

(J)

BOOK 3858

FIELD NOTES

OF THE SURVEY OF

Part of the Grand Canyon National Park Boundary

formed by

Part of the Subdivision Lines of

Township 31 North, Range 6 East

Of the Gila and Salt River Base and Meridian,

In the State of *ARIZONA*

EXECUTED BY

Benjamin J. Kinsey, U.S. Surveyor

In the capacity of U. S. Surveyor..., under Special Instructions dated *May 11*, 1927, issued by the *District Cadastral Engineer* to govern surveys included in Group No. *145, Arizona*, which were approved by the Commissioner of the General Land Office, *May 20*, 1927, and Assignment Instructions dated *Oct. 15*, 1927.

Survey commenced *November 21*, 1927.

Survey completed *November 24*, 1927.

3858

3858

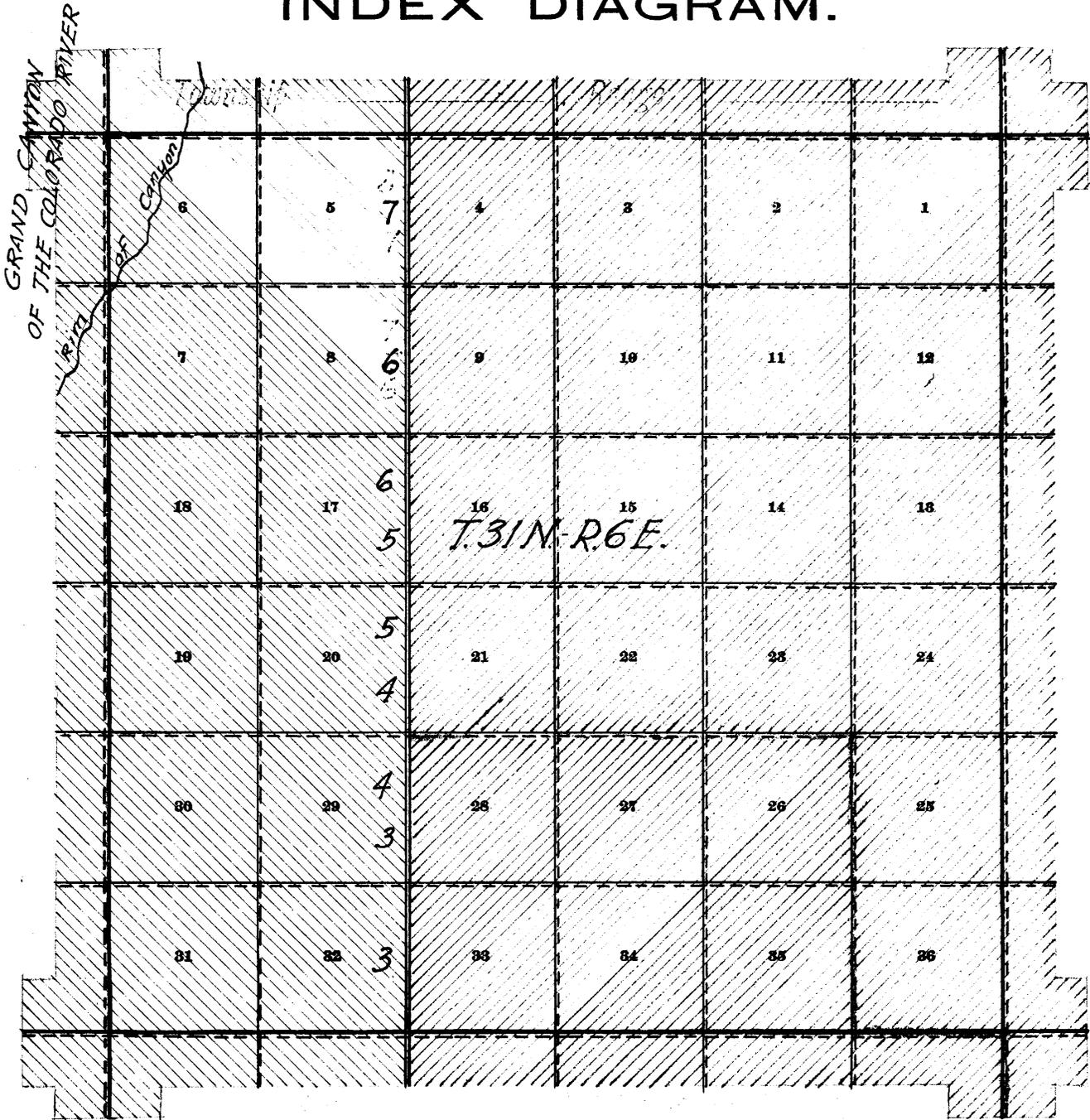
1A

Book "D"

Group 145 - Arizona.

BOOK 3858

INDEX DIAGRAM.



— Lines surveyed under this group.

- - - Unsurveyed.

▨ Land within Grand Canyon National Park.

▨ Land within Navajo Indian Reservation.

▨ Land within Tusayan National Forest.

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Book "D"
 Group 145, Arizona,
 Township 31 North, Range 6 East
 DATE DIAGRAM
 1927

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Surveyed by Benjamin J. Kinsey, U. S. Surveyor, on
 dates shown thereon.

The surveys herein described were executed on dates shown on diagram on page 1 hereof, by Benjamin J. Kinsey, U. S. Surveyor, using Buff transit No. 9940; the instrument is equipped with Smith solar attachment and otherwise conforms to the standard requirements of the General Land Office. Unless otherwise specified all azimuth determinations are accomplished with the solar attachment.

The following notes describe the survey of the Boundary of the Grand Canyon National Park, thru T. 31 N., R. 6 E., identical with the fourth meridional section line of said township.

PRELIMINARY FIELD TEST

of

Buff transit No. 9940,

by

Benjamin J. Kinsey, U. S. Surveyor.

November 19, 1927, at station in camp, near the $\frac{1}{4}$ sec. cor. secs. 1 and 12, T. 30 N., R. 5 E., G. & S. R. B. and M., Arizona, Lat. $36^{\circ} 00\frac{1}{2}'$ N., Long. $111^{\circ} 48\frac{1}{2}'$ W., examine the adjustments of the transit and find no errors; then to test the workings of the solar apparatus by comparing its indications with a true meridian established by Polaris observation proceed as follows:

November 20, at 4 h. 40 m., a. m., 1. m. t., observe Polaris at western elongation, making four observations, two each with the telescope in direct and reversed positions and marking the mean point in the line thus determined by a tack set in top of stake driven firmly in the ground about 5 chs. N.

Azimuth of Polaris at western elongation: $1^{\circ} 20' 9''$.

At 8 h. 00 m., a. m., lay off the azimuth of Polaris $1^{\circ} 20'$ to the east and mark the meridian thus determined by a tack set in stake, firmly driven in the ground about 5 chs, N.

At 9 h. 00 m., a. m., app. t., set off $36^{\circ} 00\frac{1}{2}'$ N., on the lat. arc, $19^{\circ} 32\frac{1}{2}'$ S., on the decl. arc and determine a meridian with the solar which agrees with the true meridian.

At 12 h. 00 m., app. noon, with the lat. arc unchanged, observe the sun on the meridian; the resultant reading of the decl. arc is $19^{\circ} 35'$ S., which agrees with the computed decl. of the sun.

At 3 h. 00 m., p. m., app. t., with lat. arc unchanged, set off $19^{\circ} 36'$ S., on the decl. arc and determine a meridian with the solar which agrees with the true meridian.

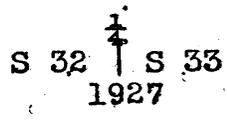
As all of the observations taken during the usual hours of solar work agree within $1'$ of the true meridian, conclude that the instrument is in satisfactory adjustment.

Unless othwrwise specified all measurements are made with a Lufkin steel tape, 5 chs. in length, compared with a Lufkin standard and found correct.

The measurements are made on the slope, the vertical angle determined and the slope measurements properly reduced to horizontal values.

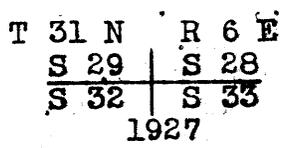
Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E., forming part of the Grand Canyon National Park Boundary.

Chains From the cor. of secs. 4, 5, 32 and 33, on S. Bdy. of T. 31 N., R. 6 E., described in book "C" of this Group. N. 0° 3' W., on true line, bet. secs. 32 and 33, on Park Bdy.
 Over mountainous land, thru scattering timber and undergrowth.
 Asc. 68 ft. over SE. slope.
 2.80 Spur, slopes NE. Desc. 80 ft. over N. slope.
 5.50 Wash, 10 lks. wide, course E. Asc. 178 ft. over SE. slope.
 14.30 Spur, slopes NE. Desc. 166 ft. over N. slope.
 27.00 Wash, 10 lks. wide, course NE. Asc. 151 ft. over SE. slope.
 33.00 Spur, slopes NE. Desc. 94 ft. over NW. slope, to
 40.00 Set an iron post, 3 ft. long, 1 in. in diam., 12 ins. in the ground to bed rock, supported by a md. of stone, for the $\frac{1}{4}$ sec. cor. of secs. 32 and 33, with brass cap marked



From which
 A pinion, 6 ins. in diam., brs. N. 31½° W., 78 lks. dist., mkd. $\frac{1}{4}$ S 32 B T.
 A pinion, 12 ins. in diam., brs. S. 18½° E., 68 lks. dist., mkd. $\frac{1}{4}$ S 33 B T.

Over top of spur, sloping NE.
 40.20 Indian trail, brs. NE-SW.
 Leave spur top, desc. 411 ft. over broken NW. slope.
 56.40 Wash, 20 lks. wide, course NE. Asc. 87 ft. over SE. slope.
 65.30 Spur, slopes NE. Desc. 257 ft. over NW. slope to
 80.00 Set an iron post 3 ft. long, 2 ins. in diam., 24 ins. in the ground for the cor. of secs. 28, 29, 32 and 33, with brass cap marked



From which
 A cedar, 4 ins. in diam., brs. S. 36° W., 140 lks. dist., mkd. B T.
 No other trees available, raise a md. of stone, 3 ft. base and 1½ ft. high, W. of cor.

Land, mountainous.
 Soil, rocky, 4th rate.
 Timber, pinion and cedar.
 Undergrowth, sagebrush and cacti.

N. 0° 3' W., on true line, bet. secs. 28 and 29, on Park Bdy.
 Over mountainous land, thru scattering timber and undergrowth.
 Desc. 23 ft. over NW. slope.
 5.50 Cedar Canyon, wash in same, 20 lks. wide, course E. Asc. 203 ft. over S. slope.
 17.00 Spur, slopes SE. Desc 161 ft. over NE. slope.
 27.60 Wash, 50 lks. wide, course SE. Asc. 224 ft. over SW. slope to
 40.00 Set an iron post, 3 ft. long, 1 in. in diam., 4 ins. in the ground to bedrock, supported by a md. of stone,

Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E., forming part of the Grand Canyon National Park Boundary.

Chains	<p>for the $\frac{1}{4}$ sec. cor. of secs. 28 and 29, with brass cap marked</p> <p style="text-align: center;"> $\frac{1}{4}$ S 29 S 28 1927 </p> <p>From which,</p> <p>A pinion, 10 ins. in diam., brs. S. 10° E., 417 lks. dist., mkd. $\frac{1}{4}$ S 28 B T.</p> <p>A pinion, 8 ins. in diam., brs. S. 80° W., 53 lks. dist., mkd. $\frac{1}{4}$ S 29 B T.</p> <p>Asc. 40 ft. over S. slope.</p> <p>45.00 Spur, slopes SE. Desc. 28 ft. over NE. slope.</p> <p>54.00 Wash, 10 lks. wide, course SE. Asc. 90 ft. over S. slope</p> <p>65.00 Spur, slopes E. Desc. 91 ft. over NE. slope.</p> <p>71.35 Wash, 10 lks. wide, course SE. Asc. 95 ft. over SW. slope to sec. cor.</p> <p>77.10 Road, brs. E. and W.</p> <p>80.00 Set an iron post, 3 ft. long, 2 ins. in diam., 20 ins. in the ground to bedrock, supported by a md. of stone, for the cor. of secs. 20, 21, 28 and 29, with brass cap mkd.</p> <p style="text-align: center;"> T 31 N. R 6 E S 20 S 21 S 29 S 28 1927 </p> <p>From which</p> <p>A cedar, 8 ins. in diam., brs. N. 57° E., 69 lks. dist., mkd. T 31 N R 6 E S 21 B T.</p> <p>A cedar, 10 ins. in diam., brs. S. 73° E., 26 lks. dist., mkd. T 31 N R 6 E S 28 B T.</p> <p>A pinion, 8 ins. in diam., brs. S. $77\frac{1}{2}^{\circ}$ W., 41 lks. dist., mkd. T 31 N R 6 E S 29 B T.</p> <p>A pinion, 8 ins. in diam., brs. N. $17\frac{1}{2}^{\circ}$ W., 129 lks. dist., mkd. T 31 N R 6 E S 20 B T.</p> <p>Land, mountainous. Soil, rocky, 4th rate. Timber, pinion and cedar. Undergrowth, sagebrush and cacti.</p> <p>-----</p> <p>N. 0° 3' W., on true line, bet. secs. 20 and 21, on Park Bdy.</p> <p>Over mountainous land, thru heavy timber and scattering undergrowth.</p> <p>Ascend 41 ft. over SE. slope.</p> <p>5.40 Spur, slopes E. Desc. 18 ft. over NE. slope.</p> <p>9.20 Wash, 10 lks. wide, course SE. Ascend 79 ft. over SE. slope.</p> <p>15.00 Spur, slopes E. Thence along E. slope.</p> <p>15.67 From which a drilled hole 1 in. in diam., 6 ins. deep, on the west end of Cedar Mountain, brs. West, 49.82 chs. This evidently marks USGS BM 7057 as no other evidence found.</p> <p>The East end of Cedar Mtn., brs. W. about 30. chs. and is about 800 ft. above line at this point. The top of Cedar Mtn. is level and brs. NE. and SW. and is about 20. chs. long and 15 chs. wide.</p> <p>23.30 Desc. 20 ft. over NE. slope.</p> <p>26.80 Wash, 10 lks. wide; course E. Asc. 12 ft. over S. slope.</p> <p>30.00 Rocky spur, slopes E. Desc. 63 ft. over N. slope.</p> <p>35.75 Wash; 10 lks. wide, course E. Asc. 28 ft. over S. slope.</p>
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Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E.,
forming part of the Grand Canyon National Park Boundary.

Chains
 36.40 Indian road, brs. E. and W.
 40.00 Set an iron post, 3 ft. long, 1 in. in diam., 26 ins. in
 the ground for the $\frac{1}{4}$ sec. cor. of secs. 20 and 21,
 with brass cap marked.

$\frac{1}{4}$
 S 20 | S 21
 1927

From which,
 A cedar, 24 ins. in diam., brs. N. 88° E., 31 lks.
 dist., mkd. $\frac{1}{4}$ S 21 B T.
 A pinion, 10 ins. in diam., brs. N. 33° W., 84 lks.
 dist., mkd. $\frac{1}{4}$ S 20 B T.

42.50 Desc. gradual NE. slope.
 45.50 Wash, 20 lks. wide, course SE. Asc. gradual SW. slope.
 57.00 Spur, slopes E. Desc. 329 ft. over NE. slope to cor.
 67.54 From which, USGS BM 6452, brs. W. 141.06 chs. dist.
 80.00 Set an iron post, 3 ft. long, 2 ins. in diam., on bed-
 rock, deposit a stone mkd. with a cross (X) at base
 of post, supported by a md. of stone, for the cor. of
 secs. 16, 17, 20 and 21, with brass cap marked.

T 31 N | R 6 E
 S 17 | S 16
 S 20 | S 21
 1927

From which,
 A pinion, 10 ins. in diam., brs. N. 10° W., 31 lks.
 dist., mkd. T 31 N R 6 E S 17 B T.
 A pinion, 4 ins. in diam., brs. S. 81° W., 12 lks.
 dist., mkd. B T.

Land, mountainous.
 Soil, rocky, 4th rate.
 Timber, pinion and cedar.
 Undergrowth, sagebrush and cacti.

N. 0° 3' W., on true line, bet. secs. 16 and 17, on Park
 Bdy.
 Over mountainous land, thru scattering timber and under-
 growth.
 Desc. 258 ft. over steep, broken N. slope into Straight
 Canyon.

7.60 Wash, 50 lks. wide, course E., in bottom of Straight
 Canyon. Asc. 436 ft. over broken S. slope.
 28.00 Spur, slopes NE. Desc. 76 ft. over NW. slope.
 37.80 Wash, 10 lks. wide, course NE.
 Asc. 29 ft. over SE. slope to
 40.00 Rocky spur, slopes E.
 Set an iron post, 3 ft. long, 1 in. in diam., on bed-
 rock, supported by a md. of stone, for the $\frac{1}{4}$ sec. cor.
 of secs. 16 and 17, with brass cap marked,

$\frac{1}{4}$
 S 17 | S 16
 1927

From which,
 A pinion, 8 ins. in diam., brs. S. 88° E., 55 lks.
 dist., mkd. $\frac{1}{4}$ S 16 B T.
 A pinion, 8 ins. in diam., brs. S. 9° W., 120 lks.
 dist., mkd. $\frac{1}{4}$ S 17 B T.

Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E.,
forming part of the Grand Canyon National Park Boundary.

Chains Desc. 88 ft. over NW. slope.
45.10 Wash, 10 lks. wide, course NE.
Asc. 36 ft. over SE. slope.
47.00 Spur, slopes E. Desc. 65 ft. along NE. slope.
54.35 Wash, 20 lks. wide, course NE.
Asc. 104 ft. over SE. slope.
62.40 Spur, slopes E. Indian trail, brs. E. & W.
Desc. 41 ft. over NW. slope.
66.80 Wash, 10 lks. wide, course NE.
Asc. 29 ft. over SE. slope.
72.30 Spur, slopes NE. Desc. 65 ft. over NW. slope to
80.00 Set an iron post, 3 ft. long, 2 ins. in diam., on bed-
rock, deposit a stone mkd. with a cross (X) at base
of post supported by a md. of stone, for the cor. of
secs. 8, 9, 16 and 17, with brass cap marked

T 31 N	R 6 E
S 8	S 9
S 17	S 16
1927	

No bearing trees available.
Land, mountainous.
Soil, rocky, 4th rate.
Timber, cedar and pinion.
Undergrowth, sagebrush and cacti.

N. 0° 3' W., on true line, bet. secs. 8 and 9, on Park
Bdy.

Over rolling land, thru scattering timber and under-
growth.

Desc. 286 ft. over N. slope.
15.00 Wash, 40 lks. wide, course E.
Asc. 330 ft. over S. slope.
27.00 Spur, slopes E. Desc. 220 ft. over NW. slope.
39.90 Wash, 10 lks. wide, course NE. Asc. gradual S. slope to
40.00 Set an iron post 3 ft. long, 1 in. in diam., 10 ins. in
the ground to bedrock, deposit a stone at base of
post, supported by a md. of stone for the $\frac{1}{4}$ sec. cor.
of secs. 8 and 9 with brass cap mkd.

S 8	S 9
1927	

No suitable trees available.

Asc. gradually over SE. slope.
46.00 Several Indian hogans bear E. about 3 chs. dist.
47.00 Spur, slopes NE. Desc. 142 ft. over NW. slope.
64.30 Wash, 20 lks. wide, course NE.
Asc. 68 ft. over SE. slope.
73.00 Spur, slopes NE. Desc. 81 ft. over NW. slope to
80.00 Set an iron post 3 ft. long, 2 ins. in diam., 24 ins. in
the ground for the cor. of secs. 4, 5, 8 and 9 with
brass cap marked

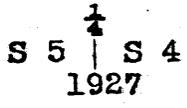
T 31 N	R 6 E
S 5	S 4
S 8	S 9
1927	

No trees available; raise a md. of stone, 3 ft. base,
 $1\frac{1}{2}$ ft. high W. of cor.

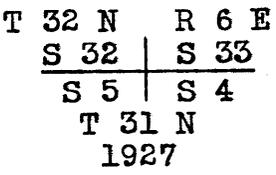
Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E., forming part of the Grand Canyon National Park Boundary.

Chains Land, mountainous.
Soil, rocky, 4th rate.
Timber, pinion and cedar.
Undergrowth, sagebrush and cacti.

N. 0° 3' W., on true line, bet. secs. 4 and 5, on Park Bdy.
Over rolling land, thru scattering undergrowth.
Desc. 17 ft. over N. slope.
1.30 Wash, 10 lks. wide, course E.
Asc. 23 ft. over SE. slope.
5.00 Spur, slopes NE. Desc. 80 ft. over NW. slope.
12.00 Wash, 20 lks. wide, course E. Asc. 80 ft. over S. slope.
18.00 Over level mesa, brs. E. and W.
30.00 Leave mesa, brs. NE. and SW.
Desc. 64 ft. over NW. slope.
31.75 Old road to Cape Solitude, brs. E. and W.
39.40 Wash, 10 lks. wide, course NE. Asc. gradual SE. slope, to
40.00 Set an iron post 3 ft. long, 1 in. in diam., 10 ins. in the ground to bedrock, deposit a stone mkd. with a cross (X) at base of post, supported by a md. of stone, for the 1/4 sec. cor. of secs. 4 and 5, with brass cap mkd.



Over rolling plateau.
58.90 Leave rolling land, desc. 74 ft. over NE. slope.
63.00 Wash, 30 lks. wide, course NW.
63.80 Same wash, course NE. Asc. 37 ft. over SE. slope.
66.80 Spur, slopes E., about 5. chs. wide.
71.80 Leave spur, desc. 52 ft. over N. slope.
78.00 Wash, 10 lks. wide, course NE.
Asc. gradual SE. slope to
80.00 Set an iron post, 3 ft. long, 2 ins. in diam., 6 ins. in the ground to bedrock, deposit a stone mkd. with a cross (X) at base of post, supported by a md. of stone, for the cor. of secs. 4, 5, 32 and 33, Ts. 31 and 32 N., R. 6 E., with brass cap mkd.



No bearing trees available.
The Park Bdy. extends northerly from this cor. thru T. 32 N., R. 6 E., identical with the fourth meridional sec. line of said Tp., the survey of which is described in Book "E" of this group.
Land, rolling and level.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, sagebrush and cacti.

For the continued satisfactory adjustment of the instrument refer to Page 2 book "E" of this Group.

Survey of Part of the Subdivision Lines of T. 31 N., R. 6 E.,
forming part of the Grand Canyon National Park Boundary.

Chains To insure accuracy of measurement the lines described in
the foregoing notes were double chained.

GENERAL DESCRIPTION.

The lands along the line surveyed as described in the
foregoing notes are rough and mountainous in the S.
four miles and rolling plateau towards the North, with
an elevation above sea level of from 6,000 to 7,000 ft.
The timber, consisting of pinion and cedar, becomes very
thinly scattered in the Northern portion of the line.
The undergrowth consists of sagebrush and cacti.
No water was found at the time of survey, altho in the
rainy seasons no doubt pocket water is available,
from which the Navajo Indians who roam this region
with their livestock, get their supply.
The Northern part of the line enters the Painted Desert.
The roads mentioned lead from Grand Canyon, Ariz., to
Cape Solitude and are winding and rocky in poor condition
and with sudden steep changes of grade. No mineral
was in evidence at the time of survey.
Sections 26, 27, 28, 33, 34 and 35, of T. 31 N., R. 6 E.,
are within the Tusayan National Forest; the west two
ranges of sections are within the Grand Canyon Nation-
al Park, and the remainder of said township is within
the Navajo Indian Reservation.

BOOK 8858

4-680

FIELD ASSISTANTS.
to

Benjamin J. Kinsey, U.S. Surveyor

NAMES.	CAPACITY.
Elliott Pierson	1st Chainman
John Boggs	2nd Chainman
Clair Pierson	Flagman
David McJanett	Axman

RECORDED

CERTIFICATE OF UNITED STATES SURVEYOR.

I, Benjamin J. Kinsey, U. S. Surveyor, hereby certify upon honor that, in pursuance of special instructions received from the District Cadastral Engineer, for Group 145, Arizona bearing date of the 11th day of May, 1927, I have well, faithfully, and truly in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of

the Subdivision Lines of

Township 31 North, Range 6 East of the Gila and Salt River Base and Meridian, in the State of Arizona, which are represented in and by diagram on page 1 hereof the foregoing field notes as having been executed by me, and under my direction; and that all the corners of said survey have been established and perpetuated in strict accordance with the Manual of Surveying Instructions, and the special written instructions of the District Cadastral Engineer, for Group 145, Arizona, and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

Place: Phoenix, Arizona

Date: April 18, 1928.

Benjamin J. Kinsey
U. S. Surveyor.

APPROVAL.

OFFICE OF THE U.S. SUPERVISOR OF SURVEYS,

Denver, Colo., 192

The foregoing field notes of the survey of

Part of the Subdivision Lines of

Township 31 North, Range 6 East

of the Gila and Salt River Base and Meridian, in the State of Arizona

executed by Benjamin J. Kinsey, U.S. Surveyor

under his special instructions dated May 11, 1927 for Group 145 Arizona, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

U.S. Supervisor of Surveys.

I certify that the foregoing transcript of the field notes of the above described surveys in

has been correctly copied from the original notes on file in this office.

U. S. Surveyor General.