

# Retrofit conditions potentially complicating air-sealing and exterior insulation

A brief street-view survey of residential housing in  
Portland, Oregon (Glenfair, Glendoveer, Rockwood nhds)

20 April 2021

Graham S. Wright

# Text

- It looks like I will be pivoting to work on retrofit for a while. This is in connection with the Advanced Building Construction Initiative of the U.S. Dept of Energy ([buildings.energy.gov/abc](https://buildings.energy.gov/abc)). Rocky Mountain Institute was funded to set up a Collaborative ([advancedbuildingconstruction.org](https://advancedbuildingconstruction.org)) and PHIUS is a member. The vision shared at the recent summit is to figure out how to decarbonize ALL THE BUILDINGS by 2050. A study of the building typologies is underway, led by NREL. It is already clear that single-family detached houses are the vast majority of buildings by number, and they also dominate the aggregated “thermal loads” of heating, cooling, and hot water that comprise most of the energy/emissions savings opportunity.
- The NREL data set though does not have all the building properties that one would need to identify the technical barriers to deep energy retrofits. There is general awareness on the ABC team that the U.S. housing stock is very diverse and that this is a challenge to the concept of industrialized retrofit. So to get a better sense of this I spend a couple of hours looking at houses within walking distance of where I live in east Portland. I looked for conditions that would complicate an exterior panelized envelope insulation retrofit, or that would complicate air-sealing. I looked at 33 houses and noted 30 separate conditions. These are assigned four-letter codes as shown in the Table below. Some were much more common than others, such as attached garages, and some were so universal I did not even list them, such as gutters/downspouts.
- My takeaway from this excursion was that the number of conditions that one would need to have a plan for is large but not endless. There are obviously some missing, such as balconies and widow’s walks. It’s not a large sample and I could only see one or two sides of the houses from the sidewalk.
- Please send photos of houses near you, annotated if you can with the condition codes in the Table or other conditions not listed, that also seem troublesome from the point of view of exterior retrofit and air-sealing.

# Legend, conditions noticed

- ACOD – air conditioner outdoor unit
- AGAR – attached garage
- CATV – cable tv line
- DISH – satellite dish
- DRYV – dryer vent
- E@RF – electrical mast through the roof
- EMTR – electrical meter
- EOUT – electrical outlet
- FENC – adjacent fence
- FCHM – fireplace chimney
- GCHM – gas appliance chimney
- GMTR – gas meter
- HOSE – hose bib / reel
- MLCA – mature landscaping close aboard
- MSXT – masonry extension from wall
- OV@R – overhang attached at roof
- OV@W – overhang attached at wall
- PBVT – roof plumbing vent
- PBCO – plumbing cleanout
- RFVT – roof vent
- SKLT – skylight / sun tunnel
- SOFF – overhang with soffit
- STOV – wood/pellet stove chimney
- TCOM – telecom or mystery wall box
- THIC – change in cladding thickness
- TITE – can't add wall thickness
- WART – wall art
- WBOX – window box
- WING – wing or fin wall
- XTLT – exterior light fixture



XTLT

?

XTLT

WBOX



WBOX

GMTR



TITE

DRYV



+CATV?



EMTR



TUOM



ACOD?

GMTR



FENC







FLIM

over

OVER

MLCA

TITE

REAL ESTATE SIGN





DISH

EQ RF

16829

MLCA

TITE

MLCA

PB?

MSXT

EQ-S26511





OVER



WING



← ov@w







?



TITE  
EMTR



TCOM  
?









FCHM

WAQT

TITE

MSXT





RENT

DISH

GCHM

FENC

THIC

FENC

MLCA





TITE

FENCE

F  
C  
H  
M

ACOD





TITE

730

MLCA





FC RM

RFVT

FENC

Portland  
Compost





TITE

6CHM

TITE

AGAR

TITE  
ROSE

640





GCHM  
OV w/ soft

PBVT  
FCHM

TITE

AGAR

APT 1352





FENC



TITE



AGAR





FCHM

MLCA



FLAM →

XTLT ↓

TITE ↓







?

E@RF

15015

T@OM

TITE

EMTR

AGAR

DRY V?

MSXT?





REVT

SILT

EACH

HOSE

OV w/  
soffit



STOV

FCAM

SKLT

FENC

AGAN OVER

TITE

?







FCAM

MSX7



DRF

←  
FCHM

15313

↙ THIC

AGAR

TITE  
ENTR  
GMTR





XTLT

TH1C

MSXT





FCAM

MZCA



329



TITE



XTLT

AGAR





E@RF



↓ OVER

XTLT →

FENC



236B

← XTLT

TITE

EOUT →

HOSE? ↓







215

TITE





XTLT

EORF

TITE

202

AGAR

XTLT





EQRF

OVQR

FENC

TUM

EMTR

LUTHM





PBVT

FCHM

DISH

FENC

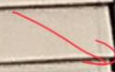
TCOM





1  
5  
6  
1  
4

THIC





EQRF

K ECHM

WISH  
ECHM

XTLT

AGAR







FCIM

GCHM

SICLT

ZORK

30

WELCOME

AGAR

XTL

TITE

TCOM

939-541





FENCE

ENTR

PROVA

TCOM

GIRTH DRAIN

DRAIN





ROOF SCAM

DISH

DBVT

FENC

NO TRESPASSING  
BEWARE OF THE DOG





12/1

OVER

MLCA

OVER

Thainada,

