

# NEC for TeleCommunications

MN State License Course Program ID 2104626



## Course Description

The State of Minnesota Board of Electricity requires that technicians doing electrical work in a residence or commercial building must hold an Electricians License. This includes low voltage systems, such as telecommunications voice and data circuits, which requires the individual to have a Low Voltage Electrical License. The License is renewable every two years and requires 16 hours of Continuing Education 4 hours of NEC and 16 hours of other related material. This seminar is Certified by the Board of Electricity and meets the requirements for Low Voltage License Renewal Continuing Education.

This 8-hour training seminar meets the requirements for 4 hours of NEC Code and 4 hours of other related material. This seminar covers aspects of the NEC 2017/2018 that specifically pertain to telecommunications circuits and equipment that are in, on or service to buildings including residential, commercial and telephone buildings (Central Offices, Remotes, Cabinets, etc.). This seminar explains not only the Code requirements but also the technical reasons for the requirements. The attendee will have a much better understanding of why the Code requirements exist.

The training seminar also covers the National Electric Safety Code (NESC) that provides Code requirements for Outside Plant cables and equipment.

These are the Official Code references for this seminar  
NFPA 70, National Electrical Code (NEC 2017/2018).  
IEEE C2-2017/2018, National Electric Safety Code (NESC 2017/2018).  
Rural Utilities Service (RUS) documents.  
E-CFR, Electronic Code of Federal Regulations

## Students Will Learn

- **After completing this training seminar, the attendee will be able to apply for their Power Limited Electrical License renewal.**
- **The attendee will be able to state NEC code requirements and the reasons for the requirements.**
- **The attendee will also be better qualified to install and maintain bonding & grounding cabling and equipment at the customer premise, in the outside plant, and in the Central Office building.**

## Prerequisites

Current Minnesota Power Limited Electrical License.

## Course Outline

Lesson 1 NEC 2017 Bonding & Grounding Requirements for Telecommunications Circuits and Equipment. 4 hours

This lesson covers general requirements for bonding and grounding of residential and commercial buildings for the safety and protection of people, buildings and equipment per the NEC:

General requirements for bonding and grounding per Article 250.

- Grounding of AC electrical systems; 250.4.
- Bonding of electrical equipment; 250.4.
- Effective ground-fault current path; 250.4.
- Grounding of separately derived systems; 250.20.C.
- Grounding electrode systems including ground rings, ground rods and resistance requirements; 250.52.
- Bonding requirements providing access for other systems; 250.94.
- Grounding of isolated receptacles; 250.146.D.
- Bonding of the DC power system to the MGN; 250.168.

Communications systems bonding and grounding per Article 800.

- Overhead wires and cables outside and entering buildings; 800.44.
- Cables entering buildings limited to 50 feet; 800.48.
- Protection device application and location; 800.90.
- Grounding or interruption of metallic sheath members; 800.93.
- Protector grounding conductor material, size and length; 800.100.
- Protector grounding conductor electrode; 800.100.B.
- Protector grounding at mobile homes; 800.106.
- Communications cables separation from electrical cables; 800.133.
- Communications cables voltage rating; 800.179.

Optical fiber cables and raceways per Article 770.

- Cables outside and entering buildings; 770.48.
- Protection device application and location; 770.93.
- Grounding or interruption of metallic sheath members; 770.100

Lesson 2 NESC and RUS Bonding & Grounding Requirements for Telecommunications Outside Plant and Central Offices 4 hours

This lesson covers general requirements for bonding and grounding telecommunications Outside Plant and Central Office cables and equipment for the safety and protection of people, buildings and equipment per the NESC (National Electric Safety Code) and RUS (Rural Utilities Service):

NESC requirements for bonding and grounding.

- MGN grounding conductor as point of connection; 092.
- Ground rod requirements; 094.B
- Ground rod resistance requirements; 096
- Bonding of electrodes; 099.C

- Clearance between AC power lines and communication lines 235.C and Table 235-5.

RUS requirements for bonding and grounding.

- Grounding and bonding of communications apparatus; 384.C.
- Shielding, grounding and equalization methods; 1751F-801 pg-26.
- Solid-State electronic equipment protection; 1751F-801 pg-30.
- Gas tube protection of electrical circuits; 1751F-801 pg-34.
- Ground electrodes, requirements and alternatives; 1751F-802 pg-9.
- Design of a Central Office grounding systems; 1751F-802 pg-19.
- Central Office ground system resistance objectives; 1751F-802 pg-24.
- Central Office Master Ground Bar Description; 1751F-810 pg-10.
- Radio/Microwave tower and fence grounding; 1751F-810 pg-12.
- Central Office ground window bar; 1751F-810 pg-15.
- Central Office isolated ground zone; 1751F-810 pg-17.
- Main Distributing Frame grounding requirements; 1751F-810 pg-17.
- Grounding cable sizing, routing and terminating; 1751F-801 pg-22.

## Delivery Method

Instructor-Led with exercises throughout.

## Equipment Requirements

**(This apply's to our hands-on courses only)**

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

## Course Length

1 Day