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ENERGY PERFORMANCE OF UNDERFLOOR AIR DISTRIBUTION SYSTEMS

Part V: EnergyPlus Development

APPENDIX E

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ENERGY PERFORMANCE OF UNDERFLOOR AIR DISTRIBUTION (UFAD) SYSTEMS PART V: ENERGYPLUS DEVELOPMENT

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1 VARIABLE SPEED FAN TERMINAL UNIT: ENERGYPLUS DOCUMENTATION

1.1 SINGLE DUCT:VAV:REHEAT:VS FAN – INPUT/OUTPUT REFERENCE

The VAV terminal unit with variable-speed (VS) fan and reheat coil is an air system terminal unit consisting of a variable speed fan in series with a heating coil. These units are usually employed in underfloor air distribution (UFAD) systems where the air is supplied at low static pressure through an underfloor plenum. The fan is used to control the flow of conditioned air that enters the space. When the fan is off the plenum pressure drives the minimum air flow through the terminal unit. At maximum cooling the fan runs at its maximum speed. At full heating the fan runs at its heating maximum – usually less than the cooling maximum flow rate. Thus this unit has two separate maximum flow rates – one for heating and one for cooling.

For cooling, control is maintained simply by varying the fan speed. For heating, the unit first tries to meet the heating load by varying the heating coil output while keeping the air flow at minimum (fan off). If this is not adequate the fan turns on and operates in variable flow mode up to the heating maximum flow rate.

This unit is modeled in EnergyPlus as a compound component – a variable speed fan and a heating coil in series in the air stream. The unit is blow through – the fan is upstream of the heating coil.

Field: Name of unit

A unique user assigned name for a particular VS fan VAV reheat terminal unit. Any reference to this unit by another object will use this name.

Field: Unit availability schedule

The name of the schedule (ref: Schedule) that denotes whether the unit can run during a given hour. A schedule value greater than 0 (usually 1 is used) indicates that the unit can be on during the hour. A value less than or equal to 0 (usually 0 is used) denotes that the unit must be off for the hour.

Field: Maximum cooling air volume flow rate

The maximum volumetric air flow rate through the unit in cubic meters per second when the thermostat is calling for cooling. Normally this is the same as the unit's fan maximum volumetric flow rate.

Field: Maximum heating air volume flow rate

The maximum volumetric air flow rate through the unit in cubic meters per second when the thermostat is calling for heating.

Field: Zone Minimum Air Flow Fraction

The minimum flow rate to the zone while the system is operating, specified as a fraction of the maximum air flow rate. For this unit this is the flow rate when the fan is off.

Field: Unit supply air inlet node

The name of the HVAC system node that is the air inlet node for the terminal unit. This is also the air inlet node for the unit's fan.

Field: Unit supply air outlet node

The name of the HVAC system node that is the air outlet node of the unit. This same node will be the unit heating coil's air outlet node. This node is also a zone inlet node.

Field: Heating coil air inlet node

The name of the HVAC system node that is the air inlet node of the unit's heating coil. The same node is the outlet node of the unit's fan. This is an internal node of this compound component.

Field: Hot water control node

The name of the HVAC system node which regulates the flow of hot water through the unit's hot water heating coil. This should be the same node as the water inlet node of the hot water coil. For gas or electric coils this field should be left blank.

Field: Fan object

The type of fan in the terminal unit. At this time the only type of fan allowed is *FAN:SIMPLE:VariableVolume*.

Field: Fan name

The name of the particular fan object in this terminal unit.

Field: Heating coil object

The type of heating coil in the terminal unit. The choices are:

COIL:Water:SimpleHeating

COIL:Electric:Heating

COIL:Gas:Heating.

Field: Heating coil name

The name of the heating coil object contained in this terminal unit.

Field: Max hot water flow

The maximum hot water volumetric flow rate in m^3/sec through the unit's heating coil. If the heating coil is not a hot water coil this field should be left blank.

Field: Min hot water flow

The minimum hot water volumetric flow rate in m^3/sec through the unit's heating coil. If the heating coil is not a hot water coil this field should be left blank.

Field: Heating Convergence Tolerance

The control tolerance for the unit heating output. The unit is controlled by matching the unit output to the zone demand. The model must be numerically inverted to obtain a specified output. The convergence tolerance is the error tolerance used to terminate the numerical inversion procedure. Basically this is the fraction:

$$\frac{\left|Q_{unit,out} - Q_{zone\ load}\right|}{Q_{zone\ load}} \leq ConvergenceTolerance$$

The default is 0.001.

Table 1: Full IDD specification for single duct VAV reheat with VS fan

```
SINGLE DUCT:VAV:REHEAT:VS FAN,
  A1,     \field Name of unit
          \required-field
  A2,     \field System availability schedule
          \required-field
          \type object-list
          \object-list ScheduleNames
  N1,     \field Maximum cooling air volume flow rate
          \required-field
          \type real
          \units m3/s
          \autosizable
          \Minimum 0.0
  N2,     \field Maximum heating air volume flow rate
          \required-field
          \type real
          \units m3/s
          \autosizable
          \Minimum 0.0
  N3,     \field Zone Minimum Air Flow Fraction
          \required-field
          \note fraction of cooling air flow rate
  A3,     \field Unit supply air inlet node
          \note same as fan inlet node
          \alpha
          \required-field
  A4,     \field Unit supply air outlet node
          \note same as heating coil air outlet node
          \note same as zone inlet node
          \alpha
          \required field
  A5,     \field heating coil air inlet node
          \note same as fan outlet node
          \alpha
          \required field
  A6,     \field Hot water control node
          \alpha
          \note same as hot water coil water inlet node
  A7,     \field Fan object
          \required field
          \type choice
          \key FAN:SIMPLE:VariableVolume
  A8,     \field Fan name
          \required field
          \type object-list
          \object-list FansVAV
  A9,     \field Heating coil object
          \type choice
          \key COIL:Water:SimpleHeating
          \key COIL:Electric:Heating
          \key COIL:Gas:Heating
  A10,    \field Heating coil name
          \type object-list
          \object-list HeatingCoilName
  N4,     \field Max hot water flow
          \type real
          \units m3/s
          \autosizable
          \ip-units gal/min
  N5,     \field Min hot water flow
          \type real
          \units m3/s
          \minimum 0.0
          \default 0.0
          \ip-units gal/min
  N6;     \field Heating Convergence Tolerance
          \type real
          \Minimum> 0.0
          \Default 0.001
```

Table 2: Example IDF inputs for single duct VAV reheat with VS fan

```
SINGLE DUCT:VAV:REHEAT:VS FAN,
    SPACE2-1 VAV Reheat,     !- Name of System
    ReheatCoilAvailSched,    !- System Availability schedule
    autosize,                !- Maximum cooling air volume flow rate
    autosize,                !- Maximum heating air volume flow rate
    0.05,                     !- Zone Minimum Air Flow Fraction
    SPACE2-1 ATU In Node,    !- Unit supply air inlet node
    SPACE2-1 In Node,        !- Unit supply air outlet node
    SPACE2-1 Zone Coil Air In Node,  !- heating coil air inlet node
    SPACE2-1 Zone Coil Water In Node,!- Hot water control node
    FAN:SIMPLE:VariableVolume,       !- Fan object
    SPACE2-1 Zone Fan,       !- Fan name
    COIL:Water:SimpleHeating,!- Heating coil object
    SPACE2-1 Zone Coil,      !- Heating coil name
    autosize,                !- Max hot water flow
    0.0,                     !- Min hot water flow
    0.001;                   !- Heating Convergence Tolerance

COIL:Water:SimpleHeating,
    SPACE2-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE2-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE2-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE2-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
    SPACE2-1 In Node;        !- Coil_Air_Outlet_Node

FAN:SIMPLE:VariableVolume,
    SPACE2-1 Zone Fan,       !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    125.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    0.0,                     !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    SPACE2-1 ATU In Node,    !- Fan_Inlet_Node
    SPACE2-1 Zone Coil Air In Node;   !- Fan_Outlet_Node
```

1.2 VARIABLE SPEED FAN TERMINAL UNIT - ENGINEERING REFERENCE

1.2.1 OVERVIEW

The VS fan VAV terminal unit (object name: Single Duct:VAV:Reheat:VSFan) is a typical VAV reheat unit with the addition of a variable-speed blower fan to assist in moving supply air from the plenum to the conditioned zone. It is typically used with under-floor air distribution systems (UFAD) where the supply air is sent at low static pressure through an under-floor supply plenum. The fan has two maximum flow rate settings: one for cooling and one for heating. The cooling maximum is usually the actual fan maximum while the heating maximum is a lesser flow rate. The fan is upstream of the heating coil (this is a blow-through unit). The heating coil can be hot-water, electric or gas. Cooling control is obtained by varying the supply air flow rate from the cooling maximum to the minimum flow rate. Heating control is established by varying both the heating coil output (or hot water flow rate for hot water coils) and the supply air flow rate. Note that for this unit the minimum supply air flow rate is the flow rate when the fan is off.

1.2.2 MODEL

The VS fan VAV terminal unit is modeled as a compound component consisting of two sub-components: a fan and a heating coil. In terms of EnergyPlus objects the fan is a *FAN:SIMPLE:VariableVolume* object and the heating coil is a *COIL:Water:SimpleHeating*, *COIL:Electric:Heating* or a *COIL:Gas:Heating*. The terminal unit is a forward model: its inputs are defined by the state of its inlets: namely its air inlet and its hot water inlet, if it has a hot water coil. The outputs of the model are the conditions of the outlet air stream: flow rate, temperature and humidity ratio. The terminal unit data and simulation are encapsulated in the module *SingleDuct*. The main simulation routine for the unit within the module is *SimVAVVS*.

1.2.3 INPUTS AND DATA

The user describes the terminal unit by inputting the name and type of the heating coil and the name and type of the fan. The user must also specify the connectivity of the component by naming the inlet air node; the air node connecting the fan and heating coil (fan outlet, coil inlet); the unit air outlet node (same as the zone inlet node); and hot water inlet node (if any). Maximum flow rates need to be specified (although these can be autosized): maximum cooling and heating air flow rates and the maximum hot water flow rate (if there is a hot water coil). Minimum flow rates are specified by giving by giving a minimum flow fraction for the air flow and a volumetric flow rate minimum for the hot water. For the units with hot water coils the relative convergence tolerance for the hot water flow rate also needs to be input (or allowed to default).

All input data for the VS fan VAV terminal units is stored in the array *Sys*.

1.2.4 CALCULATION

Given the needed inputs, the output is calculated in subroutine *CalcVAVVS*. The temperature and humidity of the supply air stream are taken from the inlet air node. The inlet air flow rate and the hot water flow rate are passed in as parameters. If the coil is electric or gas the coil heating power is passed instead of the hot water flow rate. Then

1. The fan is simulated (call *SimulateFanComponents*). If the fan is off the fan outlet conditions are set to the inlet conditions.
2. The heating coil is simulated (call *SimulateWaterCoilComponents* if the coil is a hot water coil; call *SimulateHeatingCoilComponents* if the coil is gas or electric).

Finally the sensible load met by the terminal unit is calculated and passed back to the calling routine:

$$\dot{Q}_{out} = \dot{m}_{air} \cdot c_{p,air} \cdot (T_{air,out} - T_{air,zone})$$

Note that data is never explicitly passed between the sub-components. This is all handled automatically by the node connections and the data stored on the nodes.

1.2.5 SIMULATION AND CONTROL

From the result of the zone simulation we have the heating/cooling demand on the terminal unit $\dot{Q}_{tot}$. For the given inlet conditions *CalcVAVVS* will give us the terminal unit heating/cooling output. We need to vary the air or hot water flow rate or the heating coil power (for gas or electric coils) to make the unit output match the demand. To do this we need to numerically invert *CalcVAVVS*: given the output, we want one of the inputs – the air or hot water flow rate or the heating coil power. The numerical inversion is carried out by calling subroutine *SolveRegulaFalsi*. This is a general utility routine for finding the zero

of a function (the *residual* function) of a single independent variable. In this case the residual function calculates $(\dot{Q}_{tot} - \dot{Q}_{out}) / \dot{Q}_{tot}$. *SolveRegulaFalsi* varies either the air mass flow rate, the hot water mass flow rate or the heating coil power to zero the residual.

The unit is simulated in the following sequence.

1) Decide whether the unit is on or off. The unit is off if: a) it is scheduled off; b) the inlet air mass flow rate is zero; or c) the zone thermostat is in the deadband

2) If the unit is off, call *CalcVAVVS* with flow rates set to their minimum flows and return.

3) If the unit is on, we need to establish the boundaries of 4 conditioning regions: a) active cooling with fan on; b) active heating with fan on; c) active heating with fan off; d) passive cooling with fan off. The heating/cooling demand will fall into one of these regions. Once the correct region is determined, we will know which model input to vary for control and thus how to invert the calculation.

   a) To establish the boundaries of region a) we call *CalcVAVVS* twice: once with the supply air flow rate set to the cooling maximum, once with the cooling air flow rate set to the minimum. In both cases the heating coil output is at the minimum and the fan is on. Call the 2 cooling outputs $\dot{Q}_{cool,max,\,fanon}$ and $\dot{Q}_{cool,min,\,fanon}$. Remembering that EnergyPlus convention is that cooling loads are negative, then if $\dot{Q}_{tot} < \dot{Q}_{cool,max,\,fanon}$ the terminal unit can not meet the demand. Set the air mass flow rate to the cooling maximum and call *CalcVAVV* again. This concludes the simulation. If $\dot{Q}_{cool,max,\,fanon} < \dot{Q}_{tot} < \dot{Q}_{cool,min,\,fanon}$ the cooling demand is in the active cooling region. We hold the heating at the minimum, allow the supply air flow to vary between the cooling maximum and the minimum with the fan on, and call *SolveRegulaFalsi* to obtain the supply air flow rate that will produce the unit sensible cooling output that matches the demand. This concludes the simulation.

   b) To establish the boundaries of region b) call *CalcVAVVS* twice: once with the supply air flow rate set to the heating maximum, once with the supply air flow rate set to the minimum. In both calls, if the heating coil is a hot water coil, the hot water flow rate is at the maximum. For electric and gas coils, the heating power is set to the maximum at maximum supply air flow and to zero at the minimum supply air flow. In both calls the fan is set to be on. Call the 2 heating outputs returned from the two calls to *CalcVAVVS* $\dot{Q}_{heat,max,\,fanon}$ and $\dot{Q}_{heat,min,\,fanon}$. If $\dot{Q}_{heat,max,\,fanon} < \dot{Q}_{tot}$ the terminal unit can not meet the load. Set the air flow rate to the heating maximum and the hot water flow rate or heating coil power to the maximum and call *CalcVAVVS* again. This concludes the simulation for this case. If $\dot{Q}_{heat,min,\,fanon} < \dot{Q}_{tot} < \dot{Q}_{heat,max,\,fanon}$ the heating demand is in the active heating, fan on region. For a hot water coil we call *SolveRegulaFalsi* with the supply air flow rate as the input that is varied and the hot water flow rate set to the maximum. For electric and gas coils the coil power and the supply air flow rate are both varied together from their minimum to maximum in a call to *SolveRegulaFalsi*. The call to *SolveRegulaFalsi* concludes the simulation for this case.

   c) This region only applies to terminal units with a hot water coil. To establish the boundaries of region c) the fan is set to off, the supply air flow rate is set to minimum flow and *CalcVAVVS* is called twice: once with the hot water flow at maximum and once with the hot water flow at minimum. Call the two heating outputs $\dot{Q}_{heat,max,\,fanoff}$ and $\dot{Q}_{heat,min,\,fanoff}$. If $\dot{Q}_{tot}$ is between these values, the supply air flow rate is set to its minimum, the fan is set to off, and in the call to *SolveRegulaFalsi* the hot water flow rate is varied to meet the load. This concludes the simulation for this case.

If the cooling demand does not fall into cases a) – c), the unit is assumed to be in the passive cooling state: heating is off or at the minimum, the fan is off, and the minimum supply air flow is delivered to the zone.

> Note that the terminal unit output is never explicitly passed to another routine. Instead the output is saved as the outlet conditions on the terminal unit outlet air node. The node data is accessed when the terminal unit output is needed elsewhere in the program (in *SimZoneAirLoopEquipment* for instance).

1.2.6 REFERENCES

No relevant references.

2 DUCT: ENERGYPLUS DOCUMENTATION

2.1 DUCT – INPUT/OUTPUT REFERENCE

Duct is a component for air systems that is a direct analogue for Pipe in the fluid loops. It is used when it is necessary (due to the HVAC system configuration) to have a branch that has no functional components. This case most often arises for a bypass branch. Since every branch must have at least one component, the Duct component is used for this situation. The duct is a pass-through component; all of its inlet conditions are passed through unchanged to its outlet.

Field: Duct Name

This is the unique name for this component. Any reference to this component (in a Branch List, for instance) will refer to it by this name.

Field: Inlet Node Name

The name of the component's air inlet node.

Field: Outlet Node Name

The name of the component's air outlet node.

Table 3: IDD definition of the Duct component.

```
DUCT,
       \memo Passes inlet node state variables to outlet node state variables
   A1, \field DuctName
   A2, \field Inlet Node Name
   A3; \field Outlet Node Name
```

Table 4: Example input for Duct.

```
DUCT,
    VAV Sys 1 Bypass Duct,            !- DuctName
    VAV Sys 1 Bypass Duct Inlet Node, !- Inlet Node Name
    VAV Sys 1 Bypass Duct Outlet Node;!- Outlet Node Name
```

There are no outputs for Duct.

3 SETPOINT MANAGER:RETURN AIR BYPASS FLOW: ENERGYPLUS DOCUMENTATION

3.1 SET POINT MANAGER:RETURN AIR BYPASS FLOW – INPUT/OUTPUT REFERENCE

This manger is user in conjunction with a return air bypass configuration. This type of air system is basically a standard single duct system with the addition of a by pass duct that bypasses return air around the main system components – in particular, the central cooling coil. This allows the central cooling coil to sufficiently dehumidify the mixed air; the bypassed air is then added to the supply air stream to bring the supply air temperature up to the desire temperature set point. This scheme is very useful in situations where an higher than normal supply air temperature is used – for instance, in underfloor air distribution systems.

This manager relies on the program to figure out the system configuration and to extract the needed data from the system nodes. All the user needs to input is the name of the air system and a schedule giving the desired supply air temperature set point. No node names are required. The manager will establish a bypass air flow rate that upon mixing with the non-bypassed air will yield the temperature given in the schedule.

Field: Name

A unique, user assigned name for an instance of an Return Air Bypass Flow set point manager. Anywhere in the input that this set point manager is used, it is referred to by this name.

Field: Control variable

The type of variable that will be controlled. The choices are: TEMP (temperature), HUMRAT (humidity ratio), or FLOW (mass flow rate). For this type of set point manager this input should be FLOW.

Field: AIR PRIMARY LOOP name

The name of the Air Primary Loop (the central air system) which will use this set point manager to set its return air bypass flow rate.

Field: Schedule Name

The name of a schedule whose values are temperatures in ^{o}C. The schedule value for the hour is the set point for this type of set point manager. The set point is assumed to be at the air handler outlet.

Table 5: IDD definition for the Set Point Manager:Return Air Bypass Flow object

```
SET POINT MANAGER:RETURN AIR BYPASS FLOW,
       \min-fields 4
       \memo This set point manager determines the required
       \memo mass flow rate through a return air bypass duct
       \memo to meet the specified temperature setpoint
  A1, \field Name
      \required-field
      \reference SetPointManagers
  A2, \field Control variable:
       \type choice
       \key FLOW
  A3, \field name of AIR PRIMARY LOOP for which manager will be employed
      \required-field
      \type object-list
      \object-list AirPrimaryLoops
  A4 ; \field Schedule Name; scheduled temperature setpoint
       \type object-list
       \object-list ScheduleNames
```

Table 6: Example input for Set Point Manager with Return Air Bypass Flow.

```
SET POINT MANAGER:RETURN AIR BYPASS FLOW,
    RETURN AIR BYPASS Manager 1,
    FLOW,
    VAV Sys 1,
    Seasonal Reset Supply Air Temp Sch;
```

3.2 SET POINT MANAGER:RETURN AIR BYPASS FLOW - ENGINEERING REFERENCE

3.2.1 RETURN AIR BYPASS FLOW

This set point manager sets the air flow rate in a bypass duct such that when the bypassed and non-bypassed air are mixed the resutant air stream will be at the user-specified set point temperature.

The user specifies the desired setpoint temperature T_{set} through a input temperature schedule.

This temperature is modified to account for any potential fan heat gain:

$$T_{set,mod} = T_{set} - (T_{loop,out} - T_{mixer,out})$$

Here $T_{loop,out}$ is the temperature at the air loop outlet node and $T_{mixer,out}$ is the temperature at the outlet node of the bypass – nonbypass air mixer. Depending on the system configuration these may be the same node. Then

$$\dot{m}_{bypass} = (\dot{m}_{tot} T_{set,mod} - \dot{m}_{nonbypass} T_{nonbypass}) / T_{bypass}$$

where $\dot{m}_{tot}$ is the total supply air flowrate in kg/s sent to the zones, $\dot{m}_{nonbypass}$ is the nonbypassed air flowrate (the conditioned air), $T_{nonbypass}$ is the corresponding temperature just before mixing with the bypassed air, and T_{bypass} is the temperature of the bypassed (unconditioned) air. The resulting $\dot{m}_{bypass}$ is the mass flow rate setpoint for the bypass air branch.

4 UCSD UFAD INTERIOR MODEL CONTROLS: ENERGYPLUS DOCUMENTATION

4.1 UCSD UFAD INTERIOR MODEL CONTROLS – INPUT/OUTPUT REFERENCE

This model is applicable to interior spaces that are served by an underfloor air distribution system. The dominant sources of heat gain should be from people, equipment, and other localized sources located in the occupied part of the room. The model should be used with caution in zones which have large heat gains or losses through exterior walls or windows or which have considerable direct solar gain. The model predicts two temperatures in the room:

- An occupied subzone temperature (T_{OC}), representing the temperature in the region between the floor and the boundary of the upper subzone..
- An upper subzone temperature (T_{MX}) essential for overall energy budget calculations and for modeling comfort effects of the upper layer temperature.

The following fields are used to define an instance of the 'UCSD UFAD Interior Model Controls' object.

Field: Zone Name

This field provides the unique name of a zone described elsewhere in the file. A single instance of the 'UCSD UFAD Interior Model Controls' object is needed for each zone that is to be modeled using this method.

FIELD: GAIN DISTRIBUTION SCHEDULE

This field specifies the unique name of schedule defined elsewhere in the input file. The schedule values are the fractions of the convective portion of the internal gains in the occupied subzone that remain in the occupied subzone. The remainder of the convective portion of the internal gains in the occupied subzone enters the plumes and is carried to the upper subzone. The types of internal gains that are assumed to be located in the occupied subzone are:

- people
- task lights
- electric equipment
- gas equipment
- hot water equipment
- steam equipment
- other equipment
- baseboard heat

Types of internal gains that are assumed to be in the upper subzone are:

- general lights
- tubular daylighting devices
- high temperature radiant heaters

The schedule values should be between 0 and 1. A value of 1 means that all the convection gains from equipment, task lights and people are dispersed in the lower occupied subzone. Conversely a value of 0 puts all the lower subzone convective gains into the plumes rising into the upper well-mixed subzone.

Field: Number of plumes per occupant

This field specifies number of plumes per occupant. Plumes are associated with localized sources of convective heat gain from people and equipment. For example, a value of 2 would be used if each occupant has a computer that generates a separate plume that does not merge with the plume from the occupant in the lower, occupied, subzone.

Field: Number of diffusers per plume

The zone is served by diffusers mounted in floor panels located in the raised floor. This input specifies the average number of diffusers per plume. It can be estimated by dividing the total number of diffusers in the zone by the design occupancy level (number of people).

Field: Effective area of diffuser

This is the design air flow opening area in square meters of a single diffuser. The default value depends on the diffuser type. For swirl diffusers it is .011 m^2, for variable area diffusers .035 m^2, for DV diffusers .00548 m^2, and for linear bar grilles .062 m^2.

Field: Angle between diffuser slots and the vertical

This input describes the angle at which air emerges from the diffusers. It should be the angle in degrees between the vertical and the diffuser slots. The defaults depend on the diffuser type: for swirl diffusers it is 28 degrees, for variable area diffusers 45 degrees, for DV diffusers 72.9 degrees, and for linear bar grilles 15 degrees.

Field: Height of heat sources

The average height in meters of the occupied subzone heat sources (people, workstations) above the floor. But this should take into account the finite size of the heat sources: this input is the location of the point source that would produce the plume area at the actual heat source. A good input choice would be -.26 meters.

Field: Thermostat height

This field is the height in meters of the thermostat/temperature control sensor above the floor. The default is 1.1 meters.

Field: Comfort Height

The height in meters above the floor at which air temperature is calculated for comfort purposes. The air temperature at this height is used in calculating the available measures of comfort: Fanger, Pierce or KSU. The default is 1.1 meters.

Field: Temp. Difference Threshold for Reporting

This field specifies a minimum temperature difference between the upper subzone and the occupied subzone that will be used to trigger whether or not the UFAD auxiliary outputs will be calculated. These outputs are *UF Transition* Height and *UF Average Temp Gradient*. They are set to zero when the temperature difference is less than the threshold and the output *UF Zone Is Mixed* is set to 1.

The value should be greater than or equal to zero and is in units of degrees Centigrade. The default value is 0.4 degrees C.

Field: Diffuser type

The choices for this alpha field are *SWIRL* | *VARIABLE AREA* | *DISPLACEMENT*. The swirl and displacement diffusers are fixed area diffusers. The variable area diffusers change their effective area as a function of air flow rate and maintain an approximately constant exit velocity.

Field: Transition height

An optional field to allow the user to specify the transition height (meters above floor) rather than have the program calculate it.

Table 7: IDD definition of UCSD UFAD Interior Model Controls

```
UCSD UFAD INTERIOR MODEL CONTROLS,
\min-fields 12
  A1 , \field Zone Name
       \note Name of Zone being described. Any existing zone name
       \required-field
       \type object-list
       \object-list ZoneNames
  A2 , \field Gain Distribution Schedule
       \note fraction of the occupied subzone gains that remain in the subzone;
       \note i.e., don't go into plumes.
       \note 0<= Accepted Value <= 1.
       \note In this model 1 means all convective gains in the lower layer.
       \required-field
       \type object-list
       \object-list ScheduleNames
  N1 , \field Number of plumes per occupant
       \note Effective number of separate plumes per occupant in the occupied zone.
       \note Plumes that merge together in the occupied zone count as one.
       \required-field
       \type real
       \minimum> 0.0
       \default 1.0
  N2 , \field Number of diffusers per plume
       \type real
       \minimum> 0.0
       \autosizable
       \default autosize
  N3 , \field Design effective area of diffuser
       \type real
       \units m2
       \minimum> 0.0
       \autosizable
       \default autosize
  N4 , \field angle between diffuser slots and the vertical
       \type real
       \units deg
       \minimum 0.0
       \maximum 90.
       \autosizable
       \default autosize
  N5 , \field Height of heat sources
       \note average height of the internal heat sources (people, workstations) above the floor
       \type real
       \units m
       \minimum -2.0
       \default .61
  N6 , \field Thermostat height
       \note Height of thermostat/temperature control sensor above floor
       \units m
       \type real
       \minimum> 0.0
       \default 1.1
  N7 , \field Comfort Height
       \note Height at which air temperature is calculated for comfort purposes
       \units m
       \type real
       \minimum> 0.0
       \default 1.1
  N8 , \field Temp. Difference Threshold for Reporting
       \note Minimum temperature difference between predicted upper and lower layer
       \note temperatures above which DV auxilliary outputs are calculated.
       \note These outputs are 'DV Transition Height', 'DV Fraction Min Recommended Flow Rate'
       \note 'DV Average Temp Gradient' and 'DV Maximum Temp Gradient'.  They
       \note are set to negative values when the temperature difference is less than the
       \note threshold and the output 'DV Zone Is Mixed' is set to 1
       \units deltaC
       \required-field
       \type real
       \minimum 0.0
```

```
       \default 0.4
  A3 , \field Diffuser type
       \required-field
       \type choice
       \key SWIRL
       \key VARIABLE AREA
       \key DISPLACEMENT
       \default SWIRL
 N9;   \field Transition height
       \note user-specified height above floor of boundary between occupied and upper subzones
       \type real
       \units m
       \minimum> 0.0
       \autosizable
       \default autosize
```

Table 8: Example input UCSD UFAD Interior Model Controls

```
ROOMAIR MODEL,
    SPACE5-1 RoomAir Model,  !- Room-Air Model Name
    SPACE5-1,                !- Zone Name
    UCSD UFAD INTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy

UCSD UFAD INTERIOR MODEL CONTROLS,
    SPACE5-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    2.0,                     !- Number of plumes per occupant
    0.5,                     !- Number of diffusers per plume
    autosize,                !- Design effective area of diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -.26,                    !- Height of heat sources {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    SWIRL;                   !- Diffuser type
    1.3;                     !- Transition height {m}
```

4.2 UCSD UFAD INTERIOR ZONE MODEL – ENGINEERING REFERENCE

4.2.1 OVERVIEW

The UCSD UFAD Interior Zone Model provides a simple model for heat transfer and nonuniform vertical temperature profile for interior zones of a UFAD system. These zones are expected to be dominated by internal loads, a portion of which (such as occupants and workstations) will act to generate plumes. The plumes act to potentially create room air stratification, depending on the type & number of diffusers, the amount and type of load, and the system flowrate. In order to better model this situation the fully-mixed room air approximation that is currently used in most whole building analysis tools is extended to a two node approach, with the purpose of obtaining a first order precision model for vertical temperature profiles for the interior zones of UFAD systems. The use of 2 nodes allows for greatly improved prediction of thermal comfort and overall building energy performance for the increasingly popular UFAD systems.

The UCSD UFAD Interior Zone Model is one of the non-uniform zone models provided through the Room Air Manager in EnergyPlus. The intent is to provide a selection of useful non-uniform zone air models to enable the evaluation of air-conditioning techniques that use stratified or partially stratified room air. Such techniques include displacement ventilation (DV) and underfloor air distribution (UFAD) systems. The methodology can also include natural displacement ventilation and also wind-driven cross-ventilation (CV).

4.2.2 UNDERFLOOR AIR DISTRIBUTION SYSTEMS

UFAD systems represent, in terms of room air stratification, an intermediate condition between a well-mixed zone and displacement ventilation. Air is supplied through an underfloor plenum at low pressure through diffusers in the raised floor. The diffusers can be of various types: e.g., swirl, variable-area, displacement, and produce more or less mixing in the zone. UFAD systems are promoted as saving energy due to: higher supply air temperature; low static pressure; cooler conditions in the occupied subzone than in the upper subzone; and sweeping of some portion of the convective load (from ceiling lights, for instance) into the return air without interaction with the occupied region of the zone.

Modeling a UFAD system is quite complex and involves considerably more than just a non-uniform zone model. The zones' coupling to the supply and return plenums must be modeled accurately (particularly radiative transfer from a warm ceiling to a cool floor and on into the supply plenum by conduction). The supply plenum must be accurately modeled, giving a good estimate of the supply air temperature and conduction heat transfer between supply & return plenums through the slab. The HVAC system must be modeled including return air bypass and various types of fan powered terminal units.

The UCSD UFAD interior zone model is similar to the UCSD DV model. The most obvious difference is that the UFAD model has no separate near-floor subzone. Like the UCSD DV model it is a plume equation based multi-layer model (2 layers in this case). The zone is modeled as being divided into 2 well separated subzones which we denote as "occupied" and "upper". Each subzone is treated as having a single temperature. The boundary between the 2 subzones moves up & down each time step as a function of zone loads and supply air flow rate. Thus at each HVAC time step, the height of the boundary above the floor must be calculated, portions of surfaces assigned to each subzone, and a separate convective heat balance performed on each subzone.

4.2.3 MODEL DESCRIPTION

The UFAD interior zone model is based upon non-dimensional analysis of the system and using the non-dimensional description to make a comparison between full-scale UCB test chamber data & small-scale UCSD salt tank measurements.

In order to do the non-dimensional comparisons, we need to define two dimensionless parameters. One is Γ, and the other is ϕ. Lin & Linden [Lin & Linden, 2005] showed that in a UFAD system, the buoyancy flux of the heat source (B) and the momentum flux of the cooling jets (M) are the controlling parameters on the stratification. Since $[B] = L^4T^{-3}$ and $[M] = L^4T^{-2}$, we can have a length scale as $M^{3/4} / B^{1/2}$.

4.2.3.1 Definition of Γ for the single-plume single-diffuser basic model

We observed, in our small-scale experiments, that the total room height does not affect the interface position, or the height of the occupied zone. In other words, H might not be the critical length scale for the stratification. Therefore, we started to use $\sqrt{A}$ as the reference length. Then Γ is defined as

$$\Gamma = \frac{M^{3/4}}{B^{1/2}A^{1/2}} = \frac{(Q^2/A)^{3/4}}{B^{1/2}A^{1/2}} = \frac{Q^{3/2}}{A^{5/4}B^{1/2}} \quad (0.1)$$

Definition for multi-diffuser and multi-source cases

We only considered single-diffuser, single-source cases in above analysis. Suppose there are n equal diffusers and m equal heat sources in a UFAD room. We shall divide the number of diffusers up into a number of separate heat sources so that each subsection with n'=n/m diffusers per heat source will have the same stratification as other subsections. Further, the air flow and the heat load into the subsection Q' and B' will be $Q' = Q/m$ $B' = B/m$ respectively, where Q' and B' are the total air flow and the total

heat load for the entire UFAD space. Then the momentum flux each diffuser per heat source carries is $M_d = (\frac{1}{n'}Q')^2 / A$. (0.1) will be modified as

$$\Gamma = \frac{(n'M_d)^{3/4}}{B'^{1/2}\sqrt{n'A}} = \frac{Q'^{3/2}}{(n'A)^{5/4}B'^{1/2}} = \frac{Q^{3/2}}{m(n'A)^{5/4}B^{1/2}} \qquad (0.2)$$

Full-scale cases

Because B is the buoyancy flux of the heat sources and M is the momentum flux of the cooling jets, in a real full-scale room, we shall consider the total room net heat load (plume heat input, minus the room losses) and the total net flow rate coming from the diffusers (input room air flow, minus the room leakage). Further, if the diffuser is swirl type, the vertical momentum flux should be used.

$$\Gamma = \frac{(Q\cos\theta)^{3/2}}{m(n'A)^{5/4}(0.0281W)^{1/2}} \quad (0.3)$$

where, Q is the net flow rate coming out from all diffusers (m^3/s); W is the total net heat load (kW); A is the effective area of each diffuser (m^2); n' is the number of diffusers per heat source; θ is the angle between the diffuser slots and the vertical direction and m is the number of heat sources

4.2.3.2 Definition of Φ

In our theoretical model, two-layer stratification forms at steady state, provided that each diffuser carries the same momentum flux, and each heat source has the same heat load. We could define a dimensionless parameter Φ, which indicates the strength of stratification.

Small-scale cases

In our salt-water tank experiments, fluid density ρ is measured. Define that

$$\phi = \frac{\rho_u - \rho_l}{\rho_u - \rho_o} \quad (0.4)$$

where, ρ_υ and ρ_l are the fluid density of the upper layer and lower layer, separately; and ρ_o is the source density at the diffusers.

Therefore, $\rho_l = \rho_o$ gives $\phi = 1$, which means the largest stratification (displacement ventilation case); $\rho_l = \rho_u$ leads to $\phi = 0$, in which case there is no stratification (mixed ventilation case).

4.2.3.3 Full-scale cases

Similarly, we can define ϕ for full-scale cases by using temperature.

$$\phi = \frac{T_r - T_{oz}}{T_r - T_s} \quad (0.5)$$

where T_r, T_{oz}, and T_s are the return air temperature, the occupied zone temperature and the supply temperature, respectively (K). Again $\phi=1$ occurs in displacement ventilation; while $\phi=0$ happens in mixed ventilation.

4.2.3.4 Comparisons between full-scale UCB data and small-scale UCSD data

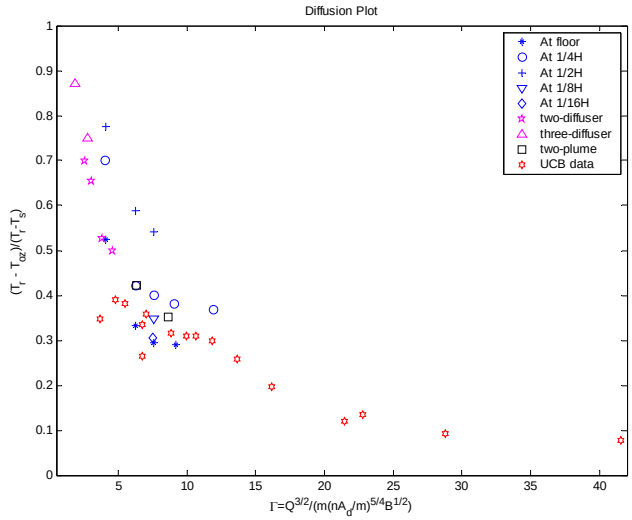
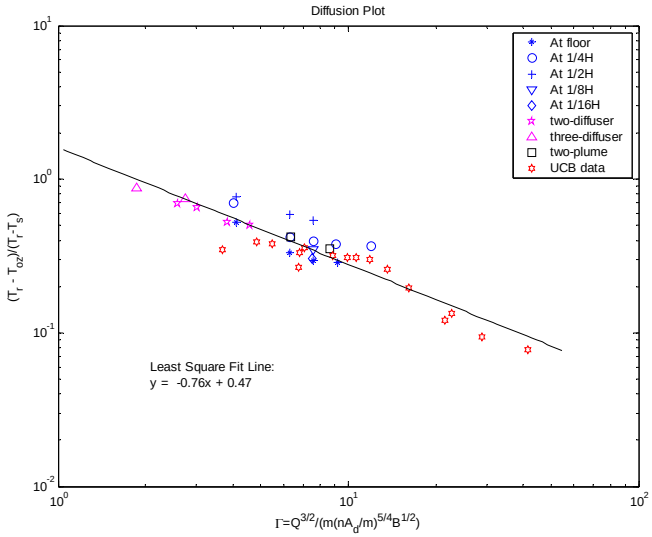


Figure 1: Data comparisons in the non-dimensional regular Γ–ϕ plot



(b)

Figure 2: Data comparisons in the non-dimensional log-log Γ–ϕ plot

Figure 1 and Figure 2 show the comparisons between UCB's data and the UCSD salt tank data in the Γ–ϕ plot. As seen in the figure, the full-scale and small-scale data are on the same trend curve. This provides the evidence that the salt-tank experiments have included most characteristics of a UFAD system. Note that big Γ (>20) of UCB's experiments all have large DDR (from 1.19 to 2.18). The largest DDR (2.18) even gives a negative $(T_r - T_{oz})/(T_r - T_s)$, which is NOT shown in the figure.)

We could work out the occupied zone temperature by using the least-square fitting line suggested in Figure 2. Hence the interface height is needed to determine a entire two-layer stratification. Figure 3 shows the dimensionless interface height $(h/\sqrt{n'A})$ of the UCSD small-scale experiments plotted against

Γ. Note that for the experiments with elevated heat source, the interface heights have been modified by $h' = h - \frac{1}{2}h_s$ where h_s is the vertical position of the elevated heat source. All data then are located along a line in Figure 3. Since the salt-tank experiments are concluded to represent important characteristics of a full-scale UFAD room, Figure 3 provides some guidelines for estimate the interface position in a real UFAD room.

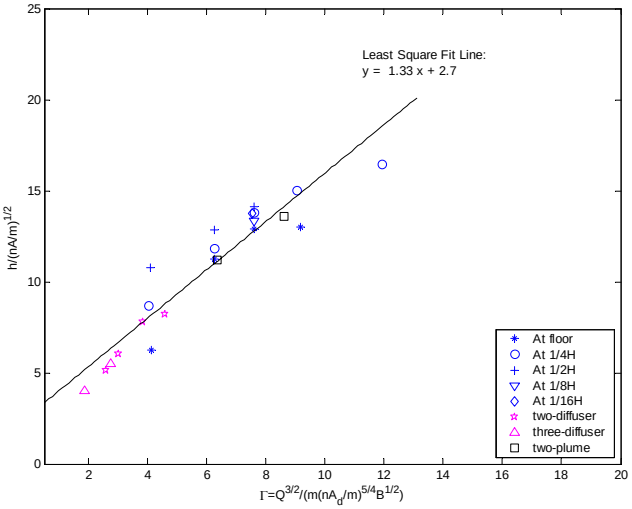


Figure 3: Non-dimensional interface height of small-scale experiments.

Formulas for EnergyPlus based on the dimensionless parameter Γ

If we have input including the supply temperature T_s (K); the number of diffusers n; the number of heat sources m; the vertical position of the heat sources h_s (m); the heat load W (kW); the effective area of a diffuser A (m^2); and the total supply air flow rate Q (m^3/s) then the output will be

$$T_r = \frac{0.0281W}{Qg}T_s + T_s \quad (0.6)$$

$$T_{oz} = T_r - 1.6\Gamma^{-0.76}(T_r - T_s) \quad (0.7)$$

$$h = \sqrt{\frac{n}{m}}A(7.43\ln(\Gamma) - 1.35) + \frac{1}{2}h_s \quad (0.8)$$

where T_r is the return temperature (K); T_{oz} is the occupied subzone temperature (K); h is the interface height (m); and Γ is defined above.

Implementation

The implementation closely follows the procedure described in the displacement ventilation zone model. The model predicts two temperatures that characterize the two main levels in the stratification of the room:

1. an occupied subzone temperature T_{oc} representing the temperature of the occupied region;

2. an upper level temperature T_{mx} representing the temperature of the upper, mixed region and the outflow temperature.

We will use (0.8) to calculate the interface height and do a heat balance calculation on each subzone. Γ is given by (0.3). The supply air flow rate $\dot{V}$ is obtained by summing all the air flows entering the zone: supply air, infiltration, ventilation, and inter-zone flow. The heat gain $\dot{Q}$ is estimated by summing all the convective internal gains located in the occupied subzone – task lights, people, equipment – and dividing this power equally among the n plumes. With these assumptions we can describe the implementation.

The UCSD UFI model is controlled by the subroutine *ManageUCSDUFModels* which is called from the *RoomAirModelManager*. The *RoomAirModelManager* selects which zone model will be used for each zone.

The calculation is done in subroutine *CalcUCSDUI*. First we calculate the convective heat gain going into the upper and lower regions.

$$\dot{Q}_{ocz} = \dot{Q}_{oc,conv} + \dot{Q}_{tl,conv} + \dot{Q}_{eleq,conv} + \dot{Q}_{gaseq,conv} + \dot{Q}_{otheq,conv} + \dot{Q}_{hw,conv} + \dot{Q}_{stmeq,conv} + \dot{Q}_{bb,conv} + \dot{Q}_{waterheater,conv} + \dot{Q}_{fuelcell,conv}$$

$$\dot{Q}_{mxz} = \dot{Q}_{gl,conv} + \dot{Q}_{ltp} + \dot{Q}_{htrad,conv}$$

$$\dot{Q}_{tot,conv} = \dot{Q}_{ocz} + \dot{Q}_{mxz}$$

Next we sum up the inlet air flows in the form of MCP (mass flow rate times the air specific heat capacity) and MCPT (mass flow rate times C_p times air temperature).

$$MCP_{zone} = MCP_i + MCP_{vent} + MCP_{mix}$$

$$MCP_{sys} = \sum_{inlets} \dot{m}_i C_{p,i}$$

$$\dot{m}_{systot} = \sum_{inlets} \dot{m}_i$$

$$MCP_{tot} = MCP_{zone} + MCP_{sys}$$

$$MCPT_{zone} = MCPT_i + MCPT_{vent} + MCPT_{mix}$$

$$MCPT_{sys} = \sum_{inlets} \dot{m}_i C_{p,i} T_i$$

$$MCPT_{tot} = MCPT_{zone} + MCPT_{sys}$$

The number of plumes per occupant $N_{plumesperpers}$ is a user input. The total number of plumes in the zone is:

$$N_{plumes} = N_{occ} \cdot N_{plumesperperson}$$

Using this we calculate the total power in the plumes and the power per plume.

$$\dot{Q}_{plumes} = \dot{Q}_{ocz}$$

$$\dot{Q}_{perplume} = \dot{Q}_{plumes} / N_{plumes}$$

The number of diffusers per plumes is also a user input. To obtain the number of diffusers in the zone:

$$N_{diffusers} = N_{plumes} \cdot N_{diffusersperplume}$$

The area A_{diff} is also a user input. For swirl diffusers and for displacement diffusers this area is used as input. For the variable area diffusers, though, we calculate the area. We assume 400 ft/min velocity at the diffuser and a design flow rate per diffuser is 150 cfm (.0708 m^3/s). The design area of the diffuser is 150 ft^3/min / 400 ft/min = .575 ft^2 = .035 m^2. Then the variable area each time step is

$$A_{diff} = \dot{m}_{systot} /(.0708 \cdot N_{diffusers})$$

We now calculate the height fraction Fr_{hb} (height of boundary layer divided by the total zone height).

$$\Gamma = \frac{(\dot{m}_{systot} \cdot \cos(\theta_{throw}))^{3/2}}{N_{plumes}(N_{diffusersperplume} \cdot A_{diff})^{5/4}(0.0281 \cdot 0.001 \cdot \dot{Q}_{plumes})^{1/2}}$$

$$Fr_{hb} = \frac{(N_{diffusersperplume} \cdot A_{diff})^{1/2}(7.43\ln(\Gamma) - 1.35 + 0.5H_s)}{H_{ceil}}$$

where θ_{throw} is a user input: the angle between the diffuser slots and vertical; and H_s is the source height above the floor (m).

Next we iterate over the following 2 steps.

4.2.3.5 Iterative procedure

1. Call subroutine *HcUCSDUF* to calculate a convective heat transfer coefficient for each surface in the zone, an effective air temperature for each surface, and HA_{mx}, HAT_{mx}, HA_{oc}, HAT_{oc}. Here HA is $\sum_{surfaces} h_{c,i} \cdot A_i$ for a region and HAT is $\sum_{surfaces} h_{c,i} \cdot A_i \cdot T_i$ for a region. The sum is over all the surfaces bounding the region; $h_{c,i}$ is the convective heat transfer coefficient for surface i, A_i is the area of surface i, and T_i is the surface temperature of surface i.
2. Calculate the two subzone temperatures: T_{oc} and T_{mx}.

The h_c's calculated in step 1 depend on the subzone temperatures. In turn the subzone temperatures depend on the HA and HAT's calculated in step 1. Hence the need for iteration

Next we describe each steps 1 and 2 in more detail.

Step 1

Subroutine *HcUCSDUF* is quite straightforward. It loops through all the surfaces in each zone and decides whether the surface is located in the upper, mixed subzone or the lower, occupied subzone, or if the surface is in both subzones. If entirely in one subzone the subzone temperature is stored in the surface effective temperature variable *TempEffBulkAir(SurfNum)* and h_c for the surface is calculated by a call to subroutine *CalcDetailedHcInForDVModel*. This routine uses the "detailed" natural convection coefficient

calculation that depends on surface tilt and $\Delta T^{1/3}$. This calculation is appropriate for situations with low air velocity.

For surfaces that bound 2 subzones, the subroutine calculates h_c for each subzone and then averages them, weighting by the amount of surface in each subzone.

During the surface loop, once the h_c for a surface is calculated, the appropriate subzone HA and HAT sums are incremented. If a surface is in 2 subzones the HA and HAT for each subzone are incremented based on the area of the surface in each subzone.

Step 2

The calculation of subzone temperatures follows the method used in the ***ZoneTempPredictorCorrector*** module and described in the section **Basis for the System and Zone Integration**. Namely a third order finite difference expansion of the temperature time derivative is used in updating the subzone temperatures. Otherwise the subzone temperatures are obtained straightforwardly by solving an energy balance equation for each subzone.

$$T_{oc} = (C_{air,oc} \cdot (3 \cdot T_{-1,oc} - (3/2) \cdot T_{-2,oc} + (1/3) \cdot T_{-3,oc}) + \dot{Q}_{ocz} \cdot Fr_{gains} + HAT_{oc} + MCPT_{tot}) \\ /((11/6) \cdot C_{air,oc} + HA_{oc} + MCP_{tot})$$

$$T_{mx} = (C_{air,mx} \cdot (3 \cdot T_{-1,mx} - (3/2) \cdot T_{-2,mx} + (1/3) \cdot T_{-3,mx}) + \dot{Q}_{ocz} \cdot (1 - Fr_{gains}) + \dot{Q}_{mxz} \\ + HAT_{mx} + T_{oc} \cdot MCP_{tot}) /((11/6) \cdot C_{air,mx} + HA_{mx} + MCP_{tot})$$

Here $C_{air,oc}$ and $C_{air,mx}$ are the heat capacities of the air volume in each subzone. $C_{air,mx}$ is calculated by

$$R_{air,mx} = V_{mx} \cdot (\Delta z_{mx} / z_{ceil}) \cdot \rho_{air,mx} \cdot c_{p,air,mx} \cdot Mul_{cap} /(\Delta t_z \cdot 3600)$$

$$C_{air,mx} = R_{air,mx} \cdot \Delta t_z / \Delta t_{sys}$$

The gains fraction Fr_{gains} is a user input via a schedule. It is the fraction of the convective gains in the occupied subzone that remain in that subzone.

The other subzone air heat capacities are calculated in the same manner.

Mixed calculation

The above iterative procedure assumed that the UFAD nonuniform zone model was appropriate: i.e., conditions were favorable temperature stratification in the zone. Now that this calculation is complete and the subzone temperatures and depths calculated, we check to see if this assumption was justified. If not, zone conditions must be recalculated assuming a well-mixed zone.

If $T_{mx} < T_{oc}$ or $MCP_{tot} \le 0$ or $H_{fr} \cdot H_{ceil} < \Delta z_{occ,\min}$ then the following mixed calculation will replace the UFAD interior zone calculation.

Note: $\Delta z_{occ,\min}$ is the minimum thickness of occupied subzone. It is set to 0.2 meters.

The mixed calculation iteratively calculates surface convection coefficients and room temperature just like the displacement ventilation calculation described above. In the mixed case however, only one zone temperature T_{avg} is calculated. The 3 subzone temperatures are then set equal to T_{avg}.

First, Fr_{hb} is set equal to zero.

Then the code iterates over these steps.

Calculate T_{avg} using

$$T_{avg} = (C_{air,z} \cdot (3 \cdot T_{-1,z} - (3/2) \cdot T_{-2,z} + (1/3) \cdot T_{-3,z}) + \dot{Q}_{tot,conv} + HAT_{oc} + HAT_{mx} + MCPT_{tot}) / ((11/6) \cdot C_{air,z} + HA_{oc} + HA_{mx} + MCP_{tot})$$

$$T_{mx} = T_{avg}$$

$$T_{oc} = T_{avg}$$

Call *HcUCSDUF* to calculate the h_c's.

Repeat step 1

Final calculations

The UFAD interior zone calculation finishes by calculating some report variables.

We define heights:

$$H_{trans} = Fr_{hb} \cdot H_{ceil}$$

$$H_{mxavg} = (H_{ceil} + H_{trans}) / 2$$

$$H_{ocavg} = H_{trans} / 2$$

Using the user defined comfort height we calculate the comfort temperature.

If mixing:

$$T_{comf} = T_{avg}$$

If UFAD:

If $H_{comf} < H_{ocavg}$

$$T_{comf} = T_{occ}$$

Else if $H_{comf} \geq H_{ocavg}$ and $H_{comf} < H_{mxavg}$

$$T_{comf} = (T_{oc}(H_{mxavg} - H_{comf}) + T_{mx}(H_{comf} - H_{ocavg})/(H_{mxavg} - H_{ocavg})$$

Else if $H_{comf} \geq H_{mxavg}$ and $H_{comf} < H_{ceil}$

$$T_{comf} = T_{mx}$$

Using the user defined thermostat height we calculate the temperature at the thermostat.
If mixing:

$$T_{stat} = T_{avg}$$

If UFAD:

If $H_{stat} < H_{ocavg}$

$$T_{stat} = T_{occ}$$

Else if $H_{stat} \geq H_{ocavg}$ and $H_{stat} < H_{mxavg}$

$$T_{stat} = (T_{oc}(H_{mxavg} - H_{stat}) + T_{mx}(H_{stat} - H_{ocavg})/(H_{mxavg} - H_{ocavg})$$

Else if $H_{stat} \geq H_{mxavg}$ and $H_{stat} < H_{ceil}$

$$T_{stat} = T_{mx}$$

The average temperature gradient is:

If $H_{mxavg} - H_{occavg} > 0.1$

$$GradT_{avg} = (T_{mx} - T_{occ})/(H_{mxavg} - H_{occavg})$$

else $GradT_{avg} = 0.0$

Finally, the zone node temperature is set to T_{mx}.

Other variables that are reported out are Γ and ϕ.

$$\phi = (T_{mx} - T_{occ})/(T_{mx} - T_{sup})$$

where T_{sup} is the zone supply air temperature.

4.2.4 REFERENCES

Lin, Y.J. and P.F. Linden. 2005. A model for an under floor air distribution system. Energy&Building, Vol. 37, pp. 399-409.

5 UCSD UFAD EXTERIOR MODEL CONTROLS: ENERGYPLUS DOCUMENTATION

5.1 UCSD UFAD EXTERIOR MODEL CONTROLS – INPUT/OUTPUT REFERENCE

This model is applicable to exterior spaces that are served by an underfloor air distribution system. The dominant sources of heat gain should be from people, equipment, and other localized sources located in the occupied part of the room, as well as convective gain coming from a warm window. The model predicts two temperatures in the room:

- An occupied subzone temperature (T_{OC}), representing the temperature in the region between the floor and the boundary of the upper subzone..
- An upper subzone temperature (T_{MX}) essential for overall energy budget calculations and for modeling comfort effects of the upper layer temperature.

The following fields are used to define an instance of the 'UCSD UFAD Exterior Model Controls' object.

Field: Zone Name

This field provides the unique name of a zone described elsewhere in the file. A single instance of the 'UCSD UFAD Interior Model Controls' object is needed for each zone that is to be modeled using this method.

FIELD: GAIN DISTRIBUTION SCHEDULE

This field specifies the unique name of schedule defined elsewhere in the input file. The schedule values are the fractions of the convective portion of the internal gains in the occupied subzone that remain in the occupied subzone. The remainder of the convective portion of the internal gains in the occupied subzone enters the plumes and is carried to the upper subzone. The types of internal gains that are assumed to be located in the occupied subzone are:

- people
- task lights
- electric equipment
- gas equipment
- hot water equipment
- steam equipment
- other equipment
- baseboard heat

Types of internal gains that are assumed to be in the upper subzone are:

- general lights
- tubular daylighting devices
- high temperature radiant heaters

The schedule values should be between 0 and 1. A value of 1 means that all the convection gains from equipment, task lights and people are dispersed in the lower occupied subzone. Conversely a value of 0 puts all the lower subzone convective gains into the plumes rising into the upper well-mixed subzone.

Field: Number of diffusers

The zone is served by diffusers mounted in floor panels located in the raised floor. This input specifies the total number of diffusers in the zone. For linear bar grille diffusers, the length of an individual diffuser is assumed to be 1.219 meters (4 feet).

Field: Design effective area of 1 diffuser

This is the design air flow opening area in square meters of a single diffuser. The default value depends on the diffuser type. For swirl diffusers it is .011 m^2, for variable area diffusers .035 m^2, for DV diffusers .00548 m^2, and for linear bar grilles .062 m^2.

Field: Angle between diffuser slots and the vertical

This input describes the angle at which air emerges from the diffusers. It should be the angle in degrees between the vertical and the diffuser slots. The defaults depend on the diffuser type: for swirl diffusers it is 28 degrees, for variable area diffusers 45 degrees, for DV diffusers 72.9 degrees, and for linear bar grilles 15 degrees.

Field: Position of plume vertex relative to floor

The average height in meters of the occupied subzone heat sources (people, workstations, window plume) above the floor. But this should take into account the finite size of the heat sources: this input is the location of the point source that would produce the plume area at the actual heat source. A good input choice would be -.5 meters.

Field: Thermostat height

This field is the height in meters of the thermostat/temperature control sensor above the floor. The default is 1.1 meters.

Field: Comfort Height

The height in meters above the floor at which air temperature is calculated for comfort purposes. The air temperature at this height is used in calculating the available measures of comfort: Fanger, Pierce or KSU. The default is 1.1 meters.

Field: Temp. Difference Threshold for Reporting

This field specifies a minimum temperature difference between the upper subzone and the occupied subzone that will be used to trigger whether or not the UFAD auxiliary outputs will be calculated. These outputs are *UF Transition* Height and *UF Average Temp Gradient.* They are set to zero when the temperature difference is less than the threshold and the output *UF Zone Is Mixed* is set to 1.

The value should be greater than or equal to zero and is in units of degrees Centigrade. The default value is 0.4 degrees C.

Field: Diffuser type

The choices for this alpha field are *SWIRL* | *VARIABLE AREA* | *DISPLACEMENT*. The swirl and displacement diffusers are fixed area diffusers. The variable area diffusers change their effective area as a function of air flow rate and maintain an approximately constant exit velocity.

Field: Transition height

An optional field to allow the user to specify the transition height (meters above floor) rather than have the program calculate it.

Table 9: IDD definition of UCSD UFAD Exterior Model Controls

```
UCSD UFAD EXTERIOR MODEL CONTROLS,
  \min-fields 11
  A1 , \field Zone Name
       \note Name of Zone being described. Any existing zone name
       \required-field
       \type object-list
       \object-list ZoneNames
  A2 , \field Gain Distribution Schedule
       \note fraction of the occupied subzone gains that remain in the subzone;
       \note i.e., don't go into plumes.
       \note 0<= Accepted Value <= 1.
       \note In this model 1 means all convective gains in the lower layer.
       \required-field
       \type object-list
       \object-list ScheduleNames
  N1 , \field Number of diffusers
       \note assume one plume
       \required-field
       \type real
       \minimum> 0.0
  N2 , \field Design effective area of 1 diffuser
       \type real
       \units m2
       \minimum> 0.0
       \autosizable
       \default autosize
  N3 , \field angle between diffuser slots and the vertical
       \type real
       \units deg
       \minimum 0.0
       \maximum 90.
       \autosizable
       \default autosize
  N4 , \field Position of plume vertex relative to floor
       \type real
       \units m
       \minimum -2.0
       \default -0.5
  N5 , \field Thermostat height
       \note Height of thermostat/temperature control sensor above floor
       \units m
       \type real
       \minimum> 0.0
       \default 1.1
  N6 , \field Comfort Height
       \note Height at which air temperature is calculated for comfort purposes
       \units m
       \type real
       \minimum> 0.0
       \default 1.1
  N7 , \field Temp. Difference Threshold for Reporting
       \note Minimum temperature difference between predicted upper and lower layer
       \note temperatures above which DV auxilliary outputs are calculated.
       \note These outputs are 'DV Transition Height', 'DV Fraction Min Recommended Flow Rate'
       \note 'DV Average Temp Gradient' and 'DV Maximum Temp Gradient'.  They
       \note are set to negative values when the temperature difference is less than the
       \note threshold and the output 'DV Zone Is Mixed' is set to 1
       \units deltaC
       \required-field
       \type real
       \minimum 0.0
       \default 0.4
  A3 , \field Diffuser type
       \required-field
       \type choice
       \key SWIRL
       \key VARIABLE AREA
       \key DISPLACEMENT
       \key LINEAR BAR GRILLE
```

```
       \default LINEAR BAR GRILLE
  N8 ; \field Transition height
       \note user-specified height above floor of boundary between occupied and upper subzones
       \type real
       \units m
       \minimum> 0.0
       \autosizable
       \default autosize
```

Table 10: Example input for UCSD UFAD Exterior Model Controls

```
UCSD UFAD EXTERIOR MODEL CONTROLS,
    SPACE2-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    3,                       !- Number of diffusers
    autosize,                !- Design effective area of 1 diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -0.5,                    !- Position of plume vertex relative to floor {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    LINEAR BAR GRILLE,       !- Diffuser type
    1.3;                     !- Transition height
```

5.2 UCSD UFAD EXTERIOR ZONE MODEL – ENGINEERING REFERENCE

5.2.1 OVERVIEW

The UCSD UFAD Exterior Zone Model provides a simple model for heat transfer and a nonuniform vertical temperature profile for exterior zones of a UFAD system. These zones are expected to be dominated by internal loads, a portion of which (such as occupants and workstations) will act to generate plumes, and by window solar and conduction heat gains. The solar radiation penetrating the room is not expected to generate plumes. However, a window plume is likely to be generated in sunny conditions, particularly if an interior blind is deployed. Thus the exterior UFAD zone will have potentially have plumes from people and equipment and plumes arising from the windows. The plumes act to potentially create room air stratification, depending on the type & number of diffusers, the amount and type of load, and the system flowrate. In order to better model this situation the fully-mixed room air approximation that is currently used in most whole building analysis tools is extended to a two node approach, with the purpose of obtaining a first order precision model for vertical temperature profiles for the exterior zones of UFAD systems. The use of 2 nodes allows for greatly improved prediction of thermal comfort and overall building energy performance for the increasingly popular UFAD systems.

The UCSD UFAD Exterior Zone Model is one of the non-uniform zone models provided through the Room Air Manager in EnergyPlus. The intent is to provide a selection of useful non-uniform zone air models to enable the evaluation of air-conditioning techniques that use stratified or partially stratified room air. Such techniques include displacement ventilation (DV) and underfloor air distribution (UFAD) systems. The methodology can also include natural displacement ventilation and also wind-driven cross-ventilation (CV).

5.2.2 UNDERFLOOR AIR DISTRIBUTION SYSTEMS

UFAD systems represent, in terms of room air stratification, an intermediate condition between a well-mixed zone and displacement ventilation. Air is supplied through an underfloor plenum at low pressure through diffusers in the raised floor. The diffusers can be of various types: e.g., swirl, variable-area, displacement, and produce more or less mixing in the zone. UFAD systems are promoted as saving energy due to: higher supply air temperature; low static pressure; cooler conditions in the occupied subzone than in the upper subzone; and sweeping of some portion of the convective load (from ceiling lights, for instance) into the return air without interaction with the occupied region of the zone.

Modeling a UFAD system is quite complex and involves considerably more than just a non-uniform zone model. The zones' coupling to the supply and return plenums must be modeled accurately (particularly radiative transfer from a warm ceiling to a cool floor and on into the supply plenum by conduction). The supply plenum must be accurately modeled, giving a good estimate of the supply air temperature and conduction heat transfer between supply & return plenums through the slab. The HVAC system must be modeled including return air bypass and various types of fan powered terminal units.

The UCSD UFAD exterior zone model is similar to the UCSD interior zone model. The most obvious difference is that the exterior UFAD has 2 different types of plume sources: people & equipment and windows. Like the UCSD UFAD interior model it is a plume equation based multi-layer model (2 layers in this case). The zone is modeled as being divided into 2 well separated subzones which we denote as "occupied" and "upper". Each subzone is treated as having a single temperature. The boundary between the 2 subzones moves up & down each time step as a function of zone loads and supply air flow rate. Thus at each HVAC time step, the height of the boundary above the floor must be calculated, portions of surfaces assigned to each subzone, and a separate convective heat balance performed on each subzone.

5.2.3 MODEL DESCRIPTION

As in the interior zone case, we define 2 dimensionless parameters: Γ and ϕ. The definitions of the 2 parameters are the same as in the previous section (equations (0.1), (0.2), (0.3), (0.4), and (0.5)). As in the previous case, the experimental data can be plotted versus Γ and lines fitted to the data give the following formulas for occupied subzone temperature and interface height.

$$T_{oz} = T_r - 1.4\Gamma^{-0.6}(T_r - T_s) \tag{0.9}$$

$$h = \sqrt{\frac{n}{m}}A(11.03\ln(\Gamma) - 10.73) + \frac{1}{2}h_s \tag{0.10}$$

where T_{oz} is the occupied subzone temperature (K); T_r is the return temperature (K); Γ is the dimensionless height parameter defined above; T_s is the supply temperature (K); h is the interface height (m); n is the number of diffusers; m is the number of heat sources; A is the effective area of a diffuser (m^2); and h_s is the vertical position of the heat sources (m). The formula for T_r is the same as in the previous section.

5.2.4 IMPLEMETATION

The implementation closely follows the procedure described in the UFAD interior zone model. The model predicts two temperatures that characterize the two main levels in the stratification of the room:

1. an occupied subzone temperature T_{oc} representing the temperature of the occupied region;
2. an upper level temperature T_{mx} representing the temperature of the upper, mixed region and the outflow temperature.

We will use (0.10) to calculate the interface height and do a heat balance calculation on each subzone. Γ is given by (0.3). The supply air flow rate $\dot{V}$ is obtained by summing all the air flows entering the zone: supply air, infiltration, ventilation, and inter-zone flow. The heat gain $\dot{Q}$ is estimated by summing all the convective internal gains located in the occupied subzone – task lights, people, equipment – and adding to this the convective gain coming from the window surface. With these assumptions we can describe the implementation.

The UCSD UFE model is controlled by the subroutine *ManageUCSDUFModels* which is called from the *RoomAirModelManager*. The *RoomAirModelManager* selects which zone model will be used for each zone.

The calculation is done in subroutine *CalcUCSDUEI*. First we calculate the convective heat gain going into the upper and lower regions.

$$\dot{Q}_{ocz} = \dot{Q}_{oc,conv} + \dot{Q}_{tl,conv} + \dot{Q}_{eleq,conv} + \dot{Q}_{gaseq,conv} + \dot{Q}_{otheq,conv} + \dot{Q}_{hw,conv} + \dot{Q}_{stmeq,conv} + \dot{Q}_{bb,conv} + \dot{Q}_{waterheater,conv} + \dot{Q}_{fuelcell,conv}$$

$$\dot{Q}_{mxz} = \dot{Q}_{gl,conv} + \dot{Q}_{ltp} + \dot{Q}_{htrad,conv}$$

$$\dot{Q}_{tot,conv} = \dot{Q}_{ocz} + \dot{Q}_{mxz}$$

Next we sum up the inlet air flows in the form of MCP (mass flow rate times the air specific heat capacity) and MCPT (mass flow rate times C_p times air temperature).

$$MCP_{zone} = MCP_i + MCP_{vent} + MCP_{mix}$$

$$MCP_{sys} = \sum_{inlets} \dot{m}_i C_{p,i}$$

$$\dot{m}_{systot} = \sum_{inlets} \dot{m}_i$$

$$MCP_{tot} = MCP_{zone} + MCP_{sys}$$

$$MCPT_{zone} = MCPT_i + MCPT_{vent} + MCPT_{mix}$$

$$MCPT_{sys} = \sum_{inlets} \dot{m}_i C_{p,i} T_i$$

$$MCPT_{tot} = MCPT_{zone} + MCPT_{sys}$$

For exterior zone model, we assume one plume: $N_{plumes} = 1$. The number of diffusers in the zone $N_{diffusers}$ is a user input.

The area A_{diff} is also a user input. For swirl diffusers, linear bar grilles, and displacement diffusers this area is used as input. For the variable area diffusers, though, we calculate the area. We assume 400 ft/min velocity at the diffuser and a design flow rate per diffuser is 150 cfm (.0708 m^3/s). The design area of the diffuser is 150 ft^3/min / 400 ft/min = .575 ft^2 = .035 m^2. Then the variable area each time step is

$$A_{diff} = \dot{m}_{systot} / (.0708 \square N_{diffusers})$$

We now make an initial estimate of the convective gain from the windows.

$$\dot{Q}_{win,conv} = \sum_{i=1,n_{win}} h_{c,i} A_{win,i} T_{winsurf,i} - h_{c,i} A_{win,i} T_{mat}$$

Then

$$\dot{Q}_{plumes} = \dot{Q}_{ocz} + \dot{Q}_{win,conv}$$

We now calculate the height fraction Fr_{hb} (height of boundary layer divided by the total zone height).

$$\Gamma = \frac{(\dot{m}_{systot} \cdot \cos(\theta_{throw}))^{3/2}}{(N_{diffusers} \cdot A_{diff})^{5/4}(0.0281 \cdot 0.001 \cdot \dot{Q}_{plumes})^{1/2}}$$

$$Fr_{hb} = \frac{(N_{diffusers} \cdot A_{diff})^{1/2}(11.03\ln(\Gamma) - 10.73 + 0.5H_s)}{H_{ceil}}$$

where θ_{throw} is a user input: the angle between the diffuser slots and vertical; and H_s is the source height above the floor (m).

Next we iterate over the following 2 steps.

5.2.4.1 Iterative procedure

1. Call subroutine *HcUCSDUF* to calculate a convective heat transfer coefficient for each surface in the zone, an effective air temperature for each surface, and HA_{mx}, HAT_{mx}, HA_{oc}, HAT_{oc}, $HA_{mx,win}$,$HAT_{mx,win}$,$HA_{oc,win}$,and $HAT_{oc,win}$. Here HA is $\sum_{surfaces} h_{c,i} \cdot A_i$ for a region and HAT is $\sum_{surfaces} h_{c,i} \cdot A_i \cdot T_i$ for a region. The sum is over all the surfaces bounding the region; $h_{c,i}$ is the convective heat transfer coefficient for surface i, A_i is the area of surface i, and T_i is the surface temperature of surface i. Variables with the *win* subscript are summed over window surfaces only. Then the convective gain from the window is recalculated:

$$\dot{Q}_{win,conv} = HAT_{mx,win} + HAT_{oc,win} - HA_{mx,win}T_{mx} - HA_{oc,win}T_{oc}$$

and the power in the plume is recalculated: $\dot{Q}_{plumes} = \dot{Q}_{ocz} + \dot{Q}_{win,conv}$.

2. Calculate the two subzone temperatures: T_{oc} and T_{mx}.

The h_c's calculated in step 1 depend on the subzone temperatures. In turn the subzone temperatures depend on the HA and HAT's calculated in step 1. Hence the need for iteration

Next we describe each steps 1 and 3 in more detail.

Step 1

Subroutine *HcUCSDUF* is quite straightforward. It loops through all the surfaces in each zone and decides whether the surface is located in the upper, mixed subzone or the lower, occupied subzone, or if the surface is in both subzones. If entirely in one subzone the subzone temperature is stored in the surface effective temperature variable *TempEffBulkAir(SurfNum)* and h_c for the surface is calculated by a call to subroutine *CalcDetailedHcInForDVModel*. This routine uses the "detailed" natural convection coefficient calculation that depends on surface tilt and $\Delta T^{1/3}$. This calculation is appropriate for situations with low air velocity.

For surfaces that bound 2 subzones, the subroutine calculates h_c for each subzone and then averages them, weighting by the amount of surface in each subzone.

During the surface loop, once the h_c for a surface is calculated, the appropriate subzone HA and HAT sums are incremented. If a surface is in 2 subzones the HA and HAT for each subzone are incremented based on the area of the surface in each subzone. The subroutine calculates a separate HA and HAT for the windows for use in calculating the window convective gain.

Step 2

The calculation of subzone temperatures follows the method used in the ***ZoneTempPredictorCorrector*** module and described in the section **Basis for the System and Zone Integration**. Namely a third order finite difference expansion of the temperature time derivative is used in updating the subzone temperatures. Otherwise the subzone temperatures are obtained straightforwardly by solving an energy balance equation for each subzone.

$$T_{oc} = (C_{air,oc} \cdot (3 \cdot T_{-1,oc} - (3/2) \cdot T_{-2,oc} + (1/3) \cdot T_{-3,oc}) + \dot{Q}_{ocz} \cdot Fr_{gains} + HAT_{oc} + MCPT_{tot}) \\ /((11/6) \cdot C_{air,oc} + HA_{oc} + MCP_{tot})$$

$$T_{mx} = (C_{air,mx} \cdot (3 \cdot T_{-1,mx} - (3/2) \cdot T_{-2,mx} + (1/3) \cdot T_{-3,mx}) + \dot{Q}_{ocz} \cdot (1 - Fr_{gains}) + \dot{Q}_{mxz} \\ + HAT_{mx} + T_{oc} \cdot MCP_{tot}) /((11/6) \cdot C_{air,mx} + HA_{mx} + MCP_{tot})$$

Here $C_{air,oc}$ and $C_{air,mx}$ are the heat capacities of the air volume in each subzone. $C_{air,mx}$ is calculated by

$$R_{air,mx} = V_{mx} \cdot (\Delta z_{mx} / z_{ceil}) \cdot \rho_{air,mx} \cdot c_{p,air,mx} \cdot Mul_{cap} /(\Delta t_z \cdot 3600)$$

$$C_{air,mx} = R_{air,mx} \cdot \Delta t_z / \Delta t_{sys}$$

The gains fraction Fr_{gains} is a user input via a schedule. It is the fraction of the convective gains in the occupied subzone that remain in that subzone.

The other subzone air heat capacities are calculated in the same manner.

Mixed calculation

The above iterative procedure assumed that the UFAD zone model was applicable: i.e., conditions were favorable temperature stratification in the zone. Now that this calculation is complete and the subzone temperatures and depths calculated, we check to see if this assumption was justified. If not, zone conditions must be recalculated assuming a well-mixed zone.

If $T_{mx} < T_{oc}$ or $MCP_{tot} \le 0$ or $H_{fr} \cdot H_{ceil} < \Delta z_{occ,\min}$ then the following mixed calculation will replace the UFAD exterior zone calculation.

Note: $\Delta z_{occ,\min}$ is the minimum thickness of occupied subzone. It is set to 0.2 meters.

The mixed calculation iteratively calculates surface convection coefficients and room temperature just like the displacement ventilation calculation described above. In the mixed case however, only one zone temperature T_{avg} is calculated. The 2 subzone temperatures are then set equal to T_{avg}.

First, Fr_{hb} is set equal to zero.

Then the code iterates over these steps.

Calculate T_{avg} using

$$T_{avg} = (C_{air,z} \cdot (3 \cdot T_{-1,z} - (3/2) \cdot T_{-2,z} + (1/3) \cdot T_{-3,z}) + \dot{Q}_{tot,conv} + HAT_{oc} + HAT_{mx} + MCPT_{tot}) / ((11/6) \cdot C_{air,z} + HA_{oc} + HA_{mx} + MCP_{tot})$$

$$T_{mx} = T_{avg}$$

$$T_{oc} = T_{avg}$$

Call *HcUCSDUF* to calculate the h_c's.

Repeat step 1

Final calculations

The UFAD exterior zone calculation finishes by calculating some report variables.

We define heights:

$$H_{trans} = Fr_{hb} \cdot H_{ceil}$$

$$H_{mxavg} = (H_{ceil} + H_{trans}) / 2$$

$$H_{ocavg} = H_{trans} / 2$$

Using the user defined comfort height we calculate the comfort temperature.

If mixing:

$$T_{comf} = T_{avg}$$

If UFAD:

If $H_{comf} < H_{ocavg}$

$$T_{comf} = T_{occ}$$

Else if $H_{comf} \geq H_{ocavg}$ and $H_{comf} < H_{mxavg}$

$$T_{comf} = (T_{oc}(H_{mxavg} - H_{comf}) + T_{mx}(H_{comf} - H_{ocavg})/(H_{mxavg} - H_{ocavg})$$

Else if $H_{comf} \geq H_{mxavg}$ and $H_{comf} < H_{ceil}$

$$T_{comf} = T_{mx}$$

Using the user defined thermostat height we calculate the temperature at the thermostat.
If mixing:

$$T_{stat} = T_{avg}$$

If UFAD:

If $H_{stat} < H_{ocavg}$

$$T_{stat} = T_{occ}$$

Else if $H_{stat} \geq H_{ocavg}$ and $H_{stat} < H_{mxavg}$

$$T_{stat} = (T_{oc}(H_{mxavg} - H_{stat}) + T_{mx}(H_{stat} - H_{ocavg})/(H_{mxavg} - H_{ocavg})$$

Else if $H_{stat} \geq H_{mxavg}$ and $H_{stat} < H_{ceil}$

$$T_{stat} = T_{mx}$$

The average temperature gradient is:

If $H_{mxavg} - H_{occavg} > 0.1$

$$GradT_{avg} = (T_{mx} - T_{occ})/(H_{mxavg} - H_{occavg})$$

else $GradT_{avg} = 0.0$

Finally, the zone node temperature is set to T_{mx}.
Other variables that are reported out are Γ and ϕ.

$$\phi = (T_{mx} - T_{occ})/(T_{mx} - T_{sup})$$

where T_{sup} is the zone supply air temperature.

5.2.5 REFERENCES

Qing Liu. 2006. The Fluid Dynamics of an Underfloor Air Distribution System. A PhD dissertation in Engineering Sciences (Systems Science) at UC San Diego.

6 SPECIAL VERSION OF ENERGYPLUS FOR MODELING YORK TEST ROOM WITH SOLAR ARRAY

A special version of EnergyPlus 1.2 (called here V1.2x) has been created that allows simulation of the York test room using the solar array, which is a bank of high-temperature lamps acting as an artificial sun. V1.2x is the same as the regular version except that it replaces the window heat transfer and solar gain calculation with measured values of glass temperature, solar radiation transmitted into zone, and, for inside opaque surfaces, ratio of solar radiation incident on surface to solar radiation transmitted into zone. When an interior blind is in place, the program also uses measured values of the slat temperature. V1.2x is based on the 5/20/04 StarTeam version of EnergyPlus.

There are several restrictions on using V1.2x (in the following the term "solar" refers to the short-wave radiation from the solar array):

There can only be one window. It must be an exterior window, which means that OutsideFaceEnvironment = ExteriorEnvironment for the window's base surface. This is the window exposed to the solar array. (The York test room also has an interior window that faces the conference room, but this window will be covered by opaque panels and so will be input as an interior wall.

If the window has a shading device it must be an interior blind. EnergyPlus allows the slat angle to be input, but for any particular measurement run and corresponding EnergyPlus calculation, the slat angle should be fixed (as opposed to allowing it to vary during the calculation, which is possible in EnergyPlus).

The window input, as entered using Material:WindowGlass (and Material:WindowGas for double glazing), should match the actual window in terms of number of glass layers and inside surface emissivity. Otherwise the glass layer input properties are ignored. Neither a window frame nor a window divider should be entered.

If a blind is present, its input, as entered using Material:WindowBlind, should match the actual blind. This is necessary since the program needs accurate blind information to (1) calculate the long-wave radiation transfer from the glass/blind combination to the rest of the room, which depends on glass emissivity and slat properties (angle, width, slat-to-slat distance and emissivity); and (2) calculate the natural convective air flow in the channel between the glass and blind, which depends on glass/blind separation, slat properties (angle, width and slat-to-slat distance) and the blind's top-, bottom-, left- and right-side opening data.

Only the window-related output variables shown in the sample inputs, below, are guaranteed to be meaningful for V1.2x. In particular, "Zone Window Heat Gain" and "Zone Window Heat Loss" are not meaningful and should not be printed. A new output variable, "Opaque Surface Inside Face Short-Wave Radiation Absorbed," is described below.

The EnergyPlus modules that were changed for V1.2x are:

- Energy+.idd (to add the MeasuredUFADWindowData and MeasuredUFADSolarFraction objects)
- SurfaceGeometry.f90
- DataSurfaces.f90
- DataHeatBalSurface.f90

- HeatBalanceSurfaceManager.f90
- WindowManager.f90
- DataHeatBalance.f90
- HeatBalanceManager.f90
- SolarShading.f90

Sample inputs with bare glass and with interior blind are given below.

The measured values of transmitted solar, glass temperature and slat temperature are read into EnergyPlus 1.2x using schedules. A new input object, MeasuredUFADWindowData, has been created that references the schedules.

Another new input object, MeasuredUFADSolarFraction, allows input of the measured value of the ratio of solar incident on a surface to the transmitted solar.

6.1 DESCRIPTION OF NEW OBJECTS

6.1.1 MEASUREDUFADWINDOWDATA

At most one of these objects is allowed per input.

Field: Name of Window to which This Measured Data Applies

This is the name of the window, i.e., the name of a Surface:HeatTransfer:Sub object with Surface Type = Window.

Field: Name of Schedule of Measured Inside Surface Glass Temperatures

This is the name of a schedule whose values are measured inside surface glass temperatures in deg C. "Inside surface" here means the glass surface in contact with the zone air. This schedule name is a required input.

It is recommended that glass temperature be measured at several roughtly equally separated points covering the entire glass surface and the results averaged. Of course, the glass temperature probes need to be well shielded from the solar radiation.

If the glass temperatures do not vary much with time it is sufficient to use an hourly schedule. Otherwise, a sub-hourly schedule should be considered.

Note that EnergyPlus does not interpolate hourly schedule values if a heat balance simulation time step less than an hour is used. In other words, if an hourly schedule is used the schedule value for a given hour will be used for the entire hour no matter what the simulation time step is.

Field: Name of Schedule of Measured Transmitted Solar Values

This is the name of a schedule whose values are measured transmitted solar values in W. This schedule name is a required input. Of course, the measured glass temperatures and measured solar values should be for the same measurement run. The V1.2x calculations will be meaningless if non-corresponding values of glass temperature and transmitted solar are used.

If the solar values do not vary much with time it is sufficient to use an hourly schedule. Otherwise, a sub-hourly schedule should be considered.

Field: Name of Schedule of Measured Blind Slat Temperatures

This is the name of a schedule whose values are measured blind slat temperatures in deg C. Assuming that the slats are metal and therefore of high conductivity, it does not matter on which side of the slat the temperature probes are placed, although placing them on the side away from the incident solar radiation will produce better solar shielding. As with the glass, slat temperatures should be measured at several equally separated points covering the blind area and the results averaged.

This schedule name is required if the window has a blind.

If the slat temperatures do not vary much with time it is probably sufficient to use an hourly schedule. Otherwise, a sub-hourly schedule should be considered.

Table 11: MeasuredUFADWindowData as it appears in the Energy+.idd file for V1.2x

```
MeasuredUFADWindowData,
       \min-fields 4
       \memo Used to enter measured window data for UCB/LBNL UFAD project
  A1,  \field Name of Window to which This Measured Data Applies
       \note Must be the name of a Surface:HeatTransfer:Sub
       \with Surface Type = WINDOW.
       \note This object can only be used with exterior windows.
       \required-field
       \type alpha
  A2,  \field Name of Schedule of Measured Inside Surface Glass Temperatures (C)
       \required-field
       \type alpha
  A3,  \field Name of Schedule of Measured Transmitted Solar Values (W)
       \required-field
       \type alpha
  A4;  \field Name of Schedule of Measured Blind Slat Temperatures (C)
       \note Used only if an interior blind is present on the window
       \type alpha
```

6.1.2 MEASUREDUFADSOLARFRACTION

There should be one of these objects for each wall, floor, ceiling and internal mass surface in the zone. This object is not used for the window.

Field: Name of Surface (wall, floor, ceiling, internal mass)

This is the name of the surface to which the following ratio applies. Applicable surfaces are:

- Surface:HeatTransfer with Surface Type = FLOOR, WALL, CEILING or ROOF, or
- Surface:HeatTransfer:InternalMass

One or more Surface:HeatTransfer:InternalMass can be used to represent furniture.

Field: Ratio of Solar Incident on Inside of Surface to Zone Transmitted Solar

This is ratio of the solar incident on the inside of the surface to the total solar transmitted into the zone. Non-intuitively, the sum of these ratios should be greater than 1.0. This is because of inter-reflection of the transmitted solar among the zone surfaces.

If MeasuredUFADSolarFraction is not specified for a surface, this ratio will default to 0.0.

Table 12: MeasuredUFADSolarFraction as it appears in the Energy+.idd file for V1.2x

```
MeasuredUFADSolarFraction,
  A1,  \field Name of Surface (wall, floor, ceiling, internal mass)
```

```
       \note Surface should be in zone containing window for which
       \MeasuredUFADWindowData applies
       \required-field
       \type alpha
  N1;  \field Ratio of Solar Incident on Inside of Surface to Zone Transmitted Solar
       \note Sum of these fractions for all surfaces in zone, including any internal
mass
       \note surfaces, should be > 1.0 due to inter-reflection of transmitted solar
       \note inside the zone.
       \type real
       \minimum 0.0
       \maximum 1.2
       \default 0.0
```

6.1.3 NEW OUTPUT VARIABLE

A new output variable has been added for V1.2x: "Opaque Surface Inside Face Short-Wave Radiation Absorbed." This has units W/m2 and is the sum of the solar radiation and short-wave radiation from the lights absorbed at the inside face of the opaque surfaces in the zone. Its value is:

[(Measured transmitted solar)*(MeasuredUFADSolarFraction for surface) +
(Short-wave radiation from lights incident on surface)]*(Solar absorptivity of surface)/(Area of surface)

APPENDIX A - SUPPLY PLENUM VALIDATION INPUTS FOR ENERGYPLUS

A.1 CFDCOMPNORETPLEN4.IDF

Table 13: Inputs for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange ON, nominal h_c's

Occupied zone ceiling temperature	81 F
Bottom of floor slab air temperature	80 F
Supply plenum radiation exchange?	Yes
Supply plenum air inlet temperature	56 F
Supply plenum air flow rate	1.5 cfm/ft^2
Supply plenum ceiling h_c	4.01 W/m^{2}K
Supply plenum floor h_c	3.52 W/m^{2}K

Table 14: Full model inputs listing for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange ON, nominal h_c's

```
!-Generator IDFEditor 1.20

!-NOTE: All comments with '!-' are ignored by the IDFEditor and are generated automatically.
!-      Use '!' comments if they need to be retained when using the IDFEditor.


!-   ===========  ALL OBJECTS IN CLASS: VERSION ===========

! Case CFDComp
! Plenum with Return Air Heat Gain; supply plenum; 1 zone building
! This deck contains 3 zones, the main zone (zone 1) with a window and internal loads and is
connected through
! the system to the plenum (zone 1a).  The plenum has the roof exposure that the main zone will
never really feel.
! The system is a standard constant volume reheat serving the one main zone and exhausts through
the
! plenum zone back to the system air loop.  The cooling coil is water with a chilled water plant
loop and the
! reheat coil is a gas fired coil.  The surfaces between the main zone and the plenum are
interzone.
! Supply air is supplied through an underfloor air distribution system - a supply plenum. The
supply
! plenum is in contact with the ground, which the occupied space will never feel.
VERSION,
    1.2.2;                  !- Version Identifier


!-   ===========  ALL OBJECTS IN CLASS: BUILDING ===========

BUILDING,
    YorkLab,                !- Building Name
    0.0000000E+00,          !- North Axis {deg}
    Suburbs,                !- Terrain
    .04,                    !- Loads Convergence Tolerance Value {W}
    .4,                     !- Temperature Convergence Tolerance Value {deltaC}
    MinimalShadowing,       !- Solar Distribution
    ;                       !- Maximum Number of Warmup Days


!-   ===========  ALL OBJECTS IN CLASS: TIMESTEP IN HOUR ===========

TIMESTEP IN HOUR,
    6;                      !- Time Step in Hour


!-   ===========  ALL OBJECTS IN CLASS: INSIDE CONVECTION ALGORITHM ===========

INSIDE CONVECTION ALGORITHM,
    Simple;                 !- InsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE CONVECTION ALGORITHM ===========

OUTSIDE CONVECTION ALGORITHM,
    Simple;                 !- OutsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: SOLUTION ALGORITHM ===========

SOLUTION ALGORITHM,
    CTF;                    !- SolutionAlgo


!-   ===========  ALL OBJECTS IN CLASS: DEBUG OUTPUT ===========

DEBUG OUTPUT,
    0,                      !- YesNo
```

```
    0;                      !- EvenDuringWarmup


!-   ===========  ALL OBJECTS IN CLASS: ZONE VOLUME CAPACITANCE MULTIPLIER ===========

ZONE VOLUME CAPACITANCE MULTIPLIER,
    1;                      !- Capacitance Multiplier


!-   ===========  ALL OBJECTS IN CLASS: RUN CONTROL ===========

RUN CONTROL,
    No,                     !- Do the zone sizing calculation
    No,                     !- Do the system sizing calculation
    No,                     !- Do the plant sizing calculation
    Yes,                    !- Do the design day simulations
    Yes;                    !- Do the weather file simulation


!-   ===========  ALL OBJECTS IN CLASS: RUNPERIOD ===========

RunPeriod,
    9,                      !- Begin Month
    13,                     !- Begin Day Of Month
    9,                      !- End Month
    20,                     !- End Day Of Month
    Tuesday,                !- Day Of Week For Start Day
    No,                     !- Use WeatherFile Holidays/Special Days
    No,                     !- Use WeatherFile DaylightSavingPeriod
    Yes,                    !- Apply Weekend Holiday Rule
    Yes,                    !- Use WeatherFile Rain Indicators
    Yes;                    !- Use WeatherFile Snow Indicators


!-   ===========  ALL OBJECTS IN CLASS: LOCATION ===========

Location,
    Harrisburg,             !- LocationName
    40.2,                   !- Latitude {deg}
    -76.77,                 !- Longitude {deg}
    -5,                     !- TimeZone {hr}
    94;                     !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: GROUNDTEMPERATURES ===========

! DesignDay,
!     Harrisburg Summer,
!     33.3,
!     10.4,
!     23.5,
!     100200,
!     5,
!     30,
!     1,
!     ,
!     ,
!     15,
!     8,
!     SummerDesignDay,
!     1;
! DesignDay,
!     Harrisburg Winter,
!     -13,
!     0,
!     -13,
!     100200,
!     5,
!     30,
!     0,
!     ,
```

```
!     ,
!     15,
!     1,
!     WinterDesignDay,
!     1;
GroundTemperatures,
    18.89,                  !- January Ground Temperature {C}
    18.92,                  !- February Ground Temperature {C}
    19.02,                  !- March Ground Temperature {C}
    19.12,                  !- April Ground Temperature {C}
    19.21,                  !- May Ground Temperature {C}
    19.23,                  !- June Ground Temperature {C}
    19.07,                  !- July Ground Temperature {C}
    19.32,                  !- August Ground Temperature {C}
    19.09,                  !- September Ground Temperature {C}
    19.21,                  !- October Ground Temperature {C}
    19.13,                  !- November Ground Temperature {C}
    18.96;                  !- December Ground Temperature {C}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR ===========

MATERIAL:REGULAR,
    BLBD - PLYWOOD 3 / 4 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Name
    Smooth,                 !- Roughness
    .0099999998,            !- Thickness {m}
    .059999999,             !- Conductivity {W/m-K}
    480.55,                 !- Density {kg/m3}
    830,                    !- Specific Heat {J/kg-K}
    .01,                    !- Absorptance:Thermal
    .32,                    !- Absorptance:Solar
    .32;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    BLBD - PLYWOOD 1 / 2 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    B10 - 2 IN WOOD,        !- Name
    MediumSmooth,           !- Roughness
    .050000001,             !- Thickness {m}
    .12,                    !- Conductivity {W/m-K}
    592.68,                 !- Density {kg/m3}
    2510,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    E5 - ACOUSTIC TILE,     !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    100,                    !- Conductivity {W/m-K}
```

```
    480.55,                  !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .32,                     !- Absorptance:Solar
    .32;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 120 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    .1,                      !- Thickness {m}
    .74,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 40 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    0.1000000    ,           !- Thickness {m}
    0.1600000    ,           !- Conductivity {W/m-K}
    640.7300    ,            !- Density {kg/m3}
    830.0000    ,            !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.6500000    ,           !- Absorptance:Solar
    0.6500000    ;           !- Absorptance:Visible

! k=0.196 W/m-K th=1.3 inches
MATERIAL:REGULAR,
    RaisedFloorAsConcrete,   !- Name
    MediumRough,             !- Roughness
    0.033,                   !- Thickness {m}
    0.196        ,           !- Conductivity {W/m-K}
    640.7300     ,           !- Density {kg/m3}
    830.0000     ,           !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.7          ,           !- Absorptance:Solar
    0.7          ;           !- Absorptance:Visible

MATERIAL:REGULAR,
    FloorSlabConcrete,       !- Name
    MediumRough,             !- Roughness
    .254,                    !- Thickness {m}
    .93,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR-R ===========

MATERIAL:REGULAR-R,
    R30-INSULATION,          !- Name
    Rough,                   !- Roughness
    5.283,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R5-INSULATION,           !- Name
    Rough,                   !- Roughness
    .881,                    !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
```

```
    R11-INSULATION,          !- Name
    Rough,                   !- Roughness
    1.937,                   !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R19-INSULATION,          !- Name
    Rough,                   !- Roughness
    3.346,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R-TateFloor,             !- Name
    Rough,                   !- Roughness
    .23,                     !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    FloorSlabHc,             !- Name
    MediumRough,             !- Roughness
    1.1737,                  !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    Carpet,                  !- Name
    Rough,                   !- Roughness
    0.06,                    !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7500000    ,           !- Absorptance:Solar
    0.7500000    ;           !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGLASS ===========

MATERIAL:WINDOWGLASS,
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    .0060000001,             !- Thickness {m}
    .775,                    !- Solar Transmittance at Normal Incidence
    .071000002,              !- Solar Reflectance at Normal Incidence: Front Side
    .071000002,              !- Solar Reflectance at Normal Incidence: Back Side
    .881,                    !- Visible Transmittance at Normal Incidence
    .079999998,              !- Visible Reflectance at Normal Incidence: Front Side
    .079999998,              !- Visible Reflectance at Normal Incidence: Back Side
    ,                        !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGAS ===========

MATERIAL:WINDOWGAS,
    WinAirB1 - AIRSPACE RESISTANCE,  !- Name
    Air,                     !- Gas Type
    .012;                    !- Thickness {m}


!-   ===========  ALL OBJECTS IN CLASS: CONSTRUCTION ===========

CONSTRUCTION,
    Wall-A,                  !- Name
```

```
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-B,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    BLBD - PLYWOOD 1 / 2 IN; !- Layer #3

CONSTRUCTION,
    Wall-C,                  !- Name
    BLBD - PLYWOOD 1 / 2 IN, !- Outside Layer
    R19-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-D,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-E,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-F,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION;          !- Layer #2

CONSTRUCTION,
    Suspened Ceiling,        !- Name
    E5 - ACOUSTIC TILE;      !- Outside Layer

CONSTRUCTION,
    Raised Floor,            !- Name
    RaisedFloorAsConcrete,   !- Outside Layer
    Carpet;                  !- Layer #2

CONSTRUCTION,
    Raised Floor SP,         !- Name
    Carpet,                  !- Outside Layer
    RaisedFloorAsConcrete;   !- Layer #2

CONSTRUCTION,
    Out Ceiling,             !- Name
    R30-INSULATION,          !- Outside Layer
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    SubFloor,                !- Name
    FloorSlabConcrete;       !- Outside Layer

CONSTRUCTION,
    DoublePaneWindow,        !- Name
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Outside Layer
    WinAirB1 - AIRSPACE RESISTANCE,  !- Layer #2
    GLASS - CLEAR PLATE 1 / 4 IN;  !- Layer #3

CONSTRUCTION,
    Raised Floor No Carpet,  !- Name
    RaisedFloorAsConcrete;   !- Outside Layer


!-   ===========  ALL OBJECTS IN CLASS: ZONE ===========

ZONE,
```

```
    Zone 1,                  !- Zone Name
    0,                       !- Relative North (to building) {deg}
    0.0000000E+00,           !- X Origin {m}
    0.0000000E+00,           !- Y Origin {m}
    0.0000000E+00,           !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100,                    !- Ceiling Height {m}
    0;                       !- Volume {m3}

ZONE,
    Zone 1b,                 !- Zone Name
    0,                       !- Relative North (to building) {deg}
    ,                        !- X Origin {m}
    ,                        !- Y Origin {m}
    -.305,                   !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100.0000,               !- Ceiling Height {m}
    0.0000000E+00;           !- Volume {m3}


!-   ===========  ALL OBJECTS IN CLASS: SURFACEGEOMETRY ===========

SurfaceGeometry,
    UpperLeftCorner,         !- SurfaceStartingPosition
    CounterClockWise,        !- VertexEntry
    WorldCoordinateSystem;   !- CoordinateSystem


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER ===========

Surface:HeatTransfer,
    TC-NorthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-NorthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-SouthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
```

```
    3.048 ,                 !- Vertex 1 Z-coordinate {m}
    0 ,                     !- Vertex 2 X-coordinate {m}
    0 ,                     !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    0 ,                     !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    14.63 ,                 !- Vertex 4 X-coordinate {m}
    0 ,                     !- Vertex 4 Y-coordinate {m}
    3.048 ;                 !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-EastWall,            !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-E,                 !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-EastWall,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                 !- Vertex 1 X-coordinate {m}
    0 ,                     !- Vertex 1 Y-coordinate {m}
    3.048 ,                 !- Vertex 1 Z-coordinate {m}
    14.63 ,                 !- Vertex 2 X-coordinate {m}
    0 ,                     !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    6.7   ,                 !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    14.63 ,                 !- Vertex 4 X-coordinate {m}
    6.7   ,                 !- Vertex 4 Y-coordinate {m}
    3.048 ;                 !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-WestWall,            !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-C,                 !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-WestWall,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    6.7   ,                 !- Vertex 1 Y-coordinate {m}
    3.048 ,                 !- Vertex 1 Z-coordinate {m}
    0 ,                     !- Vertex 2 X-coordinate {m}
    6.7   ,                 !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    0 ,                     !- Vertex 3 X-coordinate {m}
    0 ,                     !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    0 ,                     !- Vertex 4 X-coordinate {m}
    0 ,                     !- Vertex 4 Y-coordinate {m}
    3.048 ;                 !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Ceil,                !- User Supplied Surface Name
    CEILING,                !- Surface Type
    Suspened Ceiling,       !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherSideCoeff,         !- OutsideFaceEnvironment
    TC-CeilOST,             !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
```

```
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                       !- Vertex 1 X-coordinate {m}
    6.7   ,                   !- Vertex 1 Y-coordinate {m}
    3.048 ,                   !- Vertex 1 Z-coordinate {m}
    0 ,                       !- Vertex 2 X-coordinate {m}
    0 ,                       !- Vertex 2 Y-coordinate {m}
    3.048 ,                   !- Vertex 2 Z-coordinate {m}
    14.63 ,                   !- Vertex 3 X-coordinate {m}
    0 ,                       !- Vertex 3 Y-coordinate {m}
    3.048 ,                   !- Vertex 3 Z-coordinate {m}
    14.63 ,                   !- Vertex 4 X-coordinate {m}
    6.7   ,                   !- Vertex 4 Y-coordinate {m}
    3.048 ;                   !- Vertex 4 Z-coordinate {m}

! I am here
Surface:HeatTransfer,
    TC-Floor,                 !- User Supplied Surface Name
    FLOOR,                    !- Surface Type
    Raised Floor No Carpet,   !- Construction Name of the Surface
    Zone 1,                   !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-Ceil,                  !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                       !- Vertex 1 X-coordinate {m}
    0 ,                       !- Vertex 1 Y-coordinate {m}
    0 ,                       !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    6.7  ,                    !- Vertex 2 Y-coordinate {m}
    0 ,                       !- Vertex 2 Z-coordinate {m}
    14.63 ,                   !- Vertex 3 X-coordinate {m}
    6.7   ,                   !- Vertex 3 Y-coordinate {m}
    0 ,                       !- Vertex 3 Z-coordinate {m}
    14.63,                    !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    0 ;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-NorthWall,             !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-NorthWall,             !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                   !- Vertex 1 X-coordinate {m}
    6.7   ,                   !- Vertex 1 Y-coordinate {m}
    0 ,                       !- Vertex 1 Z-coordinate {m}
    14.63 ,                   !- Vertex 2 X-coordinate {m}
    6.7   ,                   !- Vertex 2 Y-coordinate {m}
    -0.305 ,                  !- Vertex 2 Z-coordinate {m}
    0 ,                       !- Vertex 3 X-coordinate {m}
    6.7   ,                   !- Vertex 3 Y-coordinate {m}
    -0.305 ,                  !- Vertex 3 Z-coordinate {m}
    0 ,                       !- Vertex 4 X-coordinate {m}
    6.7   ,                   !- Vertex 4 Y-coordinate {m}
    0 ;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-SouthWall,             !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
```

```
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-EastWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-EastWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-WestWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-WestWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
```

```
    SP-Ceil,                !- User Supplied Surface Name
    CEILING,                !- Surface Type
    Raised Floor No Carpet, !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-Floor,               !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    6.7   ,                 !- Vertex 1 Y-coordinate {m}
    0 ,                     !- Vertex 1 Z-coordinate {m}
    0 ,                     !- Vertex 2 X-coordinate {m}
    0 ,                     !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    0 ,                     !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    14.63 ,                 !- Vertex 4 X-coordinate {m}
    6.7   ,                 !- Vertex 4 Y-coordinate {m}
    0 ;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Floor,               !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    SubFloor,               !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherSideCoeff,         !- OutsideFaceEnvironment
    SP-FloorOST,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    0 ,                     !- Vertex 1 Y-coordinate {m}
    -0.305 ,                !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    6.7  ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    6.7   ,                 !- Vertex 3 Y-coordinate {m}
    -0.305 ,                !- Vertex 3 Z-coordinate {m}
    14.63,                  !- Vertex 4 X-coordinate {m}
    0,                      !- Vertex 4 Y-coordinate {m}
    -0.305 ;                !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: OTHERSIDECOEFFICIENTS ===========

OtherSideCoefficients,
    TC-CeilOST,             !- OtherSideCoeff Name
    0.,                     !- Combined convective/radiative film coefficient
!   CeilOSTemp[],
     26.67,                 !- User selected Constant Temperature {C}
    1.,                     !- Coefficient modifying the user selected constant temperature
    0.,                     !- Coefficient modifying the external dry bulb temperature
    0.,                     !- Coefficient modifying the ground temperature
    0.,                     !- Coefficient modifying the wind speed term (s/m)
    0;                      !- Coefficient modifying the zone air temperature part of the
equation

OtherSideCoefficients,
    SP-FloorOST,            !- OtherSideCoeff Name
    0.,                     !- Combined convective/radiative film coefficient
!   FloorOSTemp[],
    26.67,                  !- User selected Constant Temperature {C}
    1.,                     !- Coefficient modifying the user selected constant temperature
    0.,                     !- Coefficient modifying the external dry bulb temperature
```

```
    0.,                     !- Coefficient modifying the ground temperature
    0.,                     !- Coefficient modifying the wind speed term (s/m)
    0;                      !- Coefficient modifying the zone air temperature part of the
equation


!-   ===========  ALL OBJECTS IN CLASS: CONVECTIONCOEFFICIENTS ===========

ConvectionCoefficients,
    TC-Floor,               !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Ceil,                !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    4.01;                   !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Floor,               !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    3.52;                   !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Ceil,                !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-NorthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-SouthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-EastWall,            !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-WestWall,            !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-NorthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-SouthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-EastWall,            !- SurfaceName
    Interior,               !- Convection Type #1
```

```
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-WestWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULETYPE ===========

ScheduleType,
    Any Number;              !- ScheduleType Name

ScheduleType,
    Fraction,                !- ScheduleType Name
    0.0 : 1.0,               !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Temperature,             !- ScheduleType Name
    -60:200,                 !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Control Type,            !- ScheduleType Name
    0:4,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    On/Off,                  !- ScheduleType Name
    0:1,                     !- range
    DISCRETE;                !- Numeric Type


!-   ===========  ALL OBJECTS IN CLASS: DAYSCHEDULE ===========

DAYSCHEDULE,
    LT-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24

DAYSCHEDULE,
    EQ-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
```

```
    1.0,                    !- Hour 3
    1.0,                    !- Hour 4
    1.0,                    !- Hour 5
    1.0,                    !- Hour 6
    1.0,                    !- Hour 7
    1.0,                    !- Hour 8
    1.0,                    !- Hour 9
    1.0,                    !- Hour 10
    1.0,                    !- Hour 11
    1.0,                    !- Hour 12
    1.0,                    !- Hour 13
    1.0,                    !- Hour 14
    1.0,                    !- Hour 15
    1.0,                    !- Hour 16
    1.0,                    !- Hour 17
    1.0,                    !- Hour 18
    1.0,                    !- Hour 19
    1.0,                    !- Hour 20
    1.0,                    !- Hour 21
    1.0,                    !- Hour 22
    1.0,                    !- Hour 23
    1.0;                    !- Hour 24

DAYSCHEDULE,
    Day On Peak,            !- Name
    Fraction,               !- ScheduleType
    1.,                     !- Hour 1
    1.,                     !- Hour 2
    1.,                     !- Hour 3
    1.,                     !- Hour 4
    1.,                     !- Hour 5
    1.,                     !- Hour 6
    1.,                     !- Hour 7
    1.,                     !- Hour 8
    1.,                     !- Hour 9
    1.,                     !- Hour 10
    1.,                     !- Hour 11
    1.,                     !- Hour 12
    1.,                     !- Hour 13
    1.,                     !- Hour 14
    1.,                     !- Hour 15
    1.,                     !- Hour 16
    1.,                     !- Hour 17
    1.,                     !- Hour 18
    1.,                     !- Hour 19
    1.,                     !- Hour 20
    1.,                     !- Hour 21
    1.,                     !- Hour 22
    1.,                     !- Hour 23
    1.;                     !- Hour 24

DAYSCHEDULE,
    Summer Supply Air Temp Day Sch,  !- Name
    Temperature,            !- ScheduleType
    13.33,                  !- Hour 1
    13.33,                  !- Hour 2
    13.33,                  !- Hour 3
    13.33,                  !- Hour 4
    13.33,                  !- Hour 5
    13.33,                  !- Hour 6
    13.33,                  !- Hour 7
    13.33,                  !- Hour 8
    13.33,                  !- Hour 9
    13.33,                  !- Hour 10
    13.33,                  !- Hour 11
    13.33,                  !- Hour 12
    13.33,                  !- Hour 13
    13.33,                  !- Hour 14
    13.33,                  !- Hour 15
    13.33,                  !- Hour 16
    13.33,                  !- Hour 17
```

```
    13.33,                  !- Hour 18
    13.33,                  !- Hour 19
    13.33,                  !- Hour 20
    13.33,                  !- Hour 21
    13.33,                  !- Hour 22
    13.33,                  !- Hour 23
    13.33;                  !- Hour 24

DAYSCHEDULE,
    Winter Supply Air Temp Day Sch,  !- Name
    Temperature,            !- ScheduleType
    13.33,                  !- Hour 1
    13.33,                  !- Hour 2
    13.33,                  !- Hour 3
    13.33,                  !- Hour 4
    13.33,                  !- Hour 5
    13.33,                  !- Hour 6
    13.33,                  !- Hour 7
    13.33,                  !- Hour 8
    13.33,                  !- Hour 9
    13.33,                  !- Hour 10
    13.33,                  !- Hour 11
    13.33,                  !- Hour 12
    13.33,                  !- Hour 13
    13.33,                  !- Hour 14
    13.33,                  !- Hour 15
    13.33,                  !- Hour 16
    13.33,                  !- Hour 17
    13.33,                  !- Hour 18
    13.33,                  !- Hour 19
    13.33,                  !- Hour 20
    13.33,                  !- Hour 21
    13.33,                  !- Hour 22
    13.33,                  !- Hour 23
    13.33;                  !- Hour 24

DAYSCHEDULE,
    Chilled Water Loop Daily,!- Name
    Temperature,            !- ScheduleType
    6.67,                   !- Hour 1
    6.67,                   !- Hour 2
    6.67,                   !- Hour 3
    6.67,                   !- Hour 4
    6.67,                   !- Hour 5
    6.67,                   !- Hour 6
    6.67,                   !- Hour 7
    6.67,                   !- Hour 8
    6.67,                   !- Hour 9
    6.67,                   !- Hour 10
    6.67,                   !- Hour 11
    6.67,                   !- Hour 12
    6.67,                   !- Hour 13
    6.67,                   !- Hour 14
    6.67,                   !- Hour 15
    6.67,                   !- Hour 16
    6.67,                   !- Hour 17
    6.67,                   !- Hour 18
    6.67,                   !- Hour 19
    6.67,                   !- Hour 20
    6.67,                   !- Hour 21
    6.67,                   !- Hour 22
    6.67,                   !- Hour 23
    6.67;                   !- Hour 24

DAYSCHEDULE,
    SystemOffDaySched,      !- Name
    Fraction,               !- ScheduleType
    0.,                     !- Hour 1
    0.,                     !- Hour 2
    0.,                     !- Hour 3
    0.,                     !- Hour 4
```

```
    0.,                     !- Hour 5
    0.,                     !- Hour 6
    0.,                     !- Hour 7
    0.,                     !- Hour 8
    0.,                     !- Hour 9
    0.,                     !- Hour 10
    0.,                     !- Hour 11
    0.,                     !- Hour 12
    0.,                     !- Hour 13
    0.,                     !- Hour 14
    0.,                     !- Hour 15
    0.,                     !- Hour 16
    0.,                     !- Hour 17
    0.,                     !- Hour 18
    0.,                     !- Hour 19
    0.,                     !- Hour 20
    0.,                     !- Hour 21
    0.,                     !- Hour 22
    0.,                     !- Hour 23
    0.;                     !- Hour 24

DAYSCHEDULE,
    SystemOnDaySched,       !- Name
    Fraction,               !- ScheduleType
    1.,                     !- Hour 1
    1.,                     !- Hour 2
    1.,                     !- Hour 3
    1.,                     !- Hour 4
    1.,                     !- Hour 5
    1.,                     !- Hour 6
    1.,                     !- Hour 7
    1.,                     !- Hour 8
    1.,                     !- Hour 9
    1.,                     !- Hour 10
    1.,                     !- Hour 11
    1.,                     !- Hour 12
    1.,                     !- Hour 13
    1.,                     !- Hour 14
    1.,                     !- Hour 15
    1.,                     !- Hour 16
    1.,                     !- Hour 17
    1.,                     !- Hour 18
    1.,                     !- Hour 19
    1.,                     !- Hour 20
    1.,                     !- Hour 21
    1.,                     !- Hour 22
    1.,                     !- Hour 23
    1.;                     !- Hour 24

DAYSCHEDULE,
    ReheatCoilDaySched,     !- Name
    Fraction,               !- ScheduleType
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
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```
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[];
    1,                          !- Hour 1
    1,                          !- Hour 2
    1,                          !- Hour 3
    1,                          !- Hour 4
    1,                          !- Hour 5
    1,                          !- Hour 6
    1,                          !- Hour 7
    1,                          !- Hour 8
    1,                          !- Hour 9
    1,                          !- Hour 10
    1,                          !- Hour 11
    1,                          !- Hour 12
    1,                          !- Hour 13
    1,                          !- Hour 14
    1,                          !- Hour 15
    1,                          !- Hour 16
    1,                          !- Hour 17
    1,                          !- Hour 18
    1,                          !- Hour 19
    1,                          !- Hour 20
    1,                          !- Hour 21
    1,                          !- Hour 22
    1,                          !- Hour 23
    1;                          !- Hour 24

DAYSCHEDULE,
    Zone Setpoint Day Sch,   !- Name
    Temperature,             !- ScheduleType
    23.17,                    !- Hour 1
    23.17,                    !- Hour 2
    23.17,                    !- Hour 3
    23.17,                    !- Hour 4
    23.17,                    !- Hour 5
    23.17,                    !- Hour 6
    23.17,                    !- Hour 7
    23.17,                    !- Hour 8
    23.17,                    !- Hour 9
    23.17,                    !- Hour 10
    23.17,                    !- Hour 11
    23.17,                    !- Hour 12
    23.17,                    !- Hour 13
    23.17,                    !- Hour 14
    23.17,                    !- Hour 15
    23.17,                    !- Hour 16
    23.17,                    !- Hour 17
    23.17,                    !- Hour 18
    23.17,                    !- Hour 19
    23.17,                    !- Hour 20
    23.17,                    !- Hour 21
    23.17,                    !- Hour 22
    23.17,                    !- Hour 23
    23.17;                    !- Hour 24

DAYSCHEDULE,
    Summer Control Type Day Sch,  !- Name
    Control Type,            !- ScheduleType
    3,                          !- Hour 1
    3,                          !- Hour 2
    3,                          !- Hour 3
    3,                          !- Hour 4
    3,                          !- Hour 5
    3,                          !- Hour 6
    3,                          !- Hour 7
    3,                          !- Hour 8
    3,                          !- Hour 9
    3,                          !- Hour 10
```

```
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Winter Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    3,                        !- Hour 1
    3,                        !- Hour 2
    3,                        !- Hour 3
    3,                        !- Hour 4
    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Min OA Day Sch,           !- Name
    Fraction,                 !- ScheduleType
    1.,                       !- Hour 1
    1.,                       !- Hour 2
    1.,                       !- Hour 3
    1.,                       !- Hour 4
    1.,                       !- Hour 5
    1.,                       !- Hour 6
    1.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
    1.,                       !- Hour 20
    1.,                       !- Hour 21
    1.,                       !- Hour 22
    1.,                       !- Hour 23
    1.;                       !- Hour 24
```

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!-   ===========  ALL OBJECTS IN CLASS: WEEKSCHEDULE ===========

WEEKSCHEDULE,
    LT-WEEK,                 !- Name
    LT-1,                    !- Sunday DAYSCHEDULE Name
    LT-1,                    !- Monday DAYSCHEDULE Name
    LT-1,                    !- Tuesday DAYSCHEDULE Name
    LT-1,                    !- Wednesday DAYSCHEDULE Name
    LT-1,                    !- Thursday DAYSCHEDULE Name
    LT-1,                    !- Friday DAYSCHEDULE Name
    LT-1,                    !- Saturday DAYSCHEDULE Name
    LT-1,                    !- Holiday DAYSCHEDULE Name
    LT-1,                    !- SummerDesignDay DAYSCHEDULE Name
    LT-1,                    !- WinterDesignDay DAYSCHEDULE Name
    LT-1,                    !- CustomDay1 DAYSCHEDULE Name
    LT-1;                    !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    EQ-WEEK,                 !- Name
    EQ-1,                    !- Sunday DAYSCHEDULE Name
    EQ-1,                    !- Monday DAYSCHEDULE Name
    EQ-1,                    !- Tuesday DAYSCHEDULE Name
    EQ-1,                    !- Wednesday DAYSCHEDULE Name
    EQ-1,                    !- Thursday DAYSCHEDULE Name
    EQ-1,                    !- Friday DAYSCHEDULE Name
    EQ-1,                    !- Saturday DAYSCHEDULE Name
    EQ-1,                    !- Holiday DAYSCHEDULE Name
    EQ-1,                    !- SummerDesignDay DAYSCHEDULE Name
    EQ-1,                    !- WinterDesignDay DAYSCHEDULE Name
    EQ-1,                    !- CustomDay1 DAYSCHEDULE Name
    EQ-1;                    !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Week on Peak,            !- Name
    Day On Peak,             !- Sunday DAYSCHEDULE Name
    Day On Peak,             !- Monday DAYSCHEDULE Name
    Day On Peak,             !- Tuesday DAYSCHEDULE Name
    Day On Peak,             !- Wednesday DAYSCHEDULE Name
    Day On Peak,             !- Thursday DAYSCHEDULE Name
    Day On Peak,             !- Friday DAYSCHEDULE Name
    Day On Peak,             !- Saturday DAYSCHEDULE Name
    Day On Peak,             !- Holiday DAYSCHEDULE Name
    Day On Peak,             !- SummerDesignDay DAYSCHEDULE Name
    Day On Peak,             !- WinterDesignDay DAYSCHEDULE Name
    Day On Peak,             !- CustomDay1 DAYSCHEDULE Name
    Day On Peak;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Supply Air Temp Week Sch,  !- Name
    Summer Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Supply Air Temp Week Sch,  !- Name
    Winter Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
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    Winter Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Chilled Water Loop Weekly,  !- Name
    Chilled Water Loop Daily,!- Sunday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Monday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Tuesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Wednesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Thursday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Friday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Saturday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Holiday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- SummerDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- WinterDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- CustomDay1 DAYSCHEDULE Name
    Chilled Water Loop Daily;!- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOnWeekSched,!- Name
    SystemOnDaySched,        !- Sunday DAYSCHEDULE Name
    SystemOnDaySched,        !- Monday DAYSCHEDULE Name
    SystemOnDaySched,        !- Tuesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Wednesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Thursday DAYSCHEDULE Name
    SystemOnDaySched,        !- Friday DAYSCHEDULE Name
    SystemOnDaySched,        !- Saturday DAYSCHEDULE Name
    SystemOnDaySched,        !- Holiday DAYSCHEDULE Name
    SystemOnDaySched,        !- SummerDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- WinterDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- CustomDay1 DAYSCHEDULE Name
    SystemOnDaySched;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOffWeekSched,  !- Name
    SystemOffDaySched,       !- Sunday DAYSCHEDULE Name
    SystemOffDaySched,       !- Monday DAYSCHEDULE Name
    SystemOffDaySched,       !- Tuesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Wednesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Thursday DAYSCHEDULE Name
    SystemOffDaySched,       !- Friday DAYSCHEDULE Name
    SystemOffDaySched,       !- Saturday DAYSCHEDULE Name
    SystemOffDaySched,       !- Holiday DAYSCHEDULE Name
    SystemOffDaySched,       !- SummerDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- WinterDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- CustomDay1 DAYSCHEDULE Name
    SystemOffDaySched;       !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ReheatCoilWeekSched,     !- Name
    ReheatCoilDaySched,      !- Sunday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Monday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Tuesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Wednesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Thursday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Friday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Saturday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Holiday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- SummerDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- WinterDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- CustomDay1 DAYSCHEDULE Name
    ReheatCoilDaySched;      !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Zone Setpoint Week Sch,  !- Name
    Zone Setpoint Day Sch,   !- Sunday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Monday DAYSCHEDULE Name
```

```
    Zone Setpoint Day Sch,   !- Tuesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Wednesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Thursday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Friday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Saturday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Holiday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- SummerDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- WinterDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- CustomDay1 DAYSCHEDULE Name
    Zone Setpoint Day Sch;   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Control Type Week Sch,  !- Name
    Summer Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Control Type Week Sch,  !- Name
    Winter Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Min OA Week Sch,         !- Name
    Min OA Day Sch,          !- Sunday DAYSCHEDULE Name
    Min OA Day Sch,          !- Monday DAYSCHEDULE Name
    Min OA Day Sch,          !- Tuesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Wednesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Thursday DAYSCHEDULE Name
    Min OA Day Sch,          !- Friday DAYSCHEDULE Name
    Min OA Day Sch,          !- Saturday DAYSCHEDULE Name
    Min OA Day Sch,          !- Holiday DAYSCHEDULE Name
    Min OA Day Sch,          !- SummerDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- WinterDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- CustomDay1 DAYSCHEDULE Name
    Min OA Day Sch;          !- CustomDay2 DAYSCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE ===========

SCHEDULE,
    LIGHTS-1,                !- Name
    Fraction,                !- ScheduleType
    LT-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    EQUIP-1,                 !- Name
    Fraction,                !- ScheduleType
```

```
    EQ-WEEK,                !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    On Peak,                !- Name
    Fraction,               !- ScheduleType
    Week On Peak,           !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    Seasonal Reset Supply Air Temp Sch,  !- Name
    Temperature,            !- ScheduleType
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    3,                      !- End Month 1
    31,                     !- End Day 1
    Summer Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                      !- Start Month 2
    1,                      !- Start Day 2
    9,                      !- End Month 2
    30,                     !- End Day 2
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                     !- Start Month 3
    1,                      !- Start Day 3
    12,                     !- End Month 3
    31;                     !- End Day 3

SCHEDULE,
    CW Loop Temp Schedule,  !- Name
    Temperature,            !- ScheduleType
    Chilled Water Loop Weekly,  !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    FanAndCoilAvailSched,   !- Name
    Fraction,               !- ScheduleType
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    3,                      !- End Month 1
    31,                     !- End Day 1
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 2
    4,                      !- Start Month 2
    1,                      !- Start Day 2
    9,                      !- End Month 2
    30,                     !- End Day 2
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 3
    10,                     !- Start Month 3
    1,                      !- Start Day 3
    12,                     !- End Month 3
    31;                     !- End Day 3

SCHEDULE,
    ReheatCoilAvailSched,   !- Name
    Fraction,               !- ScheduleType
    ReheatCoilWeekSched,    !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1
```

```
SCHEDULE,
    Zone Setpoints,          !- Name
    Temperature,             !- ScheduleType
    Zone Setpoint Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Control Type Sched, !- Name
    Control Type,            !- ScheduleType
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    Summer Control Type Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    Min OA Sched,            !- Name
    Fraction,                !- ScheduleType
    Min OA Week Sch,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1


!-   ===========  ALL OBJECTS IN CLASS: LIGHTS ===========

LIGHTS,
    Zone 1,                  !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    0,                       !- Design Level {W}
    .15,                     !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights,           !- LightsEndUseKey
    No,                      !- Return Air Fraction Is Calculated from Plenum Temperature
    0,                       !- Coefficient #1 of Equation for Return Air Fraction vs. Plenum
Temperature
    0;                       !- Coefficient #2 of Equation for Return Air Fraction vs. Plenum
Temperature {1/K}


!-   ===========  ALL OBJECTS IN CLASS: NODE LIST ===========

NODE LIST,
    OutsideAirInletNodes,    !- Node List Name
    Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
    Zone1Inlets,             !- Node List Name
    Zone 1 Reheat Air Outlet Node;  !- Node_ID_1

NODE LIST,
    Supply Air Temp Nodes,   !- Node List Name
    Heating Coil Air Inlet Node,  !- Node_ID_1
    Air Loop Outlet Node;    !- Node_ID_2
```

```
NODE LIST,
    Chilled Water Loop Setpoint Node List,  !- Node List Name
    CW Supply Outlet Node;   !- Node_ID_1


!-   ===========  ALL OBJECTS IN CLASS: BRANCH LIST ===========

BRANCH LIST,
    Air Loop Branches,       !- Branch List Name
    Air Loop Main Branch;    !- Branch Name 1

BRANCH LIST,
    Cooling Supply Side Branches,  !- Branch List Name
    CW Pump Branch,          !- Branch Name 1
    Purchased Cooling Branch,!- Branch Name 2
    Supply Bypass Branch,    !- Branch Name 3
    Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
    Cooling Demand Side Branches,  !- Branch List Name
    Cooling Demand Inlet,    !- Branch Name 1
    Cooling Coil Branch,     !- Branch Name 2
    Demand Bypass Branch,    !- Branch Name 3
    Cooling Demand Outlet;   !- Branch Name 4


!-   ===========  ALL OBJECTS IN CLASS: CONNECTOR LIST ===========

CONNECTOR LIST,
    Cooling Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Loop Splitter,        !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
    Cooling Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Demand Splitter,      !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Demand Mixer;         !- Name of Connector 2


!-   ===========  ALL OBJECTS IN CLASS: BRANCH ===========

BRANCH,
    Air Loop Main Branch,    !- Branch Name
!    SysFlowRate[],
    .7475,                   !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    Air Loop Inlet Node,     !- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    FAN:SIMPLE:VariableVolume,  !- Comp2 Type
    Supply Fan 1,            !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
    Cooling Coil Air Inlet Node,  !- Comp2 Outlet Node Name
    ACTIVE,                  !- Comp2 Branch Control Type
    COIL:Water:SimpleCooling,!- Comp3 Type
    Main Cooling Coil 1,     !- Comp3 Name
    Cooling Coil Air Inlet Node,  !- Comp3 Inlet Node Name
    Heating Coil Air Inlet Node,  !- Comp3 Outlet Node Name
    PASSIVE,                 !- Comp3 Branch Control Type
    COIL:Gas:Heating,        !- Comp4 Type
    Main Heating Coil 1,     !- Comp4 Name
    Heating Coil Air Inlet Node,  !- Comp4 Inlet Node Name
    Air Loop Outlet Node,    !- Comp4 Outlet Node Name
    PASSIVE;                 !- Comp4 Branch Control Type

BRANCH,
```

```
    Cooling Demand Inlet,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Inlet Pipe,  !- Comp1 Name
    CW Demand Inlet Node,    !- Comp1 Inlet Node Name
    CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Coil Branch,     !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleCooling,!- Comp1 Type
    Main Cooling Coil 1,     !- Comp1 Name
    Cooling Coil Water Inlet Node,  !- Comp1 Inlet Node Name
    Cooling Coil Water Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Demand Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Bypass,      !- Comp1 Name
    CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    CW Demand Side Outlet Pipe,  !- Comp1 Name
    CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Outlet Pipe, !- Comp1 Name
    Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    CW Pump Branch,          !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    Circ Pump,               !- Comp1 Name
    CW Supply Inlet Node,    !- Comp1 Inlet Node Name
    CW Pump Outlet Node,     !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Purchased Cooling Branch,!- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    Purchased:Chilled Water, !- Comp1 Type
    Purchased Cooling,       !- Comp1 Name
    Purchased Cooling Inlet Node,  !- Comp1 Inlet Node Name
    Purchased Cooling Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Supply Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Bypass,      !- Comp1 Name
    CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type
```

```
!-   ===========  ALL OBJECTS IN CLASS: PIPE ===========

PIPE,
    Demand Side Inlet Pipe,  !- PipeName
    CW Demand Inlet Node,    !- Inlet Node Name
    CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Demand Side Bypass,      !- PipeName
    CW Demand Bypass Inlet Node,  !- Inlet Node Name
    CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    CW Demand Side Outlet Pipe,  !- PipeName
    CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Outlet Pipe, !- PipeName
    Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Bypass,      !- PipeName
    CW Supply Bypass Inlet Node,  !- Inlet Node Name
    CW Supply Bypass Outlet Node;  !- Outlet Node Name


!-   ===========  ALL OBJECTS IN CLASS: PLANT LOOP ===========

PLANT LOOP,
    Chilled Water Loop,      !- Plant Loop Name
    Water,                   !- Fluid Type
    CW Loop Operation,       !- Plant Operation Scheme List Name
    CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    98,                      !- Maximum Loop Temperature {C}
    1,                       !- Minimum Loop Temperature {C}
    0.0006,                  !- Maximum Loop Volumetric Flow Rate {m3/s}
    0,                       !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    CW Supply Inlet Node,    !- Plant Side Inlet Node Name
    CW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Cooling Supply Side Branches,  !- Plant Side Branch List Name
    Cooling Supply Side Connectors,  !- Plant Side Connector List Name
    CW Demand Inlet Node,    !- Demand Side Inlet Node Name
    CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Cooling Demand Side Branches,  !- Demand Side Branch List Name
    Cooling Demand Side Connectors,  !- Demand Side Connector List Name
    Optimal;                 !- Load Distribution Scheme


!-   ===========  ALL OBJECTS IN CLASS: PLANT OPERATION SCHEMES ===========

PLANT OPERATION SCHEMES,
    CW Loop Operation,       !- PlantOperationSchemeName
    LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Peak Operation,          !- Control Scheme Name 1
    On Peak;                 !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: COOLING LOAD RANGE BASED OPERATION ===========

COOLING LOAD RANGE BASED OPERATION,
    Peak Operation,          !- Name
    0,                       !- Load Range Lower Limit 1 {W}
    100000,                  !- Load Range Upper Limit 1 {W}
    Purchased Only;          !- Priority Control Equip List Name 1


!-   ===========  ALL OBJECTS IN CLASS: PLANT EQUIPMENT LIST ===========
```

```
PLANT EQUIPMENT LIST,
    Purchased Only,          !- Equip List Name
    Purchased:Chilled Water, !- KEY--Plant Equip 1
    Purchased Cooling;       !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: SPLITTER ===========

SPLITTER,
    CW Loop Splitter,        !- SplitterName
    CW Pump Branch,          !- Inlet Branch Name
    Purchased Cooling Branch,!- Outlet Branch Name 1
    Supply Bypass Branch;    !- Outlet Branch Name 2

SPLITTER,
    CW Demand Splitter,      !- SplitterName
    Cooling Demand Inlet,    !- Inlet Branch Name
    Demand Bypass Branch,    !- Outlet Branch Name 1
    Cooling Coil Branch;     !- Outlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: MIXER ===========

MIXER,
    CW Loop Mixer,           !- MixerName
    Cooling Supply Outlet,   !- Outlet Branch Name
    Purchased Cooling Branch,!- Inlet Branch Name 1
    Supply Bypass Branch;    !- Inlet Branch Name 2

MIXER,
    CW Demand Mixer,         !- MixerName
    Cooling Demand Outlet,   !- Outlet Branch Name
    Cooling Coil Branch,     !- Inlet Branch Name 1
    Demand Bypass Branch;    !- Inlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: AIR PRIMARY LOOP ===========

AIR PRIMARY LOOP,
    Typical Terminal Reheat 1,  !- Primary Air Loop Name
    Reheat System 1 Controllers,  !- Name: Controller List
    Reheat System 1 Avail List,  !- Name: System Availability Manager List
!    SysFlowRate[],
    .7475,                   !- Primary air design volumetric flow rate {m3/s}
    Air Loop Branches,       !- Air Loop Branch List Name
    ,                        !- Air Loop Connector List Name
    Air Loop Inlet Node,     !- ReturnAir AirLoop Inlet Node
    Return Air Mixer Outlet, !- ZoneEquipGroup Outlet Node
    Zone Equipment Inlet Node,  !- SupplyAirPath ZoneEquipGroup Inlet Nodes
    Air Loop Outlet Node;    !- AirLoop Outlet Nodes


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER LIST ===========

CONTROLLER LIST,
    Reheat System 1 Controllers,  !- Name
    Controller:Simple,       !- Controller Type 1
    Main Cooling Coil Controller;  !- Controller Name 1

CONTROLLER LIST,
    OA Sys 1 Controllers,    !- Name
    CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
    OA Controller 1;         !- Controller Name 1


!-   ===========  ALL OBJECTS IN CLASS: AIR LOOP EQUIPMENT LIST ===========

AIR LOOP EQUIPMENT LIST,
    OA Sys 1 Equipment,      !- Name
    OUTSIDE AIR MIXER,       !- KEY--System Component 1
```

```
    OA Mixing Box 1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR SYSTEM ===========

OUTSIDE AIR SYSTEM,
    OA Sys 1,                !- Name
    OA Sys 1 Controllers,    !- Name: Controller List
    OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
    Reheat System 1 Avail List;  !- Name of a System Availability Manager List


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR INLET NODE LIST ===========

OUTSIDE AIR INLET NODE LIST,
    OutsideAirInletNodes;    !- 1st Node name or node list name


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR MIXER ===========

OUTSIDE AIR MIXER,
    OA Mixing Box 1,         !- Name
    Mixed Air Node 1,        !- Mixed_Air_Node
    Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
    Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
    Air Loop Inlet Node;     !- Return_Air_Stream_Node


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER LIST ===========

SYSTEM AVAILABILITY MANAGER LIST,
    Reheat System 1 Avail List,  !- Name
    SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
    Reheat System 1 Avail;   !- System Availability Manager Name 1


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER:SCHEDULED ===========

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
    Reheat System 1 Avail,   !- Name
    FanAndCoilAvailSched;    !- Schedule name


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:SCHEDULED ===========

SET POINT MANAGER:SCHEDULED,
    Chilled Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    CW Loop Temp Schedule,   !- Schedule Name
    Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Supply Air Temp Manager, !- Name
    TEMP,                    !- Control variable
    Seasonal Reset Supply Air Temp Sch,  !- Schedule Name
    Supply Air Temp Nodes;   !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:SIMPLE ===========

CONTROLLER:SIMPLE,
    Main Cooling Coil Controller,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
    Heating Coil Air Inlet Node,  !- Control_Node
    Cooling Coil Water Inlet Node,  !- Actuator_Node
    0.001,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    0.0006,                  !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}
```

```
!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:OUTSIDE AIR ===========

CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    NO ECONOMIZER,           !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    .01,                     !- minimum outside air flow rate {m3/s}
!    SysFlowRate[],
    .7475,                   !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    Air Loop Inlet Node,     !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLED ZONE EQUIP CONFIGURATION ===========

CONTROLLED ZONE EQUIP CONFIGURATION,
    Zone 1,                  !- Zone Name
    Zone1Equipment,          !- List Name: Zone Equipment
    Zone1Inlets,             !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    Zone 1 Node,             !- Zone Air Node Name
    Zone 1 Outlet Node;      !- Zone Return Air Node Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE EQUIPMENT LIST ===========

ZONE EQUIPMENT LIST,
    Zone1Equipment,          !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    Zone1TermReheat,         !- Type Name 1
    1,                       !- Cooling Priority
    1;                       !- Heating Priority


!-   ===========  ALL OBJECTS IN CLASS: AIR DISTRIBUTION UNIT ===========

AIR DISTRIBUTION UNIT,
    Zone1TermReheat,         !- Air Distribution Unit Name
    Zone 1 Reheat Air Outlet Node,  !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:CONST VOLUME:REHEAT,  !- KEY--System Component Type 1
    Reheat Zone 1;           !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:CONST VOLUME:REHEAT ===========

SINGLE DUCT:CONST VOLUME:REHEAT,
    Reheat Zone 1,           !- Name of System
    FanAndCoilAvailSched,    !- System Availability schedule
    Zone 1 Reheat Air Outlet Node,  !- Unit Air Outlet Node
    Zone 1 Reheat Air Inlet Node,  !- Unit Air Inlet Node
!    SysFlowRate[],
    .7475,                   !- Maximum air flow rate {m3/s}
    ,                        !- Control node
    COIL:Gas:Heating,        !- Reheat Component Object
    Reheat Coil Zone 1,      !- Name of Reheat Component
    0.0,                     !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    0.001;                   !- Convergence Tolerance
```

```
!-   ===========  ALL OBJECTS IN CLASS: ZONE CONTROL:THERMOSTATIC ===========

ZONE CONTROL:THERMOSTATIC,
    Zone 1 Thermostat,       !- Thermostat Name
    ZONE 1,                  !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Heating Cooling Setpoint,  !- Control Type #1
    Single Setpoint;         !- Control Type Name #1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE HEATING COOLING SETPOINT ===========

SINGLE HEATING COOLING SETPOINT,
    Single Setpoint,         !- Name
    Zone Setpoints;          !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY AIR PATH ===========

ZONE SUPPLY AIR PATH,
    TermReheatSupplyPath,    !- Supply Air Path Name
    Zone Equipment Inlet Node,  !- Supply Air Path Inlet Node
    Zone Supply Plenum,      !- KEY--System Component Type 1
    Zone 1b Plenum,          !- Component Name 1
    Zone Splitter,           !- KEY--System Component Type 2
    Zone Supply Air Splitter;!- Component Name 2


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN AIR PATH ===========

ZONE RETURN AIR PATH,
    TermReheatReturnPath,    !- Return Air Path Name
    Return Air Mixer Outlet, !- Return Air Path Outlet Node
    Zone Mixer,              !- KEY--System Component Type 1
    Zone Return Air Mixer;   !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY PLENUM ===========

ZONE SUPPLY PLENUM,
    Zone 1b Plenum,          !- Zone Plenum Name
    ZONE 1b,                 !- Zone Name
    Zone 1b Node,            !- Zone Node Name
    Zone Equipment Inlet Node,  !- Inlet_Node
    Zone 1b Plenum Outlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SPLITTER ===========

ZONE SPLITTER,
    Zone Supply Air Splitter,!- Splitter Name
    Zone 1b Plenum Outlet Node,  !- Inlet_Node
    Zone 1 Reheat Air Inlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE MIXER ===========

ZONE MIXER,
    Zone Return Air Mixer,   !- Mixer Name
    Return Air Mixer Outlet, !- Outlet_Node
    Zone 1 Outlet Node;      !- Inlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: PURCHASED:CHILLED WATER ===========

PURCHASED:CHILLED WATER,
    Purchased Cooling,       !- Purchased Chilled Water Name
    Purchased Cooling Inlet Node,  !- Plant_Loop_Inlet_Node
    Purchased Cooling Outlet Node,  !- Plant_Loop_Outlet_Node
    10000;                   !- Nominal Capacity {W}
```

```
!-   ===========  ALL OBJECTS IN CLASS: PUMP:VARIABLE SPEED ===========

PUMP:VARIABLE SPEED,
    Circ Pump,               !- Pump Name
    CW Supply Inlet Node,    !- Inlet_Node
    CW Pump Outlet Node,     !- Outlet_Node
    .0006,                   !- Rated Volumetric Flow Rate {m3/s}
    300000,                  !- Rated Pump Head {Pa}
    270,                     !- Rated Power Consumption {W}
    .87,                     !- Motor Efficiency
    0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                       !- Coefficient1 of the Part Load Performance Curve
    1,                       !- Coefficient2 of the Part Load Performance Curve
    0,                       !- Coefficient3 of the Part Load Performance Curve
    0,                       !- Coefficient4 of the Part Load Performance Curve
    0,                       !- Min Flow Rate while operating in variable flow capacity; {m3/s}
    INTERMITTENT;            !- Pump Control Type


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:SIMPLECOOLING ===========

COIL:Water:SimpleCooling,
    Main Cooling Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    1600,                    !- UA of the Coil {W/K}
    .0006,                   !- Max Water Flow Rate of Coil {m3/s}
    0.95,                    !- Leaving Relative Humidity of Coil
    Cooling Coil Water Inlet Node,  !- Coil_Water_Inlet_Node
    Cooling Coil Water Outlet Node,  !- Coil_Water_Outlet_Node
    Cooling Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Heating Coil Air Inlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: COIL:GAS:HEATING ===========

COIL:Gas:Heating,
    Reheat Coil Zone 1,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Zone 1 Reheat Air Inlet Node,  !- Coil_Air_Inlet_Node
    Zone 1 Reheat Air Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Gas:Heating,
    Main Heating Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Heating Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Air Loop Outlet Node,    !- Coil_Air_Outlet_Node
    Air Loop Outlet Node;    !- Coil_Temp_Setpoint_Node


!-   ===========  ALL OBJECTS IN CLASS: FAN:SIMPLE:VARIABLEVOLUME ===========

FAN:SIMPLE:VariableVolume,
    Supply Fan 1,            !- Fan Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    100.0,                   !- Delta Pressure {Pa}
!    SysFlowRate[],
    .7475,                   !- Max Flow Rate {m3/s}
    0.001,                   !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.0015302446,            !- FanCoefficient 1
    0.0052080574,            !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -0.11635563,             !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
```

```
    Mixed Air Node 1,        !- Fan_Inlet_Node
    Cooling Coil Air Inlet Node;  !- Fan_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: REPORT VARIABLE ===========

DIAGNOSTICS,DisplayAdvancedReportVariables;

Report Variable,
    *,                       !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Ext Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                 !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                 !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Sensible Cooling Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1,                  !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Air Temp,       !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Outlet Node,      !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node Temp,        !- Variable_Name
```

```
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Mixed Air Node 1,        !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Cooling Coil Water Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Heating Coil Gas Consumption Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Total Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Sensible Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

!-   ===========  ALL OBJECTS IN CLASS: REPORT ===========

Report,
    surfaces,                !- Type_of_Report
    dxf;                     !- Name_of_Report

Report,
    Variable Dictionary;     !- Type_of_Report

Report,
    Surfaces,                !- Type_of_Report
    DETAILS;                 !- Name_of_Report
```

A.2 CFDCOMPNORETPLEN5.IDF

Table 15: Inputs for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange OFF, nominal h_c's

Occupied zone ceiling temperature	81 F
Bottom of floor slab air temperature	80 F

Supply plenum radiation exchange?	No
Supply plenum air inlet temperature	56 F
Supply plenum air flow rate	1.5 cfm/ft^2
Supply plenum ceiling h_c	4.01 W/m^2K
Supply plenum floor h_c	3.52 W/m^2K

Table 16: Full input listing for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange OFF, nominal h_c's

```
!-Generator IDFEditor 1.20

!-NOTE: All comments with '!-' are ignored by the IDFEditor and are generated automatically.
!-      Use '!' comments if they need to be retained when using the IDFEditor.


!-   ===========  ALL OBJECTS IN CLASS: VERSION ===========

! Case CFDComp
! Plenum with Return Air Heat Gain; supply plenum; 1 zone building
! This deck contains 3 zones, the main zone (zone 1) with a window and internal loads and is
connected through
! the system to the plenum (zone 1a).  The plenum has the roof exposure that the main zone will
never really feel.
! The system is a standard constant volume reheat serving the one main zone and exhausts through
the
! plenum zone back to the system air loop.  The cooling coil is water with a chilled water plant
loop and the
! reheat coil is a gas fired coil.  The surfaces between the main zone and the plenum are
interzone.
! Supply air is supplied through an underfloor air distribution system - a supply plenum. The
supply
! plenum is in contact with the ground, which the occupied space will never feel.
VERSION,
    1.2.2;                  !- Version Identifier


!-   ===========  ALL OBJECTS IN CLASS: BUILDING ===========

BUILDING,
    YorkLab,                !- Building Name
    0.0000000E+00,          !- North Axis {deg}
    Suburbs,                !- Terrain
    .04,                    !- Loads Convergence Tolerance Value {W}
    .4,                     !- Temperature Convergence Tolerance Value {deltaC}
    MinimalShadowing,       !- Solar Distribution
    ;                       !- Maximum Number of Warmup Days


!-   ===========  ALL OBJECTS IN CLASS: TIMESTEP IN HOUR ===========

TIMESTEP IN HOUR,
    6;                      !- Time Step in Hour


!-   ===========  ALL OBJECTS IN CLASS: INSIDE CONVECTION ALGORITHM ===========

INSIDE CONVECTION ALGORITHM,
    Simple;                 !- InsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE CONVECTION ALGORITHM ===========

OUTSIDE CONVECTION ALGORITHM,
    Simple;                 !- OutsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: SOLUTION ALGORITHM ===========

SOLUTION ALGORITHM,
    CTF;                    !- SolutionAlgo


!-   ===========  ALL OBJECTS IN CLASS: DEBUG OUTPUT ===========

DEBUG OUTPUT,
    0,                      !- YesNo
```

```
    0;                      !- EvenDuringWarmup


!-   ===========  ALL OBJECTS IN CLASS: DIAGNOSTICS ===========

DIAGNOSTICS,
    DisplayAdvancedReportVariables;  !- key1


!-   ===========  ALL OBJECTS IN CLASS: ZONE VOLUME CAPACITANCE MULTIPLIER ===========

ZONE VOLUME CAPACITANCE MULTIPLIER,
    1;                      !- Capacitance Multiplier


!-   ===========  ALL OBJECTS IN CLASS: RUN CONTROL ===========

RUN CONTROL,
    No,                     !- Do the zone sizing calculation
    No,                     !- Do the system sizing calculation
    No,                     !- Do the plant sizing calculation
    Yes,                    !- Do the design day simulations
    Yes;                    !- Do the weather file simulation


!-   ===========  ALL OBJECTS IN CLASS: RUNPERIOD ===========

RunPeriod,
    9,                      !- Begin Month
    13,                     !- Begin Day Of Month
    9,                      !- End Month
    20,                     !- End Day Of Month
    Tuesday,                !- Day Of Week For Start Day
    No,                     !- Use WeatherFile Holidays/Special Days
    No,                     !- Use WeatherFile DaylightSavingPeriod
    Yes,                    !- Apply Weekend Holiday Rule
    Yes,                    !- Use WeatherFile Rain Indicators
    Yes;                    !- Use WeatherFile Snow Indicators


!-   ===========  ALL OBJECTS IN CLASS: LOCATION ===========

Location,
    Harrisburg,             !- LocationName
    40.2,                   !- Latitude {deg}
    -76.77,                 !- Longitude {deg}
    -5,                     !- TimeZone {hr}
    94;                     !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: GROUNDTEMPERATURES ===========

! DesignDay,
!     Harrisburg Summer,
!     33.3,
!     10.4,
!     23.5,
!     100200,
!     5,
!     30,
!     1,
!     ,
!     ,
!     15,
!     8,
!     SummerDesignDay,
!     1;
! DesignDay,
!     Harrisburg Winter,
!     -13,
!     0,
```

```
!     -13,
!     100200,
!     5,
!     30,
!     0,
!     ,
!     ,
!     15,
!     1,
!     WinterDesignDay,
!     1;
GroundTemperatures,
    18.89,                  !- January Ground Temperature {C}
    18.92,                  !- February Ground Temperature {C}
    19.02,                  !- March Ground Temperature {C}
    19.12,                  !- April Ground Temperature {C}
    19.21,                  !- May Ground Temperature {C}
    19.23,                  !- June Ground Temperature {C}
    19.07,                  !- July Ground Temperature {C}
    19.32,                  !- August Ground Temperature {C}
    19.09,                  !- September Ground Temperature {C}
    19.21,                  !- October Ground Temperature {C}
    19.13,                  !- November Ground Temperature {C}
    18.96;                  !- December Ground Temperature {C}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR ===========

MATERIAL:REGULAR,
    BLBD - PLYWOOD 3 / 4 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Name
    Smooth,                 !- Roughness
    .0099999998,            !- Thickness {m}
    .059999999,             !- Conductivity {W/m-K}
    480.55,                 !- Density {kg/m3}
    830,                    !- Specific Heat {J/kg-K}
    .01,                    !- Absorptance:Thermal
    .32,                    !- Absorptance:Solar
    .32;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    BLBD - PLYWOOD 1 / 2 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    B10 - 2 IN WOOD,        !- Name
    MediumSmooth,           !- Roughness
    .050000001,             !- Thickness {m}
    .12,                    !- Conductivity {W/m-K}
    592.68,                 !- Density {kg/m3}
    2510,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible
```

```
MATERIAL:REGULAR,
    E5 - ACOUSTIC TILE,      !- Name
    MediumSmooth,            !- Roughness
    .0099999998,             !- Thickness {m}
    100,                     !- Conductivity {W/m-K}
    480.55,                  !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .32,                     !- Absorptance:Solar
    .32;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 120 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    .1,                      !- Thickness {m}
    .74,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 40 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    0.1000000    ,           !- Thickness {m}
    0.1600000    ,           !- Conductivity {W/m-K}
    640.7300    ,            !- Density {kg/m3}
    830.0000    ,            !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.6500000    ,           !- Absorptance:Solar
    0.6500000    ;           !- Absorptance:Visible

! k=0.196 W/m-K th=1.3 inches
MATERIAL:REGULAR,
    RaisedFloorAsConcrete,   !- Name
    MediumRough,             !- Roughness
    0.033,                   !- Thickness {m}
    0.196        ,           !- Conductivity {W/m-K}
    640.7300     ,           !- Density {kg/m3}
    830.0000     ,           !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.7          ,           !- Absorptance:Solar
    0.7          ;           !- Absorptance:Visible

MATERIAL:REGULAR,
    FloorSlabConcrete,       !- Name
    MediumRough,             !- Roughness
    .254,                    !- Thickness {m}
    .93,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
     .001,                   !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR-R ===========

MATERIAL:REGULAR-R,
    R30-INSULATION,          !- Name
    Rough,                   !- Roughness
    5.283,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R5-INSULATION,           !- Name
    Rough,                   !- Roughness
```

```
    .881,                    !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R11-INSULATION,          !- Name
    Rough,                   !- Roughness
    1.937,                   !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R19-INSULATION,          !- Name
    Rough,                   !- Roughness
    3.346,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R-TateFloor,             !- Name
    Rough,                   !- Roughness
    .23,                     !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    FloorSlabHc,             !- Name
    MediumRough,             !- Roughness
    1.1737,                  !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    Carpet,                  !- Name
    Rough,                   !- Roughness
    0.06,                    !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7500000    ,           !- Absorptance:Solar
    0.7500000    ;           !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGLASS ===========

MATERIAL:WINDOWGLASS,
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    .0060000001,             !- Thickness {m}
    .775,                    !- Solar Transmittance at Normal Incidence
    .071000002,              !- Solar Reflectance at Normal Incidence: Front Side
    .071000002,              !- Solar Reflectance at Normal Incidence: Back Side
    .881,                    !- Visible Transmittance at Normal Incidence
    .079999998,              !- Visible Reflectance at Normal Incidence: Front Side
    .079999998,              !- Visible Reflectance at Normal Incidence: Back Side
    ,                        !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGAS ===========

MATERIAL:WINDOWGAS,
    WinAirB1 - AIRSPACE RESISTANCE,  !- Name
    Air,                     !- Gas Type
    .012;                    !- Thickness {m}
```

```
!-   ===========  ALL OBJECTS IN CLASS: CONSTRUCTION ===========

CONSTRUCTION,
    Wall-A,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-B,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    BLBD - PLYWOOD 1 / 2 IN; !- Layer #3

CONSTRUCTION,
    Wall-C,                  !- Name
    BLBD - PLYWOOD 1 / 2 IN, !- Outside Layer
    R19-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-D,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-E,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-F,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION;          !- Layer #2

CONSTRUCTION,
    Suspened Ceiling,        !- Name
    E5 - ACOUSTIC TILE;      !- Outside Layer

CONSTRUCTION,
    Raised Floor,            !- Name
    RaisedFloorAsConcrete,   !- Outside Layer
    Carpet;                  !- Layer #2

CONSTRUCTION,
    Raised Floor SP,         !- Name
    Carpet,                  !- Outside Layer
    RaisedFloorAsConcrete;   !- Layer #2

CONSTRUCTION,
    Out Ceiling,             !- Name
    R30-INSULATION,          !- Outside Layer
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    SubFloor,                !- Name
    FloorSlabConcrete;       !- Outside Layer

CONSTRUCTION,
    DoublePaneWindow,        !- Name
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Outside Layer
    WinAirB1 - AIRSPACE RESISTANCE,  !- Layer #2
    GLASS - CLEAR PLATE 1 / 4 IN;  !- Layer #3

CONSTRUCTION,
    Raised Floor No Carpet,  !- Name
```

```
    RaisedFloorAsConcrete;   !- Outside Layer


!-   ===========  ALL OBJECTS IN CLASS: ZONE ===========

ZONE,
    Zone 1,                  !- Zone Name
    0,                       !- Relative North (to building) {deg}
    0.0000000E+00,           !- X Origin {m}
    0.0000000E+00,           !- Y Origin {m}
    0.0000000E+00,           !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100,                    !- Ceiling Height {m}
    0;                       !- Volume {m3}

ZONE,
    Zone 1b,                 !- Zone Name
    0,                       !- Relative North (to building) {deg}
    ,                        !- X Origin {m}
    ,                        !- Y Origin {m}
    -.305,                   !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100.0000,               !- Ceiling Height {m}
    0.0000000E+00;           !- Volume {m3}


!-   ===========  ALL OBJECTS IN CLASS: SURFACEGEOMETRY ===========

SurfaceGeometry,
    UpperLeftCorner,         !- SurfaceStartingPosition
    CounterClockWise,        !- VertexEntry
    WorldCoordinateSystem;   !- CoordinateSystem


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER ===========

Surface:HeatTransfer,
    TC-NorthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-NorthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-SouthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
```

```
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-EastWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-EastWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-WestWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-WestWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Ceil,                 !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    Suspened Ceiling,        !- Construction Name of the Surface
```

```
    Zone 1,                  !- InsideFaceEnvironment
    OtherSideCoeff,          !- OutsideFaceEnvironment
    TC-CeilOST,              !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    3.048 ,                  !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    3.048 ,                  !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

! I am here
Surface:HeatTransfer,
    TC-Floor,                !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    Raised Floor No Carpet,  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-Ceil,                 !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    6.7  ,                   !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63,                   !- Vertex 4 X-coordinate {m}
    0,                       !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-NorthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-NorthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}
```

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Surface:HeatTransfer,
    SP-SouthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-EastWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-EastWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-WestWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-WestWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
```

```
    -0.305 ,                !- Vertex 3 Z-coordinate {m}
    0 ,                     !- Vertex 4 X-coordinate {m}
    0 ,                     !- Vertex 4 Y-coordinate {m}
    0 ;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Ceil,                !- User Supplied Surface Name
    CEILING,                !- Surface Type
    Raised Floor No Carpet, !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-Floor,               !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    6.7   ,                 !- Vertex 1 Y-coordinate {m}
    0 ,                     !- Vertex 1 Z-coordinate {m}
    0 ,                     !- Vertex 2 X-coordinate {m}
    0 ,                     !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    0 ,                     !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    14.63 ,                 !- Vertex 4 X-coordinate {m}
    6.7   ,                 !- Vertex 4 Y-coordinate {m}
    0 ;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Floor,               !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    SubFloor,               !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherSideCoeff,         !- OutsideFaceEnvironment
    SP-FloorOST,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    0 ,                     !- Vertex 1 Y-coordinate {m}
    -0.305 ,                !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    6.7  ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    6.7   ,                 !- Vertex 3 Y-coordinate {m}
    -0.305 ,                !- Vertex 3 Z-coordinate {m}
    14.63,                  !- Vertex 4 X-coordinate {m}
    0,                      !- Vertex 4 Y-coordinate {m}
    -0.305 ;                !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: OTHERSIDECOEFFICIENTS ===========

OtherSideCoefficients,
    TC-CeilOST,             !- OtherSideCoeff Name
    0.,                     !- Combined convective/radiative film coefficient
!   CeilOSTemp[],
    26.67,                  !- User selected Constant Temperature {C}
    1.,                     !- Coefficient modifying the user selected constant temperature
    0.,                     !- Coefficient modifying the external dry bulb temperature
    0.,                     !- Coefficient modifying the ground temperature
    0.,                     !- Coefficient modifying the wind speed term (s/m)
    0;                      !- Coefficient modifying the zone air temperature part of the
equation

OtherSideCoefficients,
```

```
    SP-FloorOST,            !- OtherSideCoeff Name
    0.,                     !- Combined convective/radiative film coefficient
!    FloorOSTemp[],
    26.67,                  !- User selected Constant Temperature {C}
    1.,                     !- Coefficient modifying the user selected constant temperature
    0.,                     !- Coefficient modifying the external dry bulb temperature
    0.,                     !- Coefficient modifying the ground temperature
    0.,                     !- Coefficient modifying the wind speed term (s/m)
    0;                      !- Coefficient modifying the zone air temperature part of the
equation


!-   ===========  ALL OBJECTS IN CLASS: CONVECTIONCOEFFICIENTS ===========

ConvectionCoefficients,
    TC-Floor,               !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Ceil,                !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    4.01;                   !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Floor,               !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    3.52;                   !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Ceil,                !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-NorthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-SouthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-EastWall,            !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-WestWall,            !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-NorthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
    value,                  !- Convection Value Type #1
    .7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-SouthWall,           !- SurfaceName
    Interior,               !- Convection Type #1
```

```
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-EastWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-WestWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULETYPE ===========

ScheduleType,
    Any Number;              !- ScheduleType Name

ScheduleType,
    Fraction,                !- ScheduleType Name
    0.0 : 1.0,               !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Temperature,             !- ScheduleType Name
    -60:200,                 !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Control Type,            !- ScheduleType Name
    0:4,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    On/Off,                  !- ScheduleType Name
    0:1,                     !- range
    DISCRETE;                !- Numeric Type


!-   ===========  ALL OBJECTS IN CLASS: DAYSCHEDULE ===========

DAYSCHEDULE,
    LT-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24
```

```
DAYSCHEDULE,
    EQ-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24

DAYSCHEDULE,
    Day On Peak,             !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    Summer Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    13.33,                   !- Hour 1
    13.33,                   !- Hour 2
    13.33,                   !- Hour 3
    13.33,                   !- Hour 4
    13.33,                   !- Hour 5
    13.33,                   !- Hour 6
    13.33,                   !- Hour 7
    13.33,                   !- Hour 8
    13.33,                   !- Hour 9
    13.33,                   !- Hour 10
    13.33,                   !- Hour 11
```

```
    13.33,                   !- Hour 12
    13.33,                   !- Hour 13
    13.33,                   !- Hour 14
    13.33,                   !- Hour 15
    13.33,                   !- Hour 16
    13.33,                   !- Hour 17
    13.33,                   !- Hour 18
    13.33,                   !- Hour 19
    13.33,                   !- Hour 20
    13.33,                   !- Hour 21
    13.33,                   !- Hour 22
    13.33,                   !- Hour 23
    13.33;                   !- Hour 24

DAYSCHEDULE,
    Winter Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    13.33,                   !- Hour 1
    13.33,                   !- Hour 2
    13.33,                   !- Hour 3
    13.33,                   !- Hour 4
    13.33,                   !- Hour 5
    13.33,                   !- Hour 6
    13.33,                   !- Hour 7
    13.33,                   !- Hour 8
    13.33,                   !- Hour 9
    13.33,                   !- Hour 10
    13.33,                   !- Hour 11
    13.33,                   !- Hour 12
    13.33,                   !- Hour 13
    13.33,                   !- Hour 14
    13.33,                   !- Hour 15
    13.33,                   !- Hour 16
    13.33,                   !- Hour 17
    13.33,                   !- Hour 18
    13.33,                   !- Hour 19
    13.33,                   !- Hour 20
    13.33,                   !- Hour 21
    13.33,                   !- Hour 22
    13.33,                   !- Hour 23
    13.33;                   !- Hour 24

DAYSCHEDULE,
    Chilled Water Loop Daily,!- Name
    Temperature,             !- ScheduleType
    6.67,                    !- Hour 1
    6.67,                    !- Hour 2
    6.67,                    !- Hour 3
    6.67,                    !- Hour 4
    6.67,                    !- Hour 5
    6.67,                    !- Hour 6
    6.67,                    !- Hour 7
    6.67,                    !- Hour 8
    6.67,                    !- Hour 9
    6.67,                    !- Hour 10
    6.67,                    !- Hour 11
    6.67,                    !- Hour 12
    6.67,                    !- Hour 13
    6.67,                    !- Hour 14
    6.67,                    !- Hour 15
    6.67,                    !- Hour 16
    6.67,                    !- Hour 17
    6.67,                    !- Hour 18
    6.67,                    !- Hour 19
    6.67,                    !- Hour 20
    6.67,                    !- Hour 21
    6.67,                    !- Hour 22
    6.67,                    !- Hour 23
    6.67;                    !- Hour 24

DAYSCHEDULE,
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```
    SystemOffDaySched,       !- Name
    Fraction,                !- ScheduleType
    0.,                      !- Hour 1
    0.,                      !- Hour 2
    0.,                      !- Hour 3
    0.,                      !- Hour 4
    0.,                      !- Hour 5
    0.,                      !- Hour 6
    0.,                      !- Hour 7
    0.,                      !- Hour 8
    0.,                      !- Hour 9
    0.,                      !- Hour 10
    0.,                      !- Hour 11
    0.,                      !- Hour 12
    0.,                      !- Hour 13
    0.,                      !- Hour 14
    0.,                      !- Hour 15
    0.,                      !- Hour 16
    0.,                      !- Hour 17
    0.,                      !- Hour 18
    0.,                      !- Hour 19
    0.,                      !- Hour 20
    0.,                      !- Hour 21
    0.,                      !- Hour 22
    0.,                      !- Hour 23
    0.;                      !- Hour 24

DAYSCHEDULE,
    SystemOnDaySched,        !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    ReheatCoilDaySched,      !- Name
    Fraction,                !- ScheduleType
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
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!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[];
    1,                          !- Hour 1
    1,                          !- Hour 2
    1,                          !- Hour 3
    1,                          !- Hour 4
    1,                          !- Hour 5
    1,                          !- Hour 6
    1,                          !- Hour 7
    1,                          !- Hour 8
    1,                          !- Hour 9
    1,                          !- Hour 10
    1,                          !- Hour 11
    1,                          !- Hour 12
    1,                          !- Hour 13
    1,                          !- Hour 14
    1,                          !- Hour 15
    1,                          !- Hour 16
    1,                          !- Hour 17
    1,                          !- Hour 18
    1,                          !- Hour 19
    1,                          !- Hour 20
    1,                          !- Hour 21
    1,                          !- Hour 22
    1,                          !- Hour 23
    1;                          !- Hour 24

DAYSCHEDULE,
    Zone Setpoint Day Sch,   !- Name
    Temperature,             !- ScheduleType
    22.9,                    !- Hour 1
    22.9,                    !- Hour 2
    22.9,                    !- Hour 3
    22.9,                    !- Hour 4
    22.9,                    !- Hour 5
    22.9,                    !- Hour 6
    22.9,                    !- Hour 7
    22.9,                    !- Hour 8
    22.9,                    !- Hour 9
    22.9,                    !- Hour 10
    22.9,                    !- Hour 11
    22.9,                    !- Hour 12
    22.9,                    !- Hour 13
    22.9,                    !- Hour 14
    22.9,                    !- Hour 15
    22.9,                    !- Hour 16
    22.9,                    !- Hour 17
    22.9,                    !- Hour 18
    22.9,                    !- Hour 19
    22.9,                    !- Hour 20
    22.9,                    !- Hour 21
    22.9,                    !- Hour 22
    22.9,                    !- Hour 23
    22.9;                    !- Hour 24

DAYSCHEDULE,
    Summer Control Type Day Sch,  !- Name
    Control Type,            !- ScheduleType
    3,                       !- Hour 1
    3,                       !- Hour 2
    3,                       !- Hour 3
    3,                       !- Hour 4
```

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    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Winter Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    3,                        !- Hour 1
    3,                        !- Hour 2
    3,                        !- Hour 3
    3,                        !- Hour 4
    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Min OA Day Sch,           !- Name
    Fraction,                 !- ScheduleType
    1.,                       !- Hour 1
    1.,                       !- Hour 2
    1.,                       !- Hour 3
    1.,                       !- Hour 4
    1.,                       !- Hour 5
    1.,                       !- Hour 6
    1.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
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    1.,                     !- Hour 20
    1.,                     !- Hour 21
    1.,                     !- Hour 22
    1.,                     !- Hour 23
    1.;                     !- Hour 24


!-   ===========  ALL OBJECTS IN CLASS: WEEKSCHEDULE ===========

WEEKSCHEDULE,
    LT-WEEK,                !- Name
    LT-1,                   !- Sunday DAYSCHEDULE Name
    LT-1,                   !- Monday DAYSCHEDULE Name
    LT-1,                   !- Tuesday DAYSCHEDULE Name
    LT-1,                   !- Wednesday DAYSCHEDULE Name
    LT-1,                   !- Thursday DAYSCHEDULE Name
    LT-1,                   !- Friday DAYSCHEDULE Name
    LT-1,                   !- Saturday DAYSCHEDULE Name
    LT-1,                   !- Holiday DAYSCHEDULE Name
    LT-1,                   !- SummerDesignDay DAYSCHEDULE Name
    LT-1,                   !- WinterDesignDay DAYSCHEDULE Name
    LT-1,                   !- CustomDay1 DAYSCHEDULE Name
    LT-1;                   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    EQ-WEEK,                !- Name
    EQ-1,                   !- Sunday DAYSCHEDULE Name
    EQ-1,                   !- Monday DAYSCHEDULE Name
    EQ-1,                   !- Tuesday DAYSCHEDULE Name
    EQ-1,                   !- Wednesday DAYSCHEDULE Name
    EQ-1,                   !- Thursday DAYSCHEDULE Name
    EQ-1,                   !- Friday DAYSCHEDULE Name
    EQ-1,                   !- Saturday DAYSCHEDULE Name
    EQ-1,                   !- Holiday DAYSCHEDULE Name
    EQ-1,                   !- SummerDesignDay DAYSCHEDULE Name
    EQ-1,                   !- WinterDesignDay DAYSCHEDULE Name
    EQ-1,                   !- CustomDay1 DAYSCHEDULE Name
    EQ-1;                   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Week on Peak,           !- Name
    Day On Peak,            !- Sunday DAYSCHEDULE Name
    Day On Peak,            !- Monday DAYSCHEDULE Name
    Day On Peak,            !- Tuesday DAYSCHEDULE Name
    Day On Peak,            !- Wednesday DAYSCHEDULE Name
    Day On Peak,            !- Thursday DAYSCHEDULE Name
    Day On Peak,            !- Friday DAYSCHEDULE Name
    Day On Peak,            !- Saturday DAYSCHEDULE Name
    Day On Peak,            !- Holiday DAYSCHEDULE Name
    Day On Peak,            !- SummerDesignDay DAYSCHEDULE Name
    Day On Peak,            !- WinterDesignDay DAYSCHEDULE Name
    Day On Peak,            !- CustomDay1 DAYSCHEDULE Name
    Day On Peak;            !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Supply Air Temp Week Sch,  !- Name
    Summer Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Supply Air Temp Week Sch,  !- Name
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    Winter Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Chilled Water Loop Weekly,  !- Name
    Chilled Water Loop Daily,!- Sunday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Monday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Tuesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Wednesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Thursday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Friday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Saturday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Holiday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- SummerDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- WinterDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- CustomDay1 DAYSCHEDULE Name
    Chilled Water Loop Daily;!- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOnWeekSched,!- Name
    SystemOnDaySched,        !- Sunday DAYSCHEDULE Name
    SystemOnDaySched,        !- Monday DAYSCHEDULE Name
    SystemOnDaySched,        !- Tuesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Wednesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Thursday DAYSCHEDULE Name
    SystemOnDaySched,        !- Friday DAYSCHEDULE Name
    SystemOnDaySched,        !- Saturday DAYSCHEDULE Name
    SystemOnDaySched,        !- Holiday DAYSCHEDULE Name
    SystemOnDaySched,        !- SummerDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- WinterDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- CustomDay1 DAYSCHEDULE Name
    SystemOnDaySched;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOffWeekSched,  !- Name
    SystemOffDaySched,       !- Sunday DAYSCHEDULE Name
    SystemOffDaySched,       !- Monday DAYSCHEDULE Name
    SystemOffDaySched,       !- Tuesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Wednesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Thursday DAYSCHEDULE Name
    SystemOffDaySched,       !- Friday DAYSCHEDULE Name
    SystemOffDaySched,       !- Saturday DAYSCHEDULE Name
    SystemOffDaySched,       !- Holiday DAYSCHEDULE Name
    SystemOffDaySched,       !- SummerDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- WinterDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- CustomDay1 DAYSCHEDULE Name
    SystemOffDaySched;       !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ReheatCoilWeekSched,     !- Name
    ReheatCoilDaySched,      !- Sunday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Monday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Tuesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Wednesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Thursday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Friday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Saturday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Holiday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- SummerDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- WinterDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- CustomDay1 DAYSCHEDULE Name
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```
    ReheatCoilDaySched;      !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Zone Setpoint Week Sch,  !- Name
    Zone Setpoint Day Sch,   !- Sunday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Monday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Tuesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Wednesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Thursday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Friday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Saturday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Holiday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- SummerDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- WinterDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- CustomDay1 DAYSCHEDULE Name
    Zone Setpoint Day Sch;   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Control Type Week Sch,  !- Name
    Summer Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Control Type Week Sch,  !- Name
    Winter Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Min OA Week Sch,         !- Name
    Min OA Day Sch,          !- Sunday DAYSCHEDULE Name
    Min OA Day Sch,          !- Monday DAYSCHEDULE Name
    Min OA Day Sch,          !- Tuesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Wednesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Thursday DAYSCHEDULE Name
    Min OA Day Sch,          !- Friday DAYSCHEDULE Name
    Min OA Day Sch,          !- Saturday DAYSCHEDULE Name
    Min OA Day Sch,          !- Holiday DAYSCHEDULE Name
    Min OA Day Sch,          !- SummerDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- WinterDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- CustomDay1 DAYSCHEDULE Name
    Min OA Day Sch;          !- CustomDay2 DAYSCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE ===========

SCHEDULE,
    LIGHTS-1,                !- Name
    Fraction,                !- ScheduleType
    LT-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
```

```
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    EQUIP-1,                  !- Name
    Fraction,                 !- ScheduleType
    EQ-WEEK,                  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    On Peak,                  !- Name
    Fraction,                 !- ScheduleType
    Week On Peak,             !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Seasonal Reset Supply Air Temp Sch,  !- Name
    Temperature,              !- ScheduleType
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    Summer Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    CW Loop Temp Schedule,    !- Name
    Temperature,              !- ScheduleType
    Chilled Water Loop Weekly,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    FanAndCoilAvailSched,     !- Name
    Fraction,                 !- ScheduleType
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    ReheatCoilAvailSched,     !- Name
    Fraction,                 !- ScheduleType
```

```
    ReheatCoilWeekSched,     !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Setpoints,          !- Name
    Temperature,             !- ScheduleType
    Zone Setpoint Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Control Type Sched, !- Name
    Control Type,            !- ScheduleType
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    Summer Control Type Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    Min OA Sched,            !- Name
    Fraction,                !- ScheduleType
    Min OA Week Sch,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1


!-   ===========  ALL OBJECTS IN CLASS: LIGHTS ===========

LIGHTS,
    Zone 1,                  !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    0,                       !- Design Level {W}
    .15,                     !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights,           !- LightsEndUseKey
    No,                      !- Return Air Fraction Is Calculated from Plenum Temperature
    0,                       !- Coefficient #1 of Equation for Return Air Fraction vs. Plenum
Temperature
    0;                       !- Coefficient #2 of Equation for Return Air Fraction vs. Plenum
Temperature {1/K}


!-   ===========  ALL OBJECTS IN CLASS: NODE LIST ===========

NODE LIST,
    OutsideAirInletNodes,    !- Node List Name
    Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
    Zone1Inlets,             !- Node List Name
    Zone 1 Reheat Air Outlet Node;  !- Node_ID_1
```

```
NODE LIST,
    Supply Air Temp Nodes,   !- Node List Name
    Heating Coil Air Inlet Node,  !- Node_ID_1
    Air Loop Outlet Node;    !- Node_ID_2

NODE LIST,
    Chilled Water Loop Setpoint Node List,  !- Node List Name
    CW Supply Outlet Node;   !- Node_ID_1


!-   ===========  ALL OBJECTS IN CLASS: BRANCH LIST ===========

BRANCH LIST,
    Air Loop Branches,       !- Branch List Name
    Air Loop Main Branch;    !- Branch Name 1

BRANCH LIST,
    Cooling Supply Side Branches,  !- Branch List Name
    CW Pump Branch,          !- Branch Name 1
    Purchased Cooling Branch,!- Branch Name 2
    Supply Bypass Branch,    !- Branch Name 3
    Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
    Cooling Demand Side Branches,  !- Branch List Name
    Cooling Demand Inlet,    !- Branch Name 1
    Cooling Coil Branch,     !- Branch Name 2
    Demand Bypass Branch,    !- Branch Name 3
    Cooling Demand Outlet;   !- Branch Name 4


!-   ===========  ALL OBJECTS IN CLASS: CONNECTOR LIST ===========

CONNECTOR LIST,
    Cooling Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Loop Splitter,        !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
    Cooling Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Demand Splitter,      !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Demand Mixer;         !- Name of Connector 2


!-   ===========  ALL OBJECTS IN CLASS: BRANCH ===========

BRANCH,
    Air Loop Main Branch,    !- Branch Name
!    SysFlowRate[],
    .7475,                   !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    Air Loop Inlet Node,     !- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    FAN:SIMPLE:VariableVolume,  !- Comp2 Type
    Supply Fan 1,            !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
    Cooling Coil Air Inlet Node,  !- Comp2 Outlet Node Name
    ACTIVE,                  !- Comp2 Branch Control Type
    COIL:Water:SimpleCooling,!- Comp3 Type
    Main Cooling Coil 1,     !- Comp3 Name
    Cooling Coil Air Inlet Node,  !- Comp3 Inlet Node Name
    Heating Coil Air Inlet Node,  !- Comp3 Outlet Node Name
    PASSIVE,                 !- Comp3 Branch Control Type
    COIL:Gas:Heating,        !- Comp4 Type
```

```
    Main Heating Coil 1,     !- Comp4 Name
    Heating Coil Air Inlet Node,  !- Comp4 Inlet Node Name
    Air Loop Outlet Node,    !- Comp4 Outlet Node Name
    PASSIVE;                 !- Comp4 Branch Control Type

BRANCH,
    Cooling Demand Inlet,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Inlet Pipe,  !- Comp1 Name
    CW Demand Inlet Node,    !- Comp1 Inlet Node Name
    CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Coil Branch,     !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleCooling,!- Comp1 Type
    Main Cooling Coil 1,     !- Comp1 Name
    Cooling Coil Water Inlet Node,  !- Comp1 Inlet Node Name
    Cooling Coil Water Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Demand Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Bypass,      !- Comp1 Name
    CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    CW Demand Side Outlet Pipe,  !- Comp1 Name
    CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Outlet Pipe, !- Comp1 Name
    Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    CW Pump Branch,          !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    Circ Pump,               !- Comp1 Name
    CW Supply Inlet Node,    !- Comp1 Inlet Node Name
    CW Pump Outlet Node,     !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Purchased Cooling Branch,!- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    Purchased:Chilled Water, !- Comp1 Type
    Purchased Cooling,       !- Comp1 Name
    Purchased Cooling Inlet Node,  !- Comp1 Inlet Node Name
    Purchased Cooling Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Supply Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
```

```
    PIPE,                    !- Comp1 Type
    Supply Side Bypass,      !- Comp1 Name
    CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type


!-   ===========  ALL OBJECTS IN CLASS: PIPE ===========

PIPE,
    Demand Side Inlet Pipe,  !- PipeName
    CW Demand Inlet Node,    !- Inlet Node Name
    CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Demand Side Bypass,      !- PipeName
    CW Demand Bypass Inlet Node,  !- Inlet Node Name
    CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    CW Demand Side Outlet Pipe,  !- PipeName
    CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Outlet Pipe, !- PipeName
    Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Bypass,      !- PipeName
    CW Supply Bypass Inlet Node,  !- Inlet Node Name
    CW Supply Bypass Outlet Node;  !- Outlet Node Name


!-   ===========  ALL OBJECTS IN CLASS: PLANT LOOP ===========

PLANT LOOP,
    Chilled Water Loop,      !- Plant Loop Name
    Water,                   !- Fluid Type
    CW Loop Operation,       !- Plant Operation Scheme List Name
    CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    98,                      !- Maximum Loop Temperature {C}
    1,                       !- Minimum Loop Temperature {C}
    0.0006,                  !- Maximum Loop Volumetric Flow Rate {m3/s}
    0,                       !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    CW Supply Inlet Node,    !- Plant Side Inlet Node Name
    CW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Cooling Supply Side Branches,  !- Plant Side Branch List Name
    Cooling Supply Side Connectors,  !- Plant Side Connector List Name
    CW Demand Inlet Node,    !- Demand Side Inlet Node Name
    CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Cooling Demand Side Branches,  !- Demand Side Branch List Name
    Cooling Demand Side Connectors,  !- Demand Side Connector List Name
    Optimal;                 !- Load Distribution Scheme


!-   ===========  ALL OBJECTS IN CLASS: PLANT OPERATION SCHEMES ===========

PLANT OPERATION SCHEMES,
    CW Loop Operation,       !- PlantOperationSchemeName
    LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Peak Operation,          !- Control Scheme Name 1
    On Peak;                 !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: COOLING LOAD RANGE BASED OPERATION ===========

COOLING LOAD RANGE BASED OPERATION,
    Peak Operation,          !- Name
```

```
    0,                      !- Load Range Lower Limit 1 {W}
    100000,                 !- Load Range Upper Limit 1 {W}
    Purchased Only;         !- Priority Control Equip List Name 1


!-   ===========  ALL OBJECTS IN CLASS: PLANT EQUIPMENT LIST ===========

PLANT EQUIPMENT LIST,
    Purchased Only,         !- Equip List Name
    Purchased:Chilled Water, !- KEY--Plant Equip 1
    Purchased Cooling;      !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: SPLITTER ===========

SPLITTER,
    CW Loop Splitter,       !- SplitterName
    CW Pump Branch,         !- Inlet Branch Name
    Purchased Cooling Branch,!- Outlet Branch Name 1
    Supply Bypass Branch;   !- Outlet Branch Name 2

SPLITTER,
    CW Demand Splitter,     !- SplitterName
    Cooling Demand Inlet,   !- Inlet Branch Name
    Demand Bypass Branch,   !- Outlet Branch Name 1
    Cooling Coil Branch;    !- Outlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: MIXER ===========

MIXER,
    CW Loop Mixer,          !- MixerName
    Cooling Supply Outlet,  !- Outlet Branch Name
    Purchased Cooling Branch,!- Inlet Branch Name 1
    Supply Bypass Branch;   !- Inlet Branch Name 2

MIXER,
    CW Demand Mixer,        !- MixerName
    Cooling Demand Outlet,  !- Outlet Branch Name
    Cooling Coil Branch,    !- Inlet Branch Name 1
    Demand Bypass Branch;   !- Inlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: AIR PRIMARY LOOP ===========

AIR PRIMARY LOOP,
    Typical Terminal Reheat 1,  !- Primary Air Loop Name
    Reheat System 1 Controllers,  !- Name: Controller List
    Reheat System 1 Avail List,  !- Name: System Availability Manager List
!    SysFlowRate[],
    .7475,                  !- Primary air design volumetric flow rate {m3/s}
    Air Loop Branches,      !- Air Loop Branch List Name
    ,                       !- Air Loop Connector List Name
    Air Loop Inlet Node,    !- ReturnAir AirLoop Inlet Node
    Return Air Mixer Outlet, !- ZoneEquipGroup Outlet Node
    Zone Equipment Inlet Node,  !- SupplyAirPath ZoneEquipGroup Inlet Nodes
    Air Loop Outlet Node;   !- AirLoop Outlet Nodes


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER LIST ===========

CONTROLLER LIST,
    Reheat System 1 Controllers,  !- Name
    Controller:Simple,      !- Controller Type 1
    Main Cooling Coil Controller;  !- Controller Name 1

CONTROLLER LIST,
    OA Sys 1 Controllers,   !- Name
    CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
    OA Controller 1;        !- Controller Name 1
```

```
!-   ===========  ALL OBJECTS IN CLASS: AIR LOOP EQUIPMENT LIST ===========

AIR LOOP EQUIPMENT LIST,
    OA Sys 1 Equipment,      !- Name
    OUTSIDE AIR MIXER,       !- KEY--System Component 1
    OA Mixing Box 1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR SYSTEM ===========

OUTSIDE AIR SYSTEM,
    OA Sys 1,                !- Name
    OA Sys 1 Controllers,    !- Name: Controller List
    OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
    Reheat System 1 Avail List;  !- Name of a System Availability Manager List


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR INLET NODE LIST ===========

OUTSIDE AIR INLET NODE LIST,
    OutsideAirInletNodes;    !- 1st Node name or node list name


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR MIXER ===========

OUTSIDE AIR MIXER,
    OA Mixing Box 1,         !- Name
    Mixed Air Node 1,        !- Mixed_Air_Node
    Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
    Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
    Air Loop Inlet Node;     !- Return_Air_Stream_Node


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER LIST ===========

SYSTEM AVAILABILITY MANAGER LIST,
    Reheat System 1 Avail List,  !- Name
    SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
    Reheat System 1 Avail;   !- System Availability Manager Name 1


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER:SCHEDULED ===========

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
    Reheat System 1 Avail,   !- Name
    FanAndCoilAvailSched;    !- Schedule name


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:SCHEDULED ===========

SET POINT MANAGER:SCHEDULED,
    Chilled Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    CW Loop Temp Schedule,   !- Schedule Name
    Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Supply Air Temp Manager, !- Name
    TEMP,                    !- Control variable
    Seasonal Reset Supply Air Temp Sch,  !- Schedule Name
    Supply Air Temp Nodes;   !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:SIMPLE ===========

CONTROLLER:SIMPLE,
    Main Cooling Coil Controller,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
```

```
    Heating Coil Air Inlet Node,  !- Control_Node
    Cooling Coil Water Inlet Node,  !- Actuator_Node
    0.001,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    0.0006,                  !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:OUTSIDE AIR ===========

CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    NO ECONOMIZER,           !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    .01,                     !- minimum outside air flow rate {m3/s}
!    SysFlowRate[],
    .7475,                   !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    Air Loop Inlet Node,     !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLED ZONE EQUIP CONFIGURATION ===========

CONTROLLED ZONE EQUIP CONFIGURATION,
    Zone 1,                  !- Zone Name
    Zone1Equipment,          !- List Name: Zone Equipment
    Zone1Inlets,             !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    Zone 1 Node,             !- Zone Air Node Name
    Zone 1 Outlet Node;      !- Zone Return Air Node Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE EQUIPMENT LIST ===========

ZONE EQUIPMENT LIST,
    Zone1Equipment,          !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    Zone1TermReheat,         !- Type Name 1
    1,                       !- Cooling Priority
    1;                       !- Heating Priority


!-   ===========  ALL OBJECTS IN CLASS: AIR DISTRIBUTION UNIT ===========

AIR DISTRIBUTION UNIT,
    Zone1TermReheat,         !- Air Distribution Unit Name
    Zone 1 Reheat Air Outlet Node,  !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:CONST VOLUME:REHEAT,  !- KEY--System Component Type 1
    Reheat Zone 1;           !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:CONST VOLUME:REHEAT ===========

SINGLE DUCT:CONST VOLUME:REHEAT,
    Reheat Zone 1,           !- Name of System
    FanAndCoilAvailSched,    !- System Availability schedule
    Zone 1 Reheat Air Outlet Node,  !- Unit Air Outlet Node
    Zone 1 Reheat Air Inlet Node,  !- Unit Air Inlet Node
!    SysFlowRate[],
    .7475,                   !- Maximum air flow rate {m3/s}
    ,                        !- Control node
    COIL:Gas:Heating,        !- Reheat Component Object
```

```
    Reheat Coil Zone 1,      !- Name of Reheat Component
    0.0,                     !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    0.001;                   !- Convergence Tolerance


!-   ===========  ALL OBJECTS IN CLASS: ZONE CONTROL:THERMOSTATIC ===========

ZONE CONTROL:THERMOSTATIC,
    Zone 1 Thermostat,       !- Thermostat Name
    ZONE 1,                  !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Heating Cooling Setpoint,  !- Control Type #1
    Single Setpoint;         !- Control Type Name #1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE HEATING COOLING SETPOINT ===========

SINGLE HEATING COOLING SETPOINT,
    Single Setpoint,         !- Name
    Zone Setpoints;          !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY AIR PATH ===========

ZONE SUPPLY AIR PATH,
    TermReheatSupplyPath,    !- Supply Air Path Name
    Zone Equipment Inlet Node,  !- Supply Air Path Inlet Node
    Zone Supply Plenum,      !- KEY--System Component Type 1
    Zone 1b Plenum,          !- Component Name 1
    Zone Splitter,           !- KEY--System Component Type 2
    Zone Supply Air Splitter;!- Component Name 2


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN AIR PATH ===========

ZONE RETURN AIR PATH,
    TermReheatReturnPath,    !- Return Air Path Name
    Return Air Mixer Outlet, !- Return Air Path Outlet Node
    Zone Mixer,              !- KEY--System Component Type 1
    Zone Return Air Mixer;   !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY PLENUM ===========

ZONE SUPPLY PLENUM,
    Zone 1b Plenum,          !- Zone Plenum Name
    ZONE 1b,                 !- Zone Name
    Zone 1b Node,            !- Zone Node Name
    Zone Equipment Inlet Node,  !- Inlet_Node
    Zone 1b Plenum Outlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SPLITTER ===========

ZONE SPLITTER,
    Zone Supply Air Splitter,!- Splitter Name
    Zone 1b Plenum Outlet Node,  !- Inlet_Node
    Zone 1 Reheat Air Inlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE MIXER ===========

ZONE MIXER,
    Zone Return Air Mixer,   !- Mixer Name
    Return Air Mixer Outlet, !- Outlet_Node
    Zone 1 Outlet Node;      !- Inlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: PURCHASED:CHILLED WATER ===========
```

```
PURCHASED:CHILLED WATER,
    Purchased Cooling,       !- Purchased Chilled Water Name
    Purchased Cooling Inlet Node,  !- Plant_Loop_Inlet_Node
    Purchased Cooling Outlet Node,  !- Plant_Loop_Outlet_Node
    10000;                   !- Nominal Capacity {W}


!-   ===========  ALL OBJECTS IN CLASS: PUMP:VARIABLE SPEED ===========

PUMP:VARIABLE SPEED,
    Circ Pump,               !- Pump Name
    CW Supply Inlet Node,    !- Inlet_Node
    CW Pump Outlet Node,     !- Outlet_Node
    .0006,                   !- Rated Volumetric Flow Rate {m3/s}
    300000,                  !- Rated Pump Head {Pa}
    270,                     !- Rated Power Consumption {W}
    .87,                     !- Motor Efficiency
    0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                       !- Coefficient1 of the Part Load Performance Curve
    1,                       !- Coefficient2 of the Part Load Performance Curve
    0,                       !- Coefficient3 of the Part Load Performance Curve
    0,                       !- Coefficient4 of the Part Load Performance Curve
    0,                       !- Min Flow Rate while operating in variable flow capacity; {m3/s}
    INTERMITTENT;            !- Pump Control Type


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:SIMPLECOOLING ===========

COIL:Water:SimpleCooling,
    Main Cooling Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    1600,                    !- UA of the Coil {W/K}
    .0006,                   !- Max Water Flow Rate of Coil {m3/s}
    0.95,                    !- Leaving Relative Humidity of Coil
    Cooling Coil Water Inlet Node,  !- Coil_Water_Inlet_Node
    Cooling Coil Water Outlet Node,  !- Coil_Water_Outlet_Node
    Cooling Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Heating Coil Air Inlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: COIL:GAS:HEATING ===========

COIL:Gas:Heating,
    Reheat Coil Zone 1,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Zone 1 Reheat Air Inlet Node,  !- Coil_Air_Inlet_Node
    Zone 1 Reheat Air Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Gas:Heating,
    Main Heating Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Heating Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Air Loop Outlet Node,    !- Coil_Air_Outlet_Node
    Air Loop Outlet Node;    !- Coil_Temp_Setpoint_Node


!-   ===========  ALL OBJECTS IN CLASS: FAN:SIMPLE:VARIABLEVOLUME ===========

FAN:SIMPLE:VariableVolume,
    Supply Fan 1,            !- Fan Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    100.0,                   !- Delta Pressure {Pa}
!    SysFlowRate[],
    .7475,                   !- Max Flow Rate {m3/s}
    0.001,                   !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
```

```
    1.0,                     !- Motor In Airstream Fraction
    0.0015302446,            !- FanCoefficient 1
    0.0052080574,            !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -0.11635563,             !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    Mixed Air Node 1,        !- Fan_Inlet_Node
    Cooling Coil Air Inlet Node;  !- Fan_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: REPORT VARIABLE ===========

Report Variable,
    *,                       !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Ext Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                 !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                 !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Sensible Cooling Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1,                  !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Air Temp,       !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Outlet Node,      !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency
```

```
Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Mixed Air Node 1,        !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Cooling Coil Water Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Heating Coil Gas Consumption Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Total Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Sensible Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency


!-   ===========  ALL OBJECTS IN CLASS: REPORT ===========

Report,
    surfaces,                !- Type_of_Report
    dxf;                     !- Name_of_Report

Report,
    Variable Dictionary;     !- Type_of_Report

Report,
    Surfaces,                !- Type_of_Report
    DETAILS;                 !- Name_of_Report
```

A.3 CFDCOMPNORETPLEN6.IDF

Table 17: Inputs for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange OFF, high h_c's

Occupied zone ceiling temperature	81 F
Bottom of floor slab air temperature	80 F
Supply plenum radiation exchange?	No
Supply plenum air inlet temperature	56 F
Supply plenum air flow rate	1.5 cfm/ft^2
Supply plenum ceiling h_c	7.66 W/m^2K
Supply plenum floor h_c	4.72 W/m^2K

Table 18: Full input listing for single supply plenum model, 1 x 22 x 48 ft, plenum radiant exchange OFF, high h_c's

```
!-Generator IDFEditor 1.20

!-NOTE: All comments with '!-' are ignored by the IDFEditor and are generated automatically.
!-      Use '!' comments if they need to be retained when using the IDFEditor.


!-   ===========  ALL OBJECTS IN CLASS: VERSION ===========

! Case CFDComp
! Plenum with Return Air Heat Gain; supply plenum; 1 zone building
! This deck contains 3 zones, the main zone (zone 1) with a window and internal loads and is
connected through
! the system to the plenum (zone 1a).  The plenum has the roof exposure that the main zone will
never really feel.
! The system is a standard constant volume reheat serving the one main zone and exhausts through
the
! plenum zone back to the system air loop.  The cooling coil is water with a chilled water plant
loop and the
! reheat coil is a gas fired coil.  The surfaces between the main zone and the plenum are
interzone.
! Supply air is supplied through an underfloor air distribution system - a supply plenum. The
supply
! plenum is in contact with the ground, which the occupied space will never feel.
VERSION,
    1.2.2;                  !- Version Identifier


!-   ===========  ALL OBJECTS IN CLASS: BUILDING ===========

BUILDING,
    YorkLab,                !- Building Name
    0.0000000E+00,          !- North Axis {deg}
    Suburbs,                !- Terrain
    .04,                    !- Loads Convergence Tolerance Value {W}
    .4,                     !- Temperature Convergence Tolerance Value {deltaC}
    MinimalShadowing,       !- Solar Distribution
    ;                       !- Maximum Number of Warmup Days


!-   ===========  ALL OBJECTS IN CLASS: TIMESTEP IN HOUR ===========

TIMESTEP IN HOUR,
    6;                      !- Time Step in Hour


!-   ===========  ALL OBJECTS IN CLASS: INSIDE CONVECTION ALGORITHM ===========

INSIDE CONVECTION ALGORITHM,
    Simple;                 !- InsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE CONVECTION ALGORITHM ===========

OUTSIDE CONVECTION ALGORITHM,
    Simple;                 !- OutsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: SOLUTION ALGORITHM ===========

SOLUTION ALGORITHM,
    CTF;                    !- SolutionAlgo


!-   ===========  ALL OBJECTS IN CLASS: DEBUG OUTPUT ===========

DEBUG OUTPUT,
    0,                      !- YesNo
```

```
    0;                      !- EvenDuringWarmup


!-   ===========  ALL OBJECTS IN CLASS: DIAGNOSTICS ===========

DIAGNOSTICS,
    DisplayAdvancedReportVariables;  !- key1


!-   ===========  ALL OBJECTS IN CLASS: ZONE VOLUME CAPACITANCE MULTIPLIER ===========

ZONE VOLUME CAPACITANCE MULTIPLIER,
    1;                      !- Capacitance Multiplier


!-   ===========  ALL OBJECTS IN CLASS: RUN CONTROL ===========

RUN CONTROL,
    No,                     !- Do the zone sizing calculation
    No,                     !- Do the system sizing calculation
    No,                     !- Do the plant sizing calculation
    Yes,                    !- Do the design day simulations
    Yes;                    !- Do the weather file simulation


!-   ===========  ALL OBJECTS IN CLASS: RUNPERIOD ===========

RunPeriod,
    9,                      !- Begin Month
    13,                     !- Begin Day Of Month
    9,                      !- End Month
    20,                     !- End Day Of Month
    Tuesday,                !- Day Of Week For Start Day
    No,                     !- Use WeatherFile Holidays/Special Days
    No,                     !- Use WeatherFile DaylightSavingPeriod
    Yes,                    !- Apply Weekend Holiday Rule
    Yes,                    !- Use WeatherFile Rain Indicators
    Yes;                    !- Use WeatherFile Snow Indicators


!-   ===========  ALL OBJECTS IN CLASS: LOCATION ===========

Location,
    Harrisburg,             !- LocationName
    40.2,                   !- Latitude {deg}
    -76.77,                 !- Longitude {deg}
    -5,                     !- TimeZone {hr}
    94;                     !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: GROUNDTEMPERATURES ===========

! DesignDay,
!     Harrisburg Summer,
!     33.3,
!     10.4,
!     23.5,
!     100200,
!     5,
!     30,
!     1,
!     ,
!     ,
!     15,
!     8,
!     SummerDesignDay,
!     1;
! DesignDay,
!     Harrisburg Winter,
!     -13,
!     0,
```

```
!     -13,
!     100200,
!     5,
!     30,
!     0,
!     ,
!     ,
!     15,
!     1,
!     WinterDesignDay,
!     1;
GroundTemperatures,
    18.89,                  !- January Ground Temperature {C}
    18.92,                  !- February Ground Temperature {C}
    19.02,                  !- March Ground Temperature {C}
    19.12,                  !- April Ground Temperature {C}
    19.21,                  !- May Ground Temperature {C}
    19.23,                  !- June Ground Temperature {C}
    19.07,                  !- July Ground Temperature {C}
    19.32,                  !- August Ground Temperature {C}
    19.09,                  !- September Ground Temperature {C}
    19.21,                  !- October Ground Temperature {C}
    19.13,                  !- November Ground Temperature {C}
    18.96;                  !- December Ground Temperature {C}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR ===========

MATERIAL:REGULAR,
    BLBD - PLYWOOD 3 / 4 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Name
    Smooth,                 !- Roughness
    .0099999998,            !- Thickness {m}
    .059999999,             !- Conductivity {W/m-K}
    480.55,                 !- Density {kg/m3}
    830,                    !- Specific Heat {J/kg-K}
    .01,                    !- Absorptance:Thermal
    .32,                    !- Absorptance:Solar
    .32;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    BLBD - PLYWOOD 1 / 2 IN, !- Name
    MediumSmooth,           !- Roughness
    .0099999998,            !- Thickness {m}
    .11,                    !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    B10 - 2 IN WOOD,        !- Name
    MediumSmooth,           !- Roughness
    .050000001,             !- Thickness {m}
    .12,                    !- Conductivity {W/m-K}
    592.68,                 !- Density {kg/m3}
    2510,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    .78,                    !- Absorptance:Solar
    .78;                    !- Absorptance:Visible
```

```
MATERIAL:REGULAR,
    E5 - ACOUSTIC TILE,      !- Name
    MediumSmooth,            !- Roughness
    .0099999998,             !- Thickness {m}
    100,                     !- Conductivity {W/m-K}
    480.55,                  !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .32,                     !- Absorptance:Solar
    .32;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 120 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    .1,                      !- Thickness {m}
    .74,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 40 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    0.1000000    ,           !- Thickness {m}
    0.1600000    ,           !- Conductivity {W/m-K}
    640.7300    ,            !- Density {kg/m3}
    830.0000    ,            !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.6500000    ,           !- Absorptance:Solar
    0.6500000    ;           !- Absorptance:Visible

! k=0.196 W/m-K th=1.3 inches
MATERIAL:REGULAR,
    RaisedFloorAsConcrete,   !- Name
    MediumRough,             !- Roughness
    0.033,                   !- Thickness {m}
    0.196        ,           !- Conductivity {W/m-K}
    640.7300     ,           !- Density {kg/m3}
    830.0000     ,           !- Specific Heat {J/kg-K}
    0.9000000    ,           !- Absorptance:Thermal
    0.7          ,           !- Absorptance:Solar
    0.7          ;           !- Absorptance:Visible

MATERIAL:REGULAR,
    FloorSlabConcrete,       !- Name
    MediumRough,             !- Roughness
    .254,                    !- Thickness {m}
    .93,                     !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
     .001,                   !- Absorptance:Thermal
    .65,                     !- Absorptance:Solar
    .65;                     !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR-R ===========

MATERIAL:REGULAR-R,
    R30-INSULATION,          !- Name
    Rough,                   !- Roughness
    5.283,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R5-INSULATION,           !- Name
    Rough,                   !- Roughness
```

```
    .881,                    !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R11-INSULATION,          !- Name
    Rough,                   !- Roughness
    1.937,                   !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R19-INSULATION,          !- Name
    Rough,                   !- Roughness
    3.346,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R-TateFloor,             !- Name
    Rough,                   !- Roughness
    .23,                     !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR-R,
    FloorSlabHc,             !- Name
    MediumRough,             !- Roughness
    1.1737,                  !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    Carpet,                  !- Name
    Rough,                   !- Roughness
    0.06,                    !- Thermal Resistance {m2-K/W}
    .9,                      !- Absorptance:Thermal
    0.7500000    ,           !- Absorptance:Solar
    0.7500000    ;           !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGLASS ===========

MATERIAL:WINDOWGLASS,
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    .0060000001,             !- Thickness {m}
    .775,                    !- Solar Transmittance at Normal Incidence
    .071000002,              !- Solar Reflectance at Normal Incidence: Front Side
    .071000002,              !- Solar Reflectance at Normal Incidence: Back Side
    .881,                    !- Visible Transmittance at Normal Incidence
    .079999998,              !- Visible Reflectance at Normal Incidence: Front Side
    .079999998,              !- Visible Reflectance at Normal Incidence: Back Side
    ,                        !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGAS ===========

MATERIAL:WINDOWGAS,
    WinAirB1 - AIRSPACE RESISTANCE,  !- Name
    Air,                     !- Gas Type
    .012;                    !- Thickness {m}
```

```
!-   ===========  ALL OBJECTS IN CLASS: CONSTRUCTION ===========

CONSTRUCTION,
    Wall-A,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-B,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    BLBD - PLYWOOD 1 / 2 IN; !- Layer #3

CONSTRUCTION,
    Wall-C,                  !- Name
    BLBD - PLYWOOD 1 / 2 IN, !- Outside Layer
    R19-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-D,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-E,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-F,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION;          !- Layer #2

CONSTRUCTION,
    Suspened Ceiling,        !- Name
    E5 - ACOUSTIC TILE;      !- Outside Layer

CONSTRUCTION,
    Raised Floor,            !- Name
    RaisedFloorAsConcrete,   !- Outside Layer
    Carpet;                  !- Layer #2

CONSTRUCTION,
    Raised Floor SP,         !- Name
    Carpet,                  !- Outside Layer
    RaisedFloorAsConcrete;   !- Layer #2

CONSTRUCTION,
    Out Ceiling,             !- Name
    R30-INSULATION,          !- Outside Layer
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    SubFloor,                !- Name
    FloorSlabConcrete;       !- Outside Layer

CONSTRUCTION,
    DoublePaneWindow,        !- Name
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Outside Layer
    WinAirB1 - AIRSPACE RESISTANCE,  !- Layer #2
    GLASS - CLEAR PLATE 1 / 4 IN;  !- Layer #3

CONSTRUCTION,
    Raised Floor No Carpet,  !- Name
```

```
    RaisedFloorAsConcrete;   !- Outside Layer


!-   ===========  ALL OBJECTS IN CLASS: ZONE ===========

ZONE,
    Zone 1,                  !- Zone Name
    0,                       !- Relative North (to building) {deg}
    0.0000000E+00,           !- X Origin {m}
    0.0000000E+00,           !- Y Origin {m}
    0.0000000E+00,           !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100,                    !- Ceiling Height {m}
    0;                       !- Volume {m3}

ZONE,
    Zone 1b,                 !- Zone Name
    0,                       !- Relative North (to building) {deg}
    ,                        !- X Origin {m}
    ,                        !- Y Origin {m}
    -.305,                   !- Z Origin {m}
    1,                       !- Type
    1,                       !- Multiplier
    -100.0000,               !- Ceiling Height {m}
    0.0000000E+00;           !- Volume {m3}


!-   ===========  ALL OBJECTS IN CLASS: SURFACEGEOMETRY ===========

SurfaceGeometry,
    UpperLeftCorner,         !- SurfaceStartingPosition
    CounterClockWise,        !- VertexEntry
    WorldCoordinateSystem;   !- CoordinateSystem


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER ===========

Surface:HeatTransfer,
    TC-NorthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-NorthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-SouthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
```

```
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-EastWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-EastWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-WestWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-WestWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Ceil,                 !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    Suspened Ceiling,        !- Construction Name of the Surface
```

```
    Zone 1,                  !- InsideFaceEnvironment
    OtherSideCoeff,          !- OutsideFaceEnvironment
    TC-CeilOST,              !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    3.048 ,                  !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    3.048 ,                  !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    3.048 ,                  !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    3.048 ;                  !- Vertex 4 Z-coordinate {m}

! I am here
Surface:HeatTransfer,
    TC-Floor,                !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    Raised Floor No Carpet,  !- Construction Name of the Surface
    Zone 1,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-Ceil,                 !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    6.7  ,                   !- Vertex 2 Y-coordinate {m}
    0 ,                      !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    0 ,                      !- Vertex 3 Z-coordinate {m}
    14.63,                   !- Vertex 4 X-coordinate {m}
    0,                       !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-NorthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-NorthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    0 ,                      !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}
```

```
Surface:HeatTransfer,
    SP-SouthWall,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-SouthWall,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    0 ,                      !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-EastWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-EastWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    14.63 ,                  !- Vertex 1 X-coordinate {m}
    0 ,                      !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    14.63 ,                  !- Vertex 2 X-coordinate {m}
    0 ,                      !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    14.63 ,                  !- Vertex 3 X-coordinate {m}
    6.7   ,                  !- Vertex 3 Y-coordinate {m}
    -0.305 ,                 !- Vertex 3 Z-coordinate {m}
    14.63 ,                  !- Vertex 4 X-coordinate {m}
    6.7   ,                  !- Vertex 4 Y-coordinate {m}
    0 ;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-WestWall,             !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 1b,                 !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-WestWall,             !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                      !- Vertex 1 X-coordinate {m}
    6.7   ,                  !- Vertex 1 Y-coordinate {m}
    0 ,                      !- Vertex 1 Z-coordinate {m}
    0 ,                      !- Vertex 2 X-coordinate {m}
    6.7   ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                 !- Vertex 2 Z-coordinate {m}
    0 ,                      !- Vertex 3 X-coordinate {m}
    0 ,                      !- Vertex 3 Y-coordinate {m}
```

```
    -0.305 ,                !- Vertex 3 Z-coordinate {m}
    0 ,                     !- Vertex 4 X-coordinate {m}
    0 ,                     !- Vertex 4 Y-coordinate {m}
    0 ;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Ceil,                !- User Supplied Surface Name
    CEILING,                !- Surface Type
    Raised Floor No Carpet, !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-Floor,               !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    6.7   ,                 !- Vertex 1 Y-coordinate {m}
    0 ,                     !- Vertex 1 Z-coordinate {m}
    0 ,                     !- Vertex 2 X-coordinate {m}
    0 ,                     !- Vertex 2 Y-coordinate {m}
    0 ,                     !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    0 ,                     !- Vertex 3 Y-coordinate {m}
    0 ,                     !- Vertex 3 Z-coordinate {m}
    14.63 ,                 !- Vertex 4 X-coordinate {m}
    6.7   ,                 !- Vertex 4 Y-coordinate {m}
    0 ;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Floor,               !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    SubFloor,               !- Construction Name of the Surface
    Zone 1b,                !- InsideFaceEnvironment
    OtherSideCoeff,         !- OutsideFaceEnvironment
    SP-FloorOST,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0 ,                     !- Vertex 1 X-coordinate {m}
    0 ,                     !- Vertex 1 Y-coordinate {m}
    -0.305 ,                !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    6.7  ,                  !- Vertex 2 Y-coordinate {m}
    -0.305 ,                !- Vertex 2 Z-coordinate {m}
    14.63 ,                 !- Vertex 3 X-coordinate {m}
    6.7   ,                 !- Vertex 3 Y-coordinate {m}
    -0.305 ,                !- Vertex 3 Z-coordinate {m}
    14.63,                  !- Vertex 4 X-coordinate {m}
    0,                      !- Vertex 4 Y-coordinate {m}
    -0.305 ;                !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: OTHERSIDECOEFFICIENTS ===========

OtherSideCoefficients,
    TC-CeilOST,             !- OtherSideCoeff Name
    0.,                     !- Combined convective/radiative film coefficient
!   CeilOSTemp[],
    26.67,                  !- User selected Constant Temperature {C}
    1.,                     !- Coefficient modifying the user selected constant temperature
    0.,                     !- Coefficient modifying the external dry bulb temperature
    0.,                     !- Coefficient modifying the ground temperature
    0.,                     !- Coefficient modifying the wind speed term (s/m)
    0;                      !- Coefficient modifying the zone air temperature part of the
equation

OtherSideCoefficients,
```

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    SP-FloorOST,             !- OtherSideCoeff Name
    0.,                      !- Combined convective/radiative film coefficient
!    FloorOSTemp[],
    26.67,                   !- User selected Constant Temperature {C}
    1.,                      !- Coefficient modifying the user selected constant temperature
    0.,                      !- Coefficient modifying the external dry bulb temperature
    0.,                      !- Coefficient modifying the ground temperature
    0.,                      !- Coefficient modifying the wind speed term (s/m)
    0;                       !- Coefficient modifying the zone air temperature part of the
equation


!-   ===========  ALL OBJECTS IN CLASS: CONVECTIONCOEFFICIENTS ===========

ConvectionCoefficients,
    TC-Floor,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .01;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Ceil,                 !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    7.66;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Floor,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.72;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Ceil,                 !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .01;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-NorthWall,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-SouthWall,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-EastWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-WestWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-NorthWall,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-SouthWall,            !- SurfaceName
    Interior,                !- Convection Type #1
```

```
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-EastWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-WestWall,             !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    .7;                      !- Convection value #1 {W/m2-K}


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULETYPE ===========

ScheduleType,
    Any Number;              !- ScheduleType Name

ScheduleType,
    Fraction,                !- ScheduleType Name
    0.0 : 1.0,               !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Temperature,             !- ScheduleType Name
    -60:200,                 !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Control Type,            !- ScheduleType Name
    0:4,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    On/Off,                  !- ScheduleType Name
    0:1,                     !- range
    DISCRETE;                !- Numeric Type


!-   ===========  ALL OBJECTS IN CLASS: DAYSCHEDULE ===========

DAYSCHEDULE,
    LT-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24
```

```
DAYSCHEDULE,
    EQ-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24

DAYSCHEDULE,
    Day On Peak,             !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    Summer Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    13.33,                   !- Hour 1
    13.33,                   !- Hour 2
    13.33,                   !- Hour 3
    13.33,                   !- Hour 4
    13.33,                   !- Hour 5
    13.33,                   !- Hour 6
    13.33,                   !- Hour 7
    13.33,                   !- Hour 8
    13.33,                   !- Hour 9
    13.33,                   !- Hour 10
    13.33,                   !- Hour 11
```

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    13.33,                   !- Hour 12
    13.33,                   !- Hour 13
    13.33,                   !- Hour 14
    13.33,                   !- Hour 15
    13.33,                   !- Hour 16
    13.33,                   !- Hour 17
    13.33,                   !- Hour 18
    13.33,                   !- Hour 19
    13.33,                   !- Hour 20
    13.33,                   !- Hour 21
    13.33,                   !- Hour 22
    13.33,                   !- Hour 23
    13.33;                   !- Hour 24

DAYSCHEDULE,
    Winter Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    13.33,                   !- Hour 1
    13.33,                   !- Hour 2
    13.33,                   !- Hour 3
    13.33,                   !- Hour 4
    13.33,                   !- Hour 5
    13.33,                   !- Hour 6
    13.33,                   !- Hour 7
    13.33,                   !- Hour 8
    13.33,                   !- Hour 9
    13.33,                   !- Hour 10
    13.33,                   !- Hour 11
    13.33,                   !- Hour 12
    13.33,                   !- Hour 13
    13.33,                   !- Hour 14
    13.33,                   !- Hour 15
    13.33,                   !- Hour 16
    13.33,                   !- Hour 17
    13.33,                   !- Hour 18
    13.33,                   !- Hour 19
    13.33,                   !- Hour 20
    13.33,                   !- Hour 21
    13.33,                   !- Hour 22
    13.33,                   !- Hour 23
    13.33;                   !- Hour 24

DAYSCHEDULE,
    Chilled Water Loop Daily,!- Name
    Temperature,             !- ScheduleType
    6.67,                    !- Hour 1
    6.67,                    !- Hour 2
    6.67,                    !- Hour 3
    6.67,                    !- Hour 4
    6.67,                    !- Hour 5
    6.67,                    !- Hour 6
    6.67,                    !- Hour 7
    6.67,                    !- Hour 8
    6.67,                    !- Hour 9
    6.67,                    !- Hour 10
    6.67,                    !- Hour 11
    6.67,                    !- Hour 12
    6.67,                    !- Hour 13
    6.67,                    !- Hour 14
    6.67,                    !- Hour 15
    6.67,                    !- Hour 16
    6.67,                    !- Hour 17
    6.67,                    !- Hour 18
    6.67,                    !- Hour 19
    6.67,                    !- Hour 20
    6.67,                    !- Hour 21
    6.67,                    !- Hour 22
    6.67,                    !- Hour 23
    6.67;                    !- Hour 24

DAYSCHEDULE,
```

```
    SystemOffDaySched,       !- Name
    Fraction,                !- ScheduleType
    0.,                      !- Hour 1
    0.,                      !- Hour 2
    0.,                      !- Hour 3
    0.,                      !- Hour 4
    0.,                      !- Hour 5
    0.,                      !- Hour 6
    0.,                      !- Hour 7
    0.,                      !- Hour 8
    0.,                      !- Hour 9
    0.,                      !- Hour 10
    0.,                      !- Hour 11
    0.,                      !- Hour 12
    0.,                      !- Hour 13
    0.,                      !- Hour 14
    0.,                      !- Hour 15
    0.,                      !- Hour 16
    0.,                      !- Hour 17
    0.,                      !- Hour 18
    0.,                      !- Hour 19
    0.,                      !- Hour 20
    0.,                      !- Hour 21
    0.,                      !- Hour 22
    0.,                      !- Hour 23
    0.;                      !- Hour 24

DAYSCHEDULE,
    SystemOnDaySched,        !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    ReheatCoilDaySched,      !- Name
    Fraction,                !- ScheduleType
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
```

```
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[];
    1,                          !- Hour 1
    1,                          !- Hour 2
    1,                          !- Hour 3
    1,                          !- Hour 4
    1,                          !- Hour 5
    1,                          !- Hour 6
    1,                          !- Hour 7
    1,                          !- Hour 8
    1,                          !- Hour 9
    1,                          !- Hour 10
    1,                          !- Hour 11
    1,                          !- Hour 12
    1,                          !- Hour 13
    1,                          !- Hour 14
    1,                          !- Hour 15
    1,                          !- Hour 16
    1,                          !- Hour 17
    1,                          !- Hour 18
    1,                          !- Hour 19
    1,                          !- Hour 20
    1,                          !- Hour 21
    1,                          !- Hour 22
    1,                          !- Hour 23
    1;                          !- Hour 24

DAYSCHEDULE,
    Zone Setpoint Day Sch,   !- Name
    Temperature,             !- ScheduleType
    22.3,                    !- Hour 1
    22.3,                    !- Hour 2
    22.3,                    !- Hour 3
    22.3,                    !- Hour 4
    22.3,                    !- Hour 5
    22.3,                    !- Hour 6
    22.3,                    !- Hour 7
    22.3,                    !- Hour 8
    22.3,                    !- Hour 9
    22.3,                    !- Hour 10
    22.3,                    !- Hour 11
    22.3,                    !- Hour 12
    22.3,                    !- Hour 13
    22.3,                    !- Hour 14
    22.3,                    !- Hour 15
    22.3,                    !- Hour 16
    22.3,                    !- Hour 17
    22.3,                    !- Hour 18
    22.3,                    !- Hour 19
    22.3,                    !- Hour 20
    22.3,                    !- Hour 21
    22.3,                    !- Hour 22
    22.3,                    !- Hour 23
    22.3;                    !- Hour 24

DAYSCHEDULE,
    Summer Control Type Day Sch,  !- Name
    Control Type,            !- ScheduleType
    3,                       !- Hour 1
    3,                       !- Hour 2
    3,                       !- Hour 3
    3,                       !- Hour 4
```

```
    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Winter Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    3,                        !- Hour 1
    3,                        !- Hour 2
    3,                        !- Hour 3
    3,                        !- Hour 4
    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Min OA Day Sch,           !- Name
    Fraction,                 !- ScheduleType
    1.,                       !- Hour 1
    1.,                       !- Hour 2
    1.,                       !- Hour 3
    1.,                       !- Hour 4
    1.,                       !- Hour 5
    1.,                       !- Hour 6
    1.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
```

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    1.,                     !- Hour 20
    1.,                     !- Hour 21
    1.,                     !- Hour 22
    1.,                     !- Hour 23
    1.;                     !- Hour 24


!-   ===========  ALL OBJECTS IN CLASS: WEEKSCHEDULE ===========

WEEKSCHEDULE,
    LT-WEEK,                !- Name
    LT-1,                   !- Sunday DAYSCHEDULE Name
    LT-1,                   !- Monday DAYSCHEDULE Name
    LT-1,                   !- Tuesday DAYSCHEDULE Name
    LT-1,                   !- Wednesday DAYSCHEDULE Name
    LT-1,                   !- Thursday DAYSCHEDULE Name
    LT-1,                   !- Friday DAYSCHEDULE Name
    LT-1,                   !- Saturday DAYSCHEDULE Name
    LT-1,                   !- Holiday DAYSCHEDULE Name
    LT-1,                   !- SummerDesignDay DAYSCHEDULE Name
    LT-1,                   !- WinterDesignDay DAYSCHEDULE Name
    LT-1,                   !- CustomDay1 DAYSCHEDULE Name
    LT-1;                   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    EQ-WEEK,                !- Name
    EQ-1,                   !- Sunday DAYSCHEDULE Name
    EQ-1,                   !- Monday DAYSCHEDULE Name
    EQ-1,                   !- Tuesday DAYSCHEDULE Name
    EQ-1,                   !- Wednesday DAYSCHEDULE Name
    EQ-1,                   !- Thursday DAYSCHEDULE Name
    EQ-1,                   !- Friday DAYSCHEDULE Name
    EQ-1,                   !- Saturday DAYSCHEDULE Name
    EQ-1,                   !- Holiday DAYSCHEDULE Name
    EQ-1,                   !- SummerDesignDay DAYSCHEDULE Name
    EQ-1,                   !- WinterDesignDay DAYSCHEDULE Name
    EQ-1,                   !- CustomDay1 DAYSCHEDULE Name
    EQ-1;                   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Week on Peak,           !- Name
    Day On Peak,            !- Sunday DAYSCHEDULE Name
    Day On Peak,            !- Monday DAYSCHEDULE Name
    Day On Peak,            !- Tuesday DAYSCHEDULE Name
    Day On Peak,            !- Wednesday DAYSCHEDULE Name
    Day On Peak,            !- Thursday DAYSCHEDULE Name
    Day On Peak,            !- Friday DAYSCHEDULE Name
    Day On Peak,            !- Saturday DAYSCHEDULE Name
    Day On Peak,            !- Holiday DAYSCHEDULE Name
    Day On Peak,            !- SummerDesignDay DAYSCHEDULE Name
    Day On Peak,            !- WinterDesignDay DAYSCHEDULE Name
    Day On Peak,            !- CustomDay1 DAYSCHEDULE Name
    Day On Peak;            !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Supply Air Temp Week Sch,  !- Name
    Summer Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Supply Air Temp Week Sch,  !- Name
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    Winter Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Chilled Water Loop Weekly,  !- Name
    Chilled Water Loop Daily,!- Sunday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Monday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Tuesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Wednesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Thursday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Friday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Saturday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Holiday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- SummerDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- WinterDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- CustomDay1 DAYSCHEDULE Name
    Chilled Water Loop Daily;!- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOnWeekSched,!- Name
    SystemOnDaySched,        !- Sunday DAYSCHEDULE Name
    SystemOnDaySched,        !- Monday DAYSCHEDULE Name
    SystemOnDaySched,        !- Tuesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Wednesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Thursday DAYSCHEDULE Name
    SystemOnDaySched,        !- Friday DAYSCHEDULE Name
    SystemOnDaySched,        !- Saturday DAYSCHEDULE Name
    SystemOnDaySched,        !- Holiday DAYSCHEDULE Name
    SystemOnDaySched,        !- SummerDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- WinterDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- CustomDay1 DAYSCHEDULE Name
    SystemOnDaySched;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOffWeekSched,  !- Name
    SystemOffDaySched,       !- Sunday DAYSCHEDULE Name
    SystemOffDaySched,       !- Monday DAYSCHEDULE Name
    SystemOffDaySched,       !- Tuesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Wednesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Thursday DAYSCHEDULE Name
    SystemOffDaySched,       !- Friday DAYSCHEDULE Name
    SystemOffDaySched,       !- Saturday DAYSCHEDULE Name
    SystemOffDaySched,       !- Holiday DAYSCHEDULE Name
    SystemOffDaySched,       !- SummerDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- WinterDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- CustomDay1 DAYSCHEDULE Name
    SystemOffDaySched;       !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ReheatCoilWeekSched,     !- Name
    ReheatCoilDaySched,      !- Sunday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Monday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Tuesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Wednesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Thursday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Friday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Saturday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Holiday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- SummerDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- WinterDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- CustomDay1 DAYSCHEDULE Name
```

```
    ReheatCoilDaySched;      !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Zone Setpoint Week Sch,  !- Name
    Zone Setpoint Day Sch,   !- Sunday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Monday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Tuesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Wednesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Thursday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Friday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Saturday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Holiday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- SummerDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- WinterDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- CustomDay1 DAYSCHEDULE Name
    Zone Setpoint Day Sch;   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Control Type Week Sch,  !- Name
    Summer Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Control Type Week Sch,  !- Name
    Winter Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Min OA Week Sch,         !- Name
    Min OA Day Sch,          !- Sunday DAYSCHEDULE Name
    Min OA Day Sch,          !- Monday DAYSCHEDULE Name
    Min OA Day Sch,          !- Tuesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Wednesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Thursday DAYSCHEDULE Name
    Min OA Day Sch,          !- Friday DAYSCHEDULE Name
    Min OA Day Sch,          !- Saturday DAYSCHEDULE Name
    Min OA Day Sch,          !- Holiday DAYSCHEDULE Name
    Min OA Day Sch,          !- SummerDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- WinterDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- CustomDay1 DAYSCHEDULE Name
    Min OA Day Sch;          !- CustomDay2 DAYSCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE ===========

SCHEDULE,
    LIGHTS-1,                !- Name
    Fraction,                !- ScheduleType
    LT-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
```

```
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    EQUIP-1,                !- Name
    Fraction,               !- ScheduleType
    EQ-WEEK,                !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    On Peak,                !- Name
    Fraction,               !- ScheduleType
    Week On Peak,           !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    Seasonal Reset Supply Air Temp Sch,  !- Name
    Temperature,            !- ScheduleType
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    3,                      !- End Month 1
    31,                     !- End Day 1
    Summer Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                      !- Start Month 2
    1,                      !- Start Day 2
    9,                      !- End Month 2
    30,                     !- End Day 2
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                     !- Start Month 3
    1,                      !- Start Day 3
    12,                     !- End Month 3
    31;                     !- End Day 3

SCHEDULE,
    CW Loop Temp Schedule,  !- Name
    Temperature,            !- ScheduleType
    Chilled Water Loop Weekly,  !- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    12,                     !- End Month 1
    31;                     !- End Day 1

SCHEDULE,
    FanAndCoilAvailSched,   !- Name
    Fraction,               !- ScheduleType
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 1
    1,                      !- Start Month 1
    1,                      !- Start Day 1
    3,                      !- End Month 1
    31,                     !- End Day 1
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 2
    4,                      !- Start Month 2
    1,                      !- Start Day 2
    9,                      !- End Month 2
    30,                     !- End Day 2
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 3
    10,                     !- Start Month 3
    1,                      !- Start Day 3
    12,                     !- End Month 3
    31;                     !- End Day 3

SCHEDULE,
    ReheatCoilAvailSched,   !- Name
    Fraction,               !- ScheduleType
```

```
    ReheatCoilWeekSched,     !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Setpoints,          !- Name
    Temperature,             !- ScheduleType
    Zone Setpoint Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Control Type Sched, !- Name
    Control Type,            !- ScheduleType
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    Summer Control Type Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    Min OA Sched,            !- Name
    Fraction,                !- ScheduleType
    Min OA Week Sch,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1


!-   ===========  ALL OBJECTS IN CLASS: LIGHTS ===========

LIGHTS,
    Zone 1,                  !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    0,                       !- Design Level {W}
    .15,                     !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights,           !- LightsEndUseKey
    No,                      !- Return Air Fraction Is Calculated from Plenum Temperature
    0,                       !- Coefficient #1 of Equation for Return Air Fraction vs. Plenum
Temperature
    0;                       !- Coefficient #2 of Equation for Return Air Fraction vs. Plenum
Temperature {1/K}


!-   ===========  ALL OBJECTS IN CLASS: NODE LIST ===========

NODE LIST,
    OutsideAirInletNodes,    !- Node List Name
    Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
    Zone1Inlets,             !- Node List Name
    Zone 1 Reheat Air Outlet Node;  !- Node_ID_1
```

```
NODE LIST,
    Supply Air Temp Nodes,   !- Node List Name
    Heating Coil Air Inlet Node,  !- Node_ID_1
    Air Loop Outlet Node;    !- Node_ID_2

NODE LIST,
    Chilled Water Loop Setpoint Node List,  !- Node List Name
    CW Supply Outlet Node;   !- Node_ID_1


!-   ===========  ALL OBJECTS IN CLASS: BRANCH LIST ===========

BRANCH LIST,
    Air Loop Branches,       !- Branch List Name
    Air Loop Main Branch;    !- Branch Name 1

BRANCH LIST,
    Cooling Supply Side Branches,  !- Branch List Name
    CW Pump Branch,          !- Branch Name 1
    Purchased Cooling Branch,!- Branch Name 2
    Supply Bypass Branch,    !- Branch Name 3
    Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
    Cooling Demand Side Branches,  !- Branch List Name
    Cooling Demand Inlet,    !- Branch Name 1
    Cooling Coil Branch,     !- Branch Name 2
    Demand Bypass Branch,    !- Branch Name 3
    Cooling Demand Outlet;   !- Branch Name 4


!-   ===========  ALL OBJECTS IN CLASS: CONNECTOR LIST ===========

CONNECTOR LIST,
    Cooling Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Loop Splitter,        !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
    Cooling Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Demand Splitter,      !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Demand Mixer;         !- Name of Connector 2


!-   ===========  ALL OBJECTS IN CLASS: BRANCH ===========

BRANCH,
    Air Loop Main Branch,    !- Branch Name
!    SysFlowRate[],
    .7475,                   !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    Air Loop Inlet Node,     !- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    FAN:SIMPLE:VariableVolume,  !- Comp2 Type
    Supply Fan 1,            !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
    Cooling Coil Air Inlet Node,  !- Comp2 Outlet Node Name
    ACTIVE,                  !- Comp2 Branch Control Type
    COIL:Water:SimpleCooling,!- Comp3 Type
    Main Cooling Coil 1,     !- Comp3 Name
    Cooling Coil Air Inlet Node,  !- Comp3 Inlet Node Name
    Heating Coil Air Inlet Node,  !- Comp3 Outlet Node Name
    PASSIVE,                 !- Comp3 Branch Control Type
    COIL:Gas:Heating,        !- Comp4 Type
```

```
    Main Heating Coil 1,     !- Comp4 Name
    Heating Coil Air Inlet Node,  !- Comp4 Inlet Node Name
    Air Loop Outlet Node,    !- Comp4 Outlet Node Name
    PASSIVE;                 !- Comp4 Branch Control Type

BRANCH,
    Cooling Demand Inlet,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Inlet Pipe,  !- Comp1 Name
    CW Demand Inlet Node,    !- Comp1 Inlet Node Name
    CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Coil Branch,     !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleCooling,!- Comp1 Type
    Main Cooling Coil 1,     !- Comp1 Name
    Cooling Coil Water Inlet Node,  !- Comp1 Inlet Node Name
    Cooling Coil Water Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Demand Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Bypass,      !- Comp1 Name
    CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    CW Demand Side Outlet Pipe,  !- Comp1 Name
    CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Outlet Pipe, !- Comp1 Name
    Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    CW Pump Branch,          !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    Circ Pump,               !- Comp1 Name
    CW Supply Inlet Node,    !- Comp1 Inlet Node Name
    CW Pump Outlet Node,     !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Purchased Cooling Branch,!- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    Purchased:Chilled Water, !- Comp1 Type
    Purchased Cooling,       !- Comp1 Name
    Purchased Cooling Inlet Node,  !- Comp1 Inlet Node Name
    Purchased Cooling Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Supply Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
```

```
    PIPE,                    !- Comp1 Type
    Supply Side Bypass,      !- Comp1 Name
    CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type


!-   ===========  ALL OBJECTS IN CLASS: PIPE ===========

PIPE,
    Demand Side Inlet Pipe,  !- PipeName
    CW Demand Inlet Node,    !- Inlet Node Name
    CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Demand Side Bypass,      !- PipeName
    CW Demand Bypass Inlet Node,  !- Inlet Node Name
    CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    CW Demand Side Outlet Pipe,  !- PipeName
    CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Outlet Pipe, !- PipeName
    Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Bypass,      !- PipeName
    CW Supply Bypass Inlet Node,  !- Inlet Node Name
    CW Supply Bypass Outlet Node;  !- Outlet Node Name


!-   ===========  ALL OBJECTS IN CLASS: PLANT LOOP ===========

PLANT LOOP,
    Chilled Water Loop,      !- Plant Loop Name
    Water,                   !- Fluid Type
    CW Loop Operation,       !- Plant Operation Scheme List Name
    CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    98,                      !- Maximum Loop Temperature {C}
    1,                       !- Minimum Loop Temperature {C}
    0.0006,                  !- Maximum Loop Volumetric Flow Rate {m3/s}
    0,                       !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    CW Supply Inlet Node,    !- Plant Side Inlet Node Name
    CW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Cooling Supply Side Branches,  !- Plant Side Branch List Name
    Cooling Supply Side Connectors,  !- Plant Side Connector List Name
    CW Demand Inlet Node,    !- Demand Side Inlet Node Name
    CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Cooling Demand Side Branches,  !- Demand Side Branch List Name
    Cooling Demand Side Connectors,  !- Demand Side Connector List Name
    Optimal;                 !- Load Distribution Scheme


!-   ===========  ALL OBJECTS IN CLASS: PLANT OPERATION SCHEMES ===========

PLANT OPERATION SCHEMES,
    CW Loop Operation,       !- PlantOperationSchemeName
    LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Peak Operation,          !- Control Scheme Name 1
    On Peak;                 !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: COOLING LOAD RANGE BASED OPERATION ===========

COOLING LOAD RANGE BASED OPERATION,
    Peak Operation,          !- Name
```

```
    0,                      !- Load Range Lower Limit 1 {W}
    100000,                 !- Load Range Upper Limit 1 {W}
    Purchased Only;         !- Priority Control Equip List Name 1


!-   ===========  ALL OBJECTS IN CLASS: PLANT EQUIPMENT LIST ===========

PLANT EQUIPMENT LIST,
    Purchased Only,         !- Equip List Name
    Purchased:Chilled Water, !- KEY--Plant Equip 1
    Purchased Cooling;      !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: SPLITTER ===========

SPLITTER,
    CW Loop Splitter,       !- SplitterName
    CW Pump Branch,         !- Inlet Branch Name
    Purchased Cooling Branch,!- Outlet Branch Name 1
    Supply Bypass Branch;   !- Outlet Branch Name 2

SPLITTER,
    CW Demand Splitter,     !- SplitterName
    Cooling Demand Inlet,   !- Inlet Branch Name
    Demand Bypass Branch,   !- Outlet Branch Name 1
    Cooling Coil Branch;    !- Outlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: MIXER ===========

MIXER,
    CW Loop Mixer,          !- MixerName
    Cooling Supply Outlet,  !- Outlet Branch Name
    Purchased Cooling Branch,!- Inlet Branch Name 1
    Supply Bypass Branch;   !- Inlet Branch Name 2

MIXER,
    CW Demand Mixer,        !- MixerName
    Cooling Demand Outlet,  !- Outlet Branch Name
    Cooling Coil Branch,    !- Inlet Branch Name 1
    Demand Bypass Branch;   !- Inlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: AIR PRIMARY LOOP ===========

AIR PRIMARY LOOP,
    Typical Terminal Reheat 1,  !- Primary Air Loop Name
    Reheat System 1 Controllers,  !- Name: Controller List
    Reheat System 1 Avail List,  !- Name: System Availability Manager List
!    SysFlowRate[],
    .7475,                  !- Primary air design volumetric flow rate {m3/s}
    Air Loop Branches,      !- Air Loop Branch List Name
    ,                       !- Air Loop Connector List Name
    Air Loop Inlet Node,    !- ReturnAir AirLoop Inlet Node
    Return Air Mixer Outlet, !- ZoneEquipGroup Outlet Node
    Zone Equipment Inlet Node,  !- SupplyAirPath ZoneEquipGroup Inlet Nodes
    Air Loop Outlet Node;   !- AirLoop Outlet Nodes


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER LIST ===========

CONTROLLER LIST,
    Reheat System 1 Controllers,  !- Name
    Controller:Simple,      !- Controller Type 1
    Main Cooling Coil Controller;  !- Controller Name 1

CONTROLLER LIST,
    OA Sys 1 Controllers,   !- Name
    CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
    OA Controller 1;        !- Controller Name 1
```

```
!-   ===========  ALL OBJECTS IN CLASS: AIR LOOP EQUIPMENT LIST ===========

AIR LOOP EQUIPMENT LIST,
    OA Sys 1 Equipment,      !- Name
    OUTSIDE AIR MIXER,       !- KEY--System Component 1
    OA Mixing Box 1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR SYSTEM ===========

OUTSIDE AIR SYSTEM,
    OA Sys 1,                !- Name
    OA Sys 1 Controllers,    !- Name: Controller List
    OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
    Reheat System 1 Avail List;  !- Name of a System Availability Manager List


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR INLET NODE LIST ===========

OUTSIDE AIR INLET NODE LIST,
    OutsideAirInletNodes;    !- 1st Node name or node list name


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR MIXER ===========

OUTSIDE AIR MIXER,
    OA Mixing Box 1,         !- Name
    Mixed Air Node 1,        !- Mixed_Air_Node
    Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
    Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
    Air Loop Inlet Node;     !- Return_Air_Stream_Node


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER LIST ===========

SYSTEM AVAILABILITY MANAGER LIST,
    Reheat System 1 Avail List,  !- Name
    SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
    Reheat System 1 Avail;   !- System Availability Manager Name 1


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER:SCHEDULED ===========

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
    Reheat System 1 Avail,   !- Name
    FanAndCoilAvailSched;    !- Schedule name


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:SCHEDULED ===========

SET POINT MANAGER:SCHEDULED,
    Chilled Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    CW Loop Temp Schedule,   !- Schedule Name
    Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Supply Air Temp Manager, !- Name
    TEMP,                    !- Control variable
    Seasonal Reset Supply Air Temp Sch,  !- Schedule Name
    Supply Air Temp Nodes;   !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:SIMPLE ===========

CONTROLLER:SIMPLE,
    Main Cooling Coil Controller,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
```

```
    Heating Coil Air Inlet Node,  !- Control_Node
    Cooling Coil Water Inlet Node,  !- Actuator_Node
    0.001,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    0.0006,                  !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:OUTSIDE AIR ===========

CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    NO ECONOMIZER,           !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    .01,                     !- minimum outside air flow rate {m3/s}
!    SysFlowRate[],
    .7475,                   !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    Air Loop Inlet Node,     !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLED ZONE EQUIP CONFIGURATION ===========

CONTROLLED ZONE EQUIP CONFIGURATION,
    Zone 1,                  !- Zone Name
    Zone1Equipment,          !- List Name: Zone Equipment
    Zone1Inlets,             !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    Zone 1 Node,             !- Zone Air Node Name
    Zone 1 Outlet Node;      !- Zone Return Air Node Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE EQUIPMENT LIST ===========

ZONE EQUIPMENT LIST,
    Zone1Equipment,          !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    Zone1TermReheat,         !- Type Name 1
    1,                       !- Cooling Priority
    1;                       !- Heating Priority


!-   ===========  ALL OBJECTS IN CLASS: AIR DISTRIBUTION UNIT ===========

AIR DISTRIBUTION UNIT,
    Zone1TermReheat,         !- Air Distribution Unit Name
    Zone 1 Reheat Air Outlet Node,  !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:CONST VOLUME:REHEAT,  !- KEY--System Component Type 1
    Reheat Zone 1;           !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:CONST VOLUME:REHEAT ===========

SINGLE DUCT:CONST VOLUME:REHEAT,
    Reheat Zone 1,           !- Name of System
    FanAndCoilAvailSched,    !- System Availability schedule
    Zone 1 Reheat Air Outlet Node,  !- Unit Air Outlet Node
    Zone 1 Reheat Air Inlet Node,  !- Unit Air Inlet Node
!    SysFlowRate[],
    .7475,                   !- Maximum air flow rate {m3/s}
    ,                        !- Control node
    COIL:Gas:Heating,        !- Reheat Component Object
```

```
    Reheat Coil Zone 1,      !- Name of Reheat Component
    0.0,                     !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    0.001;                   !- Convergence Tolerance


!-   ===========  ALL OBJECTS IN CLASS: ZONE CONTROL:THERMOSTATIC ===========

ZONE CONTROL:THERMOSTATIC,
    Zone 1 Thermostat,       !- Thermostat Name
    ZONE 1,                  !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Heating Cooling Setpoint,  !- Control Type #1
    Single Setpoint;         !- Control Type Name #1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE HEATING COOLING SETPOINT ===========

SINGLE HEATING COOLING SETPOINT,
    Single Setpoint,         !- Name
    Zone Setpoints;          !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY AIR PATH ===========

ZONE SUPPLY AIR PATH,
    TermReheatSupplyPath,    !- Supply Air Path Name
    Zone Equipment Inlet Node,  !- Supply Air Path Inlet Node
    Zone Supply Plenum,      !- KEY--System Component Type 1
    Zone 1b Plenum,          !- Component Name 1
    Zone Splitter,           !- KEY--System Component Type 2
    Zone Supply Air Splitter;!- Component Name 2


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN AIR PATH ===========

ZONE RETURN AIR PATH,
    TermReheatReturnPath,    !- Return Air Path Name
    Return Air Mixer Outlet, !- Return Air Path Outlet Node
    Zone Mixer,              !- KEY--System Component Type 1
    Zone Return Air Mixer;   !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY PLENUM ===========

ZONE SUPPLY PLENUM,
    Zone 1b Plenum,          !- Zone Plenum Name
    ZONE 1b,                 !- Zone Name
    Zone 1b Node,            !- Zone Node Name
    Zone Equipment Inlet Node,  !- Inlet_Node
    Zone 1b Plenum Outlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SPLITTER ===========

ZONE SPLITTER,
    Zone Supply Air Splitter,!- Splitter Name
    Zone 1b Plenum Outlet Node,  !- Inlet_Node
    Zone 1 Reheat Air Inlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE MIXER ===========

ZONE MIXER,
    Zone Return Air Mixer,   !- Mixer Name
    Return Air Mixer Outlet, !- Outlet_Node
    Zone 1 Outlet Node;      !- Inlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: PURCHASED:CHILLED WATER ===========
```

```
PURCHASED:CHILLED WATER,
    Purchased Cooling,       !- Purchased Chilled Water Name
    Purchased Cooling Inlet Node,  !- Plant_Loop_Inlet_Node
    Purchased Cooling Outlet Node,  !- Plant_Loop_Outlet_Node
    10000;                   !- Nominal Capacity {W}


!-   ===========  ALL OBJECTS IN CLASS: PUMP:VARIABLE SPEED ===========

PUMP:VARIABLE SPEED,
    Circ Pump,               !- Pump Name
    CW Supply Inlet Node,    !- Inlet_Node
    CW Pump Outlet Node,     !- Outlet_Node
    .0006,                   !- Rated Volumetric Flow Rate {m3/s}
    300000,                  !- Rated Pump Head {Pa}
    270,                     !- Rated Power Consumption {W}
    .87,                     !- Motor Efficiency
    0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                       !- Coefficient1 of the Part Load Performance Curve
    1,                       !- Coefficient2 of the Part Load Performance Curve
    0,                       !- Coefficient3 of the Part Load Performance Curve
    0,                       !- Coefficient4 of the Part Load Performance Curve
    0,                       !- Min Flow Rate while operating in variable flow capacity; {m3/s}
    INTERMITTENT;            !- Pump Control Type


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:SIMPLECOOLING ===========

COIL:Water:SimpleCooling,
    Main Cooling Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    1600,                    !- UA of the Coil {W/K}
    .0006,                   !- Max Water Flow Rate of Coil {m3/s}
    0.95,                    !- Leaving Relative Humidity of Coil
    Cooling Coil Water Inlet Node,  !- Coil_Water_Inlet_Node
    Cooling Coil Water Outlet Node,  !- Coil_Water_Outlet_Node
    Cooling Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Heating Coil Air Inlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: COIL:GAS:HEATING ===========

COIL:Gas:Heating,
    Reheat Coil Zone 1,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Zone 1 Reheat Air Inlet Node,  !- Coil_Air_Inlet_Node
    Zone 1 Reheat Air Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Gas:Heating,
    Main Heating Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Heating Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Air Loop Outlet Node,    !- Coil_Air_Outlet_Node
    Air Loop Outlet Node;    !- Coil_Temp_Setpoint_Node


!-   ===========  ALL OBJECTS IN CLASS: FAN:SIMPLE:VARIABLEVOLUME ===========

FAN:SIMPLE:VariableVolume,
    Supply Fan 1,            !- Fan Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    100.0,                   !- Delta Pressure {Pa}
!    SysFlowRate[],
    .7475,                   !- Max Flow Rate {m3/s}
    0.001,                   !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
```

```
    1.0,                     !- Motor In Airstream Fraction
    0.0015302446,            !- FanCoefficient 1
    0.0052080574,            !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -0.11635563,             !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    Mixed Air Node 1,        !- Fan_Inlet_Node
    Cooling Coil Air Inlet Node;  !- Fan_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: REPORT VARIABLE ===========

Report Variable,
    *,                       !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Ext Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                 !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil,                 !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Sensible Cooling Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1,                  !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Air Temp,       !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Outlet Node,      !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency
```

```
Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Mixed Air Node 1,        !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Cooling Coil Water Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Heating Coil Gas Consumption Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Total Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Sensible Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency


!-   ===========  ALL OBJECTS IN CLASS: REPORT ===========

Report,
    surfaces,                !- Type_of_Report
    dxf;                     !- Name_of_Report

Report,
    Variable Dictionary;     !- Type_of_Report

Report,
    Surfaces,                !- Type_of_Report
    DETAILS;                 !- Name_of_Report
```

A.4 CFDCOMP2ZB.IDF

Model of a supply plenum with a 50 x 100 foot floor plate. The plenum is divided into 2 sections: interior, 35 x 100; exterior, 15 x 100. The supply air path contains 2 Zone Supply Plenums. The first has 2 outlet nodes – one connecting to the interior conditioned zone, the other to the 2nd supply plenum. The 2nd plenum has one outlet node connecting to the exterior conditioned zone.

Table 19: Inputs for plenum model of a 50 x 100 ft floorplate

Occupied zone ceiling temperature	78 F
Bottom of floor slab air temperature	80 F
Supply plenum radiation exchange?	No
Supply plenum air inlet temperature	62 F
Supply plenum air inlet flow rate	5000 cfm
Interior zone supply air flow rate	2423 cfm
Interior supply plenum ceiling h_c	5.41 W/m^2K
Interior supply plenum floor h_c	2.96 W/m^2K
Exterior zone supply air flow rate	2577 cfm
Exterior supply plenum ceiling h_c	1.8 W/m^2K
Exterior supply plenum floor h_c	1.34 W/m^2K

Table 20: Full Input listing for 50 x 100 ft floorplate

```
!-Generator IDFEditor 1.25 'current version of IDFEditor - less than 1 is a beta

!-NOTE: All comments with '!-' are ignored by the IDFEditor and are generated automatically.
!-      Use '!' comments if they need to be retained when using the IDFEditor.


!-   ===========  ALL OBJECTS IN CLASS: VERSION ===========

! Case CFDComp2Z
! 50 x 100 foot floor plan, divided into 2 zones: 35 x 100 (south) & 15 x 100 (north).
! no return plenum - ceiling temperatures fixed. Each zone is supplied through an underfloor
! supply plenum, the south first, north second. The system is constant volume reheat. It
! is just intended to deliver constant volume air at a specified temperature to the first
! supply plenum.
VERSION,
    1.2.2;                  !- Version Identifier


!-   ===========  ALL OBJECTS IN CLASS: BUILDING ===========

BUILDING,
    YorkLab,                !- Building Name
    0,                      !- North Axis {deg}
    Suburbs,                !- Terrain
    0.04,                   !- Loads Convergence Tolerance Value {W}
    0.4,                    !- Temperature Convergence Tolerance Value {deltaC}
    MinimalShadowing,       !- Solar Distribution
    ;                       !- Maximum Number of Warmup Days


!-   ===========  ALL OBJECTS IN CLASS: TIMESTEP IN HOUR ===========

TIMESTEP IN HOUR,
    6;                      !- Time Step in Hour


!-   ===========  ALL OBJECTS IN CLASS: INSIDE CONVECTION ALGORITHM ===========

INSIDE CONVECTION ALGORITHM,
    Simple;                 !- InsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE CONVECTION ALGORITHM ===========

OUTSIDE CONVECTION ALGORITHM,
    Simple;                 !- OutsideConvectionValue


!-   ===========  ALL OBJECTS IN CLASS: SOLUTION ALGORITHM ===========

SOLUTION ALGORITHM,
    CTF;                    !- SolutionAlgo


!-   ===========  ALL OBJECTS IN CLASS: DEBUG OUTPUT ===========

DEBUG OUTPUT,
    0,                      !- YesNo
    0;                      !- EvenDuringWarmup


!-   ===========  ALL OBJECTS IN CLASS: DIAGNOSTICS ===========

DIAGNOSTICS,
    DisplayAdvancedReportVariables;  !- key1


!-   ===========  ALL OBJECTS IN CLASS: ZONE VOLUME CAPACITANCE MULTIPLIER ===========
```

```
ZONE VOLUME CAPACITANCE MULTIPLIER,
    1;                      !- Capacitance Multiplier


!-   ===========  ALL OBJECTS IN CLASS: RUN CONTROL ===========

RUN CONTROL,
    No,                     !- Do the zone sizing calculation
    No,                     !- Do the system sizing calculation
    No,                     !- Do the plant sizing calculation
    Yes,                    !- Do the design day simulations
    Yes;                    !- Do the weather file simulation


!-   ===========  ALL OBJECTS IN CLASS: RUNPERIOD ===========

RunPeriod,
    9,                      !- Begin Month
    13,                     !- Begin Day Of Month
    9,                      !- End Month
    20,                     !- End Day Of Month
    Tuesday,                !- Day Of Week For Start Day
    No,                     !- Use WeatherFile Holidays/Special Days
    No,                     !- Use WeatherFile DaylightSavingPeriod
    Yes,                    !- Apply Weekend Holiday Rule
    Yes,                    !- Use WeatherFile Rain Indicators
    Yes;                    !- Use WeatherFile Snow Indicators


!-   ===========  ALL OBJECTS IN CLASS: LOCATION ===========

Location,
    Harrisburg,             !- LocationName
    40.2,                   !- Latitude {deg}
    -76.77,                 !- Longitude {deg}
    -5,                     !- TimeZone {hr}
    94;                     !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: GROUNDTEMPERATURES ===========

! DesignDay,
!     Harrisburg Summer,
!     33.3,
!     10.4,
!     23.5,
!     100200,
!     5,
!     30,
!     1,
!     ,
!     ,
!     15,
!     8,
!     SummerDesignDay,
!     1;
! DesignDay,
!     Harrisburg Winter,
!     -13,
!     0,
!     -13,
!     100200,
!     5,
!     30,
!     0,
!     ,
!     ,
!     15,
!     1,
!     WinterDesignDay,
!     1;
```

```
GroundTemperatures,
    18.89,                  !- January Ground Temperature {C}
    18.92,                  !- February Ground Temperature {C}
    19.02,                  !- March Ground Temperature {C}
    19.12,                  !- April Ground Temperature {C}
    19.21,                  !- May Ground Temperature {C}
    19.23,                  !- June Ground Temperature {C}
    19.07,                  !- July Ground Temperature {C}
    19.32,                  !- August Ground Temperature {C}
    19.09,                  !- September Ground Temperature {C}
    19.21,                  !- October Ground Temperature {C}
    19.13,                  !- November Ground Temperature {C}
    18.96;                  !- December Ground Temperature {C}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR ===========

MATERIAL:REGULAR,
    BLBD - PLYWOOD 3 / 4 IN, !- Name
    MediumSmooth,           !- Roughness
    0.0099999998,           !- Thickness {m}
    0.11,                   !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    0.78,                   !- Absorptance:Solar
    0.78;                   !- Absorptance:Visible

MATERIAL:REGULAR,
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Name
    Smooth,                 !- Roughness
    0.0099999998,           !- Thickness {m}
    0.059999999,            !- Conductivity {W/m-K}
    480.55,                 !- Density {kg/m3}
    830,                    !- Specific Heat {J/kg-K}
    0.01,                   !- Absorptance:Thermal
    0.32,                   !- Absorptance:Solar
    0.32;                   !- Absorptance:Visible

MATERIAL:REGULAR,
    BLBD - PLYWOOD 1 / 2 IN, !- Name
    MediumSmooth,           !- Roughness
    0.0099999998,           !- Thickness {m}
    0.11,                   !- Conductivity {W/m-K}
    544.62,                 !- Density {kg/m3}
    1210,                   !- Specific Heat {J/kg-K}
    0.01,                   !- Absorptance:Thermal
    0.78,                   !- Absorptance:Solar
    0.78;                   !- Absorptance:Visible

MATERIAL:REGULAR,
    B10 - 2 IN WOOD,        !- Name
    MediumSmooth,           !- Roughness
    0.050000001,            !- Thickness {m}
    0.12,                   !- Conductivity {W/m-K}
    592.68,                 !- Density {kg/m3}
    2510,                   !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    0.78,                   !- Absorptance:Solar
    0.78;                   !- Absorptance:Visible

MATERIAL:REGULAR,
    E5 - ACOUSTIC TILE,     !- Name
    MediumSmooth,           !- Roughness
    0.0099999998,           !- Thickness {m}
    100,                    !- Conductivity {W/m-K}
    480.55,                 !- Density {kg/m3}
    830,                    !- Specific Heat {J/kg-K}
    0.9,                    !- Absorptance:Thermal
    0.32,                   !- Absorptance:Solar
    0.32;                   !- Absorptance:Visible
```

```
MATERIAL:REGULAR,
    CONCRETE - 120 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    0.1,                     !- Thickness {m}
    0.74,                    !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    CONCRETE - 40 LB / CU FT 4 IN,  !- Name
    MediumRough,             !- Roughness
    0.1000000,               !- Thickness {m}
    0.1600000,               !- Conductivity {W/m-K}
    640.7300,                !- Density {kg/m3}
    830.0000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.6500000,               !- Absorptance:Solar
    0.6500000;               !- Absorptance:Visible

! k=0.196 W/m-K th=1.3 inches
MATERIAL:REGULAR,
    RaisedFloorAsConcrete,   !- Name
    MediumRough,             !- Roughness
    0.033,                   !- Thickness {m}
    0.196,                   !- Conductivity {W/m-K}
    640.7300,                !- Density {kg/m3}
    830.0000,                !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
    0.7;                     !- Absorptance:Visible

MATERIAL:REGULAR,
    FloorSlabConcrete,       !- Name
    MediumRough,             !- Roughness
    0.254,                   !- Thickness {m}
    0.93,                    !- Conductivity {W/m-K}
    1922.21,                 !- Density {kg/m3}
    830,                     !- Specific Heat {J/kg-K}
    0.01,                    !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR-R ===========

MATERIAL:REGULAR-R,
    R30-INSULATION,          !- Name
    Rough,                   !- Roughness
    5.283,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R5-INSULATION,           !- Name
    Rough,                   !- Roughness
    0.881,                   !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R11-INSULATION,          !- Name
    Rough,                   !- Roughness
    1.937,                   !- Thermal Resistance {m2-K/W}
    0.9,                     !- Absorptance:Thermal
    0.7,                     !- Absorptance:Solar
```

```
    0.7;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R19-INSULATION,         !- Name
    Rough,                  !- Roughness
    3.346,                  !- Thermal Resistance {m2-K/W}
    0.9000000,              !- Absorptance:Thermal
    0.7500000,              !- Absorptance:Solar
    0.7500000;              !- Absorptance:Visible

MATERIAL:REGULAR-R,
    R-TateFloor,            !- Name
    Rough,                  !- Roughness
    0.23,                   !- Thermal Resistance {m2-K/W}
    0.9,                    !- Absorptance:Thermal
    0.7,                    !- Absorptance:Solar
    0.7;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    FloorSlabHc,            !- Name
    MediumRough,            !- Roughness
    1.1737,                 !- Thermal Resistance {m2-K/W}
    0.9,                    !- Absorptance:Thermal
    0.65,                   !- Absorptance:Solar
    0.65;                   !- Absorptance:Visible

MATERIAL:REGULAR-R,
    Carpet,                 !- Name
    Rough,                  !- Roughness
    0.06,                   !- Thermal Resistance {m2-K/W}
    0.9,                    !- Absorptance:Thermal
    0.7500000,              !- Absorptance:Solar
    0.7500000;              !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGLASS ===========

MATERIAL:WINDOWGLASS,
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Name
    SpectralAverage,        !- Optical Data Type
    ,                       !- Name of Window Glass Spectral Data Set
    0.0060000001,           !- Thickness {m}
    0.775,                  !- Solar Transmittance at Normal Incidence
    0.071000002,            !- Solar Reflectance at Normal Incidence: Front Side
    0.071000002,            !- Solar Reflectance at Normal Incidence: Back Side
    0.881,                  !- Visible Transmittance at Normal Incidence
    0.079999998,            !- Visible Reflectance at Normal Incidence: Front Side
    0.079999998,            !- Visible Reflectance at Normal Incidence: Back Side
    ,                       !- IR Transmittance at Normal Incidence
    0.84,                   !- IR Hemispherical Emissivity: Front Side
    0.84,                   !- IR Hemispherical Emissivity: Back Side
    0.9;                    !- Conductivity {W/m-K}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGAS ===========

MATERIAL:WINDOWGAS,
    WinAirB1 - AIRSPACE RESISTANCE,  !- Name
    Air,                    !- Gas Type
    0.012;                  !- Thickness {m}


!-   ===========  ALL OBJECTS IN CLASS: CONSTRUCTION ===========

CONSTRUCTION,
    Wall-A,                 !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION,         !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
```

```
    Wall-B,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    BLBD - PLYWOOD 1 / 2 IN; !- Layer #3

CONSTRUCTION,
    Wall-C,                  !- Name
    BLBD - PLYWOOD 1 / 2 IN, !- Outside Layer
    R19-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-D,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-E,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R30-INSULATION,          !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    Wall-F,                  !- Name
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Outside Layer
    R11-INSULATION;          !- Layer #2

CONSTRUCTION,
    Suspened Ceiling,        !- Name
    E5 - ACOUSTIC TILE;      !- Outside Layer

CONSTRUCTION,
    Raised Floor,            !- Name
    RaisedFloorAsConcrete,   !- Outside Layer
    Carpet;                  !- Layer #2

CONSTRUCTION,
    Raised Floor SP,         !- Name
    Carpet,                  !- Outside Layer
    RaisedFloorAsConcrete;   !- Layer #2

CONSTRUCTION,
    Out Ceiling,             !- Name
    R30-INSULATION,          !- Outside Layer
    E8 - 5 / 8 IN PLASTER OR GYP BOARD,  !- Layer #2
    E8 - 5 / 8 IN PLASTER OR GYP BOARD;  !- Layer #3

CONSTRUCTION,
    SubFloor,                !- Name
    FloorSlabConcrete;       !- Outside Layer

CONSTRUCTION,
    DoublePaneWindow,        !- Name
    GLASS - CLEAR PLATE 1 / 4 IN,  !- Outside Layer
    WinAirB1 - AIRSPACE RESISTANCE,  !- Layer #2
    GLASS - CLEAR PLATE 1 / 4 IN;  !- Layer #3

CONSTRUCTION,
    Raised Floor No Carpet,  !- Name
    RaisedFloorAsConcrete;   !- Outside Layer


!-   ===========  ALL OBJECTS IN CLASS: ZONE ===========

ZONE,
    Zone 1,                  !- Zone Name
    0,                       !- Relative North (to building) {deg}
    0,                       !- X Origin {m}
    0,                       !- Y Origin {m}
    0,                       !- Z Origin {m}
```

```
    1,                        !- Type
    1,                        !- Multiplier
    -100,                     !- Ceiling Height {m}
    0;                        !- Volume {m3}

ZONE,
    Zone 1b,                  !- Zone Name
    0,                        !- Relative North (to building) {deg}
    ,                         !- X Origin {m}
    ,                         !- Y Origin {m}
    -.305,                    !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    -100.0000,                !- Ceiling Height {m}
    0;                        !- Volume {m3}

ZONE,
    Zone 2,                   !- Zone Name
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    -100,                     !- Ceiling Height {m}
    0;                        !- Volume {m3}

ZONE,
    Zone 2b,                  !- Zone Name
    0,                        !- Relative North (to building) {deg}
    ,                         !- X Origin {m}
    ,                         !- Y Origin {m}
    -.305,                    !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    -100.0000,                !- Ceiling Height {m}
    0;                        !- Volume {m3}


!-   ===========  ALL OBJECTS IN CLASS: SURFACEGEOMETRY ===========

SurfaceGeometry,
    UpperLeftCorner,          !- SurfaceStartingPosition
    CounterClockWise,         !- VertexEntry
    WorldCoordinateSystem;    !- CoordinateSystem


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER ===========

Surface:HeatTransfer,
    TC-NorthWall1,            !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 1,                   !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    TC-NorthWall1,            !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                    !- Vertex 1 X-coordinate {m}
    10.67,                    !- Vertex 1 Y-coordinate {m}
    3.048,                    !- Vertex 1 Z-coordinate {m}
    30.48,                    !- Vertex 2 X-coordinate {m}
    10.67,                    !- Vertex 2 Y-coordinate {m}
    0,                        !- Vertex 2 Z-coordinate {m}
    0,                        !- Vertex 3 X-coordinate {m}
    10.67,                    !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    0,                        !- Vertex 4 X-coordinate {m}
```

```
    10.67,                  !- Vertex 4 Y-coordinate {m}
    3.048;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-SouthWall1,          !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-D,                 !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-SouthWall1,          !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    0,                      !- Vertex 1 Y-coordinate {m}
    3.048,                  !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    0,                      !- Vertex 2 Y-coordinate {m}
    0,                      !- Vertex 2 Z-coordinate {m}
    30.48,                  !- Vertex 3 X-coordinate {m}
    0,                      !- Vertex 3 Y-coordinate {m}
    0,                      !- Vertex 3 Z-coordinate {m}
    30.48,                  !- Vertex 4 X-coordinate {m}
    0,                      !- Vertex 4 Y-coordinate {m}
    3.048;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-EastWall1,           !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-E,                 !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-EastWall1,           !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                  !- Vertex 1 X-coordinate {m}
    0,                      !- Vertex 1 Y-coordinate {m}
    3.048,                  !- Vertex 1 Z-coordinate {m}
    30.48,                  !- Vertex 2 X-coordinate {m}
    0,                      !- Vertex 2 Y-coordinate {m}
    0,                      !- Vertex 2 Z-coordinate {m}
    30.48,                  !- Vertex 3 X-coordinate {m}
    10.67,                  !- Vertex 3 Y-coordinate {m}
    0,                      !- Vertex 3 Z-coordinate {m}
    30.48,                  !- Vertex 4 X-coordinate {m}
    10.67,                  !- Vertex 4 Y-coordinate {m}
    3.048;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-WestWall1,           !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-C,                 !- Construction Name of the Surface
    Zone 1,                 !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-WestWall1,           !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    10.67,                  !- Vertex 1 Y-coordinate {m}
    3.048,                  !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    10.67,                  !- Vertex 2 Y-coordinate {m}
    0,                      !- Vertex 2 Z-coordinate {m}
```

```
    0,                        !- Vertex 3 X-coordinate {m}
    0,                        !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    0,                        !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    3.048;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Ceil1,                 !- User Supplied Surface Name
    CEILING,                  !- Surface Type
    Suspened Ceiling,         !- Construction Name of the Surface
    Zone 1,                   !- InsideFaceEnvironment
    OtherSideCoeff,           !- OutsideFaceEnvironment
    TC-CeilOST,               !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    10.67,                    !- Vertex 1 Y-coordinate {m}
    3.048,                    !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    0,                        !- Vertex 2 Y-coordinate {m}
    3.048,                    !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    0,                        !- Vertex 3 Y-coordinate {m}
    3.048,                    !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    10.67,                    !- Vertex 4 Y-coordinate {m}
    3.048;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Floor1,                !- User Supplied Surface Name
    FLOOR,                    !- Surface Type
    Raised Floor No Carpet,   !- Construction Name of the Surface
    Zone 1,                   !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-Ceil1,                 !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    0,                        !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    10.67,                    !- Vertex 2 Y-coordinate {m}
    0,                        !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    10.67,                    !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-NorthWall1,            !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-NorthWall1,            !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                    !- Vertex 1 X-coordinate {m}
    10.67,                    !- Vertex 1 Y-coordinate {m}
```

```
    0,                        !- Vertex 1 Z-coordinate {m}
    30.48,                    !- Vertex 2 X-coordinate {m}
    10.67,                    !- Vertex 2 Y-coordinate {m}
    -0.305,                   !- Vertex 2 Z-coordinate {m}
    0,                        !- Vertex 3 X-coordinate {m}
    10.67,                    !- Vertex 3 Y-coordinate {m}
    -0.305,                   !- Vertex 3 Z-coordinate {m}
    0,                        !- Vertex 4 X-coordinate {m}
    10.67,                    !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-SouthWall1,            !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-SouthWall1,            !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    0,                        !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    0,                        !- Vertex 2 Y-coordinate {m}
    -0.305,                   !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    0,                        !- Vertex 3 Y-coordinate {m}
    -0.305,                   !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-EastWall1,             !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-E,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-EastWall1,             !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                    !- Vertex 1 X-coordinate {m}
    0,                        !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    30.48,                    !- Vertex 2 X-coordinate {m}
    0,                        !- Vertex 2 Y-coordinate {m}
    -0.305,                   !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    10.67,                    !- Vertex 3 Y-coordinate {m}
    -0.305,                   !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    10.67,                    !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-WestWall1,             !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-C,                   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    SP-WestWall1,             !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
```

```
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    10.67,                    !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    10.67,                    !- Vertex 2 Y-coordinate {m}
    -0.305,                   !- Vertex 2 Z-coordinate {m}
    0,                        !- Vertex 3 X-coordinate {m}
    0,                        !- Vertex 3 Y-coordinate {m}
    -0.305,                   !- Vertex 3 Z-coordinate {m}
    0,                        !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Ceil1,                 !- User Supplied Surface Name
    CEILING,                  !- Surface Type
    Raised Floor No Carpet,   !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherZoneSurface,         !- OutsideFaceEnvironment
    TC-Floor1,                !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    10.67,                    !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    0,                        !- Vertex 2 Y-coordinate {m}
    0,                        !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    0,                        !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    10.67,                    !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Floor1,                !- User Supplied Surface Name
    FLOOR,                    !- Surface Type
    SubFloor,                 !- Construction Name of the Surface
    Zone 1b,                  !- InsideFaceEnvironment
    OtherSideCoeff,           !- OutsideFaceEnvironment
    SP-FloorOST,              !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0,                        !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                        !- Vertex 1 X-coordinate {m}
    0,                        !- Vertex 1 Y-coordinate {m}
    -0.305,                   !- Vertex 1 Z-coordinate {m}
    0,                        !- Vertex 2 X-coordinate {m}
    10.67,                    !- Vertex 2 Y-coordinate {m}
    -0.305,                   !- Vertex 2 Z-coordinate {m}
    30.48,                    !- Vertex 3 X-coordinate {m}
    10.67,                    !- Vertex 3 Y-coordinate {m}
    -0.305,                   !- Vertex 3 Z-coordinate {m}
    30.48,                    !- Vertex 4 X-coordinate {m}
    0,                        !- Vertex 4 Y-coordinate {m}
    -0.305;                   !- Vertex 4 Z-coordinate {m}

! ============================================================
Surface:HeatTransfer,
    TC-NorthWall2,            !- User Supplied Surface Name
    WALL,                     !- Surface Type
    Wall-D,                   !- Construction Name of the Surface
    Zone 2,                   !- InsideFaceEnvironment
```

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    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-NorthWall2,           !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                   !- Vertex 1 X-coordinate {m}
    15.24,                   !- Vertex 1 Y-coordinate {m}
    3.048,                   !- Vertex 1 Z-coordinate {m}
    30.48,                   !- Vertex 2 X-coordinate {m}
    15.24,                   !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    0,                       !- Vertex 3 X-coordinate {m}
    15.24,                   !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    0,                       !- Vertex 4 X-coordinate {m}
    15.24,                   !- Vertex 4 Y-coordinate {m}
    3.048;                   !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-SouthWall2,           !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-D,                  !- Construction Name of the Surface
    Zone 2,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-SouthWall2,           !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                       !- Vertex 1 X-coordinate {m}
    10.67,                   !- Vertex 1 Y-coordinate {m}
    3.048,                   !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    10.67,                   !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    30.48,                   !- Vertex 3 X-coordinate {m}
    10.67,                   !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    30.48,                   !- Vertex 4 X-coordinate {m}
    10.67,                   !- Vertex 4 Y-coordinate {m}
    3.048;                   !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-EastWall2,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-E,                  !- Construction Name of the Surface
    Zone 2,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-EastWall2,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                   !- Vertex 1 X-coordinate {m}
    10.67,                   !- Vertex 1 Y-coordinate {m}
    3.048,                   !- Vertex 1 Z-coordinate {m}
    30.48,                   !- Vertex 2 X-coordinate {m}
    10.67,                   !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    30.48,                   !- Vertex 3 X-coordinate {m}
    15.24,                   !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    30.48,                   !- Vertex 4 X-coordinate {m}
    15.24,                   !- Vertex 4 Y-coordinate {m}
    3.048;                   !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
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    TC-WestWall2,            !- User Supplied Surface Name
    WALL,                    !- Surface Type
    Wall-C,                  !- Construction Name of the Surface
    Zone 2,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    TC-WestWall2,            !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                       !- Vertex 1 X-coordinate {m}
    15.24,                   !- Vertex 1 Y-coordinate {m}
    3.048,                   !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    15.24,                   !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    0,                       !- Vertex 3 X-coordinate {m}
    10.67,                   !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    0,                       !- Vertex 4 X-coordinate {m}
    10.67,                   !- Vertex 4 Y-coordinate {m}
    3.048;                   !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Ceil2,                !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    Suspened Ceiling,        !- Construction Name of the Surface
    Zone 2,                  !- InsideFaceEnvironment
    OtherSideCoeff,          !- OutsideFaceEnvironment
    TC-CeilOST,              !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                       !- Vertex 1 X-coordinate {m}
    15.24,                   !- Vertex 1 Y-coordinate {m}
    3.048,                   !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    10.67,                   !- Vertex 2 Y-coordinate {m}
    3.048,                   !- Vertex 2 Z-coordinate {m}
    30.48,                   !- Vertex 3 X-coordinate {m}
    10.67,                   !- Vertex 3 Y-coordinate {m}
    3.048,                   !- Vertex 3 Z-coordinate {m}
    30.48,                   !- Vertex 4 X-coordinate {m}
    15.24,                   !- Vertex 4 Y-coordinate {m}
    3.048;                   !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TC-Floor2,               !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    Raised Floor No Carpet,  !- Construction Name of the Surface
    Zone 2,                  !- InsideFaceEnvironment
    OtherZoneSurface,        !- OutsideFaceEnvironment
    SP-Ceil2,                !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0,                       !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                       !- Vertex 1 X-coordinate {m}
    10.67,                   !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    15.24,                   !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    30.48,                   !- Vertex 3 X-coordinate {m}
    15.24,                   !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    30.48,                   !- Vertex 4 X-coordinate {m}
```

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    10.67,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-NorthWall2,          !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-D,                 !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    SP-NorthWall2,          !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                  !- Vertex 1 X-coordinate {m}
    15.24,                  !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    30.48,                  !- Vertex 2 X-coordinate {m}
    15.24,                  !- Vertex 2 Y-coordinate {m}
    -0.305,                 !- Vertex 2 Z-coordinate {m}
    0,                      !- Vertex 3 X-coordinate {m}
    15.24,                  !- Vertex 3 Y-coordinate {m}
    -0.305,                 !- Vertex 3 Z-coordinate {m}
    0,                      !- Vertex 4 X-coordinate {m}
    15.24,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-SouthWall2,          !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-D,                 !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    SP-SouthWall2,          !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    10.67,                  !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    10.67,                  !- Vertex 2 Y-coordinate {m}
    -0.305,                 !- Vertex 2 Z-coordinate {m}
    30.48,                  !- Vertex 3 X-coordinate {m}
    10.67,                  !- Vertex 3 Y-coordinate {m}
    -0.305,                 !- Vertex 3 Z-coordinate {m}
    30.48,                  !- Vertex 4 X-coordinate {m}
    10.67,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-EastWall2,           !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-E,                 !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    SP-EastWall2,           !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.48,                  !- Vertex 1 X-coordinate {m}
    10.67,                  !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    30.48,                  !- Vertex 2 X-coordinate {m}
    10.67,                  !- Vertex 2 Y-coordinate {m}
    -0.305,                 !- Vertex 2 Z-coordinate {m}
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    30.48,                  !- Vertex 3 X-coordinate {m}
    15.24,                  !- Vertex 3 Y-coordinate {m}
    -0.305,                 !- Vertex 3 Z-coordinate {m}
    30.48,                  !- Vertex 4 X-coordinate {m}
    15.24,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-WestWall2,           !- User Supplied Surface Name
    WALL,                   !- Surface Type
    Wall-C,                 !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    SP-WestWall2,           !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    15.24,                  !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    15.24,                  !- Vertex 2 Y-coordinate {m}
    -0.305,                 !- Vertex 2 Z-coordinate {m}
    0,                      !- Vertex 3 X-coordinate {m}
    10.67,                  !- Vertex 3 Y-coordinate {m}
    -0.305,                 !- Vertex 3 Z-coordinate {m}
    0,                      !- Vertex 4 X-coordinate {m}
    10.67,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Ceil2,               !- User Supplied Surface Name
    CEILING,                !- Surface Type
    Raised Floor No Carpet, !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherZoneSurface,       !- OutsideFaceEnvironment
    TC-Floor2,              !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    15.24,                  !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    0,                      !- Vertex 2 X-coordinate {m}
    10.67,                  !- Vertex 2 Y-coordinate {m}
    0,                      !- Vertex 2 Z-coordinate {m}
    30.48,                  !- Vertex 3 X-coordinate {m}
    10.67,                  !- Vertex 3 Y-coordinate {m}
    0,                      !- Vertex 3 Z-coordinate {m}
    30.48,                  !- Vertex 4 X-coordinate {m}
    15.24,                  !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SP-Floor2,              !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    SubFloor,               !- Construction Name of the Surface
    Zone 2b,                !- InsideFaceEnvironment
    OtherSideCoeff,         !- OutsideFaceEnvironment
    SP-FloorOST,            !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0,                      !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0,                      !- Vertex 1 X-coordinate {m}
    10.67,                  !- Vertex 1 Y-coordinate {m}
```

```
    -0.305,                  !- Vertex 1 Z-coordinate {m}
    0,                       !- Vertex 2 X-coordinate {m}
    15.24,                   !- Vertex 2 Y-coordinate {m}
    -0.305,                  !- Vertex 2 Z-coordinate {m}
    30.48,                   !- Vertex 3 X-coordinate {m}
    15.24,                   !- Vertex 3 Y-coordinate {m}
    -0.305,                  !- Vertex 3 Z-coordinate {m}
    30.48,                   !- Vertex 4 X-coordinate {m}
    10.67,                   !- Vertex 4 Y-coordinate {m}
    -0.305;                  !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: OTHERSIDECOEFFICIENTS ===========

OtherSideCoefficients,
    TC-CeilOST,              !- OtherSideCoeff Name
    0.,                      !- Combined convective/radiative film coefficient
!    CeilOSTemp[],
    25.56,                   !- User selected Constant Temperature {C}
    1.,                      !- Coefficient modifying the user selected constant temperature
    0.,                      !- Coefficient modifying the external dry bulb temperature
    0.,                      !- Coefficient modifying the ground temperature
    0.,                      !- Coefficient modifying the wind speed term (s/m)
    0;                       !- Coefficient modifying the zone air temperature part of the
equation

OtherSideCoefficients,
    SP-FloorOST,             !- OtherSideCoeff Name
    0.,                      !- Combined convective/radiative film coefficient
!    FloorOSTemp[],
    26.67,                   !- User selected Constant Temperature {C}
    1.,                      !- Coefficient modifying the user selected constant temperature
    0.,                      !- Coefficient modifying the external dry bulb temperature
    0.,                      !- Coefficient modifying the ground temperature
    0.,                      !- Coefficient modifying the wind speed term (s/m)
    0;                       !- Coefficient modifying the zone air temperature part of the
equation


!-   ===========  ALL OBJECTS IN CLASS: CONVECTIONCOEFFICIENTS ===========

ConvectionCoefficients,
    TC-Floor1,               !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Ceil1,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    5.41;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Floor1,               !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    2.96;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Ceil1,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-NorthWall1,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}
```

```
ConvectionCoefficients,
    TC-SouthWall1,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-EastWall1,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-WestWall1,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-NorthWall1,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-SouthWall1,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-EastWall1,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-WestWall1,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Floor2,               !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Ceil2,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    1.80;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-Floor2,               !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    1.34;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-Ceil2,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.01;                    !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-NorthWall2,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}
```

```
ConvectionCoefficients,
    TC-SouthWall2,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-EastWall2,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    TC-WestWall2,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-NorthWall2,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-SouthWall2,           !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-EastWall2,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    SP-WestWall2,            !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    0.7;                     !- Convection value #1 {W/m2-K}


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULETYPE ===========

ScheduleType,
    Any Number;              !- ScheduleType Name

ScheduleType,
    Fraction,                !- ScheduleType Name
    0.0 : 1.0,               !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Temperature,             !- ScheduleType Name
    -60:200,                 !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Control Type,            !- ScheduleType Name
    0:4,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    On/Off,                  !- ScheduleType Name
    0:1,                     !- range
    DISCRETE;                !- Numeric Type


!-   ===========  ALL OBJECTS IN CLASS: DAYSCHEDULE ===========
```

```
DAYSCHEDULE,
    LT-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24

DAYSCHEDULE,
    EQ-1,                    !- Name
    Fraction,                !- ScheduleType
    1.0,                     !- Hour 1
    1.0,                     !- Hour 2
    1.0,                     !- Hour 3
    1.0,                     !- Hour 4
    1.0,                     !- Hour 5
    1.0,                     !- Hour 6
    1.0,                     !- Hour 7
    1.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    1.0,                     !- Hour 12
    1.0,                     !- Hour 13
    1.0,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    1.0,                     !- Hour 19
    1.0,                     !- Hour 20
    1.0,                     !- Hour 21
    1.0,                     !- Hour 22
    1.0,                     !- Hour 23
    1.0;                     !- Hour 24

DAYSCHEDULE,
    Day On Peak,             !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
```

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    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
    1.,                       !- Hour 20
    1.,                       !- Hour 21
    1.,                       !- Hour 22
    1.,                       !- Hour 23
    1.;                       !- Hour 24

DAYSCHEDULE,
    Summer Supply Air Temp Day Sch,  !- Name
    Temperature,              !- ScheduleType
    16.67,                    !- Hour 1
    16.67,                    !- Hour 2
    16.67,                    !- Hour 3
    16.67,                    !- Hour 4
    16.67,                    !- Hour 5
    16.67,                    !- Hour 6
    16.67,                    !- Hour 7
    16.67,                    !- Hour 8
    16.67,                    !- Hour 9
    16.67,                    !- Hour 10
    16.67,                    !- Hour 11
    16.67,                    !- Hour 12
    16.67,                    !- Hour 13
    16.67,                    !- Hour 14
    16.67,                    !- Hour 15
    16.67,                    !- Hour 16
    16.67,                    !- Hour 17
    16.67,                    !- Hour 18
    16.67,                    !- Hour 19
    16.67,                    !- Hour 20
    16.67,                    !- Hour 21
    16.67,                    !- Hour 22
    16.67,                    !- Hour 23
    16.67;                    !- Hour 24

DAYSCHEDULE,
    Winter Supply Air Temp Day Sch,  !- Name
    Temperature,              !- ScheduleType
    16.67,                    !- Hour 1
    16.67,                    !- Hour 2
    16.67,                    !- Hour 3
    16.67,                    !- Hour 4
    16.67,                    !- Hour 5
    16.67,                    !- Hour 6
    16.67,                    !- Hour 7
    16.67,                    !- Hour 8
    16.67,                    !- Hour 9
    16.67,                    !- Hour 10
    16.67,                    !- Hour 11
    16.67,                    !- Hour 12
    16.67,                    !- Hour 13
    16.67,                    !- Hour 14
    16.67,                    !- Hour 15
    16.67,                    !- Hour 16
    16.67,                    !- Hour 17
    16.67,                    !- Hour 18
    16.67,                    !- Hour 19
    16.67,                    !- Hour 20
    16.67,                    !- Hour 21
    16.67,                    !- Hour 22
    16.67,                    !- Hour 23
    16.67;                    !- Hour 24

DAYSCHEDULE,
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    Chilled Water Loop Daily,!- Name
    Temperature,             !- ScheduleType
    6.67,                    !- Hour 1
    6.67,                    !- Hour 2
    6.67,                    !- Hour 3
    6.67,                    !- Hour 4
    6.67,                    !- Hour 5
    6.67,                    !- Hour 6
    6.67,                    !- Hour 7
    6.67,                    !- Hour 8
    6.67,                    !- Hour 9
    6.67,                    !- Hour 10
    6.67,                    !- Hour 11
    6.67,                    !- Hour 12
    6.67,                    !- Hour 13
    6.67,                    !- Hour 14
    6.67,                    !- Hour 15
    6.67,                    !- Hour 16
    6.67,                    !- Hour 17
    6.67,                    !- Hour 18
    6.67,                    !- Hour 19
    6.67,                    !- Hour 20
    6.67,                    !- Hour 21
    6.67,                    !- Hour 22
    6.67,                    !- Hour 23
    6.67;                    !- Hour 24

DAYSCHEDULE,
    SystemOffDaySched,       !- Name
    Fraction,                !- ScheduleType
    0.,                      !- Hour 1
    0.,                      !- Hour 2
    0.,                      !- Hour 3
    0.,                      !- Hour 4
    0.,                      !- Hour 5
    0.,                      !- Hour 6
    0.,                      !- Hour 7
    0.,                      !- Hour 8
    0.,                      !- Hour 9
    0.,                      !- Hour 10
    0.,                      !- Hour 11
    0.,                      !- Hour 12
    0.,                      !- Hour 13
    0.,                      !- Hour 14
    0.,                      !- Hour 15
    0.,                      !- Hour 16
    0.,                      !- Hour 17
    0.,                      !- Hour 18
    0.,                      !- Hour 19
    0.,                      !- Hour 20
    0.,                      !- Hour 21
    0.,                      !- Hour 22
    0.,                      !- Hour 23
    0.;                      !- Hour 24

DAYSCHEDULE,
    SystemOnDaySched,        !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
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    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
    1.,                       !- Hour 20
    1.,                       !- Hour 21
    1.,                       !- Hour 22
    1.,                       !- Hour 23
    1.;                       !- Hour 24

DAYSCHEDULE,
    ReheatCoilDaySched,       !- Name
    Fraction,                 !- ScheduleType
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[],
!    ReheatCoilON[];
    1,                        !- Hour 1
    1,                        !- Hour 2
    1,                        !- Hour 3
    1,                        !- Hour 4
    1,                        !- Hour 5
    1,                        !- Hour 6
    1,                        !- Hour 7
    1,                        !- Hour 8
    1,                        !- Hour 9
    1,                        !- Hour 10
    1,                        !- Hour 11
    1,                        !- Hour 12
    1,                        !- Hour 13
    1,                        !- Hour 14
    1,                        !- Hour 15
    1,                        !- Hour 16
    1,                        !- Hour 17
    1,                        !- Hour 18
    1,                        !- Hour 19
    1,                        !- Hour 20
    1,                        !- Hour 21
    1,                        !- Hour 22
    1,                        !- Hour 23
    1;                        !- Hour 24

DAYSCHEDULE,
    Zone Setpoint Day Sch,    !- Name
    Temperature,              !- ScheduleType
    23.03,                    !- Hour 1
    23.03,                    !- Hour 2
    23.03,                    !- Hour 3
    23.03,                    !- Hour 4
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    23.03,                   !- Hour 5
    23.03,                   !- Hour 6
    23.03,                   !- Hour 7
    23.03,                   !- Hour 8
    23.03,                   !- Hour 9
    23.03,                   !- Hour 10
    23.03,                   !- Hour 11
    23.03,                   !- Hour 12
    23.03,                   !- Hour 13
    23.03,                   !- Hour 14
    23.03,                   !- Hour 15
    23.03,                   !- Hour 16
    23.03,                   !- Hour 17
    23.03,                   !- Hour 18
    23.03,                   !- Hour 19
    23.03,                   !- Hour 20
    23.03,                   !- Hour 21
    23.03,                   !- Hour 22
    23.03,                   !- Hour 23
    23.03;                   !- Hour 24

DAYSCHEDULE,
    Zone Setpoint Day Sch 2, !- Name
    Temperature,             !- ScheduleType
    24.16,                   !- Hour 1
    24.16,                   !- Hour 2
    24.16,                   !- Hour 3
    24.16,                   !- Hour 4
    24.16,                   !- Hour 5
    24.16,                   !- Hour 6
    24.16,                   !- Hour 7
    24.16,                   !- Hour 8
    24.16,                   !- Hour 9
    24.16,                   !- Hour 10
    24.16,                   !- Hour 11
    24.16,                   !- Hour 12
    24.16,                   !- Hour 13
    24.16,                   !- Hour 14
    24.16,                   !- Hour 15
    24.16,                   !- Hour 16
    24.16,                   !- Hour 17
    24.16,                   !- Hour 18
    24.16,                   !- Hour 19
    24.16,                   !- Hour 20
    24.16,                   !- Hour 21
    24.16,                   !- Hour 22
    24.16,                   !- Hour 23
    24.16;                   !- Hour 24

DAYSCHEDULE,
    Summer Control Type Day Sch,  !- Name
    Control Type,            !- ScheduleType
    3,                       !- Hour 1
    3,                       !- Hour 2
    3,                       !- Hour 3
    3,                       !- Hour 4
    3,                       !- Hour 5
    3,                       !- Hour 6
    3,                       !- Hour 7
    3,                       !- Hour 8
    3,                       !- Hour 9
    3,                       !- Hour 10
    3,                       !- Hour 11
    3,                       !- Hour 12
    3,                       !- Hour 13
    3,                       !- Hour 14
    3,                       !- Hour 15
    3,                       !- Hour 16
    3,                       !- Hour 17
    3,                       !- Hour 18
    3,                       !- Hour 19
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    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Winter Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    3,                        !- Hour 1
    3,                        !- Hour 2
    3,                        !- Hour 3
    3,                        !- Hour 4
    3,                        !- Hour 5
    3,                        !- Hour 6
    3,                        !- Hour 7
    3,                        !- Hour 8
    3,                        !- Hour 9
    3,                        !- Hour 10
    3,                        !- Hour 11
    3,                        !- Hour 12
    3,                        !- Hour 13
    3,                        !- Hour 14
    3,                        !- Hour 15
    3,                        !- Hour 16
    3,                        !- Hour 17
    3,                        !- Hour 18
    3,                        !- Hour 19
    3,                        !- Hour 20
    3,                        !- Hour 21
    3,                        !- Hour 22
    3,                        !- Hour 23
    3;                        !- Hour 24

DAYSCHEDULE,
    Min OA Day Sch,           !- Name
    Fraction,                 !- ScheduleType
    1.,                       !- Hour 1
    1.,                       !- Hour 2
    1.,                       !- Hour 3
    1.,                       !- Hour 4
    1.,                       !- Hour 5
    1.,                       !- Hour 6
    1.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    1.,                       !- Hour 19
    1.,                       !- Hour 20
    1.,                       !- Hour 21
    1.,                       !- Hour 22
    1.,                       !- Hour 23
    1.;                       !- Hour 24


!-   ===========  ALL OBJECTS IN CLASS: WEEKSCHEDULE ===========

WEEKSCHEDULE,
    LT-WEEK,                  !- Name
    LT-1,                     !- Sunday DAYSCHEDULE Name
    LT-1,                     !- Monday DAYSCHEDULE Name
    LT-1,                     !- Tuesday DAYSCHEDULE Name
    LT-1,                     !- Wednesday DAYSCHEDULE Name
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    LT-1,                    !- Thursday DAYSCHEDULE Name
    LT-1,                    !- Friday DAYSCHEDULE Name
    LT-1,                    !- Saturday DAYSCHEDULE Name
    LT-1,                    !- Holiday DAYSCHEDULE Name
    LT-1,                    !- SummerDesignDay DAYSCHEDULE Name
    LT-1,                    !- WinterDesignDay DAYSCHEDULE Name
    LT-1,                    !- CustomDay1 DAYSCHEDULE Name
    LT-1;                    !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    EQ-WEEK,                 !- Name
    EQ-1,                    !- Sunday DAYSCHEDULE Name
    EQ-1,                    !- Monday DAYSCHEDULE Name
    EQ-1,                    !- Tuesday DAYSCHEDULE Name
    EQ-1,                    !- Wednesday DAYSCHEDULE Name
    EQ-1,                    !- Thursday DAYSCHEDULE Name
    EQ-1,                    !- Friday DAYSCHEDULE Name
    EQ-1,                    !- Saturday DAYSCHEDULE Name
    EQ-1,                    !- Holiday DAYSCHEDULE Name
    EQ-1,                    !- SummerDesignDay DAYSCHEDULE Name
    EQ-1,                    !- WinterDesignDay DAYSCHEDULE Name
    EQ-1,                    !- CustomDay1 DAYSCHEDULE Name
    EQ-1;                    !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Week on Peak,            !- Name
    Day On Peak,             !- Sunday DAYSCHEDULE Name
    Day On Peak,             !- Monday DAYSCHEDULE Name
    Day On Peak,             !- Tuesday DAYSCHEDULE Name
    Day On Peak,             !- Wednesday DAYSCHEDULE Name
    Day On Peak,             !- Thursday DAYSCHEDULE Name
    Day On Peak,             !- Friday DAYSCHEDULE Name
    Day On Peak,             !- Saturday DAYSCHEDULE Name
    Day On Peak,             !- Holiday DAYSCHEDULE Name
    Day On Peak,             !- SummerDesignDay DAYSCHEDULE Name
    Day On Peak,             !- WinterDesignDay DAYSCHEDULE Name
    Day On Peak,             !- CustomDay1 DAYSCHEDULE Name
    Day On Peak;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Supply Air Temp Week Sch,  !- Name
    Summer Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Supply Air Temp Week Sch,  !- Name
    Winter Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Chilled Water Loop Weekly,  !- Name
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    Chilled Water Loop Daily,!- Sunday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Monday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Tuesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Wednesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Thursday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Friday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Saturday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Holiday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- SummerDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- WinterDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- CustomDay1 DAYSCHEDULE Name
    Chilled Water Loop Daily;!- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOnWeekSched,!- Name
    SystemOnDaySched,        !- Sunday DAYSCHEDULE Name
    SystemOnDaySched,        !- Monday DAYSCHEDULE Name
    SystemOnDaySched,        !- Tuesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Wednesday DAYSCHEDULE Name
    SystemOnDaySched,        !- Thursday DAYSCHEDULE Name
    SystemOnDaySched,        !- Friday DAYSCHEDULE Name
    SystemOnDaySched,        !- Saturday DAYSCHEDULE Name
    SystemOnDaySched,        !- Holiday DAYSCHEDULE Name
    SystemOnDaySched,        !- SummerDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- WinterDesignDay DAYSCHEDULE Name
    SystemOnDaySched,        !- CustomDay1 DAYSCHEDULE Name
    SystemOnDaySched;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanAndCoilAllOffWeekSched,  !- Name
    SystemOffDaySched,       !- Sunday DAYSCHEDULE Name
    SystemOffDaySched,       !- Monday DAYSCHEDULE Name
    SystemOffDaySched,       !- Tuesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Wednesday DAYSCHEDULE Name
    SystemOffDaySched,       !- Thursday DAYSCHEDULE Name
    SystemOffDaySched,       !- Friday DAYSCHEDULE Name
    SystemOffDaySched,       !- Saturday DAYSCHEDULE Name
    SystemOffDaySched,       !- Holiday DAYSCHEDULE Name
    SystemOffDaySched,       !- SummerDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- WinterDesignDay DAYSCHEDULE Name
    SystemOffDaySched,       !- CustomDay1 DAYSCHEDULE Name
    SystemOffDaySched;       !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ReheatCoilWeekSched,     !- Name
    ReheatCoilDaySched,      !- Sunday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Monday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Tuesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Wednesday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Thursday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Friday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Saturday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- Holiday DAYSCHEDULE Name
    ReheatCoilDaySched,      !- SummerDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- WinterDesignDay DAYSCHEDULE Name
    ReheatCoilDaySched,      !- CustomDay1 DAYSCHEDULE Name
    ReheatCoilDaySched;      !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Zone Setpoint Week Sch,  !- Name
    Zone Setpoint Day Sch,   !- Sunday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Monday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Tuesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Wednesday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Thursday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Friday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Saturday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- Holiday DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- SummerDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- WinterDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch,   !- CustomDay1 DAYSCHEDULE Name
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    Zone Setpoint Day Sch;   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Zone Setpoint Week Sch 2,!- Name
    Zone Setpoint Day Sch 2, !- Sunday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Monday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Tuesday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Wednesday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Thursday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Friday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Saturday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- Holiday DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- SummerDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- WinterDesignDay DAYSCHEDULE Name
    Zone Setpoint Day Sch 2, !- CustomDay1 DAYSCHEDULE Name
    Zone Setpoint Day Sch 2; !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Control Type Week Sch,  !- Name
    Summer Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Control Type Week Sch,  !- Name
    Winter Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Min OA Week Sch,         !- Name
    Min OA Day Sch,          !- Sunday DAYSCHEDULE Name
    Min OA Day Sch,          !- Monday DAYSCHEDULE Name
    Min OA Day Sch,          !- Tuesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Wednesday DAYSCHEDULE Name
    Min OA Day Sch,          !- Thursday DAYSCHEDULE Name
    Min OA Day Sch,          !- Friday DAYSCHEDULE Name
    Min OA Day Sch,          !- Saturday DAYSCHEDULE Name
    Min OA Day Sch,          !- Holiday DAYSCHEDULE Name
    Min OA Day Sch,          !- SummerDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- WinterDesignDay DAYSCHEDULE Name
    Min OA Day Sch,          !- CustomDay1 DAYSCHEDULE Name
    Min OA Day Sch;          !- CustomDay2 DAYSCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE ===========

SCHEDULE,
    LIGHTS-1,                !- Name
    Fraction,                !- ScheduleType
    LT-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
```

```
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    EQUIP-1,                  !- Name
    Fraction,                 !- ScheduleType
    EQ-WEEK,                  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    On Peak,                  !- Name
    Fraction,                 !- ScheduleType
    Week On Peak,             !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Seasonal Reset Supply Air Temp Sch,  !- Name
    Temperature,              !- ScheduleType
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    Summer Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    CW Loop Temp Schedule,    !- Name
    Temperature,              !- ScheduleType
    Chilled Water Loop Weekly,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    FanAndCoilAvailSched,     !- Name
    Fraction,                 !- ScheduleType
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    FanAndCoilAllOnWeekSched,!- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    ReheatCoilAvailSched,     !- Name
    Fraction,                 !- ScheduleType
```

```
    ReheatCoilWeekSched,     !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Setpoints,          !- Name
    Temperature,             !- ScheduleType
    Zone Setpoint Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Setpoints 2,        !- Name
    Temperature,             !- ScheduleType
    Zone Setpoint Week Sch 2,!- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    Zone Control Type Sched, !- Name
    Control Type,            !- ScheduleType
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    Summer Control Type Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    Winter Control Type Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    Min OA Sched,            !- Name
    Fraction,                !- ScheduleType
    Min OA Week Sch,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1


!-   ===========  ALL OBJECTS IN CLASS: NODE LIST ===========

NODE LIST,
    OutsideAirInletNodes,    !- Node List Name
    Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
    Zone1Inlets,             !- Node List Name
    Zone 1 Reheat Air Outlet Node;  !- Node_ID_1

NODE LIST,
    Zone2Inlets,             !- Node List Name
    Zone 2 Reheat Air Outlet Node;  !- Node_ID_1

NODE LIST,
    Supply Air Temp Nodes,   !- Node List Name
    Heating Coil Air Inlet Node,  !- Node_ID_1
    Air Loop Outlet Node;    !- Node_ID_2
```

```
NODE LIST,
    Chilled Water Loop Setpoint Node List,  !- Node List Name
    CW Supply Outlet Node;   !- Node_ID_1


!-   ===========  ALL OBJECTS IN CLASS: BRANCH LIST ===========

BRANCH LIST,
    Air Loop Branches,       !- Branch List Name
    Air Loop Main Branch;    !- Branch Name 1

BRANCH LIST,
    Cooling Supply Side Branches,  !- Branch List Name
    CW Pump Branch,          !- Branch Name 1
    Purchased Cooling Branch,!- Branch Name 2
    Supply Bypass Branch,    !- Branch Name 3
    Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
    Cooling Demand Side Branches,  !- Branch List Name
    Cooling Demand Inlet,    !- Branch Name 1
    Cooling Coil Branch,     !- Branch Name 2
    Demand Bypass Branch,    !- Branch Name 3
    Cooling Demand Outlet;   !- Branch Name 4


!-   ===========  ALL OBJECTS IN CLASS: CONNECTOR LIST ===========

CONNECTOR LIST,
    Cooling Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Loop Splitter,        !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
    Cooling Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Demand Splitter,      !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Demand Mixer;         !- Name of Connector 2


!-   ===========  ALL OBJECTS IN CLASS: BRANCH ===========

BRANCH,
    Air Loop Main Branch,    !- Branch Name
!    SysFlowRate[],
    1.2360,                  !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    Air Loop Inlet Node,     !- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    FAN:SIMPLE:VariableVolume,  !- Comp2 Type
    Supply Fan 1,            !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
    Cooling Coil Air Inlet Node,  !- Comp2 Outlet Node Name
    ACTIVE,                  !- Comp2 Branch Control Type
    COIL:Water:SimpleCooling,!- Comp3 Type
    Main Cooling Coil 1,     !- Comp3 Name
    Cooling Coil Air Inlet Node,  !- Comp3 Inlet Node Name
    Heating Coil Air Inlet Node,  !- Comp3 Outlet Node Name
    PASSIVE,                 !- Comp3 Branch Control Type
    COIL:Gas:Heating,        !- Comp4 Type
    Main Heating Coil 1,     !- Comp4 Name
    Heating Coil Air Inlet Node,  !- Comp4 Inlet Node Name
    Air Loop Outlet Node,    !- Comp4 Outlet Node Name
    PASSIVE;                 !- Comp4 Branch Control Type
```

```
BRANCH,
    Cooling Demand Inlet,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Inlet Pipe,  !- Comp1 Name
    CW Demand Inlet Node,    !- Comp1 Inlet Node Name
    CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Coil Branch,     !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleCooling,!- Comp1 Type
    Main Cooling Coil 1,     !- Comp1 Name
    Cooling Coil Water Inlet Node,  !- Comp1 Inlet Node Name
    Cooling Coil Water Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Demand Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Demand Side Bypass,      !- Comp1 Name
    CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    CW Demand Side Outlet Pipe,  !- Comp1 Name
    CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Outlet,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Outlet Pipe, !- Comp1 Name
    Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    CW Pump Branch,          !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    Circ Pump,               !- Comp1 Name
    CW Supply Inlet Node,    !- Comp1 Inlet Node Name
    CW Pump Outlet Node,     !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Purchased Cooling Branch,!- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    Purchased:Chilled Water, !- Comp1 Type
    Purchased Cooling,       !- Comp1 Name
    Purchased Cooling Inlet Node,  !- Comp1 Inlet Node Name
    Purchased Cooling Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Supply Bypass Branch,    !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Bypass,      !- Comp1 Name
    CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type
```

```
!-   ===========  ALL OBJECTS IN CLASS: PIPE ===========

PIPE,
    Demand Side Inlet Pipe,  !- PipeName
    CW Demand Inlet Node,    !- Inlet Node Name
    CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Demand Side Bypass,      !- PipeName
    CW Demand Bypass Inlet Node,  !- Inlet Node Name
    CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    CW Demand Side Outlet Pipe,  !- PipeName
    CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Outlet Pipe, !- PipeName
    Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Bypass,      !- PipeName
    CW Supply Bypass Inlet Node,  !- Inlet Node Name
    CW Supply Bypass Outlet Node;  !- Outlet Node Name


!-   ===========  ALL OBJECTS IN CLASS: PLANT LOOP ===========

PLANT LOOP,
    Chilled Water Loop,      !- Plant Loop Name
    Water,                   !- Fluid Type
    CW Loop Operation,       !- Plant Operation Scheme List Name
    CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    98,                      !- Maximum Loop Temperature {C}
    1,                       !- Minimum Loop Temperature {C}
    0.0012,                  !- Maximum Loop Volumetric Flow Rate {m3/s}
    0,                       !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    CW Supply Inlet Node,    !- Plant Side Inlet Node Name
    CW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Cooling Supply Side Branches,  !- Plant Side Branch List Name
    Cooling Supply Side Connectors,  !- Plant Side Connector List Name
    CW Demand Inlet Node,    !- Demand Side Inlet Node Name
    CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Cooling Demand Side Branches,  !- Demand Side Branch List Name
    Cooling Demand Side Connectors,  !- Demand Side Connector List Name
    Optimal;                 !- Load Distribution Scheme


!-   ===========  ALL OBJECTS IN CLASS: PLANT OPERATION SCHEMES ===========

PLANT OPERATION SCHEMES,
    CW Loop Operation,       !- PlantOperationSchemeName
    LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Peak Operation,          !- Control Scheme Name 1
    On Peak;                 !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: COOLING LOAD RANGE BASED OPERATION ===========

COOLING LOAD RANGE BASED OPERATION,
    Peak Operation,          !- Name
    0,                       !- Load Range Lower Limit 1 {W}
    100000,                  !- Load Range Upper Limit 1 {W}
    Purchased Only;          !- Priority Control Equip List Name 1
```

```
!-   ===========  ALL OBJECTS IN CLASS: PLANT EQUIPMENT LIST ===========

PLANT EQUIPMENT LIST,
    Purchased Only,          !- Equip List Name
    Purchased:Chilled Water, !- KEY--Plant Equip 1
    Purchased Cooling;       !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: SPLITTER ===========

SPLITTER,
    CW Loop Splitter,        !- SplitterName
    CW Pump Branch,          !- Inlet Branch Name
    Purchased Cooling Branch,!- Outlet Branch Name 1
    Supply Bypass Branch;    !- Outlet Branch Name 2

SPLITTER,
    CW Demand Splitter,      !- SplitterName
    Cooling Demand Inlet,    !- Inlet Branch Name
    Demand Bypass Branch,    !- Outlet Branch Name 1
    Cooling Coil Branch;     !- Outlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: MIXER ===========

MIXER,
    CW Loop Mixer,           !- MixerName
    Cooling Supply Outlet,   !- Outlet Branch Name
    Purchased Cooling Branch,!- Inlet Branch Name 1
    Supply Bypass Branch;    !- Inlet Branch Name 2

MIXER,
    CW Demand Mixer,         !- MixerName
    Cooling Demand Outlet,   !- Outlet Branch Name
    Cooling Coil Branch,     !- Inlet Branch Name 1
    Demand Bypass Branch;    !- Inlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: AIR PRIMARY LOOP ===========

AIR PRIMARY LOOP,
    Typical Terminal Reheat 1,  !- Primary Air Loop Name
    Reheat System 1 Controllers,  !- Name: Controller List
    Reheat System 1 Avail List,  !- Name: System Availability Manager List
!    SysFlowRate[],
    2.360,                   !- Primary air design volumetric flow rate {m3/s}
    Air Loop Branches,       !- Air Loop Branch List Name
    ,                        !- Air Loop Connector List Name
    Air Loop Inlet Node,     !- ReturnAir AirLoop Inlet Node
    Return Air Mixer Outlet, !- ZoneEquipGroup Outlet Node
    Zone Equipment Inlet Node,  !- SupplyAirPath ZoneEquipGroup Inlet Nodes
    Air Loop Outlet Node;    !- AirLoop Outlet Nodes


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER LIST ===========

CONTROLLER LIST,
    Reheat System 1 Controllers,  !- Name
    Controller:Simple,       !- Controller Type 1
    Main Cooling Coil Controller;  !- Controller Name 1

CONTROLLER LIST,
    OA Sys 1 Controllers,    !- Name
    CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
    OA Controller 1;         !- Controller Name 1


!-   ===========  ALL OBJECTS IN CLASS: AIR LOOP EQUIPMENT LIST ===========

AIR LOOP EQUIPMENT LIST,
    OA Sys 1 Equipment,      !- Name
```

```
    OUTSIDE AIR MIXER,       !- KEY--System Component 1
    OA Mixing Box 1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR SYSTEM ===========

OUTSIDE AIR SYSTEM,
    OA Sys 1,                !- Name
    OA Sys 1 Controllers,    !- Name: Controller List
    OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
    Reheat System 1 Avail List;  !- Name of a System Availability Manager List


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR INLET NODE LIST ===========

OUTSIDE AIR INLET NODE LIST,
    OutsideAirInletNodes;    !- 1st Node name or node list name


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR MIXER ===========

OUTSIDE AIR MIXER,
    OA Mixing Box 1,         !- Name
    Mixed Air Node 1,        !- Mixed_Air_Node
    Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
    Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
    Air Loop Inlet Node;     !- Return_Air_Stream_Node


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER LIST ===========

SYSTEM AVAILABILITY MANAGER LIST,
    Reheat System 1 Avail List,  !- Name
    SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
    Reheat System 1 Avail;   !- System Availability Manager Name 1


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER:SCHEDULED ===========

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
    Reheat System 1 Avail,   !- Name
    FanAndCoilAvailSched;    !- Schedule name


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:SCHEDULED ===========

SET POINT MANAGER:SCHEDULED,
    Chilled Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    CW Loop Temp Schedule,   !- Schedule Name
    Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Supply Air Temp Manager, !- Name
    TEMP,                    !- Control variable
    Seasonal Reset Supply Air Temp Sch,  !- Schedule Name
    Supply Air Temp Nodes;   !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:SIMPLE ===========

CONTROLLER:SIMPLE,
    Main Cooling Coil Controller,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
    Heating Coil Air Inlet Node,  !- Control_Node
    Cooling Coil Water Inlet Node,  !- Actuator_Node
    0.001,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    0.0012,                  !- Max Actuated Flow {m3/s}
```

```
    0.0;                    !- Min Actuated Flow {m3/s}


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:OUTSIDE AIR ===========

CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    NO ECONOMIZER,           !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    0.01,                    !- minimum outside air flow rate {m3/s}
!    SysFlowRate[],
    2.360,                   !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    Air Loop Inlet Node,     !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLED ZONE EQUIP CONFIGURATION ===========

CONTROLLED ZONE EQUIP CONFIGURATION,
    Zone 1,                  !- Zone Name
    Zone1Equipment,          !- List Name: Zone Equipment
    Zone1Inlets,             !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    Zone 1 Node,             !- Zone Air Node Name
    Zone 1 Outlet Node;      !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
    Zone 2,                  !- Zone Name
    Zone2Equipment,          !- List Name: Zone Equipment
    Zone2Inlets,             !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    Zone 2 Node,             !- Zone Air Node Name
    Zone 2 Outlet Node;      !- Zone Return Air Node Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE EQUIPMENT LIST ===========

ZONE EQUIPMENT LIST,
    Zone1Equipment,          !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    Zone1TermReheat,         !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1

ZONE EQUIPMENT LIST,
    Zone2Equipment,          !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    Zone2TermReheat,         !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1


!-   ===========  ALL OBJECTS IN CLASS: AIR DISTRIBUTION UNIT ===========

AIR DISTRIBUTION UNIT,
    Zone1TermReheat,         !- Air Distribution Unit Name
    Zone 1 Reheat Air Outlet Node,  !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:CONST VOLUME:REHEAT,  !- KEY--System Component Type 1
    Reheat Zone 1;           !- Component Name 1

AIR DISTRIBUTION UNIT,
    Zone2TermReheat,         !- Air Distribution Unit Name
```

```
    Zone 2 Reheat Air Outlet Node,  !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:CONST VOLUME:REHEAT,  !- KEY--System Component Type 1
    Reheat Zone 2;           !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:CONST VOLUME:REHEAT ===========

SINGLE DUCT:CONST VOLUME:REHEAT,
    Reheat Zone 1,           !- Name of System
    FanAndCoilAvailSched,    !- System Availability schedule
    Zone 1 Reheat Air Outlet Node,  !- Unit Air Outlet Node
    Zone 1 Reheat Air Inlet Node,  !- Unit Air Inlet Node
!    SysFlowRate[],
    1.144,                   !- Maximum air flow rate {m3/s}
    ,                        !- Control node
    COIL:Gas:Heating,        !- Reheat Component Object
    Reheat Coil Zone 1,      !- Name of Reheat Component
    0.0,                     !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    0.001;                   !- Convergence Tolerance

SINGLE DUCT:CONST VOLUME:REHEAT,
    Reheat Zone 2,           !- Name of System
    FanAndCoilAvailSched,    !- System Availability schedule
    Zone 2 Reheat Air Outlet Node,  !- Unit Air Outlet Node
    Zone 2 Reheat Air Inlet Node,  !- Unit Air Inlet Node
!    SysFlowRate[],
    1.216,                   !- Maximum air flow rate {m3/s}
    ,                        !- Control node
    COIL:Gas:Heating,        !- Reheat Component Object
    Reheat Coil Zone 2,      !- Name of Reheat Component
    0.0,                     !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    0.001;                   !- Convergence Tolerance


!-   ===========  ALL OBJECTS IN CLASS: ZONE CONTROL:THERMOSTATIC ===========

ZONE CONTROL:THERMOSTATIC,
    Zone 1 Thermostat,       !- Thermostat Name
    ZONE 1,                  !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Heating Cooling Setpoint,  !- Control Type #1
    Single Setpoint 1;       !- Control Type Name #1

ZONE CONTROL:THERMOSTATIC,
    Zone 2 Thermostat,       !- Thermostat Name
    ZONE 2,                  !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Heating Cooling Setpoint,  !- Control Type #1
    Single Setpoint 2;       !- Control Type Name #1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE HEATING COOLING SETPOINT ===========

SINGLE HEATING COOLING SETPOINT,
    Single Setpoint 1,       !- Name
    Zone Setpoints;          !- Setpoint Temperature SCHEDULE Name

SINGLE HEATING COOLING SETPOINT,
    Single Setpoint 2,       !- Name
    Zone Setpoints 2;        !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY AIR PATH ===========

ZONE SUPPLY AIR PATH,
    TermReheatSupplyPath,    !- Supply Air Path Name
    Zone Equipment Inlet Node,  !- Supply Air Path Inlet Node
    Zone Supply Plenum,      !- KEY--System Component Type 1
    Zone 1b Plenum,          !- Component Name 1
```

```
    Zone Supply Plenum,      !- KEY--System Component Type 2
    Zone 2b Plenum;          !- Component Name 2


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN AIR PATH ===========

ZONE RETURN AIR PATH,
    TermReheatReturnPath,    !- Return Air Path Name
    Return Air Mixer Outlet, !- Return Air Path Outlet Node
    Zone Mixer,              !- KEY--System Component Type 1
    Zone Return Air Mixer;   !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY PLENUM ===========

ZONE SUPPLY PLENUM,
    Zone 1b Plenum,          !- Zone Plenum Name
    ZONE 1b,                 !- Zone Name
    Zone 1b Node,            !- Zone Node Name
    Zone Equipment Inlet Node,  !- Inlet_Node
    Zone 1 Reheat Air Inlet Node,  !- Outlet_Node_1
    Zone 1b Plenum Outlet Node 2;  !- Outlet_Node_2

ZONE SUPPLY PLENUM,
    Zone 2b Plenum,          !- Zone Plenum Name
    ZONE 2b,                 !- Zone Name
    Zone 2b Node,            !- Zone Node Name
    Zone 1b Plenum Outlet Node 2,  !- Inlet_Node
    Zone 2 Reheat Air Inlet Node;  !- Outlet_Node_1


!-   ===========  ALL OBJECTS IN CLASS: ZONE MIXER ===========

ZONE MIXER,
    Zone Return Air Mixer,   !- Mixer Name
    Return Air Mixer Outlet, !- Outlet_Node
    Zone 1 Outlet Node,      !- Inlet_Node_1
    Zone 2 Outlet Node;      !- Inlet_Node_2


!-   ===========  ALL OBJECTS IN CLASS: PURCHASED:CHILLED WATER ===========

PURCHASED:CHILLED WATER,
    Purchased Cooling,       !- Purchased Chilled Water Name
    Purchased Cooling Inlet Node,  !- Plant_Loop_Inlet_Node
    Purchased Cooling Outlet Node,  !- Plant_Loop_Outlet_Node
    40000;                   !- Nominal Capacity {W}


!-   ===========  ALL OBJECTS IN CLASS: PUMP:VARIABLE SPEED ===========

PUMP:VARIABLE SPEED,
    Circ Pump,               !- Pump Name
    CW Supply Inlet Node,    !- Inlet_Node
    CW Pump Outlet Node,     !- Outlet_Node
    0.0012,                  !- Rated Volumetric Flow Rate {m3/s}
    300000,                  !- Rated Pump Head {Pa}
    540,                     !- Rated Power Consumption {W}
    0.87,                    !- Motor Efficiency
    0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                       !- Coefficient1 of the Part Load Performance Curve
    1,                       !- Coefficient2 of the Part Load Performance Curve
    0,                       !- Coefficient3 of the Part Load Performance Curve
    0,                       !- Coefficient4 of the Part Load Performance Curve
    0,                       !- Min Flow Rate while operating in variable flow capacity {m3/s}
    INTERMITTENT;            !- Pump Control Type


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:SIMPLECOOLING ===========

COIL:Water:SimpleCooling,
```

```
    Main Cooling Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    3200,                    !- UA of the Coil {W/K}
    0.0012,                  !- Max Water Flow Rate of Coil {m3/s}
    0.95,                    !- Leaving Relative Humidity of Coil
    Cooling Coil Water Inlet Node,  !- Coil_Water_Inlet_Node
    Cooling Coil Water Outlet Node,  !- Coil_Water_Outlet_Node
    Cooling Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Heating Coil Air Inlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: COIL:GAS:HEATING ===========

COIL:Gas:Heating,
    Reheat Coil Zone 1,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Zone 1 Reheat Air Inlet Node,  !- Coil_Air_Inlet_Node
    Zone 1 Reheat Air Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Gas:Heating,
    Reheat Coil Zone 2,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Zone 2 Reheat Air Inlet Node,  !- Coil_Air_Inlet_Node
    Zone 2 Reheat Air Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Gas:Heating,
    Main Heating Coil 1,     !- Coil Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.8,                     !- Gas Burner Efficiency of the Coil
    100000,                  !- Nominal Capacity of the Coil {W}
    Heating Coil Air Inlet Node,  !- Coil_Air_Inlet_Node
    Air Loop Outlet Node,    !- Coil_Air_Outlet_Node
    Air Loop Outlet Node;    !- Coil_Temp_Setpoint_Node


!-   ===========  ALL OBJECTS IN CLASS: FAN:SIMPLE:VARIABLEVOLUME ===========

FAN:SIMPLE:VariableVolume,
    Supply Fan 1,            !- Fan Name
    FanAndCoilAvailSched,    !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    100.0,                   !- Delta Pressure {Pa}
!    SysFlowRate[],
    2.360,                   !- Max Flow Rate {m3/s}
    0.001,                   !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.0015302446,            !- FanCoefficient 1
    0.0052080574,            !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -0.11635563,             !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    Mixed Air Node 1,        !- Fan_Inlet_Node
    Cooling Coil Air Inlet Node;  !- Fan_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: REPORT VARIABLE ===========

Report Variable,
    TC-Ceil1,                !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Ceil1,                !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency
```

```
Report Variable,
    TC-Ceil1,                !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Floor1,               !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Floor1,               !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil1,                !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil1,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil1,                !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil1,                !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor1,               !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor1,               !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor1,               !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor1,               !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor1,               !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Ceil2,                !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Ceil2,                !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency
```

```
Report Variable,
    TC-Ceil2,                !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Floor2,               !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    TC-Floor2,               !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil2,                !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil2,                !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil2,                !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Ceil1,                !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor2,               !- Key_Value
    Opaque Surface Inside Face Conduction Gain,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor2,               !- Key_Value
    Opaque Surface Inside Face Conduction Loss,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor2,               !- Key_Value
    Surface Inside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor2,               !- Key_Value
    Surface Outside Temperature,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    SP-Floor2,               !- Key_Value
    Surface Int Convection Coeff,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Sensible Cooling Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1,                  !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
```

```
    Zone 2,                  !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Air Temperature,       !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Air Loop Outlet Node,    !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Mixed Air Node 1,        !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Outlet Node,  !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 1 Reheat Air Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 2 Reheat Air Outlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 2 Reheat Air Outlet Node,  !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Zone 2 Reheat Air Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    Cooling Coil Water Inlet Node,  !- Key_Value
    System Node Temp,        !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Heating Coil Gas Consumption Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
    Total Water Cooling Coil Rate,  !- Variable_Name
    hourly;                  !- Reporting_Frequency

Report Variable,
    *,                       !- Key_Value
```

```
    Sensible Water Cooling Coil Rate,  !- Variable_Name
    hourly;                 !- Reporting_Frequency


!-   ===========  ALL OBJECTS IN CLASS: REPORT ===========

Report,
    surfaces,               !- Type_of_Report
    dxf;                    !- Name_of_Report

Report,
    Variable Dictionary;    !- Type_of_Report

Report,
    Surfaces,               !- Type_of_Report
    DETAILS;                !- Name_of_Report

Report,Surfaces,ViewFactorInfo;
```

APPENDIX B - EXAMPLE UFAD INPUTS FOR ENERGYPLUS

B.1 5ZONESUPRETPLENVSATU.IDF

Table 21 shows inputs that illustrate the use of a single supply air plenum, UFAD interior and exterior zone models, variable speed fan terminal units on the exterior zones, supply plenum convection coefficients in a five zone model.

Table 21: Inputs for 5 zone model of system with interior and exterior modes, VS fan, supply plenum convetion coefficeints

```
!-Generator IDFEditor 1.25 'current version of IDFEditor - less than 1 is a beta

!-NOTE: All comments with '!-' are ignored by the IDFEditor and are generated automatically.
!-      Use '!' comments if they need to be retained when using the IDFEditor.


!-   ===========  ALL OBJECTS IN CLASS: VERSION ===========

! 5ZoneSupRetPlenVSATU.idf
! Basic file description:  1 story building divided into 4 exterior and one interior conditioned
zones and return plenum.
!
! Highlights:              illustrates supply plenum, UFAD inputs, variable-speed fan VAV reheat
terminal units, UFAD
!                          interior zone model, UFAD exterior zone model
!
! Simulation Location/Run: CHICAGO_IL_USA TMY2-94846, 2 design days, 2 run periods,
!                          Run Control executes the run periods using the weather file
!
! Location:                Chicago, IL
!
! Design Days:             CHICAGO_IL_USA Annual Heating 99% Design Conditions DB, MaxDB= -17.3°C
!                          CHICAGO_IL_USA Annual Cooling 1% Design Conditions, MaxDB=  31.5°C
MCWB=  23.0°C
!
! Run Period (Weather File): Winter 1/14, Summer 7/7, CHICAGO_IL_USA TMY2-94846
!
! Run Control:             Zone and System sizing with weather file run control (no design days
run)
!
! Building: Single floor rectangular building 100 ft x 50 ft. 5 zones - 4 exterior, 1 interior,
zone height 8 feet.
!           Exterior zone depth is 12 feet. There is a 2 foot high return plenum. There is a 18
inch high supply plenum.
!           There are windows on all 4 facades; the south and north
!           facades have glass doors. The south facing glass is shaded by overhangs. The walls are
woodshingle
!           over plywood, R11 insulation, and gypboard. The roof is a gravel built up roof with R-
3 mineral
!           board insulation and plywood sheathing. The windows are of various single and double
pane construction
!           with 3mm and 6mm glass and either 6mm or 13mm argon or air gap.  The window to wall
ratio is approxomately
!           0.29. The south wall and door have overhangs.
!
!           The building is oriented 30 degrees east of north.
!
! Floor Area:        463.6 m2 (5000 ft2)
! Number of Stories: 1
!
! Zone Description Details:
!
!      (0,15.2,0)                      (30.5,15.2,0)
!           _____ ________           ____
!         |\     ***        ****************   /|
!         | \                                 / |
!         |  \                 (26.8,11.6,0) /  |
!         *   \_____________________________/   *
!         *    |(3.7,11.6,0)                |    *
!         *    |                            |    *
!         *    |                            |    *
!         *    |               (26.8,3.7,0)|    *
!         *    |____________________________|    *
!         *   / (3.7,3.7,0)                 \   *
!         |  /                               \  |
!         | /                                 \ |
!         |/___*****************___***_________\|
```

```
!          |       Overhang        |   |
!          |_______________________|   |   window/door = *
!                                  |___|
!
!      (0,0,0)                           (30.5,0,0)
!
! Internal gains description:     lighting is 1.5 watts/ft2, office equip is 1.0 watts/ft2. There
is 1 occupant
!                                 per 100 ft2 of floor area. The infiltration is 0.25 air changes
per hour.
!
! Interzone Surfaces:             6 interzone surfaces (see diagram)
! Internal Mass:                  None
! People:                         50
! Lights:                         7500 W
! Windows:                        4 ea.: 1) Double pane clear, 3mm glass, 13mm air gap
!                                        2) Double pane clear, 3mm glass, 13mm argon gap
!                                        3) Double pane clear, 6mm glass, 6mm air gap
!                                        4) Double pane lowE,  6mm lowE glass outside, 6mm air
gap, 6mm clear glass
!
! Doors:                          2 ea.:    Single pane grey,  3mm glass
!
! Detached Shading:               None
! Daylight:                       None
! Natural Ventilation:            None
! Compact Schedules:              One
!
! HVAC:                           VAV system with outside air economizer, hot water reheat coils,
!                                 central chilled water cooling coil. Central Plant is single hot
water
!                                 boiler, electric compression chiller with water cooled
condenser, and
!                                 a cooling tower. All equipment is autosized.
!
!                                 The following changes have been made to reflect UFAD practice.
!                                 The zone thermostat cooling setpoints have been raised to 25C
from
!                                 23.9C to reflect zone temperature change with height. The fan
static
!                                 pressure has been lowered to 250 Pa from 600 Pa. The supply air
temperature
!                                 has been raised to 17.2C from 13C. The chilled water supply
temperature
!                                 has been increased from 7.22C to 11C.
!
!                                 The interior zone is served by a normal VAV reheat air terminal
unit; the exterior
!                                 zones are served by a variable-speed fan powered VAV reheat
terminal unit!
!
!                                 The interior zone uses the UFAD interior zone room air model
!                                 The exterior zones use the UFAD exterior zone room air model
!
!                                 The inside convection coefficients for the supply air plenum
have been set to 4
!                                 to match measured and CFD results
!
! Zonal Equipment:                SINGLE DUCT:VAV:REHEAT
! Central Air Handling Equipment: Yes
! System Equipment Autosize:      Yes
! Purchased Cooling:              None
! Purchased Heating:              None
! Coils:                          COIL:Water:DetailedFlatCooling, COIL:WATER:SIMPLEHEATING
! Pumps:                          PUMP:VARIABLE SPEED
! Boilers:                        BOILER:SIMPLE
! Chillers:                       CHILLER:ELECTRIC
! Towers:                         COOLING TOWER:SINGLE SPEED
!
! Results:
! Standard Reports:               None
```

```
! Timestep or Hourly Variables:   Hourly
! Time bins Report:               None
! HTML Report:                    None
! Environmental Emissions:        None
! Utility Tariffs:                None
VERSION,
    1.4;                    !- Version Identifier


!-   ===========  ALL OBJECTS IN CLASS: BUILDING ===========

BUILDING,
    Building,               !- Building Name
    30.,                    !- North Axis {deg}
    City,                   !- Terrain
    0.04,                   !- Loads Convergence Tolerance Value {W}
    0.4,                    !- Temperature Convergence Tolerance Value {deltaC}
    FullExterior,           !- Solar Distribution
    25;                     !- Maximum Number of Warmup Days


!-   ===========  ALL OBJECTS IN CLASS: TIMESTEP IN HOUR ===========

TIMESTEP IN HOUR,
    4;                      !- Time Step in Hour


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM CONVERGENCE LIMITS ===========

System Convergence Limits,
    1;                      !- Minimum System Time Step {minutes}


!-   ===========  ALL OBJECTS IN CLASS: INSIDE CONVECTION ALGORITHM ===========

INSIDE CONVECTION ALGORITHM,
    Detailed;               !- Algorithm


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE CONVECTION ALGORITHM ===========

OUTSIDE CONVECTION ALGORITHM,
    Simple;                 !- Algorithm


!-   ===========  ALL OBJECTS IN CLASS: SOLUTION ALGORITHM ===========

SOLUTION ALGORITHM,
    CTF;                    !- SolutionAlgo


!-   ===========  ALL OBJECTS IN CLASS: ZONE VOLUME CAPACITANCE MULTIPLIER ===========

ZONE VOLUME CAPACITANCE MULTIPLIER,
    1;                      !- Capacitance Multiplier


!-   ===========  ALL OBJECTS IN CLASS: RUN CONTROL ===========

RUN CONTROL,
    Yes,                    !- Do the zone sizing calculation
    Yes,                    !- Do the system sizing calculation
    No,                     !- Do the plant sizing calculation
    No,                     !- Do the design day simulations
    Yes;                    !- Do the weather file simulation


!-   ===========  ALL OBJECTS IN CLASS: RUNPERIOD ===========

RunPeriod,
    1,                      !- Begin Month
```

```
    14,                       !- Begin Day Of Month
    1,                        !- End Month
    14,                       !- End Day Of Month
    Tuesday,                  !- Day Of Week For Start Day
    Yes,                      !- Use WeatherFile Holidays/Special Days
    Yes,                      !- Use WeatherFile DaylightSavingPeriod
    No,                       !- Apply Weekend Holiday Rule
    Yes,                      !- Use WeatherFile Rain Indicators
    Yes;                      !- Use WeatherFile Snow Indicators

RunPeriod,
    7,                        !- Begin Month
    7,                        !- Begin Day Of Month
    7,                        !- End Month
    7,                        !- End Day Of Month
    Tuesday,                  !- Day Of Week For Start Day
    Yes,                      !- Use WeatherFile Holidays/Special Days
    Yes,                      !- Use WeatherFile DaylightSavingPeriod
    No,                       !- Apply Weekend Holiday Rule
    Yes,                      !- Use WeatherFile Rain Indicators
    Yes;                      !- Use WeatherFile Snow Indicators


!-   ===========  ALL OBJECTS IN CLASS: LOCATION ===========

Location,
    CHICAGO_IL_USA TMY2-94846,  !- LocationName
    41.78,                    !- Latitude {deg}
    -87.75,                   !- Longitude {deg}
    -6.00,                    !- TimeZone {hr}
    190.00;                   !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: DESIGNDAY ===========

! CHICAGO_IL_USA Annual Heating 99% Design Conditions DB, MaxDB= -17.3°C
DesignDay,
    CHICAGO_IL_USA Annual Heating 99% Design Conditions DB,  !- DesignDayName
    -17.3,                    !- Maximum Dry-Bulb Temperature {C}
    0.0,                      !- Daily Temperature Range {deltaC}
    -17.3,                    !- Humidity Indicating Conditions at Max Dry-Bulb
    99063.,                   !- Barometric Pressure {Pa}
    4.9,                      !- Wind Speed {m/s}
    270,                      !- Wind Direction {deg}
    0.0,                      !- Sky Clearness
    0,                        !- Rain Indicator
    0,                        !- Snow Indicator
    21,                       !- Day Of Month
    1,                        !- Month
    WinterDesignDay,          !- Day Type
    0,                        !- Daylight Saving Time Indicator
    Wet-Bulb;                 !- Humidity Indicating Type

! CHICAGO_IL_USA Annual Cooling 1% Design Conditions, MaxDB=  31.5°C MCWB=  23.0°C
DesignDay,
    CHICAGO_IL_USA Annual Cooling 1% Design Conditions DB/MCWB,  !- DesignDayName
    31.5,                     !- Maximum Dry-Bulb Temperature {C}
    10.7,                     !- Daily Temperature Range {deltaC}
    23.0,                     !- Humidity Indicating Conditions at Max Dry-Bulb
    99063.,                   !- Barometric Pressure {Pa}
    5.3,                      !- Wind Speed {m/s}
    230,                      !- Wind Direction {deg}
    1.0,                      !- Sky Clearness
    0,                        !- Rain Indicator
    0,                        !- Snow Indicator
    21,                       !- Day Of Month
    7,                        !- Month
    SummerDesignDay,          !- Day Type
    0,                        !- Daylight Saving Time Indicator
    Wet-Bulb;                 !- Humidity Indicating Type
```

```
!-   ===========  ALL OBJECTS IN CLASS: GROUNDTEMPERATURES ===========

GroundTemperatures,
    20.03,                   !- January Ground Temperature {C}
    20.03,                   !- February Ground Temperature {C}
    20.13,                   !- March Ground Temperature {C}
    20.30,                   !- April Ground Temperature {C}
    20.43,                   !- May Ground Temperature {C}
    20.52,                   !- June Ground Temperature {C}
    20.62,                   !- July Ground Temperature {C}
    20.77,                   !- August Ground Temperature {C}
    20.78,                   !- September Ground Temperature {C}
    20.55,                   !- October Ground Temperature {C}
    20.44,                   !- November Ground Temperature {C}
    20.20;                   !- December Ground Temperature {C}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR ===========

MATERIAL:REGULAR,
    WD10,                    !- Name
    MediumSmooth,            !- Roughness
    0.667,                   !- Thickness {m}
    0.115,                   !- Conductivity {W/m-K}
    513,                     !- Density {kg/m3}
    1381,                    !- Specific Heat {J/kg-K}
    0.9,                     !- Absorptance:Thermal
    0.78,                    !- Absorptance:Solar
    0.78;                    !- Absorptance:Visible

MATERIAL:REGULAR,
    RG01,                    !- Name
    Rough,                   !- Roughness
    1.2700000E-02,           !- Thickness {m}
    1.442000,                !- Conductivity {W/m-K}
    881.0000,                !- Density {kg/m3}
    1674.000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.6500000,               !- Absorptance:Solar
    0.6500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    BR01,                    !- Name
    VeryRough,               !- Roughness
    9.4999997E-03,           !- Thickness {m}
    0.1620000,               !- Conductivity {W/m-K}
    1121.000,                !- Density {kg/m3}
    1464.000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.7000000,               !- Absorptance:Solar
    0.7000000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    IN46,                    !- Name
    VeryRough,               !- Roughness
    7.6200001E-02,           !- Thickness {m}
    2.3000000E-02,           !- Conductivity {W/m-K}
    24.00000,                !- Density {kg/m3}
    1590.000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.5000000,               !- Absorptance:Solar
    0.5000000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    WD01,                    !- Name
    MediumSmooth,            !- Roughness
    1.9099999E-02,           !- Thickness {m}
    0.1150000,               !- Conductivity {W/m-K}
    513.0000,                !- Density {kg/m3}
    1381.000,                !- Specific Heat {J/kg-K}
```

```
    0.9000000,               !- Absorptance:Thermal
    0.7800000,               !- Absorptance:Solar
    0.7800000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    PW03,                    !- Name
    MediumSmooth,            !- Roughness
    1.2700000E-02,           !- Thickness {m}
    0.1150000,               !- Conductivity {W/m-K}
    545.0000,                !- Density {kg/m3}
    1213.000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.7800000,               !- Absorptance:Solar
    0.7800000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    IN02,                    !- Name
    Rough,                   !- Roughness
    9.0099998E-02,           !- Thickness {m}
    4.3000001E-02,           !- Conductivity {W/m-K}
    10.00000,                !- Density {kg/m3}
    837.0000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    GP01,                    !- Name
    MediumSmooth,            !- Roughness
    1.2700000E-02,           !- Thickness {m}
    0.1600000,               !- Conductivity {W/m-K}
    801.0000,                !- Density {kg/m3}
    837.0000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    GP02,                    !- Name
    MediumSmooth,            !- Roughness
    1.5900001E-02,           !- Thickness {m}
    0.1600000,               !- Conductivity {W/m-K}
    801.0000,                !- Density {kg/m3}
    837.0000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
    CC03,                    !- Name
    MediumRough,             !- Roughness
    0.1016000,               !- Thickness {m}
    1.310000,                !- Conductivity {W/m-K}
    2243.000,                !- Density {kg/m3}
    837.0000,                !- Specific Heat {J/kg-K}
    0.9000000,               !- Absorptance:Thermal
    0.6500000,               !- Absorptance:Solar
    0.6500000;               !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:REGULAR-R ===========

MATERIAL:REGULAR-R,
    CP01,                    !- Name
    Rough,                   !- Roughness
    0.3670000,               !- Thermal Resistance {m2-K/W}
    0.9000000,               !- Absorptance:Thermal
    0.7500000,               !- Absorptance:Solar
    0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
```

```
    MAT-SB-U,                !- Name
    Rough,                   !- Roughness
    0.117406666,             !- Thermal Resistance {m2-K/W}
    0.65,                    !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    MAT-CLNG-1,              !- Name
    Rough,                   !- Roughness
    0.652259290,             !- Thermal Resistance {m2-K/W}
    0.65,                    !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
    MAT-FLOOR-1,             !- Name
    Rough,                   !- Roughness
    3.522199631,             !- Thermal Resistance {m2-K/W}
    0.65,                    !- Absorptance:Thermal
    0.65,                    !- Absorptance:Solar
    0.65;                    !- Absorptance:Visible


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:AIR ===========

MATERIAL:AIR,
    AL21,                    !- Name
    0.1570000;               !- Thermal Resistance {m2-K/W}

MATERIAL:AIR,
    AL23,                    !- Name
    0.1530000;               !- Thermal Resistance {m2-K/W}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGLASS ===========

MATERIAL:WINDOWGLASS,
    CLEAR 3MM,               !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    0.003,                   !- Thickness {m}
    0.837,                   !- Solar Transmittance at Normal Incidence
    0.075,                   !- Solar Reflectance at Normal Incidence: Front Side
    0.075,                   !- Solar Reflectance at Normal Incidence: Back Side
    0.898,                   !- Visible Transmittance at Normal Incidence
    0.081,                   !- Visible Reflectance at Normal Incidence: Front Side
    0.081,                   !- Visible Reflectance at Normal Incidence: Back Side
    0.0,                     !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
    GREY 3MM,                !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    0.003,                   !- Thickness {m}
    0.626,                   !- Solar Transmittance at Normal Incidence
    0.061,                   !- Solar Reflectance at Normal Incidence: Front Side
    0.061,                   !- Solar Reflectance at Normal Incidence: Back Side
    0.611,                   !- Visible Transmittance at Normal Incidence
    0.061,                   !- Visible Reflectance at Normal Incidence: Front Side
    0.061,                   !- Visible Reflectance at Normal Incidence: Back Side
    0.0,                     !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
    CLEAR 6MM,               !- Name
```

```
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    0.006,                   !- Thickness {m}
    0.775,                   !- Solar Transmittance at Normal Incidence
    0.071,                   !- Solar Reflectance at Normal Incidence: Front Side
    0.071,                   !- Solar Reflectance at Normal Incidence: Back Side
    0.881,                   !- Visible Transmittance at Normal Incidence
    0.080,                   !- Visible Reflectance at Normal Incidence: Front Side
    0.080,                   !- Visible Reflectance at Normal Incidence: Back Side
    0.0,                     !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.84,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
    LoE CLEAR 6MM,           !- Name
    SpectralAverage,         !- Optical Data Type
    ,                        !- Name of Window Glass Spectral Data Set
    0.006,                   !- Thickness {m}
    0.600,                   !- Solar Transmittance at Normal Incidence
    0.170,                   !- Solar Reflectance at Normal Incidence: Front Side
    0.220,                   !- Solar Reflectance at Normal Incidence: Back Side
    0.840,                   !- Visible Transmittance at Normal Incidence
    0.055,                   !- Visible Reflectance at Normal Incidence: Front Side
    0.078,                   !- Visible Reflectance at Normal Incidence: Back Side
    0.0,                     !- IR Transmittance at Normal Incidence
    0.84,                    !- IR Hemispherical Emissivity: Front Side
    0.10,                    !- IR Hemispherical Emissivity: Back Side
    0.9;                     !- Conductivity {W/m-K}


!-   ===========  ALL OBJECTS IN CLASS: MATERIAL:WINDOWGAS ===========

MATERIAL:WINDOWGAS,
    AIR 6MM,                 !- Name
    Air,                     !- Gas Type
    0.0063;                  !- Thickness {m}

MATERIAL:WINDOWGAS,
    AIR 13MM,                !- Name
    Air,                     !- Gas Type
    0.0127;                  !- Thickness {m}

MATERIAL:WINDOWGAS,
    ARGON 13MM,              !- Name
    Argon,                   !- Gas Type
    0.0127;                  !- Thickness {m}


!-   ===========  ALL OBJECTS IN CLASS: CONSTRUCTION ===========

CONSTRUCTION,
    ROOF-1,                  !- Name
    RG01,                    !- Outside Layer
    BR01,                    !- Layer #2
    IN46,                    !- Layer #3
    WD01;                    !- Layer #4

CONSTRUCTION,
    WALL-1,                  !- Name
    WD01,                    !- Outside Layer
    PW03,                    !- Layer #2
    IN02,                    !- Layer #3
    GP01;                    !- Layer #4

CONSTRUCTION,
    CLNG-1,                  !- Name
    MAT-CLNG-1;              !- Outside Layer

CONSTRUCTION,
    SB-U,                    !- Name
```

```
    MAT-SB-U;               !- Outside Layer

CONSTRUCTION,
    FLOOR-1,                !- Name
    MAT-FLOOR-1;            !- Outside Layer

CONSTRUCTION,
    FLOOR-SLAB-1,           !- Name
    CC03;                   !- Outside Layer

CONSTRUCTION,
    INT-WALL-1,             !- Name
    GP02,                   !- Outside Layer
    AL21,                   !- Layer #2
    GP02;                   !- Layer #3

CONSTRUCTION,
    Dbl Clr 3mm/13mm Air,   !- Name
    CLEAR 3MM,              !- Outside Layer
    AIR 13MM,               !- Layer #2
    CLEAR 3MM;              !- Layer #3

CONSTRUCTION,
    Dbl Clr 3mm/13mm Arg,   !- Name
    CLEAR 3MM,              !- Outside Layer
    ARGON 13MM,             !- Layer #2
    CLEAR 3MM;              !- Layer #3

CONSTRUCTION,
    Sgl Grey 3mm,           !- Name
    GREY 3MM;               !- Outside Layer

CONSTRUCTION,
    Dbl Clr 6mm/6mm Air,    !- Name
    CLEAR 6MM,              !- Outside Layer
    AIR 6MM,                !- Layer #2
    CLEAR 6MM;              !- Layer #3

CONSTRUCTION,
    Dbl LoE (e2=.1) Clr 6mm/6mm Air,  !- Name
    LoE CLEAR 6MM,          !- Outside Layer
    AIR 6MM,                !- Layer #2
    CLEAR 6MM;              !- Layer #3


!-   ===========  ALL OBJECTS IN CLASS: ZONE ===========

ZONE,
    PLENUM-1,               !- Zone Name
    0,                      !- Relative North (to building) {deg}
    0,                      !- X Origin {m}
    0,                      !- Y Origin {m}
    0,                      !- Z Origin {m}
    1,                      !- Type
    1,                      !- Multiplier
    0.609600067,            !- Ceiling Height {m}
    283.2;                  !- Volume {m3}

ZONE,
    SPACE1-1,               !- Zone Name
    0,                      !- Relative North (to building) {deg}
    0,                      !- X Origin {m}
    0,                      !- Y Origin {m}
    0,                      !- Z Origin {m}
    1,                      !- Type
    1,                      !- Multiplier
    2.438400269,            !- Ceiling Height {m}
    239.247360229;          !- Volume {m3}

ZONE,
    SPACE2-1,               !- Zone Name
```

```
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    2.438400269,              !- Ceiling Height {m}
    103.311355591;            !- Volume {m3}

ZONE,
    SPACE3-1,                 !- Zone Name
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    2.438400269,              !- Ceiling Height {m}
    239.247360229;            !- Volume {m3}

ZONE,
    SPACE4-1,                 !- Zone Name
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    2.438400269,              !- Ceiling Height {m}
    103.311355591;            !- Volume {m3}

ZONE,
    SPACE5-1,                 !- Zone Name
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    2.438400269,              !- Ceiling Height {m}
    447.682556152;            !- Volume {m3}

ZONE,
    Sup-PLENUM-1,             !- Zone Name
    0,                        !- Relative North (to building) {deg}
    0,                        !- X Origin {m}
    0,                        !- Y Origin {m}
    0,                        !- Z Origin {m}
    1,                        !- Type
    1,                        !- Multiplier
    0.45,                     !- Ceiling Height {m}
    208.6;                    !- Volume {m3}


!-   ===========  ALL OBJECTS IN CLASS: SURFACEGEOMETRY ===========

SurfaceGeometry,
    UpperLeftCorner,          !- SurfaceStartingPosition
    CounterClockWise,         !- VertexEntry
    relative;                 !- CoordinateSystem


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER ===========

Surface:HeatTransfer,
    WALL-1PF,                 !- User Supplied Surface Name
    WALL,                     !- Surface Type
    WALL-1,                   !- Construction Name of the Surface
    PLENUM-1,                 !- InsideFaceEnvironment
    ExteriorEnvironment,      !- OutsideFaceEnvironment
    ,                         !- OutsideFaceEnvironment Object
```

```
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    0.0,                     !- Vertex 1 Y-coordinate {m}
    3.0,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    0.0,                     !- Vertex 4 Y-coordinate {m}
    3.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1PR,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    PLENUM-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    0.0,                     !- Vertex 1 Y-coordinate {m}
    3.0,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    3.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1PB,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    PLENUM-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    3.0,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    0.0,                     !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    3.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1PL,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
```

```
    WALL-1,                  !- Construction Name of the Surface
    PLENUM-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    3.0,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    0.0,                     !- Vertex 4 X-coordinate {m}
    0.0,                     !- Vertex 4 Y-coordinate {m}
    3.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    TOP-1,                   !- User Supplied Surface Name
    ROOF,                    !- Surface Type
    ROOF-1,                  !- Construction Name of the Surface
    PLENUM-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.00000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    3.0,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    3.0,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    3.0,                     !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    3.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C1-1P,                   !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    PLENUM-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    C1-1,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    3.7,                     !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    3.7,                     !- Vertex 4 X-coordinate {m}
    3.7,                     !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}
```

```
Surface:HeatTransfer,
    C2-1P,                  !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    PLENUM-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C2-1,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    30.5,                   !- Vertex 2 X-coordinate {m}
    15.2,                   !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    30.5,                   !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    26.8,                   !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C3-1P,                  !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    PLENUM-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C3-1,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    11.6,                   !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    15.2,                   !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    30.5,                   !- Vertex 4 X-coordinate {m}
    15.2,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C4-1P,                  !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    PLENUM-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C4-1,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    15.2,                   !- Vertex 3 Y-coordinate {m}
```

```
    2.4,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C5-1P,                  !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    PLENUM-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C5-1,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    26.8,                   !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    3.7,                    !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    FRONT-1,                !- User Supplied Surface Name
    WALL,                   !- Surface Type
    WALL-1,                 !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    ExteriorEnvironment,    !- OutsideFaceEnvironment
    ,                       !- OutsideFaceEnvironment Object
    SunExposed,             !- Sun Exposure
    WindExposed,            !- Wind Exposure
    0.50000,                !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                    !- Vertex 1 X-coordinate {m}
    0.0,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    30.5,                   !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    30.5,                   !- Vertex 4 X-coordinate {m}
    0.0,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C1-1,                   !- User Supplied Surface Name
    CEILING,                !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C1-1P,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
```

```
    0.0,                    !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    30.5,                   !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    26.8,                   !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F1-1,                   !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    F1-1S,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    0.0,                    !- Vertex 1 Z-coordinate {m}
    30.5,                   !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    0.0;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB12,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB21,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                   !- Vertex 1 X-coordinate {m}
    0.0,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    30.5,                   !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    26.8,                   !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    26.8,                   !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB14,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB41,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
```

```
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    0.0,                    !- Vertex 4 X-coordinate {m}
    0.0,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB15,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE1-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB51,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    26.8,                   !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    3.7,                    !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    RIGHT-1,                !- User Supplied Surface Name
    WALL,                   !- Surface Type
    WALL-1,                 !- Construction Name of the Surface
    SPACE2-1,               !- InsideFaceEnvironment
    ExteriorEnvironment,    !- OutsideFaceEnvironment
    ,                       !- OutsideFaceEnvironment Object
    SunExposed,             !- Sun Exposure
    WindExposed,            !- Wind Exposure
    0.50000,                !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                   !- Vertex 1 X-coordinate {m}
    0.0,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    30.5,                   !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    30.5,                   !- Vertex 3 X-coordinate {m}
    15.2,                   !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    30.5,                   !- Vertex 4 X-coordinate {m}
    15.2,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C2-1,                   !- User Supplied Surface Name
    CEILING,                !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE2-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C2-1P,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
```

```
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    3.7,                     !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F2-1,                    !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    SPACE2-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    F2-1S,                   !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    0.0,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    3.7,                     !- Vertex 4 Y-coordinate {m}
    0.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB21,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE2-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB12,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    3.7,                     !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    26.8,                    !- Vertex 2 X-coordinate {m}
    3.7,                     !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    0.0,                     !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB23,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
```

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    SPACE2-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB32,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    26.8,                    !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB25,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE2-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB52,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    26.8,                    !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    26.8,                    !- Vertex 3 X-coordinate {m}
    3.7,                     !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    3.7,                     !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    BACK-1,                  !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    0.0,                     !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}
```

```
Surface:HeatTransfer,
    C3-1,                    !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    C3-1P,                   !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    2.4,                     !- Vertex 2 Z-coordinate {m}
    3.7,                     !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    2.4,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F3-1,                    !- User Supplied Surface Name
    FLOOR,                   !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    F3-1S,                   !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    0.0,                     !- Vertex 1 Z-coordinate {m}
    3.7,                     !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    0.0;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB32,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB23,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    26.8,                    !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
```

```
    30.5,                    !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB34,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB43,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    3.7,                     !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    3.7,                     !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB35,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE3-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB53,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                     !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    3.7,                     !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    26.8,                    !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    LEFT-1,                  !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    SPACE4-1,                !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
```

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    0.0,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    0.0,                    !- Vertex 4 X-coordinate {m}
    0.0,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C4-1,                   !- User Supplied Surface Name
    CEILING,                !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE4-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C4-1P,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    15.2,                   !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F4-1,                   !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE4-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    F4-1S,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    0.0,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    15.2,                   !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    0.0;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB41,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE4-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB14,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                    !- Vertex 1 X-coordinate {m}
```

```
    0.0,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    3.7,                    !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB43,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE4-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB34,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    11.6,                   !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    15.2,                   !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    0.0,                    !- Vertex 4 X-coordinate {m}
    15.2,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB45,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE4-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB54,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    3.7,                    !- Vertex 3 X-coordinate {m}
    11.6,                   !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    C5-1,                   !- User Supplied Surface Name
    CEILING,                !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE5-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    C5-1P,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
```

```
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    2.4,                    !- Vertex 2 Z-coordinate {m}
    26.8,                   !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    2.4,                    !- Vertex 3 Z-coordinate {m}
    26.8,                   !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F5-1,                   !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    SPACE5-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    F5-1S,                  !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                   !- Vertex 1 X-coordinate {m}
    11.6,                   !- Vertex 1 Y-coordinate {m}
    0.0,                    !- Vertex 1 Z-coordinate {m}
    26.8,                   !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    3.7,                    !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    3.7,                    !- Vertex 4 X-coordinate {m}
    11.6,                   !- Vertex 4 Y-coordinate {m}
    0.0;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB51,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE5-1,               !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    SB15,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    2.4,                    !- Vertex 1 Z-coordinate {m}
    3.7,                    !- Vertex 2 X-coordinate {m}
    3.7,                    !- Vertex 2 Y-coordinate {m}
    0.0,                    !- Vertex 2 Z-coordinate {m}
    26.8,                   !- Vertex 3 X-coordinate {m}
    3.7,                    !- Vertex 3 Y-coordinate {m}
    0.0,                    !- Vertex 3 Z-coordinate {m}
    26.8,                   !- Vertex 4 X-coordinate {m}
    3.7,                    !- Vertex 4 Y-coordinate {m}
    2.4;                    !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB52,                   !- User Supplied Surface Name
    WALL,                   !- Surface Type
    INT-WALL-1,             !- Construction Name of the Surface
    SPACE5-1,               !- InsideFaceEnvironment
```

```
    OtherZone,               !- OutsideFaceEnvironment
    SB25,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    3.7,                     !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    26.8,                    !- Vertex 2 X-coordinate {m}
    3.7,                     !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    26.8,                    !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB53,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE5-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB35,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    26.8,                    !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    3.7,                     !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    3.7,                     !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    SB54,                    !- User Supplied Surface Name
    WALL,                    !- Surface Type
    INT-WALL-1,              !- Construction Name of the Surface
    SPACE5-1,                !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    SB45,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                     !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
    2.4,                     !- Vertex 1 Z-coordinate {m}
    3.7,                     !- Vertex 2 X-coordinate {m}
    11.6,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    3.7,                     !- Vertex 3 X-coordinate {m}
    3.7,                     !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    3.7,                     !- Vertex 4 X-coordinate {m}
    3.7,                     !- Vertex 4 Y-coordinate {m}
    2.4;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
```

```
    WALL-1SF,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    0.0,                     !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    -0.45,                   !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    -0.45,                   !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    0.0,                     !- Vertex 4 Y-coordinate {m}
    0;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1SR,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    0.0,                     !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    -0.45,                   !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    -0.45,                   !- Vertex 3 Z-coordinate {m}
    30.5,                    !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    0;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1SB,                !- User Supplied Surface Name
    WALL,                    !- Surface Type
    WALL-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    ExteriorEnvironment,     !- OutsideFaceEnvironment
    ,                        !- OutsideFaceEnvironment Object
    SunExposed,              !- Sun Exposure
    WindExposed,             !- Wind Exposure
    0.50000,                 !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    -0.45,                   !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    -0.45,                   !- Vertex 3 Z-coordinate {m}
    0.0,                     !- Vertex 4 X-coordinate {m}
```

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    15.2,                   !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    WALL-1SL,               !- User Supplied Surface Name
    WALL,                   !- Surface Type
    WALL-1,                 !- Construction Name of the Surface
    Sup-PLENUM-1,           !- InsideFaceEnvironment
    ExteriorEnvironment,    !- OutsideFaceEnvironment
    ,                       !- OutsideFaceEnvironment Object
    SunExposed,             !- Sun Exposure
    WindExposed,            !- Wind Exposure
    0.50000,                !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                    !- Vertex 1 X-coordinate {m}
    15.2,                   !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    15.2,                   !- Vertex 2 Y-coordinate {m}
    -0.45,                  !- Vertex 2 Z-coordinate {m}
    0.0,                    !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    -0.45,                  !- Vertex 3 Z-coordinate {m}
    0.0,                    !- Vertex 4 X-coordinate {m}
    0.0,                    !- Vertex 4 Y-coordinate {m}
    0;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    BOTTOM-1,               !- User Supplied Surface Name
    FLOOR,                  !- Surface Type
    FLOOR-SLAB-1,           !- Construction Name of the Surface
    Sup-PLENUM-1,           !- InsideFaceEnvironment
    Ground,                 !- OutsideFaceEnvironment
    ,                       !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.00000,                !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                   !- Vertex 1 X-coordinate {m}
    15.2,                   !- Vertex 1 Y-coordinate {m}
    -0.45,                  !- Vertex 1 Z-coordinate {m}
    30.5,                   !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    -0.45,                  !- Vertex 2 Z-coordinate {m}
    0,                      !- Vertex 3 X-coordinate {m}
    0.0,                    !- Vertex 3 Y-coordinate {m}
    -0.45,                  !- Vertex 3 Z-coordinate {m}
    0,                      !- Vertex 4 X-coordinate {m}
    15.2,                   !- Vertex 4 Y-coordinate {m}
    -0.45;                  !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F1-1S,                  !- User Supplied Surface Name
    CEILING,                !- Surface Type
    CLNG-1,                 !- Construction Name of the Surface
    Sup-PLENUM-1,           !- InsideFaceEnvironment
    OtherZone,              !- OutsideFaceEnvironment
    F1-1,                   !- OutsideFaceEnvironment Object
    NoSun,                  !- Sun Exposure
    NoWind,                 !- Wind Exposure
    0.0,                    !- View Factor to Ground
    4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                    !- Vertex 1 X-coordinate {m}
    3.7,                    !- Vertex 1 Y-coordinate {m}
    0,                      !- Vertex 1 Z-coordinate {m}
    0.0,                    !- Vertex 2 X-coordinate {m}
    0.0,                    !- Vertex 2 Y-coordinate {m}
    0,                      !- Vertex 2 Z-coordinate {m}
```

```
    30.5,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    3.7,                     !- Vertex 4 Y-coordinate {m}
    0;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F2-1S,                   !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    F2-1,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    26.8,                    !- Vertex 1 X-coordinate {m}
    3.7,                     !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    30.5,                    !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    30.5,                    !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    0;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F3-1S,                   !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    F3-1,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                    !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    0,                       !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0,                       !- Vertex 2 Z-coordinate {m}
    3.7,                     !- Vertex 3 X-coordinate {m}
    11.6,                    !- Vertex 3 Y-coordinate {m}
    0,                       !- Vertex 3 Z-coordinate {m}
    26.8,                    !- Vertex 4 X-coordinate {m}
    11.6,                    !- Vertex 4 Y-coordinate {m}
    0;                       !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F4-1S,                   !- User Supplied Surface Name
    CEILING,                 !- Surface Type
    CLNG-1,                  !- Construction Name of the Surface
    Sup-PLENUM-1,            !- InsideFaceEnvironment
    OtherZone,               !- OutsideFaceEnvironment
    F4-1,                    !- OutsideFaceEnvironment Object
    NoSun,                   !- Sun Exposure
    NoWind,                  !- Wind Exposure
    0.0,                     !- View Factor to Ground
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                     !- Vertex 1 X-coordinate {m}
    11.6,                    !- Vertex 1 Y-coordinate {m}
```

```
    0,                        !- Vertex 1 Z-coordinate {m}
    0.0,                      !- Vertex 2 X-coordinate {m}
    15.2,                     !- Vertex 2 Y-coordinate {m}
    0,                        !- Vertex 2 Z-coordinate {m}
    0.0,                      !- Vertex 3 X-coordinate {m}
    0.0,                      !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    3.7,                      !- Vertex 4 X-coordinate {m}
    3.7,                      !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer,
    F5-1S,                    !- User Supplied Surface Name
    CEILING,                  !- Surface Type
    CLNG-1,                   !- Construction Name of the Surface
    Sup-PLENUM-1,             !- InsideFaceEnvironment
    OtherZone,                !- OutsideFaceEnvironment
    F5-1,                     !- OutsideFaceEnvironment Object
    NoSun,                    !- Sun Exposure
    NoWind,                   !- Wind Exposure
    0.0,                      !- View Factor to Ground
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.7,                      !- Vertex 1 X-coordinate {m}
    11.6,                     !- Vertex 1 Y-coordinate {m}
    0,                        !- Vertex 1 Z-coordinate {m}
    3.7,                      !- Vertex 2 X-coordinate {m}
    3.7,                      !- Vertex 2 Y-coordinate {m}
    0,                        !- Vertex 2 Z-coordinate {m}
    26.8,                     !- Vertex 3 X-coordinate {m}
    3.7,                      !- Vertex 3 Y-coordinate {m}
    0,                        !- Vertex 3 Z-coordinate {m}
    26.8,                     !- Vertex 4 X-coordinate {m}
    11.6,                     !- Vertex 4 Y-coordinate {m}
    0;                        !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:HEATTRANSFER:SUB ===========

Surface:HeatTransfer:Sub,
    WF-1,                     !- User Supplied Surface Name
    WINDOW,                   !- Surface Type
    Dbl Clr 3mm/13mm Air,     !- Construction Name of the Surface
    FRONT-1,                  !- Base Surface Name
    ,                         !- OutsideFaceEnvironment Object
    0.50000,                  !- View Factor to Ground
    ,                         !- Name of shading control
    ,                         !- WindowFrameAndDivider Name
    1,                        !- Multiplier
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    3.0,                      !- Vertex 1 X-coordinate {m}
    0.0,                      !- Vertex 1 Y-coordinate {m}
    2.1,                      !- Vertex 1 Z-coordinate {m}
    3.0,                      !- Vertex 2 X-coordinate {m}
    0.0,                      !- Vertex 2 Y-coordinate {m}
    0.9,                      !- Vertex 2 Z-coordinate {m}
    16.8,                     !- Vertex 3 X-coordinate {m}
    0.0,                      !- Vertex 3 Y-coordinate {m}
    0.9,                      !- Vertex 3 Z-coordinate {m}
    16.8,                     !- Vertex 4 X-coordinate {m}
    0.0,                      !- Vertex 4 Y-coordinate {m}
    2.1;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer:Sub,
    DF-1,                     !- User Supplied Surface Name
    WINDOW,                   !- Surface Type
    Sgl Grey 3mm,             !- Construction Name of the Surface
    FRONT-1,                  !- Base Surface Name
    ,                         !- OutsideFaceEnvironment Object
    0.50000,                  !- View Factor to Ground
```

```
    ,                         !- Name of shading control
    ,                         !- WindowFrameAndDivider Name
    1,                        !- Multiplier
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    21.3,                     !- Vertex 1 X-coordinate {m}
    0.0,                      !- Vertex 1 Y-coordinate {m}
    2.4,                      !- Vertex 1 Z-coordinate {m}
    21.3,                     !- Vertex 2 X-coordinate {m}
    0.0,                      !- Vertex 2 Y-coordinate {m}
    0.0,                      !- Vertex 2 Z-coordinate {m}
    23.8,                     !- Vertex 3 X-coordinate {m}
    0.0,                      !- Vertex 3 Y-coordinate {m}
    0.0,                      !- Vertex 3 Z-coordinate {m}
    23.8,                     !- Vertex 4 X-coordinate {m}
    0.0,                      !- Vertex 4 Y-coordinate {m}
    2.4;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer:Sub,
    WR-1,                     !- User Supplied Surface Name
    WINDOW,                   !- Surface Type
    Dbl Clr 3mm/13mm Air,     !- Construction Name of the Surface
    RIGHT-1,                  !- Base Surface Name
    ,                         !- OutsideFaceEnvironment Object
    0.50000,                  !- View Factor to Ground
    ,                         !- Name of shading control
    ,                         !- WindowFrameAndDivider Name
    1,                        !- Multiplier
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    30.5,                     !- Vertex 1 X-coordinate {m}
    3.8,                      !- Vertex 1 Y-coordinate {m}
    2.1,                      !- Vertex 1 Z-coordinate {m}
    30.5,                     !- Vertex 2 X-coordinate {m}
    3.8,                      !- Vertex 2 Y-coordinate {m}
    0.9,                      !- Vertex 2 Z-coordinate {m}
    30.5,                     !- Vertex 3 X-coordinate {m}
    11.4,                     !- Vertex 3 Y-coordinate {m}
    0.9,                      !- Vertex 3 Z-coordinate {m}
    30.5,                     !- Vertex 4 X-coordinate {m}
    11.4,                     !- Vertex 4 Y-coordinate {m}
    2.1;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer:Sub,
    WB-1,                     !- User Supplied Surface Name
    WINDOW,                   !- Surface Type
    Dbl Clr 3mm/13mm Air,     !- Construction Name of the Surface
    BACK-1,                   !- Base Surface Name
    ,                         !- OutsideFaceEnvironment Object
    0.50000,                  !- View Factor to Ground
    ,                         !- Name of shading control
    ,                         !- WindowFrameAndDivider Name
    1,                        !- Multiplier
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    27.4,                     !- Vertex 1 X-coordinate {m}
    15.2,                     !- Vertex 1 Y-coordinate {m}
    2.1,                      !- Vertex 1 Z-coordinate {m}
    27.4,                     !- Vertex 2 X-coordinate {m}
    15.2,                     !- Vertex 2 Y-coordinate {m}
    0.9,                      !- Vertex 2 Z-coordinate {m}
    13.7,                     !- Vertex 3 X-coordinate {m}
    15.2,                     !- Vertex 3 Y-coordinate {m}
    0.9,                      !- Vertex 3 Z-coordinate {m}
    13.7,                     !- Vertex 4 X-coordinate {m}
    15.2,                     !- Vertex 4 Y-coordinate {m}
    2.1;                      !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer:Sub,
    DB-1,                     !- User Supplied Surface Name
    WINDOW,                   !- Surface Type
```

```
    Sgl Grey 3mm,            !- Construction Name of the Surface
    BACK-1,                  !- Base Surface Name
    ,                        !- OutsideFaceEnvironment Object
    0.50000,                 !- View Factor to Ground
    ,                        !- Name of shading control
    ,                        !- WindowFrameAndDivider Name
    1,                       !- Multiplier
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    9.1,                     !- Vertex 1 X-coordinate {m}
    15.2,                    !- Vertex 1 Y-coordinate {m}
    2.1,                     !- Vertex 1 Z-coordinate {m}
    9.1,                     !- Vertex 2 X-coordinate {m}
    15.2,                    !- Vertex 2 Y-coordinate {m}
    0.0,                     !- Vertex 2 Z-coordinate {m}
    7.0,                     !- Vertex 3 X-coordinate {m}
    15.2,                    !- Vertex 3 Y-coordinate {m}
    0.0,                     !- Vertex 3 Z-coordinate {m}
    7.0,                     !- Vertex 4 X-coordinate {m}
    15.2,                    !- Vertex 4 Y-coordinate {m}
    2.1;                     !- Vertex 4 Z-coordinate {m}

Surface:HeatTransfer:Sub,
    WL-1,                    !- User Supplied Surface Name
    WINDOW,                  !- Surface Type
    Dbl Clr 3mm/13mm Air,    !- Construction Name of the Surface
    LEFT-1,                  !- Base Surface Name
    ,                        !- OutsideFaceEnvironment Object
    0.50000,                 !- View Factor to Ground
    ,                        !- Name of shading control
    ,                        !- WindowFrameAndDivider Name
    1,                       !- Multiplier
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    11.4,                    !- Vertex 1 Y-coordinate {m}
    2.1,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    11.4,                    !- Vertex 2 Y-coordinate {m}
    0.9,                     !- Vertex 2 Z-coordinate {m}
    0.0,                     !- Vertex 3 X-coordinate {m}
    3.8,                     !- Vertex 3 Y-coordinate {m}
    0.9,                     !- Vertex 3 Z-coordinate {m}
    0.0,                     !- Vertex 4 X-coordinate {m}
    3.8,                     !- Vertex 4 Y-coordinate {m}
    2.1;                     !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: SURFACE:SHADING:ATTACHED ===========

Surface:Shading:Attached,
    Main South Overhang,     !- User Supplied Surface Name
    FRONT-1,                 !- Base Surface Name
    ShadeTransSch,           !- TransSchedShadowSurf
    4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    0.0,                     !- Vertex 1 X-coordinate {m}
    -1.3,                    !- Vertex 1 Y-coordinate {m}
    2.2,                     !- Vertex 1 Z-coordinate {m}
    0.0,                     !- Vertex 2 X-coordinate {m}
    0.0,                     !- Vertex 2 Y-coordinate {m}
    2.2,                     !- Vertex 2 Z-coordinate {m}
    19.8,                    !- Vertex 3 X-coordinate {m}
    0.0,                     !- Vertex 3 Y-coordinate {m}
    2.2,                     !- Vertex 3 Z-coordinate {m}
    19.8,                    !- Vertex 4 X-coordinate {m}
    -1.3,                    !- Vertex 4 Y-coordinate {m}
    2.2;                     !- Vertex 4 Z-coordinate {m}

Surface:Shading:Attached,
    South Door Overhang,     !- User Supplied Surface Name
```

```
    FRONT-1,                  !- Base Surface Name
    ShadeTransSch,            !- TransSchedShadowSurf
    4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups in
this surface
    21.0,                     !- Vertex 1 X-coordinate {m}
    -2.0,                     !- Vertex 1 Y-coordinate {m}
    2.6,                      !- Vertex 1 Z-coordinate {m}
    21.0,                     !- Vertex 2 X-coordinate {m}
    0.0,                      !- Vertex 2 Y-coordinate {m}
    2.6,                      !- Vertex 2 Z-coordinate {m}
    24.1,                     !- Vertex 3 X-coordinate {m}
    0.0,                      !- Vertex 3 Y-coordinate {m}
    2.6,                      !- Vertex 3 Z-coordinate {m}
    24.1,                     !- Vertex 4 X-coordinate {m}
    -2.0,                     !- Vertex 4 Y-coordinate {m}
    2.6;                      !- Vertex 4 Z-coordinate {m}


!-   ===========  ALL OBJECTS IN CLASS: CONVECTIONCOEFFICIENTS ===========

ConvectionCoefficients,
    C5-1,                     !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    C1-1,                     !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    C2-1,                     !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    C3-1,                     !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    C4-1,                     !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    F5-1S,                    !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    F1-1S,                    !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    F2-1S,                    !- SurfaceName
    Interior,                 !- Convection Type #1
    value,                    !- Convection Value Type #1
    4.0;                      !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    F3-1S,                    !- SurfaceName
    Interior,                 !- Convection Type #1
```

```
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    F4-1S,                   !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    BOTTOM-1,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    WALL-1SL,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    WALL-1SB,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    WALL-1SR,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}

ConvectionCoefficients,
    WALL-1SF,                !- SurfaceName
    Interior,                !- Convection Type #1
    value,                   !- Convection Value Type #1
    4.0;                     !- Convection value #1 {W/m2-K}


!-   ===========  ALL OBJECTS IN CLASS: ROOMAIR MODEL ===========

ROOMAIR MODEL,
    SPACE5-1 RoomAir Model,  !- Room-Air Model Name
    SPACE5-1,                !- Zone Name
    UCSD UFAD INTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy

ROOMAIR MODEL,
    SPACE1-1 RoomAir Model,  !- Room-Air Model Name
    SPACE1-1,                !- Zone Name
    UCSD UFAD EXTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy

ROOMAIR MODEL,
    SPACE2-1 RoomAir Model,  !- Room-Air Model Name
    SPACE2-1,                !- Zone Name
    UCSD UFAD EXTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy

ROOMAIR MODEL,
    SPACE3-1 RoomAir Model,  !- Room-Air Model Name
    SPACE3-1,                !- Zone Name
    UCSD UFAD EXTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy

ROOMAIR MODEL,
    SPACE4-1 RoomAir Model,  !- Room-Air Model Name
    SPACE4-1,                !- Zone Name
    UCSD UFAD EXTERIOR,      !- Room-Air Modeling Type
    DIRECT;                  !- Air Temperature Coupling Strategy
```

```
!-   ===========  ALL OBJECTS IN CLASS: UCSD UFAD INTERIOR MODEL CONTROLS ===========

UCSD UFAD INTERIOR MODEL CONTROLS,
    SPACE5-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    2.0,                     !- Number of plumes per occupant
    0.5,                     !- Number of diffusers per plume
    autosize,                !- Design effective area of diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -.26,                    !- Height of heat sources {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    SWIRL,                   !- Diffuser type
    autosize;                !- Transition height {m}


!-   ===========  ALL OBJECTS IN CLASS: UCSD UFAD EXTERIOR MODEL CONTROLS ===========

UCSD UFAD EXTERIOR MODEL CONTROLS,
    SPACE1-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    4,                       !- Number of diffusers
    autosize,                !- Design effective area of 1 diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -0.5,                    !- Position of plume vertex relative to floor {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    LINEAR BAR GRILLE,       !- Diffuser type
    autosize;                !- Transition height {m}

UCSD UFAD EXTERIOR MODEL CONTROLS,
    SPACE2-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    3,                       !- Number of diffusers
    autosize,                !- Design effective area of 1 diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -0.5,                    !- Position of plume vertex relative to floor {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    LINEAR BAR GRILLE,       !- Diffuser type
    autosize;                !- Transition height {m}

UCSD UFAD EXTERIOR MODEL CONTROLS,
    SPACE3-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    3,                       !- Number of diffusers
    autosize,                !- Design effective area of 1 diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -0.5,                    !- Position of plume vertex relative to floor {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    LINEAR BAR GRILLE,       !- Diffuser type
    autosize;                !- Transition height {m}

UCSD UFAD EXTERIOR MODEL CONTROLS,
    SPACE4-1,                !- Zone Name
    GainDistSched,           !- Gain Distribution Schedule
    4,                       !- Number of diffusers
    autosize,                !- Design effective area of 1 diffuser {m2}
    autosize,                !- angle between diffuser slots and the vertical {deg}
    -0.5,                    !- Position of plume vertex relative to floor {m}
    1.4,                     !- Thermostat height {m}
    1.0,                     !- Comfort Height {m}
    0.001,                   !- Temp. Difference Threshold for Reporting {deltaC}
    LINEAR BAR GRILLE,       !- Diffuser type
```

```
    autosize;                !- Transition height {m}


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULETYPE ===========

ScheduleType,
    Any Number;              !- ScheduleType Name

ScheduleType,
    Fraction,                !- ScheduleType Name
    0.0 : 1.0,               !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Temperature,             !- ScheduleType Name
    -60:200,                 !- range
    CONTINUOUS;              !- Numeric Type

ScheduleType,
    Control Type,            !- ScheduleType Name
    0:4,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    On/Off,                  !- ScheduleType Name
    0:1,                     !- range
    DISCRETE;                !- Numeric Type

ScheduleType,
    FlowRate,                !- ScheduleType Name
    0.0:10,                  !- range
    CONTINUOUS;              !- Numeric Type


!-   ===========  ALL OBJECTS IN CLASS: DAYSCHEDULE ===========

DAYSCHEDULE,
    OC-1,                    !- Name
    Fraction,                !- ScheduleType
    0.0,                     !- Hour 1
    0.0,                     !- Hour 2
    0.0,                     !- Hour 3
    0.0,                     !- Hour 4
    0.0,                     !- Hour 5
    0.0,                     !- Hour 6
    0.0,                     !- Hour 7
    0.0,                     !- Hour 8
    1.0,                     !- Hour 9
    1.0,                     !- Hour 10
    1.0,                     !- Hour 11
    0.8,                     !- Hour 12
    0.4,                     !- Hour 13
    0.8,                     !- Hour 14
    1.0,                     !- Hour 15
    1.0,                     !- Hour 16
    1.0,                     !- Hour 17
    1.0,                     !- Hour 18
    0.5,                     !- Hour 19
    0.1,                     !- Hour 20
    0.1,                     !- Hour 21
    0.0,                     !- Hour 22
    0.0,                     !- Hour 23
    0.0;                     !- Hour 24

DAYSCHEDULE,
    OC-2,                    !- Name
    Fraction,                !- ScheduleType
    0.0,                     !- Hour 1
    0.0,                     !- Hour 2
    0.0,                     !- Hour 3
    0.0,                     !- Hour 4
```

```
    0.0,                    !- Hour 5
    0.0,                    !- Hour 6
    0.0,                    !- Hour 7
    0.0,                    !- Hour 8
    0.0,                    !- Hour 9
    0.0,                    !- Hour 10
    0.0,                    !- Hour 11
    0.0,                    !- Hour 12
    0.0,                    !- Hour 13
    0.0,                    !- Hour 14
    0.0,                    !- Hour 15
    0.0,                    !- Hour 16
    0.0,                    !- Hour 17
    0.0,                    !- Hour 18
    0.0,                    !- Hour 19
    0.0,                    !- Hour 20
    0.0,                    !- Hour 21
    0.0,                    !- Hour 22
    0.0,                    !- Hour 23
    0.0;                    !- Hour 24

DAYSCHEDULE,
    LT-1,                   !- Name
    Fraction,               !- ScheduleType
    0.05,                   !- Hour 1
    0.05,                   !- Hour 2
    0.05,                   !- Hour 3
    0.05,                   !- Hour 4
    0.05,                   !- Hour 5
    0.05,                   !- Hour 6
    0.05,                   !- Hour 7
    0.05,                   !- Hour 8
    0.9,                    !- Hour 9
    0.95,                   !- Hour 10
    1.0,                    !- Hour 11
    0.95,                   !- Hour 12
    0.8,                    !- Hour 13
    0.9,                    !- Hour 14
    1.0,                    !- Hour 15
    1.0,                    !- Hour 16
    1.0,                    !- Hour 17
    1.0,                    !- Hour 18
    0.6,                    !- Hour 19
    0.2,                    !- Hour 20
    0.2,                    !- Hour 21
    0.05,                   !- Hour 22
    0.05,                   !- Hour 23
    0.05;                   !- Hour 24

DAYSCHEDULE,
    LT-2,                   !- Name
    Fraction,               !- ScheduleType
    0.05,                   !- Hour 1
    0.05,                   !- Hour 2
    0.05,                   !- Hour 3
    0.05,                   !- Hour 4
    0.05,                   !- Hour 5
    0.05,                   !- Hour 6
    0.05,                   !- Hour 7
    0.05,                   !- Hour 8
    0.05,                   !- Hour 9
    0.05,                   !- Hour 10
    0.05,                   !- Hour 11
    0.05,                   !- Hour 12
    0.05,                   !- Hour 13
    0.05,                   !- Hour 14
    0.05,                   !- Hour 15
    0.05,                   !- Hour 16
    0.05,                   !- Hour 17
    0.05,                   !- Hour 18
    0.05,                   !- Hour 19
```

```
    0.05,                   !- Hour 20
    0.05,                   !- Hour 21
    0.05,                   !- Hour 22
    0.05,                   !- Hour 23
    0.05;                   !- Hour 24

DAYSCHEDULE,
    EQ-1,                   !- Name
    Fraction,               !- ScheduleType
    0.02,                   !- Hour 1
    0.02,                   !- Hour 2
    0.02,                   !- Hour 3
    0.02,                   !- Hour 4
    0.02,                   !- Hour 5
    0.02,                   !- Hour 6
    0.02,                   !- Hour 7
    0.02,                   !- Hour 8
    0.4,                    !- Hour 9
    0.9,                    !- Hour 10
    0.9,                    !- Hour 11
    0.9,                    !- Hour 12
    0.9,                    !- Hour 13
    0.9,                    !- Hour 14
    0.8,                    !- Hour 15
    0.7,                    !- Hour 16
    0.5,                    !- Hour 17
    0.5,                    !- Hour 18
    0.3,                    !- Hour 19
    0.3,                    !- Hour 20
    0.02,                   !- Hour 21
    0.02,                   !- Hour 22
    0.02,                   !- Hour 23
    0.02;                   !- Hour 24

DAYSCHEDULE,
    EQ-2,                   !- Name
    Fraction,               !- ScheduleType
    0.2,                    !- Hour 1
    0.2,                    !- Hour 2
    0.2,                    !- Hour 3
    0.2,                    !- Hour 4
    0.2,                    !- Hour 5
    0.2,                    !- Hour 6
    0.2,                    !- Hour 7
    0.2,                    !- Hour 8
    0.2,                    !- Hour 9
    0.2,                    !- Hour 10
    0.2,                    !- Hour 11
    0.2,                    !- Hour 12
    0.2,                    !- Hour 13
    0.2,                    !- Hour 14
    0.2,                    !- Hour 15
    0.2,                    !- Hour 16
    0.2,                    !- Hour 17
    0.2,                    !- Hour 18
    0.2,                    !- Hour 19
    0.2,                    !- Hour 20
    0.2,                    !- Hour 21
    0.2,                    !- Hour 22
    0.2,                    !- Hour 23
    0.2;                    !- Hour 24

DAYSCHEDULE,
    INFIL-SCH-1-1,          !- Name
    Fraction,               !- ScheduleType
    1,                      !- Hour 1
    1,                      !- Hour 2
    1,                      !- Hour 3
    1,                      !- Hour 4
    1,                      !- Hour 5
    1,                      !- Hour 6
```

```
    1,                      !- Hour 7
    1,                      !- Hour 8
    1,                      !- Hour 9
    1,                      !- Hour 10
    1,                      !- Hour 11
    1,                      !- Hour 12
    1,                      !- Hour 13
    1,                      !- Hour 14
    1,                      !- Hour 15
    1,                      !- Hour 16
    1,                      !- Hour 17
    1,                      !- Hour 18
    1,                      !- Hour 19
    1,                      !- Hour 20
    1,                      !- Hour 21
    1,                      !- Hour 22
    1,                      !- Hour 23
    1;                      !- Hour 24

DAYSCHEDULE,
    INFIL-SCH-2-1,          !- Name
    Fraction,               !- ScheduleType
    0,                      !- Hour 1
    0,                      !- Hour 2
    0,                      !- Hour 3
    0,                      !- Hour 4
    0,                      !- Hour 5
    0,                      !- Hour 6
    0,                      !- Hour 7
    0,                      !- Hour 8
    0,                      !- Hour 9
    0,                      !- Hour 10
    0,                      !- Hour 11
    0,                      !- Hour 12
    0,                      !- Hour 13
    0,                      !- Hour 14
    0,                      !- Hour 15
    0,                      !- Hour 16
    0,                      !- Hour 17
    0,                      !- Hour 18
    0,                      !- Hour 19
    0,                      !- Hour 20
    0,                      !- Hour 21
    0,                      !- Hour 22
    0,                      !- Hour 23
    0;                      !- Hour 24

DAYSCHEDULE,
    ActDaySchd,             !- Name
    Any Number,             !- ScheduleType
    117.239997864,          !- Hour 1
    117.239997864,          !- Hour 2
    117.239997864,          !- Hour 3
    117.239997864,          !- Hour 4
    117.239997864,          !- Hour 5
    117.239997864,          !- Hour 6
    117.239997864,          !- Hour 7
    117.239997864,          !- Hour 8
    117.239997864,          !- Hour 9
    117.239997864,          !- Hour 10
    117.239997864,          !- Hour 11
    117.239997864,          !- Hour 12
    117.239997864,          !- Hour 13
    117.239997864,          !- Hour 14
    117.239997864,          !- Hour 15
    117.239997864,          !- Hour 16
    117.239997864,          !- Hour 17
    117.239997864,          !- Hour 18
    117.239997864,          !- Hour 19
    117.239997864,          !- Hour 20
    117.239997864,          !- Hour 21
```

```
    117.239997864,           !- Hour 22
    117.239997864,           !- Hour 23
    117.239997864;           !- Hour 24

DAYSCHEDULE,
    ShadeTransDaySch,        !- Name
    Fraction,                !- ScheduleType
    0.0,                     !- Hour 1
    0.0,                     !- Hour 2
    0.0,                     !- Hour 3
    0.0,                     !- Hour 4
    0.0,                     !- Hour 5
    0.0,                     !- Hour 6
    0.0,                     !- Hour 7
    0.0,                     !- Hour 8
    0.0,                     !- Hour 9
    0.0,                     !- Hour 10
    0.0,                     !- Hour 11
    0.0,                     !- Hour 12
    0.0,                     !- Hour 13
    0.0,                     !- Hour 14
    0.0,                     !- Hour 15
    0.0,                     !- Hour 16
    0.0,                     !- Hour 17
    0.0,                     !- Hour 18
    0.0,                     !- Hour 19
    0.0,                     !- Hour 20
    0.0,                     !- Hour 21
    0.0,                     !- Hour 22
    0.0,                     !- Hour 23
    0.0;                     !- Hour 24

DAYSCHEDULE,
    Htg-SetP-DSch-Wd,        !- Name
    Temperature,             !- ScheduleType
    12.8,                    !- Hour 1
    12.8,                    !- Hour 2
    12.8,                    !- Hour 3
    12.8,                    !- Hour 4
    12.8,                    !- Hour 5
    12.8,                    !- Hour 6
    12.8,                    !- Hour 7
    21.1,                    !- Hour 8
    21.1,                    !- Hour 9
    21.1,                    !- Hour 10
    21.1,                    !- Hour 11
    21.1,                    !- Hour 12
    21.1,                    !- Hour 13
    21.1,                    !- Hour 14
    21.1,                    !- Hour 15
    21.1,                    !- Hour 16
    21.1,                    !- Hour 17
    21.1,                    !- Hour 18
    12.8,                    !- Hour 19
    12.8,                    !- Hour 20
    12.8,                    !- Hour 21
    12.8,                    !- Hour 22
    12.8,                    !- Hour 23
    12.8;                    !- Hour 24

DAYSCHEDULE,
    Htg-SetP-DSch-We,        !- Name
    Temperature,             !- ScheduleType
    12.8,                    !- Hour 1
    12.8,                    !- Hour 2
    12.8,                    !- Hour 3
    12.8,                    !- Hour 4
    12.8,                    !- Hour 5
    12.8,                    !- Hour 6
    12.8,                    !- Hour 7
    21.1,                    !- Hour 8
```

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    21.1,                    !- Hour 9
    21.1,                    !- Hour 10
    21.1,                    !- Hour 11
    21.1,                    !- Hour 12
    21.1,                    !- Hour 13
    12.8,                    !- Hour 14
    12.8,                    !- Hour 15
    12.8,                    !- Hour 16
    12.8,                    !- Hour 17
    12.8,                    !- Hour 18
    12.8,                    !- Hour 19
    12.8,                    !- Hour 20
    12.8,                    !- Hour 21
    12.8,                    !- Hour 22
    12.8,                    !- Hour 23
    12.8;                    !- Hour 24

DAYSCHEDULE,
    Htg-SetP-DSch-WintDes,   !- Name
    Temperature,             !- ScheduleType
    21.1,                    !- Hour 1
    21.1,                    !- Hour 2
    21.1,                    !- Hour 3
    21.1,                    !- Hour 4
    21.1,                    !- Hour 5
    21.1,                    !- Hour 6
    21.1,                    !- Hour 7
    21.1,                    !- Hour 8
    21.1,                    !- Hour 9
    21.1,                    !- Hour 10
    21.1,                    !- Hour 11
    21.1,                    !- Hour 12
    21.1,                    !- Hour 13
    21.1,                    !- Hour 14
    21.1,                    !- Hour 15
    21.1,                    !- Hour 16
    21.1,                    !- Hour 17
    21.1,                    !- Hour 18
    21.1,                    !- Hour 19
    21.1,                    !- Hour 20
    21.1,                    !- Hour 21
    21.1,                    !- Hour 22
    21.1,                    !- Hour 23
    21.1;                    !- Hour 24

DAYSCHEDULE,
    Htg-SetP-DSch-LowLimit,  !- Name
    Temperature,             !- ScheduleType
    12.8,                    !- Hour 1
    12.8,                    !- Hour 2
    12.8,                    !- Hour 3
    12.8,                    !- Hour 4
    12.8,                    !- Hour 5
    12.8,                    !- Hour 6
    12.8,                    !- Hour 7
    12.8,                    !- Hour 8
    12.8,                    !- Hour 9
    12.8,                    !- Hour 10
    12.8,                    !- Hour 11
    12.8,                    !- Hour 12
    12.8,                    !- Hour 13
    12.8,                    !- Hour 14
    12.8,                    !- Hour 15
    12.8,                    !- Hour 16
    12.8,                    !- Hour 17
    12.8,                    !- Hour 18
    12.8,                    !- Hour 19
    12.8,                    !- Hour 20
    12.8,                    !- Hour 21
    12.8,                    !- Hour 22
    12.8,                    !- Hour 23
```

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    12.8;                   !- Hour 24

DAYSCHEDULE,
    Clg-SetP-DSch-Wd,       !- Name
    Temperature,            !- ScheduleType
    40,                     !- Hour 1
    40,                     !- Hour 2
    40,                     !- Hour 3
    40,                     !- Hour 4
    40,                     !- Hour 5
    40,                     !- Hour 6
    40,                     !- Hour 7
    24.9,                   !- Hour 8
    24.9,                   !- Hour 9
    24.9,                   !- Hour 10
    24.9,                   !- Hour 11
    24.9,                   !- Hour 12
    24.9,                   !- Hour 13
    24.9,                   !- Hour 14
    24.9,                   !- Hour 15
    24.9,                   !- Hour 16
    24.9,                   !- Hour 17
    24.9,                   !- Hour 18
    40,                     !- Hour 19
    40,                     !- Hour 20
    40,                     !- Hour 21
    40,                     !- Hour 22
    40,                     !- Hour 23
    40;                     !- Hour 24

DAYSCHEDULE,
    Clg-SetP-DSch-We,       !- Name
    Temperature,            !- ScheduleType
    40,                     !- Hour 1
    40,                     !- Hour 2
    40,                     !- Hour 3
    40,                     !- Hour 4
    40,                     !- Hour 5
    40,                     !- Hour 6
    40,                     !- Hour 7
    24.9,                   !- Hour 8
    24.9,                   !- Hour 9
    24.9,                   !- Hour 10
    24.9,                   !- Hour 11
    24.9,                   !- Hour 12
    24.9,                   !- Hour 13
    32.2,                   !- Hour 14
    32.2,                   !- Hour 15
    32.2,                   !- Hour 16
    32.2,                   !- Hour 17
    32.2,                   !- Hour 18
    32.2,                   !- Hour 19
    32.2,                   !- Hour 20
    32.2,                   !- Hour 21
    32.2,                   !- Hour 22
    32.2,                   !- Hour 23
    32.2;                   !- Hour 24

DAYSCHEDULE,
    Clg-SetP-DSch-SumDes,   !- Name
    Temperature,            !- ScheduleType
    24.9,                   !- Hour 1
    24.9,                   !- Hour 2
    24.9,                   !- Hour 3
    24.9,                   !- Hour 4
    24.9,                   !- Hour 5
    24.9,                   !- Hour 6
    24.9,                   !- Hour 7
    24.9,                   !- Hour 8
    24.9,                   !- Hour 9
    24.9,                   !- Hour 10
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    24.9,                    !- Hour 11
    24.9,                    !- Hour 12
    24.9,                    !- Hour 13
    24.9,                    !- Hour 14
    24.9,                    !- Hour 15
    24.9,                    !- Hour 16
    24.9,                    !- Hour 17
    24.9,                    !- Hour 18
    24.9,                    !- Hour 19
    24.9,                    !- Hour 20
    24.9,                    !- Hour 21
    24.9,                    !- Hour 22
    24.9,                    !- Hour 23
    24.9;                    !- Hour 24

DAYSCHEDULE,
    Clg-SetP-DSch-HighLimit, !- Name
    Temperature,             !- ScheduleType
    40.0,                    !- Hour 1
    40.0,                    !- Hour 2
    40.0,                    !- Hour 3
    40.0,                    !- Hour 4
    40.0,                    !- Hour 5
    40.0,                    !- Hour 6
    40.0,                    !- Hour 7
    40.0,                    !- Hour 8
    40.0,                    !- Hour 9
    40.0,                    !- Hour 10
    40.0,                    !- Hour 11
    40.0,                    !- Hour 12
    40.0,                    !- Hour 13
    40.0,                    !- Hour 14
    40.0,                    !- Hour 15
    40.0,                    !- Hour 16
    40.0,                    !- Hour 17
    40.0,                    !- Hour 18
    40.0,                    !- Hour 19
    40.0,                    !- Hour 20
    40.0,                    !- Hour 21
    40.0,                    !- Hour 22
    40.0,                    !- Hour 23
    40.0;                    !- Hour 24

DAYSCHEDULE,
    Dual Control Type Day Sch,  !- Name
    Control Type,            !- ScheduleType
    4,                       !- Hour 1
    4,                       !- Hour 2
    4,                       !- Hour 3
    4,                       !- Hour 4
    4,                       !- Hour 5
    4,                       !- Hour 6
    4,                       !- Hour 7
    4,                       !- Hour 8
    4,                       !- Hour 9
    4,                       !- Hour 10
    4,                       !- Hour 11
    4,                       !- Hour 12
    4,                       !- Hour 13
    4,                       !- Hour 14
    4,                       !- Hour 15
    4,                       !- Hour 16
    4,                       !- Hour 17
    4,                       !- Hour 18
    4,                       !- Hour 19
    4,                       !- Hour 20
    4,                       !- Hour 21
    4,                       !- Hour 22
    4,                       !- Hour 23
    4;                       !- Hour 24
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DAYSCHEDULE,
    Winter Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    1,                        !- Hour 1
    1,                        !- Hour 2
    1,                        !- Hour 3
    1,                        !- Hour 4
    1,                        !- Hour 5
    1,                        !- Hour 6
    1,                        !- Hour 7
    1,                        !- Hour 8
    1,                        !- Hour 9
    1,                        !- Hour 10
    1,                        !- Hour 11
    1,                        !- Hour 12
    1,                        !- Hour 13
    1,                        !- Hour 14
    1,                        !- Hour 15
    1,                        !- Hour 16
    1,                        !- Hour 17
    1,                        !- Hour 18
    1,                        !- Hour 19
    1,                        !- Hour 20
    1,                        !- Hour 21
    1,                        !- Hour 22
    1,                        !- Hour 23
    1;                        !- Hour 24

DAYSCHEDULE,
    Summer Control Type Day Sch,  !- Name
    Control Type,             !- ScheduleType
    2,                        !- Hour 1
    2,                        !- Hour 2
    2,                        !- Hour 3
    2,                        !- Hour 4
    2,                        !- Hour 5
    2,                        !- Hour 6
    2,                        !- Hour 7
    2,                        !- Hour 8
    2,                        !- Hour 9
    2,                        !- Hour 10
    2,                        !- Hour 11
    2,                        !- Hour 12
    2,                        !- Hour 13
    2,                        !- Hour 14
    2,                        !- Hour 15
    2,                        !- Hour 16
    2,                        !- Hour 17
    2,                        !- Hour 18
    2,                        !- Hour 19
    2,                        !- Hour 20
    2,                        !- Hour 21
    2,                        !- Hour 22
    2,                        !- Hour 23
    2;                        !- Hour 24

DAYSCHEDULE,
    Min OA Weekday Day Sch,  !- Name
    Fraction,                 !- ScheduleType
    0.02,                     !- Hour 1
    0.02,                     !- Hour 2
    0.02,                     !- Hour 3
    0.02,                     !- Hour 4
    0.02,                     !- Hour 5
    0.02,                     !- Hour 6
    1.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
```

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    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    1.,                       !- Hour 18
    0.02,                     !- Hour 19
    0.02,                     !- Hour 20
    0.02,                     !- Hour 21
    0.02,                     !- Hour 22
    0.02,                     !- Hour 23
    0.02;                     !- Hour 24

DAYSCHEDULE,
    Min OA Weekend Day Sch,   !- Name
    Fraction,                 !- ScheduleType
    0.02,                     !- Hour 1
    0.02,                     !- Hour 2
    0.02,                     !- Hour 3
    0.02,                     !- Hour 4
    0.02,                     !- Hour 5
    0.02,                     !- Hour 6
    0.02,                     !- Hour 7
    0.02,                     !- Hour 8
    0.02,                     !- Hour 9
    0.02,                     !- Hour 10
    0.02,                     !- Hour 11
    0.02,                     !- Hour 12
    0.02,                     !- Hour 13
    0.02,                     !- Hour 14
    0.02,                     !- Hour 15
    0.02,                     !- Hour 16
    0.02,                     !- Hour 17
    0.02,                     !- Hour 18
    0.02,                     !- Hour 19
    0.02,                     !- Hour 20
    0.02,                     !- Hour 21
    0.02,                     !- Hour 22
    0.02,                     !- Hour 23
    0.02;                     !- Hour 24

DAYSCHEDULE,
    FanDaySched1,             !- Name
    Fraction,                 !- ScheduleType
    0.,                       !- Hour 1
    0.,                       !- Hour 2
    0.,                       !- Hour 3
    0.,                       !- Hour 4
    0.,                       !- Hour 5
    0.,                       !- Hour 6
    0.,                       !- Hour 7
    1.,                       !- Hour 8
    1.,                       !- Hour 9
    1.,                       !- Hour 10
    1.,                       !- Hour 11
    1.,                       !- Hour 12
    1.,                       !- Hour 13
    1.,                       !- Hour 14
    1.,                       !- Hour 15
    1.,                       !- Hour 16
    1.,                       !- Hour 17
    0.,                       !- Hour 18
    0.,                       !- Hour 19
    0.,                       !- Hour 20
    0.,                       !- Hour 21
    0.,                       !- Hour 22
    0.,                       !- Hour 23
    0.;                       !- Hour 24

DAYSCHEDULE,
    FanDaySched2,             !- Name
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```
    Fraction,                !- ScheduleType
    0.,                      !- Hour 1
    0.,                      !- Hour 2
    0.,                      !- Hour 3
    0.,                      !- Hour 4
    0.,                      !- Hour 5
    0.,                      !- Hour 6
    0.,                      !- Hour 7
    0.,                      !- Hour 8
    0.,                      !- Hour 9
    0.,                      !- Hour 10
    0.,                      !- Hour 11
    0.,                      !- Hour 12
    0.,                      !- Hour 13
    0.,                      !- Hour 14
    0.,                      !- Hour 15
    0.,                      !- Hour 16
    0.,                      !- Hour 17
    0.,                      !- Hour 18
    0.,                      !- Hour 19
    0.,                      !- Hour 20
    0.,                      !- Hour 21
    0.,                      !- Hour 22
    0.,                      !- Hour 23
    0.;                      !- Hour 24

DAYSCHEDULE,
    FanDaySched3,            !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    Chilled Water Loop Daily,!- Name
    Temperature,             !- ScheduleType
    11.,                     !- Hour 1
    11.,                     !- Hour 2
    11.,                     !- Hour 3
    11.,                     !- Hour 4
    11.,                     !- Hour 5
    11.,                     !- Hour 6
    11.,                     !- Hour 7
    11.,                     !- Hour 8
    11.,                     !- Hour 9
    11.,                     !- Hour 10
    11.,                     !- Hour 11
    11.,                     !- Hour 12
    11.,                     !- Hour 13
    11.,                     !- Hour 14
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    11.,                     !- Hour 15
    11.,                     !- Hour 16
    11.,                     !- Hour 17
    11.,                     !- Hour 18
    11.,                     !- Hour 19
    11.,                     !- Hour 20
    11.,                     !- Hour 21
    11.,                     !- Hour 22
    11.,                     !- Hour 23
    11.;                     !- Hour 24

DAYSCHEDULE,
    Hot Water Loop Daily,    !- Name
    Temperature,             !- ScheduleType
    82.,                     !- Hour 1
    82.,                     !- Hour 2
    82.,                     !- Hour 3
    82.,                     !- Hour 4
    82.,                     !- Hour 5
    82.,                     !- Hour 6
    82.,                     !- Hour 7
    82.,                     !- Hour 8
    82.,                     !- Hour 9
    82.,                     !- Hour 10
    82.,                     !- Hour 11
    82.,                     !- Hour 12
    82.,                     !- Hour 13
    82.,                     !- Hour 14
    82.,                     !- Hour 15
    82.,                     !- Hour 16
    82.,                     !- Hour 17
    82.,                     !- Hour 18
    82.,                     !- Hour 19
    82.,                     !- Hour 20
    82.,                     !- Hour 21
    82.,                     !- Hour 22
    82.,                     !- Hour 23
    82.;                     !- Hour 24

DAYSCHEDULE,
    PlantDayOn,              !- Name
    Fraction,                !- ScheduleType
    1.,                      !- Hour 1
    1.,                      !- Hour 2
    1.,                      !- Hour 3
    1.,                      !- Hour 4
    1.,                      !- Hour 5
    1.,                      !- Hour 6
    1.,                      !- Hour 7
    1.,                      !- Hour 8
    1.,                      !- Hour 9
    1.,                      !- Hour 10
    1.,                      !- Hour 11
    1.,                      !- Hour 12
    1.,                      !- Hour 13
    1.,                      !- Hour 14
    1.,                      !- Hour 15
    1.,                      !- Hour 16
    1.,                      !- Hour 17
    1.,                      !- Hour 18
    1.,                      !- Hour 19
    1.,                      !- Hour 20
    1.,                      !- Hour 21
    1.,                      !- Hour 22
    1.,                      !- Hour 23
    1.;                      !- Hour 24

DAYSCHEDULE,
    Summer Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    17.2,                    !- Hour 1
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```
    17.2,                    !- Hour 2
    17.2,                    !- Hour 3
    17.2,                    !- Hour 4
    17.2,                    !- Hour 5
    17.2,                    !- Hour 6
    17.2,                    !- Hour 7
    17.2,                    !- Hour 8
    17.2,                    !- Hour 9
    17.2,                    !- Hour 10
    17.2,                    !- Hour 11
    17.2,                    !- Hour 12
    17.2,                    !- Hour 13
    17.2,                    !- Hour 14
    17.2,                    !- Hour 15
    17.2,                    !- Hour 16
    17.2,                    !- Hour 17
    17.2,                    !- Hour 18
    17.2,                    !- Hour 19
    17.2,                    !- Hour 20
    17.2,                    !- Hour 21
    17.2,                    !- Hour 22
    17.2,                    !- Hour 23
    17.2;                    !- Hour 24

DAYSCHEDULE,
    Winter Supply Air Temp Day Sch,  !- Name
    Temperature,             !- ScheduleType
    17.2,                    !- Hour 1
    17.2,                    !- Hour 2
    17.2,                    !- Hour 3
    17.2,                    !- Hour 4
    17.2,                    !- Hour 5
    17.2,                    !- Hour 6
    17.2,                    !- Hour 7
    17.2,                    !- Hour 8
    17.2,                    !- Hour 9
    17.2,                    !- Hour 10
    17.2,                    !- Hour 11
    17.2,                    !- Hour 12
    17.2,                    !- Hour 13
    17.2,                    !- Hour 14
    17.2,                    !- Hour 15
    17.2,                    !- Hour 16
    17.2,                    !- Hour 17
    17.2,                    !- Hour 18
    17.2,                    !- Hour 19
    17.2,                    !- Hour 20
    17.2,                    !- Hour 21
    17.2,                    !- Hour 22
    17.2,                    !- Hour 23
    17.2;                    !- Hour 24

DAYSCHEDULE,
    AlwaysOffDay,            !- Name
    Fraction,                !- ScheduleType
    0,                       !- Hour 1
    0,                       !- Hour 2
    0,                       !- Hour 3
    0,                       !- Hour 4
    0,                       !- Hour 5
    0,                       !- Hour 6
    0,                       !- Hour 7
    0,                       !- Hour 8
    0,                       !- Hour 9
    0,                       !- Hour 10
    0,                       !- Hour 11
    0,                       !- Hour 12
    0,                       !- Hour 13
    0,                       !- Hour 14
    0,                       !- Hour 15
    0,                       !- Hour 16
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    0,                        !- Hour 17
    0,                        !- Hour 18
    0,                        !- Hour 19
    0,                        !- Hour 20
    0,                        !- Hour 21
    0,                        !- Hour 22
    0,                        !- Hour 23
    0;                        !- Hour 24

DAYSCHEDULE,
    AlwaysOnDay,              !- Name
    Fraction,                 !- ScheduleType
    1,                        !- Hour 1
    1,                        !- Hour 2
    1,                        !- Hour 3
    1,                        !- Hour 4
    1,                        !- Hour 5
    1,                        !- Hour 6
    1,                        !- Hour 7
    1,                        !- Hour 8
    1,                        !- Hour 9
    1,                        !- Hour 10
    1,                        !- Hour 11
    1,                        !- Hour 12
    1,                        !- Hour 13
    1,                        !- Hour 14
    1,                        !- Hour 15
    1,                        !- Hour 16
    1,                        !- Hour 17
    1,                        !- Hour 18
    1,                        !- Hour 19
    1,                        !- Hour 20
    1,                        !- Hour 21
    1,                        !- Hour 22
    1,                        !- Hour 23
    1;                        !- Hour 24


!-   ===========  ALL OBJECTS IN CLASS: WEEKSCHEDULE ===========

WEEKSCHEDULE,
    OC-WEEK,                  !- Name
    OC-2,                     !- Sunday DAYSCHEDULE Name
    OC-1,                     !- Monday DAYSCHEDULE Name
    OC-1,                     !- Tuesday DAYSCHEDULE Name
    OC-1,                     !- Wednesday DAYSCHEDULE Name
    OC-1,                     !- Thursday DAYSCHEDULE Name
    OC-1,                     !- Friday DAYSCHEDULE Name
    OC-2,                     !- Saturday DAYSCHEDULE Name
    OC-2,                     !- Holiday DAYSCHEDULE Name
    OC-1,                     !- SummerDesignDay DAYSCHEDULE Name
    OC-2,                     !- WinterDesignDay DAYSCHEDULE Name
    OC-1,                     !- CustomDay1 DAYSCHEDULE Name
    OC-1;                     !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    LT-WEEK,                  !- Name
    LT-2,                     !- Sunday DAYSCHEDULE Name
    LT-1,                     !- Monday DAYSCHEDULE Name
    LT-1,                     !- Tuesday DAYSCHEDULE Name
    LT-1,                     !- Wednesday DAYSCHEDULE Name
    LT-1,                     !- Thursday DAYSCHEDULE Name
    LT-1,                     !- Friday DAYSCHEDULE Name
    LT-2,                     !- Saturday DAYSCHEDULE Name
    LT-2,                     !- Holiday DAYSCHEDULE Name
    LT-1,                     !- SummerDesignDay DAYSCHEDULE Name
    LT-2,                     !- WinterDesignDay DAYSCHEDULE Name
    LT-1,                     !- CustomDay1 DAYSCHEDULE Name
    LT-1;                     !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
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    EQ-WEEK,                !- Name
    EQ-2,                   !- Sunday DAYSCHEDULE Name
    EQ-1,                   !- Monday DAYSCHEDULE Name
    EQ-1,                   !- Tuesday DAYSCHEDULE Name
    EQ-1,                   !- Wednesday DAYSCHEDULE Name
    EQ-1,                   !- Thursday DAYSCHEDULE Name
    EQ-1,                   !- Friday DAYSCHEDULE Name
    EQ-2,                   !- Saturday DAYSCHEDULE Name
    EQ-2,                   !- Holiday DAYSCHEDULE Name
    EQ-1,                   !- SummerDesignDay DAYSCHEDULE Name
    EQ-2,                   !- WinterDesignDay DAYSCHEDULE Name
    EQ-1,                   !- CustomDay1 DAYSCHEDULE Name
    EQ-1;                   !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    INFIL-SCH-1,            !- Name
    INFIL-SCH-1-1,          !- Sunday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Monday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Tuesday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Wednesday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Thursday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Friday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Saturday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- Holiday DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- SummerDesignDay DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- WinterDesignDay DAYSCHEDULE Name
    INFIL-SCH-1-1,          !- CustomDay1 DAYSCHEDULE Name
    INFIL-SCH-1-1;          !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    INFIL-SCH-2,            !- Name
    INFIL-SCH-2-1,          !- Sunday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Monday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Tuesday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Wednesday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Thursday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Friday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Saturday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- Holiday DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- SummerDesignDay DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- WinterDesignDay DAYSCHEDULE Name
    INFIL-SCH-2-1,          !- CustomDay1 DAYSCHEDULE Name
    INFIL-SCH-2-1;          !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ActWeekSchd,            !- Name
    ActDaySchd,             !- Sunday DAYSCHEDULE Name
    ActDaySchd,             !- Monday DAYSCHEDULE Name
    ActDaySchd,             !- Tuesday DAYSCHEDULE Name
    ActDaySchd,             !- Wednesday DAYSCHEDULE Name
    ActDaySchd,             !- Thursday DAYSCHEDULE Name
    ActDaySchd,             !- Friday DAYSCHEDULE Name
    ActDaySchd,             !- Saturday DAYSCHEDULE Name
    ActDaySchd,             !- Holiday DAYSCHEDULE Name
    ActDaySchd,             !- SummerDesignDay DAYSCHEDULE Name
    ActDaySchd,             !- WinterDesignDay DAYSCHEDULE Name
    ActDaySchd,             !- CustomDay1 DAYSCHEDULE Name
    ActDaySchd;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    ShadeTransWeekSch,      !- Name
    ShadeTransDaySch,       !- Sunday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Monday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Tuesday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Wednesday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Thursday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Friday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Saturday DAYSCHEDULE Name
    ShadeTransDaySch,       !- Holiday DAYSCHEDULE Name
    ShadeTransDaySch,       !- SummerDesignDay DAYSCHEDULE Name
    ShadeTransDaySch,       !- WinterDesignDay DAYSCHEDULE Name
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    ShadeTransDaySch,        !- CustomDay1 DAYSCHEDULE Name
    ShadeTransDaySch;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Htg-SetP-WSch,           !- Name
    Htg-SetP-DSch-We,        !- Sunday DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- Monday DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- Tuesday DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- Wednesday DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- Thursday DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- Friday DAYSCHEDULE Name
    Htg-SetP-DSch-We,        !- Saturday DAYSCHEDULE Name
    Htg-SetP-DSch-We,        !- Holiday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- SummerDesignDay DAYSCHEDULE Name
    Htg-SetP-DSch-WintDes,   !- WinterDesignDay DAYSCHEDULE Name
    Htg-SetP-DSch-Wd,        !- CustomDay1 DAYSCHEDULE Name
    Htg-SetP-DSch-Wd;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Htg-SetP-WSch-Plenum,    !- Name
    Htg-SetP-DSch-LowLimit,  !- Sunday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Monday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Tuesday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Wednesday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Thursday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Friday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Saturday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- Holiday DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- SummerDesignDay DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- WinterDesignDay DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit,  !- CustomDay1 DAYSCHEDULE Name
    Htg-SetP-DSch-LowLimit;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Clg-SetP-Wsch,           !- Name
    Clg-SetP-DSch-We,        !- Sunday DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- Monday DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- Tuesday DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- Wednesday DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- Thursday DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- Friday DAYSCHEDULE Name
    Clg-SetP-DSch-We,        !- Saturday DAYSCHEDULE Name
    Clg-SetP-DSch-We,        !- Holiday DAYSCHEDULE Name
    Clg-SetP-DSch-SumDes,    !- SummerDesignDay DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- WinterDesignDay DAYSCHEDULE Name
    Clg-SetP-DSch-Wd,        !- CustomDay1 DAYSCHEDULE Name
    Clg-SetP-DSch-Wd;        !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Clg-SetP-WSch-Plenum,    !- Name
    Clg-SetP-DSch-HighLimit, !- Sunday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Monday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Tuesday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Wednesday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Thursday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Friday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Saturday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- Holiday DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- SummerDesignDay DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- WinterDesignDay DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit, !- CustomDay1 DAYSCHEDULE Name
    Clg-SetP-DSch-HighLimit; !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Control Type Week Sch,   !- Name
    Dual Control Type Day Sch,  !- Sunday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Monday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Tuesday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Wednesday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Thursday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Friday DAYSCHEDULE Name
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    Dual Control Type Day Sch,  !- Saturday DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Control Type Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Control Type Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Dual Control Type Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Dual Control Type Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Min OA Week Sch,          !- Name
    Min OA Weekend Day Sch,  !- Sunday DAYSCHEDULE Name
    Min OA Weekday Day Sch,  !- Monday DAYSCHEDULE Name
    Min OA Weekday Day Sch,  !- Tuesday DAYSCHEDULE Name
    Min OA Weekday Day Sch,  !- Wednesday DAYSCHEDULE Name
    Min OA Weekday Day Sch,  !- Thursday DAYSCHEDULE Name
    Min OA Weekday Day Sch,  !- Friday DAYSCHEDULE Name
    Min OA Weekend Day Sch,  !- Saturday DAYSCHEDULE Name
    Min OA Weekend Day Sch,  !- Holiday DAYSCHEDULE Name
    Min OA Weekend Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Min OA Weekend Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Min OA Weekend Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Min OA Weekend Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanWinterWeekSched,       !- Name
    FanDaySched3,             !- Sunday DAYSCHEDULE Name
    FanDaySched3,             !- Monday DAYSCHEDULE Name
    FanDaySched3,             !- Tuesday DAYSCHEDULE Name
    FanDaySched3,             !- Wednesday DAYSCHEDULE Name
    FanDaySched3,             !- Thursday DAYSCHEDULE Name
    FanDaySched3,             !- Friday DAYSCHEDULE Name
    FanDaySched3,             !- Saturday DAYSCHEDULE Name
    FanDaySched3,             !- Holiday DAYSCHEDULE Name
    FanDaySched3,             !- SummerDesignDay DAYSCHEDULE Name
    FanDaySched3,             !- WinterDesignDay DAYSCHEDULE Name
    FanDaySched3,             !- CustomDay1 DAYSCHEDULE Name
    FanDaySched3;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanSummerWeekSched,       !- Name
    FanDaySched2,             !- Sunday DAYSCHEDULE Name
    FanDaySched1,             !- Monday DAYSCHEDULE Name
    FanDaySched1,             !- Tuesday DAYSCHEDULE Name
    FanDaySched1,             !- Wednesday DAYSCHEDULE Name
    FanDaySched1,             !- Thursday DAYSCHEDULE Name
    FanDaySched1,             !- Friday DAYSCHEDULE Name
    FanDaySched2,             !- Saturday DAYSCHEDULE Name
    FanDaySched2,             !- Holiday DAYSCHEDULE Name
    FanDaySched3,             !- SummerDesignDay DAYSCHEDULE Name
    FanDaySched3,             !- WinterDesignDay DAYSCHEDULE Name
    FanDaySched2,             !- CustomDay1 DAYSCHEDULE Name
    FanDaySched2;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    FanOffWeekSched,          !- Name
    FanDaySched2,             !- Sunday DAYSCHEDULE Name
    FanDaySched2,             !- Monday DAYSCHEDULE Name
    FanDaySched2,             !- Tuesday DAYSCHEDULE Name
    FanDaySched2,             !- Wednesday DAYSCHEDULE Name
    FanDaySched2,             !- Thursday DAYSCHEDULE Name
    FanDaySched2,             !- Friday DAYSCHEDULE Name
    FanDaySched2,             !- Saturday DAYSCHEDULE Name
    FanDaySched2,             !- Holiday DAYSCHEDULE Name
    FanDaySched2,             !- SummerDesignDay DAYSCHEDULE Name
    FanDaySched2,             !- WinterDesignDay DAYSCHEDULE Name
    FanDaySched2,             !- CustomDay1 DAYSCHEDULE Name
    FanDaySched2;             !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Chilled Water Loop Weekly,  !- Name
    Chilled Water Loop Daily,!- Sunday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Monday DAYSCHEDULE Name
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    Chilled Water Loop Daily,!- Tuesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Wednesday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Thursday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Friday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Saturday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- Holiday DAYSCHEDULE Name
    Chilled Water Loop Daily,!- SummerDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- WinterDesignDay DAYSCHEDULE Name
    Chilled Water Loop Daily,!- CustomDay1 DAYSCHEDULE Name
    Chilled Water Loop Daily;!- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Hot Water Loop Weekly,   !- Name
    Hot Water Loop Daily,    !- Sunday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Monday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Tuesday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Wednesday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Thursday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Friday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Saturday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- Holiday DAYSCHEDULE Name
    Hot Water Loop Daily,    !- SummerDesignDay DAYSCHEDULE Name
    Hot Water Loop Daily,    !- WinterDesignDay DAYSCHEDULE Name
    Hot Water Loop Daily,    !- CustomDay1 DAYSCHEDULE Name
    Hot Water Loop Daily;    !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    PlantWeekOn,             !- Name
    PlantDayOn,              !- Sunday DAYSCHEDULE Name
    PlantDayOn,              !- Monday DAYSCHEDULE Name
    PlantDayOn,              !- Tuesday DAYSCHEDULE Name
    PlantDayOn,              !- Wednesday DAYSCHEDULE Name
    PlantDayOn,              !- Thursday DAYSCHEDULE Name
    PlantDayOn,              !- Friday DAYSCHEDULE Name
    PlantDayOn,              !- Saturday DAYSCHEDULE Name
    PlantDayOn,              !- Holiday DAYSCHEDULE Name
    PlantDayOn,              !- SummerDesignDay DAYSCHEDULE Name
    PlantDayOn,              !- WinterDesignDay DAYSCHEDULE Name
    PlantDayOn,              !- CustomDay1 DAYSCHEDULE Name
    PlantDayOn;              !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Summer Supply Air Temp Week Sch,  !- Name
    Summer Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Summer Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    Winter Supply Air Temp Week Sch,  !- Name
    Winter Supply Air Temp Day Sch,  !- Sunday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Monday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Tuesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Wednesday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Thursday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Friday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Saturday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- Holiday DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- SummerDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- WinterDesignDay DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch,  !- CustomDay1 DAYSCHEDULE Name
    Winter Supply Air Temp Day Sch;  !- CustomDay2 DAYSCHEDULE Name
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WEEKSCHEDULE,
    AlwaysOffWeek,           !- Name
    AlwaysOffDay,            !- Sunday DAYSCHEDULE Name
    AlwaysOffDay,            !- Monday DAYSCHEDULE Name
    AlwaysOffDay,            !- Tuesday DAYSCHEDULE Name
    AlwaysOffDay,            !- Wednesday DAYSCHEDULE Name
    AlwaysOffDay,            !- Thursday DAYSCHEDULE Name
    AlwaysOffDay,            !- Friday DAYSCHEDULE Name
    AlwaysOffDay,            !- Saturday DAYSCHEDULE Name
    AlwaysOffDay,            !- Holiday DAYSCHEDULE Name
    AlwaysOffDay,            !- SummerDesignDay DAYSCHEDULE Name
    AlwaysOffDay,            !- WinterDesignDay DAYSCHEDULE Name
    AlwaysOffDay,            !- CustomDay1 DAYSCHEDULE Name
    AlwaysOffDay;            !- CustomDay2 DAYSCHEDULE Name

WEEKSCHEDULE,
    AlwaysOnWeek,            !- Name
    AlwaysOnDay,             !- Sunday DAYSCHEDULE Name
    AlwaysOnDay,             !- Monday DAYSCHEDULE Name
    AlwaysOnDay,             !- Tuesday DAYSCHEDULE Name
    AlwaysOnDay,             !- Wednesday DAYSCHEDULE Name
    AlwaysOnDay,             !- Thursday DAYSCHEDULE Name
    AlwaysOnDay,             !- Friday DAYSCHEDULE Name
    AlwaysOnDay,             !- Saturday DAYSCHEDULE Name
    AlwaysOnDay,             !- Holiday DAYSCHEDULE Name
    AlwaysOnDay,             !- SummerDesignDay DAYSCHEDULE Name
    AlwaysOnDay,             !- WinterDesignDay DAYSCHEDULE Name
    AlwaysOnDay,             !- CustomDay1 DAYSCHEDULE Name
    AlwaysOnDay;             !- CustomDay2 DAYSCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE ===========

SCHEDULE,
    OCCUPY-1,                !- Name
    Fraction,                !- ScheduleType
    OC-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    LIGHTS-1,                !- Name
    Fraction,                !- ScheduleType
    LT-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    EQUIP-1,                 !- Name
    Fraction,                !- ScheduleType
    EQ-WEEK,                 !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    INFIL-SCH,               !- Name
    Fraction,                !- ScheduleType
    INFIL-SCH-1,             !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    INFIL-SCH-2,             !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
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    10,                       !- End Month 2
    31,                       !- End Day 2
    INFIL-SCH-1,              !- Name of WEEKSCHEDULE 3
    11,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    ActSchd,                  !- Name
    Any Number,               !- ScheduleType
    ActWeekSchd,              !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    ShadeTransSch,            !- Name
    Fraction,                 !- ScheduleType
    ShadeTransWeekSch,        !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Htg-SetP-Sch,             !- Name
    Temperature,              !- ScheduleType
    Htg-SetP-WSch,            !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    PlenumHtg-SetP-Sch,       !- Name
    Temperature,              !- ScheduleType
    Htg-SetP-WSch-Plenum,     !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Clg-SetP-Sch,             !- Name
    Temperature,              !- ScheduleType
    Clg-SetP-WSch,            !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    PlenumClg-SetP-Sch,       !- Name
    Temperature,              !- ScheduleType
    Clg-SetP-WSch-Plenum,     !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Zone Control Type Sched, !- Name
    Control Type,             !- ScheduleType
    Control Type Week Sch,    !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1
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SCHEDULE,
    Min OA Sched,            !- Name
    Fraction,                !- ScheduleType
    Min OA Week Sch,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    12,                      !- End Month 1
    31;                      !- End Day 1

SCHEDULE,
    FanAvailSched,           !- Name
    Fraction,                !- ScheduleType
    FanWinterWeekSched,      !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    FanSummerWeekSched,      !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    FanWinterWeekSched,      !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    CoolingCoilAvailSched,   !- Name
    Fraction,                !- ScheduleType
    FanOffWeekSched,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    FanSummerWeekSched,      !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    FanOffWeekSched,         !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    CoolingPumpAvailSched,   !- Name
    Fraction,                !- ScheduleType
    FanOffWeekSched,         !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
    1,                       !- Start Day 1
    3,                       !- End Month 1
    31,                      !- End Day 1
    FanWinterWeekSched,      !- Name of WEEKSCHEDULE 2
    4,                       !- Start Month 2
    1,                       !- Start Day 2
    9,                       !- End Month 2
    30,                      !- End Day 2
    FanOffWeekSched,         !- Name of WEEKSCHEDULE 3
    10,                      !- Start Month 3
    1,                       !- Start Day 3
    12,                      !- End Month 3
    31;                      !- End Day 3

SCHEDULE,
    ReheatCoilAvailSched,    !- Name
    Fraction,                !- ScheduleType
    FanWinterWeekSched,      !- Name of WEEKSCHEDULE 1
    1,                       !- Start Month 1
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    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    FanSummerWeekSched,       !- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    FanWinterWeekSched,       !- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    HeatingCoilAvailSched,    !- Name
    Fraction,                 !- ScheduleType
    FanWinterWeekSched,       !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    FanOffWeekSched,          !- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
    9,                        !- End Month 2
    30,                       !- End Day 2
    FanWinterWeekSched,       !- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    CW Loop Temp Schedule,    !- Name
    Temperature,              !- ScheduleType
    Chilled Water Loop Weekly,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    HW Loop Temp Schedule,    !- Name
    Temperature,              !- ScheduleType
    Hot Water Loop Weekly,    !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    PlantOnSched,             !- Name
    Fraction,                 !- ScheduleType
    PlantWeekOn,              !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    12,                       !- End Month 1
    31;                       !- End Day 1

SCHEDULE,
    Seasonal Reset Supply Air Temp Sch,  !- Name
    Temperature,              !- ScheduleType
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    3,                        !- End Month 1
    31,                       !- End Day 1
    Summer Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 2
    4,                        !- Start Month 2
    1,                        !- Start Day 2
```

```
    9,                        !- End Month 2
    30,                       !- End Day 2
    Winter Supply Air Temp Week Sch,  !- Name of WEEKSCHEDULE 3
    10,                       !- Start Month 3
    1,                        !- Start Day 3
    12,                       !- End Month 3
    31;                       !- End Day 3

SCHEDULE,
    ReportSch,                !- Name
    On/Off,                   !- ScheduleType
    AlwaysOffWeek,            !- Name of WEEKSCHEDULE 1
    1,                        !- Start Month 1
    1,                        !- Start Day 1
    1,                        !- End Month 1
    13,                       !- End Day 1
    AlwaysOnWeek,             !- Name of WEEKSCHEDULE 2
    1,                        !- Start Month 2
    14,                       !- Start Day 2
    1,                        !- End Month 2
    14,                       !- End Day 2
    AlwaysOffWeek,            !- Name of WEEKSCHEDULE 3
    1,                        !- Start Month 3
    15,                       !- Start Day 3
    7,                        !- End Month 3
    6,                        !- End Day 3
    AlwaysOnWeek,             !- Name of WEEKSCHEDULE 4
    7,                        !- Start Month 4
    7,                        !- Start Day 4
    7,                        !- End Month 4
    9,                        !- End Day 4
    AlwaysOffWeek,            !- Name of WEEKSCHEDULE 5
    7,                        !- Start Month 5
    10,                       !- Start Day 5
    12,                       !- End Month 5
    31;                       !- End Day 5


!-   ===========  ALL OBJECTS IN CLASS: SCHEDULE:COMPACT ===========

SCHEDULE:COMPACT,
    GainDistSched,            !- Name
    Fraction,                 !- ScheduleType
    Through: 12/31,           !- Complex Field #1
    For: AllDays,             !- Complex Field #2
    Until: 24:00,             !- Complex Field #3
    0.9;                      !- Complex Field #4


!-   ===========  ALL OBJECTS IN CLASS: PEOPLE ===========

PEOPLE,
    SPACE1-1 People 1,        !- Name
    SPACE1-1,                 !- Zone Name
    11,                       !- Number of People
    OCCUPY-1,                 !- Number of People SCHEDULE Name (real--fraction)
    0.6,                      !- Fraction Radiant
    ActSchd;                  !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
    SPACE2-1 People 1,        !- Name
    SPACE2-1,                 !- Zone Name
    5,                        !- Number of People
    OCCUPY-1,                 !- Number of People SCHEDULE Name (real--fraction)
    0.6,                      !- Fraction Radiant
    ActSchd;                  !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
    SPACE3-1 People 1,        !- Name
    SPACE3-1,                 !- Zone Name
    11,                       !- Number of People
```

```
    OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
    0.6,                     !- Fraction Radiant
    ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
    SPACE4-1 People 1,       !- Name
    SPACE4-1,                !- Zone Name
    5,                       !- Number of People
    OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
    0.6,                     !- Fraction Radiant
    ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
    SPACE5-1 People 1,       !- Name
    SPACE5-1,                !- Zone Name
    20,                      !- Number of People
    OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
    0.6,                     !- Fraction Radiant
    ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)


!-   ===========  ALL OBJECTS IN CLASS: LIGHTS ===========

LIGHTS,
    SPACE1-1 Lights 1,       !- Name
    SPACE1-1,                !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    1584,                    !- Design Level {W}
    0.15,                    !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights;           !- End-Use Subcategory

LIGHTS,
    SPACE2-1 Lights 1,       !- Name
    SPACE2-1,                !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    684,                     !- Design Level {W}
    0.15,                    !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights;           !- End-Use Subcategory

LIGHTS,
    SPACE3-1 Lights 1,       !- Name
    SPACE3-1,                !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    1584,                    !- Design Level {W}
    0.15,                    !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights;           !- End-Use Subcategory

LIGHTS,
    SPACE4-1 Lights 1,       !- Name
    SPACE4-1,                !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
    684,                     !- Design Level {W}
    0.15,                    !- Return Air Fraction
    0.37,                    !- Fraction Radiant
    0.18,                    !- Fraction Visible
    0,                       !- Fraction Replaceable
    GeneralLights;           !- End-Use Subcategory

LIGHTS,
    SPACE5-1 Lights 1,       !- Name
    SPACE5-1,                !- Zone Name
    LIGHTS-1,                !- SCHEDULE Name
```

```
    2964,                   !- Design Level {W}
    0.15,                   !- Return Air Fraction
    0.37,                   !- Fraction Radiant
    0.18,                   !- Fraction Visible
    0,                      !- Fraction Replaceable
    GeneralLights;          !- End-Use Subcategory


!-   ===========  ALL OBJECTS IN CLASS: ELECTRIC EQUIPMENT ===========

ELECTRIC EQUIPMENT,
    SPACE1-1 ElecEq 1,      !- Name
    SPACE1-1,               !- Zone Name
    EQUIP-1,                !- SCHEDULE Name
    1056,                   !- Design Level {W}
    0,                      !- Fraction Latent
    0.58,                   !- Fraction Radiant
    0;                      !- Fraction Lost

ELECTRIC EQUIPMENT,
    SPACE2-1 ElecEq 1,      !- Name
    SPACE2-1,               !- Zone Name
    EQUIP-1,                !- SCHEDULE Name
    456,                    !- Design Level {W}
    0,                      !- Fraction Latent
    0.58,                   !- Fraction Radiant
    0;                      !- Fraction Lost

ELECTRIC EQUIPMENT,
    SPACE3-1 ElecEq 1,      !- Name
    SPACE3-1,               !- Zone Name
    EQUIP-1,                !- SCHEDULE Name
    1056,                   !- Design Level {W}
    0,                      !- Fraction Latent
    0.58,                   !- Fraction Radiant
    0;                      !- Fraction Lost

ELECTRIC EQUIPMENT,
    SPACE4-1 ElecEq 1,      !- Name
    SPACE4-1,               !- Zone Name
    EQUIP-1,                !- SCHEDULE Name
    456,                    !- Design Level {W}
    0,                      !- Fraction Latent
    0.58,                   !- Fraction Radiant
    0;                      !- Fraction Lost

ELECTRIC EQUIPMENT,
    SPACE5-1 ElecEq 1,      !- Name
    SPACE5-1,               !- Zone Name
    EQUIP-1,                !- SCHEDULE Name
    1976,                   !- Design Level {W}
    0,                      !- Fraction Latent
    0.58,                   !- Fraction Radiant
    0;                      !- Fraction Lost


!-   ===========  ALL OBJECTS IN CLASS: INFILTRATION ===========

INFILTRATION,
    SPACE1-1 Infil 1,       !- Name
    SPACE1-1,               !- Zone Name
    INFIL-SCH,              !- SCHEDULE Name
    0.0167,                 !- Design Volume Flow Rate {m3/s}
    0,                      !- Constant Term Coefficient
    0,                      !- Temperature Term Coefficient
    0.2237,                 !- Velocity Term Coefficient
    0;                      !- Velocity Squared Term Coefficient

INFILTRATION,
    SPACE2-1 Infil 1,       !- Name
    SPACE2-1,               !- Zone Name
```

```
    INFIL-SCH,               !- SCHEDULE Name
    0.00717,                 !- Design Volume Flow Rate {m3/s}
    0,                       !- Constant Term Coefficient
    0,                       !- Temperature Term Coefficient
    0.2237,                  !- Velocity Term Coefficient
    0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
    SPACE3-1 Infil 1,        !- Name
    SPACE3-1,                !- Zone Name
    INFIL-SCH,               !- SCHEDULE Name
    0.0167,                  !- Design Volume Flow Rate {m3/s}
    0,                       !- Constant Term Coefficient
    0,                       !- Temperature Term Coefficient
    0.2237,                  !- Velocity Term Coefficient
    0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
    SPACE4-1 Infil 1,        !- Name
    SPACE4-1,                !- Zone Name
    INFIL-SCH,               !- SCHEDULE Name
    0.00717,                 !- Design Volume Flow Rate {m3/s}
    0,                       !- Constant Term Coefficient
    0,                       !- Temperature Term Coefficient
    0.2237,                  !- Velocity Term Coefficient
    0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
    SPACE5-1 Infil 1,        !- Name
    SPACE5-1,                !- Zone Name
    INFIL-SCH,               !- SCHEDULE Name
    0.031089,                !- Design Volume Flow Rate {m3/s}
    0,                       !- Constant Term Coefficient
    0,                       !- Temperature Term Coefficient
    0.2237,                  !- Velocity Term Coefficient
    0;                       !- Velocity Squared Term Coefficient


!-   ===========  ALL OBJECTS IN CLASS: SIZING PARAMETERS ===========

SIZING PARAMETERS,
    1.2,                     !- sizing factor
    4;                       !- time steps in averaging window


!-   ===========  ALL OBJECTS IN CLASS: ZONE SIZING ===========

ZONE SIZING,
    SPACE1-1,                !- Name of a zone
    19.,                     !- Zone cooling design supply air temperature {C}
    50.,                     !- Zone heating design supply air temperature {C}
    0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
    flow/person,             !- outside air method
    0.00944,                 !- outside air flow per person {m3/s}
    0.0,                     !- outside air flow per zone {m3/s}
    0.0,                     !- zone sizing factor
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}

ZONE SIZING,
    SPACE2-1,                !- Name of a zone
    19.,                     !- Zone cooling design supply air temperature {C}
    50.,                     !- Zone heating design supply air temperature {C}
    0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
    flow/person,             !- outside air method
    0.00944,                 !- outside air flow per person {m3/s}
    0.0,                     !- outside air flow per zone {m3/s}
```

```
    0.0,                     !- zone sizing factor
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}

ZONE SIZING,
    SPACE3-1,                !- Name of a zone
    19.,                     !- Zone cooling design supply air temperature {C}
    50.,                     !- Zone heating design supply air temperature {C}
    0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
    flow/person,             !- outside air method
    0.00944,                 !- outside air flow per person {m3/s}
    0.0,                     !- outside air flow per zone {m3/s}
    0.0,                     !- zone sizing factor
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}

ZONE SIZING,
    SPACE4-1,                !- Name of a zone
    19.,                     !- Zone cooling design supply air temperature {C}
    50.,                     !- Zone heating design supply air temperature {C}
    0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
    flow/person,             !- outside air method
    0.00944,                 !- outside air flow per person {m3/s}
    0.0,                     !- outside air flow per zone {m3/s}
    0.0,                     !- zone sizing factor
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}

ZONE SIZING,
    SPACE5-1,                !- Name of a zone
    19.,                     !- Zone cooling design supply air temperature {C}
    50.,                     !- Zone heating design supply air temperature {C}
    0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
    flow/person,             !- outside air method
    0.00944,                 !- outside air flow per person {m3/s}
    0.0,                     !- outside air flow per zone {m3/s}
    0.0,                     !- zone sizing factor
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM SIZING ===========

SYSTEM SIZING,
    VAV Sys 1,               !- name of an AIR PRIMARY LOOP object
    sensible,                !- type of load to size on
    autosize,                !- Design (minimum) outside air volumetric flow rate {m3/s}
    0.3,                     !- minimum system air flow ratio
    7.0,                     !- Preheat design set temperature {C}
    17.2,                    !- Central cooling design supply air temperature {C}
    17.2,                    !- Central heating design supply air temperature {C}
    noncoincident,           !- Sizing Option
    no,                      !- Cooling 100% Outside Air
    no,                      !- Heating 100% Outside Air
    0.008,                   !- Central cooling design supply air humidity ratio {kg-H2O/kg-air}
    0.008,                   !- Central heating design supply air humidity ratio {kg-H2O/kg-air}
    design day,              !- cooling design air flow method
    0,                       !- cooling design air flow rate {m3/s}
    design day,              !- heating design air flow method
    0;                       !- heating design air flow rate {m3/s}
```

```
!-   ===========  ALL OBJECTS IN CLASS: PLANT SIZING ===========

PLANT SIZING,
    Hot Water Loop,          !- name of a PLANT LOOP or CONDENSER LOOP object
    heating,                 !- loop type
    82.,                     !- Design loop exit temperature {C}
    11;                      !- Design loop delta T {deltaC}

PLANT SIZING,
    Chilled Water Loop,      !- name of a PLANT LOOP or CONDENSER LOOP object
    cooling,                 !- loop type
    11.,                     !- Design loop exit temperature {C}
    6.67;                    !- Design loop delta T {deltaC}

PLANT SIZING,
    Condenser Water Loop,    !- name of a PLANT LOOP or CONDENSER LOOP object
    condenser,               !- loop type
    29.4,                    !- Design loop exit temperature {C}
    5.6;                     !- Design loop delta T {deltaC}


!-   ===========  ALL OBJECTS IN CLASS: NODE LIST ===========

NODE LIST,
    OutsideAirInletNodes,    !- Node List Name
    Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
    SPACE1-1 In Nodes,       !- Node List Name
    SPACE1-1 In Node;        !- Node_ID_1

NODE LIST,
    SPACE2-1 In Nodes,       !- Node List Name
    SPACE2-1 In Node;        !- Node_ID_1

NODE LIST,
    SPACE3-1 In Nodes,       !- Node List Name
    SPACE3-1 In Node;        !- Node_ID_1

NODE LIST,
    SPACE4-1 In Nodes,       !- Node List Name
    SPACE4-1 In Node;        !- Node_ID_1

NODE LIST,
    SPACE5-1 In Nodes,       !- Node List Name
    SPACE5-1 In Node;        !- Node_ID_1

NODE LIST,
    Supply Air Temp Nodes 1, !- Node List Name
    VAV Sys 1 Outlet Node;   !- Node_ID_1

NODE LIST,
    Hot Water Loop Setpoint Node List,  !- Node List Name
    HW Supply Outlet Node;   !- Node_ID_1

NODE LIST,
    Chilled Water Loop Setpoint Node List,  !- Node List Name
    CW Supply Outlet Node;   !- Node_ID_1


!-   ===========  ALL OBJECTS IN CLASS: BRANCH LIST ===========

BRANCH LIST,
    VAV Sys 1 Branches,      !- Branch List Name
    VAV Sys 1 Main Branch;   !- Branch Name 1

BRANCH LIST,
    Heating Supply Side Branches,  !- Branch List Name
    Heating Supply Inlet Branch,  !- Branch Name 1
```

```
    Central Boiler Branch,   !- Branch Name 2
    Heating Supply Bypass Branch,  !- Branch Name 3
    Heating Supply Outlet Branch;  !- Branch Name 4

BRANCH LIST,
    Heating Demand Side Branches,  !- Branch List Name
    Heating Demand Inlet Branch,  !- Branch Name 1
    SPACE1-1 Reheat Branch,  !- Branch Name 2
    SPACE2-1 Reheat Branch,  !- Branch Name 3
    SPACE3-1 Reheat Branch,  !- Branch Name 4
    SPACE4-1 Reheat Branch,  !- Branch Name 5
    SPACE5-1 Reheat Branch,  !- Branch Name 6
    Main Heating Coil 1 Branch,  !- Branch Name 7
    Heating Demand Bypass Branch,  !- Branch Name 8
    Heating Demand Outlet Branch;  !- Branch Name 9

BRANCH LIST,
    Cooling Supply Side Branches,  !- Branch List Name
    CW Pump Branch,          !- Branch Name 1
    Central Chiller Branch,  !- Branch Name 2
    Cooling Supply Bypass Branch,  !- Branch Name 3
    Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
    Cooling Demand Side Branches,  !- Branch List Name
    Cooling Demand Inlet,    !- Branch Name 1
    Cooling Coil Branch,     !- Branch Name 2
    Cooling Demand Bypass Branch,  !- Branch Name 3
    Cooling Demand Outlet;   !- Branch Name 4

BRANCH LIST,
    Condenser Supply Side Branches,  !- Branch List Name
    Condenser Supply Inlet Branch,  !- Branch Name 1
    Condenser Supply Tower Branch,  !- Branch Name 2
    Condenser Supply Bypass Branch,  !- Branch Name 3
    Condenser Supply Outlet Branch;  !- Branch Name 4

BRANCH LIST,
    Condenser Demand Side Branches,  !- Branch List Name
    Condenser Demand Inlet Branch,  !- Branch Name 1
    Central Chiller Condenser Branch,  !- Branch Name 2
    Condenser Demand Bypass Branch,  !- Branch Name 3
    Condenser Demand Outlet Branch;  !- Branch Name 4


!-   ===========  ALL OBJECTS IN CLASS: CONNECTOR LIST ===========

CONNECTOR LIST,
    Heating Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    Heating Supply Splitter, !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    Heating Supply Mixer;    !- Name of Connector 2

CONNECTOR LIST,
    Heating Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    Heating Demand Splitter, !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    Heating Demand Mixer;    !- Name of Connector 2

CONNECTOR LIST,
    Cooling Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    CW Loop Splitter,        !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
    Cooling Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
```

```
    CW Demand Splitter,      !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    CW Demand Mixer;         !- Name of Connector 2

CONNECTOR LIST,
    Condenser Supply Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    Condenser Supply Splitter,  !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    Condenser Supply Mixer;  !- Name of Connector 2

CONNECTOR LIST,
    Condenser Demand Side Connectors,  !- Connector List Name
    SPLITTER,                !- Type of Connector 1
    Condenser Demand Splitter,  !- Name of Connector 1
    MIXER,                   !- Type of Connector 2
    Condenser Demand Mixer;  !- Name of Connector 2


!-   ===========  ALL OBJECTS IN CLASS: BRANCH ===========

BRANCH,
    VAV Sys 1 Main Branch,   !- Branch Name
    autosize,                !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    VAV Sys 1 Inlet Node,    !- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    COIL:Water:DetailedFlatCooling,  !- Comp2 Type
    Main Cooling Coil 1,     !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
    Main Cooling Coil 1 Outlet Node,  !- Comp2 Outlet Node Name
    PASSIVE,                 !- Comp2 Branch Control Type
    COIL:Water:SimpleHeating,!- Comp3 Type
    Main Heating Coil 1,     !- Comp3 Name
    Main Cooling Coil 1 Outlet Node,  !- Comp3 Inlet Node Name
    Main Heating Coil 1 Outlet Node,  !- Comp3 Outlet Node Name
    PASSIVE,                 !- Comp3 Branch Control Type
    FAN:SIMPLE:VariableVolume,  !- Comp4 Type
    Supply Fan 1,            !- Comp4 Name
    Main Heating Coil 1 Outlet Node,  !- Comp4 Inlet Node Name
    VAV Sys 1 Outlet Node,   !- Comp4 Outlet Node Name
    ACTIVE;                  !- Comp4 Branch Control Type

BRANCH,
    Heating Supply Inlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    HW Circ Pump,            !- Comp1 Name
    HW Supply Inlet Node,    !- Comp1 Inlet Node Name
    HW Pump Outlet Node,     !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    Central Boiler Branch,   !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    BOILER:SIMPLE,           !- Comp1 Type
    Central Boiler,          !- Comp1 Name
    Central Boiler Inlet Node,  !- Comp1 Inlet Node Name
    Central Boiler Outlet Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    Heating Supply Bypass Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Heating Supply Side Bypass,  !- Comp1 Name
    Heating Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    Heating Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type
```

```
BRANCH,
    Heating Supply Outlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Heating Supply Outlet,   !- Comp1 Name
    Heating Supply Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    HW Supply Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Heating Demand Inlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Heating Demand Inlet Pipe,  !- Comp1 Name
    HW Demand Inlet Node,    !- Comp1 Inlet Node Name
    HW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Heating Demand Outlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Heating Demand Outlet Pipe,  !- Comp1 Name
    HW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    HW Demand Outlet Node,   !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    SPACE1-1 Reheat Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    SPACE1-1 Zone Coil,      !- Comp1 Name
    SPACE1-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
    SPACE1-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    SPACE2-1 Reheat Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    SPACE2-1 Zone Coil,      !- Comp1 Name
    SPACE2-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
    SPACE2-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    SPACE3-1 Reheat Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    SPACE3-1 Zone Coil,      !- Comp1 Name
    SPACE3-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
    SPACE3-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    SPACE4-1 Reheat Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    SPACE4-1 Zone Coil,      !- Comp1 Name
    SPACE4-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
    SPACE4-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    SPACE5-1 Reheat Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    SPACE5-1 Zone Coil,      !- Comp1 Name
    SPACE5-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
    SPACE5-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
```

```
    ACTIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Main Heating Coil 1 Branch,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:SimpleHeating,!- Comp1 Type
    Main Heating Coil 1,    !- Comp1 Name
    Main Heating Coil 1 Water Inlet Node,  !- Comp1 Inlet Node Name
    Main Heating Coil 1 Water Outlet Node,  !- Comp1 Outlet Node Name
    ACTIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Heating Demand Bypass Branch,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Heating Demand Bypass,  !- Comp1 Name
    Heating Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    Heating Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Inlet,   !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Cooling Demand Side Inlet Pipe,  !- Comp1 Name
    CW Demand Inlet Node,   !- Comp1 Inlet Node Name
    CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
    Cooling Coil Branch,    !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    COIL:Water:DetailedFlatCooling,  !- Comp1 Type
    Main Cooling Coil 1,    !- Comp1 Name
    Main Cooling Coil 1 Water Inlet Node,  !- Comp1 Inlet Node Name
    Main Cooling Coil 1 Water Outlet Node,  !- Comp1 Outlet Node Name
    Active;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Bypass Branch,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Cooling Demand Side Bypass,  !- Comp1 Name
    CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                 !- Comp1 Branch Control Type

BRANCH,
    Cooling Demand Outlet,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    CW Demand Side Outlet Pipe,  !- Comp1 Name
    CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Demand Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Outlet,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Supply Side Outlet Pipe, !- Comp1 Name
    Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
    CW Pump Branch,         !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,    !- Comp1 Type
    CW Circ Pump,           !- Comp1 Name
    CW Supply Inlet Node,   !- Comp1 Inlet Node Name
```

```
    CW Pump Outlet Node,     !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Central Chiller Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    CHILLER:ELECTRIC,        !- Comp1 Type
    Central Chiller,         !- Comp1 Name
    Central Chiller Inlet Node,  !- Comp1 Inlet Node Name
    Central Chiller Outlet Node,  !- Comp1 Outlet Node Name
    Active;                  !- Comp1 Branch Control Type

BRANCH,
    Cooling Supply Bypass Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Supply Side Bypass,      !- Comp1 Name
    CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Condenser Supply Inlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PUMP:VARIABLE SPEED,     !- Comp1 Type
    Cond Circ Pump,          !- Comp1 Name
    Condenser Supply Inlet Node,  !- Comp1 Inlet Node Name
    Condenser Pump Outlet Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    Condenser Supply Tower Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    COOLING TOWER:SINGLE SPEED,  !- Comp1 Type
    Central Tower,           !- Comp1 Name
    Condenser Tower Inlet Node,  !- Comp1 Inlet Node Name
    Condenser Tower Outlet Node,  !- Comp1 Outlet Node Name
    ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
    Condenser Supply Bypass Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Condenser Supply Side Bypass,  !- Comp1 Name
    Cond Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
    Cond Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
    Condenser Supply Outlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Condenser Supply Outlet, !- Comp1 Name
    Condenser Supply Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    Condenser Supply Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Condenser Demand Inlet Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    PIPE,                    !- Comp1 Type
    Condenser Demand Inlet Pipe,  !- Comp1 Name
    Condenser Demand Inlet Node,  !- Comp1 Inlet Node Name
    Condenser Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
    Central Chiller Condenser Branch,  !- Branch Name
    0,                       !- Maximum Branch Flow Rate {m3/s}
    CHILLER:ELECTRIC,        !- Comp1 Type
    Central Chiller,         !- Comp1 Name
```

```
    Central Chiller Condenser Inlet Node,  !- Comp1 Inlet Node Name
    Central Chiller Condenser Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
    Condenser Demand Bypass Branch,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Condenser Demand Side Bypass,  !- Comp1 Name
    Cond Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
    Cond Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
    BYPASS;                 !- Comp1 Branch Control Type

BRANCH,
    Condenser Demand Outlet Branch,  !- Branch Name
    0,                      !- Maximum Branch Flow Rate {m3/s}
    PIPE,                   !- Comp1 Type
    Condenser Demand Outlet Pipe,  !- Comp1 Name
    Condenser Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
    Condenser Demand Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                !- Comp1 Branch Control Type


!-   ===========  ALL OBJECTS IN CLASS: PIPE ===========

PIPE,
    Heating Supply Side Bypass,  !- PipeName
    Heating Supply Bypass Inlet Node,  !- Inlet Node Name
    Heating Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    Heating Supply Outlet,   !- PipeName
    Heating Supply Exit Pipe Inlet Node,  !- Inlet Node Name
    HW Supply Outlet Node;   !- Outlet Node Name

PIPE,
    Heating Demand Inlet Pipe,  !- PipeName
    HW Demand Inlet Node,    !- Inlet Node Name
    HW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Heating Demand Outlet Pipe,  !- PipeName
    HW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    HW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Heating Demand Bypass,   !- PipeName
    Heating Demand Bypass Inlet Node,  !- Inlet Node Name
    Heating Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    Cooling Demand Side Inlet Pipe,  !- PipeName
    CW Demand Inlet Node,    !- Inlet Node Name
    CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Cooling Demand Side Bypass,  !- PipeName
    CW Demand Bypass Inlet Node,  !- Inlet Node Name
    CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    CW Demand Side Outlet Pipe,  !- PipeName
    CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
    Supply Side Outlet Pipe, !- PipeName
    Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
    CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
```

```
    Supply Side Bypass,      !- PipeName
    CW Supply Bypass Inlet Node,  !- Inlet Node Name
    CW Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    Condenser Supply Side Bypass,  !- PipeName
    Cond Supply Bypass Inlet Node,  !- Inlet Node Name
    Cond Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    Condenser Supply Outlet, !- PipeName
    Condenser Supply Exit Pipe Inlet Node,  !- Inlet Node Name
    Condenser Supply Outlet Node;  !- Outlet Node Name

PIPE,
    Condenser Demand Inlet Pipe,  !- PipeName
    Condenser Demand Inlet Node,  !- Inlet Node Name
    Condenser Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
    Condenser Demand Side Bypass,  !- PipeName
    Cond Demand Bypass Inlet Node,  !- Inlet Node Name
    Cond Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
    Condenser Demand Outlet Pipe,  !- PipeName
    Condenser Demand Exit Pipe Inlet Node,  !- Inlet Node Name
    Condenser Demand Outlet Node;  !- Outlet Node Name


!-   ===========  ALL OBJECTS IN CLASS: PLANT LOOP ===========

PLANT LOOP,
    Hot Water Loop,          !- Plant Loop Name
    Water,                   !- Fluid Type
    Hot Loop Operation,      !- Plant Operation Scheme List Name
    HW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    100,                     !- Maximum Loop Temperature {C}
    10,                      !- Minimum Loop Temperature {C}
    autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
    0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    HW Supply Inlet Node,    !- Plant Side Inlet Node Name
    HW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Heating Supply Side Branches,  !- Plant Side Branch List Name
    Heating Supply Side Connectors,  !- Plant Side Connector List Name
    HW Demand Inlet Node,    !- Demand Side Inlet Node Name
    HW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Heating Demand Side Branches,  !- Demand Side Branch List Name
    Heating Demand Side Connectors,  !- Demand Side Connector List Name
    Sequential;              !- Load Distribution Scheme

PLANT LOOP,
    Chilled Water Loop,      !- Plant Loop Name
    Water,                   !- Fluid Type
    CW Loop Operation,       !- Plant Operation Scheme List Name
    CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
    98,                      !- Maximum Loop Temperature {C}
    1,                       !- Minimum Loop Temperature {C}
    autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
    0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    CW Supply Inlet Node,    !- Plant Side Inlet Node Name
    CW Supply Outlet Node,   !- Plant Side Outlet Node Name
    Cooling Supply Side Branches,  !- Plant Side Branch List Name
    Cooling Supply Side Connectors,  !- Plant Side Connector List Name
    CW Demand Inlet Node,    !- Demand Side Inlet Node Name
    CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
    Cooling Demand Side Branches,  !- Demand Side Branch List Name
    Cooling Demand Side Connectors,  !- Demand Side Connector List Name
    Sequential;              !- Load Distribution Scheme
```

```
!-   ===========  ALL OBJECTS IN CLASS: CONDENSER LOOP ===========

CONDENSER LOOP,
    Condenser Water Loop,    !- Condenser Loop Name
    Water,                   !- Fluid Type
    Tower Loop Operation,    !- Condenser Operation Scheme List Name
    AIR,                     !- Condenser Loop Temperature Setpoint Node or reference
    80,                      !- Maximum Loop Temperature {C}
    10,                      !- Minimum Loop Temperature {C}
    autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
    0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
    autosize,                !- volume of the plant loop {m3}
    Condenser Supply Inlet Node,  !- Condenser Side Inlet Node Name
    Condenser Supply Outlet Node,  !- Condenser Side Outlet Node Name
    Condenser Supply Side Branches,  !- Condenser Side Branch List Name
    Condenser Supply Side Connectors,  !- Condenser Side Connector List Name
    Condenser Demand Inlet Node,  !- Demand Side Inlet Node Name
    Condenser Demand Outlet Node,  !- Demand Side Outlet Nodes Name
    Condenser Demand Side Branches,  !- Condenser Demand Side Branch List Name
    Condenser Demand Side Connectors,  !- Condenser Demand Side Connector List Name
    Sequential;              !- Load Distribution Scheme


!-   ===========  ALL OBJECTS IN CLASS: PLANT OPERATION SCHEMES ===========

PLANT OPERATION SCHEMES,
    Hot Loop Operation,      !- PlantOperationSchemeName
    HEATING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Central Boiler Only,     !- Control Scheme Name 1
    PlantOnSched;            !- Control Scheme Schedule 1

PLANT OPERATION SCHEMES,
    CW Loop Operation,       !- PlantOperationSchemeName
    COOLING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Central Chiller Only,    !- Control Scheme Name 1
    PlantOnSched;            !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: CONDENSER OPERATION SCHEMES ===========

CONDENSER OPERATION SCHEMES,
    Tower Loop Operation,    !- CondenserOperationSchemeName
    COOLING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
    Year Round Tower Operation,  !- Control Scheme Name 1
    PlantOnSched;            !- Control Scheme Schedule 1


!-   ===========  ALL OBJECTS IN CLASS: COOLING LOAD RANGE BASED OPERATION ===========

COOLING LOAD RANGE BASED OPERATION,
    Central Chiller Only,    !- Name
    0,                       !- Load Range Lower Limit 1 {W}
    900000,                  !- Load Range Upper Limit 1 {W}
    Cooling Plant;           !- Priority Control Equip List Name 1

COOLING LOAD RANGE BASED OPERATION,
    Year Round Tower Operation,  !- Name
    0,                       !- Load Range Lower Limit 1 {W}
    90000000,                !- Load Range Upper Limit 1 {W}
    All Towers;              !- Priority Control Equip List Name 1


!-   ===========  ALL OBJECTS IN CLASS: HEATING LOAD RANGE BASED OPERATION ===========

HEATING LOAD RANGE BASED OPERATION,
    Central Boiler Only,     !- Name
    0,                       !- Load Range Lower Limit 1 {W}
    1000000,                 !- Load Range Upper Limit 1 {W}
    heating plant;           !- Priority Control Equip List Name 1
```

```
!-   ===========  ALL OBJECTS IN CLASS: PLANT EQUIPMENT LIST ===========

PLANT EQUIPMENT LIST,
    heating plant,           !- Equip List Name
    BOILER:SIMPLE,           !- KEY--Plant Equip 1
    Central Boiler;          !- Equip Name 1

PLANT EQUIPMENT LIST,
    Cooling Plant,           !- Equip List Name
    CHILLER:ELECTRIC,        !- KEY--Plant Equip 1
    Central Chiller;         !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: CONDENSER EQUIPMENT LIST ===========

CONDENSER EQUIPMENT LIST,
    All Towers,              !- Equip List Name
    COOLING TOWER:SINGLE SPEED,  !- KEY--Condenser Equip 1
    Central Tower;           !- Equip Name 1


!-   ===========  ALL OBJECTS IN CLASS: SPLITTER ===========

SPLITTER,
    Heating Demand Splitter, !- SplitterName
    Heating Demand Inlet Branch,  !- Inlet Branch Name
    SPACE1-1 Reheat Branch,  !- Outlet Branch Name 1
    SPACE2-1 Reheat Branch,  !- Outlet Branch Name 2
    SPACE3-1 Reheat Branch,  !- Outlet Branch Name 3
    SPACE4-1 Reheat Branch,  !- Outlet Branch Name 4
    SPACE5-1 Reheat Branch,  !- Outlet Branch Name 5
    Main Heating Coil 1 Branch,  !- Outlet Branch Name 6
    Heating Demand Bypass Branch;  !- Outlet Branch Name 7

SPLITTER,
    Heating Supply Splitter, !- SplitterName
    Heating Supply Inlet Branch,  !- Inlet Branch Name
    Central Boiler Branch,   !- Outlet Branch Name 1
    Heating Supply Bypass Branch;  !- Outlet Branch Name 2

SPLITTER,
    CW Loop Splitter,        !- SplitterName
    CW Pump Branch,          !- Inlet Branch Name
    Central Chiller Branch,  !- Outlet Branch Name 1
    Cooling Supply Bypass Branch;  !- Outlet Branch Name 2

SPLITTER,
    CW Demand Splitter,      !- SplitterName
    Cooling Demand Inlet,    !- Inlet Branch Name
    Cooling Coil Branch,     !- Outlet Branch Name 1
    Cooling Demand Bypass Branch;  !- Outlet Branch Name 2

SPLITTER,
    Condenser Demand Splitter,  !- SplitterName
    Condenser Demand Inlet Branch,  !- Inlet Branch Name
    Central Chiller Condenser Branch,  !- Outlet Branch Name 1
    Condenser Demand Bypass Branch;  !- Outlet Branch Name 2

SPLITTER,
    Condenser Supply Splitter,  !- SplitterName
    Condenser Supply Inlet Branch,  !- Inlet Branch Name
    Condenser Supply Tower Branch,  !- Outlet Branch Name 1
    Condenser Supply Bypass Branch;  !- Outlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: MIXER ===========

MIXER,
    Heating Demand Mixer,    !- MixerName
```

```
    Heating Demand Outlet Branch,  !- Outlet Branch Name
    SPACE1-1 Reheat Branch,  !- Inlet Branch Name 1
    SPACE2-1 Reheat Branch,  !- Inlet Branch Name 2
    SPACE3-1 Reheat Branch,  !- Inlet Branch Name 3
    SPACE4-1 Reheat Branch,  !- Inlet Branch Name 4
    SPACE5-1 Reheat Branch,  !- Inlet Branch Name 5
    Main Heating Coil 1 Branch,  !- Inlet Branch Name 6
    Heating Demand Bypass Branch;  !- Inlet Branch Name 7

MIXER,
    Heating Supply Mixer,    !- MixerName
    Heating Supply Outlet Branch,  !- Outlet Branch Name
    Central Boiler Branch,   !- Inlet Branch Name 1
    Heating Supply Bypass Branch;  !- Inlet Branch Name 2

MIXER,
    CW Loop Mixer,           !- MixerName
    Cooling Supply Outlet,   !- Outlet Branch Name
    Central Chiller Branch,  !- Inlet Branch Name 1
    Cooling Supply Bypass Branch;  !- Inlet Branch Name 2

MIXER,
    CW Demand Mixer,         !- MixerName
    Cooling Demand Outlet,   !- Outlet Branch Name
    Cooling Coil Branch,     !- Inlet Branch Name 1
    Cooling Demand Bypass Branch;  !- Inlet Branch Name 2

MIXER,
    Condenser Demand Mixer,  !- MixerName
    Condenser Demand Outlet Branch,  !- Outlet Branch Name
    Central Chiller Condenser Branch,  !- Inlet Branch Name 1
    Condenser Demand Bypass Branch;  !- Inlet Branch Name 2

MIXER,
    Condenser Supply Mixer,  !- MixerName
    Condenser Supply Outlet Branch,  !- Outlet Branch Name
    Condenser Supply Tower Branch,  !- Inlet Branch Name 1
    Condenser Supply Bypass Branch;  !- Inlet Branch Name 2


!-   ===========  ALL OBJECTS IN CLASS: AIR PRIMARY LOOP ===========

AIR PRIMARY LOOP,
    VAV Sys 1,               !- Primary Air Loop Name
    VAV Sys 1 Controllers,   !- Name: Controller List
    VAV Sys 1 Avail List,    !- Name: System Availability Manager List
    autosize,                !- Primary air design volumetric flow rate {m3/s}
    VAV Sys 1 Branches,      !- Air Loop Branch List Name
    ,                        !- Air Loop Connector List Name
    VAV Sys 1 Inlet Node,    !- ReturnAir AirLoop Inlet Node
    PLENUM-1 Out Node,       !- ZoneEquipGroup Outlet Node
    Zone Eq In Node,         !- SupplyAirPath ZoneEquipGroup Inlet Nodes
    VAV Sys 1 Outlet Node;   !- AirLoop Outlet Nodes


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER LIST ===========

CONTROLLER LIST,
    VAV Sys 1 Controllers,   !- Name
    Controller:Simple,       !- Controller Type 1
    Central Cooling Coil Contoller 1,  !- Controller Name 1
    Controller:Simple,       !- Controller Type 2
    Central Heating Coil Contoller 1;  !- Controller Name 2

CONTROLLER LIST,
    OA Sys 1 Controllers,    !- Name
    CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
    OA Controller 1;         !- Controller Name 1


!-   ===========  ALL OBJECTS IN CLASS: AIR LOOP EQUIPMENT LIST ===========
```

```
AIR LOOP EQUIPMENT LIST,
    OA Sys 1 Equipment,      !- Name
    OUTSIDE AIR MIXER,       !- KEY--System Component 1
    OA Mixing Box 1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR SYSTEM ===========

OUTSIDE AIR SYSTEM,
    OA Sys 1,                !- Name
    OA Sys 1 Controllers,    !- Name: Controller List
    OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
    VAV Sys 1 Avail List;    !- Name of a System Availability Manager List


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR INLET NODE LIST ===========

OUTSIDE AIR INLET NODE LIST,
    OutsideAirInletNodes;    !- 1st Node name or node list name


!-   ===========  ALL OBJECTS IN CLASS: OUTSIDE AIR MIXER ===========

OUTSIDE AIR MIXER,
    OA Mixing Box 1,         !- Name
    Mixed Air Node 1,        !- Mixed_Air_Node
    Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
    Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
    VAV Sys 1 Inlet Node;    !- Return_Air_Stream_Node


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER LIST ===========

SYSTEM AVAILABILITY MANAGER LIST,
    VAV Sys 1 Avail List,    !- Name
    SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
    VAV Sys 1 Avail;         !- System Availability Manager Name 1


!-   ===========  ALL OBJECTS IN CLASS: SYSTEM AVAILABILITY MANAGER:SCHEDULED ===========

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
    VAV Sys 1 Avail,         !- Name
    FanAvailSched;           !- Schedule name


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:SCHEDULED ===========

SET POINT MANAGER:SCHEDULED,
    Hot Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    HW Loop Temp Schedule,   !- Schedule Name
    Hot Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Chilled Water Loop Setpoint Manager,  !- Name
    TEMP,                    !- Control variable
    CW Loop Temp Schedule,   !- Schedule Name
    Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

SET POINT MANAGER:SCHEDULED,
    Supply Air Temp Manager 1,  !- Name
    TEMP,                    !- Control variable
    Seasonal Reset Supply Air Temp Sch,  !- Schedule Name
    Supply Air Temp Nodes 1; !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: SET POINT MANAGER:MIXED AIR ===========

SET POINT MANAGER:MIXED AIR,
```

```
    Mixed Air Temp Manager 1,!- Name
    TEMP,                    !- Control variable:
    VAV Sys 1 Outlet Node,   !- reference set point node name
    Main Heating Coil 1 Outlet Node,  !- fan inlet node name
    VAV Sys 1 Outlet Node,   !- fan outlet node name
    Mixed Air Node 1;        !- Name of the set point Node or Node List


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:SIMPLE ===========

CONTROLLER:SIMPLE,
    Central Cooling Coil Contoller 1,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
    VAV Sys 1 Outlet Node,   !- Control_Node
    Main Cooling Coil 1 Water Inlet Node,  !- Actuator_Node
    0.002,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    autosize,                !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}

CONTROLLER:SIMPLE,
    Central Heating Coil Contoller 1,  !- Name
    TEMP,                    !- Control variable
    Normal,                  !- Action
    FLOW,                    !- Actuator variable
    VAV Sys 1 Outlet Node,   !- Control_Node
    Main Heating Coil 1 Water Inlet Node,  !- Actuator_Node
    0.002,                   !- Controller Convergence Tolerance: delta temp from setpoint temp
{deltaC}
    autosize,                !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLER:OUTSIDE AIR ===========

CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    ECONOMIZER,              !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    autosize,                !- minimum outside air flow rate {m3/s}
    autosize,                !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    VAV Sys 1 Inlet Node,    !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: CONTROLLED ZONE EQUIP CONFIGURATION ===========

CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE1-1,                !- Zone Name
    SPACE1-1 Eq,             !- List Name: Zone Equipment
    SPACE1-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    SPACE1-1 Node,           !- Zone Air Node Name
    SPACE1-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE2-1,                !- Zone Name
    SPACE2-1 Eq,             !- List Name: Zone Equipment
    SPACE2-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
```

```
    SPACE2-1 Node,           !- Zone Air Node Name
    SPACE2-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE3-1,                !- Zone Name
    SPACE3-1 Eq,             !- List Name: Zone Equipment
    SPACE3-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    SPACE3-1 Node,           !- Zone Air Node Name
    SPACE3-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE4-1,                !- Zone Name
    SPACE4-1 Eq,             !- List Name: Zone Equipment
    SPACE4-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    SPACE4-1 Node,           !- Zone Air Node Name
    SPACE4-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE5-1,                !- Zone Name
    SPACE5-1 Eq,             !- List Name: Zone Equipment
    SPACE5-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    SPACE5-1 Node,           !- Zone Air Node Name
    SPACE5-1 Out Node;       !- Zone Return Air Node Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE EQUIPMENT LIST ===========

ZONE EQUIPMENT LIST,
    SPACE1-1 Eq,             !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    SPACE1-1 ATU,            !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1

ZONE EQUIPMENT LIST,
    SPACE2-1 Eq,             !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    SPACE2-1 ATU,            !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1

ZONE EQUIPMENT LIST,
    SPACE3-1 Eq,             !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    SPACE3-1 ATU,            !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1

ZONE EQUIPMENT LIST,
    SPACE4-1 Eq,             !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    SPACE4-1 ATU,            !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1

ZONE EQUIPMENT LIST,
    SPACE5-1 Eq,             !- Name
    AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
    SPACE5-1 ATU,            !- Type Name 1
    1,                       !- Cooling Priority 1
    1;                       !- Heating Priority 1


!-   ===========  ALL OBJECTS IN CLASS: AIR DISTRIBUTION UNIT ===========

AIR DISTRIBUTION UNIT,
    SPACE1-1 ATU,            !- Air Distribution Unit Name
    SPACE1-1 In Node,        !- Air Dist Unit Outlet Node Name
```

```
    SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
    SPACE1-1 VAV Reheat;     !- Component Name 1

AIR DISTRIBUTION UNIT,
    SPACE2-1 ATU,            !- Air Distribution Unit Name
    SPACE2-1 In Node,        !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
    SPACE2-1 VAV Reheat;     !- Component Name 1

AIR DISTRIBUTION UNIT,
    SPACE3-1 ATU,            !- Air Distribution Unit Name
    SPACE3-1 In Node,        !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
    SPACE3-1 VAV Reheat;     !- Component Name 1

AIR DISTRIBUTION UNIT,
    SPACE4-1 ATU,            !- Air Distribution Unit Name
    SPACE4-1 In Node,        !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
    SPACE4-1 VAV Reheat;     !- Component Name 1

AIR DISTRIBUTION UNIT,
    SPACE5-1 ATU,            !- Air Distribution Unit Name
    SPACE5-1 In Node,        !- Air Dist Unit Outlet Node Name
    SINGLE DUCT:VAV:REHEAT,  !- KEY--System Component Type 1
    SPACE5-1 VAV Reheat;     !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:VAV:REHEAT ===========

SINGLE DUCT:VAV:REHEAT,
    SPACE5-1 VAV Reheat,     !- Name of System
    ReheatCoilAvailSched,    !- System Availability schedule
    SPACE5-1 Zone Coil Air In Node,  !- DAMPER Air Outlet Node
    SPACE5-1 ATU In Node,    !- UNIT Air Inlet Node
    autosize,                !- Maximum air flow rate {m3/s}
    0.3,                     !- Zone Minimum Air Flow Fraction
    SPACE5-1 Zone Coil Water In Node,  !- Control node
    COIL:Water:SimpleHeating,!- Reheat Component Object
    SPACE5-1 Zone Coil,      !- Name of Reheat Component
    autosize,                !- Max Reheat Water Flow {m3/s}
    0.0,                     !- Min Reheat Water Flow {m3/s}
    SPACE5-1 In Node,        !- UNIT Air Outlet Node
    0.001,                   !- Convergence Tolerance
    REVERSE ACTION;          !- Damper Heating Action


!-   ===========  ALL OBJECTS IN CLASS: SINGLE DUCT:VAV:REHEAT:VS FAN ===========

SINGLE DUCT:VAV:REHEAT:VS FAN,
    SPACE1-1 VAV Reheat,     !- Name of unit
    ReheatCoilAvailSched,    !- System availability schedule
    autosize,                !- Maximum cooling air volume flow rate {m3/s}
    autosize,                !- Maximum heating air volume flow rate {m3/s}
    0.05,                    !- Zone Minimum Air Flow Fraction
    SPACE1-1 ATU In Node,    !- Unit supply air inlet node
    SPACE1-1 In Node,        !- Unit supply air outlet node
    SPACE1-1 Zone Coil Air In Node,  !- heating coil air inlet node
    SPACE1-1 Zone Coil Water In Node,  !- Hot water control node
    FAN:SIMPLE:VariableVolume,  !- Fan object
    SPACE1-1 Zone Fan,       !- Fan name
    COIL:Water:SimpleHeating,!- Heating coil object
    SPACE1-1 Zone Coil,      !- Heating coil name
    autosize,                !- Max hot water flow {m3/s}
    0.0,                     !- Min hot water flow {m3/s}
    0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
    SPACE2-1 VAV Reheat,     !- Name of unit
    ReheatCoilAvailSched,    !- System availability schedule
    autosize,                !- Maximum cooling air volume flow rate {m3/s}
```

```
    autosize,                !- Maximum heating air volume flow rate {m3/s}
    0.05,                    !- Zone Minimum Air Flow Fraction
    SPACE2-1 ATU In Node,    !- Unit supply air inlet node
    SPACE2-1 In Node,        !- Unit supply air outlet node
    SPACE2-1 Zone Coil Air In Node,  !- heating coil air inlet node
    SPACE2-1 Zone Coil Water In Node,  !- Hot water control node
    FAN:SIMPLE:VariableVolume,  !- Fan object
    SPACE2-1 Zone Fan,       !- Fan name
    COIL:Water:SimpleHeating,!- Heating coil object
    SPACE2-1 Zone Coil,      !- Heating coil name
    autosize,                !- Max hot water flow {m3/s}
    0.0,                     !- Min hot water flow {m3/s}
    0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
    SPACE3-1 VAV Reheat,     !- Name of unit
    ReheatCoilAvailSched,    !- System availability schedule
    autosize,                !- Maximum cooling air volume flow rate {m3/s}
    autosize,                !- Maximum heating air volume flow rate {m3/s}
    0.05,                    !- Zone Minimum Air Flow Fraction
    SPACE3-1 ATU In Node,    !- Unit supply air inlet node
    SPACE3-1 In Node,        !- Unit supply air outlet node
    SPACE3-1 Zone Coil Air In Node,  !- heating coil air inlet node
    SPACE3-1 Zone Coil Water In Node,  !- Hot water control node
    FAN:SIMPLE:VariableVolume,  !- Fan object
    SPACE3-1 Zone Fan,       !- Fan name
    COIL:Water:SimpleHeating,!- Heating coil object
    SPACE3-1 Zone Coil,      !- Heating coil name
    autosize,                !- Max hot water flow {m3/s}
    0.0,                     !- Min hot water flow {m3/s}
    0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
    SPACE4-1 VAV Reheat,     !- Name of unit
    ReheatCoilAvailSched,    !- System availability schedule
    autosize,                !- Maximum cooling air volume flow rate {m3/s}
    autosize,                !- Maximum heating air volume flow rate {m3/s}
    0.05,                    !- Zone Minimum Air Flow Fraction
    SPACE4-1 ATU In Node,    !- Unit supply air inlet node
    SPACE4-1 In Node,        !- Unit supply air outlet node
    SPACE4-1 Zone Coil Air In Node,  !- heating coil air inlet node
    SPACE4-1 Zone Coil Water In Node,  !- Hot water control node
    FAN:SIMPLE:VariableVolume,  !- Fan object
    SPACE4-1 Zone Fan,       !- Fan name
    COIL:Water:SimpleHeating,!- Heating coil object
    SPACE4-1 Zone Coil,      !- Heating coil name
    autosize,                !- Max hot water flow {m3/s}
    0.0,                     !- Min hot water flow {m3/s}
    0.001;                   !- Heating Convergence Tolerance


!-   ===========  ALL OBJECTS IN CLASS: ZONE CONTROL:THERMOSTATIC ===========

ZONE CONTROL:THERMOSTATIC,
    SPACE1-1 Control,        !- Thermostat Name
    SPACE1-1,                !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Cooling Setpoint, !- Control Type #1
    CoolingSetPoint,         !- Control Type Name #1
    Single Heating Setpoint, !- Control Type #2
    HeatingSetpoint,         !- Control Type Name #2
    Dual Setpoint with Deadband,  !- Control Type #3
    DualSetPoint;            !- Control Type Name #3

ZONE CONTROL:THERMOSTATIC,
    SPACE2-1 Control,        !- Thermostat Name
    SPACE2-1,                !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Cooling Setpoint, !- Control Type #1
    CoolingSetPoint,         !- Control Type Name #1
    Single Heating Setpoint, !- Control Type #2
```

```
    HeatingSetpoint,         !- Control Type Name #2
    Dual Setpoint with Deadband,  !- Control Type #3
    DualSetPoint;            !- Control Type Name #3

ZONE CONTROL:THERMOSTATIC,
    SPACE3-1 Control,        !- Thermostat Name
    SPACE3-1,                !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Cooling Setpoint, !- Control Type #1
    CoolingSetPoint,         !- Control Type Name #1
    Single Heating Setpoint, !- Control Type #2
    HeatingSetpoint,         !- Control Type Name #2
    Dual Setpoint with Deadband,  !- Control Type #3
    DualSetPoint;            !- Control Type Name #3

ZONE CONTROL:THERMOSTATIC,
    SPACE4-1 Control,        !- Thermostat Name
    SPACE4-1,                !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Cooling Setpoint, !- Control Type #1
    CoolingSetPoint,         !- Control Type Name #1
    Single Heating Setpoint, !- Control Type #2
    HeatingSetpoint,         !- Control Type Name #2
    Dual Setpoint with Deadband,  !- Control Type #3
    DualSetPoint;            !- Control Type Name #3

ZONE CONTROL:THERMOSTATIC,
    SPACE5-1 Control,        !- Thermostat Name
    SPACE5-1,                !- Zone Name
    Zone Control Type Sched, !- Control Type SCHEDULE Name
    Single Cooling Setpoint, !- Control Type #1
    CoolingSetPoint,         !- Control Type Name #1
    Single Heating Setpoint, !- Control Type #2
    HeatingSetpoint,         !- Control Type Name #2
    Dual Setpoint with Deadband,  !- Control Type #3
    DualSetPoint;            !- Control Type Name #3


!-   ===========  ALL OBJECTS IN CLASS: SINGLE HEATING SETPOINT ===========

SINGLE HEATING SETPOINT,
    HeatingSetpoint,         !- Name
    Htg-SetP-Sch;            !- Setpoint Temperature SCHEDULE Name

SINGLE HEATING SETPOINT,
    PlenumHeatingSetpoint,   !- Name
    PlenumHtg-SetP-Sch;      !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: SINGLE COOLING SETPOINT ===========

SINGLE COOLING SETPOINT,
    CoolingSetpoint,         !- Name
    Clg-SetP-Sch;            !- Setpoint Temperature SCHEDULE Name

SINGLE COOLING SETPOINT,
    PlenumCoolingSetpoint,   !- Name
    PlenumClg-SetP-Sch;      !- Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: DUAL SETPOINT WITH DEADBAND ===========

DUAL SETPOINT WITH DEADBAND,
    DualSetPoint,            !- Name
    Htg-SetP-Sch,            !- Heating Setpoint Temperature SCHEDULE Name
    Clg-SetP-Sch;            !- Cooling Setpoint Temperature SCHEDULE Name


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY AIR PATH ===========

ZONE SUPPLY AIR PATH,
```

```
    Zone Supply Air Path 1,  !- Supply Air Path Name
    Zone Eq In Node,         !- Supply Air Path Inlet Node
    Zone Supply Plenum,      !- KEY--System Component Type 1
    Supply-Plenum-1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN AIR PATH ===========

ZONE RETURN AIR PATH,
    ReturnAirPath1,          !- Return Air Path Name
    PLENUM-1 Out Node,       !- Return Air Path Outlet Node
    Zone Return Plenum,      !- KEY--System Component Type 1
    Return-Plenum-1;         !- Component Name 1


!-   ===========  ALL OBJECTS IN CLASS: ZONE RETURN PLENUM ===========

ZONE RETURN PLENUM,
    Return-Plenum-1,         !- Zone Plenum Name
    PLENUM-1,                !- Zone Name
    PLENUM-1 Node,           !- Zone Node Name
    PLENUM-1 Out Node,       !- Outlet_Node
    SPACE1-1 Out Node,       !- Inlet_Node_1
    SPACE2-1 Out Node,       !- Inlet_Node_2
    SPACE3-1 Out Node,       !- Inlet_Node_3
    SPACE4-1 Out Node,       !- Inlet_Node_4
    SPACE5-1 Out Node;       !- Inlet_Node_5


!-   ===========  ALL OBJECTS IN CLASS: ZONE SUPPLY PLENUM ===========

ZONE SUPPLY PLENUM,
    Supply-Plenum-1,         !- Zone Plenum Name
    Sup-PLENUM-1,            !- Zone Name
    Sup-PLENUM-1 Zone Node,  !- Zone Node Name
    Zone Eq In Node,         !- Inlet_Node
    SPACE1-1 ATU In Node,    !- Outlet_Node_1
    SPACE2-1 ATU In Node,    !- Outlet_Node_2
    SPACE3-1 ATU In Node,    !- Outlet_Node_3
    SPACE4-1 ATU In Node,    !- Outlet_Node_4
    SPACE5-1 ATU In Node;    !- Outlet_Node_5


!-   ===========  ALL OBJECTS IN CLASS: BOILER:SIMPLE ===========

BOILER:SIMPLE,
    Central Boiler,          !- Boiler Name
    NaturalGas,              !- Fuel Type
    autosize,                !- Nominal Capacity {W}
    0.8,                     !- Theoretical Boiler Efficiency
    81.,                     !- Design Boiler Water Outlet Temp {C}
    autosize,                !- Max Design Boiler Water Flow Rate {m3/s}
    0.0,                     !- Minimum Part Load Ratio
    1.2,                     !- Maximum Part Load Ratio
    1.0,                     !- Opt Part Load Ratio
    1.0,                     !- Coefficient1 of the fuel use/part load ratio curve
    0.0,                     !- Coefficient2 of the fuel use/part load ratio curve
    0.0,                     !- Coefficient3 of the fuel use/part load ratio curve
    Central Boiler Inlet Node,  !- Boiler_Water_Inlet_Node
    Central Boiler Outlet Node,  !- Boiler_Water_Outlet_Node
    100.,                    !- Temp Upper Limit Water Outlet {C}
    VariableFlow;            !- Boiler Flow Mode


!-   ===========  ALL OBJECTS IN CLASS: CHILLER:ELECTRIC ===========

CHILLER:ELECTRIC,
    Central Chiller,         !- Chiller Name
    WATER COOLED,            !- Condenser Type
    autosize,                !- Nominal Capacity {W}
    3.2,                     !- COP
```

```
    Central Chiller Inlet Node,  !- Plant_Side_Inlet_Node
    Central Chiller Outlet Node,  !- Plant_Side_Outlet_Node
    Central Chiller Condenser Inlet Node,  !- Condenser_Side_Inlet_Node
    Central Chiller Condenser Outlet Node,  !- Condenser_Side_Outlet_Node
    0.0,                      !- Minimum Part Load Ratio
    1.0,                      !- Maximum Part Load Ratio
    0.65,                     !- Opt Part Load Ratio
    29.44,                    !- Temp Design Condenser Inlet {C}
    2.682759,                 !- Temp Rise Coefficient
    6.667,                    !- Temp Design Evaporator Outlet {C}
    autosize,                 !- Design Evaporator Volumetric Water Flow Rate {m3/s}
    autosize,                 !- Design Condenser Volumetric Water Flow Rate {m3/s}
    0.94483600,               !- Coefficient1 of the capacity ratio curve
    -.05700880,               !- Coefficient2 of the capacity ratio curve
    -.00185486,               !- Coefficient3 of the capacity ratio curve
    1.907846,                 !- Coefficient1 of the power ratio curve
    -1.20498700,              !- Coefficient2 of the power ratio curve
    0.26346230,               !- Coefficient3 of the power ratio curve
    0.03303,                  !- Coefficient1 of the full load ratio curve
    0.6852,                   !- Coefficient2 of the full load ratio curve
    0.2818,                   !- Coefficient3 of the full load ratio curve
    5,                        !- Temp Lower Limit Evaporator Outlet {C}
    VariableFlow;             !- Chiller Flow Mode


!-   ===========  ALL OBJECTS IN CLASS: COOLING TOWER:SINGLE SPEED ===========

COOLING TOWER:SINGLE SPEED,
    Central Tower,            !- Tower Name
    Condenser Tower Inlet Node,  !- Water Inlet Node Name
    Condenser Tower Outlet Node,  !- Water Outlet Node Name
    autosize,                 !- Design Water Flow Rate {m3/s}
    autosize,                 !- Design Air Flow Rate {m3/s}
    autosize,                 !- Fan Power at Design Air Flow Rate {W}
    autosize,                 !- Tower UA Value at Design Air Flow Rate {W/K}
    0.0,                      !- Air Flow Rate in Free Convection Regime {m3/s}
    0.0;                      !- Tower UA Value at Free Convection Air Flow Rate {W/K}


!-   ===========  ALL OBJECTS IN CLASS: PUMP:VARIABLE SPEED ===========

PUMP:VARIABLE SPEED,
    HW Circ Pump,             !- Pump Name
    HW Supply Inlet Node,     !- Inlet_Node
    HW Pump Outlet Node,      !- Outlet_Node
    autosize,                 !- Rated Volumetric Flow Rate {m3/s}
    179352,                   !- Rated Pump Head {Pa}
    autosize,                 !- Rated Power Consumption {W}
    0.9,                      !- Motor Efficiency
    0.0,                      !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                        !- Coefficient1 of the Part Load Performance Curve
    1,                        !- Coefficient2 of the Part Load Performance Curve
    0,                        !- Coefficient3 of the Part Load Performance Curve
    0,                        !- Coefficient4 of the Part Load Performance Curve
    0,                        !- Min Flow Rate while operating in variable flow capacity {m3/s}
    INTERMITTENT;             !- Pump Control Type

PUMP:VARIABLE SPEED,
    CW Circ Pump,             !- Pump Name
    CW Supply Inlet Node,     !- Inlet_Node
    CW Pump Outlet Node,      !- Outlet_Node
    autosize,                 !- Rated Volumetric Flow Rate {m3/s}
    179352,                   !- Rated Pump Head {Pa}
    autosize,                 !- Rated Power Consumption {W}
    0.9,                      !- Motor Efficiency
    0.0,                      !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                        !- Coefficient1 of the Part Load Performance Curve
    1,                        !- Coefficient2 of the Part Load Performance Curve
    0,                        !- Coefficient3 of the Part Load Performance Curve
    0,                        !- Coefficient4 of the Part Load Performance Curve
    0,                        !- Min Flow Rate while operating in variable flow capacity {m3/s}
```

```
    INTERMITTENT,            !- Pump Control Type
    CoolingPumpAvailSched;   !- Pump Flow Rate Schedule Name

PUMP:VARIABLE SPEED,
    Cond Circ Pump,          !- Pump Name
    Condenser Supply Inlet Node,  !- Inlet_Node
    Condenser Pump Outlet Node,  !- Outlet_Node
    autosize,                !- Rated Volumetric Flow Rate {m3/s}
    179352,                  !- Rated Pump Head {Pa}
    autosize,                !- Rated Power Consumption {W}
    0.9,                     !- Motor Efficiency
    0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
    0,                       !- Coefficient1 of the Part Load Performance Curve
    1,                       !- Coefficient2 of the Part Load Performance Curve
    0,                       !- Coefficient3 of the Part Load Performance Curve
    0,                       !- Coefficient4 of the Part Load Performance Curve
    0,                       !- Min Flow Rate while operating in variable flow capacity {m3/s}
    INTERMITTENT,            !- Pump Control Type
    CoolingPumpAvailSched;   !- Pump Flow Rate Schedule Name


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:SIMPLEHEATING ===========

COIL:Water:SimpleHeating,
    SPACE1-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE1-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE1-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE1-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
    SPACE1-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
    SPACE2-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE2-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE2-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE2-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
    SPACE2-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
    SPACE3-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE3-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE3-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE3-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
    SPACE3-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
    SPACE4-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE4-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE4-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE4-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
    SPACE4-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
    SPACE5-1 Zone Coil,      !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    SPACE5-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
    SPACE5-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
    SPACE5-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
```

```
    SPACE5-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
    Main Heating Coil 1,     !- Coil Name
    ReheatCoilAvailSched,    !- Available Schedule
    autosize,                !- UA of the Coil {W/K}
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    Main Heating Coil 1 Water Inlet Node,  !- Coil_Water_Inlet_Node
    Main Heating Coil 1 Water Outlet Node,  !- Coil_Water_Outlet_Node
    Main Cooling Coil 1 Outlet Node,  !- Coil_Air_Inlet_Node
    Main Heating Coil 1 Outlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: COIL:WATER:DETAILEDFLATCOOLING ===========

COIL:Water:DetailedFlatCooling,
    Main Cooling Coil 1,     !- Coil Name
    CoolingCoilAvailSched,   !- Available Schedule
    autosize,                !- Max Water Flow Rate of Coil {m3/s}
    autosize,                !- Tube Outside Surf Area {m2}
    autosize,                !- Total Tube Inside Area {m2}
    autosize,                !- Fin Surface Area {m2}
    autosize,                !- Minimum Air Flow Area {m2}
    autosize,                !- Coil Depth {m}
    autosize,                !- Fin Diameter {m}
    ,                        !- Fin Thickness {m}
    ,                        !- Tube Inside Diameter {m}
    ,                        !- Tube Outside Diameter {m}
    ,                        !- Tube Thermal Conductivity {W/m-K}
    ,                        !- Fin Thermal Conductivity {W/m-K}
    ,                        !- Fin Spacing {m}
    ,                        !- Tube Depth Spacing {m}
    ,                        !- Number of Tube Rows
    autosize,                !- Number of Tubes per Row
    Main Cooling Coil 1 Water Inlet Node,  !- Coil_Water_Inlet_Node
    Main Cooling Coil 1 Water Outlet Node,  !- Coil_Water_Outlet_Node
    Mixed Air Node 1,        !- Coil_Air_Inlet_Node
    Main Cooling Coil 1 Outlet Node;  !- Coil_Air_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: FAN:SIMPLE:VARIABLEVOLUME ===========

FAN:SIMPLE:VariableVolume,
    SPACE1-1 Zone Fan,       !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    125.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    0.0,                     !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    SPACE1-1 ATU In Node,    !- Fan_Inlet_Node
    SPACE1-1 Zone Coil Air In Node;  !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
    SPACE2-1 Zone Fan,       !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    125.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    0.0,                     !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
```

```
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    SPACE2-1 ATU In Node,    !- Fan_Inlet_Node
    SPACE2-1 Zone Coil Air In Node;  !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
    SPACE3-1 Zone Fan,       !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    125.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    0.0,                     !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    SPACE3-1 ATU In Node,    !- Fan_Inlet_Node
    SPACE3-1 Zone Coil Air In Node;  !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
    SPACE4-1 Zone Fan,       !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    125.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    0.0,                     !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    SPACE4-1 ATU In Node,    !- Fan_Inlet_Node
    SPACE4-1 Zone Coil Air In Node;  !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
    Supply Fan 1,            !- Fan Name
    FanAvailSched,           !- Available Schedule
    0.7,                     !- Fan Total Efficiency
    250.0,                   !- Delta Pressure {Pa}
    autosize,                !- Max Flow Rate {m3/s}
    autosize,                !- Min Flow Rate {m3/s}
    0.9,                     !- Motor Efficiency
    1.0,                     !- Motor In Airstream Fraction
    0.00153028,              !- FanCoefficient 1
    0.00520806,              !- FanCoefficient 2
    1.1086242,               !- FanCoefficient 3
    -.11635563,              !- FanCoefficient 4
    0.000,                   !- FanCoefficient 5
    Main Heating Coil 1 Outlet Node,  !- Fan_Inlet_Node
    VAV Sys 1 Outlet Node;   !- Fan_Outlet_Node


!-   ===========  ALL OBJECTS IN CLASS: REPORT VARIABLE ===========

Report Variable,
    *,                       !- Key_Value
    Outdoor Dry Bulb,        !- Variable_Name
    hourly,                  !- Reporting_Frequency
    ReportSch;               !- Schedule_Name

Report Variable,
    *,                       !- Key_Value
    Zone/Sys Air Temperature,!- Variable_Name
    hourly,                  !- Reporting_Frequency
    ReportSch;               !- Schedule_Name
```

```
Report Variable,
    *,                        !- Key_Value
    Zone/Sys Sensible Cooling Rate,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    Zone/Sys Sensible Heating Rate,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    Zone/Sys Sensible Load Predicted,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Thermostat Temperature,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Occupied Subzone Temperature,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Mixed Subzone Temperature,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Transition Height,     !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Zone Is Mixed,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF Gamma,                 !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF UCSD Sys Flow Rate,    !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF UCSD Power In Plumes,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    UF UCSD Plume Power from Windows,  !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name
```

```
Report Variable,
    *,                        !- Key_Value
    UF UCSD Supply Air Temp, !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    Mixed Air Node 1,         !- Key_Value
    System Node Temp,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    Main Cooling Coil 1 Outlet Node,  !- Key_Value
    System Node Temp,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    Main Heating Coil 1 Outlet Node,  !- Key_Value
    System Node Temp,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    VAV Sys 1 Outlet Node,    !- Key_Value
    System Node Temp,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    VAV Sys 1 Outlet Node,    !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    SPACE5-1 ATU In Node,     !- Key_Value
    System Node Temp,         !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    SPACE5-1 ATU In Node,     !- Key_Value
    System Node MassFlowRate,!- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name

Report Variable,
    *,                        !- Key_Value
    Damper Position,          !- Variable_Name
    hourly,                   !- Reporting_Frequency
    ReportSch;                !- Schedule_Name


!-   ===========  ALL OBJECTS IN CLASS: REPORT ===========

Report,
    Variable Dictionary;      !- Type_of_Report

Report,
    surfaces,                 !- Type_of_Report
    dxf;                      !- Name_of_Report
```

B.2 5ZONESUPRETPLENRAB.IDF

Table 22 contains an example inputs that illustrate the use of a Return Air Bypass configuration in a five zone model.

Table 22: Inputs for 5 zone model with return air bypass

```
! 5ZoneSupRetPlenRAB.idf
! Basic file description:  1 story building divided into 4 exterior and one interior conditioned
zones,
!                         supply and return plenum.
!
! Highlights:              illustrates supply plenum, UFAD inputs, variable-speed fan VAV reheat
terminal units,
!                         and return air bypass.
!
! Simulation Location/Run: CHICAGO_IL_USA TMY2-94846, 2 design days, 2 run periods,
!                         Run Control executes the run periods using the weather file
!
! Location:                Chicago, IL
!
! Design Days:             CHICAGO_IL_USA Annual Heating 99% Design Conditions DB, MaxDB= -17.3°C
!                         CHICAGO_IL_USA Annual Cooling 1% Design Conditions, MaxDB=  31.5°C
MCWB=  23.0°C
!
! Run Period (Weather File): Winter 1/14, Summer 7/7, CHICAGO_IL_USA TMY2-94846
!
! Run Control:             Zone and System sizing with weather file run control (no design days
run)
!
! Building: Single floor rectangular building 100 ft x 50 ft. 5 zones - 4 exterior, 1 interior,
zone height 8 feet.
!           Exterior zone depth is 12 feet. There is a 2 foot high return plenum. There is a 18
inch high supply plenum.
!           There are windows on all 4 facades; the south and north
!           facades have glass doors. The south facing glass is shaded by overhangs. The walls are
woodshingle
!           over plywood, R11 insulation, and gypboard. The roof is a gravel built up roof with R-
3 mineral
!           board insulation and plywood sheathing. The windows are of various single and double
pane construction
!           with 3mm and 6mm glass and either 6mm or 13mm argon or air gap.  The window to wall
ratio is approxomately
!           0.29. The south wall and door have overhangs.
!
!           The building is oriented 30 degrees east of north.
!
! Floor Area:        463.6 m2 (5000 ft2)
! Number of Stories: 1
!
! Zone Description Details:
!
!      (0,15.2,0)                      (30.5,15.2,0)
!          _____  ________                 ____
!         |\     ***        ***************   /|
!         | \                                / |
!         |  \                (26.8,11.6,0) /  |
!         *   \_____________________________/   *
!         *    |(3.7,11.6,0)                |    *
!         *    |                            |    *
!         *    |                            |    *
!         *    |               (26.8,3.7,0)|    *
!         *    |____________________________|    *
!         *   / (3.7,3.7,0)                 \   *
!         |  /                               \  |
!         | /                                 \ |
!         |/___******************___***________\|
!          |       Overhang        |   |
!          |_______________________|   |   window/door = *
!                                  |___|
!
!      (0,0,0)                           (30.5,0,0)
!
! Internal gains description:     lighting is 1.5 watts/ft2, office equip is 1.0 watts/ft2. There
is 1 occupant
```

```
!                                 per 100 ft2 of floor area. The infiltration is 0.25 air changes
per hour.
!
! Interzone Surfaces:             6 interzone surfaces (see diagram)
! Internal Mass:                  None
! People:                         50
! Lights:                         7500 W
! Windows:                        4 ea.: 1) Double pane clear, 3mm glass, 13mm air gap
!                                        2) Double pane clear, 3mm glass, 13mm argon gap
!                                        3) Double pane clear, 6mm glass, 6mm air gap
!                                        4) Double pane lowE,  6mm lowE glass outside, 6mm air
gap, 6mm clear glass
!
! Doors:                          2 ea.:    Single pane grey,  3mm glass
!
! Detached Shading:               None
! Daylight:                       None
! Natural Ventilation:            None
! Compact Schedules:              None
!
! HVAC:                           VAV system with outside air economizer, hot water reheat coils,
!                                 central chilled water cooling coil. Central Plant is single hot
water
!                                 boiler, electric compression chiller with water cooled
condenser, and
!                                 a cooling tower. All equipment is autosized.
!
!                                 The following changes have been made to reflect UFAD practice.
!                                 The zone thermostat cooling setpoints have been raised to 25C
from
!                                 23.9C to reflect zone temperature change with height. The fan
static
!                                 pressure has been lowered to 250 Pa from 600 Pa. The supply air
temperature
!                                 has been raised to 17.2C from 13C. The chilled water supply
temperature
!                                 has been increased from 7.22C to 11C.
!
!                                 The interior zone is served by a normal VAV reheat air terminal
unit; the exterior
!                                 zones are served by a variable-speed fan powered VAV reheat
terminal unit!
!
!                                 There is a return air bypass duct in this example; this allows
better control
!                                 of zone humidities: nonbypassed air can be cooled sufficiently
to drive out
!                                 moisture; then this cold dry air can be tempered by mixing with
bypassed return
!                                 air.
!
! Zonal Equipment:                SINGLE DUCT:VAV:REHEAT
! Central Air Handling Equipment: Yes
! System Equipment Autosize:      Yes
! Purchased Cooling:              None
! Purchased Heating:              None
! Coils:                          COIL:Water:DetailedFlatCooling, COIL:WATER:SIMPLEHEATING
! Pumps:                          PUMP:VARIABLE SPEED
! Boilers:                        BOILER:SIMPLE
! Chillers:                       CHILLER:ELECTRIC
! Towers:                         COOLING TOWER:SINGLE SPEED
!
! Results:
! Standard Reports:               None
! Timestep or Hourly Variables:   Hourly
! Time bins Report:               None
! HTML Report:                    None
! Environmental Emissions:        None
! Utility Tariffs:                None

  VERSION,
```

```
   1.4;                     !- Version Identifier

 BUILDING,
   Building,                !- Building Name
   30.,                     !- North Axis {deg}
   City,                    !- Terrain
   0.04,                    !- Loads Convergence Tolerance Value {W}
   0.4,                     !- Temperature Convergence Tolerance Value {deltaC}
   FullExterior,            !- Solar Distribution
   25;                      !- Maximum Number of Warmup Days

 TIMESTEP IN HOUR,
   4;                       !- Time Step in Hour

 INSIDE CONVECTION ALGORITHM,
   Simple;                  !- InsideConvectionValue

 OUTSIDE CONVECTION ALGORITHM,
   Simple;                  !- OutsideConvectionValue

 SOLUTION ALGORITHM,
   CTF;                     !- SolutionAlgo

 ZONE VOLUME CAPACITANCE MULTIPLIER,
   1;                       !- Capacitance Multiplier

 RUN CONTROL,
   Yes,                     !- Do the zone sizing calculation
   Yes,                     !- Do the system sizing calculation
   No,                      !- Do the plant sizing calculation
   No,                      !- Do the design day simulations
   Yes;                     !- Do the weather file simulation

 RunPeriod,
   1,                       !- Begin Month
   14,                      !- Begin Day Of Month
   1,                       !- End Month
   14,                      !- End Day Of Month
   Tuesday,                 !- Day Of Week For Start Day
   Yes,                     !- Use WeatherFile Holidays/Special Days
   Yes,                     !- Use WeatherFile DaylightSavingPeriod
   No,                      !- Apply Weekend Holiday Rule
   Yes,                     !- Use WeatherFile Rain Indicators
   Yes;                     !- Use WeatherFile Snow Indicators

 RunPeriod,
   7,                       !- Begin Month
   7,                       !- Begin Day Of Month
   7,                       !- End Month
   7,                       !- End Day Of Month
   Tuesday,                 !- Day Of Week For Start Day
   Yes,                     !- Use WeatherFile Holidays/Special Days
   Yes,                     !- Use WeatherFile DaylightSavingPeriod
   No,                      !- Apply Weekend Holiday Rule
   Yes,                     !- Use WeatherFile Rain Indicators
   Yes;                     !- Use WeatherFile Snow Indicators

Location,
 CHICAGO_IL_USA TMY2-94846,     !- Location Name
     41.78,     !- Latitude {N+ S-}
    -87.75,     !- Longitude {W- E+}
     -6.00,     !- Time Zone Relative to GMT {GMT+/-}
    190.00;     !- Elevation {m}


!-   ===========  ALL OBJECTS IN CLASS: DESIGNDAY ===========

 ! CHICAGO_IL_USA Annual Heating 99% Design Conditions DB, MaxDB= -17.3°C
 DesignDay,
     CHICAGO_IL_USA Annual Heating 99% Design Conditions DB,     !- Name
      -17.3,      !- Max Dry-Bulb {C}
```

```
       0.0,      !- Daily Temp Range {C}
     -17.3,      !- Wet-Bulb at Max {C}
    99063.,      !- Barometric Pressure {Pa}
       4.9,      !- Wind Speed {m/s} design conditions vs. traditional 6.71 m/s (15 mph)
       270,      !- Wind Direction {Degrees; N=0, S=180}
       0.0,      !- Clearness {0.0 to 1.1}
         0,      !- Rain {0-no,1-yes}
         0,      !- Snow on ground {0-no,1-yes}
        21,      !- Day of Month
         1,      !- Month
 WinterDesignDay,!- Day Type
         0,      !- Daylight Savings Time Indicator
  Wet-Bulb;      !- Humidity Indicating Temperature Type

! CHICAGO_IL_USA Annual Cooling 1% Design Conditions, MaxDB=  31.5°C MCWB=  23.0°C
DesignDay,
    CHICAGO_IL_USA Annual Cooling 1% Design Conditions DB/MCWB,     !- Name
      31.5,      !- Max Dry-Bulb {C}
      10.7,      !- Daily Temp Range {C}
      23.0,      !- Wet-Bulb at Max {C}
    99063.,      !- Barometric Pressure {Pa}
       5.3,      !- Wind Speed {m/s} design conditions vs. traditional 3.35 m/s (7mph)
       230,      !- Wind Direction {Degrees; N=0, S=180}
       1.0,      !- Clearness {0.0 to 1.1}
         0,      !- Rain {0-no,1-yes}
         0,      !- Snow on ground {0-no,1-yes}
        21,      !- Day of Month
         7,      !- Month
 SummerDesignDay,!- Day Type
         0,      !- Daylight Savings Time Indicator
  Wet-Bulb;      !- Humidity Indicating Temperature Type

 GroundTemperatures,
   20.03,                   !- January Ground Temperature {C}
   20.03,                   !- February Ground Temperature {C}
   20.13,                   !- March Ground Temperature {C}
   20.30,                   !- April Ground Temperature {C}
   20.43,                   !- May Ground Temperature {C}
   20.52,                   !- June Ground Temperature {C}
   20.62,                   !- July Ground Temperature {C}
   20.77,                   !- August Ground Temperature {C}
   20.78,                   !- September Ground Temperature {C}
   20.55,                   !- October Ground Temperature {C}
   20.44,                   !- November Ground Temperature {C}
   20.20;                   !- December Ground Temperature {C}

 MATERIAL:REGULAR,
   WD10,                    !- Name
   MediumSmooth,            !- Roughness
   0.667,                   !- Thickness {m}
   0.115,                   !- Conductivity {W/m-K}
   513,                     !- Density {kg/m3}
   1381,                    !- Specific Heat {J/kg-K}
   0.9,                     !- Absorptance:Thermal
   0.78,                    !- Absorptance:Solar
   0.78;                    !- Absorptance:Visible

 MATERIAL:REGULAR,
   RG01,                    !- Name
   Rough,                   !- Roughness
   1.2700000E-02,           !- Thickness {m}
   1.442000,                !- Conductivity {W/m-K}
   881.0000,                !- Density {kg/m3}
   1674.000,                !- Specific Heat {J/kg-K}
   0.9000000,               !- Absorptance:Thermal
   0.6500000,               !- Absorptance:Solar
   0.6500000;               !- Absorptance:Visible

 MATERIAL:REGULAR,
   BR01,                    !- Name
   VeryRough,               !- Roughness
```

```
  9.4999997E-03,           !- Thickness {m}
  0.1620000,               !- Conductivity {W/m-K}
  1121.000,                !- Density {kg/m3}
  1464.000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.7000000,               !- Absorptance:Solar
  0.7000000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  IN46,                    !- Name
  VeryRough,               !- Roughness
  7.6200001E-02,           !- Thickness {m}
  2.3000000E-02,           !- Conductivity {W/m-K}
  24.00000,                !- Density {kg/m3}
  1590.000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.5000000,               !- Absorptance:Solar
  0.5000000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  WD01,                    !- Name
  MediumSmooth,            !- Roughness
  1.9099999E-02,           !- Thickness {m}
  0.1150000,               !- Conductivity {W/m-K}
  513.0000,                !- Density {kg/m3}
  1381.000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.7800000,               !- Absorptance:Solar
  0.7800000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  PW03,                    !- Name
  MediumSmooth,            !- Roughness
  1.2700000E-02,           !- Thickness {m}
  0.1150000,               !- Conductivity {W/m-K}
  545.0000,                !- Density {kg/m3}
  1213.000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.7800000,               !- Absorptance:Solar
  0.7800000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  IN02,                    !- Name
  Rough,                   !- Roughness
  9.0099998E-02,           !- Thickness {m}
  4.3000001E-02,           !- Conductivity {W/m-K}
  10.00000,                !- Density {kg/m3}
  837.0000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.7500000,               !- Absorptance:Solar
  0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  GP01,                    !- Name
  MediumSmooth,            !- Roughness
  1.2700000E-02,           !- Thickness {m}
  0.1600000,               !- Conductivity {W/m-K}
  801.0000,                !- Density {kg/m3}
  837.0000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.7500000,               !- Absorptance:Solar
  0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  GP02,                    !- Name
  MediumSmooth,            !- Roughness
  1.5900001E-02,           !- Thickness {m}
  0.1600000,               !- Conductivity {W/m-K}
  801.0000,                !- Density {kg/m3}
  837.0000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
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  0.7500000,               !- Absorptance:Solar
  0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR,
  CC03,                    !- Name
  MediumRough,             !- Roughness
  0.1016000,               !- Thickness {m}
  1.310000,                !- Conductivity {W/m-K}
  2243.000,                !- Density {kg/m3}
  837.0000,                !- Specific Heat {J/kg-K}
  0.9000000,               !- Absorptance:Thermal
  0.6500000,               !- Absorptance:Solar
  0.6500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
  CP01,                    !- Name
  Rough,                   !- Roughness
  0.3670000,               !- Thermal Resistance {m2-K/W}
  0.9000000,               !- Absorptance:Thermal
  0.7500000,               !- Absorptance:Solar
  0.7500000;               !- Absorptance:Visible

MATERIAL:REGULAR-R,
  MAT-SB-U,                !- Name
  Rough,                   !- Roughness
  0.117406666,             !- Thermal Resistance {m2-K/W}
  0.65,                    !- Absorptance:Thermal
  0.65,                    !- Absorptance:Solar
  0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
  MAT-CLNG-1,              !- Name
  Rough,                   !- Roughness
  0.652259290,             !- Thermal Resistance {m2-K/W}
  0.65,                    !- Absorptance:Thermal
  0.65,                    !- Absorptance:Solar
  0.65;                    !- Absorptance:Visible

MATERIAL:REGULAR-R,
  MAT-FLOOR-1,             !- Name
  Rough,                   !- Roughness
  3.522199631,             !- Thermal Resistance {m2-K/W}
  0.65,                    !- Absorptance:Thermal
  0.65,                    !- Absorptance:Solar
  0.65;                    !- Absorptance:Visible

MATERIAL:AIR,
  AL21,                    !- Name
  0.1570000;               !- Thermal Resistance {m2-K/W}

MATERIAL:AIR,
  AL23,                    !- Name
  0.1530000;               !- Thermal Resistance {m2-K/W}

MATERIAL:WINDOWGLASS,
  CLEAR 3MM,               !- Name
  SpectralAverage,         !- Optical Data Type
  ,                        !- Name of Window Glass Spectral Data Set
  .003,                    !- Thickness {m}
  .837,                    !- Solar Transmittance at Normal Incidence
  .075,                    !- Solar Reflectance at Normal Incidence: Front Side
  .075,                    !- Solar Reflectance at Normal Incidence: Back Side
  .898,                    !- Visible Transmittance at Normal Incidence
  .081,                    !- Visible Reflectance at Normal Incidence: Front Side
  .081,                    !- Visible Reflectance at Normal Incidence: Back Side
  .0,                      !- IR Transmittance at Normal Incidence
  .84,                     !- IR Hemispherical Emissivity: Front Side
  .84,                     !- IR Hemispherical Emissivity: Back Side
  .9;                      !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
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  GREY 3MM,                !- Name
  SpectralAverage,         !- Optical Data Type
  ,                        !- Name of Window Glass Spectral Data Set
  .003,                    !- Thickness {m}
  .626,                    !- Solar Transmittance at Normal Incidence
  .061,                    !- Solar Reflectance at Normal Incidence: Front Side
  .061,                    !- Solar Reflectance at Normal Incidence: Back Side
  .611,                    !- Visible Transmittance at Normal Incidence
  .061,                    !- Visible Reflectance at Normal Incidence: Front Side
  .061,                    !- Visible Reflectance at Normal Incidence: Back Side
  .0,                      !- IR Transmittance at Normal Incidence
  .84,                     !- IR Hemispherical Emissivity: Front Side
  .84,                     !- IR Hemispherical Emissivity: Back Side
  .9;                      !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
  CLEAR 6MM,               !- Name
  SpectralAverage,         !- Optical Data Type
  ,                        !- Name of Window Glass Spectral Data Set
  .006,                    !- Thickness {m}
  .775,                    !- Solar Transmittance at Normal Incidence
  .071,                    !- Solar Reflectance at Normal Incidence: Front Side
  .071,                    !- Solar Reflectance at Normal Incidence: Back Side
  .881,                    !- Visible Transmittance at Normal Incidence
  .080,                    !- Visible Reflectance at Normal Incidence: Front Side
  .080,                    !- Visible Reflectance at Normal Incidence: Back Side
  .0,                      !- IR Transmittance at Normal Incidence
  .84,                     !- IR Hemispherical Emissivity: Front Side
  .84,                     !- IR Hemispherical Emissivity: Back Side
  .9;                      !- Conductivity {W/m-K}

MATERIAL:WINDOWGLASS,
  LoE CLEAR 6MM,           !- Name
  SpectralAverage,         !- Optical Data Type
  ,                        !- Name of Window Glass Spectral Data Set
  .006,                    !- Thickness {m}
  .600,                    !- Solar Transmittance at Normal Incidence
  .170,                    !- Solar Reflectance at Normal Incidence: Front Side
  .220,                    !- Solar Reflectance at Normal Incidence: Back Side
  .840,                    !- Visible Transmittance at Normal Incidence
  .055,                    !- Visible Reflectance at Normal Incidence: Front Side
  .078,                    !- Visible Reflectance at Normal Incidence: Back Side
  .0,                      !- IR Transmittance at Normal Incidence
  .84,                     !- IR Hemispherical Emissivity: Front Side
  .10,                     !- IR Hemispherical Emissivity: Back Side
  .9;                      !- Conductivity {W/m-K}

MATERIAL:WINDOWGAS,
  AIR 6MM,                 !- Name
  Air,                     !- Gas Type
  .0063;                   !- Thickness {m}

MATERIAL:WINDOWGAS,
  AIR 13MM,                !- Name
  Air,                     !- Gas Type
  .0127;                   !- Thickness {m}

MATERIAL:WINDOWGAS,
  ARGON 13MM,              !- Name
  Argon,                   !- Gas Type
  .0127;                   !- Thickness {m}

CONSTRUCTION,
  ROOF-1,                  !- Name
  RG01,                    !- Outside Layer
  BR01,                    !- Layer #2
  IN46,                    !- Layer #3
  WD01;                    !- Layer #4

CONSTRUCTION,
  WALL-1,                  !- Name
```

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  WD01,                    !- Outside Layer
  PW03,                    !- Layer #2
  IN02,                    !- Layer #3
  GP01;                    !- Layer #4

CONSTRUCTION,
  CLNG-1,                  !- Name
  MAT-CLNG-1;              !- Outside Layer

CONSTRUCTION,
  SB-U,                    !- Name
  MAT-SB-U;                !- Outside Layer

CONSTRUCTION,
  FLOOR-1,                 !- Name
  MAT-FLOOR-1;             !- Outside Layer

CONSTRUCTION,
  FLOOR-SLAB-1,            !- Name
  CC03;                    !- Outside Layer

CONSTRUCTION,
  INT-WALL-1,              !- Name
  GP02,                    !- Outside Layer
  AL21,                    !- Layer #2
  GP02;                    !- Layer #3

CONSTRUCTION,
  Dbl Clr 3mm/13mm Air,    !- Name
  CLEAR 3MM,               !- Outside Layer
  AIR 13MM,                !- Layer #2
  CLEAR 3MM;               !- Layer #3

CONSTRUCTION,
  Dbl Clr 3mm/13mm Arg,    !- Name
  CLEAR 3MM,               !- Outside Layer
  ARGON 13MM,              !- Layer #2
  CLEAR 3MM;               !- Layer #3

CONSTRUCTION,
  Sgl Grey 3mm,            !- Name
  GREY 3MM;                !- Outside Layer

CONSTRUCTION,
  Dbl Clr 6mm/6mm Air,     !- Name
  CLEAR 6MM,               !- Outside Layer
  AIR 6MM,                 !- Layer #2
  CLEAR 6MM;               !- Layer #3

CONSTRUCTION,
  Dbl LoE (e2=.1) Clr 6mm/6mm Air,  !- Name
  LoE CLEAR 6MM,           !- Outside Layer
  AIR 6MM,                 !- Layer #2
  CLEAR 6MM;               !- Layer #3

ZONE,
  PLENUM-1,                !- Zone Name
  0,                       !- Relative North (to building) {deg}
  0,                       !- X Origin {m}
  0,                       !- Y Origin {m}
  0,                       !- Z Origin {m}
  1,                       !- Type
  1,                       !- Multiplier
  0.609600067,             !- Ceiling Height {m}
  283.2;                   !- Volume {m3}

ZONE,
  SPACE1-1,                !- Zone Name
  0,                       !- Relative North (to building) {deg}
  0,                       !- X Origin {m}
  0,                       !- Y Origin {m}
```

```
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  2.438400269,              !- Ceiling Height {m}
  239.247360229;            !- Volume {m3}

ZONE,
  SPACE2-1,                 !- Zone Name
  0,                        !- Relative North (to building) {deg}
  0,                        !- X Origin {m}
  0,                        !- Y Origin {m}
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  2.438400269,              !- Ceiling Height {m}
  103.311355591;            !- Volume {m3}

ZONE,
  SPACE3-1,                 !- Zone Name
  0,                        !- Relative North (to building) {deg}
  0,                        !- X Origin {m}
  0,                        !- Y Origin {m}
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  2.438400269,              !- Ceiling Height {m}
  239.247360229;            !- Volume {m3}

ZONE,
  SPACE4-1,                 !- Zone Name
  0,                        !- Relative North (to building) {deg}
  0,                        !- X Origin {m}
  0,                        !- Y Origin {m}
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  2.438400269,              !- Ceiling Height {m}
  103.311355591;            !- Volume {m3}

ZONE,
  SPACE5-1,                 !- Zone Name
  0,                        !- Relative North (to building) {deg}
  0,                        !- X Origin {m}
  0,                        !- Y Origin {m}
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  2.438400269,              !- Ceiling Height {m}
  447.682556152;            !- Volume {m3}

ZONE,
  Sup-PLENUM-1,             !- Zone Name
  0,                        !- Relative North (to building) {deg}
  0,                        !- X Origin {m}
  0,                        !- Y Origin {m}
  0,                        !- Z Origin {m}
  1,                        !- Type
  1,                        !- Multiplier
  .45,                      !- Ceiling Height {m}
  208.6;                    !- Volume {m3}

SurfaceGeometry,
  UpperLeftCorner,          !- SurfaceStartingPosition
  CounterClockWise,         !- VertexEntry
  relative;                 !- CoordinateSystem

Surface:HeatTransfer,
  WALL-1PF,                 !- User Supplied Surface Name
  WALL,                     !- Surface Type
  WALL-1,                   !- Construction Name of the Surface
  PLENUM-1,                 !- InsideFaceEnvironment
```

```
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,0.0,3.0,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  30.5,0.0,3.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1PR,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,0.0,3.0,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,3.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1PB,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,3.0,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 3
  0.0,15.2,3.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1PL,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,15.2,3.0,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  0.0,0.0,3.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  TOP-1,                   !- User Supplied Surface Name
  ROOF,                    !- Surface Type
  ROOF-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.00000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,15.2,3.0,  !- X,Y,Z ==> Vertex 1
```

```
  0.0,0.0,3.0,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,3.0,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,3.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C1-1P,                   !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  C1-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C2-1P,                   !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  C2-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C3-1P,                   !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  C3-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C4-1P,                   !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  PLENUM-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  C4-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C5-1P,                   !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
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  CLNG-1,                 !- Construction Name of the Surface
  PLENUM-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  C5-1,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 2
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  FRONT-1,                !- User Supplied Surface Name
  WALL,                   !- Surface Type
  WALL-1,                 !- Construction Name of the Surface
  SPACE1-1,               !- InsideFaceEnvironment
  ExteriorEnvironment,    !- OutsideFaceEnvironment
  ,                       !- OutsideFaceEnvironment Object
  SunExposed,             !- Sun Exposure
  WindExposed,            !- Wind Exposure
  0.50000,                !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  30.5,0.0,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C1-1,                   !- User Supplied Surface Name
  CEILING,                !- Surface Type
  CLNG-1,                 !- Construction Name of the Surface
  SPACE1-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  C1-1P,                  !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F1-1,                   !- User Supplied Surface Name
  FLOOR,                  !- Surface Type
  CLNG-1,                 !- Construction Name of the Surface
  SPACE1-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  F1-1S,                  !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,0.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB12,                   !- User Supplied Surface Name
  WALL,                   !- Surface Type
  INT-WALL-1,             !- Construction Name of the Surface
  SPACE1-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  SB21,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
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  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB14,                     !- User Supplied Surface Name
  WALL,                     !- Surface Type
  INT-WALL-1,               !- Construction Name of the Surface
  SPACE1-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  SB41,                     !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  0.0,0.0,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB15,                     !- User Supplied Surface Name
  WALL,                     !- Surface Type
  INT-WALL-1,               !- Construction Name of the Surface
  SPACE1-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  SB51,                     !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  RIGHT-1,                  !- User Supplied Surface Name
  WALL,                     !- Surface Type
  WALL-1,                   !- Construction Name of the Surface
  SPACE2-1,                 !- InsideFaceEnvironment
  ExteriorEnvironment,      !- OutsideFaceEnvironment
  ,                         !- OutsideFaceEnvironment Object
  SunExposed,               !- Sun Exposure
  WindExposed,              !- Wind Exposure
  0.50000,                  !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C2-1,                     !- User Supplied Surface Name
  CEILING,                  !- Surface Type
  CLNG-1,                   !- Construction Name of the Surface
  SPACE2-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  C2-1P,                    !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,2.4,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
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  F2-1,                    !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  SPACE2-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F2-1S,                   !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,0.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB21,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE2-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB12,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  30.5,0.0,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB23,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE2-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB32,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB25,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE2-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB52,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  BACK-1,                  !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  SPACE3-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
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  WindExposed,              !- Wind Exposure
  0.50000,                  !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  0.0,15.2,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C3-1,                     !- User Supplied Surface Name
  CEILING,                  !- Surface Type
  CLNG-1,                   !- Construction Name of the Surface
  SPACE3-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  C3-1P,                    !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 2
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F3-1,                     !- User Supplied Surface Name
  FLOOR,                    !- Surface Type
  CLNG-1,                   !- Construction Name of the Surface
  SPACE3-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  F3-1S,                    !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 1
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,0.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB32,                     !- User Supplied Surface Name
  WALL,                     !- Surface Type
  INT-WALL-1,               !- Construction Name of the Surface
  SPACE3-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  SB23,                     !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB34,                     !- User Supplied Surface Name
  WALL,                     !- Surface Type
  INT-WALL-1,               !- Construction Name of the Surface
  SPACE3-1,                 !- InsideFaceEnvironment
  OtherZone,                !- OutsideFaceEnvironment
  SB43,                     !- OutsideFaceEnvironment Object
  NoSun,                    !- Sun Exposure
  NoWind,                   !- Wind Exposure
  0.0,                      !- View Factor to Ground
  4,                        !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,2.4;  !- X,Y,Z ==> Vertex 4
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Surface:HeatTransfer,
  SB35,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE3-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB53,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  LEFT-1,                  !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  SPACE4-1,                !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  0.0,0.0,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C4-1,                    !- User Supplied Surface Name
  CEILING,                 !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  SPACE4-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  C4-1P,                   !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,2.4,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F4-1,                    !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  SPACE4-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F4-1S,                   !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,0.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB41,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE4-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
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  SB14,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,0.0,2.4,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB43,                   !- User Supplied Surface Name
  WALL,                   !- Surface Type
  INT-WALL-1,             !- Construction Name of the Surface
  SPACE4-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  SB34,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  0.0,15.2,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB45,                   !- User Supplied Surface Name
  WALL,                   !- Surface Type
  INT-WALL-1,             !- Construction Name of the Surface
  SPACE4-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  SB54,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  C5-1,                   !- User Supplied Surface Name
  CEILING,                !- Surface Type
  CLNG-1,                 !- Construction Name of the Surface
  SPACE5-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  C5-1P,                  !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 2
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F5-1,                   !- User Supplied Surface Name
  FLOOR,                  !- Surface Type
  CLNG-1,                 !- Construction Name of the Surface
  SPACE5-1,               !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  F5-1S,                  !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 1
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 2
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  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,0.0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB51,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE5-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB15,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB52,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE5-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB25,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,3.7,0.0,  !- X,Y,Z ==> Vertex 2
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB53,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE5-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB35,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  26.8,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,11.6,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  SB54,                    !- User Supplied Surface Name
  WALL,                    !- Surface Type
  INT-WALL-1,              !- Construction Name of the Surface
  SPACE5-1,                !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  SB45,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,2.4,  !- X,Y,Z ==> Vertex 1
  3.7,11.6,0.0,  !- X,Y,Z ==> Vertex 2
  3.7,3.7,0.0,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1SF,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
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  Sup-PLENUM-1,            !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,0.0,0,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,-0.45,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,-0.45,  !- X,Y,Z ==> Vertex 3
  30.5,0.0,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1SR,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,0.0,0,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,-0.45,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,-0.45,  !- X,Y,Z ==> Vertex 3
  30.5,15.2,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1SB,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,0,  !- X,Y,Z ==> Vertex 1
  30.5,15.2,-0.45,  !- X,Y,Z ==> Vertex 2
  0.0,15.2,-0.45,  !- X,Y,Z ==> Vertex 3
  0.0,15.2,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  WALL-1SL,                !- User Supplied Surface Name
  WALL,                    !- Surface Type
  WALL-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  ExteriorEnvironment,     !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  SunExposed,              !- Sun Exposure
  WindExposed,             !- Wind Exposure
  0.50000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,15.2,0,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,-0.45,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,-0.45,  !- X,Y,Z ==> Vertex 3
  0.0,0.0,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  BOTTOM-1,                !- User Supplied Surface Name
  FLOOR,                   !- Surface Type
  FLOOR-SLAB-1,            !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  Ground,                  !- OutsideFaceEnvironment
  ,                        !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.00000,                 !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
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  30.5,15.2,-0.45,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,-0.45,  !- X,Y,Z ==> Vertex 2
  0,0.0,-0.45,  !- X,Y,Z ==> Vertex 3
  0,15.2,-0.45;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F1-1S,                   !- User Supplied Surface Name
  CEILING,                 !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F1-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,3.7,0,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,0,  !- X,Y,Z ==> Vertex 2
  30.5,0.0,0,  !- X,Y,Z ==> Vertex 3
  26.8,3.7,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F2-1S,                   !- User Supplied Surface Name
  CEILING,                 !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F2-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  26.8,3.7,0,  !- X,Y,Z ==> Vertex 1
  30.5,0.0,0,  !- X,Y,Z ==> Vertex 2
  30.5,15.2,0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F3-1S,                   !- User Supplied Surface Name
  CEILING,                 !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F3-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,15.2,0,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,0,  !- X,Y,Z ==> Vertex 2
  3.7,11.6,0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F4-1S,                   !- User Supplied Surface Name
  CEILING,                 !- Surface Type
  CLNG-1,                  !- Construction Name of the Surface
  Sup-PLENUM-1,            !- InsideFaceEnvironment
  OtherZone,               !- OutsideFaceEnvironment
  F4-1,                    !- OutsideFaceEnvironment Object
  NoSun,                   !- Sun Exposure
  NoWind,                  !- Wind Exposure
  0.0,                     !- View Factor to Ground
  4,                       !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,0,  !- X,Y,Z ==> Vertex 1
  0.0,15.2,0,  !- X,Y,Z ==> Vertex 2
  0.0,0.0,0,  !- X,Y,Z ==> Vertex 3
  3.7,3.7,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer,
  F5-1S,                   !- User Supplied Surface Name
```

```
  CEILING,                !- Surface Type
  CLNG-1,                 !- Construction Name of the Surface
  Sup-PLENUM-1,           !- InsideFaceEnvironment
  OtherZone,              !- OutsideFaceEnvironment
  F5-1,                   !- OutsideFaceEnvironment Object
  NoSun,                  !- Sun Exposure
  NoWind,                 !- Wind Exposure
  0.0,                    !- View Factor to Ground
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.7,11.6,0,  !- X,Y,Z ==> Vertex 1
  3.7,3.7,0,  !- X,Y,Z ==> Vertex 2
  26.8,3.7,0,  !- X,Y,Z ==> Vertex 3
  26.8,11.6,0;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  WF-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Dbl Clr 3mm/13mm Air,   !- Construction Name of the Surface
  FRONT-1,                !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  3.0,0.0,2.1,  !- X,Y,Z ==> Vertex 1
  3.0,0.0,0.9,  !- X,Y,Z ==> Vertex 2
  16.8,0.0,0.9,  !- X,Y,Z ==> Vertex 3
  16.8,0.0,2.1;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  DF-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Sgl Grey 3mm,           !- Construction Name of the Surface
  FRONT-1,                !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  21.3,0.0,2.4,  !- X,Y,Z ==> Vertex 1
  21.3,0.0,0.0,  !- X,Y,Z ==> Vertex 2
  23.8,0.0,0.0,  !- X,Y,Z ==> Vertex 3
  23.8,0.0,2.4;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  WR-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Dbl Clr 3mm/13mm Air,   !- Construction Name of the Surface
  RIGHT-1,                !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  30.5,3.8,2.1,  !- X,Y,Z ==> Vertex 1
  30.5,3.8,0.9,  !- X,Y,Z ==> Vertex 2
  30.5,11.4,0.9,  !- X,Y,Z ==> Vertex 3
  30.5,11.4,2.1;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  WB-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Dbl Clr 3mm/13mm Air,   !- Construction Name of the Surface
  BACK-1,                 !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
```

```
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  27.4,15.2,2.1,  !- X,Y,Z ==> Vertex 1
  27.4,15.2,0.9,  !- X,Y,Z ==> Vertex 2
  13.7,15.2,0.9,  !- X,Y,Z ==> Vertex 3
  13.7,15.2,2.1;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  DB-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Sgl Grey 3mm,           !- Construction Name of the Surface
  BACK-1,                 !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  9.1,15.2,2.1,  !- X,Y,Z ==> Vertex 1
  9.1,15.2,0.0,  !- X,Y,Z ==> Vertex 2
  7.0,15.2,0.0,  !- X,Y,Z ==> Vertex 3
  7.0,15.2,2.1;  !- X,Y,Z ==> Vertex 4

Surface:HeatTransfer:Sub,
  WL-1,                   !- User Supplied Surface Name
  WINDOW,                 !- Surface Type
  Dbl Clr 3mm/13mm Air,   !- Construction Name of the Surface
  LEFT-1,                 !- Base Surface Name
  ,                       !- OutsideFaceEnvironment Object
  0.50000,                !- View Factor to Ground
  ,                       !- Name of shading control
  ,                       !- WindowFrameAndDivider Name
  1,                      !- Multiplier
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,11.4,2.1,  !- X,Y,Z ==> Vertex 1
  0.0,11.4,0.9,  !- X,Y,Z ==> Vertex 2
  0.0,3.8,0.9,  !- X,Y,Z ==> Vertex 3
  0.0,3.8,2.1;  !- X,Y,Z ==> Vertex 4

Surface:Shading:Attached,
  Main South Overhang,    !- User Supplied Surface Name
  FRONT-1,                !- Base Surface Name
  ShadeTransSch,          !- TransSchedShadowSurf
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  0.0,-1.3,2.2,  !- X,Y,Z ==> Vertex 1
  0.0,0.0,2.2,  !- X,Y,Z ==> Vertex 2
  19.8,0.0,2.2,  !- X,Y,Z ==> Vertex 3
  19.8,-1.3,2.2;  !- X,Y,Z ==> Vertex 4

Surface:Shading:Attached,
  South Door Overhang,    !- User Supplied Surface Name
  FRONT-1,                !- Base Surface Name
  ShadeTransSch,          !- TransSchedShadowSurf
  4,                      !- Number of Surface Vertex Groups -- Number of (X,Y,Z) groups
  21.0,-2.0,2.6,  !- X,Y,Z ==> Vertex 1
  21.0,0.0,2.6,  !- X,Y,Z ==> Vertex 2
  24.1,0.0,2.6,  !- X,Y,Z ==> Vertex 3
  24.1,-2.0,2.6;  !- X,Y,Z ==> Vertex 4

ScheduleType,
  Any Number;             !- ScheduleType Name

ScheduleType,
  Fraction,               !- ScheduleType Name
  0.0 : 1.0,              !- range
  CONTINUOUS;             !- Numeric Type

ScheduleType,
  Temperature,            !- ScheduleType Name
  -60:200,                !- range
  CONTINUOUS;             !- Numeric Type
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ScheduleType,
  Control Type,            !- ScheduleType Name
  0:4,                     !- range
  DISCRETE;                !- Numeric Type

ScheduleType,
  On/Off,                  !- ScheduleType Name
  0:1,                     !- range
  DISCRETE;                !- Numeric Type

ScheduleType,
  FlowRate,                !- ScheduleType Name
  0.0:10,                  !- range
  CONTINUOUS;              !- Numeric Type

 SCHEDULE:COMPACT,
  OCCUPY-1,                !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekdays SummerDesignDay WinterDesignDay, !- Complex Field #2
  Until: 9:00,             !- Complex Field #3
  0.0,                     !- Complex Field #4
  Until: 12:00,            !- Complex Field #5
  1.0,                     !- Complex Field #6
  Until: 13:00,            !- Complex Field #7
  0.8,                     !- Complex Field #8
  Until: 14:00,            !- Complex Field #9
  0.4,                     !- Complex Field #10
  Until: 15:00,            !- Complex Field #11
  0.8,                     !- Complex Field #12
  Until: 17:00,            !- Complex Field #13
  1.0,                     !- Complex Field #14
  Until: 24:00,            !- Complex Field #19
  0.0,                     !- Complex Field #20
  For: AllOtherDays,       !- Complex Field #21
  Until: 24:00,            !- Complex Field #22
  0.0;                     !- Complex Field #23

 SCHEDULE:COMPACT,
  LIGHTS-1,                !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekdays SummerDesignDay WinterDesignDay, !- Complex Field #2
  Until: 9:00,             !- Complex Field #3
  0.05,                    !- Complex Field #4
  Until: 10:00,            !- Complex Field #5
  0.9,                     !- Complex Field #6
  Until: 11:00,            !- Complex Field #7
  0.95,                    !- Complex Field #8
  Until: 12:00,            !- Complex Field #9
  1.0,                     !- Complex Field #10
  Until: 13:00,            !- Complex Field #11
  0.95,                    !- Complex Field #12
  Until: 14:00,            !- Complex Field #13
  0.8,                     !- Complex Field #14
  Until: 15:00,            !- Complex Field #15
  0.9,                     !- Complex Field #16
  Until: 17:00,            !- Complex Field #17
  1.0,                     !- Complex Field #18
  Until: 24:00,            !- Complex Field #23
  0.05,                    !- Complex Field #24
  For: AllOtherDays,       !- Complex Field #25
  Until: 24:00,            !- Complex Field #26
  0.05;                    !- Complex Field #27

 SCHEDULE:COMPACT,
  EQUIP-1,                 !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekdays SummerDesignDay WinterDesignDay, !- Complex Field #2
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  Until: 9:00,             !- Complex Field #3
  0.02,                    !- Complex Field #4
  Until: 10:00,            !- Complex Field #5
  0.4,                     !- Complex Field #6
  Until: 15:00,            !- Complex Field #7
  0.9,                     !- Complex Field #8
  Until: 16:00,            !- Complex Field #9
  0.8,                     !- Complex Field #10
  Until: 17:00,            !- Complex Field #11
  0.7,                     !- Complex Field #12
  Until: 24:00,            !- Complex Field #17
  0.02,                    !- Complex Field #18
  For: CustomDay1 CustomDay2,           !- Complex Field #2
  Until: 9:00,             !- Complex Field #3
  0.02,                    !- Complex Field #4
  Until: 10:00,            !- Complex Field #5
  0.4,                     !- Complex Field #6
  Until: 15:00,            !- Complex Field #7
  0.9,                     !- Complex Field #8
  Until: 16:00,            !- Complex Field #9
  0.8,                     !- Complex Field #10
  Until: 17:00,            !- Complex Field #11
  0.7,                     !- Complex Field #12
  Until: 24:00,            !- Complex Field #17
  0.02,                    !- Complex Field #18
  For: AllOtherDays,       !- Complex Field #19
  Until: 24:00,            !- Complex Field #20
  0.2;                     !- Complex Field #21

SCHEDULE:COMPACT,
  INFIL-SCH,               !- Name
  Fraction,                !- ScheduleType
  Through: 3/31,           !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  1.0,                     !- Complex Field #4
  Through: 10/31,          !- Complex Field #5
  For: Alldays,            !- Complex Field #6
  Until: 24:00,            !- Complex Field #7
  0.0,                     !- Complex Field #8
  Through: 12/31,          !- Complex Field #9
  For: Alldays,            !- Complex Field #10
  Until: 24:00,            !- Complex Field #11
  1.0;                     !- Complex Field #12

SCHEDULE:COMPACT,
  ActSchd,                 !- Name
  Any Number,              !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  117.239997864;           !- Complex Field #4

SCHEDULE:COMPACT,
  ShadeTransSch,           !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  0.0;                     !- Complex Field #4

SCHEDULE:COMPACT,
  Htg-SetP-Sch,            !- Name
  Temperature,             !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekends HoliDay,   !- Complex Field #2
  Until: 7:00,             !- Complex Field #3
  12.8,                    !- Complex Field #4
  Until: 14:00,            !- Complex Field #5
  21.1,                    !- Complex Field #6
  Until: 24:00,            !- Complex Field #7
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  12.8,                    !- Complex Field #8
  For: SummerDesignDay,    !- Complex Field #9
  Until: 24:00,            !- Complex Field #10
  21.1,                    !- Complex Field #11
  For: WinterDesignDay,    !- Complex Field #12
  Until: 24:00,            !- Complex Field #13
  21.1,                    !- Complex Field #14
  For: AllOtherDays,       !- Complex Field #15
  Until: 7:00,             !- Complex Field #16
  12.8,                    !- Complex Field #17
  Until: 19:00,            !- Complex Field #18
  21.1,                    !- Complex Field #19
  Until: 24:00,            !- Complex Field #20
  12.8;                    !- Complex Field #21

SCHEDULE:COMPACT,
  Clg-SetP-Sch,            !- Name
  Temperature,             !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekends HoliDay,   !- Complex Field #2
  Until: 7:00,             !- Complex Field #3
  40.0,                    !- Complex Field #4
  Until: 14:00,            !- Complex Field #5
  25.0,                    !- Complex Field #6
  Until: 24:00,            !- Complex Field #7
  32.2,                    !- Complex Field #8
  For: SummerDesignDay,    !- Complex Field #9
  Until: 24:00,            !- Complex Field #10
  25.0,                    !- Complex Field #11
  For: WinterDesignDay,    !- Complex Field #12
  Until: 24:00,            !- Complex Field #13
  25.0,                    !- Complex Field #14
  For: AllOtherDays,       !- Complex Field #15
  Until: 7:00,             !- Complex Field #16
  40.0,                    !- Complex Field #17
  Until: 19:00,            !- Complex Field #18
  25.0,                    !- Complex Field #19
  Until: 24:00,            !- Complex Field #20
  40.0;                    !- Complex Field #21

SCHEDULE:COMPACT,
  Zone Control Type Sched, !- Name
  Control Type,            !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: AllDays,            !- Complex Field #8
  Until: 24:00,            !- Complex Field #9
  4;                       !- Complex Field #10

SCHEDULE:COMPACT,
  Min OA Sched,            !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #1
  For: Weekdays SummerDesignDay WinterDesignDay, !- Complex Field #2
  Until: 7:00,             !- Complex Field #3
  0.02,                    !- Complex Field #4
  Until: 19:00,            !- Complex Field #5
  1.0,                     !- Complex Field #6
  Until: 24:00,            !- Complex Field #7
  0.02,                    !- Complex Field #8
  For: AllOtherDays,       !- Complex Field #9
  Until: 24:00,            !- Complex Field #10
  0.02;                    !- Complex Field #11

SCHEDULE:COMPACT,
  FanAvailSched,           !- Name
  Fraction,                !- ScheduleType
  Through: 3/31,           !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  1.0,                     !- Complex Field #4
  Through: 9/30,           !- Complex Field #5
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   For: Weekdays,           !- Complex Field #6
   Until: 7:00,             !- Complex Field #7
   0.0,                     !- Complex Field #8
   Until: 18:00,            !- Complex Field #9
   1.0,                     !- Complex Field #10
   Until: 24:00,            !- Complex Field #11
   0.0,                     !- Complex Field #12
   For: Weekends Holidays CustomDay1 CustomDay2, !- Complex Field #13
   Until: 24:00,            !- Complex Field #14
   0.0,                     !- Complex Field #15
   For: AllOtherDays,       !- Complex Field #16
   Until: 24:00,            !- Complex Field #17
   1.0,                     !- Complex Field #18
   Through: 12/31,          !- Complex Field #19
   For: Alldays,            !- Complex Field #20
   Until: 24:00,            !- Complex Field #21
   1.0;                     !- Complex Field #22

  SCHEDULE:COMPACT,
   CW Loop Temp Schedule,   !- Name
   Temperature,             !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   11.0;                    !- Complex Field #4

  SCHEDULE:COMPACT,
   HW Loop Temp Schedule,   !- Name
   Temperature,             !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   82.0;                    !- Complex Field #4

  SCHEDULE:COMPACT,
   PlantOnSched,            !- Name
   Fraction,                !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   1.0;                     !- Complex Field #4

  SCHEDULE:COMPACT,
   Seasonal Reset Supply Air Temp Sch,  !- Name
   Temperature,             !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   17.2;                    !- Complex Field #4

  SCHEDULE:COMPACT,
   Heating Supply Air Temp Sch,  !- Name
   Temperature,             !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   10.0;                    !- Complex Field #4

  SCHEDULE:COMPACT,
   Dehum Supply Air Temp Sch,  !- Name
   Temperature,             !- ScheduleType
   Through: 12/31,          !- Complex Field #1
   For: Alldays,            !- Complex Field #2
   Until: 24:00,            !- Complex Field #3
   12.0;                    !- Complex Field #4

  SCHEDULE:COMPACT,
   CoolingCoilAvailSched,   !- Name
   Fraction,                !- ScheduleType
   Through: 12/31,          !- Complex Field #9
   For: Alldays,            !- Complex Field #10
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  Until: 24:00,            !- Complex Field #11
  1.0;                     !- Complex Field #12

 SCHEDULE:COMPACT,
  CoolingPumpAvailSched,   !- Name
  Fraction,                !- ScheduleType
  Through: 12/31,          !- Complex Field #9
  For: Alldays,            !- Complex Field #10
  Until: 24:00,            !- Complex Field #11
  1.0;                     !- Complex Field #12

 SCHEDULE:COMPACT,
  HeatingCoilAvailSched,   !- Name
  Fraction,                !- ScheduleType
  Through: 3/31,           !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  1.0,                     !- Complex Field #4
  Through: 9/30,           !- Complex Field #5
  For: Alldays,            !- Complex Field #6
  Until: 24:00,            !- Complex Field #7
  0.0,                     !- Complex Field #8
  Through: 12/31,          !- Complex Field #9
  For: Alldays,            !- Complex Field #10
  Until: 24:00,            !- Complex Field #11
  1.0;                     !- Complex Field #12

 SCHEDULE:COMPACT,
  ReheatCoilAvailSched,    !- Name
  Fraction,                !- ScheduleType
  Through: 3/31,           !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  1.0,                     !- Complex Field #4
  Through: 9/30,           !- Complex Field #5
  For: Weekdays,           !- Complex Field #6
  Until: 7:00,             !- Complex Field #7
  0.0,                     !- Complex Field #8
  Until: 18:00,            !- Complex Field #9
  1.0,                     !- Complex Field #10
  Until: 24:00,            !- Complex Field #11
  0.0,                     !- Complex Field #12
  For: Weekends Holidays CustomDay1 CustomDay2, !- Complex Field #13
  Until: 24:00,            !- Complex Field #14
  0.0,                     !- Complex Field #15
  For: AllOtherDays,       !- Complex Field #16
  Until: 24:00,            !- Complex Field #17
  1.0,                     !- Complex Field #18
  Through: 12/31,          !- Complex Field #19
  For: Alldays,            !- Complex Field #20
  Until: 24:00,            !- Complex Field #21
  1.0;                     !- Complex Field #22


 SCHEDULE:COMPACT,
  ReportSch,               !- Name
  On/Off,                  !- ScheduleType
  Through: 1/13,           !- Complex Field #1
  For: Alldays,            !- Complex Field #2
  Until: 24:00,            !- Complex Field #3
  0.0,                     !- Complex Field #4
  Through: 1/14,           !- Complex Field #5
  For: Alldays,
  Until: 24:00,
  1.0,
  Through: 7/6,
  For: Alldays,
  Until: 24:00,
  0.0,
  Through: 7/9,
  For: Alldays,
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  Until: 24:00,
  1.0,
  Through: 12/31,
  For: Alldays,
  Until: 24:00,
  0.0;

PEOPLE,
  SPACE1-1 People 1,       !- Name
  SPACE1-1,                !- Zone Name
  11,                      !- Number of People
  OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
  0.3,                     !- Fraction Radiant
  ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
  SPACE2-1 People 1,       !- Name
  SPACE2-1,                !- Zone Name
  5,                       !- Number of People
  OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
  0.3,                     !- Fraction Radiant
  ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
  SPACE3-1 People 1,       !- Name
  SPACE3-1,                !- Zone Name
  11,                      !- Number of People
  OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
  0.3,                     !- Fraction Radiant
  ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
  SPACE4-1 People 1,       !- Name
  SPACE4-1,                !- Zone Name
  5,                       !- Number of People
  OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
  0.3,                     !- Fraction Radiant
  ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

PEOPLE,
  SPACE5-1 People 1,       !- Name
  SPACE5-1,                !- Zone Name
  20,                      !- Number of People
  OCCUPY-1,                !- Number of People SCHEDULE Name (real--fraction)
  0.3,                     !- Fraction Radiant
  ActSchd;                 !- Activity level SCHEDULE Name (units W/person, real)

LIGHTS,
  SPACE1-1 Lights 1,       !- Name
  SPACE1-1,                !- Zone Name
  LIGHTS-1,                !- SCHEDULE Name
  1584,                    !- Design Level {W}
  0.2,                     !- Return Air Fraction
  0.59,                    !- Fraction Radiant
  0.2,                     !- Fraction Visible
  0,                       !- Fraction Replaceable
  GeneralLights;           !- LightsEndUseKey

LIGHTS,
  SPACE2-1 Lights 1,       !- Name
  SPACE2-1,                !- Zone Name
  LIGHTS-1,                !- SCHEDULE Name
  684,                     !- Design Level {W}
  0.2,                     !- Return Air Fraction
  0.59,                    !- Fraction Radiant
  0.2,                     !- Fraction Visible
  0,                       !- Fraction Replaceable
  GeneralLights;           !- LightsEndUseKey

LIGHTS,
  SPACE3-1 Lights 1,       !- Name
```

```
  SPACE3-1,                !- Zone Name
  LIGHTS-1,                !- SCHEDULE Name
  1584,                    !- Design Level {W}
  0.2,                     !- Return Air Fraction
  0.59,                    !- Fraction Radiant
  0.2,                     !- Fraction Visible
  0,                       !- Fraction Replaceable
  GeneralLights;           !- LightsEndUseKey

LIGHTS,
  SPACE4-1 Lights 1,       !- Name
  SPACE4-1,                !- Zone Name
  LIGHTS-1,                !- SCHEDULE Name
  684,                     !- Design Level {W}
  0.2,                     !- Return Air Fraction
  0.59,                    !- Fraction Radiant
  0.2,                     !- Fraction Visible
  0,                       !- Fraction Replaceable
  GeneralLights;           !- LightsEndUseKey

LIGHTS,
  SPACE5-1 Lights 1,       !- Name
  SPACE5-1,                !- Zone Name
  LIGHTS-1,                !- SCHEDULE Name
  2964,                    !- Design Level {W}
  0.2,                     !- Return Air Fraction
  0.59,                    !- Fraction Radiant
  0.2,                     !- Fraction Visible
  0,                       !- Fraction Replaceable
  GeneralLights;           !- LightsEndUseKey

ELECTRIC EQUIPMENT,
  SPACE1-1 ElecEq 1,       !- Name
  SPACE1-1,                !- Zone Name
  EQUIP-1,                 !- SCHEDULE Name
  1056,                    !- Design Level {W}
  0,                       !- Fraction Latent
  0.3,                     !- Fraction Radiant
  0;  !- Fraction Lost


ELECTRIC EQUIPMENT,
  SPACE2-1 ElecEq 1,       !- Name
  SPACE2-1,                !- Zone Name
  EQUIP-1,                 !- SCHEDULE Name
  456,                     !- Design Level {W}
  0,                       !- Fraction Latent
  0.3,                     !- Fraction Radiant
  0;  !- Fraction Lost


ELECTRIC EQUIPMENT,
  SPACE3-1 ElecEq 1,       !- Name
  SPACE3-1,                !- Zone Name
  EQUIP-1,                 !- SCHEDULE Name
  1056,                    !- Design Level {W}
  0,                       !- Fraction Latent
  0.3,                     !- Fraction Radiant
  0;  !- Fraction Lost


ELECTRIC EQUIPMENT,
  SPACE4-1 ElecEq 1,       !- Name
  SPACE4-1,                !- Zone Name
  EQUIP-1,                 !- SCHEDULE Name
  456,                     !- Design Level {W}
  0,                       !- Fraction Latent
  0.3,                     !- Fraction Radiant
  0;  !- Fraction Lost
```

```
ELECTRIC EQUIPMENT,
  SPACE5-1 ElecEq 1,       !- Name
  SPACE5-1,                !- Zone Name
  EQUIP-1,                 !- SCHEDULE Name
  1976,                    !- Design Level {W}
  0,                       !- Fraction Latent
  0.3,                     !- Fraction Radiant
  0;  !- Fraction Lost


INFILTRATION,
  SPACE1-1 Infil 1,        !- Name
  SPACE1-1,                !- Zone Name
  INFIL-SCH,               !- SCHEDULE Name
  0.0167,                  !- Design Volume Flow Rate {m3/s}
  0,                       !- Constant Term Coefficient
  0,                       !- Temperature Term Coefficient
  0.2237,                  !- Velocity Term Coefficient
  0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
  SPACE2-1 Infil 1,        !- Name
  SPACE2-1,                !- Zone Name
  INFIL-SCH,               !- SCHEDULE Name
  .00717,                  !- Design Volume Flow Rate {m3/s}
  0,                       !- Constant Term Coefficient
  0,                       !- Temperature Term Coefficient
  0.2237,                  !- Velocity Term Coefficient
  0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
  SPACE3-1 Infil 1,        !- Name
  SPACE3-1,                !- Zone Name
  INFIL-SCH,               !- SCHEDULE Name
  0.0167,                  !- Design Volume Flow Rate {m3/s}
  0,                       !- Constant Term Coefficient
  0,                       !- Temperature Term Coefficient
  0.2237,                  !- Velocity Term Coefficient
  0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
  SPACE4-1 Infil 1,        !- Name
  SPACE4-1,                !- Zone Name
  INFIL-SCH,               !- SCHEDULE Name
  .00717,                  !- Design Volume Flow Rate {m3/s}
  0,                       !- Constant Term Coefficient
  0,                       !- Temperature Term Coefficient
  0.2237,                  !- Velocity Term Coefficient
  0;                       !- Velocity Squared Term Coefficient

INFILTRATION,
  SPACE5-1 Infil 1,        !- Name
  SPACE5-1,                !- Zone Name
  INFIL-SCH,               !- SCHEDULE Name
  .031089,                 !- Design Volume Flow Rate {m3/s}
  0,                       !- Constant Term Coefficient
  0,                       !- Temperature Term Coefficient
  0.2237,                  !- Velocity Term Coefficient
  0;                       !- Velocity Squared Term Coefficient

SIZING PARAMETERS,
  1.3,                     !- sizing factor
  4;                       !- time steps in averaging window

ZONE SIZING,
  SPACE1-1,                !- Name of a zone
  18.,                     !- Zone cooling design supply air temperature {C}
  50.,                     !- Zone heating design supply air temperature {C}
  0.009,                   !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.004,                   !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
  flow/person,             !- outside air method
```

```
  0.00944,                !- outside air flow per person {m3/s}
  0.0,                    !- outside air flow {m3/s}
  0.0,                    !- zone sizing factor
  design day,             !- cooling design air flow method
  0,                      !- cooling design air flow rate {m3/s}
  design day,             !- heating design air flow method
  0;                      !- heating design air flow rate {m3/s}

ZONE SIZING,
  SPACE2-1,               !- Name of a zone
  18.,                    !- Zone cooling design supply air temperature {C}
  50.,                    !- Zone heating design supply air temperature {C}
  0.009,                  !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.004,                  !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
  flow/person,            !- outside air method
  0.00944,                !- outside air flow per person {m3/s}
  0.0,                    !- outside air flow {m3/s}
  0.0,                    !- zone sizing factor
  design day,             !- cooling design air flow method
  0,                      !- cooling design air flow rate {m3/s}
  design day,             !- heating design air flow method
  0;                      !- heating design air flow rate {m3/s}

ZONE SIZING,
  SPACE3-1,               !- Name of a zone
  18.,                    !- Zone cooling design supply air temperature {C}
  50.,                    !- Zone heating design supply air temperature {C}
  0.009,                  !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.004,                  !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
  flow/person,            !- outside air method
  0.00944,                !- outside air flow per person {m3/s}
  0.0,                    !- outside air flow {m3/s}
  0.0,                    !- zone sizing factor
  design day,             !- cooling design air flow method
  0,                      !- cooling design air flow rate {m3/s}
  design day,             !- heating design air flow method
  0;                      !- heating design air flow rate {m3/s}

ZONE SIZING,
  SPACE4-1,               !- Name of a zone
  18.,                    !- Zone cooling design supply air temperature {C}
  50.,                    !- Zone heating design supply air temperature {C}
  0.009,                  !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.004,                  !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
  flow/person,            !- outside air method
  0.00944,                !- outside air flow per person {m3/s}
  0.0,                    !- outside air flow {m3/s}
  0.0,                    !- zone sizing factor
  design day,             !- cooling design air flow method
  0,                      !- cooling design air flow rate {m3/s}
  design day,             !- heating design air flow method
  0;                      !- heating design air flow rate {m3/s}

ZONE SIZING,
  SPACE5-1,               !- Name of a zone
  18.,                    !- Zone cooling design supply air temperature {C}
  50.,                    !- Zone heating design supply air temperature {C}
  0.009,                  !- Zone cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.004,                  !- Zone heating design supply air humidity ratio {kg-H2O/kg-air}
  flow/person,            !- outside air method
  0.00944,                !- outside air flow per person {m3/s}
  0.0,                    !- outside air flow {m3/s}
  0.0,                    !- zone sizing factor
  design day,             !- cooling design air flow method
  0,                      !- cooling design air flow rate {m3/s}
  design day,             !- heating design air flow method
  0;                      !- heating design air flow rate {m3/s}

SYSTEM SIZING,
  VAV Sys 1,              !- name of an AIR PRIMARY LOOP object
  sensible,               !- type of load to size on
```

```
  autosize,                !- Design (minimum) outside air volumetric flow rate {m3/s}
  0.3,                     !- minimum system air flow ratio
  7.0,                     !- Preheat design set temperature {C}
  12.0,                    !- Central cooling design supply air temperature {C}
  10.0,                    !- Central heating design supply air temperature {C}
  noncoincident,           !- Sizing Option
  no,                      !- Cooling 100% Outside Air
  no,                      !- Heating 100% Outside Air
  0.008,                   !- Central cooling design supply air humidity ratio {kg-H2O/kg-air}
  0.008,                   !- Central heating design supply air humidity ratio {kg-H2O/kg-air}
  design day,              !- cooling design air flow method
  0,                       !- cooling design air flow rate {m3/s}
  design day,              !- heating design air flow method
  0;                       !- heating design air flow rate {m3/s}

PLANT SIZING,
  Hot Water Loop,          !- name of a PLANT LOOP or CONDENSER LOOP object
  heating,                 !- loop type
  82.,                     !- Design loop exit temperature {C}
  11;                      !- Design loop delta T {deltaC}

PLANT SIZING,
  Chilled Water Loop,      !- name of a PLANT LOOP or CONDENSER LOOP object
  cooling,                 !- loop type
  11.,                     !- Design loop exit temperature {C}
  6.67;                    !- Design loop delta T {deltaC}

PLANT SIZING,
  Condenser Water Loop,    !- name of a PLANT LOOP or CONDENSER LOOP object
  condenser,               !- loop type
  29.4,                    !- Design loop exit temperature {C}
  5.6;                     !- Design loop delta T {deltaC}

NODE LIST,
  OutsideAirInletNodes,    !- Node List Name
  Outside Air Inlet Node 1;!- Node_ID_1

NODE LIST,
  SPACE1-1 In Nodes,       !- Node List Name
  SPACE1-1 In Node;        !- Node_ID_1

NODE LIST,
  SPACE2-1 In Nodes,       !- Node List Name
  SPACE2-1 In Node;        !- Node_ID_1

NODE LIST,
  SPACE3-1 In Nodes,       !- Node List Name
  SPACE3-1 In Node;        !- Node_ID_1

NODE LIST,
  SPACE4-1 In Nodes,       !- Node List Name
  SPACE4-1 In Node;        !- Node_ID_1

NODE LIST,
  SPACE5-1 In Nodes,       !- Node List Name
  SPACE5-1 In Node;        !- Node_ID_1

BRANCH LIST,
  VAV Sys 1 Branches,      !- Branch List Name
  VAV Sys 1 Inlet Branch,  !- Branch Name 1
  VAV Sys 1 Bypass Branch, !- Branch Name 2
  VAV Sys 1 Main Branch,   !- Branch Name 3
  VAV Sys 1 Outlet Branch; !- Branch Name 4

BRANCH LIST,
  Heating Supply Side Branches,  !- Branch List Name
  Heating Supply Inlet Branch,  !- Branch Name 1
  Central Boiler Branch,   !- Branch Name 2
  Heating Supply Bypass Branch,  !- Branch Name 3
  Heating Supply Outlet Branch;  !- Branch Name 4
```

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BRANCH LIST,
  Heating Demand Side Branches,  !- Branch List Name
  Heating Demand Inlet Branch,  !- Branch Name 1
  SPACE1-1 Reheat Branch,  !- Branch Name 2
  SPACE2-1 Reheat Branch,  !- Branch Name 3
  SPACE3-1 Reheat Branch,  !- Branch Name 4
  SPACE4-1 Reheat Branch,  !- Branch Name 5
  SPACE5-1 Reheat Branch,  !- Branch Name 6
  Main Heating Coil 1 Branch,  !- Branch Name 7
  Heating Demand Bypass Branch,  !- Branch Name 8
  Heating Demand Outlet Branch;  !- Branch Name 9

BRANCH LIST,
  Cooling Supply Side Branches,  !- Branch List Name
  CW Pump Branch,          !- Branch Name 1
  Central Chiller Branch,  !- Branch Name 2
  Cooling Supply Bypass Branch,  !- Branch Name 3
  Cooling Supply Outlet;   !- Branch Name 4

BRANCH LIST,
  Cooling Demand Side Branches,  !- Branch List Name
  Cooling Demand Inlet,    !- Branch Name 1
  Cooling Coil Branch,     !- Branch Name 2
  Cooling Demand Bypass Branch,  !- Branch Name 3
  Cooling Demand Outlet;   !- Branch Name 4

BRANCH LIST,
  Condenser Supply Side Branches,  !- Branch List Name
  Condenser Supply Inlet Branch,  !- Branch Name 1
  Condenser Supply Tower Branch,  !- Branch Name 2
  Condenser Supply Bypass Branch,  !- Branch Name 3
  Condenser Supply Outlet Branch;  !- Branch Name 4

BRANCH LIST,
  Condenser Demand Side Branches,  !- Branch List Name
  Condenser Demand Inlet Branch,  !- Branch Name 1
  Central Chiller Condenser Branch,  !- Branch Name 2
  Condenser Demand Bypass Branch,  !- Branch Name 3
  Condenser Demand Outlet Branch;  !- Branch Name 4

CONNECTOR LIST,
  Heating Supply Side Connectors,  !- Connector List Name
  SPLITTER,                !- Type of Connector 1
  Heating Supply Splitter, !- Name of Connector 1
  MIXER,                   !- Type of Connector 2
  Heating Supply Mixer;    !- Name of Connector 2

CONNECTOR LIST,
  Heating Demand Side Connectors,  !- Connector List Name
  SPLITTER,                !- Type of Connector 1
  Heating Demand Splitter, !- Name of Connector 1
  MIXER,                   !- Type of Connector 2
  Heating Demand Mixer;    !- Name of Connector 2

CONNECTOR LIST,
  Cooling Supply Side Connectors,  !- Connector List Name
  SPLITTER,                !- Type of Connector 1
  CW Loop Splitter,        !- Name of Connector 1
  MIXER,                   !- Type of Connector 2
  CW Loop Mixer;           !- Name of Connector 2

CONNECTOR LIST,
  Cooling Demand Side Connectors,  !- Connector List Name
  SPLITTER,                !- Type of Connector 1
  CW Demand Splitter,      !- Name of Connector 1
  MIXER,                   !- Type of Connector 2
  CW Demand Mixer;         !- Name of Connector 2

CONNECTOR LIST,
  Condenser Supply Side Connectors,  !- Connector List Name
  SPLITTER,                !- Type of Connector 1
```

```
    Condenser Supply Splitter,  !- Name of Connector 1
    MIXER,                      !- Type of Connector 2
    Condenser Supply Mixer;  !- Name of Connector 2

  CONNECTOR LIST,
    Condenser Demand Side Connectors,  !- Connector List Name
    SPLITTER,                  !- Type of Connector 1
    Condenser Demand Splitter,  !- Name of Connector 1
    MIXER,                     !- Type of Connector 2
    Condenser Demand Mixer;  !- Name of Connector 2

  CONNECTOR LIST,
    Return Air Bypass Connectors,  !- Connector List Name
    SPLITTER,                      !- Type of Connector 1
    Return Air Bypass Splitter,    !- Name of Connector 1
    MIXER,                         !- Type of Connector 2
    Return Air Bypass Mixer;       !- Name of Connector 2

!  BRANCH,
!    VAV Sys 1 Main Branch,   !- Branch Name
!    autosize,                !- Maximum Branch Flow Rate {m3/s}
!    OUTSIDE AIR SYSTEM,      !- Comp1 Type
!    OA Sys 1,                !- Comp1 Name
!    VAV Sys 1 Inlet Node,    !- Comp1 Inlet Node Name
!    Mixed Air Node 1,        !- Comp1 Outlet Node Name
!    PASSIVE,                 !- Comp1 Branch Control Type
!    COIL:Water:DetailedFlatCooling,  !- Comp2 Type
!    Main Cooling Coil 1,     !- Comp2 Name
!    Mixed Air Node 1,        !- Comp2 Inlet Node Name
!    Main Cooling Coil 1 Outlet Node,  !- Comp2 Outlet Node Name
!    PASSIVE,                 !- Comp2 Branch Control Type
!    COIL:Water:SimpleHeating,!- Comp3 Type
!    Main Heating Coil 1,     !- Comp3 Name
!    Main Cooling Coil 1 Outlet Node,  !- Comp3 Inlet Node Name
!    Main Heating Coil 1 Outlet Node,  !- Comp3 Outlet Node Name
!    PASSIVE,                 !- Comp3 Branch Control Type
!    FAN:SIMPLE:VariableVolume,  !- Comp4 Type
!    Supply Fan 1,            !- Comp4 Name
!    Main Heating Coil 1 Outlet Node,  !- Comp4 Inlet Node Name
!    VAV Sys 1 Outlet Node,   !- Comp4 Outlet Node Name
!    ACTIVE;                  !- Comp4 Branch Control Type

  BRANCH,
    VAV Sys 1 Inlet Branch,            !- Branch Name
    autosize,                          !- Maximum Branch Flow Rate {m3/s}
    DUCT,                              !- Comp1 Type
    VAV Sys 1 Inlet Duct,              !- Comp1 Name
    VAV Sys 1 Inlet Node,              !- Comp1 Inlet Node Name
    VAV Sys 1 Inlet Duct Outlet Node,  !- Comp1 Outlet Node Name
    PASSIVE;                           !- Comp1 Branch Control Type

  BRANCH,
    VAV Sys 1 Bypass Branch,           !- Branch Name
    autosize,                          !- Maximum Branch Flow Rate {m3/s}
    DUCT,                              !- Comp1 Type
    VAV Sys 1 Bypass Duct,             !- Comp1 Name
    VAV Sys 1 Bypass Duct Inlet Node,  !- Comp1 Inlet Node Name
    VAV Sys 1 Bypass Duct Outlet Node, !- Comp1 Outlet Node Name
    PASSIVE;                           !- Comp1 Branch Control Type

  BRANCH,
    VAV Sys 1 Main Branch,   !- Branch Name
    autosize,                !- Maximum Branch Flow Rate {m3/s}
    OUTSIDE AIR SYSTEM,      !- Comp1 Type
    OA Sys 1,                !- Comp1 Name
    Main Branch Inlet Node 1,!- Comp1 Inlet Node Name
    Mixed Air Node 1,        !- Comp1 Outlet Node Name
    PASSIVE,                 !- Comp1 Branch Control Type
    COIL:Water:DetailedFlatCooling,  !- Comp2 Type
    Main Cooling Coil 1,     !- Comp2 Name
    Mixed Air Node 1,        !- Comp2 Inlet Node Name
```

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  Main Cooling Coil 1 Outlet Node,  !- Comp2 Outlet Node Name
  PASSIVE,                  !- Comp2 Branch Control Type
  COIL:Water:SimpleHeating,!- Comp3 Type
  Main Heating Coil 1,      !- Comp3 Name
  Main Cooling Coil 1 Outlet Node,  !- Comp3 Inlet Node Name
  Main Heating Coil 1 Outlet Node,  !- Comp3 Outlet Node Name
  PASSIVE;                  !- Comp3 Branch Control Type

BRANCH,
  VAV Sys 1 Outlet Branch,           !- Branch Name
  autosize,                          !- Maximum Branch Flow Rate {m3/s}
  FAN:SIMPLE:VariableVolume,         !- Comp4 Type
  Supply Fan 1,                      !- Comp4 Name
  Outlet Branch Inlet Node 1,        !- Comp4 Inlet Node Name
  VAV Sys 1 Outlet Node,             !- Comp4 Outlet Node Name
  ACTIVE;                            !- Comp4 Branch Control Type

BRANCH,
  Heating Supply Inlet Branch,  !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  PUMP:VARIABLE SPEED,      !- Comp1 Type
  HW Circ Pump,             !- Comp1 Name
  HW Supply Inlet Node,     !- Comp1 Inlet Node Name
  HW Pump Outlet Node,      !- Comp1 Outlet Node Name
  ACTIVE;                   !- Comp1 Branch Control Type

BRANCH,
  Central Boiler Branch,    !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  BOILER:SIMPLE,            !- Comp1 Type
  Central Boiler,           !- Comp1 Name
  Central Boiler Inlet Node,  !- Comp1 Inlet Node Name
  Central Boiler Outlet Node,  !- Comp1 Outlet Node Name
  ACTIVE;                   !- Comp1 Branch Control Type

BRANCH,
  Heating Supply Bypass Branch,  !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  PIPE,                     !- Comp1 Type
  Heating Supply Side Bypass,  !- Comp1 Name
  Heating Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
  Heating Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                   !- Comp1 Branch Control Type

BRANCH,
  Heating Supply Outlet Branch,  !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  PIPE,                     !- Comp1 Type
  Heating Supply Outlet,    !- Comp1 Name
  Heating Supply Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  HW Supply Outlet Node,    !- Comp1 Outlet Node Name
  PASSIVE;                  !- Comp1 Branch Control Type

BRANCH,
  Heating Demand Inlet Branch,  !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  PIPE,                     !- Comp1 Type
  Heating Demand Inlet Pipe,  !- Comp1 Name
  HW Demand Inlet Node,     !- Comp1 Inlet Node Name
  HW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                  !- Comp1 Branch Control Type

BRANCH,
  Heating Demand Outlet Branch,  !- Branch Name
  0,                        !- Maximum Branch Flow Rate {m3/s}
  PIPE,                     !- Comp1 Type
  Heating Demand Outlet Pipe,  !- Comp1 Name
  HW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  HW Demand Outlet Node,    !- Comp1 Outlet Node Name
  PASSIVE;                  !- Comp1 Branch Control Type
```

```
BRANCH,
  SPACE1-1 Reheat Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  SPACE1-1 Zone Coil,      !- Comp1 Name
  SPACE1-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
  SPACE1-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  SPACE2-1 Reheat Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  SPACE2-1 Zone Coil,      !- Comp1 Name
  SPACE2-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
  SPACE2-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  SPACE3-1 Reheat Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  SPACE3-1 Zone Coil,      !- Comp1 Name
  SPACE3-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
  SPACE3-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  SPACE4-1 Reheat Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  SPACE4-1 Zone Coil,      !- Comp1 Name
  SPACE4-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
  SPACE4-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  SPACE5-1 Reheat Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  SPACE5-1 Zone Coil,      !- Comp1 Name
  SPACE5-1 Zone Coil Water In Node,  !- Comp1 Inlet Node Name
  SPACE5-1 Zone Coil Water Out Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  Main Heating Coil 1 Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:SimpleHeating,!- Comp1 Type
  Main Heating Coil 1,     !- Comp1 Name
  Main Heating Coil 1 Water Inlet Node,  !- Comp1 Inlet Node Name
  Main Heating Coil 1 Water Outlet Node,  !- Comp1 Outlet Node Name
  ACTIVE;                  !- Comp1 Branch Control Type

BRANCH,
  Heating Demand Bypass Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  Heating Demand Bypass,   !- Comp1 Name
  Heating Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
  Heating Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
  Cooling Demand Inlet,    !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  Cooling Demand Side Inlet Pipe,  !- Comp1 Name
  CW Demand Inlet Node,    !- Comp1 Inlet Node Name
  CW Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                 !- Comp1 Branch Control Type
```

```
BRANCH,
  Cooling Coil Branch,     !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  COIL:Water:DetailedFlatCooling,  !- Comp1 Type
  Main Cooling Coil 1,     !- Comp1 Name
  Main Cooling Coil 1 Water Inlet Node,  !- Comp1 Inlet Node Name
  Main Cooling Coil 1 Water Outlet Node,  !- Comp1 Outlet Node Name
  Active;                  !- Comp1 Branch Control Type

BRANCH,
  Cooling Demand Bypass Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  Cooling Demand Side Bypass,  !- Comp1 Name
  CW Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
  CW Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
  Cooling Demand Outlet,   !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  CW Demand Side Outlet Pipe,  !- Comp1 Name
  CW Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  CW Demand Outlet Node,   !- Comp1 Outlet Node Name
  PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
  Cooling Supply Outlet,   !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  Supply Side Outlet Pipe, !- Comp1 Name
  Supply Side Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  CW Supply Outlet Node,   !- Comp1 Outlet Node Name
  PASSIVE;                 !- Comp1 Branch Control Type

BRANCH,
  CW Pump Branch,          !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PUMP:VARIABLE SPEED,     !- Comp1 Type
  CW Circ Pump,            !- Comp1 Name
  CW Supply Inlet Node,    !- Comp1 Inlet Node Name
  CW Pump Outlet Node,     !- Comp1 Outlet Node Name
  Active;                  !- Comp1 Branch Control Type

BRANCH,
  Central Chiller Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  CHILLER:ELECTRIC,        !- Comp1 Type
  Central Chiller,         !- Comp1 Name
  Central Chiller Inlet Node,  !- Comp1 Inlet Node Name
  Central Chiller Outlet Node,  !- Comp1 Outlet Node Name
  Active;                  !- Comp1 Branch Control Type

BRANCH,
  Cooling Supply Bypass Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PIPE,                    !- Comp1 Type
  Supply Side Bypass,      !- Comp1 Name
  CW Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
  CW Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                  !- Comp1 Branch Control Type

BRANCH,
  Condenser Supply Inlet Branch,  !- Branch Name
  0,                       !- Maximum Branch Flow Rate {m3/s}
  PUMP:VARIABLE SPEED,     !- Comp1 Type
  Cond Circ Pump,          !- Comp1 Name
  Condenser Supply Inlet Node,  !- Comp1 Inlet Node Name
  Condenser Pump Outlet Node,  !- Comp1 Outlet Node Name
```

```
  ACTIVE;                 !- Comp1 Branch Control Type

BRANCH,
  Condenser Supply Tower Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  COOLING TOWER:SINGLE SPEED,  !- Comp1 Type
  Central Tower,          !- Comp1 Name
  Condenser Tower Inlet Node,  !- Comp1 Inlet Node Name
  Condenser Tower Outlet Node,  !- Comp1 Outlet Node Name
  ACTIVE;                 !- Comp1 Branch Control Type

BRANCH,
  Condenser Supply Bypass Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  PIPE,                   !- Comp1 Type
  Condenser Supply Side Bypass,  !- Comp1 Name
  Cond Supply Bypass Inlet Node,  !- Comp1 Inlet Node Name
  Cond Supply Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                 !- Comp1 Branch Control Type

BRANCH,
  Condenser Supply Outlet Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  PIPE,                   !- Comp1 Type
  Condenser Supply Outlet, !- Comp1 Name
  Condenser Supply Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  Condenser Supply Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
  Condenser Demand Inlet Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  PIPE,                   !- Comp1 Type
  Condenser Demand Inlet Pipe,  !- Comp1 Name
  Condenser Demand Inlet Node,  !- Comp1 Inlet Node Name
  Condenser Demand Entrance Pipe Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
  Central Chiller Condenser Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  CHILLER:ELECTRIC,       !- Comp1 Type
  Central Chiller,        !- Comp1 Name
  Central Chiller Condenser Inlet Node,  !- Comp1 Inlet Node Name
  Central Chiller Condenser Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                !- Comp1 Branch Control Type

BRANCH,
  Condenser Demand Bypass Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  PIPE,                   !- Comp1 Type
  Condenser Demand Side Bypass,  !- Comp1 Name
  Cond Demand Bypass Inlet Node,  !- Comp1 Inlet Node Name
  Cond Demand Bypass Outlet Node,  !- Comp1 Outlet Node Name
  BYPASS;                 !- Comp1 Branch Control Type

BRANCH,
  Condenser Demand Outlet Branch,  !- Branch Name
  0,                      !- Maximum Branch Flow Rate {m3/s}
  PIPE,                   !- Comp1 Type
  Condenser Demand Outlet Pipe,  !- Comp1 Name
  Condenser Demand Exit Pipe Inlet Node,  !- Comp1 Inlet Node Name
  Condenser Demand Outlet Node,  !- Comp1 Outlet Node Name
  PASSIVE;                !- Comp1 Branch Control Type

PIPE,
  Heating Supply Side Bypass,  !- PipeName
  Heating Supply Bypass Inlet Node,  !- Inlet Node Name
  Heating Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
```

```
  Heating Supply Outlet,   !- PipeName
  Heating Supply Exit Pipe Inlet Node,  !- Inlet Node Name
  HW Supply Outlet Node;   !- Outlet Node Name

PIPE,
  Heating Demand Inlet Pipe,  !- PipeName
  HW Demand Inlet Node,    !- Inlet Node Name
  HW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
  Heating Demand Outlet Pipe,  !- PipeName
  HW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
  HW Demand Outlet Node;   !- Outlet Node Name

PIPE,
  Heating Demand Bypass,   !- PipeName
  Heating Demand Bypass Inlet Node,  !- Inlet Node Name
  Heating Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
  Cooling Demand Side Inlet Pipe,  !- PipeName
  CW Demand Inlet Node,    !- Inlet Node Name
  CW Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
  Cooling Demand Side Bypass,  !- PipeName
  CW Demand Bypass Inlet Node,  !- Inlet Node Name
  CW Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
  CW Demand Side Outlet Pipe,  !- PipeName
  CW Demand Exit Pipe Inlet Node,  !- Inlet Node Name
  CW Demand Outlet Node;   !- Outlet Node Name

PIPE,
  Supply Side Outlet Pipe, !- PipeName
  Supply Side Exit Pipe Inlet Node,  !- Inlet Node Name
  CW Supply Outlet Node;   !- Outlet Node Name

PIPE,
  Supply Side Bypass,      !- PipeName
  CW Supply Bypass Inlet Node,  !- Inlet Node Name
  CW Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
  Condenser Supply Side Bypass,  !- PipeName
  Cond Supply Bypass Inlet Node,  !- Inlet Node Name
  Cond Supply Bypass Outlet Node;  !- Outlet Node Name

PIPE,
  Condenser Supply Outlet, !- PipeName
  Condenser Supply Exit Pipe Inlet Node,  !- Inlet Node Name
  Condenser Supply Outlet Node;  !- Outlet Node Name

PIPE,
  Condenser Demand Inlet Pipe,  !- PipeName
  Condenser Demand Inlet Node,  !- Inlet Node Name
  Condenser Demand Entrance Pipe Outlet Node;  !- Outlet Node Name

PIPE,
  Condenser Demand Side Bypass,  !- PipeName
  Cond Demand Bypass Inlet Node,  !- Inlet Node Name
  Cond Demand Bypass Outlet Node;  !- Outlet Node Name

PIPE,
  Condenser Demand Outlet Pipe,  !- PipeName
  Condenser Demand Exit Pipe Inlet Node,  !- Inlet Node Name
  Condenser Demand Outlet Node;  !- Outlet Node Name

DUCT,
  VAV Sys 1 Inlet Duct,            !- DuctName
```

```
  VAV Sys 1 Inlet Node,             !- Inlet Node Name
  VAV Sys 1 Inlet Duct Outlet Node; !- Outlet Node Name

DUCT,
  VAV Sys 1 Bypass Duct,            !- DuctName
  VAV Sys 1 Bypass Duct Inlet Node, !- Inlet Node Name
  VAV Sys 1 Bypass Duct Outlet Node;!- Outlet Node Name

PLANT LOOP,
  Hot Water Loop,          !- Plant Loop Name
  Water,                   !- Fluid Type
  Hot Loop Operation,      !- Plant Operation Scheme List Name
  HW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
  100,                     !- Maximum Loop Temperature {C}
  10,                      !- Minimum Loop Temperature {C}
  autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
  0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
  autosize,                !- volume of the plant loop {m3}
  HW Supply Inlet Node,    !- Plant Side Inlet Node Name
  HW Supply Outlet Node,   !- Plant Side Outlet Node Name
  Heating Supply Side Branches,  !- Plant Side Branch List Name
  Heating Supply Side Connectors,  !- Plant Side Connector List Name
  HW Demand Inlet Node,    !- Demand Side Inlet Node Name
  HW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
  Heating Demand Side Branches,  !- Demand Side Branch List Name
  Heating Demand Side Connectors,  !- Demand Side Connector List Name
  Sequential;              !- Load Distribution Scheme

SET POINT MANAGER:SCHEDULED,
  Hot Water Loop Setpoint Manager,  !- Name
  TEMP,                    !- Control variable
  HW Loop Temp Schedule,   !- Schedule Name
  Hot Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

NODE LIST,
  Hot Water Loop Setpoint Node List,  !- Node List Name
  HW Supply Outlet Node;   !- Node_ID_1

PLANT LOOP,
  Chilled Water Loop,      !- Plant Loop Name
  Water,                   !- Fluid Type
  CW Loop Operation,       !- Plant Operation Scheme List Name
  CW Supply Outlet Node,   !- Loop Temperature Setpoint Node Name
  98,                      !- Maximum Loop Temperature {C}
  1,                       !- Minimum Loop Temperature {C}
  autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
  0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
  autosize,                !- volume of the plant loop {m3}
  CW Supply Inlet Node,    !- Plant Side Inlet Node Name
  CW Supply Outlet Node,   !- Plant Side Outlet Node Name
  Cooling Supply Side Branches,  !- Plant Side Branch List Name
  Cooling Supply Side Connectors,  !- Plant Side Connector List Name
  CW Demand Inlet Node,    !- Demand Side Inlet Node Name
  CW Demand Outlet Node,   !- Demand Side Outlet Nodes Name
  Cooling Demand Side Branches,  !- Demand Side Branch List Name
  Cooling Demand Side Connectors,  !- Demand Side Connector List Name
  Sequential;              !- Load Distribution Scheme

SET POINT MANAGER:SCHEDULED,
  Chilled Water Loop Setpoint Manager,  !- Name
  TEMP,                    !- Control variable
  CW Loop Temp Schedule,   !- Schedule Name
  Chilled Water Loop Setpoint Node List;  !- Name of the set point Node or Node List

NODE LIST,
  Chilled Water Loop Setpoint Node List,  !- Node List Name
  CW Supply Outlet Node;   !- Node_ID_1

CONDENSER LOOP,
  Condenser Water Loop,    !- Condenser Loop Name
  Water,                   !- Fluid Type
```

```
  Tower Loop Operation,    !- Condenser Operation Scheme List Name
  AIR,                     !- Condenser Loop Temperature Setpoint Node or reference
  80,                      !- Maximum Loop Temperature {C}
  10,                      !- Minimum Loop Temperature {C}
  autosize,                !- Maximum Loop Volumetric Flow Rate {m3/s}
  0.0,                     !- Minimum Loop Volumetric Flow Rate {m3/s}
  autosize,                !- volume of the plant loop {m3}
  Condenser Supply Inlet Node,  !- Condenser Side Inlet Node Name
  Condenser Supply Outlet Node,  !- Condenser Side Outlet Node Name
  Condenser Supply Side Branches,  !- Condenser Side Branch List Name
  Condenser Supply Side Connectors,  !- Condenser Side Connector List Name
  Condenser Demand Inlet Node,  !- Demand Side Inlet Node Name
  Condenser Demand Outlet Node,  !- Demand Side Outlet Nodes Name
  Condenser Demand Side Branches,  !- Condenser Demand Side Branch List Name
  Condenser Demand Side Connectors,  !- Condenser Demand Side Connector List Name
  Sequential;              !- Load Distribution Scheme

PLANT OPERATION SCHEMES,
  Hot Loop Operation,      !- PlantOperationSchemeName
  HEATING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
  Central Boiler Only,     !- Control Scheme Name 1
  PlantOnSched;            !- Control Scheme Schedule 1

PLANT OPERATION SCHEMES,
  CW Loop Operation,       !- PlantOperationSchemeName
  COOLING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
  Central Chiller Only,    !- Control Scheme Name 1
  PlantOnSched;            !- Control Scheme Schedule 1

CONDENSER OPERATION SCHEMES,
  Tower Loop Operation,    !- CondenserOperationSchemeName
  COOLING LOAD RANGE BASED OPERATION,  !- KEY--Control Scheme 1
  Year Round Tower Operation,  !- Control Scheme Name 1
  PlantOnSched;            !- Control Scheme Schedule 1

COOLING LOAD RANGE BASED OPERATION,
  Central Chiller Only,    !- Name
  0,                       !- Load Range Lower Limit 1 {W}
  900000,                  !- Load Range Upper Limit 1 {W}
  Cooling Plant;           !- Priority Control Equip List Name 1

COOLING LOAD RANGE BASED OPERATION,
  Year Round Tower Operation,  !- Name
  0,                       !- Load Range Lower Limit 1 {W}
  90000000,                !- Load Range Upper Limit 1 {W}
  All Towers;              !- Priority Control Equip List Name 1

HEATING LOAD RANGE BASED OPERATION,
  Central Boiler Only,     !- Name
  0,                       !- Load Range Lower Limit 1 {W}
  1000000,                 !- Load Range Upper Limit 1 {W}
  heating plant;           !- Priority Control Equip List Name 1

PLANT EQUIPMENT LIST,
  heating plant,           !- Equip List Name
  BOILER:SIMPLE,           !- KEY--Plant Equip 1
  Central Boiler;          !- Equip Name 1

PLANT EQUIPMENT LIST,
  Cooling Plant,           !- Equip List Name
  CHILLER:ELECTRIC,        !- KEY--Plant Equip 1
  Central Chiller;         !- Equip Name 1

CONDENSER EQUIPMENT LIST,
  All Towers,              !- Equip List Name
  COOLING TOWER:SINGLE SPEED,  !- KEY--Condenser Equip 1
  Central Tower;           !- Equip Name 1

SPLITTER,
  Heating Demand Splitter, !- SplitterName
  Heating Demand Inlet Branch,  !- Inlet Branch Name
```

```
    SPACE1-1 Reheat Branch,  !- Outlet Branch Name 1
    SPACE2-1 Reheat Branch,  !- Outlet Branch Name 2
    SPACE3-1 Reheat Branch,  !- Outlet Branch Name 3
    SPACE4-1 Reheat Branch,  !- Outlet Branch Name 4
    SPACE5-1 Reheat Branch,  !- Outlet Branch Name 5
    Main Heating Coil 1 Branch,  !- Outlet Branch Name 6
    Heating Demand Bypass Branch;  !- Outlet Branch Name 7

  SPLITTER,
    Heating Supply Splitter, !- SplitterName
    Heating Supply Inlet Branch,  !- Inlet Branch Name
    Central Boiler Branch,   !- Outlet Branch Name 1
    Heating Supply Bypass Branch;  !- Outlet Branch Name 2

  SPLITTER,
    CW Loop Splitter,        !- SplitterName
    CW Pump Branch,          !- Inlet Branch Name
    Central Chiller Branch,  !- Outlet Branch Name 1
    Cooling Supply Bypass Branch;  !- Outlet Branch Name 2

  SPLITTER,
    CW Demand Splitter,      !- SplitterName
    Cooling Demand Inlet,    !- Inlet Branch Name
    Cooling Coil Branch,     !- Outlet Branch Name 1
    Cooling Demand Bypass Branch;  !- Outlet Branch Name 2

  SPLITTER,
    Condenser Demand Splitter,  !- SplitterName
    Condenser Demand Inlet Branch,  !- Inlet Branch Name
    Central Chiller Condenser Branch,  !- Outlet Branch Name 1
    Condenser Demand Bypass Branch;  !- Outlet Branch Name 2

  SPLITTER,
    Condenser Supply Splitter,  !- SplitterName
    Condenser Supply Inlet Branch,  !- Inlet Branch Name
    Condenser Supply Tower Branch,  !- Outlet Branch Name 1
    Condenser Supply Bypass Branch;  !- Outlet Branch Name 2

  SPLITTER,
    Return Air Bypass Splitter,     !- SplitterName
    VAV Sys 1 Inlet Branch,         !- Inlet Branch Name
    VAV Sys 1 Bypass Branch,        !- Outlet Branch Name 1
    VAV Sys 1 Main Branch;          !- Outlet Branch Name 2

  MIXER,
    Heating Demand Mixer,    !- MixerName
    Heating Demand Outlet Branch,  !- Outlet Branch Name
    SPACE1-1 Reheat Branch,  !- Inlet Branch Name 1
    SPACE2-1 Reheat Branch,  !- Inlet Branch Name 2
    SPACE3-1 Reheat Branch,  !- Inlet Branch Name 3
    SPACE4-1 Reheat Branch,  !- Inlet Branch Name 4
    SPACE5-1 Reheat Branch,  !- Inlet Branch Name 5
    Main Heating Coil 1 Branch,  !- Inlet Branch Name 6
    Heating Demand Bypass Branch;  !- Inlet Branch Name 7

  MIXER,
    Heating Supply Mixer,    !- MixerName
    Heating Supply Outlet Branch,  !- Outlet Branch Name
    Central Boiler Branch,   !- Inlet Branch Name 1
    Heating Supply Bypass Branch;  !- Inlet Branch Name 2

  MIXER,
    CW Loop Mixer,           !- MixerName
    Cooling Supply Outlet,   !- Outlet Branch Name
    Central Chiller Branch,  !- Inlet Branch Name 1
    Cooling Supply Bypass Branch;  !- Inlet Branch Name 2

  MIXER,
    CW Demand Mixer,         !- MixerName
    Cooling Demand Outlet,   !- Outlet Branch Name
    Cooling Coil Branch,     !- Inlet Branch Name 1
```

```
  Cooling Demand Bypass Branch;  !- Inlet Branch Name 2

MIXER,
  Condenser Demand Mixer,  !- MixerName
  Condenser Demand Outlet Branch,  !- Outlet Branch Name
  Central Chiller Condenser Branch,  !- Inlet Branch Name 1
  Condenser Demand Bypass Branch;  !- Inlet Branch Name 2

MIXER,
  Condenser Supply Mixer,  !- MixerName
  Condenser Supply Outlet Branch,  !- Outlet Branch Name
  Condenser Supply Tower Branch,  !- Inlet Branch Name 1
  Condenser Supply Bypass Branch;  !- Inlet Branch Name 2

MIXER,
  Return Air Bypass Mixer,        !- MixerName
  VAV Sys 1 Outlet Branch,        !- Outlet Branch Name
  VAV Sys 1 Main Branch,          !- Inlet Branch Name 1
  VAV Sys 1 Bypass Branch;        !- Inlet Branch Name 2

AIR PRIMARY LOOP,
  VAV Sys 1,               !- Primary Air Loop Name
  VAV Sys 1 Controllers,   !- Name: Controller List
  VAV Sys 1 Avail List,    !- Name: System Availability Manager List
  autosize,                !- Primary air design volumetric flow rate {m3/s}
  VAV Sys 1 Branches,      !- Air Loop Branch List Name
  Return Air Bypass Connectors, !- Air Loop Connector List Name
  VAV Sys 1 Inlet Node,    !- ReturnAir AirLoop Inlet Node
  PLENUM-1 Out Node,       !- ZoneEquipGroup Outlet Node
  Zone Eq In Node,         !- SupplyAirPath ZoneEquipGroup Inlet Nodes
  VAV Sys 1 Outlet Node;   !- AirLoop Outlet Nodes

CONTROLLER LIST,
  VAV Sys 1 Controllers,   !- Name
  Controller:Simple,       !- Controller Type 1
  Central Cooling Coil Contoller 1,  !- Controller Name 1
  Controller:Simple,       !- Controller Type 2
  Central Heating Coil Contoller 1;  !- Controller Name 2

CONTROLLER LIST,
  OA Sys 1 Controllers,    !- Name
  CONTROLLER:OUTSIDE AIR,  !- Controller Type 1
  OA Controller 1;         !- Controller Name 1

AIR LOOP EQUIPMENT LIST,
  OA Sys 1 Equipment,      !- Name
  OUTSIDE AIR MIXER,       !- KEY--System Component 1
  OA Mixing Box 1;         !- Component Name 1

OUTSIDE AIR SYSTEM,
  OA Sys 1,                !- Name
  OA Sys 1 Controllers,    !- Name: Controller List
  OA Sys 1 Equipment,      !- Name of an Air Loop Equipment List
  VAV Sys 1 Avail List;    !- Name of a System Availability Manager List

OUTSIDE AIR INLET NODE LIST,
  OutsideAirInletNodes;    !- 1st Node name or node list name

OUTSIDE AIR MIXER,
  OA Mixing Box 1,         !- Name
  Mixed Air Node 1,        !- Mixed_Air_Node
  Outside Air Inlet Node 1,!- Outside_Air_Stream_Node
  Relief Air Outlet Node 1,!- Relief_Air_Stream_Node
  Main Branch Inlet Node 1; !- Return_Air_Stream_Node

SYSTEM AVAILABILITY MANAGER LIST,
  VAV Sys 1 Avail List,    !- Name
  SYSTEM AVAILABILITY MANAGER:SCHEDULED,  !- System Availability Manager Type 1
  VAV Sys 1 Avail;         !- System Availability Manager Name 1

SYSTEM AVAILABILITY MANAGER:SCHEDULED,
```

```
    VAV Sys 1 Avail,         !- Name
    FanAvailSched;           !- Schedule name

  SET POINT MANAGER:SCHEDULED,
    Dehum Supply Air Temp Manager 1,  !- Name
    TEMP,                            !- Control variable
    Dehum Supply Air Temp Sch,        !- Schedule Name
    Main Cooling Coil 1 Outlet Node;  !- Name of the set point Node or Node List

  SET POINT MANAGER:SCHEDULED,
    Heating Supply Air Temp Manager 1,  !- Name
    TEMP,                    !- Control variable
    Heating Supply Air Temp Sch,  !- Schedule Name
    Main Heating Coil 1 Outlet Node; !- Name of the set point Node or Node List

  SET POINT MANAGER:RETURN AIR BYPASS FLOW,
    RAB Manager 1,
    FLOW,
    VAV Sys 1,
    Seasonal Reset Supply Air Temp Sch;

  CONTROLLER:SIMPLE,
    Central Cooling Coil Contoller 1,  !- Name
    TEMP,                    !- Control variable
    Reverse,                 !- Action
    FLOW,                    !- Actuator variable
    Main Cooling Coil 1 Outlet Node,       !- Control_Node
    Main Cooling Coil 1 Water Inlet Node,  !- Actuator_Node
    autosize,                !- Controller Convergence Tolerance: delta temp from setpoint
{deltaC}
    autosize,                !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}

  CONTROLLER:SIMPLE,
    Central Heating Coil Contoller 1,  !- Name
    TEMP,                    !- Control variable
    Normal,                  !- Action
    FLOW,                    !- Actuator variable
    Main Heating Coil 1 Outlet Node,       !- Control_Node
    Main Heating Coil 1 Water Inlet Node,  !- Actuator_Node
    autosize,                !- Controller Convergence Tolerance: delta temp from setpoint
{deltaC}
    autosize,                !- Max Actuated Flow {m3/s}
    0.0;                     !- Min Actuated Flow {m3/s}

  CONTROLLER:OUTSIDE AIR,
    OA Controller 1,         !- Name
    NO ECONOMIZER,           !- EconomizerChoice
    NO RETURN AIR TEMP LIMIT,!- ReturnAirTempLimit
    NO RETURN AIR ENTHALPY LIMIT,  !- ReturnAirEnthalpyLimit
    NO LOCKOUT,              !- Lockout
    FIXED MINIMUM,           !- MinimumLimit
    Mixed Air Node 1,        !- Control_Node
    Outside Air Inlet Node 1,!- Actuated_Node
    autosize,                !- minimum outside air flow rate {m3/s}
    autosize,                !- maximum outside air flow rate {m3/s}
    19.,                     !- temperature limit {C}
    4.,                      !- temperature lower limit {C}
    0.0,                     !- enthalpy limit {J/kg}
    Relief Air Outlet Node 1,!- Relief_Air_Outlet_Node
    Main Branch Inlet Node 1,    !- Return_Air_Node
    Min OA Sched;            !- Minimum Outside Air Schedule Name

  CONTROLLED ZONE EQUIP CONFIGURATION,
    SPACE1-1,                !- Zone Name
    SPACE1-1 Eq,             !- List Name: Zone Equipment
    SPACE1-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
    ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
    SPACE1-1 Node,           !- Zone Air Node Name
    SPACE1-1 Out Node;       !- Zone Return Air Node Name
```

```
CONTROLLED ZONE EQUIP CONFIGURATION,
  SPACE2-1,                !- Zone Name
  SPACE2-1 Eq,             !- List Name: Zone Equipment
  SPACE2-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
  ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
  SPACE2-1 Node,           !- Zone Air Node Name
  SPACE2-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
  SPACE3-1,                !- Zone Name
  SPACE3-1 Eq,             !- List Name: Zone Equipment
  SPACE3-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
  ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
  SPACE3-1 Node,           !- Zone Air Node Name
  SPACE3-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
  SPACE4-1,                !- Zone Name
  SPACE4-1 Eq,             !- List Name: Zone Equipment
  SPACE4-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
  ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
  SPACE4-1 Node,           !- Zone Air Node Name
  SPACE4-1 Out Node;       !- Zone Return Air Node Name

CONTROLLED ZONE EQUIP CONFIGURATION,
  SPACE5-1,                !- Zone Name
  SPACE5-1 Eq,             !- List Name: Zone Equipment
  SPACE5-1 In Nodes,       !- Node List or Node Name: Zone Air Inlet Node(s)
  ,                        !- Node List or Node Name: Zone Air Exhaust Node(s)
  SPACE5-1 Node,           !- Zone Air Node Name
  SPACE5-1 Out Node;       !- Zone Return Air Node Name

ZONE EQUIPMENT LIST,
  SPACE1-1 Eq,             !- Name
  AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
  SPACE1-1 ATU,            !- Type Name 1
  1,                       !- Cooling Priority
  1;                       !- Heating Priority

ZONE EQUIPMENT LIST,
  SPACE2-1 Eq,             !- Name
  AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
  SPACE2-1 ATU,            !- Type Name 1
  1,                       !- Cooling Priority
  1;                       !- Heating Priority

ZONE EQUIPMENT LIST,
  SPACE3-1 Eq,             !- Name
  AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
  SPACE3-1 ATU,            !- Type Name 1
  1,                       !- Cooling Priority
  1;                       !- Heating Priority

ZONE EQUIPMENT LIST,
  SPACE4-1 Eq,             !- Name
  AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
  SPACE4-1 ATU,            !- Type Name 1
  1,                       !- Cooling Priority
  1;                       !- Heating Priority

ZONE EQUIPMENT LIST,
  SPACE5-1 Eq,             !- Name
  AIR DISTRIBUTION UNIT,   !- KEY--Zone Equipment Type 1
  SPACE5-1 ATU,            !- Type Name 1
  1,                       !- Cooling Priority
  1;                       !- Heating Priority

AIR DISTRIBUTION UNIT,
  SPACE1-1 ATU,                  !- Air Distribution Unit Name
  SPACE1-1 In Node,              !- Air Dist Unit Outlet Node Name
  SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
```

```
  SPACE1-1 VAV Reheat;            !- Component Name 1

AIR DISTRIBUTION UNIT,
  SPACE2-1 ATU,                   !- Air Distribution Unit Name
  SPACE2-1 In Node,               !- Air Dist Unit Outlet Node Name
  SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
  SPACE2-1 VAV Reheat;            !- Component Name 1

AIR DISTRIBUTION UNIT,
  SPACE3-1 ATU,                   !- Air Distribution Unit Name
  SPACE3-1 In Node,               !- Air Dist Unit Outlet Node Name
  SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
  SPACE3-1 VAV Reheat;            !- Component Name 1

AIR DISTRIBUTION UNIT,
  SPACE4-1 ATU,                   !- Air Distribution Unit Name
  SPACE4-1 In Node,               !- Air Dist Unit Outlet Node Name
  SINGLE DUCT:VAV:REHEAT:VS FAN,  !- KEY--System Component Type 1
  SPACE4-1 VAV Reheat;            !- Component Name 1

AIR DISTRIBUTION UNIT,
  SPACE5-1 ATU,            !- Air Distribution Unit Name
  SPACE5-1 In Node,        !- Air Dist Unit Outlet Node Name
  SINGLE DUCT:VAV:REHEAT,  !- KEY--System Component Type 1
  SPACE5-1 VAV Reheat;     !- Component Name 1

SINGLE DUCT:VAV:REHEAT:VS FAN,
  SPACE1-1 VAV Reheat,     !- Name of System
  ReheatCoilAvailSched,    !- System Availability schedule
  autosize,                !- Maximum cooling air volume flow rate
  autosize,                !- Maximum heating air volume flow rate
  0.05,                     !- Zone Minimum Air Flow Fraction
  SPACE1-1 ATU In Node,    !- Unit supply air inlet node
  SPACE1-1 In Node,        !- Unit supply air outlet node
  SPACE1-1 Zone Coil Air In Node,  !- heating coil air inlet node
  SPACE1-1 Zone Coil Water In Node,!- Hot water control node
  FAN:SIMPLE:VariableVolume,       !- Fan object
  SPACE1-1 Zone Fan,       !- Fan name
  COIL:Water:SimpleHeating,!- Heating coil object
  SPACE1-1 Zone Coil,      !- Heating coil name
  autosize,                !- Max hot water flow
  0.0,                     !- Min hot water flow
  0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
  SPACE2-1 VAV Reheat,     !- Name of System
  ReheatCoilAvailSched,    !- System Availability schedule
  autosize,                !- Maximum cooling air volume flow rate
  autosize,                !- Maximum heating air volume flow rate
  0.05,                     !- Zone Minimum Air Flow Fraction
  SPACE2-1 ATU In Node,    !- Unit supply air inlet node
  SPACE2-1 In Node,        !- Unit supply air outlet node
  SPACE2-1 Zone Coil Air In Node,  !- heating coil air inlet node
  SPACE2-1 Zone Coil Water In Node,!- Hot water control node
  FAN:SIMPLE:VariableVolume,       !- Fan object
  SPACE2-1 Zone Fan,       !- Fan name
  COIL:Water:SimpleHeating,!- Heating coil object
  SPACE2-1 Zone Coil,      !- Heating coil name
  autosize,                !- Max hot water flow
  0.0,                     !- Min hot water flow
  0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
  SPACE3-1 VAV Reheat,     !- Name of System
  ReheatCoilAvailSched,    !- System Availability schedule
  autosize,                !- Maximum cooling air volume flow rate
  autosize,                !- Maximum heating air volume flow rate
  0.05,                     !- Zone Minimum Air Flow Fraction
  SPACE3-1 ATU In Node,    !- Unit supply air inlet node
  SPACE3-1 In Node,        !- Unit supply air outlet node
  SPACE3-1 Zone Coil Air In Node,  !- heating coil air inlet node
```

```
  SPACE3-1 Zone Coil Water In Node,!- Hot water control node
  FAN:SIMPLE:VariableVolume,       !- Fan object
  SPACE3-1 Zone Fan,       !- Fan name
  COIL:Water:SimpleHeating,!- Heating coil object
  SPACE3-1 Zone Coil,      !- Heating coil name
  autosize,                !- Max hot water flow
  0.0,                     !- Min hot water flow
  0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT:VS FAN,
  SPACE4-1 VAV Reheat,     !- Name of System
  ReheatCoilAvailSched,    !- System Availability schedule
  autosize,                !- Maximum cooling air volume flow rate
  autosize,                !- Maximum heating air volume flow rate
  0.05,                     !- Zone Minimum Air Flow Fraction
  SPACE4-1 ATU In Node,    !- Unit supply air inlet node
  SPACE4-1 In Node,        !- Unit supply air outlet node
  SPACE4-1 Zone Coil Air In Node,  !- heating coil air inlet node
  SPACE4-1 Zone Coil Water In Node,!- Hot water control node
  FAN:SIMPLE:VariableVolume,       !- Fan object
  SPACE4-1 Zone Fan,       !- Fan name
  COIL:Water:SimpleHeating,!- Heating coil object
  SPACE4-1 Zone Coil,      !- Heating coil name
  autosize,                !- Max hot water flow
  0.0,                     !- Min hot water flow
  0.001;                   !- Heating Convergence Tolerance

SINGLE DUCT:VAV:REHEAT,
  SPACE5-1 VAV Reheat,     !- Name of System
  ReheatCoilAvailSched,    !- System Availability schedule
  SPACE5-1 Zone Coil Air In Node,  !- DAMPER Air Outlet Node
  SPACE5-1 ATU In Node,    !- UNIT Air Inlet Node
  autosize,                !- Maximum air flow rate {m3/s}
  0.3,                     !- Zone Minimum Air Flow Fraction
  SPACE5-1 Zone Coil Water In Node,  !- Control node
  COIL:Water:SimpleHeating,!- Reheat Component Object
  SPACE5-1 Zone Coil,      !- Name of Reheat Component
  autosize,                !- Max Reheat Water Flow {m3/s}
  0.0,                     !- Min Reheat Water Flow {m3/s}
  SPACE5-1 In Node,        !- UNIT Air Outlet Node
  0.001,                   !- Convergence Tolerance
  REVERSE ACTION;          !- Damper Heating Action

ZONE CONTROL:THERMOSTATIC,
  SPACE1-1 Control,        !- Thermostat Name
  SPACE1-1,                !- Zone Name
  Zone Control Type Sched, !- Control Type SCHEDULE Name
  Dual Setpoint with Deadband,  !- Control Type #1
  DualSetPoint;            !- Control Type Name #1

ZONE CONTROL:THERMOSTATIC,
  SPACE2-1 Control,        !- Thermostat Name
  SPACE2-1,                !- Zone Name
  Zone Control Type Sched, !- Control Type SCHEDULE Name
  Dual Setpoint with Deadband,  !- Control Type #1
  DualSetPoint;            !- Control Type Name #1

ZONE CONTROL:THERMOSTATIC,
  SPACE3-1 Control,        !- Thermostat Name
  SPACE3-1,                !- Zone Name
  Zone Control Type Sched, !- Control Type SCHEDULE Name
  Dual Setpoint with Deadband,  !- Control Type #1
  DualSetPoint;            !- Control Type Name #1

ZONE CONTROL:THERMOSTATIC,
  SPACE4-1 Control,        !- Thermostat Name
  SPACE4-1,                !- Zone Name
  Zone Control Type Sched, !- Control Type SCHEDULE Name
  Dual Setpoint with Deadband,  !- Control Type #1
  DualSetPoint;            !- Control Type Name #1
```

```
ZONE CONTROL:THERMOSTATIC,
  SPACE5-1 Control,        !- Thermostat Name
  SPACE5-1,                !- Zone Name
  Zone Control Type Sched, !- Control Type SCHEDULE Name
  Dual Setpoint with Deadband,  !- Control Type #1
  DualSetPoint;            !- Control Type Name #1

DUAL SETPOINT WITH DEADBAND,
  DualSetPoint,            !- Name
  Htg-SetP-Sch,            !- Heating Setpoint Temperature SCHEDULE Name
  Clg-SetP-Sch;            !- Cooling Setpoint Temperature SCHEDULE Name

ZONE SUPPLY AIR PATH,
  Zone Supply Air Path 1,  !- Supply Air Path Name
  Zone Eq In Node,         !- Supply Air Path Inlet Node
  Zone Supply Plenum,      !- KEY--System Component Type 1
  Supply-Plenum-1,         !- Component Name 1
  Zone Splitter,           !- KEY--System Component Type 2
  Zone Supply Air Splitter 1;  !- Component Name 2

ZONE RETURN AIR PATH,
  ReturnAirPath1,          !- Return Air Path Name
  PLENUM-1 Out Node,       !- Return Air Path Outlet Node
  Zone Return Plenum,      !- KEY--System Component Type 1
  Return-Plenum-1;         !- Component Name 1

ZONE RETURN PLENUM,
  Return-Plenum-1,         !- Zone Plenum Name
  PLENUM-1,                !- Zone Name
  PLENUM-1 Node,           !- Zone Node Name
  PLENUM-1 Out Node,       !- Outlet_Node
  SPACE1-1 Out Node,       !- Inlet_Node_1
  SPACE2-1 Out Node,       !- Inlet_Node_2
  SPACE3-1 Out Node,       !- Inlet_Node_3
  SPACE4-1 Out Node,       !- Inlet_Node_4
  SPACE5-1 Out Node;       !- Inlet_Node_5

ZONE SUPPLY PLENUM,
  Supply-Plenum-1,         !- Zone Plenum Name
  Sup-PLENUM-1,            !- Zone Name
  Sup-PLENUM-1 Zone Node,  !- Zone Node Name
  Zone Eq In Node,         !- Inlet_Node
  Sup-PLENUM-1 Outlet Node;!- Outlet_Node_1

ZONE SPLITTER,
  Zone Supply Air Splitter 1,  !- Splitter Name
  Sup-PLENUM-1 Outlet Node,!- Inlet_Node
  SPACE1-1 ATU In Node,    !- Outlet_Node_1
  SPACE2-1 ATU In Node,    !- Outlet_Node_2
  SPACE3-1 ATU In Node,    !- Outlet_Node_3
  SPACE4-1 ATU In Node,    !- Outlet_Node_4
  SPACE5-1 ATU In Node;    !- Outlet_Node_5

BOILER:SIMPLE,
  Central Boiler,          !- Boiler Name
  NaturalGas,              !- Fuel Type
  autosize,                !- Nominal Capacity {W}
  0.8,                     !- Theoretical Boiler Efficiency
  81.,                     !- Design Boiler Water Outlet Temp {C}
  autosize,                !- Max Design Boiler Water Flow Rate {m3/s}
  0.0,                     !- Minimum Part Load Ratio
  1.2,                     !- Maximum Part Load Ratio
  1.0,                     !- Opt Part Load Ratio
  1.0,                     !- Coefficient1 of the fuel use/part load ratio curve
  0.0,                     !- Coefficient2 of the fuel use/part load ratio curve
  0.0,                     !- Coefficient3 of the fuel use/part load ratio curve
  Central Boiler Inlet Node,  !- Boiler_Water_Inlet_Node
  Central Boiler Outlet Node,  !- Boiler_Water_Outlet_Node
  100.,                    !- Temp Upper Limit Water Outlet {C}
  VariableFlow;            !- Boiler Flow Mode
```

```
CHILLER:ELECTRIC,
  Central Chiller,         !- Chiller Name
  WATER COOLED,            !- Condenser Type
  autosize,                !- Nominal Capacity {W}
  3.2,                     !- COP
  Central Chiller Inlet Node,  !- Plant_Side_Inlet_Node
  Central Chiller Outlet Node,  !- Plant_Side_Outlet_Node
  Central Chiller Condenser Inlet Node,  !- Condenser_Side_Inlet_Node
  Central Chiller Condenser Outlet Node,  !- Condenser_Side_Outlet_Node
  0.0,                     !- Minimum Part Load Ratio
  1.0,                     !- Maximum Part Load Ratio
  .65,                     !- Opt Part Load Ratio
  29.44,                   !- Temp Design Condenser Inlet {C}
  2.682759,                !- Temp Rise Coefficient
  6.667,                   !- Temp Design Evaporator Outlet {C}
  autosize,                !- Design Evaporator Volumetric Water Flow Rate {m3/s}
  autosize,                !- Design Condenser Volumetric Water Flow Rate {m3/s}
  0.94483600,              !- Coefficient1 of the capacity ratio curve
  -.05700880,              !- Coefficient2 of the capacity ratio curve
  -.00185486,              !- Coefficient3 of the capacity ratio curve
  1.907846,                !- Coefficient1 of the power ratio curve
  -1.20498700,             !- Coefficient2 of the power ratio curve
  0.26346230,              !- Coefficient3 of the power ratio curve
  0.03303,                 !- Coefficient1 of the full load ratio curve
  0.6852,                  !- Coefficient2 of the full load ratio curve
  0.2818,                  !- Coefficient3 of the full load ratio curve
  5,                       !- Temp Lower Limit Evaporator Outlet {C}
  VariableFlow;            !- Chiller Flow Mode

COOLING TOWER:SINGLE SPEED,
  Central Tower,           !- Tower Name
  Condenser Tower Inlet Node,  !- Water Inlet Node Name
  Condenser Tower Outlet Node,  !- Water Outlet Node Name
  autosize,                !- Design Water Flow Rate {m3/s}
  autosize,                !- Design Air Flow Rate {m3/s}
  autosize,                !- Fan Power at Design Air Flow Rate {W}
  autosize,                !- Tower UA Value at Design Air Flow Rate {W/K}
  0.0,                     !- Air Flow Rate in Free Convection Regime {m3/s}
  0.0;                     !- Tower UA Value at Free Convection Air Flow Rate {W/K}

PUMP:VARIABLE SPEED,
  HW Circ Pump,            !- Pump Name
  HW Supply Inlet Node,    !- Inlet_Node
  HW Pump Outlet Node,     !- Outlet_Node
  autosize,                !- Rated Volumetric Flow Rate {m3/s}
  179352,                  !- Rated Pump Head {Pa}
  autosize,                !- Rated Power Consumption {W}
  0.9,                     !- Motor Efficiency
  0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
  0,                       !- Coefficient1 of the Part Load Performance Curve
  1,                       !- Coefficient2 of the Part Load Performance Curve
  0,                       !- Coefficient3 of the Part Load Performance Curve
  0,                       !- Coefficient4 of the Part Load Performance Curve
  0,                       !- Min Flow Rate while operating in variable flow capacity {m3/s}
  INTERMITTENT;            !- Pump Control Type

PUMP:VARIABLE SPEED,
  CW Circ Pump,            !- Pump Name
  CW Supply Inlet Node,    !- Inlet_Node
  CW Pump Outlet Node,     !- Outlet_Node
  autosize,                !- Rated Volumetric Flow Rate {m3/s}
  179352,                  !- Rated Pump Head {Pa}
  autosize,                !- Rated Power Consumption {W}
  0.9,                     !- Motor Efficiency
  0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
  0,                       !- Coefficient1 of the Part Load Performance Curve
  1,                       !- Coefficient2 of the Part Load Performance Curve
  0,                       !- Coefficient3 of the Part Load Performance Curve
  0,                       !- Coefficient4 of the Part Load Performance Curve
  0,                       !- Min Flow Rate while operating in variable flow capacity {m3/s}
  INTERMITTENT,            !- Pump Control Type
```

```
  CoolingPumpAvailSched;   !- Pump Flow Rate Schedule Name

PUMP:VARIABLE SPEED,
  Cond Circ Pump,          !- Pump Name
  Condenser Supply Inlet Node,  !- Inlet_Node
  Condenser Pump Outlet Node,  !- Outlet_Node
  autosize,                !- Rated Volumetric Flow Rate {m3/s}
  179352,                  !- Rated Pump Head {Pa}
  autosize,                !- Rated Power Consumption {W}
  0.9,                     !- Motor Efficiency
  0.0,                     !- Fraction of Motor Inefficiencies to Fluid Stream
  0,                       !- Coefficient1 of the Part Load Performance Curve
  1,                       !- Coefficient2 of the Part Load Performance Curve
  0,                       !- Coefficient3 of the Part Load Performance Curve
  0,                       !- Coefficient4 of the Part Load Performance Curve
  0,                       !- Min Flow Rate while operating in variable flow capacity {m3/s}
  INTERMITTENT,            !- Pump Control Type
  CoolingPumpAvailSched;   !- Pump Flow Rate Schedule Name

COIL:Water:SimpleHeating,
  SPACE1-1 Zone Coil,      !- Coil Name
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  SPACE1-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
  SPACE1-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
  SPACE1-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
  SPACE1-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
  SPACE2-1 Zone Coil,      !- Coil Name
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  SPACE2-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
  SPACE2-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
  SPACE2-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
  SPACE2-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
  SPACE3-1 Zone Coil,      !- Coil Name
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  SPACE3-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
  SPACE3-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
  SPACE3-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
  SPACE3-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
  SPACE4-1 Zone Coil,      !- Coil Name
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  SPACE4-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
  SPACE4-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
  SPACE4-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
  SPACE4-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
  SPACE5-1 Zone Coil,      !- Coil Name
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  SPACE5-1 Zone Coil Water In Node,  !- Coil_Water_Inlet_Node
  SPACE5-1 Zone Coil Water Out Node,  !- Coil_Water_Outlet_Node
  SPACE5-1 Zone Coil Air In Node,  !- Coil_Air_Inlet_Node
  SPACE5-1 In Node;        !- Coil_Air_Outlet_Node

COIL:Water:SimpleHeating,
  Main Heating Coil 1,     !- Coil Name
```

```
  ReheatCoilAvailSched,    !- Available Schedule
  autosize,                !- UA of the Coil {W/K}
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  Main Heating Coil 1 Water Inlet Node,  !- Coil_Water_Inlet_Node
  Main Heating Coil 1 Water Outlet Node,  !- Coil_Water_Outlet_Node
  Main Cooling Coil 1 Outlet Node,  !- Coil_Air_Inlet_Node
  Main Heating Coil 1 Outlet Node;  !- Coil_Air_Outlet_Node

COIL:Water:DetailedFlatCooling,
  Main Cooling Coil 1,     !- Coil Name
  CoolingCoilAvailSched,   !- Available Schedule
  autosize,                !- Max Water Flow Rate of Coil {m3/s}
  autosize,                !- Tube Outside Surf Area {m2}
  autosize,                !- Total Tube Inside Area {m2}
  autosize,                !- Fin Surface Area {m2}
  autosize,                !- Minimum Air Flow Area {m2}
  autosize,                !- Coil Depth {m}
  autosize,                !- Fin Diameter {m}
  ,                        !- Fin Thickness {m}
  ,                        !- Tube Inside Diameter {m}
  ,                        !- Tube Outside Diameter {m}
  ,                        !- Tube Thermal Conductivity {W/m-K}
  ,                        !- Fin Thermal Conductivity {W/m-K}
  ,                        !- Fin Spacing {m}
  ,                        !- Tube Depth Spacing {m}
  ,                        !- Number of Tube Rows
  autosize,                !- Number of Tubes per Row
  Main Cooling Coil 1 Water Inlet Node,  !- Coil_Water_Inlet_Node
  Main Cooling Coil 1 Water Outlet Node,  !- Coil_Water_Outlet_Node
  Mixed Air Node 1,        !- Coil_Air_Inlet_Node
  Main Cooling Coil 1 Outlet Node;  !- Coil_Air_Outlet_Node

FAN:SIMPLE:VariableVolume,
  SPACE1-1 Zone Fan,       !- Fan Name
  FanAvailSched,           !- Available Schedule
  0.7,                     !- Fan Total Efficiency
  125.0,                   !- Delta Pressure {Pa}
  autosize,                !- Max Flow Rate {m3/s}
  0.0,                     !- Min Flow Rate {m3/s}
  0.9,                     !- Motor Efficiency
  1.0,                     !- Motor In Airstream Fraction
  0.00153028,              !- FanCoefficient 1
  0.00520806,              !- FanCoefficient 2
  1.1086242,               !- FanCoefficient 3
  -.11635563,              !- FanCoefficient 4
  0.000,                   !- FanCoefficient 5
  SPACE1-1 ATU In Node,    !- Fan_Inlet_Node
  SPACE1-1 Zone Coil Air In Node;   !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
  SPACE2-1 Zone Fan,       !- Fan Name
  FanAvailSched,           !- Available Schedule
  0.7,                     !- Fan Total Efficiency
  125.0,                   !- Delta Pressure {Pa}
  autosize,                !- Max Flow Rate {m3/s}
  0.0,                     !- Min Flow Rate {m3/s}
  0.9,                     !- Motor Efficiency
  1.0,                     !- Motor In Airstream Fraction
  0.00153028,              !- FanCoefficient 1
  0.00520806,              !- FanCoefficient 2
  1.1086242,               !- FanCoefficient 3
  -.11635563,              !- FanCoefficient 4
  0.000,                   !- FanCoefficient 5
  SPACE2-1 ATU In Node,    !- Fan_Inlet_Node
  SPACE2-1 Zone Coil Air In Node;   !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
  SPACE3-1 Zone Fan,       !- Fan Name
  FanAvailSched,           !- Available Schedule
  0.7,                     !- Fan Total Efficiency
  125.0,                   !- Delta Pressure {Pa}
```

```
  autosize,                !- Max Flow Rate {m3/s}
  0.0,                     !- Min Flow Rate {m3/s}
  0.9,                     !- Motor Efficiency
  1.0,                     !- Motor In Airstream Fraction
  0.00153028,              !- FanCoefficient 1
  0.00520806,              !- FanCoefficient 2
  1.1086242,               !- FanCoefficient 3
  -.11635563,              !- FanCoefficient 4
  0.000,                   !- FanCoefficient 5
  SPACE3-1 ATU In Node,    !- Fan_Inlet_Node
  SPACE3-1 Zone Coil Air In Node;   !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
  SPACE4-1 Zone Fan,       !- Fan Name
  FanAvailSched,           !- Available Schedule
  0.7,                     !- Fan Total Efficiency
  125.0,                   !- Delta Pressure {Pa}
  autosize,                !- Max Flow Rate {m3/s}
  0.0,                     !- Min Flow Rate {m3/s}
  0.9,                     !- Motor Efficiency
  1.0,                     !- Motor In Airstream Fraction
  0.00153028,              !- FanCoefficient 1
  0.00520806,              !- FanCoefficient 2
  1.1086242,               !- FanCoefficient 3
  -.11635563,              !- FanCoefficient 4
  0.000,                   !- FanCoefficient 5
  SPACE4-1 ATU In Node,    !- Fan_Inlet_Node
  SPACE4-1 Zone Coil Air In Node;   !- Fan_Outlet_Node

FAN:SIMPLE:VariableVolume,
  Supply Fan 1,            !- Fan Name
  FanAvailSched,           !- Available Schedule
  0.7,                     !- Fan Total Efficiency
  250.0,                   !- Delta Pressure {Pa}
  autosize,                !- Max Flow Rate {m3/s}
  0.0,                     !- Min Flow Rate {m3/s}
  0.9,                     !- Motor Efficiency
  1.0,                     !- Motor In Airstream Fraction
  0.00153028,              !- FanCoefficient 1
  0.00520806,              !- FanCoefficient 2
  1.1086242,               !- FanCoefficient 3
  -.11635563,              !- FanCoefficient 4
  0.000,                   !- FanCoefficient 5
  Outlet Branch Inlet Node 1,  !- Fan_Inlet_Node
  VAV Sys 1 Outlet Node;   !- Fan_Outlet_Node

Report Variable,
  *,                       !- Key_Value
  Outdoor Dry Bulb,        !- Variable_Name
  hourly,                  !- Reporting_Frequency
  ReportSch;               !- Schedule_Name

Report Variable,
  *,                       !- Key_Value
  Zone/Sys Air Temperature,       !- Variable_Name
  hourly,                  !- Reporting_Frequency
  ReportSch;               !- Schedule_Name

Report Variable,
  *,                       !- Key_Value
  Zone Air Humidity Ratio,       !- Variable_Name
  hourly,                  !- Reporting_Frequency
  ReportSch;               !- Schedule_Name

Report Variable,
  *,                       !- Key_Value
  Zone/Sys Sensible Cooling Rate,  !- Variable_Name
  hourly,                  !- Reporting_Frequency
  ReportSch;               !- Schedule_Name

Report Variable,
```

```
  *,                        !- Key_Value
  Zone/Sys Sensible Heating Rate,  !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  *,                        !- Key_Value
  Total Water Heating Coil Rate,  !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  *,                        !- Key_Value
  Total Water Cooling Coil Rate,  !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  *,                        !- Key_Value
  Sensible Water Cooling Coil Rate,  !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Outside Air Inlet Node 1,        !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Outside Air Inlet Node 1,        !- Key_Value
  System Node Humidity Ratio,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Outside Air Inlet Node 1,        !- Key_Value
  System Node MassFlowRate,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Mixed Air Node 1,         !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Mixed Air Node 1,         !- Key_Value
  System Node Humidity Ratio,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Mixed Air Node 1,         !- Key_Value
  System Node MassFlowRate,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Main Cooling Coil 1 Outlet Node,  !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Main Cooling Coil 1 Outlet Node,   !- Key_Value
  System Node Humidity Ratio,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name
```

```
Report Variable,
  Main Heating Coil 1 Outlet Node,  !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Bypass Duct Outlet Node,   !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Bypass Duct Outlet Node,   !- Key_Value
  System Node Humidity Ratio,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Bypass Duct Outlet Node,   !- Key_Value
  System Node MassFlowRate,!- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Outlet Node,   !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Outlet Node,   !- Key_Value
  System Node Humidity Ratio,        !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  VAV Sys 1 Outlet Node,   !- Key_Value
  System Node MassFlowRate,!- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Zone Eq In Node,         !- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Zone Eq In Node,         !- Key_Value
  System Node MassFlowRate,!- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Sup-PLENUM-1 Outlet Node,!- Key_Value
  System Node Temp,         !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  Sup-PLENUM-1 Outlet Node,!- Key_Value
  System Node MassFlowRate,!- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Variable,
  *,                        !- Key_Value
  Damper Position,          !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name
```

```
Report Variable,
  *,                        !- Key_Value
  Chiller Evap Heat Trans Rate,  !- Variable_Name
  hourly,                   !- Reporting_Frequency
  ReportSch;                !- Schedule_Name

Report Meter,
  Cooling:Electricity,      !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  Heating:Gas,              !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  Fans:Electricity,         !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  HeatingCoils:EnergyTransfer,  !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  CoolingCoils:EnergyTransfer,  !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  InteriorLights:Electricity,  !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  InteriorEquipment:Electricity,  !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report Meter,
  Cooling:Electricity,      !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  Heating:Gas,              !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  Fans:Electricity,         !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  HeatingCoils:EnergyTransfer,  !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  CoolingCoils:EnergyTransfer,  !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  InteriorLights:Electricity,  !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report Meter,
  InteriorEquipment:Electricity,  !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report,
  Variable Dictionary;      !- Type_of_Report

Report,
  surfaces,                 !- Type_of_Report
  dxf;                      !- Name_of_Report

Report:Table:Style,
```

```
  HTML;                   !- ColumnSeparator

Report:Table:Monthly,
  Building Loads - Cooling,!- Name
  2,                      !- DigitsAfterDecimal
  Zone/Sys Sensible Cooling Energy,  !- VariableOrMeterName01
  SumOrAverage,           !- AggregationType01
  Zone/Sys Sensible Cooling Rate,  !- VariableOrMeterName02
  Maximum,                !- AggregationType02
  Outdoor Dry Bulb,       !- VariableOrMeterName03
  ValueWhenMaxMin,        !- AggregationType03
  Outdoor Wet Bulb,       !- VariableOrMeterName04
  ValueWhenMaxMin,        !- AggregationType04
  Zone-Total Internal Latent Gain,  !- VariableOrMeterName05
  SumOrAverage,           !- AggregationType05
  Zone-Total Internal Latent Gain,  !- VariableOrMeterName06
  Maximum,                !- AggregationType06
  Outdoor Dry Bulb,       !- VariableOrMeterName07
  ValueWhenMaxMin,        !- AggregationType07
  Outdoor Wet Bulb,       !- VariableOrMeterName08
  ValueWhenMaxMin;        !- AggregationType08

Report:Table:Monthly,
  Building Loads - Heating,!- Name
  2,                      !- DigitsAfterDecimal
  Zone/Sys Sensible Heating Energy,  !- VariableOrMeterName01
  SumOrAverage,           !- AggregationType01
  Zone/Sys Sensible Heating Rate,  !- VariableOrMeterName02
  Maximum,                !- AggregationType02
  Outdoor Dry Bulb,       !- VariableOrMeterName03
  ValueWhenMaxMin;        !- AggregationType03

Report:Table:Monthly,
  Building Loads - Electric,  !- Name
  2,                      !- DigitsAfterDecimal
  Lights-Electric Consumption,  !- VariableOrMeterName01
  SumOrAverage,           !- AggregationType01
  Lights-Electric Consumption,  !- VariableOrMeterName02
  Maximum,                !- AggregationType02
  Electric Eq-Consumption, !- VariableOrMeterName03
  SumOrAverage,           !- AggregationType03
  Electric Eq-Consumption, !- VariableOrMeterName04
  Maximum;                !- AggregationType04

Report:Table:Monthly,
  Space Loads,            !- Name
  2,                      !- DigitsAfterDecimal
  People-Total Heat Gain,  !- VariableOrMeterName01
  SumOrAverage,           !- AggregationType01
  Lights-Total Heat Gain,  !- VariableOrMeterName02
  SumOrAverage,           !- AggregationType02
  Electric Eq-Total Heat Gain,  !- VariableOrMeterName03
  SumOrAverage,           !- AggregationType03
  Gas Eq-Total Heat Gain,  !- VariableOrMeterName04
  SumOrAverage,           !- AggregationType04
  Hot Water Eq-Total Heat Gain,  !- VariableOrMeterName05
  SumOrAverage,           !- AggregationType05
  Steam Eq-Total Heat Gain,!- VariableOrMeterName06
  SumOrAverage,           !- AggregationType06
  Other Eq-Total Heat Gain,!- VariableOrMeterName07
  SumOrAverage,           !- AggregationType07
  Infiltration-Sensible Heat Gain,  !- VariableOrMeterName08
  SumOrAverage,           !- AggregationType08
  Infiltration-Sensible Heat Loss,  !- VariableOrMeterName09
  SumOrAverage;           !- AggregationType09

Report:Table:Monthly,
  Energy Consumption - Electricity & Natural Gas,  !- Name
  2,                      !- DigitsAfterDecimal
  Electricity:Building,   !- VariableOrMeterName01
  SumOrAverage,           !- AggregationType01
```

```
  Electricity:Building,    !- VariableOrMeterName02
  Maximum,                 !- AggregationType02
  Gas:Building,            !- VariableOrMeterName03
  SumOrAverage,            !- AggregationType03
  Gas:Building,            !- VariableOrMeterName04
  Maximum;                 !- AggregationType04

Report:Table:Monthly,
  Building Energy Performance - Electricity,  !- Name
  2,                       !- DigitsAfterDecimal
  InteriorLights:Electricity,  !- VariableOrMeterName01
  SumOrAverage,            !- AggregationType01
  ExteriorLights:Electricity,  !- VariableOrMeterName03
  SumOrAverage,            !- AggregationType03
  InteriorEquipment:Electricity,  !- VariableOrMeterName04
  SumOrAverage,            !- AggregationType04
  ExteriorEquipment:Electricity,  !- VariableOrMeterName05
  SumOrAverage,            !- AggregationType05
  Fans:Electricity,        !- VariableOrMeterName06
  SumOrAverage,            !- AggregationType06
  Pumps:Electricity,       !- VariableOrMeterName07
  SumOrAverage,            !- AggregationType07
  Heating:Electricity,     !- VariableOrMeterName08
  SumOrAverage,            !- AggregationType08
  Cooling:Electricity,     !- VariableOrMeterName09
  SumOrAverage,            !- AggregationType09
  HeatRejection:Electricity,  !- VariableOrMeterName10
  SumOrAverage,            !- AggregationType10
  Humidifier:Electricity,  !- VariableOrMeterName11
  SumOrAverage,            !- AggregationType11
  HeatRecovery:Electricity,!- VariableOrMeterName12
  SumOrAverage,            !- AggregationType12
  DHW:Electricity,         !- VariableOrMeterName13
  SumOrAverage,            !- AggregationType13
  Cogeneration:Electricity,!- VariableOrMeterName14
  SumOrAverage;            !- AggregationType14

Report:Table:Monthly,
  Building Energy Performance - Natural Gas,  !- Name
  2,                       !- DigitsAfterDecimal
  InteriorEquipment:Gas,          !- VariableOrMeterName01
  SumOrAverage,            !- AggregationType01
  ExteriorEquipment:Gas,   !- VariableOrMeterName02
  SumOrAverage,            !- AggregationType02
  Heating:Gas,             !- VariableOrMeterName03
  SumOrAverage,            !- AggregationType03
  Cooling:Gas,             !- VariableOrMeterName04
  SumOrAverage,            !- AggregationType04
  DHW:Gas,                 !- VariableOrMeterName05
  SumOrAverage,            !- AggregationType05
  Cogeneration:Gas,        !- VariableOrMeterName06
  SumOrAverage;            !- AggregationType06

Report:Table:Monthly,
  Peak Energy End-Use - Electricity Part 1,  !- Name
  2,                       !- DigitsAfterDecimal
  InteriorLights:Electricity,  !- VariableOrMeterName01
  Maximum,                 !- AggregationType01
  ExteriorLights:Electricity,  !- VariableOrMeterName03
  Maximum,                 !- AggregationType03
  InteriorEquipment:Electricity,  !- VariableOrMeterName04
  Maximum,                 !- AggregationType04
  ExteriorEquipment:Electricity,  !- VariableOrMeterName05
  Maximum,                 !- AggregationType05
  Fans:Electricity,        !- VariableOrMeterName06
  Maximum,                 !- AggregationType06
  Pumps:Electricity,       !- VariableOrMeterName07
  Maximum,                 !- AggregationType07
  Heating:Electricity;     !- VariableOrMeterName08

Report:Table:Monthly,
```

```
  Peak Energy End-Use - Natural Gas,  !- Name
  2,                        !- DigitsAfterDecimal
  InteriorEquipment:Gas,          !- VariableOrMeterName01
  Maximum,                  !- AggregationType01
  ExteriorEquipment:Gas,    !- VariableOrMeterName02
  Maximum,                  !- AggregationType02
  Heating:Gas,              !- VariableOrMeterName03
  Maximum,                  !- AggregationType03
  Cooling:Gas,              !- VariableOrMeterName04
  Maximum,                  !- AggregationType04
  DHW:Gas,                  !- VariableOrMeterName05
  Maximum,                  !- AggregationType05
  Cogeneration:Gas,         !- VariableOrMeterName06
  Maximum;                  !- AggregationType06

Report MeterFileOnly,
  Electricity:Facility,     !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:Building,     !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:HVAC,         !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:Plant,        !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Gas:Facility,             !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Gas:Plant,                !- Meter_Name
  monthly;                  !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:Facility,     !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:Building,     !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:HVAC,         !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report MeterFileOnly,
  Electricity:Plant,        !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report MeterFileOnly,
  Gas:Facility,             !- Meter_Name
  runperiod;                !- Reporting_Frequency

Report MeterFileOnly,
  Gas:Plant,                !- Meter_Name
  runperiod;                !- Reporting_Frequency
```