

■ Building Envelope Checklist

□ **Install Additional Insulation in Exterior Walls**

Adding insulation to exterior walls can reduce the heat gain or loss through the building envelope and save energy on maintaining comfortable conditions inside of the building. An exterior insulation and finish system (EIFS) can be used for exterior insulation. Loose-fill insulation can be used for enclosed existing walls and hard-to-reach places. Rigid fibrous insulation is good for ducts in unconditioned spaces or other places requiring insulation that can withstand high temperatures. Sprayed foam and foamed-in-place insulation can be used in enclosed existing walls.

□ **Seal Areas of Infiltration in Exterior Walls**

Using caulk or weather-stripping to seal areas of infiltration can reduce the amount of unconditioned air that enters the building and save significant amounts of energy.

□ **Fix Rain Leaks in Exterior Walls**

Rain leaks are indications of improper installation of siding material, poor-quality flashing, and faulty weather-stripping or caulking around exterior joints. This can cause a drainage plane within the wall system of the building and significantly damage the building envelope.

□ **Install Solar Shading Features on East-, West-, and South-Facing Facades**

Installing high-quality fenestration and shading features such as landscaping (trees, hedge rows), overhangs or fins, light shelves, and blinds can save heating and cooling energy as well as save on electrical lighting if designed properly. Shading features should be installed on all applicable east-, west-, and south-facing facades.

□ **Replace Old or Single-Pane Windows**

New window technologies can save significant amounts of energy. Old and metal window frames should be replaced with nonmetal insulating frames. Old or single-pane windows should be replaced with double- or triple-pane glass with insulating gas (argon or krypton). Also, the new glass should be specified based on climate and include tints, heat-reflective coatings (low emissivity [low-e]), or laminates.

□ **Add Film to Old or Single-Pane Windows**

New window film technology can significantly save energy by reducing solar heat gain into the building. Old or single-pane windows should be retrofitted with low-e products or blue/green tints that combine a low solar heat gain coefficient (SHGC) with high visible light transmission (VT).

□ **Install Revolving Doors**

Revolving doors reduce the amount of unconditioned air entering the building by a factor of eight when compared with standard swinging doors. This reduction in infiltration will significantly reduce the energy required for heating and cooling loads. Revolving doors should replace swinging doors where applicable.

Create Entrance Vestibule with Two Doors

Entrance vestibules reduce the amount of unconditioned air that enters the building, reducing the energy required for heating and cooling loads. Single-door entrances should be replaced with two-door entrance vestibules.

Install Weather-Stripping Around Loading Dock Doors

The irregular surfaces and mounting hardware of rolling doors require heavy-duty weather-stripping (vinyl or wood pile, neoprene bulb, or neoprene baffle). All loading dock doors should be insulated to reduce heat transfer through the building envelope and reduce energy demands.

Increase Roof Insulation

Increasing the amount of roof insulation will reduce heat transfer through the building envelope and reduce energy demands. Loose-fill, sprayed-foam, or foamed-in-place insulation can be used in unfinished attic floors. Batt or roll insulation can be used in unfinished attic walls and ceilings. Foam board insulation can be applied above flat roof decks.

Retrofit Existing Roof with Green Roof or Cool Roof

Retrofitting an old roof with a green roof or cool roof can save significant amounts of energy. The following Web sites can be useful for calculating savings and searching for products:

- DOE Cool Roof Calculator,
www.ornl.gov/sci/roofs+walls/facts/CoolCalcEnergy.htm
- ENERGY STAR® Roof Products,
www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products
- ORNL and LBNL Roof Savings Calculator,
www.roofcalc.com/RoofCalcBuildingInput.aspx