

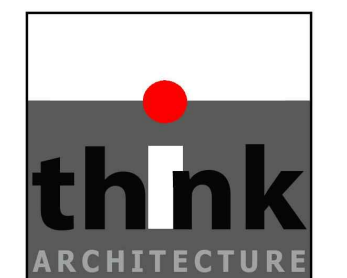
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SECTION 16715 - VOICE AND DATA COMMUNICATION CABLING
 PART 1 - GENERAL
 1.1 RELATED DOCUMENTS
 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
 1.2 SUMMARY
 A. This Section includes the following items for wiring systems used as signal pathways for voice and high-speed data transmission:
 1. Mounting elements.
 2. Unshielded twisted-pair cabling.
 3. Identification products.
 1.3 DEFINITIONS
 A. BICSI: Building Industry Consulting Service International.
 B. Horizontal Cabling: Cabling between and including the telecommunications outlet/connector and the horizontal cross-connect. Also the cabling between and including the building automation system outlet or the first mechanical terminations on the horizontal connection point and the horizontal cross-connect.
 1.4 SUBMITTALS
 A. Product Data: For features, ratings, and performance of each component specified.
 1.5 QUALITY ASSURANCE
 A. Installer Qualifications: Cabling installer must have on staff personnel certified by BICSI.
 1. Installation Supervision: Installation shall be under the direct supervision of a Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
 B. Source Limitations: Obtain all products except cables through one source from a single manufacturer.
 1.6 COORDINATION
 A. Coordinate layout and installation of voice and data communication cabling with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
 1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 2. Record agreements reached in meetings and distribute to other participants.
 3. Adjust arrangements and locations of distribution frames and cross-connect and patch panels in equipment rooms and wiring closets to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
 PART 2 - PRODUCTS
 2.1 SYSTEM REQUIREMENTS
 A. Coordinate the features of materials and equipment so they form an integrated system. Match components and interconnections for optimum future performance.
 2.2 UNSHIELDED TWISTED-PAIR CABLING
 A. Available Cable Manufacturers:
 1. Avaya Inc.
 2. Belden Inc.; Electronics Division.
 3. CommScope Properties, LLC.
 4. General Cable Technologies Corporation.
 5. Helix/HTemp Cables, Inc.
 6. KRONE Incorporated.
 7. Mohawk/CDT, a division of Cable Design Technologies.
 8. Nordex/CDT, a Subsidiary of Cable Design Technologies.
 9. Remece Products Corp.
 10. Superior Essex; Superior Telecommunications Inc.
 11. West Penn Wire/CDT, a division of Cable Design Technologies.
 B. 100-Ohm UTP: Comply with UL 444.
 C. Horizontal Copper Cable:
 1. No. 24 AWG, 100-ohm, four pair.
 2. Comply with TIA/EIA-568-B.2, Category 5e.
 3. NFPA 70, types CMG and CMP.
 4. Cable Jacket Color: Blue.
 D. Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, using modules designed for punch-down caps or tools.
 1. IDC Terminal Block Modules: Integral with connector bodies, including plugs and jacks where indicated.
 2. IDC Connecting Hardware: Consistent throughout Project.
 E. Patch Panel: Comply with TIA/EIA-568-B.2, meeting or exceeding cable performance. Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
 1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to satisfy specified expansion criteria.
 F. Jacks and Jack Assemblies: Modular, color-coded, RJ-45 receptacle units with integral IDC-type terminals.
 G. Patch Cords: Factory-made, four-pair cables in 48-inch lengths; terminated with RJ-45 plug at each end.
 2.4 GROUNDING AND BONDING
 A. Materials: Comply with NFPA 70, TIA/EIA-607, and UL 467.
 2.5 SOURCE QUALITY CONTROL
 A. UTP Cable Verification of Performance: Test every cable package or reel at factory to verify that cable complies with TIA/EIA-568-B.2 requirements.
 PART 3 - EXECUTION
 3.1 INSTALLATION STANDARDS
 A. Comply with BICSI TCI, TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3, and TIA/EIA-569-A.
 3.2 EXAMINATION
 A. Examine pathway elements intended for cables.
 1. Verify proposed routes of pathways. Check raceways, cable trays, and other elements for compliance with space allocations, clearances, installation tolerances, hazards to cable installation, and other conditions affecting installation. Verify that cabling can be installed complying with EMI clearance requirements.
 2. Prepare wall penetrations and verify that penetrations of rated fire walls are made using products labeled for type of wall penetrated.
 3. Identify plan to support cables and raceways in suspended ceilings. Verify weight of individual types and sizes of cables. Verify that load capacity of cable support structures is adequate for each pathway.
 4. Proceed with installation only after unsatisfactory conditions have been corrected.
 3.3 APPLICATION OF MEDIA
 A. Horizontal Cable for Data Service: Use UTP Category 5e cable for runs between wiring closets and workstation outlets.
 B. Horizontal Cable for Voice Service: Use UTP Category 5e cable for runs between wiring closets and workstation outlets.
 3.4 INSTALLATION
 A. Comply with NECA 1.
 B. Wiring Method: Install cables in raceway except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use UL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
 C. Cable Installation:
 1. Install exposed cables parallel and perpendicular to surfaces or exposed structural members and follow surface contours where possible.
 2. Make splices, taps, and terminations only at indicated outlets, terminals, and cross-connect and patch panels.
 3. Pulling Cable: Do not exceed manufacturer's written recommended pulling tensions. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 4. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 5. Secure and support cables at intervals not exceeding 36 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 6. Install UTP cables using techniques, practices, and methods that are consistent with Category 5e rating of components and that ensure Category 5e performance of completed and linked signal paths, end to end.
 a. Do not un twist more than 1/2 inch of Categories 5e and 6 cables at connector terminations.
 3.5 GROUNDING
 A. Comply with Division 16 Section "Grounding and Bonding" and with TIA/EIA 607.
 B. Grounding Points:
 1. Locate grounding terminals in each equipment room, wiring closet, rack, and cabinet.
 2. Telecommunications Grounding Busbars: Mount on wall of telecommunications entrance facility, equipment room, and closet, with standoff insulators.
 3.6 IDENTIFICATION
 A. In addition to requirements in this Article, comply with TIA/EIA-606-A and with applicable requirements in Division 16 Section "Electrical Identification."
 1. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
 B. Cable and Wire Identification:
 1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
 3. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 a. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 b. Label each unit and field within distribution racks and frames.
 4. Within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
 5. At Workstations: Attach label to device plate.
 C. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
 3.7 FIELD QUALITY CONTROL
 A. Perform the following field tests and inspections and prepare test reports:
 B. Category 5e UTP Cabling Tests:
 1. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in Annex I, complying with measurement accuracy specified in Annex H. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 3. Wire-map test that reports open circuits, short circuits, crossed pairs, reversed pairs, split pairs, and improper terminations.
 4. Channel and permanent link tests for cable length, insertion loss, near-end crosstalk loss, power sum near-end crosstalk loss, equal-level far-end crosstalk loss, power sum equal-level far-end crosstalk, return loss, propagation delay, and delay skew. Performance shall comply with minimum criteria in TIA/EIA-568-B.2.
 C. Remove and replace cabling where test results indicate that they do not comply with specified requirements.
 D. Retest and inspect cabling to determine compliance of replaced or additional work with specified requirements.
 END OF SECTION 16715

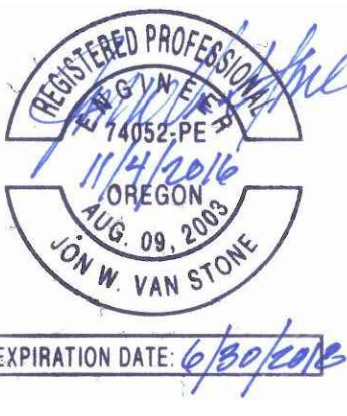
ELECTRICAL SPECIFICATIONS

NO SCALE



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NEW DEVELOPMENT
THE 27 ELM
A HUNTER RENAISSANCE DEVELOPMENT
REDMOND OREGON



COVER SHEET
Sheet Title
AS NOTED
Scale
1602
Project Number
NOVEMBER 8, 2016
Date
16154 E40 E41 E42 E43.DWG
File Name
Revisions
E4.3

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