A Method to Detect and Locate Roof Leaks Using Conductive Tapes

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A Technology Based Quality Assurance Program for Waterproof Membranes

Quality Assurance

Testing and monitoring processes that minimize the risk of installation deficiencies and assist in reducing lifecycle costs.

Quality Control

- **Membrane scanning** – During construction, quickly identify and correct membrane application deficiencies
- **Membrane monitoring** – After construction, detect and locate for repair any membrane breaches before they become costly problems
Roof Inspection and Testing

Managing the potential causes of roof failures:
- Certified on-site roof inspections
- Flood testing
- Electronic surveys and continuous monitoring
Looking For An Alternative to Flood Testing?

- CRCA & NRCA does not recommend conducting flood tests as part of a routine quality-control or quality-assurance program.
- “Flood testing also is not appropriate for identifying potential leak sources.”
Forensic Leak Locating Technologies

- Infrared Moisture Survey
- Dielectric Test Survey
- Electric Gradient Leak Locate (a.k.a EFVM)
Conductance Testing, Monitoring and Leak Locating

- Roof Membrane Integrity Scan
- Vertical Surface Leak Locating
- Waterproof Membrane Monitoring
Detection Tape Installed on Top of Membrane (Wet Side)

- Monitoring grid placed on top of waterproof membrane
- Electric potential applied between grid conductors and deck
- Current leakage to ground through membrane breach peaks at adjacent grid conductors
Installing X & Y Monitoring Grid using Peel & Stick Conductor Tape
Connecting Grid to Monitoring System

Switching and measuring unit

ETHERNET

MONITORING CENTER
Make a Hole In The Membrane

Switching and measuring unit
Perform Measurement Scan

Switching and measuring unit

ETHERNET

MONITORING CENTER
Localizing Leak to Grid Section

Switching and measuring unit

ETHERNET

MONITORING CENTER
Initial Field Trial on Waterproof Membrane
Test Equipment Set Up
Leakage Current Density Near Damage Site
Leak Locate Grid Installed in Green Roof

- Waterproof Membrane
- Leak Locate Tape

[Diagram showing layers of a green roof with labeled components]
Leak Locate Tape Installed on Waterproof Membrane
Completed Intensive Green Roof with Integrated Leak Locate Grid
Beacon Hill Reservoir Seattle
270,00 sq ft., 53 million gallons
QC Process – Scan Membrane for Damage
QC Process - Repair and Retest
Membrane Breaches
Installing Conductor Tape Monitoring Grid
Installed Grid Monitoring System

LeakLocate Array™
Commissioning Membrane Monitoring System
YMCA Patina – Vancouver 16,700 sq. ft.
Southern Alberta Institute Of Technology
135,000 sq. ft. playing field
City Creek - Salt Lake City
Green Roofs, Water Features, Plaza Decks
250,000 sq. ft. phase 1 & 2
Nintendo Building Seattle – 93,000 sq. ft.
Palomar Medical Center, CA – 165,000 sq.ft.
West Seattle Reservoir – 203,400 sq.ft. 50-million-gallon reservoir
West Seattle 50M Gallon Reservoir
Conclusions

- Quality control testing during membrane application with corrective feedback
- Early detection and location of membrane damage under a green roof, wear-course or topping slab
- Risk mitigation for warranty programs
- Support sustainable development by avoiding premature roof failure and associated costs
THANK YOU FOR YOUR INTEREST

QUESTIONS ?