
******THIS IS A NEW APPENDIX. - PLEASE READ CAREFULLY.******

COLD WEATHER PLACEMENT

The following chart will be used to determine allowable temperature and wind conditions for concrete placement during cold weather. Air temperature and wind velocity measurement should reasonably represent conditions at the site of concrete placement.

When the air temperature is below 35°F (2°C), determine the wind velocity using available wind velocity measuring equipment. Velocity determination should disregard wind gust and be based on a steady, reasonably sustained wind velocity. When the equivalent temperature is 5°F (-15°C) or above and is expected to remain above 5°F (-15°C) for the time required to complete the units involved, concrete may be placed provided the forms are covered and preheated and the concrete temperature is controlled. All forms must be covered with a suitable cover prior to concrete placement and the entire line preheated to at least 40°F (5°C). (The entire preheated line shall include forms, strands and reinforcing steel). Remove the covers only where concrete is being placed or finished and immediately recover the finished units. The concrete temperature in the forms must be maintained at 40°F (5°C) or higher at all times during the concreting operation. This procedure shall be followed until the concrete for the entire line has been placed.

| Air Temp. | | Wind Speed | | Air Temp. | | Wind Speed | |
|-----------|----|------------|-----|-----------|----|------------|-----|
| °C | °F | Kph | Mph | °C | °F | Kph | Mph |
| -1 | 30 | 160 | 100 | -9 | 16 | 14 | 9 |
| -2 | 28 | 141 | 88 | -10 | 14 | 10 | 6 |
| -3 | 26 | 94 | 59 | -11 | 12 | 6 | 4 |
| -5 | 24 | 64 | 40 | -12 | 10 | 3 | 2 |
| -6 | 22 | 45 | 28 | -13 | 8 | 3 | 2 |
| -7 | 20 | 30 | 19 | -14 | 6 | 2 | 1 |
| -8 | 18 | 21 | 13 | -15 | 5 | 2 | 1 |

When the wind velocity is greater than indicated on this chart for any corresponding air temperature, and the equivalent temperature is below 5°F (-15°C). No concrete shall be placed when the air temperature or equivalent temperature is below 5°F (-15°C).

If it is desired to place concrete when the air temperature or equivalent temperature is below 5°F (-15°C), suitable housing would be required to control the surrounding temperature. Approval of this housing system would be based on consideration of the temperature effect on the entire line.

NOTE: Plant approval by the DME is required for cold weather concrete placement.

PRECAUTIONARY NOTES

- Pallets may buckle due to temperature changes. The condition of the line should be checked immediately before commencement of concrete placement.
- Ensure no frozen material is incorporated.
- All snow, ice, and frost shall be removed from steel and forms.
- After placement and vibration, the concrete shall be allowed to attain its initial set before steam is applied. Otherwise, the elevated temperature may have a detrimental effect on the concrete strength. (Refer to Specification 2407.10.)

Steam jets shall not discharge directly onto the concrete, forms, or test cylinder.

COLD WEATHER WORK

Air temperature and wind velocity measurement shall reasonably represent conditions, which exists at the fabricator's site. Concrete placement, curing, inspection and major prestress activities shall meet the requirements of the standard specifications.

COLD WEATHER STRESSING

The maximum jacking stress in prestressing strand shall not exceed 80% of the specified minimum ultimate tensile strength ($0.80 f_s$), including the allowances for seating losses and temperature differences.

Prestressing strand that is subjected to stresses exceeding ($0.80 f_s$), including the stresses resulting from temperature drop after seating, will be considered unacceptable and subject to rejection. Enclosure and heating of the strands shall be utilized to minimize cold weather stressing problems.

When computing the effect of temperature drop after seating, the allowance for live end seating loss may be added to the available stress for temperature drop. The strand stress at seating, as determined by elongation measurement, shall be considered the base stress when computing the effect of temperature drop. The calculation of stress due to elongation measurement shall be based upon the actual strand area and the modulus of elasticity.

Overnight heating or pre-heating of the strand is an option for cold weather stressing.

NOTE: Overstressing of the strand during the loading procedure shall not be permitted.