405

REPORT OF GEOPHYSICAL SURVEY
(Electromagnetic Inductive Method)

conducted on claims of

ROI GROUP ROI #3 ROI #4, ROI #4, ROI #3 ROI FR, ROI-X FR.

~~consisting of Roi 3 to 6 inclusive, Roi I4, Roi I5, Roi I0, Roi I9, Roi 25 to 28 inclusive, Roi Fraction, Roi-X Fraction, Roi-R Fraction, Roi-S Fraction, Roi-O Fraction, Roi-P Fraction, Roi-B Fraction and Roi-C Fraction.~~

~~and~~

~~KING GROUP~~

~~consisting of Roi 30 to 33 inclusive.~~

all of which are held in the name of the owner
G. L. Oates, F. M. C. 2I65I G issued May 30, I96I, Kamloops, B. C.

and located
I0 miles west of Merritt, B. C., 50 deg. I20 deg. S E

KAMLOOPS LAND DISTRICT
NICOLA MINING DIVISION
BRITISH COLUMBIA

Work completed during period :

March 8, I962 - March I4, I962
March 22, I962-March 23, I962

(The accompanying map R-2 should be studied in conjunction with this report when planning exploration of the anomalies discussed herein.)

Field work by - G. L. Oates
Work done for - G. L. Oates
Report submitted by - G. L. Oates
545 Rosemead Ave
Kelowna, B. C.

March 23, I962

Note : Re training and qualifications of G. L. Oates please refer to letters to Chief Gold Commissioner, Victoria, B. C. :

by - Dr. Joseph T. Mandy, ME dated November 23, I95I
M. W. Jasper, ME dated October 28, I95I
C. V. Brennan, ME dated November 23, I95I
G. L. Oates, dated July 5, I95I
E. E. Mason, ME dated October I0, I960

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References :

Geophysical Exploration - by C. A. Heiland, Sc. D. Professor of Geophysics, Colorado School of Mines on ' Vertical Loop Methods,' 1940, pp 806

Geological Survey of Canada Memoir 249, 1948, by W. E. Cockfield, pp II, 15

INTRODUCTION

The claims of the Roi Group owned by G. L. Oates, Kelowna, B. C. are situated about 10 miles west of Merritt, B. C. and lie both north and south of the Nicola River. The Spences Bridge-Merritt branch of the Canadian Pacific Railway and #8 highway each pass through the property. The group consists of 24 claims and fractions embracing an area of approximately 1000 acres. The ground rises to about 500 feet above the Nicola River valley which is at an elevation of 2000 feet above sea level. The Nicola River and its tributary creeks form the principal drainage feature of the area. The region is situated within the dry belt of British Columbia, and the rainfall in the lower valleys is between 10 and 11 inches. The lower slopes of the valleys are open and covered and covered with sagebrush, and the lower slopes of the hills support an open, park-like forest with little underbrush. Rainfall on the upper slopes is, however, presumably much greater than the figure given, as is evidenced by the change in vegetation to a more dense forest growth.

The discovery and development of the Craigmont mine to the producing stage has occassioned considerable interest in the search for copper in the Merritt area. The Roi Group was staked as a prospecting 'bet', and as the ground is generally well overburdened, geophysical prospecting has been used as a first step in its exploration.

GEOLOGY

The Geological Survey of Canada, Memoir 249, by W. E. Cockfield, 1948, describes the rock formations in the vicinity of the Roi Group as Coast Intrusions and the Nicola Group.

On page 11 of the above Memoir 249 he says :

'Nicola Group

The rocks composing the Nicola Group have a large aeral development within the map area. They consist principally of volcanic rocks with which are associated minor amounts of sedimentary rocks - limestone, argillite, and conglomerate. They extend in a broad belt from the southern part of the area, where, in the Vicinity of Nicola Lake, they form the type section (Dawson 1896, page 13lB), to the northwest part of the area. The belt underlain by the rocks of this group is more than 20 miles wide in the southern part of the area, narrowing to 15 miles in its central part and to less than 5 miles in the northwest part. The rocks of the Nicola Group are, however, covered extensively by later volcanic rocks in the northern part of the area. They are also invaded by bodies of plutonic rocks, some of which attain considerable size. '

and on page 15 :

'Coast Intrusions

Plutonic rocks underlie considerable parts of the map area. They include different types and possibly rocks of several different ages, but data are generally lacking that would permit fixing their ages within precise limits. ' ------- -----

Map 886A accompanying the above Memoir 249 shows the occurrence of a Coast Intrusion into rocks of the Nicola Group which occur in the Roi Group north of the Nicola River.

METHOD USED -(ELECTROMAGNETIC INDUCTIVE)
Using Vertical Loop

The electromagnetic inductive is a direct method and is applied principally in the search for sulphide ore bodies. It depends for its operation upon the effects produced by the flow of an electric current. By studying these effects it is possible to predict the general axis of current flow. The greater flow of current is in the path of greatest effective conductivity; and since the effective conductivity of a mineralized zone is different from that of its surrounding envelope (usually much greater), it is possible to locate such a mineralized zone by the distribution of current. Due consideration is given to geologic structure, type of mineralization and other factors.

The inductive method is so named because the current flowing in the conductive body is obtained by electromagnetic induction ; without making direct contact with the conductive zone or orebody. The current flowing in a transmitting coil or antenna will create an electromagnet -ic field around the coil. This field will have the same frequency as the primary current and will radiate or travel outward from the coil in closed magnetic or flux circuits. These circuits are perpendicular to the plane of the coil and extend or travel outwards with uniform velocity in all directions. The primary current and the resulting electro -magnetic field radiating from the antenna is obtained by the use of a transmitting or 'energizing' set operating from 30 to 50 kilocycles frequency. A 10 watt vacuum tube is used in the circuit and the power supply is obtained from portable type dry cell batteries - B supply of 450 volts and A supply of 9 volts. The transmitting antenna is triangular, seven feet to the side and hinged at the corners for folding.

When the electromagnetic field radiating from the antenna of the energizing equipment flows through or ' cuts ' a mineralized body a

METHOD USED - (ELECTROMAGNETIC INDUCTIVE) cont'd

Using Vertical Loop

current is induced in this body. The current flowing in the mineralized body sets up an electromagnetic field having the same frequency as the current. This electromagnetic field will surround the body and travel outward from it in concentric circles or envelopes. The detection of this field is accomplished by the use of direction-finding equipment consisting of a direction-finding coil mounted on a tripod and electrically connected to a vacuum-tube set containing a detector and multi-stage amplifying system. The multi-stage amplifying system is employed to produce a signal of desired intensity through a set of head-phones. A direction-finding coil so pivotted that its axis of revolution is parallel to the conductor - i.e., axis of revolution of the coil and the conductor have the same "strike" - will give the maximum signal when the coil is perpendicular to a tangent to the circle of wave-front at that point. A minimum signal will be obtained when the coil is parallel to the tangent. By the use of the direction coil the relative distribution of current may be determined and the position, depth and approximate width of the mineralized body may be plotted. The dip of the field resulting from a combination of the primary (electromagnetic field surrounding the transmitting antenna) and the secondary (electromagnetic field surrounding the orebody) as determined by the use of the direction-finding coil is explained by C. A. Heiland, Sc.D., Professor of Physics, Colorado School of Mines :

(Reference : Geopyhsical Exploration by C. A. Heiland, Sc.D. Professor of Geophysics, Colorado School of Mines, page 806, 1940)

Vertical Loop Methods

In application, a vertical transmitting loop is set up with its plane approximately parallel with, and (if possible) directly above a suspected conductivity zone. A certain distance away a receiving coil is placed with its axis of rotation horizontal,

METHOD USED / (ELECTROMAGNETIC INDUCTIVE) cont'd
Using Vertical Loop

' pointing toward the transmitting loop. The field of the transmitting loop at the location of the receiving coil is horizontal if the centres of both are at the same elevation. The magnetic field of the transmitter induces currents along the edge of a subsurface conductor. These currents, in turn, are surrounded by an electromagnetic field. This field combines with the loop field into a resultant vector, whose direction may be determined by tilting the reception coil about a horizontal axis until a minimum is obtained. The current concentration may thus be located by measuring dip angles along a profile at right angles to the strike. Contrary to low-frequency vertical-loop methods, the loop field and the subsurface field are very nearly in phase; elliptical polarization is negligible and sharp minima are obtainable when the reception coil is tilted. '

' If the magnetic field surrounding a subsurface current concentration alone were present, its direction at any point A on a

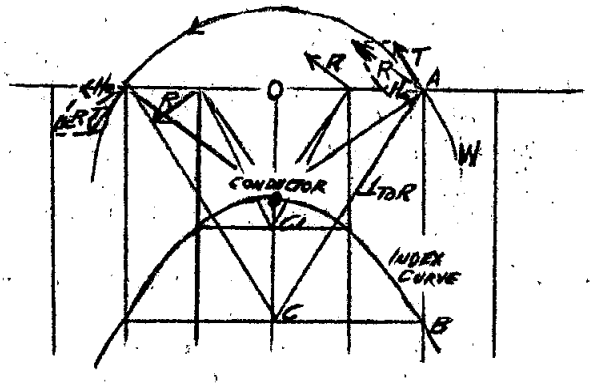


Fig. 10-124. Construction of index curve.

profile (see Fig. 10-124) would be given by the vector T, and would coincide with the direction of the plane of the detection coil in the minimum position. If normals were drawn to this position at all

METHOD USED -(ELECTROMAGNETIC INDUCTIVE) cont'd
Using Vertical Loop

' points, they would intersect in the subsurface conductor. However, the horizontal field Ho of the transmission loop combines with the subsurface field T to form the resultant field vector R, whose direction is that of the detection coil in the minimum position. Therefore, the normals to the direction of the coil will intersect the vertical at progressively deeper points CC' as the distance of points A from the point O increases. The conductor may nevertheless be located by the procedure of drawing an index curve : At any point (A) the normal to the vector R or to the plane of the detection coil is drawn to the intersection with the vertical at the point C. Through C a horizontal line is drawn to the intersection with the vertical from A to B. B is then a point on the index curve. Other points are similarly located. The apex of the index curve is the conductor. '

The equipment used to survey the Strike claims is similar to the transmitter with vertical loop, &direction-finding equipment in the above description. The transmitter was operated on a frequency of 55 kilocycles. The lines cut for the survey consisted of three base-lines (east-west) with north-south cross lines spaced at 125 foot intervals except for a small area having cross lines 100 feet apart. Reading stations were marked at 100 foot intervals on the lines, which were surveyed by chain and Brunton compass. The transmitter placements or 'set-ups' were usually 250 to 300 feet apart on the lines and from 10 to 15 readings were made with the direction-finding equipment for each 'set-up' of the transmitter.

RESULTS AND RECOMMENDATIONS

With one exception the area surveyed gave negative or nearly negative results. Map R-2 shows the area surveyed in which one anomaly having fair electrical strength and eight of minor strength and indefinite trend, were discovered.

The 'B' anomaly plotted on Map R-2 has sufficient electrical strength to warrant preliminary investigation, and a trench will be dug across its axis. The eight anomalies of minor strength will not be investigated at this time, but should further surveying in the adjacent area indicate that they are part of a general pattern, a small amount of trenching on them will be completed.

Further electromagnetic surveying will be completed on the Roi Group. Recommendations for other work will depend upon the results of this geophysical surveying.

G. L. Oates

GEOPHYSICAL FIELD NOTES

(1)

CONTRACT No. R01

LOOP LOCATION D.I.N

AMP 0.75

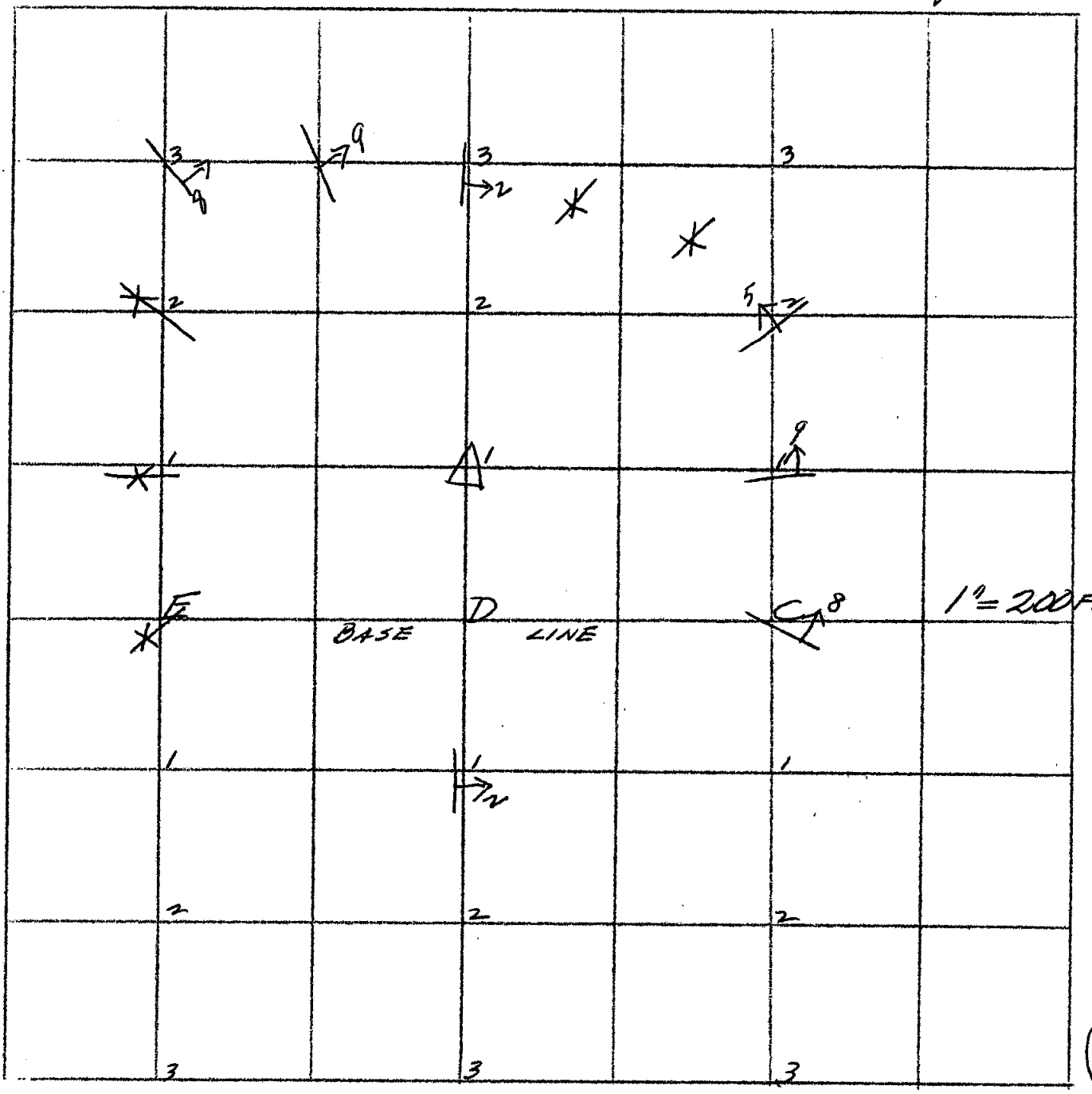
DATE March 10/62

BY G.L.O. M.B.

Δ = Loop location

✳ = zero dip

$\frac{\text{N}}{\text{6}}$ = dip in degrees



(1)

GEOPHYSICAL FIELD NOTES

CONTRACT NO R01

LOOP LOCATION E2N

AMP 0.75

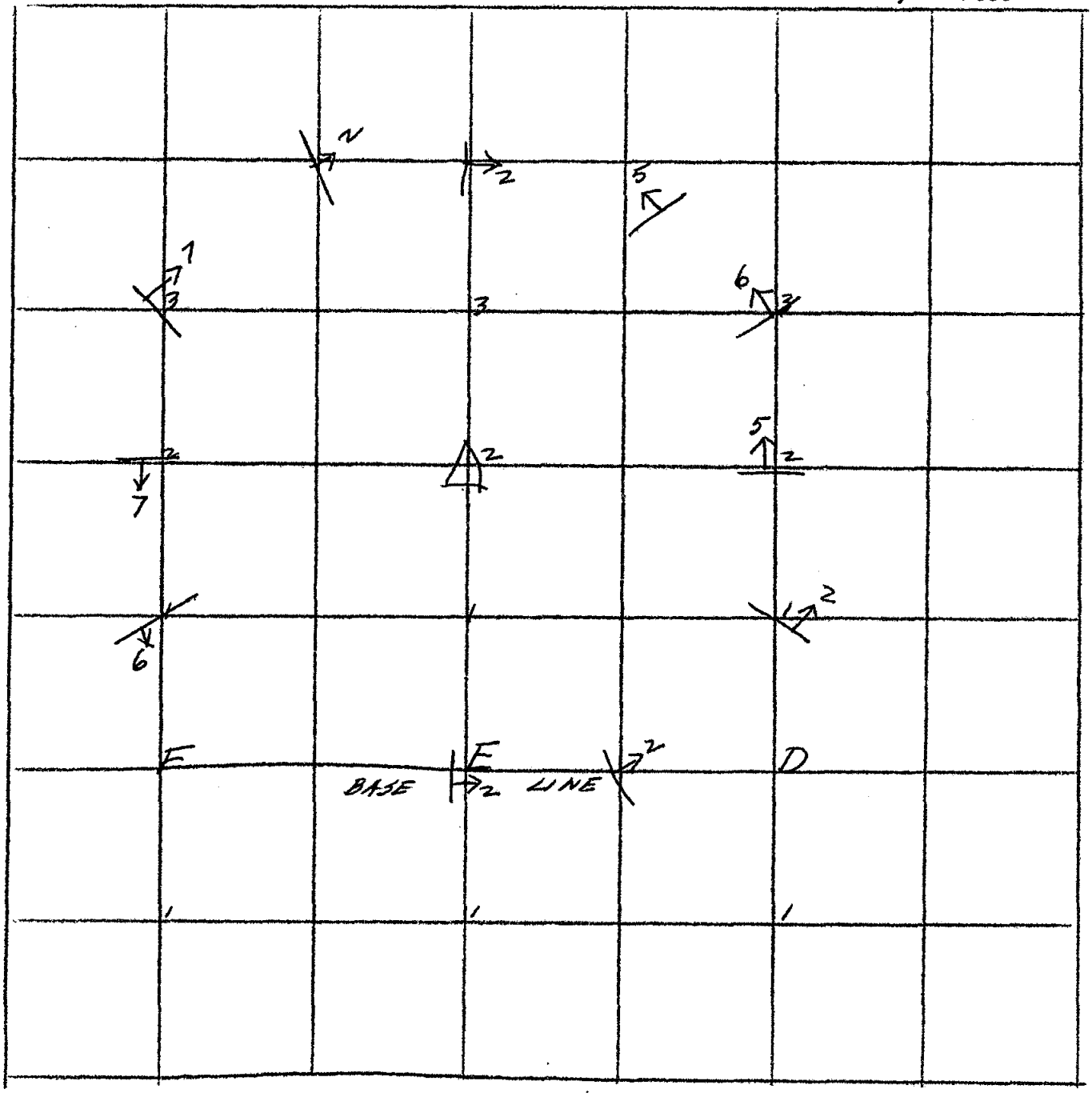
DATE March 10/62

BY G.L.C. M.B.

Δ - Loop location
✳ - zero dip
↓6 = dip in degrees

N True

1" = 200 FT.



(3)

CONTRACT NO R01

LOOP LOCATION E1S

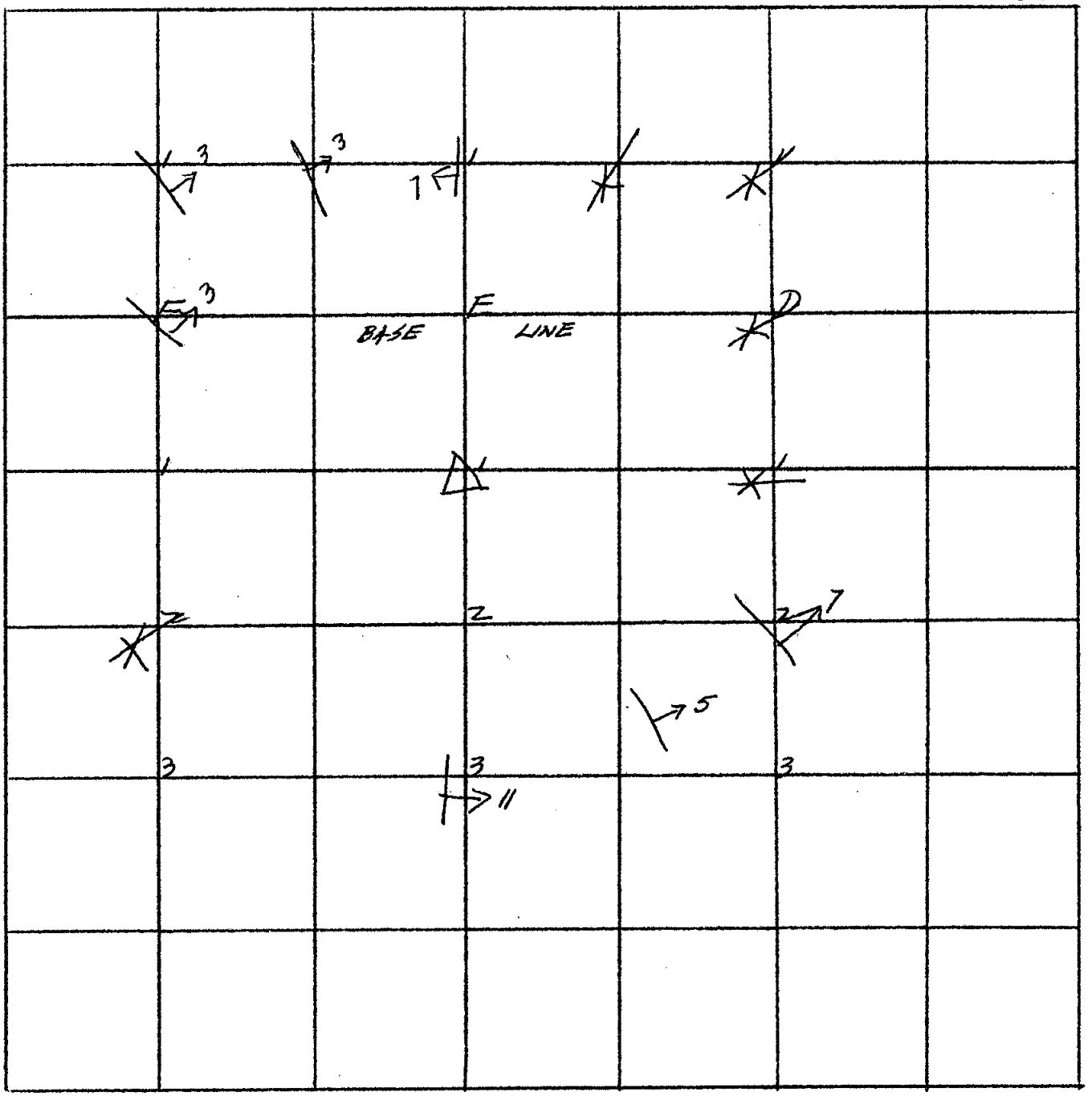
AMP 0.75

DATE March 11/62

BY G.H.C. M.B.

Δ = Loop location
× = Zero dip
↓6 - dip in degrees

1" = 200 FT.



(3)

(4)

[illegible] FIELD NOTES

CONTRACT #: ROI

LOOP LOCATION: D2S

AMP: 0.75

DATE: March 11/62

BY: G.L.O & M.B.

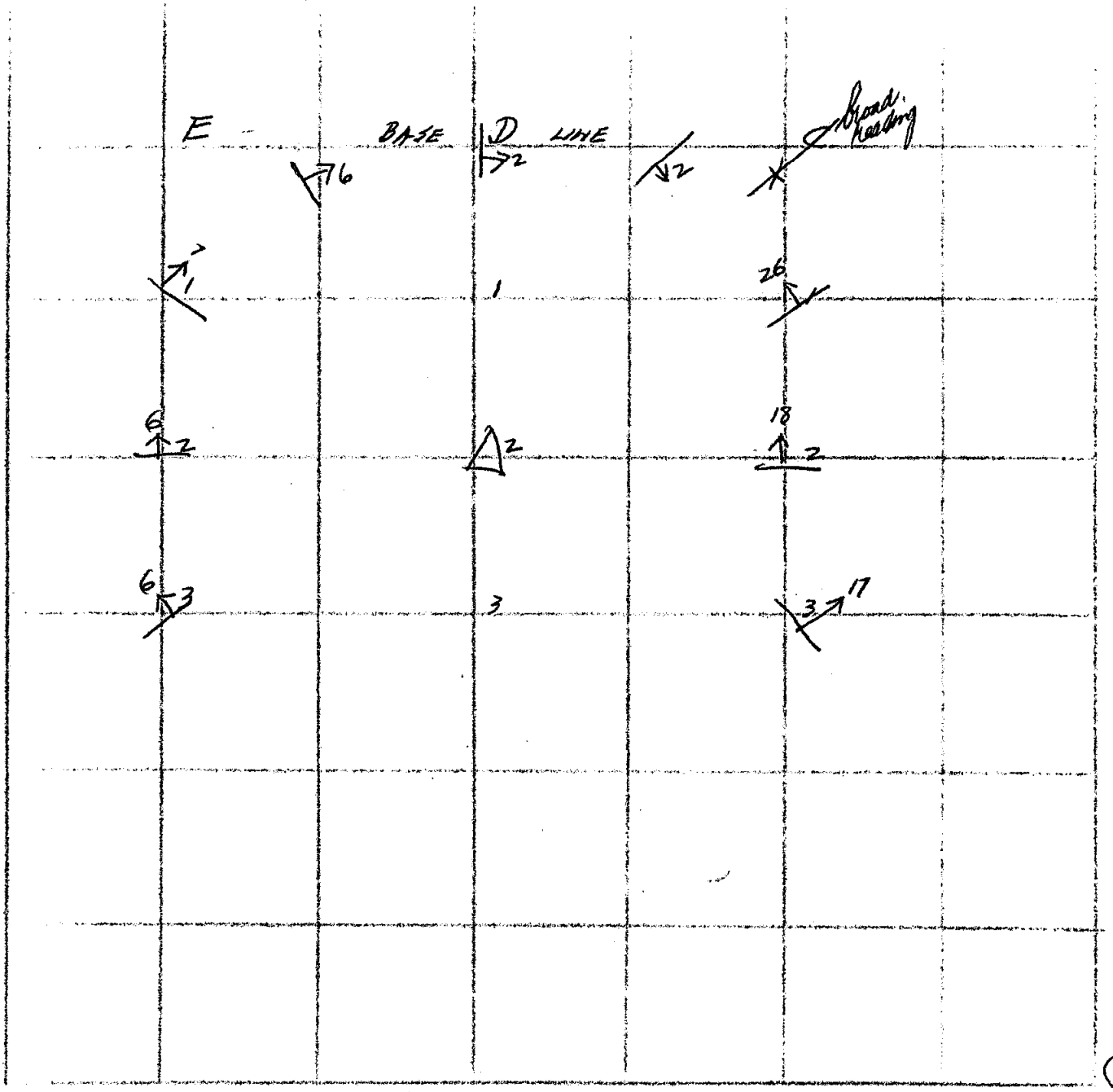
N true

Δ = Loop location

+ = zero dip

↓6 = dip in degrees

1" = 200 FT.



(4)

GEOPHYSICAL FIELD NOTES

(5)

CONTRACT N° R01

LOOP LOCATION B1+50S

AMP 0.75

DATE March 11/62

BY G.H.D. & M.B.

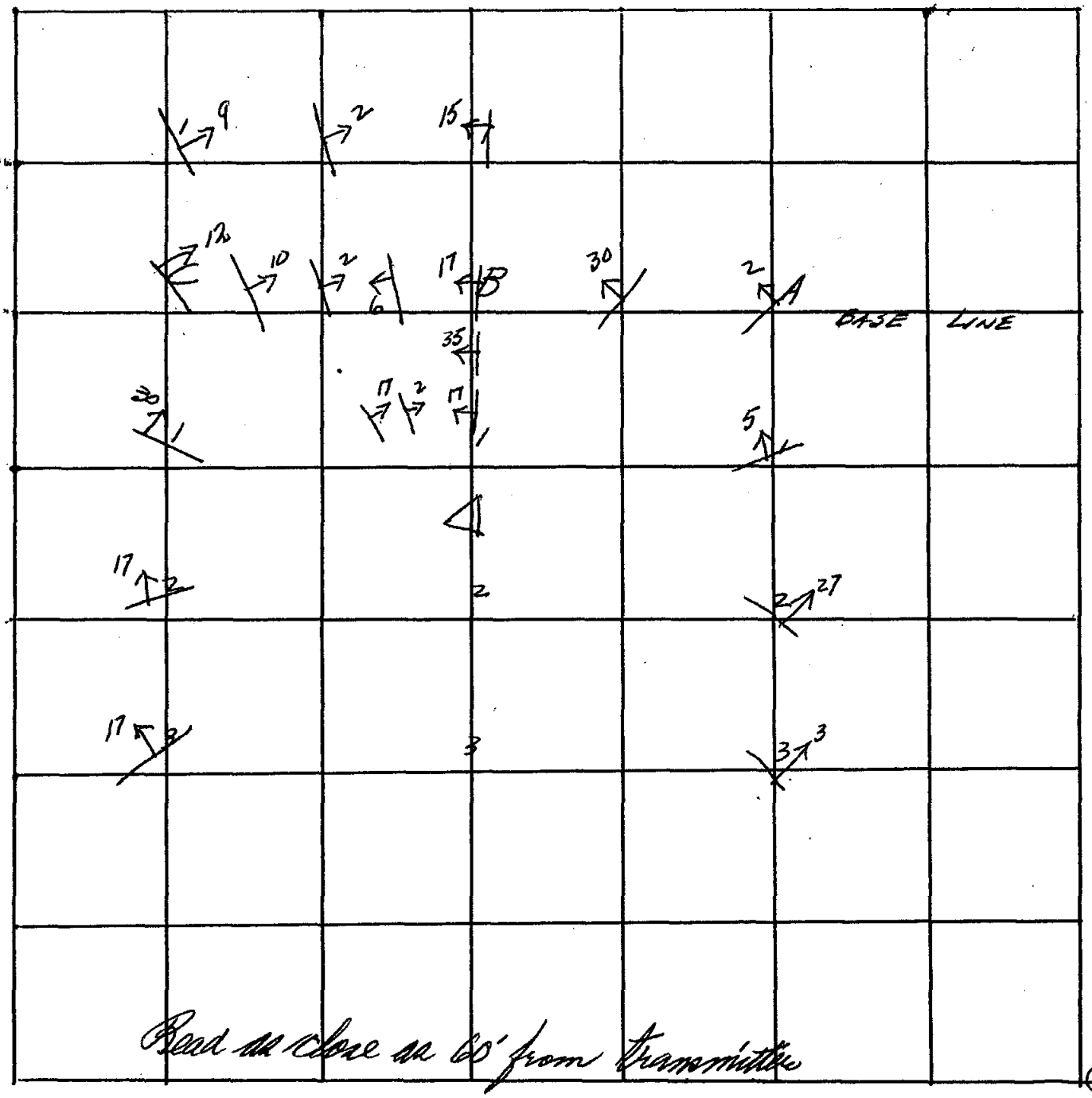
N True

Δ = Loop location

× = zero dip

↓6 = dip in degrees

1" = 200 FT.



Read as close as 60' from transmitter

(5)

GEOPHYSICAL FIELD NOTES

CONTRACT N° R01

LOOP LOCATION A1S

AMP 0.75

DATE March 11/62

BY G.F.O & M.B.

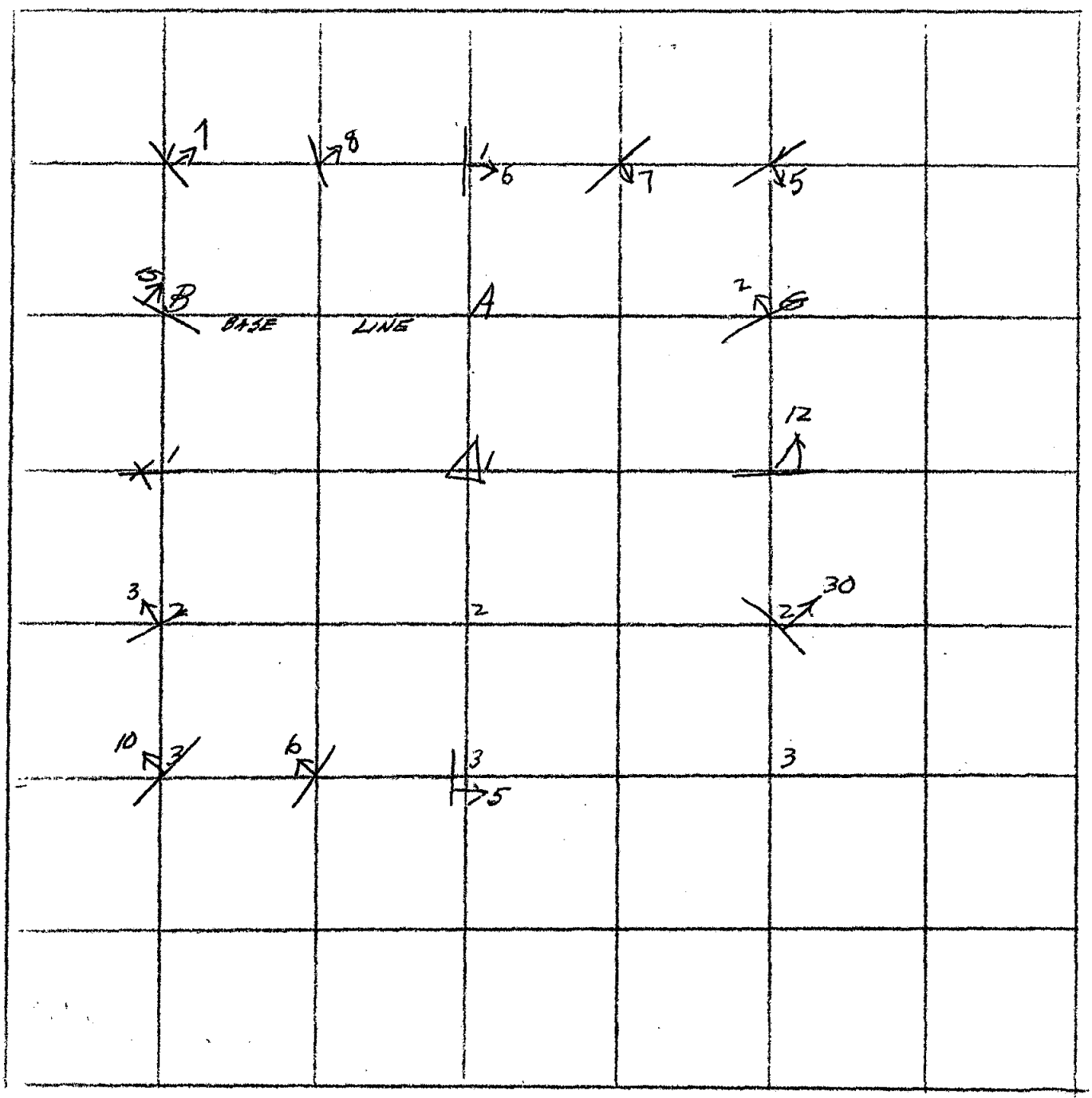
Δ = Loop location

× = zero dip

↓ 6 = dip in degrees

True

1" = 200 FT.



GEOPHYSICAL FIELD NOTES

(7)

CONTRACT Nº ROI

LOOP LOCATION G (BASE LINE)

AMP 0.75

DATE March 12/62 L.L.B. & M.B.

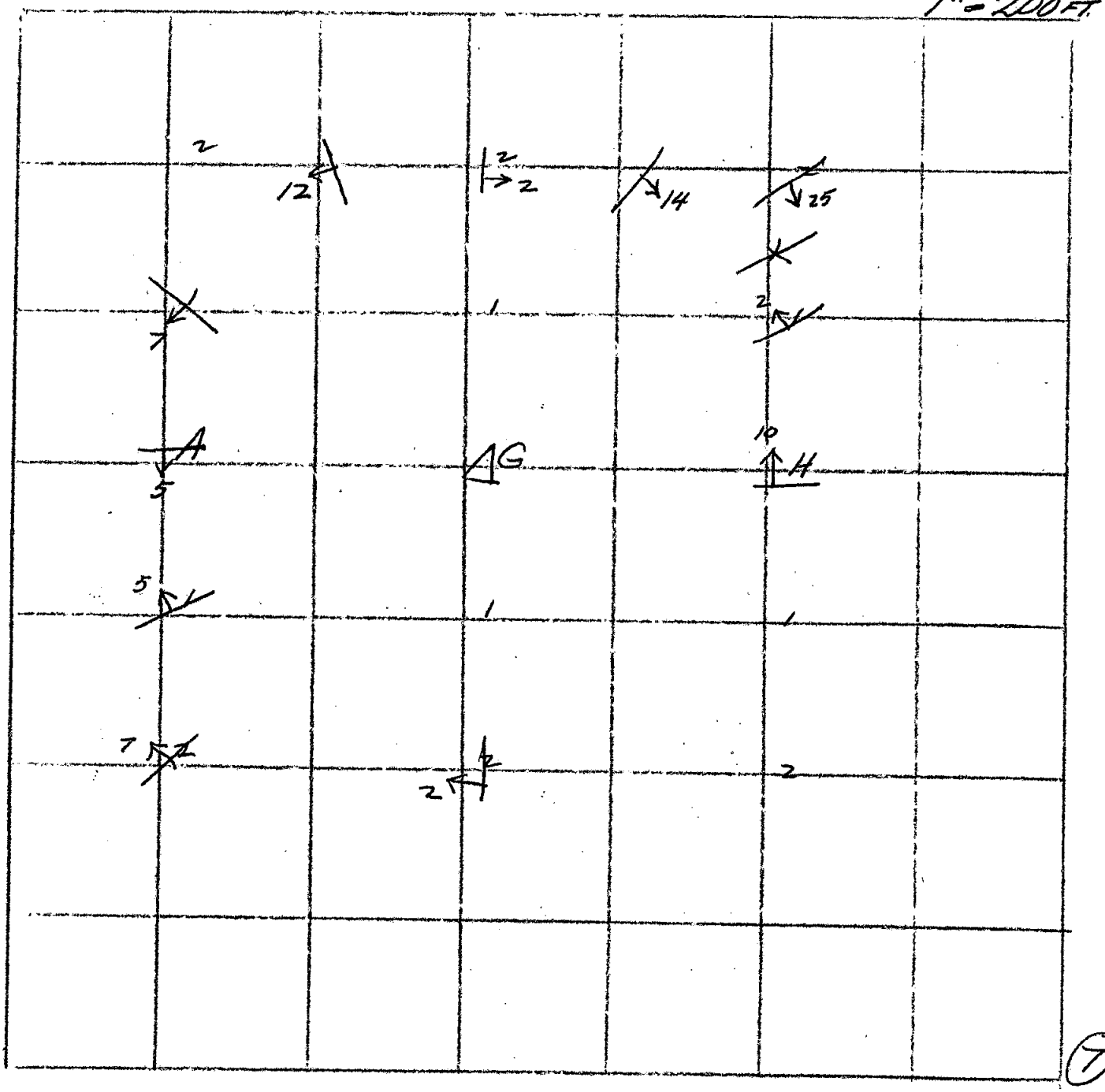
BY L.L.B. & M.B.

Δ = Loop location

\+ = zero dip

$\overset{\downarrow}{6}$ = dip in degrees

1" = 200 FT.



(7)

GEOPHYSICAL FIELD NOTES

(8)

CONTRACT # R01

LOOP LOCATION H1+50N

AMP 0.75

DATE March 12/62

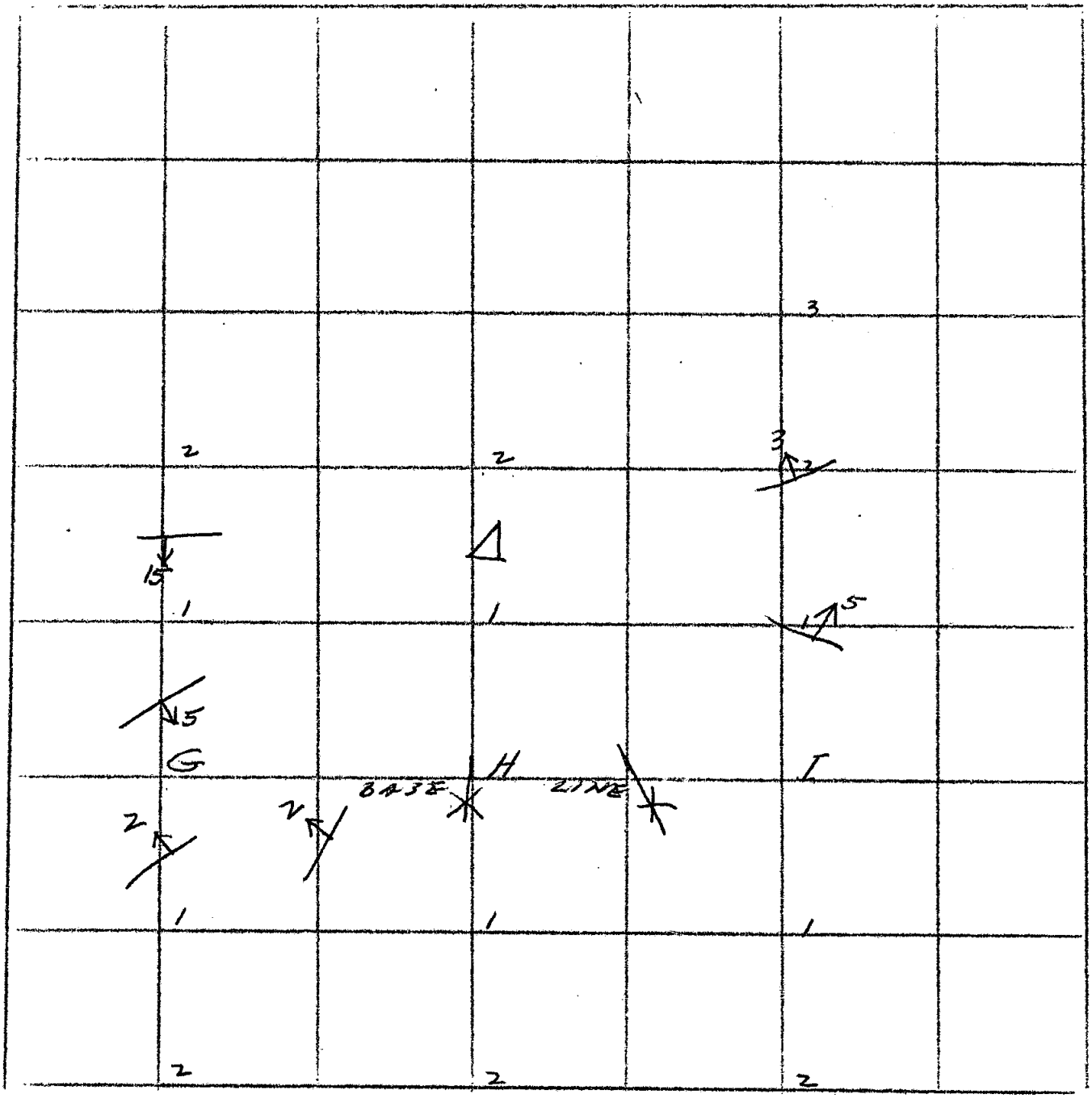
BY G.D. & M.B.

Δ = Loop location

* = zero dip

$\overset{\downarrow}{6}$ = dip in degrees

1" = 200 FT.



(8)

GEOPHYSICAL FIELD NOTES

CONTRACT № R01

LOOP LOCATION I2N

AMP 0.75

DATE March 13/62

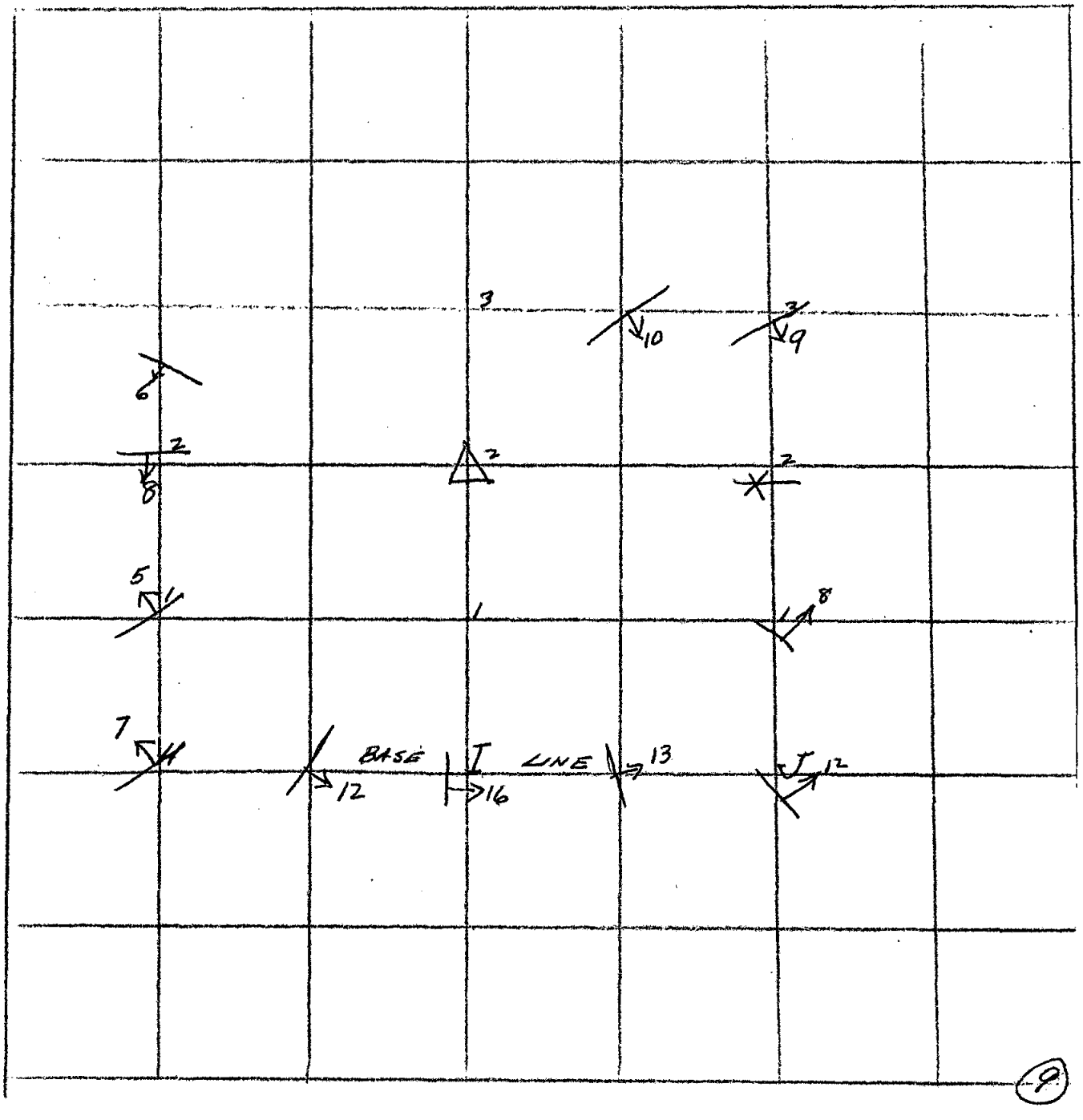
BY G.D. & M.B.

Δ = Loop location

* = Zero dip

↓6 = dip in degrees.

1" = 200 FT.



GEOPHYSICAL FIELD NOTES

CONTRACT #: R01

LOOP LOCATION: I, S

AMP: 0.75

DATE: March 14/62

BY: L.L.C. + M.B.

A = Loop location

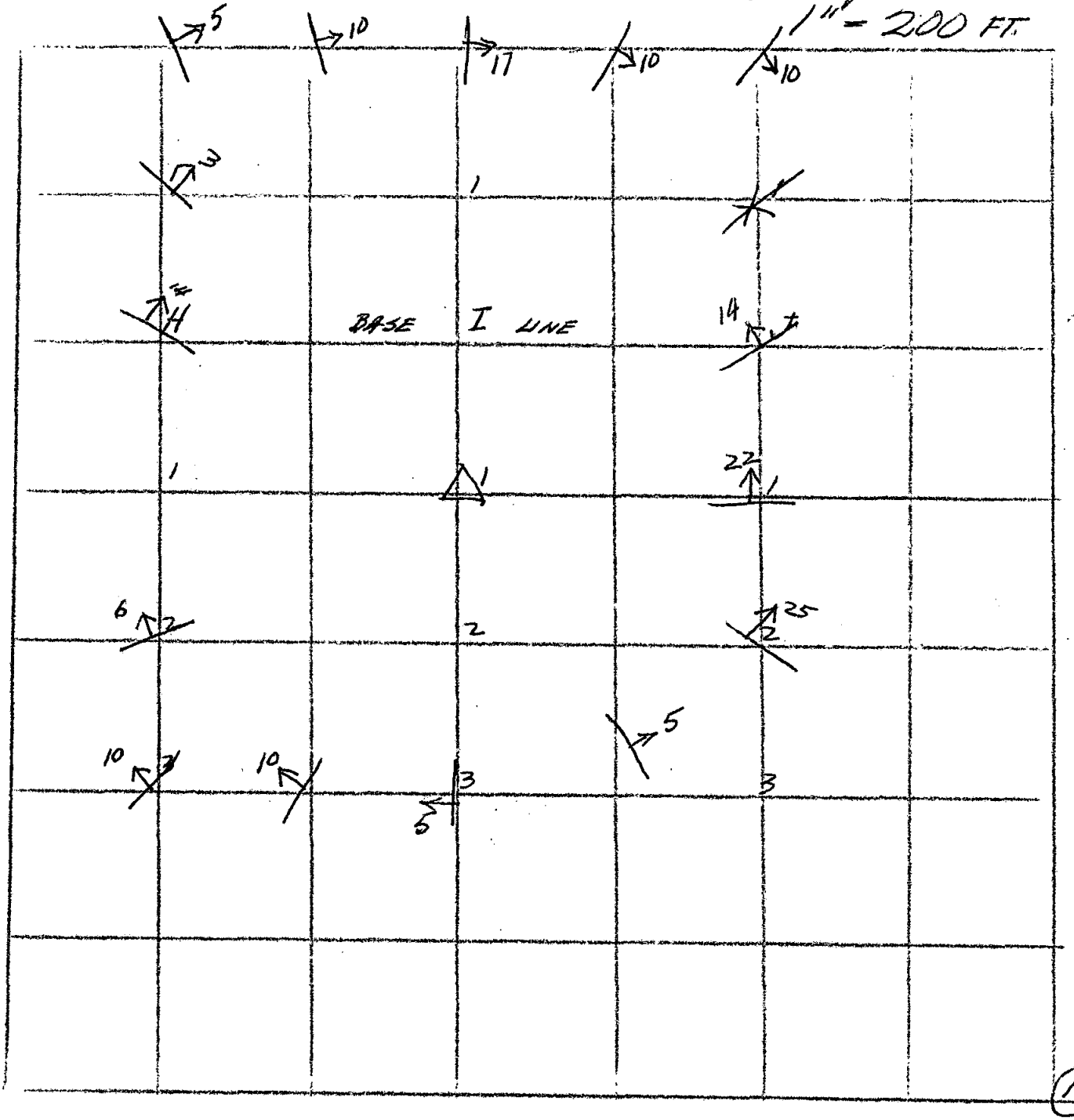
* = zero dip

↓ = dip in degrees

N

TIMM

1" = 200 FT.



(11)

Contractor Field Notes

CONTRACT N ROI

LOOP LOCATION H2S

AMP 0.75

DATE March 14/62

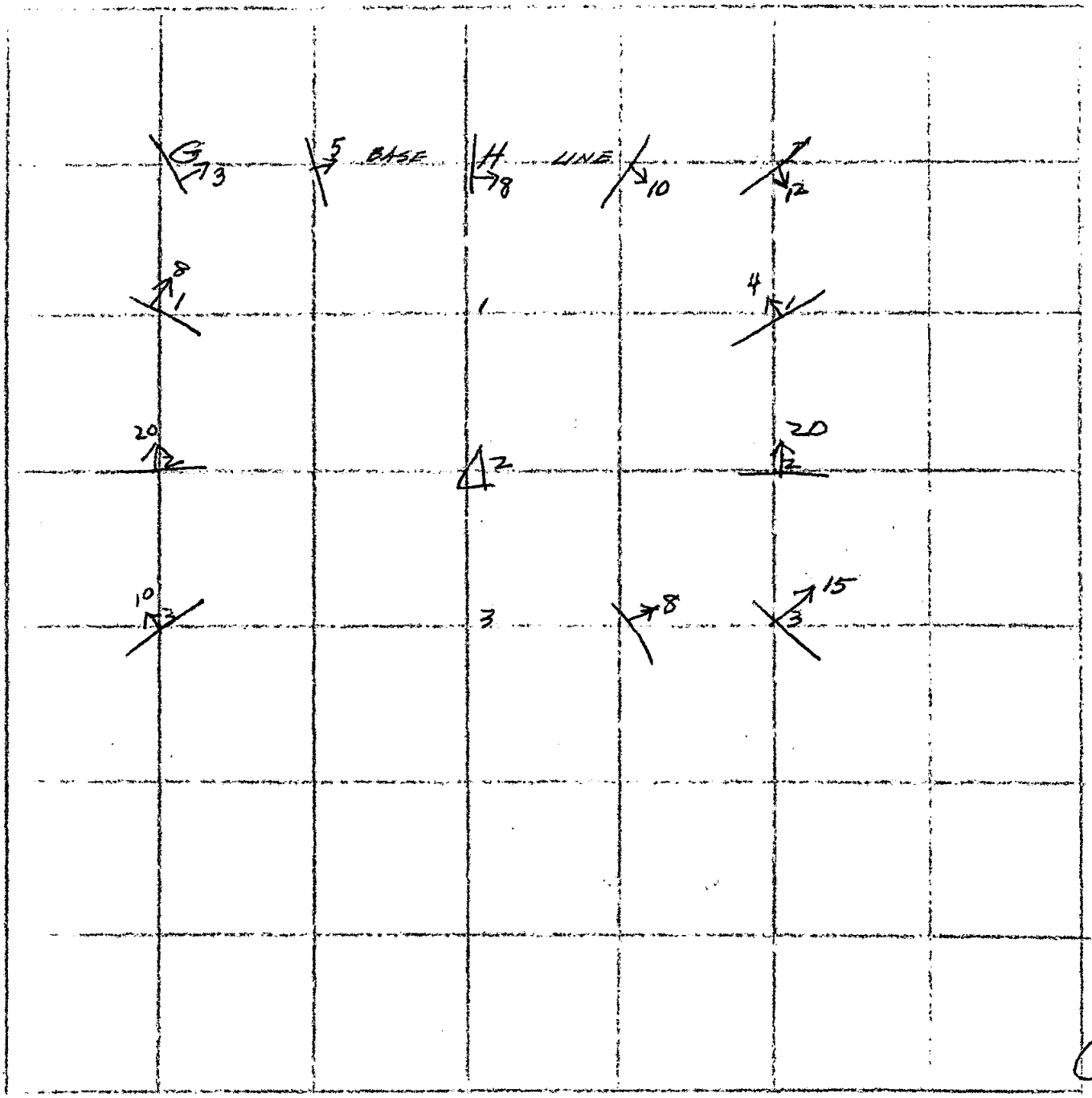
BY G.D. & M.B.

Δ = Loop location True

× = zero dip

$\frac{\downarrow 6}{}$ = dip in degrees.

1" = 200 FT.



(11)

(12)

Geophysical Field Notes

Contract No R01

Loop Location V2S

Amp 0.75

Date March 13/62

By L.C. & M.B.

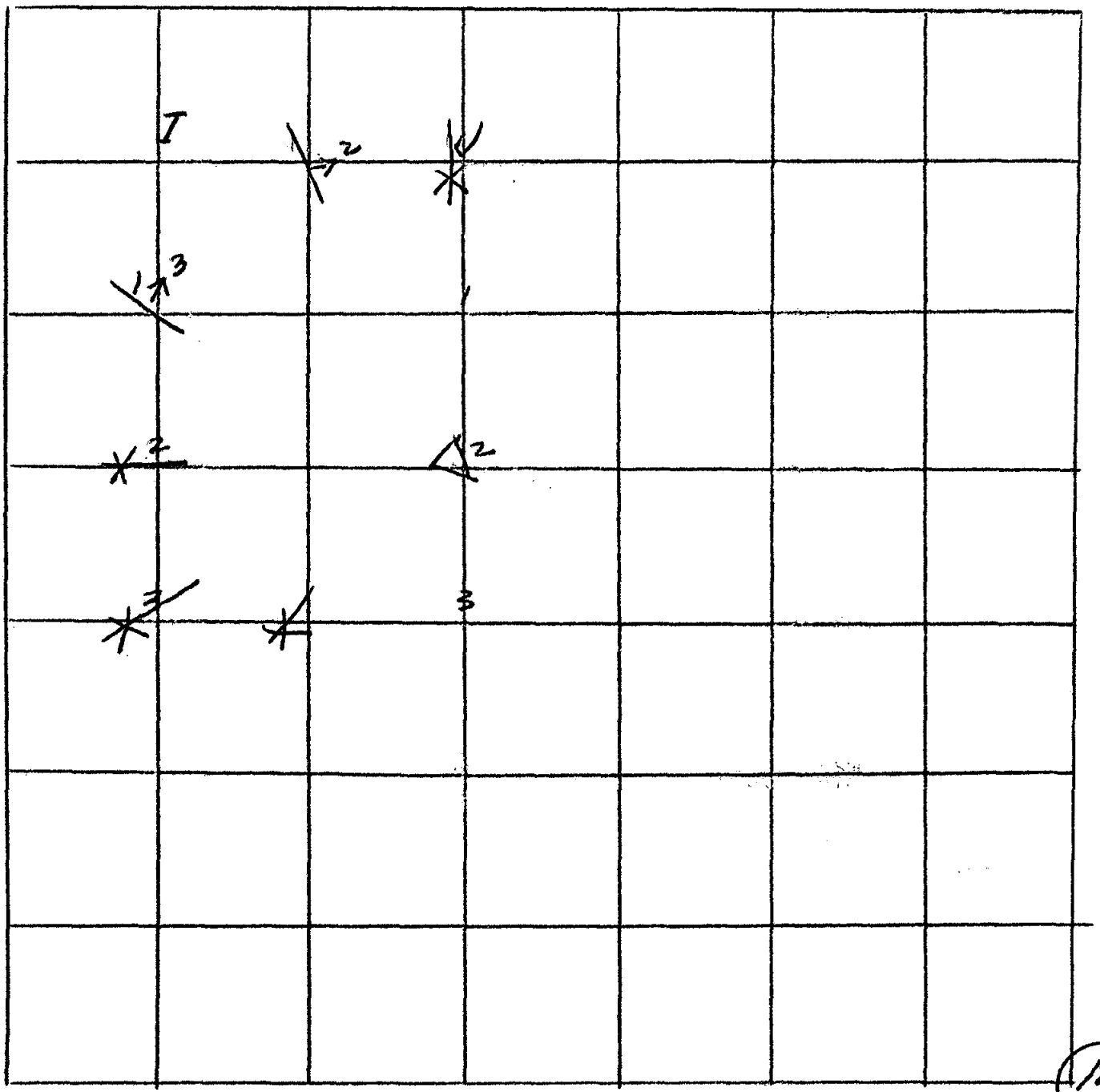
N true

Δ = Loop location

× = zero dip

$\overset{\downarrow 6}{\longrightarrow}$ = dip in degrees.

1" = 200 ft.



(12)

DOMINION OF CANADA :
PROVINCE OF BRITISH COLUMBIA
TO WIT :

IN THE MATTER OF THE MINERAL ACT and geophysical work performed on Mineral claims in the ROI group, about one mile east of Canford, B. C.

I, George Larmour Oates,
of 545 Rosemead Avenue, Kelowna,
in the Province of British Columbia, do solemnly declare that

(1) Geophysical work to the value of six hundred and ~~twenty-two~~ dollars and sixty cents ($612.60), has been completed by me on the following mineral claims : Roi #5 and Roi #6.

(2) The work is as shown in the maps and report submitted to the Department of Mines at Victoria, B. C., through the Mining Recorder at Merrit, B. C. for approval.

(3) Clients of geophysical firms are charged a fee based upon several items in addition to salaries and wages of employees. These consist of maintenance of equipment, power supplies, office and travel expense, etc., and as in the present instance I am the owner of the claims as well as the surveyor completing the work, I have included these items of cost. A 10 hour day was worked, my duties consisting of field operating, mapping, maintaining equipment, line cutting and packing. I have used a tentative rate of $20.00 perday plus expenses for myself and trust it may meet the approval of the Department of Mines. Car transportation (Buick Special-1956) was charged @ 0.14¢ per mile on the job and the return trip from Kelowna to Merritt with 500 lbs of equipment and luggage.

(4) The following is an itemized listing of costs for the survey :

Period March 8 to March & 14, & March 22-23 1962 (REPEAT)

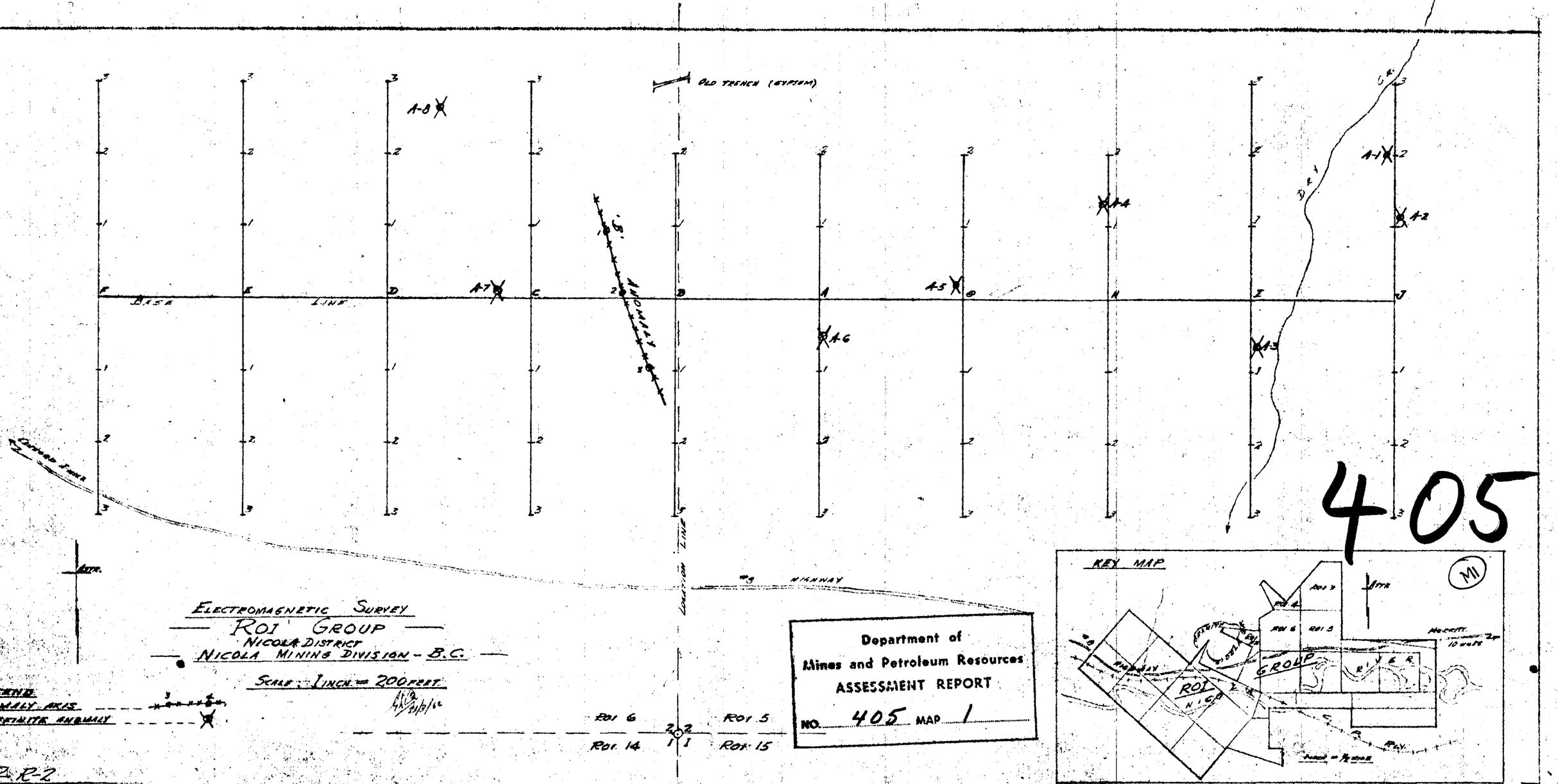
Wages - Oates 7 dys @ $30, M. Buller 7 dys. @ $20 plus I4 dys total board @ $4.50 for both Oates & Buller ---	$ 413.00
Room - Oates and Buller ----------	30.00
Car transportation - Kelowna to Merrit return with 500 lbs equipment & luggage, 340 miles - transportation on job 175 miles - total 515 miles @ $.14¢ per mile ----	72.10
Maintenance of equipment & power supply (dry batteries)	34.50
Wages Oates maps and report 2 dys @ $30, material and ($3.00) printing ----------	63.00
Total ---	612.60

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act".

G. L. Oates

Declared before me at the Village
of Merritt, in the
Province of British Columbia, this
23rd day of March 1962, A. D.

A Commissioner, etc



405

ELECTROMAGNETIC SURVEY

ROI GROUP

NICOLA DISTRICT

NICOLA MINING DIVISION - B.C.

SCALE: 1 INCH = 200 FEET

LEGEND

ANOMALY AXIS

INDEFINITE ANOMALY

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 405 MAP 1

MAP R-2