DOE Commercial Building Benchmarks
New Construction
Summary of Changes from v1.0_3.0 to v1.1_3.1
May 5, 2009

Applicable Model(s)	Applicable Model Abbreviated Name(s)	Change
All models	(all)	Run with EnergyPlus v3.1 instead of v3.0
All models	(all)	Updated header text to reflect changes
All models	(all)	U-values and SHGCs on North windows converted to be identical to those on East, South, and West windows
All models	(all)	Default ventilation rates come from ASHRAE 62-1999
All models	(all)	Added exterior façade lighting
All models	(all)	Infiltration recalculated from 0.3 ACH to 0.4 cfm/ft^2 at 75 Pa
All models	(all)	No thermostat setback on winter design days
All models	(all)	Updated against Benchmarks documentation: wall types, roof types, slab types, elevators
All models	(all)	Changed to match ASHRAE 90.1-2004: fan power, heating efficiencies, cooling efficiencies, use of air-side economizers
Fast Food Restaurant, Hospital, Large Hotel, Large Office, Medium Office, Mid-rise Apartments, Outpatient facility, Stand-alone Retail, Sit-down Restaurant, Small Hotel, Small Office, Strip Mall	FFRest, Hospital, LgHotel, LgOff, MdOff, MRapt, OutP, Retail, SDRest, SmHotel, SmOff, StMall	Used ASHRAE 62.1-2004 default values for occupant densities.
Hospital	Hospital	Zone OFFICE1_MULT4_FLR_1: changed multiplier from 4 to 5
Hospital	Hospital	Kitchen loads: Elec 80.70 W/m2, Gas 457.3 W/m2
Hospital	Hospital	SHW temperature set to 49C (120F)
Hospital	Hospital	Minimum supply flows and humidity controls as outlined in AIA Guide 2001
Hospital	Hospital	Supply air temp. changed from 13C (55F) to 11C (52F) for humidity control.
Hospital	Hospital	Changed ER exam room plug loads from 2 W/sf to 3 W/sf, per Green Guide to Health Care (GGHC) v2.2.
Hospital	Hospital	Changed lobby plug loads from 0.75 W/sf to 0.10 W/sf, per GGHC v2.2.
Hospital	Hospital	Changed ICU area plug loads from 3 W/sf to 1 W/sf, per GGHC v2.2.
Hospital	Hospital	Changed patient room plug loads from 0.75 W/sf to 1 W/sf, per GGHC v2.2.
Hospital	Hospital	Used constant-volume systems to serve ER, OR, ICU, and patient room areas.
Kitchen zones in: Fast Food Restaurant, Hospital, Large Hotel, Primary School, Secondary School, Sit-down Restaurant	FFRest, Hospital, LgHotel, Sch_pri, Sch_sec, SDRest	Exhaust fan now modeled as a plug load in kitchen zone with fraction of lost heat = 100%. This gives more flexibility with scheduling.
Kitchen zones in: Fast Food Restaurant, Hospital, Large Hotel, Primary School, Secondary School, Sit-down Restaurant	FFRest, Hospital, LgHotel, Sch_pri, Sch_sec, SDRest	Added MinOA schedule for kitchens that accounts for transfer air.
Kitchen zones in: Fast Food Restaurant, Hospital, Large Hotel, Primary School, Secondary School, Sit-down Restaurant	FFRest, Hospital, LgHotel, Sch_pri, Sch_sec, SDRest	Adjusted equipment fraction lost, latent, and radiant.
Large Hotel	LgHotel	Replaced steel frame construction with 90.1-2004 mass wall residential constructions.
Large Hotel	LgHotel	Kitchen loads: Elec 508 W/m2, Gas 2419.26 W/m2

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Large Hotel	LgHotel	Dining & Banquet loads: Elec 67.82 W/m2
Large Hotel, Small Hotel	LgHotel, SmHotel	Laundry room: recalculated for 65% peak occupancy and correct heat of vaporization, included gas dryers
Large Hotel, Small Hotel	LgHotel, SmHotel	Adjusted room occupancy schedules to peak at 65%
Large Hotel, Large Office, Medium Office, Outpatient facility, Primary School, Secondary School, Small Hotel, Small Office	LgHotel, LgOff, MdOff, OutP, Sch_pri, Sch_sec, SmHotel, SmOff	Slab floor is carpet pad over 4in concrete instead of 8 in concrete
Hospital, Large Office, Medium Office, Primary School, Secondary School	Hospital, LgHotel, LgOff, MdOff, Sch_pri, Sch_sec	VAV terminal operation changed from reverse-acting to normal
Midrise Apartment, Small Hotel	MRapt, SmHotel	Add unit heaters (15.56C constant htg setpoint) to previously unconditioned zones to prevent extremely cold zones
Midrise Apartment	MRapt	Ventilation changed to 90 cfm per apartment.
Outpatient	OutP	SHW load: 5.6 g/h/floor, 21.04 L/h/floor
Primary School	Sch_pri	Reduced occupancy schedules to 75% (650 students total).
Primary School, Secondary School	Sch_pri, Sch_sec	SHW in restrooms: 56.5 g/h (214 L/h) ASHRAE 2007 Handbook
Stand-alone retail	Retail	Removed extra "floor" in the core zone
Stand-alone retail	Retail	Building height changed from 12 ft to 20 ft (6.1 m)
Large Hotel (retail areas), Stand-alone Retail, Strip Mall	LgHotel, Retail, StMall	Sales occupancy: 66.67 ft^2/person, 16.15 person/100m^2
Primary School	Sch_pri	Name changed from "Elementary School" to "Primary School"
Secondary school	Sch_sec	Name changed from "High School" to "Secondary School"
Primary School, Secondary School	Sch_pri, Sch_sec	Minimum OA schedules to zero on weekends and holidays
Primary School, Secondary School	Sch_pri, Sch_sec	Removed people from main corridor and lobby
Secondary school	Sch_sec	Lighting power densities (LPDs) changed to ASHRAE 90.1-2004 (previously 90.1-1999).
Secondary school	Sch_sec	Cafeteria electric loads: 19.26 W/m^2
Secondary school	Sch_sec	Occupancy schedules reduced to peak of 70% (1200 students)
Secondary school	Sch_sec	Gym SHW load: 189.5 g/h (717.23 L/h) ASHRAE 2007 Handbook
Small Hotel	SmHotel	Infiltration schedule no longer has any zero values
Small Hotel	SmHotel	Guest room LPD changed to ASHRAE 90.1-2004 value of 11.84 W/m^2
Small Hotel	SmHotel	Use 90.1 residential constructions instead of non-residential.
Small Hotel	SmHotel	Guest room plug loads schedule set to constant 20% for unoccupied rooms
Small Hotel	SmHotel	Ventilation air no longer supplied through DOAS; is brought in by PTACs instead
Large Hotel, Small Hotel	LgHotel, SmHotel	Guest rooms ventilation decreased from 65 cfm/room to 30 cfm/room
Warehouse	ware	No carpet over the 8in concrete slab.
Warehouse	ware	HVAC now provided by unit heater with ventilation
Warehouse	ware	Fine and bulk storage: added schedules with expanded set points and no setback