PERMASCAN-I 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*, APRIL 2012 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.

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 HEADER 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.

PART 1 - GENERAL

THIS SPECIFICATION IS APPLICABLE ONLY TO MEMBRANES INSTALLED ON CONDUCTIVE MATERIALS SUCH AS CONCRETE, METAL, OR OTHER CONDUCTIVE MATERIAL AS APPROVED BY DETEC.

1.1 SUMMARY

A. Section Includes:

1. Electric conductance leak detection survey of membrane and installation of the permanent PermaScan-I System with appurtenant access enclosure for areas indicated below, and as scheduled at the end of this section, to verify membrane integrity.

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

a. New waterproof membrane [horizontal surfaces only] [horizontal and vertical surfaces] – [all roof, plaza and balcony areas] [roof, plaza and balcony areas as shown on Drawings].

b. Existing waterproof membrane [horizontal surfaces only] [horizontal and vertical surfaces] – [all roof, plaza and balcony areas] [roof, plaza and balcony areas as shown on Drawings].

B. Monitoring:

1. Manufacturer's Central Monitoring Service with Manufacturer Maintenance Services: A separate fee Agreement executed between the Owner and the detection and monitoring system manufacturer to include the following:

a. Provide the following Report Types:

1) Monthly Standard Report. Reports shall include name, address, date and time created, dates of initial wetting and subsequent dates of drying including trend analysis. E-mail to Owner-designated recipients.

b. Provide the following services during the term of the Agreement:

1) 24 hour per day, 365 day per year monitoring service.

2) Telephone and on-line technical support.

INSERT SECTIONS BELOW SPECIFYING THE MEMBRANE AND ANY PRODUCTS OR SYSTEMS PLACED ABOVE THE MEMBRANE SUCH AS BALLAST, PAVERS OR VEGETATED ROOFING, ROOF PENETRATIONS, AND SECTIONS SPECIFYING ROOF REPAIR.

C. Related Sections:

1. __ __ __ – _____.

IF THE ACCESS ENCLOSURE IS LOCATED WITHIN THE BUILDING, CONDUIT FROM THE ENCLOSURE TO THE ROOF AND/OR PLAZA DECK MUST BE PROVIDED UNDER THE APPROPRIATE ELECTRICAL SECTION, AND THE ELECTRICAL SECTION MUST CROSS REFERENCE THIS SECTION. SEE 2.3 B. FOR ACCESS ENCLOSURE LOCATION.

2. 26 00 00 – **_____.** Electrical (Raceway)

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. OTHERWISE DELETE FOLLOWING PARAGRAPH.

D. Alternates:

1. Reference Section 01 23 00–Alternates.

1.2 SUBMITTALS

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

1. Product Data.

2. Shop Drawings:

a. Show PermaScan-I System components and locations.

b. Location of Access Enclosure.

c. Wiring path from PermaScan-I System to Access Enclosure.

d. Location and size of roof penetrations.

3. Quality Assurance/Control Submittals:

a. Qualifications: Proof of survey company qualifications.

B. Closeout Submittals: Reference Section 01 78 00–Closeout Submittals; submit following items:

1. Commissioning Report including the following minimum information.

a. Record Drawings prepared in accordance with Conditions of the Contract and denoting field changes.

b. Daily Field Reports (DFRs).

c. Installation photos.

d. Proposal for Maintenance and Testing or Monitoring Service as specified herein.

1.3 QUALITY ASSURANCE

A. Qualifications:

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

1.4 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 damage from dust, extreme heat and moisture.

1.5 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Do not perform scan(s) or install system in heavy rain or freezing conditions or if there is a threat of heavy rain or freezing conditions.

B. 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.

C. Existing Conditions:

1. Membranes must be non-conductive, broom-clean and be free of overburden, construction materials, equipment, and debris.

CALL DETEC FOR CLARIFICATION OR PRODUCT TESTING.

2. Vents, pipes, supports and similar membrane penetrating items must be made of non-conductive material or be electrically isolated from layers of material added above the waterproof membrane.

3. A 6 mil polyethylene plastic sheet must be installed directly on top of the PermaScan-I embedded grid system. Above the 6 mil poly plastic sheet a drain mat plus a minimum of 2” of insulation must be installed to protect against electrical paths through soil or concrete overburden. Contact Detec Systems for a review of overburden conditions on project.

4. The waterproof membrane must extend above all overburden to avoid unintended electrical paths to ground.

5. A suitable liquid-applied weatherproof insulating material may be applied to exposed concrete, metal flashings, metal vent stacks or other elements to achieve the required level of electrical insulation.

6. An Ethernet connection and 120V-AC power receptacle must be installed at access enclosure location to allow for continuous monitoring of system on cloud based monitoring center.

1.6 WARRANTY

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

B. PermaScan-I System:

1. Manufacturer's Warranty: Warrant against defective equipment and components for a period of not less than two years.

2. Installation Warranty: Warrant against defects in workmanship for a period of not less than two years.

1.7 COMMISSIONING

A. Reference Section 01 91 00–Commissioning.

B. With reference to the DX250 User Manual, include the following for programming the monitoring center database:

1. Project and site location information.

2. Remote Monitoring Unit (RMU) serial numbers and input zone information.

3. Monitoring report customer schedule.

4. Review system operation with Owner's Representative.

5. Instruct Owner's Representative on report scheduling.

1.8 MAINTENANCE

A. Maintenance Service: Submit monitoring agreement to perform continuous monitoring of the PermaScan-I System. System maintenance will be included in monitoring agreement.

PART 2 - PRODUCTS

2.1 LEAK DETECTION COMPANY (BASIS OF DESIGN)

SELECT "DETEC SYSTEMS, LLC" FOR PROJECTS IN THE US OR "DETEC SYSTEMS, LTD" FOR PROJECTS IN AUSTRALIA.

A. [Detec Systems, LLC] [Detec Systems Ltd] or a Detec Systems certified agent.

Toll free:1.855.753.3832 (1.855.75.DETEC) info@detecnsw.com.au

2.2 EQUIPMENT

A. Roof Membrane Integrity Scanner (RMIS): Wheel-mounted sweeper unit with analog metering gauges and audible alert.

B. Vertical Surface Leak Locater (VSLL): Handheld water absorptive device with analog metering gauges and audible signaling.

2.3 COMPONENTS

A. Electrical Conductors: Flat conductors or wire capable of facilitating location of membrane breaches.

B. Access Enclosure(s): A watertight NEMA Enclosure (required for outdoor installations only) or Leviton Media Enclosure (indoor) with internal PCB panel and screw terminal barrier blocks for connecting system cable wiring to provide field test access. Install Access Enclosure(s) in _____.

FILL IN BLANK SPACE ABOVE DESCRIBING LOCATION OF ACCESS ENCLOSURE.

VERIFY THAT DRAWINGS SHOW LOCATION OF FOLLOWING MOISTURE SENSING DEVICES AT ALL AREAS DESIRED TO BE MONITORED.

C. DX250: A computer based Ethernet connected gateway designed to, on command, interrogate the RMU's connected to the CAN busses and forward the sensor data collected from the RMUs to the monitoring center for analysis.

D. Moisture Detection Tape (MDT): A sensor installed under waterproof membranes. The tape with parallel flat copper conductors detects surface moisture that dampens the area between the conductors.

E. Remote Monitoring Unit: Provides data acquisition from the building monitoring sensors. The RMU sends the data to the DX250 via a CAN bus connection which is then forwarded over an Ethernet connection to the monitoring center.

F. Electrical Cable and Related Accessories: Provide as recommended by Detec to connect the PermaScan-I System with the Access Enclosure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be surveyed.

B. Examine surfaces upon which the PermaScan-I System will be installed.

1. Verify that membrane and penetrations are of a non-conductive material or are electrically isolated by applying applications of additional layers of waterproof insulating material.

C. Verify availability of hose and water supply.

D. Coordinate with responsible entity to correct unsatisfactory conditions.

E. Commencement of work by surveyor is deemed as acceptance of installation conditions.

3.2 SURVEY PROCEDURE

A. Membrane Integrity Survey: Testing to be performed in accordance with ASTM D8231-19 (Standard Practice for the Use of a Low Voltage Electronic Scanning System for Detecting and Locating Breaches in Roofing and Waterproofing Membranes). Survey horizontal and vertical surfaces as specified including inside and outside corners of parapets and equipment curbs. Use RMIS and/or VSLL scanners as appropriate to surfaces being scanned and as selected by surveyor.

1. Mark breach locations on membrane with approved marker.

3.3 INSTALLATION

A. PermaScan-I System:

1. Conductors:

a. Place peel-and-stick tape with flat conductors in the specified pattern on top of waterproof membrane.

b. Install in accordance with Detec installation instructions.

2. Install Access Enclosure.

3. Install and terminate electrical cable from the PermaScan-I System to control unit located in the Access Enclosure.

4. Connect system to Ethernet data connection and 120V-AC power receptacle to connect system to cloud based monitoring center.

5. Verify system is functioning as designed and produce system commissioning documents to client.

3.4 DAILY FIELD REPORT (DFR)

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

3.5 INSTALLATION

REVIEW MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PROVIDE ADDITIONAL INFORMATION IN THIS ARTICLE FOR TYPES OF CONSTRUCTION AND SPECIAL CIRCUMSTANCES THAT MAY BE ENCOUNTERED AND ARE NOT COVERED IN THE INSTRUCTIONS.

A. Install components in accordance with manufacturer's installation instructions.

1. Building Computer (Gateway):

a. Install computer in the location indicated on Drawings.

b. Connect to computer via network, serial, or modem connection.

2. Make final electrical cable connections between moisture detection devices, remote measurement units, and the computer.

B. Repair or replace components deemed defective by Field Tests specified below.

3.6 FIELD QUALITY CONTROL

A. Field Tests: Perform tests in accordance with the manufacturer's installation instructions. Include the following minimum procedures:

1. Immediately following installation of roof membrane.

2. Just prior to installation of materials above system.

3. During system commissioning once Ethernet data connection and 120V-AC power supply are available.

4. If the above tests result in failure of any component, notify Architect for a determination regarding corrective action to be taken.

5. Maintain records of tests performed

1. (Optional construction quality control addition) Use cellar gateway for temporary data connection to fully monitor the PermaScan-I system throughout construction on 15 minute intervals. Send weekly reports to roofing/waterproofing superintendent, general contractor superintendent and design team.

2. Once permanent Ethernet connection and 120V-AC power supply is furnished terminate cables and commission system to cloud based monitoring center.

3.7 CLEANING

A. Reference Section 01 74 00–Cleaning and Waste Management.

END OF SECTION[1]

[1] Issue Date: July 30, 2019