Land Use and Environmental Service Agency
(Code Enforcement)

NC Mechanical Code

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917 - Question: I am designing a BBQ restaurant. The owner has specified a smoker to use. We are being told the smoker has to be listed to UL 2162. We can find no information the smoker meets this standard, is this correct?

Answer: Yes, section 917 NCMC requires solid fuel ovens to be listed to UL 2162. The section states ovens, but this covers smokers as well.

N1102.4.1 - Question: Are HVAC boots required to be caulked to the drywall on the ceiling?

Answer: Yes, Section N1102.4.1 requires HVAC boots to be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material. If a blower door test is performed and passes, that would demonstrate the envelope is tight.

Policy - Question: Are duct detectors required in all apartments per the interpretation Mecklenburg County Code Enforcement issued on dampers in apartments?

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Answer: No, duct detectors is only one option provided to use a static damper. The other option is to use a firestat with a static damper. If a properly listed dynamic damper is used, then no duct detector or firestat would be required.

Residential - Question: Does a sunroom need to be zoned?

Answer: If the sunroom is thermally isolated, then it can be considered unconditioned and nothing further is required. If it is to be considered a conditioned habitable room, then it might need a zone control. The Administrative Code for the licensing board limits the temperature difference between rooms to 4 degrees. This is a licensing board requirement and not a mechanical code requirement. If the sunroom is fed from the existing mechanical system, it would be considered to be a conditioned room, as a permanent return air path would need to be provided.

M1502.3 NCRC - Question: I was turned down for the dryer exhaust being within 3 feet of the rated wall on a townhouse. The inspector said the wall was the property line and the dryer vent could not be within 3 feet of the property line. I have looked at section M1502.3 in the residential code and can't find a requirement for distance from the property line. Where is this in the code.

Answer: Section M1502.3 deals primarily with dryer duct termination in regards to building openings. If the manufacturer's installation instructions doesn't specify a minimum distance to building openings, then the default is 3 feet. Section M1506.3 deals with exhaust terminations in general and states not less from 3 feet from property lines. This section would apply to kitchen exhaust, bathroom exhaust and dryer exhaust.
M1506.3 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable and nonoperable openings into the building and 10 feet (3048 mm) from mechanical

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air intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.5.2 and R303.6.

C403.2.9 Energy - Question: In the past I have used the exception where the air in the duct and the outside of the duct did not exceed 15F to omit the duct insulation. I was told that is no longer an option, is that correct?

Answer: Yes, that exception was deleted by NC when the 2018 NC Energy Code was adopted.

Other - Question: Can the drain from the flue of a tankless waterheater discharge to a washer box?

Answer: We can find nothing in the code that would prohibit this. A neutralizer maybe needed before discharging to the washer box depending on the ph of the discharge. The manufacturer's installation instruction could also be specific on where the line could discharge.

Other - Question: We are doing a design on an existing office building. After field investigation, the existing office has a common return in the hallway and the office doors are undercut for return. The corridor was being used as the return air path. The building was built in the late 90s. If we don't change anything, except moving the diffusers a couple of feet in the offices, can we continue to use the corridor as a return air path?

Answer: Yes, In the 1999 code, it would have been allowed for "B" Occupancies. The code prohibited corridors in hotels, hospitals and institutions back then. That said, if the HVAC layout is original and you are not modifying it, then you would be able to continue to use the corridor as a return air path. Back then the base code was the 1994 code and if it was updated between then and 1999, there was a blue page. So this page with this code section was not updated since the 1994 code.

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Manufacturer's Installation Instructions - Question: We have more and more homeowners wanting the condensing unit set out away from the house. What are the requirements for burying linesets?

Answer: This would be determined by the manufacturer's installation instructions. We cannot find anything in the code that addresses this. Keep in mind the listing on the suction line insulation usually will not allow direct burial. If the lines penetrate a slab and enter the building, provisions for rodent proofing maybe needed.

R302 - Question: Can a dryer vent terminate in the 4 foot area from a fire wall on a townhome?

Answer: No, for the roof and eaves. Section R302.1 NCRC provides an exception for openings or penetrations in walls perpendicular to the fire rated assembly. The 4 foot requirement would not apply to wall perpendicular to the rated assembly, but that rated wall in a townhouse is also a property line. Environmental Air is required to terminate a minimum of 3 feet from property lines.

M1501.1 - Question: A home inspector is quoting M1501.1 stating a bath fan cannot terminate in the soffit. The exhaust duct connects to an exhaust hood in the soffit and projects the exhaust away from the building. Is the home inspector correct?

Answer: Section M1501.1 does state exhaust cannot terminate in the attic or soffit, but this is referring to terminating the exhaust within the soffit. The exhaust is still considered in the building unless ducted to the outside. An attic and crawlspace are not considered to be outside. It is acceptable to terminate the exhaust through the soffit directly to an exhaust hood or grill.

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M1501.1 (501.3) Outdoor discharge. The air removed by every mechanical exhaust system shall be discharged to the outdoors in accordance with Section M1506.3. Air shall not be exhausted into an attic, soffit, ridge vent or crawl space. Exhaust shall not be directed onto walkways, balconies, decks, breezeways, covered walkways and similar horizontal projections.

Listing - Question: I recently inspected 3 Type I hoods that shared the same duct and fan. The hoods had a damper plate installed to balance the air between the hoods. Is this allowed?

Answer: Yes, it can be. Chapter 9 of NFPA 96 does allow for dampers in the exhaust system, but that has to be accepted as an alternate method.
Refer to Section 9.1.1 of NFPA 96
9.11 Dampers shall not be installed in exhaust ducts or exhaust duct systems.
9.1.2 Where specifically listed for such use or where required as a part of a listed device or system, dampers in exhaust ducts or exhaust duct systems shall be permitted.
If the hood manufacturer has it as an option as part of the listed assembly it is okay per NFPA 96, or if it is a third party that is listed specifically for this application

M1507.4 - Question: Does the 2018 Residential Code Section M1507.4, now require minimum kitchen exhaust for one and two family dwellings?

Answer: It is the same general logic as the 2012 code. Mechanical ventilation is only required when they cannot meet the prescriptive natural ventilation option. The prescriptive means of doing it in one-and-two family dwellings was added that mimics ASHRAE 62.2-Ventialtion for low-rise residential buildings.

202 - Question: Would the space above a cloud feature be considered an above ceiling plenum?

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Answer: No, per the definition; a plenum is an enclosed portion of the building structure. This would be the space above a lay in ceiling, or a crawl space. A cloud feature is not enclosed, they are either a small potion of the ceiling or open around the perimeter.

PLENUM. An enclosed portion of the building structure, other than an occupiable space being conditioned, that is designed to allow air movement, and thereby serve as part of an air distribution system.

R303.5 - Question: How are fresh air intakes installed on townhouses less than 20 feet wide code compliant?

Answer: This comes from the requirement of fresh air intakes required to be 10 feet from property lines. The 2018 NCRC is a stand alone book this code cycle. The previous version were abridged versions. In the 2018 NCRC the mechanical section that corresponds to 401.4 was not reprinted in the NCRC. In fact, Chapter 4 of the mechanical code was left out entirely. The only section in the NCRC that gives requirements for intake openings is R303.5, which does not mention property lines.

306.3 And M1305.1.3 - Question: Is access required from a platform in an attic through the guards/wall to access volume dampers?

Answer: No, volume dampers do not require periodic maintenance and should not require routine adjustment once balanced. They need to be accessible and cannot be concealed in construction, but no passageway or platform is required for them.

307.2.2 - Question: Is the condensate line in one and two family dwellings, required to be insulated?

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Answer: No, Section 307.2.2 NCMC requires provisions to be taken to prevent condensation on the exterior of primary condensate drain piping. The corresponding section in the NCRC, Section M1411.3.2, does not have the added requirement.

307.2.3.1 - Question: I was turned down for not having water level switch on a RTU. Where is this in the code?

Answer: Section 307.2.3.1 NCMC requires water level monitoring devices on downflow units and all other coils that do not have a secondary drain. RTUs only have the one drain, there is not secondary drain. This section requires a water level monitoring device to be installed inside the primary drain pan.
307.2.3.1 Water-level monitoring devices. On downflow units and all other coils that do not have a secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the equipment served in the event that the primary drain becomes restricted. Devices installed in the drain line shall not be permitted.

313.4.1.1 - Question: Are CO detectors required in fire houses where there are sleeping quarters?

Answer: Yes, the sleeping area would be considered an R occupancy and the requirements for CO detectors would apply
313.4.1.1 Where required. Carbon monoxide detection shall be provided in Group I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 313.4.2 where any of the conditions in Sections 313.4.1.2 through 313.4.1.6 exist.

403.1.1 - Question: We are doing a vehicle repair garage. The owner is providing a carbon monoxide capture system with hoses connecting directly to the vehicles.

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My question is would the .75/cfm sf as noted in chapter 4 of the NCMC still be required in addition to the capture system?

Answer: Yes, Section 502.14 NCMC requires areas where motor vehicles operate to be provided with mechanical ventilation in accordance with section 403, and additionally are required to have source capture for areas where stationary motor vehicles are operated. The .75 cfm is a general requirement. The source capture is a specific requirement for when you must run the vehicle to work or trouble shoot it.

403.2 - Question: If a window has a limiter on it, does that effect the natural ventilation calculation?

Answer: We have researched this and not found a limiter that requires 2 people to operate. Since the limiter can be operated by an individual, the limiter would not be a factor when calculating the natural ventilation.

403.3 - Question: Table 403.3 in the 2018 NCMC has deleted the section for "Hospitals, nursing and convalescent homes". How is the ventilation for these type of uses calculated now?

Answer: The 2018 NCMC did delete "Hospitals, nursing and convalescent homes" from Table 403.3. Section 407 was added to the 2018 NCMC and refers you to ASHRAE 170 for ventilation of ambulatory care facilities and Group I-2 occupancies.

403.3.1.1.1.2 - Question: I am reviewing a project where the designer is using footnote "f" for Table 403.3.1.1.1.2 which allows a distribution effectiveness of 1.0 for systems with a ceiling supply of warm air. What do we need for plan review?

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Answer: The exception is based on the system design, both air temperature and velocity. We need confirmation from the designer with a statement on the plans covering all the requirements of the footnote.
1. The supply air temperature and the space temperature will be less than 15F difference.
2. The velocity of the supply outlet is a minimum of 150 feet per minute
3. The air jet from the supply outlet must reach to with in 4.5 feet of the floor

403.3 - Question: What is the difference between a locker room and a sports locker room in education?

Answer: Table 403.3 has it listed as Locker/dressing rooms, This is simply a dressing room with lockers. For example a hospital. They have a dressing room with lockers for the nurses and doctors to change their clothes. This would not be associated with a sporting activity, so sweat and odor would be minimum.
The sporting locker would be just that, a locker room associated with a sporting activity.

504 - Question: Can a clothes dryer terminate in a custom louver box flush with the building?

Answer: No, The intent of the code is to have no obstructions in the exhaust between the dryer and the termination. Having a louver box before the termination provides an area for lint to accumulate and louvers to catch and create lint buildup.

504.8 - Question: Can a flexible dryer duct be used in the middle of the duct run?

Answer: No, Section 504.8 NCMC requires the duct material (except the transition duct) to be constructed with a smooth interior and atleast 28 ga metal. The

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transition duct can be flex, but is limited to 8 feet and must be in the same room as the dryer.

505.2 - Question: For domestic kitchen exhaust, is it acceptable to install a pressure switch in the make up air unit to bring on the unit rather than interlock it with the hood?

Answer: No, Section 505.2 requires the make up air unit to be controlled automatically to START and OPERATE simultaneously with the exhaust.

505.2 - Question: It was my understanding that I could go up to 600 cfm on domestic kitchen hoods before I had to provide makeup air, but I was told I had to provide it because the house had a fireplace. Is this correct?

Answer: Yes, the code was changed to allows domestic exhaust hoods that do not exceed 600 cfm to be installed without providing makeup air. There is a stipulation, all the appliance in the house have to be direct-vent, power-vent, unvented or electric. The fireplace is not a direct vent.
See attached code reference and flow chart.

506.3.8 - Question: I have a grease duct in a shaft, where are cleanouts required?

Answer: Section 506.3.8 requires sections of the duct that are not accessible from the hood or discharge to have cleanouts spaced no further than 20 feet apart. Cleanouts are also required within 10 feet of changes of direction greater than 45 degrees.

507.3 - Question: The 2018 NCMC does not have exceptions for Type II hoods. Does this mean atleast a Type II hood is required for appliances such as electric counter top oven or a under counter dishwasher?

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Answer: No, Section 507.3 NCMC may not have exceptions listed, but it does state, a hood is not required where the heat and moisture loads are incorporated into the HVAC system design. If the appliance does not produce grease or smoke, they can incorporate the heat and moisture in the HVAC system design.

507.3 - Question: The 2018 NCMC does not have exceptions for Type II hoods. Does this mean atleast a Type II hood is required for appliances such as electric counter top oven or a under counter dishwasher?

Answer: No, Section 507.3 NCMC may not have exceptions listed, but it does state, a hood is not required where the heat and moisture loads are incorporated into the HVAC system design. If the appliance does not produce grease or smoke, they can incorporate the heat and moisture in the HVAC system design.

507.6.2 - Question: Do we have to accept a hood certification from an engineer. The phrase, "or at the code official's option" is not in the 2018 code. Does this mean we have to accept a hood certification from an engineer?

Answer: We reached out to NCDOI for an interpretation on this. The slight change in the code language was never meant to require acceptance of a certification by an engineer. The code official still has the option to accept or not.

508.1.2 - Question: I was disapproved in plan review because I did not provide an air balance schedule on my plans. This hasn't been a requirement before, what has changed?

Answer: Section 508.1.2 was added to the 2018 NCMC. This section requires an air balance schedule be submitted with the design plans for facilities with a commercial kitchen.

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607.3.1 - Question: I was told I can no longer use a room smoke detector to shut down the air handler in the apartment, is there a new policy?

Answer: Yes, The interpretation had an effective date of 1/1/19. The interpretation reads:
After researching the issue and possible solutions to provide an equal level of compliance to Section 607.3.1 of the NC Mechanical Code, any of the following are acceptable:
1. A listed UL 555C dynamic radiation damper with the appropriate rating for the assembly.
2. A static damper with a duct detector on the air handling unit to shut down the unit upon detection of smoke.
3. A static damper with a firestat located below the damper to shut down the air handling unit. The firestat shall have a setting between 160 degrees and 215 degrees, but in no case higher than the damper's fusible link.
Please Note: The use of a room smoke detector to shut down the air handling unit will no longer be accepted.

607.5.4 - Question: I have a general question that I would like to get your opinion on dealing with fire-smoke dampers in ductwork crossing hotel corridor walls. Recently, I have been getting a lot of pushback from hotel owners, as well as contractors saying that the make-up air ducts crossing the corridor walls into guestrooms do not require fire-smoke dampers. They admit that they may require fire dampers but don't believe smoke dampers are required. If you read the code (607.5.4 NCMC) closely, it says the a smoke damper is required where duct crosses a smoke barrier wall or a corridor enclosure required to have a smoke and draft control doors. My thinking on this is that these corridors are not smoke barriers and they never require the smoke and draft control doors (only fire doors) and therefore this exception can't be used.

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Answer: The answer is complicated. It goes back and forth between the NCMC and the NCBC.
You are correct, Section 607.5.4 NCMC does state smoke dampers are only required in a corridor enclosure required to have smoke and draft control doors. Then you have to go to the NCBC and see when "draft control doors" are required. The main Section 716.5.3 NCBC deals with "Door assemblies in corridors and smoke barriers". The sub section of 716.5.3.1 NCBC states that "Fire Doors" shall meet the requirements for a smoke and draft control door assembly.
The end result is, anytime a "Fire Door" is required (which is a draft control door), smoke dampers will be required in the duct work per Section 607.5.4 NCMC. In short, if a rated corridor is required, then smoke dampers will also be required because fire doors are required.

607.5.4 - Question: I am installing duct in an office, and was told I cannot use flex to connect the duct to the diffuser; because If I did then I would need to install a smoke damper?

Answer: Section 607.5.4 NCMC allows smoke dampers at the corridor walls to be omitted, if the duct is metal having a minimum thickness of 0.019 inch (26 ga) and there is no openings to the corridor. It is a common practice for a designer to spec the last 5 feet of a duct run as flex to connect to the diffuser. If the exception for the smoke damper is being used, then flex would not be allowed.

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404.7.2 - Question: How far from the side of a stud would a copper gas line need to be to not require nail plates?

Answer: Section 404.7.2 requires protection for the length of the pipe when installed adjacent to a framing member and with in 1.5 inches from the nailing surface. We have researched this and have determined if the gas line is adjacent to the stud but atleast 1.5 inches away from the stud, then no protection would be required under 404.7.2.

404.7.2 Piping installed in other locations. Where the piping is located within a framing member (i.e. steel studs) and is less than 11/2 inches (38 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. Where the piping is located outside of a framing member and is located less than 11/2 inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. When outside of the framing member, measurement shall be made on the horizontal or vertical axis for horizontal and vertical members, respectively, and not diagonally. The measurement is from the member's face edge, not the member's plane.

404.7.2 - Question: I have gas piping consisting of copper tubing, installed adjacent to a stud. The tubing is about an inch from the front of the stud, but

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does not go through the stud. I am being told I have to install a plate the length of the pipe because it is less than 1.5 inches to the front of the stud. Is this correct?

Answer: Yes, Section 404.7.2 NCFGC requires piping located outside of a framing member and is located less than 1.5 inches from the nearest edge of the face of the framing member to be protected by shield plates that cover the width and length of the pipe.
404.7.2 Piping installed in other locations. Where the piping is located within a framing member (i.e. steel studs) and is less than 11/2 inches (38 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. Where the piping is located outside of a framing member and is located less than 11/2 inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. When outside of the framing member, measurement shall be made on the horizontal or vertical axis for horizontal and vertical members, respectively, and not diagonally. The measurement is from the member's face edge, not the member's plane.

404.9 - Question: Can Sch 40 Black Steel gas piping be installed within 3.5 inches of a patio (poured/pavers)?

Answer: Yes, 404.9 NCFGC prohibits it the piping from being within 3.5 inches of the ground or roof. (states ground not grade). The concern is corrosion when the pipe is within 3.5 inches of the ground. Mulch or other debris can accumulate on or against the pipe and promote corrosion. If the roof doesn't drain properly, the pipe could be submerged in water. With an installation above a patio, it is less improbable for the water level to reach the piping when it rains.

404.9 - Question: Is Sch 40 Black Steel gas piping prohibited from being within 3.5 inches of the ground?

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Answer: Yes, 404.9 NCFGC states "piping" and the definition of piping includes ridged steel piping. This is more of a corrosion issue than a physical damage issue. Mulch or other debris can accumulate on or against the pipe and promote corrosion. If the black steel pipe is installed within 3.5 inches of the ground it would be treated the same as an underground pipe and must be protected.

404.9 Above-ground outdoor piping. Piping installed outdoors shall be elevated not less than 31/2 inches (89 mm) above ground and where installed across roof surfaces, shall be elevated not less than 31/2 inches (89 mm) above the roof surface. Piping installed above ground, outdoors, and installed across the surface of roofs shall be securely supported and located where it will be protected from physical damage. Where passing through an outside wall, the piping shall be protected

against corrosion by coating or wrapping with an inert material. Where piping is encased in a protective pipe sleeve, the annular space between the piping and the sleeve shall be sealed.

PIPING. Where used in this code, "piping" refers to either pipe or tubing, or both.

Pipe. A rigid conduit of iron, steel, copper, brass or plastic.

Tubing. Semirigid conduit of copper, aluminum, plastic or steel.

406.1.3 - Question: I am cutting a gas line to add a new branch. The branch must be pressure tested, but does the tee, nipple and shutoff used to tie into the line have to be pressure tested also?

Answer: No, Section 406.1.3 NCFGC only requires the new branch to be pressure tested. The connection to the existing line is allowed to be leak checked with a noncorrosive leak detecting fluid or other approved methods.

406.1.3 New branches. Where new branches are installed to new appliances, only the newly installed branches shall be required to be pressure tested. Connections between the new piping and the existing piping shall be tested with a noncorrosive leak-detecting fluid or other approved leak detecting methods.

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408.4 - Question: Does the 2018 code require a change of direction for sediment traps?

Answer: Yes, the intent has always been to have change in direction for sediment traps, but the code did not directly require it. The commentary always stated a change of direction was needed. The 2018 NCFGC references Figure 408.4 which shows a change of direction.

409.5 - Question: Can the shut off for a gas light on a porch be located in the crawl space or attic?

Answer: Section 409.5 requires that a shutoff valve be supplied for each appliance in the same room within 6 feet of the appliance and requires that the valves have access.
Section 9.6.5.3 of NFPA 58-2018 allows manifolds to be located within 50 feet of the appliance served and requires that the valves be readily accessible and permanently identified as to what appliance they serve. This would be an alternate method to the code if you use it.
To be readily accessible the manifold and valves should be within 3 feet of the point of entry into the crawlspace or attic, similar to what we do with a water heater in a closet.

501.14 - Question: Are Category IV vents required to be atleast 10 feet from the property line?

Answer: The design, sizing and installation of vents for Category IV appliances shall be in accordance with the appliance manufacturer's installation instructions. The code does not have a requirement for 10 foot separation from property lines. If the installation instructions does not prohibit the installation it would be allowed. The code does require a 10 foot separation to openings in an adjacent

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building in Section 503.8. This requirement does not address property lines, just the distance to another building; which could be across a property line.

502.1 - Question: Can the blue rain or shine glue be used on PVC flue pipe?

Answer: No, it is not listed for application on flue pipes. Section 502.1 NCFGC states plastic vents for Category IV appliances are not required to be listed and labeled where they are specified by the appliance manufacturer and installed in accordance with the installation instructions. We were not able to find a manufacturer that allowed rain and shine.

623.7 - Question: If a microwave is installed over a gas range, which clearance requirements do we use?

Answer: Section 623.7 requires 24 inches of clearance. If the range is listed and the microwave is listed, then the clearances provided for the upper appliance, the microwave, can be used.

623.7 (IFGS) Vertical clearance above cooking top. Household cooking appliances shall have a vertical clearance above the cooking top of not less than 30 inches (760 mm) to combustible material and metal cabinets. A minimum clearance of 24 inches (610 mm) is permitted where one of the following is installed:

1. The underside of the combustible material or metal cabinet above the cooking top is protected with not less than 1/4-inch (6 mm) insulating millboard covered with sheet metal not less than 0.0122 inch (0.3 mm) thick.

2. A metal ventilating hood constructed of sheet metal not less than 0.0122 inch (0.3 mm) thick is installed above

the cooking top with a clearance of not less than 1/4 inch (6.4 mm) between the hood and the underside of the combustible material or metal cabinet. The hood shall have a width not less than the width of the appliance and shall be centered over the appliance.

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3. A listed cooking appliance or microwave oven is installed over a listed cooking appliance and in compliance with the terms of the manufacturer's installation instructions for the upper appliance.

624.1 - Question: Section 624.1 NCFGC states water heaters shall be tested in accordance with ANSI Z21.10.1 and ANSI Z21.10.3. Does this require water heaters to be tested to both standards?

Answer: No, Z21.10.1 is for water heaters less than 75,000 btu and Z21.10.3 if for 75,000 btu and greater, and tankless

Other - Question: Are Viega Pro-press/Mega Press-G fittings approved for use with Fuel Gas?

Answer: Yes, per ICC ES Letter PMG 1036, they are approved for use for fuel gas service within the manufacturers restrictions.
See Attachment

Manufacture Instructions - Question: Can a 2 psi regulator be installed in below grade in a valve box to feed a fire pit?

Answer: No, the regulator is not listed to be installed where subject to submersion under water. If installed below grade the potential for the valve box to fill with water is very high.