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CAMPUS MONUMENT SURVEY

Thesis for the Degree of B. S.

J. S. Aldrich W. L. Alston

L. J. Samppala

1935

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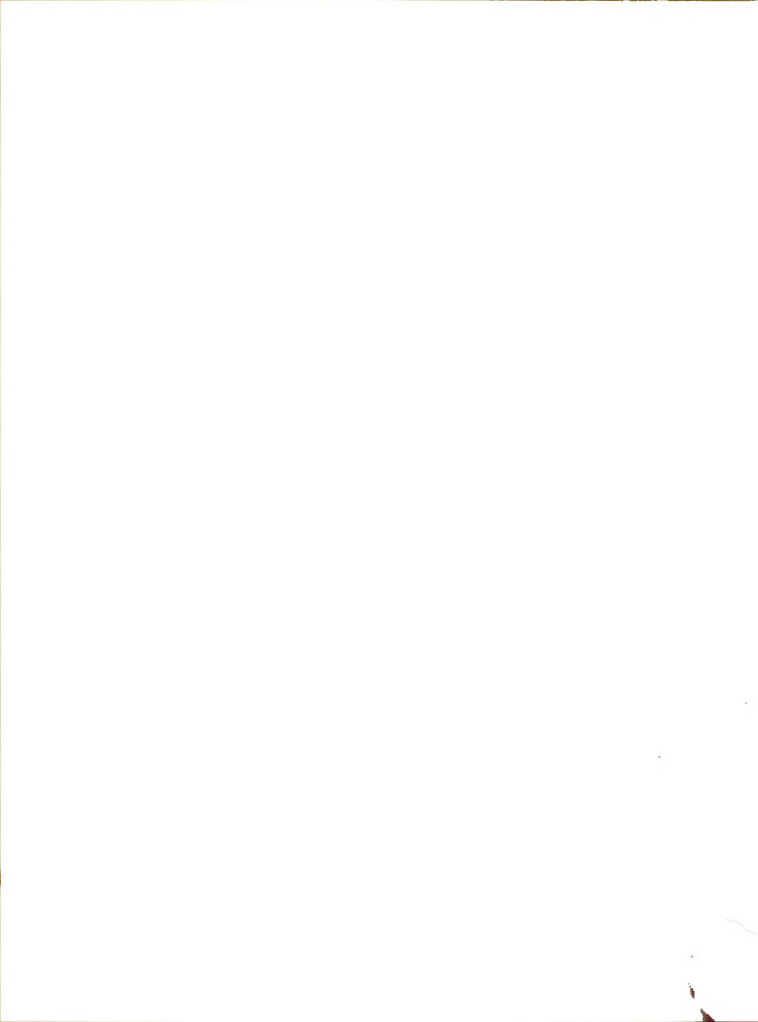
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Campus Monument Survey

A Thesis Submitted to

The Faculty of

MICHIGAN STATE COLLEGE

of

AGRICULTURE AND APPLIED SCIENCE

By

J. S. Aldrich

W. L. Alston

L. J. Samppala

Candidates for the Degree of

Bachelor of Science

June 1935

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— * —

ACKNOWLEDGEMENT

In presenting this thesis it is only fair to acknowledge that without the splendid help and cooperation given us the work would have been impossible. We wish to convey our thanks to the Civil Engineering Department of Michigan State College, as a whole, for their willing advice and the loan of equipment.

Especially do we wish to express our appreciation to Mr. Smith for his patient supervision, and to Professor Gade for information and equipment obtained from him both as an individual and as the United States Coast & Geodetic Survey representative. We, at all times, found any request for help promptly and cheerfully supplied, and were never lacking in advice nor guidance

J. S. A.

W. L. A.

L. J. S.

MEMORANDUM

1. The purpose of this memorandum is to inform you of the results of the investigation conducted by the FBI on the matter of the alleged activities of the [redacted] in the [redacted] area.

2. The investigation was conducted by the FBI on the matter of the alleged activities of the [redacted] in the [redacted] area.

3. The results of the investigation are as follows:

4. The [redacted] in the [redacted] area have been identified as follows:

5. The [redacted] in the [redacted] area have been identified as follows:

6. The [redacted] in the [redacted] area have been identified as follows:

7. The [redacted] in the [redacted] area have been identified as follows:

8. The [redacted] in the [redacted] area have been identified as follows:

9. The [redacted] in the [redacted] area have been identified as follows:

10. The [redacted] in the [redacted] area have been identified as follows:

11. The [redacted] in the [redacted] area have been identified as follows:

12. The [redacted] in the [redacted] area have been identified as follows:

13. The [redacted] in the [redacted] area have been identified as follows:

14. The [redacted] in the [redacted] area have been identified as follows:

15. The [redacted] in the [redacted] area have been identified as follows:

INTRODUCTION

For many years it has been the custom for elementary surveying classes at Michigan State College, to practice surveying on the lawns of the campus. In the course of their work many stakes had been driven and most of them, having served their purpose, were left in the ground. This was a very bad condition in several respects. First, the stakes driven in at traverse points were located more or less at the student's own discretion, resulting in some surveys being completed with amazing accuracy while others showed horrible results. In either case there was no way for an instructor to check up on the location of errors or to discover which part of the data had been "dogged". A second, and perhaps a more or less minor difficulty, was the multitude of stakes which covered the campus. A party might start out with one set of

stakes and finish up on an entirely different group. This of course, led to much confusion and error.

The main reason for finding a new method to supplant the old system came as an outgrowth of the many complaints from the Buildings and Grounds Department. Power mowers are used by this department in the upkeep of the lawns of the campus. Many blades were broken off as these machines ran across stakes left projecting above the ground. It was a common event to hear the peacefull purr of a lawn mower stopped with a clang and have the balmy spring air rent with the profanity of an outraged mechanic. It was decided that a remedy must be found to alter these conditions. The remedy chosen was that of concrete monuments whose tops would set flush with the surface of the ground. These originally consisted of fifteen (15) groups, A, to P, with I, omitted. Each group consists of four (4) monuments numbered, one to four (1 to 4).

The area covered was to be from Farm Lane Road on the

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And, again, the whole of the world is in a state of confusion.

east to the Hospital on the west; and from the R.E.Olds Hall
of Engineering on the south to Grand River Avenue on the north.

It is planned that at later dates othe groups will be
added to the present system.

[illegible]

There is no evidence that the defendant is a member of any organization or is involved in any activity which is prohibited by law.

1. The following information was obtained from the records of the Department of the Interior, Bureau of Land Management, regarding the land owned by the United States in the State of Nevada:

DATE: 11/10/2010 08:10:00

PURPOSE AND SCOPE

The purpose of this thesis was to accurately determine the coordinates of groups A, to P, inclusive, of the campus monuments.

To do this it was necessary to determine the distances between the points with an accuracy of at least one in ten thousand (1 in 10,000). Angles were to be measured by twenty four (24) repetitions. When these preliminary investigations were completed the data was to be adjusted by the principles of Least Squares. The coordinates of all points were to be computed. The computations were to be based on the United States Coast & Geodetic triangulation station, "State" having the X and Y coordinates of 5,000--5,000 respectively.

The following pages relate in detail how this work was done showing results by means of tabulated data, and maps.

THE PROBLEM

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the fourteenth of the three problems is the problem of the

the fifteenth of the three problems is the problem of the

FIELD WORK

The field work done by our party can be divided into three parts chaining, turning angles, and sketch mapping.

The chaining was done with as great an accuracy as was possible with three men. A transit was used for lining in from point to point. In addition to the transit the other tools used in chaining were an invar steel tape, thermometer, spring scales, two chaining bucks or stools, a level rod, a hand level, two marking pins, and two range poles.

The positions of work were as follows: number one man acted as head chainman and rod-man for levels. Number two man was rear chainman, rear marker, and note keeper. Number three man was transit man, front marker, and hand level man.

The tape used was one belonging to the United

Introduction

The field work was done by one person and the divided labor

three persons operating, working on line, and another working.

As outlined, the time was spent in recording in the

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The time was spent in recording. The time was spent in recording in the

States Coast & Geodetic Survey. It had been standardized at known tension and temperature. This tension was carefully held at each reading and the temperature of the tape recorded.

The chaining done was between the number one point of each station or group of monuments. The system was tied in to the triangulation station "State", and the east and west azimuth points to "State". Each line was measured at least two times, the measuring the second time being done in the opposite direction from the first and on different days. If the error was found to be greater than one in ten thousand (1 in 10,000), the line was measured the third time. The greatest error on any one line was one in twelve thousand (1 in 12,000) and the least error was one in two hundred and fifty thousand (1 in 250,000). The distances were corrected for temperature, inclination and tape correction.

Turning angles was done with an ordinary 30" engineers transit. Accuracy was obtained by measuring 6 direct then 6 reversed with the telescope inverted, and then measuring the complement of the angle in the same manner. Thus every angle was actually measured twenty four (24) times.

Signals used were the flat United States Coast & Geodetic's reds tripods to hold them in place. The rods were leveled up by means of a flat bubble or spirit level.

The accuracy obtained by this method was very satisfactory. Only one angle had to be re-measured, this being due to the faulty placing of a signal.

The before mentioned facts took care of the main traverse. In addition the transit was set up over each number one point and angles were turned to the subsidiary points, two, three, and four. These angles were not measured by repetition but were taken with great care.

Distances were also taken from number one (1) to the other monuments of each group, in the ordinary manner.

Turning again we look at the other side of the picture. The first thing that strikes the eye is the fact that the majority of the population are engaged in some form of manual labor. This is not only true of the working class, but also of the middle class. The only exception to this rule is the small group of the population who are engaged in intellectual or artistic work. This is a very small group, and it is not clear whether it is a result of the social system or of the individual characteristics of the population. The fact that the majority of the population are engaged in manual labor is a result of the social system. The social system is such that the majority of the population are engaged in manual labor. This is a result of the social system, and it is not clear whether it is a result of the individual characteristics of the population.

No corrections were applied to these distances.

The sketch mapping consisted of tying each group of monuments into existing structures.

The tools used for sketch mapping were a plane table, an alidade, a compass, a metallic tape, and a set of pins. The sketches were with reasonable accuracy and all tying in distances were measured to tenths of a foot. These sketches were subsequently traced and blueprints made which are contained in the following pages.

The traverse itself was plotted up on a map of the campus which was already in existence. This map is contained in a pocket in the back of this book.

It is important to note that the traverse itself is accurate but the map is not. When trying to locate any of the points, always refer to the point sketches and not to this map.

of operations were as listed in the Appendix.

The system being considered is shown in Figure 1.

The system is shown in Figure 1.

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COMPUTATIONS AND RESULTS

The following pages show examples of our computations in detail.

It was originally planned to compute the system of points as outlined by the United States Coast & Geodetic Survey methods. The first thing that had to be done was to figure the x and y coordinates of the point, West Azimuth. This was done but due to the fact that this method involved reducing angles and distances to grid angles and distances thus lengthening the computations far beyond the time available this method was discarded along with the computations for the West Azimuth. It was decided to use the plain rectangular coordinate system using the government triangulation station "State", located in front of the power house, as the reference, or datum point. "State" was given the coordinate

values of $X=5,000$ and $Y=5,000$. This brings the origin or zero point, of the system about thirteen hundred (1300) feet west and six thousand (6000) feet south of the intersection of Harrison Road and Michigan Avenue. By placing the coordinate axis in this position it is believed that all future additions to the present system will fall in the first quadrant of the axis.

As worked out , this system is composed of three interconnected traverses and three auxillary points. The distances and angle measurements given for these auxillary points are uncorrected values as taken in the field. Therefore, when using them in the future this fact should be kept in mind and corrections made. They do however contain the field note corrections.

LIST OF OBSERVED ANGLES OF THE SYSTEM

Station	From	To	
State	W. Azimuth	E. Azimuth	172° 10' 30.20"
W. Azimuth	State	A-1	2° 23' 55.00"
State	B-1	W. Azimuth	00° 03' 40.00"
State	E. Azimuth	C-1	9° 51' 43.75"
E. Azimuth	State	D-1	2° 08' 55.70"
A-1	W. Azimuth	B-1	174° 48' 06.50"
A-1	N-1	B-1	114° 27' 50.00"
A-1	B-1	M. B. M.	40° 53' 33.80"
B-1	A-1	State	182° 44' 07.50"
B-1	A-1	C-1	184° 09' 23.10"
C-1	B-1	D-1	164° 37' 48.80"
C-1	D-1	E. AZ.	00° 43' 28.70"
D-1	C-1	E-1	124° 46' 10.30"
D-1	E. AZ.	C-1	171° 39' 51.25"
D-1	E. AZ.	E-1	295° 44' 11.90"
E-1	D-1	F-1	77° 41' 50.60"
F-1	E-1	G-1	139° 36' 31.25"
G-1	F-1	H-1	194° 52' 41.90"
G-1	F-1	P-1	297° 14' 30.00"
H-1	G-1	J-1	210° 55' 52.50"
J-1	H-1	K-1	164° 08' 18.80"
K-1	J-1	L-1	178° 36' 57.50"

Station	From	To	
L-1	K-1	M-1	43° 44' 37.50"
M-1	L-1	N-1	121° 54' 15.00"
NN1	A-1	O-1	170° 56' 04.40"
N-1	M-1	A-1	260° 27' 45.00"
C-1	State	D-1	163° 57' 14.38"

	DATE	TIME	LOCATION
100.10	10.10	10.10	10.10
100.11	10.11	10.11	10.11
100.12	10.12	10.12	10.12
100.13	10.13	10.13	10.13
100.14	10.14	10.14	10.14

REDUCTION TO MEAN SEA LEVEL OF SURVEY DATA

FIELD DATA

Average elevation
850 feetElevation Factor
.99999571

STATION	COMBINED ELEVATION	GEOGRAPHIC ELEVATION	ADJUSTED ELEVATION	ADJUSTED ELEVATION
Az. - State	901.842	901.804	.99999571	901.761
E. Az. - State	1084.934	1084.890		1084.837
W. Az. - A, 1	337.935	337.919		337.913
A, 1 - B, 1	329.312	329.297		329.293
B, 1 - State	135.330	135.322		135.321
C, 1 - G, 1	575.012	575.009		575.007
G, 1 - I, 1	442.488	442.482		442.480
I, 1 - State	390.4025	390.447		390.443
D, 1 - E, 1	770.330	770.340		770.347
D, 1 - E. Az.	61.415			
E, 1 - F, 1	539.977	539.977		539.971
F, 1 - G, 1	420.300	420.273		420.272
H, 1 - G, 1	352.0305	352.033		352.032
I, 1 - G, 1	400.570	400.540		400.542
J, 1 - K, 1	627.0315	627.007		627.005
K, 1 - L, 1	635.307	635.297		635.293
L, 1 - M, 1	735.175	735.143		735.141
M, 1 - N, 1	641.701	641.707		641.703
N, 1 - O, 1	623.5045	623.490		623.490
O, 1 - A, 1	625.407	625.400		625.398

Figure 1. The effect of the concentration of the inhibitor on the rate of polymerization of α -methylstyrene in the presence of SnCl_4 at 25°C .

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The number of transformed cells was determined by the number of colonies obtained on the selective medium. The results are the mean of three independent experiments. Error bars represent the standard deviation.

1. *Chlorophyll a* (Chl *a*) and *Chlorophyll b* (Chl *b*) were determined using a spectrophotometer (Shimadzu UV-1601U) at 663 nm and 646 nm, respectively. The concentrations of Chl *a* and Chl *b* were calculated using the following equations:

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The *Agrobacterium* strains were grown in the YEA medium for 24 h at 28 °C. The cell concentration of the *Agrobacterium* strains was adjusted to 10⁸ cells/ml. The cell suspension was then mixed with the plant tissue and the transformation efficiency was determined. The results are shown as the mean ± SD of three independent experiments.

Mean latitude = 42° 43' 50.501"

Elevation factor = $\frac{Ra}{Ra + Ave. Elev.}$

Log Ra = 5.8304093 - $\frac{1}{2}$ log A - $\frac{1}{2}$ log B

= 5.8304093 - $\frac{1}{2}$ (8.5090488-10) - $\frac{1}{2}$ (8.5106427-10)

= 5.8304093 - (9.2545444-10) - (9.25532135-10)

= 7.3205635

Ra = 20920087.661

Elevation factor = $\frac{20920088}{29920938}$ = 0.99995937

10-11-1945 = Additional info.

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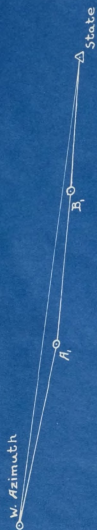
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TRAVERSE NUMBER 1

Scale 1" = 200'

COMPUTATION OF AZIMUTHS OF TRAVERSE N^o I

Line	Azimuth	Corr.	Corrected Azimuth
W. Az. to State	278° 15' 56.30"		278° 15' 56.30"
∠ State to A-1	2° 23' 55.00"	2.8	57.80"
W. AZ. to A-1	280° 39' 51.30"		280° 15' 54.10"
A-1 to W. AZ.	100° 39' 51.39"		100° 39' 54.10"
∠ W. Az. to B-1	174° 48' 06.50"	2.7	9.20"
A-1 to B-1	275° 27' 57.80"		275° 28' 3.30"
B-1 to A-1	95° 27' 57.80"		95° 28' 3.30"
∠ A-1 to State	182° 44' 07.50"	2.8	10.20"
B-1 to State	278° 12' 05.30"		278° 12' 13.60"
State to B-1	98° 12' 05.30"		98° 12' 13.60"
∠ B-1 to W. Az.	00° 03' 40.00"	2.7	42.70"
State to W. Az.	98° 15' 45.30"		98° 15' 56.30"
State to W. Az (F)	98° 15' 56.30"		
Discrepancy	-11.00"		

COMPUTATIONS OF LATITUDE AND DEPARTURE

TRAVERSE N^o I

West Azimuth to A-1

Lat.		71.7936
Log Lat.		1.8560875
Log Cos	79° 20' 05.90"	9.2673285-10
Log	387.935	2.58875897-10
Log Sin	79° 20' 05.90"	9.99243242-10
Log Dep.		2.58119139
Dep.		381 .234

A-1 to B-1

Lat.		31.3491
Log Lat.		1.49622518
Log Cos	84° 31' 56.70"	8.97901344-10
Log	329.012	2.51721174
Log Sin	84° 31' 56.70"	9.99801957-10
Log Dep		2.51523131
Dep.		327.515

B-1 to State

Lat		26.4884
Log Lat		1.42305446
Log Cos	81° 47' 46.40"	9.15440630-10
Log	185.630	2.26864816
Log Sin	81° 47' 46.40"	9.99553289-10
Log Dep		2.26418105
Dep		183.7304

State to West Azimuth

Lat		129.651
Log Lat		2.11277680
Log Cos	81° 44' 03.70"	9.15764635-10
Log	901.842	2.95513045
Log Sin	81° 44' 03.70"	9.99546504-10
Log Dep		2.95059549
Dep		892.474

CORRECTIONS FOR LATITUDE AND DEPARTURE

TREVERSE N° I

$$\text{Corr.} = \frac{\text{Total error} \cdot \text{Latitude (Departure)}}{\text{Sum of all the Latitudes (Departures) with out regard to sign}}$$

Constants;

$$\text{Lat.} = \frac{0.237}{136.76} = 0.00015197$$

$$\text{Dep.} = \frac{.005}{892.479} = 0.0000056$$

Line	Lat	Corr.	Dep	Corr.
West Azimuth to A-1	71.7938	.0109	381.234	.0021
A-1 to B-1	31.3490	.0048	327.515	.0020
B-1 to State	26.4884	.0040	183.730	.0020
		<u>.0197</u>		<u>.0050</u>

Summary of Assets

198.891		198.891
198.891		198.891
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891

Summary of Liabilities

198.891

(The following is a summary of the assets and liabilities of the company as of the date of the report.)

$$198.891 = \frac{198.891}{198.891} = 1.00$$

$$198.891 = \frac{198.891}{198.891} = 1.00$$

Assets	Liabilities	Equity
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891
198.891	198.891	198.891

COMPUTATION OF COORDINATE POINTS OF TRAVERSE N°1

Point	X	Y
State	5,000.000	5,000.000
	<u>-892.474</u>	<u>66 129.651</u>
West Azimuth	4,107.526	5,129.651
	<u>+381.232</u>	<u>- 71.8047</u>
A-1	4,488 .758	5,057.8463
	<u>+327 .513</u>	<u>- 31.3539</u>
B-1	4,816.271	5,026.4924
	<u>+ 183.729</u>	<u>- 26.4924</u>
State	5,000.000	5,000.0000

SECRET

[illegible]

TABULATED RESULTS OF

Pt.	Line	Azimuth	Bearing	Distance	Latitude	
					N	S
W. Az						
W. AZ-A		280 39 54.10	S79 20 05.90E	387.935		71.7938
A	A-B	275 28 03.30	S84 31 56.70E	329.012		31.3491
B	B-St.	278 12 13.60	S81 47 46.40E	185.630		26.4884
St	St-W. Az	98 15 56.30	N81 44 03.70W	901.842	129.651	
					129.651	
					129.6313	
				Diff	.0197	
						129.6313

TRAVERSE N^o I

Departure		Corrections				Balanced	
						Latitude	Departure
E	W	N	S	E	W		
381.234			.011	.002		- 71.805	381.232
327.515			.005	.002		- 31.3539	327.513
183.730			.004	.001		- 26.492	183.729
	892.474					129.651	892.474
<u>892.479</u>	<u>892.474</u>						
892.474							
<u>.005</u>	Diff						

[illegible]



TRAVERSE NUMBER 2
Scale 1" = 200'



COMPUTATIONS OF AZIMUTHS OF TRAVERSE NO II

Line	Azimuth	Corr.	Corrected Azimuths
E. AZ to State	90° 26' 26.50"		90° 26' 26.50"
∠ State to D-1	2° 08' 55.70"	+ .29	55.99"
E. AZ. to D-1	92° 35' 22.20"		92° 26' 26.50"
D-1 to E. AZ	272° 35' 22.20"		272° 35' 22.49"
∠ E.AZ to C-1	171° 39' 51.25"	+ .30	51.55"
D-1 to C-1	84° 15' 13.45"		84° 15' 14.04"
C-1 to D-1	264° 15' 13.45"		264° 15' 14.04"
∠ D-1 to State	196° 02' 45.62"	+ .24	45.91"
C-1 to State	100° 17' 59.07"		100° 17' 59.95"
State to C-1	280° 17' 59.07"		280° 17' 59.95"
∠ C-1 to E.AZ.	350° 08' 16.25"	+ .30	16.55"
State to E. AZ.	270° 26' 25.32"		270° 26' 26.50"
State To E. AZ (Fixed)	270° 26' 26.50"		
Discrepancy	- 1.18		

COMPUTATIONS OF THE EFFECTS OF THE 1964-65 FLOOD

Line	Amount	Percentage	Comments
1-1	100.00	100.00	100.00
1-2	100.00	100.00	100.00
1-3	100.00	100.00	100.00
1-4	100.00	100.00	100.00
1-5	100.00	100.00	100.00
1-6	100.00	100.00	100.00
1-7	100.00	100.00	100.00
1-8	100.00	100.00	100.00
1-9	100.00	100.00	100.00
1-10	100.00	100.00	100.00
1-11	100.00	100.00	100.00
1-12	100.00	100.00	100.00
1-13	100.00	100.00	100.00
1-14	100.00	100.00	100.00
1-15	100.00	100.00	100.00
1-16	100.00	100.00	100.00
1-17	100.00	100.00	100.00
1-18	100.00	100.00	100.00
1-19	100.00	100.00	100.00
1-20	100.00	100.00	100.00
1-21	100.00	100.00	100.00
1-22	100.00	100.00	100.00
1-23	100.00	100.00	100.00
1-24	100.00	100.00	100.00
1-25	100.00	100.00	100.00
1-26	100.00	100.00	100.00
1-27	100.00	100.00	100.00
1-28	100.00	100.00	100.00
1-29	100.00	100.00	100.00
1-30	100.00	100.00	100.00
1-31	100.00	100.00	100.00
1-32	100.00	100.00	100.00
1-33	100.00	100.00	100.00
1-34	100.00	100.00	100.00
1-35	100.00	100.00	100.00
1-36	100.00	100.00	100.00
1-37	100.00	100.00	100.00
1-38	100.00	100.00	100.00
1-39	100.00	100.00	100.00
1-40	100.00	100.00	100.00
1-41	100.00	100.00	100.00
1-42	100.00	100.00	100.00
1-43	100.00	100.00	100.00
1-44	100.00	100.00	100.00
1-45	100.00	100.00	100.00
1-46	100.00	100.00	100.00
1-47	100.00	100.00	100.00
1-48	100.00	100.00	100.00
1-49	100.00	100.00	100.00
1-50	100.00	100.00	100.00
1-51	100.00	100.00	100.00
1-52	100.00	100.00	100.00
1-53	100.00	100.00	100.00
1-54	100.00	100.00	100.00
1-55	100.00	100.00	100.00
1-56	100.00	100.00	100.00
1-57	100.00	100.00	100.00
1-58	100.00	100.00	100.00
1-59	100.00	100.00	100.00
1-60	100.00	100.00	100.00
1-61	100.00	100.00	100.00
1-62	100.00	100.00	100.00
1-63	100.00	100.00	100.00
1-64	100.00	100.00	100.00
1-65	100.00	100.00	100.00
1-66	100.00	100.00	100.00
1-67	100.00	100.00	100.00
1-68	100.00	100.00	100.00
1-69	100.00	100.00	100.00
1-70	100.00	100.00	100.00
1-71	100.00	100.00	100.00
1-72	100.00	100.00	100.00
1-73	100.00	100.00	100.00
1-74	100.00	100.00	100.00
1-75	100.00	100.00	100.00
1-76	100.00	100.00	100.00
1-77	100.00	100.00	100.00
1-78	100.00	100.00	100.00
1-79	100.00	100.00	100.00
1-80	100.00	100.00	100.00
1-81	100.00	100.00	100.00
1-82	100.00	100.00	100.00
1-83	100.00	100.00	100.00
1-84	100.00	100.00	100.00
1-85	100.00	100.00	100.00
1-86	100.00	100.00	100.00
1-87	100.00	100.00	100.00
1-88	100.00	100.00	100.00
1-89	100.00	100.00	100.00
1-90	100.00	100.00	100.00
1-91	100.00	100.00	100.00
1-92	100.00	100.00	100.00
1-93	100.00	100.00	100.00
1-94	100.00	100.00	100.00
1-95	100.00	100.00	100.00
1-96	100.00	100.00	100.00
1-97	100.00	100.00	100.00
1-98	100.00	100.00	100.00
1-99	100.00	100.00	100.00
1-100	100.00	100.00	100.00

COMPUTATIONS OF LATITUDE AND DEPARTURE

TRAVERSE N^o II

East Azimuth to D-1

Lat.		2.7775
Log Lat		0.44365757
Log Cos	87° 24' 37.41"	8.65495893-10
Log	61.485	1. 78869854
Log Sin	87° 24' 37.41"	9.99955627-10
Log Dep		1.78825481
Dep		61.412

D-1 to C-1

Lat.		64.3257
Log Lat		1.80838461
Log Cos	84° 15' 14.04"	9.00052230-10
Log	642.488	2.80736231
Log Sin	84° 15' 14.04"	9.99781232-10
Log Dep		2.80507433
Dep		639.256

C-1 to State

Lat		69.650
Log Lat		1.84295219
Log Cos	79° 42' 0.05"	9.25137231-10
Log	390.463	2.59157988
Log Sin	79° 42' 0.05"	9.99294437-10
Log Dep		2.59452425-10
Dep		384.171

CORRECTIONS FOR LATITUDES AND DEPARTURES

TRAVERSE N^o II

$$\text{Corr} = \frac{\text{Total error} \cdot \text{Latitude (Deparature)}}{\text{Sum of all the Latitudes (Deparature) without regard to sign}}$$

Constants;

$$\text{Lat.} = \frac{0.237}{136.76} = 0.0017329$$

$$\text{Dep.} = \frac{0.063}{1084.839} = 0.00005807$$

Line	Lat	Corr	Dep	Corr
E. Az. to D-1	2.778	.005	61.412	.0036
D-1 to C-1	64.326	.111	639.256	.0371
C-1 to State	69.656	.121	384.171	.0223
		.237		.0630

PROBABLE FILE - 1971-72 - 1971-72 - 1971-72

1971-72 - 1971-72

1971-72 - 1971-72 - 1971-72 - 1971-72 - 1971-72

1971-72 - 1971-72 - 1971-72 - 1971-72 - 1971-72

1971-72 - 1971-72

$$1971-72 - 1971-72 = 1971-72$$

$$1971-72 - 1971-72 = 1971-72$$

1971-72	1971-72	1971-72	1971-72	1971-72
1971-72	1971-72	1971-72	1971-72	1971-72
1971-72	1971-72	1971-72	1971-72	1971-72
1971-72	1971-72	1971-72	1971-72	1971-72
1971-72	1971-72	1971-72	1971-72	1971-72
1971-72	1971-72	1971-72	1971-72	1971-72

COMPUTATION OF COORDINATES OF TRAVERSE N° II

Point	X	Y
State	5,000.000	5,000.000
	<u>+ 1,084.902</u>	<u>- 8.345</u>
East Azimuth	6,084.902	4,991.655
	<u>- 61.416</u>	<u>+ 2.783</u>
D-1	6,023.486	4,994.438
	<u>- 639.293</u>	<u>- 64.215</u>
C-1	5,384.193	4,930.223
	<u>- 384.193</u>	<u>+ 69.777</u>
State	5,000.000	5,000.000

COMPARISON OF COORDINATE DATA

X	Y	Z
100.0000	100.0000	100.00
100.0000	100.0000	
100.0000	100.0000	100.0000
100.0000	100.0000	
100.0000	100.0000	100.00
100.0000	100.0000	
100.0000	100.0000	100.00
100.0000	100.0000	
100.0000	100.0000	100.00

TO:

Description		Quantity	Unit Price	Total Price	Tax	Total
1	Item 1	100	1.00	100.00	0.00	100.00
2	Item 2	50	2.00	100.00	0.00	100.00
3	Item 3	25	4.00	100.00	0.00	100.00
4	Item 4	10	10.00	100.00	0.00	100.00
5	Item 5	5	20.00	100.00	0.00	100.00
6	Item 6	2	50.00	100.00	0.00	100.00
7	Item 7	1	100.00	100.00	0.00	100.00
8	Item 8	0.5	200.00	100.00	0.00	100.00
9	Item 9	0.2	500.00	100.00	0.00	100.00
10	Item 10	0.1	1000.00	100.00	0.00	100.00
11	Item 11	0.05	2000.00	100.00	0.00	100.00
12	Item 12	0.02	5000.00	100.00	0.00	100.00
13	Item 13	0.01	10000.00	100.00	0.00	100.00
14	Item 14	0.005	20000.00	100.00	0.00	100.00
15	Item 15	0.002	50000.00	100.00	0.00	100.00
16	Item 16	0.001	100000.00	100.00	0.00	100.00
17	Item 17	0.0005	200000.00	100.00	0.00	100.00
18	Item 18	0.0002	500000.00	100.00	0.00	100.00
19	Item 19	0.0001	1000000.00	100.00	0.00	100.00
20	Item 20	0.00005	2000000.00	100.00	0.00	100.00
21	Item 21	0.00002	5000000.00	100.00	0.00	100.00
22	Item 22	0.00001	10000000.00	100.00	0.00	100.00
23	Item 23	0.000005	20000000.00	100.00	0.00	100.00
24	Item 24	0.000002	50000000.00	100.00	0.00	100.00
25	Item 25	0.000001	100000000.00	100.00	0.00	100.00
26	Item 26	0.0000005	200000000.00	100.00	0.00	100.00
27	Item 27	0.0000002	500000000.00	100.00	0.00	100.00
28	Item 28	0.0000001	1000000000.00	100.00	0.00	100.00
29	Item 29	0.00000005	2000000000.00	100.00	0.00	100.00
30	Item 30	0.00000002	5000000000.00	100.00	0.00	100.00
31	Item 31	0.00000001	10000000000.00	100.00	0.00	100.00
32	Item 32	0.000000005	20000000000.00	100.00	0.00	100.00
33	Item 33	0.000000002	50000000000.00	100.00	0.00	100.00
34	Item 34	0.000000001	100000000000.00	100.00	0.00	100.00
35	Item 35	0.0000000005	200000000000.00	100.00	0.00	100.00
36	Item 36	0.0000000002	500000000000.00	100.00	0.00	100.00
37	Item 37	0.0000000001	1000000000000.00	100.00	0.00	100.00
38	Item 38	0.00000000005	2000000000000.00	100.00	0.00	100.00
39	Item 39	0.00000000002	5000000000000.00	100.00	0.00	100.00
40	Item 40	0.00000000001	10000000000000.00	100.00	0.00	100.00
41	Item 41	0.000000000005	20000000000000.00	100.00	0.00	100.00
42	Item 42	0.000000000002	50000000000000.00	100.00	0.00	100.00
43	Item 43	0.000000000001	100000000000000.00	100.00	0.00	100.00
44	Item 44	0.0000000000005	200000000000000.00	100.00	0.00	100.00
45	Item 45	0.0000000000002	500000000000000.00	100.00	0.00	100.00
46	Item 46	0.0000000000001	1000000000000000.00	100.00	0.00	100.00
47	Item 47	0.00000000000005	2000000000000000.00	100.00	0.00	100.00
48	Item 48	0.00000000000002	5000000000000000.00	100.00	0.00	100.00
49	Item 49	0.00000000000001	10000000000000000.00	100.00	0.00	100.00
50	Item 50	0.000000000000005	20000000000000000.00	100.00	0.00	100.00
51	Item 51	0.000000000000002	50000000000000000.00	100.00	0.00	100.00
52	Item 52	0.000000000000001	100000000000000000.00	100.00	0.00	100.00
53	Item 53	0.0000000000000005	200000000000000000.00	100.00	0.00	100.00
54	Item 54	0.0000000000000002	500000000000000000.00	100.00	0.00	100.00
55	Item 55	0.0000000000000001	1000000000000000000.00	100.00	0.00	100.00
56	Item 56	0.00000000000000005	2000000000000000000.00	100.00	0.00	100.00
57	Item 57	0.00000000000000002	5000000000000000000.00	100.00	0.00	100.00
58	Item 58	0.00000000000000001	10000000000000000000.00	100.00	0.00	100.00
59	Item 59	0.000000000000000005	20000000000000000000.00	100.00	0.00	100.00
60	Item 60	0.000000000000000002	50000000000000000000.00	100.00	0.00	100.00
61	Item 61	0.000000000000000001	100000000000000000000.00	100.00	0.00	100.00
62	Item 62	0.0000000000000000005	200000000000000000000.00	100.00	0.00	100.00
63	Item 63	0.0000000000000000002	500000000000000000000.00	100.00	0.00	100.00
64	Item 64	0.0000000000000000001	1000000000000000000000.00	100.00	0.00	100.00
65	Item 65	0.00000000000000000005	2000000000000000000000.00	100.00	0.00	100.00
66	Item 66	0.00000000000000000002	5000000000000000000000.00	100.00	0.00	100.00
67	Item 67	0.00000000000000000001	10000000000000000000000.00	100.00	0.00	100.00
68	Item 68	0.000000000000000000005	20000000000000000000000.00	100.00	0.00	100.00
69	Item 69	0.000000000000000000002	50000000000000000000000.00	100.00	0.00	100.00
70	Item 70	0.000000000000000000001	100000000000000000000000.00	100.00	0.00	100.00
71	Item 71	0.0000000000000000000005	200000000000000000000000.00	100.00	0.00	100.00
72	Item 72	0.0000000000000000000002	500000000000000000000000.00	100.00	0.00	100.00
73	Item 73	0.0000000000000000000001	1000000000000000000000000.00	100.00	0.00	100.00
74	Item 74	0.00000000000000000000005	2000000000000000000000000.00	100.00	0.00	100.00
75	Item 75	0.00000000000000000000002	5000000000000000000000000.00	100.00	0.00	100.00
76	Item 76	0.00000000000000000000001	10000000000000000000000000.00	100.00	0.00	100.00
77	Item 77	0.000000000000000000000005	20000000000000000000000000.00	100.00	0.00	100.00
78	Item 78	0.000000000000000000000002	50000000000000000000000000.00	100.00	0.00	100.00
79	Item 79	0.000000000000000000000001	100000000000000000000000000.00	100.00	0.00	100.00
80	Item 80	0.0000000000000000000000005	200000000000000000000000000.00	100.00	0.00	100.00
81	Item 81	0.0000000000000000000000002	500000000000000000000000000.00	100.00	0.00	100.00
82	Item 82	0.0000000000000000000000001	1000000000000000000000000000.00	100.00	0.00	100.00
83	Item 83	0.00000000000000000000000005	2000000000000000000000000000.00	100.00	0.00	100.00
84	Item 84	0.00000000000000000000000002	5000000000000000000000000000.00	100.00	0.00	100.00
85	Item 85	0.00000000000000000000000001	10000000000000000000000000000.00	100.00	0.00	100.00
86	Item 86	0.000000000000000000000000005	20000000000000000000000000000.00	100.00	0.00	100.00
87	Item 87	0.000000000000000000000000002	50000000000000000000000000000.00	100.00	0.00	100.00
88	Item 88	0.000000000000000000000000001	100000000000000000000000000000.00	100.00	0.00	100.00
89	Item 89	0.0000000000000000000000000005	200000000000000000000000000000.00	100.00	0.00	100.00
90	Item 90	0.0000000000000000000000000002	500000000000000000000000000000.00	100.00	0.00	100.00
91	Item 91	0.0000000000000000000000000001	1000000000000000000000000000000.00	100.00	0.00	100.00
92	Item 92	0.00000000000000000000000000005	2000000000000000000000000000000.00	100.00	0.00	100.00
93	Item 93	0.00000000000000000000000000002	5000000000000000000000000000000.00	100.00	0.00	100.00
94	Item 94	0.00000000000000000000000000001	10000000000000000000000000000000.00	100.00	0.00	100.00
95	Item 95	0.000000000000000000000000000005	20000000000000000000000000000000.00	100.00	0.00	100.00
96	Item 96	0.000000000000000000000000000002	50000000000000000000000000000000.00	100.00	0.00	100.00
97	Item 97	0.000000000000000000000000000001	100000000000000000000000000000000.00	100.00	0.00	100.00
98	Item 98	0.0000000000000000000000000000005	200000000000000000000000000000000.00	100.00	0.00	100.00
99	Item 99	0.0000000000000000000000000000002	500000000000000000000000000000000.00	100.00	0.00	100.00
100	Item 100	0.0000000000000000000000000000001	1000000000000000000000000000000000.00	100.00	0.00	100.00

TABULATED RESULTS OF

Pt.	Line	Azimuth	Bearing	Distance	Latitude	
					N	S
St.	St.-E. Az.	270 26 26.50	S89 33 33.50E	1084.934		8.345
	E. Az.-D					
E. Az.		92 35 22.49	N87 24 37.51W	61.485	2.778	
D	D-C	84 15 14.04	S84 15 14.04W	642.488		64.326
C	C-St.	100 17 59.95	N79 42 00.05W	390.463	69.656	
					72.434	72.671
						72.434
					Diff. .237	

TRAVERSE N^o II

Departure		Corrections				Balanced	
		Latitude		Deparature		Lat.	Dep.
E	W	N	S	E	W		
1084.902			.			- 8.345	1084.902
	61.412	.005			.004	2.783	-61.416
	639.256		.111		.037	-64.215	-639.293
	<u>384.171</u>	.121			.022	69.777	-384.193
1084.902	1084.839						
1084.839							
<u>.063</u>	Diff.						

Debiture		Corrections				Balanced	
Debiture		Debiture				Debiture	
W	4	W	4	W	4	W	4
1084.208	1084.208					1084.208	1084.208
814.18	814.18	400.				814.18	814.18
643.230	643.230	730.		111.		643.230	643.230
384.171	384.171	820.				384.171	384.171
1084.208	1084.208						
2110	2110						



TRAVERSE NUMBER 3
Scale 1" = 400'

COMPUTATIONS OF AZIMUTHS OF TRAVERSE N-III

Line	Azimuth	Corr.	Corrected Azimuth
D-1 to C-1	84° 15' 14.04"		84° 15' 14.04"
∠ C-1 to E-1	124° 46' 10.30"	-.10	10.20"
D-1 to E-1	209° 01' 24.34"		209° 01' 24.24"
E-1 to D-1	29° 01' 24.34"		29° 01' 24.24"
∠ D-1 to F-1	77° 41' 50.60"	-.10	50.50"
E-1 to F-1	106° 43' 14.94"		106° 43' 14.74"
F-1 to E-1	286° 43' 14.94"		286° 43' 14.74"
∠ E-1 to G-1	139° 36' 31.25"	-.09	31.16"
F-1 to G-1	66° 19' 46.19"		66° 19' 45.90"
G-1 to F-1	245° 19' 46.19"		245° 19' 45.90"
∠ F-1 to H-1	194° 52' 41.90"	-.10	41.80"
G-1 to H-1	81° 12' 28.09"		81° 12' 27.70"
H-1 to G-1	261° 12' 28.09"		261° 12' 27.70"
∠ G-1 to J-1	210° 55' 52.50"	-.10	52.40"
H-1 to J-1	112° 08' 20.59"		112° 08' 20.10"

Line	Azimuth		Corr. Corrected Azimuth
J-1 to H-1	292° 08' 20.59"		292° 08' 20.10"
∠ H-1 to K-1	164° 08' 18.80"	-.10	18.70"
J-1 to K-1	96° 16' 39.39"		96° 16' 38.80"
K-1 to J-1	276° 16' 39.37"		276° 16' 39.80"
∠ J-1 to L-1	178° 36' 57.50"	+.09	57.41"
K-1 to L-1	94° 53' 36.87"		94° 53' 36.21"
L-1 to K-1	274° 53' 36.87"		274° 53' 36.21"
∠ K-1 to M-1	43° 44' 37.50"	-.10	37.40"
L-1 to M-1	318° 38' 14.37"		318° 38' 13.61"
M-1 to L-1	138° 38' 14.37"		138° 38' 13.61"
∠ L-1 to N-1	121° 54' 15.00"	-.10	14.90"
M-1 to N-1	260° 32' 29.37"		260° 32' 28.51"
N-1 to M-1	80° 32' 29.37"		80° 32' 28.51"
∠ M-1 to A-1	260° 27' 45.00"	-.10	44.90"
N-1 to A-1	341° 00' 14.37"		341° 00' 13.41"
A-1 to N-1	161° 00' 14.37"		161° 00' 13.41"
∠ N-1 to B-1	114° 27' 50.00"	-.09	49.90"
A-1 to B-1	275° 28' 04.37"		275° 28' 03.30"
A-1 to B-1 (Fixed)	275° 28' 03.30"		
Discrepancy	+ 1.07"		

Amplifier	Model	Frequency	Amplifier	Model
101.00	100	1000	101.00	100
101.01	101	1000	101.01	101
101.02	102	1000	101.02	102
101.03	103	1000	101.03	103
101.04	104	1000	101.04	104
101.05	105	1000	101.05	105
101.06	106	1000	101.06	106
101.07	107	1000	101.07	107
101.08	108	1000	101.08	108
101.09	109	1000	101.09	109
101.10	110	1000	101.10	110
101.11	111	1000	101.11	111
101.12	112	1000	101.12	112
101.13	113	1000	101.13	113
101.14	114	1000	101.14	114
101.15	115	1000	101.15	115
101.16	116	1000	101.16	116
101.17	117	1000	101.17	117
101.18	118	1000	101.18	118
101.19	119	1000	101.19	119
101.20	120	1000	101.20	120
101.21	121	1000	101.21	121
101.22	122	1000	101.22	122
101.23	123	1000	101.23	123
101.24	124	1000	101.24	124
101.25	125	1000	101.25	125
101.26	126	1000	101.26	126
101.27	127	1000	101.27	127
101.28	128	1000	101.28	128
101.29	129	1000	101.29	129
101.30	130	1000	101.30	130
101.31	131	1000	101.31	131
101.32	132	1000	101.32	132
101.33	133	1000	101.33	133
101.34	134	1000	101.34	134
101.35	135	1000	101.35	135
101.36	136	1000	101.36	136
101.37	137	1000	101.37	137
101.38	138	1000	101.38	138
101.39	139	1000	101.39	139
101.40	140	1000	101.40	140
101.41	141	1000	101.41	141
101.42	142	1000	101.42	142
101.43	143	1000	101.43	143
101.44	144	1000	101.44	144
101.45	145	1000	101.45	145
101.46	146	1000	101.46	146
101.47	147	1000	101.47	147
101.48	148	1000	101.48	148
101.49	149	1000	101.49	149
101.50	150	1000	101.50	150
101.51	151	1000	101.51	151
101.52	152	1000	101.52	152
101.53	153	1000	101.53	153
101.54	154	1000	101.54	154
101.55	155	1000	101.55	155
101.56	156	1000	101.56	156
101.57	157	1000	101.57	157
101.58	158	1000	101.58	158
101.59	159	1000	101.59	159
101.60	160	1000	101.60	160
101.61	161	1000	101.61	161
101.62	162	1000	101.62	162
101.63	163	1000	101.63	163
101.64	164	1000	101.64	164
101.65	165	1000	101.65	165
101.66	166	1000	101.66	166
101.67	167	1000	101.67	167
101.68	168	1000	101.68	168
101.69	169	1000	101.69	169
101.70	170	1000	101.70	170
101.71	171	1000	101.71	171
101.72	172	1000	101.72	172
101.73	173	1000	101.73	173
101.74	174	1000	101.74	174
101.75	175	1000	101.75	175
101.76	176	1000	101.76	176
101.77	177	1000	101.77	177
101.78	178	1000	101.78	178
101.79	179	1000	101.79	179
101.80	180	1000	101.80	180
101.81	181	1000	101.81	181
101.82	182	1000	101.82	182
101.83	183	1000	101.83	183
101.84	184	1000	101.84	184
101.85	185	1000	101.85	185
101.86	186	1000	101.86	186
101.87	187	1000	101.87	187
101.88	188	1000	101.88	188
101.89	189	1000	101.89	189
101.90	190	1000	101.90	190
101.91	191	1000	101.91	191
101.92	192	1000	101.92	192
101.93	193	1000	101.93	193
101.94	194	1000	101.94	194
101.95	195	1000	101.95	195
101.96	196	1000	101.96	196
101.97	197	1000	101.97	197
101.98	198	1000	101.98	198
101.99	199	1000	101.99	199
102.00	200	1000	102.00	200
102.01	201	1000	102.01	201
102.02	202	1000	102.02	202
102.03	203	1000	102.03	203
102.04	204	1000	102.04	204
102.05	205	1000	102.05	205
102.06	206	1000	102.06	206
102.07	207	1000	102.07	207
102.08	208	1000	102.08	208
102.09	209	1000	102.09	209
102.10	210	1000	102.10	210
102.11	211	1000	102.11	211
102.12	212	1000	102.12	212
102.13	213	1000	102.13	213
102.14	214	1000	102.14	214
102.15	215	1000	102.15	215
102.16	216	1000	102.16	216
102.17	217	1000	102.17	217
102.18	218	1000	102.18	218
102.19	219	1000	102.19	219
102.20	220	1000	102.20	220
102.21	221	1000	102.21	221
102.22	222	1000	102.22	222
102.23	223	1000	102.23	223
102.24	224	1000	102.24	224
102.25	225	1000	102.25	225
102.26	226	1000	102.26	226
102.27	227	1000	102.27	227
102.28	228	1000	102.28	228
102.29	229	1000	102.29	229
102.30	230	1000	102.30	230
102.31	231	1000	102.31	231
102.32	232	1000	102.32	232
102.33	233	1000	102.33	233
102.34	234	1000	102.34	234
102.35	235	1000	102.35	235
102.36	236	1000	102.36	236
102.37	237	1000	102.37	237
102.38	238	1000	102.38	238
102.39	239	1000	102.39	239
102.40	240	1000	102.40	240
102.41	241	1000	102.41	241
102.42	242	1000	102.42	242
102.43	243	1000	102.43	243
102.44	244	1000	102.44	244
102.45	245	1000	102.45	245
102.46	246	1000	102.46	246
102.47	247	1000	102.47	247
102.48	248	1000	102.48	248
102.49	249	1000	102.49	249
102.50	250	1000	102.50	250
102.51	251	1000	102.51	251
102.52	252	1000	102.52	252
102.53	253	1000	102.53	253
102.54	254	1000	102.54	254
102.55	255	1000	102.55	255
102.56	256	1000	102.56	256
102.57	257	1000	102.57	257
102.58	258	1000	102.58	258
102.59	259	1000	102.59	259
102.60	260	1000	102.60	260
102.61	261	1000	102.61	261
102.62	262	1000	102.62	262
102.63	263	1000	102.63	263
102.64	264	1000	102.64	264
102.65	265	1000	102.65	265
102.66	266	1000	102.66	266
102.67	267	1000	102.67	267
102.68	268	1000	102.68	268
102.69	269	1000	102.69	269
102.70	270	1000	102.70	270
102.71	271	1000	102.71	271
102.72	272	1000	102.72	272
102.73	273	1000	102.73	273
102.74	274	1000	102.74	274
102.75	275	1000	102.75	275
102.76	276	1000	102.76	276
102.77	277	1000	102.77	277
102.78	278	1000	102.78	278
102.79	279	1000	102.79	279
102.80	280	1000	102.80	280
102.81	281	1000	102.81	281
102.82	282	1000	102.82	282
102.83	283	1000	102.83	283
102.84	284	1000	102.84	284
102.85	285	1000	102.85	285
102.86	286	1000	102.86	286
102.87	287	1000	102.87	287
102.88	288	1000	102.88	288
102.89	289	1000	102.89	289
102.90	290	1000	102.90	290
102.91	291	1000	102.91	291
102.92	292	1000	102.92	292
102.93	293	1000	102.93	293
102.94	294	1000	102.94	294
102.95	295	1000	102.95	295
102.96	296	1000	102.96	296
102.97	297	1000	102.97	297
102.98	298	1000	102.98	298
102.99	299	1000	102.99	299
103.00	300	1000	103.00	300
103.01	301	1000	103.01	301
103.02	302	1000	103.02	302
103.03	303	1000	103.03	303
103.04	304	1000	103.04	304
103.05	305	1000	103.05	305
103.06	306	1000	103.06	306
103.07	307	1000	103.07	307
103.08	308	1000	103.08	308
103.09	309	1000	103.09	309
103.10	310	1000	103.10	310
103.11	311	1000	103.11	311
103.12	312	1000	103.12	312
103.13	313	1000	103.13	313
103.14	314	1000	103.14	314
103.15	315	1000	103.15	315
103.16	316	1000	103.16	316
103.17	317	1000	103.17	317
103.18	318	1000	103.18	318
103.19	319	1000	103.19	319
103.20	320	1000	103.20	320
103.21	321	1000	103.21	321
103.22	322	1000	103.22	322
103.23	323	1000	103.23	323
103.24	324	1000	103.24	324
103.25	325	1000	103.25	325
103.26	326	1000	103.26	326
103.27	327	1000	103.27	327
103.28	328	1000	103.28	328
103.29	329	1000	103.29	329
103.30	330	1000	103.30	330
103.31	331	1000	103.31	331
103.32	33			

COMPUTATIONS OF LATITUDE AND DEPARTURES

TRAVERSE N^o III

D-1 to E-1

Lat.		673.899
Log Lat		2.82859498
Log Cos	29° 01' 24.24"	9.94172089-10
Log	770.680	2.88687409
Log Sin	29° 01' 24.24"	9.68589106-10
Log Dep		2.57276515
Dep		373.908

E-1 to F-1

Lat		169.483
Log Lat		2.22912266
Log Cos	73° 16' 45.36"	9.45895059-10
Log	589.077	2.77017207
Log Sin	73° 16' 45.36"	9.98123785-10
Log Dep		2.75140992
Dep		564.170

F-1 to G-1

Lat		168.777
Log Lat		2.22731371
Log Cos	66° 19' 45.90"	9.60366133-10
Log	420.390	2.62365238
Log Sin	66° 19' 45.90"	9.96183329-10
Log Dep		2.58548567
Dep		385.022

G-1 to H-1

Lat.		53.815
Log Lat		1.73089901
Log Cos	81° 12' 27.70"	9.18427431-10
Log	352.0665	2.54662470
Log sin	81° 12' 27.70"	9.99486635-10
Log Dep		2.54149105
Dep		347.930

H-1 to J-1

Lat		226.322
Log Lat		2.35473618
Log Cos	67° 51' 39.90"	9.57617255-10
Log	600.570	2.77856363
Log Sin	67° 51' 39.90"	9.96673895-10
Log Dep		2.74530258
Dep		556.292

J-1 to K-1

Lat		68.562
Log Lat		1.83608039
Log Cos	83° 43' 21.20"	9.03879103-10
Log	627.0315	2.79728936
Log Sin	83° 43' 21.20"	9.99738817
Log Dep		2.79467753
Dep		623.272

K-1 to L-1

Lat.		54.194
Log Lat		1.73395383
Log Cos	85° 06' 23.79"	8.93095925-10
Log	635.323	2.80299458
Log Sin	85° 06' 23.79"	9.99841416-10
Log Dep		2.80140874
Dep		633.008

L-1 to M-1

Lat.		590.522
Log Lat		2.77123643
Log Cos	41° 21' 45.63"	9.87537484-10
Log	786.795	2.89586159
Log Sin	41° 21' 45.63"	9.82008520-10
Log Dep		2.71594679
Dep		519.932

M-1 To N-1

Lat.		90.196
Log Lat		1.95518802
Log Cos	80° 32' 29.37"	9.21572565-10
Log	548.861	2.73946237
Log Sin	80° 32' 29.37"	9.99405521-10
Log Dep		2.73351758
Dep		541.399

I-I of I-K

001.00		.001
001.01		.001
01-001.00	001.00	.001
001.00	001.00	.001
01-001.00	001.00	.001
001.00		.001
001.00		.001

I-I of I-I

001.00		.001
001.01		.001
01-001.00	001.00	.001
001.00	001.00	.001
01-001.00	001.00	.001
001.00		.001
001.00		.001

I-I of I-I

001.00		.001
001.01		.001
01-001.00	001.00	.001
001.00	001.00	.001
01-001.00	001.00	.001
001.00		.001
001.00		.001

N-1 to A-1

Lat.		406.022
Log Lat		2.60854897
Log Cos	18° 59' 46.50"	9.97567985-10
Log	429.407	2.63286912
Log Sin	18° 59' 46.50"	9.51255936-10
Log Dep		2.14542848
Dep		139.775

CORRECTIONS FOR LATITUDE AND DEPARTURETRAVERSE N° III

Constants:	Lat.	= $\frac{.112}{2501.792}$	= 0.00004477
	Dep.	= $\frac{.048}{4684.71}$	= 0.000010246

Line	Lat.	Corr.	Dep.	Corr.
D-1 E-1	673.899	.030	373.908	.004
E-1 to F-1	169.483	.008	564.170	.006
F-1 to G-1	168.777	.007	385.022	.004
G-1 to H-1	53.815	.002	387.930	.004
H-1 to J-1	226.322	.010	556.292	.006
J-1 to K-1	68.562	.003	623.272	.006
K-1 to L-1	54.194	.002	633.008	.007
L-1 to M-1	590.522	.026	519.932	.005
M-1 to N-1	90.196	.004	541.399	.005
N-1 to A-1	460.022	<u>.020</u>	139.775	<u>.001</u>
		.112		.048

COMPUTATION OFF COORDINATES OF TRAVERSE N^o III

Point	X	Y
D-1	6,023.486	4,994.438
	<u>+373.904</u>	<u>+673.869</u>
E-1	6,397.390	5,668.307
	<u>- 564.176</u>	<u>+ 169.475</u>
F-1	5,833.214	5,337.782
	<u>- 385.026</u>	<u>- 168.784</u>
G-1	5,448.188	5,668.998
	<u>- 347.934</u>	<u>- 53.817</u>
H-1	5,100.254	5,615.181
	<u>- 556.298</u>	<u>+226.312</u>
J-1	4,543.956	5,841.493
	<u>- 623.278</u>	<u>+ 68.559</u>
K-1	3,920.678	5,910.052
	<u>-633.015</u>	<u>+ 54.192</u>
L-1	3,287.663	5,964.244
	<u>+ 519.927</u>	<u>- 590.548</u>
M-1	3,807.590	5,373.696
	<u>+ 541.394</u>	<u>+ 90.192</u>
N-1	4,348.984	5,403.888
	<u>+ 139.774</u>	<u>- 406.042</u>
A-1	4,488.758	5,057.846

THE HISTORY OF THE UNITED STATES OF AMERICA

		DATE
1776	DECLARATION OF INDEPENDENCE	7-4
1787	CONSTITUTION	9-17
1791	FIRST AMENDMENT	9-17
1791	SECOND AMENDMENT	9-17
1791	THIRD AMENDMENT	9-17
1791	FOURTH AMENDMENT	9-17
1791	FIFTH AMENDMENT	9-17
1791	SIXTH AMENDMENT	9-17
1791	SEVENTH AMENDMENT	9-17
1791	EIGHTH AMENDMENT	9-17
1791	NINTH AMENDMENT	9-17
1791	TENTH AMENDMENT	9-17
1791	ELEVENTH AMENDMENT	9-17
1791	TWELFTH AMENDMENT	9-17
1791	THIRTEENTH AMENDMENT	9-17
1791	FOURTEENTH AMENDMENT	9-17
1791	FIFTEENTH AMENDMENT	9-17
1791	SIXTEENTH AMENDMENT	9-17
1791	SEVENTEENTH AMENDMENT	9-17
1791	EIGHTEENTH AMENDMENT	9-17
1791	NINETEENTH AMENDMENT	9-17
1791	TWENTIETH AMENDMENT	9-17
1791	TWENTY-FIRST AMENDMENT	9-17
1791	TWENTY-SECOND AMENDMENT	9-17
1791	TWENTY-THIRD AMENDMENT	9-17
1791	TWENTY-FOURTH AMENDMENT	9-17
1791	TWENTY-FIFTH AMENDMENT	9-17
1791	TWENTY-SIXTH AMENDMENT	9-17
1791	TWENTY-SEVENTH AMENDMENT	9-17
1791	TWENTY-EIGHTH AMENDMENT	9-17
1791	TWENTY-NINTH AMENDMENT	9-17
1791	THIRTIETH AMENDMENT	9-17

TABULATED RESULTS OF

Pt.	Line	Azimuth	Bearing	Distance	Latitudes	
D	D-E	209 01 24.24	N29 01 24.24E	770.680	673.899	
E	E-F	106 43 14.74	N73 16 45.36W	589.077	169.483	
F	F-G	66 19 45.90	S 66 19 45.90W	420.390		168.777
G	G-H	81 12 27.70	S81 12 27.70W	352.067		53.815
H	H-J	112 08 20.10	N67 51 39.90W	600.570	226.322	
J	J-K	96 16 38.80	N83 43 21.20W	627.032	68.562	
K	K-L	94 53 36.21	N85 06 23.79W	635.323	54.194	
L	L-M	318 38 14.37	S41 21 45.63E	786.795		590.522
M	M-N	260 32 29.37	N80 32 24.37E	548.861	90.196	
N	N-A	341 40 13.41	S18 59 46.52E	429.407		406.022
A	A-B	275 28 03.30	S84 31 56.70EE	329.012		31.354
B	B- State					26.492
St:	State--	E.Az. (These Computations				8.345
E.Az.		From Traverse #2)				
	E.Az.---D				2.783	
D	D-E	(Above)				
					1285.439	1285.327
					1285.327	
					.112	

TRAVERSE NUMBER THREE

						---Balanced-----		
Departures		Corrections				Latitudes	Departures	
E	W	N	S	E	W			
373.908		.030		.004		673.869	373.904	D
	564.170	.008			.006	169.475	564.176	E
	385.022		.007	1.007	.004	168.784	385.026	F
	347.930		.002	1.002	.004	53.817	347.934	G
	556.292	.010			.006	226.312	556.298	H
	623.272	.003			.006	68.559	623.278	J
	633.008	.002			.007	54.192	633.015	K
519.932			.026	.005		590.548	519.927	L
541.399		.004		.005		90.192	541.394	M
139.775			.020	.001		406.042	139.774	N
327.513								A
								B
183.729								St.
1084.902								1.11
								E.Az.
	61.416							D
3171.158	3171.110							
3171.110								
.048								

DATE		DESCRIPTION		AMOUNT		BALANCE	
1	1950.01.01	TO	INITIAL	100.00		100.00	
2	1950.01.01	TO	INITIAL	100.00		200.00	
3	1950.01.01	TO	INITIAL	100.00		300.00	
4	1950.01.01	TO	INITIAL	100.00		400.00	
5	1950.01.01	TO	INITIAL	100.00		500.00	
6	1950.01.01	TO	INITIAL	100.00		600.00	
7	1950.01.01	TO	INITIAL	100.00		700.00	
8	1950.01.01	TO	INITIAL	100.00		800.00	
9	1950.01.01	TO	INITIAL	100.00		900.00	
10	1950.01.01	TO	INITIAL	100.00		1000.00	
11	1950.01.01	TO	INITIAL	100.00		1100.00	
12	1950.01.01	TO	INITIAL	100.00		1200.00	
13	1950.01.01	TO	INITIAL	100.00		1300.00	
14	1950.01.01	TO	INITIAL	100.00		1400.00	
15	1950.01.01	TO	INITIAL	100.00		1500.00	
16	1950.01.01	TO	INITIAL	100.00		1600.00	
17	1950.01.01	TO	INITIAL	100.00		1700.00	
18	1950.01.01	TO	INITIAL	100.00		1800.00	
19	1950.01.01	TO	INITIAL	100.00		1900.00	
20	1950.01.01	TO	INITIAL	100.00		2000.00	
21	1950.01.01	TO	INITIAL	100.00		2100.00	
22	1950.01.01	TO	INITIAL	100.00		2200.00	
23	1950.01.01	TO	INITIAL	100.00		2300.00	
24	1950.01.01	TO	INITIAL	100.00		2400.00	
25	1950.01.01	TO	INITIAL	100.00		2500.00	
26	1950.01.01	TO	INITIAL	100.00		2600.00	
27	1950.01.01	TO	INITIAL	100.00		2700.00	
28	1950.01.01	TO	INITIAL	100.00		2800.00	
29	1950.01.01	TO	INITIAL	100.00		2900.00	
30	1950.01.01	TO	INITIAL	100.00		3000.00	
31	1950.01.01	TO	INITIAL	100.00		3100.00	
32	1950.01.01	TO	INITIAL	100.00		3200.00	
33	1950.01.01	TO	INITIAL	100.00		3300.00	
34	1950.01.01	TO	INITIAL	100.00		3400.00	
35	1950.01.01	TO	INITIAL	100.00		3500.00	
36	1950.01.01	TO	INITIAL	100.00		3600.00	
37	1950.01.01	TO	INITIAL	100.00		3700.00	
38	1950.01.01	TO	INITIAL	100.00		3800.00	
39	1950.01.01	TO	INITIAL	100.00		3900.00	
40	1950.01.01	TO	INITIAL	100.00		4000.00	
41	1950.01.01	TO	INITIAL	100.00		4100.00	
42	1950.01.01	TO	INITIAL	100.00		4200.00	
43	1950.01.01	TO	INITIAL	100.00		4300.00	
44	1950.01.01	TO	INITIAL	100.00		4400.00	
45	1950.01.01	TO	INITIAL	100.00		4500.00	
46	1950.01.01	TO	INITIAL	100.00		4600.00	
47	1950.01.01	TO	INITIAL	100.00		4700.00	
48	1950.01.01	TO	INITIAL	100.00		4800.00	
49	1950.01.01	TO	INITIAL	100.00		4900.00	
50	1950.01.01	TO	INITIAL	100.00		5000.00	

COMPUTATION OF AZIMUTH OF EXTRANEIOUS POINTS

Line	Computation	Azimuth
A-1 to B-1	275° 28' 03.30"	
/ B-1 to M.B.M.	40° 53' 33.80"	
A-1 to M.B.M.	316° 21' 37.10"	316° 21' 37.10"
G-1 to F-1	246° 19' 45.90"	
/ F-1 to P-1	297° 14' 30.00"	
G-1 to P-1	183° 34' 15.90"	183° 34' 15.90"
N-1 to A-1	341° 00' 13.41"	
/ A-1 to O-1	170° 56' 04.40"	
N-1 to O-1	151° 56' 17.81"	151° 56' 17.81"

TABLE 1. SUMMARY OF THE DATA FOR THE 1954-55

Station	Location	Year
1	100.00 N 100.00 W	1-10 of 1-10
2	100.00 N 100.00 W	1-10 of 1-10 \
3	100.00 N 100.00 W	1-10 of 1-10
4	100.00 N 100.00 W	1-10 of 1-10
5	100.00 N 100.00 W	1-10 of 1-10
6	100.00 N 100.00 W	1-10 of 1-10 \
7	100.00 N 100.00 W	1-10 of 1-10
8	100.00 N 100.00 W	1-10 of 1-10
9	100.00 N 100.00 W	1-10 of 1-10
10	100.00 N 100.00 W	1-10 of 1-10 \
11	100.00 N 100.00 W	1-10 of 1-10
12	100.00 N 100.00 W	1-10 of 1-10
13	100.00 N 100.00 W	1-10 of 1-10
14	100.00 N 100.00 W	1-10 of 1-10
15	100.00 N 100.00 W	1-10 of 1-10
16	100.00 N 100.00 W	1-10 of 1-10
17	100.00 N 100.00 W	1-10 of 1-10
18	100.00 N 100.00 W	1-10 of 1-10
19	100.00 N 100.00 W	1-10 of 1-10
20	100.00 N 100.00 W	1-10 of 1-10

Coordinates of M.B.M.

Asimuth of A-1 to B-1	275	28	03.3
Angle B-1, A-1, M.B.M.	40	53	33.8
Asimuth of A-1 to M.B.M.	316	21	37.1
Bearing of A-1 to M.B.M.	S 43	38	22.9 E
Distance	134.795	ft.	

Lat.	97.550
Log Lat.	<u>1.98922870</u>
Log Cos.	9.85955492
Log Line	2.12967378
Log Sin.	9.83892430
Log Dep.	<u>1.96859808</u>
Dep.	93.024

	Y-Lat.	X-Dep.
Coordinates of A-1	5057.846	4488.758
- M.B.M.	97.550	93.024
Coordinates of M.B.M.	4960.296	4581.782

COORDINATES OF O-1

Azimuth of N-1, A-1 341 00 13.41

Angle Δ , N, O 170 56 04.40

511 56 17.81

360

Azimuth of N-1 151 56 17.81

Bearing of N-1 to O-1 N 28 03 42.19 W

Distance 226.505 ft.

Lat. 199.877

Log Lat. 2.30076286

Log Cos. 9.94568607

Log Line 2.35507679

Log Sin. 9.67248725

Log Dep. 2.02756404

Dep. 106.553

	Y-Lat.	X- Dep.
Coordinates of N-1	5463.888	4348.984

O-1	199.877	106.553
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Coordinates of O-1	5663.765	4455.537
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14.21 00 13.41	1-4, I-A-1	Latitude of I-A-1
01.40 00 00.10	Angle	Angle
16.11 00 14.91		
150		
101 11 14.11	1-4, I-A-1	Latitude of I-A-1
01.40 00 00.10	Angle	Angle
150.000.000	Distance	Distance
100.001	Lat.	Lat.
5.00000000	Log Lat.	Log Lat.
9.0400000	Log Cos.	Log Cos.
9.9999999	Log Sine	Log Sine
9.9999999	Log Sin.	Log Sin.
9.0400000	Log Tan.	Log Tan.
100.001	Log Det.	Log Det.
100.001	Log	Log
100.001	Y-Def.	Y-Def.
100.001	X-Def.	X-Def.
100.001	Coordinates of I-A-1	Coordinates of I-A-1
100.001	I-A-1	I-A-1
100.001	Coordinates of G-1	Coordinates of G-1

Coordinates Of P-1

Azimuth G-1, F-1 246 19 45.9

Length G-1, P-1 222.622 ft.

Angle F, G, P 297 14 30.0

246 19 45.9

543 34 15.9

360

Azimuth G-1, P-1 183 34 15.9

Bearing N. 3 34 15.9

Lat. 222.194

Log. Lat. 2.34672597

Log. Cos. 9.99915589

Log. Line 2.34757008

Log. Sin. 8.79439951

Log. Dep. 1.14196959

Dep. 13.8665

Y-Lat.

X-Dep.

Coordinates of G-1 5668.988

5448.188

P-1 222.194

13.866

Coordinates of P-1 5891.182

5462.054

Coordinates of A-1, A-2, & A-3

Azimuth of A,B	275°	28'	03.3"
A-2	1	09	30.0
	276	37	33.3
A-3	1	48	30.0
	277	16	03.3
A-4	1	58	30.3
	277	36	33.3

Bearings	Distances			
A-1, A-2	S. 83°	22'	26.7" E.	9.965
A-1, A-3	S. 82°	43'	26.7" E.	19.960
A-1, A-4	S. 82°	23'	26.7" E.	29.851

Latitude	1.150	2.528	3.953
Log. Lat.	9.06063217	0.40276773	0.59696275
Log. Cos.	9.06215487	9.10259719	9.12200387
Log. Line	0.99847730	1.30016054	1.47495888
Log. Sin.	9.99708948	9.99648880	9.99615874
Log. Dep.	0.99556678	1.29664934	1.47111762
Departure	9.898	19.799	29.588

Coordinates of A-1 X=4488.758, Y=5057.846

4488.758	5057.846	4488.758	5057.846	4488.758	5057.846
9.898	1.150	19.799	2.528	29.588	3.953

4498.656	5056.696	4508.557	5055.318	4518.346	5053.893
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	X	Y
A-2	4498.656	5056.696
A-3	4508.557	5055.318
A-4	4518.346	5053.893

COORDINATION OF A-1

Amount of A-1	Rate	Time	Cost
1-1	1	10	10.00
1-2	1	10	10.00
1-3	1	10	10.00
1-4	1	10	10.00
1-5	1	10	10.00

COORDINATION OF A-1

1-1	1	10	10.00
1-2	1	10	10.00
1-3	1	10	10.00
1-4	1	10	10.00

1-1	1	10	10.00
1-2	1	10	10.00
1-3	1	10	10.00
1-4	1	10	10.00
1-5	1	10	10.00
1-6	1	10	10.00
1-7	1	10	10.00
1-8	1	10	10.00
1-9	1	10	10.00
1-10	1	10	10.00

COORDINATION OF A-1

1-1	1	10	10.00
1-2	1	10	10.00
1-3	1	10	10.00
1-4	1	10	10.00

1-1 1-2 1-3 1-4 1-5 1-6 1-7 1-8 1-9 1-10

1-1	1	10	10.00
1-2	1	10	10.00
1-3	1	10	10.00
1-4	1	10	10.00

Coordinates of B-2, B-3, B-4.

Azimuth of B-1---A-1		95	28	03.3
<u>1</u>	B-2	232	22	00.00
Azimuth		327	50	03.3
<u>L</u>	B3	232	33	00.0
Azimuth		328	01	03.3
	B-4	232	19	00.0
Azimuth		327	47	03.3

Bearings:

Distances

B-1 to B-2	S 32	09	56.7 E	9.903 ft.
B-1 " B-3	S 31	58	56.7 E	19.980 "
B-1 " B-4	S 32	12	56.7 E	30.029 "

Latitude	8.383	16.760	25.406
Log Lat.	0.92339967	1.22427341	1.40494385
Log Cos.	9.92763289	9.92367793	9.92739298
Log Line	0.99576678	1.30059548	1.47754087
Log Sin.	9.72621386	9.73590347	9.72681591
Log Dep.	0.72198064	1.03649895	1.20435678
Departure	5.272	10.877	16.010

Coordinates of B-1 Y--5026.492 X-- 4816.271

5026.492	4816.271	5026.492	4816.271	5026.492	4816.492
8.383	5.272	16.760	10.877	25.406	16.010
5018.109	4821.543	5009.732	4827.148	5001.086	4832.281

X

Y

B-2	4821.543	5018.109
B-3	4827.148	5009.732
B-4	4832.281	5001.086

100-443887-100

Category	Item	Quantity	Unit Price	Total Price
Furniture	Office Chair	10	\$150.00	\$1,500.00
	Desk	5	\$300.00	\$1,500.00
Electronics	Computer Monitor	20	\$100.00	\$2,000.00
	Printer	10	\$200.00	\$2,000.00
Supplies	Paper	1000	\$0.50	\$500.00
	Ink	50	\$10.00	\$500.00
Services	Consulting	10	\$100.00	\$1,000.00
	Training	5	\$200.00	\$1,000.00
Travel	Hotel	10	\$100.00	\$1,000.00
	Transportation	5	\$200.00	\$1,000.00
Food & Beverage	Coffee	100	\$10.00	\$1,000.00
	Snacks	50	\$20.00	\$1,000.00
Miscellaneous	Postage	100	\$10.00	\$1,000.00
	Insurance	5	\$200.00	\$1,000.00

PL 96-363 101-101-00 1-1 1 10/10/1990

101-229	102-210	103-2139	104-211	105-209	106-2099
107-21	108-21	109-21	110-21	111-21	112-21
113-21	114-21	115-21	116-21	117-21	118-21

T	E	
801.51-1	801.51-1	8-2
801.51-2	801.51-2	8-3
801.51-3	801.51-3	8-4

COORDINATES OF C-1, C-2, & C-3

Azimuth of C-1, D-1	264°	15'	14.04"
C-2	91	32	00.00
	355	47	14.04
C-3	91	42	00.00
	355	57	14.04
C-4	92	03	00.00
	356	18	14.04

Bearing	Distance
C-1, C-2 S. 04° 12' 45.96 E	9.977
C-1, C-3 S. 04 02 45.96 E	19.980
C-1, C-4 S. 03 41 45.96 E	30.035

Lat.	9.950	19.9302	29.969
Log. Lat.	0.99882497	1.29951169	1.47672336
Log. Cos.	9.99882500	9.99891621	9.99909572
Log. Line	0.99899997	1.30059548	1.47762764
Log. Sine	8.86605453	8.84855415	8.80932115
Log. Dep.	9.86505450	0.14914963	0.28694877
Dep.	0.73292	1.40977	1.93619

Coordinates of C-1 X=5384.193 Y=4930.223

4930.223 5384.193 4930.223 5384.193 4930.223 5384.193
9.950 0.733 19.930 1.409 29.969 1.936

	X	Y
C-2	5384.926	4920.273
C-3	5385.603	4910.293
C-4	5386.129	4900.254

COORDINATES OF D-2, D-3, & D-4

Azimuth of D-1, E-1	209° 01'	24.24"
D-2	131 05	00.00
	340 06	24.24
D-3	131 14	30.00
	340 15	54.24
D-4	130 54	00.00
	339 55	24.24

Bearing	Distance
D-1, D-2 S. 19° 53' 35.76" E.	9.991
D-1, D-23 S. 19 44 05.76 E.	19.880
D-1, D-4 S. 20 04 35.76 E.	29.985

Lat.	9.3948	18.7133	28.163
Log. Lat.	0.97288820	1.27212804	1.44967791
Log. Cos.	9.97327924	9.97371166	9.97277386
Log. Line	0.99960896	1.29841638	1.47690405
Log. Sin	9.53182384	9.52849287	9.53564499
Log. Dep.	0.53143280	0.82690925	1.01254904
Dep.	3.3996	6.129	10.2932

Coordinates of D-1 X = 6023.486 Y = 4994.438

D-2x	D-2y	D-3x	D-3y	D-4x	D-4y
6023.486	4994.438	6023.486	4994.438	6023.486	4994.438
3.400	9.395	6.129	18.713	10.293	28.163

	X	Y
D-2	6026.886	4985.043
D-3	6029.615	4975.725
D-4	6033.779	4966.275

COORDINATES OF POINTS E-2, E-3, E-4

Azimuth of E-1 to F-1	106° 43' 14.74"
E-2	309° 23' 00.00"
	56° 06' 14.74"
E-3	309° 39' 00.00"
	56° 22' 14.70"
E-4	309° 16' 00.00"
	56° 59' 14.74"

Line	Bearing	Distance
E-1 to E-2	S 56° 06' 14.74" W	9.862
E-1 to E-3	S 56° 22' 14.74" W	19.876
E-1 to E-4	S 56° 59' 14.74" W	30.051

Lat	5.5012	11.0002	16.3724
Log Lat	0.74045377	1.04169408	1.21411356
Log Cos	9.74638877	9.74336509	9.73625463
Log Line	0.99396500	1.29832899	1.47785893
Log Sin	9.91910574	9.92045697	9.92352986
Log Dep	0.90407074	1.21878596	1.40138679
Dep	8.2044	16.9495	25.257

Coordinates of E-1 X = 6397.390 Y = 5668.307

E-2x	E-2y	E-3x	E-3y	E-4x	E-4y
6397.390	5668.307	6397.390	5668.307	6397.390	5668.307
- 8.204	- 5.501	-16.950	-11.000	-25.257	-16.372

	X	Y
E-2	6389.186	5662.806
E-3	6380.440	5657.307
E-4	6372.133	5651.935

1. *Phragmites australis* (Cav.) Trin. ex Steud. (Common reed)

[illegible][illegible][illegible][illegible]

1. *Chlorophyll a* (Chl *a*)
 2. *Chlorophyll b* (Chl *b*)
 3. *Chlorophyll c* (Chl *c*)
 4. *Chlorophyll d* (Chl *d*)
 5. *Chlorophyll e* (Chl *e*)
 6. *Chlorophyll f* (Chl *f*)
 7. *Chlorophyll g* (Chl *g*)
 8. *Chlorophyll h* (Chl *h*)
 9. *Chlorophyll i* (Chl *i*)
 10. *Chlorophyll j* (Chl *j*)
 11. *Chlorophyll k* (Chl *k*)
 12. *Chlorophyll l* (Chl *l*)
 13. *Chlorophyll m* (Chl *m*)
 14. *Chlorophyll n* (Chl *n*)
 15. *Chlorophyll o* (Chl *o*)
 16. *Chlorophyll p* (Chl *p*)
 17. *Chlorophyll q* (Chl *q*)
 18. *Chlorophyll r* (Chl *r*)
 19. *Chlorophyll s* (Chl *s*)
 20. *Chlorophyll t* (Chl *t*)
 21. *Chlorophyll u* (Chl *u*)
 22. *Chlorophyll v* (Chl *v*)
 23. *Chlorophyll w* (Chl *w*)
 24. *Chlorophyll x* (Chl *x*)
 25. *Chlorophyll y* (Chl *y*)
 26. *Chlorophyll z* (Chl *z*)
 27. *Chlorophyll aa* (Chl *aa*)
 28. *Chlorophyll ab* (Chl *ab*)
 29. *Chlorophyll ac* (Chl *ac*)
 30. *Chlorophyll ad* (Chl *ad*)
 31. *Chlorophyll ae* (Chl *ae*)
 32. *Chlorophyll af* (Chl *af*)
 33. *Chlorophyll ag* (Chl *ag*)
 34. *Chlorophyll ah* (Chl *ah*)
 35. *Chlorophyll ai* (Chl *ai*)
 36. *Chlorophyll aj* (Chl *aj*)
 37. *Chlorophyll ak* (Chl *ak*)
 38. *Chlorophyll al* (Chl *al*)
 39. *Chlorophyll am* (Chl *am*)
 40. *Chlorophyll an* (Chl *an*)
 41. *Chlorophyll ao* (Chl *ao*)
 42. *Chlorophyll ap* (Chl *ap*)
 43. *Chlorophyll aq* (Chl *aq*)
 44. *Chlorophyll ar* (Chl *ar*)
 45. *Chlorophyll as* (Chl *as*)
 46. *Chlorophyll at* (Chl *at*)
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 54. *Chlorophyll abz* (Chl *abz*)
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 131. *Chlorophyll ayz* (Chl *ayz*)
 132. *Chlorophyll ayz* (Chl *ayz*

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398</
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[illegible]

COORDINATES OF POINTS F-1, F-2, F-3, & F-4

Azimuth of F-1 to E-1	286° 43' 14.74"
F-2	370° 26' 45.00"
	324° 09' 59.74"
F-3	26° 20' 00.00"
	3 13° 03' 14.74"
F-4	26° 13' 00.00"
	312° 56' 14.74"

Line	Bearing	Distance
F-1 to F-2	S 35° 50' 00.26" E	10.322
F-1 to F-3	S 46° 56' 45.26" E	20.083
F-1 to F-4	S 47° 03' 45.26" E	20.279

	F-2	F-3	F-4
Lat	8.3683	13.7107	20.626
Log Lat	0.92263654	1.13705954	1.31441402
Log Cos	9.90887269	9.83422095	9.83327249
Log Line	1.01376385	1.30283859	1.48114153
Log Sin	9.76747455	9.86374620	9.86457071
Log Dep	0.78123840	1.16358479	1.34571224
Dep	6.0428	14.6753	22.167

Coordinates of F-1 X = 5833.214 Y = 5837.788

F-2x	F-2y	F-3x	F-3y	F-4x	F-4y
5833.214	5837.788	5833.214	5837.788	5833.214	5837.788
+ 6.042	- 83368	14.675	- 13.710	22.167	- 20.626

	X	Y
F-2	5839.256	5829.414
F-3	5847.889	5824.072
F-4	5855.381	5817.156

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5. The information is being furnished to you for your information only. It is not to be used for any other purpose without the express written consent of the Department of Defense.

COORDINATES OF POINTS G-2, G-3, G-4.

Azimuth of G-1 to F-1	246° 19' 45.90"
G-2	83° 21' 00.00"
G-3	329° 40' 45.90"
G-3	66° 59' 30.00"
	313° 19' 25.90"
G-4	83° 39' 30.00"
	329° 58' 25.90"

Line	Bearing	Distance
G-1 to G-2	S 30° 19' 14.10" E	9.976
G-1 to G-3	S 46° 40' 34.10" E	21.069
G-1 to G-4	S 30° 01' 34.10" E	29.689

	G-2	G-3	G-4
Lat	8.6114	14.4559	25.710
Log Lat	0.93507516	1.16004509	1.41001187
Log Cos	9.93611872	9.83640117	9.93741630
Log Line	0.99895644	1.32364392	1.47259557
Log Sin	9.70215147	9.86182509	9.69931263
Log Dep	0.70210791	1.18546901	1.17190820
Dep	5.0633	15.3274	14.8562

Coordinates of G-1 X 5448.188 Y 5668.988

G-2x	G-2y	G-3x	G-3y	G-4x	G-4y
5448.188	5668.988	5448.188	5668.988	5448.188	5668.988
<u>5.063</u>	<u>- 8.611</u>	<u>15.327</u>	<u>-14.456</u>	<u>14.856</u>	<u>- 25.710</u>
5453.251	5660.377	5463.515	5654.532	5463.044	5643.278

	X	Y
G-2	5453.251	5660.377
G-3	5463.515	5654.532
G-4	5463.044	5643.278

SECRET

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

Category	Sub-category	Value	Unit
Category 1	Sub-category 1	100	100
Category 1	Sub-category 2	100	100
Category 1	Sub-category 3	100	100

[illegible]

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (A), 10⁷ cells/ml (B), 10⁸ cells/ml (C), and 10⁹ cells/ml (D).

DATE	DESCRIPTION	AMOUNT	DATE	DESCRIPTION	AMOUNT
1911.10.01	111.8147	111.8147	1911.10.01	111.8147	111.8147
1911.10.01	111.8147	111.8147	1911.10.01	111.8147	111.8147
1911.10.01	111.8147	111.8147	1911.10.01	111.8147	111.8147

0.05.1992	0.05.1992	0.05.1992
0.05.1992	0.05.1992	0.05.1992
0.05.1992	0.05.1992	0.05.1992

COORDINATES OF POINTS H-2, H-3, H-4.

Azimuth of G-1 to H-1	261° 12' 27.70"
H-2	1° 31' 30.00"
	262° 43' 57.70"
H-3	1° 14' 30.00"
	262° 26' 57.70"
H-4	1° 10' 00.90"
	262° 22' 27.70"

Line	Bearing	Distance
H-1 to H-2	N 82° 43' 57.70" E	9.735
H-1 to H-3	N 82° 26' 57.70" E	19.790
H-1 to H-4	N 82° 26' 27.20" E	29.770

	H-2	H-3	H-4
Lat	1.23429	2.6313	3.9598
Log Lat	0.09141668	0.42017227	0.59767053
Log Cos	9.10308072	9.11959852	9.12388170
Log Line	0.98333596	1.30057375	1.47378883
Log Sin	9.99649721	9.99621794	9.99614193
Log Dep	0.99483317	1.29679169	1.46993076
Dep	9.8817	19.8057	29.507

COORDINATES OF H-1 X 5100.254 Y 5615.181

H-2x	H-2y	H-3x	H-3y	H-4x	H-4y
5100.254	5615.181	5100.254	5615.181	5100.254	5615.181
9.882	-1.234	19.806	= 2.631	29.507	- 3.960
5110.136	5613.947	5120.060	5612.550	5129.761	5611.221

	X	Y
H-2	5110.136	5613.947
H-3	5120.060	5612.550
H-4	5129.761	5611.221

[illegible]

1-10 to 1-11

DATE	TIME	ONLY
1970.0	1970.0	1970.0
1970.1	1970.1	1970.1
1970.2	1970.2	1970.2
1970.3	1970.3	1970.3

[illegible]

71-1	72-1	73-1	74-1	75-1	76-1
101.015	102.015	103.015	104.015	105.015	106.015
107.015	108.015	109.015	110.015	111.015	112.015
113.015	114.015	115.015	116.015	117.015	118.015
119.015	120.015	121.015	122.015	123.015	124.015
125.015	126.015	127.015	128.015	129.015	130.015
131.015	132.015	133.015	134.015	135.015	136.015
137.015	138.015	139.015	140.015	141.015	142.015
143.015	144.015	145.015	146.015	147.015	148.015
149.015	150.015	151.015	152.015	153.015	154.015
155.015	156.015	157.015	158.015	159.015	160.015
161.015	162.015	163.015	164.015	165.015	166.015
167.015	168.015	169.015	170.015	171.015	172.015
173.015	174.015	175.015	176.015	177.015	178.015
179.015	180.015	181.015	182.015	183.015	184.015
185.015	186.015	187.015	188.015	189.015	190.015
191.015	192.015	193.015	194.015	195.015	196.015
197.015	198.015	199.015	200.015	201.015	202.015
203.015	204.015	205.015	206.015	207.015	208.015
209.015	210.015	211.015	212.015	213.015	214.015
215.015	216.015	217.015	218.015	219.015	220.015
221.015	222.015	223.015	224.015	225.015	226.015
227.015	228.015	229.015	230.015	231.015	232.015
233.015	234.015	235.015	236.015	237.015	238.015
239.015	240.015	241.015	242.015	243.015	244.015
245.015	246.015	247.015	248.015	249.015	250.015
251.015	252.015	253.015	254.015	255.015	256.015
257.015	258.015	259.015	260.015	261.015	262.015
263.015	264.015	265.015	266.015	267.015	268.015
269.015	270.015	271.015	272.015	273.015	274.015
275.015	276.015	277.015	278.015	279.015	280.015
281.015	282.015	283.015	284.015	285.015	286.015
287.015	288.015	289.015	290.015	291.015	292.015
293.015	294.015	295.015	296.015	297.015	298.015
299.015	300.015	301.015	302.015	303.015	304.015
305.015	306.015	307.015	308.015	309.015	310.015
311.015	312.015	313.015	314.015	315.015	316.015
317.015	318.015	319.015	320.015	321.015	322.015
323.015	324.015	325.015	326.015	327.015	328.015
329.015	330.015	331.015	332.015	333.015	334.015
335.015	336.015	337.015	338.015	339.015	340.015
341.015	342.015	343.015	344.015	345.015	346.015
347.015	348.015	349.015	350.015	351.015	352.015
353.015	354.015	355.015	356.015	357.015	358.015
359.015	360.015	361.015	362.015	363.015	364.015
365.015	366.015	367.015	368.015	369.015	370.015
371.015	372.015	373.015	374.015	375.015	376.015
377.015	378.015	379.015	380.015	381.015	382.015
383.015					

700,000	301,0118	2.1
710,000	300,4118	2.2
720,000	300,0118	2.3

COORDINATES OF POINTS J-2, J-3, J-4.

Azimuth of J-1 to K-1	96° 16' 38.80"
J-2	187° 32' 30.00"
	283° 49' 8.80"
J-3	187° 24' 30.00"
	283° 40' 8.80"
J-4	186° 55' 00.00"
	283° 11' 38.80"

Line	Bearing	Distance
J-1 to J-2	S 76° 10' 51.20" E	9.990
J-1 to J-3	S 76° 19' 51.20" E	20.075
J-1 to J-4	S 76° 19' 21.20" E	30.025

	J-2	J-3	J-4
Lat	2.3862	4.7440	7.0996
Log Lat	0.37770584	0.67614735	0.85123446
Log Cos	9.37384035	9.57349180	9.37375144
Log Line	0.99956549	1.30265555	1.47748302
Log Sin	9.98724357	9.98752167	9.98750630
Log Dep	0.98680906	1.29017722	1.46498922
Dep	9.7008	19.5064	29.174

Coordinates of J-1 X 4543.956 Y 5841.493

J-2x	J-2y	J-3x	J-3y	J-4x	J-4y
4543.956	5841.493	4543.956	5841.493	4543.956	5841.493
9.701	- 2.386	19.506	- 4.744	29.174	- 7.100
4553.657	5839.107	4563.462	5836.749	4573.130	5834.393

	X	Y
J-2	4553.657	5839.107
J-3	4563.462	5836.749
J-4	4573.130	5834.393

COORDINATES OF POINTS K-2, K-3, & K-4

Azimuth of K-1, L-1	94°	53'	36.21"
K-2	159°	24'	30.00"
	254°	18'	06.21"
K-3	159°	41'	00.00"
	254°	34'	36.21"
K-4	159°	50'	00.00"
	254°	43'	36.21"

Line	Bearing	Distance
K-1, K-2	N. 74° 18' 06.2" E.	9.965
K-1, K-3	N. 74° 34' 36.2" E.	20.115
K-1, K-4	N. 74° 43' 56.2" E.	29.931

	K-2	K-3	K-4
Lat.	2.6963	5.6319	7.8845
Log Lat.	0.43076083	0.72931794	0.89677673
Log Cos	9.43228356	9.42579790	9.42065550
Log Line	0.99847730	1.30352004	2.42612123
Log Sin	9.98349080	9.98407120	9.98436333
Log Dep	0.98196810	1.28759130	1.46050450
Dep	9.5933	19.3906	28.874

Coordinates of K-1 X=3930.271 Y=5912.748

K-2x	K-2y	K-3x	K-3y	K-4x	K-4y
3930.271	5912.748	3930.271	5912.748	3930.271	5912.748
+9.598	+9.598	+19.392	+5.362	+28.874	+7.885

3930.271 5912.748 3940.069 5915.414 3949.592 5917.937

	X	Y
K-2	3930.271	5912.748
K-3	3940.069	5915.414
K-4	3949.592	5917.937

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

1. 1. 1.	1. 1. 1.	1. 1. 1.	1. 1. 1.
1. 1. 2.	1. 1. 2.	1. 1. 2.	1. 1. 2.
1. 1. 3.	1. 1. 3.	1. 1. 3.	1. 1. 3.
1. 1. 4.	1. 1. 4.	1. 1. 4.	1. 1. 4.
1. 1. 5.	1. 1. 5.	1. 1. 5.	1. 1. 5.
1. 1. 6.	1. 1. 6.	1. 1. 6.	1. 1. 6.
1. 1. 7.	1. 1. 7.	1. 1. 7.	1. 1. 7.
1. 1. 8.	1. 1. 8.	1. 1. 8.	1. 1. 8.
1. 1. 9.	1. 1. 9.	1. 1. 9.	1. 1. 9.
1. 1. 10.	1. 1. 10.	1. 1. 10.	1. 1. 10.

[illegible][illegible][illegible]

Year	Population	Population	Population
1960	1,100	1,100	1-1
1961	1,100	1,100	1-1
1962	1,100	1,100	1-1

COORDINATES OF POINTS L-2, L-3, & L-4

Azimuth of L-1, K-1	274°	53'	36.2"
L-2	24°	49'	00.00"
	299°	42'	36.2"
L-3	23°	12'	30.00"
	298°	05'	06.20"
L-4	23°	03'	30.00"
	297°	56'	06.20"

Line	Bearing	Distance
L-1, L-2	S. 60° 17' 23.8" E.	9.934
L-1, L-2	S. 61° 54' 53.8" E.	19.953
L-1, L-4	S. 62° 03' 53.8" E.	30.043

	L-2	L-3	L-4
Lat	4.923	9.415	14.074
Log Lat.	0.69226445	0.97382706	1 1.14842470
Log Cos.	9.69514089	9.67381886	9.67063140
Log Line	0.99712416	1.30000820	1.47774330
Log Sin	9.93879234	9.94559174	9.94619654
Log Dep	0.93791650	1.24599945	2.42593984
Dep	8.668	17.604	26.542

Coordinates of L-1 X=3287.663 Y=5964.244

L-2x	L-2y	L-3x	L-3y	L-4x	L-4y
3287.663	5964.244	3287.663	5964.244	3287.663	5964.244
*8.668	-4.923	+17.604	-9.415	+26.542	-14.074

3296.331 5959.321 3305.267 5954.829 3314.206 5950.170

	X	Y
L-2	3296.331	5959.321
L-3	3305.267	5954.829
L-4	3314.206	5950.170

ANALYSIS OF BOWEN L-2, L-3, & L-4

ANALYSIS OF BOWEN L-2, L-3, & L-4		
L-2	100.00	100.00
L-3	100.00	100.00
L-4	100.00	100.00
L-2	100.00	100.00
L-3	100.00	100.00
L-4	100.00	100.00

Time		
L-2	100.00	100.00
L-3	100.00	100.00
L-4	100.00	100.00

L-2	L-3	L-4
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00

ANALYSIS OF BOWEN L-2, L-3, & L-4

L-2	L-3	L-4
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00

ANALYSIS OF BOWEN L-2, L-3, & L-4

L-2	L-3	L-4
100.00	100.00	100.00
100.00	100.00	100.00
100.00	100.00	100.00

COORDINATES OF POINTS M-2, M-3, & M-4

Azimuths of M-1, N-1	260°	32'	29.37"
M-2	24°	05'	00.00"
	284°	37'	29.37"
M-3	24°	17'	30.00"
	284°	49'	59.37"
M-4	24°	11'	30.00"
	284°	43'	59.37"

Line	Bearing	Distance
M-1, M-2	S. 75° 22' 30.6" E.	9.770
M-1, M-3	S. 75° 10' 0.6" E.	19.674
M-1, M-4	S. 75° 16' 0.6" E.	29.784

	M-2	M-3	M-4
Lat	2.467	5.037	7.574
Log Lat.	0.59213339	0.70214653	0.87936462
Log Cos	9.40223683	9.40825386	9.40538160
Log Line	0.98989456	1.29389267	1.47398302
Log Sin	9.98569600	9.98528031	9.98548035
Log Dep	0.97559056	1.27917298	1.45946337
Dep	9.453	19.018	28.805

Coordinates of M-1 X=3807.590 Y=5373.696

M-2x	M-2y	M-3x	M-3y	M-4x	M-4y
3807.590	5373.696	3807.590	5373.696	3807.590	5373.696
+9.453	-2.467	+19.018	-5.037	+28.805	-7.574
3817.043	5371.229	3826.608	5368.659	3836.395	5366.122

	X	Y
M-2	3817.043	5371.229
M-3	3826.608	5368.659
M-4	3836.395	5366.122

DOCKMASTER'S REPORT

DATE	TIME	NAME	STATUS
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK

DOCKMASTER'S REPORT

DATE	TIME	NAME	STATUS
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK

DATE	TIME	NAME	STATUS
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK

DOCKMASTER'S REPORT

DATE	TIME	NAME	STATUS
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK

DATE	TIME	NAME	STATUS
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK
10-10-68	11:00	JOHN	OK

COORDINATES OF POINTS N-2, N-3, & N-4

Azimuth of N-1, A-1	341°	00.00'	13.41"
N-2	335°	08'	30.00"
	316°	08'	43.41"
N-3	335°	36'	00.00"
	316°	36'	13.41"
N-4	335°	53'	30.00"
	316°	53'	43.41"

Line	Bearing	Distance
N-1, N-2	S. 43° 51' 16.6" E.	10.120
N-1, N-3	S. 43° 23' 46.6" E.	20.100
N-1, N-3	S. 43° 06' 16.6" E.	30.075

Coordinates of N-1 X=4348.984 Y=5463.988

	N-2	N-3	N-4
Lat	7.297	14.540	21.958
Log Lat	0.86317531	1.16255323	1.34159153
Log Cos	9.85799480	9.86130614	9.86336589
Log Line	1.00518051	1.30124709	1.47820564
Log Sin	9.84062806	9.83698311	9.83463300
Log Dep	0.84580857	1.13823020	1.31283864
Dep	7.011	13.748	20.551

4348.984	5463.988	4348.984	5463.988	4348.984	5463.988
+7.011	-7.297	+13.748	-14.540	+20.551	-21.958
4355.995	5456.691	4362.732	5449.348	4369.535	5441.930

	X	Y
N-2	4355.995	5456.691
N-3	4362.732	5449.348
N-4	4369.535	5441.930

COORDINATES OF 0-2, 0-3, & 0-4

Azimuth of 0-1, N-1	331°	56'	17.8"
0-2	329°	53'	00.0"
	301°	49'	17.8"
0-3	330°	18'	00.0"
	302°	11'	17.8"
0-4	330°	55'	00.0"
	302°	51'	17.8"

Line	Bearing			Distance
0-1, 0-2	S. 58°	10'	42.2" E.	9.921
0-1, 0-3	S. 57°	48'	42.2" E.	19.809
0-1, 0-4	S. 57°	08'	42.2" E.	29.849

	0-2	0-3	0-4
Lat	5.231	10.552	16.194
Log Lat	0.71859372	1.02334781	1.20934107
Log Cos	9.72203827	9.72648526	9.73441228
Log Line	0.99655545	1.29686255	1.47492979
Log Sin	9.92926249	9.92752546	9.92430345
Log Dep	0.92581794	1.32438801	1.39923324
Dep	8.430	16.764	25.074

Coordinates of 0-1 X=4455.537 Y=5663.765

4455.537	5663.765	4455.537	5663.765	4455.537	5663.765
+8.430	-5.231	+16.764	-10.552	+25.074	-16.194
4463.967	5658.534	4472.301	5653.213	4480.611	5647.571

	X	Y
0-2	4463.973	5658.534
0-3	4472.301	5653.213
0-4	4480.611	5647.571

COORDINATES OF P-2, P-3, & P-4

Azimuth of P-1, G-1	3° 34'	15.9"
P-2	188° 35'	00.0"
	192° 09'	15.9"
P-3	187° 56'	00.0"
	191° 05'	15.9"
P-4	187° 58'	00.0"
	191° 32'	15.9"

Line	Bearing	Distance
P-1, P-2	N. 12° 09' 15.9" E.	4.985
P-1, P-3	N. 11° 05' 15.9" E.	19.876
P-1, P-4	N. 12° 32' 15.9" E.	30.051

	P-2	P-3	P-4
Lat	9.7612	19.130	29.445
Log Lat	0.98950193	1.29014571	1.46899328
Log Cos	9.99015391	9.99181672	9.99113435
Log Sine	0.99934807	1.29832899	1.47785893
Log Sin	9.32335028	9.28400782	9.30106040
Log Dep	0.32269835	0.58233681	0.77891933
Dep	2.1023	3.8224	6.0106

Coordinates of P-1 X=5462.054 Y=5891.182

5462.054	5891.182	5462.054	5891.182	5462.054	5891.182
+2.102	+9.761	+3.822	+19.130	+6.011	+29.443
<u>5464.156</u>	<u>5900.943</u>	<u>5465.876</u>	<u>5910.312</u>	<u>5468.065</u>	<u>5920.625</u>

	X	Y
P-2	5464.156	5900.943
P-3	5465.876	5910.312
P-4	5468.065	5920.625

STATE OF ALABAMA

10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00

10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00

10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00

10.00 100 100 1-2 1-2 100.00

10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00

10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00
10.00	100	100	1-2	1-2	100.00

TABULATED COORDINATES

STATION	X-Coordinate	Y-Coordinate
State	5000.000	5000.000
West Azimuth	4107.526	5129.651
East Azimuth	6084.902	4991.655
Master B. M.	4581.782	4960.296
A-1	4488.758	5057.843
A-2	4498.656	5056.696
A-3	4508.557	5055.318
A-4	4518.346	5053.893
B-1	4816.271	5026.492
B-2	4821.543	5018.109
B-3	4827.148	5009.732
B-4	4832.281	5001.086
C-1	5384.193	4930.223
C-2	5384.926	4920.273
C-3	5385.603	4910.293
C-4	5386.129	4900.254
D-1	6023.480	4994.438
D-2	6026.886	4985.043
D-3	6029.615	4975.725
D-4	6033.779	4966.275
F-1	5833.214	5837.788
F-2	5839.256	5829.414
F-3	5847.699	5824.072
F-4	5855.381	5817.156

STATION	Wavelength	Wavelength
Station	700.000	700.000
West	410.000	410.000
West	300.000	300.000
West	200.000	200.000
A-1	100.000	100.000
A-2	100.000	100.000
A-3	100.000	100.000
A-4	100.000	100.000
A-5	100.000	100.000
A-6	100.000	100.000
A-7	100.000	100.000
A-8	100.000	100.000
A-9	100.000	100.000
A-10	100.000	100.000
A-11	100.000	100.000
A-12	100.000	100.000
A-13	100.000	100.000
A-14	100.000	100.000
A-15	100.000	100.000
A-16	100.000	100.000
A-17	100.000	100.000
A-18	100.000	100.000
A-19	100.000	100.000
A-20	100.000	100.000
A-21	100.000	100.000
A-22	100.000	100.000
A-23	100.000	100.000
A-24	100.000	100.000
A-25	100.000	100.000
A-26	100.000	100.000
A-27	100.000	100.000
A-28	100.000	100.000
A-29	100.000	100.000
A-30	100.000	100.000
A-31	100.000	100.000
A-32	100.000	100.000
A-33	100.000	100.000
A-34	100.000	100.000
A-35	100.000	100.000
A-36	100.000	100.000
A-37	100.000	100.000
A-38	100.000	100.000
A-39	100.000	100.000
A-40	100.000	100.000

TABULATED COORDINATES (cont.)

STATION	X-Coordinate	Y-Coordinate
E-1	6397.590	5668.307
E-2	6589.186	5662.806
E-3	6380.440	5657.307
E-4	6372.135	5651.935
G-1	5448.188	5668.988
G-2	5453.251	5660.377
G-3	5403.815	5654.532
G-4	5465.044	5643.278
H-1	5100.254	5615.181
H-2	5110.136	5613.947
H-3	5120.000	5612.550
H-4	5129.761	5611.231
J-1	4543.950	5841.490
J-2	4553.057	5859.107
J-3	4563.432	5836.749
J-4	4573.130	5834.393
K-1	3930.276	5912.748
K-2	3930.271	5912.748
K-3	3940.069	5915.414
K-4	3942.592	5917.937
L-1	3287.363	5964.244
L-2	3296.331	5959.321
L-3	3305.267	5954.829
L-4	3314 205	5950.170

TABLE 1. SUMMARY OF DATA

STATION	DATE	TIME
1-1	1954.10.1	10.00
2-1	1954.10.1	10.00
3-1	1954.10.1	10.00
4-1	1954.10.1	10.00
5-1	1954.10.1	10.00
6-1	1954.10.1	10.00
7-1	1954.10.1	10.00
8-1	1954.10.1	10.00
9-1	1954.10.1	10.00
10-1	1954.10.1	10.00
11-1	1954.10.1	10.00
12-1	1954.10.1	10.00
13-1	1954.10.1	10.00
14-1	1954.10.1	10.00
15-1	1954.10.1	10.00
16-1	1954.10.1	10.00
17-1	1954.10.1	10.00
18-1	1954.10.1	10.00
19-1	1954.10.1	10.00
20-1	1954.10.1	10.00
21-1	1954.10.1	10.00
22-1	1954.10.1	10.00
23-1	1954.10.1	10.00
24-1	1954.10.1	10.00
25-1	1954.10.1	10.00
26-1	1954.10.1	10.00
27-1	1954.10.1	10.00
28-1	1954.10.1	10.00
29-1	1954.10.1	10.00
30-1	1954.10.1	10.00

TABULATED COORDINATES (cont)

Station	X-Coordinate	Y-Coordinate
M-1	3807.590	5373.696
M-2	3817.043	5371.229
M-3	3826.603	5368.659
M-4	3836.695	5366.122
N-1	4348.384	5463.988
N-2	4356.908	5456.591
N-3	4362.732	5449.343
N-4	4369.535	5441.930
O-1	4455.537	5663.765
O-2	4463.973	5658.534
O-3	4472.301	5653.213
O-4	4480.611	5647.571
P-1	5462.054	5891.582
P-2	5464.156	5900.943
P-3	5465.876	5910.312
P-4	5468.065	5920.625

Table: Summary of Data

Station	63223000-2	63223000-1
1-M	3804.380	3804.380
2-M	3811.380	3811.380
3-M	3818.380	3818.380
4-M	3825.380	3825.380
5-M	3832.380	3832.380
6-M	3839.380	3839.380
7-M	3846.380	3846.380
8-M	3853.380	3853.380
9-M	3860.380	3860.380
10-M	3867.380	3867.380
11-M	3874.380	3874.380
12-M	3881.380	3881.380
13-M	3888.380	3888.380
14-M	3895.380	3895.380
15-M	3902.380	3902.380
16-M	3909.380	3909.380
17-M	3916.380	3916.380
18-M	3923.380	3923.380
19-M	3930.380	3930.380
20-M	3937.380	3937.380
21-M	3944.380	3944.380
22-M	3951.380	3951.380
23-M	3958.380	3958.380
24-M	3965.380	3965.380
25-M	3972.380	3972.380
26-M	3979.380	3979.380
27-M	3986.380	3986.380
28-M	3993.380	3993.380
29-M	4000.380	4000.380
30-M	4007.380	4007.380

N

Point Sketch Group "A"

Scale 1" = 50'

April, 1935

Manhole

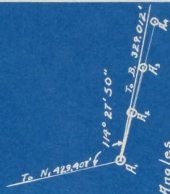
Hydrant

Main B.M.

Wells Hall

Olds

Hall



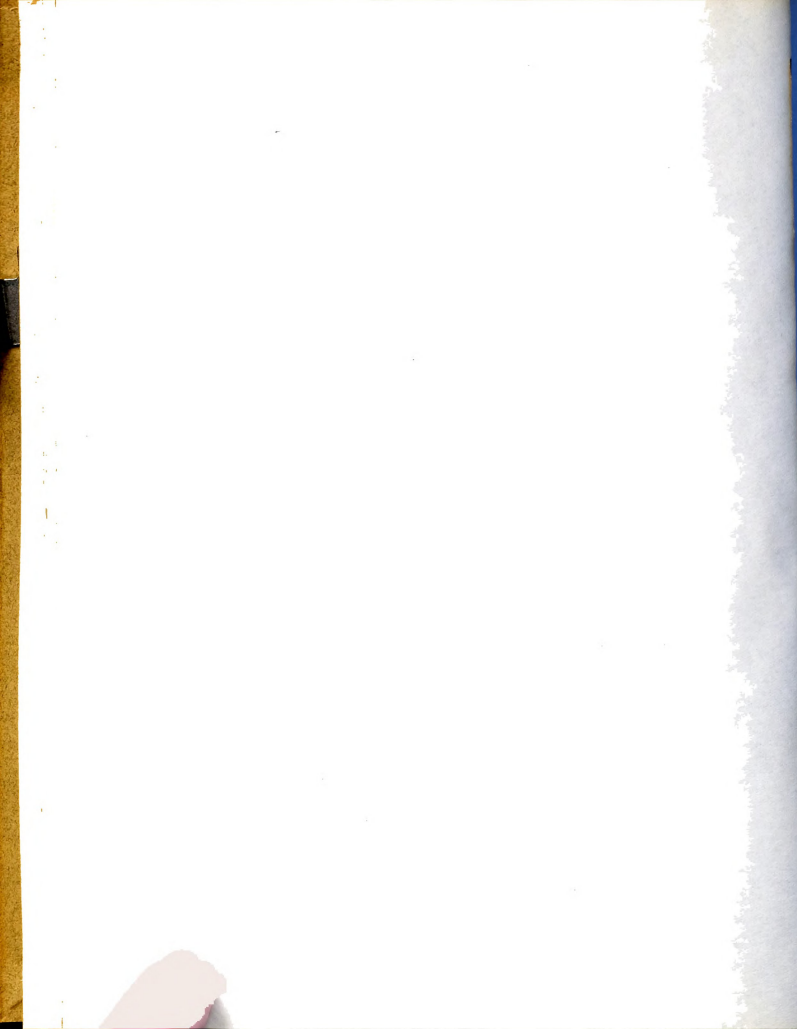
Angles

A_1, A_2, A_3, A_4 1° 9' 30"
 B_1, B_2, B_3, B_4 1° 48' 30"
 A_1, A_2, A_3, A_4 1° 58' 30"

Distances

A_1, A_2 2965'
 A_3, A_4 19,960'
 B_1, B_2 29,851'

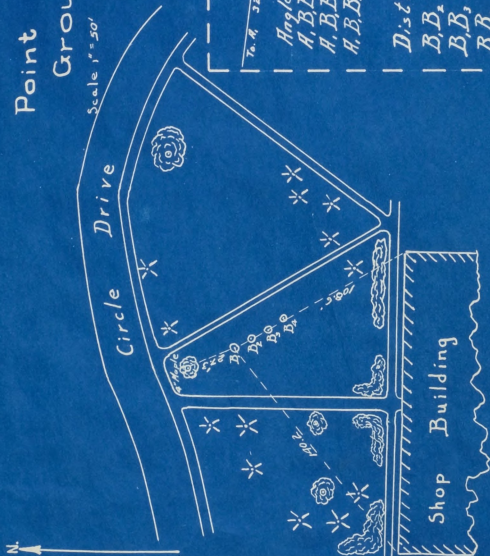
Scale 1" = 50'



Point Sketch Group "B"

April, 1935

Scale 1" = 50'



Angles

A, B, B_2 $232^\circ 22' 00''$
 A, B, B_3 $232^\circ 33' 00''$
 A, B, B_4 $232^\circ 19' 00''$

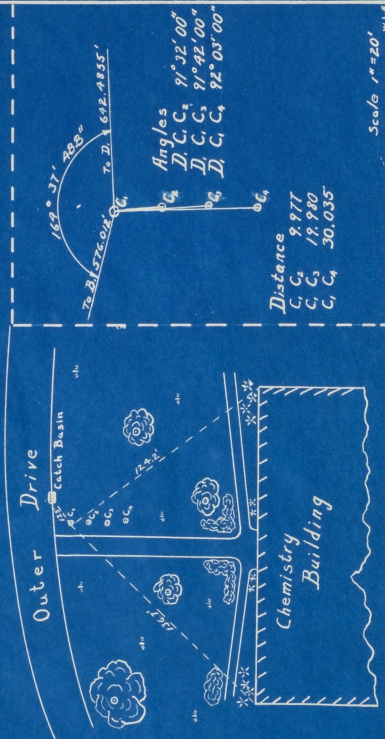
Distances

B, B_2 9.903
 B, B_3 19.980
 B, B_4 30.022

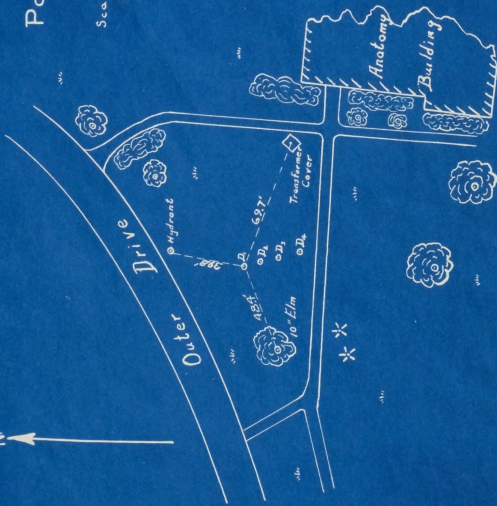
Scale 1" = 20'

Point Sketch Group "C"

Scale 1" = 50'



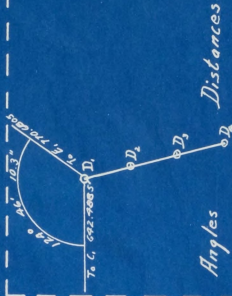




Point Sketch Group "D"

Scale 1" = 50'

April, 1935



Angles	Distances
E, D_1, D_2	131° 05' 00"
D_1, D_2	9.991'
E, D_2, D_3	131° 14' 00"
D_2, D_3	19.880'
E, D_3, D_4	130° 54' 00"
D_3, D_4	29.985'

Scale 1" = 20'

Point Sketch "E"

Scale 1"=50'
April, 1935

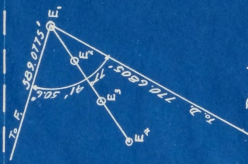
Haslett St.

Grand

River

Ave

Outer Drive



Angles	Distances
F, E_1, E_2 $309^\circ 23' 00''$	E, E_1 2.862'
F, E_1, E_3 $309^\circ 39' 00''$	E, E_2 19.876
F, E_1, E_4 $309^\circ 16' 00''$	E, E_3 30.051

Scale 1"=20'

N.E.H.



N.

Shell
Gas
Station

Bailey Street

Grand River Avenue

8" Maples

This is last
8" tree in row

Site of proposed
arboretum

Point Sketch "F" Group

Scale 1" = 50'

April, 1935



Scale 1" = 20'

N

Drive

Point Sketch Group C

Scale 1" = 50'

April, 1935



Angles

Distances

F, G, G₂ 21.00' G, G₂ 9.976'
 F, G, G₃ 66.59.30' G, G₃ 21.069'
 F, G, G₄ 83.39.30' G, G₄ 29.689'

Scale 1" = 20'

W. G. B.





Point Sketch Group "H"

Scale 1"=50' April, 1935



Angles

G, H, H₂ 1° 31' 30"
G, H, H₃ 1° 19' 30"
G, H, H₄ 1° 10' 00"

Distances

H, H₂ 9.735'
H, H₃ 19.790'
H, H₄ 29.710'

Scale 1"=20'
W. L. R.



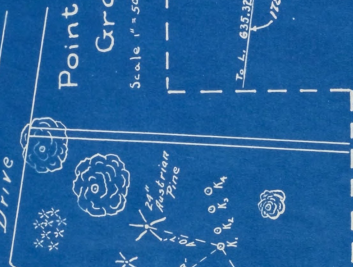




Campus Entry

Circle Drive

Drive



Point Sketch "K" Group

Scale 1" = 50'

April, 1935



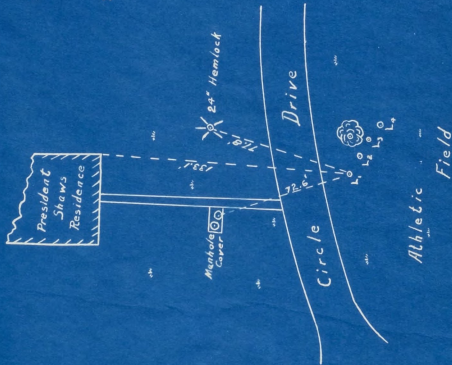
Angles

- L, K, K₂ 159° 24' 30"
- L, K, K₃ 159° 41' 00"
- L, K, K₄ 159° 50' 00"

Distances

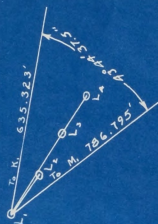
- K₁, K₂ 9.965
- K₁, K₃ 20.115
- K₁, K₄ 29.931

Scale 1" = 20'



Point Sketch "L"

Scale 1"=50'
April, 1935



Angles

K, L₁, L₂ 24° 49' 00"

K, L₁, L₃ 23° 12' 30"

K, L₁, L₄ 23° 03' 30"

Distances

L₁, L₂ 9.934'

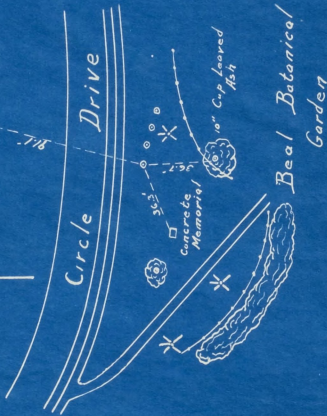
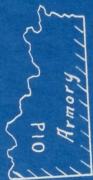
L₁, L₃ 19.953'

L₁, L₄ 30.0425'

Scale 1"=20'

W. L. R.

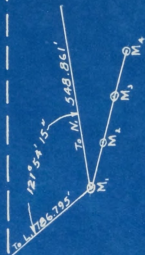




Point Sketch 'M'

Scale 1" = 50'

April, 1935



Angles

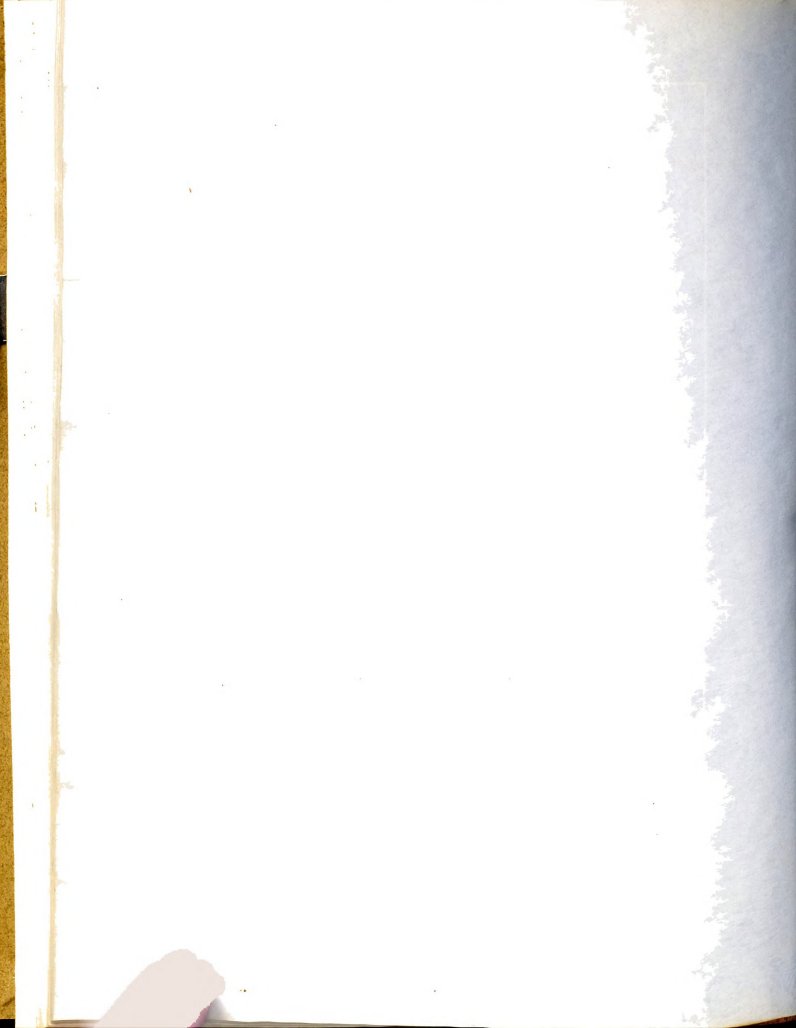
N. M. M₂ 24° 05' 00"
N. M. M₃ 24° 17' 30"
N. M. M₄ 24° 11' 30"

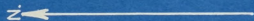
Distances

M₁ M₂ 27.695
M₁ M₃ 19.6735
M₁ M₄ 29.784

Scale 1" = 20'

W.L.H.

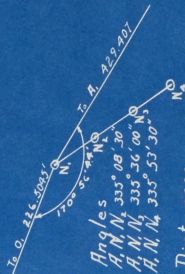
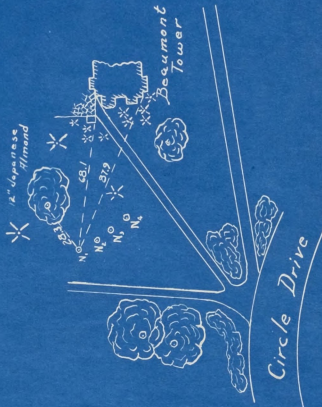


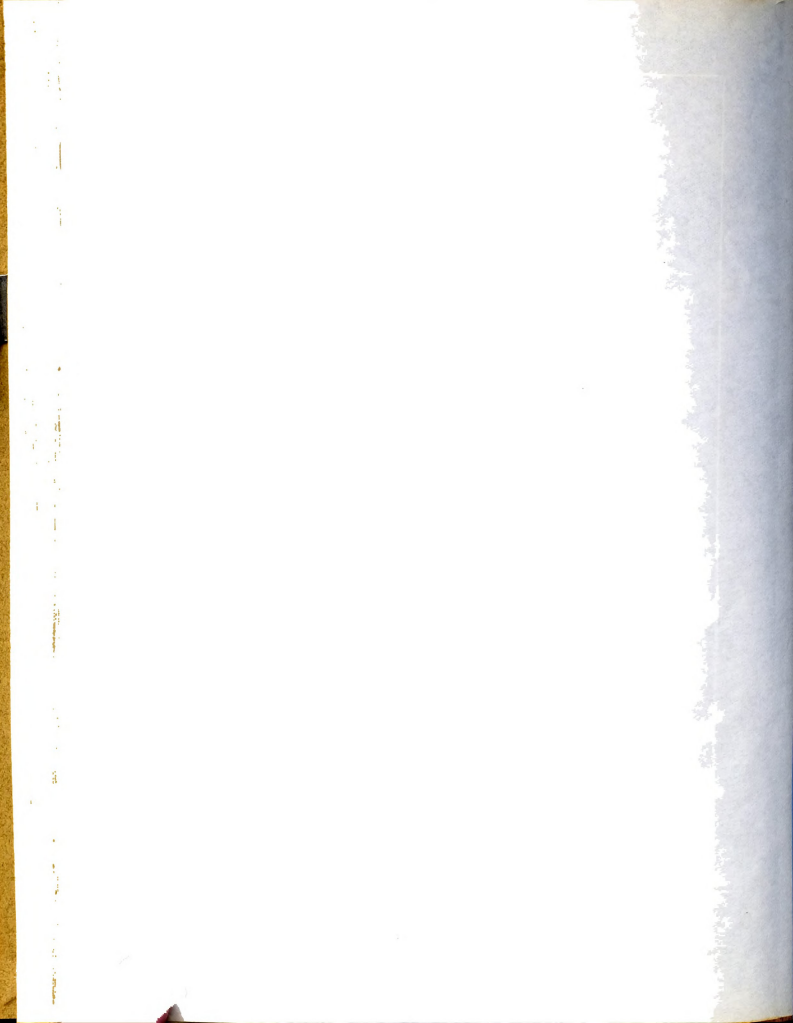


Point Sketch Group N

Scale 1"=50'

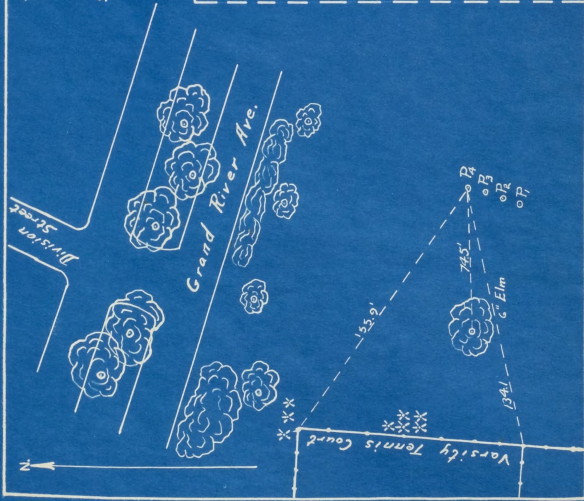
April, 1935





Point Sketch Group 'P'

Scale 1" = 50'
April, 1935



Angles
G.P.P. 188° 35' 00"
G.P.P. 187° 36' 00"
G.P.P. 187° 58' 00"

Distances
P.P. 9.985'
P.P. 19.876'
P.P. 30.051'

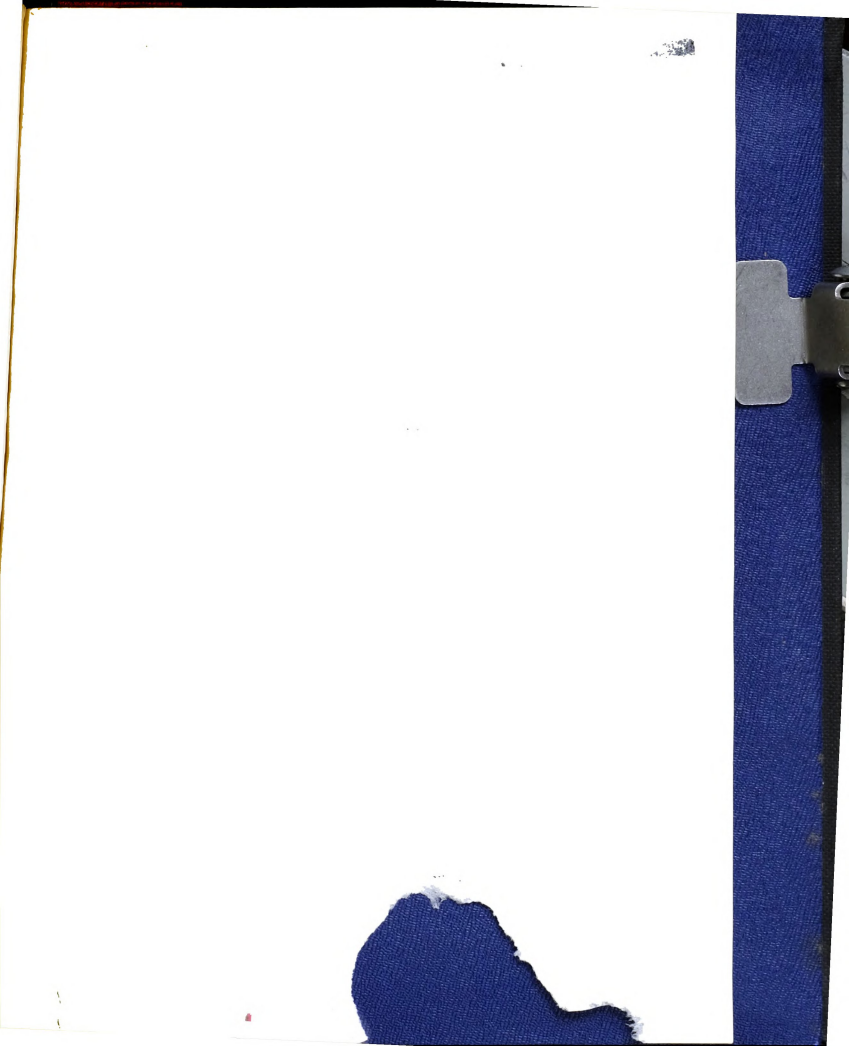
Scale 1" = 20'
W.L.H.

CONCLUSION

The contents of this book indicate how well we accomplished what we set out to do. The coordinates of all points from A-1 to PP-4 were determined to three decimal places. Our results are contained in tabular form here in and are also tabulated on the large map which is contained in the back pocket. Computations are shown in very elaborate form so that any subsequently discovered error may be readily located. Sketch maps of each point are bound in the volume. Original field notes are on file in Prof. Allens office.

So having accomplished our purpose we bring this volume to a close.

FINIS



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