

112 PURDUE ENGINEERING EXTENSION DEPARTMENT

mentally agile enough to avert the accident, when he finds himself in a hazardous situation, is entirely a chance condition. For this reason the study was based solely upon the cost to the public of traffic delay. The cost of elimination of each grade crossing was determined and weighed against the public cost occasioned by each crossing. In that manner an economic priority was determined for each location, and a program of elimination totaling \$18,000,000.00 was developed.

HIGHWAY AUTHORITY NEEDED

Reviewing these major projects consisting of superhighways in Chicago, the initial units of which are estimated to cost \$100,000,000.00, express highways through the county, estimated to cost \$80,000,000.00, and grade crossing elimination work, costing \$18,000,000.00, it was found that local road-building agencies did not have sufficient annual revenues to undertake the construction of such work. Every means of raising the necessary funds was investigated, and it was found that the creation of a highway authority, a public corporation empowered to use private money in constructing highways, was the only feasible solution. A service charge or toll would be made for the use of such projects, which in no way would interfere with the use of the present system of highways.

The bonds issued by such an authority would be a charge solely against the tolls collected and would not be an obligation of any governmental agency. Ample evidence of the effectiveness of such highway construction is to be found in the New York City area, within which there have been built over \$300,000,000.00 of such highway authority projects.

A bill creating such an authority under the Superintendent of Highways of Cook County is now being prepared and will be introduced before the current session of the State Legislature.

A CRITICAL ANALYSIS OF INDIANA DRAINAGE LAWS

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The power to construct drains is no part of the ordinary powers of municipalities. Such authority must be conferred by the legislature, as the right to construct drains over the lands of others did not exist at common law.

The authority of the legislative body of the State to enact drainage laws is derived from the police power of the State, the right of eminent domain, and the general power of taxation.

It is within the police power of a State to require local improvements that are essential to the public health and welfare. Such improvements are of public utility, and to this end the State may make provisions for the construction of drains. If the public purpose is present and the improvement tends to the general prosperity of the community, the fact that private interests will also be promoted is immaterial. We must look, then, to the Acts of the General Assembly of Indiana for authority to construct and repair drains. For this reason the statutory laws should be strictly followed, in order that liens against real estate for assessments may be valid.

The legislature of the State of Indiana has provided that county surveyors shall have charge of ditch construction. The county surveyors are also given charge of the superintendence and maintenance of all ditches already constructed in their respective counties, so that whether proposed improvements be new construction or repair and maintenance, the county surveyor has charge of the project.

The term "ditch" or "drain" as used in the statutes of Indiana is defined to mean any natural or artificial channel for the carrying off of surplus water from the land.

THE ESTABLISHMENT AND CONSTRUCTION OF NEW DRAINS

When petitions for drainage have been filed and granted by the court, the proceedings are referred to the county surveyor for him to make all necessary surveys, maps, profiles, plans and specifications for the drainage system, together with the estimates of cost and the assessments of benefits and damages thereon. The surveyor is authorized to appoint as many deputies and assistants as the work will require, subject to the approval of the Board of County Commissioners.

The various steps required under the Act of 1933 for the drainage of land when the drainage thereof cannot be accomplished without affecting the lands of others, are as follows:

THE PETITION

1. (a) A petition for such drainage must be filed by the owner or owners of 10 per cent in acreage of the land lying outside of the corporate limits of any city or town which will be affected by the drainage petitioned for. (The petition may be filed by the county commissioners for the drainage of a public highway, by a township trustee for the drainage of public school grounds, or by the common council of a city or board of trustees of a town to drain public grounds within such city or town.)

The petition may be filed with the Board of County Commissioners, or in the circuit court or superior court, as these courts have concurrent jurisdiction.

- (b) The petition must describe the lands of each owner, using the legal description according to congressional surveys as shown by the tax duplicate of the county. It shall state the names of the owners, and if they are unknown, shall so state.

The petition and proper notice will give the court jurisdiction over all the lands described in the petition and such lands as may afterward be included in the project; so the county surveyor may include in his report to the court land which is not included in the petition, if the land reported will be affected by the drainage project.

- (c) The petition must state that in the opinion of the petitioners the public health will be improved or that highways or streets will be benefited by the proposed drainage or that the proposed work will be of public utility.
- (d) The petition should also state the method by which such drainage can be accomplished in the cheapest and best manner and that the costs and damages will be less than the benefits which will result to the owners.
- (e) The petition shall describe an area of land equal to $\frac{4}{5}$ or more of all the lands which will be affected, and the petition shall also describe the route of the proposed drain, so that the length of the proposed drainage described therein shall be equal to at least $\frac{4}{5}$ of the aggregate length of the work to be reported for construction, not including branches which may be provided for in the report of the surveyor, although not described in the petition.

NOTICE

2. The petition must be filed in the auditor's office if before the county commissioners, and in the county clerk's office if the circuit court or superior court is to assume jurisdiction.

The petitioners must fix a day when the petition is to be docketed by the court as a case pending, and after filing the petition, the petitioners shall give written notice to the owner or an occupant of each tract of land stating the route of the proposed drain, the fact of the filing of the petition, and the date when it will be docketed. This notice must be given not less than ten days before the day of docketing. On the day set, the court shall order the cause placed on the court docket as an action pending.

VIEWERS

3. At the time of docketing the cause, the court shall appoint two viewers to act with the surveyor. The viewers appointed must be disinterested freeholders, not related to landowners affected, and residents of a township through or into which the proposed drain is to be constructed.

The petitioners shall notify the viewers of their appointment and the viewers must qualify by taking an oath faithfully and

honestly to perform their duties. The viewers then act with the county surveyor to pass upon the project as hereinafter shown.

REMONSTRANCES

4. (a) Any owner of real estate described in the petition may, within ten days after the petition is docketed (exclusive of Sundays), file a remonstrance or objections to the form of the petition, or as to why the surveyor or viewers should not act, either on account of interest in the work or kinship to any person affected thereby.

If the court finds the petition defective, it shall dismiss it, unless the petition is amended within a time fixed by the court.

- (b) Within 20 days (exclusive of Sundays) from the date of docketing of the petition, the owners of $\frac{2}{3}$ in area of the acreage of the lands described in the petition, may remonstrate in writing against the construction of such drain or ditch, and in such event the petition shall be dismissed at the cost of petitioners.

Up to this point in the procedure, the county surveyor has had no duties to perform, as the petition must be prepared by counsel for the petitioners, and the petitioners must prepare and give the written notices required.

REFERENCE TO SURVEYOR

5. If no remonstrance is filed, the court shall then refer the matter to the surveyor and viewers, and fix a time when they shall make their report.

The surveyor and viewers shall make personal inspection of the lands described in the petition and also of any other lands likely to be affected by the proposed work, and they shall report:

- (a) Whether the drainage proposed is practicable.
- (b) Whether, when accomplished, it will improve the public health, or benefit any public highway in the county or street of a city or town, or will be a public utility.
- (c) Whether the costs, damages and expenses of effecting the drainage will be less than the benefits to the owners of the lands to be benefited by the proposed drainage.

If they report these three in the negative, the petition shall be dismissed at cost of the petitioners.

If the viewers report favorably to the proposed work, the duty of the two viewers appointed by the court is at an end, and the surveyor alone shall proceed from this point.

SURVEYOR'S DUTIES

The surveyor shall:

6. (a) Determine the best and cheapest method of drainage.
- (b) Determine the termini and route, location and character of the work, and fix the same by metes and bounds, courses and dis-

- tances. The character of the work shall include grades and bench marks, necessary arms and branches.
- (c) The surveyor shall estimate the cost of the work; divide the drain or ditch into sections of not more than 100 feet in length.
 - (d) Compute and set out the number of cubic yards of excavation *in each section*.
 - (e) Assess the benefits, or damages if any, as the case may be, to each separate tract of land in the watershed to be affected, including benefits or damages to railroad rights-of-way, streets, and highways.
 - (f) Report to the court under oath as to all such matters.

When a ditch crosses a highway or railroad right-of-way and the abutments of a permanent bridge or culvert are not of sufficient depth, the surveyor shall include in his report the specifications for the repair, underpinning, or rebuilding of the abutments and pro-rate the cost to the property owners receiving the benefit therefrom.

If new bridges are necessary the state, county, or railroad affected shall bear one-half of the cost and the remainder shall be borne by the improvement.

In locating the lines of work, the surveyor may vary from the line described in the petition, as he may deem best, and may fix the beginning or outlet so as to secure the best results. He may run the line so as to avoid injury to the lands, easements, or public grounds, and so as to benefit highways, streets, or alleys, not sacrificing the best interests of such work or drainage. The surveyor may determine what the method of drainage shall be. He may remove obstructions from a natural or artificial water course, or divert such water course from its channel by deepening, widening, or changing the channel of such water course; by constructing an artificial channel; by providing that the work may be the tiling of an already-existing public open drain or by converting an already-existing tile drain into an open ditch or tiling an open ditch and constructing as a part of such work a new drain.

He may provide that such drain shall be open or tiled and covered or partially open and partially tiled, and dug by shovel, dredge, or otherwise, or by any or all such methods combined.

All timber, shrubs, and trees standing within 25 feet of any part of any public tile drain shall be cut and removed, or deadened, and of open ditches within the discretion of the surveyor not exceeding 25 feet from the top edge of each bank.

The surveyor and his deputies have the right to enter upon lands within 25 feet of any such public drain.

Drains shall not be located so close to any lake covering 10 acres or more of ground as to lower the water level of

such lake and shall at no point be nearer than 60 rods to the high-water mark of such lake, except where such drains empty into such a lake.

The statute provides that in locating drains and fixing the size and dimensions of drains and ditches, the survey shall provide ample means for the drainage or protection from overflow of the land to be affected, keeping in view future contingencies.

In making the survey and preparing the assessments and the report of the surveyor, the surveyor must keep an itemized account of the costs and expenses incurred by him and include them in his report to the court.

REPORT OF THE SURVEYOR

When the surveyor's report has been prepared, it must be filed with the auditor if the proceedings are before the county commissioners, and with the clerk of the court if the proceedings are in the circuit court or superior court, and the court shall fix a date, not less than 30 nor more than 40 days after the filing of the report, for a hearing to be had upon the report by the surveyor. Upon such date being fixed, the surveyor shall within five days notify by United States mail on a stamped, five-day-return postcard, all the owners of land whose names appear in the surveyor's report, showing the amount of assessments or damages. If the schedule of assessment or damages filed by the surveyor contains names of landowners other than those mentioned in the petition, notices shall also be mailed to such additional landowners. The notices shall give the location of the drain; shall state that the land described therein is in the assessed area, and show the amount assessed and the date when the hearing will be had.

Upon the date fixed in the notice, the surveyor shall be present at the clerk's office of the court in which the proceedings are pending, and the surveyor shall hear and determine all objections made to such apportionment and assessments. The surveyor may adjourn the hearing from day to day or from time to time and may adjourn from the clerk's office to any other suitable room in the courthouse for the hearing. All objections filed shall be in writing and verified.

After hearing all the objections to assessments, the surveyor may confirm the report and assessments as made or may change them as justice may require, and if he changes them, shall show the amount assessed in his report, which action shall be reported to the court.

Any landowner affected may remonstrate against the final decision of the surveyor to the court where the petition is pending within ten days from the date of the filing of the

report. The remonstrance must be in writing and verified by the owner or by some person authorized on his behalf. A remonstrance may be made for any of the following causes:

1. That the report of the surveyor is not according to law.
2. That the damages assessed to any specific tract of land are exorbitant.
3. That the lands are assessed too much as compared to other lands assessed.
4. That other specific tracts are assessed too low according to the benefits to be received.
5. That the lands will not be affected nor benefited to the extent of the assessment.
6. That the damages assessed are inadequate.
7. That the lands will be damaged by the construction of the proposed work.
8. That it will not be practicable and cannot be constructed without expenses exceeding the aggregate benefits.
9. That the proposed work will neither benefit the public health nor benefit any public highway or be of public utility.
10. That the proposed work as decided upon and reported by the surveyor will not be sufficient properly to drain the land to be affected.

If a remonstrance to the surveyor's report is filed with the clerk, the court, after a hearing, may direct the surveyor to amend his report or the court may in its discretion set aside the report and refer the matter back to the surveyor for a new report.

If there be no remonstrance to the surveyor's report or if the finding and judgment of the court shall be in favor of the surveyor's report, the court shall then make an order declaring the proposed work established and approving the assessments as made by the surveyor, or as made by the surveyor and modified by the court, and shall assign the project to the county surveyor for construction.

When the improvement has been assigned to the engineer for construction, the county surveyor has charge of the execution of the work. It then becomes his duty to give notice in a newspaper of general circulation in the county where the lands are situated that, on a certain day not less than ten days from the date of the publication of said notice, he will receive sealed bids for furnishing of material and labor necessary for the construction of the work and will let the contract to the lowest and best bidder, or may reject all bids and advertise for new bids.

The surveyor may let the work as a whole or subdivide the work into two or more sections and let the work in separate contracts, as in his judgment seems best. The successful bidder or bidders shall enter into a contract with the surveyor

and give a bond payable to the State of Indiana in a proper penalty for the proper performance of the contract.

The contract must be approved by the court, and no contract shall be let by the surveyor until it has been approved by the court and the contractor's bond has likewise been approved by the court. When all the work has been finished and the surveyor has accepted it, the surveyor shall then make a final report to the court showing that the work has been completed and accepted.

THE ALTERATION AND REPAIR OF EXISTING DRAINS

The Act of 1933 providing for the alteration and repair of drains was amended in 1937; and the law now provides that, where a public drain or any part thereof is out of repair and not sufficient properly to perform the drainage for which it was originally designed, the owner or owners of 5 percent in acreage of the land affected and assessed for the construction of any public drain shall have the right to file a petition therein showing that by tiling and covering, or by increasing the size of the tile and changing the course, or extending the length of the drain, or by deepening or widening or extending an open drain, or by making any other change, such repair would be of public utility.

This amendment provides that no petition filed in conformity with the provisions thereof shall contemplate the increasing of the tile or the average deepening and widening or extension of the drain as originally established by more than 10 percent. This provision is arbitrary and does not permit the increasing of the size of the tile to any appreciable degree. To illustrate, 10-inch tile could be increased only to 11 inches under the law providing for alteration and repair of drains.

The form and contents of the petition and the procedure so far as applicable shall conform to the procedure as provided relative to original petitions for the construction of a new drain. This procedure is outlined in detail in part I, relative to the establishment and construction of new drains, and need not here be repeated.

It is worthy to note, however, that under the alteration and repair statute, no petition shall be denied by reason of the filing of a remonstrance signed by owners of two-thirds of the land unless the signers of such remonstrance shall be the owners of the land abutting on one-half of the total length of the ditch. Furthermore, when the petition alleges that the drain has not been cleaned out in the last ten years preceding and is out of repair and is not sufficient properly to perform the drainage for which it was designed and intended, and when the prayer of the petition is to clean such ditch so as to conform to the original specifications, then on proof of such facts the right to remonstrate is denied.

This provision prevents a remonstrance when the petition asks for a clean-out to conform to the original specifications, and when it is not intended that there shall be an increase in the size of the ditch or drain and when there has been no clean-out in the past ten years.

Provision is made for extensions of drains when landowners have been assessed for the construction of an established and constructed drain, and when it shall develop that the lands of such owners are not adequately and satisfactorily drained and such drainage cannot be attained without constructing such an extension through the lands of not more than two other persons whose lands are so situated that they intervene between the lands which it is proposed to drain; or when lands are flooded by a drain or ditch higher than the land affected, a majority of such landowners so affected may file a petition with the county surveyor to construct such an extension. The provisions for this extension are contained in the Act of 1933 as amended in 1935, found on page 1049 of the Acts of 1935.

BIENNIAL CLEANING AND REPAIRING

The drainage laws of Indiana contain a provision making it the duty of the county surveyor of each county to clean out and repair open ditches and drains and to remove all obstructions therefrom biennially.

Open ditches and drains in each county shall be divided into two groups. One group shall be cleaned out and repaired one year, and the other group shall be cleaned and repaired the following year, and thus alternating each year thereafter.

The act makes it the duty of the county surveyor to examine every ditch or drain within the county and determine the portion which should be biennially cleaned and kept in repair by the owner of each tract, and each corporation, county, or township which was assessed for the construction thereof. Such owner shall annually remove the weeds, willows, and debris therefrom. He shall likewise apportion to each railroad, township, or municipality where public highways or grounds are benefited, a share of such ditch or drain according to the benefits received, to be cleaned biennially and kept in repair. When allotments are so made, the county surveyor shall use such allotments until a new allotment is requested by proper petition.

Where dredge ditches have a bottom width greater than six feet, the county surveyor shall fix the number of feet from which each affected property owner shall remove the weeds, willows, and debris, unless the owners of twenty percent of the land shall petition to allot such ditch for a biennial clean-out, as other ditches are cleaned, or to award a contract for the repair and clean-out of such ditch. If, upon petition, a contract is awarded, it shall be done in conformity with the

procedure for the construction of drains, including notice, right of remonstrance, awarding of the contract, and collecting of assessments. In making a clean-out allotment the surveyor shall begin at the mouth of the ditch and give the location of each share, its number and length in feet. Each ditch or drain must be cleaned to a depth and width not less than the original specifications. No owner's allotment shall be above his upper land line.

The County Surveyor of any county is authorized to repair any open drain within his jurisdiction, at any time, upon notice of the necessity of such repairs by any person or corporation interested.

Upon receipt of such notice, the surveyor may proceed immediately to have such drain repaired without advertising, letting a contract for the performance of the work, or imposing or apportioning assessments if the total cost of such repairs does not exceed \$100.00 on any one ditch; but the total amount expended for that purpose in one county in any year shall not exceed \$1,000.00. The cost of such repairs shall be paid out of the general fund of the county.

Tile Drains—Repair. All public tile drains shall be repaired under the direction of the surveyor whenever the necessity for such repairs may exist, and tile drains shall not be classified for biennial repairs as provided for open drains.

Tile drains may be repaired at any time upon notice of the necessity of such repairs by any person or corporation interested. This may be done in the case of tile drains without advertising or letting a contract if the cost of such repairs does not exceed \$50.00.

If the cost of such repairs of a tile drain shall exceed \$50.00, then the surveyor shall proceed by advertising and letting a contract or contracts for the work in the same manner as provided for the letting of contracts for original construction. All proposals shall be figured by the unit. As soon as the contract or contracts have been completed, the surveyor shall pay the costs out of the ditch improvement fund, and then compute the cost of such repairs together with six per cent interest on the money paid out of the ditch fund, and assess it upon the lands in proportion to the original assessments for construction. The assessments shall be certified to the auditor for collection as in an original assessment, and such assessments shall be paid at the first taxpaying time thereafter.

It is made the duty of the county surveyor to set stakes to aid any person in locating his allotment. The person to whom the cleaning out and repair has been assigned shall, during the month of August of each year, remove and burn the brush, weeds, and other natural growth from the sides and bottoms of all open drains and all tile ditches or drains

which lie within his allotment for a distance of five feet on either side thereof, except where such natural growth protects the washing of such ditches and does not interfere with the flow of the water.

The allotment should be reduced to writing and recorded in a book kept for that purpose to be known as the Drainage Clean-Out Record. Provision is made for notice to be given of the allotments and for objections to allotments and hearings thereon.

Before the first day of June of each year, the surveyor shall fix a time within which each allotment shall be completed by the person required to perform the work. The surveyor shall begin with the allotment nearest the mouth of the ditch in fixing the time for completion of the allotment. He shall make a record of the time so fixed in a book provided for that purpose and shall notify each party affected.

After the county surveyor shall have notified each owner of his allotment and fixed the time for such cleaning and repair, such owner shall clean out and repair the ditch biennially, and it shall not be necessary to serve notice for each biennial repair unless the ownership of the land is changed.

Owners may convert the portion of any ditch allotted to them into a tile drain by putting in drain tile of sufficient dimensions to serve the purpose of drainage, thus preventing the necessity of cleaning that portion of said ditch so tiled, and thereafter such owner shall be exempt from allotment in that particular drain.

If the portion of any open ditch or drain allotted to any landowner becomes filled or obstructed by the negligence of such owner or occupant of such land, or by cattle, horses, or other livestock, it is the duty of such owner or occupant to remove all such obstruction at his own expense. Upon his failure to do so, after 15 days' notice in writing from the surveyor, served by registered mail, the surveyor shall have such fillings or obstructions removed, and when completed, he shall serve notice on the owner or occupant of such completion, together with the amount of costs, including his per diem for services; and if it is not paid within thirty days from the service of the notice, the person who performed the work may be paid out of the Ditch Improvement Fund and such sum placed upon the books of the auditor, together with 10 percent penalty, and collected as other taxes are collected.

FEDERAL AID IN REHABILITATION AND RECONSTRUCTION OF PUBLIC DRAINS

In 1937 the legislature passed an act providing that when an existing public open or tile drain is in need of rehabilitation and reconstruction, upon proper application and negotiations with officers or agents of the United States government, aid

will be extended by the Civilian Conservation Corps to assist in the reconstruction and rehabilitation of such public drain. In such event, the expense involved will be shared by the Federal government, and the owners of the land which may have been assessed for benefits will assume the remainder of such expense required for the reconstruction and rehabilitation of such drain. Five or more owners of land which will be assessed for benefits may apply for such improvement. Such application shall be addressed to the Board of Commissioners of the county in which the greatest length of such drain is located.

The commissioners may act upon the petition and all matters pertaining thereto with respect to the procedure necessary to establish the work. The act provides that no contract shall be awarded for the construction of such project, but the materials or machinery necessary for the construction or reconstruction of such drain shall be purchased or leased in the same manner as materials and equipment for other county purposes. No bonds shall be issued, but all expenses incurred shall be paid out of the County Ditch Improvement Fund or the general fund without appropriation by the county council, and when benefits assessed have been collected the general fund shall be reimbursed in the amount of such advancement.

By an Act of 1939 it is provided that in any county through which a drainage ditch extends into one or more counties, and which ditch has an average width of approximately 15 feet or more, and when an allotment has been made by the county surveyor for cleaning such ditch, whenever a petition signed by at least 20 percent of the persons to whom allotments for cleaning have been assigned is filed with the Board of County Commissioners praying that the cleaning of such ditch be done by contract or by the Civilian Conservation Corps or the Works Progress Administration under the supervision of the county surveyor, the Board of County Commissioners is authorized to rent the necessary machinery and tools for the cleaning of any such ditch, and the cost of cleaning such ditch shall be assessed against landowners to whom an allotment has been made for the cleaning of such ditch.

It is my opinion that the placing of drainage construction and repair in charge of and under the supervision of the respective county surveyors has resulted in more economical construction and maintenance and greater efficiency in the drainage of lands. The provision for a hearing by the county surveyor upon his report, with provision for the amendment of the report, affords the landowners an opportunity to correct errors or inequitable assessments without being required to file objections with the court, unless such remonstrants are dissatisfied with the surveyor's final report after hearing such objections as may have been presented.