Honza Group Incorporated

Roofing & Waterproofing Consultants

Electronic Leak Detection

The problem of water penetration through roof and waterproofing assemblies is common to many buildings. Low slope roofs, commonly referred to as 'Flat Roofs,' have a disproportionate share of leaks due mostly to the fact that they are expected to not only prevent water penetration, but also act as a staging area for other trades during new construction and as a walking surface and work platform for performing building maintenance on roof top equipment and adjacent surfaces.

When the inevitable leak occurs before the building is occupied or after some years of maintenance, the only non-destructive methods of locating its point of entry were to implement compartmentalized flood testing or a "Trial and Error" technique. The flood testing technique the industry standard for decades, is to create enough hydrostatic pressure that any anomalies will result in an interior leak that can be tracked similarly to the Trial and Error procedure.

The 'Trial and Error' procedure would deduce the approximate location of the leak based upon the roof and roof deck assembly as well as the characteristics of the leak. This approximate location would then be investigated on hands and knees and all possible deficiencies that could cause the leak were marked and repairs made to all potential leak sources. This type of leak detection was not always successful and often had to be repeated numerous times before the leak was found. With innovative state-of-the-art leak detection equipment, electricity can now be utilized to follow the path of a leak and will locate its exact pin-point location without the application of hundreds or thousands of gallons of water as used in traditional flood testing.

Electronic Leak Detection locates breaches through a roofing or waterproofing membrane by measuring, or more accurately, following electric current across the surface of the membrane to the breach.

Electronic leak detection (ELD) is used as a quality assurance test method at the completion of membrane application on new construction and membrane replacement projects or locating the exact source of existing leaks well after construction.

ELD can be completed on non-conductive membranes such as built-up roof membranes, modified bitumen membranes, hot fluid applied rubberized asphalt, self-adhering polymer modified roll goods, urethane membranes, thermal welded (thermoplastic) membranes and white EPDM (thermoset) membranes. ELD is not be effective on black EPDM due to it's conductive composition.

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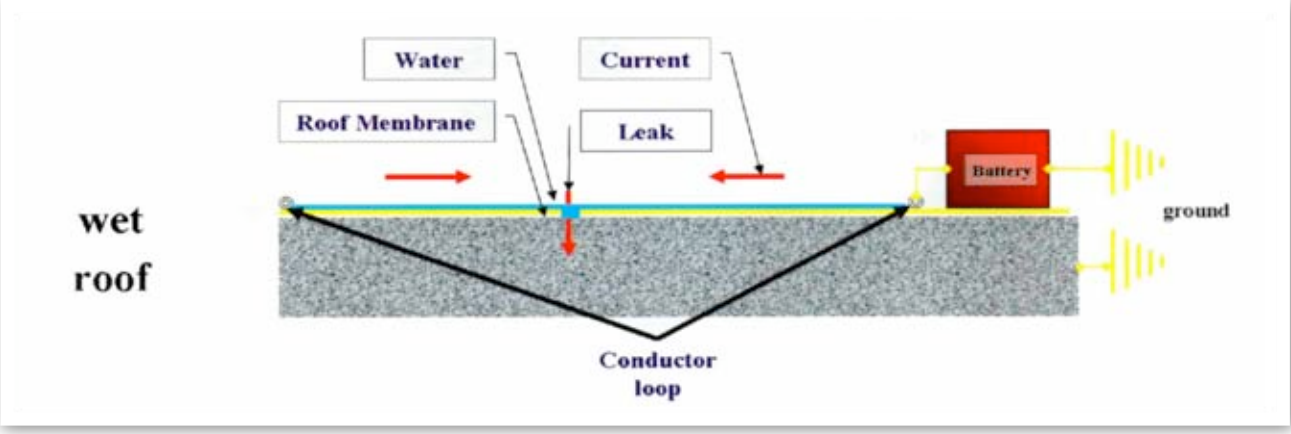
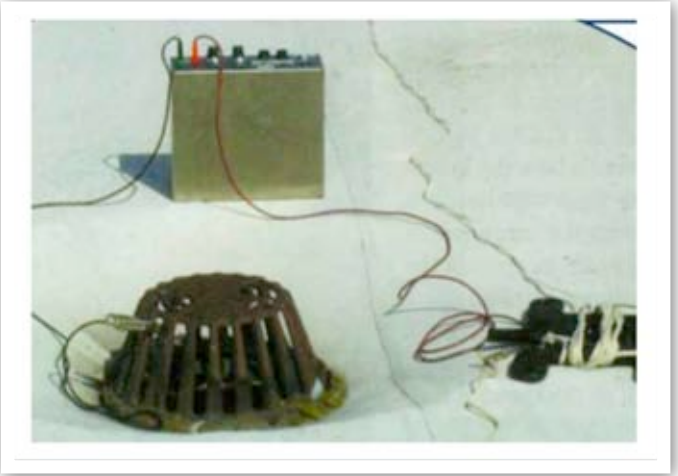
Low Voltage

A wire loop, to act as a conductor, is placed directly on the membrane or the membrane's protection course around the perimeter of the area to be tested. One of the two leads from a pulse generator is connected to this wire loop conductor. A second lead from the pulse generator is grounded to the structural deck. The surface of the waterproofing must be wetted (not flooded) to provide an electrically conductive medium.



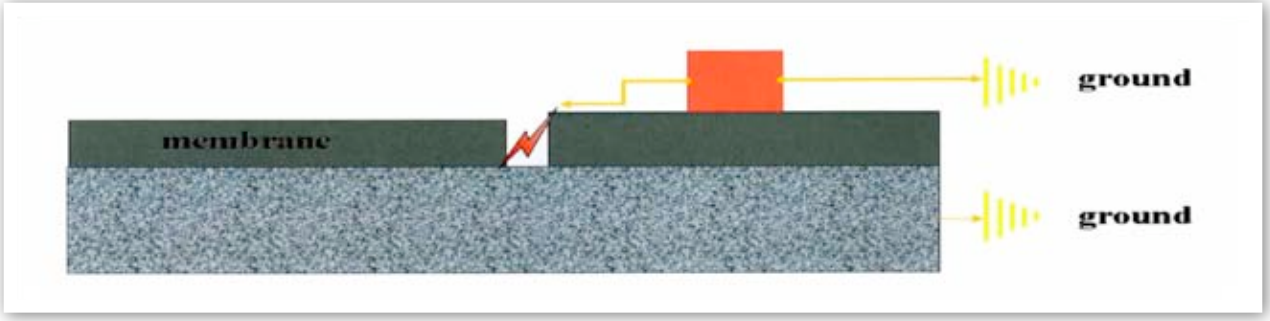
Every few seconds a low-volt charge is delivered from the pulse generator for one second, as a result, an electrical potential difference is set up between the roof surface, which is wet, and the roof deck, which is "earthed" or grounded – essentially producing two electric plates. If there are any "leaks" or breaches through the waterproofing membrane, which acts as an electric insulator, the small electric current will flow across the membrane surface and down through the breach, completing the circuit between the two "electric plates."

A technician uses a receiver connected to two probes, to identify the direction of the electric current. By moving the probes the technician is able to systematically follow the flow to even the smallest breach or leak through the membrane. Once located, the breach in the membrane can be repaired and quickly retested.



High Voltage

The power source like Low Voltage ELECTRONIC LEAK DETECTION is still grounded to the conductive deck and the membrane acts as an insulator. When the broom head which is made of small conductive bristles makes its way over a breach in the membrane the circuit is completed, allowing current to flow and the power source then emits an audible tone to alert the operator. When the bristles have located a breach within the area of the broom, the operator will then sweep that area again, however this time the contact area is reduced to pinpoint the exact location.



A continuous higher voltage charge than produced by the low voltage pulse generator is delivered from the generator to the piece of testing equipment. With the electrical potential difference between the grounded roof deck and high voltage testing equipment we essentially have two electric plates. If there are any breaches or punctures through the waterproofing membrane, which acts as an electric insulator, the electric current will ground itself at the breach.

Reporting

1. All breaches are identified on the membrane and numbered.
2. Each numbered breach is photographed.
3. All breaches are plotted on a roof plan.
4. Report is submitted with roof plan, plotted breaches and photographs.

Sample Breach Location / Report

Number 1 - Puncture Location (Feet) - 161' / 10.5'

Number 17 - Puncture Location (Feet) - 5' / 12.5'

Quick Facts

Low Voltage
- Less time consuming than Flood Testing.
- Testing not impacted by steeper slopes.
- Saves water roof only wetted.
- Breaches located with pin point accuracy.
- Wiring can be left in place for additional testing at a later date.
- Testing can be completed with overburden in place in many cases.

High Voltage
- Less time consuming than Flood Testing.
- Testing not impacted by steeper slopes.
- No water used – Roof must be dry.
- Breaches located with pin-point accuracy.
- Wiring can be installed for low voltage testing later.
- Verticals walls readily tested.

Honza Group Incorporated offers over 40 years experience in every facet of the roofing and waterproofing industry. Our firm has acquired in-depth knowledge of a broad range of roofing and waterproofing products and installations that is used when completing ELD.

Honza Group has surveyed over 30,000,000 square feet of roofs and participated in designing roofing, and waterproofing assemblies for over 600 projects totaling over 15,000,000 square feet.

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