Omni Block
Large Retail Facility Envelope Analysis
Richmond, VA & Charlotte, NC

Energy Analysis Report

Provided by
April 2011
The following document is intended to demonstrate the thermal performance and energy impacts of an insulated masonry wall system - Omni Block. Omni Block is a unique masonry wall system which incorporates an engineering design which minimizes the impact of thermal bridging while still maintaining the same functionality and durability of conventional block.

This study determines the annual energy and utility cost impacts of utilizing 8” Omni Block in lieu of standard un-insulated 12-inch block for large big box 100,000 square foot retail home improvement facility. Thermal performance properties of both a standard CMU wall and the Omni Block wall are listed below. The analysis was completed for two locations: Richmond, Virginia and Charlotte, North Carolina.

<table>
<thead>
<tr>
<th>Construction</th>
<th>R-Value</th>
<th>U-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 12” CMU Block</td>
<td>2.0</td>
<td>0.509</td>
</tr>
<tr>
<td>8” Omni Block</td>
<td>13.57*</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Omni Block Thermal Resistance from Northwest Testing Laboratories Inc. Report #306501

eQUEST (DOE2.2) Model
Richmond, VA Results

<table>
<thead>
<tr>
<th>Name</th>
<th>Tons</th>
<th>kW</th>
<th>kWh</th>
<th>Therm</th>
<th>kWh</th>
<th>kWh</th>
<th>kWh</th>
<th>kWh</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>Total</th>
<th>$/sqft</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; CMU</td>
<td>467</td>
<td>682</td>
<td>2,699,960</td>
<td>13,745</td>
<td>990,995</td>
<td>1,102,64</td>
<td>405,176</td>
<td>$98,830</td>
<td>$12,173</td>
<td>$111,003</td>
<td>$0.83</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omni Block</td>
<td>445</td>
<td>671</td>
<td>2,703,585</td>
<td>4,154</td>
<td>990,995</td>
<td>1,106,266</td>
<td>405,176</td>
<td>$99,319</td>
<td>$3,831</td>
<td>$103,150</td>
<td>$0.77</td>
<td>7.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Savings: $7,853
### Charlotte, NC Results

**Savings:** $6,562

<table>
<thead>
<tr>
<th>Name</th>
<th>Cool Tons</th>
<th>Peak Elec kWh</th>
<th>Total Electric kWh</th>
<th>Gas Therms kWh</th>
<th>Total HVAC kWh</th>
<th>Equipment Electric kWh</th>
<th>Equipment Gas $</th>
<th>Total $</th>
<th>Total $ /sqft</th>
<th>Savings %</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; CMU</td>
<td>457</td>
<td>695</td>
<td>2,730,709</td>
<td>9,620</td>
<td>990,995</td>
<td>1,133,390</td>
<td>$168,045</td>
<td>$9,849</td>
<td>$177,894</td>
<td>$1.33</td>
</tr>
<tr>
<td>Omni Block</td>
<td>468</td>
<td>692</td>
<td>2,732,015</td>
<td>2,377</td>
<td>990,995</td>
<td>1,134,696</td>
<td>$168,217</td>
<td>$3,115</td>
<td>$171,332</td>
<td>$1.28</td>
</tr>
</tbody>
</table>

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**12" CMU Charlotte, N**

- **Lighting:** $2,695
- **Equipment:** $33,348
- **Space Heating:** $9,849
- **Space Cooling:** $24,934
- **DHW:** $592

Total Savings: $70,668

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**Omni Block Charlotte, N**

- **Lighting:** $2,697
- **Equipment:** $33,366
- **Space Heating:** $146
- **Space Cooling:** $3,115
- **DHW:** $24,948

Total Savings: $70,706

Total Savings: $6,562
Heating Utility Cost Comparison

**Monthly Natural Gas Util**

**Richmond, VA**

![Graph showing monthly natural gas utility costs for Richmond, VA, comparing 12" CMU and Omni Block.]

**Monthly Natural Gas Util**

**Charlotte, NC**

![Graph showing monthly natural gas utility costs for Charlotte, NC, comparing 12" CMU and Omni Block.]

- **Richmond, VA**: The graph displays higher utility costs in January and February compared to other months. The 12" CMU costs are significantly higher than Omni Block.
- **Charlotte, NC**: The utility costs are generally lower than Richmond, with a notable increase in February. Both 12" CMU and Omni Block show similar trends with a peak in January.