

Statute Requirements for Office of County Surveyor in Indiana

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INTRODUCTION

The purpose of this paper is to present: (1) statute requirements for the Office of County Surveyor in Indiana, (2) "Tiffin's Instructions" pertaining to the original United States Public Land Survey of Indiana, (3) restoration of lost corners in lands originally surveyed under "Tiffin's Instructions," and (4) review of highlights of proposed perpetuation manual.

The statute requirements for the Office of County Surveyor will be discussed first. "Tiffin's Instructions" will then be discussed. After the presentation of "Tiffin's Instructions" those attending will be given problems to solve concerning lost corners which were originally set under "Tiffin's Instructions." Discussions of solutions of those attending the workshop will be discussed. The weight-of-authority solution will be given for each problem. Finally, in conclusion, highlights of the proposed perpetuation manual, which is jointly sponsored by the County Surveyors' Association of Indiana and Indiana Society of Professional Land Surveyors will be presented.

STATUTE REQUIREMENTS

It behooves every county surveyor to read the statutes related to his office to learn both his duties and his rights. The statutes pertaining to the Office of County Surveyor are found in "Burns Indiana Statutes—Annotated." They appear in Title 49, "Offices and Officers" under Chapter 33, "County Surveyor" and in Title 27, "Drains, Levees, and Water Conservation" under Chapter 20, "Indiana Drainage Code—Drainage Boards—Powers and Duties." This paper will discuss Title 49, Chapter 33, "County Surveyor" only. The subject of drainage is a separate topic in itself and was discussed as a separate special topic in your meeting in December 1971.

CORNER PERPETUATION

In March 1965, the Indiana General Assembly passed the "Perpetual Corners Records Act of 1965." This act is incorporated in Title

49, Chapter 33, Sections 3332 to 3339 inclusive of "Burns Indiana Statutes." This act set forth the following requirements:

1. Method of Establishment and Perpetuation of Corners
 - a. Starting with the year 1966 the county surveyor shall check and establish or reestablish and reference at least five per cent of all original government corners in his county annually; these shall be recorded in a record book as specified in items (2) and (3) which follow.
 - b. The county surveyor shall check five per cent of the corners and their references as shown in the record book each year.
2. Corner Record Book—The county surveyor shall be responsible for the preparation, maintenance, and custody of a corner record book which shall contain:
 - a. Record and index by location of all government corners within the county.
 - b. Outline maps of defined areas in sufficient detail so that the location of each corner within an area can be shown; notation shall be made by each corner stating where references for such corner can be found.
 - c. A reference index for each corner.
3. Details of Records of Corners—The record of each corner referenced in the record book shall contain:
 - a. Location of corner
 - b. Type of monument used
 - c. Distance and bearing to at least three references
 - d. Date last checked and condition of monument and references
 - e. Name of surveyor making check
 - f. Method of establishment of location

The corner perpetuation program is, in my opinion, a most important responsibility of the Office of the County Surveyor. The corner perpetuation manual, whose predicted publication date is still June 30, 1972, covers these requirements, and suggested procedures to comply with them, rather thoroughly. Highlights of this manual as mentioned earlier, is a separate topic later in this presentation so these sections will not be discussed in detail now. Present plans call for distribution of this manual to all members of the Indiana Society of Professional Land Surveyors and to the office of each county surveyor in Indiana.

Two items should be noted at this time, however. First, as of December 31, 1971, thirty per cent of the corners in every county should have been established or reestablished and referenced since January 1, 1966. Also, in 1972, five per cent of the corners in the county should be established or reestablished and referenced and five per cent of those in the record book (0.05 of $0.30 = 0.015$) should be verified. This means, in the year 1972, that each county surveyor should be

checking a total of six and one-half percent of the original government corner positions in his county.

Under Section 3306, all services now required of county surveyors by law may be done by any regularly appointed deputy county surveyor, who shall be a competent civil engineer, and the county surveyor appointing such deputy shall be liable for the work done by said deputy the same as if said work be done by himself, and the county surveyor shall receive the same compensation for the services rendered by the said deputy as though the work and labor was performed by himself, provided however, the work done by such deputy shall be approved and officially signed by the county surveyor.

Section 3315 states that all division lines which may be run to divide any of the lands sold by the United States shall be made agreeable to the laws of the United States directing the mode of surveying public lands. I am of the opinion that the courts would interpret this to imply that restoration of obliterated and lost corners would also be made agreeable to the laws of the United States directing the mode of surveying public lands. This would mean compliance with the pamphlet, *Restoration of Lost and Obliterated Corners*, written by the General Land Office, Department of the Interior in 1883, included as an appendix in the proposed perpetuation manual; with the pamphlet, *Restoration of Lost and Obliterated Corners and Subdivision of Sections . . . a Guide for Surveyors*, written by the Bureau of Land Management, Department of the Interior available from the United States Government Printing Office; and with the *Manual of Instructions for the Survey of the United States 1947*, written by the Bureau of Land Management, Department of the Interior.

Some of the surveying and engineering duties of the county surveyor in counties of 150,000 or more are spelled out in Sections 3319 to 3321 inclusive. These sections include, “. . . he shall have charge of all surveying and civil engineering work of the county . . . including the preparation of plans and specifications for, and general supervision of, the construction of all bridges and specifications for, and general supervision of the construction of all bridges, turnpikes, or other roads, ditches, drains or levees, and all other surveying and civil engineering work within and for the county . . .” Within these sections is included also the statement relative to the county surveyor that he, “. . . shall have general supervision of all the highway bridge repairs . . . , and when such repairs are let by contract, he shall prepare plans and specifications, therefore . . .”

Such requirements require an individual qualified as an engineer and as a land surveyor. This must be realized and the work should

be executed in a way that a qualified person performs it. When these sections became laws, in the period between 1901-1905, the graduate civil engineer was considered qualified to do both engineering and land surveying. This is an interesting situation in the present day since the graduate civil engineer is not adequately trained to perform land surveying and the graduate land surveyor is not adequately trained to perform the engineering work required.

The following sections of the statutes are not discussed in this paper since (1) it was felt that they are common knowledge and/or (2) did not fall within the mission of this paper which was to discuss primarily the duties, especially as related to land surveying, of the county surveyor :

<i>Section</i>	<i>General Topic</i>
3301	Election and Term
3302-3304	Bond
3305	Superseded by 49-1002
3307-3308	Swearing of Deputies and Assistants, Oaths, Return of Fieldnotes
3309	Fieldnotes—Papers to Successor
3310	Expiration of Term
3313-3314, 3340-3444	Legal Surveys
3316	Power to Administer Certain Oaths
3317	Use of Official Seal
3318	Repealed
3322, 3326	Office and Supplies
3323	Purdue Road School
3324-3325	Repealed
3327-3329	Repealed
3331	Transportation

TIFFIN'S INSTRUCTIONS

Township Boundaries

Rayner and Schmidt in their text *Elementary Surveying* (1937) have the following explanation concerning the controlling lines in the Public Land Survey:

“The difficulty of subdividing the earth’s curved surface into rectangular tracts was evident from the beginning. This difficulty was met by various arbitrary methods by the different Surveyors General until the *Manual of Instructions of the General Land Office* of 1855 prescribed the method that has been used since that

time. Two methods early came into use: first, a surplus of distance was placed in the south boundaries of townships; and second, 'standard' lines or 'correction' lines were established as true east-west lines which served to adjust, or correct, the converging range lines. In the earlier years (1800-1855), correction lines were used; but the intervals between them were not uniform, as illustrated in Figure 247 (Figure 1, this paper), which shows the principal meridians, base lines, and correction lines for Illinois. Below the base line for the third principal meridian, the subdivision was carried to the Ohio River, a distance of 16 townships (96) miles with no correction lines. North of the base line the intervals vary from four (24 miles) to nine townships (54 miles)." [Data in the parentheses was added by the author of this paper.]

The second method listed in the above paragraph is comparable to the procedure prescribed in the 1947 manual. Closing corners are placed on correction lines to apply to the townships to the south, and standard corners to apply to the townships to the north double corners. Indiana, whose surveys were principally done between 1805 and 1830, employed correction lines—second method listed in the preceding paragraph. To be safe in retracement of old surveys one should always study the original notes and plats to ascertain the procedures employed. The first correction line in Indiana is 16 townships (96 miles) north of the base line; the next correction line which is extended only east of the second principal meridian is 15 townships (90 miles) from the correction line. There is no second correction line west of the principal meridian thus these townships extend 21 townships (126 miles) north without a correction line intervening.

Subdivision of Townships

According to a paper, "The Public Domain and Its Survey" by J. O. Henderson, who was auditor of the state of Indiana during the latter part of the nineteenth century, instructions issued by E. Tiffin, surveyor-general of the United States, governed the public land surveys in central Indiana. Henderson stated that these instructions were not dated (in the book by Rayner and Schmidt, quoted earlier, it is stated that the instructions were issued in 1815) and that the records of the General Land Office do not show when they were first issued. He was of the belief, however, that "Tiffin's Instructions" also controlled the public land surveys in the northern and southern part of the state.

"Tiffin's Instructions" for the subdivision of townships are as follows (use Figure 2 which follows these instructions to aid interpretation):

1. When the township lines are completed you must begin the survey of sections at the southeast corner of the township and

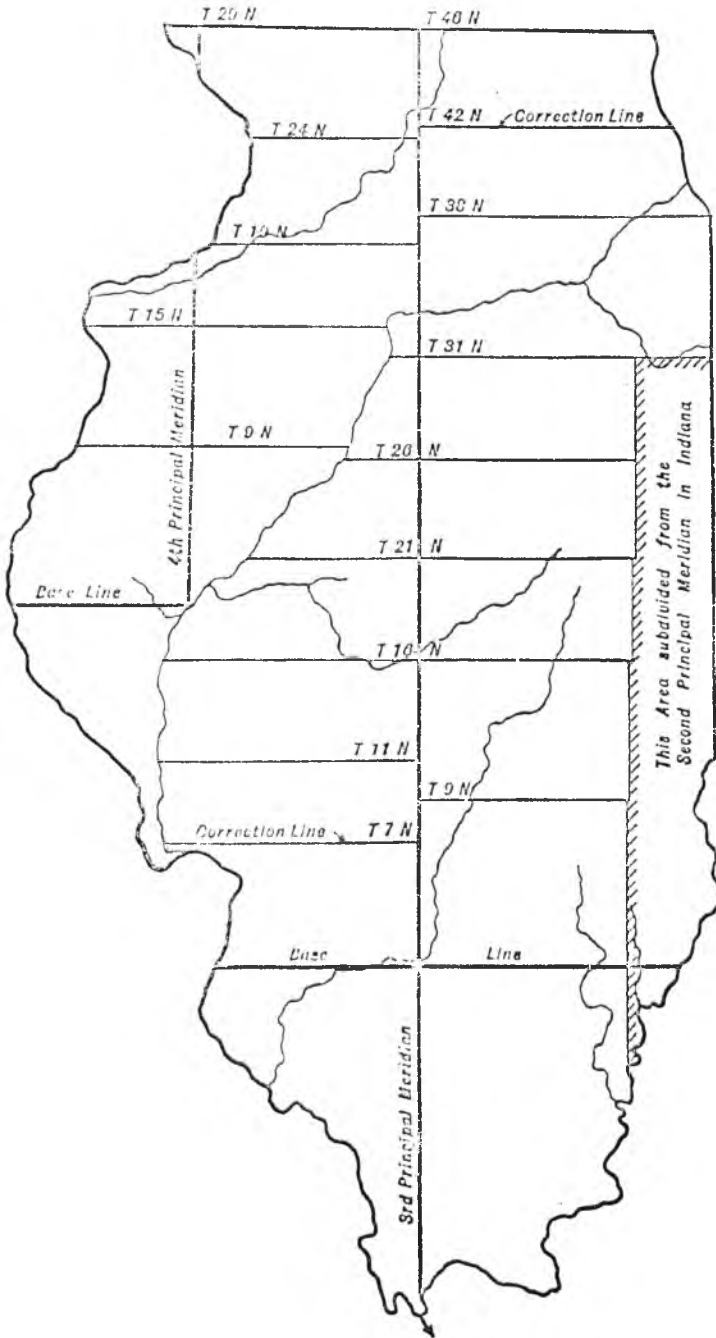


Fig. 1. (Fig. 247.) Showing Principal Meridians and Correction Lines in Illinois.

	A	a	B	b	C	c	D	d	E	e	F	f	G
Y	+3.10	S 6	42.30	-6 S 5	42.11	-6 S 4	42.20	-6 S 3	42.00	-6 S 2	41.00	-6 S 1	S
Y		6		5		4		3		2		1	H
x	+3.50	S 7	40	-5 S 8	-5 S 9	-5 S 10	-5 S 11	-5 S 12					h
X		6		5		4		3		2		1	I
w		S 18		-4 S 17	-4 S 16	-4 S 15	-4 S 14	-4 S 13					i
W		6		5		4		3		2		1	I
v	44.10	S 19	40	-3 S 20	-3 S 21	-3 S 22	-3 S 23	-3 S 24					k
V		6		5		4		3		2		1	L
u	44.20	S 30	40	-2 S 29	-2 S 28	-2 S 27	-2 S 26	-2 S 25					l
U		6		5		4		3		2		1	M
t	43.80	S 31	40	-1 S 32	-1 S 33	-1 S 34	-1 S 35	-1 S 36					m
T		6		5		4		3		2		1	N
		s	S	r	R	a	Q	p	P	o	O	n	

Fig. 2.

move on in continued progression from east to west and from south to north, in order that the excess or defect of the township as to complete sections may fall on the west and north sides of the township, according to the provisions of the act of the 10th of May, 1800.

2. "Each side of a section must be made one mile in measure by the chain, and quarter section corners are to be established at every half mile except when in the closing of a section, if the measure of the closing side should vary from 80 chains or one mile. You are in that case to place the quarter-section corners equidistant, or at an average distance from the corners of the section. But in running out the sectional lines on the west or north side of the township you will establish your quarter-section posts or corners at the distance of half a mile from the last corner and leave the remaining excess or defect on the west or north tier of quarter sections, which balance or remainder you will carefully measure and put down in your field notes in order to calculate the remaining or fractional quarter section on the north and west side of the township. Also, in running to the western or northern boundary,

unless your sectional lines fall in with the posts established there for the corners of sections in the adjacent townships, you must set post and mark bearing trees at the points of intersection of your lines with the town boundaries, and take the distance of your corners from the corners of the sections of the adjacent townships, and note that and the side on which it varies in chains or links, or both.

3. "The sections must be made to close by running a random line from one corner to another, except on the north and west ranges of sections, and the true line between them is to be established by means of offsets.

4. "In fractional townships on rivers it will be necessary to vary from the foregoing rules, and the lines must be continued from the recti-linear boundaries of the township which may be parallel to the river, perpendicularly to those boundaries till they meet the river. The sections, however, must be made complete on the sides of the townships bounded by straight lines, and all excess or defect of measure must be thrown into the fractional sections on the river; the measure of the lines from the last entire sectional corner should be made very exact in order to calculate the fractional section with exactness."

ILLUSTRATION

"Begin at N, the southeast corner of the township, and run west 40 chains and establish the quarter-section corner at n of section 36, if it be not already established; continue 40 chains further and establish the corner at O of section 36 and 35, from O run a true north course 40 chains and mark the quarter-section corner between 35 and 36; continue 40 chains further on the north line and establish the corner of 25, 26, 35 and 36. From this corner run a random line for the post or corner of M without blazing; at the distance of every 20 chains on this line set up a stake or post or mark some other mark on the random line. If you strike the post or corner M exactly you have only to blaze the lines back and establish the quarter section corner, which you will take care to establish at the average distance between the corner at M and the corner between 25, 26, 35 and 36; but if running for the post M you fall north or south of it you must note the departure or deviation in your field book and return on the true course, observing to correct it by means of offsets from your marks made on the random line.

"From the corner of sections 25, 26, 35 and 36, run due north one mile, setting the half-mile post as before at 2 on the line from O to F. Return south to O and establish at o and P your quarter section and section corners, then run north from P and establish quarter-

section and section corners as before, and run a random line from the section corner on the line PE to the corresponding corner on the line OF. Proceed in this manner till you arrive to the last corner towards the western boundary of the township from M to U, viz.: between sections 29, 30, 31 and 32. From this corner run west and at the distance of 40 chains from it, establish the quarter-section corner at 6 on the line from M to U, continue west till you intersect the town boundary, suppose at U, note carefully the distance of the point of intersection from the last section or quarter-section corner and also the distance of this point from the section corner of the adjacent township west of you, or the distance of U from M and on which side it lies, viz.: either north or south, at the point of intersection U, set the section post or corner and take bearing trees.

“In this manner you will proceed until your township is completed, observing always to move either in a range of sections from that at the southeast corner of the township to the western boundary or from that section to the northern boundary. But when you shall have completed the sections to the north boundary of the township you will proceed from the last section corners, establish quarter section corners at 40 chains from them and continue north until you intersect the town boundary in the same manner as on the western side of the township, observing to note the distance at which you intersect the north boundary from the section or quarter-section corner you left last. Also you will be careful to note the distance of the point of intersection from the corner of the section of the adjacent township and whether it is on the east or west side of it, then the distance from 6 to F or from 6 to E on the line OF and PE must be carefully noted in your field notes and also the distance from F where you intersect to O the post on the town above and on which side, whether east or west . . .”

It should be noted from the above instructions that the north quarter corners for the sections on the north boundary of the township (1, 2, 3, 4, 5 and 6) were never set on the original survey; the quarter corners on this line, apply to the sections to the north. Also, the west quarter corners for the sections on the west boundary of the township (6, 7, 18, 19, 30 and 31) were never set; the quarter-section corners on this line apply to the sections to the west.

RESTORATION OF LOST CORNERS

Three very important principles control the relocation of corners of the public lands. First, the surveyor doing the retracement of the original survey must “follow the steps” of the original surveyor. Second,

existing original corners cannot be disturbed or moved. Third, proportionate measurement is a matter of last resort.

Since it is the requirement that the surveyor retrace the steps of the original surveyor he must retrace the line according to the instructions in effect at the time of the original survey. In Indiana, therefore, he will follow "Tiffin's Instructions" as presented in the preceding section of this paper. One should remember that under "Tiffin's Instructions," (1) quarter corners were not set on the original survey for sections on the north and west boundary of the township, and (2) double corners can occur on range and township lines. Double corner, as used here, designates the occurrence of a standard corner and a closing corner on a north-south line or an east-west line.

Two publications of the United States Department of the Interior should be used as constant references here when relocating corners which are determined as lost in Indiana. One of these, *Restoration of Lost or Obliterated Corners and Subdivision of Sections . . . A Guide for Surveyors*, 1963 edition as written by the Bureau of Land Management. This 1963 publication presents a good discussion of single and double proportionate measurement and when each is used. It is available from the United States Government Printing Office. The other publication is, *Restoration of Lost or Obliterated Corners*, dated March 13, 1883 as written by the General Land Office. This 1883 pamphlet presents the most complete discussion of the method to be used to relocate lost double and triple corners on range and township lines. The 1883 pamphlet will appear as Appendix C in the perpetuation manual. For further discussion of the situation in Indiana the paper, "Double Corners in Indiana and Illinois" is reproduced as an appendix to this article.

Problems

Example 1 (See Figure 3)

Discussion: When running the boundary line in Indiana under "Tiffin's Instructions" which is common to sections 2 and 3, the original surveyor did not close upon the standard corner previously set on the township line, but set a closing corner at the intersection of this line with the northern boundary of the township (see Figure 1).

Situation: The closing corner set in the above discussion (NE corner of section 3) is determined as lost. Pertinent record and measured dimensions are given in Figure 3.

Problem: To reestablish the position of the closing corner.

Solution: (1) Determine beyond a doubt to which sections the existing corner belongs, that is, whether it is a standard corner for the

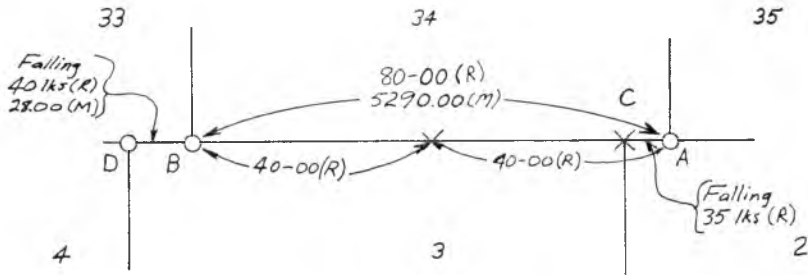


Fig. 3. Legend:

O Original corner found in place
X Lost corner position

Notes:

1. (M) - Distance measured this survey
2. (R) Record distance
3. Record distances are given in chains and links, i.e., 40-20 means 40 chains and 20 links
4. Measured distances are given in feet

sections to the north (SE corner of section 34 or SW corner of section 35) or a closing corner for the sections to the south (NE corner of section 3 or NW corner of section 2).

(2) Set the missing corner on the E W line as determined by the found standard corners at the SW and SE corners of section 34 to the north. This distance should be determined by proportionate measurement, that is

$$\overline{AC}(M) = \frac{AC(R)}{AB(R)} \quad AB(M) = \frac{0.35}{80.00} (5290.00) = 23.14 \text{ ft.}$$

(3) Check the relocation by remeasurement to the opposite corresponding corner of the section to which the missing corner belongs, such as SE corner of section 3 or NW corner of section 3.

Example 2 (Figure 4)

Discussion: When running the boundary line in Indiana under "Tiffin's Instructions" which is common to sections 2 and 3, the original surveyor did not close upon the standard corner previously set on the township line, but set a closing corner at the intersection of this line with the northern boundary of the township (see Figure 1).

Situation: The closing corner and the standard corner discussed in Example 1 are both determined as lost, i.e., the NE corner of section 3 and the SW corner of section 35 are lost.

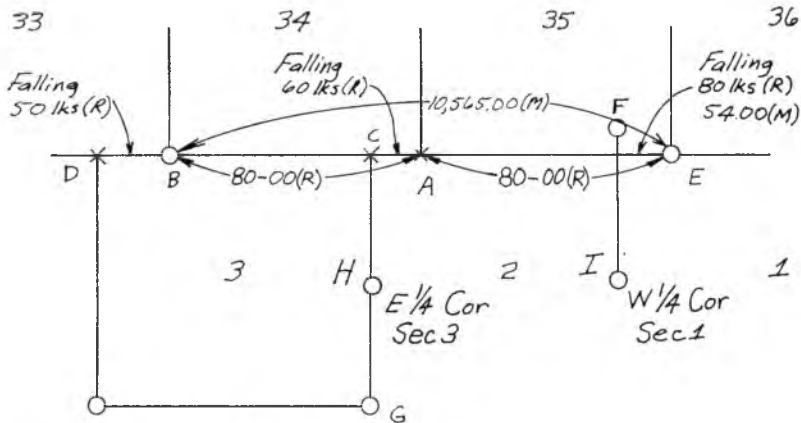


Fig. 4. Legend:

O Original corner found in place
X Lost corner position

Notes:

1. (M) Distance measured this survey
2. (R) Record distance
3. Record distances are given in chains and links, i.e., 40-20 means 40 chains and 20 links
4. Measured distances are given in feet

Problem: To reestablish the NE corner of section 3 (the closing corner set when the township was subdivided).

Solution: (1) Reestablish the township line upon which the section line between sections 2 and 3 closed; this will be line EB.

(2) Reestablish the section line which is the E boundary of section 3; this will be line GH and its prolongation.

(3) Set a temporary corner at the intersection of lines EB and GH prolonged as an estimate of the position of the lost closing corner.

(4) Check the above estimated location of the lost closing corner by record measurements in the original field notes to known objects and known corners on the township line.

(5) Make corrections, if judged necessary, and set permanent corners.

Example 3 (Figure 4)

Problem: Where is NE corner of section 2?

Solution: At J.

Discussion: This is the only instance in which a found original corner may be moved. The legal NE corner of section 2 is on the line

IJ where it intersects line EB. The closing corner determines the direction of the east boundary line of section 2 but not its terminus. Corner F should be moved to J.

Example 4

Problem: Where would the $N\frac{1}{4}$ corner be placed for section 3 in Example 1 (Figure 3)?

Discussion: The $N\frac{1}{4}$ corner for section 3 was not placed in the original surveys in Indiana. It will be related to the closing corners at the NW and NE corners of section 3. The $\frac{1}{4}$ corner found in this area, if one is found, is the $S\frac{1}{4}$ corner of section 34 to the north which was set when the township line EB was run.

Solution 1: The 1833 pamphlet written by the General Land Office, *Restoration of Lost or Obliterated Corners*, states in item 6 under the section "To Restore Lost or Obliterated Corners" (italics inserted by author):

"Reestablishment of quarter-section corners on township boundaries—only one set of quarter-section corners are actually marked in the field on township lines, and they are established at the time when the township exteriors are run. When double-section corners are found, the quarter-section corners are considered generally as standing midway between the corners of their *respective sections*, and when required to be *established* or reestablished, as the case may be, they should be generally so placed; but great care should be exercised not to mistake the corners of one section for those of another. After determining the proper section corners marking the line upon which the missing quarter-section corner is to be reestablished, and measuring said line, the missing quarter-section corner will be reestablished in accordance with the requirements of the original field notes of survey by proportion measurement between the section corners marking the line.

"Where there are double sets of section corners on township and range lines, and the quarter-section corners for sections south of the township or east of the range lines are required to be established in the field, the said quarter-section corners should be so placed as to suit the calculations of areas of the quarter section adjoining the township boundaries as expressed upon the official township plat, adopting proportionate measurements when the present measurements of the north and west boundaries of the section differ from the original measurements."

The first paragraph of the above quotation from the pamphlet would indicate that the quarter-section corner would be set midway between the two closing corners concerned. For section 3, Example 1, where $AC = 23.14(M)$, $BD = 28.00(M)$ and $AB = 5290.00(M)$, CD (north boundary line of section 3) would equal $AB - AC + BD$

= 5290.00—23.14 + 28.00 or 5294.86. This would mean that the $N\frac{1}{4}$ corner of section 3 would be placed on line AB at a distance of $\frac{1}{2}CD$ or $\frac{1}{2}(2647.43 \text{ ft.})$ from C.

The second paragraph states the fact that dimensions must conform to areas given in the official plat. This could lead to an entirely different solution depending on the method employed to protract the subdivision of the section by the original surveyors. A discussion of this type of approach will be presented in solution 2.

The 1963 pamphlet written by the Bureau of Land Management, *Restoration of Lost or Obliterated Corners and Subdivision of Sections . . . A Guide for Surveyors*, states in section 19:

“. . . Where there are double sets of section corners on township and range lines, the quarter-section corners for the sections south of the township line and east of the range line were not established in the original surveys. In subdividing such sections new quarter-section corners are required, so placed as to suit the calculation of the areas that adjoin the township boundary, as indicated on the official plat, adopting proportional measurements where the new measurements of the north or west boundaries of the section differ from the record distances.”

The 1963 pamphlet further states under the section, “Double Sets of Corners” on page 31 concerning the double-section corners which occur on standard parallels:

“. . . Subsequent to 1919 it has been the practice to establish the second set of quarter-section corners. These are at midpoint for distances between the closing corners, except where the plan for the subdivision indicates otherwise . . .”

It further states under this same section:

“. . . These conditions merit careful study of the plats to the end that the subdivisions shown on the plats be given proper protection. The plats will indicate whether these quarter-section corners should be at midpoint between the closing corners, or if they should be located with regard to a fractional distance . . .”

The 1963 pamphlet indicates that the conditions given the original plats control. If areas are given, it appears that they control. If areas are not given, it appears that the quarter-section corner is set midway between the closing corners concerned.

Solution 2: In the paper “The Public Domain and Its Survey” by J. O. Henderson mentioned earlier in this paper (in the section entitled “Tiffin’s Instructions”), he said in effect that areas of quarter sections were figured by using dimensions between closing corners on the township or range line concerned and the quarter-section corners

for the section to the north or west as the case may be. In Example 1 (Figure 3) he would therefore use the north boundary (R) of the NE quarter of section 3 as $(40-00)-(00-35) = 39-65$ to figure the area (R) which would be recorded on the official plat. He would use the north boundary of the NW quarter of section 3 as $(40-00) + (00-40)$ or $(40-40)$ (R) to figure the area (R). If the methods of Henderson were used to figure areas, then we are really attempting to locate the quarter-section corner for the section to the north or west which was set on the original survey.

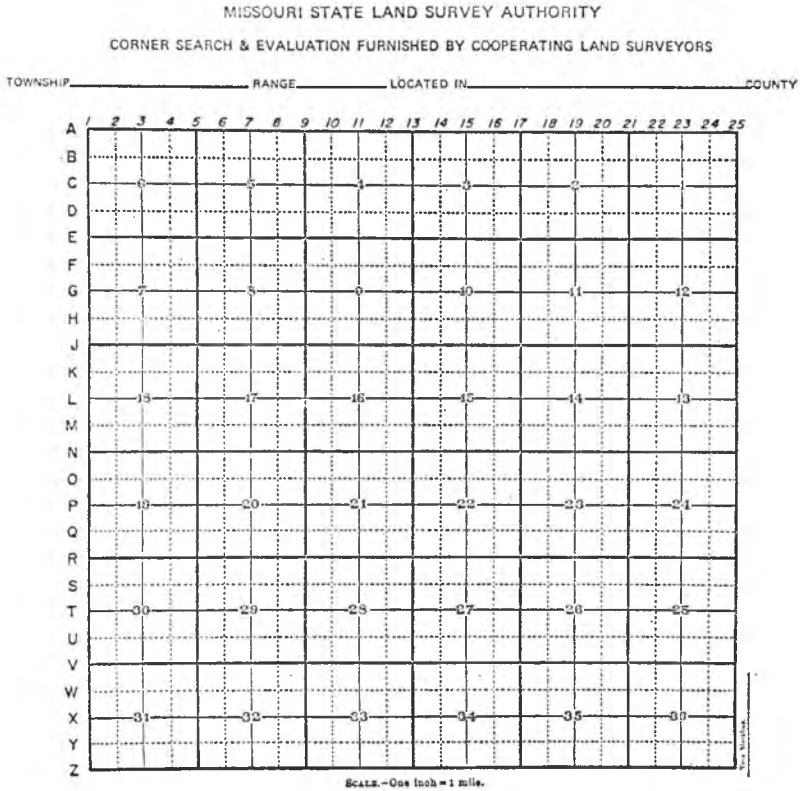
This discussion again emphasizes the necessity of retracing the steps of the original surveyor. When it is required to locate the north quarter corner of section 3 in Indiana, we must refer to the original plats. If the area is given, the position of the quarter corner must be such that the area controls. It is conceivable in this case that the position might be that of the quarter corner for the section to the north which was set on the original survey. If the area is not given, a logical conclusion would be to set the quarter corner midway between the closing section corners—NW and NE corners. In any event diligent research and judgment are required.

HIGHLIGHTS OF PROPOSED PERPETUATION MANUAL

The proposed perpetuation manual was discussed by me in detail at the Road School meeting of this group in 1970. This paper is published in the *Proceedings of The 56th Annual Road School*, pages 232-249.

This paper will only give a brief summary concerning the manual. The official title of the manual is, *The Perpetuation of Section Corners in Indiana*. It is composed of seven chapters: (I) "Introduction," (II) "United States Public Land System," (III) "Records," (IV) "Monumentation," (V) "Equipment," (VI) "Indiana State Plane Coordinate System" and (VII) "Summary." It has four valuable appendices: (A) "Perpetual Corner Records Act of 1965," (B) "Tiffin's Instructions," (C) General Land Office pamphlet, *Restoration of Lost and Obliterated Corners*, 1883, and (D) "Double Corners in Indiana and Illinois" by John G. McEntyre, *Surveying and Mapping Journal*, December 1968. It also has a most useful bibliography of articles and books which relate to corner perpetuation.

The reader is now referred to the figures on the following pages which are self-explanatory and are an effective means of presenting highlights of the manual. The figures are presented as follows;



CODING SYSTEM USED BY THE MISSOURI STATE LAND SURVEY AUTHORITY

Fig. 5A.

Methods of Maintaining Records—Figures 5a, 5b, 6a, 6b, 7a, 7b, 8a, 8b, 9a, 9b, 9c, 9d, 10

Monumentation—Figure 11

As of March 1, the publication date of the manual is still planned to be June 1, 1972. It is felt that this manual will be an excellent library reference for all land surveyors who practice in Indiana and particularly for the county surveyor.

PAGE _____

CORNER RECORD

TIPECANOE _____ COUNTY

CORNER 15 B TOWNSHIP 23 NORTH RANGE 4 WEST _____ 2 ND PRINCIPAL MERIDIAN

LOCATION	DESCRIPTION OF		DISTANCE FROM CORNER	BEARING FROM CORNER	DATE CHECKED	CHECKED BY	FIELD BOOK	REMARKS
	MONUMENT	REFERENCE						
NORTH 1/4 SECTION 27	4"x4"x36" IS cross on top	6" Elm	50 lks	N 50° E	6-16-65	J.P.W.	2,p.18	Lost. Data as recorded in original field notes. No record of survey for this corner on file.
		8" Oak	80 lks	S 15° W				
NORTH 1/4 SECTION 27	4"x4"x36" concrete post with 1/2" rebar as mark.	4"x4"x36" concrete post with 1/2" rebar as mark.	88.68 ft.	N 66° E	6-19-66	J.P.W.	3,p.10	Relocated by testimony of old residents and old fence lines. Concrete witness posts set this survey.
		8" Oak	53.11 ft.	S 16° W				
		4"x4"x36" concrete post	48.73 ft.	N 22° W				24" Oak is thought to be 8" Oak referred to in original notes.

Fig. 5B.

CORNER CODE SYSTEM

ELKHART COUNTY

SEC. 10 TWP. 37 NORTH RANGE 5 EAST 2 ND P. M.

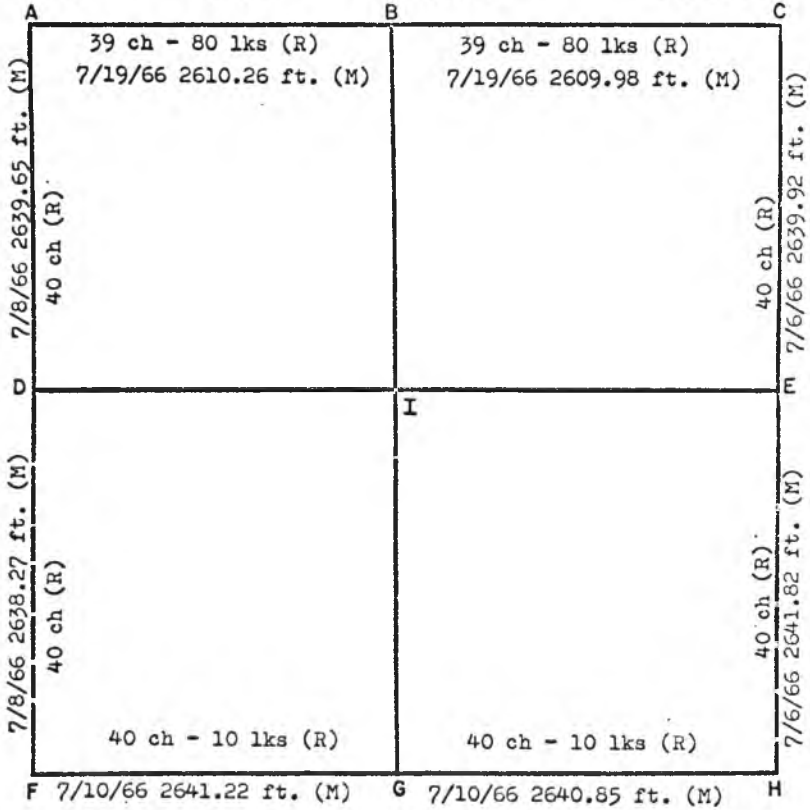


Fig. 6A.

PAGE _____

RECORD OF SECTION CORNERS

WAYNE COUNTY

SECTION 10 TOWNSHIP 17 NORTH RANGE 13 EAST 2 ND PRINCIPAL MERIDIAN

DATE	COR LOCATION	DESCRIPTION OF		DISTANCE FROM CORNER	BEARING FROM CORNER	COND	CHECK	FIELD BOOK	REMARKS
		MONUMENT	REFERENCE						
7/6/66	E E 1/4 COR	6"x6"x40" IS	Conc Post	40 ft.	N 30° E	Exc.	PAR	3, p.9	Fd. in place
			Conc Post	36 ft.	N 80° W	Exc.	PAR	3, p.9	Fd. in place
			8" Oak	64 ft.	S 10° E	Good	PAR	3, p.9	Fd. in place
								Exc.	PAR
8/1/70	E E 1/4 COR	4"x4"x36" Conc	Conc Post	40 ft.	N 30° E	Lost	PT	8, p.7	Reset
			Conc Post	50 ft.	N 75° W	Exc.	PT	8, p.7	Fd. in place
			8" Oak	64 ft.	S 10° E	Lost	PT	8, p.7	Replaced
								Exc.	PT

Fig. 6B.

GENERAL		DESCRIPTION OF WOUND	DISTANCE FROM OWNER	REMARKS FROM OWNER	DATE CHECKED	FIELD CHECKED BY	REMARKS	DISTANCE FROM OWNER	REMARKS FROM OWNER	DATE CHECKED	FIELD CHECKED BY	REMARKS				
													DESCRIPTION OF WOUND	DISTANCE FROM OWNER	REMARKS FROM OWNER	DATE CHECKED
<p>MADISON COUNTY SEC. 28, TWP. 20N., R7E.</p> <table border="1" data-bbox="281 882 617 1218"> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>																

Fig. 7A.

WHITE COUNTY

SHEET 5

SEC. 5 TWP. 26 NORTH RANGE 4 WEST 2 ND P. M.

CORNER	DATE	INT.	UPDATING	CORNER	DATE	INT.	UPDATING
CENTER	6/10/64	J.M.	SHEET 41				

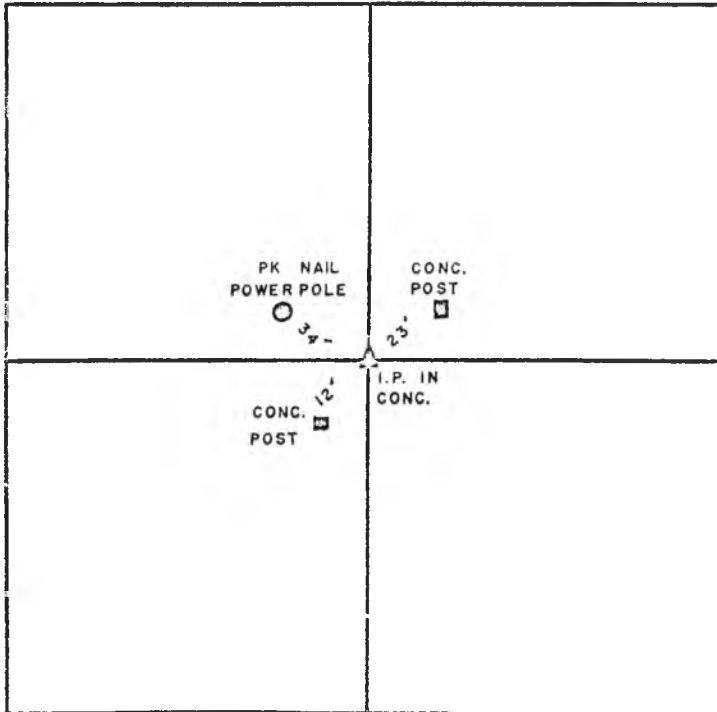


Fig. 7B.

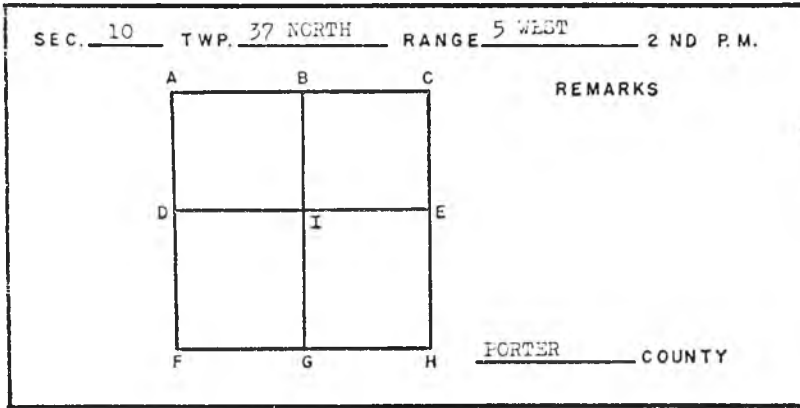


Fig. 8A.

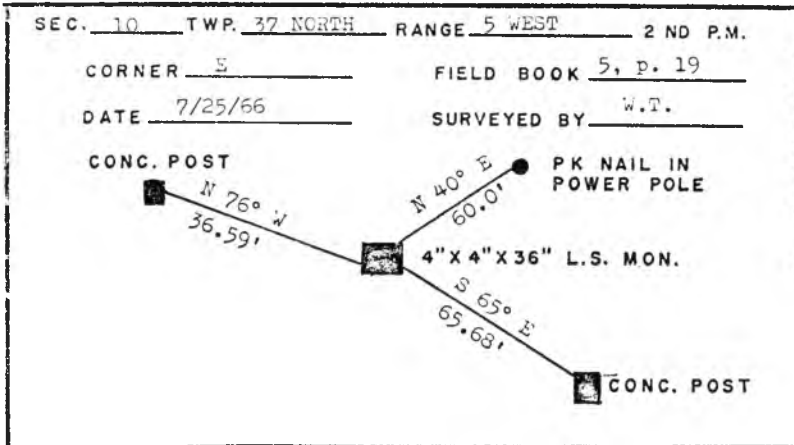
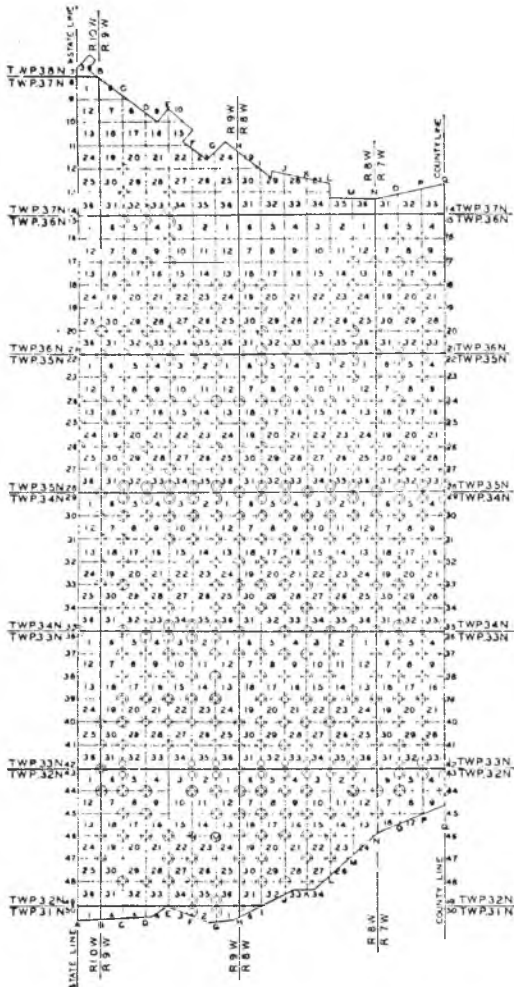


Fig. 8B.



INDEX
 FOR LOCATING
 CERTIFICATE OF
 SECTION CORNERS & WITNESSES
 IN
 LAKE COUNTY INDIANA

ILLUSTRATION
 TO FIND CERTIFICATE FOR SW CORNER
 SEC. 21, TWP. 35N. R. 8W. FOLLOW VERTICAL
 LINE #10 TO INTERSECTION OF HORIZONTAL
 LINE #28, THEN LOOK FOR 4-28 IN CER-
 TIFICATE FILE.

COLOR CODE
 RED—PERMANENT MONUMENT INSTALLED
 GREEN—CORNERS WITNESSED
 WHITE—PIPE OR STONE CORNER

PREPARED BY OFFICE
 OF
STEVE W. JANICH
 LAKE COUNTY SURVEYOR & ENGINEER
 1964

Fig. 9A.

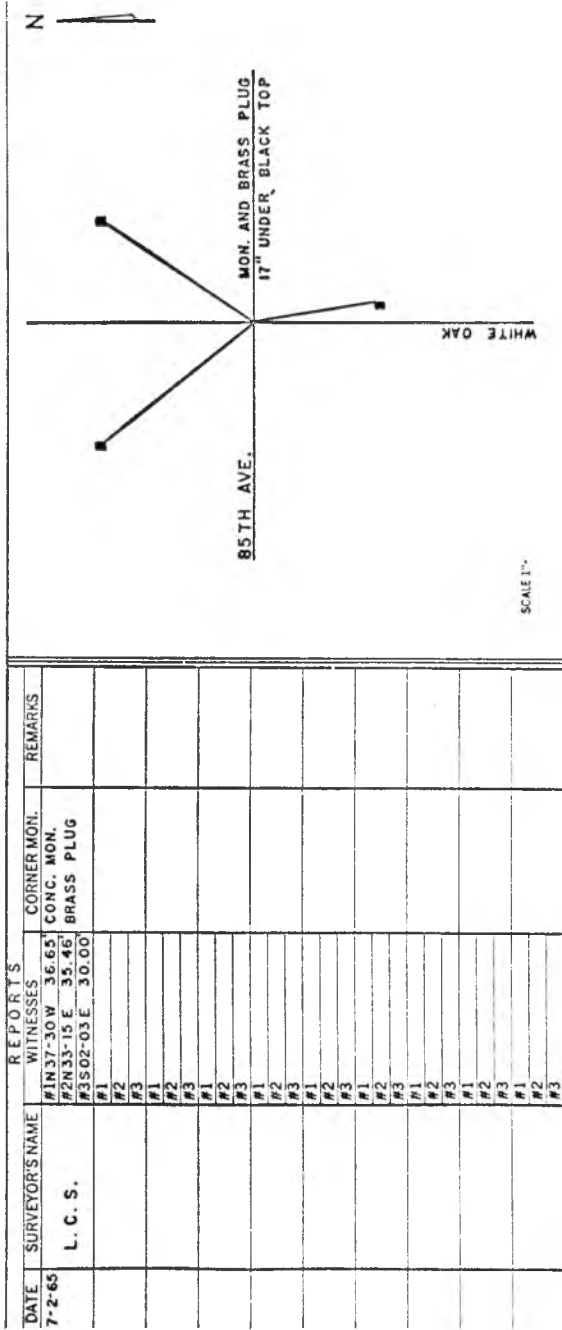
CORNER	SEC.	TWP.	RANGE
NE	30	- 35	- 9
NW	29	- 35	- 9
SE	19	- 35	- 9
SW	20	- 35	- 9

INDEX: C - 26

LAKE COUNTY, INDIANA
SURVEYOR'S OFFICE

Corner Record File
Act of March 12, 1965

RECORD OF MONUMENT
COMMON TO:



SCALE 1" =

Fig. 9B.

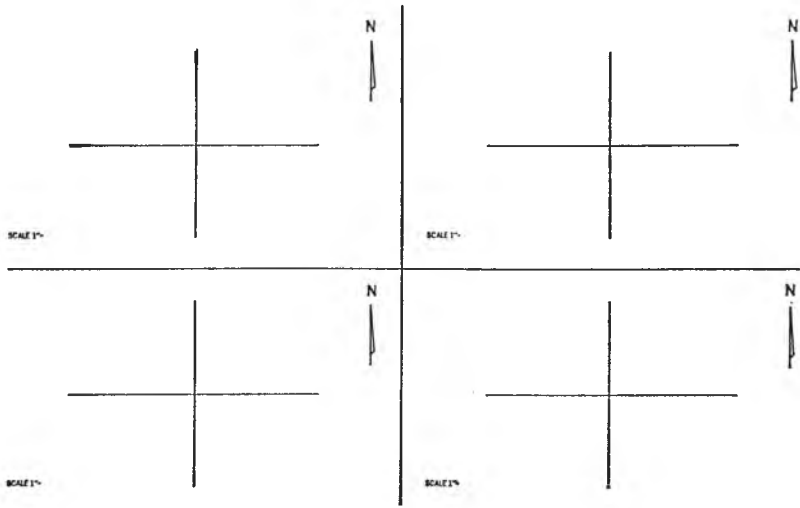


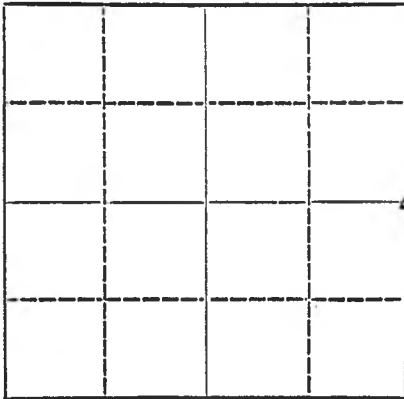
Fig. 9C.

M I C R O F I L M M E T H O D

INDEX TO LANDMARKS

THE MARION COUNTY SURVEYOR'S OFFICE

SECTION 1 TOWNSHIP 14 N., RANGE 2 E.



REMARKS

SECTION 1 TOWNSHIP 14 N., RANGE 2 E.

INDEX TO LANDMARKS

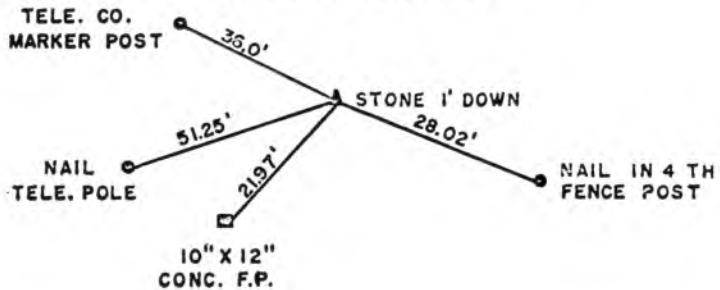


Fig. 10.

SUMMARY

The intent of this paper was to emphasize the high points of: (1) statute requirements for the county surveyor in Indiana, (2) "Tiffin's Instructions" pertaining to the original United States Public Land Survey of Indiana, (3) restoration of lost corners in lands surveyed under "Tiffin's Instructions," and (4) proposed perpetuation manual. There was no intent to cover any of these topics in detail; however, it was hoped that an awareness for these topics was initiated or increased and that each individual who reads this paper has a desire to pursue these topics on his own in the future.

APPENDIX A

Indiana and Illinois* Double Corners in

JOHN G. McENTYRE

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School of Technology, Purdue University, West Lafayette, Indiana
ABSTRACT—This paper discusses the occurrence of double and triple corners in Illinois and Indiana and presents the reasons for the occurrence of double and triple corners in these states. It gives the procedure, with variations, for relocation of a lost double or triple corner and discusses the subdivision of a section with double or triple corners on its boundaries.

INTRODUCTION

The Public Land System now in effect, as controlled by the "Manual of Instructions for the Survey of the Public Lands of the United States 1947," is about as simplified as possible. It has evolved from years of experience. It is the resurvey of lands, surveyed during the development of the present rules, and the subdivision of lands, surveyed during the same period, which present many problems for the present-day land surveyor.

The system now in effect calls for only one set of corners on township boundaries, except on base lines and correction lines or in some exceptional cases. The double set of corners occurring on base lines and

*"Double Corners in Indiana and Illinois" by John G. McEntyre, *Surveying and Mapping Journal*, December 1968, Vol. XXVIII, No. 4, pp. 622-626.

correction lines basically allows us to absorb convergence into our rectangular system. As all land surveyors know, the corners set on these lines in the original layout of the system are called standard corners, and the corners set later during the subdivision of a tract into townships and a township into sections are called closing corners.

In earlier surveys double corners were often set on township lines. There are surveys in which triple corners were set on range lines.

SPECIFIC CASE OF ILLINOIS AND INDIANA

Most of Indiana and Illinois was surveyed in accordance with the instructions of Mansfield and Tiffin.² Therefore, the resurvey or subdivision of public land in many areas of these states is not covered by the 1947 manual, or by the 1963 edition of the pamphlet "Restoration of Lost or Obliterated Corners and Subdivision of Sections . . . a Guide to Surveyors." (Hereinafter referred to as the Restoration Pamphlet.)³ The Restoration Pamphlet, in fact, states in its preface: "The pamphlet does not cover controversial questions or exceptional situations." To resurvey the type of area discussed in this paper one must read the instructions applicable to the original survey and then use every means possible to follow the steps of the original surveyor. The Restoration Pamphlet issued in 1883 has instructions relative to double and triple corners which are most useful⁴ and the Restoration Pamphlet of 1963 has a pertinent discussion concerning double corners.³ Interior sections of townships in Illinois and Indiana were surveyed under regulations similar to those in the present manual. Figure 1 shows a situation in which double corners occur on all the boundaries of a township. This figure is a reproduction of an illustration appearing in the article "Sectionalized Land Surveys in the Northwest Territory" by Curtis M. Brown.² The figure demonstrates that significant differences occur on the closing lines along the north tier of sections and the west range of sections.

Specific Examples

Let us first consider a specific example along the northern tier of sections. When running the boundary line which is common to sections 2 and 3, the regional surveyor did not close on the standard corner previously set on the township line, but set a closing corner at the intersection of this line with the northern boundary of the township. He was required to note the falling from the standard corner in his field notes. Therefore, in this area there is a standard corner for sections 34 and 35 in the township to the north and a closing corner for sections 2 and 3 in the township to the south.

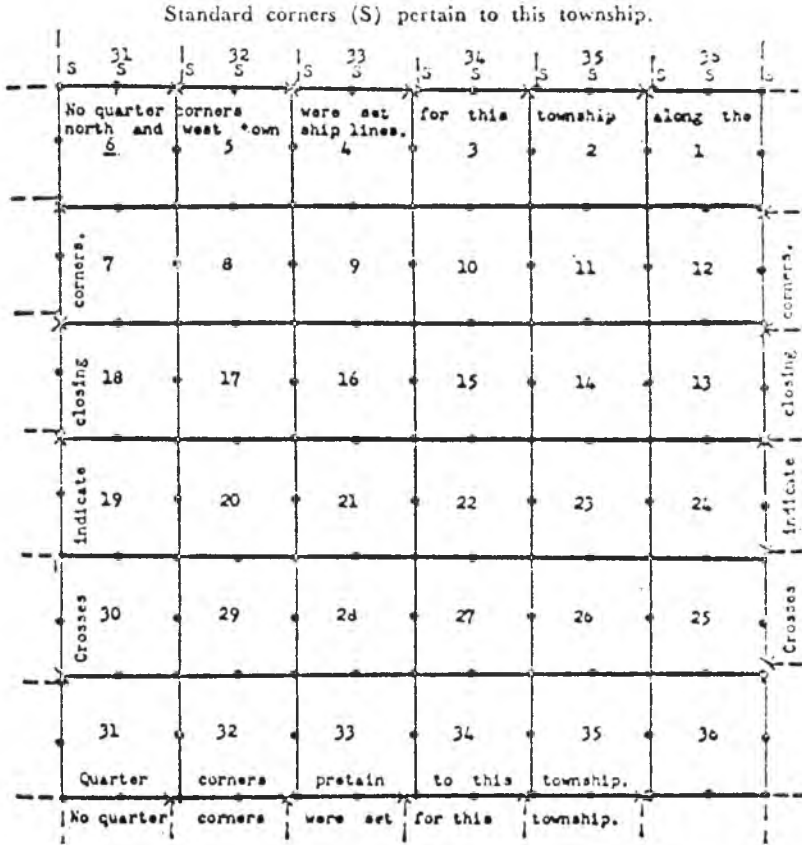


Fig. 1. Double corners in Indiana, Illinois, and Michigan. Dots indicate original standard corners set; crosses indicate original closing corners.

Consider next an example along the western range of sections in this township. When running the boundary line west which is common to sections 7 and 18, the original surveyor did not close on the standard corner previously set on the township line but set a closing corner at the intersection of this line with the west boundary of the township. It is obvious, similarly, that double corners could exist on all boundaries of a township, the closing corners on the north and west boundaries referring to the township concerned, those on the eastern boundary to the township on the east, and those on the south boundary to the township on the south.

Triple corners did occasionally occur on range lines. In these instances the original surveyor, when running east-west lines to divide

the township into sections, did not close on the standard corner on the eastern boundary of the township being divided but ran a line due east from an interior section corner and placed a closing corner at the intersection of this line with the east boundary of the township being divided.⁵ This means that at the corner common to sections 25 and 36 (Figure 1) three corners could exist—(1) a standard corner set when running the township line, (2) a closing corner from the township to east, and (3) a closing corner for this township being divided.

Resurvey

The Restoration Pamphlet of 1883 presents the most complete discussion of the method to be used to relocate lost double and triple corners along township lines.⁴ These procedures will be discussed briefly for the cases covered by the pamphlet.

The first case covered is where double corners were originally established, one of which is standing; to re-establish the other. The pamphlet cautions the surveyor to determine beyond a doubt to which sections the existing corner belongs, that is, whether it is a standard corner for the sections to the north or west or a closing corner for the sections to the south or east. The missing corner should then be set in line to the north or south (or east or west as the case may be) at the falling stated in the field notes; this distance should be determined by proportionate measurement. The relocation should be checked by remeasurement to the opposite corresponding corner of the section to which the missing section corner belongs.

The second case covered is where double corners were originally established, and both are missing; to reestablish the one established when the township line was run. In this case the survey is to connect the nearest known corners on the township line, being careful to distinguish standard corners from closing corners. The missing corner is then set on this line by proportionate measurement from these known corners. This standard corner will be common to two sections to the north or west of the township line, depending on its location. The section north or west, as the case may be, should be retraced carefully to verify the results of the relocation of the corner.

The third case covered is where double corners were originally established and both are missing; to reestablish the one established when the township was subdivided. In this instance, the closing corner controlling two common sections to the south or east, as the case may be, is to be reestablished. For this purpose, the township line to be closed upon must be reestablished; then the section line concerned must be retraced to an intersection with the township line. A temporary

point is set at this intersection, and is tested and verified by measurements to noted objects and known corners on the township line, as noted in the original field notes of the survey. Corrections are made, if necessary, and a permanent corner is set at the correct location.

The fourth case covered is where triple corners were originally established on range lines and one or two of them have been obliterated; to reestablish either of them. Two cases occur here: one where the distance between the triple corners is stated in the original field notes, and one where it is not. In both cases the surveyor will be particularly sure to determine the type of corner(s) which he has found. If the falling from the other corner(s) is noted in the field notes, he will then proceed to re-establish the missing corners in line north or south according to the distances stated in the original field notes, by proportionate measurement. He will test the accuracy of his location by measurement to the opposite corresponding section corner to which the missing corner belongs. If, however, the distances between triple corners are not stated in the original field notes, another procedure must be followed. In this instance, the range line and the two section lines closing upon it must be re-established. The intersections of these section lines with the range line are marked with temporary points. These temporary points are tested as prescribed for double corners. Corrections are made, if necessary, and the corner (s) is permanently re-established.

The fifth and last case covered is where triple corners were originally established on range lines and all of them are missing; to re-establish them. In this case the standard corner is re-established by proportionate measurement from the nearest known corners to the north and south. The two remaining closing corners are then re-established in conformity with the general rules for reestablishment of double corners, which are discussed above.

For those who do not have a copy of the Restoration Pamphlet of 1883, the pertinent sections are quoted in their entirety in "Restoration of Lost or Obliterated Corners in the Sectionalized Land Areas of Parts of Ohio, Indiana, Illinois, and Michigan" by Curtis M. Brown.¹

Subdivision of Sections

Closing corners present a special case in the subdivision of sections. Where double corners occur, the standard corners only control the sections to the north or west, as the case may be. This includes quarter-section corners if they were set on the original survey. Quarter-section corners for the section to the south or east must be prorated properly

between the appropriate closing corners. In Figure 1 this means that the quarter-section corner for section 2 would be set midway between the two "X's," the closing corners which are the NE and NW corners of section 2.

CONCLUSIONS

When resurveying or subdividing old public land surveys in Illinois or Indiana, the original method of survey must be carefully investigated. The possibility of the occurrence of double corners, or even triple corners, must be thoroughly checked. If double or triple corners occur, extreme care must be taken on a resurvey to assure that all found corners are properly identified and that the present surveyor does everything possible to retrace the steps of the original surveyor. On resurveys or subdividing old surveys, the present-day surveyor must realize that standard corners control those sections to the north or west only, as the case may be. Surveys concerning the Public Land System undertaken in these states should be executed only after painstaking research and should be carefully performed in the field.

REFERENCES

1. Brown, Curtis M., "Restoration of Lost or Obliterated Corners in the Sectionalized Land Areas of Parts of Ohio, Indiana, Illinois and Michigan," *SURVEYING AND MAPPING*, Vol. XXV, No. 4, December 1965, pp. 594-596.
2. Brown, Curtis M., "Sectionalized Land Surveys in the Northwest Territory," *SURVEYING AND MAPPING*, Vol. XXIV, No. 3, September 1964, pp. 491-494.
3. Bureau of Land Management, United States Department of the Interior, "Restoration of Lost and Obliterated Corners and Subdivisions of Sections . . . a Guide for Surveyors," United States Government Printing Office, Washington, D. C., 1963.
4. General Land Office of the United States Department of the Interior, "Restoration of Lost and Obliterated Corners," Washington, D. C., March 13, 1883.
5. Grimes, John S., "Clark on Surveying and Boundaries," The Bobbs-Merrill Company, Indianapolis, Indiana, 1959.