SECTION 27 0526 - TECHNOLOGY GROUNDING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications, apply to this Section.

1.2 SUMMARY

A. Section Includes

1. Busbars
2. Lugs
3. Grounding Accessories
4. Labeling Requirements

B. RELATED SECTIONS

1. Section 27 05 00 – Technology Common Work Results
2. Section 27 05 28 - Communications Systems Pathways
3. Section 27 10 00 – Structured Cabling
4. Division 26 - Electrical

1.3 QUALITY ASSURANCE

A. Codes, regulations and standards referenced in the Section are:

1. NFPA 70 – The National Electrical Code, including but not limited to, Article 250 Grounding and Bonding
2. IEEE 1100 – Recommended Practice for Powering and Grounding Electronic Equipment.
3. ANSI/TIA 607-B – Commercial Building Grounding and Bonding Requirements for Telecommunications.
4. ANII /TIA-606B – Administration Standard for Telecommunications Infrastructure.
5. BICSI TDMM – Telecommunications Distribution Methods Manual
6. Northwestern University Design Inf

2. Busbar accessories
3. Conductors
4. Lugs
5. Labels
6. Tools

C. Shop Drawings

1. The Contractor shall submit the following shop drawings:

a. A detailed riser diagram demonstrating the contractor's understanding of the grounding system.

1.5 DELIVERY STORAGE AND HANDLING

A. The Contractor shall be responsible for the storage and handling of all Materials required by the Structured Cabling portion of this Contract.

B. Storage and Protection

1. Any Materials that show signs of mishandling or have been stored in a fashion so s to reduce the value of the Materials shall be replaced with new Materials at no additional cost to the Owner.

C. Waste Management and Disposal

1. All excess Materials shall be discarded in an appropriate manner.
2. Any/all hazardous materials shall be handled appropriately and shall be disposed of in a manner consistent with same, and compliant with all applicable codes and regulations

1.6 PROJECT/SITE CONDITIONS

A. The Contractor shall become and remain familiar with all project/site conditions that may have impact on the timing, quality and/or quantity of Materials for the project. The Contractor shall coordinate their efforts with changes in the Project/Site conditions so as to optimize the installation for the Owner.

B. Any additional efforts by the Contractor due to a lack of awareness of project/site conditions shall not require additional compensation from the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conductors

1. Conductors shall be as specified within the materials and methods of Division 26, but shall be compliant with any additional requirements listed in this Section.
2. Conductors shall be insulated as appropriate for the environment for which they are installed. Where non-insulated conductors are used, they shall be insulated from contact

2.2 COMPONENTS

A. Busbars

1. All busbars shall be ¼" solid electro-tin plated copper.
2. All busbars shall be ASTM B187-C11000 compliant.
3. All busbars shall be UL and cUL listed to UL 467.
4. TMGB

a. The TMGB shall:

1) be a minimum of 20" long x4" high,
2) have a minimum of 24 pairs of 5/16" holes, and
3) have a minimum of 3 pairs of 7/16" holes.

b. The TGB shall:

1) be a minimum of 20" long x 2" high (or 12" long x 4" high),
2) have a minimum of 12 pairs of 5/16" holes, and
3) have a minimum of 3 pairs of 7/16" holes

c. Acceptable busbars shall be:

1) Panduit TMGB – GB4B0624TPI-1
2) TGB – GB2B0312TPI-1
3) Equal by Erico or Harger

5. Insulators

a. All insulators shall be manufactured from an environmentally friendly, halogen free nylon material, 6er

a. Panduit Code (Or Flex, depending on the conductor type) Conductor, Two Hole. Long Barrel with Window Lug
b. Equal by Burndy
c. Equal by T&B or 3M

C. HTAPs

1. All HTAPs shall be UL listed and CSA certified to 600V.
2. All HTAPs shall be contain a crimp location for the main cable run and a minimum of one tap.
3. All HTAPs shall be designed for use with continuous cabling runs.
4. All HTAPs shall be tin plated to inhibit galvanic corrosion.
5. All HTAPs shall come with a clear cover having a UL 94 V-0 flame rating and an oxygen index of 28 providing self-extinguishing, flame retardant properties.
6. Acceptable HTAPs shall be:

a. Panduit Code/Flex Conductor HTAPs
b. Equal by Burndy
c. Equal by T&B or 3M

2.3 ACCESSORIES

A. Ground Straps

1. Straps shall be constructed of flexible tinned copper flat braid.
2. Straps shall utilize all compression flat lugs.
3. Strap kit shall come with a toothed lock washer for each bolt location
4. Acceptable Manufacturer and Kit shall be:

a. Homaco GS8, or equal

B. Paint Piercing Ground Washers (PPGW)

1. PPGW shall not require paint scraping.
2. PPGW shall have a 3/8” stud
3. PPGW shall have machine cut spurs to provide the piercing action through any of the coating processes potentially encountered.
4. PPGW kits shall contain antioxidant treatment.
5. Acceptable PPGW shall be:

a. Panduit RGW series.

C. Electrostatic Discharge (ESD) Port Kit

1. ESD Port kit shall contain one 3M 4mm plug socket that shall accept a standard 3M ESD wrist strap.
2. ESD Port kit shall contain antioxidant treatment
3. ESD port kit shall contain a thread forming screw designed to clear any paint that may exist within the screw thread.
4. ESD Port kit shall include one 3M ESD wrist strap.
5. Acceptable ESD Port kit shall be:

a. Panduit RGESD-1.

6. Acceptable ESD wrist strap shall be as manufactured by:

    a. Panduit
    b. Or Equal, approved by NUIT.

D. Tools

1. The crimp tools shall be capable of utilizing multiple heads, either rotating or replaceable dies, which contain a die number able to be embossed into the lug.
2. The crimp tools shall contain a physical means by which to notify the user that sufficient pressure has been applied to the lug, and will not allow the tools to generate additional pressure thereby damaging or destroying the cable retention.
3. Acceptable Tools shall be:

    a. Panduit Contour Crimped Controlled Cycle Tools; Die Type, Manual Hydraulic, 14 Ton, Crimping Tool; or, Die Type, Battery Powered Hydraulic, 12 Ton, Crimping Tool;
    b. Equal by Burndy
    c. Engineer Approved Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Materials shall be examined for damage on receiving the materials. Reject any materials that are damaged.

B. Examine all materials before installation. Reject and materials that are damaged

C. Examine elements and surfaces to which materials will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected

3.2 INSTALLATION

A. General

1. Technology System grounding and bonding shall be in accordance with the NEC and NFPA. Horizontal Cables and equipment shall be grounded in compliance with ANSI/NFPA 70 and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunications equipment and test apparatus and equipment. Provide a minimum of a # 6 AWG bonding conductor to provide direct bonding between equipment located in a given area and the associated TGB. Note that the Technology Grounding System shall be an independent system from the Building Grounding Electrode System with the exception of the bond to the Building Grounding Electrode System.
2. The Technology Contractor shall bond all non-current carrying equipment provided by the

3. The Electrical Contractor shall bond all non-current carrying equipment provided by the Electrical Contractor including, but not limited to, cable trays, conduit, back boxes, etc., to the local TGB.

B. Busbars

1. All busbars shall be located as indicated on the Drawings, and installed in accordance with manufacturer's suggested installation practices.
2. All Busbars shall labeled as indicated on the Drawings and as enumerated elsewhere in these specifications.

C. Conductors

1. All conduits routed through metallic conduit for greater the 12" shall be bonded to the conduit at both the point of entry and exit. A #6 AWG wire shall be used to bond the conduit.
2. The Contractor shall keep all cabling continuous throughout the length of the run.
3. All conductors shall be routed by means of a smooth radius turn consisting of a radius that is a minimum of 10 times the conductor diameter.
4. Conductors 1/0 and greater shall make any required turns by means of a smooth bend with a radius of at least 48".
5. Conductors shall remain insulated from structure throughout the length of the runs other

2. Busbars

   a. Each Busbar shall be labeled with the following information.

      1) Busbar name
      2) Source of ground
      3) Room being serviced
      4) Standard warning

   b. The label shall be screwed to the wall as indicated on the drawings utilizing the appropriate wall anchors for the type of surface to which the label is being applied.
   c. The label shall be located so as to be easily readable by a person of standard height standing in front of the busbar.
   d. The standard warning shall be: “WARNING – The device is an integral part of the Technology Grounding System. Do not disconnect. Should any portion of this system require servicing, contact NUIT.

3. Terminations

   a. All terminations shall be by means of irreversible crimp. Contractor shall utilize a crimp tool that provides an imprint of the dye used. Use the appropriate dye as recommenUded b1.t45 Tm [(d)4 <</M.4(p.)-1a9(s)-8(f)-13.2(or)-6.3(t)-1gaun ang v24.4(pr)-6.4(i)15.

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