

three winter months from December 15 through March 15. In portions of the state only two months are considered to be non-profitable for structure contracts. Approximately 12% of the structural work and possibly 20% of the entire yearly highway program is completed in winter. North Carolina is considered to be in temperate zone. Protection of structures and conditioning of materials are the major considerations in North Carolina.

Ohio: From December 1 to March 1, 5% of Ohio's roadway excavation is completed, along with 10% of the construction of rock embankment. Some bridge concrete work is attempted. Protection must be provided on concrete work so that the structure does not drop below 50 degrees F. Concrete work on bridges varies from \$3.00 to \$12.00 more per cubic yard depending on type of protection provided. Protection and weather forecasting are the major problems.

Oregon: Between November 1 and March 31, approximately 30% of the construction program is completed (major portion is that done east of the Cascade Range). West of the Cascade during winter some crushing and structure work is performed, but no paving anywhere in the state is allowed. Very little cost increase is involved with work in winter. Winterizing of equipment is a major consideration.

Pennsylvania: A large portion of the construction program in Pennsylvania is performed in winter, but operations are limited and can be completely suspended. Base courses, pavements and surface courses are usually not built during the period from November 1 through April 15. It is felt that it could cost 50% more to cure structural concrete properly. Biggest problem is maintaining proper temperature of structures and materials prior to their incorporation.

Rhode Island: During the period from December 15 through March 15 work in Rhode Island proceeds at from 65 to 80% of the normal construction rate, with from 16 to 20% of the year's work being completed. Pavement, fill and minor structural work are not permitted. Cost figures are not available. Insulating and heating of structures, as well as protection of equipment and personnel, are the major problems.

South Carolina: From December 1 to March 15, 30% of the yearly program is completed. Bituminous surfacing is not permitted between October 1 and March 15. Placing of Portland Cement concrete and bituminous plant mixes are restricted by unfavorable weather conditions and temperature limitations which are evaluated at the local level. There are no increases in prices bid by contractors because of the temperate climate of South Carolina.

South Dakota: Two and one half per cent of the year's program is undertaken between November 15 and April 1. In heavy cuts and fills grading sometimes proceeds until January, but work in cold weather is limited to bridge structures with no deck work. Though a contractor works in winter, time count on contracts is not made on work performed between December 1 and March 31. No cost figures are available, and no major problems are encountered.

Tennessee: Very little work is performed between December 1 and March 1 unless a contractor is working in rock cuts. Clearing and grubbing, small drainage structures, and some bridge work are undertaken. Concrete work requires 35 degrees F. and rising or 40 degrees and falling. Hot plant mix asphalts are not permitted during this period, and seal coat work is suspended between November 1 and April 1. Contractors often work with their straight time men to keep their organizations intact even though it would be more economical to shut down. Protection of concrete is the biggest problem.

Texas: Construction is continued on a twelve month basis, and the four questions did not apply.

Utah: From December to April, 10% of Utah's highway work is performed, consisting primarily of structural concrete and excavation in rock cuts. Cold weather structural concrete work costs are higher, but cost comparisons are not available. Rock work costs substantially the same. The major problem encountered is that of providing the necessary heating and protection for concrete materials.

Vermont: Little construction is performed between December 1 and April 15. Concrete work, rock excavation and clearing and grubbing are sometimes attempted. During January and February temperatures of 20 to 30 degrees F. below zero are not uncommon. It is estimated that winter work costs from 15 to 20% more than when performed under warmer conditions. Major problems involved in winter operations are those of protecting work using insulation and artificial heating. Equipment is difficult to start, with breakdowns occurring more frequently.