

# Data Types

Data Type	Description	JSON Schema Type	Examples
Integer	A positive or negative whole number (i.e., a number that can be written without a fractional part).	integer	3, 19, -4
Numeric	A number that may include a fractional part with optional leading sign and optional exponent (engineering notation).	number	3.43, 0, -4, 1.03e4
Boolean	True or false.	boolean	true, false
String	A sequence of characters of any length using any (specified) character set.	string	Indirect evaporative cooler
Null	Indicator that no value is provided. Only used in combination with other data types, e.g., 'Number/Null'.	null	null

# ConditioningType

Enumerator	Description	Notes
HEATED_AND_COOLED	Heated and cooled	
HEATED_ONLY	Heated only	
SEMIHEATED	Semiheated	
UNCONDITIONED	Unconditioned	
PLENUM	Plenum	

# UseClassType

Enumerator	Description	Notes
AUTOMOTIVE_FACILITY	Automotive facility	
CONVENTION_CENTER	Convention center	
COURTHOUSE	Courthouse	
DINING_BAR_LOUNGE_LEISURE	Dining: Bar lounge/leisure	
DINING_CAFETERIA_FAST_FOOD	Dining: Cafeteria/fast food	
DINING_FAMILY	Dining: Family	
DORMITORY	Dormitory	
EXERCISE_CENTER	Exercise center	
FIRE_STATION	Fire station	
GYMNASIUM	Gymnasium	
HEALTH_CARE_CLINIC	Health-care clinic	
HOSPITAL	Hospital	
HOTEL_MOTEL	Hotel/motel	
LIBRARY	Library	
MANUFACTURING_FACILITY	Manufacturing facility	
MOTION_PICTURE_THEATER	Motion picture theater	
MULTIFAMILY	Multifamily	
MUSEUM	Museum	
OFFICE	Office	
PARKING_GARAGE	Parking garage	
PENITENTIARY	Penitentiary	
PERFORMING_ARTS_THEATER	Performing arts theater	
POLICE_STATION	Police station	
POST_OFFICE	Post office	
RELIGIOUS_FACILITY	Religious facility	
RETAIL	Retail	
SCHOOL_UNIVERSITY	School/university	
SPORTS_ARENA	Sports arena	
TOWN_HALL	Town hall	
TRANSPORTATION	Transportation	
WAREHOUSE	Warehouse	
WORKSHOP	Workshop	
ATRIUM_LOW	Atrium - Low	
ATRIUM_MEDIUM	Atrium - Medium	
ATRIUM_HIGH	Atrium - High	
AUDIENCE_SEATING_AREA_AUDITORIUM	Audience Seating Area - Auditorium	
AUDIENCE_SEATING_AREA_GYMNASIUM	Audience Seating Area - Gymnasium	
AUDIENCE_SEATING_AREA_MOTION_PICTURE_THEATER	Audience Seating Area - Motion picture theater	
AUDIENCE_SEATING_AREA_PENITENTIARY	Audience Seating Area - Penitentiary	
AUDIENCE_SEATING_AREA_PERFORMING_ARTS_THEATER	Audience Seating Area - Performing arts theater	
AUDIENCE_SEATING_AREA_RELIGIOUS_FACILITY	Audience Seating Area - Religious facility	
AUDIENCE_SEATING_AREA_SPORTS_ARENA	Audience Seating Area - Sports arena	
AUDIENCE_SEATING_AREA_ALL_OTHER	Audience Seating Area - All other	
BANKING_ACTIVITY_AREA	Banking Activity Area	
CLASSROOM_LECTURE_HALL_TRAINING_ROOM_PENITENTIARY	Classroom/Lecture Hall/Training Room - Penitentiary	
CLASSROOM_LECTURE_HALL_TRAINING_ROOM_ALL_OTHER	Classroom/Lecture Hall/Training Room - All other	
CONFERENCE_MEETING_MULTIPURPOSE_ROOM	Conference/Meeting/Multipurpose Room	
CONFINEMENT_CELLS	Confinement Cells	
COPY_PRINT_ROOM	Copy/Print Room	
CORRIDOR_FACILITY_FOR_THE_VISUALLY_IMPAIRED	Corridor - Facility for the visually impaired (and not used primarily by the staff)	
CORRIDOR_HOSPITAL	Corridor - Hospital	
CORRIDOR_ALL_OTHERS	Corridor - All others	
COURT_ROOM	Court room	

Enumerator	Description	Notes
COMPUTER_ROOM	Computer Room	
DINING_AREA_PENITENTIARY	Dining Area - Penitentiary	
DINING_AREA_FACILITY_FOR_THE_VISUALLY_IMPAIRED	Dining Area - Facility for the visually impaired (and not used primarily by the staff)	
DINING_AREA_BAR_LOUNGE_OR_LEISURE_DINING	Dining Area - Bar/lounge or leisure dining	
DINING_AREA_CAFETERIA_OR_FAST_FOOD_DINING	Dining Area - Cafeteria or fast food dining	
DINING_AREA_FAMILY_DINING	Dining Area - Family dining	
DINING_AREA_ALL_OTHERS	Dining Area - All others	
ELECTRICAL_MECHANICAL_ROOM	Electrical/Mechanical Room	
EMERGENCY_VEHICLE_GARAGE	Emergency Vehicle Garage	
FOOD_PREPARATION_AREA	Food Preparation Area	
GUEST_ROOM	Guest Room	
LABORATORY_IN_OR_AS_A_CLASSROOM	Laboratory - In or as a classroom	
LABORATORY_ALL_OTHERS	Laboratory - All others	
LAUNDRY_WASHING_AREA	Laundry/Washing Area	
LOADING_DOCK_INTERIOR	Loading Dock, Interior	
LOBBY_FACILITY_FOR_THE_VISUALLY_IMPAIRED	Lobby - Facility for the visually impaired (and not used primarily by the staff)	
LOBBY_ELEVATOR	Lobby - Elevator	
LOBBY_HOTEL	Lobby - Hotel	
LOBBY_MOTION_PICTURE_THEATER	Lobby - Motion picture theater	
LOBBY_PERFORMING_ARTS_THEATER	Lobby - Performing arts theater	
LOBBY_ALL_OTHERS	Lobby - All others	
LOCKER_ROOM	Locker Room	
LOUNGE_BREAKROOM_HEALTH_CARE_FACILITY	Lounge/Breakroom - Health care facility	
LOUNGE_BREAKROOM_ALL_OTHERS	Lounge/Breakroom - All others	
OFFICE_ENCLOSED_AND_SMALL	Office - Enclosed and small	
OFFICE_ENCLOSED_AND_LARGE	Office - Enclosed and large	
OFFICE_OPEN_PLAN	Office - Open plan	
PARKING_AREA_INTERIOR	Parking Area, Interior	
PHARMACY_AREA	Pharmacy Area	
RESTROOM_FACILITY_FOR_THE_VISUALLY_IMPAIRED	Restroom - Facility for the visually impaired (and not used primarily by the staff)	
RESTROOM_ALL_OTHERS	Restroom - All others	
SALES_AREA	Sales Area	
SEATING_AREA_GENERAL	Seating Area, General	
STAIRWAY	Stairway	
STAIRWELL	Stairwell	
STORAGE_ROOM_SMALL	Storage Room - Small	
STORAGE_ROOM_LARGE	Storage Room - Large	
VEHICULAR_MAINTENANCE_AREA	Vehicular Maintenance Area	
FACILITY_FOR_THE_VISUALLY_IMPAIRED_CHAPEL	Facility for the Visually Impaired - Chapel (used primarily by residents)	
FACILITY_FOR_THE_VISUALLY_IMPAIRED_RECREATION_ROOM_COMMON_LIVING_ROOM	Facility for the Visually Impaired - Recreation room/common living room (and not used primarily by staff)	
CONVENTION_CENTER_EXHIBIT_SPACE	Convention Center — Exhibit Space	
DORMITORY_LIVING_QUARTERS	Dormitory — Living Quarters	
FIRE_STATION_SLEEPING_QUARTERS	Fire Station — Sleeping Quarters	
GYMNASIUM_FITNESS_CENTER_EXERCISE_AREA	Gymnasium/Fitness Center - Exercise area	
GYMNASIUM_FITNESS_CENTER_PLAYING_AREA	Gymnasium/Fitness Center - Playing area	
HEALTHCARE_FACILITY_EXAM_TREATMENT_ROOM	Healthcare Facility - Exam/treatment room	
HEALTHCARE_FACILITY_IMAGING_ROOM	Healthcare Facility - Imaging room	
HEALTHCARE_FACILITY_MEDICAL_SUPPLY_ROOM	Healthcare Facility - Medical supply room	
HEALTHCARE_FACILITY_NURSERY	Healthcare Facility - Nursery	
HEALTHCARE_FACILITY_NURSES_STATION	Healthcare Facility - Nurse's station	

Enumerator	Description	Notes
HEALTHCARE_FACILITY_OPERATING_ROOM	Healthcare Facility - Operating room	
HEALTHCARE_FACILITY_PATIENT_ROOM	Healthcare Facility - Patient room	
HEALTHCARE_FACILITY_PHYSICAL_THERAPY_ROOM	Healthcare Facility - Physical therapy room	
HEALTHCARE_FACILITY_RECOVERY_ROOM	Healthcare Facility - Recovery room	
LIBRARY_READING_AREA	Library - Reading area	
LIBRARY_STACKS	Library - Stacks	
MANUFACTURING_FACILITY_DETAILED_MANUFACTURING_AREA	Manufacturing Facility - Detailed manufacturing area	
MANUFACTURING_FACILITY_EQUIPMENTROOM	Manufacturing Facility - Equipment room	
MANUFACTURING_FACILITY_EXTRA_HIGH_BAY_AREA	Manufacturing Facility - Extra high bay area	
MANUFACTURING_FACILITY_HIGH_BAY_AREA	Manufacturing Facility - High bay area	
MANUFACTURING_FACILITY_LOW_BAY_AREA	Manufacturing Facility - Low bay area	
MUSEUM_GENERAL_EXHIBITION_AREA	Museum - General exhibition area	
MUSEUM_RESTORATION_ROOM	Museum - Restoration room	
PERFORMING_ARTS_THEATER_DRESSING_ROOM	Performing Arts Theater — Dressing Room	
POST_OFFICE_SORTING_AREA	Post Office — Sorting Area	
RELIGIOUS_FACILITY_FELLOWSHIP_HALL	Religious Facility - Fellowship hall	
RELIGIOUS_FACILITY_WORSHIP_PULPIT_CHOIR_AREA	Religious Facility - Worship/pulpit/choir area	
RETAIL_FACILITIES_DRESSING_FITTING_ROOM	Retail Facilities - Dressing/fitting room	
RETAIL_FACILITIES_MALL_CONCOURSE	Retail Facilities - Mall concourse	
SPORTS_ARENA_PLAYING_AREA_CLASS_I_FACILITY	Sports Arena — Playing Area - Class I facility	
SPORTS_ARENA_PLAYING_AREA_CLASS_II_FACILITY	Sports Arena — Playing Area - Class II facility	
SPORTS_ARENA_PLAYING_AREA_CLASS_III_FACILITY	Sports Arena — Playing Area - Class III facility	
SPORTS_ARENA_PLAYING_AREA_CLASS_IV_FACILITY	Sports Arena — Playing Area - Class IV facility	
TRANSPORTATION_FACILITY_BAGGAGE_CAROUSEL_AREA	Transportation Facility - Baggage/carousel area	
TRANSPORTATION_FACILITY_AIRPORT_CONCOURSE	Transportation Facility - Airport concourse	
TRANSPORTATION_FACILITY_TICKET_COUNTER	Transportation Facility - Ticket counter	
WAREHOUSE_STORAGE_AREA_MEDIUM_TO_BULKY_PALLETIZED_ITEMS	Warehouse — Storage Area - Medium to bulky, palletized items	
WAREHOUSE_STORAGE_AREA_SMALLER_HAND_CARRIED_ITEMS	Warehouse — Storage Area - Smaller, hand-carried items	

## TransformerType

Enumerator	Description	Notes
DRY_TYPE	Dry Type	
FLUID_FILLED	Fluid Filled	
OTHER	Other	

## TransformerPhase

Enumerator	Description	Notes
SINGLE_PHASE	Single Phase	
THREE_PHASE	Three Phase	

## ASHRAE229

Data Element Name	Description	Data Type	Units	Range	Req	Notes
transformers	Electrical transformers at the building site	[[Transformer]]				Contains a list of transformers that convert electricity from a higher voltage to one used by the building, exterior lighting, and other services at the site.
buildings	Buildings on the site	[[Building]]				Contains a list of buildings on the site (often just one).
schedules	Schedules for internal loads, thermostats, equipment operation and control, and any other need.	[[Schedule]]				Contains a list of schedules used in model.
schedules_alternative_01	Alternative way of expressing schedules with only a few key values including a fingerprint-hash value	[[ScheduleAlternative01]]				Contains a list of schedules used in model.

## Building

Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Name of the Building	String			✓	
number_of_floors	Number of floors	Numeric		>=0	✓	
spaces	Spaces in the building	[[Space]]				Contains a list of spaces in the building.

## Space

Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Name fo the Space	String			✓	
floor_area	The floor area of a space within the building, including basements, mezzanine and intermediate-floored tiers, and penthouses with a headroom height of 7.5 ft or greater. It is measured from the exterior faces of walls or from the center-line of walls separating buildings, but excluding covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.	Numeric		>=0	✓	
conditioning_type	Space conditioning category				✓	

Data Element Name	Description	Data Type	Units	Range	Req	Notes
use_class	Whether space use types are building area types from Table 9.5.1 or space use types from Table 9.6.1				✓	

## Transformer

Data Element Name	Description	Data Type	Units	Range	Req	Notes
name	Transformer Name	String			✓	
type	The type of transformer				✓	
phase	The number of electrical phases				✓	
efficiency	Transformer efficiency	Numeric		>=0	✓	
capacity	Rated Capacity of the Transformer	Numeric	Va	>=0	✓	
peak_load	Annual Peak electric load on the transformer	Numeric	W	>=0	✓	
capacity_ratio	Annual Peak electric load of the transformer divided by the capacity	Numeric		>=0	✓	

## Schedule

Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Name of the Schedule	String			✓	
type	The type of schedule	String			✓	Not an enumerations because we only care that the type assigned by BEM tool matches across RMR
week_schedules	List of week schedules in annual schedule	[{WeekSchedule}]				Contains a list of week specficiations

## WeekSchedule

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Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Week Schedule Name	String			✓	
start_month	start month of assigned weeks	Integer		>=1, <=12	✓	
start_day	start day of month of assigned weeks	Integer		>=1, <=31	✓	
end_month	end month of assigned weeks	Integer		>=1, <=12	✓	
end_day	end day of month of assigned weeks	Integer		>=1, <=31	✓	
monday_day_schedule	Monday Schedule Name	{DaySchedule}			✓	
tuesday_day_schedule	Tuesday Schedule Name	{DaySchedule}			✓	
wednesday_day_schedule	Wednesday Schedule Name	{DaySchedule}			✓	
thursday_day_schedule	Thursday Schedule Name	{DaySchedule}			✓	
friday_day_schedule	Friday Schedule Name	{DaySchedule}			✓	
saturday_day_schedule	Saturday Schedule Name	{DaySchedule}			✓	
sunday_day_schedule	Sunday Schedule Name	{DaySchedule}			✓	
holiday_day_schedule	Holiday Schedule Name	{DaySchedule}			✓	
cooling_design_day_day_schedule	Cooling design day Schedule Name	{DaySchedule}			✓	
heating_design_day_day_schedule	Heating design day Schedule Name	{DaySchedule}			✓	

## DaySchedule

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Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Name of the Day Schedule	String			✓	
values	Hourly Values of Schedule	[Numeric] [1..24]			✓	

# ScheduleAlternative01

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Data Element Name	Description	Data Type	Units	Range	Req	Notes
id	Unique Identification Number	Numeric			✓	
name	Name of the Schedule	String			✓	
type	The type of schedule	String			✓	Not an enumerations because we only care that the type assigned by BEM tool matches across RMR
hash_fingerprint	A digital fingerprint or hash of all schedule values	Integer			✓	The hash algorithm would need to result in significant different hash values when only minor changes are made to the schedule and is primarily to check for sameness
equivalent_full_load_hours	Equivalent full load hours	Numeric			✓	The sum of the schedule values for entire year
average_value	The average value of the schedule	Numeric			✓	the average value of schedule for all hours in the schedule
average_occupied_value	The average value of the schedule during occupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
average_unoccupied_value	The average value of the schedule during unoccupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
fraction_of_occupied_hours_nonzero	Fraction of the occupied hours that are nonzero or 'on'	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
fraction_of_unoccupied_hours_nonzero	Fraction of the unoccupied hours that are nonzero or 'on'	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.

Data Element Name	Description	Data Type	Units	Range	Req	Notes
most_common_occupied_hour_value	Most common value of schedule during occupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
most_common_unoccupied_hour_value	Most common value of schedule during unoccupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
fraction_of_occupied_hours_at_most_common_value	Fraction of the occupied hours that are at the most common value during occupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.
fraction_of_unoccupied_hours_at_most_common_value	Fraction of the unoccupied hours that are at the most common value during unoccupied hours	Numeric			✓	The occupied and unoccupied time periods are defined elsewhere.