OSFM
NC DEPARTMENT OF INSURANCE

ENGINEERING
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MIKE CAUSEY, INSURANCE COMMISSIONER & STATE FIRE MARSHAL
BRIAN TAYLOR, CHIEF STATE FIRE MARSHAL

May 13, 2022

Mr. Robert L. Yarborough
Chief Building Code Official
Town of Clayton Building Inspections
111 E. Second Street
PO BOX 879
Clayton, NC 27528

RE: 2018 NC Mechanical Code
2018 NCMC 602.2.1 Materials within plenums

Mr. Yarborough:

This letter is in response to your request for formal interpretation dated May 4, 2022, that was received in NCDOI by email on May 4, 2022. Your request for formal interpretation states:

"Request Formal Interpretation of Section 602, 602.2.1 Exception #7.

Question: Is a non-habitable room located in a Group R-2 Building allowed be used as a return air plenum that contains other non-fuel fired appliances, and other materials with an open condensation receptor connected to storm drainage systems via PVC piping per #7 noted below?

602.2.1 Materials within plenums.

Except as required by Sections 602.2.1.1 through 602.2.1.7, materials within plenums shall be noncombustible or

shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of

not more than 50 when tested in accordance with ASTM E84 or UL 723.

Exceptions:

7.This section shall not apply to materials exposed within equipment rooms and furnace rooms in dwelling units.

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.

MECHANICAL EQUIPMENT/APPLIANCE ROOM. A room or space in which nonfuel-fired mechanical

equipment and appliances are located.

FURNACE ROOM. A room primarily utilized for the installation of fuel-burning, space-heating and water-heating appliances other than boilers (see also “Boiler room”).

Noted equipment and materials are shown in attached images.”

Remarks:

Code sections noted in this letter are referring to the 2018 edition of the NC Mechanical Code or the 2018 NC Plumbing Code unless otherwise noted.

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

Code Analysis:

2018 NCMC Chapter 2 Definitions states the following:

> **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.

2018 NCMC 602.1 General states the following:

> **602.1 General.** Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling equipment. Fuel-fired appliances shall not be installed within a plenum.

Comments: Mechanical equipment rooms (air handler rooms) are permitted to be used as plenums as per 2018 NCMC 602.1 General. Although a mechanical equipment room is occupiable, there is an exception for a mechanical equipment room to be used as a plenum since the room is occupiable only for maintenance.

2018 NCMC 602.2 Construction states the following:

> **602.2 Construction.** *Plenum* enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.5 of the *International Building Code* or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.
>
> The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125°F (52°C) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

Comments: This code section only applies to the building materials that enclose and create mechanical equipment room plenums. Plenums shall be constructed of non-combustible materials, or such materials of construction shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723. Plenums bounded by gypsum board

are permitted where the air temperatures do not exceed 125°F (52°C) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature.

2018 NCMC 602.2.1 Materials within plenums states the following:

> **602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.7, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.
>
> **Exceptions:**
>
> 1. Rigid and flexible ducts and connectors shall conform to Section 603.
> 2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
> 3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
> 4. This section shall not apply to smoke detectors.
> 5. Combustible materials fully enclosed within one of the following:
>   5.1. Continuous noncombustible raceways or enclosures.
>   5.2. Approved gypsum board assemblies.
>   5.3. Materials listed and labeled for installation within a plenum.
> 6. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.
> 7. This section shall not apply to materials exposed within equipment rooms and furnace rooms in dwelling units.

Comments: This code section only applies to the building systems appliances and equipment installed within mechanical equipment room plenums, which includes electrical, plumbing, mechanical, fire protection and communication system components. Building systems appliances and equipment installed within mechanical equipment room plenums shall be constructed of non-combustible materials, or such materials of construction shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723. Building systems appliances and equipment installed within mechanical equipment room plenums in dwelling units are excluded from the requirements of 2018 NCMC 602.2.1 Materials within plenums as per Exception #7, which also excludes the requirements of 2018 NCMC 602.2.1.1 through 602.2.1.7.

2018 NCPC 802.3 Waste receptors states the following:

> **802.3 Waste receptors.** Every waste receptor shall be of an *approved* type. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in concealed spaces. Waste receptors shall not be installed in plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors. Ready *access* shall be provided to waste receptors.
>
> **Exception:** Where hub drains are installed in a crawl space for condensate waste.

Comments: Waste receptors are prohibited from being installed in mechanical equipment room plenums.

Conclusions:

The gypsum board enclosed mechanical equipment room referenced in the Attachment A photos is permitted by code if the damage to the walls is repaired and if the air temperatures do not exceed 125°F (52°C) and the building and mechanical system design conditions are such that the gypsum board surface temperatures will be maintained above the airstream dew-point temperature. Since the mechanical equipment room plenum is within a dwelling unit, the building systems appliances and equipment installed within mechanical equipment room plenum are permitted and are not required to be non-combustible. The building systems appliances and equipment are still required to meet the materials requirements of the applicable NC Building Codes and NFPA 70, which in many cases those materials are either non-combustible or have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723. For the waste receptor to be code-compliant, the return shall be ducted from the furnace to the return grille in the wall. In many instances when the mechanical equipment room within a dwelling unit is used as a plenum, the condensate waste is piped to avoid having the waste receptor in the plenum space.

Please call if you have comments or questions.

Sincerely,

David B. Rittlinger, PE, LEED AP
Chief Code Consultant
NCDOI-OSFM Engineering & Codes Division

cc: File
Bridget Herring, Chair – BCC
Danny Priest, Vice-Chair – BCC, BCC Building Standing Committee

ATTACHMENT A

APPENDIX E
APPEALS
NORTH CAROLINA
BUILDING CODE COUNCIL
325 North Salisbury Street, Room 5_44
Raleigh, North Carolina 27603
(919) 647-0095

APPEAL TO NCDOI/NCBCC **Hearing Date _____ / _____ / _____**

GS 153A-374, GS 160A-434	GS 143-140, GS 143-141
Formal Interpretation by NCDOI YES	Appeal of Local Decision to NCBCC_____
Appeal of Local Decision to NCDOI_____	Appeal of NCDOI Decision to NCBCC_____

APPELLANT Robert L Yarborough **PHONE (** 919 **)** 623**-** 8649 **x** _____
REPRESENTING TOWN OF CLAYTON **ADDRESS** 111 E. Second St. P.O. Box 879

CITY Clayton **STATE** NC **ZIP** 27528
E-MAIL ryarborough@townofclaytonnc.org **FAX (** 919 **)** 553**-** 1720

North Carolina State Building Code, Volume 2018 MECHANICAL **- Section** 602.2.1 Exception # 7

REQUEST ONE: **[X] Formal Interpretation by NCDOI** **[ ] Appeal of Local Decision to NCBCC**
[ ] Appeal of Local Decision to NCDOI **[ ] Appeal of NCDOI Decision to NCBCC**

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

Please see attached provided documents and images as reference to the 2018 NCSMC Section 602.2.1 Exception #7.

Areas used as return air Plenum within a Group R-2 Building.

Question as follows: Does exception # 7 Noted under Section 602.2.1 exceptions remove the requirements of materials used within the plenum from meeting the requirements of 602.2.1.1 through 602.2.1.7 in each of the dwelling units of a Group R-2 Building?

REASON:

Exception #7 included both Equipment & Furnace room but failed to include a area used as a plenum.

Signature Robert L. Yarborough Digitally signed by Robert L. Yarborough Date: 2022.05.04 11:31:05 -04'00' **DATE:** 05/04/2022

APPEAL TO NCDOI/NCBCC
FORM 3/14/17

TOWN OF CLAYTON
Building Inspections
111 E. Second St., P.O. Box 879
Clayton, NC 27528
Phone: 919-553-5002
Fax: 919-553-1720

05/04/2022

NCDOI
Chief Mechanical Code and Fuel Gas Code Consultant
David Rittlinger, PE

RE: 200 McKenzie Ridge Dr. PN# 2021-00030020 & 202 McKenzie Ridge Dr. PN# 2021-00030021

Request Formal Interpretation of Section 602, 602.2.1 Exception #7

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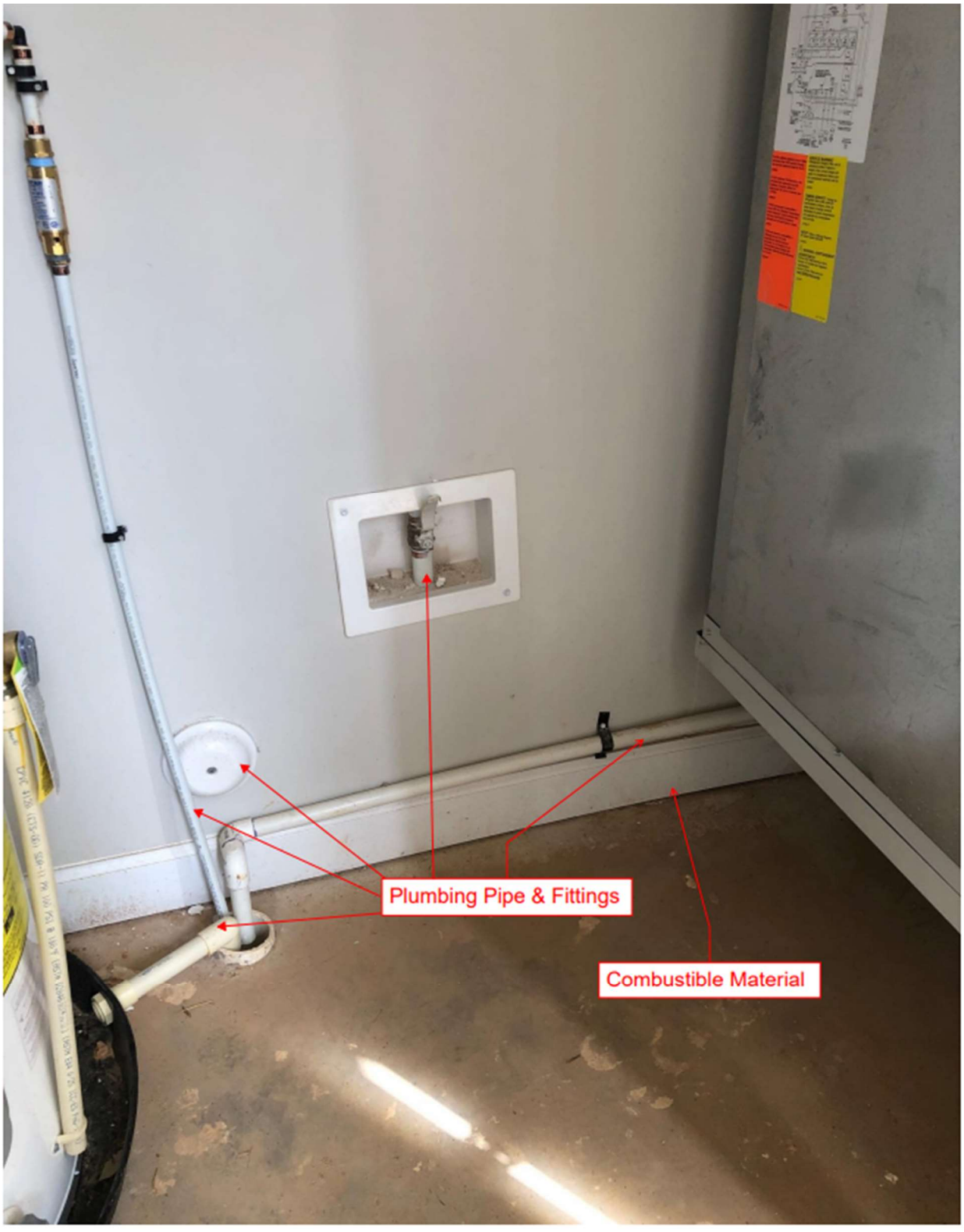
Electrical Materials
Plumbing Pipe & Fittings
Paper
American Standard
Open Receptor
Plastic Pan

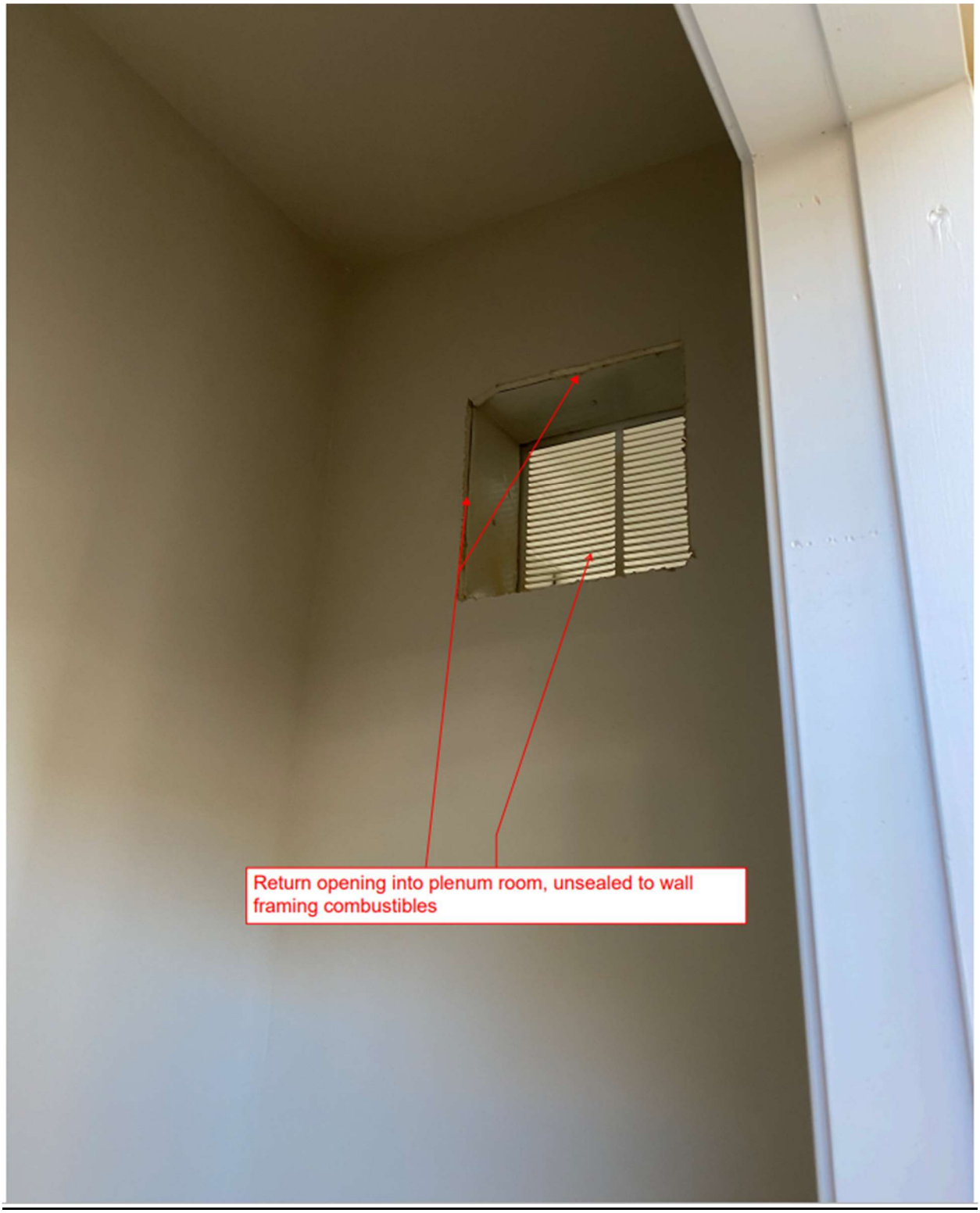

Equipment Sensors Plastic
Plastic box


Plumbing Pipe & Fittings
Combustible Material


Air Handler Return
Paper Manual


Electrical Devices
Wood Materials


Sheetrock Damage openings
Receptor Drain to Storm system


Return opening into plenum room, unsealed to wall framing combustibles