Approved as submitted 4.24.02

Village of Downers Grove

Electrical Commission Meeting
Minutes

March 13, 2002

Donald Scheidler, Chief Electrical Inspector called the March 13, 2002 meeting of the Downers Grove Electrical Commission Meeting to order at 6:33 p.m.

Present: Robert Carlson, Michael Johnson, Curt Frank, Electrical Engineer, John Dumanski, Downers Grove Fire Department Representative, Don Scheidler, Chief Electrical Inspector

Staff: Ms. Hope Hathaway, Recording Secretary

Don Scheidler stated the first order of business was the acceptance of the Minutes from the February 19, 2002 meeting. He asked the Committee if there were any changes or corrections to the minutes.

The Committee briefly discussed the acceptance of the minutes.

Curt Frank presented to the members a corrected version to the amendment as follows:

Item 348.60 Grounding and Bonding

Where Aluminum flexible metal conduit is used, an equipment bonding jumper shall be installed.

Where used to connect equipment where flexibility is required, an equipment grounding conductor shall be installed.

Where required or installed, equipment grounding conductors shall be installed in accordance with 250.134(B).

Where required or installed, equipment bonding jumpers shall be installed in accordance with 250.102.

Don Scheidler asked the Members if the Minutes were reviewed and asked for any additional changes. None being offered, a call to accept the Minutes was requested.

Item 10-14. Wiring

(y) All detached and attached garages will be required to have at least one accessible 110V GFCI protected outlet and an interior light with switch. An exterior light and switch is required at exterior service doors.

Committee Member Michael Johnson moved to accept the February 19, 2002 minutes with the changes as noted.

Committee Member John Dumanski seconded the motion.

Motion carried 4:0.

Bob Carlson asked Don S. if the arc fault breaker was going to be enforced by the new code. Don replied that in adopting the code, they could not do less that what the code allowed. Michael Johnson agreed, stating that one could upgrade the code, but that it cannot be downgraded. Don S. agreed and asked what would be used in place of the arc fault breaker.

Curt Frank stated that it seemed illogical to have this only in bedrooms. Don S. answered that he and Michael Johnson had had the same conversation at a recent seminar. Don S. added that the reasoning for the bedroom is due to the fact that sleeping occurs the majority of time in the bedroom, therefore, one is unaware of what is happening and this would provide additional safety. However, typically if you are in another area of the home, one would be aware of smoke and able to exit the house, but if sleeping, one is reliant for a smoke detector to sound before waking up to exit. Michael Johnson added that one may not wake up even when the alarm sounds.

Curt Frank asked the value of the arc fault versus GFI circuit breaker. Don S. answered that the arc fault operates on the arc of a wire as opposed to the circuit breaker. The circuit breaker acts like a GFI. It will not react as quickly as a GFI reacts. It protecting the conductors in the pipe, no matter what is plugged into it, it does not protect that, until an arc fault outlet is available. Michael Johnson stated that such a device is available, but it is not being produced to date.

Curt Frank asked why does the arc fault only stop at the outlet, rather than down the whole line. Michael Johnson stated that he learned at class that it can only sense what is in the hard wire and were it to sense something outside the hard wire, which would be something plugged into receptacle, it needs to be a different device, i.e., an arc fault receptacle. Mike stated it would only protect what is outside. It is possible that in each bedroom, there will be an arc fault breaker for the hard wire, an arc fault receptacle for anything outside of and an arc fault 'something', which has not been yet developed, for items such as fluorescent lights. Mike has discovered that an arc fault circuit breaker will trip when a closet fluorescent pull chain is pulled on. The code specifically reads that everything in the bedroom must be on the arc fault. He stated that the light fixtures should not be required because most customers prefer a fluorescent light in their bedroom as well as their closet. If the bedroom light is on the same arc fault circuit as the closet light, the arc will be blown. Discussion ensued regarding this theory.

Don S. said that (from the Seminar) is that anything from the hard wire outside will not be detected. Curt Frank disagreed with that. Bob Carlson and Michael Johnson both agreed. Don S. also agreed. He mentioned that the electrical fires that John Dumanski, i.e., Fire Department would encounter happen outside of that system rather than inside that system. Therefore, the goal is to stop the arcs from happening from that side. Don S. added that the Seminar informed that it does not protect from the outlet out, it is from the outlet into the hard wire.

Discussion continued regarding this topic.

John Dumanski stated that from the 1999 NEC, the bedroom can be protected by a smoke detector, which offers more protection than what the arc fault code states.

Discussion continued with all the Members.

Curt Frank stated that all were in agreement that a GFI receptacle senses all types of failures including water to ground, as well as the total balance of the circuit. Curt asked that they insist on GFI outlets in the bedroom. Bob Carlson had stated that same bedroom concept four years ago. Curt Frank added it would be very do-able, inexpensive, and offers more protection versus a straight 15 amp breaker could offer.

Michael Johnson stated that (in Oak Brook Terrace) he did not want the lighting or the smoke detector on the arc fault, only on the receptacle by his choice.

Bob Carlson asked Don S. how this code could be remedied. Customers may not be told they cannot use fluorescents. Michael Johnson pointed out that the 1999 Arc Fault Code differs from 2002, in that 2002 states *everything in the bedroom.*

John Dumanski stated that in 25 years on the Fire Department, he has never seen a problem of arcing causing a fire. Other causes of fires were overloaded receptacles, electrical cords over or under carpeting, and lastly curtains. Michael Johnson added space heaters in office spaces. John Dumanski asked if arc faulting was in regards to fire protection, not electrocution.

Discussion ensued regarding the merits of GFI versus arc fault receptacles.

Both Curt Frank and Michael Johnson agreed that GFI were preferred as it would sense an arc and trip.

Don S. stated that if the GFI will sense the arc or sense that trouble, much as the arc fault would, he believes that they would make a change in the code that bedrooms would now have GFI breakers instead of the arc because it offers that protection.

Don S. read form 2002 NEC P. 82 handbook the following:

Discussion ensued regarding the merits of going to a breaker versus resetting the GFI in a room to reset a tripped circuit.

Don S. stated that one should not extend too far beyond what the code was requiring. He states the code is requiring that each branch circuit of that bedroom to be on its own circuit and have its own arc fault. He further stated that if GFI is preferred, a single circuit or GFI protection or single wiring for that bedroom having its own breaker, the next bedroom would be identical. Don S. suggested several scenarios to the code.

Michael Johnson stated he is in favor of the GFI's due to the fact that there are no means to test arc faults. We may have to add to the code that we do not accept any liability if this fails. He added that as electricians install this per code, it must be noted that there is no means for testing. Michael was advised at the Seminar that there is a product pending patent approval to be used for

testing, with no definite date to use same. Therefore, he is recommending that we do not eliminate this, but rather change it.

Don S added that if this is correct, and the arc fault breaker does not sense anything beyond the hard wire, then what would be used to test it. He stated that as soon as something is plugged in, according to the information from Seminar, it could not be tested.

Michael Johnson recommended that instead of the arc fault, that we require that bedrooms be on GFI's. Curt Frank stated that he would not want to change the code, but to rather make it as an exception that the arc fault could be used per code, that GFI could be used in place of. Michael Johnson asked if a disclaimer would be necessary until such time when the tester becomes available. Don S. stated he would check with the Legal Department. John Dumanski stated that he prefers GFI over arc faults

Discussion continued to the pros and cons or arc fault with regard to safety and cost effectiveness.

Don S. questioned whether or not the arc fault should be kept in the code with legal interpretation and have it written stating it is acceptable to use, however, there is no way for testing, therefore, we cannot be responsible for its use because of that. In lieu of the arc fault, the GFI protection would be allowed to be installed in the same manner as the arc fault.

Michael Johnson agreed.

Curt Frank agreed that all the Members agreed in reference to the GFI be allowed. The question remained whether or not the ground fault be maintained or eliminated.

John Dumanski stated that the Legal Department be consulted noting that testing cannot be accomplished.

Don S. stated that the Members were in favor of the GFI's and that the Legal Department be consulted regarding a disclaimer if an arc fault is used that we cannot be responsible for it due to the fact it cannot be tested or is the 2002 NEC acceptable or try to eliminate it saying that GFI's are as good as at this point and for code cycle run with these instead.

Michael Johnson suggested that NEC be called advising them of this situation, as they may not even be aware of it and they may enlighten us on this subject.

Don S. stated he would call NEC and report back to the Members. This item will remain open till the next meeting. Don S. stated that he would work on the language of where to put the ……..

Bob Carlson stated that an entire house could be GFI protected. Discussion continued with the Members.

Don S. stated that it is from the outlet in that the breaker protects. The outlet, once it has been installed, protects anything that is plugged into that system, i.e., the wiring from the plug into the TV set and the TV wiring.

NEXT ITEM TO BE DISCUSSED – Office Partitions

Michael Johnson stated that after reading the 2002 NEC Handbook and VODG Amendments on Office Partitions, felt that the VODG amendments were more stringent, and should be kept over the 2002 NEC. The Members agreed.

Don S. stated that he would obtain panel information for the members.

John Dumanski questioned that there was something in the code regarding 3-phase that there was a problem requiring a need for a neutral. Partitions had three legs.

Curt Frank explained that partitions here are not wired for 120 or 120/240, so there are two neutrals and three circuits, but one neutral takes care of two of the circuits. There is a neutral and an AB leg as two circuits and a separate neutral and another hot, either A or B, it makes no difference, ending with two neutrals, but three circuits. These are similar to the partitions put in at the Police Department. Those harnesses are all pre-wired in this manner. There are two grounds, an isolated ground for that separate circuit and a regular ground, two neutrals and three legs.

Don S. stated he would bring in old minutes referring to the partitions per John Dumanski's request. He will contact several manufacturer's for their current procedures and determine whether or not a minor change would be necessary on our part.

NEXT ITEM – Heights Above Equipment

Don S. stated that the height new code called for above any piece of equipment could be six feet and if 20 is available, that space could be filled with anything. He asked the Members if a minimum should be added to the code. The code reads: Six feet or next structural ceiling, whichever is less. This means if there is a 9 foot ceiling with a 7 foot piece of equipment, there would be two feet remaining to work in, assuming you can get in on top to run your lines. Should a minimum be noted. Don S. asked the Members for their comments regarding the following two questions.

The first question is whether or not we want anything above any of the electrical equipment like the old code read. It allowed up to 25 feet, which usually remained as total open space.

The second question is whether a minimum space that must be over the machines to be used as a workspace as needed.

John Dumanski stated for the first item, that there should be nothing above it until the next floor or ceiling.

Don S. agreed that we should be looking at a clear open space from the top of the equipment up to at least 25 feet. Bob Carlson questioned how far out or behind it. Don S. answered that typically the code reads that there is a fine line, i.e., if your equipment ends here and your sprinkler line starts here, it is not over it, therefore it is allowed. It cannot be over it because if you need to get in to work in the space, that space was supposed to be dedicated for the

electrician to work on. At one time, the electrician's had to deal with everybody being over the equipment, until the ruling stating that that space is to be left alone. Now, they are coming in saying that the space can be brought down a small amount because everybody wants to use that space up above. Don S. agreed with Curt Frank and brought the subject up last meeting whether or not you want to use it for the floor over the top of this, making the next structural ceiling; now he questions what height is preferred over the equipment to still maintain a workspace.

Curt Frank made comments regarding a three-foot space.

Discussion ensued regarding the spacing issue.

Don S. stated that the definition requires a 6 ½ foot clear headroom in a residential installation. The panel can be installed wherever you need. At this time, this is in reference to commercial where you might have 100 conduits coming out of an electrical closet going up to a certain height and right out the electrical room. There may be a few two-inch, depending on where they are going. Don S. stated would six feet be your minimum? If a ceiling is put in, all equipment must be cleared out at six feet before the next floor, which is six feet from your tallest piece of equipment.

John Dumanski commented that it sounded a little high, but you will find a lot of room above in many buildings.

Curt Frank questioned if a design does not have those specifications, Don S. answered that would be fine. Curt Frank stated that if a roof is short in height, then the owner would not be able to use that space, he would not be fined for not having that space. Don S. ended with the fact that we would not be limiting the fact that six feet must be provided. Further, the code would limit the owner by saying he would have to have three feet of clearance to work on the equipment. Don continued, if you have to work in front of the panel, on top of the panel, behind the panel, there must be a three foot clearance. Don S. stated that the code would read 'there should be nothing in the above space all the way and if they want to do something up there, they should be looking at putting a structural floor in.

NEXT ITEM – PLASTIC PIPE – Section 314.17C

Don S. stated that the priority issue is to review the nonmetallic conduit, as it has never been allowed in town, this is brand new. He invited comments from the Members.

Michael Johnson preferred PVC and adding that it worked well in concrete. He commented that when PVC is run for a project and it crosses under a parking lot, it must be encased in concrete. If it is in greenspace, he has no problem with that. At his current employer, if it is under a parking lot with heavy truck traffic, it must be encased in concrete, i.e., a slush coat.

Discussion ensued regarding the depth of the trench for the piping and the type and size of stone versus pea gravel. It is not one's position to state to the General Contractor that one must use ¾" stone or larger versus pea gravel.

Michael Johnson stated that contractors cannot be trusted to use 'rock'. He further stated that heavy usage of 40 foot trucks on a commercial or industrial parking lot will cause shifting of the lot. He prefers the piping be encased in concrete.

Discussion ensued regarding repair of concrete.

Bob Carlson stated that the Members were all in concensus that PVC outdoors is acceptable. The issue of using PVC indoors would be addressed.

Don S. commented to the Members at what point would you either deny it or accept it and if accepted, then to what degree would it be accepted? You would not necessarily wire a house with it. Would general contractors be allowed to construct ten story buildings and put it underneath the slab? Maybe.

Discussion continued with the Members. Some were in favor for underground use, extreme moisture conditions, such as swimming pool areas with a high chlorine content (corrosive chemicals) and car washes.

Don S. stated that he has the authority and has granted a variance on a swimming pool filter room in the past. He stated that Midwestern University is seeking a garage parking deck permit; this is an exterior structure which will get wet, concrete gets activated, there are chemicals (metals) present and the code state that PVC can be used for parking lot light. So, in the parking deck, as long as PVC is kept out of the way of damage, i.e., a vehicle running into it, cracking and breaking it, there is no reason why it cannot be used and it will last longer. This refers to PVC placed on the surface.

Don S. stated that on visual inspection at older sites, the metal rigid conduit has shown deterioration. Therefore, using plastic out there was a correct decision. It is important to note that the PVC must be protected from damage by car. Don S. stated that metal conduit should be used wherever vehicle damage may occur and PVC could be used from that point on. Don S. mentioned that he approved the use of PVC in the rehab at the Orchard Brook Pool Room, as the metal piping shows the corrosive effects of ten years of usage.

Don S. asked the Members how far we could go with the code? He believes the first floor or ground floor of any structure could use plastic. However, would that be all concrete slabs? Would rigid conduit be used in concrete slabs that stay dry and inactive or do we allow PVC. At what point do we say plastic is out? Don S. stated that he could designate the code to have specific terminology, as in the previous VODG code to read 'rigid underground, rigid in all concrete slabs'. A general contractor could request a favor to Don S. due to a specific situation.

Curt Frank stated that the wording could be stated specifically to read that plastic would be allowed in conditions of high moisture in (a) swimming pool equipment rooms, (b) below grade, (c) exterior lighting for parking structures, etc. If there are further situations, a variance could be requested and/or granted.
Don S. asked the Members if they were to stop at Schedule 40 rigid or let them use anything. He stated that there is a new plastic out...p. 374 of NEC Handbook. Don S. let the Members read the article.

Curt Frank stated that Schedule 40 rigid was used at the new Police Department. He did not understand why plastic was put inside plastic.

The Members discussed the use of Schedule 40 rigid.

Don S. stated that he will prepare a list for usage and present to the next meeting.

John Dumanski asked what would the minimum size be underground and the minimum size be inside the slab?

Curt Frank stated it would depend on what it is used for.

It was noted that a minimum 24" depth is used for plastic.

The Members discussed using ¾" plastic versus ½" piping.

John Dumanski stated that nothing less than ¾" piping should be used in any concrete work that is buried or encased.

Michael Johnson said one would have difficulty when pulling strings and circuits through ½" piping that runs a distance, and has some offsets as well.

Bob Carlson asked Don S. if it was correct that a ground for a 200Amp service in a basement, PVC could be used and come up with rigid on each side for the ground

Michael Johnson answered that technically one could use PVC in the slab (not 24" depth) and rigid for the ground for the service. According to the code it could be done. It is not allowed in Westmont. Don S. has the option of making variances with the code.

Don S. asked if the Members were in agreement to ¾" as a minimum. The Members were in agreement.

John Dumanski asked Don S. whether rigid (heavy wall) or IMC (intermediate) was required in Village of Downers Grove in slab above grade.

Don S. answered that either one could be used.

Don S. will prepare comments on this subject for the Members to review at the next meeting.

Curt Frank added comments to using ½" piping in a current building project.

Don S. suggested they propose a ¾" piping minimum below grade, make the bend with heavy wall, come up and reduce to ½" piping. He repeated if one could use a reducer at above grade and would it make sense to do that.

John Dumanski stated that he would not want to see ½" piping below grade in commercial buildings.

The Members continued discussing the above.

John Dumanski asked about running plastic inside a slab as in a highrise.

Don S. stated that the Members had decided not use ½" plastic piping below a slab, but rather IMC intermediate or rigid metal conduit minimum.

Curt Frank asked about using ½" IMC as a minimum inside a wall.

Michael Johnson stated that if you were inside a brick wall, thin wall could be used.

Don S. answered unless he were asked 'can I use plastic if filling in with concrete filled CMU, and because of the fact that CMU would get wet, it will become damp, which will be conducted to the concrete?', then I would be apt to say 'yes you may'. It would be better to do that than to use an EMT, which could be used and be encased in concrete.

Michael Johnson stated he did not have a problem with PVC being encased in concrete, whether it is on the floor or in a wall.

Don S. stated that it still must be ¾" minimum. It was noted that Curt had stated that that cannot be done if going into the wall and then connecting to a box, it is better to use ½" inch, or as John Dumanski had mentioned, if loops are made outside the building going below grade the run and then come up and then below grade the run, how do you keep breaking off to go ¾" below grade and then come up with the ½"?

Discussion continued with the Members regarding the above.

Don S. stated that he would write up something on this subject for the next minutes and asked the Members to also bring in their own written version of the code for discussion at the next meeting just as Curt Frank had done today.

Don S. stated that live panels will be discussed at the next meeting. They must be totally enclosed as per 1983 code. Don S. read from the 2002 NEC Handbook.

Don S. asked the Members to continue to review the 2002 NEC Handbook. He asked the Members if there was any additional business.

As there was no other business, Don S. called for a motion to adjourn.

MICHAEL JOHNSON MOVED TO ADJOURN.

ROBERT CARLSON SECONDED THE MOTION.

THE MOTION PASSED UNANIMOUSLY.

The meeting adjourned at 8:35 p.m.