

## CRREL's Cold Regions Infrastructure Mission

To provide innovative cold regions solutions and services to agencies planning, constructing, operating, and maintaining standard and strategic facilities in cold regions worldwide.

## Cold Challenges

- Strategic defense and national facilities located in cold and remote locations.
- Performance criteria must be adapted to provide high reliability.
- Cold regions can add significant cost penalties to build and sustain facilities.
- Effects of extreme cold on material and procedures.
- Army Transformation infrastructure must support all season operations.

## CRREL CRI Programs

- Cold regions facilities planning, construction and maintenance criteria.
- Design and construction techniques for permanent and contingency airfields.
- Design review for DoD and polar facilities.
- Logistics, operations and infrastructure planning for remote polar sites.

## CRREL CRI Research Facilities

- Frost Effects Research Facility
- Materiel Evaluation Facility
- Environmental Wind Tunnel
- Comprehensive Geotechnical Labs
- Ice Engineering Research Facility

## The Cold Regions Research and Engineering Laboratory (CRREL)

The Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire and Anchorage and Fairbanks, Alaska is part of the US Army Corps of Engineers Engineer Research and Development Center (ERDC). Our mission is to solve interdisciplinary, strategically important problems of the US Army Corps of Engineers, Army, Department of Defense, and the Nation by advancing and applying science and engineering to complex environments, materials, and processes in all seasons and climates, with unique core competencies related to the Earth's cold regions.



**BUILDING STRONG®**

### Contact

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**US Army Corps  
of Engineers®**



South Pole Station, Antarctica



**Building Envelopes**

**Pavements, Concrete  
and Airfields**

**Polar Facilities and  
Logistics**

U.S. Army Engineer Research  
and Development Center  
Cold Regions Research and  
Engineering Laboratory

### Building Envelopes

- Criteria and design guidance for Army and Air Force buildings and facilities including:
  - Headquarters, barracks and dining facilities
  - Medical and dental facilities
  - Family housing and child development centers



Snow Shedding



Clear Radar Upgrade, Alaska

- Thermal analysis of unique, cold regions infrastructure.
- Roof ventilation design guidance to avoid problematic icing.
- Research on permafrost engineering and interactions with infrastructure.
- Techniques to minimize snow and ice problems in and around buildings.
- Energy efficiency analysis.

### Pavements, Utilities and Site Work



Thule Air Base, Greenland

Shallow Utilidors at Eielson Air Force Base

- Development and testing of innovative phase change materials for heat exchange systems.
- Snow drift siting studies using wind tunnel facility.
- Development of cold tolerant concrete mixes.
- Mechanistic-empirical models for pavement sub-grade design.
- Research on permafrost and terrains.
- Design and repair guidance and criteria for Air Force bases and fixed runways.

### Innovative Polar Logistics Solutions

- Research to improve the Army's ability to conduct operations in extreme climates and remote locations.
- Improved site planning for Arctic land disturbance analyses.
- Arctic and Antarctic operation and logistics support.



Fuel Bladders



- Development of construction methods and design requirements for sea ice, glacial ice and deep snow airfields.
- Development of autonomous instrument shelters for extreme climates.

# Pole to Pole Cold Regions Infrastructure



Fort Wainwright, Alaska



McMurdo Shear Zone



South Pole, Antarctica

