



Electrical Industry Construction Training Criteria

Residential

**Condensed and Revised
January 25, 2001**

Residential Training Criteria – Appendix B Curriculum

SAFETY

- A. General jobsite safety awareness
- B. Emergency procedures
- C. Compliance with OSHA and EPA regulations
- D. Substance abuse

TOOLS, MATERIALS AND HANDLING

- A. Proper tool management
- B. Proper rigging methods
- C. Proper digging techniques
- D. Proper use of motorized tools (use of platform lifts, bucket trucks, and truck-mounted cranes)
- E. Proper material management

MATH

- A. Appropriate mathematical calculations to solve for unknowns

ELECTRICAL THEORY

- A. Basic electrical theory
- B. Ohm's Law, Kirchoff's Laws, Lenz's Law, Thevenin's and Nortons Theorems
- C. Series circuits
- D. Parallel circuits
- E. Combination circuits
- F. Characteristics of voltages in circuits
- G. Characteristics of magnetism/electromagnetism
- H. Theory of superposition and solving for multiple voltage sources circuits
- I. Operation and characteristics of three wire systems
- J. Operation and characteristics of three phase systems
- K. AC Theory
- L. Use of Electronics

CODE REQUIREMENTS

National Electrical Code and local codes

CONDUCTORS

- A. Various types of conductors
- B. Conductor installation techniques
- C. Methods for selecting conductors
- D. Cable fault situations

CONDUIT, RACEWAYS, PANELBOARDS AND SWITCHBOARDS

- A. Terms associated with conduits and raceways
- B. Conduit and wiring support systems recognized by Code
- C. Procedures for laying out various types of bends
- D. Procedures for making bends when fabricating conduits
- E. Fabricating raceways and wiring support systems
- F. Cable assembly wiring methods recognized by the Code
- G. Function, operation and requirements for various panelboards and switch gear

LIGHTING SYSTEMS

- A. Function, operation and characteristics of various lighting systems
- B. Lighting distribution and layout
- C. Installation and connection of fixtures

OVERCURRENT DEVICES

- A. Function, operation and characteristics of overcurrent protection devices

GROUNDING SYSTEMS

- A. Functions, operation and characteristics of grounding systems
- B. Sizing, layout and installation of grounding systems
- C. Difference between insulation, isolation and elevation
- D. Difference between grounding, grounded, and bonding
- E. Special circumstances

PRINTS AND SPECIFICATIONS

- A. Creation of blueprints, plans, and specifications
- B. Symbols used in electrical and related trades
- C. Use of blueprints, plans and specifications

MOTORS, MOTOR CONTROLLERS AND PROCESS CONTROLLERS

- A. Function, operation and characteristics of various types of motors (AC, DC, dual voltage, repulsion, universal, 3 phase, squirrel cage, synchronous)
- B. Proper techniques for motor installations
- C. Function, operation and characteristics of motor controllers, circuits and devices
- D. Function, operation and characteristics of switches and relays
- E. Mechanical connections to utilize motors
- F. Process control systems and devices

GENERATORS AND POWER SUPPLIES

- A. Principles of electromotive force
- B. Principles of generating electricity
- C. Types and configurations of uninterruptible power supplies (UPS)
- D. Types and configurations of battery systems used for UPS systems

TRANSFORMERS

- A. Function, operation, and characteristics of transformers
- B. Selection and installation of transformers
- C. Distribution systems

PERSONAL DEVELOPMENT

- A. Orientation
- B. Methods of working with others
- C. Economic considerations

JOBSITE MANAGEMENT

- A. Coordinating tool needs with office of other jobs
- B. Coordinating schedule with other crafts
- C. Developing timetables and progress charts
- D. Completing time sheets, logs and other necessary documentation
- E. Clearances or permits if necessary
- F. Inventory and order necessary equipment according to job needs
- G. Developing alternative solutions and choose the best alternative
- H. Planning and organizing tasks to meet deadlines
- I. Supervising and monitoring others
- J. Picturing the way the project will appear when completed

TESTING

- A. Steps used for various testing processes
- B. Utilizing the results of testing procedures

SPECIALTY SYSTEMS

- A. Fire Alarms
- B. Security Alarms
- C. Voice, Data, TV, Signaling Systems
- D. Lightning Protection Systems
- E. Fiber Optic Systems
- F. Heating, Air Conditioning and Refrigeration