Waterproof Membrane Quality Assurance Testing (Low Voltage) + Future Testing

Part One - General

1.1 Description

A. Work to include: Furnish and permanently install perimeter wire and isolated wire for grounds in membrane field. Attach direct current electronic testing system that creates a voltage potential difference between the roof/waterpoofing membrane surface and the conductive structural deck (i.e. – concrete, metal). Complete testing with receiver to locate breaches.

B. Related Sections: Work contained elsewhere that applies to testing.

1. Scope of Work

2. Roofing or Waterproofing Membrane Section (Div. 7)

3. Vegetated Roof Section

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1.2 References

A. ASTM D 7877-14 – Standard Guide for Electronic Methods of Detecting and Locating Leaks in Waterproofing Membranes.

1.3 Submittals

A. Test procedure description.

B. Product Data Sheets for materials permanently installed to provide specified leak detection system.

C. Proposed perimeter and isolation wiring layout.

1. Proposed segmentation of roofing/waterproofing area into individual test grids.

2. Locate perimeter wire lead location for each grid within test area

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3. As built grid plan as needed

D. Final report shall be provided, including

1. Digital roof plan

2. Breach photographs

3. Plotted breaches when repairs are not completed same day of testing

4. Verification of breach repairs

5. Location of any permanent components installed on roof such as surface wiring.

1.4 Quality Assurance

A. Testing agency shall have a minimum of 10 years experience of testing

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B. Testing agency shall examine all surfaces to be tested. Testing agency shall notify roofing/waterproofing contractor of any and all conditions in which in his opinion, will affect satisfactory execution of the testing.

C. Tested area should be protected from construction traffic as soon as possible after test is completed.

D. Testing company shall complete and submit a final report. (see submittal 1.3.D)

E. Pre-construction conference – site or phone conference

1. Coordinate meeting with general contractor, roofer/waterproofer, testing agency, landscaper, owner's representative, architect and other trades whose work interfaces with roofing (waterproofing) application.

2. Verify project requirements

3. Discuss test procedures, needs to complete testing and coordination

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4. Discuss site conditions
5. Discuss post testing protection of membrane

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Part Two - Products

2.0 Membrane Quality Assurance Testing Agency

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2.1 Provide products that are accepted by the membrane manufacturer and are fully compatible with the indicated substrate and other components.

2.2 System Description

A. LV-Electronic Leak Detection (ELD): Direct current leak detection equipment shall deliver low voltage electronic charge to create an electronic potential difference between the roof membrane surface and the conductive structural deck (ie. - concrete, metal). Using a receiver, the technician will vector in on breaches identified by an electrical connection.

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2.3 Materials

A. Conductive wire used to deliver electronic charge around perimeter of all areas being tested and to isolate grounds (ie. drains, railings).

1. Composite poly-wire has 9 strands of 0.07 inch stainless steel wire interwoven into braided polyethylene strands.

2. Tapes and sealants used to secure conductive wire to membrane assembly surface shall be compatible with membrane manufacturer's membrane.

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Part Three - Execution

3.1 Testing

A. Verify membrane assembly and visually examine area to be tested.

1. Materials, debris and equipment must be removed from area to be tested.

2. Grounds must be located for creating an electronic charge in the structural deck.

B. Install perimeter and isolation wire. (Leave in Place for Future Testing)

1. Membrane surface must be dry for securement of perimeter and isolation wire.

2. Install perimeter wire within 4" of base flashings.

3. Any penetrations that act as grounds shall have isolation wire installed around them. (ie. drains)

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4. No single area shall exceed 6,000 SF.

5. Secure wire using materials compatible with membrane and acceptable to membrane manufacturer.

C. Turn on equipment and verify ground lead is activating structural deck.

D. Testing

1. Area tested must be wet to provide an electronically charged field.

   a. Water source shall provide 45 psi water pressure.

   b. Wet membrane using a hose or shortly after precipitation.

2. Identify membrane breaches, mark, number and plot location. Photograph breach for documentation.

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3. After breaches have been repaired, complete confirmation testing to assure repair is watertight.

E. Prepare and submit report.

F. Post Test Membrane Protection

1. Protect membrane from construction activities and storage of materials after testing is complete.

2. Re-test membrane if it has not been protected in a satisfactory manner.

Memo: The specification is the way to have something enforceable. It is not enough to simply state that the membrane be protected. It is not happening.

Memo: If a vegetated roof is to be installed you may want to install surface wiring around the perimeter and at grounds (drains) before the overburden is installed. This wiring can reduce the discovery area in the event of a future leak.

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