

BARNES 1

SURVEY
NOTEBOOK

1

BARNES - 1 - OXON HILL

★ TELEDYNE

416

FIELD / TRANSIT BOOK

DIAGONALS - 1X1 - 1.41
 2X2 - 2.82
 1X3 - 3.16

Feet	Meters
1	.3048
2	.6096
3	.9144
4	1.2192
5	1.5240
6	1.8288
7	2.1336
8	2.4384
9	2.7432
10	3.0480

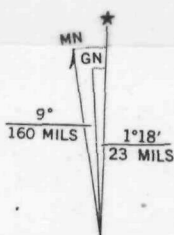
To convert feet to meters
 multiply by .3048

To convert meters to feet
 multiply by 3.2808

Property of _____

Address _____

Telephone _____



UTM GRID AND 1983 MAGNETIC NORTH
 DECLINATION AT CENTER OF SHEET

This Book is manufactured of a High Grade
 50% Rag Paper having a Water Resisting Surface,
 and is sewed with Nylon Waterproof Thread.

OXON HILL
1985

JULIE A. BARNES

TASK CODE - SURVEYING - B

INDEX

UNITS IN AREA I	19
PARTIAL LIST OF ELEVATIONS - AREA I	33, 55, 65, 70, 21, 63
DIMENSIONS - AREAS I - V	62
COORDINATES - AREAS I - V	62-63
BACKHOE TRENCHES - AREA III	76-79
BACKHOE TRENCHES - AREA IV	79-82
UNIT COORDINATES - AREA II	83-84
COORDINATES (2x2) & ELEV. - AREA IV	89-95, 100 104-105
ELEVATIONS - AREA II	112-115
ELEVATIONS - AREA V	116
AREA VI	31
FEATURE ELEV. (SELECTED) - AREA I	154
ELEVATIONS - AREA VI-A	118-128
ADDITIONAL ELEV. NORTH OF ROAD	128
ELEVATIONS - AREA VI-C	142-143
AREA VI-D	144
ADDITIONAL AREA VI ELEVATIONS	145
ELEVATIONS - AREA VI-B	150-153 (2:1-B)
K101001	147, 149

07 JAN 1985

AFTER CHECKING IN ETC. TOM SHOWED GINA
CUPSTID AND I THE SITE.

TWO AREAS OF CONCENTRATION EXIST ADJACENT TO
THE AREA TESTED PREVIOUSLY:

1: BETWEEN BASE LINE RIGHT OF WAY

STAKES 73+50 (I-295 NBR) AND
74+00 (I-295 NBR).

NORTH EDGE IS 22.93 m SOUTH/W. OF LINE.
APPROX 17.5 m WIDE (E/W)-18.34 (N/S)

2: BETWEEN APPROX 71+40 AND 72+30
15.29 m (N/S) AND 30.58 m (E/W)

08 JAN 1985

USING BLUE LINE (STATE OF MARYLAND, DEPT. OF TRANS.
ST. H'WAY ADMIN, STATE ROADS COMM.)(RIGHT OF WAY
PROJEC P 878-3D3-372) - APPROX. EXCAVATION
AREAS WERE CONVERTED TO METRIC AND PRELIMINARY
MAPS WERE DONE OF EACH AREA. THESE ARE
SUBJECT TO CHANGE WHEN PREVIOUS ARCHAEOLOGICAL
STAKES ARE TAKEN INTO CONSIDERATION AND THE
ACTUAL AREA LINE DESIGNATED.

PRELIMINARY AREA DIMENSIONS:

PRELIMINARY
MAP

2

AREA I	-	33.63 m	X	24.46 m	✓
AREA II	-	85.32 m	X	19.87 m	✓
AREA III	-	19.11 m	X	16.81 m	✓
AREA IV	-	32.11 m	X	27.52 m	✓
AREA V	-	9.93 m	X	7.64 m	✓

5.35 m BETWEEN AREAS I AND IV (WEST)

24.46 m BETWEEN AREAS I AND V (EAST)

AREAS I AND II SHARE A COMMON BORDER

AREA 2'S WEST EDGE BEGINS 9.48 m EAST OF

AREA 1'S WEST EDGE

11.62 m BETWEEN AREAS II AND V (NORTH/SOUTH)

21.40 m BETWEEN AREAS II AND III (EAST/WEST)

25.07 m BETWEEN AREAS III AND IV (SOUTH/NORTH)

AREAS ARE APPROX. 28° WEST OF NORTH INDICATED ON
BLUE LINE.

ORIGINAL LINE IS $69^{\circ} 20'$ FROM BENCH MARK A TO
BENCH MARK B

WE CHECKED THIS FIGURE ON ANOTHER LINE S218 E 200,
THE FIGURES WERE NOT THE SAME. WE THOUGHT

PERHAPS THAT THE LINES WERE OFF, BUT MEASUREMENT
INDICATED THAT THEY WERE OK.

SET UP ON BENCH MARK A AGAIN. THIS TIME
THE READING WAS $71^{\circ}20'$

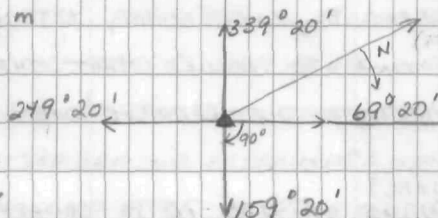
I THINK PERHAPS IT IS NOT THEY ORIGINAL GARD
BUT EITHER MYSELF OR THE TRANSIT.

WE AGAIN SET UP ON S 218 E 200 AND FOUND THE ORIGINAL $69^{\circ}20'$ ANGLE. THE DIFFERENCE INDICATES THAT IT IS THE INSTRUMENT (OR OPERATOR). THE LINE IS OK.

I WANT TO USE STAKE 5218 E 240 (?) AS
START DATUM FOR AREA 1. I THINK THE SAFEST
BET IS TO SET UP AT THIS POINT AND SHOOT
BACK TO 5218/E 200 ($249^{\circ}20'$ / $69^{\circ}20'$). TO TEST,

← I THINK 70° 0' EAST WAS THE INTENDED
ANGLE; THIS TO UTILIZE THE ROAD RATHER
THAN CLEAR WOODS. THE BLUE PIN FLAGS
GRIDDED THE HEAVILY WOODED AREAS.

— S 218/E 200 IS INSIDE AREA 1, SO AN AREA
BEHIND IT WILL HAVE TO BE GRIDDED AS WELL.
PROBABLY 1-2 m



DISREGARDED
THIS IDEA

09 JAN 1985

BILL ASSISTED IN SETTING UP THE TRANSIT -

BENCH MARKS LINED UP AT:

$67^{\circ}47'$ / THEN AT $67^{\circ}40'$

WE TESTED THE LINE AGAIN USING A NARROWER OBJECT ON THE BENCH MARK. - $67^{\circ}29'$ *

90' TO S 218 E 200 AND ESTABLISHED THE NEW E/W LINE AT S 220 E 200. THEN TURNED 90° E INTO AREA I - PUT IN STAKES AT 10 M INCREMENTS. AT S 220 E 230 A TRANSIT STATION WAS ESTABLISHED AND THE E/W LINE COMPLETED. A N/S LINE WAS THEN SHOT IN.

ONE STAKE WAS PLACED 5 M. FURTHER SOUTH TO THE SOUTHERN BOUNDARY OF AREA I. (S 225 E 230).

THE GRID EXTENDS JUST BEYOND THE AREA I BOUNDARY ON THE SOUTH, WEST AND IS BASICALLY FLUSH WITH ALL BUT THE NORTH WHERE IT IS APPROX 2-3 M. SOUTH. THIS SIDE IS ADJACENT TO AREA II AND WILL BE EXTENDED.

I NOW NEED TO, ONCE AGAIN, SET UP ON THE S 200 E 200 LINE TO ASSURE THAT THE GRID IS CONSISTENT WITH THE PREVIOUS ONE.

(DIAGONAL)
THE HYPOTENEUS OF THE 10 M SQUARE IS 14.14.

ON 10 JAN 1985 - NEED TO:

- CHECK S200 E200 LINE
- PUT IN ANY ADDITIONAL STAKES
- ESTABLISH 1 m GRID WITHIN THE 10m.

THE 10 m UNITS ARE: (X - HAVE BEEN SET UP)

X S 220 E 220	S 210 E 220 X
X S 220 E 230	S 210 E 230 X
X S 220 E 240	S 210 E 240 X
X S 220 E 250	S 210 E 250 X

S 200 E 220 X

S 200 E 230 X

S 200 E 240 (X)

X S 200 E 250 (X)

10 JAN 1985

LINED TRANSIT UP ON BENCH MARKS - LINED UP AT 70°06' TODAY THIS IS ~ 3° SOUTH OF YESTERDAY'S READING. RECHECKED AND EVERYTHING SEEMS IN ORDER. ALSO THE STAKES LINE UP WITHIN MINS OF THE 70°06' LINE. THE NAILS VARY SLIGHTLY BUT THIS IS MINIMAL.

USING THE TRANSIT, S200 E240 AND S200 E250 WERE PUT IN (S200 E250 WAS ALREADY IN LINE BUT WAS OFF THE GRID WE ESTABLISHED YESTERDAY) THE NEW S200 E250 STAKE IS 20 cm SOUTH OF ORIGINAL STAKE.

THE PRESENT LINE FALLS APPROX. 40 CM SOUTH OF BEACH M. B

- AREA 1 HAS BEEN GRIDDED ENTIRELY.

- A LINE AT S 215 WAS ESTABLISHED TO SET UP 1 m GRID WITHIN SHELTER. THIS AREA EXTENDS FROM S 215, E 240 TO S 215, E 227 AND S 213 TO S 216.

- THE GRID WILL CONTAIN 36 - 1 METER UNITS.

(
 DIAGONAL OF 1 m. UNIT = 1.41.
 DIAGONAL OF 1 m x 3 m = 3.16
)

THE SITE WILL BE GRIDDED ALONG THE PERIMETER WITH CROSSED STRINGS IN THE INTERIOR.

- THE BAULKS WILL CUT 15 CM OUT OF EACH UNIT AROUND THE 10 m. UNITS.

THE GRID PERIMETERS ARE IN SOME CASES OUTSIDE THE AREA:

S 220 E 210 (1 m. WEST)

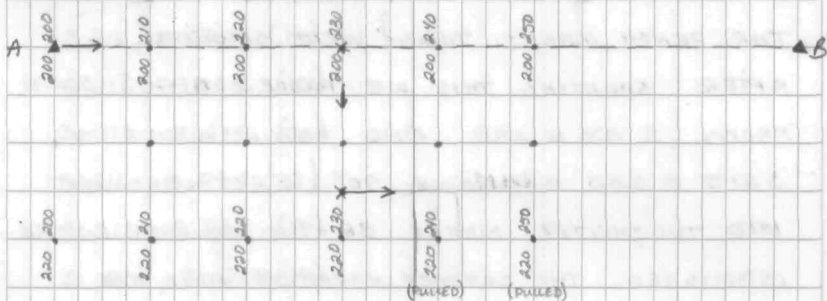
S 200 E 210 (EXACT BOUNDARY, 120 CM NORTH)

S 200 E 250 (^{APPROX} 2.5 m N, APPROX EXACT BOUNDARY)

S 220 LINE (APPROX 5 m N OF BOUNDARY)

- BECAUSE OF THE DISCREPANCY BETWEEN THE PRESENT GRID AND THE ORIGINAL WE WILL RESHOOT THE GRID OFF OF THE BENCH MARKS RATHER THAN

WITH THE COMPASS. THIS WILL MAKE THE GRID CONSISTENT REGARDLESS OF THE COMPASS ANGLE WHICH HAS BEEN INCONSISTENT



A LINE FROM S200/E200 TO S200/E230 WILL BE SHOT INITIALLY THEN TURNED 90° SOUTH. A LINE WILL THEN BE SHOT TO S215/E230 THEN TURNED ANOTHER 90° EAST TO GRID THE INTERIOR OF THE SHELTER.

ALTHOUGH THIS WILL BE TIME CONSUMING TO REDD THE GRID, IN THE LONG RUN IT WILL BE MORE ACCURATE AND EASIER TO LIVE WITH.

BETSY GROVE, DAVID MURACA AND DICK BRYANT HAVE AGREED TO HELP OUT. WE WORK WELL TOGETHER AND THE LINE SHOULD GO IN RAPIDLY.

11 JAN 1985

BETSY, DAVID, DICK AND I ARRIVED AT THE SITE ABOUT 8:15 AND SENT THE COMPUTERS TO THE LAB. WE THEN REESTABLISHED A BASE LINE BETWEEN THE BENCH MARKS. THINGS WENT SMOOTHLY. AFTER SHOOTING THIS WE PULLED A 90° SOUTH FROM S 800 E 220 AND AGAIN MOVED TO S 215 E 220 WHERE A 90° EAST WAS SHOT INTO THE SHELTER WHERE 36-1 m SQUARES WERE ESTABLISHED. THE SURFACE VARIATIONS MAKE THE SQUARES LESS THAN IDEAL. THE NAILS HAVE ALL BEEN MEASURED IN, BUT THE CROSS STRINGS INSIDE WAVER WITH GROUND SURFACE.

WE FINISHED REGRIDDING THE SITE - THINGS HAVE BEEN GOING SMOOTHLY. BECAUSE OF THE SHELTER WE WERE UNABLE TO VERIFY S 220 E 240, S 225, E 230. AND WE COULDN'T GET A SIGHT ON S 220 E 250. THESE STAKES WERE PULLED AND WILL BE REPLACED WHEN A CLEAR LINE IS POSSIBLE.

WE ALSO ADDED A STAKE AT S 230 E 220 THIS IS ABOUT 3 m. BEYOND THE EDGE OF AREA 1. THE BOUNDARIES ARE ARBITRARY, BUT AN ESTABLISHED STAKE OUTSIDE CAN GIVE BETTER REFERENCE IF NECESSARY. COMPLETED THE GRID AT APPROX. 2:00 P.M.

14 JAN 1985

UNITS - FIRST GRID, AREA I

S 216, E 239 (12) ✓

S 216, E 238 (13)

S 216, E 237 (14)

S 216, E 236 (15)

S 216, E 235 (16)

S 216, E 234 (17)

S 216, E 233 (18)

S 216, E 232 (19)

S 216, E 231 (20)

S 216, E 230 (21)

S 216, E 229 (22)

S 216, E 228 (23) ✓

S 215, E 239 (53)

S 215, E 238 (54)

S 215, E 237 (55)

S 215, E 236 (56)

S 215, E 235 (57)

S 215, E 234 (58)

S 215, E 233 (59)

S 215, E 232 (60)

S 215, E 231 (61)

S 215, E 230 (62)

S 215, E 229 (63)

S 215, E 228 (64)

15 JAN 1985

THE ENGLISH STADIA ROD WILL BE KEPT AND A METRIC TAPE ATTACHED. THIS WILL DO UNTIL THE METRIC ROD ARRIVES.

THE SHELTER WAS DOWN WHEN WE ARRIVED. WE SPENT ABOUT A HOUR RECONSTRUCTING IT. WHILE MUCH OF THIS WAS BEING DONE, DICK, ALLYSON AND I PUT IN THE EAST HALF OF THE GRID STARTED YESTERDAY. DICK AND I COMPLETED HALF OF IT.

THE DATUM PLACED AT THE TOP OF THE STAKE WAS KICKED OVER. DATUMS SEEM TO BE A PROBLEM. THEY SHOULD BE PULLED AT GROUND LEVEL FROM A DESIGNATED CORNER. THE ELEVATION OF THE CORNER CAN THEN BE TAKEN AND SURFACE (VERTICEE) CONTROL MAINTAINED.

THE REMAINDER OF THE DAY WAS SPENT CONSTRUCTING SHELTERS.

AFTER RETURNING FROM THE FIELD TOM AND I SPENT ABOUT AN HOUR DISCUSSING THE DATUM PROBLEM, NEW GRIDS, ETC. WE SCOPED OUT WHAT SHOULD BE DONE IN THE NEXT FEW DAYS TO STAY AHEAD OF THE CREWS AND KEEP EVERYONE BUSY:

WEDNESDAY - NEED TO SHOOT IN ELEVATIONS OF CORNERS.

OF 2 X 2 - NE CORNERS

- SKETCH IN LANDMARKS

- SKETCH IN SURFACE FEATURES

- COMPLETE GRID	}	S220 E240
IN 10 m SQUARES		S220 E230
LAY OUT 2 X 2'S		S220 E 220 (TO ERIS LINE)

KEEP FIELD MAPS, ETC IN LOOSE LEAF NOTEBOOK IN TRAILER.

TUESDAY PM -

DAVID CAME BY AT ABOUT 10:00 AND WE WENT OVER THE FIELD MAP OF AREA I AND WHAT TOM AND I DISCUSSED. WE AGREED THAT VEGETATION COULD BE PROBLEM IN ESTABLISHING A TRANSIT STATION AT S200, E200. S200 E230, HOWEVER, IS CENTRALLY LOCATED AND WOULD ALLOW A CLEAR LINE TO EACH BENCH MARK, AS WELL AS THE ENTIRE AREA.

16 JAN 1985

HAD A CREW CHIEF MEETING TO DISCUSS TIME SHEETS, ²/₃ DATUMS.

THE ONE METER STAKES WERE PULLED BETWEEN THE S 220 E 220 AND S 220 E 225 LINES.

A LINE WAS SHOT IN ALONG THE S 210 E/W LINE AND STAKES PLACED AT 2 m INTERVALS.

A SECOND LINE SOUTH OF THIS ONE AT S 212 WAS ESTABLISHED.

A "PERMANENT" TRANSIT STATION WAS ESTABLISHED AT S 200, E 230. THE TREE MARKING THE NORTH WEST AREA BOUNDARY WAS USED TO MAINTAIN CONTROL OF ELEVATIONS. ALL FUTURE ELEVATIONS IN AREA I WILL BE SHOT FROM THIS POINT.

TOM AND DICK ASSISTED THROUGHOUT THE DAY

A METRIC TAPE WILL BE TAPED TO THE ENGLISH STADIA ROD PROVIDING ELEVATIONS IN METRIC.

ALL ELEVATIONS WILL BE SHOT FROM S 200, E 230.

THE INSTRUMENT HEIGHT IS : 1.44

THE NAIL ELEVATION IS : (1.712 m)

RAW ELEV.

BENCH MARK (S 200, E 200) : $\begin{matrix} 2.652 \\ 2.502 \end{matrix}$ $\begin{matrix} 1.212 \\ 1.062 \end{matrix}$ BELOW S 200 E 230

BENCH MARK (S 200, E 300) : .50 $\begin{matrix} (1.44 + H) \\ (-H = .94) \end{matrix}$ 2.152

S 200, E 210 : (2.074) 2.074

S 200, E 220 : (1.57) 1.59

S 200, E 230 : .50 1.44 (INST. HEIGHT)

COORDINATES

RAW
ELEVATIONS

15

S 200 E 240	1.404
S 200 E 250	1.044
S 210 E 210	
S 210 E 220	1.66
S 210 E 222	.95
S 210 E 224	.936
S 210 E 226	.837
S 210 E 228	.642
S 210 E 230	.524
S 210 E 232	.48
S 210 E 234	.371
S 210 E 236	.38
S 210 E 238	.212
S 210 E 240	.08
S 212 E 220	1.22
S 212 E 222	.98
S 212 E 224	.824
S 212 E 226	.776
S 212 E 228	.61
S 212 E 230	.538
S 212 E 232	.462
S 212 E 234	.368
S 212 E 236	.336
S 212 E 238	.282
S 212 E 240	

AREA - UNITS
AREA
WMC ELEV.
ATIONS

16 COORDINATES

RAW
ELEVATIONS

S 214 E 220

.953

S 214 E 222

.856

S 214 E 224

.764

S 214 E 226

S 216 E 220

.862

S 216 E 222

.736

S 216 E 224

S 218 E 220

.804

S 218 E 222

.672

S 220 E 220

.717

S 220, E 218

S 218, E 218

S 216, E 218

S 214, E 218

S 212, E 218

S 210, E 218

S 210, E 216

S 212, E 216

S 214, E 216

S 216, E 216

S 218, E 216

S 220, E 216

S 216, E 235 (1.440 + .032)

1.472 ABOVE
S 200, E 230

(STAKES)

UNITS NOW EXTEND, EVERY 2 M. FROM S210, E220
 TO S210, E238; BACK TO S216 E239 TO S216 E220
 ALSO, SPIKES HAVE BEEN PLACED S220 E224 TO
 S220 E216

X
 S210 E220

X
 S216 E240

S220 E220

(2m)

SLITS - 1 VERT. AREA 1 - UNITS
 AREA 1 - UNITS
 VERT. RELEV.
 UNITS

17 JAN 1985

UNIT NUMBERS OF NEW LINES FOLLOW - AN ADDITIONAL LINE WILL BE PUT IN S 208, E 220 TO S 208 E 240 AND AT S 206, E 220, TO S 206, E 240.

DICK AND I PUT IN THE TWO NEW LINES. AFTER AN INITIAL SETUP PERIOD WE COMPLETED THE GRID BY ABOUT 2:30.

A MAJORITY OF THE FLAGS NOW CONTAIN TWO SETS OF NUMBERS. THE FIRST (S_, E_) IS THE GRID NUMBER. THE SECOND NUMBER, IN PARENTHESES IS THE UNIT NUMBER.

X INDICATES A 2 X 2 - ELEVATIONS HAVE BEEN, OR WILL BE, TAKEN ON THESE POINTS. FURTHERMORE, THESE COORDINATES WILL BE USED FOR MAIN UNIT DATUMS.

ADDITIONAL UNITS WILL BE ADDED TO THESE TO COMPLETE THE AREA. THESE WILL BE LOCATED NORTH OF THE S 206 LINE, SOUTH OF THE S 220 LINE, EAST OF THE E 240 LINE AND WEST OF THE E 216 LINE. THESE WILL COMPLETE THE AREA 1 GRID.

FIRST NUMBER IS GRID / SECOND NUMBER IS UNIT #.

19

X	S 212 E 216 (199)	S 211 E 216 (240)
X	S 212 E 218 (197)	S 211 E 218 (238)
	S 212 E 217 (198)	S 211 E 217 (239)
X	S 212 E 220 (195)	S 211 E 220 (236)
	S 212 E 219 (196)	S 211 E 219 (237)
X	S 212 E 222 (193)	S 211 E 222 (234)
	S 212 E 221 (194)	S 211 E 221 (235)
X	S 212 E 224 (191)	S 211 E 224 (232)
	S 212 E 223 (192)	S 211 E 223 (233)
X	S 212 E 226 (189)	S 211 E 226 (230)
	S 212 E 225 (190)	S 211 E 225 (231)
X	S 212 E 228 (187)	S 211 E 228 (228)
	S 212 E 227 (188)	S 211 E 227 (229)
X	S 212 E 230 (185)	S 211 E 230 (226)
	S 212 E 229 (186)	S 211 E 229 (227)
X	S 212 E 232 (183)	S 211 E 232 (224)
	S 212 E 231 (184)	S 211 E 231 (225)
X	S 212 E 234 (181)	S 211 E 234 (222)
	S 212 E 233 (182)	S 211 E 233 (223)
X	S 212 E 236 (179)	S 211 E 236 (220)
	S 212 E 235 (180)	S 211 E 235 (221)
X	S 212 E 238 (177)	S 211 E 238 (218)
	S 212 E 237 (178)	S 211 E 237 (219)
X	S 212 E 240 (175)	S 211 E 240 (216)
	S 212 E 239 (176)	S 211 E 239 (217)

X	S 210 E 216	(281)	S 209 E 216	(322)
	S 210 E 217	(280)	S 209 E 217	(321)
X	S 210 E 218	(279)	S 209 E 218	(320)
	S 210 E 219	(278)	S 209 E 219	(319)
X	S 210 E 220	(277)	S 209 E 220	(318)
	S 210 E 221	(276)	S 209 E 221	(317)
X	S 210 E 222	(275)	S 209 E 222	(316)
	S 210 E 223	(274)	S 209 E 223	(315)
X	S 210 E 224	(273)	S 209 E 224	(314)
	S 210 E 225	(272)	S 209 E 225	(313)
X	S 210 E 226	(271)	S 209 E 226	(312)
	S 210 E 227	(270)	S 209 E 227	(311)
X	S 210 E 228	(269)	S 209 E 228	(310)
	S 210 E 229	(268)	S 209 E 229	(309)
X	S 210 E 230	(267)	S 209 E 230	(308)
	S 210 E 231	(266)	S 209 E 231	(307)
X	S 210 E 232	(265)	S 209 E 232	(306)
	S 210 E 233	(264)	S 209 E 233	(305)
X	S 210 E 234	(263)	S 209 E 234	(304)
	S 210 E 235	(262)	S 209 E 235	(303)
X	S 210 E 236	(261)	S 209 E 236	(302)
	S 210 E 237	(260)	S 209 E 237	(301)
X	S 210 E 238	(259)	S 209 E 238	(300)
	S 210 E 239	(258)	S 209 E 239	(299)
X	S 210 E 240	(257)	S 209 E 240	(298)

X S 208 E 216 (363)

S 207 E 216 (404)

S 208 E 217 (362)

S 207 E 217 (403)

X S 208 E 218 (361)

S 207 E 218 (402)

S 208 E 219 (360)

S 207 E 219 (401)

X S 208 E 220 (359)

S 207 E 220 (400)

S 208 E 221 (358)

S 207 E 221 (399)

X S 208 E 222 (357)

S 207 E 222 (398)

S 208 E 223 (356)

S 207 E 223 (397)

X S 208 E 224 (355)

S 207 E 224 (396)

S 208 E 225 (354)

S 207 E 225 (395)

X S 208 E 226 (353)

S 207 E 226 (394)

S 208 E 227 (352)

S 207 E 227 (393)

X S 208 E 228 (351)

S 207 E 228 (392)

S 208 E 229 (350)

S 207 E 229 (391)

X S 208 E 230 (349)

S 207 E 230 (390)

S 208 E 231 (348)

S 207 E 231 (389)

X S 208 E 232 (347)

S 207 E 232 (388)

S 208 E 233 (346)

S 207 E 233 (387)

X S 208 E 234 (345)

S 207 E 234 (386)

S 208 E 235 (344)

S 207 E 235 (385)

X S 208 E 236 (343)

S 207 E 236 (384)

S 208 E 237 (342)

S 207 E 237 (383)

X S 208 E 238 (341)

S 207 E 238 (382)

S 208 E 239 (340)

S 207 E 239 (381)

X S 208 E 240 (339)

S 207 E 240 (380)

X S 206 E 216 (445)	S 205 E 216 (486)
S 206 E 217 (444)	S 205 E 217 (485)
X S 206 E 218 (443)	S 205 E 218 (484)
S 206 E 219 (442)	S 205 E 219 (483)
X S 206 E 220 (441)	S 205 E 220 (482)
S 206 E 221 (440)	S 205 E 221 (481)
X S 206 E 222 (439)	S 205 E 222 (480)
S 206 E 223 (438)	S 205 E 223 (479)
X S 206 E 224 (437)	S 205 E 224 (478)
S 206 E 225 (436)	S 205 E 225 (477)
X S 206 E 226 (435)	S 205 E 226 (476)
S 206 E 227 (434)	S 205 E 227 (475)
X S 206 E 228 (433)	S 205 E 228 (474)
S 206 E 229 (432)	S 205 E 229 (473)
X S 206 E 230 (431)	S 205 E 230 (472)
S 206 E 231 (430)	S 205 E 231 (471)
X S 206 E 232 (429)	S 205 E 232 (470)
S 206 E 233 (428)	S 205 E 233 (469)
X S 206 E 234 (427)	S 205 E 234 (468)
S 206 E 235 (426)	S 205 E 235 (467)
X S 206 E 236 (425)	S 205 E 236 (466)
S 206 E 237 (424)	S 205 E 237 (465)
X S 206 E 238 (423)	S 205 E 238 (464)
S 206 E 239 (422)	S 205 E 239 (463)
X S 206 E 240 (421)	S 205 E 240 (462)

X S 204 E 216 (527)	S 203 E 216 (568)
S 204 E 217 (524)	S 203 E 217 (567)
X S 204 E 218 (525)	S 203 E 218 (566)
S 204 E 219 (524)	S 203 E 219 (565)
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S 204 E 221 (522)	S 203 E 221 (563)
X S 204 E 222 (521)	S 203 E 222 (562)
S 204 E 223 (520)	S 203 E 223 (561)
X S 204 E 224 (519)	S 203 E 224 (560)
S 204 E 225 (518)	S 203 E 225 (559)
X S 204 E 226 (517)	S 203 E 226 (558)
S 204 E 227 (516)	S 203 E 227 (557)
X S 204 E 228 (515)	S 203 E 228 (556)
S 204 E 229 (514)	S 203 E 229 (555)
X S 204 E 230 (513)	S 203 E 230 (554)
S 204 E 231 (512)	S 203 E 231 (553)
X S 204 E 232 (511)	S 203 E 232 (552)
S 204 E 233 (510)	S 203 E 233 (551)
X S 204 E 234 (509)	S 203 E 234 (550)
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X S 204 E 236 (507)	S 203 E 236 (548)
S 204 E 237 (506)	S 203 E 237 (547)
X S 204 E 238 (505)	S 203 E 238 (546)
S 204 E 239 (504)	S 203 E 239 (545)
X S 204 E 240 (503)	S 203 E 240 (544)

S 222 E 216 (936)	S 223 E 216 (911)	S 224 E 216 (889)
S 222 E 217 (935)	S 223 E 217 (910)	S 224 E 217 (888)
S 222 E 218 (934)	S 223 E 218 (909)	S 224 E 218 (887)
S 222 E 219 (933)	S 223 E 219 (908)	S 224 E 219 (886)
S 222 E 220 (932)	S 223 E 220 (907)	S 224 E 220 (885)
S 222 E 221 (931)	S 223 E 221 (906)	S 224 E 221 (884)
S 222 E 222 (930)	S 223 E 222 (905)	S 224 E 222 (883)
S 222 E 223 (929)	S 223 E 223 (904)	S 224 E 223 (882)
S 222 E 224 (928)	S 223 E 224 (903)	S 224 E 224 (881)
S 222 E 225 (927)	S 223 E 225 (902)	S 224 E 225 (880)
S 222 E 226 (926)	S 223 E 226 (901)	S 224 E 226 (879)
S 222 E 227 (925)	S 223 E 227 (900)	S 224 E 227 (878)
S 222 E 228 (924)	S 223 E 228 (899)	S 224 E 228 (877)
S 222 E 229 (923)	S 223 E 229 (898)	S 224 E 229 (876)
S 222 E 230 (922)	S 223 E 230 (897)	S 225 E 216 (869)
S 222 E 231 (921)	S 223 E 231 (896)	S 225 E 217 (868)
S 222 E 232 (920)	S 226 E 216 (852)	S 225 E 218 (867)
S 222 E 233 (919)	S 226 E 217 (851)	S 225 E 219 (866)
S 222 E 234 (918)	S 226 E 218 (850)	S 225 E 220 (865)
S 227 E 216 (837)	S 226 E 219 (849)	S 225 E 221 (864)
S 227 E 217 (836)	S 226 E 220 (848)	S 225 E 222 (863)
S 227 E 218 (835)	S 226 E 221 (847)	S 225 E 223 (862)
S 227 E 219 (834)	S 226 E 222 (846)	S 225 E 224 (861)
S 227 E 220 (833)	S 226 E 223 (845)	S 225 E 225 (860)
S 227 E 221 (832)	S 226 E 224 (844)	S 225 E 226 (859)

S 213 E 216 (158)

S 214 E 216 (117)

S 213 E 217 (157)

S 214 E 217 (116)

S 213 E 218 (156)

S 214 E 218 (115)

S 213 E 219 (155)

S 214 E 219 (114)

S 213 E 220 (154)

S 214 E 220 (113)

S 213 E 221 (153)

S 214 E 221 (112) ✓

S 213 E 222 (152)

S 214 E 222 (111) ✓

S 213 E 223 (151)

S 214 E 223 (110)

S 213 E 224 (150)

S 214 E 224 (109)

S 213 E 225 (149)

S 214 E 225 (108)

S 213 E 226 (148)

S 214 E 226 (107)

S 213 E 227 (147)

S 214 E 227 (106)

S 213 E 228 (146)

S 214 E 228 (105)

S 213 E 229 (145)

S 214 E 229 (104)

S 213 E 230 (144)

S 214 E 230 (103)

S 213 E 231 (143)

S 214 E 231 (102)

S 213 E 232 (142)

S 214 E 232 (101)

S 213 E 233 (141)

S 214 E 233 (100)

S 213 E 234 (140)

S 214 E 234 (99)

S 213 E 235 (139)

S 214 E 235 (98)

S 213 E 236 (138)

S 214 E 236 (97)

S 213 E 237 (137)

S 214 E 237 (96)

S 213 E 238 (136)

S 214 E 238 (95)

S 213 E 239 (135)

S 214 E 239 (94)

S 215 E 216 (76)	S 216 E 216 (35)
S 215 E 217 (75)	S 216 E 217 (34)
S 215 E 218 (74)	S 216 E 218 (33)
S 215 E 219 (73)	S 216 E 219 (32)
S 215 E 220 (72)	S 216 E 220 (31)
S 215 E 221 (71)	S 216 E 221 (30)
S 215 E 222 (70)	S 216 E 222 (29)
S 215 E 223 (69)	S 216 E 223 (28)
S 215 E 224 (68)	S 216 E 224 (27)
S 215 E 225 (67)	S 216 E 225 (26)
S 215 E 226 (66)	S 216 E 226 (25)
S 215 E 227 (65)	S 216 E 227 (24)
S 215 E 228 (64)	S 216 E 228 (23)
S 215 E 229 (63)	S 216 E 229 (22)
S 215 E 230 (62)	S 216 E 230 (21)
S 215 E 231 (61)	S 216 E 231 (20)
S 215 E 232 (60)	S 216 E 232 (19)
S 215 E 233 (59)	S 216 E 233 (18)
S 215 E 234 (58)	S 216 E 234 (17)
S 215 E 235 (57)	S 216 E 235 (16)
S 215 E 236 (56)	S 216 E 236 (15)
S 215 E 237 (55)	S 216 E 237 (14)
S 215 E 238 (54)	S 216 E 238 (13)
S 215 E 239 (53)	S 216 E 239 (12)

S 217 E 216	(814)			S 218 E 216	(773)		
S 217 E 217	(813)			S 218 E 217	(772)		
S 217 E 218	(812)			S 218 E 218	(771)		
S 217 E 219	(811)			S 218 E 219	(770)		
S 217 E 220	(810)			S 218 E 220	(769)		
S 217 E 221	(809)			S 218 E 221	(768)		
S 217 E 222	(808)			S 218 E 222	(767)		
S 217 E 223	(807)			S 218 E 223	(766)		
S 217 E 224	(806)			S 218 E 224	(765)		
S 217 E 225	(805)			S 218 E 225	(764)		
S 217 E 226	(804)			S 218 E 226	(763)		
S 217 E 227	(803)			S 218 E 227	(762)		
S 217 E 228	(802)			S 218 E 228	(761)		
S 217 E 229	(801)			S 218 E 229	(760)		
S 217 E 230	(800)			S 218 E 230	(759)		
S 217 E 231	(799)			S 218 E 231	(758)		
S 217 E 232	(798)			S 218 E 232	(757)		
S 217 E 233	(797)			S 218 E 233	(756)		
S 217 E 234	(796)			S 218 E 234	(755)		
S 217 E 235	(795)			S 218 E 235	(754)		
S 217 E 236	(794)			S 218 E 236	(753)		
S 217 E 237	(793)			S 218 E 237	(752)		
S 217 E 238	(792)			S 218 E 238	(751)		
S 217 E 239	(791)			S 218 E 239	(750)		

5219 E216 (732)	5220 E216 (691)	5221 E216 (963)
5219 E217 (731)	5220 E217 (690)	5221 E217 (962)
5219 E218 (730)	5220 E218 (689)	5221 E218 (961)
5219 E219 (729)	5220 E219 (688)	5221 E219 (960)
5219 E220 (728)	5220 E220 (687)	5221 E220 (959)
5219 E221 (727)	5220 E221 (686)	5221 E221 (958)
5219 E222 (726)	5220 E222 (685)	5221 E222 (957)
5219 E223 (725)	5220 E223 (684)	5221 E223 (956)
5219 E224 (724)	5220 E224 (683)	5221 E224 (955)
5219 E225 (723)	5220 E225 (682)	5221 E225 (954)
5219 E226 (722)	5220 E226 (681)	5221 E226 (953)
5219 E227 (721)	5220 E227 (680)	5221 E227 (952)
5219 E228 (720)	5220 E228 (679)	5221 E228 (951)
5219 E229 (719)	5220 E229 (678)	5221 E229 (950)
5219 E230 (718)	5220 E230 (677)	5221 E230 (949)
5219 E231 (717)	5220 E231 (676)	5221 E231 (948)
5219 E232 (716)	5220 E232 (675)	5221 E232 (947)
5219 E233 (715)	5220 E233 (674)	5221 E233 (946)
5219 E234 (714)	5220 E234 (673)	
5219 E235 (713)	5220 E235 (672)	5228 E216 (825)
5219 E236 (712)	5220 E236 (671)	5228 E217 (824)
5219 E237 (711)	5220 E237 (670)	5228 E218 (823)
5219 E238 (710)	5220 E238 (669)	5228 E219 (822)
5219 E239 (709)		5228 E220 (821)

10 JAN 1985

THE GRID IS NOW SEVERAL DAYS AHEAD OF THE EXCAVATORS. NO ELEVATIONS HAVE BEEN TAKEN ON THE S208 OR S206 LINES BECAUSE OF SNOW. AS SOON AS THE GROUND IS VISIBLE THESE CAN BE SHOT IN. ELEVATIONS ARE ALSO NEEDED FOR UNITS IN THE SOUTHWEST PORTION OF THE SITE BETWEEN S212 AND S220. THESE CAN ALSO BE DONE WHEN SNOW THAWS. MOREOVER, THE INITIAL EXCAVATION AREAS MUST BE SHOT IN.

THERE IS ROOM IN THE NORTHERN EDGE OF AREA I FOR TWO MORE LINES AT 2 M. INTERVALS. THESE WILL BE ESTABLISHED WHEN NECESSARY - S202 AND S204. ADDITIONAL UNITS MAY BE PLACED EAST OF THE E240 LINE AND BETWEEN THE E210 AND E216 LINES. UNITS MAY (OR MAY NOT) EXTEND BACK TO THE S230 LINE. THESE HAVE NOT YET BEEN ESTABLISHED.

BECAUSE OF A FEATURE WHICH WILL BE FOLLOWED SOUTH FROM UNIT 16 (S216, E235) AN ELEVATION WAS SHOT AT THIS POINT. THE DATUM WAS ABOVE THE CROSS HAIR BY 3.2 CM (.032 M) ADDED TO THE INSTRUMENT HEIGHT OF 1.454, THE ELEVATION ABOVE S200, E230 IS 1.486. NO ADDITIONAL SURVEY OR MAPPING WORK WAS NECESSARY.

SPENT THE REMAINDER OF THE DAY ASSISTING DICK FOR A CHANGE.

21 JAN 1985

BECAUSE OF LOW TEMPERATURES WE ARE NOT IN THE FIELD TODAY

MANAGED TO COMPLETE HALF OF THE LISTS OF UNITS

22 JAN 1985

WILL SPEND THE MORNING COMPLETING LISTS OF UNITS
NOTHING SPECIFIC YET NEEDS TO BE SURVEYED OR
DRAWN. COMPLETED THESE AT ABOUT 11:00.

AFTER LUNCH I ASSISTED DICK FOR A WHILE.

ESTHER WAS NOT FEELING WELL, SO AT 1:30 I
TOOK OVER AS SCREEN CREW CHIEF.

TOOK THE LISTS TO BRUCE TO BE COPIED - THEY SHOULD
BE COMPLETE NEXT WEEK.

BEFORE LUNCH I HAD ANOTHER DISCUSSION WITH BILL
BRYANT ABOUT THE DATUM. HE FEELS THE DATUM
SYSTEM IS INEFFICIENT AND WILL CREATE ADDITIONAL
WORK. DAVID, LORETTA AND I TRIED TO CONVINCE HIM
THAT, ALTHOUGH HIS SYSTEM WAS GOOD, THE Q GROUND
SURFACE SYSTEM WAS ALSO CORRECT. MORE CONFUSION
AMONG THE CREW WOULD OCCUR WHEN DEALING WITH
ADDITIONAL NUMBERS (WHICH ARE ARBITRARY, ALSO
REQUIRING POST FIELD COMPUTATIONS).

HOPEFULLY, THE ISSUE IS CLOSED. I TOLD HIM THE
CURRENT METHOD REMAINED BECAUSE IT WAS THE WAY
GARROW & ASSOC. WANTED IT.

23 JAN 1985

AREA VI, THE LARGEST AREA TO BE INVESTIGATED
CONTAINS FOUR (4) AREAS TO BE EXCAVATED.

AREA VI-A: 30 m (APPROX) X 17.5 (EAST), 25 (WEST)

THE SOUTHERN EDGE BOUNDS ON THE RIGHT
WHICH IS 8m SOUTH OF THE ROAD.
OF WAY LINE. THE EASTERN EDGE IS

5m WEST OF S 200, E 320

THE WEST EDGE IS 5m WEST OF

S 200, E 290.

EXTENDS NORTH 15 m FROM S 200, E 290

AND APPROX. 8 m SOUTH. (AND EAST

30 m) (AREA VI-A EXTENDS FROM RW TO S 182, E 285-E 315)

AREA VI-B: IS 45 m X 55 m. THE AREA IS

IRREGULARLY SHAPED.

THE WEST EDGE EXTENDS 45 m BETWEEN

THE RIGHT OF WAY LINE AND THE FENCE

LINE 5 m EAST OF THE E 350 GRID

LINE. IT CONTINUES FOR 55 m

ALONG THE FENCE LINE (NORTH) AND

35 m ALONG THE RIGHT OF WAY.

AT S 170, E 380 THE LINE MOVES.

THE LINE CONTINUES ALONG THE S 170

LINE TO END THE AREA AT S 170, E 410

THE EAST AREA BOUNDARY FALLS ON

THE E 410 LINE.

(E 355-E 410, FENCE TO RW)

AREA VI-B : A SMALL AREA ALONG THE RIGHT OF WAY
 (CONT.) LINE 15 m LONG AND 3 m WIDE
 BEGINS APPROX 9 m FROM THE E 410
 LINE AT THE NW CORNER AND 10 m TO
 SW CORNER. THE EAST EDGE IS APPROX
 6 m FROM THE E 440 LINE AT THE NE
 CORNER AND 5 m AT THE SE CORNER.
 SOUTH EDGE RUNS ALONG RIGHT OF WAY.

AREA VI-C: IS A SMALL SQUARE AREA 10 m X 10 m
 WHOSE WEST EDGE BEGINS 5 m EAST OF
 THE E 470 LINE. THE AREA EXTENDS APPROX 4 m
 SOUTH OF THE S 140 LINE AND 6 m NORTH
 OF THIS LINE. SOUTHEAST CORNER EXTENDS
 INTO CURRENT ACCESS ROAD. (E 475 - E 485)
 (S 134 - S 144)

AREA VI-D: IS A SMALL RECTANGULAR AREA ≈ 2.75 m X
 10 m. THE WEST EDGE IS 5 m EAST
 OF THE E 500 LINE AND IS ABOUT 2 m
 NORTH OF THE S 140 LINE. BETWEEN ROADS
 (E 505 - E 515, S 134.5 - S 137.5)
 CLOSEST TO PREVIOUS ROAD AT NE CORNER.

THESE AREAS WILL BE MEASURED AND FLAGGED WITH
 PINK FLAGGING. THIS IS JUST A CURSORY SURVEY
 WITH AN EXACT GRID ESTABLISHED LATER.

THE GRID FOR THESE AREAS WILL BE RELATIVELY
 EASY TO ESTABLISH. PREVIOUS STAKES ARE IN GOOD
 CONDITION AND CONSISTENTLY PLACED. AND AREAS ARE
 DELINEATED IN TERMS OF THIS GRID.

24 JAN 1985

TODAY I WILL SHOOT IN ELEVATIONS ON THE ESTABLISHED GRID. IT WOULD BE NICE TO COMPLETE EACH OF THESE SO TRANSCRIBING TO ABOVE BENCHMARK ELEVATIONS. COULD BE DONE, HOWEVER, SHELTERS, PLASTIC, SNOW ET. PREVENT THIS. MOST HAVE BEEN OBTAINED.

I WILL DUPLICATE THE AREA MAP WITH THE UNITS TONIGHT SO FINISHED AREAS CAN BE DELINEATED. TO COLOR CODE THE MAP BY CREW CHIEF WOULD ADD AN ADDITIONAL CONTROL.

SHOT IN AS MANY ELEVATIONS AS POSSIBLE.

ASSISTED DICK FOR MOST OF THE AFTERNOON.

BROKE DOWN THE TRANSIT AT ABOUT 3:50 WHEN IT SEEMED NO OTHER ELEVATIONS WOULD BE SHOT TODAY.

WILL CONTINUE WORK ON THE MAP THIS EVENING. NEED A COUPLE OF ITEMS:

✓ COLORED PENCILS

✓ .5 LEAD

EARLIER ELEVATIONS ARE ON PAGES 14, 15, 16.

SEVERAL OF THESE WERE TRANSFERRED TO THE FOLLOWING PAGES. SOME ELEVATIONS, HOWEVER, REMAIN IN THE PREVIOUS ENTRY. ALSO, ELEVATIONS ON 1X15 WILL BE TAKEN FOR THE INITIAL GRID OPENED.

INSTRUMENT HEIGHT IS 1.44 M. AT 5000, E230

34

2x2	RAW ELEV.	2x2	RAW ELEV.	2x2	RAW ELEV.
S 206 E 216	1.402	S 210 E 216		S 214 E 216	
S 206 E 218	1.254	S 210 E 218		S 214 E 218	
S 206 E 220	1.14	S 210 E 220	1.66	S 214 E 220	.955
S 206 E 222	1.0	S 210 E 222	.95	S 214 E 222	.856
S 206 E 224	.921	S 210 E 224	.986	S 214 E 224	.764
S 206 E 226	.84	S 210 E 226	.837	S 214 E 226	.641
S 206 E 228	.749	S 210 E 228	.642	S 214 E 228	.538
S 206 E 230	.687	S 210 E 230	.524	S 214 E 230	.538
S 206 E 232	.67	S 210 E 232	.48	S 214 E 231	.300
S 206 E 234	.672	S 210 E 234	.371	S 214 E 232	.272
S 206 E 236	.654	S 210 E 236	.38	S 214 E 236	(TAKE BOTTOM ELEV. ADD UNIT DEPTH)
S 206 E 238	.67	S 210 E 238	.212	S 214 E 238	(TAKE BOTTOM ELEV. ADD UNIT DEPTH) (SEE UNIT 95)
S 206 E 240	.636	S 210 E 240	.08	S 214 E 240	
S 208 E 216	1.42	S 212 E 216		S 216 E 216	
S 208 E 218	1.316	S 212 E 218		S 216 E 218	.99
S 208 E 220	1.194	S 212 E 220	1.22	S 216 E 220	.852
S 208 E 222	1.081	S 212 E 222	.98	S 216 E 222	.736
S 208 E 224	.936	S 212 E 224	.824	S 216 E 224	.610
S 208 E 226	.80	S 212 E 226	.776	S 216 E 226	.443
S 208 E 228	.661	S 212 E 228	.61	S 216 E 228	.324
S 208 E 230	.60	S 212 E 230	.538	S 216 E 230	.225
S 208 E 232	.591	S 212 E 232	.462	S 216 E 231	.248
S 208 E 234	.54	S 212 E 234	.368	S 216 E 232	.227
S 208 E 236	.571	S 212 E 236	.336	S 216 E 233	
S 208 E 238	.510	S 212 E 238	.282	S 216 E 234	
S 208 E 240	.475	S 212 E 240		S 216 E 236	
				S 216 E 238	
				S 216 E 240	
				(S 216 E 235 = +.032)	

2X 2	RAW ELEV	2X 2	ELEV	2X 2	ELEV
S218 E 216					
S218 E 218	.898				
S218 E 220	.701				
S218 E 222	.626				
S218 E 224	.505				
S218 E 226	.086				
S218 E 228					
S218 E 230					
S218 E 232					
S218 E 234					
S218 E 236					
S218 E 238					
S218 E 240					
S220 E 216	.905				
S220 E 218	.750				
S220 E 220	.698				
S220 E 222	.565				
S220 E 224	.320				
S220 E 226					
S220 E 228					
S220 E 230					
S220 E 232					
S220 E 234					
S220 E 236					
S220 E 238					
S220 E 240					

25 JAN 1985

CREW CHIEF MEETING AT 8:30. DISCUSSED FEATURE NUMBERING SYSTEM. - F/1/0/0000/000

- 1 - NORTH HALF OF FEATURE
- 2 - SOUTH HALF OF FEATURE
- 3 - EAST HALF OF FEATURE
- 4 - WEST HALF OF FEATURE
- 5 - NE QUARTER OF FEATURE
- 6 - SE QUARTER OF FEATURE
- 7 - NW QUARTER OF FEATURE
- 8 - SW QUARTER OF FEATURE
- 9 - TECHNIQUE NOT INCLUDED ABOVE.

FIRST NUMBER OF THE THREE DIGIT CODE WILL BE A LETTER A-Z INDICATING FEATURE TYPE

SECOND & THIRD DIGITS WILL INDICATE TECHNIQUES AS NOTED ABOVE. AND ADDITIONAL OUT OF ORDINARY CIRCUMSTANCES.

SHOT IN ADDITIONAL ELEVATIONS TODAY WHILE THE AREAS WERE UNCOVERED. THESE WERE ADDED TO ELEVATIONS ON PAGES 34-35.

ADDITIONAL UNITS WILL BE LAID OUT AND SHOT IN THESE WILL ALSO BE INCLUDED ON PGS 34-35 AND PGS 20-28

THE ORANGE BOUNDARY MARKERS PLACED BY TOM ARE
 AT APPROX. S 216 E 245 AND AT S 228 E 216
 THESE MARK THE SOUTHERN BOUNDARY OF THE AREA,
 BUT IT IS UNCLEAR WHETHER THESE MARK THE
 EAST AND WEST BOUNDARIES ALSO. IF SO, THE
 ADDITIONAL GRID WILL BE MINIMAL.

DICK AND I EXTENDED THE SOUTHERN LINK TO S 222.

THE ADDITIONAL 2X25 ARE:

S 222 E 216	S 220 E 222	S 218 E 222
S 222 E 218	S 220 E 224	S 218 E 224
S 222 E 220	S 220 E 226	S 218 E 226
S 222 E 224	S 220 E 228	S 218 E 228
S 222 E 226	S 220 E 230	S 218 E 230
S 222 E 228	S 220 E 232	S 218 E 232
S 222 E 230		

THE COLOR CODED SITE MAP WAS FILLED IN TO DATE. I
 THINK THIS METHOD IS GOING TO PROVIDE A GOOD RUNNING
 ACCOUNT OF FIELD PROGRESS ON A DAILY BASIS.

THE CREW CHIEF COLORS ARE:

BRENDA
 ANDREA

ESTHER

CHUCK

LORETTA

DAVID M.

BILL

JEFF

26 JAN 1985

WORKING ON SATURDAY DUE TO POOR WEATHER ON MONDAY.

I UPDATED THE UNIT LISTS TO INCLUDE THE 2 X 23 ESTABLISHED YESTERDAY. THE S 222 LINE IS OUTSIDE THE NUMBERED AREA. THIS WILL BE COMPLETED WHEN THE FULL EXTENT OF THE SOUTH EDGE OF THE AREA IS KNOWN. AT THE SOUTHWEST CORNER OF THE AREA THE SOUTH EDGE EXTENDS TO S 228. THE SOUTHEAST END, AS IT STANDS, EXTENDS TO S 216. THE LINE DELINEATING THE SOUTHERN EDGE ESSENTIALLY PARALLELS THE RIGHT OF WAY.

FEATURES ETC WILL BE PLACED ON THE CLEAN MAP GIVING A RELATIVE RELATIONSHIP BETWEEN THESE. - FEATURES TO DATE WERE PLACED ON SITE MAP BECAUSE MUCH OF THE CREW LEFT AT NOON, TOM CALLED THE DAY EARLY. DAVID AND I WILL SPEND THE AFTERNOON TRYING TO RECTIFY THE EARLY DATUM CONFUSION. WE TOOK ELEVATIONS FROM THE TOP OF STAKE S 215, E 240 TO GROUND SURFACE. : 23 cm

THEN AN ELEVATION FROM THE TOP OF THE TREE STUMP USED FOR SEVERAL DATUMS TO GROUND SURFACE WAS TAKEN : 24 cm

THEN THE DEPTH OF UNIT 21 WAS TAKEN TO

DETERMINE HOW HIGH THE TOP OF THE STAKE WAS FROM GROUND SURFACE - 24 cm

THESE DATUMS WERE USED FOR A NUMBER OF UNIT ELEVATIONS TAKEN THE FIRST WEEK DIGGING. BY SUBTRACTING THE STAKE OR STUMP HEIGHT THE CORRECT BELOW SURFACE ELEVATIONS WILL BE KNOWN.

AS IT TURNED OUT NO ELEVATIONS WERE TAKEN FROM THE S215, E230 STAKE OR THE STUMP. INSTEAD DATUMS WERE SET UP NEAR THE ORIGINAL DATUM.

A LIST OF NEEDED ELEVATIONS WAS MADE FOR THOSE MAIN DATUMS NOT ON THE CORNER OF A 2 X 2 UNIT. THESE WILL BE SHOT IN WHEN POSSIBLE.

ADJUSTMENTS WERE MADE ON SEVERAL OF ANDREA'S MAPS & FORMS WHERE ELEVATIONS WERE TAKEN FROM THE TOP OF STAKE S215, E240.

THESE WERE (WHEN NECESSARY) REDUCED BY 23 cm. ALTHOUGH SOME DATUM/ELEVATION QUESTIONS REMAIN, MOST OF THEM HAVE BEEN RESOLVED.

I THINK A GOOD WAY OF DETECTING ERROR IN DATUM/ELEVATIONS WILL BE TO SHOOT SURFACE AND BOTTOM ELEVATIONS FOR EACH 2 X 2.

THIS WILL PROVIDE A BETTER VERTICAL CONTROL OF THE SITE.

ALSO SHOOT TOP ELEVATIONS ON FEATURES.

28 JAN 1985

I NUMBERED THE FINAL SECTION OF AREA I LAST NIGHT, MADE THE LISTS OF COORDINATES AND UNIT NUMBERS, AND TOOK THEM TO BRUCE TO BE COPIED.

FIRST THING TODAY DAVID AND I MADE SURE ALL MAPS WERE UP TO DATE AND I ADDED THE NEW NUMBERS TO THE COLOR CODED MAP. THE TOTAL NUMBER OF UNITS IS 969. NOT ALL OF THESE WILL BE EXCAVATED, HOWEVER, ONLY ABOUT 55%.

I DID RELATIVELY LITTLE TODAY. NO NEW GRIDS WERE ADDED. THE DAY WAS SPENT MOSTLY MAKING SURE ALL MAPS ARE IN ORDER AND UNIT INFO. UP TO DATE AND CLEAR.

TOMORROW WILL PROBABLY MORE OF THE SAME.

29 JAN 1985

AFTER GOING TO ABE'S TO GET SPIKES ETC, I HAD A SHORT MEETING WITH JIM WILSON RE: RELATIVE DIMENSIONS OF AREAS I-V. ARRIVED AT THE SITE AT ~ 8:30.

DAVID AND I FILLED IN THE PREVIOUS UNITS FROM THE HURRY REPORT (1984), SEVERAL OF THESE CORRESPOND CLOSELY TO FEATURES FOUND. THE UNITS ARE:

S 221 E 212

S 216 E 231.5

S 222 E 215

S 218 E 234 (2x2 m WELL)

S 220 E 223

S 221 E 231

S 221 E 223

S 217 E 241

S 216 E 244

THESE UNITS CORRESPOND TO UNIT NUMBERS:

S 221 E 212 - (967)

S 218 E 234 - (755)

S 222 E 215 - (937)

S 218 E 233 - (756)

S 220 E 223 - (684)

S 217 E 234 - (796)

S 221 E 223 - (956)

S 217 E 233 - (797)

S 216 E 231.5 - (19-20)

S 221 E 231 - (948)

S 217 E 241 - (789)

S 216 E 244 - (7)

(4 MILES TO GET SHOVELS AND KEROSENE)

30 JAN 1985

WE ARE EXPECTING VISITORS AT ABOUT 9:30. THE MAPS ARE IN ORDER, AS ARE THE CURRENT FEATURES AND UNIT LISTS. TODAY WAS ROUTINE WITH NO ADDITIONAL GRID ADDED. I DID, HOWEVER, LEAVE AT 12:00 AND RETURNED AT 3:00.

NO ADDITIONAL SURVEY OR MAPPING DONE. TOOK BLUE LINE OF AREAS I-V TO JIM WILSON. WE FOUND THAT THE CONTOURS FOR PART OF AREA VI WERE DIFFERENT IN THE TWO MAPS. THIS WAS AT THE EAST END OF THE RAVINE ADJACENT TO THE TRAILER. I WILL CHECK THIS TO DETERMINE WHICH CONTOUR IS CLOSEST TO CORRECT. I HAVE THE BLUE LINES OF AREAS I-VI.

31 JAN 1985

FILLED IN THE CREW CHIEF NAMES AND FEATURE NUMBERS ON THE UNIT LISTS. THE LISTS NOW CORRESPOND TO THE UNIT AND FEATURE MAPS.

AT ABOUT 10:30 DAVID SINGER LEFT TO RUN AN ERRAND AND LEFT ME IN CHARGE. 3 FEATURE NUMBERS WERE ASSIGNED TO DAVID M. (38, 39, 40) AND A BAG # TO LORETTA. FEATURE 41 WAS ASSIGNED TO JEFF. DAVID RETURNED ABOUT 2:00. ASSISTED DICK FOR THE REMAINDER OF THE DAY.

01 FEB 1985

TODAY IS RAINY - NOT TOO COLD - FILLED IN ADDITIONAL FEATURES. AND ASSIGNED UNITS, NO ADDITIONAL SURVEYING WAS DONE TODAY. DUE TO RAIN WORK WOUND DOWN EARLY.

04 FEB 1985

ASSISTED DICK ALL DAY.

05 FEB 1985

ASSISTED DICK ALL DAY.

TOM WANTS TO SHOOT IN THE ANGLE OF THE HOUSE IN RELATION TO THE FIELD STRUCTURES.

TOM WANTS ANOTHER FEATURE MAP LIKE THE FIELD MAP AT 1CM = 50CM SCALE. THIS WILL BE THE CLEAN FINAL MAP SHOWING FEATURE RELATIONSHIPS.

06 FEB 1985

BILL HUSER WAS ASSIGNED 6 UNITS WHICH WERE NOT 2X25. HE USED S 211, E 233 AS HIS MAIN DATUM. THIS WILL HAVE TO BE SHOT IN.

SET UP TRANSIT ON S220 E230 THIS LINE IS 0°

NE CORNER OF HOUSE - $40^\circ 20'$ - 15.30 m

NW CORNER - $80^\circ 40'$ - 10.24 m

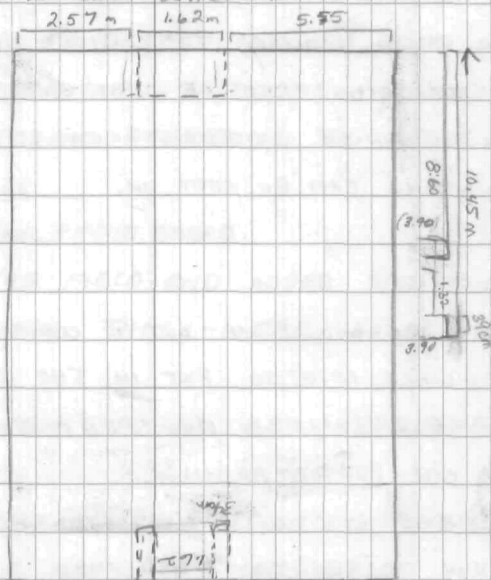
SE CORNER - 72°

SW CORNER - COULD NOT SEE DUE TO VEGETATION

WIDTH $\begin{matrix} N \\ 9.75 \end{matrix} / \begin{matrix} S \\ 9.75 \end{matrix}$
 LENGTH $\begin{matrix} E \\ 18.83 \end{matrix} / \begin{matrix} W \\ 18.83 \end{matrix}$

FROM WEST WALL TO WEST EDGE OF BREAK IN
 NORTH WALL IS 2.57m - OPENING IS 1.62 m

FROM E WALL TO EAST WALL IS 5.55



(NOT TO SCALE)

26'0"

26'7"

07 FEB 85

SPENT THE ENTIRE MORNING RUNNING ERRANDS -

PICKED UP THE METRIC STADIA ROD, FLAGGING TAPE,
FOLDING RULES AND FIELD BOOKS. I ALSO ORDERED
(\$69.58)
A ROLL OF GRID PAPER, METRIC 36" WIDE X 50 YDS LONG.

ARRIVED BACK ON THE SITE AT 12:20.

{ STARTING MILEAGE - 40317.2 }

{ ENDING MILEAGE - 40391.8 }

{ TOTAL MILEAGE - 74.6 }

08 FEB 85

HAD AN INSPECTION TODAY.

THE MAPS AND ALL WERE IN ORDER.

TOM AND I DISCUSSED THE CONTOUR MAP OF THE SITE.

HE WANTS AN IDEA OF WHATS GOING ON.

I WILL FINISH GRIDDING AREA 1 SO THE ADDITIONAL
ELEVATIONS CAN BE SHOT IN.

11 FEB 1985

TODAY DICK AND I SET OUT TO COMPLETE THE GRID.

WE WERE ABLE TO PUT IN THE S 204 LINE AND
THE E 214 LINE. WE SPENT THE REMAINDER OF
THE DAY PHOTOGRAPHING.

THE GRID HAS BEEN COMPLETED NOW FROM

E 214 TO E 240 AND FROM S 204 TO S 222

12 FEB 1985

TODAY WAS EXTREMELY WET/RAINY. THE CREW
ENDED UP IN THE LAB.

FEATURE WHICH NEED TO BE ADDED TO MAP:

FEATURE 31 - UNIT 101 ✓

CHECKED THROUGH UNIT SUMMARY FORMS TO
MAKE SURE LISTS WERE UP TO DATE.

PM LETTERED PHOTO BOARD

13 FEB 1985

WAS IN LAB FROM 8:30 - 11:30

CHECKED REMAINING FORMS, FEATURE &
UNIT SUMMARY. TO DETERMINE IF LISTS WERE
CORRECT. AFTER THESE CHECKED OUT I
FILED THE FORMS ACCORDING TO UNIT AND
FEATURE NUMBER.

MADE SCALES FOR PHOTO BOARD.

RETURNED TO THE FIELD AND ADDED ADDITIONAL
COMPLETED FORMS. THESE WERE FILED.

PICKED UP THE TRANSIT AND GOT KEROSENE (99°)

WILL SHOOT IN ELEVATIONS FOR UNITS ALONG
THE 1M BALK NORTH OF THE WELL.

DAVID AND CAUCH WILL PROFILE THIS.

A RISE IN UNITS 58, 99 & 140 NEEDS TO BE

DETAILED ON A CONTOUR MAP. ADDITIONAL 2X2 S.
WILL ALSO BE SHOT IN.

TRANSIT DID NOT LEVEL UP WITH NAIL DUE TO GROUND
CHANGES. THE TRANSIT WAS 3.8 CM BELOW NAIL.
BECAUSE THE TRIPOD LEGS ARE NOT ADJUSTABLE
WE HAD TO PACK DIRT UNDER THE LEGS TO TRY
TO OBTAIN PREVIOUS HEIGHT. - OBTAINED HI OF 1.44

BAULK UNITS :

S 218 E 230 -.04

S 216 E 230 -.235 (ORIGINALLY .225)

S 214 E 230 -.350 (ORIGINALLY .538)

(STONE SLAB : .334) NORTH OF SLAB : .41

S 213.7 E 230 SOUTH OF SLAB : .360

S 212 E 230 .55 (ORIGINALLY .538)

1 M BAULK

S 211 E 233 -.387

S 211 E 234 -.392

S 212 E 233 -.394

S 212 E 234 -.367 (.268)

S 213 E 233 -.31

S 213 E 234 -.312

S 214 E 233 -.135

S 214 E 234 -.167

S 215 E 233 .098

S 215 E 234 -.055

S 216 E 233 -.168

S 216 E 234 —

S 217 E 233 -.142

S 217 E 234 —

S 216 E 235 ~~(STORAGE)~~

S 216 E 236 (+.5)

TOP OF COBBLE FEATURE - S 213.5 E 235 - .392

BOTTOM OF FEATURE 3 - .773

S 218 E 232 - .174

S 218 E 230 - .04

S 218 E 228 - .08

S 218 E 226 - .08 (.086)

S 218 E 225.5 - .182

S 218 E 225 - .33

S 218 E 224.5 - .418

S 218 E 224 - .492

S 220 E 230 - .035

2.617 (abs)

SE CORNER - S 216 E 228 - .317 (.178)

DATUM - S 216 E 228 (TOP OF NAIL) - .298

Δ 0145 S 212 E 228 (GROUND SURF) - .610

NOTE: THE ELEVATIONS FOR UNIT S 216 E 228 ARE OF THE TOP OF THE NAIL USED AS DATUM BECAUSE OF DIFFERENT GROUND ELEVATIONS THE TOP OF THE NAIL WAS .298 AND THE GROUND SURFACE ADJACENT TO THE NAIL WAS .317. (THUS, THE NAIL WAS .019 ABOVE SURFACE AT THE AREA MEASURED?) THE SURFACE IS ACTUALLY THE HEIGHT OF THE NAIL - LORETTA HAD TO RESET BECAUSE OF MUD ETC - GO WITH .298 ELEVATION -

14 FEB 1985

NEED MAPS SHOWING EACH LEVEL AND FEATURES
ENCOUNTERED ACCORDING TO LEVEL.

PUT YESTERDAYS ELEVATIONS ON THE ELEVATION
LIST. FOR THOSE DUPLICATED, THE ELEVATION
DIFFERENCES ARE 1cm OR LESS. THIS IS DUE,
I'M SURE, TO WALKING ON THE GROUND,
MUD, RAIN, SNOW, FREEZING - ETC. THE
ELEVATIONS ARE, HOWEVER, SURPRISINGLY
CONSISTENT CONSIDERING THE TRIPOD DIFFICULTIES
AND GROUND CHANGES.

TODAY I WANT TO TRY AND FINISH GRIDDING AREA 1.
ALL THAT REMAINS IS THE S202 LINE,
E 240 (PORTIONS OF), E 242, E 244, E 246
E 212,

ELEVATIONS NEED TO BE SHOT IN FOR NEWLY
GRIDDED AREAS: ALSO, ADDITIONAL ELEVATIONS
FOR THE CONTOUR MAP MUST BE OBTAINED
AN ADDITIONAL TRANSIT STATION WILL BE SET
UP AT S220 E230. WE CAN THEN BACKSHOOT
TO S200 E230 THIS WILL ENABLE US TO
GET READINGS ON THE HIGHER AREAS.

15 FEB 1985

YESTERDAY I STARTED SHOOTING THE 5200 LINE IN WITH THE TRANSIT. THIS ENABLED ME TO DOUBLE CHECK THE GRID MEASURED IN. THE LINES ARE CHECKING OUT OK.

TODAY I COMPLETED THE 5200 LINE AND AM NOW FILLING IN THE GAPS. I WILL COMPLETE GRIDDING AREA 1 MONDAY AND WILL TRY TO SHOOT AS MANY ELEVATIONS AS POSSIBLE. THE OVERALL SLOPE OF THE SITE FOR CONTOUR CAN BE OBTAINED FROM THE ELEVATIONS TAKEN AT 2m INTERVALS. THE DROP BETWEEN 5200 AND 5202 WILL BE SHOT IN E/W AT 2m INTERVALS AND N/S AT 2m INTERVALS. THIS WILL HOLD TRUE FOR THE TERRACE SOUTH OF THIS ONE. ONLY A FEW MORE LINES REMAIN.

I WILL PROBABLY RELOCATE THE TRANSIT EARLY NEXT WEEK TO SHOOT IN THE HIGH ELEVATIONS AND THE 2X2 CORNERS NOT VISIBLE FROM THE 5200 E230 STATION. THE NEW STATION WILL BE AT 5230 E230 AS THE STRAIGHT LINE BETWEEN THE TWO BISECTS THE SITE ALLOWING GREATER CONTROL.

TOM WANTS ME TO BEGIN THINKING ABOUT THE CONTOURS FOR AREA II. I WILL BEGIN THIS NEXT WEEK USING 5200 E230 AS THE MAIN DATUM.

TOM APPARENTLY SPOKE WITH SILAS HURRY AND HE RELATED THAT—THE CONTOURS ON THE BLUE LINE ARE METRIC AND THE ELEVATION FOR 5200 E200 IS 48 METERS ASL.

17 FEB 1985

ROBIN TEAS MAY BE WORKING WITH ME ON SURVEYING. I SPOKE WITH DAVID AND BILL HUSER. BOTH AGREED THAT ROBIN COULD HELP ME OUT. SHE WILL REMAIN WITH BILL'S CREW AND WILL BE SURVEY CREW WHEN NEEDED.

THINGS TO DO TOMORROW = MONDAY:

✓ FINISH GRIDDING AREA I

SHOOT REMAINING 2x2 ELEVATIONS + 1

SHOOT ADDITIONAL ELEV. FOR CONTOUR.

✓ TALK WITH TOM ABOUT AREA II

19 FEB 1985

TOM, DAVID AND I WENT OVER THE MAP TODAY AND ELIMINATED THE EXCESS UNITS. WE ALSO ADDED ADDITIONAL 2X2S TO THE UNSCREENED SAMPLE. THIS MADE FINISHING AREA 1 MORE FEASIBLE.

BECAUSE ONLY 400+ UNITS WERE PROJECTED FOR AREA 1 - THE CORNERS FOR THE AREA ARE NOW:

S 201 E 214

S 201 E 231

S 206 E 231

S 206 E 239

S 218 E 239

S 218 E 234

S 220 E 234

S 220 E 220

S 218 E 220

S 218 E 214

BEGAN SETTING UP INSTRUMENT TO SHOOT REMAINING ELEVATIONS. DUE TO GROUND CHANGES WE HAD A LOT OF TROUBLE ACHIEVING THE SAME INSTRUMENT HEIGHT. WE WERE ABLE TO FINALLY OBTAIN A GOOD READING ON THE NAIL WEST OF AREA 1. THERE WERE ADDITIONAL PROBLEMS WITH THE INST.

WHEN THE INSTRUMENT IS TURNED 180° THE INST. LEVEL IS INCONSISTENT. WE DECIDED TO LEAVE THE H.I. AT 1.44 AS IT WAS AND SHOOT THE ELEVATIONS AS WE HAVE IN THE PAST. THERE MAY BE SOME ERROR, BUT ONLY A FEW MILLIMETERS ON THE EAST SIDE OF THE SITE.

I THINK THE INSTRUMENT LEVEL PROBLEM MAY BE DUE TO TEMP. LATER, THE TEMP DROPPED AND THE TRANSIT LEVELED UP. REALLY WEIRD!

THE REMAINING ELEVATIONS WILL BE SHOT FROM S220 E230.

19 FEB 1985

AFTER COMPLETING PAPER WORK I BEGAN TO
SET UP TO SHOOT ELEVATIONS ON THE
REMAINDER OF THE SITE.

I SET THE TRANSIT UP IN S220 E230

(TEMPERATURE CHANGES EFFECT THE TRANSIT DRASTICALLY)

INSTRUMENT HEIGHT (HI) 1.47

THESE ARE
RAW ELEV.
HAVE BEEN
COMPUTED ON
ANOTHER SHEET
SEE LOOSE LEAF

$$S200 E230 - 2.773 = 2.617$$

$$S200 E200 - 3m +$$

$$S210 E250 - 1.148$$

$$S220 E210 - 2.618$$

$$S222 E230 - \text{BASE OF RUBBLE PILE} - 1.232$$

$$S222 E228 - 1.368$$

$$S222 E226 - 1.350$$

$$S222 E224 - 1.352$$

$$S222 E222 - 1.699$$

$$S222 E220 - 1.847$$

$$S222 E218 - 2.067$$

$$S222 E216 - 2.155$$

$$S222 E214 - 2.270$$

$$S222 E212 - 2.405$$

56

H.I. - 1.47

S 220	E 231	-	1.387		
S 220	E 232	-	1.126	(BRICK RUBBLE - BASE	
S 220	E 233	-	.765		
S 220	E 234	-	.258		
S 220	E 235	-	.082		
S 220	E 236	-	.156		
S 220	E 237	-	.553		
S 220	E 238	-	.861		
S 220	E 239	-	.875		
S 220	E 240	-	1.068		
S 218	E 234	-	1.17		
S 216	E 234	-	1.489		
S 216	E 232	-	1.445		
S 216	E 238	-	1.407		
S 216.5	E 235	-	1.40		
S 213	E 230	-	1.752		
S 224	E 216	-			
S 224	E 226	-	.845		
S 223	E 228	-	1.298		
S 224	E 228	-	.953		

S 226 E 226 - .909

S 225 E 226 - .727

S 226 E 228 - .608

S 225 E 228 - .409

S 225.70 E 230 - .003

S 224.70 E 230 - .170

S 223.70 E 230 - .512

S 222.70 E 230 - .886

S 224 E 222 - 1.30

S 224 E 220 - 1.378

S 224 E 218 - 1.472

S 224 E 216 - 1.541

S 224 E 214 - 1.736

S 224 E 212 - 1.780

S 226 E 222 - .975

S 226 E 220 —

S 226 E 218 - 1.145

S 226 E 216 - 1.195

S 226 E 214 - 1.243

S 226 E 212 - 1.30

THE TOP OF THE RUBBLE PILE AT
 5221 E235 WAS SHOT USING A
 BEAM & ARCH METHOD. THE DISTANCE FROM
 THE POINT SHOT IN TO THE TRANSIT WAS
 5.31 m. THE SCOPE WAS ANGLED 1.5°



1.47 +

$HI + A = \text{TOP OF PILE ELEV.}$

20 FEB 1985

MOST OF THE ELEVATIONS FOR THE CONTOUR MAP
 HAVE BEEN SHOT IN. THERE ARE SOME, HOWEVER,
 WHICH WERE BLOCKED BY SHELTERS AND MUST
 BE GOTTEN. (SEE PG 59)

ALSO, I NEED TO CHECK THROUGH THE SUMMARY
 FORMS TO MAKE SURE ALL MAIN DATUMS
 HAVE BEEN OBTAINED.

SET UP AT S220 E230 — 1.49

59

NEED THE FOLLOWING 2 X 2 S :

S220 E226 - 1.457	S204 E210 - 3.182
S220 E228 - 1.493	S204 E212 - 3.035
S218 E210 - 2.80	S204 E236 - 2.232
S218 E212 - 2.59	S204 E238 - 2.227
S218 E234 - 1.499 (TOP COBBLES)	S204 E240 - 2.279
S218 E236 - 1.432	S202 E210 - 3.260
S218 E238 - 1.353	S202 E212 - 3.148
S218 E240 - 1.327	S202 E214 - 3.033
S216 E210 - 2.909	S202 E216 - 2.932
S216 E212 - 2.822	S202 E218 - 2.77
S216 E214 - 2.56	
S216 E238 - 1.458	S215 E240 - 1.498
S216 E239 - 1.434	S214 E236 - (BOTTOM OF EXC UNIT - 1.872)
S216 E240 - 1.345	
S214 E210 - 2.992	S216.4 E230.3 - $\frac{1.864 + 3.2}{2} = 2.532$
S214 E212 - 2.998	S216.4 E230 - 1.646
S214 E238 BOTTOM OF LEVEL - 1.999 TOPOF STRIKE - 1.615	S208 E237 - (BOTTOM OF UNIT - 2.152)
S214 E240 - 1.526	
S212 E210 - 3.045	S202 E240 - 2.724
S212 E240 - 1.552	
S210 E210 - 3.136	MAIN DATUM - STUMP - CORETIA.
S210 E216 - 2.894	S218.55 E226 - 1.425
S210 E218 - 2.656	
S208 E210 - 3.229	
S206 E210 - 3.272	

60

21 FEB 1985

WENT THROUGH THE FORMS TO DETERMINE WHICH 2x2 ELEVATIONS, ESPECIALLY MAIN DATUMS MUST BE SHOT IN.

AFTER COMPLETING PAPERWORK, FILING, ETC - DID ADDITIONAL CLEARING AND ASSISTED DICK

22 FEB 1985

SET UP TRANSIT TO SHOOT IN ELEV. ON PG. 59.

THE HI IS 1.49 M. I'M SHOOTING FROM S220, E230.

ROBIN IS CREW CHIEF FOR THE DAY SO DICK IS ASSISTING ME BETWEEN PHOTOS.

BETSY ASSISTED ME DURING LUNCH AND WE WERE ABLE TO COMPLETE ELEVATIONS TO DATE.

AREA II

BEGAN TO LOOK AT AREA II - $85 \times 20 \text{ m}$
~~85.32 m x 19.87~~

BEGINS AT 5198 E 228 FOLLOWING ROAD TO APPROX 5198 E 285. - NORTH TO 5178 E 228 - EAST TO 5178 E 285

THERE ARE STAKES AT S 190 E 280

S 190 E 260

S 185 E 260

S E 250 (?)

S 240

TEST PITS AT S 186 E 259

(ESTIMATED S 190 E 256

COORDINATES) S 187 E 246 (?)

S 190 E 229

SHOOT NORTH OFF OF E 228 - 20 m.

" EAST 50-60 m,

GRID AREA II IN 10 m INCREMENTS.

THEN, ON A MAP GRID EACH 10 m SECTION INTO

2 X 25 & 1 X 15 (ON SEPARATE MAPS)

NUMBER EACH UNIT FOR RANDOM SAMPLE SELECTION.

AREA
III

THIS AREA WILL CONTAIN 2 BACKHOE TRENCHES

AND 30 1 m UNITS. IN AN APPROXIMATE

(19.11) (16.81)

20 m X 17 m AREA.

STAKE

AREA III IS GRID NORTH OF S 200 E 190 NO

ADDITIONAL STAKES ARE EVIDENT.

WILL SET UP THESE AREAS ON MAPS THIS

WEEKEND AND SHOOT THEM MONDAY.

AREA II IN A 10 m GRID AND AREA III'S

PERIMETERS.

THE BLUE LINES WERE NOT ENGLISH BUT METRIC
ON A 1:20 SCALE - THUS, THE AREAS
CALCULATED EARLIER ARE INCORRECT.

$$\text{AREA I} = 35 \text{ m} \times 24 \text{ m}$$

$$\text{AREA II} = 89.6 \text{ m} \times 20 \text{ m} (90 \times 20)$$

$$\text{AREA III} = 19 \text{ m} \times 16 \text{ m}$$

$$\text{AREA IV} = 31 \text{ m} \times 28 \text{ m}$$

$$\text{AREA V} = 10 \text{ m} \times 8 \text{ m}$$

THE BLUE LINE SHOWS AREA II BEGINNING
AT E 220. THE FLAGGING IN THE
FIELD, HOWEVER, SHOWS THE AREA STARTING
AT E 228.

ACCORDING TO THE BLUE LINE THE CORNERS
OF EACH AREA ARE :

AREA II - S 200 E 220

S 200 E 310 (285)

S 180 E 220

S 180 E 310 (285)

AREA III - S 187 E 197

S 171 E 197

S 187 E 178

S 171 E 178

AREA IV - S 215 E 203

S 243 E 203

S 215 E 172

S 243 E 172

AREA V - S 213 E 270 ✓ S 215 E 270

S 213 E 280 S 215 E 280

S 221 E 270 ✓

S 221 E 280

AREA II'S DIMENSIONS WERE ALTERED WHEN
AREA VI WAS DEFINED. MOREOVER, HURRY
APPARENTLY MADE CHANGES IN THE FIELD.
IF SO, AREA II'S COORDINATES ARE:

S 198 E 228

S 198 E 285

S 180 E 228

S 180 E 285

THE AREA WILL BE GRIDDED FROM:

S 200 E 220

S 200 E 285

S 180 E 220

S 180 E 285

IN TEN METER UNITS.

25 FEB 1985

BEGAN GRIDDING AREA II. THE AMOUNT OF VEGETATION IS MAKING IT DIFFICULT TO PULL A STRAIGHT LINE.

WE ARE CLEARING N/S TRANSECTS AND PLACING 2 STAKES - 1 AT S 180 & 1 AT S 190.

HURRY'S LINE IS HAPHAZARDLY PLACED, THUS THE BLUE LINE COORDINATES ARE BEING USED.

I CAN'T DECIDE IF IT WOULD BE BETTER TO CONTINUE ALONG THE S 200 LINE AND SHOOT NORTH, OR PUT IN A LINE AT E 300 AND SHOOT WEST. SHOOTING WEST WOULD MEAN SETTING UP THE TRANSIT LESS.

S200 E230 - H1 - 1.44

S202 E242 - 1.257

S204 E242 - .760

S206 E242 - .560

S208 E242 - .420

S210 E241 - .038

S210 E243 - .025

S212 E242 - .01

S214 E242 + .05

S216 E242 - +.05

BASE OF STUMP IN S.210 E242 IS 1.54 m

ABOVE S200 E230 (10 cm ABOVE H1)

STUMP = S210 E241.7

26 FEB 1985

DECIDED TO PUT IN A LINE ALONG THE N 200 BASELINE TO E 300 THIS PROVIDES A CONTINUOUS LINE BETWEEN BENCH MARKS. ALYSON HELMS IS HELPING TODAY.

WE COMPLETED THE BASELINE AND PUT IN STAKES AS S190 E300; S180 E300; S190 E285; S180 E285 AND S190, E280; S180, E280.

27 FEB 1985

BEGAN TODAY AT S180 E280 AND RAN A LINE ALONG S190 FROM E 220 TO E 300. WE THEN MOVED THE TRANSIT TO S180 AND RAN A LINE 10 m NORTH (S180) FROM E 220 TO E 300.

THIS ESSENTIALLY COMPLETES THE PRELIMINARY GRID FOR AREA II.

WE THEN MOVED TO AREA III AND SHOT OFF OF THE E/W BASE LINE AND PUT IN STAKES AT E 197 AND E 178. TOMORROW WE WILL TURN 90° NORTH OF OF S200 E 197 AND S200 E 178 TO ESTABLISH THE CORNERS OF AREA III.

PAPER CAME AT SESCO - MUST GO TOMORROW A.M. TO PICK UP.

28 FEB

AFTER COMPLETING PAPER WORK WENT TO BESCO
TO PICK UP GRID PAPER. LEFT AT 11:00 AND
RETURNED AT 1:00.

STARTING MILEAGE 40581.9

ENDING MILEAGE 40633.1

SET UP TRANSIT ON S200, E197 TO SHOOT
EAST EDGE OF AREA III

WILL PLACE STAKES AT:

S 187 E 197	13 m	FROM S200
S 171 E 197	29 m	FROM S200
S 187 E 178	13 m	"
S 171 E 178	29 m	"

AREA III IS LAID OUT.

NEED TO COMPLETE AREAS IV AND V TOMORROW
AND IF POSSIBLE BEGIN AREA VI.

MAPS OF THESE AREAS AT THE 1:100 AND 1:50
SCALES. THE 1:100 SCALE MAPS WILL BE
USED IN THE FIELD. THE MAIN MAPS NEEDED
FIRST ARE FOR SETTING UP THE SAMPLE
STRATEGY.

1 MARCH 1985

THINGS TO GET DONE:

 $\frac{3}{1}\checkmark$ SET UP AREA IV $\frac{3}{4}\checkmark$ SET UP AREA V~~SET UP AREA VI - A~~~~SET UP AREA VI - C~~~~SET UP AREA VI - D~~~~SET UP AREA VI - B~~

AREAS IV AND VI WILL BE SET UP IN A 10 M GRID. THIS IS PRELIMINARY AS IN AREA II.

AREA IV WILL HAVE CORNERS AT: S215 E203 $\checkmark$ S215 E172 $\checkmark$ S243 E203 $\checkmark$ S243 E172 $\checkmark$

PLACE STAKES ALONG BORDERS AT:

UNABLE TO { S243 E200

S215 E200 $\checkmark$

PULL LINE { S243 E190

S215 E190 $\checkmark$

DO TO VEG. { S243 E180

S215 E180 $\checkmark$ $\checkmark$ S220 E203S280 E172 $\checkmark$ $\checkmark$ S230 E203S230 E172 $\checkmark$ $\checkmark$ S240 E203S240 E172 $\checkmark$

FOR AREA V. NEED TO PLACE STAKES AT 3 CORNERS:

S213 E270

S213 E280

S221 E270

PLACE SPIKE AT E 203 AND AT E 172

(172 WILL BE 28 m FROM 200/200)

FINISHED AREA IV. COULDN'T GET TO AREAS V & VI.

AREA V WILL BE DONE FIRST THING MONDAY AND
AREA VI - A, C, D WILL BE FINISHED BY
WED. PAT SUGGESTED WAITING ON VI-B

4 MARCH 1985

THINGS TO DO - CONTINUE LIST ON PG 68 -

AREA V	S213 E270 ✓	S215 E 270 ✓
	S213 E280 ✓	S215 E 280 ✓
	S221 E 270 ✓	

FINISHED GRIDDING AREA V - PLACED 5 STAKES
AT THE ABOVE COORDINATES.

AREA VI WILL BE PUT ON HOLD FOR A FEW
DAYS WHILE AREA I MAPS ARE DRAFTED.

5. MARCH 1985

COMPLETED FEATURE MAP 1:50

TOPO MAP 1:50

SET UP TRANSIT ON NAIL. ELEVATION, PROBABLY DUE
 TO WEATHER HAS CHANGED FROM 1.712 TO 1.720
 THE H1 HAS CHANGED FROM 1.44 TO 1.47

FEATURES	BOTTOM	TOP OF FEATURE WEST PIN
23	1.07	.782
17	.958	.767
16	1.320	.759
33(D11)	.615	.585
99	1.140	.569
68	.655	.611
175(A02)	.692	.512

PIN INDICATES THE POINTS FROM WHICH THE LINE
 WAS PULLED FOR PROFILES.

WENT TO THE LAB AT 10:30 - LEFT BETSY AND DICK
 IN CHARGE

BETSY TOOK THE FOLLOWING FEATURES WHILE I WAS IN THE LAB.

FEATURE	BOTTOM ELEV.	TOP OF FEAT. WEST SIDE	TOP OF FEAT. EAST HALF
101	1.275	1.118	—
117	.959	.422	.655
4	.650	.505	—
208	.888	.625	—

WAS ABLE TO CALCULATE ALL OF THE ELEVATIONS FOR AREA I. WITH 5200 E 200 AT 0.00 WITH EVERYTHING ABOVE THIS POINT.

6 MARCH 1985

WENT TO THE FIELD TO COMPLETE PAPER WORK AND
SET UP TRANSIT.

FINALLY LEFT FOR THE LAB AT 9:45.

WILL TRY TO COMPLETE CONTOUR MAP TODAY.

MADE UP A LIST FOR FEATURES.

NEED AT LEAST 4 FEATURE MAPS AT 1:50

OVERVIEW

SQUARE POST HOLES

ROUND POST HOLES

PLANTING FEATURES

WENT BACK TO THE FIELD AT 1:30. DAVID AND TOM
HAD A MEETING IN THE LAB. I WILL REMAIN THE REST
OF THE DAY AND CONTINUE IN THE LAB TOMORROW

7 MARCH 1985

AFTER SETTING UP TRANSIT I HAD A MEETING WITH JEFF SNYDER AND TOM. I TURNED THE UNIT LISTS AND THE FEATURE LISTS OVER TO JEFF. I ALSO TURNED THE FILING OVER TO HIM. I BRIEFED HIM ON WHERE MOST PROBLEMS HAD BEEN IN THE FORMS AND HOW TO USE THE LIST TO DOUBLE CHECK COORDINATES ETC. HE & THE CREW CHIEFS WILL STILL CHECK WITH ME ON MAPPING AND MAIN DATUMS.

LEFT ALLISON HELMS, ROBIN TEAS AND DICK B. IN CHARGE OF MAKING SURE ELEVATIONS ON FEATURES WERE SHOT IN. DICK WILL HELP IF THEY HAVE ANY PROBLEMS. OTHERWISE IT WILL BE ALLISON AND ROBIN.

ARRIVED IN THE LAB AT ABOUT 10:15. CAUGHT UP ON NOTES.

FIVE MAPS NEED TO BE SET UP FOR AREA I:

1. CONTOUR MAP
2. FEATURE OVERVIEW
3. SQUARE POST HOLES (ARCHITECTURAL)
4. ROUND POST HOLES
5. PLANTING FEATURES.

I ALSO WANT TO SET UP MAPS FOR AREAS
II-V ON THE SMALL AND LARGE SCALES.
AREA II-V.

LARGE SCALE - 1:50

1. CONTOUR MAP

2. FEATURE MAP

SMALL SCALE - 1:100

1. UNIT MAP -

FEATURE ELEVATIONS:

FEATURE	UNIT	DESCRIPTION	TOP ELEV	BOTTOM E.
121	397	3m TRENCH	1.185	1.202
223	396	CIRC. FEA.	1.160	1.200
140	INCLUDED IN 12 UNITS.	—	EAST- 1.175 WEST 1.018	MID- 1.246 DEEPEST- 1.529
134	—	—	.875	EXTENDING INTO BOTTOM IN TIERS .755, .765, .963
186	—	—	.422	.505

MARION ESTABLISHED A DATUM - LOCATION UNKNOWN
THE ELEVATION WAS .367 m. ABOVE NAIL -

8 MARCH 1985

TODAY IS RAINY - I DID NOT PUT UP THE TRANSIT BUT ASKED DICK TO TAKE CARE OF IT IF NECESSARY. HOPEFULLY NO ONE WILL NEED ELEVATIONS. BESIDES, THEY CAN'T BE SHOT THROUGH THE SHELTERS.

ARRIVED IN THE LAB AFTER 9:00 - STARTED ON THE FEATURE OVERVIEW. THEN TOM CAME IN AND WE STARTED ON THE CONTOUR MAP.

BASICALLY WORKED ON THE CONTOUR ALL DAY.

11 MARCH 1985

WENT TO THE FIELD TO MAKE SURE ALL WAS WELL WITH THE TRANSIT WHICH ACCIDENTALLY SPENT THE WEEKEND IN THE TRAILER.

SET UP THE TRANSIT FOR ELEVATIONS -

ARRIVED IN THE LAB AT 9:30.

WILL CONTINUE WITH FEATURE & CONTOUR MAPS.

FEATURE MAP IS UP TO DATE (UNTIL TOMORROW - OR THIS AFTERNOON)

CONTINUING CONTOUR MAP.

WILL BE IN THE FIELD TOMORROW BECAUSE THE BACKHOE IS COMING IN.

12 MARCH 1985

- ✓ ① SECURE STAKES IN ROAD - DRIVE ALL THE WAY DOWN
- ② LAY OUT GRID IN AREA II.
- ✓ ③ DEFINE BACKHOE TRENCHES IN AREA III WITHIN GRID.

AREA III - BUT A LINE IN AT S187 E 192.815

4.125 m (W) FROM S187 E 197 TO STAKE TO EAST PROFILE

7.815 m (N) FROM S187 E 197 TO STAKE AT SOUTH PROFILE.

EAST PROFILE IS 98° (RATHER THAN 90°)

LINE IS 8° OFF OF GRID.

SOUTH PROFILE IS $82^{\circ}40'$ OFF OF GRID.

BACKHOE TRENCHES - PROFILE ELEVATIONS

FROM 3187 E 192.875 TO 5200 E 200 -

5200 E 200 - .397 (-H1 = 1.038)

H.I. = 1.435 (3187 E 192.875)

1.938 (EAST END OF S PROFILE)

3.059 ^{NORTH} (END OF EAST PROFILE)

2.895 (WEST END OF S PROFILE)

FROM STAKE (T. STATION) TO S EDGE 45 cm

TO JUNCTION OF S PROFILE 7.25 m

5187.000

7.815

.185

2 m

4

6

END

1.602

1.782

1.943

2.06

1.709

1.837

2.022

2.185

2.173

2.385

2.550

2.552

(8.35)

2.017 m

10 2.130

12 2.69

2.312 m

2.626

2.873

2.708

2.90

3.115

(END)
(19.90)

3.10

(12.98) 3.20

3.280

78

W

STAKE

W. EDGE 8.50

E. EDGE

9.70

TRENCH - 15.05 LONG

W → E

2m	2.86	4m	2.55	6m	2.494
	3.132		2.932		2.837

8m

2.380

W

EDGE

2.348

E

EDGE

2.70

2.632

2.588

10m

2.255

12m

1.855

14m

1.765

2.560

2.555

2.40

END - 1.739

1.905

ELEVATIONS - AREA III ABOVE S200 E200

S187 E192.875 - 1.038

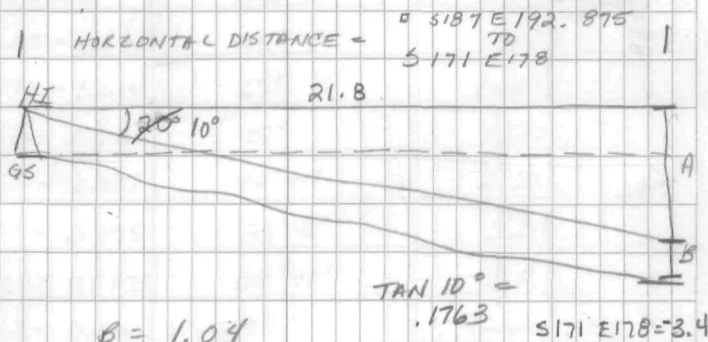
S171 E178

S 187 E 197 - 1.073

S 187 E 188 - 2.360

NW CORNER - AREA III - 3 m + (rod too short)

NE CORNER AREA III - 3.312.



SCOPE ANGLE IS 20° - (3-22-85 THIS ANGLE CANNOT BE CORRECT - MUST HAVE READ THE WRONG SCALE 20 CORRESPONDS TO 10°)

AREA IV CONTAINS _____ TRENCHES RUNNING ACROSS AREA. THESE ARE CLOSE TO GRID LINES.

CORNERS ARE: S 215 E 203

S 243 E 208

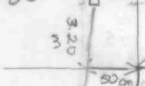
S 215 E 172

S 243 E 172

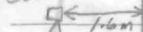
3 TRENCHES RUN NORTH/SOUTH

2 TRENCHES RUN EAST/WEST

80 S240 E203



S230 E203



3m

6m

TRENCHES ARE ABOUT 90 cm WIDE

IF THE TRANSIT IS SET UP AT S230 E203 A
CLEAR VIEW OF THE AREA IS POSSIBLE FOR
ELEVATIONS AS WELL AS LOCATING AND
DEFINING TRENCHES.

IF THE CORNERS OF THE TRENCHS ARE ESTABLISHED
ON A 1:100 SCALE MAP, ANGLES FROM
S230 E203 CAN BE USED TO LOCATE THE
TRENCHES.

AREA III IS COMPLETE - NO UNITS WILL BE PLACED

13 MARCH 1985

AREA IV - THE TRENCHES WILL BE SHOT IN AND MEASURED WITH THE TRANSIT. THE CORNERS OF EACH TRENCH WILL BE SHOT IN AND THE ANGLE AND DISTANCE PLOTTED. $H1 = 1.48$

	DISTANCE	ANGLE	RAN	ELEVATION
63	1.665 - 1.662	165°		1.433
2.4	1.590 - 1.614	67°		1.607
4	1.68 - 1.72	51°		1.70
13.2	2.165 - 2.297	82° 40'		2.23
14.4	2.131 - 2.275	83° 40'		2.204
14.2	2.081 - 2.173	88° 40'		2.1
12.9	2.532 - 2.661	89°		—
15	1.809 - 1.959	118° 20'		1.884
14	1.922 - 2.062	120°		1.992
15	1.91 - 2.06	123.5°		1.850
24.3	1.972 - 2.215	110°		2.095
24.2	1.92 - 2.162	113°		2.04
24.2	2.225 - 2.527	117°		2.375
24	2.119 - 2.409	118°		2.261
25.1	2.439 - 2.69	91.5°		2.563
24	2.538 - 2.788	89°		2.62
		71° 40'		4.055
30	3.78 - 4.08	70°		3.93
19.8	3.30 - 3.498	50°		
18.4	3.877 - 4.061	47° 20'		3.969
8.8	2.715 - 2.863	27° 40'		2.818

82

DIST.

ANGLE

ELEV

8

2.82 ~

2.90

19 1/4

2.86

COMPLETED THE TRENCH MAP OF AREA IV. THE MEASUREMENTS ON THE PRECEEDING PAGES ARE RELATIVE DO TO SWAMPING. THE FOLLOWING COORDINATES PINPOINT THE TRENCH BOUNDARIES.

S 219.5 E 173.8

S 238.4 E 180.1

S 219.5 E 174.8

S 239.5 E 180.6

S 243.8 E 176.2

S 236.2 E 201.35

S 243.8 E 177.2

S 237.1 E 202.4

S 217.3 E 187.8

S 217.4 E 188.75

S 237.1 E 189.7

S 237.0 E 190.8

S 222 E 199

S 222 E 200

S 236.2 E 201.35

S 237.1 E 202.4

S 229.5 E 179

S 230.5 E 178.5

S 227.7 E 200

S 228.8 E 200.4

14 MARCH 1985

AREAS II AND IV WILL BE LAID OUT TODAY
IN AREA II THERE WILL BE ONE 2X2 PER
10 X 10.

THE COORDINATES FOR 8 X 2 S ARE:

S 187 E 228 (SE) S 186 E 235 (SE)

S 187 E 226 (SW) S 186 E 233 (SW)

S 185 E 226 (NW) S 184 E 235 (NE)

S 185 E 228 (NE) S 184 E 233 (NW)

S 184 E 248 (SE)

S 184 E 246 (SW)

S 182 E 248 (NE)

S 182 E 246 (NW)

S 186 E 253 (SE)

S 186 E 251 (SW)

S 184 E 253 (NE)

S 184 E 251 (NW)

S 182 E 269 (SE)

S 182 E 267 (SW)

S 180 E 269 (NE)

S 180 E 267 (NW)

S 189 E 280 (SE)

S 189 E 278 (SW)

S 187 E 280 (NE)

S 187 E 278 (NW)

1X2

S 183 E 283 (SE)

S 183 E 282 (SW)

S 181 E 283 (NE)

S 181 E 282 (NW)

1X2

S 196 E 284 (SE)

S 196 E 283 (SW)

S 194 E 284 (NE)

S 194 E 283 (NW)

84 AREA II

2X25

under
tree

S 195 E 278 (SE)

S 195 E 276 (SW)

S 193 E 278 (NE)

S 193 E 276 (NW)

needs
clearing

S 197 E 227 (SE)

S 197 E 225 (SW)

S 195 E 227 (NE)

S 195 E 225 (NW)

S 200 E 264 (SE)

S 200 E 262 (SW)

S 198 E 264 (NE)

S 198 E 262 (NW)

in
road

S 196 E 259 (SE)

S 196 E 257 (SW)

S 194 E 259 (NE)

S 194 E 257 (NW)

S 196 E 250 (SE)

S 196 E 248 (SW)

S 194 E 250 (NE)

S 194 E 248 (NW)

brush pile

S 194 E 240 (SE)

S 194 E 238 (SW)

S 192 E 240 (NE)

S 192 E 238 (NW)

needs
clearing

AREA IV WILL BE GRIDDED IN 2X2s

SOUTH OF 5230, BETWEEN TRENCHES. -

THE COORDINATES FOR 2X2s ARE : SE CORNERS

5230 E200 ✓

5230 E198 ✓

5232 E200

5232 E198

5234 E200

5234 E198

5236 E200

5236 E198

5238 E200

5230 E196 ✓

5230 E194 ✓

5232 E196

5232 E194

5234 E196

5234 E194

5236 E196

5236 E194

5230 E192 ✓

5230 E188 ✓

5232 E192

5232 E188

5234 E192

5234 E188

5236 E192

5236 E188

5240 E188

5242 E188

5232 E186 (TRENCH)

5232 E184 (TRENCH)

5234 E186

5234 E184

5236 E186

5236 E184

5240 E186

5238 E184

5242 E186

5240 E184

5242 E184

86 AREA IV

5232 E 182 (TRENCH)	5232 E 180 (TRENCH)
5234 E 182	5234 E 180
5236 E 182	5236 E 180
5238 E 182	5238 E 180
5240 E 182	5240 E 180
5242 E 182	5242 E 180
✓ 5280 E 178	✓ 5230 E 176
5232 E 178	5232 E 176
5234 E 178	5234 E 176
5236 E 178	5236 E 176 (TRENCH)
5238 E 178	5238 E 176 (TRENCH)
5240 E 178	5240 E 176 (TRENCH)
5242 E 178	5242 E 176 (TRENCH ?)
✓ 5230 E 174	
5232 E 174	
5234 E 174	
5236 E 174	
5238 E 174	
5240 E 174	
5242 E 174	

PUTTING IN AREA IV FROM S230 E203 -
 WILL SHOOT ALONG THE S230 LINE PLACING
 STAKES AT 2 M INTERVALS - THIS WILL BE DONE
 AGAIN AT S240, THE 2X2s BETWEEN CAN
 THEN BE PULLED.

TOM EXTENDED THE GRID INTO THE NE CORNER
 OF AREA IV. - THIS WILL BE COMPLETE
 TOMORROW AND ELEVATIONS WILL BE
 SHOT IN FOR CONTOUR MAP.

WILL WORK ON AREA III TOMORROW -
 WORKED ON MAPS, FORMS, ETC 2 HOURS IN P.M.

15 MARCH 1985

COMPLETED GRIDDING AREA IV - CORNERS ARE:

S 220 E 203

S 220 E 190

S 230 E 190

S 230 E 172

S 230 E 203

S 240 E 203

S 240 E 172

STARTED WORKING ON AREA II. PUT IN 4 (FOUR) UNITS WITH NO PROBLEMS. MOST OF THE OTHERS, HOWEVER WE IN HEAVY BRUSH, UNDERGROWTH, TREE FALLS ETC. THESE EITHER HAVE TO BE CLEARED OR THE UNIT CHANGED. SOME CLEARING WILL HAVE TO BE DONE REGARDLESS OF WHETHER THE UNITS ARE MOVED.

I WOULD LIKE TO GO AHEAD AND SHOOT IN ELEVATIONS FOR AREA IV. SO THE CONTOUR MAP CAN BE DONE. THESE WOULD BE DONE, AS WITH AREA I, ON THE TWO METER GRID POINTS AND ALONG NOTICABLE CHANGES IN GROUND SURFACE - WILL DO IT ON MONDAY OR TUESDAY -

WENT HOME SICK AT 1:00 BUT WORKED ON MAPS AT HOME. WENT BACK TO FIELD AT 4:00 WITH COMPLETED FORMS.

WILL WORK THIS WEEKEND.

18 MARCH 1985

THERE ARE SEVERAL FEATURES WHICH SHOULD BE COMPLETE BUT APPARENTLY ARE NOT, OR I JUST HAVE QUESTIONS ABOUT:

FEATURES - 241 - NOT TURNED IN YET

166 - NOT TURNED IN YET

ALSO, I WANT TO CHECK AGAIN:

(NO POST MOLD) FEATURES - 3 20 (NO POST MOLD)
 (NO POST MOLD) 94 21 (NO POST MOLD)
 ? 90 22 ?
 (NO POST MOLD) 95

JUST WANT TO CHECK POST MOLDS ETC & PUT THEM ON MAP IF NOT ALREADY THERE.

WILL BEGIN ON ELEVATIONS ETC. FOR AREA IV.

WILL TAKE THEM FROM S230 E203 - BACKSHOOT TO S200 E200 AND BASICALLY DO THE ENTIRE AREA FROM S210 LINE TO S240.

RAW ELEV	- HI (1.44)	2.796 - (RE-HI) ABSOLUTE ELEV
HI = 1.44		
S200 E200 - 4.236	- 2.796	(48 m ASL) 0
S215 E203 - 3.139	- 1.699	1.097
S220 E203 - 3.016	- 1.576	1.22
S222 E203 - 2.881	- 1.441	1.355
S224 E203 - 2.242	- 0.802	1.994

907

COORDINATE	RAW ELEV.	(1.44) -H1	ABSOLUTE ELEV.
S226 E203	1.618	-.178	2.618
S228 E203	1.502	-.062	2.734
S230 E203	1.44	0	2.796
S232 E203	1.412	.028	2.768
S234 E203	1.510	-.07	2.726
S236 E203	1.517	-.077	2.719
S238 E203	1.512	-.072	2.724
S240 E203	1.593	-.153	2.643
S243 E203	1.635	-.195	2.601
S215 E200	3.470	-2.03	.766
S220 E200	3.190	-1.75	1.046
S222 E200	TRENCH	—	—
S224 E200	TRENCH	—	—
S226 E200	TRENCH	—	—
S228 E200	TRENCH	—	—
S230 E200 (BACKDRT)	1.507	-.067	2.729
S232 E200	1.538	-.098	2.698
S234 E200	1.561	-.121	2.675
S236 E200	1.598	-.158	2.638
S238 E200	1.702	-.262	2.534
S240 E200	1.685	-.245	2.551
S220 E198	3.264	-1.824	.972
S222 E198	2.910	-1.47	1.326
S224 E198	2.450	-1.01	1.786
S226 E198	2.071	-.631	2.165

COORDINATE	RAW ELEV.	(1.44)	ABSOLUTE ELEV.
		- 1.41	
S228 E198	TRENCH	—	—
S230 E198	1.65	-.21	2.586
S232 E198	1.65	-.21	2.586
S234 E198	1.609	-.169	2.627
S236 E198	1.712	-.272	2.524
S238 E198	1.723	-.283	2.513
S240 E198	1.712	-.272	2.524
S220 E196	3.353	-1.91	.886
S222 E196	2.965	-1.525	1.271
S224 E196	2.610	-1.17	1.626
S226 E196	2.195	-0.755	2.041
S228 E196	TRENCH	—	—
S230 E196	1.864	-.424	2.372
S232 E196	1.712	-.272	2.524
S234 E196	1.727	-.287	2.509
S236 E196	1.756	-.316	2.48
S238 E196	1.806	-.366	2.43
S240 E196	1.867	-.427	2.369
S220 E194	3.383	-1.943	.853
S222 E194	3.003	-1.563	1.233
S224 E194	2.551	-1.111	1.686
S226 E194	2.265	-.825	1.971
S228 E194	2.059	-.619	2.177
S230 E194	1.978	-.538	2.258
S232 E194	1.842	-.402	2.394

12		(1.44)	
COORDINATE	RAW ELEV	- HI	ABSOLUTE ELEV
S 234 E 194	1.880	-.44	2.356
S 236 E 194	1.803	-.363	2.433
S 238 E 194	1.830	-.39	2.406
S 240 E 194	1.775	-.335	2.461
S 220 E 192	3.443	-2.003	.793
S 222 E 192	2.943	-1.503	1.293
S 224 E 192	2.723	-1.283	1.513
S 226 E 192	2.406	-.966	1.83
S 228 E 192	2.130	-.69	2.106
S 230 E 192	2.023	-.583	2.213
S 232 E 192	1.902	-.462	2.334
S 234 E 192	1.887	-.447	2.349
S 236 E 192	1.875	-.435	2.361
S 238 E 192	1.899	-.459	2.337
S 240 E 192	1.817	-.377	2.419
S 215 E 190	3.870	-2.43	.366
S 220 E 190	3.460	-2.02	.776
S 222 E 190	3.053	-1.613	1.183
S 224 E 190	2.710	-1.27	1.526
S 226 E 190	2.489	-1.049	1.747
S 228 E 190	TRENCH		
S 230 E 190			
S 232 E 190			
S 234 E 190			
S 236 E 190			

COORDINATE	RAW ELEV	- HI (1.44)	ABSOLUTE ELEV.
S238 E190	TRENCH	—	
S240 E190	1.862	-.422	2.374
S230 E188	2.052	-.612	2.184
S232 E188	1.939	-.499	2.297
S234 E188	1.922	-.482	2.314
S236 E188	1.985	-.545	2.251
S238 E188	TRENCH	—	
S240 E188	1.865	-.425	2.371
S230 E186	TRENCH	—	
S232 E186	1.984	-.544	2.252
S234 E186	1.903	-.463	2.333
S236 E186	1.900	-.46	2.336
S238 E186	TRENCH	—	
S240 E186	1.941	-.501	2.295
S230 E184	TRENCH	—	
S232 E184	2.068	-.628	2.168
S234 E184	2.041	-.601	2.195
S236 E184	1.909	-.469	2.327
S238 E184	TRENCH	—	
S240 E184	1.939	-.499	2.297
S230 E182	TRENCH	—	

94

COORDINATE	RAW ELEV.	(1.44) - HI	ABSOLUTE ELEV.
S 232 E 182	2.090	-.65	2.146
S 234 E 182	2.015	-.575	2.221
S 236 E 182	2.010	-.57	2.226
S 238 E 182	1.978	-.538	2.258
S 240 E 182	1.947	-.507	2.289
S 215 E 180	/		
S 220 E 180			
S 230 E 180			
S 232 E 180	2.294	-.854	1.942
S 234 E 180	2.212	-.772	2.024
S 236 E 180	2.121	-.681	2.115
S 238 E 180	2.060	-.62	2.176
S 240 E 180	2.028	-.588	2.208
S 230 E 178 (END OF TRENCH)	2.578	-1.138	1.658
S 232 E 178	2.472	-1.032	1.764
S 234 E 178	2.320	-.88	1.916
S 236 E 178	2.251	-.811	1.985
S 238 E 178	2.225	-.785	2.011
S 240 E 178	2.179	-.739	2.057
S 230 E 176	TRENCH ↑ ↓	/	
S 232 E 176			
S 234 E 176			

COORDINATE	RAW ELEV.	(1.44) - H.I.	ABSOLUTE ELEV.
S236 E176	↕	/	
S238 E176	↕		
S240 E176	—		1.877
S230 E174	2.730	-1.29	1.506
S232 E174	2.681	-1.191	1.605
S234 E174	2.550	-1.11	1.686
S236 E174	2.592	-1.152	1.644
S238 E174	2.532	-1.092	1.704
S240 E174	2.450	-1.01	1.786
S215 E172	—	/	
S220 E172	—		
S230 E172	2.892	-1.452	1.344
S232 E172	—	/	
S234 E172	—		
S236 E172	—		
S238 E172	—		
S240 E172	2.640	-1.20	1.596
S242 E172	2.589	-1.149	1.647
S215 E172	4.197	-2.757	.089

18 MARCH 1985
(CONT)

TOM PULLED ME TO WORK WITH BILL HUSER ON
DRAWING FEATURE 200. THIS TOOK MOST OF THE
DAY. WILL GET TO AREA IV LATER.

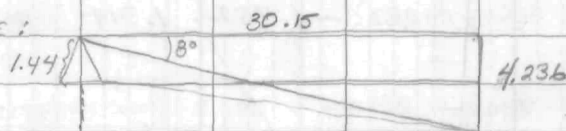
19 MARCH 1985

SPENT ENTIRE MORNING AND WILL PROBABLY SPEND
THE AFTERNOON ON FORMS & AREA I FEATURES.

SHOT IN SEVERAL FEATURE ELEVATIONS FOR DAVID
MURACA - SEE PGS 154-156.

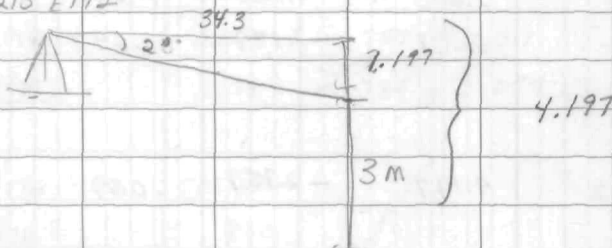
20 MARCH 1985

WILL FINALLY SHOOT ELEVATIONS FOR AREA IV. WILL HAVE TO
SHOOT AN ANGLE ON S200 E200. WILL SHOOT TO GROUND
LIKE:



WILL GET DISTANCE OFF MAP.

S215 E172



(H1 = 1.44)

97

TRENCH #1 - EAST PROFILE - FROM 5230 E203

NORTH END		SOUTH END (JUNCTION W/TRENCH #1)		2.855	
1 TREE	5 1.508	9 1.475	13 1.957		
2 TREE	6 1.517	10 1.532	14 2.277		
3 TREE	7 1.483	11 1.649			
4 TREE	8 1.481	12 1.732			

TRENCH #2 - WEST FACE - SOUTH END - 1.859
NORTH END -

1-1.898	5-2.022	9-2.247	13-2.95	17-3.556
2-1.93	6-1.995	10-2.489	14-3.132	18-3.725
3-1.955	7-2.067	11-2.60	15-3.317	19-
4-1.962	8-2.154	12-2.785	16-3.451	

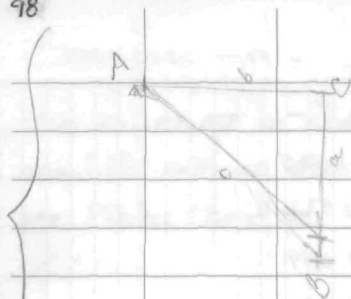
TRENCH #5 - NORTH PROFILE EAST END - 1.693
ABOUT THE E 200 LINE

1-1.704	5-1.949	9-2.158	13-2.13
2-1.820	6-2.063	10-2.206 (EE2)	14-2.198
3-1.870	7-2.082	11-2.141 (WED)	15-2.220
4-1.922	8-2.130	12-2.169	16-2.315
			17 2.355
			18 2.381
			19 2.388
			20 2.476

TRENCH #3 - WEST FACE - N END - 3.692
S END - 2.362

1-2.319	5-2.373	9-2.478	13-2.653
2-2.314	6-2.420	10-2.505	14-2.779
3-2.291	7-2.436	11-2.535	15-2.89
4-2.325	8-2.480	12-2.613	16-3.032

17-3.169 18-3.255 19-3.350 20-3.473 21-3.580



ANGLE A WOULD BE GIVEN AS WOULD C
TO OBTAIN a WE NEED c OR b

TRENCH # 4- SOUTH FACE

1.5 FROM CORNER	1.685	18 m FROM CORN	1.916
W → 3 m FROM CORNER	1.675	19 "	1.901
4 m "	1.698	20 "	1.905
5 m "	1.747	21 "	1.958
6 m "	1.798	22 "	1.991
7 m "	1.838	23 "	2.025
8 m "	1.892	END 24 "	2.070
9 m "	1.839		
10 m "	1.878		
11 m "	(E/92.2) 1.899		
12 m "	1.949		
13 "	1.860.		
14 "	1.867		
15 "	1.849		
16 "	1.863		
17 "	1.903		

AREA I - 1-969

AREA II - 2000 - 2051 (SO FAR)

- AREA III - 0

AREA IV - 4000 -

AREA V - 5000 - 5014 (SO FAR)

AREA VI - 6000 -

CALCULATED THE ELEVATIONS FOR AREAS III & IV.

WILL COMPLETE THE CONTOUR MAPS THIS WEEK (END).

21 MARCH 1985

WORKED ON MAPS OF AREA IV AND II

AREA IV HAS BEEN NUMBERED FROM 5143 TO 5220. ADDITIONAL ELEVATIONS ARE NEEDED ON THE S 242 LINE AND THE E 202 LINE. AND SPIKES PLACED AT THE COORDINATES (SEE PG 100).

I WILL DO THIS TODAY TO COMPLETE AREA IV THEN WILL MOVE TO AREA VI-A

THIS AREA (VI-A) WILL BE SET UP WITH STAKES ON THE 10X10 GRID AND SPIKES COMPLETING THE AREA AT 2m INTERVALS.

THE AREA CORNERS ARE:

5182 E 285	RW	E 285
5182 E 315	RW	E 315

ADDITIONAL ELEV. - AREA IV

COORDINATE	RAW ELEV	- H (1.44)	ABSOLUTE ELEV.
5220 E202	3.074	-1.634	1.162
5222 E202	2.905	-1.465	1.331
5224 E202	2.290	-.85	1.946
5226 E202	1.748	-.308	2.488
5228 E202	1.525	-.085	2.711
5230 E202	1.498	-.058	2.738
5232 E202	TRENCH	-	-
5234 E202	TRENCH	-	-
5236 E202	TRENCH	-	-
5238 E202	TRENCH	-	-
5240 E202	TREE	-	-
5242 E202	TREE	-	-
5242 E200	1.623	-.183	2.613
5242 E198	BACKDIAT	-	-
5242 E196	BACKDIAT	-	-
5242 E194	1.812	-.372	2.424
5242 E192	1.830	-.39	2.406
5242 E190	1.878	-.438	2.358
5242 E188	1.908	-.468	2.328
5242 E186	1.870	-.43	2.366
5242 E184	1.925	-.485	2.311
5242 E182	2.023	-.583	2.213
5242 E180	2.049	-.609	2.187
5242 E178	2.175	-.735	2.061
5242 E176	2.348	-.908	1.888
5242 E174	2450	-1.01	1.786

AREA VI-C = E475 - E485 (3 x 15)
5134 - 5144

AREA VI-D = E505 - E515 (10 x 10)
5134 - 5137.5

²²
~~22~~ MARCH 1985

WEATHER IS FOUL. RAIN IS KEEPING ME TO MAPS.

WENT TO THE LAB AT NOON - WORKED ON 1:50 MAPS OF AREA IV. ELEVATIONS FOR THE CONTOUR ARE ON THE MAP. WILL TRY TO CATCH UP THIS WEEKEND.

25 MARCH 1985

SPENT THE DAY IN THE LAB WORKING ON MAPS. CAUGHT UP ON ALL OF THE FIELD MAPS AND DRAFTED THE 1:50 MAPS OF AREAS IV AND V. SET UP AREA VI TO BE LAID OUT

26 MARCH 1985

WORKING IN FIELD TODAY. DECIDED TO RECHECK SOME OF THE NORTHERNMOST ELEVATIONS IN AREA I. THESE ARE MOSTLY ASSOCIATED WITH THE LEDGE ADJACENT TO THE ROAD. THESE WILL HELP DEFINE THE LEDGE MORE CLEARLY ON THE CONTOUR MAP.

Corrected

See pg 105

TAKEN FROM

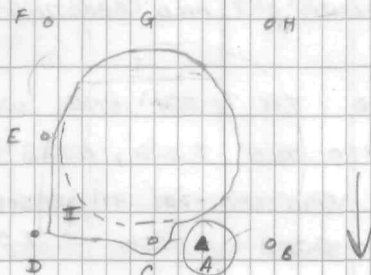
AREA I - LEDGE		ADJACENT TO ROAD		- H1		1.44
	RAW	- H1		RAW	- H1	ABS-
S200 E 232	1.475	-.055 1.157	S201.2 E 230	1.41	.03	1.242
		.027				
S201.3 E 232	1.413	1.239	S201 E 228	1.414	.026	1.238
		0				
S200 E 234	1.44	1.212	S201 E 227	1.405	.035	1.247
		.066				
S201.55 E 234	1.374	1.278	S200 E 226	1.479	-.039	1.173
		.519				
S202.3 E 234	.921	1.731	S201 E 226	1.40	.04	1.252
		.032				
S200 E 236	1.408	1.244	S202 E 226	1.015	.425	1.637
		.128				
S201.65 E 236	1.312	1.34	S201.8 E 226	1.015	.425	1.637
		.495				
S202.3 E 236	.945	1.707	S200 E 225	1.502	-.062	1.45
		.018				
S200 E 238	1.422	1.23	S201 E 225	1.363	.077	1.135
S202 E 238	—		S202 E 225	1.055	.385	1.597
		.452				
S202.5 E 238	.988	1.664	S201.6 E 225	1.087	.353	1.565
		.013				
S200 E 240	1.427	1.225	S200 E 224	1.510	-.07	1.142
S200 E 240	—		S201 E 224	1.422	.018	1.23
		.509				
S202.7 E 240	.931	1.721	S202 E 224	1.075	.365	1.577
		.059				
S200 E 242	1.381	1.271	S200 E 222	1.561	-.121	1.091
S202 E 242	—		S201 E 222	1.411	.029	1.241
		.6				
S203 E 242	.840	1.812	S202 E 222	1.212	.228	1.44
		.12				
S200 E 244	1.32	1.332	S200 E 220	1.610	-.17	1.042
S202 E 244	—		S201 E 220	1.41	.03	1.242
		.662				
S203.1 E 244	.778	1.874	S202 E 220	1.286	.154	1.366
		.22				
S200 E 246	1.220	1.432	S200 E 218	1.72	-.28	.982
		.364				
S202.4 E 246	1.076	1.576	S201 E 218	1.535	-.095	1.117
		.745				
S203.15 E 246	.695	1.957	S202 E 218	1.327	.113	1.325
			S200 E 216	1.82	-.38	.832
		.64				
S200 E 210	2.080	.572	S200 E 214	1.905	-.465	.747
			S200 E 212	1.988	-.548	.664

WILL FINISH AREA IV AND SHOOT ADDITIONAL
ELEVATIONS (NOTED ON PG 100 -)

NEED A SOLID DATUM FOR THE WELL - WILL USE A
WOODEN STAKE AND DRIVE IT ADJACENT TO WELL.

MAIN DATUM FOR WELL - S216 E232.63

(A) ELEVATION OF MAIN DATUM = $\frac{RAW}{-HI} / \frac{AB}{AB}$ = $.450 / .99 / 2.052$



	RAW	-HI	ABS -	
B	.450	.99	2.052	TAKEN FROM S200E230
C	.458	.982	2.044	H1 = 1.44
D	.443	.997	2.059	
F	.446	.994	2.056	
F	.427	1.013	2.075	
G	.473	.967	2.029	
H	.334	1.106	2.168	
I	.700	.74	1.802	

NEED TO EXTEND AREA IV NORTH FROM:

S232 E182

S232 E184

TO INCLUDE A TRENCH (BUILDER'S ?) EVIDENT IN
THE PROFILE OF TRENCH 5.

27 MARCH 1985

WORKED ON MAPS - AREA II.

WILL COMPLETE LAYING OUT AND SHOOTING ELEVATIONS
ON AREA IV.

WILL EXTEND THE S 224 UNE WEST TO

E180. ALSO THE S 226, S 228

COORDINATE	RAW ELEV	-HI (1.44)	ABSOLUTE ELEV.
S224 E188	2.728	-1.288	1.508
S224 E186	2.818	-1.378	1.418
S224 E184	2.793	-1.353	1.443
S224 E182	2.936	-1.496	1.30
S224 E180	2.984	-1.544	1.252
S226 E188	2.505	-1.065	1.731
S226 E186	2.494	-1.054	1.742
S226 E184	2.583	-1.143	1.653
S226 E182	2.593	-1.153	1.643
S226 E180	2.745	-1.305	1.491

COORDINATE	RAW ELE	-HI (1.44)	ABS. ELEV
S228 E188	2.173	-.733	2.063
S228 E186	2.228	-.788	2.008
S228 E184	2.336	-.896	1.90
S228 E182	2.452	-1.012	1.784
S228 E180	2.565	-1.125	1.671
S228 E178	2.725	-1.285	1.511
S226 E178	2.897	-1.457	1.339
S224 E178	3.150	-1.71	1.086

28 MARCH 1985

WORKED ON MAPS -

FIGURED ADDITIONAL ELEVATIONS FOR AREAS I AND IV.
 NEED TO SHOOT IN DEEP FEATURES IN AREA I
 AND LAY OUT GRID IN AREA VI-A.

BOY, DID WE HIT A PROBLEM - APPARENTLY WHEN
 THE ELEVATION FOR S200 E200 WAS SHOT, AN ERROR
 WAS MADE. A MAJOR ERROR. I THINK THE STADIA
 ROD WAS PLACED NEXT TO THE STAKE RATHER THAN
 ON THE BENCH MARK OR, BECAUSE WE WERE
 USING A MAKESHIFT ROD, SOMETHING WENT
 WRONG. ANYWAY, THERE IS AN ERROR. EACH
 ELEVATION WILL HAVE TO BE RECALCULATED AND
 THE CONTOUR MAP REDRAWN. WILL ADD 15cm TO
 ALL ELEVATIONS.

29 MARCH 1985

TRIED TO BEGIN AREA VI-A.

PULLED UP SPIKES IN AREA-I- AND SPENT THE MORNING AND A GOOD PART OF THE AFTERNOON REMOVING SPIKES FROM STRING. ATTEMPTED TO UNTANGLE THE USED STRING BUT IT PROVED TOO TIME CONSUMING.

FOUND A PROBLEM WITH THE GRID IN AREA IV THE EAST WEST LINES, S140 AND S142.

DID NOT LINE UP WHEN STRUNG. CHECKED IT OUT TO FIND THE S140 LINE OFF WEST OF E188. THE S142 LINE WAS FINE. WE

PULLED THE STRING STRAIGHT, PAST THE S140 SPIKES. THEY WERE OFF-ABOUT 5-7cm TO FAR EAST. THE DISCREPANCY WILL BE CORRECTED ON THE COMPLETED FORMS.

AREA IV APPEARS TO BE OK NOW.

1 APRIL 1985

WILL PUT IN AREA VI-A. USING THE TRANSIT
I'LL RUN A LINE ALONG THE S200, S190 AND
S180 LINES AT 2 M INTERVALS USING SPIKES
FOR ALL EXCEPT THE 10 M CORNERS
A LINE WILL ALSO BE SHOT IN AT S202
AS THIS IS THE SE CORNER - S202 E315
THE TRANSIT WILL ALSO BE USED FOR THE
E 185 LINE.

AREA VI-A'S CORNERS ARE:

S182 E 185	S182 E315
S210 E 185	S202 E 315

PUT IN THE S200 LINE, THE E 185, E300,
AND E 315 LINES. THIS WILL SIMPLIFY
GRIDDING THE REST OF VI-A.

2 APRIL 1985

WORKED WITH DICK THROUGH ABOUT 11:00, THEN
DID SOME PAPER WORK. FOUND SOME FEATURES
WHICH HAVE NOT BEEN EXCAVATED OR COMPLETED
IN AREA I.

DM - 4-3-85

2006 (5189 E231) (MD - 5189 E230)
2005 (5188 E232)
FEA 2001

3 APRIL 1985

WORKED ON MAPS AT THE APARTMENT.

4 APRIL 1985

AFTER GOING TO FIELD WORKED ON MAPS.

5 APRIL 1985

WORKED ON GRAPHIC FOR PAT. WAS UNABLE
TO COMPLETE IT SO I'LL MAIL IT ON
MON

8 APRIL 1985

HAD COPIES MADE OF AREA I. FEATURE
MAP AND MAILED IT TO PAT.
ALSO HAD ELEVATION SUMMARIES TYPED
AND COPIED.

9 APRIL 1985

WORKED ON MAPS AT THE APARTMENT —
ALSO DID SOME PAPERWORK.

10 APRIL 1985

WILL BE OFF THE 11TH AND 12TH
SPENT TODAY LEARNING THE FINER POINTS
OF THE SITE'S PHOTOGRAPHY.

11-12 APRIL 1985

IN GEORGIA.

15 APRIL 1985

MADE IT BACK. WILL CHECK WITH TOM TO
SEE IF ANYTHING NEEDS TO BE DONE IN
THE FIELD. IF NOT WILL TAKE THE
PAPERWORK HOME. WORKED IN FIELD
ALL DAY - IN AREA VI-A

16 APRIL 1985

AREA VI-A - SOUTH EDGE

S210. E285	S209.6 E286
S208.7 E290	S209.2 E288
S207.6 E294	S208.2 E292
S207 E296	S206.5 E298
S205.5 E302	S204.9 E304

S 204.4 E306

S 203.8 E308

S 203.3 E310

S 202.8 E312

S 202.2 E314

S 202 E315

AREA VI-A IS GRIDDED SOUTH OF THE ROAD
AND EAST OF E300. HAD TO GET MORE
SPIKES TO FINISH.

WILL WORK ON MAPS AND PAPERWORK THE
REST OF THE DAY AT THE APT.

17 APRIL 1985

WORKING ON PAPERWORK AND MAPS AT THE APT.

COMPLETED (REDOING) THE CONTOUR OF AREA I
HAD TO CORRECT TWO SETS OF ERRORS.

COMPLETED THE CONTOUR OF AREA IV

18 APRIL 1985

LAST NIGHT DICK AND I WORKED ON

CORRELATING THE HISTORIC MAPS (1863 & 1908)

TO THE CURRENT USGS. I DID CLEAN

COPIES OF THESE. I'M PLEASED WITH HOW

THEY LOOK.

19 APRIL 1985

FROM THE 1863 MAP AND USING HURRY'S
-MAPS AND THE HOUSE I SCALED DOWN
THE CURRENT STUDY AREAS TO THE SAME
SCALE AS THE HISTORIC & USGS MAPS.

WAS PLEASED WITH THE MAPS. FEATURE
200 (K101001) WAS AT 6200 E 230.

I THEN WENT TO THE FIELD TO SHOW
THESE TO TOM & PAT. THE STATE WAS
THERE SO I HELPED DICK. IN THE
AFTERNOON WHEN TOM RETURNED FROM
THE LAB I SHOWED HIM THE MAPS. HE
WAS PLEASED. THERE WAS, HOWEVER, A
DISCREPANCY BETWEEN MY MAPS & HURRY'S
INTERPRETATION OF AREA VI.

BEFORE WE APPROACH THE STATE
WITH THIS WE ARE GOING TO DOUBLE
CHECK OUR MAPS.

WILL BE IN THE FIELD MONDAY WITH
TRANSIT. WILL TRY TO SHOOT ELEVATIONS
FOR AREAS II, IV & VI-A.

AREA II -		ELEVATIONS		Below
COORDINATE	RAW	-HI	ABOVE 3200 E 300	ABSOLUTE
S186 E 228	3.750	-2.365	-1.203	
S188 E 228	3.399	-2.014	-.852	
S186 E 230	3.795	-2.41	-1.248	
(SE) S188 E 230	3.487	-2.102	-0.94	
S187 E 230	3.775	-2.39	-1.228	
S189 E 230	3.281	-1.896	-.734	
S187 E 232	3.852	-2.467	-1.305	
(SE) S189 E 232	3.335	-1.95	-.788	
(SE) S182 E 245	9° (4.614) 1.272	-3.229	-2.067	
S180 E 245	5° (5.063) 3.086	-3.678	-2.516	
S180 E 243	8° (5.271) 2.272	-3.886	-2.724	
S182 E 243	9° (4.726) 1.6	-3.351	-2.185	
(SE) S186 E 253	3° (4.112) 3.295	-2.643	-1.025	
S184 E 253	3° (4.506) 3.595	-3.037	-1.422	
S186 E 251	3° (4.199) 3.530	-2.73	-1.115	
S184 E 251	5° (4.579) 2.9	-3.11	-1.495	
(SE) S182 E 264	Not visible	X		
S180 E 264				
S180 E 262	3° (4.503) 3.450	-3.034	-1.419	
S182 E 262	3° (4.138) 3.195	-2.669	-1.054	

COORDINATE	RAW	-HI	ABSOLUTE
(SE) S187 E278	2.699	-1.271	.467
S185 E278	2.965	-1.531	.201
S187 E276	2.701	-1.273	.465
S185 E276	2.986	-1.558	.18
(SE) S183 E283	3.395	-1.967	-.229
S181 E283	3.73	-2.302	-.564
S181 E282	3.772	-2.344	-.606
S183 E282	3.38	-1.952	-.214
(SE) S192 E223	2.038	-.653	.509
S190 E223	2.541	-1.156	.006
S190 E221	2.46	-1.075	.087
S192 E221	2.00	-.615	.547
(SE) S194 E235	2.130	-.745	.417
S192 E235	2.720	-1.335	-.173
S192 E233	2.602	-1.217	-.055
S194 E233	2.090	-.705	.457
(SE) S192 E247	2.46	-1.075	.087
S190 E247	2.850	-1.465	-.303
S190 E245	3.005	-1.62	-.458
S192 E245	2.515	-1.13	.032

 ELEVATIONS
 AREA II

COORDINATE	RAW ELEV	-HI	ABSOLUTE
(SE) S195 E265	1.945	-.517	1.221
S193 E265	2.25	-.822	.916
S193 E263	2.192	-.764	.974
S195 E263	1.97	-.542	1.196
(SE) S196 E273	1.715	-.287	1.451
S194 E273	1.950	-.522	1.216
S196 E271	1.785	-.357	1.381
S194 E271	2.009	-.581	1.157
(SE) S195 E284	1.68	-.252	1.486
S193 E284	1.945	-.517	1.221
S195 E283	1.581	-.153	1.585
S193 E283	1.87	-.442	1.296
S190 E220	2.463	-1.078	.084
S180 E220	8° (4.087) 1.334	(HI - 1.385) -2.702	TAKEN FROM - S197 E230 -1.54
S190 E230	3.009	-1.624	-.462
S180 E230	8° (5.326) 2.938	(HI - 1.385) -3.941	TAKEN FROM S197 E230 -2.779
S190 E240	3.114	-1.729	-.567
S180 E240	9° (5.264) 2.16	HI = 1.385 -3.875	S197 E230 -2.713
S200 E250	—	—	1.044
S190 E250	3.421	-1.952	-.337

WRONG

COORDINATE	RAW	-HI	ABSOLUTE
S180 E250	5° (5.531) 3.58	H1 = 1.469 -4.062	S200 E260 -2.447
S200 E260	_____	_____	1.615
S190 E260	2.835	-1.366	0.249
S180 E260	5° (4.555) 2.805	-3.086	-1.471
S200 E270	_____	_____	1.788
S190 E270	5° (3.349) 1.599	-1.921	- .183
S180 E270	_____	_____	_____
S200 E280	_____	_____	_____
S190 E280	2.291	- .863	.875
S180 E280	5° (3.979) 2.025	-2.548	- .81
S200 E290	_____	_____	_____
S190 E290	_____	_____	.917
S180 E290	_____	_____	_____
S191 E258	2.863	-1.594	.221
S191 E256	3.013	-1.544	.071
S193 E258	2.471	-1.002	.613
S193 E256	2.607	-1.138	.477

116 AREA V

COORDINATE	RAW	1.655 -H1	ABSOLUTE
S212 E268	.538	1.117	3.067
S213 E268	.845	1.31	3.26
S215 E268	.305	1.35	3.3
S212 E269	.525	1.13	3.08
S212 E270	.52	1.135	3.085
S212 E271	.532	1.123	3.073
S212.5 E271	.430	1.225	3.175
S213 E274	.410	1.245	3.195
S213 E275	.365	1.29	3.24
S213 E280	.510	1.145	3.095
S215 E280	.465	1.19	3.14
S215 E270	.249	1.406	3.356
S215 E271	.131	1.524	3.474
S215 E272	.08	1.575	3.525
S215 E273	.099	1.556	3.506
* S215 E274	.081	1.574	3.524
S215 E275	.072	1.583	3.533
S215 E276	.081	1.574	3.524
S215 E278	.259	1.396	3.346
S215 E269	.315	1.34	3.29
S212.5 E272	.420	1.235	3.185
S212.5 E274	.435	1.22	3.17
S213 E276	.395	1.26	3.21
S213 E278	.443	1.212	3.162

S200 E300 IS .94 M. ABOVE S200 E280

AND IS THEREFORE 2.152 ABOVE S200 E200

	RAW	H/I	ABSOLUTE
S200 E280 -	1.669	-1.202	1.95

FROM S200 E300 AT H/I OF 1.463

S200 E260	1.802	-1.335	1.615
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S200 E270	1.679	-1.212	1.738
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FROM S200 E280 AT H/I 1.655

118 AREA 6-A

COORDINATE	RAW ELEV	1.46	(ABOVE 5200 F 500)
		-H1	ABSOLUTE
S 210 E 285	.689	.771	2.923
S 208 E 285	.758	.702	2.854
S 206 E 285	.802	.658	2.810
S 204 E 285	1.433	.027	2.179
S 202 E 285	1.585	-.125	2.027
S 200 E 285	1.647	-.187	1.965
S 198 E 285	1.641	-.181	1.971
S 196 E 285	1.794	-.334	1.818
S 194 E 285	2.06	-.6	1.552
S 192 E 285	2.295	-.835	1.317
S 190 E 285	2.615	-1.155	.997
S 188 E 285	2.90	-1.44	.712
S 186 E 285	3.231	-1.771	.381
S 184 E 285	3.590	-2.13	.022
S 182 E 285	3.57 (1°)	^{3.979} -2.519	-.367
S 180 E 285	GROUND AT (9°30')	^{4.182} -2.722	-.57
S 210 E 286	.720	.74	2.892
S 208 E 286	.740	.72	2.872
S 207 E 286	.715	.745	2.897
S 206 E 286	1.02	.44	2.592
S 204 E 286	1.371	.089	2.241
S 202 E 286	1.589	-.129	2.023
S 200 E 286	1.661	-.201	1.951
S 198 E 286	1.667	-.207	1.945
S 196 E 286	1.806	-.346	1.806

COORDINATE	RAW	1.46 -H1	ABSOLUTE
S194 E286	2.01	-.55	1.602
S192 E286	2.32	-.86	1.292
S190 E286	2.63	-1.17	.982
S188 E286	2.910	-1.45	.702
S186 E286	3.235	-1.775	.377
S184 E286	3.638	-2.178	-.026
S182 E286	1.02 (1.5°)	4.022 -2.562	-.41
S180 E286	—		
S210 E288	.700	.76	2.912
S208 E288	.640	.82	2.972
S207 E288	.875	.582	2.734
S206 E288	1.056	.404	2.556
S204 E288	1.43	.03	2.182
S202 E288	1.55	-.09	2.062
S200 E288	1.671	-.211	1.941
S198 E288	1.681	-.221	1.931
S196 E288	1.732	-.272	1.88
S194 E288	2.006	-.546	1.606
S192 E288	2.266	-.806	1.346
S190 E288	2.642	-1.182	.97
S188 E288	2.94	-1.48	.672
S186 E288	3.299	-1.839	.313
S184 E288	GROUND AT 10°	3.526 -2.066	.086
S182 E288	NO VISIBILITY AT ALL		
S180 E288	—		

COORDINATE	RAW	1.46 -H1	ABSOLUTE
S210 E290	.540	.92	3.072
S208 E290	.634	.826	2.978
S207 E290	.961	.499	2.651
S206 E290	1.177	.283	2.435
S204 E290	1.60	-.14	2.012
S202 E290	1.642	-.182	1.97
S200 E290	1.668	-.208	1.944
S198 E290	1.70	-.24	1.912
S196 E290	1.778	-.318	1.834
S194 E290	1.838	-.378	1.774
S192 E290	2.327	-.867	1.285
S190 E290	2.695	-1.235	.917
S188 E290	3.027	-1.567	.585
S186 E290	3.261	-1.801	.351
S184 E290	3.735	-2.275	-.123
S182 E290	3.0 ^{AT} 3.15 ^{4.169}	-2.709	-.557
S180 E290	—		
S210 E292	—		
S208 E292	1.062	.398	2.55
S207 E292	1.165	.295	2.447
S206 E292	1.221	.239	2.391
S204 E292	1.550	-.09	2.062
S202 E292	1.527	-.067	2.085
S200 E292	1.675	-.215	1.937
S198 E292	1.698	-.238	1.914
S196 E292	1.80	-.34	1.812

COORDINATE	RAW	1.46 - HI	ABSOLUTE
S 194 E 292	1.953	-.493	1.659
S 192 E 292	2.250	-.79	1.362
S 190 E 292	2.638	-1.178	.974
S 188 E 292	3.078	-1.618	.534
S 186 E 292	3.380	-1.92	.232
S 184 E 292	3.0 ^{AT} 2°30' 3.860	-2.4	-.248
S 182 E 292	3.0 ^{AT} 2°40' 4.606	-2.546	-.394
S 180 E 292	—		
S 208 E 294	.951	.509	2.661
S 206 E 294	—		TREE
S 204 E 294	1.278	.182	2.334
S 202 E 294	1.530	-.07	2.082
S 200 E 294	1.657	-.197	1.955
S 198 E 294	1.71	-.25	1.902
S 196 E 294	1.842	-.382	1.77
S 194 E 294	2.075	-.615	1.537
S 192 E 294	2.272	-.812	1.34
S 190 E 294	2.70	-1.24	.912
S 188 E 294	3.093 2.0 AT 4°40" (13.4 m)	-1.633	.519
S 186 E 294	3.435	-1.975	.177
S 184 E 294	3.718	-2.258	-.106
S 182 E 294	3.0 ^{AT} 2°40' 3.885	-2.425	-.273
S 180 E 294	—		

122

COORDINATE	RAN	1.46 -H1	ABSOLUTE
S207 E296	.978	.482	2.634
S206 E296	1.024	.436	2.588
S204 E296	1.064	.396	2.548
S202 E296	1.437	.023	2.175
S200 E296	1.575	-.115	2.037
S198 E296	1.688	-.228	1.924
S196 E296	1.821	-.361	1.791
S194 E296	2.033	-.573	1.579
S192 E296	2.36	-0.9	1.252
S190 E296	2.71	-1.25	.902
S188 E296	3.08	-1.62	.532
S186 E296	3.398	-1.938	.214
S184 E296	3.647	-2.187	-.035
S182 E296	3.24 ^{AT} ₂	3.882 -2.422	-.27
S180 E296	—		
S207 E298	.857	.603	2.755
S206 E298	.912	.548	2.70
S204 E298	1.049	.411	2.563
S202 E298	1.296	.164	2.316
S200 E298	1.535	-.075	2.077
S198 E298	1.676	-.216	1.936
S196 E298	1.781	-.321	1.831
S194 E298	2.018	-.558	1.594
S192 E298	2.348	-.888	1.264
S190 E298	2.669	-1.209	.943

COORDINATE	RAW	1.46	ABSOLUTE
		-H1	
S188 E298	2.979	-1.519	.633
S186 E298	3.255	-1.795	.357
S184 E298	3.531	-2.071	.081
S182 E298	2.91 ^{AT} 2°30'	-2.24 ^{3.70}	-.088
S180 E298	—		
S206 E300	.817	.643	2.795
S204 E300	.972	.488	2.64
S202 E300	1.258	.202	2.354
S200 E300	—		2.152
S198 E300	1.598	-.138	2.014
S196 E300	1.772	-.312	1.84
S194 E300	2.019	-.559	1.593
S192 E300	2.282	-.822	1.33
S190 E300	2.558	-1.098	1.054
S188 E300	2.847	-1.387	.765
S186 E300	3.130	-1.67	.482
S184 E300	3.422	-1.962	.19
S182 E300	3.691	-2.23	-.078
S180 E300	3.69 AT 1°	-2.58 ^{4.04}	-.428
S206 E302	.880	.58	2.732
S204 E302	.971	.489	2.641
S202 E302	1.219	.241	2.393
S200 E302	1.418	.042	2.194

124

COORDINATE	RAW	1.46 -HI	ABSOLUTE
S198 E302	1.572	-.112	2.04
S196 E302	1.750	-.29	1.862
S194 E302	1.912	-.452	1.7
S192 E302	2.177	-.717	1.435
S190 E302	2.437	-.977	1.175
S188 E302	2.705	-1.245	.907
S186 E302	2.918	-1.458	.694
S184 E302	3.295	-1.835	.317
S182 E302	3.585	-2.125	.027
S180 E302	—		
S205 E304	.888	.572	2.724
S204 E304	.921	.539	2.691
S202 E304	1.183	.277	2.429
S200 E304	1.378	.082	2.234
S198 E304	1.522	-.062	2.091
S196 E304	1.659	-.199	1.953
S194 E304	1.786	-.326	1.826
S192 E304	2.06	-.6	1.552
1.467 S190 E304	2.295	-.835	1.317
S188 E304	2.59	-1.123	1.029
S186 E304	2.88	-1.413	.739
S184 E304	3.212	-1.745	.407
S182 E304	3.508	-2.041	.111
S180 E304	—		

COORDINATE	RAW	1.467 -H1	ABSOLUTE
S205 E306	.857	.61	2.762
S204 E306	.90	.567	2.719
S202 E306	1.178	.289	2.441
S200 E306	1.35	.117	2.269
S198 E306	1.502	-.035	2.117
S196 E306	1.593	-.126	2.026
S194 E306	1.72	-.253	1.899
S192 E306	1.891	-.424	1.728
S190 E306	2.210	-.743	1.409
S188 E306	2.45	-.983	1.169
S186 E306	2.762	-1.295	.857
S184 E306	3.112	-1.645	.507
S182 E306	3.426	-1.959	.193
S180 E306	—		
S206 E308	—		
S204 E308	.871	.596	2.748
S202 E308	1.175	.292	2.444
S200 E308	1.35	.117	2.269
S198 E308	1.455	.012	2.272
S196 E308	1.535	-.068	2.084
S194 E308	1.625	-.158	1.994
S192 E308	1.775	-.308	1.844
S190 E308	2.087	-.62	1.532
S188 E308	2.379	-.912	1.24

COORDINATE	RAW	1.467 -H1	ABSOLUTE
S186 E308	2.66	-1.193	.959
S184 E308	2.975	-1.508	.644
S182 E308	3.32	-1.853	.299
S180 E308	—		
S204 E310	.933	.534	2.686
S202 E310	1.22	.247	2.399
S200 E310	1.339	.128	2.28
S198 E310	1.44	.027	2.179
S196 E310	1.514	-.047	2.105
S194 E310	1.755	-.288	1.864
S192 E310	1.838	-.371	1.781
S190 E310	2.095	-.628	1.524
S188 E310	2.402	-.935	1.217
S186 E310	2.73	-1.263	.889
S184 E310	2.978	-1.511	.641
S182 E310	3.298	-1.831	.321
S180 E310	—		
S203 E312	1.092	.375	2.527
S202 E312	1.252	.215	2.367
S200 E312	1.378	.089	2.241
S198 E312	1.438	.029	2.181
S196 E312	1.52	-.053	2.099
S194 E312	1.65	-.183	1.969

COORDINATE	RAW	1.467 -H1	ABSOLUTE
S192 E312	1.84	-.373	1.779
S190 E312	2.12	-.653	1.499
S188 E312	2.416	-.949	1.203
S186 E312	2.667	-1.2	.952
S184 E312	2.948	-1.481	.671
S182 E312	3.32	-1.853	.299
S180 E312	—		
S202 E314	1.276	.191	2.343
S200 E314	1.4	.067	2.219
S198 E314	1.47	.003	2.155
S196 E314	1.57	-.103	2.049
S194 E314	1.74	-.273	1.879
S192 E314	1.918	-.451	1.701
S190 E314	2.172	-.705	1.447
S188 E314	2.482	-1.015	1.137
S186 E314	2.74	-1.273	.879
S184 E314	2.952	-1.485	.667
S182 E314	3.299	-1.832	.32
S180 E314	—		
S202 E315	1.33	.137	2.289
S200 E315	1.416	.051	2.203
S198 E315	1.50	-.033	2.119
S196 E315	1.537	-.07	2.082

COORDINATE	RAW	1.467 - H1	ABSOLUTE
S194 E315	1.735	-.268	1.884
S192 E315	1.918	-.451	1.701
S190 E315	2.223	-.756	1.396
S188 E315	2.49	-1.023	1.129
S186 E315	2.725	-1.258	.894
S184 E315	2.974	-1.507	.645
S182 E315	3.308	-1.841	.311
S180 E315	3.79	-2.323	-.171

ELEVATIONS RELATED TO AREA VI - B

S180 E340	2.190	-.723	1.429
S160 E335	1.938	-.471	1.681
S161 E335	—		
S160 E360	2.435 1.435	1.032 -.032	3.181 2.184
		See pg 150	

* NOTED ON 24 MAY 1985 THAT ELEVATIONS SHOT ABOVE FOR S160 E360 DO NOT CORRESPOND TO THOSE SHOT ON 24 MAY. POOR VISIBILITY FROM S200 E300 TO S160 E360 MAY HAVE RESULTED IN INCORRECT ELEVATIONS. IN MY OPINION THE ELEVATIONS ON PG 150 ARE CORRECT, THE ONES ABOVE ARE NOT!

22 APRIL 1985

WORKED ON GRID OF AREA VI-A - FINISHED ABOUT $3/4$ OF THE AREA. WILL FINISH TOMORROW AND PREPARE FOR ELEVATIONS.

23 APRIL 1985

COMPLETED GRIDDING AREA VI-A. CAN NOW SHOOT IN ELEVATIONS. WILL PROBABLY GET TO THESE FIRST THING TOMORROW. I ALSO WILL SHOOT AREA V. AND WILL TRY TO GET TO AREA II. TOM, HOWEVER, WANTS ME IN THE LAB TOMORROW AFTERNOON TO DISCUSS THE MAPS, SPECIFICALLY THE HISTORIC ONES.

I NEED TO SHOOT CONTOURS TO THE FENCE LINE NORTH OF AREAS VI AND II.

I THINK I CAN DO THESE BY SHOOTING ANGLES AND PULLING THE DISTANCES OFF OF THE ROD.

24 APRIL 1985

SHOT APPROX HALF OF THE ELEVATIONS FOR AREA VI-A (HI AT 1.46)

3.582 FROM S200 F 300 TO S200 F 200
(NEED TO SUBTRACT H1)

25 APRIL 1985

COMPLETED ELEVATIONS IN AREA 6-A AND
TOOK ELEVATIONS IN AREA 5.

26 APRIL 1985

STARTED OUT TRYING TO DO PAPERWORK.
TOM CALLED AT 8:30 - NEEDED TO GRID AROUND
WELL IN 6-B. FINISHED THIS AND WORKED
ON MAPS OF AREA 6-A AND 6-B.

29 APRIL 1985

SET UP AREAS 6-C AND 6-D. DAVID MURACA'S
CREW WILL MOVE IN THERE AS SOON AS
POSSIBLE.

FINISHED NUMBERING AREA 6-A AND 6-B

29 APRIL 1985

NEED TO GRID AREA VI-B IN 10 METER
UNITS WHICH CAN BE SUBDIVIDED BY
THE INDIVIDUAL CREWS. WOODEN STAKES
WILL BE PLACED AT THESE LOCATIONS:

S140 E390

S140 E410

S140 E400

S150 E355

S160 E355

S150 E360 ✓

S160 E360 (X)

S150 E370 ✓

S160 E370 ✓

S150 E380 ✓

S160 E380 ✓

S150 E390 ✓

S160 E390 ✓

S150 E400 ✓

S160 E400 ✓

S150 E410 ✓

S160 E410 ✓

S170 E355

S180 E355

S170 E360

S180 E360

S170 E370 ✓

S180 E370 ✓

S170 E380 ✓

S180 E380 ✓

S170 E390 ✓

S180 E400 ✓

S170 E400 ✓

S190 E355

S170 E410 ✓

S190 E360

S170 E420 ✓

S190 E370 ✓

S170 E430 ✓

S190 E380 ✓

S170 E440 ✓

S190 E400 ✓

S200 E370 ✓

S140 E380

30 APRIL 1985

COULDN'T COMPLETE AREA 6-B BECAUSE
I NEED STAKES - GOT SOME THIS AM.
AND SET UP ABOUT HALF THE AREA IN A
10 X 10 m GRID.

1 MAY 1985

CONTINUED WORKING IN AREA 6-B.

2 MAY 1985

COMPLETED AREA 6-B ALSO PLACED
ADDITIONAL STAKES TO ASSIST IN TYING
AREA 6 TOGETHER FOR ELEVATIONS.

THE S 160 LINE EXTENDS FROM
E 355 TO E 460.

AREA 6-B WILL BE GRIDDED AS NEEDED SO NO
ELEVATIONS CAN BE SHOT YET - WHEN THEY
ARE THEY CAN BE SHOT BASED ON S160 E360
WHICH IS 2.184 m ABOVE S200 E200

3 MAY 1985

WORKING AT HOME ON MAPS AND ELEVATIONS.
COMPUTED THE ELEVATIONS FOR AREAS 6-A
AND 5.

LISTS NEED TO BE MADE FOR AREA 6.
WILL DO THAT TODAY TOO.

STARTED LISTS FOR AREA 6. THEY WILL
TAKE A WHILE TO COMPLETE.

6 MAY 1985

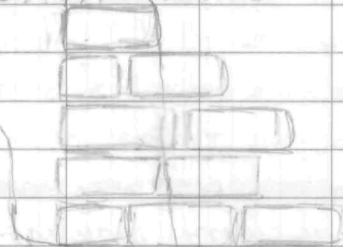
COMPLETED LIST FOR AREA 6-A.
WORKING WITH DICK OFF AND ON, WILL
HAVE TO TAKE OVER FOR HIM ON
FRIDAY.

COMPLETED LIST FOR 6-C AND 6-D.

THE ONLY LIST REMAINING IS AREA 6-B.

GARROWS
LEPORS

AT
OXON HILL



~~GARROWS~~
~~FRORS~~

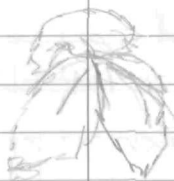
OXON HILL
MANOR
III

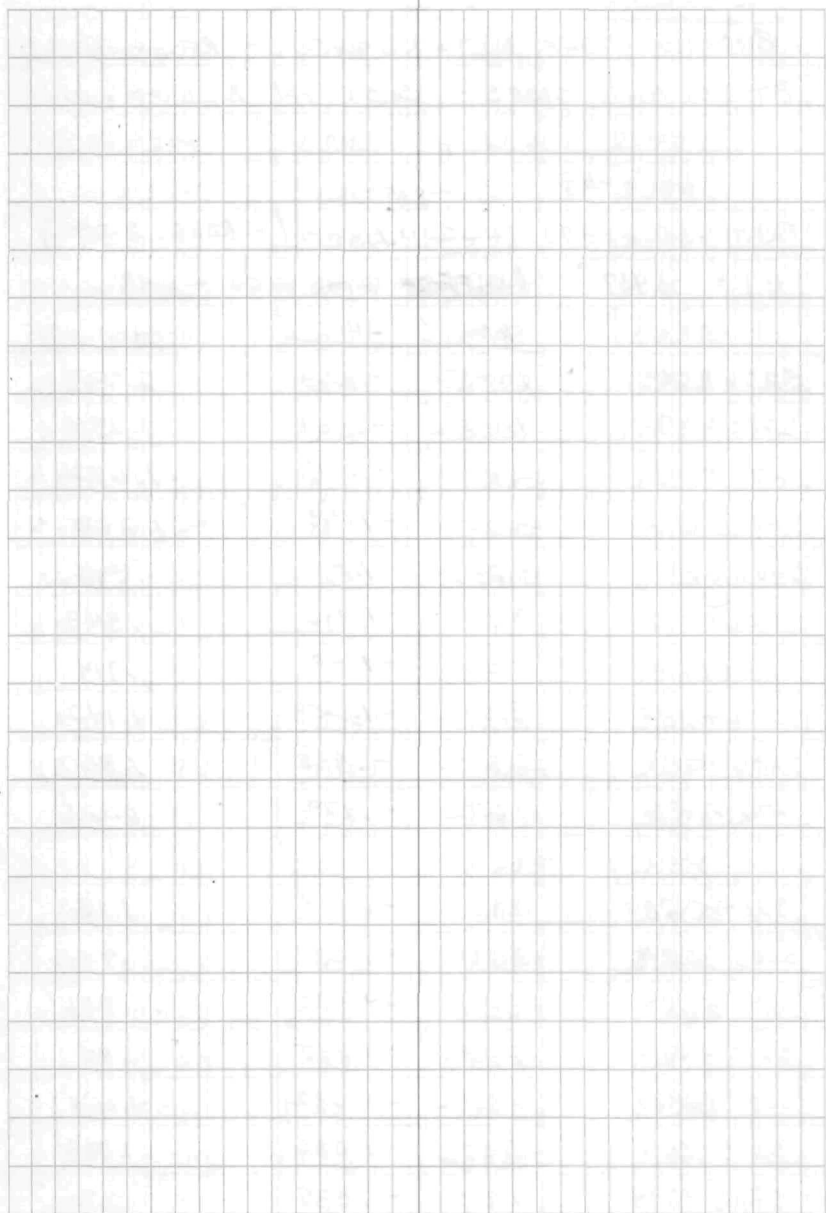
AND THE
MANSION OF DOOM?

BASED ON THE BEST SELLER:

YOU CAN GET IT FROM A TOILET SEAT!

CARROWS
CARROWS





7 MAY 1985

BACKHOE TOOK OUT K6A6001 - REGRIDDED
BOTTOM AND SIDES - SHOT IN ELEVATIONS

2.795

2152

FROM S206E300 TO S200E300 (- READ 2.080)

H1 = 1.437 (-DIFF OF ABOVE ELEV = .643)

	RAW	-H1	ABSOLUTE
S206E295	1.695	-.258	2.537
S206E294	1.938	-.501	2.294
S206E293	2.55	-1.113	1.682
S206E292	3.027	-1.59	1.205
S206E291	3.237	-1.8	.995
S206E290	3.383	-1.946	.849
S206E289	3.318	-1.881	.914
S206E288	3.09	-1.653	1.142
S206E287	2.375	-.938	1.857
206E286	1.614	-.179	2.616
S205E288	3.05	-1.613	1.182
S205E289	3.288	-1.851	.944
S205E290	3.346	-1.909	.886
S205E291	3.282	-1.845	.95
S205E292	3.069	-1.632	1.163
S205E293	2.523	-1.086	1.709
S205E294	1.972	-.535	2.26

ABSOLUTE

S205 E 295	1.718	-.281	2.514
S204 E 295	1.805	-.368	2.427
S204 E 294	2.037	-.6	2.195
S204 E 293	2.168	-.731	2.064
S204 E 292	3.082	-1.645	1.15
S204 E 291	3.15	-1.713	1.082
S204 E 290	3.209	-1.772	1.023
S204 E 289	3.188	-1.751	1.044
S204 E 288	2.675	-1.238	1.557
S204 E 287	2.11	-.673	2.122
S204 E 286	2.065	-.628	2.167
S204 E 285	—		
S203 E 295	1.945	-.508	2.287
S203 E 294	2.032	-.595	2.20
S203 E 293	2.20	-.763	2.082
S203 E 292	2.642	-1.205	1.59
S203 E 291	2.757	-1.32	1.475
S203 E 290	2.726	-1.289	1.506
S203 E 289	2.664	-1.227	1.568
S203 E 288	2.259	-.822	1.973
S203 E 287	2.199	-.762	2.033
S203 E 286	2.172	-.735	2.06

ELEVATIONS
ARE IN FEET ABOVE SEA LEVEL

S202E295	2.147	-.71	2.085
S202E294	2.152	-.715	2.08
S202E293	2.167	-.73	2.065
S202E292	2.145	-.708	2.087
S202E291	2.442	-1.005	1.79
S202E290	2.278	-.841	1.954
S202E289	2.232	-.795	2.0
S202E288	2.22	-.783	2.012
S202E287	2.221	-.784	2.011
S202E286	2.24	-.803	1.992

S207E287.1
 MAIN DATUM - K6001 = 1.965 - .528 2.267

8 MAY 1985

WORKED IN TODAY. COMPLETED A BULK
 OF THE AREA 6-B LIST.

FINISHED THE AREA IV FORMS. WILL
 PROBABLY HAVE A FEW MORE TO CHECK.
 MOST OF THE FEATURES HAVE BEEN
 MAPPED.

9 MAY 1985

FINISHED THE AREA 6-B LIST. GOT TO THE
 FIELD AT ABOUT 10:00. WILL TAKE OVER FOR

DICK THIS AFTERNOON AS HE IS NOT FEELING WELL. WILL ALSO BE PHOTOGRAPHER TOMORROW WHILE DICK IS IN ATLANTA (HORSE SHOW).

10 MAY 1985
WAS PHOTOGRAPHER TODAY.

13 MAY 1985
TOOK THE AREA MAPS TO THE LAB AND COPIED THEM FOR CASSANDRA. GOT BACK TO THE FIELD AT 11:30. STAYED UNTIL ABOUT 12:30 THEN CAME HOME TO WORK.

WORKED ON AREA V FORMS. AND ORGANIZED MAPS AND ELEVATION FORMS.

14 MAY 1985
WORKED IN TODAY. COMPLETED AREAS 5, 6-C AND 6-D. WORKED ON ELEVATIONS - WILL START ON CONTOUR MAP OF AREA 6-A AND AREA 5.

ELEVATIONS IN AREA 6-C AND 6-D NEED
TO BE SHOT. THE MAIN DATUMS AND
PERTINANT COORDINATES ARE :

$$HI = 1.53$$

AREA 6-C - BELOW - SHOT FROM 6131 E 480 - 2.794

COORDINATE	RAW EL.	(1.53) - #1	ABSOLUTE
5135 E 475	1.231	.299	3.093
5135 E 485	1.325	.205	2.999
5145 E 475	IN Rd	—	
5145 E 485	IN Rd	—	
5136 E 475 (root)	1.12	.41	3.204 3.216
5138 E 475	1.004	.526	3.32
5140 E 475	1.33	.2	2.994
5142 E 475	1.458	.072	2.866
5144 E 475	^N Edge of Road - Gully	—	
5135 E 480	1.294	.236	3.038
5136 E 480	1.341	.189	2.983
5138 E 480	1.380	.15	2.944
5140 E 480	1.452	.078	2.872
5142 E 480	^{Edge of Road} 1.40	.13	2.924
5144 E 480	IN Rd -		
✓ 5136 E 485	1.281	.249	3.043
✓ 5138 E 485	1.44	.09	2.884
5140 E 485	1.582	-.052	2.742
5142 E 485 (NEAR Rd)	1.491	.039	2.833
5144 E 485	IN Rd	—	
5134 E 485	1.521	.009	2.803

AREA 6-C MAIN DATUMS -

COORDINATE	RAW	-141 (1.472)	ABSOLUTE
S136 E475	1.340	.132	3.215
S135 E477	1.483	-.011	3.072
S136 E479	1.585	-.113	2.970
S136 E481	1.560	-.088	2.995
S135 E480	1.517	-.045	3.038
S136 E483	1.558	-.086	2.997
S136 E485	1.47	.002	3.085
S140 E481	1.662	-.19	2.893
S136 E476		3.080 - 5.5	1.13
S140 E482	1.725	(1.472) -.253	2.83
S141 E482	1.832	(1.472) -.36	2.723
(ALL ABOVE SHOT FROM S142 E458 -			3.083)
S131 E480	1.761	(1.472) +.289	2.794
S131 E485	1.645	(1.53) +.115	2.679
(SHOT FROM S131 E480 -			2.794
S125 E480	.961	(1.53) .563	3.357
S120 E480	.878	.652	3.446

		SHOT FROM 5131 E 510 - 2.389	
AREA 6-D		HI = 1.535	
<u>COORDINATE</u>	<u>RAW</u>	<u>-HI</u>	<u>ABSOLUTE</u>
5135 E 505	1.385	.15	2.539
5138 E 505 ^{pt. 2nd}	1.413 ^{intended}	.122	2.511
5135 E 515	1.511	.024	2.413
5138 E 515	1.448	.087	2.302
5135 E 510	1.454	.081	2.47
5138 E 510 ^{pt. 2nd}	1.455	.08	2.469
MAIN DATUMS - 6-D :			
5136 E 510	1.378	.157	2.546
5136 E 512	1.405	.13	2.519
5136 E 513	1.41	.125	2.514
5135 E 512	1.519	.016	2.405
ELEV SHOT FROM 5131 E 480 - HI = 1.53 - Δ = 2.794			
5131 E 510	1.935	-.405	2.389
5131 E 500	1.871	-.341	2.453
5131 E 490	1.740	-.21	2.584
20.8 m TO FENCE	FROM 5131 E 510		
13.5 m TO FENCE	FROM 5131 E 490		
5120 E 490	1.025	.505	3.299
5120 E 500	1.210	.32	3.114

WILL WORK FROM 5200 E300 AND SHOOT
TO VISIBLE POINTS ALONG THE ROAD
AND WORK TOWARD 6-C AND 6-D.

COORDINATE	RAW	-HI	ABSOLUTE
5200 E300	—————→		2.152

NOTE - RATHER THAN SHOOT ALONG ROAD -
POINTS INSIDE THE SITE AREA WERE USED
TO CONNECT AREAS VI - B, C & D.
ADDITIONAL ELEVATIONS FOR THE CONTOUR
MAP WILL ALSO BE SHOT THROUGH THE
INTERMITTANT AREAS. HI = 1.472

5160 E430	—————	—————	3.141	} .057
5142 E458	—————	—————	3.083	
5135 E458	—————			
5130 E458	1.468	.004	3.087	
5145 E458	1.546	-.074	3.009	
5150 E458	1.370	.102	3.185	
5149 E458	1.580	-.108	2.975	
5142 E472	1.42	.052	3.135	

15 MAY 1985

WORKING ON MAPS, FORMS ETC.

NEED TO GO TO THORPE-SMITH THIS
AFTERNOON. PICKED UP FLAGGING TAPE.

16 MAY 1985

WORKED ON MAPS IN THE A.M. DICK HAD TO
DO SOME LAB PHOTOS SO I WENT TO THE
FIELD TO PLAY PHOTOGRAPHER.
CONTINUED ON MAPS IN THE AFTERNOON.

17 MAY 1985

WORKED ON MAPS UNTIL 10:30. WENT TO
LAB TO WORK ON SOME NOTES. WILL CONTINUE
WITH MAPS, FORMS, ETC THIS AFTERNOON.

20 MAY 1985

FINISHED THE AREA VI-A CONTOUR.

WORKED ON AREA I ELEVATION FORMS.

WAS CALLED TO FIELD AT 1:00 AND FILLED
IN ADDITIONAL NUMBERS FOR AREA VI-B
SOUTH OF HURRY'S MITIGATION AREA.

PUT IN A NAIL AT 6195 E370 TO USE
FOR A TRANSIT STATION.

THINGS TO DO - 21 MAY 85

SHOOT ELEV. CONNECTING AREA 5 TO
AREA 1 - IC LEDGE ALONG ROAD.

START ELEV. FOR ~~AREA II~~ (PG 112)
AREA VI-C (PG 142)
AREA VI-D (PG 144)

21 MAY 85

K101001

PUT IN LINE AT S197, THE ELEVATIONS FOR
THESE WERE TAKEN FROM S197 E230

COORDINATE - RAW ^(1.385) - HI ABSOLUTE

S197 E230 = $\longleftrightarrow$ 1.162

S197 E226 - 1.325 .06 1.222

S197 E227 1.351 .034 1.196

S197 E228 1.380 .005 1.167

S197 E229 1.352 .033 1.195

S197 E231 1.42 -.035 1.127

S197 E232 1.392 -.007 1.155

S197 E233 1.406 -.02 1.142

S197 E234 1.445 -.06 1.102

S197 E235 1.461 -.076 1.086

S200 E235 1.286 .099 1.261

S204 E230 .543 .842 2.004

S204 E228 = 1.654

DATUM
STAKE -
NOT ORIGINAL
SURFACE.

RESET TRANSIT ON E260 - 1.615 AB.

E270 - 1.738

HI = 1.469

Reset transit of E270

HI = 1.428

SHOT IN ELEVATIONS FOR AREA II.

WILL NEED TO DO CONTOUR MAP OF THIS AREA.

22 MAY 1985

CONVERTED AREA II ELEV. YESTERDAY (P.M).

ALSO STARTED ON FEATURES IN AREA I

SHOT IN WITH TRANSIT FROM 5200 E230

(SEE PGS-156 & 154) - THE ABSOLUTE ELEV.

ARE ON 3 LEGAL PGS IN THE LOOSE LEAF

NOTEBOOK OF AREA I FEATURE ELEVATION SUMMARIES.

WILL WORK THE REST OF TODAY ON AREA I

FORMS / ELEV.

23 MAY 1985

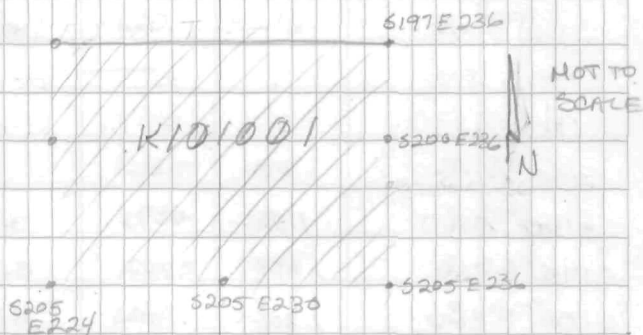
RAIN DAY. WORKED IN FIELD MAKING UP A LIST FOR AREA VI-B SOUTH EXTENSION.

TOOK THE FORMS FOR AREA 4 TO THE LAB TO
 CONVERT ELEVATIONS. FOUND A NUMBER OF
 PROBLEMS - MOSTLY RELATED TO CHANGING
 MAIN DATUMS, CHANGING CREW MEMBERS IN
 UNITS OR ALL THREE. TALKED IT OVER WITH
 JEFF AND WE'LL WORK ON IT.

24 MAY 1985

TALKED TO LORETTA ABOUT THE AREA IV PROBLEMS.
 WE WILL GET TOGETHER TO TRY AND SORT OUT
 THE MAJOR ONES.

PUT IN LINES AROUND K101001 (F200)



NEED TO SHOOT IN DATUMS IN AREA VI-B
 THESE WILL INITIALLY BE SHOT FROM
 6160 E360. THE 10 X 10S WILL BE SHOT
 IN - PERHAPS SUBDIVIDING THEM TO 5X5S

150

24 MAY 1985

28 MAY 1985

AREA VI-B

COORDINATE	RAW	-HI	ABSOLUTE
S200 E300		(1.408)	2.152
S160 E360	2.995	-1.527	3.679
BACKSHOT FROM S160 E360 TO S200 E300 TO CHECK ELEVATION - THE ABOVE IS CORRECT.			

COORDINATE	RAW	^{1.460} -HI	ABSOLUTE
S180 E340	2.76	-1.3	2.379
S160 E335	2.34	-.88	2.799
S195 E370 (RD)	1.54	-.08	3.599 (ROAD)
S200 E370	1.679	-.219	3.46

S140 E360	1.552	-.092	3.587
S145 E360	1.258	.202	3.881
S150 E360	1.306	.154	3.833
S155 E360	1.61	-.15	3.529 (MACH STRIP)
S160 E360	—	—	3.679
S165 E360	1.566	-.106	3.573
S170 E360	1.51	-.05	3.629
S175 E360	1.528	-.068	3.611

COORDINATE	RAW	1.460	ABSOLUTE
		-H1	
S180 E360	1.56	-.1	3.579
S185 E360	1.675	-.215	3.464
S190 E360	1.785	-.325	3.354
S145 E365	1.120	-.34	4.019
S150 E365	1.171	-.289	3.968
S155 E365	1.407	.053	3.732
S180 E365	1.421	.039	3.718
S165 E365	1.391	.069	3.748
S170 E365	1.420	.04	3.719
S175 E365	1.450	.01	3.689
S180 E365	1.543	-.083	3.596
S185 E365	1.570	-.11	3.569
S190 E365	1.620	-.16	3.519
S195 E365	—		
S145 E370	1.005	.455	4.134
S150 E370	.930	.53	4.209
S155 E370	1.215	.245	3.924
S160 E370	1.160	.3	3.979
S165 E370	1.265	.195	3.874
S170 E370	1.306 1.298	.154 .145	3.833 3.824
S175 E370	1.342	.118	3.797
S180 E370	1.378	.082	3.761
S185 E370	1.442	.018	3.697
S190 E370	1.530	-.07	3.609

152

COORDINATE	RAW	1.460 -41	ABSOLUTE
S145 E375	1.08	.38	4.059
S150 E375	.781	.679	4.358
S155 E375			
S160 E375			
S165 E375			
S170 E375			
S175 E375	1.391	.069	3.748
S180 E375	1.265	.195	3.874
S185 E375	1.550	-.09	3.589
S190 E375	—		
S140 E380	—		
S145 E380	—		
S150 E380	1.023	.437	4.116
S155 E380	1.075	.385	4.064
S160 E380	1.173	.287	3.966
S165 E380	1.291	.169	3.848
S170 E380	1.265	.195	3.874
S175 E380	1.509	-.049	3.63
S180 E380	1.34	-.12	3.799
S185 E380	1.47	-.01	3.669
S190 E380	1.47	.02	3.699
S140 E385	—		
S145 E385	—		
S150 E385	1.03	.43	4.109

COORDINATE	RAW	1.460	ABSOLUTE			
		-H1				
S155 E385	1.108	.352	4.031			
S160 E385	1.169	.291	3.97			
S165 E385	1.280	.18	3.859			
S170 E385	1.359	.101	3.78			
S175 E385	1.45	.01	3.689			
S180 E385	1.517	-.057	3.622			
S185 E385	1.55	-.09	3.589			
S190 E385 (R)	1.48	-.02	3.659			
S140 E390	—					
S145 E390	.910	.55	4.229			
S150 E390	1.00	.46	4.139			
S155 E390	1.012	.448	4.127			
S160 E390	1.00	.46	4.139 4.103			
S165 E390	1.20	.26	3.939			
S170 E390	1.346	.12	3.799			
S175 E390	1.432	.028	3.707			
S180 E390	1.509	-.049	3.63			
S185 E390	1.520	-.06	3.619			
S190 E390	1.583	-.123	3.556			
CONT. IN BOOK 2, PG 1						
S155 E390						
S165 E390						

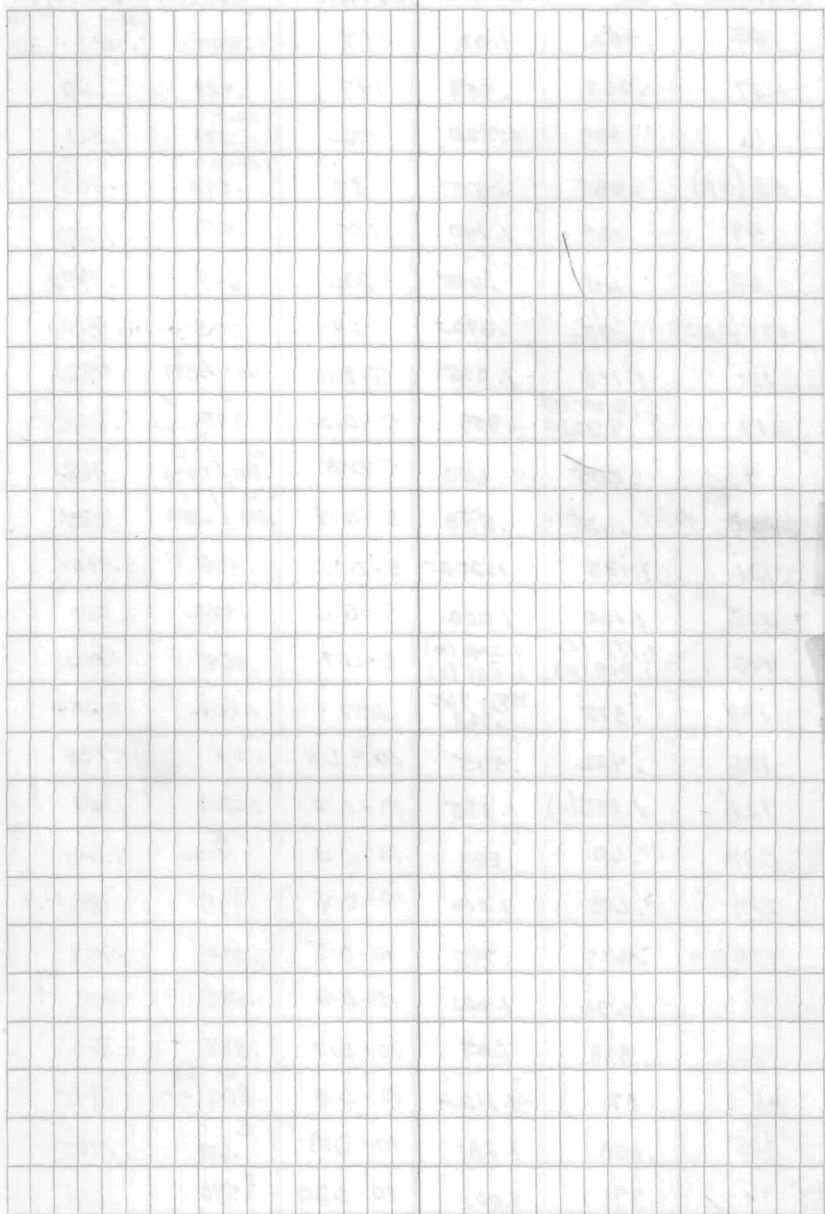
154

CONVERTED - 22 MAY 85 - SEE
LOOSE LEAF

FEATURE	TOP (W) E	BOTTOM			
254	.594	.761			
25	.924	1.204			
19	1.068	1.252			
222	W / E 1.057 / .970	HOLE 1.141 MOLD 1.215			
40	.843	.899			
128	1.155	1.875			

NEED ELEVATIONS ON THE FOLLOWING FEATURES:

7	.340	.934	107	1.149	1.44
179	1.362	2.056	251		
46	1.363	1.980	28	521 E 227 1.121	MOLD 1.482
207	SOUTH 1.52	1.845	29	1.153	1.567
503 E 216 ?	SOUTH 1.653	HOLE / MOLD 1.867 / 2.058	231	EAST .975	1.383
138 ?			58	.948	1.350
211	1.565	1.890	94	.904	1.269
227	1.496	1.930	232	.526	1.50
180	1.371	LEAF / MOLD 1.455 / 1.575	30	SOUTH 1.10	1.459
217 ?			219	WEST 1.566	2.060
249	SHALLOW		111	1.108	1.883
162	SHALLOW		70/71	1.059	1.46
204	.967	1.463			
220					
50	.590	.923			
92	1.01	HOLE / MOLD 1.282 / 1.346			
78					
125	E / W .405 / 1.46	1.725			
105	W 1.244	1.860			



156 FEATURE ELEVATIONS - AREA I - H1 1.44

FEATURE	TOP (W)	BOTTOM	FEAT.	TOP (W)	BOTTOM
23	.782	1.07	149	.485	.721 .813
17	.767	.958	147	.429	.60
16	.759	1.320	172	EAST .271	.521
33 (D11)	.585	.615	37	(EAST) .570	.765
99	.569	1.140	100	.570	1.229
68	.611	.655	236	.649	.992
175 (A02)	.512	.692	24	.773	.872
101	1.118	1.275	5-D11	.641 ^W /.599 ^E	.792
117	{ .655 (E) .422 (W)	.959	5-D12	.748 ^W /.660 ^E	.832
4	.505	.650	5-D13	.800 ^W /.778 ^E	.868
208	.625	.888	5-D14	.818 ^W /.880 ^E	.885
121	1.185	1.202	5-D15	.858	.896
223	1.160	1.200	5-D16	.942	.965
140	1.175 (E) 1.018 (W)	1.246 (W) 1.529 (E)	5-D17	.965	1.012
134	.375	.755 .765 .963	251	1.010	1.285
186	.422	.505	10-D11	.113 ^W /	1.198
128	1.155 (W)	1.375	10-D12	1.085	1.129
208	.60	.888	10-D13	(E) 1.000	1.081
224	.608	1.006	10-D14	.970 ^W	.989
175 D13	.659	.795	10-D15	.898	.953
95	.671	1.021	10-D16	.880	.950
22	.878	1.07	10-D17	.848	.880
21	.871	1.112	10-D18	.800 ^W /.757 ^E	.845
225	.858	1.281	10-D19	E .688	.735
96	.771	1.003	10-D20	E .590	.644

CONVERTED - 22 MAY 85 - SEE LOOSE LEAF

ELEVATIONS -
FEATURES - AREA I

$$5200 \text{ E230} = 1.212$$

FEATURE CODES -

A - POST HOLE (WITH OR WITHOUT POST MOLD)

B - POST MOLD

C - PLANTING HOLE

D - PLANTING DITCH

E - WELL

F - PRIVY

G - PIT (GENERALIZED)

H - FOUNDATION

J - BUILDERS TRENCH

K - CHIMNEY BASE

L - DRIP LINE

M - CISTERN

N - WALKWAY

P - SHELL MIDDEN

R - CELLAR HOLE

S - ROOT CELLAR

T - DUMP

U - Y UNASSIGNED

Z - UNEXCAVATED

FEATURE NUMBERS

1 NORTH HALF

2 SOUTH HALF

3 EAST HALF

4 WEST HALF

MON	TUES	WED	THURS	FRI	
				22	
25 AREA II - III	26 AREA IV - V	27 AREA VI - C/D	28	1	MARCH
4	5	6 END AREA I	7 BEGIN AREAS II - VI	8	
11	12	13	14	15	
18	19	20	21	22	
25	26	27	28	29	
1	2	3	4	5	APRIL
8	9	10	11	12	
15	16	17	18	19	
22	23	24	25	26	
29	30	1	2	3	
6	7	8	9	10	MAY
13	14	15	16	17	
20	21	22	23	24	
27	28	29	30	31	
3	4	5	6	7	
10	11	12	13	14	JUNE
17	18	19	20	21	
24	25	26	27	28	

INDEX OF CURVE AND REDUCTION TABLES

Table I—SLOPE STAKE

Table II—STADIA CORRECTION AND HORIZONTAL DISTANCES

Table III—TRIGONOMETRIC FORMULAE

Table IV—NATURAL TRIGONOMETRICAL FUNCTIONS

CURVE FORMULAE

Table V—TANGENTS AND EXTERNALS TO A 1° CURVE

USEFUL RELATIONS

Table VI—INCHES TO DECIMALS OF A FOOT

Table VII—MINUTES IN DECIMALS OF A DEGREE

Table VIII—MIDDLE ORDINATES OF RAILS

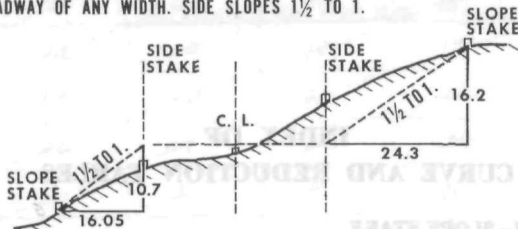
Table IX—SHORT RADIUS CURVES

Table X—RODS IN FEET, 10THS AND 100THS OF FEET

Table XI—LINKS IN FEET, 10THS AND 100THS OF FEET

TABLE I. SLOPE STAKE

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

ROADWAY OF ANY WIDTH. SIDE SLOPES $1\frac{1}{2}$ TO 1.

Cut or Fill	Distance out from Side or Shoulder Stake.										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0 30	0 45	0 60	0 75	0 90	1 05	1 20	1 35	0
1	1 50	1 65	1 80	1 95	2 10	2 25	2 40	2 55	2 70	2 85	1
2	3 00	3 15	3 30	3 45	3 60	3 75	3 90	4 05	4 20	4 35	2
3	4 50	4 65	4 80	4 95	5 10	5 25	5 40	5 55	5 70	5 85	3
4	6 00	6 15	6 30	6 45	6 60	6 75	6 90	7 05	7 20	7 35	4
5	7 50	7 65	7 80	7 95	8 10	8 25	8 40	8 55	8 70	8 85	5
6	9 00	9 15	9 30	9 45	9 60	9 75	9 90	10 05	10 20	10 35	6
7	10 50	10 65	10 80	10 95	11 10	11 25	11 40	11 55	11 70	11 85	7
8	12 00	12 15	12 30	12 45	12 60	12 75	12 90	13 05	13 20	13 35	8
9	13 50	13 65	13 80	13 95	14 10	14 25	14 40	14 55	14 70	14 85	9
10	15 00	15 15	15 30	15 45	15 60	15 75	15 90	16 05	16 20	16 35	10
11	16 50	16 65	16 80	16 95	17 10	17 25	17 40	17 55	17 70	17 85	11
12	18 00	18 15	18 30	18 45	18 60	18 75	18 90	19 05	19 20	19 35	12
13	19 50	19 65	19 80	19 95	20 10	20 25	20 40	20 55	20 70	20 85	13
14	21 00	21 15	21 30	21 45	21 60	21 75	21 90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23 10	23 25	23 40	23 55	23 70	23 85	15
16	24 00	24 15	24 30	24 45	24 60	24 75	24 90	25 05	25 20	25 35	16
17	25 50	25 65	25 80	25 95	26 10	26 25	26 40	26 55	26 70	26 85	17
18	27 00	27 15	27 30	27 45	27 60	27 75	27 90	28 05	28 20	28 35	18
19	28 50	28 65	28 80	28 95	29 10	29 25	29 40	29 55	29 70	29 85	19
20	30 00	30 15	30 30	30 45	30 60	30 75	30 90	31 05	31 20	31 35	20
21	31 50	31 65	31 80	31 95	32 10	32 25	32 40	32 55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33 60	33 75	33 90	34 05	34 20	34 35	22
23	34 50	34 65	34 80	34 95	35 10	35 25	35 40	35 55	35 70	35 85	23
24	36 00	36 15	36 30	36 45	36 60	36 75	36 90	37 05	37 20	37 35	24
25	37 50	37 65	37 80	37 95	38 10	38 25	38 40	38 55	38 70	38 85	25
26	39 00	39 15	39 30	39 45	39 60	39 75	39 90	40 05	40 20	40 35	26
27	40 50	40 65	40 80	40 95	41 10	41 25	41 40	41 55	41 70	41 85	27
28	42 00	42 15	42 30	42 45	42 60	42 75	42 90	43 05	43 20	43 35	28
29	43 50	43 65	43 80	43 95	44 10	44 25	44 40	44 55	44 70	44 85	29
30	45 00	45 15	45 30	45 45	45 60	45 75	45 90	46 05	46 20	46 35	30
31	46 50	46 65	46 80	46 95	47 10	47 25	47 40	47 55	47 70	47 85	31
32	48 00	48 15	48 30	48 45	48 60	48 75	48 90	49 05	49 20	49 35	32
33	49 50	49 65	49 80	49 95	50 10	50 25	50 40	50 55	50 70	50 85	33
34	51 00	51 15	51 30	51 45	51 60	51 75	51 90	52 05	52 20	52 35	34
35	52 50	52 65	52 80	52 95	53 10	53 25	53 40	53 55	53 70	53 85	35
36	54 00	54 15	54 30	54 45	54 60	54 75	54 90	55 05	55 20	55 35	36
37	55 50	55 65	55 80	55 95	56 10	56 25	56 40	56 55	56 70	56 85	37
38	57 00	57 15	57 30	57 45	57 60	57 75	57 90	58 05	58 20	58 35	38
39	58 50	58 65	58 80	58 95	59 10	59 25	59 40	59 55	59 70	59 85	39
40	60 00	60 15	60 30	60 45	60 60	60 75	60 90	61 05	61 20	61 35	40

TABLE II. STADIA CORRECTION AND HORIZONTAL DISTANCES

STADIA REDUCTIONS FOR READING 100					
Vertical Angle	Horizontal Correction	Difference in Elevation	Vertical Angle	Horizontal Correction	Difference in Elevation
2°-00'	0.1	3.5	18°-30'	10.1	30.1
3°-00'	0.3	5.3	19°-00'	10.6	30.8
4°-00'	0.5	7.0	19°-30'	11.2	31.5
5°-00'	0.8	8.7	20°-00'	11.7	32.1
6°-00'	1.1	10.4	20°-30'	12.3	32.8
7°-00'	1.5	12.1	21°-00'	12.8	33.5
8°-00'	1.9	13.8	21°-30'	13.4	34.1
9°-00'	2.5	15.5	22°-00'	14.0	34.7
10°-00'	3.0	17.10	22°-30'	14.7	35.4
10°-30'	3.3	17.9	23°-00'	15.3	36.0
11°-00'	3.6	18.7	23°-30'	15.9	36.6
11°-30'	4.0	19.5	24°-00'	16.5	37.2
12°-00'	4.3	20.3	24°-30'	17.2	37.7
12°-30'	4.7	21.1	25°-00'	17.9	38.3
13°-00'	5.1	21.9	25°-30'	18.6	39.0
13°-30'	5.5	22.7	26°-00'	19.2	39.4
14°-00'	5.9	23.4	26°-30'	19.9	39.9
14°-30'	6.3	24.2	27°-00'	20.6	40.5
15°-00'	6.7	25.0	27°-30'	21.3	41.0
15°-30'	7.2	25.8	28°-00'	22.0	42.0
16°-00'	7.6	26.5	28°-30'	22.8	41.9
16°-30'	8.1	27.2	29°-00'	23.5	42.4
17°-00'	8.5	28.0	29°-30'	24.3	42.9
17°-30'	9.0	28.7	30°-00'	25.0	43.3
18°-00'	9.5	29.4			

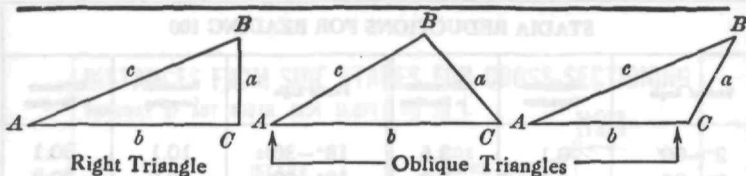
Chains to Feet

1	66
2	132
3	198
4	264
5	330
6	396
7	462
8	528
9	594
10	660

Feet to Chains

100	1.515
200	3.030
300	4.545
400	6.060
500	7.575
600	9.090
700	10.606
800	12.121
900	13.636
1,000	15.151

TABLE III. TRIGONOMETRIC FORMULAE



Solution of Right Triangles

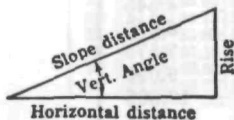
For Angle A . $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, IV, $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft.. slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

TABLE IV. NATURAL TRIGONOMETRICAL FUNCTIONS

Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.		Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0	0	0	1.	∞	∞	1.	90	0	1	0	∞	0	∞	0	90
10	.0029	.0029		343.8	343.8	1.	50	10	.1392	.1405	1.0098	7.185	7.115	.99027	82
20	.0058	.0058		171.9	171.9	.99998	40	20	.1421	.1435	1.0102	7.040	6.968	.98986	50
30	.0087	.0087		114.6	114.6	.99996	30	30	.1449	.1465	1.0107	6.900	6.827	.98944	40
40	.0116	.0116	1.0001	85.94	85.94	.99993	20	40	.1478	.1495	1.0111	6.766	6.691	.98902	30
50	.0145	.0145	1.0001	68.76	68.75	.99989	10	50	.1507	.1524	1.0115	6.636	6.561	.98858	20
									.1536	.1554	1.0120	6.512	6.435	.98814	10
1	.0175	.0175	1.0002	57.30	57.29	.99985	89	9	.1564	.1584	1.0125	6.394	6.314	.98769	81
10	.0204	.0204	1.0002	49.11	49.10	.99979	50	10	.1593	.1614	1.0129	6.277	6.197	.98723	50
20	.0233	.0233	1.0003	42.98	42.96	.99973	40	20	.1622	.1644	1.0134	6.166	6.084	.98676	40
30	.0262	.0262	1.0003	38.20	38.19	.99966	30	30	.1650	.1673	1.0139	6.059	5.976	.98629	30
40	.0291	.0291	1.0004	34.38	34.37	.99958	20	40	.1679	.1703	1.0144	5.955	5.871	.98580	20
50	.0320	.0320	1.0005	31.26	31.24	.99949	10	50	.1708	.1733	1.0149	5.855	5.769	.98531	10
2	.0349	.0349	1.0006	28.65	28.64	.99939	88	10	.1736	.1763	1.0154	5.759	5.671	.98481	80
10	.0378	.0378	1.0007	26.45	26.43	.99929	50	10	.1765	.1793	1.0160	5.665	5.576	.98430	50
20	.0407	.0407	1.0008	24.56	24.54	.99917	40	20	.1794	.1823	1.0165	5.575	5.485	.98378	40
30	.0436	.0437	1.0010	22.93	22.90	.99905	30	30	.1822	.1853	1.0170	5.488	5.396	.98325	30
40	.0465	.0466	1.0011	21.49	21.47	.99892	20	40	.1851	.1883	1.0176	5.403	5.309	.98272	20
50	.0494	.0495	1.0012	20.23	20.21	.99878	10	50	.1880	.1914	1.0181	5.320	5.226	.98218	10
3	.0523	.0524	1.0014	19.11	19.08	.99863	87	11	.1908	.1944	1.0187	5.241	5.145	.98163	79
10	.0552	.0553	1.0015	18.10	18.07	.99847	50	10	.1937	.1974	1.0193	5.164	5.066	.98107	50
20	.0581	.0582	1.0017	17.20	17.17	.99831	40	20	.1965	.2004	1.0199	5.089	4.989	.98050	40
30	.0610	.0612	1.0019	16.38	16.35	.99813	30	30	.1994	.2035	1.0205	5.016	4.915	.97992	30
40	.0640	.0641	1.0020	15.64	15.60	.99795	20	40	.2022	.2065	1.0211	4.945	4.843	.97934	20
50	.0669	.0670	1.0022	14.96	14.92	.99776	10	50	.2051	.2095	1.0217	4.877	4.773	.97875	10
4	.0698	.0699	1.0024	14.34	14.30	.99756	86	12	.2079	.2126	1.0223	4.810	4.705	.97815	78
10	.0727	.0729	1.0027	13.76	13.73	.99736	50	10	.2108	.2156	1.0230	4.745	4.638	.97754	50
20	.0756	.0758	1.0029	13.23	13.20	.99714	40	20	.2136	.2186	1.0236	4.682	4.574	.97692	40
30	.0785	.0787	1.0031	12.75	12.71	.99692	30	30	.2164	.2217	1.0243	4.620	4.511	.97630	30
40	.0814	.0816	1.0033	12.29	12.25	.99668	20	40	.2193	.2247	1.0249	4.560	4.449	.97566	20
50	.0843	.0846	1.0036	11.87	11.83	.99644	10	50	.2221	.2278	1.0256	4.502	4.390	.97502	10
5	.0872	.0875	1.0038	11.47	11.43	.99619	85	13	.2250	.2309	1.0263	4.445	4.331	.97437	77
10	.0901	.0904	1.0041	11.10	11.06	.99594	50	10	.2278	.2339	1.0270	4.390	4.275	.97371	50
20	.0929	.0934	1.0043	10.76	10.71	.99567	40	20	.2306	.2370	1.0277	4.336	4.219	.97304	40
30	.0958	.0963	1.0046	10.43	10.39	.99540	30	30	.2334	.2401	1.0284	4.284	4.165	.97237	30
40	.0987	.0992	1.0049	10.13	10.08	.99511	20	40	.2363	.2432	1.0291	4.232	4.113	.97169	20
50	.1016	.1022	1.0052	9.839	9.788	.99482	10	50	.2391	.2462	1.0299	4.182	4.061	.97100	10
6	.1045	.1051	1.0055	9.567	9.514	.99452	84	14	.2419	.2493	1.0306	4.133	4.011	.97030	76
10	.1074	.1080	1.0058	9.309	9.255	.99421	50	10	.2447	.2524	1.0314	4.086	3.962	.96959	50
20	.1103	.1110	1.0061	9.065	9.010	.99390	40	20	.2476	.2555	1.0321	4.039	3.914	.96887	40
30	.1132	.1139	1.0065	8.834	8.777	.99357	30	30	.2504	.2586	1.0329	3.994	3.867	.96815	30
40	.1161	.1169	1.0068	8.614	8.556	.99324	20	40	.2532	.2617	1.0337	3.949	3.821	.96742	20
50	.1190	.1198	1.0072	8.405	8.345	.99290	10	50	.2560	.2648	1.0345	3.906	3.776	.96667	10
7	.1219	.1228	1.0075	8.206	8.144	.99255	83	15	.2588	.2679	1.0353	3.864	3.732	.96593	75
10	.1248	.1257	1.0079	8.016	7.953	.99219	50	10	.2616	.2711	1.0361	3.822	3.689	.96517	50
20	.1276	.1287	1.0082	7.834	7.770	.99182	40	20	.2644	.2742	1.0369	3.782	3.647	.96440	40
30	.1305	.1317	1.0086	7.661	7.596	.99144	30	30	.2672	.2773	1.0377	3.742	3.606	.96363	30
40	.1334	.1346	1.0090	7.496	7.429	.99106	20	40	.2700	.2805	1.0386	3.703	3.566	.96285	20
50	.1363	.1376	1.0094	7.337	7.269	.99067	10	50	.2728	.2836	1.0394	3.665	3.526	.96206	10
							82								74
							0								0
	Cosin	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle		Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

TABLE IV CONTD. NATURAL TRIGONOMETRICAL FUNCTIONS

Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.		Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
16	.2756	.2867	1.0403	3.628	3.487	.96126		74	.4067	.4452	1.0946	2.459	2.246	.91355	66
10	.2784	.2899	1.0412	3.592	3.450	.96046	50	10	.4094	.4487	1.0961	2.443	2.229	.91236	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40	20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30	30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20	40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10	50	.4200	.4628	1.1019	2.381	2.161	.90753	10
17	.2924	.3057	1.0457	3.420	3.271	.95630		73	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.2952	.3089	1.0466	3.388	3.237	.95545	50	10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.2979	.3121	1.0476	3.357	3.204	.95459	40	20	.4279	.4734	1.1064	2.337	2.112	.90383	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30	30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20	40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10	50	.4358	.4841	1.1110	2.295	2.066	.90007	10
18	.3090	.3249	1.0515	3.236	3.078	.95106		72	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.3118	.3281	1.0525	3.207	3.048	.95015	50	10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40	20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30	30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20	40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10	50	.4514	.5057	1.1207	2.215	1.977	.89232	10
19	.3256	.3443	1.0576	3.072	2.904	.94552		71	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.3283	.3476	1.0587	3.046	2.877	.94457	50	10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40	20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30	30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20	40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10	50	.4669	.5280	1.1308	2.142	1.894	.88431	10
20	.3420	.3640	1.0642	2.924	2.747	.93969		70	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.3448	.3673	1.0653	2.900	2.723	.93869	50	10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40	20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30	30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20	40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10	50	.4823	.5505	1.1415	2.073	1.816	.87603	10
21	.3584	.3839	1.0711	2.790	2.605	.93358		69	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.3611	.3872	1.0723	2.769	2.583	.93253	50	10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40	20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30	30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20	40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10	50	.4975	.5735	1.1528	2.010	1.744	.86748	10
22	.3746	.4040	1.0785	2.670	2.475	.92718		68	.5000	.5774	1.1547	2.000	1.732	.86603	60
10	.3773	.4074	1.0798	2.650	2.455	.92609	50	10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40	20	.5050	.5851	1.1586	1.980	1.709	.86310	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30	30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20	40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10	50	.5125	.5969	1.1646	1.951	1.675	.85866	10
23	.3907	.4245	1.0864	2.559	2.356	.92050		67	.5150	.6009	1.1666	1.924	1.664	.85717	59
10	.3934	.4279	1.0877	2.542	2.337	.91936	50	10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40	20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30	30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20	40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10	50	.5275	.6208	1.1770	1.896	1.611	.84959	10
							66								58
							o r								o r
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle		Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

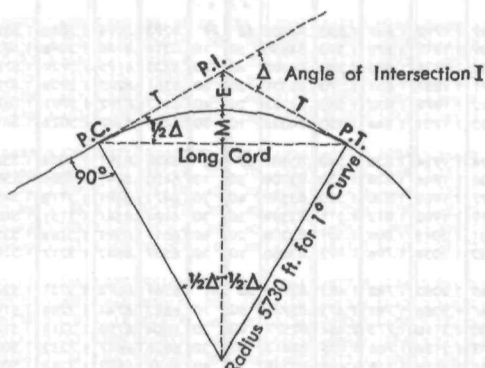
TABLE IV CONTD. NATURAL TRIGONOMETRICAL FUNCTIONS

Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.		Angle	Sin.	Tan	Sec.	Cosec.	Cotg.	Cosin.	
°								°							°
32	.5299	.6249	1.1792	1.887	1.600	.84805	58	39	.6293	.8098	1.2868	1.589	1.235	.77715	51
10	.5324	.6289	1.1813	1.878	1.590	.84650	50	10	.6316	.8146	1.2898	1.583	1.228	.77531	50
20	.5348	.6330	1.1835	1.870	1.580	.84495	40	20	.6338	.8195	1.2929	1.578	1.220	.77347	40
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	30	.6361	.8243	1.2959	1.572	1.213	.77162	30
40	.5398	.6412	1.1879	1.853	1.560	.84182	20	40	.6383	.8292	1.2991	1.567	1.206	.76977	20
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	50	.6406	.8342	1.3022	1.561	1.199	.76791	10
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	40	.6428	.8391	1.3054	1.556	1.192	.76604	50
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	10	.6450	.8441	1.3086	1.550	1.185	.76417	50
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	20	.6472	.8491	1.3118	1.545	1.178	.76229	40
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	30	.6494	.8541	1.3151	1.540	1.171	.76041	30
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	40	.6517	.8591	1.3184	1.535	1.164	.75851	20
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	50	.6539	.8642	1.3217	1.529	1.157	.75661	10
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	41	.6561	.8693	1.3251	1.524	1.150	.75471	49
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	10	.6583	.8744	1.3284	1.519	1.144	.75280	50
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	20	.6604	.8796	1.3318	1.514	1.137	.75088	40
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	30	.6626	.8847	1.3352	1.509	1.130	.74896	30
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	40	.6648	.8899	1.3386	1.504	1.124	.74703	20
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	50	.6670	.8952	1.3421	1.499	1.117	.74509	10
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	42	.6691	.9004	1.3456	1.494	1.111	.74314	48
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	10	.6713	.9057	1.3492	1.490	1.104	.74120	50
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	20	.6734	.9110	1.3527	1.485	1.098	.73924	40
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	30	.6756	.9163	1.3563	1.480	1.091	.73728	30
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	40	.6777	.9217	1.3600	1.476	1.085	.73531	20
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	50	.6799	.9271	1.3636	1.471	1.079	.73333	10
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	43	.6820	.9325	1.3673	1.466	1.072	.73135	47
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	10	.6841	.9380	1.3711	1.462	1.066	.72937	50
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	20	.6862	.9435	1.3748	1.457	1.060	.72737	40
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	30	.6884	.9490	1.3786	1.453	1.054	.72537	30
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	40	.6905	.9545	1.3824	1.448	1.048	.72337	20
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	50	.6926	.9601	1.3863	1.444	1.042	.72136	10
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	44	.6947	.9657	1.3902	1.440	1.036	.71934	46
10	.6041	.7581	1.2549	1.655	1.319	.79688	50	10	.6967	.9713	1.3941	1.435	1.030	.71732	50
20	.6065	.7627	1.2577	1.649	1.311	.79512	40	20	.6988	.9770	1.3980	1.431	1.024	.71529	40
30	.6088	.7673	1.2605	1.643	1.303	.79335	30	30	.7009	.9827	1.4020	1.427	1.018	.71325	30
40	.6111	.7720	1.2633	1.636	1.295	.79158	20	40	.7030	.9884	1.4061	1.422	1.012	.71121	20
50	.6134	.7766	1.2661	1.630	1.288	.78980	10	50	.7050	.9942	1.4101	1.418	1.006	.70916	10
38	.6157	.7813	1.2690	1.624	1.280	.78801	52		.7071	1.	1.414	1.414	1.	.70711	45
10	.6180	.7860	1.2719	1.618	1.272	.78622	50								
20	.6202	.7907	1.2748	1.612	1.265	.78442	40								
30	.6225	.7954	1.2778	1.606	1.257	.78261	30								
40	.6248	.8002	1.2808	1.601	1.250	.78079	20								
50	.6271	.8050	1.2838	1.595	1.242	.77897	10								
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle		Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

CURVE FORMULAE

CURVE TABLE

Table of Tangent and External to a 1° Curve



To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

CURVE FORMULAS

Radius:
$$R = \frac{50}{\sin \frac{1}{2} D}$$

Length of Curve:
$$L = 100 \frac{\Delta}{D}$$

also
$$L = .0174533 \times \Delta \times R$$

Degree of Curve:
$$D = 100 \frac{\Delta}{L}$$

Tangent:
$$T = R \tan \frac{1}{2} \Delta$$

Long Cord:
$$LC = 2R \sin \frac{1}{2} \Delta$$

Middle Ordinate:
$$M = R (1 - \cos \frac{1}{2} \Delta)$$

External:
$$E = T \tan \frac{1}{4} \Delta$$

TABLE V. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10'	58.34	.297	5° C.	10'	560.11	27.313	5° C.	10'	1070.6	99.155	5° C.
20'	66.67	.388	T	20'	568.53	28.137	T	20'	1079.2	100.75	T
30'	75.01	.491	.03	30'	576.95	28.974	.06	30'	1087.8	102.35	.10
40'	83.34	.606	E	40'	585.36	29.824	E	40'	1096.4	103.97	E
50'	91.68	.733	.001	50'	593.79	30.686	.006	50'	1105.1	105.60	.013
2°	100.01	.873	10° C.	12°	602.21	31.561	10° C.	22°	1113.7	107.24	10° C.
10'	108.35	1.024	T	10'	610.64	32.447	T	10'	1122.4	108.90	T
20'	116.68	1.188	.06	20'	619.07	33.347	.13	20'	1131.0	110.57	.19
30'	125.02	1.364	E	30'	627.50	34.259	E	30'	1139.7	112.25	E
40'	133.36	1.552	.003	40'	635.93	35.183	.011	40'	1148.4	113.95	.025
50'	141.70	1.752	15° C.	50'	644.37	36.120	15° C.	50'	1157.0	115.66	15° C.
3°	150.04	1.964	20° C.	13°	652.81	37.070	20° C.	23°	1165.7	117.38	20° C.
10'	158.38	2.188	T	10'	661.25	38.031	T	10'	1174.4	119.12	T
20'	166.72	2.425	.06	20'	669.70	39.006	.13	20'	1183.1	120.87	.19
30'	175.06	2.674	E	30'	678.15	39.993	E	30'	1191.8	122.63	E
40'	183.40	2.934	.003	40'	686.60	40.992	.011	40'	1200.5	124.41	.025
50'	191.74	3.207	15° C.	50'	695.06	42.004	15° C.	50'	1209.2	126.20	15° C.
4°	200.08	3.492	20° C.	14°	703.51	43.029	20° C.	24°	1217.9	128.00	20° C.
10'	208.43	3.790	T	10'	711.97	44.066	T	10'	1226.6	129.82	T
20'	216.77	4.099	.06	20'	720.44	45.116	.13	20'	1235.3	131.65	.19
30'	225.12	4.421	E	30'	728.90	46.178	E	30'	1244.0	133.50	E
40'	233.47	4.755	.003	40'	737.37	47.253	.011	40'	1252.8	135.35	.025
50'	241.81	5.100	15° C.	50'	745.85	48.341	15° C.	50'	1261.5	137.23	15° C.
5°	250.16	5.459	20° C.	15°	754.32	49.441	20° C.	25°	1270.2	139.11	20° C.
10'	258.51	5.829	T	10'	762.80	50.554	T	10'	1279.0	141.01	T
20'	266.86	6.211	.06	20'	771.29	51.679	.13	20'	1287.7	142.93	.19
30'	275.21	6.606	E	30'	779.77	52.818	E	30'	1296.5	144.85	E
40'	283.57	7.013	.004	40'	788.26	53.969	.017	40'	1305.3	146.79	.038
50'	291.92	7.432	15° C.	50'	796.75	55.132	15° C.	50'	1314.0	148.75	15° C.
6°	300.28	7.863	20° C.	16°	805.25	56.309	20° C.	26°	1322.8	150.71	20° C.
10'	308.64	8.307	T	10'	813.75	57.498	T	10'	1331.6	152.69	T
20'	316.99	8.762	.06	20'	822.25	58.699	.13	20'	1340.4	154.69	.19
30'	325.35	9.230	E	30'	830.76	59.914	E	30'	1349.2	156.70	E
40'	333.71	9.710	.006	40'	839.27	61.141	.017	40'	1358.0	158.72	.038
50'	342.08	10.202	15° C.	50'	847.78	62.381	15° C.	50'	1366.8	160.76	15° C.
7°	350.44	10.707	20° C.	17°	856.30	63.634	20° C.	27°	1375.6	162.81	20° C.
10'	358.81	11.224	T	10'	864.82	64.900	T	10'	1384.4	164.86	T
20'	367.17	11.753	.06	20'	873.35	66.178	.13	20'	1393.2	166.95	.19
30'	375.54	12.294	E	30'	881.88	67.470	E	30'	1402.0	169.04	E
40'	383.91	12.847	.006	40'	890.41	68.774	.017	40'	1410.9	171.15	.038
50'	392.28	13.413	15° C.	50'	898.95	70.091	15° C.	50'	1419.7	173.27	15° C.
8°	400.66	13.991	20° C.	18°	907.49	71.421	20° C.	28°	1428.6	175.41	20° C.
10'	409.03	14.582	T	10'	916.03	72.764	T	10'	1437.4	177.55	T
20'	417.41	15.184	.06	20'	924.58	74.119	.13	20'	1446.3	179.72	.19
30'	425.79	15.799	E	30'	933.13	75.488	E	30'	1455.1	181.89	E
40'	434.17	16.426	.006	40'	941.69	76.869	.017	40'	1464.0	184.08	.038
50'	442.55	17.065	15° C.	50'	950.25	78.264	15° C.	50'	1472.9	186.29	15° C.
9°	450.93	17.717	20° C.	19°	958.81	79.671	20° C.	29°	1481.8	188.51	20° C.
10'	459.32	18.381	T	10'	967.38	81.092	T	10'	1490.7	190.74	T
20'	467.71	19.058	.06	20'	975.96	82.525	.13	20'	1499.6	192.99	.19
30'	476.10	19.746	E	30'	984.53	83.972	E	30'	1508.5	195.25	E
40'	484.49	20.447	.007	40'	993.12	85.431	.017	40'	1517.4	197.53	.038
50'	492.88	21.161	15° C.	50'	1001.7	86.904	15° C.	50'	1526.3	199.82	15° C.
10°	501.28	21.887	20° C.	20°	1010.3	88.389	20° C.	30°	1535.3	202.12	20° C.
10'	509.68	22.624	T	10'	1018.9	89.888	T	10'	1544.2	204.44	T
20'	518.08	23.375	.06	20'	1027.5	91.399	.13	20'	1553.1	206.77	.19
30'	526.48	24.138	E	30'	1036.1	92.924	E	30'	1562.1	209.12	E
40'	534.89	24.913	.008	40'	1044.7	94.462	.017	40'	1571.0	211.48	.038
50'	543.29	25.700	15° C.	50'	1053.3	96.013	15° C.	50'	1580.0	213.86	15° C.

$$T = R \tan \frac{1}{2} I$$

$$E = R \operatorname{exsec} \frac{1}{2} I$$

TABLE V CONTD. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1	T	20'	2161.2	394.1	T	20'	2753.4	627.2	T
30'	1615.9	223.5	.13	30'	2170.8	397.4	.17	30'	2763.7	631.7	.21
40'	1624.9	226.0	E	40'	2180.3	400.8	E	40'	2773.9	636.2	E
50'	1633.9	228.4	.023	50'	2189.9	404.2	.037	50'	2784.2	640.7	.056
32°	1643.0	230.9		42°	2199.4	407.6		52°	2794.5	645.2	
10'	1652.0	233.4		10'	2209.0	411.1		10'	2804.9	649.7	
20'	1661.0	235.9		20'	2218.6	414.5		20'	2815.2	654.3	
30'	1670.0	238.4		30'	2228.1	418.0		30'	2825.6	658.8	
40'	1679.1	241.0		40'	2237.7	421.4		40'	2835.9	663.4	
50'	1688.1	243.5		50'	2247.3	425.0		50'	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10'	1706.3	248.7	T	10'	2266.6	432.0	T	10'	2867.1	677.3	T
20'	1715.3	251.3	.26	20'	2276.2	435.6	.34	20'	2877.5	682.0	.42
30'	1724.4	253.9	E	30'	2285.9	439.2	E	30'	2888.0	686.7	E
40'	1733.5	256.5	.046	40'	2295.6	442.8	.075	40'	2898.4	691.4	.112
50'	1742.6	259.1		50'	2305.2	446.4		50'	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10'	1760.8	264.5		10'	2324.6	453.6		10'	2929.9	705.7	
20'	1770.0	267.2		20'	2334.3	457.3		20'	2940.4	710.5	
30'	1779.1	269.9		30'	2344.1	461.0		30'	2951.0	715.3	
40'	1788.2	272.6		40'	2353.8	464.6		40'	2961.5	720.1	
50'	1797.4	275.3	15° C.	50'	2363.5	468.4	15° C.	50'	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10'	1815.7	280.8	.40	10'	2383.1	475.8	.51	10'	2993.3	734.8	.63
20'	1824.9	283.6	E	20'	2392.8	479.6	E	20'	3003.9	739.7	E
30'	1834.1	286.4	.070	30'	2402.6	483.4	.116	30'	3014.5	744.6	.168
40'	1843.3	289.2		40'	2412.4	487.2		40'	3025.2	749.6	
50'	1852.5	292.0		50'	2422.3	491.0		50'	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10'	1870.9	297.7		10'	2441.9	498.7		10'	3057.2	764.6	
20'	1880.1	300.6		20'	2451.8	502.5		20'	3067.9	769.7	
30'	1889.4	303.5		30'	2461.7	506.4		30'	3078.7	774.7	
40'	1898.6	306.4		40'	2471.5	510.3	20° C.	40'	3089.4	779.8	20° C.
50'	1907.9	309.3	T	50'	2481.4	514.3	T	50'	3100.2	784.9	T
37°	1917.1	312.2	.53	47°	2491.3	518.2	.68	57°	3110.9	790.1	.84
10'	1926.4	315.2	E	10'	2501.2	522.2	E	10'	3121.7	795.2	E
20'	1935.7	318.1	.093	20'	2511.2	526.1	.151	20'	3132.6	800.4	.225
30'	1945.0	321.1		30'	2521.1	530.1		30'	3143.4	805.6	
40'	1954.3	324.1		40'	2531.1	534.2		40'	3154.2	810.9	
50'	1963.6	327.1		50'	2541.0	538.2		50'	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10'	1982.2	333.2	25° C.	10'	2561.0	546.3	25° C.	10'	3186.9	826.7	25° C.
20'	1991.5	336.3	T	20'	2571.0	550.4	T	20'	3197.8	832.0	T
30'	2000.9	339.3	.67	30'	2581.0	554.5	.85	30'	3208.8	837.3	.105
40'	2010.2	342.4	E	40'	2591.0	558.6	.189	40'	3219.7	842.7	E
50'	2019.6	345.5		50'	2601.1	562.8		50'	3230.7	848.1	.283
39°	2029.0	348.6	.117	49°	2611.2	566.9		59°	3241.7	853.5	
10'	2038.4	351.8		10'	2621.2	571.1		10'	3252.7	858.9	
20'	2047.8	354.9		20'	2631.3	575.3		20'	3263.7	864.3	
30'	2057.2	358.1		30'	2641.4	579.5		30'	3274.8	869.8	
40'	2066.6	361.3		40'	2651.5	583.8		40'	3285.8	875.3	
50'	2076.0	364.5		50'	2661.6	588.0		50'	3296.9	880.8	
40°	2085.4	367.7	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10'	2094.9	371.0	T	10'	2681.9	596.6	T	10'	3319.1	892.0	T
20'	2104.3	374.2	.80	20'	2692.1	600.9	1.02	20'	3330.3	897.5	1.27
30'	2113.8	377.5	E	30'	2702.3	605.3	E	30'	3341.4	903.2	E
40'	2123.3	380.8	.141	40'	2712.5	609.6	.227	40'	3352.6	908.8	.340
50'	2132.7	384.1		50'	2722.7	614.0		50'	3363.8	914.5	

$$T = R \tan \frac{1}{2} I$$

$$E = R \operatorname{exsec} \frac{1}{2} I$$

TABLE V CONTD. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10'	3386.3	925.9	5° C.	10'	4099.5	1315.6	5° C.	10'	4908.0	1814.7	5° C.
20'	3397.5	931.6	T	20'	4112.1	1322.9	T	20'	4922.5	1824.1	T
30'	3408.8	937.3	.25	30'	4124.8	1330.3	.30	30'	4937.0	1833.6	.36
40'	3420.1	943.1	E	40'	4137.4	1337.7	E	40'	4951.5	1843.1	E
50'	3431.4	948.9	.080	50'	4150.1	1345.1	.110	50'	4966.1	1852.6	.149
62°	3442.7	954.8		72°	4162.8	1352.6		82°	4980.7	1862.2	
10'	3454.1	960.6		10'	4175.6	1360.1		10'	4995.4	1871.8	
20'	3465.4	966.5		20'	4188.5	1367.6		20'	5010.0	1881.5	
30'	3476.8	972.4		30'	4201.2	1375.2		30'	5024.8	1891.2	
40'	3488.3	978.3		40'	4214.0	1382.8		40'	5039.5	1900.9	
50'	3499.7	984.3		50'	4226.8	1390.4		50'	5054.3	1910.7	
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10'	3522.6	996.2	T	10'	4252.6	1405.7	T	10'	5084.0	1930.4	T
20'	3534.1	1002.3	.51	20'	4265.6	1413.5	.61	20'	5099.0	1940.3	.72
30'	3545.6	1008.3	E	30'	4278.5	1421.2	E	30'	5113.9	1950.3	E
40'	3557.2	1014.4	.159	40'	4291.5	1429.0	.220	40'	5128.9	1960.2	.299
50'	3568.7	1020.5		50'	4304.6	1436.8		50'	5143.9	1970.3	
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10'	3591.9	1032.8		10'	4330.7	1452.5		10'	5174.1	1990.5	
20'	3603.5	1039.0		20'	4343.8	1460.4		20'	5189.3	2000.6	
30'	3615.1	1045.2		30'	4356.9	1468.4		30'	5204.4	2010.8	
40'	3626.8	1051.4		40'	4370.1	1476.4		40'	5219.7	2021.1	
50'	3638.5	1057.7	15° C.	50'	4383.3	1484.4	15° C.	50'	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10'	3661.9	1070.2	.76	10'	4409.8	1500.5	.91	10'	5265.6	2052.1	1.09
20'	3673.7	1076.6	E	20'	4423.1	1508.6	E	20'	5281.0	2062.5	E
30'	3685.4	1082.9	.240	30'	4436.4	1516.7	.332	30'	5296.4	2073.0	.450
40'	3697.2	1089.3		40'	4449.7	1524.9		40'	5311.9	2083.5	
50'	3709.0	1095.7		50'	4463.1	1533.1		50'	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10'	3732.7	1108.6		10'	4489.9	1549.7		10'	5358.6	2115.3	
20'	3744.6	1115.1		20'	4503.4	1558.0		20'	5374.2	2126.0	
30'	3756.5	1121.7		30'	4516.9	1566.3		30'	5389.9	2136.7	
40'	3768.5	1128.2	20° C.	40'	4530.4	1574.7	20° C.	40'	5405.6	2147.5	20° C.
50'	3780.4	1134.8	T	50'	4544.0	1583.1	T	50'	5421.4	2158.4	T
67°	3792.4	1141.4	1.02	77°	4557.6	1591.6	1.22	87°	5437.2	2169.2	1.45
10'	3804.4	1148.0	E	10'	4571.2	1600.1	E	10'	5453.1	2180.2	E
20'	3816.4	1154.7	.321	20'	4584.8	1608.6	.445	20'	5469.0	2191.1	.603
30'	3828.4	1161.3		30'	4598.5	1617.1		30'	5484.9	2202.2	
40'	3840.5	1168.1		40'	4612.2	1625.7		40'	5500.9	2213.2	
50'	3852.6	1174.8		50'	4626.0	1634.4		50'	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10'	3876.8	1188.4		10'	4653.6	1651.7		10'	5549.2	2246.7	
20'	3889.0	1195.2	25° C.	20'	4667.4	1660.5	25° C.	20'	5565.4	2258.0	25° C.
30'	3901.2	1202.0	T	30'	4681.3	1669.2	T	30'	5581.6	2269.3	T
40'	3913.4	1208.9	1.28	40'	4695.2	1678.1	1.53	40'	5597.8	2280.6	1.83
50'	3925.6	1215.8	E	50'	4709.2	1686.9	E	50'	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756
10'	3950.2	1229.7		10'	4737.2	1704.7		10'	5646.9	2315.0	
20'	3962.5	1236.7		20'	4751.2	1713.7		20'	5663.4	2326.6	
30'	3974.8	1243.7		30'	4765.3	1722.7		30'	5679.9	2338.2	
40'	3987.2	1250.8		40'	4779.4	1731.7		40'	5696.4	2349.8	
50'	3999.5	1257.9		50'	4793.6	1740.8		50'	5713.0	2361.5	
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10'	4024.4	1272.1	T	10'	4822.0	1759.0	T	10'	5746.3	2385.1	T
20'	4036.8	1279.3	1.54	20'	4836.2	1768.2	1.84	20'	5763.1	2397.0	2.20
30'	4049.3	1286.5	E	30'	4850.5	1777.4	E	30'	5779.9	2408.9	E
40'	4061.8	1293.6	.485	40'	4864.8	1786.7	.671	40'	5796.7	2420.9	.910
50'	4074.4	1300.9		50'	4879.2	1796.0		50'	5813.6	2432.9	

$$T = R \tan \frac{1}{2}I$$

$$E = R \operatorname{exsec} \frac{1}{2}I$$

TABLE V CONTD. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+ 5° C. T .43 E .200	101°	6950.6	3278.1	+ 5° C. T .51 E .268	111°	8336.7	4386.1	+ 5° C. T .62 E .360
10°	5847.5	2457.1		10°	6971.3	3294.1		10°	8362.7	4407.6	
20°	5864.6	2469.3		20°	6992.0	3310.1		20°	8388.9	4429.2	
30°	5881.7	2481.5		30°	7012.7	3326.1		30°	8415.1	4450.9	
40°	5898.8	2493.8		40°	7033.6	3342.3		40°	8441.5	4472.7	
50°	5916.0	2506.1		50°	7054.5	3358.5		50°	8468.0	4494.6	
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10°	5950.5	2531.0		10°	7096.6	3391.2		10°	8521.3	4538.8	
20°	5967.9	2543.5		20°	7117.8	3407.7		20°	8548.1	4561.1	
30°	5985.3	2556.0		30°	7139.0	3424.3		30°	8575.0	4583.4	
40°	6002.7	2568.6		40°	7160.3	3440.9		40°	8602.1	4606.0	
50°	6020.2	2581.3		50°	7181.7	3457.6		50°	8629.3	4628.6	
93°	6037.8	2594.0	10° C. T .86 E .401	103°	7203.2	3474.4	10° C. T .103 E .536	113°	8656.6	4651.3	10° C. T 1.25 E .721
10°	6055.4	2606.8		10°	7224.7	3491.3		10°	8684.0	4674.2	
20°	6073.1	2619.7		20°	7246.3	3508.2		20°	8711.5	4697.2	
30°	6090.8	2632.6		30°	7268.0	3525.2		30°	8739.2	4720.3	
40°	6108.6	2645.5		40°	7289.8	3542.4		40°	8767.0	4743.6	
50°	6126.4	2658.5		50°	7311.7	3559.6		50°	8794.9	4766.9	
94°	6144.3	2671.6	15° C. T 1.30 E .604	104°	7333.6	3576.8	15° C. T 1.56 E .806	114°	8822.9	4790.4	15° C. T 1.93 E 1.09
10°	6162.2	2684.7		10°	7355.6	3594.2		10°	8851.0	4814.1	
20°	6180.2	2697.9		20°	7377.8	3611.7		20°	8879.3	4837.8	
30°	6198.3	2711.2		30°	7399.9	3629.2		30°	8907.7	4861.7	
40°	6216.4	2724.5		40°	7422.2	3646.8		40°	8936.3	4885.7	
50°	6234.6	2737.9		50°	7444.6	3664.5		50°	8965.0	4909.9	
95°	6252.8	2751.3	20° C. T 1.74 E .809	105°	7467.0	3682.3	20° C. T 2.08 E 1.08	115°	8993.8	4934.1	20° C. T 2.52 E 1.46
10°	6271.1	2764.8		10°	7489.6	3700.2		10°	9022.7	4958.6	
20°	6289.4	2778.3		20°	7512.2	3718.1		20°	9051.7	4983.1	
30°	6307.9	2792.0		30°	7534.9	3736.2		30°	9080.9	5007.8	
40°	6326.3	2805.6		40°	7557.7	3754.4		40°	9110.3	5032.6	
50°	6344.8	2819.4		50°	7580.5	3772.6		50°	9139.8	5057.6	
96°	6363.4	2833.2	25° C. T 2.18 E 1.02	106°	7603.5	3791.0	25° C. T 2.61 E 1.36	116°	9169.4	5082.7	25° C. T 3.16 E 1.83
10°	6382.1	2847.0		10°	7626.6	3809.4		10°	9199.1	5107.9	
20°	6400.8	2861.0		20°	7649.7	3827.9		20°	9229.0	5133.3	
30°	6419.5	2875.0		30°	7672.9	3846.5		30°	9259.0	5158.8	
40°	6438.4	2889.0		40°	7696.3	3865.2		40°	9289.2	5184.5	
50°	6457.3	2903.1		50°	7719.7	3884.0		50°	9319.5	5210.3	
97°	6476.2	2917.3	30° C. T 2.62 E 1.22	107°	7743.2	3902.9	30° C. T 3.14 E 1.63	117°	9349.9	5236.2	30° C. T 3.81 E 2.20
10°	6495.2	2931.6		10°	7766.8	3921.9		10°	9380.5	5262.3	
20°	6514.3	2945.9		20°	7790.5	3940.9		20°	9411.3	5288.6	
30°	6533.4	2960.3		30°	7814.3	3960.1		30°	9442.2	5315.0	
40°	6552.6	2974.7		40°	7838.1	3979.4		40°	9473.2	5341.5	
50°	6571.9	2989.2		50°	7862.1	3998.7		50°	9504.4	5368.2	
98°	6591.2	3003.8	35° C. T 3.14 E 1.63	108°	7886.2	4018.2	35° C. T 3.66 E 2.08	118°	9535.7	5395.1	35° C. T 3.81 E 2.20
10°	6610.6	3018.4		10°	7910.4	4037.8		10°	9567.2	5422.1	
20°	6630.1	3033.1		20°	7934.6	4057.4		20°	9598.9	5449.2	
30°	6649.6	3047.9		30°	7959.0	4077.2		30°	9630.7	5476.5	
40°	6669.2	3062.8		40°	7983.5	4097.1		40°	9662.6	5504.0	
50°	6688.8	3077.7		50°	8008.0	4117.0		50°	9694.7	5531.7	
99°	6708.5	3092.7	40° C. T 3.66 E 2.08	109°	8032.7	4137.1	40° C. T 4.18 E 2.53	119°	9727.0	5559.4	40° C. T 3.81 E 2.20
10°	6728.4	3107.7		10°	8057.4	4157.3		10°	9759.4	5587.4	
20°	6748.2	3122.9		20°	8082.3	4177.5		20°	9792.0	5615.5	
30°	6768.1	3138.1		30°	8107.3	4197.9		30°	9824.8	5643.8	
40°	6788.1	3153.3		40°	8132.3	4218.4		40°	9857.7	5672.3	
50°	6808.2	3168.7		50°	8157.5	4239.0		50°	9890.8	5700.9	
100°	6828.3	3184.1	45° C. T 4.18 E 2.53	110°	8182.8	4259.7	45° C. T 4.70 E 3.04	120°	9924.0	5729.7	45° C. T 3.81 E 2.20
10°	6848.5	3199.6		10°	8208.2	4280.5		10°	9957.5	5758.6	
20°	6868.8	3215.1		20°	8233.7	4301.4		20°	9991.0	5787.7	
30°	6889.2	3230.8		30°	8259.3	4322.4		30°	10025.0	5817.0	
40°	6909.6	3246.5		40°	8285.0	4343.6		40°	10059.0	5846.5	
50°	6930.1	3262.3		50°	8310.8	4364.8		50°	10093.0	5876.1	

$$T = R \tan \frac{1}{2} I$$

$$E = R \operatorname{exsec} \frac{1}{2} I$$

USEFUL RELATIONS

Lineal feet	$\times .00019$	= miles
Lineal yards	$\times .0006$	= miles
Square inches	$\times .007$	= square feet
Square feet	$\times .111$	= square yards
Square yards	$\times .0002067$	= acres
Acres	$\times 4840$	= square yards
Cubic inches	$\times .00058$	= cubic feet
Cubic feet	$\times .03704$	= cubic yards
Links	$\times .22$	= yards
Links	$\times .66$	= feet
Feet	$\times 1.5$	= links

$$360^\circ = 21600' = 1296000''$$

$$\text{Radius} = \text{arc of } 57.2957790^\circ$$

$$\text{Arc of } 1^\circ (\text{radius} = 1) = .017453292$$

$$\text{Arc of } 1' (\text{radius} = 1) = .000290888$$

$$\text{Arc of } 1'' (\text{radius} = 1) = .000004848$$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = $0.667 (\text{Dist. in miles})^2$

Difference between arc and chord length, 0.05 feet in $11\frac{1}{2}$ miles

$$\text{Probable error of a single observation} = 0.6754 \sqrt{\frac{\sum v^2}{n - 1}}$$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at center of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

SQUARE MEASURE

$$144 \text{ sq. inches} = 1 \text{ sq. ft.}$$

$$9 \text{ sq. ft.} = 1 \text{ sq. yard}$$

$$30\frac{1}{4} \text{ sq. yds.} = 1 \text{ sq. rd.}$$

$$40 \text{ sq. rds.} = 1 \text{ rood.}$$

$$4 \text{ roods} = 1 \text{ acre}$$

$$640 \text{ acres} = 1 \text{ sq. mile.}$$

SURVEYORS' MEASURE

$$7.92 \text{ inches} = 1 \text{ link.}$$

$$25 \text{ links} = 1 \text{ rd.}$$

$$4 \text{ rds.} = 1 \text{ chain.}$$

$$10 \text{ sq. chains or } 160 \text{ sq. rods} = 1 \text{ acre.}$$

$$640 \text{ acres} = 1 \text{ sq. mile.}$$

$$36 \text{ sq. miles (6 miles sq.)} = 1 \text{ township.}$$

TABLE VI. INCHES TO DECIMALS OF A FOOT

In.	0	1	2	3	4	5	6	7	8	9	10	11	In.
0	Foot	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	0
1-32	.0026	.0859	.1693	.2526	.3359	.4193	.5026	.5859	.6693	.7526	.8359	.9193	1-32
1-16	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	1-16
3-32	.0078	.0911	.1745	.2578	.3411	.4245	.5078	.5911	.6745	.7578	.8411	.9245	3-32
1-8	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	1-8
5-32	.0130	.0964	.1797	.2630	.3464	.4297	.5130	.5964	.6797	.7630	.8464	.9297	5-32
3-16	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	3-16
7-32	.0182	.1016	.1849	.2682	.3516	.4349	.5182	.6016	.6849	.7682	.8516	.9349	7-32
1-4	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	1-4
9-32	.0234	.1068	.1901	.2734	.3568	.4401	.5234	.6068	.6901	.7734	.8568	.9401	9-32
5-16	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	5-16
11-32	.0286	.1120	.1953	.2786	.3620	.4453	.5286	.6120	.6953	.7786	.8620	.9453	11-32
3-8	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	3-8
13-32	.0339	.1172	.2005	.2839	.3672	.4505	.5339	.6172	.7005	.7839	.8672	.9505	13-32
7-16	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	7-16
15-32	.0391	.1224	.2057	.2891	.3724	.4557	.5391	.6224	.7057	.7891	.8724	.9557	15-32
1-2	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	1-2
17-32	.0443	.1276	.2109	.2943	.3776	.4609	.5443	.6276	.7109	.7943	.8776	.9609	17-32
9-16	.0469	.1302	.2135	.2969	.3802	.4635	.5469	.6302	.7135	.7969	.8802	.9635	9-16
19-32	.0495	.1328	.2161	.2995	.3828	.4661	.5495	.6328	.7161	.7995	.8828	.9661	19-32
5-8	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	5-8
21-32	.0547	.1380	.2214	.3047	.3880	.4714	.5547	.6380	.7214	.8047	.8880	.9714	21-32
11-16	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	11-16
23-32	.0599	.1432	.2266	.3099	.3932	.4766	.5599	.6432	.7266	.8099	.8932	.9766	23-32
3-4	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	3-4
25-32	.0651	.1484	.2318	.3151	.3984	.4818	.5651	.6484	.7318	.8151	.8984	.9818	25-32
13-16	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	13-16
27-32	.0703	.1536	.2370	.3203	.4036	.4870	.5703	.6536	.7370	.8203	.9036	.9870	27-32
7-8	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	7-8
29-32	.0755	.1589	.2422	.3255	.4089	.4922	.5755	.6589	.7422	.8255	.9089	.9922	29-32
15-16	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	15-16
31-32	.0807	.1641	.2474	.3307	.4141	.4974	.5807	.6641	.7474	.8307	.9141	.9974	31-32
	0	1	2	3	4	5	6	7	8	9	10	11	

TABLE VII. MINUTES IN DECIMALS OF A DEGREE

0' 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 30"	.50833	40' 30"	.67500	50' 30"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000

TABLE VIII. MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C o	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C o	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE IX. SHORT RADIUS CURVES

	Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
	35	10	16-26	8-13	49.3
	45	10	12-46	6-23	38.3
	50	15	17-16	8-38	34.5
	60	15	14-22	7-11	28.8
	75	15	11-30	5-45	23.0
	100	20	11-30	5-45	17.3
	120	20	9-34	4-47	14.3
	150	20	7-39	3-49	11.5
	190	25	7-32	3-46	9.15
	200	25	7-10	3-35	8.6
	225	25	6-25	3-12	7.7
	240	25	5-58	2-59	7.2
	250	25	5-44	2-52	6.9
	275	25	5-12	2-36	6.2
	288	50	9-58	4-59	6.0
	300	50	9-32	4-46	5.7
	350	50	8-12	4-06	4.9
	376	50	7-40	3-50	4.6
	400	50	7-10	3-35	4.3
	410	50	7-00	3-30	4.2

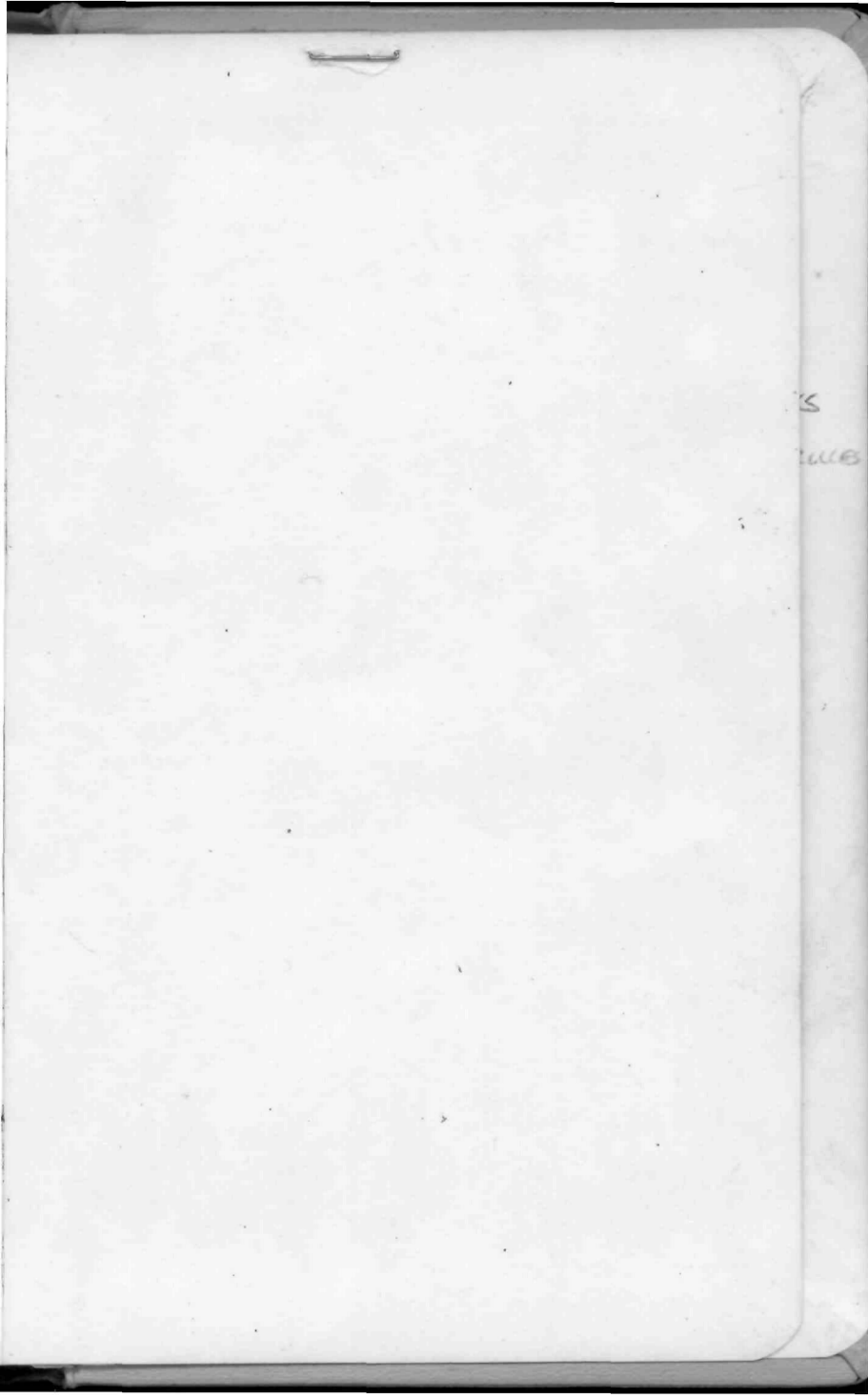
To find length of curve divide angle from P. C. to P. T. by central angle of chord, and multiply by length of chord.

TABLE X. RODS IN FEET, 10THS AND 100THS OF FEET

Rods	Feet	Rods	Feet	Rods	Feet	Rods	Feet	Rods	Feet
1	16.50	21	346.50	41	676.50	61	1006.50	81	1336.50
2	33.00	22	363.00	42	693.00	62	1023.00	82	1353.00
3	49.50	23	379.50	43	709.50	63	1039.50	83	1369.50
4	66.00	24	396.00	44	726.00	64	1056.00	84	1386.00
5	82.50	25	412.50	45	742.50	65	1072.50	85	1402.50
6	99.00	26	429.00	46	759.00	66	1089.00	86	1419.00
7	115.50	27	445.50	47	775.50	67	1105.50	87	1435.50
8	132.00	28	462.00	48	792.00	68	1122.00	88	1452.00
9	148.50	29	478.50	49	808.50	69	1138.50	89	1468.50
10	165.00	30	495.00	50	825.00	70	1155.00	90	1485.00
11	181.50	31	511.50	51	841.50	71	1171.50	91	1501.50
12	198.00	32	528.00	52	858.00	72	1188.00	92	1518.00
13	214.50	33	544.50	53	874.50	73	1204.50	93	1534.50
14	231.00	34	561.00	54	891.00	74	1221.00	94	1551.00
15	247.50	35	577.50	55	907.50	75	1237.50	95	1567.50
16	264.00	36	594.00	56	924.00	76	1254.00	96	1584.00
17	280.50	37	610.50	57	940.50	77	1270.50	97	1600.50
18	297.00	38	627.00	58	957.00	78	1287.00	98	1617.00
19	313.50	39	643.50	59	973.50	79	1303.50	99	1633.50
20	330.00	40	660.00	60	990.00	80	1320.00	100	1650.00

TABLE XI. LINKS IN FEET, 10THS AND 100THS OF FEET

Links	Feet	Links	Feet	Links	Feet	Links	Feet	Links	Feet	Links	Feet
1	0.66	18	11.88	35	23.10	52	34.32	69	45.54	86	56.76
2	1.32	19	12.54	36	23.76	53	34.98	70	46.20	87	57.42
3	1.98	20	13.20	37	24.42	54	35.64	71	46.86	88	58.08
4	2.64	21	13.86	38	25.08	55	36.30	72	47.52	89	58.74
5	3.30	22	14.52	39	25.74	56	36.96	73	48.18	90	59.40
6	3.96	23	15.18	40	26.40	57	37.62	74	48.84	91	60.06
7	4.62	24	15.84	41	27.06	58	38.28	75	49.50	92	60.72
8	5.28	25	16.50	42	27.72	59	38.94	76	50.16	93	61.38
9	5.94	26	17.16	43	28.38	60	39.60	77	50.82	94	62.04
10	6.60	27	17.82	44	29.04	61	40.26	78	51.48	95	62.70
11	7.26	28	18.48	45	29.70	62	40.92	79	52.14	96	63.36
12	7.92	29	19.14	46	30.36	63	41.58	80	52.80	97	64.02
13	8.58	30	19.80	47	31.02	64	42.24	81	53.46	98	64.68
14	9.24	31	20.46	48	31.68	65	42.90	82	54.12	99	65.34
15	9.90	32	21.12	49	32.34	66	43.56	83	54.78	100	66.00
16	10.56	33	21.78	50	33.00	67	44.22	84	55.44	101	66.66
17	11.22	34	22.44	51	33.66	68	44.88	85	56.10	102	67.32



LAB

568-0001

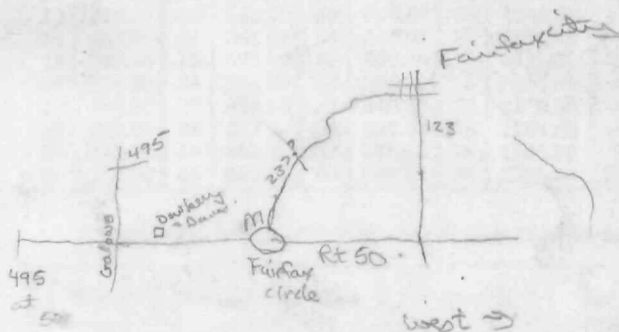
568-0002

SESCO - 273-4477

385-1056

FIELD

567-6115



SESCO - CORNER OF UNIVERSITY AND 123

11 m - 236-1820
(IN SAV)

36" GRID PAPER

PINK FLAGGING

1/2 doz FIELD BOOKS

5-6 FOLDING TAPES/RULES

11 M - 236-1820
(IN SAV)

36" GRID PAPER
PINK FLAGGING

1/2 ~~doz~~ FIELD BOOKS

5-6 FOLDING TAPES/RULES

RE:

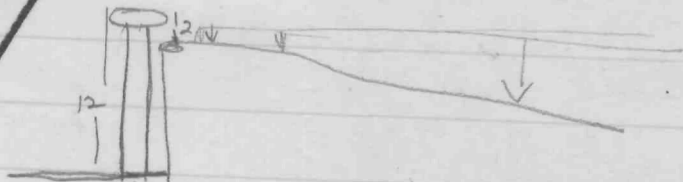
DATUM OF UNIT 95

LAB

568-0001

11 M - 236-1820
(IN SAV)

Unit 9



OOKS

S/RWES

LAB

568-0001

568-0002

SESCO - 273-4477

385-1050

FIELD

JULIE

The measurements & contours on
Silas' map are metric.

S200/E200 is 48 meters above sea level.

Gay

11 M - 236-1820
(IN SAV)

36" GRID PAPER
PINK FLAGGING

LD BOOKS
TAPES/RULES