

Appendix C

Occupancy Simulation Schedule

Appendix C - Occupancy Simulation Schedule

Figure C.1 and Figure C.2 present the load simulation and occupancy schedules for the lab homes highly insulating windows demonstration. The bases for occupancy simulation were data and analysis developed in previous residential simulation activities (NREL 2010, ORNL 2010). The occupancy simulations and schedules developed here were derived specific to the home style, square footage, and an assumed occupancy of three adults. The per-person sensible heat generation and occupancy profiles were mapped from previous studies to be applicable to this demonstration.

Occupancy and connected-lighting heat generation were simulated by activating portable and fixed lighting fixtures throughout the home. Each bedroom was equipped with a table lamp to simulate human occupancy; occupancy and lighting loads in other areas of the home were simulated via fixed lighting. In both cases (portable and fixed lighting), schedules were programmed into the electrical panel for run times commensurate with identified use profiles. The profiles enabled sought to match daily total occupancy characteristics with less emphasis on defined hourly simulation.

This set of experiments focused on sensible loads only; latent loads and their generation will be simulated in the next set of experiments detailing the cooling season implications of the high-performance windows.

Figure C.1. Daily Occupancy Schedules and Simulated Load

Hours of Day	Simulation Strategy	Simulated Watts	Load Locations
1 a.m. – 7 a.m.	3 60-Watt table lamps	180	Lamps in master and each bedroom
7 a.m. – 8 a.m.	3 60-Watt table lamps	180	Lamps in master and each bedroom
8 a.m. – 9 a.m.	1 60-Watt table lamp	60	Lamp in master
9 a.m. – 4 p.m.	1 60-Watt table lamp	60	Lamp in master
4 p.m. – 5 p.m.	1 60-Watt table lamp	60	Lamp in master
5 p.m. – 6 p.m.	2 60-Watt table lamps	120	Lamps in master and East bedroom
6 p.m. – 9 p.m.	3 60-Watt table lamps	180	Lamps in master and each bedroom
9 p.m. – 12 p.m.	3 60-Watt table lamps	180	Lamps in master and each bedroom
Wattage Totals		3,180	

Figure C.2. Daily Lighting Schedules and Simulated Load

Hours of Day	Simulation Strategy	Simulated Watts	Load Locations
1 a.m. – 4 a.m.	Ceiling fixture, 1 60-Watt lamp	60	Hall fixture
4 a.m. – 5 a.m.	Ceiling fixture, 2 60-Watt lamps	120	Entry and living room fixtures
5 a.m. – 6 a.m.	2 ceiling fixtures, 2 60-Watt lamps each	240	Kitchen fixtures
6 a.m. – 7 a.m.	2 ceiling fixtures, 2 60-Watt lamps each	240	Kitchen fixtures
7 a.m. – 8 a.m.	2 ceiling fixtures, 2 60-Watt lamps each	240	Kitchen fixtures
8 a.m. – 9 a.m.	Ceiling fixture, 2 60-Watt lamps	120	Kitchen fixtures
9 a.m. – 3 p.m.	Ceiling fixture, 1 60-Watt lamp	60	Hall fixture
3 p.m. – 4 p.m.	Ceiling fixture, 2 60-Watt lamps	120	Entry and living room fixtures
4 p.m. – 5 p.m.	2 ceiling fixtures, 2 60-Watt lamps each	240	Kitchen fixtures

Figure C.2. (Contd)

Hours of Day	Simulation Strategy	Simulated Watts	Load Locations
5 p.m. – 6 p.m.	3 ceiling fixtures, 2 60-Watt lamps each	360	Kitchen and entry fixtures
6 p.m. – 7 p.m.	5 ceiling fixtures, 2 60-Watt lamps each	600	Master, kitchen, and 2 bedroom fixtures
7 p.m. – 8 p.m.	5 ceiling fixtures, 2 60-Watt lamps each	600	Master, kitchen, and 2 bedroom fixtures
8 p.m. – 9 p.m.	5 ceiling fixtures, 2 60-Watt lamps each	600	Master, kitchen, and 2 bedroom fixtures
9 p.m. – 10 p.m.	4 ceiling fixtures, 1 and 2 60-Watt lamps each	420	Master, kitchen and hall fixtures
10 p.m. – 11 p.m.	2 ceiling fixtures, 2 60-Watt lamps each	240	Kitchen fixtures
11 p.m. – 12 p.m.	Ceiling fixture, 1 60-Watt lamp	60	Hall fixture
Wattage Totals		4,800	

C.1 References

NREL 2010. *Building America House Simulation Protocols*. National Renewable Energy Laboratory, Golden, Colorado 2010. TP-550-49426

ORNL 2010. Tennessee Valley Authority's Campbell Creek Energy Efficiency Homes Project: 2010 First Year Performance Report July 1, 2009 - August 31, 2010. Oak Ridge National Laboratory, Oak Ridge, Tennessee, 2010. ORNL/TM-2010/206