ND WxTech Committee

WxTech Mission Statement. “Formulate input to the state and weatherization advisory committee regarding technical matters, and strive towards quality and consistency in the weatherization program.”

R-Values for WXEO 2002

R-Values were taken from Manual J and ASHRAE Handbook of Fundamentals

Walls:

Pre R-Value: Add R-Value of 3.8 to existing insulation R-Value (R 3 per inch)

Post R-Value: Cellulose: R 3.8 per inch + 1.8*
*Blown to a Density of 3.5 per Cubic Ft.
Example – 2x4 wall would be R-15.1

Fiberglass: R 4.0 per inch + 1.8*
*Blown to a Density of 1.6 per Cubic Ft.
Example – 2x4 wall would be R-15.8

Use Weatherization Spreadsheet for best accuracy

Attics:

Pre R-Value: Add R-Value of 1.8 to existing insulation R-Value (R 3 per inch)

Post R-Value: Use manufacturer’s label for per inch R-Value
All heat sources except electric should be R-50
Electric heat should be R-60

Floors:

Pre R-Value: Add R-Value of 3.93 to existing insulation R-Value (R 3 per inch)
Example – Floor with 3 inches existing insulation would be R-12.93

Post R-Value: Use manufacturer’s label on fiberglass batts (R-11 or R-19) + 1.8
Fiberglass: R 4.0 per inch + 1.8*
*Blown to a Density of 1.6 per Cubic Ft.
Example – 2x6 joists would be R-23.8

Rim Joists:

Pre R-Value: 4.0*
*Add for additional installed materials

Post R-Value: Fiberglass: Add R 2.5 Per Inch
2 Part Foam: Add R 5.0 Per Inch
Doors:

Pre R-Value: .85*
  *Can use Pre R-Value below .85 if documented with picture
  *Add R-Value of 1.0 for a good existing storm door

Post R-Value: Wood Solid Core: 2.2*
  Steel Slab or Small Lite: 7.0*
  Steel with Large Lite: 5.4*
  Mobile Home Door: 5.0*
  *Add R-Value of 1.0 for a good existing storm door

Windows:

Pre R-Value: Single glass - .85 Double pane or Single glass with storm – 2.0*
  *Can use Pre R-Value below .85 if documented with picture

Post R-Value: Double pane or Single glass with storm – 2.0*
  *Any R-Value above 2.0, Must be Documented by Manufacturer

Storm Windows

Pre R-Value: Single glass - .85 Double pane or Single glass with storm – 2.0

Post R-Value: Single glass with storm – 2.0 Double pane with storm – 2.9

Basement Walls and Non-Exposed Crawl Spaces:

Pre R-Value: Use R-Value Chart Below

<table>
<thead>
<tr>
<th>Approximate R-Values below grade</th>
<th>R0</th>
<th>R4</th>
<th>R7</th>
<th>R11</th>
<th>R19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ft below grade</td>
<td>1.19</td>
<td>5.72</td>
<td>8.85</td>
<td>12.96</td>
<td>21.52</td>
</tr>
<tr>
<td>2 ft below grade</td>
<td>2.06</td>
<td>7.27</td>
<td>10.70</td>
<td>15.16</td>
<td>24.69</td>
</tr>
<tr>
<td>3 ft below grade</td>
<td>2.83</td>
<td>8.61</td>
<td>12.36</td>
<td>17.25</td>
<td>27.74</td>
</tr>
<tr>
<td>4 ft below grade</td>
<td>3.51</td>
<td>9.71</td>
<td>13.78</td>
<td>19.00</td>
<td>30.27</td>
</tr>
<tr>
<td>5 ft below grade</td>
<td>4.10</td>
<td>10.58</td>
<td>14.81</td>
<td>20.26</td>
<td>32.01</td>
</tr>
<tr>
<td>6 ft below grade</td>
<td>4.69</td>
<td>11.32</td>
<td>15.70</td>
<td>21.34</td>
<td>33.44</td>
</tr>
<tr>
<td>7 ft below grade</td>
<td>5.22</td>
<td>12.05</td>
<td>16.59</td>
<td>22.48</td>
<td>35.62</td>
</tr>
</tbody>
</table>

All R-values listed above include losses from the floor
Use for both pre and post R-values in Wxeor

Example - A block wall with no existing insulation 6 ft. below grade would have a pre R-value of 4.69
If you are adding R-11 to that wall the post R-value would be 21.34
Foundation Perimeter:

Pre R-Value: 1.0*  
*Add for additional installed materials

Post R-Value: Add R 5.0 per inch of Polystyrene

Mobile Homes:

Walls:

Pre R-Value: Add R-Value of 3.8 to existing insulation R-Value (R 3 per inch)  
Downgrade existing R-Value by 25% if cavity is not full

Post R-Value: Fiberglass: R 4.0 per inch* + 1.8  
*Blown to a Density of 1.6 per Cubic Ft.  
Example – 2x4 wall would be R-14

Use Weatherization Spreadsheet for best accuracy

Ceilings:

Pre R-Value: Add R-Value of 1.8 to existing insulation R-Value (R 3 per inch)

Post R-Value: Fiberglass: R 4.0 per inch of edge height + R 2.0 per inch x (center height – edge height) *  
*Blown to a Density of 1.6 per Cubic Ft.

Use Weatherization Spreadsheet for best accuracy

Floors:

Pre R-Value: Add R-Value of 3.93 to existing insulation R-Value (R 3 per inch)

Post R-Value: Use manufacturer’s label when using fiberglass batts (R-11 or R-19)  
Use 4.0 per inch installed when blowing fiberglass  
Example – 2 x 6 joists would be R-22

Use Weatherization Spreadsheet for best accuracy