



Prefabricated concrete slabs are dropped into place quickly to form experimental roadbed.

Prefabricated Highways?

Though the world is full of technicians, computers, highly advanced equipment and improved methods of construction, highways still take time to build. Would you believe . . . prefabricated highways?

Through the efforts of South Dakota Department of Highways and the Bureau of Public Roads, Emil R. Hargett, associated professor of civil engineering, South Dakota State University, has developed a prestressed, precast portland cement concrete panel which can be lowered on a roadbed by a crane.

"The idea of prestressed concrete isn't new," Hargett explains, "but prestressed and precast have never before been linked together and used in highway construction."

The precast panels are 6 x 24 ft. long and 4½ in. thick. Each reinforced panel weighs four tons and contains two cu. yd. of concrete.

The panels are shipped from their construction location by truck and are put in place with the use of a large crane. Four loops are precast in the panels for easy handling and are removed after the panels are in place.

This type of construction can be used for emergency repairs on highways and spot construction at busy intersections.

In the development of a prefab

highway, Hargett said, "The increase in traffic, particularly heavy truck traffic, has created a need for a stronger but more flexible pavement. It must withstand heavy wheel loading without maintenance problems which are common to many pavements subjected to large traffic volumes."

Construction of rigid pavement with the use of prestressed concrete has had recent application in airport runways and limited highway use. Prestressed rigid pavement has definite advantages through the elimination of most expansion joints required in rigid pavement. Tension held by an embedded cable eliminates weather and stress cracks, and prestressed design makes a more efficient use of material.

A combination of prestressed rigid pavement and a flexible pavement overlay could introduce a new method of highway construction.

Hargett has contacted the South Dakota Department of Highways in an effort to coordinate his research with practical application. His plans are to combine the present-day highway construction with a type of offsite precasting, thereby reducing the expense presently involved with prestressed rigid

pavement construction.

He has now divided the program into three phases; 1) investigation; 2) installation of slabs, and 3) field study of performance with cost of a short length composite pavement. The installed sections consist of prestressed and precast concrete panels interconnected and covered with a 1½ in. asphalt mat, and includes a 24 x 96-ft. installation off the present South Dakota highway system. His study also includes 900 ft. of roadbed installation on the state highway system which will be let to contract this winter.

A. W. Potter, director of the material and tests division for the Department of Highways, said, "If this type of construction proves successful, it could eliminate some of the maintenance problems we'll be faced with when the Interstate system is complete. Small segments of the concrete pavement could be removed to correct subgrade problems and replaced by using this method of prefabrication."

The Bureau of Public Roads has expressed an interest in Hargett's research by sharing part of the cost of the small scale field study. They have also indicated that additional federal funds may be made available for further study. ■

APWA HIGHLIGHTS

(Continued from page 42)

locomotive, according to the demands which will be made on it.

- The front end loader with bucket capacities from three-quarters to three yards with a complement of trucks will become active when snow reaches a depth, through natural fall and drifting or through plowing, where it must be moved to another location. Where plows have windrowed the snow, belt type loader is very effective.

- The snow blower comes into its own for loading trucks from a windrow of snow or moving the snow to an adjacent roadside.

Each of these specialized loaders has its own application. The belt loader will pick up light or heavy snow. It will work when the snow is melting and heavy with water and will fill a large tandem dump truck in sixty seconds.

The snow blower will load trucks as fast as the belt loader. It will grind ice that cannot be handled by the other machine. It is not as effective with heavy or wet snow, when it becomes subject to clogging. Its spout will show wear from abrasives which may have been spread early in the storm. It will, however, clear snow that no other machine will touch and either load it or blow it clear of its path. It is the only machine which will cope with extreme situations.

- The melting machine is one of the recent special devices to aid in combatting snow. This apparatus, either mobile or set in a fixed installation, will reduce snow and ice to water and allow it to be carried away in our sewer system.

The mobile units, either self-loading or requiring auxiliary loaders, can have a definite application if snow dumps are not available in the area. Capacity is limited.

Fixed melting units can be built with almost any capacity and they do an excellent job. We have estimated that, in the Toronto area, the capital and operating cost of the snow melting unit make its construction economical if the haul distance to the snow dump is more than three and one-half miles greater than the haul distance to the melting unit. ■



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