

for temporary sealing at joints. Substructure concrete costs between \$4.00 and \$5.00 per cubic yard for heating and concrete form insulation. Uniform heating of materials, protective coverings, loss of manpower and equipment efficiency appear to be the major difficulties encountered.

Minnesota: Between December 1 and April 1, 5% of the constructure program is undertaken. This work consists of swamp excavation, granular back-filling and substructure work on bridges. Limitations are on specification items and it is seldom possible to work above these limitations in the winter months. No estimate was made regarding added costs of grading and paving work, but 15% more was given as the added cost for concrete bridge work. Protection of work, preparation and storage of materials are major considerations.

Montana: Winter construction is looked upon as an integral part of usual construction in Montana's winter months between November and April. Work is generally limited to clearing and grubbing, rock excavation, and some bridge substructure construction. Earth embankment work is usually not attempted because of frozen materials. No information was available concerning comparative costs. Major problems—starting and maintaining equipment and loss of surveying efficiency.

Mississippi: Construction of lime-treated sub-base, cement-treated bases and double bituminous surfaces are not performed in winter, however, all other highway work proceeds the year-round. Wet soil presents the most difficult problem during this time of year. Information about comparative costs for winter work is not available, and protection of structures is the biggest problem.

Missouri: From December through April in 1965, 22% of Missouri's work was paid for. Winters vary considerably, with grading, laying of pipe, building of culverts and structural work on bridges proceeding under milder conditions. With extreme cold conditions contractors limit their work to clearing and grubbing. Cost figures are not available; protection of structures and heating of materials are the biggest problems from the state's point of view.

Nebraska: Mean average temperatures from December 1 to March 15 in Nebraska can be expected to be below freezing, and only 5% of the state's work is undertaken then. Work is usually limited to major culverts and bridge structures. Structure work costs from 20 to 25% more. Labor efficiency, protection and material preparation are the problems encountered.

Nevada: It was estimated that less than 10% of Nevada's work is performed between November 1 and March 1. No limitations are encountered in the southern portion of the state, and little or no work with cement-treated bases or asphalt plant mix aggregates is possible in the northern portion in winter. Concrete work generally requires protection throughout the state during these months. Concrete placement costs are increased by approximately 5%. Protection of materials from freezing and finding work for key personnel are major considerations.

New Hampshire: Approximately 14% of highway work is paid for between December 1 and April 1. Construction work is limited to those items which can be economically protected from frost: clearing, ledge excavation, and concreting of structures. For many reasons it was estimated that 20% of the time paid to labor on projects is lost. Protection and heating is estimated to increase structure costs by about 25%.

New Jersey: Rock excavation and embankments, drainage structures, and bridges are worked upon between December 1 and April 1 in areas that do not affect traffic. Cost figures are not available. Problems related to loss of production, structure protection, loss of manpower efficiency, and union requirement on payment are the most difficult ones to overcome.

New Mexico: Asphaltic concrete is the only item prohibited by calendar dates from December 1 through March 1. The amount of work performed varies greatly upon weather conditions and the location of particular projects. Work is at the option of the contractor and there is no way of knowing how costs are affected. Protection of subgrade and surfacing material from freezing, temperature limitations on concrete and road oil seem to be the most important winter considerations.

New York: From December to April less than 15% of New York's highway construction program is performed (mostly structural work in New York City). Earth work is banned after November 15. It takes ten times the compactive effort to obtain equivalent densities in cold weather. Principal difficulties encountered are loss of manpower production, frozen moisture in material stock-piled, and protection of equipment.

North Carolina: Very little profitable work can be accomplished during the