Fact Sheet

ANTIFREEZE ADMIXTURES FOR COLD-WEATHER CONCRETING

PROBLEM

Concrete is the backbone of modern construction. Construction traditionally has been avoided during winter because low temperatures slow the strength development of concrete to unacceptable levels. Heat, insulation, and enclosures are needed to promote concrete strength when temperatures fall below 5°C and to protect immature concrete from freezing at lower temperatures. The energy cost for concrete thermal protection is estimated to be $800 million per year.

SOLUTION

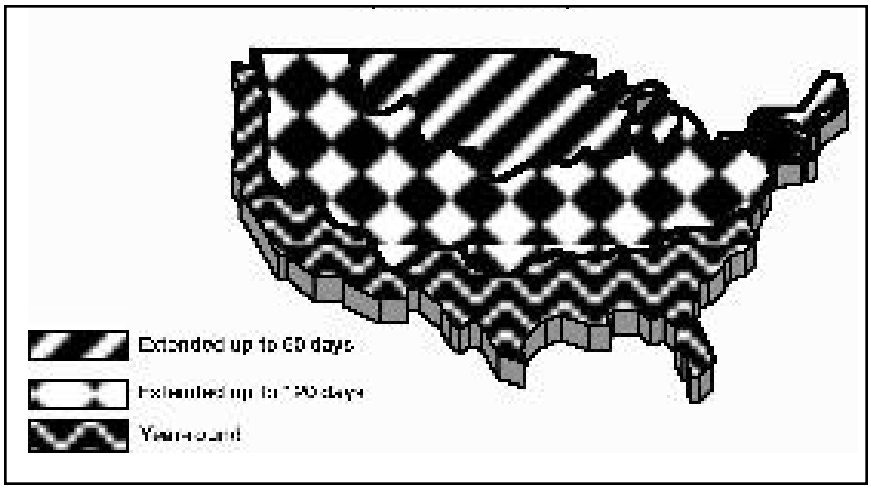
Develop chemical admixtures that depress the freezing point of mix water and promote concrete strength at low temperatures.

RESULTS

CRREL has worked with private industry to develop prototype admixtures that protect concrete down to –5°C, temperatures at which normal concrete suffers irreparable damage. The work was conducted under the authority of the Corps of Engineers Construction Productivity Advancement Research (CPAR) program, which is a cost-shared program between the Corps and the U.S. construction industry. Currently, two prototype admixtures—one from Master Builders, Cleveland, Ohio, and the other from W.R. Grace, Cambridge, Massachusetts—have been brought to the threshold of commercialization.

Antifreeze concrete will

- Extend the construction season.
- Reduce winter costs.
- Increase winter employment.



Extension of concrete construction season (–5°C admixture)

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