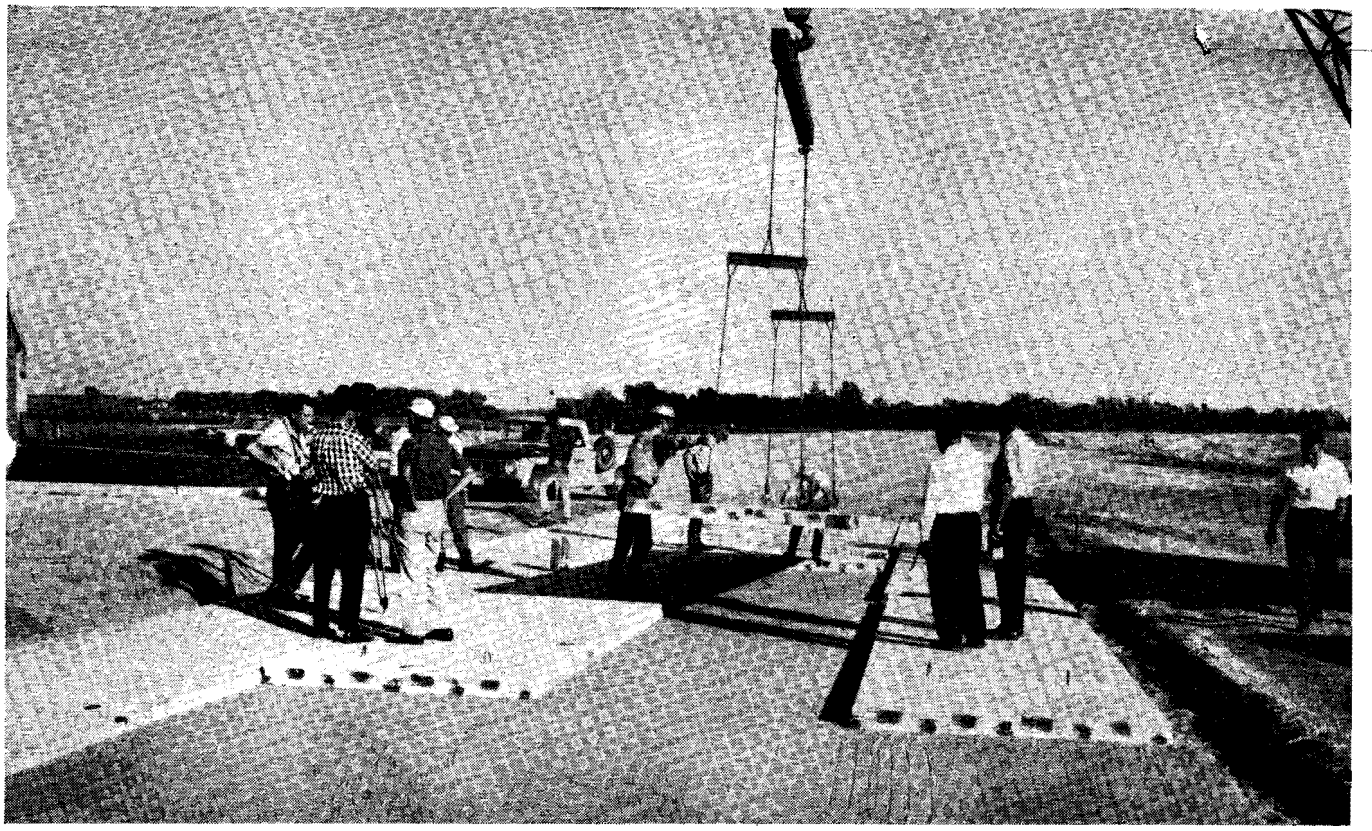

Placing a section of prefabricated highway.

Prefabricated Highway Tested in South Dakota

By Merle R. Bach, Publicity Division, South Dakota Department of 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 we now have prefabricated highways?

Through the efforts of South Dakota Department of Highways and the Bureau of Public Roads, South Dakota State University has developed the first prefabricated highway in existence.

Emil R. Hargett, associate professor of civil engineering, South Dakota State University, 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 feet long and 4½ inches thick. Each reinforced panel weighs four tons and contains two cubic yards 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.

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."

Today, highway construction consists mainly of two types — flexible and rigid. The use of concrete is comparable to a suspended bridge, with the load spread over the subgrade for a rigid pavement. The other type is known as a flexible pavement, or an asphalt mat spread over layers of gravel material to provide protection for the roadbed. The advantages and disadvantages of both flexible and rigid pavement construction are varied.

Flexible pavement is constructed with less equipment and personnel. By eliminating the use of joints, the flexible method also speeds construction, contributes surface smoothness, and generally requires less yearly maintenance.

However, the lack of a rigid beam action in flexible pavement is offset by the more uniform distribution of loads. After a period of years combined with heavy traffic, asphalt tends to become brittle and cracking occurs.

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 high-

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Bids Asked for Five Utah Road Projects

SALT LAKE CITY, Utah — The State Road Commission of Utah in Salt Lake City, will receive bids November 16 for five projects, according to an announcement by Henry C. Helland, director of highways.

In Box Elder County, Project No. I-80N-5(19)8 First Contract, will consist of signing and delineation on Interstate Highway No. 80N from East Howell to East Snowville. The project will include seventy-five Type C-2 signs; two 30-inch stop Type C-2 signs; three Yield Type C-2 signs; eleven Interstate Shields; twenty-five cutout shield and route markers. Delineation work will consists of 280 Type I delineators; 70 Type II delineators; and installing 90 State-furnished Type I delineators. Completion of this project is required within seventy-five working days.

Project No. I-15-6(15)287 First Contract and I-15-7(83)289 First Contract, in Salt Lake County, includes construction of a three-span steel beam structure 148.5 ft. O. to O. and a cantilever steel beam structure 438.36 ft. O. to O. located on Interstate Highway 15 near 123rd South. One hundred-fifty working days will be allowed for completion.

Project No. I-15-6(52)287 First Contract will include construction of the three-span steel beam structure and will consist of 1,209 cu. yds. excavation, unclassified; 408 cu. yds. Class "A" concrete (AE); 601 cu. yds. Class "AA" concrete (AE); 183,850 lbs. reinforcing steel; 291,714 lbs. structural steel, plus other miscellaneous items of work.

Project No. I-15-7(83)289 First Contract, the cantilever structure, will include 948 cu. yds. unclassified excavation for structures; 472 cu. yds. Class "A" concrete (AE); 601 cu. yds. Class "AA" concrete (AE); 247,910 lbs. reinforcing steel and 621,695 lbs. structural steel.

In Emery County, Project LSF-024-2(1) and LSF-024-2(4) will include construction of rest area development and one double box culvert extension 22.25 ft. O. to O. on State Road No. 10 at Emery and four miles southwesterly from Castle Dale. One hundred working days allowed for completion.

Major items of work will include 6,500 cu. yds. unclassified roadway excavation; 149 cu. yds. excavation for structures, unclassified; 6,100 cu. yds. imported borrow (granular material); 7,900 cu. yds. compaction, Method "B"; 330,000 gals. watering; 482 lin. ft. Type II chain link fence; 1,700 lin. ft. Type "B" right-of-way fence; also miscellaneous amounts of alkali resistant corrugated steel pipe and pipe arch; galvanized steel pipe; concrete curb and gutter, and ditch excavation.

State Project No. NS-256(1), in Duchesne County, will include construction of a graded and drained roadway consisting of 10,000 cu. yds. unclassified roadway excavation; 175 cu. yds. excavation for structures, unclassified; 28,000 cu. yds. imported borrow; 2,000 cu. yd. imported borrow (granular material), etc.; and construction of one prestressed concrete structure 82.69 ft. O. to O. consisting of 13,710 lbs. reinforcing steel; 1,635 lbs. structural steel; 79 cu. yds. Class "A" concrete (AE) and 550 cu. yds. excavation for structures, unclassified.

The project is situated on State Road No. 35 seven miles southeast of Tabiona over the Duchesne River and is scheduled for completion within forty-five working days.

In San Juan County, Project S-0402 (5) consists of 6.572 miles construction of a road mixed bituminous surfaced roadway on State Road No. 47, beginning eight miles northeast of Mexican Hat and extending toward Bluff. Scheduled for completion within one hundred-fifty working days.

Major items of work will include 186,000 cu. yds. unclassified roadway excavation; 34,200 cu. yds. imported borrow; 300 cu. yds. excavation for structures, unclassified; 271,000 cu. yds. compaction Method "B"; 706,000 sta. yds. Class "A" and 23,000 yd. miles Class "B" overhaul; 2,200,000 gals. watering; 1,622 lin. ft. corrugated metal pipe; plus base course, bituminous material, gravel surfacing and cover material.

Prefabricated Highway—

(Continued from Preceding Page)

way construction with a type of offsite precasting, thereby reducing the expense presently involved with prestressed rigid pavement.

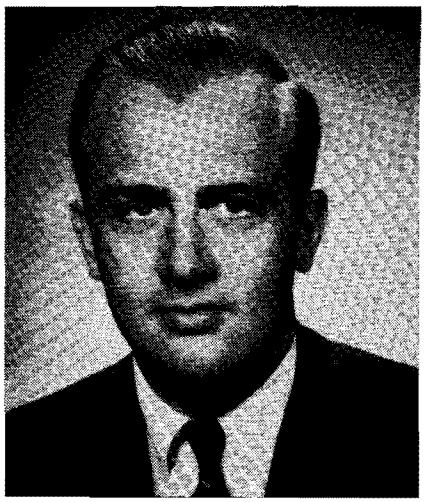
He has now divided the program into three phases: (1) investigation; (2) installation of slabs; and (3) field study of performance with cost of a short length composite pavement. The installed sections consist of prestressed and precast concrete panels interconnected and covered with a 1½-inch asphalt mat, and includes a 24 x 96-foot installation off the present South Dakota highway system. His study also includes 900 feet 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 South Dakota 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.

Knorr Joins ACP Sales Staff

CHICAGO, Ill.—The board of directors of Associated Construction Publications announces the appointment of Thomas H. Knorr, Jr. as sales development manager. Knorr recently assumed his duties in ACP's Chicago, Illinois headquarters at 112 S. Michigan Avenue. He will assist Robert Teichmann, director of marketing and research and will handle accounts mainly in the midwest.



Thomas H. Knorr, Jr.

Knorr brings to ACP's 14 regional publications, a background of experience in advertising. His previous assignment was with Ojibway Press, as midwestern advertising representative of their paper group.

His former advertising experience included that of cooperative advertising manager for Dr. Pepper, Dallas, Texas, and responsibilities in the media department of Compton Advertising, Chicago, Illinois.

Knorr attended Trinity College, Hartford, Connecticut, and is a graduate of Kendall College. Later he specialized in advertising and marketing at Northwestern University.