Amendment
Manual of Instructions
Dominion Lands
Tenth Edition (1946)

1982

1982 Amendment
to the
Manual of Instructions for the Survey of Dominion Lands,
Tenth Edition (1946), the
Manual of Instructions for the Survey of Dominion Lands,
Tenth Edition (reprint, 1956) and the
Manual of Instructions for the Survey of Canada Lands,
First Edition (1961), Appendix C

1982 Amendment, Section 118, Tenth Edition (1946), Manual of Instructions for the Survey of Dominion Lands

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    Amendment to Manual of Instructions, ninth edition (1918)
    to make copies of the ninth edition the same as the tenth edition

2. Excerpt, Manual of Instructions, tenth edition (1946)
    Excerpt, Appendix C, Manual of Instructions, first edition (1961)

3. Memorandum to file by G. E. LeSueur, R. & D. Section:
    "Width of Road Allowance on Correction Line in D.L.S. Township System"
    11 May, 1982
    Attachment: Excerpt - Page 139, Report of the Director, Topographical and Air Survey Bureau, Part V, Annual Report of the Department of the Interior for the fiscal year ended March 31, 1934.

4. Memorandum, G. Raymond, Acting Surveyor General re: "Width of Road Allowance on Correction Line in Dominion Lands Survey System" 7 June, 1982

5. Distribution of Memorandum:
    12 May, 1982: to Mr. G. K. Allred, Alberta Land Surveyors Association.
    18 June, 1982: to Mr. M. R. Skelton, Saskatchewan Land Surveyors Association.
    6 July, 1982: Mr. A. L. Hayward, Association of Manitoba Land Surveyors.

6. "Als news", summer, 1982, article "Width of Road Allowance on Correction Line in Dominion Lands Survey System"

7. Letter: Allred, Association of Alberta Land Surveyors - Raymond, 23 March, 1983

8. Letter: Raymond, Surveyor General - Allred, 6 May, 1983

9. Memorandum, G. Raymond, Acting Surveyor General re: "Width of Road Allowance on Correction Line in Dominion Lands Survey System" (revised) 7 June, 1982

1982 Amendment to the
Manual of Instructions for the Survey of Dominion Lands, Tenth Edition (1946), the
Manual of Instructions for the Survey of Dominion Lands, Tenth Edition (reprint, 1956)
and the
Manual of Instructions for the Survey of Canada Lands, First Edition (1961), Appendix C

According to the explanation of the amendment, issued by G. Raymond, Acting Surveyor General, in a Memorandum dated 7 June, 1982, an error was introduced into section (clause) 118, paragraph 4 (page 81) of the tenth edition (1946) of the **"Manual of Instructions for the Survey of Dominion Lands"** when this edition was first published. The error was continued uncorrected through the reprint of 1956 and in Appendix C of the first edition (1961) of the **"Manual of Instructions for the Survey of Canada Lands."** In a sense the error was extended back in time as well. After the tenth edition was published an "amendment" was also published to bring copies of the ninth edition (1918) of the Manual of Instructions up to date and to allow the copies to be used as the tenth edition. In some copies of the ninth edition, pasted to the page facing the title page, there is a page of amendments entitled **"Amendments to Ninth Edition, D.L.S. Manual, Incorporated in the Tenth Edition."** (The page included an amendment to section 118.) However, this does not change the fact that the error dates from the tenth edition (1946) of the Manual of Instructions.

According to a memorandum to file 2520-1 (now SM8630-2) by G. E. LeSueur, dated 11 May, 1982, it appears that Mr. R. E. Lafreniere, C.L.S., A.L.S., of Alberta, raised questions concerning the following statement in the report of F. H. Peters, Surveyor General and Director of the Topographical and Air Survey Bureau, contained in the Annual Report of the Department of the Interior for the year ended 31 March, 1934:

> "The transfer to the Dominion of the Duck Mountain Forestry Experimental Area in Manitoba necessitated instructions for the survey of the boundaries, and these involved the survey and adjustment of a jog at a correction line where it was affected by a heavy deflection of one of the base lines.
>
> "There are many land surveyors who are puzzled about adjusting a jog because the Supplement to the Manual does not explain it, nor furnish a proper table to use; nor does the empirical formula contained in the Manual emit much light. Fundamentally, where no irregularities of survey are involved, the object of the surveyor is to establish, for the Third system of survey, corresponding corners on both sides of the correction line that are on two latitude circles exactly 100 links apart. To do this he must consider the convergence between the corresponding meridian lines from the north and south, which convergence varies with the actual length of the jog and with the latitude of the correction line; it is only necessary to adopt this principle to compute the direction on which to run the trial line, and any surveyor can do this for himself.
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> "In the case in point, the deflection of the base line on the north would produce an excessive width in the road allowance opposite the western end of the jog (85 chains long), so the instructions specified that the township corner on the south side of the correction line should be established 100 links south of the theoretic position of the north side of the correction line in the range to the east, and that the north boundary of section 36 in the range to the west be drawn parallel to this said

line, thus making the jog road allowance uniformly 100 links wide for one mile."

Mr. LeSueur stated that the question about this portion of the 1934 annual report "had the effect of bringing out an error in the D.L.S. Manual, 10th edition, 1946, sec. 118 dealing with this topic." Mr. LeSueur then went on to explain the problems with the formula presented in section 118 and worked through an example calculation using Table VIII from the first edition (1952) of the **"Supplement to the Manual of Instructions for the Survey of Canada Lands."**

It appears that a copy of Mr. LeSueur's memo was sent to Mr. G. K. Allred of the Association of Alberta Land Surveyors on 12 May, 1982, in a letter signed by Mr. R. O. Semper, for G. Raymond, Acting Surveyor General. The subject of the letter was identified as: "Calculation for Correction Line in D.L.S. System." The letter contained permission to circulate the contents of the memo.

It appears that on 7 June, 1982, the original memo was re-worked into an official "Memorandum" about the error entitled "Width of Road Allowance on Correction Line in Dominion Lands Survey System." This memorandum was sent to the Association of Saskatchewan Land Surveyors on 18 June, 1982, and to the Association of Manitoba Land Surveyors on 6 July, 1982. It was published in the journal of the Association of Alberta Land Surveyors ("als news, summer, 1982").

On 23 March, 1983, Mr. G. K. Allred of the Association of Alberta Land Surveyors wrote to the Surveyor General identifying problems with the amendment as published in the "als news." The Surveyor General responded on 6 May, 1983, and identified problems with the published version as well as agreeing that there were problems with the original memorandum. A copy of the "als news" article was sent to the Association with the corrections marked in red. A version of the original 7 June, 1982, memorandum was revised to correct the errors.

A.M. Macleod, C.L.S., O.L.S.
12 January, 2004

AMM: C:\AMM-WPWD\Guides\Instructions\1982amend.wpd - 12 Jan., 2004

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1

DOMINION OF CANADA

Manual of Instructions

FOR THE

Survey of Dominion Lands

Issued by authority of the Honourable
the Minister of the Interior

NINTH EDITION

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1918

29566—½A

and erect the permanent monument at once, without waiting for the establishment of the adjoining section corners.

113. Neither chords nor meridional section lines are deflected in the interior of a township, except in the last quarter-section adjoining a township outline previously surveyed. Any deflection or deficiency or surplus is left in this last quarter-section.

114. The central meridian or the central chord may, on account of the nature of the ground or for some other reason, be unsuitable for control. In such a case the surveyor may take for control another meridian or another chord, but unless some reason exists for the change, the central lines are preferable. It must be remembered that if the control meridian is not the central one, the chords are not perpendicular to it.

115. The lengths laid out on the control meridian and control chord are chained twice. Two tapes are used: one divided into chains and links and the other into feet. Where a triangle is resorted to for passing an obstruction, the operation is checked by another triangle in order to conform to the principle of double independent chainage.

116. All section lines are surveyed whether they are along road allowances or not and all section and quarter-section corners on such lines are marked by monuments.

In special cases, for which instructions are issued, quarter-section lines are surveyed and the corners of legal subdivisions on the surveyed lines are marked by monuments.

Section lines are extended across all bodies of water struck by them when it is possible to do so; corners falling on islands are marked by monuments in the regular way.

117. Only one limit of the road allowance along a correction line is surveyed at one time, but connections are made with the monuments on the opposite side of the road and are recorded in the field notes.

118. The opposite limits of the road allowance on a correction line are not parallel; they are perpendicular to the respective control meridians and form an angle equal to the convergence of the said meridians. This angle is calculated from the jog and from the convergence per mile taken from the diagram in the astronomical field tables.

In Fig. 25, which represents a correction line in a range numbering west of an initial meridian, the control meridian

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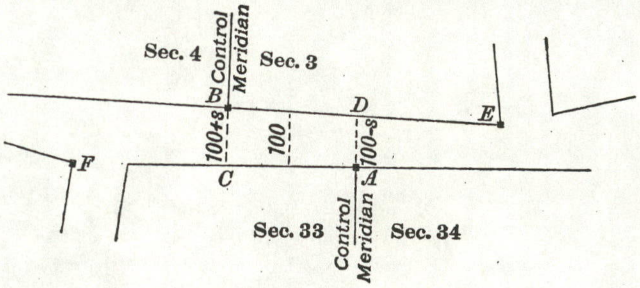

Fig. 25

chains, the surveyor calculates from the data supplied to him, what the depth must be in order to leave one chain for the road allowance and he lays out both quarter-sections of that depth, placing temporary marks at A and B.

The road allowance must be one hundred links wide midway between A and B. Opposite A, it is a little narrower, (100-s) links, while opposite B it is a little wider, (100+s) links. Designating by J the jog in chains and by c the convergence of meridians in minutes per mile,

$$s = 3.7 \times \frac{c}{2}\left\{\frac{J}{100}\right\}^2 \text{ Links.}$$

The convergence of meridians is taken from the diagram in the astronomical field tables.

At the township corner E, the road is narrower than 100 links, the deficiency d, in links, being:

$$d = s\left\{\frac{486}{J} - 1\right\}$$

It is wider than 100 links by the same amount at the township corner F.

119. Starting from the temporary post A at right angles to the control meridian, the line is run westerly as far as C, opposite B and the width CB measured. The deficiency or surplus is divided equally between the last quarter-sections of the control meridians and permanent monuments erected.

Or the start may be made from the temporary post B at right angles to the control meridian and the line run

Amendments to Ninth Edition, D.L.S. Manual, Incorporated in the Tenth Edition

(1) The 9th to the 21st line of Sec. 118 on page 81 is revised in the 10th Edition of D.L.S. Manual to read,-

The road allowance must be one hundred links wide at the point O, midway between A and B. Opposite A it is a little narrower, (100-S) links, while opposite B it is a little wider (100+S) links.

Representing by J the length of the jog in links and by θ the convergence of meridians per chain, θ being expressed in circular measure, $S = \theta \times \frac{J}{2}$ links.

Representing by "ℓ" the distance in links from the point O to the township corner E, the deficiency d in the width of the road at this corner is $d = \theta \ell$ links.

The road is wider than 100 links by the same amount at the township corner F.

(2) Clauses 136 and 137 on page 87 are omitted in the 10th Edition of the D.L.S. Manual.

(3) Clause 279 on page 125 is omitted from the 10th Edition of the D.L.S. Manual.

(4) Chapters VII and VIII covered by pages 146 to 172 inclusive relating to Levels and Regulations do not appear in the 10th Edition of the D.L.S. Manual.

Note: The Dominion Lands Surveyors Act has been superseded by the Canada Lands Surveys Act assented to on 21st Dec. 1951.

2

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DOMINION OF CANADA

24051

Manual of Instructions

FOR THE

Survey of Dominion Lands

Issued by authority of the Honourable the
Minister of Mines and Resources

TENTH EDITION

OTTAWA
EDMOND CLOUTIER
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1946

and erect the permanent monument at once, without waiting for the establishment of the adjoining section corners.

113. Neither chords nor meridional section lines are deflected in the interior of a township, except in the last quarter-section adjoining a township outline previously surveyed. Any deflection or deficiency or surplus is left in this last quarter-section.

114. The central meridian or the central chord may, on account of the nature of the ground or for some other reason, be unsuitable for control. In such a case the surveyor may take for control another meridian or another chord, but unless some reason exists for the change, the central lines are preferable. It must be remembered that if the control meridian is not the central one, the chords are not perpendicular to it.

115. The lengths laid out on the control meridian and control chord are chained twice. Two tapes are used: one divided into chains and links and the other into feet. Where a triangle is resorted to for passing an obstruction, the operation is checked by another triangle in order to conform to the principle of double independent chainage.

116. All section lines are surveyed whether they are along road allowances or not and all section and quarter-section corners on such lines are marked by monuments.

In special cases, for which instructions are issued, quarter-section lines are surveyed and the corners of legal subdivisions on the surveyed lines are marked by monuments.

Section lines are extended across all bodies of water struck by them when it is possible to do so; corners falling on islands are marked by monuments in the regular way.

117. Only one limit of the road allowance along a correction line is surveyed at one time, but connections are made with the monuments on the opposite side of the road and are recorded in the field notes.

118. The opposite limits of the road allowance on a correction line are not parallel; they are perpendicular to the respective control meridians and form an angle equal to the convergence of the said meridians. This angle is calculated from the jog and from the convergence per mile taken from the diagram in the astronomical field tables.

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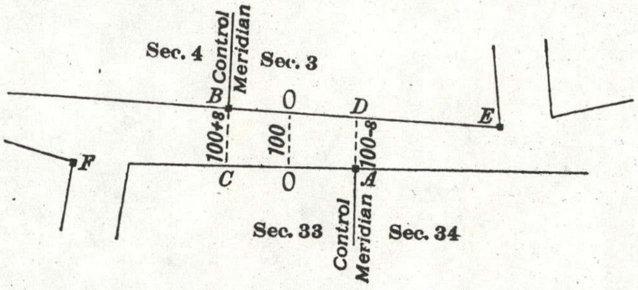

Fig. 25

The road allowance must be one hundred links wide at the point 0, midway between A and B. Opposite A, it is a little narrower, (100−s) links, while opposite B it is a little wider, (100+s) links.

Representing by J the length of the jog in links and by θ the convergence of meridians per chain, θ being expressed in circular measure,

$$s = \theta \times \frac{J}{2} \text{ links}$$

Representing by ℓ the distance in links from the point 0 to the township corner E, the deficiency d in the width of the road at this corner is $d = \theta \ell$ links

The road is wider than 100 links by the same amount at the township corner F.

119. Starting from the temporary post A at right angles to the control meridian, the line is run westerly as far as C, opposite B and the width CB measured. The deficiency or surplus is divided equally between the last quarter-sections of the control meridians and permanent monuments erected.

Or the start may be made from the temporary post B at right angles to the control meridian and the line run

Manual of Instructions for the Survey of Canada Lands

Legal Surveys and
Aeronautical Charts Division

Surveys and Mapping Branch

Department of Mines
and Technical Surveys

98630-7—1

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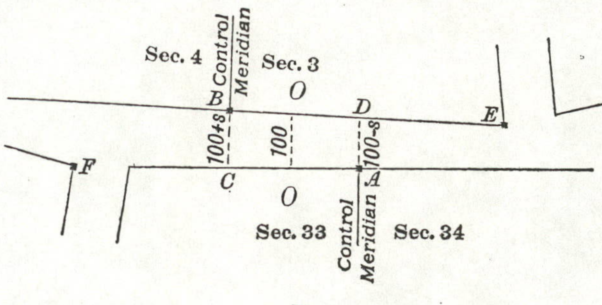
In Fig. 25, which represents a correction line in a range numbering west of an initial meridian, the control meridian is brought from the south to the point A and the other control meridian from the north to the point B. Instead of making the last quarter-sections at A and B forty chains, the surveyor calculates from the data supplied to him, what the depth must be in order to leave one chain



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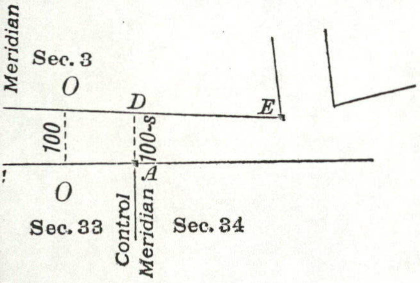

Fig. 25

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The road allowance must be one hundred links wide at the point O, midway between A and B. Opposite A, it is a little narrower, (100 − s) links, while opposite B it is a little wider, (100 + s) links.

Representing by J the length of the jog in links and by θ the convergence of meridians per chain, θ being expressed in circular measure,

$$s = \theta \times \frac{J}{2} \text{ links}$$

Representing by l the distance in links from the point 0 to the township corner E, the deficiency d in the width of the road at this corner is $d = \theta l$ links.

The road is wider than 100 links by the same amount at the township corner F.

119. Starting from the temporary post A at right angles to the control meridian, the line is run westerly as far as C, opposite B and the width CB measured. The deficiency or surplus is divided equally between the last quarter-sections of the control meridians and permanent monuments erected.

Or the start may be made from the temporary post B at right angles to the control meridian and the line run easterly as far as D opposite A. The width DA is measured and the deficiency or surplus divided equally as before.

120. In running the north or the south limit of the road allowance along a correction line when the opposite limit has been previously established, the subdivider may find that owing to irregularities in the prior survey, the width of the road allowance at some points differs from the normal width by twenty links or more. If the irregularity is due to an error in the prior survey, the surveyor may correct it if there is authority in the Dominion Lands Surveys Act for the correction. If the error cannot be corrected he must deflect his own line at some section or quarter-section corner so as to leave a road allowance of normal width.

3

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Government of Canada | Gouvernement du Canada

MEMORANDUM **NOTE DE SERVICE**

TO / À: File

FROM / DE: G.E. LeSueur,
R. & D. Section

SECURITY- CLASSIFICATION-DE SECURITE:

OUR FILE – N/REFERENCE: 2520-1

YOUR FILE – V/REFERENCE:

DATE: May 11, 1982

SUBJECT / OBJET: Width of Road Allowance on Correction Line in D.L.S. Township System.

A question was raised recently on this topic by R.E. Lafrenière, C.L.S., A.L.S., relating to the report of the Surveyor General in the Annual Report for the Dept. of the Interior for the fiscal year ended March 31, 1934, (See copy of extract attached). It is noted that when abnormal widths for the road allowance would be brought about because of large irregularities in the township surveys, specific instructions might be issued to make the two limits parallel.

At the same time this query had the effect of bringing out an error in the D.L.S. Manual, 10th Edition, 1946, sec. 118 dealing with this topic. The error was never corrected and appears again in the extracts appended to the C.L.S. Manual, 1st Edition, 1961. The following formula is given for the ~~convergence or divergence~~ departure from parallel of the limits of the road allowance across half the length of the jog between the respective control meridians:

> "Representing by J the length of the jog in links and by θ the convergence of meridians <u>per chain</u>, θ being expressed in circular measure,
> $$s = \theta \times \frac{J}{2} \text{ links."}$$

This is simply the application of the formula

$$\text{arc distance} = \theta \times r$$

where θ is the angle between two radii, expressed in radians. So θ in sec. 118 should represent "the convergence of the two meridians" as explained in 1st ¶ of sec. 118. and the words "per chain" should be struck out.

...2

Formerly, to calculate θ the surveyor would obtain meridian convergence per mile at the given township from the diagram in the star tables. After 1952, Table VIII in the Supplement gave the convergence per 100 chains.

To verify this let us take an example on the 1st correction line, 3rd system, between Townships 2 and 3. From Table VIII, 1952 Supplement, jog per range = 3.42 chains. For 30 ranges, say (which is ~~the~~ about the maximum possible)

$$J = 30 \times 3.42 = 102.6 \text{ chains}$$

For 100 chains, convergence is 75.15"

so that for 102.6 chains convergence is $77'' = 0.000374^{r}$

$$\text{Therefore } s = 0.000374 \times \frac{10260}{2} \text{ links} = 1.9 \text{ links}$$

This is of the right order.

If we followed the text, s would be 1/50 of a link!

Likewise for the deficiency in width of the road allowance at township corner E, using the correct formula for θ,

$$d = \theta\, 1 = 0.000374\ (24,386 - 5130) = 7.2 \text{ links}$$

Following the text it would be 0.07 links.

G. E. L. S.

G.E. LeSueur.

ANNUAL REPORT of the DEPT. of the INTERIOR – for FISCAL YEAR ended Mar. 31, 1934
V TOPOGRAPHICAL AND AIR SURVEY BUREAU
LEGAL SURVEYS

Moreover, the regulations had been interpreted to permit the staking of eight submerged claims from one marginal claim, and this created the necessity of defining witnessed boundaries in cardinal direction to prevent chaos in the survey of submerged claims. Considerable opposition developed to the defining of witnessed boundaries in cardinal direction and, after much discussion, the regulations were reinterpreted to permit the staking of only two submerged claims from one marginal claim, and were amended in May, 1933, to qualify the requirement that the boundaries be astronomically north, south, east, and west. The instructions for survey were immediately revised to require that boundaries partly submerged shall be produced, and submerged boundaries shall in general be parallel to the boundaries on land. These instructions have applied to the survey of 134 claims this season and so far no objections have been raised.

The regulations were further amended to provide that the excess area of over-sized claims might be disposed of under penalty per acre to the owner of the claim, or cut off by the Surveyor General for disposal otherwise. A satisfactory procedure for dealing with such has been evolved and a number have been finally dealt with under this amendment to the regulations.

The mineral claim surveys of 1932 have been examined and approved or returned to the surveyor for amendment and some progress made on the examination of the 1933 surveys, the returns of which were received during the late months of the fiscal year. These disclose even greater diversity in size, the largest exceeding 179 acres of land within the area defined by the four location posts. This is one of a group of 21 claims, 12 of which exceed sixty acres in area, the total excess of the 12 claims amounting to 518 acres. It is hoped that the penalties under which the excess area of claims may be acquired will have a salutary effect upon future staking.

From the Yukon Territory, the returns of four mineral claims were dealt with, also eight and a half miles of resurvey of the base line in Bonanza creek. The original survey had become lost through dredging operations and a revival of interest in the creek and hillside claims rendered necessary the re-establishment of the lines governing their boundaries.

The transfer to the Dominion of the Duck Mountain Forestry Experimental Area in Manitoba necessitated instructions for the survey of the boundaries, and these involved the survey and adjustment of a jog at a correction line where it was affected by a heavy deflection of one of the base lines.

There are many land surveyors who are puzzled about adjusting a jog * because the Supplement to the Manual does not explain it, nor furnish a proper + table to use; nor does the empirical formula contained in the Manual emit much light. Fundamentally, where no irregularities of survey are involved, the object of the surveyor is to establish, for the Third system of survey, corresponding corners on both sides of the correction line that are on two latitude circles exactly 100 links apart. To do this he must consider the convergence between the corresponding meridian lines from the north and south, which convergence varies with the actual length of the jog and with the latitude of the correction line; it is only necessary to adopt this principle to compute the direction on which to run the trial line; any surveyor can do this for himself.

In the case in point, the deflection of the base line on the north would produce an excessive width in the road allowance opposite the western end of the jog (85 chains long), so the instructions specified that the township corner on the south side of the correction line should be established 100 links south of the theoretic position of the north side of the correction line in the range to the east, and that the north boundary of section 36 in the range to the west be drawn parallel to this said line, thus making the jog road allowance uniformly 100 links wide for one mile.

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* 1917 edition
+ 9th edition, 1918. This complicated formula was simplified in the 10th edition....

DOMINION OF CANADA

81781

ANNUAL REPORT

OF THE

DEPARTMENT OF THE INTERIOR

FOR THE

FISCAL YEAR ENDED MARCH 31, 1934

OTTAWA
J. O. PATENAUDE
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1934

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III—NATIONAL PARKS OF CANADA

IV—WATER POWER AND HYDROMETRIC BUREAU

V—TOPOGRAPHICAL AND AIR SURVEY BUREAU

VI—GEODETIC SURVEY AND INTERNATIONAL BOUNDARY COMMISSION

Moreover, the regulations had been interpreted to permit the staking of eight submerged claims from one marginal claim, and this created the necessity of defining witnessed boundaries in cardinal direction to prevent chaos in the survey of submerged claims. Considerable opposition developed to the defining of witnessed boundaries in cardinal direction and, after much discussion, the regulations were reinterpreted to permit the staking of only two submerged claims from one marginal claim, and were amended in May, 1933, to qualify the requirement that the boundaries be astronomically north, south, east, and west. The instructions for survey were immediately revised to require that boundaries partly submerged shall be produced, and submerged boundaries shall in general be parallel to the boundaries on land. These instructions have applied to the survey of 134 claims this season and so far no objections have been raised.

The regulations were further amended to provide that the excess area of over-sized claims might be disposed of under penalty per acre to the owner of the claim, or cut off by the Surveyor General for disposal otherwise. A satisfactory procedure for dealing with such has been evolved and a number have been finally dealt with under this amendment to the regulations.

The mineral claim surveys of 1932 have been examined and approved or returned to the surveyor for amendment and some progress made on the examination of the 1933 surveys, the returns of which were received during the late months of the fiscal year. These disclose even greater diversity in size, the largest exceeding 179 acres of land within the area defined by the four location posts. This is one of a group of 21 claims, 12 of which exceed sixty acres in area, the total excess of the 12 claims amounting to 518 acres. It is hoped that the penalties under which the excess area of claims may be acquired will have a salutary effect upon future staking.

From the Yukon Territory, the returns of four mineral claims were dealt with, also eight and a half miles of resurvey of the base line in Bonanza creek. The original survey had become lost through dredging operations and a revival of interest in the creek and hillside claims rendered necessary the re-establishment of the lines governing their boundaries.

The transfer to the Dominion of the Duck Mountain Forestry Experimental Area in Manitoba necessitated instructions for the survey of the boundaries, and these involved the survey and adjustment of a jog at a correction line where it was affected by a heavy deflection of one of the base lines.

There are many land surveyors who are puzzled about adjusting a jog because the Supplement to the Manual does not explain it, nor furnish a proper table to use; nor does the empirical formula contained in the Manual emit much light. Fundamentally, where no irregularities of survey are involved, the object of the surveyor is to establish, for the Third system of survey, corresponding corners on both sides of the correction line that are on two latitude circles exactly 100 links apart. To do this he must consider the convergence between the corresponding meridian lines from the north and south, which convergence varies with the actual length of the jog and with the latitude of the correction line; it is only necessary to adopt this principle to compute the direction on which to run the trial line, and any surveyor can do this for himself.

In the case in point, the deflection of the base line on the north would produce an excessive width in the road allowance opposite the western end of the jog (85 chains long), so the instructions specified that the township corner on the south side of the correction line should be established 100 links south of the theoretic position of the north side of the correction line in the range to the east, and that the north boundary of section 36 in the range to the west be drawn parallel to this said line, thus making the jog road allowance uniformly 100 links wide for one mile.

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Government of Canada
Gouvernement du Canada

ACTION REQUEST
FICHE DE SERVICE

To - À

Date

Time - Heure

From - De

Language spoken - Langue utilisée
☐ English Anglais
☐ French Français

Telephone - Téléphone

Extension Poste

☐ Please call Prière d'appeler
☐ Returned your call Vous a rappelé
☐ Will call again Vous rappellera
☐ Wants to see you Désire vous voir

☐ Action Donner Suite
☐ Comments Commentaires
☐ As requested Comme demandé
☐ Approval Approbation
☐ Draft reply Projet de réponse
☐ Signature
☐ Note and return Noter et retourner
☐ Note and forward Noter et faire suivre
☐ Note and file Noter et classer

File No. - Nº de dossier

Message taken by - Message reçu par

The original memo of
7 June, 1982 was
not found

GC 12 (91.01)   7540-21-868-3907

The original memo of
7 June, 1982 was
not found.

MEMORANDUM

Re: Width of Road Allowance on Correction Line in Dominion Lands Survey System

Surveyors still referring to the 10th Edition of the D.L.S. Manual, 1946 should correct as follows an error in section 118, paragraph 4, dealing with this matter. In the definition of θ strike out the words "per chain" and before "meridians" insert the words "the two".

This error was introduced when the mathematical formulae given in the corresponding section of the 9th Edition were changed in 1946. It was never corrected and appears again in the extracts appended to the C.L.S. Manual, 1st Edition, 1961. The paragraph in question gives the following formula for s, the departure from parallel of the limits of the road allowance across half the length of the jog between the respective control meridians:

> "Representing by J the length of the jog in links and by θ the convergence of meridians per chain, θ being expressed in circular measure,
>
> $$s = \theta \times \frac{J}{2} \text{ links."}$$

This is just the application of the formula

$$\text{arc distance} = \theta \times r$$

where θ is the angle between two radii, expressed in radians. Therefore θ in sec. 118 should represent "the convergence of the two meridians" as explained at the beginning of the section. It may be noted that θ is in proportion to α the convergence per range, as the length of the jog is to the length of the range. Referring to Figure A,

$$\theta/\alpha = J/FG$$

Formerly, to calculate θ the surveyor would obtain meridian convergence per mile at the given township line from the diagram in the star tables. After 1952, Table VIII in the Supplement gave the convergence per 100 chains on a correction line for the 3rd system.

To verify this take an example on the 1st correction line, 3rd system, between Townships 2 and 3. From Table VIII of the Supplement, jog per range = 3.42 chains. For 30 ranges, say

$$J = 30 \times 3.42 = 102.6 \text{ chains}$$

For 100 chains, the tabulated convergence is 75.15"

so that for 102.6 chains convergence is 77" = 0.000374^{r}

$$\text{Therefore } s = 0.000374 \times \frac{10260}{2} \text{ links} = 1.9 \text{ links.}$$

...2

This is of the right order whereas the text gives a result far too small.

Then for the deficiency in width of the road allowance at township corner E,

$$d = \theta \, (1) = 0.000374 \, (24{,}386 - 5{,}130) = 7.2 \text{ links}$$

It was an enquiry by an Alberta Land Surveyor in regard to this matter that drew the error in sec. 118 to our attention at this time. It had been noticed before but this puts it on record.

G Raymond

Ottawa, Ontario
June 7, 1982

G. Raymond
A/Surveyor General & Director

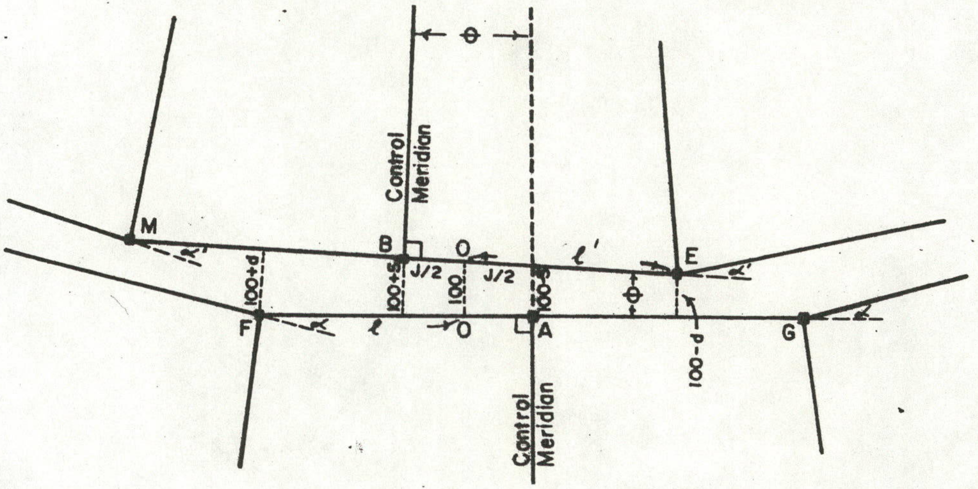
Θ
Control Meridian
M
α'
B
O
J/2
J/2
ℓ'
E
α'
100+d
100+S
100
100-S
Θ
100-d
F
α
ℓ
O
A
G
α
Control Meridian

FIGURE "A"

5

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P.A.

Energy, Mines and Resources Canada
Science and Technology

Énergie, Mines et Ressources Canada
Science et Technologie

Your file Votre référence

Our file Notre référence
2520-1

May 12, 1982

Mr. G.K. Allred,
Secretary-Treasurer,
Alberta Land Surveyors Association,
210, 14964-121A Avenue,
Edmonton, Alberta.
T5V 1A3

Dear Mr. Allred:

Re: Calculations for Correction Line in D.L.S. System.

Herewith for the information of surveyors in Western Canada who may still be referring to the 10th edition of the Dominion Lands Surveys Manual, 1946, is a memo pointing out an error in sec. 118. You may circulate the contents of this memo (for example to teaching institutions) as you see fit.

Yours truly,

f.

G. Raymond,
A/Surveyor General and Director,
Legal Surveys Division.

Encl.

Surveys and Mapping Branch
615 Booth Street
Ottawa Ontario
K1A 0E9

Direction des levés et de la cartographie
615, rue Booth
Ottawa (Ontario)
K1A 0E9

Canada

Energy, Mines and Resources Canada
Earth Sciences
Surveys and Mapping Branch
615 Booth Street
Ottawa, Ontario
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Énergie, Mines et Ressources Canada
Sciences de la Terre
Direction des levés et de la cartographie
615, rue Booth
Ottawa (Ontario)
K1A 0E9

P.A.

Your file Votre référence

Our file Notre référence
2520-1

June 18, 1982

M.R. Skelton, S.L.S.,
Secretary-Treasurer,
Saskatchewan Land Surveyors
Association,
Suite 5 - 2700 Montagne Street,
Regina, Saskatchewan.
S4S 0J9

Dear Mr. Skelton:

RE: Width of Road Allowance on Correction Line in Dominion Lands Survey System

Enclosed herewith are two copies of a self-explanatory memorandum on this subject, for the information of your Association. We would appreciate it if you would forward one of the copies to your Director of Surveys.

We might add that this memorandum is being published in the A.L.S. News and we also expect to have a condensed version published in the Canadian Surveyor.

Yours truly,

fr

Gérard Raymond
A/Surveyor General and Director
Legal Surveys Division

encl.

Energy, Mines and Resources Canada
Earth Sciences
Surveys and Mapping Branch
615 Booth Street
Ottawa, Ontario
K1A 0E9

Énergie, Mines et Ressources Canada
Sciences de la Terre
Direction des levés et de la cartographie
615, rue Booth
Ottawa (Ontario)
K1A 0E9

Your file Votre référence

Our file Notre référence
2520-1

July 6, 1982

Mr. A.L. Hayward, M.L.S.,
Secretary-Treasurer,
Association of Manitoba Land Surveyors,
171 Donald Street,
Winnipeg, Manitoba.
R3C 1M4

Dear Mr. Hayward:

Re: Width of Road Allowance on Correction Line in Dominion Lands Survey System.

Enclosed herewith are two copies of a self-explanatory memorandum on this subject, for the information of your Association. We would appreciate it if you would forward one of the copies to your provincial Director of Surveys.

We might add that this memorandum is being published in the A.L.S. News.

Yours truly,

for

W.V. Blackie,
Surveyor General and Director,
Legal Surveys Division.

Encl.

6

6

WIDTH OF ROAD ALLOWANCE ON CORRECTION LINE IN DOMINION LANDS SURVEY SYSTEM

Surveyors still referring to the ***10th Edition of the D.L.S. Manual, 1946*** should correct as follows an error in section 118, paragraph 4, dealing with this matter. In the definition of θ strike out the words "per chain" and before "meridians" insert the words "the two".

This error was introduced when the mathematical formulae given in the corresponding section of the 9th Edition were changed in 1946. It was never corrected and appears again in the extracts appended to the C.L.S. Manual, 1st Edition, 1961. The paragraph in question gives the following formula for s, the departure from parallel of the limits of the road allowance across half the length of the jog between the respective control meridians:

> "Representing by J the length of the jog in links and by θ the convergence of meridians per chain, θ being expressed in circular measure,
>
> $$s = \theta \times \frac{J}{2} \text{ links".}$$

This is just the application of the formula — arc distance = θ x r — where θ is the angle between two radii, expressed in radians. Therefore θ in sec. 118 should represent "the convergence of the two meridians" as explained at the beginning of the section. It may be noted that θ is in proportion to ∝ the convergence per range, as the length of the jog is to the length of the range. Referring to Figure A — θ/∝ = J/FG.

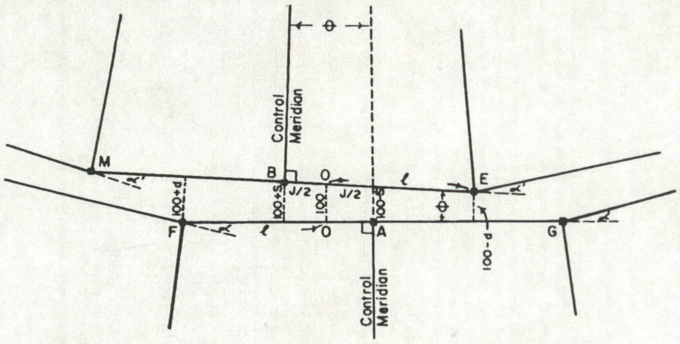


FIGURE "A"

Formerly, to calculate θ the surveyor would obtain meridian convergence per mile at the given township line from the diagram in the star tables. After 1952, Table VIII in the Supplement gave the convergence per 100 chains on a correction line for the 3rd system.

To verify this take an example on the 1st correction line, 3rd system, between Townships 2 and 3. From Table VIII of the Supplement, jog per range = 3.42 chains. For 30 ranges, say

$$J = 30 \times 3.42 = 102.6 \text{ chains}$$

For 100 chains, the tablulated covergence is 75.15"
so that for 102.6 chains convergence is 77" = 0.000374r

$$\text{Therefore } s = 0.000374 \times \frac{10260}{2} \text{ links} = 1.9 \text{ links.}$$

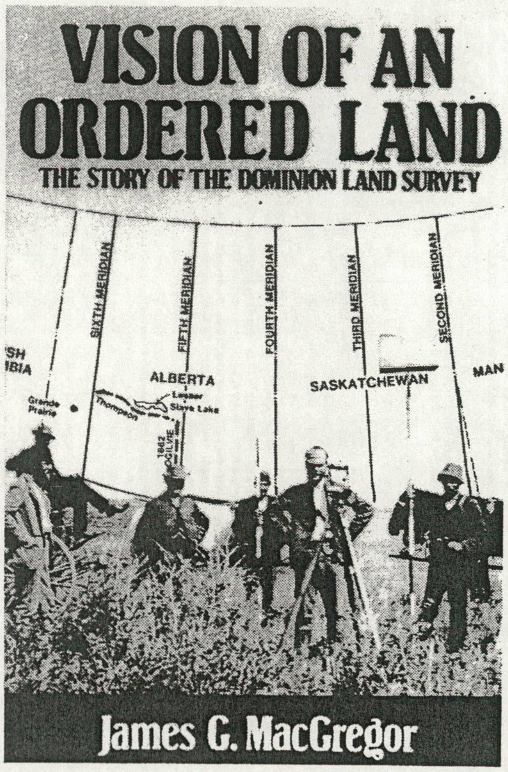
This is of the right order whereas the text gives a result far too small.

Then for the deficiency in width of the road allowance at township corner E,

$$d = 0\,(1) = 0.000374\,(24,386 - 5,130) = 7.2 \text{ links}$$

It was an inquiry by an Alberta land surveyor in regard to this matter that drew the error in sec. 118 to our attention at this time. It had been noticed before but this puts it on record.

G. Raymond
A/Surveyor General & Director



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Alberta
Land Surveyors'
Association

[redacted]

Telephone: 452-7662
114, 14315 - 118 Avenue
Edmonton, Alberta T5L 4S6

March 23, 1983

Mr. Gerard Raymond
Assistant Surveyor General
615 Booth Street
OTTAWA, Ontario
K1A 0E9

Dear Gerard:

RE: WIDTH OF ROAD ALLOWANCE ON CORRECTION LINE IN THE DOMINION LAND SURVEY SYSTEM

Enclosed herewith is a copy of page 39 of our ALS News, Summer, 1982 wherein we reproduced an article by yourself on the width of road allowances on correction lines in the Dominion Lands Survey System. It has been brought to our attention that there are errors on the distance between O and E which should read ℓ' and in the text of the article which should read $d=\theta(\ell')$. I would appreciate your comments on this theory and if you would please indicate on the copy where corrections should be made. This may very well be a result of a typographical error in this office as we have not been able to locate your original submission to us.

Yours truly,

G.K. Allred, A.L.S.
Executive Director

GKA/ss
Enclosure

SURVEYOR
GENERAL
MAR 28 [illegible]
ENERGY, MINES &
RESOURCES

8

8

Energy, Mines and
Resources Canada

Earth Sciences

Surveys and Mapping
Branch
615 Booth Street
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K1A 0E9

Énergie, Mines et
Ressources Canada

Sciences de la Terre

Direction des levés et
de la cartographie
615, rue Booth
Ottawa (Ontario)
K1A 0E9

Your file Votre référence

Our file Notre référence

2520-1

6 May, 1983.

Mr. G.K. Allred, A.L.S.,
Executive Director,
Alberta Land Surveyors'
Association
114, 14315-118 Avenue,
Edmonton, Alberta.
T5L 4S6.

Ken
Dear Mr. ~~A~~llred:

Re: Width of Road Allowance on Correction Line in Dominion Lands Survey System

I have received your letter of March 23, 1983 pointing out slight errors in my memorandum on this matter which you included in the A.L.S. News, summer 1982.

1. The error in not distinguishing the lengths of OE and AF was ours and we agree that the best way to do this is to show OE as ℓ'.

2. The typographical error in showing θ as 0 in the formulation at the end added to the confusion and this formula should now read $d = \theta(\ell')$. We leave it to you as to whether to use ℓ' or 1' but the old D.L.S. Manual uses script there.

   We note that for the example we took, the excess in width of the road allowance at F, $d = \theta\ell = 0.000374\ (24{,}215 - 5{,}130)$
   $= 7.1$ links

3. One other small point — we now find that the official abbreviation for radian in the International System of Units is rad (Standards Council of Canada, 1976).

   Corrections 1, 2 and 3 have been indicated in red on attached copy of the article.

Gérard Raymond,
Assistant Surveyor General,
Legal Surveys Division.

Encl.

Canada

G.E.L.8.

9

9

MEMORANDUM

Re: Width of Road Allowance on Correction Line
in Dominion Lands Survey System

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Ottawa, Ontario
June 7, 1982

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A/Surveyor General & Director

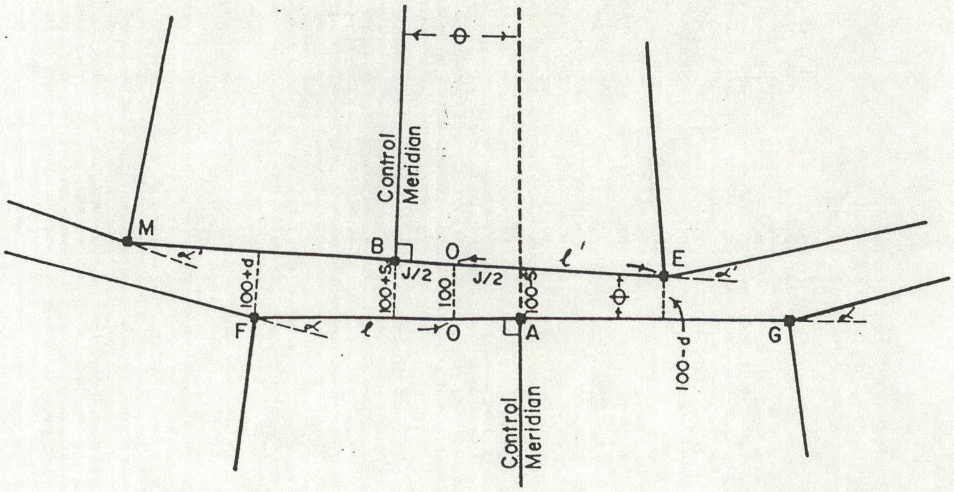

FIGURE "A"

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