

## SECTION 07 50 00 – MEMBRANE ROOFING

### 1.1 VERIFICATION OF MEMBRANE INTEGRITY

#### A. SUMMARY

1. Engage a qualified Independent Testing Agency to perform electronic membrane integrity testing after installing the membrane and before placing overburden. Provide testing to verify installed membrane is waterproof and free of any holes, open seams or capillary defects that could allow water to pass.
  - a. High-Voltage Membrane Integrity Testing (HVIT)
  - b. Low-Voltage Membrane Integrity Testing (LVIT)
  - c. Leave-in-place Vector Mapping Test System

#### B. MANUFACTURER

1. Basis-of-Design Manufacturer: Subject to compliance with project requirements, provide membrane integrity test system and service by Atlantic Leak Detection, 1-888-696-6429, service@atlanticleak.com, or comparable system and service from a single manufacturer approved by Architect prior to bidding.

#### C. EXECUTION

1. Utilize Combined High-Low Voltage Membrane Integrity Testing as designed by Atlantic Leak Detection, (888) 696-6429, as follows:
2. Testing Procedures – High Voltage (HVIT)
  - a. Test equipment shall consist of conductive phosphor bronze brush electrodes and a portable battery powered generator capable of providing variable DC current from 1,000-35,000 volts at low amperage
  - b. One terminal of the generator shall be connected to a ground in the assembly. The other terminal shall be connected to the phosphor bronze brush. The voltage level will be calibrated to the thickness of the membrane being tested.
  - c. The Technician shall methodically pass the brush electrode over all testable horizontal and vertical membrane surfaces in the contract.
  - d. If no current flow is detected after a complete search, then the certified inspector shall begin LVIT procedure.
  - e. If there is an audible alarm while passing the brush over the installed membrane, it indicates that the current has grounded through a breach at the alarmed location. The Technician shall mark any breach locations on the membrane with spray paint, chalk, tape or other approved method.

- f. The Inspector shall maintain communication with the Contractor's representative regarding the number and locations of breaches detected. After a complete search of all testable horizontal and vertical membrane surfaces in the contract, the technician shall proceed to LVIT procedures.

### 3. Testing Procedures – Low Voltage (LVIT)

- a. Installation of LVIT conductive boundary wire around the perimeter of all areas to be tested. Isolated areas shall not exceed 7,500 square feet. The boundary wire (1.5mm in diameter) will consist of stainless steel strands with a total tensile strength of not less than 250 lbs.
- b. Boundary wire shall be placed in direct contact with the membrane and secured 3 inches from the perimeter of all areas to be tested. Wire will be secured with anchors or tape compatible with the membrane to prevent movement, damage, or a tripping hazard.
- c. Isolation of the membrane field from contact with any metal items, grounded soil, drains, or other grounded parts of the structure by installation of conductor wire around items, or by temporary removal of items if possible, to isolate them from the field and prevent unintended grounding (false positives).
- d. One terminal of a LVIT pulse generator shall be attached to the boundary wire loop with a removable connector, the other terminal of the generator will be connected to a ground such as the building structure or a conductive mesh within the assembly.
- e. The contractor shall wet the entire test area with water sufficient enough to create an electrical "plate" on the surface of the membrane. Contractor shall maintain wet for the duration of the testing.
- f. A one second long 20-40 volt electrical impulse will be delivered to the conductor wire at an average rate of one impulse every three seconds.
- g. Utilization of a Low-Voltage potentiometer and two probes placed on the surface of the membrane to detect the presence or absence of electrical flows.
- h. If no current flow is detected after a methodical search, then the certified inspector shall report the installed membrane within the tested area is free of holes, or seam and capillary defects, and is therefore waterproof at that time.
- i. If there is current flow detected during the test then it indicates that current has grounded through a breach. The certified inspector shall work to trace the current vectors to their source and locate the breach(s) in the membrane. The inspector shall report to the contractor immediately if possible the exact location of any defects on the installed membrane in the area tested.
- j. Defects found shall be repaired by the contractor and retested by the inspector.

- k. The Agency providing the testing shall provide a report documenting each days' test results including a written description of the testing procedures, status of the membrane, daily activity, and a schematic drawing indicating location of the stationary boundary wire and of any defects found in testing. This report shall be submitted to the Contractor, and Architect if required.
4. Installation - Vector Mapping Test System
    - a. When required, the LVIT boundary wire shall be left in place to facilitate future testing.
    - b. Each LVIT boundary wire shall be connected by a PVC coated conductor wire to a termination box that will be used for future connection to the system. Termination box locations shall be chosen by the contractor and installed by the Inspection Agency Technician.
    - c. After testing and repair of all membrane breaches, the membrane should be immediately protected by the placement of the specified overburden (if applicable). Care to be exercised in placing the overburden so as not to displace or damage the conductor wires or cause damage to the roofing membrane.
    - d. Construction traffic and the storage of construction materials should be avoided on the newly tested and accepted membrane system if possible until the installation of overburden.