

## Energy Efficiency - Building Design Strategies: Building Envelope Design

**Strategy:** Design and build a tight, well-insulated shell to help reduce heating and cooling loads.

**Relevant Store Scale/Type:** S,M,L/New, Adapted, Existing

### Initial Cost:

1. Higher performing products tend to have higher first costs, but not all. Some exceptions are TPO /EPDM roofing, metal SIPs, and ICFs.

### Return on Investment:

1. Savings as high as 25% can be realized on energy bills within the first year by simply creating a tight building envelope.
2. Recommendations include using energy modeling to study first cost trade-offs with energy saving benefits.

### Operator Benefits:

1. Reduces cooling and heating loads for interior of building.
2. Reduces air infiltration and helps with humidity control.
3. Better acoustic performance.

### Technical Considerations:

1. Reduce exterior envelope (for example, party walls or multiple stories, mixed use development).
2. Consider high performance glazing, roofing with high SRI (solar reflectance index >29 for sloped roofs), high R-value insulation with low infiltration rates such as spray foam insulation over batts, metal SIPs (Structurally Insulated Panels), ICFs (Insulated Concrete Forms)
3. Include air locks / vestibules at all primary entrances.

### Product/Manufacturer Suggestions, Resources & Examples:

Carlisle white TPO roofing <http://www.carlisle-syntec.com/>

Solarban Glazing by PPG Glass <http://corporateportal.ppg.com/NA/IdeaScapes/productInfo/glass/>

BioBased Spray Insulation <http://www.biobased.net/>

King Span Metal SIPs <http://www.kingspanpanels.ca/>

Kortek <http://www.koreteck.com/>

Insulated Concrete Forms:

<http://www.forms.org/>

Study on thermal performance in supermarkets as related to thermal insulation:

[http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6V2V-4H7THGJ-1&\\_user=10&\\_rdoc=1&\\_fmt=&\\_orig=search&\\_sort=d&\\_view=c&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=ccd70c05df830fe866316ed643c85709](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V2V-4H7THGJ-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=ccd70c05df830fe866316ed643c85709)