Our Goal is FOR ALL STAKEHOLDERS TO HAVE A SUCCESSFUL PROJECT with us and that together we keep people and structures safe and buildings economically viable to serve the needs of our community.

We strive for:

EXCELLENT CUSTOMER SERVICE!
and
QUALITY INSPECTIONS!

February 8th, 2016

OUR NEXT MEETING is March 8th

We’ll have a Selective Coordination Presentation

I. Customer Service Reminder, Hartman

II. Selective Coordination Policy
Selective OCP Coordination Policy

The National Electrical Code (NEC) requires selective overcurrent studies be conducted on electrical systems where operation of overcurrent devices can cause unwanted and sometimes dangerous outages to emergency and special systems, due to improperly coordinated electrical systems. In plan review these projects are stamped so that the inspector is to receive the report before TCO/CO and spot check the installation for conformance to the design.

Emergency Systems are required to have selective coordination be designed into electrical distribution per NEC 700.27, 701.27, 517.26 and 517.17C. COPS selective coordination is required per NEC 708.54. Elevator coordination is required per NEC 620.62.

These studies by their nature can include large amounts of documentation, and we cannot collect, analyze or
store the completed studies. So as a result we would only require verification that the proper selection study has been performed and made available to the project owner. This can be achieved through a sealed engineer’s letter stating that the study has been;

- Conducted on the specified address, under Electrical Permit Number__________
- Conducted on the appropriate system per the applicable NEC sections with moderate details
- This must be on the design professional’s letter head, affixed with the professional seal and uploaded to the permit prior to TCO/CO.

Below is a suggested template acceptable to Code enforcement.

Your Letterhead
Date
Project Address
Electrical Permit Number

An overcurrent device selective coordination study has been performed on both the normal and alternant source side, at the above location per Article(s)
of the NEC. Based on that study the required electrical system is found to be selectively coordinated.

III. Consistency Questions

1. When is an ‘IT Room’ subject to Article 645? What if someone wants to put a mini-split system dedicated to a room with computer equipment in it, but wires the room compliant to chapters 1-4. Would it still have to meet the provisions of 645 also?
Per NC Code Policy from NCDOI the room would need to be identified as an IT room by the owner/occupant.

2. If a building has 2 services because of capacity requirements, do the mains have to be grouped or can one be outside and the other inside? If the services qualify by capacity listed in 230.2 C 1 or 2 they can be both in, or both out, or one in and one out. Location is not specified.

3. In calculating the adjustment factors in 310.15(B)(3), when are the neutral conductors counted as a current carrying conductors? 310.15(B)(5) seems a little unclear on some situations. If I have a conduit with 9 120v hot conductors with 9 neutrals. Do I or do I not count these neutrals? What if I were to use 3 hots per neutral conductor? The calculation is based on current carrying conductors. In a 2 wire circuit that is the total load of the circuit. In multiwire circuits that will be only the unbalanced load between the ungrounded
conductors, so that if A carries 12 amps and B carries 9 amps the return is 3 amps. In non linear loads you need to count the neutral as total load.

4. Residential jobs with Non-IC cans. How are we to handle rough inspections where Non-IC cans are installed in areas that would normally be batted or blown insulation? GC says it will have spray foam insulation in the attic rather than insulation in the ceiling joists. Would this require an additional inspection to verify proper clearance around these fixtures after insulation and before drywall? Yes, if the inspector thinks so. There may be closed areas that need to be checked before closing. The inspector needs to advise the contractor of this need and note it on his inspection record.

5. Am I required to use an AFCI breaker on any 2-pole 15 or 20 amp circuits when the Covered Work Policy applies. Example is 15 amp 2-pole on multi-wire circuit for the disposal/dishwasher. Does it apply to 240 volt also or only to 120 volt 15 and 20 amp circuits with or without tie-handles.
The policy is to require the AFCI protection for all covered items as stated.

6. I have the following LED light that can be mounted on ceiling or wall and also can be mounted to 5 or 6" recessed housings. It says flush mount in the literature. If I retrofit an existing recess in a closet, what are my required clearances? It's being used on a recess type fixture so I assume 6" clearance. Or am I going to be required to meet the clearance of a surface mounted fixture being 12"? The fixture is made by WAC Lighting, model FM-306. I have provided a spec sheet as well as the installation instructions. This appears to be a surface mounted light. 12” would be required.
**Disc LED Ceiling and Wall**

**FM-30**

**PRODUCT DESCRIPTION**
Multiple mid-powered LEDs illuminate the acrylic diffuser uniformly without socket shadows which are common in conventional flush mounts.

**FEATURES**
- Energy Star® rated
- Wet Location Listed
- CEC Title 24 Compliant
- CSA listed
- ADA compliant
- Wall or Ceiling Mount
- Opaque acrylic diffuser
- Multiple LED array for uniform illumination
- 120VAC - no driver needed
- Smooth and continuous ELV dimming
- 36,000 hour rated life
- 5 year warranty

**SPECIFICATIONS**
- Construction: Steel with white acrylic diffuser
- Input: 120VAC
- ELV Dimming: 100% - 10% Electronic Low Voltage
- Harmonic Distortion (THD): 16% for Input Current at 120VAC
- Operating Temperature: -35°C (-31°F) to 50°C (122°F)

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Example: FM-306-940-WT

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WAC Lighting retains the right to modify the design of our products at any time as part of the company's continuous improvement program. JUL 2016
INSTALLATION INSTRUCTION
LED DISC
FM-306

Installation onto existing 5 inch or 6 inch recessed housings

1. Screw E26 "medium screw base" socket adapter into socket in housing. (Fig. 2)
2. Plug the female connector of the disc light onto the male connector of the socket adapter assembly. (Fig. 3)
3. Squeeze the torsion springs together as shown and install into torsion spring brackets inside the housing. (Fig. 4)
4. Tuck all wires into the housing and carefully push the disc light into housing. (Fig. 4)

LENS INSTALLATION
Twist the lens clockwise on disc light metal enclosure and lock the lens in place.

Caution
Make sure that tab in bracket should be positioned inward.
INSTALLATION INSTRUCTION
LED DISC
FM-306

WARNING
IMPORTANT: NEVER attempt any work without shutting off the electricity.
- Read all instructions before installing.
- System is intended for installation by a qualified electrician in accordance with the National Electrical Code and local regulations.
- Go to the main fuse box, or circuit breaker. Place the main power switch in the "OFF" position and unscrew the fuse(s) or switch "OFF" the circuit breaker switch(es) that control the power to the fixture or room that you are working on.
- Place the wall switch in the "OFF" position.
- Supply conductors (Power Wires) Connecting the fixture must be rated minimum 90°F. If uncertain, consult an electrician.

CAUTIONS
- These luminaires (fixtures) are designed to meet the latest NEC requirements and are listed in full compliance with UL 1598.
- Before attempting installation, check your local electrical code, as it sets the wiring standards for your locality.

INSTALLATION
Over standard electrical junction box

1. Attach two mounted screws into outlet box leaving enough of screw exposed to engage keyholes in the top of disc light (Fig. 1).
2. Provide electrical service according to the "National Electrical Code" or your local electrical code to the outlet box.
3. Connect supply wires to fixture wires and insulate with proper size wire nuts (Fig. 1).
4. Connect incoming ground wire (green or bare) to fixture ground wire (green or bare).
5. Connect incoming common (white) wire to fixture common (white).
6. Connect incoming hot (typically black) wire to fixture black wire.
7. Raise the disc light to the junction box and tighten screws.

LENS INSTALLATION
Twist the lens clockwise on disc light metal enclosure and lock the lens in place.
7. Can I install multi-wire branch circuits to serve the emergency lights? 
No. 700.19 states “The branch circuit serving the emergency lighting and power circuits shall not be part of a multiwire branch circuit.”

8. I have an apartment building, 3 story garden style units, all wood construction. There is no metal water line entering the building so the only grounding electrode system I have is 2 driven ground rods. The building has 4 six pack meter banks located at least 50 feet apart. My question is, what size conductor is required to connect these services together since the only grounding electrode available are the 2 rods to create a common grounding electrode?

Per good engineering large enough to safely conduct the fault current. Per code in 250.66 A, a #6 cu.

9. Can a dimmer be used to satisfy the energy code requirements of 505.2.2.1?
Yes, it would effectively allow for a uniform 50% reduction of all lamps or luminaires as in 1.

10. What are the requirements for temporary utilities?
Requirements of system conditions are as set forth in NCEC 10.8.

10.8 Temporary Power

10.8.1 Scope. The provisions of this section apply to the utilization of portions of the wiring system within a building to facilitate construction.

10.8.2 Provisions for Temporary Power. The Code enforcement official shall give permission and issue a permit to energize the electrical service when the provisions of 10.8 and the following requirements have been met:

1) The service wiring and equipment, including the meter socket enclosure, shall be installed, the service wiring terminated, and the service equipment covers installed.
2) The portions of the electrical system that are to be energized shall be complete and physically protected.
3) The grounding electrode system shall be complete.
4) The grounding and the grounded conductors
shall be terminated in the service equipment.
5) At least one receptacle outlet with ground fault circuit interrupter protection for personnel shall be installed with the circuit wiring terminated.
6) The applicable requirements of the North Carolina Electrical Code apply.

10.8.3 Uses Prohibited. In no case shall any portion of the permanent wiring be energized until the portions have been inspected and approved by an electrical Code Enforcement Official. Failure to comply with this section may result in disconnection of power or revocation of permit.

10.8.4 Application for Temporary Power. Application for temporary power shall be made by and in the name of the applicant. The application shall explicitly state the portions of the energized electrical system, mechanical system, or plumbing system for which application is made, and its intended use and duration.

10.8.5 Security and Notification. The applicant shall maintain the energized electrical system or that portion of the building containing the energized electrical system in a secured and locked manner or under constant supervision to exclude unauthorized personnel. The applicant shall alert personnel working in the vicinity of the energized electrical system to its presence.
On our website see;

11. We had a customer whose 1000 amp main burned out. We replaced the breaker and drew an online permit and called for inspection. The inspector turned us down. We had to move the breaker due to damage on the B leg bus where the original breaker was. We drilled and tapped the buss just as the original was and cut the deadfront in a professional manner. What gives? We’ve replaced many breakers this way in the past without issue. We weren’t even allowed a temporary on this.

Per the NCEC all products must be listed and used as listed and labeled. Without information showing that this field alteration could be made the panelboard or switchboard would be considered to be in violation as unlisted equipment. If the factory could come in and their field personnel make a
repair and have it field listed, then we could approve the modification.

12. In our electrical consistency info it is stated that boxes must be installed on exterior except when using brick. So many contractors are using the mount blocks and the electricians don't want the box in the wall so the siding guys can remove it if necessary. This has gotten more complicated to enforce due to others using weather proof boxes etc. Does the consistency board of today agree with this ruling or should we alter that to allow no boxes and put the responsibility on the contractor and spot check?

This is a consideration that has been back and forth with inspectors and jurisdictions through the years. For most all fixtures a box is required. The issue is when and how does an inspector verify its installation. There really is no difference from brick to another exterior so the committee recommends pulling the policy and leaving it to the inspector to spot check the mounting. For roughs it is sufficient to just leave a cable at the lighting location.
13. Can I use a cord and plug connected condensate pump above a lay in plenum ceiling? What if it's a non-plenum ceiling?
Perhaps. If the pump and cord are listed for the purpose it would be fine (110.3B) & (300.22C), most are not though. The NCEC would not allow a cord to penetrate the ceiling or a wall, so the receptacle would need to be installed at the pump (400.7 & 8).

14. Can a surface mounted range outlet be mounted face up behind the range? There is nowhere I can find in the code that prohibits this. NCEC 406.5 covers the mounting of receptacles. 110.3 B states that we should use equipment per the manufacturer’s instructions. I haven’t seen one that states put the receptacle in a face up position unless it has a cover on it. 406.5 E and F seem to verify this intent.

15. Can I use a window sill outlet face up in window sill as a part of my required small appliance receptacles?
Yes, if it will meet all counter top and small appliance requirements. If face up they should have covers.

16. We have a multi-tenant building that currently has two service troughs with six main service disconnects each. Where there where two tenants at one time it appears someone has opened the demising wall so that there are now two sub panels in this single tenant fed from two different services. We are informing the owner that he needs to make this code compliant by having the mains grouped for that tenant. He of course objects to the cost and does not want this to be done. I can’t directly find this in the code. What is the requirement?

NCEC 230.2 informs us of the services we may have on a building. In this case the existing building services were qualified using 230.2 (B) which requires special permission. As a condition of that permission and in keeping with the spirit of the code in 230.72 we require the service disconnect grouping to be maintained for each tenant. As an
alternative this might be resolved by feeding one sub panel from another provided the loading requirements can be met.

17. I was just turned down because I did not have a dedicated circuit for the vehicle charging receptacles in a detached garage. Where is that in the code?

The turn down was wrong. The charger is an option, not a requirement. A garage requires a receptacle for each vehicle space per 210.52 G 1. If it is a detached garage one circuit is required for the light and general use receptacles.

18. I have a job with both 480 and 120/208. I printed labels to put on each panels that said "480/277V-Brown, Orange, Yellow" and "208/120V-Black, Red, Blue". My Inspector failed me because he said I needed to include the color of the neutral conductor. I've never done that before, what's changed?
NCEC 210.5 C requires identification of ungrounded conductors where you have systems of more than one voltage. 200.6 D requires identification of grounded conductors of different systems and one way is to permanently post it where the conductor originates.

19. I installed an isolated ground receptacle in some Wiremold plastic wireway. Per the job specs, I installed a stainless steel face plate on the receptacle. My Inspector failed me. What's the problem?
NCEC 406.6 B requires the faceplate to be grounded. An iso. ground is established for the equipment use only. An equip. grd. is needed.

20. I have isolated ground receptacles being installed in some metal boxes that are hard piped back to the panel, and I pulled an insulated EGC that lands on the ground bar in the panel that feeds the receptacle. The Inspector tells me that I have to pull that ground back to the panel that feeds my
panel because that is the service panel. Is this correct?
The isolated ground purpose is to bypass all possible input from other grounding issues feedback. This requires looping through the system to the service panel where the grounding conductor is established. If not completed in this method an isolated grounding conductor is not established. See 250.146 D.

21. Do receptacles within 6’ of dental sinks require GFCI protection, or do they fall under 210.8(B)(5) Exception No. 2?
These receptacles are not patient bed receptacles and require GFCI protection.

22. Does a stairwell unit wall heater require a disconnect, or will a breaker lock-off suffice?
See NCEC 424.19. More info needed for this unit.
23. When applying NCECC 505.2.2.1 rules on lighting reduction do we take into consideration minimum lighting requirements of Health Dept./Food Services.

We review plans for compliance with the NC Energy Conservation Code. Unless their requirements fit the code we cannot accept them. Inspectors spot check by the plans for compliance with the code. A solution to this may be the use of task lighting as allowed by 505.2.5.3.

24. a. Is it permissible to install PVC within an electrical room of a type 1A structure, if the room provides air exchange to other areas of the structure? b. In a high rise structure? Per NCEC 352.12 PVC shall not be used generally; in hazardous locations, for support of luminaires or other equipment, where subject to damage, where ambient temp. exceeds 122 degrees F, in plenums (300.22), in theaters (520), places of assembly (518) and similar locations.
25. Are coin operated commercial washers and dryers considered vending machines, for the purpose of NEC 422.51?

They do not meet the definition of vending machines in 422.2, so the answer is no.

26. Are rooftop HVAC units fed using LFMC on 20 ampere circuits required to have equipment grounding conductors installed between the disconnect and the unit?

Maybe. The LFMC has to meet all the conditions specified in 250.118 (6).

27. Are panels and other equipment installed in a corrosive area, such as a pool equipment room or a pool chemical storage room, required to be of corrosive resistant construction?

Maybe. Most times an exhaust fan is installed that provide 6 or more changes of air per hour. This results in a non-corrosive atmosphere provided
good housekeeping methods are employed. If this is not specified, we then need to assure all of the system is rated for the corrosive environment per NCEC 110.11 and 300.6.

28. Are assisted living centers classified as dwelling units to apply the branch circuits requirements, covered in 210.8, 210.11, 210.12, 210.18, 210.52, and 210.60?

As defined in code a dwelling unit is, A single unit, providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, cooking, and sanitation. Chapters 1-4 of the code apply to these facilities. If they qualify as Healthcare then additionally requirements and amendments to Chapters 1-4 apply. We would also need to establish where this facility falls in other code definitions. Is it a Nursing Home or a Limited Care Facility (517)? Would it be a dormitory or similar occupancy (210.60)? These sections could also impact the project. As stated in this question it would seem the units are not independent living
facilities. Therefore, the rules in 210 regarding dwellings above would not be enforceable. This appears to be a **limited care facility** and would need to follow the rules in 517.

29. A GEC for a separately derived system as specified in 250.30 is the structural steel framework sized per 250.66. However, if the steel framework does not qualify as a grounding electrode per 250.52, and can only be used as GEC per 250.64(C)(3), and the only grounding electrode is a driven ground rod, can the connection to the separately derived system grounded conductor be sized as the connection to the ground rods at a #6 cu or #4cu maximum?  
250.66 A only requires a #6 for connection to the ground rods.

30. Is it permissible to install raceways between layers of insulation above metal roof decking as specified on a project currently under construction in the county?
Most all things are possible. Many though are impractical, but sometimes necessary. The raceway would need to meet all code requirements and consideration would need to be given to the environmental and ambient concerns. See 300.4 E exception which allows this installation.

31. I noticed that the residential contractors are installing self-contained receptacles in granite back splashes in high end homes. Are they legal to use as counter spacing? Are they allowed to glue them in place with epoxy instead of the 2 screws supplied by the manufacturer?

Per the specs we’ve seen on these units mounting to granite or by glue is unacceptable (110.3 B).

32. Am I required to use a ground wire in 2" flex. I am only told that in Mecklenburg?

Not if you are using it for plumbing. If as an electrical raceway yes in accordance with 250.
33. The NEC requires (300.7) where a conduit passes through areas with different temperatures it must be sealed to eliminate air circulation that causes condensation to occur within the conduit. Recently an inspector failed a freezer installation, that had a run on Carlon passing through the insulated exterior wall. We had sealed the end of the conduit approx. 3 feet from the wall, and he stated the seal should take place at the point of insulation. Is that correct?
The seal needs to be inside the conduit at the point of transition.

34. We have HDPE conduit that states it is ETL listed and can be used for boring. Is this acceptable in Mecklenburg County?
We did see this product previously and incorrectly approved its use. The manufacturer’s instructions stated it was approved for boring. After further product research it was found the standard of testing used was UL and it does not recognize boring since no testing was performed for this. Currently we could only recognize this product as a
sleeve if it was used for boring. Since our codes and standards are statewide this product should not qualify by code throughout the State.

IV. Haz Loc CE