Enggigma

Empowering Engineers

Cold Weather Engineering Reference Guide

- Applicability:
  - Wintertime in temperate climates
  - Excludes arctic engineering.
  - Building awareness for professionals who previously worked in warm climates
- Project Planning
  - Schedule to avoid winter construction
  - Surveying constraints
    - Topo survey in snow/ice takes longer
    - Less competition for resources in the winter
  - Length of Day
    - Days get shorter in winter the further from equator. Obviously
    - Consider reduced ability for overtime because of less daylight hours
- Design Considerations
  - Roads
    - Superelevation- lower maximum cross slope than Green Book
    - Flatten backslopes- reduces drifting and adds more snow storage capacity
    - Raise gradeline above upwind catch point to minimize drifting on road
    - Flatten intersections to enable stopping/ starting at intersection
    - Watch where traffic is stopping- stopping on grade
  - Frost Depth
    - Check frost depth to minimize movement from freezing when needed
    - Different depth needed to prevent freezing of water & sewer
- Construction
  - Winter construction is possible, but expensive
    - Short days
    - Ground heaters
    - Insulating blankets
    - Insulated Forms
    - Safety issues- less productivity
      - Frequent Brakes Required
    - Some materials cannot be worked with in cold weather.

- ACI Cold Weather Concrete Guide
  - ACI 306R-16
  - Guide not specification.
- Air entrainment required in concrete subject to freezing temperatures
- Weather disruptions in Fall affect until spring
  - Drying weather- days aren't long enough or warm enough to dry soil effectively