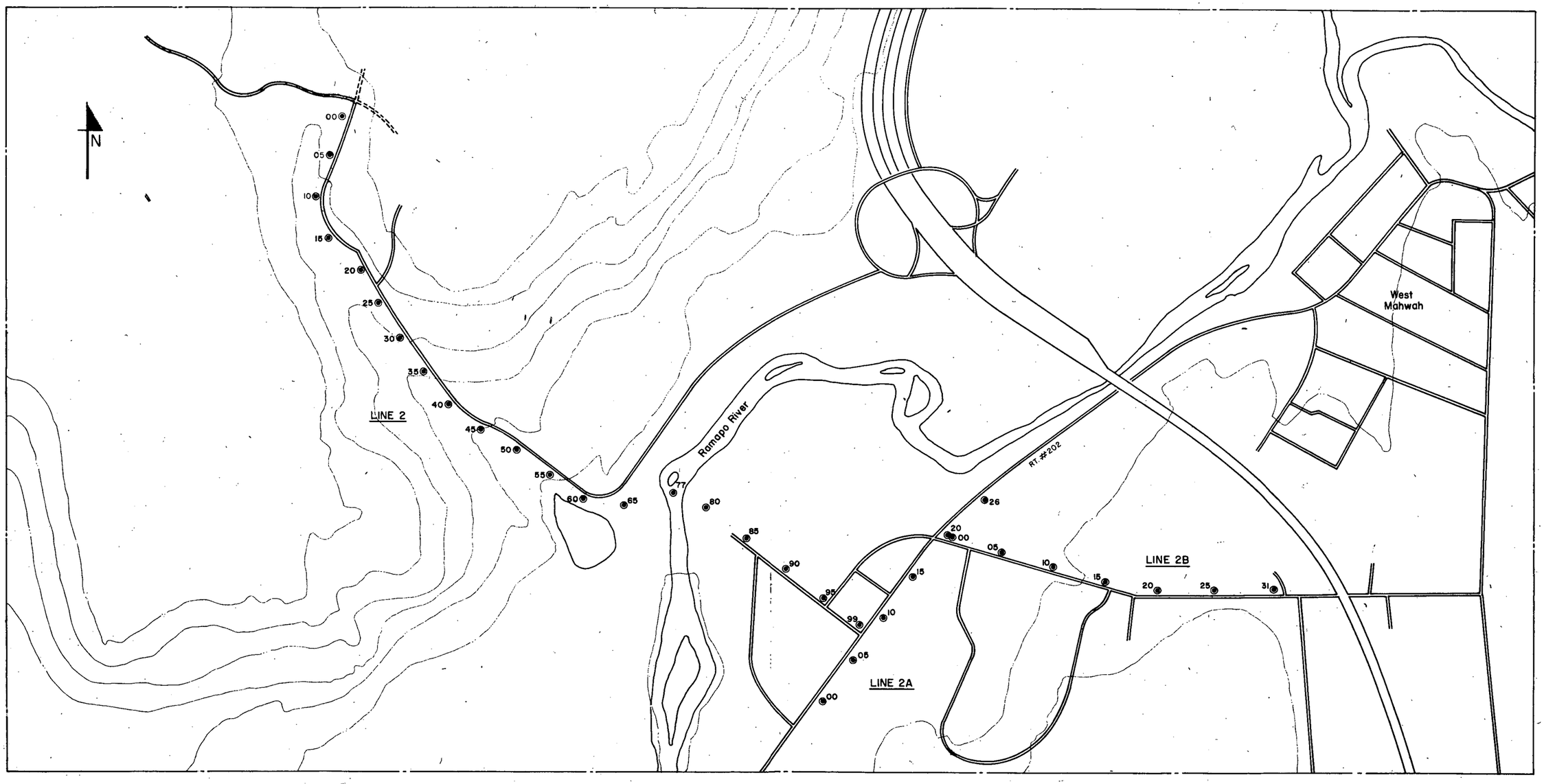
0 1/16 1/8 1/4 mile

CONTOUR INTERVAL 100 FEET

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

DAMES & MOORE

PLATE D.7-11




0 1/16 1/8 1/4 mile

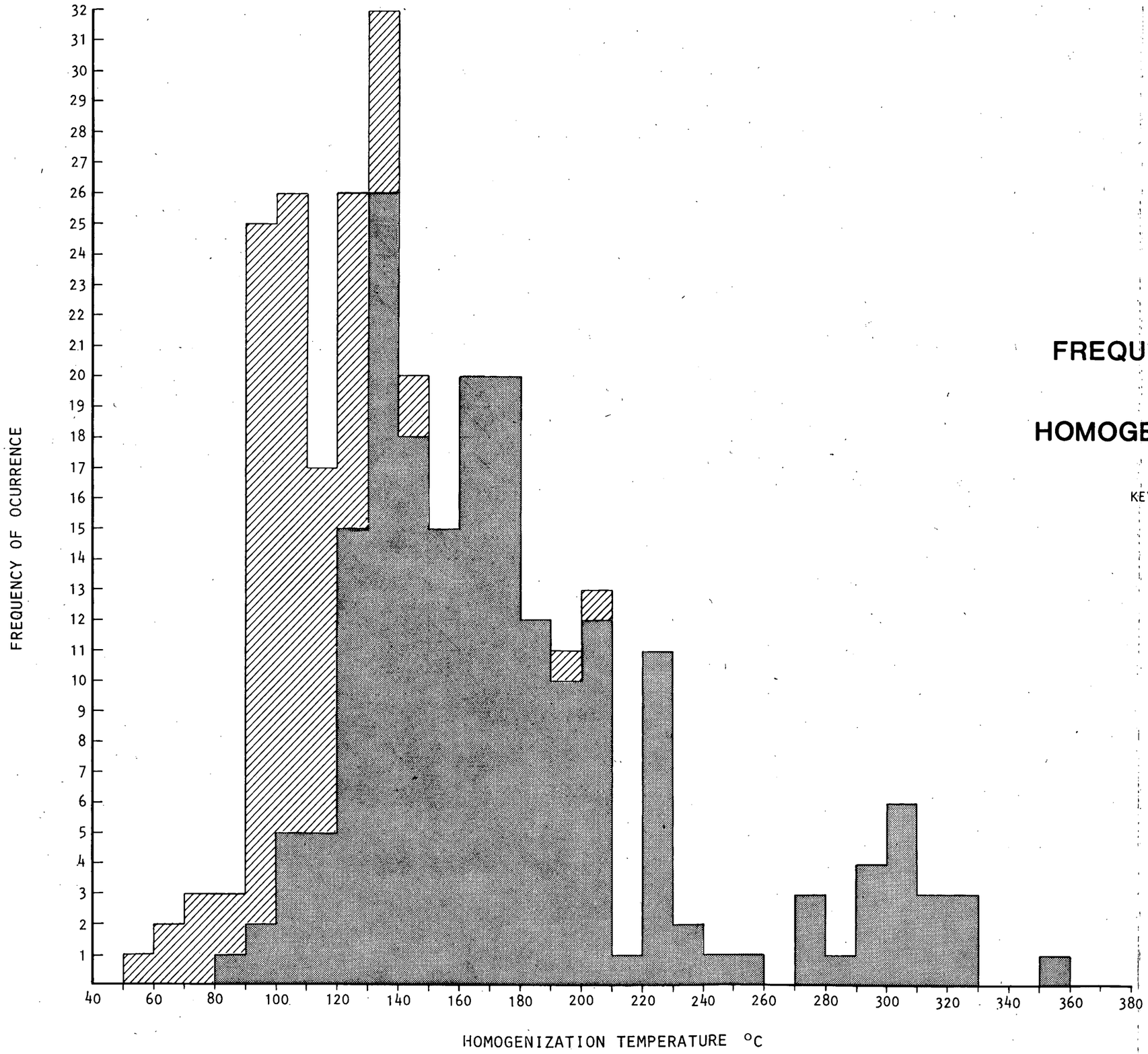
CONTOUR INTERVAL 100 FEET

REFERENCE: MAP PROVIDED BY TARGET SURVEY INC., OF HOUSTON, TEXAS.

# HIGH RESOLUTION SEISMIC REFLECTION SURVEY

## SHOT POINT LOCATION MAP 11

DAMES & MOORE



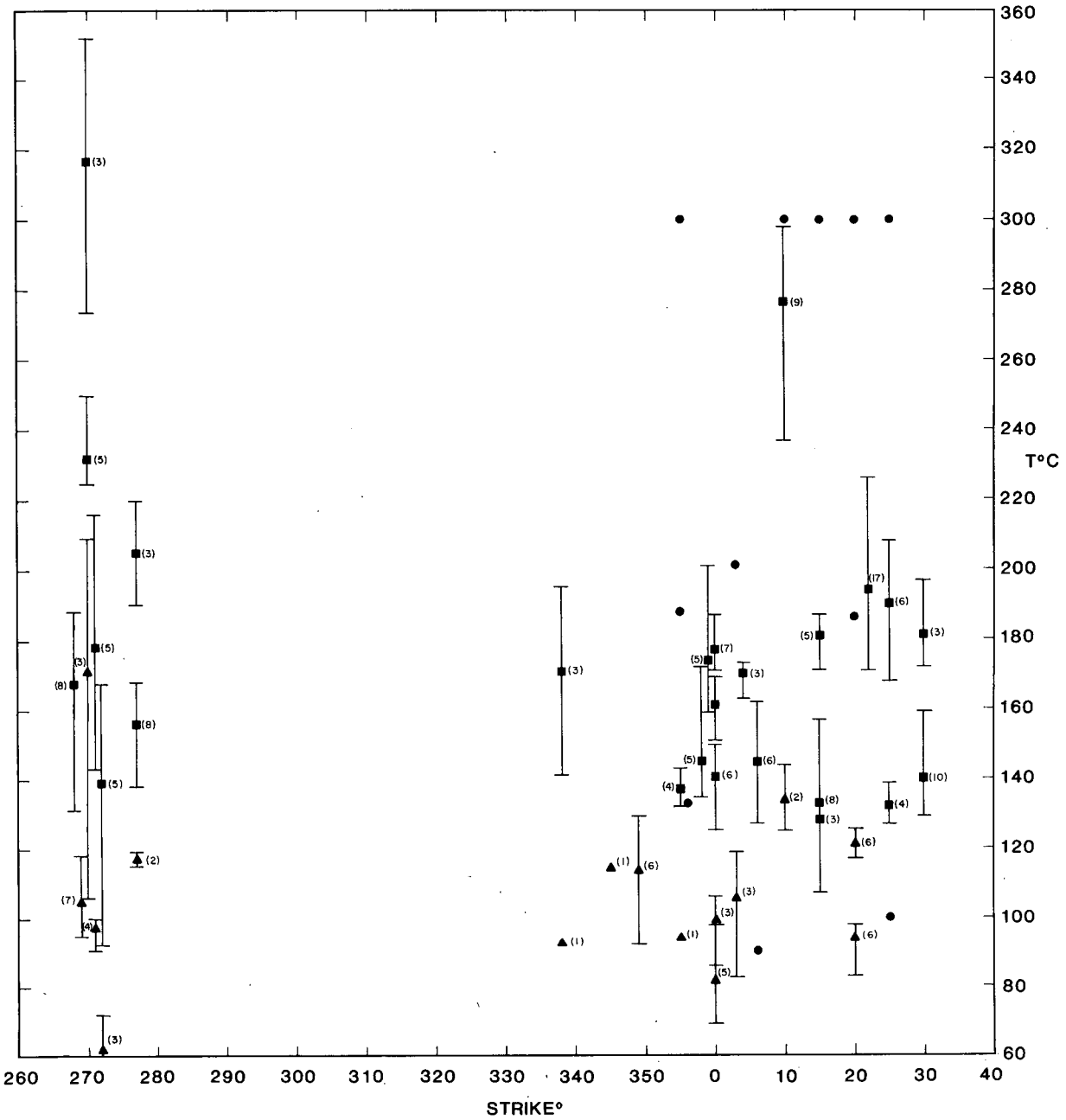

# FREQUENCY OF OCCURRENCE VS. HOMOGENIZATION TEMPERATURE

KEY:

- PRIMARY OR PSEUDOSECONDARY HOMOGENIZATION TEMPERATURE
- SECONDARY OR LATE STAGE HOMOGENIZATION TEMPERATURE

DAMES & MOORE

PLATE 5-1




# STRIKE OF FAULT OR FRACTURE PLANE SAMPLED VS. HOMOGENIZATION TEMPERATURE °C IN PALEOZOIC HOST ROCK

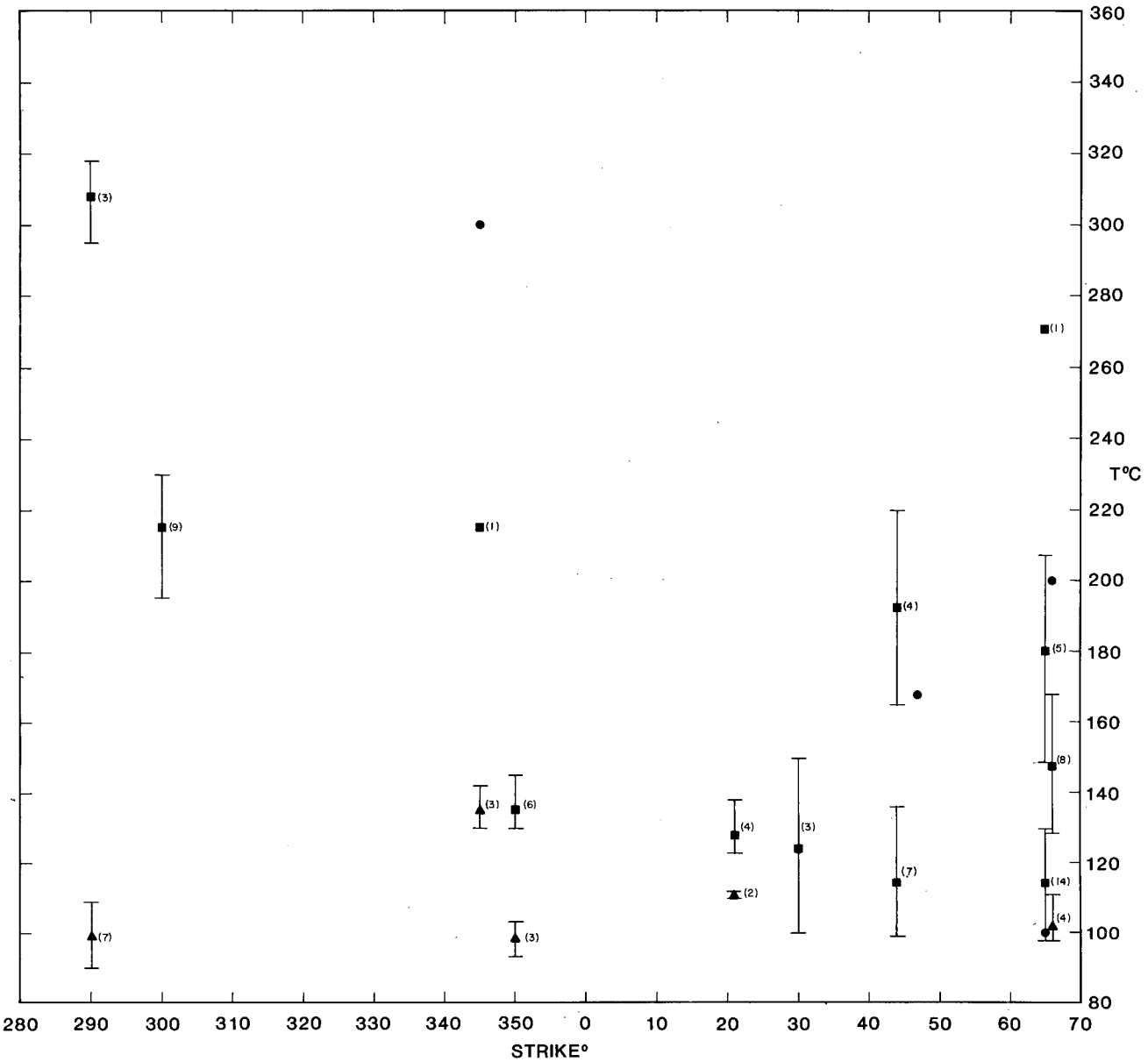
LEGEND:

- ■ PRIMARY OR PSEUDOSECONDARY FLUID INCLUSION AVERAGE HOMOGENIZATION TEMPERATURE
- ▲ SECONDARY OR LATE STAGE FLUID INCLUSION AVERAGE HOMOGENIZATION TEMPERATURE
- ● HOMOGENIZATION TEMPERATURE INFERRED OR POOR TEMPERATURE MEASUREMENT

KEY:

RANGE OF TEMPERATURES MEASURED — (3) — AVERAGE HOMOGENIZATION TEMPERATURE BASED ON THREE DETERMINATIONS

DAMES & MOORE




# STRIKE OF FAULT OR FRACTURE PLANE SAMPLED VS. HOMOGENIZATION TEMPERATURE °C IN MESOZOIC HOST ROCK

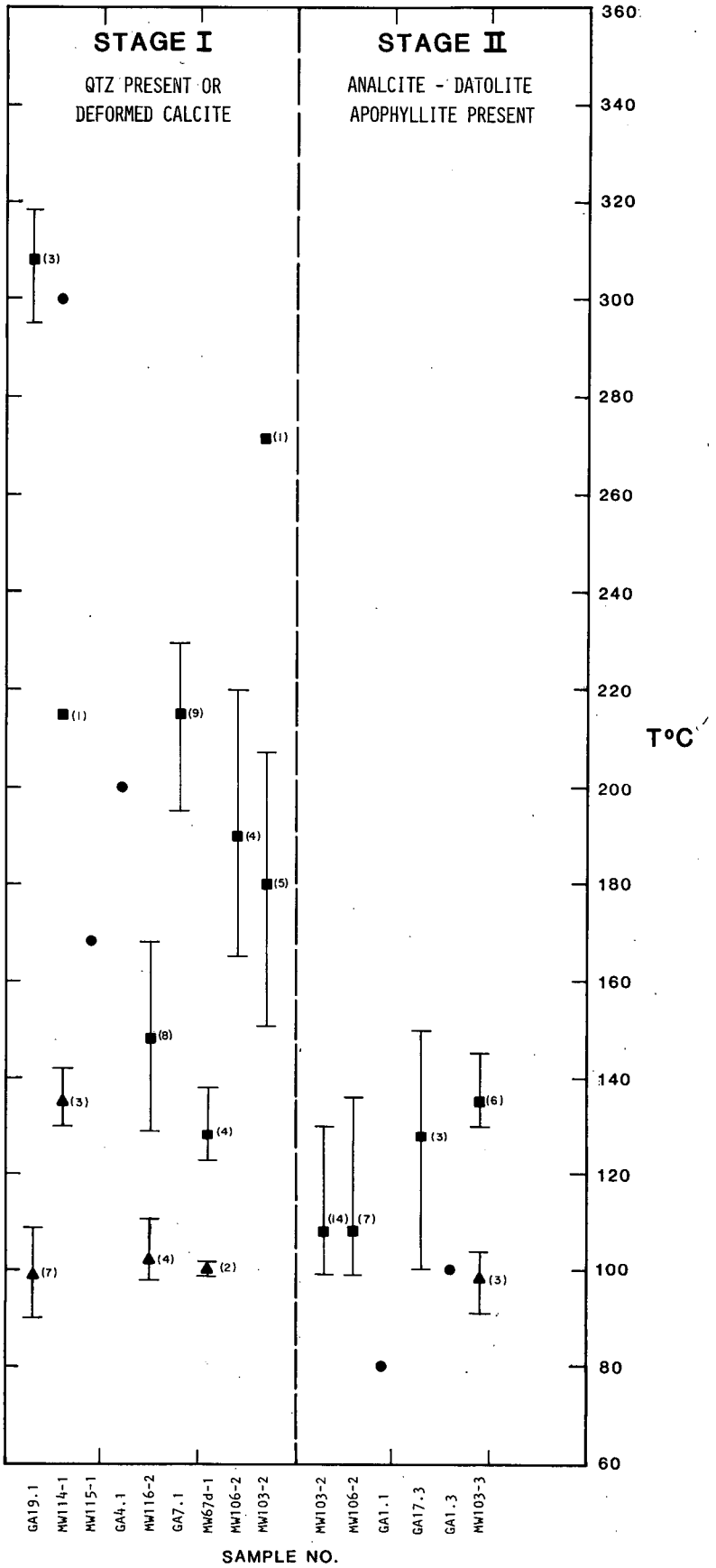
LEGEND:

- ■ PRIMARY OR PSEUDOSECONDARY FLUID INCLUSION AVERAGE HOMOGENIZATION TEMPERATURE
- ▲ SECONDARY OR LATE STAGE FLUID INCLUSION AVERAGE HOMOGENIZATION TEMPERATURE
- ● HOMOGENIZATION TEMPERATURE INFERRED OR POOR TEMPERATURE MEASUREMENT

KEY:

RANGE OF TEMPERATURES MEASURED — (3) — AVERAGE HOMOGENIZATION TEMPERATURE BASED OF THREE DETERMINATIONS

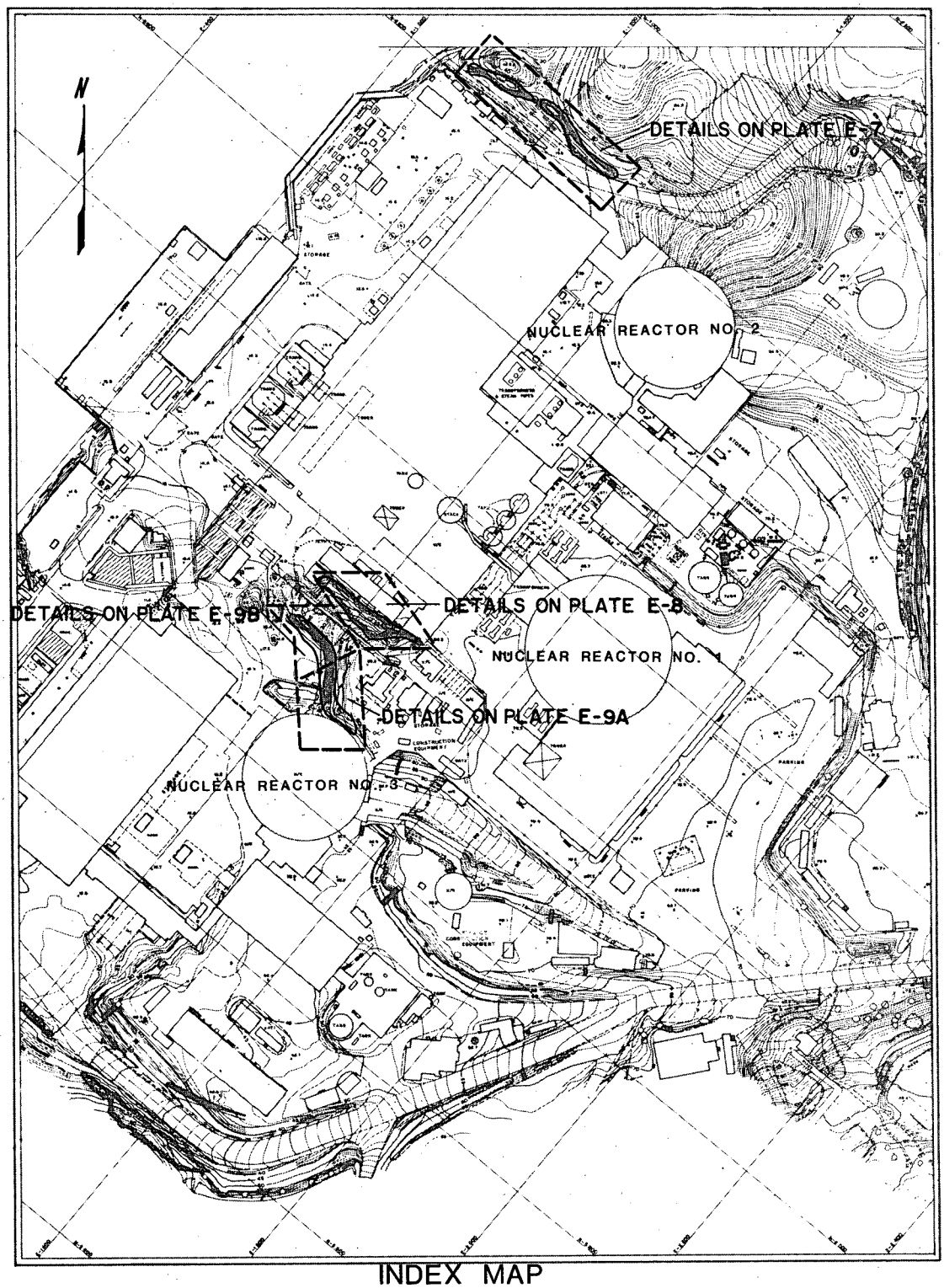
DAMES & MOORE




MINERAL PHASE VS HOMOGENIZATION TEMPERATURE

DAMES & MOORE

PLATE E-4




# INDEX MAP

## SHOWING ONSITE OUTCROPS AND REFERENCES TO DETAILED DIAGRAMS E-7 THRU E-9B

WHICH CONTAIN F.S. SERIES SAMPLE LOCATIONS

100 0 100 200

NOTE: PLANT NORTH IS 38½° EAST OF TRUE NORTH

REFERENCE:

THE BASE OF THIS MAP WAS PREPARED FROM;
DRAWING NUMBERS 808 FROM THE OFFICE OF
J.W. DELANO, 12 BOND ST.,WHITE PLAINS, N.Y.

DAMES & MOORE

or B - WELL DEFINED HEALED BRECCIA

or PB- POORLY DEFINED HEALED BRECCIA

or Ub- UNHEALED BRECCIA

or M - MINERALIZATION: PYRITE, MICA, K-FELDSPAR, PINK CALCITE

- STRATIGRAPHIC MARKER

- LOCATION OF SAMPLE TAKEN FOR PETROGRAPHIC STUDY (SAMPLE NUMBER SHOWN ON OUTCROP PLANS)

70° 70° - STRIKE AND DIP OF PREDOMINANTLY STRIKE SLIP FAULT; DASHED WHERE INFERRED.

70° 70° - STRIKE AND DIP OF PREDOMINANTLY STRIKE SLIP FAULT; ARROWS INDICATE OBSERVED SENSE OF MOVEMENT; DASHED WHERE INTERPRETED.

60° 60° - STRIKE AND DIP OF PREDOMINANTLY DIP SLIP FAULT; DASHED WHERE INFERRED. HATCHURES INDICATE DOWNTHROWN SIDE.

65° - STRIKE AND DIP OF JOINT OR FRACTURE

65° - STRIKE AND DIP OF JOINT OR FRACTURE; ARROW INDICATES RAKE OR PLUNGE OF SLICKENSIDES

- STRIKE OF VERTICAL JOINT OR FRACTURE

60° - STRIKE AND DIP OF ORIGINAL BEDDING ($S_o$)

60° - STRIKE AND DIP OF FOLIATION ($S_1$)

60° - STRIKE AND DIP OF FOLIATION ($S_2$)

20 - DIRECTION AND AMOUNT OF PLUNGE OF AXIS OF $F_1$ FOLDING; OR LINEATION ASSOCIATED WITH $F_1$ FOLDING

30 - DIRECTION AND AMOUNT OF PLUNGE OR AXIS OF $F_2$ FOLDING; OR LINEATION ASSOCIATED WITH $F_2$ FOLDING

20 40 - STRIKE AND DIP OF AXIAL PLANE OF MINOR FOLD; ARROW INDICATES DIRECTION AND AMOUNT OF PLUNGE

- MATCH LINE

# EXPLANATION OF SYMBOLS UTILIZED ON GEOLOGIC PLANS OF SITE OUTCROPS

DAMES & MOORE

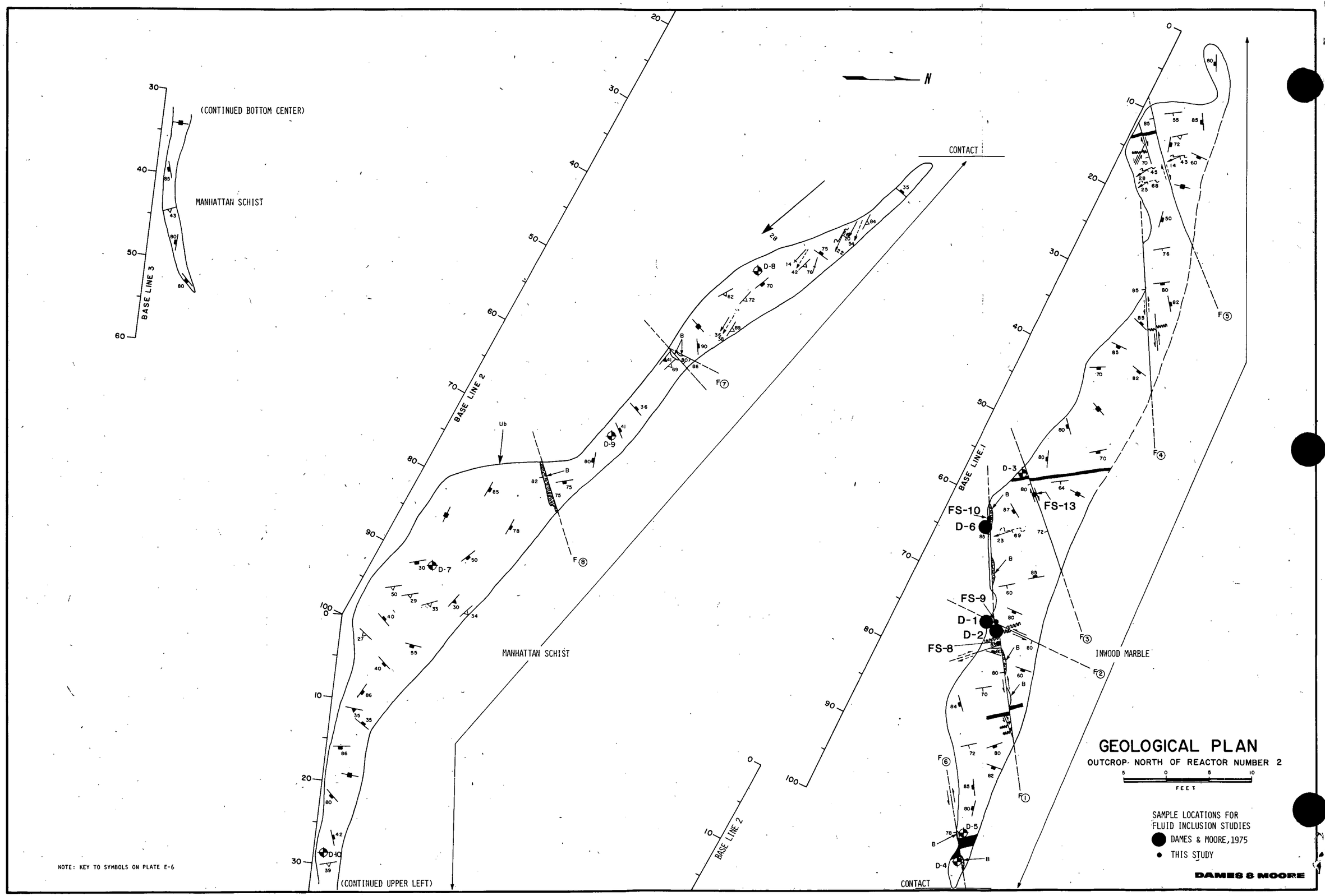

GEOLOGICAL PLAN
OUTCROP NORTH OF REACTOR NUMBER 2
FEET
SAMPLE LOCATIONS FOR FLUID INCLUSION STUDIES
DAMES & MOORE, 1975
THIS STUDY
DAMES & MOORE
N
CONTACT
(CONTINUED BOTTOM CENTER)
MANHATTAN SCHIST
BASE LINE 3
BASE LINE 2
BASE LINE 1
INWOOD MARBLE
(CONTINUED UPPER LEFT)
NOTE: KEY TO SYMBOLS ON PLATE E-6
FS-10
FS-13
FS-9
FS-8
D-1
D-2
D-3
D-4
D-5
D-6
D-7
D-8
D-9
D-10
F①
F②
F③
F④
F⑤
F⑥
F⑦
F⑧

PLATE E-7

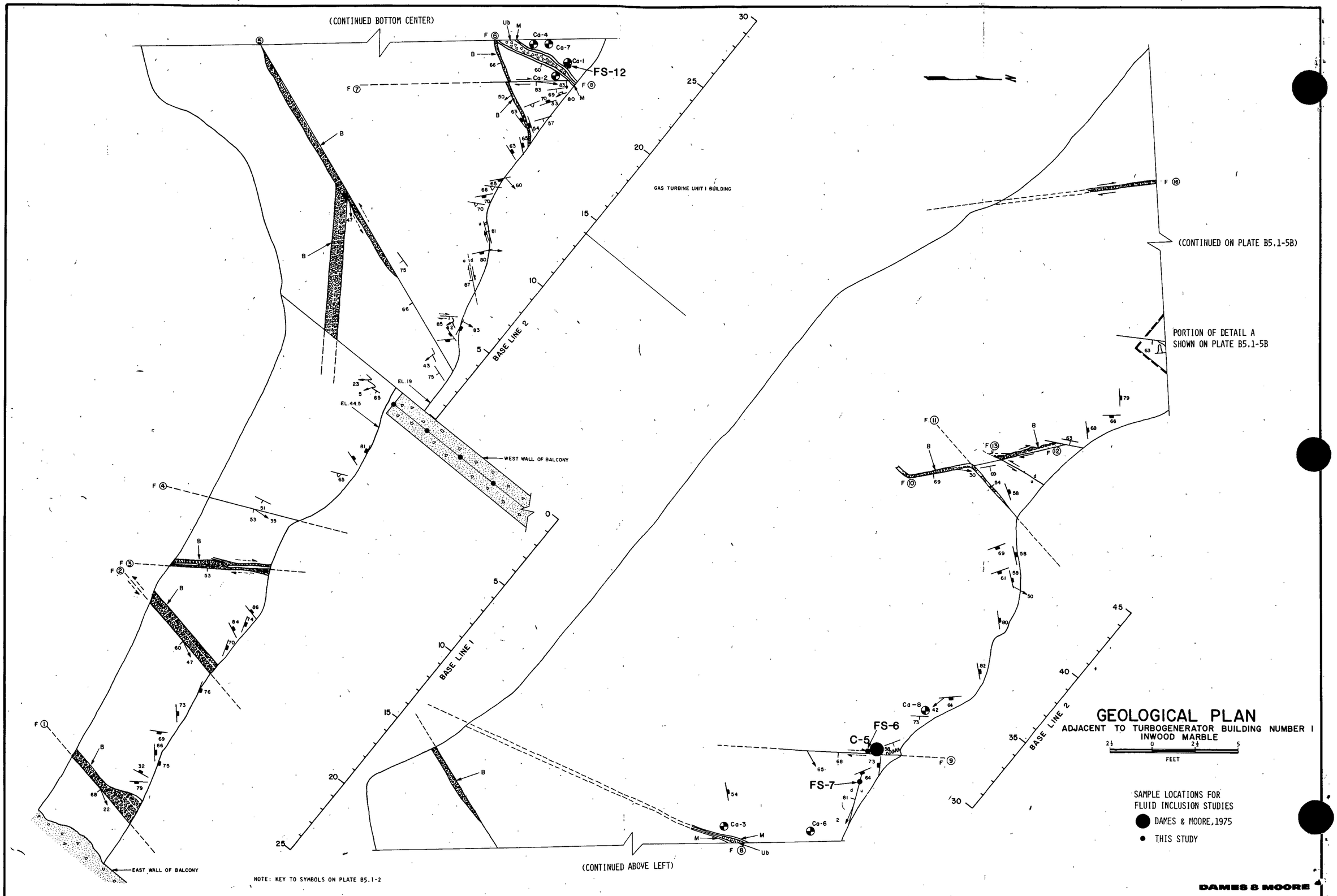
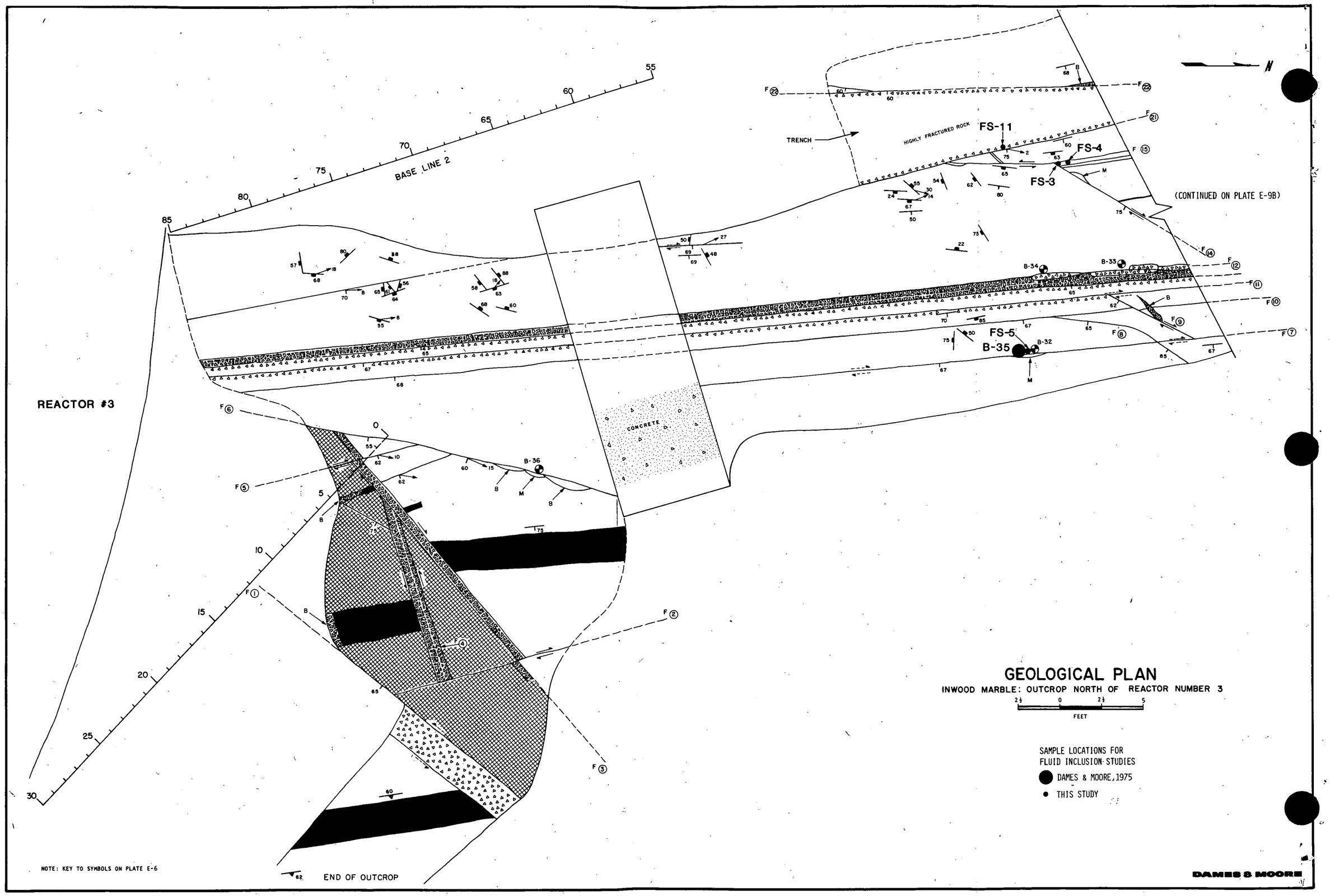

(CONTINUED BOTTOM CENTER)
FS-12
GAS TURBINE UNIT I BUILDING
BASE LINE 2
WEST WALL OF BALCONY
EL. 19
EL. 44.5
BASE LINE 1
EAST WALL OF BALCONY
(CONTINUED ON PLATE B5.1-5B)
PORTION OF DETAIL A
SHOWN ON PLATE B5.1-5B
FS-6
C-5
FS-7
(CONTINUED ABOVE LEFT)
NOTE: KEY TO SYMBOLS ON PLATE B5.1-2
GEOLOGICAL PLAN
ADJACENT TO TURBOGENERATOR BUILDING NUMBER I
INWOOD MARBLE
FEET
SAMPLE LOCATIONS FOR
FLUID INCLUSION STUDIES
DAMES & MOORE, 1975
THIS STUDY
DAMES & MOORE

PLATE E-8


BASE LINE 2
REACTOR #3
TRENCH
HIGHLY FRACTURED ROCK
FS-11
FS-4
FS-3
FS-5
B-35
B-32
B-33
B-34
B-36
CONCRETE
(CONTINUED ON PLATE E-9B)
END OF OUTCROP
NOTE: KEY TO SYMBOLS ON PLATE E-6
GEOLOGICAL PLAN
INWOOD MARBLE: OUTCROP NORTH OF REACTOR NUMBER 3
FEET
SAMPLE LOCATIONS FOR
FLUID INCLUSION STUDIES
DAMES & MOORE, 1975
THIS STUDY
DAMES & MOORE

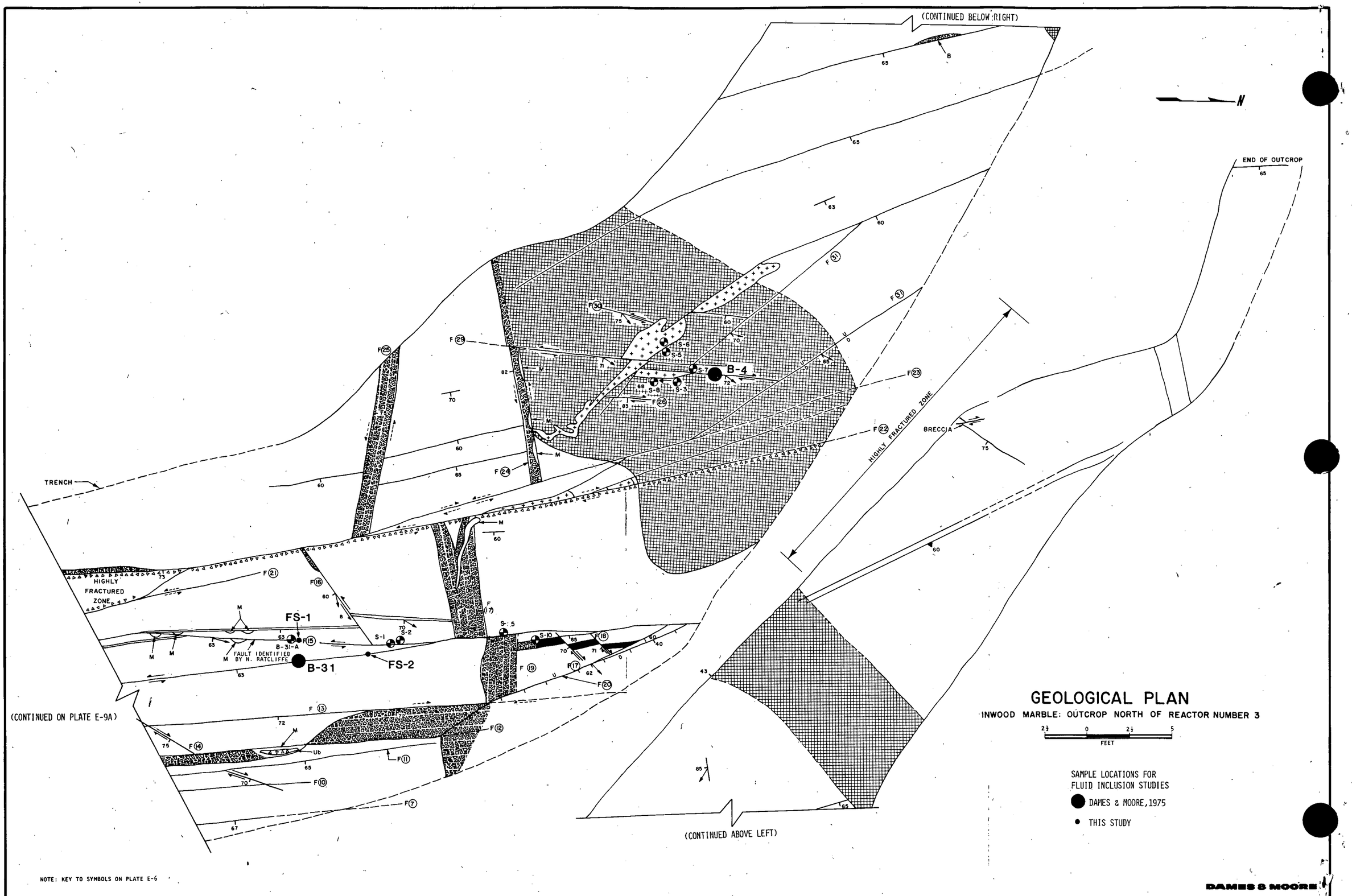
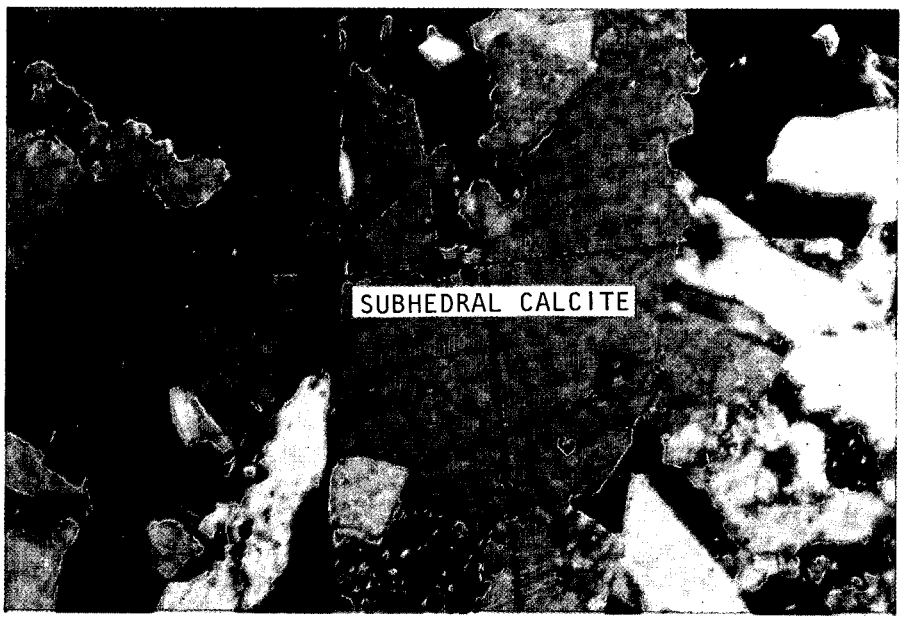

(CONTINUED BELOW RIGHT)
N
END OF OUTCROP
TRENCH
HIGHLY FRACTURED ZONE
BRECCIA
HIGHLY FRACTURED ZONE
FS-1
FS-2
B-31
B-31-A
FAULT IDENTIFIED BY N. RATCLIFFE
B-4
S-1
S-2
S-3
S-5
S-6
S-7
S-8
S-10
(CONTINUED ON PLATE E-9A)
(CONTINUED ABOVE LEFT)
NOTE: KEY TO SYMBOLS ON PLATE E-6
GEOLOGICAL PLAN
INWOOD MARBLE: OUTCROP NORTH OF REACTOR NUMBER 3
FEET
SAMPLE LOCATIONS FOR FLUID INCLUSION STUDIES
DAMES & MOORE, 1975
THIS STUDY
DAMES & MOORE

PLATE E-9B




PHOTOMICROGRAPH OF SAMPLE M.W.-67D-1
SAMPLE TAKEN FROM FRACTURE TRENDING N55E,74S
WITHIN A SHEAR ZONE ORIENTED N21E,80E

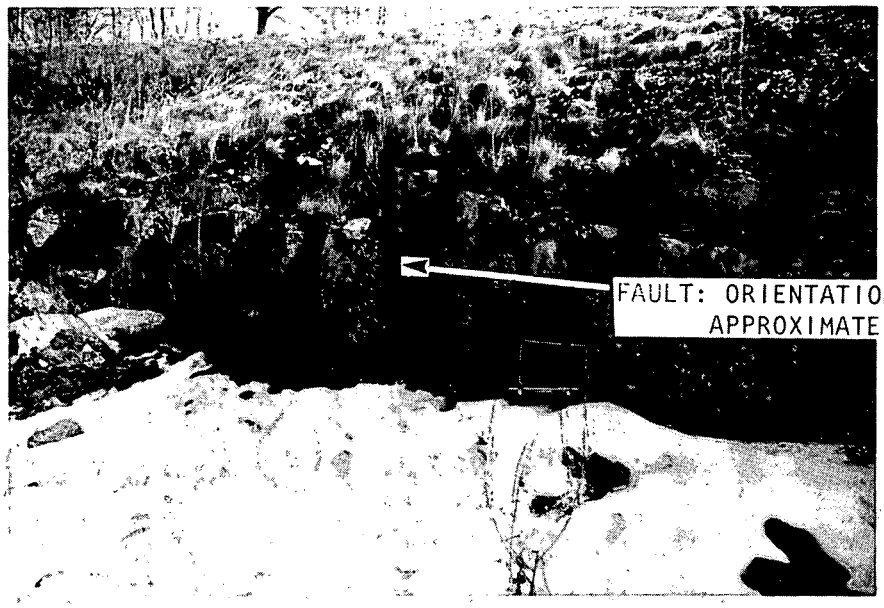



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-17

LOCATION - SE CORNER OF SOCCER FIELD AT THE SOUTHERN END OF ROCKLAND LAKE

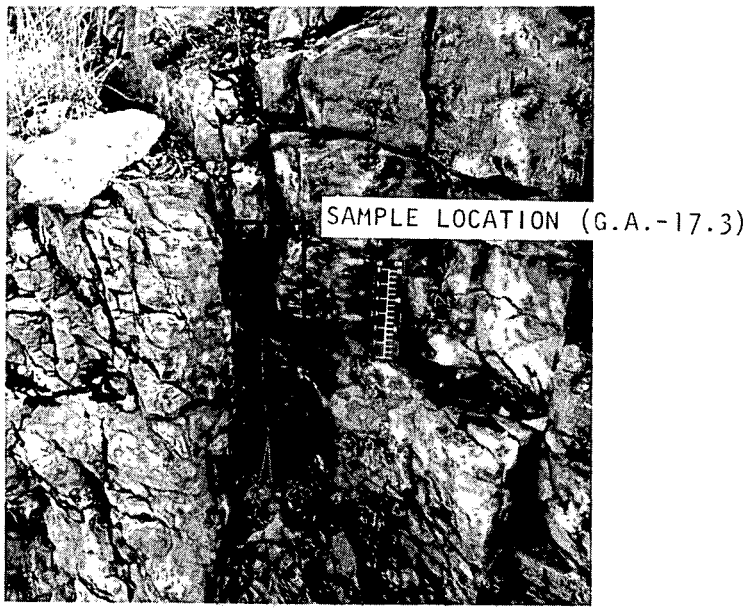
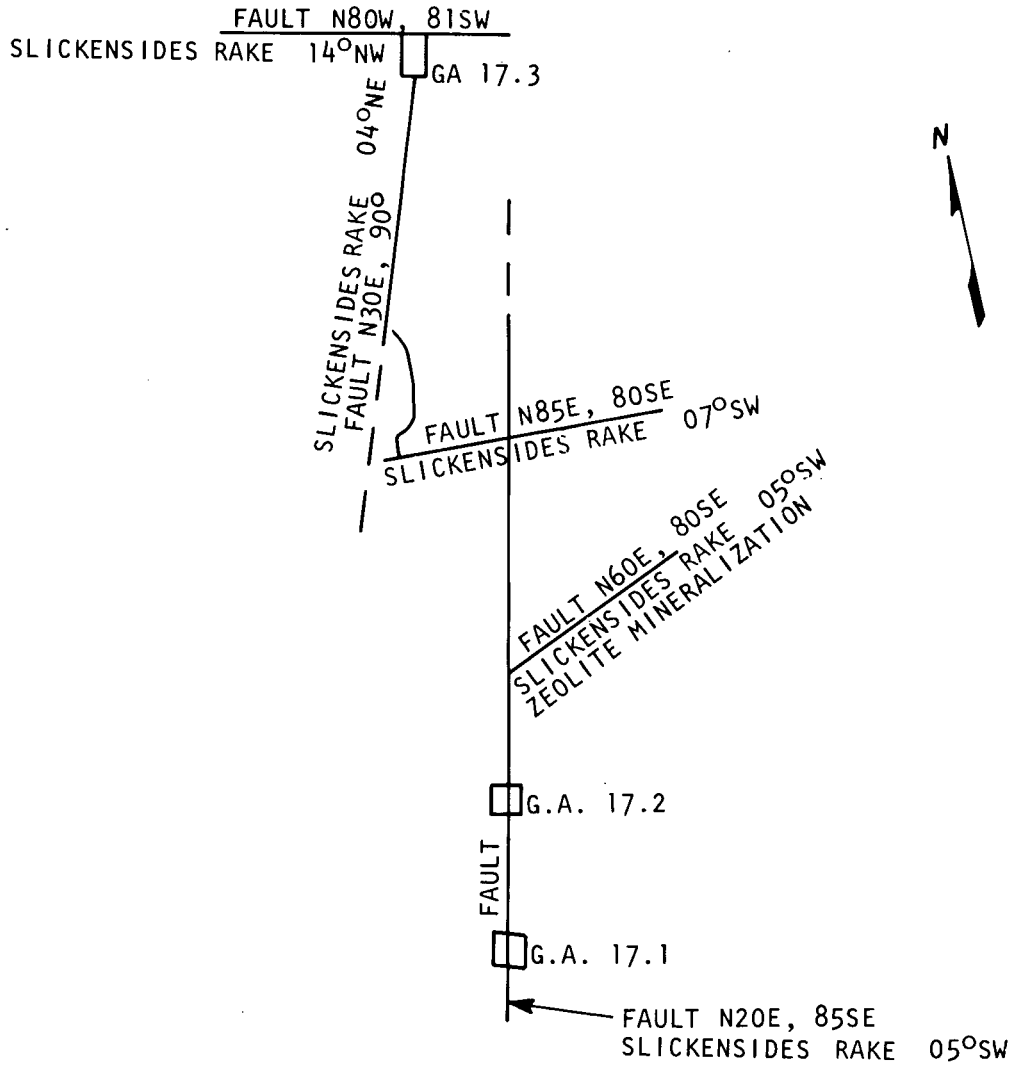
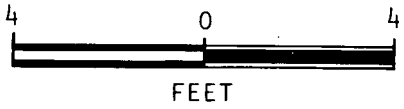



PHOTO B: CLOSEUP OF SAMPLE G.A.-17.3




PLAN VIEW




# STATION G.A.-17
# MINERALIZATION SAMPLING

SOUTH END OF ROCKLAND LAKE - SOUTHEAST CORNER OF SOCCER FIELD

NOTE : SAMPLES APPARENTLY UNDEFORMED CALCITE WITH ZEOLITES IN SAMPLES G.A. 17.2 AND G.A. 17.3

DAMES & MOORE

PLATE E-15B

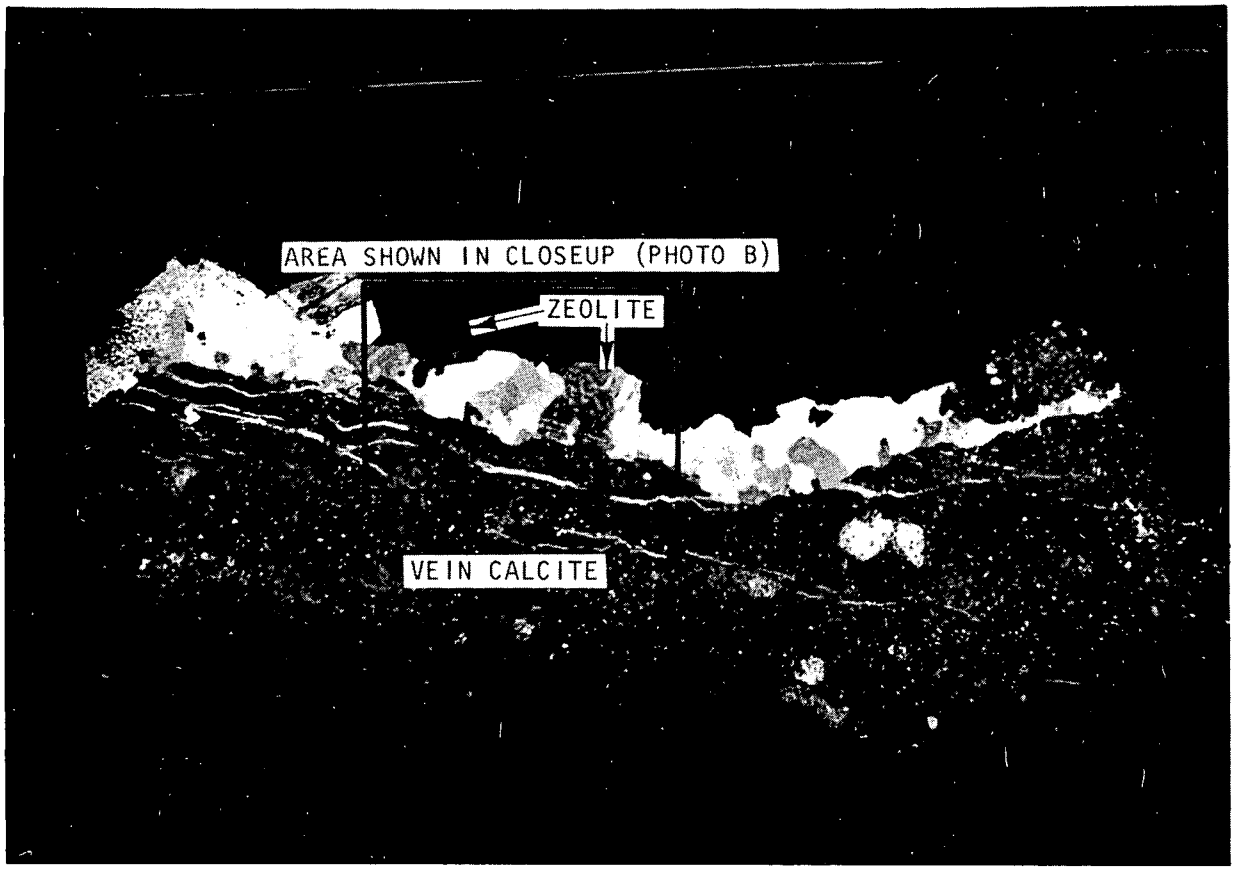



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-17.3
MAGNIFICATION: 4X
X - NICOLS

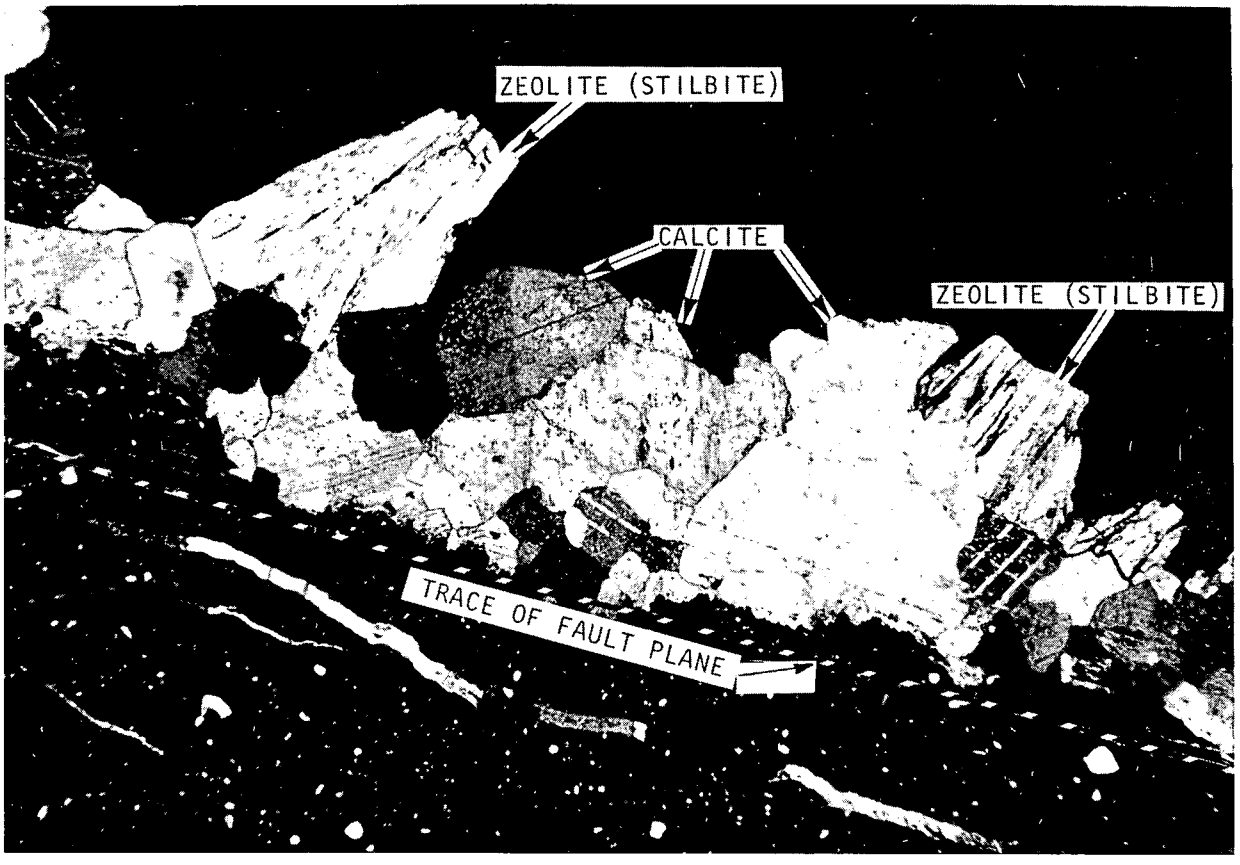



PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-17.3 SHOWING COEXISTING ZEOLITE AND EUHEDRAL, UNDEFORMED CALCITE.
MAGNIFICATION: 17X
X - NICOLS

DAMES & MOORE

PHOTO A: OUTCROP VIEW OF SAMPLING STATION M.W.-106
LOCATION: TROUGH HOLLOW AT VERDRIETEGE HOOK

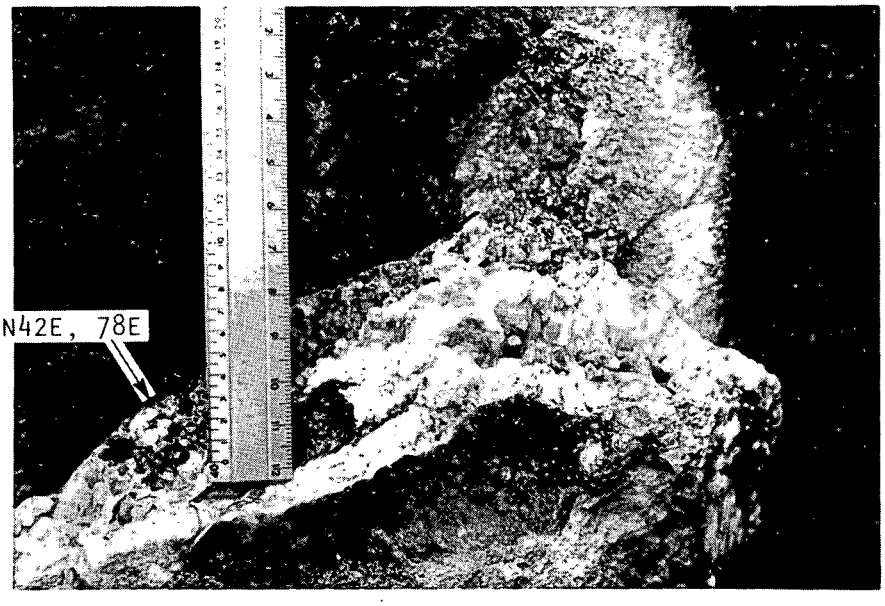
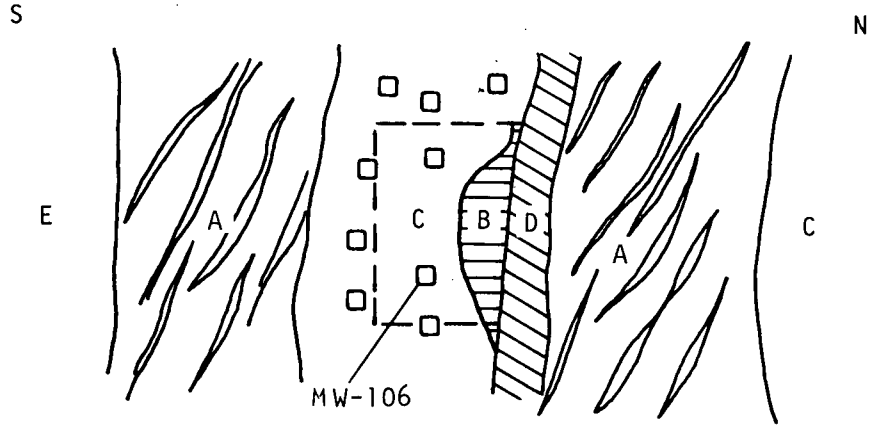



PHOTO B: CLOSEUP OF SAMPLING STATIONS M.W.-106-2



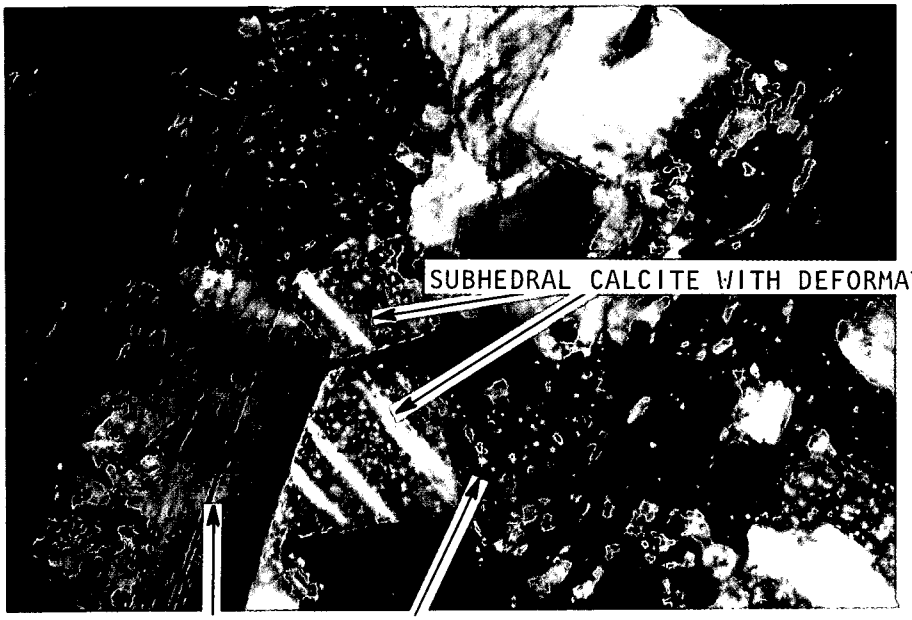

A = SHEARED DIABASE WITH STRINGERS OF CALCITE, HEALED
B = LARGE SPARRY CALCITE RILLS
C = HEALED BRECCIA COMPOSED OF FRAGMENTS OF "B"
D = WEATHERED EQUIVALENT OF "A"
E = SOLID DIABASE

# STATION M.W.-106
# MINERALIZATION SAMPLING

## LOCATION: TROUGH HOLLOW AT VERDRIETEGE HOOK

DAMES & MOORE

PLATE E-16B




PHOTOMICROGRAPH OF SAMPLE M.W.-106-2

MAGNIFICATION: 40 X

SHEAR N47E, 87SE

PHOTO A: OUTCROP VIEW OF SAMPLING STAION M.W.-115
LOCATION: TURTLE HILL, RAMAPO RESERVATION

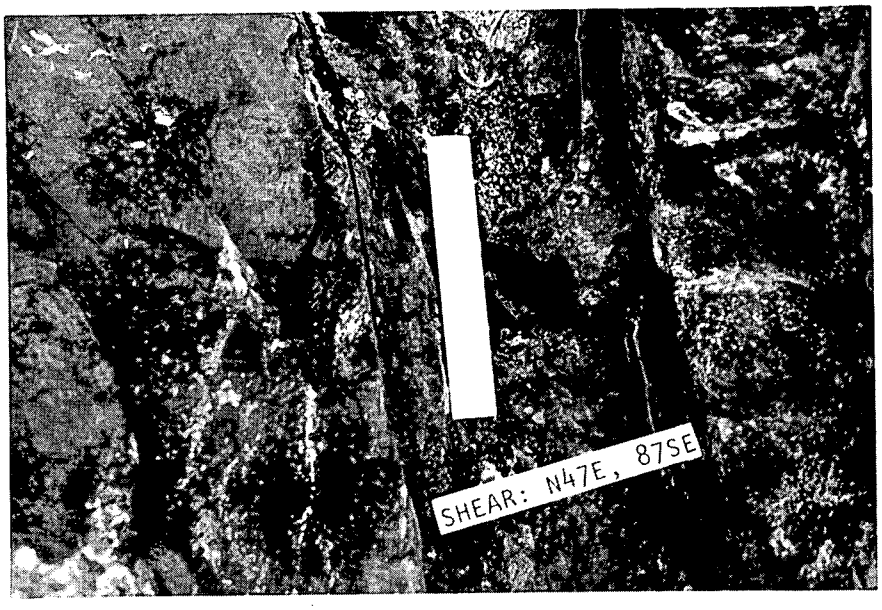



PHOTO B: CLOSEUP OF SAMPLING STATION M.W.-115-1

VEIN QUARTZ

PHOTOMICROGRAPH OF SAMPLE M.W.-115-1

MAGNIFICATION: 40 X

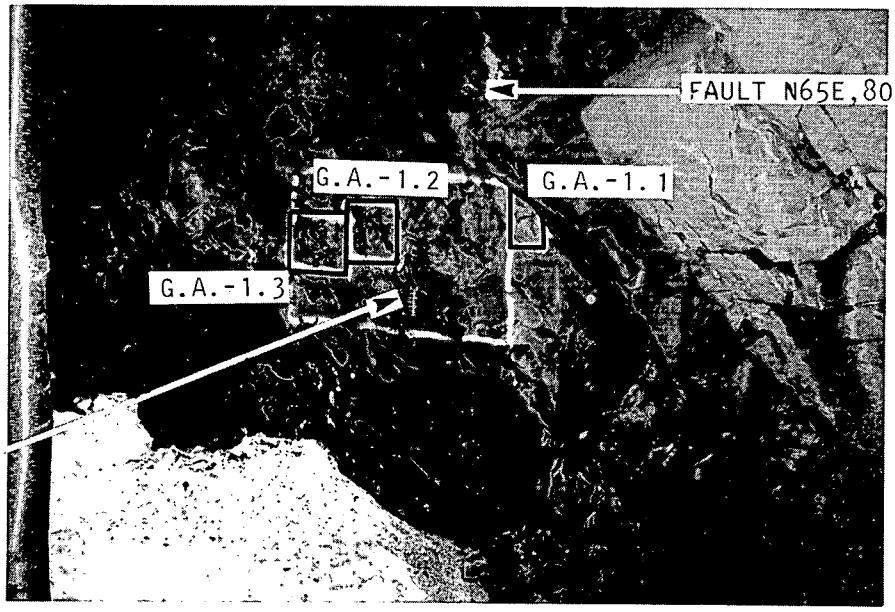



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-1
LOCATION - SOUTH WALL OF QUARRY AT MT. IVY, N.Y.

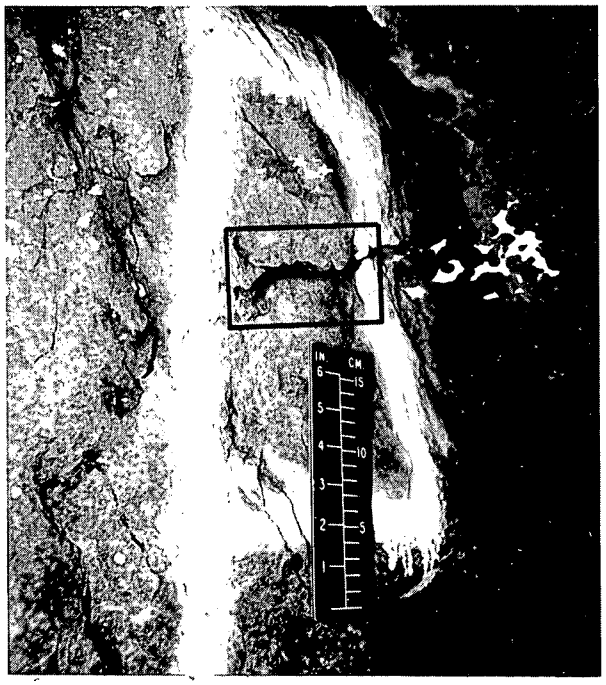
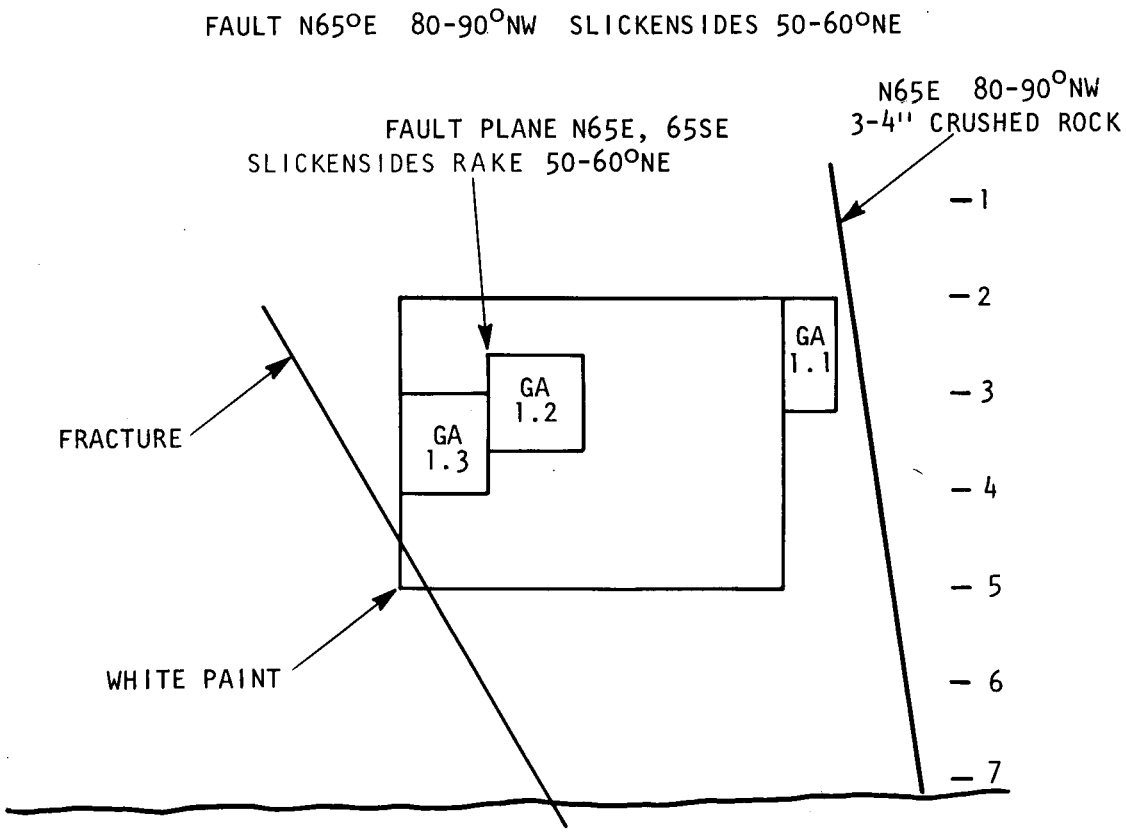
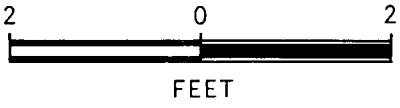



PHOTO B: CLOSEUP OF SAMPLE LOCATION G.A.-1.1




DRAWING VIEW: S45W




# STATION G.A.-1
# MINERALIZATION SAMPLING

## LOCATION: MT. IVY DIABASE QUARRY

NOTE 1: SAMPLE GA-1.1, SAMPLE GA-1.2, SAMPLE GA-1.3 — ALL APPEAR TO BE UNDEFORMED CALCITE OR QUARTZ

NOTE 2: PLANE OF SAMPLING ACTUALLY BEHIND (TO LEFT) OF FAULT PROJECTION: MINERALS OF GA-1.2 GROWN BETWEEN PROJECTED SLICKENSIDED PLANES

DAMES & MOORE

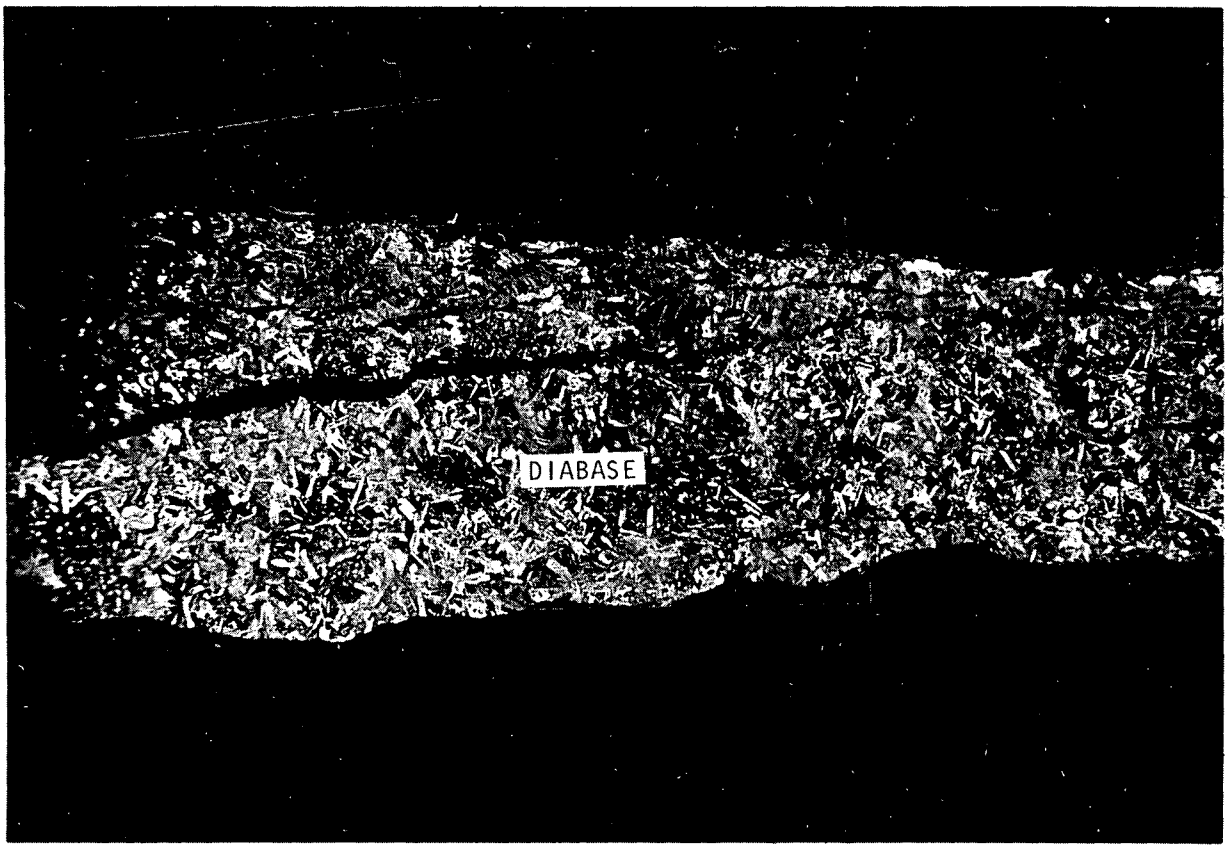



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-1.1
MAGNIFICATION: 4X
X - NICOLS

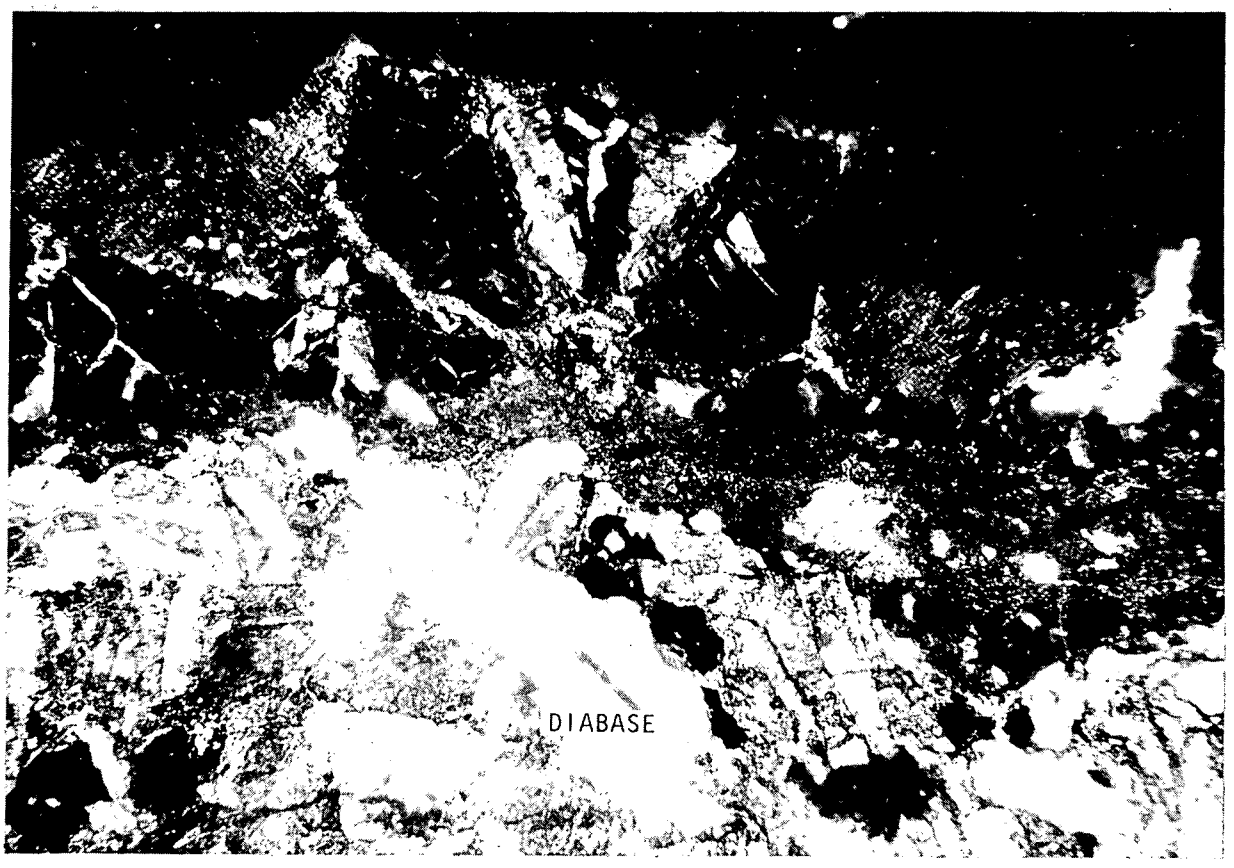



PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-1.1
MAGNIFICATION: 50X
X - NICOLS

DAMES & MOORE

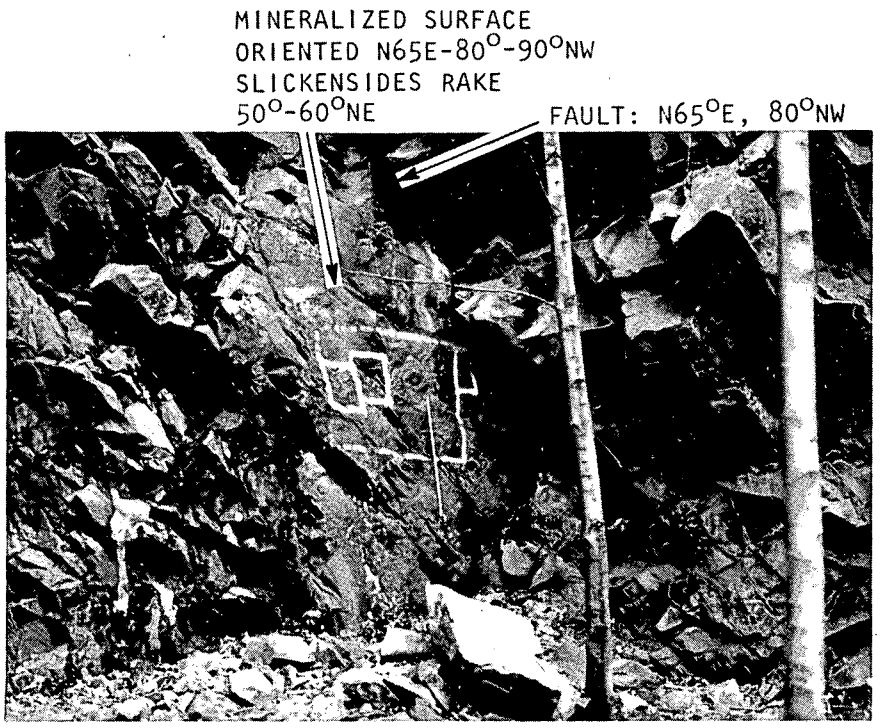
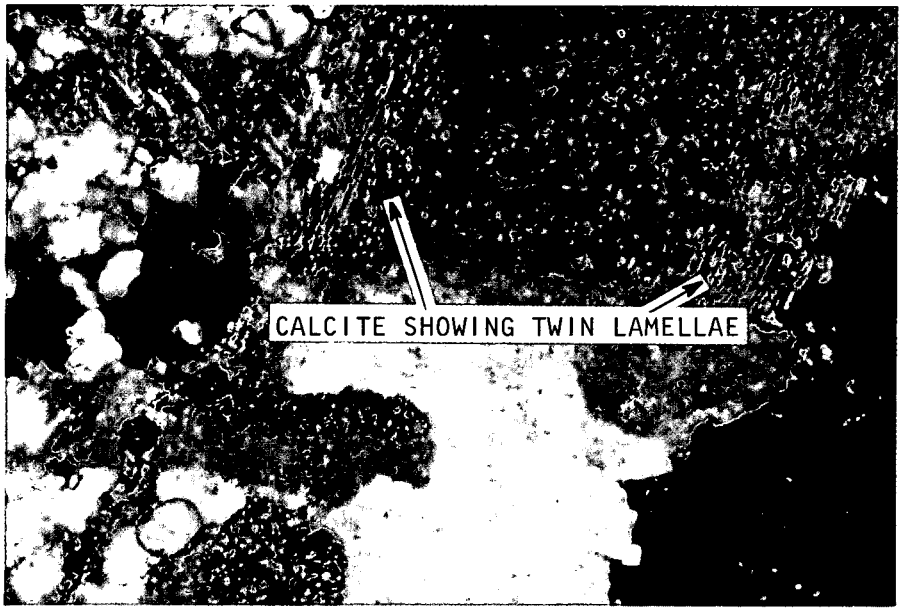



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-1
LOCATION: SOUTH WALL OF QUARRY, MT. IVY, N.Y.

PHOTO B: CLOSEUP OF SAMPLE LOCATION G.A.-1.3




PHOTOMICROGRAPH OF SAMPLE G.A.-1.3

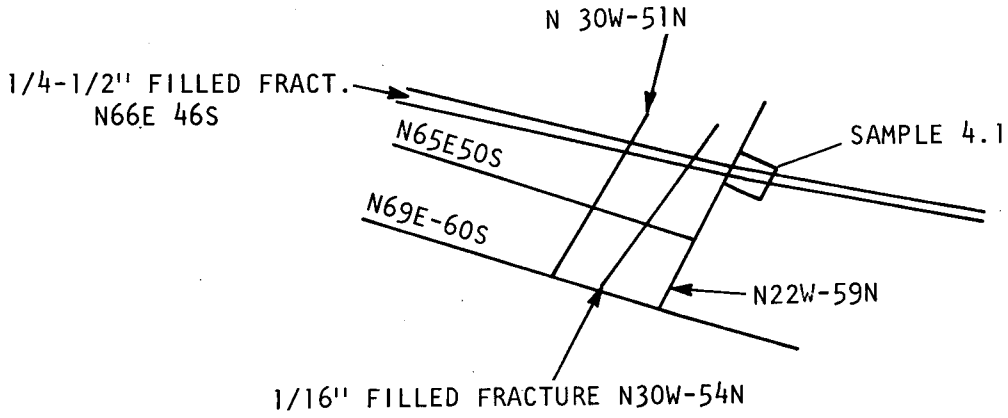
SAMPLE TAKEN FROM SLICKENSIDED SURFACE ORIENTED N65E,80NW

PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-4

LOCATION- EASTSIDE OF RT.# 202
200 FT. NORTH OF LIMEKILN RD.
WESLEY CHAPEL, N.Y.

CROSS SECTION VIEW (S55E)

SCALE 1" = 1'



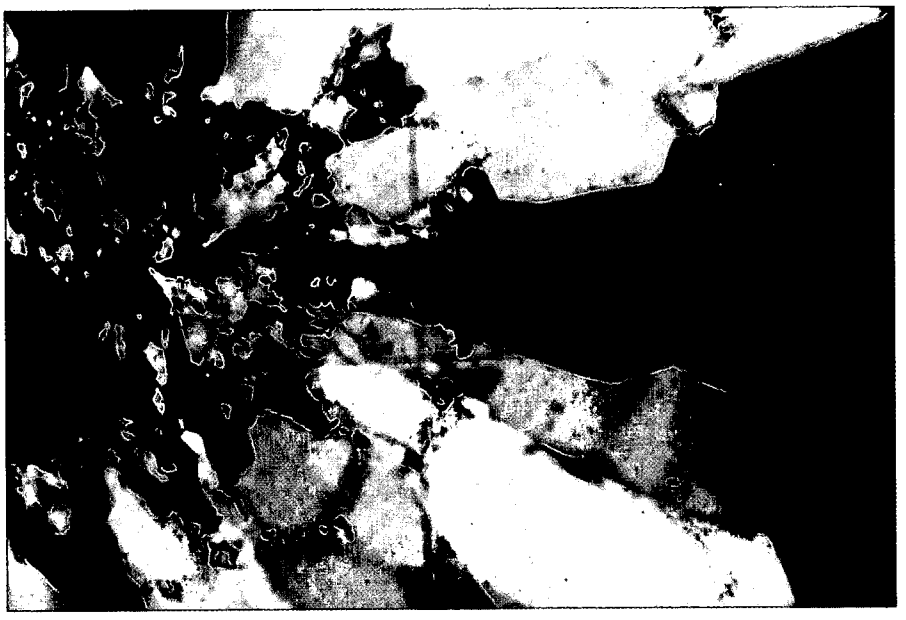

# STATION G.A.-4
# MINERALIZATION SAMPLING

## LOCATION: EAST SIDE OF RT.202

## 200 FEET NORTH OF LIMEKILN RD. INTERSECTION

DAMES & MOORE

PLATE E-20B



QUARTZ PHASES WITH OVERGROWTH
PHOTOMICROGRAPH OF SAMPLE G.A.-4.1
MAGNIFICATION: 40 X
SAMPLE TAKEN FROM FRACTURE TRENDING N66E,46S

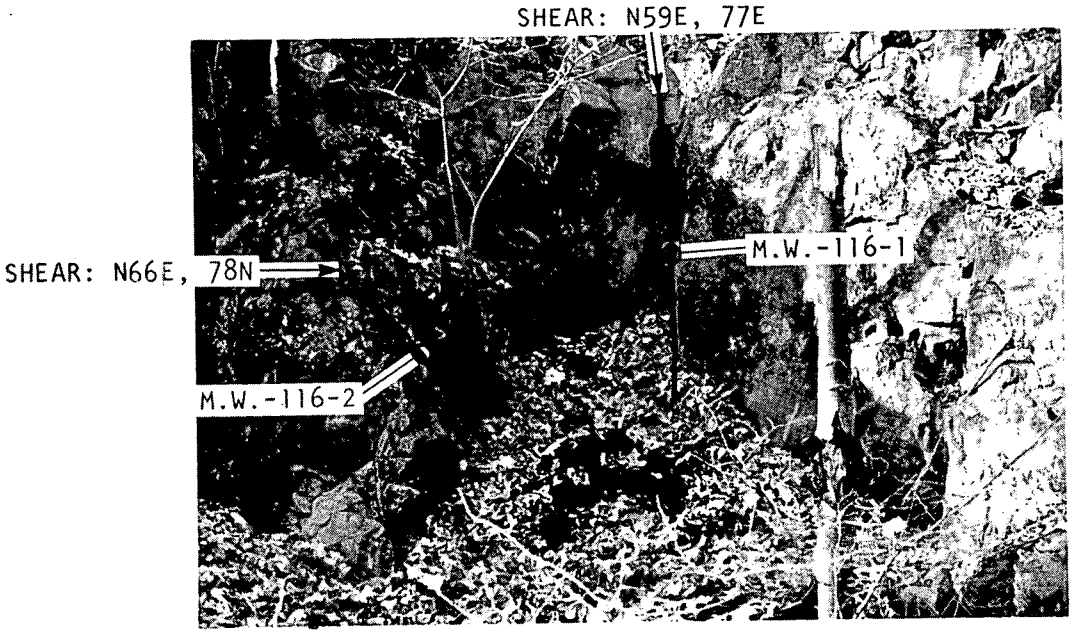



PHOTO A: OUTCROP VIEW OF SAMPLING STATION M.W.-116
LOCATION: ABANDONED QUARRY E. SIDE OF HILL TO W.S.W. OF THRUWAY EXIT 12

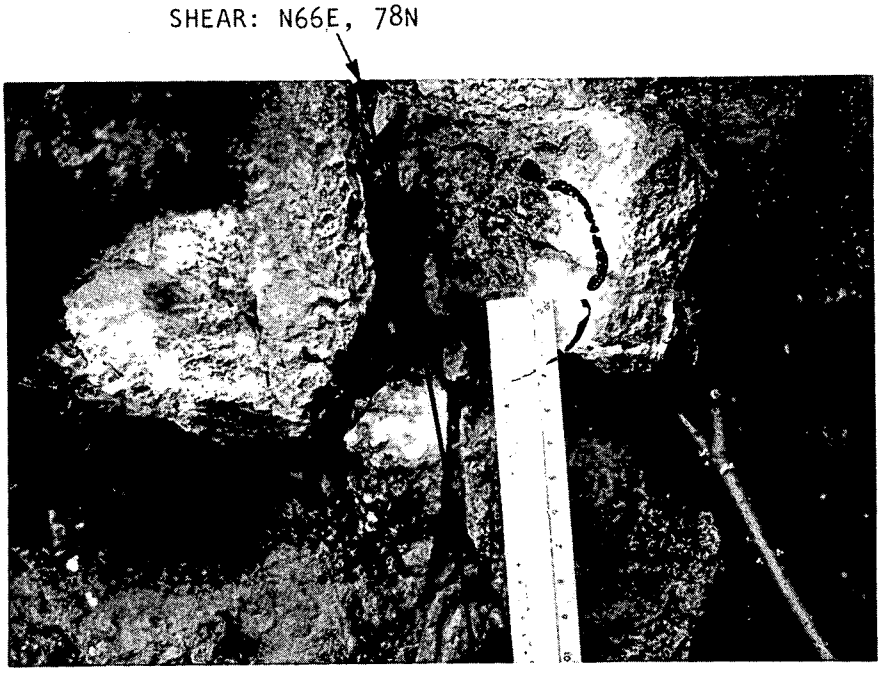
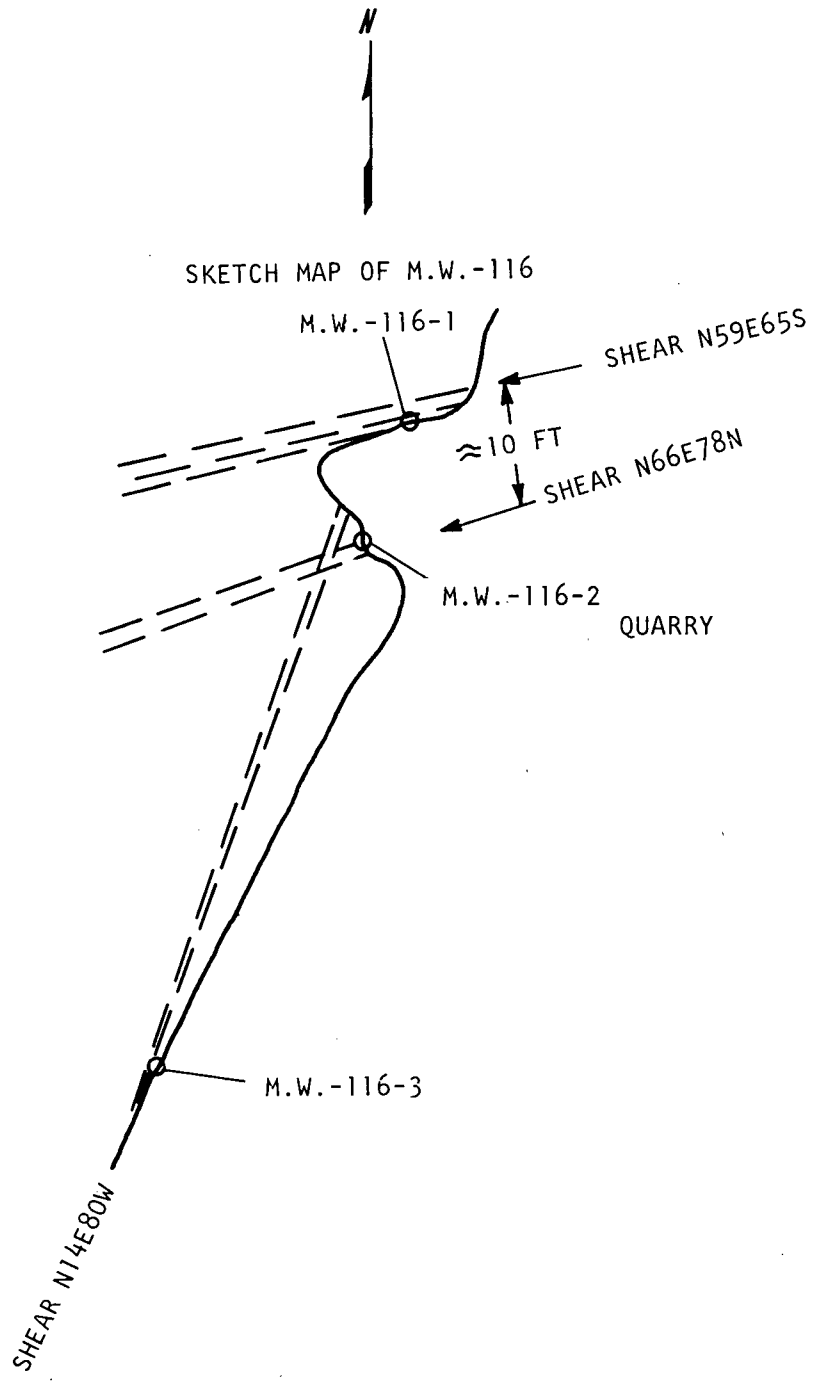



PHOTO B: CLOSEUP OF SAMPLING STATION M.W.-116-2

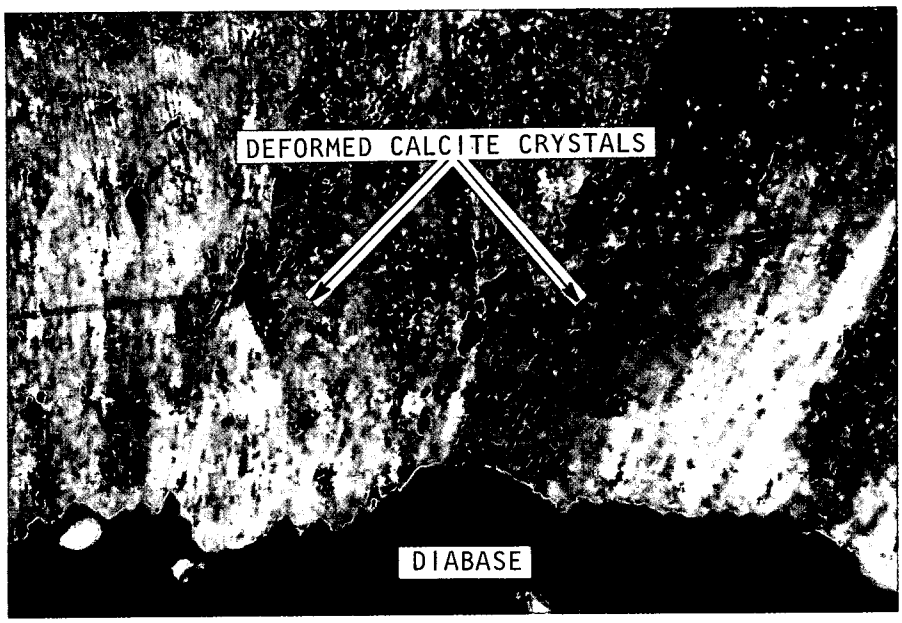



# STATION M.W.-116
# MINERALIZATION SAMPLING

LOCATION: ABANDONED QUARRY TO W.S.W. OF THRUWAY EXIT # 12

DAMES & MOORE

PLATE E-21B




PHOTOMICROGRAPH OF SAMPLE M.W.-116-2

MAGNIFICATION: 40 X

SAMPLE TAKEN FROM ALONG BORDER OF SHEAR ZONE TRENDING N66E,78N

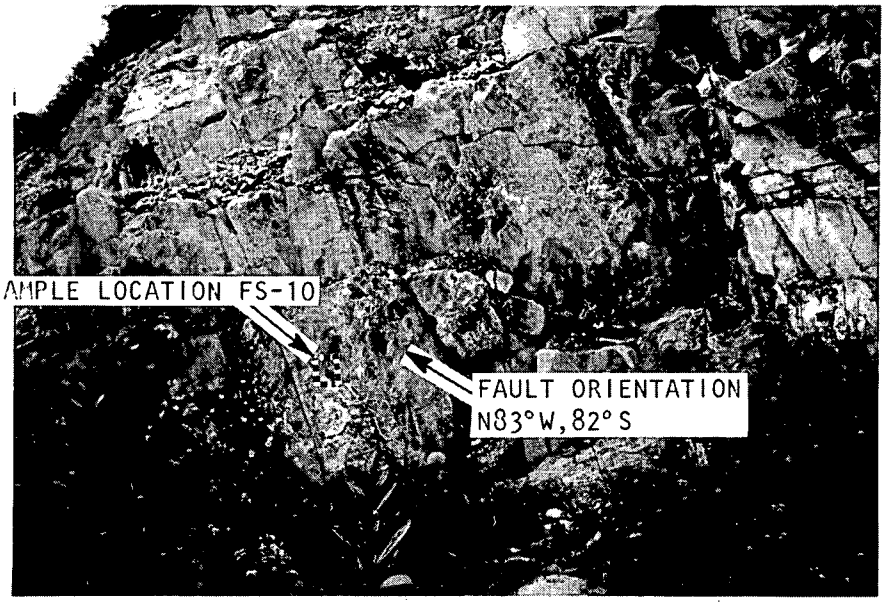



PHOTO A: OUTCROP NORTH OF REACTOR NO. 2
SAMPLE LOCATION FS-10

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

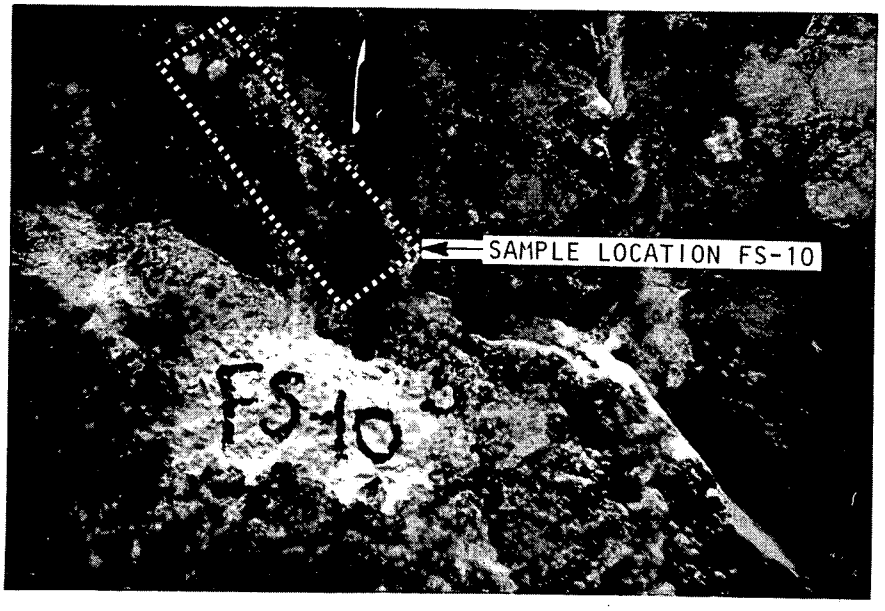
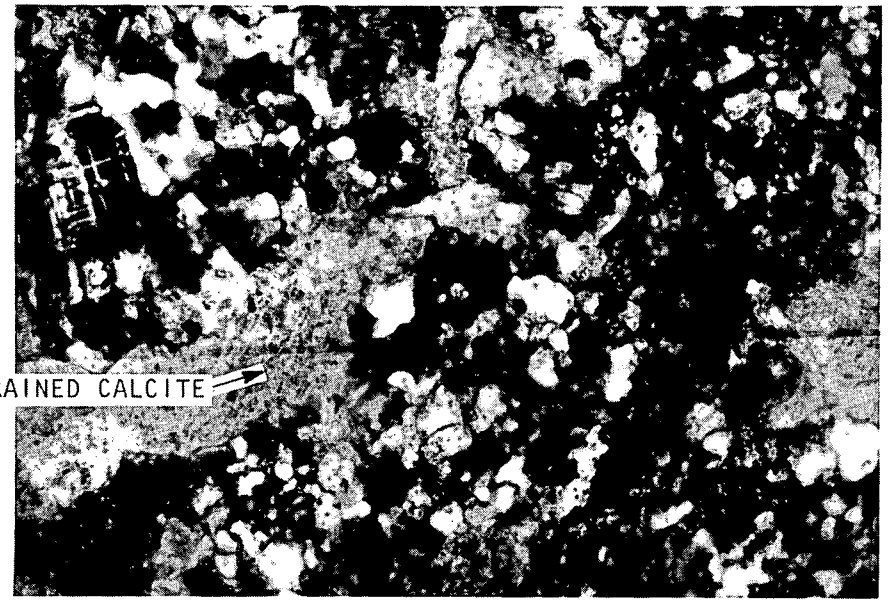
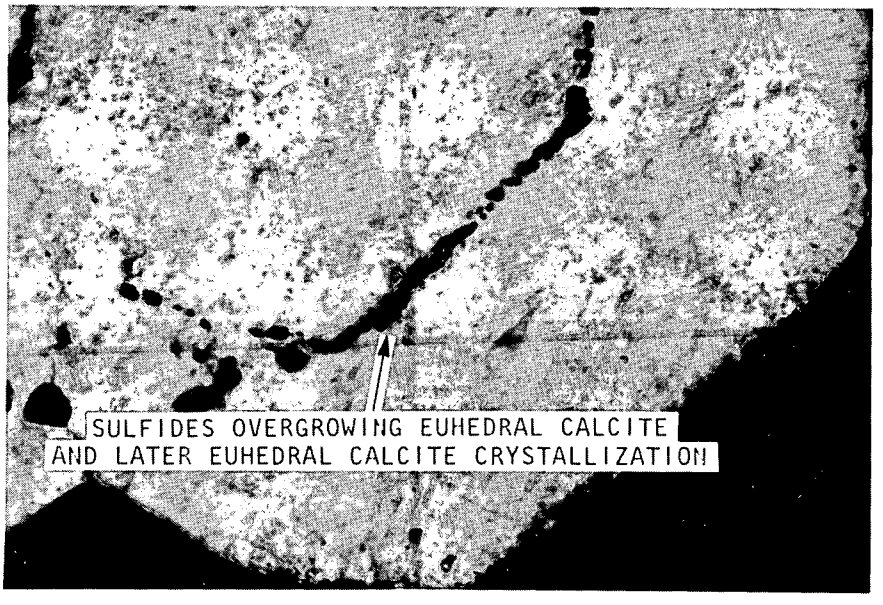



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-10

DAMES & MOORE




A




B

## PHOTOMICROGRAPHS OF SAMPLE FS-10

MAGNIFICATION: 40X

SAMPLE TAKEN FROM FAULT ORIENTED N83W, 82S

DAMES & MOORE

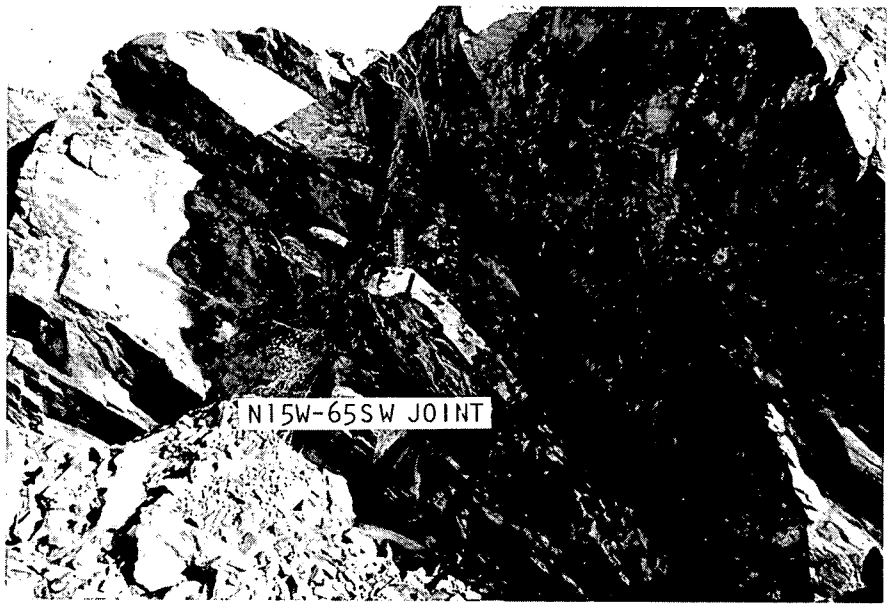



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-9

LOCATION - EAST WALL OF VERPLANCK QUARRY
APPROXIMATELY 200 FEET SOUTH
OF NORTHEAST CORNER

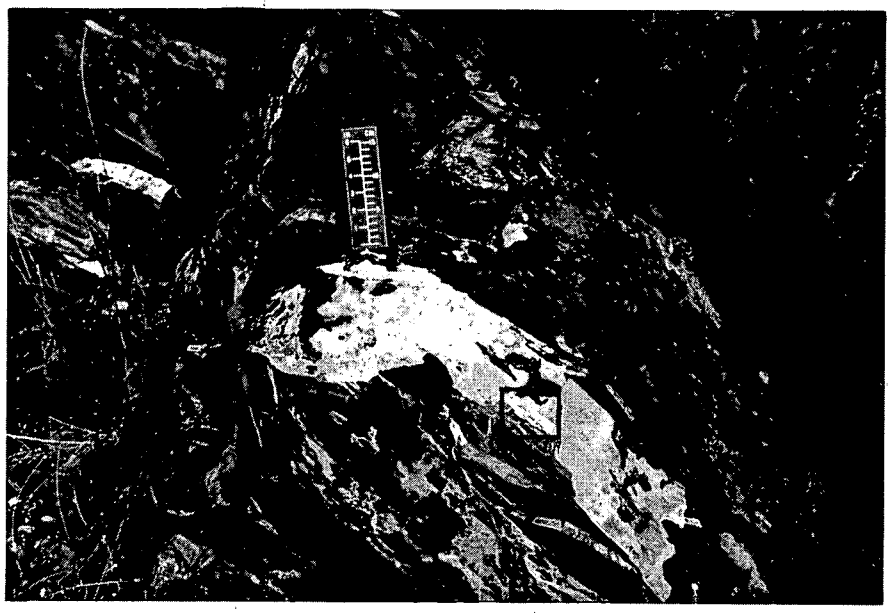
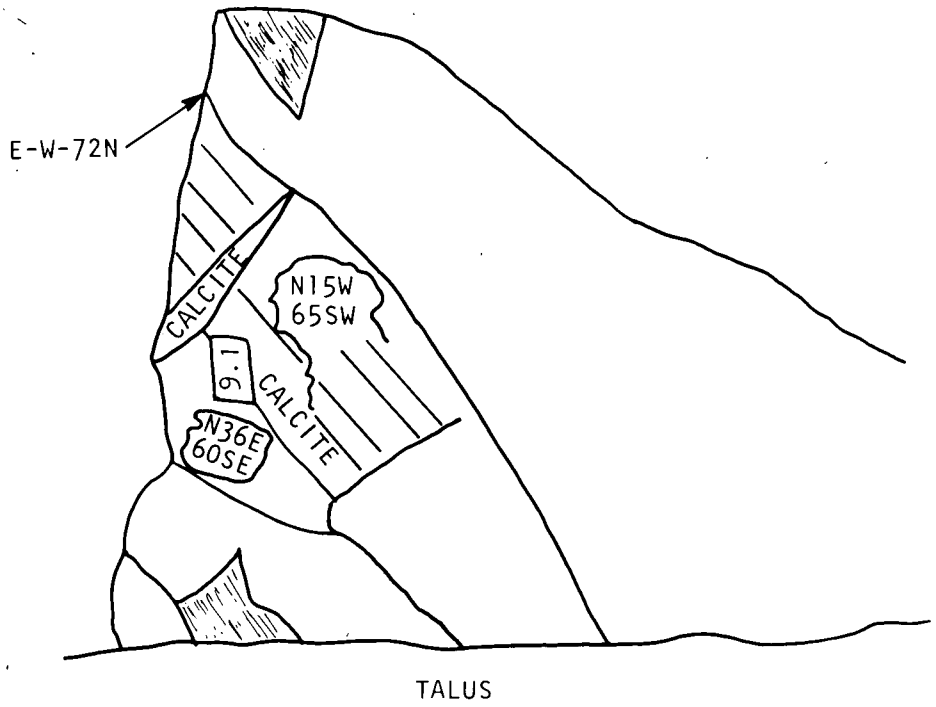
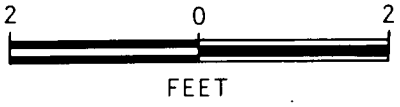


PHOTO B: CLOSEUP OF SAMPLE G.A.-9.1

DAMES & MOORE




CROSS SECTION (DUE EAST)




# STATION G.A.-9
# MINERALIZATION SAMPLING

LOCATION: EAST WALL OF VERPLANCK QUARRY ABOUT 200'
FROM NORTHEAST CORNER (MANHATTAN SCHIST)

NOTE: SAMPLE 9.1 (CALCITE, DEFORMED?)

DAMES & MOORE

PLATE E-23B

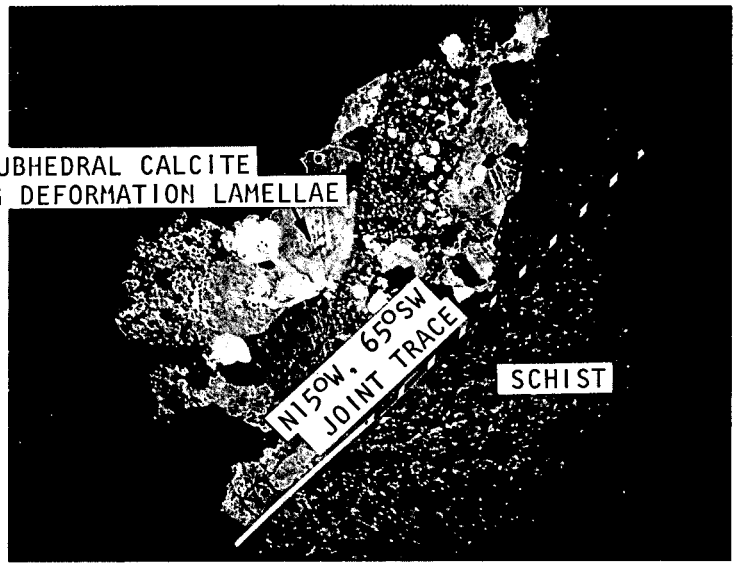



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-9.1

MAGNIFICATION 8X

X - NICOLS

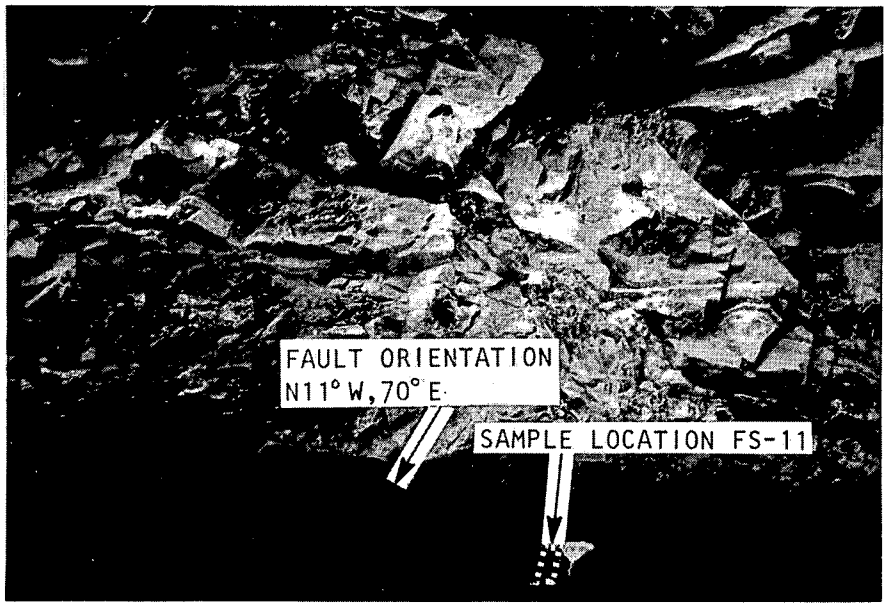



PHOTO A: OUTCROP NORTH OF REACTOR NO. 3
SAMPLE LOCATION FS-11

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

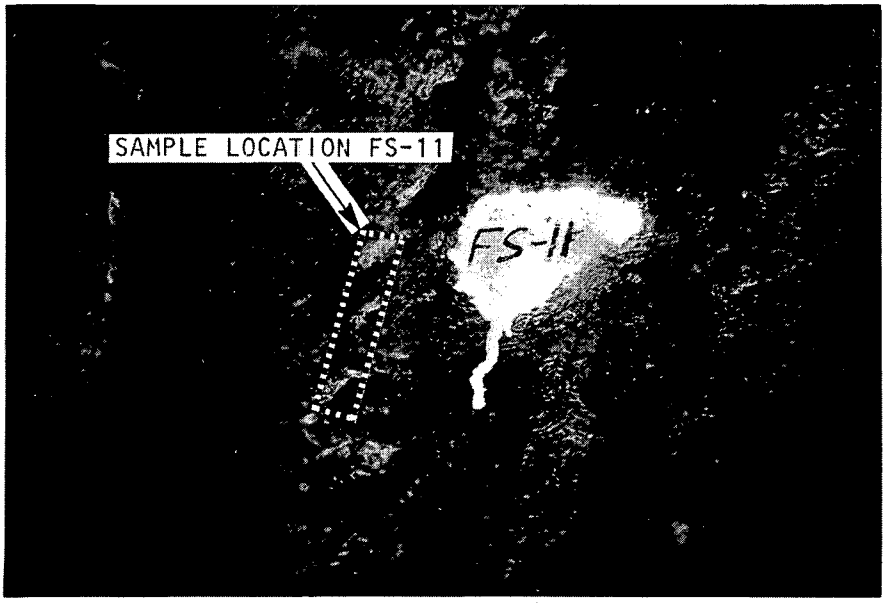
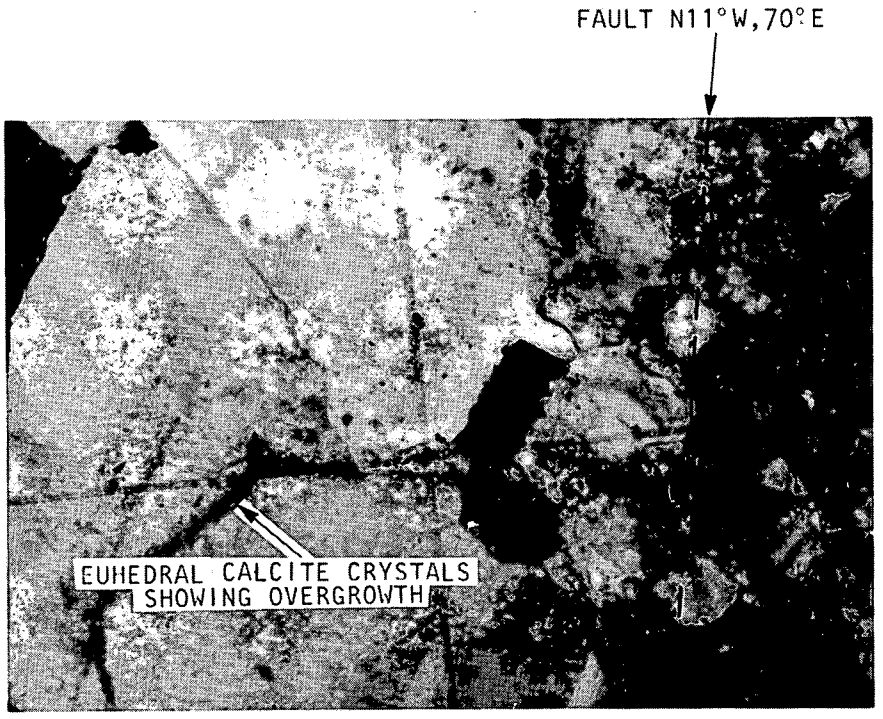



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-11




PHOTOMICROGRAPH OF SAMPLE FS-11

MAGNIFICATION:40X

DAMES & MOORE

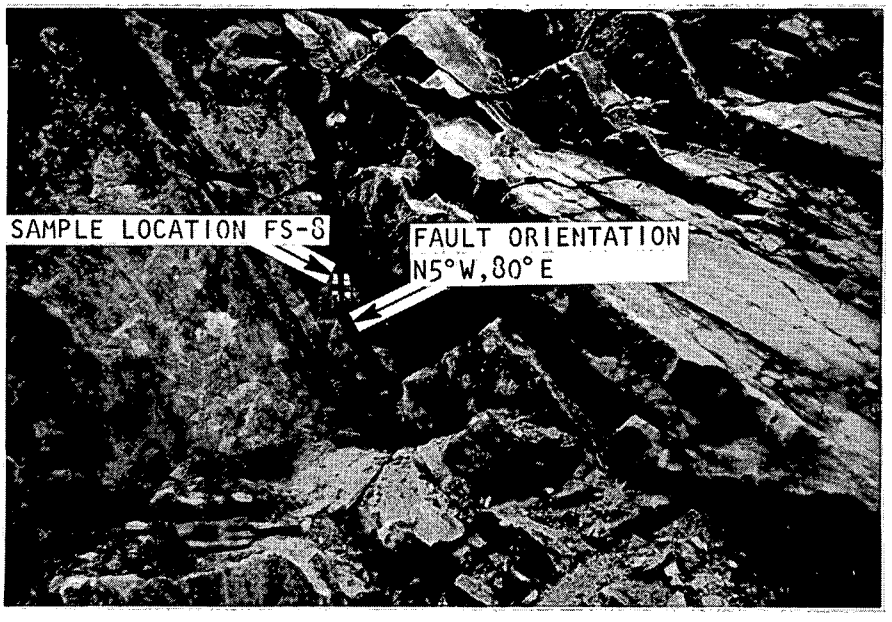



PHOTO A: OUTCROP NORTH OF REACTOR NO.2
SAMPLE LOCATION FS-8

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

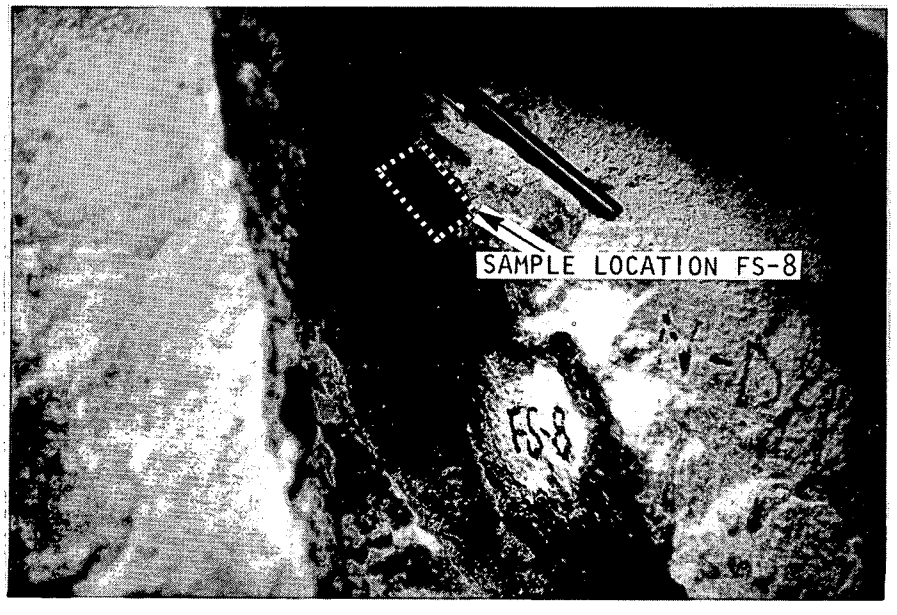



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-8

PHOTOMICROGRAPH OF SAMPLE FS-8

MAGNIFICATION:40X

DAMES & MOORE

PLATE E-25B

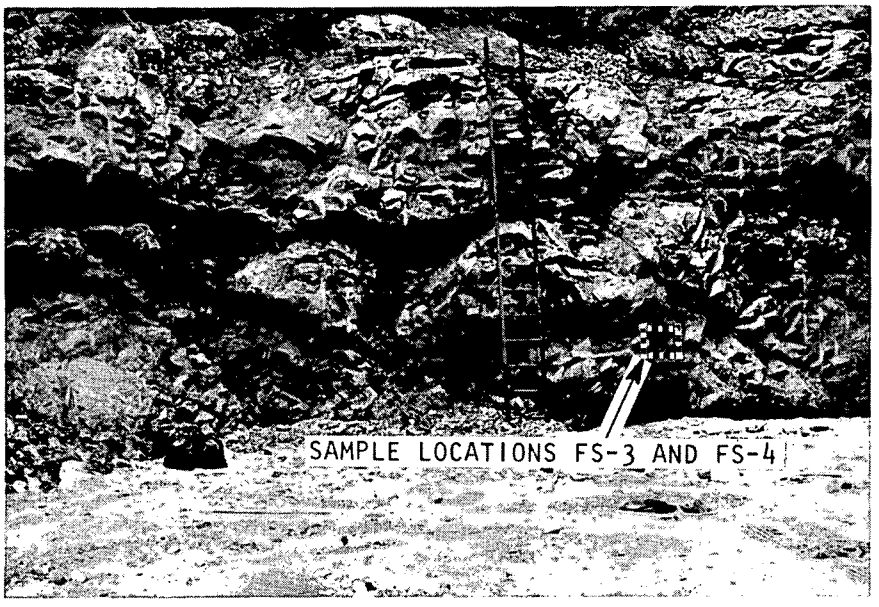



PHOTO A: OUTCROP NORTH OF REACTOR NO. 3
SAMPLE LOCATION FS-3 AND FS-4

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

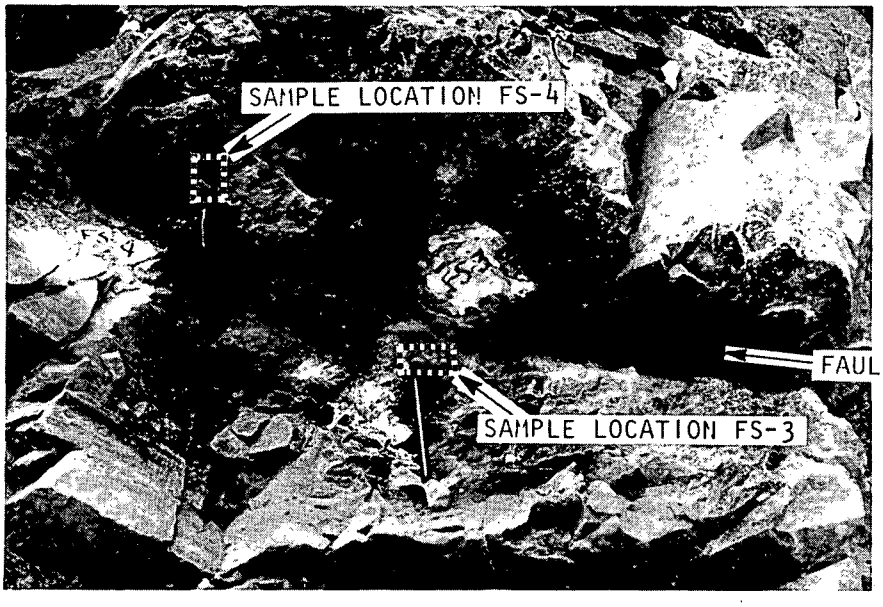



PHOTO B: SAMPLE LOCATION FS- 3 AND FS-4

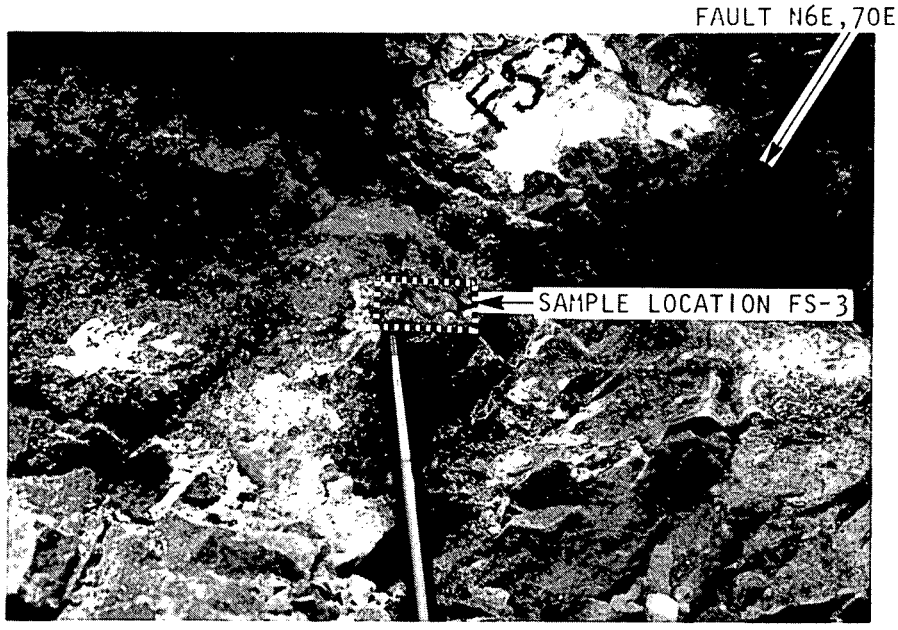



PHOTO A: CLOSE-UP OF SAMPLE LOCATION FS-3

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

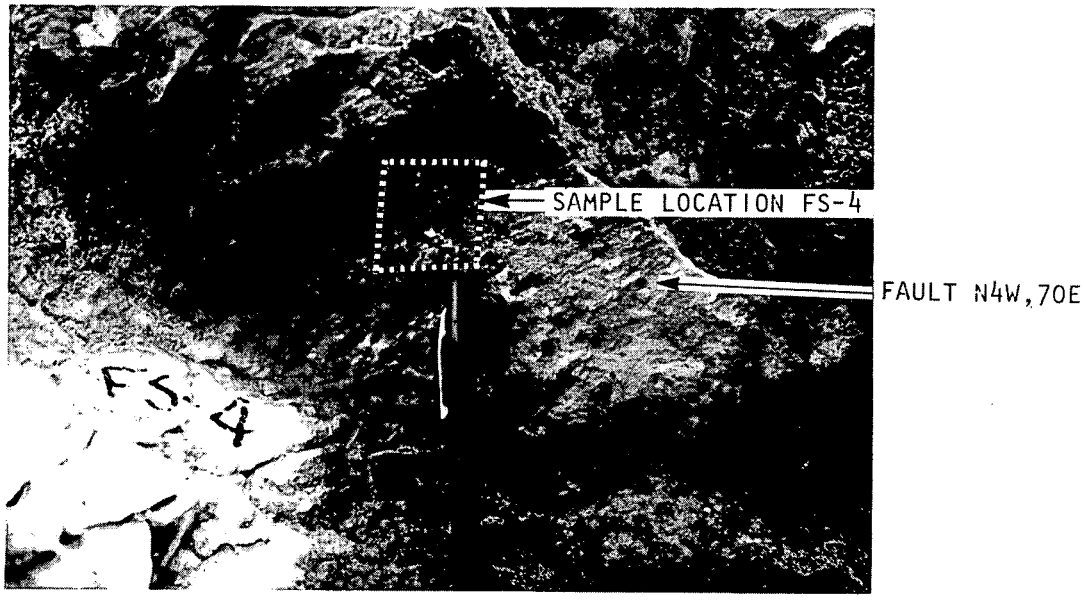
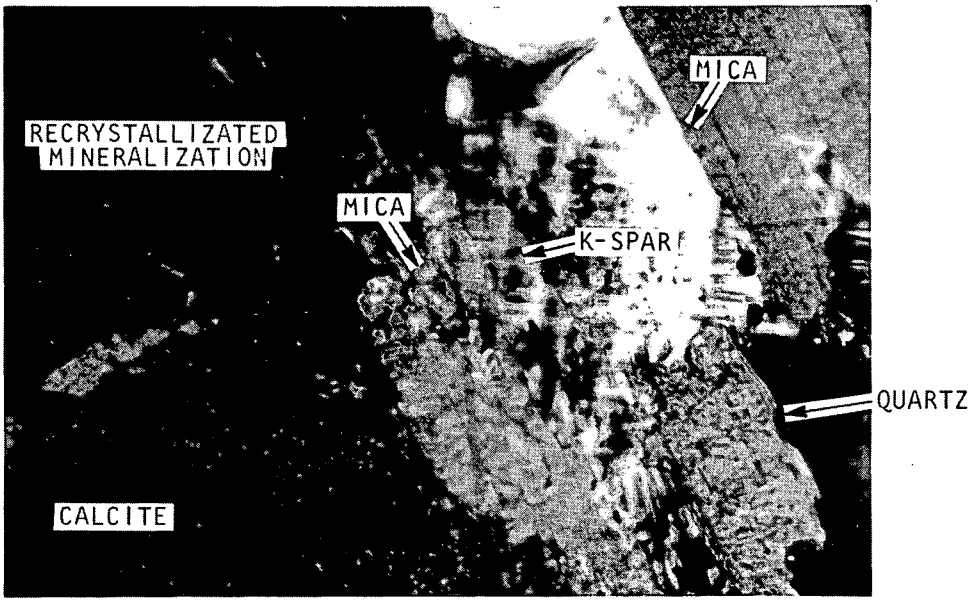



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-4

DAMES & MOORE

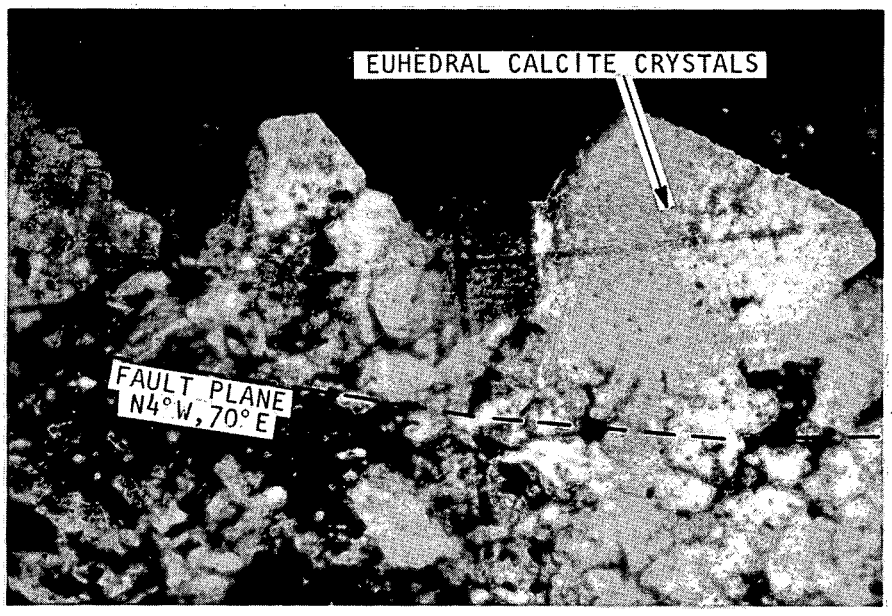



## PHOTOMICROGRAPH OF SAMPLE FS-3

MAGNIFICATION:40X

SAMPLE TAKEN FROM VUG
APPROXIMATELY 2 INCHES AWAY FROM FAULT TRENDING N6E,70E

DAMES & MOORE




**PHOTOMICROGRAPH OF SAMPLE FS-4**

MAGNIFICATION: 40 X

DAMES & MOORE

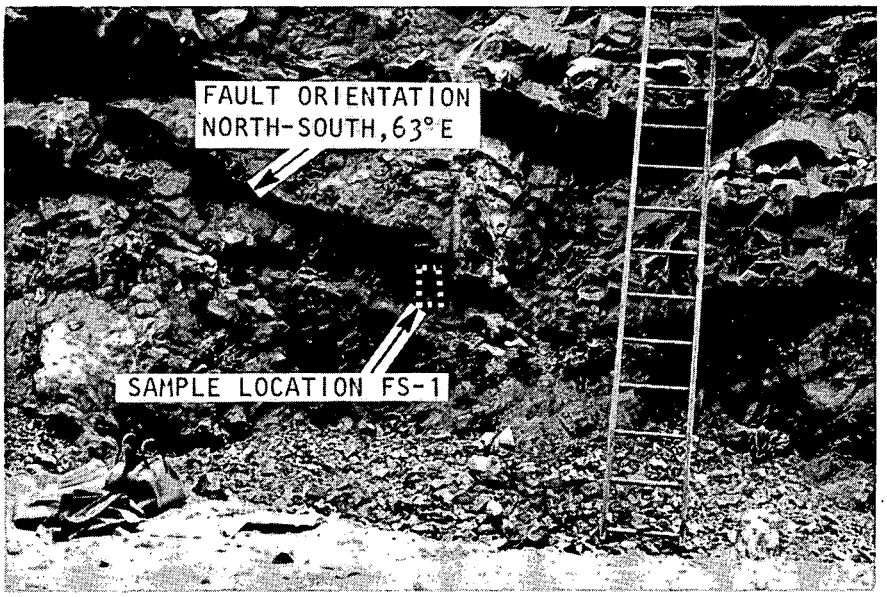



PHOTO A: OUTCROP NORTH OF REACTOR NO. 3
SAMPLE LOCATION FS-1

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

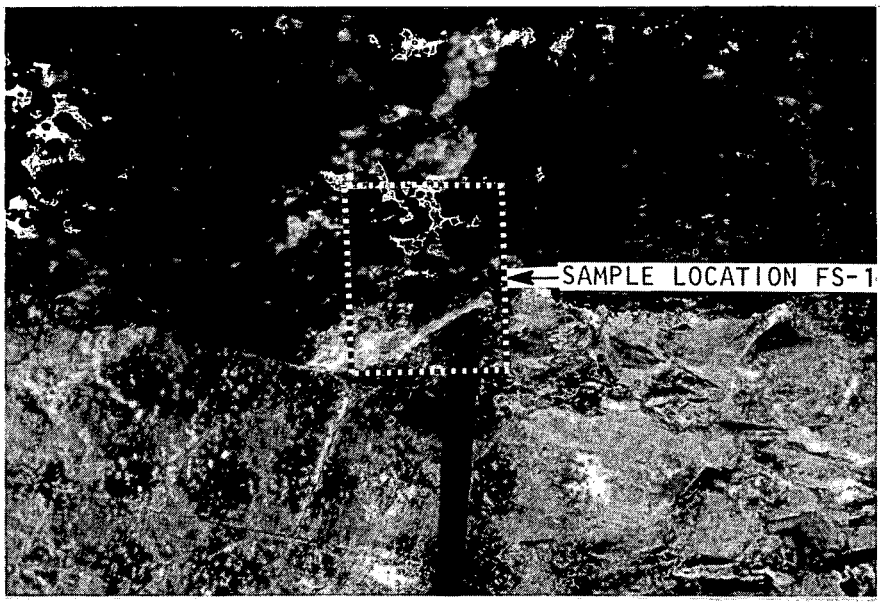
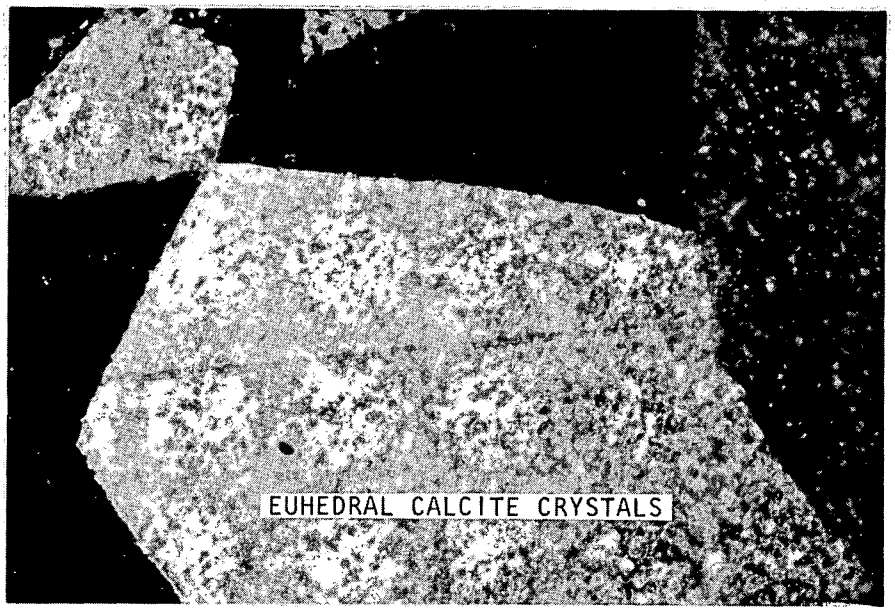



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-1




**PHOTOMICROGRAPH OF SAMPLE FS-1**

MAGNIFICATION:40X

SAMPLE TAKEN FROM FAULT PLANE TRENDING N-S,63E

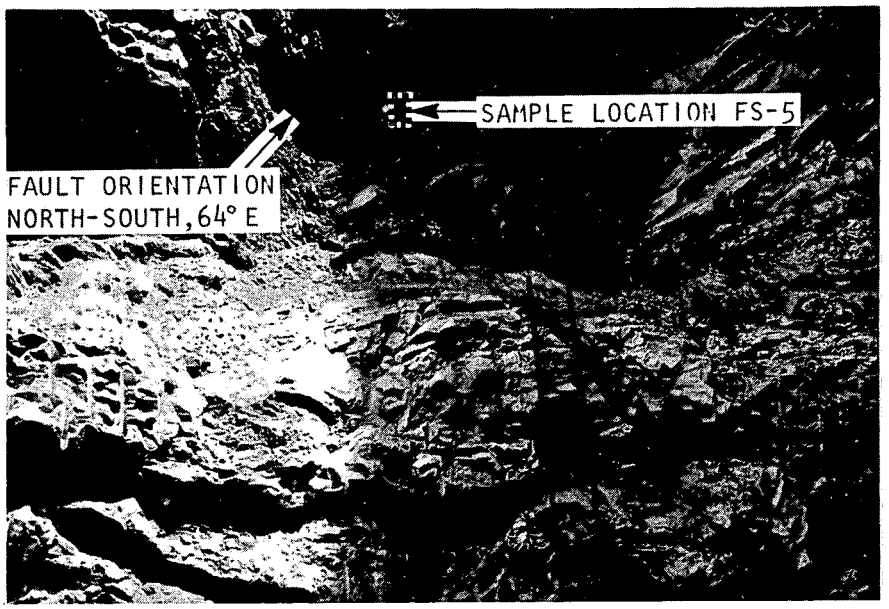



PHOTO A: OUTCROP NORTH OF REACTOR NO. 3
SAMPLE LOCATION FS-5

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

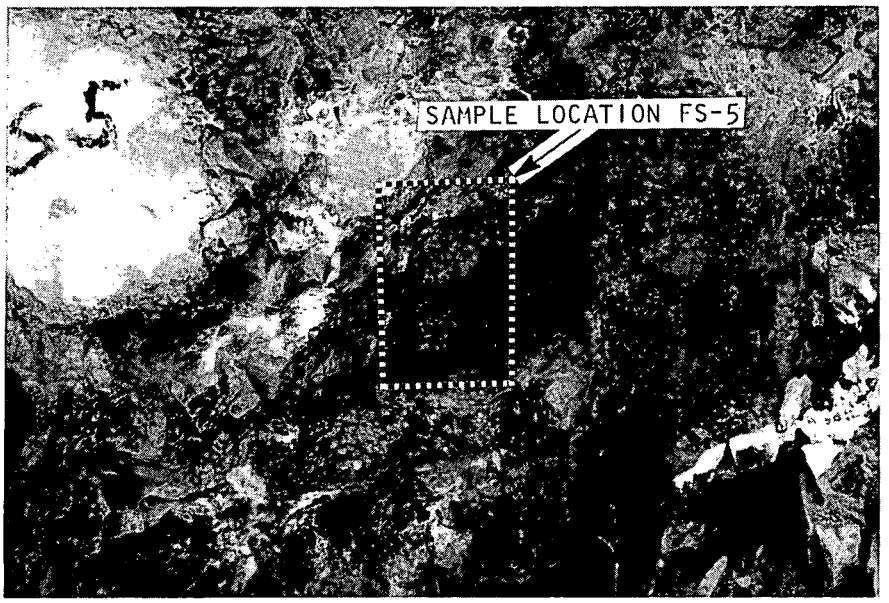
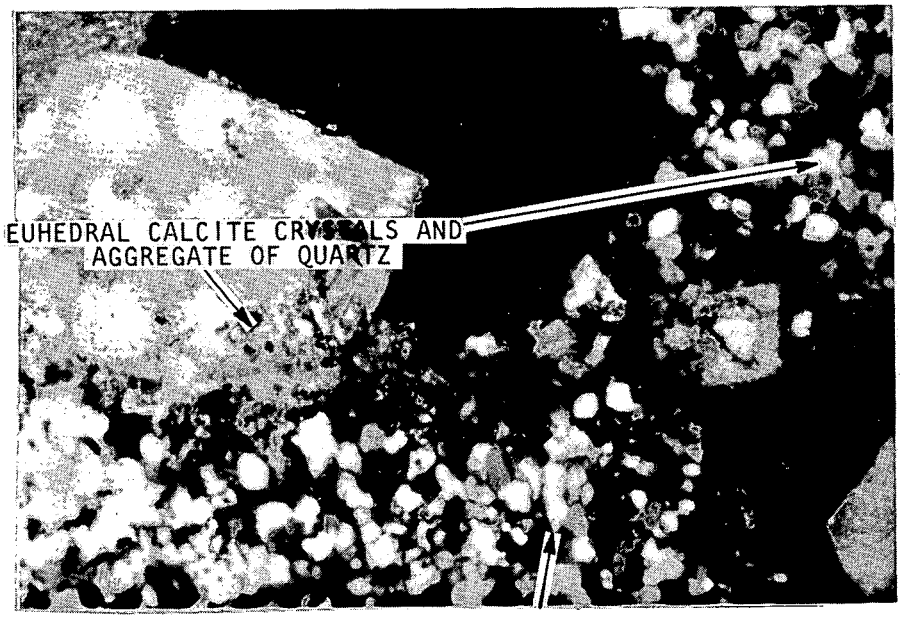



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-5




EUHEDRAL CALCITE CRYSTALS AND AGGREGATE OF QUARTZ

## PHOTOMICROGRAPH OF SAMPLE FS-5

MAGNIFICATION:40 X

SAMPLE TAKEN FROM VUG NEARBY FAULT ORIENTED N-S,64E

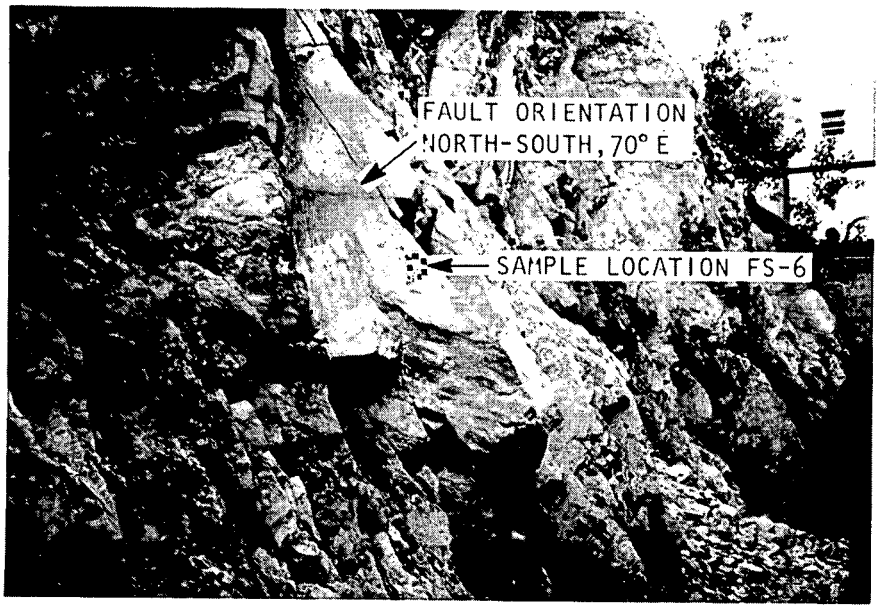



PHOTO A: OUTCROP ADJACENT TO TURBOGENERATOR BUILDING NO. 1 SAMPLE LOCATION FS-6

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

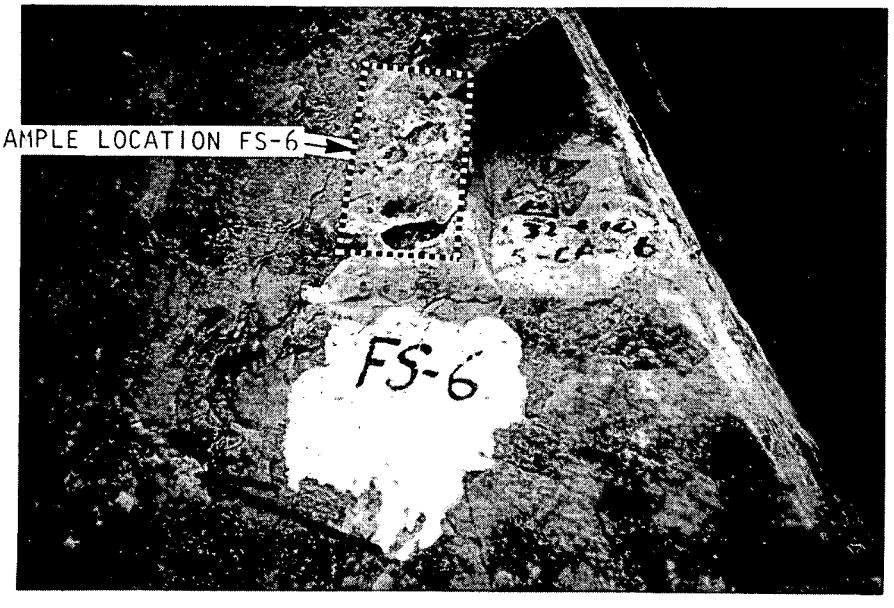
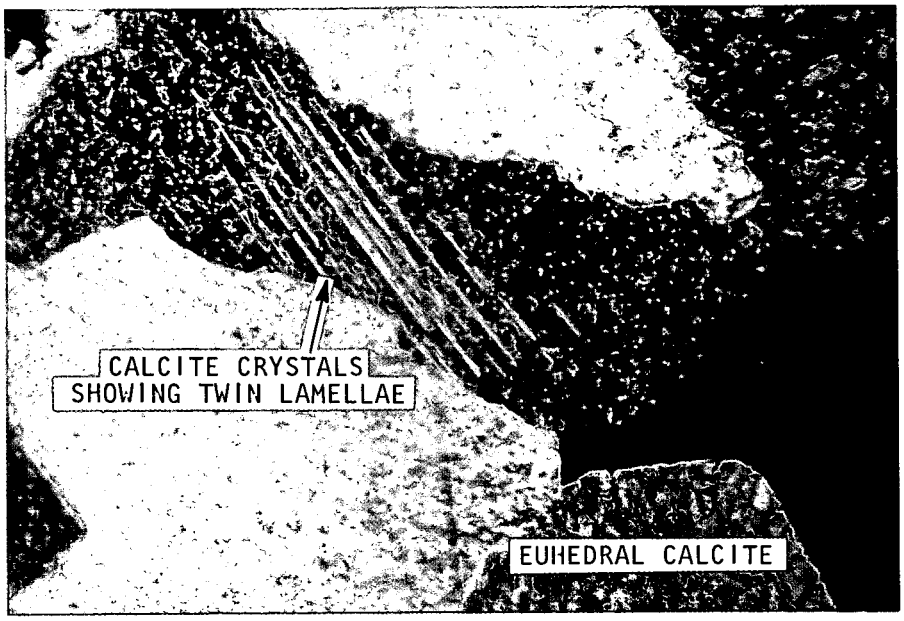



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-6

DAMES & MOORE




## PHOTOMICROGRAPH OF SAMPLE FS-6

MAGNIFICATION:40X

SAMPLE TAKEN FROM VUG ON FAULT PLANE ORIENTED N-S,70E

DAMES & MOORE

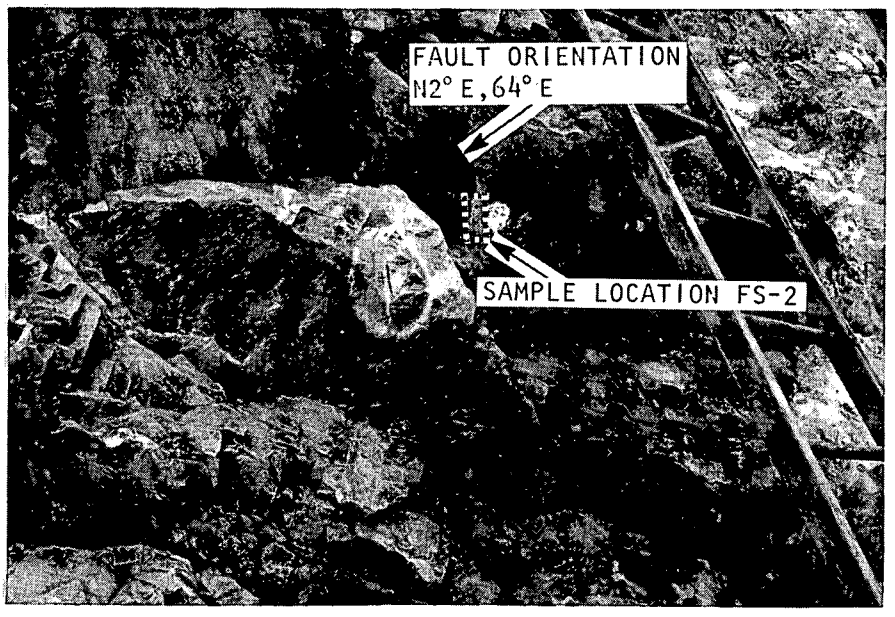



PHOTO A: OUTCROP NORTH OF REACTOR NO. 3
SAMPLE LOCATION FS-2

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

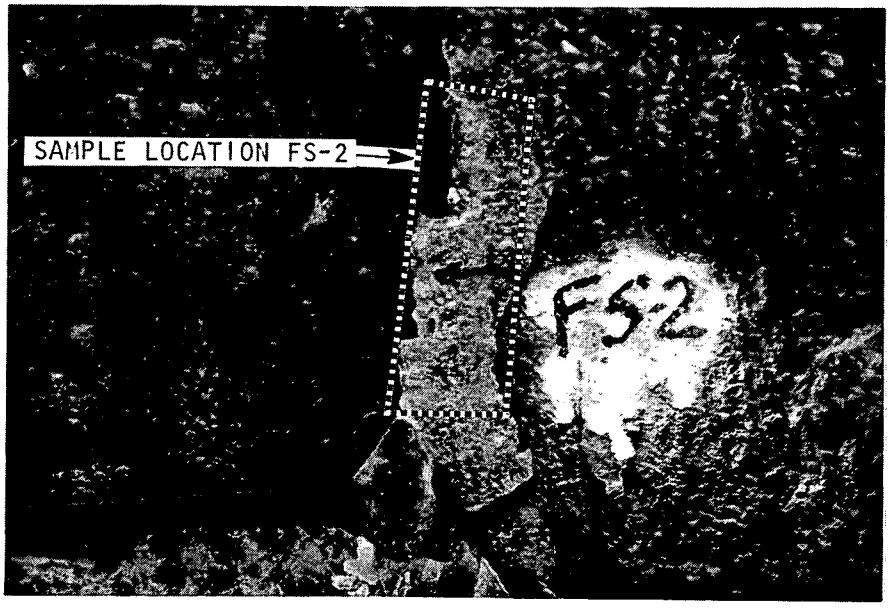
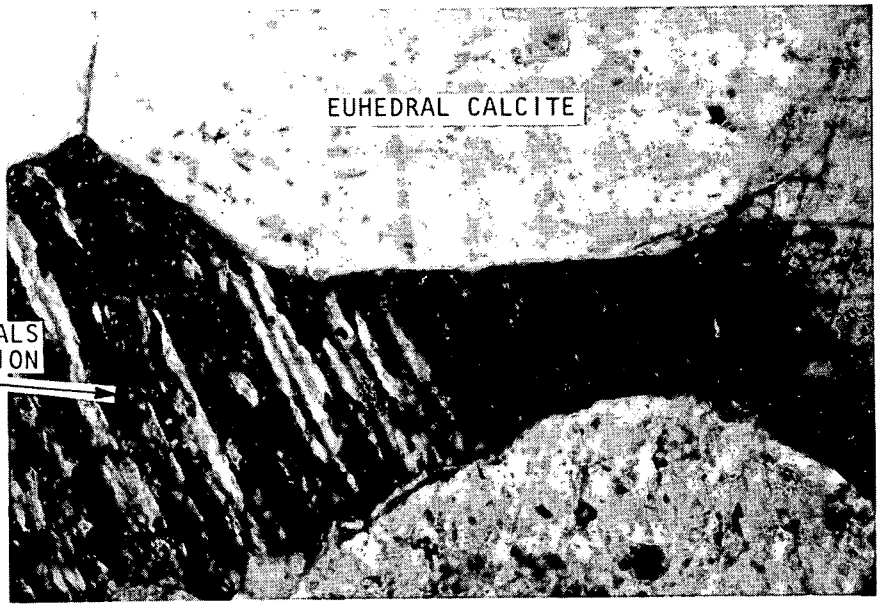



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-2




## PHOTOMICROGRAPH OF SAMPLE FS-2

MAGNIFICATION:40X

SAMPLE TAKEN FROM FAULT ORIENTED N2E,64E

DAMES & MOORE

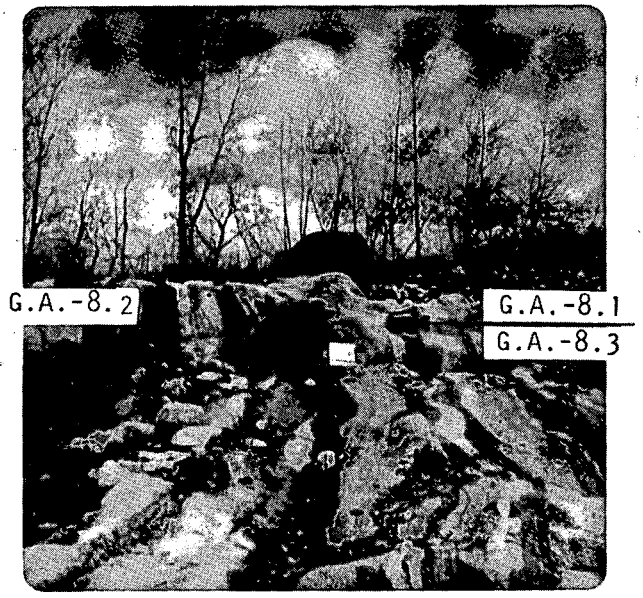



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-8

LOCATION: PARKING LOT OF CHEVROLET DEALER IN CROTON-ON-HUDSON

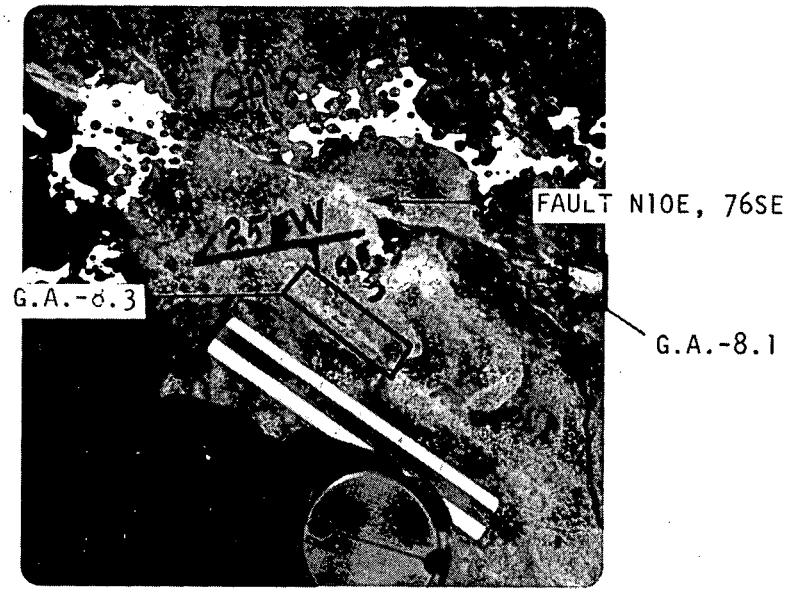
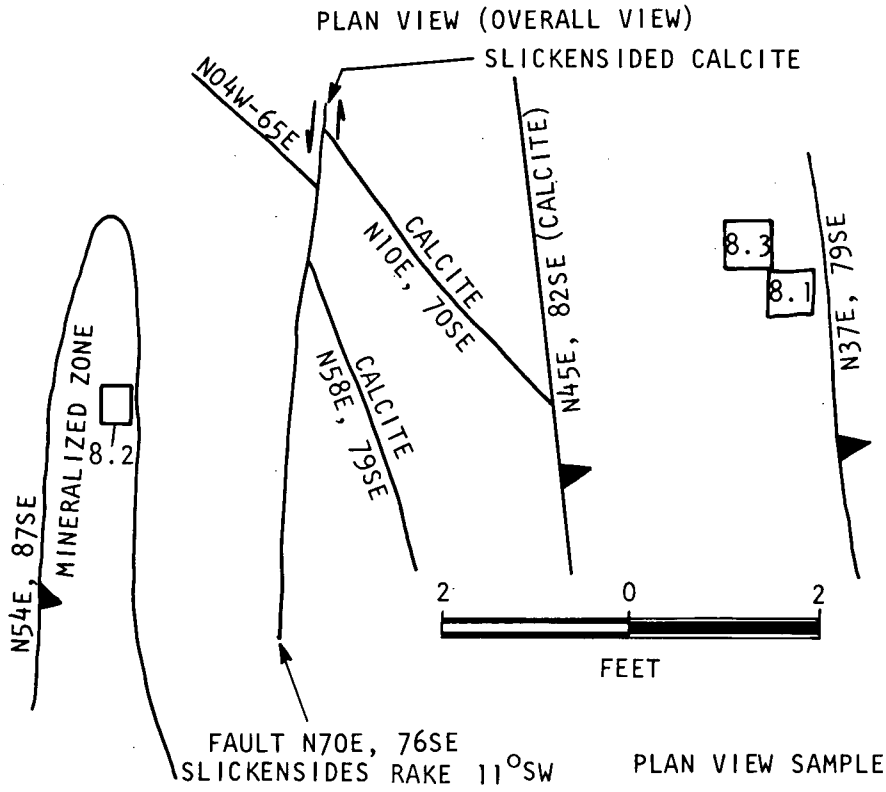
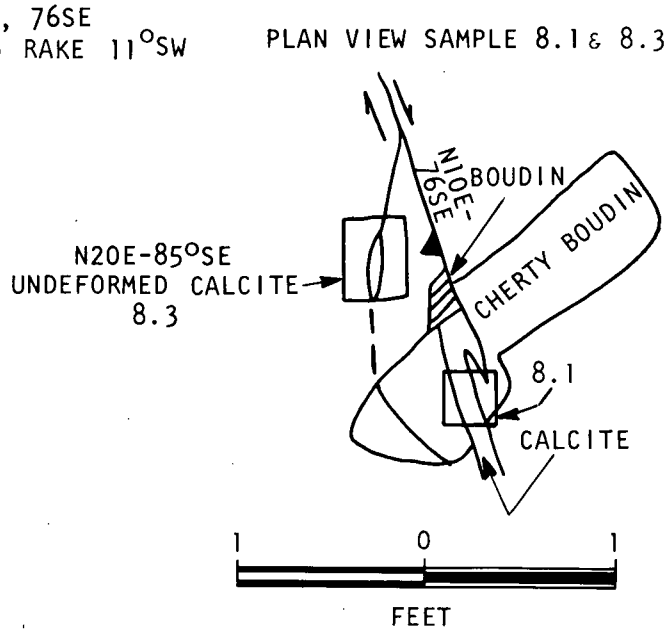



PHOTO B: CLOSE UP OF SAMPLES G.A.-8.1 AND G.A.-8.3




# STATION G.A.-8
# MINERALIZATION SAMPLING

LOCATION: CROTON-ON-HUDSON

NOTE: SAMPLES CALCITE, 8.2 + 8.3 PROBABLY UNDEFORMED CALCITE

DAMES & MOORE

PLATE E-31B

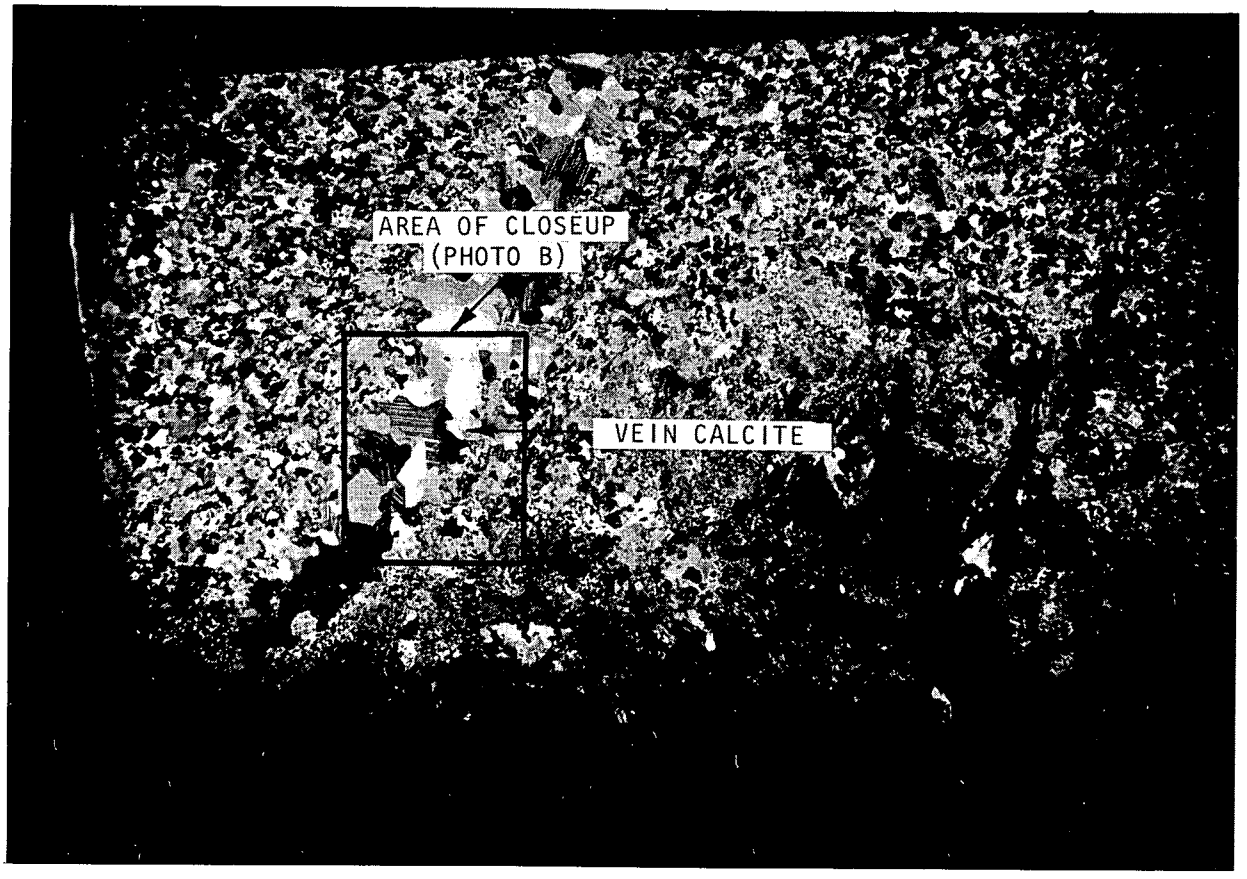



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-8.1
MAGNIFICATION: 4X
X - NICOLS
SAMPLE TAKEN FROM FAULT TRENDING N10E,76S

PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-8.1 SHOWING EUHEDRAL, UNDEFORMED CALCITE EXHIBITING TWIN LAMELLAE.
MAGNIFICATION: 16X
X - NICOLS

DAMES & MOORE

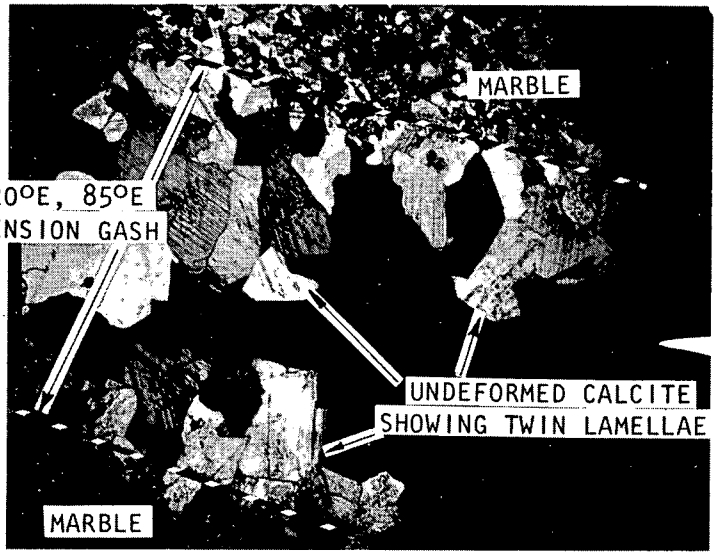



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-8.3

MAGNIFICATION 8X

X - NICOLS

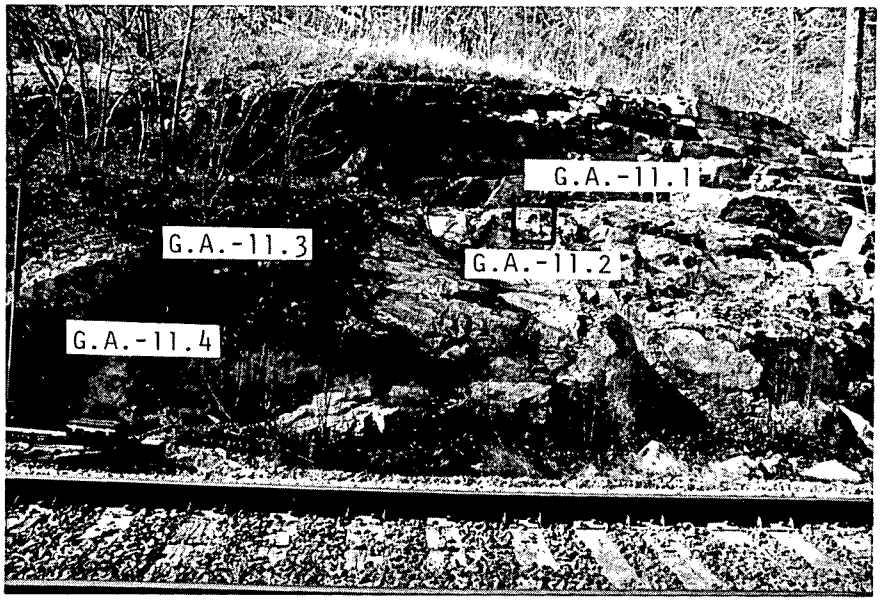



PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-11

LOCATION - RAILROAD CUT WEST OF LOVETT GENERATING STATION, TOMPKINS COVE, N.Y.

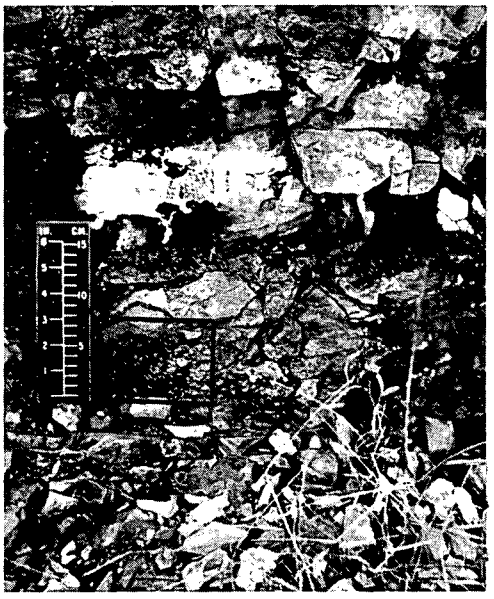


PHOTO B: CLOSEUP OF SAMPLE G.A.-11.3

PHOTO C: CLOSEUP OF SAMPLE G.A.-11.4

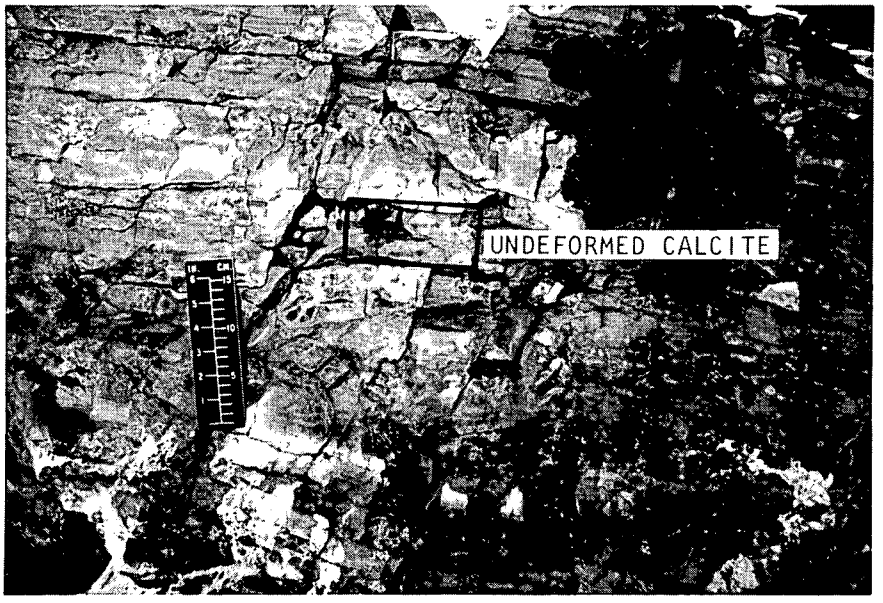



PHOTO A: CLOSEUP OF SAMPLE GA-11.1

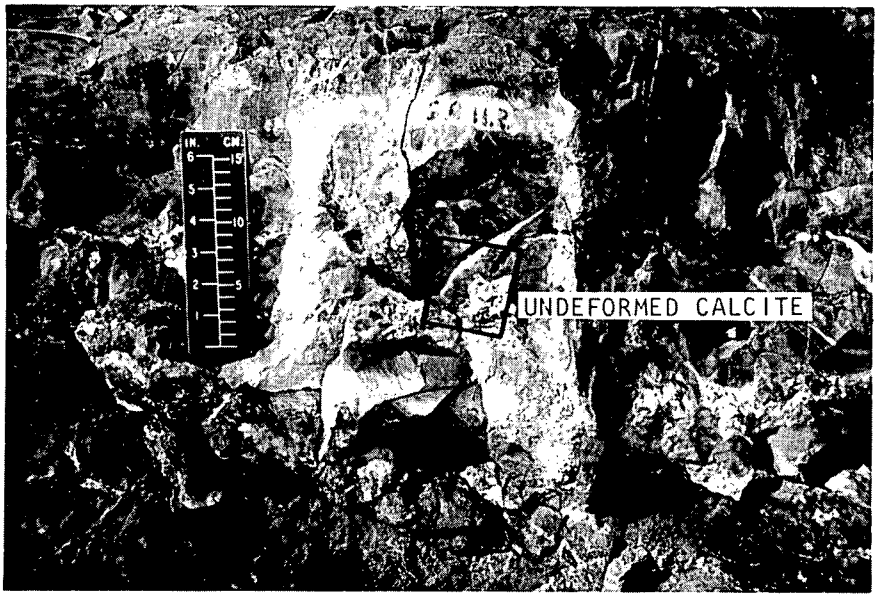
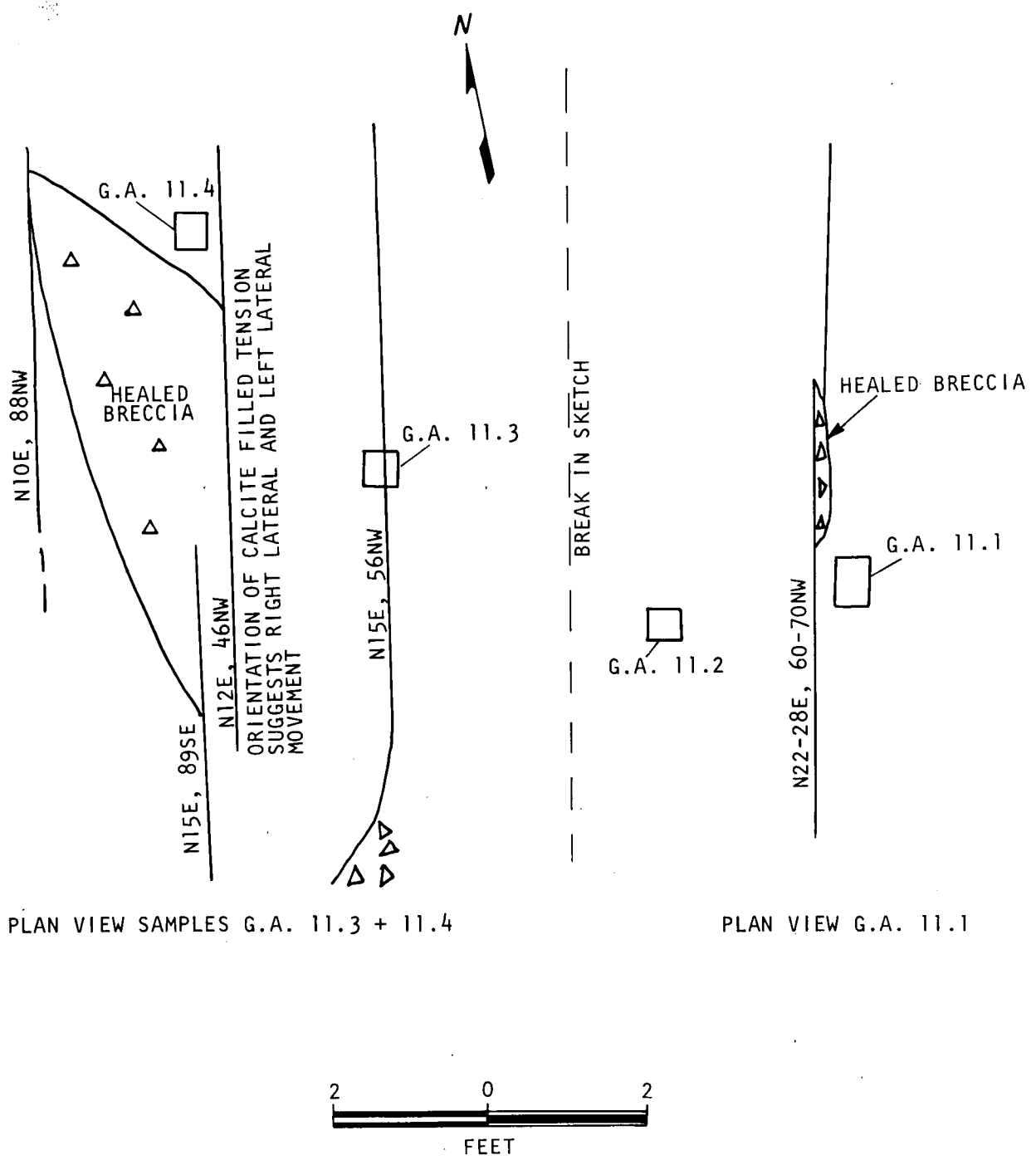



PHOTO B: CLOSEUP OF SAMPLE G.A.-11.2




# STATION G.A.-11
# MINERALIZATION SAMPLING

LOCATION: SOUTH END RAILROAD CUT
WEST OF LOVETT GENERATING STATION

DAMES & MOORE

PLATE E-32C

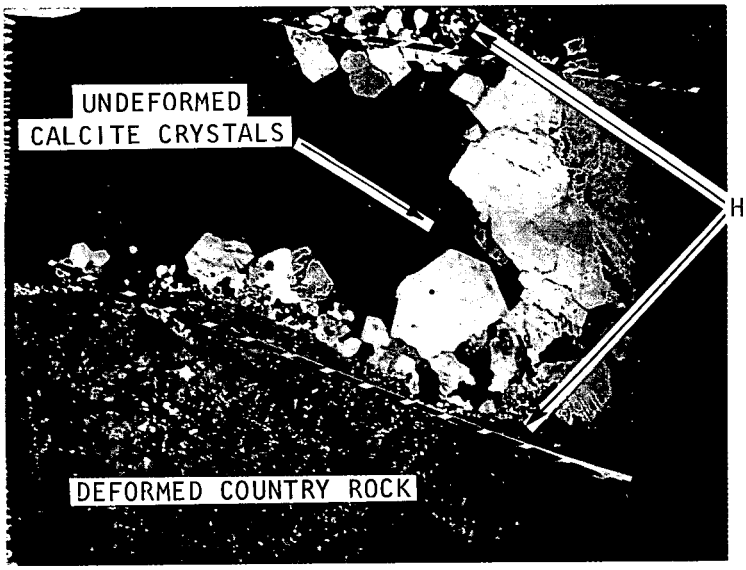



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-11.1

EUHEDRAL CALCITE CRYSTALS

MAGNIFICATION 8X X - NICOLS

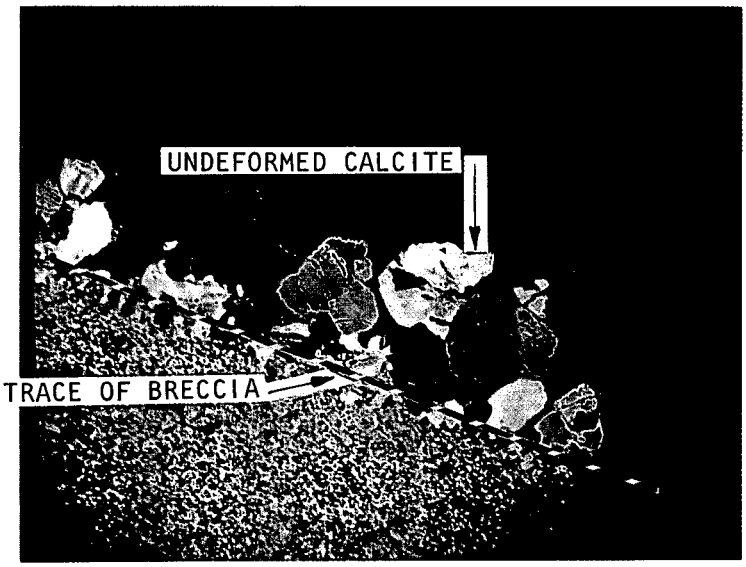



PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-11.2

EUHEDRAL CALCITE CRYSTALS

MAGNIFICATION 8X X - NICOLS

BOTH SAMPLES TAKEN NEAR HEALED BRECCIA TRENDING N22E,60W

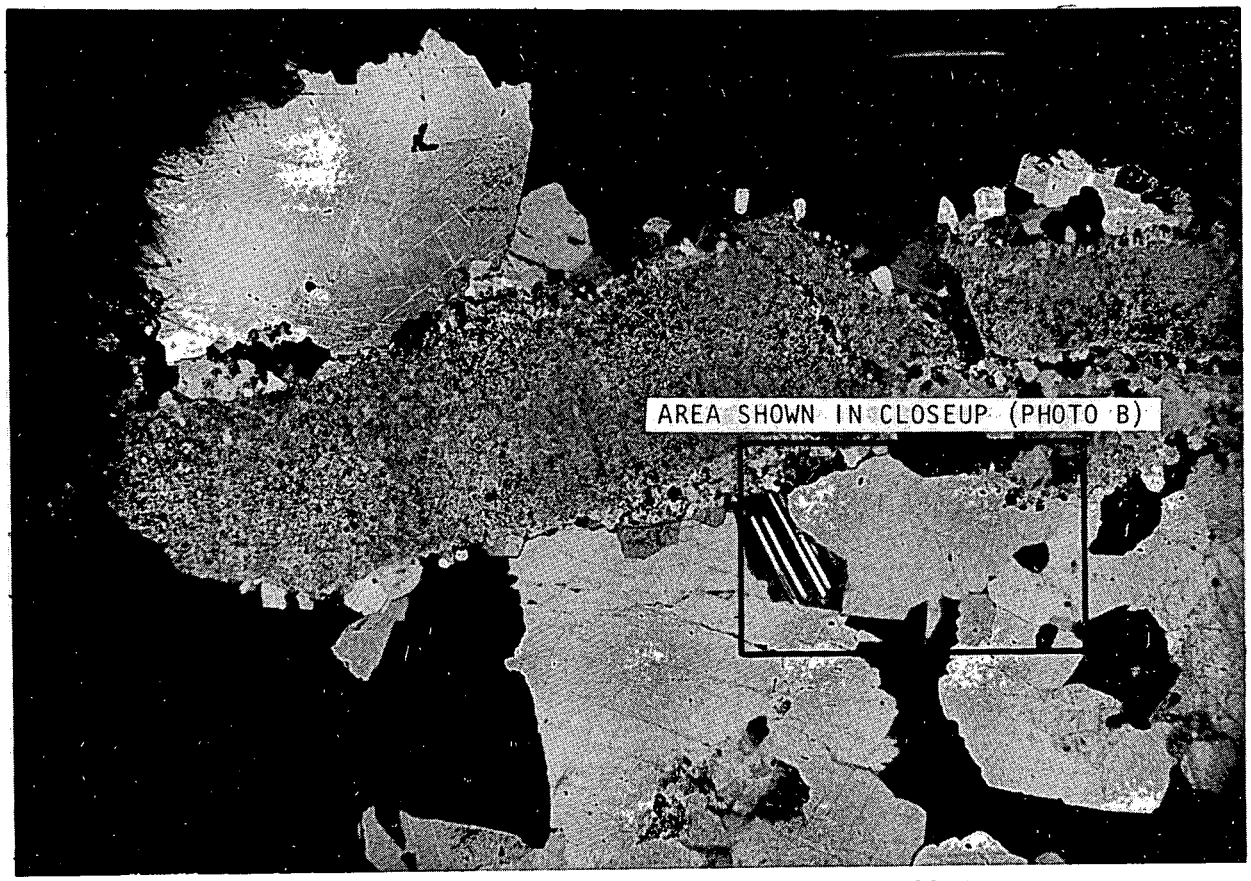



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-11.3
MAGNIFICATION: 4.2X
X - NICOLS

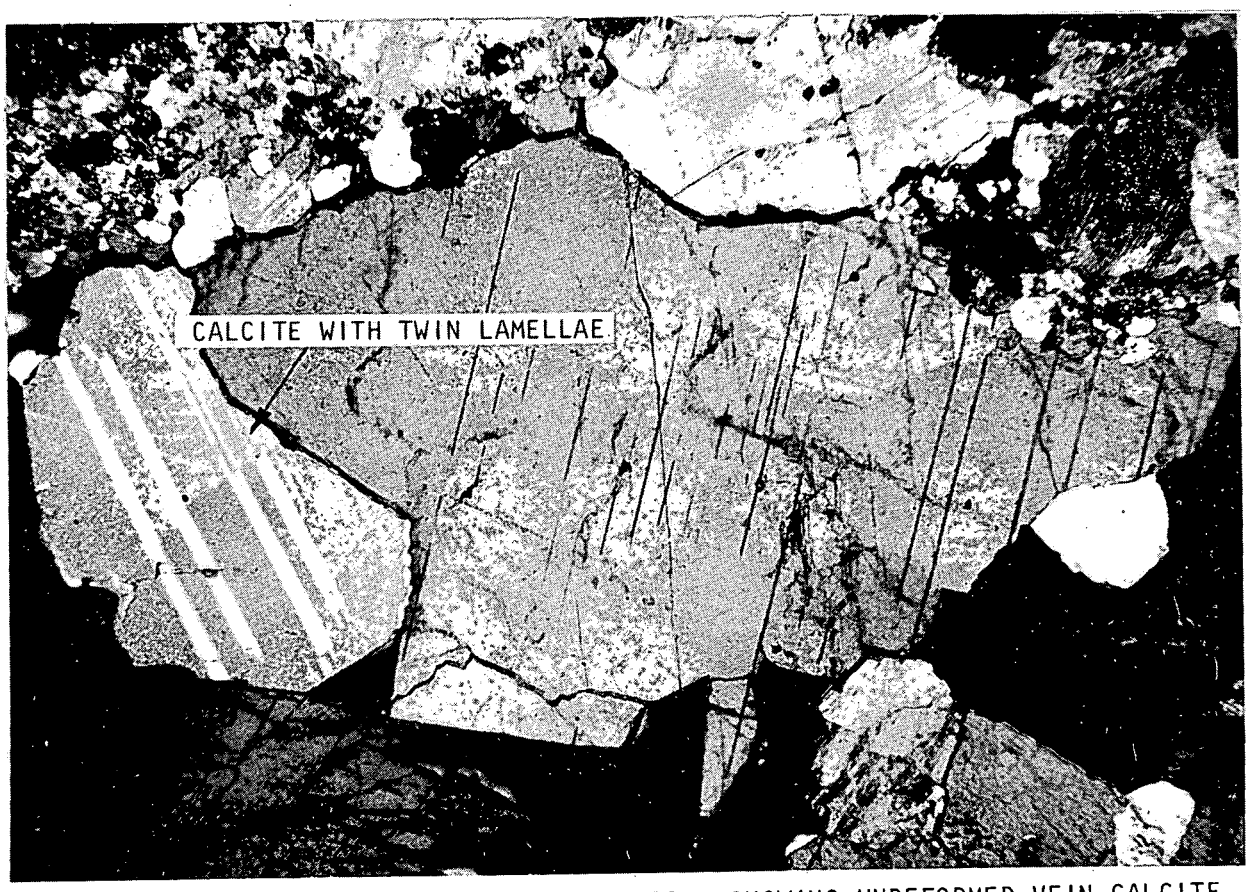



PHOTO B: PHOTOMICROGRAPH OF SAMPLE G.A.-11.3 SHOWING UNDEFORMED VEIN CALCITE
MAGNIFICATION: 16X
X - NICOLS
SAMPLE TAKEN FROM INHEALED BRECCIA ORIENTED N15E,56NW

DAMES & MOORE

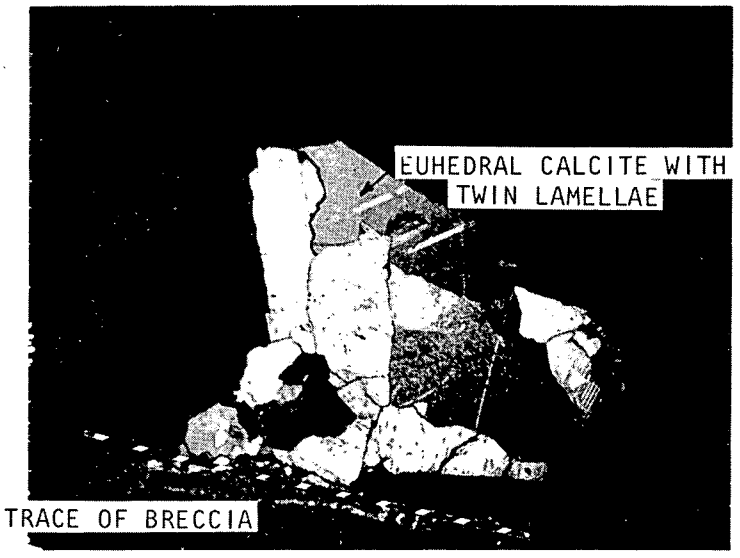



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-11.4A

MAGNIFICATION 8X

X - NICOLS

SAMPLE TAKEN FROM WITHIN NEARLY VERTICAL HEALED BRECCIA ZONE TRENDING N10-15E

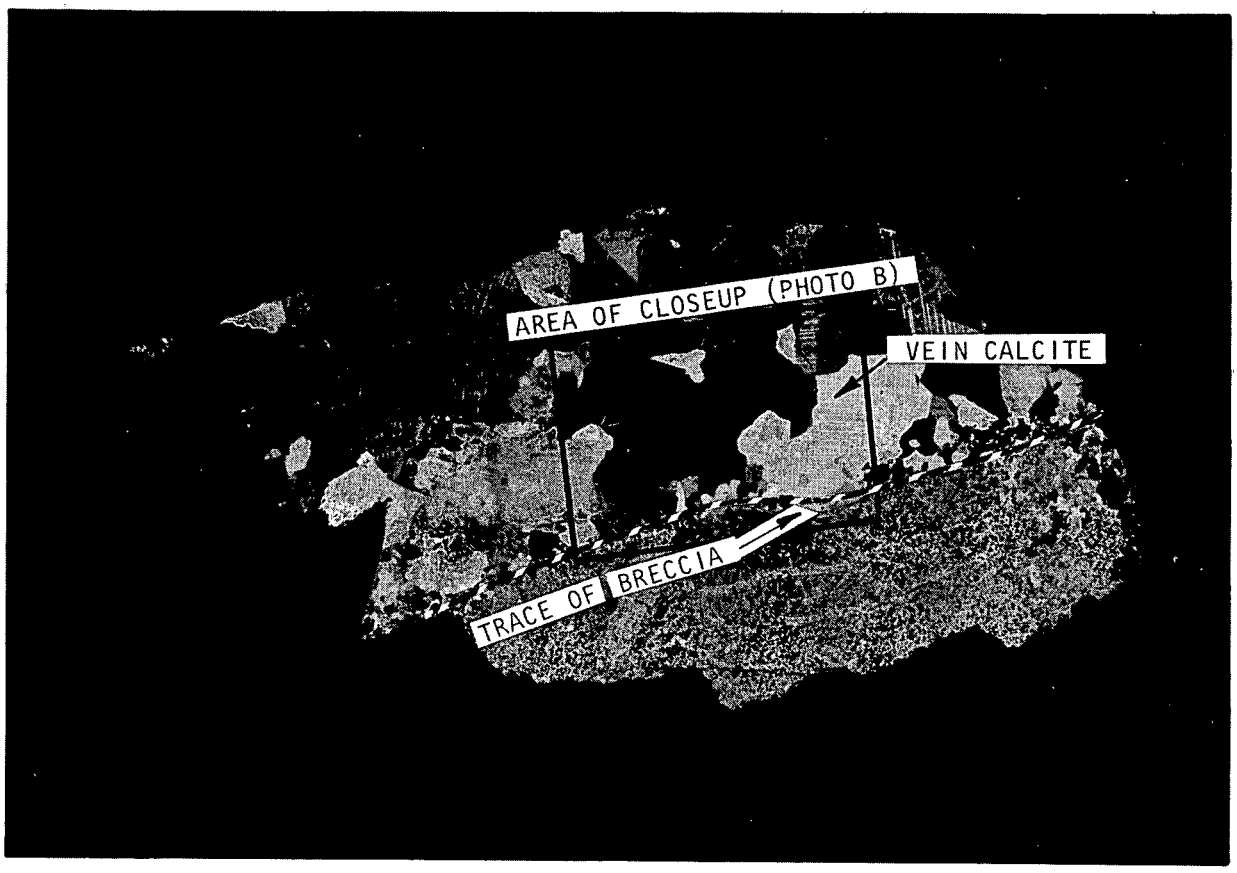



PHOTO A: PHOTOMICROGRAPHY OF SAMPLE G.A.-11.4B
MAGNIFICATION: 4.5X
X - NICOLS

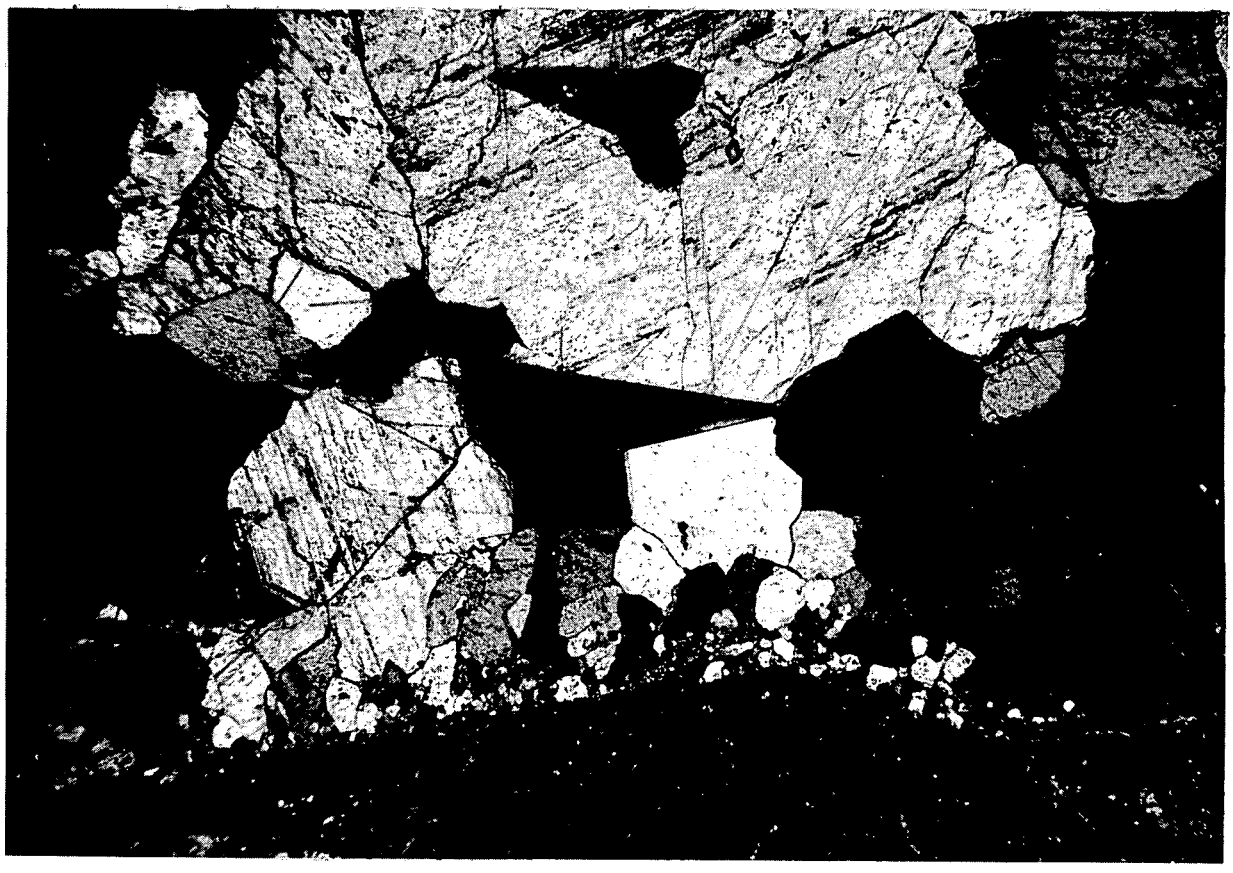


PHOTO B: CLOSEUP OF AREA OUTLINED IN PHOTO A: SHOWING UNDEFORMED VEIN CALCITE. NOTE TWIN LAMELLAE.
MAGNIFICATION: 16X
X - NICOLS

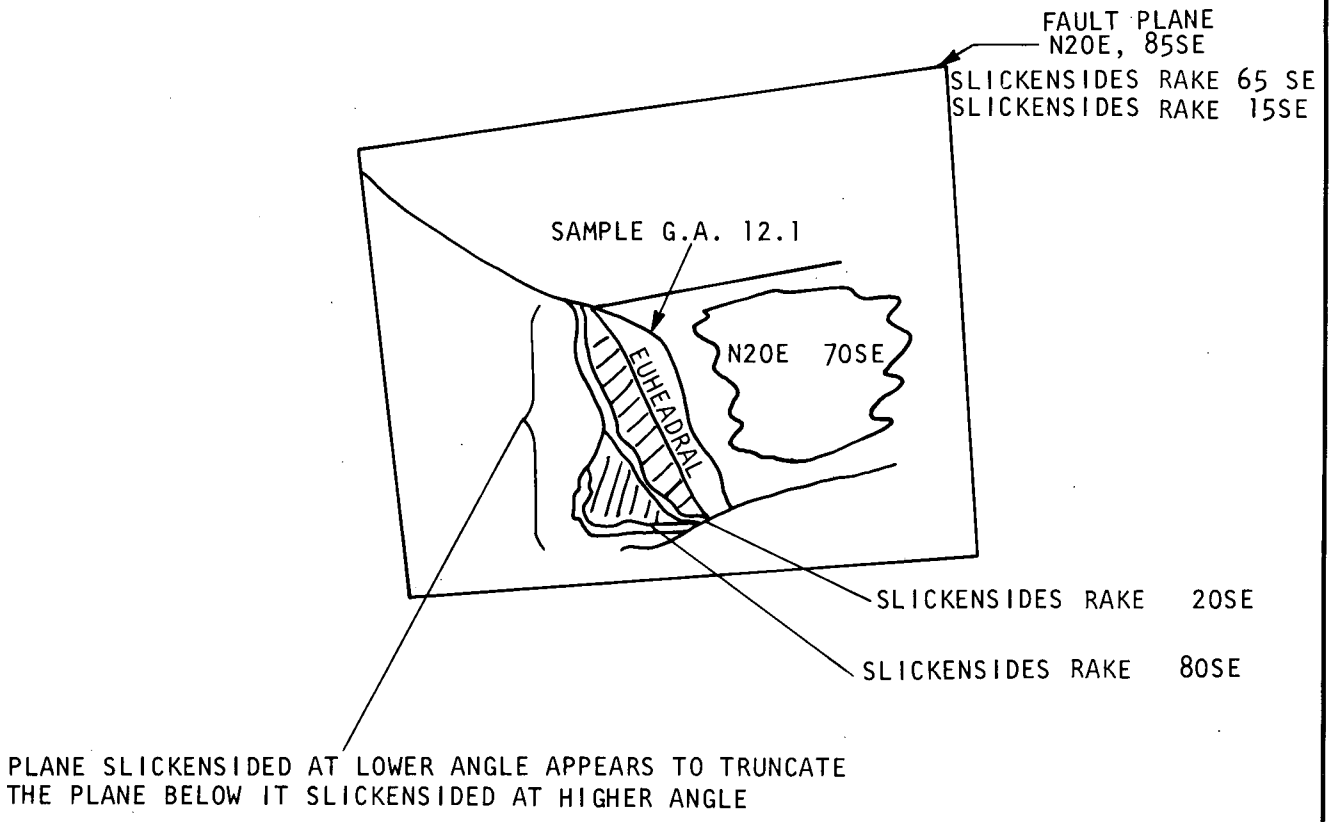
DAMES & MOORE

SAMPLE TAKEN FROM WITHIN NEARLY VERTICAL HEALED BRECCIA ZONE TRENDING N10-15E

PHOTO A: OUTCROP VIEW OF SAMPLING STATION G.A.-12

LOCATION - RAILROAD CUT WEST OF LOVETT GENERATING STATION, TOMKINS COVE, N.Y.

PHOTO B: CLOSEUP OF SAMPLE G.A.-12.1




# STATION G.A.-12
# MINERALIZATION SAMPLING

LOCATION: LOVETT RAILROAD CUT; 50' NORTH OF G.A. 11

NOTE: SAMPLE COMPOSED OF EUHEDRAL CALCITE CRYSTALS
ON TOP OF 2 GENERATIONS OF SLICKENSIDED CALCITE

DAMES & MOORE

PLATE E-33B

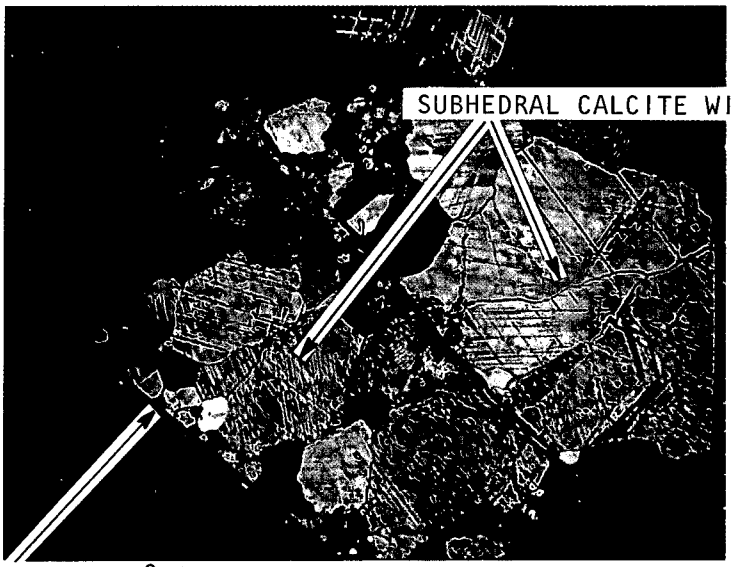



PHOTO A: PHOTOMICROGRAPH OF SAMPLE G.A.-12.1

NOTE DEFORMATION LAMELLAE IN CALCITE

MAGNIFICATION 8X

X - NICOLS

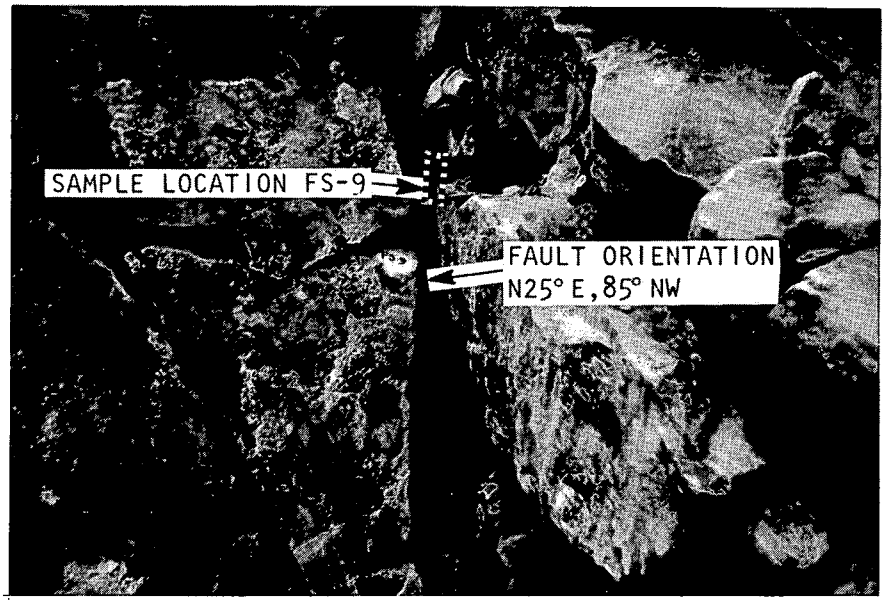



PHOTO A: OUTCROP NORTH OF REACTOR NO. 2
SAMPLE LOCATION FS-9

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

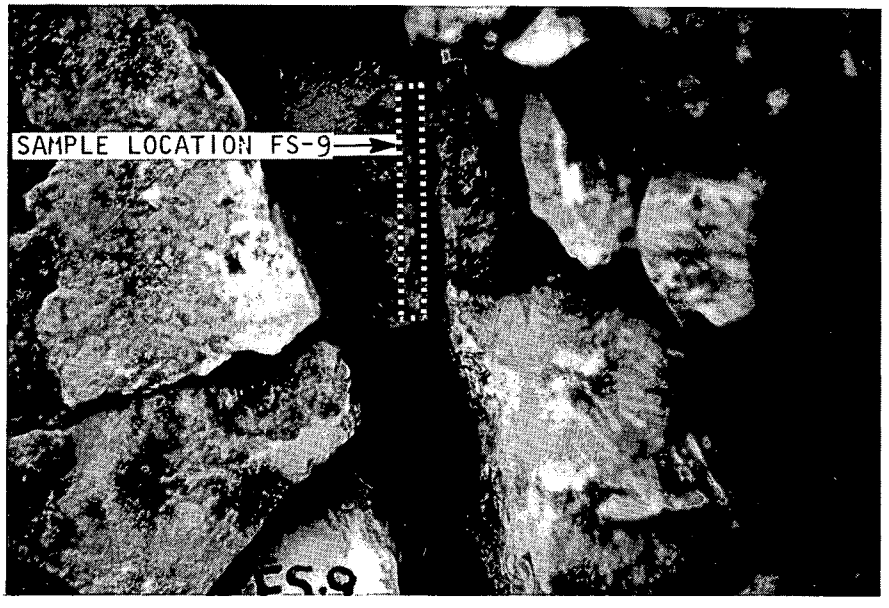



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-9

PHOTO A: OUTCROP ADJACENT TO TURBOGENERATOR BUILDING NO. 1 SAMPLE LOCATION FS-12

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

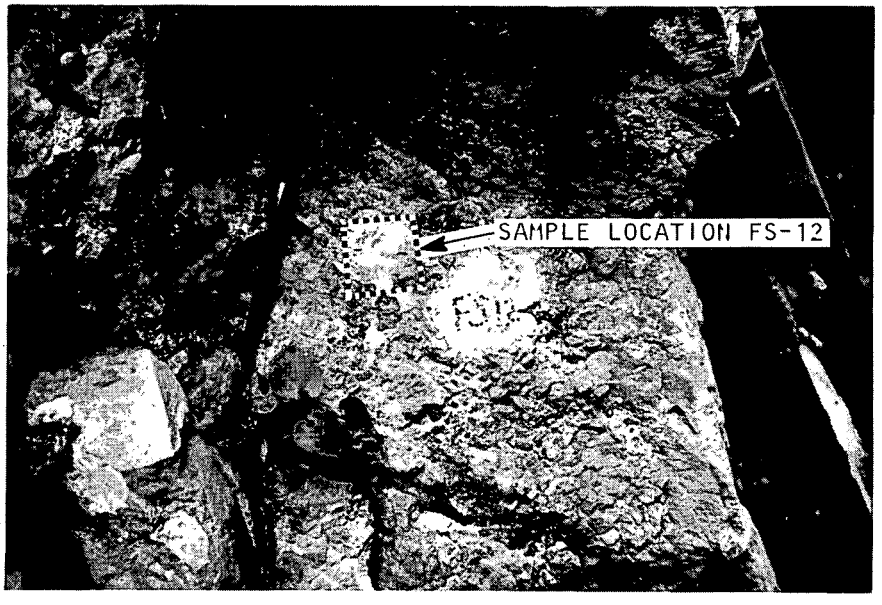



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-12

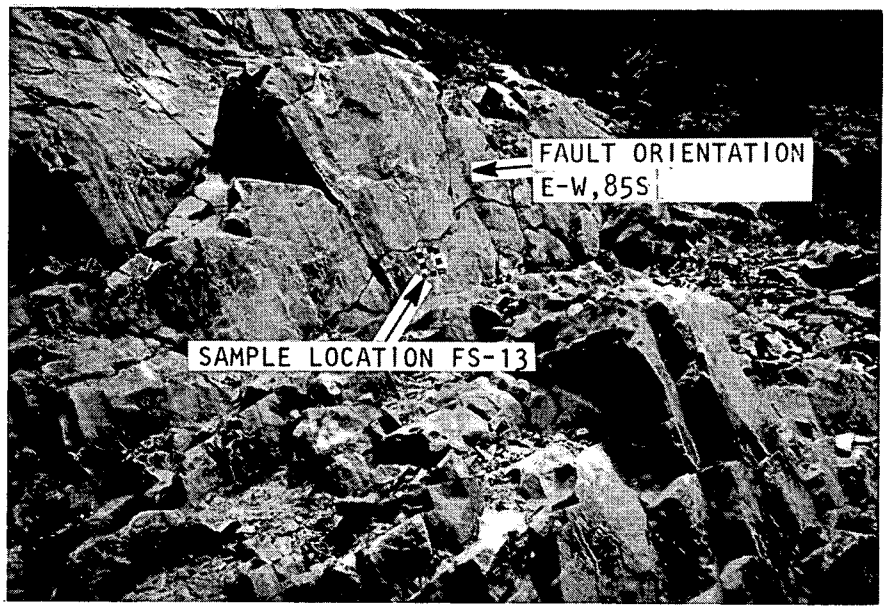



PHOTO A: OUTCROP NORTH OF REACTOR NO. 2
SAMPLE LOCATION FS-13

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

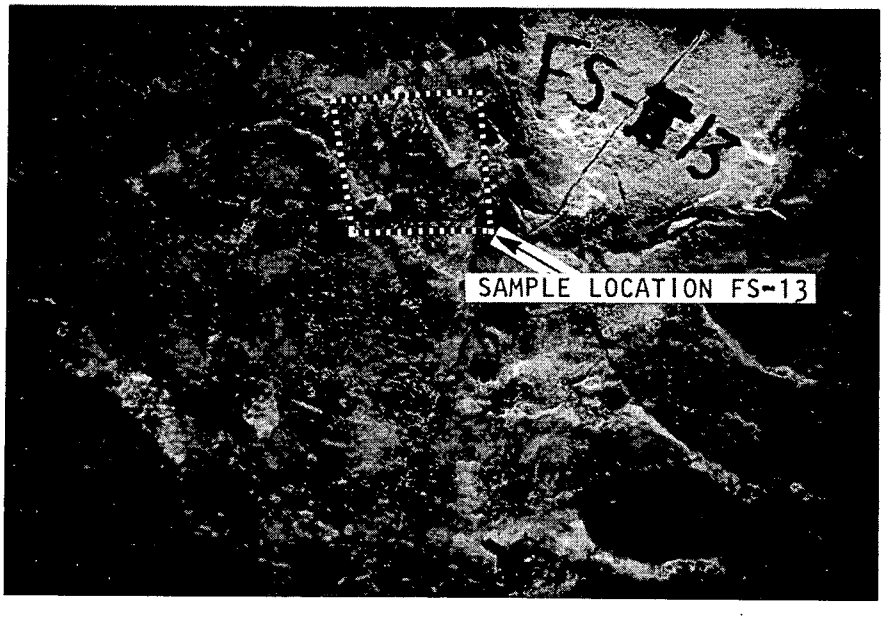
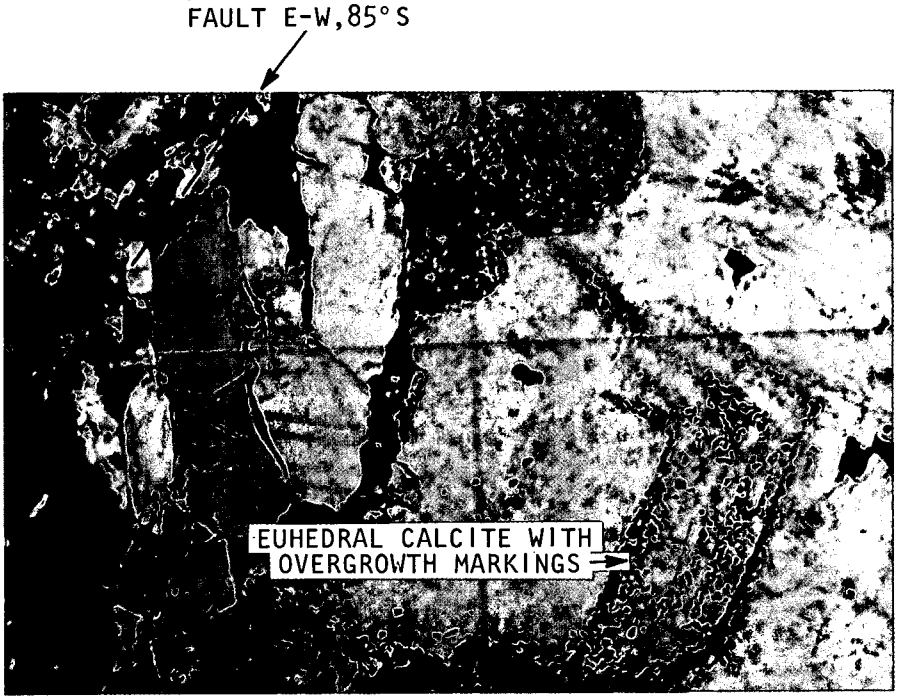



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-13




PHOTOMICROGRAPH OF SAMPLE FS-13

MAGNIFICATION:40X

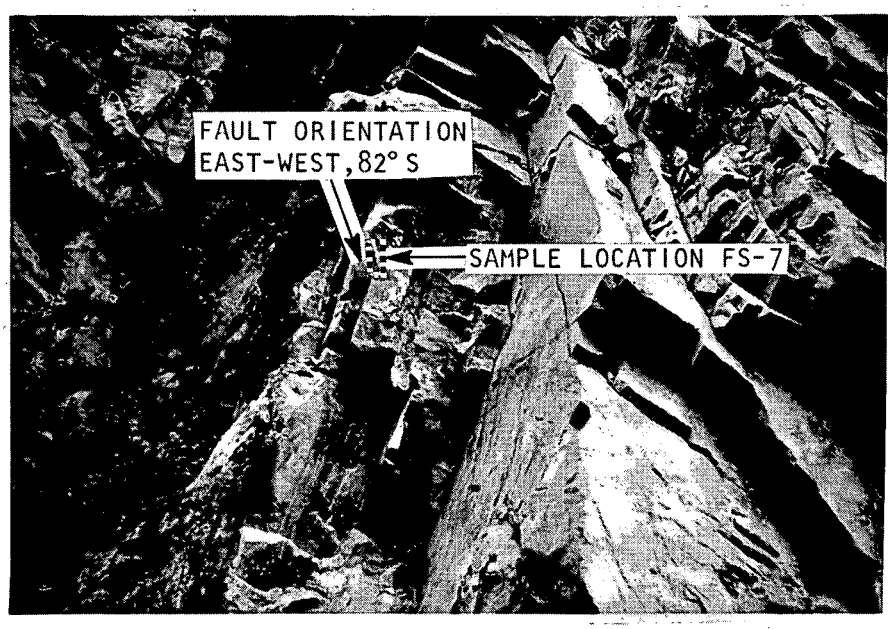



PHOTO A: OUTCROP ADJACENT TO TURBOGENERATOR BUILDING NO. 1 SAMPLE LOCATION FS-7

LOCATION- INDIAN POINT GENERATING STATION, BUCHANAN, N.Y.

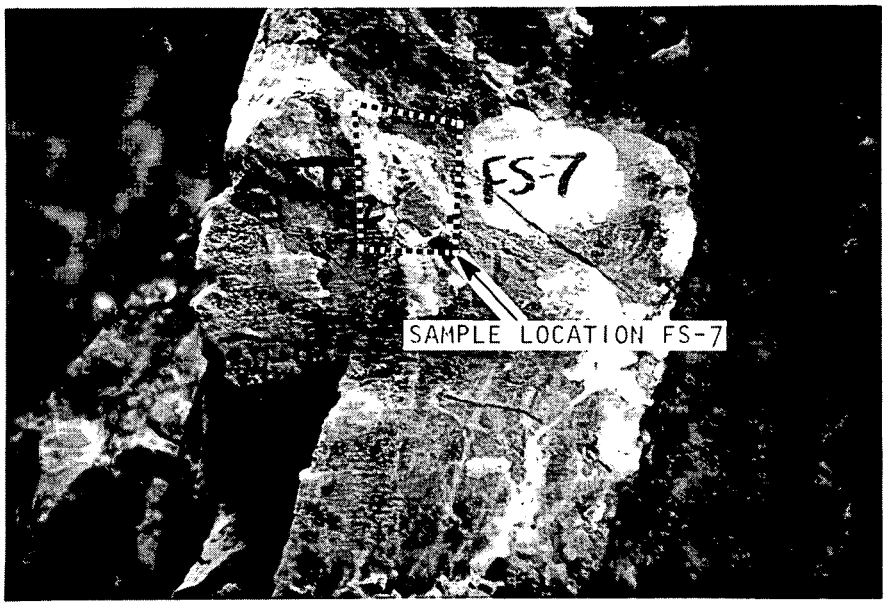
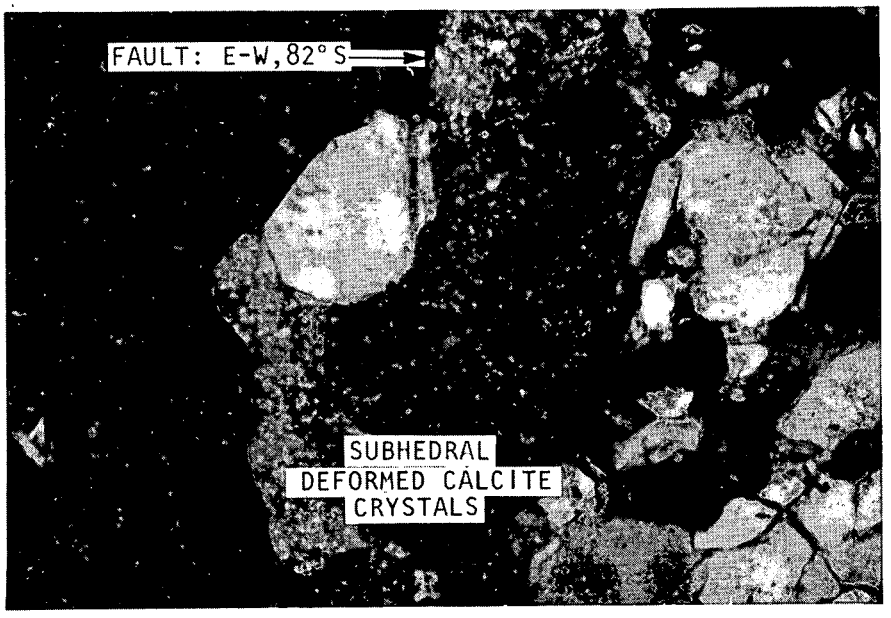



PHOTO B: CLOSE-UP OF SAMPLE LOCATION FS-7




PHOTOMICROGRAPH OF SAMPLE FS-7

MAGNIFICATION:40X

DAMES & MOORE

PLATE E-37B

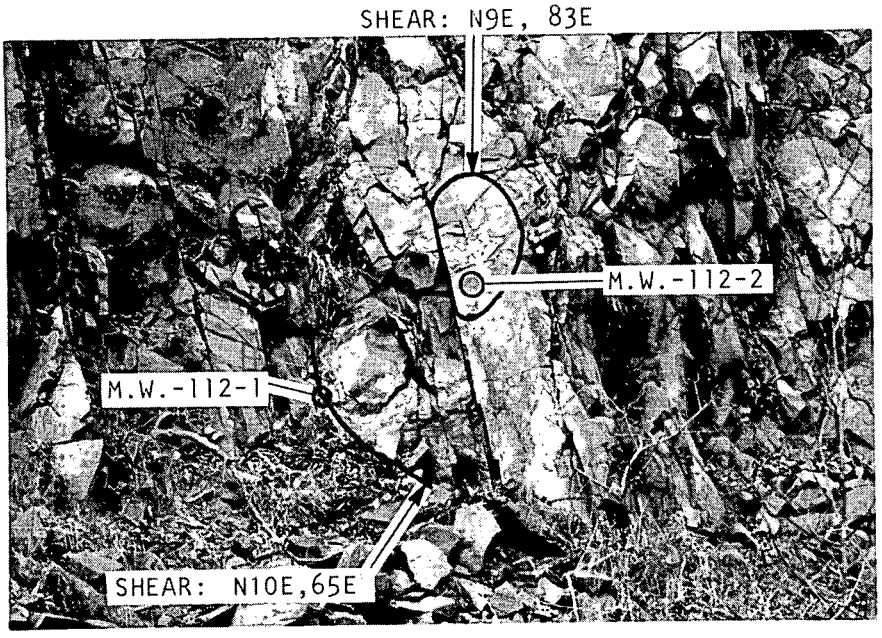



PHOTO A: OUTCROP VIEW OF SAMPLING STATION M.W.-112
LOCATION: VERDRIETEGE HOOK SOUTH OF TROUGH HOLLOW

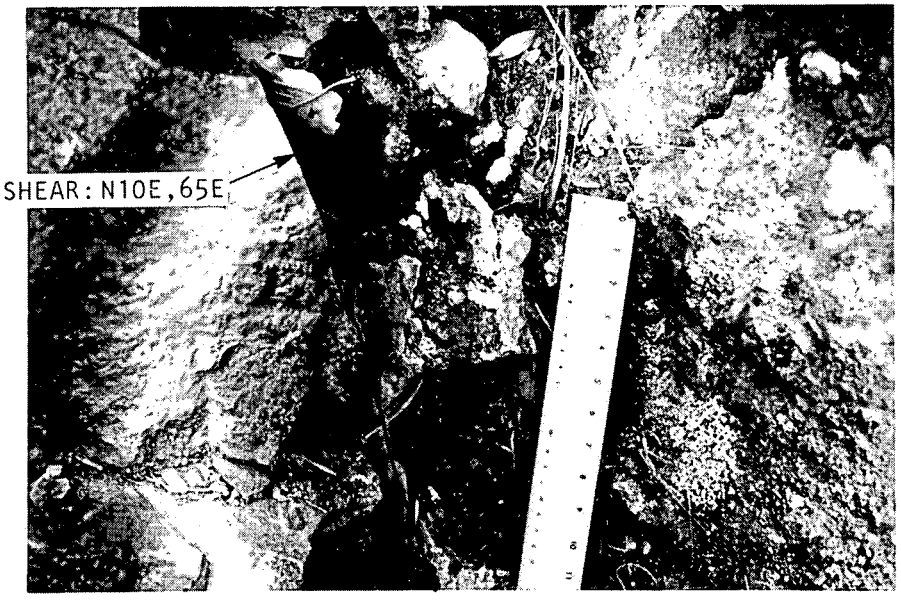
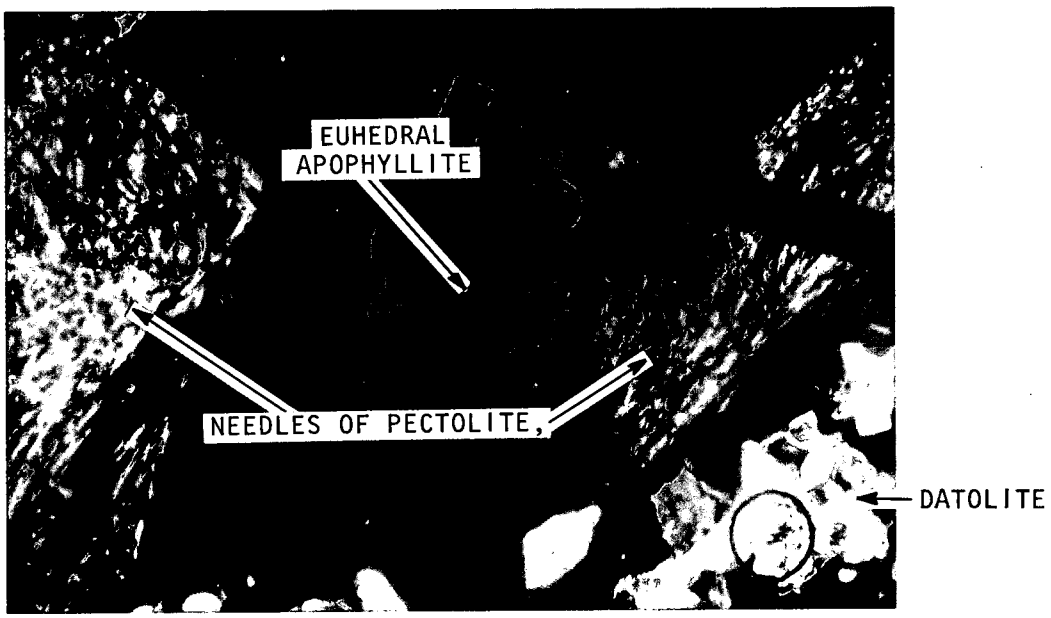



PHOTO B: CLOSE UP OF SAMPLING STATION M.W.-112-1

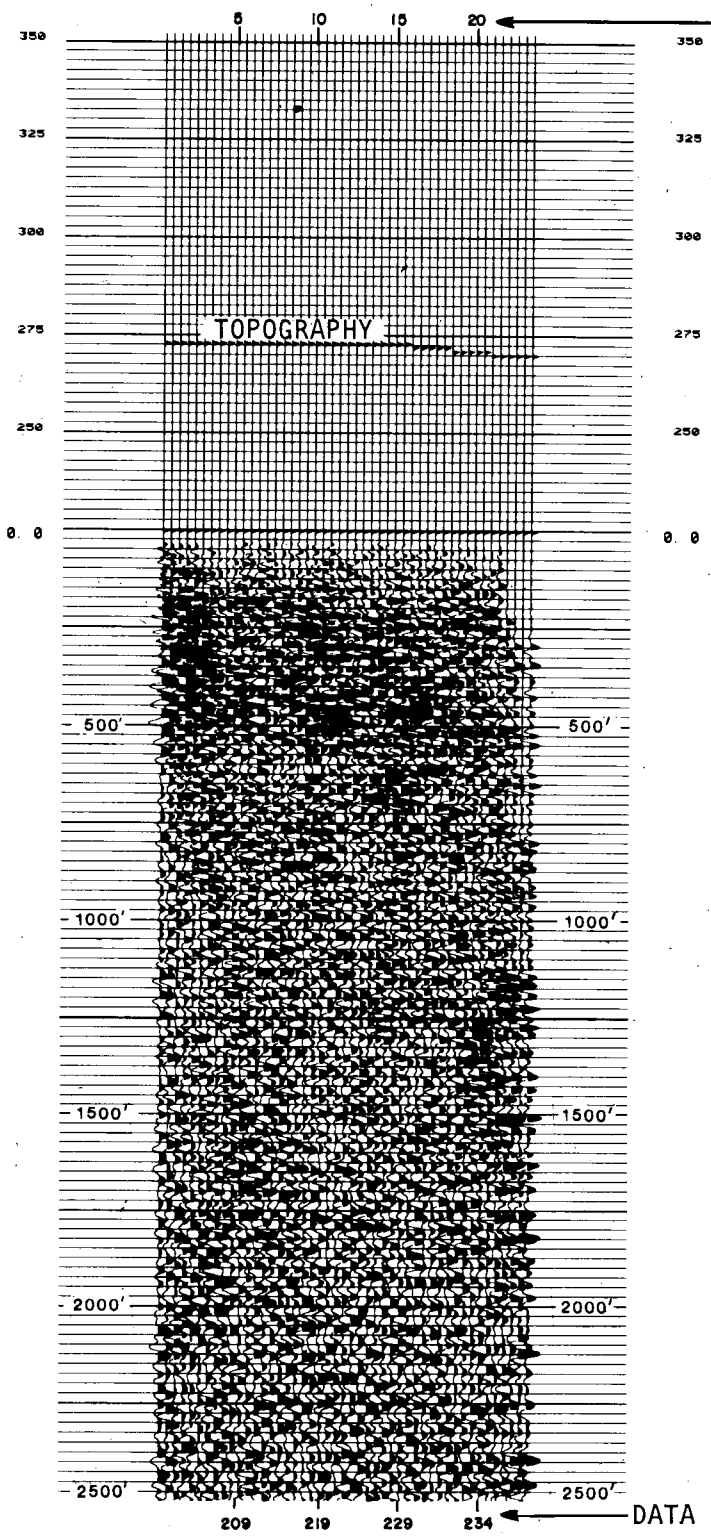



PHOTOMICROGRAPH OF SAMPLE M.W.-112-1

MAGNIFICATION: 40 X

PECTOLITE OVERGROWN BY APOPHYLLITE AND DATOLITE

SAMPLE TAKEN FROM SHEAR ZONE TRENDING N10E,65E




LINE 2A DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY SEISMOGRAPH SERVICE CORPORATION
JOB NUMBER
DATE
PHOENIX SEISYSTEM 70

**PROCESSING SEQUENCE**

- 1 DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- 1 VELOCITY ANALYSIS
- 1 NORMAL MOVEOUT
- 1 DATUM STATICS
- 1 AUTOMATIC STATICS
- 1 STACK 1 FOLD
- DECONVOLUTION
- 1 FILTER
- TRACE EQUALIZATION

ADDITIONAL PROCESSING
0.5 MP MOON
9 DEPTH

**PROCESSING PARAMETERS**

DATUM SLOPING (20' BELOW ELEV.)
VE 8000'/Sec. VM 8000'/Sec.
AUTOMATIC STATICS WINDOW 500' TO 4000' FT
ADDITIONAL

| | LENGTH (MS) | MEDIAN (MSEC) | RESTRICTION (MS) |
|---|---|---|---|
| DECONVOLUTION OPERATOR | | | |
| DECONVOLUTION OPERATOR | | | |

| | BAND PASS | OPL. (FT) | OVERLAP (MSEC) |
|---|---|---|---|
| BAND PASS FILTERS | 60-240 | 0.0-1000 | |

SAMPLE RATE 6 MS
ONE INCH 18 TRACES
ONE SECOND 18 INCHES
PLAYBACK GAIN -24 DB MEAN VALUE

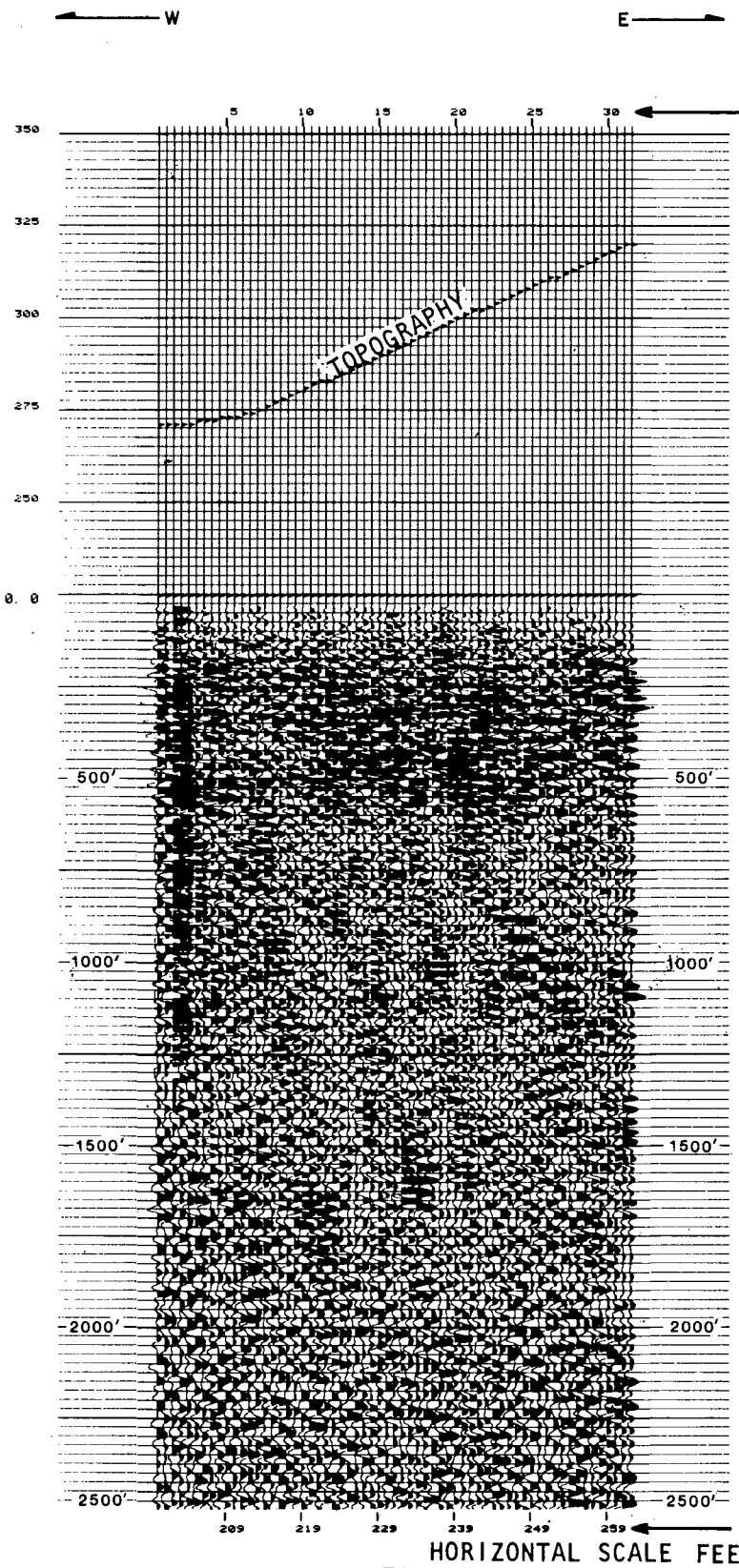
**RECORDING PARAMETERS**

RECORDED BY TARGET SURVEY
CONTRACT PARTY 1 DATE RECORDED 072076
SP/VP INTERVAL 70' INSTRUMENT TYPE FAIRFIELD
GEOPHONE INTERVAL 70' AMPLIFIERS
NEAR OFFSET 70' RECORDING FILTER OUT/OUT
FAR OFFSET 840' SAMPLE RATE 6MS
NUMBER TRACES 12 RECORD LENGTH 500MS
CONFIGURATION SWEEP LENGTH
PROGRESSION SW/NE SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

HORIZONTAL SCALE FEET
700 0 700 1400
VERTICAL EXAGGERATION : 1.7

# HIGH RESOLUTION SEISMIC REFLECTION LINE

DAMES & MOORE




LINE 2B DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY GEISMOGRAPH SERVICE CORPORATION
JOB NUMBER [illegible]
DATE [illegible]
PHOENIX SEISYSTEM 70

## PROCESSING SEQUENCE

- 1 DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- 1 VELOCITY ANALYSIS
- 1 NORMAL MOVEOUT
- 2 DATUM STATICS
- 1 AUTOMATIC STATICS
- 2 STACK 1 FOLD
- DECONVOLUTION
- 1 FILTER
- TRACE EQUALIZATION

ADDITIONAL PROCESSING
0.5P ROOM
9 DEPTH

## PROCESSING PARAMETERS

CORRECTIONS
DATUM SLOPPING (20' BELOW ELEV.)
VE [illegible] VW [illegible]
AUTOMATIC STATICS WINDOW 500' TO 4000' FT
ADDITIONAL

| | LENGTH (MS) | WINDOW (SEC) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION BEFORE STACK | | | |
| DECONVOLUTION AFTER STACK | | | |

| | BAND PASS | APPL. (FT) | OVERLAP (SEC) |
|---|---|---|---|
| BAND PASS FILTERS | 60-240 | 0.0-3000' | |

SAMPLE RATE 8 MS
ONE INCH 12 TRACES
ONE SECOND 10 INCHES
PLAYBACK GAIN -26 DB MEAN VALUE

## RECORDING PARAMETERS

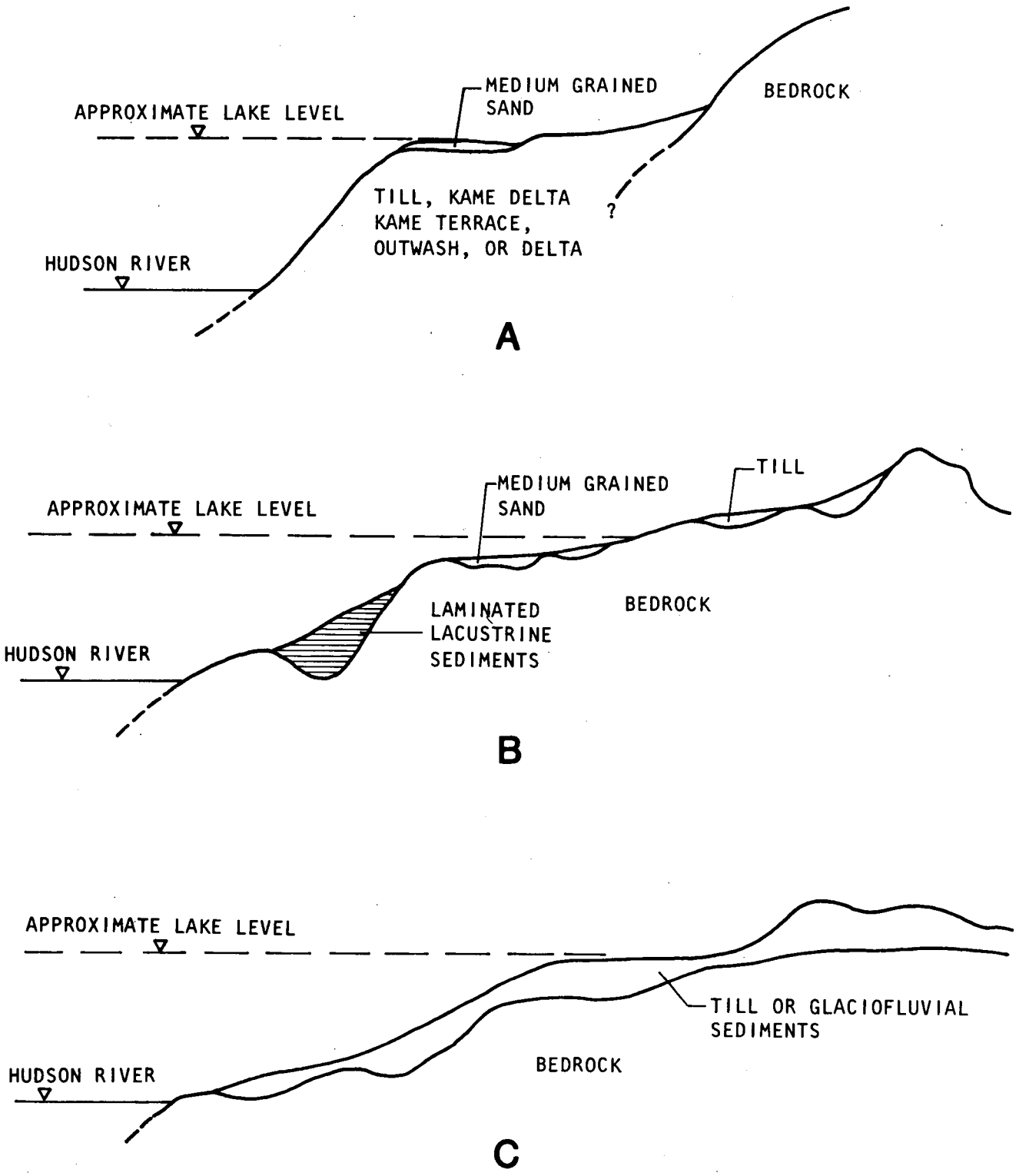
RECORDED BY TARGET SURVEY
CONTRACT PARTY 1 DATE RECORDED [illegible]
SP/VP INTERVAL 20' INSTRUMENT TYPE [illegible]
GEOPHONE INTERVAL 20' AMPLIFIERS
NEAR OFFSET 20' RECORDING FILTER OUT/OUT
FAR OFFSET [illegible] SAMPLE RATE [illegible]
NUMBER TRACES 12 RECORD LENGTH [illegible]
CONFIGURATION SWEEP LENGTH
PROGRESSION W/E SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

HORIZONTAL SCALE FEET
700 0 700 1400

VERTICAL EXAGGERATION : 1.7

# HIGH RESOLUTION SEISMIC REFLECTION LINE

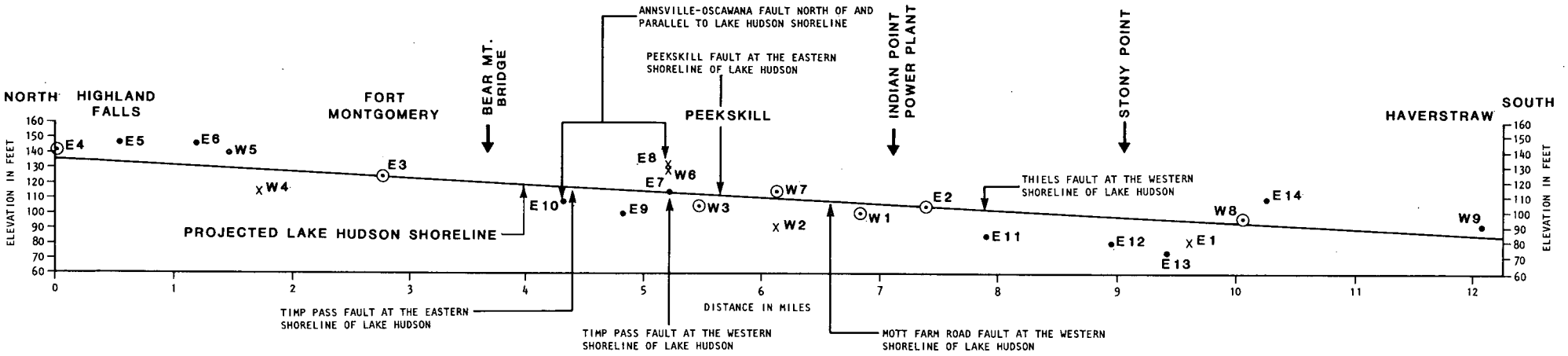
DAMES & MOORE




# DIAGRAMATIC SECTIONS SHOWING EVIDENCE USED TO IDENTIFY LAKE HUDSON SHORELINE

DAMES & MOORE

PLATE F-2




## TYPE OF EVIDENCE

| SURVEY POINT | ELEVATION IN FEET | TOPOGRAPHIC EVIDENCE | SEDIMENTARY EVIDENCE | TOPOGRAPHIC AND SEDIMENTARY EVIDENCE |
|---|---|---|---|---|
| E1 | 80 | | LACUSTRINE SAND SECTION B, PLATE F-2 | |
| E2 | 104 | | | SECTION A, PLATE F-2 |
| E3 | 123 | | | SECTION A, PLATE F-2 |
| E4 | 141 | | | SECTION A, PLATE F-2 |
| E5 | 147 | CHANGE IN SLOPE WITH SOME LACUSTRINE SAND, SECTION C, PLATE F-2 | | |
| E6 | 145 | SAME AS E5 | | |
| E7 | 114 | SAME AS E5 | | |
| E8 | 132 | | TOP OF DELTA | |
| E9 | 99 | SAME AS E5 | | |
| E10 | 106 | CHANGE IN SLOPE SECTION C, PLATE F-2 | | |
| E11 | 84 | CHANGE IN SLOPE SECTION C, PLATE F-2 | | |
| E12 | 79 | SAME AS E5 | | |
| E13 | 72 | SAME AS E5 | | |
| E14 | 109 | CHANGE IN SLOPE SECTION C, PLATE F-2 | | |
| W1 | 98 | | | SECTION A, PLATE F-2 |
| W2 | 90 | | LACUSTRINE SEDIMENTS SECTION B, PLATE F-2 | |
| W3 | 104 | | | SECTION A, PLATE F-2 |
| W4 | 114 | | LACUSTRINE SEDIMENTS SECTION B, PLATE F-2 | |
| W5 | 139 | CHANGE IN SLOPE SECTION C, PLATE F-2 | | |
| W6 | 129 | | TOP OF A SMALL REMNANT OF A DELTA | |
| W7 | 113 | | | SECTION A, PLATE F-2 |
| W8 | 96 | | | SECTION A, PLATE F-2 |
| W9 | 90 | SECTION C, PLATE F-2 | | |

# PROFILE SHOWING UPWARPED LAKE HUDSON SHORELINE

KEY:

⊙E2 SURVEY POINTS ON SHORELINE SEGMENTS IDENTIFIED FROM BOTH SEDIMENTARY AND TOPOGRAPHIC EVIDENCE.

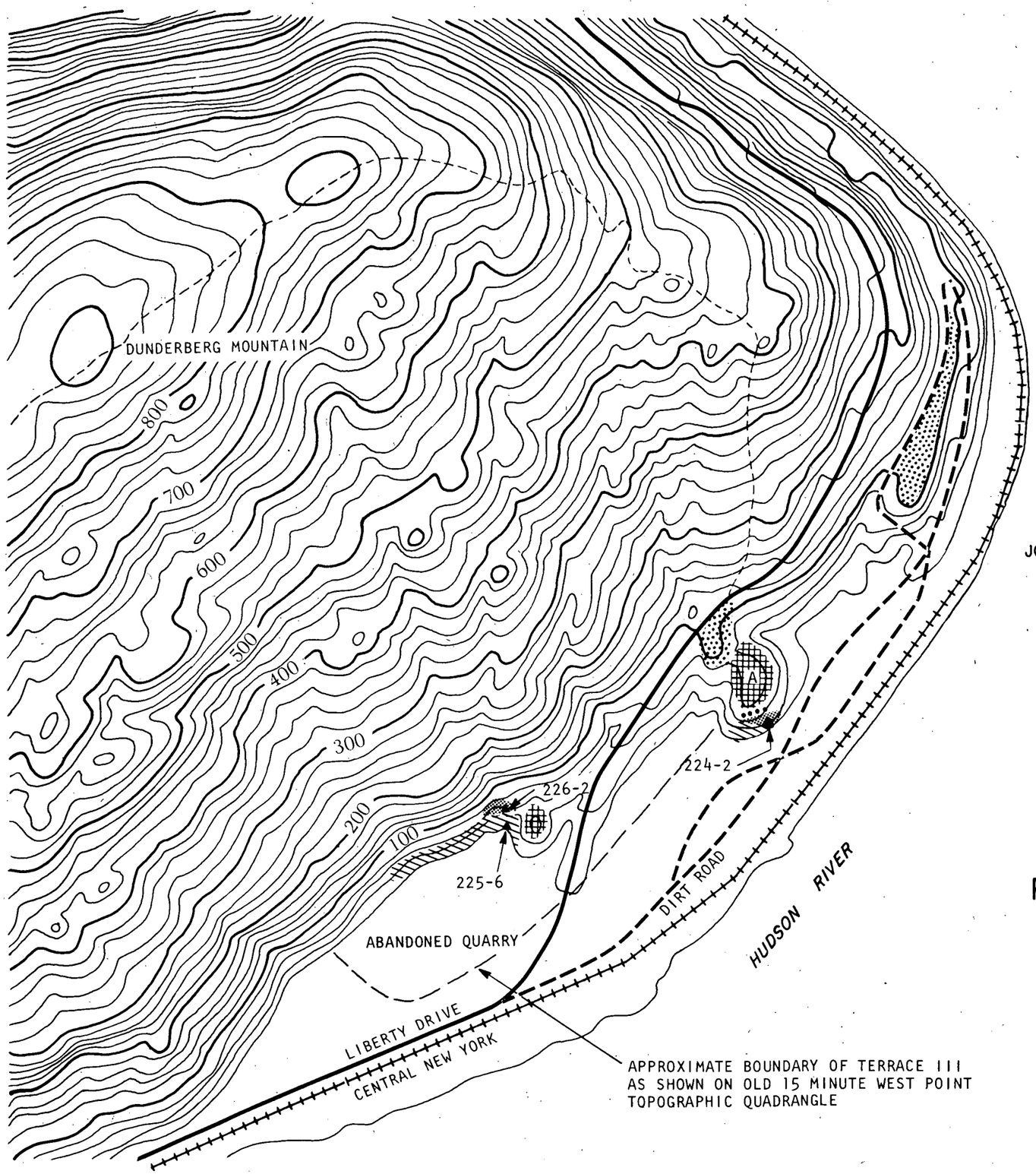
XW2 SURVEY POINTS ON SHORELINE SEGMENTS IDENTIFIED FROM SEDIMENTARY EVIDENCE.

•E5 SURVEY POINTS ON SHORELINE SEGMENTS IDENTIFIED FROM TOPOGRAPHIC EVIDENCE.

NOTE:

1. SURVEY DATA FOR SHORELINE SEGMENTS WERE PROVIDED BY CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
2. REFER TO PLATE F-1 FOR LOCATIONS OF SURVEY POINTS.

DAMES & MOORE




N

K E Y

- TERRACE I, GLACIOFLUVIAL SAND AND GRAVEL
- TERRACE II, GALCIOFLUVIAL SAND AND GRAVEL, "A" INDICATES 3 TO 4 FEET OF SAND CAPPING THE TERRACE
- TERRACE III, FLUVIAL SAND AND GRAVEL
- LACUSTRINE CLAY, SILT, AND FINE SAND
- .... POSSIBLE SLUMP SCAR
- ▲ 224-2 LOCATION OF OUTCROPS SHOWN IN PLATES F-5 THROUGH F-8

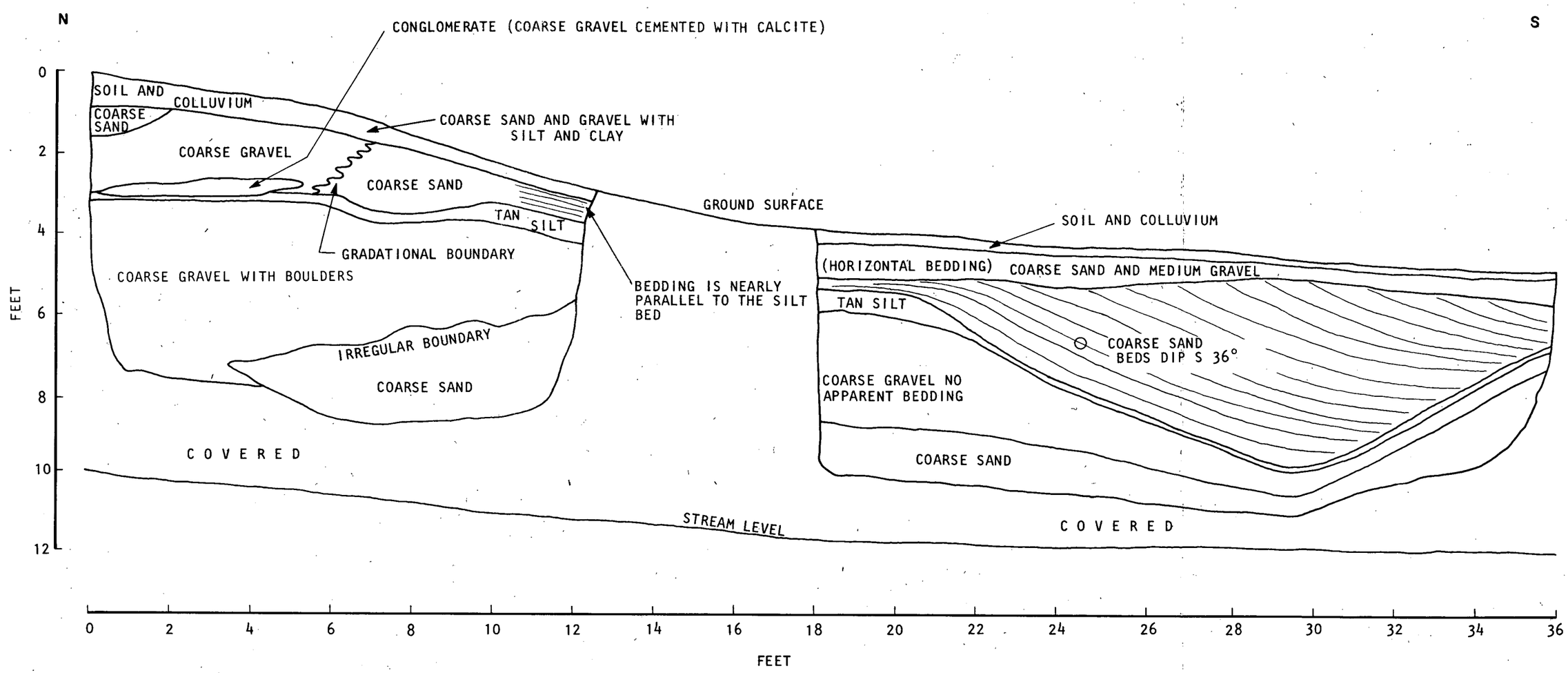
500 0 1000

FEET

# MAP OF PLEISTOCENE DEPOSITS, JONES POINT

NOTE: BASE MAP DRAWN FROM PEEKSKILL, N.Y., 7½ MINUTE TOPOGRAPHIC QUADRANGLE CONTOUR INTERVAL 20 FEET

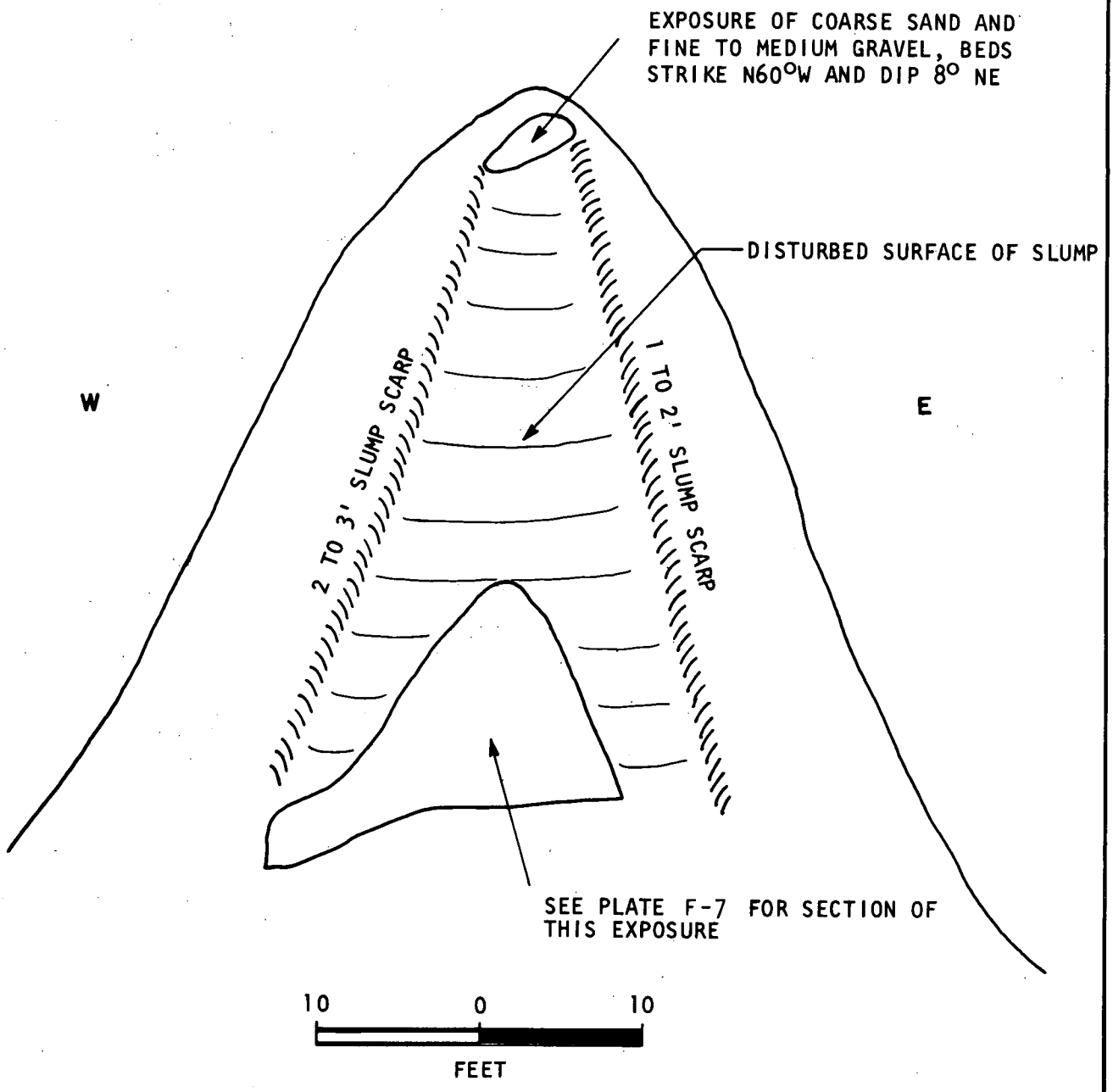
DAMES & MOORE




# CROSS SECTION OF DELTA DEPOSITS 225-6, QUARRY AT JONES POINT

NOTE:
REFER TOP PLATE F-4 FOR LOCATION OF SECTION

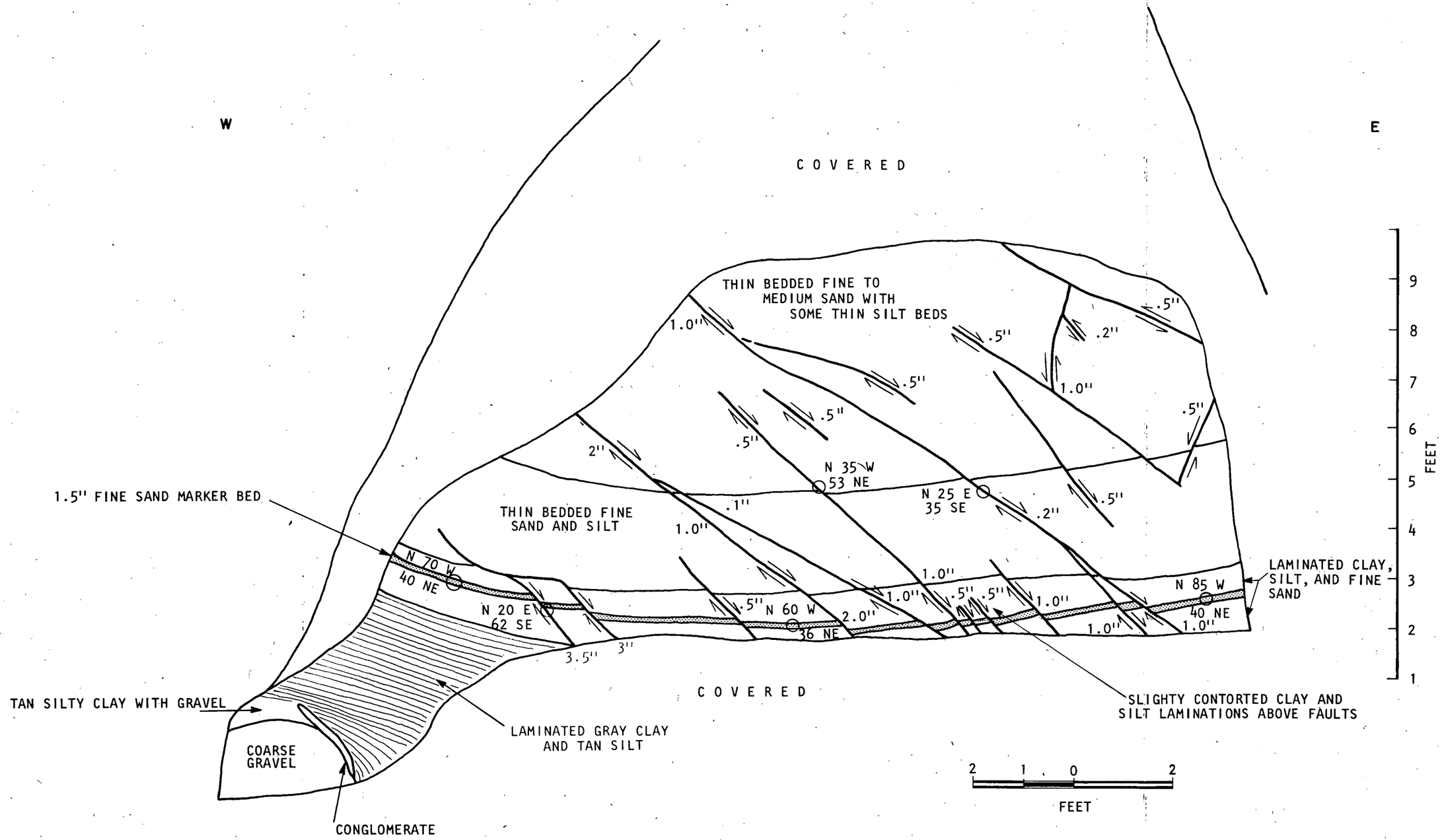
DAMES & MOORE




# SKETCH OF
# SLUMP FEATURE 224-2, JONES POINT
## (ELEVATION VIEW)

NOTE:
REFER TO PLATE F-4 FOR LOCATION OF EXPOSURE

DAMES & MOORE




# SLUMP FEATURE 224-2, JONES POINT

(ELEVATION VIEW)

KEY:

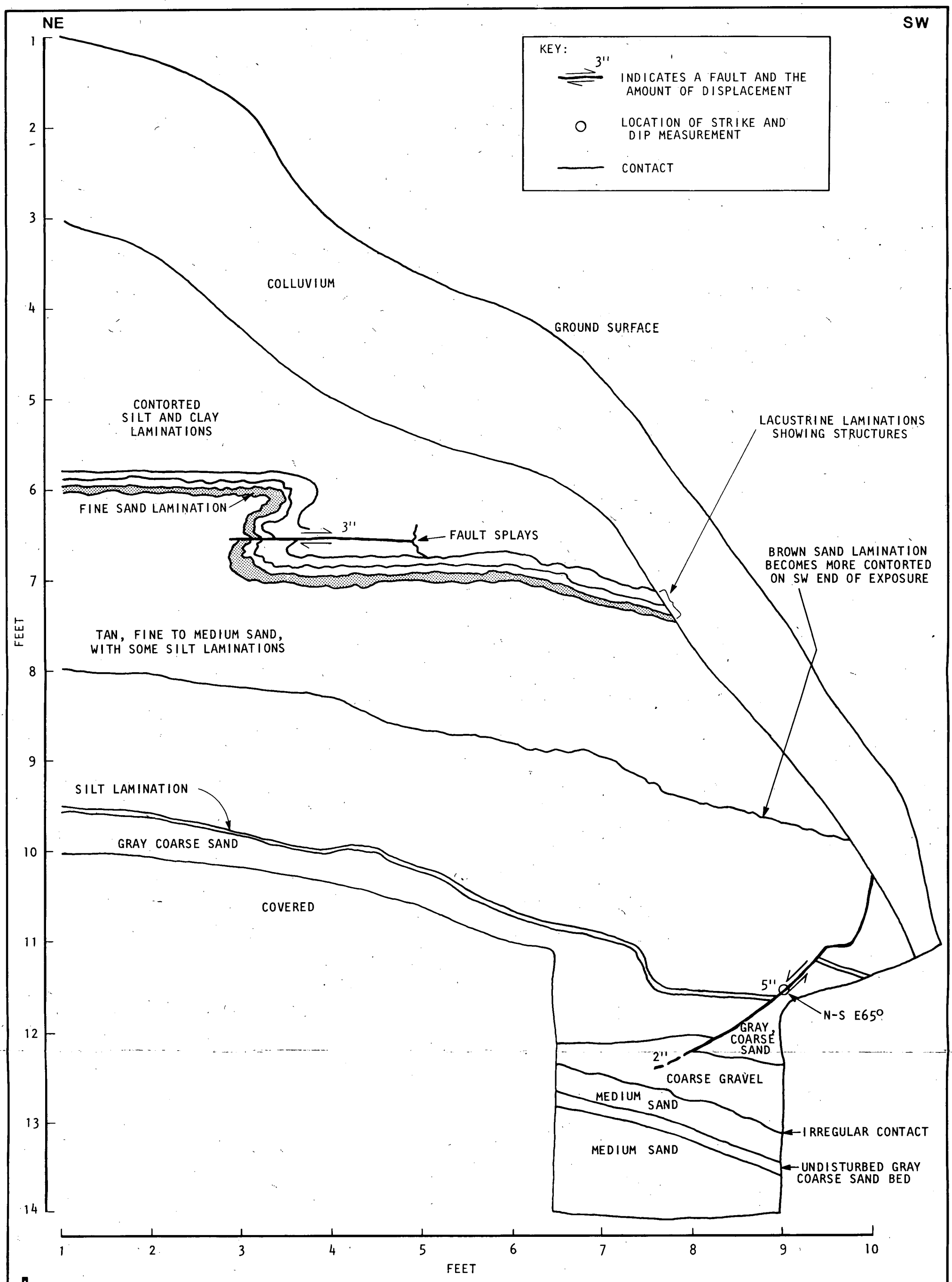
1.0" INDICATES A FAULT AND THE AMOUNT OF DISPLACEMENT

LOCATION OF STRIKE AND DIP MEASUREMENTS

CONTACT

NOTE:
REFER TO PLATES F-4 AND F-6 FOR LOCATION OF SECTION

DAMES & MOORE




# DISTURBED LACUSTRINE DEPOSITS

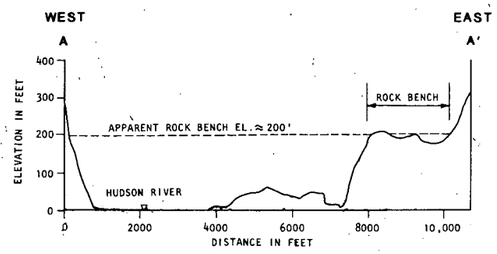
## 226-2, JONES POINT

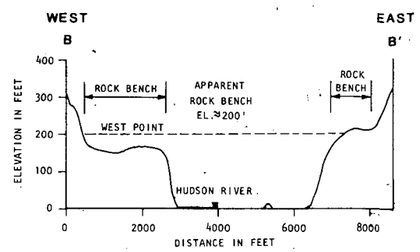
(CROSS SECTIONAL VIEW)

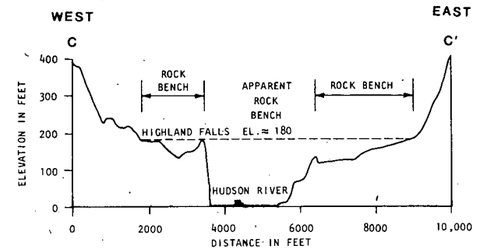
NOTE:
REFER TO PLATE F-4 FOR LOCATION OF SECTION.

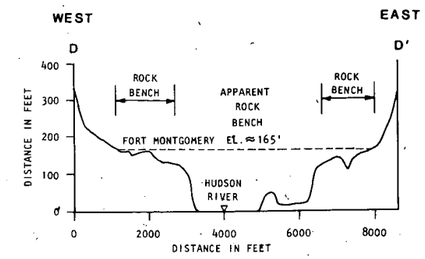
DAMES & MOORE

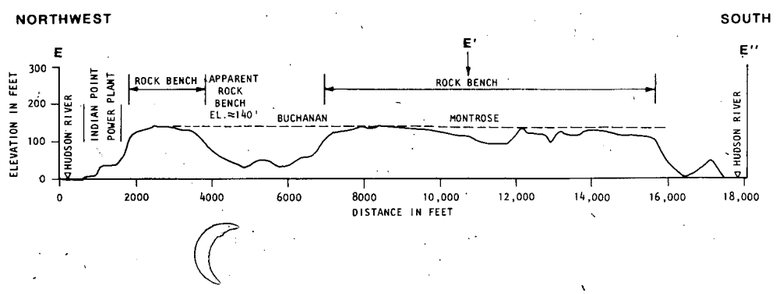
PLATE F-8

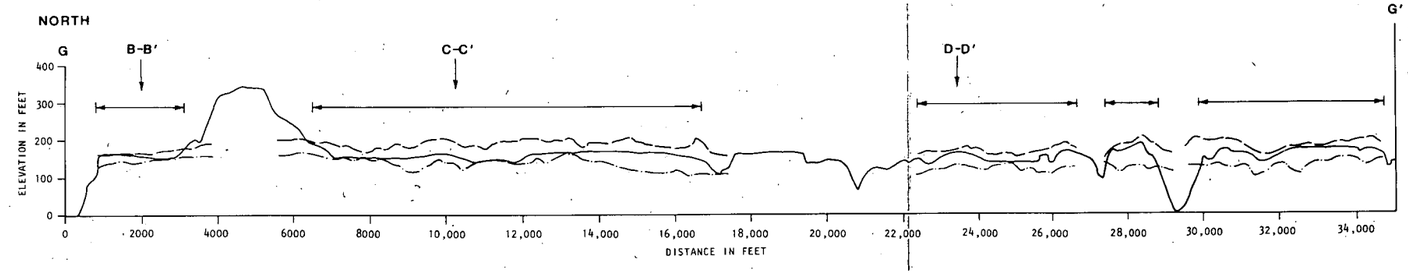


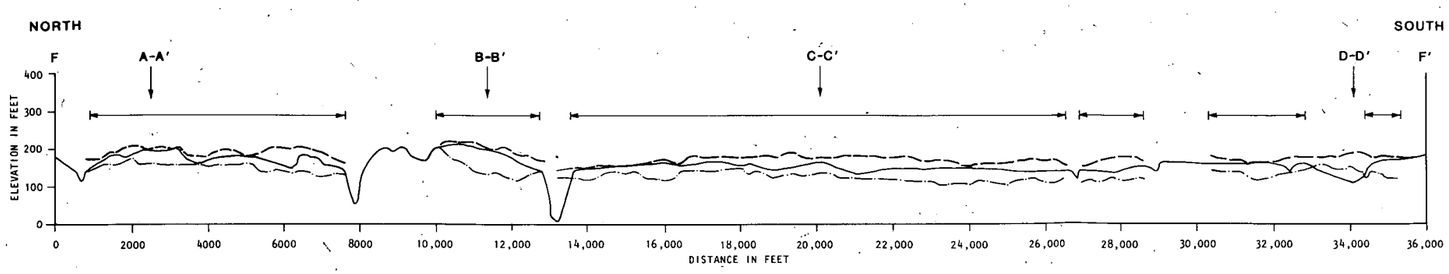




# ROCK BENCH CROSS SECTIONS

KEY:

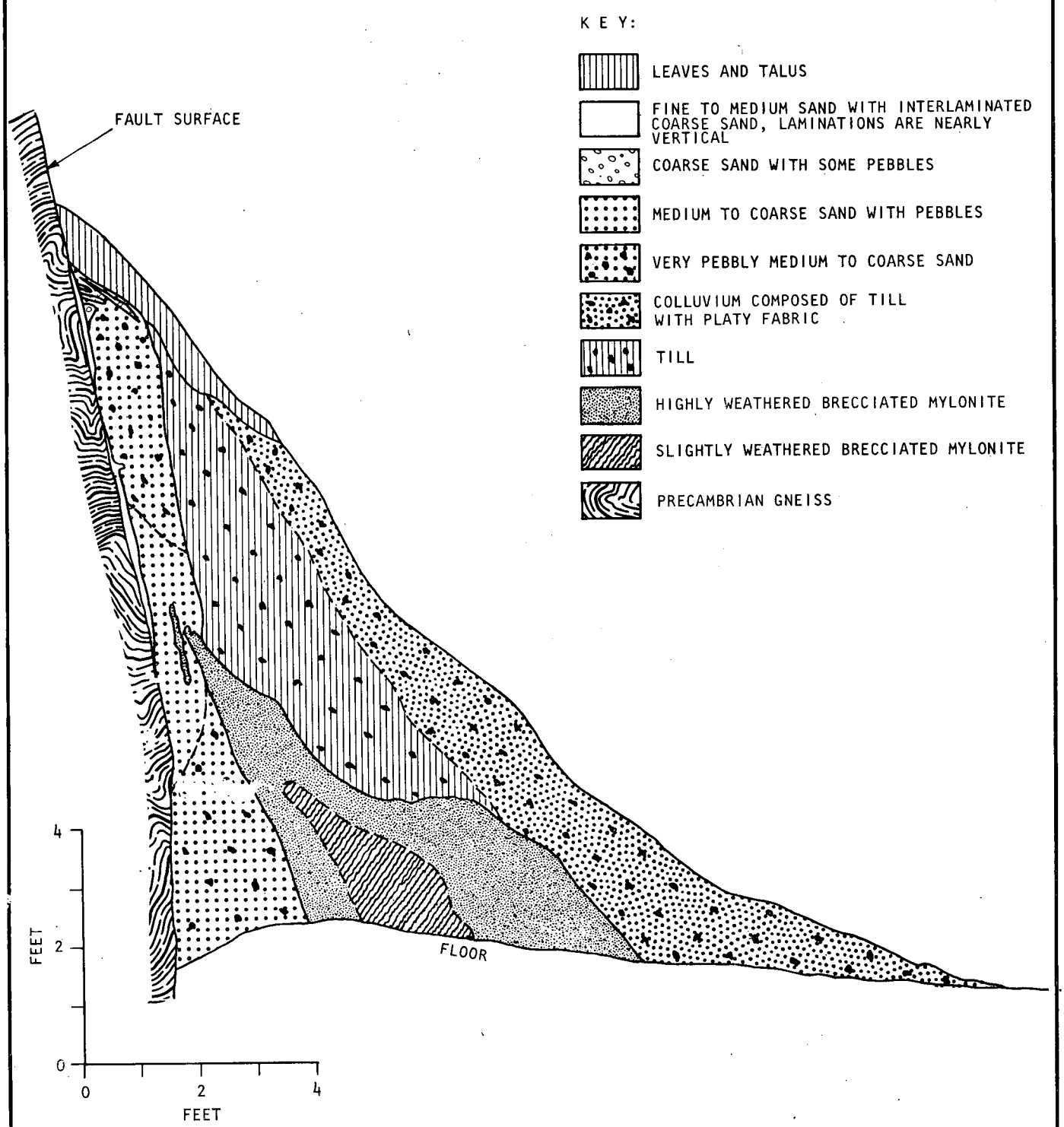
A — A' TOPOGRAPHIC CROSS-SECTION (REFER TO PLATE F-1 FOR LOCATION)

INDICATES THE PORTIONS OF THE CROSS-SECTIONS THAT CROSS THE ROCK BENCH

PROJECTED PROFILE OF THE HIGHEST ELEVATIONS ON THE ROCK BENCH REMNANTS (SKYLINE VIEW). THIS PROFILE WAS CONSTRUCTED BY PLOTTING THE HIGHEST ELEVATION OF THE ROCK BENCH ALONG PROJECTION LINES PERPENDICULAR TO LONGITUDINAL PROFILES G-G' AND F-F'. THE SPACING OF THE PROJECTION LINES WAS 200 FEET.

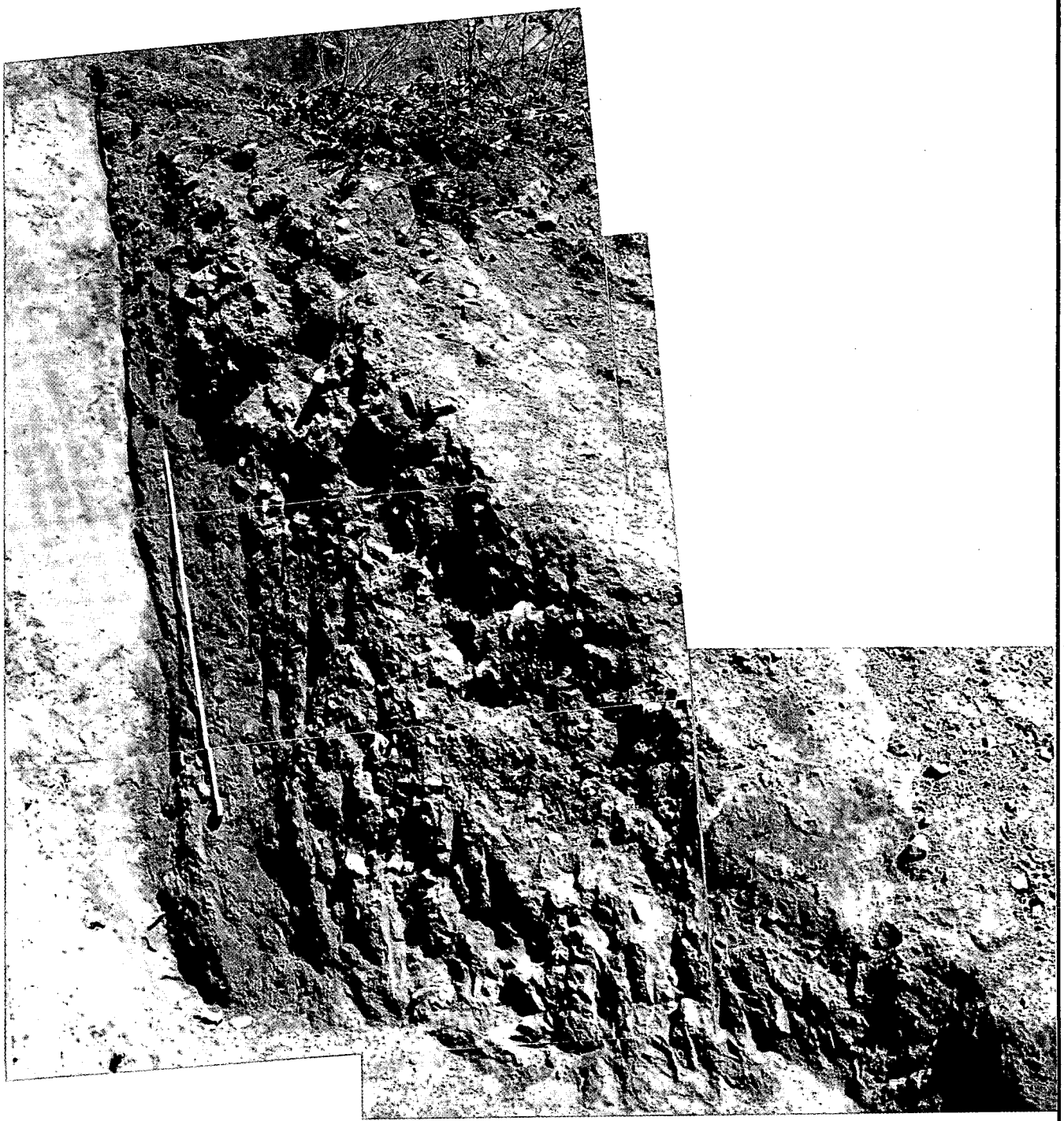
PROJECTED PROFILE OF THE LOWEST ELEVATIONS ON THE ROCK BENCH REMNANTS. THIS PROFILE WAS CONSTRUCTED BY PLOTTING THE LOWEST ELEVATION OF THE ROCK BENCH ALONG PROJECTION LINES PERPENDICULAR TO LONGITUDINAL PROFILES G-G' AND F-F'. THE SPACING OF THE PROJECTION LINES WAS 200 FEET.

DAMES & MOORE




# TRENCH A - MOTT FARM ROAD
## VIEW IS N 45 E

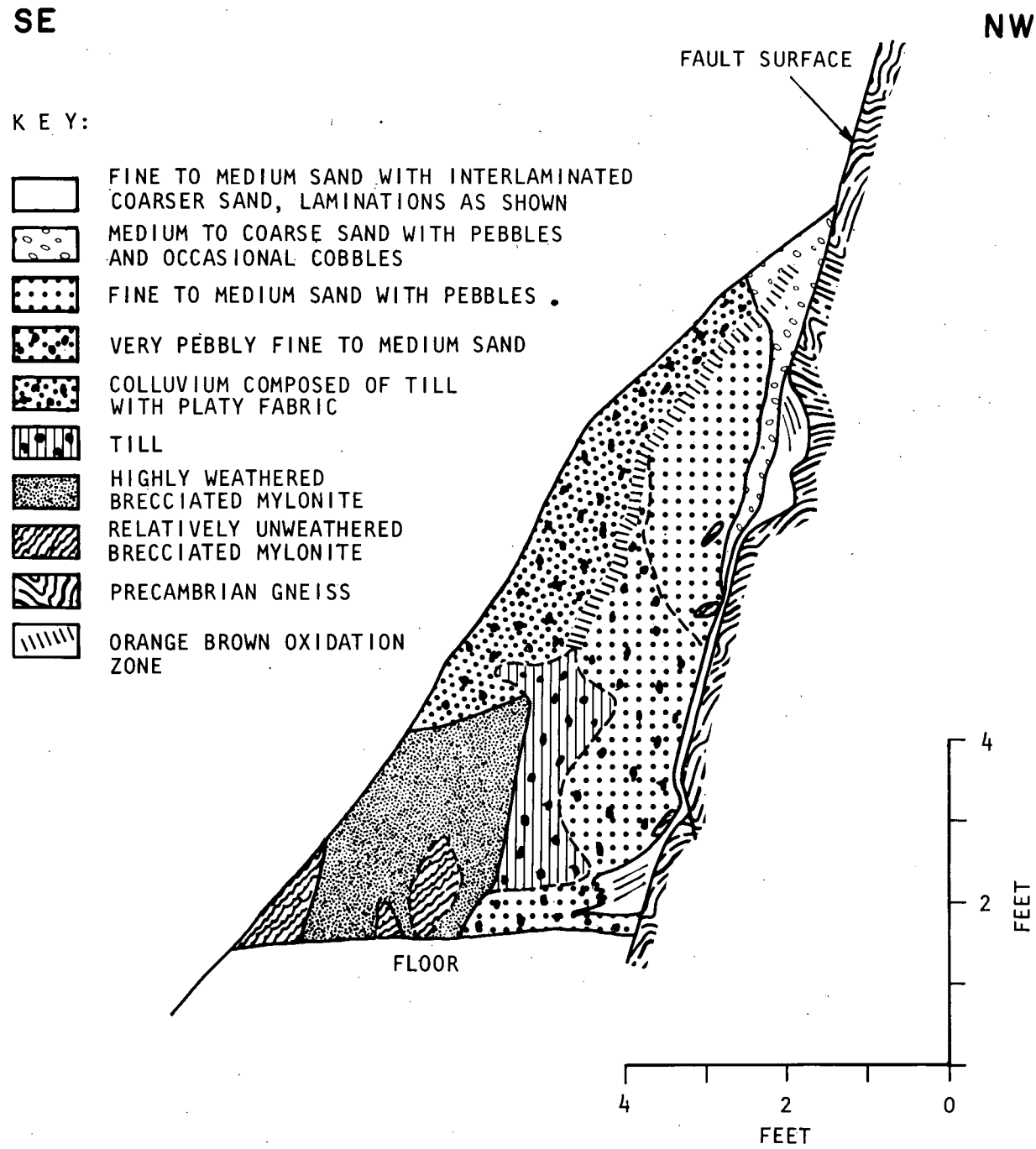
DAMES & MOORE



PHOTOGRAPH TRENCH A
MOTT FARM ROAD
VIEW IS NORTHEAST

NOTE: TAPE LENGTH = 4 FEET

DAMES & MOORE

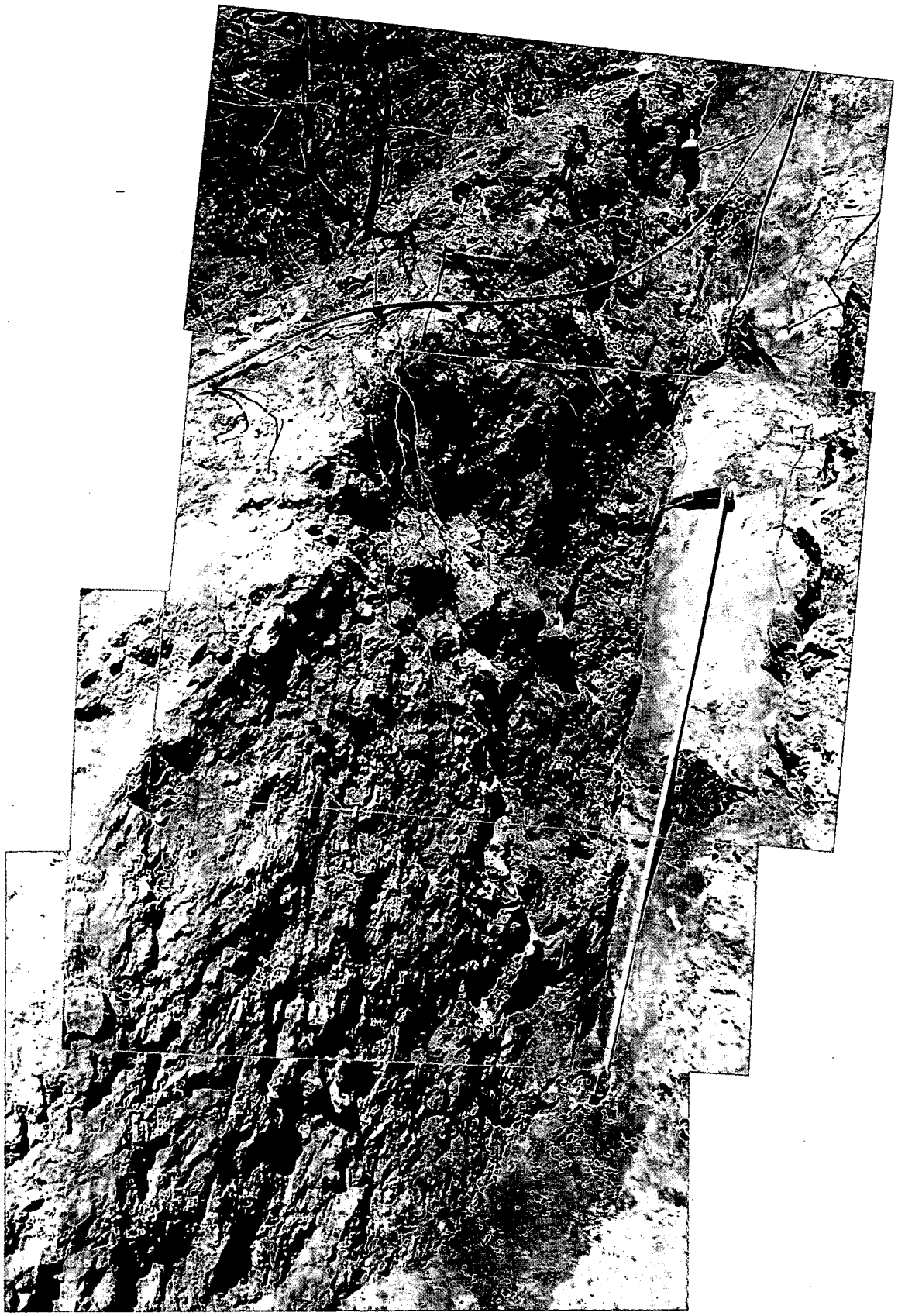



# TRENCH B - MOTT FARM ROAD

## VIEW IS S 60 W

DAMES & MOORE

PLATE F-12



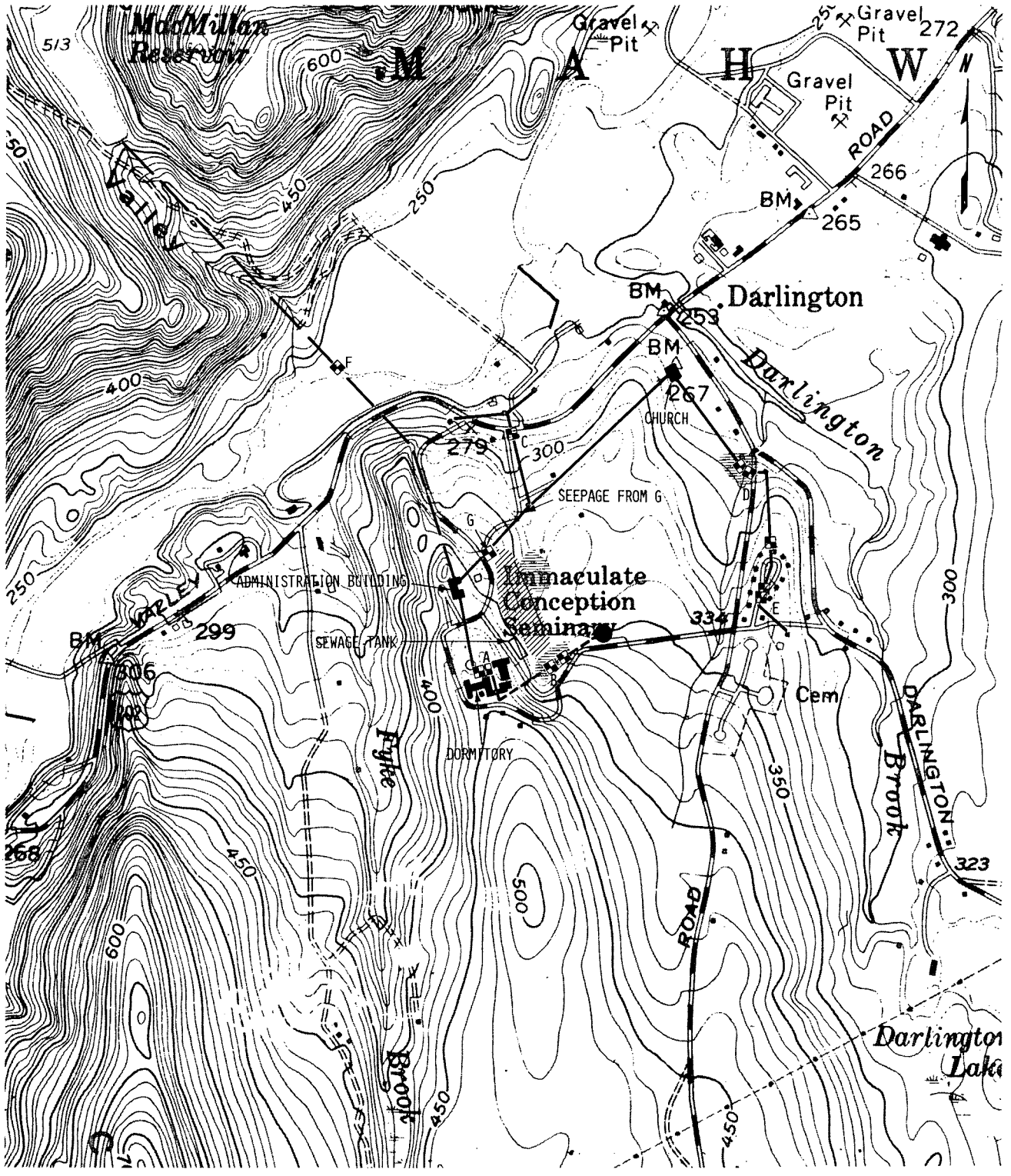
PHOTOGRAPH TRENCH B

MOTT FARM ROAD

VIEW IS SOUTHWEST

NOTE: TAPE LENGTH = 4 FEET

DAMES & MOORE




# MAP: SHOWING LOCATION OF WATER LINE BREAKS AT IMMACULATE CONCEPTION SEMINARY, DARLINGTON, NEW JERSEY

0 500 1000 1500

SCALE IN FEET
CONTOUR INTERVAL - 10'

KEY:

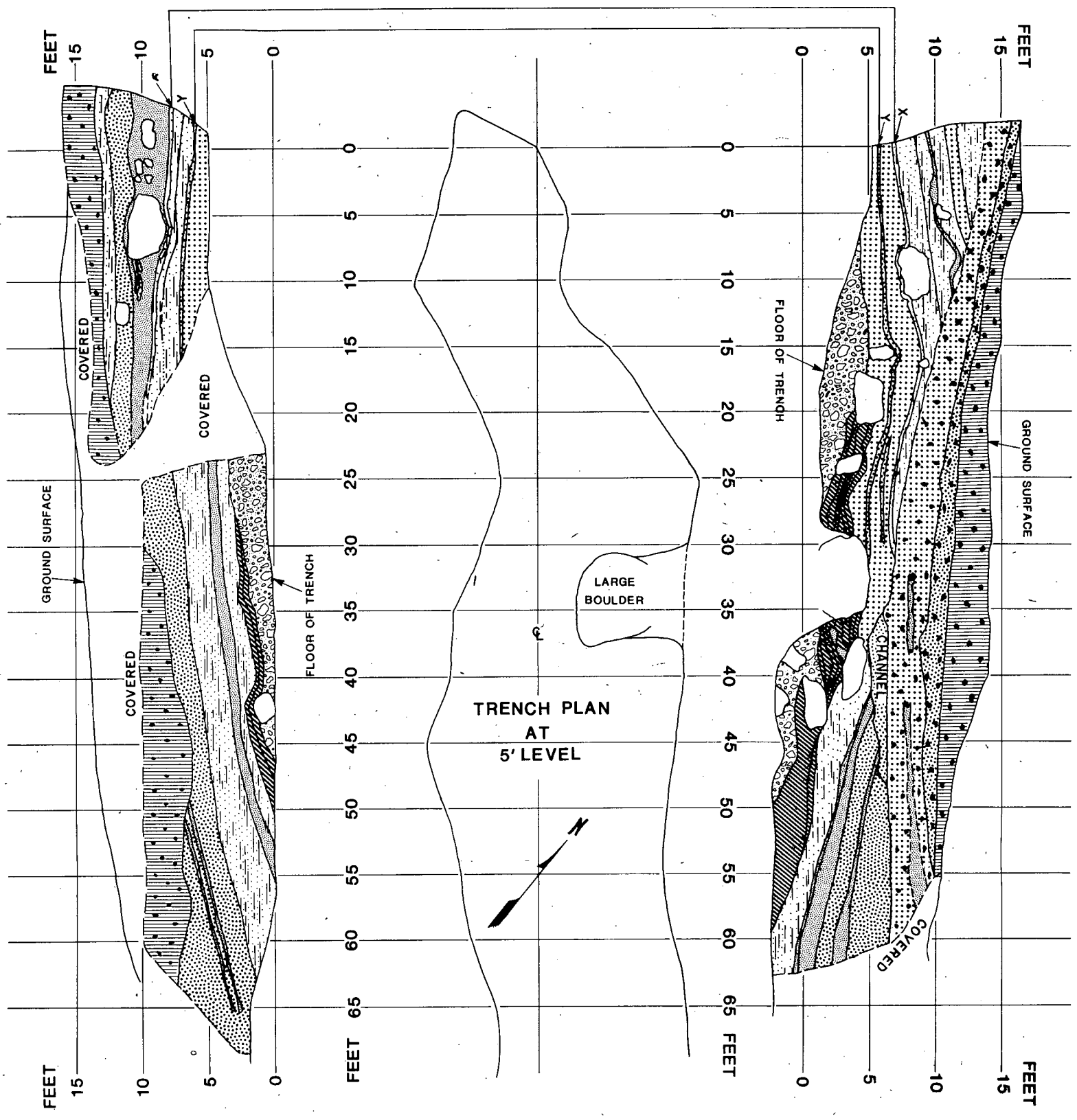
- ● WELLS (400+ FEET DEEP)
- A ■ APPROXIMATE LOCATIONS OF WATER LINE BREAKS AND NOTATION REFERRED TO IN THE TEXT
- APPROXIMATE LOCATION OF 6 INCH WROUGHT IRON WATER LINE
- APPROXIMATE LOCATION OF 6 INCH CAST IRON WATER LINE
- APPROXIMATE LOCATION OF 4 INCH CAST IRON WATER LINE
- MARSHY AREAS
- AREA OF OBSERVED MASS WASTAGE FEATURES

REFERENCE:

BASE MAP PREPARED FROM RAMSEY, N.J. (1955); U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE.

DAMES & MOORE

PLATE F-14

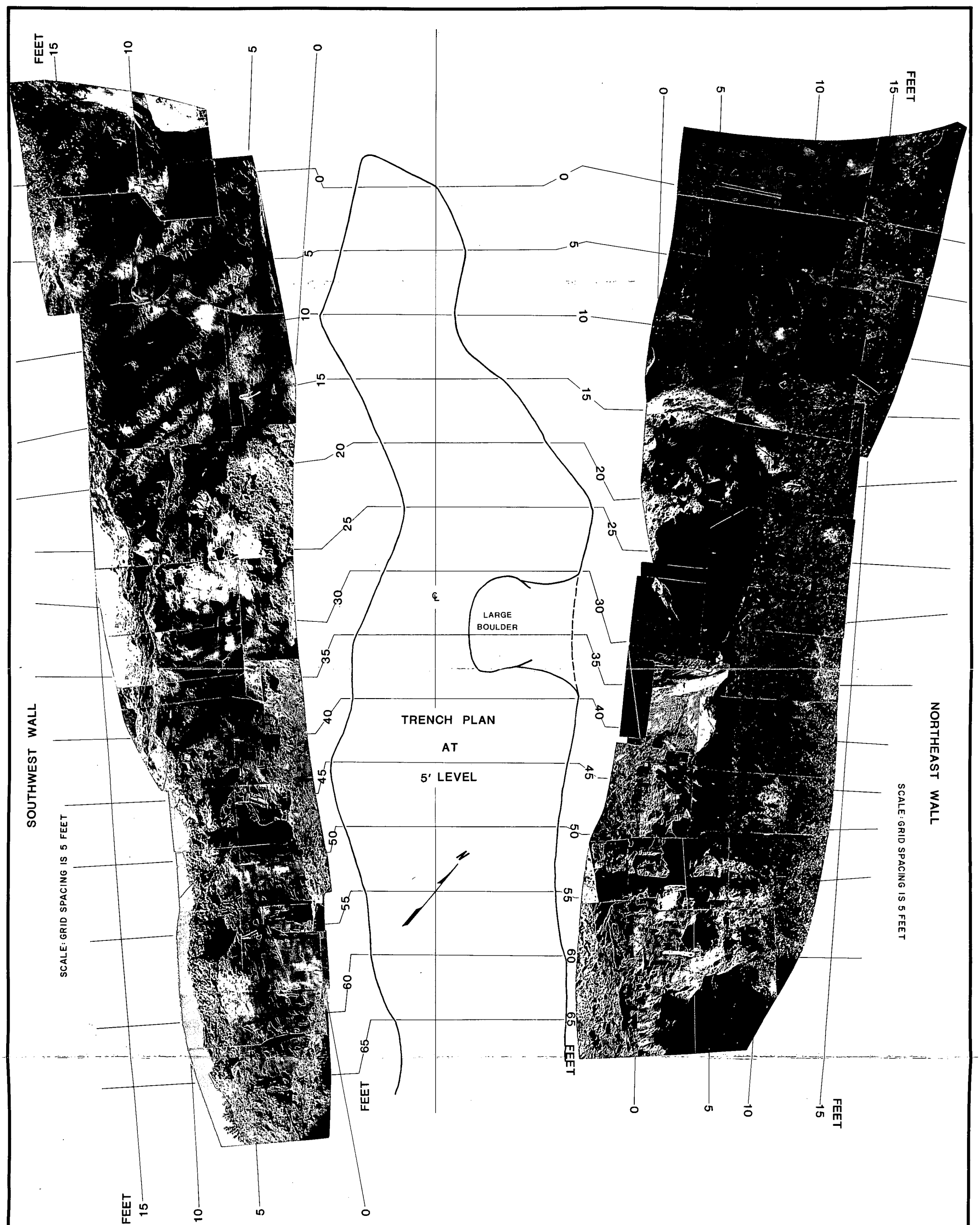



KEY:

- GRAVEL DISTURBED BY QUARRYING (FILL)
- SANDY GRAVEL WITH ORGANIC MATERIAL
- POORLY SORTED GRAVEL
- WELL SORTED VERY FINE TO FINE SAND
- WELL SORTED MEDIUM TO FINE SAND
- SILTY SAND
- SILTY PEBBLY SAND
- LAMINATED CLAY AND SILT OR SILT AND VERY FINE SAND
- TILL
- BOULDER OR LARGE COBBLE
- X UPPER MARKER BED
- Y LOWER MARKER BED

NOTE: GRID SPACING IS 5 FEET

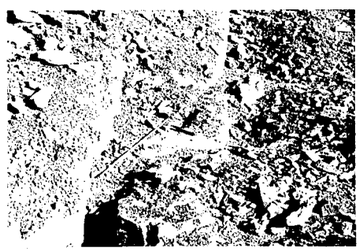
# SKETCHES OF TRENCH AT STAG HILL




PHOTOGRAPH OF TRENCH AT STAG HILL

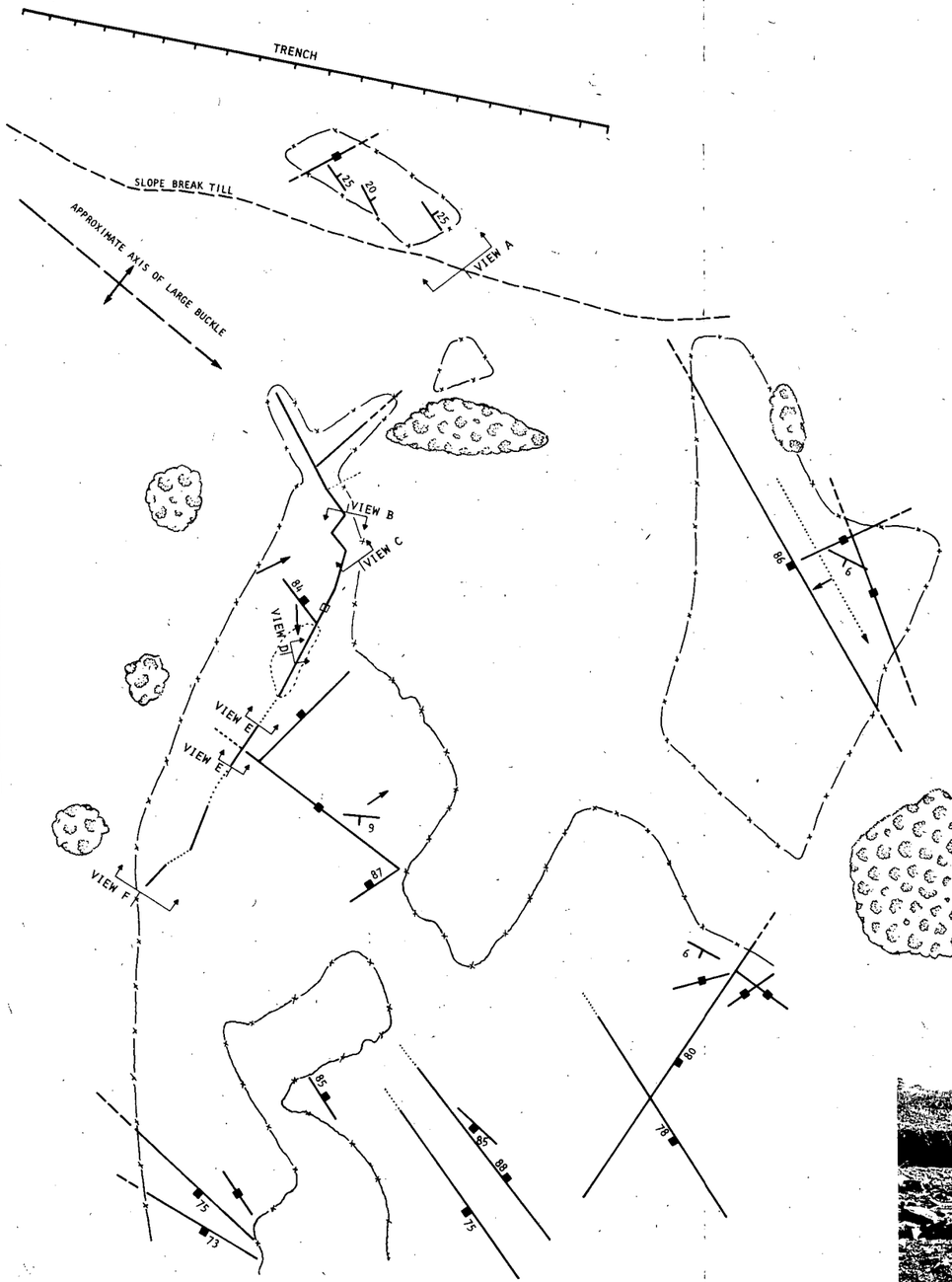
DAMES & MOORE

VIEW B
TAPE = 3 FEET



VIEW C
TAPE = 3 FEET

VIEW F
HAMMER ≈ 1 FOOT



VIEW A
TAPE = 3 FEET

VIEW D
TAPE = 1 FOOT

VIEW E
TAPE = 3 FEET

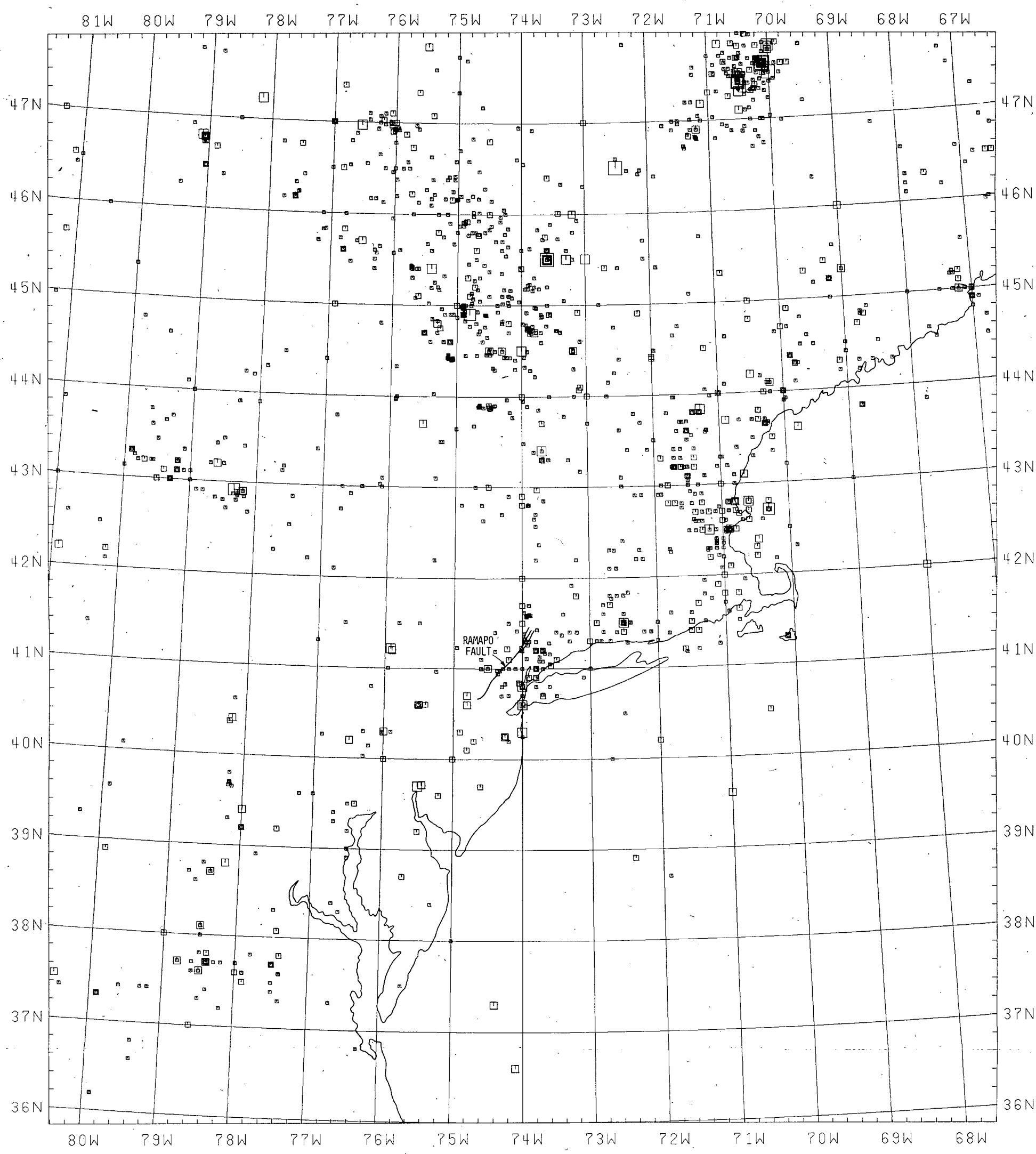
KEY :

- VEGETATION
- STRIKE AND DIP OF BEDDING
- TREND OF GLACIAL STRIATIONS
- STRIKE AND DIP OF JOINT
- STRIKE OF VERTICAL JOINT
- STRIKE OR VERTICAL OPEN JOINT
- AXIAL TREND OF UPWARD
- LIMIT OF EXPOSED BEDROCK

0 20 40
SCALE IN FEET

# PHOTOGRAPHS OF SOUTH END OF CENTRAL NYACK OUTCROP
## WITH MAP SHOWING POSITION OF VIEWS

DAMES & MOORE




# EPICENTER MAP OF NORTHEASTERN UNITED STATES

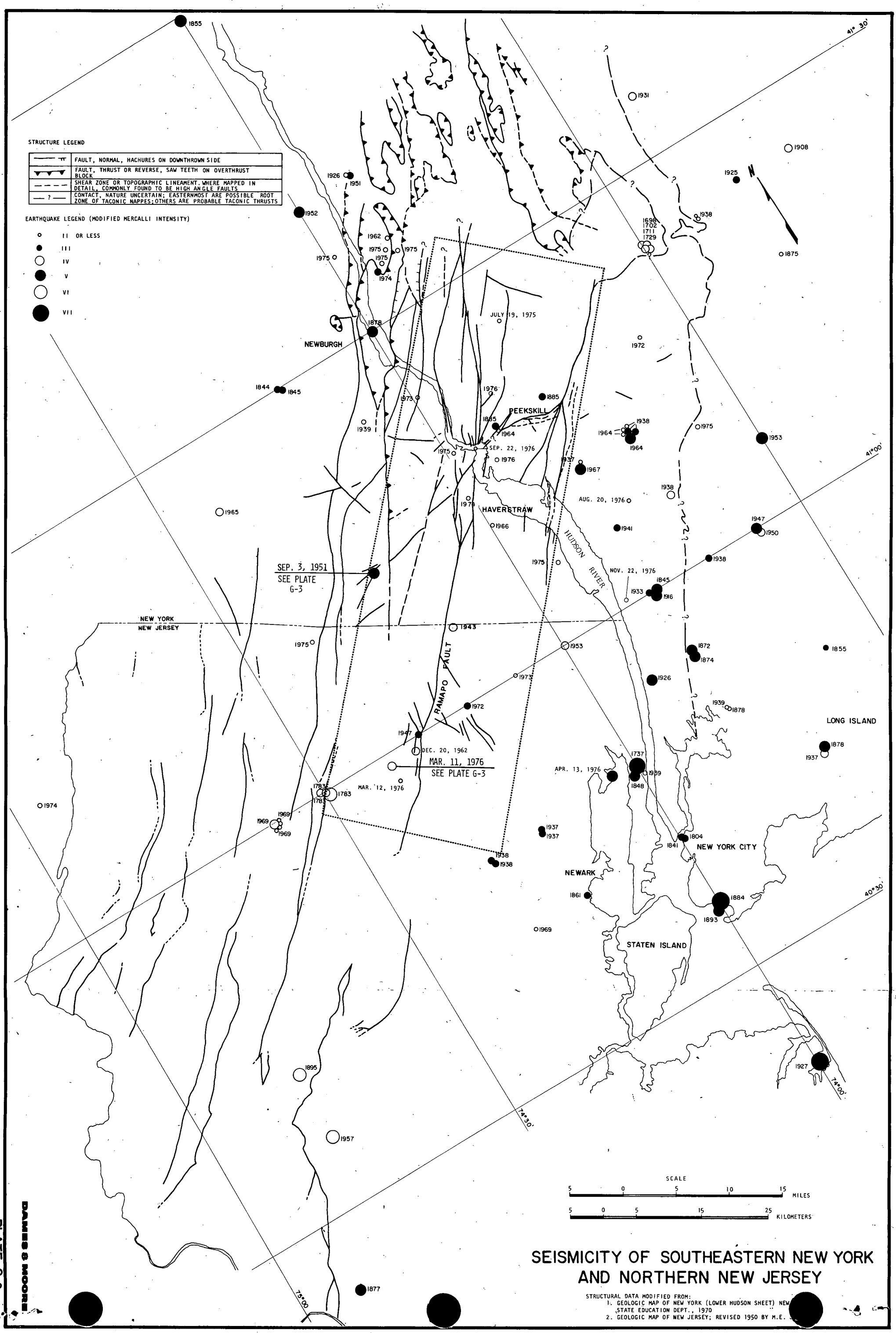
LEGEND:

(MODIFIED MERCALLI INTENSITY)

- IV OR LESS
- V
- VI
- VII
- VIII
- IX
- X

DAMES & MOORE

PLATE G-1

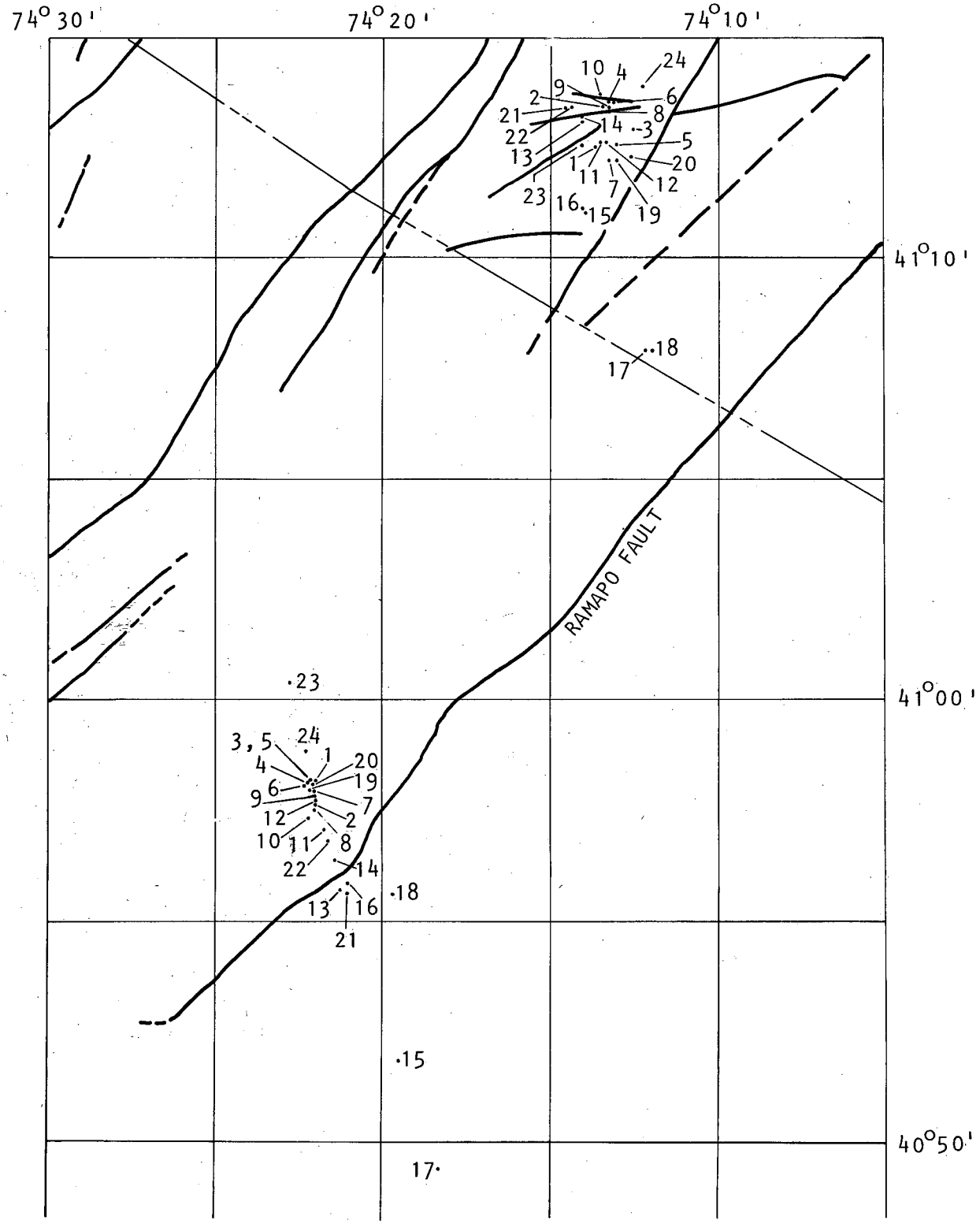



# SEISMICITY OF SOUTHEASTERN NEW YORK AND NORTHERN NEW JERSEY

STRUCTURAL DATA MODIFIED FROM:
1. GEOLOGIC MAP OF NEW YORK (LOWER HUDSON SHEET) NEW STATE EDUCATION DEPT., 1970
2. GEOLOGIC MAP OF NEW JERSEY; REVISED 1950 BY M.E.

DAMES & MOORE

PLATE G-2

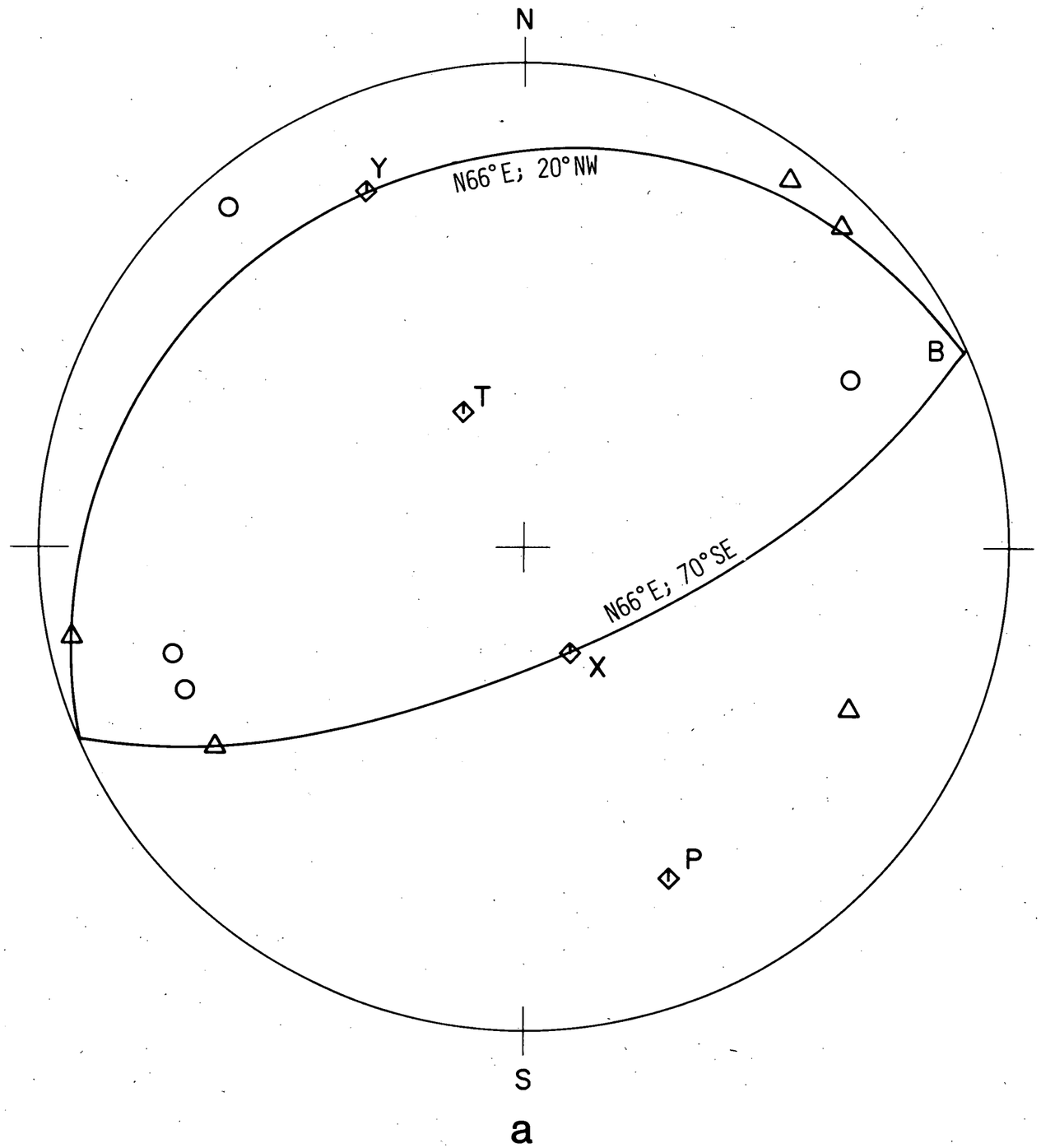



DIFFERENT SOLUTIONS FOR THE LOCATIONS OF SEPTEMBER 3, 1951 AND MARCH 11, 1976 EARTHQUAKES.

THE NUMBERS REFER TO TABLES G-4 AND G-6

DAMES & MOORE

PLATE G-3




# FOCAL MECHANISM FOR JULY 19, 1975 EARTHQUAKE

## LOWER HEMISPHERE PLOT

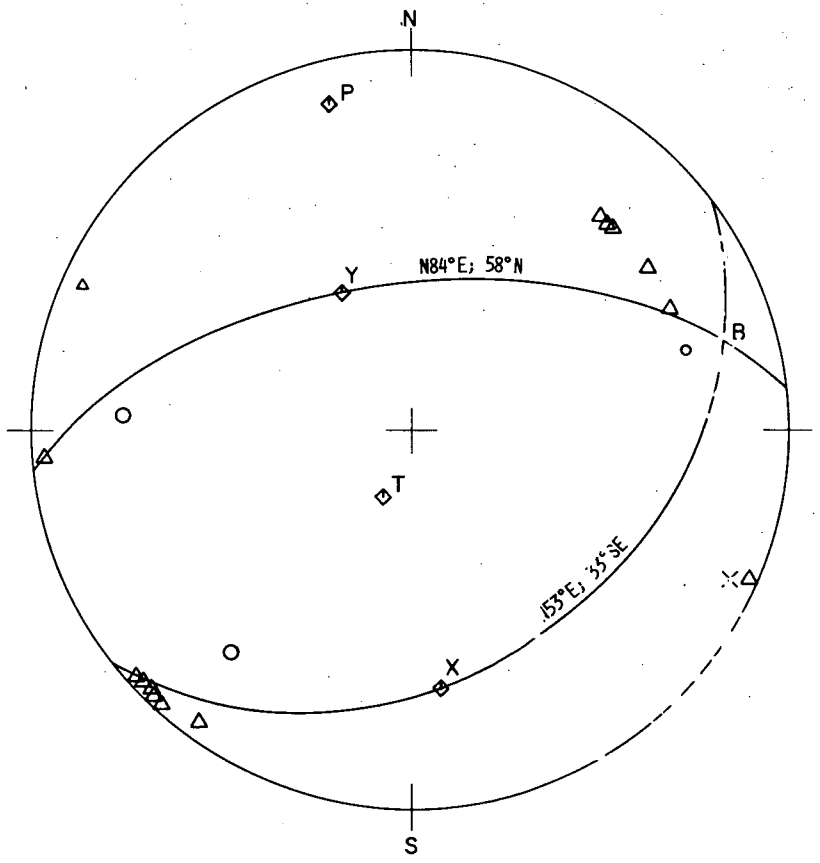
LEGEND:

○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
△ DILATATION } SYMBOLS OF SMALLER SIZE

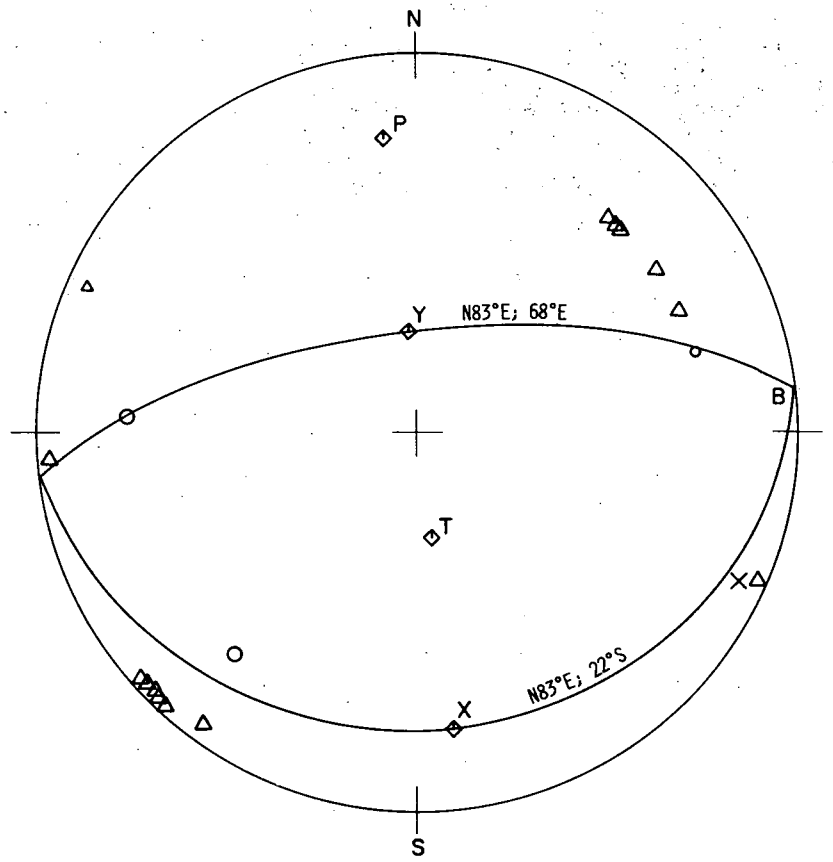
◇ MECHANISM AXES

P = PRESSURE  T = TENSION  X,Y = POLES

DAMES & MOORE




a




b

# FOCAL MECHANISM FOR MARCH 11, 1976 EARTHQUAKE

## LOWER HEMISPHERE PLOT

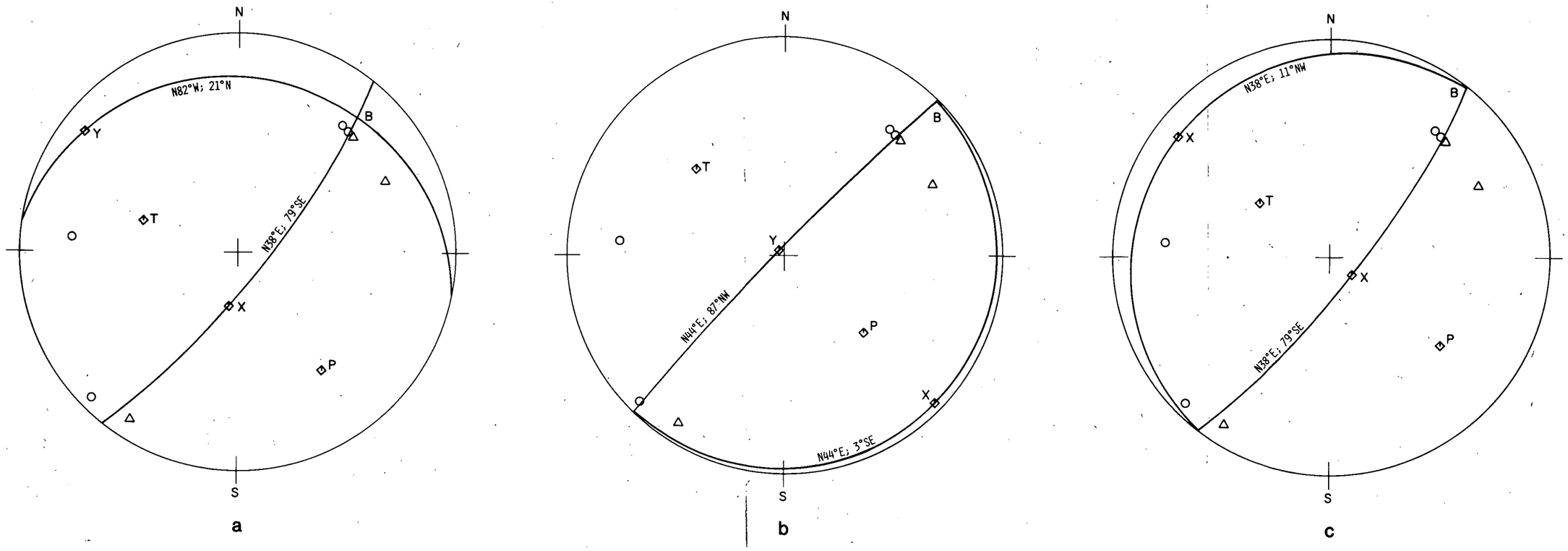
LEGEND:

- ○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
- △ DILATATION } SYMBOLS OF SMALLER SIZE
- × NODAL ARRIVAL OR VERY SMALL DILATATION AT OGD
- ◇ MECHANISM AXES

P = PRESSURE  T = TENSION  X,Y = POLES

DAMES & MOORE

PLATE G-5




# FOCAL MECHANISM FOR MARCH 12, 1976 EARTHQUAKE

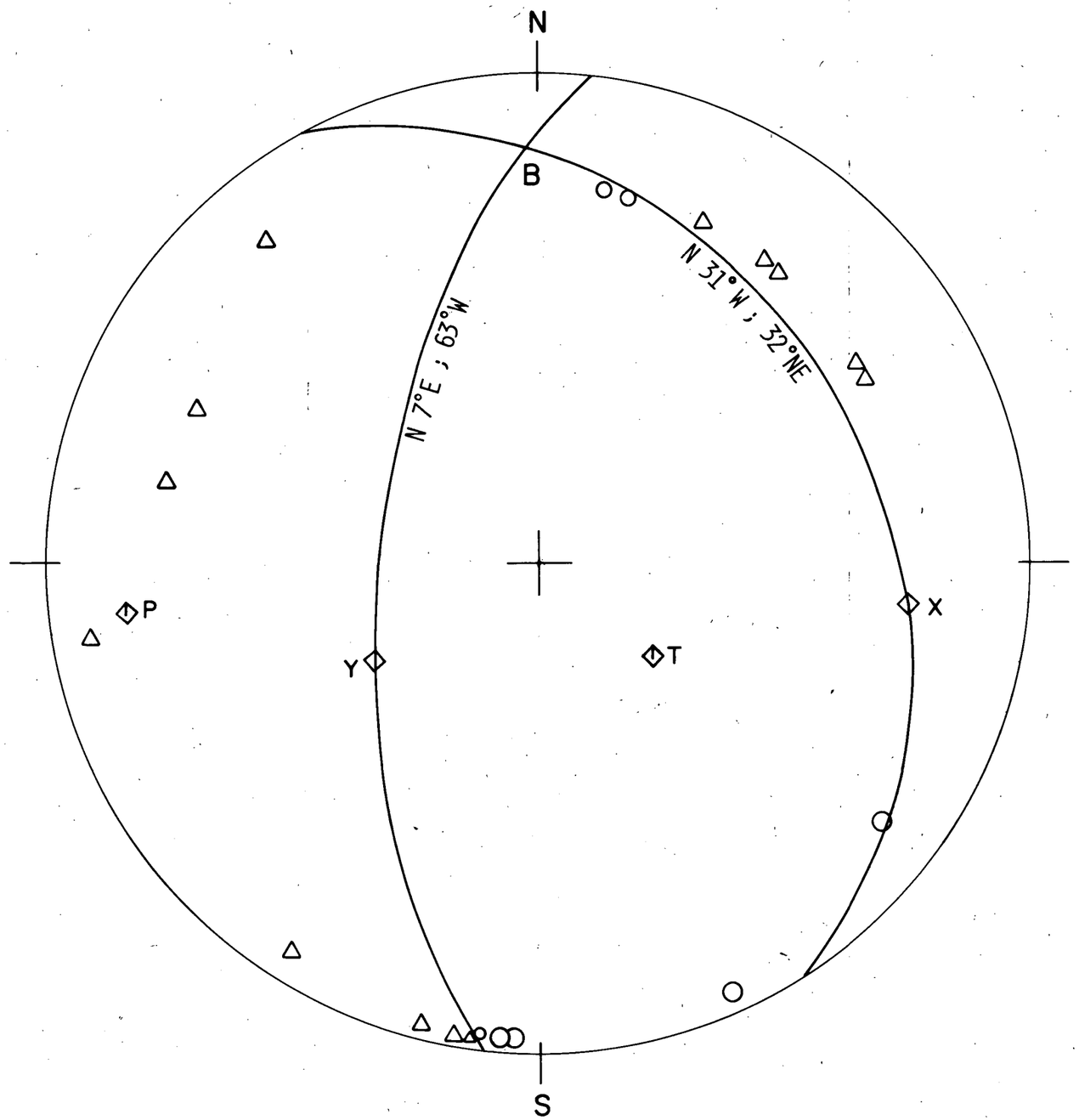
**LOWER HEMISPHERE PLOT**

LEGEND:

- ○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
- △ DILATATION } SYMBOLS OF SMALLER SIZE
- ◇ MECHANISM AXES

P = PRESSURE  T = TENSION  X,Y = POLES

DAMES & MOORE




# FOCAL MECHANISM FOR APRIL 13, 1976 EARTHQUAKE

## LOWER HEMISPHERE PLOT

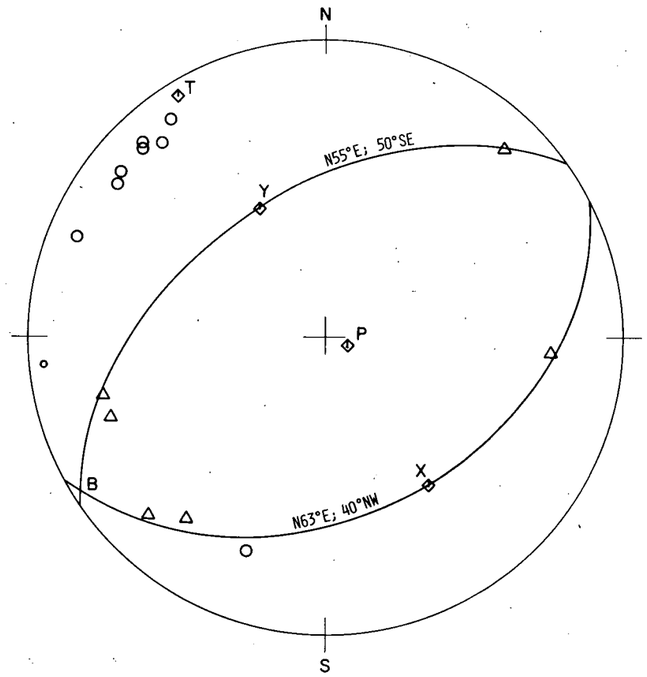
LEGEND :

○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
△ DILATATION } SYMBOLS OF SMALLER SIZE

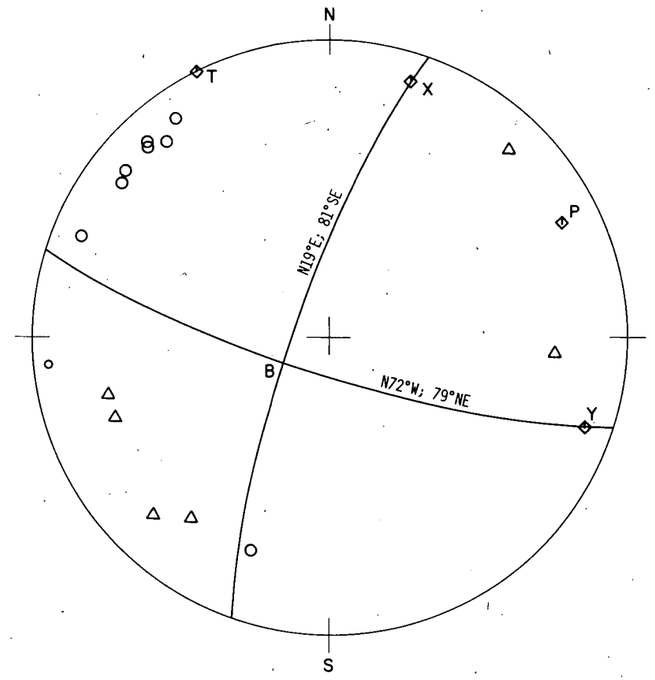
◇ MECHANISM AXES
P = PRESSURE T = TENSION X,Y = POLES

DAMES & MOORE

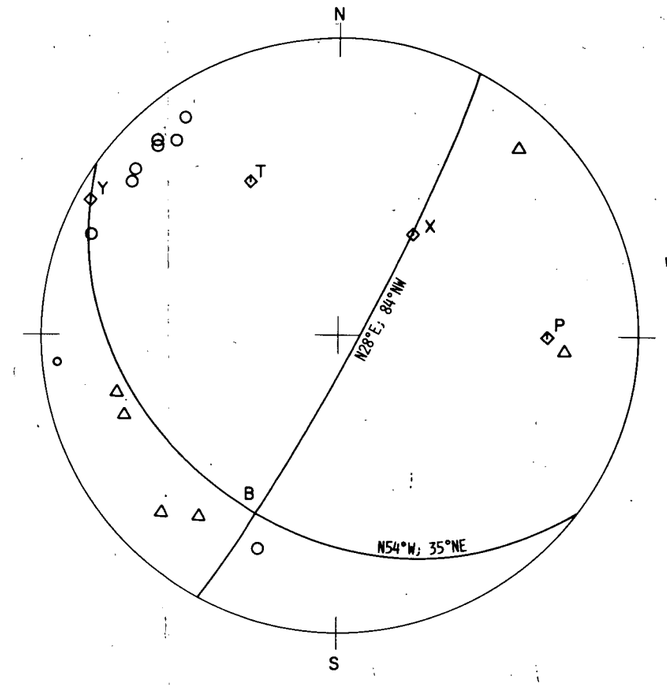
PLATE G-7




a




b




c

# FOCAL MECHANISM FOR AUGUST 20, 1976 EARTHQUAKE

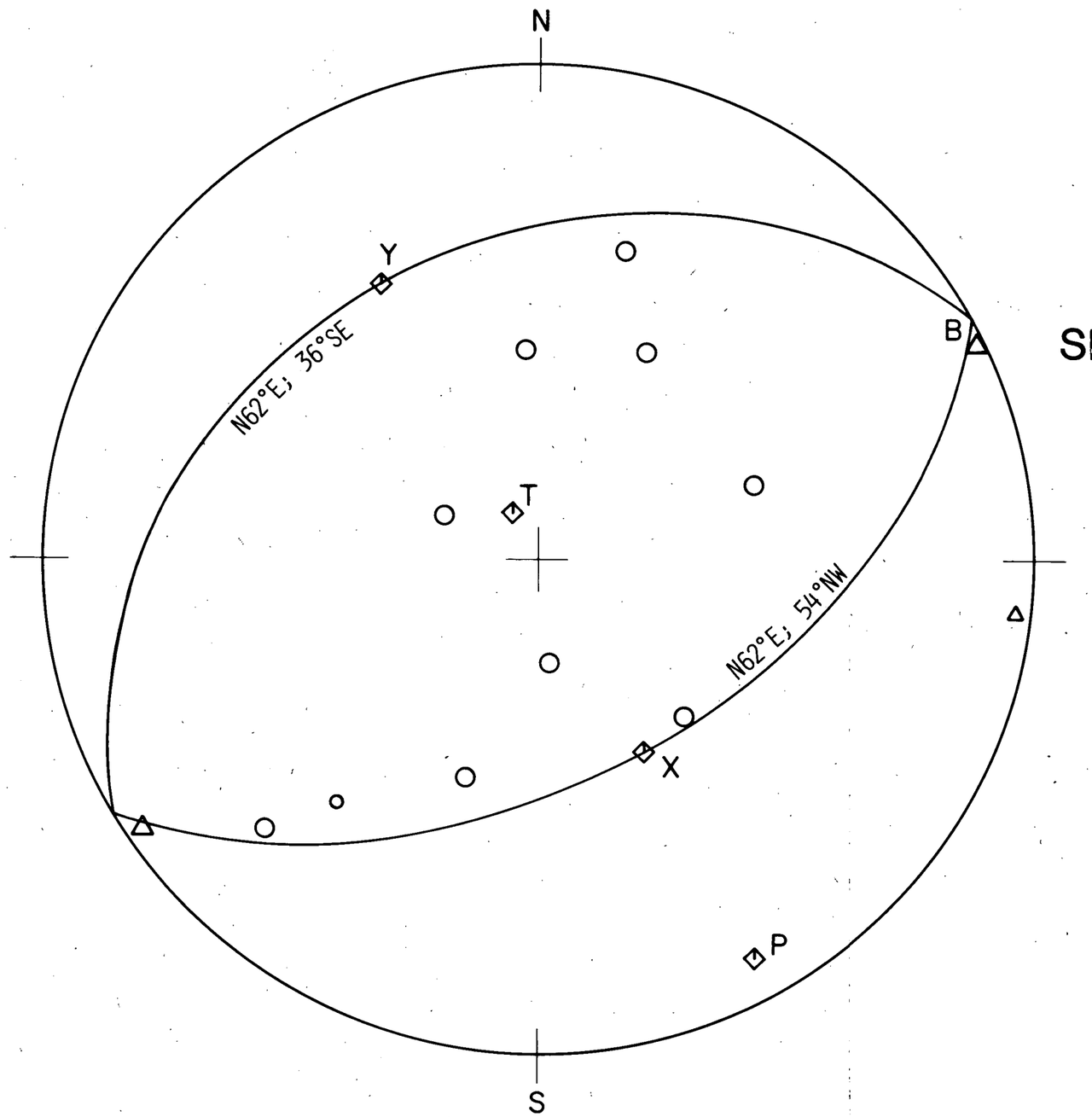
**UPPER HEMISPHERE PLOT**

LEGEND:

- ○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
- △ DILATATION } SYMBOLS OF SMALLER SIZE
- ◇ MECHANISM AXES

P = PRESSURE  T = TENSION  X,Y = POLES

DAMES & MOORE




a

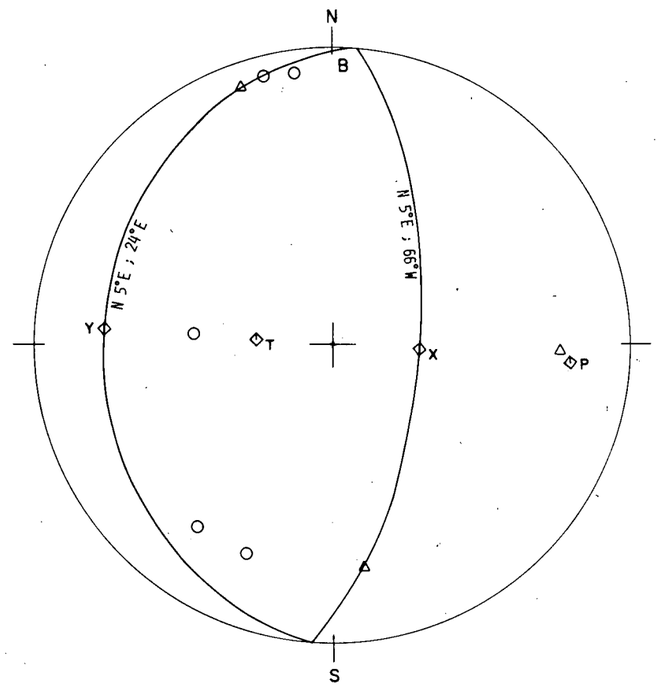
# FOCAL MECHANISM FOR SEPTEMBER 22, 1976 EARTHQUAKE

## UPPER HEMISPHERE PLOT

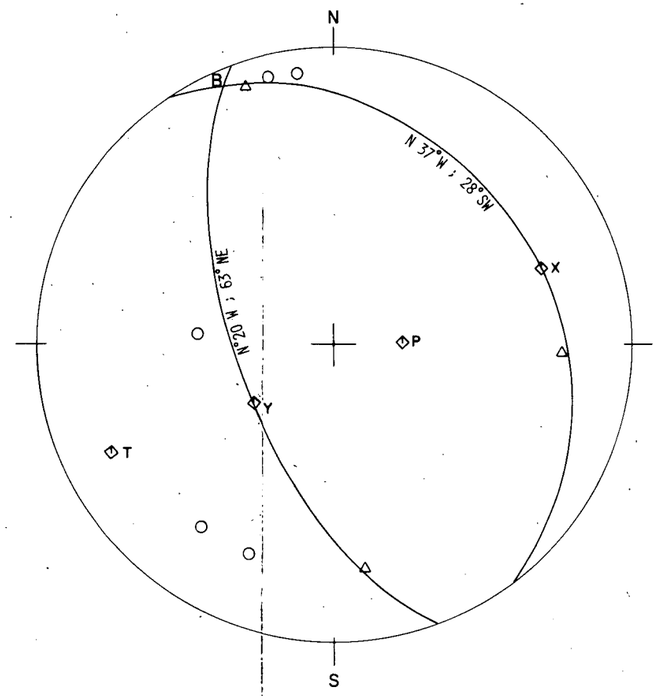
LEGEND:

- ○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
- △ DILATATION } SYMBOLS OF SMALLER SIZE
- ◇ MECHANISM AXES
- P = PRESSURE  T = TENSION  X,Y = POLES

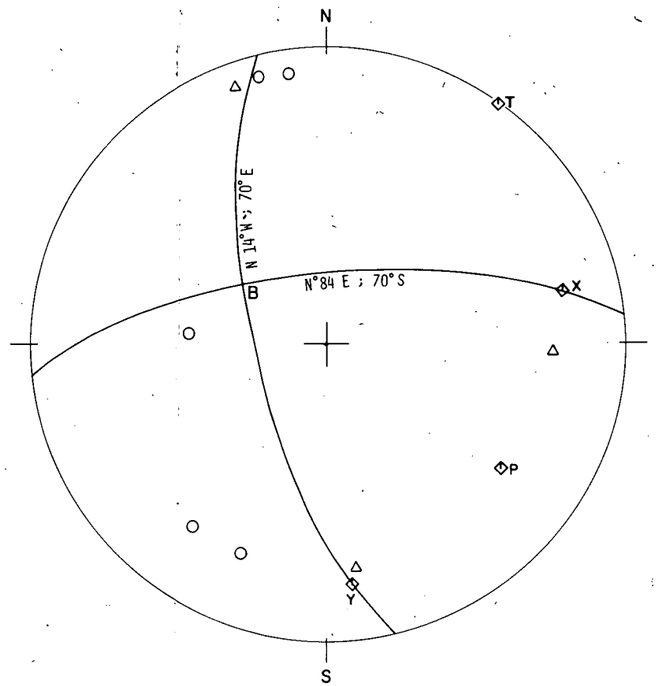
DAMES & MOORE




a




b




c

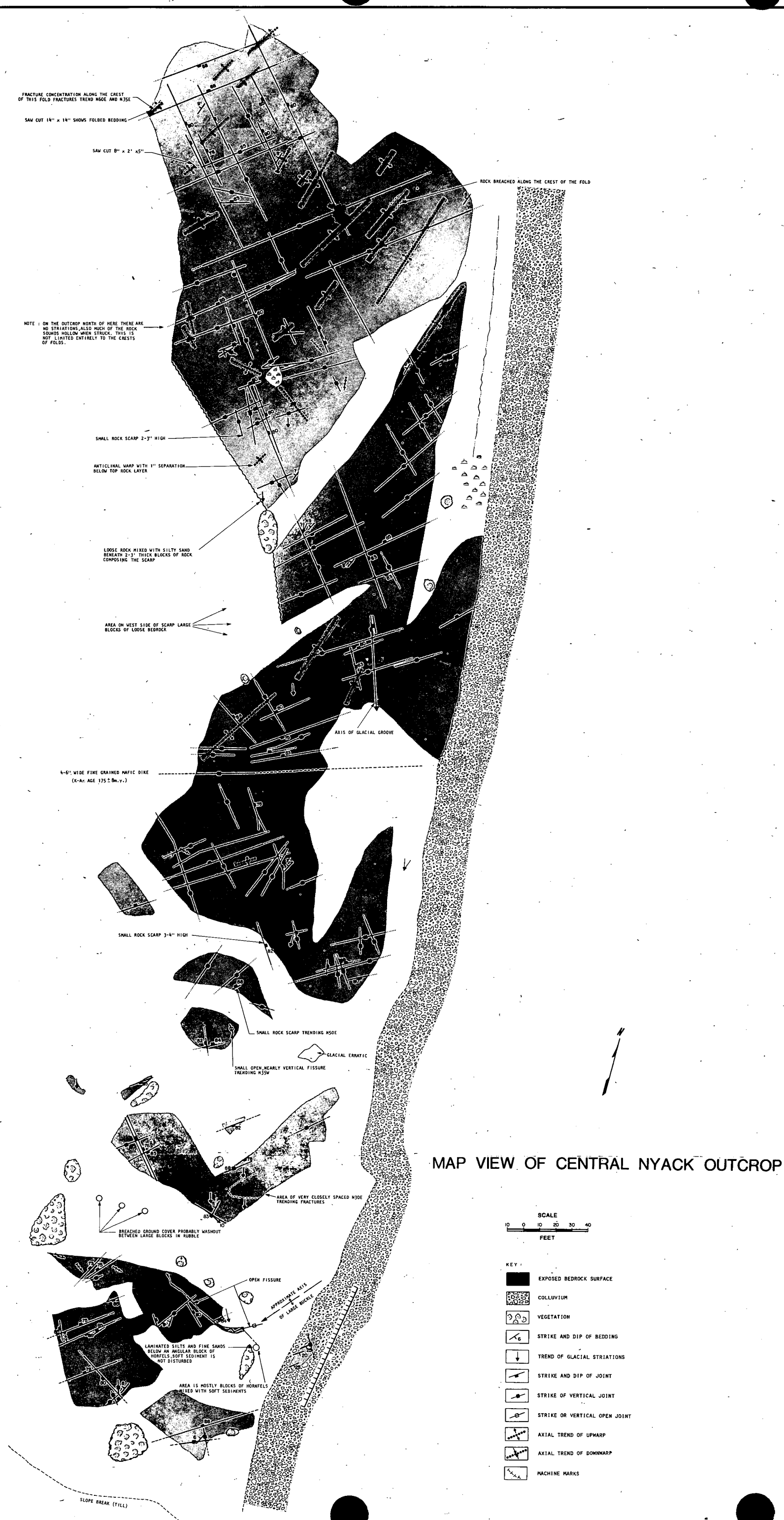
# FOCAL MECHANISM FOR NOVEMBER 22, 1976 EARTHQUAKE

## UPPER HEMISPHERE PLOT

LEGEND :

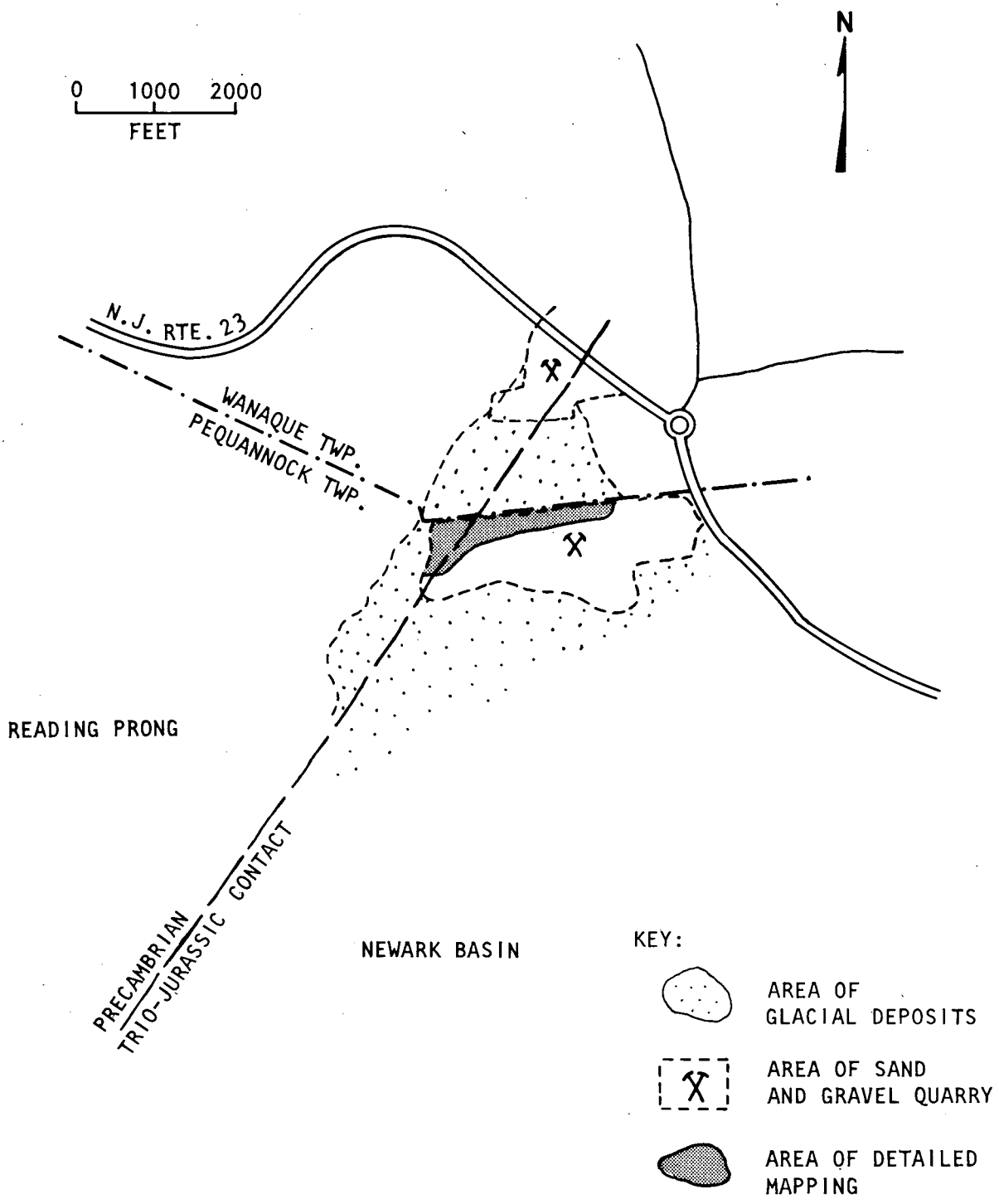
- ○ COMPRESSION } LESS RELIABLE DATA ARE SHOWN BY
- △ DILATATION } SYMBOLS OF SMALLER SIZE
- ◇ MECHANISM AXES
  P= PRESSURE T= TENSION X,Y= POLES

DAMES & MOORE




MAP VIEW OF CENTRAL NYACK OUTCROP

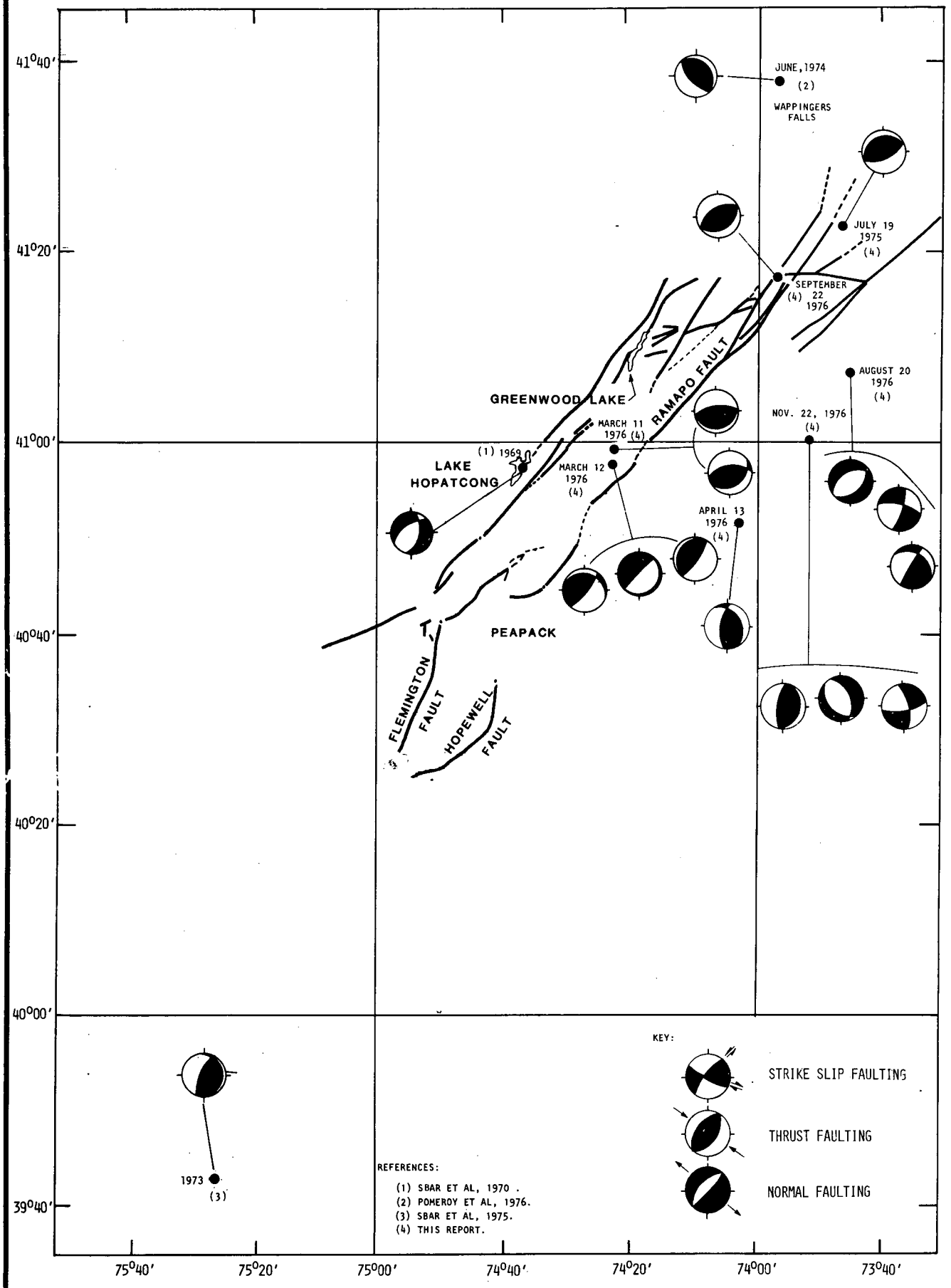
DAMES & MOORE




## LOCATION MAP

SAND AND GRAVEL QUARRIES CONTAINING PLEISTOCENE DEPOSITS ALONG RAMAPO FAULT ZONE, PEQUANNOCK, N.J.

DAMES & MOORE

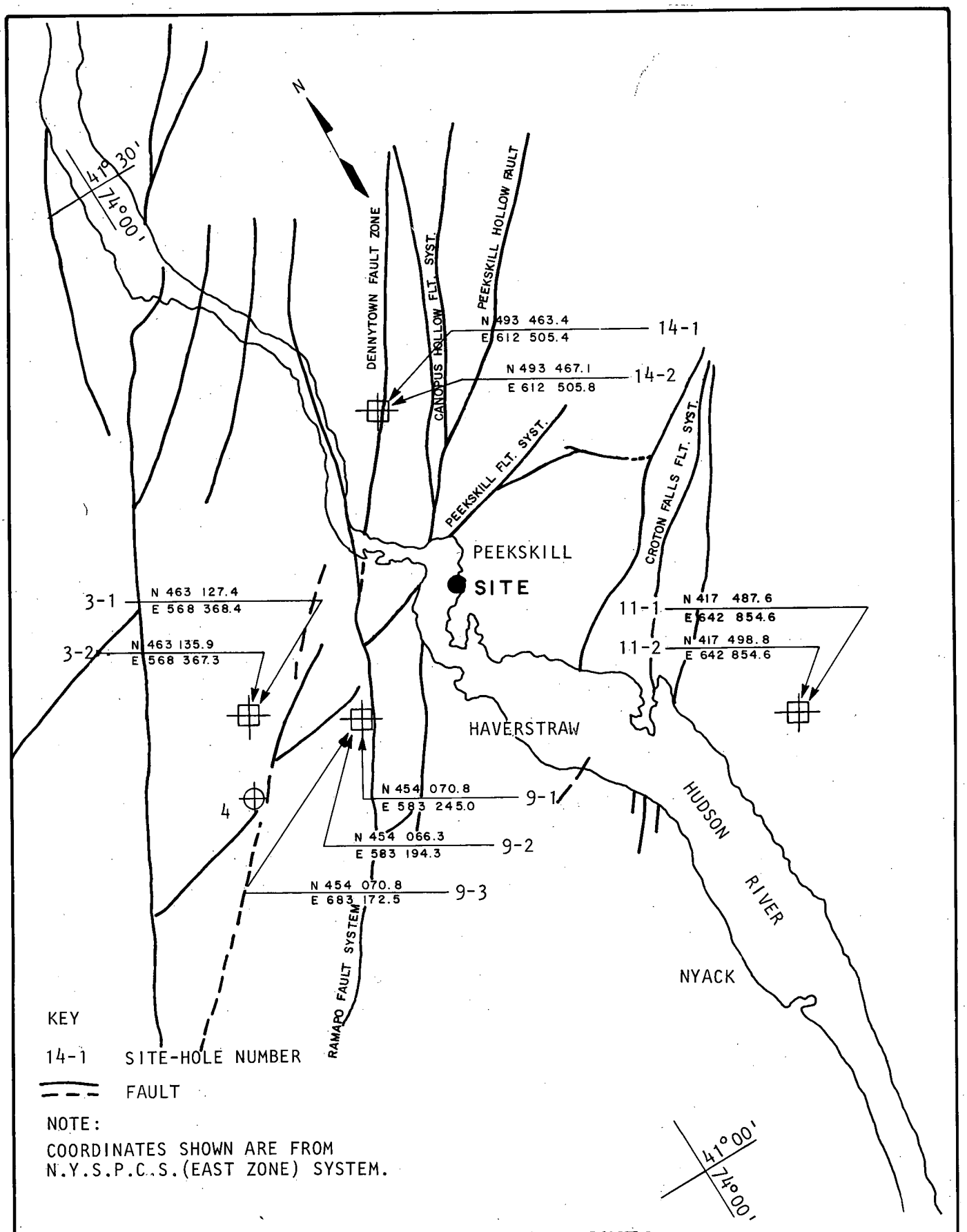



# FAULT PLANE SOLUTIONS FOR EARTHQUAKES IN THE REGION AROUND RAMAPO FAULT

LOWER HEMISPHERE EQUAL AREA PROJECTION
P-WAVE COMPRESSION QUADRANTS ARE SHOWN IN DARK

DAMES & MOORE

PLATE G-11




# LOCATION OF TEST SITES

SOURCE:
J.W. DELANO, PLAN OF LOCATION OF GEOLOGIC TEST SITES, PREPARED FOR CONSOLIDATED EDISON JULY 9, 1976

DAMES & MOORE

# BORING LOG

SIZE OF CORE NX DATE STARTED 2-18-76 DATE COMP. 2-19-76 GEOLOGIST E. LINDNER CHECKED S. ZALEWSKI

COLLAR ELEV. +1091.5' TOTAL DEPTH 81.5' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED UNIAXIAL COMPRESSION WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. 6'

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| GRAY-GREEN, MEDIUM GRAINED PYROXENE-HORNBLENDE-PLAGIOCLASE-GNEISS, FOLIATED, OCCASIONAL PEGMATITE<br>FOLIATION ABOUT 80° | | | 100 | 93 | | NONE | | |
| AT 0' TO 8' PEGMATITIC INTRUSION; QUARTZ PINK FELDSPAR, GREEN HORNBLENDE<br>AT 8" TO 1' COARSE HORNBLENDE<br>AT 2' TO 4' PEGMATITE | 5 | AT 4' TO 6'6" FRACTURE, NEARLY VERTICAL, WEAKLY COATED WITH IRON OXIDES | | | | | | |
| AT 10' TO 12'4" PEGMATITE; PINK FELDSPAR AND PYRITE AND MAGNETITE ORE (AT 11') | 10 | | 65 | 95 | | | | |
| AT 15'10" PEGMATITE 2" WIDE<br>FOLIATION NEARLY HORIZONTAL<br>AT 18'4" PEGMATITE 1" WIDE | 15 | | 95 | 65 | | | | |
| | 20 | | | | | | | EC,D<br>EC,D<br>EC,D |
| | 25 | AT 26' IRREGULAR FRACTURE ABOUT 30 WITH LIMONITE STAINING | 98 | 100 | | | | EC,D<br>EC,D<br>EC,D |
| AT 32'6" QUARTZ, HORNBLENDE, PYRITE 3" ZONE<br>FOLIATION ABOUT 50° | 30 | AT 31' TO 32'6" HEALED FRACTURES NEARLY VERTICAL WITH LIMONITE<br>AT 32' FRACTURE SLICKENSIDED ABOUT 35°, STEEP SLICKS | 89 | 100 | | | | |
| AT 35'9" COARSE PEGMATITE<br>AT 36'4" GREEN HORNBLENDE AND BIOTITE CONCENTRATION, 5" WIDE<br>FROM 36'9" TO 56' HORNBLENDE RICH ROCK<br>FOLIATION ABOUT 45° | 35 | AT 33'8" IRREGULAR FRACTURE, SUBHORIZONTAL WITH LIMONITE<br>AT 35' FRACTURE 6" LONG, NEARLY VERTICAL<br>AT 36' TO 38'4" IRREGULAR FRACTURE NEARLY VERTICAL WITH LIMONITE STAINING | | | | | | EC,D<br>EC,D<br>CS |
| | 40 | AT 39' TO 41' HEALED FRACTURES NEARLY VERTICAL | | | | | | |
| AT ABOUT 43' TO 43'9" COARSE HORNBLENDE CRYSTALS<br>AT 44'6" TO 46' FEW PEGMATITIC VEINLETS PARALLEL TO FOLIATION<br>AT 47' FOLIATION SUBHORIZONTAL | 45 | AT 43'10" SET OF FRACTURES PARALLEL AND PERPENDICULAR TO FOLIATION<br>AT 45' TO 46' INTERVAL SEVERAL FRACTURES ABOUT 45°, PERPENDICULAR TO FOLIATION, SOME LIMONITE STAINING | 67 | 100 | | | | |
| | 50 | | 96 | 100 | | | | |
| AT 55'4" TO 55'9" HORNBLENDE CONCENTRATIONS<br>AT 55'9" TO 57'6" LIGHT GRAY QUARTZ RICH ROCK, FINE GRAINED, FAINT FOLIATION<br>AT 57'6" DARK GRAY BIOTITE HORNBLENDE RICH ROCK<br>FOLIATION ABOUT 70° | 55 | AT 55'8" TO 55'9" HEALED DISCRETE FRACTURING<br>AT 58'4" HEALED FRACTURE, SUBHORIZONTAL | | | | | | |
| AT 59' TO 63' QUARTZ IMPREGNATED ROCK, NON FOLIATED<br>FROM 63' DARK GRAY BIOTITE AMFIBOLITE WITH OCCASIONAL BANDS OF FELSIC MATERIAL<br>FOLIATION ABOUT 70°<br>AT 68'8" QUARTZ PEGMATITE 2" WIDE | 60 | AT 60'3" FRACTURE ABOUT 30°<br>AT 60'5" IRREGULAR FRACTURE | 88 | 94 | | | | |
| | 65 | AT 64'3" HEALED FRACTURE, NEARLY VERTICAL | | | | | | |
| | 70 | AT 67' HEALED FRACTURE PARALLEL TO FOLIATION<br>AT 68'8" SLICKENSIDED FRACTURE, ABOUT 30°<br>AT 71'3" IRREGULAR FRACTURE ABOUT 30<br>AT 72'6" SLICKENSIDED FRACTURE ABOUT 45° | | | | | | |
| | | AT 73' FRACTURE ABOUT 45° | 73 | 100 | | | | |
| AT 76'2" TO 76'8" QUARTZ IMPREGNATED ZONE<br>FOLIATION ABOUT 45° | 75 | AT 76' FRACTURE ABOUT 45°<br>AT 76'8" FRACTURE ABOUT 65° | | | | | | |
| | 80 | AT 79' TO 79'7" SET OF FRACTURES<br>AT 80' TO 81' IRREGULAR FRACTURE NEARLY VERTICAL | 45 | 96 | | | | |
| | 85 | BORING TERMINATED AT 81.5' ON 2/2/76 | | | | | | |

SITE 3 HOLE 1
IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-2

# BORING LOG

SIZE OF CORE 5½" DATE STARTED 2-27-76 DATE COMP. 3-12-76 GEOLOGIST E. LINDNER CHECKED S. ZALEWSKI

COLLAR ELEV. +1090.2' TOTAL DEPTH 38.3' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED OVERCORING WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. 15'

| ROCK TYPE | GRAPHIC LOG | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|
| GRAY GREEN, MEDIUM-GRAINED, PYROXENE-HORNBLENDE-PLAGIOCLASE GNEISS, FOLIATED, OCCASIONAL PEGMATITE | | | | NA | 100 | NA | NONE | | |
| | | 5 | | | | | | | |
| | | | | | 100 | | | | |
| | | 10 | | | | | | | |
| | | | | | 100 | | | | |
| | | 15 | | | 100 | | | | |
| AT 16'2" PEGMATITIC INTRUSION 1" WIDE | | | | | 100 | | | | |
| AT 17'1" TO 17'10" LIGHT GRAY LITHOLOGY FOLIATION SUBHORIZONTAL | | | | | 100 | | | | O#1 |
| | | | | | 100 | | | | T.S. |
| | | 20 | | | | | | | O#2 |
| | | | | | 100 | | | | O#3 |
| | | | | | 100 | | | | O#4 |
| | | | | | 100 | | | | O#5 |
| | | 25 | | | 100 | | | | O#6 |
| | | | | | 100 | | | | O#7 |
| | | | | | 100 | | | | |
| | | 30 | AT 29'2" IRREGULAR FRACTURES ABOUT 70° WITH LIMONITE STAINING | | 100 | | | | O#8 |
| AT 32' TO 34'8" LIGHT GRAY LITHOLOGY | | | AT 30'11" TO 32'11" FRACTURE ABOUT 15° WITH LIMONITE STAINING | | 100 | | | | T.S. |
| AT 34'10" HORNBLENDE AND BIOTITE RICH ZONE | | | AT 33'8" NEARLY VERTICAL FRACTURE AND FEW HEALED FRACTURES | | 100 | | | | |
| | | 35 | AT 34'8" IRREGULAR FRACTURE WITH LIMONITE STAINING | | | | | | O#9 |
| | | | | | 83 | | | | O#10 |
| | | | BORING TERMINATED AT 38.3' ON 3/12/76 | | | | | | |
| | | 40 | | | | | | | |
| | | 45 | | | | | | | |
| | | 50 | | | | | | | |
| | | 55 | | | | | | | |
| | | 60 | | | | | | | |
| | | 65 | | | | | | | |
| | | 70 | | | | | | | |
| | | 75 | | | | | | | |
| | | 80 | | | | | | | |

SITE 3 HOLE 2

IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-3

# BORING LOG

SIZE OF CORE NX DATE STARTED 2-20-76 DATE COMP. 2-20-76 GEOLOGIST E. LINDNER CHECKED S. ZALEWSKI

COLLAR ELEV. NA TOTAL DEPTH 26.5' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED NONE WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

| ROCK TYPE | GRAPHIC LOG | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD 75 50 25 | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT 1 4 16 64 | CASING DEPTH | WATER RETURN (%) 25 50 75 | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|
| TOPSOIL<br>SAND AND GRAVEL WITH OCCASIONAL CLAY POCKETS<br>GLACIAL TILL | | 5<br>10<br>15 | NA | NA | NA | NA | | | |
| LIGHT GRAY-PINKISH, FINE GRAINED BIOTITE PLAGIOCLASE-GNEISS, WELL FOLIATED, HIGHLY DEFORMED<br>FOLIATION ABOUT 65° | | 20<br>25 | AT 18' AND 18'6" SLICKENSIDED FRACTURE ABOUT 45°, OBLIQUE SENSE OF MOVEMENT<br>AT 20' TO 21' FRACTURED ZONE WITH HIGH ANGLE FRACTURES<br>AT 22' TO 23' HIGHLY FRACTURED ZONE<br>AT 23'8" SLICKENSIDED FRACTURE ABOUT 25°, SLICKS PERPENDICULAR TO CORE AXIS<br>AT 24' TO 25' HIGHLY FRACTURED ZONE<br>AT 25'8" SLICKENSIDED FRACTURE ABOUT 30°, SLICK PERPENDICULAR TO CORE AXIS<br>BORING TERMINATED AT 26.5' ON 2/20/76 | 30<br>20 | 75<br>100 | | | | T.S. |
| | | 30<br>35<br>40<br>45<br>50<br>55<br>60<br>65<br>70<br>75<br>80 | | | | | | | |

SITE 4 HOLE 1
IN SITU, STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY,
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-4

# BORING LOG

SIZE OF CORE NX DATE STARTED 2-24-76 DATE COMP. 2-26-76 GEOLOGIST E. LINDNER CHECKED S. ZALEWSKI

COLLAR ELEV. +312.4' TOTAL DEPTH 79' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED UNIAXIAL COMPRESSION WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | OTHER TESTS |
|---|---|---|---|---|---|
| FINE TO COARSE SAND AND GRAVEL WITH CLAY POCKETS<br>GLACIAL TILL | 5 | | | | |
| LIGHT GRAY, COARSE HORNBLENDE GRANITE, GNEISS, MASSIVE, POORLY FOLIATED WITH OCCASIONAL PEGMATITIC INTRUSIONS AND CONCENTRATIONS OF HORNBLENDE CRYSTALS CHARACTERIZED BY ABUNDANT HEALED FRACTURES ALONG ENTIRE LENGTH OF CORE<br>AT 11' COARSE PEGMATITIC BAND ABOUT 5" WIDE FOLIATION POORLY DEFINED ABOUT 45°<br>AT 13'10" TO 14'8" PEGMATITE | 10 | AT 9'1" FRACTURE ABOUT 45° PARALLEL TO FOLIATION<br>AT 10'5" SLICKENSIDED FRACTURE ABOUT 45°, PARALLEL TO FOLIATION<br>AT 12'2" SLICKENSIDED FRACTURE ABOUT 45°, OPPOSITE FOLIATION<br>AT 14'1" SLICKENSIDED FRACTURE ABOUT 20° OBLIQUE SENSE OF MOVEMENT | 76 | 100 | |
| | 15 | AT 15' TO 17'6" TIGHT FRACTURING, SOME SLICKENSIDED | 76 | 100 | |
| AT ABOUT 21' TO 22' HORNBLENDE CONCENTRATION<br>AT 23' TO 24'6" PEGMATITE | 20 | AT 21' FRACTURE ABOUT 45° | | | |
| | 25 | AT 24' FRACTURE ABOUT 25° | 97 | 100 | |
| AT 28' COARSE PEGMATITE (QUARTZ AND HORNBLENDE) ABOUT 5" WIDE | 30 | AT 27'5" IRREGULAR FRACTURE ABOUT 45°<br>AT 28' HEALED FRACTURES<br>AT 30' FRACTURE ABOUT 15° | | | EC,D<br>EC,D |
| | 35 | | 100 | 100 | EC,CS |
| FOLIATION ABOUT 50° | 40 | AT 39'6" SLICKENSIDED FRACTURE ABOUT 45° AND HEALED FRACTURES | | | EC,D<br>EC,D |
| | 45 | AT 44'3" AND 44'6" SLICKENSIDED FRACTURES ABOUT 35°, OBLIQUE SENSE OF MOVEMENT | 100 | 97 | |
| | 50 | AT 51'11" FRACTURE ABOUT 60° WITH OBLIQUE SLICKS<br>AT 52'11" TO 54' SET OF FRACTURES<br>AT 53'10" SLICKENSIDED ABOUT 45°, OBLIQUE SLICKS | | | |
| AT 57' COARSE HORNBLENDE ABOUT 2" WIDE | 55 | AT 54'8" TO 55'7" SET OF SLICKENSIDED FRACTURES ABOUT 45°, DIP-SLIP SENSE OF MOVEMENT | 83 | 100 | |
| AT 59'10" TO 60'9" PEGMATITIC BAND<br>FOLIATION ABOUT 45°, POORLY DEFINED | 60 | AT 59'5" FRACTURE ABOUT 50°<br>AT 60'3" AND 61'2" IRREGULAR FRACTURES ABOUT 70° | 97 | 100 | |
| | 65 | AT 67'3" FRACTURE ABOUT 70°, WITH SMOOTH SURFACE COATED WITH Mn OXIDES | 100 | 100 | |
| FOLIATION ABOUT 45° | 70 | AT 70'11" FRACTURE ABOUT 45°, OPPOSITE FOLIATION, MANGANESE COATING<br>AT 72'1" FRACTURE ABOUT 45°, SMOOTH SURFACE WITH LIMONITE STAINING<br>AT 72'10" FRACTURE ABOUT 65°, WITH SMOOTH SURFACE | 98 | 100 | |
| | 75 | | | | |
| | 80 | BORING TERMINATED AT 79' ON 2/26/76 | | | |

NUMBER OF FRACTURES PER FOOT (1 4 16 64): NA

CASING DEPTH

WATER RETURN (%) (25 50 75)

SITE 9 HOLE 2

IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY,
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-5

# BORING LOG

SIZE OF CORE NX DATE STARTED 2-23-76 DATE COMP. 2-24-76 GEOLOGIST E.LINDNER/N.MYSORE CHECKED S. ZALEWSKI

COLLAR ELEV. +309.7' TOTAL DEPTH 45.0' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED NONE WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) |
|---|---|---|---|---|
| FINE TO COARSE SAND AND GRAVEL WITH CLAY POCKETS<br>GLACIAL TILL | 5 | | NA | NA |
| LIGHT GRAY, COARSE GRAINED HORNBLENDE GRANITE GNEISS, MASSIVE, POORLY FOLIATED<br>FOLIATION WEAKLY DEFINED BY HORNBLENDE CRYSTALS | 10 | AT 9'6" TO 10'6" FRACTURES ABOUT 30° CLOSELY SPACED, MANY HEALED<br>AT 11'6" FRACTURE ABOUT 40° WITH LIMONITE STAINING | 30 | 100 |
| | 15 | AT 14' AND 14'9" FRACTURES ABOUT 45° AND PARALLEL TO CORE AXIS WITH LIMONITE<br>AT 15'6" FRACTURE ABOUT 20° WITH LIMONITE<br>AT 16'5" AND 18'6" FRACTURES ABOUT 25° WITH LIMONITE STAINING | 37 | 100 |
| | 20 | AT 19' TO 19'6" SET OF FRACTURES<br>AT 21'7" FRACTURE ABOUT 35° WITH LIMONITE STAINING | 43 | 100 |
| | 25 | AT 24'3" FRACTURE ABOUT 40° AND VERTICAL, BOTH WITH LIMONITE<br>AT 25'6" FRACTURE ABOUT 35° SMOOTH SURFACE, LIMONITE STAINING<br>AT 25'9" TO 27' SEVERAL SIMILAR FRACTURES | 57 | 66 |
| | 30 | AT 27'6" TO ABOUT 31' FAULT ZONE; HIGHLY FRACTURED WITH LIMONITE STAINING | | |
| | 35 | AT 32' TO 32'6" SET OF FRACTURES; IRREGULAR FRACTURE NEARLY VERTICAL TERMINATED AT FRACTURES ABOUT 30° WITH OPPOSITE SENSE LIMONITE STAINING<br>AT 33' TO 36' HIGHLY FRACTURED ZONE<br>AT 36' TO 38' FRACTURE VERTICAL WITH LIMONITE STAINING | 24 | 78 |
| | 40 | AT 40' FRACTURE ABOUT 30°, SMOOTH SURFACE, LIMONITE STAINING<br>AT 40'6", 41'3", 42'2", 42'6", 43', 43'7" FRACTURES ABOUT 45°, LIMONITE STAIN | 0<br>100 | 100<br>100 |
| | 45 | AT 44'6" SET OF 5 FRACTURES ABOUT 20°<br>BORING TERMINATED AT 45' ON 2/24/76 | 0 | 100 |
| | 50 | | | |
| | 55 | | | |
| | 60 | | | |
| | 65 | | | |
| | 70 | | | |
| | 75 | | | |
| | 80 | | | |

NUMBER OF FRACTURES PER FOOT (1 4 16 64)

CASING DEPTH

WATER RETURN (%) (25 50 75)

OTHER TESTS

SITE 9 HOLE 1
IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-6

# BORING LOG

SIZE OF CORE 5½" DATE STARTED 3-16-76 DATE COMP. 4-9-76 GEOLOGIST E.LINDNER/T.MILLS CHECKED S. ZALEWSKI

COLLAR ELEV. +313.5' TOTAL DEPTH 49.6' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED OVERCORING WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. 5'

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| FINE TO COATSE SAND AND GRAVEL WITH OCCASIONAL CLAY POCKETS GLACIAL TILL | | NA | NA | NA | NA | | | |
| LIGHT GRAY, COARSE GRAINED HORNBLENDE GRANITE GNEISS, MASSIVE, POORLY FOLIATED WITH OCCASIONAL PEGMATITIC INTRUSIONS AND CONCENTRATIONS OF HORNBLENDE | 5 | AT 6'5" FRACTURE ABOUT 45° AT 7' FRACTURE~45° , SMOOTH SURFACE COATED WITH ALTERATION PRODUCTS | | 100 100 100 | | | | |
| FOLIATION ABOUT 45°, POORLY DEFINED AT 13' COARSE HORNBLENDE CONCENTRATION AT 13'6" TO 14' PEGMATITE | 10 | AT 9'3" SIMILAR FRACTURE<br>AT 11' SET OF 2 FRACTURES-ORTHOGONAL, SMOOTH SURFACE<br>AT 13' SET OF ORTHOGONAL FRACTURES WITH SOME DARK ALTERED COATING | | 100 100 100 | | | | |
| | 15 | AT 17'3" SLICKENSIDED FRACTURE ABOUT 35°, DIP-SLIP SENSE OF MOVEMENT AT 18'9" IRREGULAR FRACTURE ABOUT 70° | | 100 | | | | |
| | 20 | | | 100 100 | | | | |
| | 25 | | | 100 | | | | |
| AT 31' TO 32' COARSE PEGMATITE WITH HORNBLENDE | 30 | AT 29'7" HEALED FRACTURE, VERTICAL ABOUT 8" LONG<br>AT 32' IRREGULAR FRACTURE ABOUT 45° AND NUMEROUS HEALED ONES | | 100<br>100 100 100 | | | | O#1<br>O#2<br>T.S. |
| | 35 | AT 35' TO 38' FRACTURE ABOUT VERTICAL, SMOOTH SURFACE WITH ALTERED COATING AND LIMONITE STAINING | | 100 100 100 | | | | O#3<br>O#4<br>O#5 |
| | 40 | AT 40' IRREGULAR FRACTURE ABOUT 45° AT 41' SLICKENSIDED FRACTURE ABOUT 45° | | 100<br>100 100 | | | | T.S.<br>O#6<br>O#7 |
| | 45 | BORING TERMINATED AT 44.6' ON 4/9/76 | | | | | | |
| | 50 | | | | | | | |
| | 55 | | | | | | | |
| | 60 | | | | | | | |
| | 65 | | | | | | | |
| | 70 | | | | | | | |
| | 75 | | | | | | | |
| | 80 | | | | | | | |

SITE 9 HOLE 3
IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY,
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-7

# BORING LOG

SIZE OF CORE NX DATE STARTED 4-12-76 DATE COMP. 4-13-76 GEOLOGIST E.LINDNER/T.MILLS CHECKED S. ZALEWSKI

COLLAR ELEV. +244.3' TOTAL DEPTH 77.0' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED UNIAXIAL COMPRESSION WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | OTHER TESTS |
|---|---|---|---|---|---|
| TOPSOIL<br>COARSE TO FINE SAND AND GRAVEL-GLACIAL TILL | 5 | NA | | | |
| LIGHT GRAY, FINE TO MEDIUM GRAINED GNEISS, WITH PEGMATITIC INTRUSIONS, OFTEN IN FORM OF PTYGMATIC FOLDS. MASSIVE, UNWEATHERED, WELL FOLIATED | 10 | | 100 | 97 | |
| | 15 | AT 13'2" IRREGULAR FRACTURE PARALLEL TO FOLIATION | | | EC,D |
| AT 17'2" TO 19'4" PEGMATITE | | AT 16'8" IRREGULAR FRACTURE PARALLEL TO FOLIATION | 99 | 100 | EC,D<br>CS |
| AT 21'4" ABOUT 3" CONCENTRATION OF COARSE HORNBLENDE AND BIOTITE | 20 | AT 20' IRREGULAR FRACTURE ABOUT 20° | | | EC,D |
| AT 25' HORNBLENDE CONCENTRATION ABOUT 3" WIDE<br>FOLIATION ABOUT 40° | 25 | AT 24'2" IRREGULAR FRACTURE WITH LIMONITE STAINING | 99 | 97 | EC,D |
| | 30 | | | | |
| FOLIATION ABOUT 45°<br>AT 37' TO 46' INTERVAL SCHISTOSE BIOTITE RICH LITHOLOGY IN NEAR VERTICAL CONTACT | 35 | AT 34'6" TO 36' FRACTURE ZONE, FRACTURES ABOUT 20°, LIMONITE STAINING; HEALED FRACTURES PARALLEL TO FOLIATION | 82 | 100 | EC,D<br>T.S.<br>EC,D |
| | 40 | | | | |
| | | | | | EC,D |
| | 45 | AT 45'4" FRACTURE ABOUT 45° | 98 | 100 | |
| FOLIATION ABOUT 30°<br>FOLIATION NEARLY VERTICAL<br>IRREGULAR PEGMATITIC INTRUSION | 50 | AT 49' IRREGULAR FRACTURE PARALLEL TO FOLIATION<br>AT 50'6" PERPENDICULAR FRACTURE, COATED WITH PYRITE | | | |
| FOLIATION ABOUT 45° | 55 | AT 55' TO 56' SET OF PERPENDICULAR FRACTURES WITH PYRITE<br>AT 56'8" IRREGULAR FRACTURE ABOUT 75°<br>AT 57'10" IRREGULAR FRACTURE WITH PYRITE<br>AT 58'1" HEALED FRACTURE | 97 | 100 | |
| | 60 | | | | |
| AT 64'10" PTYGMATIC FOLDS<br>FOLIATION ABOUT 65°<br>AT 67'6" PEGMATITE 1" WIDE<br>AT 69' TO 70'6" PEGMATITE ZONE | 65 | AT 64'3" IRREGULAR FRACTURE ABOUT 75°<br>AT 65'3" FRACTURE PARALLEL TO FOLIATION | 89 | 100 | |
| | 70 | AT 72'5" FRACTURE ABOUT 45° | | | |
| FOLIATION ABOUT 45°<br>AT 75' ABOUT 6" PEGMATITE ZONE | 75 | AT 74'5" FRACTURE WITH MINOR SLICKS, ABOUT 45°, PARALLEL TO FOLIATION | 100 | 98 | |
| | | BORING TERMINATED AT 77' ON 4/13/76 | | | |
| | 80 | | | | |

NUMBER OF FRACTURES PER FOOT (1 4 16 64)

CASING DEPTH

WATER RETURN (%) (25 50 75)

SITE 11 HOLE 1
IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-8

# BORING LOG

SIZE OF CORE 5¼" DATE STARTED 4-14-76 DATE COMP. 4-30-76 GEOLOGIST E.LINDNER/T.MILLS CHECKED S. ZALEWSKI

COLLAR ELEV. +245.5' TOTAL DEPTH 43.7' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED OVERCORING WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

| ROCK TYPE | GRAPHIC LOG | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|
| LIGHT GRAY, FINE TO MEDIUM GRAINED GNEISS, WITH PEGMATITIC INTRUSIONS, OFTEN IN FORM OF PTYGMATIC FOLDS. MASSIVE, UNWEATHERED, WELL FOLIATED | | | | | 100 | | | | |
| | | 5 | | NA | | NA | | | |
| | | | | | 98 | | | | |
| | | 10 | | | | | | | |
| FOLIATION ABOUT 45° | | | | | 97 | | GROUTED | | |
| | | | AT 13'3" FRACTURE AT ABOUT 45°, OPPOSITE TO FOLIATION, LIMONITE STAINING | | | | | | T.S. |
| | | 15 | AT 13'6" IRREGULAR FRACTURE ABOUT 45° IRON STAINING | | | | | | 0#1 0#2 |
| AT 17'4" PEGMATITE 2" WIDE FOLIATION ABOUT 40° | | | AT 17'4" AND 17'6" IRREGULAR FRACTURE PARALLEL TO FOLIATION | | | | | | 0#3 0#4 |
| | | 20 | AT 20'2" IRREGULAR FRACTURE PARALLEL TO FOLIATION | | 100 | | | | |
| | | | AT 21'3" IRREGULAR FRACTURE ABOUT 45° OPPOSITE FOLIATION | | | | | | 0#5 |
| FOLIATION ABOUT 40° | | | AT 23'5" FRACTURE PERPENDICULAR WITH PYRITE AND SOME IRON OXIDES | | | | | | |
| | | 25 | AT 25'6" FRACTURE ZONE WITH FAULT GOUGE 2" THICK | | 85 | | | | |
| | | | AT 26'11" IRREGULAR FRACTURE ABOUT 70° | | 75 | | | | |
| | | | AT 27'2" FRACTURE PARALLEL TO FOLIATION | | 100 | | | | 0#6 |
| | | 30 | | | | | | | |
| | | | AT 31'1" IRREGULAR FRACTURE ABOUT 65° OPPOSITE TO FOLIATION WITH LIMONITE | | | | | | T.S. |
| AT 34' PEGMATITE ABOUT 6" WITH HORNBLENDE AND GARNET | | | AT 32'7" TO 33'9" FRACTURE ZONE; FRACTURES AT ABOUT 45° OPPOSITE TO FOLIATION, SOME WITH SMOOTH SURFACE AND LIMONITE STAINING | | 100 | | | | 0#7 0#8 |
| AT 35'6" TO ABOUT 37' DARK GRAY HORNBLENDE RICH UNIT | | 35 | | | | | | | |
| GRADING LIGHT GRAY WITH PEGMATITIC INTRUSIONS | | | | | | | | | 0#9 0#10 0#11 |
| | | 40 | | | | | | | 0#12 0#13 |
| | | 45 | BORING TERMINATED AT 43.7' ON 4/30/76 | | | | | | |
| | | 50 | | | | | | | |
| | | 55 | | | | | | | |
| | | 60 | | | | | | | |
| | | 65 | | | | | | | |
| | | 70 | | | | | | | |
| | | 75 | | | | | | | |
| | | 80 | | | | | | | |

SITE 11 HOLE 2
IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

PLATE H-9

# BORING LOG

SIZE OF CORE NX DATE STARTED 5-3-76 DATE COMP. 5-4-76 GEOLOGIST E.LINDNER/T.MILLS CHECKED S. ZALEWSKI

COLLAR ELEV. +457.2' TOTAL DEPTH 79.8' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED UNIAXIAL COMPRESSION WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. 3 FT.

| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| GRAY-GREEN, MEDIUM-GRAINED PYROXENE HORNBLENDE-PLAGIOCLASE GNEISS WELL FOLIATED WITH OCCASIONAL BANDS OF PEGMATITIC ZONES<br>FOLIATION ABOUT 80°<br>AT 2'3" ABOUT 6" COARSE PEGMATITE<br>FOLIATION ABOUT 45° | 5 | AT 1'9" IRREGULAR FRACTURE ~ 45° COATED WITH SOME ALTERED MINERALIZATION<br>AT 4'3" AND 5' FRACTURE PARALLEL TO FOLIATION | 86 | 100 | | NONE | | |
| FOLIATION ABOUT 60° | 10 | AT 7' IRREGULAR HORIZONTAL FRACTURE WITH ALTERED MINERALIZED ZONE ~ 3mm THICK (PYRITE, LIMONITE...)<br>AT 9'4" SLICKENSIDED FRACTURE ~ 60° NOT PARALLEL TO FOLIATION, OBLIQUE SENSE OF MOVEMENT<br>AT 11'2" SLICKENSIDED FRACTURE, HORIZONTAL SENSE OF MOVEMENT | 95 | 100 | | | | |
| FOLIATION ABOUT 65°<br>AT 15'7" FELSIC ZONE ABOUT 2" WIDE<br>FOLIATION ABOUT 65° | 15 | AT 14'6" TO 15'1" SLICKENSIDED FRACTURE ~ 15°<br>AT 16'2" SLICKENSIDED FRACTURE VERTICAL TO FOLIATION DIP-SLIP SENSE OF MOVEMENT<br>AT 17'4" TO 18' FRACTURED ZONE | 82 | 100 | | | | |
| FOLIATION ABOUT 50° | 20 | AT 18'10" SLICKENSIDED FRACTURE ~ 20° OPPOSITE FOLIATION<br>AT 21'10" TO 22'2" SLICKENSIDED FRACTURES ~ 40° OPPOSITE FOLIATION | | | | | | |
| FOLIATION ABOUT 45° | 25 | AT 25'10" SLICKENSIDED FRACTURE PARALLEL TO FOLIATION, OBLIQUE SLICKS<br>AT 26'1" TO 26'7" SLICKENSIDED FRACTURE ABOUT 20°<br>AT 28'4" SLICKENSIDED FRACTURE PARALLEL TO FOLIATION | 78 | 100 | | | | |
| | 30 | AT 30'6" SLICKENSIDED FRACTURE, NEARLY VERTICAL, HORIZONTAL SENSE OF MOVEMENT<br>AT 30'8" TO 32' 7 FRACTURES PARALLEL TO FOLIATION | | | | | | |
| AT 36' TO 38' FELSIC ZONE | 35 | AT 33'3" SLICKENSIDED FRACTURE ~ 30° OPPOSITE FOLIATION, DIP-SLIP SENSE OF MOVEMENT<br>AT 37' TO 38' FAULT ZONE BRECCIATED AND MINERALIZED (CALCITE, PYRITE) ZONE | 56 | 100 | | | | |
| AT 41' COARSE PEGMATITE WITH ABUNDANT PYRITE ABOUT 3" ZONE | 40 | TO 41' ABUNDANT FRACTURES; HEALED SLICKENSIDED<br>AT 42' FRACTURE ABOUT 15° SMOOTH SURFACE | | | | | | EC,D<br>EC,D |
| | 45 | AT 45' SEVERAL HEALED FRACTURES WITH PYRITE | 97 | 100 | | | | |
| | 50 | | | | | | | EC,D<br>CS,D<br>EC,D |
| | 55 | AT 52'9" IRREGULAR FRACTURE ABOUT 70° WITH PYRITE | | | | | | EC,D<br>EC,D |
| FROM 57'6" LIGHT COLORED GNEISSIC LITHOLOGY<br>FOLIATION ABOUT 45° LESS DEFINED | 60 | AT 57'11" FRACTURE ABOUT 45° OPPOSITE FOLIATION<br>AT 58'2" SLICKENSIDED FRACTURE, PARALLEL TO FOLIATION, OBLIQUE SENSE OF MOVEMENT<br>AT 59'3" TO 60' FRACTURE ABOUT 15°<br>AT 63'1" TO 63'8" FRACTURE ABOUT 25° OPPOSITE FOLIATION | 82 | 100 | | | | EC,D |
| | 65 | AT 65'10" TO 67'1" FRACTURES ABOUT 20° | 82 | 100 | | | | |
| AT 68' TO 70' DARK LITHOLOGY WITH WELL DEFINED FOLIATION BY HORNBLENDE ABOUT 45°<br>AT 70' PEGMATITIC INTRUSIONS ABOUT 1' TO 2' WIDE | 70 | AT 69'4" IRREGULAR FRACTURE VERTICAL WITH LIMONITE STAINING | | | | | | |
| FOLIATION ABOUT 50°<br>AT 75'7" TO 75'11" COARSE PEGMATITE | 75 | AT 73'9" FRACTURE ABOUT 30° OPPOSITE FOLIATION<br>AT 74'8" IRREGULAR FRACTURE ABOUT 45° OPPOSITE FOLIATION | 100 | 100 | | | | |
| | 80 | BORING TERMINATED AT 79.8' ON 5/3/76 | | | | | | |

SITE 14 HOLE 1

IN SITU. STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY.
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

# BORING LOG

SIZE OF CORE 54" DATE STARTED 5-5-76 DATE COMP. 5-24-76 GEOLOGIST E.LINDNER/T.MILLS CHECKED S. ZALEWSKI

COLLAR ELEV. +457.2' TOTAL DEPTH 59.7' INCLIN. FROM VERTICAL 0 AZIMUTH DIR. OF HOLE —

TESTS PERFORMED OVERCORING WATER LEVEL DURING DRILLING AT SURFACE AFTER COMPL. AT SURFACE

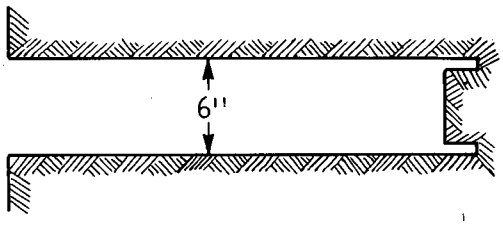
| ROCK TYPE | DEPTH IN FEET | DESCRIPTION OF ROCK DEFECTS | RQD (75 50 25) | CORE RECOVERY (%) | NUMBER OF FRACTURES PER FOOT (1 4 16 64) | CASING DEPTH | WATER RETURN (%) (25 50 75) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| GRAY-GREEN, MEDIUM-GRAINED PYROXENE-HORNBLENE-PLAGIOCLASE-GNEISS, WELL FOLIATED WITH OCCASIONAL PEGMATITIC ZONES | | | | 100 | | NONE | | |
| AT 1'4" TO 2'6" COARSE PEGMATITE | | AT 3' FRACTURE ABOUT 60°<br>AT 3.9' TO 4', 3 FRACTURES WITH LIMONITE STAINING | NA | 90 | NA | | | |
| | 5 | | | | | | | |
| FOLIATION ABOUT 60° | | | | 100 | | | | |
| | | AT 7'6" FRACTURE ~ 45°<br>AT 8' TO 9' FRACTURE ABOUT 25° WITH LIMONITE STAINING | | | | | | |
| | 10 | | | 95 | | | | |
| | | AT 11' FRACTURE ABOUT 45° WITH LIMONITE | | 100 | | | | |
| | | AT 13' AND 13'6" FRACTURES ~ 45° SMOOTH SURFACE | | | | | | |
| | 15 | AT 15' FRACTURE ~ 45° | | 100 | | | | |
| AT 16' HORNBLENDE CONCENTRATION AND FELSIC IMPREGNATION<br>FOLIATION ABOUT 50° | | AT 17' FRACTURE ~ 55° WITH LIMONITE STAINING<br>AT 18'9" FRACTURE ~ 45°<br>AT 19' FRACTURE 45° OPPOSITE FOLIATION | | 100 | | | | |
| | 20 | | | | | | | |
| AT 21'6" TO 24' FELSIC ZONE | | | | 100 | | | | |
| | | AT 23' TO 24' SEVERAL FRACTURE ABOUT 30° | | 100 | | | | |
| FOLIATION ABOUT 45° | 25 | AT 25' TO 26' FRACTURE ZONE<br>AT 26' TO 27' FRACTURE NEARLY VERTICAL | | 100 | | | | |
| | | AT 27'6" IRREGULAR FRACTURE ~ 40° | | 100 | | | | |
| | | AT 28'9" AND 29' FRACTURES ~ 45° | | 100<br>100 | | | | |
| AT 30' TO 30'6" FELSIC ZONE | 30 | | | | | | | |
| FOLIATION ABOUT 45° | | AT 31' TO 32' SEVERAL SLICKENSIDED FRACTURES<br>AT 32'9" FRACTURE ABOUT 60° | | 60 | | | | |
| | | AT 33'2" FRACTURE VERTICAL, HEALED | | 95 | | | | |
| AT 35' LIGHT GRAY LITHOLOGY | 35 | AT 33' TO 35' SEVERAL VERTICAL FRACTURES, CALCITE FILLED<br>AT 34'11" OFFSET 2" ALONG VERTICAL FRACTURE | | | | | | |
| | | AT 36' FRACTURE ABOUT 45° OPPOSITE FOLIATION | | 88<br>100 | | | | |
| AT 39'3" TO 40' COARSE UP TO 2" HORNBLENDE CRYSTALS | 40 | AT 39'8" TO 41'2" FRACTURE ABOUT 45° COATED WITH SULFIDES | | 100 | | | | T.S. |
| AT 43' ABUNDANT HORNBLENDE AND PYRITE ALONG FOLIATION<br>FOLIATION ABOUT 45°<br>DEFINED BY HORNBLENDE CRYSTALS | | AT 42'4" FRACTURE ABOUT 15° COATED WITH SULFIDES | | 100 | | | | O#1<br>O#2 |
| | 45 | | | | | | | |
| | | AT 46' FRACTURE ABOUT 45° OPPOSITE FOLIATION<br>AT 46' TO 47'5" IRREGULAR FRACTURE ABOUT 15° TO CORE AXIS OPPOSITE FOLIATION COATED WITH GREEN ALTERATION PRODUCTS | | 100 | | | | |
| | 50 | AT 50'3" FRACTURE ABOUT 55° PYRITE AND MAGNETITE MINERALIZATION | | 100<br>100 | | | | O#3<br>O#4 |
| | | AT 51'6" TO 54'6" HIGHLY FRACTURED ZONE | | 100 | | | | T.S. |
| FOLIATION ABOUT 45°<br>AT 56' PEGMATITE AND MINERALIZED ZONE ABOUT 2" WIDE | 55 | AT 55' FRACTURE ABOUT 45° AND VERTICAL PYRITE AND MAGNETITE INCRUSTATION | | 100<br>100 | | | | O#5 |
| | | AT 58' FRACTURES-ORTHOGONAL SET | | 100<br>100 | | | | O#6<br>O#7 |
| | 60 | BORING TERMINATED AT 59.7' ON 5/24/76 | | 100 | | | | |
| | 65 | | | | | | | |
| | 70 | | | | | | | |
| | 75 | | | | | | | |
| | 80 | | | | | | | |

SITE 14 HOLE 2

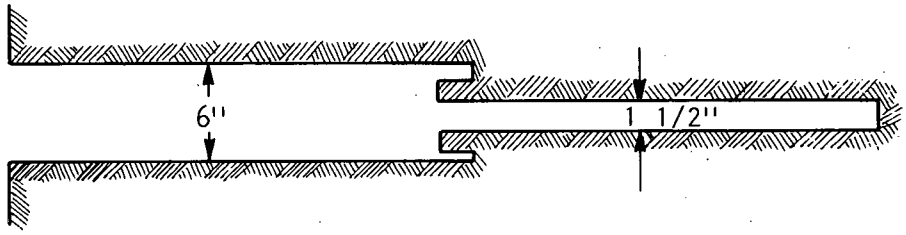
IN SITU, STRESS MEASUREMENTS
THE RAMAPO FAULT STUDY,
CONSOLIDATED EDISON COMPANY
OF NEW YORK

DAMES & MOORE

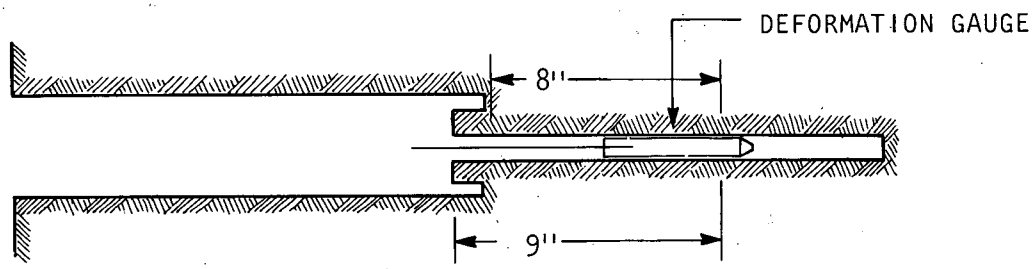
PLATE H-11



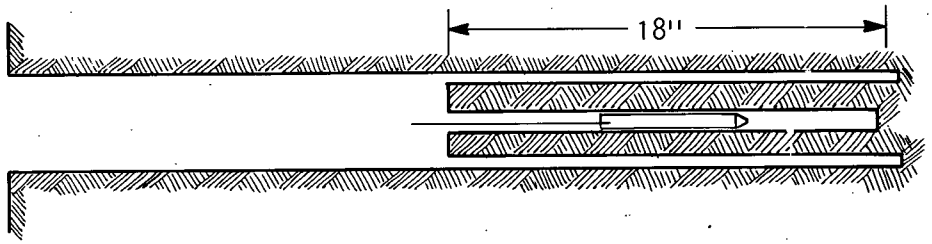

6-INCH DIAMETER HOLE IS DRILLED TO WITHIN 12INCHES OF DEPTH AT WHICH THE STRESS MEASUREMENT IS TO BE TAKEN.




EX-BOREHOLE(1 1/2 INCH DIAMETER) IS DRILLED WITHIN THE 6-INCH BOREHOLE.




DEFORMATION GAUGE IS ORIENTED AND POSITIONED AT DEPTH OF APPROX. 9 INCHES FROM COLLAR OF EX-BOREHOLE.

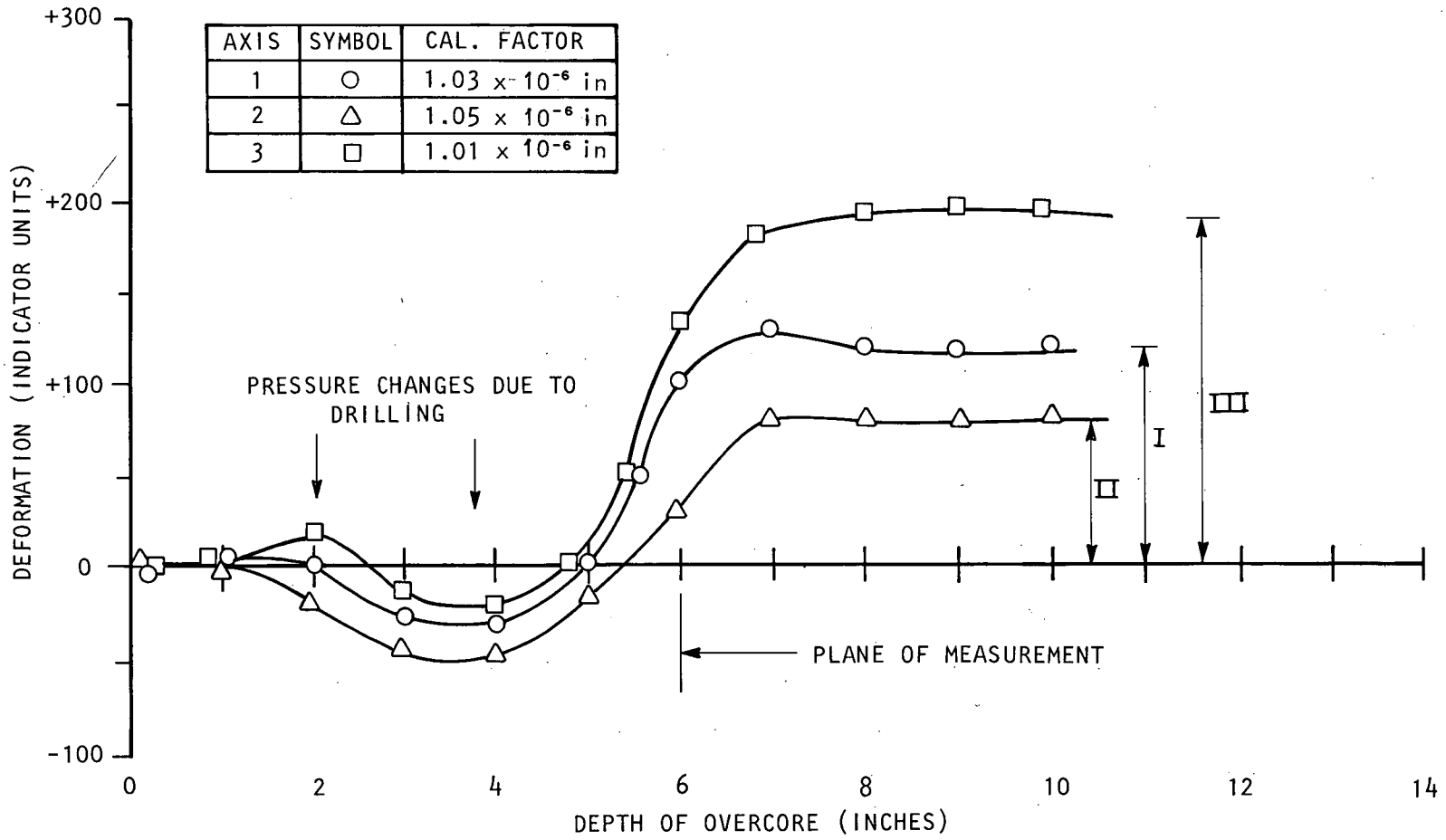



EX-BOREHOLE IS OVERCORED USING THE 6-INCH DIAMETER BIT FOR A DEPTH OF 18 INCHES. OVERCORE IS RECOVERED AND YOUNG'S MODULUSIS DETERMINED.

# OVERCORING SCHEMATIC:

## BOREHOLE DEFORMATION GAUGE

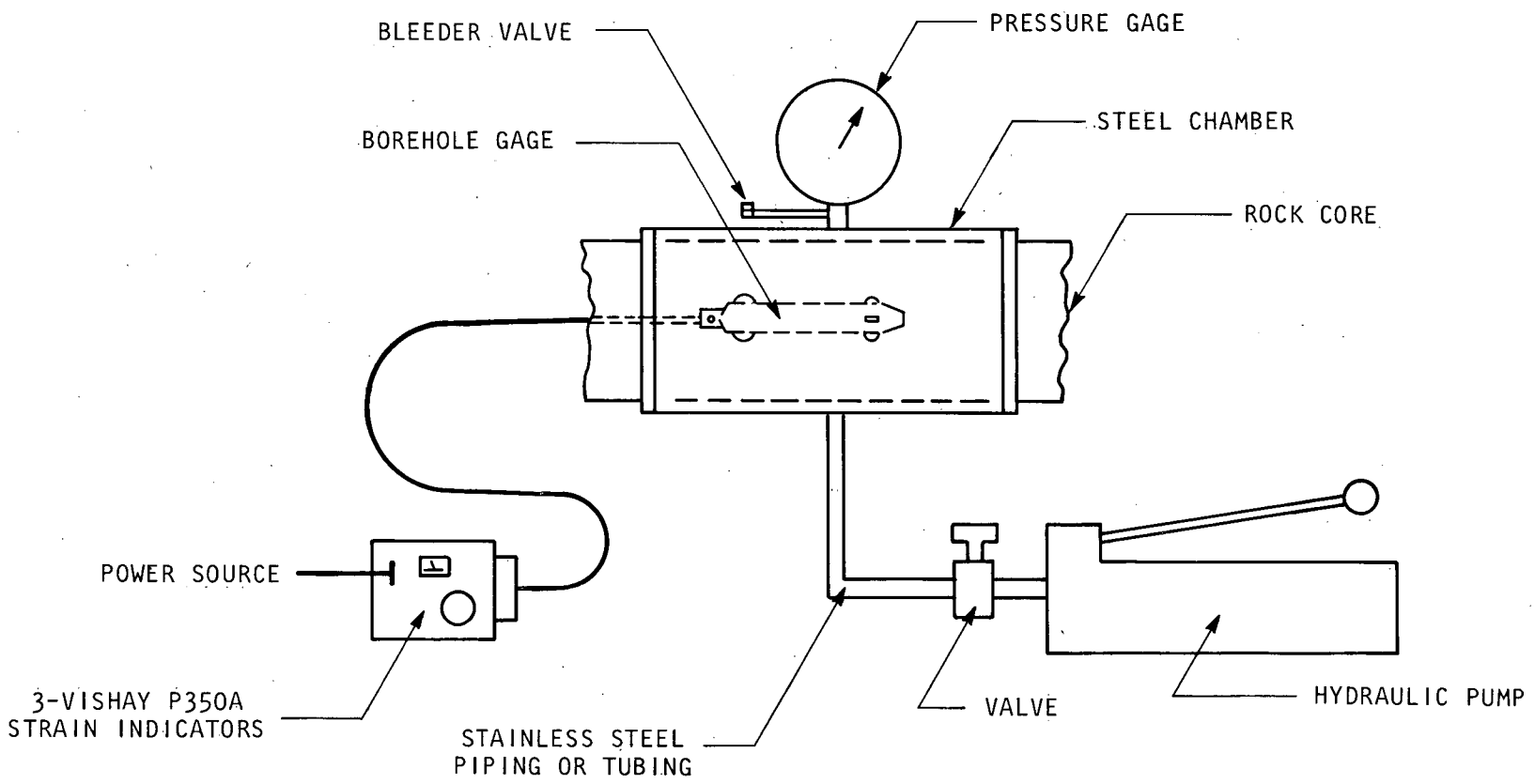
(ORIENTATION MAY BE VERTICAL OR HORIZONTAL)




| AXIS | SYMBOL | CAL. FACTOR |
|---|---|---|
| 1 | ○ | $1.03 \times 10^{-6}$ in |
| 2 | △ | $1.05 \times 10^{-6}$ in |
| 3 | □ | $1.01 \times 10^{-6}$ in |

# TYPICAL OVERCORE RESULTS

DAMES & MOORE




# SCHEMATIC : BI-AXIAL TEST APPARATUS

# MODULUS OF DEFORMATION

## SITE 3 TEST 2

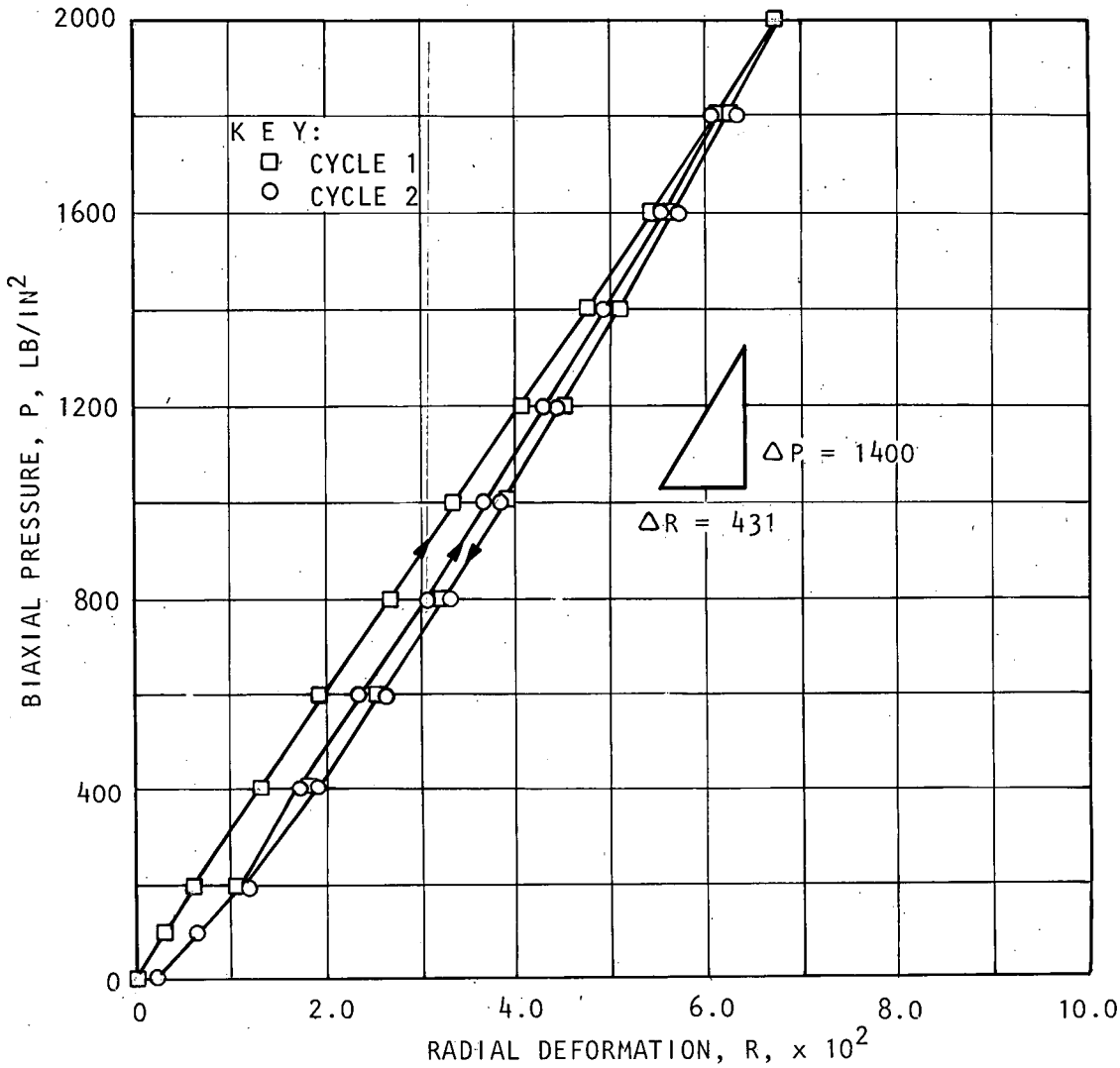
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.03 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 1




$E = 8.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 2

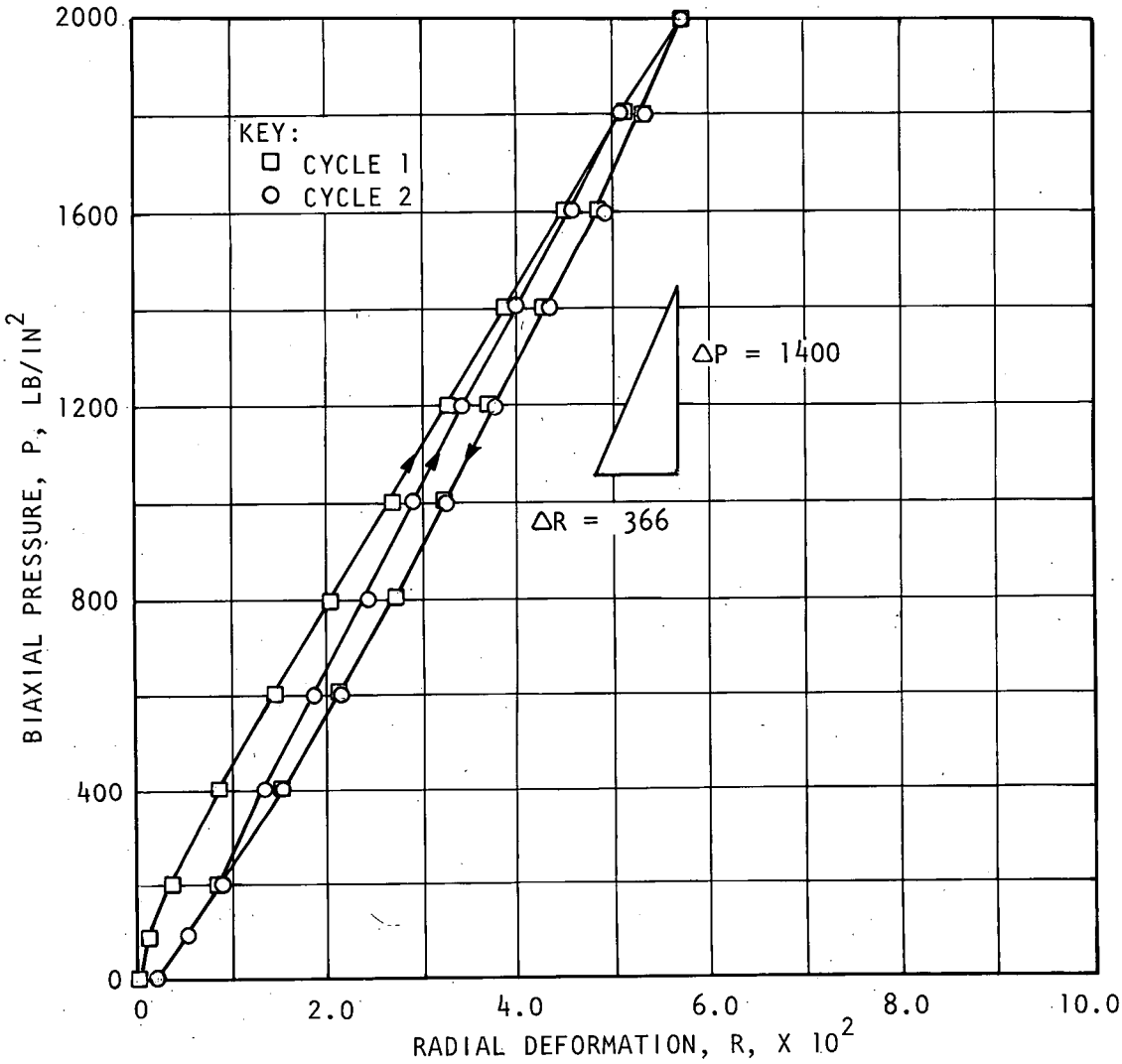
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




$E = 12.5 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 2

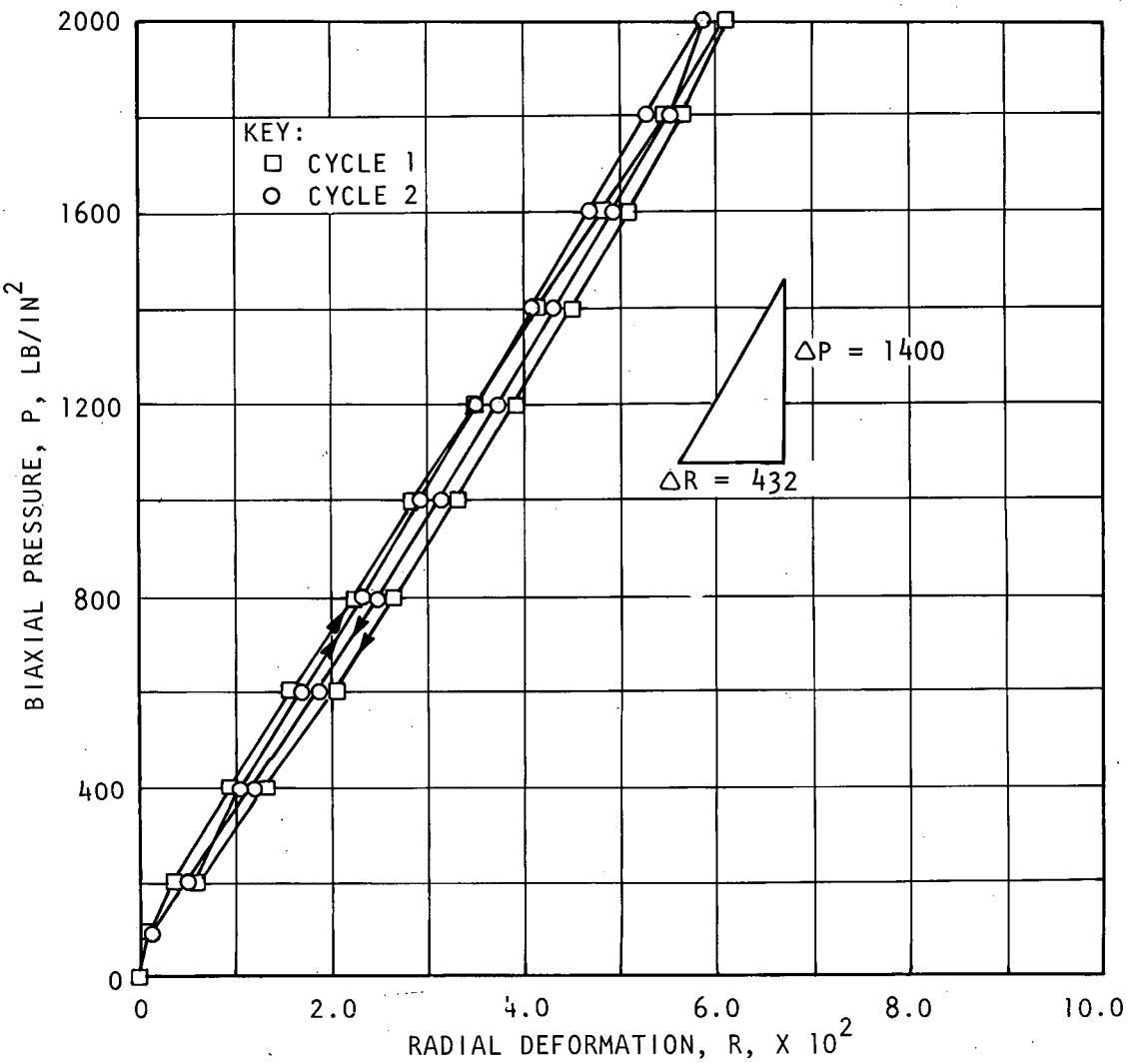
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.05 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 10.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 3

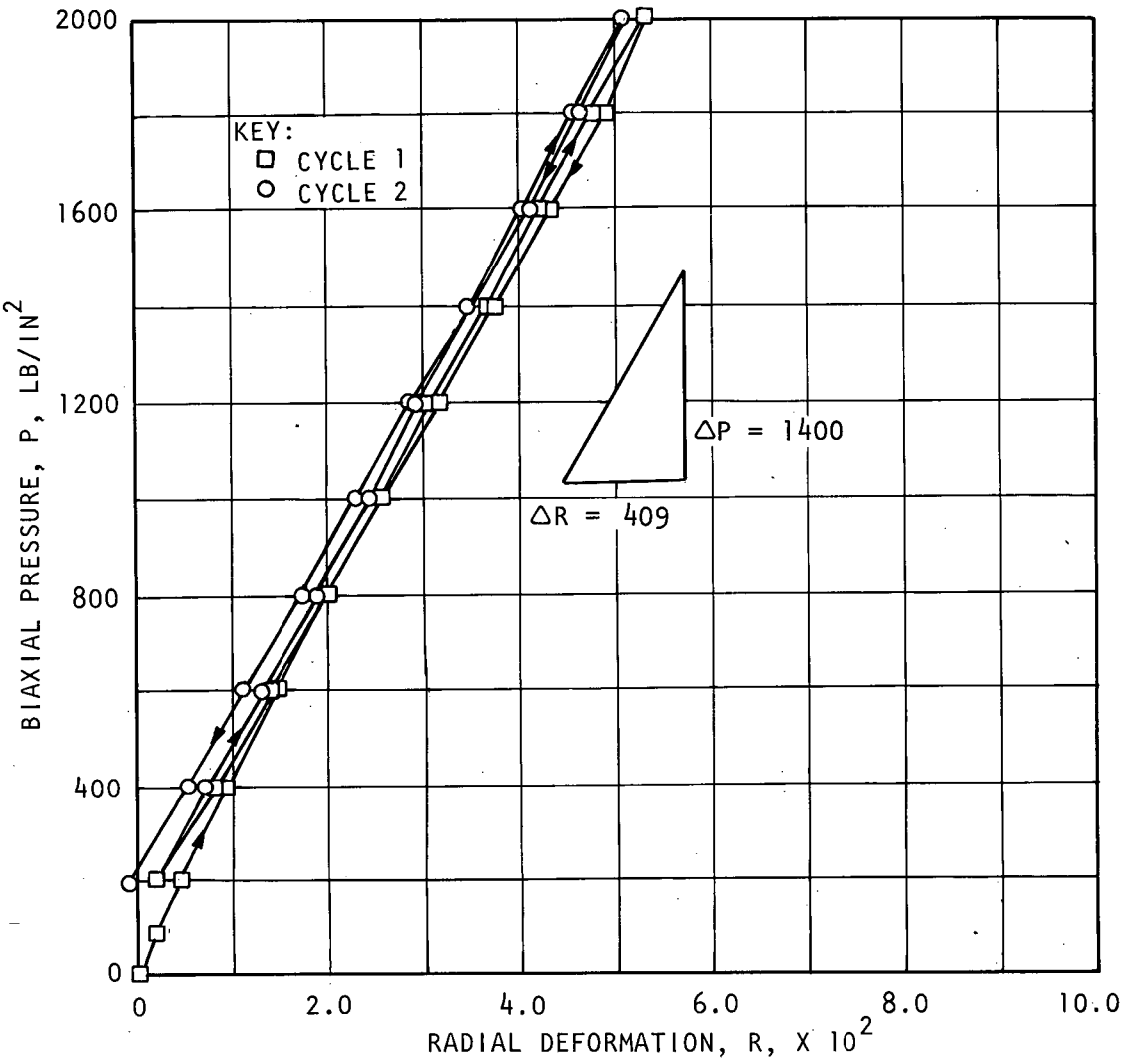
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




$E = 10.9 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 3

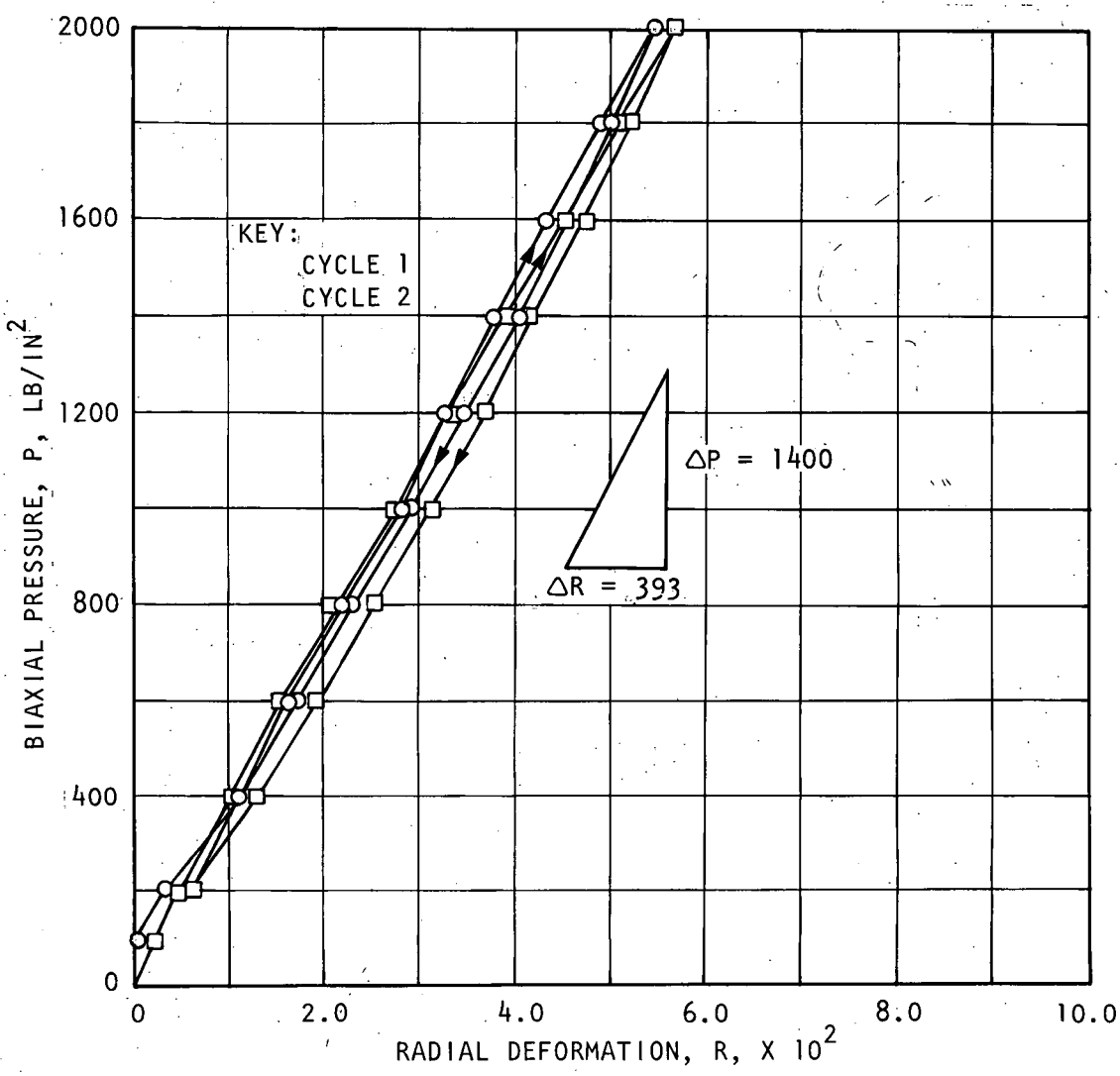
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 11.6 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 3

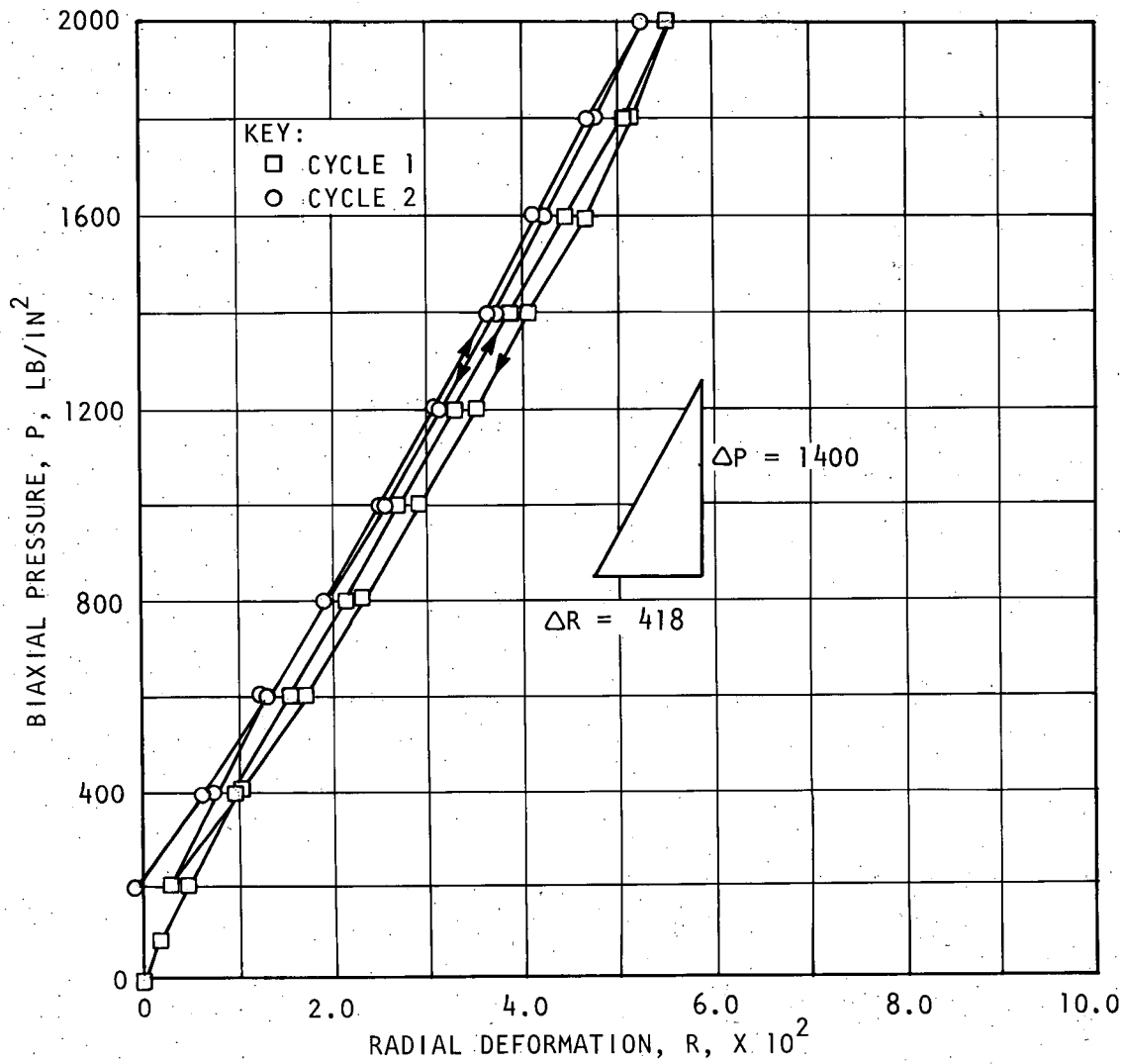
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.05 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 10.4 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 4

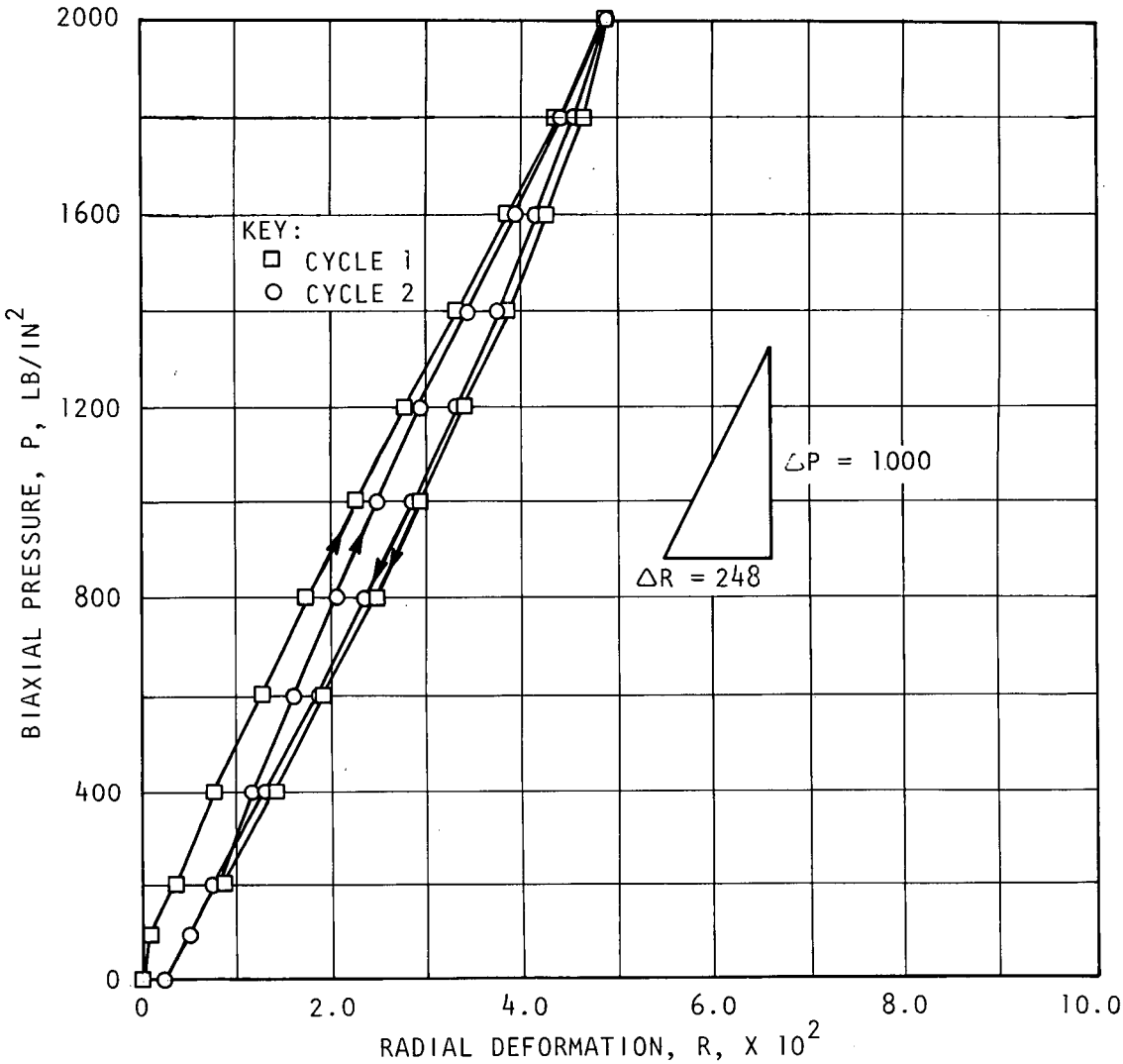
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $12.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 4

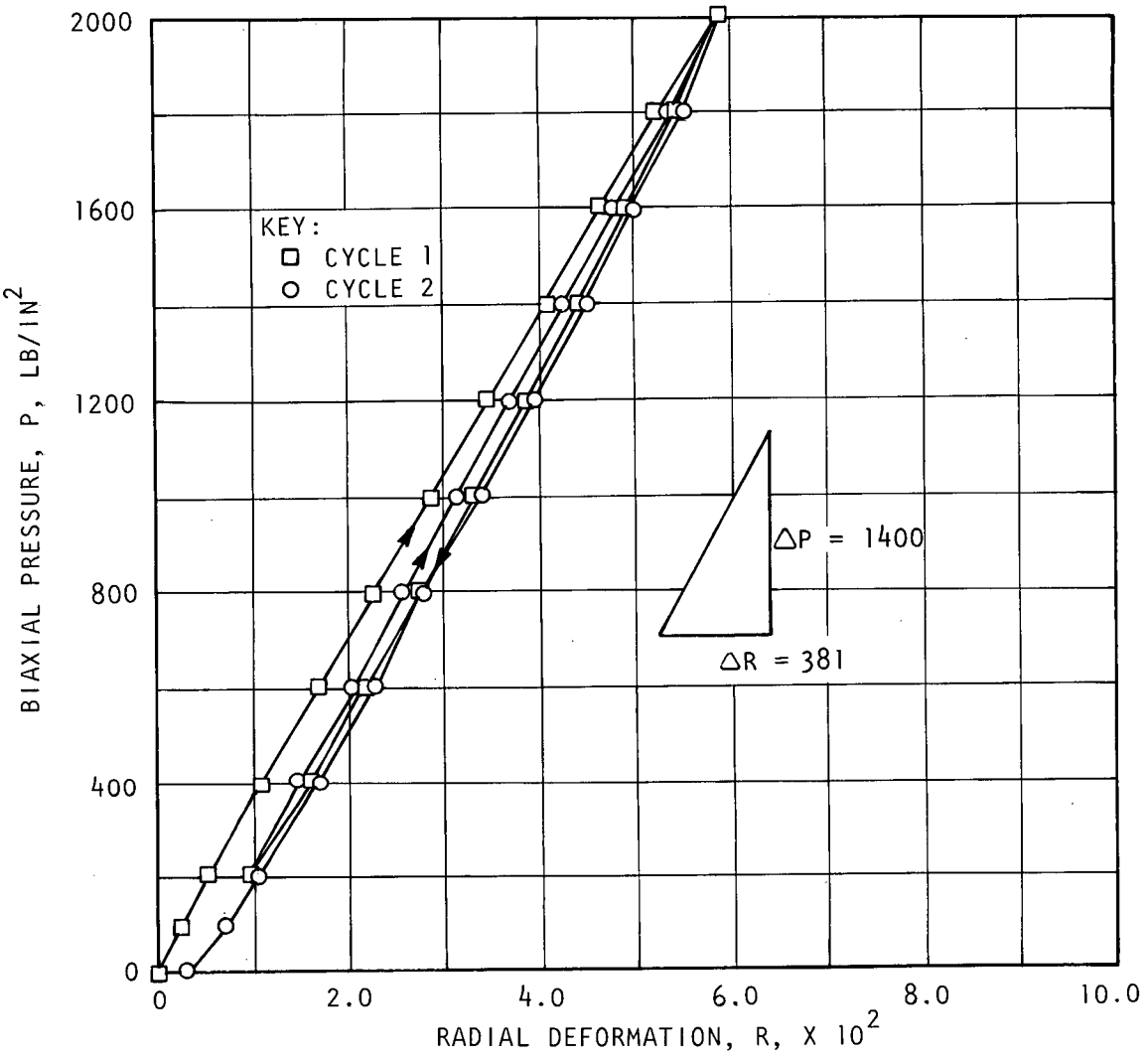
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 12.0 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 4

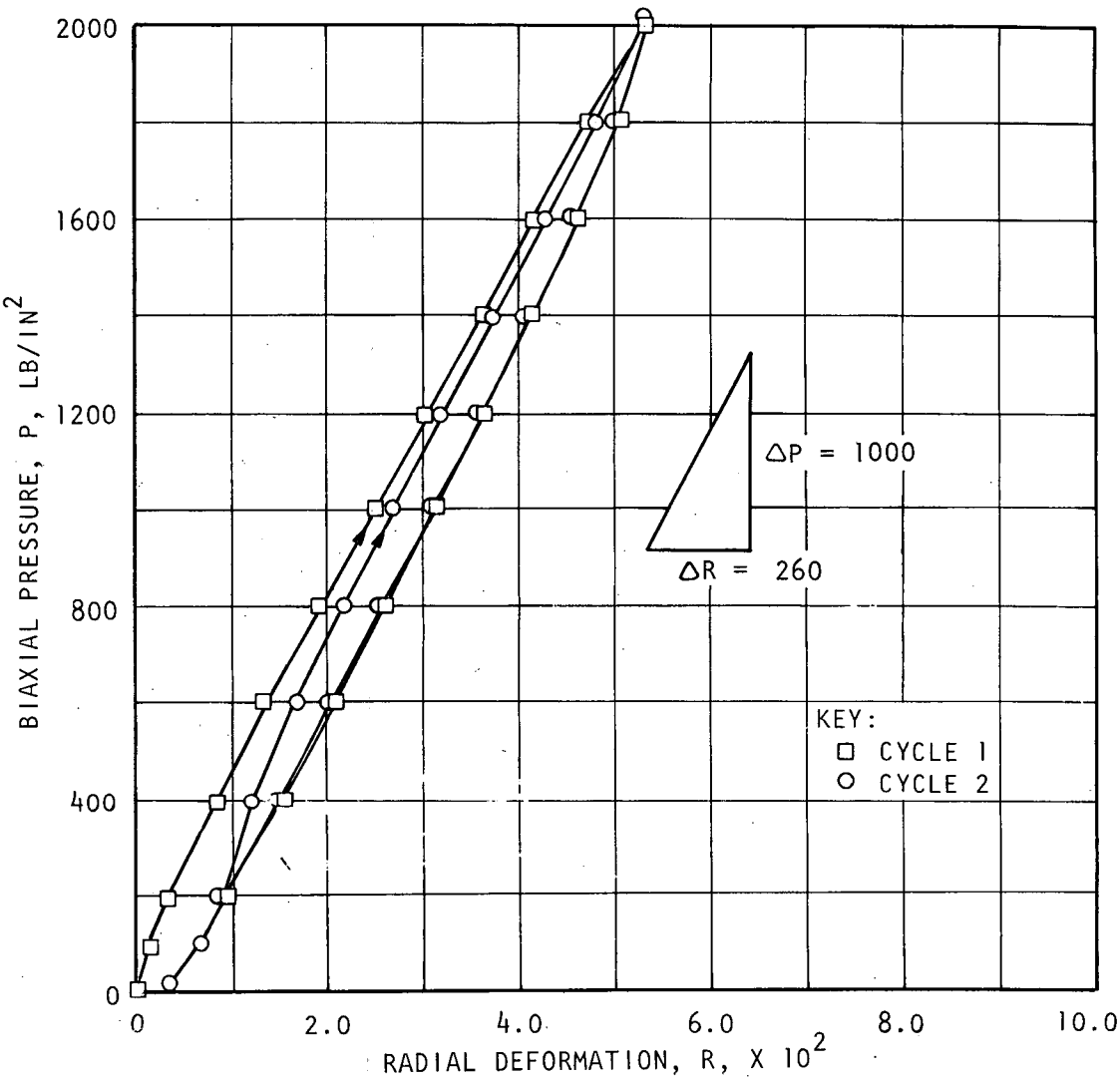
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 12.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 5

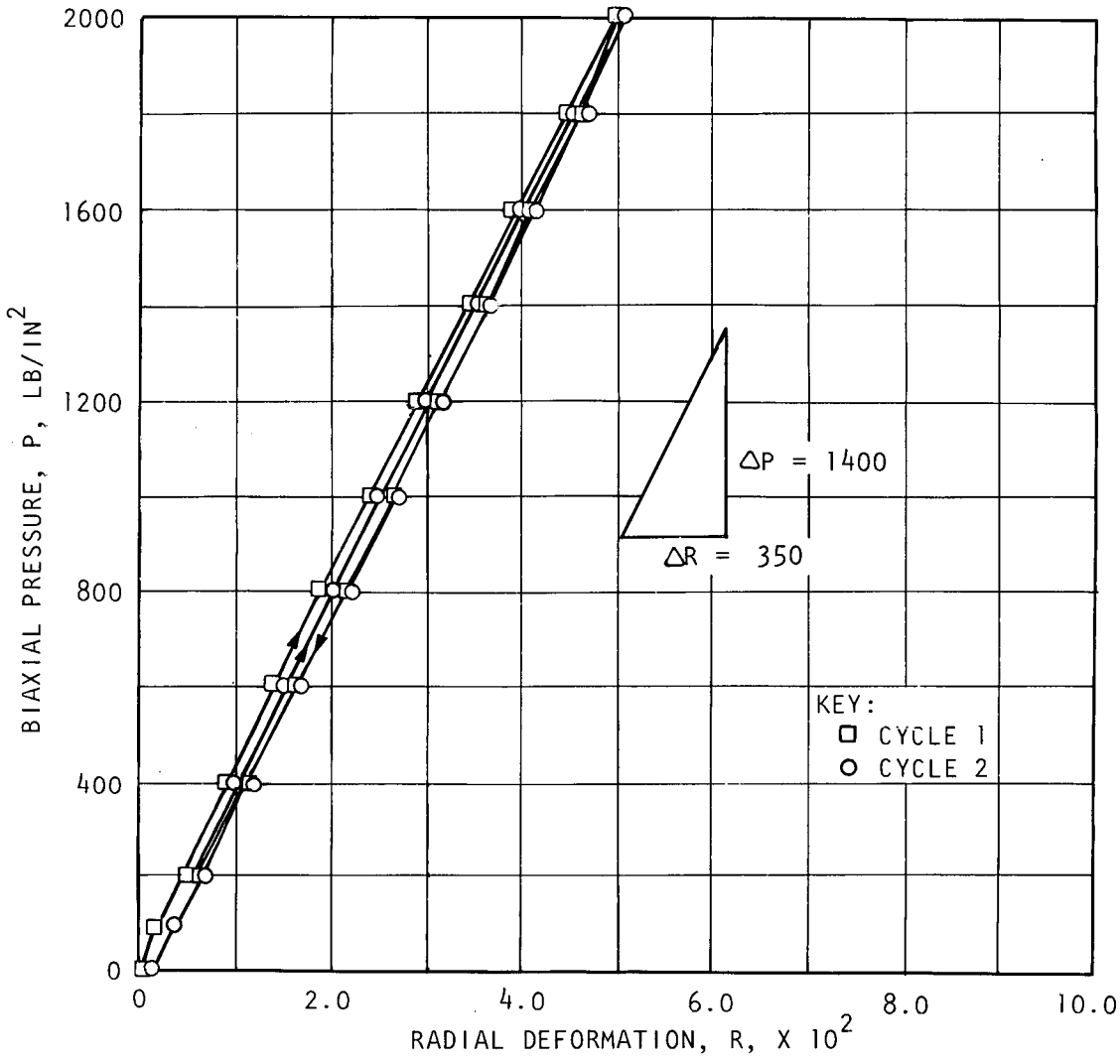
SPECIMEN LENGTH $20\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 12.7 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 5

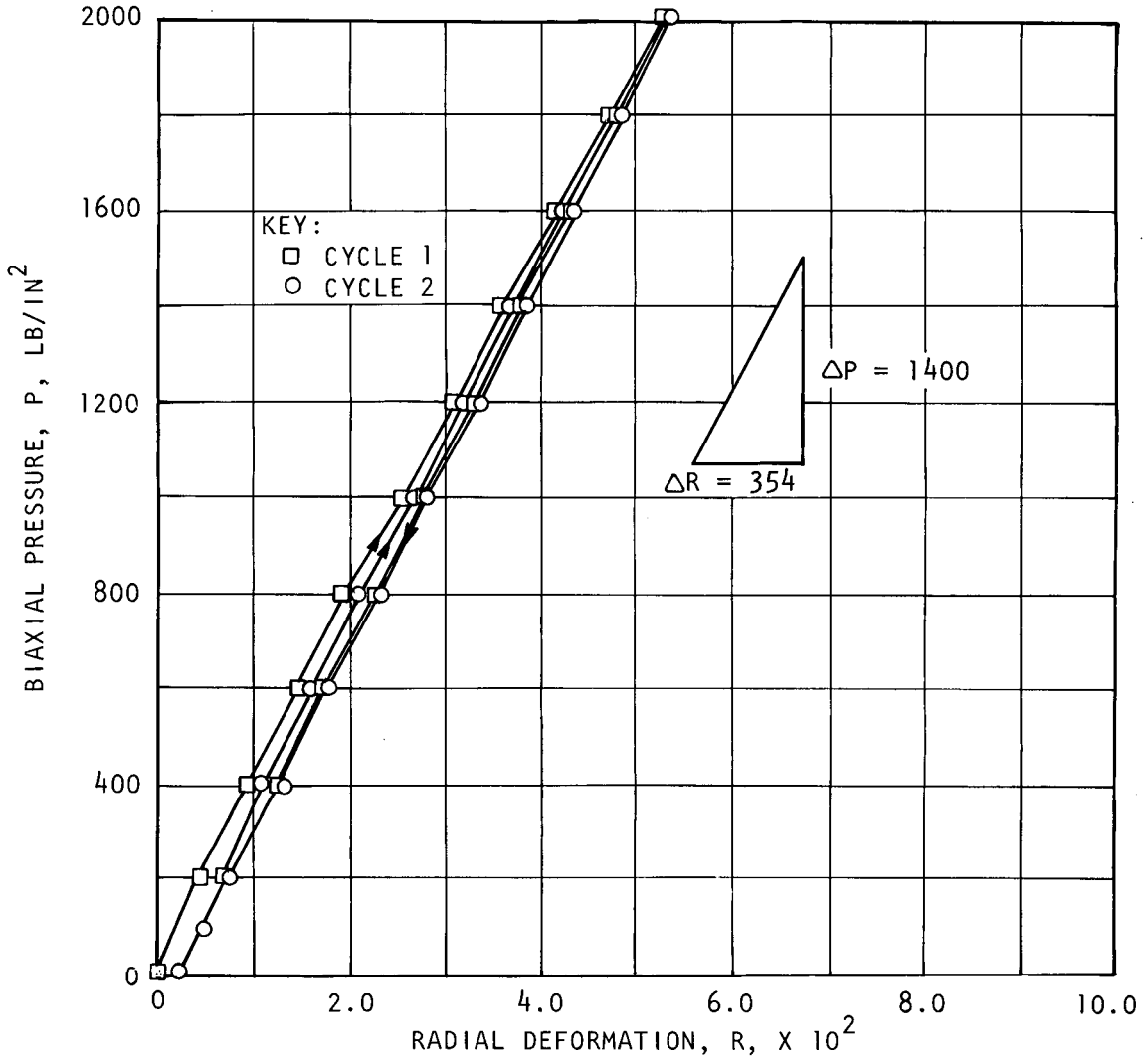
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 12.9 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 5

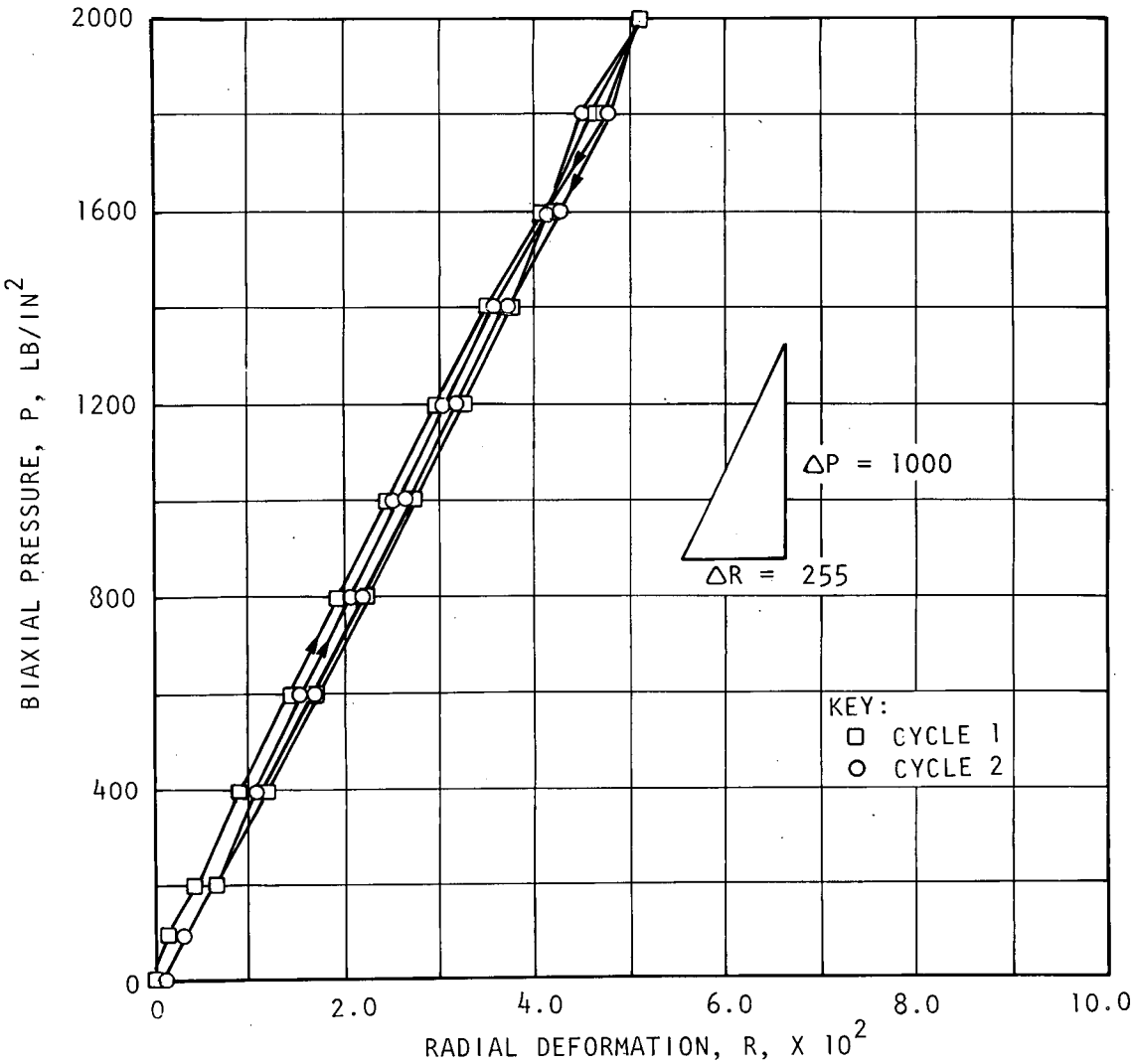
SPECIMEN LENGTH $20\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $12.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 6

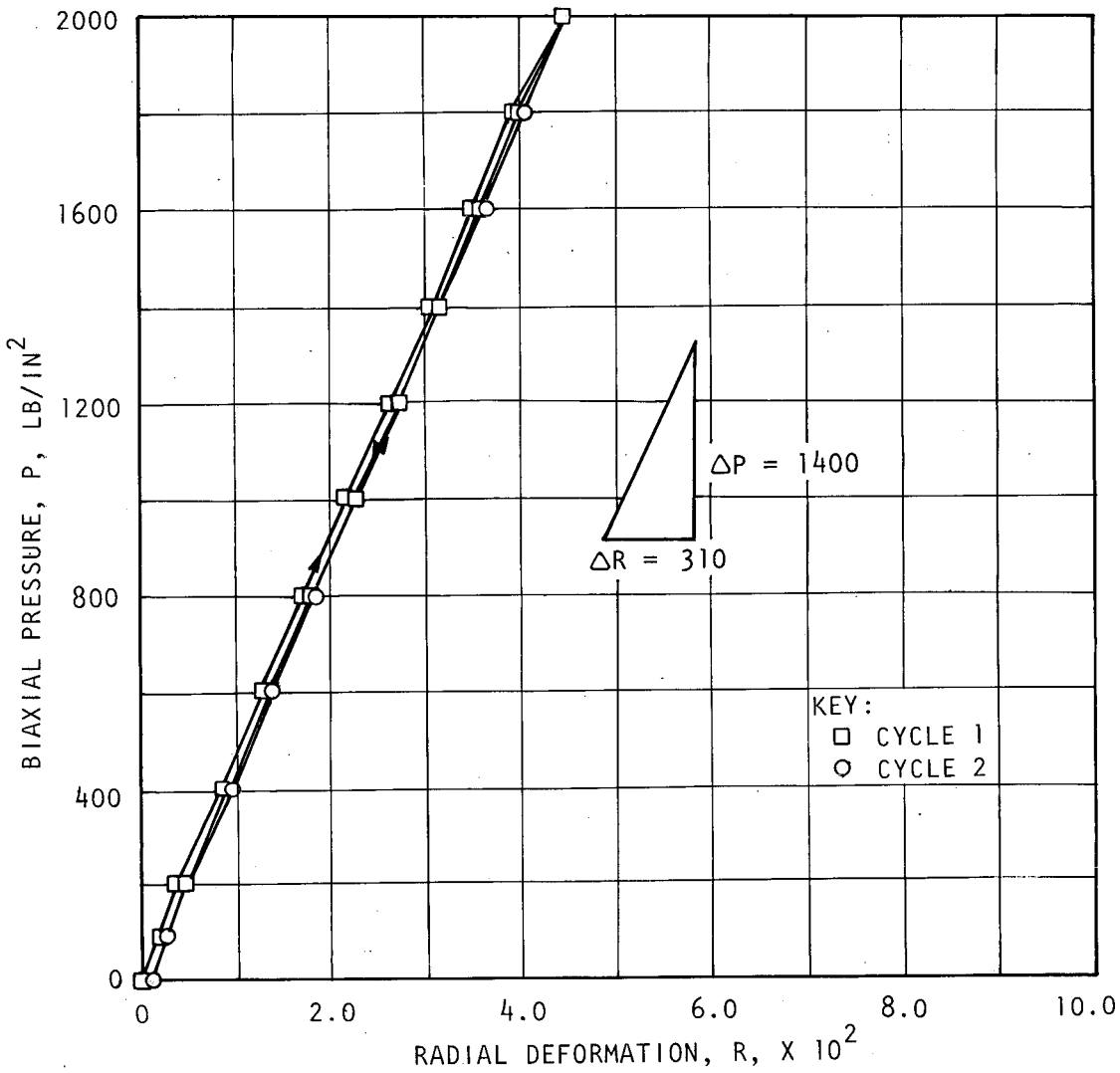
SPECIMEN LENGTH $19\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




$E = 14.3 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 6

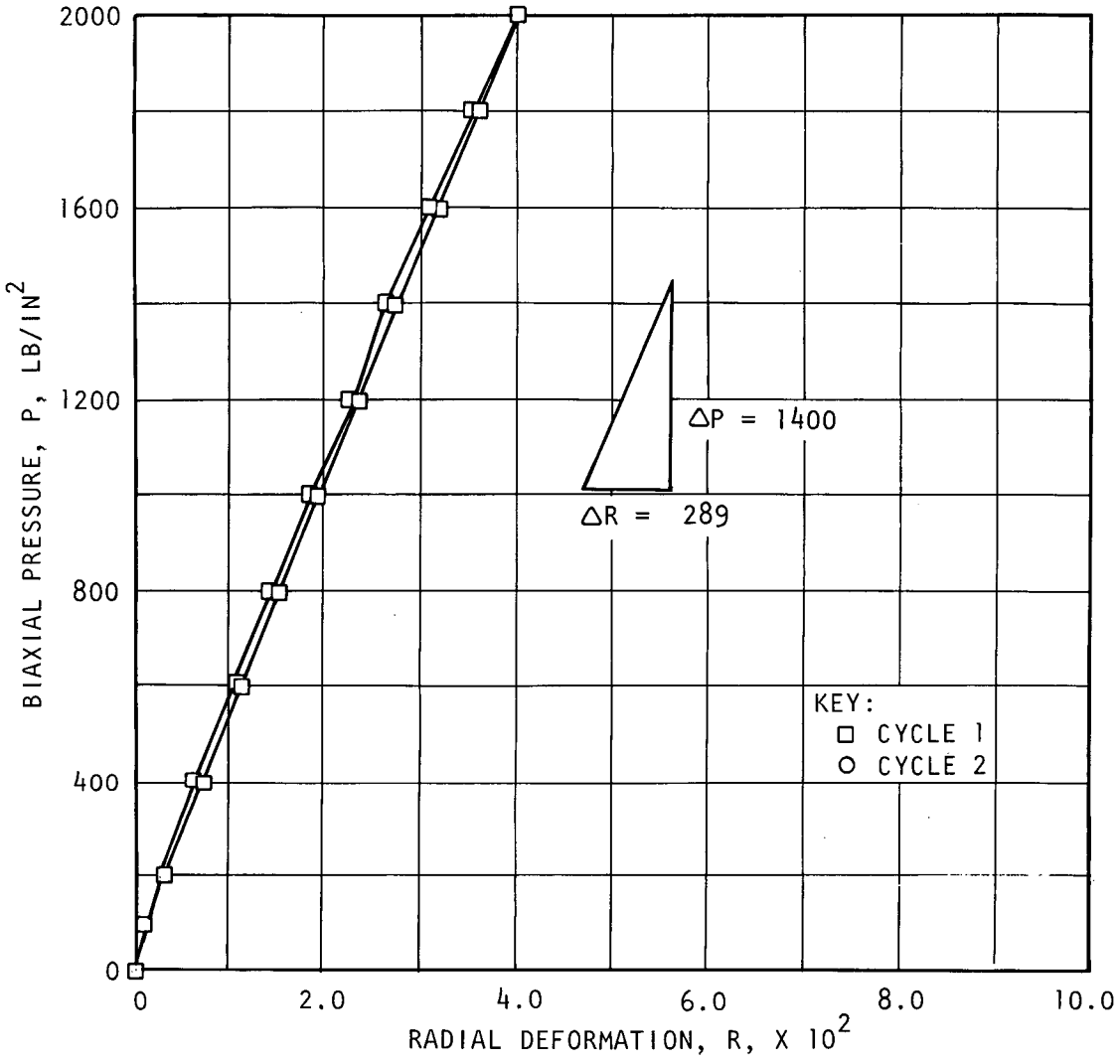
SPECIMEN LENGTH $19\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $15.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 6

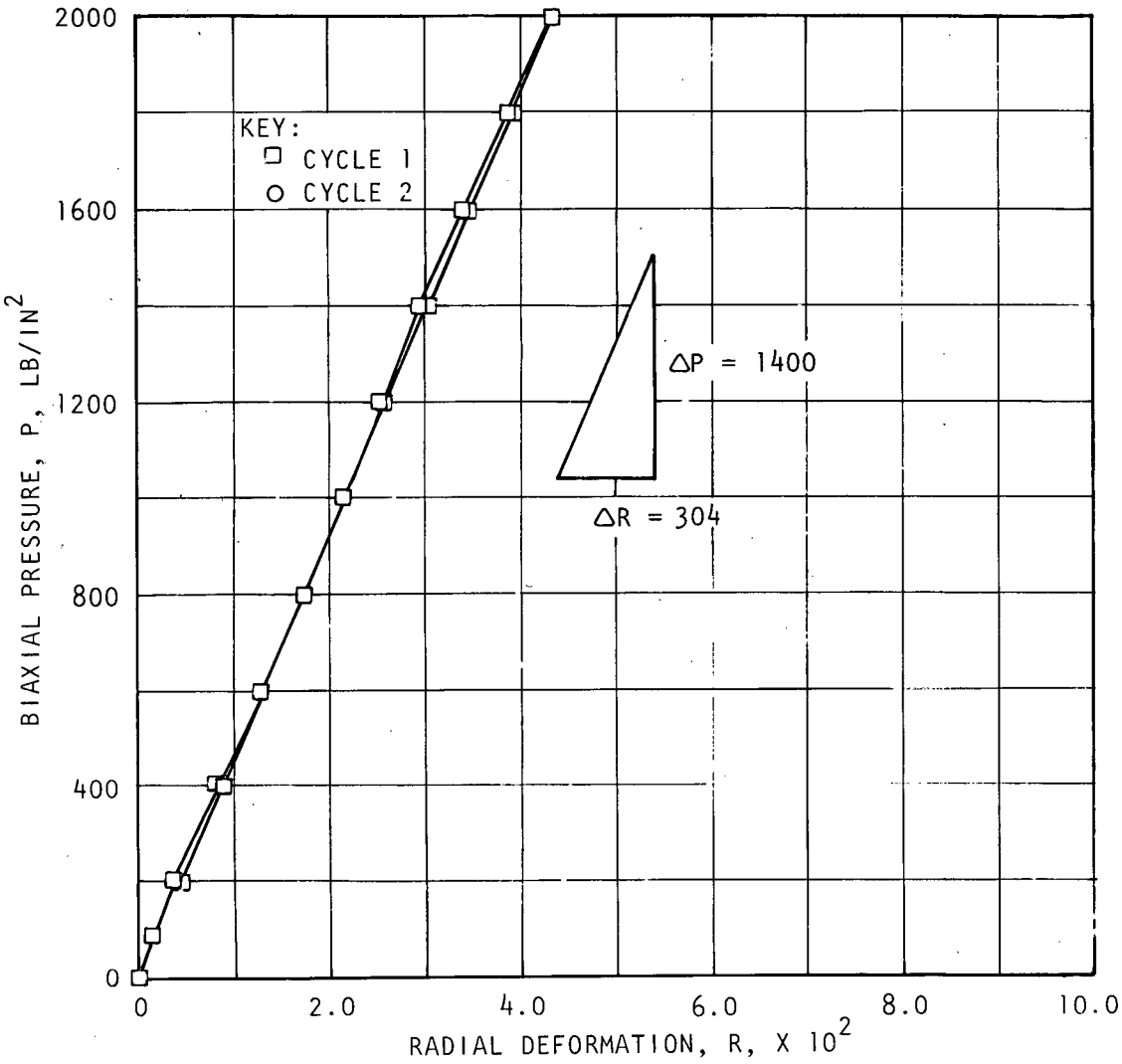
SPECIMEN LENGTH 19½ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.05 X $10^{-6}$ IN.

β = 3.27 IN.

AXIS 3




E = 14.3 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 7

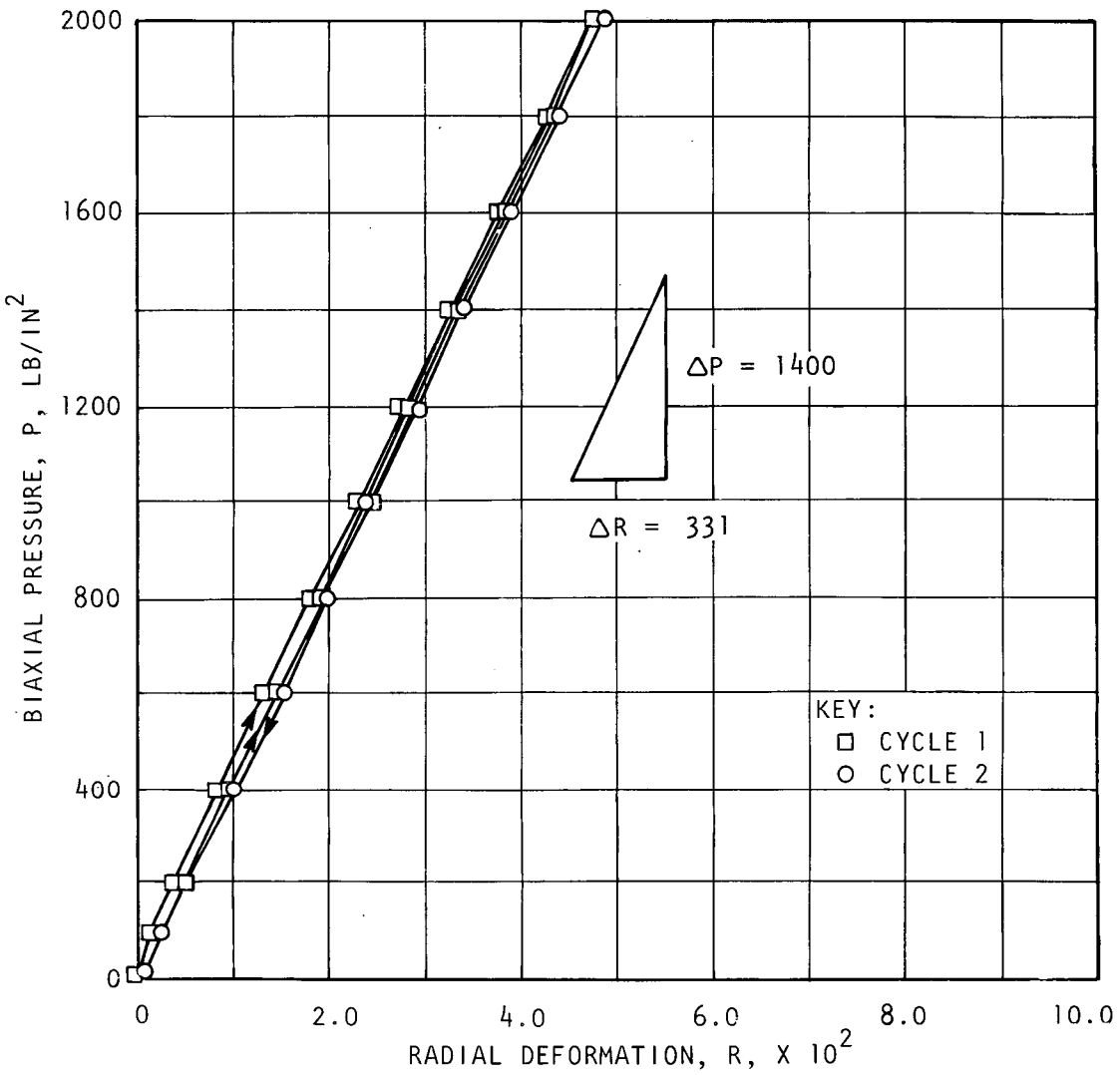
SPECIMEN LENGTH $15\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




$E = 13.4 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 7

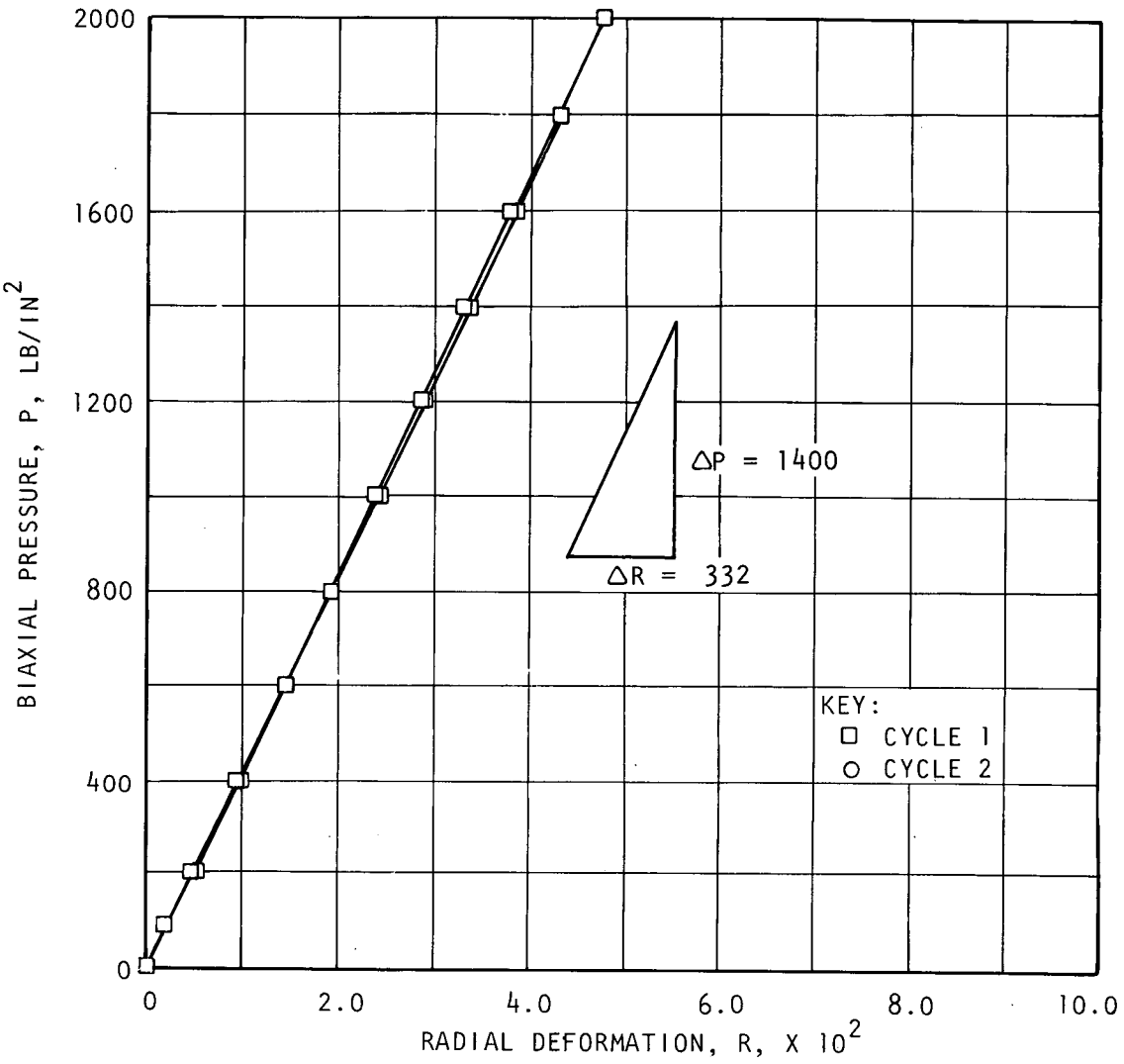
SPECIMEN LENGTH $15\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $13.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 7

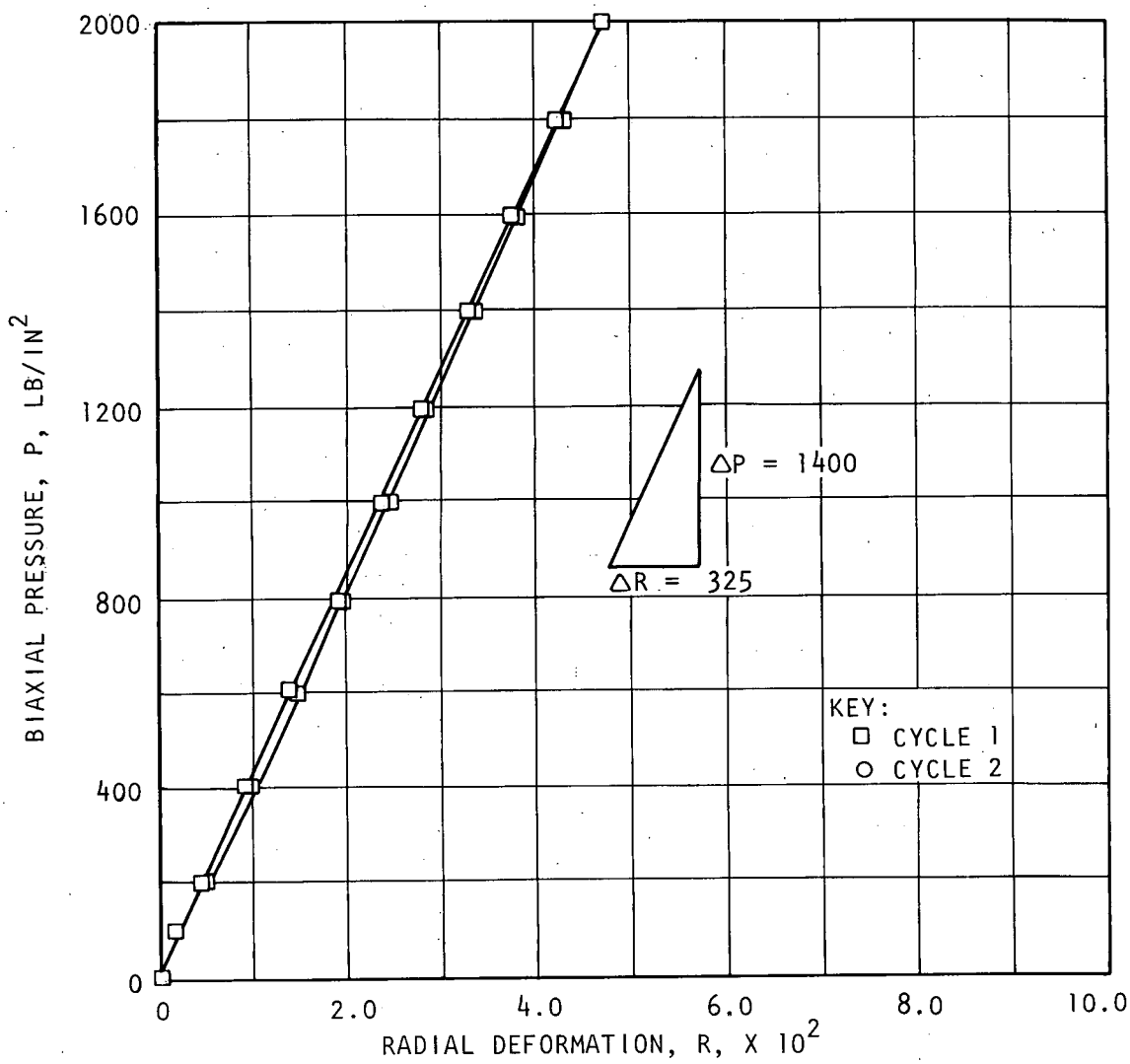
SPECIMEN LENGTH $15\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

AXIS 3

$K_i = 1.05 \times 10^{-6}$ IN.

$\beta = 3.27$ IN.




$E = 13.4 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 9

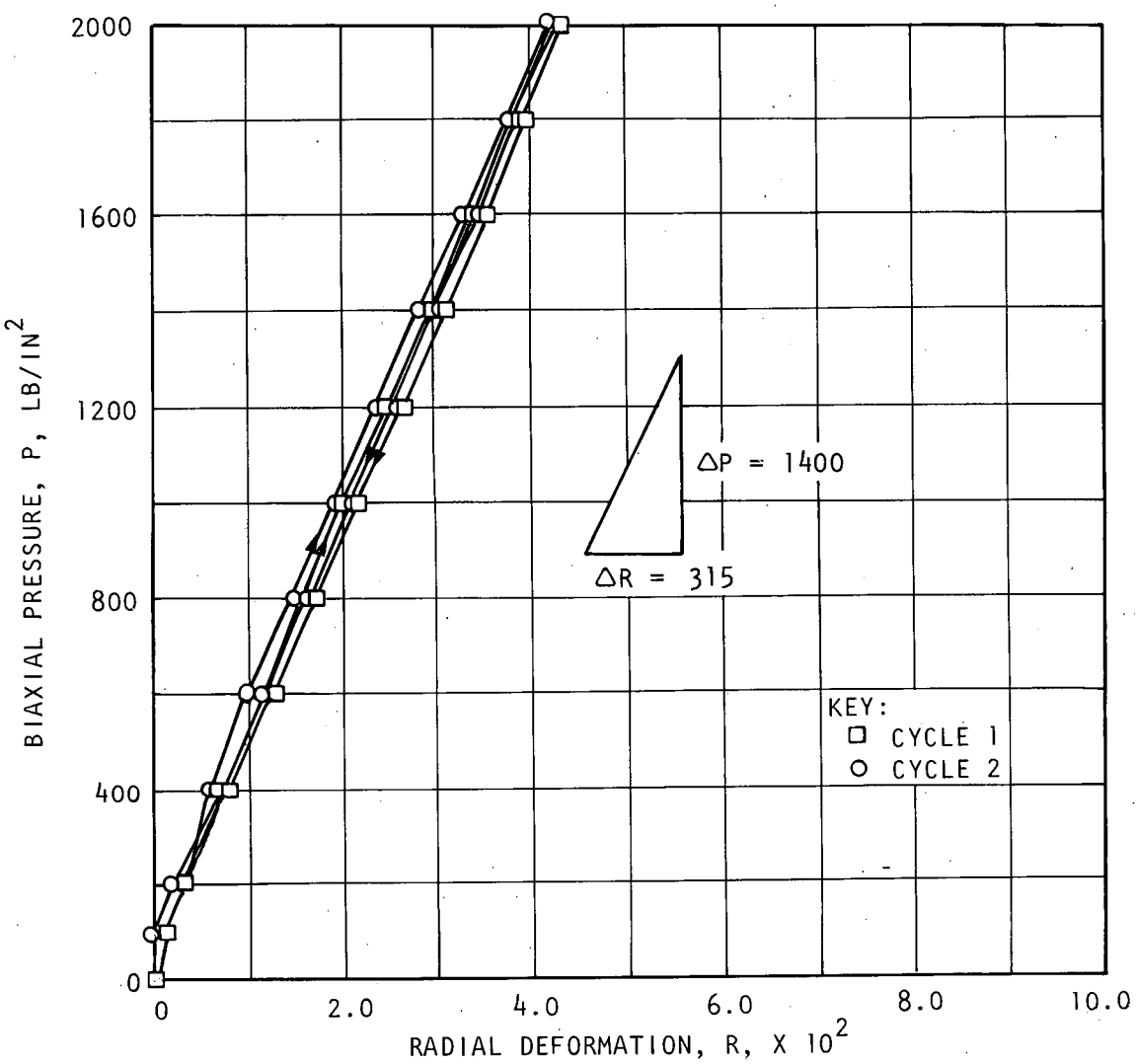
SPECIMEN LENGTH 20 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $14.1 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 9

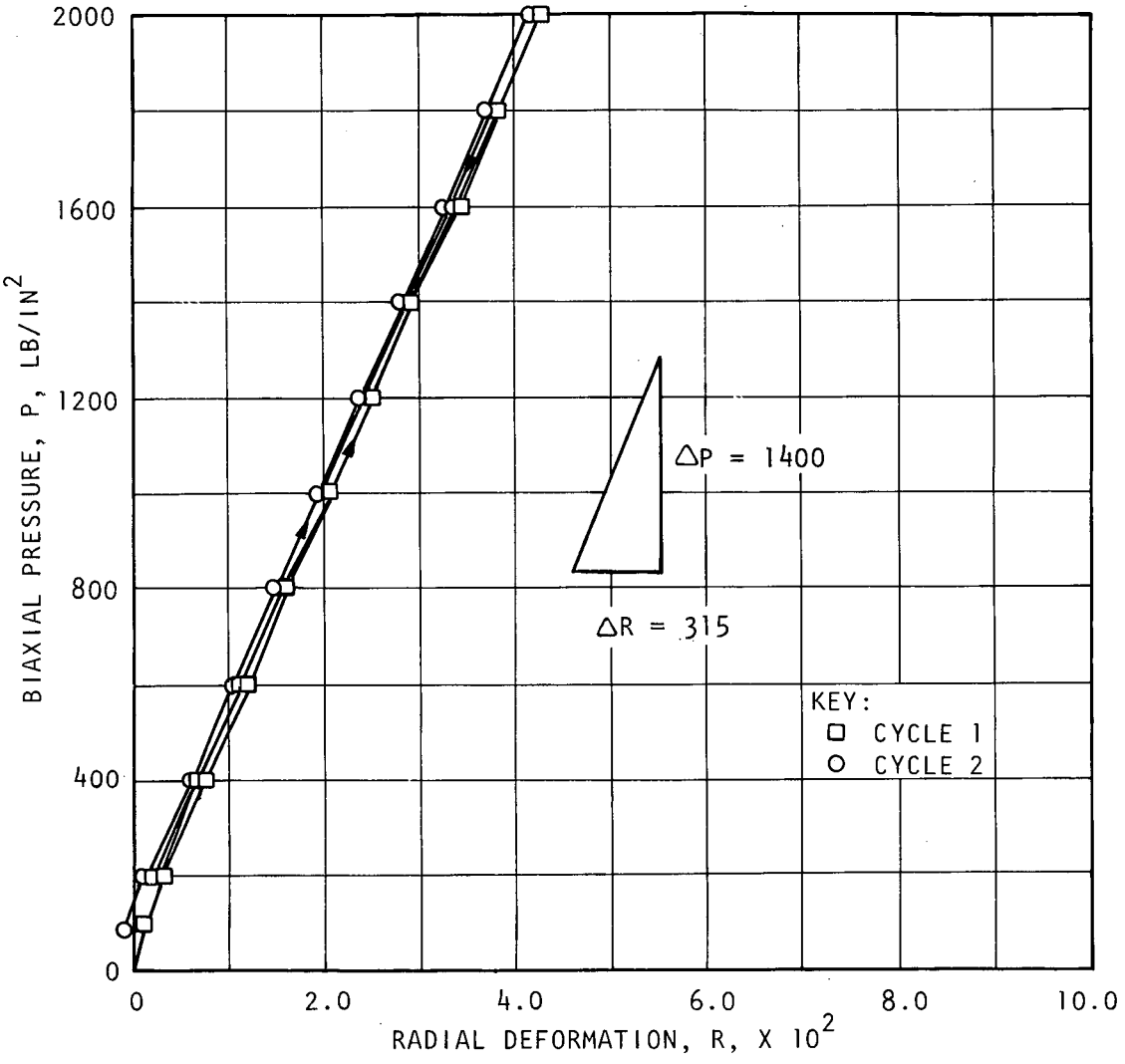
SPECIMEN LENGTH 20 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 14.5 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 9

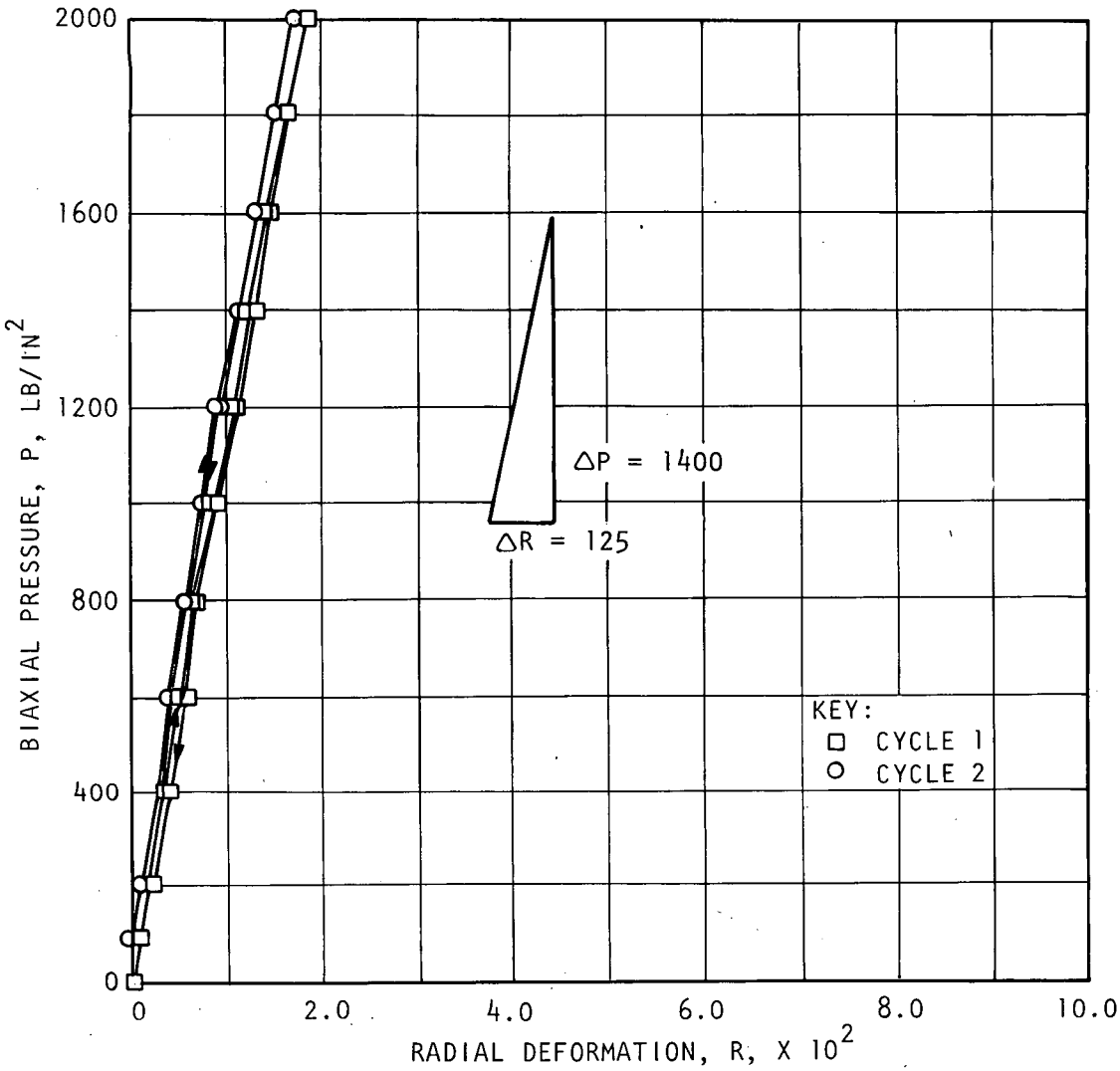
SPECIMEN LENGTH 20 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 34.9 X$10^6$ LB/IN$^2$ (?)

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 10

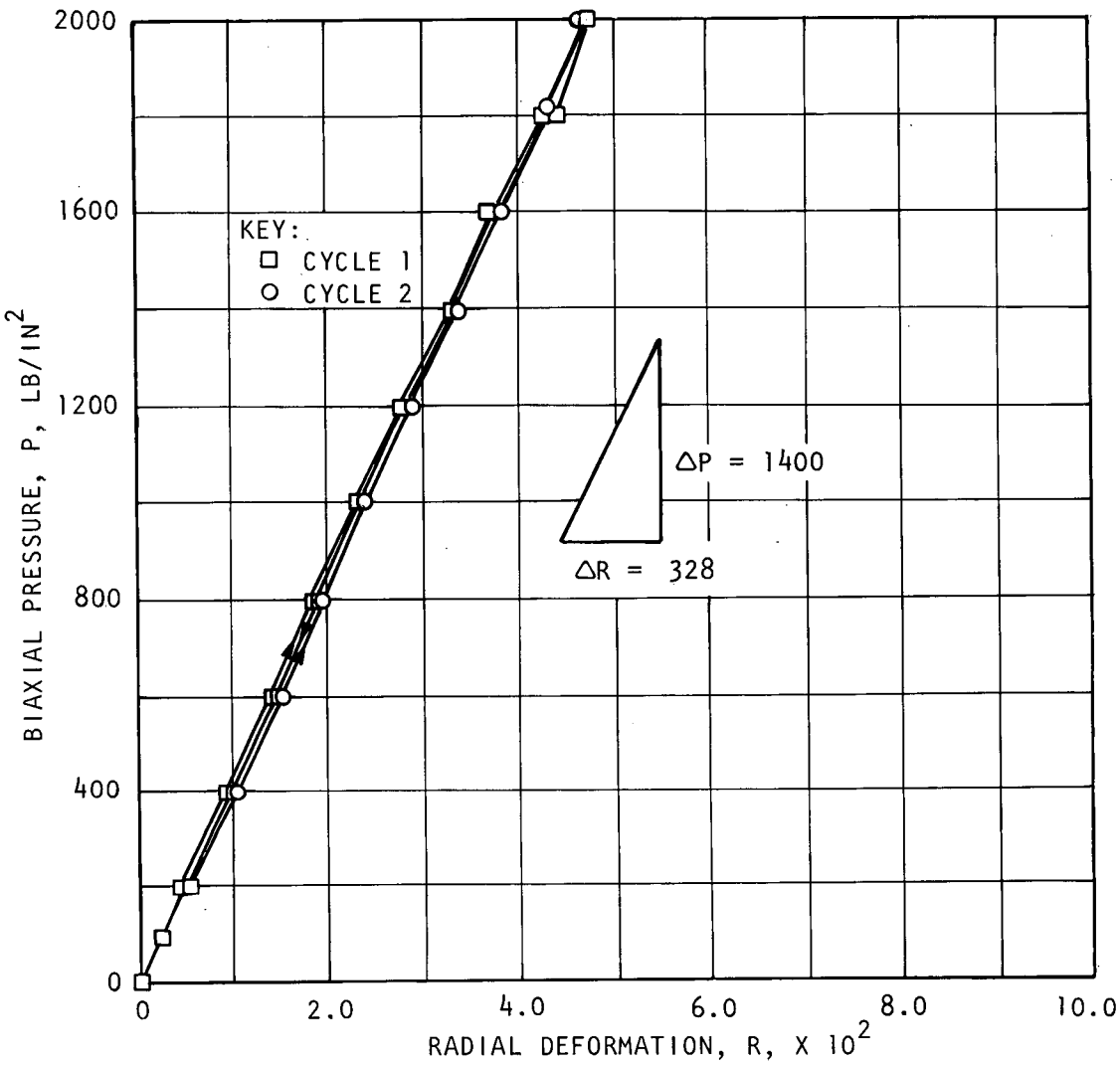
SPECIMEN LENGTH $16\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




$E = 13.6 \times 10^6$ LB/IN$^2$

NOTE: REBOUND FOR CYCLE #2 NOT SHOWN AS IT OVERLIES CYCLE #1 REBOUND

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 10

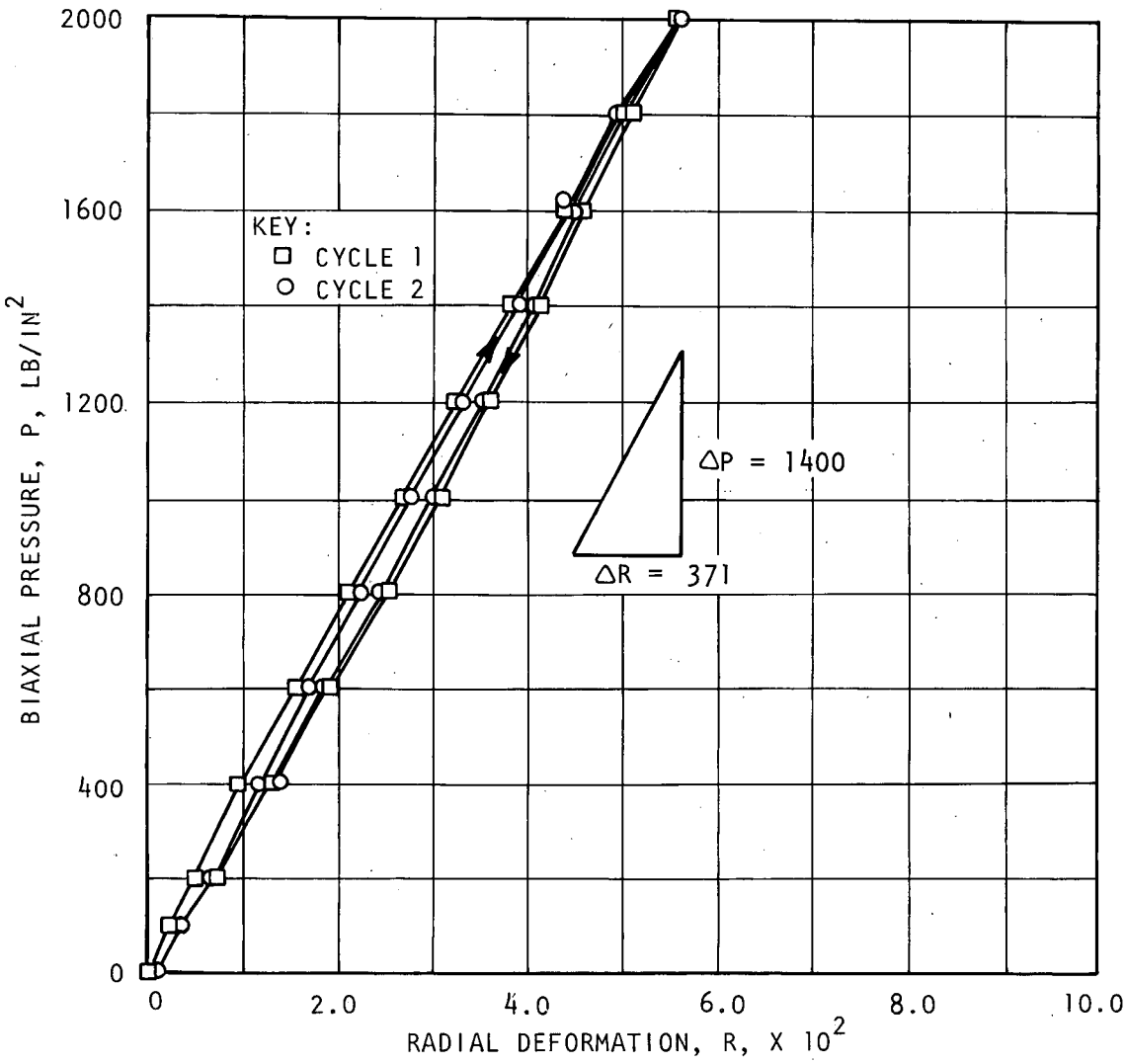
SPECIMEN LENGTH $16\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $12.3 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 3 TEST 10

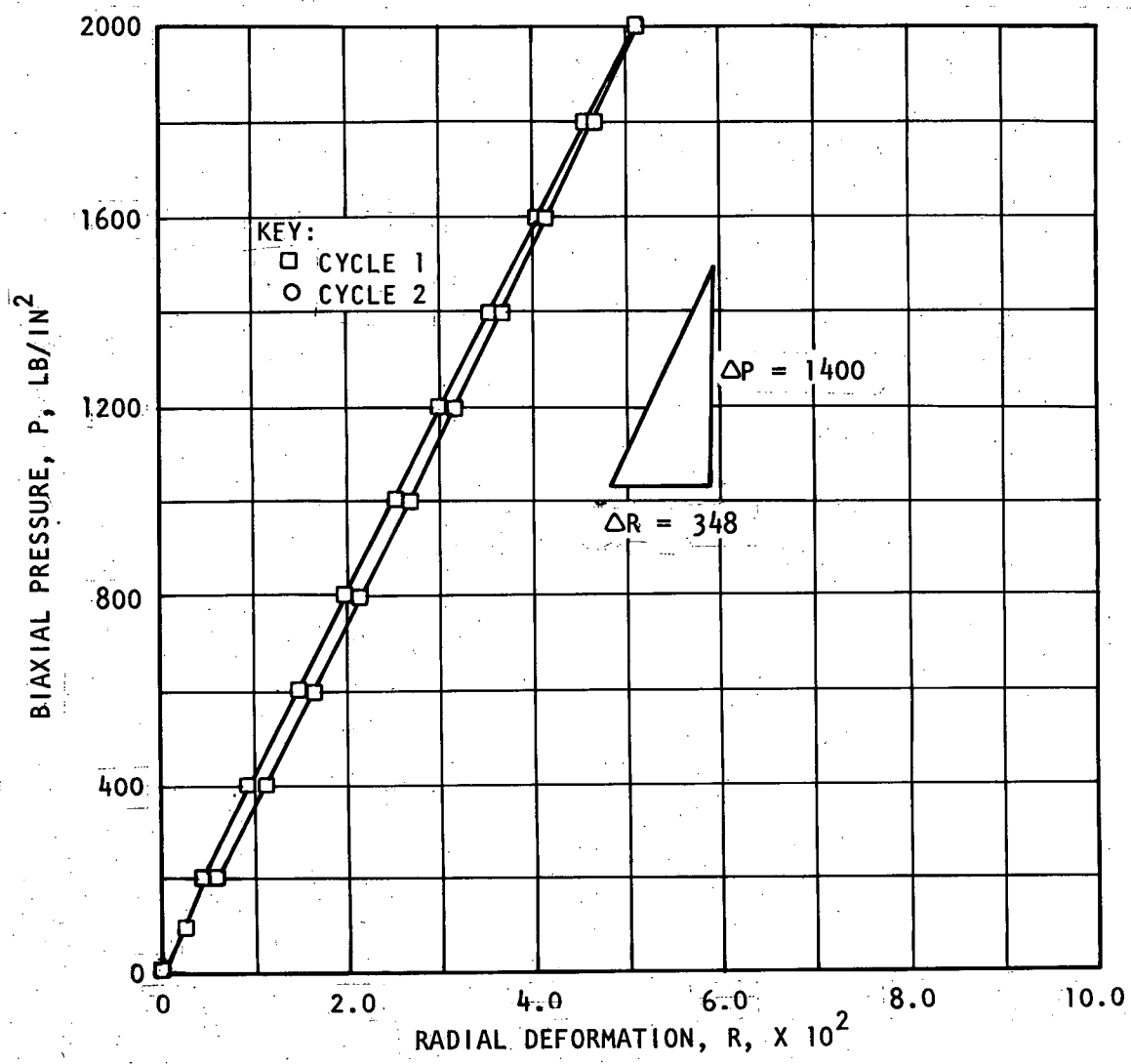
SPECIMEN LENGTH $16\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 12.5 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 1

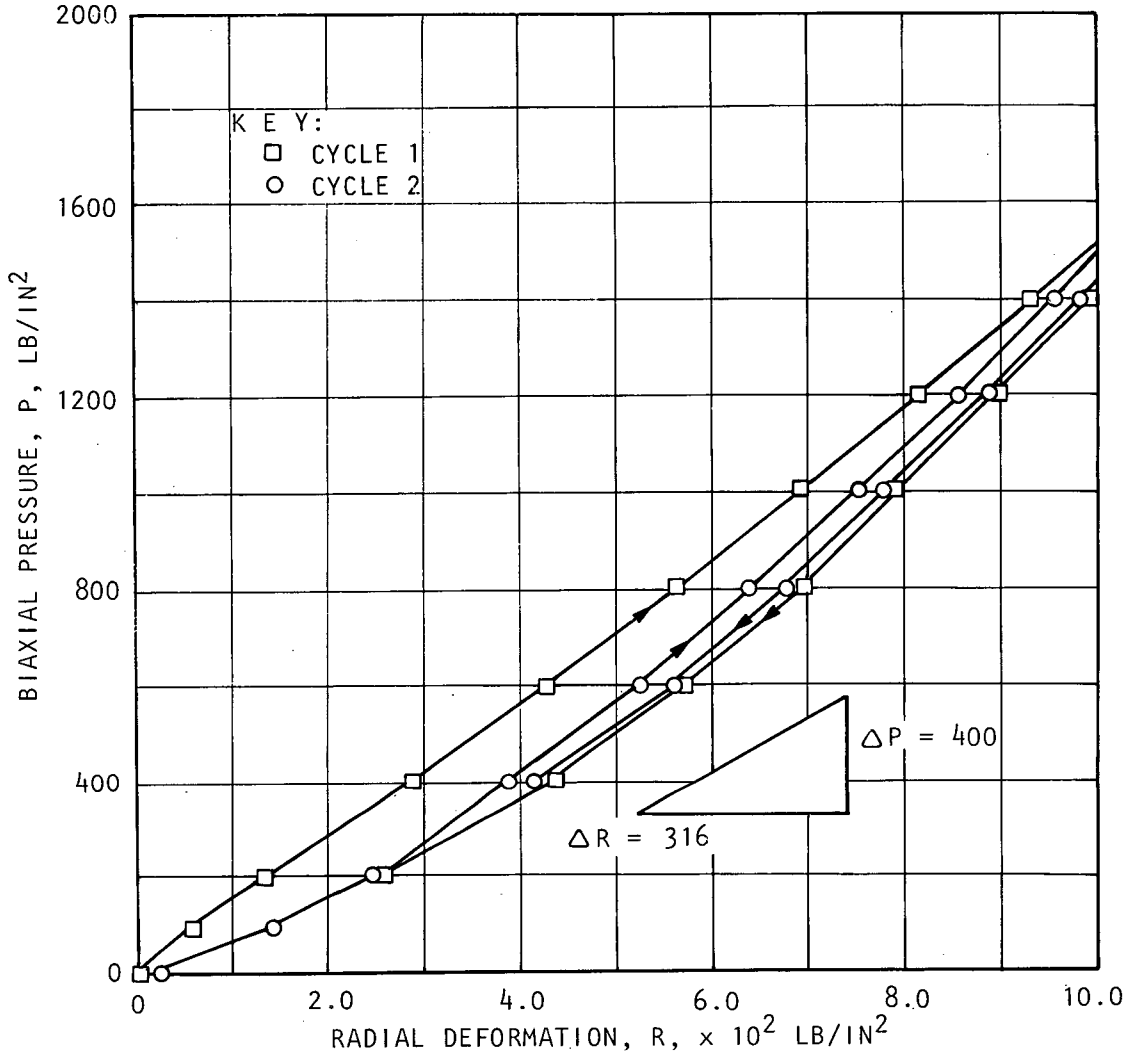
SPECIMEN LENGTH 17 1/2 IN.

SPECIMEN O.D. 5 7/32 IN.

AXIS 1

$K_i = 1.03 \times 10^{-6}$ IN

$\beta = 3.27$ IN.




$E = 4.0 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 1

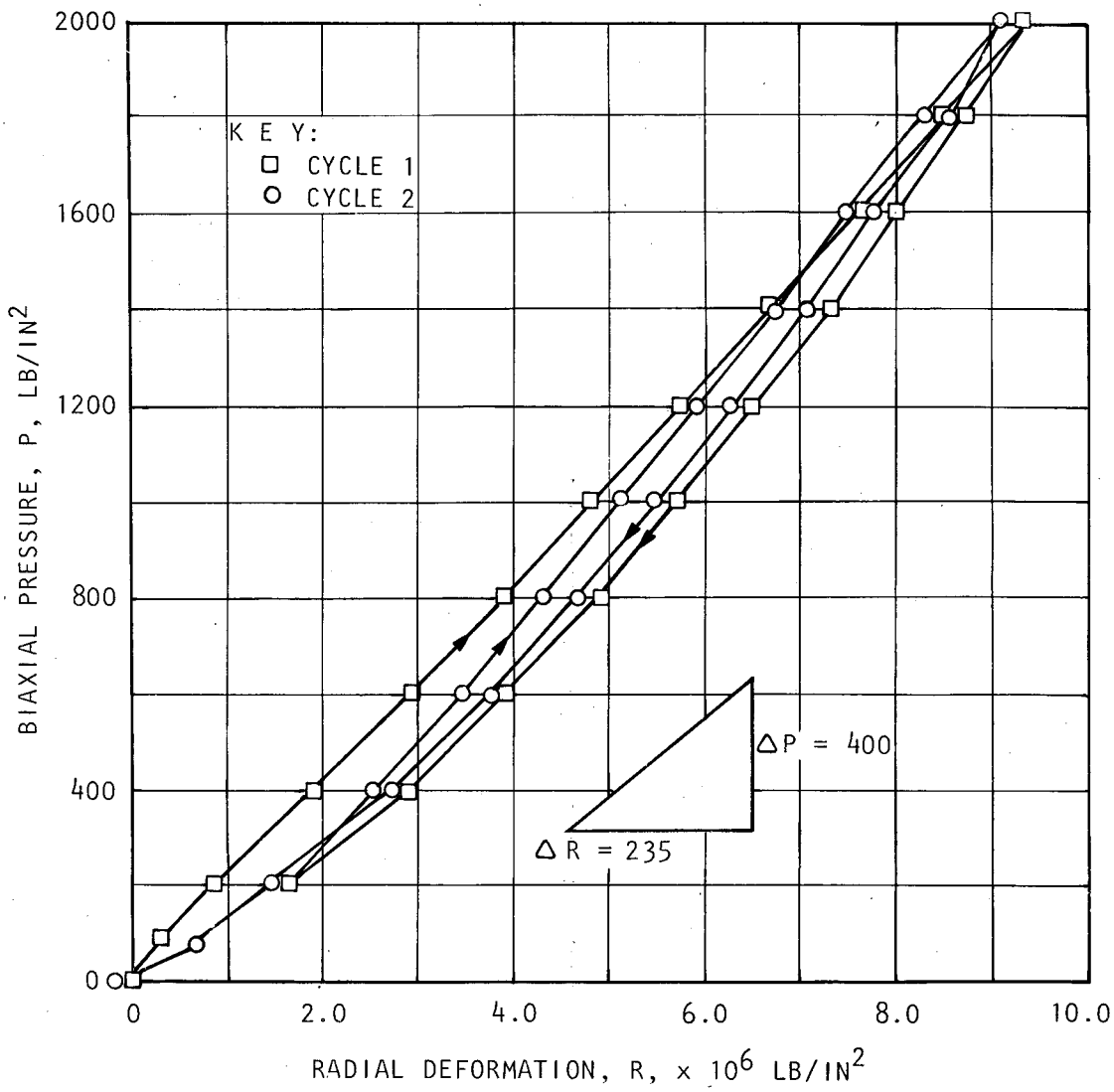
SPECIMEN LENGTH 17 1/2 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.00 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 2




$E = 5.6 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 1

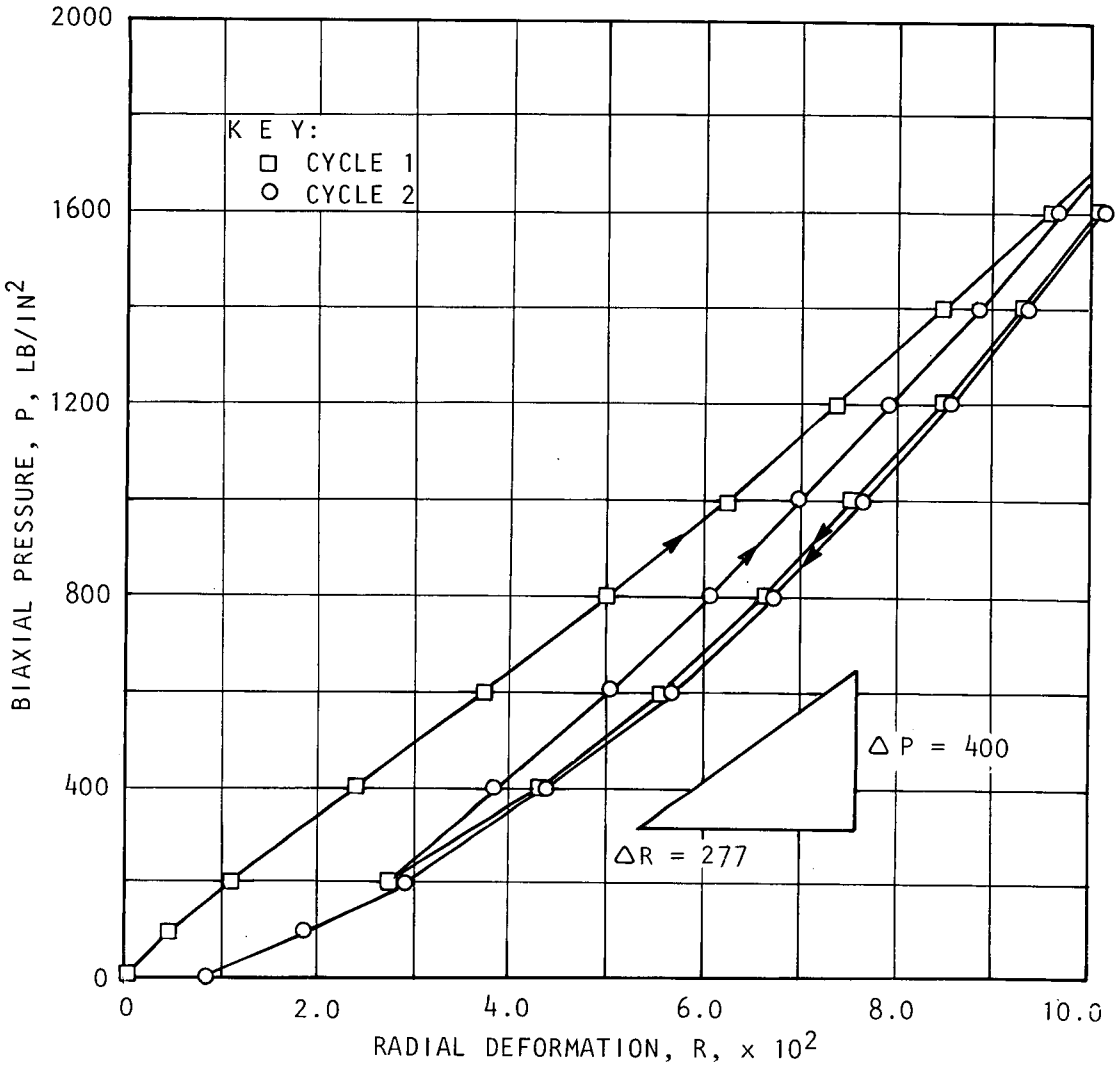
SPECIMEN LENGTH 17 1/2 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.05 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 3




$E = 4.5 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 3

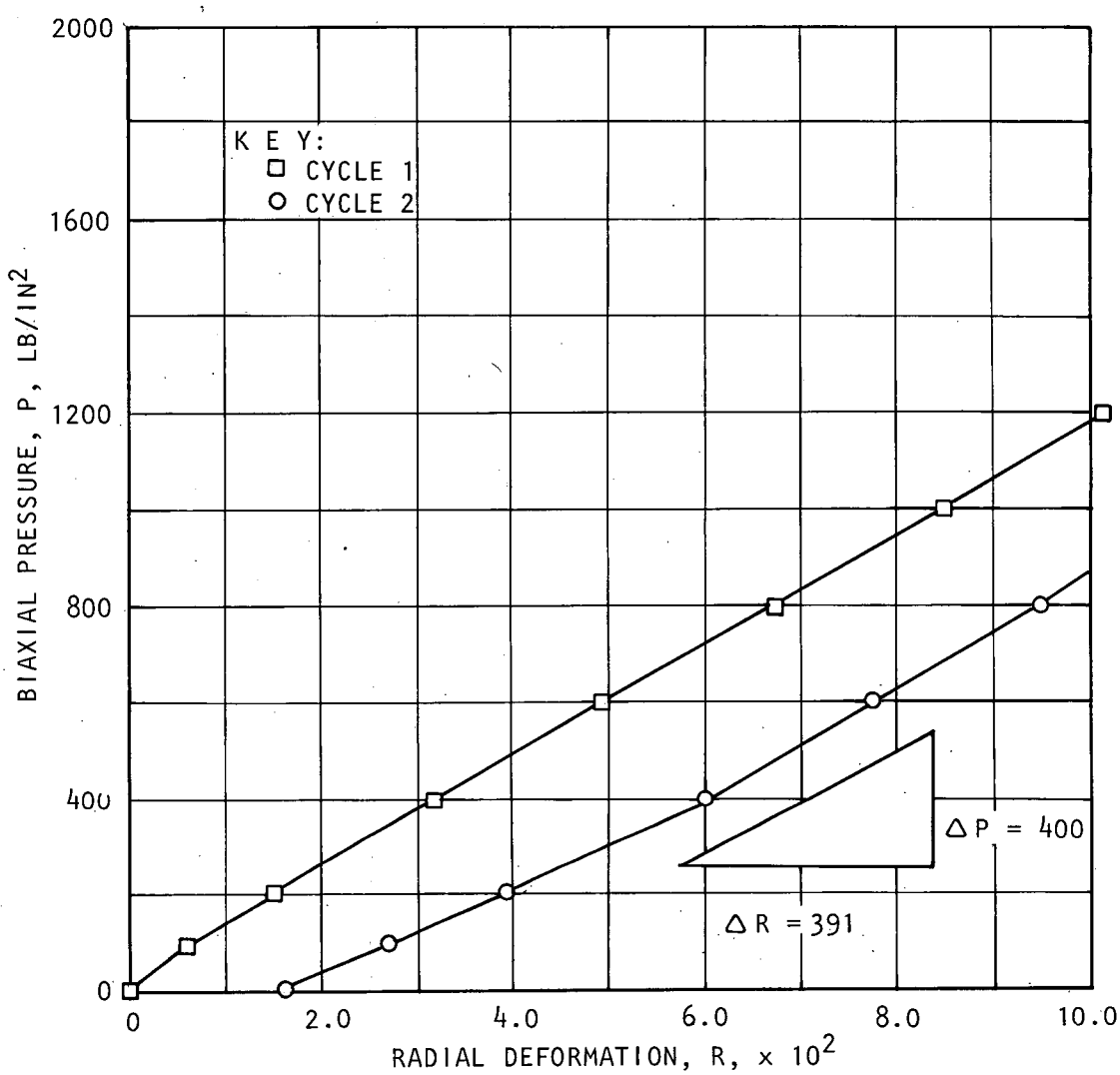
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.03 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 1




$E = 3.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 3

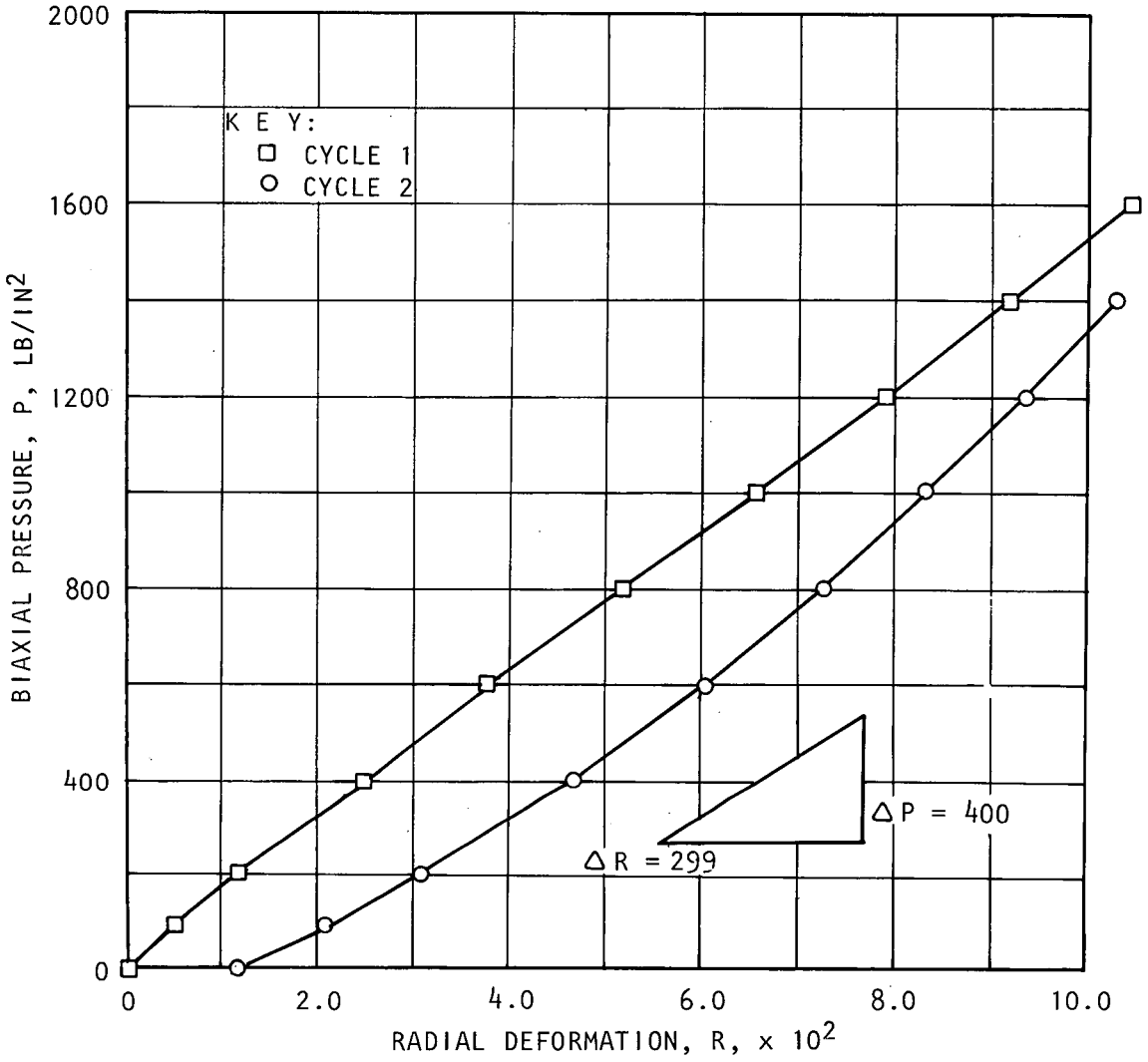
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.00 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 2




$E = 4.4 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 3

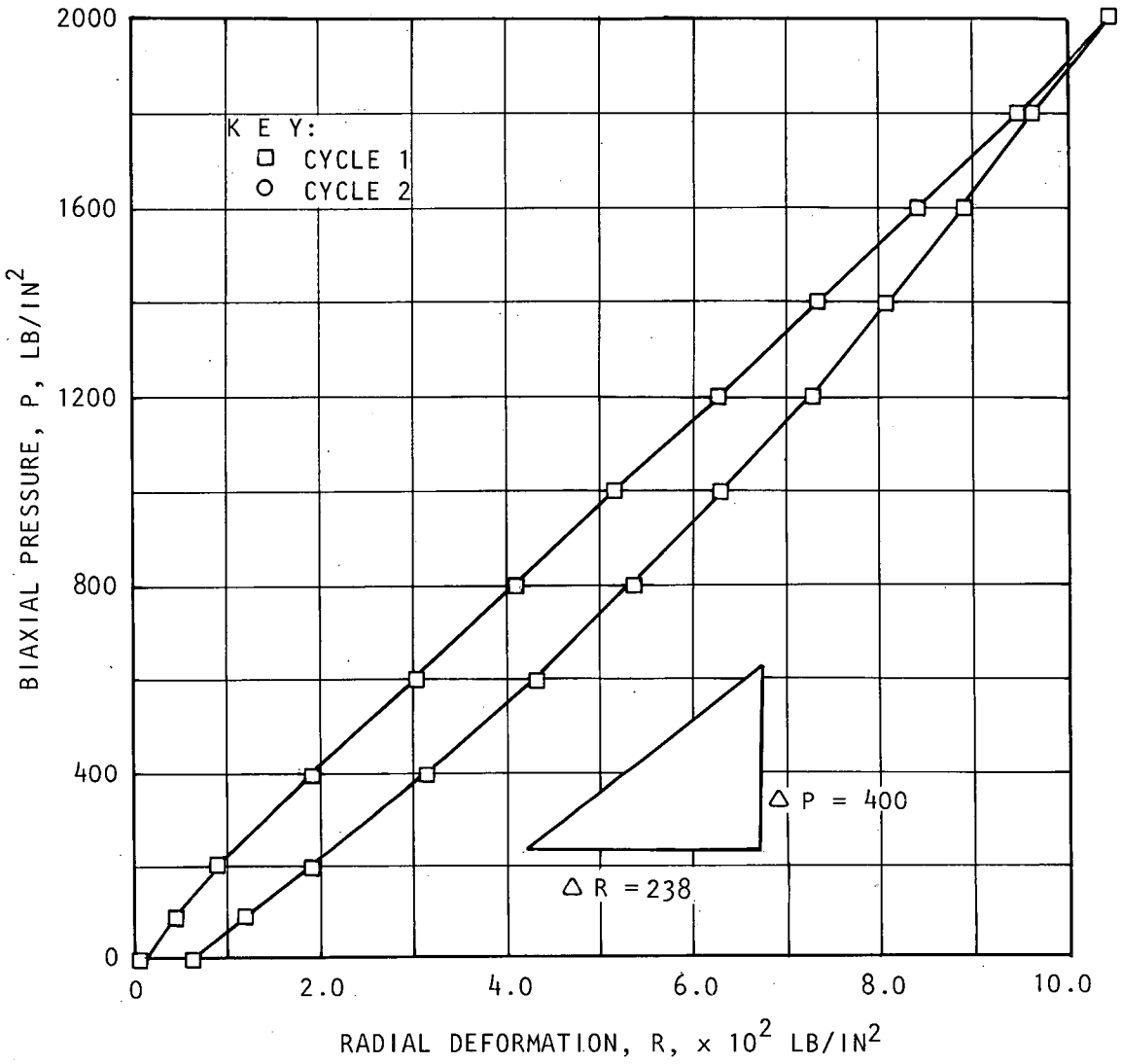
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5 7/32 IN.

$K_i = 1.05 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 3




$E = 5.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 4

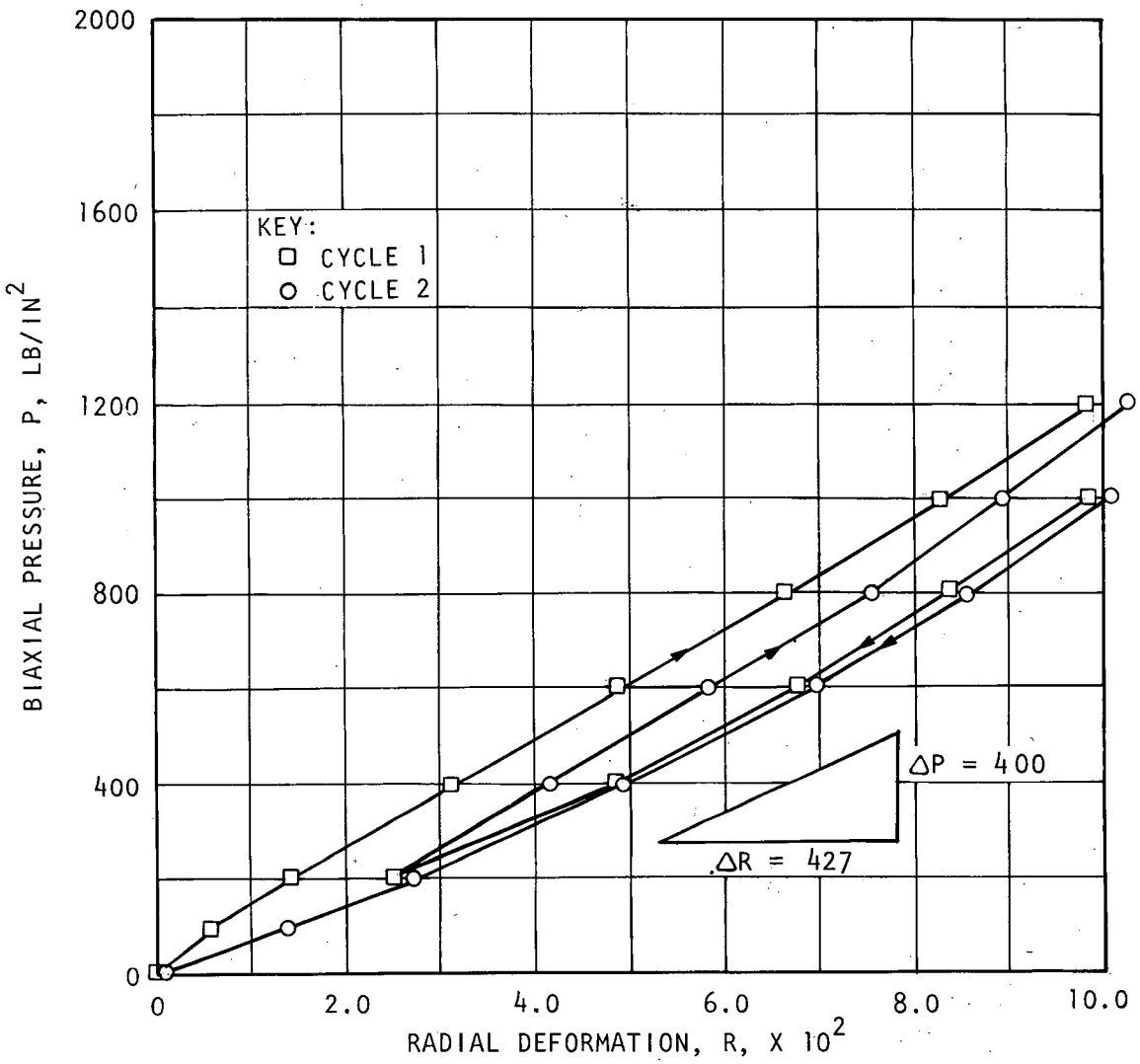
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $3.0 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 4

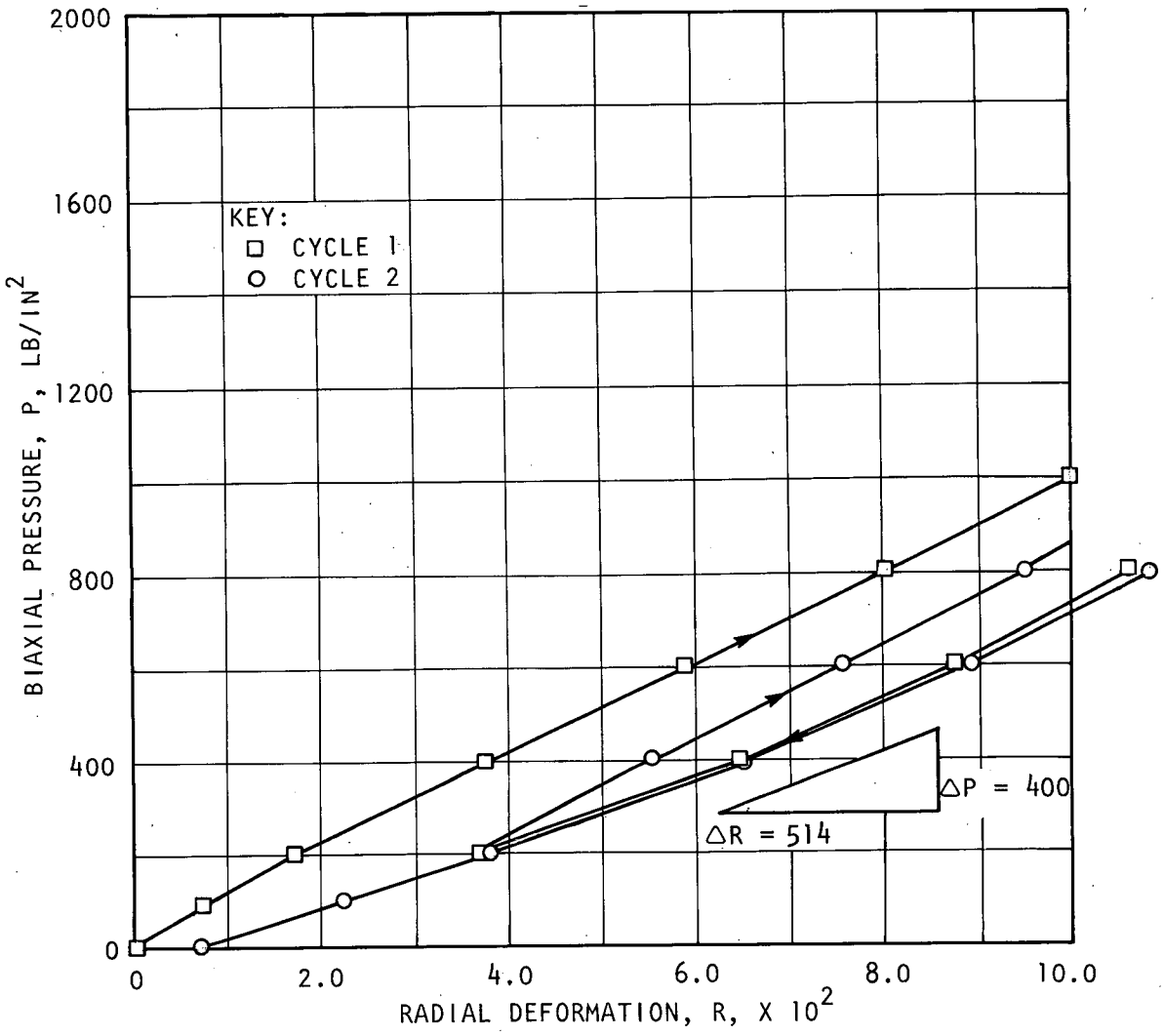
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $2.5 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 4

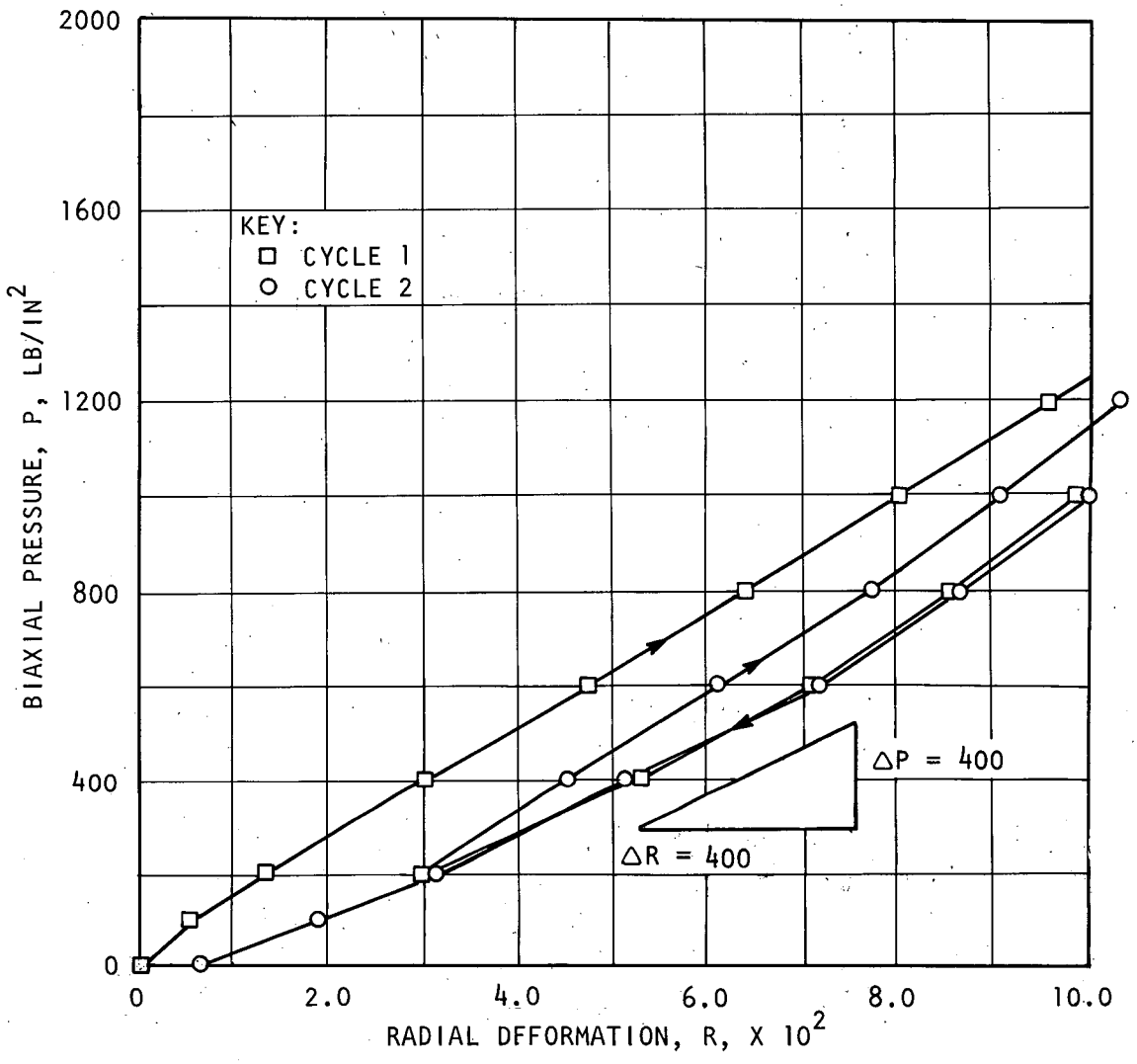
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $3.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 7

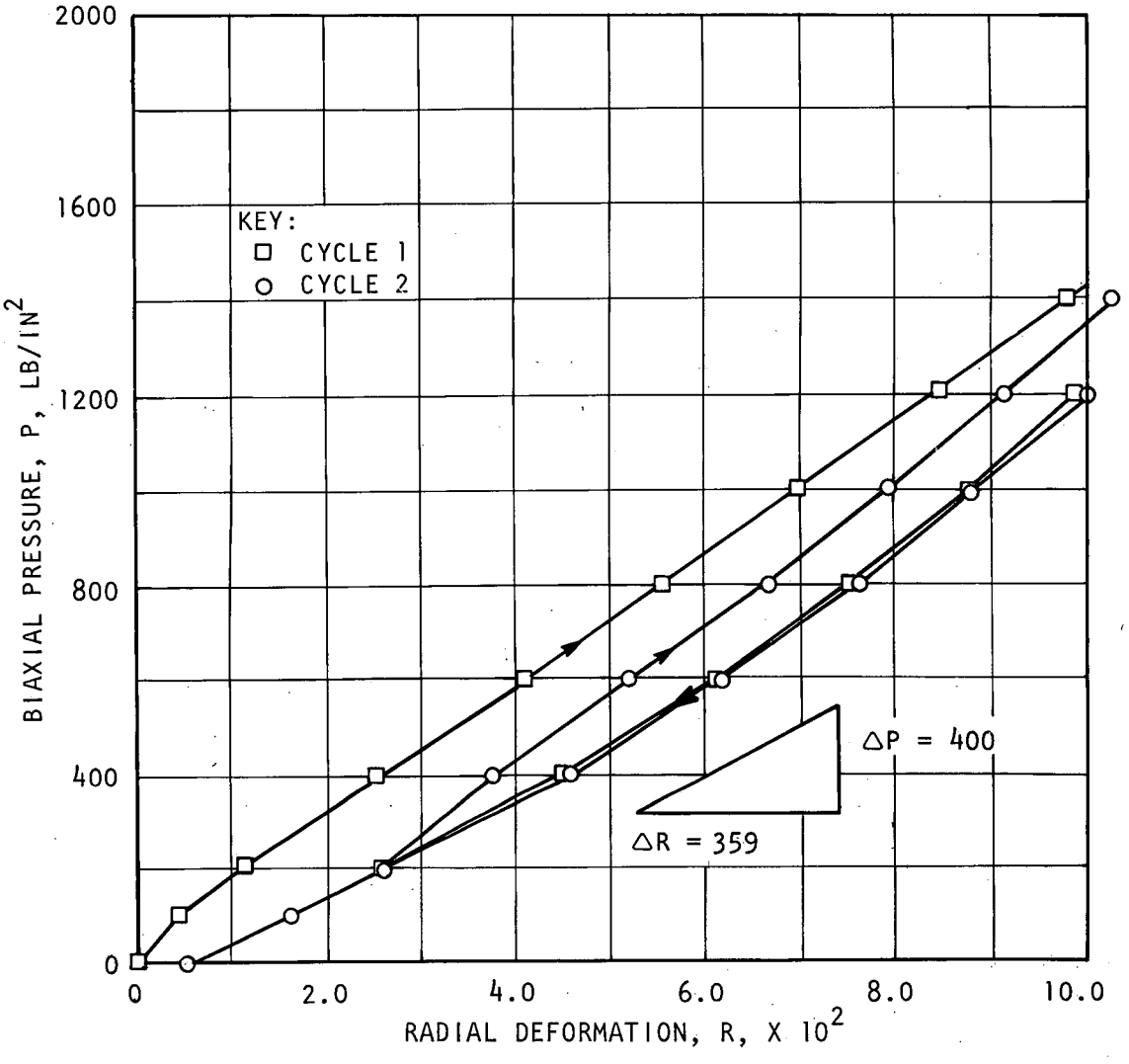
SPECIMEN LENGTH $16\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 3.5 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 7

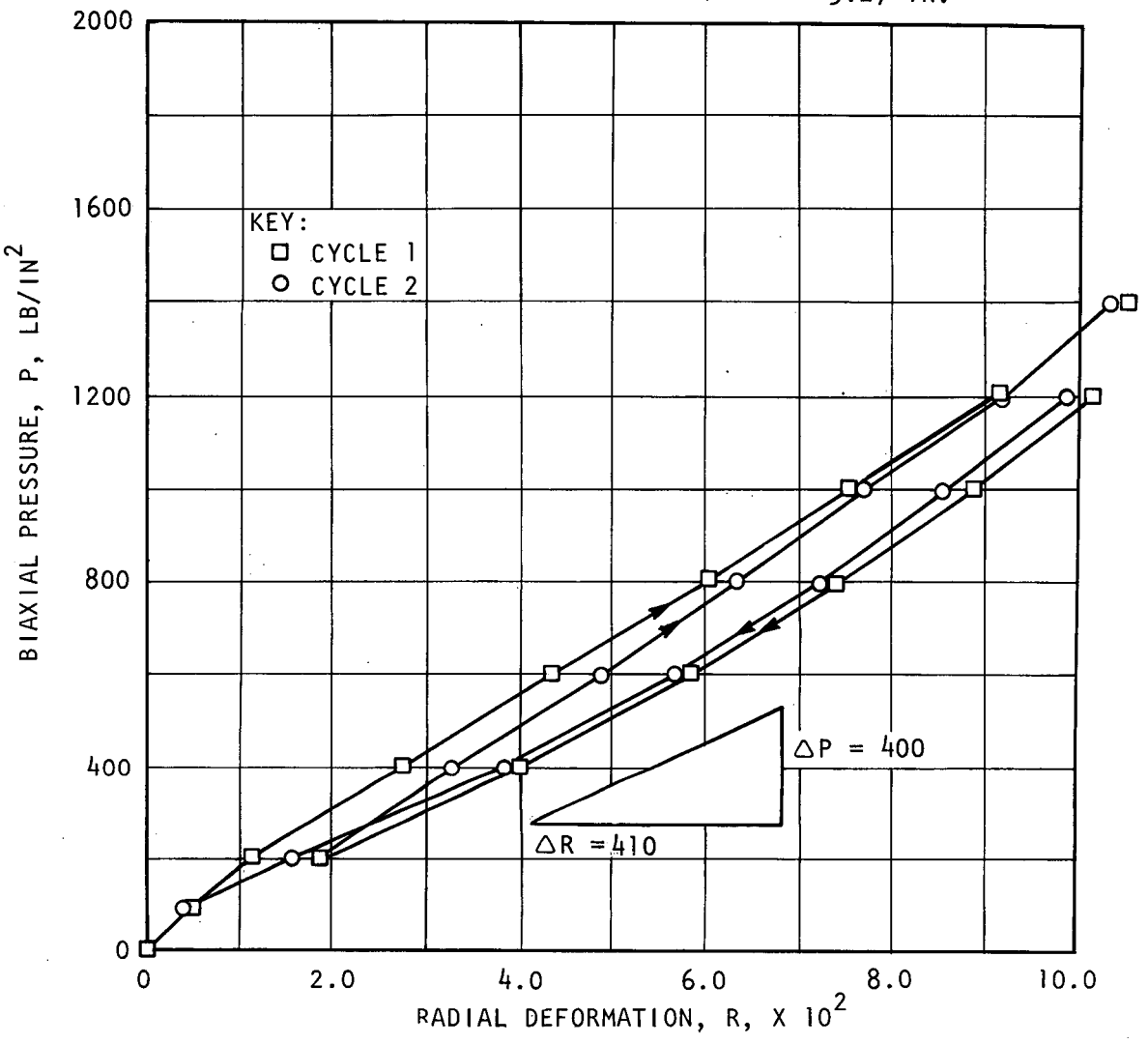
SPECIMEN LENGTH 16½ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $3.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 9 TEST 7

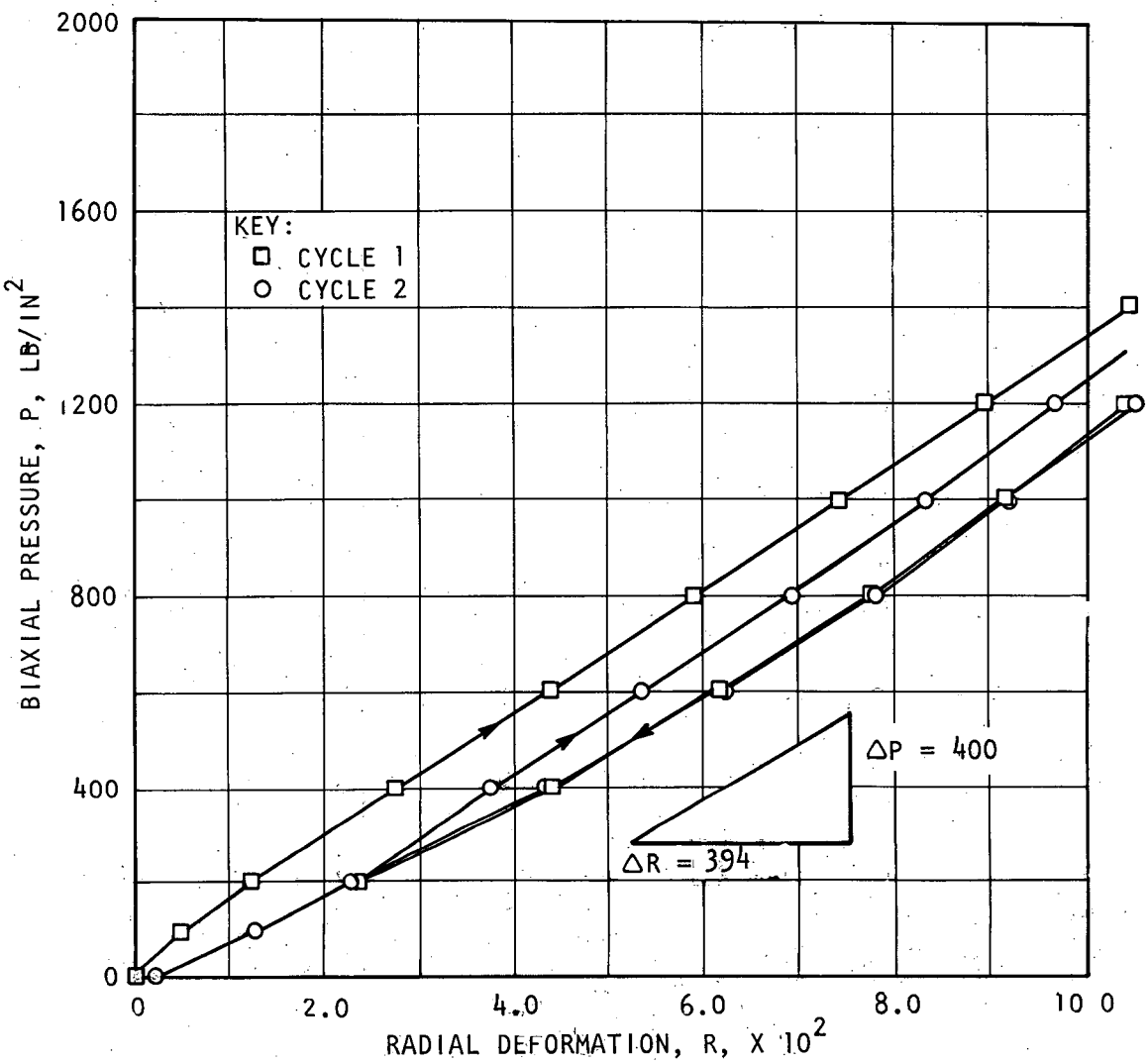
SPECIMEN LENGTH $16\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 3.2 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 1

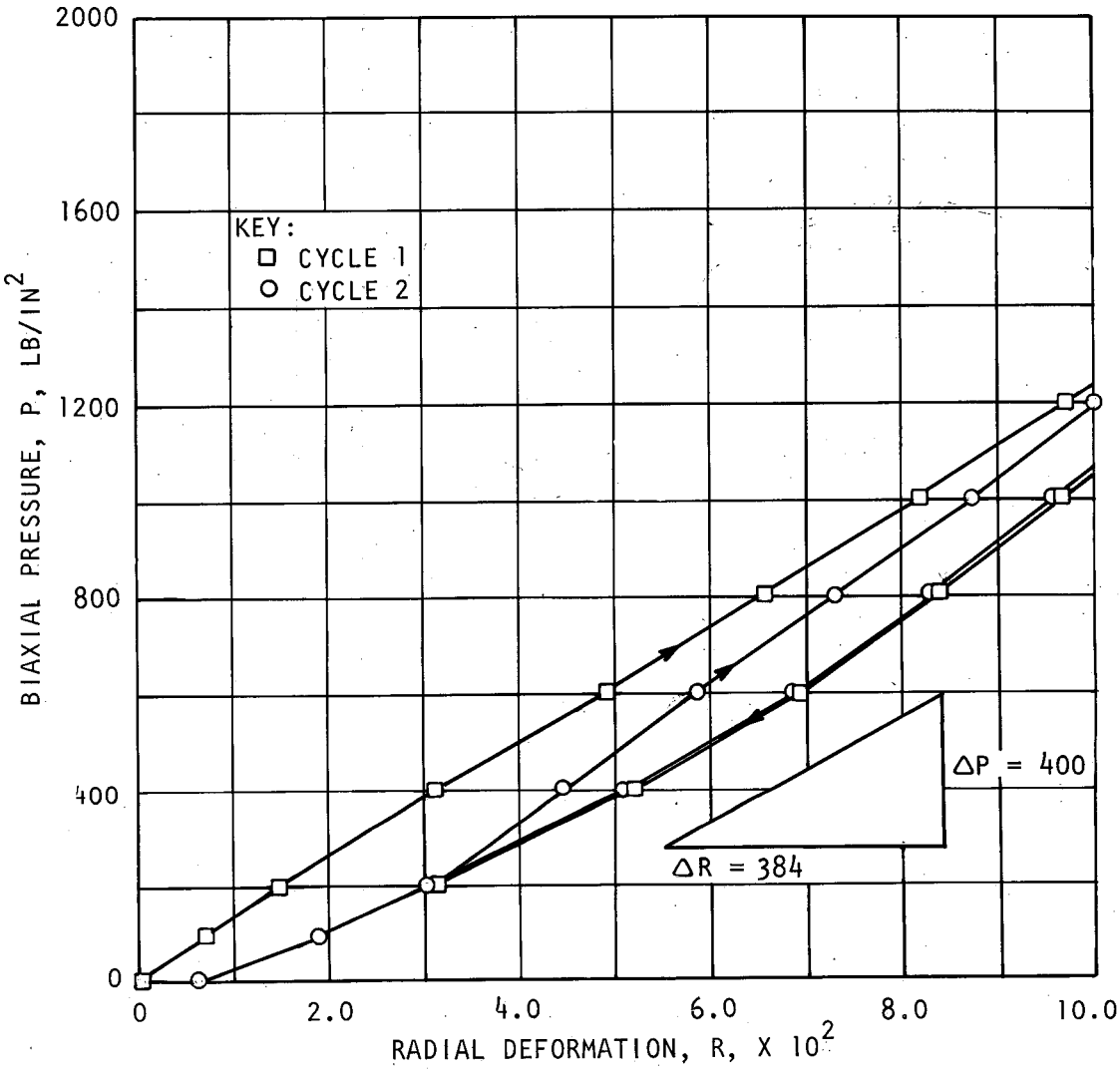
SPECIMEN LENGTH 18 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 3.3 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 1

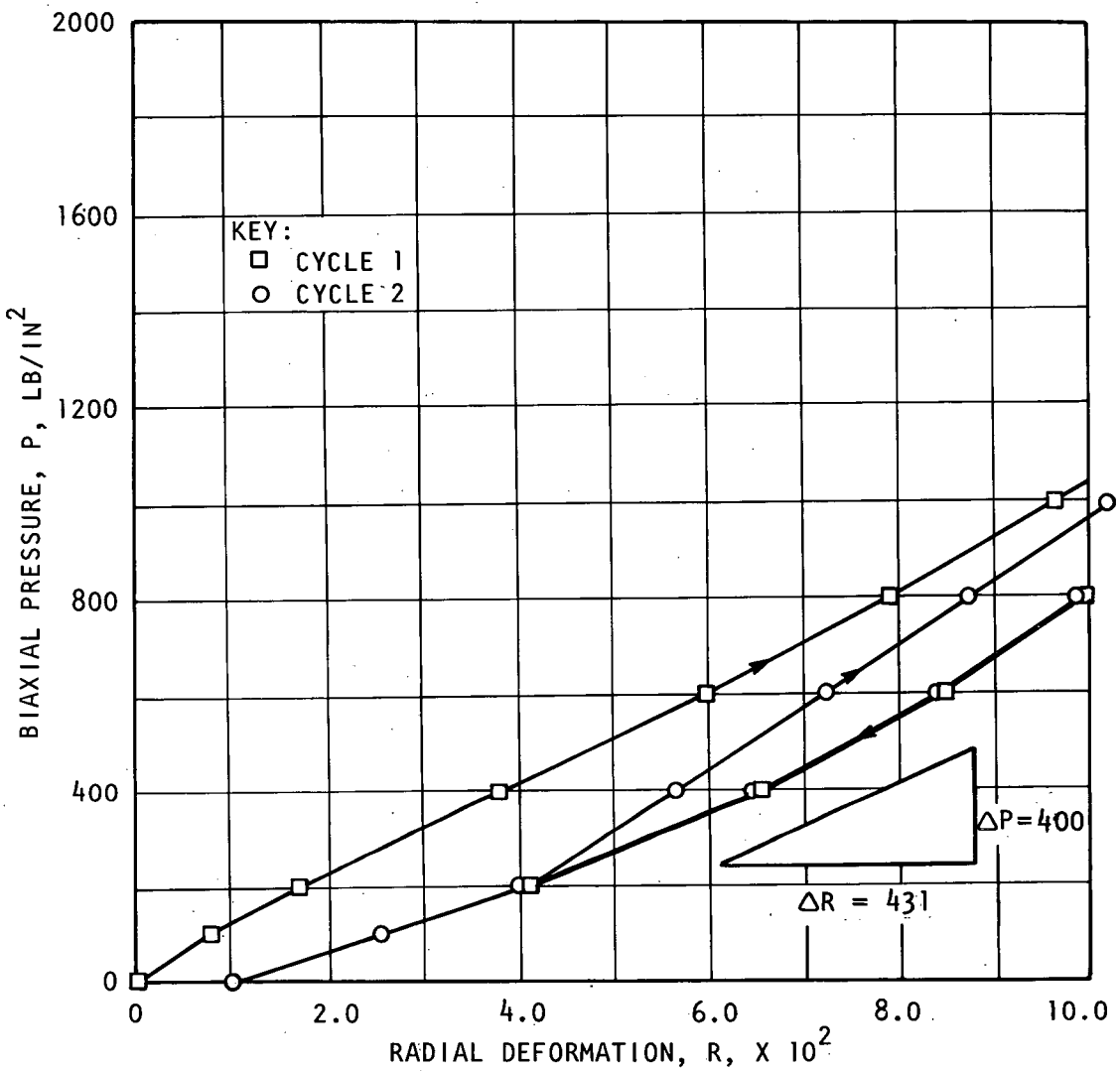
SPECIMEN LENGTH 18 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 3.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 1

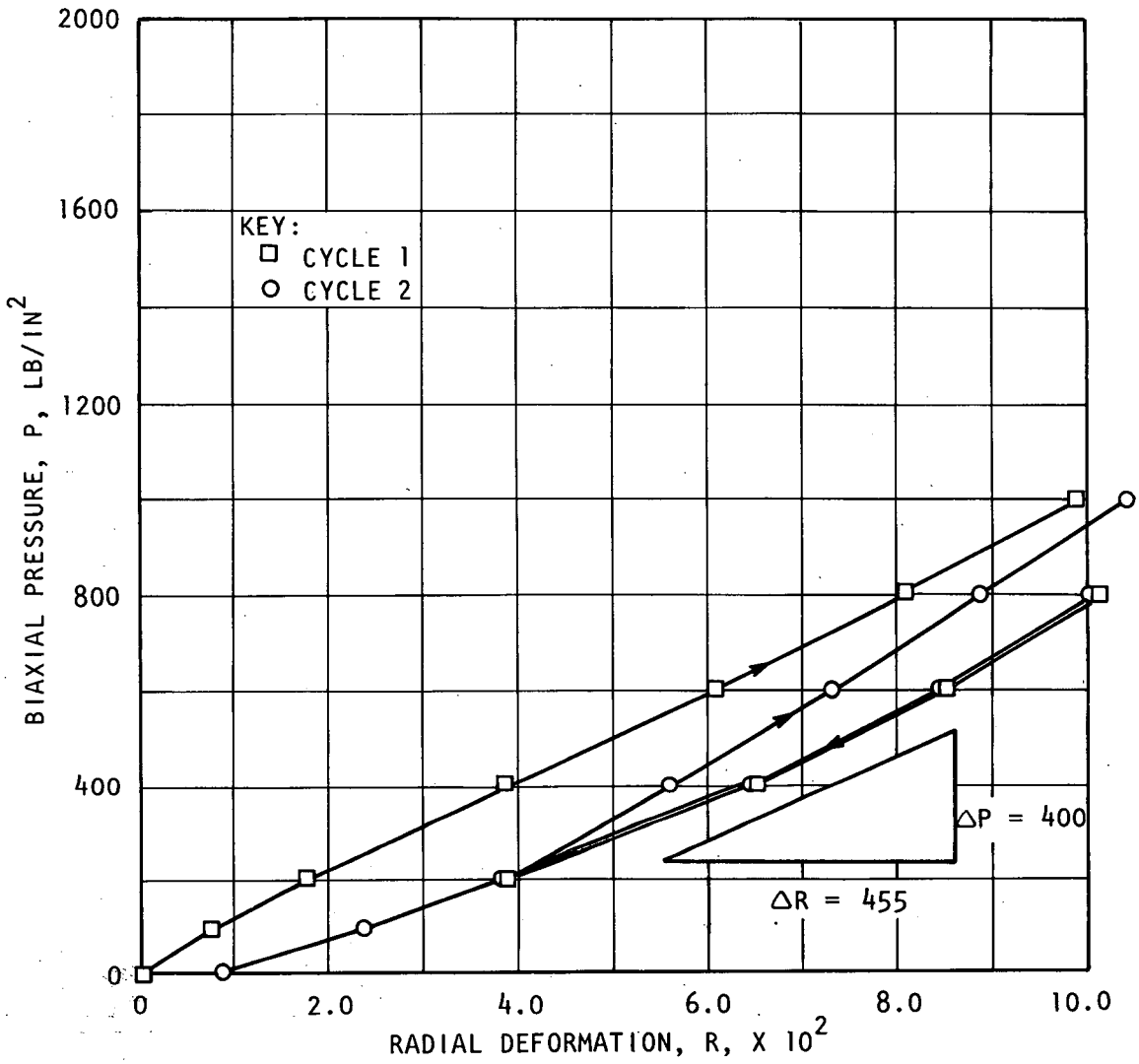
SPECIMEN LENGTH 18 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 2.7 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 2

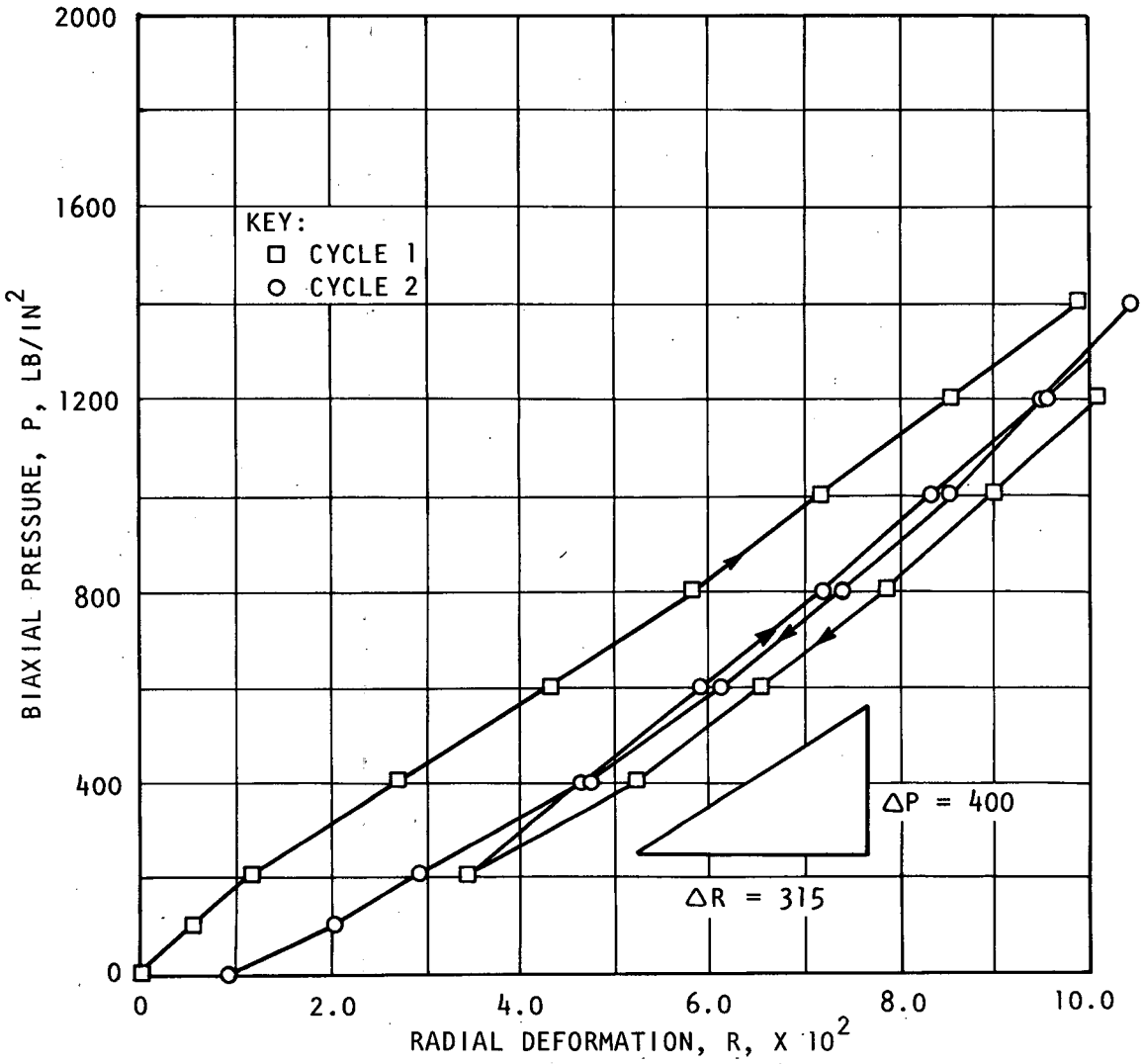
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 4.0 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 2

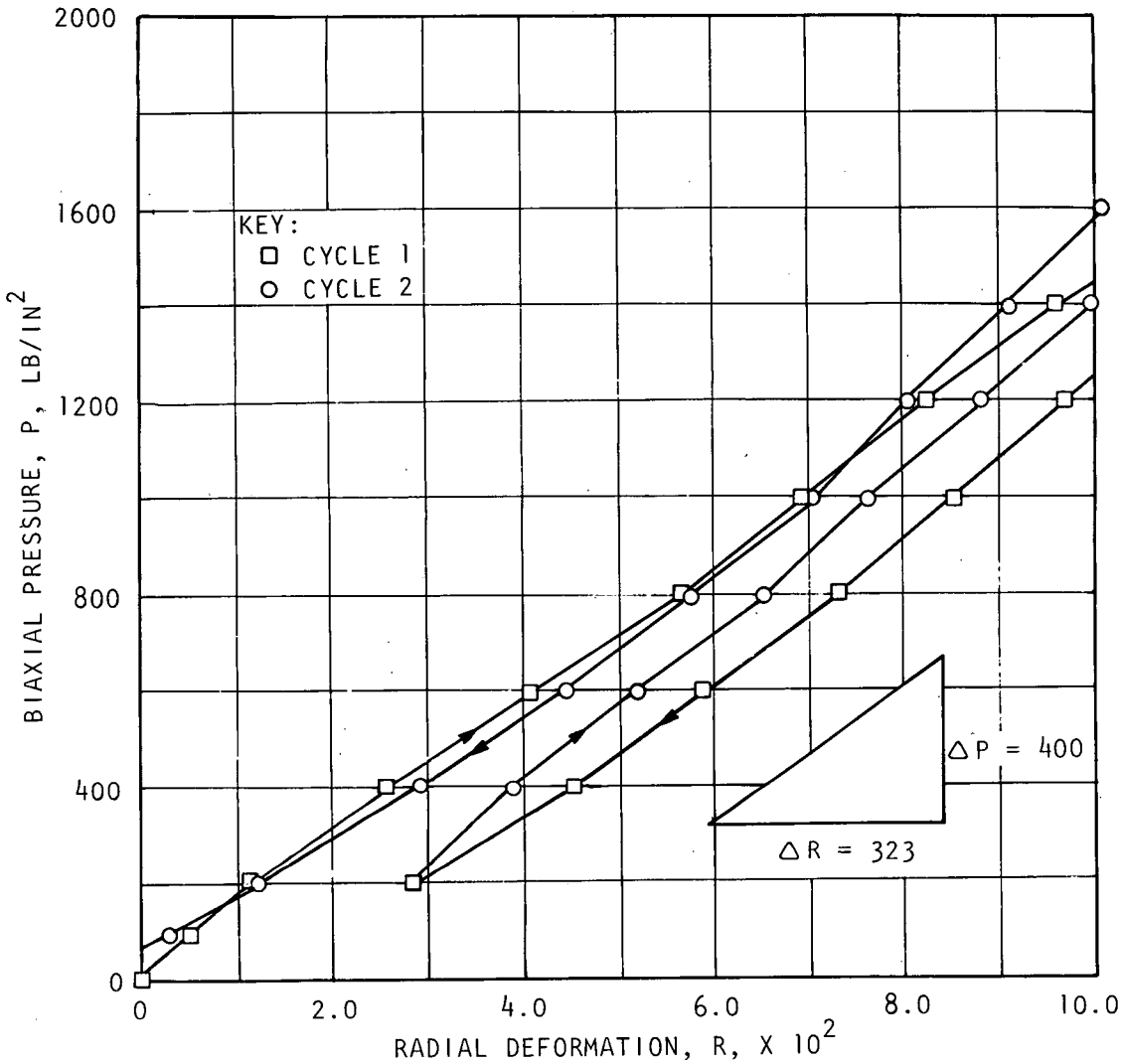
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 4.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 2

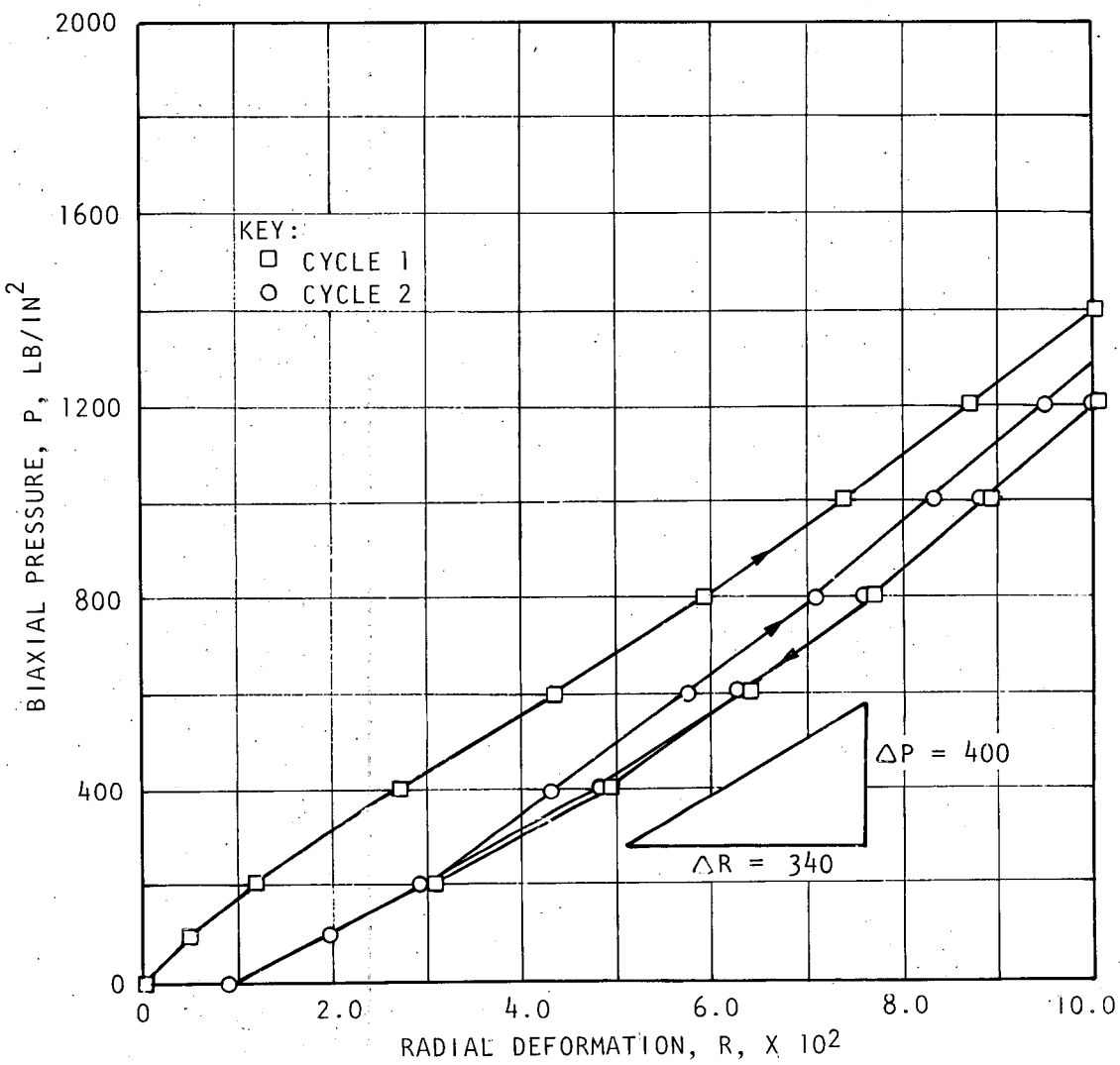
SPECIMEN LENGTH 17 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 3.7 X10$^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 3

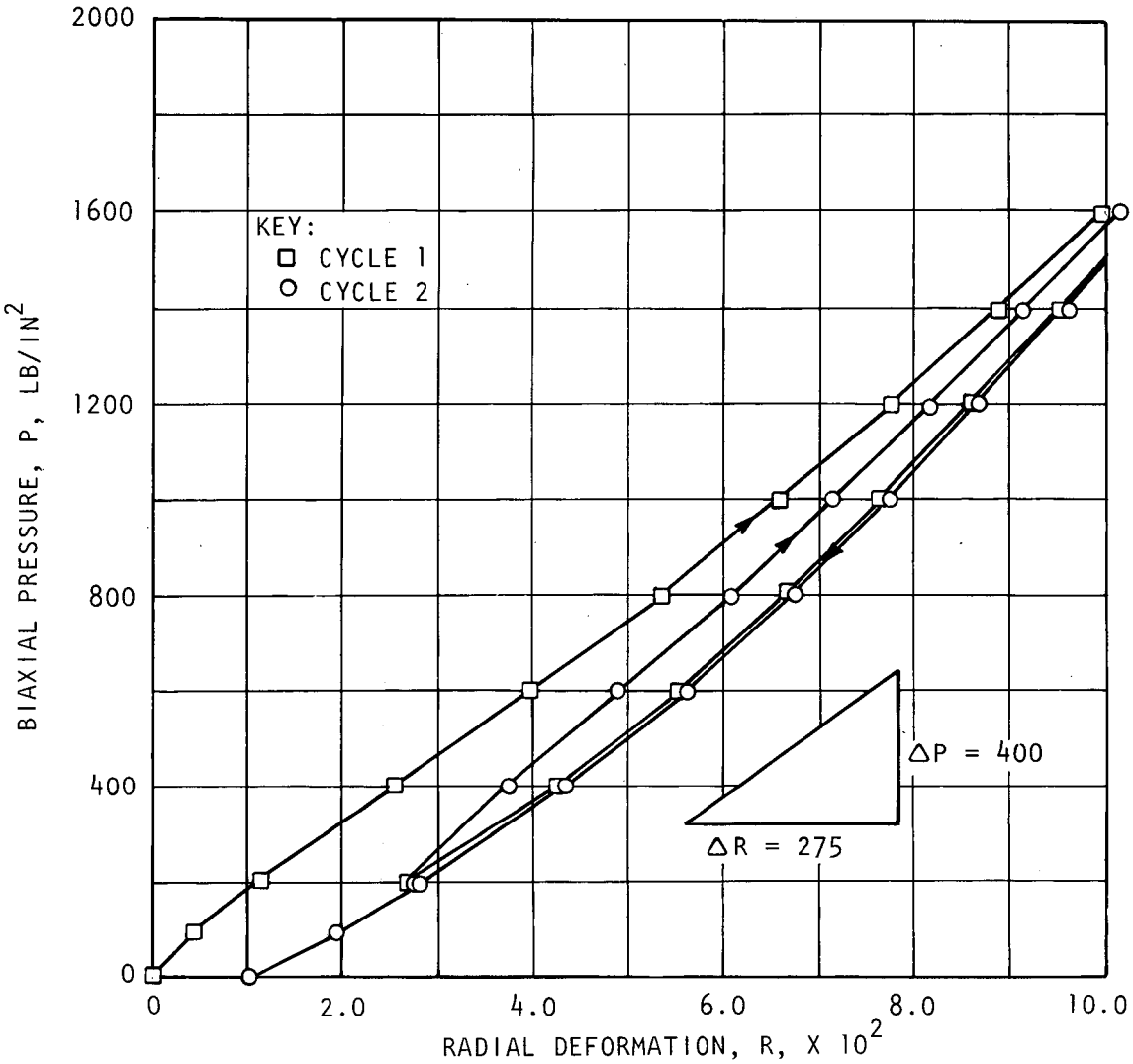
SPECIMEN LENGTH 14 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.03 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 4.6 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 3

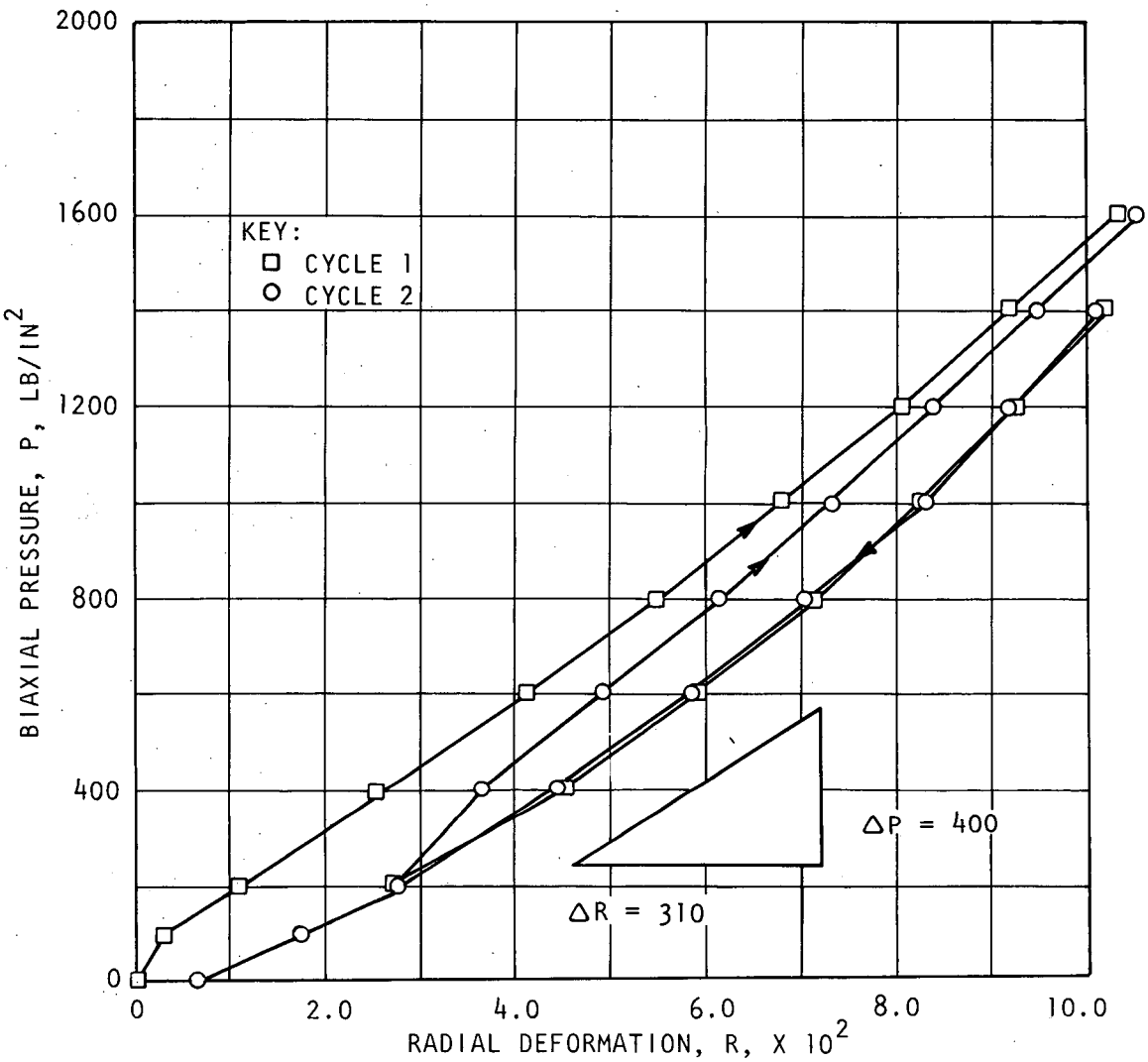
SPECIMEN LENGTH 14 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 4.2 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 3

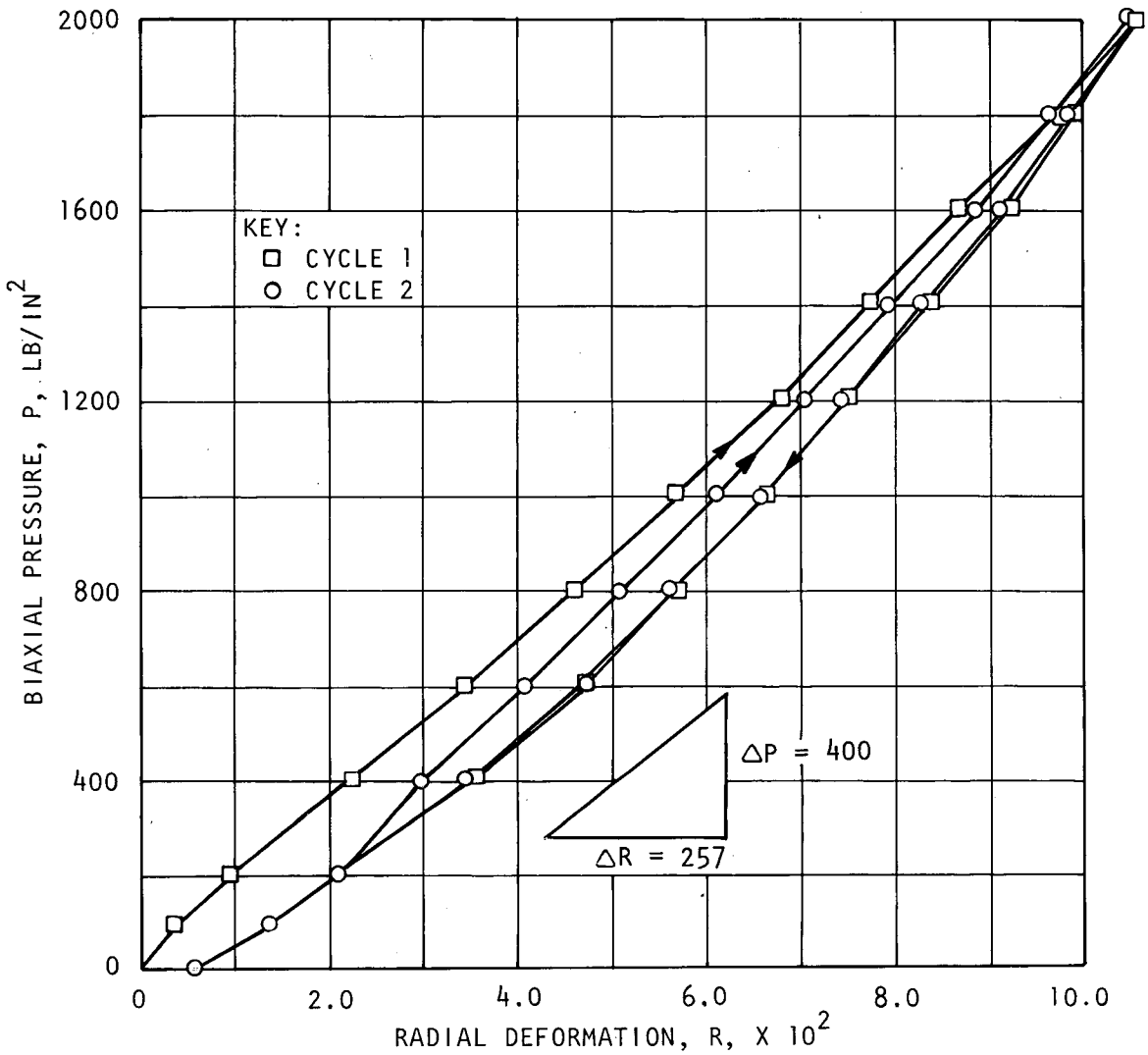
SPECIMEN LENGTH 14 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $4.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 4

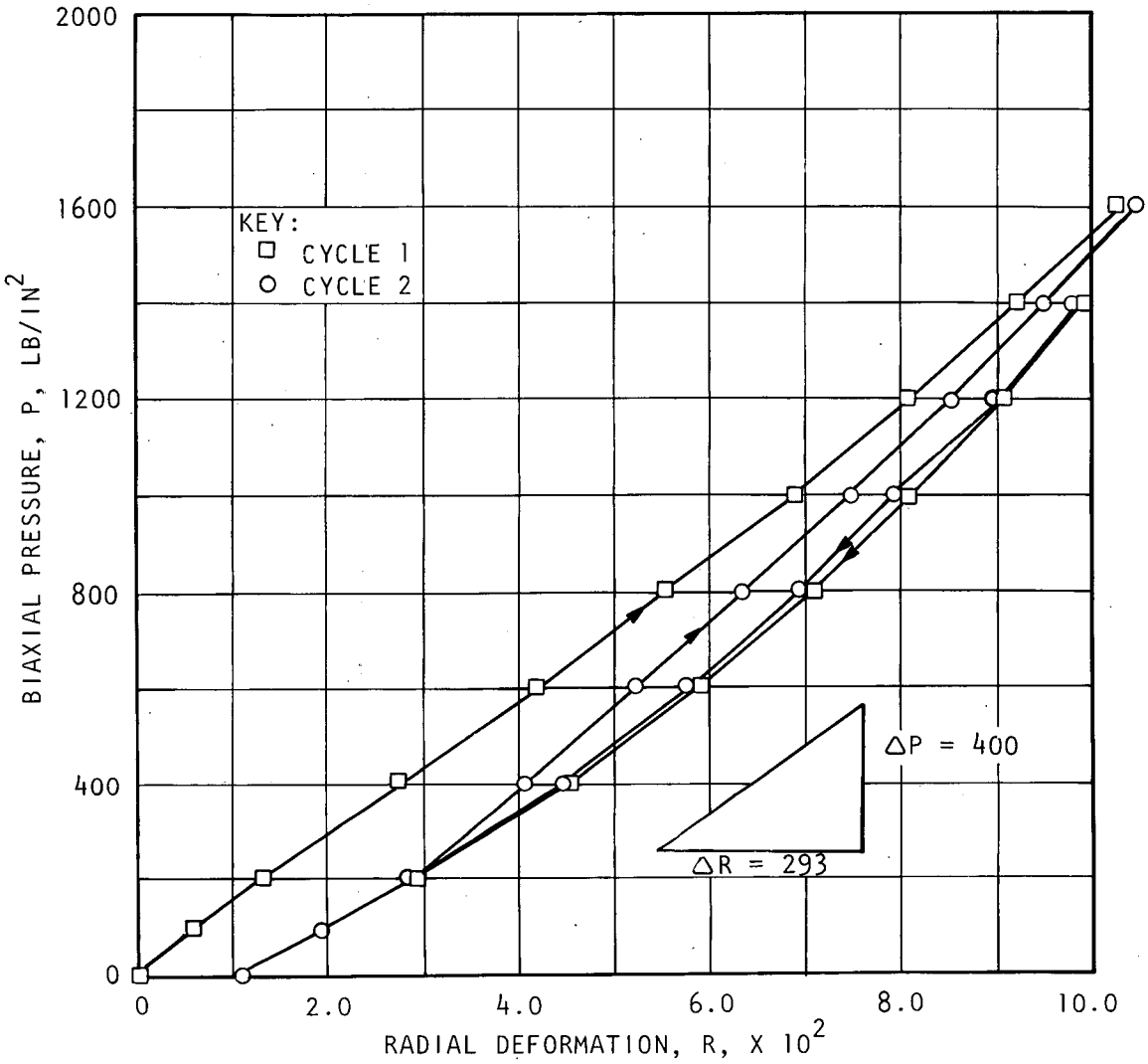
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 4.4 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 4

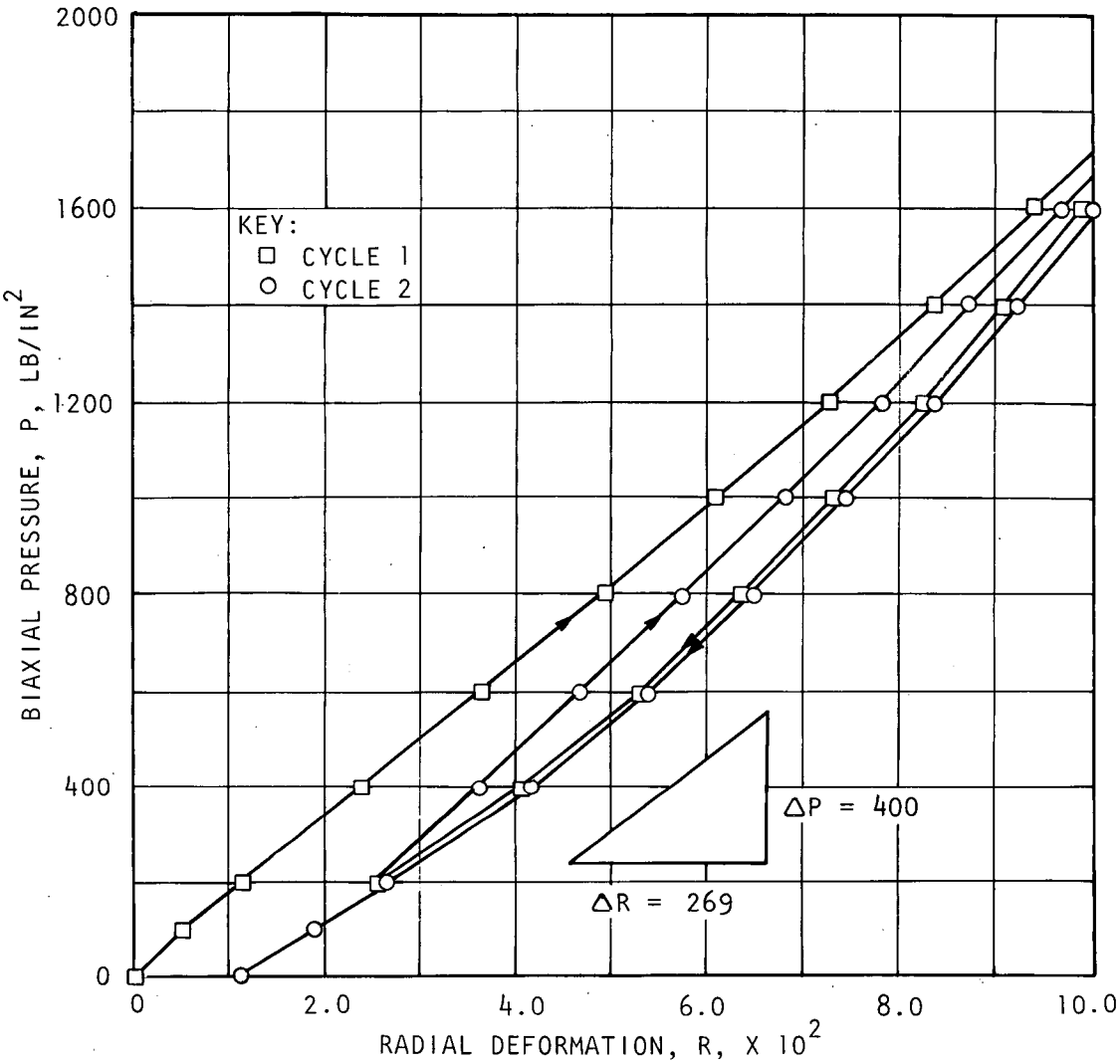
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 4.8 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 4

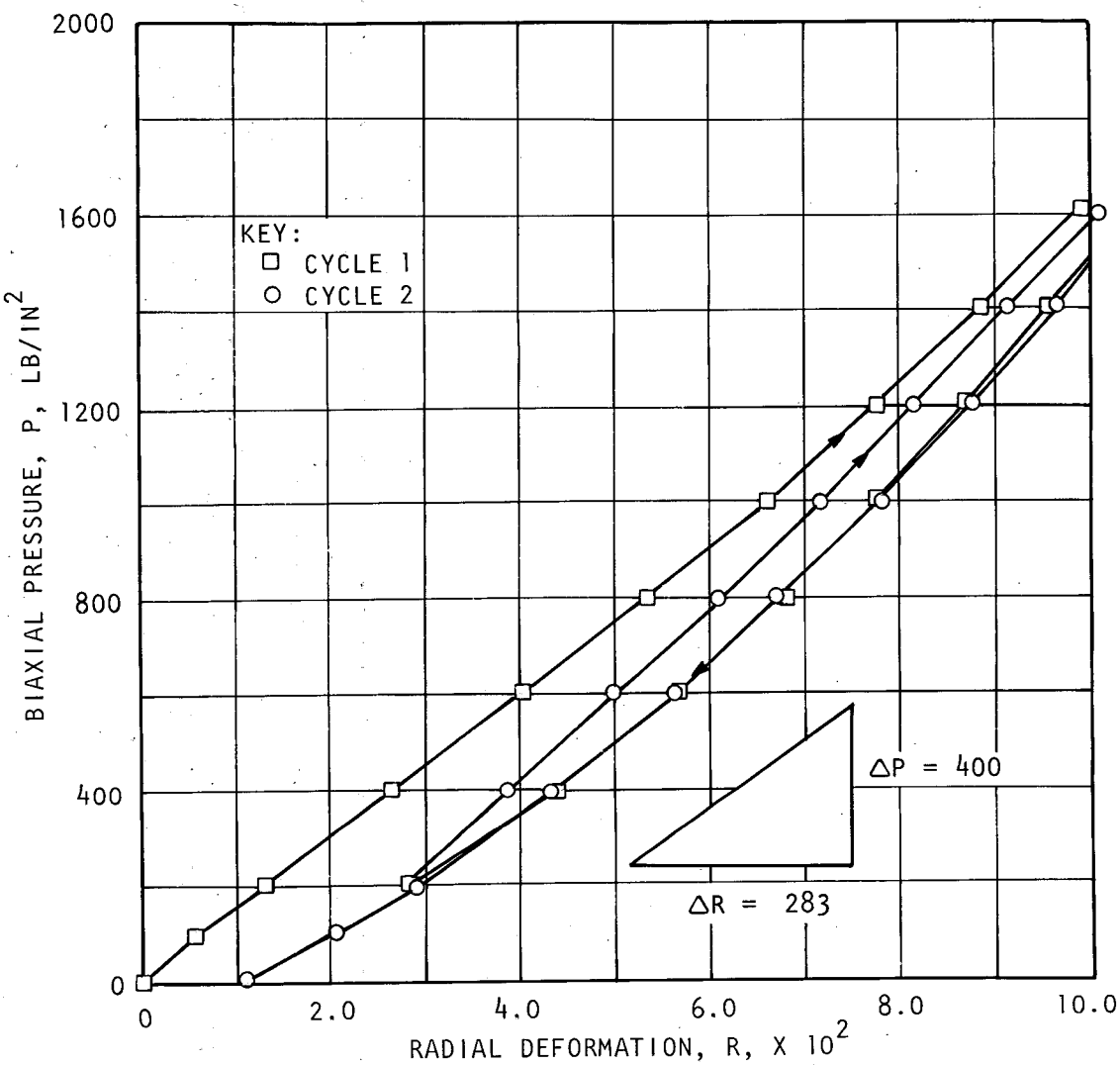
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 4.5 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 5

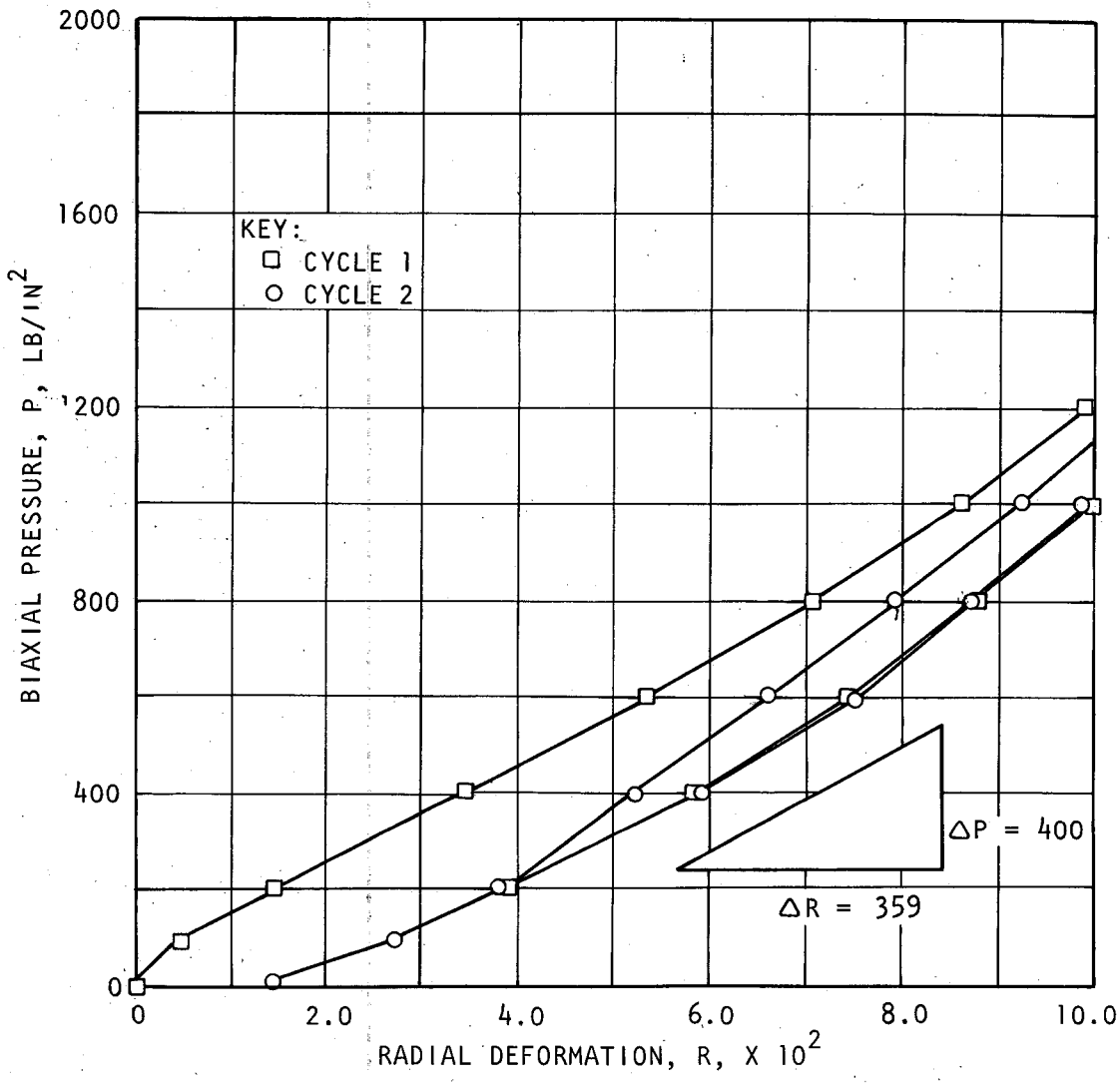
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $3.5 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 5

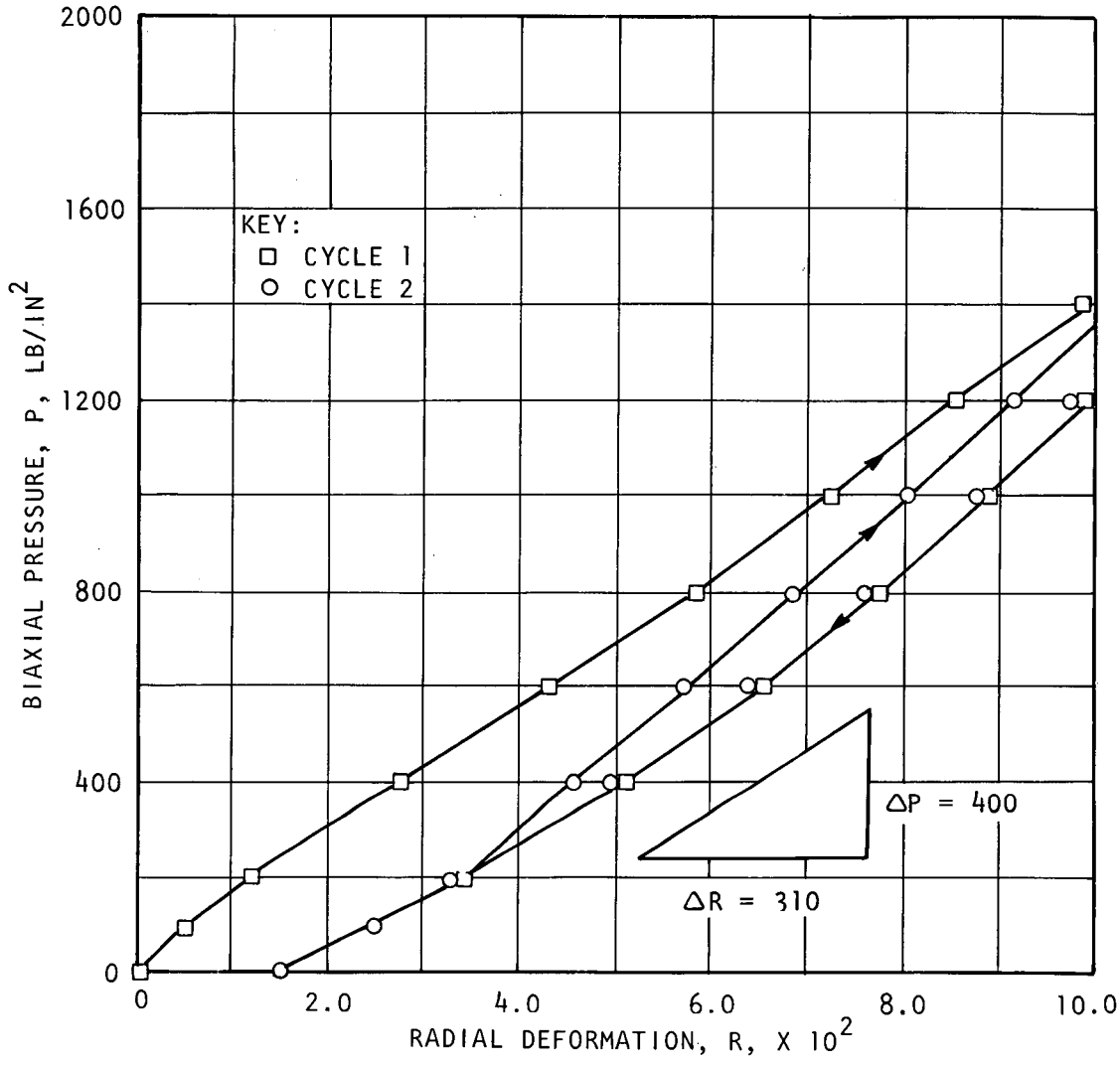
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 4.2 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 5

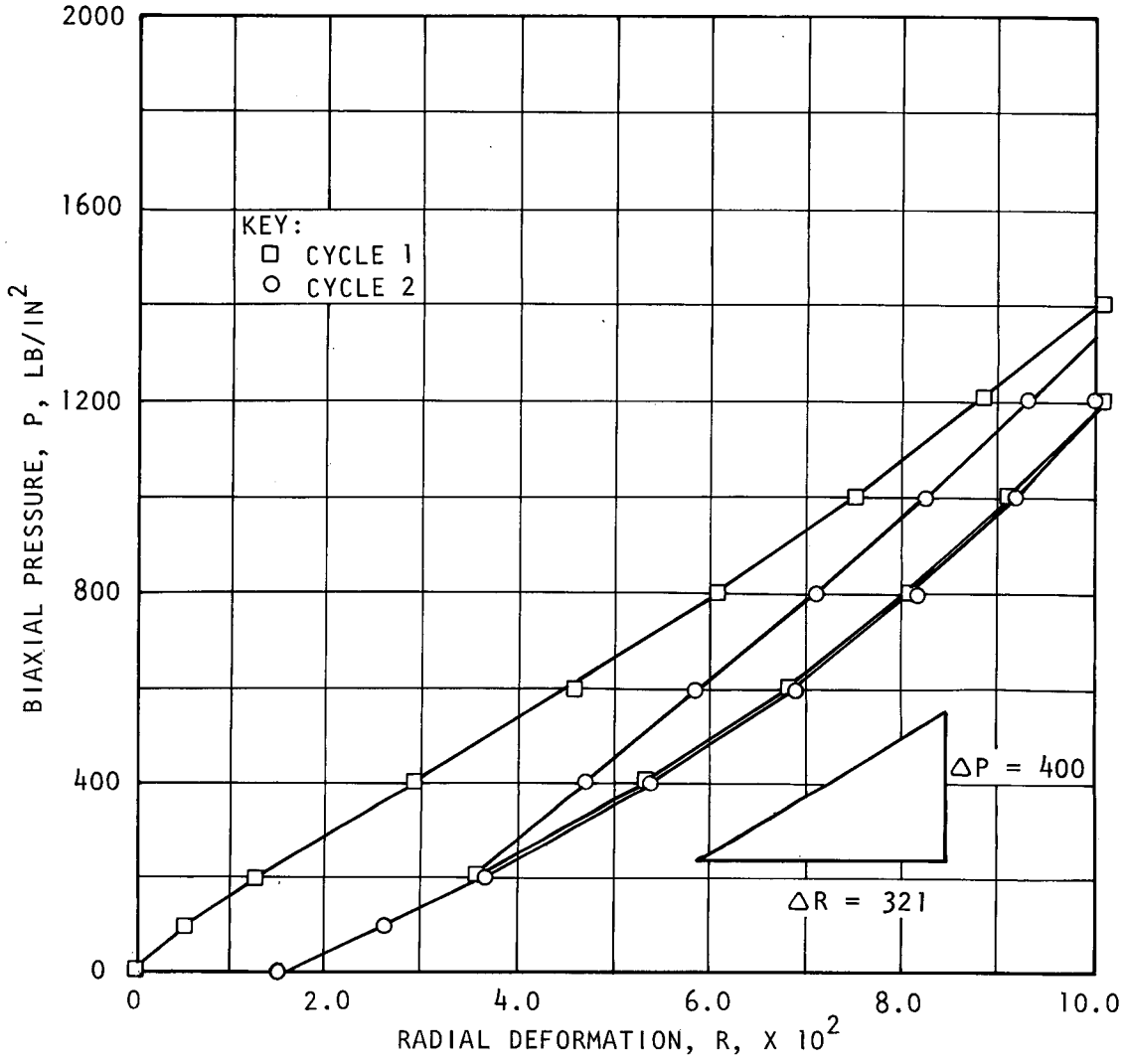
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 3.9 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 6

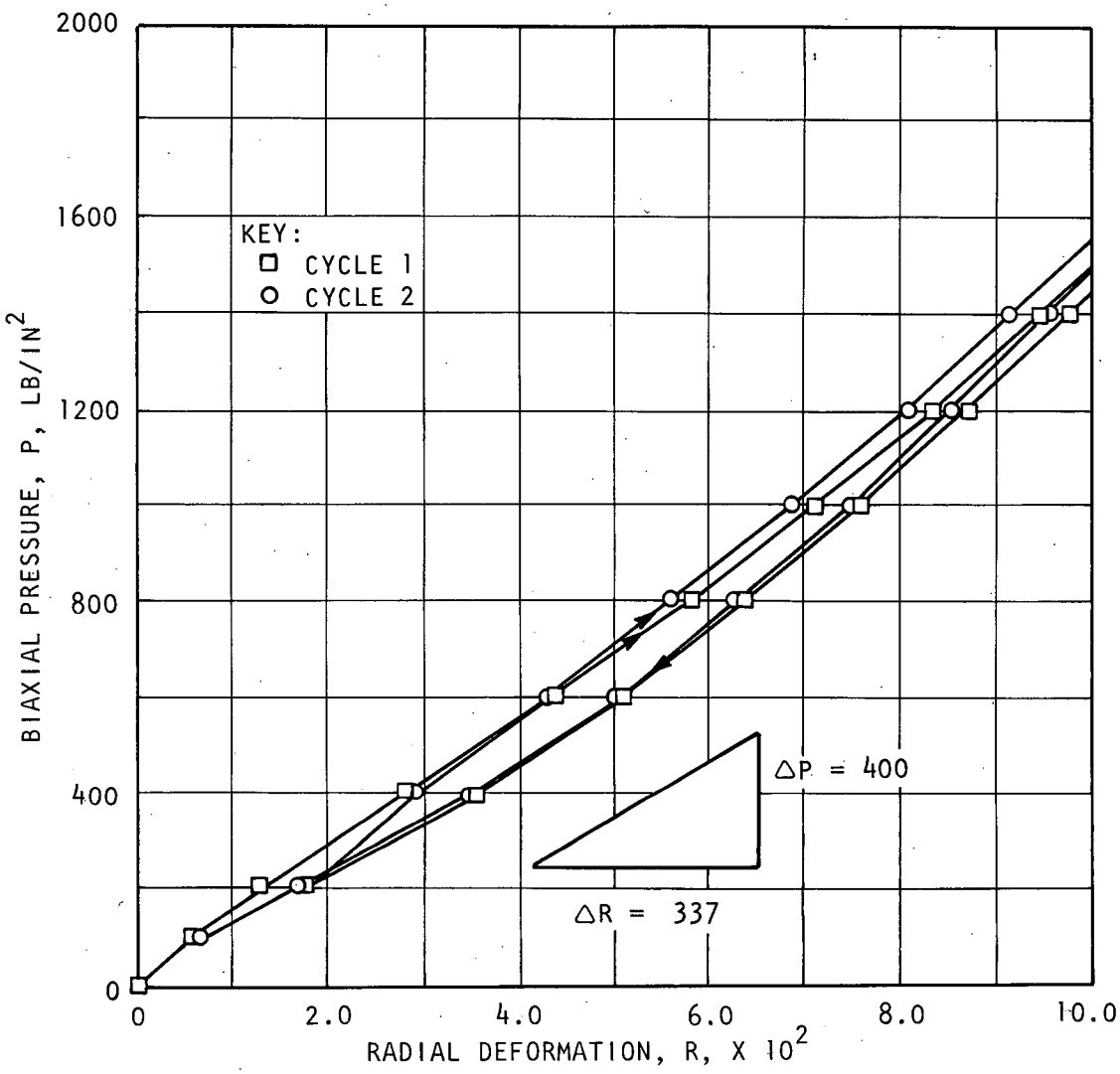
SPECIMEN LENGTH 13 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.03 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 3.8 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 6

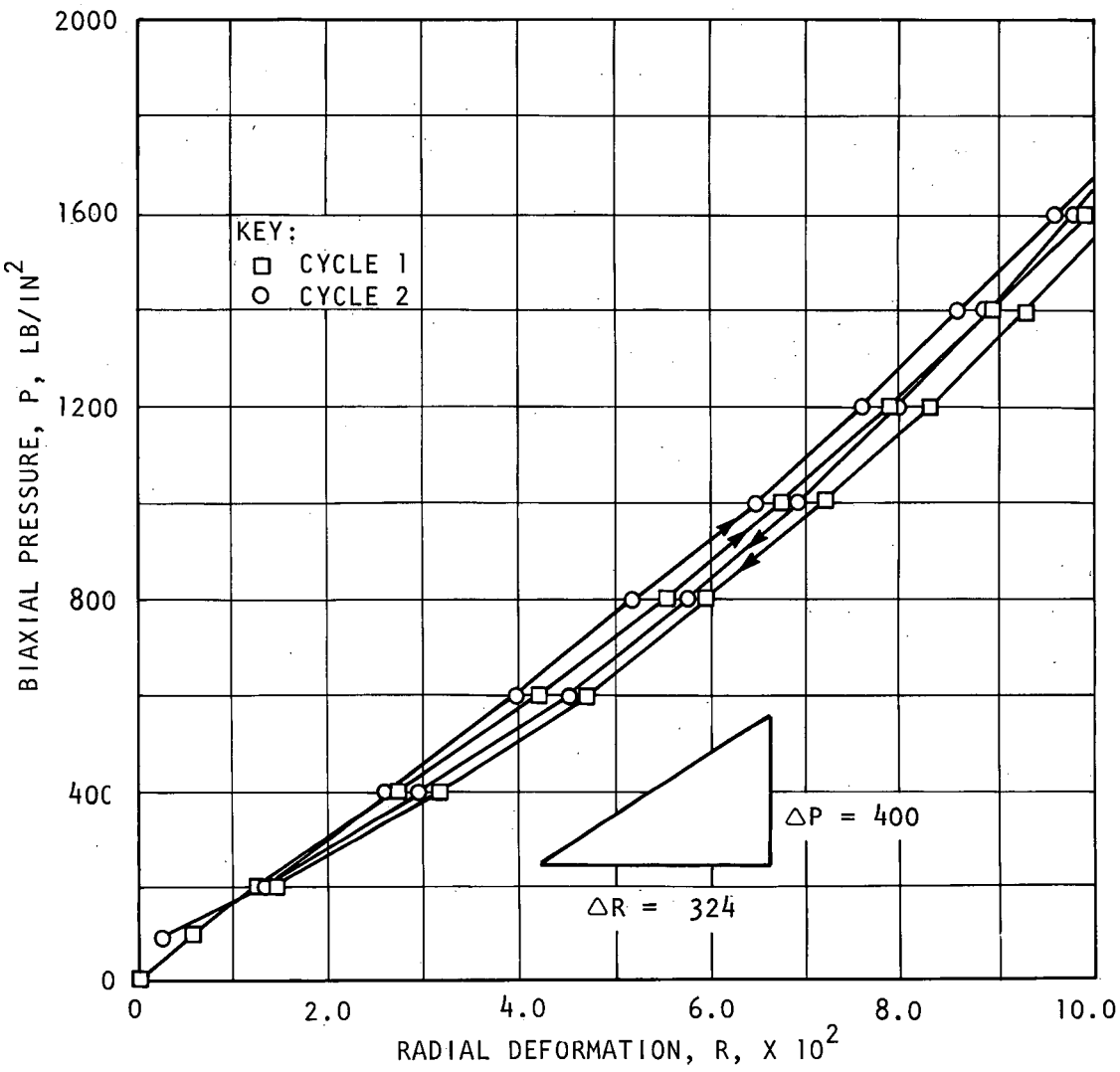
SPECIMEN LENGTH 13 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 4.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 6

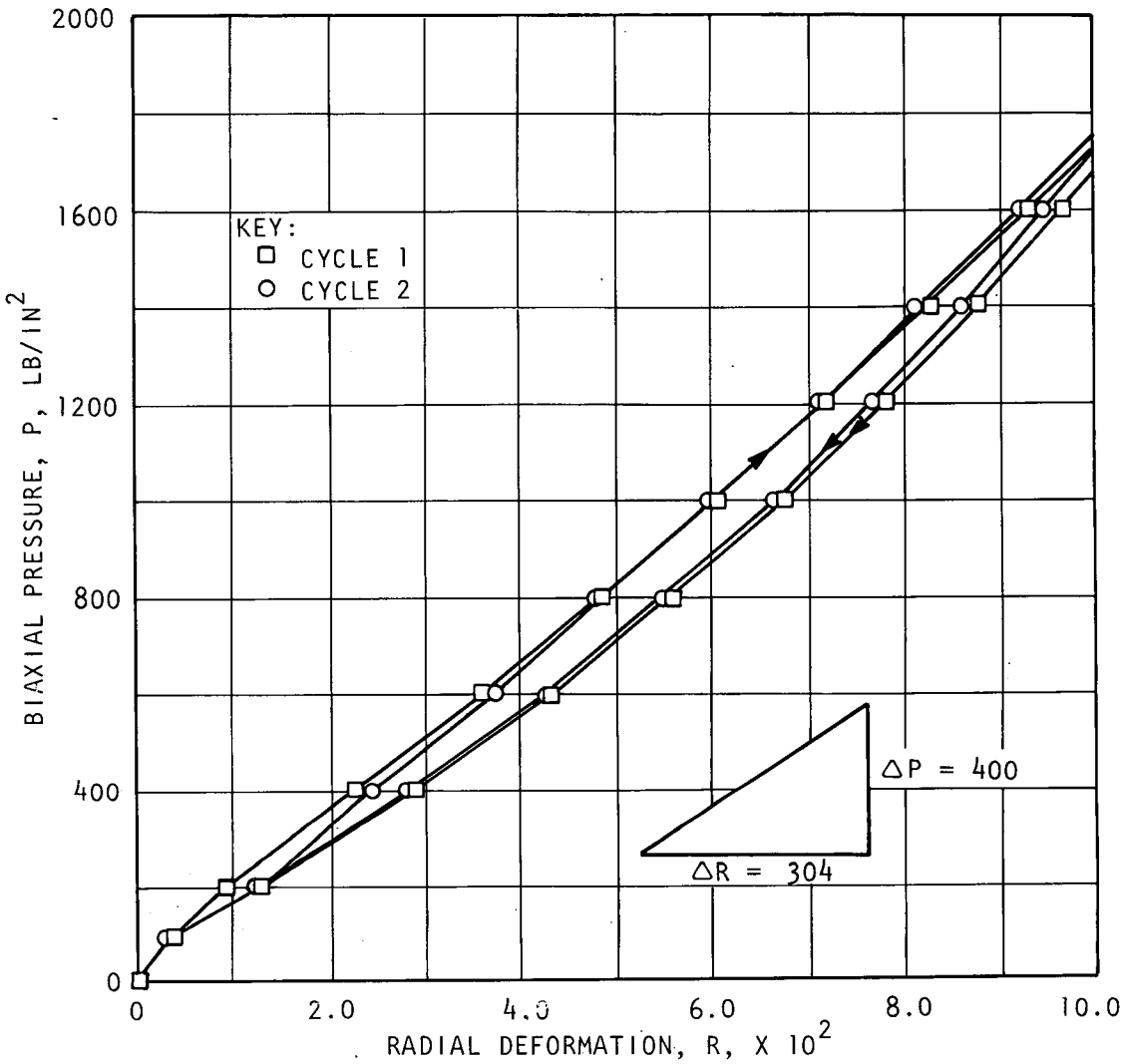
SPECIMEN LENGTH 13 IN.

SPECIMEN O.D. 5-7/32 IN.

AXIS 3

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.




E = 4.1 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 7

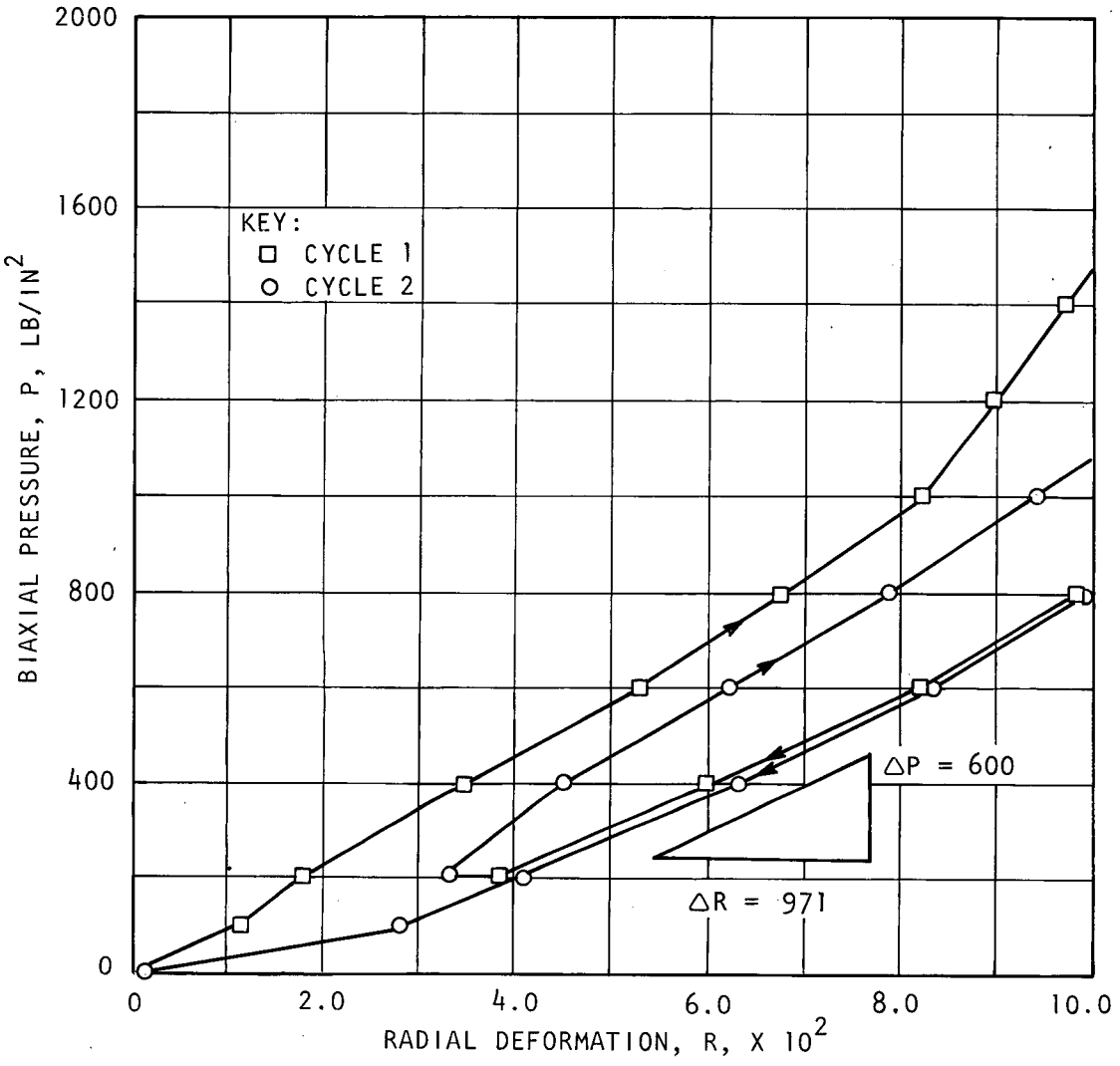
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-7/32 IN.

AXIS 1

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.




E = 2.0 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 7

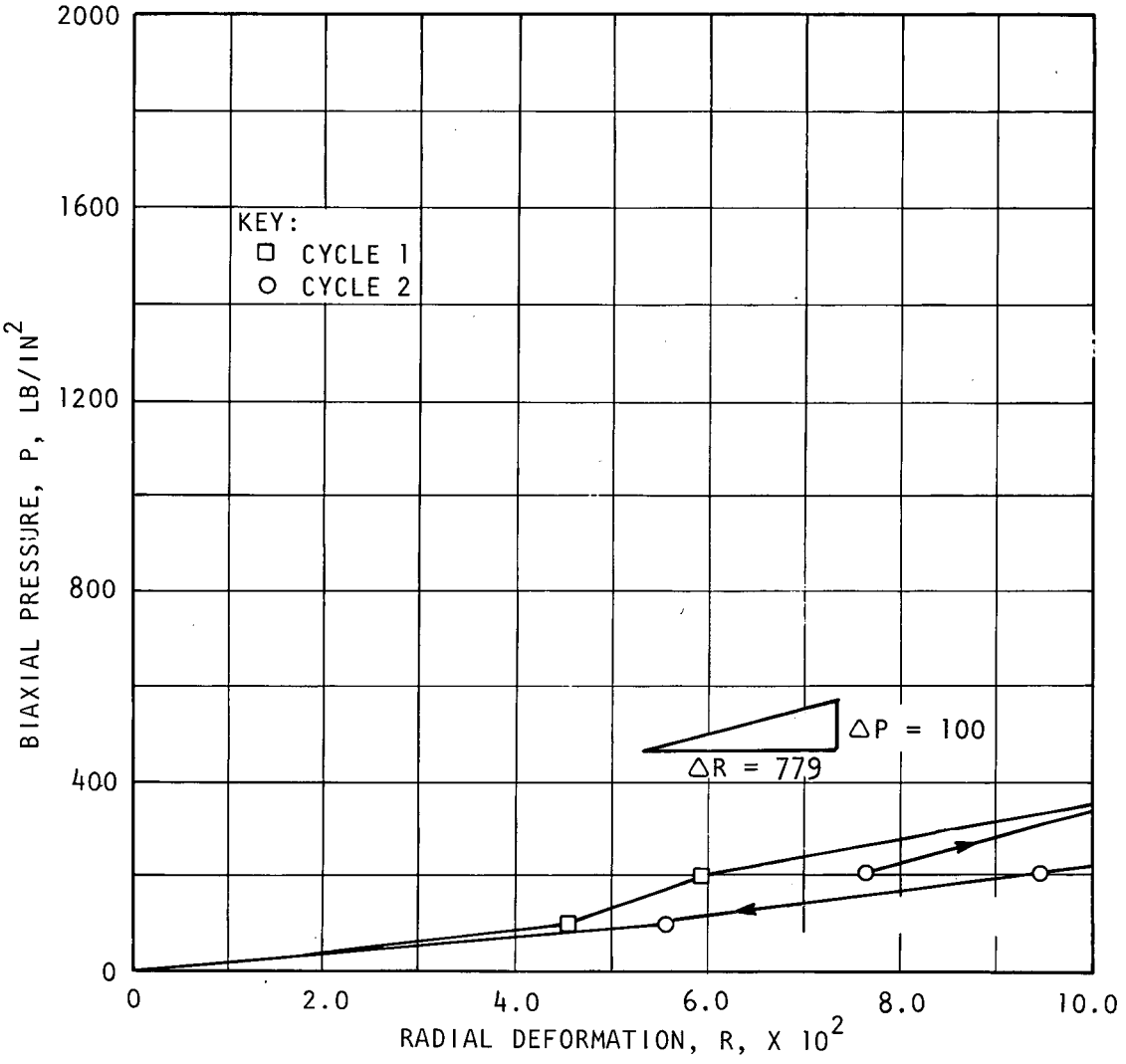
SPECIMEN LENGTH 15 IN.

SPECIMEN

AXIS 2

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.




E = 0.4 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 7

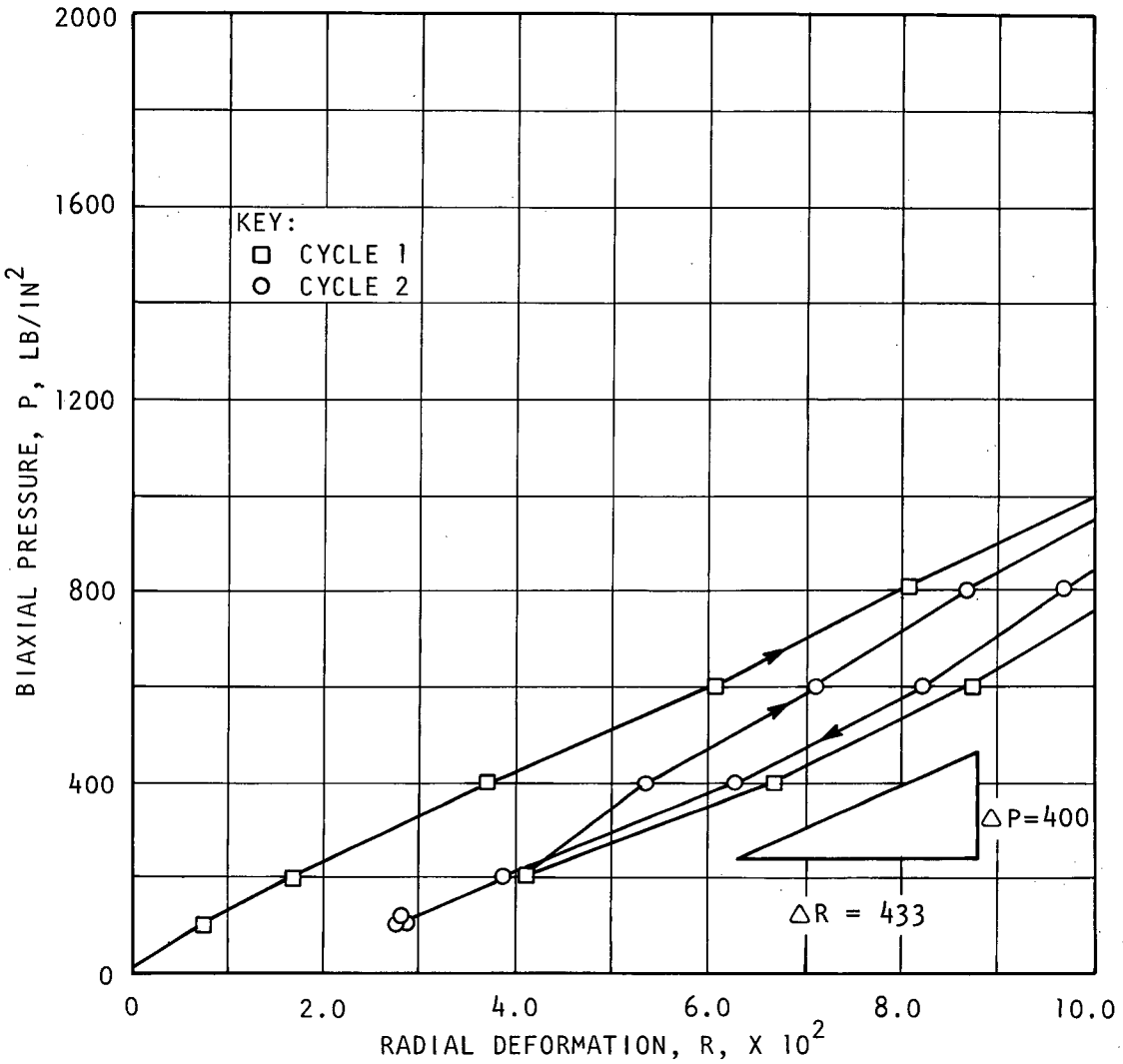
SPECIMEN LENGTH 15 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $2.9 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 8

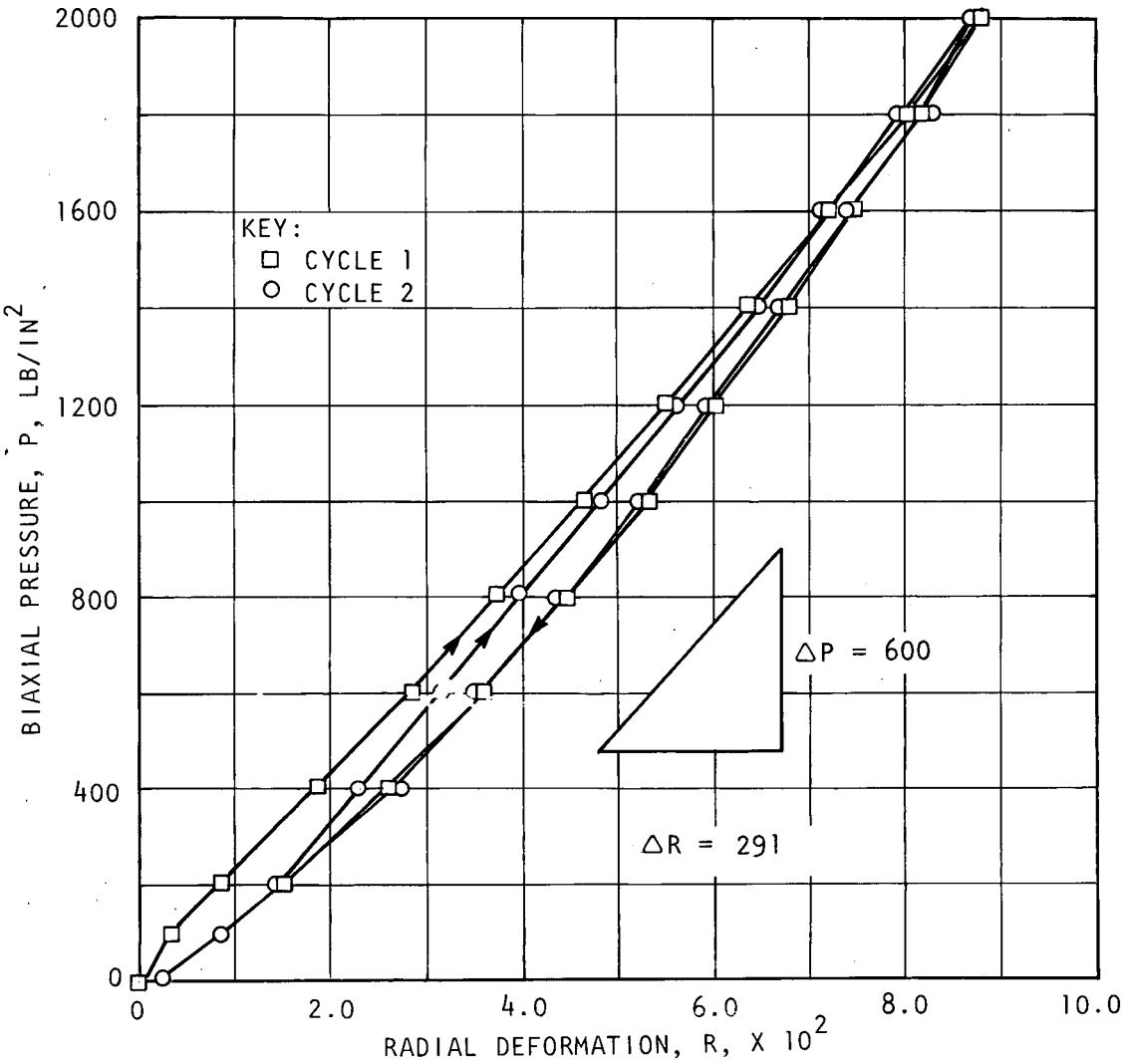
SPECIMEN LENGTH $12\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

AXIS 1

$K_i = 1.01 \times 10^{-6}$ IN.

$\beta = 3.27$ IN.




$E = 6.7 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 8

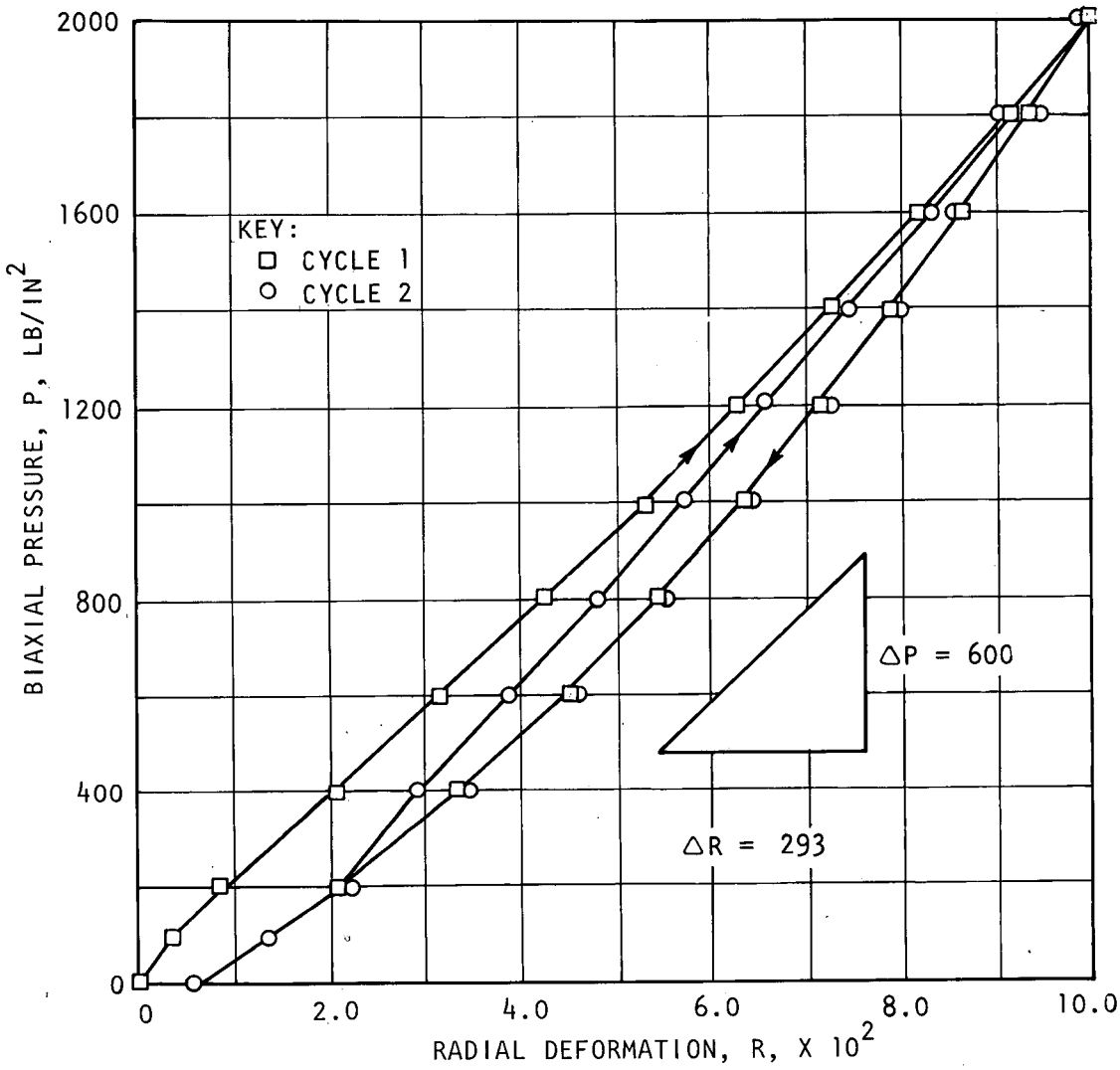
SPECIMEN LENGTH $12\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 6.6 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 8

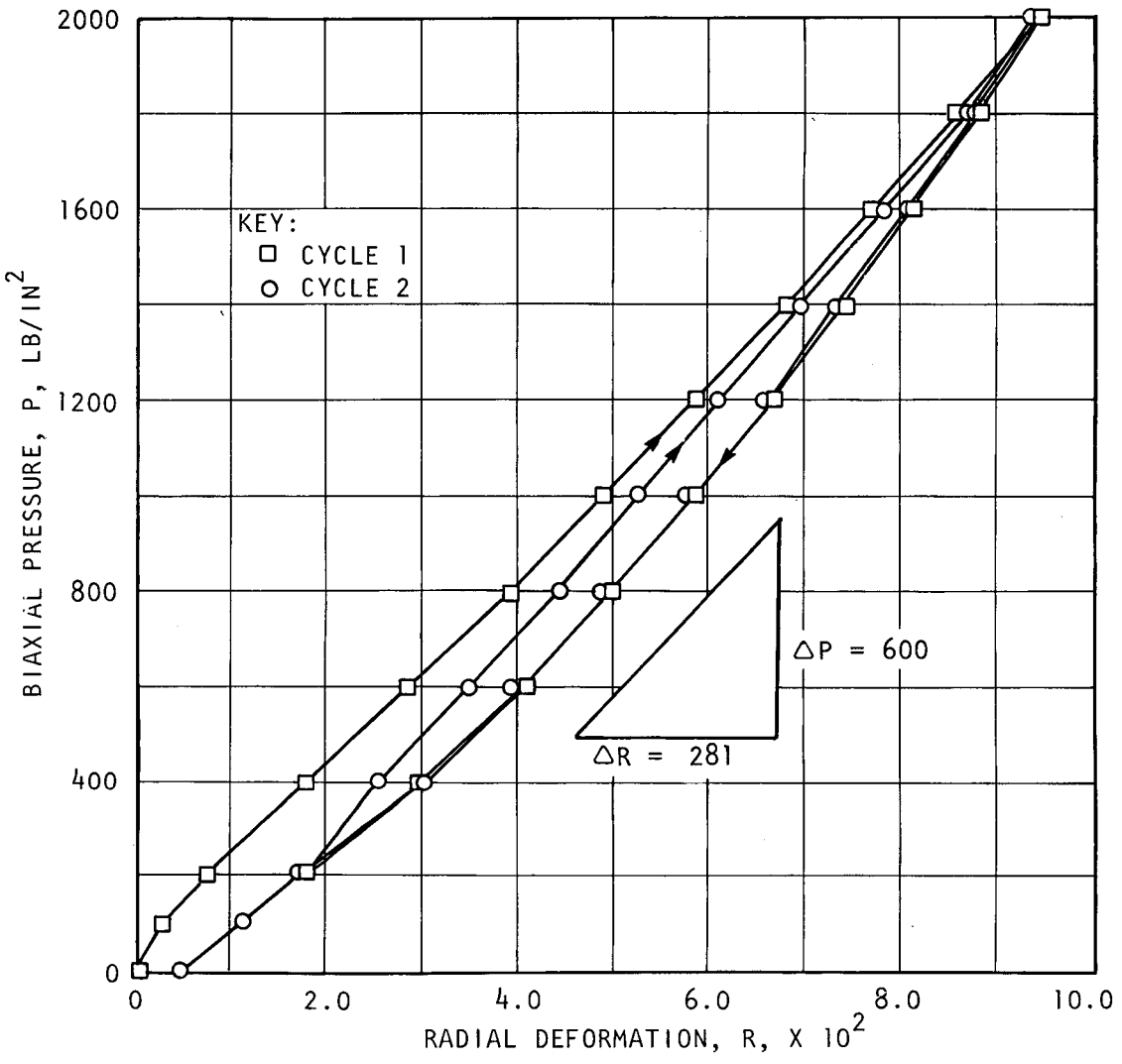
SPECIMEN LENGTH $12\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $6.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 9

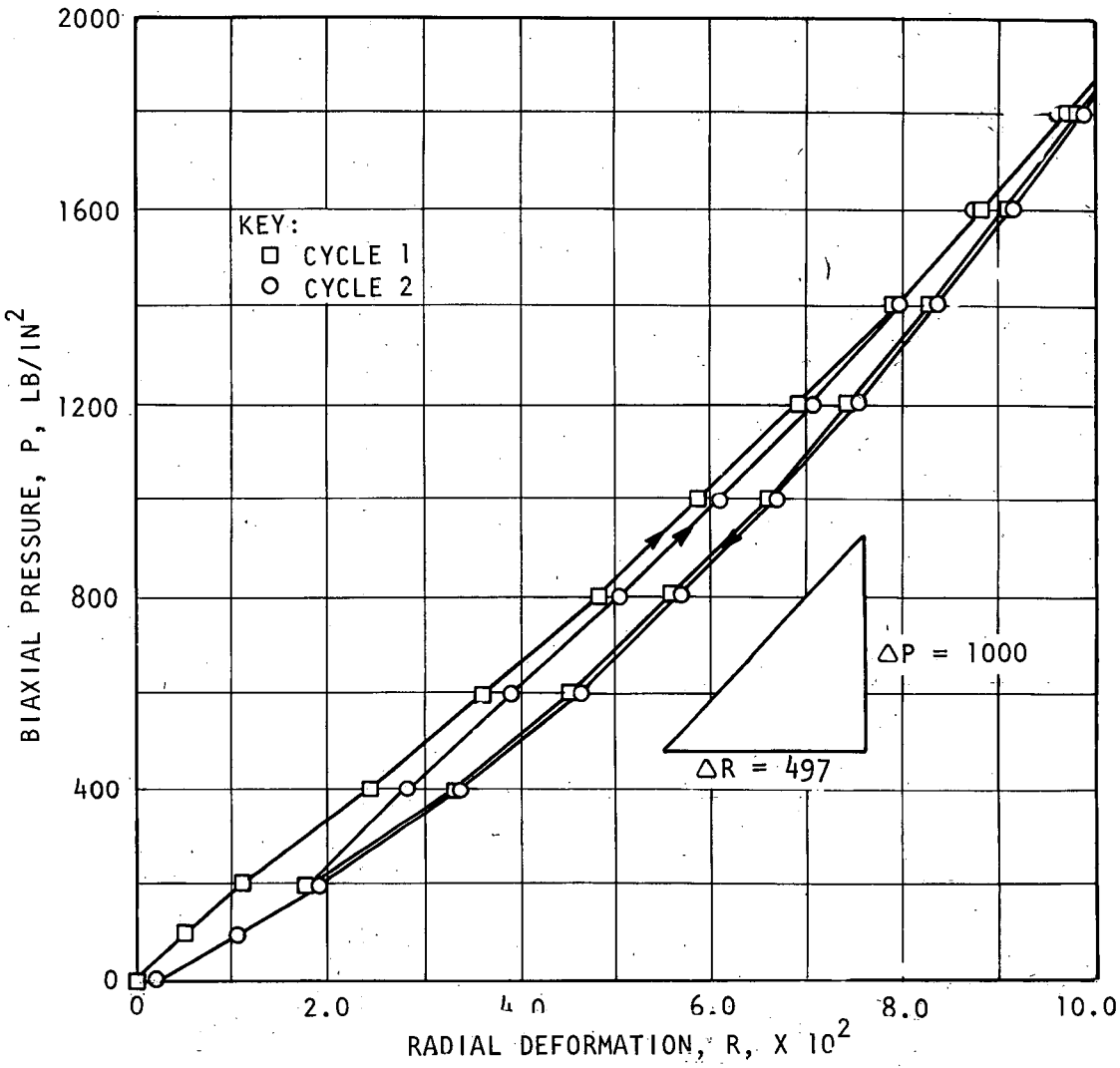
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

AXIS 1

$K_i$ = 1.03 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.




E = 6.4 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 9

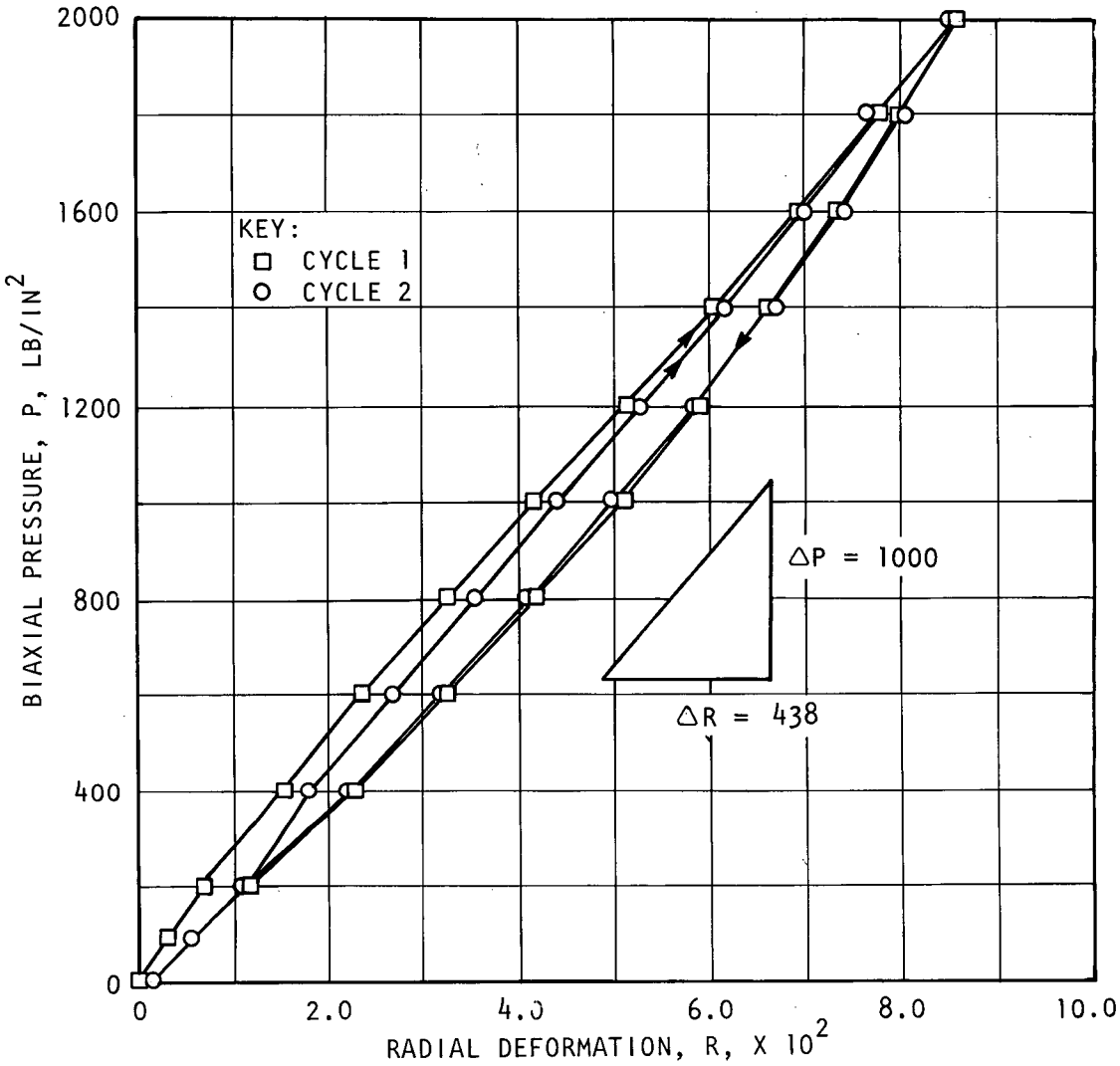
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 7.5 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 9

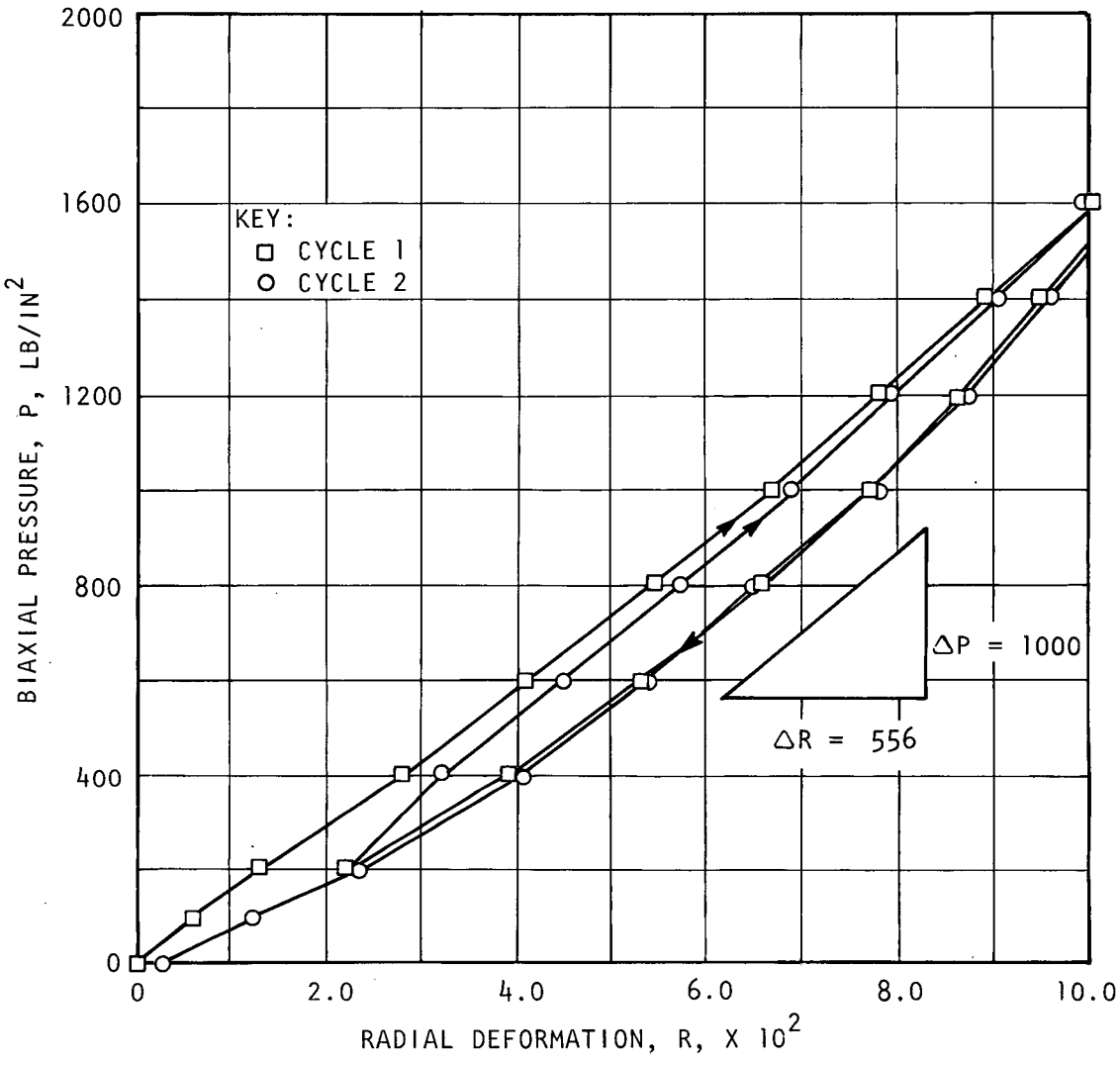
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $5.6 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 10

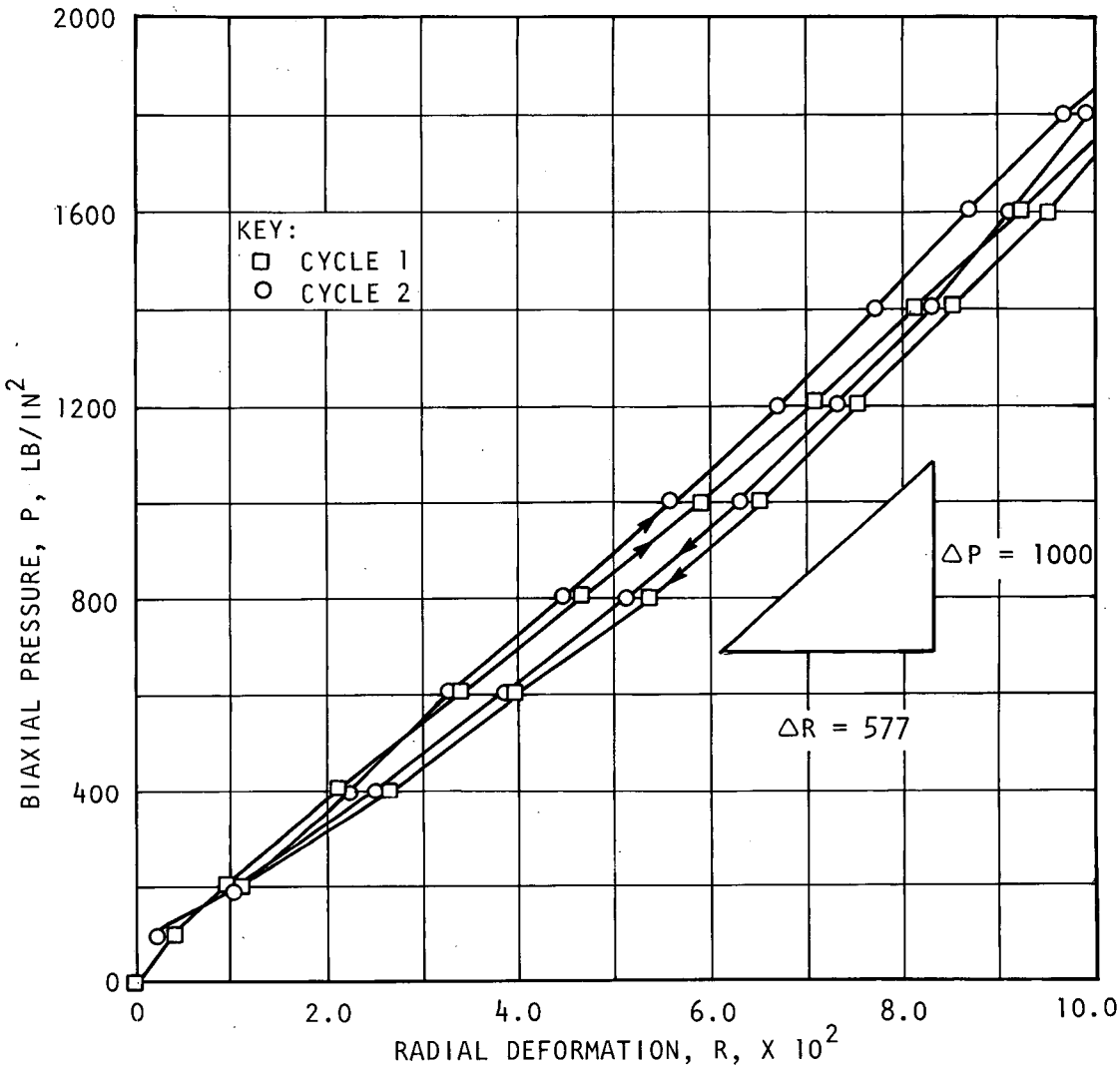
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 5.6 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 10

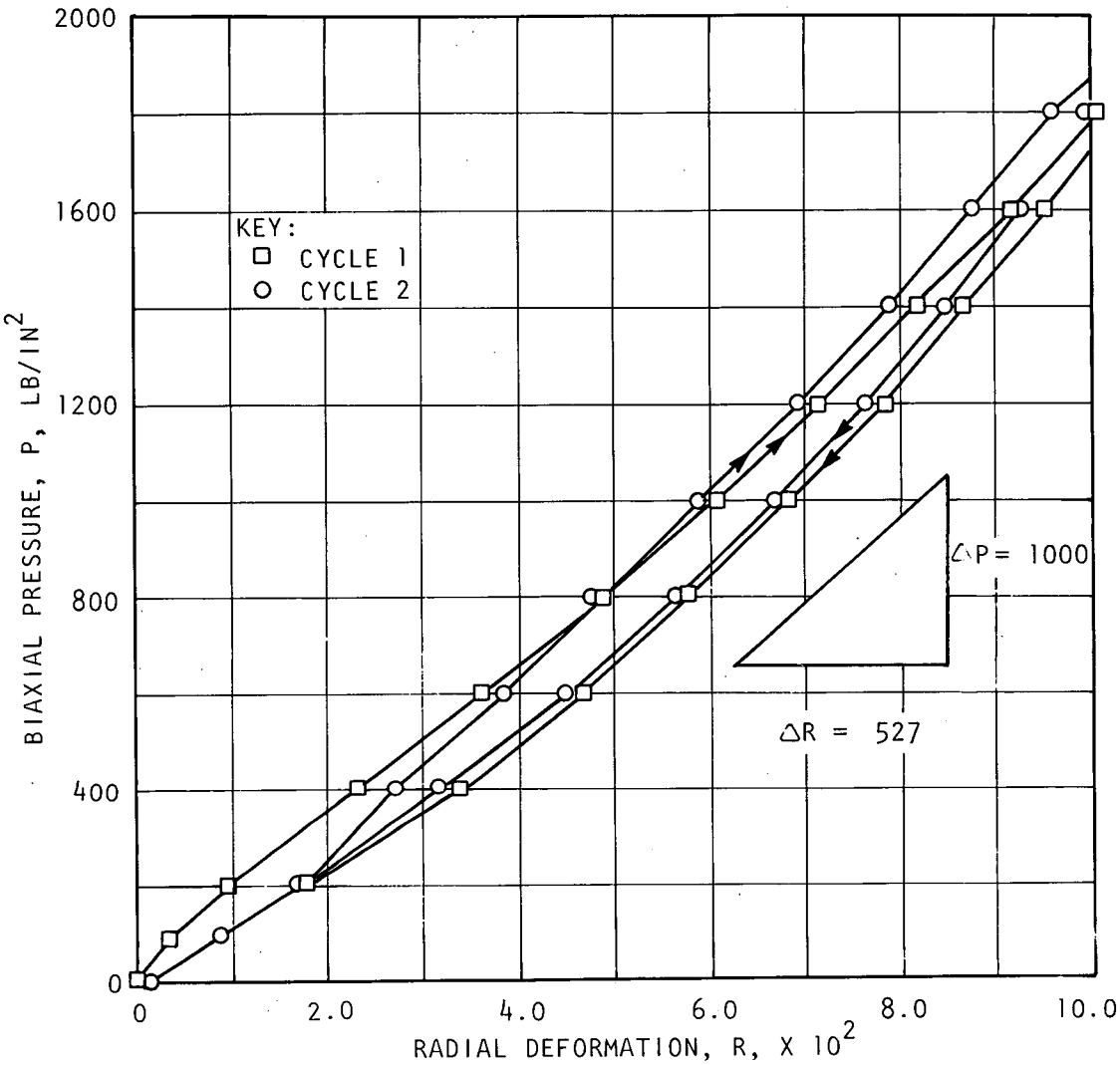
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 6.1 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 10

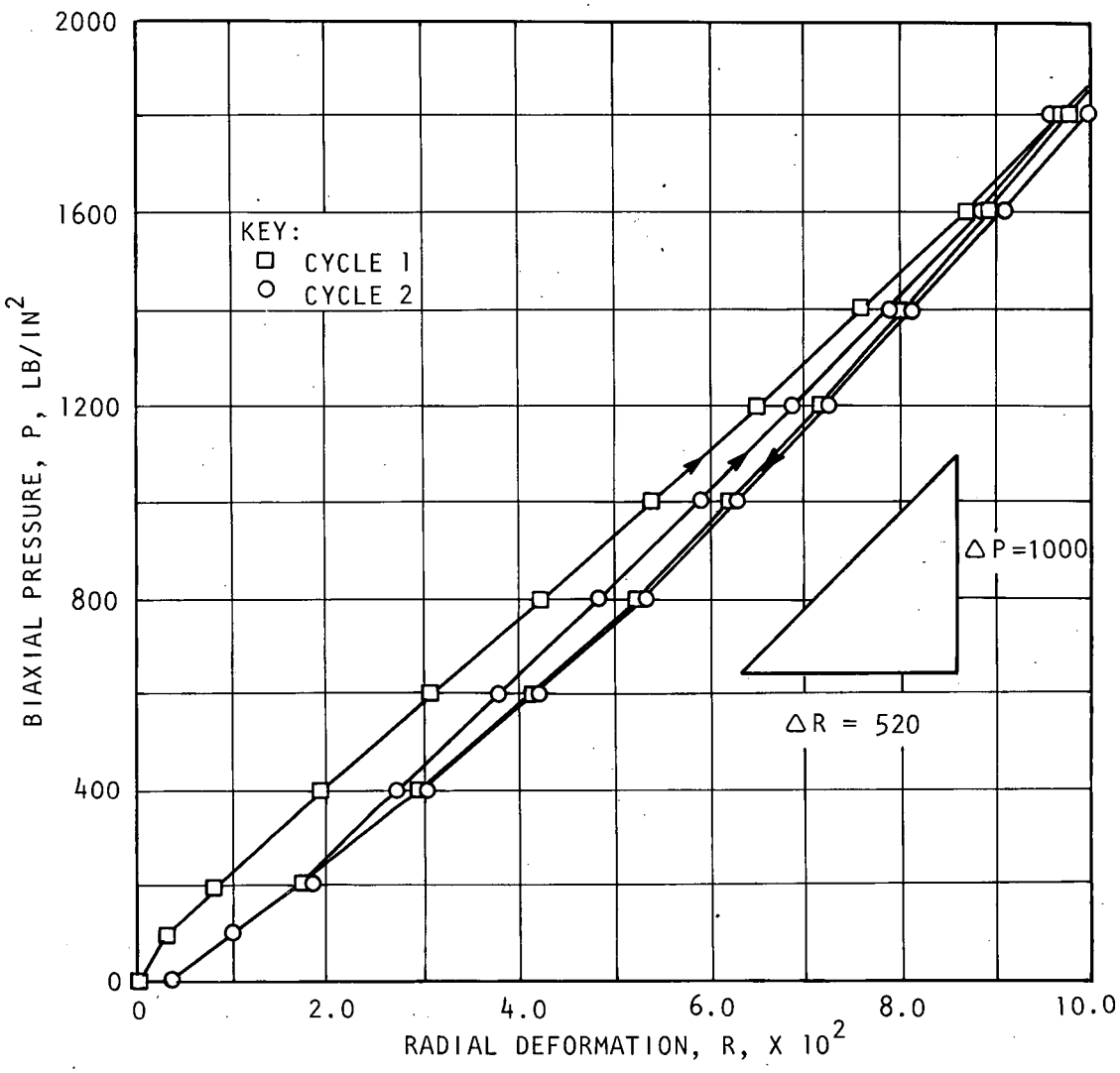
SPECIMEN LENGTH 16 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = $6.1 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 11

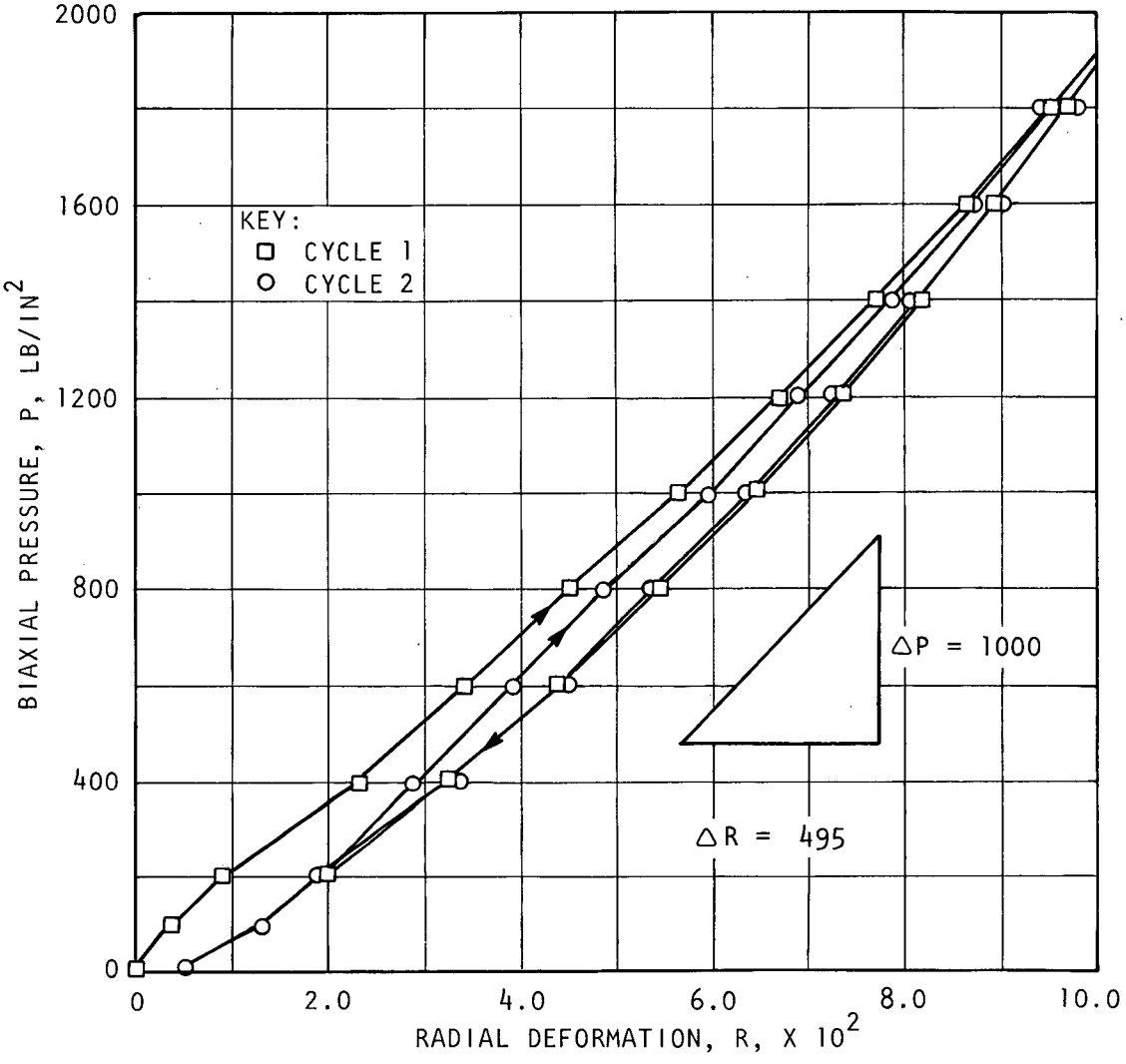
SPECIMEN LENGTH 18½ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 6.5 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 11

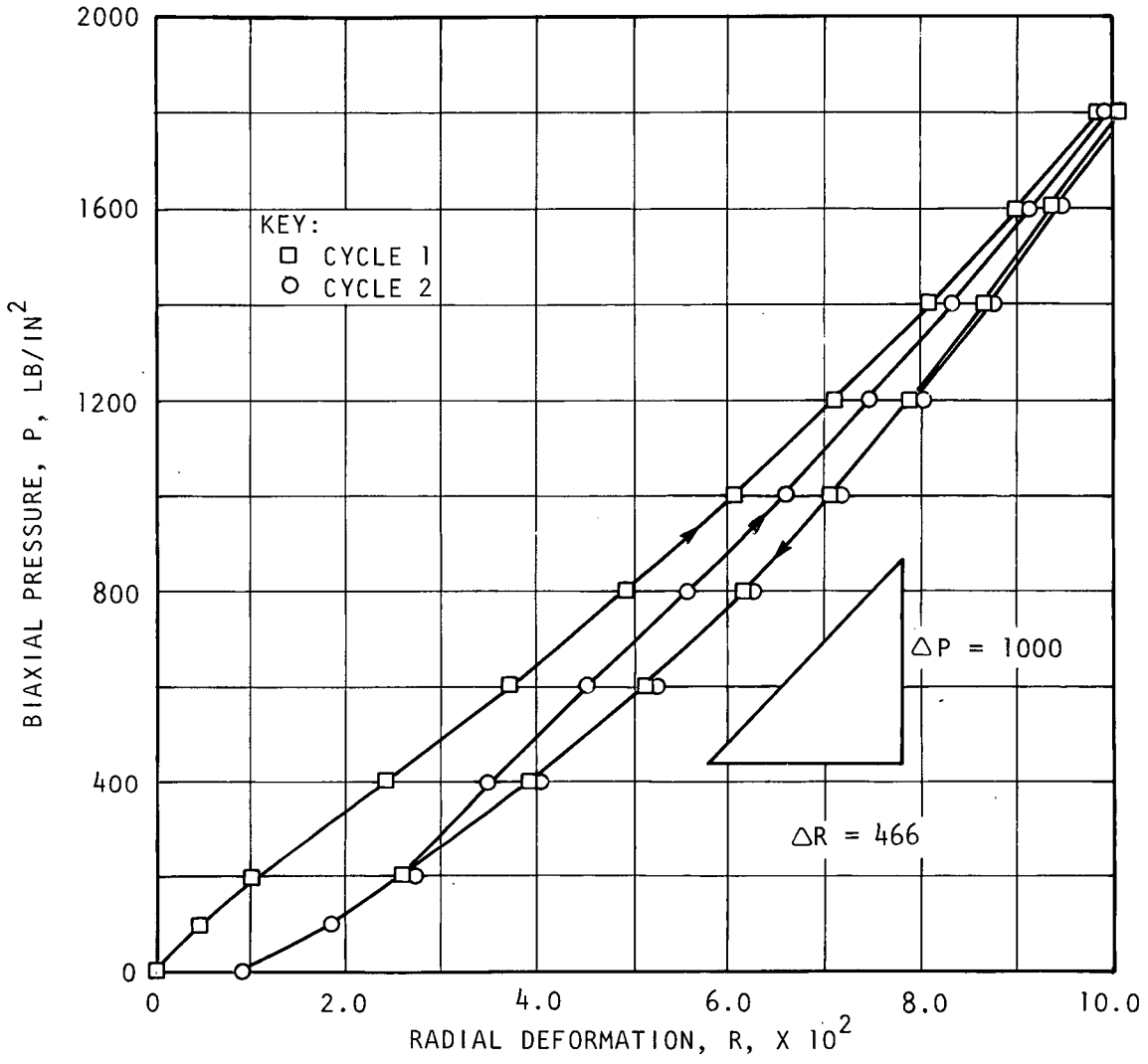
SPECIMEN LENGTH $18\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 6.9 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 11

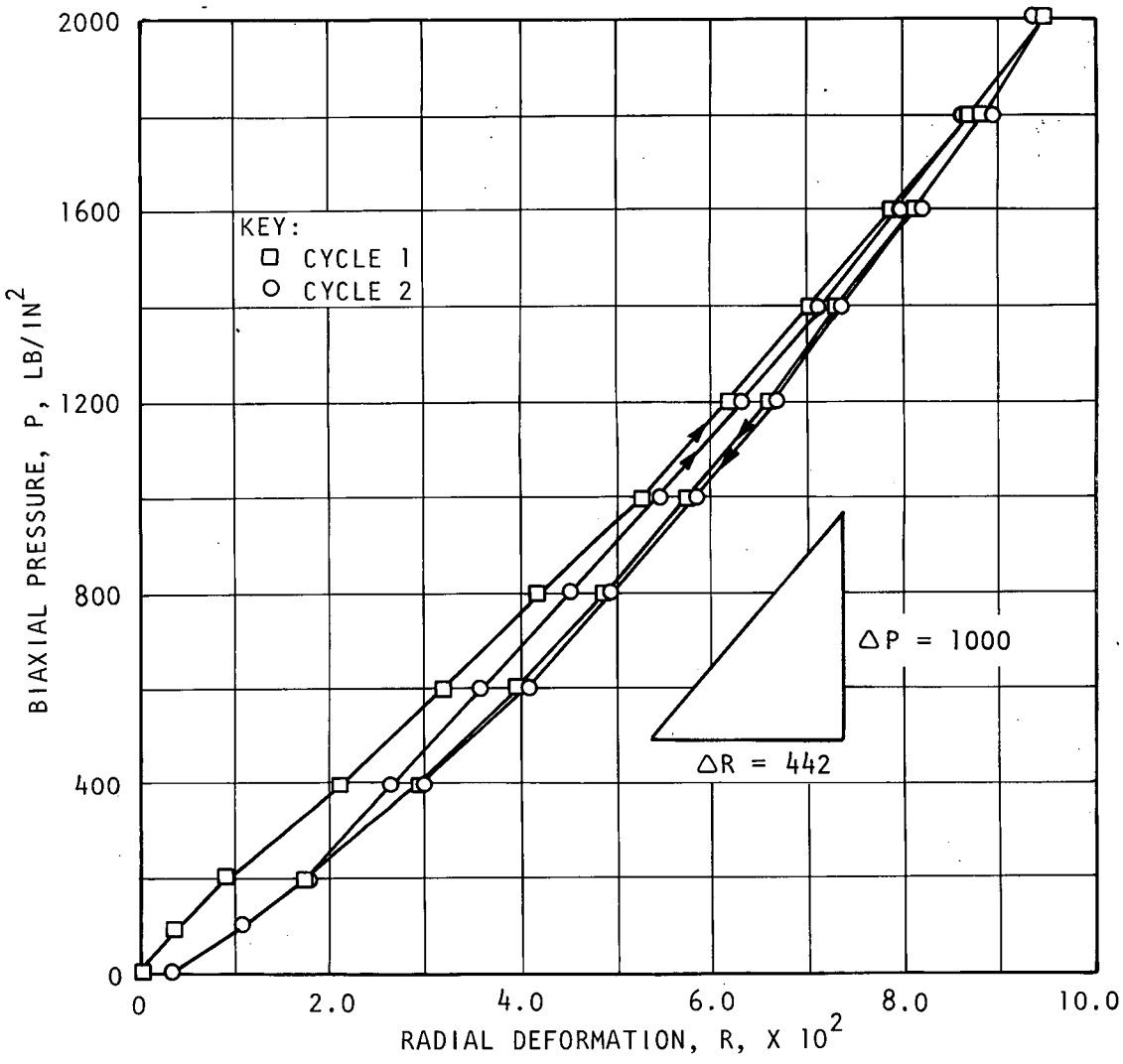
SPECIMEN LENGTH $18\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 7.2 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 12

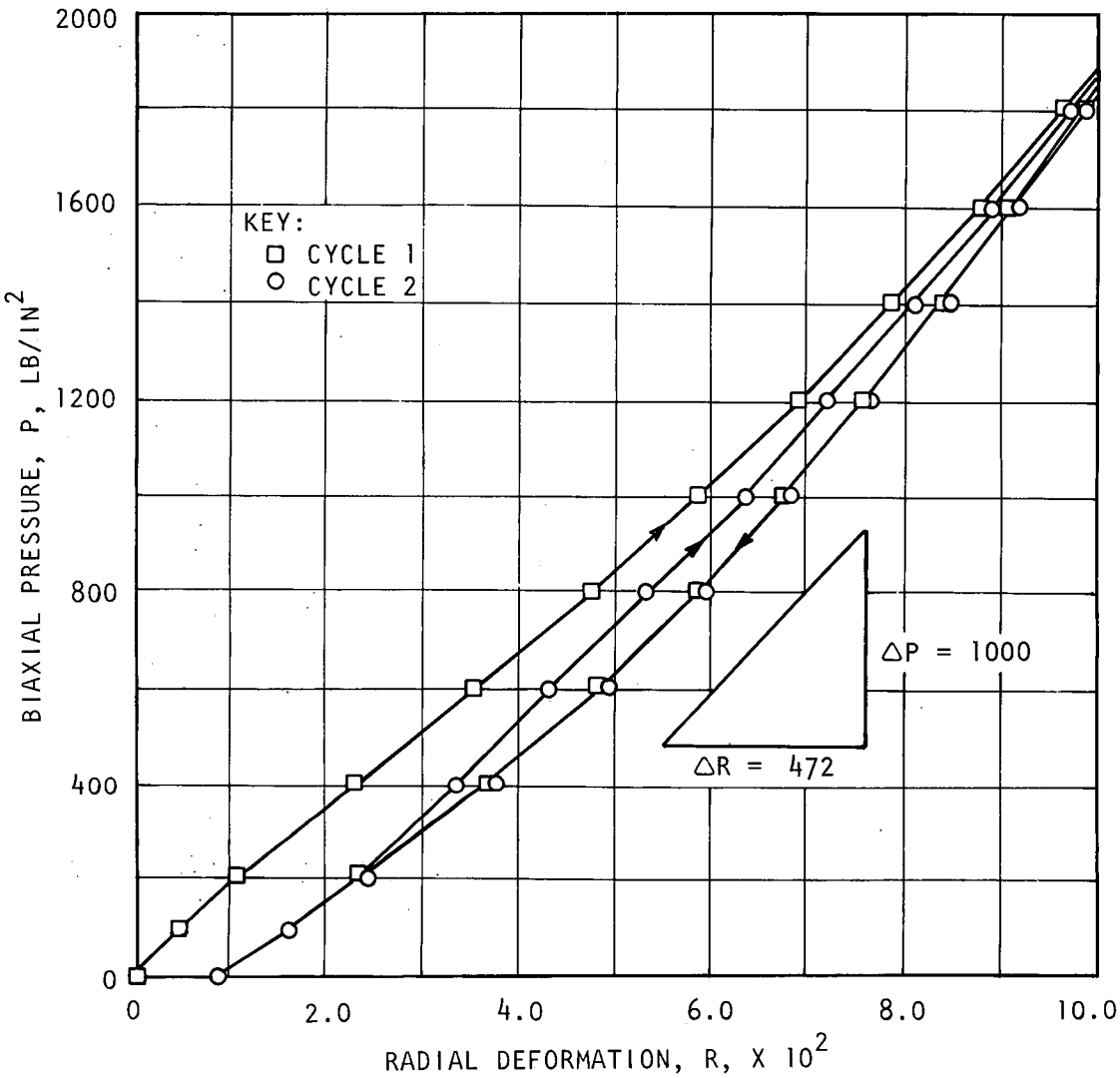
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $6.9 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 12

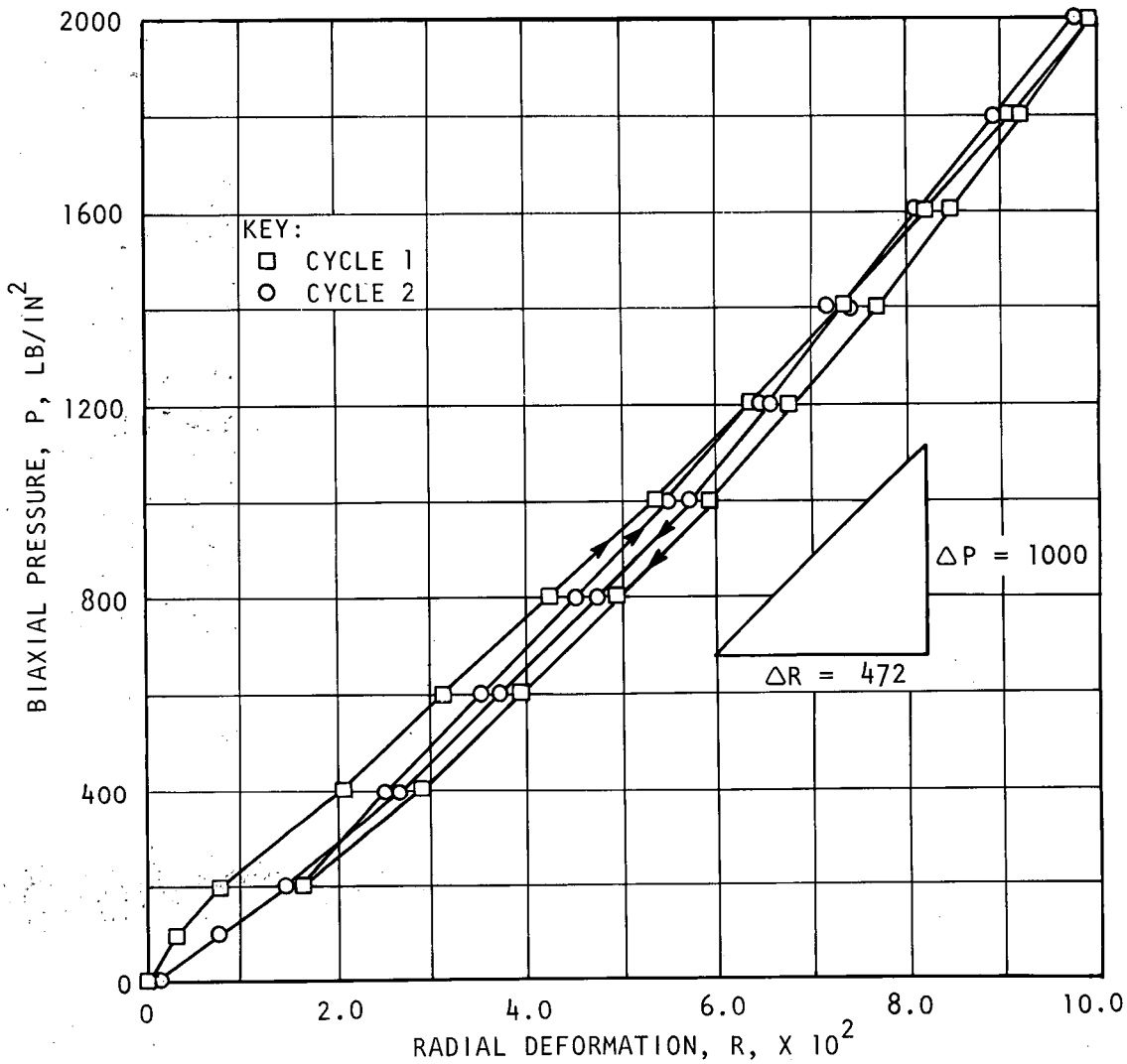
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = 1.01 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 6.9 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 12

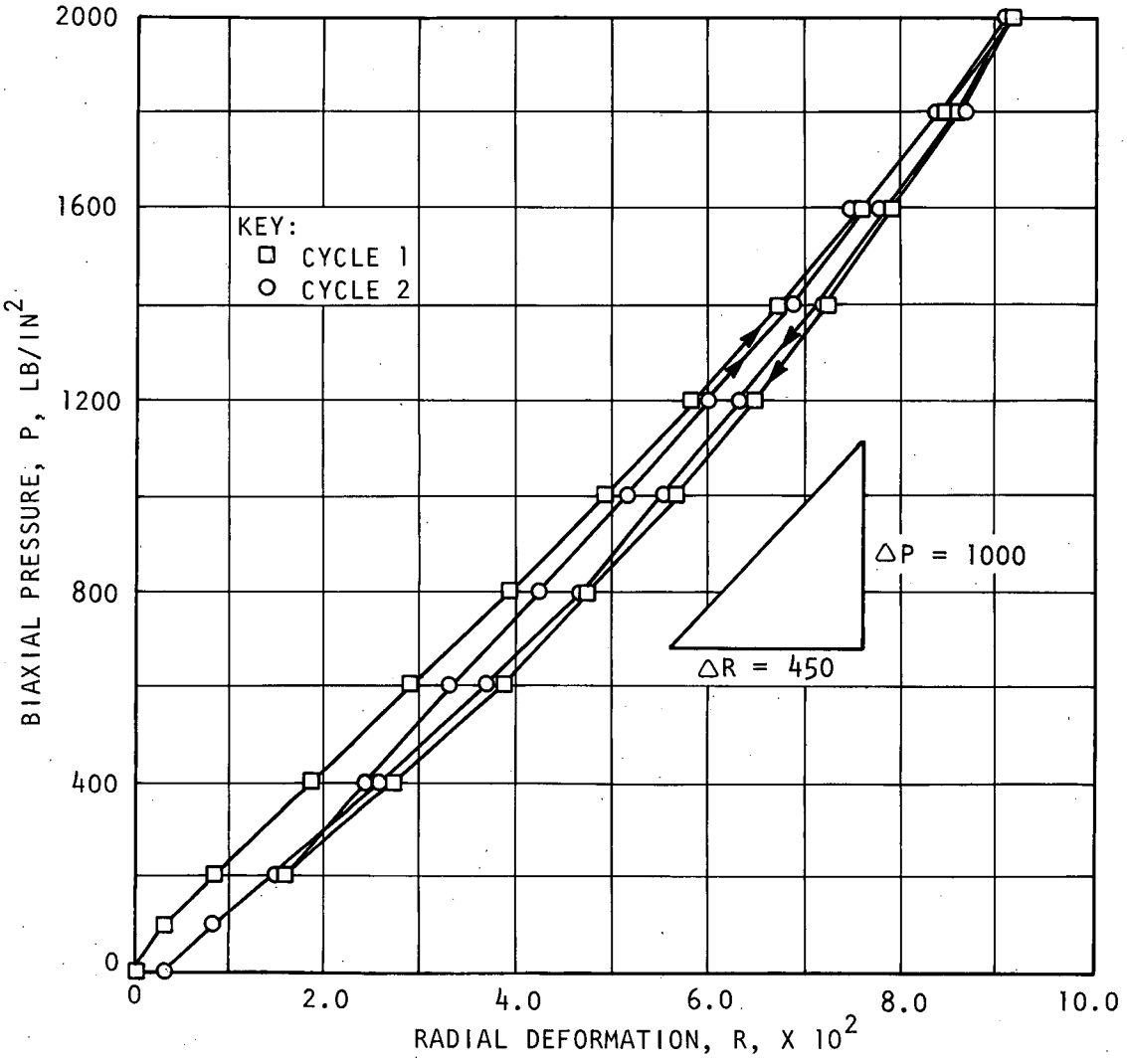
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 7.1 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 13

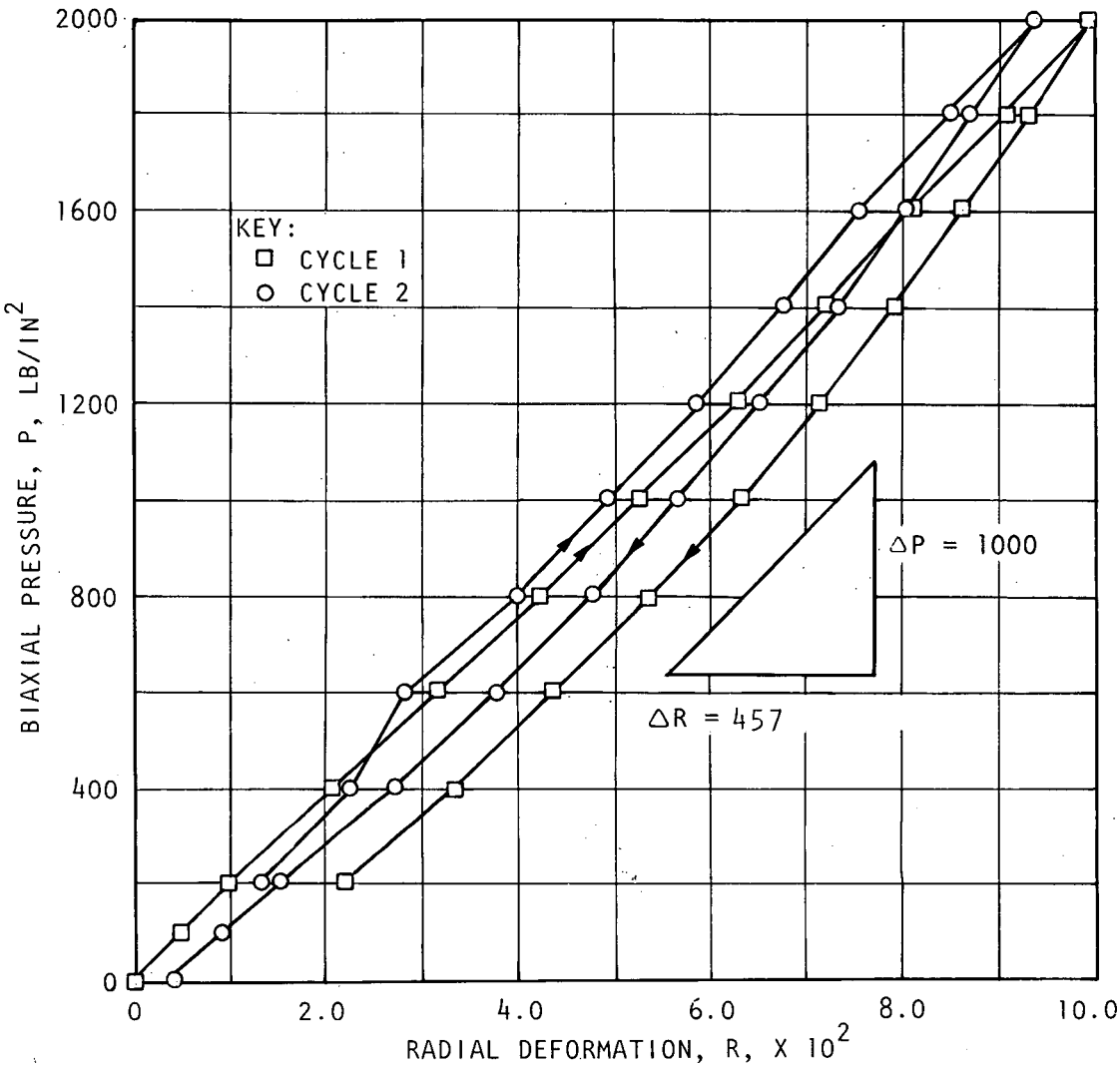
SPECIMEN LENGTH $19\frac{1}{2}$ IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = $7.1 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 13

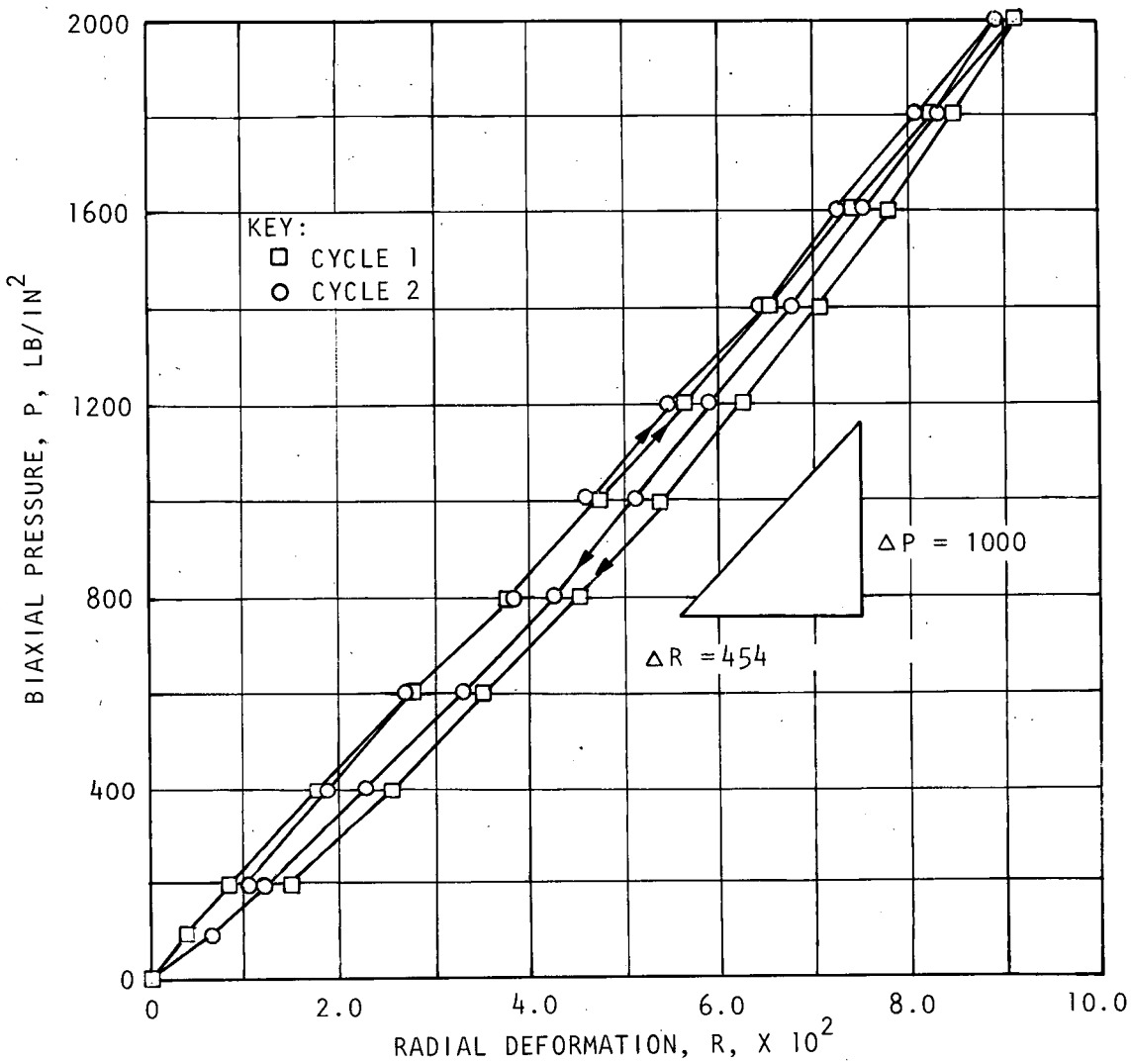
SPECIMEN LENGTH 19½ IN.

SPECIMEN O.D. 5-7/32

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




$E = 7.1 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 11 TEST 13

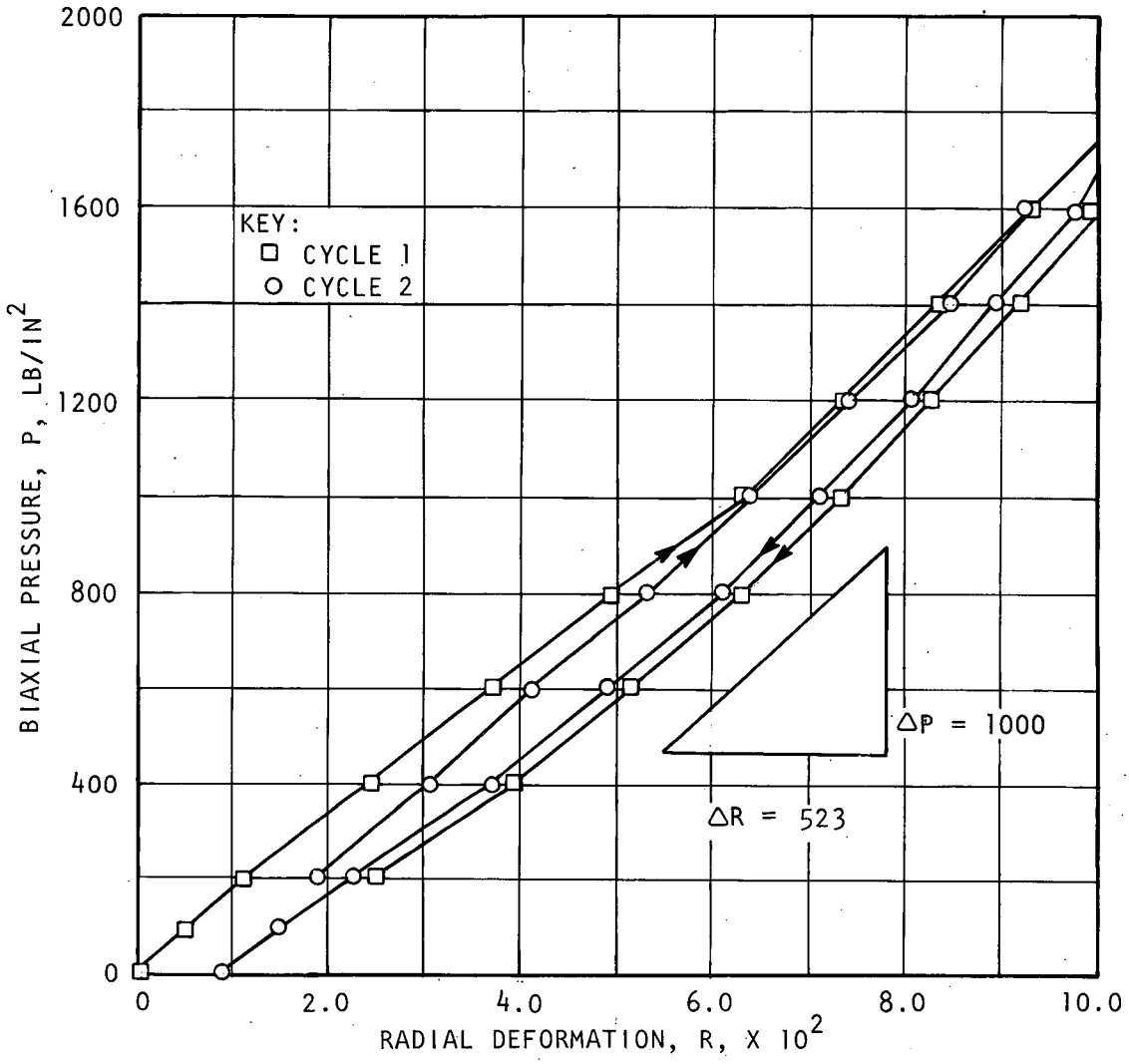
SPECIMEN LENGTH 19 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i = 1.03 \times 10^{-6}$ IN.

$\beta = 3.27$ IN.

AXIS 3




$E = 6.1 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 2

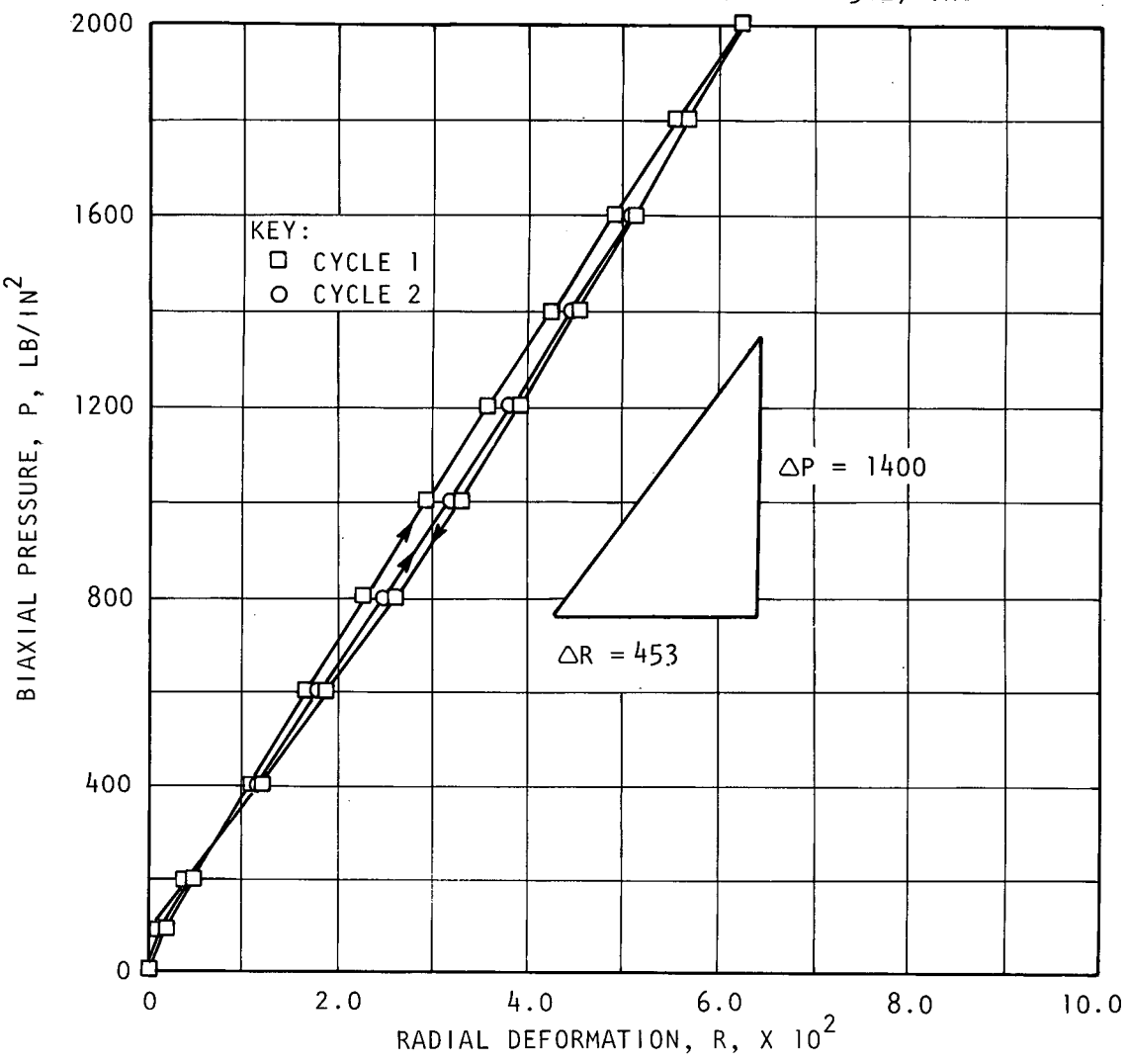
SPECIMEN LENGTH 25 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 9.8 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 2

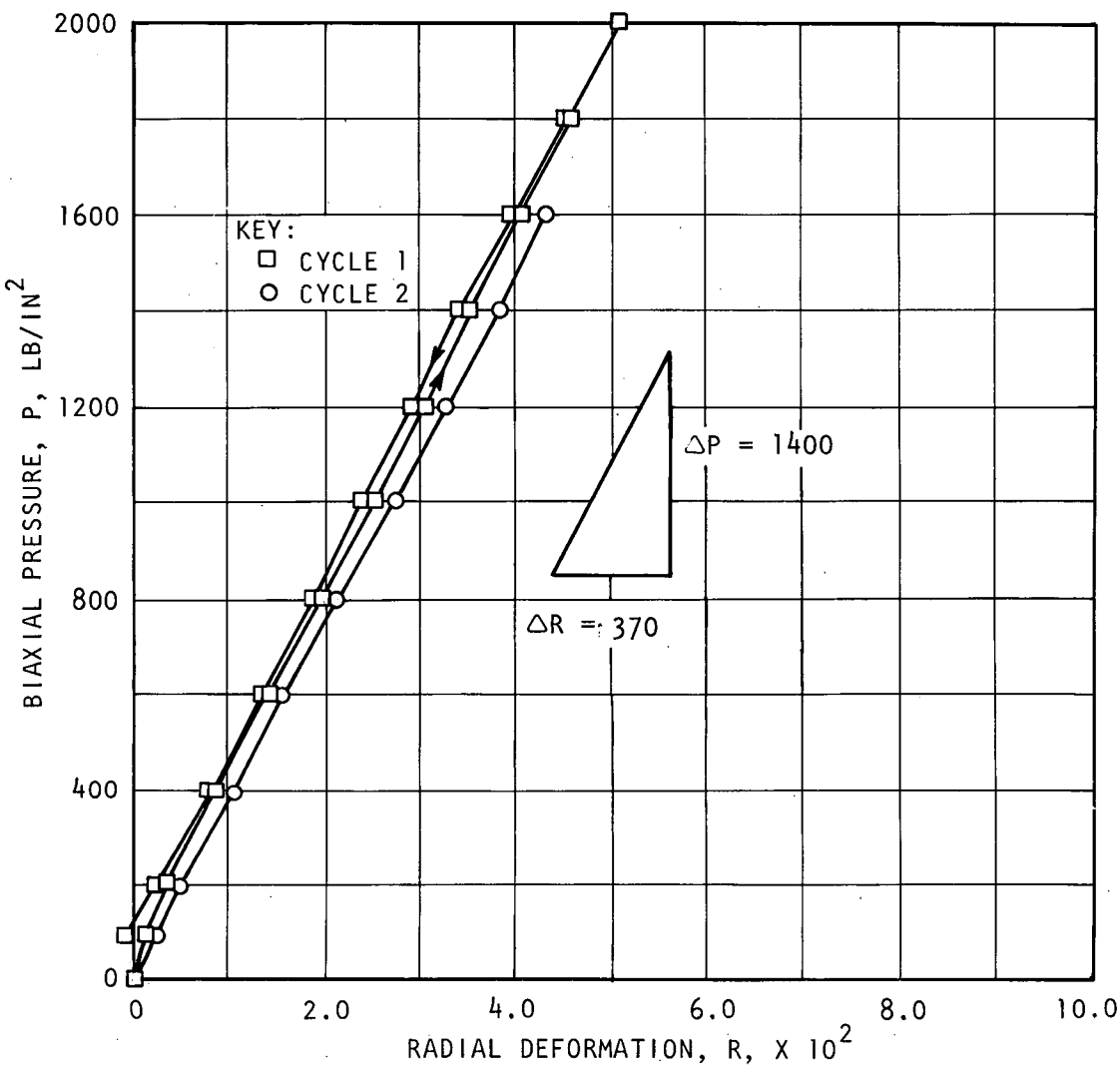
SPECIMEN LENGTH 25 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = 1.00 X $10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 12.4 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 2

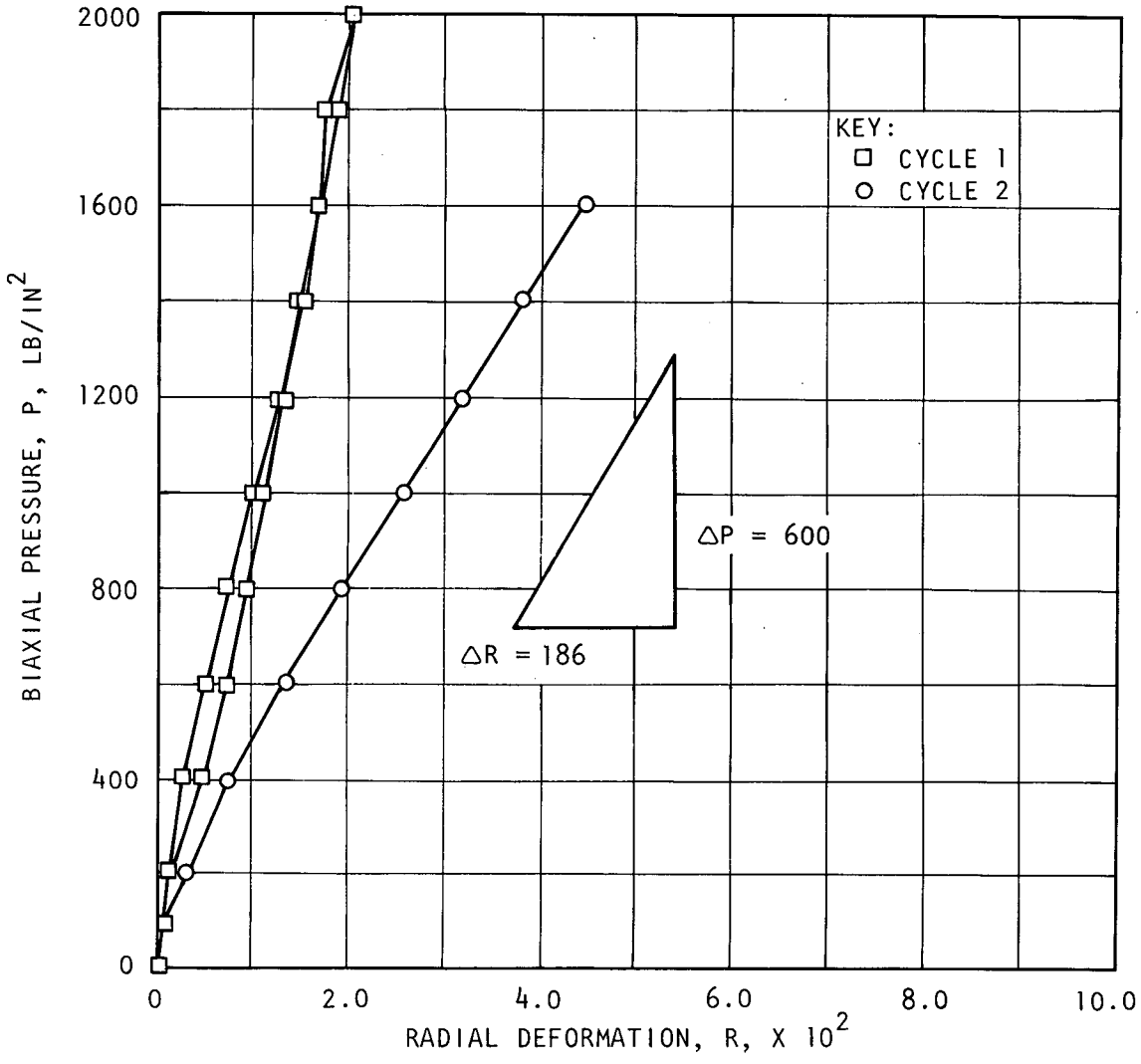
SPECIMEN LENGTH 25 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 10.0 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 3

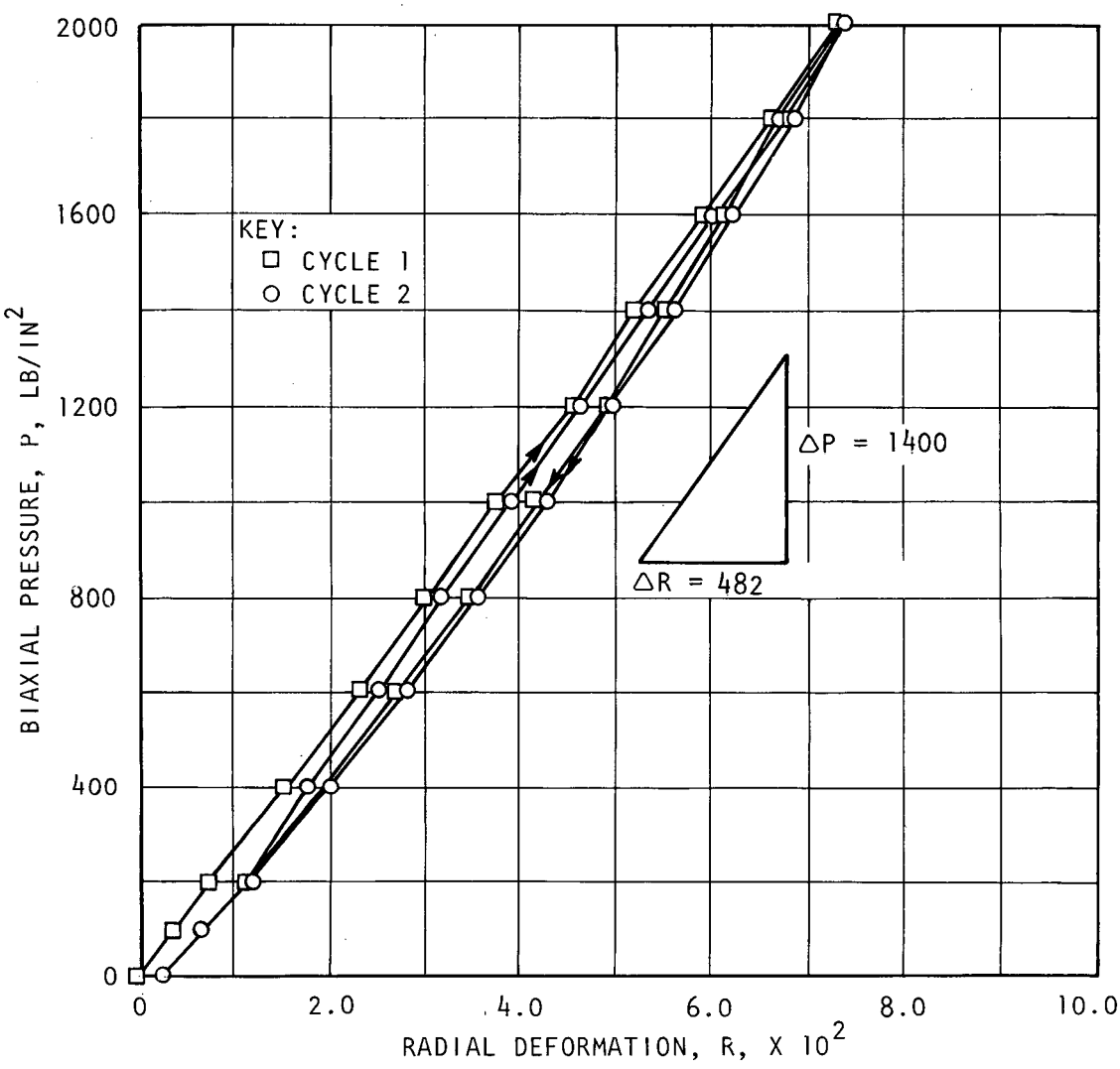
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-7/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




$E = 9.4 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 3

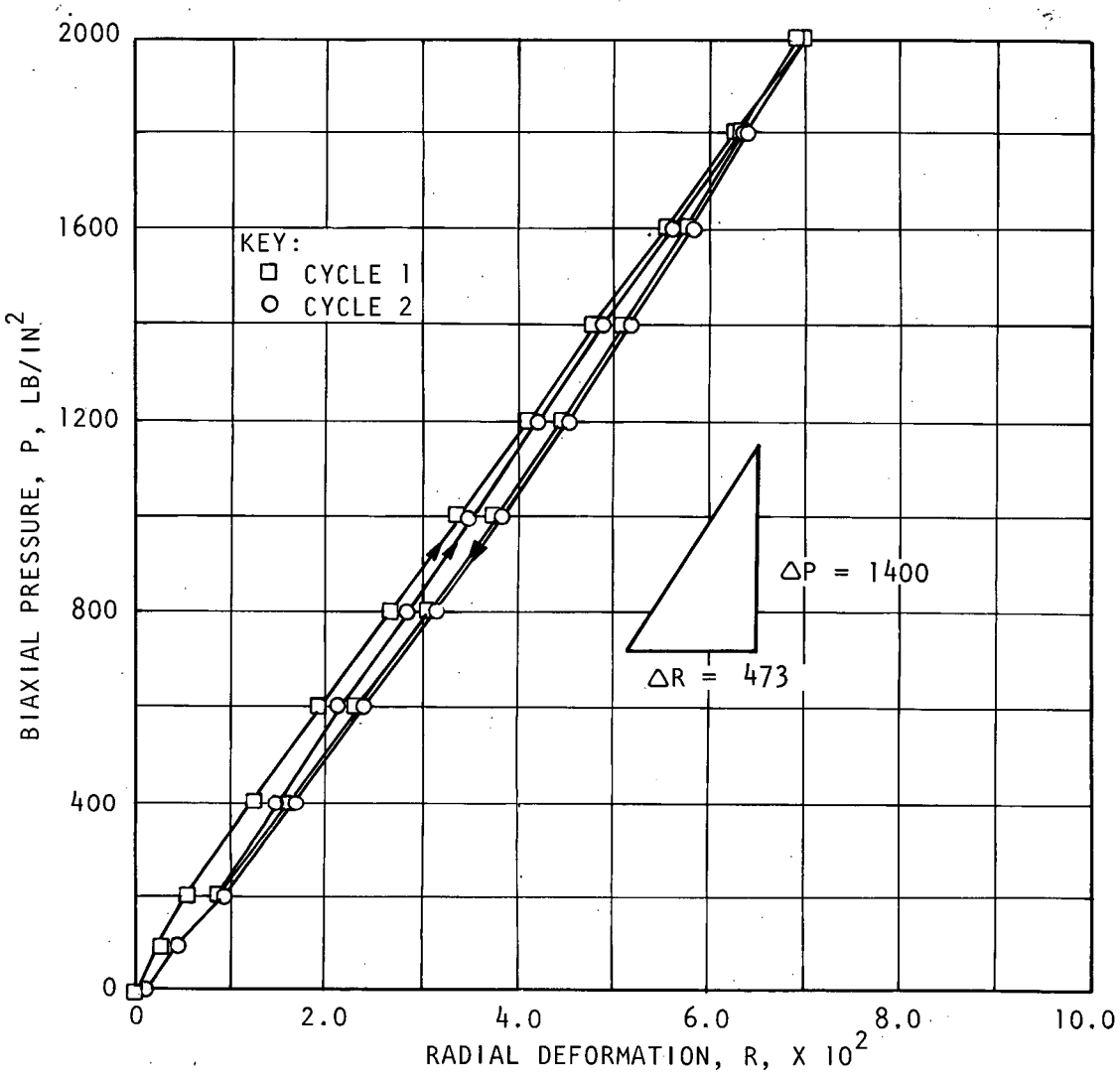
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.01 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = $9.6 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 3

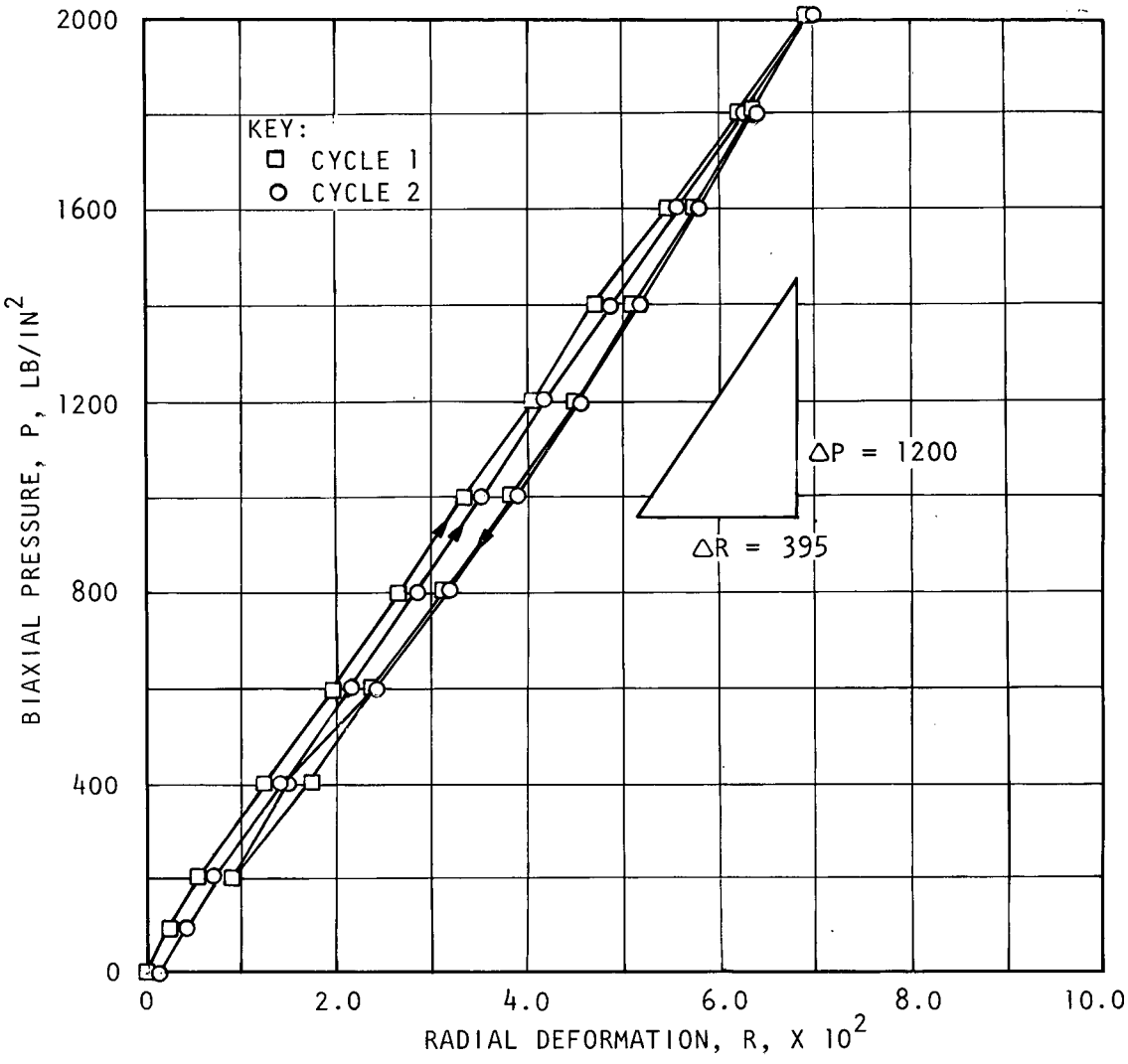
SPECIMEN LENGTH 21 IN.

SPECIMEN O.D. 5-6/32 IN.

AXIS 3

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.




$E = 9.6 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 5

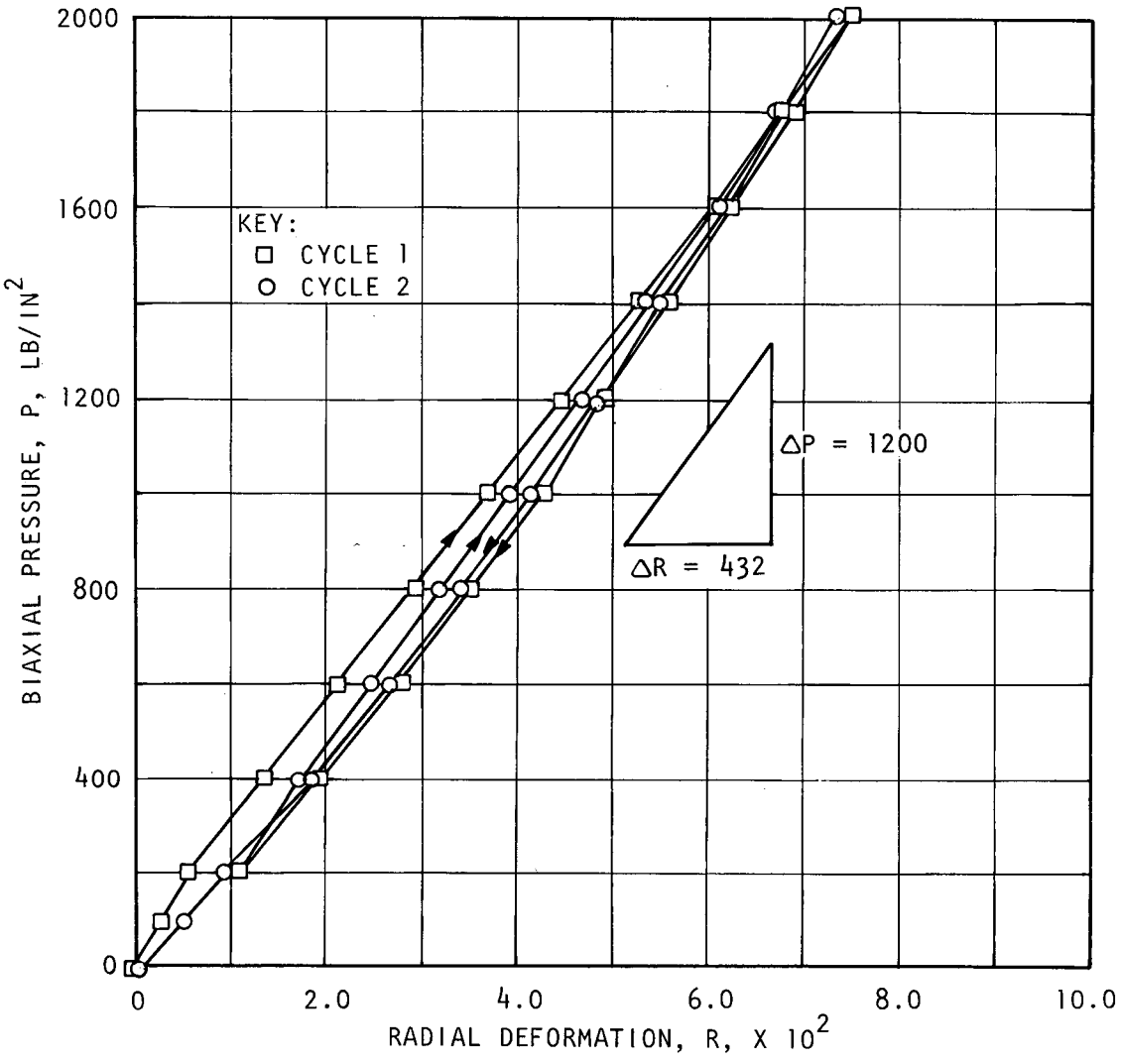
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.03 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 1




E = 8.8 X$10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 5

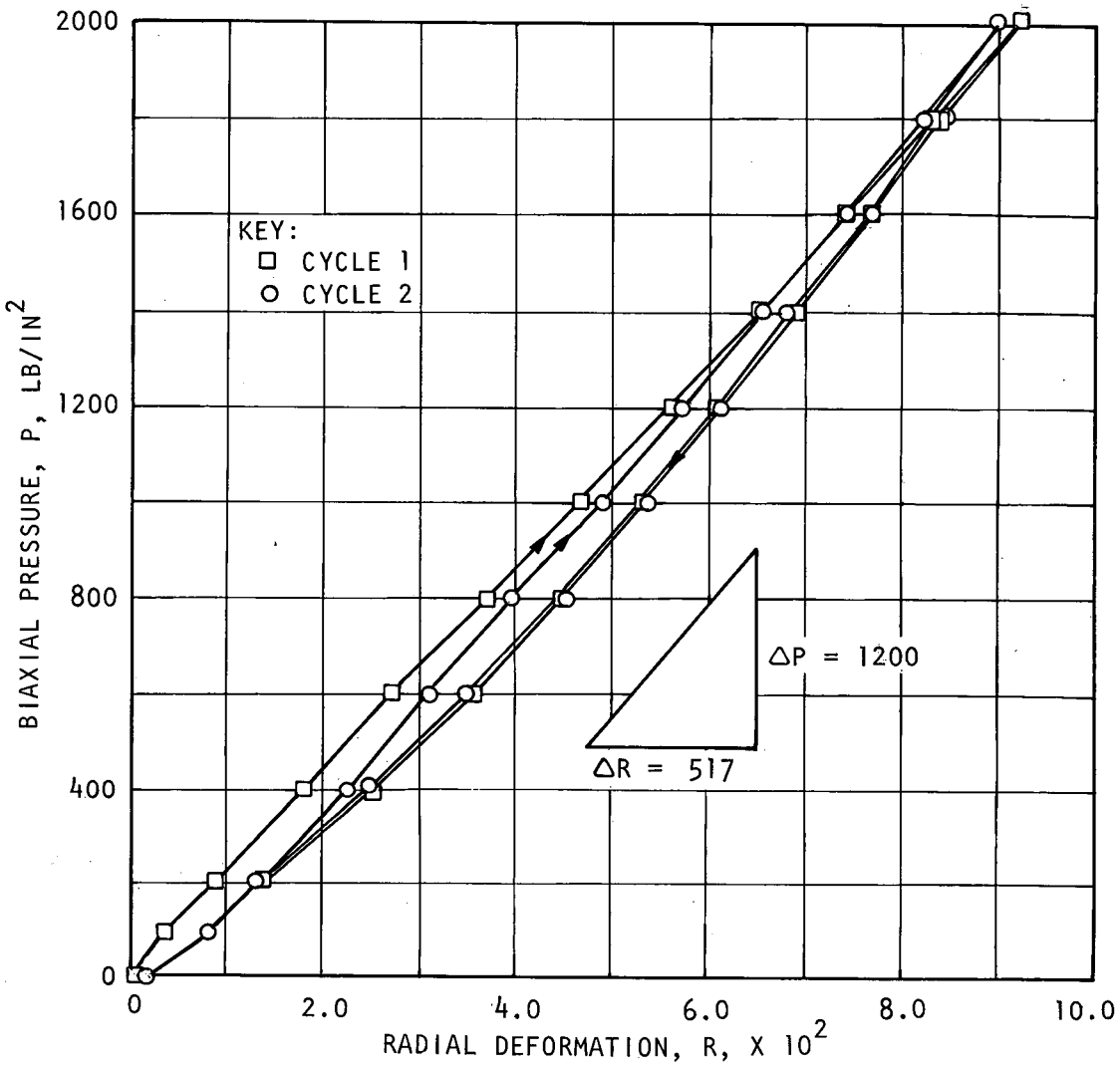
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.00 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 2




E = 7.6 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 5

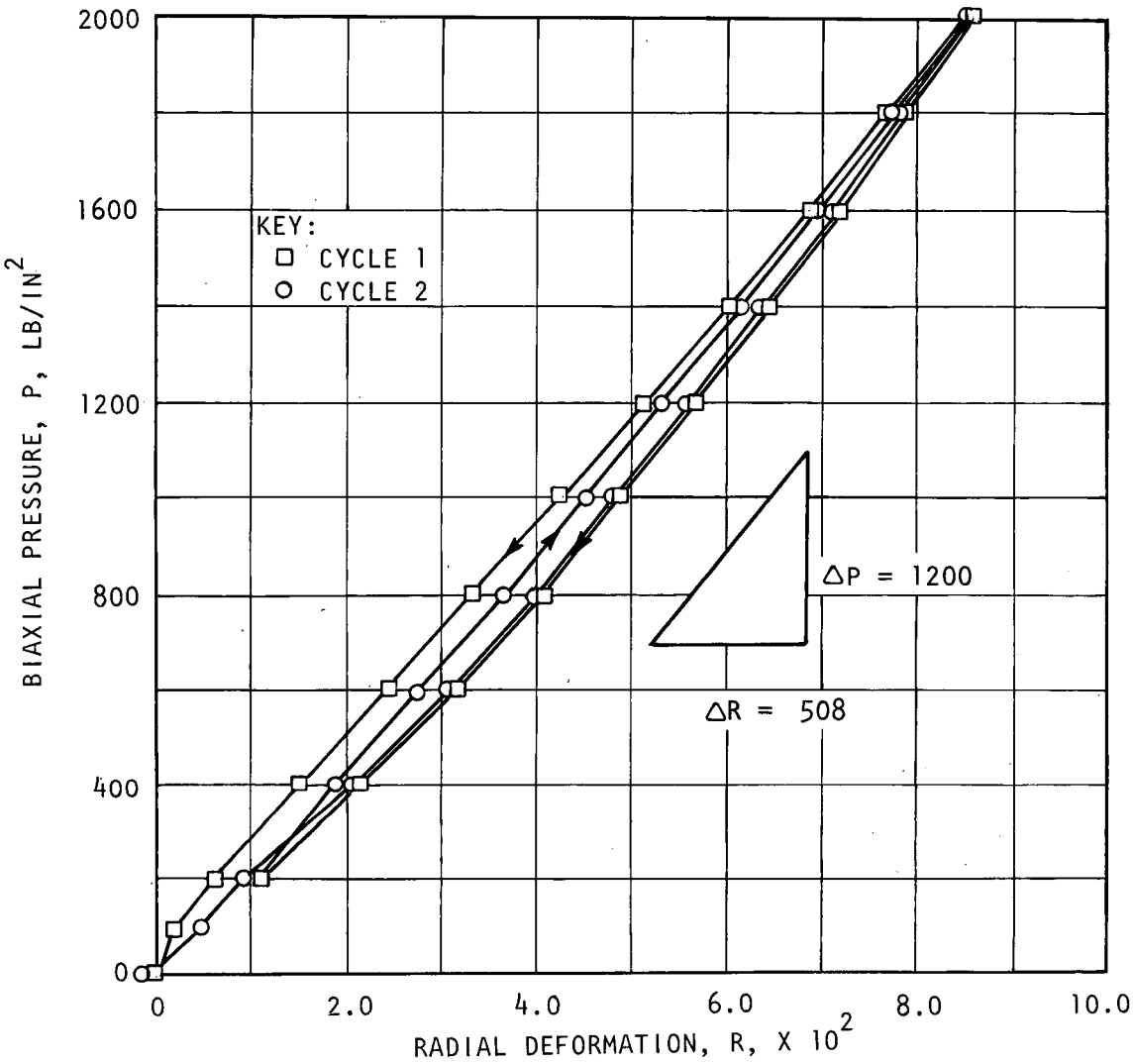
SPECIMEN LENGTH 12 IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

$\beta$ = 3.27 IN.

AXIS 3




E = 7.4 $\times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 7

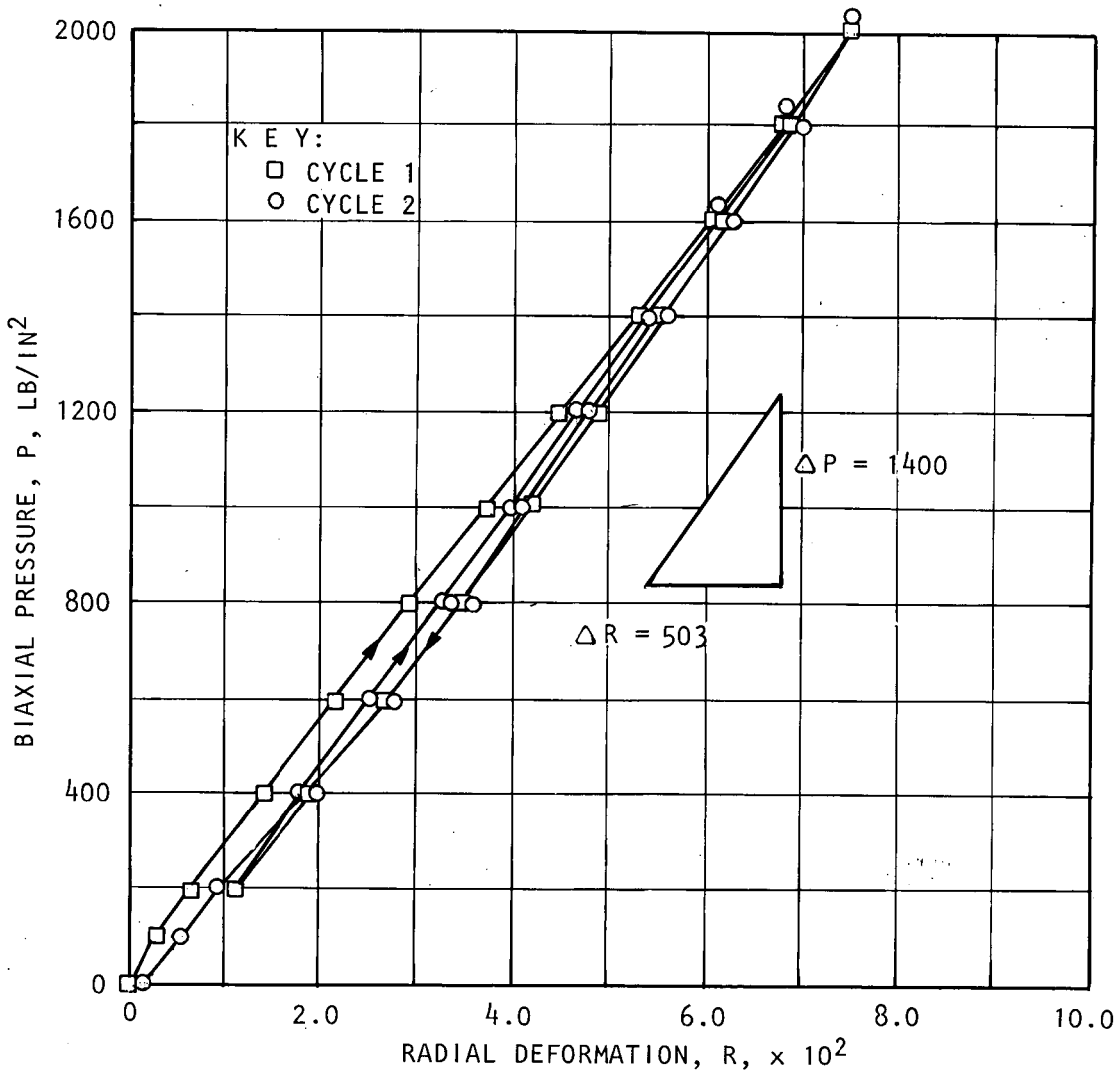
SPECIMEN LENGTH 15 1/2 IN.

SPECIMEN O.D. 5 6/32 IN.

$K_i = 1.03 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

AXIS 1




$E = 8.8 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 7

SPECIMEN LENGTH 15 1/2 IN.

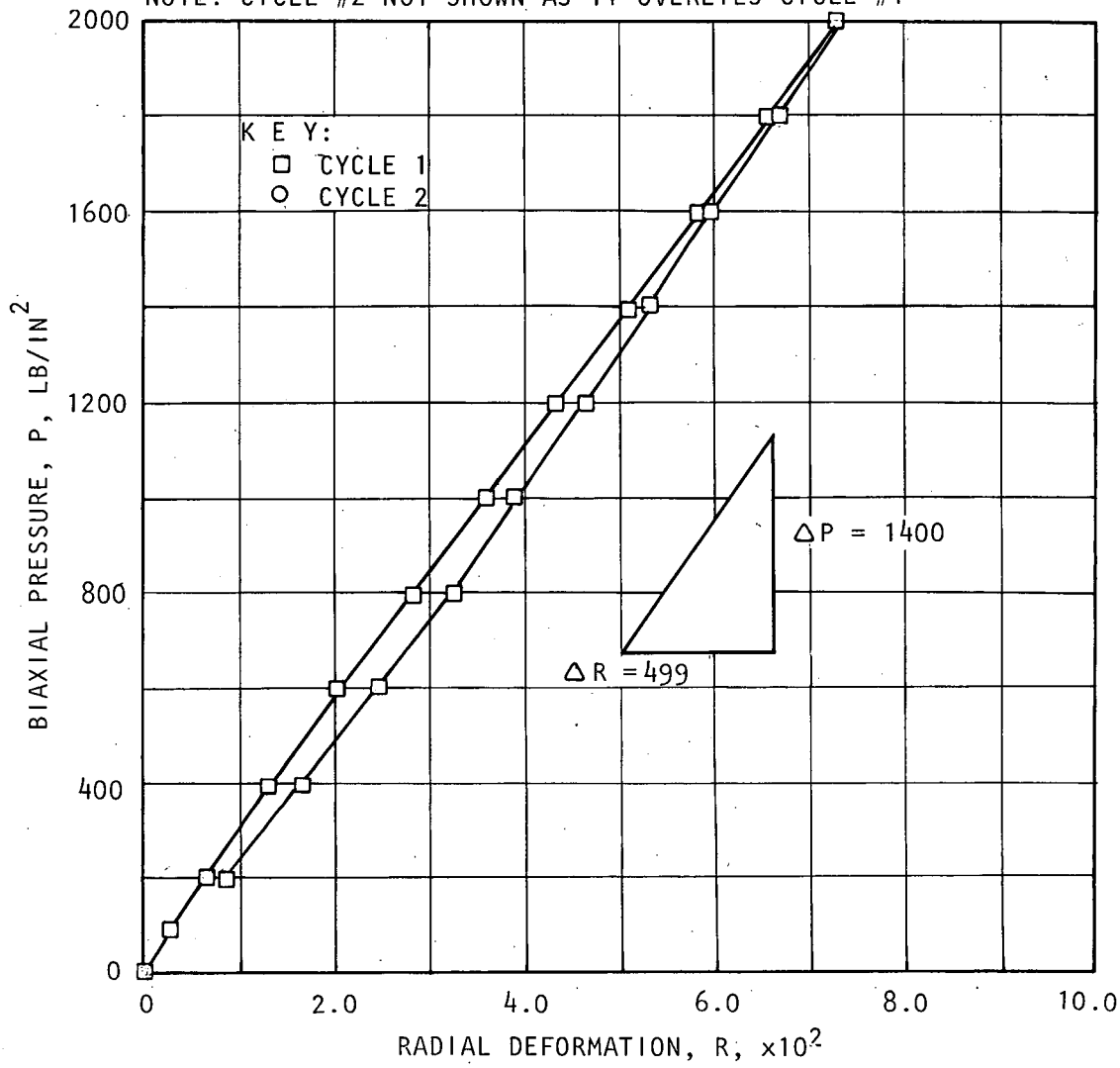
SPECIMEN O.D. 5 6/32 IN.

AXIS 2

$K_i = 1.00 \times 10^{-6}$ IN

$\beta = 3.27$ IN.

NOTE: CYCLE #2 NOT SHOWN AS IT OVERLIES CYCLE #1




$E = 9.2 \times 10^6$ LB/IN$^2$

DAMES & MOORE

# MODULUS OF DEFORMATION

## SITE 14 TEST 7

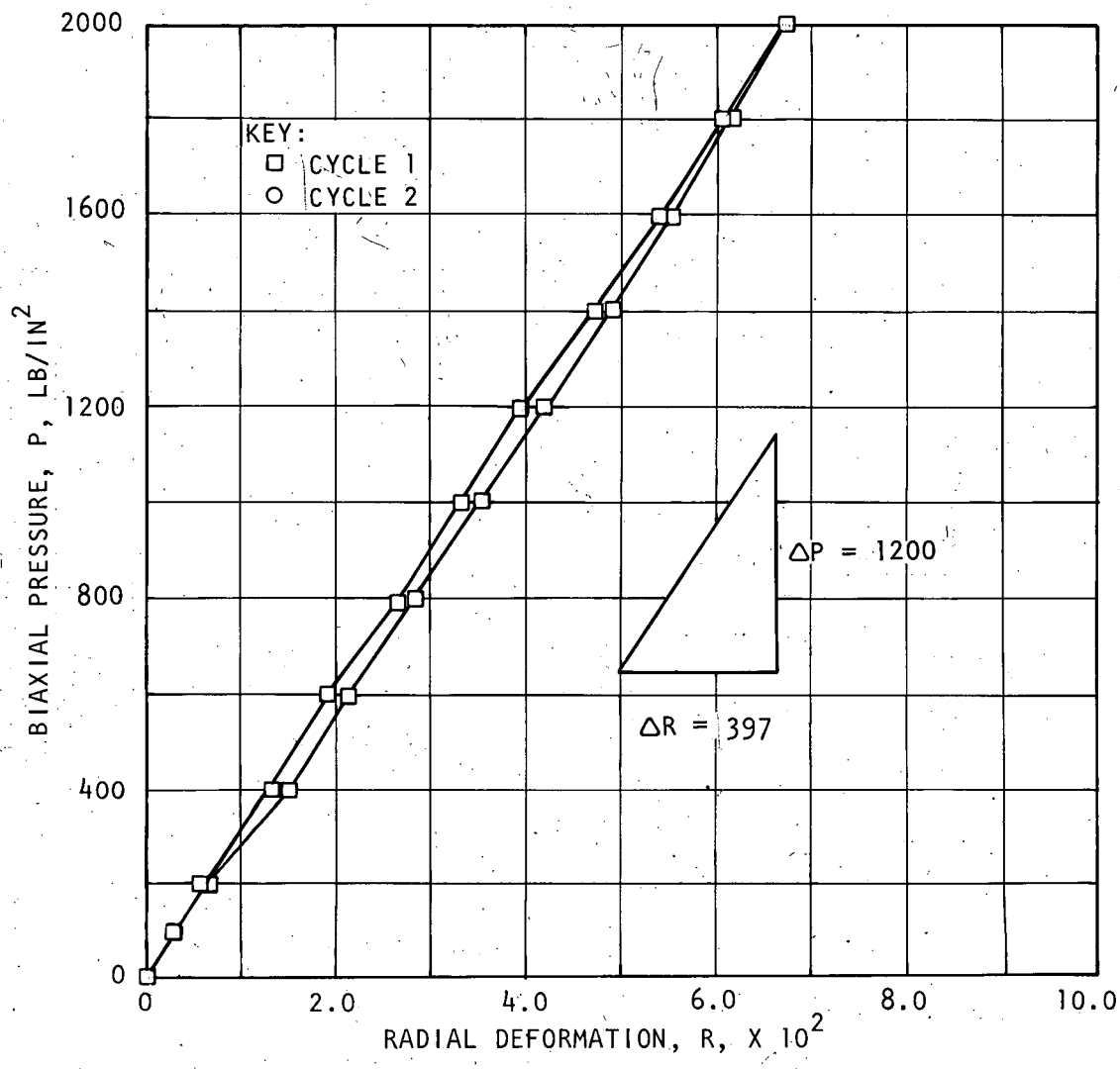
SPECIMEN LENGTH $15\frac{1}{2}$ IN.

SPECIMEN O.D. 5-6/32 IN.

$K_i$ = $1.05 \times 10^{-6}$ IN.

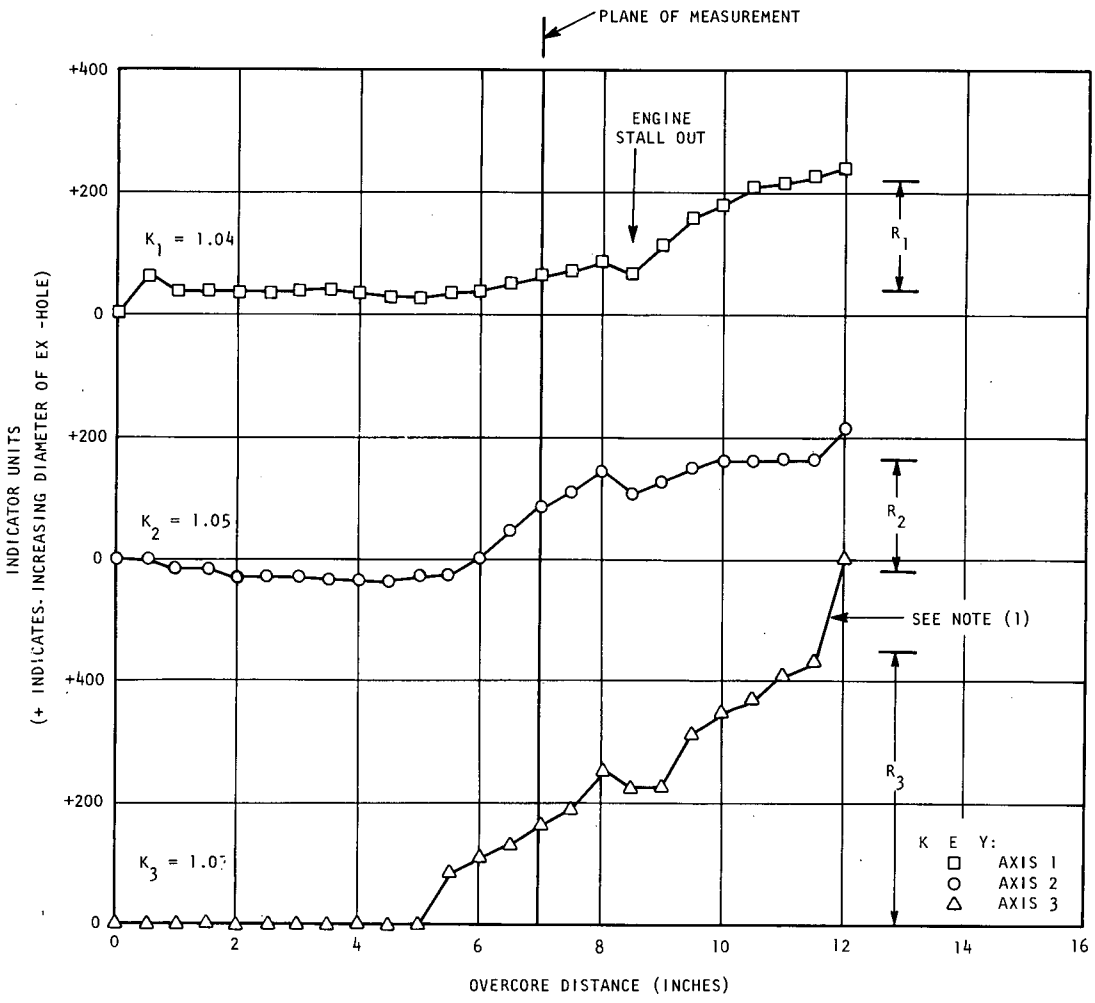
$\beta$ = 3.27 IN.

AXIS 3




$E = 9.4 \times 10^6$ LB/IN$^2$

DAMES & MOORE




TEST NO. 1

DEPTH 17 FT. 9½ IN.

$\mu_1\theta$ N 82 W

$R_1$ = +40 TO +220 = +180

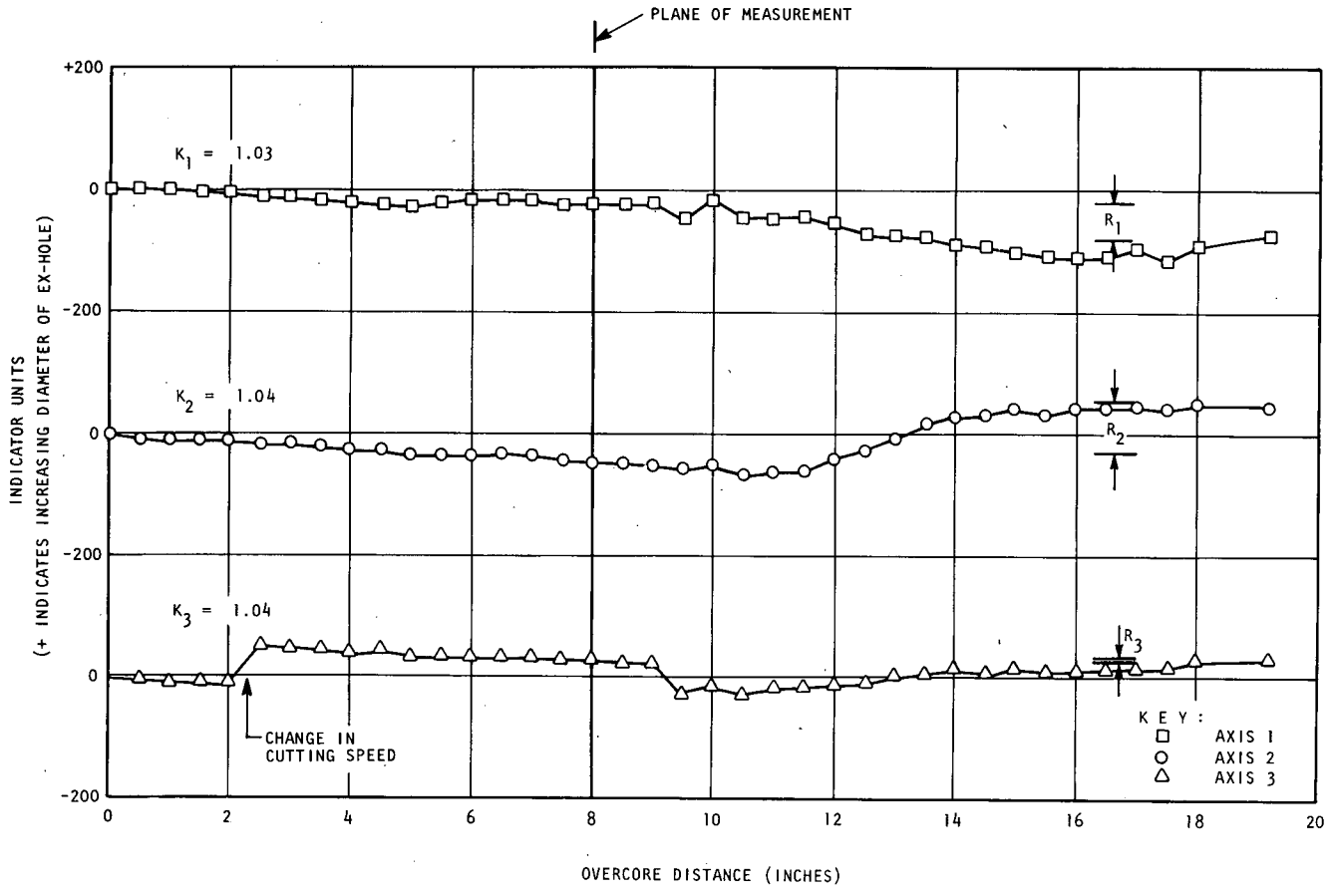
$R_2$ = -18 TO +162 = +180

$R_3$ = 0 TO +450 = +450

NOTES:
(1) TEST STOPPED AT 12 INCHES OF OVERCORE DUE TO VIBRATION OF STRAIN INDICATOR.
(2) ENGINE STALLED-OUT AT 8.5 INCHES OF OVERCORE RUN.
(3) PLANE OF MEASUREMENT = 7 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 1




TEST NO. 2

DEPTH 19 FT. 6 IN.

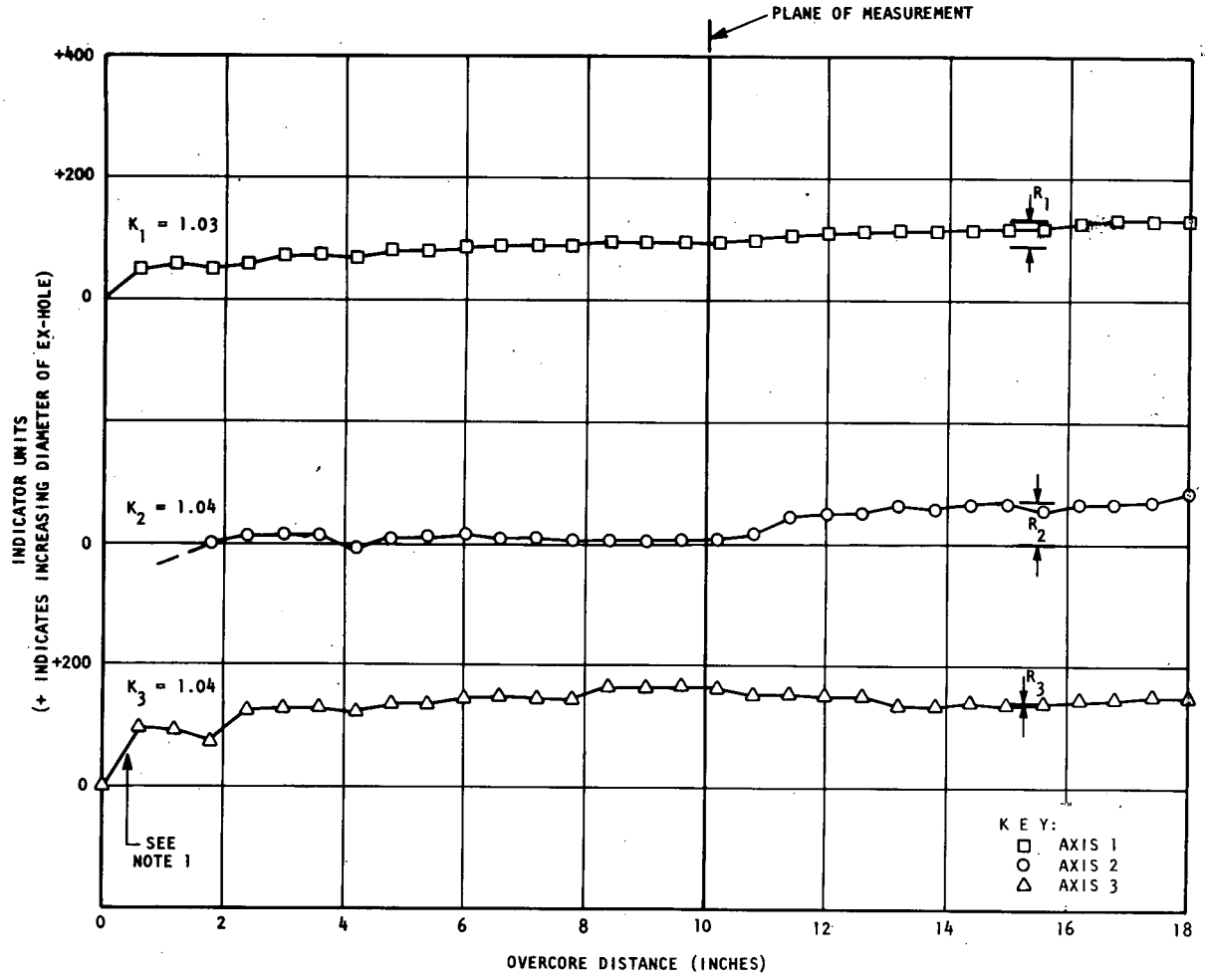
$\mu_1\theta$ N 78 W

$R_1$ = -20 TO -80 = -60
$R_2$ = -30 TO +56 = +86
$R_3$ = +34 TO +37 = +3

NOTES:
(1) CUTTING SPEED CHANGED SIGNIFICANTLY AT 2 INCHES, PROBABLY DUE TO DEBRIS IN GROOVE OF 6-INCH BIT
(2) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 2




TEST NO. 3

DEPTH 21 FT. 1 IN.

$\mu_1\theta$ N 85 W

$R_1$ = +88 TO 133 = +45

$R_2$ = 0 TO +66 = +66

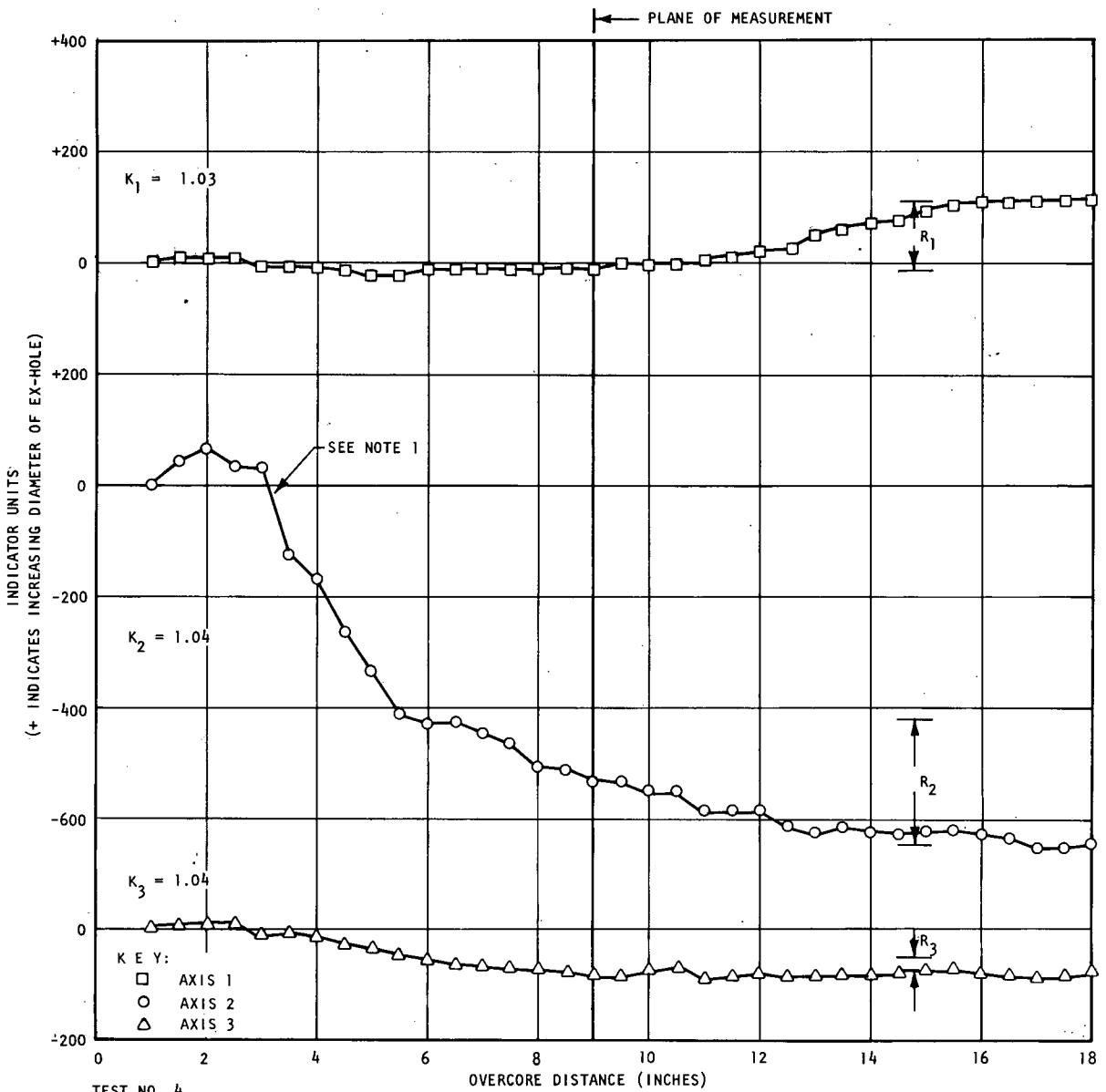
$R_3$ = +140 TO +140 = 0

NOTES:
(1) ZERO READING TAKEN PRIOR TO INITIATION OF DRILLING, HENCE LARGE INCREASE IN READING DUE TO DRILL BIT PRESSURE
(2) DISTANCE WAS MEASURED IN 10 TH'S OF FEET
(3) PLANE OF MEASUREMENT = 10 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 3

DAMES & MOORE




TEST NO. 4

DEPTH 22 FT. 4 IN.

$\mu_1\theta$ N 86 W

$R_1$ = -11 TO +113 = +124

$R_2$ = -420 TO -647 = -227

$R_3$ = -55 TO -79 = -24

NOTES:

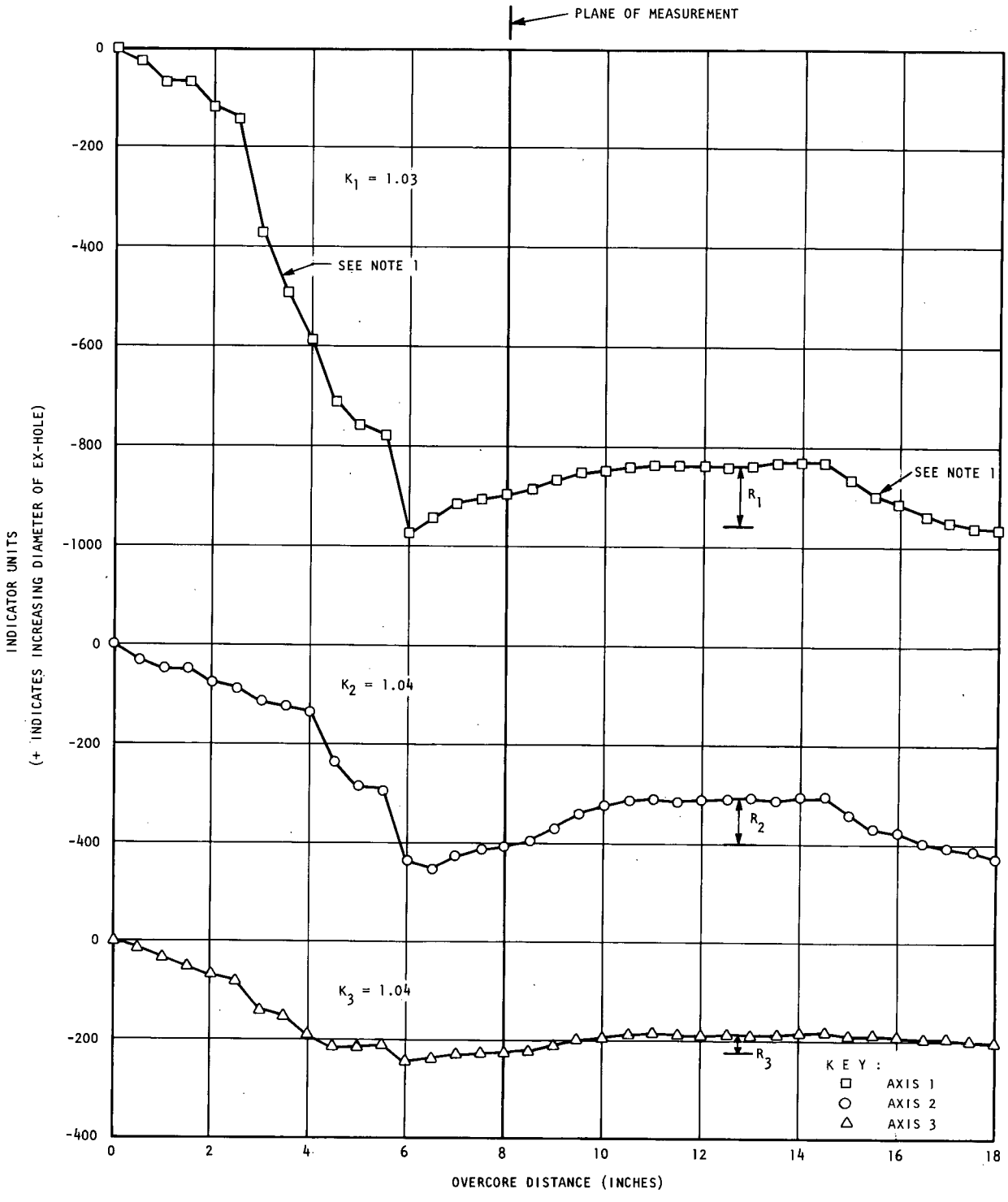
(1) APPARENT SLIPPAGE OF GAGE DOWN-HOLE. NOTE STRESS RELIEF OF CANTILEVER NO. 1 INDICATES A MEASUREMENT PLANE OF 10 INCHES. STABILITY OF POSITION WAS REACHED AT APPROX. 6 INCHES OF OVERCORE RUN.

(2) PLANE OF MEASUREMENT = 9 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 4

DAMES & MOORE




TEST NO. 5

DEPTH 23 FT. 11 IN.

$\mu_1\theta$ N 85 W

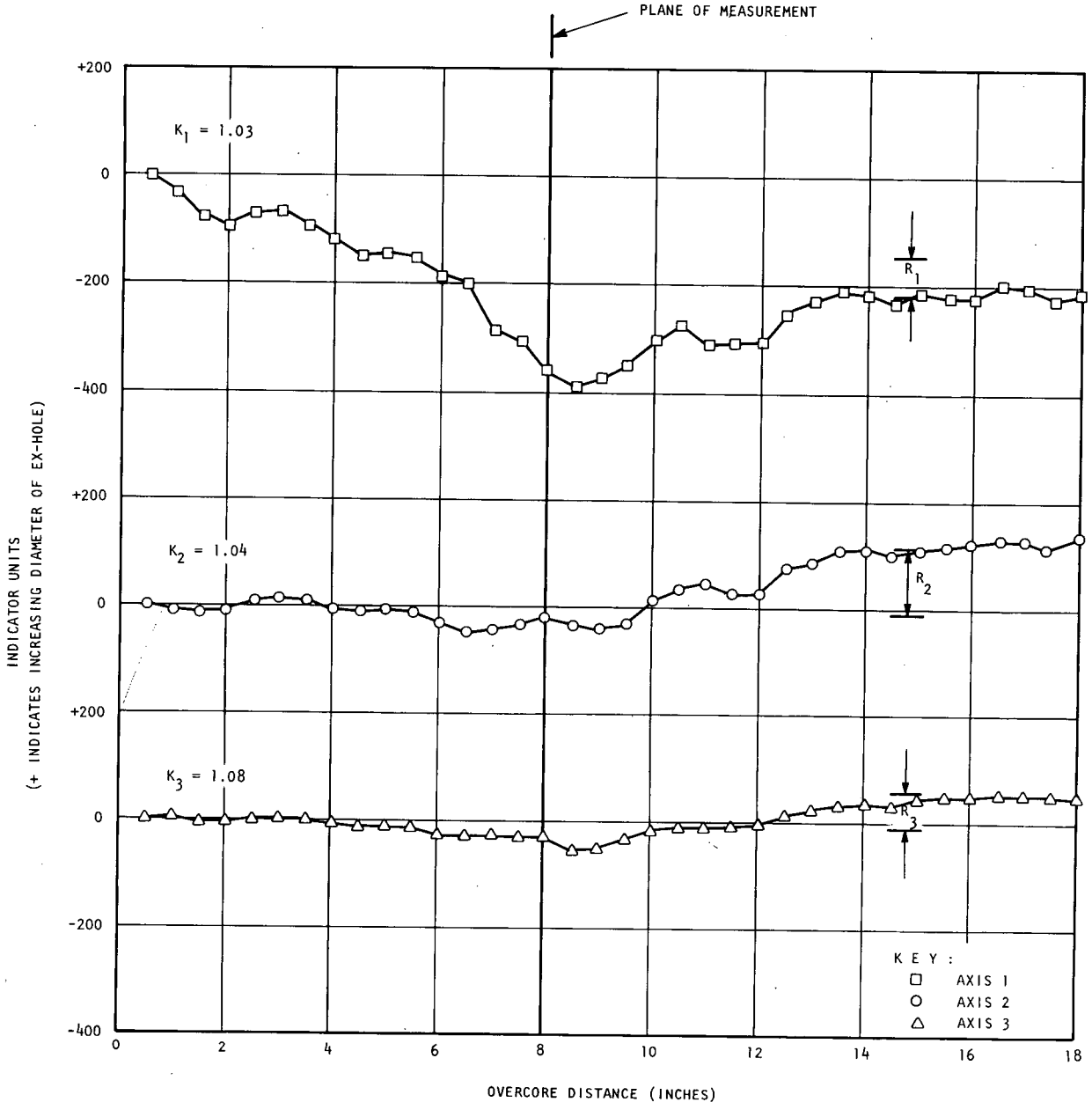
$R_1$ = -960 TO -840 = +120
$R_2$ = -400 TO -308 = +92
$R_3$ = -222 TO -187 = +35

NOTES:
(1) APPARENT SLIPPAGE OF GAGE. SLIPPAGE STOPPED AT APPROX. 6 INCHES OF OVERCORE RUN AND RESUMED AT 15 INCHES. NO SIGNIFICANT ROTATION OF GAGE NOTED UPON RETRIEVAL.
(2) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 5

DAMES & MOORE




TEST NO. 6

DEPTH 25 FT. 7½ IN.

$\mu_1\theta$ N 85 E

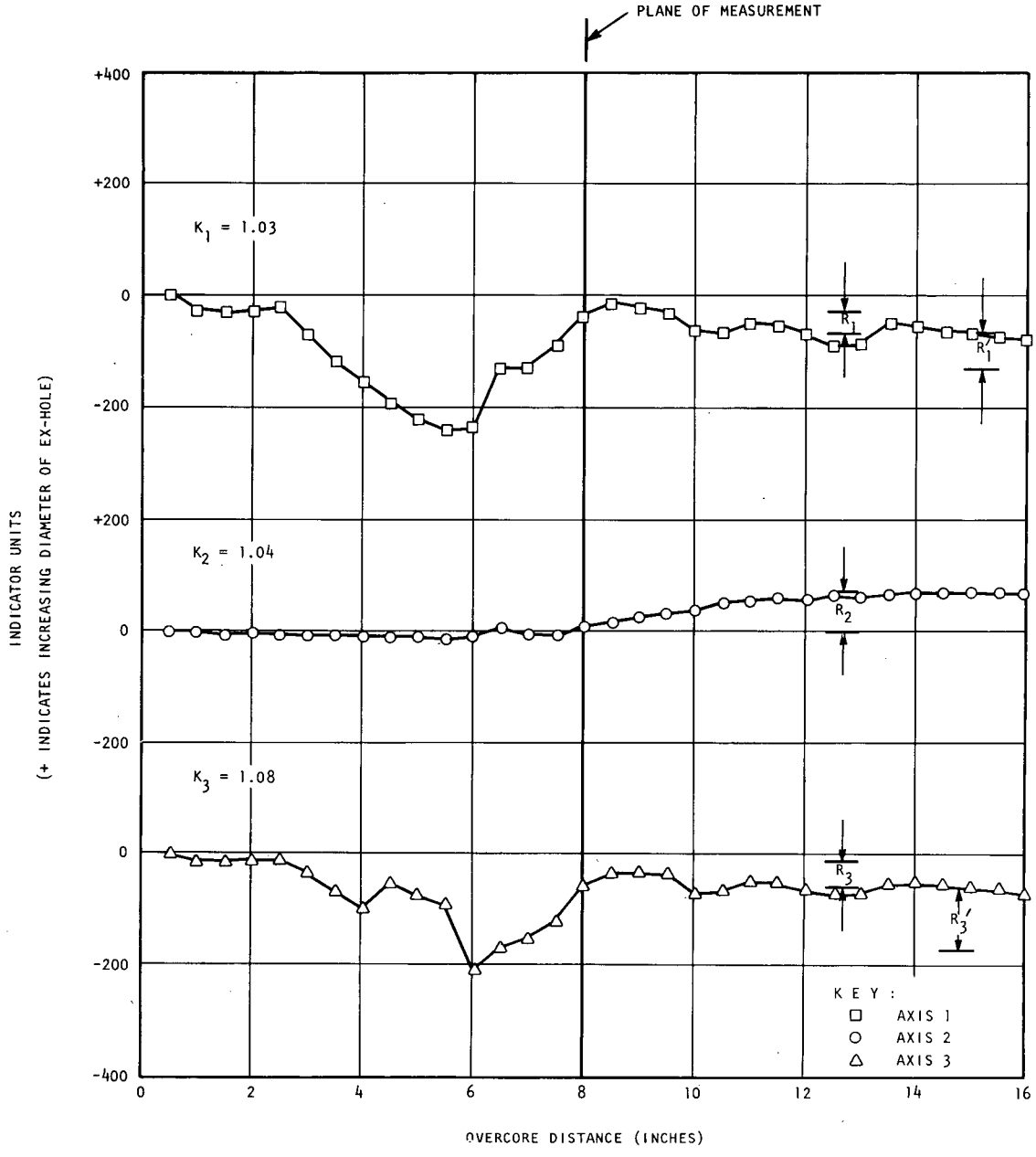
NOTES:
(1) APPARENT INSTABILITY OF CANTILEVER NO. 1, ARRESTED AT 4.5 INCHES OF OVERCORE RUN.
(2) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = -149 TO -220 = -71
$R_2$ = -10 TO +107 = +117
$R_3$ = -12 TO +45 = +57

# OVERCORE TEST RESULTS

## SITE 3 TEST 6

DAMES & MOORE




TEST NO. 7

DEPTH 27 FT. 4 IN.

$\mu_1\theta$ N 80 W

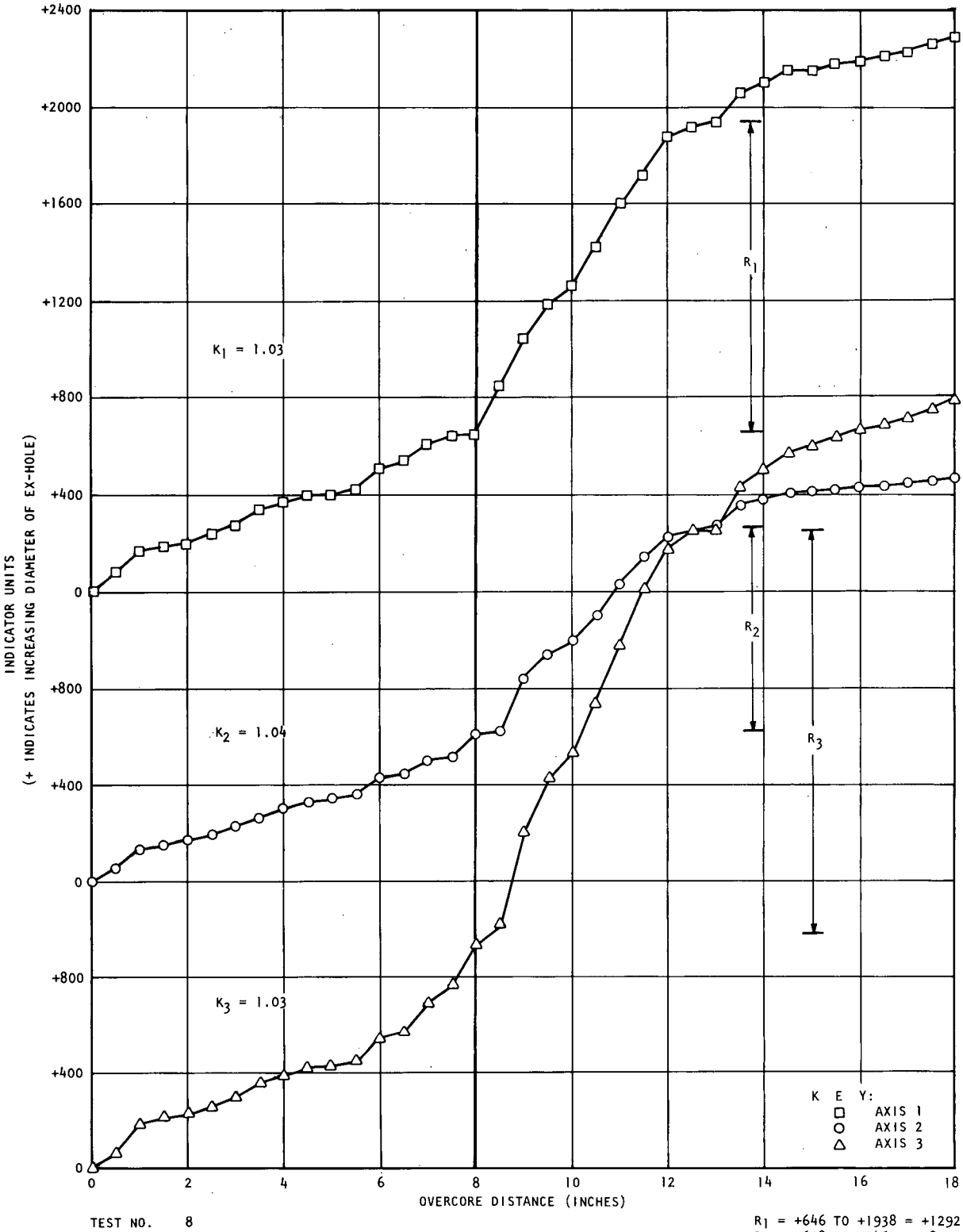
NOTES:
(1) JOINT LOCATED AT 29 FT. 0 INCHES, WITH AN INCLINATION OF
(2) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = -24 TO -63 = -19
$R_2$ = 0 TO + 67 = +67
$R_3$ = -12 TO -60 = -48
$R_1'$ = -124 TO -63 = +61
$R_3'$ = -168 TO -60 = +108

# OVERCORE TEST RESULTS

## SITE 3 TEST 7

DAMES & MOORE




TEST NO. 8

DEPTH 30 FT. 4 IN.

$\mu_1\theta$ N5°W

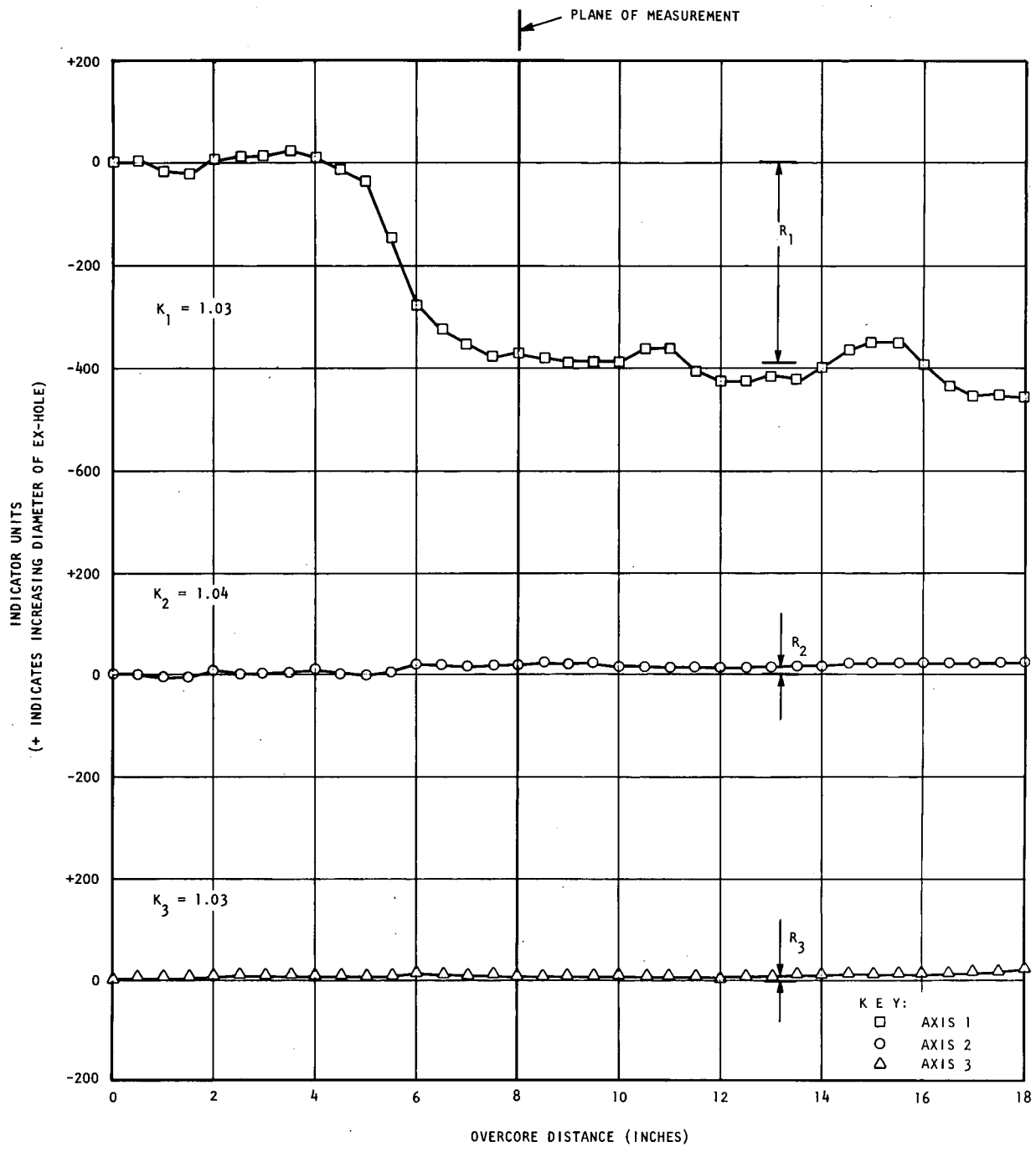
$R_1$ = +646 TO +1938 = +1292
$R_2$ = +608 TO +1460 = +852
$R_3$ = +980 TO +2668 = +1688

NOTES:
(1) APPARENT ROTATION OF GAGE IN-HOLE; DATA EXTREMELYFQUESTIONABLE
(2) NOTE SCALE CHANGE
(3) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 8

DAMES & MOORE




TEST NO. 9

DEPTH 35 FT. 7 IN.

$\mu_1\theta$ N 5 E

$R_1$ = 0 TO -390 = -390

$R_2$ = 0 TO +20 = +20

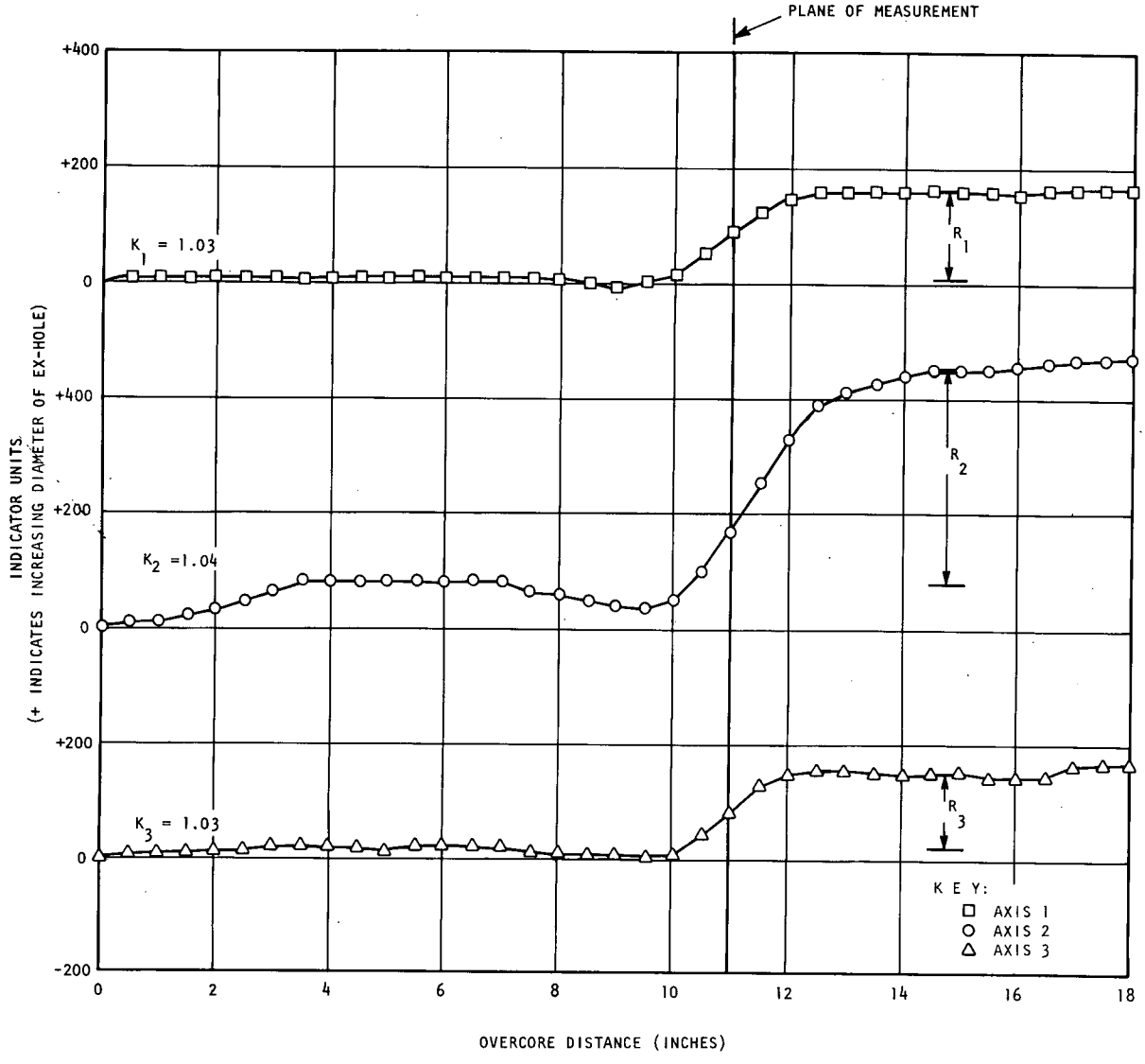
$R_3$ = +6 TO +16 = +10

NOTES:
(1) FRACTURE ZONE LOCATED AT 34 FT. 8 IN.
(2) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 9

DAMES & MOORE




TEST NO. 10

DEPTH 37 FT. 6 IN.

$\mu_1\theta$ N 5 E

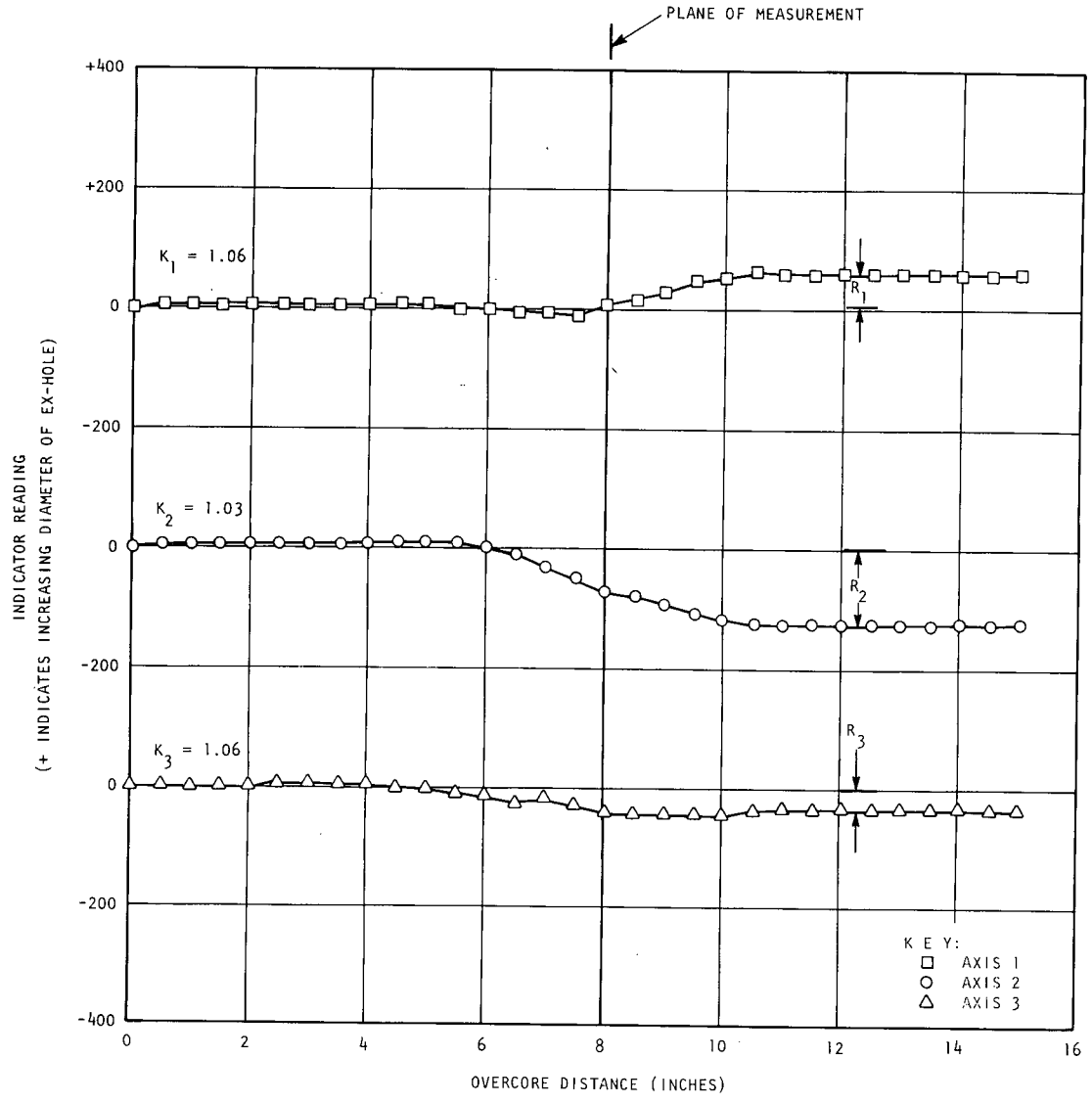
$R_1$ = +10 TO +160 = +150
$R_2$ = +81 TO +452 = +135
$R_3$ = +22 TO +157 = +135

NOTES:
(1) EXCEPTIONAL TEST FOR SITE. AS TEST IS BELOW MAJOR FRACTURE ZONE AT 34 FT., TEST IS PROBABLY MOST REPRESENTATIVE OF NATURAL STRESS IN AREA.
(2) PLANE OF MEASUREMENT = 11 INCHES

# OVERCORE TEST RESULTS

## SITE 3 TEST 10

DAMES & MOORE




TEST NO. 1

DEPTH 30 FT. 5 IN.

$\mu_1\theta$ N 70 W

$R_1$ = +3 TO +59 = +56

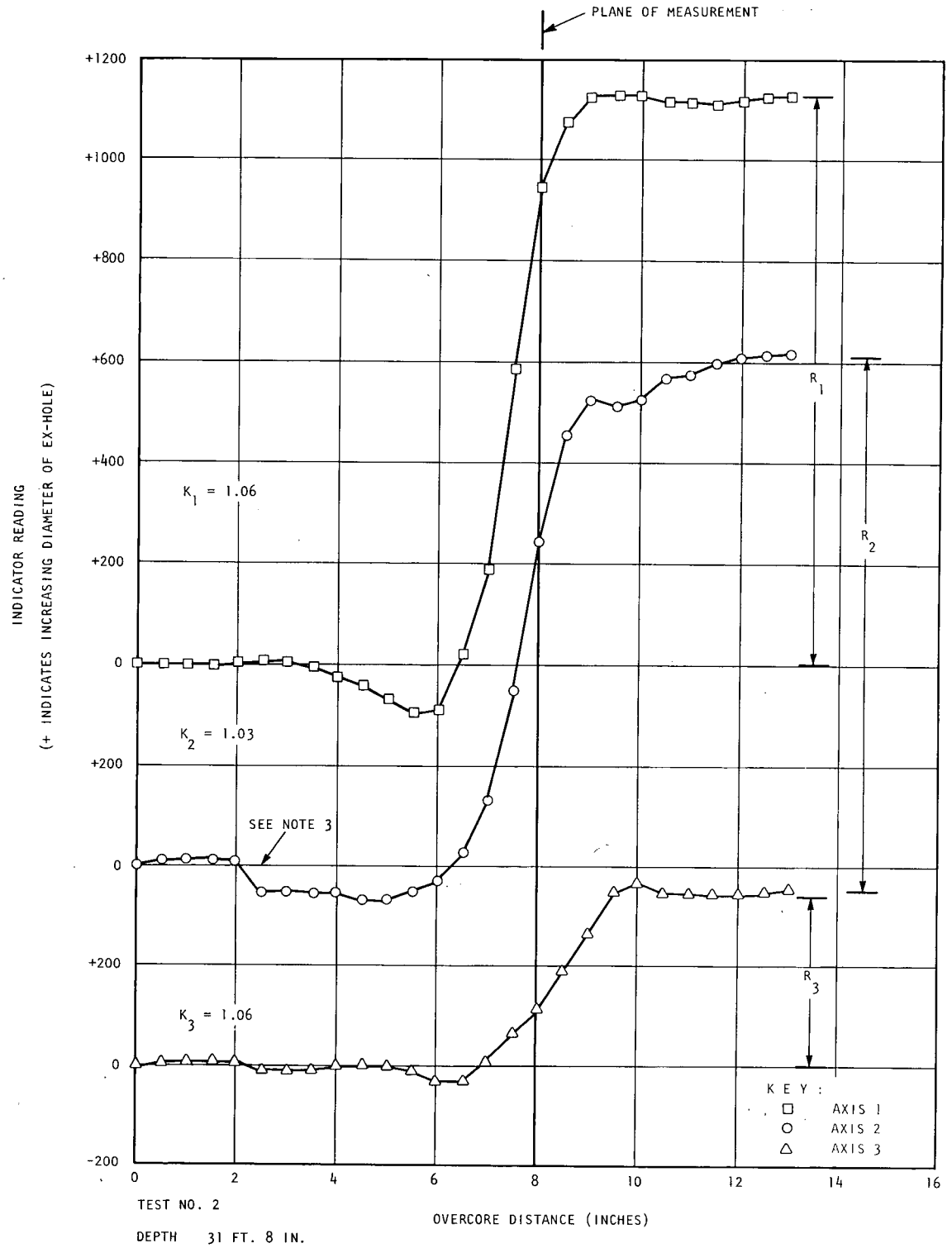
$R_2$ = +4 TO -126 = -130

$R_3$ = 0 TO -38 = -38

NOTES:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 9 TEST 1




TEST NO. 2

DEPTH 31 FT. 8 IN.

$\mu_1\theta$ N 70 W

NOTES:

(1) TEST LOCATED BETWEEN TWO FRACTURES (HAIRLINE JOINTS) AT 31 FT. 3 IN. AND 31 FT. 11 IN.

(2) TEST STOPPED AT 13 INCHES DUE TO VARIATION IN DRILL SPEED. VARIATION PROBABLY DUE TO OPENING OF HAIRLINE FRACTURE AT 31 FT. 11 IN. RETRIEVED CORE WAS INTACT TO 31 FT. 11 IN.

(3) PRESSURE INCREASE IN DRILLING

(4) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = 0 TO +1125 = +1125

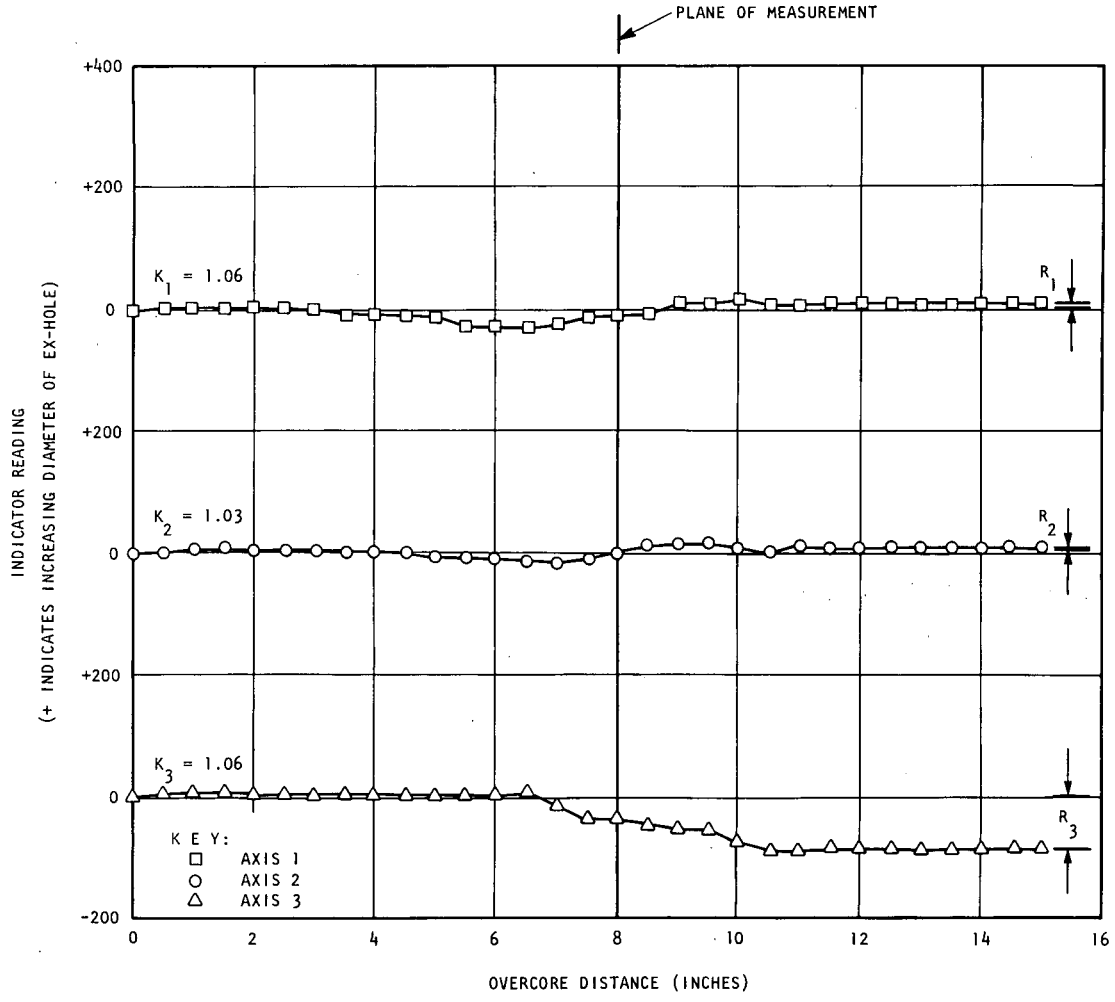
$R_2$ = -50 TO +1010 = +1060

$R_3$ = 0 TO +341 = +341

# OVERCORE TEST RESULTS

## SITE 9 TEST 2

DAMES & MOORE




TEST NO. 3

DEPTH 34 FT. 3 IN.

$\mu_1\theta$ N 66 W

$R_1$ = +2 TO +14 = +12

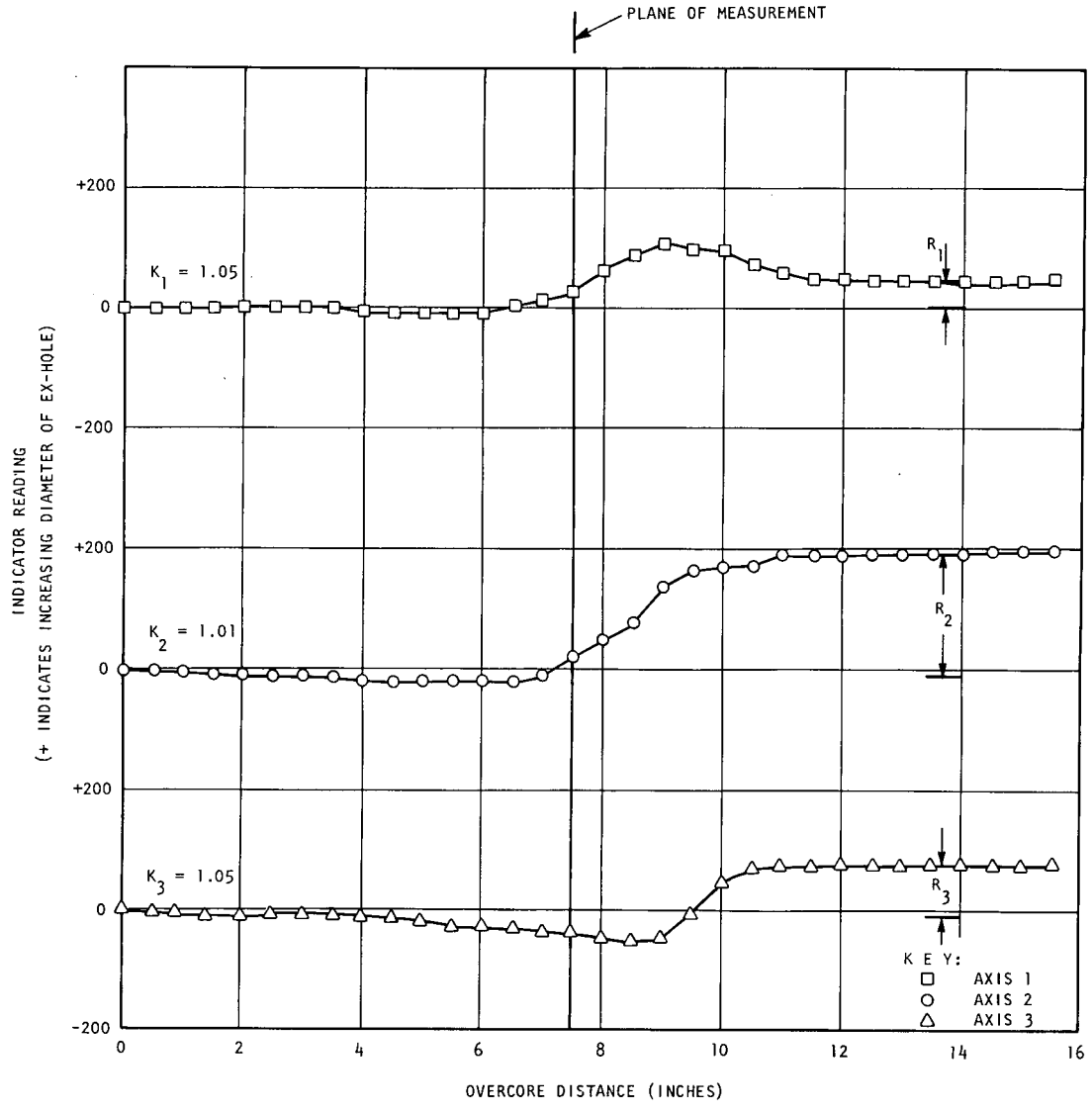
$R_2$ = +3 TO +7 = +4

$R_3$ = +5 TO -85 = +90

NOTES:
(1) EX-HOLE OFF-CENTER TO 34 FT. 1 IN.; HOLE RE-DRILLED
(2) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 9 TEST 3




TEST NO. 4

DEPTH 35 FT. 5 IN.

$\mu_1\theta$ N 67 W

$R_1$ = +1 TO +43 = +42

$R_2$ = -12 TO +197 = +209

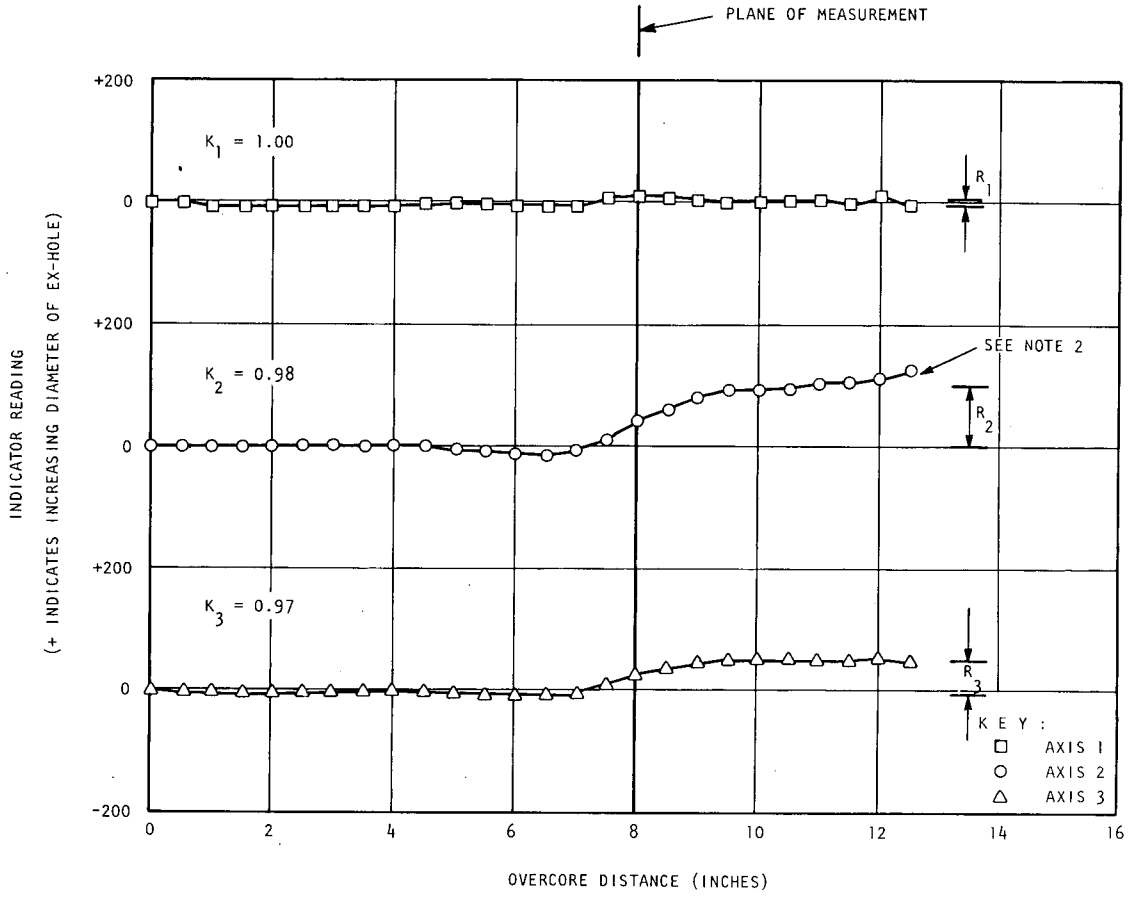
$R_3$ = -4 TO +78 = +82

NOTE:
(1) PLANE OF MEASUREMENT = 7.5 INCHES

# OVERCORE TEST RESULTS

## SITE 9 TEST 4

DAMES & MOORE




TEST NO. 5

DEPTH 37 FT. 9½ IN.

$\mu_1\theta$ N 71 W

$R_1$ = -5 TO 0 = +5

$R_2$ = 0 TO +100 = +100

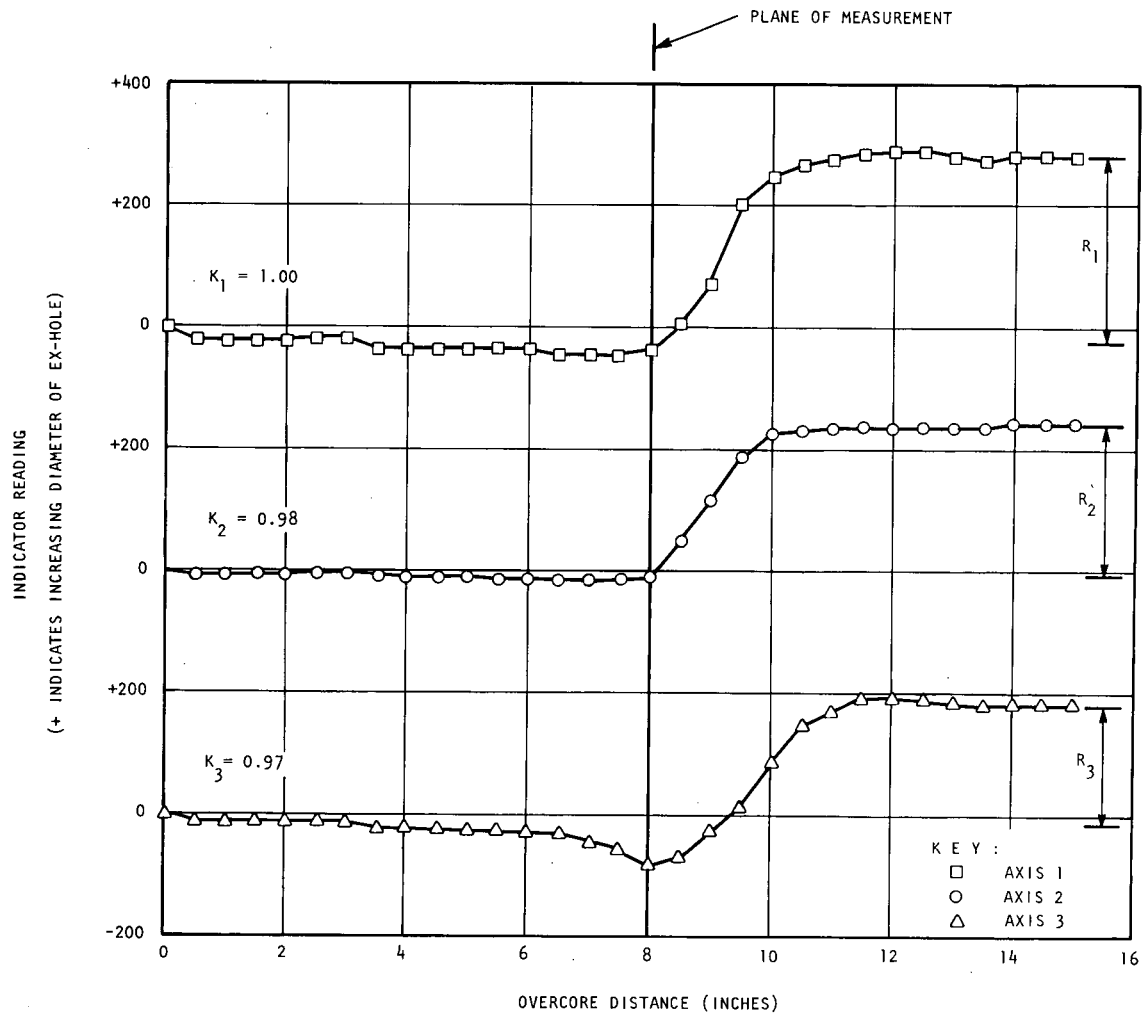
$R_3$ = -4 TO +50 = +54

NOTES:
(1) NEARBY, NEAR-VERTICAL FRACTURE WITH CHLORITE DISCOLORATION
(2) TEST TERMINATED AT 12.5 INCHES DUE TO EXCESSIVE NEEDLE VIBRATION
(3) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 9 TEST 5

DAMES & MOORE




TEST NO. 6

DEPTH 42 FT. 8 IN.

$\mu_1\theta$ N 70 W

$R_1$ = -21 TO +280 = +301

$R_2$ = -6 TO +241 = +246

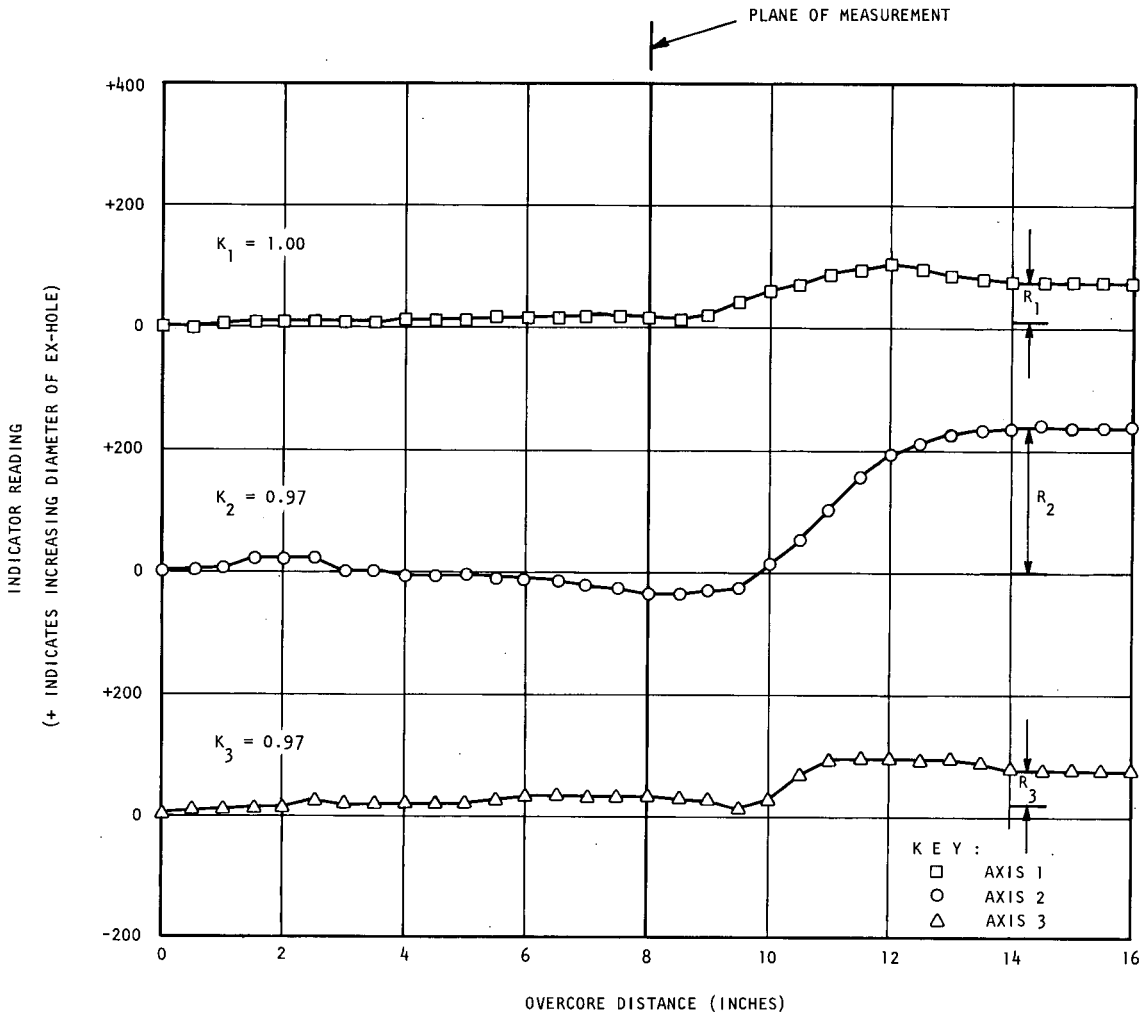
$R_3$ = -16 TO +180 = +196

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 9 TEST 6

DAMES & MOORE




TEST NO. 7

DEPTH 43 FT. 10½ IN.

$\mu_1\theta$ N 74 W

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = +8 TO +72 = +64

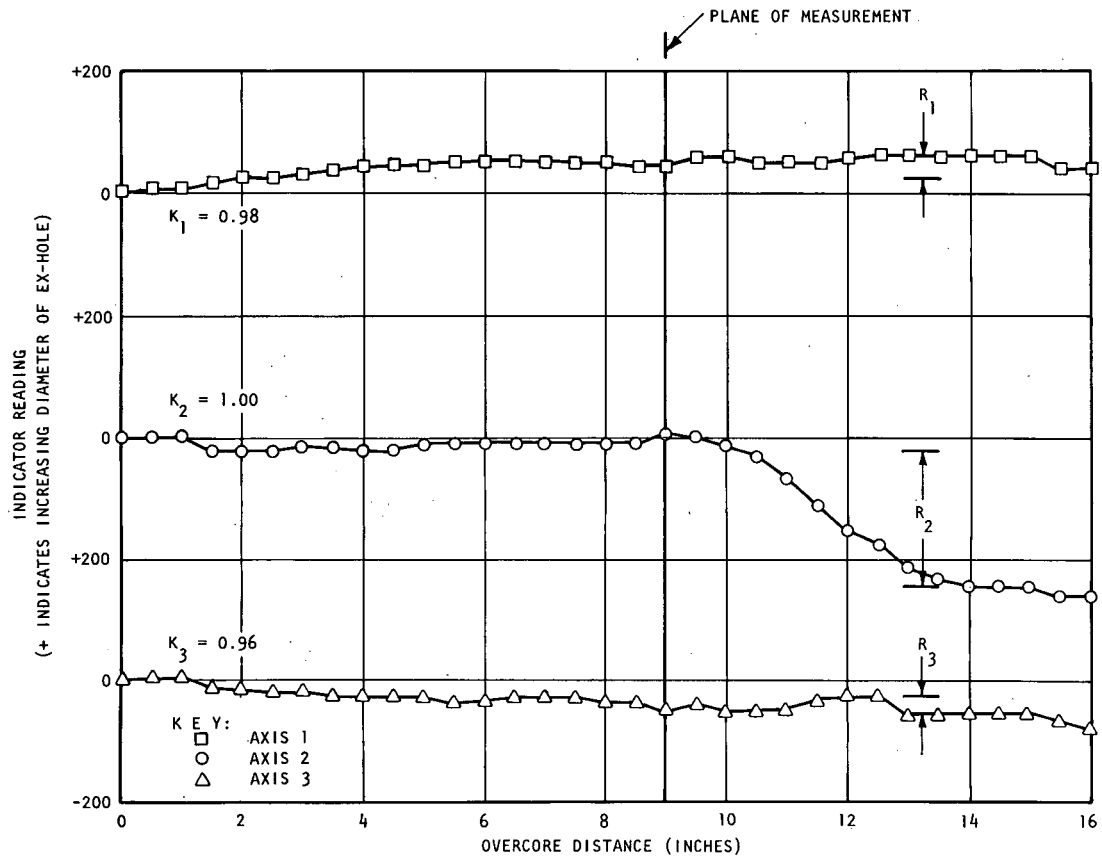
$R_2$ = 0 TO +238 = +238

$R_3$ = +20 TO +72 = +52

# OVERCORE TEST RESULTS

## SITE 9 TEST 7

DAMES & MOORE




TEST NO. 1

DEPTH 15 FT. 0 IN.

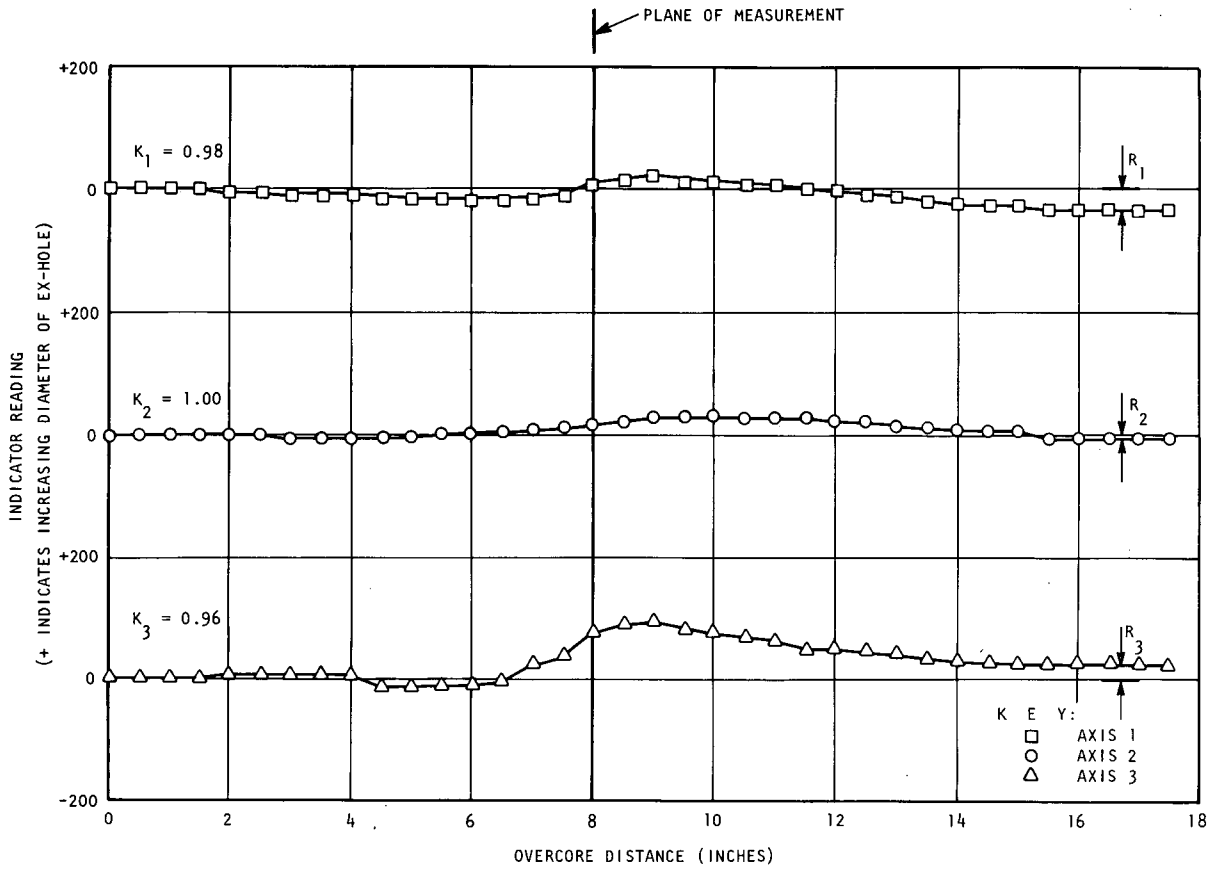
$\mu_1\theta$ N 42 E

$R_1$ = +25 TO +60 = +35
$R_2$ = -21 TO -243 = -222
$R_3$ = -25 TO -56 = -31

NOTES:
(1) CHANGE IN DRILLING CONDITIONS NOTES AT 15 INCHES OF OVERCORE RUN. APPARENTLY SMALL ROCK FRAGMENT IS IN HOLE.
(2) PLANE OF MEASUREMENT = 9 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 1




TEST NO. 2

DEPTH 16 FT. 4 IN.

$\mu_1\theta$ N 30 E

$R_1$ = 0 TO -37 = -37

$R_2$ = 0 TO -6 = -6

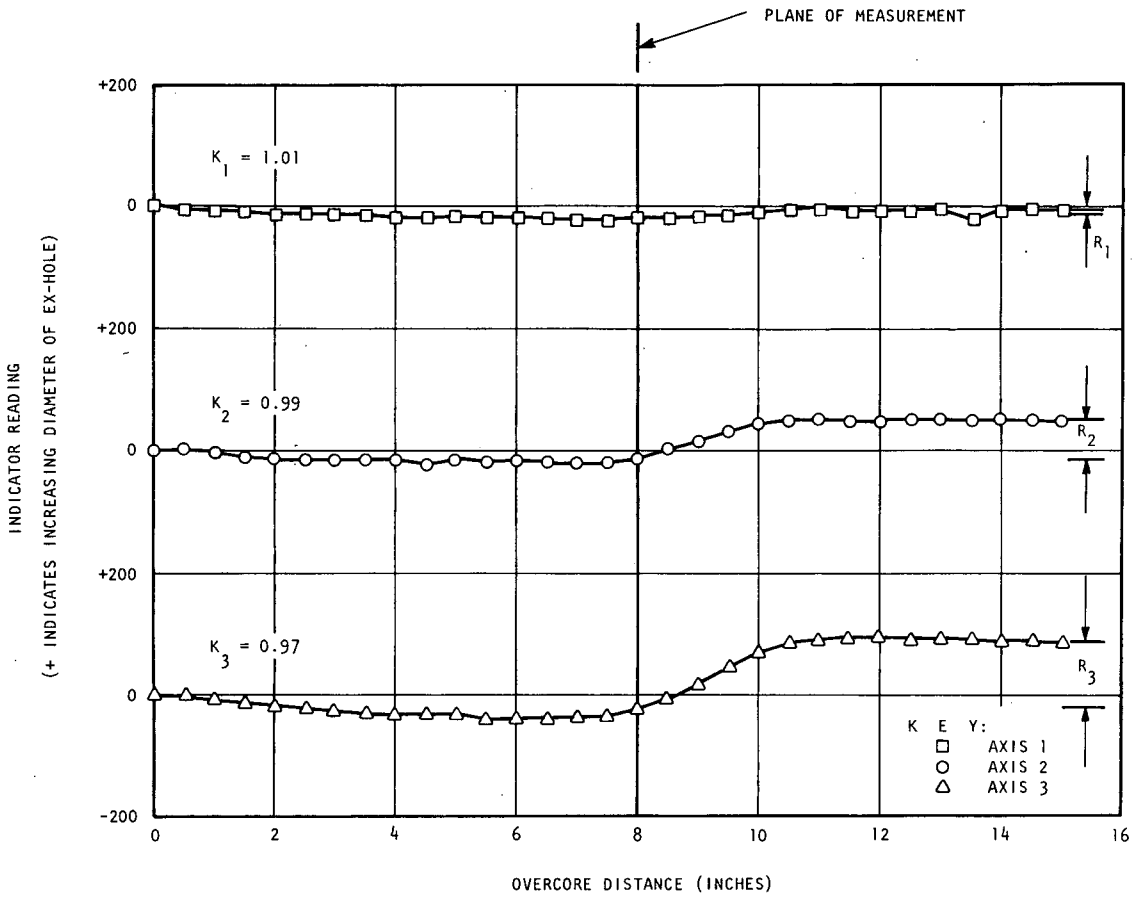
$R_3$ = 0 TO +21 = +21

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 2

DAMES & MOORE




TEST NO. 3

DEPTH 18 FT. 4 IN.

$\mu_1\theta$ N 40 E

$R_1$ = -14 TO -7 = +7

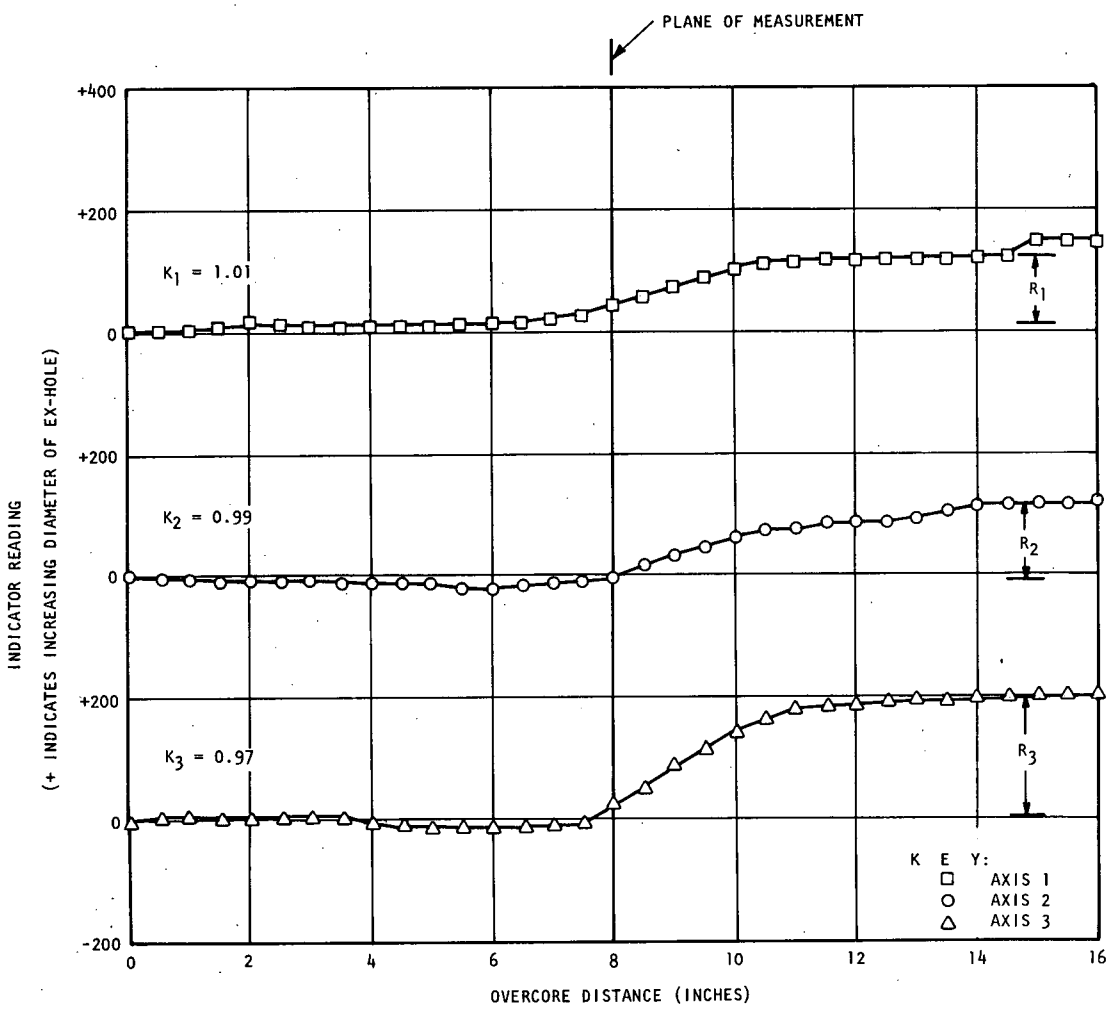
$R_2$ = -14 TO +51 = +66

$R_3$ = -20 TO +86 = +106

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 3




TEST NO. 4

DEPTH 19 FT. 7 IN.

$\mu_1\theta$ N 40 E

$R_1$ = +14 TO +121 = +107

$R_2$ = -7 TO +116 = +123

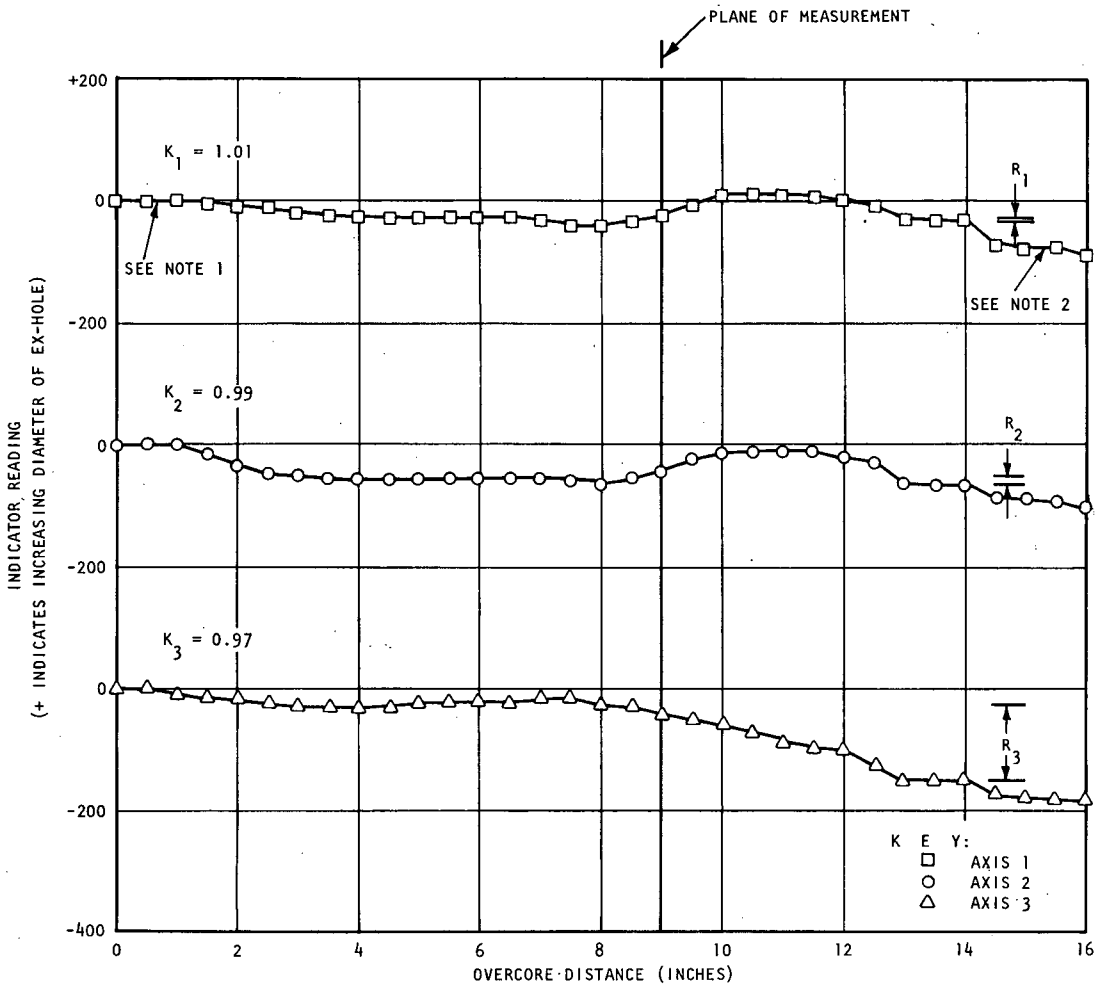
$R_3$ = +3 TO +200 = +197

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 4

DAMES & MOORE




TEST NO. 5

DEPTH 22 FT. 5 IN.

$\mu_1\theta$ N 30 E

$R_1$ = -27 TO -36 = -9

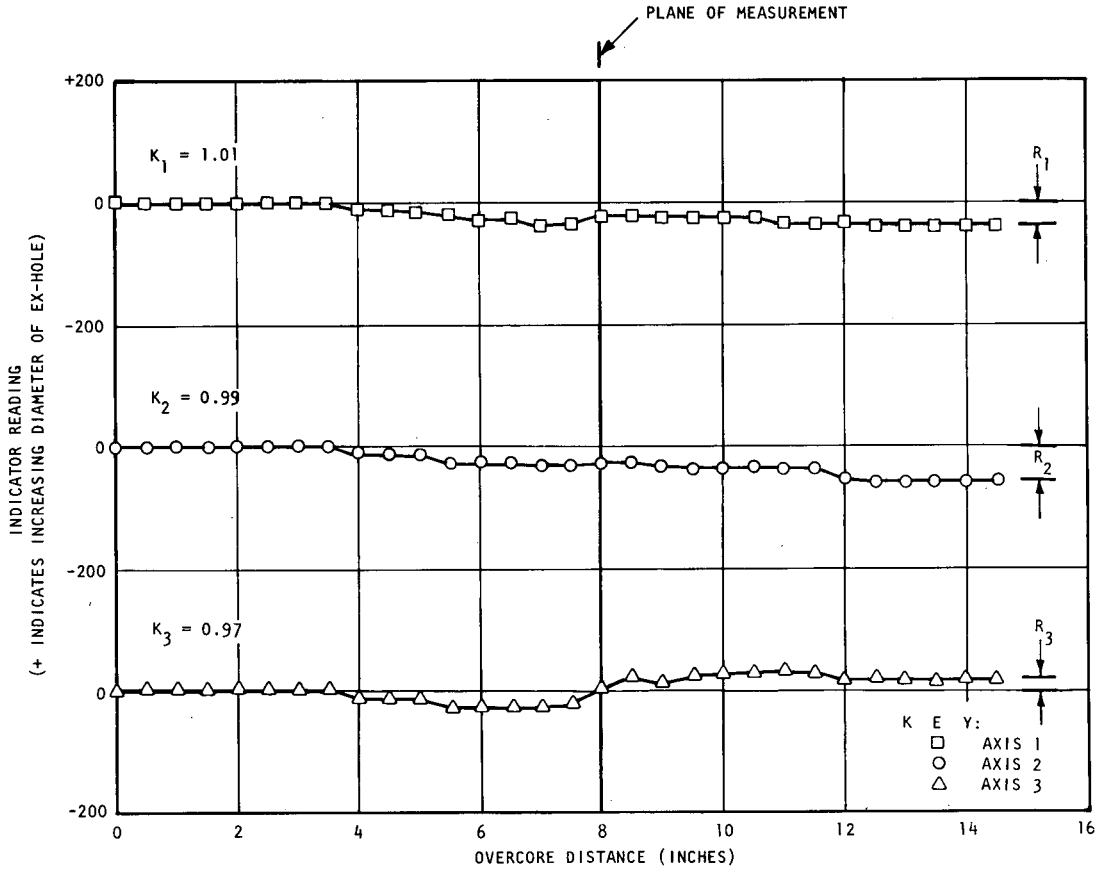
$R_2$ = -55 TO -65 = -10

$R_3$ = -28 TO -153 = -125

NOTES:
(1) INITIAL INCH OF OVERCORE RUN DRILLED DEBRIS IN 6-INCH BIT GROOVE
(2) READINGS JUMPED RADICALLY AT 14.5 INCHES OF OVERCORE RUN. SMALL ROCK FRAGMENT RECOVERED ON TOP OF CORE; THIS PIECE PROBABLY STRUCK CORE AT 14.5 INCHES.
(3) PLANE OF MEASUREMENT = 9 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 5




TEST NO. 6

DEPTH 28 FT. 7 IN.

$\mu_1\theta$ N 37 E

$R_1$ = 0 TO -39 = -39

$R_2$ = 0 TO -59 = -59

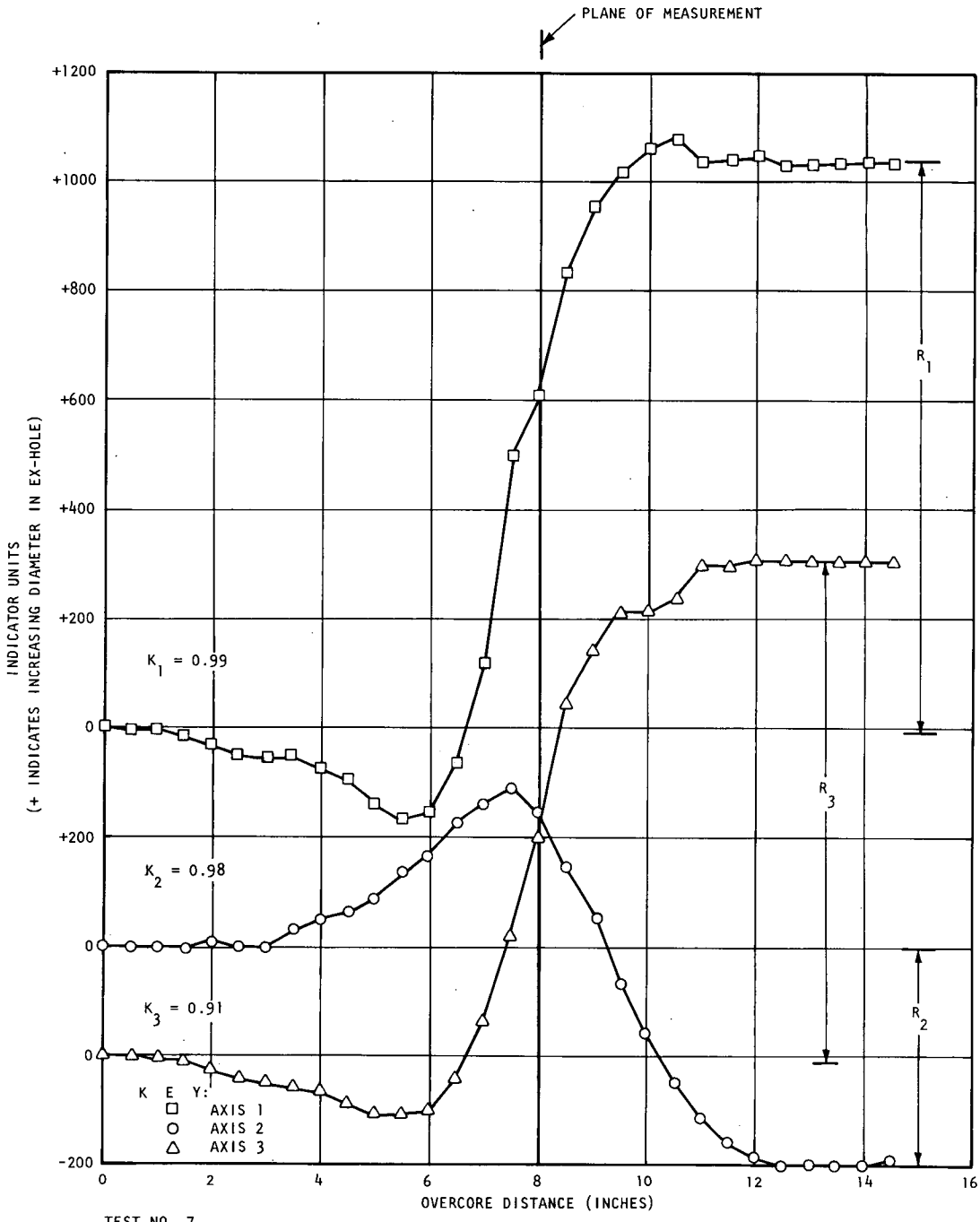
$R_3$ = +3 TO +19 = +16

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 6

DAMES & MOORE




TEST NO. 7

DEPTH 34 FT. 9 IN.

$\mu_1\theta$ N 35 E

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = -7 TO +1034 = +1041

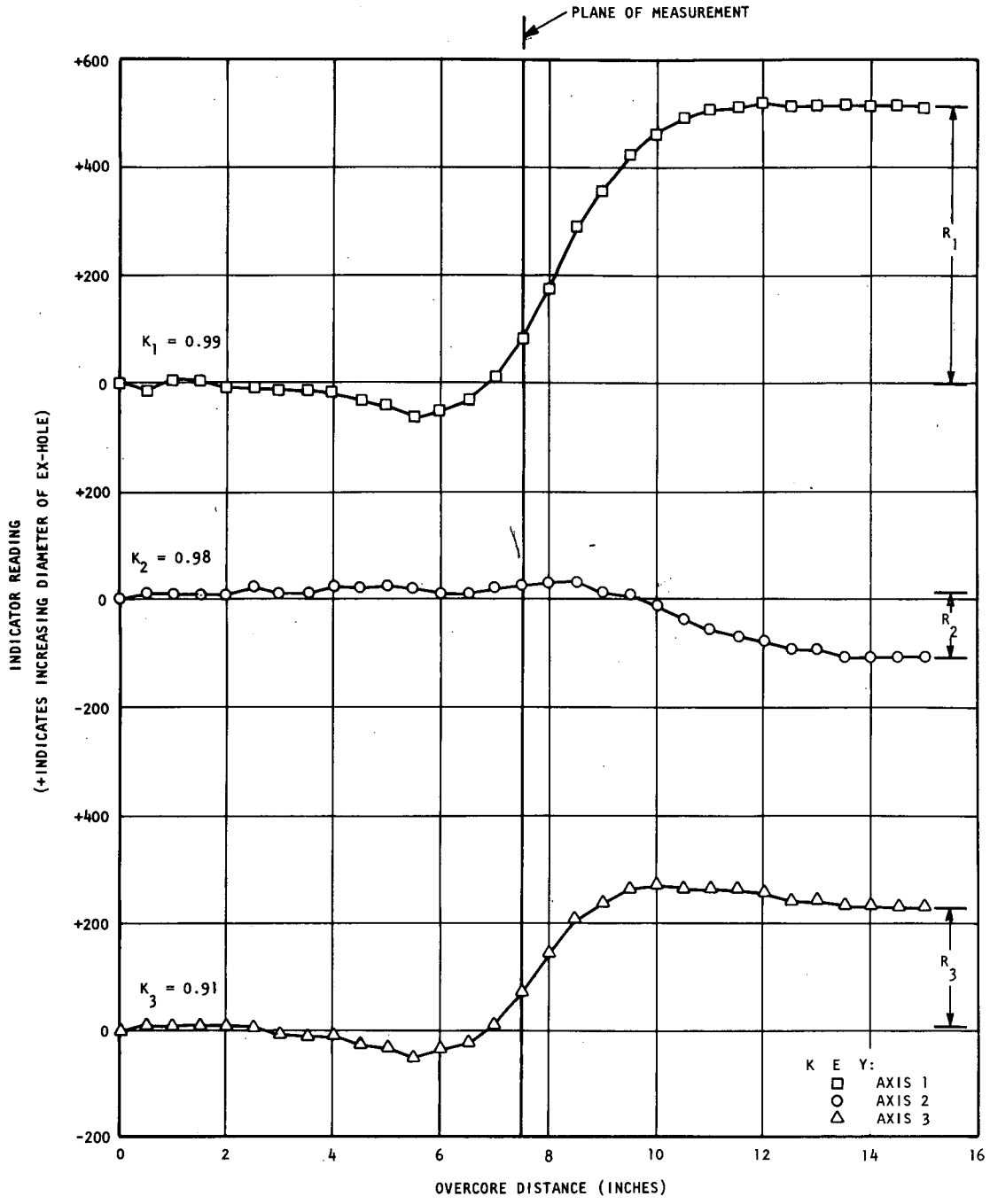
$R_2$ = 0 TO -403 = -403

$R_3$ = -10 TO +904 = +914

# OVERCORE TEST RESULTS

## SITE 11 TEST 7

DAMES & MOORE




TEST NO. 8

DEPTH 36 FT. 0 IN.

$\mu_1\theta$ N 38 E

$R_1$ = 0 TO +514 = +514

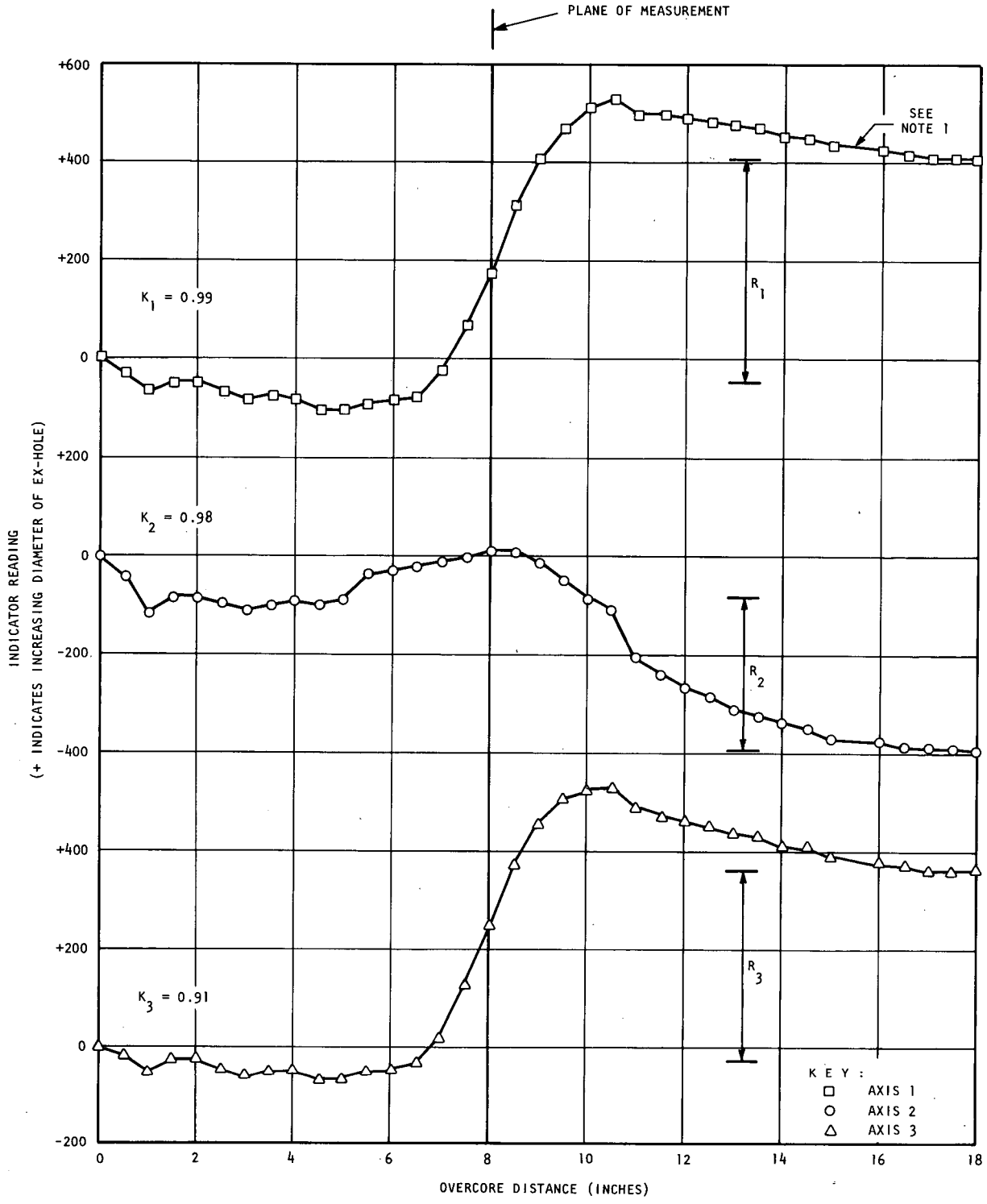
$R_2$ = +8 TO -103 = -111

$R_3$ = +10 TO +230 = +220

NOTE:
(1) PLANE OF MEASUREMENT = 7.5 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 8




TEST NO. 9

DEPTH 37 FT. 2½ IN.

$\mu_1\theta$ N 38 E

NOTES:
(1) NO READING TAKEN AT 15.5 INCHES OF OVERCORE RUN.
(2) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = -52 TO +503 = +455

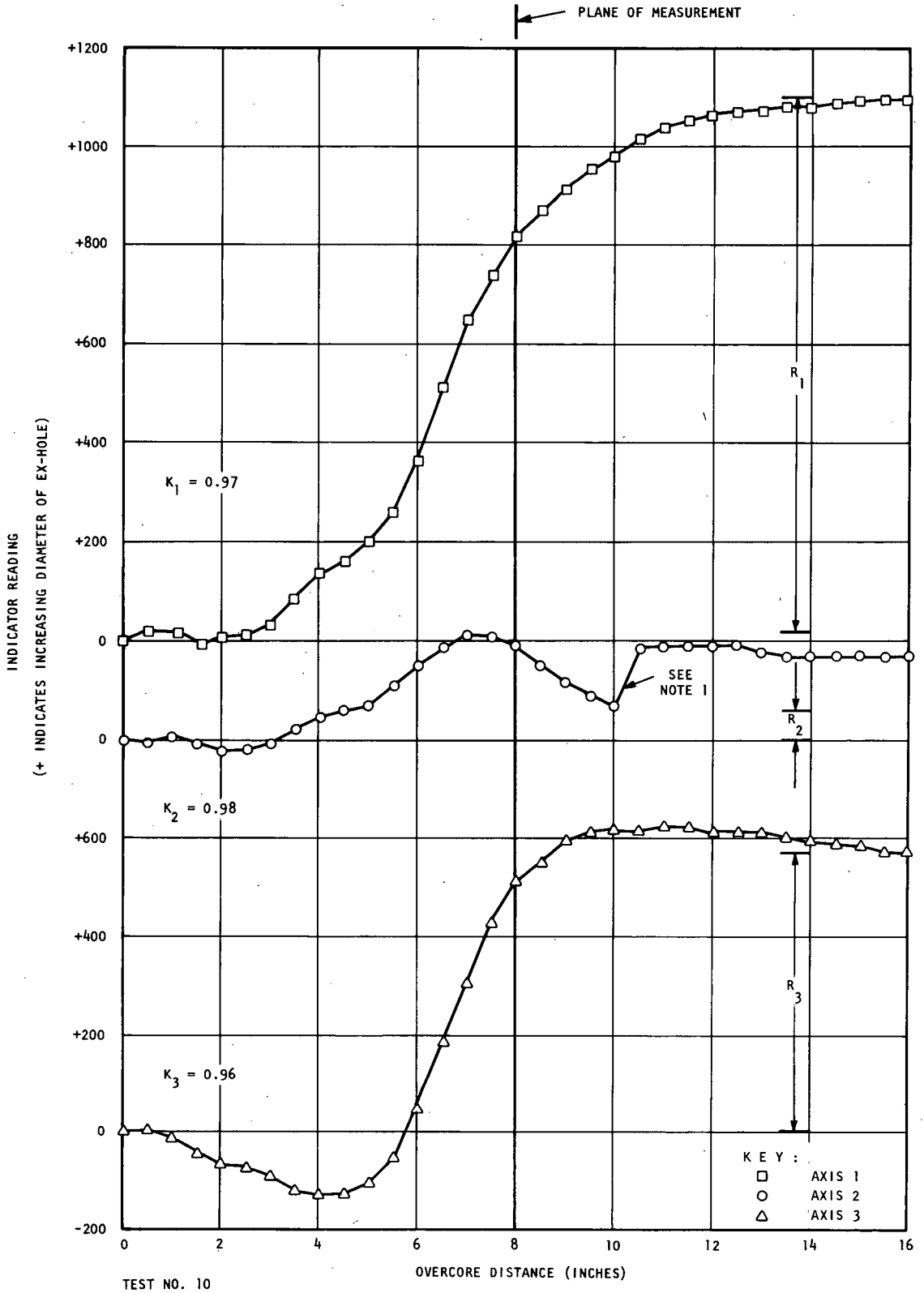
$R_2$ = -84 TO -390 = -306

$R_3$ = -25 TO +360 = +385

# OVERCORE TEST RESULTS

## SITE 11 TEST 9

DAMES & MOORE




TEST NO. 10

DEPTH 38 FT. 8½ IN.

$\mu_1\theta$ N 40 E

NOTES:

(1) JUMP IN READING PROBABLY DUE TO WASH OUT OF ROCK FRAGMENT BETWEEN BUTTON AND CORE WALL. NOTE STABILITY AFTER 10.5 INCHES OF OVERCORE RUN.

(2) PLANE OF MEASUREMENT = 8 INCHES

$R_1$ = +15 TO +1097 = +1082

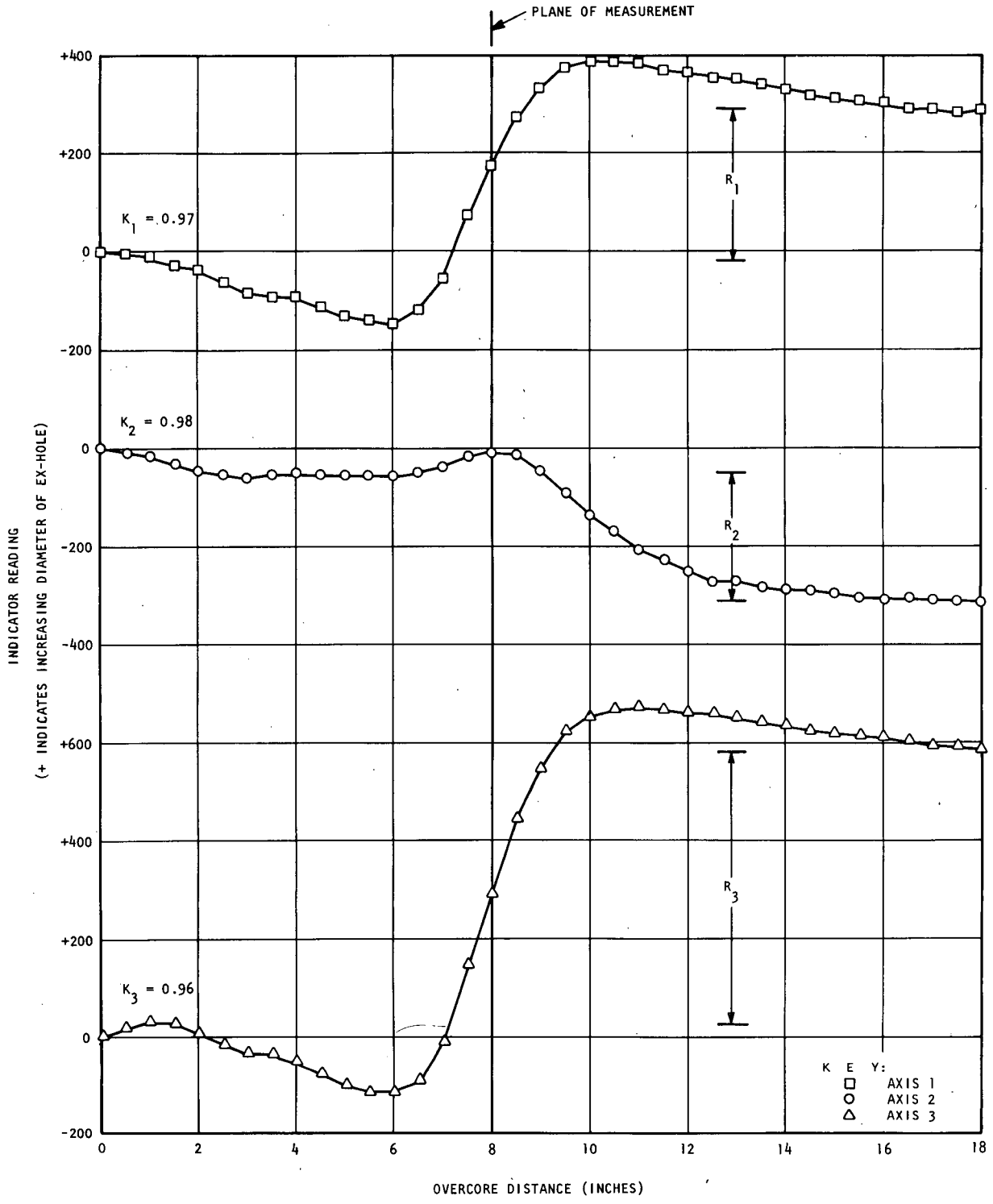
$R_2$ = 0 TO +62 = +62

$R_3$ = 0 TO +572 = +572

# OVERCORE TEST RESULTS

## SITE 11 TEST 10

DAMES & MOORE




TEST NO. 11

DEPTH 40 FT. 1 IN.

$\mu_1\theta$ N 40 E

$R_1$ = -20 TO +287 = +307

$R_2$ = -51 TO -310 = -259

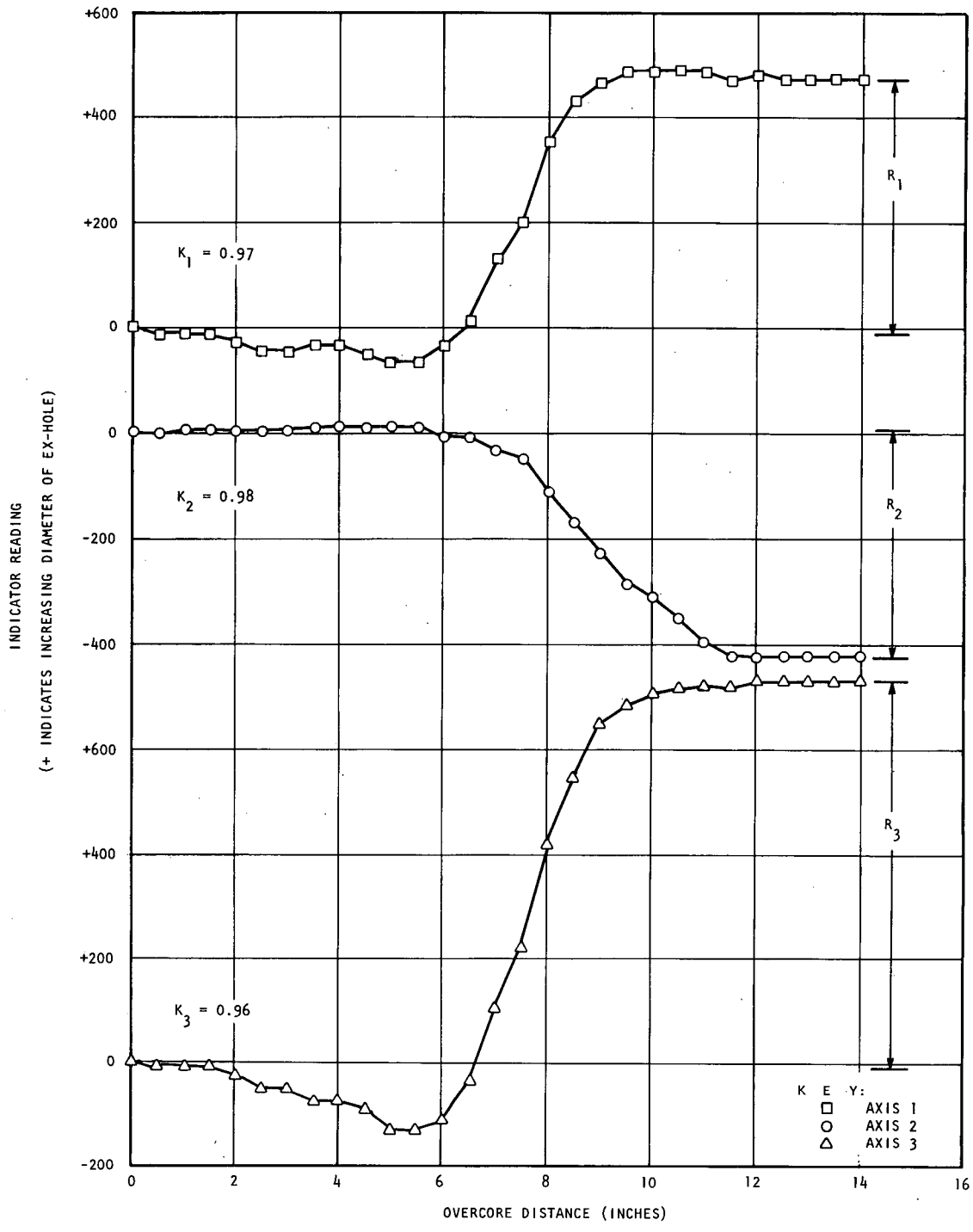
$R_3$ = +25 TO +581 = +556

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 11

DAMES & MOORE




TEST NO. 12

DEPTH 41 FT. 7 IN.

$\mu_1\theta$ N 36 E

NOTE:
(1) PLANE OF MEASUREMENT = 7 INCHES

$R_1$ = -12 TO +476 = +488

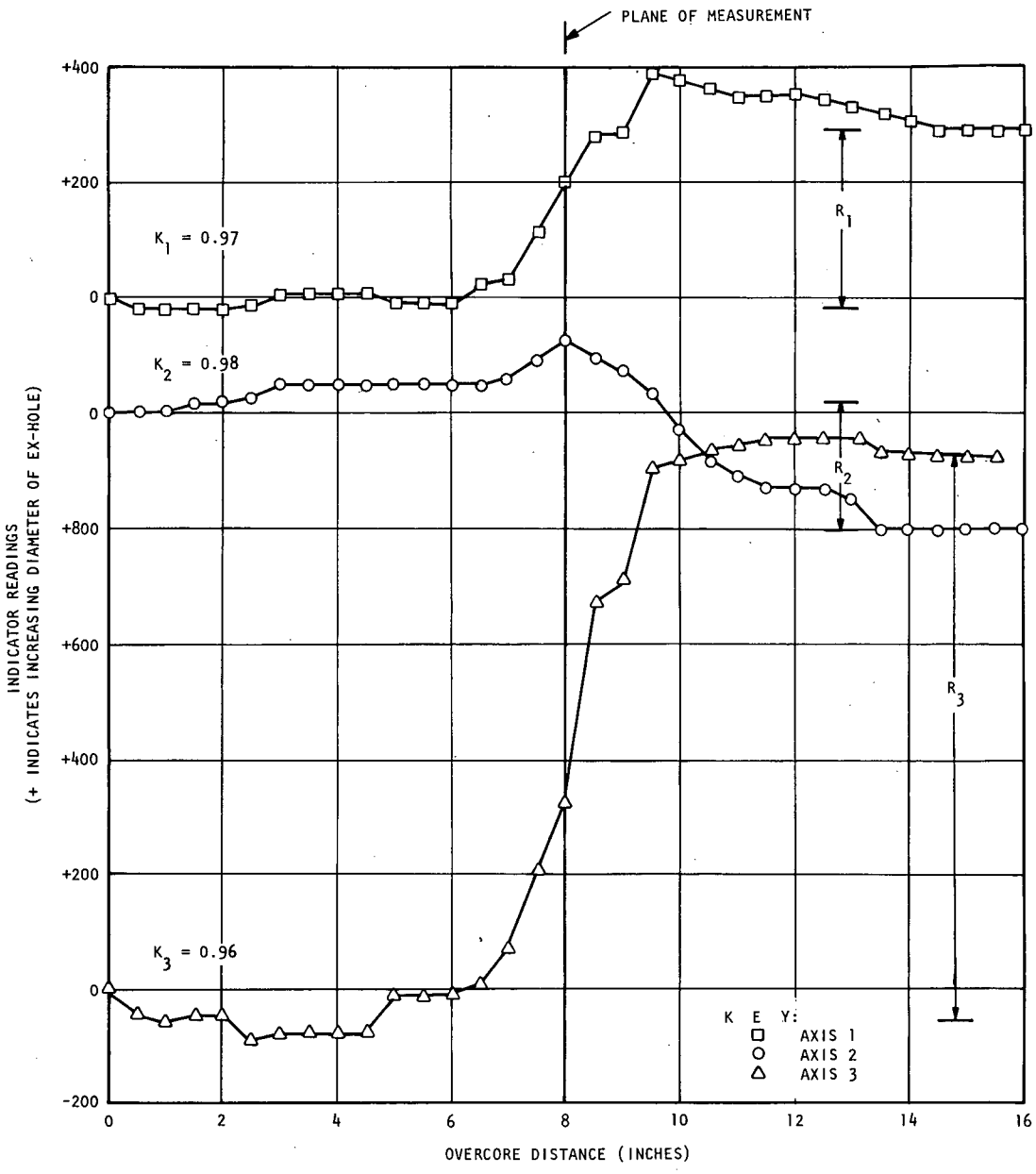
$R_2$ = +7 TO -423 = -430

$R_3$ = -9 TO +731 = +740

# OVERCORE TEST RESULTS

## SITE 11 TEST 12

DAMES & MOORE




TEST NO. 13

DEPTH 42 FT. 11 IN.

$\mu_1\theta$ N 36 E

$R_1$ = -20 TO +289 = +309

$R_2$ = +18 TO -203 = -221

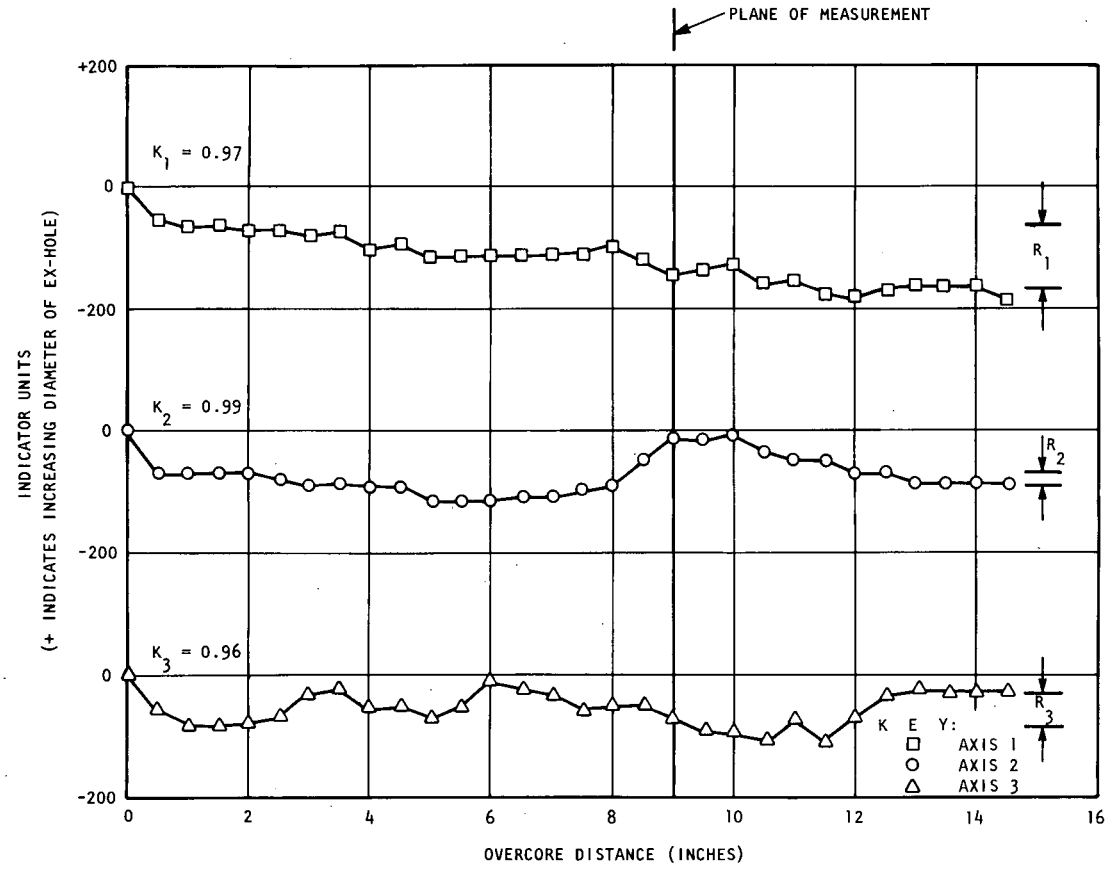
$R_3$ = -46 TO +922 = +968

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 11 TEST 13

DAMES & MOORE




TEST NO. 1

DEPTH 42 FT. 4½ IN.

$\mu_1\theta$ N 45 W

$R_1$ = -63 TO -164 = -101

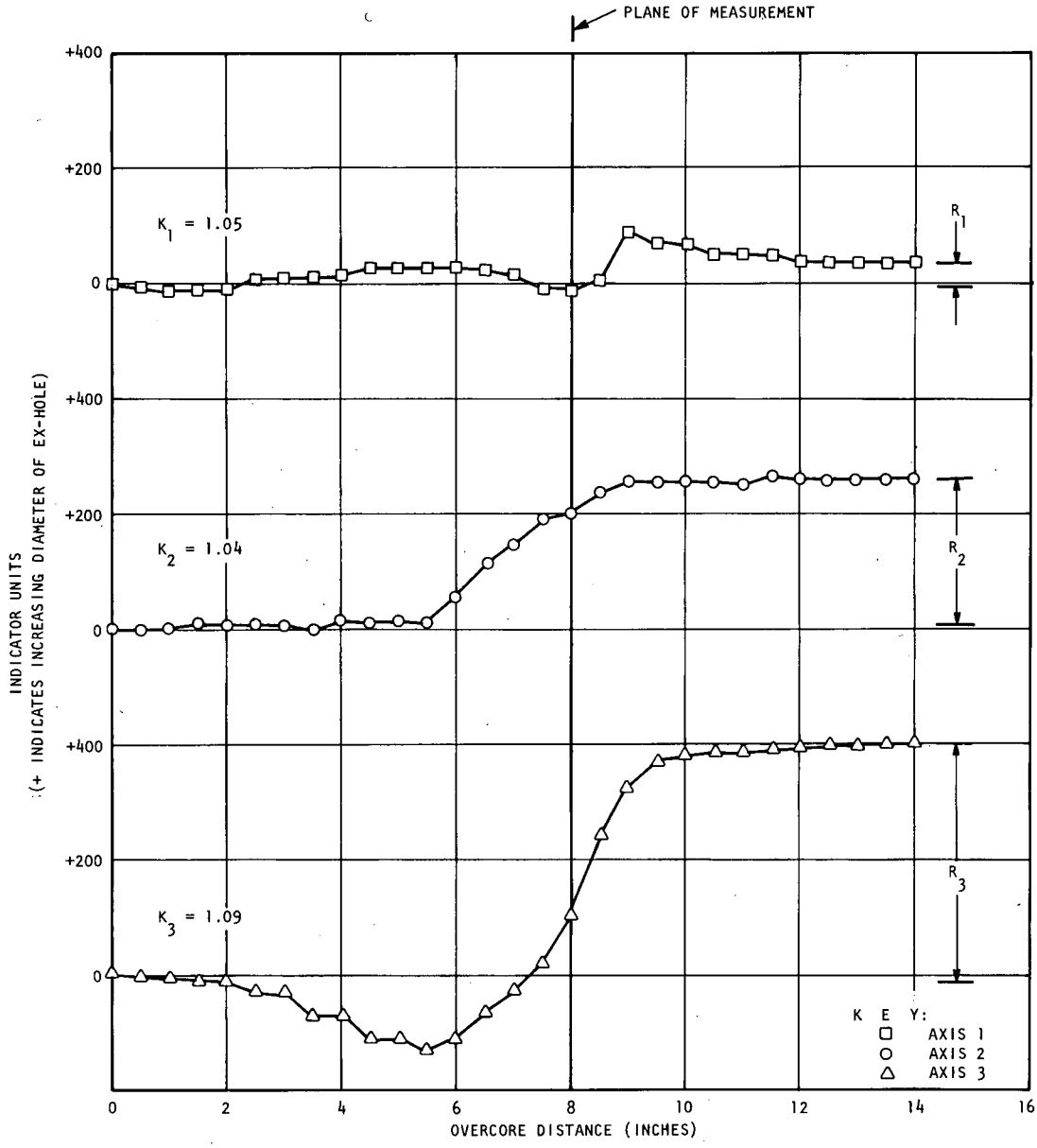
$R_2$ = -70 TO -85 = -15

$R_3$ = -82 TO -28 = +54

NOTES:
(1) NEAR FRACTURE, INCLINED _____@ 42 FT. IN; HEALED WITH MINOR CHLORITE DISCOLORATION
(2) PLANE OF MEASUREMENT = 9 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 1




TEST NO. 2

DEPTH 44 FT. 2 IN.

$\mu_1\theta$ N 58 W

$R_1$ = -9 TO +35 = +44

$R_2$ = +9 TO +259 = +250

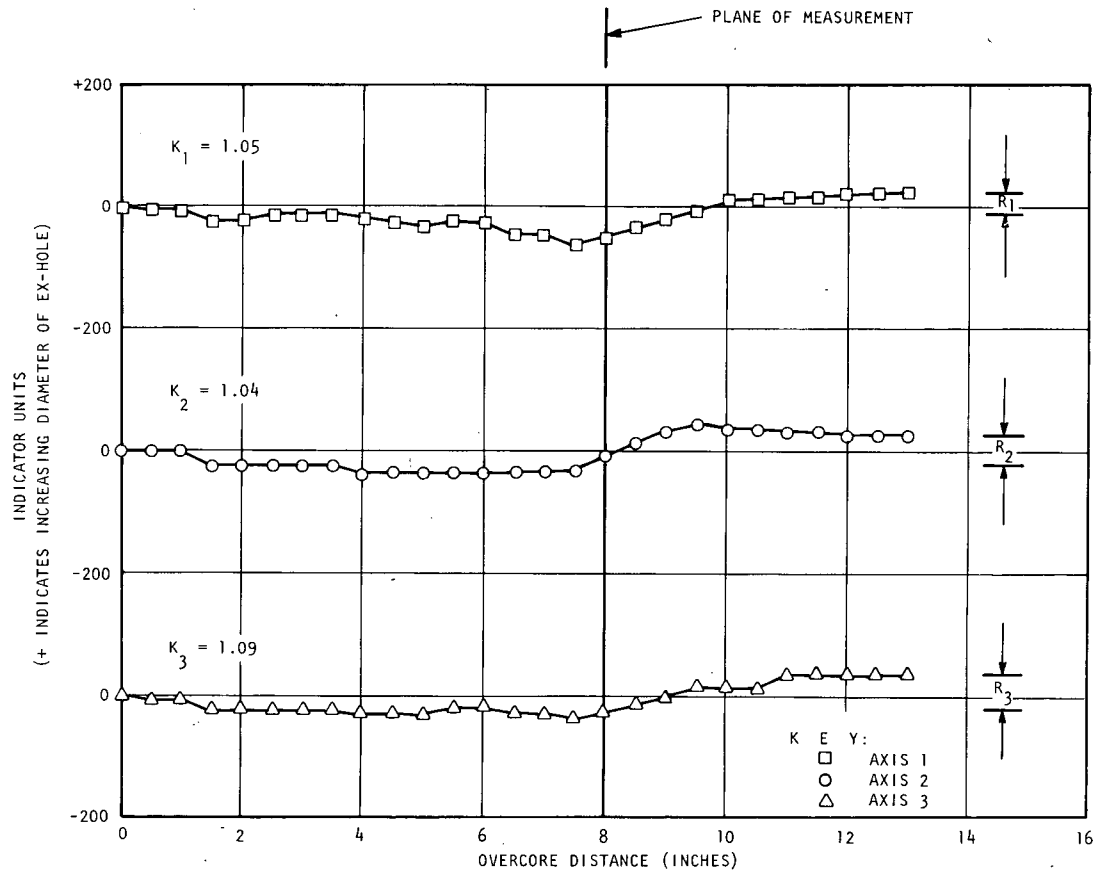
$R_3$ = -16 TO +400 = +416

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 2

DAMES & MOORE




TEST NO. 3

DEPTH 49 FT. 2½ IN.

$\mu_1\theta$ N 58 W

$R_1$ = -11 TO +22 = +33

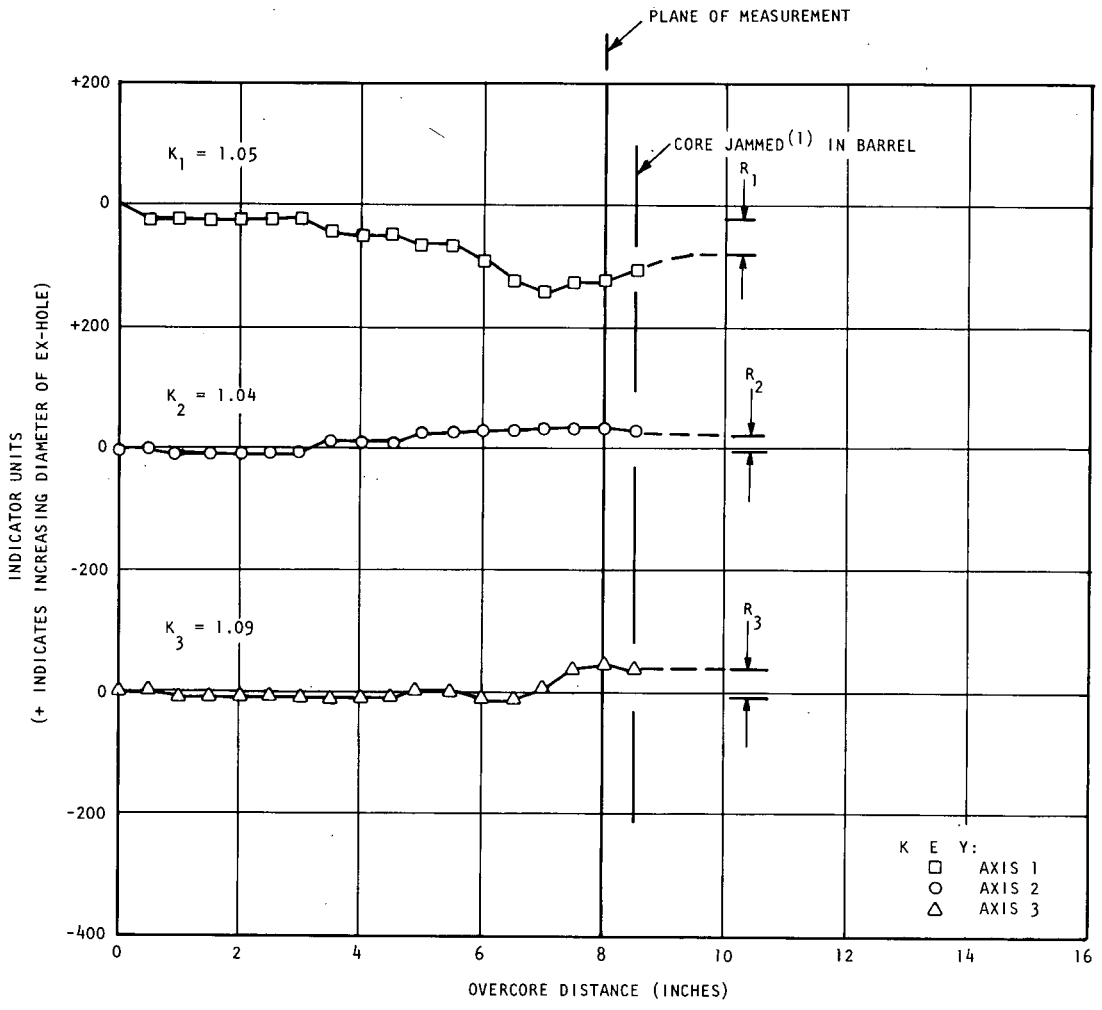
$R_2$ = -21 TO +26 = +47

$R_3$ = -21 TO +38 = +59

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 3




TEST NO. 4

DEPTH 51 FT. 6½ IN.

$\mu_1\theta$ N 58 W

$R_1$ = -25 TO -80 = -55

$R_2$ = -5 TO +20 = +25

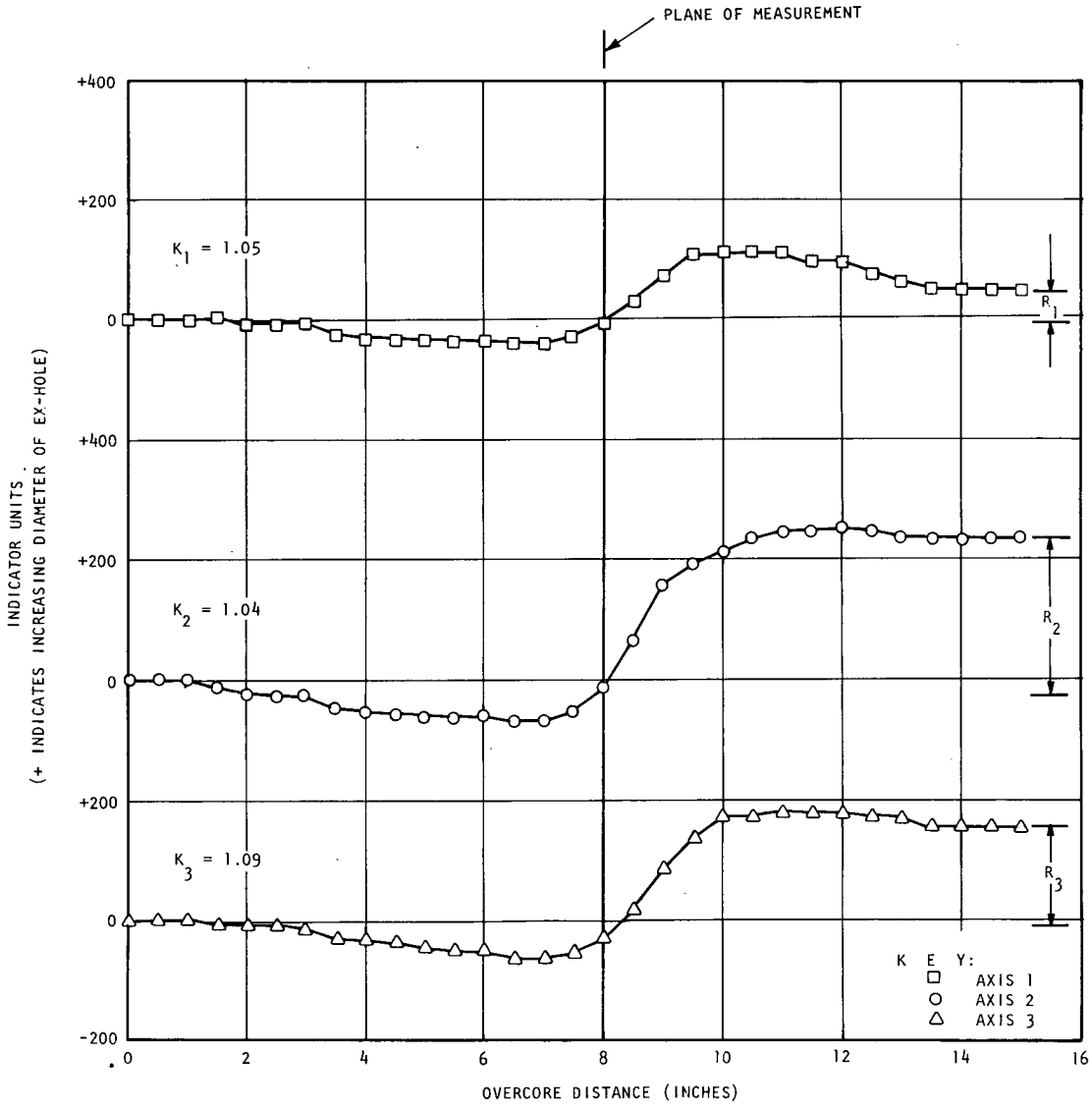
$R_3$ = -4 TO +39 = +44

NOTES:
(1) TEST STOPPED AT 8½ INCHES DUE TO CORE JAMMING IN OVERCORE BARREL. AFTER STALL-OUT OF RIG.
(2) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 4

DAMES & MOORE




TEST NO. 5

DEPTH 55 FT. 8 IN.

$\mu_1\theta$ N 58 W

$R_1$ = -6 TO +53 = +59

$R_2$ = -22 TO +235 = +257

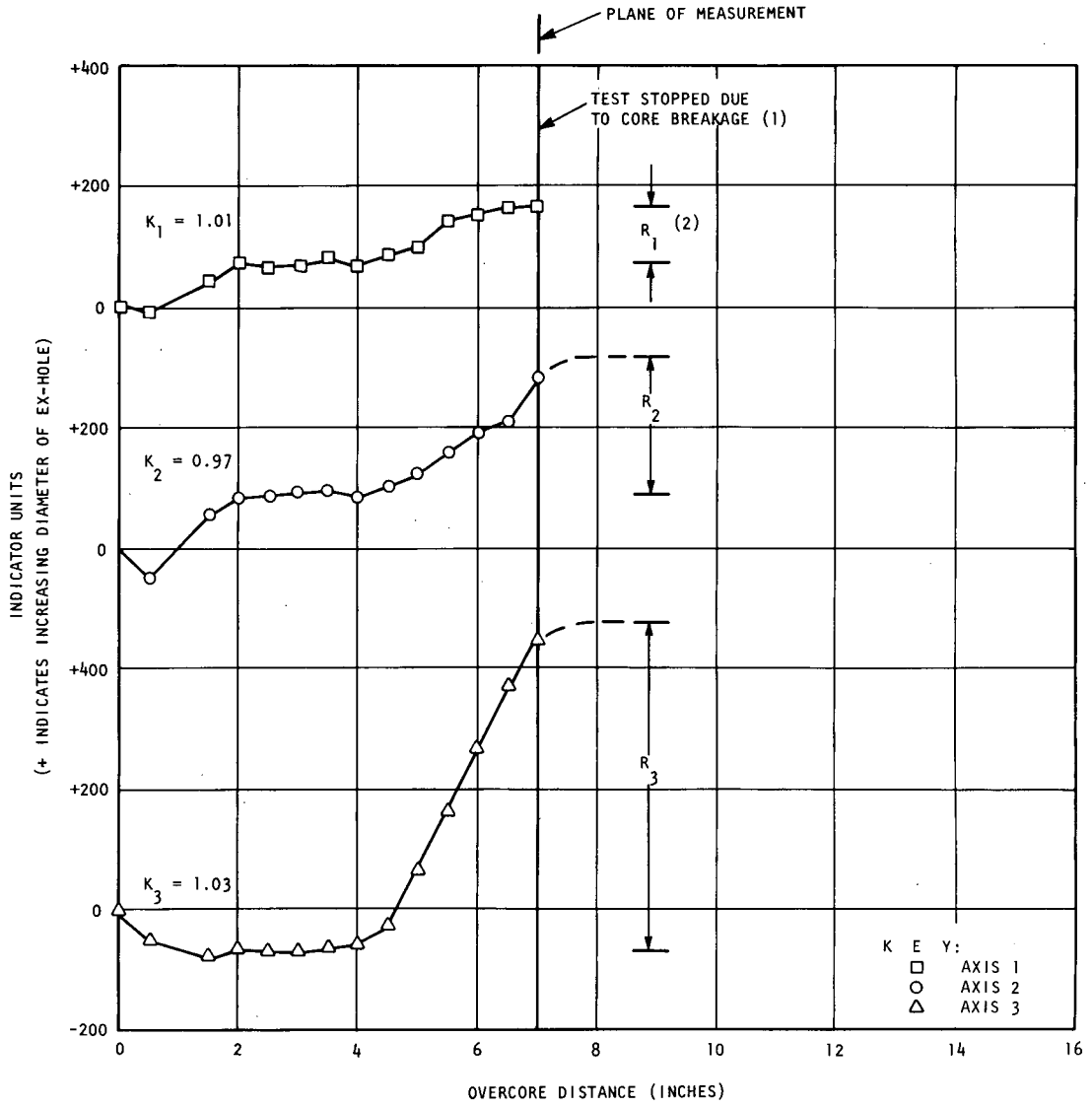
$R_3$ = -4 TO +159 = +163

NOTE:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 5

DAMES & MOORE




TEST NO. 6

DEPTH 57 FT. 6 IN.

$\mu_1\theta$ N 58 W

$R_1$ = +68 TO +165 = +97

$R_2$ = +85 TO +320 = +235

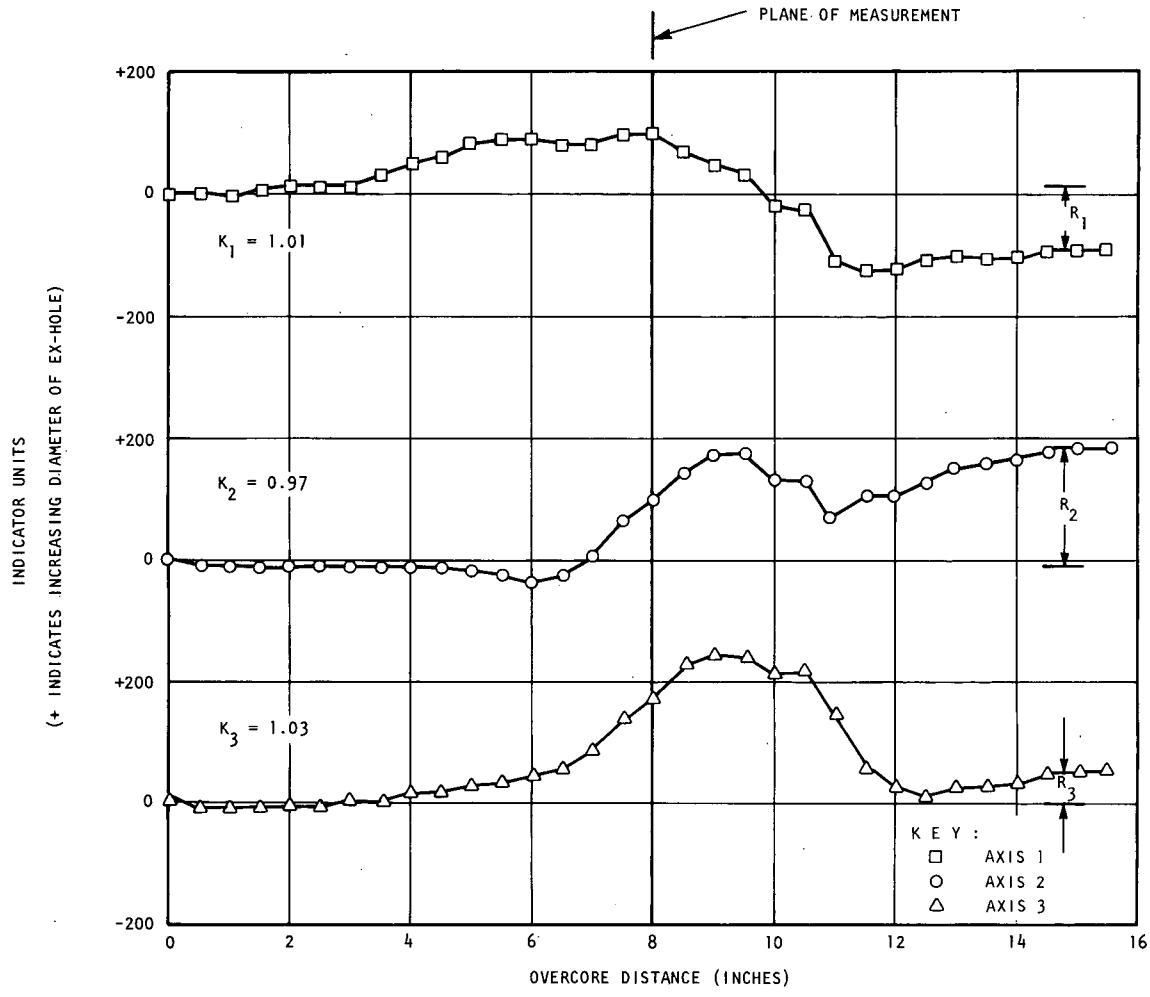
$R_3$ = -71 TO +480 = +551

NOTES:
(1) TEST STOPPED AT 7 INCHES OF TEST RUN DUE TO CORE BREAKAGE ALONG NATURAL FRACTURE.
(2) READINGS ARE ESTIMATES BASED ON CURVE TRENDS.
(3) PLANE OF MEASUREMENT = 7 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 6

DAMES & MOORE




TEST NO. 7

DEPTH 59 FT. 1½ INCHES

$\mu_1\theta$ N 58 W

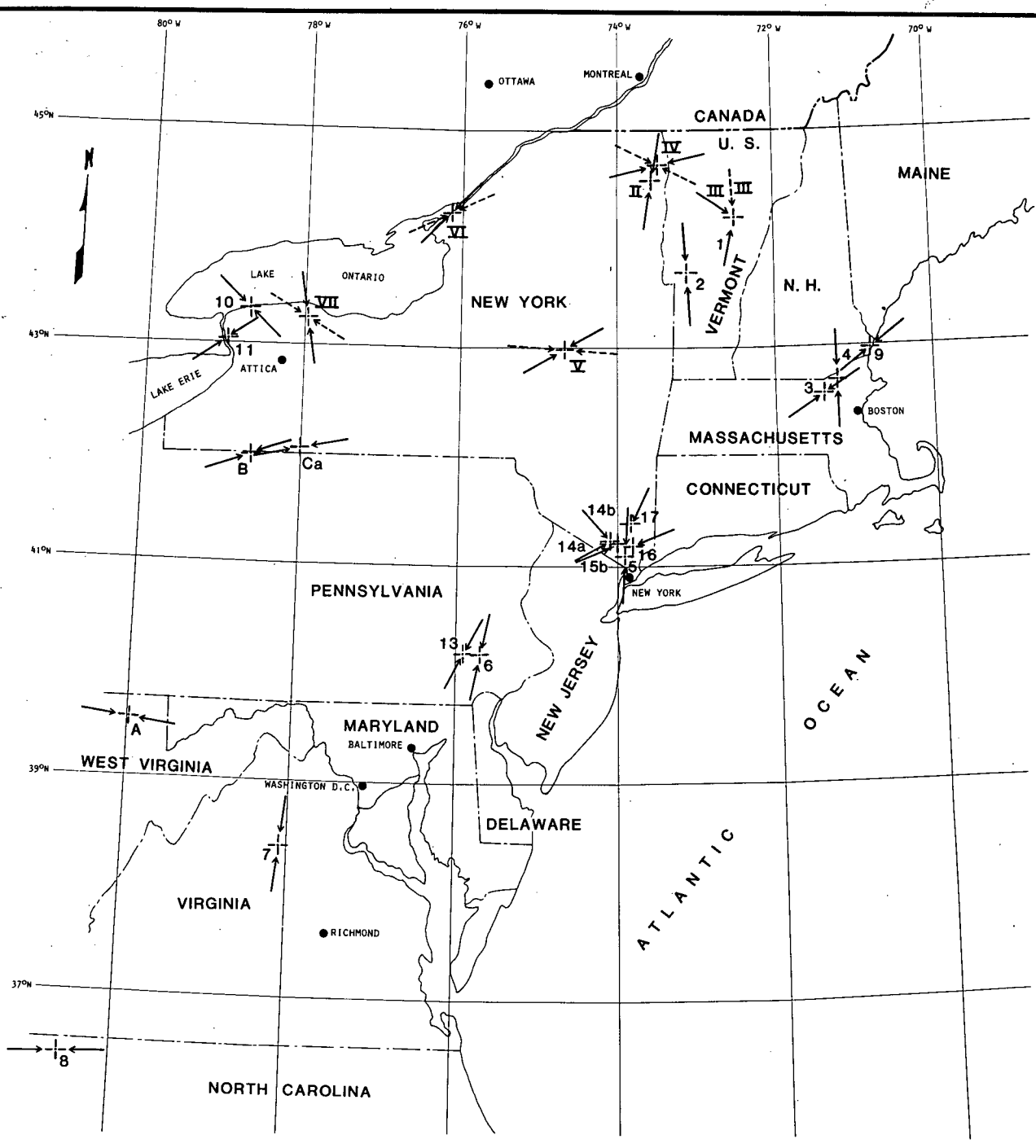
$R_1$ = +10 TO -92 = -102
$R_2$ = -11 TO +183 = +194
$R_3$ = -6 TO +51 = +57

NOTES:
(1) PLANE OF MEASUREMENT = 8 INCHES

# OVERCORE TEST RESULTS

## SITE 14 TEST 7

DAMES & MOORE




# AVERAGE STRIKE OF HORIZONTAL COMPONENT OF MAXIMUM COMPRESSION

25 0 25 50 75 100 125 150 175 200
SCALE IN MILES

25 0 25 50 75 100 125 150 175 200
SCALE IN KILOMETERS

LEGEND:

TREND OF Pc

COMPUTED TREND OF Pc (SEE TEXT AND TABLE H-18 FOR EXPLANATION)

1 ORIENTATION OF PRINCIPAL STRESS, Pc (TABLE H-16)

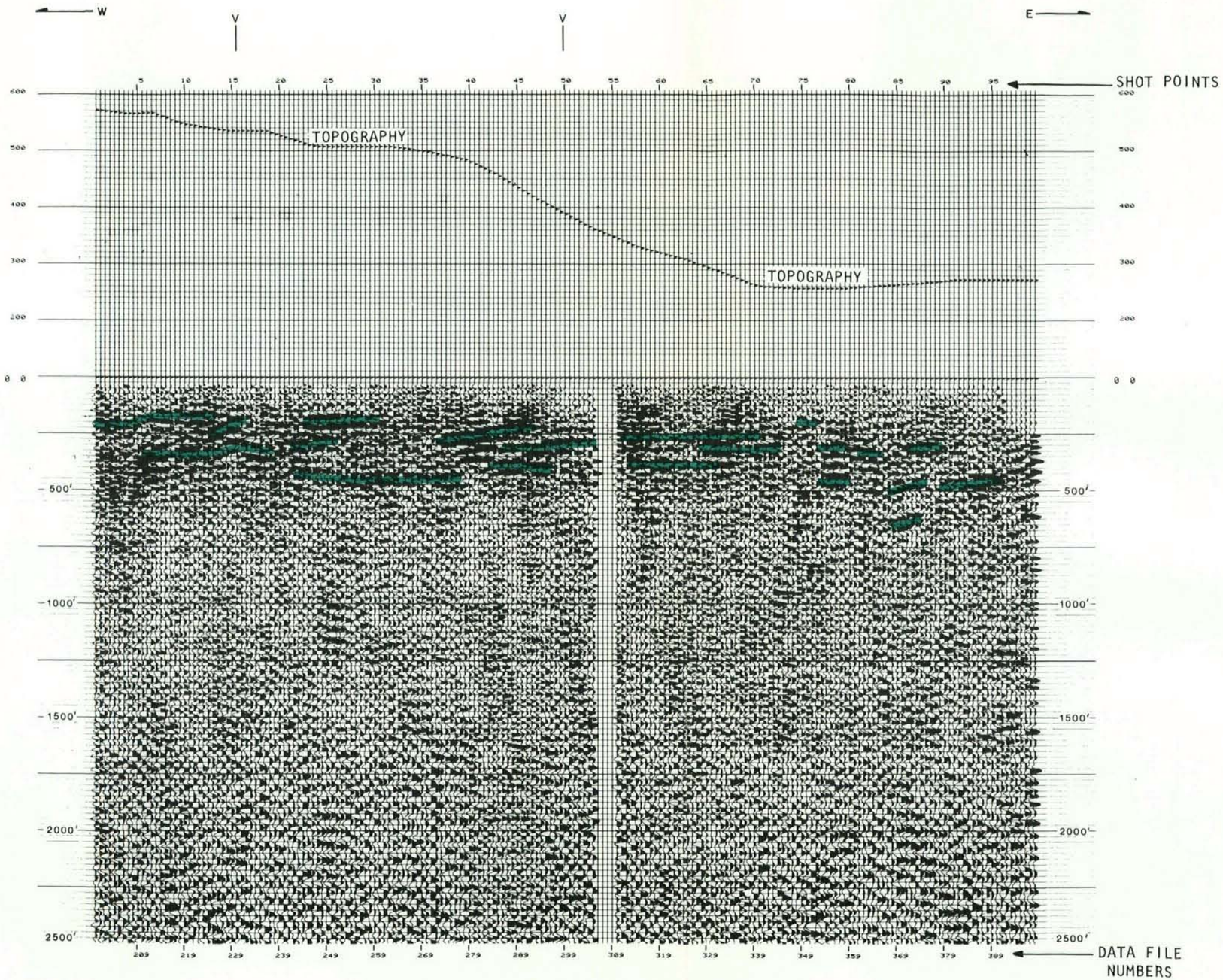
A TREND OF HYDRAULIC FRACTURE, EQUIVALENT TO Pc (TABLE H-17)

I AVERAGE ORIENTATION OF MAXIMUM EXPANSION, EQUIVALENT TO Pc (TABLE H-18)

NOTE: MEASUREMENT 12 ON TABLE H-1 FALLS OUTSIDE THE NORTHERN BOUNDARY OF THIS MAP
MEASUREMENTS I & IV AT SAME SITE (TABLE H-18)

DAMES & MOORE

PLATE H-139




LINE 2 DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY SEISMOGRAPH SERVICE CORPORATION
JOB NUMBER 1823
DATE 082176
PHOENIX SEISYSTEM 70

## PROCESSING SEQUENCE

- 1 DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- 1 VELOCITY ANALYSIS
- 1 NORMAL MOVEOUT
- 2 DATUM STATICS
- 1 AUTOMATIC STATICS
- 1 STACK 1 FOLD
- DECONVOLUTION
- 1 FILTER
- TRACE EQUALIZATION
- 1 ADDITIONAL PROCESSING
- 0 SP MOVE
- 9 DEPTH

## PROCESSING PARAMETERS

CORRECTIONS
DATUM SLOPING (20' BELOW ELEV.)
VE 8888'/Sec. VM 8888'/Sec.
AUTOMATIC STATICS WINDOW 500' TO 4000' FT
ADDITIONAL

| | LENGTH (MS) | WINDOW (SEC) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION BEFORE STACK | | | |
| DECONVOLUTION AFTER STACK | | | |

| | BAND PASS | APPL. (FT) | OVERLAP (SEC) |
|---|---|---|---|
| BAND PASS FILTERS | 60-240 | 8.8-5000' | |

SAMPLE RATE .5 MS
ONE INCH 12 TRACES
ONE SECOND 16 INCHES
PLAYBACK GAIN -36 DB MEAN VALUE

## RECORDING PARAMETERS

RECORDED BY TRACER SURVEY
CONTRACT PARTY 1 DATE RECORDED 072376
SP/VP INTERVAL 18' INSTRUMENT TYPE CASSET
GEOPHONE INTERVAL 18' AMPLIFIERS
NEAR OFFSET 18' RECORDING FILTER OUT/OUT
FAR OFFSET 888' SAMPLE RATE .5MS
NUMBER TRACES 12 RECORD LENGTH 8888
CONFIGURATION SWEEP LENGTH
PROGRESSION W-E SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

KEY:

PROMINENT REFLECTORS

FAULTS: WELL DEFINED

HORIZONTAL SCALE

700 0 700 1400 FEET

VERTICAL EXAGGERATION : 1.7

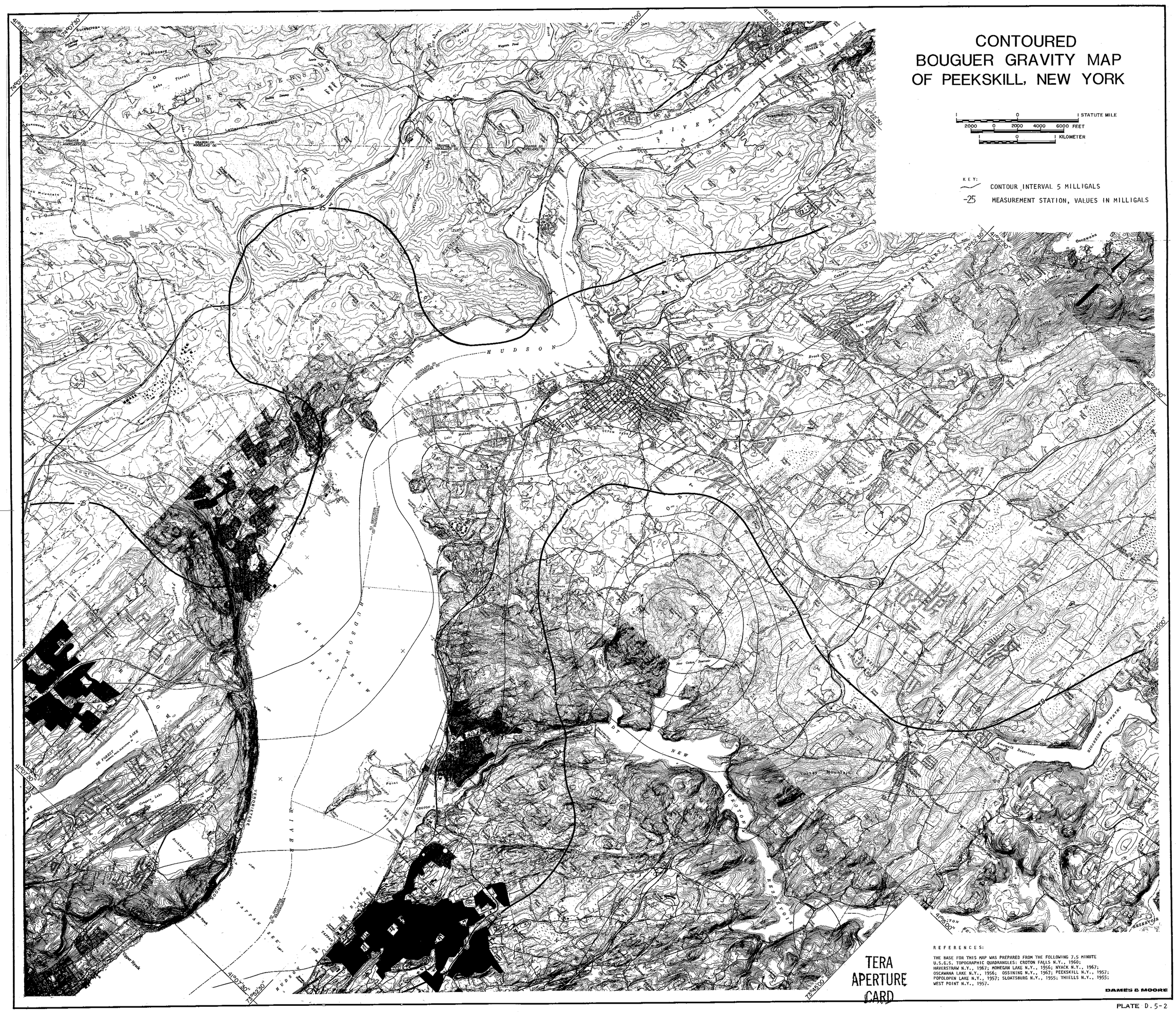
DAMES & MOORE

# HIGH RESOLUTION SEISMIC REFLECTION LINE

PLATE D.5-1

493-15-16

# CONTOURED BOUGUER GRAVITY MAP OF PEEKSKILL, NEW YORK




REFERENCES:

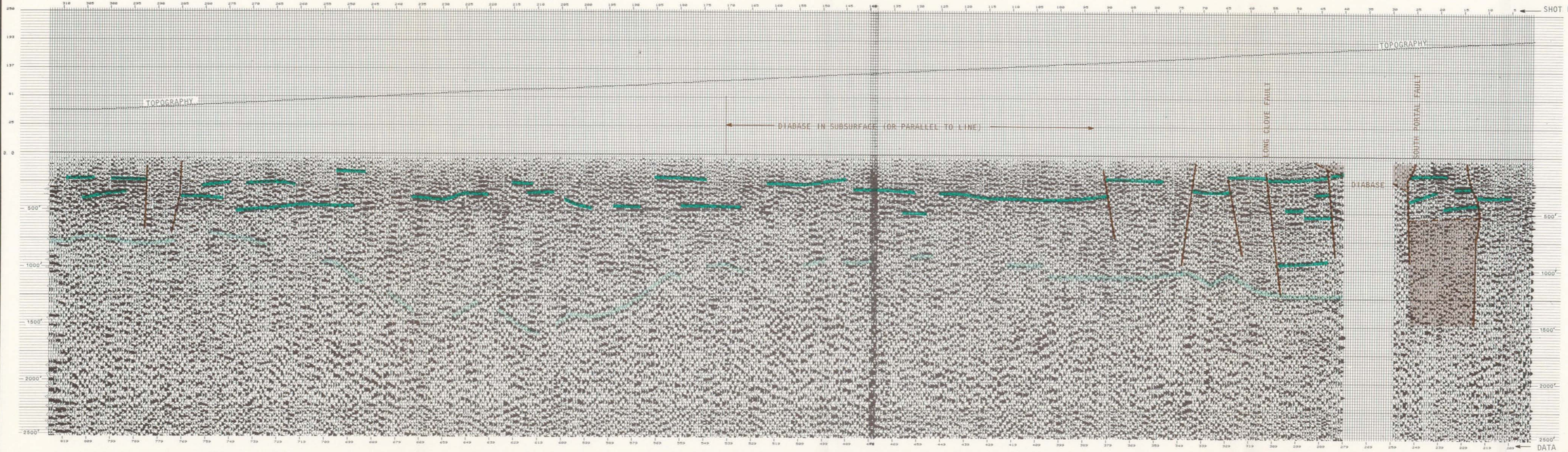
THE BASE FOR THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLES: CROTON FALLS N.Y., 1960; HAVERSTRAW N.Y., 1967; MOHEGAN LAKE N.Y., 1956; NYACK N.Y., 1967; OSCAWANA LAKE N.Y., 1956; OSSINING N.Y., 1967; PEEKSKILL N.Y., 1957; POPOLOPEN LAKE N.Y., 1957; SLOATSBURG N.Y., 1955; THIELLS N.Y., 1955; WEST POINT N.Y., 1957.

DAMES & MOORE

TERA APERTURE CARD

493
82-14

TERA
APERTURE
CARD




HIGH RESOLUTION SEISMIC REFLECTION LINE

HORIZONTAL SCALE

700 0 700 1400 FEET

VERTICAL EXAGGERATION : 1.7

LINE 5 DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY SEISMOGRAPH SERVICE CORPORATION
JOB NUMBER 1632
DATE 1969

PHOENIX SEISYSTEM 70

PROCESSING SEQUENCE

- 1 DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- 1 VELOCITY ANALYSIS
- 1 NORMAL MOVEOUT
- 1 DATUM STATICS
- 1 AUTOMATIC STATICS
- 1 STACK -1.0 FOLD
- DECONVOLUTION
- 1 FILTER
- TRACE EQUALIZATION
- ADDITIONAL PROCESSING
- 0.1P-MOM
- 0.00P-TM

PROCESSING PARAMETERS

CORRECTIONS

DATUM 0.1P-TM(100' BELOW ELEV.)

VE 5000/SEC VM 5000/SEC

AUTOMATIC STATICS WINDOW 500' TO 4000' FT

ADDITIONAL

| | LENGTH MS | WINDOW (SEC) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION BEFORE STACK | | | |
| DECONVOLUTION AFTER STACK | | | |

| | BAND PASS | APPL. (FT) | OVER(.AP SEC) |
|---|---|---|---|
| BAND PASS FILTERS | 60-250 | 3000-5000 | |

SAMPLE RATE .5 MS
ONE INCH 1.0 TRACES
ONE SECOND 10 INCHES
PLAYBACK GAIN 0B 0B MEAN VALUE

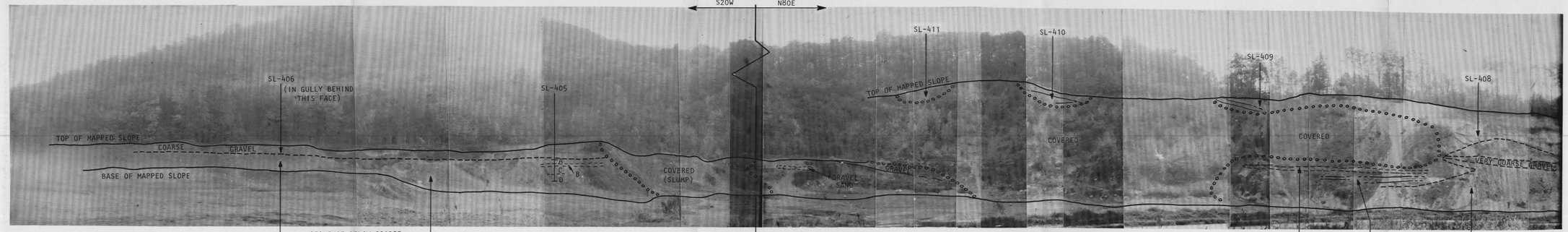
RECORDING PARAMETERS

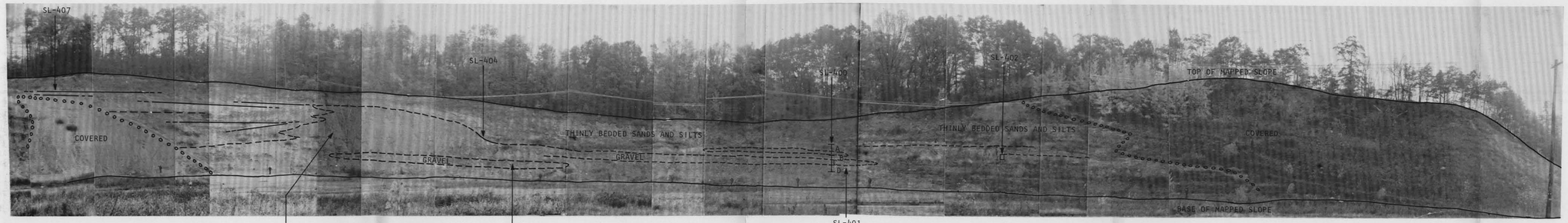
RECORDED BY IMAGES SURVEY
CONTRACT PORT DATE RECORDED 08/18
SP/VP INTERVAL 36 INSTRUMENT TYPE 2SS337
GEOPHONE INTERVAL 36 AMPLIFIERS
NEAR OFFSET 36 RECORDING FILTER 80/0/0/
FAR OFFSET 864 SAMPLE RATE .5MS
NUMBER TRACES 12 RECORD LENGTH 5SEC
CONFIGURATION SWEEP LENGTH
PROGRESSION 36/36 SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

K E Y:

- PROMINENT REFLECTORS
- POSSIBLE BASEMENT REFLECTORS
- INTRUSIVE BODIES
- FAULTS: WELL DEFINED
- POSSIBLE CONTACTS

DAMES & MOORE




KEY:

SL-400 STATION NUMBER SEDIMENT DESCRIPTION IN TEXT

SEDIMENTARY CONTACT, APPROXIMATE

A B C SEDIMENTARY COLUMN DESCRIBED IN TABLE F-1

DENOTES LIMIT OF COVERED AREA

# PHOTO MOSAIC OF PLEISTOCENE DEPOSITS

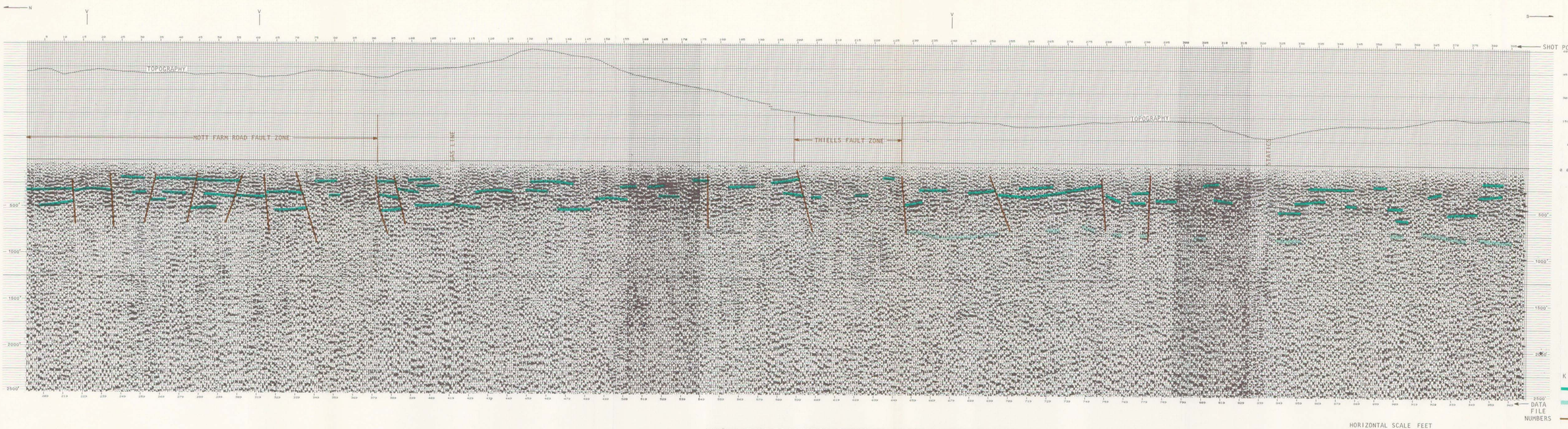
IN QUARRY PEQUANNOCK, N.J.

TERA APERTURE CARD

-017

DAMES & MOORE

PLATE F-18




HIGH RESOLUTION SEISMIC REFLECTION LINE

HORIZONTAL SCALE FEET

700 0 700 1400

VERTICAL EXAGGERATION : 1.7

LINE 4 DEPTH SECTION

AREA NEW YORK

FOR DAMES & MOORE

BY GEOSEISMIGRAPH SERVICES CORPORATION

JOB NUMBER 3330

DATE 1969

PHOENIX SEISYSTEM 70

PROCESSING SEQUENCE

- DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- VELOCITY ANALYSIS
- NORMAL MOVEMENT
- DATUM STATICS
- AUTOMATIC STATICS
- F-K FIELD
- DECONVOLUTION
- FILTER
- TRACE EQUALIZATION

ADDITIONAL PROCESSING

PROCESSING PARAMETERS

DIRECTION

DATUM ELEVATION 700' BELOW ELEV.

VE 8000/SH VH 8000/SH

AUTOMATIC STATICS WINDOW 500' TO 4000' FT

ADDITIONAL

| | LENGTH (MS) | WINDOW (MS) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION DATA FIELD | | | |
| DECONVOLUTION STACK FIELD | | | |

| | BAND PASS | OPER. (FT) | OVERLAP (MS) |
|---|---|---|---|
| BAND PASS FILTERS | 60-250 | 3000, 5000 | |

SAMPLE RATE 2 MS

ONE CHECK 16 TRACES

ONE SECING 8 INCHES

PLAYBACK GAIN 36 DB

HEAVY VALUE

RECORDING PARAMETERS

RECORDED BY DAMES&MOORE

CONTRACTOR PORTI

| | | | |
|---|---|---|---|
| SHOT INTERVAL | 50' | DATE RECORDED | 6/8/69 |
| GEOPHONE INTERVAL | 50' | HARDWARE TYPE | 16BIT |
| NEAR OFFSET | 50' | RECORDING FORM | |
| FAR OFFSET | 800' | RECORD FILTER | 60-250 |
| NUMBER TRACES | 16 | SAMPLE RATE | 2 MS |
| CONF GEOPHONE | 4 | RECORD LENGTH | 1000 |
| PROGRESSION | N/A | SWEEP LENGTH | |
| GEOPHONES/TRACE | | SWEEP FREQUENCY | |
| | | NUMBER SWEEPS | |

KEY:

PROMINENT REFLECTORS

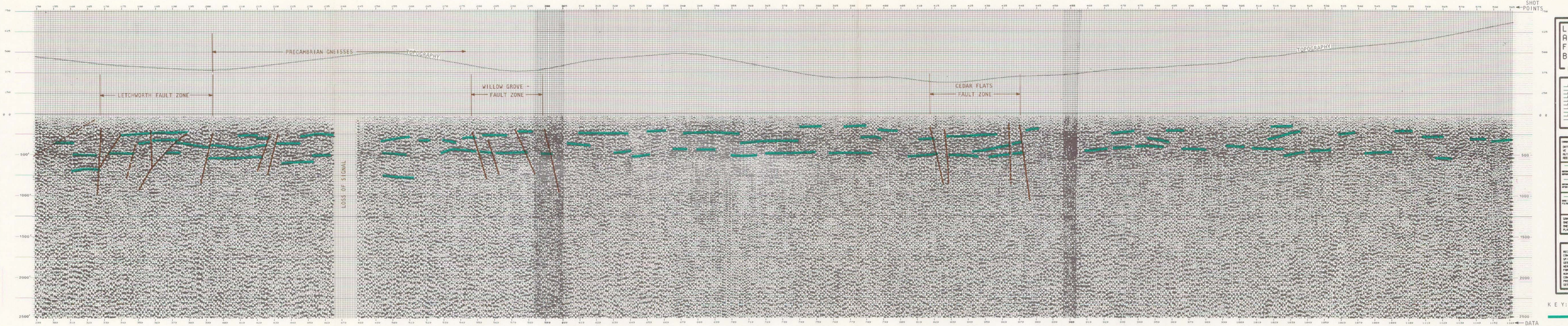
POSSIBLE BASEMENT REFLECTORS

FAULTS: WELL DEFINED

TERA APERTURE CARD

DAMES & MOORE

TERA
APERTURE
CARD




HIGH RESOLUTION SEISMIC REFLECTION LINE

HORIZONTAL SCALE
700 0 700 1400 FEET
VERTICAL EXAGGERATION : 1.7

LINE 1 PT 2 DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY GEOSUBSURFA SERVICE CORPORATION
JOB NUMBER 5210
DATE 08/27/8
PHOENIX SEISYSTEM 70

**PROCESSING SEQUENCE**

- 1 DEMULTIPLEX-EDIT-SUM
- 2 GEOMETRY CORRECTION
- 3 VELOCITY ANALYSIS
- 4 NMO CORRECTION
- 5 DATUM STATICS
- 6 AUTOMATIC STATICS
- 7 STACK
- 8 DECONVOLUTION
- 9 FILTERING
- 10 TRACE EQUALIZATION

ADDITIONAL PROCESSING
X-Y MIX
X DEPTH

**PROCESSING PARAMETERS**

CONSTANTS
DATUM ELEVATION (FT MSL/OW ELEV)
VE 0000/1500 FM 0000/1500
AUTOMATIC STATICS WINDOW 500 TO 0000 FT
ADDITIONAL

| | LENGTH (MS) | WINDOW (MS) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION OPERA SPAN | | | |
| DECONVOLUTION OPER GATE | | | |

| | BAND PASS (HZ-PTS) | ROFL (FT) | OVERLAP (MS) |
|---|---|---|---|
| BAND PASS FILTERS | 30-250 | 4.0-5000 | |

SAMPLE RATE 4 MS
ONE CHECK 12 TRACES
PLUS-MINUS 18 TRACES
PLUS-MINUS GRIDS 36 OR MEAN VALUE

**RECORDING PARAMETERS**

RECORDED BY TARGET SURVEY
CONTRACT PARTY DATE RECORDED 08/27/8
GF/HP LATERAL GF INSTRUMENT TYPE 24BIT
GF/HP VERTICAL SPACING 12 GF/HP NUMBER 24
NEAR OFFSET 18 INSTRUMENT FILTER 30/250
FAR OFFSET 888 SAMPLE RATE 4 MS
NUMBER TRACES 48 RECORD LENGTH 5000 MS
COMP/SUMMATION CHECK LENGTH
PLUS-MINUS 5/6 CHECK SHOT DATE
DEPTH/MS/TRACE NUMBER SHOTS

KEY:

- PROMINENT REFLECTORS
- FAULTS: WELL DEFINED; APPROXIMATED
- POSSIBLE CONTACTS

DAMES & MOORE

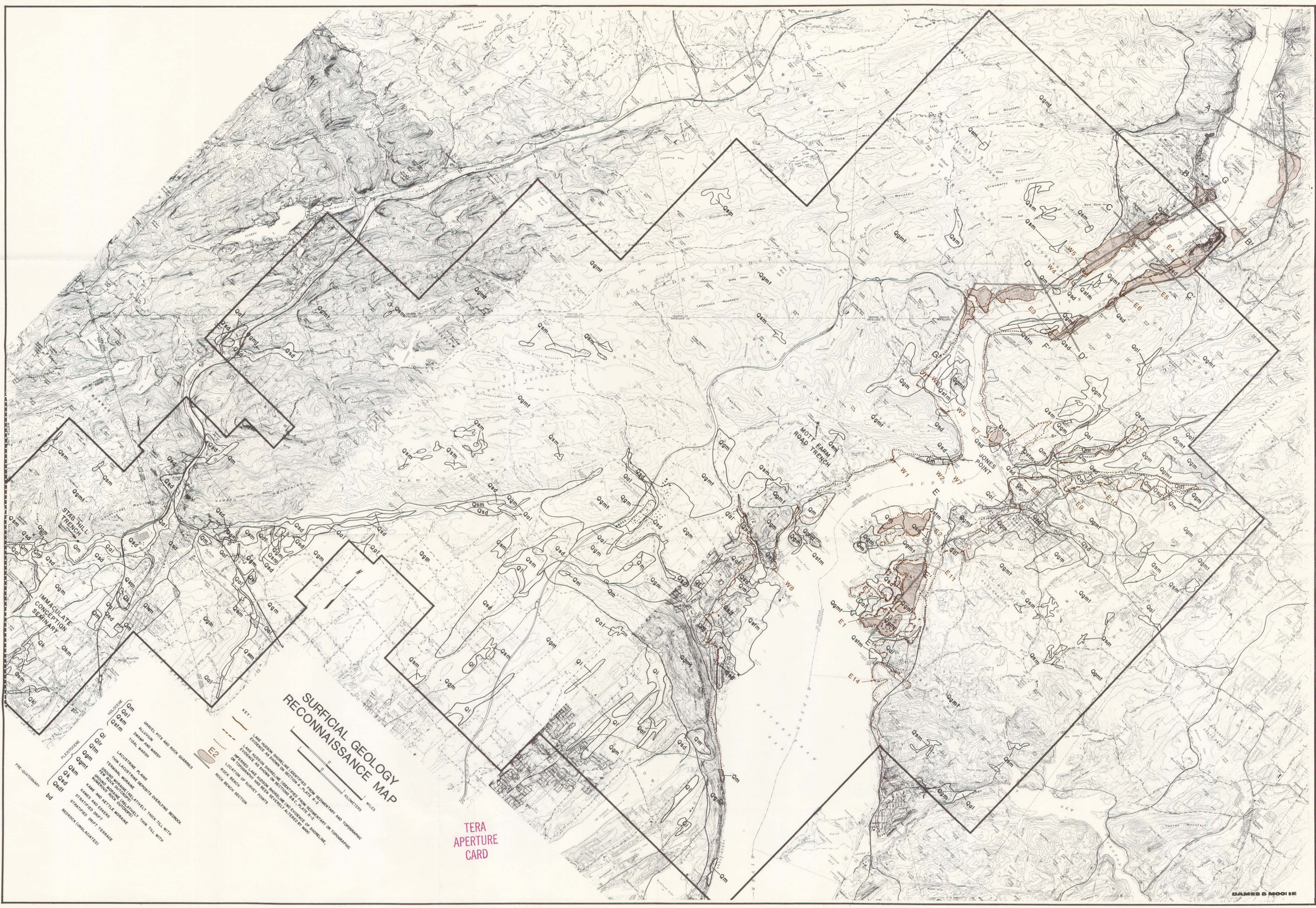
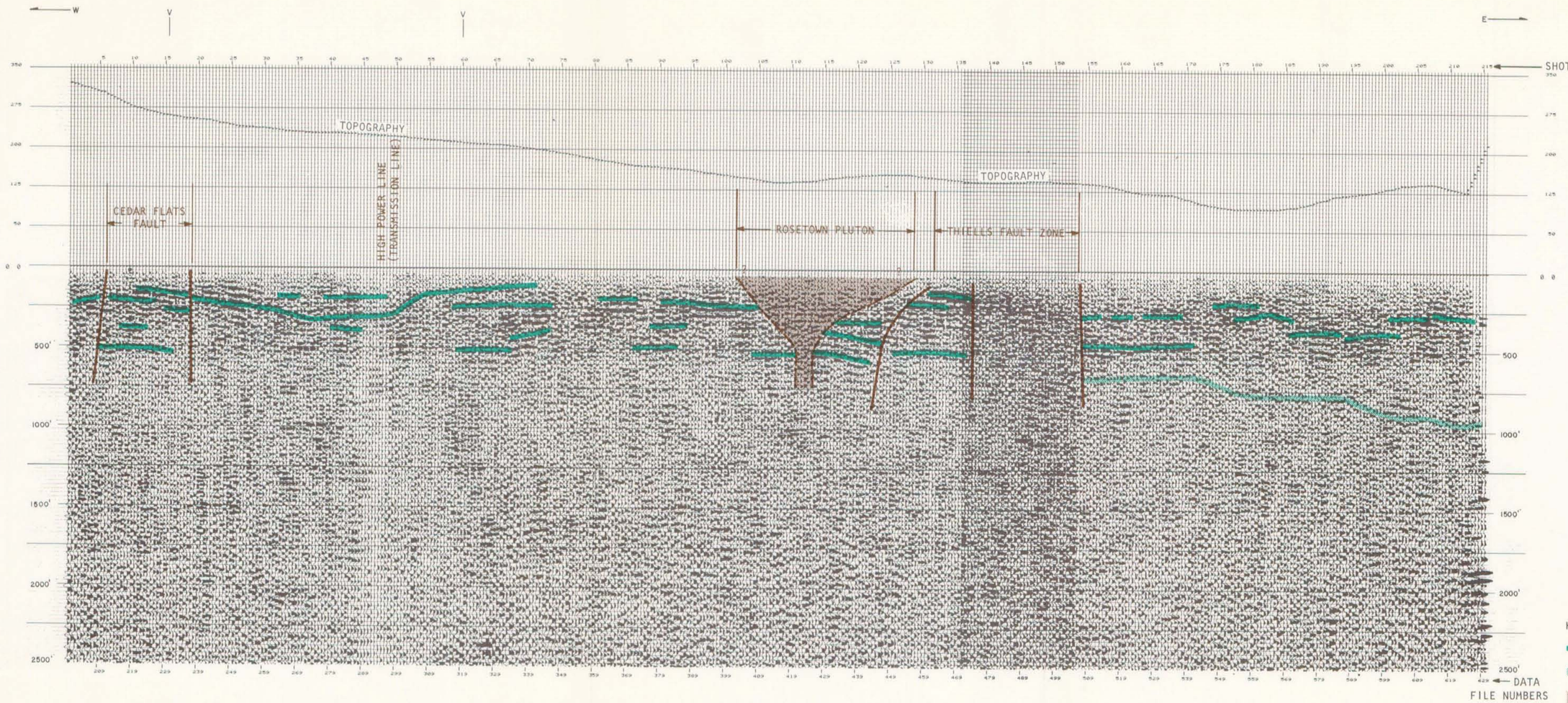

SURFICIAL GEOLOGY
RECONNAISSANCE MAP
0
2
KILOMETERS
MILES
KEY:
LAKE HUDSON SHORELINE (IDENTIFIED FROM SEDIMENTARY AND TOPOGRAPHIC EVIDENCE AS SHOWN ON SECTION A, PLATE K-2
LAKE HUDSON SHORELINE (IDENTIFIED FROM SEDIMENTARY OR TOPOGRAPHIC EVIDENCE AS SHOWN ON SECTIONS B-E, PLATE K-2
INFERRED LAKE HUDSON SHORELINE (NO EVIDENCE OF SHORELINE, OR TOPOGRAPHY HAS BEEN SEVERELY ALTERED BY MAN)
E2
LOCATION OF SURVEY POINTS
ROCK BENCH
ROCK BENCH SECTION
HOLOCENE
Qm
Qal
Qsm
Qsd
GRAVEL PITS AND ROCK QUARRIES
ALLUVIUM
SWAMP AND MARSH
TIDAL MARSH
PLEISTOCENE
Ql
Qlr
Qgm
Qgmt
LACUSTRINE PLAINS
THIN LACUSTRINE DEPOSITS OVERLYING BEDROCK
TERMINAL MORAINE
GROUND MORAINE (RELATIVELY THICK TILL WITH FEW ROCK OUTCROPS)
GROUND MORAINE (RELATIVELY THIN TILL WITH NUMEROUS ROCK OUTCROPS)
PRE-QUATERNARY
Qkm
Qk
Qsd
Qsdt
bd
KAME AND KETTLE MORAINE
KAMES AND ESKERS
STRATIFIED DRIFT
STRATIFIED DRIFT TERRACE
BEDROCK (UNGLACIATED)
STAG HILL TRENCH
IMMACULATE CONCEPTION SEMINARY
MOTT FARM ROAD TRENCH
JONES POINT
TERA APERTURE CARD
DAMES & MOORE

PLATE F-1A




HIGH RESOLUTION SEISMIC REFLECTION LINE

HORIZONTAL SCALE
700 0 700 1400 FEET

VERTICAL EXAGGERATION : 1.7

TERA APERTURE CARD

LINE 3 DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY GEISMOGRAPH SERVICE CORPORATION
JOB NUMBER
DATE
PHOENIX SEISYSTEM 70

**PROCESSING SEQUENCE**

- DEMULTIPLEX-EDIT-GUN
- VIBROSEIS CORRELATION
- VELOCITY ANALYSIS
- NORMAL MOVEOUT
- DATUM STATICS
- AUTOMATIC STATICS
- STACK
- FOLD
- DECONVOLUTION
- FILTER
- TRACE EQUALIZATION
- ADDITIONAL PROCESSING
- F-P NORM
- DEPTH

**PROCESSING PARAMETERS**

CORRECTIONS
DATUM SLOPPING
VE
AUTOMATIC STATICS WINDOW 500' TO 4000' FT
ADDITIONAL

| | LENGTH (MS) | WINDOW (MS) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION BEFORE STACK | | | |
| DECONVOLUTION AFTER STACK | | | |

| | BAND PASS | APPL. (FT) | OVERLAP (MS) |
|---|---|---|---|
| BAND PASS FILTERS | 50/240 | 5.5/500 | |

SAMPLE RATE 5 MS
ONE INCH 12 TRACES
ONE SECOND 10 INCHES
PLAYBACK GAIN -38 DB MEAN VALUE

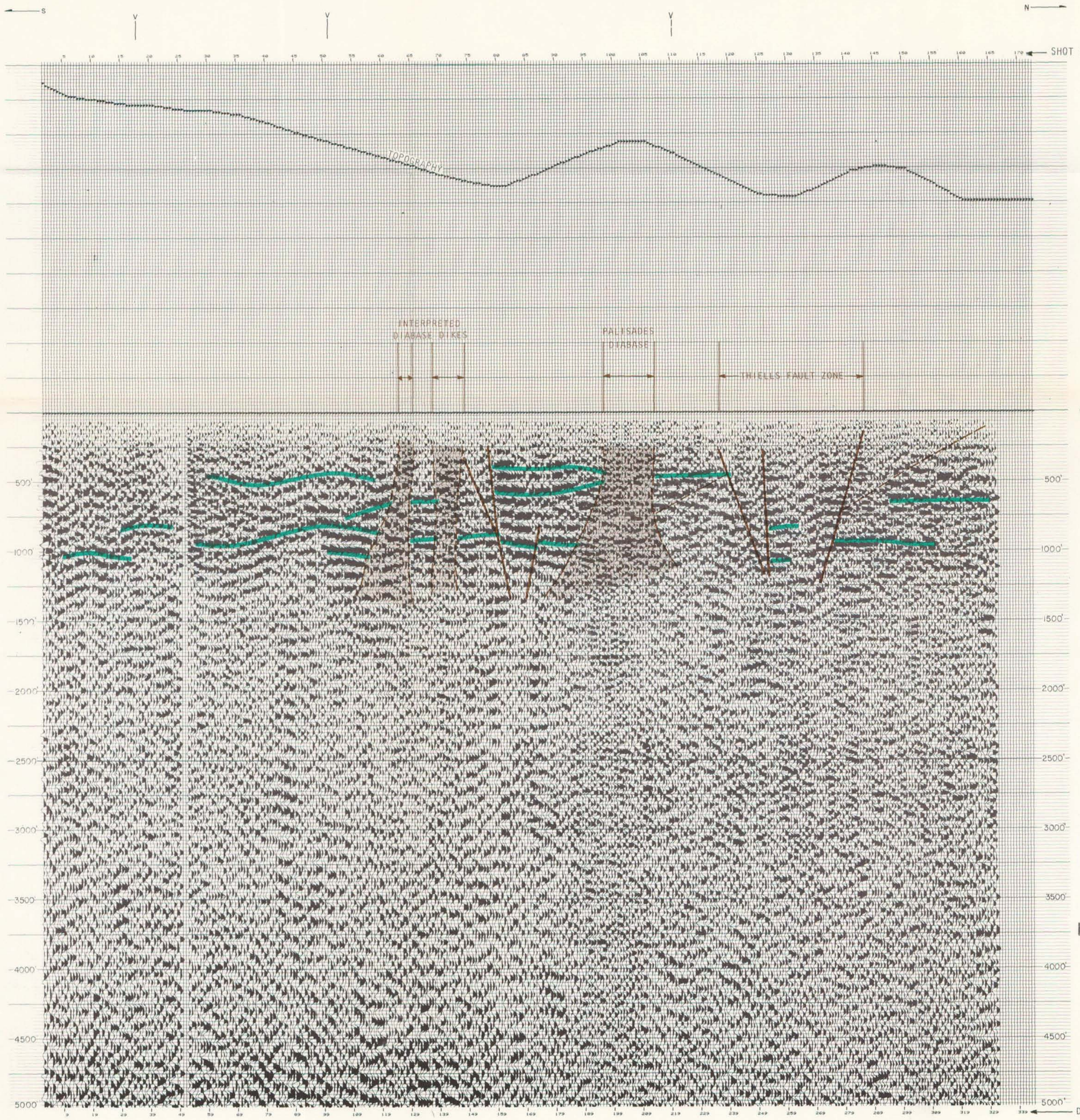
**RECORDING PARAMETERS**

RECORDED BY
CONTRACT PART 1 DATE RECORDED
SP/VP INTERVAL INSTRUMENT TYPE
GEOPHONE INTERVAL AMPLIFIERS
NEAR OFFSET RECORDING FILTER
FAR OFFSET SAMPLE RATE
NUMBER TRACES RECORD LENGTH
CONFIGURATION SWEEP LENGTH
PROGRESSION SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

KEY:

- PROMINENT REFLECTORS
- POSSIBLE BASEMENT REFLECTORS
- INTRUSIVE BODIES
- FAULTS: WELL DEFINED
- POSSIBLE CONTACTS

DAMES & MOORE




LINE 1PT 1 DEPTH SECTION
AREA NEW YORK
FOR DAMES & MOORE
BY SEISMOGRAPH SERVICE CORPORATION
JOB NUMBER 3310
DATE 88/1/6
PHOENIX SEISYSTEM 70

## PROCESSING SEQUENCE

- 1 DEMULTIPLEX-EDIT-SUM
- VIBROSEIS CORRELATION
- 1 VELOCITY ANALYSIS
- 1 NORMAL MOVEOUT
- 2 DATUM STATICS
- 1 AUTOMATIC STATICS
- 1 STACK 1 FOLD
- DECONVOLUTION
- 1 FILTER
- TRACE EQUALIZATION

ADDITIONAL PROCESSING
X,Y MOVE
9 DEPTH

## PROCESSING PARAMETERS

CORRECTIONS
DATUM SLOPPING
VE 8000'/Sec VM 8000'/Sec
AUTOMATIC STATICS WINDOW 1000' TO 8000' FT
ADDITIONAL:

| | LENGTH (MS) | WINDOW (SEC) | PREDICTION (MS) |
|---|---|---|---|
| DECONVOLUTION BEFORE STACK | | | |
| DECONVOLUTION AFTER STACK | | | |

| | BAND PASS | APPL. (FT) | OVERLAP (SEC) |
|---|---|---|---|
| BAND PASS FILTERS | 60-240 | 0.0-10000' | |

SAMPLE RATE 1 MS
ONE INCH 12 TRACES
ONE SECOND 50 INCHES
PLAYBACK GAIN -26 DB MEAN VALUE

## RECORDING PARAMETERS

RECORDED BY TARGET SURVEY
CONTRACT PARTY 1 DATE RECORDED 88/1/6
SP/VP INTERVAL 36' INSTRUMENT TYPE CRAIGT
GEOPHONE INTERVAL 36' AMPLIFIERS
NEAR OFFSET 36' RECORDING FILTER OUT/OUT
FAR OFFSET 864' SAMPLE RATE 1 Ms
NUMBER TRACES 12 RECORD LENGTH 1 Sec
CONFIGURATION SWEEP LENGTH
PROGRESSION 1/3 SWEEP FREQUENCY
GEOPHONES/TRACE NUMBER SWEEPS

KEY:
- PROMINENT REFLECTORS
- INTRUSIVE BODIES
- FAULTS: WELL DEFINED
- POSSIBLE CONTACTS

HORIZONTAL SCALE
700 0 700 1400 FEET

VERTICAL EXAGGERATION : 1.7

# HIGH RESOLUTION SEISMIC REFLECTION LINE

TERA APERTURE CARD

DAMES & MOORE

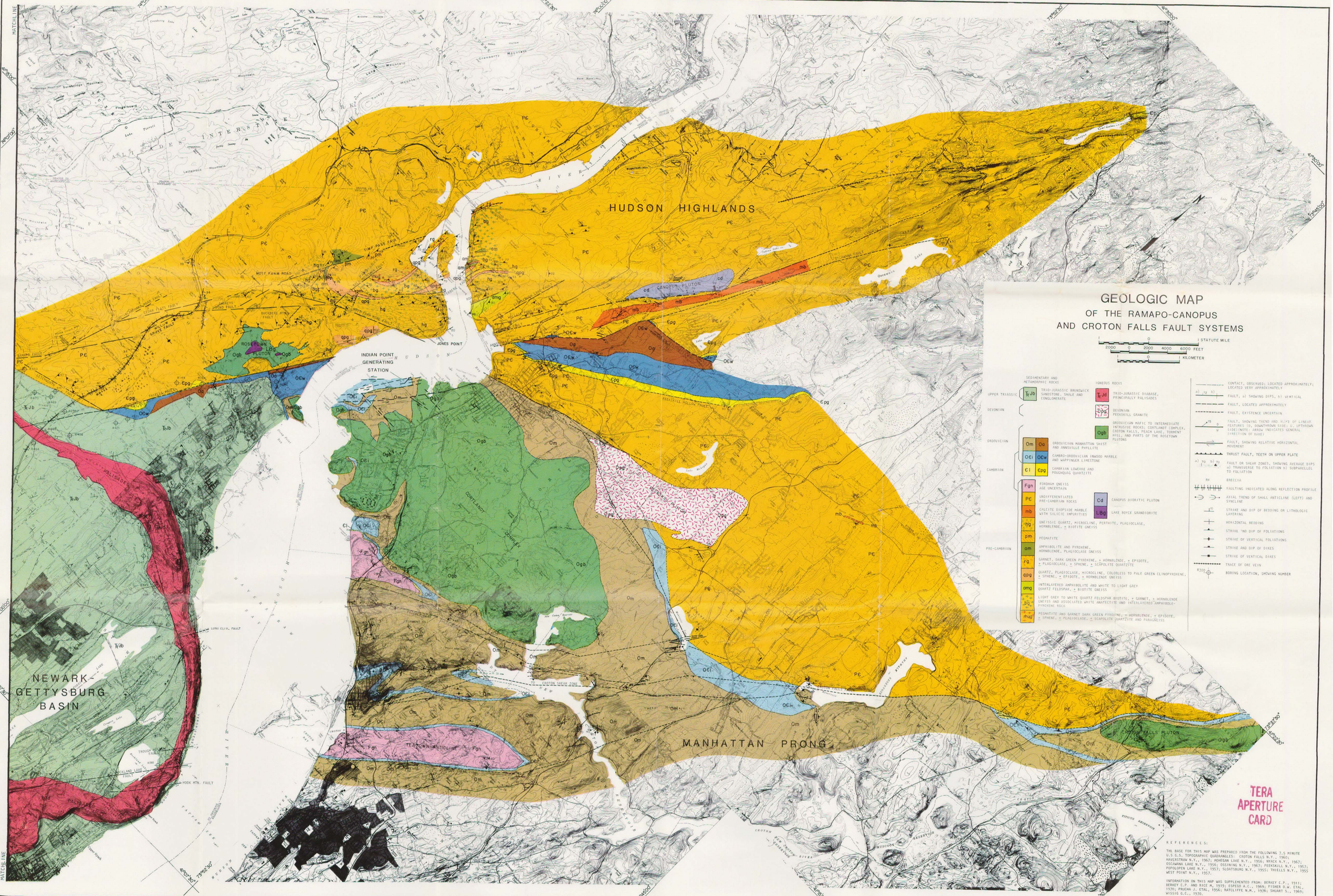
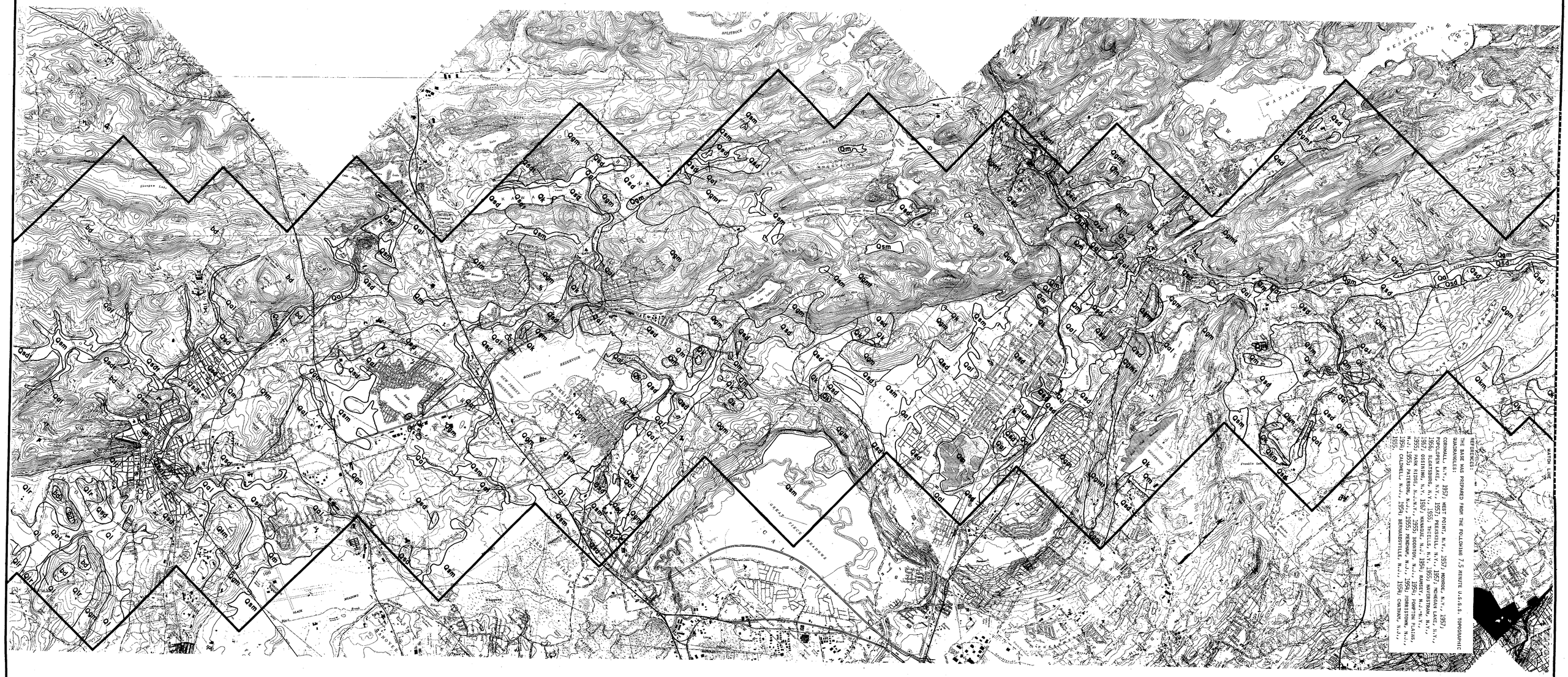

GEOLOGIC MAP
OF THE RAMAPO-CANOPUS
AND CROTON FALLS FAULT SYSTEMS
STATUTE MILE
KILOMETER
SEDIMENTARY AND METAMORPHIC ROCKS
UPPER TRIASSIC
TRIO-JURASSIC BRUNSWICK SANDSTONE, SHALE AND CONGLOMERATE
DEVONIAN
ORDOVICIAN
CAMBRIAN
PRE-CAMBRIAN
IGNEOUS ROCKS
TRIO-JURASSIC DIABASE, PRINCIPALLY PALISADES
DEVONIAN PEEKSKILL GRANITE
ORDOVICIAN MAFIC TO INTERMEDIATE INTRUSIVE ROCKS; CORTLANDT COMPLEX, CROTON FALLS, PEACH LAKE, TORMENT HILL, AND PARTS OF THE ROSETOWN PLUTONS
ORDOVICIAN MANHATTAN SCHIST AND INWOOD PHYLLITE
CAMBRO-ORDOVICIAN INWOOD MARBLE AND WAPPINGER LIMESTONE
CAMBRIAN LOWERKE AND POUGHQUAG QUARTZITE
FORDHAM GNEISS AGE UNCERTAIN
UNDIFFERENTIATED PRE-CAMBRIAN ROCKS
CALCITE DIOPSIDE MARBLE WITH SILICIC IMPURITIES
GNEISSIC QUARTZ, MICROCLINE, PERTHITE, PLAGIOCLASE, HORNBLENDE, ± BIOTITE GNEISS
PEGMATITE
AMPHIBOLITE AND PYROXENE, HORNBLENDE, PLAGIOCLASE GNEISS
GARNET, DARK GREEN PYROXENE, + HORNBLENDE, + EPIDOTE, + PLAGIOCLASE, ± SPHENE, ± SCAPOLITE QUARTZITE
QUARTZ, PLAGIOCLASE, MICROCLINE, COLOBLESS TO PALE GREEN CLINOPYROXENE, + SPHENE, + EPIDOTE, + HORNBLENDE GNEISS
INTERLAYERED AMPHIBOLITE AND WHITE TO LIGHT GREY QUARTZ FELDSPAR, + BIOTITE GNEISS
LIGHT GREY TO WHITE QUARTZ FELDSPAR BIOTITE, + GARNET, + HORNBLENDE GNEISS AND ASSOCIATED WHITE ANATECTITE AND INTERLAYERED AMPHIBOLE-PYROXENE ROCK
PEGMATITE AND GARNET DARK GREEN PYROXENE, + HORNBLENDE, + EPIDOTE, + SPHENE, + PLAGIOCLASE, ± SCAPOLITE QUARTZITE AND PARAGNEISS
CANOPUS DIORITIC PLUTON
LAKE BOYCE GRANDIORITE
CONTACT, OBSERVED; LOCATED APPROXIMATELY; LOCATED VERY APPROXIMATELY
FAULT, a) SHOWING DIPS, b) VERTICAL
FAULT, LOCATED APPROXIMATELY
FAULT, EXISTENCE UNCERTAIN
FAULT, SHOWING TREND AND PLUNGE OF LINEAR FEATURES (D, DOWNTHROWN SIDE; U, UPTHROWN SIDE)(NOTE: ARROW INDICATES GENERAL DIRECTION OF RAKE)
FAULT, SHOWING RELATIVE HORIZONTAL MOVEMENT
THRUST FAULT, TEETH ON UPPER PLATE
FAULT OR SHEAR ZONES, SHOWING AVERAGE DIPS a) TRANSVERSE TO FOLIATION b) SUBPARALLEL TO FOLIATION
BRECCIA
FAULTING INDICATED ALONG REFLECTION PROFILE
AXIAL TREND OF SMALL ANTICLINE (LEFT) AND SYNCLINE
STRIKE AND DIP OF BEDDING OR LITHOLOGIC LAYERING
HORIZONTAL BEDDING
STRIKE AND DIP OF FOLIATIONS
STRIKE OF VERTICAL FOLIATIONS
STRIKE AND DIP OF DIKES
STRIKE OF VERTICAL DIKES
TRACE OF ORE VEIN
BORING LOCATION, SHOWING NUMBER
HUDSON HIGHLANDS
NEWARK-GETTYSBURG BASIN
MANHATTAN PRONG
INDIAN POINT GENERATING STATION
JONES POINT
ROSETOWN PLUTON
CANOPUS PLUTON
CORTLANDT COMPLEX
CROTON FALLS PLUTON
TEATOWN ANTICLINE
CROTON SHEAR ZONE
PALISADES
MATCHLINE
REFERENCES:
THE BASE FOR THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLES: CROTON FALLS N.Y., 1960; HAVERSTRAW N.Y., 1967; HOHEGAN LAKE N.Y., 1956; NYACK N.Y., 1967; OSCAWANA LAKE N.Y., 1956; OSSINING N.Y., 1967; PEEKSKILL N.Y., 1967; POPOLOPEN LAKE N.Y., 1957; SLOATSBURG N.Y., 1955; THIELLS N.Y., 1955 WEST POINT N.Y., 1957.
INFORMATION ON THIS MAP WAS SUPPLEMENTED FROM: BERKEY C.P., 1911; BERKEY C.P. AND RICE M, 1919; ESPESO A.C., 1969; FISHER D.W. ETAL, 1970; PRUCHA J. ETAL, 1956; RATCLIFFE N.M., 1976; SHUART S., 1969; WISSIG G.C., 1970.
DAMES & MOORE
TERA APERTURE CARD

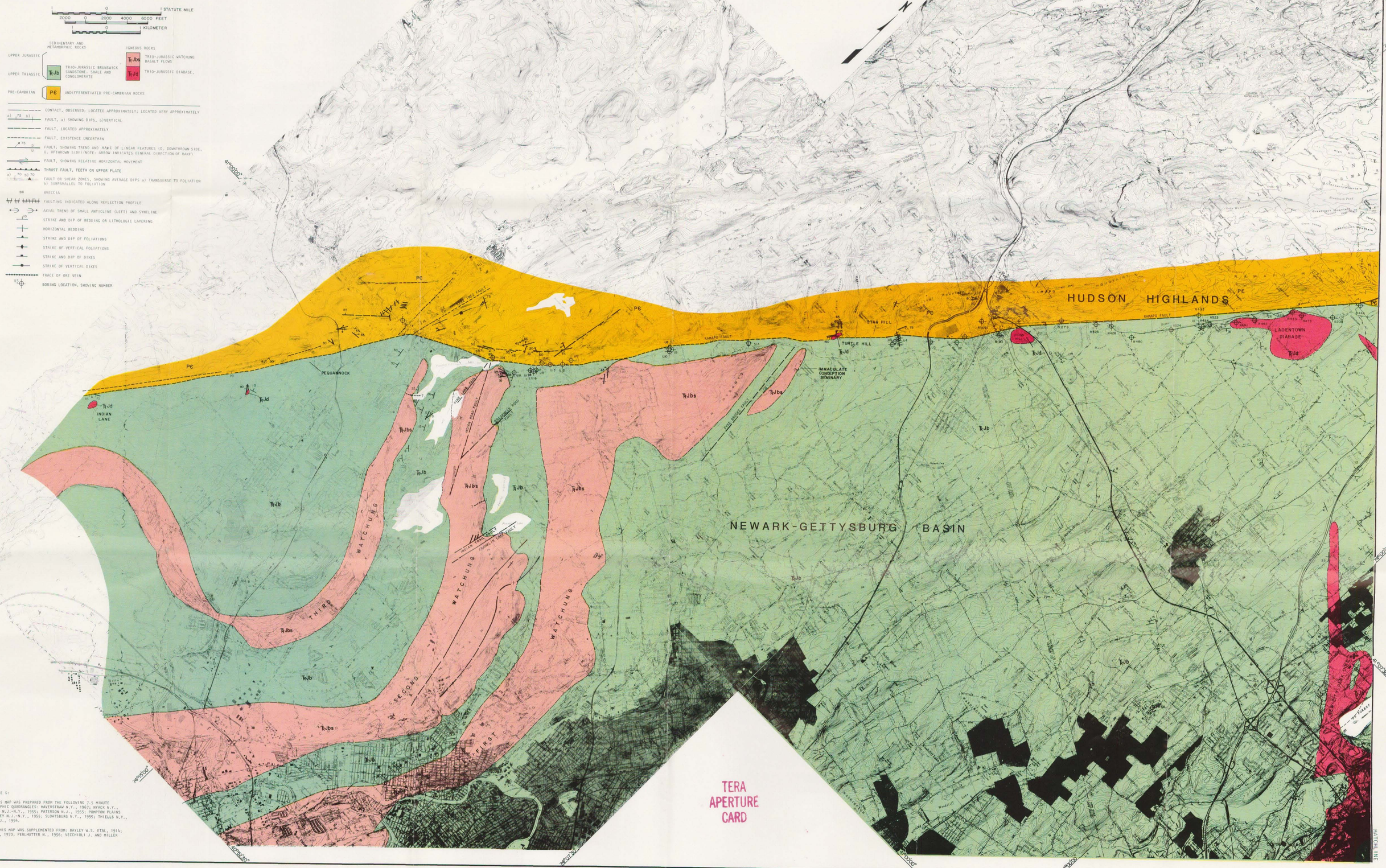
PLATE 1A




DAMES & MOORE

PLATE F-1B

# GEOLOGIC MAP
## OF THE RAMAPO-CANOPUS AND CROTON FALLS FAULT SYSTEMS




REFERENCES:

THE BASE FOR THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUARRANGLES: HAVERSTRAW N.Y., 1967; NYACK N.Y., 1967; PARK RIDGE N.J.-N.Y., 1955; PATERSON N.J., 1955; POMPTON PLAINS N.J., 1955; RAMSEY N.J.-N.Y., 1955; SLOATSBURG N.Y., 1955; THIELLS N.Y., 1955; WANAQUE N.J., 1954.

INFORMATION ON THIS MAP WAS SUPPLEMENTED FROM: BAYLEY W.S. ETAL, 1914; FISHER D.W. ETAL, 1970; PERLMUTTER N., 1956; VECCHIOLI J. AND MILLER E.G., 1973.

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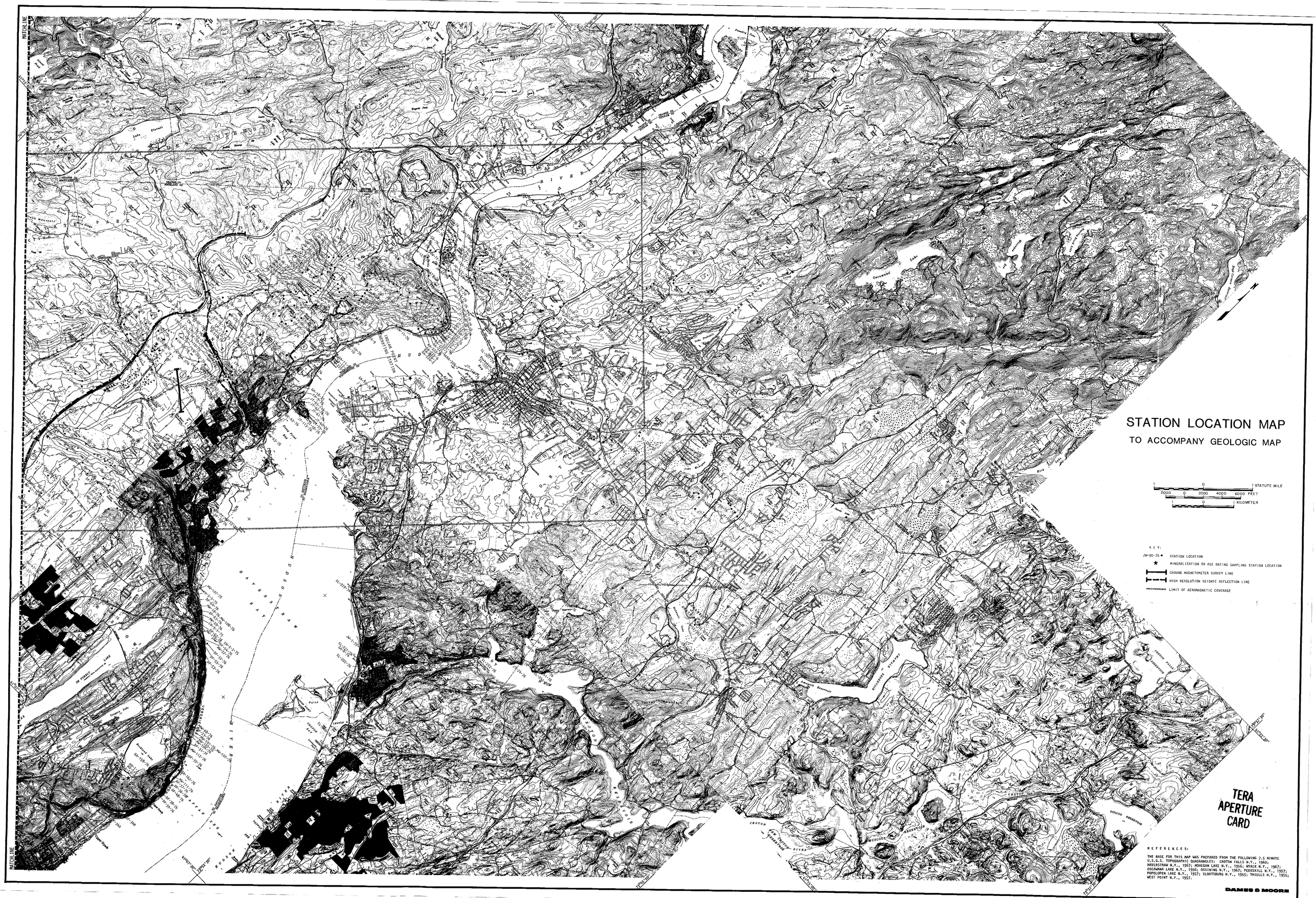


REFERENCES:

THE BASE FOR THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLES: CROTON FALLS N.Y., 1960; HAVERSTRAW N.Y., 1967; MOHEGAN LAKE N.Y., 1966; NYACK N.Y., 1967; OSCAWANA LAKE N.Y., 1956; OSSINING N.Y., 1967; PEEKSKILL N.Y., 1957; POPOLOPEN LAKE N.Y., 1957; SLOATSBURG N.Y., 1955; THIELLS N.Y., 1955; WEST POINT N.Y., 1957.

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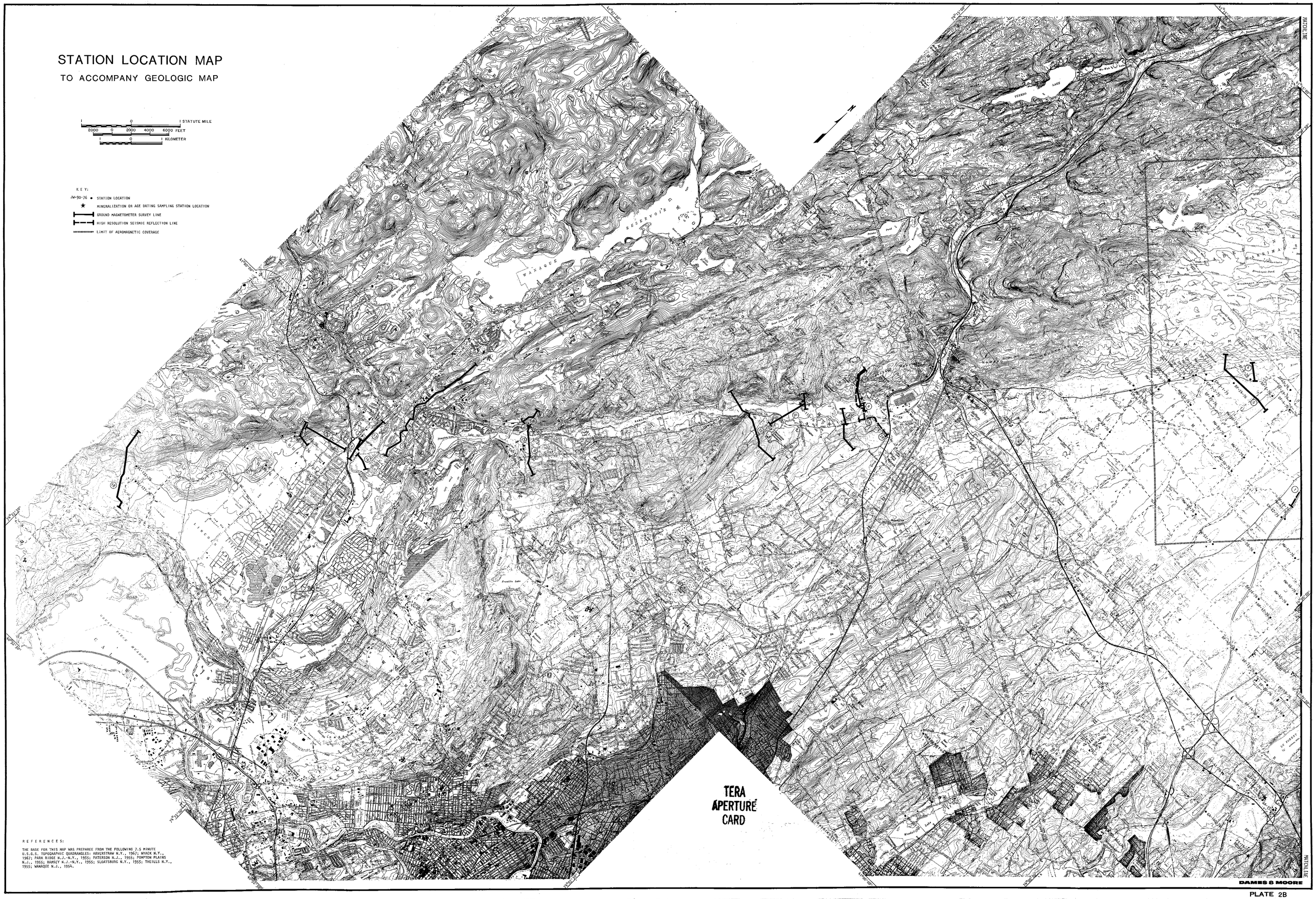
PLATE 2A

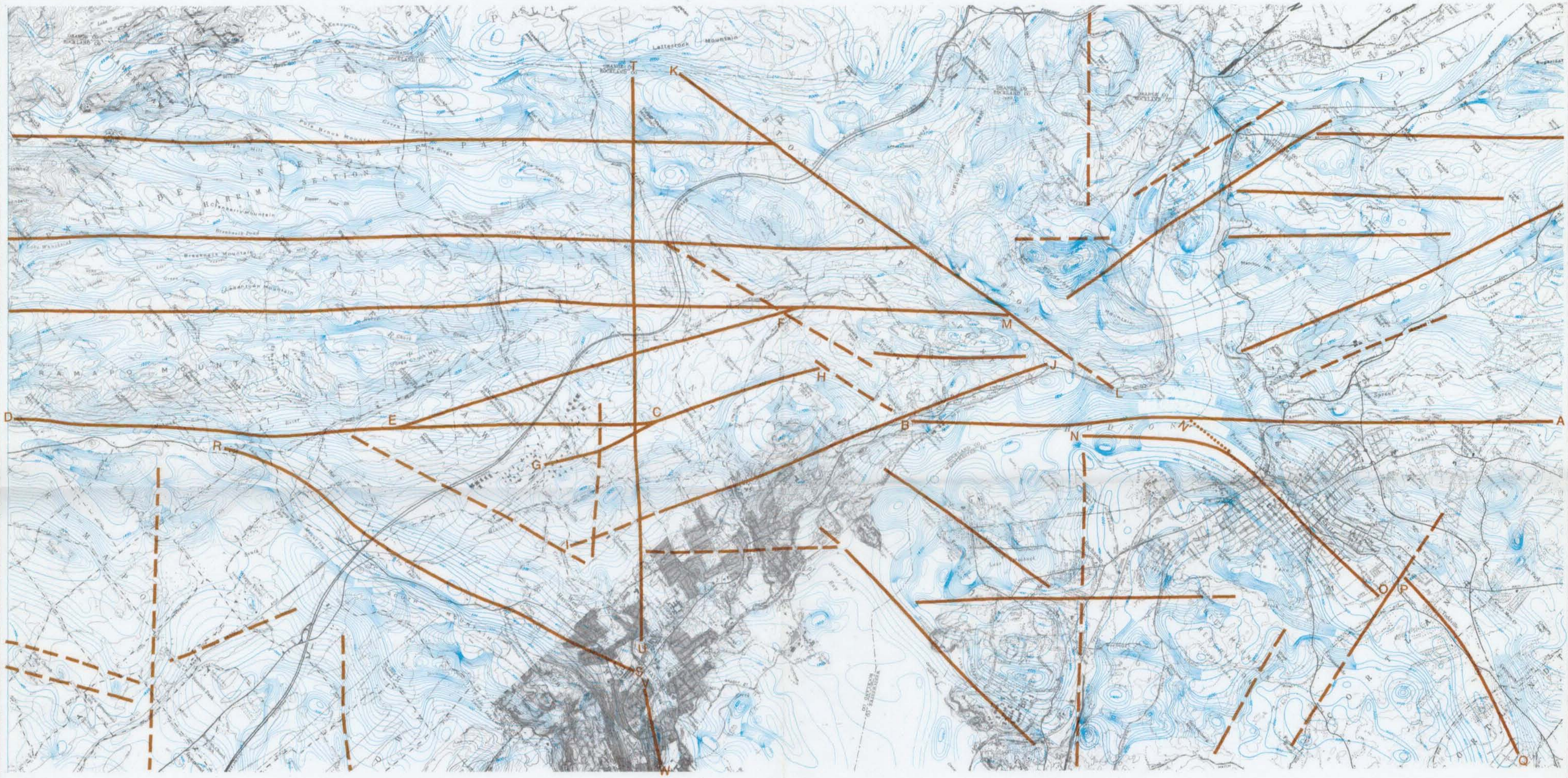
# STATION LOCATION MAP

## TO ACCOMPANY GEOLOGIC MAP




REFERENCES:

THE BASE FOR THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLES: HAVERSTRAW N.Y., 1967; WYCK N.Y., 1967; PARK RIDGE N.J.-N.Y., 1955; PATERSON N.J., 1955; POMPTON PLAINS N.J., 1955; RAMSEY N.J.-N.Y., 1955; THEILLS N.Y., 1955; WANAQUE N.J., 1954.




# AEROMAGNETIC MAP

## OF AREA SURROUNDING THE INDIAN POINT GENERATING STATION

TERA APERTURE CARD

1 0 1 MILE

1 0 1 KILOMETER

KEY:

MAGNETIC LINEARS

TOTAL FIELD CONTOURS

10 GAMMAS
100 GAMMAS

| | | |
|---|---|---|
| FLIGHT LINE DIRECTION | NW/SW | |
| FLIGHT LINE SPACING | 528 FEET | |
| FLIGHT ALTITUDE | 500 FEET | TERRAIN CLEARANCE |
| BASE VALUE | 54,985 | |

NOTE:
THIS OVERLAY IS AT THE SAME SCALE AS THE ACCOMPANYING GEOLOGIC MAPS, PLATES 1A AND 1B.

REFERENCE :
PRODUCED FOR DAMES & MOORE BY AIRMAG INC. PHILADELPHIA, PA.
FLOWN MARCH/APRIL 1976.
COMPILED APRIL/MAY 1976.

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