WAC 296-46B

294-46B-358 - Wiring Methods and Materials – Electrical Metallic Tubing

012 Electrical Metallic Tubing

(1) In addition to complying with the provisions of Article 358 NEC, electrical metallic tubing may not be installed in direct contact with the earth or in concrete on or below grade. Also see NEC 300.6 for resistance to corrosion.

(2) Where electrical metallic tubing is installed in wet locations, an equipment grounding conductor must be provided within the raceway and sized per NEC 250.122.

296-46B-394 - Wiring Methods and Materials – Concealed Knob-and-Tube Wiring

001 Knob-and-Tube Wiring

Article 394 NEC does not prohibit the installation of loose or rolled thermal insulating material in spaces containing existing knob-and-tube wiring provided that all the following conditions are met:

(1) The wiring must be surveyed by an appropriately licensed electrical contractor who must certify in writing to the department that the wiring is in good condition with no evidence of improper overcurrent protection, conductor insulation failure or deterioration, and with no improper connections or splices. The electrical inspector must inspect all repairs, alterations, or extensions to the electrical system.

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

(3) All knob-and-tube circuits must have overcurrent protection in compliance with NEC Table

310.16, 60 degree centigrade, Column C. Overcurrent protection must be either circuit breakers or Type S fuses.

296-46B-410 – Equipment for General use – Luminaires

010 Luminaires

(1) All luminaires within an enclosed shower area or within five feet of the waterline of a bathtub must be enclosed, unless specifically listed for such use; these luminaires, with exposed metal parts that are grounded, must be ground fault circuit interrupter protected.

030 Flexible Cord Connection of Electric Discharge Luminaires

(2) A ground-type attachment plug cap and receptacle connection at the source junction box is not required when the flexible cord complies with NEC 410.30 and the following:

(a) Connection to a source junction box must utilize an approved cable connector or clamp;

(b) The maximum length of the cord for a suspended pendant drop from a permanently installed junction box to a suitable tension take-up device above the pendant luminaire must not exceed six feet;

(c) The flexible cord must be supported at each end with an approved cord grip or strain relief connector fitting/device that will eliminate all stress on the conductor connections;

(d) The flexible cord must be a minimum #14 AWG copper;

(e) The flexible cord ampacity must be determined in NEC Table 400.5(A) column A;

(f) The flexible cord must be hard or extra hard usage; and

(g) A vertical flexible cord supplying electric discharge luminaires must be secured to the luminaire support as per NEC 334.30(A).

042 Exposed Luminaire (Fixture) Parts

(3) Replacement luminaires that are directly wired or attached to boxes supplied by wiring

methods that do not provide a ready means for grounding and that have exposed conductive parts will be permitted only where the luminaires are provided with ground-fault circuit-interrupter protection and marked "no equipment ground."

296-46B-410 – Equipment for General Use – Luminaires

010 Luminaires

(1) All luminaires within an enclosed shower area or within five feet of the waterline of a bathtub must be enclosed, unless specifically listed for such use; these luminaires, with exposed metal parts that are grounded, must be ground fault circuit interrupter protected.

030 Flexible Cord Connection of Electric Discharge Luminaires

(2) A ground-type attachment plug cap and receptacle connection at the source junction box is not required when the flexible cord complies with NEC 410.30 and the following:

(a) Connection to a source junction box must utilize an approved cable connector or clamp;

(b) The maximum length of the cord for a suspended pendant drop from a permanently installed junction box to a suitable tension take-up device above the pendant luminaire must not exceed six feet;

(c) The flexible cord must be supported at each end with an approved cord grip or strain relief connector fitting/device that will eliminate all stress on the conductor connections;

(d) The flexible cord must be a minimum #14 AWG copper;

(e) The flexible cord ampacity must be determined in NEC Table 400.5(A) column A;

(f) The flexible cord must be hard or extra hard usage; and

(g) A vertical flexible cord supplying electric discharge luminaires must be secured to the luminaire support as per NEC 334.30(A).

042 Exposed Luminaire (Fixture) Parts

(3) Replacement luminaires that are directly wired or attached to boxes supplied by wiring methods that do not provide a ready means for grounding and that have exposed conductive parts will be permitted only where the luminaires are provided with ground-fault circuit-interrupter protection and marked "no equipment ground."

296-46B-422 – Equipment for General Use – Appliances

010 Water Heater Circuit

Water heaters with a rated circuit load in excess of 3,500 watts at 208 or 240 volts must be provided with branch circuit conductors not smaller than #10 AWG copper or equal. Overcurrent protection must comply with NEC 422.11(E).

294-46B-430 – Motors, Motor Circuits, and Controllers

007 Marking on Motors and Multi-Motor Equipment

Except as required by the National Electrical Code, there is no requirement for motors to be identified for use or listed/field evaluated by a laboratory. All motors must be manufactured according to National Electrical Manufacturer's Association (NEMA) standards for motors except motors that:

(1) Are a component part of equipment listed or field evaluated by a laboratory; or

(2) Are a component part of industrial utilization equipment approved by the department per WAC 296-46B-903.

296-46B-445 – Wind Driven Generator Equipment

This equipment includes alternators or generators that produce electrical current through the conversion of wind energy into electrical energy. Wind driven generation equipment must

demonstrate conformance to applicable safety standards recognized by the department.

Installation

(1) A wind driven generator system design review must be submitted at the time of the first inspection. The design review must be available to the inspector on the job site. Permit holders must submit a copy of the wind driven generator equipment manufacturer's installation information and a legible one-line diagram of the wind driven generator design and calculations used to determine voltage and current within the generation system to the electrical inspector. This diagram must show the wind driven generator equipment, devices, overcurrent protection, conductor sizing, grounding, ground fault protection if required, and any system interconnection points.

(2) For utility interactive systems, any person making interconnections between the generator system and the utility distribution network must consult the serving utility and is required to meet all additional utility standards.

(3) All wind driven generator equipment and disconnecting means must be permanently identified as to their purpose, maximum voltages and type of current within the system with an identification plate.

296-46B-450 – Equipment for General Use – Transformers and Transformer Vaults

027 Flammable-Liquid or Oil-Filled Transformers Installed Outdoors

(1) Flammable-liquid or oil-filled transformers installed outdoors must meet the following requirements:

(a) A transformer installed adjacent to a building/structure with any combustible surface may be located only in the shaded "Approved Transformer Area" shown in Figure 450-1;

(b) A transformer installed adjacent to a building/structure with no combustible surface(s) may be located only in the shaded "Approved Transformer Area" shown in Figure 450-2;

(c) In an area in which a transformer is to be installed next to a uninhabited structure, the transformer may be no closer than two feet to the building/structure and must be outside a line extended vertically from the ends of the eaves or rooflines;

(d) A building/structure may have no doors, windows, stairways, or other openings closer than eight feet to the transformer;

(e) The finished grade at the location of the transformer must be such that any oil leaking from the transformer will flow away from the building/structure and will not pool; and

(f) If transformers are installed in areas subject to traffic other than pedestrian traffic, they must be provided with adequate guarding.

(2) Enclosures for total underground flammable-liquid or oil-filled transformers must not be located within eight feet of a doorway, operable window, stairways or fire escape. Adequate space must be maintained above the enclosure so that a boom may be used to lift the transformer from the enclosure.

296-46B-500 – Hazardous Locations, Classes I, II, and III, Divisions 1 and 2

005 Classification of Locations

Classification of locations may only be done by the authority having jurisdiction or a professional engineer registered in Washington who uses appropriate National Fire Protection Standards as a basis for classification. The authority having jurisdiction is allowed to make the final determination in cases of conflict.

296-46B-501 – Special Occupancies NEC Class I Locations

001 Sewage Disposal Systems

(1) Pumping chambers for sewage, effluent, or grinder pumps in on-site and septic tank effluent pump (S.T.E.P.) disposal systems will be considered unclassified when not more than five residential units are connected to the system, residential units are connected to a utility sewage system, or when nonresidential systems have residential loading characteristics and all of the following general installations requirements are complied with:

(a) The pumping chamber must be adequately vented. Venting may be accomplished through the building or structure plumbing vents where the system venting has been approved by the local jurisdiction authority or by a direct two-inch minimum vent to the atmosphere;

(b) Equipment that in normal operation may cause an arc or spark must not be installed in any pumping chamber;

(c) Float switches installed in a pumping chamber must be hermetically sealed to prevent the entrance of gases or vapors;

(d) Junction boxes, conduits and fittings installed in the septic atmosphere must be of a noncorrosive type, installed to prevent the entrance of gases or vapors;

(e) Where a conduit system is installed between the pumping chamber and the control panel, motor disconnect, or power source, an approved sealing method must be installed to prevent the migration of gases or vapors from the pumping chamber, and must remain accessible; and

(f) Wire splices in junction boxes installed in pumping chambers must be suitable for wet locations.

(2) Residential wastewater loading characteristics in a nonresidential installation:

(a) For systems that process less than three thousand five hundred gallons of wastewater per day may be certified by:

(i) An on-site wastewater designer licensed under chapter 18.210 RCW; or

(ii) A professional engineer, engaged in the business of on-site wastewater system design, licensed under chapter 18.43 RCW.

(b) For systems that process three thousand five hundred gallons or more of wastewater per day may be certified by a professional engineer, engaged in the business of on-site wastewater system design, licensed under chapter 18.43 RCW.

Written documentation must be signed and stamped by the designer or engineer and provided to the electrical inspector prior to inspection.

(3) Any residential or nonresidential system that has building or structure floor drains being discharged into the system is classified as Class I Division 1. Drains from any commercially made tub, shower, basin, sink, or toilet are not considered floor drains.

(4) Pumping chamber access covers can be covered by gravel, light aggregate, or noncohesive granulated soil, and must be accessible for excavation. Access covers that are buried must have their exact location identified at the electrical panel or other prominent location by an identification plate. The authority having jurisdiction for performing electrical inspections must approve the identification plate location.

(5) Indoor grinder pumps installed in chambers with less than fifty gallons capacity are not required to meet the requirements of this section, except for the venting requirements in subsection (1)(a) of this section. Indoor grinder pumps installed in chambers with less than fifty gallons capacity are not classified systems as described in Article 500 NEC.

(6) Secondary treatment effluent pumping chambers such as sand filters are unclassified, and require no special wiring methods.

(7) Inspection approval is required prior to covering or concealing any portion of the septic

electrical system, including the pump. New septic and effluent tanks containing electrical wires and equipment must be inspected and approved prior to being loaded with sewage.

296-46B-505 – Class I, Zone 0, 1, and 2 Locations

007 Implementation of Zone Classification

For the purposes of NEC 505.7, qualified person means a professional engineer registered in Washington.

296-46B-513 Special Occupancies – Aircraft Hangers

001 Scope

The scope for NEC 513 applies only when the property containing the building is classified or zoned as an aircraft hanger by the authority having jurisdiction.

296-46B-514 Special Occupancies – Motor Fuel Dispensing Facilities

001 General

(1) In addition to the scope included in NEC 514.1, Article 514 NEC must be complied with for all liquefied flammable gas storage or transfer facilities.

011 Emergency Disconnecting Means - Dispensing and Service Stations

(2) An emergency disconnecting means or operator must be provided to disconnect the pump or dispensing equipment serving gasoline, volatile flammable liquids, or liquefied flammable gases. The emergency disconnecting means or operator must disconnect all conductors of the circuit supplying all station dispensers and/or pumps (including the grounded conductor) simultaneously from the source(s) of supply.

(3) For installations with only one dispensing device, the emergency disconnecting

means/operator may be used to satisfy subsection (2) of this section.

(4) For multi-circuit installations, an electrically held normally open contactor operated by a push-button may serve as the disconnecting means to satisfy subsection (2) of this section. If a disconnecting pushbutton is used, the pushbutton may not function as the resetting mechanism for the electrically held contactor. The resetting means must be:

(a) Located at least fifteen feet or out of sight from the disconnecting pushbutton;

(b) Installed behind a cover or guard; and

(c) Identified with an identification plate that is substantially black in color.

(5) The disconnecting means satisfying subsection (2) of this section must be labeled with an identification plate, with letters at least one inch high, as the emergency disconnecting means. The disconnecting means or operator must be:

(a) Substantially red in color; and

(b) For attended facilities - must be readily accessible and must be located outdoors and within sight of the pump or dispensing equipment it controls; or

(c) For unattended facilities - must be readily accessible and must be located within sight, but at least twenty feet from the pump or dispensing equipment it controls.

296-46B-517 – Special Occupancies – Health Care Facilities

001 Health Care Facilities

In health care facilities, the following methods must be used to determine adequate capacity and ratings of equipment providing electrical power for the essential electrical systems defined in Article 517 NEC:

(1) Systems in new facilities:

(a) Emergency system: The emergency branch must consist of two branches known as:

(i) Life safety system: The feeder conductors and equipment used to supply electrical power to the life safety branch must be determined by summation of the connected loads as determined by Article 220 NEC and may not be subjected to any reduction due to the diversity of the loads. Feeder and equipment will be subject to a one hundred twenty-five percent multiplier for continuous loads in accordance with Article 220 NEC.

(ii) Critical branch system: The feeder conductors and equipment must be calculated in accordance with Article 220 NEC, including a level of diversity as determined by such article.

(b) Equipment branch: The feeder conductors and equipment used to supply electrical power to the equipment branch of the essential electrical system must be calculated in accordance with Article 220 NEC, including a level of diversity as determined by such article.

(c) Generator sizing: The rating of the generator(s) supplying electrical power to the essential system of a health care facility must meet or exceed the summation of the loads determined in (a) and (b) of this subsection with no additional demand factors applied. Momentary X-ray loads may be ignored if the generator is rated at least three hundred percent of the largest momentary X-ray load connected.

(2) Existing essential systems in facilities to which additional load is to be added:

(a) Existing loads: The existing loads of the separate branches of the essential electrical system may be determined by WAC 296-46B-900 (3)(j).

(b) Added loads: Added loads to the separate branches of the essential electrical system must be determined by subsection (1) of this section.

(c) Generator sizing: The rating of the generator(s) supplying electrical power to the essential electrical system must meet or exceed the summation of the loads determined by (a) and (b) of this subsection with no additional demand factors applied.

296-46B-520 – Special Occupancies – Theatres, Motion Picture and Television Studios, Performance Areas and Similar Areas

001 Concerts, Motion Picture Productions, Stage Shows, and Similar Shows

(1) Service equipment, separately derived systems, feeders and circuits for concerts, motion picture productions, stage shows, and similar shows, must comply with the NEC and this chapter.

(2) The ampacity of cords and cables must be determined from the appropriate Article 400 NEC cord and cable ampacity tables including all notes.

296-46B-547 Special Occupancies – Agricultural Buildings

001 Scope

NEC 547 requirements apply only when the agricultural building is greater than 1,000 square feet and is used as part of a business or commercial farming activity.

296-46B-550 – Special Occupancies – Mobile Homes, Manufactured Homes and Mobile Parks

001 Mobile/Manufactured Homes - Inspection

(1) All alterations to the mobile/manufactured home electrical system must be permitted and inspected by the factory assembled structures section of the department. Electrical wiring in structures that are attached to the mobile/manufactured home and for which the source of power is from the mobile/manufactured home is inspected by the factory assembled structures section of the department.

032 Mobile/Manufactured Homes - Service

(2) If an electrical service is installed on the mobile/manufactured home:

(a) It must be installed only by the manufacturer, at the manufacturing plant. The manufacturer must complete the service except for service connections, meter, and grounding electrode conductor; and

(b) The owner or an electrical contractor must complete the service at the site.

033 Mobile/Manufactured Homes - Feeder

(3) When the mobile or manufactured home is supplied with power using a permanent wiring method, the equipment grounding conductor will be permitted to be bare. Bare conductors used underground must be copper. For the purposes of this section, portable cord is not considered a permanent wiring method.

296-46B-553 – Special Occupancies – Floating Buildings

004 Floating Buildings and Similar Facilities - Services and Feeders

(1) Where electrical power is provided, floating buildings and similar facilities in addition to complying with the appropriate sections of Article 553 NEC must have a readily accessible service rated disconnect located on the shoreline within sight of the shoreline connection of the dock, wharf or similar structure to which the floating building or similar facility is moored.

(2) Where shore power is provided, each floating building or similar facility must have a disconnecting means located within sight of each floating building or similar facility. The disconnecting means must be installed adjacent to but not in or on the floating building or similar facility.

007 Floating Buildings and Similar Installations - Wiring Methods

(3) Extra-hard usage portable power cables rated not less than 75°C, 600 volts, listed for wet locations and sunlight resistance and having an outer jacket rated for the environment may be used as a permanent wiring method when joining the structures indicated above and for any

concealed or protected wiring on a sectionalized floating dock leading to a floating building or similar facility. The cable needs to be resistant only to environments it is normally exposed to on an ongoing basis.

(4) Conductors operating in excess of 600 volts, nominal may not be installed on floating portions of a floating building or similar facility.

296-46B-555 Special Occupancies – Marinas and Boatyards

(1) For the purposes of NEC 555.1, the scope of work includes private, noncommercial docking facilities.

(2) For the purposes of NEC 555.5, transformer terminations must be located a minimum of twelve inches above the deck of a dock (datum plane requirements do not apply for this section).

(3) For the purposes of NEC 555.7, adjacent means within sight.

(4) For the purposes of NEC 555.9, all electrical connections must be installed a minimum of twelve inches above the deck of a pier unless the connections are approved for wet locations (datum plane requirements do not apply for this section).

(5) For the purposes of NEC 555.10, all enclosures must be corrosion resistant. All gasketed enclosures must be arranged with a weep hole to discharge condensation.

(6) For the purposes of NEC 555.11, gasketed enclosures are only required for wet locations.

(7) For the purposes of NEC 555.13, the following wiring methods are allowed:

(a) All wiring installed in a damp or wet location must be suitable for wet locations.

(b) Extra-hard usage portable power cables rated not less than 75°C, 600 volts, listed for wet locations and sunlight resistance and having an outer jacket rated for the environment are permitted. Portable power cables are permitted as a permanent wiring method under or within docks and piers or where provided with physical protection. The requirements of NEC 555.13

(B)(4)(b) do not apply.

(c) Overhead wiring must be installed at the perimeter of areas where boats are moored, stored, moved, or serviced to avoid possible contact with masts and other parts of boats.

(d) For the purposes of NEC 555.13 (B)(5), the wiring methods of Chapter 3 NEC will be permitted.

(8) For the purposes of NEC 555.19, receptacles must be mounted not less than twelve inches above the deck surface of the pier or dock (datum plane requirements do not apply for this section). Shore power receptacles that provide shore power for boats must be rated not less than 20 amperes and must be single outlet type and must be of the locking and grounding type or pin and sleeve type.

(9) For the purposes of NEC 555.21 (B)(1), delete exception No. 1 and No. 2 and replace with: Dock, pier, or wharf sections that do not support fuel dispensers and may abut a section(s) that supports a fuel dispenser(s) are permitted to be unclassified where documented air space between the sections is provided and where flammable liquids or vapors cannot travel to these sections. See NEC 500.4(A) for documentation requirements.

296-46B-590 – Special Occupancies – Temporary Installations

001 Temporary Installations

(1) For the purposes of this section, any circuit used for construction purposes is considered to be temporary.

003 Temporary Installations - Time Constraints

(2) Temporary construction service equipment may only be used for construction purposes and must be disconnected when the permanent service is connected unless the department grants an extension of time.

004 Temporary Installations - Splices

(3) A splice or junction box is required for all wiring splice or junction connections in a temporary installation.

296-46B-600 – Special Equipment – Electric Signs and Outline Lighting

001 Electrical Signs - General

(1) All electrical signs within the scope of UL Standard 48, the electrical sign standard, must be listed. All electrical signs outside the scope of UL Standard 48 will be inspected for compliance with the NEC.

(2) Luminaires in outdoor awnings must be suitable for wet locations and be connected by a wiring method suitable for wet locations.

(3) Fluorescent luminaires must be located at least six inches from the awning fabric. Incandescent lamps or luminaires must be located at least eighteen inches from the awning fabric. A disconnecting means must be installed per Article 600 NEC.

(4) Listed awning signs must be installed in compliance with the manufacturer's instructions and the NEC.

010 Portable or Mobile Outdoor Electrical Signs

(5) A weatherproof receptacle outlet that is weatherproof with the supply cord connected must be installed within six feet of each electrical sign.

(6) Extension cords are not permitted to supply portable outdoor signs.

(7) All portable outdoor electrical signs must be listed or field evaluated by a laboratory accredited by the department.

030 Neon Tubing

(8) NEC 600, Part II, Field-Installed Skeleton Tubing, will apply to all neon tubing and neon circuit conductors.

296-46B-645 – Information Technology Equipment

017 Power Distribution Units

Power distribution units that are used for information technology equipment will be permitted to have multiple panelboards with a single cabinet, provided that the power distribution unit is utilization equipment listed for information technology application.

296-46B-680 Special Equipment – Swimming Pools, Fountains and Similar Installations

001 General

(1) Package spa or hot tubs. Electrical heating, pumping, filtering, and/or control equipment installed within five feet of a spa or hot tub must be listed or field evaluated as a package with the spa or hot tub.

(2) A factory assembled skid pack of electrical heating, pumping, filtering, and/or control equipment (skid pack) must be installed more than five feet from a spa or hot tub and shall be listed as a package unit.

(3) The maintenance disconnect and field installed, listed electrical equipment for a hot tub, spa, or swim spa must be located at least five feet from the hot tub, spa or swim spa. Field installed listed equipment must meet the following additional requirements:

(a) The heater is listed as a "spa heater or swimming pool heater";

(b) The pump is listed as a "spa pump" or "swimming pool/spa pump" (the pump may be combined with a filter assembly); and

(c) Other listed equipment such as panelboards, conduit, and wire are suitable for the

environment and comply with the applicable codes.

(4) Field installed, listed electrical equipment for a swimming pool must be located at least five feet from the swimming pool. Field installed listed equipment must meet the following additional requirements:

(a) The heater must be listed as a "swimming pool heater or a spa heater";

(b) The pump must be listed as a "swimming pool pump" or "spa pump" or "swimming pool/spa pump"; and

(c) Other equipment such as panelboards, conduit, and wire must be suitable for the environment and comply with the applicable codes.

The five-foot separation may be reduced by the installation of a permanent barrier, such as a solid wall, fixed glass windows or doors, etc. The five-foot separation will be determined by the shortest path or route that a cord can travel from the spa, hot tub, swim spa, or swimming pool to an object.

(5) The field assembly or installation of "recognized components" will not be permitted.

(6) Hydromassage bathtubs must be listed as a unit and bear a listing mark which reads "hydromassage bathtub."

(7) Manufacturers' instructions must be followed as part of the listing requirements.

(8) Electrical components which have failed and require replacement must be replaced with identical products unless the replacement part is no longer available; in which case, a like-in-kind product may be substituted provided the mechanical and grounding integrity of the equipment is maintained.

(9) Cut-away-type display models may not be sold for other than display purposes and are not expected to bear a listing mark.

025 Feeders

(10) NEC 680.25(A) is amended to read: A feeder between the service equipment and the remote panelboard is permitted to run in flexible metal conduit, an approved cable assembly that includes an equipment grounding conductor within its outer sheath (the equipment grounding conductor must comply with NEC 250.24 (A)(5)), rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit, electrical metallic tubing (when installed on or within a building or crawl space), and electrical nonmetallic tubing (when installed within a building or crawl space). Aluminum conduit is not permitted.

040 Spas and Hot Tubs

(11) NEC 680.42(C) will apply for interior and exterior wiring to outdoor installations of spas and hot tubs.

296-46B-690 Solar Photovoltaic Systems

002 Definitions

(1) Photovoltaic system. The photovoltaic system may conduct alternating current, direct current, or both and will comprise all interconnected circuits to the point of connection with the building distribution circuits or utility service conductors.

(2) Support structure, foundation, and tracker. For the purposes of this section, those portions of the array or tracker that are exclusively mechanical and are built specifically for the purpose of physically supporting the modules or panels will not be considered part of the photovoltaic system as defined by this article.

004 Installation

(3) A photovoltaic system design review must be submitted at the time of the first inspection.

The design review must be available to the inspector on the job site. Permit holders must submit, to the electrical authority having jurisdiction, copies of the photovoltaic equipment manufacturer's installation information, accompanied by a legible one-line diagram of the photovoltaic design and calculations used to determine voltage and current within the photovoltaic system. This diagram must show the photovoltaic equipment, devices, overcurrent protection, conductor sizing, grounding, ground fault protection if required, and any system interconnection points.

(4) For utility interactive systems, persons making interconnections between solar photovoltaic system and the utility distribution network must consult the serving utility and are required to meet all additional utility standards.

007 Maximum Voltage

(5) The open-circuit voltage temperature coefficients supplied in the instructions of listed photovoltaic modules will be used to determine the maximum direct current photovoltaic system voltage. Otherwise the voltage will be calculated using Table 690.7 of the NEC. For the purposes of this calculation, a temperature correction factor of 1.25 will be used unless another factor can be justified and is approved by the authority having jurisdiction.

053 Direct-Current Photovoltaic Power Source

(6) All photovoltaic equipment and disconnecting means must be permanently identified as to their purpose, maximum voltages, and type of current within the system with an identification plate. All photovoltaic circuits must be identified at each overcurrent protection device(s) and panel directory(ies).

(7) Required "WARNING" labels as specified by NEC 690 are required to be an identification plate on or immediately adjacent to the pertinent equipment.

296-46B-700 Emergency Systems

001 Emergency Systems - General

(1) In all health or personal care facilities defined in this chapter, educational facilities, institutional facilities, hotels, motels, and places of assembly for one hundred or more persons, all exit and emergency lights must be installed in accordance with Article 700 NEC and located as required in standards adopted by the state building code council under chapter 19.27 RCW.

008 Signs

(2) The sign(s) required in NEC 700.8 must be placed at the service disconnecting means and the meter base if the service disconnecting means and meter base are not located within sight and within 5' of each other.

009 Emergency Systems - Equipment Identification

(3) All exit and emergency lights, whether or not required by the NEC, must be installed in accordance with Article 700 NEC.

(4) All boxes and enclosures, for Article 700 NEC systems, larger than six inches by six inches, including transfer switches, generators, and power panels for emergency systems and circuits must be permanently identified with an identification plate that is substantially orange in color, except in existing health care facilities the existing nameplate identification color scheme can be retained for transfer switches, generators, and power panels for existing emergency systems that are not being replaced or modified. All other device and junction boxes for emergency systems and circuits must be substantially orange in color, both inside and outside.

027 Coordination

(5) The requirements for selective coordination described in NEC 700.27 are not required where the emergency system was installed prior to June 1, 2006. For new emergency systems that are

supplied from an existing emergency system installed prior to June 1, 2006, the new portion of the emergency system must comply with NEC 700.27. The ground fault sensing function of overcurrent protective devices will only be required to selectively coordinate with the ground fault sensing functions of other overcurrent protective devices.

296-46B-701 – Legally Required Standby Systems

008 Signs

(1) The sign(s) required in NEC 701.8 must be placed at the service disconnecting means and the meter base if the service disconnecting means and meter base are not located within sight and within 5' of each other.

018 Coordination

(2) The requirements for selective coordination described in NEC 701.18 are not required where the legally required standby system was installed prior to June 1, 2006. For new legally required standby systems that are supplied from an existing legally required standby system installed prior to June 1, 2006, the new portion of the legally required standby system must comply with NEC 701.18. The ground fault sensing function of overcurrent protective devices will only be required to selectively coordinate with the ground fault sensing functions of other overcurrent protective devices.

296-46B-702 Optional Standby Systems

008 Signs

The sign(s) required in NEC 702.8 must be placed at the service disconnecting means and the meter base if the service disconnecting means and meter base are not located within sight and within 5' of each other.

296-46B-760 – Fire Alarm Systems

Device and junction boxes for fire alarm systems other than the surface raceway type, must be substantially red in color, both inside and outside. Power-limited fire protective signaling circuit conductors must be durably and plainly marked in or on junction boxes or other enclosures to indicate that it is a power-limited fire protective signaling circuit.

296-46B-800 – Communications Systems – Communications Circuits

001 Installation

(1) All telecommunications installations on an end-user's property, beyond the end-user's telecommunications network demarcation point, made by a telecommunications service provider, both inside and outside of a building or structure, must conform to all licensing, certification, installation, permitting, and inspection requirements described in chapter 19.28 RCW and this chapter.

(2) Telecommunications service providers including its subcontractors and agents must install and maintain points of demarcation in conformance with Code of Federal Regulations (CFR), Title 47, Chapter 1, Part 68, Subpart B, Sec. 68.105 and may not place a point of demarcation further than twelve inches within an end-user's occupied space.

(3) The telecommunications service provider must identify the telecommunications network demarcation point(s) with an identification plate or label having:

(a) The provider's name;

(b) Customer/end-user's name; and

(c) If a CWSTP is used, the option type used.

(4) The CFR prescribes that telecommunications service providers must choose either a MPOE (minimum point of entry) or CWSTP (cable wire service termination policy) which regulates where demarcations are placed within a multitenant environment.

(5) A telecommunications service provider, including its subcontractors and agents provisioning service for a second provider who is not the end-user of the service, must place the point of demarcation no further than twelve inches from the nearest POP (point of presence), of the serving provider, to the eventual end-user.

(6) Telecommunications service providers must designate each building that they provide services to with labeling at the terminating point(s) of their facilities indicating:

(a) Whether the building is under a MPOE policy; or

(b) Which option of a CWSTP is in effect.

(7) The CWSTP options for demarcation placement are as follows:

(a) All telecommunications service provider facilities will terminate at one location, mutually agreed upon by the provider and the building owner or designee, upon entry into the building, normally at the lowest common serving point. All demarcations will be placed no more than twelve inches from this point. The building owner and/or tenants will provide, manage and maintain building wire and cable placed beyond this demarcation point location.

(b) The telecommunications service provider's facilities will terminate at common locations, mutually agreed upon by the provider and the building owner or designee, throughout the building (terminal rooms, utility closets, etc.). The telecommunications service provider will provide, manage and maintain the building cable and registration jacks that denote the demarcation points. The demarcation points will be placed at these locations and will be accessible to end-users at these locations. This (b) is not an option for single tenant buildings.

(c) The telecommunications service provider will terminate facilities and place demarcations at locations, mutually agreed upon by the provider and the building owner or designee, within the individually occupied units, within twelve inches or a similarly reasonable distance of cable/wire entry. The provider will provide, manage and maintain the building cable, network terminating wire and registration jacks that denote the demarcation point. This (c) is not an option for single tenant buildings.

(d) All telecommunications service provider facilities and demarcations will terminate at one location on the property, mutually agreed upon by the provider and the building owner or designee. The building owner and/or tenants will provide, manage and maintain building wire and cable placed beyond the demarcation point location.

(8) The telecommunications installer must confer with the telecommunications provider when determining the point of demarcation.

002 Definitions

(9) **"CWSTP (cable, wire and service termination policy)"** is the policy of the Federal Communications Commission (FCC) and the Washington utilities and transportation commission (WUTC) prescribed by tariff that governs negotiations between building owners and telecommunications service providers regarding the configuration of POP(s) and demarcation point(s) in multitenant buildings when a MPOE policy is not elected by the telecommunications service provider.

(10) **"MPOE (minimum point of entry)"** is a building wiring policy of the FCC and WUTC for multitenant environment locations that can be elected by telecommunications service providers. It prescribes that the telecommunications service provider will provide a single POP for access to its network and is located either at the closest practicable point to where a telecommunications

service provider's facilities (fiber, coax, or copper) cross a property line or at the closest practicable point to where the wiring enters a multiunit building or buildings. All demarcations provided for customers and end-users by the provider will be placed within twelve inches of that POP.

(11) **"POP (point-of-presence),"** also called a **"POT (point-of-termination),"** is a designated point at or near a customer premise at which a telecommunications service provider's facilities for the provision of access service ends. This can be a fiber, coax, or copper connection point. Depending on the telecommunications service provider's CWSTP with the individual building owner, demarcations may be established at the POP or at other designated locations. When the customer of a telecommunications service provider is another carrier, the demarcation will be at the closest POP to the end-user. A telecommunications service provider may have multiple POPs within a multiple tenant environment.

296-46B-900 – Electrical Plan Review

Classification or Definition of Occupancies

(1) Occupancies are classified and defined as follows:

(a) Educational facility refers to a building or portion of a building used primarily for educational purposes by six or more persons at one time for twelve hours per week or four hours in any one day. Educational occupancy includes: Schools (preschool through grade twelve), colleges, academies, universities, and trade schools.

(b) Institutional facility refers to a building or portion of a building used primarily for detention or correctional occupancies where some degree of restraint or security is required for a time period of twenty-four or more hours. Such occupancies include, but are not restricted to: Penal institutions, reformatories, jails, detention centers, correctional centers, and residential-restrained

care.

(c) Health or personal care facility. Health or personal care facility refers to buildings or parts of buildings that contain, but are not limited to, facilities that are required to be licensed by the department of social and health services or the department of health (e.g., hospitals, nursing homes, private alcoholism hospitals, private psychiatric hospitals, boarding homes, alcoholism treatment facilities, maternity homes, birth centers or childbirth centers, residential treatment facilities for psychiatrically impaired children and youths, and renal hemodialysis clinics) and medical, dental, or chiropractic offices or clinics, outpatient or ambulatory surgical clinics, and such other health care occupancies where patients who may be unable to provide for their own needs and safety without the assistance of another person are treated.

(i) "Hospital" means any institution, place, building, or agency providing accommodations, facilities, and services over a continuous period of twenty-four hours or more, for observation, diagnosis, or care of two or more individuals not related to the operator who are suffering from illness, injury, deformity, abnormality, or from any other condition for which obstetrical, medical, or surgical services would be appropriate for care or diagnosis.

(ii) "Nursing home," "nursing home unit" or "long-term care unit" means a group of beds for the accommodation of patients who, because of chronic illness or physical infirmities, require skilled nursing care and related medical services but are not acutely ill and not in need of the highly technical or specialized services ordinarily a part of hospital care.

(iii) "Boarding home" means any home or other institution, however named, which is advertised, announced, or maintained for the express or implied purpose of providing board and domiciliary care to seven or more aged persons not related by blood or marriage to the operator. It must not include any home, institution, or section thereof which is otherwise licensed and regulated under

the provisions of state law providing specifically for the licensing and regulation of such home, institution, or section thereof.

(iv) "Private alcoholism hospital" means an institution, facility, building, or equivalent designed, organized, maintained, or operated to provide diagnosis, treatment, and care of individuals demonstrating signs or symptoms of alcoholism, including the complications of associated substance use and other medical diseases that can be appropriately treated and cared for in the facility and providing accommodations, medical services, or other necessary services over a continuous period of twenty-four hours or more for two or more individuals unrelated to the operator, provided that this chapter will not apply to any facility, agency, or other entity which is owned and operated by a public or governmental body.

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

(vi) "Private psychiatric hospital" means a privately owned and operated establishment or institution which: Provides accommodations and services over a continuous period of twenty-four hours or more, and is expressly and exclusively for observing, diagnosing, or caring for two or more individuals with signs or symptoms of mental illness who are not related to the licensee.

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

(viii) "Birth center" or "childbirth center" means a type of maternity home which is a house, building, or equivalent organized to provide facilities and staff to support a birth service

provided that the birth service is limited to low-risk maternal clients during the intrapartum period.

(ix) "Ambulatory surgical facility" means a facility, not a part of a hospital, providing surgical treatment to patients not requiring inpatient care in a hospital. This term does not include a facility in the offices of private physicians or dentists, whether for individual or group practice, if the privilege of using such facility is not extended to physicians or dentists outside the individual or group practice. (NEC: Ambulatory Health Care Center.)

(x) "Hospice care center" means any building, facility, place, or equivalent, organized, maintained, or operated specifically to provide beds, accommodations, facilities, or services over a continuous period of twenty-four hours or more for palliative care of two or more individuals, not related to the operator, who are diagnosed as being in the latter stages of an advanced disease which is expected to lead to death.

(xi) "Renal hemodialysis clinic" means a facility in a building or part of a building which is approved to furnish the full spectrum of diagnostic, therapeutic, or rehabilitative services required for the care of renal dialysis patients (including inpatient dialysis furnished directly or under arrangement). (NEC: Ambulatory Health Care Center.)

(xii) "Medical, dental, and chiropractic clinic" means any clinic or physicians' office where patients are not regularly kept as bed patients for twenty-four hours or more. Electrical plan review is not required.

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

(xiv) "Adult residential rehabilitation center" means a residence, place, or facility designed or organized primarily to provide twenty-four-hour residential care, crisis and short-term care or long-term individualized active treatment and rehabilitation for clients diagnosed or evaluated as psychiatrically impaired or chronically mentally ill as defined herein or in chapter 71.24 RCW.

(xv) "Group care facility" means a facility other than a foster-family home maintained or operated for the care of a group of children on a twenty-four-hour basis.

(d) Licensed day care centers.

(i) "Child day care center" means a facility providing regularly scheduled care for a group of children one month of age through twelve years of age for periods less than twenty-four hours.

(ii) "School-age child care center" means a program operating in a facility other than a private residence accountable for school-age children when school is not in session. The facility must meet department of licensing requirements and provide adult supervised care and a variety of developmentally appropriate activities.

(iii) "Family child day care home" means the same as "family child care home" and "a child day care facility" licensed by the state, located in the family abode of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home. Electrical plan review is not required.

Plan Review For Educational, Institutional or Health Care Facilities/Buildings

(2) Plan review is a part of the electrical inspection process; its primary purpose is to determine:

(a) That service/feeder conductors are calculated and sized according to the proper NEC or WAC article or section;

(b) The classification of hazardous locations; and

(c) The proper design of emergency and standby systems.

(3) Electrical plan review.

(a) Electrical plan review is not required for:

(i) Lighting specific projects that result in an electrical load reduction on each feeder involved in the project;

(ii) Low voltage systems;

(iii) Modifications to existing electrical installations where all of the following conditions are met:

Service or distribution equipment involved is rated not more than 400 amperes and does not exceed 250 volts;

Does not involve emergency systems other than listed unit equipment per NEC 700.12(F);

Does not involve branch circuits or feeders of an essential electrical system as defined in NEC 517.2; and

Service and feeder load calculations are increased by 5% or less.

(iv) Stand-alone utility fed services that do not exceed 250 volts, 400 amperes where the project's distribution system does not include:

Emergency systems other than listed unit equipment per NEC 700.12(F);

Critical branch circuits or feeders as defined in NEC 517.2; or

A required fire pump system.

(b) Electrical plan review is required for all other new or altered electrical projects in educational, institutional, or health care occupancies classified or defined in this chapter.

(c) If a review is required, the electrical plan must be submitted for review and approval before the electrical work is begun.

(d) Electrical plans.

(i) The plan must be submitted for plan review prior to beginning any electrical inspection. If a plan is rejected during the plan review process, no electrical inspection(s) may proceed until the plan is resubmitted and a conditional acceptance is granted.

(ii) The submitted plan will receive a preliminary review within seven business days after receipt by the department or city authorized to do electrical inspections.

(iii) If the submitted plan:

Is rejected at the preliminary review, no inspection(s) will be made on the project.

Receives conditional acceptance, the permit holder may request a preliminary inspection(s) in writing to the department or city authorized to do electrical inspections. The request must note that the preliminary inspection(s) is conditional and subject to any alterations required from the final plan review process.

(iv) Once the submitted plan has preliminary plan review approval, a copy of the submitted plan must be available on the job site for use by the electrical inspector.

(v) The final approved plan must be available on the job site, for use by the electrical inspector, after it is approved, but no later than prior to the final electrical inspection.

(vi) If the final approved plan requires changes from the conditionally accepted plan, alterations to the project may be required to make the project comply with the approved plan.

(vii) If the installer deviates from the service/feeder design shown on the final approved plan, a supplemental plan must be submitted for review before inspection can proceed. Load reductions or moving branch circuit locations within a panelboard do not require resubmission.

(e) All electrical plans for educational facilities, hospitals, and nursing homes must be prepared by, or under the direction of, a consulting engineer registered under chapter 18.43 RCW, and chapters246-320, 180-29, and 388-97 WAC and stamped with the engineer's mark and signature.

(f) Refer plans for review to the Electrical Section, Department of Labor and Industries, P.O. Box 44460, Olympia, Washington 98504-4460 or the city authorized to do electrical inspections.

(g) Plans for projects within cities that perform electrical inspections must be submitted to that city for review.

(h) Plans to be reviewed must be legible, identify the name and classification of the facility, clearly indicate the scope and nature of the installation and the person or firm responsible for the electrical plans. The plans must clearly show the electrical installation or alteration in floor plan view, include all switchboard and panelboard schedules and when a service or feeder is to be installed or altered, must include a riser diagram, load calculation, fault current calculation, and interrupting rating of equipment. Where existing electrical systems are to supply additional loads, the plans must include documentation that proves adequate capacity and ratings. The plans must be submitted with a plan review submittal form available from the department or city authorized to do electrical inspections. Plan review fees are not required to be paid until the review is completed. Plans will not be returned until all fees are paid. Fees will be calculated based on the date the plans are received by the department or city authorized to do electrical inspections.

(i) The department may perform the plan review for new or altered electrical installations of other types of construction when the owner or electrical contractor makes a voluntary request for review. A city authorized to do electrical inspections may require a plan review of any electrical system.

(j) For existing structures where additions or alterations to feeders and services are proposed, NEC 220.87(1) may be used. If NEC 220.87(1) is used, the following is required:

(i) The date of the measurements.

(ii) A statement attesting to the validity of the demand data, signed by a professional electrical engineer or the electrical administrator of the electrical contractor performing the work.

(iii) A diagram of the electrical system identifying the point(s) of measurement.

(iv) Building demand measured continuously on the highest-loaded phase of the feeder or service over a thirty-day period, with the demand peak clearly identified. Demand peak is defined as the maximum average demand over a fifteen-minute interval.