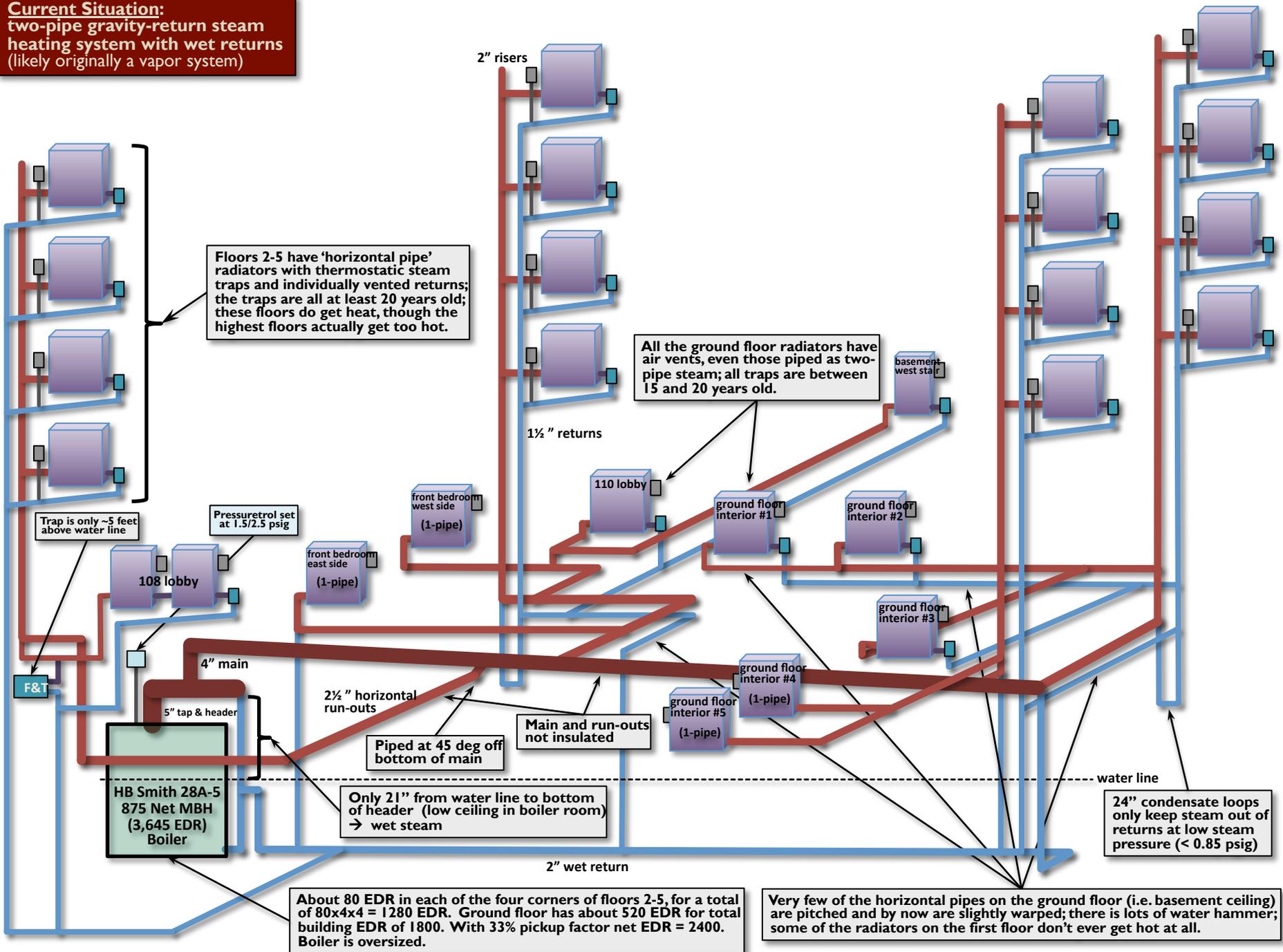


Current Situation:
 two-pipe gravity-return steam
 heating system with wet returns
 (likely originally a vapor system)



Floors 2-5 have 'horizontal pipe' radiators with thermostatic steam traps and individually vented returns; the traps are all at least 20 years old; these floors do get heat, though the highest floors actually get too hot.

All the ground floor radiators have air vents, even those piped as two-pipe steam; all traps are between 15 and 20 years old.

Trap is only ~5 feet above water line

Pressuretrol set at 1.5/2.5 psig

HB Smith 28A-5
 875 Net MBH
 (3,645 EDR)
 Boiler

Only 21" from water line to bottom of header (low ceiling in boiler room) → wet steam

24" condensate loops only keep steam out of returns at low steam pressure (< 0.85 psig)

About 80 EDR in each of the four corners of floors 2-5, for a total of $80 \times 4 \times 4 = 1280$ EDR. Ground floor has about 520 EDR for total building EDR of 1800. With 33% pickup factor net EDR = 2400. Boiler is oversized.

Very few of the horizontal pipes on the ground floor (i.e. basement ceiling) are pitched and by now are slightly warped; there is lots of water hammer; some of the radiators on the first floor don't ever get hot at all.

Piped at 45 deg off bottom of main

Main and run-outs not insulated

2 1/2" horizontal run-outs

2" wet return

1 1/2" returns

2" risers

water line

F&T

5" tap & header

4" main

108 lobby

front bedroom east side (1-pipe)

front bedroom west side (1-pipe)

110 lobby

ground floor interior #1

ground floor interior #2

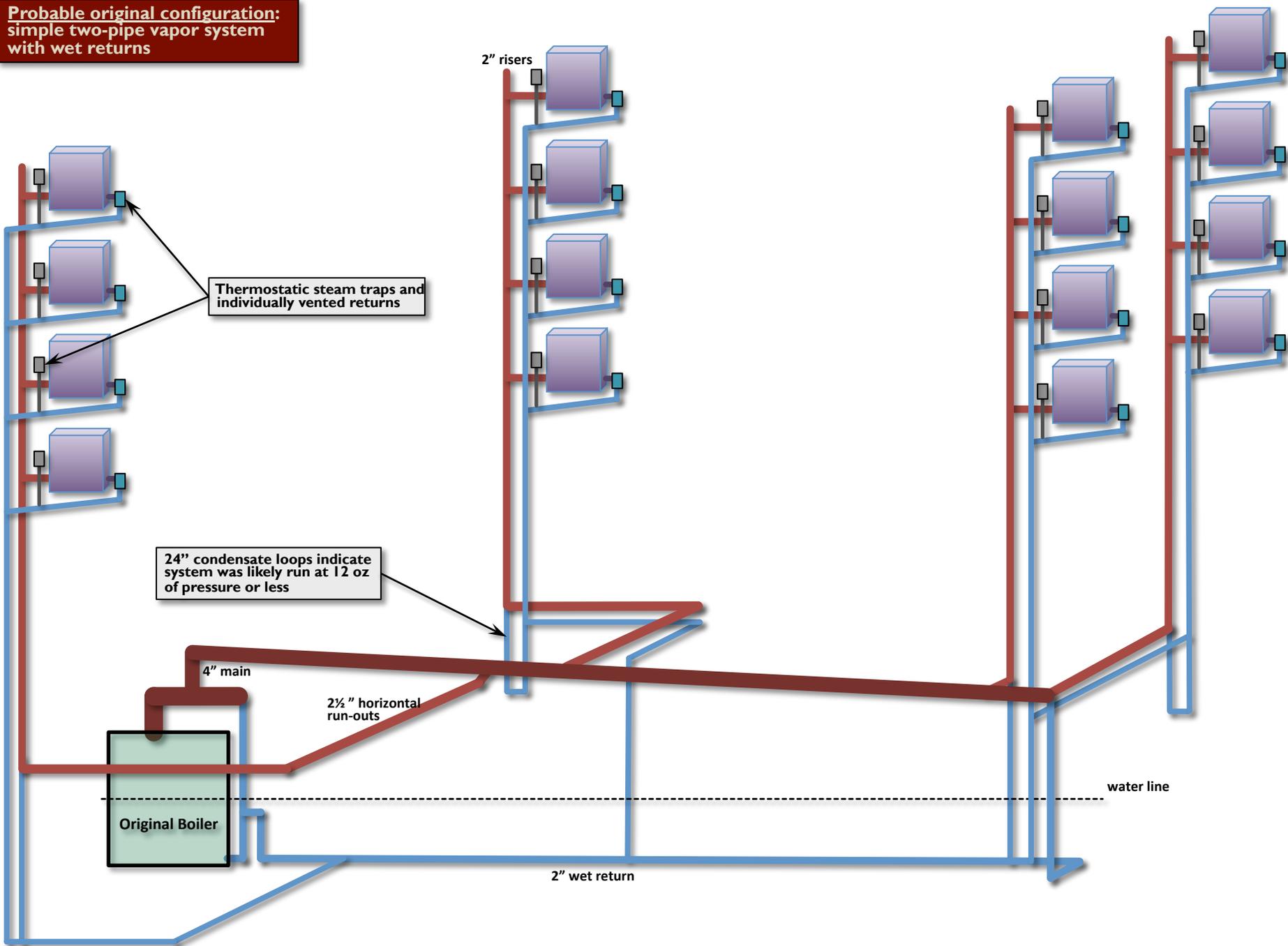
ground floor interior #3

ground floor interior #4

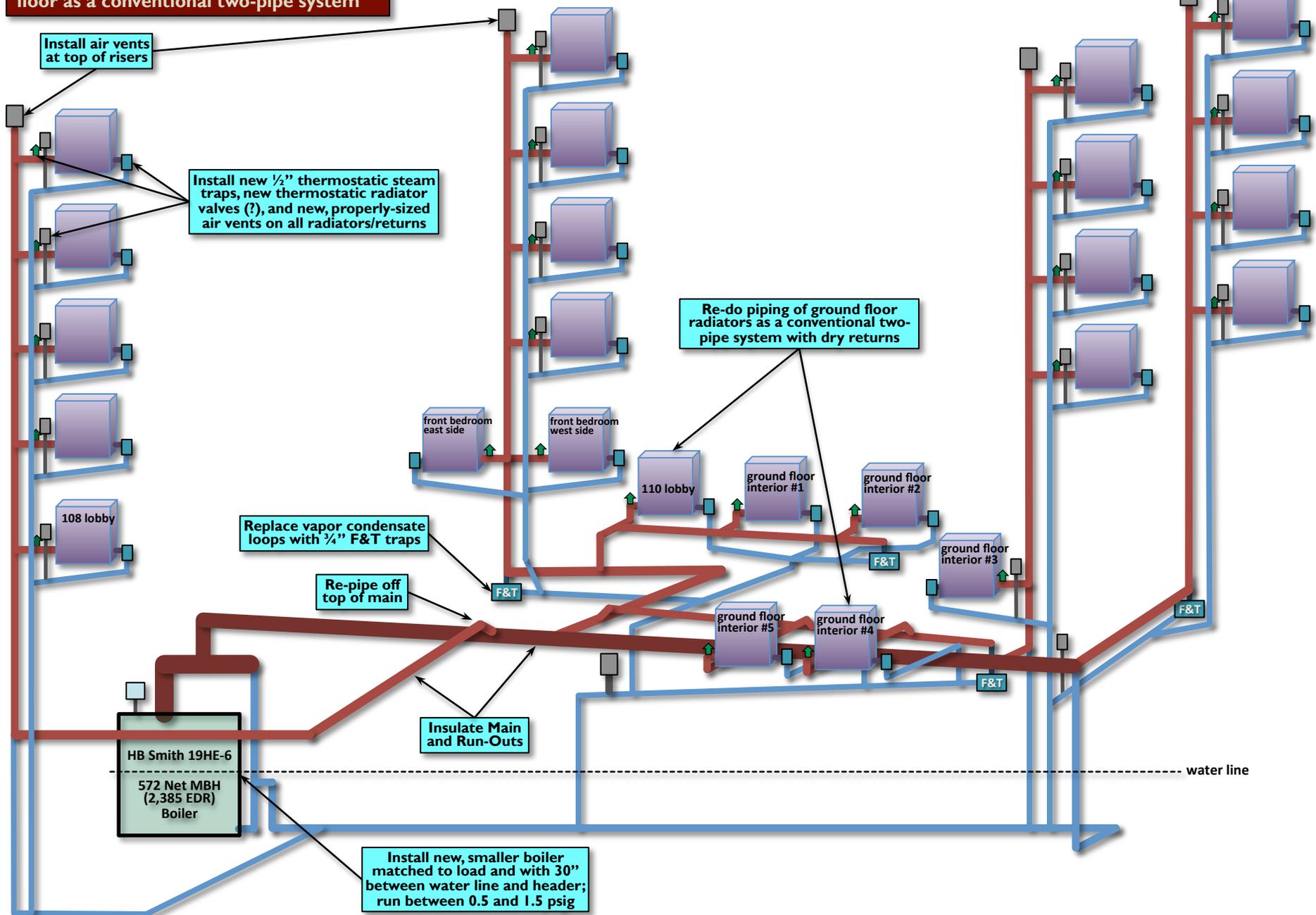
ground floor interior #5

basement west side

**Probable original configuration:
simple two-pipe vapor system
with wet returns**



**Proposed new configuration:
refurbish upper floors and re-pipe ground
floor as a conventional two-pipe system**



Install air vents at top of risers

Install new 1/2" thermostatic steam traps, new thermostatic radiator valves (?), and new, properly-sized air vents on all radiators/returns

Re-do piping of ground floor radiators as a conventional two-pipe system with dry returns

Replace vapor condensate loops with 3/4" F&T traps

Re-pipe off top of main

Insulate Main and Run-Outs

Install new, smaller boiler matched to load and with 30" between water line and header; run between 0.5 and 1.5 psig

HB Smith 19HE-6
572 Net MBH
(2,385 EDR)
Boiler

water line

front bedroom east side

front bedroom west side

110 lobby

ground floor interior #1

ground floor interior #2

ground floor interior #3

ground floor interior #5

ground floor interior #4

108 lobby

F&T

F&T

F&T

F&T