Understanding the Construction Code Rules, Part 8
Based on the 2011 NEC® and the 2009 MRC

The State of Michigan is operating under the 2011 edition of the National Electrical Code® as amended by the Construction Code Act, Part 8 of P.A. 230 of 1972. A copy can be obtained from the Bureau of Construction Codes, P.O. Box 30254, Lansing, MI 48909 or at 2501 Woodlake Circle, Okemos, MI. The purpose of this document is to explain how the Michigan Electrical Code (MEC) differs from the 2011 National Electrical Code (NEC®), and when the Michigan Residential Code (MRC) is to be used in place of the MEC for wiring installations. To access official information on the internet, go to the web site http://www.michigan.gov/lara/. The electrical portion of the Construction Code Act is Part 8 of Public Act 230 of 1972. This Tech Note is not an official document. Direct any questions to the local code enforcing agency.

Rule 801: This rule adopts the 2011 NEC® with some sections omitted and some rewritten. Also omitted are Article 547 dealing with agricultural wiring, and Informational Annex G which contains suggested administrative rules. This amended version of the NEC® is called the Michigan Electrical Code or MEC.

Deleted from the MEC are sections 110.24, 501.30(B), 502.30(B), 503.30(B), 505.25(B), and 506.25(B). Section 110.24 is a requirement that all services except dwelling services be marked with the available fault current at the time of installation or modification. This rule does not apply in Michigan, however, a similar rule has been in effect in Michigan for many years and that is 110.9 and 110.10. Administrative Rule 80.21(g) now requires available fault current calculations to be included when plans are submitted for approval. The other Code sections were deleted because they permitted a practice not allowed in Michigan. Michigan Rules 867, 868, and 869 do not permit the use of flexible metal conduit (FMC) or liquidtight flexible metal conduit (LFMC) as an equipment grounding conductor.

Administrative Rule Changes: Additions and revisions resulting in new administrative rules that apply in Michigan are discussed in the next several pages. Rules that remain in effect from the previous enactment of the Construction Code Act are not covered. A complete set of Michigan Electrical Code Rules, Part 8 can be obtained from the Bureau of Construction Codes.

80.1 Exception: This exception exempts certain types of buildings from the Michigan Electrical Code (MEC) and instead requires them to have wiring installed in accordance with the Michigan Residential Code (MRC). One-family dwellings and two-family dwellings are to have wiring installed according to the MRC. There are two changes to this exception. Change one is that townhouses which are multiple single-family dwellings now come under the MRC if they are not over three floors in height and if they each have separate means of egress from the dwelling unit. The second change is that accessory structures for these dwellings are also permitted to be wired using the MRC.

80.9.1(b): This rule deals with existing facilities that were in compliance at the time they were constructed, but not necessarily in compliance with the present Code. It is now pointed out that the "code official" is the one that makes the determination whether a hazard to life, health, or property exists. A statement was deleted implying that corrections could be required.

---

1 Developed by the Electrical Technology staff of the Biosystems & Agricultural Engineering Department of Michigan State University, East Lansing, MI 48824-1323. For a copy of this Tech Note and other educational papers, visit the Electrical Technology web site at http://www.egr.msu.edu/bae/et/.

Copyright 2013, Biosystems & Agricultural Engineering Department, Michigan State University. All rights reserved ©.
80.13 Stop work order, authority: This is a new provision that the enforcing agency may issue a stop work order if work is contrary to the Code or being performed in a dangerous and unsafe manner. Work shall stop except for any work required to remove a violation or unsafe condition.

80.14 Duties and powers of the code official: This rule was revised and made much more specific with respect to duties of the code official. Several new subsections were added. The code official has the authority to render code interpretations. Interpretations, policies, and procedures of the code official are required to be in compliance with the Code. Subsection 80.14.1 specifies the records that are required to be kept by the enforcing agency. Subsection 80.14.2 requires the code official to carry proper identification when performing an inspection. Subsection 80.14.3 gives the code official right of entry and spells out actions that can be taken if entry is refused.

80.15 Means of appeal: A new last sentence was added pointing out that an appeal of a code official ruling is to be directed to a local board of appeals. The local board of appeals ruling can be appealed to the Construction Code Commission. This process was not made clear in the past. There is a new subsection 80.15.2 that requires members of a board of appeals to be qualified.

80.19 Permits and certificates: There are some revisions to subsections of this rule as well as several new subsections. Subsection 80.19.3 deals with permit expiration, and now there is a requirement that there must be an inspection within 180 days of the date the work begins. The work must begin within 180 days of the date of the permit. Subsection 80.19.3.1 is new and it requires a copy of the permit to be kept at the work site. Subsection 80.19.9 is new and it states the conditions under which the code official has the authority to suspend or revoke a permit. Subsection 80.19.10 is new and it creates what is known as an "annual permit." For an existing facility an annual permit can be issued. This is particularly useful when a firm or corporation has on-site maintenance electricians. Subsection 80.19.11 requires the holder of an annual permit to keep records of work that is performed. The records are required to be filed with the enforcing agency, but no directions as to when this filing is to occur are stated. There is no mention as to if and when inspections are to be performed. Subsection 80.19.13 is new and it states that issuing a permit and approving plans does not mean that errors or code violations missed are approved.

80.21 Plans and specifications: For those installations requiring plans and specifications to be submitted there is a new requirements under item (g). Available fault current calculations are now required. Presumably this fault current calculation requirement is at the service equipment, however, it is not stated as to the extent of this requirement if any beyond the service equipment. Subsection 80.21.2 allows for a permit to be issued for a portion of the work before plans for an entire installation are available. This does not imply that subsequent requests for a permit will be approved. Subsection 80.21.3 makes it clear that a project is only required to meet the Code that is in effect at the time the plans are approved and the permit is issued provided the work is started within 180 days of the date of the permit. Subsection 80.21.4 requires the code official to retain a set of construction documents for 180 days after the final inspection.

80.22 Inspection requests: Subsection 80.22.2 now contains a statement making it clear that any costs incurred in order to make a concealed installation available for inspection are not the responsibility of the enforcing agency.

80.23 Violations: There is a statement making it clear that if there is a violation it is not permitted to cover or conceal the installation until authorized to do so by the code official. The second addition to this rule is the listing of Public Act 217 which is the Electrical Administrative Act covering licensing of electricians and registration of apprentices. It is now clear that Public Act 217 also applies which requires a licensed electrician on the site when electrical work is being performed, and it also contains the rules for ratio of licensed electricians to registered apprentices.

80.25 Connection to electricity supply: The rule now makes it clear that it is the enforcing agency that authorizes when an installation is to be connected to an electrical supply.
80.26 Service equipment: This section states who approves service equipment. There is a new subsection 80.26.1 that deals with the connection of a repaired electrical system to power under emergency circumstances such as may occur as a result of storm damage. A utility is permitted to restore power to a repaired installation prior to approval by the enforcing agency provided the repair is made by a licensed electrical contractor. The electrical contractor is then required to secure a permit for the repair the first business day following the completion of the work.

Michigan Amendments to the 2011 NEC: Refer to a copy of the Michigan Electrical Code Rules, Part 8 for the actual text of the following code sections.

230.40: What was Exception 3 of 230.40 in the 2011 NEC® was deleted from the Michigan Electrical Code, and the remaining exceptions were renumbered. This is not new. This exception has been deleted from every edition of the MEC since it was first introduced. The exception that was deleted applies in the case of a single-family dwelling and permitted an outbuilding as well as the dwelling to be supplied directly from a single service drop or lateral similar to the diagram in Figure 1. This is not permitted in Michigan. It is required to provide overcurrent protection on the feeder supplying the outbuilding.

Figure 1 Exception 3 of NEC® 230.40 was deleted from the MEC. It is not permitted to directly supply an outbuilding from a single-family dwelling service drop or lateral.

230.71(A): The change in this section is only editorial due to the change that was made in 230.40 by the deletion of Exception 3.

250.104(B)(3): There have been concerns about possible lightning damage to corrugated stainless steel tubing (CSST) gas piping in buildings. The 2011 National Electrical Code does not have a rule with respect to bonding of CSST. Paragraph (3) in the Michigan Electrical Code is a requirement for bonding CSST. It is required to run a bonding conductor from the service disconnect enclosure, the grounded conductor at the service disconnect, the service grounding electrode conductor, or an electrical system grounding electrode to a point closest to the gas meter where the CSST first originates. Sometimes it originates right at the gas meter and sometimes there is some length of rigid gas piping before the CSST begins. This bond connection is to be made to a CSST terminal fitting, as shown in Figure 2, or to some point on the rigid gas pipe. The connection is never made to the CSST itself or to any pipe on the utility supply side of the gas meter. This rule is also in the Michigan Residential Code as E3609.7.2. The bonding wire is to be not smaller than the grounding electrode wire for the electrical service and not smaller that size 6 AWG copper.

250.118: This section lists the acceptable means of providing equipment grounding. The corresponding section in the MRC is E3908.8. The NEC permits flexible metal conduit and liquidtight flexible metal conduit as an equipment grounding conductor under certain circumstances. In Michigan FMC and LFMC are never permitted as an equipment grounding conductor under any circumstances. This is not new. It has been the rule in Michigan for many years. What is different in 250.118 and E3908.8 is that FMC and
LFMC have been deleted from the list of acceptable equipment grounding conductors. See Figure 5 and Figure 6.

Figure 2 Both the MEC and the MRC require a bonding connection to a section of rigid gas piping or to a CSST terminal connector closest to the gas meter when corrugated stainless steel tubing is installed as a part of the gas piping system in a building.

334.10(2): The uses permitted for nonmetallic-sheathed cable has been modified for use in Michigan. The first modification deals with 334.10(2). In the NEC there is a reference to Type III, IV, and V construction of multifamily dwellings which in Michigan has been deleted. The significance of this revision is that in Michigan nonmetallic sheathed cable is permitted to be installed in any multifamily dwelling regardless of the type of construction of the building. This is illustrated in Figure 3.

Figure 3 Nonmetallic-Sheathed Cable is permitted to be installed in multifamily dwellings of any type of construction in Michigan.
334.10(3): The NEC limits the installation of nonmetallic-sheathed cable in non-dwellings. It is required to be run concealed within walls, floors, or ceilings with a 15-minute finish fire rating. The wording of 334.10(3) has been changed for application in Michigan. Nonmetallic-sheathed cable is permitted to be installed as surface wiring or concealed within walls, floors, and ceilings that do not have a 15-minute finish fire rating provided the building is not more than one floor in height. This is illustrated in Figure 4. When the building exceeds one floor in height, nonmetallic sheathed cable is required to be concealed in walls, floors, or ceilings that provide a 15-minute finish fire rating.

![Figure 4](image-url)

**Figure 4** Nonmetallic-Sheathed Cable is permitted to be installed as surface wiring or concealed except for buildings of two or more floors and then it must be installed concealed within walls, floors, or ceilings with a 15-minute finish fire rating.

348.60: Flexible metal conduit (FMC) is not permitted to serve as an equipment grounding conductor in Michigan. This has been the rule for many years. When installed and equipment grounding is required, either an equipment grounding conductor or bonding jumper must be installed. This same rule is in the MRC as E3908.8.1. In the Michigan Electrical Code in 250.118 as well as in E3908.8 of the MRC, FMC has been deleted from the list of acceptable equipment grounding conductors. An example of this rule is shown in Figure 5.

![Figure 5](image-url)

**Figure 5** Flexible Metal Conduit (FMC) is not permitted to be used as an equipment grounding or bonding conductor in Michigan. A bonding jumper is required to be installed in all cases to provide a satisfactory fault current path from one end to the other of Flexible Metal Conduit.

350.60: Liquidtight flexible metal conduit (LFMC) is not permitted to serve as an equipment grounding conductor in Michigan. This has been the rule for many years. When installed and equipment grounding is required, either an equipment grounding conductor or bonding jumper must be installed. This same rule is in the MRC as E3908.8.2. In the Michigan Electrical Code in 250.118 as well as in E3908.8 of the MRC, LFMC has been deleted from the list of acceptable equipment grounding conductors. An example of this rule is shown in Figure 6.
Figure 6  Liquidtight Flexible Metal Conduit is not permitted to be used as equipment grounding or bonding conductor in Michigan. A bonding jumper is required to be installed in all cases to provide a satisfactory fault current path from one end to the other of Liquidtight Flexible Metal Conduit.

404.2(C) Exception 2: The NEC now requires a neutral conductor to be provided at the switch location for lighting circuits. There is an exception where the neutral can be installed later because there is space available in a raceway or the cable between the luminaire box and the switch box remain accessible. The question is whether the neutral is required to be made available at all switch locations where there are two or more switches controlling the lighting? Exception 2 was added to the Michigan Electrical Code only requiring the neutral to be provided at one switch location as illustrated in Figure 7.

Figure 7 In Michigan the neutral is only required to be provided at one switch location where there are multiple switch locations for the lighting. As a reminder, it will be necessary to either terminate an unused neutral with a wire nut or tape the end of the conductor.
625.21: There is a rule in the NEC that specifies how to size the branch circuit to supply an electric vehicle charging station. It is required to include the electric vehicle charging station at 125% of the rated load. The NEC permits other equipment to be supplied by the same branch circuit. The Michigan Electrical Code requires the electric vehicle charging station branch circuit to be a dedicated circuit as illustrated in Figure 8.

![Figure 8](image)

**Figure 8** The Michigan Electrical Code requires the branch circuit to be a dedicated circuit only serving the charging station and no other loads.

**Michigan Residential Code:** One-family dwelling, two-family dwellings, and townhouses consisting of multiple single-family dwellings not more than three floors in height and having means of egress from each dwelling unit are permitted to have wiring installed according to the 2009 Michigan Residential Code. Multi-family dwellings consisting of individual living units are to have wiring installed according to the Michigan Electrical Code which consists of the 2011 National Electrical Code as amended by Part 8 of the Construction Code Act. Those amendments were discussed earlier in this Tech Note. The following discussion compares differences that exist for dwellings between the 2009 Michigan Residential Code and the 2011 Michigan Electrical Code. The following discussion is not necessarily a complete list of differences.

E3406.7 Conductors of the same circuit.
The corresponding section in the NEC is 300.3(B). This is the requirement that all of the wires of a circuit be run together in the same raceway, trench, cable, or cord including the neutral and equipment grounding conductor. When conductors are run in parallel the NEC permits sets of conductors to be run in separate raceways or separate cables. The rule in the MRC does not permit separate raceways or separate cables. The other difference deals with equipment grounding conductors and bonding jumpers. This rule requires all equipment grounding conductors and bonding jumpers to be run inside raceway or cable. It would then be a violation to run a bonding jumper on the outside of a section of flexible metal conduit or liquidtight flexible metal conduit.

**Figure E3405.1 Working Space and Clearances.**
Footnote b requires clear working space from the floor to a height of 6.5 feet. The NEC in 110.26(A)(3) Ex 1 permits space to be less than 6.5 feet from floor to ceiling for an existing dwelling unit for services and panelboards not exceeding 200 amperes if approved by the code official. This exception is not in the MRC.

E3601.6.3 Separate outdoor electric space conditioning equipment.
This is a service equipment rule that is in the MRC but not in the NEC. This rule permits the service disconnecting means for space conditioning equipment to be separated from the service disconnecting means for the remainder of the dwelling. This is where the space conditioning equipment is separately metered. The disconnect must be located adjacent to the meter. A plaque or directory is required at each disconnect identifying the location of the other disconnect. An example is illustrated in Figure 9.
Figure 9 In the case of a single- or two-family dwelling, it is permitted to provide a separate disconnecting means on the outside of the house for separately metered space conditioning equipment.

E3601.6.4 Electric vehicle charging system service disconnect.
This is a service equipment rule that is in the MRC but not in the NEC. This rule permits the service disconnecting means for an electric vehicle charging station to be separated from the service disconnecting means for the remainder of the dwelling. This is where the electric vehicle charging station is separately metered. The disconnect must be located adjacent to the meter. A plaque or directory is required at each disconnect identifying the location of the other disconnect.

Figure 10 In the case of a single- or two-family dwelling, it is permitted to provide a separate disconnecting means on the outside of the house for separately metered electric vehicle charging station.
E3609.7.2 Corrugated stainless steel tubing (CSST).
Whenever corrugated stainless steel tubing (CSST) is used within a dwelling as the gas piping system it is required to run an equipment grounding conductor from some part of the grounding electrode system of the service to the closest end of the CSST to the gas meter. Do not connect the wire to the CSST. Either clamp the wire to the CSST connector or to a rigid metal section of the gas pipe somewhere between the CSST and the gas meter. This is illustrated in Figure 2. The wire is to be not smaller than the grounding electrode conductor size for the service but in no case smaller that 6 AWG copper. This requirement is not in the NEC.

E3803.6 Raceway seals.
Whenever a raceway is used as a part of an underground circuit the raceway is to be sealed if it is likely moisture may result in contact with live parts. The difference is that in the MRC it is required that the sealing material be listed and suitable for the conductor insulation.

E3902.11 Arc-fault protection of bedroom outlets.
The MRC only requires arc-fault circuit interrupter protection for circuits supplying 15- or 20-ampere, 120 volt outlets in dwelling bedrooms as illustrated in Figure 11. The AFCI is permitted to be of the combination type or the branch/feeder type. The rule specifies protection for the entire circuit which means the source of the circuit. This rule presently does not recognize the receptacle type AFCI to be installed at a location other than the source of the circuit. The NEC requires circuits to be AFCI protected if the circuit is modified or extended. This provision is not presently in the MRC.

Figure 11 One-family, two-family, and townhouses consisting of multiple single-family dwellings are only required to provide arc-fault circuit interrupter protection for 15- and 20-ampere, 120 volt circuits serving outlets in bedrooms.

E3902.11 Exception
The exception permits an AFCI to be installed not more than 6 feet from the circuit source panelboard provided the wiring between the source panelboard and the AFCI is run in metal raceway or metal clad cable such as Type AC or Type MC cable. Receptacle type AFCIs are listed as branch circuit type not combination type or branch/feeder type. The rule from the 2009 MRC is illustrated in Figure 12.

E3908.8 Types of equipment grounding conductors.
This section is similar to 250.118 in the NEC except in the MRC flexible metal conduit (FMC) and liquidtight flexible metal conduit (LFMC) are not contained in the list.

E3908.8.1 Grounding of flexible metal conduit.
Flexible metal conduit (FMC) is not permitted to be used as an equipment grounding conductor or as a bonding jumper in Michigan. The corresponding section in the NEC is 348.60. This is illustrated in Figure 5.
One-family, two-family, and townhouses consisting of multiple single-family dwellings are permitted to have an arc-fault circuit interrupter installed up to 6 feet from the service panel for protection of 15- and 20-ampere, 120 volt circuits serving outlets in bedrooms.

E3908.8.2 Grounding of liquid-tight flexible metal conduit. Liquidtight flexible metal conduit (LFMC) is not permitted to be used as an equipment grounding conductor or as a bonding jumper in Michigan. The corresponding section in the NEC is 350.60. This is illustrated in Figure 6.

E4002.15 Replacements (receptacles). The corresponding section in the NEC is 406.4(D). According to the 2009 MRC, when a receptacle is replaced in an existing dwelling bedroom where the circuit is not protected with an AFCI, it is not required to install an AFCI receptacle. When an outside receptacle is replaced it is not required to install a weather resistant (WR) receptacle. When a receptacle is replaced in the dwelling it is not required to install a tamper-resistant (TR) receptacle. However it is recommended that these replacements be installed even though they are not required.

R302.11 Fireblocking. In combustible construction, fireblocking shall be provided to cut off all concealed draft openings both vertical and horizontal and to form an effective fire barrier between stories, and between a top story and the roof space. This rule applies to electrical installations as well as other trade installations. More information about dwelling fireblocking, smoke alarm and carbon monoxide detection and alarm installations can be found in Tech Note 252. This publication can be accessed at the web site http://www.egr.msu.edu/bae/et/.

R314 Smoke Alarms. Smoke alarms are required to be installed in each bedroom of a dwelling with an additional smoke alarm outside the bedrooms in the bedroom area. At least one smoke alarm is required to be installed on each habitable floor such as a basement used only for recreation and/or storage and utility appliances and equipment. This also includes any floor that does not have sleeping spaces. Helpful information about dwelling smoke alarm placement can be found in Tech Note 252. When alterations to a dwelling are made that require a permit, smoke alarms are to be installed meeting the requirements of new construction. For exceptions review this reference in the MRC or contact the local building code enforcing agency.

R315 Carbon monoxide. Carbon monoxide alarms are required to be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms within which fuel-fired appliances are installed and in dwelling units that have attached garages. Helpful information about dwelling carbon monoxide alarms and their placement can be found in Tech Note 252. When alterations to a dwelling are made that require a permit, carbon monoxide alarms are to be installed meeting the requirements of new construction. For exceptions review this reference in the MRC or contact the local building code enforcing agency.