

EXTERIOR WALL ASSEMBLY

PROPOSED EXTERIOR WALL ASSEMBLY / SUMMARY

The proposed exterior wall assembly locates the air barrier, and 56% of the insulation outside the sheathing. The "Thermax" exterior insulation proposed has an R value of 10, and a water vapour permeance ASTM E96, less than .03 perms. (BCBC calls for less than 1.05 perms (60 ng (Pa.s.m2).

The air barrier, provided by "Weathermate" a housewrap, has air leakage characteristics 0 .0036 L/sqm. (BCBC calls for less than 0 .1 l/sqm), CCMC requirement is less than .02@75 Pa). It does allow vapour permeance of 312 ng (Pa.s.m2).

The three most important aspects this wall assembly was designed to address are:

1. A very good air barrier to reduce air transported moisture into the wall, as air movement has the potential to transport much more moisture than vapour diffusion.

It is easier to install and maintain the integrity of an air barrier and moisture barrier on the outside face of the exterior insulation than on the inside face of studs, where electrical fittings create potential for breaching this membrane, and the poly must be interwoven through framing members at floor intersections. This assembly limits air movement, and air transported moisture through the wall . Moisture moved by vapour diffusion into the wall is reduced by the painted gypsum board (1140 ng(pa.s.m2) and by the fact that the stud space will be warmer, and the temperature differential driving the diffusion from the inside is reduced.

2. Arrange the insulation in such a way as to cause the dew point to fall outside the plywood sheathing. The wall is proposed for a residence where the air conditioning system is expected to limit the interior RH to 50%. The dew point temperature then falls outside the sheathing for a outside design temperature of 39F.

3. Reduce the thermal bridging through the studs that occur if all the insulation is in the stud space. The fact that there is R10 insulation outside the studs reduces heat loss by thermal bridging through the studs. Thermal transfer through the studs can reduce the effective R value of a wall assembly by as much as 20%.

Conclusion: All the walls considered conform to the BCBC 2006. From the BCBC 2006 requirements for exterior walls and the resultant calculated dew points, the proposed wall assembly is considered to be superior to wall assemblies that have all the insulation on the interior of the sheathing and have vapour barriers on the inside face of the studs.

ROL FIELDWALKER
architect
408, 611 Alexander St.
Vancouver, B.C. V6A 1E1
Tel: 604-813-6044
Fax: 604-266-8842
Email: rol@rolfieldwalker.com