



NC Mechanical Code

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102.2 - Question: When doing work in a condo, the ceiling is removed and plastic vent pipe is found on the bathroom fans; does it need to be replaced?

Answer: If it was code complaint when it was installed and it isn't being touched then it doesn't need to be replaced; unless it is a life safety issue.

R303.5 - Question: I have been told the 10 foot separation for intake openings to property lines changed in the 2018 Residential Code, is that correct?

Answer: Yes, 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.

R303.5.1 Intake openings. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots



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and loading docks. For the purpose of this section, the exhaust from dwelling unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

Exceptions:

1. The 10-foot (3048 mm) separation is not required where the intake opening is located 3 feet (914 mm) or greater below the contaminant source.
2. Vents and chimneys serving fuel-burning appliances shall be terminated in accordance with the applicable provisions of Chapters 18 and 24.
3. Clothes dryer exhaust ducts shall be terminated in accordance with Section M1502.3.

304.3 - Question: If there is a mechanical room accessed from a carport, does the mechanical equipment need to be elevated?

Answer: No, if it is a carport (open on at least 2 sides), then elevation is not required.

R309.2 Carports. Carports shall be open on at least two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

304.6.2 - Question: If there is a mechanical room with no ceiling between the room and the attic, is a low combustion air pipe required?

Answer: No, the entire mechanical room would be considered the same as a one pipe combustion system. Per 304.6.2 NCFGC, a single combustion air opening must provide a minimum of 1 square inch per 3,000 btu/h of the total input.

304.6.2 One-permanent-opening method. One permanent opening, commencing within 12 inches (305 mm) of the top of the enclosure, shall be provided. The appliance shall have clearances of at least 1 inch (25 mm) from the sides and back and 6 inches (152 mm) from the front of the appliance. The opening shall directly communicate with the outdoors or through a vertical or horizontal duct to the



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outdoors, or spaces that freely communicate with the outdoors (see Figure 304.6.2) and shall have a minimum free area of 1 square inch per 3,000 Btu/h (734 mm²/kW) of the total input rating of all appliances located in the enclosure and not less than the sum of the areas of all vent connectors in the space.

306.4 - Question: If I have a crawlspace with 6ft for the first 10 feet in from the crawlspace door, can I start my 20ft run where the 6ft head height ends?

Answer: No, the exception to 306.4 NCMC requires 6 feet high for the entire length. If any part of the passage way drops below 6 feet high, then the exception does not apply and requirements of 306.4 would stand.

306.4 Appliances under floors. Underfloor spaces containing appliances shall be provided with an access opening and unobstructed passageway large enough to remove the largest appliance. The passageway shall not be less than 22 inches (559 mm) high and 36 inches (914 mm) wide, nor more than 20 feet (6096 mm) in length measured along the centerline of the passageway from the opening to the appliance. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry. Such concrete or masonry shall extend a minimum of 4 inches (102 mm) above the adjoining grade and shall have sufficient lateral-bearing capacity to resist collapse. The clear access opening dimensions shall be a minimum of 22 inches high by 30 inches wide (559mm by 762 mm), and large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open and the appliance is capable of being serviced and removed through the required opening.



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2. Where the passageway is not less than 6 feet (1829 mm) high unobstructed and not less than 6 feet high (1929 mm) for its entire length, the passageway shall not be limited in length.

306.5 - Question: I have a client that has concerns about the permanent ladder allowing unauthorized people to get on the roof. Can we stop the ladder about 10 feet above grade where a portable ladder would be required to gain access to the roof.

Answer: No, Section 306.5 requires permanent roof access when the roof exceeds 16 feet. Such access shall be from grade or floor level to the appliances' level service space.

306.5 - Question: Does the requirements of 306.5 for roof access apply to one- and two- family dwellings and townhouses?

Answer: No, Section 306.5 was not reprinted in the 2012 NCRC or the 2018 NCRC. There is nothing prohibiting the installation of HVAC equipment on the roof or single family or townhouses, but the requirements for roof permanent roof access is not there.

307 - Question: What is an acceptable method to size manifolding multiple condensate lines together?

Answer: There is nothing that provides a prescriptive method in the NCMC to manifold condensate lines together. Section 307.2.2 was deleted from the code when NC adopted it.

We do have an in house method that is a pre-approved alternate to size manifolded lines. For each piece of equipment added, increase the size one pipe size to a maximum of 2 inches. This is just one method that we have pre-approved for acceptance, other methods may be submitted via "Alternate



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Materials and Methods Request Form". The alternate submitted should be based on an industry accepted engineering practice.

307.2.3(1) - Question: Does Section 307.2.3(1) require that the auxiliary drain pan be sized three inches larger in overall width and length with respect to the unit or is three inches of clearance required on all sides of the unit?

Answer: Section 307.2.3(1) only requires that the auxiliary drain pan be sized three inches larger in overall width and length with respect to the unit. The code does not require three inches clearance on each side. The auxiliary drain pan shall be located such that any leakage from the unit housing resulting from primary drain blockage is collected in the auxiliary drain pan.

See NCDOT Interpretation

401.4 - Question: If a fresh air intake was installed on the rear corner of a house, does it still need to be 10 feet away from the side property or only the rear?

Answer: It would need to be at least 10 feet from both the rear and side property lines.

501.2.1 - Question: Can a residential kitchen exhaust terminate under a screened porch?

Answer: No, this needs to terminate outdoors and would need to go the roof's edge. The building area is considered anything under the roof.

501.2.1 - Question: Can environmental air discharge under a porch, balcony or covered patio?

Answer: No, exhaust outlets are required to discharge to the outdoors. These terminations need to go to the roofs edge.



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501.2.1 - Question: Is there an exception to allow environmental exhaust to be 3 feet above a mechanical air intake?

Answer: Section 401.4 #3 offers a general requirement that intake openings can be 3 feet below contaminant sources located within 10 feet. Section 501.2.1 #3 gives a specific requirement for mechanical air intakes from environmental air exhaust, requiring a 10 foot separation. A specific requirement is enforced before a general requirement.

502.14 - Question: Can a repair garage be naturally ventilated by Section 402 NCMC?

Answer: There is a general requirement from 401.2 that requires Natural (402) or Mechanical (403) ventilation. Section 502.14 gives a specific requirement that if motor vehicles are operated, then mechanical ventilation shall be provided in accordance with Section 403.

504.6.1 - Question: Does the tail piece on a dryer wall cap need to be 28 gauge?

Answer: No, if the tail piece came with the wall cap, it will be accepted.

504.6 - Question: Section 504.6.1 requires a dryer duct to be 4 inches in diameter. This has been accepted the pipe must be 4 inch round pipe. Would a dryer box that the pipe must be compressed to enter the box be acceptable?

Answer: If it is a listed box, it would be acceptable. The box would have been tested with the 4 inch compressed and a 3rd party is certifying the box performance. We would not accept a homemade box.



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504.6.1 - Question: I am bidding a job for a builder that will have a couple of slab on grade houses where the property slopes and the back foundation is built up. He wants to know if we can run 4 inch PVC pipe under the slab for the dryer?

Answer: No, Section 5.4.6.1 requires the duct to have a smooth interior finish and shall be constructed of metal. There is a lot of discussion about this online. While the PVC does have a smooth interior, it is still plastic and can ignite and burn in the event of a lint fire, even underground. The hot air traveling across plastic also has the potential of producing static which could ignite any lint build up.

504.7 - Question: Does a commercial clothes dryer require a back-draft damper as stated in NCMC 504.4?

Answer: Section 504.4 gives general requirements for dryer exhaust installation, but Section 504.7 gives a specific requirement for Type II dryers requiring them to comply with the appliance installation instructions. If the installation instructions don't require a back-draft damper, then one would not be required.

506 - Question: Would it be acceptable to paint a grease duct? Designing a supermarket and they want everything in the trusses painted white.

Answer: We can find nothing in the code that would prohibit this. The light test would need to be done before being painted.

507.1 - Question: I am using a recirculating Type I hood for my space. The inspector has turned me down stating it needs to be UL 710B listed. There is a UL label on the hood, is that not enough?

Answer: Section 507.1 NCMC requires recirculating systems to be specifically listed to UL 710B. Most of the time the manufacturer will provide a label with this information, but not always. The UL label alone just shows it passed a UL



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standard, but we cannot verify which standard by just the label. Further documentation would be required in this case. There have been occurrences where a hood has a UL label, but it was only tested for the electrical components, it is still a UL listed hood, but not to the UL 710B standard.

507.9 - Question: I am installing a Type I hood on a concrete block wall. The owner doesn't want the stainless steel, he wants to use epoxy paint on the wall to seal it. The Health Dept doesn't have an issue with the paint. Would this be acceptable by code?

Answer: Yes, the nonabsorbent and noncombustible material requirement is only in the exception of Section 507.9, when the hood is being installed on a gypsum wallboard and metal stud wall. This type of wall is considered a limited combustible wall by NFPA 96 and adding the stainless gives an extra layer of protection and allows easy cleaning. The block wall is a noncombustible wall.

607 - Question: I have an apartment that the bathroom ceiling was dropped down a foot, the inspector is telling me the damper has to go at the upper ceiling. Is this correct?

Answer: Yes, the upper ceiling is the bottom of the rated assembly. A damper is required to protect the penetration. Putting the damper in the lower ceiling (non-rated ceiling) would not provide protection at the penetration.

607.5.3 - Question: If you have 2 fresh air ducts from a shaft, one feeding the corridor and one for the sleeping units. Fire/smoke dampers are installed at the shaft, are fire/smoke required at the penetrations for the sleeping units?

Answer: Fire/Smoke damper would not be required if they meet the exceptions in the building/mechanical code and don't communicate with the corridor.



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1101.3 - Question: Is there a minimum distance that a lineset must be from the underneath of the subfloor?

Answer: There is not a minimum required distance of separation. There is a general requirement from 1101.3 to protect all portions of a refrigeration system from damage.

1101.3 Protection. Any portion of a refrigeration system that is subject to physical damage shall be protected in an approved manner.

1108 - Question: Does the inspector need to witness the pressure test on a refrigeration system on a commercial job?

Answer: Yes, unless the component falls under the exception for tested at the factory.

1108.1 General. Every refrigerant-containing part of every system that is erected on the premises, except compressors, condensers, vessels, evaporators, safety devices, pressure gauges and control mechanisms that are listed and factory tested, shall be tested and proved tight after complete installation, and before operation. Tests shall include both the high and low-pressure sides of each system at not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing shall be those listed on the condensing unit, compressor or compressor unit nameplate, as required by ASHRAE 15.

Policy - Question: Are the outdoor units required to be fully wired for final inspection?

Answer: The low voltage portion does not need to be completed. The wiring can be stubbed into the unit and completed at start up. If an outdoor thermostat is required, it must be installed in the unit for the final inspection. The air handler/furnace can also have the wiring stubbed into the unit. If float switches are required, they must be installed in the pan, but the wiring can be completed at the startup.



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Policy - Question: When an air handler is installed with electric heat strips and the sticker is not marked to indicate the size of the heat strips; who should be turned down, the mechanical contractor or the electrical contractor?

Answer: Most of these stickers have a statement on them requiring the installer to mark the heat strip size. It was discussed with management and the electrical CA and the answer is both should be turned down. The mechanical contractor would be turned down as it is their responsibility to mark it. The electrical contractor would be turned down, (defect by others), as it needs to be indicated to confirm the circuit is of the right size.

Other - Question: Can a water heater with a PVC vent be used in a highrise building?

Answer: Yes, if the unit and vent is all contained in a mechanical room and vents directly out to the exterior. If the vent must pass through a fire rated assembly, then the vent would need to be protected with a shaft from the penetration of the rated assembly to the termination; or be protected with an approved alternate means.

Other - Question: With canopy and telescopic hoods what is the requirements for final? Meaning do we need to leave a portion of the custom canopy off and on telescopic hoods do we need to leave the pipe cover off so that the inspectors can see the pipe and such?

Answer: After discussing this with the inspection supervisors, the cover needs to be left off so the connection can be inspected.

Manufacturer's Installation Instructions - Question: Can the condenser unit of a mini split system be installed in an above ceiling space?



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Answer: This would have to be specified in the installation instructions. Several manufacturers state the units can be installed in doors, but when asked for clarification, this would be indoors on top of an office space of a warehouse. There have been a couple of jobs where the manufacturer was ok for the unit to be installed in an above ceiling space. There was a size requirement on the space and the it could not be used as a plenum.

Product Listing - Question: I have installed a recirculating Type I hood listed to UL 710B. The inspector is questioning the cooktop I used with the hood, it is not on the approved list in the installation instructions.

Answer: The manufacture specifies the allowed appliances under a recirculating hood. The hood has been tested with these appliances as part of the listing. If the appliance is not approved by the manufacture, we would not be able to approve it.

Manufacture's Installation Instructions - Question: Can the flue (PVC) of a unit heater terminate under the landing of an exterior stairway?

Answer: Since this would be a category IV appliance, the termination would default to the manufacture's installation instruction.

Other - Question: Is a separate demo permit required for a renovation?

Answer: Usually a separate demo permit is not required for a renovation, as the demo is part of the renovation and included in the renovation cost. A demo sheet should be provided in the plans and this should be looked at in the field to confirm construction is staying within the scope of work that was permitted. There are instances where the plans may still be in review and the contractor wants to get started. In this case the demo portion can be pulled out of the



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project and permitted separately. Another case would be where the owner wants to demo a space to make it more marketable and there is no tenant or renovation plans.

Energy 403.2.1 - Question: What are the insulation requirements for ducts installed between floors?

Answer: Section 403.2.1 states Supply ducts located in semi-conditioned spaces are required to be insulated to R-4. A semi-conditioned space is defined as a space indirectly conditioned within the thermal envelope that is not directly heated or cooled. The joist space between floors would be a semi-conditioned space.

403.2.1 also states there is no insulation requirement for return ducts in semi-conditioned space.

We have discussed this with Dan Dittman from NCDOL. We are reading the section correctly and will start enforcing it on December 1st, 2014. An email blast will go out on NotifyMe. See attached email from Dan Dittman.

403.2.1 Insulation (Prescriptive). Supply and return ducts in unconditioned space and outdoors shall be insulated to R-8. Supply ducts inside semi-conditioned space shall be insulated to R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated.

Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

SEMI-CONDITIONED SPACE. A space indirectly conditioned within the thermal envelope that is not directly heated or cooled. For energy purposes, semi-conditioned spaces are treated as conditioned spaces.

Manufacturer's Installation Instructions - Question: Can grease duct wrap be used to reduce the 6 inch clearance for Type II clothes dryers?



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Answer: No, grease duct wrap is a listed product and is not listed for that application. Duct wrap is not listed to reduce clearances, but to take the place of a shaft around the dryer duct.

Other - Question: Does the installation of a process boiler require a mechanical contractors license?

Answer: No, we have contacted the State Board of Plumbing, Heating and Fire Sprinkling. They have stated, if the boiler does not condition the space, a license is not required. A mechanical permit is still required.

Other - Question: Can nylon duct strapping be used in an above ceiling plenum?

Answer: Yes, if it meets the 25 flame and 50 smoke spread per section 602.2.1 NCMC.

Other - Question: Is lpe wood considered a non-combustible?

Answer: No, while the industry considers it fire resistant, there is very little testing on the wood. Timber holdings did testing to the 1989 ASTM E-84 and it was classified as a Class A, but when the test was updated in 2007 and re-tested, it was classified as a Class B.



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POLICY	OTHER

304 - Question: I have a homeowner that wants to seal the attic with foam at the rafters. They have an existing 80% furnace. What options do I have for combustion air?

Answer: Available options include:

1. Construct an enclosure around the furnace and maintain the required clearances. Then duct in combustion air in accordance with 304.6 NCFGC.
2. Provide transfer grills from the attic to the house to provide combustion air in accordance with 304.5. (This will require the foam to be protected with an barrier).
3. Install a 90% furnace that will draw all the required combustion air directly from the outside.

310.1.1 - Question: Who gets turned down if the CSST is not bonded properly, the mechanical contractor or the electrical contractor?

Answer: The requirement would come back to the mechanical contractor. Per NCDOL's interpretation, a person does not need to be a licensed electrical contractor to bond the CSST, if they are not opening the panel. Because of this, it is difficult to determine who did the bonding. The responsibility would fall to the mechanical contractor.



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403.4.2 - Question: Can socket weld saddle fittings be used on black steel?

Answer: No, these fittings are listed to ASME B31.8 for gas transmission and distribution. The standard is for utility use and is not referenced in the NCFGC.

404.3 - Question: Are brazed fittings for gas piping installed in a wall required to have an access opening?

Answer: No, Section 404.3 has an exception that allows brazed joints in concealed locations

404.3 Piping in concealed locations. Portions of a piping system installed in concealed locations shall not have unions, tubing fittings, right and left couplings, bushings, compression couplings and swing joints made by combinations of fittings.

Exceptions:

1. Tubing joined by brazing.
2. Fittings listed for use in concealed locations.

404.7 - Question: Is aboveground gas piping outdoors required to be protected where it is subject to damage?

Answer: From NCDOL Interpretation:

Yes. Section 404.72 is clearly prescriptive about minimum support heights above ground and roof surfaces:

“...All piping installed outdoors shall be elevated not less than 3-1/2 inches (152 mm) above ground and where installed across roof surfaces, shall be elevated not less than 3-1/2 inches (152 mm) above the roof surface.”

However, section 404.7 is only general in nature for protection of piping above ground but still subject to damage:



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“...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”

In order to provide a standard acceptable means of protecting fuel gas piping from damage commonly caused by string trimmers and similar lawn tools, the following method³ has been and shall continue to be an acceptable minimum installation method to provide protection if the gas piping is installed in an area frequently associated with string trimmers such as the perimeter of a house, deck, or light commercial building:

Copper tubing, corrugated stainless steel tubing (csst), and brass pipe shall be protected with a schedule 40 polyvinyl chloride (pvc) sleeve or equivalent⁴ from a point 3 inches below grade to a point 3 feet above grade. The protection shall be provided at the building, when the piping is not protected by the gas meter, gas appliance or other means, and also at the storage tank when LP gas is used. The protection will not be required for black steel and galvanized

406.4 - Question: I was turned down for using 3 psi to test the gas piping, the inspector stated he didn't have enough information to complete the inspection. Why?

Answer: Section 406.4 requires the minimum test pressure to be 1.5 times the proposed maximum working pressure, with a minimum of 3 psi. The test shall not be less than half hour for each 500 cubic feet of pipe volume, with a maximum of 24 hours. The gauge must also be able to read pressure loss at this pressure. The inspector is correct. The contractor will need to provide us with the proposed working pressure, calculate the volume of gas piping and coordinate the required time for inspections.



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As an alternate, we still accept the traditional method of 10 psi for 10 mins for less than 5 psi systems. Most customers prefer this method for the ease and time savings, but this is only an alternate method and not a requirement.

501.14 - Question: Are Category IV vents required to be at least 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

621.4 - Question: Am I allowed to install a ventless fireplace in a lobby of a car dealership?

Answer: Possibly, if the lobby is less than 10 percent of the floor area, then it would be accessory. If it is over 10 percent, it would be considered mixed occupancy and the lobby would be classified as an "Assembly". Section 621.4 NCFGC prohibits the installation of unvented room heaters in groups A, E and I.

Policy - Question: A set of gas logs were installed in a masonry fireplace, the main mechanical contractor ran the gas piping, but did not install the logs. Would a separate permit be needed for the gas logs?

Answer: Yes, this would be no different than our policy on gas inserts. A contractor's license is not required to install the gas logs, but a mechanical permit is. If the main mechanical contractor is not the one installing the logs, then a separate permit would be required from the person or company performing the installation.

Manufacture Instructions - Question: Can an appliance connector be under 2 psi and used as gas piping?



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Answer: The appliance connector would need to be rated for 2 psi, we were unable to find one rated greater than 1/2 psi. These are listed as connectors only.

Manufacture Instructions - Question: Can the vent of a Category IV appliance turn down then back up? An example, the go under a beam.

Answer: The design, sizing and installation of vents for Category IV appliances shall be in accordance with the appliance manufacturer's installation instructions