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July 24 2014

To: Contractors

RE: Rochester Housing Authority,  
**Security Camera Upgrade**

**270 Lake Ave.**

*12 pages including cover*

**ADDENDUM #1**

SEE ATTACHED

**Acknowledgement:**

**I have received the above referenced Addendum #1 and have used it in the calculation/preparation of this bid.**

\_\_\_\_\_  
Contractor

**THIS MUST BE SUBMITTED WITH YOUR BID SUBMISSION**  
**FAILURE TO DO SO MAY RENDER YOUR BID INVALID.**



**ROCHESTER HOUSING AUTHORITY  
SECURITY SYSTEM UPGRADES  
270 LAKE AVE.  
HUNT 2285-025**

BID ADDENDUM NO. 1

**JULY 24, 2014**

The following Addendum (Addenda) shall be considered a part of the contract documents prepared by HUNT ENGINEERS, ARCHITECTS & LAND SURVEYORS; P.C., issued for Bid on 07/07/14

**Project Manual Sections Issued by this Addendum:**

27 15 23 – Communications Optical Fiber Cabling  
27 15 55 – Communications Cable Testing

**Drawings Issued by this Addendum:**

None.

**Clarifications Issued by this Addendum:**

1. Existing cameras are IQ eye Sentinel 3MP IP Cameras.
2. The existing cabling for the security camera system is terminated in the MDF Location as shown on drawing per General Note A on T1.1.
3. The project scope is replacing the existing headend with new DVMS and NVR.
4. The existing server and client workstation are not being reused.
5. One new work station is required see Drawing note #3 on T1.1.
6. One new work station is required see Drawing note #3 on T1.1.
7. For all camera located on out buildings see Drawing T1.2, (3) cameras require media converters. See specification 271523 for details.
8. The Existing patch panel and network equipment to be relocated to new rack. 66 block and access control panel will be relocated to make room for installation of new rack. Coordinate moves and relocation of all equipment with owner.

**Revisions to Drawings:**

**ITEM AD1-A1 Refer to Drawing T1.2 – Security Site Plan**  
**AMEND** note at fiber building entrance that reads "BUILDING CABLE ENTRANCE. USE EXISTING CONDUITS LOCATED IN CLOSET" to read:

"BUILDING CABLE ENTRANCE. USE EXISTING CONDUITS LOCATED IN CLOSET, CONTINUE FIBER CABLING TO MDF FOR CONNECTION TO MEDIA CONVERTERS"

**ITEM AD1-A2 Refer to Drawing T1.1 – First Floor Security Plan**

**AMEND** note notations on cameras 11 & 13 to read: "ER" to designate existing to be relocated per owner directive.

**ITEM AD1-A3 Refer to Drawing T1.1 – First Floor Security Plan**

**AMEND** Drawing note #7 to read:

"Provide three Cat6 data outlets mounted to the interior wall for connection to media convertors to the security patch panels. Provide three media convertors (Garrettcom - CS14H-ST-HD) for connection to the cameras in the garage. Provide three 25' patch cables for the connection to the network switch.

**Revisions to Project Manual:**

**ITEM AD1-A4 Refer to Section 01 10 00 - Summary of Work, 1.3, paragraphs A & B.**

**AMEND** to read:

- A. Contract Documents, titled "Rochester Housing Authority Security System Upgrades", dated June 13, 2014 were prepared for the Project by Hunt Engineers, Architects & Land Surveyors, PC, 4 Commercial St., Suite 300, 3rd Floor, Rochester, NY 14614-1008.
- B. The contract shall be constructed under a Single Prime contract.
  1. Definition of Extent of Prime Contract Work:
    - a. Contract #1 – 270 Lake Ave., Digital Video Management System Upgrades.
      - 1) Removal of obsolete camera surveillance system and replace with a new storage server with the Housing Authority's standard software. Some installation of new IP cameras and re-aiming of some existing cameras. The associated wiring and infrastructure will be replaced as part of the project.

SECTION 27 15 23  
COMMUNICATIONS OPTICAL FIBER CABLING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiber Optic Cabling inside building(s).

1.2 RELATED REQUIREMENTS

- A. Section 07 84 00 - Firestopping.

1.3 REFERENCE STANDARDS

- A. EIA-310 - Cabinets, Racks, Panels, and Associated Equipment; Electronic Industries Association; Revision D, 1992.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. TIA-492AAAA-B - Detail Specification for 62.5-um Core Diameter/125-um Cladding Diameter Class Ia Graded-Index Multimode Optical Fibers; 2009.
- D. TIA-492CAAA - Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers; 1998 (R 2002).
- E. TIA-526-7 - OFSTP-7 - Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant; 2002.
- F. TIA-526-14 - OFSTP-14 - Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant; Rev B, 2010.
- G. TIA/EIA-568-C.1 - Commercial Building Telecommunications Cabling Standard - Part 1: General Requirements; Rev C, 2012; Addenda 1-7.
- H. TIA/EIA-568-C.3 - Commercial Building Telecommunications Cabling Standard - Part 3: Optical Fiber Cabling Components Standard, and Addendum 1 - Additional Transmission Performance Specifications for 50/125 um Optical Fiber Cables
- I. TIA-569 - Commercial Building Standard for Telecommunications Pathways and Spaces; 2012.
- J. TIA-570 - Residential Telecommunications Infrastructure Standard; 2012.
- K. TIA/EIA-606 - Administration Standard for the Telecommunications Infrastructure; Rev B, 2012.
- L. ANSI/J-STD-607 - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications; Rev A, 2002.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.

- C. Shop Drawings: Show compliance with requirements on isometric schematic diagram of network layout, showing cable routings, telecommunication closets, rack and enclosure layouts and locations, service entrance, and grounding, prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
- D. Manufacturer Qualifications.
- E. Installer Qualifications.
- F. Field Test Reports.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: At least 3 years experience manufacturing products of the type specified.
- B. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and:
  - 1. Employing a BICSI Registered Communications Distribution Designer (RCDD).
  - 2. Supervisors and installers factory certified by manufacturers of products to be installed.
  - 3. Employing BICSI Registered Cabling Installation Technicians (RCIT) for all work.
  - 4. Employing experienced technicians for all work; show at least 3 years experience in the installation of the type of system specified, with evidence from at least 2 projects that have been in use for at least 18 months; submit project name, address, and written certification by user.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep stored products clean and dry.

#### 1.7 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a 2 year period after Date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Cabling and Equipment:
  - 1. Corning Cable Systems OM1 Multi-Mode Fiber Model: 002K8P-31130-29
- B. Connector Panels
- C. ST Multi-Mode Connectors
  - 1. CORNING Unicam ST Multimode-Mode Connector Model 95-000-51
- D. Media Converter
  - 1. Garrettcom Hardened ST Multimode convereter 100Mb Model CS14H-ST-Hd
- E. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.2 SYSTEM DESIGN

- A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
  - 1. Comply with TIA/EIA-568 and TIA/EIA-569, latest editions.
  - 2. Comply with TIA-570, latest edition.
  - 3. Provide fixed cables and pathways that comply with NFPA 70 and ANSI/J-STD-607 and are UL listed or third party independent testing laboratory certified.
  - 4. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.

## PART 3 EXECUTION

### 3.1 INSTALLATION - GENERAL

- A. Comply with latest editions and addenda of TIA/EIA-568, TIA/EIA-569, ANSI/J-STD-607, NFPA 70, and SYSTEM DESIGN as specified in PART 2.
- B. Comply with latest editions and addenda of TIA-570, ANSI/J-STD-607, NFPA 70, and SYSTEM DESIGN as specified in PART 2.

### 3.2 INSTALLATION OF CABLING

- A. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
  - 1. At Outlets - Optical Fiber: 36 inches.
  - 2. After Building Entrance - Optical Fiber: 20 feet
- B. Fiber Optic Cabling:
  - 1. Prepare for pulling by cutting outer jacket for 10 inches from end, leaving strength members exposed. Twist strength members together and attach to pulling eye.
  - 2. Support vertical cable at intervals as recommended by manufacturer.
- C. Field-Installed Labels: Comply with TIA/EIA-606 using encoded identifiers.
  - 1. Cables: Install color coded labels on both ends.

### 3.3 FIELD QUALITY CONTROL

- A. Comply with inspection and testing requirements of specified installation standards.
- B. Visual Inspection:
  - 1. Inspect cable jackets for certification markings.
  - 2. Inspect cable terminations for color coded labels of proper type.
  - 3. Inspect outlet plates and patch panels for complete labels.

END OF SECTION

SECTION 27 15 55  
COMMUNICATIONS CABLE TESTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Provide all labor, materials, tools, equipment, and field-test instruments required for the complete testing, identification and administration of the work called for in the Contract Documents.
- B. To conform to the overall project schedule, the cabling contractor shall survey the work areas and coordinate cabling testing with other applicable trades.
- C. Minimum requirements for the test certification, identification and administration of backbone and horizontal optical fiber cabling.
  - 1. Category 6 Copper Cabling
  - 2. Multimode Fiber Cabling
  - 3. Single-Mode Fiber Cabling

1.2 RELATED REQUIREMENTS

- A. Section 27 10 05 - Communications Copper Cabling
- B. Section 27 15 23 - Communications Optical Fiber Cabling

1.3 REFERENCE STANDARDS

- A. TIA-455-21 - FOTP-21 - Mating Durability of Fiber Optic Interconnecting Devices; 2012.
- B. TIA-492AAAA-B - Detail Specification for 62.5-um Core Diameter/125-um Cladding Diameter Class Ia Graded-Index Multimode Optical Fibers; 2009.
- C. TIA-492AAAB-A - Detail Specification for 50-um Core Diameter/125-um Cladding Diameter Class Ia Graded-Index Multimode Optical Fibers; 2009.
- D. TIA-492CAAA - Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers; 1998 (R 2002).
- E. TIA/EIA-568-C.1 - Commercial Building Telecommunications Cabling Standard - Part 1: General Requirements; Rev C, 2012; Addenda 1-7.
- F. TIA/EIA-568-C.2 - Commercial Building Telecommunications Cabling Standard - Part 2: Balanced Twisted Pair Cabling Components; Rev C, 2012; Addenda 1-11.
- G. TIA/EIA-568-C.3 - Commercial Building Telecommunications Cabling Standard - Part 3: Optical Fiber Cabling Components Standard, and Addendum 1 - Additional Transmission Performance Specifications for 50/125 um Optical Fiber Cables
- H. ANSI/TIA/EIA 455 61A, Measurement of Fiber or Cable Attenuation Using an OTDR.
- I. ANSI/TIA/EIA-455-59A, Measurement of Fiber Point Discontinuities Using an OTDR.
- J. ANSI/TIA/EIA 455 60A, Measurement of Fiber or Cable Length Using an OTDR.
- K. ANSI Z136.2, ANS for Safe Use Of Optical Fiber Communication Systems Utilizing Laser Diode And LED Sources.

- L. ANSI/TIA/EIA 526 7, Optical Power Loss Measurements of Installed Singlemode Fiber Cable Plant.
- M. ANSI/EIA/TIA 455 50B, Light Launch Conditions For Long-Length Graded-Index Optical Fiber Spectral Attenuation Measurements
- N. ANSI/TIA 526 14 B, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant; IEC 61280-4-1 edition 2, Fiber Optic Communications Subsystem Test Procedure- Part 4-1: Installed cable plant- Multimode attenuation measurement.
- O. TIA/EIA-606 - Administration Standard for the Telecommunications Infrastructure; Rev B, 2012.

#### 1.4 SUBMITTALS

- A. Manufacturers catalog sheets and specifications for copper field-test instruments.
- B. Sample test reports.
- C. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

#### 1.5 QUALITY ASSURANCE

- A. Installer / Tester Qualifications:
  - 1. Trained technicians who have successfully attended an appropriate training program and have obtained a certificate as proof thereof shall execute the tests. Appropriate training programs include but are not limited to installation certification programs provided by BiCSi or the ACP (Association of Cabling Professionals).
    - a. Manufacturer of the copper cable and copper connectors, manufacturer of the fiber optic cable and/or the fiber optic connectors.
    - b. Manufacturer of the test equipment used for the field certification.
- B. Testing Equipment Qualifications:
  - 1. Field test instruments shall comply with the accuracy requirements for level III field testers as defined in ANSI/TIA-1152. The tester including the appropriate interface adapter must meet the specified accuracy requirements. The accuracy requirements for the permanent link test configuration (baseline accuracy plus adapter contribution) are specified in Table 3 of ANSI/TIA-1152 (Table 3 in this TIA document also specifies the accuracy requirements for the Channel configuration).
  - 2. Field-test instruments shall have the latest software and firmware installed.
  - 3. Field-test instruments (tester) shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy.
  - 4. The RJ45 test plug shall fall within the values specified in ANSI/TIA-568-C Annex C for NEXT, FEXT and Return Loss.
  - 5. Testing of the fiber cabling shall be performed using high-quality test cords of the same fiber type as the cabling under test. The test cords for OLTS testing shall be between 1 m and 5 m in length. The test cords for OTDR testing shall be approximately 100 m for the launch cable and at least 25 m for the receive cable.
  - 6. The copper tester interface adapters must be of high quality and the cable shall not show any twisting or kinking resulting from coiling and storing of the tester interface adapters. In order to deliver optimum accuracy, preference is given to a permanent link interface adapter for the tester that can be calibrated to extend the reference plane of the Return Loss measurement to the permanent link interface. The contractor shall provide proof that the interface has been calibrated within the period recommended by the vendor. To ensure that normal handling on the job does not cause measurable Return Loss change, the adapter cord cable shall not be of twisted-pair construction.
  - 7. Field-test instruments (tester) shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy.



8. Field-test instruments shall have the latest software and firmware installed.

## PART 2 EXECUTION

### 2.1 COPPER

- A. Every cabling link in the installation shall be tested in accordance with the field test specifications defined in ANSI/TIA-568-C.2 "Commercial Balanced Twisted-Pair Telecommunications Cabling and Components Standard". This document will be referred to as the "Category 6 Standard."
- B. Every cabling link in the installation shall be tested for the following:
  1. Wire map
  2. Length
  3. Insertion loss
  4. NEXT loss
  5. PS NEXT loss
  6. ACR-F loss
  7. PS ACR-F loss
  8. Return loss
  9. Propagation delay
  10. Delay skew
- C. The cable type must be set to match the cable manufacturer and type installed, do not set to the default Cat 6 UTP. If the manufacturer of the cable installed is not listed in the field test equipment, only then, the default Cat 6 UTP may be used.
- D. The location of the "Main" shall be at the MDF or IDF and the location of the "Remote" shall be at the outlet. If the location of the "Main" and "Remote" are reversed, it must be noted in the test report documentation for any and all instances.
- E. The installed twisted-pair horizontal links shall be tested from the IDF in the telecommunications room to the telecommunication wall outlet in the work area for compliance with the "Permanent Link" performance specification as defined in the Category 6 Standard.
- F. One hundred percent of the installed cabling links must pass the requirements of the Category 6 Standard and as further detailed in this Section. Any failing link must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements. The final and passing result of the tests for all links shall be provided in the test results documentation in accordance with this Section.
- G. A Pass or Fail result for each parameter is determined by comparing the measured values with the specified test limits for that parameter. The test result of a parameter shall be marked with an asterisk " \* " when the result is closer to the test limit than the accuracy of the field tester. The field tester manufacturer must provide documentation as an aid to interpret results marked with asterisks. To which extent " \* " results shall determine approval or disapproval of the element under test shall be defined in the relevant detail specification, or agreed on as a part of a contractual specification.
- H. The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests (detailed in Section 4.2.2 of ANSI/TIA-1152). Any Fail or Fail\* result yields a Fail for the link-under-test. In order to achieve an overall Pass condition, the results for each individual test parameter must Pass or Pass\*.

## 2.2 FIBER

- A. Every fiber cable link shall be tested in accordance with this document. This includes testing the attenuation and polarity of the installed cable plant with an optical loss test set (OLTS) and the installed condition of the cabling system and its components with an optical time domain reflectometer (OTDR). The condition of the fiber end faces shall also be verified.
- B. Testing shall not include any active devices or passive devices within the link or channel other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.
- C. All tests performed on optical fiber cabling that use a laser or LED in a test set shall be carried out with safety precautions in accordance with ANSI Z136.2.
- D. All outlets, cables, patch panels and associated components shall be fully assembled and labeled prior to field-testing. Any testing performed on incomplete systems shall be redone on completion of the work.
- E. Link and channel test results from the OLTS and OTDR shall be recorded in the test instrument upon completion of each test for subsequent uploading to a PC in which the administrative documentation (reports) may be generated.
- F. Fiber end faces shall be inspected at x200 or x400 magnification. x200 magnification is suitable for inspecting multimode and singlemode fibers. x400 magnification may be used for detailed examination of singlemode fibers. Scratched, pitted or dirty connectors shall be diagnosed and corrected.
  - 1. It is preferable that the end face images be recorded in the memory of the test instrument for subsequent uploading to a PC and reporting.
- G. Testing shall be performed on each cabling segment (connector to connector).
- H. Testing shall be performed on each cabling channel (equipment to equipment) that is planned for use per the owner's instructions.
- I. Optical loss testing - Horizontal / Backbone link
  - 1. Multimode links shall be tested at 850 nm and 1300 nm in accordance with ANSI/TIA-526-14-B, one-cord reference method.
  - 2. Singlemode backbone links shall be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA/EIA-526-7, Method A.1, One Reference Jumper equivalent method.
  - 3. Link attenuation does not include any active devices or passive devices other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.
- J. OTDR Testing
  - 1. Fiber links shall be tested at the appropriate operating wavelengths for anomalies and to ensure uniformity of cable attenuation and connector insertion loss.
    - a. Multimode: 850 nm and 1300 nm
    - b. Singlemode: 1310 nm and 1550 nm
  - 2. Each fiber link and channel shall be tested in both directions.
  - 3. A launch cable shall be installed between the OTDR and the first link connection.
  - 4. A receive cable shall be installed after the last link connection.
- K. Magnified End face Inspection
  - 1. Fibers shall be inspected at x250 or x400 magnification. x250 magnification is suitable for inspecting multimode and singlemode fibers. x400 magnification may be used for detailed examination of singlemode fibers.
- L. Length Measurement
  - 1. The length of each fiber shall be recorded.

2. It is preferable that the optical length be measured using an OLTS or OTDR.

M. Polarity Testing

1. Paired duplex fibers in multi-fiber cables shall be tested to verify polarity in accordance with Clause E.5.3 of ANSI/TIA 568 C.0. The polarity of the paired duplex fibers shall be verified using an OLTS.

2.3 DOCUMENTATION

- A. The test results / measurements saved within the field test instrument shall be transferred into a Windows™-based database utility that allows for the maintenance, inspection and archiving of the test records. A guarantee shall be made that the measurement results are transferred to the PC unaltered, i.e., "as saved in the field test instrument" at the end of each test and that these results cannot be modified at a later time. The file format, CSV (comma separated value), does not provide adequate protection of these records and shall not be used.
- B. The test results documentation shall be available for inspection by the Owner or the Owner's representative during the installation period and shall be passed to the Owner's representative within 5 working days of completion of tests on cabling served by a telecommunications room or of backbone cabling. The installer shall retain a copy to aid preparation of as built information.
- C. The database for the completed job shall be stored and delivered on CD-ROM or DVD prior to Owner acceptance. This CD-ROM or DVD shall include the software tools required to view, inspect, and print any selection of test reports.
- D. Circuit IDs reported by the test instrument should match the specified label ID.
- E. Detailed test result documentation shall be provided in an electronic data base and shall include the following information for each link:
  1. Identification of the customer site as specified by the owner.
  2. Identification of the link in accordance with the naming convention defined in the overall system documentation.
  3. The name of the test limit selected to execute the stored test results.
  4. The name of the personnel performing the test.
  5. The overall Pass/Fail evaluation of the link-under-test.
    - a. Including the NEXT Headroom (overall worst case) number for copper.
    - b. Including OLTS and OTDR measurements for fiber.
  6. Identification of the tester interface.
  7. Date and time the test results were saved in the memory of the tester.
  8. The manufacturer, model and serial number of the field-test instrument.
  9. The version of the test software and the version of the test limit database held within the test instrument
  10. Test results information must contain information on each of the required test parameters that are listed in this Section and as further detailed below.
- F. Copper
  1. Detailed test results data to be provided in the electronic database for must contain the following information:
    - a. For each of the frequency-dependent test parameters, the value measured at every frequency during the test is stored. The PC-resident database program must be able to process the stored results to display and print a color graph of the measured parameters. The PC-resident software must also provide a summary numeric format in which some critical information is provided numerically as defined by the summary results (minimum numeric test results documentation) as outlined above for each of the test parameters.
      - 1) Length: Identify the wire-pair with the shortest electrical length, the value of the length rounded to the nearest 0.1 m (1) and the test limit value.

- 2) Propagation delay: Identify the pair with the shortest propagation delay, the value measured in nanoseconds (ns) and the test limit value.
  - 3) Delay Skew: Identify the pair with the largest value for delay skew, the value calculated in nanoseconds (ns) and the test limit value.
  - 4) Insertion Loss (Attenuation): Minimum test results documentation as explained in this Section for the worst pair.
  - 5) Return Loss: Minimum test results documentation as explained in this Section for the worst pair as measured from each end of the link.
  - 6) NEXT, ACR-F: Minimum test results documentation as explained in this Section for the worst pair combination as measured from each end of the link.
  - 7) PS NEXT and PS ACR-F: Minimum test results documentation as explained in this Section for the worst pair as measured from each end of the link.
- b. Cable type and the value of NVP used for length calculations.
- G. Fiber
1. Detailed test results data to be provided in the electronic database for must contain the following information:
    - a. The fiber identification number.
    - b. The length for each optical fiber.
    - c. The length for each optical fiber as calculated by the OTDR.
    - d. Test results to include OTDR link and channel traces and event tables at the appropriate wavelength(s).
    - e. Test results to include OLTS attenuation link and channel measurements at the appropriate wavelength(s) and the margin (difference between the measured attenuation and the test limit value).

#### 2.4 FIELD QUALITY CONTROL

- A. A representative of the owner shall reserve the right to be invited to witness field testing. The representative shall be notified of the start date of the testing phase five business days before testing commences.
- B. A representative of the owner shall reserve the right to select a random sample of 5% of the installed links. The representative (or his / her authorized delegate) shall test these randomly selected links and the results are to be stored in accordance with the prescriptions in this Section. The results obtained shall be compared to the data provided by the installation contractor. If more than 2% of the sample results differ in terms of the pass/fail determination, the installation contractor under supervision of the end-user representative shall repeat 100% testing and the cost shall be borne by the installation contractor.

END OF SECTION