

State estimates and contractors' bids reflect a winter shutdown. State officials estimate that it costs approximately 20% more to perform work above 6,000 feet because of the loss of time during the winter shutdown. No major problems exist because work continues at the lower elevations. It is felt that the cost of winter protection of structures and materials is unjustifiable.

Arkansas: Between December 1 and March 31 only 10 to 15% of the construction program is undertaken with contractors avoiding bridge deck construction during freezing weather. In areas earthwork is not undertaken in winter, but in mountains it continues in normal fashion. Major problems encountered consist of protection of concrete from freezing, excessive moisture and freezing in earthwork compaction, and loss of labor efficiency.

California: From December through February, California in 1965-66 winter paid out 18% of its yearly construction money. Work in the northern part of the state is curtailed in winter, but work in the southern portion is not. During these colder months the greatest limitation is one of unsuitable weather (rain) in the coast range and the Sacramento Valley areas. Heavy snows and low temperatures limit work in the Sierra Nevada range. Blasting, drilling and construction of rock fills is accomplished under frozen conditions; and the placing of base materials and surfacing is allowed to continue as the temperature rises above freezing and sufficient drying takes place.

Figures regarding increased costs for winter work are not available, but a reasonable certainty exists that it is expensive because of spasmodic production and loss of efficiency of both labor and equipment. There is also a great risk involved with the loss of completed work due to floods, snow, etc. and contractors consider this in their bids on winter work.

Colorado: Approximately 30% of the construction work is performed during the winter months from November through March. Earthwork is extremely limited, and protection of concrete against freezing weather is the major difficulty. Costs would increase because of equipment and manpower efficiency losses.

Connecticut: Contractors can continue work year-round or suspend operations with temperature limitations being placed on both flexible and rigid pavement work. Paving operations are usually suspended because of the impracticality and expense of protecting such large areas. Cost figures are not available, but these are presumed to be only a little higher because contractors choose to continue their operations through the winter. Principal difficulties encountered consist of the protection of concrete structures with insulated forms and heaters.

Delaware: Highway building is kept to a minimum during the months of December through March. Some structural work is performed along with other items that are not affected by cold conditions. Cost comparison figures are not available, but it is estimated that the contract costs would be increased by some 10 to 20%. The higher cost would result from the necessary material protection, loss of efficient production of both equipment and personnel. Some loss in quality might also result. Protection of roadway material is the greatest difficulty encountered in Delaware.

District of Columbia: Between December 1 and March 31 approximately 28% of the work on large jobs is completed. Small jobs are usually left to warmer weather. Awards are unaffected, and overall restrictions because of winter conditions are not made. Specifications restrict work by items involving concrete, asphaltic, stonemasonry work, and painting, etc. Comparative cost figures are not available, but it is felt that the variation in techniques and procedures used by individual contractors under winter conditions greatly affects the cost of this work.

Idaho: The state allows sufficient time on its contracts so that cold weather operations are not forced on contractors, and any winter work performed is at the contractor's choice. Temperature restrictions are placed on asphalt and concrete work, and frost restrictions are placed on roadway subgrades and bases. Cost comparisons are not available; however, there appears to be little variation in costs within the state because of climate.

Illinois: Between December 1 and March 15 approximately 11% of Illinois' highway funds have been expended. Winter work is required principally on substructures where completion of the structure will permit a traffic facility to be used at an earlier date. Contractors often carry on their construction operations in wintertime to keep their key employees. Standard specifications allow for adjusted unit prices ranging from 103 to 120% for required winter work. The per cent paid depends on the type of protection required, type of construc-