

## ASHRAE 90.1 Building Envelope Requirements for Heated Spaces\*

| City               | Roof<br>Ins.above deck | Roof<br>Metal Bldg. | Wall<br>Mass     | Wall<br>Metal Bldg. | HDD65/<br>CDD50 |
|--------------------|------------------------|---------------------|------------------|---------------------|-----------------|
| Albuquerque, NM    | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 4423/3942       |
| Atlanta, GA        | R-7.6 cont. ins.       | R-13                | NR               | R-13                | 3215/5038       |
| Baltimore, MD      | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 4707/3709       |
| Birmingham, AL     | R-7.6 cont. ins.       | R-13                | NR               | R-13                | 2882/5182       |
| Boise, ID          | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5667/2828       |
| Boston, MA         | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5775/2810       |
| Buffalo, NY        | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6747/2468       |
| Charlotte, NC      | R-7.6 cont. ins.       | R-13                | NR               | R-13                | 3341/4704       |
| Chicago, IL        | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6331/2941       |
| Cincinnati, OH     | R-10 cont. ins.        | R-19                | R-5.7 cont. ins. | R-13                | 5260/3424       |
| Cleveland, OH      | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6313/2755       |
| Columbia, SC       | R-10 cont. ins.        | R-13                | NR               | R-13                | 2666/5613       |
| Columbus, OH       | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5493/3195       |
| Dallas, TX         | R-7.6 cont. ins.       | R-10                | NR               | R-10                | 2604/6587       |
| Denver, CO         | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6411/2312       |
| Des Moines, IA     | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6447/3116       |
| Detroit, MI        | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 6730/2731       |
| Harrisburg, PA     | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 5251/3518       |
| Indianapolis, IN   | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5831/3453       |
| Jackson, MS        | R-7.6 cont. ins.       | R-10                | NR               | R-10                | 2424/5927       |
| Kansas City, MO    | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 5393/2872       |
| Little Rock, AR    | R-7.6 cont. ins.       | R-13                | NR               | R-13                | 3091/5351       |
| Louisville, KY     | R-10 cont. ins.        | R-19                | R-5.7 cont. ins. | R-13                | 4539/4144       |
| Memphis, TN        | R-10 cont. ins.        | R-13                | NR               | R-13                | 3082/5467       |
| Milwaukee, WI      | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 7324/2388       |
| Minneapolis, MN    | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 8134/2680       |
| Nashville, TN      | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 3609/4583       |
| Newark, NJ         | R-10 cont. ins.        | R-19                | R-5.7 cont. ins. | R-13                | 4888/3748       |
| Oklahoma City, OK  | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 3825/4901       |
| Omaha, NE          | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5968/3618       |
| Ottawa, ON         | R-10 cont. ins.        | R-19                | R-9.8 cont. ins. | R-13                | 8571/2045       |
| Philadelphia, PA   | R-10 cont. ins.        | R-19                | R-5.7 cont. ins. | R-13                | 4923/3661       |
| Phoenix, AR        | R-7.6 cont. ins.       | R-10                | NR               | R-10                | 1382/7830       |
| Pittsburgh, PA     | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 5907/2989       |
| Portland, ME       | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 7378/1943       |
| Portland, OR       | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 4522/2517       |
| Richmond, VA       | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 3963/3104       |
| Sacramento, CA     | R-5 cont. ins.         | R-10                | NR               | R-10                | 2361/3577       |
| Salt Lake City, UT | R-10 cont. ins.        | R-19                | R-5.7 cont. ins. | R-13                | 5765/2390       |
| Seattle, WA        | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 4611/2120       |
| St. Louis, MO      | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 4758/4283       |
| Toronto, ON        | R-10 cont. ins.        | R-19                | R-7.6 cont. ins. | R-13                | 7508/2202       |
| Tulsa, OK          | R-10 cont. ins.        | R-13                | R-5.7 cont. ins. | R-13                | 3732/5244       |

### \*Heated Space Criteria:

|                          |                                |
|--------------------------|--------------------------------|
| 5 btu/h*ft <sup>2</sup>  | 0-1,800 HDD <sub>65</sub>      |
| 10 btu/h*ft <sup>2</sup> | 1,801-4,500 HDD <sub>65</sub>  |
| 15 btu/h*ft <sup>2</sup> | 4,501-7,200 HDD <sub>65</sub>  |
| 20 btu/h*ft <sup>2</sup> | 7,201-10,800 HDD <sub>65</sub> |

ashrae90.1 envelope table

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