ORDINANCE No. 121286

COUNCIL BILL No. 114704

AN ORDINANCE relating to building and construction codes: repealing Section 22.300.015 of the Seattle Municipal Code (Ordinance 119507), and adopting a new Section 22.300.016 to adopt the 2002 National Electrical Code with Seattle amendments as the Seattle Electrical Code.

COMPTROLLER FILE No.

Introduced: SEP 15 2003	By: NICASTRO
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Reported: 9-22-03	Second Reading:
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Passed over Veto:	Veto Sustained:

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Honorable President:

Your Committee on

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9/14/03 - Pass as A

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Law Department *[signature]*

The City of Seattle--Legislative Department

Date Reported and Adopted

REPORT OF COMMITTEE

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... that we have considered the same and respectfully recommed that the same:

...6/03 — Pass as Amended 2-0 (JN, RC)

...2.03 Passed 9-0

Committee Chair

SMEAD 25 YSP 17703

Michael Aoki-Kramer/mak
2002 Edition Seattle Electrical Code 4.doc
6/30/2003
Version 5

ORDINANCE 121286

AN ORDINANCE relating to building and construction codes: repealing Section 22.300.015 of the Seattle Municipal Code (Ordinance 119507), and adopting a new Section 22.300.016 to adopt the 2002 National Electrical Code with Seattle amendments as the Seattle Electrical Code.

WHEREAS, Chapter 19.28, Revised Code of Washington grants local jurisdictions the authority to adopt regulations applicable to electrical installations that differ from regulations adopted by the state; and

WHEREAS, the Mayor and City Council of the City of Seattle affirm the findings of the Department of Planning and Development, as set forth in Exhibit A, that the 2003 Seattle Electrical Code provides an equal, higher, or better standard of construction and an equal, higher, or better standard of materials, devices, appliances, and equipment than the regulations adopted by the Washington State Department of Labor and Industries amending the 2002 National Electrical Code, as set forth at Chapter 296-46B Washington Administrative Code; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. Section 22.300.015 of the Seattle Municipal Code adopting the 1999 National Electrical Code as adopted in Ordinance 119507 is hereby repealed, and a new Section 22.300.016 is added to the Seattle Municipal Code to read as follows:

22.300.016 Adoption of the National Electrical Code.

The National Electrical Code, 2002 edition, published by the National Fire Protection Association, one copy of which is filed with the City Clerk in C.F.306325, is hereby adopted and by this reference made a part of this subtitle. The National Electrical Code, 2002 edition, together with the amendments and additions thereto adopted by this ordinance, constitute the Seattle Electrical Code.

Section 2. The National Electrical Code, 2002 edition, is amended by adding Chapters 1, 2 and 3 as follows:

CHAPTER 1
APPLICATION OF THIS CODE

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

Section 102.1 Purpose. The purpose of this code is to promote public safety in a practical manner from hazards arising from the use of electricity. This code is intended to provide 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. This code is not intended as a design specification nor an instruction manual for untrained persons.

Section 102.2 Chapter 296-46B Washington Administrative Code. 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). Those sections of the Washington State Electrical Code amending the National Electric Code, as set forth at Chapter 296-46B of the Washington Administrative Code (WAC), are adopted except those sections that are amended by or are in conflict with this code. The following administrative sections of Chapter 296-46B WAC are superseded by this code: WAC 296-46B-010 (1) – (13), (15), (16), (19), (20), (23), (24); and WAC 296-46B-030.

Section 103 Scope. The Electrical Code shall apply to all electrical wiring and equipment, including communications systems, 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 service point 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.

Section 104 APPLICATION TO EXISTING BUILDINGS

(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. This section does not limit the effect of applicable retroactive ordinances.

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, other than for the replacement of receptacles as provided in NEC Section 406.3(D), 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 detrimental to public safety.

(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 required by this code or 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 owner's agent to maintain in a safe and usable condition all parts of buildings or equipment that 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 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 that, 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 that has been designated for preservation by City Landmarks Preservation Board or the State of Washington; has been listed, or has been determined eligible to be listed, in 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 special review 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 compliance with those standards within one year from the date of permit issuance and is found to be a public nuisance may be abated.

Buildings wired by standards other than those recognized by this code and the National Electrical Code are not in compliance with these provisions.

Section 105 Tests. 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 to be made, at no expense to the City, as proof of compliance.

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. The building official shall retain reports of tests.

Section 106 Utilization Equipment and Alternate Materials and Methods of Wiring. This code does not prevent the use of any utilization equipment, material, method or design of wiring not specifically allowed or prohibited by this code, provided the same has been approved and its use authorized by the building official.

The building official may approve an alternate, provided he/she finds that the proposed alternate complies with the provisions of this code and the alternate, when considered together with other safety features or relevant circumstances, will provide at least an equivalent level of strength, effectiveness, fire resistance, durability, safety and sanitation.

The building official may require that sufficient evidence or proof be submitted to substantiate any claims regarding the use or suitability of utilization equipment, material, method or design of wiring. The building official may, but is not required to, record the approval of alternate materials and methods, and any relevant information in the files of the building official or on the approved permit plans. This section supersedes the requirements of WAC 296-46B-030.

Section 107 Modifications. 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 the strict application of this code is impractical under the circumstances 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 building official may, but is not required to, record the approval of modifications and any relevant information in the files of the building official or on the approved permit plans.

CHAPTER 2
ORGANIZATION AND ENFORCEMENT

Section 201 Authority. 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 Planning and Development, and his or her designees.

Section 202 POWERS AND DUTIES OF THE BUILDING OFFICIAL

(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 Planning and Development.

(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 general public safety. 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 that 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.

(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.

Section 203 Unsafe Conditions. 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 is authorized to 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.

Section 204 VIOLATIONS AND PENALTIES

(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) Notice of Violation. If after investigation the building official determines that standards or requirements of this code have been violated, the building official may serve a notice of violation upon the owner or other person responsible for the action or condition. The notice of violation shall state the standards or requirements violated, shall state what corrective action, if any, is necessary to comply with the standards or requirements, and shall set a reasonable time for compliance. The notice shall be served upon the owner or other responsible person by personal service, certified mail with return receipt requested or registered mail with return receipt requested or registered mail addressed to the last known address of such person. In addition, a copy of the notice may be posted at a conspicuous place on the property. The notice of violation shall be considered an order of the building official. Nothing in this subsection shall be deemed to limit or preclude any action or proceeding pursuant to this code, and nothing in this section shall be deemed to obligate or require the building official to issue a notice of violation prior to the imposition of civil or criminal penalties in this section.

(C) 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.

(D) 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 Section 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.

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

Section 205 Notices. 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.

Section 206 Rules of the Building Official

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

(1) "Electrical Wiring Standards" to promulgate standards that are acceptable as a method or as an alternative design for meeting code required performance criteria, to edit or update national standards that 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 that 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 Seattle Municipal Code.

Section 207 Construction Codes Advisory Board. An Electrical Code Committee of the Construction Codes Advisory Board, as established in Section 105 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 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.

Section 208 Appeals. 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.

Section 209 Review by the Director.

209.1 Any party affected by a notice of violation issued by the Director pursuant to Section 204(B) may obtain a review of the notice by requesting such review in writing within ten days after service of the notice. When the last day of the period computed is a Saturday, Sunday, federal or City holiday, the period shall run until 5:00 p.m. of the next business day. Upon receipt of a request, the Director shall notify the person requesting the review of the date, time and place of the Director's review. The review shall be not less than ten nor more than twenty days after the request is received, unless otherwise agreed by the person requesting the review. Any person affected by the notice of violation may submit any written material to the Director for consideration on or before the date of the review.

209.2 The review will consist of an informal review meeting held at the Department. A representative of the Director who is familiar with the case and the applicable ordinances will attend. The Director's representative shall explain the reasons for the issuance of the notice of violation and will consider any information presented by the persons attending. At or after the review, the Director shall:

1. Sustain the notice of violation; or
2. Withdraw the notice of violation; or
3. Continue the review to a future date; or
4. Amend the notice of violation.

209.3 The Director shall issue a decision within a reasonable time after the conclusion of the review. The Director shall mail the decision by regular first class mail to the person or persons named in the notice of violation.

CHAPTER 3
PERMITS AND INSPECTIONS

Section 301 PERMITS

(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) Replacing flush or snap switches, fuses, lamp sockets, receptacles, or ballasts.

(2) Reconnecting or replacing a range within an individual dwelling unit, hot plate, water heater, electric baseboard, and wall-heating unit to a circuit that 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) Wiring for communication systems, as set forth in NEC Chapter 8 and Article 770, as follows:

(a) in single family residences, or

(b) installations of 1000 feet or less.

(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) Flood Hazard Areas. 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 filed in C.F. 295948, 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.

Section 302 APPLICATION AND PLANS

(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 or occupant in possession of the building or premises where the work is to be done, the name of the licensed contractor, if any, that will be responsible for the installation, and such other information as the building official may require. Application shall include documentation of compliance with the Seattle Energy Code. 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 the following:

(a) services or feeders of 400 amperes or over;

(b) all switches or circuit breakers rated 400 amperes or over;

(c) any proposed installation the scope of which covers more than 2,500 square feet

(d) any proposed installation which cannot be adequately described on the application form; and

(e) installations of emergency generators.

Exception: Plans and specifications shall not be required for installations in one- and two-family dwellings that can be adequately described on the application form.

Two sets of electrical plans shall be submitted with each electrical permit application for new or altered electrical installations in educational, institutional, and health or personal care occupancies as indicated in WAC 296-46B-010 (14), (17) and WAC 296-46B-010 Tables 010-1 and 010-2.

Exception: One set of electrical plans shall be submitted with each application when a service or feeder is new or altered and the sum of the equipment ampere rating is less than 200 amperes.

Three sets of plans and specifications for fire alarm systems shall be submitted. See Seattle Fire Code Section 1007.3.1 for required submittal information.

(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. 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.** Information on plans and specifications shall include the following:

a. The type of occupancy and a complete scope of work.

b. A complete riser and one line diagram to include all service and feeder connections.

c. Clear identification of all circuitry, to include but not limited to: circuit numbers, wire sizes, insulation types, conduit sizes and types.

d. A complete set of switchboard and panel schedules. These shall include all load calculations and demand factors used for computation.

e. A complete project load summary to include existing loads as computed in accordance with NEC Article 220 and all added loads. Electrical calculations, heat loss calculations and lighting summaries may be submitted on separate computation sheets.

f. Fault current calculations and the listed interrupting rating of all feeder and service equipment.

g. Voltage characteristics of all electrical systems and equipment.

h. A key to all symbols used.

i. A fixture schedule showing all pertinent fixture information.

j. 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.

Section 303 PERMITS

(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 Fee Subtitle 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(s) 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 that 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, 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. The licensed installer responsible for the work shall be identified on the electrical permit.

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 that they own as described in RCW 19.28.261.

(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 canceled 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 canceled 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 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 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 that 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) **Re-establishment.** 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 Section 303(d)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 Department of Transportation. All temporary installations shall comply with all other requirements of this code.

Section 304 Permit Fees. 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 Fee Subtitle.

Section 305 INSPECTIONS

(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 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 Section 305(E) below.

(E) Required Inspections.

(1) **Cover Inspection.** The building official is authorized to conduct cover inspections 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. Electrical Equipment grounding (boxes, equipment, conductors and provisions for grounding receptacles, etc.) for all systems shall be completely made-up.

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

(2) **Final Inspection.** The building official is authorized to conduct a final inspection 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 is authorized to conduct or require any other inspections of any construction work to ascertain compliance with the provisions of this code and other laws 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 Fee Subtitle.

(G) Reinspections. The building official is authorized to conduct a reinspection when work is not complete, corrections not made, 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 that 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 Fee Subtitle 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 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. Article 80 of the National Electrical Code, 2002 edition, is repealed.

Section 4. Sections 90.1 and 90.2 of the National Electrical Code, 2002 edition, are repealed.

Section 5. Article 100 of the National Electrical Code, 2002 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 or commonly defined technical terms from related codes and standards. In general, only those terms that are 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 I of this article contains definitions intended to apply wherever the terms are used throughout this code. Part II contains definitions applicable only to the parts of articles specifically covering installations and equipment operating at over 600 volts, nominal.

Terms and phrases used in this code but not defined in this code shall be as defined in the Seattle Building Code and the Seattle Mechanical Code. Where undefined terms are used, the definitions of the most recent edition of *Webster's Third New International Dictionary, Unabridged*, shall apply.

Section 6. The definition of "service point" as set forth in Article 100, Part I of the National Electrical Code, 2002 edition, is amended as follows:

Service Point. The point of connection between the facilities of the serving utility and the premises wiring. For requirements for service point connections, see Section 230.12.

Section 7. Article 100, Part I of the National Electrical Code, 2002 edition, is amended by adding, in alphabetical order, a definition of "service terminal box" to the list of defined terms:

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 8. Section 110.13 of the National Electrical Code, 2002 edition, is amended as follows:

110.13. Mounting, ((~~and~~)) Cooling and Location of Equipment.

(A) Mounting. Electrical 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.

(B) Cooling. Electrical equipment that depends on the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room airflow 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.

(C) Location. No electrical equipment shall project beyond the face of the wall in halls, corridors or other locations that 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.

Exception: Within a required stairway enclosure, electrical raceways may be installed to exclusively serve fire and life safety devices within the stairway enclosure.

FPN: See Seattle Building Code Sections 1005.3.3.1 and 1005.3.3.5.

Equipment containing overcurrent protection shall be placed so that the lowest possible overcurrent device is no less than one foot above the floor or working platform.

Section 9. Section 110.22 of the National Electrical Code, 2002 edition, is amended as follows:

110.22 Identification of Disconnecting Means. Each disconnecting means shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. The marking shall be of sufficient durability to withstand the environment involved.

Where circuit breakers or fuses are applied in compliance with the series combination ratings marked on the equipment by the manufacturer, the equipment enclosure(s) shall be legibly marked in the field to indicate the equipment has been applied with a series combination rating. The marking shall be readily visible and state the following:

CAUTION — SERIES COMBINATION SYSTEM RATED ____ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.

FPN No. 1: See Section 240.86(A) for interrupting rating marking for end-use equipment.

FPN No. 2: See WAC 296-46B-110 022, Identification of disconnecting means, for clarification of identification requirements.

Section 10. The National Electrical Code, 2002 edition, is amended by adding Section 110.24 as follows:

110.24. Electrified Fences. Electrified fences, associated equipment and similar devices shall be permitted only by special permission from the building official.

Section 11. Section 110.26 of the National Electrical Code, 2002 edition, is amended as follows:

110.26 Spaces about Electrical Equipment. 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. Enclosures housing electrical apparatus that are controlled by lock and key shall be considered accessible to qualified persons.

(A) Working Space. Working space for equipment operating at 600 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (2), and (3) or as required or permitted elsewhere in this code.

(1) Depth of Working Space. The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (b), or (c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

	Minimum Clear Distance		
Nominal Voltage to Ground	**Condition 1**	**Condition 2**	**Condition 3**
0-150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151-600	900 mm (3 ft)	1 m (3½ ft)	1.2 m (4 ft)

Note: Where the conditions are as follows:

Condition 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 to ground shall not be considered live parts.

Condition 2 — Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls shall be considered as grounded.

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

(a) Dead-Front Assemblies. Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) Low Voltage. By special permission, smaller working spaces shall be permitted where all uninsulated parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) Existing Buildings. In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

(2) Width of Working Space. The width of the working space in front of the electric equipment shall be the width of the equipment or 750 mm (30 in.), whichever is greater. In all cases, the work space shall permit at least a 90 degree opening of equipment doors or hinged panels.

(3) Height of Working Space. The work space shall be clear and extend from the grade, floor, or platform to the height required by 110.26(E). Within the height requirements of this section, other equipment that is associated with the electrical installation and is located above or below the electrical equipment shall be permitted to extend not more than 150 mm (6 in.) beyond the front of the electrical equipment.

(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) Entrance to Working Space.

(1) Minimum Required. At least one entrance of sufficient area shall be provided to give access to working space about electrical equipment.

(2) Large Equipment. For equipment rated 1200 amperes or more and over 1.8 m (6 ft) wide that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. Where the entrance has a personnel door(s), the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.

A single entrance to the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (b) is met.

(a) Unobstructed Exit. Where the location permits a continuous and unobstructed way of exit travel, a single entrance to the working space shall be permitted.

(b) Extra Working Space. Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located so that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

(D) Illumination. Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, or motor control centers installed indoors. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles. In electrical equipment rooms, the illumination shall not be controlled by automatic means only. In residential installations, illumination shall be provided for all working spaces where lighting and appliance panelboards are installed outdoors.

(E) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 2.0 m (6½ ft) in height. Where the electrical equipment exceeds 2.0 m (6½ ft) in height, the minimum headroom shall be not less than the height of the equipment.

~~*Exception: In existing dwelling units, service equipment or panelboards that do not exceed 200 amperes shall be permitted in spaces where the headroom is less than 2.0 m (6½ ft).*~~

(F) Dedicated Equipment Space. All switchboards, panelboards, distribution boards, and motor control centers shall be located in dedicated spaces and protected from damage.

Exception: Control equipment that by its very nature or because of other rules of the Code must be adjacent to or within sight of its operating machinery shall be permitted in those locations.

(1) Indoor. Indoor installations shall comply with 110.26(F)(1)(a) through (d).

(a) Dedicated Electrical Space. The space equal to the width and depth of the equipment and extending from the floor to a height of 1.8 m (6 ft) above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Suspended ceilings with removable panels shall be permitted within the 1.8-m (6-ft) zone.

(b) Foreign Systems. The area above the dedicated space required by 110.26(F)(1)(a) shall be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks, or breaks in such foreign systems.

(c) Sprinkler Protection. Sprinkler protection shall be permitted for the dedicated space where the piping complies with this section.

(d) Suspended Ceilings. A dropped, suspended, or similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling.

(2) Outdoor. Outdoor electrical equipment shall be installed in suitable enclosures and shall be protected from accidental contact by unauthorized personnel, or by vehicular traffic, or by accidental spillage or leakage from piping systems. The working clearance space shall include the zone described in 110.26(A). No architectural appurtenance or other equipment shall be located in this zone.

Section 12. Section 210.8 of the National Electrical Code, 2002 edition, is amended as follows:

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

FPN: See 215.9 for ground-fault circuit-interrupter protection for personnel on feeders.

(A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (8) shall have ground-fault circuit-interrupter protection for personnel.

(1) Bathrooms

(2) Garages, and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use.

Exception No. 1: Receptacles that are not readily accessible.

Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.7(A)(6), (A)(7), or (A)(8).

Receptacles installed under the exceptions to 210.8(A)(2) shall not be considered as meeting the requirements of 210.52(G).

(3) Outdoors

Exception: Receptacles that are not readily accessible and are supplied by a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.

(4) Crawl spaces — at or below grade level

(5) Unfinished basements — for purposes of this section, unfinished basements are defined as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like

Exception No. 1: Receptacles that are not readily accessible.

Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.7(A)(6), (A)(7), or (A)(8).

Exception No. 3: A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have ground-fault circuit-interrupter protection.

Receptacles installed under the exceptions to 210.8(A)(5) shall not be considered as meeting the requirements of 210.52(G).

(6) Kitchens — where the receptacles are installed to serve the countertop surfaces

(7) ((~~Wet bar~~)) All other sinks — where the receptacles are installed to serve the countertop surfaces and are located within 1.8 m (6 ft) of the outside edge of the ((~~wet bar~~)) sink.

(8) Boathouses

(B) Other Than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1), (2), ((~~and~~)) (3), and (4) shall have ground-fault circuit-interrupter protection for personnel:

(1) Bathrooms

(2) ((~~Rooftops~~)) Outdoors

Exception: Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.

(3) Kitchens

FPN: See WAC 296-46B-210 008B, Other Than Dwelling Units – GFCI Requirements.

(4) Crawlspaces at or below grade level.

Section 13. Section 210.52 of the National Electrical Code, 2002 edition, is amended as follows:

210.52 Dwelling Unit Receptacle Outlets. This section provides requirements for 125-volt, 15- and 20-ampere receptacle outlets. Receptacle outlets required by this section shall be in addition to any receptacle that is part of a luminaire (lighting fixture) or appliance, located within cabinets or cupboards, or located more than 1.7 m (5½ ft) above the floor.

Permanently installed electric baseboard heaters equipped with factory-installed receptacle outlets or outlets provided as a separate assembly by the manufacturer shall be permitted as the required outlet or outlets for the wall space utilized by such permanently installed heaters. Such receptacle outlets shall not be connected to the heater circuits.

FPN: Listed baseboard heaters include instructions that may not permit their installation below receptacle outlets.

(A) General Provisions. In every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, or similar room or area of dwelling units, receptacle outlets shall be installed in accordance with the general provisions specified in 210.52(A)(1) through (A)(3).

(1) Spacing. Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 1.8 m (6 ft) from a receptacle outlet.

(2) Wall Space. As used in this section, a wall space shall include the following:

(1) Any space 600 mm (2 ft) or more in width (including space measured around corners) and unbroken along the floor line by doorways, fireplaces, and similar openings

(2) The space occupied by fixed panels in exterior walls, excluding sliding panels

(3) The space afforded by fixed room dividers such as freestanding bar-type counters or railings

(3) Floor Receptacles. Receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets unless located within 450 mm (18 in.) of the wall.

(B) Small Appliances.

(1) Receptacle Outlets Served. In the kitchen, pantry, breakfast room, dining room, or similar area of a dwelling unit, the two or more 20-ampere small-appliance branch circuits required by 210.11(C)(1) shall serve all receptacle outlets covered by 210.52(A) and (C) and receptacle outlets for refrigeration equipment.

Exception No. 1: In addition to the required receptacles specified by 210.52, switched receptacles supplied from a general-purpose branch circuit as defined in 210.70(A)(1), Exception No. 1, shall be permitted.

Exception No. 2: The receptacle outlet for refrigeration equipment shall be permitted to be supplied from an individual branch circuit rated 15 amperes or greater.

(2) No Other Outlets. The two or more small-appliance branch circuits specified in 210.52(B)(1) shall have no other outlets.

Exception No. 1: A receptacle installed solely for the electrical supply to and support of an electric clock in any of the rooms specified in 210.52(B)(1).

Exception No. 2: Receptacles installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter-mounted cooking units.

(3) Kitchen Receptacle Requirements. Receptacles installed in a kitchen to serve countertop surfaces shall be supplied by not fewer than two small-appliance branch circuits, either or both of which shall also be permitted to supply receptacle outlets in the same kitchen and in other rooms specified in 210.52(B)(1). Additional small-appliance branch circuits shall be permitted to supply receptacle outlets in the kitchen and other rooms specified in 210.52(B)(1). No small-appliance branch circuit shall serve more than one kitchen.

(C) Countertops. In kitchens and dining rooms of dwelling units, receptacle outlets for counter spaces shall be installed in accordance with 210.52(C)(1) through (5).

(1) Wall Counter Spaces. A receptacle outlet shall be installed at each wall counter space that is 300 mm (12 in.) or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space.

(2) Island Counter Spaces. At least one receptacle outlet shall be installed at each island counter space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater.

(3) Peninsular Counter Spaces. At least one receptacle outlet shall be installed at each peninsular counter space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater. A peninsular countertop is measured from the connecting edge.

(4) Separate Spaces. Countertop spaces separated by range tops, refrigerators, or sinks shall be considered as separate countertop spaces in applying the requirements of 210.52(C)(1), (2), and (3).

(5) Receptacle Outlet Location. Receptacle outlets shall be located above, but not more than 500 mm (20 in.) above, the countertop. Receptacle outlets rendered not readily accessible by appliances fastened in place((~~, appliance garages, or appliances occupying dedicated space~~)) shall not be considered as these required outlets.

Exception: To comply with the conditions specified in (a) or (b), receptacle outlets shall be permitted to be mounted not more than 300 mm (12 in.) below the countertop. Receptacles mounted below a countertop in accordance with this exception shall not be located where the countertop extends more than 150 mm (6 in.) beyond its support base.

(a) Construction for the physically impaired.

(b) On island and peninsular countertops where the countertop is flat across its entire surface (no backsplashes, dividers, etc.) and there are no means to mount a receptacle within 500 mm (20 in.) above the countertop, such as an overhead cabinet.

(D) Bathrooms. In dwelling units, at least one wall receptacle outlet shall be installed in bathrooms within 900 mm (3 ft) of the outside edge of each basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop.

(E) Outdoor Outlets. For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet accessible at grade level and not more than 2.0 m (6½ ft) above grade shall be installed at the front and back of the dwelling. See 210.8(A)(3).

(F) Laundry Areas. In dwelling units, at least one receptacle outlet shall be installed for the laundry.

Exception No. 1: In a dwelling unit that is an apartment or living area in a multifamily building where laundry facilities are provided on the premises and are available to all building occupants, a laundry receptacle shall not be required.

Exception No. 2: In other than one-family dwellings where laundry facilities are not to be installed or permitted, a laundry receptacle shall not be required.

(G) Basements and Garages. For a one-family dwelling, at least one receptacle outlet, in addition to any provided for laundry equipment, shall be installed in each basement and in each attached garage, and in each detached garage with electric power. See 210.8(A)(2) and (A)(5). Where a portion of the basement is finished into one or more habitable rooms, each separate unfinished portion shall have a receptacle outlet installed in accordance with this section.

(H) Hallways. In dwelling units, hallways of 3.0 m (10 ft) or more in length shall have at least one receptacle outlet.

As used in this subsection, the hall length shall be considered the length along the centerline of the hall without passing through a doorway.

Section 14. The National Electrical Code, 2002 edition, is amended by adding Section 215.12 as follows:

215.12. Panelboards. Panelboards, existing or installed in an individual unit of multifamily dwellings, shall be supplied by one feeder.

Section 15. Section 220.3 of the National Electrical Code, 2002 edition, is amended as follows:

220.3 Computation of Branch Circuit Loads. Branch-circuit loads shall be computed as shown in 220.3(A) through (C).

(A) Lighting Load for Specified Occupancies. A unit load of not less than that specified in Table 220.3(A) for occupancies specified therein shall constitute the minimum lighting load. The floor area for each floor shall be computed from the outside dimensions of the building, dwelling unit, or other area involved. For dwelling units, the computed floor area shall not include open porches, garages, or unused or unfinished spaces not adaptable for future use.

FPN: The unit values herein are based on minimum load conditions and 100 percent power factor, and may not provide sufficient capacity for the installation contemplated.

Exception: Occupancy Lighting Loads. In determining feeder and service entrance conductor sizes and equipment ratings, the currently adopted Washington State Energy Code with Seattle Amendments (the Seattle Energy Code) Table 15-1, Unit Lighting Power Allowance, may be used in lieu of NEC Table 220.3(A).

Table 220.3(A) General Lighting Loads by Occupancy

	Unit Load	
Type of Occupancy	**Volt-Amperes per Square Meter**	**Volt-Amperes per Square Foot**
Armories and auditoriums	11	1
Banks	39 [b]	3½ [b]
Barber shops and beauty parlors	33	3
Churches	11	1
Clubs	22	2
Court rooms	22	2
Dwelling units [a]	33	3
Garages — commercial (storage)	6	½
Hospitals	22	2
Hotels and motels, including apartment houses without provision for cooking by tenants [a]	22	2
Industrial commercial (loft) buildings	22	2
Lodge rooms	17	1 ½
Office buildings	39	3½ [b]
Restaurants	22	2
Schools	33	3
Stores	33	3
Warehouses (storage)	3	¼
In any of the preceding occupancies except one-family dwellings and individual dwelling		

units of two-family and multifamily dwellings:		
Assembly halls and auditoriums	11	1
Halls, corridors, closets, stairways	6	½
Storage spaces	3	¼

[a] See 220.3(B)(10).
[b] In addition, a unit load of 11 volt-amperes/m^2 or 1 volt-ampere/ft^2 shall be included for general-purpose receptacle outlets where the actual number of general-purpose receptacle outlets is unknown.

(B) Other Loads — All Occupancies. In all occupancies, the minimum load for each outlet for general-use receptacles and outlets not used for general illumination shall not be less than that computed in 220.3(B)(1) through (11), the loads shown being based on nominal branch-circuit voltages.

Exception: The loads of outlets serving switchboards and switching frames in telephone exchanges shall be waived from the computations.

(1) Specific Appliances or Loads. An outlet for a specific appliance or other load not covered in (2) through (11) shall be computed based on the ampere rating of the appliance or load served.

(2) Electric Dryers and Household Electric Cooking Appliances. Load computations shall be permitted as specified in 220.18 for electric dryers and in 220.19 for electric ranges and other cooking appliances.

(3) Motor Loads. Outlets for motor loads shall be computed in accordance with the requirements in 430.22, 430.24, and 440.6.

(4) Recessed Luminaires (Lighting Fixtures). An outlet supplying recessed luminaire(s) [lighting fixture(s)] shall be computed based on the maximum volt-ampere rating of the equipment and lamps for which the luminaire(s) [fixture(s)] is rated.

(5) Heavy-Duty Lampholders. Outlets for heavy-duty lampholders shall be computed at a minimum of 600 volt-amperes.

(6) Sign and Outline Lighting. Sign and outline lighting outlets shall be computed at a minimum of 1200 volt-amperes for each required branch circuit specified in 600.5(A).

(7) Show Windows. Show windows shall be computed in accordance with either of the following:

(1) The unit load per outlet as required in other provisions of this section

(2) At 200 volt-amperes per 300 mm (1 ft) of show window

(8) Fixed Multioutlet Assemblies. Fixed multioutlet assemblies used in other than dwelling units or the guest rooms of hotels or motels shall be computed in accordance with (1) or (2). For the purposes of this section, the computation shall be permitted to be based on the portion that contains receptacle outlets.

(1) Where appliances are unlikely to be used simultaneously, each 1.5 m (5 ft) or fraction thereof of each separate and continuous length shall be considered as one outlet of not less than 180 volt-amperes.

(2) Where appliances are likely to be used simultaneously, each 300 mm (1 ft) or fraction thereof shall be considered as an outlet of not less than 180 volt-amperes.

(9) Receptacle Outlets. Except as covered in 220.3(B)(10), receptacle outlets shall be computed at not less than 180 volt-amperes for each single or for each multiple receptacle on one yoke. A single piece of equipment consisting of a multiple receptacle comprised of four or more receptacles shall be computed at not less than 90 volt-amperes per receptacle.

This provision shall not be applicable to the receptacle outlets specified in 210.11(C)(1) and (2).

(10) Dwelling Occupancies. In one-family, two-family, and multifamily dwellings and in guest rooms of hotels and motels, the outlets specified in (1), (2), and (3) are included in the general lighting load calculations of 220.3(A). No additional load calculations shall be required for such outlets.

(1) All general-use receptacle outlets of 20-ampere rating or less, including receptacles connected to the circuits in 210.11(C)(3)

(2) The receptacle outlets specified in 210.52(E) and (G)

(3) The lighting outlets specified in 210.70(A) and (B)

(11) Other Outlets. Other outlets not covered in 220.3(B)(1) through (10) shall be computed based on 180 volt-amperes per outlet.

(C) Loads for Additions to Existing Installations.

(1) Dwelling Units. Loads added to an existing dwelling unit(s) shall comply with the following as applicable:

(1) Loads for structural additions to an existing dwelling unit or for a previously unwired portion of an existing dwelling unit, either of which exceeds 46.5 m^2 (500 ft^2), shall be computed in accordance with 220.3(A) and (B).

(2) Loads for new circuits or extended circuits in previously wired dwelling units shall be computed in accordance with either 220.3(A) or (B), as applicable.

(2) Other Than Dwelling Units. Loads for new circuits or extended circuits in other than dwelling units shall be computed in accordance with either 220.3(A) or (B), as applicable.

Section 16. Section 220.15 of the National Electrical Code, 2002 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 or service load current rating be less than the rating of the largest branch circuit supplied.

Exception: ((~~*Where reduced loading of the conductors results from units operating on duty cycle, intermittently, or from all units not operating at the same time, the authority having*~~

~~*jurisdiction may grant permission for feeder and service conductors to have an ampacity less than 100 percent, provided the conductors have an ampacity for the load so determined.*~~)) *A demand factor of 75 percent of the installed heating capacity may be used in sizing service entrance and feeder 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.*

Section 17. Section 220.17 of the National Electrical Code, 2002 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, other than electric ranges, clothes dryers, space-heating equipment, or air-conditioning equipment, that are served by the same feeder or service in a one-family, two-family, or multifamily dwelling. For space heating equipment, see Section 220.15.

Section 18. Section 225.32 of the National Electrical Code, 2002 edition, is amended as follows:

225.32 Location. The disconnecting means shall be installed either inside or outside of the building or structure served or where the conductors pass through the building or structure. ((~~The disconnecting means shall be at a readily accessible location nearest the point of entrance of the conductors.~~)) For the purposes of this section, the requirements in 230.6 shall be permitted to be utilized.

FPN: See WAC 296-46B-225 032, Location of outside feeder disconnecting means.

Exception No. 1: For installations under single management, where documented safe switching procedures are established and maintained for disconnection, and where the installation is monitored by qualified individuals, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 2: For buildings or other structures qualifying under the provisions of Article 685, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 3: For towers or poles used as lighting standards, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 4: For poles or similar structures used only for support of signs installed in accordance with Article 600, the disconnecting means shall be permitted to be located elsewhere on the premises.

Section 19. Section 230.1 of the National Electrical Code, 2002 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 Figure 230-1.

(B) Service Requirements. The serving utility shall be consulted by the owner, the owner's 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 20. The National Electrical Code, 2002 edition, is amended by adding Section 230.5 as follows:

230.5 Types of Services. All services shall be grounded single-phase, or grounded three-phase 4-wire systems. Three-phase 3-wire services shall not be installed unless prior approval is granted by the utility and the building official.

Section 21. The National Electrical Code, 2002 edition, is amended by adding Section 230.12 as follows:

230.12 Service Point Connection. Service point connections shall comply with paragraphs (A) through (C) below.

(A) 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.

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

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

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

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

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

(1) 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.

(2) A transformer vault within the building.

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

Section 22. Section 230.28 of the National Electrical Code, 2002 edition, is amended as follows:

230.28. Service Masts as Supports. ((~~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. Only power service-drop~~

~~conductors shall be permitted to be attached to a service mast.~~)) Service masts used to support service-drop conductors shall comply with the following:

(1) All raceway fittings shall be identified for use with service masts.

(2) Service masts shall be rigid steel galvanized conduit no smaller than 2 inches.

(3) Service masts shall support only power service-drop conductors.

(4) Service-drops shall be attached to a bracket on the mast, or other approved structure located with 24 inches of the mast.

(5) Masts 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.

(6) Service conduits for mast type services shall be supported by one of the methods identified in WAC 296-46B-230-028 and drawings E-101 through E-103 with corresponding notes. Snuggle bars properly installed between wood framing members are permitted.

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

(8) Couplings shall be permitted only below the roofline and shall be below a point of support for the mast.

FPN: See WAC 296-46B-230 028 regarding mast supports for feeders and branch circuits.

Section 23. Section 230.29 of the National Electrical Code, 2002 edition, is amended as follows:

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 the Fire District shall terminate on the side of the building nearest to the lines or mains of the utility. The 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 wire access fittings or junction boxes of any type shall be permitted within 15 feet of the ground level on street, alley, or driveway margins.

Section 24. Section 230.33 of the National Electrical Code, 2002 edition, is amended as follows:

230.33 Spliced Conductors. Service-lateral conductors shall be permitted to be spliced or tapped in accordance with 110.14, 300.5(E), 300.13, and 300.15.

FPN: Service lateral conductors are utility conductors under the serving utility's jurisdiction.

Section 25. The National Electrical Code, 2002 edition, is amended by adding Section 230.34 as follows:

230.34 Conversion to Underground Service or Increasing Existing Overhead Services. Where 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 permitted to be installed over an existing meter enclosure that is embedded in a finished exterior wall. 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 an 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 26. Section 230.43 of the National Electrical Code, 2002 edition, is amended as follows:

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 shall be limited to the following methods:

(((~~(1) Open wiring on insulators~~

~~(2) Type IGS cable~~))

(3) Rigid metal conduit

(4) Intermediate metal conduit

(((~~(5) Electrical metallic tubing~~

~~(6) Electrical nonmetallic tubing (ENT)~~

~~(7) Service entrance cables~~

~~(8) Wireways~~))

(9) Busways

(((~~(10) Auxiliary gutters~~))

(11) Rigid nonmetallic conduit

(12) Cablebus

(((~~(13) Type MC cable~~))

(14) Mineral-insulated, metal-sheathed cable

(((~~(15) Flexible metal conduit not over 1.8 m (6 ft) long or liquidtight flexible metal conduit not over 1.8 m (6 ft) long between raceways, or between raceway and service equipment, with equipment bonding jumper routed with the flexible metal conduit or liquidtight flexible metal conduit according to the provisions of Section 250.102(A), (B), (C), and (E)~~

~~(16) Liquidtight flexible nonmetallic conduit~~))

Section 27. Section 230.44 of the National Electrical Code, 2002 edition, is amended as follows:

230.44 Cable trays. Cable tray systems ((~~shall~~)) may, with prior approval by the building official, be permitted to support cable used as service-entrance conductors.

Section 28. Section 230.46 of the National Electrical Code, 2002 edition, is amended as follows:

230.46 Spliced Conductors. Service-entrance conductors shall be permitted to be spliced or tapped in accordance with 110.14, 300.5(E), 300.13, and 300.15 only by special permission of the building official.

Section 29. Section 230.52 of the National Electrical Code, 2002 edition, is repealed.

Section 30. Section 230.54 of the National Electrical Code, 2002 edition, is amended as follows:

230.54 Overhead Service Locations.

(A) Raintight Service Head. Service raceways shall be equipped with a raintight service head at the point of connection to service-drop conductors.

(B) Service Cable Equipped with Raintight Service Head or Gooseneck. Service cables shall be equipped with a raintight service head.

Exception: Type SE cable shall be permitted to be formed in a gooseneck and taped with a self-sealing weather-resistant thermoplastic.

(C) Service Heads Above Service-Drop Attachment. Service heads and goosenecks in service-entrance cables shall be located above the point of attachment of the service-drop conductors to the building or other structure.

Exception: Where it is impracticable to locate the service head above the point of attachment, the service head location shall be permitted not farther than 600 mm (24 in.) from the point of attachment.

(D) Secured. Service cables shall be held securely in place.

(E) Separately Bushed Openings. Service heads shall have conductors of different potential brought out through separately bushed openings.

Exception: For jacketed multiconductor service cable without splice.

(F) Drip Loops. Drip loops shall be formed on individual conductors. To prevent the entrance of moisture, service-entrance conductors shall be connected to the service-drop conductors either (1) below the level of the service head or (2) below the level of the termination of the service-entrance cable sheath.

(G) Arranged That Water Will Not Enter Service Raceway or Equipment. Service-drop conductors and service-entrance conductors shall be arranged so that water will not enter service raceway or equipment.

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

FPN: See also WAC 296-46B-230 Drawing E-101, E-102, and E-103.

Section 31. Section 230.70 of the National Electrical Code, 2002 edition, is amended as follows:

230.70 General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors.

(A) Location. The service disconnecting means shall be installed in accordance with 230.70(A)(1), (2), and (3).

(1) Readily Accessible Location. The service disconnecting means shall be installed at a readily accessible location either outside of a building or structure or inside nearest the point of entrance of the service conductors. Service disconnecting means shall be readily accessible, including after any subsequent building alterations or additions.

FPN: See also WAC 296-46B-230 070(13)(b).

(2) Bathrooms and Other Locations. Service disconnecting means shall not be installed in bathrooms, clothes closets, shower rooms, cupboards, attics, stairways, nor above any washers, ranges, dryers, water heaters, sinks, plumbing fixtures or drain boards.

(3) Remote Control. Where a remote control device(s) is used to actuate the service disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1).

(B) Marking. Each service disconnect shall be permanently marked to identify it as a service disconnect.

(C) Suitable for Use. Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the requirements of Articles 500 through 517.

Section 32. Section 230.82 of the National Electrical Code, 2002 edition, is amended as follows:

230.82 Equipment Connected to the Supply Side of Service Disconnect. Only the following equipment shall be permitted to be connected to the supply side of the service disconnecting means:

(1) Cable limiters ((~~or other current-limiting devices~~)) by special permission of the building official.

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

(a) The cable 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 cable limiter enclosure shall not be used for service taps or extensions and shall be clearly recognized and marked as cable limiters.

(2) Meters, meter sockets, or meter disconnect switches nominally rated not in excess of 600 volts, provided all metal housings and service enclosures are grounded. Taps under meter socket lugs shall not be permitted, except by prior approval from the building official.

(3) Instrument transformers (current and voltage), high-impedance shunts, load management devices, and surge arresters.

(4) Taps used only to supply load management devices, circuits for standby 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.

(5) Solar photovoltaic systems, fuel cell systems, or interconnected electric power production sources.

(6) Control circuits for power-operable service disconnecting means, if suitable overcurrent protection and disconnecting means are provided.

(7) Ground-fault protection systems where installed as part of listed equipment, if suitable overcurrent protection and disconnecting means are provided.

(8) Current transformer cabinets shall contain only the main service conductors, metering equipment and secondary wiring. One tap shall be permitted on the load side of the current transformers for a legally-required standby service and one tap shall be permitted on the load side of the current transformers for a fire pump service. One additional normal power service tap from the current transformer enclosure may be made by special permission of the service utility. In a single-family dwelling, two connections shall be permitted on the load side of the current transformers. No other taps shall be permitted. Approved terminal lugs shall be provided for the main service conductors and for all taps.

(9) Listed service accessory buss gutters or termination boxes that are approved for use on the line side of service equipment. Junction and pull boxes are not permitted

Section 33. Section 230.90 of the National Electrical Code, 2002 edition, is amended as follows:

230.90 Where Required. Each ungrounded service conductor shall have overload protection.

(A) Ungrounded Conductor. Such protection shall be provided by an overcurrent device in series with each ungrounded service conductor that has a rating or setting not higher than the allowable ampacity of the conductor. A set of fuses shall be considered all the fuses required to protect all the ungrounded conductors of a circuit. Single-pole circuit breakers, grouped in accordance with 230.71(B), shall be considered as one protective device.

Exception No. 1: For motor-starting currents, ratings that conform with 430.52, 430.62, and 430.63 shall be permitted.

Exception No. 2: Fuses and circuit breakers with a rating or setting that conform with 240.4(B) or (C) and 240.6 shall be permitted.

Exception No. 3: Two to six circuit breakers or sets of fuses shall be permitted as the overcurrent device to provide the overload protection. The sum of the ratings of the circuit breakers or fuses shall be permitted to exceed the ampacity of the service conductors, provided the calculated load does not exceed the ampacity of the service conductors.

FPN: See WAC 296-46B-230 042, Service conductor – size and rating, if the service conductors have a lesser ampacity than the overcurrent protection or the equipment rating that they terminate in or on.

Exception No. 4: Overload protection for fire pump supply conductors shall conform with 695.4(B)(1).

Exception No. 5: Overload protection for 120/240-volt, 3-wire, single-phase dwelling services shall be permitted in accordance with the requirements of 310.15(B)(6).

(B) Not in Grounded Conductor. No overcurrent device shall be inserted in a grounded service conductor except a circuit breaker that simultaneously opens all conductors of the circuit.

Section 34. Section 230.95 of the National Electrical Code, 2002 edition, is amended as follows:

230.95 Ground-Fault Protection of Equipment. Ground-fault protection of equipment shall be provided for solidly grounded wye electrical services of more than 150 volts to ground but not exceeding 600 volts phase-to-phase for each service disconnect rated 1000 amperes or more.

The rating of the service disconnect shall be considered to be the rating of the largest fuse that can be installed or the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated or can be adjusted.

Solidly Grounded — Definition. Connection of the grounded conductor to ground without inserting any resistor or impedance device.

Exception No. 1: The ground-fault protection provisions of this section shall not apply to a service disconnect for a continuous industrial process where a nonorderly shutdown will introduce additional or increased hazards.

Exception No. 2: The ground-fault protection provisions of this section shall not apply to fire pumps.

(A) Setting. The ground-fault protection system shall operate to cause the service disconnect to open all ungrounded conductors of the faulted circuit. The maximum setting of the ground-fault protection shall be 1200 amperes, and the maximum time delay shall be one second for ground-fault currents equal to or greater than 3000 amperes.

(B) Fuses. If a switch and fuse combination is used, the fuses employed shall be capable of interrupting any current higher than the interrupting capacity of the switch during a time that the ground-fault protective system will not cause the switch to open.

(C) Performance Testing. The ground-fault protection system shall be performance tested when first installed on site. The test shall be conducted in accordance with instructions that shall be provided with the equipment. A written record of this test shall be made and shall be available to the authority having jurisdiction. <u>This performance test and subsequent evaluation shall be performed by a firm having qualified personnel and proper equipment. The tested equipment shall be labeled identifying the firm, date of test, and setting.</u>

FPN No. 1: Ground-fault protection that functions to open the service disconnect affords no protection from faults on the line side of the protective element. It serves only to limit damage to conductors and equipment on the load side in the event of an arcing ground fault on the load side of the protective element.

FPN No. 2: This added protective equipment at the service equipment may make it necessary to review the overall wiring system for proper selective overcurrent protection coordination. Additional installations of

ground-fault protective equipment may be needed on feeders and branch circuits where maximum continuity of electrical service is necessary.

FPN No. 3: Where ground-fault protection is provided for the service disconnect and interconnection is made with another supply system by a transfer device, means or devices may be needed to ensure proper ground-fault sensing by the ground-fault protection equipment.

Section 35. Section 230.202 of the National Electrical Code, 2002 edition, is amended as follows:

230.202 Service-Entrance Conductors. Service-entrance conductors to buildings or enclosures shall be installed to conform to 230.202(A) and (B).

(A) Conductor Size. Service-entrance conductors shall not be smaller than 6 AWG unless in multiconductor cable. Multiconductor cable shall not be smaller than 8 AWG.

(B) Wiring Methods. Service-entrance conductors shall be installed by one of the following wiring methods ((~~covered in 300.37 and 300.50~~)):

(1) Rigid metal conduit

(2) Intermediate metal conduit

(3) Rigid nonmetallic conduit

(4) Busways

(5) Cablebus

(6) Cable Trays only with prior permission by the Building Official.

Section 36. Section 240.24 of the National Electrical Code, 2002 edition, is amended as follows:

240.24 Location in or on Premises.

(A) Accessibility. Overcurrent devices shall be readily accessible unless one of the following applies:

(1) For busways, as provided in 368.12.

(2) For supplementary overcurrent protection, as described in 240.10.

(3) For overcurrent devices, as described in 225.40 and 230.92.

(4) For overcurrent devices adjacent to utilization equipment that they supply, access shall be permitted to be by portable means.

(B) Occupancy. Each occupant shall have ready access to all overcurrent devices protecting the conductors supplying that occupancy.

Exception No. 1: Where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the service overcurrent devices and feeder overcurrent devices supplying more than one occupancy shall be permitted to be accessible to only authorized management personnel in the following:

(a) Multiple-occupancy buildings

(b) Guest rooms of hotels and motels that are intended for transient occupancy

Exception No. 2: Where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the branch circuit overcurrent devices supplying any guest rooms shall be permitted to be accessible to only authorized management personnel for guest rooms of hotels and motels that are intended for transient occupancy.

(C) Not Exposed to Physical Damage. Overcurrent devices shall be located where they will not be exposed to physical damage.

FPN: See 110.11, Deteriorating Agents.

(D) ((~~Not in Vicinity of Easily Ignitible Material.~~ ~~Overcurrent devices shall not be located in the vicinity of easily ignitible material, such as in clothes closets.~~)) Location. Overcurrent protection devices, other than supplementary overcurrent protection, 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, drain board, or similar locations

(E) ((~~Not Located in Bathrooms.~~ ~~In dwelling units and guest rooms of hotels and motels, overcurrent devices, other than supplementary overcurrent protection, shall not be located in bathrooms as defined in Article 100.~~)) Accessory Dwelling Unit, Two-Family and Multi-Family Occupancies. Branch circuit overcurrent devices shall be located either within the dwelling unit that they serve or in common areas accessible to all occupants.

Section 37. Section 250.30 of the National Electrical Code, 2002 edition, is amended as follows:

250.30 Grounding Separately Derived Alternating-Current Systems.

(A) Grounded Systems. A separately derived ac system that is grounded shall comply with 250.30(A)(1) through (6).

Exception: High-impedance grounded neutral system grounding connection requirements shall not be required to comply with 250.30(A)(1) and (2) and shall be made as specified in 250.36 and 250.186.

(1) Bonding Jumper. A bonding jumper in compliance with 250.28(A) through (D) that is sized for the derived phase conductors shall be used to connect the equipment grounding conductors of the separately derived system to the grounded conductor. Except as permitted by 250.24(A)(3), this connection shall be made at any point on the separately derived system from the source to the first system disconnecting means or overcurrent device, or it shall be made at the source of a separately derived system that has no disconnecting means or overcurrent devices. The point of connection shall be the same as the grounding electrode conductor as required in 250.30(A)(2).

Exception No. 1: A bonding jumper at both the source and the first disconnecting means shall be permitted where doing so does not establish a parallel path for the grounded circuit conductor. Where a grounded conductor is used in this manner, it shall not be smaller than the size specified for the bonding jumper but shall not be required to be larger than the ungrounded

conductor(s). For the purposes of this exception, connection through the earth shall not be considered as providing a parallel path.

Exception No. 2: The size of the bonding jumper for a system that supplies a Class 1, Class 2, or Class 3 circuit, and is derived from a transformer rated not more than 1000 volt-amperes, shall not be smaller than the derived phase conductors and shall not be smaller than 14 AWG copper or 12 AWG aluminum.

(2) Grounding Electrode Conductor. The grounding electrode conductor shall be installed in accordance with (a) or (b). Where taps are connected to a common grounding electrode conductor, the installation shall comply with 250.30(A)(3).

(a) Single Separately Derived System. A grounding electrode conductor for a single separately derived system shall be sized in accordance with 250.66 for the derived phase conductors and shall be used to connect the grounded conductor of the derived system to the grounding electrode as specified in 250.30(A)(4). Except as permitted by 250.24(A)(3) or (A)(4), this connection shall be made at the same point on the separately derived system where the bonding jumper is installed.

Exception: A grounding electrode conductor shall not be required for a system that supplies a Class 1, Class 2, or Class 3 circuit and is derived from a transformer rated not more than 1000 volt-amperes, provided the system grounded conductor is bonded to the transformer frame or enclosure by a jumper sized in accordance with 250.30(A)(1), Exception No. 2, and the transformer frame or enclosure is grounded by one of the means specified in 250.134.

(b) Multiple Separately Derived Systems. Where more than one separately derived system is connected to a common grounding electrode conductor as provided in 250.30(A)(3), the common grounding electrode conductor shall be sized in accordance with 250.66, based on the total area of the largest derived phase conductor from each separately derived system.

(3) Grounding Electrode Conductor Taps. It shall be permissible to connect taps from a separately derived system to a common grounding electrode conductor. Each tap conductor shall connect the grounded conductor of the separately derived system to the common grounding electrode conductor.

(a) Tap Conductor Size. Each tap conductor shall be sized in accordance with 250.66 for the derived phase conductors of the separately derived system it serves.

(b) Connections. All connections shall be made at an accessible location by an irreversible compression connector listed for the purpose, listed connections to copper busbars not less than 6 mm × 50 mm (¼ in. × 2 in.), ((~~or~~)) by the exothermic welding process, or other approved means. The tap conductors shall be connected to the common grounding electrode conductor as specified in 250.30(A)(2)(b) in such a manner that the common grounding electrode conductor remains without a splice or joint.

(c) Installation. The common grounding electrode conductor and the taps to each separately derived system shall comply with 250.64(A), (B), (C), and (E).

(d) Bonding. Where exposed structural steel that is interconnected to form the building frame or interior metal piping exists in the area served by the separately derived system, it shall be bonded to the grounding electrode conductor in accordance with 250.104.

(4) Grounding Electrode. The grounding electrode shall be as near as practicable to and preferably in the same area as the grounding electrode conductor connection to the system. The grounding electrode shall be the nearest one of the following:

(1) An effectively grounded structural metal member of the structure

(2) An effectively grounded metal water pipe within 1.5 m (5 ft) from the point of entrance into the building

Exception: In industrial and commercial buildings where conditions of maintenance and supervision ensure that only qualified persons service the installation and the entire length of the interior metal water pipe that is being used for the grounding electrode is exposed, the connection shall be permitted at any point on the water pipe system.

(3) Other electrodes as specified by 250.52 where the electrodes specified by 250.30(A)(4)(1) or (A)(4)(2) are not available

Exception to (1), (2), and (3): Where a separately derived system originates in listed equipment suitable for use as service equipment, the grounding electrode used for the service or feeder shall be permitted as the grounding electrode for the separately derived system, provided the grounding electrode conductor from the service or feeder to the grounding electrode is of sufficient size for the separately derived system. Where the equipment ground bus internal to the service equipment is not smaller than the required grounding electrode conductor, the grounding electrode connection for the separately derived system shall be permitted to be made to the bus.

FPN: See 250.104(A)(4) for bonding requirements of interior metal water piping in the area served by separately derived systems.

(5) Equipment Bonding Jumper Size. Where a bonding jumper is run with the derived phase conductors from the source of a separately derived system to the first disconnecting means, it shall be sized in accordance with 250.28(A) through (D), based on the size of the derived phase conductors.

(6) Grounded Conductor. Where a grounded conductor is installed and the bonding jumper is not located at the source of the separately derived system, the following shall apply:

(a) Routing and Sizing. This conductor shall be routed with the derived phase conductors and shall not be smaller than the required grounding electrode conductor specified in Table 250.66, but shall not be required to be larger than the largest ungrounded derived phase conductor. In addition, for phase conductors larger than 1100 kcmil copper or 1750 kcmil aluminum, the grounded conductor shall not be smaller than 12½ percent of the area of the largest derived phase conductor. The grounded conductor of a 3-phase, 3-wire delta system shall have an ampacity not less than the ungrounded conductors.

(b) Parallel Conductors. Where the derived phase conductors are installed in parallel, the size of the grounded conductor shall be based on the total circular mil area of the parallel

conductors as indicated in this section. Where installed in two or more raceways, the size of the grounded conductor in each raceway shall be based on the size of the ungrounded conductors in the raceway but not smaller than 1/0 AWG.

FPN: See 310.4 for grounded conductors connected in parallel.

(c) High Impedance. The grounded conductor on a high-impedance grounded neutral system shall be grounded in accordance with 250.36.

(B) Ungrounded Systems. The equipment of an ungrounded separately derived system shall be grounded as specified in 250.30(B)(1) and (2).

(1) Grounding Electrode Conductor. A grounding electrode conductor, sized in accordance with 250.66 for the derived phase conductors, shall be used to connect the metal enclosures of the derived system to the grounding electrode as specified in 250.30(B)(2). This connection shall be made at any point on the separately derived system from the source to the first system disconnecting means.

(2) Grounding Electrode. Except as permitted by 250.34 for portable and vehicle-mounted generators, the grounding electrode shall comply with 250.30(A)(4).

Section 38. Section 250.32 of the National Electrical Code, 2002 edition, is amended as follows:

250.32 Two or More Buildings or Structures Supplied from a Common Service.

(A) Grounding Electrode. Where two or more buildings or structures are supplied from a common ac service by a feeder(s) or branch circuit(s), the grounding electrode(s) required in Part III of this article at each building or structure shall be connected in the manner specified in 250.32(B) or (C). Where there are no existing grounding electrodes, the grounding electrode(s) required in Part III of this article shall be installed.

Exception: A grounding electrode at separate buildings or structures shall not be required where only one branch circuit supplies the building or structure and the branch circuit includes an equipment grounding conductor for grounding the conductive non-current-carrying parts of all equipment.

(B) Grounded Systems. For a grounded system at the separate building or structure, the connection to the grounding electrode and grounding or bonding of equipment, structures, or frames required to be grounded or bonded shall comply with ((~~either~~)) 250.32(B)(1) ((~~or (2)~~)).

(1) Equipment Grounding Conductor. An equipment grounding conductor as described in 250.118 shall be run with the supply conductors and connected to the building or structure disconnecting means and to the grounding electrode(s). The equipment grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded. The equipment grounding conductor shall be sized in accordance with 250.122. Any installed grounded conductor shall not be connected to the equipment grounding conductor or to the grounding electrode(s).

(((~~**(2) Grounded Conductor.** Where (1) an equipment grounding conductor is not run with the supply to the building or structure, (2) there are no continuous metallic paths bonded to the grounding system in both buildings or structures involved, and (3) ground-fault protection of equipment has not been installed on the common ac service, the grounded circuit conductor run with the supply to the building or structure shall be connected to the building or structure disconnecting means and to the grounding electrode(s) and shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded. The size of the grounded conductor shall not be smaller than the larger of~~

~~(1) That required by 220.22~~

~~(2) That required by 250.122~~))

FPN: See WAC 296-46B-250 032, Two or more buildings or structures.

(C) Ungrounded Systems. The grounding electrode(s) shall be connected to the building or structure disconnecting means.

(D) Disconnecting Means Located in Separate Building or Structure on the Same Premises. Where one or more disconnecting means supply one or more additional buildings or structures under single management, and where these disconnecting means are located remote from those buildings or structures in accordance with the provisions of 225.32, Exception Nos. 1 and 2, all of the following conditions shall be met:

(1) The connection of the grounded circuit conductor to the grounding electrode at a separate building or structure shall not be made.

(2) An equipment grounding conductor for grounding any non–current-carrying equipment, interior metal piping systems, and building or structural metal frames is run with the circuit conductors to a separate building or structure and bonded to existing grounding electrode(s) required in Part III of this article, or, where there are no existing electrodes, the grounding electrode(s) required in Part III of this article shall be installed where a separate building or structure is supplied by more than one branch circuit.

(3) Bonding the equipment grounding conductor to the grounding electrode at a separate building or structure shall be made in a junction box, panelboard, or similar enclosure located immediately inside or outside the separate building or structure.

(E) Grounding Electrode Conductor. The size of the grounding electrode conductor to the grounding electrode(s) shall not be smaller than given in 250.66, based on the largest ungrounded supply conductor. The installation shall comply with Part III of this article.

Section 39. Section 250.56 of the National Electrical Code, 2002 edition, is amended as follows:

250.56 Resistance of Rod, Pipe, and Plate Electrodes. A single electrode consisting of a rod, pipe, or plate ((~~that 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 by 250.52(A)(2) through (A)(7). Where multiple rod, pipe, or plate electrodes are installed to meet the requirements of this section, they shall not be less than ((~~1.8 m (6 ft)~~)) 2.5 m (8 ft) apart. The requirements of this section apply to

temporary construction services and supersede the requirements set forth in WAC 296-46B-250 052.

FPN: The paralleling efficiency of rods longer than 2.5 m (8 ft) is improved by spacing greater than 1.8 m (6 ft).

Section 40. Section 250.64 of the National Electrical Code, 2002 edition, is amended as follows:

250.64 Grounding Electrode Conductor Installation. Grounding electrode conductors shall be installed as specified in 250.64(A) through (F).

(A) Aluminum or Copper-Clad Aluminum Conductors. Bare aluminum or copper-clad aluminum grounding conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. Where used outside, aluminum or copper-clad aluminum grounding conductors shall not be terminated within 450 mm (18 in.) of the earth.

(B) Securing and Protection from Physical Damage. A grounding electrode conductor or its enclosure shall be securely fastened to the surface on which it is carried. A 4 AWG copper or aluminum or larger conductor shall be protected if exposed to severe physical damage. A 6 AWG grounding conductor that is free from exposure to physical damage shall be permitted to be run along the surface of the building construction without metal covering or protection where it is securely fastened to the construction; otherwise, it shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor. Grounding conductors smaller than 6 AWG shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor.

(C) Continuous. The grounding electrode conductor shall be installed in one continuous length without a splice or joint, unless spliced only by irreversible compression-type connectors listed for the purpose or by the exothermic welding process.

Exception: Sections of busbars shall be permitted to be connected together to form a grounding electrode conductor.

(D) Grounding Electrode Conductor Taps. Where a service consists of more than a single enclosure as permitted in 230.40, Exception No. 2, it shall be permitted to connect taps to the grounding electrode conductor. Each such tap conductor shall extend to the inside of each such enclosure. The grounding electrode conductor shall be sized in accordance with 250.66, but the tap conductors shall be permitted to be sized in accordance with the grounding electrode conductors specified in 250.66 for the largest conductor serving the respective enclosures. The tap conductors shall be connected to the grounding electrode conductor ((~~in such a manner that the grounding electrode conductor remains without a splice~~)) in accordance with the requirements of 250.30 (A)(3)(b).

(E) Enclosures for Grounding Electrode Conductors. Metal enclosures for grounding electrode conductors shall be electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode and shall be securely fastened to the ground clamp or fitting. Metal enclosures that are not physically continuous from cabinet or equipment to the grounding electrode shall be made electrically continuous by bonding each end to the grounding

electrode conductor. Where a raceway is used as protection for a grounding electrode conductor, the installation shall comply with the requirements of the appropriate raceway article.

(F) To Electrode(s). A grounding electrode conductor shall be permitted to be run to any convenient grounding electrode available in the grounding electrode system or to one or more grounding electrode(s) individually. The grounding electrode conductor shall be sized for the largest grounding electrode conductor required among all the electrodes connected to it.

Section 41. Section 250.104 of the National Electrical Code, 2002 edition, is amended as follows:

250.104 Bonding of Piping Systems and Exposed Structural Steel.

(A) Metal Water Piping. The metal water piping system shall be bonded as required in (1), (2), (3), or (4) of this section. The bonding jumper(s) shall be installed in accordance with 250.64(A), (B), and (E). The points of attachment of the bonding jumper(s) shall be accessible.

(1) General. Metal water piping system(s) installed in or attached to a building or structure 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(s) shall be sized in accordance with Table 250.66 except as permitted in 250.104(A)(2) and (A)(3).

(2) Buildings of Multiple Occupancy. In buildings of multiple occupancy where the metal water piping system(s) installed in or attached to a building or structure for the individual occupancies is metallically isolated from all other occupancies by use of nonmetallic water piping, the metal water piping system(s) for each occupancy shall be permitted to be bonded to the equipment grounding terminal of the panelboard or switchboard enclosure (other than service equipment) supplying that occupancy. The bonding jumper shall be sized in accordance with Table 250.122.

(3) Multiple Buildings or Structures Supplied from a Common Service. The metal water piping system(s) installed in or attached to a building or structure shall be bonded to the building or structure disconnecting means enclosure where located at the building or structure, to the equipment grounding conductor run with the supply conductors, or to the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with 250.66, based on the size of the feeder or branch circuit conductors that supply the building. The bonding jumper shall not be required to be larger than the largest ungrounded feeder or branch circuit conductor supplying the building.

(4) Separately Derived Systems. The grounded conductor of each separately derived system shall be bonded to the nearest available point of the interior metal water piping system(s) in the area served by each separately derived system. This connection shall be made at the same point on the separately derived system where the grounding electrode conductor is connected. Each bonding jumper shall be sized in accordance with Table 250.66.

Exception: A separate water piping bonding jumper shall not be required where the effectively grounded metal frame of a building or structure is used as the grounding electrode for a

separately derived system and is bonded to the metallic water piping in the area served by the separately derived system.

(B) Other Metal Piping. Where installed in or attached to a building or structure, metal piping system(s), including gas piping, that 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(s) shall be sized in accordance with 250.122 using the rating of the circuit that may energize the piping system(s). The equipment grounding conductor for the circuit that may energize the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

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

(C) Structural Steel. Exposed structural steel that is interconnected to form a steel building frame and is not intentionally grounded and 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 the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with Table 250.66 and installed in accordance with 250.64(A), (B), and (E). The points of attachment of the bonding jumper(s) shall be accessible.

(D) Water System Requirements. It is unlawful to connect to or use any water main or water pipe belonging to Seattle Public Utilities distribution and transmission systems for electrical grounding purposes.

Section 42. Section 300.1 of the National Electrical Code, 2002 edition, is amended as follows:

300.1 Scope.

(A) All Wiring Installations. This article covers wiring methods for all wiring installations unless modified by other articles.

(B) Integral Parts of Equipment. The provisions of this article are not intended to apply to the conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory assembled control equipment or listed utilization equipment.

(C) Metric Designators and Trade Sizes. Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be as designated in Table 300.1(C).

Table 300.1(C) Metric Designator and Trade Sizes

Metric Designator	Trade Size
12	⅜
16	½
21	¾
27	1
35	1¼
41	1½
53	2

63	2½
78	3
91	3½
103	4
129	5
155	6

Note: The metric designators and trade sizes are for identification purposes only and are not actual dimensions.

FPN: See WAC 296-46B-010 (14), (25), (26) and WAC 296-46B-010 Tables 010-1 and 010-2 for wiring methods for designated building occupancies.

Section 43. Section 300.4 of the National Electrical Code, 2002 edition, is amended as follows:

300.4 Protection Against Physical Damage. Where subject to physical damage, conductors shall be adequately protected.

(A) Cables and Raceways Through Wood Members.

(1) Bored Holes. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed through bored holes in joists, rafters, or wood members, holes shall be bored so that the edge of the hole is not less than 32 mm (1¼ in.) from the nearest edge of the wood member. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by screws or nails by a steel plate or bushing, at least 1.6 mm (1/16 in.) thick, and of appropriate length and width installed to cover the area of the wiring.

Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(2) Notches in Wood. Where there is no objection because of weakening the building structure, in both exposed and concealed locations, cables or raceways shall be permitted to be laid in notches in wood studs, joists, rafters, or other wood members where the cable or raceway at those points is protected against nails or screws by a steel plate at least 1.6 mm (1/16 in.) thick installed before the building finish is applied.

Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(B) Nonmetallic-Sheathed Cables and Electrical Nonmetallic Tubing Through Metal Framing Members.

(1) Nonmetallic-Sheathed Cable. In both exposed and concealed locations where nonmetallic-sheathed cables pass through either factory or field punched, cut, or drilled slots or holes in metal members, the cable shall be protected by listed two-piece interlocking bushings or listed two-piece interlocking grommets covering all metal edges that are securely fastened in the opening prior to installation of the cable.

(2) Nonmetallic-Sheathed Cable and Electrical Nonmetallic Tubing. Where nails or screws are likely to penetrate nonmetallic-sheathed cable or electrical nonmetallic tubing, a steel sleeve,

steel plate, or steel clip not less than 1.6 mm (1/16 in.) in thickness shall be used to protect the cable or tubing.

(C) Cables Through Spaces Behind Panels Designed to Allow Access. Cables or raceway-type wiring methods, installed behind panels designed to allow access, shall be supported according to their applicable articles.

(D) Cables and Raceways Parallel to Framing Members. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed parallel to framing members, such as joists, rafters, or studs, the cable or raceway shall be installed and supported so that the nearest outside surface of the cable or raceway is not less than 32 mm (1¼ in.) from the nearest edge of the framing member where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1.6 mm (1/16 in.) thick.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: For concealed work in finished buildings, or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permissible to fish the cables between access points.

(E) Cables and Raceways Installed in Shallow Grooves. Cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, shall be protected by 1.6 mm (1/16 in.) thick steel plate, sleeve, or equivalent or by not less than 32 mm (1¼ in.) free space for the full length of the groove in which the cable or raceway is installed.

Exception: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(F) Insulated Fittings. Where raceways containing ungrounded conductors 4 AWG or larger enter a cabinet, box enclosure, or raceway, the conductors shall be protected by a substantial fitting providing a smoothly rounded insulating surface, unless the conductors are separated from the fitting or raceway by substantial insulating material that is securely fastened in place.

Exception: Where threaded hubs or bosses that are an integral part of a cabinet, box enclosure, or raceway provide a smoothly rounded or flared entry for conductors.

Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors.

Section 44. Section 300.11 of the National Electrical Code, 2002 edition, is amended as follows:

300.11 Securing and Supporting.

(A) Secured in Place. Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place. Support wires that do not provide secure support shall not be permitted as the sole support. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. Where independent support wires are used, they shall be secured at both ends. Cables and raceways shall not be supported by ceiling grids.

(1) Fire-Rated Assemblies. Wiring located within the cavity of a fire-rated floor–ceiling or roof–ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.

Exception: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

FPN: One method of determining fire rating is testing in accordance with NFPA 251-1999, Standard Methods of Tests of Fire Endurance of Building Construction and Materials.

(2) Non–Fire-Rated Assemblies. Wiring located within the cavity of a non–fire-rated floor–ceiling or roof–ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided.

Exception: The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment where installed in accordance with the ceiling system manufacturer's instructions.

(B) Raceways Used as Means of Support. ((~~Raceways shall only be used as a means of support for other raceways, cables, or nonelectric equipment under the following conditions:~~

~~(1) Where the raceway or means of support is identified for the purpose; or~~

~~(2) Where the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits; or~~

~~(3) Where the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires (fixtures) in accordance with 410.16(F)~~))

FPN: See WAC 296-46B-300 011, Support of raceways, cables, or boxes in suspended ceilings.

(C) Cables Not Used as Means of Support. Cable wiring methods shall not be used as a means of support for other cables, raceways, or nonelectrical equipment.

Section 45. Section 300.17 of the National Electrical Code, 2002 edition, is amended as follows:

300.17 Number and Size of Conductors in Raceway. The number and size of conductors in any raceway shall not be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors without damage to the conductors or to their insulation.

FPN No. 1: See WAC 296-46B-300 017, Conductors in Raceway.

FPN No.2: See the following sections of this Code: intermediate metal conduit, 342.22; rigid metal conduit, 344.22; flexible metal conduit, 348.22; liquidtight flexible metal conduit, 350.22; rigid nonmetallic conduit, 352.22; liquidtight nonmetallic flexible conduit, 356.22; electrical metallic tubing, 358.22; flexible metallic tubing, 360.22; electrical nonmetallic tubing, 362.22; cellular concrete floor raceways, 372.11; cellular metal floor raceways, 374.5; metal wireways, 376.22; nonmetallic wireways, 378.22; surface metal raceways, 386.22; surface nonmetallic raceways 388.22; underfloor raceways, 390.5; fixture wire, 402.7; theaters, 520.6; signs, 600.31(C); elevators, 620.33; audio signal processing, amplification, and reproduction equipment, 640.23(A) and 640.24; Class 1, Class 2, and Class 3 circuits, Article 725; fire alarm circuits, Article 760; and optical fiber cables and raceways, Article 770.

Section 46. Section 300.21 of the National Electrical Code, 2002 edition, is 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 made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating. All out-of-service cable shall be removed from accessible ceiling spaces.

FPN: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance–rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 300.21 can be found in building codes, fire resistance directories, and product listings.

Section 47. Section 314.1 of the National Electrical Code, 2002 edition, is amended as follows:

314.1 Scope. This article covers the installation and use of all boxes and conduit bodies used as outlet, device, junction, or pull boxes, depending on their use, and manholes and other electric enclosures intended for personnel entry. Cast, sheet metal, nonmetallic, and other boxes such as FS, FD, and larger boxes are not classified as conduit bodies. This article also includes installation requirements for fittings used to join raceways and to connect raceways and cables to boxes and conduit bodies.

FPN: See Section 1206 of the Seattle Building Code for location of outlet boxes in sound transmission control assemblies.

Section 48. Section 314.15 of the National Electrical Code, 2002 edition, is amended as follows:

314.15 Damp, Wet, or Hazardous (Classified) Locations.

(A) Damp or Wet Locations. In damp or wet locations, boxes, conduit bodies, and fittings shall be placed or equipped so as to prevent moisture from entering or accumulating within the box, conduit body, or fitting. Boxes, conduit bodies, and fittings installed in wet locations shall be listed for use in wet locations.

FPN No. 1: For boxes in floors, see 314.27(C).

FPN No. 2: For protection against corrosion, see 300.6.

FPN No. 3: See WAC 296-46B-314 001(1), Boxes and fittings.

(B) Hazardous (Classified) Locations. Installations in hazardous (classified) locations shall conform to Articles 500 through 517.

Section 49. Section 314.29 of the National Electrical Code, 2002 edition, is amended as follows:

314.29 Boxes and Conduit Bodies to Be Accessible. Boxes and conduit bodies shall be installed so that the wiring contained in them can be rendered accessible without removing any part of the building or, in underground circuits, without excavating sidewalks, paving, earth, or other substance that is to be used to establish the finished grade. Conduit bodies, junction, pull and outlet boxes shall be installed so that the wiring contained in them can be located without removing any part of the building structure, including insulation material.

Exception: Listed boxes shall be permitted where covered by gravel, light aggregate, or noncohesive granulated soil if their location is effectively identified and accessible for excavation.

Section 50. Section 326.10 of the National Electrical Code, 2002 edition, is amended as follows:

326.10 Uses Permitted. Type IGS cable shall be permitted for use under ground, including direct burial in the earth, as the following:

(1) ((~~Service-entrance conductors~~))

(2) Feeder or branch-circuit conductors

Section 51. Section 330.10 of the National Electrical Code, 2002 edition, is amended as follows:

330.10 Uses Permitted.

(A) General Uses. 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

(5) Direct buried where identified for such use

(6) In cable tray

(7) In any 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, 504, and 505

(11) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations

(12) In wet locations where any of the following conditions are met:

a. The metallic covering is impervious to moisture.

b. A lead sheath or moisture-impervious jacket is provided under the metal covering.

c. The insulated conductors under the metallic covering are listed for use in wet locations.

(13) Where single-conductor cables are used, all phase conductors and, where used, the neutral conductor shall be grouped together to minimize induced voltage on the sheath.

(B) Specific Uses. Type MC cable shall be installed in compliance with Articles 300, 490, 725, and 770.52 as applicable and in accordance with 330.10(B)(1) through (B)(4).

(1) Cable Tray. Type MC cable installed in cable tray shall comply with Article 392.

(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 300.50, as appropriate.

(3) Installed as Service-Entrance Cable. Type MC cable installed as service-entrance cable shall comply with Article 230.

(4) 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 396.

Section 52. Section 334.10 of the National Electrical Code, 2002 edition, is amended as follows:

334.10 Uses Permitted. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

(1) One- and two-family dwellings.

(2) Multifamily dwellings ((~~permitted to be~~)) of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

(3) Other structures ((~~permitted to be~~)) of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

FPN No. 1: Building constructions are defined in ((~~NFPA 220-1999, *Standard on Types of Building Construction*, or the applicable building code, or both~~)) the Seattle Building Code.

((~~FPN No. 2: See Annex E for determination of building types [NFPA 220, Table 3-1].~~))

(4) Cable trays, where the cables are identified for the use.

FPN: See 310.10 for temperature limitation of conductors.

(A) Type NM. Type NM cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in normally dry locations except as prohibited in 334.10(3).

(2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC. Type NMC cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in dry, moist, damp, or corrosive locations, except as prohibited in 334.10(3)

(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 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish

(C) Type NMS. Type NMS cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in normally dry locations except as prohibited in 334.10(3)

(2) To be installed or fished in air voids in masonry block or tile walls

(3) To be used as permitted in Article 780

Section 53. Section 334.15 of the National Electrical Code, 2002 edition, is amended as follows:

334.15 Exposed Work. In exposed work, except as provided in 300.11(A), the cable shall be installed as specified in 334.15(A) through (C).

(A) ((~~To Follow Surface. The cable shall closely follow the surface of the building finish or of running boards.~~)) Work Considered as Concealed. Nonmetallic-sheathed cable shall be considered as concealed where installed in inaccessible void areas of buildings or where run between or through bored holes of studs, joists and similar members as required in Section 300.4. 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, Schedule 80 PVC rigid nonmetallic conduit, pipe, guard strips, listed surface metal or nonmetallic raceway, or other means. ((~~Where passing through a floor, the cable shall be enclosed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC rigid nonmetallic conduit, listed surface metal or nonmetallic raceway, or other metal pipe extending at least 150 mm (6 in.) 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 it is protected from physical damage by the use of running boards, conduit, guard strips or other approved means as required in Section 334.23

Exception No. 2: Exposed nonmetallic-sheathed cable that is properly supported 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) ((~~In Unfinished Basements.~~ ~~Where the cable is run at angles with joists in unfinished basements, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards.~~)) **Unexcavated Spaces.** Type NM 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 54. Section 334.40 of the National Electrical Code, 2002 edition, is amended as follows:

334.40 Boxes and Fittings.

(A) Boxes of Insulating Material. Nonmetallic outlet boxes shall be permitted as provided in 314.3.

(B) ((~~Devices of Insulating Material.~~ ~~Switch, outlet, and tap devices of insulating material shall be permitted to be used without boxes in exposed cable wiring and for rewiring in existing buildings where the cable is concealed and fished. Openings in such devices shall form a close fit around the outer covering of the cable, and the device shall fully enclose the part of the cable from which any part of the covering has been removed. Where connections to conductors are by binding-screw terminals, there shall be available as many terminals as conductors.~~)) Reserved.

(C) Devices with Integral Enclosures. Wiring devices with integral enclosures identified for such use shall be permitted as provided in 300.15(E).

Section 55. Section 338.10 of the National Electrical Code, 2002 edition, is amended as follows:

338.10 Uses Permitted.

(A) ((~~Service-Entrance Conductors.~~ ~~Service-entrance cable used as service-entrance conductors shall be installed as required by Article 230.~~

~~Type USE used for service laterals shall be permitted to emerge from the ground outside at terminations in meter bases or other enclosures where protected in accordance with 300.5(D)~~)). Reserved.

(B) Branch Circuits or Feeders.

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

(2) Grounded Conductor Not Insulated. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.

Exception: Uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.140.

(3) 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.

(4) Installation Methods for Branch Circuits and Feeders.

(a) Interior Installations. In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Parts I and II of Article 334, excluding 334.80.

FPN: See 310.10 for temperature limitation of conductors.

(b) Exterior Installations. In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed as required by Article 225. The cable shall be supported in accordance with 334.30, unless used as messenger-supported wiring as allowed by Article 396.

Type USE cable shall be installed outside in accordance with the provisions of Article 340. Where Type USE cable emerges from the ground at terminations, it shall be protected in accordance with 300.5(D). Multiconductor service-entrance cable shall be permitted to be installed as messenger-supported wiring in accordance with Articles 225 and 396.

Section 56. Section 358.10 of the National Electrical Code, 2002 edition, is amended as follows:

358.10 Uses Permitted.

(A) Exposed and Concealed. The use of EMT shall be permitted for both exposed and concealed work.

(B) Corrosion Protection. Ferrous or nonferrous EMT, elbows, couplings, and fittings shall be permitted to be installed in concrete((~~, in direct contact with the earth,~~)) above grade or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.

(C) Wet Locations. All supports, bolts, straps, screws, and so forth shall be of corrosion-resistant materials or protected against corrosion by corrosion-resistant materials.

Circuits installed in electrical metallic tubing in wet locations shall use equipment grounding wires sized according to Section 250.122.

FPN: See 300.6 for protection against corrosion.

Section 57. Section 382 of the National Electrical Code, 2002 edition, is repealed.

Section 58. Section 394.12 of the National Electrical Code, 2002 edition, is amended as follows:

394.12 Uses Not Permitted. Concealed knob-and-tube wiring shall not be used in the following:

(1) Commercial garages

(2) Theaters and similar locations

(3) Motion picture studios

(4) Hazardous (classified) locations

(5) Hollow spaces of walls, ceilings, and attics where such spaces are insulated by loose, rolled, or foamed-in-place insulating material that envelops the conductors

FPN: See WAC 296-46B-394 001, Knob and Tube Wiring, for insulating voids in spaces containing existing knob and tube wiring.

Section 59. Section 404.3 of the National Electrical Code, 2002 edition, is amended as follows:

404.3 Enclosure.

(A) General. 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 312.6.

((~~*Exception No. 1: Pendant- and surface-type snap switches and knife switches mounted on an open-face switchboard or panelboard shall be permitted without enclosures.*~~

~~*Exception No. 2: Switches and circuit breakers installed in accordance with 110.27(A)(1), (2), (3), or (4) shall be permitted without enclosures.*~~))

(B) Used as a Raceway. Enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless the enclosure complies with 312.8.

Section 60. Section 404.10 of the National Electrical Code, 2002 edition, is amended as follows:

404.10 Mounting of Snap Switches.

(A) ((~~**Surface-Type.** Snap switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm (½ in.) from the surface wired over.~~)) Reserved.

(B) Box Mounted. Flush-type snap switches mounted in boxes that are set back of the wall surface as permitted in 314.20 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 from it shall be installed so that the mounting yoke or strap of the switch is seated against the box.

Section 61. Section 404.13 of the National Electrical Code, 2002 edition, is amended as follows:

404.13 Knife Switches.

(A) Isolating Switches. Knife switches rated at over 1200 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 1200 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 404.13(A) and (B) 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) Interlocking. All switches shall be of the interlocking type to prevent the door from being opened when the circuit is energized. All switches used as service disconnecting means and those rated over 300 volts shall be of the two-way interlocking type.

Section 62. The National Electrical Code, 2002 edition, is amended by adding Sections 450.19 and 450.20 as follows:

450.19 Location and Construction.

(A) Location of Pad-Mounted Transformers. See WAC 296-46B-450 027 (1) and Figures 450-1 and 450-2.

(B) Total Underground Transformers. See WAC 296-46B-450(2), except that enclosures for total underground transformers shall not be located within 10 feet of a doorway or fire escape.

(C) Transformer Vault Construction. See the Seattle Building Code, Section 414 and Appendix Chapter 4 for construction requirements for public and private transformer vaults.

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 NEC.

Section 63. Article 450, Part III of the National Electrical Code, 2002 edition, is amended as follows:

III. Transformer Vaults

Section 450.41 through 450.48 are not adopted. See Seattle Building Code Section 414 and Appendix Chapter 4 for requirements for private and utility transformer vaults.

Section 64. Sections 450.41 through 450.48 of the National Electrical Code, 2002 edition, are repealed.

Section 65. Section 553.4 of the National Electrical Code, 2002 edition, is amended as follows:

553.4 Location of Service Equipment. The service equipment for a floating building shall be located adjacent to, but not in or on, the building.

Exception: In existing situations, the service equipment may be located in or on the building by special permission.

Section 66. A new Section 555.24 is added to the National Electrical Code, 2002 edition, as follows:

555.24 Luminaires Required. All walkways over water shall be illuminated to provide safe access. All luminaires shall be listed for the use.

Section 67. Section 620.5 of the National Electrical Code, 2002 edition, is amended as follows:

620.5 Working Clearances. Working space shall be provided about controllers, disconnecting means, and other electrical equipment. The minimum working space shall not be less than that specified in ((~~110.26(A)~~)) the Seattle Building Code, Section 3016.3.

((~~Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance requirements of 110.26(A) shall be waived as permitted in 620.5(A) through (D).~~

~~**(A) Flexible Connections to Equipment.** Electrical equipment in (1) through (4) shall be permitted to be provided with flexible leads to all external connections so that it can be repositioned to meet the clear working space requirements of 110.26(A).~~

~~(1) Controllers and disconnecting means for dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts installed in the same space with the driving machine~~

~~(2) Controllers and disconnecting means for elevators installed in the hoistway or on the car~~

~~(3) Controllers for door operators~~

~~(4) Other electrical equipment installed in the hoistway or on the car~~

~~**(B) Guards.** Live parts of the electrical equipment are suitably guarded, isolated, or insulated, and the equipment can be examined, adjusted, serviced, or maintained while energized without removal of this protection.~~

~~FPN: See definition of Exposed in Article 100.~~

~~**(C) Examination, Adjusting, and Servicing.** Electrical equipment is not required to be examined, adjusted, serviced, or maintained while energized.~~

~~**(D) Low Voltage.** Uninsulated parts are at a voltage not greater than 30 volts rms, 42 volts peak, or 60 volts dc.~~

The clear working space in front of a disconnecting means shall be not less than 1220 mm (48 inches) in depth and 760 mm (30 inches) in width.

Elevator machine rooms are required to have not less than 7 feet 0 inches of headroom, per ASME A17.1, Rule 101.4.

Section 68. Section 620.21 of the National Electrical Code, 2002 edition, is amended as follows:

620.21 Wiring Methods. Conductors and optical fibers located in hoistways, in escalator and moving walk wellways, in wheelchair lifts, stairway chair lift runways, machinery spaces, control spaces, in or on cars, in machine rooms and control rooms, not including the traveling cables connecting the car or counterweight and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, rigid nonmetallic conduit, or wireways, ((~~or shall be Type MC, MI, or AC cable~~)) unless otherwise ((~~permitted~~)) specified in 620.21(A) through (C).

Type MC cable or Type MI cable may be permitted to be installed in elevator spaces only by special permission.

(A) Elevators.

(1) Hoistways.

(a) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in hoistways between risers and limit switches, interlocks, operating buttons, and similar devices. Flexible conduit runs are limited to 1.8 m (6 ft) in length.

(b) ((~~Cables used in Class 2 power-limited circuits shall be permitted to be installed between risers and signal equipment and operating devices, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Feeders shall be permitted inside the hoistway for elevators with driving machine motors located in the hoistway or on the car or counterweight.

(c) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted in the hoistway, in lengths not to exceed 1.8 m (6 ft), without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(2) Cars.

(a) Nonmetallic raceways and wireways shall not be installed on cars located in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding ((~~1.8 m (6 ft)~~)) 915 mm (3 ft) in length, shall be permitted on cars where located so as to be free from oil and if securely fastened in place. Flexible conduit shall not be located where it can be walked on or damaged.

~~((Exception: Liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, as defined by 356.2, shall be permitted in lengths in excess of 1.8 m (6 ft).))~~

(b) Hard-service cords and junior hard-service cords that conform 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 the portable-type top-of-car operating devices or the car-top work lights. Devices or luminaires (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.

(c) ((~~Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(d) Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted on the car assembly, in lengths not to exceed ((~~1.8 m (6 ft)~~)) 915 mm (3 ft) without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves.

~~((Exception: Liquidtight flexible nonmetallic conduit metric designator 12 (trade size ⅜) or larger, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).))~~

(b) 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 1.8 m (6 ft) 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.

(c) ((~~Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(d) On existing or listed equipment, 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 900 mm (3 ft) and located so as to be protected from physical damage.

(4) Counterweight. Nonmetallic raceways and wireways shall not be installed on counterweights installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted on the counterweight assembly, in lengths not to exceed 1.8 m (6 ft) without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(B) Escalators.

(1) Wiring Methods. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in escalator and moving walk wellways. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size ⅜) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size ⅜), nominal, or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) ((~~**Class 2 Circuit Cables.** Cables used in Class 2 power-limited circuits shall be permitted to be installed within escalators and moving walkways, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(3) Flexible Cords. Hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections on escalators and 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 620.5.

(C) Wheelchair Lifts and Stairway Chair Lift Raceways.

(1) Wiring Methods. Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in wheelchair lifts and stairway chair lift runways and machinery spaces. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size ⅜) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size ⅜) or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) Class 2 Circuit Cables. Traveling ((~~C~~))cables used in Class 2 power-limited circuits shall be permitted to be installed within wheelchair lifts and stairway chair lift runways and machinery spaces, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

Section 69. Section 620.22 of the National Electrical Code, 2002 edition, is amended as follows:

620.22 Branch Circuits for Car Lighting, Receptacle(s), Ventilation, Heating, and Air Conditioning.

(A) Car Light Source. A separate branch circuit shall supply the car lights, receptacle(s), auxiliary lighting power source, and ventilation on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space.

Required lighting shall not be connected to the load side terminals of a ground-fault circuit-interrupter receptacle(s).

(B) Air-Conditioning and Heating Source. A dedicated branch circuit shall supply the air-conditioning and heating units on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space.

Section 70. Section 620.44 of the National Electrical Code, 2002 edition, is amended as follows:

620.44 Installation of Traveling Cables. Traveling cable shall be permitted to be run without the use of a raceway for a distance not exceeding 1.8 m (6 ft) in length as measured from the first point of support on the elevator car or hoistway wall, or counterweight where applicable, provided the conductors are ((~~grouped together and taped or corded, or~~)) in the original sheath.

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

Section 71. Section 620.51 of the National Electrical Code, 2002 edition, is amended as follows:

620.51 Disconnecting Means. A single means for disconnecting all ungrounded main power supply conductors for each unit shall be provided and be designed so that no pole can be operated independently. Where multiple driving machines are connected to a single elevator, escalator, moving walk, or pumping unit, there shall be one disconnecting means to disconnect the motor(s) and control valve operating magnets.

The disconnecting means for the main power supply conductors shall not disconnect the branch circuit required in 620.22, 620.23, and 620.24.

(A) Type. The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker capable of being locked in the open position. The disconnecting means shall be a listed device.

FPN: For additional information, see ASME/ANSI A17.1-1996, *Safety Code for Elevators and Escalators.*

Exception: Where an individual branch circuit supplies a wheelchair lift, the disconnecting means required by 620.51(C)(4) shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be capable of being locked in the open position.

(B) Operation. No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to ((~~automatically~~)) open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.

FPN: To reduce hazards associated with water on live elevator electrical equipment.

(C) Location. The disconnecting means shall be located where it is readily accessible to qualified persons.

(1) On Elevators Without Generator Field Control. On elevators without generator field control, the disconnecting means shall be located within sight of the motor controller. Driving machines or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power supply conductors shall be provided and be capable of being locked in the open position.

(2) On Elevators with Generator Field Control. On elevators with generator field control, the disconnecting means shall be located within sight of the motor controller for the driving motor of the motor-generator set. Driving machines, motor-generator sets, or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine or the motor-generator set is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power supply conductors shall be provided and be capable of being locked in the open position.

(3) On Escalators and Moving Walks. On escalators and moving walks, the disconnecting means shall be installed in the space where the controller is located.

(4) On Wheelchair Lifts and Stairway Chair Lifts. On wheelchair lifts and stairway chair lifts, the disconnecting means shall be located within sight of the motor controller.

(D) Identification and Signs. Where there is more than one driving machine in a machine room, the disconnecting means shall be numbered to correspond to the identifying number of the driving machine that they control.

The disconnecting means shall be provided with a sign to identify the location of the supply side overcurrent protective device.

(E) Automatic Power Disconnect Device Control Circuit. The control circuit for a required automatic power disconnect device or shunt trip shall be derived either from:

(1) Within the disconnecting means enclosure when the shunt trip circuit equipment is a part of the listed assembly and the control circuit controls only the disconnect(s) within the listed equipment; or

(2) A dedicated circuit from an appropriate panelboard located in the machine room.

Section 72. Section 620.71 of the National Electrical Code, 2002 edition, is 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 space set aside for that purpose unless otherwise permitted in 620.71(A) or (B). The room or space 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 and wiring that pertain to the elevator and its operation are permitted in these elevator spaces. See Section 3022 of the Seattle Building Code.

Elevator motor controllers and driving machines may be permitted inside the hoistway by special permission.

(A) Motor Controllers. Motor controllers shall be permitted outside the spaces herein specified, provided they are in enclosures with doors or removable panels that are capable of being locked in the closed position and the disconnecting means is located adjacent to or is an integral part of the motor controller. Motor controller enclosures for escalator or moving walks shall be permitted in the balustrade on the side located away from the moving steps or moving treadway. If the disconnecting means is an integral part of the motor controller, it shall be operable without opening the enclosure.

(B) Driving Machines. Elevators with driving machines located on the car, on the counterweight, or in the hoistway, and driving machines for dumbwaiters, wheelchair lifts, and stairway lifts shall be permitted outside the spaces herein specified.

Section 73. Section 680.40 of the National Electrical Code, 2002 edition, is amended as follows:

680.40 General. Electrical installations at spas and hot tubs shall comply with the provisions of Part I and Part IV of this article.

FPN: See also WAC296-46B-680, Special Equipment – Swimming pools, fountains and similar installations, for additional requirements.

Section 74. Section 700.1 of the National Electrical Code, 2002 edition, is amended as follows:

700.1 Scope.

(A) The provisions of this article apply to the electrical safety of the installation, operation, and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination, power, or both, to required facilities when the normal electrical supply or system is interrupted.

Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life.

FPN No. 1: For further information regarding wiring and installation of emergency systems in health care facilities, see Article 517.

FPN No. 2: For further information regarding performance and maintenance of emergency systems in health care facilities, see NFPA 99-1999, *Standard for Health Care Facilities*.

FPN No. 3: Emergency systems are generally installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons, such as hotels, theaters, sports arenas, health care facilities, and similar institutions. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, fire detection and alarm systems, elevators, fire pumps, public safety communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.

FPN No. 4: For specification of locations where emergency lighting is considered essential to life safety, see NFPA 101®-2000, *Life Safety Code®*.

FPN No. 5: For further information regarding performance of emergency and standby power systems, see NFPA 110-1999, *Standard for Emergency and Standby Power Systems*.

FPN No. 6: See Seattle Building Code Section 1003 for means of egress identification and illumination requirements.

(B) Permitted Loads for the Emergency System. The power sources listed in section 700.12 (B), (C), or (D), are permitted for the emergency circuits for the following systems:

(1) Exit and egress lighting

(2) Fire alarm system

(3) Fire pump(s) (when the fire pump system requires an emergency source of power)

In addition, the following loads shall be installed on the emergency system when required by the Seattle Fire Code or the Seattle Building Code:

(1) Ventilation: Required air pressurization, smoke removal, supply air, direct digital control (DDC) systems and other environmental control systems.

(2) Communication Systems: Communication systems required for security notification, Fire Department use, and rescue operations.

(3) Other emergency circuits specifically approved by the Seattle Fire Department or the building official.

(4) Other emergency circuits as may be specifically required by the Seattle Fire Code or the Seattle Building Code.

Section 75. Section 700.4 of the National Electrical Code, 2002 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 of 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 ensure the systems are maintained 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.

FPN: For testing and maintenance procedures of emergency power supply systems (EPSSs), see NFPA 110-1999, *Standard for Emergency and Standby Power Systems.*

Section 76. Section 700.9 of the National Electrical Code, 2002 edition, is amended as follows:

700.9 Wiring, Emergency System.

(A) Identification. All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system.

FPN: See WAC 296-46B-700 009 (4) for device and junction box identification requirements.

(B) Wiring. Wiring of two or more emergency circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet. Wiring from an emergency source or emergency source distribution overcurrent protection to emergency loads shall be kept entirely independent of all other wiring and equipment, unless otherwise permitted in (1) through (4):

(1) Wiring from the normal power source located in transfer equipment enclosures

(2) Wiring supplied from two sources in exit or emergency luminaires (lighting fixtures)

(3) Wiring from two sources in a common junction box, attached to exit or emergency luminaires (lighting fixtures)

(4) Wiring within a common junction box attached to unit equipment, containing only the branch circuit supplying the unit equipment and the emergency circuit supplied by the unit equipment

(C) Wiring Design and Location. Emergency wiring circuits shall be designed and located so as to minimize the hazards that might cause failure due to flooding, fire, icing, vandalism, and other adverse conditions.

(D) Fire Protection. Emergency systems shall meet the following additional requirements in assembly occupancies for not less than 1000 persons or in buildings above 23 m (75 ft) in height with any of the following occupancy classes: assembly, educational, residential, detention and correctional, business, and mercantile.

(1) Feeder-Circuit Wiring. Feeder-circuit wiring shall meet one of the following conditions:

(1) Be installed with buildings that are fully protected by an approved automatic fire suppression system

(2) Be a listed electrical circuit protective system with a minimum 1-hour fire rating

(3) Be protected by a listed thermal barrier system for electrical system components

(4) Be protected by a fire-rated assembly listed to achieve a minimum fire rating of 1 hour

(5) Be embedded in not less than 50 mm (2 in.) of concrete

(6) Be a cable listed to maintain circuit integrity for not less than 1 hour when installed in accordance with the listing requirements

(2) Feeder-Circuit Equipment. Equipment for feeder circuits (including transfer switches, transformers, and panelboards) shall be located either in spaces fully protected by approved automatic fire suppression systems (including sprinklers, carbon dioxide systems) or in spaces with a 1-hour fire resistance rating.

FPN: For the definition of occupancy class, see 4.1 of NFPA 101-2000, Life Safety Code.

Section 77. Section 700.16 of the National Electrical Code, 2002 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 designed and installed so that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space that 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.

Exit signs with open bottom lighting shall not be used in lieu of a required pathway light unless specifically approved for the purpose.

Exit illumination (pathway lighting) and emergency area lighting shall comply with Chapter 10 of the Seattle Building Code.

Exception: Alternative means that ensure emergency lighting illumination level is maintained shall be permitted when pre-approved by the building official.

Section 78. Section 701.10 of the National Electrical Code, 2002 edition, is amended as follows:

701.10 Wiring Legally Required Standby Systems. ((~~The~~)) For shaft pressurization installed according to exception 2 of Section 905.2.1 of the Seattle Building Code, the legally required standby system wiring shall be kept entirely independent of all other wiring and equipment and shall not enter the same raceway, cable, box, or cabinet with other wiring. Other legally required standby system wiring shall be permitted to occupy the same raceways, cables, boxes, and cabinets with other general wiring.

Section 79. Section 760.10 of the National Electrical Code, 2002 edition, is amended as follows:

760.10 Fire Alarm Circuit Identification. Fire alarm circuits shall be identified at terminal and junction locations, in a manner that will prevent unintentional interference with the signaling circuit during testing and servicing.

FPN: See WAC 296-46B-700 009 (3) for device and junction box identification requirements.

Section 80. Severability. The provisions of this ordinance are declared to be separate and severable. The invalidity of any clause, sentence, paragraph, sub-division, section or portion of this ordinance, or the invalidity of the application thereof to any person or circumstance shall not affect the validity of the remainder of this ordinance, or the validity of its application to other persons or circumstances.

Section 81. This ordinance shall take effect and be in force thirty (30) days from and after its approval by the Mayor, but if not approved and returned by the Mayor within ten (10) days after presentation, it shall take effect as provided by the Municipal Code Section 1.04.020.

Passed by the City Council the 22nd day of September, 2003 and signed by me in open session in authentication of its passage this 22nd day of September, 2003.

Peter Steinbrueck
President _____ of the City Council

Approved by me this 1 day of October, 2003.

Greg Nickels, Mayor

Filed by me this 1st day of October, 2003.

City Clerk

(SEAL)

Exhibit A: Summary and Comparison of 2003 Seattle Electrical Code provisions in relation to the 2003 Washington State Electrical Code, Chapter 296-46B Washington Administrative Code (WAC)

Exhibit B: NFPA 70, National Electrical Code®, 2002 Edition

Michael Aoki-Kramer/mak
2002 Edition Seattle Electrical Code 4.doc
7/16/2003
Version 4

EXHIBIT A

Summary and Comparison of 2003 Seattle Electrical Code provisions in relation to the 2003 Washington State Electrical Code, Chapter 296-46B Washington Administrative Code (WAC)

Prepared by the Department of Planning and Development, Code Development and Electrical Review Section staff

Legislation Reviewed and Approved by the Seattle Electrical Code Review Committee, a duly appointed committee of the City of Seattle's Construction Codes Advisory Board, and the Construction Codes Advisory Board

Authority

Chapter 19.28, Revised Code of Washington (RCW) grants local jurisdictions the authority to adopt regulations applicable to electrical installations that differ from regulations adopted by the state, provided that the local regulations meet a minimum standard. The authority to adopt local regulations and the standard by which those regulations are judged is set forth at RCW 19.28.010 (3), which states:

> This chapter (RCW 19.28) shall not limit the authority or power of any city or town to enact and enforce under authority given by law, any ordinance, rule, or regulation requiring an equal, higher, or better standard of construction and an equal, higher, or better standard of materials, devices, appliances, and equipment than that required by this chapter.

Purpose

The purpose of this document is twofold: The primary purpose is to set forth the City of Seattle's analysis and determination that the differences between the 2003 Seattle Electrical Code (SEC) and the 2003 Washington State Electrical Code, meet the standard of RCW 19.28.010 (3) for local amendments. The secondary purpose of this document is to identify sections containing new amendments and clarifying language not found in the 1999 SEC, noted below as "***NEW***" in the "2003 SEC" column.

WAC/NEC	2003 SEC	Analysis
WAC 296-46B-010 (1)-(13), (15), (16), (19), (20), (23), (24)	102.2 ***NEW***	**Chapter 296-46B Washington Administrative Code.** Certain WAC sections are not adopted for the following reasons: 296-46B-010 (1): Seattle Municipal Code section 22.300.016, as proposed by the Seattle Electrical Code ordinance, adopts the 2002 NEC as the base code. The other standards referenced in this WAC section are not affected by the Seattle Electrical Code as they do not amend the 2002 NEC. 296-46B-010 (2): This is an administrative standard not related to a specific NEC requirement. SEC provides an equivalent standard at Section 202(G).

WAC/NEC	2003 SEC	Analysis
		296-46B-010 (3): This is an administrative standard not related to a specific NEC requirement. The City of Seattle enforces the WACs rules and SEC. 296-46B-010 (4): This is an administrative standard not related to a specific NEC requirement. SEC Section provides an equivalent standard for variances. 296-46B-010 (5)-(10): These are administrative standards not related to specific NEC requirements. SEC Section 305 provides equivalent standards relating to inspections and elsewhere in the code as appropriate. 296-46B-010 (11)-(13): These are administrative standards not related to specific NEC requirements. SEC Section 104(E) provides an equivalent or better standard for moved buildings. 296-46B-010 (15)-(16): These are administrative standards not related to specific NEC requirements. SEC Section 302(B) requires plan review meeting the requirements of the WACs for educational, institutional or health care facilities and other buildings. 296-46B-010 (19)-(20): These are administrative standards not related to specific NEC requirements. Requirements for plan review are set forth in Section 302(B). 296-46B-010 (23): This is an administrative standard not related to specific NEC requirements. The Seattle Fire Code requires that plans be submitted for review and approval of fire alarm systems. 296-46B-010 (24): This is an administrative standard not related to specific NEC requirements. SEC plan review and permitting requirements are set forth at Section 302 and 303.
	104(A) ***NEW***	**Additions, Alterations and Repairs.** Amendment to this section requires installation of receptacles in additions, alterations and repairs to existing buildings per the requirements set forth at Section 406.3(D) regulating replacement of receptacles.
WAC 296-46B-030	106 ***NEW***	**Utilization Equipment and Alternate Materials and Methods of Wiring.** This is an administrative standard not related to specific NEC requirements. The provisions for utilization equipment in WAC 296-46B-030 are superseded by SEC Section 106, which provides an equivalent standard. Section 106 requires applicants to demonstrate that the proposed utilization equipment or alternate means and methods of wiring provide an equivalent level of strength, effectiveness, fire resistance, durability, safety and sanitation as set forth in the SEC for similar installations. This language is similar to sections in the Building and Mechanical codes and gives DCLU clearer authority to approve variations from strict compliance with the code when staff believe all the features of the building make it as safe as if there had been literal compliance with the code.
NEC 90.1, 90.2 and 90.4	102.1, 103, and 106	SEC provides equivalent purpose, scope, and enforcement/interpretation sections specific to administration of the Electrical Code in Seattle.

WAC/NEC	2003 SEC	Analysis
	204(B) *NEW*	**Notice of Violation.** Added section that mimics authority granted in other building-related codes. Omission of this section from previous versions of the SEC appears to be an oversight.
	209 *NEW*	**Review by the Director.** Added section to enhance due process/review of notices of violation an other levied penalties. This section is similar to a section found in the Building Code.
	301(B)(4) *NEW*	**Exempted Work.** Amendment clarifies that wiring for communication systems in single family residences and other installations of 1000 feet or less do not need to apply for a permit.
	302(B) *NEW*	**Plans and Specifications.** Amendment clarifies that any proposed installation covering more than 2,500 square feet or that cannot be adequately described on a permit application require plan review. Other amendments coordinate plan review requirements for certain occupancies with State regulations.
NEC Art. 100	Art. 100 *NEW*	**Definitions.** SEC provides equivalent standard. Added language aligns meaning of terms not defined in the NEC or SEC with terms defined in the Seattle Building and Mechanical Codes and Webster's Dictionary.
NEC Art. 100, Part I	Art. 100, Part I	Cross reference added to code section that provides requirements for service point connections.
NEC Art. 100, Part I	Art. 100, Part I	Added definition of "service terminal box," a term of art used in Seattle but not defined in the NEC or WAC.
NEC 110.13	110.13 *NEW*	**Mounting, Cooling and Location of Equipment.** SEC amendment adds clarity to this section by aligning it with the Seattle Building Code and local utility requirements.
NEC 110.22	110.22 *NEW*	**Identification of Disconnecting Means.** SEC amendment adds clarity to this section by aligning it with the WAC requirements.
	110.24	**Electrified fences.** SEC adds section enhancing public safety by permitting electric fences only by special permission.
NEC 110.26	110.26 *NEW*	**110.26 Spaces about Electrical Equipment.** SEC provides better standard by requiring illumination of residential panelboards installed outdoors and prohibits panelboards in crawlspaces or similar potentially difficult or dangerous locations.
NEC 210.8	210.8 *NEW*	Ground-Fault Circuit-Interrupter Protection for Personnel. SEC provides better standard by requiring installation of GFCI outlets serving countertops near all sinks. SEC amendment mirrors requirements for residential construction and requires GFCI protection of all outlets located outside or in crawlspaces at or below grade where risk of electrical shock due to wet conditions may be prevalent. GFCI protection of outlets is widely accepted as the most cost effective, safe and prudent method of protecting personnel from shock hazards in potentially wet locations.
NEC 210.52	210.52 *NEW*	**Dwelling Unit Receptacle Outlets.** Amendment aligns SEC with WAC that allows receptacles in appliance garages to be counted as required countertop receptacles.

WAC/NEC	2003 SEC	Analysis
WAC 296-46B-215 010	230.95(C)	SEC provides an equivalent standard by incorporating the performance testing requirements of WAC 296-46B-215 010 into SEC Section 230.95(C). NEC 215.10 refers the user to Section 230.95 for GFPE requirements; thus, it was determined that SEC 230.95 is the more appropriate location for the testing requirement.
	215.12	**Panelboards.** Added section provides better standard than NEC by limiting the number of power sources supplying one multifamily dwelling unit for occupant protection.
NEC 220.3	220.3	**Computation of Branch Circuit Loads.** SEC provides equivalent standard. Aligns SEC with Seattle Energy Code limits on lighting power density for calculating lighting loads.
NEC 220.15	220.15	**Fixed Electric Space Heating.** SEC amendment exercises NEC grant of authority to local jurisdictions to set standards for calculating diversity; SEC amendment establishes demand factor to calculate diversity.
NEC 220.17	220.17	**Appliance Load - Dwelling Unit(s).** SEC amendment adds cross reference to Section 220.15.
NEC 225.32	225.32 ***NEW***	**Location.** SEC amendment adds cross reference to WAC for clarity.
WAC 296-46B-230 001	230.1	**Scope.** SEC provides equivalent standard for general service requirements that are specific to the electric utility serving the City of Seattle.
	230.5 ***NEW***	**Types of Services.** SEC adds section to NEC requiring grounded services, which enhances public safety; language from previous SEC clarified.
	230.12	**Service Point Connection.** SEC adds section to NEC to align the code with utility service point connection requirements.
WAC 296-46B-230 028	230.28 ***NEW***	**Service Masts as Supports.** Amendment provides better standard for service mast supports by requiring that services masts shall be rigid steel galvanized conduit no smaller than 2 inches; NEC minimum is 1 inch.
NEC 230.29	230.29	**Supports Over Buildings and Wires on or about Buildings or Structures Over Water.** SEC amendment aligns NEC with local utility requirements and provides a higher level of public safety for support of wires over water, structures, streets and alleys.
NEC 230.33	230.33 ***NEW***	**Spliced Conductors.** Fine print note added for clarification and alignment with utility.
NEC 230.34 (230.34 continued)	230.34 ***NEW***	**Conversion to Underground Service or Increasing Existing Overhead Services.** SEC adds section to NEC regarding retrofitting of existing services. Added SEC section provides more specific requirements for scenarios common in Seattle, e.g. meter embedded in exterior wall.
WAC 296-46B-230 043	230.43	**Wiring Methods For 600 Volts, Nominal, or Less.** SEC section provides equivalent standard for wiring methods for 600 volts, nominal, or less.

WAC/NEC	2003 SEC	Analysis
NEC 230.44	230.44 *NEW*	**Cable Trays.** SEC provides higher level of public safety by requiring prior approval to use cable tray systems to support cable used as service-entrance conductors.
NEC 230.46	230.46 *NEW*	**Spliced Conductors.** SEC provides higher level of public safety by requiring special permission to splice or tap service-entrance conductors.
NEC 230.52	230.52	**Individual Conductors Entering Buildings or Other Structures.** SEC provides higher level of public safety by not allowing individual open conductors to enter buildings per this section.
NEC 230.54	230.54 *NEW*	**Overhead Service Locations.** SEC amendment aligns code with utility requirements.
NEC 230.70	230.70	**General.** SEC amendments add specificity to the NEC requirements for accessibility and location of service disconnects.
NEC 230.82	230.82 *NEW*	**Equipment Connected to the Supply Side of Service Disconnect.** SEC amendments provide specific requirements for equipment connected to supply side of the service disconnect to enhance public safety and to align the code with utility requirements.
NEC 230.90	230.90 *NEW*	**Where Required.** SEC adds cross-reference to WAC for clarity.
WAC 296-46B-230 095	230.95 *NEW*	**Ground-Fault Protection of Equipment.** SEC provides an equivalent standard by incorporating performance testing requirements of WAC 296-46B-215 010 into SEC Section 230.95(C). NEC 215.10 refers the user to Section 230.95 for GFPE requirements; thus, it was determined that SEC 230.95 is the more appropriate location for the testing requirement.
NEC 230.202	230.202 *NEW*	**Service-Entrance Conductors.** SEC amendment clarifies application of NEC requirements regarding wiring methods for service entrance conductors and aligns this section with WAC and other SEC amendments.
NEC 240.24	240.24 *NEW*	**Location in or on Premises.** SEC amendment provides clarification of NEC requirement and aligns this section of the code with the Seattle Housing Code.
NEC 250.30	250.30 *NEW*	**Grounding Separately Derived Alternating-Current Systems.** SEC amendment provides equivalent standard and clarifies the intent of this NEC section to allow other approved means of making connections at grounding electrode conductor taps.
WAC 296-45B-250 032	250.32 *NEW*	**Two or More Buildings or Structures Supplied from a Common Service.** SEC provides equivalent standard by amending NEC to incorporate WAC reference and striking NEC 250.32(B)(2), which coordinates this section with the WAC.
WAC 296-46B-250 052	250.56 *NEW*	**Resistance of Rod, Pipe, and Plate Electrodes.** SEC provides better standard by requiring temporary construction services to be provided with at least two grounding electrodes, instead of one as required by the WAC.
NEC 250.64	250.64 *NEW*	**Grounding Electrode Conductor Installation.** Amendment adds cross-reference to SEC section 250.30.

WAC/NEC	2003 SEC	Analysis
NEC 250.104	250.104	**Bonding of Piping Systems and Exposed Structural Steel.** SEC amendment incorporates Seattle Public Utility's prohibition on use of water distribution system for electrical grounding purposes.
NEC 300.1	300.1 *NEW*	**Scope.** SEC amendments adds cross-reference to WAC for clarity.
NEC 300.4	300.4 *NEW*	**Protection Against Physical Damage.** SEC amendment provides higher level of safety for NM cable in metal studs by requiring use of two-piece interlocking grommets.
NEC 300.11	300.11 *NEW*	**Securing and Supporting.** SEC amendment aligns requirements for using raceways as a means of support to WAC and adds cross-reference.
NEC 300.17	300.17 *NEW*	**Number and Size of Conductors in Raceway.** SEC amendments adds cross-reference to WAC for clarity.
NEC 300.21	300.21	**Spread of Fire or Products of Combustion.** SEC amendment provides better fire safety standard by requiring removal of all out of service cabling from accessible ceiling spaces.
NEC 314.1	314.1 *NEW*	**Scope.** SEC amendment adds cross-reference to the Seattle Building Code for locating outlet boxed in sound transmission control assemblies.
NEC 314.15	314.15 *NEW*	**Damp, Wet, or Hazardous (Classified) Locations.** SEC amendment adds cross-reference to WAC for clarity.
WAC 296-46B-314 001 (2)	314.29 *NEW*	**Boxes and Conduit Bodies to Be Accessible.** SEC provides equivalent standard. The committee recommends the amendment to NEC 314.29 as a more practical method of accomplishing the intent of WAC 296-46B-314 001(2). The committee decided that allowing some amount of building structure or insulation material to be removed, provided the conduit bodies, junction, pull and outlet boxes can be easily located and accessed, is appropriate and would not compromise the safety and integrity of the electrical installation.
NEC 326.10	326.10 *NEW*	**Uses Permitted.** SEC amendment aligns this section with other SEC amendments pertaining to use of IGS cable as service entrance conductors.
NEC 330.10	330.10 *NEW*	**Uses Permitted.** Amendment aligns this section with other SEC amendments pertaining permitted uses of MC cables.
WAC 296-46B-334 010	334.10 *NEW*	**Uses Permitted.** SEC provides equivalent standard as WAC. The committee recommended adopting and modifying the national standard for wiring Type III, IV, and V buildings, which allows use of NM cable. The SEC provides a better standard than the NEC by restricting use of NM cable to concealed locations providing a thermal barrier of at least a 15-minute finish rating as identified in listing of fire rated assemblies. In Seattle, the effect of this section would be to allow use of NM cable in up to 5 stories of a wood-framed structure above grade rather than 3 stories above grade as provided by the WAC. Reasons considered by the committee in making their recommendation include, but are not limited to, the following: • This provision would be used most frequently in multifamily buildings that the Seattle Building Code typically requires to be

WAC/NEC	2003 SEC	Analysis
		protected throughout by sprinkler systems, fire alarm systems, and stairway pressurization systems, in addition to other robust fire resistive construction requirements for means of egress components. The aggregate of these Seattle Building Code requirements improves the overall fire and life safety conditions of these structures that would not be diminished by allowing use of NM cable through two additional stories of wood frame construction. • There are many UL-listed through-penetration firestop systems for NM cable that have been tested and certified to meet fire-resistive rating requirements for wood-frame assemblies of Type III, IV, and V buildings. • There is not an appreciable difference in risk between 3-story and 5-story wood frame buildings. A 3-story wood frame building is less likely to be protected throughout by sprinkler, fire alarm, and pressurization systems. • In wood-frame structures, MC cable may be subject to more damage due to its inflexibility. NM cable was specifically developed as a substitute for MC cable due to persistent problems of breakage and subsequent cutting or shorting of conductors within MC cable used in wood-frame assemblies. • The requirement that NM cable be concealed behind at least a 15-minute thermal barrier provides an equivalent amount of protection to the conductors as does MC cable. • If MC cable is accidentally punctured by a nail, an arc-fault can be created to the sheath, whereas this hazard is minimized by use of NM cable. • Amendment to Section 300.4 requires two-piece interlocking grommets, which provides NM cable additional protection from physical damage if used in metal frame assemblies. • This issue has been debated on a national level for several years and two international model code bodies, the National Fire Protection Association and the International Code Council have decided in favor of allowing the expanded use of NM cable. In addition, this issue has been debated and settled for the 2005 edition of the NEC with no change from the current edition. The City of Seattle supports the majority recommendation of the Electrical Review Committee that the weight of evidence in support of expanding the use of NM cable through two more stories of wood-frame construction does not represent a diminishment of the fire and life safety requirements pertaining to these structures.
NEC 334.15	334.15	**Exposed Work.** SEC amendment clarifies installation requirements pertaining to NM cable in concealed spaces that provide a higher degree of safety. Where the NEC allows exposed use of NM cable, SEC amendment limits use of exposed NM cable to locations considered concealed, which provides and additional level of protection.

WAC/NEC	2003 SEC	Analysis
NEC 334.40	334.40	**Boxes and Fittings.** SEC amendment provides a higher degree of safety for use of NM cable by requiring boxes where switches and outlets are installed.
NEC 338.10	338.10	**Uses Permitted.** SEC amendment aligns this section with other SEC sections that prohibit use of SE cable as a service-entrance conductor.
NEC 358.10	358.10	**Uses Permitted.** SEC amendment provides higher level of safety for use of electrical metallic tubing (EMT) that is responsive to Seattle's soggy climate, i.e., prohibits direct contact with the earth to slow deterioration.
NEC 382	382	**Nonmetallic Extensions.** SEC amendment prohibits use of nonmetallic extensions, a material that is not typically in use anywhere.
NEC 394.12	394.12 ***NEW***	**Uses Not Permitted.** SEC amendment adds cross-reference to WAC for clarity.
NEC 404.3	404.3	**Enclosure.** SEC amendment provides higher level of public safety by limiting exposure to energized components of certain switches.
NEC 404.10	404.10	**Mounting of Snap Switches.** SEC amendment provides higher level of public safety by prohibiting surface type snap switches with open wiring.
NEC 404.13	404.13	**Knife Switches.** SEC amendment provides higher level of public safety by requiring certain switches to be interlocked with the door covering them. The required interlock prevents the door from being opened when the switches are energized.
WAC 296-46B-450 027 (2)	450.19 ***NEW***	**Location and Construction.** SEC provides better standard by requiring greater separation (10 feet rather than 8 feet) between underground transformer vaults and doorways or fire escapes.
	450.20	**Rating of Dry-Type Transformers.** SEC amendment adds cross-reference to align sizing of dry-type transformers with SEC Article 220 and WAC requirements.
NEC 450.41-450.48	450.41-450.48	**Transformer Vaults.** SEC amendments replace NEC sections relating to transformer vault installations with cross-references to Seattle Building Code transformer vault requirements.
WAC 296-46B-553 004	553.4	**Location of Service Equipment.** SEC not in conflict with WAC. Amendment provides an additional requirement that falls under the Section 106 authority to approve alternates; this section mainly relates to existing houseboat installations.
NEC 555.24	555.24	**Luminaires Required.** SEC amendment enhances public safety by requiring all walkways over water to be illuminated.
NEC 620.5	620.5	**Working Clearances**. SEC amendment aligns the SEC with the building construction and elevator regulations set forth in the Building Code.
NEC 620.21	620.21	**Wiring Methods.** SEC amendment aligns the code with the building construction and elevator regulations set forth in the Building Code.
NEC 620.22	620.22	**Branch Circuits for Car Lighting, Receptacle(s), Ventilation, Heating, and Air Conditioning.** SEC amendment clarifies that required lighting in elevator installations shall not be connected to the load side terminals of GFCI receptacles.

WAC/NEC	2003 SEC	Analysis
NEC 620.44	620.44	**Installation of Traveling Cables.** SEC amendment provides higher standard of protection for traveling cables in elevator installations.
NEC 620.51	620.51 ***NEW***	**Disconnecting Means.** SEC amendment clarifies requirements for automatic power disconnect device controls circuits.
NEC 620.71	620.71	**Guarding Equipment.** SEC amendment aligns code with elevator regulations set forth in the Seattle Building Code.
NEC 680.40	680.40 ***NEW***	**General.** SEC amendment adds cross-reference to WAC for clarity.
WAC 296-46B-700 001	700.1 ***NEW***	**Scope.** SEC not in conflict. SEC provides an additional references to Seattle Building Code and Seattle Fire Code requirements that augment and coordinate the requirements of this section with the other codes.
NEC 700.4	700.4	**Tests and Maintenance.** SEC amendment clarifies building owner and Seattle Fire Department responsibilities for tests and maintenance.
NEC 700.9	700.9 ***NEW***	**Wiring, Emergency System.** SEC amendment adds cross-reference to WAC for clarity.
NEC 700.16	700.16	**Emergency Illumination.** SEC amendment aligns code with Seattle Building Code means of egress requirements for emergency illumination.
NEC 701.10	701.10	**Wiring Legally Required Standby Systems.** SEC amendment aligns code with Seattle Building Code requirements for shaft pressurization.
NEC 760.10	760.10 ***NEW***	**Fire Alarm Circuit Identification.** SEC amendment add cross-reference to WAC for clarity.

City of Seattle

Gregory J. Nickels, Mayor

Office of the Mayor

July 21, 2003

Honorable Peter Steinbrueck
President
Seattle City Council
Municipal Building, 11th Floor

Dear Council President Steinbrueck:

The attached ordinance adopts the 2002 Edition of the Seattle Electrical Code, which is comprised of the 2002 National Electrical Code (NEC), the 2003 Washington State amendments to the NEC as set forth in Chapter 296-46B of the Washington Administrative Code, and the Seattle Amendments to the NEC. The NEC is a model code published by the National Fire Protection Association. Seattle and the State of Washington have been adopting it for many years. A new edition is published every three years; the 2002 NEC was published late last year. Both the State and City of Seattle amend the NEC to provide greater flexibility and to respond to local conditions and practices. For Seattle, there are issues unique to a large city, and issues involving coordination with Seattle City Light.

Very few new substantive amendments are proposed for the 2002 Edition of the Seattle Electrical Code. A complete list of changes is attached to the Ordinance as Exhibit A. The most significant changes from the current code include:

- Adding amendments to several sections to improve coordination of City and State codes.
- Allowing use of nonmetallic (NM) cable, i.e., "romex", to be installed in all stories of wood-frame buildings (maximum of 5 stories), per new 2002 NEC requirement, with additional protections above NEC minimums. Previously, use of NM cable was limited to three-stories of wood frame construction. This change differs from the State electrical regulations, which maintained the three-story limit on the use of NM cable, but is believed to be justified given the additional fire and life safety protections required of 5 story wood frame buildings in Seattle.
- Changing administrative Sections 301 and 302 to clarify what types of work do not require a permit and further clarify what types of work require plans and specifications to be submitted with the permit application.
- Requiring ground-fault circuit interrupter protection on all outlets at or near countertops with sinks, all outdoor outlets on nonresidential buildings, and most replaced outlets.

Thank you for your consideration of this legislation. Should you have questions, please contact Michael Aoki-Kramer, DCLU Code Development Analyst, at 206-684-7932.

Sincerely,

GREG NICKELS
Mayor of Seattle

cc: Honorable Members of the Seattle City Council

ACTING CITY CLERK

Michael Aoki-Kramer/ma
July 3, 2003
2002 Edition, Seattle Electrical Code
Version 4

FISCAL NOTE FOR NON-CAPITAL PROJECTS

Department:	Contact Person/Phone:	DOF Analyst/Phone:
DCLU	Michael Aoki-Kramer/4-7932	Casey Doyle/4-8075

Legislation Title:
AN ORDINANCE relating to building and construction codes: repealing Section 22.300.015 of the Seattle Municipal Code (Ordinance 119507), and adopting a new Section 22.300.016 to adopt the 2002 National Electrical Code with Seattle amendments as the Seattle Electrical Code.

- **Summary of the Legislation:**

Legislation adopts 2002 Edition of the Seattle Electrical Code, which consists of the 2002 National Electrical Code (NEC), the 2003 Washington State Electrical Regulations, as set forth in Chapter 296-46B of the Washington Administrative Code, and the Seattle Amendments to the National Electrical Code. The legislation replaces the 1999 Seattle Electrical Code.

Very few new substantive amendments are proposed for the 2002 Edition of the Seattle Electrical Code. A complete list of changes is attached to the Ordinance as Exhibit A. The most significant changes from the current code include:

- Adding amendments to improve coordination of City and State codes.
- Allowing use of nonmetallic (NM) cable, i.e., "romex", to be installed in all stories of wood-frame buildings, per new 2002 NEC requirement, with additional protections above NEC minimums. Previously, use of NM cable was limited to three-stories of wood frame construction. This change differs from the State electrical regulations, which maintained the three-story limit on the use of NM cable, but was felt justified given the additional fire and life safety protections required of 5 story wood frame buildings in Seattle.
- Changing administrative Sections 301 and 302 to clarify what types of work do not require a permit and further clarify what types of work require plans and specifications to be submitted with the permit application.
- Requiring ground-fault circuit interrupter protection on all outlets at or near countertops with sinks, all outdoor outlets on nonresidential buildings, and most replaced outlets.

- **Background:**

The Seattle Electrical Code is typically updated every three years after the national model electrical code, the National Electrical Code, is updated. This update cycle is common to all of the national model building-related codes. Both the State and Seattle amend the NEC to provide greater flexibility and to respond to local conditions and practices. For Seattle, there are also issues unique to a large city and issues involving coordination with Seattle City Light.

Chapter 19.28 RCW, Electricians and Electrical Installations, charges the State Department of Labor and Industries with adopting regulations governing and licensing electricians and electrical installations throughout the state. RCW 19.20.010 (3) grants local jurisdictions the authority to adopt regulations applicable to electrical installations that differ from regulations adopted by the state, provided the local regulations require "an equal, higher, or better standard of construction and an equal, higher, or better standard of materials, devices, appliances, and equipment than that required by this chapter [19.28. RCW]". DCLU has analyzed the proposed amendments 2002 National Electrical Code and 2003 Washington Administrative Code regulations and determined that the proposed regulations provide equal, higher, or better requirements.

As no changes are proposed to existing electrical permitting or licensing programs, no fiscal impacts are anticipated to stem from adoption of this ordinance.

- *Please check one of the following:*

X **This legislation does not have any financial implications.**

Attachment 1: Director's Report and Recommendation

DIRECTOR'S REPORT AND RECOMMENDATION
2003 Seattle Electrical Code

INTRODUCTION

DCLU is proposing to adopt the 2002 Edition of the Seattle Electrical Code, which is comprised of the 2002 National Electrical Code with Seattle Amendments. The 2002 Edition of the Seattle Electrical Code would update the 1999 Seattle Electrical Code, which is comprised of the 1999 National Electrical Code with Seattle Amendments.

BACKGROUND

The National Electrical Code (NEC) is a model code published by the National Fire Protection Association. Seattle and the State of Washington have been adopting it for many years. A new edition is published every three years; the 2002 NEC was published late last year.

Both the State and Seattle amend the NEC to provide greater flexibility and to respond to local conditions and practices. For Seattle, there are also issues unique to a large city and issues involving coordination with Seattle City Light.

PUBLIC REVIEW

In late 2002 the Construction Codes Advisory Board appointed an eight person committee to review the draft of the Code that was prepared by DCLU staff. Members of the committee included electrical contractors, electrical engineers, and manufacturer representatives; organized labor; the Seattle Fire Department; and the State Department of Labor and Industries. The Review Committee held five two-hour meetings and one four-hour meeting between January 9 and March 13. The availability of the draft code and the activities of the Committee will be announced to the public in the June issue DCLU's INFO newsletter and in the Daily Journal of Commerce. Environmental review is in process.

The Electrical Code Review Committee and DCLU staff reached agreement on all but one issue.

PROPOSED CHANGES

Very few new substantive amendments are proposed for the 2002 Seattle Electrical Code; most amendments carry forward existing amendments or add clarity to existing amendments. A complete list of changes follows, but the most significant changes from the current Seattle Electrical Code include:

- The Seattle Electrical Code adopts Washington State Electrical Regulations except those sections specifically modified by the Seattle Electrical Code amendments. Amendments were added to several NEC sections to improve coordination of City and State requirements.
- Allowing use of nonmetallic (NM) cable, i.e., "romex", to be installed in all stories of wood-frame buildings (maximum of 5), per new 2002 NEC requirement, with additional protections above NEC minimums. Previously, use of NM cable was limited to three-stories

of wood frame construction. This change differs from the State electrical regulations, which maintained the three-story limit on the use of NM cable. This amendment is supported by a majority of the Electrical Code Review Committee; representatives of the committee representing the State Department of Labor and Industries and the International Brotherhood of Electrical Workers voted against this proposal, but CCAB and DCLU staff support the proposal.

- Changes to Section 301 and 302 clarify what types of work do not require a permit and further clarify what types of work require plans and specifications to be submitted with the permit application.
- All outlets at or near countertops with sinks and all outdoor outlets are required to have ground-fault circuit interrupter protection for personnel.

RECOMMENDATION

DCLU recommends approval of the proposed ordinance. DCLU has considered the recommendations or comments from the Electrical Code Review Committee, the firms organizations committee member represent, and the Construction Codes Advisory Board, as well as conducted an environmental review of the proposed amendments. Comment letters and environmental documentation are available upon request.

For questions, please contact Michael Aoki-Kramer at michael.aoki-kramer@seattle.gov or (206) 684-7932.

Summary and Comparison of 2003 Seattle Electrical Code provisions in relation to
the 2003 Washington State Electrical Code,
Chapter 296-46B Washington Administrative Code (WAC)

Prepared by the Department of Design, Construction and Land Use,
Code Development and Electrical Review Section staff

Reviewed and Approved by the Seattle Electrical Code Review Committee,
a duly appointed committee of the City of Seattle's Construction Codes Advisory Board

Chapter 19.28, Revised Code of Washington (RCW) grants local jurisdictions the authority to adopt regulations applicable to electrical installations that differ from regulations adopted by the state, provided that the local regulations meet a minimum standard. The authority to adopt local regulations and the standard by which those regulations are judged is set forth at RCW 19.28.010 (3), which states:

> This chapter (RCW 19.28) shall not limit the authority or power of any city or town to enact and enforce under authority given by law, any ordinance, rule, or regulation requiring an equal, higher, or better standard of construction and an equal, higher, or better standard of materials, devices, appliances, and equipment than that required by this chapter.

The purpose of this document is twofold: The primary purpose is to set forth the City of Seattle's analysis and determination that the differences between the 2003 Seattle Electrical Code (SEC) and the 2003 Washington State Electrical Code, meet the standard of RCW 19.28.010 (3) for local amendments. The secondary purpose of this document is to identify sections containing new amendments and clarifying language not found in the 1999 SEC, noted below as "***NEW***" in the "2003 SEC" column.

WAC / NEC	2003 SEC	Analysis
WAC 296-46B-010 (1)-(13), (15), (16), (19), (20), (23), (24)	102.2 ***NEW***	**Chapter 296-46B Washington Administrative Code.** Certain WAC sections are not adopted for the following reasons: 296-46B-010 (1): Seattle Municipal Code section 22.300.016, as proposed by the Seattle Electrical Code ordinance, adopts the 2002 NEC as the base code. The other standards referenced in this WAC section are not affected by the Seattle Electrical Code as they do not amend the 2002 NEC. 296-46B-010 (2): This is an administrative standard not related to a specific NEC requirement. SEC provides an equivalent standard at Section 202(G). 296-46B-010 (3): This is an administrative standard not related to a specific NEC requirement. The City of Seattle enforces the WACs rules and SEC. 296-46B-010 (4): This is an administrative standard not related to a specific NEC requirement. SEC Section provides an equivalent standard for variances. 296-46B-010 (5)-(10): These are administrative standards not related to specific NEC requirements. SEC Section 305 provides equivalent standards relating to inspections and elsewhere in the code as appropriate.

WAC / NEC	2003 SEC	Analysis
		296-46B-010 (11)-(13): These are administrative standards not related to specific NEC requirements. SEC Section 104(E) provides an equivalent or better standard for moved buildings. 296-46B-010 (15)-(16): These are administrative standards not related to specific NEC requirements. SEC Section 302(B) requires plan review meeting the requirements of the WACs for educational, institutional or health care facilities and other buildings. 296-46B-010 (19)-(20): These are administrative standards not related to specific NEC requirements. Requirements for plan review are set forth in Section 302(B). 296-46B-010 (23): This is an administrative standard not related to specific NEC requirements. The Seattle Fire Code requires that plans be submitted for review and approval of fire alarm systems. 296-46B-010 (24): This is an administrative standard not related to specific NEC requirements. SEC plan review and permitting requirements are set forth at Section 302 and 303.
	104(A) ***NEW***	**Additions, Alterations and Repairs.** Amendment to this section requires installation of receptacles in additions, alterations and repairs to existing buildings per the requirements set forth at Section 406.3(D) regulating replacement of receptacles.
WAC 296-46B-030	106 ***NEW***	**Utilization Equipment and Alternate Materials and Methods of Wiring.** This is an administrative standard not related to specific NEC requirements. The provisions for utilization equipment in WAC 296-46B-030 are superseded by SEC Section 106, which provides an equivalent standard. Section 106 requires applicants to demonstrate that the proposed utilization equipment or alternate means and methods of wiring provide an equivalent level of strength, effectiveness, fire resistance, durability, safety and sanitation as set forth in the SEC for similar installations. This language is similar to sections in the Building and Mechanical codes and gives DCLU clearer authority to approve variations from strict compliance with the code when staff believe all the features of the building make it as safe as if there had been literal compliance with the code.
NEC 90.1, 90.2 and 90.4	102.1, 103, and 106	SEC provides equivalent purpose, scope, and enforcement/interpretation sections specific to administration of the Electrical Code in Seattle.
	204(B) ***NEW***	**Notice of Violation.** Added section that mimics authority granted in other building-related codes. Omission of this section from previous versions of the SEC appears to be an oversight.
	209 ***NEW***	**Review by the Director.** Added section to enhance due process/review of notices of violation an other levied penalties. This section is similar to a section found in the Building Code.
	301(B)(4) ***NEW***	**Exempted Work.** Amendment clarifies that wiring for communication systems in single family residences and other installations of 1000 feet or less do not need to apply for a permit.
	302(B) ***NEW***	**Plans and Specifications.** Amendment clarifies that any proposed installation covering more than 2,500 square feet or that cannot be adequately described on a permit application require plan review. Other amendments coordinate plan review requirements for certain occupancies with State regulations.
NEC Art. 100	Art. 100	**Definitions.** SEC provides equivalent standard. Added language aligns

WAC / NEC	2003 SEC	Analysis
	NEW	meaning of terms not defined in the NEC or SEC with terms defined in the Seattle Building and Mechanical Codes and Webster's Dictionary.
NEC Art. 100, Part I	Art. 100, Part I	Cross reference added to code section that provides requirements for service point connections.
NEC Art. 100, Part I	Art. 100, Part I	Added definition of "service terminal box," a term of art used in Seattle but not defined in the NEC or WAC.
NEC 110.13	110.13 ***NEW***	**Mounting, Cooling and Location of Equipment.** SEC amendment adds clarity to this section by aligning it with the Seattle Building Code and local utility requirements.
NEC 110.22	110.22 ***NEW***	**Identification of Disconnecting Means.** SEC amendment adds clarity to this section by aligning it with the WAC requirements.
	110.24	**Electrified fences.** SEC adds section enhancing public safety by permitting electric fences only by special permission.
NEC 110.26	110.26 ***NEW***	**110.26 Spaces about Electrical Equipment.** SEC provides better standard by requiring illumination of residential panelboards installed outdoors and prohibits panelboards in crawlspaces or similar potentially difficult or dangerous locations.
NEC 210.8	210.8 ***NEW***	Ground-Fault Circuit-Interrupter Protection for Personnel. SEC provides better standard by requiring installation of GFCI outlets serving countertops near all sinks. SEC amendment mirrors requirements for residential construction and requires GFCI protection of all outlets located outside or in crawlspaces at or below grade where risk of electrical shock due to wet conditions may be prevalent. GFCI protection of outlets is widely accepted as the most cost effective, safe and prudent method of protecting personnel from shock hazards in potentially wet locations.
NEC 210.52	210.52 ***NEW***	**Dwelling Unit Receptacle Outlets.** Amendment aligns SEC with WAC that allows receptacles in appliance garages to be counted as required countertop receptacles.
WAC 296-46B-215 010	230.95(C)	SEC provides an equivalent standard by incorporating the performance testing requirements of WAC 296-46B-215 010 into SEC Section 230.95(C). NEC 215.10 refers the user to Section 230.95 for GFPE requirements; thus, it was determined that SEC 230.95 is the more appropriate location for the testing requirement.
	215.12	**Panelboards.** Added section provides better standard than NEC by limiting the number of power sources supplying one multifamily dwelling unit for occupant protection.
NEC 220.3	220.3	**Computation of Branch Circuit Loads.** SEC provides equivalent standard. Aligns SEC with Seattle Energy Code limits on lighting power density for calculating lighting loads.
NEC 220.15	220.15	**Fixed Electric Space Heating.** SEC amendment exercises NEC grant of authority to local jurisdictions to set standards for calculating diversity; SEC amendment establishes demand factor to calculate diversity.
NEC 220.17	220.17	**Appliance Load - Dwelling Unit(s).** SEC amendment adds cross reference to Section 220.15.
NEC 225.32	225.32 ***NEW***	**Location.** SEC amendment adds cross reference to WAC for clarity.
WAC 296-46B-230 001	230.1	**Scope.** SEC provides equivalent standard for general service requirements that are specific to the electric utility serving the City of Seattle.
	230.5	**Types of Services.** SEC adds section to NEC requiring grounded services,

WAC / NEC	2003 SEC	Analysis
	NEW	which enhances public safety; language from previous SEC clarified.
	230.12	**Service Point Connection.** SEC adds section to NEC to align the code with utility service point connection requirements.
WAC 296-46B-230 028	230.28 ***NEW***	**Service Masts as Supports.** Amendment provides better standard for service mast supports by requiring that services masts shall be rigid steel galvanized conduit no smaller than 2 inches; NEC minimum is 1 inch.
NEC 230.29	230.29	**Supports Over Buildings and Wires on or about Buildings or Structures Over Water.** SEC amendment aligns NEC with local utility requirements and provides a higher level of public safety for support of wires over water, structures, streets and alleys.
NEC 230.33	230.33 ***NEW***	**Spliced Conductors.** Fine print note added for clarification and alignment with utility.
NEC 230.34 (230.34 continued)	230.34 ***NEW***	**Conversion to Underground Service or Increasing Existing Overhead Services.** SEC adds section to NEC regarding retrofitting of existing services. Added SEC section provides more specific requirements for scenarios common in Seattle, e.g. meter embedded in exterior wall.
WAC 296-46B-230 043	230.43	**Wiring Methods For 600 Volts, Nominal, or Less.** SEC section provides equivalent standard for wiring methods for 600 volts, nominal, or less.
NEC 230.44	230.44 ***NEW***	**Cable Trays.** SEC provides higher level of public safety by requiring prior approval to use cable tray systems to support cable used as service-entrance conductors.
NEC 230.46	230.46 ***NEW***	**Spliced Conductors.** SEC provides higher level of public safety by requiring special permission to splice or tap service-entrance conductors.
NEC 230.52	230.52	**Individual Conductors Entering Buildings or Other Structures.** SEC provides higher level of public safety by not allowing individual open conductors to enter buildings per this section.
NEC 230.54	230.54 ***NEW***	**Overhead Service Locations.** SEC amendment aligns code with utility requirements.
NEC 230.70	230.70	**General.** SEC amendments add specificity to the NEC requirements for accessibility and location of service disconnects.
NEC 230.82	230.82 ***NEW***	**Equipment Connected to the Supply Side of Service Disconnect.** SEC amendments provide specific requirements for equipment connected to supply side of the service disconnect to enhance public safety and to align the code with utility requirements.
NEC 230.90	230.90 ***NEW***	**Where Required.** SEC adds cross-reference to WAC for clarity.
WAC 296-46B-230 095	230.95 ***NEW***	**Ground-Fault Protection of Equipment.** SEC provides an equivalent standard by incorporating performance testing requirements of WAC 296-46B-215 010 into SEC Section 230.95(C). NEC 215.10 refers the user to Section 230.95 for GFPE requirements; thus, it was determined that SEC 230.95 is the more appropriate location for the testing requirement.
NEC 230.202	230.202 ***NEW***	**Service-Entrance Conductors.** SEC amendment clarifies application of NEC requirements regarding wiring methods for service entrance conductors and aligns this section with WAC and other SEC amendments.
NEC 240.24	240.24 ***NEW***	**Location in or on Premises.** SEC amendment provides clarification of NEC requirement and aligns this section of the code with the Seattle Housing Code.
NEC 250.30	250.30	**Grounding Separately Derived Alternating-Current Systems.** SEC

WAC / NEC	2003 SEC	Analysis
	NEW	amendment provides equivalent standard and clarifies the intent of this NEC section to allow other approved means of making connections at grounding electrode conductor taps.
WAC 296-45B-250 032	250.32 ***NEW***	**Two or More Buildings or Structures Supplied from a Common Service.** SEC provides equivalent standard by amending NEC to incorporate WAC reference and striking NEC 250.32(B)(2), which coordinates this section with the WAC.
WAC 296-46B-250 052	250.56 ***NEW***	**Resistance of Rod, Pipe, and Plate Electrodes.** SEC provides better standard by requiring temporary construction services to be provided with at least two grounding electrodes, instead of one as required by the WAC.
NEC 250.64	250.64 ***NEW***	**Grounding Electrode Conductor Installation.** Amendment adds cross-reference to SEC section 250.30.
NEC 250.104	250.104	**Bonding of Piping Systems and Exposed Structural Steel.** SEC amendment incorporates Seattle Public Utility's prohibition on use of water distribution system for electrical grounding purposes.
NEC 300.1	300.1 ***NEW***	**Scope.** SEC amendments adds cross-reference to WAC for clarity.
NEC 300.4	300.4 ***NEW***	**Protection Against Physical Damage.** SEC amendment provides higher level of safety for NM cable in metal studs by requiring use of two-piece interlocking grommets.
NEC 300.11	300.11 ***NEW***	**Securing and Supporting.** SEC amendment aligns requirements for using raceways as a means of support to WAC and adds cross-reference.
NEC 300.17	300.17 ***NEW***	**Number and Size of Conductors in Raceway.** SEC amendments adds cross-reference to WAC for clarity.
NEC 300.21	300.21	**Spread of Fire or Products of Combustion.** SEC amendment provides better fire safety standard by requiring removal of all out of service cabling from accessible ceiling spaces.
NEC 314.1	314.1 ***NEW***	**Scope.** SEC amendment adds cross-reference to the Seattle Building Code for locating outlet boxed in sound transmission control assemblies.
NEC 314.15	314.15 ***NEW***	**Damp, Wet, or Hazardous (Classified) Locations.** SEC amendment adds cross-reference to WAC for clarity.
WAC 296-46B-314 001 (2)	314.29 ***NEW***	**Boxes and Conduit Bodies to Be Accessible.** SEC provides equivalent standard. The committee recommends the amendment to NEC 314.29 as a more practical method of accomplishing the intent of WAC 296-46B-314 001(2). The committee decided that allowing some amount of building structure or insulation material to be removed, provided the conduit bodies, junction, pull and outlet boxes can be easily located and accessed, is appropriate and would not compromise the safety and integrity of the electrical installation.
NEC 326.10	326.10 ***NEW***	**Uses Permitted.** SEC amendment aligns this section with other SEC amendments pertaining to use of IGS cable as service entrance conductors.
NEC 330.10	330.10 ***NEW***	**Uses Permitted.** Amendment aligns this section with other SEC amendments pertaining permitted uses of MC cables.
WAC 296-46B-334 010	334.10 ***NEW***	**Uses Permitted.** SEC provides equivalent standard as WAC. The committee recommended adopting and modifying the national standard for wiring Type III, IV, and V buildings, which allows use of NM cable. The SEC provides a better standard than the NEC by restricting use of NM cable to concealed locations providing a thermal barrier of at least a 15-

WAC / NEC	2003 SEC	Analysis
		minute finish rating as identified in listing of fire rated assemblies. In Seattle, the effect of this section would be to allow use of NM cable in up to 5 stories of a wood-framed structure above grade rather than 3 stories above grade as provided by the WAC. Reasons considered by the committee in making their recommendation include, but are not limited to, the following: • This provision would be used most frequently in multifamily buildings that the Seattle Building Code typically requires to be protected throughout by sprinkler systems, fire alarm systems, and stairway pressurization systems, in addition to other robust fire resistive construction requirements for means of egress components. The aggregate of these Seattle Building Code requirements improves the overall fire and life safety conditions of these structures that would not be diminished by allowing use of NM cable through two additional stories of wood frame construction. • There are many UL-listed through-penetration firestop systems for NM cable that have been tested and certified to meet fire-resistive rating requirements for wood-frame assemblies of Type III, IV, and V buildings. • There is not an appreciable difference in risk between 3-story and 5-story wood frame buildings. A 3-story wood frame building is less likely to be protected throughout by sprinkler, fire alarm, and pressurization systems. • In wood-frame structures, MC cable may be subject to more damage due to its inflexibility. NM cable was specifically developed as a substitute for MC cable due to persistent problems of breakage and subsequent cutting or shorting of conductors within MC cable used in wood-frame assemblies. • The requirement that NM cable be concealed behind at least a 15-minute thermal barrier provides an equivalent amount of protection to the conductors as does MC cable. • If MC cable is accidentally punctured by a nail, an arc-fault can be created to the sheath, whereas this hazard is minimized by use of NM cable. • Amendment to Section 300.4 requires two-piece interlocking grommets, which provides NM cable additional protection from physical damage if used in metal frame assemblies. • This issue has been debated on a national level for several years and two international model code bodies, the National Fire Protection Association and the International Code Council have decided in favor of allowing the expanded use of NM cable. In addition, this issue has already been debated and settled for the 2005 edition of the NEC with no change from the current 2002 edition. The City of Seattle supports the majority recommendation of the Electrical Review Committee that the weight of evidence in support of expanding the use of NM cable through two more stories of wood-frame construction does not represent a diminishment of the fire and life safety requirements

WAC / NEC	2003 SEC	Analysis
		pertaining to these structures.
NEC 334.15	334.15	**Exposed Work.** SEC amendment clarifies installation requirements pertaining to NM cable in concealed spaces that provide a higher degree of safety. Where the NEC allows exposed use of NM cable, SEC amendment limits use of exposed NM cable to locations considered concealed, which provides and additional level of protection.
NEC 334.40	334.40	**Boxes and Fittings.** SEC amendment provides a higher degree of safety for use of NM cable by requiring boxes where switches and outlets are installed.
NEC 338.10	338.10	**Uses Permitted.** SEC amendment aligns this section with other SEC sections that prohibit use of SE cable as a service-entrance conductor.
NEC 358.10	358.10	**Uses Permitted.** SEC amendment provides higher level of safety for use of electrical metallic tubing (EMT) that is responsive to Seattle's soggy climate, i.e., prohibits direct contact with the earth to slow deterioration.
NEC 382	382	**Nonmetallic Extensions.** SEC amendment prohibits use of nonmetallic extensions, a material that is not typically in use anywhere.
NEC 394.12	394.12 ***NEW***	**Uses Not Permitted.** SEC amendment adds cross-reference to WAC for clarity.
NEC 404.3	404.3	**Enclosure.** SEC amendment provides higher level of public safety by limiting exposure to energized components of certain switches.
NEC 404.10	404.10	**Mounting of Snap Switches.** SEC amendment provides higher level of public safety by prohibiting surface type snap switches with open wiring.
NEC 404.13	404.13	**Knife Switches.** SEC amendment provides higher level of public safety by requiring certain switches to be interlocked with the door covering them. The required interlock prevents the door from being opened when the switches are energized.
WAC 296-46B-450 027 (2)	450.19 ***NEW***	**Location and Construction.** SEC provides better standard by requiring greater separation (10 feet rather than 8 feet) between underground transformer vaults and doorways or fire escapes.
	450.20	**Rating of Dry-Type Transformers.** SEC amendment adds cross-reference to align sizing of dry-type transformers with SEC Article 220 and WAC requirements.
NEC 450.41-450.48	450.41-450.48	**Transformer Vaults.** SEC amendments replace NEC sections relating to transformer vault installations with cross-references to Seattle Building Code transformer vault requirements.
WAC 296-46B-553 004	553.4	**Location of Service Equipment.** SEC not in conflict with WAC. Amendment provides an additional requirement that falls under the Section 106 authority to approve alternates; this section mainly relates to existing houseboat installations.
NEC 555.24	555.24	**Luminaires Required.** SEC amendment enhances public safety by requiring all walkways over water to be illuminated.
NEC 620.5	620.5	**Working Clearances**. SEC amendment aligns the SEC with the building construction and elevator regulations set forth in the Building Code.
NEC 620.21	620.21	**Wiring Methods.** SEC amendment aligns the code with the building construction and elevator regulations set forth in the Building Code.
NEC 620.22	620.22	**Branch Circuits for Car Lighting, Receptacle(s), Ventilation, Heating, and Air Conditioning.** SEC amendment clarifies that required lighting in elevator installations shall not be connected to the load side terminals of

WAC / NEC	2003 SEC	Analysis
		GFCI receptacles.
NEC 620.44	620.44	**Installation of Traveling Cables.** SEC amendment provides higher standard of protection for traveling cables in elevator installations.
NEC 620.51	620.51 *NEW*	**Disconnecting Means.** SEC amendment clarifies requirements for automatic power disconnect device controls circuits.
NEC 620.71	620.71	**Guarding Equipment.** SEC amendment aligns code with elevator regulations set forth in the Seattle Building Code.
NEC 680.40	680.40 *NEW*	**General.** SEC amendment adds cross-reference to WAC for clarity.
WAC 296-46B-700 001	700.1 *NEW*	**Scope.** SEC not in conflict. SEC provides an additional references to Seattle Building Code and Seattle Fire Code requirements that augment and coordinate the requirements of this section with the other codes.
NEC 700.4	700.4	**Tests and Maintenance.** SEC amendment clarifies building owner and Seattle Fire Department responsibilities for tests and maintenance.
NEC 700.9	700.9 *NEW*	**Wiring, Emergency System.** SEC amendment adds cross-reference to WAC for clarity.
NEC 700.16	700.16	**Emergency Illumination.** SEC amendment aligns code with Seattle Building Code means of egress requirements for emergency illumination.
NEC 701.10	701.10	**Wiring Legally Required Standby Systems.** SEC amendment aligns code with Seattle Building Code requirements for shaft pressurization.
NEC 760.10	760.10 *NEW*	**Fire Alarm Circuit Identification.** SEC amendment add cross-reference to WAC for clarity.

g. Voltage characteristics of all electrical systems and equipment.

h. A key to all symbols used.

i. A fixture schedule showing all pertinent fixture information.

j. 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.

Section 303 PERMITS

(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 Fee Subtitle 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(s) 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 that 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, 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. The licensed installer responsible for the work shall be identified on the electrical permit.

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 that they own as described in RCW 19.28.261.

(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 canceled 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 canceled 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 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 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 that 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) **Re-establishment.** 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 Section 303(d)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 Department of Transportation. All temporary installations shall comply with all other requirements of this code.

Section 304 Permit Fees. 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 Fee Subtitle.

Section 305 INSPECTIONS

(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 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 Section 305(E) below.

(E) Required Inspections.

(1) **Cover Inspection**. The building official is authorized to conduct cover inspections 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. Electrical Equipment grounding (boxes, equipment, conductors and provisions for grounding receptacles, etc.) for all systems shall be completely made-up.

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

(2) **Final Inspection.** The building official is authorized to conduct a final inspection 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 is authorized to conduct or require any other inspections of any construction work to ascertain compliance with the provisions of this code and other laws 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 Fee Subtitle.

(G) Reinspections. The building official is authorized to conduct a reinspection when work is not complete, corrections not made, 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 that 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 Fee Subtitle 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 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. Article 80 of the National Electrical Code, 2002 edition, is repealed.

Section 4. Sections 90.1 and 90.2 of the National Electrical Code, 2002 edition, are repealed.

Section 5. Article 100 of the National Electrical Code, 2002 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 or commonly defined technical terms from related codes and standards. In general, only those terms that are 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 I of this article contains definitions intended to apply wherever the terms are used throughout this code. Part II contains definitions applicable only to the parts of articles specifically covering installations and equipment operating at over 600 volts, nominal.

Terms and phrases used in this code but not defined in this code shall be as defined in the Seattle Building Code and the Seattle Mechanical Code. Where undefined terms are used, the definitions of the most recent edition of *Webster's Third New International Dictionary, Unabridged*, shall apply.

Section 6. The definition of "service point" as set forth in Article 100, Part I of the National Electrical Code, 2002 edition, is amended as follows:

Service Point. The point of connection between the facilities of the serving utility and the premises wiring. For requirements for service point connections, see Section 230.12.

Section 7. Article 100, Part I of the National Electrical Code, 2002 edition, is amended by adding, in alphabetical order, a definition of "service terminal box" to the list of defined terms:

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 8. Section 110.13 of the National Electrical Code, 2002 edition, is amended as follows:

110.13. Mounting, ((~~and~~)) Cooling and Location of Equipment.

(A) Mounting. Electrical 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.

(B) Cooling. Electrical equipment that depends on the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room airflow 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.

(C) Location. No electrical equipment shall project beyond the face of the wall in halls, corridors or other locations that 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.

Exception: Within a required stairway enclosure, electrical raceways may be installed to exclusively serve fire and life safety devices within the stairway enclosure.

FPN: See Seattle Building Code Sections 1005.3.3.1 and 1005.3.3.5.

Equipment containing overcurrent protection shall be placed so that the lowest possible overcurrent device is no less than one foot above the floor or working platform.

Section 9. Section 110.22 of the National Electrical Code, 2002 edition, is amended as follows:

110.22 Identification of Disconnecting Means. Each disconnecting means shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. The marking shall be of sufficient durability to withstand the environment involved.

Where circuit breakers or fuses are applied in compliance with the series combination ratings marked on the equipment by the manufacturer, the equipment enclosure(s) shall be legibly marked in the field to indicate the equipment has been applied with a series combination rating. The marking shall be readily visible and state the following:

CAUTION — SERIES COMBINATION SYSTEM RATED ____ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.

FPN No. 1: See Section 240.86(A) for interrupting rating marking for end-use equipment.

FPN No. 2: See WAC 296-46B-110 022, Identification of disconnecting means, for clarification of identification requirements.

Section 10. The National Electrical Code, 2002 edition, is amended by adding Section 110.24 as follows:

110.24. Electrified Fences. Electrified fences, associated equipment and similar devices shall be permitted only by special permission from the building official.

Section 11. Section 110.26 of the National Electrical Code, 2002 edition, is amended as follows:

110.26 Spaces about Electrical Equipment. 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. Enclosures housing electrical apparatus that are controlled by lock and key shall be considered accessible to qualified persons.

(A) Working Space. Working space for equipment operating at 600 volts, nominal, or less to ground and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions of 110.26(A)(1), (2), and (3) or as required or permitted elsewhere in this code.

(1) Depth of Working Space. The depth of the working space in the direction of live parts shall not be less than that specified in Table 110.26(A)(1) unless the requirements of 110.26(A)(1)(a), (b), or (c) are met. Distances shall be measured from the exposed live parts or from the enclosure or opening if the live parts are enclosed.

Table 110.26(A)(1) Working Spaces

	Minimum Clear Distance		
Nominal Voltage to Ground	**Condition 1**	**Condition 2**	**Condition 3**
0-150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151-600	900 mm (3 ft)	1 m (3½ ft)	1.2 m (4 ft)

Note: Where the conditions are as follows:

Condition 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 to ground shall not be considered live parts.

Condition 2 — Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls shall be considered as grounded.

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

(a) Dead-Front Assemblies. Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from locations other than the back or sides. Where rear access is required to work on nonelectrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

(b) Low Voltage. By special permission, smaller working spaces shall be permitted where all uninsulated parts operate at not greater than 30 volts rms, 42 volts peak, or 60 volts dc.

(c) Existing Buildings. In existing buildings where electrical equipment is being replaced, Condition 2 working clearance shall be permitted between dead-front switchboards, panelboards, or motor control centers located across the aisle from each other where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit equipment on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.

(2) Width of Working Space. The width of the working space in front of the electric equipment shall be the width of the equipment or 750 mm (30 in.), whichever is greater. In all cases, the work space shall permit at least a 90 degree opening of equipment doors or hinged panels.

(3) Height of Working Space. The work space shall be clear and extend from the grade, floor, or platform to the height required by 110.26(E). Within the height requirements of this section, other equipment that is associated with the electrical installation and is located above or below the electrical equipment shall be permitted to extend not more than 150 mm (6 in.) beyond the front of the electrical equipment.

(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) Entrance to Working Space.

(1) Minimum Required. At least one entrance of sufficient area shall be provided to give access to working space about electrical equipment.

(2) Large Equipment. For equipment rated 1200 amperes or more and over 1.8 m (6 ft) wide that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to the required working space not less than 610 mm (24 in.) wide and 2.0 m (6½ ft) high at each end of the working space. Where the entrance has a personnel door(s), the door(s) shall open in the direction of egress and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.

A single entrance to the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (b) is met.

(a) Unobstructed Exit. Where the location permits a continuous and unobstructed way of exit travel, a single entrance to the working space shall be permitted.

(b) Extra Working Space. Where the depth of the working space is twice that required by 110.26(A)(1), a single entrance shall be permitted. It shall be located so that the distance from the equipment to the nearest edge of the entrance is not less than the minimum clear distance specified in Table 110.26(A)(1) for equipment operating at that voltage and in that condition.

(D) Illumination. Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, or motor control centers installed indoors. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source or as permitted by 210.70(A)(1), Exception No. 1, for switched receptacles. In electrical equipment rooms, the illumination shall not be controlled by automatic means only. In residential installations, illumination shall be provided for all working spaces where lighting and appliance panelboards are installed outdoors.

(E) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 2.0 m (6½ ft) in height. Where the electrical equipment exceeds 2.0 m (6½ ft) in height, the minimum headroom shall be not less than the height of the equipment.

~~*Exception: In existing dwelling units, service equipment or panelboards that do not exceed 200 amperes shall be permitted in spaces where the headroom is less than 2.0 m (6½ ft).*~~

(F) Dedicated Equipment Space. All switchboards, panelboards, distribution boards, and motor control centers shall be located in dedicated spaces and protected from damage.

Exception: Control equipment that by its very nature or because of other rules of the Code must be adjacent to or within sight of its operating machinery shall be permitted in those locations.

(1) Indoor. Indoor installations shall comply with 110.26(F)(1)(a) through (d).

(a) Dedicated Electrical Space. The space equal to the width and depth of the equipment and extending from the floor to a height of 1.8 m (6 ft) above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No piping, ducts, leak protection apparatus, or other equipment foreign to the electrical installation shall be located in this zone.

Exception: Suspended ceilings with removable panels shall be permitted within the 1.8-m (6-ft) zone.

(b) Foreign Systems. The area above the dedicated space required by 110.26(F)(1)(a) shall be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks, or breaks in such foreign systems.

(c) Sprinkler Protection. Sprinkler protection shall be permitted for the dedicated space where the piping complies with this section.

(d) Suspended Ceilings. A dropped, suspended, or similar ceiling that does not add strength to the building structure shall not be considered a structural ceiling.

(2) Outdoor. Outdoor electrical equipment shall be installed in suitable enclosures and shall be protected from accidental contact by unauthorized personnel, or by vehicular traffic, or by accidental spillage or leakage from piping systems. The working clearance space shall include the zone described in 110.26(A). No architectural appurtenance or other equipment shall be located in this zone.

Section 12. Section 210.8 of the National Electrical Code, 2002 edition, is amended as follows:

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

FPN: See 215.9 for ground-fault circuit-interrupter protection for personnel on feeders.

(A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (8) shall have ground-fault circuit-interrupter protection for personnel.

(1) Bathrooms

(2) Garages, and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use.

Exception No. 1: Receptacles that are not readily accessible.

Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.7(A)(6), (A)(7), or (A)(8).

Receptacles installed under the exceptions to 210.8(A)(2) shall not be considered as meeting the requirements of 210.52(G).

(3) Outdoors

Exception: Receptacles that are not readily accessible and are supplied by a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.

(4) Crawl spaces — at or below grade level

(5) Unfinished basements — for purposes of this section, unfinished basements are defined as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like

Exception No. 1: Receptacles that are not readily accessible.

Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.7(A)(6), (A)(7), or (A)(8).

Exception No. 3: A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have ground-fault circuit-interrupter protection.

Receptacles installed under the exceptions to 210.8(A)(5) shall not be considered as meeting the requirements of 210.52(G).

(6) Kitchens — where the receptacles are installed to serve the countertop surfaces

(7) ((~~Wet bar~~)) All other sinks — where the receptacles are installed to serve the countertop surfaces and are located within 1.8 m (6 ft) of the outside edge of the ((~~wet bar~~)) sink.

(8) Boathouses

(B) Other Than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1), (2), ((~~and~~)) (3), and (4) shall have ground-fault circuit-interrupter protection for personnel:

(1) Bathrooms

(2) ((~~Rooftops~~)) Outdoors

Exception: Receptacles that are not readily accessible and are supplied from a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.

(3) Kitchens

FPN: See WAC 296-46B-210 008B, Other Than Dwelling Units – GFCI Requirements.

(4) Crawlspaces at or below grade level.

Section 13. Section 210.52 of the National Electrical Code, 2002 edition, is amended as follows:

210.52 Dwelling Unit Receptacle Outlets. This section provides requirements for 125-volt, 15- and 20-ampere receptacle outlets. Receptacle outlets required by this section shall be in addition to any receptacle that is part of a luminaire (lighting fixture) or appliance, located within cabinets or cupboards, or located more than 1.7 m (5½ ft) above the floor.

Permanently installed electric baseboard heaters equipped with factory-installed receptacle outlets or outlets provided as a separate assembly by the manufacturer shall be permitted as the required outlet or outlets for the wall space utilized by such permanently installed heaters. Such receptacle outlets shall not be connected to the heater circuits.

FPN: Listed baseboard heaters include instructions that may not permit their installation below receptacle outlets.

(A) General Provisions. In every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, or similar room or area of dwelling units, receptacle outlets shall be installed in accordance with the general provisions specified in 210.52(A)(1) through (A)(3).

(1) Spacing. Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 1.8 m (6 ft) from a receptacle outlet.

(2) Wall Space. As used in this section, a wall space shall include the following:

(1) Any space 600 mm (2 ft) or more in width (including space measured around corners) and unbroken along the floor line by doorways, fireplaces, and similar openings

(2) The space occupied by fixed panels in exterior walls, excluding sliding panels

(3) The space afforded by fixed room dividers such as freestanding bar-type counters or railings

(3) Floor Receptacles. Receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets unless located within 450 mm (18 in.) of the wall.

(B) Small Appliances.

(1) Receptacle Outlets Served. In the kitchen, pantry, breakfast room, dining room, or similar area of a dwelling unit, the two or more 20-ampere small-appliance branch circuits required by 210.11(C)(1) shall serve all receptacle outlets covered by 210.52(A) and (C) and receptacle outlets for refrigeration equipment.

Exception No. 1: In addition to the required receptacles specified by 210.52, switched receptacles supplied from a general-purpose branch circuit as defined in 210.70(A)(1), Exception No. 1, shall be permitted.

Exception No. 2: The receptacle outlet for refrigeration equipment shall be permitted to be supplied from an individual branch circuit rated 15 amperes or greater.

(2) No Other Outlets. The two or more small-appliance branch circuits specified in 210.52(B)(1) shall have no other outlets.

Exception No. 1: A receptacle installed solely for the electrical supply to and support of an electric clock in any of the rooms specified in 210.52(B)(1).

Exception No. 2: Receptacles installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter-mounted cooking units.

(3) Kitchen Receptacle Requirements. Receptacles installed in a kitchen to serve countertop surfaces shall be supplied by not fewer than two small-appliance branch circuits, either or both of which shall also be permitted to supply receptacle outlets in the same kitchen and in other rooms specified in 210.52(B)(1). Additional small-appliance branch circuits shall be permitted to supply receptacle outlets in the kitchen and other rooms specified in 210.52(B)(1). No small-appliance branch circuit shall serve more than one kitchen.

(C) Countertops. In kitchens and dining rooms of dwelling units, receptacle outlets for counter spaces shall be installed in accordance with 210.52(C)(1) through (5).

(1) Wall Counter Spaces. A receptacle outlet shall be installed at each wall counter space that is 300 mm (12 in.) or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space.

(2) Island Counter Spaces. At least one receptacle outlet shall be installed at each island counter space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater.

(3) Peninsular Counter Spaces. At least one receptacle outlet shall be installed at each peninsular counter space with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater. A peninsular countertop is measured from the connecting edge.

(4) Separate Spaces. Countertop spaces separated by range tops, refrigerators, or sinks shall be considered as separate countertop spaces in applying the requirements of 210.52(C)(1), (2), and (3).

(5) Receptacle Outlet Location. Receptacle outlets shall be located above, but not more than 500 mm (20 in.) above, the countertop. Receptacle outlets rendered not readily accessible by appliances fastened in place((~~, appliance garages, or appliances occupying dedicated space~~)) shall not be considered as these required outlets.

Exception: To comply with the conditions specified in (a) or (b), receptacle outlets shall be permitted to be mounted not more than 300 mm (12 in.) below the countertop. Receptacles mounted below a countertop in accordance with this exception shall not be located where the countertop extends more than 150 mm (6 in.) beyond its support base.

(a) Construction for the physically impaired.

(b) On island and peninsular countertops where the countertop is flat across its entire surface (no backsplashes, dividers, etc.) and there are no means to mount a receptacle within 500 mm (20 in.) above the countertop, such as an overhead cabinet.

(D) Bathrooms. In dwelling units, at least one wall receptacle outlet shall be installed in bathrooms within 900 mm (3 ft) of the outside edge of each basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop.

(E) Outdoor Outlets. For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet accessible at grade level and not more than 2.0 m (6½ ft) above grade shall be installed at the front and back of the dwelling. See 210.8(A)(3).

(F) Laundry Areas. In dwelling units, at least one receptacle outlet shall be installed for the laundry.

Exception No. 1: In a dwelling unit that is an apartment or living area in a multifamily building where laundry facilities are provided on the premises and are available to all building occupants, a laundry receptacle shall not be required.

Exception No. 2: In other than one-family dwellings where laundry facilities are not to be installed or permitted, a laundry receptacle shall not be required.

(G) Basements and Garages. For a one-family dwelling, at least one receptacle outlet, in addition to any provided for laundry equipment, shall be installed in each basement and in each attached garage, and in each detached garage with electric power. See 210.8(A)(2) and (A)(5). Where a portion of the basement is finished into one or more habitable rooms, each separate unfinished portion shall have a receptacle outlet installed in accordance with this section.

(H) Hallways. In dwelling units, hallways of 3.0 m (10 ft) or more in length shall have at least one receptacle outlet.

As used in this subsection, the hall length shall be considered the length along the centerline of the hall without passing through a doorway.

Section 14. The National Electrical Code, 2002 edition, is amended by adding Section 215.12 as follows:

215.12. Panelboards. Panelboards, existing or installed in an individual unit of multifamily dwellings, shall be supplied by one feeder.

Section 15. Section 220.3 of the National Electrical Code, 2002 edition, is amended as follows:

220.3 Computation of Branch Circuit Loads. Branch-circuit loads shall be computed as shown in 220.3(A) through (C).

(A) Lighting Load for Specified Occupancies. A unit load of not less than that specified in Table 220.3(A) for occupancies specified therein shall constitute the minimum lighting load. The floor area for each floor shall be computed from the outside dimensions of the building, dwelling unit, or other area involved. For dwelling units, the computed floor area shall not include open porches, garages, or unused or unfinished spaces not adaptable for future use.

FPN: The unit values herein are based on minimum load conditions and 100 percent power factor, and may not provide sufficient capacity for the installation contemplated.

Exception: Occupancy Lighting Loads. In determining feeder and service entrance conductor sizes and equipment ratings, the currently adopted Washington State Energy Code with Seattle Amendments (the Seattle Energy Code) Table 15-1, Unit Lighting Power Allowance, may be used in lieu of NEC Table 220.3(A).

Table 220.3(A) General Lighting Loads by Occupancy

	Unit Load	
Type of Occupancy	**Volt-Amperes per Square Meter**	**Volt-Amperes per Square Foot**
Armories and auditoriums	11	1
Banks	39 [b]	3½ [b]
Barber shops and beauty parlors	33	3
Churches	11	1
Clubs	22	2
Court rooms	22	2
Dwelling units [a]	33	3
Garages — commercial (storage)	6	½
Hospitals	22	2
Hotels and motels, including apartment houses without provision for cooking by tenants [a]	22	2
Industrial commercial (loft) buildings	22	2
Lodge rooms	17	1 ½
Office buildings	39	3½ [b]
Restaurants	22	2
Schools	33	3
Stores	33	3
Warehouses (storage)	3	¼
In any of the preceding occupancies except one-family dwellings and individual dwelling		

units of two-family and multifamily dwellings:		
Assembly halls and auditoriums	11	1
Halls, corridors, closets, stairways	6	½
Storage spaces	3	¼

[a] See 220.3(B)(10).
[b] In addition, a unit load of 11 volt-amperes/m^2 or 1 volt-ampere/ft^2 shall be included for general-purpose receptacle outlets where the actual number of general-purpose receptacle outlets is unknown.

(B) Other Loads — All Occupancies. In all occupancies, the minimum load for each outlet for general-use receptacles and outlets not used for general illumination shall not be less than that computed in 220.3(B)(1) through (11), the loads shown being based on nominal branch-circuit voltages.

Exception: The loads of outlets serving switchboards and switching frames in telephone exchanges shall be waived from the computations.

(1) Specific Appliances or Loads. An outlet for a specific appliance or other load not covered in (2) through (11) shall be computed based on the ampere rating of the appliance or load served.

(2) Electric Dryers and Household Electric Cooking Appliances. Load computations shall be permitted as specified in 220.18 for electric dryers and in 220.19 for electric ranges and other cooking appliances.

(3) Motor Loads. Outlets for motor loads shall be computed in accordance with the requirements in 430.22, 430.24, and 440.6.

(4) Recessed Luminaires (Lighting Fixtures). An outlet supplying recessed luminaire(s) [lighting fixture(s)] shall be computed based on the maximum volt-ampere rating of the equipment and lamps for which the luminaire(s) [fixture(s)] is rated.

(5) Heavy-Duty Lampholders. Outlets for heavy-duty lampholders shall be computed at a minimum of 600 volt-amperes.

(6) Sign and Outline Lighting. Sign and outline lighting outlets shall be computed at a minimum of 1200 volt-amperes for each required branch circuit specified in 600.5(A).

(7) Show Windows. Show windows shall be computed in accordance with either of the following:

(1) The unit load per outlet as required in other provisions of this section

(2) At 200 volt-amperes per 300 mm (1 ft) of show window

(8) Fixed Multioutlet Assemblies. Fixed multioutlet assemblies used in other than dwelling units or the guest rooms of hotels or motels shall be computed in accordance with (1) or (2). For the purposes of this section, the computation shall be permitted to be based on the portion that contains receptacle outlets.

(1) Where appliances are unlikely to be used simultaneously, each 1.5 m (5 ft) or fraction thereof of each separate and continuous length shall be considered as one outlet of not less than 180 volt-amperes.

(2) Where appliances are likely to be used simultaneously, each 300 mm (1 ft) or fraction thereof shall be considered as an outlet of not less than 180 volt-amperes.

(9) Receptacle Outlets. Except as covered in 220.3(B)(10), receptacle outlets shall be computed at not less than 180 volt-amperes for each single or for each multiple receptacle on one yoke. A single piece of equipment consisting of a multiple receptacle comprised of four or more receptacles shall be computed at not less than 90 volt-amperes per receptacle.

This provision shall not be applicable to the receptacle outlets specified in 210.11(C)(1) and (2).

(10) Dwelling Occupancies. In one-family, two-family, and multifamily dwellings and in guest rooms of hotels and motels, the outlets specified in (1), (2), and (3) are included in the general lighting load calculations of 220.3(A). No additional load calculations shall be required for such outlets.

(1) All general-use receptacle outlets of 20-ampere rating or less, including receptacles connected to the circuits in 210.11(C)(3)

(2) The receptacle outlets specified in 210.52(E) and (G)

(3) The lighting outlets specified in 210.70(A) and (B)

(11) Other Outlets. Other outlets not covered in 220.3(B)(1) through (10) shall be computed based on 180 volt-amperes per outlet.

(C) Loads for Additions to Existing Installations.

(1) Dwelling Units. Loads added to an existing dwelling unit(s) shall comply with the following as applicable:

(1) Loads for structural additions to an existing dwelling unit or for a previously unwired portion of an existing dwelling unit, either of which exceeds 46.5 m^2 (500 ft^2), shall be computed in accordance with 220.3(A) and (B).

(2) Loads for new circuits or extended circuits in previously wired dwelling units shall be computed in accordance with either 220.3(A) or (B), as applicable.

(2) Other Than Dwelling Units. Loads for new circuits or extended circuits in other than dwelling units shall be computed in accordance with either 220.3(A) or (B), as applicable.

Section 16. Section 220.15 of the National Electrical Code, 2002 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 or service load current rating be less than the rating of the largest branch circuit supplied.

Exception: ((~~*Where reduced loading of the conductors results from units operating on duty cycle, intermittently, or from all units not operating at the same time, the authority having*~~

~~*jurisdiction may grant permission for feeder and service conductors to have an ampacity less than 100 percent, provided the conductors have an ampacity for the load so determined.*~~)) *A demand factor of 75 percent of the installed heating capacity may be used in sizing service entrance and feeder 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.*

Section 17. Section 220.17 of the National Electrical Code, 2002 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, other than electric ranges, clothes dryers, space-heating equipment, or air-conditioning equipment, that are served by the same feeder or service in a one-family, two-family, or multifamily dwelling. For space heating equipment, see Section 220.15.

Section 18. Section 225.32 of the National Electrical Code, 2002 edition, is amended as follows:

225.32 Location. The disconnecting means shall be installed either inside or outside of the building or structure served or where the conductors pass through the building or structure. ((~~The disconnecting means shall be at a readily accessible location nearest the point of entrance of the conductors.~~)) For the purposes of this section, the requirements in 230.6 shall be permitted to be utilized.

FPN: See WAC 296-46B-225 032, Location of outside feeder disconnecting means.

Exception No. 1: For installations under single management, where documented safe switching procedures are established and maintained for disconnection, and where the installation is monitored by qualified individuals, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 2: For buildings or other structures qualifying under the provisions of Article 685, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 3: For towers or poles used as lighting standards, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 4: For poles or similar structures used only for support of signs installed in accordance with Article 600, the disconnecting means shall be permitted to be located elsewhere on the premises.

Section 19. Section 230.1 of the National Electrical Code, 2002 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 Figure 230-1.

(B) Service Requirements. The serving utility shall be consulted by the owner, the owner's 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 20. The National Electrical Code, 2002 edition, is amended by adding Section 230.5 as follows:

230.5 Types of Services. All services shall be grounded single-phase, or grounded three-phase 4-wire systems. Three-phase 3-wire services shall not be installed unless prior approval is granted by the utility and the building official.

Section 21. The National Electrical Code, 2002 edition, is amended by adding Section 230.12 as follows:

230.12 Service Point Connection. Service point connections shall comply with paragraphs (A) through (C) below.

(A) 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.

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

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

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

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

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

(1) 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.

(2) A transformer vault within the building.

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

Section 22. Section 230.28 of the National Electrical Code, 2002 edition, is amended as follows:

230.28. Service Masts as Supports. ((~~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. Only power service-drop~~

~~conductors shall be permitted to be attached to a service mast.~~)) Service masts used to support service-drop conductors shall comply with the following:

(1) All raceway fittings shall be identified for use with service masts.

(2) Service masts shall be rigid steel galvanized conduit no smaller than 2 inches.

(3) Service masts shall support only power service-drop conductors.

(4) Service-drops shall be attached to a bracket on the mast, or other approved structure located with 24 inches of the mast.

(5) Masts 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.

(6) Service conduits for mast type services shall be supported by one of the methods identified in WAC 296-46B-230-028 and drawings E-101 through E-103 with corresponding notes. Snuggle bars properly installed between wood framing members are permitted.

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

(8) Couplings shall be permitted only below the roofline and shall be below a point of support for the mast.

FPN: See WAC 296-46B-230 028 regarding mast supports for feeders and branch circuits.

Section 23. Section 230.29 of the National Electrical Code, 2002 edition, is amended as follows:

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 the Fire District shall terminate on the side of the building nearest to the lines or mains of the utility. The 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 wire access fittings or junction boxes of any type shall be permitted within 15 feet of the ground level on street, alley, or driveway margins.

Section 24. Section 230.33 of the National Electrical Code, 2002 edition, is amended as follows:

230.33 Spliced Conductors. Service-lateral conductors shall be permitted to be spliced or tapped in accordance with 110.14, 300.5(E), 300.13, and 300.15.

FPN: Service lateral conductors are utility conductors under the serving utility's jurisdiction.

Section 25. The National Electrical Code, 2002 edition, is amended by adding Section 230.34 as follows:

230.34 Conversion to Underground Service or Increasing Existing Overhead Services. Where 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 permitted to be installed over an existing meter enclosure that is embedded in a finished exterior wall. 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 an 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 26. Section 230.43 of the National Electrical Code, 2002 edition, is amended as follows:

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 shall be limited to the following methods:

(((~~(1) Open wiring on insulators~~

~~(2) Type IGS cable~~))

(3) Rigid metal conduit

(4) Intermediate metal conduit

(((~~(5) Electrical metallic tubing~~

~~(6) Electrical nonmetallic tubing (ENT)~~

~~(7) Service entrance cables~~

~~(8) Wireways~~))

(9) Busways

(((~~(10) Auxiliary gutters~~))

(11) Rigid nonmetallic conduit

(12) Cablebus

(((~~(13) Type MC cable~~))

(14) Mineral-insulated, metal-sheathed cable

(((~~(15) Flexible metal conduit not over 1.8 m (6 ft) long or liquidtight flexible metal conduit not over 1.8 m (6 ft) long between raceways, or between raceway and service equipment, with equipment bonding jumper routed with the flexible metal conduit or liquidtight flexible metal conduit according to the provisions of Section 250.102(A), (B), (C), and (E)~~

~~(16) Liquidtight flexible nonmetallic conduit~~))

Section 27. Section 230.44 of the National Electrical Code, 2002 edition, is amended as follows:

230.44 Cable trays. Cable tray systems ((~~shall~~)) may, with prior approval by the building official, be permitted to support cable used as service-entrance conductors.

Section 28. Section 230.46 of the National Electrical Code, 2002 edition, is amended as follows:

230.46 Spliced Conductors. Service-entrance conductors shall be permitted to be spliced or tapped in accordance with 110.14, 300.5(E), 300.13, and 300.15 only by special permission of the building official.

Section 29. Section 230.52 of the National Electrical Code, 2002 edition, is repealed.

Section 30. Section 230.54 of the National Electrical Code, 2002 edition, is amended as follows:

230.54 Overhead Service Locations.

(A) Raintight Service Head. Service raceways shall be equipped with a raintight service head at the point of connection to service-drop conductors.

(B) Service Cable Equipped with Raintight Service Head or Gooseneck. Service cables shall be equipped with a raintight service head.

Exception: Type SE cable shall be permitted to be formed in a gooseneck and taped with a self-sealing weather-resistant thermoplastic.

(C) Service Heads Above Service-Drop Attachment. Service heads and goosenecks in service-entrance cables shall be located above the point of attachment of the service-drop conductors to the building or other structure.

Exception: Where it is impracticable to locate the service head above the point of attachment, the service head location shall be permitted not farther than 600 mm (24 in.) from the point of attachment.

(D) Secured. Service cables shall be held securely in place.

(E) Separately Bushed Openings. Service heads shall have conductors of different potential brought out through separately bushed openings.

Exception: For jacketed multiconductor service cable without splice.

(F) Drip Loops. Drip loops shall be formed on individual conductors. To prevent the entrance of moisture, service-entrance conductors shall be connected to the service-drop conductors either (1) below the level of the service head or (2) below the level of the termination of the service-entrance cable sheath.

(G) Arranged That Water Will Not Enter Service Raceway or Equipment. Service-drop conductors and service-entrance conductors shall be arranged so that water will not enter service raceway or equipment.

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

FPN: See also WAC 296-46B-230 Drawing E-101, E-102, and E-103.

Section 31. Section 230.70 of the National Electrical Code, 2002 edition, is amended as follows:

230.70 General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors.

(A) Location. The service disconnecting means shall be installed in accordance with 230.70(A)(1), (2), and (3).

(1) Readily Accessible Location. The service disconnecting means shall be installed at a readily accessible location either outside of a building or structure or inside nearest the point of entrance of the service conductors. Service disconnecting means shall be readily accessible, including after any subsequent building alterations or additions.

FPN: See also WAC 296-46B-230 070(13)(b).

(2) Bathrooms and Other Locations. Service disconnecting means shall not be installed in bathrooms, clothes closets, shower rooms, cupboards, attics, stairways, nor above any washers, ranges, dryers, water heaters, sinks, plumbing fixtures or drain boards.

(3) Remote Control. Where a remote control device(s) is used to actuate the service disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1).

(B) Marking. Each service disconnect shall be permanently marked to identify it as a service disconnect.

(C) Suitable for Use. Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the requirements of Articles 500 through 517.

Section 32. Section 230.82 of the National Electrical Code, 2002 edition, is amended as follows:

230.82 Equipment Connected to the Supply Side of Service Disconnect. Only the following equipment shall be permitted to be connected to the supply side of the service disconnecting means:

(1) Cable limiters ((~~or other current-limiting devices~~)) by special permission of the building official.

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

(a) The cable 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 cable limiter enclosure shall not be used for service taps or extensions and shall be clearly recognized and marked as cable limiters.

(2) Meters, meter sockets, or meter disconnect switches nominally rated not in excess of 600 volts, provided all metal housings and service enclosures are grounded. Taps under meter socket lugs shall not be permitted, except by prior approval from the building official.

(3) Instrument transformers (current and voltage), high-impedance shunts, load management devices, and surge arresters.

(4) Taps used only to supply load management devices, circuits for standby 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.

(5) Solar photovoltaic systems, fuel cell systems, or interconnected electric power production sources.

(6) Control circuits for power-operable service disconnecting means, if suitable overcurrent protection and disconnecting means are provided.

(7) Ground-fault protection systems where installed as part of listed equipment, if suitable overcurrent protection and disconnecting means are provided.

(8) Current transformer cabinets shall contain only the main service conductors, metering equipment and secondary wiring. One tap shall be permitted on the load side of the current transformers for a legally-required standby service and one tap shall be permitted on the load side of the current transformers for a fire pump service. One additional normal power service tap from the current transformer enclosure may be made by special permission of the service utility. In a single-family dwelling, two connections shall be permitted on the load side of the current transformers. No other taps shall be permitted. Approved terminal lugs shall be provided for the main service conductors and for all taps.

(9) Listed service accessory buss gutters or termination boxes that are approved for use on the line side of service equipment. Junction and pull boxes are not permitted

Section 33. Section 230.90 of the National Electrical Code, 2002 edition, is amended as follows:

230.90 Where Required. Each ungrounded service conductor shall have overload protection.

(A) Ungrounded Conductor. Such protection shall be provided by an overcurrent device in series with each ungrounded service conductor that has a rating or setting not higher than the allowable ampacity of the conductor. A set of fuses shall be considered all the fuses required to protect all the ungrounded conductors of a circuit. Single-pole circuit breakers, grouped in accordance with 230.71(B), shall be considered as one protective device.

Exception No. 1: For motor-starting currents, ratings that conform with 430.52, 430.62, and 430.63 shall be permitted.

Exception No. 2: Fuses and circuit breakers with a rating or setting that conform with 240.4(B) or (C) and 240.6 shall be permitted.

Exception No. 3: Two to six circuit breakers or sets of fuses shall be permitted as the overcurrent device to provide the overload protection. The sum of the ratings of the circuit breakers or fuses shall be permitted to exceed the ampacity of the service conductors, provided the calculated load does not exceed the ampacity of the service conductors.

FPN: See WAC 296-46B-230 042, Service conductor -- size and rating, if the service conductors have a lesser ampacity than the overcurrent protection or the equipment rating that they terminate in or on.

Exception No. 4: Overload protection for fire pump supply conductors shall conform with 695.4(B)(1).

Exception No. 5: Overload protection for 120/240-volt, 3-wire, single-phase dwelling services shall be permitted in accordance with the requirements of 310.15(B)(6).

(B) Not in Grounded Conductor. No overcurrent device shall be inserted in a grounded service conductor except a circuit breaker that simultaneously opens all conductors of the circuit.

Section 34. Section 230.95 of the National Electrical Code, 2002 edition, is amended as follows:

230.95 Ground-Fault Protection of Equipment. Ground-fault protection of equipment shall be provided for solidly grounded wye electrical services of more than 150 volts to ground but not exceeding 600 volts phase-to-phase for each service disconnect rated 1000 amperes or more.

The rating of the service disconnect shall be considered to be the rating of the largest fuse that can be installed or the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated or can be adjusted.

Solidly Grounded — Definition. Connection of the grounded conductor to ground without inserting any resistor or impedance device.

Exception No. 1: The ground-fault protection provisions of this section shall not apply to a service disconnect for a continuous industrial process where a nonorderly shutdown will introduce additional or increased hazards.

Exception No. 2: The ground-fault protection provisions of this section shall not apply to fire pumps.

(A) Setting. The ground-fault protection system shall operate to cause the service disconnect to open all ungrounded conductors of the faulted circuit. The maximum setting of the ground-fault protection shall be 1200 amperes, and the maximum time delay shall be one second for ground-fault currents equal to or greater than 3000 amperes.

(B) Fuses. If a switch and fuse combination is used, the fuses employed shall be capable of interrupting any current higher than the interrupting capacity of the switch during a time that the ground-fault protective system will not cause the switch to open.

(C) Performance Testing. The ground-fault protection system shall be performance tested when first installed on site. The test shall be conducted in accordance with instructions that shall be provided with the equipment. A written record of this test shall be made and shall be available to the authority having jurisdiction. <u>This performance test and subsequent evaluation shall be performed by a firm having qualified personnel and proper equipment. The tested equipment shall be labeled identifying the firm, date of test, and setting.</u>

FPN No. 1: Ground-fault protection that functions to open the service disconnect affords no protection from faults on the line side of the protective element. It serves only to limit damage to conductors and equipment on the load side in the event of an arcing ground fault on the load side of the protective element.

FPN No. 2: This added protective equipment at the service equipment may make it necessary to review the overall wiring system for proper selective overcurrent protection coordination. Additional installations of

ground-fault protective equipment may be needed on feeders and branch circuits where maximum continuity of electrical service is necessary.

FPN No. 3: Where ground-fault protection is provided for the service disconnect and interconnection is made with another supply system by a transfer device, means or devices may be needed to ensure proper ground-fault sensing by the ground-fault protection equipment.

Section 35. Section 230.202 of the National Electrical Code, 2002 edition, is amended as follows:

230.202 Service-Entrance Conductors. Service-entrance conductors to buildings or enclosures shall be installed to conform to 230.202(A) and (B).

(A) Conductor Size. Service-entrance conductors shall not be smaller than 6 AWG unless in multiconductor cable. Multiconductor cable shall not be smaller than 8 AWG.

(B) Wiring Methods. Service-entrance conductors shall be installed by one of the following wiring methods ((~~covered in 300.37 and 300.50~~)):

(1) Rigid metal conduit

(2) Intermediate metal conduit

(3) Rigid nonmetallic conduit

(4) Busways

(5) Cablebus

(6) Cable Trays only with prior permission by the Building Official.

Section 36. Section 240.24 of the National Electrical Code, 2002 edition, is amended as follows:

240.24 Location in or on Premises.

(A) Accessibility. Overcurrent devices shall be readily accessible unless one of the following applies:

(1) For busways, as provided in 368.12.

(2) For supplementary overcurrent protection, as described in 240.10.

(3) For overcurrent devices, as described in 225.40 and 230.92.

(4) For overcurrent devices adjacent to utilization equipment that they supply, access shall be permitted to be by portable means.

(B) Occupancy. Each occupant shall have ready access to all overcurrent devices protecting the conductors supplying that occupancy.

Exception No. 1: Where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the service overcurrent devices and feeder overcurrent devices supplying more than one occupancy shall be permitted to be accessible to only authorized management personnel in the following:

(a) Multiple-occupancy buildings

(b) Guest rooms of hotels and motels that are intended for transient occupancy

Exception No. 2: Where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the branch circuit overcurrent devices supplying any guest rooms shall be permitted to be accessible to only authorized management personnel for guest rooms of hotels and motels that are intended for transient occupancy.

(C) Not Exposed to Physical Damage. Overcurrent devices shall be located where they will not be exposed to physical damage.

FPN: See 110.11, Deteriorating Agents.

(D) ((~~Not in Vicinity of Easily Ignitible Material.~~ ~~Overcurrent devices shall not be located in the vicinity of easily ignitible material, such as in clothes closets.~~)) Location. Overcurrent protection devices, other than supplementary overcurrent protection, 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, drain board, or similar locations

(E) ((~~Not Located in Bathrooms.~~ ~~In dwelling units and guest rooms of hotels and motels, overcurrent devices, other than supplementary overcurrent protection, shall not be located in bathrooms as defined in Article 100.~~)) Accessory Dwelling Unit, Two-Family and Multi-Family Occupancies. Branch circuit overcurrent devices shall be located either within the dwelling unit that they serve or in common areas accessible to all occupants.

Section 37. Section 250.30 of the National Electrical Code, 2002 edition, is amended as follows:

250.30 Grounding Separately Derived Alternating-Current Systems.

(A) Grounded Systems. A separately derived ac system that is grounded shall comply with 250.30(A)(1) through (6).

Exception: High-impedance grounded neutral system grounding connection requirements shall not be required to comply with 250.30(A)(1) and (2) and shall be made as specified in 250.36 and 250.186.

(1) Bonding Jumper. A bonding jumper in compliance with 250.28(A) through (D) that is sized for the derived phase conductors shall be used to connect the equipment grounding conductors of the separately derived system to the grounded conductor. Except as permitted by 250.24(A)(3), this connection shall be made at any point on the separately derived system from the source to the first system disconnecting means or overcurrent device, or it shall be made at the source of a separately derived system that has no disconnecting means or overcurrent devices. The point of connection shall be the same as the grounding electrode conductor as required in 250.30(A)(2).

Exception No. 1: A bonding jumper at both the source and the first disconnecting means shall be permitted where doing so does not establish a parallel path for the grounded circuit conductor. Where a grounded conductor is used in this manner, it shall not be smaller than the size specified for the bonding jumper but shall not be required to be larger than the ungrounded

conductor(s). For the purposes of this exception, connection through the earth shall not be considered as providing a parallel path.

Exception No. 2: The size of the bonding jumper for a system that supplies a Class 1, Class 2, or Class 3 circuit, and is derived from a transformer rated not more than 1000 volt-amperes, shall not be smaller than the derived phase conductors and shall not be smaller than 14 AWG copper or 12 AWG aluminum.

(2) Grounding Electrode Conductor. The grounding electrode conductor shall be installed in accordance with (a) or (b). Where taps are connected to a common grounding electrode conductor, the installation shall comply with 250.30(A)(3).

(a) Single Separately Derived System. A grounding electrode conductor for a single separately derived system shall be sized in accordance with 250.66 for the derived phase conductors and shall be used to connect the grounded conductor of the derived system to the grounding electrode as specified in 250.30(A)(4). Except as permitted by 250.24(A)(3) or (A)(4), this connection shall be made at the same point on the separately derived system where the bonding jumper is installed.

Exception: A grounding electrode conductor shall not be required for a system that supplies a Class 1, Class 2, or Class 3 circuit and is derived from a transformer rated not more than 1000 volt-amperes, provided the system grounded conductor is bonded to the transformer frame or enclosure by a jumper sized in accordance with 250.30(A)(1), Exception No. 2, and the transformer frame or enclosure is grounded by one of the means specified in 250.134.

(b) Multiple Separately Derived Systems. Where more than one separately derived system is connected to a common grounding electrode conductor as provided in 250.30(A)(3), the common grounding electrode conductor shall be sized in accordance with 250.66, based on the total area of the largest derived phase conductor from each separately derived system.

(3) Grounding Electrode Conductor Taps. It shall be permissible to connect taps from a separately derived system to a common grounding electrode conductor. Each tap conductor shall connect the grounded conductor of the separately derived system to the common grounding electrode conductor.

(a) Tap Conductor Size. Each tap conductor shall be sized in accordance with 250.66 for the derived phase conductors of the separately derived system it serves.

(b) Connections. All connections shall be made at an accessible location by an irreversible compression connector listed for the purpose, listed connections to copper busbars not less than 6 mm × 50 mm (¼ in. × 2 in.), ((~~or~~)) by the exothermic welding process, or other approved means. The tap conductors shall be connected to the common grounding electrode conductor as specified in 250.30(A)(2)(b) in such a manner that the common grounding electrode conductor remains without a splice or joint.

(c) Installation. The common grounding electrode conductor and the taps to each separately derived system shall comply with 250.64(A), (B), (C), and (E).

(d) Bonding. Where exposed structural steel that is interconnected to form the building frame or interior metal piping exists in the area served by the separately derived system, it shall be bonded to the grounding electrode conductor in accordance with 250.104.

(4) Grounding Electrode. The grounding electrode shall be as near as practicable to and preferably in the same area as the grounding electrode conductor connection to the system. The grounding electrode shall be the nearest one of the following:

(1) An effectively grounded structural metal member of the structure

(2) An effectively grounded metal water pipe within 1.5 m (5 ft) from the point of entrance into the building

Exception: In industrial and commercial buildings where conditions of maintenance and supervision ensure that only qualified persons service the installation and the entire length of the interior metal water pipe that is being used for the grounding electrode is exposed, the connection shall be permitted at any point on the water pipe system.

(3) Other electrodes as specified by 250.52 where the electrodes specified by 250.30(A)(4)(1) or (A)(4)(2) are not available

Exception to (1), (2), and (3): Where a separately derived system originates in listed equipment suitable for use as service equipment, the grounding electrode used for the service or feeder shall be permitted as the grounding electrode for the separately derived system, provided the grounding electrode conductor from the service or feeder to the grounding electrode is of sufficient size for the separately derived system. Where the equipment ground bus internal to the service equipment is not smaller than the required grounding electrode conductor, the grounding electrode connection for the separately derived system shall be permitted to be made to the bus.

FPN: See 250.104(A)(4) for bonding requirements of interior metal water piping in the area served by separately derived systems.

(5) Equipment Bonding Jumper Size. Where a bonding jumper is run with the derived phase conductors from the source of a separately derived system to the first disconnecting means, it shall be sized in accordance with 250.28(A) through (D), based on the size of the derived phase conductors.

(6) Grounded Conductor. Where a grounded conductor is installed and the bonding jumper is not located at the source of the separately derived system, the following shall apply:

(a) Routing and Sizing. This conductor shall be routed with the derived phase conductors and shall not be smaller than the required grounding electrode conductor specified in Table 250.66, but shall not be required to be larger than the largest ungrounded derived phase conductor. In addition, for phase conductors larger than 1100 kcmil copper or 1750 kcmil aluminum, the grounded conductor shall not be smaller than 12½ percent of the area of the largest derived phase conductor. The grounded conductor of a 3-phase, 3-wire delta system shall have an ampacity not less than the ungrounded conductors.

(b) Parallel Conductors. Where the derived phase conductors are installed in parallel, the size of the grounded conductor shall be based on the total circular mil area of the parallel

conductors as indicated in this section. Where installed in two or more raceways, the size of the grounded conductor in each raceway shall be based on the size of the ungrounded conductors in the raceway but not smaller than 1/0 AWG.

FPN: See 310.4 for grounded conductors connected in parallel.

(c) High Impedance. The grounded conductor on a high-impedance grounded neutral system shall be grounded in accordance with 250.36.

(B) Ungrounded Systems. The equipment of an ungrounded separately derived system shall be grounded as specified in 250.30(B)(1) and (2).

(1) Grounding Electrode Conductor. A grounding electrode conductor, sized in accordance with 250.66 for the derived phase conductors, shall be used to connect the metal enclosures of the derived system to the grounding electrode as specified in 250.30(B)(2). This connection shall be made at any point on the separately derived system from the source to the first system disconnecting means.

(2) Grounding Electrode. Except as permitted by 250.34 for portable and vehicle-mounted generators, the grounding electrode shall comply with 250.30(A)(4).

Section 38. Section 250.32 of the National Electrical Code, 2002 edition, is amended as follows:

250.32 Two or More Buildings or Structures Supplied from a Common Service.

(A) Grounding Electrode. Where two or more buildings or structures are supplied from a common ac service by a feeder(s) or branch circuit(s), the grounding electrode(s) required in Part III of this article at each building or structure shall be connected in the manner specified in 250.32(B) or (C). Where there are no existing grounding electrodes, the grounding electrode(s) required in Part III of this article shall be installed.

Exception: A grounding electrode at separate buildings or structures shall not be required where only one branch circuit supplies the building or structure and the branch circuit includes an equipment grounding conductor for grounding the conductive non-current-carrying parts of all equipment.

(B) Grounded Systems. For a grounded system at the separate building or structure, the connection to the grounding electrode and grounding or bonding of equipment, structures, or frames required to be grounded or bonded shall comply with ((~~either~~)) 250.32(B)(1) ((~~or (2)~~)).

(1) Equipment Grounding Conductor. An equipment grounding conductor as described in 250.118 shall be run with the supply conductors and connected to the building or structure disconnecting means and to the grounding electrode(s). The equipment grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded. The equipment grounding conductor shall be sized in accordance with 250.122. Any installed grounded conductor shall not be connected to the equipment grounding conductor or to the grounding electrode(s).

~~(((2) Grounded Conductor. Where (1) an equipment grounding conductor is not run with the supply to the building or structure, (2) there are no continuous metallic paths bonded to the grounding system in both buildings or structures involved, and (3) ground-fault protection of equipment has not been installed on the common ac service, the grounded circuit conductor run with the supply to the building or structure shall be connected to the building or structure disconnecting means and to the grounding electrode(s) and shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded. The size of the grounded conductor shall not be smaller than the larger of~~

~~(1) That required by 220.22~~

~~(2) That required by 250.122~~))

FPN: See WAC 296-46B-250 032, Two or more buildings or structures.

(C) Ungrounded Systems. The grounding electrode(s) shall be connected to the building or structure disconnecting means.

(D) Disconnecting Means Located in Separate Building or Structure on the Same Premises. Where one or more disconnecting means supply one or more additional buildings or structures under single management, and where these disconnecting means are located remote from those buildings or structures in accordance with the provisions of 225.32, Exception Nos. 1 and 2, all of the following conditions shall be met:

(1) The connection of the grounded circuit conductor to the grounding electrode at a separate building or structure shall not be made.

(2) An equipment grounding conductor for grounding any non–current-carrying equipment, interior metal piping systems, and building or structural metal frames is run with the circuit conductors to a separate building or structure and bonded to existing grounding electrode(s) required in Part III of this article, or, where there are no existing electrodes, the grounding electrode(s) required in Part III of this article shall be installed where a separate building or structure is supplied by more than one branch circuit.

(3) Bonding the equipment grounding conductor to the grounding electrode at a separate building or structure shall be made in a junction box, panelboard, or similar enclosure located immediately inside or outside the separate building or structure.

(E) Grounding Electrode Conductor. The size of the grounding electrode conductor to the grounding electrode(s) shall not be smaller than given in 250.66, based on the largest ungrounded supply conductor. The installation shall comply with Part III of this article.

Section 39. Section 250.56 of the National Electrical Code, 2002 edition, is amended as follows:

250.56 Resistance of Rod, Pipe, and Plate Electrodes. A single electrode consisting of a rod, pipe, or plate ((~~that 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 by 250.52(A)(2) through (A)(7). Where multiple rod, pipe, or plate electrodes are installed to meet the requirements of this section, they shall not be less than ((~~1.8 m (6 ft)~~)) 2.5 m (8 ft) apart. The requirements of this section apply to

temporary construction services and supersede the requirements set forth in WAC 296-46B-250 052.

FPN: The paralleling efficiency of rods longer than 2.5 m (8 ft) is improved by spacing greater than 1.8 m (6 ft).

Section 40. Section 250.64 of the National Electrical Code, 2002 edition, is amended as follows:

250.64 Grounding Electrode Conductor Installation. Grounding electrode conductors shall be installed as specified in 250.64(A) through (F).

(A) Aluminum or Copper-Clad Aluminum Conductors. Bare aluminum or copper-clad aluminum grounding conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. Where used outside, aluminum or copper-clad aluminum grounding conductors shall not be terminated within 450 mm (18 in.) of the earth.

(B) Securing and Protection from Physical Damage. A grounding electrode conductor or its enclosure shall be securely fastened to the surface on which it is carried. A 4 AWG copper or aluminum or larger conductor shall be protected if exposed to severe physical damage. A 6 AWG grounding conductor that is free from exposure to physical damage shall be permitted to be run along the surface of the building construction without metal covering or protection where it is securely fastened to the construction; otherwise, it shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor. Grounding conductors smaller than 6 AWG shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor.

(C) Continuous. The grounding electrode conductor shall be installed in one continuous length without a splice or joint, unless spliced only by irreversible compression-type connectors listed for the purpose or by the exothermic welding process.

Exception: Sections of busbars shall be permitted to be connected together to form a grounding electrode conductor.

(D) Grounding Electrode Conductor Taps. Where a service consists of more than a single enclosure as permitted in 230.40, Exception No. 2, it shall be permitted to connect taps to the grounding electrode conductor. Each such tap conductor shall extend to the inside of each such enclosure. The grounding electrode conductor shall be sized in accordance with 250.66, but the tap conductors shall be permitted to be sized in accordance with the grounding electrode conductors specified in 250.66 for the largest conductor serving the respective enclosures. The tap conductors shall be connected to the grounding electrode conductor ((~~in such a manner that the grounding electrode conductor remains without a splice~~)) in accordance with the requirements of 250.30 (A)(3)(b).

(E) Enclosures for Grounding Electrode Conductors. Metal enclosures for grounding electrode conductors shall be electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode and shall be securely fastened to the ground clamp or fitting. Metal enclosures that are not physically continuous from cabinet or equipment to the grounding electrode shall be made electrically continuous by bonding each end to the grounding

electrode conductor. Where a raceway is used as protection for a grounding electrode conductor, the installation shall comply with the requirements of the appropriate raceway article.

(F) To Electrode(s). A grounding electrode conductor shall be permitted to be run to any convenient grounding electrode available in the grounding electrode system or to one or more grounding electrode(s) individually. The grounding electrode conductor shall be sized for the largest grounding electrode conductor required among all the electrodes connected to it.

Section 41. Section 250.104 of the National Electrical Code, 2002 edition, is amended as follows:

250.104 Bonding of Piping Systems and Exposed Structural Steel.

(A) Metal Water Piping. The metal water piping system shall be bonded as required in (1), (2), (3), or (4) of this section. The bonding jumper(s) shall be installed in accordance with 250.64(A), (B), and (E). The points of attachment of the bonding jumper(s) shall be accessible.

(1) General. Metal water piping system(s) installed in or attached to a building or structure 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(s) shall be sized in accordance with Table 250.66 except as permitted in 250.104(A)(2) and (A)(3).

(2) Buildings of Multiple Occupancy. In buildings of multiple occupancy where the metal water piping system(s) installed in or attached to a building or structure for the individual occupancies is metallically isolated from all other occupancies by use of nonmetallic water piping, the metal water piping system(s) for each occupancy shall be permitted to be bonded to the equipment grounding terminal of the panelboard or switchboard enclosure (other than service equipment) supplying that occupancy. The bonding jumper shall be sized in accordance with Table 250.122.

(3) Multiple Buildings or Structures Supplied from a Common Service. The metal water piping system(s) installed in or attached to a building or structure shall be bonded to the building or structure disconnecting means enclosure where located at the building or structure, to the equipment grounding conductor run with the supply conductors, or to the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with 250.66, based on the size of the feeder or branch circuit conductors that supply the building. The bonding jumper shall not be required to be larger than the largest ungrounded feeder or branch circuit conductor supplying the building.

(4) Separately Derived Systems. The grounded conductor of each separately derived system shall be bonded to the nearest available point of the interior metal water piping system(s) in the area served by each separately derived system. This connection shall be made at the same point on the separately derived system where the grounding electrode conductor is connected. Each bonding jumper shall be sized in accordance with Table 250.66.

Exception: A separate water piping bonding jumper shall not be required where the effectively grounded metal frame of a building or structure is used as the grounding electrode for a

separately derived system and is bonded to the metallic water piping in the area served by the separately derived system.

(B) Other Metal Piping. Where installed in or attached to a building or structure, metal piping system(s), including gas piping, that 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(s) shall be sized in accordance with 250.122 using the rating of the circuit that may energize the piping system(s). The equipment grounding conductor for the circuit that may energize the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

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

(C) Structural Steel. Exposed structural steel that is interconnected to form a steel building frame and is not intentionally grounded and 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 the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with Table 250.66 and installed in accordance with 250.64(A), (B), and (E). The points of attachment of the bonding jumper(s) shall be accessible.

(D) Water System Requirements. It is unlawful to connect to or use any water main or water pipe belonging to Seattle Public Utilities distribution and transmission systems for electrical grounding purposes.

Section 42. Section 300.1 of the National Electrical Code, 2002 edition, is amended as follows:

300.1 Scope.

(A) All Wiring Installations. This article covers wiring methods for all wiring installations unless modified by other articles.

(B) Integral Parts of Equipment. The provisions of this article are not intended to apply to the conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory assembled control equipment or listed utilization equipment.

(C) Metric Designators and Trade Sizes. Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be as designated in Table 300.1(C).

Table 300.1(C) Metric Designator and Trade Sizes

Metric Designator	Trade Size
12	⅜
16	½
21	¾
27	1
35	1¼
41	1½
53	2

63	2½
78	3
91	3½
103	4
129	5
155	6

Note: The metric designators and trade sizes are for identification purposes only and are not actual dimensions.

FPN: See WAC 296-46B-010 (14), (25), (26) and WAC 296-46B-010 Tables 010-1 and 010-2 for wiring methods for designated building occupancies.

Section 43. Section 300.4 of the National Electrical Code, 2002 edition, is amended as follows:

300.4 Protection Against Physical Damage. Where subject to physical damage, conductors shall be adequately protected.

(A) Cables and Raceways Through Wood Members.

(1) Bored Holes. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed through bored holes in joists, rafters, or wood members, holes shall be bored so that the edge of the hole is not less than 32 mm (1¼ in.) from the nearest edge of the wood member. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by screws or nails by a steel plate or bushing, at least 1.6 mm (1/16 in.) thick, and of appropriate length and width installed to cover the area of the wiring.

Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(2) Notches in Wood. Where there is no objection because of weakening the building structure, in both exposed and concealed locations, cables or raceways shall be permitted to be laid in notches in wood studs, joists, rafters, or other wood members where the cable or raceway at those points is protected against nails or screws by a steel plate at least 1.6 mm (1/16 in.) thick installed before the building finish is applied.

Exception: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(B) Nonmetallic-Sheathed Cables and Electrical Nonmetallic Tubing Through Metal Framing Members.

(1) Nonmetallic-Sheathed Cable. In both exposed and concealed locations where nonmetallic-sheathed cables pass through either factory or field punched, cut, or drilled slots or holes in metal members, the cable shall be protected by listed two-piece interlocking bushings or listed two-piece interlocking grommets covering all metal edges that are securely fastened in the opening prior to installation of the cable.

(2) Nonmetallic-Sheathed Cable and Electrical Nonmetallic Tubing. Where nails or screws are likely to penetrate nonmetallic-sheathed cable or electrical nonmetallic tubing, a steel sleeve,

steel plate, or steel clip not less than 1.6 mm (1/16 in.) in thickness shall be used to protect the cable or tubing.

(C) Cables Through Spaces Behind Panels Designed to Allow Access. Cables or raceway-type wiring methods, installed behind panels designed to allow access, shall be supported according to their applicable articles.

(D) Cables and Raceways Parallel to Framing Members. In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed parallel to framing members, such as joists, rafters, or studs, the cable or raceway shall be installed and supported so that the nearest outside surface of the cable or raceway is not less than 32 mm (1¼ in.) from the nearest edge of the framing member where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1.6 mm (1/16 in.) thick.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: For concealed work in finished buildings, or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permissible to fish the cables between access points.

(E) Cables and Raceways Installed in Shallow Grooves. Cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, shall be protected by 1.6 mm (1/16 in.) thick steel plate, sleeve, or equivalent or by not less than 32 mm (1¼ in.) free space for the full length of the groove in which the cable or raceway is installed.

Exception: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

(F) Insulated Fittings. Where raceways containing ungrounded conductors 4 AWG or larger enter a cabinet, box enclosure, or raceway, the conductors shall be protected by a substantial fitting providing a smoothly rounded insulating surface, unless the conductors are separated from the fitting or raceway by substantial insulating material that is securely fastened in place.

Exception: Where threaded hubs or bosses that are an integral part of a cabinet, box enclosure, or raceway provide a smoothly rounded or flared entry for conductors.

Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors.

Section 44. Section 300.11 of the National Electrical Code, 2002 edition, is amended as follows:

300.11 Securing and Supporting.

(A) Secured in Place. Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place. Support wires that do not provide secure support shall not be permitted as the sole support. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. Where independent support wires are used, they shall be secured at both ends. Cables and raceways shall not be supported by ceiling grids.

(1) Fire-Rated Assemblies. Wiring located within the cavity of a fire-rated floor–ceiling or roof–ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.

Exception: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

FPN: One method of determining fire rating is testing in accordance with NFPA 251-1999, Standard Methods of Tests of Fire Endurance of Building Construction and Materials.

(2) Non–Fire-Rated Assemblies. Wiring located within the cavity of a non–fire-rated floor–ceiling or roof–ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided.

Exception: The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment where installed in accordance with the ceiling system manufacturer's instructions.

(B) Raceways Used as Means of Support. ((~~Raceways shall only be used as a means of support for other raceways, cables, or nonelectric equipment under the following conditions:~~

~~(1) Where the raceway or means of support is identified for the purpose; or~~

~~(2) Where the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits; or~~

~~(3) Where the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires (fixtures) in accordance with 410.16(F)~~))

FPN: See WAC 296-46B-300 011, Support of raceways, cables, or boxes in suspended ceilings.

(C) Cables Not Used as Means of Support. Cable wiring methods shall not be used as a means of support for other cables, raceways, or nonelectrical equipment.

Section 45. Section 300.17 of the National Electrical Code, 2002 edition, is amended as follows:

300.17 Number and Size of Conductors in Raceway. The number and size of conductors in any raceway shall not be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors without damage to the conductors or to their insulation.

FPN No. 1: See WAC 296-46B-300 017, Conductors in Raceway.

FPN No.2: See the following sections of this Code: intermediate metal conduit, 342.22; rigid metal conduit, 344.22; flexible metal conduit, 348.22; liquidtight flexible metal conduit, 350.22; rigid nonmetallic conduit, 352.22; liquidtight nonmetallic flexible conduit, 356.22; electrical metallic tubing, 358.22; flexible metallic tubing, 360.22; electrical nonmetallic tubing, 362.22; cellular concrete floor raceways, 372.11; cellular metal floor raceways, 374.5; metal wireways, 376.22; nonmetallic wireways, 378.22; surface metal raceways, 386.22; surface nonmetallic raceways 388.22; underfloor raceways, 390.5; fixture wire, 402.7; theaters, 520.6; signs, 600.31(C); elevators, 620.33; audio signal processing, amplification, and reproduction equipment, 640.23(A) and 640.24; Class 1, Class 2, and Class 3 circuits, Article 725; fire alarm circuits, Article 760; and optical fiber cables and raceways, Article 770.

Section 46. Section 300.21 of the National Electrical Code, 2002 edition, is 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 made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating. All out-of-service cable shall be removed from accessible ceiling spaces.

FPN: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance-rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 300.21 can be found in building codes, fire resistance directories, and product listings.

Section 47. Section 314.1 of the National Electrical Code, 2002 edition, is amended as follows:

314.1 Scope. This article covers the installation and use of all boxes and conduit bodies used as outlet, device, junction, or pull boxes, depending on their use, and manholes and other electric enclosures intended for personnel entry. Cast, sheet metal, nonmetallic, and other boxes such as FS, FD, and larger boxes are not classified as conduit bodies. This article also includes installation requirements for fittings used to join raceways and to connect raceways and cables to boxes and conduit bodies.

FPN: See Section 1206 of the Seattle Building Code for location of outlet boxes in sound transmission control assemblies.

Section 48. Section 314.15 of the National Electrical Code, 2002 edition, is amended as follows:

314.15 Damp, Wet, or Hazardous (Classified) Locations.

(A) Damp or Wet Locations. In damp or wet locations, boxes, conduit bodies, and fittings shall be placed or equipped so as to prevent moisture from entering or accumulating within the box, conduit body, or fitting. Boxes, conduit bodies, and fittings installed in wet locations shall be listed for use in wet locations.

FPN No. 1: For boxes in floors, see 314.27(C).

FPN No. 2: For protection against corrosion, see 300.6.

FPN No. 3: See WAC 296-46B-314 001(1), Boxes and fittings.

(B) Hazardous (Classified) Locations. Installations in hazardous (classified) locations shall conform to Articles 500 through 517.

Section 49. Section 314.29 of the National Electrical Code, 2002 edition, is amended as follows:

314.29 Boxes and Conduit Bodies to Be Accessible. Boxes and conduit bodies shall be installed so that the wiring contained in them can be rendered accessible without removing any part of the building or, in underground circuits, without excavating sidewalks, paving, earth, or other substance that is to be used to establish the finished grade. Conduit bodies, junction, pull and outlet boxes shall be installed so that the wiring contained in them can be located without removing any part of the building structure, including insulation material.

Exception: Listed boxes shall be permitted where covered by gravel, light aggregate, or noncohesive granulated soil if their location is effectively identified and accessible for excavation.

Section 50. Section 326.10 of the National Electrical Code, 2002 edition, is amended as follows:

326.10 Uses Permitted. Type IGS cable shall be permitted for use under ground, including direct burial in the earth, as the following:

(1) ((~~Service-entrance conductors~~))

(2) Feeder or branch-circuit conductors

Section 51. Section 330.10 of the National Electrical Code, 2002 edition, is amended as follows:

330.10 Uses Permitted.

(A) General Uses. 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

(5) Direct buried where identified for such use

(6) In cable tray

(7) In any 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, 504, and 505

(11) In dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations

(12) In wet locations where any of the following conditions are met:

a. The metallic covering is impervious to moisture.

b. A lead sheath or moisture-impervious jacket is provided under the metal covering.

c. The insulated conductors under the metallic covering are listed for use in wet locations.

(13) Where single-conductor cables are used, all phase conductors and, where used, the neutral conductor shall be grouped together to minimize induced voltage on the sheath.

(B) Specific Uses. Type MC cable shall be installed in compliance with Articles 300, 490, 725, and 770.52 as applicable and in accordance with 330.10(B)(1) through (B)(4).

(1) Cable Tray. Type MC cable installed in cable tray shall comply with Article 392.

(2) Direct Buried. Direct-buried cable shall comply with 300.5 or 300.50, as appropriate.

(3) Installed as Service-Entrance Cable. Type MC cable installed as service-entrance cable shall comply with Article 230.

(4) 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 396.

Section 52. Section 334.10 of the National Electrical Code, 2002 edition, is amended as follows:

334.10 Uses Permitted. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

(1) One- and two-family dwellings.

(2) Multifamily dwellings ((~~permitted to be~~)) of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

(3) Other structures ((~~permitted to be~~)) of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

FPN No. 1: Building constructions are defined in ((~~NFPA 220-1999, *Standard on Types of Building Construction*, or the applicable building code, or both~~)) the Seattle Building Code.

((~~FPN No. 2: See Annex E for determination of building types [NFPA 220, Table 3-1].~~))

(4) Cable trays, where the cables are identified for the use.

FPN: See 310.10 for temperature limitation of conductors.

(A) Type NM. Type NM cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in normally dry locations except as prohibited in 334.10(3).

(2) To be installed or fished in air voids in masonry block or tile walls

(B) Type NMC. Type NMC cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in dry, moist, damp, or corrosive locations, except as prohibited in 334.10(3)

(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 1.59 mm (1/16 in.) thick and covered with plaster, adobe, or similar finish

(C) Type NMS. Type NMS cable shall be permitted as follows:

(1) For ((~~both exposed and~~)) concealed work in normally dry locations except as prohibited in 334.10(3)

(2) To be installed or fished in air voids in masonry block or tile walls

(3) To be used as permitted in Article 780

Section 53. Section 334.15 of the National Electrical Code, 2002 edition, is amended as follows:

334.15 Exposed Work. In exposed work, except as provided in 300.11(A), the cable shall be installed as specified in 334.15(A) through (C).

(A) ((~~To Follow Surface. The cable shall closely follow the surface of the building finish or of running boards.~~)) Work Considered as Concealed. Nonmetallic-sheathed cable shall be considered as concealed where installed in inaccessible void areas of buildings or where run between or through bored holes of studs, joists and similar members as required in Section 300.4. 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, Schedule 80 PVC rigid nonmetallic conduit, pipe, guard strips, listed surface metal or nonmetallic raceway, or other means. ((~~Where passing through a floor, the cable shall be enclosed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC rigid nonmetallic conduit, listed surface metal or nonmetallic raceway, or other metal pipe extending at least 150 mm (6 in.) 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 it is protected from physical damage by the use of running boards, conduit, guard strips or other approved means as required in Section 334.23

Exception No. 2: Exposed nonmetallic-sheathed cable that is properly supported 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) ((~~In Unfinished Basements.~~ ~~Where the cable is run at angles with joists in unfinished basements, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards.~~)) Unexcavated Spaces. Type NM 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 54. Section 334.40 of the National Electrical Code, 2002 edition, is amended as follows:

334.40 Boxes and Fittings.

(A) Boxes of Insulating Material. Nonmetallic outlet boxes shall be permitted as provided in 314.3.

(B) ((~~Devices of Insulating Material.~~ ~~Switch, outlet, and tap devices of insulating material shall be permitted to be used without boxes in exposed cable wiring and for rewiring in existing buildings where the cable is concealed and fished. Openings in such devices shall form a close fit around the outer covering of the cable, and the device shall fully enclose the part of the cable from which any part of the covering has been removed. Where connections to conductors are by binding-screw terminals, there shall be available as many terminals as conductors.~~)) Reserved.

(C) Devices with Integral Enclosures. Wiring devices with integral enclosures identified for such use shall be permitted as provided in 300.15(E).

Section 55. Section 338.10 of the National Electrical Code, 2002 edition, is amended as follows:

338.10 Uses Permitted.

(A) ((~~Service-Entrance Conductors.~~ ~~Service-entrance cable used as service-entrance conductors shall be installed as required by Article 230.~~

~~Type USE used for service laterals shall be permitted to emerge from the ground outside at terminations in meter bases or other enclosures where protected in accordance with 300.5(D)~~)). Reserved.

(B) Branch Circuits or Feeders.

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

(2) Grounded Conductor Not Insulated. Type SE service-entrance cable shall be permitted for use where the insulated conductors are used for circuit wiring and the uninsulated conductor is used only for equipment grounding purposes.

Exception: Uninsulated conductors shall be permitted as a grounded conductor in accordance with 250.140.

(3) 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.

(4) Installation Methods for Branch Circuits and Feeders.

(a) Interior Installations. In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Parts I and II of Article 334, excluding 334.80.

FPN: See 310.10 for temperature limitation of conductors.

(b) Exterior Installations. In addition to the provisions of this article, service-entrance cable used for feeders or branch circuits, where installed as exterior wiring, shall be installed as required by Article 225. The cable shall be supported in accordance with 334.30, unless used as messenger-supported wiring as allowed by Article 396.

Type USE cable shall be installed outside in accordance with the provisions of Article 340. Where Type USE cable emerges from the ground at terminations, it shall be protected in accordance with 300.5(D). Multiconductor service-entrance cable shall be permitted to be installed as messenger-supported wiring in accordance with Articles 225 and 396.

Section 56. Section 358.10 of the National Electrical Code, 2002 edition, is amended as follows:

358.10 Uses Permitted.

(A) Exposed and Concealed. The use of EMT shall be permitted for both exposed and concealed work.

(B) Corrosion Protection. Ferrous or nonferrous EMT, elbows, couplings, and fittings shall be permitted to be installed in concrete((~~, in direct contact with the earth,~~)) above grade or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.

(C) Wet Locations. All supports, bolts, straps, screws, and so forth shall be of corrosion-resistant materials or protected against corrosion by corrosion-resistant materials.

Circuits installed in electrical metallic tubing in wet locations shall use equipment grounding wires sized according to Section 250.122.

FPN: See 300.6 for protection against corrosion.

Section 57. Section 382 of the National Electrical Code, 2002 edition, is repealed.

Section 58. Section 394.12 of the National Electrical Code, 2002 edition, is amended as follows:

394.12 Uses Not Permitted. Concealed knob-and-tube wiring shall not be used in the following:

(1) Commercial garages

(2) Theaters and similar locations

(3) Motion picture studios

(4) Hazardous (classified) locations

(5) Hollow spaces of walls, ceilings, and attics where such spaces are insulated by loose, rolled, or foamed-in-place insulating material that envelops the conductors

FPN: See WAC 296-46B-394 001, Knob and Tube Wiring, for insulating voids in spaces containing existing knob and tube wiring.

Section 59. Section 404.3 of the National Electrical Code, 2002 edition, is amended as follows:

404.3 Enclosure.

(A) General. 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 312.6.

((~~*Exception No. 1: Pendant and surface-type snap switches and knife switches mounted on an open-face switchboard or panelboard shall be permitted without enclosures.*~~

~~*Exception No. 2: Switches and circuit breakers installed in accordance with 110.27(A)(1), (2), (3), or (4) shall be permitted without enclosures.*~~))

(B) Used as a Raceway. Enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless the enclosure complies with 312.8.

Section 60. Section 404.10 of the National Electrical Code, 2002 edition, is amended as follows:

404.10 Mounting of Snap Switches.

(A) ((~~**Surface-Type.** Snap switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm (½ in.) from the surface wired over.~~)) Reserved.

(B) Box Mounted. Flush-type snap switches mounted in boxes that are set back of the wall surface as permitted in 314.20 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 from it shall be installed so that the mounting yoke or strap of the switch is seated against the box.

Section 61. Section 404.13 of the National Electrical Code, 2002 edition, is amended as follows:

404.13 Knife Switches.

(A) Isolating Switches. Knife switches rated at over 1200 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 1200 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 404.13(A) and (B) 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) Interlocking. All switches shall be of the interlocking type to prevent the door from being opened when the circuit is energized. All switches used as service disconnecting means and those rated over 300 volts shall be of the two-way interlocking type.

Section 62. The National Electrical Code, 2002 edition, is amended by adding Sections 450.19 and 450.20 as follows:

450.19 Location and Construction.

(A) Location of Pad-Mounted Transformers. See WAC 296-46B-450 027 (1) and Figures 450-1 and 450-2.

(B) Total Underground Transformers. See WAC 296-46B-450(2), except that enclosures for total underground transformers shall not be located within 10 feet of a doorway or fire escape.

(C) Transformer Vault Construction. See the Seattle Building Code, Section 414 and Appendix Chapter 4 for construction requirements for public and private transformer vaults.

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 NEC.

Section 63. Article 450, Part III of the National Electrical Code, 2002 edition, is amended as follows:

III. Transformer Vaults

Section 450.41 through 450.48 are not adopted. See Seattle Building Code Section 414 and Appendix Chapter 4 for requirements for private and utility transformer vaults.

Section 64. Sections 450.41 through 450.48 of the National Electrical Code, 2002 edition, are repealed.

Section 65. Section 553.4 of the National Electrical Code, 2002 edition, is amended as follows:

553.4 Location of Service Equipment. The service equipment for a floating building shall be located adjacent to, but not in or on, the building.

Exception: In existing situations, the service equipment may be located in or on the building by special permission.

Section 66. A new Section 555.24 is added to the National Electrical Code, 2002 edition, as follows:

555.24 Luminaires Required. All walkways over water shall be illuminated to provide safe access. All luminaires shall be listed for the use.

Section 67. Section 620.5 of the National Electrical Code, 2002 edition, is amended as follows:

620.5 Working Clearances. Working space shall be provided about controllers, disconnecting means, and other electrical equipment. The minimum working space shall not be less than that specified in ((~~110.26(A)~~)) the Seattle Building Code, Section 3016.3.

((~~Where conditions of maintenance and supervision ensure that only qualified persons examine, adjust, service, and maintain the equipment, the clearance requirements of 110.26(A) shall be waived as permitted in 620.5(A) through (D).~~

~~**(A) Flexible Connections to Equipment.** Electrical equipment in (1) through (4) shall be permitted to be provided with flexible leads to all external connections so that it can be repositioned to meet the clear working space requirements of 110.26(A).~~

~~(1) Controllers and disconnecting means for dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts installed in the same space with the driving machine~~

~~(2) Controllers and disconnecting means for elevators installed in the hoistway or on the car~~

~~(3) Controllers for door operators~~

~~(4) Other electrical equipment installed in the hoistway or on the car~~

~~**(B) Guards.** Live parts of the electrical equipment are suitably guarded, isolated, or insulated, and the equipment can be examined, adjusted, serviced, or maintained while energized without removal of this protection.~~

~~FPN: See definition of Exposed in Article 100.~~

~~**(C) Examination, Adjusting, and Servicing.** Electrical equipment is not required to be examined, adjusted, serviced, or maintained while energized.~~

~~**(D) Low Voltage.** Uninsulated parts are at a voltage not greater than 30 volts rms, 42 volts peak, or 60 volts dc.~~

The clear working space in front of a disconnecting means shall be not less than 1220 mm (48 inches) in depth and 760 mm (30 inches) in width.

Elevator machine rooms are required to have not less than 7 feet 0 inches of headroom, per ASME A17.1, Rule 101.4.

Section 68. Section 620.21 of the National Electrical Code, 2002 edition, is amended as follows:

620.21 Wiring Methods. Conductors and optical fibers located in hoistways, in escalator and moving walk wellways, in wheelchair lifts, stairway chair lift runways, machinery spaces, control spaces, in or on cars, in machine rooms and control rooms, not including the traveling cables connecting the car or counterweight and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, rigid nonmetallic conduit, or wireways, ((~~or shall be Type MC, MI, or AC cable~~)) unless otherwise ((~~permitted~~)) specified in 620.21(A) through (C).

Type MC cable or Type MI cable may be permitted to be installed in elevator spaces only by special permission.

(A) Elevators.

(1) Hoistways.

(a) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in hoistways between risers and limit switches, interlocks, operating buttons, and similar devices. Flexible conduit runs are limited to 1.8 m (6 ft) in length.

(b) ((~~Cables used in Class 2 power-limited circuits shall be permitted to be installed between risers and signal equipment and operating devices, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Feeders shall be permitted inside the hoistway for elevators with driving machine motors located in the hoistway or on the car or counterweight.

(c) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) Nonmetallic raceways and wireways shall not be installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted in the hoistway, in lengths not to exceed 1.8 m (6 ft), without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(2) Cars.

(a) Nonmetallic raceways and wireways shall not be installed on cars located in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding ((~~1.8 m (6 ft)~~)) 915 mm (3 ft) in length, shall be permitted on cars where located so as to be free from oil and if securely fastened in place. Flexible conduit shall not be located where it can be walked on or damaged.

~~((Exception: Liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, as defined by 356.2, shall be permitted in lengths in excess of 1.8 m (6 ft).))~~

(b) Hard-service cords and junior hard-service cords that conform 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 the portable-type top-of-car operating devices or the car-top work lights. Devices or luminaires (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.

(c) ((~~Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(d) Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted on the car assembly, in lengths not to exceed ((~~1.8 m (6 ft)~~)) 915 mm (3 ft) without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves.

~~((Exception: Liquidtight flexible nonmetallic conduit metric designator 12 (trade size ⅜) or larger, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).))~~

(b) 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 1.8 m (6 ft) 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.

(c) ((~~Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(d) On existing or listed equipment, 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 900 mm (3 ft) and located so as to be protected from physical damage.

(4) Counterweight. Nonmetallic raceways and wireways shall not be installed on counterweights installed in hoistways required to be of noncombustible fire resistive construction. Flexible metal conduit, liquidtight flexible metal conduit, liquidtight flexible nonmetallic conduit or flexible cords and cables, or conductors grouped together and taped or corded that are part of listed equipment, a driving machine, or a driving machine brake shall be permitted on the counterweight assembly, in lengths not to exceed 1.8 m (6 ft) without being installed in a raceway and where located to be protected from physical damage and are of a flame-retardant type.

(B) Escalators.

(1) Wiring Methods. Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in escalator and moving walk wellways. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size ⅜) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size ⅜), nominal, or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) ((~~**Class 2 Circuit Cables.** Cables used in Class 2 power-limited circuits shall be permitted to be installed within escalators and moving walkways, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.~~)) Reserved.

(3) Flexible Cords. Hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections on escalators and 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 620.5.

(C) Wheelchair Lifts and Stairway Chair Lift Raceways.

(1) Wiring Methods. Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in wheelchair lifts and stairway chair lift runways and machinery spaces. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size ⅜) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size ⅜) or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) Class 2 Circuit Cables. Traveling ((C))cables used in Class 2 power-limited circuits shall be permitted to be installed within wheelchair lifts and stairway chair lift runways and machinery spaces, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

Section 69. Section 620.22 of the National Electrical Code, 2002 edition, is amended as follows:

620.22 Branch Circuits for Car Lighting, Receptacle(s), Ventilation, Heating, and Air Conditioning.

(A) Car Light Source. A separate branch circuit shall supply the car lights, receptacle(s), auxiliary lighting power source, and ventilation on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space.

Required lighting shall not be connected to the load side terminals of a ground-fault circuit-interrupter receptacle(s).

(B) Air-Conditioning and Heating Source. A dedicated branch circuit shall supply the air-conditioning and heating units on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space.

Section 70. Section 620.44 of the National Electrical Code, 2002 edition, is amended as follows:

620.44 Installation of Traveling Cables. Traveling cable shall be permitted to be run without the use of a raceway for a distance not exceeding 1.8 m (6 ft) in length as measured from the first point of support on the elevator car or hoistway wall, or counterweight where applicable, provided the conductors are ((~~grouped together and taped or corded, or~~)) in the original sheath.

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

Section 71. Section 620.51 of the National Electrical Code, 2002 edition, is amended as follows:

620.51 Disconnecting Means. A single means for disconnecting all ungrounded main power supply conductors for each unit shall be provided and be designed so that no pole can be operated independently. Where multiple driving machines are connected to a single elevator, escalator, moving walk, or pumping unit, there shall be one disconnecting means to disconnect the motor(s) and control valve operating magnets.

The disconnecting means for the main power supply conductors shall not disconnect the branch circuit required in 620.22, 620.23, and 620.24.

(A) Type. The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker capable of being locked in the open position. The disconnecting means shall be a listed device.

FPN: For additional information, see ASME/ANSI A17.1-1996, *Safety Code for Elevators and Escalators.*

Exception: Where an individual branch circuit supplies a wheelchair lift, the disconnecting means required by 620.51(C)(4) shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be capable of being locked in the open position.

(B) Operation. No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to ((~~automatically~~)) open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.

FPN: To reduce hazards associated with water on live elevator electrical equipment.

(C) Location. The disconnecting means shall be located where it is readily accessible to qualified persons.

(1) On Elevators Without Generator Field Control. On elevators without generator field control, the disconnecting means shall be located within sight of the motor controller. Driving machines or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power supply conductors shall be provided and be capable of being locked in the open position.

(2) On Elevators with Generator Field Control. On elevators with generator field control, the disconnecting means shall be located within sight of the motor controller for the driving motor of the motor-generator set. Driving machines, motor-generator sets, or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine or the motor-generator set is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power supply conductors shall be provided and be capable of being locked in the open position.

(3) On Escalators and Moving Walks. On escalators and moving walks, the disconnecting means shall be installed in the space where the controller is located.

(4) On Wheelchair Lifts and Stairway Chair Lifts. On wheelchair lifts and stairway chair lifts, the disconnecting means shall be located within sight of the motor controller.

(D) Identification and Signs. Where there is more than one driving machine in a machine room, the disconnecting means shall be numbered to correspond to the identifying number of the driving machine that they control.

The disconnecting means shall be provided with a sign to identify the location of the supply side overcurrent protective device.

(E) Automatic Power Disconnect Device Control Circuit. The control circuit for a required automatic power disconnect device or shunt trip shall be derived either from:

(1) Within the disconnecting means enclosure when the shunt trip circuit equipment is a part of the listed assembly and the control circuit controls only the disconnect(s) within the listed equipment; or

(2) A dedicated circuit from an appropriate panelboard located in the machine room.

Section 72. Section 620.71 of the National Electrical Code, 2002 edition, is 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 space set aside for that purpose unless otherwise permitted in 620.71(A) or (B). The room or space 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 and wiring that pertain to the elevator and its operation are permitted in these elevator spaces. See Section 3022 of the Seattle Building Code.

Elevator motor controllers and driving machines may be permitted inside the hoistway by special permission.

(A) Motor Controllers. Motor controllers shall be permitted outside the spaces herein specified, provided they are in enclosures with doors or removable panels that are capable of being locked in the closed position and the disconnecting means is located adjacent to or is an integral part of the motor controller. Motor controller enclosures for escalator or moving walks shall be permitted in the balustrade on the side located away from the moving steps or moving treadway. If the disconnecting means is an integral part of the motor controller, it shall be operable without opening the enclosure.

(B) Driving Machines. Elevators with driving machines located on the car, on the counterweight, or in the hoistway, and driving machines for dumbwaiters, wheelchair lifts, and stairway lifts shall be permitted outside the spaces herein specified.

Section 73. Section 680.40 of the National Electrical Code, 2002 edition, is amended as follows:

680.40 General. Electrical installations at spas and hot tubs shall comply with the provisions of Part I and Part IV of this article.

FPN: See also WAC296-46B-680, Special Equipment – Swimming pools, fountains and similar installations, for additional requirements.

Section 74. Section 700.1 of the National Electrical Code, 2002 edition, is amended as follows:

700.1 Scope.

(A) The provisions of this article apply to the electrical safety of the installation, operation, and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination, power, or both, to required facilities when the normal electrical supply or system is interrupted.

Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life.

FPN No. 1: For further information regarding wiring and installation of emergency systems in health care facilities, see Article 517.

FPN No. 2: For further information regarding performance and maintenance of emergency systems in health care facilities, see NFPA 99-1999, *Standard for Health Care Facilities.*

FPN No. 3: Emergency systems are generally installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons, such as hotels, theaters, sports arenas, health care facilities, and similar institutions. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, fire detection and alarm systems, elevators, fire pumps, public safety communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.

FPN No. 4: For specification of locations where emergency lighting is considered essential to life safety, see NFPA 101®-2000, *Life Safety Code®.*

FPN No. 5: For further information regarding performance of emergency and standby power systems, see NFPA 110-1999, *Standard for Emergency and Standby Power Systems.*

FPN No. 6: See Seattle Building Code Section 1003 for means of egress identification and illumination requirements.

(B) Permitted Loads for the Emergency System. The power sources listed in section 700.12 (B), (C), or (D), are permitted for the emergency circuits for the following systems:

(1) Exit and egress lighting

(2) Fire alarm system

(3) Fire pump(s) (when the fire pump system requires an emergency source of power)

In addition, the following loads shall be installed on the emergency system when required by the Seattle Fire Code or the Seattle Building Code:

(1) Ventilation: Required air pressurization, smoke removal, supply air, direct digital control (DDC) systems and other environmental control systems.

(2) Communication Systems: Communication systems required for security notification, Fire Department use, and rescue operations.

(3) Other emergency circuits specifically approved by the Seattle Fire Department or the building official.

(4) Other emergency circuits as may be specifically required by the Seattle Fire Code or the Seattle Building Code.

Section 75. Section 700.4 of the National Electrical Code, 2002 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 of 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 ensure the systems are maintained 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.

FPN: For testing and maintenance procedures of emergency power supply systems (EPSSs), see NFPA 110-1999, *Standard for Emergency and Standby Power Systems*.

Section 76. Section 700.9 of the National Electrical Code, 2002 edition, is amended as follows:

700.9 Wiring, Emergency System.

(A) Identification. All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system.

FPN: See WAC 296-46B-700 009 (4) for device and junction box identification requirements.

(B) Wiring. Wiring of two or more emergency circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet. Wiring from an emergency source or emergency source distribution overcurrent protection to emergency loads shall be kept entirely independent of all other wiring and equipment, unless otherwise permitted in (1) through (4):

(1) Wiring from the normal power source located in transfer equipment enclosures

(2) Wiring supplied from two sources in exit or emergency luminaires (lighting fixtures)

(3) Wiring from two sources in a common junction box, attached to exit or emergency luminaires (lighting fixtures)

(4) Wiring within a common junction box attached to unit equipment, containing only the branch circuit supplying the unit equipment and the emergency circuit supplied by the unit equipment

(C) Wiring Design and Location. Emergency wiring circuits shall be designed and located so as to minimize the hazards that might cause failure due to flooding, fire, icing, vandalism, and other adverse conditions.

(D) Fire Protection. Emergency systems shall meet the following additional requirements in assembly occupancies for not less than 1000 persons or in buildings above 23 m (75 ft) in height with any of the following occupancy classes: assembly, educational, residential, detention and correctional, business, and mercantile.

(1) Feeder-Circuit Wiring. Feeder-circuit wiring shall meet one of the following conditions:

(1) Be installed with buildings that are fully protected by an approved automatic fire suppression system

(2) Be a listed electrical circuit protective system with a minimum 1-hour fire rating

(3) Be protected by a listed thermal barrier system for electrical system components

(4) Be protected by a fire-rated assembly listed to achieve a minimum fire rating of 1 hour

(5) Be embedded in not less than 50 mm (2 in.) of concrete

(6) Be a cable listed to maintain circuit integrity for not less than 1 hour when installed in accordance with the listing requirements

(2) Feeder-Circuit Equipment. Equipment for feeder circuits (including transfer switches, transformers, and panelboards) shall be located either in spaces fully protected by approved automatic fire suppression systems (including sprinklers, carbon dioxide systems) or in spaces with a 1-hour fire resistance rating.

FPN: For the definition of occupancy class, see 4.1 of NFPA 101-2000, Life Safety Code.

Section 77. Section 700.16 of the National Electrical Code, 2002 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 designed and installed so that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space that 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.

Exit signs with open bottom lighting shall not be used in lieu of a required pathway light unless specifically approved for the purpose.

Exit illumination (pathway lighting) and emergency area lighting shall comply with Chapter 10 of the Seattle Building Code.

Exception: Alternative means that ensure emergency lighting illumination level is maintained shall be permitted when pre-approved by the building official.

Section 78. Section 701.10 of the National Electrical Code, 2002 edition, is amended as follows:

701.10 Wiring Legally Required Standby Systems. ((~~The~~)) For shaft pressurization installed according to exception 2 of Section 905.2.1 of the Seattle Building Code, the legally required standby system wiring shall be kept entirely independent of all other wiring and equipment and shall not enter the same raceway, cable, box, or cabinet with other wiring. Other legally required standby system wiring shall be permitted to occupy the same raceways, cables, boxes, and cabinets with other general wiring.

Section 79. Section 760.10 of the National Electrical Code, 2002 edition, is amended as follows:

760.10 Fire Alarm Circuit Identification. Fire alarm circuits shall be identified at terminal and junction locations, in a manner that will prevent unintentional interference with the signaling circuit during testing and servicing.

FPN: See WAC 296-46B-700 009 (3) for device and junction box identification requirements.

Section 80. Severability. The provisions of this ordinance are declared to be separate and severable. The invalidity of any clause, sentence, paragraph, sub-division, section or portion of this ordinance, or the invalidity of the application thereof to any person or circumstance shall not affect the validity of the remainder of this ordinance, or the validity of its application to other persons or circumstances.

Section 81. This ordinance shall take effect and be in force thirty (30) days from and after its approval by the Mayor, but if not approved and returned by the Mayor within ten (10) days after presentation, it shall take effect as provided by the Municipal Code Section 1.04.020.

Passed by the City Council the _____ day of _____, 2003 and signed by me in open session in authentication of its passage this _____ day of _____, 2003.

_____
President _____ of the City Council

Approved by me this _____ day of _____, 2003.

_____
Greg Nickels, Mayor

Filed by me this _____ day of _____, 2003.

_____
City Clerk

(SEAL)

Exhibit A: Summary and Comparison of 2003 Seattle Electrical Code provisions in relation to the 2003 Washington State Electrical Code, Chapter 296-46B Washington Administrative Code (WAC)

Exhibit B: NFPA 70, National Electrical Code®, 2002 Edition

Michael Aoki-Kramer/mak
2002 Edition Seattle Electrical Code 4.doc
6/30/2003
Version 4

ORDINANCE _____

AN ORDINANCE relating to building and construction codes: repealing Section 22.300.015 of the Seattle Municipal Code (Ordinance 119507), and adopting a new Section 22.300.016 to adopt the 2002 National Electrical Code with Seattle amendments as the Seattle Electrical Code.

WHEREAS, Chapter 19.28, Revised Code of Washington grants local jurisdictions the authority to adopt regulations applicable to electrical installations that differ from regulations adopted by the state; and

WHEREAS, the Mayor and City Council of the City of Seattle affirm the findings of the Department of Planning and Development, as set forth in Exhibit A, that the 2003 Seattle Electrical Code provides an equal, higher, or better standard of construction and an equal, higher, or better standard of materials, devices, appliances, and equipment than the regulations adopted by the Washington State Department of Labor and Industries amending the 2002 National Electrical Code, as set forth at Chapter 296-46B Washington Administrative Code; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. Section 22.300.015 of the Seattle Municipal Code adopting the 1996 National Electrical Code as adopted in Ordinance 119507is hereby repealed, and a new Section 22.300.016 is added to the Seattle Municipal Code to read as follows:

22.300.016 Adoption of the National Electrical Code.

The National Electrical Code, 2002 edition, published by the National Fire Protection Association, one copy of which is filed with the City Clerk in C.F. 306325, is hereby adopted and by this reference made a part of this subtitle. The National Electrical Code, 2002 edition, together with the amendments and additions thereto adopted by this ordinance, constitute the Seattle Electrical Code.

Section 2. The National Electrical Code, 2002 edition, is amended by adding Chapters 1, 2 and 3 as follows:

CHAPTER 1
APPLICATION OF THIS CODE

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

Section 102.1 Purpose. The purpose of this code is to promote public safety in a practical manner from hazards arising from the use of electricity. This code is intended to provide 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. This code is not intended as a design specification nor an instruction manual for untrained persons.

Section 102.2 Chapter 296-46B Washington Administrative Code. 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). Those sections of the Washington State Electrical Code amending the National Electric Code, as set forth at Chapter 296-46B of the Washington Administrative Code (WAC), are adopted except those sections that are amended by or are in conflict with this code. The following administrative sections of Chapter 296-46B WAC are superseded by this code: WAC 296-46B-010 (1) – (13), (15), (16), (19), (20), (23), (24); and WAC 296-46B-030.

Section 103 Scope. The Electrical Code shall apply to all electrical wiring and equipment, including communications systems, 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 service point 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.

Section 104 APPLICATION TO EXISTING BUILDINGS

(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. This section does not limit the effect of applicable retroactive ordinances.

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, other than for the replacement of receptacles as provided in NEC Section 406.3(D), 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 detrimental to public safety.

(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 required by this code or 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 owner's agent to maintain in a safe and usable condition all parts of buildings or equipment that 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 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 that, 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 that has been designated for preservation by City Landmarks Preservation Board or the State of Washington; has been listed, or has been determined eligible to be listed, in 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 special review 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 compliance with those standards within one year from the date of permit issuance and is found to be a public nuisance may be abated.

Buildings wired by standards other than those recognized by this code and the National Electrical Code are not in compliance with these provisions.

Section 105 Tests. 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 to be made, at no expense to the City, as proof of compliance.

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. The building official shall retain reports of tests.

Section 106 Utilization Equipment and Alternate Materials and Methods of Wiring. This code does not prevent the use of any utilization equipment, material, method or design of wiring not specifically allowed or prohibited by this code, provided the same has been approved and its use authorized by the building official.

The building official may approve an alternate, provided he/she finds that the proposed alternate complies with the provisions of this code and the alternate, when considered together with other safety features or relevant circumstances, will provide at least an equivalent level of strength, effectiveness, fire resistance, durability, safety and sanitation.

The building official may require that sufficient evidence or proof be submitted to substantiate any claims regarding the use or suitability of utilization equipment, material, method or design of wiring. The building official may, but is not required to, record the approval of alternate materials and methods, and any relevant information in the files of the building official or on the approved permit plans. This section supersedes the requirements of WAC 296-46B-030.

Section 107 Modifications. 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 the strict application of this code is impractical under the circumstances 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 building official may, but is not required to, record the approval of modifications and any relevant information in the files of the building official or on the approved permit plans.

CHAPTER 2
ORGANIZATION AND ENFORCEMENT

Section 201 Authority. 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 Planning and Development, and his or her designees.

Section 202 POWERS AND DUTIES OF THE BUILDING OFFICIAL

(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 Planning and Development.

(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 general public safety. 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 that 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.

(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.

Section 203 Unsafe Conditions. 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 is authorized to 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.

Section 204 VIOLATIONS AND PENALTIES

(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) Notice of Violation. If after investigation the building official determines that standards or requirements of this code have been violated, the building official may serve a notice of violation upon the owner or other person responsible for the action or condition. The notice of violation shall state the standards or requirements violated, shall state what corrective action, if any, is necessary to comply with the standards or requirements, and shall set a reasonable time for compliance. The notice shall be served upon the owner or other responsible person by personal service, certified mail with return receipt requested or registered mail with return receipt requested or registered mail addressed to the last known address of such person. In addition, a copy of the notice may be posted at a conspicuous place on the property. The notice of violation shall be considered an order of the building official. Nothing in this subsection shall be deemed to limit or preclude any action or proceeding pursuant to this code, and nothing in this section shall be deemed to obligate or require the building official to issue a notice of violation prior to the imposition of civil or criminal penalties in this section.

(C) 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.

(D) 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 Section 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.

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

Section 205 Notices. 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.

Section 206 Rules of the Building Official

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

(1) "Electrical Wiring Standards" to promulgate standards that are acceptable as a method or as an alternative design for meeting code required performance criteria, to edit or update national standards that 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 that 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 Seattle Municipal Code.

Section 207 Construction Codes Advisory Board. An Electrical Code Committee of the Construction Codes Advisory Board, as established in Section 105 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 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.

Section 208 Appeals. 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.

Section 209 Review by the Director.

209.1 Any party affected by a notice of violation issued by the Director pursuant to Section 204(B) may obtain a review of the notice by requesting such review in writing within ten days after service of the notice. When the last day of the period computed is a Saturday, Sunday, federal or City holiday, the period shall run until 5:00 p.m. of the next business day. Upon receipt of a request, the Director shall notify the person requesting the review of the date, time and place of the Director's review. The review shall be not less than ten nor more than twenty days after the request is received, unless otherwise agreed by the person requesting the review. Any person affected by the notice of violation may submit any written material to the Director for consideration on or before the date of the review.

209.2 The review will consist of an informal review meeting held at the Department. A representative of the Director who is familiar with the case and the applicable ordinances will attend. The Director's representative shall explain the reasons for the issuance of the notice of violation and will consider any information presented by the persons attending. At or after the review, the Director shall:

1. Sustain the notice of violation; or
2. Withdraw the notice of violation; or
3. Continue the review to a future date; or
4. Amend the notice of violation.

209.3 The Director shall issue a decision within a reasonable time after the conclusion of the review. The Director shall mail the decision by regular first class mail to the person or persons named in the notice of violation.

CHAPTER 3
PERMITS AND INSPECTIONS

Section 301 PERMITS

(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) Replacing flush or snap switches, fuses, lamp sockets, receptacles, or ballasts.

(2) Reconnecting or replacing a range within an individual dwelling unit, hot plate, water heater, electric baseboard, and wall-heating unit to a circuit that 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) Wiring for communication systems, as set forth in NEC Chapter 8 and Article 770, as follows:

(a) in single family residences, or

(b) installations of 1000 feet or less.

(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) Flood Hazard Areas. 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 filed in C.F. 295948, 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.

Section 302 APPLICATION AND PLANS

(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 or occupant in possession of the building or premises where the work is to be done, the name of the licensed contractor, if any, that will be responsible for the installation, and such other information as the building official may require. Application shall include documentation of compliance with the Seattle Energy Code. 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 the following:

(a) services or feeders of 400 amperes or over;

(b) all switches or circuit breakers rated 400 amperes or over;

(c) any proposed installation the scope of which covers more than 2,500 square feet

(d) any proposed installation which cannot be adequately described on the application form; and

(e) installations of emergency generators.

Exception: Plans and specifications shall not be required for installations in one- and two-family dwellings that can be adequately described on the application form.

Two sets of electrical plans shall be submitted with each electrical permit application for new or altered electrical installations in educational, institutional, and health or personal care occupancies as indicated in WAC 296-46B-010 (14), (17) and WAC 296-46B-010 Tables 010-1 and 010-2.

Exception: One set of electrical plans shall be submitted with each application when a service or feeder is new or altered and the sum of the equipment ampere rating is less than 200 amperes.

Three sets of plans and specifications for fire alarm systems shall be submitted. See Seattle Fire Code Section 1007.3.1 for required submittal information.

(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. 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.** Information on plans and specifications shall include the following:

a. The type of occupancy and a complete scope of work.

b. A complete riser and one line diagram to include all service and feeder connections.

c. Clear identification of all circuitry, to include but not limited to: circuit numbers, wire sizes, insulation types, conduit sizes and types.

d. A complete set of switchboard and panel schedules. These shall include all load calculations and demand factors used for computation.

e. A complete project load summary to include existing loads as computed in accordance with NEC Article 220 and all added loads. Electrical calculations, heat loss calculations and lighting summaries may be submitted on separate computation sheets.

f. Fault current calculations and the listed interrupting rating of all feeder and service equipment.

STATE OF WASHINGTON – KING COUNTY

--ss.

163923 No. ORDINANCE IN FULL
City of Seattle,Clerk's Office

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

CT:121286 ORD IN FULL

was published on

10/17/2003

MELISSA M. DOWD NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES NOV 21, 2007

Subscribed and sworn to before me on

10/17/2003

Notary public for the State of Washington,
residing in Seattle

those bonds, notes, or
tedness.

ions" includes struc-
to house or moor one
emergency services
ther apparatus, and
ilities in or associated
to accommodate the
and other emergency

includes facilities to
ing, and other admin-
functions such as but
ng fire alarms and fire
nvestigating fires, and
suing bonds, notes, or
btedness.

paredness" includes
d to reduce or mitigate
asters or to facilitate
such as but not limited
and other facilities for
irefighting, improving
rgency shelters, estab-
ncy operations center,
ipping caches of emer-

acquisition, construc-
of one or more fireboats
efighting or other emer-

of Additional Regular
mittal.

ubmits to the qualified
roposition as authorized
exceed the levy limita-
erty taxes contained in
roperty taxes levied in
for collection in 2004
ctively, for the sole pur-
$167,200,000 in aggre-
up to nine (9) years for
ty and other emergency
The proposition shall be
City shall not levy more
ive Million Dollars
first year, in addition to
ant of regular property
levied consistent with
V in the absence of this
to RCW 84.55.050(4), the
roperty taxes that may be
ollection in 2015 and in
omputed as if the limit on
as had not been increased
.

Levy Proceeds.

eeds shall be allocated to
ategories: Neighborhood
Facilities, Emergency
Marine. Total funding
for each category shall not
ive amounts identified in
unless the City in an ordi-
wo-thirds (2/3) vote of the
mines to change the allo-
eeds after the Council or a
public hearing and after
ers any recommendation
made by the Mayor or by
mmittee established in

nticipated Allocation of

Stations - $106,620,000

ies - $30,258,000

paredness - $18,698,000

34,000

00,000

rojects on which Levy
pent within each of the cat-
estimated amount of Levy
voted to each project, are
y Proceeds Allocations" col-
nt A. Total expenditure of
each project shall not exceed
vy Proceeds shown for that
ent A by more than ten per-
City Council approves the
iture by ordinance after the
ittee holds a public hearing

by the end of August, the
ies Department or its func-
he "Department") shall sub-
uncil a report on spending to
Proceeds and any interest
, and a proposed spending
xpected Levy Proceeds and
ings among the categories
e upcoming budget year, the
in which additional taxes
under this ordinance, and
ars in which the Department
evy Proceeds.

will design and build the fol-
re reasonably anticipated to
current LEED Silver rating.
propriation of sufficient funds
at rating while reasonably
sign objectives for each facil-

shall be subject to removal by the City Council for being absent without good cause from two (2) consecutive meetings or for moving his or her residence from Seattle, or for other cause. Others shall cease to be members if they no longer belong to the group from which selected. Vacancies shall be filled by the original selecting authority, provided that if a vacancy for the member who is an eligible fire fighter is not filled within 60 days, then the City Council president shall fill the vacancy from among eligible fire fighters. Members shall serve without pay but, at the option of the Director of Fleets and Facilities, the "Seattle resident" member may be reimbursed his or her expenses from Levy Proceeds, including payments for child care while attending meetings. The FFOC may adopt rules for its own procedures, including quorum requirements and the frequency of meetings. Meetings of the FFOC will be open to the public unless, had the FFOC been subject to chapter 42.30 RCW, that law would not have required that the meeting or portion of the meeting be open to the public.

Section 8. Election - Ballot Title. The City Council finds that an emergency exists that requires proposing the Levy Plan and requests that the Director of Records and Elections of King County, Washington, as ex officio Supervisor of Elections, find the existence of an emergency pursuant to RCW 29.13.020 and call and conduct a special election in the City in conjunction with the state general election to be held on November 4, 2003, for the purpose of submitting to the qualified electors of the City the proposition set forth below. The City Clerk is hereby authorized and directed to certify the proposition to the King County Director of Records and Elections in the following form:

THE CITY OF SEATTLE

PROPOSITION NUMBER 1

FIRE FACILITIES AND EMERGENCY RESPONSE LEVY

The City of Seattle's Proposition 1 concerns a levy for fire stations and other emergency response facilities.

If approved, this proposition would authorize Seattle to replace, remodel, expand, equip, or seismically strengthen fire stations, build new emergency response and training facilities, and acquire and remodel fire boats. It would lift the RCW 84.55 limit on regular property taxes, allowing $167,200,000 additional taxes over nine years, according to Ordinance 121230. Up to $25,000,000 could be collected in 2004. The 2004 total regular tax limit would be $3.71/$1,000 assessed value, including approximately $0.31 additional taxes.

Should this levy lid lift be approved?

Levy, Yes

Levy, No

Section 9. For purposes of receiving notice of the exact language of the ballot title required by RCW 29.27.0665, the City hereby designates the City Clerk as the individual to whom the Director of Records and Elections of King County, Washington, shall provide such notice.

Section 10. Any actions of officers or employees of the City or other governmental agencies prior to the effective date of this ordinance and consistent with its provisions, are hereby ratified and confirmed.

Section 11. This ordinance shall take effect and be in force immediately upon its approval by the Mayor or, if not approved and returned by the Mayor within ten (10) days after presentation, then on the eleventh (11th) day after its presentation to the Mayor or, if vetoed by the Mayor, then immediately upon its passage over his veto.

Passed by the City Council the 21st day of July, 2003, and signed by me in open session in authentication of its passage this 21st day of July, 2003.

Peter Steinbrueck

President of the City Council

Approved by me this 29th day of July, 2003.

Gregory J. Nickels, Mayor

Filed by me this 30th day of July, 2003.

Judith E. Pippin

City Clerk

Publication ordered by JUDITH PIPPIN, City Clerk

Date of first publication in the Seattle Daily Journal of Commerce, October 1, 2003.

1114(163662)

BANKRUPTCY NOTICES

Street SW #2, Mountlake Terrace, WA 98043, Ref 03-23286, filed on Oct 15. (Ch. 13)

Barbara Ann McAbee, 534-06-1461, 1434 Dogwood Hill SW, Port Orchard, WA 98366, Ref 03-23287, filed on Oct 15. (Ch. 7)

Kenneth W Worley, Margaret Worley, 532-30-2623, 535-72-3882, 1511 3rd St, Port Townsend, WA 98368, Ref 03-23288, filed on Oct 15. (Ch. 7)

Rodulfo Tagyobon Jumamil, Conchita C Jumamil, 607-46-0079, 532-33-2654, 3816 S 184th St, Seatac, WA 98188, Ref 03-23289, filed on Oct 15. (Ch. 7)

Sanjuana Sanjuana, 533-50-1693, 1111 SW Holden Street, Seattle, WA 98106, Ref 03-23290, filed on Oct 15. (Ch. 7)

Jo Ann Morris, 439-98-9580, 25515 32nd Place South, Kent, WA 98032, Ref 03-23291, filed on Oct 15. (Ch. 7)

Cody Day, 533-15-8078, 1311 Merritt Avenue, Enumclaw, WA 98022, Ref 03-23292, filed on Oct 15. (Ch. 7)

Andrea Yvonne Gitchell, 537-06-9589, 21841 SE 271st Street, Maple Valley, WA 98038, Ref 03-23293, filed on Oct 15. (Ch. 7)

Michael Bao O'Neil, Sophie O'Neil, 538-90-2698, 539-29-3542, 5252 237th Terrace SE, Issaquah, WA 98029, Ref 03-23294, filed on Oct 15. (Ch. 7)

Mary K D Webb, Andrew D Webb, 488-62-0744, 559-17-3618, 9012 17th Ave SW #4, Seattle, WA 98106, Ref 03-23295, filed on Oct 15. (Ch. 7)

Michael Daniel Connelly, 534-70-0376, 7703 46th Pl W, Mukilteo, WA 98275, Ref 03-23296, filed on Oct 15. (Ch. 7)

TySonia Rose McClain, 537-80-5709, 2225 S 112th St #D206, Seattle, WA 98168, Ref 03-23297, filed on Oct 15. (Ch. 7)

Ronald David Matula, 352-36-2211, PO Box 730, Tracyton, WA 98393, Ref 03-23298, filed on Oct 15. (Ch. 7)

David Alan Bell, 539-68-2783, 2309 Haines St, Port Townsend, WA 98368, Ref 03-23299, filed on Oct 15. (Ch. 7)

John R Schrengohst, 601-28-2797, 2022 Dexter Ave N #C, Seattle, WA 98109, Ref 03-23300, filed on Oct 15. (Ch. 7)

Donna Lee Pilon, 536-36-4221, 16048 19th Ave SW, Burien, WA 98166-2712, Ref 03-23301, filed on Oct 15. (Ch. 7)

Walter Preston Heyman, III, Tasha Renee Graviett-Heyman, 270-72-8292, 534-92-9530, 22921 - 30th Ave. S #105, Des Moines, WA 98198, Ref 03-23302, filed on Oct 15. (Ch. 7)

Aaron Miles Wenholz, 538-06-9340, 33010 17th Pl S Apt A207, Federal Way, WA 98003-6462, Ref 03-23303, filed on Oct 15. (Ch. 7)

Paul M. Mueller, 348-46-6046, 6827 39th Ave. NE, Seattle, WA 98115-0000, Ref 03-23304, filed on Oct 15. (Ch. 7)

Russell George Gamman, Lori Ann Gamman, 539-80-0601, 537-68-4311, 16741 39th Place, Seattle, WA 98155-0000, Ref 03-23305, filed on Oct 15. (Ch. 7)

Robert Donald Calhoun, 535-62-9844, 22120 NE 27th Pl, Sammamish, WA 98074, Ref 03-23306, filed on Oct 15. (Ch. 13)

Ray Lawrence Taylor, Naneta Ann Taylor, 533-30-7514, 489-44-7239, 1218 NE Patrick Ln, Oak Harbor, WA 98277, Ref 03-23307, filed on Oct 15. (Ch. 7)

Michael Fred Mengual, Paula Lynn Mengual, 334-40-1130, 553-76-0547, 32414 5th Ave, Black Diamond, WA 98010-9603, Ref 03-23308, filed on Oct 15. (Ch. 7)

Russell James Cummins, Cynthia Diane Cummins, 535-72-4679, 535-72-[illegible], 50704, filed on Oct 15. (Ch. 7)

Martin LeRay Mallars, Susan LeAnn Mallars, 530-76-0996, 530-86-3638, 116 Mulkey Ln, Ariel, WA 98603, Ref 03-50705, filed on Oct 15. (Ch. 7)

Evelyn E Stallone, 531-48-0258, 1414 S Cedar St, Tacoma, WA 98405, Ref 03-50706, filed on Oct 15. (Ch. 7)

John Glenn, Brenda Glenn, 519-68-9584, 561-98-3809, 2212 27th Ave SE, Puyallup, WA 98374, Ref 03-50707, filed on Oct 15. (Ch. 13)

Randy L Anderson, 552-25-1157, 1205 Marion #12, Centralia, WA 98531, Ref 03-50708, filed on Oct 15. (Ch. 7)

Jeffery L Gill Jr, Heidi L Gill, 531-96-2539, 537-08-4480, 15607 65th Ave E, Puyallup, WA 98375, Ref 03-50709, filed on Oct 15. (Ch. 7)

David W Paul, 514-74-3677, 19505 131st St E, Sumner, WA 98390, Ref 03-50710, filed on Oct 15. (Ch. 7)

Matthew M Ragan, Deborah M Ragan, 536-90-4864, 531-82-3525, 21816 52nd Ave E, Spanaway, WA 98387, Ref 03-50711, filed on Oct 15. (Ch. 7)

Billie A Banner, 525-86-7354, 9713 Lk Steilacoom Dr SW, Lakewood, WA 98498, Ref 03-50712, filed on Oct 15. (Ch. 7)

Ruth A Abouzeid, 616-24-7521, 5110 Chicago SW #10, Lakewood, WA 98499, Ref 03-50713, filed on Oct 15. (Ch. 7)

William G Fisher, Anna M Fisher, 520-62-2953, 534-30-6556, 1416 South 92nd St, Tacoma, WA 98444, Ref 03-50714, filed on Oct 15. (Ch. 7)

Kenneth J Gustafson, Diane L Gustafson, 533-50-3733, 531-62-3327, 14920 16th Ave S, Spanaway, WA 98387, Ref 03-50715, filed on Oct 15. (Ch. 7)

Adam L Chavez, 520-04-3814, 206 Lilly Rd #C6, Olympia, WA 98506, Ref 03-50716, filed on Oct 15. (Ch. 7)

Henry Mario Luckenbaugh, Tina Chung Luckenbaugh, 518-56-7025, 522-90-4846, 15218 16th Ave E, Tacoma, WA 98445, Ref 03-50717, filed on Oct 15. (Ch. 7)

Vernon L Callantine, Jennifer D Callantine, 516-96-0994, 535-06-1620, PO Box 46, Curtis, WA 98538, Ref 03-50718, filed on Oct 15. (Ch. 7)

Brad M Barratt, Darci M Barratt, 191-62-8318, 536-11-2009, 410 Maple St, Toledo, WA 98591, Ref 03-50719, filed on Oct 15. (Ch. 7)

Daniel E Harris, 533-02-0829, 5411 384th St, Eatonville, WA 98328, Ref 03-50720, filed on Oct 15. (Ch. 7)

Angela R Harding, 531-04-9469, PO Box 143, Roy, WA 98580, Ref 03-50721, filed on Oct 15. (Ch. 7)

Jamie A Rougutt, Stacie M Rougutt, 537-02-7429, 539-88-1426, 16537 Mimosa Ct, Yelm, WA 98597, Ref 03-50722, filed on Oct 15. (Ch. 7)

Doris Lee Sands, 531-54-5615, PO Box 2321, Shelton, WA 98584, Ref 03-50724, filed on Oct 15. (Ch. 7)

Michael D Perkins, Aleta R Perkins, 533-52-6560, 531-54-7406, 1424 Travis Ct, Kelso, WA 98626, Ref 03-50725, filed on Oct 15. (Ch. 7)

Jeffrey S Hoan, 544-08-2534, 2281 W Star Lake Dr, Elma, WA 98541-9646, Ref 03-50726, filed on Oct 15. (Ch. 7)

Richard L Peterson, Jeannie L Peterson, 532-70-5415, 537-68-7794, 722 Central St SE, Olympia, WA 98501, Ref 03-50727, filed on Oct 15. (Ch. 13)

Renee Janell Wood-Wagnild, 387-74-5317, 10214 NW 21st Ave, Vancouver, WA 98685, Ref 03-50728, filed on Oct 15. (Ch. 13)

Robert Leslie Porterfield, Marsha Millie Porterfield, 524-62-7054, 529-62-4329,

Electrical Code, 2002 edition, is 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 space set aside for that purpose unless otherwise permitted in 620.71(A) or (B). The room or space 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 and wiring that pertain to the elevator and its operation are permitted in these elevator spaces. See Section 3022 of the Seattle Building Code.

Elevator motor controllers and driving machines may be permitted inside the hoistway by special permission.

(A) Motor Controllers. Motor controllers shall be permitted outside the spaces herein specified, provided they are in enclosures with doors or removable panels that are capable of being locked in the closed position and the disconnecting means is located adjacent to or is an integral part of the motor controller. Motor controller enclosures for escalator or moving walks shall be permitted in the balustrade on the side located away from the moving steps or moving treadway. If the disconnecting means is an integral part of the motor controller, it shall be operable without opening the enclosure.

(B) Driving Machines. Elevators with driving machines located on the car, on the counterweight, or in the hoistway, and driving machines for dumbwaiters, wheelchair lifts, and stairway lifts shall be permitted outside the spaces herein specified.

Section 73. Section 680.40 of the National Electrical Code, 2002 edition, is amended as follows:

680.40 General. Electrical installations at spas and hot tubs shall comply with the provisions of Part I and Part IV of this article.

FPN: See also WAC296-46B-680, Special Equipment - Swimming pools, fountains and similar installations, for additional requirements.

Section 74. Section 700.1 of the National Electrical Code, 2002 edition, is amended as follows:

700.1 Scope.

(A) The provisions of this article apply to the electrical safety of the installation, operation, and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination, power, or both, to required facilities when the normal electrical supply or system is interrupted.

Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life.

FPN No. 1: For further information regarding wiring and installation of emergency systems in health care facilities, see Article 517.

FPN No. 2: For further information regarding performance and maintenance of emergency systems in health care facilities, see NFPA 99-1999, *Standard for Health Care Facilities*.

FPN No. 3: Emergency systems are generally installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons, such as hotels, theaters, sports arenas, health care facilities, and similar institutions. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, fire detection and alarm systems, elevators, fire pumps, public safety communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.

FPN No. 4: For specification of locations where emergency lighting is considered essential to life safety, see NFPA 101®-2000, *Life Safety Code®*.

FPN No. 5: For further information regarding performance of emergency and standby power systems, see NFPA 110-1999, *Standard for Emergency and Standby Power Systems*.

...in authentication of its passage this ...day of September, 2003.

...STER STEINBRUECK,
...sident of the City Council

...proved by me this 1st day of October,

...EG NICKELS,
...yor

...by me this 1st day of October, 2003.

...al) JUDITH PIPPIN,
...ty Clerk.

...xhibit A: Summary and Comparison of Seattle Electrical Code provisions in ...to the 2003 Washington State ...rical Code, Chapter 296-46B Washington ...nistrative Code (WAC)

...xhibit B: NFPA 70, National Electrical ..., 2002 Edition

...e City Clerk for Exhibits.

...ublication ordered by Judith Pippin, City ...

Date of publication in the Seattle Daily ...nal of Commerce, October 17, 2003.

10/17(163923)

Date of first pu
Friday, September 19, 20
THEODORE M.
BLUME & ASSOCIAT
By: THEODORE M.
BLUME, WSBA #2226, A
for Plaintiff, The Logan
500 Union Street, Su
Seattle, WA 98101-230
625-1111, FAX (206) 625-
10/24(

SEATTLE CITY NOTICES

City of Seat

Furnishing of: Vehicle Upholstery Services

Bid Date: Nov. 5, 2:00 P

CITY OF SEATTLE
DEPARTMENT OF EXECUTIVE ADMINISTRATION
Purchasing Services Secti
700 3rd Avenue, Room 91
Seattle, WA 98104
(206) 684-0444

October

Five (5) year contract for veh upholstery services. RFQ 0000000047. Bid Opening Date: Wed November 5, 2003, 2:00 P.M. TO C BID DOCUMENTS: Call Pam Toku (206) 233-7114.

The Department of Ex Administration reserves the right t any and all bids, to waive any inform in bids, and to accept any item in a bi

KEN NAKATSU,
DEA Director.

Date of publication in the Seattl Journal of Commerce, October 17, 200
10/17(1

City of Seattl

Furnishing of: Armored Ca Service

Bid Date: Nov. 6, 11:00 AM

CITY OF SEATTLE
DEPARTMENT OF EXECUTIVE ADMINISTRATION
Purchasing Services Section
700 3rd Avenue, Room 910
Seattle, WA 98104
(206) 684-0444

October 16,

Until 11:00 AM 11/06/03 for the nishing of an annual contract Armored Car Service for various Ci Seattle departments, per specs. F copy of bid documents #SCL430 con the buyer, C. Atwood at 206/684-054 cheryl.atwood@seattle.gov, or Purchasing Services Receptionist 206/684-0444.

The Department of Execu Administration reserves the right to re any and all quotations, to waive any in malities in quotations, and to accept any i in a quotation.

KEN NAKATSU,
DEA Director.

Date of publication in the Seattle Da Journal of Commerce, October 17, 2003.
10/17(1642

City of Seattle

---

velling Units. Loads added to an velling unit(s) shall comply with the s applicable:

ds for structural additions to an welling unit or for a previously rtion of an existing dwelling unit, which exceeds 46.5 m2 (500 ft2), puted in accordance with 220.3(A)

s for new circuits or extended cir- viously wired dwelling units shall ed in accordance with either (B), as applicable.

r Than Dwelling Units. Loads uits or extended circuits in other ng units shall be computed in with either 220.3(A) or (B), as

6. Section 220.15 of the National de, 2002 edition, is amended as

ixed Electric Space Heating. e space heating loads shall be 00 percent of the total connect- ver, in no case shall a feeder or urrent rating be less than the argest branch circuit supplied. ~~((Where reduced loading of the ...~~ [illegible] *and factor of 75 percent of the ng capacity may be used in siz- ance and feeder equipment for ercial and industrial occupan- ce service is provided to four ce heaters, or electric furnaces trolled. These exceptions shall optional calculations allowed 2 are used.*

Section 220.17 of the National 2002 edition, is amended as

lliance Load - Dwelling l be permissible to apply a 75 percent to the nameplate r or more appliances fastened an electric ranges, clothes ating equipment, or air-con- ent, that are served by the ervice in a one-family, two- amily dwelling. For space see Section 220.15.

ction 225.32 of the National 002 edition, is amended as

ion. The disconnecting talled either inside or out- ng or structure served or rs pass through the build- ~~[illegible]~~ this section, the require- ll be permitted to be uti-

96-46B-225.032. Location connecting means.

For installations under where documented safe es are established and nnection, and where the red by qualified individ- g means shall be permit- here on the premises.

For buildings or other under the provisions of necting means shall be elsewhere on the prem-

or towers or poles used s, the disconnecting ted to be located else-

poles or similar struc- ort of signs installed in 600, the disconnecting ted to be located else-

230.1 of the National dition, is amended as

re service conductors rol and protection of lation requirements.

1.

ments. The serving d by the owner, the tractor ...

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 the Fire District shall terminate on the side of the building nearest to the lines or mains of the utility. The 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 wire access fittings or junction boxes of any type shall be permitted within 15 feet of the ground level on street, alley, or driveway margins.

Section 24. Section 230.33 of the National Electrical Code, 2002 edition, is amended as follows:

230.33 Spliced Conductors. Service-lateral conductors shall be permitted to be spliced or tapped in accordance with 110.14, 300.5(E), 300.13, and 300.15.

FPN: Service lateral conductors are utility conductors under the serving utility's jurisdiction.

Section 25. The National Electrical Code, 2002 edition, is amended by adding Section 230.34 as follows:

230.34 Conversion to Underground Service or Increasing Existing Overhead Services. Where 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 permitted to be installed over an existing meter enclosure that is embedded in a finished exterior wall. 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 an 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 26. Section 230.43 of the National Electrical Code, 2002 edition, is amended as follows:

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 shall be limited to the following methods:

((~~(1)~~ ~~Open wiring on insulators~~
~~(2)~~ ~~Type IGS cable~~))
(3) Rigid metal conduit
(4) Intermediate metal conduit
((~~(5)~~ ~~Electrical metallic tubing~~
~~(6)~~ ~~Electrical ...~~

---

(2) Bathrooms and Other Locations. Service disconnecting means shall not be installed in bathrooms, clothes closets, shower rooms, cupboards, attics, stairways, nor above any washers, ranges, dryers, water heaters, sinks, plumbing fixtures or drain boards.

(3) Remote Control. Where a remote control device(s) is used to actuate a remote ice disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1).

(B) Marking. Each service disconnect shall be permanently marked to identify it as a service disconnect.

(C) Suitable for Use. Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the requirements of Articles 500 through 517.

Section 32. Section 230.82 of the National Electrical Code, 2002 edition, is amended as follows:

230.82 Equipment Connected to the Supply Side of Service Disconnect. Only the following equipment shall be permitted to be connected to the supply side of the service disconnecting means:

(1) Cable limiters ((~~or other current-limiting devices~~)) by special permission of the building official.

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

(a) The cable 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 cable limiter enclosure shall not be used for service taps or extensions and shall be clearly recognized and marked as cable limiters.

(2) Meters, meter sockets, or meter disconnect switches nominally rated not in excess of 600 volts, provided all metal housings and service enclosures are grounded. Taps under meter socket lugs shall not be permitted, except by prior approval from the building official.

(3) Instrument transformers (current and voltage), high-impedance shunts, load management devices, and surge arresters.

(4) Taps used only to supply load management devices, circuits for standby 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.

(5) Solar photovoltaic systems, fuel cell systems, or interconnected electric power production sources.

(6) Control circuits for power-operable service disconnecting means, if suitable overcurrent protection and disconnecting means are provided.

(7) Ground-fault protection systems where installed as part of listed equipment, if suitable overcurrent protection and disconnecting means are provided.

(8) Current transformer cabinets shall contain only the main service conductors, metering equipment and secondary wiring. One tap shall be permitted on the load side of the current transformers for a legally-required standby service and one tap shall be permitted on the load side of the current transformers for a fire pump service. One additional normal power service tap from the current transformer enclosure may be made by special permission of the service utility. In a single-family dwelling, two connections shall be permitted on the load side of the current transformers. No other taps shall be permitted. Approved terminal lugs shall be provided for the main service conductors and for all taps.

(9) Listed service accessory buss gutters or termination boxes that are approved for use on the line side of service equipment. Junction and pull boxes are not permitted.

Section 33. Section 230.90 of the National Electrical Code, 2002 edition, is amended as follows:

230.90 Where Required. Each ungrounded service conductor shall have ...

Na **on 35.** Section 23 am Electrical Code, 20 as follows:

2 Service-Entranc ... ntrance conductors enclo shall be installe 230.2 and (B).

(A) Conductor Size. S conduc shall not be sm unless in multicon Multiconductor cable sha than 8 AW ...

(B) Wiring Methods ... shall be instal ... ng methods

(1) Rig
(2) Intermediate cond
(3) Rigid nonme
(4) Busways
(5) Cablebus
(6) Cable Trays ... by the Building Offi

Section 38. Sect Electrical Code, 200 follows:

240.24 Locatio

(A) Accessibil shall be readily ac following applies:

(1) For busways
(2) For supplem tion, as described i
(3) For overcurr 225.40 and 230.92.
(4) For overcurr lization equipmen shall be permitted

(B) Occupan have ready access protecting the con pancy.

Exception No. electrical mainte building manag under continuo supervision, the and feeder overcu than one occupa accessible to only sonnel in the foll

(a) Multiple-
(b) Guest roo are intended for

Exception No. electrical main building manag under continu supervision, th devices supply permitted to b management hotels and ma sient occupan

(C) Not E Overcurrent they will not

FPN: See

(D) ((Not Material. [illegible] Overcurrent supplemen not be locat shower roo above a was sink, plumb locations

(E) (([illegible] **Family a** Branch ci located ei they serve occupants

Sectio Electrical follows:

250.3 Alternat