



State of Connecticut

Continuing Education for Electricians 2021 License Renewal Year

License Types: E-1,E-2,E-9

State of CT Statutes includes new apprentice ratio
2018 CT. State Building Code & Amendments per NEC 2017
Calculation Questions as per Chapter 6
OSHA PPT presentations to include but not limited to:

- Chemical hazards
- Trailer Safety
- Asbestos
- Chemical Hazards
- Confined Spaces
-

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Job, tool, storage and field office trailers are common to most construction sites. You probably take them for granted, but you should be aware that jobsite trailers can be hazardous if installed incorrectly, poorly located or poorly maintained.

How to set up and maintain a safe jobsite trailer:

- Before using the job trailer, you should inspect it to make sure it is safe. Check for holes in the floor, leaking roofs, electrical problems, lighting problems, etc.
- There should be two ways of access and egress on trailers. Make sure there are alternate ways to exit the trailer if a fire should start.
- There must be a legible manufacturer's data plate. Generally, it is installed in a permanent manner near the main electrical panel.
- After you have chosen a safe trailer, you should find a safe and accessible location to set up. Look for access to power, parking and ways to enter and exit the trailer safely.
- The ground should be solid, stable and have good drainage. You may need to spread some rock and lightly grade the area before setting up.
- When you install the trailer, make sure that it is firmly blocked and level. Some safety codes may require the trailer to be securely tied down to prevent movement by high winds.
- All access and egress points should be accessible by all employees. Ramps and steps should be OSHA-compliant, have hand rails, be level, and be secure and stable.
- Each trailer should have a fire extinguisher mounted and available for quick use, a working smoke detector and a first aid kit.
- A list of emergency numbers should be posted by telephones for quick reference.
- Electrical panels should be labeled and sized to support the electrical load.
- Outdoor receptacles must be approved for outdoor use and be of a gasket-cover type, ground fault-protected (GFCI) type for use in wet weather conditions.
- Trailers with heaters that burn petroleum products should have a Carbon Monoxide (CO) detector installed and operating.
- Waste cans should be made of metal or of an approved fire-resistant material.
- Many trailers have fans to keep them cool in the warmer months. Be sure the fan blades, belt and pulley are properly guarded to prevent injuries to fingers.

Trailers are what you make of them. If their use is well-planned and they are properly installed and maintained, they will make your job easier and more efficient.

STATE OF CONNECTICUT
 DEPARTMENT OF CONSUMER PROTECTION
 OCCUPATIONAL & PROFESSIONAL LICENSING DIVISION

EVALUATION FORM FOR ELECTRICAL CONTINUING EDUCATION COURSE

TO BE FILLED OUT BY THE STUDENT AND MAILED TO THE ADDRESS BELOW
PROVIDERS ARE NOT PERMITTED TO COLLECT, PROCESS OR DELIVER THIS INFORMATION

Date: _____ Email Address: _____ Phone: _____

Student Name: _____

School Name: _____ Course Name: _____

Location of Class: _____ Time: _____ Course Date: _____

Each instructor shall be evaluated by the students at the end of the course. Please rate your instructor and course in the following categories. Circle your choices.

INSTRUCTOR / FACILITY	POOR	FAIR	GOOD	VERY GOOD
1. Started and ended class on time	1	2	3	4
2. Instructor's delivery of subject matter	1	2	3	4
3. Level of preparation for the class	1	2	3	4
4. Knowledge of the subject	1	2	3	4
5. Ability to answer questions	1	2	3	4
6. Rapport with the class	1	2	3	4
7. Made learning enjoyable	1	2	3	4
8. Enthusiasm	1	2	3	4
9. Depth of coverage	1	2	3	4
10. Taught the course as it was advertised	1	2	3	4
11. Gave me information that will benefit	1	2	3	4
12. Overall evaluation of the Instructor	1	2	3	4
13. Registration process	1	2	3	4
14. Staff handled in a professional manner	1	2	3	4
15. Materials (handouts)	1	2	3	4
16. Course content	1	2	3	4
17. Overall evaluation of the course	1	2	3	4
18. Accommodations of Facility	1	2	3	4

Comments: _____

Mail to: Department of Consumer Protection
 Occupational & Professional Licensing Division
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CHAPTER 393*

**ELECTRICIANS, PLUMBERS, SOLAR, HEATING,
PIPING
AND COOLING CONTRACTORS AND
JOURNEYMEN,
ELEVATOR AND FIRE PROTECTION SPRINKLER
CRAFTSMEN,
IRRIGATION CONTRACTORS AND JOURNEYMEN,
AND
GAS HEARTH INSTALLER CONTRACTORS AND
JOURNEYMEN**

Definitions

(1) "Contractor" means any person regularly offering to the general public services of such person or such person's employees in the field of electrical work, plumbing and piping work, solar work, heating, piping, cooling and sheet metal work, fire protection sprinkler systems work, elevator installation, repair and maintenance work, irrigation work, automotive glass work or flat glass work, as defined in this section;

(2) "Electrical work" means the installation, erection, maintenance, alteration or repair of any wire, cable, conduit, busway, raceway, support, insulator, conductor, appliance, apparatus, fixture or equipment that generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, but does not include low voltage wiring, not exceeding twenty-four volts, used within a lawn sprinkler system;

(6) "Apprentice" means any person registered with the Labor Department for the purpose of learning a skilled trade;

(18) "Solar electricity work" means the installation, erection, repair, replacement, alteration, or maintenance of photovoltaic or wind generation equipment used to distribute or store ambient energy for heat, light, power or other purposes to a point immediately inside any structure or adjacent to an end use

Examining Boards

(a) There shall be in the Department of Consumer Protection separate examining boards for each of the following occupations: (1) Electrical work; (2) plumbing and piping work; (3) heating, piping, cooling and sheet metal work; (4) elevator installation, repair and maintenance work; (5) fire protection sprinkler systems work; and (6) automotive glass work and flat glass work.

(b) The Electrical Work Board shall consist of twelve members who shall be residents of this state, one of whom shall be a general contractor or an unlimited contractor licensed for such occupation under this chapter, two of whom shall be unlimited contractors licensed for such occupation under this chapter, neither of whom at the time of appointment shall be a member or an employee of a member of a trade union or a party or an employee of a party to a contract with a trade union, one of whom shall be an electronic technician licensed under chapter 394, four of whom shall be unlimited journeymen licensed for such occupation under this chapter, who at the time of appointment shall be members of a trade union and four of whom shall be public members.

Sec. 20-332b. Hiring ratios re apprentices, journeymen and contractors. Electrical, plumbing, heating, piping and cooling, sprinkler fitter and sheet metal work. Regulations.

. The Commissioner of Consumer Protection shall amend existing regulations of Connecticut state agencies adopted pursuant to section 20-332 to specify the following allowable hiring ratios regarding apprentices, journeymen and contractors for the following trades:

TRADE
Electrical, Plumbing, Heating,
Piping and Cooling,
Sprinkler Fitter and Sheet
Metal Work

- 1 apprentice to 1 Journey man or Contractors
 - 2 Apprentices to 2 journeymen or contractors
 - 3 apprentices to 5 Journeymen or contractors
 - 4 apprentices to 8 Journeymen or contractors
- This continues on a ratio of 3 Journeymen to 1 apprentice

Sec. 20-333. Examinations.

To obtain a license under this chapter, an applicant shall have attained such applicant's eighteenth birthday and shall furnish such evidence of competency as the appropriate board, with the consent of the Commissioner of Consumer Protection, shall require. The applicant shall satisfy such board that such applicant is of good moral character, possesses a diploma or other evidence of graduation from the eighth grade of grammar school, or possesses an equivalent education to be determined on examination and has the requisite skill to perform the work in the trade for which such applicant is applying for a license and can comply with all other requirements of this chapter and the regulations adopted under this chapter.

The department shall conduct such written, oral and practical examinations as the appropriate board, with the consent of the commissioner, deems necessary to test the knowledge of the applicant in the work for which a license is being sought. Any person completing the required apprentice training program for a journeyman's license under section 20-334a shall, within thirty days following such completion, apply for a licensure examination given by the department.

If an applicant does not pass such licensure examination, the commissioner shall provide each failed applicant with information on how to retake the examination and a report describing the applicant's strengths and weaknesses in such examination. Any apprentice permit issued under section 20-334a to an applicant who fails three licensure examinations in any one-year period shall remain in effect if such applicant applies for and takes the first licensure examination given by the department following the one-year period from the date of such applicant's third and last unsuccessful licensure examination

Sec. 20-333a. Reciprocity.

The Commissioner of Consumer Protection may, upon the payment of the appropriate fee, as provided in section 20-335, grant a license or a card of registration provided for in this chapter, without an examination, to any currently practicing, competent person who holds a similar license or card of registration granted by any other state, licensure jurisdiction within another state, the District of Columbia or any territory or commonwealth of the United States having licensure or registration requirements substantially similar to, or higher than, those of this state, if the licensing authority in such other state, licensure jurisdiction within another state, the District of Columbia or any territory or commonwealth of the United States may grant such similar license or card of registration, without an examination, to any currently practicing, competent licensee or registrant from this state. The commissioner, with the advice and consent of the appropriate examining board, may adopt regulations in accordance with the provisions of chapter 54 in order to carry out the provisions of this section.

Sec. 20-334. License or card of registration. Requirements. Suspension or revocation.

(a) No person shall engage in, practice or offer to perform the work of any occupation subject to this chapter in this state, including offering to perform such work in any print, electronic, television or radio advertising or listing, unless such person has first obtained a license as provided in section 20-333, or possesses a card of registration from the Labor Department or the board and is subject to all of the regulations adopted under this chapter for the purpose of governing apprenticeship training, or has been issued a license for such particular work under this chapter prior to July 6, 1967.

(b) The Department of Consumer Protection shall furnish to each qualified applicant a license certifying that the holder thereof is entitled to engage in the work or occupation for which the person has been issued a license under this chapter, and the holder of such license shall carry it on his person while engaging in such work or occupation. Such license shall be shown to any properly interested person on request. No such license shall be transferred to or used by any person other than the person to whom the license was issued. Contractors shall display their state license number on all commercial vehicles used in their business and shall display such number in a conspicuous manner on all printed advertisements, bid proposals, contracts, invoices and on all stationery used in their business. The department shall keep a register in which shall be entered the names of all persons to whom such licenses are issued. The register shall be at all times open to public inspection.

(c) Each board established under section 20-331 may suspend or revoke any license or certificate granted or issued by it under this chapter if the holder of such license or certificate is convicted of a felony, is grossly incompetent, engages in malpractice or unethical conduct or knowingly makes false, misleading or deceptive representations regarding his work or violates the regulations adopted under this chapter. Before any such license is suspended or revoked, such holder shall be given notice and opportunity for hearing as provided in regulations adopted by the Commissioner of Consumer Protection. Any person whose license has been suspended or revoked may, after ninety days, apply to the board to have such license reinstated.

Sec. 20-334a. Types of licenses. (a) Except as otherwise provided in this section, the following licenses may be issued by the Department of Consumer Protection, upon authorization of the boards, under the provisions of section 20-333:

(1) (A) An unlimited contractor's license may be issued to a person who has served as a journeyman in the trade for which such person seeks a license for not less than two years and, if such service as a journeyman was outside this state, has furnished evidence satisfactory to the appropriate state board that such service is comparable to similar service in this state, or has furnished satisfactory evidence of education and experience and has passed an examination which has demonstrated that such person is competent in all aspects of such trade to be an unlimited contractor. (B) A limited contractor's license may be issued to a person who fulfills the requirements of subparagraph (A) of this subdivision as to a specific area or areas within the trade for which such person seeks a license.

(C) The holder of an unlimited or a limited contractor's license may, within the trade, or the area or areas of the trade, for which such holder has been licensed, furnish supplies and do layout, installation, repair and maintenance work and distribute and handle materials, provided nothing in this subdivision shall be construed to authorize the performance of any action for which licensure is required under the provisions of chapter 390 or 391. Such licensee shall furnish the board with evidence that such licensee will comply with all state requirements pertaining to workers' compensation and unemployment insurance and that such evidence shall be available to any properly interested person prior to the issuance of a license under this subdivision.

(2) (A) An unlimited journeyman's license may be issued to any person who has completed a bona fide apprenticeship program, including not less than four years' experience in the trade for which such person seeks a license, and has demonstrated such person's competency to perform all services included in the trade for which a license is sought by successfully completing the applicable state licensure examination. (B) A limited journeyman's license may be issued to a person who fulfills the requirements of subparagraph (A) of this subdivision in a specific area or areas of the trade for which such person seeks a license, provided the length of experience required may be less than four years for such area or areas of the trade.

(i) The Electrical Work Board shall authorize any person to install, service and repair residential security systems limited to twenty-five volts and five amperes in one to three-family residential dwellings, provided the person is in the employ of an electrical contractor holding an E-1 unlimited contractor license or an L-5 contractor license issued pursuant to subdivision (1) of subsection (a) of this section and the person has successfully completed an apprenticeship and training program established and approved by the Labor Department with the advice of the Connecticut State Apprenticeship Council.

Any person authorized to work under this subsection shall not perform telecommunications electrical work, as defined in section 20-340b, with the exception of work involving interface wiring from a residential security system to an existing telephone connection for monitoring purposes. Any person who is authorized to work under this subsection shall, no later than fifteen months after being issued said authorization, secure an L-6 limited electrical journey person's license pursuant to subdivision (2) of subsection (a) of this section.

Sec. 20-334d. Continuing professional education requirements for electricians and plumbers. Regulations. Exemptions. (a) As used in this section:

(1) "Accredited continuing professional education" means any education of an electrician or plumber that is designed to maintain professional competence in the pursuit, practice and standards of electrical work or plumbing and piping work and that is approved by the commissioner and is provided by an organization, institution or agency that is approved by the commissioner;

(2) "Certificate of continuing education" means a document issued to an electrician or plumber by an organization, institution or agency approved by the commissioner that offers accredited continuing professional education, which (A) certifies that an electrician or plumber has satisfactorily completed a specified number of continuing education hours, and (B) bears the name of such organization, institution or agency, the title of the program, the dates during which the program was conducted, the number of continuing education hours satisfactorily completed and the signature of the director of such organization, institution or agency or the signature of the director's authorized agent;

(3) "Commissioner" means the Commissioner of Consumer Protection.

(b) The commissioner, with the advice and assistance of the Electrical Work Board established pursuant to subsection (b) of section 20-331, shall adopt regulations, in accordance with chapter 54, to (1) establish requirements for accredited continuing professional education for electricians licensed pursuant to sections 20-330 to 20-341, inclusive; (2) establish qualifying criteria for accredited continuing professional education programs and establish qualifying criteria for acceptable certificates of continuing education; and (3) provide for the waiver of required accredited continuing professional education for electricians for good cause. Such regulations shall require not less than four hours per year of accredited continuing professional education for such electricians, except upon request of the Electrical Work Board, the commissioner may increase such hours to a maximum of seven hours.

Sec. 20-334e. Eligibility of holders of L-5 or L-6 licenses to take licensure examination for C-5 or C-6 license.

Any person who has been issued an L-5 or L-6 license pursuant to subdivision (1) of subsection (a) of section 20-334a shall be eligible to take the licensure examination for a C-5 or C-6 license issued pursuant to subdivision (1) of subsection (a) of section 20-334a, provided such person submits a complete license application and a nonrefundable application fee pursuant to section 20-333 and provides satisfactory evidence of experience in the field of telecommunications work to the Electrical Work Board.

Sec. 20-335. License fee. Continuing professional education requirements. Expiration and renewal.

Any person who has successfully completed an examination for such person's initial license under this chapter shall pay to the Department of Consumer Protection a fee of one hundred fifty dollars for a contractor's license or a fee of one hundred twenty dollars for any other such license. All such licenses shall expire annually. No person shall carry on or engage in the work or occupations subject to this chapter after the expiration of such person's license until such person has filed an application bearing the date of such person's registration card with the appropriate board. Such application shall be in writing, addressed to the secretary of the board from which such renewal is sought and signed by the person applying for such renewal. A licensee applying for renewal shall, at such times as the commissioner shall by regulation prescribe, furnish evidence satisfactory to the board that the licensee has completed any continuing professional education required under sections 20-330 to 20-341, inclusive, or any regulations adopted thereunder.

The board may renew such license if the application for such renewal is received by the board no later than one month after the date of expiration of such license, upon payment to the department of a renewal fee of one hundred fifty dollars in the case of a contractor and of one hundred twenty dollars for any other such license. For any completed renewal application submitted pursuant to this section that requires a hearing or other action by the applicable examining board, such hearing or other action by the applicable examining board shall occur not later than thirty days after the date of submission for such completed renewal application. The department shall issue a receipt stating the fact of such payment, which receipt shall be a license to engage in such work or occupation. A licensee who has failed to renew such licensee's license for a period of over one year from the date of expiration of such license shall have it reinstated only upon complying with the requirements of section 20-333. All license fees and renewal fees paid to the department pursuant to this section shall be deposited in the General Fund.

Sec. 20-336. Appeals. Any person aggrieved by any action of any board may appeal there from in accordance with the provisions of section 4-183.

Sec. 20-338. License as contractor and journeyman. Valid throughout state.

The Department of Consumer Protection shall issue a separate license to persons qualified to engage in work as contractors and as journeymen. Any person licensed under this chapter shall be permitted to perform the work or occupation covered by such license in any town or municipality of this state without further examination or licensing by any town or municipality.

Sec. 20-338a. Work required to be performed by licensed persons.

Any contractor who applies for a building permit from a local building official for any work required to be performed by a person licensed under the provisions of this chapter, shall cause such work to be performed by a person licensed under the provisions of this chapter.

Sec. 20-338b. Building permit applications. Who may sign.

Any licensed contractor who seeks to obtain a permit from a building official may sign the building permit application personally or delegate the signing of the building permit application to an employee, subcontractor or other agent of the licensed contractor, provided, the licensed contractor's employee, subcontractor or other agent submits to the building official a dated letter on the licensed contractor's letterhead, signed by the licensed contractor, stating that the bearer of the letter is authorized to sign the building permit application as the agent of the licensed contractor. The letter shall not be a copy or a facsimile, but shall be an original letter bearing the original signature of the licensed contractor. The letter shall also include: (1) The name of the municipality where the work is to be performed; (2) the job name or a description of the job; (3) the starting date of the job; (4) the name of the licensed contractor; (5) the name of the licensed contractor's agent; and (6) the license numbers of all contractors to be involved in the work.

Sec. 20-338c. Work not to commence until permit obtained.

No person licensed pursuant to sections 20-330 to 20-341, inclusive, shall commence work within the scope of sections 20-330 to 20-341, inclusive, unless each applicable permit with respect to the specific work being performed by such licensee has been obtained as required pursuant to local ordinances and the general statutes.

INTRODUCTION

Adopted and Referenced Publications

Pursuant to Connecticut General Statute §29-252, as amended by Public Act 16-215, the following national model codes, as amended herein, are adopted and shall be known as the 2018 Connecticut State Building Code:

- 2015 International Building Code
- 2009 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
- 2015 International Existing Building Code
- 2015 International Plumbing Code
- 2015 International Mechanical Code
- 2015 International Energy Conservation Code
- 2017 NFPA 70, National Electrical Code, of the National Fire Protection Association Inc.
- 2015 International Residential Code of the International Code Council, Inc.

Copies of the International Codes may be obtained from the International Code Council, Inc., 4051 West Flossmoor Road., Country Club Hills, IL 60478-5795 (website: www.iccsafe.org).

Copies of the 2017 NFPA 70, National Electrical Code, may be obtained from the National Fire Protection Association Inc., 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02169-7471 (website: www.nfpa.org).

Copies of the 2018 Connecticut State Building Code document may be downloaded from the website: www.portal.ct.gov/DAS.

The requirements of the 2018 State Building Code shall apply to all work for which a permit application was made on or after the date of adoption.

As used in this document, these annotations have the following meaning:

Add: A section or subsection preceded by (Add) indicates the addition of this section or subsection to the adopted referenced standard.

Amd: A section or subsection preceded by (Amd) indicates the substitution of this section or subsection in the adopted referenced standard.

Del: A section or subsection preceded by (Del) indicates the deletion of this section or subsection from the adopted referenced standard.

DEPARTMENT OF ADMINISTRATIVE SERVICES

2018 Connecticut State Building Code

**DIVISION OF
CONSTRUCTION SERVICES**
Office of the State Building Inspector

450 Columbus Boulevard
Hartford, CT 06103

MELODY A. CURREY
Commissioner

JOSEPH V. CASSIDY, P.E.
State Building Inspector



**DRAFT
FOR PUBLIC COMMENT
JANUARY 2, 2018**

TABLE OF CONTENTS
2018 CONNECTICUT STATE BUILDING CODE

Introduction and adopted model codes	1
Amendments to the 2015 International Building Code	3
Amendments to the ICC/ANSI A117.1 – 2009	71
Amendments to the 2015 International Existing Building Code	73
Amendments to the 2015 International Plumbing Code	83
Amendments to the 2015 International Mechanical Code	91
Amendments to the 2015 International Energy Conservation Code	99
Amendments to the 2017 NFPA 70, National Electrical Code	107
Amendments to the 2015 International Residential Code	113

AMENDMENTS TO THE 2017 NFPA 70, NATIONAL ELECTRICAL CODE

ARTICLE 90 – INTRODUCTION

(Amd) 90.2 Scope.

(A) Covered. This Code covers the installation of electrical conductors, equipment and raceways; signaling and communications conductors, equipment and raceways; and optical fiber cables and raceways for the following:

(1) Public and private premises, including:

- a. buildings and structures;
- b. installations in detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures shall be in accordance with the requirements of this code or with the requirements of the 2015 International Residential Code portion of the State Building Code;
- c. utility connections, additions and alterations to mobile homes;
- d. utility connections to recreational vehicles; and
- e. floating buildings.

(2) Yards, lots, parking lots, carnivals and industrial substations.

(3) Installations of conductors and equipment that connect to the supply of electricity.

(4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops and recreational buildings that are not an integral part of a generating plant, substation or control center.

(B) Not covered. This code does not cover the following:

(1) Installations in ships, watercraft other than floating buildings, railway rolling stock, aircraft or automotive vehicles other than mobile homes and recreational vehicles

(2) Installations underground in mines and self-propelled mobile surface mining machinery and its attendant electrical trailing cable

(3) Installations of railways for generation, transformation, transmission or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communications purposes

(4) Installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations

(5) Installations under the exclusive control of an electric utility where such installations

- a. Consist of service drops or service laterals, and associated metering; or

- b. Are located in legally established easements, rights-of-way or by other agreements either designated by or recognized by public service commissions, utility commissions or other regulatory agencies having jurisdiction for such installations; or
- c. Are on property owned or leased by the electric utility for the purpose of communications, metering, generation, control, transformation, transmission or distribution of electric energy; or
- d. Are located by other written agreements either designated by or recognized by public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations. These written agreements shall be limited to installations for the purpose of communications, metering, generation, control, transformation, transmission, or distribution of electric energy where legally established easements or rights-of-way cannot be obtained. These installations shall be limited to federal lands, Native American reservations through the U.S. Department of the Interior Bureau of Indian Affairs, military bases, lands controlled by port authorities and state agencies and departments, and lands owned by railroads.

(6) Installations in one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures not more than three stories above grade plane in height, that are in accordance with the provisions of the 2015 International Residential Code portion of the State Building Code.

(C) Special permission. The State Building Inspector may grant an exception for the installation of conductors and equipment that are not under the exclusive control of the electric utilities and are used to connect the electric utility supply system to the service-entrance conductors of the premises served, provided such installations are outside a building or terminate immediately inside a building wall.

(Amd) 90.4 Enforcement. Administration of this code shall be in accordance with the provisions of Chapter 1 of the 2015 International Building Code portion of the State Building Code. For the purposes of this code, the authority having jurisdiction for interpreting the rules and for granting the special permission contemplated in a number of rules is the State Building Inspector. Interpretations shall be requested verbally or in writing from the Office of the State Building Inspector. Special permission shall be requested in writing using the Request for Modification of the State Building Code form available from local building departments or from the Office of the State Building Inspector, 450 Columbus Boulevard, Hartford CT 06103. www.portal.ct.gov/DAS.

CHAPTER 1 – GENERAL

ARTICLE 100 – Definitions.

(Amd) Accessible, readily (Readily Accessible). Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to actions such as to use tools, to climb over or remove obstacles, or to resort to portable ladders, and so forth. For overcurrent devices located within listed enclosures or assemblies for which access requires the use of a tool, the readily accessible requirement of this section shall not apply.

(Amd) Authority having jurisdiction. The organization, office or individual responsible for approving equipment, material, an installation, or a procedure. The local building official has the responsibility for approving construction documents, issuing permits, approving materials and procedures and for making inspections from time to time as the construction process requires.

The State Building Inspector has the responsibility for administering the State Building Code, interpreting the State Building Code and for granting exceptions from specific rules of the State Building Code. See the definition of "Special Permission," and Article 90.4.

(Amd) **Special Permission.** For the purposes of this code, the authority having jurisdiction for granting the special permission contemplated in a number of rules is the State Building Inspector. Special permission shall be requested in writing using the Request for Modification of the State Building Code form available from local building departments or from the Office of the State Building Inspector, 450 Columbus Boulevard, Hartford CT 06103. www.portal.ct.gov/DAS.

CHAPTER 2 – WIRING AND PROTECTION

(Del) **240.67 Arc Energy Reduction.** Delete in its entirety without substitution.

(Amd) **250.50 Grounding Electrode System.** If available on the premises at each building or structure served, each item in 250.52 (A)(1) to (A)(7), inclusive, shall be bonded together to form the grounding electrode system. Where none of these grounding electrodes are available, one or more of the grounding electrodes specified in 250.52 (A)(4) to (A)(8), inclusive, shall be installed and used.

CHAPTER 3 – WIRING METHODS AND MATERIALS

(Add) **300.4.1 Drilling and notching.**

(A) Structural floor, wall, ceiling and roof members.

(1) Solid sawn lumber. Notches in solid lumber joists, rafters and beams shall not exceed one-sixth of the depth of the member, shall not be longer than one-third of the depth of the member and shall not be located in the middle one-third of the span. Notches at the ends of the member shall not exceed one-fourth the depth of the member. The tension side of members 4 inches or greater in nominal thickness shall not be notched except at the ends of the members. The diameter of holes bored or cut into members shall not exceed one-third the depth of the member. Holes shall not be closer than 2 inches to the top or bottom of the member, or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches to the notch.

Exception: Notches on cantilevered portions of rafters are permitted provided the dimension of the remaining portion of the rafter is not less than 4-inch nominal and the length of the cantilever does not exceed 24 inches.

(2) Engineered wood products. Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated members or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.

(3) Studs. Any stud in an exterior wall or interior bearing partition may be cut or notched to a depth not exceeding 25 percent of its width. Studs in nonbearing interior partitions may be notched to a depth not to exceed 40 percent of a single stud width. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no greater than 40 percent of the stud width, the edge of the hole is no closer than 5/8 inch to the edge of the stud and the hole is not located in the same section as a cut or notch.

Exceptions:

1. A stud may be bored or drilled to a diameter not exceeding 60 per cent of its width, provided that such studs located in exterior walls or interior bearing partitions are doubled and not more than two successive studs are bored.
2. Approved stud shoes may be used when installed in accordance with the manufacturer's recommendations.

(4) Top plates. When wiring, conduit, piping or ductwork is placed in or partly in an exterior wall or interior bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 per cent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 ½ inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) nails at each side or equivalent. The metal tie must extend a minimum of 6 inches past the opening.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

CHAPTER 4 – EQUIPMENT FOR GENERAL USE

(Amd) 404.2 Switch Connections.

(A) Three-Way and Four-Way Switches. Three-way and four-way switches shall be wired so that all switching is done only in the ungrounded circuit conductor. Where in metal raceways or metal-armored cables, wiring between switches and outlets shall be in accordance with 300.20(A).

Exception: Switch loops shall not require a grounded conductor.

(B) Grounded Conductors. Switches or circuit breakers shall not disconnect the grounded conductor of a circuit.

Exception: A switch or circuit breaker shall be permitted to disconnect a grounded circuit conductor where all circuit conductors are disconnected simultaneously, or where the device is arranged so that the grounded conductor cannot be disconnected until all the ungrounded conductors of the circuit have been disconnected.

(C) Switches Controlling Lighting Loads. The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, or rooms suitable for human habitation or occupancy as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions:

- (1) Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor
- (2) Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials
- (3) Where snap switches with integral enclosures comply with 300.15(E)
- (4) Where lighting in the area is controlled by automatic means
- (5) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary that require line-to-neutral voltage to operate the electronics of the switch in the standby mode and shall meet the requirements of 404.22.

Informational Note: The provision for a (future) grounded conductor is to complete a circuit path for electronic lighting control devices.

(Amd) **404.22 Electronic Lighting Control Switches.** Electronic lighting control switches shall be listed.

(Amd) **406.4 General Installation Requirements**

(D) **Replacements.** Replacement of receptacles shall comply with 406.4(D)(1), 406.4(D)(2), 406.4(D)(3), 406.4(D)(5) and 406.4(D)(6).

(D)(4) **Arc-Fault Circuit-Interrupter Protection.** Replacement receptacles are not required to be provided with arc-fault circuit-interrupter protection

(Amd) **440.14 Location**

(Add) **Exception No. 3:** Where the interior section of a factory packaged split system is fed solely from the exterior section of the system and the disconnecting means for the exterior section is capable of being locked in the open position, a separate disconnecting means for the interior section shall not be required within sight from that section. The provisions for locking or adding a lock to the disconnecting means shall remain in place with or without the lock installed.

CHAPTER 5 - SPECIAL OCCUPANCIES

(Amd) **525.5 Overhead Conductor Clearances**

(B) **Clearances to Portable Structures**

(2) **Over 600 Volts.**

(Add) **Exception:** Tents erected and dismantled under the supervision of a licensed electrician or other person approved by the authority having jurisdiction may be placed within the 15 feet (4.5 m) space provided the finished height of the tent is a minimum of 10 feet (3.0 m) below the conductors.

Chapter 6 – SPECIAL EQUIPMENT

(Amd) **690.12 Rapid Shutdown of PV Systems on Buildings.** PV system circuits installed on or in buildings shall include a rapid shutdown function to reduce shock hazard for emergency responders in accordance with 690.12(A) through (D).

Exception: Ground mounted PV system circuits that enter buildings, of which the sole purpose is to house PV system equipment, shall not be required to comply with 690.12.

(A) **Controlled Conductors.** Requirements for controlled conductors shall apply to PV circuits supplied by the PV system.

(Amd) 105.1 Required. Any owner or owner's authorized agent who intends to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to move a lot line that will affect any existing building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be performed, shall first make application to the building official and obtain the required permit.

(Add) 105.1.3 Connecticut State Fire Safety Code abatement. Where conflicts exist between the requirements of this code and the requirements of a Connecticut State Fire Safety Code abatement order issued in writing by the local fire marshal with respect to an existing building, the requirements of that portion of the Connecticut State Fire Safety Code that regulates existing buildings shall take precedence.

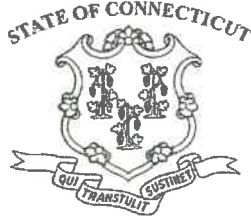
Exceptions:

1. New fire protection systems shall meet the requirements of Chapter 9 of this code.
2. Electrical work shall meet the requirements of the NFPA 70, National Electrical Code.
3. Structural, plumbing and mechanical work shall conform to the requirements of this code.

(Amd) 105.2 Work exempt from permit. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws, statutes, regulations or ordinances of the jurisdiction. Permits shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area is not greater than 200 square feet (18.58 m²).
2. Fences, other than swimming pool barriers, not over 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not higher than 3 feet (914 mm) measured from finished grade at the bottom of the wall to finished grade at the top of the wall, unless supporting a surcharge or impounding Class I, II or III-A liquids.
5. Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
6. Sidewalks, driveways and on-grade concrete or masonry patios not more than 30 inches (762 mm) above adjacent grade and not over any basement or story below and which are not part of an accessible route.
7. Painting, papering, tiling, carpeting, cabinets, countertops and similar finish work not involving structural changes or alterations.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Use Group R-3 occupancy, as applicable in Section 101.2, which are equal to or less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18 927 L) capacity and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes and not including service systems.
11. Swings and other playground equipment.
12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.



Substitute Senate Bill No. 353

Public Act No. 17-76

AN ACT ESTABLISHING AN APPRENTICE, JOURNEYMEN AND CONTRACTOR WORKING GROUP.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. (NEW) (Effective from passage) (a) There is established a working group to discuss hiring ratios for apprentices, journeymen and contractors and study the hiring ratio relief process. The working group shall meet at least three times annually and shall study and make recommendations related to apprentices, journeymen and contractors.

(b) The working group shall consist of ten members, and shall be evenly divided between members of the following union and nonunion industry trade groups: The International Brotherhood of Electrical Workers, the Independent Electrical Contractors of New England, the Associated Builders and Contractors of Connecticut, Sheet Metal Local 40, Sprinkler Fitters Local 669, the Connecticut Chapter of American Fire Sprinkler Association, the United Association of Plumbers and Pipefitters Local 777, the Plumbing Heating and Cooling Contractors of Connecticut, the Connecticut Heating and Cooling Contractors and the Connecticut State Building and Construction Trades Council. Each union industry trade group member shall be either the business manager of such group or such

Substitute Senate Bill No. 353

business manager's designee from such group. Each nonunion industry trade group member shall be either the president of such group or such president's designee from such group.

(c) Such members shall be selected as follows:

(1) Two union members appointed by the speaker of the House of Representatives;

(2) Two union members appointed by the president pro tempore of the Senate;

(3) One nonunion member appointed by the majority leader of the House of Representatives;

(4) One union member appointed by the majority leader of the Senate;

(5) Two nonunion members appointed by the minority leader of the House of Representatives; and

(6) Two nonunion members appointed by the minority leader of the Senate.

(d) All appointing authorities shall consult with the chairpersons and ranking members of the joint standing committee of the General Assembly having cognizance of matters relating to the Department of Consumer Protection prior to making any appointments pursuant to this section.

(e) All appointments to the working group shall be made not later than thirty days after the effective date of this section. Any vacancy shall be filled by the appointing authority.

(f) The members of the working group shall select the chairpersons of the working group from among the members of the group. One

Substitute Senate Bill No. 353

chairperson shall be a union member and one chairperson shall be a nonunion member. Such chairpersons shall schedule the first meeting of the working group.

(g) The administrative staff of the joint standing committee of the General Assembly having cognizance of matters relating to the Department of Consumer Protection shall serve as administrative staff of the working group.

(h) Not later than December 1, 2017, and annually thereafter, the working group shall submit a report on its recommendations to the joint standing committee of the General Assembly having cognizance of matters relating to the Department of Consumer Protection, in accordance with the provisions of section 11-4a of the general statutes.

Sec. 2. Section 20-332b of the general statutes is repealed and the following is substituted in lieu thereof (*Effective from passage*):

The Commissioner of Consumer Protection shall amend existing regulations of Connecticut state agencies adopted pursuant to section 20-332 to specify the following allowable hiring ratios regarding apprentices, journeymen and contractors for the following trades:

TRADE

**Electrical, Plumbing, Heating, Piping and Cooling,
Sprinkler Fitter and Sheet Metal Work**

Apprentices

**1
2
3
4**

Licensees

(Journeymen or Contractors)

**1
2
[5] 3
[8] 6**

Substitute Senate Bill No. 353

5	[11]	9
6	[14]	<u>12</u>
7	[17]	<u>15</u>
8	[20]	<u>18</u>
9	[23]	<u>21</u>
10	[26]	<u>24</u>

**Ratio continues at 3 Journeypersons
To 1 Apprentice**

Approved June 27, 2017

OSHA[®] FactSheet

Personal Protective Equipment

Personal protective equipment, or PPE, is designed to protect workers from serious workplace injuries or illnesses resulting from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Besides face shields, safety glasses, hard hats, and safety shoes, protective equipment includes a variety of devices and garments such as goggles, coveralls, gloves, vests, earplugs, and respirators.

Employer Responsibilities

OSHA's primary personal protective equipment standards are in Title 29 of the Code of Federal Regulations (CFR), Part 1910 Subpart I, and equivalent regulations in states with OSHA-approved state plans, but you can find protective equipment requirements elsewhere in the General Industry Standards. For example, 29 CFR 1910.156, OSHA's Fire Brigades Standard, has requirements for firefighting gear. In addition, 29 CFR 1926.95-106 covers the construction industry. OSHA's general personal protective equipment requirements mandate that employers conduct a hazard assessment of their workplaces to determine what hazards are present that require the use of protective equipment, provide workers with appropriate protective equipment, and require them to use and maintain it in sanitary and reliable condition.

Using personal protective equipment is often essential, but it is generally the last line of defense after engineering controls, work practices, and administrative controls. Engineering controls involve physically changing a machine or work environment. Administrative controls involve changing how or when workers do their jobs, such as scheduling work and rotating workers to reduce exposures. Work practices involve training workers how to perform tasks in ways that reduce their exposure to workplace hazards.

As an employer, you must assess your workplace to determine if hazards are present that require the use of personal protective equipment. If such hazards are present, you must select protective equipment and require workers to use it, communicate your protective equipment selection decisions to your workers, and select personal protective equipment that properly fits your workers.

You must also train workers who are required to wear personal protective equipment on how to do the following:

- Use protective equipment properly,
- Be aware of when personal protective equipment is necessary,
- Know what kind of protective equipment is necessary,
- Understand the limitations of personal protective equipment in protecting workers from injury,
- Put on, adjust, wear, and take off personal protective equipment, and
- Maintain protective equipment properly.

Protection from Head Injuries

Hard hats can protect your workers from head impact, penetration injuries, and electrical injuries such as those caused by falling or flying objects, fixed objects, or contact with electrical conductors. Also, OSHA regulations require employers to ensure that workers cover and protect long hair to prevent it from getting caught in machine parts such as belts and chains.

Protection from Foot and Leg Injuries

In addition to foot guards and safety shoes, leggings (e.g., leather, aluminized rayon, or other appropriate material) can help prevent injuries by protecting workers from hazards such as falling or rolling objects, sharp objects, wet and slippery surfaces, molten metals, hot surfaces, and electrical hazards.

Protection from Eye and Face Injuries

Besides spectacles and goggles, personal protective equipment such as special helmets or shields, spectacles with side shields, and faceshields can protect workers from the hazards of flying fragments, large chips, hot sparks,

optical radiation, splashes from molten metals, as well as objects, particles, sand, dirt, mists, dusts, and glare.

Protection from Hearing Loss

Wearing earplugs or earmuffs can help prevent damage to hearing. Exposure to high noise levels can cause irreversible hearing loss or impairment as well as physical and psychological stress. Earplugs made from foam, waxed cotton, or fiberglass wool are self-forming and usually fit well. A professional should fit your workers individually for molded or preformed earplugs. Clean earplugs regularly, and replace those you cannot clean.

Protection from Hand Injuries

Workers exposed to harmful substances through skin absorption, severe cuts or lacerations, severe abrasions, chemical burns, thermal burns, and harmful temperature extremes will benefit from hand protection.

Protection from Body Injury

In some cases workers must shield most or all of their bodies against hazards in the workplace, such as exposure to heat and radiation as well as hot metals, scalding liquids, body fluids, hazardous materials or waste, and other hazards. In addition to fire-retardant wool and fire-retardant cotton, materials used in whole-body personal protective equipment include rubber, leather, synthetics, and plastic.

When to Wear Respiratory Protection

When engineering controls are not feasible, workers must use appropriate respirators to protect against adverse health effects caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. Respirators generally cover the nose and mouth or the entire face or head and help prevent illness and injury. A proper fit is essential, however, for respirators to be effective. Required respirators must be NIOSH-approved and medical evaluation and training must be provided before use.

Additional Information

For additional information concerning protective equipment view the publication, *Assessing the Need for Personal Protective Equipment: A Guide for Small Business Employers* (OSHA 3151) available on OSHA's web site at www.osha.gov. For more information about personal protective equipment in the construction industry, visit www.osha-slc.gov/SLTC/constructionppe/index.html.

Contacting OSHA

To report an emergency, file a complaint or seek OSHA advice, assistance or products, call (800) 321-OSHA or contact your nearest OSHA regional or area office.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For more complete information:



U.S. Department of Labor

www.osha.gov

(800) 321-OSHA

DOC 4/2006

Portable Ladder Safety



Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries.

- Read and follow all labels/markings on the ladder.
- Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.

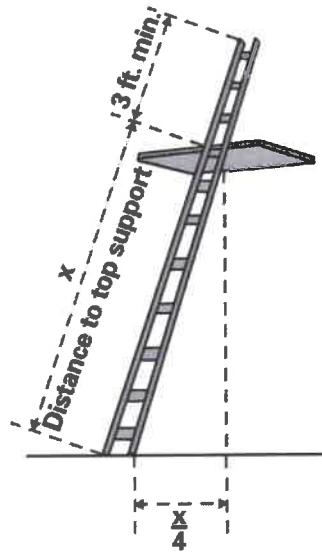


3-Point Contact

- Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).
 - Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
 - Ladders must be free of any slippery material on the rungs, steps or feet.
- Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
 - Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.

(continued on reverse)

- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Do not move or shift a ladder while a person or equipment is on the ladder.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).
- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.
- Be sure that all locks on an extension ladder are properly engaged.
- Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.



For more information:



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Journey Person to Apprentice Ratio

ALL TRADES	
Apprentices	Licensee (Journey person or Contractor)
1	1
2	2
3	3
4	6
5	9
6	12
7	15
8	18
9	21
10	24
Ratio continues at 3 journey person to 1 apprentice	

200 Folly Brook Boulevard, Wethersfield, CT 06109 / Phone: 860-263-6000

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CONNECTICUT DEPARTMENT OF LABOR APPLICATION FOR APPRENTICESHIP RATIO RELIEF

Ratio Relief applicants must advertise open journey person position(s) for 30 days on CThires.com prior to subcommittee review of application beginning January 1, 2018

Ratio Relief is intended to help when qualified Journey workers cannot be found

GENERAL INFORMATION

- 1. Name of Firm/Sponsor Date of Application
dba Name, if any
Mailing Address Zip Code
Physical Location Zip Code
City County/State
Trade License Category
Email Phone # Fax #
2. Type of Firm (Check only one) Corporation Partnership Proprietorship Joint Venture LLC
3. How many years has the Firm been in business? Under the same name? Program Approval Date
4. Number of previous requests for ratio relief within the past five years
5. Please answer the following questions & attach the proper documentation:
A. Is the Firm actively seeking Journey workers? B. Is the Firm actively seeking Apprentices?
C. Registered and posted job listing with CT Hires? www.cthires.com Job #
D. Advertising for licensed position(s)? Please attach all copies.
6. Within the past five years has the firm, any affiliate, (including any contractor of record), any predecessor company or entity, owner of 5.0% or more of the firm's shares, director, officer, partner, or proprietor been subject of: (check any that apply and explain under sponsor remarks. It is imperative that a full explanation of the circumstances relating to a "yes" statement be submitted to ensure an objective evaluation by the Department. Attach additional pages if necessary).
A. A judgment or conviction of any business related conduct constituting a crime under state or federal law?
B. A currently pending indictment for any business-related conduct constituting a crime under state or federal law?
C. A grant of immunity for any business-related conduct constituting a crime under state or federal law or regulation?
D. Any final determination of a violation of any federal labor law or regulation?
E. Any OSHA violation that was categorized as willful, repeat, failure to abate, or was based on retaliating against an employee for filing a safety or health complaint.
F. Any final determination of a violation of any state labor law or regulation?
G. A consent order with the Connecticut Department of Environmental Protection, or a federal or state enforcement determination involving a construction-related violation of federal or state environmental laws?
H. A debarment from federal contracts for violation of the Davis-Bacon Act, 49 Stat. 101(1931), 40 USC 278a-2?
I. A debarment from state contracts for violation of Connecticut's prevailing wage law pursuant to Conn. Gen. Stat. Section 31-53a?
J. A debarment or suspension for violation of any other state prevailing wage law?
K. Rejection of any bid or proposed subcontract or general contract for lack of responsibility pursuant to state law?
L. Any final determination of a violation of any state occupational licensing statute or regulation?
M. A consent order entered into with the Connecticut Department of Consumer Protection or any other state or federal government agency?
N. Any pending enforcement proceeding by a federal, state or municipal agency regarding an alleged violation of the law?
O. Are all current apprentices attending related instruction (if required)?

SPONSOR _____ TRADE _____

CURRENT NUMBER OF JOURNEYPERSONS EMPLOYED _____

CURRENT NUMBER OF PRE-APPRENTICES REGISTERED _____

CURRENT NUMBER OF APPRENTICES REGISTERED _____

CURRENT NUMBER OF APPRENTICES (STATUS)

YEAR 1 _____ YEAR 2 _____ YEAR 3 _____ YEAR 4 _____ YEAR 5 _____ YEAR 6 _____

NUMBER OF APPRENTICES RATIO RELIEF IS REQUESTED FOR? _____ TRADE _____

Is this request for a CT Technical High School graduate? yes no School Attended? _____

Is this request for a pre-apprentice student? yes no

Is this request for a U.S. Military Veteran? yes no

CUMULATIVE APPRENTICESHIP RECORD (based on previous five years)

Registered _____ *Completed _____

* Completed is defined as those individuals who have been awarded a certificate of completion per the Regulations of Connecticut State Agencies, Sec. 31-51d-2(h).

PRE-APPRENTICE STARTING (WAGE) RATE \$ _____

APPRENTICE STARTING (WAGE) RATE \$ _____ or _____ %

JOURNEYPERSON COMPLETION (WAGE) RATE \$ _____

TOTAL NUMBER OF JOURNEYPERSONS TERMINATED IN THE PAST FIVE YEARS? _____

TOTAL NUMBER OF JOURNEYPERSONS WHO VOLUNTARILY QUIT IN THE PAST FIVE YEARS? _____

TOTAL NUMBER OF APPRENTICES TERMINATED IN THE PAST FIVE YEARS? _____ PRE-APPRENTICES _____

TOTAL NUMBER OF APPRENTICES WHO VOLUNTARILY QUIT IN THE PAST FIVE YEARS? _____ PRE-APPRENTICES _____

TERMINATION DATA (based on previous five years)

<u>TERMINATION CODES</u>	<u>NUMBER OF APPRENTICES TERMINATED</u>
1. Discharged/Released	_____
2. Left to accept related employment	_____
3. Left to accept other employment	_____
4. Unsatisfactory Performance	_____
5. Lack of work	_____
6. Entered military service	_____
7. Illness/death	_____
8. Voluntarily quit	_____
9. Probationary period – discharge/voluntary quit	_____
Total	_____

SPONSOR REMARKS (Reason(s) for request, attach additional sheet if necessary):

TOOLBOXTOPICS.COM

Company Name _____ Job Name _____ Date _____

SAFE OPERATING RULES AND PRACTICES

Safe operating rules and practices are to be established during the planning meeting at the start of the job as dictated by the hazards inherent in the nature of the work, federal and state Safety and Health Regulations, company policies, and owner and other regulatory agency requirements. Other safety rules may have to be added as the work progresses due to changed conditions, new methods, new equipment, and as an outgrowth of accident experience.

General safe operating rules and practices apply to all employees, regardless of the nature of their duties. These rules are to be explained to each new hire during indoctrination and must be reemphasized at toolbox meetings and in day-to-day contacts. These are minimum requirements, and are to be rigidly enforced. Examples of general rules follow:

Wear personal protective equipment as required.

Wear suitable shoes and work clothes in good repair

Lift correctly. Get help on the heavy loads.

Do not smoke in prohibited areas.

Avoid off-balanced positions when pulling, pushing, or prying, especially at heights

Report all injuries promptly, even though minor in nature,

Keep alert around moving equipment

Always inspect ladders prior to use and use ladders correctly.

Always follow the approved lock and tag procedures.

Operate equipment and vehicles only if authorized

Correct unsafe conditions as noted, or if you can't correct them, call them to the attention of your foreman immediately.

Keep tools and materials away from the edge of scaffolds or floor openings where they can be knocked off on employees working below.

Be considerate of the welfare of fellow employees. Do not distract their attention or engage in horseplay.

Replace all guards removed for servicing or other reasons,

Pressure cylinders should be used and stored in an upright position and secured against accidental tipping.

Keep all stairways, ladders, ramps, scaffold platforms, walkways and work areas free from loose materials and trash.

Riding on loads, hooks and hoists is prohibited.

their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

j. Climbers shall not be worn while performing work from an aerial lift

κ. The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

l. Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position except as provided in paragraph h. above.

Safety
Recommendations: _____

Job Specific
Topics: _____

M.S.D.S
Reviewed: _____

Attended By:

TOOLBOXTOPICS.COM

Company Name _____ Job Name _____ Date _____

ELECTRICAL

All electrical work, installation and wire capacities shall be in accordance with provisions of the National Electrical Code.

Job sites will have a Ground Fault Circuit Interrupter system, or an Assured Equipment Grounding Conductor Program. This is required for all 120 volt, single phase 15 and 20 ampere receptacle outlets which are not a part of the permanent wiring of the building or structure in use by employees.

The company shall not permit an employee to work in such proximity to any part of an electric power circuit that he/she may come in contact with it in the course of his/her work unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it by effective insulation or other means. In work areas where the exact location of underground electric power lines is unknown, workmen using jackhammers, bars, or other hand tools which may come in contact with a line shall be provided with insulated protective gloves.

Before work is begun, the cognizant supervisor shall ascertain by inquiry, direct observation, or instruments whether any part of an electric power circuit, exposed or concealed, is located so that the performance of the work may bring any person, tool, or machine into physical or electrical contact with it. The company shall post and maintain proper warning signs where such a circuit exists. Employees shall be advised of the location of such lines, the hazards involved, and the protective measures to be taken.

Suitable barriers or other means shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

Sufficient space shall be provided and maintained in the area of electrical equipment to permit ready and safe operation and maintenance of such equipment. When parts are exposed, the minimum clearance for the workspace shall be not less than 6-1/4 feet high nor less than a radius of 3 feet wide. There shall be a clearance sufficient to permit at least a 90 degree opening of all doors or hinged panels. All working clearances shall be maintained in accordance with the National Electrical Code.

Equipment or circuits that are de-energized shall be rendered inoperative and have tags attached at all points where such equipment or circuits can be energized. Controls that are to be deactivated during the course of work or energized or de-energized equipment or circuits shall be tagged. Tags shall be placed to identify plainly the equipment or circuits being worked on. Unexpected energizing of any electrical line can cause death, shock, serious injury, etc. In addition to the tag, the circuit at the switch box should be padlocked in the "OFF" position. A lockout hoop should be provided and used.

Safety
Recommendations: _____

Job Specific
Topics: _____

M.S.D.S
Reviewed: _____

TOOLBOXTOPICS.COM

Company Name _____ Job Name _____ Date _____

LOCKOUT/TAGOUT PROCEDURES

Lockout/Tagout Procedures

Before any maintenance, construction, demolition, tie-in, inspection or servicing of equipment (electrical, mechanical, steam or other) that requires entrance into or close contact with machinery, equipment, power sources or line breaking, the power shall be disconnected and locked out.

Electrical

Electrical sources will have the main power switch locked out, and if possible, the fuses removed. Locks with dissimilar keys will be provided to each person working on the affected job. Only the person attaching the lock shall remove it. Multiple locking devices shall be provided. Tags will be attached to each lock indicating the name of the person attaching the lock, the location where he/she is working and the person's foreman or supervisor. Hot work will be avoided, if possible.

Moving Equipment

The main power source, or sources, shall be locked out; drive gear disengaged and locked out; and appropriate tags applied.

Piping

Piping shall be blanked or valves shall be closed, chained and locked. Where possible, at least two valves before and after the affected section should be chained, locked and tagged. Piping shall be de-pressurized, drained and purged, if necessary.

Other Energy Sources

Other power sources shall be rendered inoperative as directed by a qualified supervisor or manager

Locks And Tags

Locks and tags will be attached and removed only by the individual employee directly involved in the operation. The last person removing his/her lock shall ensure that there are no persons exposed should the power be turned on.

Safety
Recommendations: _____

Job Specific
Topics: _____

M.S.D.S
Reviewed: _____

Attended By: _____

TOOLBOXTOPICS.COM

Company Name _____ Job Name _____ Date _____

AERIAL LIFTS

Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to work at above ground elevations:

- 1 Extensible boom platforms
- 2 Articulating boom platforms
- 3 Vertical towers
- 4 Aerial ladders
- 5 A combination of any of the above

Aerial equipment may be powered or manually operated and are deemed aerial lifts whether or not they are capable of rotating about a substantially vertical axis. Specific requirements:

- 1 Ladder trucks and tower trucks - Ladders shall be locked in lowered and stowed position prior to highway travel.
- 2 Extensible and articulating boom platforms
 - a. Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.
 - b. Only authorized persons shall operate an aerial lift.
 - c. Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.
 - d. Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders or other devices for a work position.
 - e. A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.
 - f. Boom and basket load limits specified by the manufacturer shall not be exceeded.
 - g. The brakes shall be set and when outriggers are used, they shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.
 - h. An aerial lift truck shall not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of 1926.556(a)(1) and (2).
 - i. Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to

their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

j. Climbers shall not be worn while performing work from an aerial lift

κ. The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

l. Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position except as provided in paragraph h. above.

Safety
Recommendations: _____

Job Specific
Topics: _____

M.S.D.S
Reviewed: _____

Attended By: _____

Welcome

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Welders

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The code requirements for this are
in Article 630.

Size electric welders supply
conductors for an ampacity at least
as much as the I_{eff} value on
the rating plate [630.11].

If this number isn't there, visit the
manufacturer's Website to find it.
If that doesn't pan out, then you'll
have to multiply the primary
current shown on the nameplate
by the relevant factor shown in
Table 630.11(A).

What if you have a welding
receptacle at every fourth column
along the perimeter walls? That
ends up being quite a few welders,
if you are indeed using all those
receptacles.

You can apply standard diversity
factors; you know, for example, the
tenant is never going to have more
than 3 welders on the premises so you
can base your calculations on intended
use and intended duty cycles and get
the AHJ to sign off on it.

But it's unlikely you'll have that exact scenario. More typically, you will have to use the "group of welders" calculation specified in 630.11(B). That means you add together the amperage of the two largest welders, 85% of the third largest, 70% of the fourth largest, and 60% of the remaining welders.

Just make sure you have enough ampacity for actual use.!!!

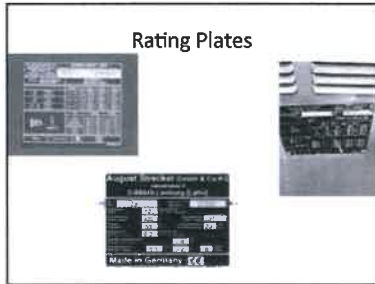
When you calculate your overcurrent protection, the values might not correspond to the standard ratings in 240.6. In such a case, you can use the next higher standard rating [630.12].

The overcurrent rating for each welder cannot exceed 200% of the $I_{(sub)1max}$ [630.12(A)].

Conductors supplying more than one welder must be protected by an overcurrent protection device (OCPD) rated (or set) at not more than 200% of the conductor ampacity [630.12(B)].

For each welder that doesn't have an integral disconnect, you must install a disconnect for it. And you must identify it as such. The disconnect must be a switch or circuit breaker [630.13].

The rating plate must have the eight types of information identified by 630.14. If it doesn't, contact the manufacturer for a replacement plate that does.



The electrode and work conductor of an arc welder constitute the secondary circuit of the welder. Don't treat this as premises wiring for purposes of applying Article 250 [630.15].

Resistance welders have special requirements above and beyond those for other welders. These are detailed in Article 630, Part III.



Welding cables have special requirements, and these are detailed in Article 630, Part IV.



Q. How do I size the conductors for an arc welder?

A. The supply conductors for arc welders must have an ampacity not less than the welder nameplate rating. If the nameplate rating isn't available, the supply conductors must have an ampacity not less than the rated primary current as adjusted by the multiplier in Table 630.11(A), based on the duty cycle of the welder.

Let's work an example problem to help hit this point home.

A non-motor/generator arc welder has a primary current rating of 40A with a duty cycle of 50%.
 Calculated Load = Primary Rating x Multiplier [Table 630.11(A)]
 Calculated Load = 40A x 0.71 = 28.40A

Therefore, the branch-circuit conductor for the welder must not be sized less than 30A. As per Table 310.15(B)(16), a 10 AWG conductor has an ampacity of 35A at 75°C



Multiple Welders Question

What is the minimum circuit ampacity and minimum size conductor required for the feeder conductors supplying the following group of electric arc welders?

Q. What is the minimum circuit ampacity and minimum size conductor required for the feeder conductors supplying the following group of electric arc welders?

one each—80A rated, non-motor generator, 100% duty cycle.
 one each—70A rated, motor generator, 90% duty cycle.
 one each—60A rated, non-motor generator, 70 % duty cycle.
 one each—50A rated, non-motor generator, 80% duty cycle.
 four each—40A rated, motor generator, 60% duty cycle.
 four each—25A rated, non-motor generator, 40% duty cycle.

Terminals at the feeder overcurrent device and in the welder disconnects are rated 75°C. The feeder consists of one conductor per phase, which is specified as THHN insulated, dry location.

Answer???

A) 350 kcmil THHN
 B) 400 kcmil THHN
 C) 500 kcmil THHN
 D) 600 kcmil THHN

Explanation:

As per a change to the 2005 NEC, section 630.11(B) was revised to note that the minimum conductor ampacity shall be based on the individual currents determined in 630.11(A) as the sum of: 100% of the two largest welders, plus 85% of the third largest welder, plus 70% of the fourth largest welder, plus 60% of all remaining welders.

Therefore, the answer is calculated as follows (individual calculations are in same order as listed in the prior slides):

$$\begin{aligned}
 &80 \times 1.00 = 80A \\
 &70 \times 0.96 = 67.2A \\
 &60 \times 0.84 = 50.4A \\
 &50 \times 0.89 = 44.5A \\
 &40 \times 0.81 \times 4 = 129.6A \\
 &25 \times 0.63 \times 4 = 63A \\
 &80 + 67.2 + (0.85 \times 50.4) + (0.70 \times 44.5) + [0.60 \times (129.6 + 63)] \\
 &= \\
 &80 + 67.2 + 42.84 + 31.15 + (0.60 \times 192.6) = \\
 &80 + 67.2 + 42.84 + 31.15 + 115.56 = 336.75, \text{ round up to} \\
 &337A
 \end{aligned}$$

From Table 310.16, 75°C column, we can see that a 500kcmil conductor is rated at 380A. This is the minimum size conductor that will work for this particular application.

- A) 350 kcmil THHN
- B) 400 kcmil THHN
- C) 500 kcmil THHN
- D) 600 kcmil THHN

Answer: C

OCPD at 200%

760 Amperes !!!!

STATE OF CONNECTICUT
DEPARTMENT OF CONSUMER PROTECTION
OCCUPATIONAL & PROFESSIONAL LICENSING DIVISION

EVALUATION FORM FOR ELECTRICAL CONTINUING EDUCATION COURSE

TO BE FILLED OUT BY THE STUDENT AND MAILED TO THE ADDRESS BELOW
PROVIDERS ARE NOT PERMITTED TO COLLECT, PROCESS OR DELIVER THIS INFORMATION

Date: _____ Email Address: _____ Phone: _____

Student Name: _____

School Name: _____ Course Name: _____

Location of Class: _____ Time: _____ Course Date: _____

Each instructor shall be evaluated by the students at the end of the course. Please rate your instructor and course in the following categories. Circle your choices.

INSTRUCTOR / FACILITY	POOR	FAIR	GOOD	VERY GOOD
1. Started and ended class on time	1	2	3	4
2. Instructor's delivery of subject matter	1	2	3	4
3. Level of preparation for the class	1	2	3	4
4. Knowledge of the subject	1	2	3	4
5. Ability to answer questions	1	2	3	4
6. Rapport with the class	1	2	3	4
7. Made learning enjoyable	1	2	3	4
8. Enthusiasm	1	2	3	4
9. Depth of coverage	1	2	3	4
10. Taught the course as it was advertised	1	2	3	4
11. Gave me information that will benefit	1	2	3	4
12. Overall evaluation of the Instructor	1	2	3	4
13. Registration process	1	2	3	4
14. Staff handled in a professional manner	1	2	3	4
15. Materials (handouts)	1	2	3	4
16. Course content	1	2	3	4
17. Overall evaluation of the course	1	2	3	4
18. Accommodations of Facility	1	2	3	4

Comments: _____

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