



Residential Energy Additional Measure Selection – 2021 ORSC

City of Medford
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RESIDENTIAL INFORMATION

Date: _____ Permit Number: _____

Applicant's Name: _____ Signature: _____

Job Address: _____ City: _____ State: _____ Zip: _____

INSTRUCTIONS

Please select type of construction below; sign, date, and complete the entire form. Submit this form with your permit application or your project will be placed on hold until the required information is provided.

- New construction.** All conditioned spaces within residential buildings must comply with Table N1101.1(1) and one additional measure from Table N1101.1(2) on page 2.
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- Additions.** Additions to existing buildings or structures may be made without making the entire building or structure comply if the new additions comply with the requirements of this chapter. (N1101.3)
- Large additions.** Additions that are equal to 600 square feet (55 m²) in area must comply with Table N1101.1(2) on page 2. (N1101.3.1) *(Note: You must select one measure.)*
- Small additions.** Additions that are less than 600 square feet in area must select one measure from Table N1101.1(2) on page 2 or comply with Table N1101.3 on page 2. (N1101.3.2)
- Exception:** Additions that are less than 225 square feet in area are not required to comply with Table N1101.1(2) or Table N1101.3.

**TABLE N1101.2
EXISTING BUILDING COMPONENT REQUIREMENTS**

BUILDING COMPONENT	REQUIRED PERFORMANCE	EQUIVALENT VALUE
Wall insulation	U-0.083	R-15
Flat ceiling	U-0.025	R-49
Vaulted ceiling > 10 inches nominal rafter depth	U-0.040	R-25
Vaulted ceiling > 8 inches nominal rafter depth	U-0.047	R-21
Underfloor > 10 inches nominal joist depth	U-0.028	R-30
Underfloor > 8 inches nominal joist depth	U-0.039	R-25
Slab-edge perimeter	F-0.52	R-15
Windows	U-0.30	U-0.30
Skylights	U-0.50	U-0.50
Exterior doors	U-0.20	R-5
Exterior doors with > 2.5ft ² glazing	U-0.40	R-2.5
Forced air ducts	n/a	R-8

For SI: inch-25.4mm, 1 square foot = 0.0929m²

***Note:** N1101.2.3 change of occupancy or use. Definition of "Change of use" for purposes of Section N1101.2.3 is a change of use in an existing residential building and shall include any of the following: any unconditioned spaces such as an attached garage, basement, porch, or canopy that are to become conditioned spaces; any unconditioned, inhabitable space that is to become conditioned space, such as a large attic.*

N1101.2.3.1 Change of use. See section N1101.2.3.2 Change of occupancy. See section.

TABLE N1101.3 – SMALL ADDITION ADDITIONAL MEASURES (SELECT ONE)

<input type="checkbox"/>	1	Increase the ceiling insulation of the existing portion of the home as specified in Table N1101.2.
<input type="checkbox"/>	2	Replace all existing single-pane wood or aluminum windows to be U-value as specified in Table N1101.2.
<input type="checkbox"/>	3	Insulate the existing floor, crawl space or basement wall systems as specified in Table N1101.2 and install 100 percent of permanently installed lighting fixtures as CFL, LED or linear fluorescent, or a minimum efficacy of 40 lumens per watt as specified in Section N1107.2.
<input type="checkbox"/>	4	Test the entire dwelling with blower door and exhibit no more than 4.5 air changes per hour @ 50 Pascals.
<input type="checkbox"/>	5	Seal and performance test the duct system.
<input type="checkbox"/>	6	Replace existing 80 percent AFUE or less gas furnace with a 92 percent AFUE or greater system.
<input type="checkbox"/>	7	Replace existing electric radiant space heaters with a ductless mini-split system with a minimum HSPF of 10.0.
<input type="checkbox"/>	8	Replace existing electric forced air furnace with an air source heat pump with a minimum HSPF of 9.5.
<input type="checkbox"/>	9	Replace existing water heater with a water heater meeting: <ul style="list-style-type: none"> • Natural gas/propane water heater with minimum UEF 0.90, or • Electric heat pump water heater with minimum 2.0 COP

TABLE N1101.1(2) ADDITIONAL MEASURES

1	HIGH EFFICIENCY HVAC SYSTEM a. Gas-fired furnace or boiler AFUE 94%, or b. Air source heat pump HSPF 10.0/14.0 SEER cooling, or c. Ground source heat pump COP 3.5 or Energy Star rated
2	HIGH EFFICIENCY WATER HEATING SYSTEM a. Natural gas/propane water heater with minimum UEF 0.90, or b. Electric heat pump water heater with minimum 2.0 COP, or c. Natural gas/propane tankless/instantaneous heater with minimum 0.80 UEF and Drain Water Heat Recovery Unit installed on minimum of one shower/tub-shower
3	WALL INSULATION UPGRADE Exterior walls – U-0.045/R-21 conventional framing with R-5.0 continuous insulation
4	ADVANCED ENVELOPE Windows - U-0.21 (Area weighted average), and Flat ceiling – U-0.017/R-60, and Framed floors - U-0.026/R-38 or slab edge insulation to F-0.48 or less (R-10 for 48"; R-15 for 36" or R-5 fully insulated slab)
5	DUCTLESS HEAT PUMP For dwelling units with all-electric heat provide: <ul style="list-style-type: none"> • Ductless heat pump of minimum HSPF 10 in primary zone replaces zonal electric heat • Programmable thermostat for all heaters in bedrooms
6	HIGH EFFICIENCY THERMAL ENVELOPE UA Proposed UA is 8 percent lower than the code UA
7	GLAZING AREA Glazing area, measured as the total of framed openings is less than 12 percent of conditioned floor area
8	3 ACH AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION Achieve a maximum of 3.0 ACH50 whole-house air leakage when third-party tested and provide a whole-house ventilation system including heat recovery with a minimum sensible heat recovery efficiency of not less than 66 percent

Choose one of the following methods to meet the Mechanical Whole-House Ventilation System requirements (see BCD technical bulletin)

<input type="checkbox"/>	Supply and exhaust fans providing continuously-operating, balanced, WHV without a furnace.
<input type="checkbox"/>	Supply and exhaust fans providing continuously-operating, balanced, WHV with a furnace.
<input type="checkbox"/>	Central Fan Integrated Supply (CFIs) continuously-operating, balanced WHV. Furnace serves as the intake fan. Shall be interlocked with exhaust system and an override switch.
<input type="checkbox"/>	Heat recovery/energy recovery ventilation providing continuously-operating, balanced, WHV. Supply may be connected to the central furnace return air.
<input type="checkbox"/>	Other approved method detailed on the construction documents. Reference page number _____.

BALANCED MECHANICAL WHOLE-HOUSE VENTILATION STRATEGIES OREGON RESIDENTIAL SPECIALTY CODE

On April 1, 2021, the 2021 Oregon Residential Specialty Code (ORSC) became effective, introducing new requirements for continuously-operating, balanced mechanical whole-house ventilation (WHV) in Section R303.4 and revised other requirements. This document highlights the intent of the 2021 ORSC when installing mechanical ventilation and provides compliance examples. Use of a furnace fan for ventilation was permitted under the 2017 ORSC and is not prohibited under 2021 ORSC.

SECTION M1505.4— MECHANICAL WHOLE-HOUSE VENTILATION SYSTEM (WHV)

Section M1505.4 of the 2021 ORSC requires that the WHV system provide balanced ventilation. Local exhaust or supply fans are permitted to serve as part of such a system. Outdoor air ventilation provided by a supply fan ducted to the return side of an air handler shall be considered as providing supply ventilation for the balanced system. A furnace fan for ventilation is not prohibited under the 2021 ORSC.

The WHV system shall be provided with controls that enable manual override. The continuous ventilation rate shall be determined in accordance with Table M1505.4.3(1) or the equation: ventilation rate in cubic feet per minute = $(0.01 \times \text{total square foot area of house}) + [7.5 \times (\text{number of bedrooms} + 1)]$.

There is an exception which allows the WHV to operate intermittently where the system has controls that enable operation for not less than 25% of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2). Reducing operation time requires an increase in the ventilation rate.

**TABLE M1505.4.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS**

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m², 1 cubic foot per minute = 0.0004719 m³/s.

**TABLE M1505.4.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{a, b}**

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor ^a	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

b. Extrapolation beyond the table is prohibited.

BALANCED VENTILATION SYSTEMS

Balanced ventilation systems are a combination of exhaust and supply methods providing approximately equal (within a 10% margin) indoor exhaust and outdoor supply air flow. Outside air should be taken from a known fresh air location then filtered and tempered before delivery to the conditioned space. Balanced ventilation should not affect the pressure of the interior space relative to outdoors.

A typical balanced ventilation system is designed to supply fresh air to bedrooms and living rooms where occupants spend the most time. It then exhausts air from rooms where moisture and pollutants are most often generated such as the kitchen, bathrooms, and/or the laundry room. A balanced system may, or may not, include a heat recovery ventilator (HRV) or an energy recovery ventilator (ERV).

EXAMPLE SECTION FIGURES

These figures provide examples of compliant WHV systems, but not all possible examples, relative to what is intended and what is not allowed by the ORSC.

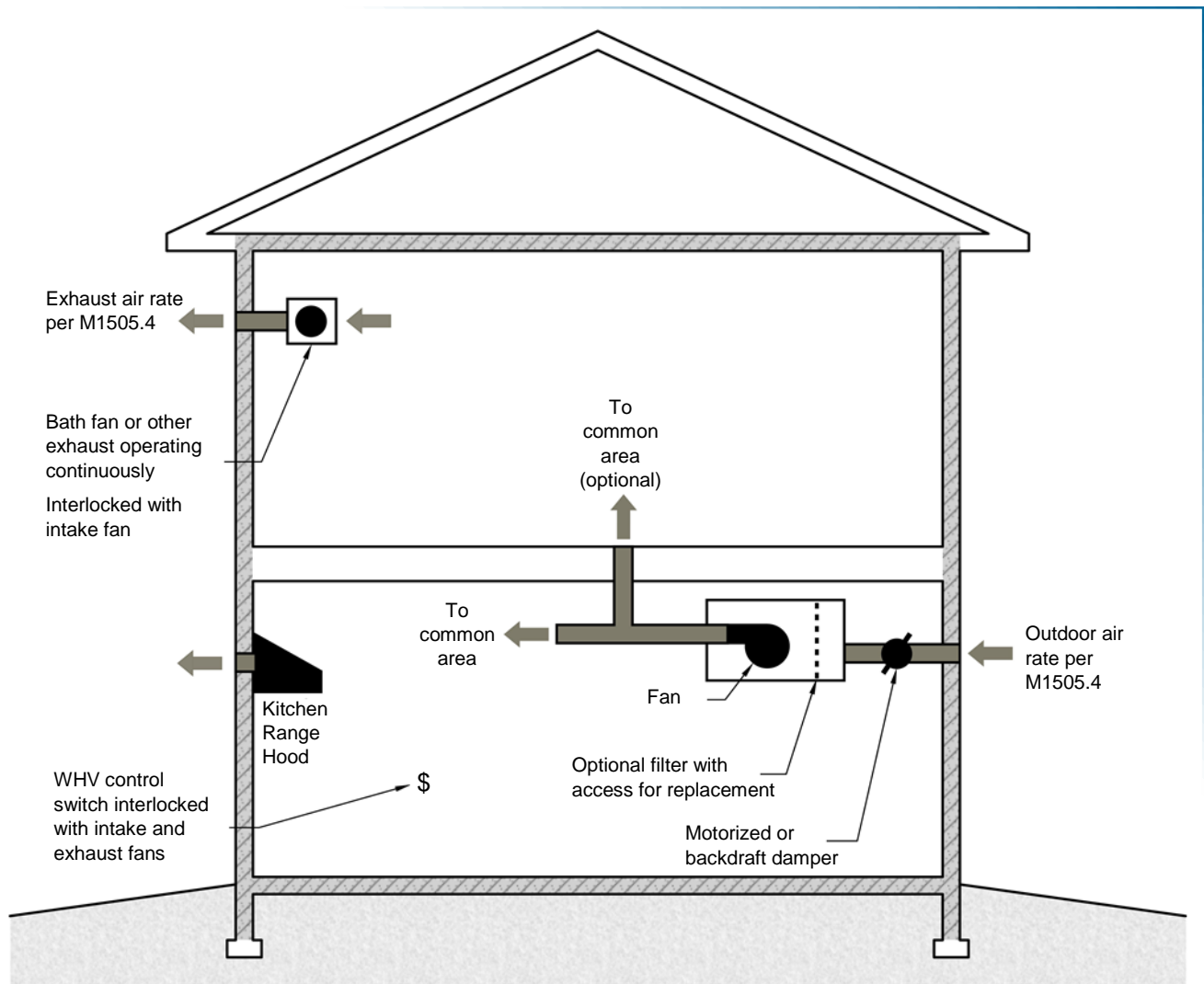


FIGURE 1.

Minimum compliance:

Supply and exhaust fans providing continuously-operating, balanced, WHV *without* a furnace.

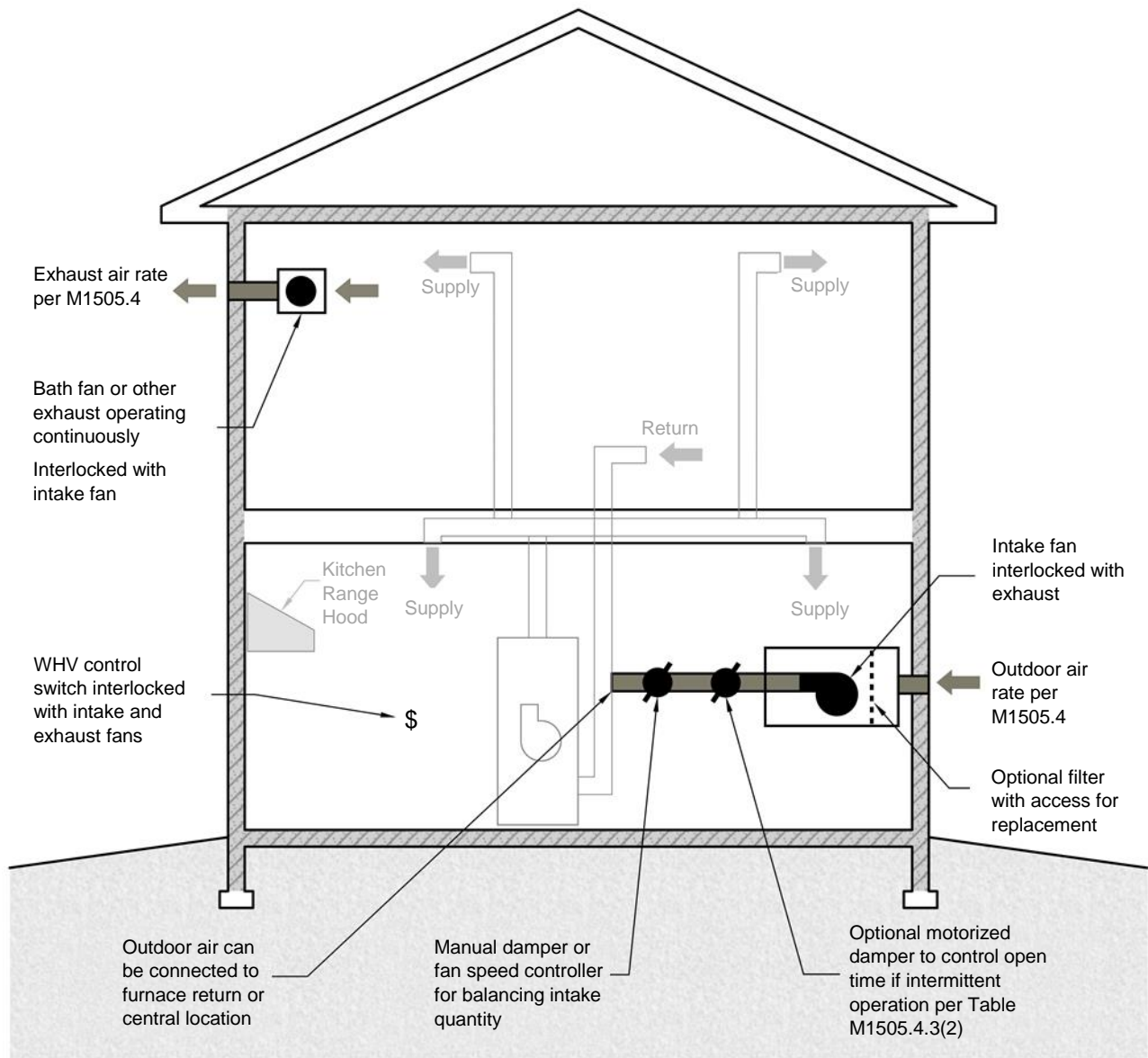


FIGURE 2. Supply and exhaust fans providing continuously-operating, balanced, WHV *with* furnace.

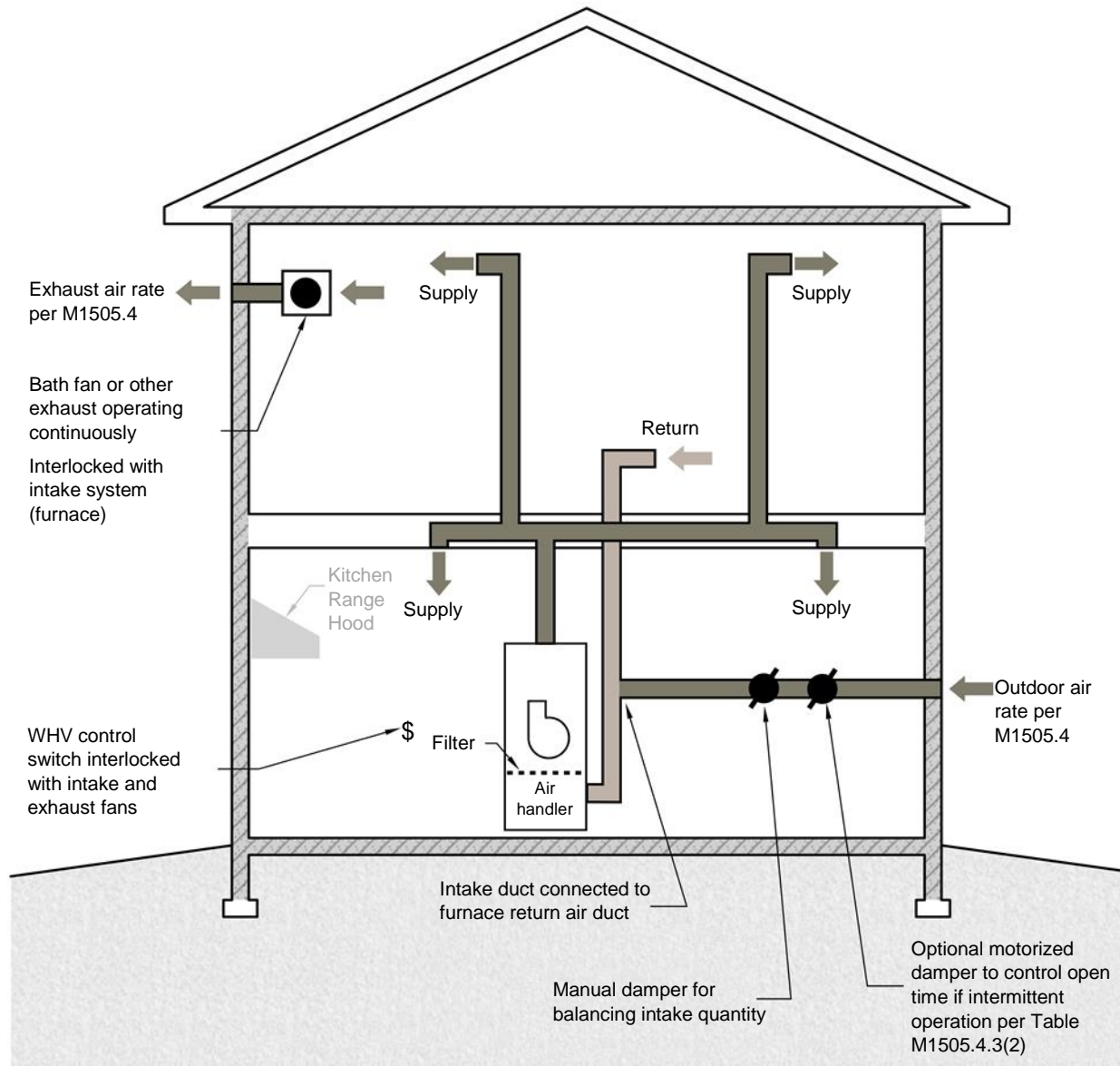
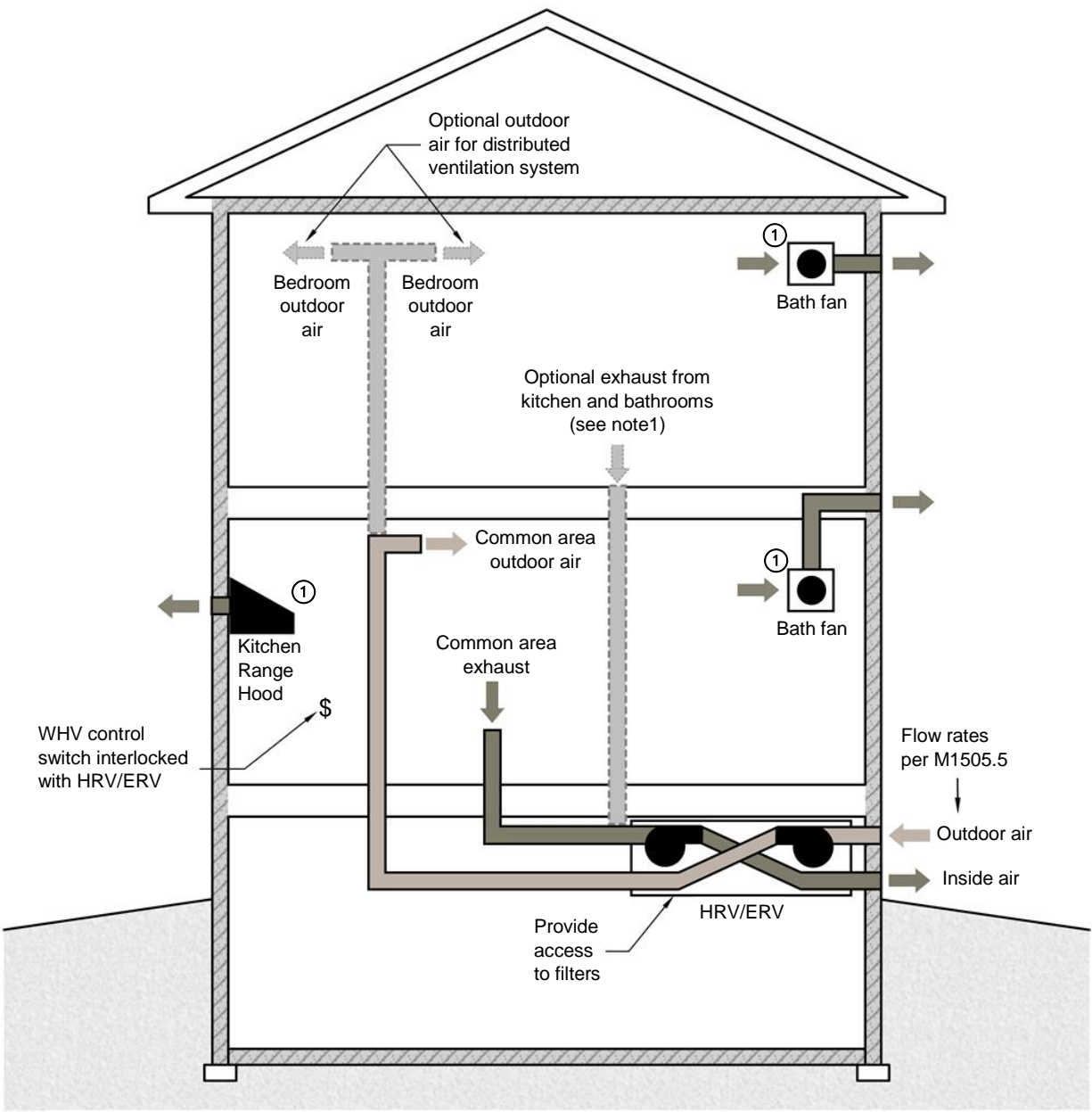


FIGURE 3.

Central Fan Integrated Supply (CFIS) continuously-operating, balanced WHV. Furnace serves as the intake fan. Shall be interlocked with the exhaust system AND an override switch.



① ERV/HRV exhaust may serve bath or kitchen in lieu of local intermittent fan per M1505.5 and M1503.3, Exception

FIGURE 4. Heat Recovery/Energy Recovery Ventilation (HRV/ERV) providing continuously-operating, balanced, WHV. Supply may be connected to the central furnace return air.

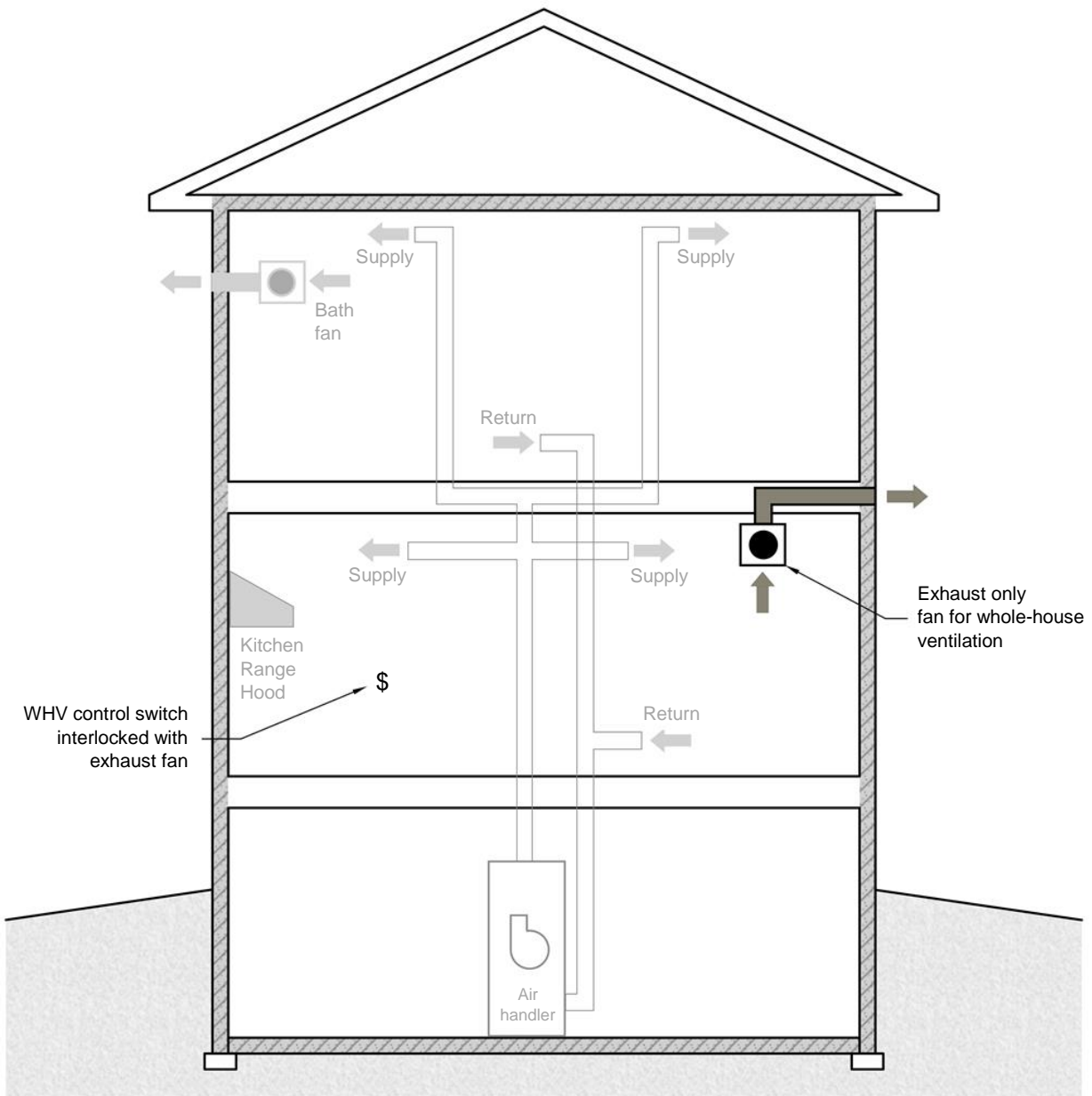


FIGURE 5.
Unacceptable ventilation configuration: Single-point exhaust only ventilation (without balanced intake).

CONCLUSION

There are many ways to provide a balanced mechanical WHV system in accordance with the 2021 ORSC. There are also many ways to improperly ventilate a home. The section drawings above provide common examples, but not all possible examples, relative to what is intended by the ORSC.

As with all site-specific matters, it is recommended to begin development discussions early in the initial planning stages. This technical bulletin also reminds the end user that local building officials retain broad local flexibility and discretionary authority.