SKA CONSULTING ENGINEERS

# BUILDING ENVELOPE FAILURE

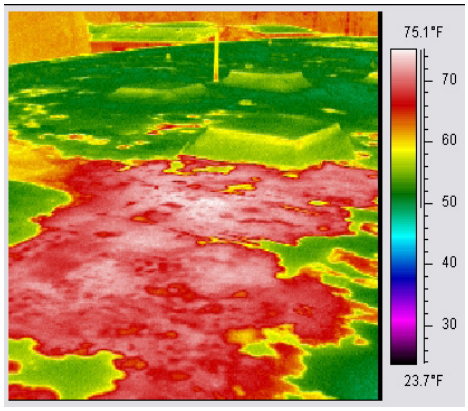
## ROOF REPLACEMENT

## YOU CAN'T SEE WHAT YOU CAN'T SEE

It's almost inevitable, roofs and fenestrations are going to leak. Extreme weather conditions, normal wear and tear over time and environmental and foreign intrusions deteriorate and penetrate even the best building envelope solutions on the market. Water leaks not only damage interior finishes, they promote membrane deterioration and decrease the effectiveness of insulation. Often, the worst damage is beyond what the human eye can see or what has happened behind the walls. An infrared survey is the most effective way to locate and quantify moisture saturated insulation.

## CASE STUDY: SANDPIPER RUN

Leaks through roofs and from roof drains were a dilemma for three of the four beach front condominiums in Pawleys Island, SC for the Sandpiper Run Council of Co-Owners, especially when the leaks interrupted use and damaged interior spaces in occupied units. As soon as the leaks were reported (2011 - Building A, 2015 - Buildings C&D), SKA was contacted to investigate. Investigation through the use of infra-red cameras and from exploratory openings revealed the leak sources where water had previously been hidden and helped SKA to develop replacement roof systems that would resolve the leaks and more importantly, save the owners money long term by having a service life of 25+ years.




Repairs in 2011 were on the existing green roof over the parking structure. Concrete repairs to restore the existing topping slab and structural supports that had corroded from water damage were completed first before the new roof system was installed. The new roof system selected by the Owners included new thermoplastic membrane, flashings and protection course for a green roof system that was designed to support intensive shallow vegetation. Drainage was improve through the use of new roof drains and storm drain piping. Future leak detection was captured by imbedding an electronic field vector mapping system under the roof system.

To limit interior renovation costs and interruption to occupants, the repairs in 2015 included closing of the primary roof drains and using the secondary drains as the primary drainage with overflow scuppers through the parapet as the secondary back-up. This unique solution saved the owners time and money, and provided a new roof system with better drainage from the original through the redesign of the tapered insulation. Coordination and planning to complete the re-routing of the piping was key to the success of the roof installation. The new roof system was a 20 year warranty SBS modified bitumen roofing system.

## SERVICES

- Investigation
- Condition Assessment
- Design Drawings and Specs
- Construction Observation
- Window, Door and Veneer Testing
- Expert Witness
- Third-Party Design Review
- Thermal & Vapor Transmission Analysis
- Infrared Surveys