5.x Input Specifications for Weather Drivers Tests

5.x.1 Case WD100: Base Case. Begin with Case WD100. Case WD100 shall be modeled as specified in this section and its subsections.

5.x.1.1 Weather and Site Data
5.x.1.1.1 Weather Data. The WD100.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD100. These data are described in Normative Annex A1, Section A1.1.1.
5.x.1.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 1 shall be used.

Table 1: Site Data for Weather File WD100.tmy3

Latitude	39.833° north
Longitude	104.65° west
Altitude	1650 m
Time Zone	-7

5.x.1.2 Ground Reflectance. The ground reflectance shall be 0 (i.e. no ground reflected solar radiation).

5.x.1.3 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

5.x.1.4 Incident Radiation Surfaces. For programs that are not able to directly specify surfaces for calculating incident solar radiation, skip the remainder of this section and model the surfaces by applying the alternative building surfaces specified in Section 5.x.1.5.

The incident solar radiation on the surfaces with the azimuths and slopes listed in Table 2 shall be calculated.

Table 2: Azimuth and Slope for Surfaces

Azimuth	Slope
Horizontal	0° from horizontal
South	90° from horizontal
East	90° from horizontal
North	90° from horizontal
West	90° from horizontal
45° East of South	90° from horizontal
45° West of South	90° from horizontal
East	30° from horizontal
South	30° from horizontal
West	30° from horizontal

5.x.1.5 Alternative Surface Specification. If the program being tested was able to model the solar radiation incident on the surfaces as specified in Section 5.x.1 skip this section. The building surfaces are used to test the incident solar radiation on the different slopes and azimuths. Building geometry for a single story building with the same surfaces as listed in Table 2 is given in Figure 1 and Figure 2. Any external shading or building self-shading shall be ignored.

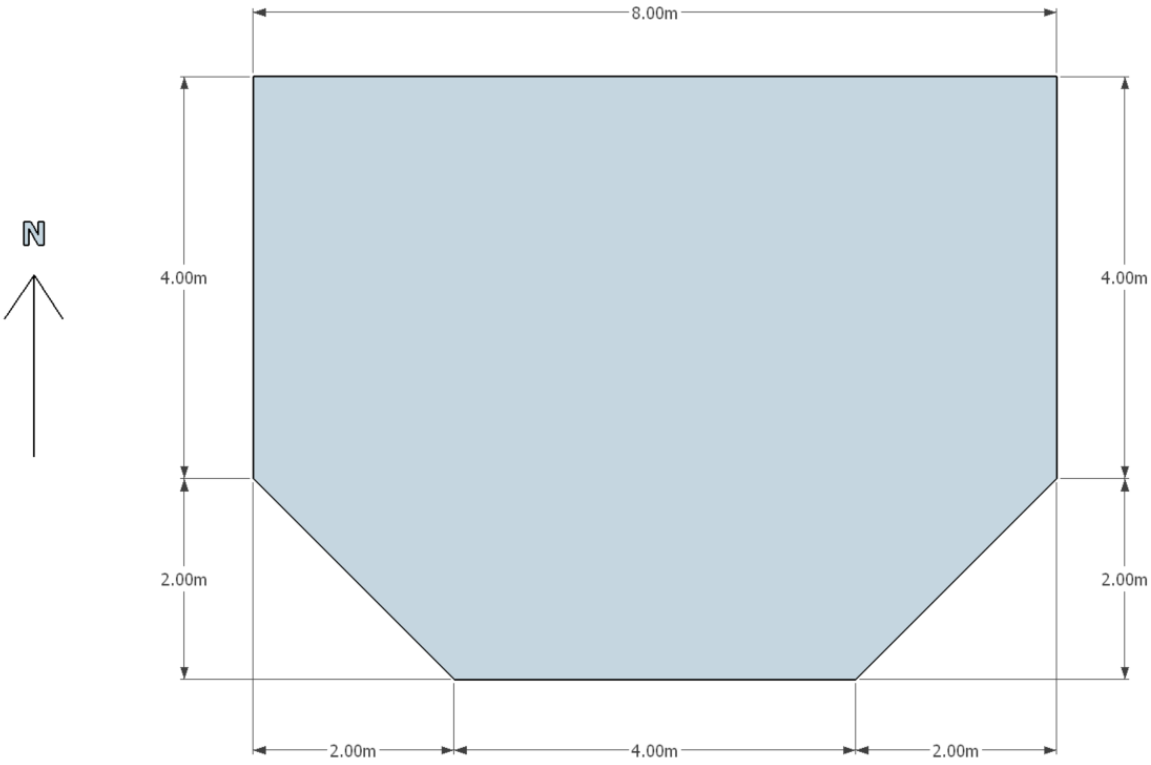

Figure 1 Floor Plan for Building Geometry

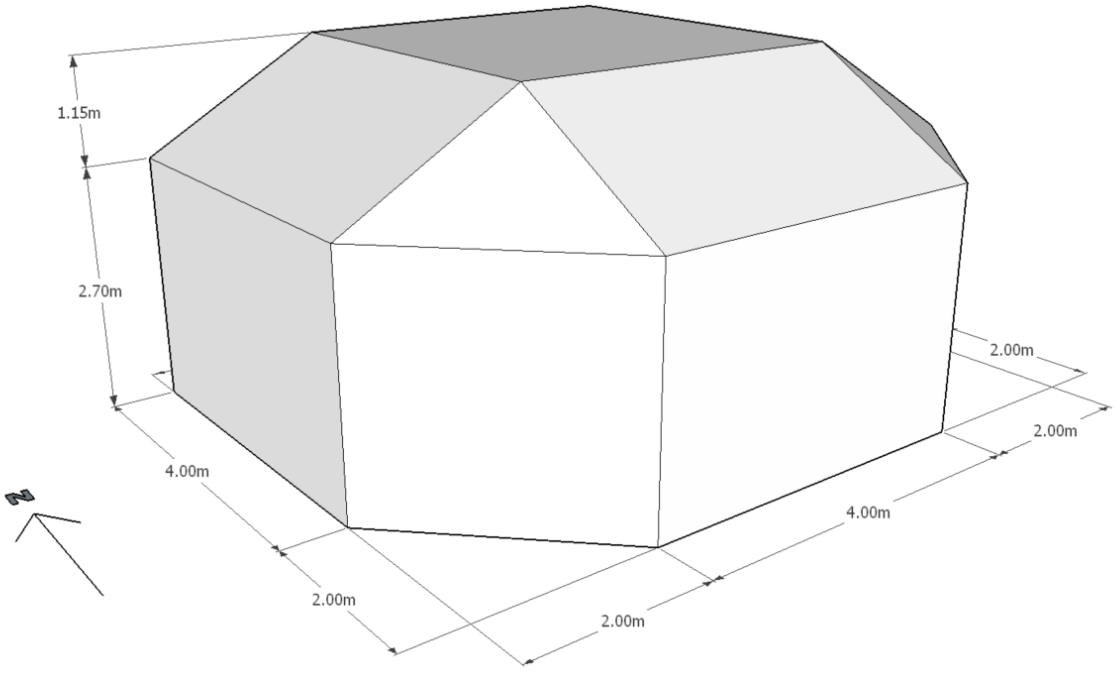

Figure 2 Dimensions for Building Geometry

Informative Note: Since the building is only used to determine the surfaces for the incident solar radiation, the actual construction materials have no influence on the results. Thus, any material properties can be used for the building model.

5.x.2 Case WD200: Low Elevation, Hot and Humid Case. Case WD200 shall be modeled exactly the same as Case WD100 except for the changes noted in the subsections below.

5.x.2.1 Weather and Site Data
5.x.2.1.1 Weather Data. The WD200.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD200.
5.x.2.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 3 shall be used.

Table 3: Site Data for Weather File WD200.tmy3

Latitude	33.633° north
Longitude	84.433° west
Altitude	308 m
Time Zone	-5

5.x.2.2 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

5.x.3 Case WD300: Southern Hemisphere Case. Case WD300 shall be modeled exactly the same as Case WD100 except for the changes noted in the subsections below.

5.x.3.1 Weather and Site Data
5.x.3.1.1 Weather Data. The WD300.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD300.
5.x.3.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 4 shall be used.

Table 4: Site Data for Weather File WD300.tmy3

Latitude	33.393° south
Longitude	70.786° west
Altitude	474 m
Time Zone	-4

5.x.3.2 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

5.x.3.3 Incident Radiation Surfaces. The north and south directions shall be reversed from those in WD100.

5.x.4 Case WD400: High Latitude Case. Case WD400 shall be modeled exactly the same as Case WD100 except for the changes noted in the subsections below.

5.x.4.1 Weather and Site Data
5.x.4.1.1 Weather Data. The WD400.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD400.
5.x.4.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 5 shall be used.

Table 5: Site Data for Weather File WD400.tmy3

Latitude	71.286° north
Longitude	156.767° west
Altitude	10 m

Time Zone	-9

5.x.4.2 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

5.x.5 Case WD500: Time Zone Case. Case WD500 shall be modeled exactly the same as Case WD100 except for the changes noted in the subsections below.

5.x.5.1 Weather and Site Data
5.x.5.1.1 Weather Data. The WD500.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD500.
5.x.5.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 6 shall be used.

Table 6: Site Data for Weather File WD500.tmy3

Latitude	28.567° north
Longitude	77.103° east
Altitude	236.8 m
Time Zone	5.5

5.x.5.2 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

5.x.6 Case WD600: Ground Reflectance. Case WD600 shall be modeled exactly the same as Case WD100 except for the changes noted in the subsections below.

5.x.6.1 Weather and Site Data
5.x.6.1.1 Weather Data. The WD600.tmy3 weather data provided with the electronic files accompanying this standard shall be used for Case WD600.
5.x.6.1.2 Site Data. The site latitude, longitude, altitude, and time zone provided in Table 1 shall be used.

5.x.6.1 Ground Reflectance. The ground reflectance shall be 0.2.

5.x.6.2 Output Requirements. Output shall be provided in accordance with Section 6.x.1.

6.x.1 Weather Driver Test Outputs

6.x.1.1 Annual Outputs The following outputs shall be provided for an annual simulation:

- Average dry bulb temperature (C)
- Average relative humidity (%)
- Average dewpoint temperature (C)
- Average humidity ratio (kg moisture/kg dry air)
- Average wet bulb temperature (C)
- Sum of total, beam, and diffuse solar radiation incident on each surface (Wh/m2)

6.x.1.2 Hourly Outputs The following outputs shall be provided for each hour of the days specified for each test case in Table 7:

- Dry bulb temperature (C)
- Relative humidity (%)
- Dewpoint temperature (C)
- Humidity ratio (kg moisture/kg dry air)

- Wet bulb temperature (C)
- Windspeed (m/s)
- Wind direction (degrees from north)
- Station pressure (mbar)
- Total cloud cover (tenths of sky)
- Opaque cloud cover (tenths of sky)
- Sky temperature (C)
- Sum of total, beam, and diffuse solar radiation incident on each surface (Wh/m2)

Table 7: Specific Days for Output

Case	Days
WD100	May 4th, July 14th, September 6th
WD200	May 24th, August 26th
WD300	February 7th, August 13th
WD400	January 24th, July 1st
WD500	March 1st, September 14th
WD600	May 4th, July 14th, September 6th

For each value, provide the time for the value. If the output value is an instantaneous value at a specific time, report the time for the value at the specific time (for example, if the dry bulb temperature is 15 C at the end of the hour from 6 to 7 the output value is 15 C at 7). If the output value is an average value over a specific time period, report the time for the value at the midpoint of the time period (for example, if the dry bulb temperature is an average of 12 C over the hour from 6 to 7 the output value is 12 C at 6.5).

6.x.1.3 Sub-hourly Outputs

The following outputs shall be provided at each timestep of the days specified for each test case in Table 7:

- Dry bulb temperature (C)
- Relative humidity (%)
- Sum of total, beam, and diffuse solar radiation incident on each surface (W/m2)

For each value, provide the time for the value. If the output value is an instantaneous value at a specific time, report the time for the value at the specific time (for example, if the dry bulb temperature is 15 C at the end of the 15 minute timestep from 6 to 6:15 the output value is 15 C at 6.25). If the output value is an average value over a specific time period, report the time for the value at the midpoint of the time period (for example, if the dry bulb temperature is an average of 12 C over the 15 minute timestep from 6 to 6:15 the output value is 12 C at 6.125).

The following outputs shall be provided integrated hourly for the days specified for each test case in Table 7:

- Total incident horizontal solar radiation (Wh/m2)
- Total incident horizontal beam solar radiation (Wh/m2)
- Total incident horizontal diffuse solar radiation (Wh/m2)

Informative Note: A specific timestep for the sub-hourly outputs is not specified. The choice of timestep is left up to the person running the tests, but a typical sub-hourly timestep for the software being tested is a good choice.