We have experienced a few projects regarding insulation and wiring issues. The 2008 Electric Code has conditions for insulation around wires. Please refer to the enclosed commentary from Teton County. Basically, standard #12 size wires can be clustered in groups as long as there are not more than 4 wires in the group. If there are more than 4 wires grouped together, insulation of any type cannot be in contact with the wires. Your electrician can explain this in better detail.

While this does not affect most standard wiring runs, it can become an issue in mechanical rooms and around electrical panels. Additionally, more projects are using sections 8.15.1.2.(7&8) of the NFPA, which is for filling the bays full with insulation in lieu of installing sprinklers. If the NFPA sections are designed into the building, it is imperative that the wiring is separated as required so that it does not void NFPA design.

Sincerely -

David Bressler

TETON COUNTY COMMENTARY

Ampacity of NM Cable in Thermal Insulation

The following commentary is concerning 2008 NEC 334.80 and is based on my understanding of Article 334.80. If there are questions, please contact the authority having jurisdiction in your area.

Article 334.80 in the 2008 NEC requires ampacity reduction of NM cables when more than two (2) NM cables containing two (2) or more current conductors are installed without maintaining spacing and in contact with thermal insulation.

Ampacity for NM cable shall be from the 60-degree column (table 310.16) as far as overcurrent protection and allowable load is concerned. However, 334.80 allows the 90-degree column (table 310.16) to be used for ampacity reduction. By allowing the 90-degree column to be used for ampacity reduction the effect of this change are not as severe as one might at first conclude.

Example: You are allowed to de-rate from 90-degrees which would allow nine #12 current carrying conductors without maintaining spacing with over current protection at 20 amps before de-rating (30 amp from table 310.16, 90 degree column: 30 amps X 70% = 21 amps). This would be a total of four (4) 12/2 NM.

Number 12 NM and 14 NM are the sizes most affected by this change. However, other sizes NM are also affected.

Example: Number 8 NM has an ampacity of 40 amps from the 60-degree column. However the 90-degree column allows 55 amps. So if you feed three loads, each with their own 8-2 NM branch circuit protected by a 40 amp breaker, they would not need separation (55 amp from table 310.16, 90-degree column: 55 amps X 80% = 44 amps).

As shown, this new requirement should be relatively easy to comply with if the electrician is aware of the change in 2008 NEC 334.80 before rough-in. In Teton County, we consider NM to be separated if installed as per manufacturer's recommendation on multi cable staples (stack its) or stapled 1/4" apart.

In areas where maintain spacing is difficult because of the number of cables in one stud space (panel and dimming enclosures locations, for example), some contractors are furring out the wall to the depth of the enclosure so the conductors are not in contact with thermal insulation.

INSTALLATION REQUIREMENTS
(NFPA 13 - PAGE 81)

8.14.9.3 Where two or more adjacent water spray systems in one fire area are controlled by separate pilot line detector systems, the detectors on each system shall be spaced independently as if the dividing line between the systems were a wall or draft curtain.

8.14.9.4 Where pilot line detectors are installed in water cooling tower applications, they shall be in accordance with Section 21.24.

8.14.10 Pipe supplying pilot line detectors shall be permitted to be supported from the same points of hanger attachment as the piping system it selves.

8.14.10.1 Pipe supplying pilot line detectors shall not be required to meet the requirements of 9.3.5.

8.15 Special Situations.

8.15.1 Concealed Spaces.

8.15.1.1 Concealed Spaces Requiring Sprinkler Protection.
All concealed spaces enclosed wholly or partly by exposed combustible construction shall be protected by sprinklers except in concealed spaces where sprinklers are not required to be installed by 8.15.1.2.1 through 8.15.1.2.16 and 8.15.6.

8.15.1.2* Concealed Spaces Not Requiring Sprinkler Protection.

8.15.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum. *(For additional information on combustible loading, see A. 8.15.1. 2.1.)*

8.15.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustibles shall not require sprinkler protection. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

8.15.1.2.3 Concealed spaces formed by studs or joists with less than 6 in. (152 mm) between the inside or near edges of the studs or joists shall not require sprinkler protection. *(See Figure 8.6.4.1.5.1.)*

8.15.1.2.4 Concealed spaces formed by bar joists with less than 6 in. (152 mm) between the roof or floor deck and ceiling shall not require sprinkler protection.

8.15.1.2.5 Concealed spaces formed by ceilings attached directly to or within 6 in. (152 mm) of wood joist construction shall not require sprinkler protection.

8.15.1.2.6* Concealed spaces formed by ceilings attached to composite wood joist construction either directly or onto metal channels not exceeding 1 in. (25.4 mm) in depth, provided the joist channels are fires topped into volumes each not exceeding 160 ft.³ (4.53 m³) using materials equivalent to the web construction and at least 3 ½" in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels, shall not require sprinkler protection.

8.15.1.2.7 Concealed spaces entirely filled with noncombustible insulation shall not require sprinkler protection.

8.15.1.2.8 Concealed spaces within wood joist construction and composite wood joist construction having noncombustible insulation filling the space from the ceiling up to the bottom edge of the joist of the roof or floor deck, provided that in composite wood joist exceeding 160 ft.³ (4.53 m³) to the full depth of the joist with material equivalent to the web construction, shall not require sprinkler protection.

8.15.1.2.9 Concealed spaces over isolated small rooms not exceeding 55 ft.² (5.1 m²) in area shall not require sprinkler protection.

8.15.1.2.10 Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.

8.15.1.2.11 Concealed spaces in which the exposed materials are constructed entirely of fire-retardant treated wood as defined by NFPA 703, *Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials*, shall not require sprinkler protection.

8.15.1.2.12 Noncombustible concealed spaces having exposed combustible insulation where the heat content of the facing and substrate of the insulation material does not exceed 1000 Btu/ft.² (11,356 k]/m²) shall not require sprinkler protection.

8.15.1.2.13 Concealed spaces below insulation that is laid directly on top of or within wood joists or composite wood joists used as ceiling joists in an otherwise sprinklered concealed space, with the ceiling attached directly to the bottom of the joists, shall not require sprinkler protection.

8.15.1.2.14 Vertical pipe chases under 10 ft.² (0.93 m²) where provided in multifloor buildings where the chases are firestopped at each floor using materials equivalent to the floor construction, and where such pipe chases shall contain no sources of ignition, piping shall be noncombustible and pipe penetrations at each floor shall be properly sealed and shall not require sprinkler protection.

8.15.1.2.15 Exterior columns under 10 ft.² (0.93 m²) in area, formed by studs or wood joist supporting exterior canopies that are fully protected with a sprinkler system, shall not require sprinkler protection.

8.15.1.2.16* Concealed spaces formed by noncombustible or limited combustible ceilings suspended from the bottom of wood joists, composite wood joists, wood bar joists, or wood trusses that have insulation filling all of the gaps between the bottom of the trusses or joists, and where sprinklers are present in the space above the insulation within the trusses or joists, shall not require sprinkler protection. The heat content of the facing, substrate, and support of the insulation material shall not exceed 1000 Btu/ft.² (11,356 k]/m²).

8.15.1.3 Concealed Space Design Requirements. Sprinklers in concealed spaces having no access for storage or other use shall be installed in accordance with the requirements for light hazard occupancy.

8.15.1.4 Heat-Producing Devices with Composite Wood Joist Construction. Where heat-producing devices such as furnaces or process equipment are located in the joist channels above a ceiling attached directly to the underside of composite wood joist construction that would not otherwise require sprinkler protection of the spaces, the joist channel containing the heat-producing devices shall be sprinklered by installing sprinklers in each joint channel, on each side, adjacent to the heat-producing device.