

O.5
WORK PROCESS SCHEDULE
ELECTRICIAN (CONSTRUCTION)
O*NET-SOC CODE: 47-2111.00 RAPIDS CODE: 0159

This trade schedule is attached to and a part of the Apprenticeship Standards for the above identified occupation. This sequence of Related Classroom Instruction is competency based and will be offered as traditional classroom training or independent study, which may include electronic media.

1. TERM OF APPRENTICESHIP

The term of the occupation shall be four (4) years with an OJL attainment of 8,000 hours supplemented by the required hours of related technical instruction.

2. RATIO OF APPRENTICES TO JOURNEYPERSONS

Two (2) Apprentices to three (3) Journeyman: one apprentice for the first skilled journeyman employed.

(Cannot employ the second apprentice unless you have three (3) Journey persons

3. APPRENTICE WAGE SCHEDULE

Apprentices shall be paid a progressively increasing schedule of wages based on a percentage of the current journeyman wage rate.

Term: 8,000 Hours

East

West

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| 1 st 1000 hours = 40 percent of journeyman's rate | 1 st 1000 hours = 40 percent of journeyman's rate |
| 2 nd 1000 hours = 40 percent of journeyman's rate | 2 nd 1000 hours = 45 percent of journeyman's rate |
| 3 rd 1000 hours = 45 percent of journeyman's rate | 3 rd 1500 hours = 50 percent of journeyman's rate |
| 4 th 1000 hours = 45 percent of journeyman's rate | 4 th 1500 hours = 55 percent of journeyman's rate |
| 5 th 1000 hours = 50 percent of journeyman's rate | 5 th 1500 hours = 65 percent of journeyman's rate |
| 6 th 1000 hours = 55 percent of journeyman's rate | 6 th 1500 hours = 70 percent of journeyman's rate |
| 7 th 1000 hours = 60 percent of journeyman's rate | 8 th 1000 hours = 65 percent of journeyman's rate |

4. SCHEDULE OF WORK EXPERIENCE (See attached Work Process Schedule)

Apprenticeship Oversight Committee may add to the work processes prior to submitting these Standards to the Division of Apprentice Training for approval.

5. SCHEDULE OF RELATED TECHNICAL INSTRUCTION (See attached Related Classroom Instruction Outline)

Instruction can incorporate elements of both electronic media and traditional classroom including online training, distance learning, or independent study of established curriculum.

Curricula modules are based on industry standardized applications of current construction practices. Modules are knowledge and skill based including a system for assessment. The assessment will include task objectives, procedures, review materials, and competency-based performance tests.

O.5 - WORK PROCESS SCHEDULE

HOURS

This instruction and experience shall include the following operations, but not necessarily in the listed sequence. Time spent on specific operations need not be continuous.

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| 1. Preliminary work | 600 |
| a. Learning the names and uses of the equipment used in the trade, such as kind, size, and use of cable, wire, boxes, conduits and fitting, switches, receptacles, service switches, cutouts, etc | |
| b. Learning names and uses of the various tools use in assembling this material, care of these tools, and other instructions necessary to familiarize the apprentice with the material and tools of the trade | |
| c. Safety | |
| 2. Residential and commercial rough wiring | 2500 |
| a. Assisting in getting the material from stockroom | |
| b. Loading truck and unloading material and equipment on the job | |
| c. Laying out the various outlets, switches, receptacles, and other details of the job from blueprints or by direction of the superintendent of construction | |
| d. Laying out the system with materials to be used, where they are to be placed, and other details as to how they shall be run | |
| e. Cutting wires, cables, conduit and raceway; threading and reaming conduit, boring and cutting chases under the direction of the journeyman | |
| f. Installing various kinds of wires, cables, and conduits in accordance with requirements | |
| g. Assisting journeyman in pulling wires, attaching wires to fish tape, and keeping wires from kinks or abrasions | |
| h. Connecting conductors to switches, receptacles, or appliances with proper methods of splicing, or soldering, and typing | |
| i. Installing service switches or load center and sub-feeders and fastening up these parts, running raceways and pulling in conductors under the direction of journeyman electricians | |
| j. Assisting in preparing lists of materials used, including names, number of pieces, or number of feet, etc. for office records | |
| k. Loading unused material and cleaning UP job area | |
| 3. Residential and commercial finish work | 1500 |
| a. Connecting and setting switches, receptacles, plates, etc. | |
| b. Installing proper size and types of fuses for each circuit | |
| c. Installing and connecting various kinds of fixtures | |
| d. Tracing the polarity of conductors and devices | |
| e. Testing the circuit for grounds and shorts and locating and correcting job defects | |
| f. Assisting journeyman in installing and completion of work in accordance with the rules and regulations of the National Board of Fire Underwriters and special local regulations- proper sizes of wires, service, conduits, etc. | |

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| 4. Industrial lighting and service installation | 2000 |
| a. Installing rigid conduit, electric metallic tubing, BX armored cable wire molds on all types of heavy electrical equipment and major size service entrance | |
| b. Wiring all types (gas, oil, stoker, etc.) of heating equipment | |
| c. Installing wiring and controls for air conditioning | |
| d. Wiring of specialized systems to include: sound systems, CRT and data systems, telephones, fire alarm systems, fiber optics, energy management systems, nurse call systems, closed circuit TV, street and highway lighting, and signal systems | |
| 5. Troubleshooting | 1000 |
| a. Repairing all kinds of electrical work | |
| b. Checking out trouble and making repairs under supervision of electrician | |
| c. Checking out trouble and making repairs without supervision | |
| 6. Motor installation and control | 400 |
| a. Installing over current devices. | |
| b. Checking for installation and rotation. | |
| c. Installing replacement motors. | |
| d. Analyzing motor circuits and troubleshooting. | |
| e. Installing emergency generators and controls. | |
| f. Installing pushbuttons, pilot lights, relays, timing devices, and interlocking controls. | |
| TOTAL HOURS (Over a five (5) year period | 8000 |

O.5 - ELECTRICIAN RELATED CLASSROOM INSTRUCTION

Note: Due to regional and local code differences and climate conditions, duration of instructional competencies/modules is suggested estimates only.

| Modules | Hours |
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| Basic Safety | 15 |
| Introduction to Construction Math | 15 |
| Introduction to Hand Tools | 10 |
| Introduction to Power Tools | 5 |
| Introduction to Blueprints | 7.5 |
| Electrical Safety | 12.5 |
| Hand Bending | 7.5 |
| Fasteners and Anchors | 5 |
| Electrical Theory One | 7.5 |
| Electrical Theory Two | 7.5 |
| Electrical Test Equipment | 7.5 |
| Introduction to the National Electrical Code | 2.5 |
| Raceways, Boxes, and Fittings | 12.5 |
| Conductors | 15 |
| Introduction to Electrical Blueprints | 7.5 |
| Wiring: Commercial and Industrial | 7.5 |
| Wiring: Residential | 15 |
| Alternating Current | 15 |
| Motors: Theory and Application | 20 |
| Grounding | 12.5 |

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| Conduit Bending | 15 |
| Boxes and Fittings | 10 |
| Conductor Installations | 10 |
| Cable Tray | 15 |
| Conductor Terminations and Splices | 7.5 |
| Installation of Electric Services | 15 |
| Circuit Breakers and Fuses | 12.5 |
| Contactors and Relays | 10 |
| Electric Lighting | 10 |
| Load Calculations-Branch Circuits | 12.5 |
| Conductor Selection and Calculations | 15 |
| Over current Protection | 12.5 |
| Raceway, Box and Fitting Fill Requirements | 12.5 |
| Wiring Devices | 10 |
| Distribution Equipment | 12.5 |
| Distribution System Transformers | 15 |
| Lamps, Ballasts, and Components | 5 |
| Motor Calculations | 12.5 |
| Motor Maintenance, Part One | 12.5 |
| Motor Controls | 20 |
| Hazardous Locations | 15 |
| Load Calculations-Feeder and Services | 15 |
| Practical Applications of Lighting | 10 |
| Standby and Emergency Systems | 12.5 |
| Basic Electronic Theory | 20 |
| Fire Alarm System | 15 |
| Specialty Transformers | 15 |
| Advanced Motor Controls | 20 |
| HVAC Controls | 15 |
| Heat Tracing and Freeze Protection | 10 |
| Motor Maintenance, Part 2 | 12.5 |
| High Voltage Terminations/Splices | 10 |
| TOTAL HOURS | 622.50 |

DAT apprenticeship program standards recommend 150 hours of related technical instruction per year.