Snow and Ice Removal from City Streets

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The removal of snow and ice from city streets often presents a serious problem to street superintendents and engineers. The actual removal of ice and snow, within itself, does not present too serious a problem. The real problem is that of organization and preparation. Logical thinking compels the engineer to prepare a plan of attack which will allow him to be prepared for almost all conditions. In the preparation of a plan the engineer must take into consideration the method, personnel, and type of equipment which are available for his use.

In Muncie we have used the following plan, and in most instances we have found that it has worked with a very high degree of success.

During the month of November, or even earlier, there are delivered to the city storage yard approximately 100 tons of washed concrete sand. This sand meets the requirements of the Indiana State Highway Commission for concrete sand. You will note that washed sand is specified, as we have found that with it a cleaner condition is obtained on the streets after ice and snow have melted. This is a very important point, especially in the business district, where patrons entering the various places of business are bound to track in small amounts of the aggregate. Most merchants raise considerable objection to anything that makes their stores unsightly. After the sand has been delivered to the storage yard, it is immediately run through a 7S concrete mixer, with approximately 60 pounds of calcium chloride added to each ton. The sand and calcium chloride are retained in the drum of the mixer a sufficient length of time to allow for thorough mixing. When taken from the mixer, the mixed material is then placed in stock piles and well covered with building paper or with the empty sacks in which the calcium chloride was received. Care should be taken in the covering of the stock pile to prevent the washing away of the calcium chloride. If this care is not taken, you will find that the sand will freeze and trouble will be encountered at the time you are ready to use it.

When ice is starting to form on the pavements, a truck is loaded with the prepared sand from the stock pile. The truck is equipped with a tail-gate spreader of the spinner type. As the truck is being loaded,
an additional 75 to 100 pounds of calcium chloride is added to each ton of sand. No attempt is made to mix the calcium chloride with the sand, as we have found that sufficient mixing is accomplished at the time of spreading. The loaded truck is then taken to the important business district street intersections and spread in an extremely thin coat. Additional applications are made from time to time to prevent the formation of ice. In applying the sand, we have found that the application can be made on the right-hand side of the street, extending far enough back from the intersection to assure the motorist a nonskid surface for the stopping of his car. We have determined that this distance should be held to a minimum of 125 feet. This guarantees the motorist an adequate distance in which to stop when close behind another vehicle.

No attempt is made to cover the intersection itself, as the movement of traffic will carry enough of the sand onto the intersection to prevent the formation of any ice coat.

Having discussed the plan for the removal of ice from pavements, it is also well to discuss a plan for snow removal. In Muncie and in other cities in the central part of the state, the snow-removal problem does not become too serious since the central part of state lies in the belt which does not have large or prolonged snow storms. If the ice-removal program previously outlined has been followed when icing conditions are indicated, in all probability there will already be a coating of calcium chloride on the streets. If it has not been followed, then the engineer should plan to have a thin coat of sand and calcium chloride spread on the streets within a very short time after the storm has started. This is to prevent the formation of ice under the snow and also to prevent the snow from freezing to the pavement.

In removing the snow from the pavements we use a motorized grader, pulling the snow away from the curb into windrows in the center of the street, the grader operating down one side of the street and back on the opposite side and making a sufficient number of passes to get the snow into one windrow. As we have an industrial tractor equipped with a front-end shovel, all loading is accomplished by means of this equipment. After as much snow as possible is removed, it is advisable to give the pavements an additional application of calcium chloride and sand to prevent the formation of any ice.

In Muncie this method of snow removal is confined entirely to the business district, and no attempt it made to remove the snow from residential streets. In residential sections when conditions become hazardous the streets are given a thin coating of cinders, containing no calcium chloride. The average amount of calcium chloride used in an ordinary winter is approximately 30 to 50 tons.