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INSPECTION CHECKLIST
Residential Mechanical Rough In
March 2006

Please verify the following before calling for inspection.

This checklist is intended for use to prepare for an inspection. This is only a general list and is not intended to address all possible conditions. References are to the 2003 International Residential Code (R = Residential, M = Mechanical, G =Gas), the 2003 Uniform Plumbing Code (UPC), the 2003 National Electrical Code (NEC), the 2003 Ventilation and Indoor Air Quality Code (VIAQ) and the 2003 Washington State Energy Code (WSEC).

Permits and Plans

- ❑ Job address is posted in a visible location. (R321.1)
- ❑ Permit and approved plans are on site and accessible to the inspector. (R105.7, R106.3.1)
- ❑ Permit information is correct (address, permit number, scope of work, etc). (R105.3)

Forced-Air Furnace

General

- ❑ Fuel burning appliances not installed in bedroom, bathroom or closet except as allowed by exceptions. (G2406.2)
- ❑ Heat producing equipment installed in order to maintain clearances to combustibles. (M1306.1)
- ❑ Furnace room passageway minimum 24" wide. (M1305.1.2)
- ❑ Work space 30" deep to height of unit or minimum 30". (M1305.1.2)
- ❑ Total space is 12" wider than furnace. See exception. (M1305.1.1)
- ❑ A minimum of 6" required clearance to closed door from front of combustion chamber. (M1305.1.1)
- ❑ Electrical receptacle required at or near the appliance. (M1305.1.3.1)
- ❑ Means of disconnect required within sight of appliance. (NEC 424.19)
- ❑ Switch controlled lighting provided for servicing of equipment. (M1305.1.1)
- ❑ Refer to section M1409 for the installation of a wall furnace.

Underfloor

- ❑ Access opening to equipment and passageway in underfloor areas is large enough to remove the largest piece of equipment, but not less than 30" x 22". (M1305.1.4)
- ❑ Access door is no more than 20' to equipment. (M1305.1.1)
- ❑ Light switch located at access entrance to underfloor equipment. (M1305.1.4.3)
- ❑ When a furnace is installed in a underfloor area it is suspended a minimum of 6" above grade or installed on a slab extending above adjoining grade. (M1305.1.4.1)
- ❑ When equipment is installed on wood platforms the framing and sheathing is pressure treated when installed within 18" of soil. (R319)
- ❑ Excavations for equipment extends 6" below the appliance and 30" out on the control side and 12" out on all other sides. (M1305.1.4.2)

Attic

- ❑ Access opening and passageway to equipment in attic areas large enough to remove largest piece of equipment, but no less than 30" x 22". (M1305.1.3)
- ❑ Maximum 20' from access to equipment. (M1305.1.3)
- ❑ Continuous solid floor from access door to equipment, minimum 24" wide. (M1305.1.3)
- ❑ Minimum 30" deep platform in front of service side of equipment except where serviceable directly from the access. (M1305.1.3)

Garage

- ❑ Equipment which has a flame, generates a spark or uses a glowing ignition source is open to the space in which it is installed and is elevated such that the source of ignition is at least 18" above the floor. (M1307.3)

- ❑ Ducts which penetrate a wall or ceiling separating the garage from the dwelling are 26 gage with no openings to the garage. (R309.1.1)
- ❑ Bollard or wheel stop required if subject to impact by automobile. (M1307.3.1)

Condensing Furnace (High Efficiency)

- ❑ Condensate drain required to drain by gravity to an approved drain or condensate pump. (G2427.9 & UPC 815)
- ❑ Drain pipe minimum 3/4" with 1/8"/ft. slope. (Per manufacturer's installation instructions)
- ❑ May drain to indirect receptor (lav tailpiece, tub over flow, etc.). (Per manufacturer's installation instructions)

Ducting

General

- ❑ Two story maximum vertical rise on factory made duct. (M1601.2)
- ❑ Duct to ground minimum 4" clearance. (M1601.3.6)
- ❑ Duct in or under concrete, encased in a minimum 2" of concrete. (M1601.1.2)
- ❑ Round ducts have crimped joints lapped minimum 1½" and fastened with (3) sheet-metal screws or rivets equally spaced around the joint. (M1601.3.1)
- ❑ Joints, seams, and fittings of ducts sealed with tapes, mastic or other approved means. (UL-181 tape). (M1601.3.1 & WSEC 503.10.2)
- ❑ Ducting (including enclosed stud bays or joist cavities used to transport air), installed outside the conditioned space have all seams and joints, both longitudinal and transverse, sealed. (M1601.3.1 & WSEC 503.10.2)
- ❑ Flex duct supported per manufacturer's specifications. (M1601.3.2)
- ❑ Metal duct minimum support every 10'. (M1601.3.2)

Return Air

- ❑ Return air taken from a room or space ≥25% of the total volume served. (M1602.2)
- ❑ Can't be taken from bathroom, kitchen, toilet room, mechanical room, closet, furnace room, other dwelling unit, or garage. (M1602.2)
- ❑ Source ≥ 10' from combustion chamber or fireplace. (M1602.2)
- ❑ Duct minimum size 2 sq.in./kBtu output rating. (M2442.2)

Insulation

- ❑ Insulate ducts, boots and connectors used for heating or cooling to R-8 in unconditioned spaces. R-5 in slabs or in ground. (WSEC Tbl. 5-11)
- ❑ Ducting installed in cold walls insulated to R-8. (WSEC Tbl. 5-11)
- ❑ Exhaust ventilation ducting insulated to R-4. (VIAQ 303.3.4)

Combustion Air

- ❑ The minimum duct cross section dimension is 3". (M1703.2.1 for oil and G2407.6 for gas)
- ❑ No dampers in combustion air ducts. (M1701.3)
- ❑ Sources of combustion air ≥ 10' from return air. (M1602)
- ❑ Joist and/or stud space ducting ok only if a maximum of one fire stop is removed. (G2407.11)
- ❑ Openings screened (except in attic) with 1/4" mesh. (M1703.5)
- ❑ Opening sleeved to 6" above ceiling joists and insulation. (M1703.3 & G2407.11)
- ❑ Combustion air obtained from outside of the building when the building is of unusually tight construction. (M1701.1.1) (Typically homes built after 1986)
    1. Minimum of 100 sq.in. per opening of combustion air is required.
    2. One opening in upper 12" and one opening in lower 12" of room.
- ❑ Combustion air obtained from outside of the building, when the building is of ordinary construction (homes built prior to 1986) and the area of the room is less than 50 cubic feet per 1000 Btu/h of aggregate input rating of appliances. (M1702.1) See also Construction Tip Sheet 7, Water Heaters.

1. Minimum of 100 sq.in. per opening of combustion air is required.
2. One opening in upper 12" and one opening in lower 12" of room. (UMC 702.1, see exception)
3. Where vertical ducts are used each opening requires 1square inch per 4,000 Btu/h of total input rating of all appliances in the space. (M1703.2.1)
4. Where horizontal ducts are used each opening requires 1 square inch per 2,000 Btu/h or total input rating of all appliances in the space. (M1703.2.1)
5. When the one opening method is used. 12" from top of enclosure 1:3000 Btu/h or total input rating al all appliances in the space. (G2407.6)

- ❑ Only the lower of the two combustion air openings can be connected to an underfloor area. (M 1703.4)
- ❑ Foundation vents supplying underfloor area minimum 2x required combustion air openings. (M1703.4)
- ❑ Crawlspace must meet minimum International Residential Code clearance of 18" from soils to bottom of joists. (R319)
- ❑ When combustion air is obtained from the attic the attic must be sufficiently vented. (M1703.3)
- ❑ Combustion air openings of correct size. (M1701.5)

Vents and Connectors

- ❑ Where two gas appliances are vented through a common vent connector it is equal to largest connector plus 50% of the smaller flue outlet. (G2427.10.3.4)
- ❑ B vents less than 12" in diameter, terminate 2' above any vertical surfaces within 8'. (G2427.6.5 #1)
- ❑ B vents with vent caps 12" in size or smaller shall terminate a minimum of 12" from roofs when 6/12 or flatter. See Tbl. 8-A for other. (G2427.6.5)
- ❑ Vent clearances to combustibles per manufacturer's listing or performance standards. (M1803.3.4, M1306.2, G2427.7.7)
- ❑ Single wall vents cannot penetrate a wall, floor or ceiling without a listed pass through assembly. (M1803.3.1, G2427.7.4)
- ❑ Vent terminations installed per the manufacturer's listing. (M1804.2.1)
- ❑ Venting systems terminate not less than 4' below or 4' horizontally from, and not less than 1' above a door, an operable window or a gravity air inlet into a building, nor less than 3' above any forced air intake within 10', nor within 12" of grade. (M1804.2.6 & G2427.8)
- ❑ Vent terminal not mounted directly above or within 3' horizontally of a gas meter or oil tank. (M1804.2.6)
- ❑ Vent terminal no closer than 3' to an interior corner formed by (2) perpendicular walls. (M1804.2.6)
- ❑ Power exhaust terminals not located within 10' of property line and adjacent buildings. (M1804.2.6)
- ❑ Where vents extending into an attic pass through insulated assemblies, an insulation shield of 26 gage sleeve not less than 2 inches above the insulation, secured in place and maintain required clearances to combustibles. (G2426.4)
- ❑ Venting supported per manufacturer's listing. (M1803.3 & G2427.5.7)
- ❑ Vent connector joints are fastened with sheet metal screws or rivets. (M1803.3)
- ❑ Vent and chimney connectors installed within the same space that the appliance is located. (M1803.3)

Appliances

Clothes Dryer

- ❑ Install appliances per manufacturer's instructions. (M1307.1 & G2408.1)
- ❑ Clothes dryer exhaust ducts of metal with smooth interior surfaces. (M1501.1 & G2439.5)
- ❑ Connector not concealed in construction. (M1501.1 & G2439.5)
- ❑ No screws used to attach connector to duct. (M1501.1 & G2439.3)
- ❑ Duct connector 4" minimum or appliance outlet size. (G2439.5)
- ❑ Exhaust duct doesn't exceed 25'. Deduct 2.5' for each 45-degree elbow and 5' for each 90-degree bend. (See also manufacturer's installation instructions when make and model of dryer are known at rough in.) (M1501.3 & G2439.5.1)
- ❑ Clothes dryer ducting run independently of other ducted systems. (M1501.1 & G2439.3)
- ❑ Exterior termination is backdraft damper with no screens. (M1501.1 & G2439.3)
- ❑ Dryer duct connector maximum 8' long. (G2439.5)
- ❑ Gas dryer gas connectors maximum 6' long. (G2422.1.2)

- ❑ Gas connectors are not concealed within, or extend through walls, floors, partitions, ceilings or appliance housing. (G2422.1.2)
- ❑ Gas valve installed immediately ahead of connector. (G2422.1.2)

Range
- ❑ Vertical clearance to combustibles is 30" minimum or per manufacturer's listing. (M1901.1)
- ❑ Gas connector maximum 6' long. (G2422.1.2)
- ❑ Gas valve installed immediately ahead of connector. (G2422.1.2)

Range Hood Duct
- ❑ Terminates outside, is air tight and is equipped with a backdraft damper. (M1502.1)
- ❑ Ducting is galvanized steel, stainless steel, or copper, with a smooth interior. (M1502.1)

Fireplace
- ❑ Penetrations sealed with listed materials. (G2432.1)
- ❑ Factory built chimney requires spark arrester. (M1002.1)
- ❑ When retrofitting gas units in masonry fireplaces, dampers are blocked open per approved methods. (M2433.1)
- ❑ An accessible shutoff valve is installed ahead of the union, within 6' of appliance, and in the same room. (G2420.5)
- ❑ Shutoff valve may be located inside the control compartment. (G2420.5)

Air-Conditioning
- ❑ Evaporator installed downstream from furnace. (M1411.2)
- ❑ Working space minimum 30" x 30". (M1305)
- ❑ Condensate line doesn't drain to public way. (M1411.3)
- ❑ Condensate drain minimum 3/4" and sloped to drain termination without sags. (M1411.3.1 & UPC 815)
- ❑ May drain to indirect receptor (sink tailpiece, tub overflow). (M1411.3)

Exhaust Venting

- ❑ Source specific ventilation fans are required in kitchens, bathrooms, water closet rooms, laundry rooms and indoor swimming pools or spas. (VIAQ 302.2.1)
- ❑ Bathroom fans 50 cfm. (VIAQ Tbl 3-1)
- ❑ Kitchen fans 100 cfm. (VIAQ Tbl 3-1)
- ❑ Insulate exhaust vent ducts with R-4 in unconditioned spaces such as attics and crawlspaces. (VIAQ 302.2.3)

Whole house ventilation systems

Intermittent Whole House ventilation using Exhaust Fans (VIAQ 303.4.1)
- ❑ Whole house fan located $\leq$ 4' from the interior grille have a sone rating on fan 1.5 or less.
- ❑ Accessible 24 hr timer, set to operated 8 hours /day and tied to exhaust fan.
- ❑ Label affixed to controls: "Whole House Ventilation. (See operating instructions)".
- ❑ Outdoor air inlets not less than 4 sq.in. in each habitable room.
- ❑ Doors undercut minimum 1/2" where separated from exhaust source.
  Exception: Exhaust only ventilation systems do not require outdoor air inlets if the home has a ducted forced air heating system that communicates with all habitable rooms and the interior doors are undercut to a minimum of 1/2" above finish floor covering.

Whole House Ventilation Integrated with Forced Air System (VIAQ 303.4.2)
- ❑ Screened outdoor air inlet to return air plenum with motorized damper.
- ❑ Outdoor air inlet duct connection to the return air stream located upstream of the forced-air blower.
- ❑ Accessible 24 hour timer, set to operated 8 hours /day and tied in to furnace blower and motorized damper.
- ❑ Label affixed to control: "Whole House Ventilation (See operating instructions)".

Intermittent Whole House Ventilation Using Supply Fan (VIAQ 303.4.3)

- ❑ Uses inline supply fan.
- ❑ Outdoor air must be filtered before it is delivered to habitable rooms.
- ❑ Outdoor inlet located downstream of blower when connected to the supply side.
- ❑ Outdoor inlet minimum 4' upstream when connected to the return side.
- ❑ Accessible 24 hour timer, set to operated 8 hours /day and tied in to the inline supply fan.
- ❑ Label affixed to control: "Whole House Ventilation (See operating instructions)".

Whole House Ventilation Using a Heat Recovery Ventilation System (VIAQ 303.4.4)

- ❑ All ducts must be minimum 6" diameter.
- ❑ Balancing dampers are installed on the inlet and exhaust side.
- ❑ Supply ducts in conditioned space upstream of the heat exchanger insulated to minimum R4.
- ❑ Accessible 24 hour timer, set to operated 8 hours /day and tied in to the inline supply fan.
- ❑ Label affixed to control: "Whole House Ventilation (See operating Instruction)".

Outdoor Air Inlets

- ❑ Inlets are screened.
- ❑ Inlets located so as not to draw air from any of the following locations:
    a) Within 10' of an appliance vent outlet, unless such vent outlet is 3' above the outdoor air inlet.
    b) Where it will pick up objectionable odors, fumes or flammable vapors.
    c) A hazardous or unsanitary location.
    d) A room or space having any fuel burning appliances therein.
    e) Within 10' of a vent opening for a plumbing drainage system unless the vent opening is at least 3' above the air inlet.
    f) Attic, crawl spaces or garages.