to make a smooth joint with the old arch. The space in the center was filled with a wet grout, which was placed through a hole in the top of the old arch. By making the replacement in this way, a practically new structure was secured at less than half the estimated cost of removing the old arch and building a new structure, and with very little inconvenience or delay to traffic.

The foregoing has given you in a somewhat rambling style the history, the many applications, and the possible advantages of multi-plate pipe and arches, the latest material offered by research to the engineer and the road man as an aid in solving his small bridge problems. I have not tried to give you the details or tell you how it is done, for it has been my experience that those can best be worked out for each particular installation in co-operation with the representative of the company supplying the material, who is trained in the use of his material and has the information to help you design a structure that will best meet your needs. He can by the use of tables and graphs give you the size and shape, the pressures for the different loadings, the proper gauge of the material, and other necessary information.

NEW LEGISLATION AFFECTING THE MAINTENANCE AND REPAIR OF INDIANA COUNTY HIGHWAYS

By Charles A. West, Tippecanoe County Attorney

Since the enactment of the law creating county highway systems in each county of the state, there have been many changes made in the laws governing their operation and control. At first, the system was only a makeshift, but experience soon showed that changes must be made from time to time in order to conserve, as far as possible, the money available with which to maintain such highways and to give the traveling public the best highways possible with the least expenditure of money. The legislature of 1933 enacted a new law with the idea in mind of enabling the building and maintenance of a better county highway system in order to give the public the greatest benefits possible with the money available. It is with this law (Chapter 27, Acts of Indiana General Assembly, 1933) that we are now concerned.

Section 1, page 139, provides that the county surveyor shall have general charge of the repair and maintenance of the county highways, and that he shall receive, as compensation for such services, a sum not less than two dollars and not more than three dollars per year for each mile of highway under his supervision, the amount to be fixed by the board of commissioners. This provision should remind all those who have
been appointed highway supervisors that they should know the exact mileage in each county road system because their compensation depends thereon. The amount of money received by the county from the gasoline tax collections is also based on this mileage. In addition to the compensation stated above, the road supervisor or surveyor is entitled to receive five cents per mile when using his own conveyance for necessary travel in the performance of his duties.

Under this act, the board of commissioners has the right to employ any other person than the surveyor as supervisor of highways to serve at the will of the commissioners, his duties and responsibilities to be the same as when the surveyor is appointed.

The surveyor or supervisor shall have general supervision of the maintenance and repair of all highways, bridges, and culverts. He has no authority, however, in the expenditure of more than $50 on any one project without the approval of the board of commissioners; and when the expenditure is more than $500, the work must be advertised and let by contract. The surveyor or supervisor is given police power in control of the highways and may fix the limit of loads for any highway bridge or culvert. However, in the event of his closing bridges or limiting the loads, he must furnish adequate detour signs and provide such detours as are necessary. He must investigate and determine the best method of highway maintenance and establish standards for the maintenance of bridges and culverts and determine the availability of road repair materials.

At first glance, this provision would seem to indicate that the surveyor or supervisor would have the authority to decide what kind of material to use and that he would be authorized to purchase the material he so desired. This is not the case, since Section 5 of this act places the authority in the board of commissioners to contract for and purchase all road and bridge materials and all machinery, tools, and equipment necessary. This clause can only mean that the surveyor or supervisor should recommend and advise the commissioners what materials would be best for such maintenance and repair. He is also required to call a meeting of all his assistants at least once a year to discuss matters relating to highways. In my opinion, this provision should be amended to require more frequent meetings. Such meetings for discussion of questions relating to their work and the exchange of opinions and ideas would result in great benefit not only to the employees and the supervisor, but also to the commissioners who, after all, are held responsible for this department.

This act requires that the highway assistants shall make such reports as may be required and that each assistant shall file with the supervisor, on or before a day of the month to be
designated by the auditor, an itemized report of all the work done by him or under his supervision during the month, showing the names of the workmen, the nature and location of the work done, the material used, and the cost of such material. This report should be sworn to. Each assistant shall give bond in the sum of $1,000 for the faithful performance of his duties. I take it that this provision means that those who are required to give this bond are those who have charge of a district and does not include all those who work in the department.

The surveyor or supervisor shall file itemized monthly reports of all work done by him with the board of county commissioners. He shall also file with the board, on the first Monday of January of each year, a report of the work in his department and a complete statement of all moneys expended in accordance with the budget classification. He shall meet with the board to advise them on matters pertaining to the highway department.

He shall annually, on or before the first day of September of each year, make a complete itemized statement and estimate on forms prescribed by the State Board of Accounts of the cost of maintenance and repair of highways for the ensuing year. He should prepare a budget based on an estimate of the amount of money which can be reasonably expected to be received from the gasoline tax, and this must be filed with the auditor for the use of the board of commissioners who can, during the year, change or alter any estimate and make transfers of items on the budget. This is a matter which the county council has no authority to alter or change, and the tax adjustment board has no duty to perform in this connection.

It is the duty of the board of commissioners to appoint and employ all assistants, including teams, trucks, and men necessary to carry on the work; and there is no authority vested in the surveyor or supervisor to appoint or employ anyone without the approval of the board.

Section 8 of this act gives the surveyor the authority to enter upon land, after first filing a verified petition before the board setting forth that it is his opinion that the interests of a road require an entry upon the land to make drains or procure gravel, stone, or other necessary material to repair such roads, together with a description of such land, the probable damage to the landowner thereof, and the name of such landowner. The board must give such landowner ten days' notice of the filing of such petition and then appoint three disinterested freeholders to view the land and hear evidence as to the value of the material and the amount of damages. The board shall allow such damages and the auditor shall draw his warrant for the amount; and then the surveyor can enter upon such land to arrange for such drainage and the use of material.
If the landowner deems the amount so allowed inadequate, he may appeal to the circuit or superior court for a review of the amount of damages only. I would suggest that, if this provision is ever invoked by the surveyor and board, great care be taken to conform strictly to this law; otherwise, it might cause the county to become involved in a suit at law.

It is also the duty of the surveyor to make a map of all the highways in the county system, setting forth the length and character of the road, the kind and volume of the traffic using such road. In dividing the districts, he shall give each road a distinct number or name and maintain, as far as possible, the patrol system.

If the surveyor is appointed as supervisor, he cannot draw both his salary as surveyor and as road supervisor. He must take one or the other. Last, but not least, he must attend the Annual Road School for not less than one week, and he may be allowed his expenses of transportation, together with lodging, the same to be paid from the highway fund. This is without doubt a good provision, as much benefit will be derived from attendance at this school.

In the performance of your duties, it should be the desire and aim of all to make our county highway systems as nearly perfect as possible in order that those who use the highways and provide the funds will realize the greatest possible benefit.

**TIGHTENING UP ON SPECIFICATIONS AND INSPECTION**

By Earl Mings, Shelby County Surveyor

Specifications should be worded in plain English, simple words, and complete sentences coherently arranged, so that any ordinary person can thoroughly understand the meaning.

The specifications should be in harmony with the job or work to be done and the plans thereof. Set aside the different classes of work and specify separately just how this work is to be carried on, how it is to be finished, and how it should look when completed, and emphasize the quality of materials and workmanship according to their classifications. When specifications are made up in this way, they will not cause an unnecessary expenditure of money on a project. A very elaborate project will require an elaborate set of specifications; a very plain or ordinary type of project will require a very ordinary set of specifications. You may have a very complete and elaborate set of plans for a project, but with a very loose or incomplete set of specifications, when the project is completed, you may have something on your hands or hanging over your head that you are not at all proud of and are really afraid of.