

Description
The installation will comply with applicable federal, local, and State of Nevada codes and ordinances as dictated by the Authority of Having Jurisdiction (AHJ). This will include regulations and specifications of the latest edition of the following standards. They are to be considered minimum requirements as UNLV/NDE may be above and beyond these specifications:
ADA; Americans with Disabilities Act 1990 (www.ada.gov)
ADA; Standards for Accessible Design (www.federalregister.gov)
AIA; American Institute of Architects (www.aia.org)
ANSI; American National Standards Institute (www.ansi.org)
ASTM; American Society for Testing and Material (www.astm.org)
APWA; American Public Works Association (www.apwa.net)
AVIXA; (Formerly INFOCOMM) (www.avixa.org)
BICSI; Building industry Consulting Service International (www.bicsi.org)
CEA; Consumer Electronic Association (www.cta.tech)
CSI; Construction Specification Institute (www.csiresources.org) of 49 Divisions
ESPEC; Telcordia Technologies GR-CORE Specifications (www.espec.com)
ETL; Edison Testing Lab > Intertek (www.intertek.com)
FCC ; Federal Communications Commission (www.fcc.gov)
FOA; Fiber Optic Association (www.thefoa.org)
IBC; International Building Code (www.iccsafe.org)
ICEA; Insulated Cable Engineers Association (www.icea.net)
ICIA; International Communications Industries Association (www.icahdq.org)
IEC; International Electrotechnical Commission (www.iec.ch)
IECC; International Energy Conservation Code (www.energyefficientcodes.org)
IEEE; Institute of Electrical and Electronics Engineers (www.ieee802.org)
IFC; International Fire Code (codes.iccsafe.org)
INFOCOMM; www.infocommshow.org (now referred to as AVIXA)
ISO; International Organization of Standards (www.iso.org)
ITU; International Telecommunications Union (www.itu.int)
NEC; National Electrical Code (www.nfpa.org)
NECA; National Electrical Contractors Association (www.necanet.org)
NEMA; National Electrical Manufacturers Association Standards (www.nema.org)
NESC; National Electrical Safety Code (www.nfpa.org)
NFPA 70; National Fire Protection Agency (www.nfpa.org)
NRTL: Nationally Recognized Testing Laboratory (NRTL) Program (www.OSHA.gov/nationally-recognized-testing-laboratory-program)
OSHA; Occupational Safety and Health Administration (www.osha.gov)
RoHS: Restrictions of Hazrdous Substances (www.rohsguide.com)
SCTE; Society of Cable Telecommunications Engineers (www.scte.org & www.ansi.org)
SBCCI; Southern Building Code Congress International (www.iccsafe.org)
SMPTE; Global Society of Media Professionals, Technologists, and Engineers (www.smpte.org)
SNBO; Southern Nevada Building Officials amendments (www.snbo.org)
TIA; Telecommunications Industry Association (www.tiaonline.org)
UL; Underwriter Laboratories Incorporated Standards (www.ul.com)
UMC; Uniform Mechanical Code (codes.iapmo.org)
Follow and adhere to UNLV/NDE and BICSI Design and Installation Guidelines. Each are selectively referenced in the Sections of the Division 27 UNLV Campus Wiring Design Guide and the bidding contractor and the low-voltage telecommunications manufacturer(s) should have available for reference:
Division 27 UNLV Campus Wiring Design Guide V.1.3 May, 2023 (https://it.unlv.edu/cdwg)
BICSI Telecommunications Distribution Methods Manual (TDMM) Vol 1 and 2/ latest edition 14
BICSI Telecommunications Distribution Methods Manual (TDMM) latest edition 8
BICSI Telecommunications Project Management Manual latest edition 1

ANSI/BICSI 001-2017-R22; Information and Communications Technology Systems Design and Implementation Best Practices for Educational Institutions and Facilities
ANSI/BICSI 002-2019; Data Center Operations and Maintenance Best Practices
ANSI/BICSI 003-2019; Building Information Modeling (BIM) Practices for Information Technology Systems
ANSI/BICSI 004-2019; Information Communication Technology Systems Design and Implementation Best Practices for Healthcare Institutions and Facilities
ANSI/BICSI 005-Electronic Safety and Security (ESS) System Design and Implementation Best Practices NOTE: Incorporated into ANSI/TIA 007-2020
ANSI/BICSI 006-2020; Distributed Antenna System (DAS) Design and Implementation Best Practices.
ANSI/BICSI 007-2020; Information Communications Technology Design and Implementation Practices for Intelligent Buildings and Premises
ANSI/BICSI 008-2018; Wireless Local Area Network (WLAN) System Design and Implementation Best Practices
ANSI/BICSI; Essentials of a Data Center Project latest edition 1
ANSI/BICSI G1-17; ICT Outside Plant Construction and Installation: General Practices
ANSI/BICSI N1-17; Installation Practices for Telecommunications and ICT Cabling and Related Cabling Infrastructure - Demonstration version
ANSI/BICSI N2-17; Practices for the Installation of Telecommunications and ICT Cabling to Support Remote Power (PoE) Applications
ANSI/BICSI N3-20; Planning and Installation Methods for the Bonding and Grounding of Telecommunication and ICT Systems and Infrastructure
Vol 1; General Cable latest edition 1
Vol 2; Copper Cabling latest edition 1
Vol 3; Optical Fiber Cabling latest edition 1
BICSI G1-17; ICT Outside Plant Construction and Installation General Practices
Follow and adhere to the following industry-standard ICT publications. Each are selectively referenced in the Sections of the UNLV Division 27 Campus Wiring Design Guide and the bidding contractor and the low-voltage telecommunications manufacturer(s) should have available for reference:
AASHTO HB-17, et al; Design Standards for the Maintenance and Rehabilitation of Older, Existing Structures (Jan 2002)
AASHTO-M-306; <i>Standard Specification for Drainage-Sewer-Utility-and Related Castings (Vault lids, 2010)</i>
ADA Standards for Accessible Design (2010)
ANSI/INFOCOMM 2M: 2010; <i>Standard Guide for Audiovisual Design and Coordination Processes (2010)</i>
ANSI/INFOCOMM 10: 2013; <i>Audiovisual Systems Performance Verification (2013)</i>
ANSI Z136.2; <i>Safe Use of Optical Fiber Communications Systems Utilizing Laser Diode and LED Sources</i> (Apr, 2010)
ANSI/TIA-455 Series; <i>Standard Procedures for Testing Optical Fiber</i>
ANSI/TIA 472; <i>General Specifications for Fiber Optic Cables</i> (Nov, 1993)
ANSI/TIA-526-7A; <i>Measurement of Optical Power Loss of Installed Single-mode Fiber Cable Plant</i> (IEC 61280-4-2-2015)
ANSI/TIA-568.0-E; <i>Generic Telecommunications Cabling For Customer Premises</i> (Rev E; Mar, 2020)
ANSI/TIA-568.1-E; <i>Commercial Building Telecommunications Cabling Standard Part 1: General Requirements</i> (Rev E; Mar 2020)
ANSI/TIA-568.2-D; <i>Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Cabling</i> (Rev D; Sept 2018)
ANSI/TIA-568.3-E; <i>Commercial Building Telecommunications Cabling Standard Part 3: Optical Fiber Cabling Component Standard</i> (Rev E; Sept, 2022)
ANSI/TIA-569-E; <i>Commercial Building Standard for Telecommunications Pathways and Spaces</i> (Rev E; May 2019)
ANSI/TIA-598-D; <i>Optical Fiber Cable Color Coding</i> (Rev D; Jul 2014)
ANSI/TIA-598.D-1; <i>Optical Fiber Cable Color Coding in Cable Addendum for Additional Colors</i> (extending color codes for MPO/MTP from 12 to 16 ribbon fiber, adding lime, tan, olive, and magenta)
ANSI/TIA 604-FOCIS 10; <i>Fiber Optic Connector Intermateability Standard</i>
ANSI/TIA 606-D; <i>Administration Standard for Commercial Telecommunications Infrastructure, Including Addendum 1 – Administration of Equipment Rooms and Data Center</i> (Rev D; Oct, 2021)
ANSI/TIA 607-D; <i>Generic Telecommunications Bonding and Grounding (Earthing) For Customer Premises</i> (Rev D; Jul, 2019). ANSI J-STD-607
ANSI TIA-758-B; <i>Customer-owned Outside Plant Telecommunications Cabling Standard</i> (Rev B; Mar, 2012)
ANSI/TIA-862-C; <i>Structured Cabling Infrastructure for Intelligent Building Systems</i> (June, 2022)
ANSI/TIA-942-B; <i>Telecommunications Infrastructure for Data Centers</i> (July, 2017)

ANSI/TIA-1152-A; <i>Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling</i> (Rev A; Nov, 2016)
ANSI/TIA-4966-A; <i>Telecommunications Infrastructure Standard for Educational Facilities, Including Addendum 1: Updated References Accommodation of New Media Types</i> (Feb, 2022)
ANSI/TIA-5017; <i>Telecommunications Physical Network Security</i> (Feb, 2016)
ANSI/ICEA S-102-732-2009; <i>Standard for Cat 6 and 6A; 100 ohm Individually Unshielded Twisted-pair Indoor Cables</i> (2009) - Incorporated into ANSI/TIA 568.2-D
APWA 2021; <i>American Public Works Association for Underground Utility Color Coding Tape</i>
ASTM A 48; <i>Standard Specification for Gray Iron Casting</i> (Sept, 2018)
ASTM B.3, B.8, B.33; <i>Standard Specifications for Soft and Annealed Copper (6 AWG) and Tinned-Coated</i> (2020)
ASTM C 270; <i>Standard Specification for Mortar for Unit Masonry</i> (July, 2019)
ASTM C 387; <i>Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete</i> (Aug, 2017)
ASTM C 858; <i>Standard Specification for Underground Precast Utility Structures</i> (Feb, 2010)
ASTM C 891; <i>Standard Practice for Installation of Underground Precast Concrete Utility Structures</i> (Dec, 2020)
ASTM C 990; <i>Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants</i> (1991)
ASTM C 1037; <i>Standard Practice for Inspection of Underground Precast Concrete Utility Structures</i> (Dec, 2016)
ASTM C 1107/C 1107M; <i>Grade B: Standard Specification for Packaged Dry, (Non shrink) Hydraulic-Cement Grout</i> (Feb, 2020)
ASTM E 119 - <i>Fire Tests of Building Construction Materials</i> (for fire-rated architectural barriers)
ASTM E 329; <i>Standard Specification for Agencies Engaged in Construction Inspection and Testing.</i> (May, 2021)
ASTM E 814; <i>Standard Test Method for Fire Tests of Through-Penetration Firestops Systems</i> (Dec, 2013 - UL 1479)
ASTM F 2160; <i>Standard Specification for Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD)</i> (Sept, 2022)
AVIXA (Formerly INFOCOMM) 102.01: 2017; <i>Audio Coverage Uniformity in Listener Areas</i> (2017)
AVIXA (Formerly INFOCOMM) F501.01: 2015; <i>Cable Labeling for Audiovisual Systems</i> (2015)
AVIXA (Formerly INFOCOMM) F502.01: 2018; <i>Rack Building for Audiovisual Systems</i> (2018)
CEA-861-B; <i>A DTV Profile for Uncompressed High Speed Digital Interface</i> (May2002)
CEA-861-D; <i>A DTV Profile for Uncompressed High Speed Digital Interface</i> (Jul, 2006)
EIA/ECA 310-E; <i>Cabinets, Racks, Panels, and Associated Equipment</i> (Dec, 2005)
GR-20-CORE; <i>Telcordia/Ericsson General Requirements for Optical Fiber Cable</i> (Jul, 2013)
GR-196-CORE; <i>Telcordia/Ericsson Optical Time Domain Reflectometer</i> (Bellcore)
GR-326-CORE; <i>Telcordia/Ericsson Generic Requirements for Single-mode Optical Connectors and Jumper Assemblies</i> (Bellcore)
GR-356-CORE; <i>Telcordia/Ericsson Generic Requirements for Optical Cable Innerduct, Associated Conduit, and Accessories</i> (Bellcore)
GR-409-CORE; <i>Telcordia/Ericsson General Requirements for Premises Fiber Optic Cable</i> (Bellcore - Jan, 2013)
GR-3155-CORE; <i>Telcordia/Ericsson General Requirements for Single/Bundled Microducts and In-Living (ILU) Cable Pathways</i> (Bellcore - Dec, 2014)
ICEA S-104-696; <i>Indoor/Outdoor Optical Cable</i> (Jun, 2019)
IEC 874-10; <i>Sectional 10 Specification Fiber Optic Connectors</i> (Jun, 1992)
IEC 60529; <i>International Standard for Enclosure Ingress Protection (IP) Ratings (NEMA like)</i> - 2019)
IEC 60793-2-50; <i>Sectional Product Specifications for Class B Single-mode Fibers</i> (Dec, 2009)
IEC 61280-4-2; <i>Fibre-Optic Communications Subsystem Test Procedure - Part 4-2: Installed Cable Plant - Single-mode Attenuation and Optical Return Loss Measurement</i> (July, 2014)
IEC 61537; <i>Cable Management Cable Tray Systems and Cable Ladder Systems</i> (2023)
IEC 61754-20; <i>Fiber Optic Interconnecting Devices and Passive Components</i> Jun, 2022)
IEC 61935-1; <i>Specifications for the Testing of Balanced Twisted-pair and Coaxial Information Technology Cabling - Part 1: per ISO/IEC 11801 - 2015</i>
IEEE 802.3; <i>IEEE Standard for Ethernet</i> - 2015
IEEE 802.11; <i>IEEE Wireless Local Area Networks Working Group</i> - 2012
IEEE/ANSI 100-1992; <i>IEEE Standards Dictionary of Electrical and Electronics Terms</i> (Jun, 1993)
INFOCOMM F501.0: 2015; <i>Cable Labeling for Audiovisual Systems</i>

ISO 9000-2015; <i>Quality Management Systems</i>
ISO/IEC 11801-1 4th Edition; EN 50173-2: 2007 + A1: 2012 (CENELEC TC215); <i>Information Technology - Generic Cabling for Customer Premises (Sept, 2017) - Part 1: General Requirements and, Part 2: Office Premises</i>
ISO/IEC 14763-3: 2014/Amd 1:2018; <i>Information Technology - Implementation and Operation of Customer Premises Cabling - Part 3: Testing of Optical Fibre Cabling - Amendment 1 (2nd Edition)</i>
ISO/IEC 61280-4-2; <i>Fibre-Optic Communications Subsystem Test Procedures - Part 4-2 - Installed Cable Plant and Links - Single-mode Attenuation and Optical Return Loss Measurement (June, 2014)</i>
ISO/IEC 61280-4-4; <i>Fibre-Optic Communications Subsystem Test Procedures - Part 4-4 - Installed Cable Plant and Links -Polarization Mode Dispersion Measurements for Installed Links (Mar, 2017)</i>
ISO/IEC 61300-3-5; <i>Fibre Optic Interconnecting Devices and Passive Components - Basic Test and Measurement Procedures - Part 3-35: Visual Inspection of Fibre Optic Connectors and Fibre-stub Transceivers (Sept, 2022)</i>
ITU-T G.652.D; <i>Characteristics of Single-Mode Optical Fiber (Nov, 2009)</i>
ITU-T G.655; <i>Characteristics of Non-Zero Disersion-Shifted Single-mode Optical Fibre and Cable (Nov, 2009)</i>
ITU-T G.657.A.1; <i>Characteristics of Bending Loss Insensitive Single-mode Optical Fiber (Jun, 2015)</i>
ITU-T G.671; <i>Transmission Systems and Media, Digital Systems and Networks (Feb, 2012)</i>
NEMA FB 2.10; <i>Selection and Installation Guidelines For Fittings for Use With Non-Flexible Metallic Conduit or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, and Electrical Metallic Tubing (Jan, 2013)</i>
NEC Article 250; <i>Grounding and Bonding of Electrical Systems</i>
NEC Article 386; <i>Surface Metal Raceways</i>
NEC Article 392; <i>Cable Trays</i>
NEC Article 720; <i>Circuits and Equipment Operating at Less Than 50 Volts</i>
NEC Article 800; <i>Communications Circuits</i>
NECA/NEMA 105; <i>Standard for Installing Metal Cable Tray Systems (2015 ANSI)</i>
NEMA 5-20R; 20 amp 125VAC Receptacle
NEMA FB 2.10; <i>Selection and Installation Guidelines For Fittings for Use With Non-Flexible Metallic Conduit or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, and Electrical Metallic Tubing (Sep, 2021)</i>
NEMA FG 1; <i>Fiberglass Cable Tray Standards (1993)</i>
NEMA L6-30R; 30 amp 250 VAC Receptacle
NEMA RN 1; <i>Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit (Sept, 2018)</i>
NEMA TC 7-2021; <i>Solid-Wall Coilable and Straight Electrical Polyethylene Conduit (2021)</i>
NEMA VE 1 & 2; <i>Standard for Manufacturing, Performance, and Testing for Cable Trays Systems (2009)</i>
NEMA 250; <i>Enclosure Ingress Protection Rating (IEC 60529)</i>
NFPA 2002 Sec 800-52; <i>Spread of Fire and Products Combustion</i>
NFPA-70 <i>National Electric Code (Publication year determined by AHJ) latest edition 2023:</i>
NFPA 262; <i>Standard Method for Flame Travel and Smoke of Wire and Cables for Use in Air-handling Chambers (2023)</i>
RoHS 2011/65/EU; <i>Restrictions of Hazardous Substances (2011)</i>
SBCCI; <i>Southern Building Code Congress International</i>
SCTE 77; <i>Specifications for Underground Enclosure Integrity (2017)</i>
SR-1471; <i>Blue Book - Manual of Construction Procedures (Communications in underground fiber and FTTX - inclusive of Telcordia specifications for blown fiber - Mar, 2017)</i>
TIA-492 CAAB; <i>Detail Specification for Class IVa Dispersion-Unshifted Single-mode Optical Fibers</i>
TIA TSB-162-A; <i>Telecommunications Cabling Guidelines for Wireless Access Points</i>
TIA TSB-184-A; <i>Guidelines for Supporting Power Delivery over Balanced Twisted-Pair Cabling</i>
TIA TSB-190; <i>Guidelines on Shared Pathways and Shared Sheaths</i>
TIA TSB-5018; <i>Structured Cabling Infrastructure Guidelines to Support Distributed Antenna Systems (DAS)</i>
TR 42.11; <i>Optical Power Loss of Installed Single-mode Optical Fiber Cable</i>

TR 42.12; <i>Optical Fiber and Cables</i>
TR 42.13; <i>Passive Optical Devices and Fiber Optic Metrology</i>
TSB 140; <i>Additional Guidelines for Field-Testing Length, Loss, and Polarity of Optical Fiber Cable</i> (Feb, 2004)
TSB 155A; <i>Guideline for the Assessment Migration of Installed Cat 6 to Support 10GBase-T</i>
UL 5; <i>UL Standard for Surface Metal Raceways and Fittings</i> (Jul, 2022)
UL 6; <i>UL Standard for Electrical Rigid Metal Conduit</i> (November 2022) - ANSI C.80.0
UL 83; <i>UL Standard for Safety Thermoplastic Insulated Wire</i> (6 AWG) (June, 2017)
UL 94 V.0; <i>UL Classification and Flame Retardant Testing of Thermoplastics (Cable trough 10 sec))</i>
UL 444; <i>Standard for Safety Communication Cables</i> (Jun, 2021)
UL 467; <i>UL Standard for Grounding and Bonding Equipment</i> (Mar, 2016)
UL 486A-486B; <i>UL Standard of Safety for Wire Connectors</i> (Jan, 2013)
UL 508A; <i>Standard for Safety for Industrial Control Panels</i> (Dec, 2013)
UL 797; <i>UL Standard for Safety Electrical Metallic Tubing</i> (EMT: Nov, 2007)
UL 910; <i>UL Standard for Safety Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical Fiber Cables Used in Spaces Transporting Environmental Air</i> (5t h Ed. Nov, 1998)
UL 969A; <i>UL Standard for Marking and Labeling Systems</i> (Jul, 2020)
UL 1479; <i>UL Fire Tests of Through Penetration Firestops</i> (Jun, 2015 In accordance with ASTM E814)
UL 1651; <i>UL Standard for Safety Optical Fiber Cables</i> (May, 2015)
UL 1666: <i>UL Safety Test for Flame Propagation Height of Electrical and Optical Fiber Cables Installed Vertically in (Riser-ratings) Shafts</i> (Feb., 2007)
UL 1863; <i>UL Standard for Safety Communication-Circuit Accessories</i> (PCB - Aug, 2008)
UL 1950; <i>UL Standard for Safety of Information Technology Equipment</i> (Jul, 2002)
UL 2024; <i>UL Standard for Cable Routing Assemblies and Communication Raceways</i> (Innerduct - Mar, 2021)
UL 1950; <i>UL Standard for Information Technology Equipment Safety</i> (May, 2019)