The Perfect Wall
Keeps the Outside Out and the Inside In
Damage Functions
Water
Heat
Ultra-violet Radiation
2nd Law of Thermodynamics
Heat Flow Is From Warm To Cold
Moisture Flow Is From Warm To Cold
Moisture Flow Is From More To Less
Air Flow Is From A Higher Pressure to a Lower Pressure
Gravity Acts Down
Water Control Layer
Air Control Layer
Vapor Control Layer
Thermal Control Layer
Cladding
Control layers
Structure
Brick veneer/stone veneer

Drained cavity

Exterior rigid insulation — extruded polystyrene, expanded polystyrene, isocyanurate, rock wool, fiberglass

Membrane or trowel-on or spray applied drainage plane, air barrier and vapor retarder

Concrete block

Metal channel or wood furring

Gypsum board

Latex paint or vapor semi-permeable textured wall finish

Vapor Profile
Brick veneer/stone veneer

Drained cavity

Exterior rigid insulation — extruded polystyrene, expanded polystyrene, isocyanurate, rock wool, fiberglass

Membrane or trowel-on or spray applied drainage plane, air barrier and vapor retarder

Non paper-faced exterior gypsum sheathing, plywood or oriented strand board (OSB)

Uninsulated steel stud cavity

Gypsum board

Latex paint or vapor semi-permeable textured wall finish

Vapor Profile
Brick veneer/stone veneer

Drained cavity

Exterior rigid insulation — extruded polystyrene, expanded polystyrene, isocyanurate, rock wool, fiberglass

Membrane or trowel-on or spray applied drainage plane, air barrier and vapor retarder

Non paper-faced exterior gypsum sheathing, plywood or oriented strand board (OSB)

Insulated wood stud cavity

Gypsum board

Latex paint or vapor semi-permeable textured wall finish

Vapor Profile
<table>
<thead>
<tr>
<th>IECC Climate Zone</th>
<th>Minimum Continuous Insulation/Cavity Insulation Ratio</th>
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<tbody>
<tr>
<td>Marine 4</td>
<td>0.2</td>
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<tr>
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Brick veneer cladding

Drained and vented cavity

Spray-applied closed-cell high-density foam (2 lb/ft³) water control layer (also air control layer, vapor control layer and thermal control layer)

Concrete masonry unit wall

Metal channel

Gypsum board interior lining

Latex paint
Brick veneer/stone veneer

Drained cavity

Spray-applied closed-cell high-density foam (2 lb/ft³) water control layer (also air control layer, vapor control layer and thermal control layer)

Non paper-faced exterior gypsum sheathing, plywood or oriented strand board (OSB)

Uninsulated steel stud cavity

Gypsum board

Latex paint or vapor semi-permeable textured wall finish
Brick veneer/stone veneer

Drained cavity

Spray-applied closed-cell high-density foam (2 lb/ft³) water control layer (also air control layer, vapor control layer and thermal control layer)

Non paper-faced exterior gypsum sheathing, plywood or oriented strand board (OSB)

Insulated wood stud cavity

Gypsum board

Latex paint or vapor semi-permeable textured wall finish
Brick veneer/stone veneer

Drained cavity

Exterior rigid insulation — extruded polystyrene, expanded polystyrene, isocyanurate, rock wool, fiberglass

Membrane or trowel-on or spray applied drainage plane, air barrier and vapor retarder

Non paper-faced exterior sheathing, plywood or OSB

Spray foam insulation

Gypsum board

Latex paint or vapor semi-permeable textured wall finish
Brick veneer/stone veneer

Drained cavity

Exterior rigid insulation — extruded polystyrene, expanded polystyrene, isocyanurate

Spray foam insulation

Gypsum board

Latex paint or vapor semi-permeable textured wall finish
Brick veneer/stone veneer

Drained cavity

Drainage plane

Non paper-faced exterior sheathing, plywood or OSB

Spray foam insulation

Gypsum board

Latex paint or vapor semi-permeable textured wall finish
Liquid-applied membrane lining, sub-sill window flashing, air and water barrier transition membrane

HD spray foam “filet” to be applied before rest of foam

HD spray foam
HD spray foam

Liquid-applied membrane lining, window flashing, air and water barrier transition membrane

Flashing

HD spray foam “filet” to be applied before rest of foam

Air seal
Liquid-applied membrane lining, sub-sill window flashing, air and water barrier transition membrane

HD spray foam “filet” to be applied before rest of foam

HD spray foam
HD spray foam

Liquid-applied membrane lining, window flashing, air and water barrier transition membrane

Flashings

HD spray foam “filet” to be applied before rest of foam

Paperless gypsum sheathing

Air seal