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MANUAL

DOMINION LAND SURVEYS.

Department of the Interior,

CANADA.

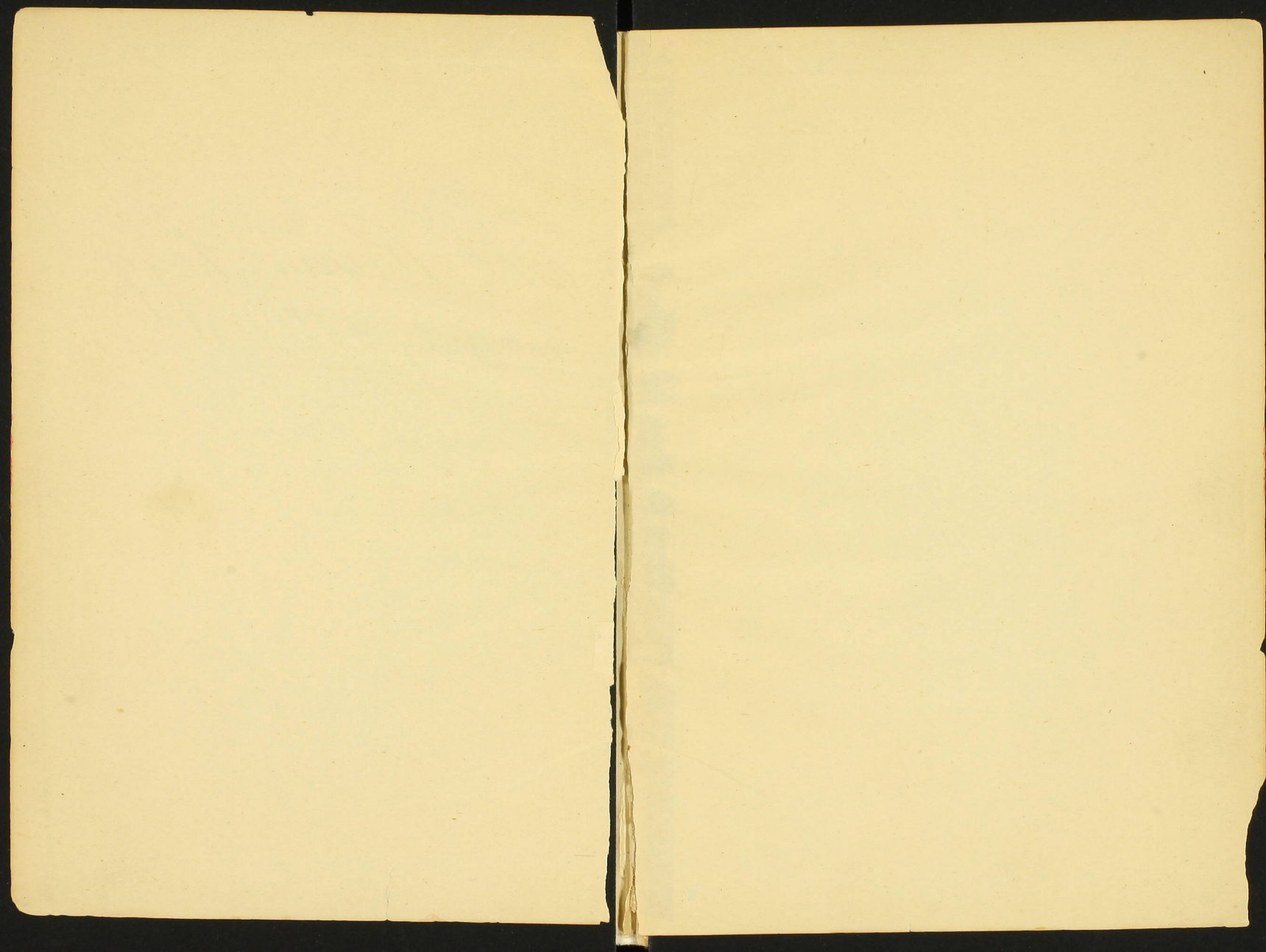
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E. L. Rowan - Legg  
July 25<sup>th</sup> 1896





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MANUAL  
SHOWING THE  
SYSTEM OF SURVEY  
OF THE  
DOMINION LANDS,  
WITH  
INSTRUCTIONS TO SURVEYORS.

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*FIRST PART—(PRELIMINARY EDITION).*

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PUBLISHED BY AUTHORITY OF  
THE MINISTER OF THE INTERIOR.

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OTTAWA :  
PRINTED BY BROWN CHAMBERLIN, PRINTER TO THE QUEEN'S MOST  
EXCELLENT MAJESTY.

1890.



NOTICE TO DOMINION LAND SURVEYORS.

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Owing to important changes in the mode of perpetuating boundary corners and in other particulars, this revised edition of the first part of the Manual of Survey has been issued for the guidance of Dominion Land Surveyors in the discharge of their official duties. It supersedes all former editions.

Surveyors are requested to govern themselves accordingly.

E. DEVILLE,  
*Surveyor-General.*

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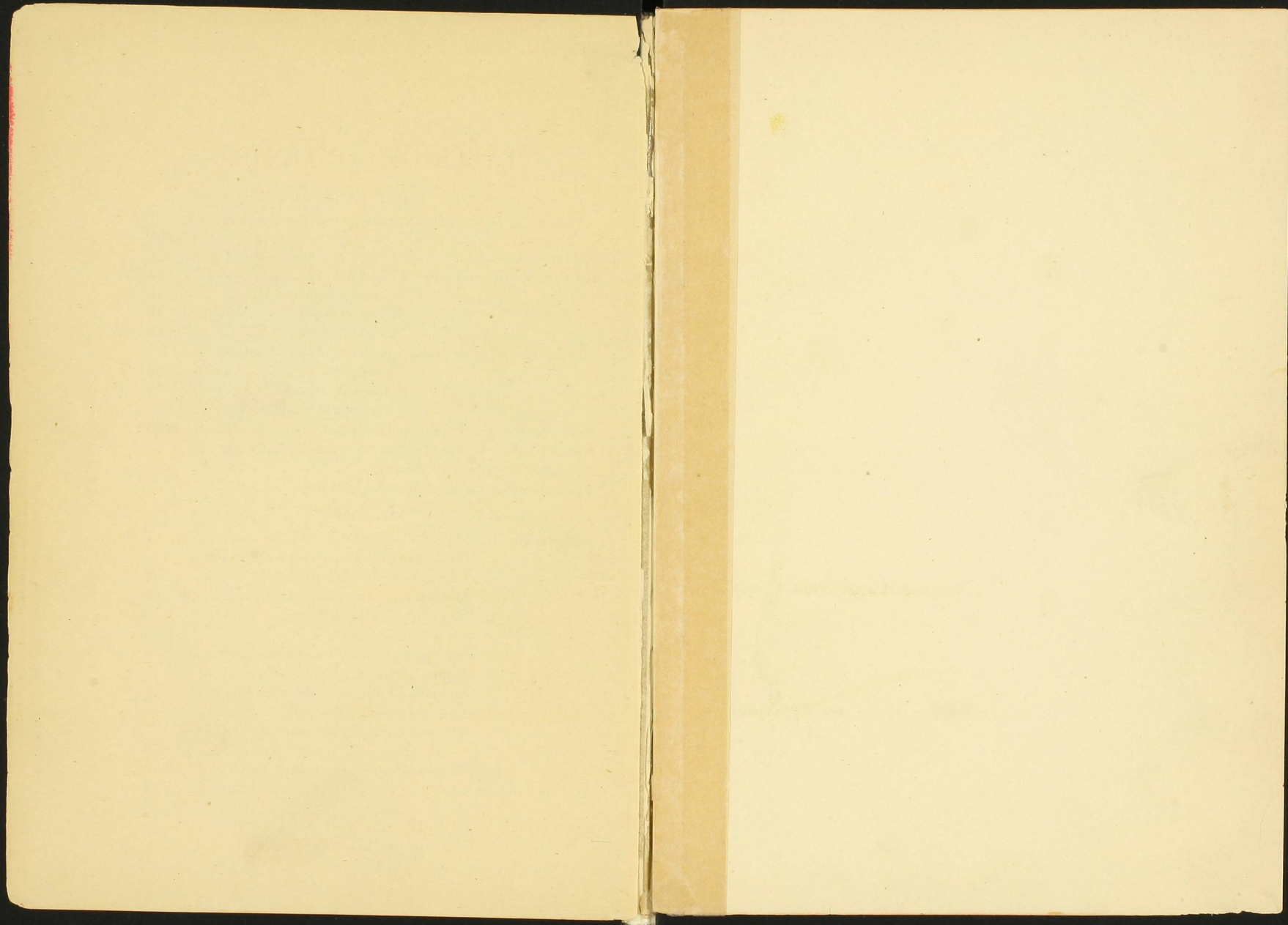
### SYSTEM OF SURVEY AND INSTRUCTIONS TO SURVEYORS.

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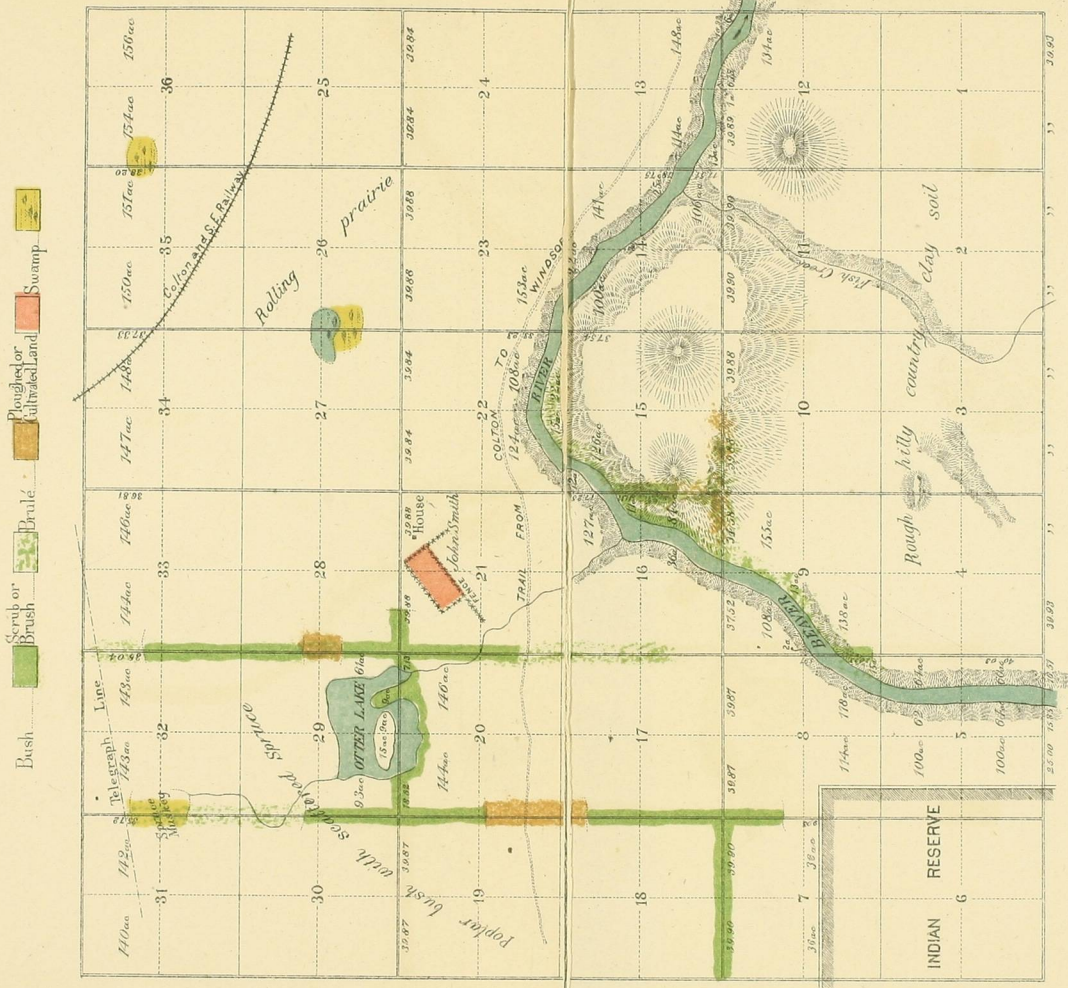
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## Diagram No. 1

# Explanation of Colours



*Surveyed by the Undersigned*

Thomas Anderson D.D.S.  
June and July 1886

Dominion Lands Office  
Ottawa

Approved and confirmed

Surveyor General

## Contents

Land in Sections.....21217. 00 Acres

Roads.....424.80 "

Water	613.00
-------	--------

Total Area.....2254.80 "



# SYSTEM OF SURVEY

## AND

# INSTRUCTIONS

## TO

# SURVEYORS.

---

### PRESENT OR THIRD SYSTEM OF SURVEY.

1. The Dominion lands are laid off in quadrilateral townships containing thirty-six sections of six hundred and forty acres or one square mile in each, subject to the deficiency or surplus from the convergence or divergence of meridians, as hereinafter mentioned, together with road allowances of one chain on every section line running north and south and on every alternate section line running east and west.

Towship contains thirty-six square miles, more or less, exclusive of road allowance.

2. The sections are bounded and numbered as shown by the following diagram :

N					
31	32	33	34	35	36
30	29	28	27	26	25
19	20	21	22	23	24
18	17	16	15	14	13
7	8	9	10	11	12
6	5	4	3	2	1
S					

W
E

Fig. 1.



Townships measure 483 chains on east and west sides, and 486 on north and south sides.

Lines bounding townships.

Lines bounding sections.

How townships are numbered.

How to designate the fractional township or range adjoining the line between two different systems of survey.

3. The township, therefore, measures on the east and west sides, from centre to centre of the road allowances bounding the same, four hundred and eighty-three chains, and on the north and south sides four hundred and eighty-six chains, subject to the deficiency or surplus from converging or diverging meridians, as the case may be.

4. The lines bounding townships on the east and west sides are true meridians, and those on the north and south sides are chords of the parallels of latitude passing through the corners of the township.

5. The lines bounding sections on the east and west sides are true meridians, and those on the north and south sides are parallel to the north and south boundaries of the township.

6. The townships number in regular order, northerly from the International Boundary or forty-ninth parallel of latitude, and lie in ranges which are numbered east and west from a meridian line styled the Principal Meridian; ranges lie also and are numbered west from other meridians styled the Second, Third, . . . . Initial Meridians, according to their order westward from the Principal Meridian.

7. The fractional township or range between two townships or ranges surveyed according to different systems, when its number is the same as the number of the adjoining one surveyed under the former system, is designated by that number, followed by the letter A, as for instance:

Tp. 19, A,

For the fractional township between townships 18 and 19 west of the Second *Principal* Meridian, and

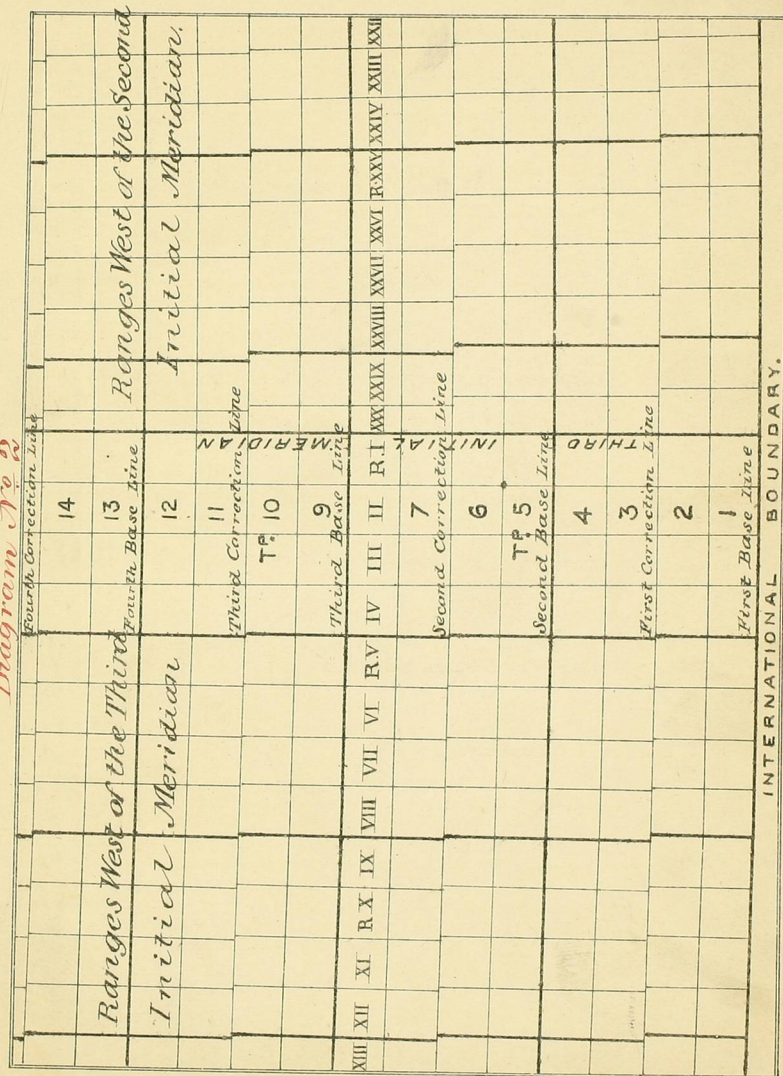
Range 21, A,

For the fractional range between ranges 20 and 21 west of the Second *Principal* Meridian.

The line between two parts of the country surveyed according to different systems is established as a correction line, that is to say, posts are planted on both sides of the road allowance on such line, each row governing the position of the boundary lines on its own side. Such road allowance is one chain and fifty links wide, except in the case of the dividing line between the third or present system of survey in the North West Territory, and the system in force in the "Railway Belt" in British Columbia, hereinafter described. Here the road allowance between the systems is one chain wide.

INTO BLOCKS AND TOWNSHIPS

Diagram No. 2





8. The sections are laid out of the precise width eighty chains, as aforesaid, or eighty-one chains with the road allowance, on certain lines called "*base lines*," and the meridians between the sections are drawn from such bases, north or south, to the depth of two townships, that is to say, to the correction lines herein-after mentioned. The sections south of the base measure therefore more than eighty chains, while they measure less north of the same line. The interval between a base line and the next one is equal to the depth of four townships.

Sections are 80 chains on base lines.

9. The "*correction lines*" are those upon which the "*jog*" "*Jog*" resulting from the want of parallelism of meridians, is allowed, or, in other words, they are those township lines running east and west which are equi-distant from the bases at the depth of two townships. The interval between the correction lines is equal to the depth of four townships.

allowed on correction lines.

10. The first base line is the forty-ninth parallel of latitude or International Boundary; the second base is between townships four and five; the third between townships eight and nine; the fourth between townships twelve and thirteen; the fifth between townships sixteen and seventeen, and so on northerly, in regular succession.

Base lines in the system.

11. The first correction line is between townships two and three; the second between townships six and seven; the third between townships ten and eleven, and so on, northerly, in regular succession.

Correction lines in the system.

12. Each section is divided into quarter sections of one hundred and sixty acres, or one-half mile square, more or less.

Division of sections.

13. Preliminary to the sub-division into townships and sections of any given portion of country proposed to be laid out for settlement, the same is laid out into blocks of sixteen townships each, by projecting the base lines and the east and west meridian boundaries of each block.

Country laid out into blocks of sixteen townships each.

14. Such blocks are sub-divided into townships by projecting the meridians from the base lines to the correction line, and connecting by straight lines the township corners on the meridians.

Blocks sub-divided into townships and how.

15. Except that in the case of the townships between the first and second bases, the meridians are to be surveyed south from the second base to the first correction line, and thence south to the first base line, making the "*jogs*" of theoretical lengths.

Exceptions.



Allowance for deficiency or surplus on meridian lines.

16. In the survey of any block or township outlines or the sub-division of any township, the surplus or deficiency found on meridians when closing on the correction line is left in the last quarter section adjoining said line.

Except on meridians across townships one and two, on which meridians the quarter sections adjoining the correction line shall be given the theoretical depth of forty chains, and the deficiency or surplus, as the case may be, shall be allowed for in the quarter sections adjoining the first base line or International Boundary.

In the case of the fractional range adjoining an initial meridian, when the initial meridian intersects the "jog" (that is when there is one more range south of the correction line than north of it), the last quarter section on the meridian township outline surveyed from the south shall be made of the same depth as that on the next meridian township outline to the east. See Fig. 17.

Corners.

17. On the block and township outlines, at the time of the survey, all townships, section and quarter section corners are marked, which corners govern respectively in the subsequent sub-division of the block or township.

Posts and monuments.

18. Only a single row of posts or monuments to indicate the corners of the township or sections (except as hereinafter provided) is placed on any survey line. These posts and monuments, as an invariable rule (with the exceptions above referred to) are placed in the west limit of the road allowances on north and south lines, and in the south limit of road allowances, or on the line between the sections, on east and west lines; and in all cases fix and govern the positions of the boundary corners of the adjoining townships, sections or quarter-sections on the opposite side of the road allowance.

Posts and monuments on correction lines.

19. The township, section, or quarter-section corners on correction lines, or on lines between different systems of surveys, are in all cases indicated by posts or monuments planted and marked independently for the townships on ~~either~~ <sup>each</sup> side; those for the townships north or east of the line, in the north or east limit of the road allowance, and those for the townships south or west, in the south or west limit. Indian reserve boundaries are also posted on both sides of the road allowance; on one side for the reserve and on the other side for the township.

Quarter-quarter sections.

20. To facilitate the descriptions for letters patent of less than a quarter-section, the quarter-sections composing every section in accordance with the boundaries of the same as planted or

placed in the original survey, are supposed to be divided into quarter quarter-sections, or forty acres, and such quarter quarter-sections are numbered as shown in the following diagram:

N			
13	14	15	16
12	11	10	9
5	6	7	8
4	3	2	1
S			

Fig. 2.

21. Legal sub-divisions as applicable to the survey, sale and granting of the Dominion lands, are as follows:—

- A section or 640 acres;
- A half section or 320 acres;
- A quarter section or 160 acres;
- A half quarter section or 80 acres.
- A quarter quarter section or 40 acres.

Legal sub-divisions of townships.

22. The township sub-division surveys of the Dominion lands, according to the system above described, are carried out and performed by contract at a certain rate per township, per mile or per acre, fixed from time to time by the Governor in Council, or by competitive tender, as the Governor in Council from time to time directs.

In special cases, where circumstances render it advisable to effect otherwise the survey of a township or townships, the Governor in Council may order the same to be done.

#### FIRST SYSTEM OF SURVEY.

23. In the first system of survey, there is a road allowance of one chain and fifty links on every section line.

Road allowances.

24. The township, therefore, measures on each side from centre to centre of the road allowance, bounding the same, four hundred and eighty-nine chains, subject to the deficiency or surplus resulting from converging or diverging meridians.

Townships measure 489 chains on each side, more or less. Closing errors left in the western range of quarter sections

25. In the survey of a township the deficiency or surplus resulting from converging or diverging meridians is set out and allowed in the range of quarter sections adjoining the western boundary of the township. It follows that generally the lines



bounding sections on the east or west sides are not meridians, but lines parallel to the eastern boundary of the township. All quarter section sides are exactly forty chains, except in the western range of quarter sections of a township and in the sections adjoining a correction line and subject to the discrepancies of the survey.

Other rules the same as in present system of survey. Area surveyed under the first system.

26. Where not provided otherwise above, the rules laid down for the present system of survey govern the first system.

27. The operation of the first system of survey is restricted to the area bounded as follows, viz.:

To the south, by the International Boundary line, to the west by the Second Initial Meridian, as far as the eighth correction line; by said correction line as far as the meridian between ranges twenty-eight and twenty-nine west of the Principal Meridian; by said meridian between ranges twenty-eight and twenty-nine, as far as the seventh correction line; by said correction line as far as the meridian between ranges seven and eight east of the Principal Meridian; by said meridian between ranges seven and eight east as far as the north boundary of Township nineteen; by the north boundary of Township nineteen in ranges eight, nine and ten east of the Principal Meridian as far as the meridian between ranges ten and eleven east of the Principal Meridian; by said meridian, between ranges ten and eleven east, as far as the third correction line; by said correction line, as far as the eastern boundary of the Province of Manitoba; by said eastern boundary as far as the International Boundary line.

Also Township 44, R. 21; Tp. 45, R. 21, 22, 27, 28; Tps. 46 and 47, R. 25, 26, 27, and 28; Tp. 48, R. 24, 25, 26 and 27, west of the Second Initial Meridian.

Townships 42 to 47 inclusive, R. 1; and Tps. 43 and 44, R. 2 and 3, west of the Third Initial Meridian.

Deficiency or surplus from converging or diverging meridians divided equally between all quarter sections. Area surveyed under the second system of survey.

28. The second system of survey is similar in all respects to the first system, except in regard to the deficiency or surplus from converging or diverging meridians which is distributed equally among all quarter-sections as in the third or present system.

29. The operation of the second system of survey is restricted to Tps. 1 and 2, R. 1 to 8 inclusive; Tps. 19 to 30, R. 1 to 12 inclusive; and Tps. 27 to 30, R. 13 to 16 inclusive; the above ranges being all west of the Second Initial Meridian.

#### SYSTEM OF SURVEY IN RAILWAY BELT, BRITISH COLUMBIA.

30. The system adopted for the survey of the lands within the belt of twenty miles on each side of the Canadian Pacific Railway in British Columbia, is the third system of the North-West Territories, modified by adding to each quarter section of 160 acres, an allowance of three acres for roads, instead of locating this allowance on the section lines.

31. This allowance is provided for by making each quarter section on the base lines 40 chains and 50 links, and on the meridians 40 chains and 25 links.



## INSTRUCTIONS TO SURVEYORS.

## FIELD WORK.

Surveys to be astronomical.

32. The surveys of the Dominion lands are to be astronomical; that is to say, the directions of their lines must be referred to the astronomical meridian. The use of the magnetic needle on Dominion land surveys is forbidden.

Chain to be used.

33. All measurements shall be made with the ordinary four pole, or Gunter's chain. It is to be tested and corrected, during use, by the subsidiary standard of the surveyor. If stopping at any point where a standard section has been established, the surveyor will train his chainmen there until they can chain correctly. Eleven pins should be used, so as to leave one in the ground when exchanging tallies. The number of chains at any point is then equal to the number of pins, minus one, *held by the rear chainman*.

Chainmen to be sworn.

34. Previous to entering on their duties the chainmen shall be sworn according to the form below and such oath shall be filed with the returns of the survey.

## (Form of Oath.)

I, A. B., do solemnly swear that I will faithfully discharge the duties of a chainman to the best of my ability and knowledge. So help me God.

(Signed) A. B.

Sworn before me at this day of 18 } ..... C.D..... D.L.S.

Precautions in chaining over broken ground.

35. In chaining over uneven ground, should the same be so broken as not to permit of the full chain being levelled, the measurement should be made with such portion thereof as may be easily levelled, and particular care should be taken at such times, in plumbing and dropping the pins, in order to obtain the accurate horizontal measurement.

Obstacles on the line,

36. In case the survey line be obstructed by a lake, pond, deep marsh or other obstacle, the surveyor will pass it by right-angled offsets; or, if more convenient, by a trigonometrical operation. The angle opposite to the base should be, whenever practicable, at least thirty degrees. It shall never be less than fifteen degrees.

37. Surveyors will understand that all lines through woodland are to be well opened out, those connecting the posts are to be marked by blazing the adjacent trees on three sides, namely, each of the sides in the direction in which the line is being run as well as the side on which the line passes.

38. No blazes or marks of any description are to be made on traverse lines between the points on township or section lines which intersect the same. No blaze on traverse lines.

39. The Dominion Lands Law does not recognize a blazed line as a legal boundary; therefore it is not necessary that any such line be a perfectly straight one, but it should never differ very much from it. When correcting a trial line in the woods, the surveyor, instead of opening the true line, may connect the trial line with the posts by short lines. The angles formed by the latter and the trial line should, however, not be too large, say not over 5°. The blazed line must pass through all the posts. Blazed lines not required to be perfectly straight.

40. The instructions contained in the Manual are to be strictly followed, even when there appears to be evident advantage to depart therefrom. Errors in the lines previously surveyed, or any other reason, would not justify a departure therefrom. Instructions to be strictly followed.

41. When a township, whether fractional or otherwise, adjoins lands surveyed under a different system, all lines within such township must be stopped at the inner side of the road allowance dividing the two systems and a corner post or monument erected at the point of intersection. In no case must a line be extended across the aforesaid road allowance. Surveys under different systems to be distinct.

42. A road allowance of the same width as in the adjoining township is to be left on the boundaries of all Indian reserves, and the intersections of the section lines with the inner side of such road allowance are to be indicated by proper posts or monuments. When a reserve not yet surveyed is to be formed of a certain number of full sections, the surveyor, in establishing the same, shall plant the posts as usual on the west and south boundaries; but on the north and east side they are to be planted in the north or east limit of the road allowance. The side of the road allowance adjoining the township is the only one to be posted by the surveyors employed by the Department of the Interior. Road allowance to be left on Indian Reserve boundaries.

## BOUNDARY CORNERS.

43. Having ascertained by exact running and measurement the proper point for establishing the township, section or quarter-section corner, as the case may be, the surveyor, in marking the same, is to be governed by the following directions:—



Township corner on wooded spot.

44. On a wooded spot a township corner is marked by a pointed iron tube five feet long and one and three-eighth inches in diameter. It is driven perpendicularly with a sledge to within ten inches from the top, and the appropriate marks and numbers as hereinafter directed are cut thereon with a cold chisel. A mound of earth is erected as hereinafter described.

Township corner on prairie spot.

45. On a prairie spot the corner of a township is also marked by an iron tube as above, but no mound is built; the earth from the pits is scattered about.

Section corner on a wooded spot.

46. A section corner on a wooded spot is to be marked by an iron tube three feet long and three-quarter inch diameter, driven into the ground to within ten inches from the top. It is marked with a cold chisel, and a mound of earth is erected as hereinafter described.

Section corner on a prairie spot.

47. On a prairie spot a section corner is marked as above, but no mound is built. The earth from the pits is scattered about so as not to attract attention.

Quarter section corner on a prairie spot.

48. A quarter-section corner is marked, in prairie, by a wooden post planted in the centre of four pits as hereinafter described, such post to be two feet six inches long, so as to be eighteen inches in the ground and twelve inches above. It is flattened on two sides and marked with the fraction  $\frac{1}{4}$  (fraction wise) to identify it as a quarter-section post. The flattened sides should be at least three inches wide and placed at right angles to the direction in which the line runs. When wood for posts is not to be found within three miles from the site of a quarter-section corner, such corner may be indicated simply by four pits.

Quarter section corner on a timbered spot.

49. In the woods, a quarter-section corner is marked by a wooden post, flattened and marked on two sides as above, and at least eighteen inches above and twelve inches below the surface of the ground. No mound is erected.

Form, size and height of the mounds.

50. The mounds erected at the corners of townships and sections in the woods are to be in the form of rectangular pyramids. The mound thrown up at the corner of a township will be three feet high with sides of base six feet; at section corners, the sides of the base will be five feet, and the height two and a-half feet.

Earth to be taken from pits.

51. In the formation of mounds, the earth will be taken from four several "pits" three feet square and eighteen inches deep, the centres of the pits to be four feet six inches outside and opposite the centres of the respective bases. These regulations as to size, depth, and position of pits will be rigidly enforced.

In wooded country one of the pits may be omitted, when, on account of large trees or other obstacles, it is found impracticable to dig the four pits.

In prairie, the pits are of the same size and in the same position as above, but the earth taken therefrom, instead of being used for building a mound, is scattered.

52. Mounds are to be formed of solid earth, sod, roots and all foreign substances being excluded, and the earth well pressed down with the spade during the process. The post is to be firmly planted in the solid ground before beginning to build the mound. In order to facilitate the speedy erection of the mound, a rope skeleton may be used. By taking hold of each corner and making a knot of the three lines running to it, the line is carried without becoming tangled; or the spade used may have marked on it the distance from the centre to the corners of the mound and to the sides of the pits, and small pickets be planted at those distances and in the proper directions,

To be formed of solid earth.

53. Whenever stones can be readily procured, mounds must be built of stones properly piled so as to conform as nearly as possible in size and shape to the earth mounds. A mound must not be made partly of stone and partly of earth.

54. On all north and south, and east and west survey lines, excepting the correction lines and lines between different systems of survey, corner posts and mounds shall be so placed that lines connecting the cardinal points will pass through the angles.

Angles of mounds to be towards the cardinal points.

55. Witness posts and the posts and mounds erected to mark the corners in either limit of the road allowance on correction lines and lines between different systems of survey shall be so placed that lines connecting the cardinal points shall pass through the centres of the bases of the mounds or of the faces of the posts.

Exception on correction lines, in which case they will stand square with the line.

56. In wooded spots, the positions of the pits relative to the directions of the lines may, when necessary, be altered to suit circumstances, provided the distances between themselves and from the centre of the mound are preserved.

Pits in wooded spots.

57. If a township or section corner fall in a lake, bed of a stream or in any other locality unfavorable to the planting of a post, the digging of pits or the erection of a mound, the surveyor shall perpetuate such corner by a witness iron post with trench or mound and trench, at the nearest suitable point of the surveyed line, that is either north, south, east, or west of the true corner. The distance in chains and the bearing of the site of the true corner from such witness post are to be cut on the post with

Witness post.



a cold chisel, the bearing being indicated by one of the letters N. S., E., or W. By placing the post at an even number of chains from the corner the marking of the post will be simplified. Care must be taken to indicate the bearing from the witness post to the true corner ; thus a witness post south of the true corner is to be marked with letter " N " for north.

Witness mound or trench.

58. A witness trench is circular, and six feet inside diameter. The trench proper is twenty-four inches wide and twelve inches deep.

In prairie, the earth taken from the trench is scattered about, but in the woods it is employed to build a conical mound, six feet in diameter and two and a-half feet high. It is thrown up so that the post stands at the point of the base nearest to the corner, while in prairie, the post is at the centre of the trench.

Mounds at township and section corners.

59. The mounds thrown up at township and section corners will be so placed that the post will stand at the northerly angle or point thereof.

Mounds at township, section and quarter section corners on correction lines.

60. Except on correction lines and on the lines between different systems of survey, where the township and section corner mounds will be so placed that the post will stand precisely in the centre of the north or south base as the corner may be intended for the township south or north of the correction line.

Pits without mound at township, section and quarter section corners.

61. In prairie, the pits for township and section corners are in the same position as if a mound of the proper size had been thrown up around the post as a centre. The post stands therefore at the intersection of the lines joining the middle points of the opposite pits.

The pits for a quarter section corner are the same as for a section corner.

Wooden posts to be bevelled.

62. All wooden posts are to be bevelled on top to turn rain.

#### MARKS ON POSTS.

Posts at township and section corners generally.

63. The post planted at a township or section corner not on a correction line or on a line between different systems of survey is to be marked on its south-west side with the number of the section the north-east corner of which the post is to indicate, followed by the numbers of the township and the range in which that section lies.

DIAGRAM N<sup>o</sup> 3

## EARTH MOUND AND PITS

PERSPECTIVE

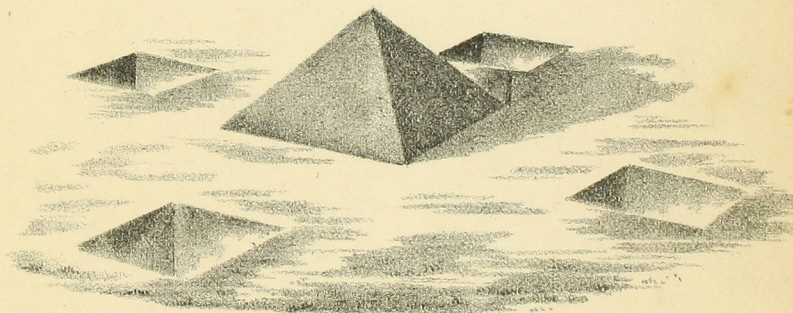




DIAGRAM N<sup>o</sup> 4

# EARTH MOUND AND PITS

SECTION

2 1/2' high for Section  
and quarter section corners

3' high for Township  
corners

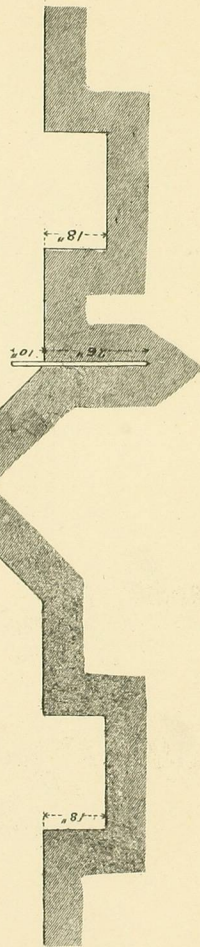


DIAGRAM N<sup>o</sup> 5

## POST AND PITS FOR PRAIRIE SPOTS

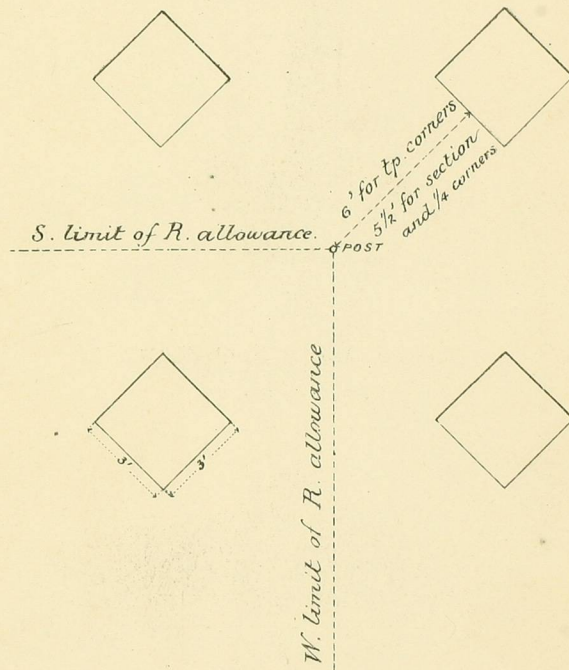
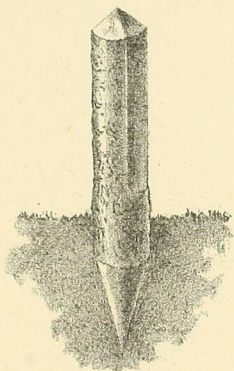


DIAGRAM N° 6

**POST**  
QUARTER SECTION  
3 INCHES WIDE FLATTENED



**STONE MOUND**  
PERSPECTIVE

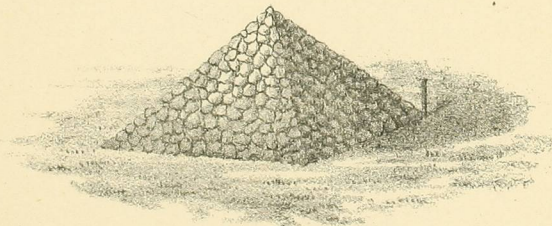


DIAGRAM N° 7

**ORDINARY MOUND FOR WOODED SPOTS**  
6 FEET SQUARE FOR TOWNSHIP CORNERS  
5 FEET SQUARE FOR ALL OTHER CORNERS

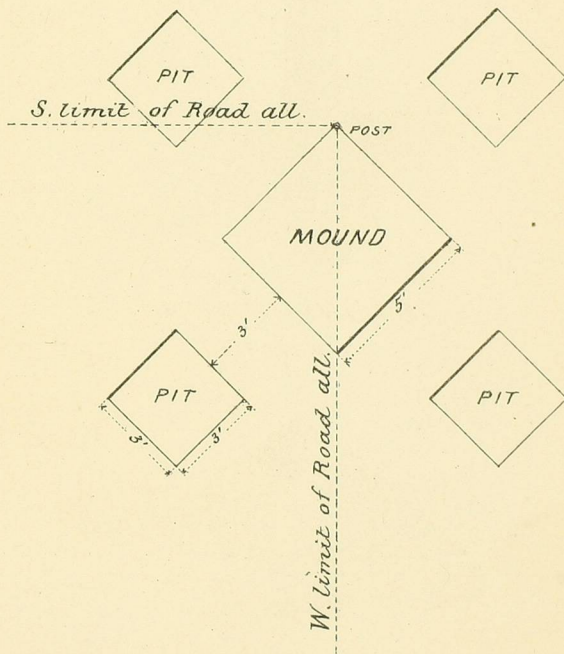




DIAGRAM N° 8

MOUND ON CORRECTION LINE

6 FEET SQUARE FOR TOWNSHIP CORNERS

5 FEET SQUARE FOR ALL OTHER CORNERS

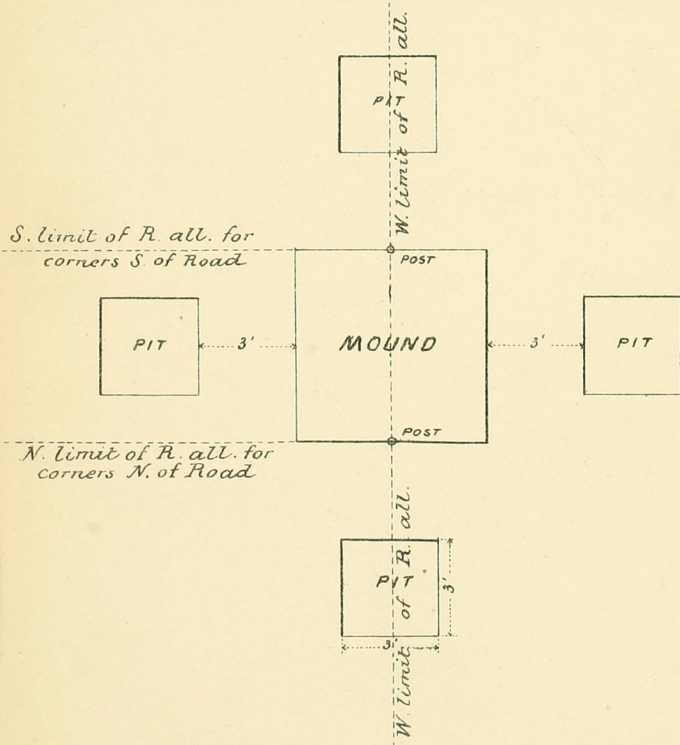


DIAGRAM N° 9

PITS ON CORRECTION LINE

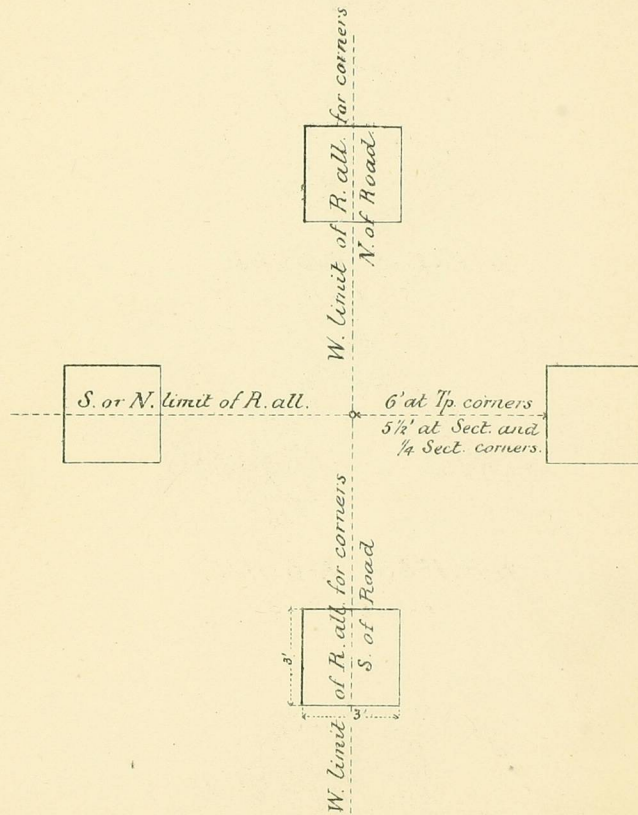
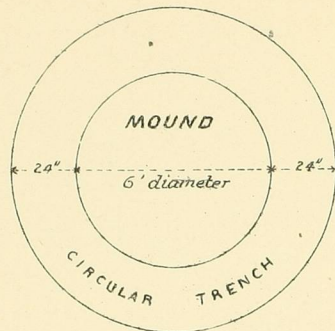


DIAGRAM N° 10

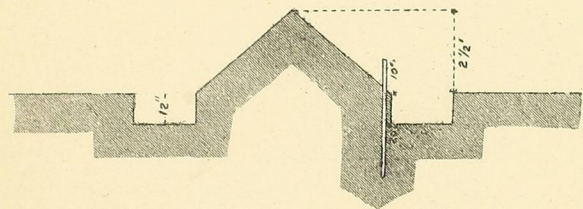
WITNESS MOUND

PLAN



WITNESS MOUND

SECTION



WITNESS MOUND

PERSPECTIVE

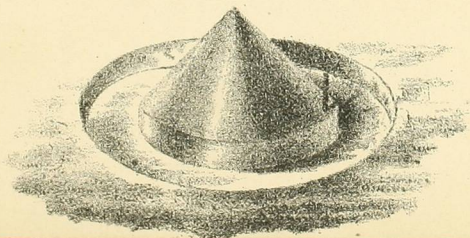
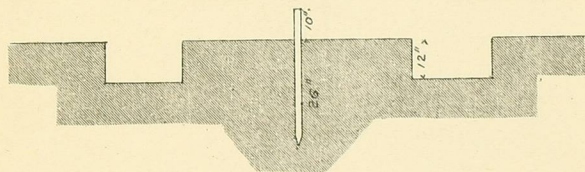
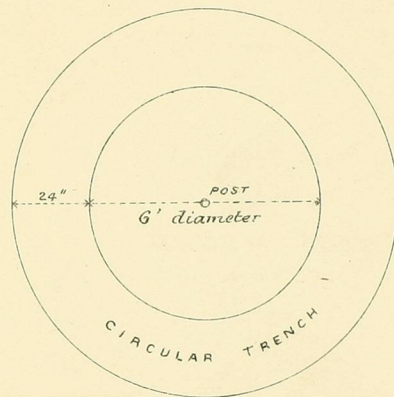


DIAGRAM N° 11

WITNESS TRENCH

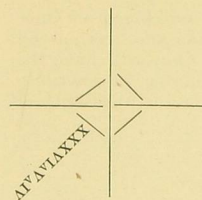
PLAN



WITNESS TRENCH

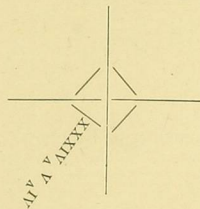
SECTION





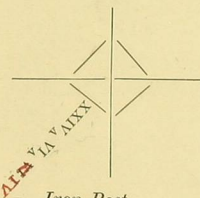
For the corner between Townships 5 and 6, and the 3rd and 4th Ranges.

*Iron Post.*  
*Fig. 3.*



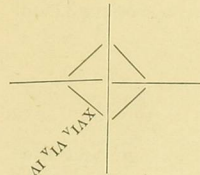
For the northerly corner between Sections 34 and 35, Township 5, Range 4.

*Iron Post.*  
*Fig. 4.*



For the easterly corner between Sections 24 and 25, Township 6, Range 4.

*Iron Post.*  
*Fig. 5.*



For the corner between Sections 15, 16, 21, 22, Township 6, Range 4.

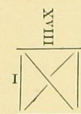
*Iron Post.*  
*Fig. 6.*



Posts at corners on correction lines.

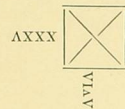
64. Posts at township and section corners on correction lines are to be marked exclusively for the townships and sections on the respective sides of the road allowance. They will have the number of section on the west side and the number of township and range on the north or south side for posts north or south of the road allowance respectively.

For instance :—



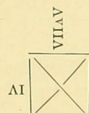
Iron post.  
Fig. 7.

For the south-east corner of Township 3, Range 10.



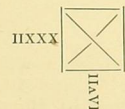
Iron post.  
Fig. 8.

For the north-east corner of Township 6, Range 5.



Iron post.  
Fig. 9.

For the southerly corner between Sections 3 and 4, Township 7, Range 5.



Iron Post.  
Fig. 10.

For the northerly corner between sections 32 and 33, township 2, range 6.

Posts on east and west lines between different systems of survey.

65. Posts at township and section corners on east and west lines dividing two systems of survey are to be marked in the same manner as posts on correction lines.

66. Posts at township and section corners on north and south lines dividing two systems of survey are to be marked on their south side with the number of the section the north boundary of which they indicate, and with the number of the township and range on their east or west side, according as the posts are on the east or west side of the road allowance respectively.

For instance :—



Fig. 11.

XXVIII<sub>A</sub> XVI

For the post marking the north-westerly corner of Section 7, Township 28, Range 16, west of Second Initial Meridian, on the east side of the road allowance dividing the second from the third system of survey.

XXVIII<sub>A</sub> XVII



Fig. 12.

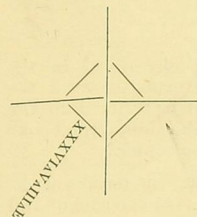
For the north-easterly corner of Township 28, Range 17, west of the Second Initial Meridian.

67. The general rule is that posts which govern townships and sections on both sides of the road allowance are to be set diagonally, and marked as above; but those which govern only townships and sections on one side of the road are set square to the cardinal points.

Quarter section posts are always set so that the flat sides face the direction of the line, and they are marked with the fraction  $\frac{1}{4}$ .

68. In ranges numbered from the principal meridian, the letter W or E will be marked on the post after the number of the range, to denote that it is west or east of the meridian, as for instance :

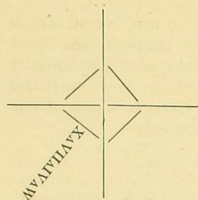
Marks of boundaries in ranges numbered from the principal meridian.



Iron post.  
Fig. 13.

For the township corner between Townships 5 and 6, and the 3rd and 4th Ranges east of the Principal Meridian.





For the corner between Sections 10, 11, 14, 15, Township 7, Range 4, west of the Principal Meridian.

*Iron post.*

*Fig. 14.*

Letters W and E to be marked only for principal meridian.  
Witness post.

69. The letters W and E are not to be marked for any meridian other than the Principal Meridian. The number of meridian is never to be marked.

70. The distance in chains and the bearing of the true corner are marked on the side of the post facing towards the corner, thus:



For witness post standing four chains north of the corner of the section.

*Fig. 15.*

How marks are to be made.

71. Marks on an iron post are to be made with a hammer and cold chisel. Wooden posts are to be marked neatly and distinctly with a knife or scribing iron, which is to be kept in good order by a whetstone and small file carried for the purpose.

The surveyor will be careful to provide himself with these very indispensable implements before leaving for his survey.

#### THE FIELD BOOK.

Field notes.

72. The field-notes sent in to be placed on record in the Dominion Lands Office are to be a fair and exact copy of the original notes taken in the field, and are to be written in the books furnished for that purpose (bound at the side); the books supplied for field use are not accepted as office copies.

Of the field book.

73. The first page will give the title, showing the nature of the survey, by whom surveyed, and the dates of commencement and completion of the work. The second page will contain the names

and duties of all assistants, and whenever a new assistant is employed or anyone changed, an appropriate entry thereof with the reasons therefor will be made in the field book previous to entering any notes under the changed arrangements. The third page will contain a skeleton diagram, with each section line numbered to correspond with the page of the notes.

74. The field notes must be a faithful, distinct and minute record of everything officially done and observed by the surveyor and his assistants pursuant to instructions in relation to running, measuring and marking lines, establishing boundary corners, laying off road allowances, &c., and present, as far as possible, a full and complete topographical description of the country surveyed.

75. The field-notes of every section line surveyed must be complete in themselves, and be placed on a separate page. Section lines are to be entered in the Field Book in the order in which they are run. The chaining must, in all cases, commence on the inside of the road allowance so as to show for the quarter-section and section corners the distances from the corner of the section.

Each page to be complete.

76. Section lines are to be described as north and east boundaries of sections, not as south or west boundaries, except on the north side of a correction line where they are properly described as south boundaries of sections 1, 2, 3, . . . &c. On Indian Reserve boundaries and on lines between different systems of survey, cases may also occur in which the lines surveyed are the south or west boundaries of sections.

Description of section lines.

77. The measurements on a section line are to be given in all cases exclusive of road allowances.

78. The following abbreviations of words, but no others, will be allowed in the notes, that is to say:—

Abbreviations allowed.

“Sec.” for “Section,” “Tp.” for “Township,” “R.” for “Range,” “N.” for “North,” “S.” for “South,” “E.” for “East,” “W.” for “West,” “diam.” for “diameter,” “chs.” for “chains,” “lks.” for “links,” “dist.” for “distance” or “distant,” “W. M.” for “Witness Mound,” “W. T.” for “Witness Trench,” “I.P.” for “Iron Post,” “I.P. and M.” for “Iron Post and Mound,” and “I.P. and Pits,” for “Iron Post and Pits.”

79. The field-notes must be always written down on the spot, leaving nothing to be supplied from memory, and are to give the following information in relation to the survey:—

Information to be given in notes.



(a) The length and exact bearing of every line run, noting all necessary offsets therefrom, with the reasons for the same.

(b) The course and distance for all witness mounds and bearing trees, with the kind and diameter of the latter.

(c) The character of corner boundaries, if wooden post, mark "W.P." if iron post and mound, "I.P. and M."; if iron post and pits "I.P. and pits"; stone mound "Stone M."; and whether such corner boundary was or was not established by a previous survey. The above information is to be given on each page for every corner shown thereon.

(d) The distances at which the line first intersects, and, also, where it leaves settlers' claims or improvements, lakes, ponds, rivers, bottom lands, swamps, marshes; also the beginning of ascent, the top and the foot of descent, of all remarkable hills or ridges, with their estimated height in feet above the bottom lands near which they may be situated; also where a stream, lake or pond is crossed, the data used for ascertaining the distance across it.

(e) The course, average width and depth, and rate of current of all streams, and whether the water is fresh or salt in the lakes which may fall within the survey.

(f) Whether the surface of the country is level, rolling, broken or hilly.

(g) The nature of the soil, classifying it, according to its fitness for agriculture, as first, second, third, or fourth rate,—entering the class, at the time of survey, on each quarter-section where indicated in the notes.

(h) Depth of loam and kind of sub-soil, where pits are dug.

(i) If there is timber, the kinds, quality and average dimensions thereof.

(j) Rapids or falls of water affording mill sites, with estimated fall and supply of water in general terms.

(k) Coal deposits, minerals (transmitting specimens of the same), and salt springs, &c., &c.

Field-notes  
to be distinct  
and neat.

80. The field-notes must be distinctly and neatly made out in language precise and clear, and their figures, letters, words and meaning, are always to be unmistakable.

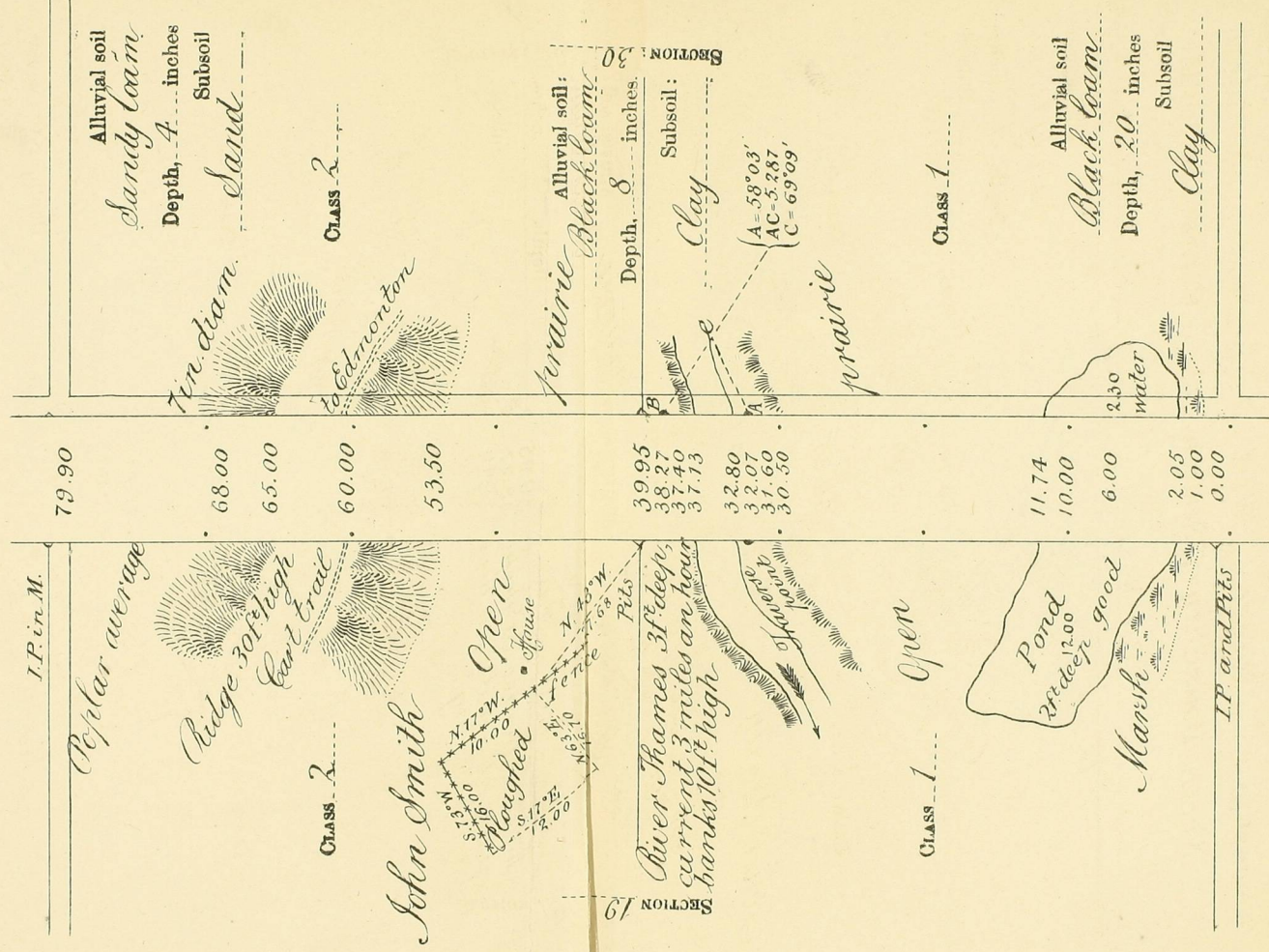
Road allowances  
to be ruled in.

81. The road allowances in the Field Book are to be ruled in the proper position, and the position of corner boundaries indicated.



Diagram No. 12.

Township \_\_\_\_\_, Range \_\_\_\_\_ West of \_\_\_\_\_ Meridian  
North Boundary of Section 12 Course: S 89° 30' W



The above line was run on the Twelfth day of August 1883

82. Following the field-notes the surveyor will make the following affidavit :—

Affidavit to  
be made,

I ..... of the ..... of  
..... in the Province of ..... Dominion  
Land Surveyor, make oath and say that I have, in my own proper  
person, according to law and the instructions of the Surveyor-  
General, faithfully and correctly executed the survey shown by  
the foregoing field-notes and accompanying plan, and that the  
said field-notes and plan are correct and true to the best of my  
knowledge and belief. So help me God.

Sworn before me at ..... }  
this ..... day of ..... 18... } *D.L.S.*



## SUBDIVISION OF TOWNSHIPS INTO SECTIONS.

### INSTRUMENT AND METHOD OF SURVEY.

**Instrument.** 83. The instrument used in subdivision surveys is to be a transit, transit theodolite or solar compass, reading at least to minutes; before use it shall be submitted for the inspection and approval of the Surveyor-General.

As explained in the exposition of the system of survey, all surveys are to be astronomical; they shall, therefore, be performed independently of the magnetic needle.

**Outline diagrams.** 84. The subdivider will receive from the head office, or from the surveyor of outlines, diagrams showing the outlines surveyed.

**Chaining to be compared with previous lines.** 85. Before the subdivider enters on his survey he will measure carefully one or two miles of the township outline; this will enable him to compare his chaining with that of the lines previously run, and to modify it so as to obtain the best agreement with the township outlines.

**Subdivider to establish the north and south boundaries of the township before commencing the subdivision.** 86. The meridian exteriors of a township are established by the surveyor of township outlines. The subdivider will, therefore, commence his operations by running the north and south boundaries of the township, if they have not been previously surveyed.

In order to do so he will join, by a trial line, the opposite township corners on the meridians, and, returning, plant the posts permanently, making all quarter-sections equal. The appended table gives the number of minutes by which the course of the trial line is to be altered in order to strike the post. The true course is to be given in the field-notes.

Only one side of a correction line is to be surveyed at one time. The process will be the same as described above.

**Correction lines near an initial meridian.** 87. When a correction line has to be deflected across the last fractional range in order to close on an initial meridian, the south or the north side, as the case may be, of the road allowance

is to be broken in such a way as to leave the full width of one chain for the road.

The general case is represented in fig. 16.

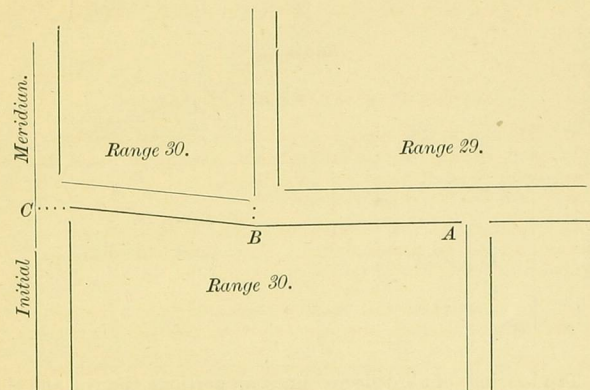


Fig. 16.

The north-east corner, A, of the last range is joined by a straight line to a point, B, one chain south of the post at the west end of the "jog," and this last point is again joined by a straight line to the corresponding post, C, of the initial meridian. The northern boundary of the township is thus a line, A B C, broken at B.

88. Another position of the lines is shown in fig. 17, the initial meridian intersecting the "jog". The south-east corner, A, of the last range on the north side of the correction line, is joined by a straight line to a point, B, one chain north of the post at the eastern end of the jog, and this last point is again joined by a straight line to the corresponding post, C, of the initial meridian. The southern boundary of the township is thus a line, A B C, broken at B.

When the initial meridian intersects the jog.



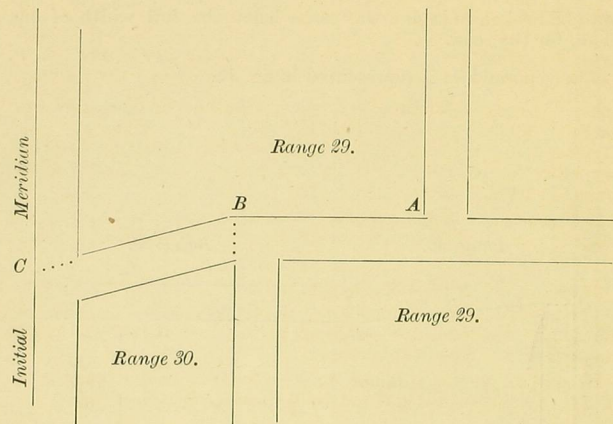


Fig. 17.

The bearings of all deflected lines or portions thereof and the points of deflection must be given in the notes.

How townships are to be subdivided.

89. A township is to be sub-divided by first projecting meridians, and then joining the opposite corners on such meridians by trial lines. The appended table may be used in this case for correcting the trial lines.

The true course of each line must be shown in the field notes. It is wrong, for instance, to enter a course as west, when the direction although westerly, is not exactly west.

In sub-dividing a township, the quarter-section posts on east and west lines are placed midway between the section corners on the respective meridians, that is to say, both quarter-section sides are made equal.

In closing with a meridian on the north or south boundary of a township, the last quarter-section post on such meridian is at once planted permanently and connected by a straight line with the section corner on the outline of the township. The true course of the deflected line and also the distance east or west from the corner, of the intersection of the township outline by the trial line, are to be entered in the notes.

The directions given above (§ 39) in regard to blazed lines apply in this case.

Should a meridian strike more than fifty links from the corner on the outline, the whole of such meridian must be re-surveyed across the township. Offsetting the posts is not sufficient, a new line must be run and, if in the woods, opened throughout.

90. The only section lines to be surveyed, established and permanently marked as boundaries are those along which the road allowances are. Their total length for every township is forty-two miles and twenty-seven chains, more or less, exclusive of township lines.

Lines to be surveyed.

Indian reserve boundaries and other lines must also be retraced, when the areas of the quarter-sections adjoining cannot be found without such a survey.

91. In starting from a correction line, the surveyor will give to the adjoining quarter-section, a depth proportional to those of the quarter-sections at each end of the tier, as shewn on the diagram of the township outlines.

Quarter sections adjoining correction lines.

He will be careful to connect with the posts in the inner limit of the road allowance and not with those in the outer limit.

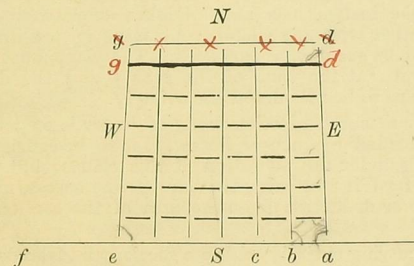


Fig. 18.

It has been explained, in the exposition of the system of survey, that sections are of unequal width, on account of the convergence or divergence of meridians. To better illustrate this fact the convergence has been exaggerated in Fig. 18.

92. The angle formed by the meridians with the east and west lines is different for each meridian and varies uniformly from one corner of the township to the other. The surveyor shall not, therefore, start his meridians at right angles to the township lines, but he must, in each case, calculate the angle formed by these two lines from the data supplied to him with the diagram of township outlines.

Angles of meridians with east and west lines.



Supposing, for instance, the angle  $d a f$  to be  $90^{\circ}03'$ , and  $g e f$   $90^{\circ}09'$ , he will use as angles at  $b, c, S$ , &c.,  $90^{\circ}04'$ ,  $90^{\circ}05'$ ,  $90^{\circ}06'$ ,  $90^{\circ}07'$ ,  $90^{\circ}08'$ .

The angles, between the meridians  $a d$  or  $e g$ , and the east and west lines, would be deduced in a similar manner.

Limits of  
error  
allowed.

93. It follows, from the foregoing, that all quarter-sections on meridians are to be forty chains except in the tiers of quarter-sections adjoining the correction lines, where they should be proportional to the quarter-sections at each end of the tier. Should all the survey lines be perfectly correct, all other sections should have the theoretic width. The maximum error in distance that will be allowed in the closing of any section corner will be fifty links. When the closing error exceeds this quantity, the lines involving the error must be re-surveyed. The opposite boundaries of sections are to be within fifty links of equal length.

All distances to be entered in the field book such as measured on the ground.

Rivers,  
lakes and  
islands to  
be sur-  
veyed.

94. In sub-dividing townships, such rivers as are specially mentioned in the instructions and all lakes over twenty acres in extent, together with any islands containing not less than twenty acres, are to be accurately surveyed. The plans must show the extent of water at the time of the survey and the deductions from areas are to be calculated accordingly.

Whenever a marsh or other body of water is so deep that it cannot be forded by men or horses, it is to be considered as a lake, coming under the operation of this clause; but when it is possible to ford it and carry the survey line across, no traverse of the same or deduction from the area of the section is to be made.

Lakes occurring entirely within a section and islands in lakes and rivers must have their traverse properly connected with the rest of the survey. When a river which is to be traversed exceeds three chains in width, the surveyor will traverse both banks of the same, referring to such traverse in his field notes as on the "right" or "left" bank, as the same would be on his right or left, respectively, looking down the stream.

Points of the feature traversed shall be so determined that the distance of any point from the next one does not exceed ten chains; they may be fixed either by offsets or auxiliary bearings and distances. Traverse lines are to be connected with the nearest post on all section lines which they intersect.

The use of the micrometer for such work will be allowed, provided that the closing error does not exceed one chain in one

hundred chains. The micrometer must be of an approved pattern and must be submitted to the Department before being used on the survey.

95. At those points where township or section lines intersect the banks of a stream or lake to be traversed, temporary posts or marks are to be established, and the distance across the river between the same ascertained trigonometrically or otherwise, at the time of running such lines. Such temporary marks or posts will be called traverse points, and are to be marked T.P. The survey of a stream or lake will be effected by connecting them with traverse lines and offsets, on the respective sides of the river or lake, the bearings of such lines being checked at the intersection thereof by each township or section line.

96. Traverse lines shall be run to settler's claims or improvements, and the extent and position thereof shown on the plans of the survey. Settlers  
claims or  
improve-  
ments.

97. The surveyor will also obtain from every settler a statutory declaration, on the form supplied, setting forth the date at which he first began continuous occupation of the land; whether he is aware of any conflicting claim thereto; if so, its nature and the name of the claimant. Statutory  
declara-  
tions to be  
obtained  
from set-  
tlers.

The settler is also therein to declare whether or not he has previously had a homestead entry, if so, the number of quarter-section and township.

In signing the declaration, the settler is to write clearly all his names in full, and see that there is no accidental error in the spelling of these.

If some of the words in the printed form do not agree with the declaration of the settler, they must be crossed over and new sentences added where necessary.

All declarations from squatters are to be accepted, no matter how many there may be on a quarter-section. The only case in which a declaration should be refused is when it is clearly untrue, or in opposition to the facts.

A statutory declaration does not give any right or legal status to the declarant; it is simply for the information of the Department.

98. Surveyors are strictly forbidden to make any charge to squatters for receiving their declarations, and to say that, by doing so, claims will be secured. Such a practice would expose a surveyor to prosecution for obtaining money under false pretences, and to dismissal from the practice of the profession under clause 120 of the Dominion Lands Act. No charge  
to be made  
for statu-  
tory decla-  
rations.



It is no part of the duty of a Surveyor to explain the law or to give directions to intending or actual settlers for securing land, and surveyors in the employment of the Department are recommended to abstain from giving such advice.

## PROGRESS REPORTS.

Sketches of survey to accompany the progress reports. 99. Each progress report shall be accompanied by sketches showing work done up to date. Such sketches shall shew in red the lines surveyed, together with the main topographical features of the country, that is to say, the rivers, lakes, trails, hills, &c.

It is not necessary to use a scale for plotting, a rough estimate of distances is all that is required.

The sketches may be drawn with pencils of different colors.

It should be understood that only the main topographical features are to be shown, and that it is useless to indicate every little swamp, pond, or rise that may be found.

## RETURNS OF SURVEY.

Accounts to be placed at the end of the field notes. 100. In addition to what is prescribed for field notes in general, there will be an account at the end of the field book, signed by the surveyor, showing in miles and decimals of a mile, the distances run on section and traverse lines in the township, with the rates in each case, according to contract, and the total amount for the township.

Final returns.

101. The final returns of survey consist of :—

- (a.) Field notes.
- (b.) A plan of each township.
- (c.) A timber report for each township.
- (d.) Formulas of oath of chainmen.
- (e.) Statutory declarations of settlers.
- (f.) Accounts in duplicate on the forms supplied.

Report.

102. The surveyor will also subjoin in a concise report such further description or other information connected with the township surveyed as he may be able to afford, which may be useful or necessary to be known, giving a general description of the character of the country, its soil and geological features, timber, minerals, waters, &c.

Plans.

103. The plans shall be on a scale of forty chains to the inch, on the forms supplied by the Department. Every fractional township, however small, is to be shown on a separate plan.

Township outlines, when surveyed by the subdivider, are to be shown on the same plan as the sub-division.

104. The plans shall exhibit the length of all quarter-section lines as measured on the ground when not exactly forty chains, and the length of every broken part of a section line. Length of quarter section lines.

105. The plans shall show all the topographical features of the country as referred to in the field books. The topography is to be represented in the following manner :—

Bush,—a wash of light green without any imitation of trees.

Brulé,—a wash of light brown without any imitation of trees.

Swamps,—a wash of light yellow, with small strokes of green representing reeds, &c.

106. The plans shall also show the areas in acres and hundredths of all irregular quarter-sections, *i.e.*, quarter-sections adjoining correction lines, initial meridians, boundaries of reserves, or lines separating different systems of survey, and quarter-sections broken by lakes or streams that have been traversed. All other quarter-sections will be considered as regular, and reckoned as 160 acres in area. Areas.

In cases where a quarter-section is divided into two or more parts by a stream or lake large enough to require traversing, each of the parts is to have its separate area shown.

107. A table on the plan shall exhibit the contents of the township thus : Contents of township.

Land in sections.....	acres.
Roads.....	"
Water.....	"
Total area.....	"

The "Land in Sections" is the sum of the net area of all the quarter-sections in the township, and in a township in which there are no irregular quarter-sections and no deductions for water, amounts to 23,040 acres.

In the area of "Roads" are included all the road allowances within the township, together with those on the west and south outlines ; in a regular township this area is 872.10 acres for townships of the first and second systems, and 433.80 for townships of the third system. In townships in the railway belt there are no roads and the total area of land in sections, in a township without irregular quarter-sections or deductions for water, is 23,473.80 acres.



The area of "Water" is the area of all water that has been traversed within the sections, and should not include any of the road allowances.

Traverse lines.

108. Traverse lines are not to be shown on the plan, but to be plotted on one of the blank pages at the end of the field book, on which are also to be shown the shore lines of the lake or stream. In case the lake, pond, &c., is of too great an area to admit of its being plotted on a page, then the plot should be made on tracing linen and pasted in the end of the field book.

Traverse lines are to be plotted on a scale of 20 chains to an inch. Astronomical bearings (not angles), distances and offsets must be given; none of these need be marked on the plot; it is preferable to give them separately in table form, numbering the stations to correspond with numbers on the plot.

Settlers' improvements.

109. The extent and position of settlers' improvements are to be shown on the notes and on the plan; also the names of the settlers who have made statutory declarations on the quarter-sections which they claim. The names of settlers who have made no declaration are not to be shown on the plan or in the field notes.

Timber report.

110. In the timber report the surveyor will state whether, in his judgment, from the knowledge gained on the ground, it would be desirable to reserve the timber for the needs of the settlers, or whether it would be advisable to set apart the same as a timber berth; if the latter, he will give a general statement of the quality and extent of timber over 10 inches in diameter suitable for lumbering purposes. If reporting on several timbered townships he shall make a statement as to their relative value, taking into account the extent, quality and facilities afforded by streams, &c., for getting out the timber.

A timber report shall be furnished for every township. Should there be no wood in the township, the fact is stated. One page of the report is given for each township.

Plans and field-notes returned to surveyor in certain cases.

111. The field notes shall be neatly written, in a clear manner and fair hand. The plans shall be drawn with care and should be fair specimens of draughtsmanship.

Any plans or field notes not complying with the above conditions will either be returned to the surveyor, to be written or drawn again, or prepared by the Department, and the cost charged to the surveyor.

## EXTRACTS

FROM THE

## DOMINION LANDS ACT,

49 VIC., CHAP. 54.

§120. The board may, in its discretion, suspend or dismiss from the practice of his profession, any Dominion land or topographical surveyor whom it finds guilty of gross negligence or corruption in the execution of the duties of his office; but the board shall not suspend or dismiss such surveyor without having previously summoned him to appear in order to be heard in his defence, nor without having heard the evidence offered both in support of the complaint and on behalf of such surveyor; and, if, after being summoned as aforesaid, the surveyor does not appear, the board may appoint a fit and proper person to present the evidence on behalf of the surveyor. 49 V., c. 27, s. 20, *part*.

Board may suspend or dismiss negligent or corrupt surveyor.

Surveyor or some one on his behalf, to be heard.

§121. The Surveyor General shall require every Dominion land or topographical surveyor, in addition to the oath by this Act required to be administered to him on receiving his commission as such, to take and subscribe an oath, or make and subscribe an affirmation, on the return of his surveys of Dominion lands, that the same have been faithfully and correctly executed according to law and the instructions of the Surveyor General; and if it is proved, on satisfactory evidence, before any court of competent jurisdiction, that such surveys, or any part thereof, have not been so executed, the Attorney General of Canada shall, upon the application of the Surveyor General, immediately institute a suit upon the bond of such surveyor; and the institution of such suit shall operate as a lien on any property owned or held by such surveyor, or his sureties, at the time the suit is instituted. 46 V., c. 17, s. 107, *part*.

Surveyors to add to their returns of survey an affidavit of the faithful and correct execution thereof.

If statement is false, proceedings to be instituted on the bond. Effect of such suit.

### CHAIN BEARERS.

§124. Every chain bearer employed in the survey of Dominion lands shall, before he commences his chaining or measuring, take an oath or affirmation that he will discharge such duty with ex-

Chain bearer to be sworn.



actness, according to the best of his judgment and ability, and render a true account of his chaining or measuring to the surveyor by whom he has been appointed to such duty; and any Dominion land surveyor may administer such oath or affirmation. 46 V., c. 17, s. 108.

## STANDARD OF MEASURE.

Standard to be English measure of length.

Measuring instruments to be regulated thereby. Testing subsidiary standards.

Penalty for surveyor without standard.

§125. The measure of length used in the surveys of Dominion lands shall be the English measure of length; and every Dominion land surveyor shall be in possession of a subsidiary standard thereof—which subsidiary standard, tested and stamped as correct by the Department of Inland Revenue, shall be furnished to him by the secretary of the board on payment of a fee of eight dollars therefor; and all Dominion land surveyors shall, from time to time, regulate and verify, by such standard, the length of their chains and other instruments for measuring; and the said standard measure shall be returned to the secretary of the board as often as it requires to be tested again:

2. Every surveyor who is found performing his duties without being in possession of the standard measure which, by this clause, he is required to have, shall be liable to be suspended for a period not exceeding twelve months. 49 V., c. 27, s. 21.

## RENEWAL OF LOST CORNERS AND OBLITERATED LINES.

Provision where the original mound or post is lost.

If a township corner

If on one of the outlines of a township.

As to correction lines.

§126. Whenever a Dominion land surveyor is employed to run any dividing line or limit between sections or other legal subdivisions, and the mound, post or monument erected, marked or planted in the original survey, to define the corner of such section or other legal sub-division, cannot be found, he shall obtain the best evidence that the nature of the case admits of, respecting such corner mound, post or monument; but if the position of the same cannot be satisfactorily so ascertained, he shall proceed as follows:—

(a.) If the lost corner mound, post or monument is that of a township corner, he shall report the circumstances of the case to the Surveyor General, who shall instruct him how to proceed;

(b.) If the lost corner mound, post or monument is on one of the outlines of a township, he shall join, by a straight line, the nearest undisputed section or quarter-section corners on such outline, and divide such straight line into such number of sections or quarter-sections or other legal sub-divisions as the same contained in the original survey,—giving to each an equal breadth;

(c.) If, in re-establishing the east or west boundary of a township, one of the nearest undisputed corners is on a correction

line, every quarter-section shall be made exactly forty chains, and the deficiency or surplus, as the case may be, shall be left in the quarter-section adjoining the correction line;

(d.) If, in re-establishing the north or south boundary of a township surveyed under the first system of survey, one of the nearest undisputed corners is the western corner of the township, every quarter-section shall be made exactly forty chains, and the deficiency or surplus, as the case may be, shall be left in the western quarter-section;

(e.) When the position of the township corner is also lost, it shall be re-established as aforesaid, previously to re-establishing the outline of the township;

(f.) When the lost corner is in the interior of a township, on the limit of a meridian road allowance, the surveyor shall connect the two nearest undisputed corners on such limit by a straight line, and divide the distance into such number of sections or other legal sub-divisions as the same contained in the original survey, giving to each an equal breadth;

(g.) If one of the nearest undisputed corners is on a correction line, he shall make each quarter-section exactly forty chains and leave the deficiency or surplus, as the case may be, in the quarter-section adjoining the correction line;

(h.) When the nearest undisputed corners on the said limit of a meridian road allowance are in different townships, the outline between such townships shall be re-established previous to re-establishing the meridian;

(i.) When the lost corner is that of a quarter-section on a line running east and west, the surveyor shall join, by a straight line, the opposite section corners on the meridians on each side, and give to each quarter-section an equal breadth;

(j.) If, in townships surveyed under the first system of survey, the lost corner is in the western row of sections of a township, the first quarter-section shall be made exactly forty chains, and the deficiency or surplus, as the case may be, shall be left in the western quarter-section;

(k.) When the position of one of the corners on the meridians is also lost, such meridian shall be re-established previously to re-establishing the east and west line;

(l.) Whenever a surveyor erects, plants or places a mound, post or monument as aforesaid, to renew a lost or obliterated corner, he shall duly take into account any allowance for road or

Where a deficiency shall be left.

Township corner to be re-established.

When the lost corner is in the interior of a township.

When nearest undisputed corner is on a correction line.

When nearest undisputed corners are in different townships.

When of a quarter-section on a line running east to west.

When in western row under first system of survey.

When meridian shall be re-established.

Allowance for road to be considered.



Effect of such survey.

roads; and the corner, or division or limit so established, shall be the true corner, or division or limit of such section or other legal sub-division. 46 V., c. 17, s. 110.

#### SURVEY OF LEGAL SUB-DIVISIONS.

Method of proceeding in laying out a half or quarter section or other legal sub-division.

§127. When, in the survey of legal sub-divisions, it is necessary for a Dominion land surveyor to establish the division line between two sections, he shall effect this by connecting, by a straight line, the opposite original section corners, if they exist, and if not, by similarly connecting the points established in renewal thereof, in accordance with the next preceding clause, giving, in either case, the quarter-sections involved an equal breadth:

Half or quarter section. Other sub-divisions.

2. In laying out a half section or a quarter-section he shall connect the opposite quarter section posts by straight lines:

3. In laying out other and minor legal sub-divisions he shall give to every such sub-division its proportionate share of frontage and interior breadth, and connect the resulting terminal points by a straight line:

Lines drawn to be true limits.

4. The lines or limits so drawn on the ground in the manner above prescribed shall, in the respective cases, be the true lines or limits of such section, half section or other legal sub-division, whether the same correspond or do not correspond with the area expressed in the respective patents for such lands. 46 V., c. 17, s. 111.

#### DIVISION LINES IN FRACTIONAL SECTIONS.

Dividing lines to be drawn from original corners.

§128. The dividing lines or limits between legal sub-divisions, in fractional sections, shall be drawn from the original corners (or the points representing such corners, as defined on the ground, in accordance with the provisions of this Act), in the section line intended as the front of the lot:

Northerly and southerly lines. Easterly and westerly lines.

2. Northerly or southerly lines shall be drawn due north or due south:

3. Easterly or westerly lines shall be drawn at an angle with the meridian equal to the mean of the angles formed with the same meridian by the lines which are the northern and the southern boundaries respectively of the section. 46 V., c. 17, s. 112.

*Extracts from the Act 52 Victoria, Chap. 27, amending "The Dominion Lands Act."*

R.S.C., c. 54, s. 11, repealed, new provision.

§1. Clause eleven of the said Act is hereby repealed and the following substituted therefor:—

"11. Except as herein otherwise provided, townships shall be given their prescribed width on the base lines hereinafter mentioned; and the meridians between townships shall be drawn across such bases, northward and southward, to the depth of two townships therefrom, that is to say, to the correction lines hereinafter mentioned:

Width of townships on base lines.

"2. The meridians between those townships situated between the International Boundary or first base line and the first correction line, shall be surveyed to the south from the said first correction line to the said International Boundary or first base line."

Certain meridians how surveyed.

§2. Clause fifteen of the said Act is hereby repealed and the following substituted therefor:—

"15. In the survey of a township, the deficiency or surplus, resulting from convergence of meridians, shall be allowed in the range of quarter-sections adjoining the west boundary of the township, and the north and south error in closing on the correction lines from the north or south shall be allowed in the ranges of quarter-sections adjoining, and north or south respectively of, the said correction lines; excepting in the case of the north and south closings in those townships between the first correction line and the International Boundary or first base line, which error is to be left in the last quarter-section adjoining the said first base line; but the Governor in Council may order such deficiency or surplus, and such north and south error, or either of them, to be equally distributed among all the quarter-sections involved."

S. 15 repealed, new provision. Allowances for deficiency or surplus.

Exception.

§7. Clause one hundred and twenty-nine of the said Act is hereby repealed and the following substituted therefor:—

"129. All boundary lines of townships, sections or legal sub-divisions, towns or villages, and all boundary lines of blocks, gores and commons, all section lines and governing points, all limits of lots surveyed, as defined by mounds, posts or monuments, erected, placed or planted at the angles of any townships, towns, villages, sections or other legal sub-divisions, blocks, gores, commons and lots or parcels of land under the authority of this Act or of the Governor in Council, shall, subject to the provisions hereinafter in this clause contained, be the true and unalterable boundaries of such townships, towns and villages, sections or other legal sub-divisions, blocks, gores, commons and lots or parcels of land respectively, whether the same, upon admeasurement, are or are not found to contain the exact area or dimensions mentioned or expressed in any patent, grant or other instrument in respect of any such township, town, village, section or other legal sub-division, block, gore, common, lot or parcel of land:

Section 129, repealed, new provision. Boundaries under this Act are to be deemed the true ones.



Township  
survey may  
be can-  
celled.

"2. Whenever the Minister of the Interior has reason to believe that any gross irregularity or error has been made in the survey of any township surveyed under the authority of this Act, the Governor in Council, upon the recommendation of the Minister of the Interior, may direct that such survey shall be cancelled and a new survey made, and the said new survey shall be made accordingly :

Boundary  
marks in  
such case.

"3. In effecting any new survey as provided by the preceding sub-clause, all posts, mounds or other marks placed to mark the original survey which is to be corrected, may be removed, and the new posts, mounds or other marks placed to mark and define the new survey, shall become the original marks of such survey :

Amend-  
ment of  
plans.

"4. The plan of any survey performed under the provisions of this Act, and of record in the Department of the Interior, or any tracing or lithographed copy of the same, may be altered and amended so as to show any and all alterations made by a new survey effected as provided by this Act."

## APPENDIX A.

### ACCOUNTS OF SURVEYORS UNDER DAILY PAY.

Surveyors who are employed by the day, will receive, before leaving for their surveys, advances sufficient to procure their outfit and supplies.

When a payment is applied for, a statement must be furnished on the printed forms supplied, showing the disposal of the moneys received and those applied for.

No draft on the Department, or order, or power of attorney for moneys on account of the survey will be accepted until the returns of the survey have been examined and approved.

At the completion of the survey, the horses and outfit shall be sold, but when directed to do so, surveyors shall winter such of their horses and such part of their outfit as are in sufficiently good condition for another year's service.

The accounts are to be in duplicate, and the original and duplicate must be exactly alike in all respects and made up in separate bundles.

Each is to consist of :—

1st An account of personal services.

2nd A pay list of party, showing the date of engagement and discharge of every man, his occupation and rate of pay, and the number of rations for the party. It must be signed by each of the men.

3rd A transport account, with vouchers duly numbered, accompanied by a separate and detailed statement of travelling expenses.

4th A balance sheet showing on the credit side the gross amounts of personal services, pay list and transport accounts, and camp equipage and stationery allowances, and on the debit side the payments received on account of the survey.

Each of the accounts is to have its vouchers attached and statements of sales, if any, attested by the purchasers.

The vouchers must give the detail of articles purchased, with the price of each.

The items of boarding allowance, camp equipage and stationery, for which specific amounts are allowed, are to be charged each in one lump sum, without giving details or vouchers.



## SURVEYORS UNDER DAILY PAY.

## ALLOWANCES TO SURVEYORS.

SERVICE.	Number or Quantity.	\$ cts.
<i>Personal Services and Allowances.</i>		
Salary of Surveyor in charge, per diem.....	1	
Ration allowance in the field do .....	1	1 00
do at office work do .....		
<i>Pay-list.</i>		
Assistant, per diem.....	1	
Chainmen do (if allowed by instructions).....	2	
Cook do .....	1	
Laborers do .....		
Ration allowances, per diem.....		
<i>Transport.</i>		
Horses .....		
Buckboard .....		
Carts .....		
Cart covers .....		
Sets of harness .....		
Hobbles .....		
Horse bells .....		
Oats and horse-keeping .....		
Leather, twine, oil, for repairing harness, horse shoes, axle grease .....		
Freight and storage, west of Winnipeg .....		
Railway fare and sleeping car for surveyor in charge, east of Winnipeg .....		
Travelling expenses of party, west of Winnipeg .....		
Boarding allowance .....		
<i>Camp Equipage and Plant.</i>		
All articles, tents included .....		
<i>Stationery.</i>		
All articles .....		

The preparation of the returns of survey immediately after the surveyor has completed his field work for the season will be insisted upon.

## APPENDIX B.

## CONTRACT SURVEYS.

The subdivision of townships is to be made, according to law, at certain rates per mile. These rates are generally determined in advance for each township.

Where not so fixed, the mileage will be classified as follows :—

1st Class. Any land not classified as second or third class.

2nd Class. Poplar, and other soft woods, where occurring in alternation with prairie.

3rd Class. Contracts composed of townships all woods, and wherever they occur, heavy underbrush, hard woods, windfalls, thick willows.

Traverse lines are paid for at the rate of nine dollars per mile east of the fourth initial meridian, and ten dollars per mile west of the same. The distances for the account are measured along the shore from each point determined by an offset, on a straight line, to the next one.

Nothing will be paid for trial lines, offsets or triangles.

In addition to the above rates, the surveyor will receive one dollar for each settler's declaration of occupation.

It is to be clearly understood that the above prices are to include the making of plans, field notes, reports, &c., as well as the cost of survey. Nothing will be paid for lines the marking of which in the manner provided for in this manual is not completed.

When the number of offsets in a traverse is less than required by the manual, a deduction of one dollar will be made for every offset missing. Should any part of the work not be performed in accordance with the instructions, a sum sufficient to cover the cost of corrections will be deducted from the amount of the contract.

A surveyor, upon obtaining a contract, will be required to enter into a bond, jointly with two securities each, in a sum equal to the estimated amount of his contract, for the due and faithful fulfilment thereof.



Surveyors will receive, with their contract, blank books for field use, blanks of progress accounts, statutory declarations, oath of chainmen and township sketches.

Blank books for office copies of field notes, skeleton township plans, timber reports and forms of general account will be supplied on the application of the surveyor,—stating the number of each required. It is recommended that such blanks should only be applied for at the time they are required for use, as, when carried in the field, they are liable to be spoiled.

Iron posts will be supplied free of cost, provided they are all used on the survey. Those not so used will have to be returned to store, otherwise they will be charged for at 40c. each.

The lines embraced in any survey under contract must be run by the surveyor *in person*, and no payment will be made on such contract work if otherwise performed.

A rigid inspection of the work will be made. On satisfactory evidence of any impropriety or unfaithfulness in the execution of a contract being reported to the Department, the survey will be cancelled and steps taken at once to recover from the surveyor or his sureties.

On receipt of the bond, properly executed, from a surveyor to whom a contract has been given, an advance of \$200 will be sent to his address, and a further advance of \$800 on account of contract, will be placed in the Bank of Montreal at Winnipeg, Regina or Calgary, payable there to himself in person.

Seventy-five per cent. on account of the work performed will, from time to time, be paid to the contractor or be placed to his credit, as he may direct. Such payments will be made on receipt of the progress accounts accompanied by sketches of the work. Credits may be telegraphed to the Bank of Montreal, if urgently required, but only after receipt of the sketches.

All payments are made by cheques, issued either in favor of the payee, or in favor of the Bank of Montreal to be placed to the payee's credit. It is therefore useless to ask that bank bills be sent instead of cheques.

When a payment on account is applied for, the letter should state whether a cheque is wanted or a credit, and where.

It is of the utmost importance that the Department should be kept well informed of the surveyors' post office addresses. Every letter sent should state where the answer is to be forwarded to. Particular attention is called to this matter, as the most vexatious delays, due to this cause, are continually occurring, and surveyors are the first to suffer therefrom.

Charges for returns of survey prepared by the Department are as follows:—

Township plan (old system).....	\$ 8 00
do (new system).....	6 00
Copying a Field Book (old system) per township.....	13 00
Copying a Field Book (new system) per township.....	10 00

Charges for returns of survey prepared by the Department.

These prices include only a small amount of traverse lines. Extra work on that account will be charged for. Plots of traverses are to be furnished in all cases, as the Department will not undertake to plot a traverse for a surveyor.



# APPENDIX C.

TABLE showing the Deflection of a Trial Line for Deviations from 1 to 149 links at the end of eighty-one chains.

Links.	Decimal Division.	Sexagesimal Division.	Links.	Decimal Division.	Sexagesimal Division.	Links.	Decimal Division.	Sexagesimal Division.	Links.	Decimal Division.	Sexagesimal Division.
0	0° 00'	0 00	40	283	16 59	80	566	33 57	120	849	50 55
1	0° 07'	0 07	41	290	17 24	81	573	34 23	121	856	51 21
2	0° 14'	0 14	42	297	17 50	82	580	34 48	122	863	51 46
3	0° 21'	1 16	43	304	18 15	83	587	35 13	123	870	52 12
4	0° 28'	2 07	44	311	18 41	84	594	35 39	124	877	52 37
5	0° 35'	2 07	45	318	19 06	85	601	36 04	125	884	53 03
6	0° 42'	3 33	46	325	19 31	86	608	36 30	126	891	53 28
7	0° 50'	3 33	47	332	19 57	87	615	36 55	127	898	53 54
8	0° 57'	3 24	48	340	20 22	88	622	37 21	128	905	54 19
9	0° 06'	4 49	49	347	20 48	89	630	37 46	129	912	54 45
10	0° 13'	4 15	50	354	21 13	90	637	38 12	130	919	55 10
11	0° 20'	4 40	51	361	21 39	91	644	38 37	131	927	55 35
12	0° 28'	5 06	52	368	22 04	92	651	39 03	132	934	56 01
13	0° 35'	5 31	53	375	22 30	93	658	39 28	133	941	56 26
14	0° 42'	5 57	54	382	22 55	94	665	40 54	134	948	56 52
15	0° 50'	6 22	55	389	23 21	95	672	41 19	135	955	57 17
16	0° 57'	7 47	56	396	23 46	96	679	41 44	136	962	57 43
17	1° 04'	7 13	57	403	24 12	97	686	42 10	137	969	58 08
18	1° 12'	8 38	58	410	24 37	98	693	42 35	138	976	58 34
19	1° 19'	8 03	59	417	25 02	99	700	43 01	139	983	59 00
20	1° 27'	8 29	60	424	25 28	100	707	43 26	140	990	59 25
21	1° 34'	8 55	61	432	25 53	101	714	43 52	141	997	59 50
22	1° 42'	9 20	62	439	26 19	102	721	44 17	142	1004	60 16
23	1° 49'	9 46	63	446	26 44	103	729	44 43	143	1011	60 41
24	1° 57'	10 11	64	453	27 10	104	736	45 08	144	1018	61 06
25	2° 04'	10 37	65	460	27 35	105	743	45 34	145	1026	61 32
26	2° 12'	11 02	66	467	28 01	106	750	45 59	146	1033	61 57
27	2° 19'	11 28	67	474	28 26	107	757	46 24	147	1040	62 23
28	2° 27'	11 53	68	481	28 52	108	764	46 50	148	1047	62 48
29	2° 34'	12 19	69	488	29 17	109	771	47 15	149	1054	63 13
30	2° 42'	12 44	70	495	29 43	110	778	47 41			
31	2° 50'	13 09	71	502	30 08	111	785	48 06			
32	2° 57'	13 35	72	509	30 33	112	792	48 32			
33	3° 05'	13 60	73	516	30 59	113	799	48 57			
34	3° 12'	13 26	74	523	31 24	114	806	49 23			
35	3° 20'	13 51	75	531	31 50	115	813	49 48			
36	3° 27'	14 17	76	538	32 15	116	820	50 14			
37	3° 35'	14 42	77	545	32 41	117	828	50 39			
38	3° 42'	15 08	78	552	33 06	118	835	51 05			
39	3° 50'	15 23	79	559	33 32	119	842	51 30			



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