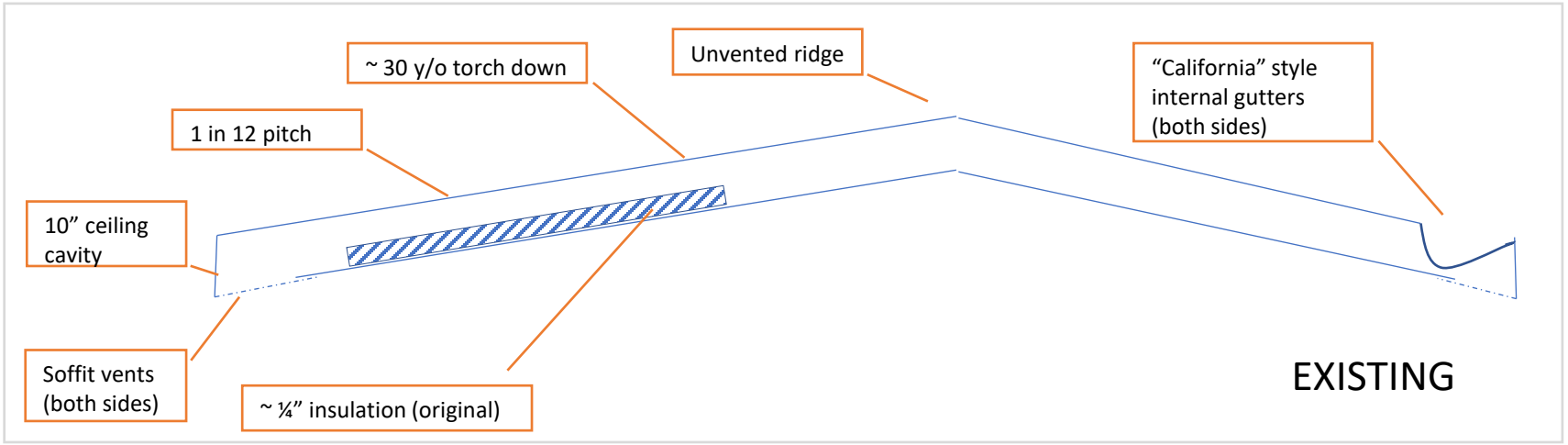
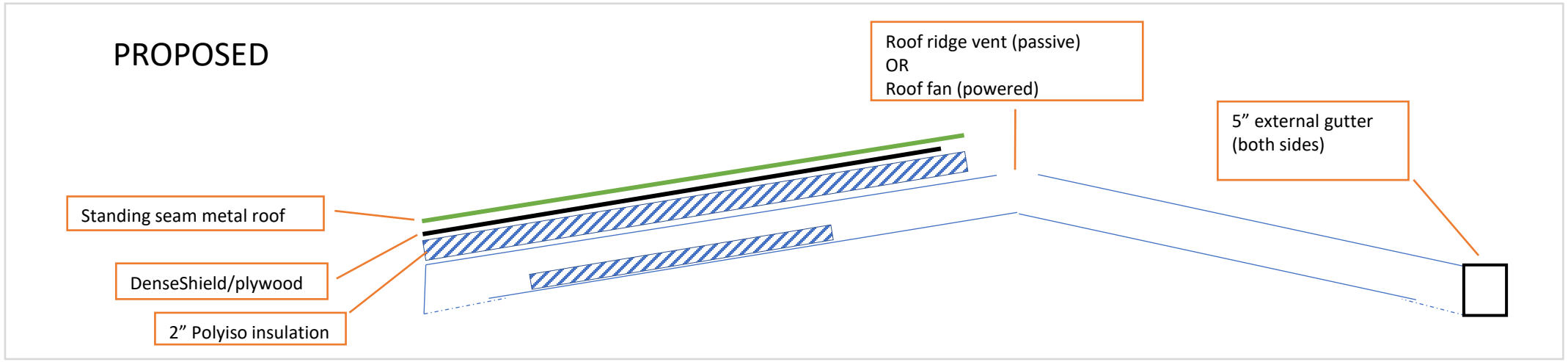
Roofing project

My 67 y/o mid-century modern, Seattle home needs a new roof, and I'm proposing adding insulation under a standing seam metal roof… but I have questions





Questions

CONTEXT

In the winter the loss of heat through the roof results in having to use the warm air central heating incessantly, and even then, some rooms remain cold. Some of this is to do with the challenge of moving warm air a long distance, and some to do with the very small amount of (old, original, ineffective) insulation that exists in the roof cavity. I don't want to insulate the ceiling cavity with blown foam or fiberglass lest it block air flow through the soffits and result in accumulated moisture. I'm planning on replacing the current torch down roof and was made aware of standing seam metal roofing panels with insulation (example) and was inspired to investigate insulation on the roof.

In the summer, the sun used to heat the black torch down roof , which would heat the ceiling cavity and prevent the loss of heat from the house. Painting the roof with a white silicone paint solved that problem. I intend to have my new roof made of a sun-reflecting material/color.

QUESTIONS

1. Given the air flow in the roof cavity, what insulation performance can I expect from the addition of 2 inches of Polyiso to the roof? (My thought is that the ceiling heats the air in the ceiling cavity, which loses heat through the roof, and so reducing heat loss from the ceiling cavity by insulating the roof will keep the house warmer).

2. 2 of the 3 roofing companies I've engaged to give quotes insist that a passive ridge vent is essential. I'm concerned that in the winter a vent will cool the ceiling cavity and so suck heat from the ceiling. One contractor offered the option of a powered ridge vent fan, which could be turned on and off, e.g., based on moisture content. In the winter it could be used sparingly and allow warm air to remain in the ceiling cavity. But I'm unable to find such fan. Do you know of one?

3. The roof has been unvented since the house was built in 1955, with no apparent ill effect (other than heat in the summer, which was solved, see above). Do you see any reason why adding insulation to the roof will necessitate additional venting?

4. Are you aware of other solutions or ideas?