



PROJECT PROFILE

The Allen Tower

Mass Concrete Consulting | Houston, TX



CLIENT

TAS Commercial Concrete

BACKGROUND

Located west of downtown Houston along the Buffalo Bayou, this mixed-use development on Allen Parkway includes a forty-two-story hotel and condominium tower.

The client retained WJE to provide mass concrete consulting services for a ten-foot-thick concrete pile cap. The mass concrete specifications required that the maximum temperature be less than 160°F and that the between center and surface of placement not exceed 35°F.



SOLUTION

Using thermal analysis software, WJE modeled the temperature development due to the heat of cement hydration to predict the maximum temperature of the concrete core and the temperature differential between the concrete core and the concrete surface. WJE provided recommendations for a performance-based maximum temperature limit. Based on a review and analysis of the project concrete mixture design, the WJE team developed a project-specific thermal control plan which allowed maximum concrete temperature above 160°F.

Using the results of the thermal analysis, WJE engineers then developed a mass concrete thermal control plan to reduce the risk of thermal cracking. The plan included guidelines for precooling methods, concrete placement temperature, insulation application, and installation of temperature sensors. The mass concrete thermal control plan provided by WJE was able to successfully limit the maximum core temperature and temperature differentials of the mass concrete pile cap.