MICHIGAN STATE UNIVERSITY
INFRASTRUCTURE PLANNING AND FACILITIES

MICHIGAN STATE UNIVERSITY - IT INFRASTRUCTURE

SECTION 27 10 00 (Working Draft – Subject for Revision)

COMMUNICATIONS CABLING INFRASTRUCTURE

PART 1 – GENERAL

1.1 SUMMARY

A. This Section defines the minimum requirements for the design, materials, installation, testing, labeling, and documentation of communications cabling infrastructure.

B. Systems covered under this Section include:

1. Horizontal copper cabling
2. Copper backbone cabling
3. Interior (ISP) fiber optic cabling
4. Exterior (OSP) fiber optic cabling
5. Coaxial cabling supporting CATV and Distributed Antenna Systems (DAS)

C. This Section is intended to function as a **technical standard**. Project-specific details such as cable types, strand counts, conductor quantities, and pathway configurations shall be defined during design by **IPF and IT Infrastructure**.

1.2 RELATED SECTIONS

A. Division 01 – General Requirements
B. Division 26 – Electrical

1.3 REFERENCES

(Condensed and modernized from all attached sections)

- ANSI/TIA-568 Series
- ANSI/TIA-569

- ANSI/TIA-606
- ANSI/TIA-607
- ANSI/TIA-758 (OSP)
- BICSI TDMM
- BICSI ITSIMM
- NEC (NFPA 70)

1.4 DEFINITIONS

Use ER / FR / TR / TE / EF definitions exactly as established in the OSP and ISP standards to avoid conflicts.

1.5 SUBMITTALS

A. Product data for all proposed cable, termination hardware, enclosures, and accessories.

B. Shop drawings, reviewed by MSU IT Infrastructure, including:

- Pathways
- Backbone and horizontal routing
- Splice and termination details
- Labeling schemes

C. Test plans and final certification results.

1.6 QUALITY ASSURANCE

A. Installation shall be performed by technicians who are **BICSI-certified** or who have a **minimum of five (5) years of documented experience** installing communications cabling systems of similar scope and complexity.

B. The Contractor shall have a **BICSI-certified Registered Communications Distribution Designer (RCDD)** on staff responsible for design oversight, coordination, and quality control.

C. Installation supervision shall be provided by a technician who is **BICSI-certified** or who has a **minimum of five (7) years of documented experience**, and shall be present on site whenever work under this Section is being performed.

PART 2 – PRODUCTS

2.1 GENERAL MATERIAL REQUIREMENTS (IMPORTANT)

A. Materials specified in this Section establish **performance and compliance requirements only**.

B. **Final selection of materials**, including but not limited to:

- Cable type
- Fiber type (OS2, OM4, etc.)
- Strand counts
- Conductor quantities
- Connector types
- Manufacturer / basis of design

shall be **defined on a per-project basis** by **IT Infrastructure** in coordination with **Infrastructure Planning & Facilities (IPF)**.

C. No substitutions shall be made without prior written approval from MSU IPF and IT Infrastructure.

2.2 HORIZONTAL COPPER CABLING

A. Category 6 (CAT 6) is the minimum standard for workstation outlets.

B. Category 6A (CAT 6A) is required for:

- Wireless access points

- High-density or multi-gigabit applications

C. Category 8 cabling is **not permitted** for general use and may only be installed with written approval for specialized environments.

2.3 COPPER BACKBONE CABLING

A. Copper backbone cabling may be used for:

- Voice systems
- Low-bandwidth signaling
- Legacy system support where fiber is not required

B. Backbone copper cabling shall comply with ANSI/TIA standards and MSU design criteria.

C. Final cable category, pair counts, and routing shall be determined during design by IPF and IT Infrastructure.

2.4 INTERIOR (ISP) FIBER OPTIC CABLING

A. Interior fiber optic cabling shall be used for backbone and horizontal applications where copper limitations exist.

B. Fiber type (single-mode or multimode) shall be determined during design.

C. No splices are permitted in horizontal fiber runs.

(Execution, testing, and handling requirements shall align with ISP fiber standards .)

2.5 EXTERIOR (OSP) FIBER OPTIC CABLING

A. Exterior fiber optic cabling shall be used for:

- Inter-building connectivity
- Campus backbone infrastructure
- Service provider entrance facilities

B. OSP fiber shall be designed and installed in accordance with ANSI/TIA-758 and BICSI TDMM.

C. Cable construction, strand counts, and pathway type (ductbank, direct-buried, aerial) shall be defined per project by IPF and IT Infrastructure .

2.6 COAXIAL CABLING (CATV & DAS)

A. Coaxial cabling systems shall support:

- Campus CATV distribution
- Distributed Antenna Systems (DAS)
- Public safety and cellular services where applicable

B. Connector types, cable ratings, and grounding requirements shall be coordinated with:

- IT Infrastructure
- Carrier or DAS integrator
- Authority Having Jurisdiction (AHJ)

C. Fiber is the preferred backbone medium for CATV and DAS systems; coax shall be limited to distribution where required.

PART 3 – EXECUTION

3.1 INSTALLATION PRACTICES

A. Maintain separation from electrical systems per NEC and TIA requirements.

3.2 APPROVED PATHWAYS

A. All communications cabling shall be installed in **approved, NEC-compliant pathways** and in accordance with applicable **ANSI/TIA**, **BICSI**, and MSU IT Infrastructure standards.

B. Acceptable pathway systems include, but are not limited to:

1. **Cable tray systems** listed for communications use

2. **J-hooks** or cable supports listed for communications cabling and installed at intervals compliant with manufacturer recommendations
3. **Conduit systems** (EMT, rigid, or nonmetallic as approved)
4. **Sleeves** through walls and floors with approved firestopping systems

C. Pathways shall not be attached to or supported by:

1. Ceiling grid systems
2. Lighting fixtures
3. Mechanical, plumbing, or fire protection systems

D. Conduit and sleeves shall be sized to allow for current installation and future growth and shall include pull strings where applicable.

E. All penetrations shall be **firestopped** in accordance with UL-listed systems and code requirements.

3.3 TESTING

A. Copper

All copper cabling shall be tested and certified using a **Fluke Versiv Series cable certification platform**, or MSU IT Infrastructure–approved equivalent. Copper cabling shall meet or exceed performance requirements defined by **MSU IT Infrastructure** and applicable **ANSI/TIA**, **BICSI**, and manufacturer standards. All copper test results shall indicate a passing result for the installed cable category. Failed links shall be corrected and retested at the Contractor's expense.

B. Fiber

All fiber optic cabling shall be tested using a **Fluke Versiv Series Optical Loss Test Set (OLTS)** and **Optical Time Domain Reflectometer (OTDR)**, or MSU IT Infrastructure–approved equivalent. Fiber testing shall be performed in accordance with requirements defined by **MSU IT Infrastructure** and applicable **ANSI/TIA**, **BICSI**, and manufacturer standards. All fibers shall meet the approved project loss budget. Failed fibers shall be corrected and retested at the Contractor's expense.

3.4 LABELING AND DOCUMENTATION

A. Labeling shall comply with ANSI/TIA-606 and MSU standards.

B. Provide complete as-built documentation including:

- Cable IDs
- Fiber strand assignments
- Test results
- Pathway routing