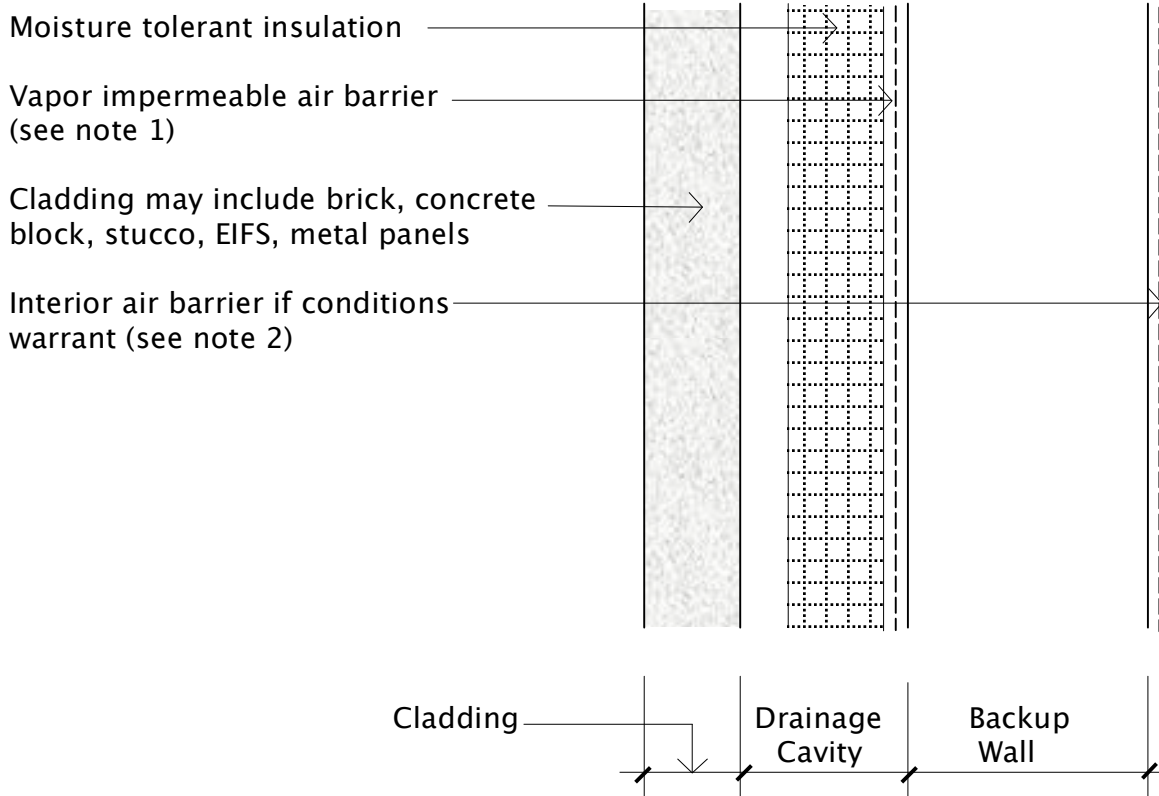


ABOVE GRADE WALL SELECTION GUIDE

The following diagrams show two basic wall types, *drainage cavity wall systems* and *barrier wall systems*.

Drainage Cavity Wall Systems



Note 1: If insulation is low permeance the air barrier can be permeable. Verify via hygrothermal analysis.

Note 2: For specialty buildings, such as natatoriums, humidified museums, libraries, laboratories, etc., consult with a building enclosure consultant.

Barrier Wall Systems

Vapor retarder except in high outdoor humidity environments. Second air barrier if cold or mixed climate. See Note 1.

Cladding: see note no. 4. If precast concrete, use 5,000 psi concrete. Consider using a breathable elastomeric coating on the outside

Two-stage drainable joint for precast. Horizontal joint shown. Slope to outside at vertical joint. Ignore this for other wall types.

Transition membrane adhered to precast at joints with a bellows to allow movement

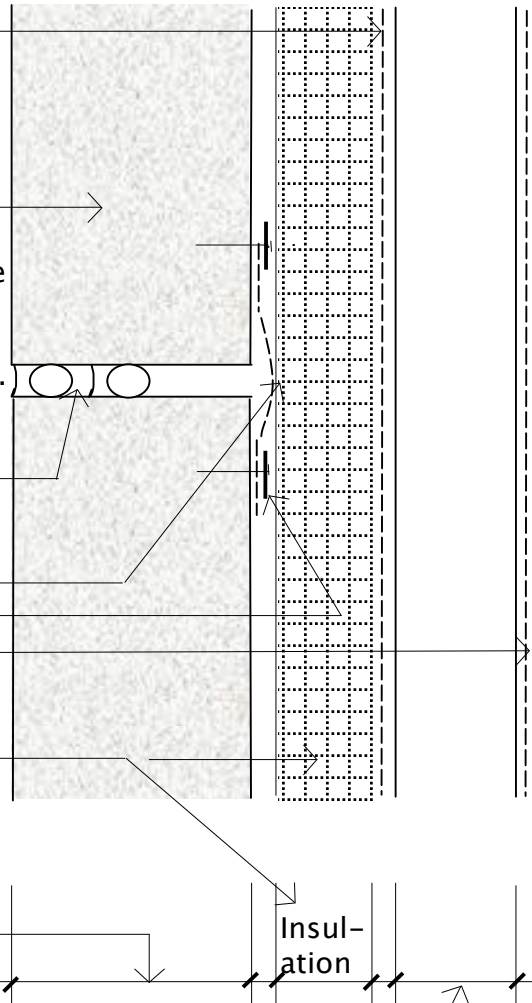
Termination bars

Interior air barrier if conditions warrant

Preferred insulation; closed-cell spray polyurethane foam with a fireproof coating (review with building official). See Note 2

Exterior Barrier Wall. See Note 3

Interior non-structural wall



Note 1: Vertical joint is shown. Barrier walls (except pre-cast concrete) are less common in current new construction and are not as effective in controlling the transfer of heat, air and moisture as drainage cavity wall systems

Note 2: May be achieved by the use of continuous closed-cell insulation or open-cell insulation with its skin intact.

Note 3: Exterior barrier wall must also serve as an air barrier.

Note 4: Cladding may include precast concrete, cast-in-place concrete, brick or stone at least 8 inches thick, composite brick and CMU walls at least 12 inches thick (precast may be 5 inches thick) and similar massive materials not degradable by the natural wetting/drying cycles for the climate. Thin barriers such as traditional EIFS and face-sealed metal panels have not proven reliable. If precast concrete, use 5,000 psi concrete. Consider using a breathable elastomeric coating on the outside

Climate Zone References

The following resources are available to determine the appropriate climate zone for your project:

1. ANSI/AHRAE/IESNA Standard 90.1-2007 – Energy Standard for Buildings Except Low-Rise Residential Buildings – Normative Appendix B – Building Envelope Climate Criteria, Figure B-1 and Table B-1
2. 2009 ICC International Energy Conservation Code (IECC) – Chapter 3 – Climate Zones – Figure 301.1 and Table 301.1

General Notes for both Drainage Cavity Wall Systems and Barrier Wall Systems:

1. Follow all local and national building code requirements, carefully examining all allowances and exceptions.
2. See Definitions in the Wall Section General Overview.
3. Backup wall may be used for structural loading to support the exterior veneer or to support interior drywall and finishes.
4. Designers also need to examine the precipitation zone in which the building is to be sited in as well as the building orientation and wind direction during wind driven rain events to determine the amount of precipitation the building enclosure will need to control.
5. Insulation products placed in the drainage cavity must be highly moisture tolerant and not sag under wetting loads. Air flow around or through the insulation must also be examined to determine if this air flow will undermine the expected R-value.
6. The designer is responsible for all material choices on their project. The diagrams are for general guidance only. Final material selection and material placement in the assembly must be thoroughly examined through a detailed thermal and hygrothermal analysis that is climate, micro-climate, orientation and location specific.
7. Manufacturers should provide written verification that their product(s) are appropriate for their intended use. Require such a submittal in all specification sections.
8. An interior side air barrier may also be needed at exterior walls and at partitions, ceiling or other elements when the conditions warrant (i.e. high RH and temperature differentials that increase the risk for condensation due to moisture-laden air egress from the interior to exterior or moisture-laden air transport between interior zones separated by partitions or ceiling elements)
9. If the interior drywall is to serve as an air barrier, all joints must be sealed, including the top and bottom joints and the product will need to extend the full height of the wall assembly from the slab surface to the soffit of the slab above. This requires the drywall to extend above drop ceilings and below access floors. Not sealing the drywall fully or carrying the material through from floor line to floor line may create an accidental plenum to exterior conditions in the access floor or raised ceiling space. This includes providing air tight fixtures and sealing all fixtures such as electrical outlets and light switches.
10. Air barriers are to be made continuous at all interfaces, tied-in at windows, penetrations, and other locations.

11. The vapor permeance rating of vapor retarders must meet the requirements of all local and national building code requirements, including exceptions, and must be examined by hygrothermal analysis.
12. Avoid vapor retarders where possible. Confirm by hygrothermal analysis.
13. Designers should examine the material properties of each layer in their design, specifically the vapor permeance, the air permeance, the structural rigidity, the rate of thermal gain and loss, the rate of absorption of moisture, the moisture storage capacity, the rate of wetting and drying, and the contraction and expansion rates of the material under moisture and thermal cycling. Designers will need to ensure their design will create a structure capable of accommodating movement and thermal, moisture, and air flow loads. Elements within the wet zone must be carefully examined for their susceptibility to moisture damage. Examine each element, then the entire system, to determine if a misplaced or unintended vapor retarder exists that will inhibit the drying of the wall system after wetting events.
15. The provision of a tighter enclosure through proper 3-dimensional detailing and installation of a fully integrated and effective air barrier system will necessitate additional consideration and care when designing the mechanical system to ensure proper fresh-air ventilation rates, contaminant dilution, and interior humidity control.

Prepared by the Building Enclosure Council (BEC) chairs, September 2010.