ORDINANCE No. 115781

COUNCIL BILL No. 108638

AN ORDINANCE relating to the Seattle Electrical Code, repealing Ordinances 114181 and 114182, and adopting and amending the 1990 National Electric Code

The City o

Honorable President:

Your Committee on

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COMPTROLLER FILE No.

Introduced: AUG 5 1991	By: SMITH
Referred: AUG 5 1991	To: Whites
Referred:	To:
Referred:	To:
Reported: SEP 3 1991	Second Reading: SEP 3 1991
Third Reading: SEP 3 1991	Signed:
Presented to Mayor: SEP 4 1991	Approved: SEP 9 1991
Returned to City Clerk:	Published:
Vetoed by Mayor:	Veto Published:
Passed over Veto:	Veto Sustained:

Of

Law Department

The City of Seattle--Legislative Department

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the

Date Reported and Adopted

REPORT OF COMMITTEE

President:

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-91/HOLD/Utility Committee

-91/HOLD/Utility Committee

-91/DO PASS/Utility Committee

Committee Chair

ORDINANCE 115781

AN ORDINANCE relating to the Seattle Electrical Code, repealing Ordinances 114181 and 114182; adopting the 1990 National Electrical Code; repealing sections 90-1 and 90-2, Purpose and scope of the code; sections 220-30 and 220-31, Optional calculations for loads in dwelling units; section 333-10, Flat conductor cable installed through studs, joists and rafters; sections 336-12 and 336-16, Use of nonmetallic-sheathed cable in basements and use of insulating material; article 342, Nonmetallic extensions; section 348-4, Use of electrical metallic tubing in wet locations; sections 450-41 through 450-48, transformer vault; adding chapters 1, 2 and 3, Application and enforcement of the code, permits and inspections; section 110-23, Electrified fences; section 220-5, Individual branch circuits; section 220-23, Service entrance calculation; section 230-5, Type of services; section 230-33, Conversion or increase of service; article 343, Nonmetallic extensions prohibited; section 450-20, Rating of dry-type transformers; section 555-10, Lighting fixtures for marinas and boatyards; section 620-102, Convenience outlets for elevator machine rooms; amending article 100, Definitions; section 110-13, Mounting and cooling of equipment; section 110-16, Working space around equipment; section 210-8, Ground-fault circuit interrupter protection; section 215-2, Feeders; section 220-15, Fixed electric space heating; section 220-17, Appliance loads for dwelling units; sections 220-19 and 220-20, Feeder demand load for kitchen equipment; section 230-1, Service entrance locations; section 230-3, Service of one building through another; sections 230-28 and 230-29, Supports for service-drop conductors; sections 230-40 and 230-42, Number, size and rating of service-entrance conductor sets; section 230-43, Wiring methods for service-entrance conductors; section 230-52, Conductors entering buildings; section 230-62, Enclosure of service equipment; section 230-82, Connecting equipment to supply side of service disconnect; section 250-1, Scope of grounding provisions; section 250-80, Bonding of piping systems; section 250-81, Grounding electrode system; section 250-84, Resistance of made electrodes; section 300-1, Wiring methods for health and personal care facilities; section 300-21 and 300-22, Spread of fire through penetrations, ducts and plenums; section 310-4, Conductors in parallel; section 324-4, Uses not permitted for knob-and-tube wiring; section 331-4, Uses not permitted for electrical nonmetallic tubing; section 333-6, Uses permitted for armored cable; sections 334-3 and 334-10, Permitted uses and installation of metal-clad cable; sections 336-3, 336-4 and 336-10, Uses permitted and not permitted for nonmetallic-sheathed cable and its installation in exposed locations; sections 338-2 and 338-3, Uses permitted for service-entrance cable; section 347-2, Uses permitted for rigid nonmetallic conduit; sections 348-1 and 348-8, Use of electrical metallic tubing and couplings and connectors; section 370-1, Scope of provisions for outlet, device, pull and junction boxes, conduit bodies and fittings; section 373-3, Position of cabinets and cutout boxes; section 374-1, Use of auxiliary gutters; sections 380-3, 380-10 and 380-13, Enclosure of switches, and mounting of snap and knife switches; section 384-14, Lighting and appliance branch-circuit panelboards; sections 450-10 and 450-13, Grounding and location of transformers and transformer vaults; sections 555-4 and 555-6, Branch circuits and wiring methods in marinas and boatyards; section 600-5,

Grounding of electric signs and outline lighting; section 620-21, Wiring methods for elevators, dumbwaiters, escalators and moving walks; section 620-37, Wiring in hoistways; section 620-44, Installation of elevator traveling cables; sections 620-71 and 620-72, Guarding equipment and clearances around elevator control panels and disconnecting means; section 620-81, Metal raceways attached to elevator cars; sections 700-4 and 700-12, Tests, maintenance and general requirements for emergency systems; section 700-16, Emergency illumination.

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. Section 22.300.010 of the Seattle Municipal Code adopting the 1987 National Electrical Code is hereby repealed, and a new Section 22.300.010 is added to the Seattle Municipal Code to read as follows:

22.300.010 Adoption of National Electrical Code

The National Electrical Code, 1990 Edition, published by the National Fire Protection Association, one copy of which is filed with the City Comptroller in C.F. _____, is hereby adopted and by this reference made a part of this subtitle. The National Electrical Code, 1990 Edition, together with the amendments and additions thereto adopted by Ordinance 115781, shall constitute the Seattle Electrical Code.

Section 2. The National Electrical Code, 1990 Edition, (Seattle Municipal Code Section 22.300.010), is amended by adding new Chapters 1, 2, and 3 as follows:

CHAPTER 1
APPLICATION OF THIS CODE

TITLE

Section 101. This code shall be known as the "Seattle Electrical Code Supplement" and may be so cited. It is referred to herein as the "Electrical Code" or "this code."

PURPOSE

Section 102. The purpose of this code is to protect persons, buildings and the contents thereof in a practical manner from hazards arising from the use of electricity for lights, heat, power, radio, signaling and other purposes. An additional purpose of this code is to provide equal, higher or better standards of construction and/or equal, higher or better standards of materials, devices, appliances and equipment than that required by the State of Washington under the provisions of Chapter 19.28 RCW (Revised Code of Washington). This code is intended to pro-

vide for and promote the health, safety and welfare of the general public, and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this code.

SCOPE

Section 103. The Electrical Code shall apply to all electrical wiring and equipment, including optical fiber cables, installed or used within the City.

Exception No. 1: Installations in ships and watercraft not connected to public utilities, railway rolling stock, aircraft or automotive vehicles.

Exception No. 2: Installations of railways or generation, transformation, transmission or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communication purposes.

Exception No. 3: Installations of communication equipment under exclusive control of communication utilities, located outdoors or in building spaces used exclusively for such installations.

Exception No. 4: Installation of communication or signaling equipment used exclusively for the operation of a municipal fire alarm or police telegraph system.

Exception No. 5: Installations under the exclusive control of electric utilities for the purpose of communication, metering or for the generation, control, transformation, transmission and distribution of electric energy located in buildings used for such purposes or leased by the utility or on public highways, streets, roads or other public ways, or outdoors on established rights on private property up to the point of connection as defined in this code. The installation and maintenance of all service conductors up to the point of connection to the consumer's service entrance conductors shall be the responsibility of the serving utility.

APPLICATION TO EXISTING BUILDINGS

Section 104. (a) **Additions, Alterations and Repairs.** Additions, alterations and repairs may be made to the electrical system of existing buildings or structures without making the entire electrical system comply with all of the requirements of this code for new buildings or structures, provided the additions, alterations or repairs that are made shall comply with the requirements of this code except as otherwise specifically provided in other applicable retroactive ordinances of the City.

Exception: Subject to the approval of the building official, repairs may be made with the same materials of which the building or structure is constructed, provided the repair complies with the electrical code in effect at the time of original installation and provided further that no change shall be permitted which increases its hazard.

(b) **Existing Electrical Systems.** Electrical systems in existence at the time of the passage of this code may continue to be used provided such use was legal at the time of the passage of this code and provided continued use is not dangerous to life or limb.

(c) **Maintenance.** All buildings or structures, both existing and new, and all parts thereof shall be maintained in a safe condition. All devices or safeguards which are required by this code or which were required by a code in effect when the building or structure was erected, altered or repaired shall be maintained in good working order. The owner or the owner's agent shall be responsible for the maintenance of buildings and structures.

It shall be the duty of the owner or the owners' agent to maintain in a safe and usable condition all parts of buildings or equipment which are intended to assist in the extinguishing of fire, or to prevent the origin or spread of fire, or to safeguard life or property. It shall be unlawful to fail to immediately comply with any notice or order of the fire chief or the building official.

Exception: The building official may modify the requirements of this subsection where all or a portion of a building is unoccupied.

(d) **Historic Buildings and Structures.** The building official may modify the specific requirements of this code as it applies to buildings and structures designated as landmarks of historical or cultural importance and require in lieu thereof alternate requirements which in the opinion of the building official will result in a reasonable degree of safety to the public and the occupants of those buildings.

A historic building or structure is one which has been designated for preservation by City Council or the State of Washington, has been listed, or has been determined eligible to be listed, on the National Register of Historic Places, has been officially nominated for such status, or is a structure contributing to the character of a designated landmark or historic district.

(e) **Moved Buildings.** Buildings or structures moved into or within the city shall comply with standards adopted by the building official. No building shall be moved into or within the City unless, prior to moving, the building official has inspected the building for compliance with those standards and the permit holder has agreed to correct all deficiencies found and has been issued an electrical permit for the work. Any moved building that is not in complete compliance with those standards within one year from the date of permit issuance and is found to be a public nuisance may be abated.

TESTS

Section 105. Whenever there is insufficient evidence of compliance with the provisions of this code or evidence that any material or construction does not conform to the requirements of this code, the building official may require tests as proof of compliance to be made at no expense to the City.

Test methods shall be specified by this code or by other recognized test standards. If there are no recognized and accepted test methods for the proposed alternate, the building official shall determine the test procedures.

All tests shall be made by an approved agency. Reports of tests shall be retained by the building official.

ALTERNATE MATERIALS AND METHODS OF WIRING

Section 106. The provisions of this code are not intended to prevent the use of any material, method or design of wiring not specifically prescribed by this code, provided any alternate has been approved and its use authorized by the building official.

The building official may approve an alternate provided the building official finds that the proposed design is satisfactory and complies with the provisions of this code and that the material, method and design offered is, for the purpose intended, at least the equivalent of that prescribed in this code in suitability, strength, effectiveness, fire resistance, durability, safety and sanitation.

The building official may require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding the use of an alternate. The details of any action granting approval of an alternate shall be retained by the building official.

MODIFICATIONS

Section 107. The building official may grant modifications for individual cases whenever there are practical difficulties involved in carrying out the provisions of this code. The building official must first find that a special individual reason makes the strict letter of this code impractical and that the modification is in conformity with the intent and purpose of this code and does not lessen any fire protection requirements or any degree of structural integrity. The details of any action granting modifications shall be recorded and entered in the files of the building official.

CHAPTER 2

ORGANIZATION AND ENFORCEMENT

AUTHORITY

Section 201. Whenever the term or title "Authority Having Jurisdiction," "Administrative Authority," "Responsible Official," "Building Official," "Chief Inspector" or "Code Enforcement Officer" is used in this code, it shall be construed to mean the Director of the Department of Construction and Land Use of the City of Seattle.

POWERS AND DUTIES OF THE BUILDING OFFICIAL

Section 202. (a) **General.** The building official is authorized and directed to interpret and enforce the provisions and intent of this code.

Compliance with the requirements of this code shall be the obligation of the owner of the building, structure or premises, the duly authorized agent of the owner, or other person responsible for the condition or work, and not of the city or any of its officers or employees.

(b) **Deputies.** The building official may appoint such officers, inspectors, assistants and other employees as shall be authorized from time to time. The building official may deputize such employees as may be necessary to carry out the functions of the Department of Construction and Land Use.

(c) **Right of Entry.** With the consent of the owner or occupier of a building or premises, or pursuant to a lawfully issued warrant, the building official may enter a building or premises at any reasonable time to perform the duties imposed by this code.

(d) **Stop Orders.** Whenever any installation, alteration, repair or removal of electrical work is being done contrary to the provisions of this code, or in the event of dangerous or unsafe conditions related to electrical work, the building official may order the affected work stopped and a notice describing the violation in writing posted on the premises or served on any person responsible for the condition or work. It shall be unlawful for any person to engage in or cause any further work to be done until authorization from the building official is received.

(e) **Authority to Disconnect Utilities.** The building official shall have the authority to disconnect or order discontinuance of any utility service or energy supply to buildings, structures or equipment therein regulated by this code in cases of emergency or where necessary for safety to life and property. The building official may enter any building or premises to disconnect utility service or energy supply. Utility service shall be discontinued until the equipment, appliances, devices or wiring found to be defective or defectively installed are removed or restored to a safe condition.

It shall be unlawful for any person to reconnect any electrical equipment which has been disconnected by the building official until the equipment has been placed in a safe condition and approved by the building official.

(f) **Liability.** Nothing contained in this code is intended to be nor shall be construed to create or form the basis for any liability on the part of the City, or its officers, employees or agents, for any injury or damage resulting from the failure of a building to conform to the provisions of this code, or by reason or in consequence of any inspection, notice, order, certificate, permission or approval authorized or issued or done in connection with the implementation or enforcement of this code, or by reason of any action or inaction on the part of the City related in any manner to the enforcement of this code by its officers, employees or agents.

Neither the building official nor any employee charged with the enforcement of this code shall be personally liable for any damage that accrues to persons or property as a result of any act or omission committed in the discharge of their duties, provided that the building official or employee acted in good faith and without malice. Any suit brought against the building official or an employee because of an act or omission performed in the enforcement of any provisions of this code shall be defended by the City.

(g) **Code Interpretation or Explanation.** Electrical inspectors may give information as to the meaning or application of the National Electrical Code and the Seattle Supplement, but shall not lay out work or act as consultants for contractors, owners or users.

(h) **Cooperation of Other Officials and Officers.** The building official may request, and shall receive so far as may be necessary in the discharge of duties, the assistance and cooperation of other officials of the City of Seattle and officers of public and private utilities.

UNSAFE CONDITIONS

Section 203. The building official may inspect any new or existing electrical installation or equipment, and if the installation or equipment is found to be maintained or used in an unsafe condition or found to be in violation of this code, the building official shall serve upon the owner or user a notice or order requiring correction. Any person served such notice who fails to comply with the order therein shall be in violation of this ordinance and subject to the penalties provided in this code.

Whenever the building official finds that any building or structure, or portion thereof, is in such a dangerous and unsafe condition as to constitute an imminent hazard to life or limb, the building official may issue an emergency order directing that the building or structure, or portion thereof, be restored to a safe condition. The order shall specify the time for compliance. The order may also require that the building or structure, or portion thereof, be vacated within a reasonable time, to be specified in the order. In the case of extreme danger, the order may specify immediate vacation of the building or structure, or may authorize disconnection of the utilities or energy source pursuant to Section 202(e). No person shall occupy the building or structure, or portion thereof, after the date on which it is required to be vacated until it is restored to a safe condition as required by the order and this code. It shall be unlawful for any person to fail to comply with an emergency order issued by the building official.

VIOLATIONS AND PENALTIES

Section 204. (a) **Violations.** It shall be a violation of this code for any person, firm or corporation to erect, construct, enlarge, repair, move, improve, remove, convert or demolish, equip, occupy, or maintain any building or structure in the city, contrary to or in violation of any of the provisions of this code.

It shall be a violation of this code for any person, firm or corporation to aid, abet, counsel, encourage, hire, commend, induce or otherwise procure another to violate or fail to comply with any of the provisions of this code.

It shall be a violation of this code for any person, firm or corporation to use any materials or to install any device, appliance or equipment which does not comply with applicable standards of this code or which has not been approved by the building official.

(b) **Civil Penalty.** Any person, firm or corporation failing to comply with the provisions of this code shall be subject to a cumulative civil penalty in an amount not to exceed $500 per day for each violation from the date the violation occurs or begins until compliance is achieved.

(c) **Criminal Penalties.** 1. Anyone violating or failing to comply with any order issued by the building official pursuant to

this code shall, upon conviction thereof, be punished by a fine of not more than $1,000 or by imprisonment for not more than 360 days, or by both such fine and imprisonment. Each day's violation or failure to comply shall constitute a separate offense.

2. Anyone violating or failing to comply with any of the provisions of this code and who within the past five years has had a judgment against them pursuant to Sec. 204(b), shall upon conviction thereof be fined in a sum not to exceed $500 or by imprisonment for not more than 180 days, or by both such fine and imprisonment. Each day's violation or failure to comply shall constitute a separate offense.

(d) **Additional Relief.** The building official may seek legal or equitable relief to enjoin any acts or practices and abate any condition which constitutes a violation of this code when civil or criminal penalties are inadequate to effect compliance.

NOTICES

Section 205. It shall be unlawful for any person to remove, mutilate, destroy or conceal any lawful notice issued or posted by the building official pursuant to the provisions of this code.

The building official may record a copy of any order or notice with the Department of Records and Elections of King County.

The building official may record with the Department of Records and Elections of King County a notification that a permit has expired without a final inspection after reasonable efforts have been made to obtain a final inspection.

RULES OF THE BUILDING OFFICIAL

Section 206. (a) Authority. The building official is authorized to promulgate, adopt and issue the following rules:

(1) "Electrical Wiring Standards" to promulgate standards which are acceptable as a method or as an alternative design for meeting code required performance criteria, to edit or update national standards which are referenced in the electrical code and to eliminate conflicts among code requirements.

(2) "Code Interpretations" to interpret and clarify conditions or language expressed in this code.

(3) "Product Approvals" to approve a specific building construction material or product, or a particular component fabricator which has been found acceptable as meeting required performance criteria of this code.

(4) Any other rule necessary for administration of the purpose and intent of this code.

(b) **Procedure for Adoption of Rules.** The building official shall promulgate, adopt and issue rules according to the procedures as specified in Chapter 3.02 of the Administrative Code, Seattle Municipal Code.

CONSTRUCTION CODES ADVISORY BOARD

Section 207. An Electrical Code committee of the Construction Codes Advisory Board, as established in Section 208 of the Seattle Building Code, may examine proposed new editions of, and amendments to this code and any proposed administrative rules promulgated to enforce this code. The Electrical Code committee may, according to rules of procedure adopted by the Board, make recommendations to the building official and to the City Council relating to this code and administrative rules. The committee shall be called on an as-needed basis for the Construction Codes Advisory Board.

APPEALS

Section 208. Appeals from decisions or actions pertaining to the administration and enforcement of this code shall be addressed to the building official. The applicant may request a review by a panel of the Construction Codes Advisory Board, convened by the Board Chair. The chair shall select a panel of at least three members from the Electrical Code Committee. The results of the panel's review shall be advisory only.

CHAPTER 3

PERMITS AND INSPECTIONS

PERMITS REQUIRED

Section 301. (a) Permits Required. It shall be unlawful to install, alter, extend or connect any electrical equipment in a building or premises, or allow the same to be done, without first obtaining a permit for the work from the building official.

(b) **Exempted Work.** An electrical permit shall not be required for the following work:

(1) Repairing flush or snap switches, replacing fuses, repairing lamp sockets and receptacles, or replacing ballast.

(2) Reconnecting or replacing a range within an individual dwelling unit, hot plate, water heater, electric baseboard, wall heating unit to a circuit which has been lawfully installed and approved, when no alteration of the circuit is necessary.

(3) The setting of meters by the City Light Department of the City of Seattle or anyone else engaged in the business of supplying electricity to the public, provided that meter loops have been installed under permit and that such meters are not connected to any electrical installation regulated by this code until approval for such connection has been given by the building official.

(4) The installation of 1000 feet or less of wiring for communications systems provided no portion of the wiring is located in a concealed ceiling cavity.

(5) The installation or repair of electrical equipment installed in connection with an elevator, dumbwaiter, or similar conveyance provided that work is covered under the issuance of an elevator 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 or ordinances of the City.

(c) **Areas of Flood Hazard.** In addition to the permit required by this section, all work to be performed in areas of special flood hazard, as identified in the report entitled "Flood Insurance Study for King County, Washington and Incorporated Areas" and the accompanying Flood Insurance Rate Maps and filed in C.F. 296948, is subject to additional standards and requirements, including floodplain development approval or a Floodplain Development License, as set forth in Chapter 25.06, the Seattle Floodplain Development Ordinance.

APPLICATION AND PLANS

Section 302. (a) **Application.** Application for an electrical permit shall be made on a form provided by the building official. Each application shall state the name and address of the owner, vendee or occupant in possession of the building or premises where the work is to be done, the name of the licensed contractor, if any, making the application, and such other information as the building official may require. The building official may refuse to issue or revoke a permit if any statement in the permit application is found to be untrue.

(b) **Plans and Specifications. 1. General.** In addition to the requirements of Section 302(a), two sets of plans and specifications shall be submitted with each application for an electrical permit for an installation of: services or feeders of 400 amperes or over, all switches or circuit breakers rated 400 amperes or over, any proposed installation which cannot be adequately described on the application form, and installations of emergency generators.

Exception: Plans and specifications shall not be required for installations for one- and two-family dwellings.

Two sets of electrical plans shall be submitted with each application for an electrical permit for new or altered electrical installations in educational, institutional, and health or personal care occupancies as indicated in Tables 300(A) and 300(B) of this Code.

Three sets of plans and specifications for fire alarm systems shall be submitted.

2. **Clarity of Plans.** Plans shall be drawn to a clearly indicated and commonly accepted scale of not less than 1/8 inch to 1 foot upon substantial paper such as blueprint quality or standard drafting paper. Tissue paper, posterboard or cardboard will not be accepted. The plans shall be of microfilm quality and limited to a minimum size of 11 inches by 17 inches and maximum size of 41 inches by 54 inches. Plans shall indicate the nature and extent of the work proposed and shall show in detail that it will conform to the provisions of this code. All electrical work shall be readily distinguishable from other mechanical work. If plans are incomplete, unintelligible or indefinite, the building official may require that the plans be prepared by a licensed electrical engineer, or may reject or refuse to examine such plans, even though a plan examination fee has been paid.

3. **Information on Plans and Specifications.** Plans and specifications shall indicate the following:

(1) The proposed use or occupancy of the various portions of the building in which the installation is to be made.

(2) A complete riser diagram.

(3) The calculated load schedule and demand factor selected for each branch circuit, feeder, subfeeder, main feeder and service. Panel and circuit schedules shall be shown. Note: Load calculations and heat loss calculations may be submitted on separate computation sheets.

(4) Fault current calculations and the listed interrupting rating for feeder or service installation or alteration.

(5) A key to any symbols used.

(6) Letters and numbers designating mains, feeders, branch circuits and distribution panels.

(7) Wattage, number of sockets and type of lighting fixture.

(8) Wattage and purpose of all other outlets.

(9) Voltage at which any equipment will operate.

(10) Identification of size of wires, type of insulation and all conduit sizes.

(11) Any other information as may be required by the plans examiner.

(c) **Advance Plan Examination.** An architect or engineer registered in the State of Washington may apply for an electrical permit and may request an advance plan examination of electrical plans where the electrical contractor has not yet been selected. Upon submission of an application including required plans, and payment of fifty percent of the estimated permit fee, the Department will review the application. When the application and plans are found to be in compliance with the Seattle Electrical Code, the Department will approve the application and plans as ready for issuance. Neither the permit nor the plans shall be issued until the remainder of the fee is paid and the electrical contractor's name and license number is placed on the permit.

PERMITS

Section 303. (a) Issuance. 1. General. The application and plans filed by an applicant for a permit shall be checked by the building official. Such plans may be reviewed by other departments of the City to check compliance with the laws and ordinances under their jurisdiction. If the building official finds that the work as described in an application for permit and the plans filed therewith conforms to the requirements of this code and other pertinent laws and ordinances and that the fees specified in the Permit Fee Ordinance have been paid, the building official shall issue a permit to the applicant who becomes the permit holder. The building official may refuse to issue an electrical permit to any person who refuses or fails to complete the work permitted by an existing permit on the same building or premises.

Exception No. 1: The building official may issue a permit for the installation of part of the electrical system of a building or structure before complete plans for the whole building or structure have been submitted or approved, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. Holders of such permits may proceed at their own risk without assurance that the permit for the entire building or structure will be granted.

Exception No. 2: A permit may be issued for work to commence prior to the approval of plans, if such approval is delayed beyond 10 working days after the plans have been submitted for examination. The holders of such permits may proceed at their own risk, with the understanding that any work undertaken prior to approval of plans shall be done in accordance with the provisions of this code and in accordance with the plans as subsequently approved.

2. **Compliance with Approved Plans and Permit.** When issuing a permit, the building official shall endorse the permit in writing and endorse in writing or stamp the plans APPROVED. Approved plans shall not be changed, modified or altered without authorization from the building official, and all work shall be done in accordance with the approved plans, except as the building official may require during field inspection to correct errors or omissions.

3. **Amendments to the Permit.** When substitutions and changes are made during construction, approval shall be secured prior to execution; however, the electrical inspector may approve minor modifications to the plans for work not reducing the fire and life safety of the structure. Substitutions, changes and clarifications shall be as shown on two sets of plans which shall be submitted to the building official, accompanied by redesign fees, prior to occupancy. These changes shall conform to the requirements of this code and other pertinent laws and ordinances.

4. **Requirement for License.** No electrical permit shall be issued to an applicant who is engaging in or conducting or carrying on the business of installing wires or equipment to convey electric current or of installing apparatus to be operated by electric current unless the applicant possesses a valid State of Washington license as required by RCW 19.28.

Exception: Persons not possessing a license may obtain an electrical permit in order to do electrical work at a residence, farm, place of business or other property which they own. The holder of a license may not perform electrical work under a permit issued to the property owner.

5. **Cancellation of Permit Application.** If a permit is not issued after a period of sixty days from the date of approval for issuance or if corrections are not received after a period of sixty days from the date of notification of required corrections, the building official may initiate cancellation procedures. Prior to cancellation, the building official shall notify the applicant that the permit application will expire and shall be cancelled after 30 days. After the applicant has been notified, the site may be inspected to verify that no work has taken place. The application shall be cancelled 30 days after notice has been sent to the applicant, and it and any accompanying plans and specifications destroyed and the portion of the fee paid forfeited. Upon written request of the applicant, the

building official may extend the life of the permit application for a period not to exceed six months, with no further extensions possible, except that applications may be further extended by the building official where permit issuance is delayed by litigation, appeals or similar problems.

(b) **Retention of Plans and Permits.** One set of approved plans, which may be on microfilm, shall be retained by the building official. One set of approved plans shall be returned to the applicant and shall be kept at the site or the building or work at all times during which the work authorized thereby is in progress. The plans shall be available at the site of the work or installation for use by the inspection personnel at all times. The permit issued by the building official shall be kept posted on the premises at all times during the course of the installation or work.

(c) **Validity.** The issuance or granting of a permit or approval of plans shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or any other ordinance. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid, except insofar as the work or use which it authorizes is lawful.

The issuance of a permit based upon plans shall not prevent the building official from later requiring the corrections of errors in the plans. The issuance of a permit based upon plans shall not be construed as permitting violations of this code or of any other ordinance of the City.

The issuance of an electrical permit shall not prevent the building official from requiring correction of conditions found to be in violation of this code or any other ordinance of the City. The period of time for which a permit is issued shall not be construed to extend or otherwise affect any period of time for compliance specified in any notice or order issued by the building official or other administrative authority requiring the correction of any such conditions.

(d) **Expiration and Renewal.** 1. **Expiration.** Permits and renewed permits shall expire one year from the date of issuance.

Exception No.1: Initial permits for major construction projects that require more than one year to complete, according to a construction schedule submitted by the applicant, may be issued for a period that provides reasonable time to complete the work but in no case longer than three years.

Exception No.2: Permits which expire in less than one year may be issued where the building official determines a shorter period is appropriate.

2. **Renewal.** Permits may be renewed and renewed permits may be further renewed by the building official provided the following conditions are met:

A. Application for renewal shall be made within the thirty-day period immediately preceding the date of expiration of the permit;

B. The work authorized by the permit has been started and is progressing at a rate approved by the building official;

C. If an application for renewal is made either more than one year after the effective date of a new or revised edition of the Electrical Code, the permit shall not be renewed unless:

(i) The building official determines that the permit complies, or is modified to comply, with the code or codes in effect on the date of application for renewal; or

(ii) The work authorized by the permit is substantially underway and progressing at a rate approved by the building official.

Permits may also be renewed where commencement or completion of the work authorized by the permit was delayed by litigation, appeals, strikes or other causes related to the work authorized by the permit, beyond the permit holder's control.

3. **Reestablishment.** A new permit shall be required to complete work where a permit has expired and was not renewed.

Exception: A permit which has been expired for less than one year may be reestablished upon approval of the building official provided it complies with Items B and C of Subsection 2, above.

(e) **Suspension or Revocation.** The building official may, by written order, suspend or revoke a permit issued under the provisions of this code whenever the permit is issued in error or on the basis of incorrect information, or in violation of any ordinance or regulation or any provision of this code.

(f) **Permit for Temporary Installations.** The building official may issue permits for temporary electrical installations for use during the construction of buildings or for carnivals, conventions, festivals, fairs, the holding of religious services, temporary lighting of streets and the like if it is found that life or property will not be jeopardized.

Permission to use a temporary installation shall be granted for no longer than six months, except that a permit for a temporary installation to be used for the construction of a building may be issued for the necessary period of construction. Should temporary lighting be over the street area, proper authority for use of the street shall first be obtained from the Seattle Engineering Department. All temporary installations shall comply with all other requirements of this code.

PERMIT FEES

Section 304. A fee for each electrical permit and for other activities related to the enforcement of this Code shall be paid as set forth in the Permit Fee Ordinance.

INSPECTIONS

Section 305. (a) General. It shall be unlawful to connect or to allow the connection of any electrical installations, extensions thereof, or electrical equipment to the electric current until the work is inspected and approved by the building official.

(b) **Inspection Requests.** It shall be the duty of the owner of the property, the owner's authorized agent, or the person designated by the owner/agent to do the work authorized by a permit to notify the building official that work requiring inspection as specified in this section is ready for inspection. Where a permit has been issued to a licensed contractor, it shall be the duty of the contractor to notify the building official that work requiring inspection is ready for inspection.

It shall be the duty of the person requesting any inspections required by this code to provide access to and means for proper inspection of the work. It shall be the duty of the permit holder to cause the work to be accessible and exposed for inspection purposes. Neither the building official nor the City shall be liable for expense entailed in the required removal or replacement of any material to allow inspection.

(c) **Inspection Record.** Work requiring a permit shall not be commenced until the permit holder or agent has posted an inspection record in a conspicuous place on the premises and in a position which allows the building official to conveniently make the required entries thereon regarding inspection of the work. This record shall be maintained in such position by the permit holder until final approval has been granted by the building official and the serving utility has made the connection to the electric current.

(d) **Approvals Required.** No work shall be done on any part of the building or structure beyond the point indicated in each successive inspection without first obtaining the written approval of the building official. Written approval shall be given only after an inspection has been made of each successive step in the construction as indicated by each of the inspections required in subsection (e).

(e) **Required Inspections.** 1. **Cover Inspection.** Cover inspections may be required when all of the following work has been completed:

A. All piping, ducts, plumbing and like installations of other trades which are liable to interfere or run in close proximity to the electrical installation are permanently in place and inspected, but prior to any work to cover or conceal any installation of electrical equipment, and;

B. For make-up of equipment conductors, see Article 250-1 of this code; and

C. For conduit systems, after all conduit has been installed and properly secured to the structure.

2. **Final Inspection.** A final inspection shall be made after all wiring has been completed and all permanent fixtures such as switches, outlet receptacles, plates, electric hot water tanks, lighting fixtures and all other equipment has been properly installed. The permit holder shall call for a final inspection when the work described on the permit has been completed.

(f) **Other Inspections.** In addition to the called inspections specified in Subsection (e), the building official may make or require any other inspections of any construction work to ascertain compliance with the provisions of this code and other laws which are enforced by the building official.

Where work, for which any permit or approval is required, is commenced or performed prior to making formal application and receiving the building official's permission to proceed, the building official may make a special investigation inspection before a permit may be issued for the work. Where a special investigation is made, a special investigation fee may be assessed in accordance with the Permit Fee Ordinance.

(g) **Reinspections.** The building official may require a reinspection when work for which inspection is called is not complete, corrections called for are not made, the permit card is not properly posted on the work site, the approved plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, or when deviations from plans which require the approval of the building official have been made without proper approval.

For the purpose of determining compliance with Section 104(c) Maintenance, the building official or the fire chief may cause any structure to be reinspected.

The building official may assess a reinspection fee as set forth in the Permit Fee Ordinance for any action listed above for which reinspection may be required, whether or not a reinspection is actually performed. A reinspection fee shall not be assessed the first time the work subject to inspection is rejected for failure to comply with the requirements of this Electrical Code.

In instances where reinspection fees have been assessed, no additional inspection of the work shall be performed until the required fees have been paid.

Section 3. Sections 90-1 and 90-2 of the National Electrical Code, 1990 Edition, are hereby repealed.

Section 4. Article 100 of the National Electrical Code, 1990 Edition, is amended as follows:

ARTICLE 100 - DEFINITIONS

SCOPE. This article contains only those definitions essential to the proper application of this Code. It is not intended to include commonly defined general terms nor commonly defined technical terms from related codes and standards. In general, only those terms used in two or more articles are defined in Article 100. Other definitions are included in the article in which they are used but may be referenced in Article 100.

Part A of this article contains definitions intended to apply wherever the terms are used throughout this Code. Part B contains definitions applicable only to the parts of articles covering specifically installations and equipment operating at over 600 volts, nominal.

Terms and phrases used in this code but not defined herein shall be as defined in the Seattle Building Code and the Seattle Mechanical Code. Where undefined terms are used, the definitions of Webster's Third New International Dictionary of The English Language, Unabridged, copyright 1986, shall apply.

* * *

POINT OF CONNECTION: The terminating point of the utility's distribution system, and is further defined and located as follows:

(1) For overhead service drop conductors from the utility pole to the point of attachment to the building, connections of the service entrance conductors shall be at a weatherhead outside the building.

(2) For underground service connections outside of buildings, connection shall be made in one of the following:

(i) A service terminal box or current transformer cabinet.

(ii) A handhole or power transformer installed outdoors in accordance with requirements of the utility, the Seattle Building Code, or any other applicable ordinance.

(iii) A meter socket of 200 amperes minimum size, direct-metered.

(3) For underground service connections inside of buildings, connection shall be made to one of the following:

(i) Where utility-supplied conductors are used, a service terminal box or current transformer cabinet connected by no more than eighteen inches of rigid conduit inside the building.

(ii) A transformer vault within the building.

(iii) A meter socket of 200 amperes minimum size, direct-metered.

* * *

SERVICE TERMINAL BOX: An approved box to be used exclusively for the connection of the utility distribution system to the consumer's service entrance conductors.

* * *

Section 5. Article 110-13 of the National Electrical Code, 1990 Edition, is amended as follows:

110-13. MOUNTING AND COOLING OF EQUIPMENT.

(a) **Mounting.** Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

No electrical equipment shall project beyond the face of the wall in halls, corridors or other locations which would reduce the width required by the Building Code for such locations. No electrical equipment such as pull boxes, junction boxes, conduit, panels, transformers, water heaters, motors, compressors, or similar equipment shall be installed within a required stairway enclosure. Electrical raceways pertaining to fire and life safety devices may be installed within a required stairway enclosure.

(b) **Cooling.** Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air.

Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

Section 6. Section 110-16 of the National Electrical Code, 1990 Edition, is amended as follows:

110-16 WORKING SPACE ABOUT ELECTRIC EQUIPMENT (600 VOLTS, NOMINAL, OR LESS).

Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(a) **Working Clearances.** Except as elsewhere required or permitted in this Code, the dimension of the working space in the direction of access to live parts operating at 600 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall not be less than indicated in Table 110-16(a). Distances shall be measured from the live parts if such are exposed or from the enclosure front or opening if such are enclosed. Concrete, brick, or tile walls shall be considered as grounded.

In addition to the dimensions shown in Table 110-16(a), the work space shall not be less than 30 inches (762 mm) wide in front of the electric equipment. In all cases, the work space shall permit at least a 90-degree opening of equipment doors or hinged panels.

Table 110-16(a). Working Clearances

Voltage to Ground, Nominal	Minimum Clear Distance (feet)		
Condition:	1	2	3
0-150	3	3	3
151-600	3	3 1/2	4

For SI units: one inch = 25.4 millimeters; one foot = 0.3048 meter.

Where the "conditions" are as follows:

1. Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at not over 300 volts shall not be considered live parts.

2. Exposed live parts on one side and grounded parts on the other side.

3. Exposed live parts on both sides of the work space (not guarded as provided in Condition 1) with the operator between.

Exception No.1: Working space shall not be required in back of assemblies such as dead-front switchboards, or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Exception No.2: By special permission smaller spaces may be permitted (1) where it is judged that the particular arrangement of the installation will provide adequate accessibility, or (2) where all uninsulated parts are at a voltage no greater than 30 volts RMS or 42V dc.

(b) **Clear Spaces.** Working space required by this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded.

(c) **Access and Entrance to Working Space.** At least one entrance of sufficient area shall be provided to give access to the working space about electric equipment.

For equipment rated 1200 amperes or more and over 6 feet (1.83 m) wide, containing overcurrent devices, switching devices, or control devices, there shall be one entrance not less than 24 inches (610 mm) wide and 6-1/2 feet (1.98 m) high at each end.

Exception No.1: Where the location permits a continuous and unobstructed way of exit travel.

Exception No.2: Where the work space required by Section 110-16(a) is doubled, only one entrance to the working space is required.

Working space with one entrance provided shall be so located that the edge of the entrance nearest the equipment is the minimum clear distance given in Table 110-16(a) away from such equipment.

(d) **Front Working Space.** In all cases where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(e) **Illumination.** Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, or motor control centers installed indoors.

((**Exception:** ~~Service equipment or panelboards, in dwelling units, that do not exceed 200 amperes.~~))

(f) **Headroom.** The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6-1/4 feet (1.91 m).

((**~~Exception:~~** ~~Service equipment or panelboards, in dwelling units, that do not exceed 200 amperes.~~))

(FPN No. 1): For higher voltages, see Article 710.

(FPN No. 2): As used in this section, a motor control center is an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

Section 7. Article 110 of the National Electrical Code, 1990 Edition, is amended by adding a new section 110-23 as follows:

110-23 ELECTRIFIED FENCES.

Electrified fences, associated equipment and similar devices shall be permitted only by special permission from the Building Official.

Section 8. Section 210-8, of the National Electrical Code, 1990 Edition, is amended as follows:

210-8 GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL.

(a) **Dwelling Units.**

(1) All 125-volt, single-phase, 15- and 20-ampere receptacles installed in bathrooms shall have ground-fault circuit-interrupter protection for personnel. These receptacles shall be supplied from one or more dedicated circuits which shall supply no other loads.

(2) All 125-volt, single-phase, 15- or 20-ampere receptacles installed in garages shall have ground-fault circuit-interrupter protection for personnel.

Exception No.1 to (a) (2): Receptacles which are not readily accessible.

Exception No.2 to (a) (2): Receptacles for appliances occupying dedicated space which are cord- and plug-connected in accordance with Section 400-7 (a)(6), (a)(7), or (a)(8).

Receptacles installed under exceptions to Section 210-8(a)(2) shall not be considered as meeting the requirements of Section 210-52(g).

(3) All 125-volt, single-phase, 15- and 20-ampere receptacles installed outdoors ((~~where there is direct grade level access to the dwelling unit and to the receptacles~~)) at a dwelling unit shall have ground-fault circuit-interrupter protection for personnel.

(FPN): See Section 215-9 for feeder protection.

((~~For the purposes of this section, "direct grade level access" is defined as being located not more than 6 feet, 6 inches (1.98 m) above grade level and being readily accessible.~~))

(4) All 125-volt, single-phase, 15- and 20-ampere receptacles installed in crawl spaces at or below grade level and in unfinished basements shall have ground-fault circuit-interrupter protection for personnel.

Exception No. 1: A single receptacle supplied by a dedicated branch circuit which is located and identified for specific use by a cord- and plug-connected appliance, such as a refrigerator or freezer.

Exception No. 2: The laundry circuit as required by Sections 210-52(f) and 220-4(c).

Exception No. 3: A single receptacle supplying a permanently installed sump pump.

(5) All 125-volt, single-phase, 15- and 20-ampere receptacles installed ((~~within 6 feet (1.83 m) of a kitchen sink to serve counter top surfaces~~)) in kitchens in a dwelling unit on the small appliance branch circuit shall have ground-fault circuit-interrupter protection for personnel.

Exception: Receptacle outlets for dedicated use, such as for a dishwasher, disposal, trash compactor, refrigerator or freezer.

(FPN): The intent of this subsection is to permit the exemption of receptacles which are located specifically for appliances such as refrigerators and freezers from ground-fault circuit-interrupter protection for personnel.

(6) All 125-volt, single-phase, 15- or 20-ampere receptacles installed in boathouses shall have ground-fault circuit-interrupter protection for personnel.

(b) Hotels and Motels. All 125-volt, single-phase 15- and 20-ampere receptacles installed in bathrooms of guest rooms in hotels and motels shall have ground-fault circuit-interrupter protection for personnel.

Bathroom: All used in Section 210-8, a bathroom is an area including a basin with one or more of the following: a toilet, a tub or a shower.

Section 9. Section 215-2 of the National Electrical Code, 1990 Edition, is amended as follows:

215-2. MINIMUM RATING AND SIZE.

Feeder conductors shall have an ampacity not lower than required to supply the load as computed in Parts B, C, and D of Article 220. The minimum sizes shall be as specified in (a) and (b) below under the conditions stipulated. Feeder conductors for a dwelling unit or a mobile home need not be larger than service-entrance conductors. Article 310, Note 3, Notes to Ampacity Tables of 0 to 2000 Volts shall be permitted to be used for conductor size.

(a) **For Specified Circuits.** The ampacity of feeder conductors shall not be less than 30 amperes where the load supplied consists of any of the following number and types of circuits: (1) two or more 2-wire branch circuits supplied by a 2-wire feeder; (2) more than two 2-wire branch circuits supplied by a 3-wire feeder; (3) two or more 3-wire branch circuits supplied by a 3-wire feeder; or (4) two or more 4-wire branch circuits supplied by a 3-phase 4-wire feeder.

(b) **Ampacity Relative to Service-Entrance Conductors.** The feeder conductor ampacity shall not be lower than that of the service-entrance conductors where the feeder conductors carry the total load supplied by service-entrance conductors with an ampacity of 55 amperes or less.

(FPN No. 1): See Examples 1 through 8 in Chapter 9.

(FPN No. 2): Conductors for feeders as defined in Article 100, sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads and where the maximum total voltage drop on both feeders and branch circuits to the farthest outlet does not exceed 5 percent, will provide reasonable efficiency of operation.

(FPN No. 3): See Section 210-19(a) for voltage drop for branch circuits.

(c) **Panelboards.** Panelboards, existing or installed in an individual unit of multifamily dwellings shall be supplied by one feeder and shall be calculated as per Section 220-10. Sections 220-30 and 220-31 will not be recognized.

Section 10. Article 220 of the National Electrical Code, 1990 Edition, is amended by adding a new Section 220-5 as follows:

220-5 INDIVIDUAL BRANCH CIRCUITS.

Each fixed or portable appliance rated at more than 15 amperes shall be supplied by an individual branch circuit except as otherwise permitted by Section 210-23.

The individual branch circuits shall be calculated and wired sufficient for the nameplate rating but not less than shown in Table 220-4:

Table 220-4

		Volt-Amps Rating	Minimum Amps	Minimum Wire Size
(a)	Water heaters	4500	30	10
(b)	Clothes dryers	5000	30	10
(c)	Dishwashers	1500	20	12
(d)	Disposals	750	15	14
(e)	Trash compactors	750	15	14
(f)	Motor operated space-heating equipment	750	15	14

Exception No. 1: Storage and instantaneous water heaters, 2160 Volt-Amps or less - 20 amps, #12 Wire

Exception No. 2: Any two of the following list of appliances may be wired with 20 amps, #12 wire:

Trash Compactors up to 750 Volt-Amps
Disposals up to 750 Volt-Amp rating
Insta-hot up to 750 Volt-Amp rating

Section 11. Section 220-15 of the National Electrical Code, 1990 Edition, is amended as follows:

220-15 FIXED ELECTRIC SPACE HEATING.

Fixed electric space heating loads shall be computed at 100 percent of the total connected load; however, in no case shall a feeder load current rating be less than the rating of the largest branch circuit supplied. Where fixed electric space heating is installed as the primary means of heating, heat loss calculations shall be submitted.

Exception No. 1: ((~~Where reduced loading of the conductors results from units operating on duty cycle, intermittently, or from all units not operating at one time, the authority having jurisdiction may grant permission for feeder conductors to have an ampacity less than 100 percent provided the conductors have an ampacity for the load so determined.~~)) A minimum demand factor of 75 percent of the installed heating capacity may be used in sizing service entrance equipment for dwelling, commercial and industrial occupancies when electric service is provided to four or more fixed space heaters, or electric furnaces sequentially controlled. These exceptions shall not apply when optional calculations allowed by Section 220-32 are used.

Exception No. 2: ((~~The use of the optional calculations in Sections 220-30 and 220-31 shall be permitted for fixed electric space heating loads in a dwelling unit.~~)) In a multifamily dwelling the use of the optional calculation in Section 220-32 shall be permitted.

Section 12. Section 220-17 of the National Electrical Code, 1990 Edition, is amended as follows:

220-17 APPLIANCE LOAD - DWELLING UNIT(S).

It shall be permissible to apply a demand factor of 75 percent to the nameplate rating load of four or more appliances fastened in place served by the same feeder in a one-family, two-family or multifamily dwelling.

Exception: This demand factor shall not be applied to electric ranges, clothes dryers, ((~~space heating equipment~~)) or air air conditioning equipment. (For space heating equipment, see Section 220-15.)

Section 13. Sections 220-19 and 220-20 of the National Electrical Code, 1990 Edition, are amended as follows:

220-19 ELECTRIC RANGES AND OTHER COOKING APPLIANCES - DWELLING UNIT(S).

The feeder demand load for household electric ranges, wall-mounted ovens, counter-mounted cooking units, and other household cooking appliances individually rated in excess of 1-3/4 kW shall be permitted to be computed in accordance with Table 220-19. Where two or more single-phase ranges are supplied by a 3-phase, 4-wire feeder, the total load shall be computed on the basis of twice the maximum number connected between any two phases. kVA shall be considered equivalent to kW for loads computed under this section.

(FPN): See Example 5(a), Chapter 9.

The branch circuit for a standard free-standing electric range 50 amperes or less (other than wall-mounted ovens or counter-mounted cooking units) shall terminate in an approved flush or surface type plug-in device elevated at least 2 inches above the floor. Minimum circuit capacity for such circuits shall be 50 amperes.

Table 220-19 and notes thereto are adopted as written. See pages 52 and 53 of the 1990 NEC.

220-20 KITCHEN EQUIPMENT - OTHER THAN DWELLING UNIT(S).

It shall be permissible to compute the load for commercial electric cooking equipment, dishwasher booster heaters, water heaters, and other kitchen equipment in accordance with Table 220-20. These demand factors shall be applied to all equipment which has either thermostatic control or intermittent use as kitchen equipment. They shall not apply to space heating, ventilating or air conditioning equipment.

However, in no case shall the feeder demand be less than the sum of the largest two kitchen equipment loads.

Table 220-20

FEEDER DEMAND FACTORS FOR KITCHEN EQUIPMENT - OTHER THAN DWELLING UNIT(S)

Rated 2 kW or More

Number of Units of Equipment	Demand Factors Percent
1	100
2	100
3	90
4	80
5	70
6 & Over	65

NOTE: The demand shall be not less than the sum of the two largest units of equipment.

Section 14. Article 220 of the National Electrical Code, 1990 Edition, is amended by adding a new section 220-23 as follows:

220-23 SERVICE ENTRANCE CALCULATIONS.

(a) The size of service entrance conductors installed in a new and/or existing single family dwelling shall be calculated in accordance with the National Electrical Code, Section 220-10.

(b) Provisions of Sections 220-30 and 220-31 of the National Electrical Code, optional calculations for additional loads in existing one-family dwelling occupancy or individual apartment of multifamily dwelling, are not adopted.

(c) If any building is moved to a new location, the service entrance conductors shall be calculated to meet load requirements in accordance with paragraph (a) of this Section.

Section 15. Sections 220-30 and 220-31 of the National Electrical Code, 1990 Edition, are hereby repealed.

Section 16. Section 230-1 of the National Electrical Code, 1990 Edition, is amended as follows:

230-1 SCOPE.

(a) This article covers service conductors and equipment for control and protection of services and their installation requirements.

(FPN): See Diagram 230-1.

(b) **Service Requirements.** The serving utility shall be consulted by the owner, his/her agent or the contractor making the installation regarding service entrance location before installing equipment. Provisions for metering equipment, attachment of service drop, or for an underground service lateral shall be made at a location acceptable to the serving utility.

Section 17. Section 230-3 of the National Electrical Code, 1990 Edition, is amended as follows:

230-3 ONE BUILDING OR OTHER STRUCTURE NOT TO BE SUPPLIED THROUGH ANOTHER

Service conductors supplying a building or other structure shall not ((~~pass through the interior of~~)) supply another building or other structure.

(FPN): See Section 230-6 for concrete or masonry-encased conductors considered outside of a building.

Section 18. Article 230 of the National Electrical Code, 1990 Edition, is amended by adding a new section 230-5 as follows:

230-5 TYPE OF SERVICES.

All services shall be single-phase or three-phase 4-wire. Three-phase 3-wire services shall not be installed unless prior approval is granted by the utility and the building official.

Section 19. Sections 230-28 and 230-29 of the National Electrical Code, 1990 Edition, are amended as follows:

230-28 SERVICE MASTS AS SUPPORTS

(a) Where a service mast is used for the support of service-drop conductors, it shall be of adequate strength or be supported by braces or guys to withstand safely the strain imposed by the service drop. Where raceway-type service masts are used, all raceway fittings shall be identified for use with service masts.

(b) Where service masts are used for support of the service drop conductors, the conduit shall be secured as required by WAC 296-46-23028 Drawings E-101, E-102, and E-103.

(c) Service drops to buildings with service conduits extended through the roof shall be attached to the bracket installed on the mast, or other approved supporting structure located within 24 inches of the mast.

Service conduits for mast-type services shall be rigidly supported with minimum 5/16-inch U-bolts fastened through at least 2-inch solid wood backing. A minimum of 2 x 6 inch wood solidly secured between rafters shall be installed and drilled for snug fit of the conduit.

Brackets shall be installed to permit a clearance of not less than 18 inches from the roof to the lowest wire. Service conduits through the roof shall be a minimum of 2-inch rigid steel conduit. Service conduits over 26 inches above the roof shall be rigidly supported with brackets or guy wires. The serving utility shall be consulted for bracket and guy wire requirements.

In no case shall a coupling be installed between the last support below the roof line to the bracket. All connections and service drops shall be below the weatherhead.

Openings where service conduits pass through the roof shall be made watertight with approved neoprene or lead flashings.

230-29 SUPPORTS OVER BUILDINGS AND WIRES ON OR ABOUT BUILDINGS OR STRUCTURES OVER WATER

((~~Service-drop conductors passing over a roof shall be securely supported by substantial structures. Where practicable, such supports shall be independent of the building.~~))

(a) All service entrance conductors for piers, docks, wharves and other structures over water shall terminate in a disconnecting means or service equipment at the street side or end of such structure, or as otherwise approved by the building official.

Exception: When the vault for the utility transformer is located over water, a disconnecting means for the service entrance conductors shall be provided immediately outside the vault at a location acceptable to the building official.

(FPN): For utility service conductors on piers, docks or wharves refer to "Requirements for Electric Service Connection" published by Seattle City Light.

(b) Service entrance conduit containing wires not protected by circuit breakers or switches and fuses shall follow and be supported on parapets or other walls and shall not be laid upon or across roofs.

(c) All service entrance conduits in a Fire District shall terminate on that side of the building nearest to the lines or mains of the utility; such service shall not terminate over adjacent private property, and shall extend to the street or alley wall of the buildings.

(d) Open wiring for service conductors shall contact the building at only one point except where the utility will agree to contact the building at more than one point.

(e) No cast fittings of any type shall be permitted within 15 feet of the ground level on street, alley, or driveway margins.

Section 20. Article 230 of the National Electrical Code, 1990 Edition, is amended by adding a new section 230-33 as follows:

230-33 CONVERSION TO UNDERGROUND SERVICE OR INCREASING EXISTING OVERHEAD SERVICES.

Where a service for an existing single-family dwelling is converted to an underground service or where existing overhead services are increased, the following requirements shall be met:

(a) Unless a 200 ampere meter enclosure was provided for the existing service, a new 200 ampere approved wide meter enclosure shall be installed over the existing meter enclosure. Service grounding continuity shall be maintained and the perimeter of such new enclosure shall be sealed watertight with a silicone sealant or approved equivalent.

(b) Conversions to underground service shall have existing overhead service conductors removed and the top opening of the existing conduit at the weatherhead shall be closed.

(c) Where a new meter enclosure is installed the interior of the existing meter enclosure shall be removed and service conductors of the same size as those removed shall be installed from the new meter enclosure to the existing service panel. Conductors shall be run through a 2-inch bushing in the back of such new enclosure, through the void area between enclosures, and continue in the existing conduit to the panel.

(d) Any exposed wood or combustible material between the two meter enclosures shall be covered with noncombustible material.

(e) On installations where a meter has been moved outdoors, the existing meter shall be removed. An approved fitting shall be installed on the existing conduit with new conduit of the same size as the existing, to extend from such fitting to a new 200 ampere meter enclosure.

(f) Conductors shall be continuous from the new meter enclosure to the service panel.

(g) On existing services, a weatherhead to weatherhead connection shall be permitted. The distance between weatherheads shall not exceed 24 inches.

Section 21. Section 230-40 of the National Electrical Code, 1990 Edition, is amended as follows:

230-40 NUMBER OF SERVICE-ENTRANCE CONDUCTOR SETS

(a) Each service drop or lateral shall supply only one set of service-entrance conductors.

Exception No. 1: Buildings with more than one occupancy shall be permitted to have one set of service-entrance conductors run to each occupancy or to a group of occupancies.

Exception No. 2: Where two to six service disconnecting means in separate enclosures are grouped at one location and supply separate loads from one service drop or lateral, one set of service-entrance conductors shall be permitted to supply each or several such service equipment enclosures.

(b) **Service-Entrance Conductors.**

(1) Service-entrance conductors shall extend at least 18 inches from the service head to permit connection to the service drop.

(2) Service-entrance raceways shall extend no more than 15 feet inside a building.

Section 22. Sections 230-42 and 230-43 of the National Electrical Code, 1990 Edition, are amended as follows:

230-42 SIZE AND RATING

(a) **General.** Service-entrance conductors shall be of sufficient size to carry the loads as computed in Article 220, and shall not be sized less than the rated ampacity of the service equipment or service accessory buss gutter. Ampacity shall be determined from Section 310-15.

Exception No. 1: The maximum allowable ampacity of approved busways shall be that value for which the busway has been listed or labeled.

Exception No. 2: Except as provided in Section 240-3, exception nos. 4, 6, 7 and 8.

Exception No. 3: Dwelling units.

(b) **Ungrounded Conductors.** Ungrounded conductors shall have an ampacity of not less than:

(1) 100 amperes for a 3-wire service to a one-family dwelling with six or more 2-wire branch circuits.

(2) 100 amperes for a 3-wire service to a one-family dwelling with an initial net computed load of 10 kVA or more.

(3) 60 amperes for other loads.

Exception No. 1: For loads consisting of not more than two 2-wire branch circuits, No. 8 copper or No. 6 aluminum or copper-clad aluminum.

Exception No. 2: By special permission, for loads limited by demand or by the source of supply, No. 8 copper or No. 6 aluminum or copper-clad aluminum.

Exception No. 3: For limited loads of a single branch circuit, No. 12 copper or No. 10 aluminum or copper-clad aluminum, but in no case smaller than the branch-circuit conductors.

(c) **Grounded Conductors.** The grounded (neutral) conductor shall not be less than the minimum size as required by Section 250-23(b).

230-43 WIRING METHODS FOR 600 VOLTS, NOMINAL, OR LESS.

Service-entrance conductors shall be installed in accordance with the applicable requirements of this Code covering the type of wiring method used and limited to the following methods: ((~~(1) open wiring on insulaters;~~)) (2) rigid metal conduit; (3) intermediate metal conduit; ((~~(4) electrical metallic tubing; (5) service entrance cables; (6) wireways;~~)) (7) busways; ((~~(8) auxiliary gutters;~~)) (9) rigid non-metallic conduit installed per Article 347; (10) cablebus; ((~~(11) Type MC cable;~~)) (12) mineral-insulated, metal-sheathed cable; ((~~(13) flexible metal conduit not over 6 feet (1.83 m) long between raceways, or between raceway and service equipment, with equipment bonding jumper routed with the flexible metal conduit according to provisions of Section 250-79(a), (c), (d), and (f); or (14) liquidtight flexible nonmetallic conduit. Also see Section 350-2.~~))

Approved cable tray systems shall be permitted to support cables approved for use as service-entrance conductors. See Article 318.

Section 23. Section 230-52 of the National Electrical Code, 1990 Edition, is amended as follows:

230-52 INDIVIDUAL CONDUCTORS ENTERING BUILDINGS OR OTHER STRUCTURES.

((~~Where individual open conductors enter a building or other structure, they shall enter through roof bushings or through the wall in an upward slant through individual, noncombustible, nonabsorbent insulating tubes. Drip loops shall be formed on the conductors before they enter the tubes.~~))

Individual open conductors shall not enter buildings or other structures.

Section 24. Section 230-62 of the National Electrical Code, 1990 Edition, is amended as follows:

230-62 SERVICE EQUIPMENT - ENCLOSED OR GUARDED.

Energized parts of service equipment shall be enclosed as specified in (a) below, or guarded as specified in (b) below.

(a) **Enclosed.** Energized parts shall be enclosed so that they will not be exposed to accidental contact or guarded as in (b) below.

(b) **Guarded.** Energized parts that are not enclosed shall be installed on a switchboard, panelboard, or control board and guarded in accordance with Sections 110-17 and 110-18. Such an enclosure shall be provided with means for locking or sealing doors providing access to energized parts.

(c) **Location.** Service equipment shall be readily accessible and shall not be located in a bathroom, clothes closet, shower room, cupboard, attic, stairway, nor above a washer, range, dryer, water heater, sink, plumbing fixture or drain board.

(d) **Accessible.** Service equipment shall be readily accessible after any subsequent building additions.

Section 25. Section 230-82 of the National Electrical Code, 1990 Edition, is amended as follows:

230-82 EQUIPMENT CONNECTED TO THE SUPPLY SIDE OF SERVICE DISCONNECT.

Equipment shall not be connected to the supply side of the service disconnecting means.

Exception No. 1.: Cable limiters or other current-limiting devices by special permission of the building official.

When fault current limiters are installed on the line side (utility's side) of the first disconnect or main breaker, there shall be a "current limiter enclosure" for the installation of such current limiters which shall meet the following requirements:

(a) The "current limiter enclosure" shall be separate from the utility's service termination point. The weatherhead, service terminal box, meter socket or current transformer can is not an acceptable location.

(b) The "current limiter enclosure" shall not be used for service taps or extensions and shall be clearly recognized and marked "fault current limiters."

Exception No. 2: Fuses and disconnecting means or circuit breakers suitable for use as service equipment, in meter pedestals or otherwise provided and connected in series with the ungrounded service conductors and located away from the building supplied.

Exception No. 3: Meters nominally rated not in excess of 600 volts, provided all metal housings and service enclosures are grounded in accordance with Article 250.

Exception No. 4: Instrument transformers (current and voltage), high-impedance shunts, surge-protective devices identified for use on the supply side of the service disconnect, load management devices, and surge arresters.

Exception No. 5: Taps used only to supply load management devices, circuits for emergency systems, stand-by power systems, fire pump equipment, and fire and sprinkler alarms if provided with service equipment and installed in accordance with requirements for service-entrance conductors.

Exception No. 6: Solar photovoltaic systems or interconnected electric power production sources. See Articles 690 or 705 as applicable.

Exception No. 7: Where the service disconnecting means is power operable, the control circuit shall be permitted to be connected ahead of the service disconnecting means if suitable overcurrent protection and disconnecting means are provided.

Exception No. 8: Ground-fault protection systems where installed as part of listed equipment, if suitable overcurrent protection and disconnecting means are provided.

Exception No. 9: Current transformer cabinets shall contain only the main service conductors, metering equipment and secondary wiring and shall not be used as a junction box or gutter for the purpose of making taps. One tap shall be permitted on the load side of the current transformers on all installations for emergency service and one tap shall be permitted on the load side of the current transformers for a fire pump service. Approved terminal lugs shall be provided for the main service conductors and for all taps. In a single-family dwelling, two connections shall be permitted on the load side of the current transformers where approved terminal lugs are provided. Taps under meter socket lugs shall not be permitted.

Section 26. Section 250-1 of the National Electrical Code, 1990 Edition, is amended as follows:

250-1 SCOPE.

This article covers general requirements for grounding and bonding of electrical installations, and specific requirements in (a) through (f) below.

All electrical equipment grounding (boxes, service and equipment and provisions for grounding receptacles, etc.) for all systems, shall be completely made up at the time of rough-in.

(a) Systems, circuits and equipment required, permitted, or not permitted to be grounded.

(b) Circuit conductor to be grounded on grounded systems.

(c) Location of grounding connections.

(d) Types and sizes of grounding and bonding conductors and electrodes.

(e) Methods of grounding and bonding.

(f) Conditions under which guards, isolation, or insulation may be substituted for grounding.

(FPN No. 1): Systems and circuit conductors are grounded to limit voltages due to lightning, line surges, or unintentional contact with higher voltage lines, and to stabilize the voltage to ground during normal operation. Systems and circuit conductors are solidly grounded to facilitate overcurrent device operation in case of ground faults.

(FPN No. 2): Conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, are grounded to limit the voltage to ground on these materials and to facilitate overcurrent device operation in case of ground faults. See Section 110-10.

Section 27. Sections 250-80 and 250-81 of the National Electrical Code, 1990 Edition, are amended as follows:

250-80 BONDING OF PIPING SYSTEMS

(a) **Metal Water Piping.** The interior metal water piping system shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper shall be sized in accordance with Table 250-94 and installed in accordance with Section 250-92(a) and (b). The points of attachment of the bonding jumper shall be accessible.

Exception: In buildings of multiple occupancy, where the interior metal water piping system for the individual occupancies is metallically isolated from all other occupancies by use of nonmetallic water piping, the interior metal water piping system for each occupancy shall be permitted to be bonded to the panelboard or switchboard enclosure (other than service equipment) supplying that occupancy. The bonding jumper shall be sized in accordance with Table 250-95.

(b) **Other Metal Piping.** Interior metal piping which may become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper shall be sized in accordance with Table 250-95 using the rating of the circuit which may energize the piping.

The equipment grounding conductor for the circuit which may energize the piping shall be permitted to serve as the bonding means.

(FPN): Bonding all piping and metal air ducts within the premises will provide additional safety.

(c) **Metallic Plumbing Lines.** All metallic water lines including waste systems, shall be bonded together by approved means. The metallic water lines shall not be relied upon as the grounding means.

250-81 GROUNDING ELECTRODE SYSTEM.

If available on the premises at each building or structure served, each item (a) through (d) below, and any made electrodes in accordance with Section 250-83(c) and (d), shall be bonded together to form the grounding electrode system. The bonding jumper shall be installed in accordance with Section 250-92(a), shall be sized in accordance with Section 250-94, and shall be connected in the manner specified in Section 250-115. The unspliced grounding electrode conductor shall be permitted to run to any convenient grounding electrode available in the grounding electrode system. It shall be sized for the largest grounding electrode conductor required among all the available electrodes.

Exception: In industrial and commercial locations it shall be permitted to extend the grounding electrode conductor by means of the exothermic welding process.

(FPN): See Section 547-8 for special grounding and bonding requirements for agricultural buildings.

(a) **Metal Underground Water Pipe.** A metal underground water pipe in direct contact with the earth for 10 feet (3.05 m) or more (including any metal well casing effectively bonded to the pipe), and electrically continuous (or made electrically continuous by bonding around insulating joints or sections or insulating pipe) to the points of connection of the grounding electrode conductor and the bonding conductors. Continuity of the grounding path or the bonding connection to interior piping shall not rely on water meters. A metal underground water pipe shall be supplemented by an additional electrode of a type specified in Section 250-81 or in Section 250-83. The supplemental electrode shall be permitted to be bonded to the grounding electrode conductor, the grounded service-entrance conductor, the grounded service raceway, any grounded service enclosure, or the interior metal water piping at any convenient point.

Where the supplemental electrode is a made electrode as in Section 250-83 (c) or (d), that portion of the bonding jumper which is the sole connection to the supplemental grounding electrode shall not be required to be larger than No. 6 copper wire or No. 4 aluminum wire.

It shall be unlawful to connect to, or use, any water main or water pipe belonging to the Municipal Water System for electrical grounding purposes.

(b) **Metal Frame of the Building.** The metal frame of the building, where effectively grounded.

(FPN): Effectively grounded means intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages which may result in undue hazard to connected equipment or to persons.

(c) **Concrete-Encased Electrode.** An electrode encased by at least 2 inches (50.8 mm) of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth, consisting of at least 20 feet (6.1 m) of one or more steel reinforcing bars or rods of not less than 1/2 inch (12.7 mm) diameter, or consisting of at least 20 feet (6.1 m) of bare copper conductor not smaller than No. 4 AWG.

(d) **Ground Ring.** A ground ring encircling the building or structure, in direct contact with the earth at a depth below earth surface not less than 2 1/2 feet (762 mm), consisting of at least 20 feet (6.1 m) of bare copper conductor not smaller than No. 2 AWG.

Section 28. Section 250-84 of the National Electrical Code, 1990 Edition, is amended as follows:

250-84 RESISTANCE OF MADE ELECTRODES.

A single electrode consisting of a rod, pipe, or plate ((~~which does not have a resistance to ground of 25 ohms or less~~)) shall be augmented by one additional electrode of any of the types specified in Section 250-81 or 250-83. ((~~Where multiple rod, pipe, or plate electrodes are installed to meet the requirements of this section, t~~))<u>T</u>hey shall be not less than ((~~6~~)) <u>8</u> feet (((~~1.83~~)) <u>2.44</u> m) apart.

(FPN): The paralleling efficiency of rods longer than 8 feet (2.44 m) is improved by spacing greater than 6 feet (1.83 m).

Section 29. Section 300-1 of the National Electrical Code, 1990 Edition, is amended as follows:

300-1 SCOPE

(a) **All Wiring Installations.** This Article covers wiring methods for all wiring installations.

Exception No. 1: Only those sections referenced in Article 504 shall apply to intrinsically safe systems.

Exception No. 2: Only those sections referenced in Article 725 shall apply to Class 1, Class 2, and Class 3 circuits.

Exception No. 3: Only those sections referenced in Article 760 shall apply to fire protective signaling circuits.

Exception No. 4: Only those sections referenced in Article 770 shall apply to optical fiber cables.

Exception No. 5: Only those sections referenced in Article 800 shall apply to communications systems.

Exception No. 6: Only those sections referenced in Article 810 shall apply to radio and television equipment.

Exception No. 7: Only those sections referenced in Article 820 shall apply to community antenna television and radio distribution systems.

(b) **Integral Parts of Equipment.** The provisions of this Article are not intended to apply to the conductors which form an integral part of equipment, such as motors, controllers, motor control centers, or factory-assembled control equipment.

(c) **Wiring Methods for Designated Building Occupancies.** Wiring methods for institutional, educational, and health care facilities, as defined in WAC 296-46-130 and Places of Assembly of one hundred or more persons per Article 518 and the Seattle Building Code, shall be wired per Tables 300(A) or (B) and notes thereto. In a multiple occupancy building, these wiring methods shall apply to the specific occupancy only.

WAC 296-46-130 Classification or Definition of Occupancies

These classifications are taken from WAC 296-46-130 and are included in this supplement for reference.

(1) **Education facility** refers to a building or portion of a building used primarily for educational purposes and shall include buildings used for the gathering of groups of six or more persons for purposes of instruction. Educational occupancy includes, but is not restricted to: Schools, colleges, academies and universities.

(2) **Institutional facility** refers to a building or portion of a building used primarily for detention and correctional occupancies where some degree of restraint or security is required. Such occupancies shall include, but are not restricted to: Penal institutions, reformatories, jails, detention centers, correctional centers, and residential-restrained care.

(3) **Health or personal care facility** refers to buildings or parts of buildings that contain but are not limited to facilities such as a hospital, nursing home, alcoholism hospital, psychiatric hospital, boarding home, alcoholism treatment facility, maternity home, birth center or childbirth center, residential treatment facility for psychiatrically impaired children and youths, and renal hemodialysis clinics that are licensed by the Department of Social and Health Services; and medical, dental or chiropractic offices or clinics, outpatient or ambulatory surgical clinics, and such other health care occupancies where patients who may be unable to provide for their own needs and safety without the assistance of another person are treated.

(a) **Boarding home** means any home or other institution, however named, which is advertised, announced, or maintained for the express or implied purpose of providing board and domiciliary care to three or more aged persons not related by blood or marriage to the operator. It shall not include any home, institution, or section thereof which is otherwise licensed and regulated under the provisions of state law providing specifically for the licensing and regulation of such home, institution, or section thereof.

(b) **Private alcoholism hospital** means an institution, facility, building, or equivalent designed, organized, maintained, and operated to provide diagnosis, treatment, and care of individuals demonstrating signs or symptoms of alcohol-

ism, including the complications of associated substance use and other medical diseases that can be appropriately treated and cared for in the facility and providing accommodations, medical services, and other necessary services over a continuous period of twenty-four hours or more for two or more individuals unrelated to the operator, provided that this chapter shall not apply to any facility, agency, or other entity which shall be both owned and operated by a public or governmental body.

(c) **Detoxification** means care or treatment of an intoxicated person during a period where the individual recovers from the effects of intoxication.

(d) **Private psychiatric hospital** means an institution, facility, building, or agency specializing in the diagnosis, care, and treatment of individuals demonstrating signs and/or symptoms of mental disorder as defined in RCW 71.05.020(2), and providing accommodations and other necessary services over a continuous period of twenty-four hours or more for two or more individuals not related to the operator, provided that this chapter shall not apply to any facility, agency, or other entity which shall be both owned and operated by a public or governmental body.

(e) **Alcoholism treatment facility** means a private place or establishment, other than a licensed hospital, operated primarily for the treatment of alcoholism.

(f) **Maternity home** means any home, place, hospital, or institution in which facilities are maintained for the care of four or more women, not related by blood or marriage to the operator, during pregnancy or during or within ten days after delivery: Provided, however, that this definition shall not apply to any hospital approved by the American College of Surgeons, American Osteopathic Association or its successor.

(g) **Birth center or childbirth center** means a type of maternity home which is a house, building, or equivalent organized to provide facilities and staff to support a birth service, provided that the birth service is limited to low-risk maternal clients during the intrapartum period.

(h) **Residential treatment facility for psychiatrically impaired children and youth** means a residence, place, or facility designed and organized to provide twenty-four hour residential care and long-term individualized, active treatment for clients who have been diagnosed or evaluated as psychiatrically impaired.

(i) **Ambulatory surgical center or ASC** means any distinct entity that operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization or that has an agreement with HFCA under Medicare to participate as an ASC.

(j) **Renal hemodialysis clinic** is a facility in a building or part of a building which is approved to furnish the full spectrum of diagnostic, therapeutic, and rehabilitative services required for the care of renal dialysis patients (including inpatient dialysis furnished directly or under arrangement).

(k) **Adult residential treatment facility** means a residence, place, or facility designed and organized primarily to provide twenty-four hour residential care, crisis and short-term care, and/or long-term individualized active treatment and

rehabilitation for clients diagnosed or evaluated as psychiatrically impaired or chronically mentally ill as defined herein or in chapter 204, Laws of 1982.

(l) **Private adult treatment home** means a dwelling which is the residence or home of two adults providing food, shelter, beds, and care for two or fewer psychiatrically impaired clients, provided these clients are detained under chapter 71.05 RCW and the dwelling is certified as an evaluation and treatment facility under chapter 71.05 RCW.

(m) **Group care facility** means a facility maintained and operated for the care of a group of children on a twenty-four-hour basis.

(4) Licensed Day Care Centers.

(a) **Day care center** means an agency that provides care for thirteen or more children either within the abode of the licensee or within a building or portion of a building used for such purposes for periods of less than twenty-four hours.

(b) **Mini day care center** means:

(1) Day care center for the care of twelve or fewer children in a facility other than the family abode of the person or persons under whose direct care and supervision the child is placed, or

(2) The care of from seven through twelve children in the family abode of such person or persons.

TABLE 300(A)
WIRING METHODS FOR HEALTH AND PERSONAL CARE FACILITIES

Health or Personal Care Facility	Power, Lighting or Class I Circuits	Patient Care Area	Emergency Power, Lighting or Signalling	Low Voltage Systems	Special Requirements
Hospital	3	2	2	6,7	4,5,10
Nursing home	3	2	2	6,7	4,10
Boarding home	3	X	2	6,7	4,10
Alcoholism hospital	3	2	2	6,7	4,10
Detoxification facility	3	2	2	6,7	4,10
Psychiatric hospital	3	2	2	6,7	4,5,10
Alcoholism treatment facility (other than detoxification facility)	3	3	2	6,7	4,10
Maternity home	3	2	2	7,8	4,10
Birth or childbirth center	3	2	2	7,8	X
Residential treatment facility for psychiatrically impaired children and youth	3	2	2	6,7	4,5,10
Medical, dental and chiropractic clinic	3	2	2	7,8	X
Ambulatory surgery and clinic	3	2	2	7,8	10
Freestanding renal hemodialysis clinic	3	2	2	7,8	10
Adult residential treatment facility more than 16 persons	3	2	2	6,7	5,10
Adult residential treatment facility 16 persons or less	3	2	2	7,8	4,10
Group care facility for children more than 16 persons	3	X	2	6,7	4,5,10
Group care facility for children 16 persons or less	3	X	2	7,8	4,5,10

General lighting load for the facilities in Table 300 (A) shall be calculated at two watts per square foot or connected load if greater.

TABLE 300(B)
WIRING METHODS FOR DESIGNATED BUILDING OCCUPANCIES

Facility	Power, Lighting or Class I Circuits	Emergency Power, Lighting	Low Voltage Systems	Special Requirements
Educational	2,9	2	6,7	10
Institutional	2,9	2	6,7	10
Place of assembly for 100 or more persons	3,9	2	6,7	X
Day care center for 30 or more children	2,9	2	6,7	4,5,10
Day care center for less than 30 children	3	2	7,8	4,5,10
Mini day care center	3	2	7,8	4,5

NOTES TO TABLES 300 (A) AND (B)

1. Metallic raceways.

2. Metallic raceways, type MI or MC cable where the outer metal jacket is an approved grounding means of a listed cable assembly, with an insulated equipment grounding conductor. A manufactured wiring system is permitted to be installed in compliance with Article 604 of the National Electrical Code.

3. Wiring methods in accordance with the Seattle Electrical Code.

4. Ground-fault circuit-interrupter protection of 15 or 20 ampere, 125-volt receptacles within a bathroom or shower room or within five feet of a basin that is located in a patient room.

5. Tamper resistant receptacles in licensed day care facilities and pediatric or psychiatric patient care areas for 15 or 20 ampere, 125 volt receptacles. Tamper resistant receptacles shall, by construction, limit improper access to energized contacts.

6. Fire alarm, nurse call, public address systems used to give directions during an emergency situation or other emergency systems shall be installed in a metallic raceway.

7. Class 2 or 3 limited energy systems and communication systems including telephone, intercom, data processing or similar systems shall be permitted to be installed as open cable systems in compliance with the National Electrical Code.

8. Fire alarm systems shall be permitted to be installed as open cable systems in compliance with the National Electrical Code.

9. Rigid nonmetallic raceways shall be permitted to be installed outside of buildings, in the earth or in concrete on or below grade.

10. Plan review required.

Section 30. Sections 300-21 and 300-22 of the National Electrical Code, 1990 Edition, are amended as follows:

300-21 SPREAD OF FIRE OR PRODUCTS OF COMBUSTION.

Electrical installations in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be so made that the possible spread of fire or products of combustion will not be substantially increased. Penetrations where permitted through construction described above shall be made of approved ferrous raceways. Flexible raceways are not permitted. Openings around electrical penetrations through fire resistance rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire-resistance ratings.

300-22 WIRING IN DUCTS, PLENUMS, AND OTHER AIR-HANDLING SPACES.

The provisions of this section apply to the installation and uses of electric wiring and equipment in ducts, plenums, and other air-handling spaces.

(FPN): See Article 424, Part F for Electric Duct Heaters.

(a) **Ducts for Dust, Loose Stock, or Vapor Removal.** No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.

(b) **Ducts or Plenums Used for Environmental Air.** Only wiring methods consisting of Type MI cable, Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit shall be installed in ducts or plenums specifically fabricated to transport environmental air. Flexible metal conduit and liquidtight flexible metal conduit shall be permitted, in lengths not to exceed 4 feet (1.22 m), to connect physically adjustable equipment and devices permitted to be in these ducts and plenum chambers. The connectors used with flexible metal conduit shall effectively close any openings in the connection. Equipment and devices shall be permitted within such ducts or plenum chambers only if necessary for their direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type fixtures shall be permitted.

(c) **Other Space Used for Environmental Air.** Section 300-22(c) applies to space used for environmental air-handling purposes other than ducts and plenums as specified in Sections 300-22(a) and 300-22(b). Only totally enclosed nonventilated insulated busway having no provisions for plug-in connections and wiring methods consisting of Type MI cable, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor control or power cable which is specifically listed for the use shall be installed in such other space.

Other type cables and conductors shall be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit, flexible metal conduit, or where accessible, surface metal raceway or wireway with metal covers or solid bottom metal cable tray with solid metal covers.

Electric equipment with a metal enclosure or with a nonmetallic enclosure listed for the use and having adequate fire-resistant and low-smoke-producing characteristics, and associated wiring material suitable for the ambient temperature shall be permitted to be installed in such other space unless prohibited elsewhere in this Code.

(FPN): The space over a hung ceiling used for environmental air-handling purposes is an example of the type of other space to which Section 300-22(c) applies.

Exception No. 1: Liquidtight flexible metal conduit in single lengths not exceeding 6 feet (1.83 m).

Exception No. 2: Integral fan systems specifically identified for such use.

Exception No. 3: This section does not include habitable rooms or areas of buildings, the prime purpose of which is not air handling.

Exception No. 4: Listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath shall be permitted where listed for this use.

Exception No. 5: This section does not include the joist or stud spaces in dwelling units when wiring or equipment passes through such spaces perpendicular to the long dimension of such spaces.

Exception No. 6: Open wiring with limited energy source including communication wiring shall be permitted in these spaces. No cable, out of service, shall be allowed to remain in spaces used for environmental air. This exception shall not reduce the fire resistance listing below that required for wiring within buildings as specified in Articles 725, 760, 770, 800 and 820.

(d) **Data Processing Systems.** Electric wiring in air-handling areas beneath raised floors for data processing systems shall comply with Article 645.

Section 31. Section 310-4 of the National Electrical Code, 1990 Edition, is amended as follows:

310-4 CONDUCTORS IN PARALLEL.

Aluminum, copper-clad aluminum, or copper conductors of size 1/0 ((~~and larger~~)) to 750 MCM, comprising each phase, neutral, or grounded circuit conductor, shall be permitted to be connected in parallel (electrically joined at both ends to form a single conductor).

Exception No. 1: As permitted in Section 620-12(a)(1), Exception.

Exception No. 2: Conductors in sizes smaller than No. 1/0 AWG shall be permitted to be run in parallel to supply control power to indicating instruments, contactors, relays, solenoids, and similar control devices provided: (a) they are contained within the same raceway or cable; (b) the ampacity of each individual conductor is sufficient to carry the entire load current shared by the parallel conductors; and (c) the overcurrent protection is such that the ampacity of each individual conductor will not be exceeded if one or more of the parallel conductors become inadvertently disconnected.

Exception No. 3: Conductors in sizes smaller than 1/0 shall be permitted to be run in parallel for frequencies of 360 hertz and higher when all of the conditions of Exception No. 2(a), (b), and (c) are met.

The paralleled conductors in each phase, neutral, or grounded circuit conductor, shall:

(1) Be the same length;
(2) Have the same conductor material;
(3) Be the same size in circular mil area;
(4) Have the same insulation type;
(5) Be terminated in the same manner;
(6) Not exceed 8 in number.

Where run in separate raceways or cables, the raceways or cables shall have the same physical characteristics.

(FPN): Differences in inductive reactance and unequal division of current can be minimized by choice of materials, methods of construction and orientation of conductors. It is not the intent to require that conductors of one phase, neutral or grounded circuit conductor be the same as those of another phase, neutral or grounded circuit conductor to achieve balance.

When equipment grounding conductors are used with conductors in parallel, they shall comply with the requirements of this section except that they shall be sized as per Section 250-95.

When conductors are used in parallel, space in enclosures shall be given consideration (see Articles 370 and 373).

Conductors installed in parallel shall comply with the provisions of Article 310 Note 8, Notes to Ampacity Tables of 0 to 2000 Volts.

Section 32. Section 324-4 of the National Electrical Code, 1990 Edition, is amended as follows:

324-4 USES NOT PERMITTED.

Concealed knob-and-tube wiring shall not be used in commercial garages, theaters and similar locations, motion picture studios, hazardous (classified) locations or in the hollow spaces of walls, ceilings and attics when such spaces are insulated by loose, rolled or foamed in place insulating material that envelops the conductors.

(FPN): This provision of 324-4 shall not be construed to prohibit the installation of loose or rolled thermal insulating material in such a concealed space provided all the following conditions are met:

(1) The wiring shall be surveyed by an appropriately licensed electrical contractor who shall certify that the wiring is in good condition with no evidence of improper overcurrent protection, conductor insulation failure or deterioration, and with no improper connections or splices. Repairs, alterations or extensions of or to the electrical system shall be inspected by an electrical inspector as defined in RCW 19.28.070.

(2) The insulation shall meet Class I specifications as identified in the Uniform Building Code, with a flame spread factor of 25 or less as tested using ASTM E84-81a. Foam insulation may not be used with knob-and-tube wiring.

(3) All knob-and-tube circuits shall have over-current protection limited to 15 amp, or protection which is appropriate for the wire size. Over-current protection devices must either be circuit breakers or S-type adapters, equipped with S-type fuses.

Section 33. Section 331-4 of the National Electrical Code, 1990 Edition, is amended as follows:

331-4 USES NOT PERMITTED.

Electrical nonmetallic tubing shall not be used:

(1) In hazardous (classified) locations.

Exception: Except as permitted by Section 504-20.

(2) For the support of fixtures and other equipment.

(3) Where subject to ambient temperatures exceeding those for which the tubing is listed.

(4) For conductors whose insulation temperature limitations would exceed those for which the tubing is listed.

(5) For direct earth burial.

(6) Where the voltage is over 600 volts.

(7) In exposed locations except as permitted by Sections 331-3(1) and (5).

(8) In theaters and similar locations, except as provided in Articles 518 and 520.

(9) In a Fire District except by permission of the building official.

Section 34. Section 333-6 of the National Electrical Code, 1990 Edition, is amended as follows:

333-6 USE

(a) **Uses Permitted.** Except where otherwise specified elsewhere in this Code, and where not subject to physical damage, Type AC cable shall be permitted for branch circuits and feeders in ((~~both~~)) exposed ((~~and concealed~~)) work and in cable trays where identified for such use.

((~~Type AC cable shall be permitted in dry locations; for under plaster extensions as provided in Article 344; and embedded in plaster finish on brick or other masonry, except in damp or wet locations. It shall be permissible to run or fish this cable in the air voids of masonry block or tile walls; where such walls are exposed or subject to excessive moisture or dampness or are below grade line, Type ACL cable shall be used. This cable shall contain lead-covered conductors (Type ACL) if used where exposed to the weather or to continuous moisture; for underground runs in raceways; where embedded in masonry, concrete, or fill in buildings in course of construction; or where exposed to oil, or other conditions having a deteriorating effect on the insulation.~~))

(b) **Uses Not Permitted.** Type AC cable shall not be used where prohibited elsewhere in this Code, including (1) in theaters and similar locations, except as provided in Article 518, Places of Assembly; (2) in motion picture studios; (3) in any hazardous (classified) location except as permitted by Sections 501-4(b) and 504-20; (4) where exposed to corrosive fumes or vapors; (5) on cranes or hoists, except as provided in Section 610-11, Exception No. 3; (6) in storage battery rooms; (7) in hoistways or on elevators, except as provided in Section 620-21; ((~~or~~)) (8) in commercial garages where prohibited in Article 511; or (9) in damp or wet locations.

Type ACL cable shall not be used for direct burial in the earth.

Section 35. Section 333-10 of the National Electrical Code, 1990 Edition, is hereby repealed.

Section 36. Section 334-3 of the National Electrical Code, 1990 Edition, is amended as follows:

334-3 USES PERMITTED.

Except where otherwise specified in this Code and where not subject to physical damage, Type MC cables shall be permitted as follows: (1) for ((~~services,~~)) feeders, and branch circuits; (2) for power, lighting, control and signal circuits; (3) indoors or outdoors; (4) where exposed or concealed; provided a grounding conductor is installed as part of the cable assembly; (5) ((~~direct buried when identified for such use;~~)) (6) in cable tray; (7) in any approved raceway; (8) as open runs of cable; (9) as aerial cable on a messenger; (10) in hazardous (classified) locations as permitted in Articles 501, 502, 503, and 504; (11) in dry locations; and (12) in wet locations when any of the following conditions are met:

(1) The metallic covering is impervious to moisture.

(2) A lead sheath or moisture impervious jacket is provided under the metal covering.

(3) The insulated conductors under the metallic covering are approved for use in wet locations.

Exception No. 1: In (4) above, where used as a branch circuit and where the outer metal jacket is an approved grounding means of a listed cable assembly, a separate grounding conductor is not required.

Exception No. 2: See Section 501-4 (b), Exception.

(FPN): See Section 300-6 for protection against corrosion.

Section 37. Section 334-10 of the National Electrical Code, 1990 Edition, is amended as follows:

334-10 INSTALLATION.

Type MC cable shall be installed in compliance with Articles 300, 710 and 725 as applicable.

(a) **Support.** Type MC cable shall be supported and secured at intervals not exceeding ((~~6 feet (1.83 m)~~)) 3 feet and at 12 inches from every box.

(b) **Cable Tray.** Type MC cable installed in cable tray shall comply with Article 318.

(c) **Direct Buried.** ((~~Direct buried cable shall comply with Section 300-5 or 710-3, as appropriate.~~)) Direct buried Type MC cable is not permitted.

(d) **Installed as Service Entrance Cable.** ((~~Type MC cable installed as service-entrance cable shall comply with Article 230.~~)) Type MC cable is not permitted to be installed as service entrance cable.

(e) **Installed Outside of Buildings or as Aerial Cable.** Type MC cable installed outside of buildings or as aerial cable shall comply with Article 225 and Article 321.

Section 38. Sections 336-3 and 336-4 of the National Electrical Code, 1990 Edition, are amended as follows:

336-3 USES PERMITTED.

Type NM and Type NMC cables shall be permitted to be used in one- and two-family dwellings, multifamily dwellings and other structures, except as prohibited in Section 336-4. Where installed in cable trays, cables shall be identified for this use.

(FPN): See Section 310-10 for temperature limitation of conductors.

(a) **Type NM.** Type NM cable shall be permitted for ((~~both exposed and~~)) concealed work in normally dry locations. It shall be permissible to install or fish Type NM cable in air voids in masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness.

(b) **Type NMC.** Type NMC cable shall be permitted: (1) for ((~~both exposed and~~)) concealed work in dry, moist, damp, or corrosive locations; (2) in outside and inside walls of masonry block or tile; (3) in a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1/16 inch (1.59 mm) thick and covered with plaster, adobe, or similar finish.

336-4 USES NOT PERMITTED.

(a) **Type NM or NMC.** Types NM and NMC cables shall not be used: (1) in any dwelling or structure exceeding three floors above grade; (2) as service-entrance cable and shall not be permitted as feeders in multifamily buildings and other structures of more than one story; (3) in commercial garages, having hazardous (classified) locations as provided in Section 511-3; (4) in theaters and similar locations, except as provided in Article 518, Places of Assembly; (5) in motion picture studios; (6) in storage battery rooms; (7) in hoistways; (8) embedded in poured cement, concrete, or aggregate; ~~or~~ (9) in any hazardous (classified) location except as permitted by Sections 501-4(b), Exception, and 504-20; or (10) in any building or structure located in a Fire District. For the purpose of this article, the first floor of a building shall be that floor that has fifty percent or more of the exterior wall surface area level with or above finished grade. One additional level that is the first level and not designed for human habitation and used only for vehicle parking, storage, or similar use shall be permitted.

(b) **Type NM.** Type NM cable shall not be installed: (1) where exposed to corrosive fumes or vapors; (2) where embedded in masonry, concrete, adobe, fill, or plaster; (3) in a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish.

Section 39. Section 336-10 of the National Electrical Code, 1990 Edition, is amended as follows:

336-10 EXPOSED WORK - GENERAL

In exposed work, except as provided in Section((~~s 336-12 and~~)) 336-13, the cable shall be installed as specified in (a), ((~~and~~)) (b) and (c) below.

((~~(a) To Follow Surface. The cable shall closely follow the surface of the building finish or of running boards.~~))
(a) Work considered as concealed. Nonmetallic-sheathed cable shall be considered as concealed where installed in inaccessible void areas of buildings or where run in between or through bored holes of studs, joists and similar members as required in Section 300-4, provided that all outlet, junction or device boxes shall be installed as required for concealed work.

(b) **Protection from Physical Damage.** The cable shall be protected from physical damage where necessary by conduit, electrical metallic tubing, pipe, guard strips, or other means. ((~~Where passing through a floor the cable shall be enclosed in~~

~~rigid metal conduit, intermediate metal conduit, electrical metallic tubing, or other metal pipe extending at least 6 inches (152 mm) above the floor.~~)) Nonmetallic-sheathed cable shall not be considered as concealed by boxing in, or by the use of running boards, and shall not be run across the face of ceilings, walls, beams or similar unoccupied locations.

Exception No. 1: Nonmetallic-sheathed cable may be installed in the attic space of buildings, provided such cable is protected from physical damage by the use of running boards, conduit, guard strips or other approved means as required in Sections 336-13 and 333-12.

Exception No. 2: Exposed nonmetallic-sheathed cable which is properly supported and neatly disposed may enter the top section only of a surface-mounted main service panel where the distance from the top of the panel to the bottom of the ceiling joist above does not exceed 2-1/2 feet.

(c) **Unexcavated Spaces.** Type NMC cable installed in compliance with the requirements of this section may be used in unexcavated spaces under dwellings provided that all outlet and junction boxes are installed in accessible locations.

Section 40. Section 336-12 of the National Electrical Code, 1990 Edition, is hereby repealed.

Section 41. Section 336-16 of the National Electrical Code, 1990 Edition, is hereby repealed.

Section 42. Sections 338-2 and 338-3 of the National Electrical Code, 1990 Edition, are amended as follows:

338-2 USES PERMITTED AS SERVICE-ENTRANCE CONDUCTORS.

((~~Service entrance cable used as service entrance conductors shall be installed as required by Article 230.~~)) Type SE and USE cables shall not be permitted for service entrance conductors and shall not be permitted for feeders or branch circuits in a Fire District.

338-3 USES PERMITTED AS BRANCH CIRCUITS OR FEEDERS.

(a) **Grounded Conductor Insulated.** Type SE service-entrance cables shall be permitted in interior wiring systems where all of the circuit conductors of the cable are of the rubber-covered or thermoplastic type.

(b) **Grounded Conductor Not Insulated.** Type SE service-entrance cables without individual insulation on the grounded circuit conductor shall not be used as a branch circuit or as a

feeder within a building, except a cable that has a final nonmetallic outer covering and is supplied by alternating current at not over 150 volts to ground shall be permitted: (1) as a branch circuit to supply only a range, wall-mounted oven, countermounted cooking unit, or clothes dryer as covered in Section 250-60, or (2) as a feeder to supply only other buildings on the same premises.

Type SE service-entrance cable shall be permitted for interior use where the fully insulated conductors are used for circuit wiring and the uninsulated conductor is used for equipment grounding purposes.

Exceptions 1 and 2 shall apply to (a) and (b) above.

Exception 1: Type SE and USE cables shall not be permitted in a Fire District.

Exception 2: Type SE cable shall not be permitted as feeders in structures over one story, excluding one- and two-family dwellings.

(c) **Temperature Limitations.** Type SE service-entrance cable used to supply appliances shall not be subject to conductor temperatures in excess of the temperature specified for the type of insulation involved.

Section 43. Article 342 of the National Electrical Code, 1990 Edition, is hereby repealed.

Section 44. The National Electrical Code, 1990 Edition, is amended by adding a new Article 343 and a new section 343-1 as follows:

ARTICLE 343 NONMETALLIC EXTENSIONS

343-1 USES NOT PERMITTED

Nonmetallic extensions shall not be permitted.

Section 45. Section 347-2 of the National Electrical Code, 1990 Edition, is amended as follows:

347-2 USES PERMITTED.

The use of rigid nonmetallic conduit and fittings shall be permitted under the following conditions: also see Section 300-1 for special building occupancy wiring methods.

Exception: Rigid nonmetallic conduit and fittings shall not be permitted inside building lines unless encased in not less than 2 inches of concrete in any building or structure located in a Fire District.

(FPN): Extreme cold may cause some nonmetallic conduits to become brittle and therefore more susceptible to damage from physical contact.

(a) **Concealed.** In walls, floors, and ceilings.

(b) **Corrosive Influences.** In locations subject to severe corrosive influences as covered in Section 300-6 and where subject to chemicals for which the materials are specifically approved.

(c) **Cinders.** In cinder fill.

(d) **Wet Locations.** In portions of dairies, laundries, canneries, or other wet locations and in locations where walls are frequently washed, the entire conduit system including boxes and fittings used therewith shall be so installed and equipped as to prevent water from entering the conduit. All supports, bolts, straps, screws, etc., shall be of corrosion-resistant materials or be protected against corrosion by approved corrosion-resistant materials.

(e) **Dry and Damp Locations.** In dry and damp locations not prohibited by Section 347-3.

(f) **Exposed.** For exposed work where not subject to physical damage if identified for such use.

(g) **Underground Installations.** For underground installations, see Sections 300-5 and 710-3(b).

Section 46. Section 348-1 of the National Electrical Code, 1990 Edition, is amended as follows:

348-1 USE.

The use of electrical metallic tubing shall be permitted for both exposed and concealed work. Electrical metallic tubing shall not be used: (1) where during installation or afterward, it will be subject to severe physical damage; (2) where protected from corrosion solely by enamel; (3) in cinder concrete or cinder fill ((~~where subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 2 inches (50.8 mm) thick or unless the tubing is at least 18 inches (457 mm) under the fill~~)); (4) in any hazardous (classified) location except as permitted by Sections 502-4, 503-3, and 504-20; (5) in wet locations; (6) underground. Where practicable, dissimilar metals in contact anywhere in the system shall be avoided to eliminate the possibility of galvanic action.

Galvanized steel electrical metallic tubing may be installed in noncinder concrete above grade. All fittings shall be concrete tight and listed for use in concrete.

Exception No. 1: Aluminum fittings and enclosures shall be permitted to be used with steel electrical metallic tubing.

Exception No. 2.: Electrical metallic tubing shall be permitted in damp locations as per Article 100 - DEFINITIONS.

((~~Ferrous or nonferrous electrical metallic tubing, elbows, couplings, and fittings shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences when protected by corrosion protection and judged suitable for the condition.~~))

(FPN): See Section 300-6 for protection against corrosion.

Section 47. Section 348-4 of the National Electrical Code, 1990 Edition, is hereby repealed.

Section 48. Section 348-8 of the National Electrical Code, 1990 Edition, is amended as follows:

348-8 COUPLINGS AND CONNECTORS.

Couplings and connectors used with tubing shall be made up tight. ((~~Where buried in masonry or concrete, they shall be concrete tight type. Where installed in wet locations, they shall be of the raintight type.~~))

Section 49. Section 370-1 of the National Electrical Code, 1990 Edition, is amended as follows:

370-1 SCOPE.

This Article covers the installation and use of all boxes, conduit bodies, and fittings as required by Section 300-15, and boxes, conduit bodies, and fittings referred to in Section 300-15 used as outlet, junction, or pull boxes depending on their use. Cast, sheet metal, nonmetallic, and other boxes such as FS, FD, and larger boxes are not classified as conduit bodies. Fittings such as capped elbows and service entrance elbows are not classified as conduit bodies.

(FPN): For systems over 600 volts, nominal, see Part D of this Article.

See Chapter 35 of the Seattle Building Code for location of outlet boxes in sound transmission control assemblies.

Section 50. Section 373-3 of the National Electrical Code, 1990 Edition, is amended as follows:

373-3 POSITION IN WALL AND ABOVE FLOOR

In walls of concrete, tile, or other noncombustible material, cabinets shall be so installed that the front edge of the cabinet will not set back of the finished surface more than 1/4 inch (6.35mm). In walls constructed of wood or other combustible material, cabinets shall be flush with the finished surface or project therefrom.

Cabinets, cutout boxes and similar equipment shall be so placed that no overcurrent device installed therein will be more than 6-1/2 feet nor less than 1 foot above the floor or working platform, provided that in private residences and apartments, the cabinet shall be so installed that the lowest overcurrent device placed therein shall not be less than 2 feet above the floor. Cabinets, cutout boxes and similar equipment shall be readily accessible, and shall not be located in a bathroom, clothes

closet, shower room, cupboard, attic; above a range, washer, dryer, water heater, sink, plumbing fixture, drain board; or where continuous headroom is less than 6 feet 3 inches.

Section 51. Section 374-1 of the National Electrical Code, 1990 Edition, is amended as follows:

374-1 USE.

Auxiliary gutters shall be permitted to supplement wiring spaces at meter centers, distribution centers, switchboards, and similar points of wiring systems and may enclose conductors or busbars but shall not be used to enclose switches, overcurrent devices, appliances, or other similar equipment. Conductors so enclosed shall not be run in multiple and shall not exceed 4/0 in size.

Section 52. Section 380-3 of the National Electrical Code, 1990 Edition, is amended as follows:

380-3 ENCLOSURE

Switches and circuit breakers shall be of the externally operable type mounted in an enclosure listed for the intended use. The minimum wire bending space at terminals and minimum gutter space provided in switch enclosures shall be as required in Section 373-6.

((~~Exception. Pendant- and surface-type snap switches and knife switches mounted on an open-face switchboard or panelboard.~~))

Section 53. Section 380-10 of the National Electrical Code, 1990 Edition, is amended as follows:

380-10 MOUNTING OF SNAP SWITCHES.

((~~(a) Surface Type. Snap switches used with open wiring on insulators shall be mounted on insulating material that will separate the conductors at least 1/2 inch (12.7 mm) from the surface wired over.~~))

(b) **Box Mounted.** Flush-type snap switches mounted in boxes that are set back of the wall surface as permitted in Section 370-10 shall be installed so that the extension plaster ears are seated against the surface of the wall. Flush-type snap switches mounted in boxes that are flush with the wall surface or project therefrom shall be so installed that the mounting yoke or strap of the switch is seated against the box.

Section 54. Section 380-13 of the National Electrical Code, 1990 Edition, is amended as follows:

380-13 KNIFE SWITCHES

(a) **Isolating Switches.** Knife switches rated at over 1,200 amperes at 250 volts or less, and at over 600 amperes at 251 to 600 volts, shall be used only as isolating switches and shall not be opened under load.

(b) **To Interrupt Currents.** To interrupt currents over 1,200 amperes at 250 volts, nominal, or less, or over 600 amperes at 251 to 600 volts, nominal, a circuit breaker or a switch of special design listed for such purpose shall be used.

(c) **General-Use Switches.** Knife switches of ratings less than specified in (a) and (b) above shall be considered general-use switches.

(FPN): See definition of general-use switch in Article 100.

(d) **Motor Circuit Switches.** Motor-circuit switches shall be permitted to be of the knife-switch type.

(FPN): See definition of a motor-circuit switch in Article 100.

(e) **Service Switches.** For service switches, see also Section 230-70 of the National Electrical Code.

(f) **Capacity Limitation.** All switches shall be of the interlocking type. All switches used as service disconnecting means or those rated over 300 volts shall have two way interlocking.

Section 55. Section 384-14 of the National Electrical Code, 1990 Edition, is amended as follows:

384-14 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARD.

For the purposes of this article, a lighting and appliance branch-circuit panelboard is one having more than 10 percent of its overcurrent devices rated 30 amperes or less, for which neutral connections are provided. Lighting and appliance panelboards shall not be installed outside of a building or structure.

Exception 1: Approved lighting and appliance branch-circuit panelboards in single family dwellings shall be permitted to be installed outdoors in an approved dry or damp location, as defined in Article 100 for damp or dry locations. Illumination shall be provided. Installations in damp locations shall be rain tight type factory built in accordance with NEMA-3R standards.

Exception 2: Lighting and appliance branch-circuit panelboards which only serve outdoor electrical equipment.

Section 56. Section 450-10 of the National Electrical Code, 1990 Edition, is amended as follows:

450-10 GROUNDING.

(a) Exposed noncurrent-carrying metal parts of transformer installations, including fences, guards, etc., shall be grounded where required under the conditions and in the manner specified for electric equipment and other exposed metal parts in Article 250.

(b) **Transformer Neutral Grounding.** Where services over 600 volts are supplied from multi-ground, neutral systems in

transformer protection provided by fuses in the primary feeders as provided in the National Electrical Code, Section 450-3(a), the grounded neutral conductor shall be connected to a grounding electrode at each transformer location. Where the secondary of the transformer or transformers is grounded, the secondary ground shall be connected to the common neutral ground.

Exception: Will not apply to industrial distribution systems.

Section 57. Section 450-13 of the National Electrical Code, 1990 Edition, is amended as follows:

450-13 LOCATION

Transformers and transformer vaults shall be readily accessible to qualified personnel for inspection and maintenance.

Exception No. 1: Dry-type transformers 600 volts, nominal, or less, located in the open on walls, columns, or structures, shall not be required to be readily accessible.

Exception No. 2: Dry-type transformers not exceeding 600 volts, nominal, and 50 kVA shall be permitted in fire-resistant hollow spaces of buildings not permanently closed in by structure and provided they meet the ventilation requirements of Section 450-9.

Unless specified otherwise in this article, the term "fire resistant" means a construction having a minimum fire rating of 1 hour.

(FPN No. 1): See Method for Fire Tests of Building Construction and Materials, ANSI/ASTM E119-83, and Fire Tests of Building Construction and Materials, NFPA 251-1985.

(FPN No. 2): The location of different types of transformers is covered in Part B of Article 450. The location of transformer vaults is covered in Section 450-41.

(a) **Location of Pad-Mounted Transformers.**

(1) **Definition** - A pad-mounted transformer installation is an installation of an oil-filled transformer outdoors wherein all bushings, handholes and live and operating parts are guarded by a solid metal enclosure so secured as to be available to authorized qualified personnel only. This will not prohibit the use of approved glass monitoring devices or properly baffled ventilators.

(2) Where a pad-mounted transformer is to be installed adjacent to a structure of combustible material, it shall not be closer than 10 feet. This ten-foot separation should be measured from the nearest metal portion of the pad-mounted transformer installation to the nearest building features required to be safeguarded. In the case of overhanging eaves or roof lines of combustible material on standard single story structure, the ten-foot measurement should be made in such a way as to provide at least ten feet of clear space between said eaves and the nearest metal portion of the pad-mounted transformer installed outside a vertical line extended from the ends of the eaves to the ground if this distance is at least ten feet horizontally from a combustible wall. In addition, the grade of the ground at the

location of the pad-mounted transformer shall be such that any oil leaking from the transformer will flow away from the building and will not form pools.

Exception: In urban residential areas where improved alleyways are utilized, and where a pad-mounted transformer is to be installed adjacent to a structure of combustible material, it shall not be closer than 2 feet provided the structure is noninhabited, such as a detached automobile garage.

(3) Pad-mounted transformer installations shall not be made nearer than two feet, measured horizontally, to a noncombustible building surface having no doors, windows or other openings closer than indicated in paragraph (2).

(4) Pad-mounted transformer installations should not be located where exposed to damage by automobiles, trucks or other mobile types of machinery. Where transformers are installed in areas subject to other than pedestrian traffic, they shall be provided with additional guarding.

(5) Pad-mounted transformer installations shall meet the requirements for being effectively grounded as provided in Section 250-51, National Electrical Code.

(b) **Location of Total Underground Transformers.** Enclosures for total underground transformers shall not be located within 10 feet of a doorway or fire escape. Adequate space shall be maintained above the total underground transformer enclosure so that a boom may be used to lift the transformer.

Section 58. Sections 450-41, 450-42, 450-43, 450-45, 450-46, 450-47, and 450-48 of the National Electrical Code, 1990 Edition, are hereby repealed.

Section 59. Article 450 of the National Electrical Code, 1990 Edition, is amended by adding a new section 450-20 as follows:

450-20 RATING OF DRY-TYPE TRANSFORMERS.

Dry-type transformers shall be rated not less than the load served as determined in accordance with Article 220 of the National Electrical Code.

Section 60. Section 555-4 of the National Electrical Code, 1990 Edition, is amended as follows:

555-4 BRANCH CIRCUITS.

Every boat space shall be individually supplied with shore power except such spaces reserved for transient use only. Each single receptacle that supplies shore power ((~~to boats~~)) for a boat space shall be supplied from a power outlet or panelboard by an individual or multiwire branch circuit of not less than No. 12 copper wire and of the voltage class and rating corresponding to the rating of the receptacle.

Section 61. Section 555-6 of the National Electrical Code, 1990 Edition, is amended as follows:

555-6 WIRING METHODS.

The wiring method shall be of a type identified for use in wet locations.

Open wiring shall not be permitted. ((~~only by special permission.~~))

((~~FPN No. 1): In granting special permission, major factors include possible contact of open wires with masts, cranes, or similar structures or equipment.~~))

(FPN ((~~No. 2~~))): For further information on wiring methods for various locations, see Marinas and Boatyards, NFPA 303-1986 (ANSI).

Section 62. Article 555 of the National Electrical Code, 1990 Edition, is amended by adding a new section 555-10 as follows:

555-10 LIGHTING FIXTURES.

All walkways over water shall be illuminated to provide safe access. All lighting fixtures shall be listed for the use.

Section 63. Section 600-5 of the National Electrical Code, 1990 Edition, is amended as follows:

600-5 GROUNDING.

Signs, troughs, tube terminal boxes, and other metal frames shall be grounded in the manner specified in Article 250.

Exception No. 1: Isolated Parts. Isolated noncurrent-carrying metal parts of outline lighting shall be permitted to be bonded by No. 14 conductors, protected from physical damage, and grounded in accordance with Article 250.

Exception No. 2: Where portions of electric-discharge neon or cold cathode signs with noncurrent-carrying metal parts which are insulated from ground and from other conductive surfaces and are inaccessible to unauthorized persons.

Section 64. Section 620-21 of the National Electrical Code, 1990 Edition, is amended as follows:

620-21 WIRING METHODS

All conductors (power, signal, telephone, communications, fire alarm, smoke detector, etc.) located in hoistways, in escalator and moving-walk wellways, in or on cars, and in machine and control rooms, not including the traveling cables connecting the car and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, or ((~~rigid nonmetallic conduit,~~)) wireways. ((~~or be type MC cable or Type MI cable~~)).

Exception No. 1: Flexible metal conduit ((~~or Type AC cable~~)) shall be permitted in hoistways and in escalator and moving-walk wellways between risers and limit switches, interlocks, operating buttons, and similar devices. ((~~Class 2 power limited cables (30 volts RMS or less or 42 Vdc or less) shall be permitted to be installed between risers and signal fixtures and within escalators and moving walkways where supported and protected from physical abuse.~~)) Flexible metal conduit runs are limited to 6 feet (1.83m) in length.

Exception No. 2: Flexible metal conduit or Type AC cable not exceeding ((~~6 feet (1.83 m)~~)) 3 feet (.915 m) in length, shall be permitted on cars where so located as to be free from oil and if securely fastened in place and cannot be walked on or damaged.

Exception No. 3: Hard service cords and junior hard service cords conforming to the requirements of Article 400 (Table 400-4) shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates. Hard service cords only shall be permitted as flexible connections for portable type top-of-car operating devices or ((~~the~~)) car-top work lights. Devices or fixtures shall be grounded by means of an equipment grounding conductor run with the circuit conductors. Cables with smaller conductors and other types and thicknesses of insulation and jackets shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates, if listed for this use.

Exception No. 4: Flexible metal conduit or Type AC cable, not exceeding 6 feet (1.83 m) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, and pumping unit motors and valves. Conductors shall also be permitted to be grouped together and taped or corded without being installed in a raceway. Such cable groups shall be supported at intervals not over 3 feet (914 mm) and so located as to be free from physical damage.

Exception No. 5: Flexible metal conduit of 3/8 inch nominal trade size shall be permitted in lengths not in excess of 6 feet (1.83m) in hoistways and 3 feet (.915m) on cars.

Exception No. 6: Hard service cords conforming to the requirements of Article 400 (Table 400-4) shall be permitted as flexible connections on escalators or moving walk control panels and disconnecting means where the entire control panel and disconnecting means are arranged for removal from machine spaces as permitted in Section 620-72, Exception.

Exception No. 7: Type MC cable or Type MI cable shall be permitted to be installed in elevator spaces only by special permission and prior approval of the building official.

Where motor-generators, machine motors, or pumping unit motors and valves are located adjacent to or underneath control equipment and are provided with extra length terminal leads not exceeding 6 feet (1.83m) in length, such leads shall be permitted to be extended to connect directly to controller terminal studs without regard to the carrying-capacity requirements of Articles 430 and 445. Auxiliary gutters shall be permitted in machine and control rooms between controllers, starters, and similar apparatus.

Section 65. Section 620-37 of the National Electrical Code, 1990 Edition, is amended as follows:

620-37 WIRING IN HOISTWAYS

Main feeders for supplying power to elevators and dumbwaiters shall be installed outside the hoistway. Only such electric wiring, raceways, and cables used directly in connection with the elevator or dumbwaiter, including wiring for signals, for communication with the car, for lighting, heating, air conditioning and ventilating the car, for fire detecting systems, for pit sump pumps, and for heating and lighting the hoistway, shall be permitted inside the hoistway.

Exception: By special permission, feeders for elevators shall be permitted within an existing hoistway, if no conductors are spliced within the hoistway and prior approval is obtained from the building official.

Section 66. Section 620-44 of the National Electrical Code, 1990 Edition, is amended as follows:

620-44 INSTALLATION OF TRAVELING CABLES

Traveling cable shall be permitted to be run without the use of raceway for a distance not exceeding 6 feet (1.83m) in length as measured from the first point of support on the elevator car or hoistway wall, providing the conductors are ((~~grouped together and taped or corded, or~~)) in the original sheath.

Traveling cables shall be permitted to be continued to elevator control panels and to elevator car and machine room connections, as fixed wiring, ((~~providing they are suitably supported and protected from damage~~)) and shall be installed in conduits or raceways.

Section 67. Sections 620-71 and 620-72 of the National Electrical Code, 1990 Edition, are amended as follows:

620-71 GUARDING EQUIPMENT

Elevator, dumbwaiter, escalator, and moving-walk driving machines, motor-generator sets, motor controllers, and disconnecting means shall be installed in a room or enclosure set aside for that purpose. The room or enclosure shall be secured against unauthorized access. Non-elevator equipment, wiring, pipes, etc., are prohibited in elevator hoistways, pits, machine rooms and spaces. Only such equipment, wiring, pipes, etc., as pertain to the elevator and its operation are permitted in these elevator spaces. See Section 5122 of the Seattle Building Code.

Exception: Dumbwaiter, escalator, or moving-walk motor controllers shall be permitted outside the spaces herein specified, provided they are enclosed in cabinets with doors or removable panels capable of being locked in the closed position and the disconnecting means is located adjacent to the motor controller. Such cabinets shall be permitted in the balustrading on the side away from the moving steps or moving treadway.

620-72 CLEARANCE AROUND CONTROL PANELS AND DISCONNECTING MEANS

Sufficient clear working space shall be provided around control panels and disconnecting means to provide safe and convenient access to all live parts of the equipment necessary for maintenance and adjustment. The minimum clear working space about live parts on control panels and disconnecting means shall not be less than specified in Section 110-16.

Exception No. 1: Where an escalator or moving walk control panel and disconnecting means are mounted in the same space as the escalator or moving walk drive machine and the clearances specified cannot be provided, the clearance requirements of Section 110-16 shall be permitted to be waived where the entire panel and disconnecting means are arranged so that they can be readily removed from the machine space and are provided with flexible leads to all external connections.

Exception No. 2: Elevator machine rooms are required to have not less than 7 feet 0 inches of headroom, per ANSI A17.1, Rule 101.4.

Where control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or removable panels capable of being locked in the closed position. Such cabinets shall be permitted in the balustrading on the side away from the moving steps or moving treadway.

Section 68. Section 620-81 of the National Electrical Code, 1990 Edition, is amended as follows:

620-81 METAL RACEWAYS ATTACHED TO CARS

Metal raceways, ((~~Type MC cable, Type MI Cable, or Type AC cable~~)) attached to elevator cars shall be bonded to grounded metal parts of the car which they contact.

Section 69. Article 620 of the National Electrical Code, 1990 Edition, is amended by adding a new section 620-102 as follows:

620-102 CONVENIENCE OUTLETS

110-volt convenience outlets of the grounded type are required in elevator machine rooms, secondary machinery spaces, and pits.

Section 70. Section 700-4 of the National Electrical Code, 1990 Edition, is amended as follows:

700-4 TESTS AND MAINTENANCE.

(a) **Conduct or Witness Test.** The authority having jurisdiction shall conduct or witness a test on the complete system upon installation and periodically afterward under the control of the Seattle Fire Department.

(b) **Tested Periodically.** Systems shall be tested periodically by the building owner and/or manager on a schedule acceptable to the authority having jurisdiction to assure their maintenance in proper operating condition.

(c) **Battery Systems Maintenance.** Where battery systems or unit equipments are involved, including batteries used for starting, control or ignition in auxiliary engines, the authority having jurisdiction shall require periodic maintenance by the building owner and/or manager.

(d) **Written Record.** A written record shall be kept of such tests and maintenance.

(e) **Testing Under Load.** Means for testing all emergency lighting and power systems during maximum anticipated load conditions shall be provided.

Section 71. Section 700-12 of the National Electrical Code, 1990 Edition, is amended as follows:

700-12 GENERAL REQUIREMENTS.

Current supply shall be such that in the event of failure of the normal supply to, or within, the building or group of buildings concerned, emergency lighting, emergency power, or both will be available within the time required for the application but not to exceed 10 seconds. The supply system for emergency purposes, in addition to the normal services to the building and meeting the general requirements of this section, shall be permitted to comprise one or more of the types of systems described in (a) through (e) below. Unit equipments in accordance with Section 700-12(f) shall satisfy the applicable requirements of this article.

In selecting an emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building.

Consideration shall be given to the location and/or design of all equipment to minimize the hazards that might cause complete failure due to floods, fires, icing, and vandalism.

(FPN): Assignment of degree of reliability of the recognized emergency supply system depends upon the careful evaluation of the variables at each particular installation.

(a) **Storage Battery.** Storage batteries used as source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for a period of 1-1/2 hours minimum, without the voltage applied to the load falling below 87-1/2 percent of normal.

Batteries, whether of the acid or alkali type, shall be designed and constructed to meet the requirements of emergency service and shall be compatible with the charger for that particular installation.

For a sealed battery, the container shall not be required to be transparent. However, for the lead acid battery which requires water additions, transparent or translucent jars shall be furnished. Automotive-type batteries shall not be used.

An automatic battery charging means shall be provided.

(b) **Generator Set.**

(1) A generator set driven by a prime mover acceptable to the authority having jurisdiction and sized in accordance with Section 700-5. Means shall be provided for automatically starting the prime mover on failure of the normal service and for automatic transfer and operation of all required electrical circuits. A time delay feature permitting a 15-minute setting shall be provided to avoid retransfer in case of short-time reestablishment of the normal source.

(2) Where internal combustion engines are used as the prime mover, ((~~an on-site~~)) a fuel supply shall be provided with an on-premise fuel supply sufficient for not less than 2 hours full-demand operation of the system. The fuel supply shall be on-site unless otherwise approved by the building official.

(3) Prime movers shall not be solely dependent upon a public utility gas system for their fuel supply or municipal water supply for their cooling systems. Means shall be provided for automatically transferring from one fuel supply to another where dual fuel supplies are used.

Exception: Where acceptable to the authority having jurisdiction, the use of other than on-site fuels shall be permitted when there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company.

(4) Where a storage battery is used for control or signal power, or as the means of starting the prime mover, it shall be suitable for the purpose and shall be equipped with an automatic charging means independent of the generator set.

(5) Generator sets which require more than 10 seconds to develop power are acceptable providing an auxiliary power supply will energize the emergency system until the generator can pick up the load.

(c) **Uninterruptible Power Supplies.** Uninterruptible power supplies used to provide power for emergency systems shall comply with the applicable provision of Section 700-12(a) and (b).

(d) **Separate Service.** Where acceptable to the authority having jurisdiction as suitable for use as an emergency source, a second service shall be permitted. This service shall be in accordance with Article 230, with separate service drop or lateral, widely separated electrically and physically from the normal service to minimize the possibility of simultaneous interruption of supply.

(e) **Connection Ahead of Service Disconnecting Means.** Where acceptable to the authority having jurisdiction as suitable for use as an emergency source, connection ahead of, but not within, the main service disconnecting means shall be permitted. The emergency service shall be sufficiently separated from the normal

main service disconnecting means to prevent simultaneous interruption of supply through an occurrence within the building or groups of buildings served.

(FPN): See Section 230-82 for equipment permitted on the supply side of a service disconnecting means.

(f) **Unit Equipment.** Individual unit equipment for emergency illumination shall consist of: (1) a rechargeable battery; (2) a battery charging means; (3) provisions for one or more lamps mounted on the equipment and/or shall be permitted to have terminals for remote lamps; and (4) a relaying device arranged to energize the lamps automatically upon failure of the supply to the unit equipment. The batteries shall be of suitable rating and capacity to supply and maintain at not less than 87-1/2 percent of the nominal battery voltage for the total lamp load associated with the unit for a period of at least 1-1/2 hours, or the unit equipment shall supply and maintain not less than 60 percent of the initial emergency illumination for a period of at least 1-1/2 hours. Storage batteries, whether of the acid or alkali type, shall be designed and constructed to meet the requirements of emergency service.

Unit equipment shall be permanently fixed in place (i.e., not portable) and shall have all wiring to each unit installed in accordance with the requirements of any of the wiring methods in Chapter 3. Flexible cord- and plug-connection shall be permitted provided that the cord does not exceed 3 feet (914 mm) in length. The branch circuit feeding the unit equipment shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches. Emergency illumination fixtures that obtain power from a unit equipment and are not part of the unit equipment shall be wired to the unit equipment as required by Section 700-9 and by one of the wiring methods of Chapter 3.

Exception: In a separate and uninterrupted area supplied by a minimum of 3 normal lighting circuits, a separate branch circuit for unit equipment shall be permitted if it originates from the same panelboard as that of the normal lighting circuits and is provided with a lock-on feature.

Section 72. Section 700-16 of the National Electrical Code, 1990 Edition, is amended as follows:

700-16 EMERGENCY ILLUMINATION.

Emergency illumination shall include all required means of egress lighting, illuminated exit signs, and all other lights specified as necessary to provide required illumination.

Emergency lighting systems shall be so designed and installed that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space which requires emergency illumination.

Where high-intensity discharge lighting such as high- and low-pressure sodium, mercury vapor, and metal halide is used as the sole source of normal illumination, the emergency lighting system shall be required to operate until normal illumination has been restored.

Exception: Where alternative means have been taken to ensure that the emergency lighting illumination level is maintained.

Fixtures of alternate design may be used when specifically approved by the building official.

Exit signs with open bottom lighting shall not be considered as taking the place of a required pathway light unless specifically approved for the purpose.

Exit illumination (pathway lighting) and emergency area lighting shall comply with Chapter 33 of the Seattle Building Code.

Section 73. If any section, subsection, sentence, clause or phrase of this subtitle is, for any reason, held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this subtitle. The City Council hereby declares that it would have passed this subtitle and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases are declared unconstitutional or otherwise invalid.

Section 74. This ordinance shall take effect and be in force thirty days from and after its passage and approval, if approved by the Mayor, otherwise it shall take effect at the time it shall have become a law under the provisions of the City Charter.

Passed by the City Council the 3rd day of September, 1991, and signed by me in open session in authentication of its passage this 3rd day of September, 1991.

President of the City Council

Approved by me this 9th day of September, 1991

MAYOR

Filed by me this 10th day of September, 1991

ATTEST: Norvand J. Brooks
City Comptroller and City Clerk

BY: Margaret Carter
Deputy Clerk

MT:jl
910624
I:Electric.cpt/3-jord.1-3-jord.63

CS 19.2

LEGISLATION

CITY OF SEATTLE

ANALYSIS AND DECISION OF THE DIRECTOR OF

THE DEPARTMENT OF CONSTRUCTION AND LAND USE

Application Number: 8901485

Applicant Name: City of Seattle Department of Construction and Land Use

Address of Proposal: City-wide Application

SUMMARY OF PROPOSED ACTION

Revisions to the Seattle Electrical Code and adoption of the 1990 National Electrical Code with Seattle amendments.

The following Master Use Permit component is required:

SEPA - Environmental Determination (Chapter 25.05, Seattle Municipal Code)

SEPA DETERMINATION: [ ] Exempt [x] DNS [ ] EIS [ ] MDNS

[ ] DNS with conditions

[ ] DNS involving non exempt grading or demolition or involving another

BACKGROUND DATA

Proposed Action

The proposed action would revise the Seattle Electrical Code and adopt the 1990 National Electrical Code (NEC) with local Seattle amendments. The City Council would act upon the proposed amendments, with final approval by the Mayor. Changes from the current code include the adoption of portions of the 1990 National Electrical Code (NEC) and Washington Administrative Code (WAC) by amendment to the

Seattle Electrical Code (SEC); the establishment of a new Construction Codes Advisory Board (CCAB) with appeal authority; and, minor revisions to clarify certain code sections. Additionally, technical provisions pertaining to materials handling and installation will be revised.

Public Comment

Public notice was given and comments solicited as part of the legislative process. The work of the Electrical Code Advisory Board over a period of three months composed of members of the public has resulted in the recommendations discussed in this analysis and the code modifications. The full text of the proposed amendments and code language is available from the Code Development and Coordination (CDC) section of the Department of Construction and Land Use (DCLU).

ANALYSIS - SEPA

Environmental impacts are described in the environmental checklist prepared by this Department and dated February 5, 1991. The information in that checklist and the experience of the lead agency with review of similar legislative proposals constitutes the basis for this analysis and decision.

The proposal is not expected to have probable significant adverse impacts on any element of the environment. The change in the Electrical Code provisions are intended to incorporate portions of the 1990 NEC and WAC requirements, establish the CCAB with appeal authority, and provide for clarification of the code and removal of inconsistencies with other City of Seattle Codes. Other proposed changes will increase enforceability of code provisions and increase safety in general.

Adoption of the National Electrical Code (NEC) and the Washington Administrative Code (WAC). The 1990 NEC, revised every three years, will be adopted and amended by the City of Seattle from the recommendation of the Electrical Code Advisory Board (ECAB). The advisory board also recommended incorporation of portions of the WAC requirements. Incorporation of the NEC and WAC regulations by amendment is essentially an administrative function which brings the local code into compliance with State and Federal regulations. This periodic update should aid implementation of the code.

Construction Codes Advisory Board (CCAB) . A new CCAB committee will be established composed of appointed members of the public. Composed of the current Building Code Advisory Board (BCAB) members and two members of the existing Electrical Code Advisory Board (ECAB), the board will meet once a month as does the BCAB. Currently, the ECAB is only appointed once every three years to update the electrical code; a subcommittee of the CCAB will take over this function. The CCAB will have the authority to hear appeals on code interpretations made by DCLU.

Including members of the ECAB on the CCAB will ensure that electrical code issues will be resolved on a continuing basis. Initiation of revisions will come from daily enforcement of SEC provisions by electrical inspectors and plan review staff, instead of by recommendation of an advisory board once every three years. This change has the potential for proposed revisions to be more timely and pragmatic.

Authority to resolve code interpretation issues through appeal to the CCAB should result in more responsive answers to disputes. Currently, code interpretation challenges are reviewed first at the field inspection/plans examiner level, then move onto to the construction division director if not resolved; the division director has the final authority. Giving the CCAB authority to hear appeals of DCLU decisions or actions may help ferret out true code interpretation decisions for appeal from those which can be resolved at the field inspection stage. Thus a more efficient process may result.

Additional Seattle Electrical Code (SEC) changes. Proposed changes to the Code will clarify terms, delete redundancies, and remove inconsistencies with other City codes. Code changes will also increase safety in general, alter the timing of initiation of penalties, and codify Director's Rule 7-89. These changes should make enforcement and the processing of permits more efficient.

All the proposed changes to the Seattle Electrical Code should improve the efficiency of the implementation process and increase safety in general. Overall impacts should positively affect the general public health, safety, and welfare.

DECISION

This decision was made after review by the responsible official on behalf of the lead agency of a completed environmental checklist and other information on file with the responsible department. This constitutes the Threshold Determination and form. The intent of this declaration is to satisfy the requirements of the State Environmental Policy Act (RCW 43.21.C), including the requirement to inform the public of agency decisions pursuant to SEPA.

[x] Determination of Non-Significance. This proposal has been determined to not have a significant adverse impact upon the environment. An EIS is not required under RCW 43.21C.030.(2)(c).

[ ] Determination of Significance. This proposal has or may have a significant adverse impact upon the environment. An EIS is required under RCW 43.21C.030(2)(c).

Signature Sandra H. Howard Date

Sandra H. Howard
Land Use Specialist

shh/8901485/3.5

ESTIMATES OF COST IMPACTS OF ADOPTION OF 1990 NATIONAL ELECTRICAL CODE AND SEATTLE AMENDMENTS

January 1991

Estimated Cost Impacts of 1990 Seattle Electrical Code

	Task	Hours	Costs[1]
1.	Training		
	a. Prepare materials	10	$ 1100
	b. Give training	20	2200
	c. Receive training[2]	--	--
2.	Copying		
	a. Cost for Ordinance		110
3.	Publishing		
	a. Cost for Code pages		2280
4.	Revise Director's Rules		
	a. New or revised rule(s)	--	--
	b. Rescind rule(s)	2	220
	c. Process rule(s)	10	1100
5.	Total for amendment	42	7010

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1 Costs are based on $110/hour of staff time.
2 Staff training will occur during regularly-scheduled staff meetings.

i:electric.cpt/estim.1

ANALYSIS OF REVISIONS
1990 SEATTLE ELECTRICAL CODE

This memo describes only new amendments to the Seattle Electrical Code. Amendments from previous codes are not analyzed, nor are changes to the NEC discussed.

Section	**Reason for change**
104(c) Maintenance of Existing Buildings	Minor language changes.
104(e) Moved Buildings	Revised to comply with 1990 state legislation which prohibits the city from requiring relocated buildings to comply with standards applied to new construction.
210 Authority	The term "authority having jurisdiction" is added as a term referring to the Director of DCLU. This term is commonly used by the NEC.
202 (c) Right of Entry	Revised for clarity. Content was not changed.
202(d) Stop Orders	Provision added allowing notice of violation to be served on any person responsible for the work.
202(f) Liability	Revised for clarity. Content not changed.
203 Unsafe Conditions	Second paragraph revised for clarity. Content not changed.
204(b) Civil Penalty	Change states that a penalty begins to accrue when the violation occurs or begins rather than when the building official requires compliance.

207 Construction Code Advisory Board	Electrical Code Advisory Board (ECAB) is changed from a separate Board to a committee of a new Construction Codes Advisory Board (CCAB). Companion changes are being made in the Building Code which will change the Building Code Advisory Board to the Construction Codes Advisory Board. Representatives of the electrical industry will be members of CCAB, and CCAB will have a standing committee charged with advising DCLU on Electrical Code issues.
208 Appeals	The electrical committee of CCAB is given authority to make advisory decisions on appeals of DCLU interpretations of the Electrical Code.
301(c) Areas of Flood Hazard	Added to alert applicants to the Seattle Floodplain Development Ordinance.
302(b) Plans and Specifications--General	Clarifies that two sets of plans are required in addition to the application required by the preceding section. The exception is rewritten to clarify that no plans are required for one- and two-family dwellings. Three sets of plans are required for fire alarm systems so the third set may be routed to the Seattle Fire Department.
302(b) Plans and Specifications--Clarity of Plans	The minimum size of plans is reduced to 11 X 17 which can be reproduced on office copiers. The quality of plans is safeguarded by a code requirement for minimum scale.

302(b) Plans and Specifications--Information on Plans and Specs	Requirements added for riser diagram, demand factor for branch circuits and panel and circuit schedules.
302(c) Advance Plan Examination	This provision is moved into the code from Director's Rule 7-89. State law prohibits issuance of an electrical permit to anyone other than a licensed electrical contractor, except in limited circumstances. This revision allows an electrical engineer or building owner to begin the permit process before the contractor is hired.
303(a)4 Requirement for License	Exception revised for clarity.
303(a)5 Cancellation of Permit Application	Provision for refund is deleted since it is also found in the Permit Fee Ordinance.
303(e) Suspension or Revocation of Permit	New section allows the Building Official to suspend or revoke a permit issued in error, consistent with the Building and Mechanical codes.
305(e)1 Required Inspections--Cover Inspection	Name changed from "rough-in inspection" to "cover inspection". Section rewritten for clarity. Subsection B refers to a later section of the code for description of when inspection of equipment conductors is required.

210-8 Ground Fault Circuit Interrupter Protection in Dwelling Units	Amendment added which repeats a requirement from WAC 296-46-21008. It prohibits circuits supplying bathroom receptacles in dwelling units from supplying other loads. A paragraph in subsection (3) is deleted which defines "direct grade level access". Use of that term was deleted in a prior Seattle code.
215-10 Multifamily Occupancy Buildings & Other Occupancies	Seattle amendment is deleted because of NEC format change. Its provisions were relocated to 336-4 and 338-3.
230-28(b) Service Masts as Supports	Reference to WAC is updated.
230-29 Supports Over Buildings and Wires On or About Buildings or Structures Over Water	Sections (a), (b) & (c) are revised to apply only to service entrance conductors because other service conductors belong to the utility--the NEC does not apply to a utility's conductors. The phrase "other structures over water" is added. A disconnecting means is added as an alternative to terminating the conductor at service equipment. An exception is added which requires an accessible disconnecting means outside the vault. It is intended for Fire Department use. A new fine print note alerts applicants that City Light may have additional requirements.

230-41 Insulation of Service Entrance Conductors	Seattle amendment deleted because the topic is adequately covered by the NEC.
230-42 Size and Rating of Service-Entrance Conductors	Section (a) and exceptions 2 and 3 are added. They repeat requirements added to WAC 296-46-23040 in 1990.
	Text and a table are deleted at City Light's suggestion. These sections had advised applicants to consult with the utility when the capacity of service exceeded sizes listed in the table. City Light has found that customers are not consulting with them. The requirements do not affect safety, so are deleted from the code.
250-1 Grounding	The requirement that grounding equipment be made up at time of rough-in is extended to all systems, rather than only non-metallic cable systems as in the 1987 code.
250-84 Resistance of Made Electrodes	ECAB recommended increasing the separation between required ground rods from 6 feet to 8 feet to provide a more effective grounding grid.

300-1 Wiring Methods for Specific Occupancies	This article was changed to include changes made to WAC 296-46-130 and -150 in 1990. The text defining the occupancies is included here for convenience--compliance with these WAC sections as minimum standards is mandatory throughout the state. The definitions were in an appendix to the 1987 Seattle code. The only change from the WAC is found in footnote 2. Seattle's footnote forbids armored cable. This is consistent with Article 333 of the 1990 Seattle Electrical Code.
300-21 Spread of Products of Combustion	The Seattle amendment requires penetrations to be enclosed in ferrous raceways, and prohibits flexible raceways. The 1987 code applied the amendment to all penetrations. The location of the amendment, but not the wording, is changed. It now applies only to penetrations in hollow spaces, vertical shafts and ventilation or air-handling ducts.
333-6 Uses Not Permitted for Armored Cable	Use of AC in damp and wet locations is prohibited. This is consistent with NEC and prior Seattle codes.
334-3 Uses Permitted for Metal Clad Cable	Exception 1 is added to allow MC cable in branch circuits when the outer covering is approved as a grounding means. Information was presented to ECAB about new product approvals which justify this change in use of MC cable.

334-10 Installation of MC Cable	Support for MC cable is required at shorter intervals to be consistent with requirements for other types of cable, such as AC and NMC.
336-4 Uses Not Permitted for NM and NMC Cable	A provision prohibiting NM and NMC cable as feeders in certain structures is relocated from Article 215-10 to conform to a change in NEC format.
338-3 SE and USE Cable Permitted as Branch Circuits or Feeders	Exceptions which prohibit SE and USE cable in certain instances is relocated from Article 215-10 to conform to a change in NEC format.
384-14 Lighting and Appliance Branch-Circuit Panelboard	An exception is added which allows lighting and appliance branch-circuit panelboards to be outside if they serve only outdoor equipment.
450-20 Rating of Dry-type Transformers	This section states a new state regulation, WAC 296-46-45001. It is included in the Seattle Code for convenience.
550 Mobile Homes and Mobile Home Parks	Seattle amendment deleted because the topic is adequately covered by the NEC.
555-6 Wiring Methods for Marinas and Boatyards	Fine print note 1 is deleted because it discusses granting special permission for open wiring. It is unnecessary because the Seattle Code prohibits open wiring.

555-10 Lighting Fixtures for Marinas and Boatyards	The prior code specified the minimum level of lighting required in foot-candles. ECAB and DCLU staff made the requirement more general because the prior standard was too difficult to enforce.
600-5 Grounding of Electric Signs	An exception was added which provides a less restrictive grounding requirement in certain situations. This exception was deleted from the 1987 NEC because of difficulty in enforcement. The Seattle amendment will be enforceable because it is limited in application.

Seattle
Department of Construction and Land Use

Dennis J. McLerran, Director
Norman B. Rice, Mayor

M E M O R A N D U M

TO: Mayor Norman B. Rice
via Andrew Lofton, OMB

FROM: Dennis J. McLerran, Director, Department of Construction and Land Use D.J.M.

DATE: March 15, 1991

SUBJECT: Proposed Revision of Seattle Electrical Code

SUMMARY

With this memorandum we are transmitting to you our proposal for revisions to the Seattle Electrical Code. The proposal adopts the 1990 National Electrical Code with Seattle amendments.

The proposal is based on the recommendation of the Electrical Code Advisory Board. The Board and DCLU agree on the recommendation.

Major changes from the current code include:

* Elimination of the Electrical Code Advisory Board (ECAB) as an appointed Board, making it a committee of a new Construction Codes Advisory Board (CCAB). The ECAB recommended that the CCAB also be given authority to hear appeals of DCLU interpretations of the Electrical Code.

* A disconnecting means is required outside transformers located over water.

* Non-ferrous raceways are allowed for some types of penetrations.

* The outer covering of metal clad cable is allowed as a grounding means in some circumstances.

ECAB considered other important issues in addition to the changes listed above. ECAB decided to continue to allow non-plenum-rated cable in spaces used for handling environmental air. The Board also decided to continue to prohibit Types NM and NMC cable as feeders in multifamily buildings and other buildings of more than one story.

A complete summary of the changes made in this proposed Electrical Code accompanies this memo.

Mayor Norman B. Rice
March 15, 1991

Code Review

A public advisory board, as authorized by section 207 of the Seattle Electrical Code, was convened to review the proposed code. This Electrical Code Advisory Board (ECAB) met ten times. It consisted of representatives of the electrical contractors' and electrical engineers' organizations, electrical products manufacturers, general contractors and the general public. Representatives of the Washington Department of Labor and Industries' Electrical Inspection Division, Seattle City Light and the Seattle Fire Department participated with ECAB in reviewing the proposed code.

We submitted the draft to the Seattle Water Department, Department of Licenses and Consumer Affairs and Seattle Engineering Department for review and comment.

Environmental review of the code has resulted in a Declaration of Non-significance.

Code Implementation

The cost of implementing the proposed code will be low. The code does not make major changes requiring significant staff training, nor does it change DCLU procedures or require additional Director's Rules. A summary of the anticipated cost of implementation is attached. These costs can be accommodated within DCLU's existing budget.

We recommend an implementation date thirty days after final approval of the code.

Many people contributed valuable assistance to the development of this code. We appreciate the many hours of time and the careful attention given by the Electrical Code Advisory Board, the Department of Labor and Industries, Seattle City Light and the Seattle Fire Department.

We would be pleased to provide you with briefings or additional information about our recommended code.

City of Seattle

Executive Department-Office of Management and Budget

Andrew J. Lofton, Director
Norman B. Rice, Mayor

March 25, 1991

6/28/91

The Honorable Mark Sidran
City Attorney
City of Seattle

Dear Mr. Sidran:

The Mayor is proposing to the City Council that the enclosed legislation be adopted.

REQUESTING DEPARTMENT	Construction and Land Use
SUBJECT:	An ordinance relating to the Seattle Electrical Code, repealing Ordinances 114181 and 114182, and adopting and amending the 1990 National Electric Code.

Pursuant to the City Council's S.O.P. 100-014, the Executive Department is forwarding this request for legislation to your office for review and drafting.

After reviewing this request and any necessary redrafting of the enclosed legislation, return the legislation to OMB. Any specific questions regarding the legislation can be directed to Victoria Runkle, 4-8080.

Sincerely,

Norman B. Rice
Mayor

by

ANDREW J. LOFTON
Budget Director

AL/vr/lw

Enclosure

cc: Superintendent, Water

STATE OF WASHINGTON - KING COUNTY

9240
City of Seattle

—ss.

No.

Affidavit of Publication

The undersigned, on oath states that he is an authorized representative of The Daily Journal of Commerce, a daily newspaper, which newspaper is a legal newspaper of general circulation and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a daily newspaper in Seattle, King County, Washington, and it is now and during all of said time was printed in an office maintained at the aforesaid place of publication of this newspaper. The Daily Journal of Commerce was on the 12th day of June, 1941, approved as a legal newspaper by the Superior Court of King County.

The notice in the exact form annexed, was published in regular issues of The Daily Journal of Commerce, which was regularly distributed to its subscribers during the below stated period. The annexed notice, a

ORD: 115781

was published on

09/19/91

The amount of the fee charged for the foregoing publication is the sum of $, which amount has been paid in full.

C. Trent

Subscribed and sworn to before me on

09/19/91

Jennifer A. Nicholson

Notary Public for the State of Washington,
residing in Seattle