SMT – STRUCTURE MONITORING TECHOLOGY
WATERPROOF MEMBRANE SURVEY AND LEAK LOCATE MONITORING SYSTEM

3-PART SPECIFICATION

GENERAL NOTES TO SPECIFIER:

THIS SPECIFICATION SECTION HAS BEEN PREPARED TO ASSIST DESIGN PROFESSIONALS IN THE PREPARATION OF PROJECT OR OFFICE MASTER SPECIFICATIONS. IT FOLLOWS GUIDELINES ESTABLISHED BY THE CONSTRUCTION SPECIFICATIONS INSTITUTE, AND THEREFORE MAY BE USED WITH MOST MASTER SPECIFICATION SYSTEMS WITH MINOR EDITING.

EDIT CAREFULLY TO SUIT PROJECT REQUIREMENTS. MODIFY AS NECESSARY AND DELETE ITEMS THAT ARE NOT APPLICABLE. VERIFY THAT REFERENCED SECTION NUMBERS AND TITLES ARE CORRECT. (NUMBERS AND TITLES REFERENCED ARE BASED ON *MASTERFORMAT*, 2004 EDITION).

THIS SECTION ASSUMES THE PROJECT MANUAL WILL CONTAIN COMPLETE DIVISION 1 DOCUMENTS INCLUDING SECTIONS 01 25 13 PRODUCT SUBSTITUTION PROCEDURES, 01 33 00 SUBMITTAL PROCEDURES, 01 62 00 PRODUCT OPTIONS, 01 66 00 PRODUCT STORAGE AND HANDLING REQUIREMENTS, 01 74 00 CLEANING AND WASTE MANAGEMENT, 01 77 00 CLOSEOUT PROCEDURES, AND 01 78 00 CLOSEOUT SUBMITTALS. CLOSE COORDINATION WITH DIVISION 1 SECTIONS IS REQUIRED.

IF THE PROJECT MANUAL DOES NOT CONTAIN THESE SECTIONS, ADDITIONAL INFORMATION SHOULD BE INCLUDED UNDER THE APPROPRIATE ARTICLES.
THIS IS A PROPRIETARY SPECIFICATION BASED ON THE RGC ROOFING PRACTICES MANUAL TAB 9.5.1 . THE SPECICATION IS TO COMPLY WITH RGC GUARRANTEE WATERPROOFING STANDARDS. NOTES TO THE SPECIFIER ARE CONTAINED IN BOXES AND SHOULD BE DELETED FROM FINAL
COPY.

OPTIONAL ITEMS REQUIRING SELECTION BY THE SPECIFIER ARE ENCLOSED WITHIN BRACKETS, E.G. [35] [40] [45]. MAKE APPROPRIATE SELECTIONS AND DELETE OTHERS.
ITEMS REQUIRING ADDITIONAL INFORMATION ARE UNDERLINED BLANK SPACES, E.G. _____
.
BOLD FACE TYPE IDENTIFIES OPTIONAL PARAGRAPHS AND FEATURES THAT MAY BE INCLUDED OR DELETED DEPENDING ON PROJECT REQUIREMENTS. CONVERT THE BOLD FACE TYPE TO REGULAR TYPE WHEN INCLUDING THESE PARAGRAPHS OR FEATURES. WHEN DELETING A PARAGRAPH, BE CERTAIN THAT ALL SUBPARAGRAPHS ARE ALSO DELETED.

REVISE FOOTER TO SUIT PROJECT/OFFICE REQUIREMENTS.

ELECTRONIC VERSIONS OF THIS SPECIFICATION UTILIZE AUTOMATIC PARAGRAPH NUMBERING.

WHEN EDITING IS COMPLETE, DELETE ALL TEXT ON THIS PAGE, THEN REMOVE THE SECTION

BREAK AT THE TOP OF THE NEXT PAGE TO REMOVE THIS PAGE FROM THE DOCUMENT.

SPECIFICATION BEGINS ON THE FOLLOWING PAGE.

SECTION 07 01 51

(MasterFormat 1995 Edition: 07590)

WATERPROOF MEMBRANE INTEGRITY SURVEY
AND
LEAK LOCATE AND MONITORING ARRAY

PART 1 – GENERAL

1.01 Summary

A. Section Includes:

1. Digital Multi-Vector detection scan of membrane areas indicated below, and as scheduled at the end of this section, to verify membrane water proof integrity.

SELECT PARAGRAPH a. AND/OR b. BELOW DEPENDENT ON PROJECT REQUIREMENTS. DELETE EITHER PARAGRAPH THAT IS NOT APPLICABLE.

a. New waterproof membrane including vertical surfaces and penetration seals [–all roof and deck areas] [–roof and deck areas as shown on Drawings].

b. Existing waterproof membrane including vertical surfaces and penetration seals [–all roof and deck areas] [–roof and deck areas as shown on Drawings].

2. Installation of permanent Monitoring Grid with associated Access Closure and related testing and measuring apparatus to facilitate membrane leak locations to within an area defined by the grid spacing. The leak locate function is performed at the grid access closure or by remote computer control using associated switching and measuring equipment without requiring access and testing on the surface of the covered roof.

INSERT SECTIONS BELOW SPECIFYING THE MEMBRANE AND ANY PRODUCTS OR SYSTEMS PLACED ABOVE THE MEMBRANE SUCH

B. Related Sections:

1. __ __ __ – _____.
2. __ __ __ – _____.
3. **__ __ __ – _____:**

Roof penetrations required by work of this section.

INCLUDE APPROPRIATE LANGUAGE BELOW IF PROCEDURES SPECIFIED IN THIS SECTION ARE TO BE BID AS ALTERNATES.

C. Alternates:

1. Reference Section 01 23 00 Alternates.

1.02 Submittals

A. Reference Section 01 33 00 Submittal Procedures; submit following items:

1. Product Data
2. Shop Drawings:
   a. Show Membrane Monitoring Grid.
   b. Location of Access Closure.

c. Wiring path from Monitoring Grid to Access Closure.
d. Show location where grid cables will be terminated, and area where monitoring electronics or future monitoring electronics would be installed.
e. Location and type of roof penetrations.
f. Location of roof drains and details of electrical guard circuits around drains.

3. Quality Assurance/Control Submittals:
   A. Qualifications: Proof of survey company qualifications. Closeout Submittals: Reference
   B. Section 01 78 00 Closeout Submittals; submit following items:
   C. Closeout Submittals : Reference Section 01 78 00-Closeout Submittals; submit following items:
      1. Field Report.
      2. Proposal for Maintenance Service as specified below.

1.03 Quality Assurance

A. Qualifications:
   1. Survey Company Qualifications: Minimum three years experience in performing roof surveys, or as certified by SMT Research to perform surveys as specified herein.

1.04 Delivery, Storage, and Handling

A. Reference Section 01 66 00 Product Storage and Handling Requirements.
B. Special Instructions: Protect electronic equipment and sensing and detection devices against potential damage from dust and moisture.

1.05 PROJECT/SITE Conditions

C. Environmental Requirements: Do not perform scan(s) when heavy rain is falling.
D. A hose connected to a water supply, and of sufficient length to reach all points on surfaces to be surveyed, shall be provided for surveyors use.
E. Existing Conditions:
   1. Membranes to be scanned must be broom clean (except for follow-up surveys on vegetated waterproofing) and be free of overburden, construction materials, equipment and debris.
   2. Vents, pipes, supports and similar membrane penetrating components must be made of nonconductive material or be electrically isolated by layers of material added to the penetrating component above the waterproof membrane.
   3. The waterproof membrane must extend above all overburden to avoid unintended electrical paths to ground.
   4. A suitable liquid applied or weather proof insulating material or a cap sheet may be applied to insulate exposed concrete. Metal flashings and other metal elements should be clear of overburden and soil to achieve the electrical insulation and avoid unintended grounds.

1.06 Warranty

A. Membrane Integrity Scan: The membrane integrity scan provides the integrity condition only at the time of the scan and gives no assurance of future condition. No warranty is expressed or implied.

1.07 Commissioning

A. Reference Section 01 91 00–Commissioning.
B. Perform initial membrane scan to establish baseline conditions.
C. Verify wiring sequence, electrical continuity and the absence of shorts or grounds.

1.08 Maintenance

SELECT PARAGRAPH a. OR b. BELOW DEPENDENT ON PROJECT REQUIREMENTS. DELETE THE ONE PARAGRAPH THAT IS NOT APPLICABLE.

A. Maintenance Service: Submit proposal to perform future membrane integrity scans, as outlined herein, every [3 months] [2 months] [_____].
OR
B. Maintenance Automated Service: The automated electronics and monitoring system shall perform notification and reporting features of membrane status, system status and grid status.

PART 2 - PRODUCTS

2.01 SURVEY COMPANY

A. SMT Research or a SMT Research certified agent.

SMT Research Ltd.
www.smtresearch.ca

200-75 West Broadway
Vancouver, British Columbia - ph: 778-373-2070 or 778-373-2071
email info@smtresearch.ca

2.02 Equipment

A. DigiSCAN Digitial Multi-Vector Mapping (DMVM) scanner: A hand-held digital output device which screen output points to the location of the membrane breach. Optional features of the DigiScan device include:
   a. extended range base
   b. water retention sheet for sloped installation

SELECT PARAGRAPH b. OR c. BELOW DEPENDENT ON PROJECT REQUIREMENTS. DELETE THE ONE PARAGRAPH THAT IS NOT APPLICABLE.

B. Grid Monitoring Set: a series of wired or wireless data acquisition devices which monitor the membrane on a continuous permanently installed system showing the vectors towards the leak.
C. Grid Monitoring Set: a series of wired or wireless data acquisition devices which monitor the membrane when a technician brings the monitoring system to site for periodic review.

2.03 Components

A. Detection Grid: Moisture Detection Sensor (MDS) of a laminate construction with peel-and-stick insulating substrate with two or more STAINLESS STEEL (TYPE 316) conductors. Access closure: a watertight closure with space for cable terminations on terminal blocks and monitoring electronics (future feature in some projects).
B. Electrical Cable and Related Accessories: Provide as recommended by the Survey Company to connect Grid with Access Closure.

Part 3- EXECUTION

3.01 Examination

A. Examine surfaces to be surveyed.
B. Examine surfaces upon which monitoring grid will be installed.
   1. Verify that membrane penetrations are of a non-conductive material or are electrically isolated by

applying applications of additional layers of non-conductive waterproof material or other electrically insulating materials.

C. Verify availability of hose and water supply.
D. Coordinate with responsible entity to correct unsatisfactory conditions.
E. Commencement of work by surveyor is acceptance of installation conditions.

3.02 Survey Procedure

A. DigiScan Membrane Integrity Scan: Scan roof surfaces including inside and outside corners of parapets and equipment curbs. Use the scanning equipment as appropriate to surfaces being scanned and as selected by surveyor.
   1. Mark breach locations on membrane with a marker approved by the waterproof membrane contractor and/or Inspector.
   2. Record location of membrane breach on sketch or drawings for communication with contractor and/or Inspector.

3.03 Installation

A. Monitoring Grid:
   1. Conductors:
      a. Place a conductor with 316 stainless steel conductors in the specified pattern on top of waterproof membrane.
      b. Install in accordance with Survey Company installation instructions.
   2. Install Access Closure.
   3. Install and terminate electrical cables from grid on approved screw terminal blocks in Access Closure.

3.04 Field report

A. Identify date, time, and weather conditions when survey was conducted. Provide general description of scan/survey equipment and process. Describe typical membrane breaches located and areas not accessible by scanning equipment. Document survey with photographs and plan view scale drawings with approximate location of breaches noted.

3.05 Schedule

A. Perform water proof surveys as follows:

SELECT SUBPARAGRAPH 1. OR SOME COMBINATION OF 2, 3, AND 4. BELOW DEPENDING ON PROJECT REQUIREMENTS or B.

   1. On existing waterproof membrane to locate existing leaks.
   2. Immediately following installation of roof membrane.
   3. Immediately following installation of final layer of inverted or vegetated roof.
   4. Immediately following installation of _____waterproof membrane.
   5. After waterproof membrane installation and immediately prior to covering of the membrane with protection boards, drainage mats or other subsequent overburden.

B. Automated Monitoring Equipment shall monitor the roof membrane as site conditions are applicable every _____ hours.
   1. Notification of possible membrane breach or system maintenance shall be made to the following: (choose the applicable party) general contractor, roofing contractor, consultant, facilities manager, owner.