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Welcome to the quarterly newsletter from ESP Associates, PA (ESP). Each quarter, ESP produces an informational article about a particular topic that we feel may be of value to our clientele. We hope you find the material informative and we welcome the opportunity to assist you with any support that you may need. All articles presented are also available on our website www.espassociates.com.

Hot Weather Concreting

When the heat rises, maintaining the structural integrity and aesthetic appearance of your newly placed concrete members can be a challenge. The following factors can, independently or in combination, contribute to detrimental concrete placement results:

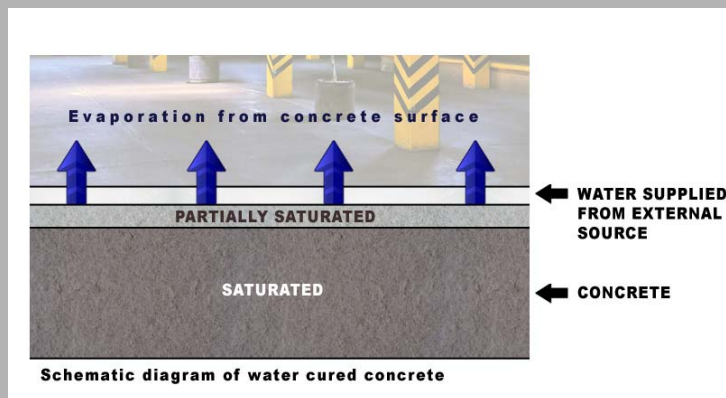
- High ambient temperature
- High concrete temperature
- Relative humidity
- Wind speed
- Solar radiation

The effects of the above factors can cause:

- Increased water demand during placement
- Lower concrete strength due to added water and/or excessive temperature
- Premature “setting” of concrete during placement
- Increased potential for “cold joints” during placement
- Difficulty in proper finishing
- Increased tendency for plastic-shrinkage cracking
- Increased shrinkage cracking and/or curling associated with high temperature and/or high wind
- Increased cracking from dramatic differential temperature
- Greater variability in visual appearance associated with above factors



How do you reduce the potential for these conditions to occur? There are numerous approaches that can be taken to help control the above conditions. The right approach will depend on your specific site conditions.



The following are just a few approaches for consideration.

- Control plastic concrete temperature using chilled water and/or ice during batching and mixing
- Control the temperature of the concrete aggregates and materials prior to mixing
- Select cooler timeframes for placement of concrete
- Use barriers and/or overhead cover when possible to protect concrete from wind and heat during and after placement
- Keep all placement materials, equipment, etc. cool prior to and during placement
- Consider sprinkling or fogging all forms, steel members and/or subgrades prior to pouring
- If possible, reduce transport times/distances to avoid heat build-up
- Reduce unnecessary mixing of concrete while in transit or on site
- Use evaporation retarders after screeding of slabs
- Use appropriate covers, reflective sheeting, etc. to control evaporation and temperature
- Use misters, foggers, soakers and/or other wet techniques during critical curing of concrete to control evaporation and temperature
- Use curing compounds that will reduce evaporation by providing protection from excessive heat, wind, solar radiation, etc.



The above are but a few of the methods that can help during the hot weather timeframes. A targeted approach can be developed for specific sites in specific climatic regions. The American Concrete Institute (ACI), Portland Cement Association (PCA) and National Ready Mixed Concrete Association (NRMCA) all provide guidance and detailed information with regard to Hot Weather Concrete concerns. ESP can assist clients to better utilize these techniques at your specific site.

As an added piece of information to avoid some unnecessary discussions, test specimens that are cast for concrete compressive strength testing spend their first day (or so) at the construction site prior to being transported to the laboratory. The environmental condition of their initial curing period can have a dramatic effect on the compressive strength test results performed in the laboratory. ACI 311.5 states that “The contractor should provide a suitable area or container at the project site for initial storage and curing ... of specimens ...” This is a commonly overlooked requirement that can cause numerous false test results and undue alarm, particularly during hot weather conditions. Pro-active planning by all parties can alleviate some of these concerns.

If ESP can be of assistance to you, please contact us. We have a vast array of expertise awaiting a client’s needs.