
Reroofing Over Failed Roofs Containing Moisture: An ORNL/RCI/SPRI Collaborative Demonstration Project

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ABSTRACT

Although widely practiced within the roofing industry, roof re-cover, particularly over failed roofs that contain significant amounts of moisture, remains a controversial issue. The key issues surrounding this controversy are the drying of wetted insulation, deck deterioration (dry rot of wood, disintegration of concrete, corrosion of metal), and fastener failures. To address these issues, a consortium made up of SPRI and its member companies, the Roof Consultants Institute (RCI), and the Oak Ridge National Laboratory (ORNL), have initiated demonstration projects to re-cover failed roofing systems containing moisture and to monitor the performance of those roofing systems after the reroofing.

In 1997, SPRI identified a building that satisfied criteria developed by SPRI for a satisfactory demonstration site. Representatives of SPRI, RCI, and ORNL visited the building and, with the permission of the church, used this building for a demonstration project. The reroofing was performed in June 1998.

The roof has been continuously monitored and yearly visits to the building for inspection and sampling purposes have been undertaken. Evaluating the compressive properties of the original insulation has been used to monitor the adequacy of the existing roof as a substrate for the re-cover roof. Fastener pullouts have been employed to monitor the structural integrity of the deck and the corrosion protection of the fasteners. Measuring the moisture content of the existing and re-cover insulation examined whether the original roof is drying and whether the re-cover roof was being compromised by water from the original roofing system. Moisture content data were also used to assess a computer model that has been developed to predict the drying rates of roofing systems containing wet insulation. Finally, the reflectance of the membranes was cataloged to determine how rapidly white membranes foul due to dirt accumulation and degradation and its impact on the drying process.

This full-scale re-cover demonstration project has helped define an acceptable technique to review the possibility of roof re-cover. Steps to be taken include the following:

- *Core cuts should be taken to verify the roof cross-section and from “suspect” areas to determine the extent of damage. If areas of insulation are wet, their ability to support the new roofing system should be analyzed.*
- *The deck should be inspected; fastener pullout tests should be conducted to verify the structural integrity of the deck.*
- *The moisture content of the insulation should be measured. Using a simulation tool or an accepted alternate, an estimate of the length of time that is required to dry the insulation should be performed. Insulation that requires an excessive length of time to dry may create other conditions that lead to roof component failures and should be removed.*

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