MAINTENANCE OF SIDE DITCHES

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I have been invited to talk to this session on the subject of maintenance of side ditches. We are all aware of the fact that proper drainage is one of the most important items in the maintenance of a road. We cannot have proper drainage unless our side ditches are properly constructed and maintained. It has been said that a dirt road could be very easily maintained if it had perfect drainage. In setting up and maintaining our road systems, I do not believe enough emphasis has been placed on ditching. It has been my experience in meeting with various Fiscal Courts and County Road Departments in the state, in outlining their programs for the year that a lot of them do not want to consider anything but additional surfacing. This is also the opinion of the average citizen in our rural communities. He seems to be satisfied with the road past his farm or homestead if additional white rock is placed each year, and nothing else is done toward the maintenance of the road.

It is a proven fact that adequate ditches reduce the overall maintenance cost of a road system. Less surfacing materials will be needed for maintaining traffic-bound roads and they will not require patrolling as often. Low type bituminous surfaces will require less patching if the sub-grade is properly drained. I think the ditches in a road system should be checked several times a year and regular maintenance be performed on them. The operator of a patrol grader, as he is patrolling a traffic-bound surface, should watch the ditches and open sections that are accessible. Some of us seem to think that once a road is ditched, we do not have to pay any attention to it for the next several years. I believe that we are wrong in this idea. I think that maintenance of ditches is a continual job and should be followed throughout the year. We should keep our entrance pipe open. When an entrance pipe is not functioning properly, it will turn the water out into the roadway and form a ditch in the shoulder, which may eventually cause a dangerous traffic hazard. Loose boulders or solid rock ledges in ditches might cause the same hazard. An air compressor should be used in the maintenance of ditches in order to remove solid rock or boulders that are too large for the grader to pull out. I have noticed very often when a road is ditched the ditch is carried through the cut and out onto a fill causing the shoulder on the fill to wash away. This
practice should be watched closely and the water turned away from the road as soon as possible after it leaves the cut. Water should not be carried down a side ditch any further than it is absolutely necessary. Anywhere it can be turned away from the roadway, it should be turned out. I have noticed especially on county roads that grader operators have a tendency to pull the ditches too deep and have almost a vertical slope from the shoulder line to the bottom ditch. This should be watched, and as near to a 3:1 slope as possible from the shoulders to the bottom of the ditch should be maintained. Sometime this is difficult on the narrow right-of-way that we have on some of our county roads, but it should be followed if it is at all possible. I have also noticed where water is carried in side ditches down a steep slope for a long distance, the ditches wash out in the roadway, causing the section of road to narrow down to where sometimes two-way traffic cannot be maintained. In side ditches like this we should place stops or dams made of stone, concrete, wood, or other suitable materials. In most cases a ditch should not be any deeper and wider than is necessary for adequate drainage. I have also noticed that after the road has been ditched there are a lot of vertical back slopes. If there is a vertical back slope left of any height, the bank should be resloped. If this is not done the first few freezes and thaws will cause the earth to sluff off and fill the ditch. All loose materials should be removed from the slopes as soon as ditching has been completed. I also believe it is a wise idea where you have room on a right-of-way to construct a wide ditch with a slope of less than 3:1 from the shoulder.

I have also noticed considerable damage from vegetation, bushes, garbage, and other debris which have caused ditches to stop up. These items should be removed from ditches as soon as they are detected.

It is sometimes necessary to carry a large amount of water along the side of a roadway to a drainage structure. This should be carried in a special ditch of adequate capacity placed as near the edge of the right-of-way line as possible.

In the late fall of 1950 we conducted sort of an experiment on a certain road in our district which conclusively proved the value of adequate side ditches. We ditched a road in the month of November 1950 and work was completed about Thanksgiving. The road went through the winter of 1950 and 1951 without any replacement stone and was passable at all times. Other roads that were not ditched in this same locality had 100 tons per mile replacement stone placed on them in the late fall and there were times during the winter that everyone of them were impassable.
It has been our plan each year to do a lot of ditching with rural highway funds in the various counties but we have never been able to complete the ditching program we had planned. I think it would be a good idea for any county to spend a large portion of their rural highway funds and county funds on a county-wide-ditching program. I believe it would be worth more to a county road system than any money that could be spent for maintenance. We kept a cost account of a ditching program by force account in 1950. We found that it cost approximately $182.00 per mile to perform this work, not including overhead.

Since we were not able to perform the amount of ditching planned with our own forces, it was decided in our district to try some rural highway ditching projects by contract. This was discussed with officials in Frankfort and they were all very much in favor of this program. We worked up a project of approximately 100 miles of roads to be ditched in four adjoining counties. Special specifications were prepared by the specification committee for this work. In the meantime we selected our roads and prepared estimates and sent them to Frankfort to be advertised. We tried to interest all the contractors in our area in this work. Contracts were let around September 1 of 1951. The work was finally started about October 1. The contracts were let in two ways; two of the counties were advertised for ditching by the road mile, and two by the mile of ditch. This work was awarded to three contractors; one contractor bid two counties for the ditching by road mile; the other two bid single counties by the ditch mile. The cost per road mile was $250.00. The bids in one county for ditch mile was $295.00 and in another county $265.00. In one of the counties which was let by the ditch mile the total cost of ditches overran the estimates and the average cost was $338.00 per mile. It is our opinion that it would be better to let ditching by road mile contract. We believe that if the contractors had known that they were bidding by he ditch mile, a more reasonable bid would have been received. Two of the contractors finished the work before bad weather set in. In one county work was not finished until sometime in November and overran the thirty-day specified limit for this work. However, when the jobs were completed all the work had been finished satisfactorily and we were well pleased. Some slight changes have been made in the specifications for pulling ditches by contract since the original specifications were prepared. The only major change was the leveling and grading of shoulders through the entire project. In the original specifications the contractor was required to shape the shoulders only on sections where ditches were pulled. I hope that a lot of this work can be done on our rural road systems in the future.
There is one other item that is very necessary in the proper main­
tenance of side ditches; and that is side entrance pipe. It is my opinion,
and I'm sure a few here will agree with me, that the county should
furnish side entrance pipe for their county road system. The reason I
say this is, that if the county furnishes pipe, they would be of standard
lengths, would meet necessary specifications, and would be of proper
size to carry the drainage involved. I have noticed in so many places
excessive damage has been caused to our road systems due to im­
proper side drain pipes. If property owners are allowed to place their
own entrance pipe without proper supervision, they might place any­
thing from a hollow log to an old steel boiler for an entrance pipe, and
in numerous cases he will fill the ditch with dirt or rock which would
turn the water directly into the roadway, so I think some standard pro­
cedure should be followed in the construction of private entrances. It
might be possible for the counties to buy pipe and in turn charge the
property owner for the entrances that are placed. This is a very im­
portant item in the maintenance of any road system, and I believe that
the compliance with certain rules and regulations in regard to en­
trance pipe should be strictly enforced.

I hope that I have explained to you some of the problems that might
be encountered in the maintenance of side ditches in your county road
programs. If there are any questions that you might have, I will be
glad to attempt to answer them. Thank you.