



STATE OF WISCONSIN

Department of Safety and Professional Services
1400 E Washington Ave. Madison WI 53703
Web: dsps.wi.gov

Governor Scott Walker **Secretary Dave Ross**

Electrical Program

Web: [Electrical Program](#)

2016 Winter Electrical Code Update Commercial Electrical Program

- 1) We have hot tubs going on some decks/patios on a high rise building. The question came up for bonding within 5 feet horizontally and 12 feet vertically of these hot tubs. The door and window frames, exposed metal trims, water faucet, sprinkler head and railing are within this range. Do we have to bond these items?

NEC 680.26(B)(7)

Answer: Yes. We agree that NEC 680.26(B) (7) would apply to many of these metal building appurtenances. Exception No. 1 applies where the metal part is separated by a "permanent barrier". The exception does not exempt metal parts that are painted or epoxy coated. It would be reasonable to consider the parts bonded together if they are mounted to structural framing system. I am specifically thinking of steel stud construction. The common framing system would have to be bonded to the hot tub frame or equipment grounding point.

- 2) I would like to use a listed "cable management system" to route cords and cables from the outlets in the wall to the cardio machines in my gym. I plan to secure them to the floor, route the cables and cords through it, then snap on the protective cover. Is either of these products acceptable?

NEC 400.8(6), NEC 388.10

Answer: No. NEC Article 388 contains the requirements for Surface Nonmetallic Raceways. Both products are listed as a surface-mounted nonmetallic raceway. It would be "legal" to pull power conductors or, with separation, data or communications cables through the raceway. However a flexible cord is not a cable. NEC Article 400 regulates flexible cords. Section 400.8 prohibits cords "where installed in raceways, except as otherwise permitted in this Code". However, there is no permission to place the cord in a raceway to provide this protection in a typical permanent installation.

- 3) We installed the electrical wiring for an underground lift pump station. The pumps and floats were supplied with 30' cords. We had to use a junction box to splice the cords to wiring that

connects to control cabinet. The junction box is outside of the wet well, is the junction box classified as Class I Division I or Division 2? Is RMC or IMC required from the junction box to the control cabinet? The control cabinet is located above ground in a non-hazardous area.

NEC 500.4(A), 501.15(B)(2)

Answer: NEC 500.4(A) requires that the hazardous locations be properly documented. The questions you ask are normally addressed by the documentation. The interior of a wet well is typically a Class I, Division 1 location. The submersible pump and float switch are cord connected so normally a splice box or the control enclosure is located just outside of the well. The cords are often run through a "sleeve" in order to route them out of the wet well. NEC 501.140(A)(3) addresses this use. The area between the cords and the sleeve must be filled with a sealing material such as "duct seal". This material should be removable in order to facilitate removal of the pumps or float switch assemblies without cutting the cords within the wet well or pumping chamber. The interior of the splice box is typically considered a Class I, Division 2 location. Therefore, the splice box is not required to be "explosion proof" per NEC 501.10(B)(4). At the splice box, the wiring method must change to conductors in a Chapter 3 wiring method such as RMC or IMC. This permits the installation of a seal at the boundary between the splice box and the control enclosure. The seal fitting is normally installed above grade and in compliance with NEC 501.15(B)(2).

- 4) This is the one-line drawing for a solar PV install I am installing. Can I connect this panel to the existing metering equipment provided I have proper lugs? I am trying to avoid removing a brand new 200 amp service panel.

NEC 705.12(D), 230.71(A)

Answer: Yes. The NEC provides several alternatives. One is back-feeding a circuit breaker in the existing panel. Since both the supply main and the proposed PV supply breaker total more than 200 amperes, this forces a change. The applicable requirements are covered in NEC 705.12(D). Yes, there are other permitted options; NEC 705.12(A) does permit the PV source to be connected ahead of the service disconnecting means for the house. A suitable, service rated, disconnecting means would have to be installed per NEC 230.71(A). You could check PSC 113. That may give you some other options such as requiring the PV disconnecting means on the exterior of the building.

- 5) Is an emergency disconnect switch required for a stand-alone 120 volt diesel fuel pump?

NFPA 30

Answer: Yes. Controls meeting the requirements of NEC 514.11 (A) and (B) are required for diesel fuel dispensers on farms, contractors yards and similar locations. The requirements in NEC 514.11 are drawn from NFPA 30. NFPA 30 has been adopted in Wisconsin and applies to diesel dispensing locations.

- 6) A local pharmacy has a dedicated room for providing patients with flu shots. Is this considered patient care? There are two receptacle outlets. One is located in the wall and about 18-inches AFF and the other one is above the countertop with the sink. Are Hospital Grade receptacles required? GFCI protection for either one?

NEC 517.2

Answer: Yes. The definition of Health Care Facilities in 517.2 indicates that portions of buildings in which medical care is provided fall under the scope of Article 517. However, hospital grade receptacles are not required. The room is a general care area. Hospital Grade receptacles are required at patient bed locations and in critical care areas such as hospital operating rooms. Likely as any receptacle outlet within 6 feet of the sink requires GFCI protection per 210.8(B)(5). Exception No. 2 is not applicable as the room is not a patient bed location.

- 7) When is Ground Fault Protection for equipment required to be tested? What does the test consist of?

NEC 215.10

Answer: 215.10 states in part, "Each feeder....shall be provided with ground-fault protection of equipment in accordance with the provisions of 230.95." 230.95(C) requires the testing to be done "...when first installed on site." Notice the word "first", the inspectors should be requiring the test to be done when it is installed and prior to energizing the service. Testing shall be done in accordance with the manufacturer's instructions. Typical testing involves a neutral insulation resistance test, primary injection testing, reduced control voltage tripping capabilities. In short, it is a lot more involved than pushing the test button.

- 8) Can you tell me if the installation of Low Voltage Wiring requires an electrician's license in the state of WI?

State Statue 101.862 (4) (d)

Answer: No, A license is not needed from the State of Wisconsin. State Statue 101.862 (4) (d) A person engaged in installing, repairing, or maintaining equipment or systems that operate at 100 volts or less is not required to have a License or Registration.

- 9) Is it permissible to allow the concrete encased electrode to be turned up and out of concrete and then attached to a #4 copper?

NEC 250.68 (A)

Answer: Yes, they do make a clamp for a number 4 bare conductor to connect to rebar. Exception # 1 in NEC 250.68(A): An encased or buried connection to a concrete-encased, driven,

or buried grounding electrode shall not be required to be accessible. This issue is clarified in the 2014 NEC; it permits an extension-stub up for a concrete encased electrode.

- 10) Is it permissible to use the poured wall section as a concrete encased electrode? One side of the poured wall foundation will be in contact with the earth. The other side would be covered with 2 inches of insulating foam.

NEC 250.52.(A)(3) (1) & (2)

Answer: Yes. NEC 250.52 (A)(3) states that the concrete footing or concrete foundation shall be in direct contact with the earth.

- 11) A contractor is installing a 3000 amp 480/277 service. He will be using the 6 disconnect rule. The largest breaker will have the trip set at 900 amps. However, it is a 1200 amp frame size. Would this require any ground fault protection?

NEC 230.95

Answer : Yes, 230.95 reads, "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. "

- 12) An industrial facility in our city is installing retrofit kits in their fluorescent lights. Should the retrofit kits be listed?

SPS 316.003(1) and SPS 316.012

Answer: Yes, the retrofit light kit would have to be listed by a recognized Nationally Recognized Testing Laboratory. The installation instructions would indicate what needs to be done to make this a code compliant installation.

- 13) Could you please tell me when separate metering became a state requirement?

PSC 113.0803

Answer: It became a requirement in March of 1980

PSC 113.0803 Individual electric meters required for non-transient multi-dwelling unit residential buildings, mobile home parks and for commercial establishments.

(1) Each dwelling in a multi-dwelling unit residential building and mobile home park constructed after March 1, 1980, shall have installed a separate electric meter for each such dwelling unit. Dwelling unit means a structure or that part of a structure which is used or intended to be used as a home, residence or a sleeping place by one or more persons maintaining a common household and shall exclude transient multi-dwelling buildings and mobile home parks: for example, hotels, motels, campgrounds, hospitals, community-based

residential facilities, residential care apartment complexes or similar facilities, nursing homes, college dormitories, fraternities, and sororities.

(2) Each tenant space in a commercial building constructed after March 1, 1980 shall have installed a separate electric meter.

(3) Any existing building which undergoes alterations involving a change in type of occupancy or substantial remodeling shall have installed a separate electric meter for each separate tenant space.

(4) For the purpose of carrying out the provisions of sub. [\(1\)](#), individual unit metering will not be required:

(a) In commercial buildings where the commercial unit space requirements are subject to alteration, as evidenced by temporary versus permanent type of wall construction separating the commercial unit spaces. Examples of temporary wall construction are partition walls which do not extend through the ceiling and walls which do not constitute a code-required fire separation.

(b) For electricity used in central heating, ventilating and air conditioning systems.

[PSC 113.0803\(4\)\(c\)](#) **(c)** For electric back-up service to storage heating and cooling systems or when alternative renewable energy resources are utilized in connection with central heating ventilating and air conditioning systems.

14) Can I use SER cable for a temporary feeder in a City Park for a Holiday light show?

NEC 338.12 (A) (1), 338.12(A) (3)

Answer: Yes, however there are conditions. This cable is not intended to be laid on the ground as a temporary wiring method. For exterior branch circuit and feeder wiring the installation shall comply with the provisions of Part I of Article 225 and is supported in accordance with 334.30.

15) We are running 6 sets of parallel 500 kcmil aluminum conductors to a 2000 amp rated service. How do I determine the correct ampacity of the conductors?

NEC 240.4 (C), 310.15(B)(16)

Answer: Where the overcurrent device is rated over 800 amperes, the ampacity of the conductors it protects shall be equal to or greater than the rating of the overcurrent device. 2000 ampere service conductors must carry the full 2000 ampere load. Per your drawing 500 kcmil aluminum at 310 amperes times 6 = 1860 amperes. The calculations show that these service conductors are not equal to or greater than 2000 amperes. This does not meet the requirements of NEC 240.4 (C).

- 16) In an operating room I need to install one 240 volt 20 amp receptacle outlet for specific equipment. The isolation panel is not capable of supplying 240 volts. Is it ok to do this?

NEC 517.20(A)(2)

Answer: Yes, with conditions.

(A) Receptacles and Fixed Equipment. Wet procedure location patient care areas shall be provided with special protection against electric shock by one of the following means.

(1) Power distribution system that inherently limits the possible ground fault current due to a first fault to a low value, without interrupting the power supply. This requirement refers to the isolation panel.

(2) Power distribution system in which the power supply is interrupted if the ground fault current does, in fact exceed a value of 6mA. This requirement refers to GFCI protection for personnel. Since the isopanel is not an option GFCI protection would be required.

- 17) I'm working on a new dormitory building. Each sleeping unit is equipped with a living room, bedroom, closet and bathroom. There is no permanent provision for cooking. Are these units treated as dwelling units? Are the requirements for TR receptacles, AFCI and GFCI protection applicable?

NEC Article 100 Definition of Dwelling Unit

Answer: No. The dormitory room does not qualify as a dwelling unit. You do not have to follow the requirements of NEC 210.12 (A) for the Arc-Fault Circuit-Interrupter Protection as that would only apply in a dwelling unit. TR receptacles would be required if this room meets the definition of a guest room. GFCI protection is required in the areas covered under 210.8(B).

- 18) I am a licensed electrician but in MN. If I become licensed in WI (master electrician license), can I pull my own permit and install the electrical? Or can I do both with my current MN license?

State Statue 101.862(1) & (2)

Answer: You would have to be a Wisconsin licensed master electrician and electrical contractor. Wisconsin and Minnesota do not have any reciprocal agreements regarding electrical licensing at this time. Once you have these two licenses you would be able to secure a permit and install electrical wiring.

- 19) Are occupancy sensors required for control of lighting in the bathrooms of commercial buildings?

IECC 505.2.2, SPS 363.0505

Answer: Occupancy sensors are not the only method. Other methods are mentioned in IECC 502.2.2.2

- 20) We used PVC conduit to wire overhead lighting in a new free stall barn. The inspector indicated we need to install expansion joints in the straight conduit runs between the receptacle boxes. The lights are about 30-feet apart. Are the expansion joints required?

NEC 352.44

Answer: Yes. 352.44 indicates expansion joints are required where expansion more than $\frac{1}{4}$ " can occur. Table 352.44 gives expansion characteristics. You need to calculate what the expected change in temperature is. For example if the barn gets down to freezing in the winter and up to 90-in the summer, the change in temperature is 60 degrees. The change in length for a 60 degree change in temperature is 2.43-inches per 100-feet of PVC conduit. Over 30-feet, the expansion will be about $\frac{3}{4}$ inch. You would need at least one fitting in each straight run. [Math: $2.43\text{-inches} / 100\text{-feet} \times 30\text{-feet} = .73\text{ inches or } \frac{3}{4}\text{ inch}$]

- 21) We installed a 150 kva, 3-phase transformer. Copper is expensive so we would like to use paralleled 4/0 Aluminum to supply the secondary panel. The calculated load is 289-amperes and we plan to use a panel with a 400-amp aluminum buss. Is this OK?

NEC 240.21(C)

Answer: Yes, with a 350 amp over current protective device. The "round-up rule" or 240.4(B) does not apply to taps or transformer secondary conductors. The secondary conductors must be protected at or below their ampacity. Based upon Table 310.16 or new Table 310.15(B) (16), the allowable ampacity of 4/0 XHHW conductors is 180-amperes at 75 C. That gives a combined ampacity of 360 for parallel conductors. The conductors are more than adequate for the load. The 400-amp bus is OK, but you will have to install a 350-ampere main or increase the size of the conductors.

- 22) We have an employee who installs electrical wiring in our facility. We are licensed as a RCAC or residential care facility. Does our employee have to be licensed as an electrician? What are her options as far as the type of license needed to perform her work?

ss 101.862(4)(b)

Answer: Yes for installation. No for repair. Ss 101.862(4) (b) Employees may perform maintenance or repair. Installation must be done by licensed electricians. If the employee was born before 1/1/1956, no current license or certification is needed in order to obtain the Registered Master Electrician credential. The person applying for this credential would need to provide verification of their birth date, and verify at least 15 years of installing, maintaining, or repairing electrical wiring. According to the current emergency rule, at this time, this certification would not expire, and no continuing education is needed to keep the certification current. Legislation is pending that would require these individuals to take CEU classes. This emergency rule created the Registered Master Electrician category, which is not the same as the existing Master Electrician category.

- 23) I have an application where we are replacing old panelboards in separate tenant spaces of a building. The existing panels are main lug only. The main distribution panel is located in the basement electrical room. Do the new panels require a main breaker?

NEC 408.36

Answer: No. Overcurrent protection is not required in the panelboard enclosure if the rating of the breaker protecting the feeder conductors does not exceed the ampacity rating of the panelboard. 408.36 allows the overcurrent protective device to be located within or at any point on the supply side of the panelboard.

- 24) Are tamper resistant receptacles required in guest rooms of hotels? Is AFCI protection required for lighting and receptacle outlets where located in guest rooms of hotels?

NEC 406.13, 210.18 , 210.12(A)

Answer: Yes. Maybe. 406.13 of the 2011 NEC requires all 125 volt 15 and 20 ampere receptacles in guest rooms and suites to be of the tamper resistant type. The 2014 NEC further clarifies this requirement by adding the wording "of Hotels and Motels" to the title of 406.13. Although 406.13 and 210.18 do not specifically mention hotels, the definition of guest room in Article 100 describes the typical hotel room. NEC 210.18 states that guest rooms and suites that have permanent provisions for cooking shall meet the requirements for dwelling units. If the guest room has permanent provisions for cooking, the room would need to have AFCI protection provided for the outlets listed in 210.12(A). Microwaves are not considered to be permanent provisions for cooking.

- 25) The clay soils in my area are prone to frost heaving. Can I require direct-buried cables to have a "s-loop" at the point where it enters the conduit used to protect the cables at point of emergence?

NEC 300.5(J)

Answer: Yes. You are interpreting 300.5(J) correctly. If you believe that conductors or cables will be subject to movement due to settlement or frost, you can require the conductors or cables to be arranged or installed to prevent damage to them.

- 26) We are wiring an addition to a service garage. The new service bays will have what they are calling a ramp. Basically it is a service pit with an open end. The open end will also extend into an area where they store their tools, supplies, and spare parts at that lower level. Does the storage area have to be classified the same as the pit? Venting the pit is not likely.

NEC 511.1, 511.3(C)(3)

Answer: There is no simple answer. You indicated they will not likely ventilate the pit. Therefore entire area open to the pit must be classified the same as the pit. On the plus side, you must base the classification of the pit based upon the use.

NEC 511.1 indicates the requirements apply to vehicles in which “volatile flammable liquids or flammable gases” are used for the fuel. Gasoline, natural gas, and LNG are flammable liquids or gasses respectively. Diesel fuel is a combustible liquid.

If the owner indicates only diesel-fueled vehicles will be serviced in the garage, get that in writing. Consult with the local AHJ including electrical and fire officials. They will be approving the project and may be familiar with the current use of the facility.

- 27) Can I connect loads to the Life Safety, Critical, and Equipment Branch in a hospital if they are not specifically called out in the Code?

NEC 517.32(A), 517.33(A), 517.34(A)

Answer: Generally No. NEC 517.32(A) Life Safety Branch, Page 447 States: “No function other than listed in 517.32(A) through (H) shall be connected to the life safety branch.”

NEC 517.33(A) Critical Branch, Page 448, “The critical branch of the emergency system shall supply power for task illumination, fixed equipment, selected receptacles, and special power circuits serving the following areas and functions related to patient care: “(9) Additional task illumination, receptacles, and selected power circuits needed for effective hospital operation.” This determination is made by the health care administrator for the facility and not the local electrical inspector.

NEC 517.34 Equipment System Connection to Alternate Power Source, page 448. “...such that the equipment described in 517.34 (A) is automatically restored to operation...also provide for the subsequent connection of equipment described in 517.34(B) Meet most restrictive requirement.

For LS and CB, follow 517.30(A) and Article 700. For Equipment branch, follow Article 701.

- 28) The NEC requires that abandoned fire alarm cable that is not terminated at equipment other than a connector, and not identified for future use with a tag shall be removed. Do abandoned notification appliances such as pull-stations of heat detectors have to be removed also? Since the devices are still visible, there is the appearance of fire alarm coverage.

NFPA 1 4.5.8.3

Answer: Yes. The devices must be removed. Code Reference: NFPA 1 4.5.8.3 Existing life safety features obvious to the public, if not required by the code, shall be either maintained or removed. Also NFPA 1 (2012 Edition) Section 10.2.4 that stipulates: “The owner, operator, or occupant of a building that is deemed unsafe by the AHJ shall abate, through corrective action

approved by the AHJ, the condition causing the building to be unsafe either by repair, rehabilitation, demolition, or other corrective action approved by the AHJ.” The thinking is that abandoned notification appliances would give the false impression they are providing some level of protection which would make the building unsafe. The corrective action would be to remove the appliances.

- 29) I have existing master/satellite T8 fixtures and am converting them to LED retrofits. The retrofits have LED drivers for each fixture. The contractor would like to use the conductors and raceway to feed the driver for the slave fixture. Can they use the raceway and existing conductors based on the reduced load? Would the strapping requirements for Flexible Metal Conduit be required?

NEC 210.3, 210.19(A)(1)

Answer: No. Yes. The use of a driver in each fixture changes the slave whip wiring to branch circuit wiring with all applicable NEC requirements. The current slave conductors cannot be used as installed since they are #18 conductors and the flexible conduit unsupported. Replacement of the conductors and support of the flexible conduit are required.

UL has listed/approved over 650 different LED retrofit kit assemblies. An LED assembly in which the driver feeds both fixtures could be installed in the master fixture. This scenario would allow for the existing wiring to remain as is. Information on LED retrofit assemblies can be found at www.productspec.ul.com.

- 30) I'm designing the electrical system for a major repair garage. It includes an adjacent office area. I'm struggling with the classification for the adjacent area. How are areas adjacent to the repair area required to be classified?

NEC 511.3(C) & 511.3(E)(1)

Answer: Yes, but there are options available to declassify these areas. 511.3(C) indicates that in a major repair garage, or areas not effectively cut off by walls or partitions, the area up to 18" shall be considered Class 1 Div. 2. Also, you may have classified ceiling areas if they meet 511.3(C)(2) and are servicing vehicles with lighter than air fuels.

SPS 316.511 deletes NEC 511.3(C)(1)(a) and (C)(2)(a) from declassification by using ventilation.

511.3(E)(1) does allow for adjacent areas where flammable vapors are not likely to be released such as stockrooms, offices, and showrooms to be unclassified where mechanically ventilated at a rate of four air changes per hour or designed with positive air pressure. Sometimes the areas outside of the repair area are positively pressurized to prevent the migration of the volatile flammable vapors from entering those areas. Any ventilation or pressurization method used would be required to be run 24/7 if vehicles are present in the showroom or service area. Another method would be to keep all equipment, devices, more than 18" above the floor. If the wiring is not kept 18" off the floor, the wiring shall conform to the applicable provisions of Article 501.

- 31) Can MC cable be unsupported from a junction box to a light fixture? From one light fixture to another? The fixtures are not being used as a raceway.

NEC 330.30(D)(2) & 330.30(A)

Answer: Yes, with conditions. When going from a box to fixture the MC is being used as a fixture whip. It must not be longer than six feet. Going from the 4 square box to a fixture is allowable according to NEC 330.30 (D) 2 Unsupported Cables. Type MC cable shall be permitted to be unsupported where the cable: (2) Is not more than six foot in length from the last point of cable support to the point of connection to luminaires or other electrical equipment and the cable and point of connection are within an accessible ceiling. For the purpose of this section, Type MC cable fittings shall be permitted as a means of cable support. When the MC is run from light fixture to light fixture, it is no longer a fixture whip. It must now be secured and supported. Some call this practice "daisy-chaining". NEC 330.30 Securing and Supporting 330.30 (A) General: Type MC cable shall be supported and secured using staples, cable tie, straps, hangers, or similar fittings or other approved means designed and installed so as not to damage the cable. NEC 330.30(B) Securing. Unless otherwise provided, cables shall be secured at intervals not exceeding 6 feet. Cables containing four or fewer conductors sized no larger than 10 AWG shall be secured within 12 inches of every box, cabinet, fitting, or other cable termination.

- 32) I plan to install chain hung, cord connected electric-discharge luminaires (Fluorescent fixtures) in a large industrial facility. The owner would like the flexibility to adjust the fixtures and does not want them to be cord and plug connected. Can the fixtures be hard wired with flexible cord?

NEC 410.62(B)

Answer: Yes. NEC 410.62(B) allows the adjustable luminaires to be hard wired provided the exposed cord is of the hard-usage or extra-hard-usage type and is not longer than necessary for maximum adjustment. The cord shall be supported with strain relief and not be subjected to physical damage.

- 33) A new addition is going on that will require an additional electrical service. This service is 480 volt. There is an existing 3000 amp 120/208 volt service on the other side of the building. 1000' away is where the water comes into the building. From that water entry point, a 3" water pipe will go through the school and past the new 480 volt electrical service. Do we need to pull a ground wire all the way back to the water service entrance to bond at that location, or can we connect to the 3" water line at our closest point in the new addition?

NEC 250.58, 250.68(C)

Answer: It depends on the construction of the building. If the building has a steel frame and is consider an electrode per 250.52(A)(2), the bonding connection to the frame will suffice. If the building has a wood frame, the GEC must be pulled the 1000 feet to the water pipe location. NEC 250.58 requires a common grounding electrode for the (2) Services. It reads:

Common Grounding Electrode. Where an AC system is connected to a grounding electrode in or at a building or structure, the same electrode shall be used to ground conductor enclosures and equipment in or on that building or structure. Where separate services, feeders, or branch circuits supply a building and are required to be connected to a grounding electrode(s), the same grounding electrode(s) shall be used. Two or more grounding electrodes that are bonded together shall be considered as a single grounding electrode system in this sense.

NEC 250.68(C) Has specific requirements for the location of the connection to the metallic water pipe. It reads: (C) Metallic Water Pipe and Structural Metal. Grounding electrode conductors and bonding jumpers shall be permitted to be connected at the following locations and used to extend the connection to an electrode(s): (1) Interior metal water piping located not more than 1.52 m (5 ft) from the point of entrance to the building shall be permitted to be used as a conductor to interconnect electrodes that are part of the grounding electrode system.

There is an exception in NEC 250.68(C) that may or may not apply to the facility you are working on.

Another possible option is to use the structural frame of a building that is directly connected to a grounding electrode and use this as a bonding connector to interconnect electrodes. This is permitted in NEC 250.68(C)(2). It Reads: (2) The structural frame of a building that is directly connected to a grounding electrode as specified in 250.52(A)(2) or 250.68(C)(2)(a), (b), or (c) shall be permitted as a bonding conductor to interconnect electrodes that are part of the grounding electrode system, or as a grounding electrode conductor. a. By connecting the structural metal frame to the reinforcing bars of a concrete-encased electrode, as provided in 250.52(A)(3), or ground ring as provided in 250.52(A)(4) b. By bonding the structural metal frame to one or more of the grounding electrodes, as specified in 250.52(A)(5) or (A)(7), that comply with 250.53(A)(2) c. By other approved means of establishing a connection

You have options available to you that may be helpful in your installation.

- 34) I have a question concerning the 8' rule for service entrance conductors. SPS 316.230.3(b) limits the length of "service entrance cable not contained within a raceway" to 8-feet once the cable has entered the building. Do we count the total conductor length including the stripped ends of the cable?

SPS 316.230.3(B)

Answer: No. Measure the unstripped length of the cable similar to measuring along the length of a raceway. The length of the conductors located within enclosures is not included in the measurement. SPS 316.230.3(b) Reads:

"(b) Location. This is a department rule in addition to the requirements of NEC 230.70 (A): Raceways containing service conductors or cables, or service entrance cable not contained within a raceway, may not extend longer than 8 feet into a building to the service disconnect or

the first service disconnect of a group of disconnects as permitted by NEC 230.71. The raceways or conductors shall be considered to have entered the building at the point where they pass through the outer surface of the building exterior, except as permitted by NEC 230.6.”

- 35) Are tattoo parlors licensed as health care providers per State Statues? Does Article 517 apply to the electrical installation?

SS 146.81

Answer: No. The term “Health care provider” is defined in Ss 146.81.

Tattoos for cosmetic purposes may be given by other individuals that are licensed but not as a “Health Care Provider”. Examples of such licenses are aesthetician, cosmetologist, and manicurists. Cosmetic purposes is defined under ss 454.01 (2), (13) WI Stats.

NEC Article 517 applies only to facilities licensed as a “health care provider”.

- 36) What are the requirements for emergency lighting regarding open areas with no fixed furniture or architectural appurtenances? Some lighting designers/inspectors are under the impression that they can define an egress path, and that path would be the only area that would require emergency lighting.

IBC 1006.1 & 1006.3

Answer: With no fixed furniture in place the egress path is not defined. The entire area requires EM egress lighting.

See definition of Exit Access in the IBC. See IBC 1006.1 & 1006.3

- 37) I am remodeling an existing retail store and the inspector is requiring that the existing conduits and boxes be lowered to meet the code keeping 1-1/2" clearance from the roof deck. The owner wants to install new fixtures form the existing boxes. Do we indeed need to comply with a new code that was not in place at the time of the original install?

SPS 316.003(3) & NEC 300.4(E)

Answer: No. Per SPS 316.003 (3), existing conduits that met code at the time of original installation do not need to, or are required to comply with NEC 300.4(E). You are permitted to reuse these existing conduits, and install additional branch circuits in these existing conduits as you see fit without having to lower these existing conduits to current code standards. Code reference permitting the existing installation is SPS 316.003(3). All new conduits and fixtures added, altered or moved shall meet the current code requirements of NEC 300.4(E).

- 38) We cannot physically install conduit into fixed office furniture in a health care facility. We can install healthcare rated mc cable. Can we use mc cable and fish it into office partitions used for nursing stations. The health care administrator says the circuits are to be on critical branch.

NEC 517.30(C)(3)(3)(b)

Answer: Yes. Please review NEC 517.30(C)(3)(3)(b) on page 447.

Listed Flexible Metal Raceways and listed metal sheathed cable assemblies are permitted for wiring of emergency systems under (4) conditions:

- a. Where used in listed prefabricated medical headwalls
- b. In listed office furnishings
- c. Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage
- d. Where necessary for flexible connection to equipment

I would verify that the proposed office furnishings are listed and then use the above code language to assist the customer with compliance.

- 39) Do 2x4 fluorescent lay-in ceiling lights need to be wired with redundant grounds in a medical clinic setting? The lights are greater than 7-1/2' from the ground and should not come in contact with personnel.

NEC 517.13(B)(1) Exception No. 2

Answer: No. NEC 517.13(B)(1) Exception No.2 to (3): Exempts Redundant grounding for Luminaries more than (7 ½') above the floor and switch's located outside of the patient care vicinity. The fixture whips shall be connected to an equipment grounding conductor complying with 517.13(A) NEC 517.13(A) requires the whips & luminaires to be grounded by a metallic raceway or cable system that qualifies per NEC 250.118. NEC 517.13(A) does not require a redundant ground means. The insulated equipment grounding conductor & redundant grounding requirements are found in NEC 517.13(B).

- 40) I have a commercial building that at one time had two tenants in it with separation walls. Now this has been turn into a single business and the walls have been opened up. It has a two meter socket with two separate 100 ampere panels. They are now using both panels to serve the circuits through the building. Is this permitted?

SPS 316.230(1)(b), NEC 230.2(E)

Answer: No. SPS 316.230(1)(b) could apply to the installation. Is the installation really two services? If it is, the (2) service drops would have to located more than 150' feet apart measured in a straight line with no shared electrical wiring in a common raceway.

If this condition does not apply, a violation exists.

One More requirement to consider is 230.2(E). If the services comply with SPS 316.230(1)(b) make sure they identify the services per NEC 230.2(E)

- 41) A Level 1 EPSS was installed at a hospital. Originally the building design had the EPSS in a room separated from the service equipment by a door. The door was omitted during construction. The electrical service is 3000 amperes and 480/277 volts. Would NFPA 110 7.2.2 permit this installation?

NFPA 110 7.2.1, NFPA 110 7.2.1., NFPA 110 7.2.2

Answer: No. If the service equipment is over 150 volts to ground and rated 1000 amperes or greater, the EPSS must be in a separate room. The separate room can only contain the EPSS. The walls and doors must be a minimum (2) hr. fire rated.

- 42) An elevator is required to have stand-by power. The basement is below the water level. A generator will supply the power for the pumps to keep the water out of the basement. Are the pumps permitted on the Legally-required standby system (NEC Article 701) that supplies power to the elevator?

NEC 701, NEC 702, IBC Chapter 27

Answer: No, they would need to be supplied by an optional standby system. Such pumps are not legally required to be provided with stand-by power. Pumps are not listed in Chapter 27 of the IBC, and as such would not be allowed to be connected to a legally required system. Also, 2015 Wisconsin Act 55 prohibits municipalities from adopting or enforcing electrical codes that are not in strict conformity with state codes. The sump pumps could be installed as part of a NEC 702, Optional Stand-by Load as long as the generator was sized to accommodate all of the required loads plus all optional loads.

- 43) I thought telephone wire in elevator machine rooms had to be in conduit to be considered "protected". An elevator inspector has been seeing telephone wire in flexible ribbed plastic sheathing and in rigid plastic stick-on wire-mold type material. Are those acceptable?

NEC 620.21(A)(3)(c)

Answer: Yes for several reasons.

One is the exception for short lengths of "low-voltage" control cables as permitted by 620.21(A)(3)(c). The physical protection could easily be justified by the location (within a locked room) and the routing of the cable. Physical protection is often afforded by the way the cable is routed. A cable installed such that it follows the contours of the surface and is secured to the surface is considered "protected" from ordinary damage.

The affirmative answer for telephone cables is a bit different path but ends up with the same answer. NEC Section 90.3 indicates that the requirements in Chapter 8 stand alone. This means

only the specific requirements in the applicable article apply unless there is a reference back to a requirement in chapters 1 through 7. Telephone wiring is covered by article 800. Article 800.3 covers the applicability of other articles. Note that very few are referred to. So we would end up applying 800.24 to telephone wiring in the machine room for the elevator.

I know this is a different interpretation. But it is based upon the Code requirements and the structure of the NEC and not someone's opinion.

- 44) Is a licensed electrician required to install temporary wiring that falls under the Scope of Article 590?

SS 101.862(4)

Answer: Yes. Ss 101.862 (4) Stats does not have an exception for temporary wiring. A reasonable interpretation would be to exclude "manufactured equipment" such as stage lighting that is connected to a permanently connected distribution board. This would be in keeping with Exemption (g). Temporary distribution equipment used in conjunction with a traveling show or similar would have to be installed by a licensed electrician. What if the temporary distribution equipment was cord-an-plug connected to a permanent power outlet? Is reasonable to consider both the lighting and the portable distribution board to be "manufacture red equipment? Staff consensus-No.1st reason. Exemption (g) applies to equipment "that is designed to provide a function that is not primarily electrical in nature. 2nd reason. Wiring exempted under (g) starts at the "disconnection point" and stops at the manufactured equipment.

- 45) Can we use a listed LED or Electric discharge luminaire with integral modular supply receptacle and the factory supplied power cord and meet code?

NEC 410.62(C)(1)

Answer: Yes. This type of lighting fixture may employ a modular power cord that plugs into the modular power supply receptacle. The receptacle is mounted into the top of the fixture's wiring compartment. The connection is accessible from outside the fixture and provides a means to disconnect the fixture without entering the wiring compartment. This type of connection is a option with many current LED, fluorescent, and similar discharge luminaires. The connection between the cord and the outlet box must be made with suitable cord grip or strain relief. No additional receptacle and attachment plug is required at the outlet box. The other applicable conditions of NEC 410.62(C)(1) and Article 400 must be met.

- 46) Can you refresh my memory on what the time for selective coordination is to? Is it .1 seconds or .01seconds?

NEC 700.27, 701.27

Answer: Yes. NEC 700.27 and 701.27 requires selective coordination across the time current range. That translates for time = 0.01 seconds up to infinity. On the current axis we would expect to see coordination from I (current) equal to the breakers rating up to the maximum available short circuit current at the line terminals of the breaker.

- 47) Regarding electronic overload protection, do we set the dial at the FLA of the motor or at 125% of the motor?

SPS 316.110 NEC 430.32

Answer: Read the specifications for the product. Typical instructions indicated to set the dial at the motor FLA. The allowable percentage increase is built in. It also may be assuming the motor has a Service factor of 1.15 or better or a temperature rise of 40°C or less. The product noted below has a “built-in” setting of 125% of the motor’s FLA. Setting the dial to 125% of the motor FLA would result in under-protecting the motor from overloads by a factor of 50%. For example, take a motor with a SF of 1.15 and a FLA of 10-amperes. Setting the dial at $10 \times 1.25 = 12.5$ amperes. But because of the internal “built-in” 120% factor, the overload protection is actually set at 15-amperes.

- 48) Do you know of any DSPS regulations that stipulate separation between the prime mover of a generator and building openings such as the fresh air intake(s) for HVAC? The NEC and SPS 316 do not address this issue.

IMC 401.4

Answer: Yes. The WI Commercial Building Code requires a minimum of 10 ft distance from intakes and vents for such installations per 2009 IMC 401.4. However, in the specific case of hospitals, the minimum clearance requirement as enforced by DHS is 25 ft. as based on the Guidelines for Design and Construction of Health Care Facilities. This is a baseline reference for the majority of their rules. Check with DHS for specific requirements.

- 49) A technical college auto repair shop installed new drop cord receptacles that are not GFCI protected in the shop area. This is a classroom even though it is a repair area and falls under the scope of NEC 511. Is GFCI protection required for these receptacles?

NEC 511.1 & 511.2

Answer: Yes. NEC 511.1 & 511.2 identifies what a major repair garage consists of. If the school is conducting repairs that fall within the scope and definition of Article 511 then GFCI protection would be required for the drop cords per NEC 210.8(B)(8).

- 50) Can I use an FS style threaded box directly below the roof decking on a commercial building? It is legal for me to use IMC and rigid pipe. This box has the same make up as the conduit system? What if I put a ¼ inch metal plate above the box for physical protection?

NEC 300.4(E)

Answer. Possibly. The owner could apply to the state for a Petition for variance. The Petition would have to demonstrate an equivalent amount of protection to that required by the code section, and show that the installation meets the intent of NEC 300.4(E).

- 51) A 120-volt 15 ampere receptacle is to be installed inside a generator to power a battery charger and block heater. Does this receptacle require GFCI protection? The generator is located outdoors. The receptacle is installed "inside" the generator. The installer and manufacturer worry about nuisance tripping of the GFCI.

NEC 210.8(B)(4)&(6)

Answer: No. 210.8(B)(4) GFCI protection is not required. You indicated the generator is located "outdoors". Outdoors is defined as "outside of a building: in or into the open air". The receptacle outlet is "indoors" Indoors is defined as "in or into a building". The housing of the generators serves as the building in this case. NEC 210.8(B)(6) does require GFCI protections for wet locations "indoors". You indicated that the interior of the housing is "not a wet location" GFCI protection is not required. Both definitions are from Webster's New Collegiate Dictionary, 8th edition.

- 52) Can a branch circuit panelboard be located in a fire pump room?

None

Answer: Yes. A branch circuit panelboard can be located in the Fire Pump Room. No NEC or State Electrical Codes prohibit the installation as described in your question.

- 53) Does the NEC Require an Arc Flash Analysis study? What are the NEC & SPS 316 requirements for Arc Flash Hazard Warning Labels?

NEC 110.16, NFPA 70E

Answer: No. The National Electrical Code does not require an Arc Flash analysis study. NEC 110.16 requires that the Electrical equipment such as the switchboards, panelboards and etc. at other than dwelling units, be field marked to warn qualified persons of potential electric arc flash hazards. The marking shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. ANSI-Z535.4-1998 gives the guidelines for this type of label.

- 54) We are remodeling a 1960's apartment building. The panels are located in the bathrooms of the apartments. I am supposed to run some new circuits to the panel for a second kitchen circuit, dishwasher and more lighting. The inspector says I have to move the panels out of the bathroom per NEC 240.24(E). Is he right?

NEC 240.24(E), SPS 316.003, SPS 316.005

Answer: Yes, the inspector is correct. When installing new circuits, the circuits must comply with the current code. Existing wiring is permitted to remain as is per SPS 316.003. The prohibition on overcurrent devices in a bathroom is to ensure that these devices remain accessible. A locked bathroom door would make the devices inaccessible. A petition for variance would be a possibility if the locks were removed from the bathroom doors. Check the local ordinances for a requirement for a lock on bathroom doors.

- 55) I have a store front for a restaurant that has more than 20 feet of window. The main window extends from about 2 feet above the floor to 10 feet above the floor. 14 inches above these windows is another row of windows that are about 3 feet high and run the same distance as the lower windows. Do I need show window outlets above both sets of windows?

NEC 210.63

Answer: Not necessarily. The upper window may not meet the NEC definition of show window. If the windows are "used or designed to be use for the display of goods" NEC 210.62 requires at least one receptacle outlet shall be installed within 18 inches of the top of a show window for each 12 linear feet or major fraction thereof of show window area measured horizontally at its maximum width. If the windows are not used or designed to be used for the display of goods it is not a show window.

- 56) I tapped a 100 feeder off a 1200 amp feeder using the 10' tap rule. I used #2 copper THHN/THWN conductors. The inspector said the wire wasn't big enough. I had 100 amp fuses in the disconnect and NEC 310.15(B)(16) says #2 THHN/THWN is good for 115 amps in the 75 degree chart. The inspector said this was a violation. Is he correct?

NEC 240.21(B)(1)(4)

Answer: Yes. The inspector is correct; the wire is not large enough. Using the 10' tap rule in NEC 240.21(B)(1)(4), the conductor must be sized no less than 10 percent of the main overcurrent device if the tap is taken outside the enclosure or vault where the tap is made. Since #2 THHN/THWN is good for 115 amps, it would not be large enough since 1/10th of 1200 amps is 120 amps.

- 57) I installed a 480 volt transformer in a building to supply 120/208 volt loads. I ran metal flexible conduit from the transformer about 3 feet to an EMT which went to my panel. Can I use the flexible conduit as to serve as the supply side bonding jumper. Can I use a wire and jumper around the flex?

NEC 250.30(A)(2), 250.102(E)(2)

Answer: No. Yes. NEC 250.30(A)(2) requires that if the overcurrent device and the source are in separate enclosures, a supply side bonding jumper must be of a non-flexible metal raceway, or of a wire or bus as described. The requirements found in 250.102(E)(2) shall be followed.

58) I installed a 75 kVA transformer to feed a panel located 80 feet from the transformer. The panel has a 200 amp main overcurrent device in it. The inspector said I had to install a disconnect with Overcurrent Protection near the transformer. Is this correct? The wire is well protected per NEC 450.3(B).

NEC 240.21(C)

Answer: Yes the inspector is correct. 450.3(B) is for the protection of the transformer, not the secondary conductors. The secondary conductors of a transformer are required to follow the rules in NEC 240.21(C) for transformer secondary conductors. Typically the installation would need to meet the requirements of the 25' tap rule unless the installation is in an industrial location, but there are other factors to review in NEC 240.21(C).

59) I am installing a temporary service. The utility says the available short circuit current is 42,000 Amperes. The permanent service will meet this when we set it. Is the temporary service required to have a short circuit current rating of 42,000 Amperes?

NEC 110.9 and 110.10

Answer: Yes. NEC 590.4 (A) requires temporary services shall be installed in conformance with parts 1-8 in Article 230. NEC 110.9 & 110.10 applies to temporary services and permanent services. Just because the services are temporary in nature does not negate the safety concerns regarding the AIC ratings. Temporary services must meet the same requirements as permanent services.

60) My question relates to GFP protection of a 480Y/277 Volt 3-phase 4-wire wye system. If you have a 1200 Amperes main lug panel board with the largest installed breaker being a 225A 3ph breaker is GFP required?

NEC 230.95 and 215.10

Answer: No. GFP protection is only required for solidly grounded wye electrical services where each service disconnect is 1000 amperes or more per NEC 230.95. The second paragraph in 230.95 clarifies the requirement. It reads: "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." We do not add the service disconnects to get to 1000 amperes. If the overcurrent protection devices are less than 1000 amperes, GFP is not required.

61) There is this high-rise residential building that was remodeled some time ago. I notice that the dryers, about 20 to 30, located in the utilities rooms of each floor, are connected with 3 prong receptacles. I opened one of them and noticed that there is not a grounding jumper to the neutral. Is this the norm on this type of building?

NEC 250.140

Answer: No. The use of SE cable was allowed up until the 1996 NEC. Dryers and ranges were allowed to ground through the neutral. A "non grounding" type plug was used. NEMA 10-30 for dryers and NEMA 10-50 for ranges. These just had 2 hots and a neutral. The frames of the dryers are required to be grounded, and in this case they are not. The thing to keep in mind these circuits were supposed to be have an insulated neutral, or SE cable was permitted to be used if the SE cable originated at the service equipment.

62) Is compensation for voltage drop a recommendation or requirement?

Informational notes to 210.19(a), 215.2(b)

Answer: Recommendation. The only requirements for voltage drop in the NEC are found in Articles 695 and 647. However, Section 215.2(A)(4) FPN No. 2 does have some guidelines that can be followed. Conductors for feeders as defined in Article 100, sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads, and where the maximum total voltage drop on both feeders and branch circuits to the farthest outlet does not exceed 5 percent, will provide reasonable efficiency of operation. Voltage drop affects the efficiency of the equipment, but is not a safety issue. The NEC recommends [Informational notes to 210.19(A)(1), 215.2(A)(4)] a maximum of 3% voltage drop for branch circuits, a maximum of 3% voltage drop for feeders, but a maximum of 5% voltage drop overall for branch circuits and feeders combined.

63) Are anti-short bushings required for both Type AC and Type MC cable terminations?

NEC 320.40

Answer: No. Type AC cable must terminate in boxes or fittings specifically listed for Type AC cable to protect the conductors from abrasion. An insulating anti-short bushing, sometimes called a "redhead," must be installed at all Type AC cable terminations. The termination fitting must permit the visual inspection of the anti-short bushing once the cable has been installed.

The NEC does not require anti-short bushings (redheads) at the termination of Type MC cable.

64) Any thought on why the NEC and NFPA 70E do not clearly define all electrical equipment that has a potential flash hazard to be labeled? (Example: disconnect switch at 200 A feeding an HVAC unit requiring PPE Category 3).

NEC 110.16 and NFPA 70E 130.5(D)

Answer: While the NEC and NFPA 70E standards both have arc flash labeling requirements, the specific requirements in NEC 110.16 and NFPA 70E 130.5(D) are quite different. However, both standards have one element in common: the requirement that electrical equipment "...likely to require examination, adjustment, servicing, or maintenance while energized..." should be labeled. The list of equipment that may require labeling (switchboards, panelboards, etc.) is

inclusive (e.g., "...equipment such as..."), so both standards provide general guidance rather than an exhaustive list of equipment requiring labeling.

65) Can EMT be used over 600 volts?

NEC 300.37, UL Whitebook FJMX

Answer: Yes. The White Book 2014 states that EMT is listed for "installation of conductors in circuits rated above or below 600V, nominal, and in accordance with ANSI/NFPA 70, National Electrical Code". Part II of Article 300 is requirements for over 600 volts and 300.37 lists EMT as one of the permitted wiring methods.

66) Are special EMT fittings required for use in wet locations?

NEC 358.42, 314.15

Answer: Yes, per Article 358 all fittings are required to be listed (358.6) and suitable for a wet location (358.42). In 358.42, it is stated that "Couplings and connectors used with EMT shall be made up tight. Where buried in masonry or concrete, they shall be concrete tight type. Where installed in wet locations, they shall comply with 314.15." 314.15 states that 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."

67) My inspector states that the NEC requires each corner of the ceiling grid where a recessed fixture is installed be secured to the building structure. Is this correct?

NEC 410.16(C)

Answer: No. Section 410.16(C) states the framing members of suspended ceiling systems used to support fixtures shall be securely fastened to each other and shall be securely attached to the building structure at appropriate intervals. Fixtures shall be securely fastened to the ceiling framing member by mechanical means such as bolts, screws, rivets or listed clips.

If the suspended ceiling is installed in accordance with the building code, there is no need for additional support of the ceiling-framing members. Just install the fixture and securely fasten it to the ceiling-framing members by mechanical means.

Note: There might be a building code requirement to independently secure fixtures to the building structure if the ceiling is part of a fire rated assembly.

68) In hospitals, the wiring of the emergency system shall be mechanically protected by installation in nonflexible metal raceways. Must these raceways be painted red?

NEC 517.30(C)(3), 700.10(A)

Answer: No. the emergency circuit raceway does not need to be identified in any manner (painted red). Section 517.30(C)(3) contains the requirements for mechanical protection for emergency circuit conductors, but there is no requirement that the raceway be painted red. However, 700.10(A) requires all boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits to be permanently marked so they will be readily identified as a component of an emergency circuit or system.

69) I am being charged for an electrical permit but no one is inspecting the work in commercial buildings. What can I do?

SPS 316.920(2), SPS 316.940(2)

Answer: Contact the municipality. If the municipality exercises jurisdiction over electrical installations in accordance with SPS 316.920(2), they are required to provide inspections in accordance with SPS 316.940(2). And they must do so within two business days of the request.

70) Can the breaker box be enclosed in a sealed box? I can build a box from ridged food processing approved washboard and plywood and seal the door with Teflon weather stripping and install a tight latch?

NEC 110.26

Answer: Possibly. Enclosing a panel in a kitchen could be done if there is no equipment in front of the load center. It all depends on clear working space. Do you have any information where the panel is? What the clear working space would be in front and side to side of the panel ? Is there a height limitation in front of the panel ? We need 36" from floor to 6 ½', or top of panel in front of the panel. We need 30" wide from one side of the panel opening to the other side. (Imagine if you set a refrigerator in front of the electric box. That is how big of an area we need for clear working space.)

71) Does a floor receptacle outlet serving a dental chair need GFCI protection?

NEC 210.8(B)(5)

Answer: Possibly. If this chair has an outlet that is on a swing arm and could be closer than 6 feet from a sink, then GFCI would also be required. Look at the listing on the cord for this chair, It may require to be plugged into a hospital grade receptacle. Some of these chairs require to be hard wired to maintain the redundant ground.

72) I am doing a new CBRF building and the local inspector is suggesting that we get state inspection. I am wondering if this is required and also what is your availability to perform the inspection. Is there a state form to send in? Do you charge a permit fee?

Form SBD-10822

Answer: Yes. The state will do such inspections upon request. The form is on the DSPS website. It needs to be filled out and mailed or emailed to DSPS. The fees for inspection are \$80.00 per hour for time inspected and travel time. We also have a mileage fee of \$.352 cents per mile. When DHS is involved with a project, the state electrical inspector is called in unless the Municipality has a commercial inspector.

- 73) We have a design question regarding the emergency egress exiting a building. The project is an ambulatory surgery center and professional office building. In the future (unknown time frame) the facility will become a full I-2 occupancy. We are designing as much as we can to an I-2. The question that arose is if lighting egress needs to provide illumination extending just past the width of the exterior door opening or if it needs to extend to the site's property line.

IBC 1006.3.5 and IBC 1006

Answer: The exit discharge is required to be illuminated. The IBC defines exit discharge as "That portion of a means of egress system between the termination of an exit and a public way." The property line is not necessarily the "public way". The definition of "public way" is "A street, alley or **other parcel of land** open to the outside air leading to a street, that has been deeded, dedicated or **otherwise permanently appropriated to the public for public use** and which has a clear width and height of not less than 10 feet." The public way could be a sidewalk, parking lot, or a parcel of land that the public has access to.

- 74) Is there anything in the NEC and/or SPS 316 that would prohibit the use of a Class 2 rated Fire Alarm Cable for wiring a class 2 lighting system? For example: A fire alarm cable is used to connect the load side of a class 2 power supply, to a LED luminaire. I have not found anything in Art 760 or 725 that prohibit this. Assuming that the lighting system is listed for use with this cable, and also the cable listing allows for this type of installation as well, would this be acceptable?

NEC 411.4(A)(2), 725.130(B), 725.154 (G)

Answer: Yes. NEC 411.4(A)(2) requires the installation of concealed wiring comply with 725.130. NEC 725.130(B) requires that the cable comply with 725.154. NEC 725.154 (G) lists the permitted substitutions. FPL is not on the list. A cable listed for multiple uses such as FPL and any of the permitted types would work.