

AIA BP KC Details Forum

The Building Performance Knowledge Community is launching a new section on the BP site dedicated to the sharing of architectural building details. Details are the fundamental building blocks of the structures we bring from our imagination into reality. The details determine whether the building functions as clients expect or falls short of expectations.

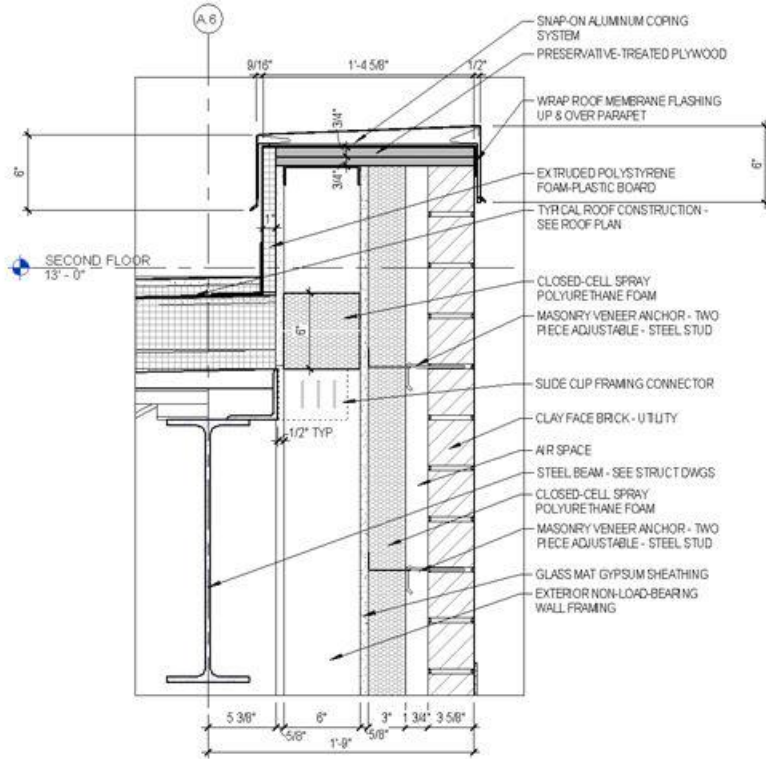
Details, generally shown at a scale of $\frac{3}{4}'' = 1'-0''$, $1\frac{1}{2}'' = 1'-0''$ or $3'' = 1'-0''$, show how the thermal barrier layer, air barrier layer, vapor control layer and water control layer are detailed, transition from one material to another and are continuous. The requirement for continuous insulation has complicated the detailing of buildings.

Other considerations in developing details include code and standards compliance such as:

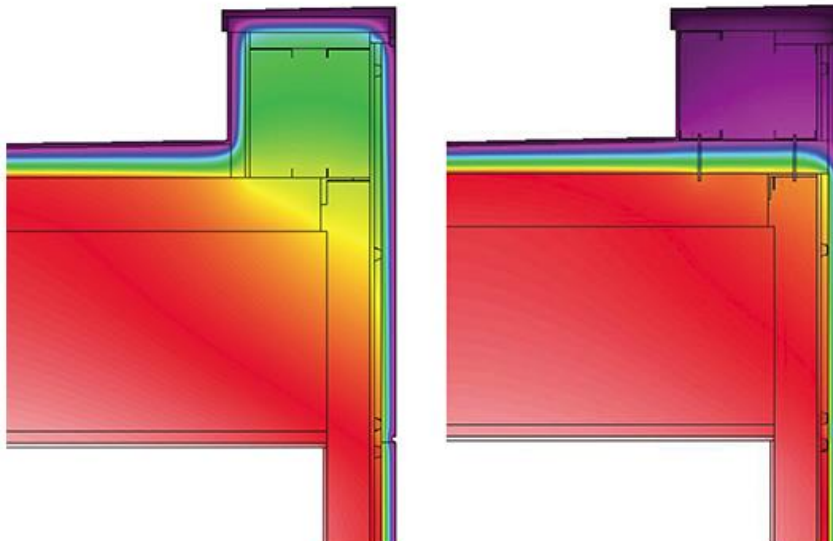
- NFPA 185 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components
- IECC – International Energy Conservation Code
- Applicable Building Code
- AHJ – Authority Having Jurisdiction, such as the local Fire Marshall

To launch this Forum, the BP KC is discussing and reviewing details for a common, non-esoteric, building detail – a masonry veneer parapet in a non-protected, non-combustible building (Type IIB construction) steel framed building in Climate Zone 5. This climate zone has both heating and cooling degree days (HDD and CDD) complicating insulation and vapor drive issues - though structures in this zone are typically designed for the HDD.

A further consideration in parapet walls is whether the wall is a rated parapet. In these details, the wall is not a fire separation wall as per IBC 705.11.



Note how this detail follows the recommend thermal separation discussed in <https://www.payette.com/research-innovation/thermal-bridging-research-parapets/>

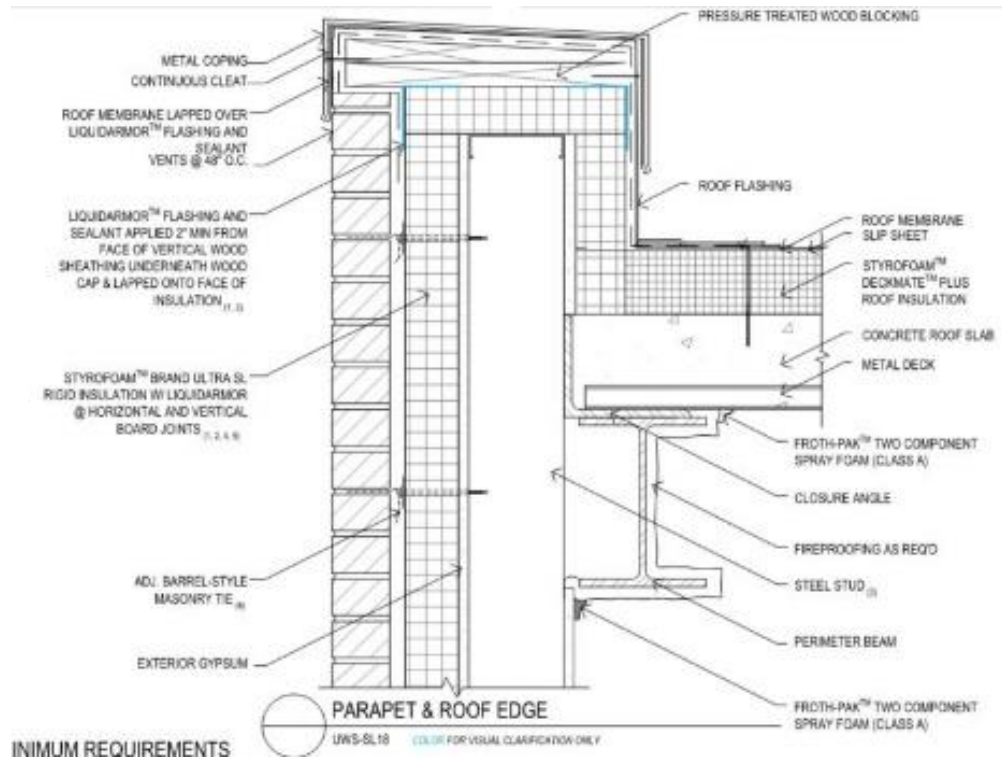


THERM Simulation of parapet: insulating around (left) versus insulating under the parapet (right)

From the Payette Report:

Starting with a well-insulated parapet, the study into the impact of height showed that there was about a 6% decrease in assembly R-value for every 15" increase in the parapet height. This is due simply because the additional surface area acts like a fin that radiates. Considering these results, we concluded the best way to avoid a diminishing R-value is to insulate beneath the parapet, thus effectively eliminating the negative impact from the height of the parapet.

Notice the different approach taken by Dow with their Thermax Details



Here the emphasis is on the continuity of the thermal layer. The question with the non-Dow details, is there a danger of condensation occurring in the cavity in the parapet wall above the insulation level?

For discussion...