



PROJECT PROFILE

Life Time Fitness

Roof Moisture and Debonding Membrane Investigation | Beachwood, OH



CLIENT

Life Time Fitness

BACKGROUND

The Lifetime Fitness building in Beachwood, Ohio, was built in 2010. A portion of the fitness building contains an indoor pool area. The exterior walls of the two-story fitness building consists of precast stone and brick veneer over tilt-up precast concrete panels. The roof system consists of a single-ply TPO roofing system with two layers of rigid roof insulation over precast concrete double-tees. At the pool area, a vapor retarder was incorporated into the roofing system by applying the vapor retarder directly over the precast concrete double-tees.

A year after the building was completed, the original TPO roofing system over the indoor pool area and several interior spaces to the north of the pool were replaced due to moisture-related problems. A few years later, the new fully adhered roofing membrane above portions of the indoor pool and adjacent spaces became un-adhered from the underlying insulation board, and water stains became evident in the pool area. WJE was retained to investigate the causes of moisture-related issues and debonding of the single-ply roofing membrane.



SOLUTION

WJE performed a condition assessment; indoor moisture survey; infrared thermography of the exterior facade, roofing, and interiors; air exfiltration testing using a blower door, digital manometer, and smoke generators; temperature and humidity measurements; and roof test cuts. Based on the investigation, WJE determined the causes of the moisture-related issues and debonding roofing membrane to be primarily related to discontinuities in the vapor retarder, missing air seals, and over-pressurization of the pool area. WJE prepared a detailed report summarizing the causes of the excess moisture within the roofing assembly and debonding roofing membrane. Recommendations to repair deficient conditions and mitigate future distress included replacement of the roofing system, including the wet insulation; repair of the copings; installation of interior seals at the pool area; and adjustments and rebalancing of the pool HVAC system.

