# Synopsis

Synopsis of model Matrix of small offices with different P PI PD PID controls. defined in office\_ctl\_pid.cfg generated on Sun Dec 4 09:15:03 2022. Associated notes are in ../doc/office\_ctl.log

Location latitude 59.65 longitude difference 2.90 (from local time meridian (east +ve). Simulations year 2016 with Weekends occuring on Saturday and Sunday. Site exposure is typical city centre

Exterior surface heat transfer method: MoWiTT exterior hc method

Interior surface heat transfer method: Alamdari and Hammond (default)

The Site exposure is typical city centre and the ground reflectance is 0.20.

Weather file: Sweden Stockholm Arlanda 1984 in SWE\_Stockholm with hour-centred solar data. Standard annual weather SWE\_Stockholm  
Calculated ground temperature at depth  
0.5 m: -1.9593 -2.7908 -1.3161 0.99155 7.0276 11.686 14.827 15.784 14.154 10.538 5.7050 1.2207  
1.0 m: -0.82306 -1.9623 -0.96745 0.92127 6.2288 10.560 13.684 14.934 13.835 10.818 6.5257 2.3488  
1.5 m: 0.19756 -1.1522 -0.54409 0.98537 5.6254 9.6165 12.660 14.108 13.436 10.940 7.1505 3.2961  
2.0 m: 1.1002 -0.38132 -0.0788431 1.1469 5.1858 8.8370 11.757 13.325 12.991 10.940 7.6103 4.0795  
2.5 m: 1.8877 0.33652 0.40283 1.3754 4.8808 8.2029 10.972 12.599 12.525 10.852 7.9340 4.7176  
3.0 m: 2.5663 0.99338 0.88182 1.6461 4.6841 7.6954 10.298 11.936 12.060 10.700 8.1478 5.2292  
3.5 m: 3.1446 1.5857 1.3444 1.9395 4.5727 7.2957 9.7242 11.341 11.607 10.507 8.2746 5.6328  
4.0 m: 3.6327 2.1135 1.7812 2.2408 4.5269 6.9867 9.2417 10.811 11.179 10.290 8.3341 5.9455  
4.5 m: 4.0410 2.5788 2.1865 2.5389 4.5299 6.7525 8.8394 10.346 10.779 10.061 8.3431 6.1832  
5.0 m: 4.3798 2.9855 2.5573 2.8261 4.5680 6.5790 8.5066 9.9399 10.413 9.8300 8.3155 6.3598  
5.5 m: 4.6590 3.3385 2.8927 3.0971 4.6303 6.4541 8.2331 9.5883 10.081 9.6050 8.2623 6.4876  
6.0 m: 4.8878 3.6432 3.1932 3.3489 4.7078 6.3673 8.0098 9.2854 9.7825 9.3904 8.1925 6.5769  
6.5 m: 5.0746 3.9051 3.4605 3.5799 4.7940 6.3099 7.8283 9.0255 9.5167 9.1893 8.1131 6.6366  
7.0 m: 5.2266 4.1296 3.6970 3.7897 4.8838 6.2747 7.6810 8.8032 9.2811 9.0033 8.0291 6.6739  
7.5 m: 5.3503 4.3218 3.9054 3.9789 4.9734 6.2558 7.5618 8.6132 9.0732 8.8332 7.9444 6.6946  
8.0 m: 5.4509 4.4864 4.0886 4.1485 5.0603 6.2485 7.4651 8.4508 8.8902 8.6788 7.8616 6.7034  
8.5 m: 5.5333 4.6276 4.2495 4.3000 5.1428 6.2494 7.3864 8.3116 8.7293 8.5395 7.7827 6.7040  
9.0 m: 5.6010 4.7491 4.3908 4.4350 5.2200 6.2555 7.3219 8.1920 8.5878 8.4144 7.7086 6.6991  
9.5 m: 5.6572 4.8542 4.5151 4.5552 5.2914 6.2649 7.2686 8.0887 8.4633 8.3022 7.6399 6.6908  
10.0 m: 5.7044 4.9456 4.6248 4.6622 5.3568 6.2759 7.2240 7.9989 8.3533 8.2018 7.5768 6.6807

## Integrated Performance View

An Integrated Performance View has been defined  
Title Matrix of small offices with different h  
synopsis :The heat\_transfer Images 0

Simulations to be undertaken

| name | simulations | days | descripion |
| --- | --- | --- | --- |
| 1st win | Sat-09-Jan to Fri-15-Jan | 7 | 1st winter week run |
| spring | Sun-06-Mar to Sat-12-Mar | 7 | spring week run |
| summer | Mon-11-Jul to Sun-17-Jul | 7 | summer week run |
| autumn | Sun-02-Oct to Sat-08-Oct | 7 | autumn week run |
| 2nd win | Sun-20-Nov to Sat-26-Nov | 7 | 2nd winter week run |

display day Sun-10-Jan. display day Mon-07-Mar. display day Tue-12-Jul. display day Mon-03-Oct. display day Mon-21-Nov.

Seasons (as found in climatelist)

|  | winter | spring | summer | autumn | winter |
| --- | --- | --- | --- | --- | --- |
| start | 01-Jan | 19-Mar | 07-May | 13-Aug | 19-Nov |
| finish | 18-Mar | 06-May | 12-Aug | 18-Nov | 31-Dec |
| days | 77 | 49 | 98 | 98 | 43 |

| Ratios for: | winter | spring | summer | autumn | winter |
| --- | --- | --- | --- | --- | --- |
| heating | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| cooling | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| lighting | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| small power | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| fans&pumps | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DHW | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

| ID | Metric | zones | area | scale | weight | type | name | zones |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Resultant T (degC) | 0 | 1.00 | 1.00 | 1.00 | zones | ocup\_zones |  |

| ID | Name | Zones | Area | Scale | Notes |
| --- | --- | --- | --- | --- | --- |
| 1 | zones | 0 | 1.00 | 1.000 |  |

## Databases

Databases associated with the model

|  |  |
| --- | --- |
| standard pressure distr | pressc.db1 |
| standard materials | material.db |
| constructions | ../dbs/office\_ctl.constrdb |
| standard plant comp | plantc.db1 |
| standard event profiles | profiles.db2.a |
| standard optical prop | optics.db |
| standard UK NCM data | SBEM.db1 |
| standard predefined obj | predefined.db1 |
| standard mould isopleth | mould.db1 |

## Controls

The model includes ideal controls - a mix of ideal controls room\_bc is ideal pure covective room\_pi uses P+D controller with 2m D. Looser DB for P+D & P. Master control switched to Prop control and dbT sensing. Prop+D given more capacity. Prop+D with 4deg range. 3pos longer reaction time

Zones control includes 18 functions.

The following day types are defined weekdays saturday sunday holiday

Details of control loops referenced in the model  
loop: convective

The sensor for function 1 senses a mix of dry bulb 50% and MRT in the current zone.  
The actuator for function 1 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 6.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 20.00C cooling setpoint 24.00C. |
| 3 | 18.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 7.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 20.00C cooling setpoint 24.00C. |
| 3 | 14.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| loop | : propo | rtional |  |  |

The sensor for function 2 senses dry bulb temperature in room\_prop+I.  
The actuator for function 2 is the air point in room\_prop+I.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 30.0s. |
| 2 | 6.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 24.00C throttling range 4.00C integral action time 30.0s. |
| 3 | 18.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 30.0s. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s. |
| 2 | 7.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 24.00C throttling range 4.00C integral action time 60.0s. |
| 3 | 14.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s. |
| loop | : floor | \_heating |  |  |

The sensor for function 3 senses the temperature of the current zone.  
The actuator for function 3 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |
| 2 | 6.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 20.0 24.0 |
| 3 | 18.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |
| 2 | 7.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 20.0 24.0 |
| 3 | 14.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | Ideal multi-sensor: max heat cp 3000.W min heat cp 0.W max cool cp 3000.W min heat cp 0.W Heat stpt 35.0C cool stpt 100.0C Aux:senses dry bulb T in floor\_heat. h/c 15.0 26.0 |
| loop | : separ | ateONOFF |  |  |

The sensor for function 4 senses a mix of dry bulb 50% and MRT in the current zone.  
The actuator for function 4 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |
| 2 | 6.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 19.00C heating off above 20.00C cooling on above 25.00C cooling off below 24.00C. |
| 3 | 18.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |
| 2 | 7.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 19.00C heating off above 20.00C cooling on above 25.00C cooling off below 24.00C. |
| 3 | 14.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | separate ON/OFF flux: heating capacity 1400.00W cooling capacity 1400.00W heating on below 15.00C heating off above 16.00C cooling on above 26.00C cooling off below 25.00C. |
| loop | : dummy | \_floor\_hea | ting |  |

The sensor for function 5 senses a mix of dry bulb 50% and MRT in the current zone.  
The actuator for function 5 is the air point in floor\_heat.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 6.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 20.00C cooling setpoint 24.00C. |
| 3 | 18.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 7.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 20.00C cooling setpoint 24.00C. |
| 3 | 14.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 20.0W. cooling capacity 20.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| loop | : match | mid to lo | w void |  |

The sensor for function 6 senses dry bulb temperature in void\_low.  
The actuator for function 6 is the air point in void\_low.  
> 1 periods of validity during the year have been defined.

Control is valid Fri-01-Jan to Sat-31-Dec, 2016 with 1 periods.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | match temperature (ideal): max heat cp 2000.W min heat cp 0.W max cool cp 2000.W min heat cp 0.W Aux sensors 1. mean value @senses dry bulb T in mid\_void. scale 1.00 offset 0.00 |
| loop | : match | mid to hi | gh void |  |

The sensor for function 7 senses dry bulb temperature in upper\_void.  
The actuator for function 7 is the air point in upper\_void.  
> 1 periods of validity during the year have been defined.

Control is valid Fri-01-Jan to Sat-31-Dec, 2016 with 1 periods.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | match temperature (ideal): max heat cp 2000.W min heat cp 0.W max cool cp 2000.W min heat cp 0.W Aux sensors 1. mean value @senses dry bulb T in mid\_void. scale 1.00 offset 0.00 |
| loop | : VAV\_C | V |  |  |

The sensor for function 9 senses the temperature of the current zone.  
The actuator for function 9 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 6.00 | db temp | > flux | VAV and CAV air based: reheat cap 1400.00W air supply temp 11.000C room setpoint 20.000C max air flow rate 0.1660m^3/s min air flow rate 0.0560m^3/s |
| 3 | 18.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| 2 | 7.00 | db temp | > flux | VAV and CAV air based: reheat cap 1400.00W air supply temp 11.000C room setpoint 20.000C max air flow rate 0.1660m^3/s min air flow rate 0.0560m^3/s |
| 3 | 14.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | basic control: heating capacity 1400.0W. cooling capacity 1400.0W. heating setpoint 15.00C cooling setpoint 26.00C. |
| loop | : maste | r\_p |  |  |

The sensor for function 10 senses dry bulb temperature in room\_master.  
The actuator for function 10 is the air point in room\_master.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| 2 | 6.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 20.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 24.00C throttling range 3.00C. |
| 3 | 18.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| 2 | 7.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 20.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 24.00C throttling range 3.00C. |
| 3 | 14.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| loop | : slave | \_one |  |  |

The sensor for function 11 senses dry bulb temperature in room\_master.  
The actuator for function 11 is the air point in room\_slave1.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | master/slave control: index of master control loop10 slave max heating capacity 1000.00 slave max cooling capacity 1000.00. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | master/slave control: index of master control loop10 slave max heating capacity 1000.00 slave max cooling capacity 1000.00. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | master/slave control: index of master control loop10 slave max heating capacity 1000.00 slave max cooling capacity 1000.00. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | master/slave control: index of master control loop10 slave max heating capacity 1000.00 slave max cooling capacity 1000.00. |
| loop | : time\_ | prop\_ONOFF |  |  |

The sensor for function 13 senses the temperature of the current zone.  
The actuator for function 13 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |
| 2 | 6.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1400.00W cool cap 1400.00W heat ON 19.00C heat OFF 20.00C cool ON 25.00C cool OFF 24.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |
| 3 | 18.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |
| 2 | 7.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1400.00W cool cap 1400.00W heat ON 19.00C heat OFF 20.00C cool ON 25.00C cool OFF 24.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |
| 3 | 14.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | time proportioning ON/OFF: heat cap 1000.00W cool cap 1000.00W heat ON 15.00C heat OFF 16.00C cool ON 26.00C cool OFF 25.00C tot heat 10.mn min heat ON 5.mn min heat OFF 5.mn tot cool mnts10. min cool ON 5.mn min cool OFF 5.mn. |
| loop | : three | pos |  |  |

The sensor for function 15 senses the temperature of the current zone.  
The actuator for function 15 is air point of the current zone

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 1.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1000.0W min ht cap 0.0W ROC ht 5.ts max cl cap 1000.0W min cl cap 0.0W ROC cl 5.ts. |
| 2 | 6.00 | db temp | > flux | floating 3-pos: heat sp 20.00C ht dbd 2.00C ht shut df 1.00C ht open df 1.00C cool sp 24.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1400.0W min ht cap 0.0W ROC ht 5.ts max cl cap 1400.0W min cl cap 0.0W ROC cl 5.ts. |
| 3 | 18.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 1.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1000.0W min ht cap 0.0W ROC ht 5.ts max cl cap 1000.0W min cl cap 0.0W ROC cl 5.ts. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 2.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1000.0W min ht cap 0.0W ROC ht10.ts max cl cap 1000.0W min cl cap 0.0W ROC cl10.ts. |
| 2 | 7.00 | db temp | > flux | floating 3-pos: heat sp 20.00C ht dbd 2.00C ht shut df 1.00C ht open df 2.00C cool sp 24.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1400.0W min ht cap 0.0W ROC ht10.ts max cl cap 1400.0W min cl cap 0.0W ROC cl10.ts. |
| 3 | 14.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 2.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1000.0W min ht cap 0.0W ROC ht10.ts max cl cap 1000.0W min cl cap 0.0W ROC cl10.ts. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 2.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1400.0W min ht cap 0.0W ROC ht 5.ts max cl cap 1400.0W min cl cap 0.0W ROC cl 5.ts. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | floating 3-pos: heat sp 16.00C ht dbd 2.00C ht shut df 1.00C ht open df 2.00C cool sp 26.00C cl dbd 2.00C cl open df 1.00C cl shut df 1.00C max ht cap 1400.0W min ht cap 0.0W ROC ht 5.ts max cl cap 1400.0W min cl cap 0.0W ROC cl 5.ts. |
| loop | : prop\_ | no\_I |  |  |

The sensor for function 16 senses dry bulb temperature in room\_p.  
The actuator for function 16 is the air point in room\_p.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| 2 | 6.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 20.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 24.00C throttling range 3.00C. |
| 3 | 18.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| 2 | 7.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 20.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 24.00C throttling range 3.00C. |
| 3 | 14.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional: max heating 1400.0W min heating 0.0W heating spt 15.00C throttling range 3.00C. Max cooling 1400.0C min cooling 0.0W cooling spt 26.00C throttling range 3.00C. |
| loop | : prop+ | D |  |  |

The sensor for function 17 senses dry bulb temperature in room\_prop+D.  
The actuator for function 17 is the air point in room\_prop+D.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |
| 2 | 6.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 24.00C throttling range 4.00C derivative action time 60.0s. |
| 3 | 18.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |
| 2 | 7.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 24.00C throttling range 4.00C derivative action time 60.0s. |
| 3 | 14.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0 W cool spt 26.00C throttling range 4.00C derivative action time 60.0s. |
| loop | : Prop+ | P+I+D |  |  |

The sensor for function 18 senses dry bulb temperature in room\_pid.  
The actuator for function 18 is the air point in room\_pid.

| Per | Start | Sensing | Actuating | weekdays control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |
| 2 | 6.00 | db temp | > flux | proportional+I+D: max heat 1400.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1400.0W min cool 0.0W cool spt 24.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |
| 3 | 18.00 | db temp | > flux | proportional+I+D: max heat 1900.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | saturday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I+D: max heat 1900.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |
| 2 | 7.00 | db temp | > flux | proportional+I+D: max heat 1900.0W min heat 0.0W heat spt 20.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 24.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |
| 3 | 14.00 | db temp | > flux | proportional+I+D: max heat 1900.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | sunday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I+D: max heat 1900.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |

| Per | Start | Sensing | Actuating | holiday control laws |
| --- | --- | --- | --- | --- |
| 1 | 0.00 | db temp | > flux | proportional+I+D: max heat 1400.0W min heat 0.0W heat spt 15.00C throttling range 4.00C. Max cool 1900.0W min cool 0.0W cool spt 26.00C throttling range 4.00C integral action time 60.0s derivative action time 60.0s. |

Zone to contol loop linkages  
zone ( 1) room\_bc << control 1 convective  
zone ( 2) room\_prop+I << control 2 proportional  
zone ( 3) room\_p << control 16 prop\_no\_I  
zone ( 4) room\_3pos << control 15 threepos  
zone ( 5) room\_pid << control 18 Prop+P+I+D  
zone ( 6) room\_prop+D << control 17 prop+D  
zone ( 7) corid\_conv << control 1 convective  
zone ( 8) void\_low << control 6 match mid to low void  
zone ( 9) room\_master << control 10 master\_p  
zone (10) room\_slave1 << control 11 slave\_one  
zone (11) room\_onoffsh << control 4 separateONOFF  
zone (12) floor\_heat << control 5 dummy\_floor\_heating  
zone (13) room\_vave << control 9 VAV\_CV  
zone (14) room\_tprop << control 13 time\_prop\_ONOFF  
zone (15) corid\_rad << control 1 convective  
zone (16) mid\_void << control 0 no control imposed  
zone (17) thin\_floor << control 3 floor\_heating  
zone (18) upper\_void << control 7 match mid to high void

## Flow network description

The model includes a mass flow network. The details are shown below.

51 nodes, 44 components, 44 connections; wind reduction = 0.600

Network summary

| # | Node | Fluid | Node Type | X | Y | Z | Temperature | Data\_1 | Data\_2 |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | room\_bc\_conv | air | internal & unknown | 1.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 2 | room\_prop | air | internal & unknown | 4.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 3 | CAV\_mixed | air | internal & unknown | 7.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 4 | VAV\_mix\_CVh | air | internal & unknown | 10.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 5 | VAV\_mix\_VVh | air | internal & unknown | 13.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 6 | room\_prop+D | air | internal & unknown | 16.500 | 2.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 7 | corid\_conv | air | internal & unknown | 9.000 | 5.250 | 1.500 | 20.000 | (-) | 1.000 | vol | 81.002 |
| 8 | void\_low | air | internal & unknown | 9.000 | 3.000 | -0.200 | 20.000 | (-) | 1.000 | vol | 43.201 |
| 9 | room\_bc\_rad | air | internal & unknown | 1.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 10 | rad\_at\_fac | air | internal & unknown | 4.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 11 | rad\_at\_wall | air | internal & unknown | 7.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 12 | floor\_heat | air | internal & unknown | 10.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 13 | user\_hc | air | internal & unknown | 13.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 14 | warm\_wall | air | internal & unknown | 16.500 | 2.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 40.312 |
| 15 | corid\_rad | air | internal & unknown | 9.000 | 5.250 | 4.900 | 20.000 | (-) | 1.000 | vol | 81.002 |
| 16 | mid\_void | air | internal & unknown | 9.000 | 3.000 | 3.200 | 20.000 | (-) | 1.000 | vol | 40.501 |
| 17 | thin\_floor | air | internal & unknown | 10.500 | 2.250 | 3.300 | 20.000 | (-) | 1.000 | vol | 2.700 |
| 18 | upper\_void | air | internal & unknown | 9.000 | 3.000 | 6.600 | 20.000 | (-) | 1.000 | vol | 43.201 |
| 19 | ambient | air | boundary & wind ind | -1.000 | -1.000 | 1.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 20 | BW-Ve01:008 | air | boundary & wind ind | 1.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 21 | BW-Cr01:009 | air | boundary & wind ind | 1.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 22 | BW-Ve02:008 | air | boundary & wind ind | 4.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 23 | BW-Cr02:009 | air | boundary & wind ind | 4.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 24 | BW-Ve03:008 | air | boundary & wind ind | 7.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 25 | BW-Cr03:009 | air | boundary & wind ind | 7.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 26 | BW-Ve04:008 | air | boundary & wind ind | 10.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 27 | BW-Cr04:009 | air | boundary & wind ind | 10.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 28 | BW-Ve05:008 | air | boundary & wind ind | 13.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 29 | BW-Cr05:009 | air | boundary & wind ind | 13.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 30 | BW-Ve06:008 | air | boundary & wind ind | 16.210 | -0.900 | 3.000 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 31 | BW-Cr06:009 | air | boundary & wind ind | 16.500 | -0.900 | 1.950 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 32 | BW-Uc07:037 | air | boundary & wind ind | -0.900 | 5.250 | 0.000 | 0.0000 | coef | 1.000 | azim | 270.000 |
| 33 | BW-Uc07:038 | air | boundary & wind ind | 18.900 | 5.250 | 0.000 | 0.0000 | coef | 1.000 | azim | 90.000 |
| 34 | BW-Uc08:014 | air | boundary & wind ind | 18.900 | 3.500 | -0.400 | 0.0000 | coef | 1.000 | azim | 90.000 |
| 35 | BW-Ve09:008 | air | boundary & wind ind | 1.210 | -0.900 | 6.400 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 36 | BW-Cr09:009 | air | boundary & wind ind | 1.500 | -0.900 | 5.350 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 37 | BW-Ve10:008 | air | boundary & wind ind | 4.210 | -0.900 | 6.400 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 38 | BW-Cr10:009 | air | boundary & wind ind | 4.500 | -0.900 | 5.350 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 39 | BW-Ve11:008 | air | boundary & wind ind | 7.210 | -0.900 | 6.400 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 40 | BW-Cr11:009 | air | boundary & wind ind | 7.500 | -0.900 | 5.350 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 41 | BW-Ve12:008 | air | boundary & wind ind | 10.210 | -0.900 | 6.400 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 42 | BW-Cr12:009 | air | boundary & wind ind | 10.500 | -0.900 | 5.350 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 43 | BW-Ve13:008 | air | boundary & wind ind | 13.210 | -0.900 | 6.400 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 44 | BW-Cr13:009 | air | boundary & wind ind | 13.500 | -0.900 | 5.350 | 0.0000 | coef | 1.000 | azim | 180.000 |
| 45 | BW-Uc15:037 | air | boundary & wind ind | -0.900 | 5.250 | 3.400 | 0.0000 | coef | 1.000 | azim | 270.000 |
| 46 | BW-Uc15:038 | air | boundary & wind ind | 18.900 | 5.250 | 3.400 | 0.0000 | coef | 1.000 | azim | 90.000 |
| 47 | BW-Uc16:025 | air | boundary & wind ind | 18.900 | 3.500 | 3.000 | 0.0000 | coef | 1.000 | azim | 90.000 |
| 48 | BW-Uc18:014 | air | boundary & wind ind | 18.900 | 3.300 | 6.400 | 0.0000 | coef | 1.000 | azim | 90.000 |
| 49 | BF-Cr08:013 | air | boundary & wind ind | -0.900 | 3.500 | -0.200 | 0.0000 | coef | 1.000 | azim | 270.000 |
| 50 | BF-Cr16:024 | air | boundary & wind ind | -0.900 | 3.500 | 3.200 | 0.0000 | coef | 1.000 | azim | 270.000 |
| 51 | BF-Cr18:015 | air | boundary & wind ind | -0.900 | 3.300 | 6.560 | 0.0000 | coef | 1.000 | azim | 270.000 |

Components (C+ = atributes L+ connection atributes):

| Component | Type | Fluid | C+ | L+ | Associated with | @X | @Y | @Z | Description |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DoUcz01:003 | 40 | air | 3 | 0 | room\_bc\_conv:bc\_door | 0.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez01:008 | 40 | air | 3 | 0 | room\_bc\_conv:frame | 1.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz01:009 | 120 | air | 3 | 0 | room\_bc\_conv:glazing | 1.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz02:003 | 40 | air | 3 | 0 | room\_fan:fc\_door | 3.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez02:008 | 40 | air | 3 | 0 | room\_fan:frame | 4.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz02:009 | 120 | air | 3 | 0 | room\_fan:glazing | 4.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz03:003 | 40 | air | 3 | 0 | CAV\_mixed:cav\_door | 6.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez03:008 | 40 | air | 3 | 0 | CAV\_mixed:frame | 7.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz03:009 | 120 | air | 3 | 0 | CAV\_mixed:glazing | 7.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz04:003 | 40 | air | 3 | 0 | VAV\_mix\_CVh:vavc\_door | 9.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez04:008 | 40 | air | 3 | 0 | VAV\_mix\_CVh:frame | 10.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz04:009 | 120 | air | 3 | 0 | VAV\_mix\_CVh:glazing | 10.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz05:003 | 40 | air | 3 | 0 | VAV\_mix\_VVh:vavv\_door | 12.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez05:008 | 40 | air | 3 | 0 | VAV\_mix\_VVh:frame | 13.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz05:009 | 120 | air | 3 | 0 | VAV\_mix\_VVh:glazing | 13.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz06:003 | 40 | air | 3 | 0 | CEN\_hc:cen\_door | 15.8 | 4.5 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez06:008 | 40 | air | 3 | 0 | CEN\_hc:frame | 16.2 | 0.0 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz06:009 | 120 | air | 3 | 0 | CEN\_hc:glazing | 16.5 | 0.0 | 2.0 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz07:037 | 40 | air | 3 | 0 | corid\_conv:left | 0.0 | 5.2 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 022 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz07:038 | 40 | air | 3 | 0 | corid\_conv:right | 18.0 | 5.2 | 0.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 022 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz08:014 | 40 | air | 3 | 0 | void\_low:right | 18.0 | 3.5 | -0.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 090 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz09:003 | 40 | air | 3 | 0 | room\_bc\_rad:bcr\_door | 0.8 | 4.5 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez09:008 | 40 | air | 3 | 0 | room\_bc\_rad:frame | 1.2 | 0.0 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz09:009 | 120 | air | 3 | 0 | room\_bc\_rad:glazing | 1.5 | 0.0 | 5.3 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz10:003 | 40 | air | 3 | 0 | rad\_at\_fac:radf\_door | 3.8 | 4.5 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez10:008 | 40 | air | 3 | 0 | rad\_at\_fac:frame | 4.2 | 0.0 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz10:009 | 120 | air | 3 | 0 | rad\_at\_fac:glazing | 4.5 | 0.0 | 5.3 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz11:003 | 40 | air | 3 | 0 | rad\_at\_wall:radw\_door | 6.8 | 4.5 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez11:008 | 40 | air | 3 | 0 | rad\_at\_wall:frame | 7.2 | 0.0 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz11:009 | 120 | air | 3 | 0 | rad\_at\_wall:glazing | 7.5 | 0.0 | 5.3 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz12:003 | 40 | air | 3 | 0 | floor\_heat:flrh\_door | 9.8 | 4.5 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez12:008 | 40 | air | 3 | 0 | floor\_heat:frame | 10.2 | 0.0 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz12:009 | 120 | air | 3 | 0 | floor\_heat:glazing | 10.5 | 0.0 | 5.3 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz13:003 | 40 | air | 3 | 0 | user\_hc:user\_door | 12.8 | 4.5 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 012 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrVez13:008 | 40 | air | 3 | 0 | user\_hc:frame | 13.2 | 0.0 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 010 | discharge factor (-) 0.34 | 0 |  |  |  |
| WiCrz13:009 | 120 | air | 3 | 0 | user\_hc:glazing | 13.5 | 0.0 | 5.3 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 9.400 |  |  |  |  |
| DoUcz15:037 | 40 | air | 3 | 0 | corid\_rad:left | 0.0 | 5.2 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 022 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz15:038 | 40 | air | 3 | 0 | corid\_rad:right | 18.0 | 5.2 | 3.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 022 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz16:025 | 40 | air | 3 | 0 | mid\_void:right | 18.0 | 3.5 | 3.0 | Common orifice flow |
| With opening | area | (m^2) | 0. | 090 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz16:029 | 40 | air | 3 | 0 | mid\_void:thin\_back | 10.3 | 4.5 | 3.2 | Common orifice flow |
| With opening | area | (m^2) | 0. | 045 | discharge factor (-) 0.70 | 0 |  |  |  |
| DoUcz18:014 | 40 | air | 3 | 0 | upper\_void:right | 18.0 | 3.3 | 6.4 | Common orifice flow |
| With opening | area | (m^2) | 0. | 090 | discharge factor (-) 0.70 | 0 |  |  |  |
| FrCrz08:013 | 120 | air | 3 | 0 | void\_low:left | 0.0 | 3.5 | -0.2 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 12.800 |  |  |  |  |
| FrCrz16:024 | 120 | air | 3 | 0 | mid\_void:left | 0.0 | 3.5 | 3.2 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 12.800 |  |  |  |  |
| FrCrz18:015 | 120 | air | 3 | 0 | upper\_void:left | 0.0 | 3.3 | 6.6 | Specific air flow crack |
| With crack wi | dth(m | ) 0.0 | 020 | cr | ack length(m) 12.800 |  |  |  |  |

Connection summary

| # | +Node | dHght | -Node | dHght | Component | Z @+ | Z @- |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | room\_bc\_conv | -1.500 | corid\_conv | -1.500 | DoUcz01:003 | 0.000 | 0.000 |
| 2 | BW-Ve01:008 | 0.000 | room\_bc\_conv | 1.500 | FrVez01:008 | 3.000 | 3.000 |
| 3 | BW-Cr01:009 | 0.000 | room\_bc\_conv | 0.450 | WiCrz01:009 | 1.950 | 1.950 |
| 4 | room\_prop | -1.500 | corid\_conv | -1.500 | DoUcz02:003 | 0.000 | 0.000 |
| 5 | BW-Ve02:008 | 0.000 | room\_prop | 1.500 | FrVez02:008 | 3.000 | 3.000 |
| 6 | BW-Cr02:009 | 0.000 | room\_prop | 0.450 | WiCrz02:009 | 1.950 | 1.950 |
| 7 | CAV\_mixed | -1.500 | corid\_conv | -1.500 | DoUcz03:003 | 0.000 | 0.000 |
| 8 | BW-Ve03:008 | 0.000 | CAV\_mixed | 1.500 | FrVez03:008 | 3.000 | 3.000 |
| 9 | BW-Cr03:009 | 0.000 | CAV\_mixed | 0.450 | WiCrz03:009 | 1.950 | 1.950 |
| 10 | VAV\_mix\_CVh | -1.500 | corid\_conv | -1.500 | DoUcz04:003 | 0.000 | 0.000 |
| 11 | BW-Ve04:008 | 0.000 | VAV\_mix\_CVh | 1.500 | FrVez04:008 | 3.000 | 3.000 |
| 12 | BW-Cr04:009 | 0.000 | VAV\_mix\_CVh | 0.450 | WiCrz04:009 | 1.950 | 1.950 |
| 13 | VAV\_mix\_VVh | -1.500 | corid\_conv | -1.500 | DoUcz05:003 | 0.000 | 0.000 |
| 14 | BW-Ve05:008 | 0.000 | VAV\_mix\_VVh | 1.500 | FrVez05:008 | 3.000 | 3.000 |
| 15 | BW-Cr05:009 | 0.000 | VAV\_mix\_VVh | 0.450 | WiCrz05:009 | 1.950 | 1.950 |
| 16 | room\_prop+D | -1.500 | corid\_conv | -1.500 | DoUcz06:003 | 0.000 | 0.000 |
| 17 | BW-Ve06:008 | 0.000 | room\_prop+D | 1.500 | FrVez06:008 | 3.000 | 3.000 |
| 18 | BW-Cr06:009 | 0.000 | room\_prop+D | 0.450 | WiCrz06:009 | 1.950 | 1.950 |
| 19 | BW-Uc07:037 | 0.000 | corid\_conv | -1.500 | DoUcz07:037 | 0.000 | 0.000 |
| 20 | BW-Uc07:038 | 0.000 | corid\_conv | -1.500 | DoUcz07:038 | 0.000 | 0.000 |
| 21 | BW-Uc08:014 | 0.000 | void\_low | -0.200 | DoUcz08:014 | -0.400 | -0.400 |
| 22 | room\_bc\_rad | -1.500 | corid\_rad | -1.500 | DoUcz09:003 | 3.400 | 3.400 |
| 23 | BW-Ve09:008 | 0.000 | room\_bc\_rad | 1.500 | FrVez09:008 | 6.400 | 6.400 |
| 24 | BW-Cr09:009 | 0.000 | room\_bc\_rad | 0.450 | WiCrz09:009 | 5.350 | 5.350 |
| 25 | rad\_at\_fac | -1.500 | corid\_rad | -1.500 | DoUcz10:003 | 3.400 | 3.400 |
| 26 | BW-Ve10:008 | 0.000 | rad\_at\_fac | 1.500 | FrVez10:008 | 6.400 | 6.400 |
| 27 | BW-Cr10:009 | 0.000 | rad\_at\_fac | 0.450 | WiCrz10:009 | 5.350 | 5.350 |
| 28 | rad\_at\_wall | -1.500 | corid\_rad | -1.500 | DoUcz11:003 | 3.400 | 3.400 |
| 29 | BW-Ve11:008 | 0.000 | rad\_at\_wall | 1.500 | FrVez11:008 | 6.400 | 6.400 |
| 30 | BW-Cr11:009 | 0.000 | rad\_at\_wall | 0.450 | WiCrz11:009 | 5.350 | 5.350 |
| 31 | floor\_heat | -1.500 | corid\_rad | -1.500 | DoUcz12:003 | 3.400 | 3.400 |
| 32 | BW-Ve12:008 | 0.000 | floor\_heat | 1.500 | FrVez12:008 | 6.400 | 6.400 |
| 33 | BW-Cr12:009 | 0.000 | floor\_heat | 0.450 | WiCrz12:009 | 5.350 | 5.350 |
| 34 | user\_hc | -1.500 | corid\_rad | -1.500 | DoUcz13:003 | 3.400 | 3.400 |
| 35 | BW-Ve13:008 | 0.000 | user\_hc | 1.500 | FrVez13:008 | 6.400 | 6.400 |
| 36 | BW-Cr13:009 | 0.000 | user\_hc | 0.450 | WiCrz13:009 | 5.350 | 5.350 |
| 37 | BW-Uc15:037 | 0.000 | corid\_rad | -1.500 | DoUcz15:037 | 3.400 | 3.400 |
| 38 | BW-Uc15:038 | 0.000 | corid\_rad | -1.500 | DoUcz15:038 | 3.400 | 3.400 |
| 39 | BW-Uc16:025 | 0.000 | mid\_void | -0.200 | DoUcz16:025 | 3.000 | 3.000 |
| 40 | mid\_void | 0.000 | thin\_floor | -0.100 | DoUcz16:029 | 3.200 | 3.200 |
| 41 | BW-Uc18:014 | 0.000 | upper\_void | -0.200 | DoUcz18:014 | 6.400 | 6.400 |
| 42 | BF-Cr08:013 | 0.000 | void\_low | 0.000 | FrCrz08:013 | -0.200 | -0.200 |
| 43 | BF-Cr16:024 | 0.000 | mid\_void | -0.000 | FrCrz16:024 | 3.200 | 3.200 |
| 44 | BF-Cr18:015 | 0.000 | upper\_void | -0.040 | FrCrz18:015 | 6.560 | 6.560 |

Thermal zone -> flow node mapping:

| zone | to | node |
| --- | --- | --- |
| room\_bc | -> | room\_bc\_conv |
| room\_prop+I | -> | room\_prop |
| room\_p | -> | CAV\_mixed |
| room\_3pos | -> | VAV\_mix\_CVh |
| room\_pid | -> | VAV\_mix\_VVh |
| room\_prop+D | -> | room\_prop+D |
| corid\_conv | -> | corid\_conv |
| void\_low | -> | void\_low |
| room\_master | -> | room\_bc\_rad |
| room\_slave1 | -> | rad\_at\_fac |
| room\_onoffsh | -> | rad\_at\_wall |
| floor\_heat | -> | floor\_heat |
| room\_vave | -> | user\_hc |
| room\_tprop | -> | warm\_wall |
| corid\_rad | -> | corid\_rad |
| mid\_void | -> | mid\_void |
| thin\_floor | -> | thin\_floor |
| upper\_void | -> | upper\_void |

## Zones

Zone summary

| ID | Zone name | Volume (m3) | Floor (m2) | Description |
| --- | --- | --- | --- | --- |
| 1 | room\_bc | 40.3 | 13.5 | manager describes cellular office on left (base case) |
| 2 | room\_prop+I | 40.3 | 13.5 | room\_prop+I is a small office with a P+I Controller |
| 3 | room\_p | 40.3 | 13.5 | A small office with ideal proportional (No I or D) controller. |
| 4 | room\_3pos | 40.3 | 13.5 | Small office ideal threed position controler |
| 5 | room\_pid | 40.3 | 13.5 | Small office with ideal pid controller. |
| 6 | room\_prop+D | 40.3 | 13.5 | A small office with Prop+D controller for convective regime. |
| 7 | corid\_conv | 81.0 | 27.0 | corid\_conv is passage adjacet to convective heating rooms |
| 8 | void\_low | 43.2 | 108.0 | void\_low describes lower boundary ceiling void |
| 9 | room\_master | 40.3 | 13.5 | room\_master is office with master controler |
| 10 | room\_slave1 | 40.3 | 13.5 | small office slaved to room\_master |
| 11 | room\_onoffsh | 40.3 | 13.5 | small office with ON OFF controller for short timesteps |
| 12 | floor\_heat | 40.3 | 13.5 | floor\_heat office with thin zone floor heating |
| 13 | room\_vave | 40.3 | 13.5 | small office with ideal VAV with terminal reheat. |
| 14 | room\_tprop | 40.3 | 13.5 | small office with a time-proportioning ONOFF control |
| 15 | corid\_rad | 81.0 | 27.0 | corid\_rad describes corridor adjacent to radiator rooms |
| 16 | mid\_void | 41.9 | 108.0 | mid\_void is the ceiling void between convective and radiant |
| 17 | thin\_floor | 1.4 | 13.5 | thin\_floor a thin zone for floor heat injection |
| 18 | upper\_void | 43.2 | 108.0 | upper\_void describes ceiling void over radiator rooms |
| - | all | 775. | 553.5 | - |

### Zone 1: room\_bc

Zone room\_bc ( 1) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. manager describes cellular office on left (base case).  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 56.168 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_bc( 1)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_prop+I |
| 2 | 0.920 | 360. | 0. | bc\_corid\_fra | - | sash\_fr92mm | bc\_corid\_fra:corid\_conv |
| 3 | 2.32 | 0. | 0. | bc\_door | DOOR | door | bc\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | identical environment |
| 5 | 13.5 | 0. | 90. | ceiling\_bc | - | ceiling | ceiling\_bc:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_bc | - | slate\_over\_struc room>voi | floor\_bc:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | bc\_part\_glaz | - | dbl\_glz | bc\_part\_glaz:corid\_conv |
| 11 | 1.28 | 360. | 0. | bc\_ptn\_corid | - | gyp\_gyp\_ptn | bc\_ptn\_corid:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_bc |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_bc |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_bc |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_bc |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_bc |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_bc |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_bc |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_bc |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_bc |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_bc |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_bc |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_bc |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_bc |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_bc |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_bc |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_bc |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_bc |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_bc |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_bc |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_bc |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_bc |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_bc |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| bc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 14.8 | 0.0 | 0.0 | 13.5 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | -0.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | -0.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | -0.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | -0.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | -0.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | -0.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_bc and typcial ceiling ceiling\_bc. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Ventilation & infiltration is assessed via network analysis and the associated network node is: room\_bc\_conv

| Daytype | ID | Label | Type | Unit | Hours | Sens.(W) | Late.(W) | Rad. Frac | Con. Frac |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| weekdays | 1 | Occupants | people | W | 0- 8 | 0.0 | 0.0 | 0.60 | 0.40 |
| weekdays | 2 | Occupants | people | W | 8- 9 | 30.0 | 15.0 | 0.60 | 0.40 |
| weekdays | 3 | Occupants | people | W | 9-12 | 100.0 | 50.0 | 0.60 | 0.40 |
| weekdays | 4 | Occupants | people | W | 12-13 | 60.0 | 30.0 | 0.60 | 0.40 |
| weekdays | 5 | Occupants | people | W | 13-16 | 100.0 | 50.0 | 0.60 | 0.40 |
| weekdays | 6 | Occupants | people | W | 16-18 | 80.0 | 40.0 | 0.60 | 0.40 |
| weekdays | 7 | Occupants | people | W | 18-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| weekdays | 8 | Lights | lighting | Wm2 | 0- 8 | 0.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 9 | Lights | lighting | Wm2 | 8-12 | 7.0 | 11.6 | 0.30 | 0.70 |
| weekdays | 10 | Lights | lighting | Wm2 | 12-14 | 5.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 11 | Lights | lighting | Wm2 | 14-18 | 7.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 12 | Lights | lighting | Wm2 | 18-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 13 | SmallPower | equipment | Wm2 | 0- 7 | 2.0 | 0.0 | 0.40 | 0.60 |
| weekdays | 14 | SmallPower | equipment | Wm2 | 7-17 | 11.7 | 0.0 | 0.40 | 0.60 |
| weekdays | 15 | SmallPower | equipment | Wm2 | 17-24 | 3.0 | 0.0 | 0.40 | 0.60 |
| saturday | 1 | Occupants | people | W | 0- 8 | 0.0 | 0.0 | 0.60 | 0.40 |
| saturday | 2 | Occupants | people | W | 8- 9 | 30.0 | 15.0 | 0.60 | 0.40 |
| saturday | 3 | Occupants | people | W | 9-12 | 100.0 | 50.0 | 0.60 | 0.40 |
| saturday | 4 | Occupants | people | W | 12-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| saturday | 5 | Lights | lighting | Wm2 | 0- 8 | 0.0 | 0.0 | 0.30 | 0.70 |
| saturday | 6 | Lights | lighting | Wm2 | 8-12 | 7.0 | 0.0 | 0.30 | 0.70 |
| saturday | 7 | Lights | lighting | Wm2 | 12-24 | 5.0 | 0.0 | 0.30 | 0.70 |
| saturday | 8 | SmallPower | equipment | Wm2 | 0- 7 | 2.0 | 0.0 | 0.40 | 0.60 |
| saturday | 9 | SmallPower | equipment | Wm2 | 7-14 | 11.7 | 0.0 | 0.40 | 0.60 |
| saturday | 10 | SmallPower | equipment | Wm2 | 14-24 | 2.0 | 0.0 | 0.40 | 0.60 |
| sunday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| sunday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| sunday | 3 | SmallPower | equipment | Wm2 | 0-24 | 2.0 | 0.0 | 0.40 | 0.60 |
| holiday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| holiday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| holiday | 3 | SmallPower | equipment | Wm2 | 0-24 | 2.0 | 0.0 | 0.40 | 0.60 |

### Zone 2: room\_prop+I

Zone room\_prop+I ( 2) is composed of 39 surfaces and 77 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. room\_prop+I is a small office with a P+I Controller.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_prop+I( 2)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_p |
| 2 | 0.920 | 360. | 0. | fc\_corid\_fra | - | sash\_fr92mm | fc\_corid\_fra:corid\_conv |
| 3 | 2.32 | 0. | 0. | fc\_door | DOOR | door | fc\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_bc |
| 5 | 13.5 | 0. | 90. | ceiling\_fan | - | ceiling | ceiling\_fan:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_fan | - | slate\_over\_struc room>voi | floor\_fan:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | fc\_part\_glaz | - | dbl\_glz | fc\_part\_glaz:corid\_conv |
| 11 | 1.28 | 360. | 0. | fc\_ptn\_corid | - | gyp\_gyp\_ptn | fc\_ptn\_corid:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_prop+I |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_prop+I |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_prop+I |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_prop+I |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_prop+I |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_prop+I |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_prop+I |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_prop+I |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_prop+I |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_prop+I |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_prop+I |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_prop+I |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_prop+I |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_prop+I |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_prop+I |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_prop+I |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_prop+I |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_prop+I |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_prop+I |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_prop+I |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_prop+I |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_prop+I |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| fc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 2.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 2.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 2.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 2.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 2.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cseat | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdrt\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdscreen | collector\_ |
| vis | 1rot | dl\_arm\_res | steel\_gr\_3 | vis | 1rot | fan\_heater | collector\_ |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_fan and typcial ceiling ceiling\_fan. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone 3: room\_p

Zone room\_p ( 3) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. A small office with ideal proportional (No I or D) controller..  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_p( 3)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_3pos |
| 2 | 0.920 | 360. | 0. | cav\_corid\_fr | - | sash\_fr92mm | cav\_corid\_fr:corid\_conv |
| 3 | 2.32 | 0. | 0. | cav\_door | DOOR | door | cav\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_prop+I |
| 5 | 13.5 | 0. | 90. | ceiling\_cav | - | ceiling | ceiling\_cav:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_cav | - | slate\_over\_struc room>voi | floor\_cav:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | cav\_part\_gla | - | dbl\_glz | cav\_part\_gla:corid\_conv |
| 11 | 1.28 | 360. | 0. | cav\_ptn\_cori | - | gyp\_gyp\_ptn | cav\_ptn\_cori:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_p |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_p |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_p |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_p |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_p |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_p |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_p |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_p |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_p |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_p |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_p |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_p |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_p |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_p |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_p |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_p |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_p |
| 35 | 1.55 | 90. | -0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_p |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_p |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_p |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_p |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_p |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| cav\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 5.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 5.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 5.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 5.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 5.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 5.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_cav and typcial ceiling ceiling\_cav. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone 4: room\_3pos

Zone room\_3pos ( 4) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. Small office ideal threed position controler.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_3pos( 4)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_pid |
| 2 | 0.920 | 360. | 0. | vavc\_corid\_f | - | sash\_fr92mm | vavc\_corid\_f:corid\_conv |
| 3 | 2.32 | 0. | 0. | vavc\_door | DOOR | door | vavc\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_p |
| 5 | 13.5 | 0. | 90. | ceiling\_vavc | - | ceiling | ceiling\_vavc:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_vavc | - | slate\_over\_struc room>voi | floor\_vavc:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | vavc\_part\_gl | - | dbl\_glz | vavc\_part\_gl:corid\_conv |
| 11 | 1.28 | 360. | 0. | vavc\_ptn\_cor | - | gyp\_gyp\_ptn | vavc\_ptn\_cor:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_3pos |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_3pos |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_3pos |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_3pos |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_3pos |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_3pos |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_3pos |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_3pos |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_3pos |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_3pos |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_3pos |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_3pos |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_3pos |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_3pos |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_3pos |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_3pos |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_3pos |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_3pos |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_3pos |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_3pos |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_3pos |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_3pos |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| vavc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 8.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 8.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 8.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 8.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 8.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 8.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_vavc and typcial ceiling ceiling\_vavc. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone 5: room\_pid

Zone room\_pid ( 5) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. Small office with ideal pid controller..  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_pid( 5)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_prop+D |
| 2 | 0.920 | 360. | 0. | vavv\_corid\_f | - | sash\_fr92mm | vavv\_corid\_f:corid\_conv |
| 3 | 2.32 | 0. | 0. | vavv\_door | DOOR | door | vavv\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_3pos |
| 5 | 13.5 | 0. | 90. | ceiling\_vavv | - | ceiling | ceiling\_vavv:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_vavv | - | slate\_over\_struc room>voi | floor\_vavv:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | vavv\_part\_gl | - | dbl\_glz | vavv\_part\_gl:corid\_conv |
| 11 | 1.28 | 360. | 0. | vavv\_ptn\_cor | - | gyp\_gyp\_ptn | vavv\_ptn\_cor:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_pid |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_pid |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_pid |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_pid |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_pid |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_pid |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_pid |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_pid |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_pid |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_pid |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_pid |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_pid |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | -0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_pid |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_pid |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_pid |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_pid |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_pid |
| 35 | 1.55 | 90. | -0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_pid |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_pid |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_pid |
| 38 | 0.123 | 90. | -0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_pid |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_pid |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| vavv\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 11.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 11.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 11.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 11.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 11.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 11.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_vavv and typcial ceiling ceiling\_vavv. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone 6: room\_prop+D

Zone room\_prop+D ( 6) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. A small office with Prop+D controller for convective regime..  
There is 22.500 m2 of exposed surface area, 22.500 m2 of which is vertical. Facade opaque is 17.180 m2 & 127.3 % of floor area & average U of 0.394 & UA of 6.7622. Facade glazing is 5.3200 m2 & 39.4 % of floor & 23.6 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 56.168 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_prop+D( 6)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | insul\_frc\_facade\_heater | external |
| 2 | 0.920 | 360. | 0. | cen\_corid\_fr | - | sash\_fr92mm | cen\_corid\_fr:corid\_conv |
| 3 | 2.32 | 0. | 0. | cen\_door | DOOR | door | cen\_door:corid\_conv |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_pid |
| 5 | 13.5 | 0. | 90. | ceiling\_cen | - | ceiling | ceiling\_cen:mid\_void |
| 6 | 13.5 | 0. | -90. | floor\_cen | - | slate\_over\_struc room>voi | floor\_cen:void\_low |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | cen\_part\_gla | - | dbl\_glz | cen\_part\_gla:corid\_conv |
| 11 | 1.28 | 360. | 0. | cen\_ptn\_cori | - | gyp\_gyp\_ptn | cen\_ptn\_cori:corid\_conv |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_prop+D |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_prop+D |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_prop+D |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_prop+D |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_prop+D |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_prop+D |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_prop+D |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_prop+D |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_prop+D |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_prop+D |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_prop+D |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_prop+D |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 360. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_prop+D |
| 31 | 0.500 | 0. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_prop+D |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_prop+D |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_prop+D |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_prop+D |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_prop+D |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_prop+D |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_prop+D |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_prop+D |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_prop+D |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| cen\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 14.8 | 0.0 | 14.8 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 13.5 | 13.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 14.5 | -0.1 | 3.1 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 14.5 | -0.3 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 14.5 | -0.5 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 14.5 | -0.7 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 14.5 | -0.9 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 14.5 | -1.1 | 3.1 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_cen and typcial ceiling ceiling\_cen. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone 7: corid\_conv

Zone corid\_conv ( 7) is composed of 44 surfaces and 88 vertices. It encloses a volume of 81.0 m3 of space, with a total surface area of 171. m2 & approx floor area of 27.0 m2. corid\_conv is passage adjacet to convective heating rooms.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 9.0000 m2 & 33.3 % of floor area & average U of 0.360 & UA of 3.2388. Opaque partitions:ceiling:floor 81.120 m2 & trasparent partitions:ceiling:floor 26.880 m2.

A summary of the surfaces in corid\_conv( 7)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0.920 | 180. | -0. | bc\_corid\_fra | - | sash\_fr92mm | bc\_corid\_fra:room\_bc |
| 2 | 2.32 | 180. | 0. | bc\_door | DOOR | door | bc\_door:room\_bc |
| 3 | 4.48 | 180. | 0. | bc\_part\_glaz | - | dbl\_glz | bc\_part\_glaz:room\_bc |
| 4 | 1.28 | 180. | 0. | bc\_ptn\_corid | - | gyp\_gyp\_ptn | bc\_ptn\_corid:room\_bc |
| 5 | 0.920 | 180. | 0. | fc\_corid\_fra | - | sash\_fr92mm | fc\_corid\_fra:room\_prop+I |
| 6 | 2.32 | 180. | 0. | fc\_door | DOOR | door | fc\_door:room\_prop+I |
| 7 | 4.48 | 180. | 0. | fc\_part\_glaz | - | dbl\_glz | fc\_part\_glaz:room\_prop+I |
| 8 | 1.28 | 180. | 0. | fc\_ptn\_corid | - | gyp\_gyp\_ptn | fc\_ptn\_corid:room\_prop+I |
| 9 | 0.920 | 180. | 0. | cav\_corid\_fr | - | sash\_fr92mm | cav\_corid\_fr:room\_p |
| 10 | 2.32 | 180. | 0. | cav\_door | DOOR | door | cav\_door:room\_p |
| 11 | 4.48 | 180. | 0. | cav\_part\_gla | - | dbl\_glz | cav\_part\_gla:room\_p |
| 12 | 1.28 | 180. | 0. | cav\_ptn\_cori | - | gyp\_gyp\_ptn | cav\_ptn\_cori:room\_p |
| 13 | 0.920 | 180. | 0. | vavc\_corid\_f | - | sash\_fr92mm | vavc\_corid\_f:room\_3pos |
| 14 | 2.32 | 180. | 0. | vavc\_door | DOOR | door | vavc\_door:room\_3pos |
| 15 | 4.48 | 180. | 0. | vavc\_part\_gl | - | dbl\_glz | vavc\_part\_gl:room\_3pos |
| 16 | 1.28 | 180. | 0. | vavc\_ptn\_cor | - | gyp\_gyp\_ptn | vavc\_ptn\_cor:room\_3pos |
| 17 | 0.920 | 180. | 0. | vavv\_corid\_f | - | sash\_fr92mm | vavv\_corid\_f:room\_pid |
| 18 | 2.32 | 180. | 0. | vavv\_door | DOOR | door | vavv\_door:room\_pid |
| 19 | 4.48 | 180. | 0. | vavv\_part\_gl | - | dbl\_glz | vavv\_part\_gl:room\_pid |
| 20 | 1.28 | 180. | 0. | vavv\_ptn\_cor | - | gyp\_gyp\_ptn | vavv\_ptn\_cor:room\_pid |
| 21 | 0.920 | 180. | 0. | cen\_corid\_fr | - | sash\_fr92mm | cen\_corid\_fr:room\_prop+D |
| 22 | 2.32 | 180. | 0. | cen\_door | DOOR | door | cen\_door:room\_prop+D |
| 23 | 4.48 | 180. | 0. | cen\_part\_gla | - | dbl\_glz | cen\_part\_gla:room\_prop+D |
| 24 | 1.28 | 180. | 0. | cen\_ptn\_cori | - | gyp\_gyp\_ptn | cen\_ptn\_cori:room\_prop+D |
| 25 | 4.50 | 0. | -90. | cor\_floor\_a | - | slate\_over\_struc room>voi | cor\_floor\_a:void\_low |
| 26 | 4.50 | 0. | -90. | cor\_floor\_b | - | slate\_over\_struc room>voi | cor\_floor\_b:void\_low |
| 27 | 4.50 | 0. | -90. | cor\_floor\_c | - | slate\_over\_struc room>voi | cor\_floor\_c:void\_low |
| 28 | 4.50 | 0. | -90. | corid\_floor\_ | - | slate\_over\_struc room>voi | corid\_floor\_:void\_low |
| 29 | 4.50 | 0. | -90. | corid\_flr\_e | - | slate\_over\_struc room>voi | corid\_flr\_e:void\_low |
| 30 | 4.50 | 0. | -90. | corid\_flr\_f | - | slate\_over\_struc room>voi | corid\_flr\_f:void\_low |
| 31 | 4.50 | 0. | 90. | cor\_ceil\_a | - | ceiling | cor\_ceil\_a:mid\_void |
| 32 | 4.50 | 0. | 90. | cor\_ceil\_b | - | ceiling | cor\_ceil\_b:mid\_void |
| 33 | 4.50 | 0. | 90. | cor\_ceil\_c | - | ceiling | cor\_ceil\_c:mid\_void |
| 34 | 4.50 | 0. | 90. | cor\_ceil\_d | - | ceiling | cor\_ceil\_d:mid\_void |
| 35 | 4.50 | 0. | 90. | cor\_ceil\_e | - | ceiling | cor\_ceil\_e:mid\_void |
| 36 | 4.50 | 0. | 90. | cor\_ceil\_f | - | ceiling | cor\_ceil\_f:mid\_void |
| 37 | 4.50 | 270. | 0. | left | DOOR | insul\_frc\_facade\_heater | external |
| 38 | 4.50 | 90. | 0. | right | DOOR | insul\_frc\_facade\_heater | external |
| 39 | 9.00 | 0. | 0. | corid\_a | - | gyp\_blk\_ptn | identical environment |
| 40 | 9.00 | 0. | 0. | corid\_b | - | gyp\_blk\_ptn | identical environment |
| 41 | 9.00 | 0. | 0. | corid\_c | - | gyp\_blk\_ptn | identical environment |
| 42 | 9.00 | 0. | 0. | corid\_d | - | gyp\_blk\_ptn | identical environment |
| 43 | 9.00 | 0. | 0. | corid\_e | - | gyp\_blk\_ptn | identical environment |
| 44 | 9.00 | 0. | 0. | corid\_f | - | gyp\_blk\_ptn | identical environment |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| bc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| fc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| cav\_door | 0.80 | 2.90 | 0.00 | DOOR |
| vavc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| vavv\_door | 0.80 | 2.90 | 0.00 | DOOR |
| cen\_door | 0.80 | 2.90 | 0.00 | DOOR |
| left | 1.50 | 3.00 | 0.00 | DOOR |
| right | 1.50 | 3.00 | 0.00 | DOOR |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_blk\_ptn | 54.0 | 0.0 | 0.0 | 0.0 | 0.0 | 54.0 |
| gyp\_gyp\_ptn | 7.7 | 0.0 | 7.7 | 0.0 | 0.0 | 0.0 |
| door | 13.9 | 0.0 | 13.9 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 26.9 | 0.0 | 26.9 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 5.5 | 0.0 | 5.5 | 0.0 | 0.0 | 0.0 |
| ceiling | 27.0 | 0.0 | 27.0 | 0.0 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 9.0 | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| slate\_over\_struc r | 27.0 | 0.0 | 27.0 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor cor\_floor\_a and typcial ceiling cor\_ceil\_a. Floor upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external 8.000.

Ventilation & infiltration is assessed via network analysis and the associated network node is: corid\_conv

| Daytype | ID | Label | Type | Unit | Hours | Sens.(W) | Late.(W) | Rad. Frac | Con. Frac |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| weekdays | 1 | Occupants | people | W | 0- 7 | 32.0 | 20.0 | 0.60 | 0.40 |
| weekdays | 2 | Occupants | people | W | 7- 8 | 75.0 | 45.0 | 0.60 | 0.40 |
| weekdays | 3 | Occupants | people | W | 8- 9 | 166.0 | 91.0 | 0.60 | 0.40 |
| weekdays | 4 | Occupants | people | W | 9-12 | 75.0 | 45.0 | 0.60 | 0.40 |
| weekdays | 5 | Occupants | people | W | 12-14 | 166.0 | 91.0 | 0.60 | 0.40 |
| weekdays | 6 | Occupants | people | W | 14-17 | 32.0 | 20.0 | 0.60 | 0.40 |
| weekdays | 7 | Occupants | people | W | 17-18 | 166.0 | 91.0 | 0.60 | 0.40 |
| weekdays | 8 | Occupants | people | W | 18-21 | 32.0 | 20.0 | 0.60 | 0.40 |
| weekdays | 9 | Occupants | people | W | 21-24 | 16.0 | 11.6 | 0.60 | 0.40 |
| weekdays | 10 | Lights | lighting | Wm2 | 0- 7 | 1.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 11 | Lights | lighting | Wm2 | 7-21 | 8.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 12 | Lights | lighting | Wm2 | 21-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 13 | SmallPower | equipment | Wm2 | 0- 7 | 0.0 | 0.0 | 0.40 | 0.60 |
| weekdays | 14 | SmallPower | equipment | Wm2 | 7- 8 | 3.0 | 0.0 | 0.40 | 0.60 |
| weekdays | 15 | SmallPower | equipment | Wm2 | 8-24 | 0.0 | 0.0 | 0.40 | 0.60 |
| saturday | 1 | Occupants | people | W | 0- 7 | 32.0 | 20.0 | 0.60 | 0.40 |
| saturday | 2 | Occupants | people | W | 7- 8 | 75.0 | 45.0 | 0.60 | 0.40 |
| saturday | 3 | Occupants | people | W | 8- 9 | 166.0 | 91.0 | 0.60 | 0.40 |
| saturday | 4 | Occupants | people | W | 9-12 | 75.0 | 45.0 | 0.60 | 0.40 |
| saturday | 5 | Occupants | people | W | 12-14 | 100.0 | 50.0 | 0.60 | 0.40 |
| saturday | 6 | Occupants | people | W | 14-24 | 32.0 | 11.6 | 0.60 | 0.40 |
| saturday | 7 | Lights | lighting | Wm2 | 0- 8 | 1.0 | 0.0 | 0.30 | 0.70 |
| saturday | 8 | Lights | lighting | Wm2 | 8-12 | 7.0 | 0.0 | 0.30 | 0.70 |
| saturday | 9 | Lights | lighting | Wm2 | 12-24 | 5.0 | 0.0 | 0.30 | 0.70 |
| saturday | 10 | SmallPower | equipment | Wm2 | 0- 7 | 0.0 | 0.0 | 0.40 | 0.60 |
| saturday | 11 | SmallPower | equipment | Wm2 | 7-14 | 1.0 | 0.0 | 0.40 | 0.60 |
| saturday | 12 | SmallPower | equipment | Wm2 | 14-24 | 0.0 | 0.0 | 0.40 | 0.60 |
| sunday | 1 | Occupants | people | W | 0-24 | 8.0 | 4.0 | 0.60 | 0.40 |
| sunday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| sunday | 3 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 0.0 | 0.40 | 0.60 |
| holiday | 1 | Occupants | people | W | 0-24 | 8.0 | 4.0 | 0.60 | 0.40 |
| holiday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.30 | 0.70 |
| holiday | 3 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 0.0 | 0.40 | 0.60 |

### Zone 8: void\_low

Zone void\_low ( 8) is composed of 18 surfaces and 39 vertices. It encloses a volume of 43.2 m3 of space, with a total surface area of 235. m2 & approx floor area of 108. m2. void\_low describes lower boundary ceiling void.  
There is 12.000 m2 of exposed surface area, 12.000 m2 of which is vertical. Facade opaque is 12.000 m2 & 11.1 % of floor area & average U of 0.319 & UA of 3.8272. Opaque partitions:ceiling:floor 108.00 m2.

A summary of the surfaces in void\_low( 8)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4.50 | 0. | 90. | cor\_floor\_a | - | slate\_scr\_struc\_rev | cor\_floor\_a:corid\_conv |
| 2 | 4.50 | 0. | 90. | cor\_floor\_b | - | slate\_scr\_struc\_rev | cor\_floor\_b:corid\_conv |
| 3 | 4.50 | 0. | 90. | cor\_floor\_c | - | slate\_scr\_struc\_rev | cor\_floor\_c:corid\_conv |
| 4 | 4.50 | 0. | 90. | corid\_floor\_ | - | slate\_scr\_struc\_rev | corid\_floor\_:corid\_conv |
| 5 | 4.50 | 0. | 90. | corid\_flr\_e | - | slate\_scr\_struc\_rev | corid\_flr\_e:corid\_conv |
| 6 | 4.50 | 0. | 90. | corid\_flr\_f | - | slate\_scr\_struc\_rev | corid\_flr\_f:corid\_conv |
| 7 | 13.5 | 0. | 90. | floor\_bc | - | slate\_scr\_struc\_rev | floor\_bc:room\_bc |
| 8 | 13.5 | 0. | 90. | floor\_fan | - | slate\_scr\_struc\_rev | floor\_fan:room\_prop+I |
| 9 | 13.5 | 0. | 90. | floor\_cav | - | slate\_scr\_struc\_rev | floor\_cav:room\_p |
| 10 | 13.5 | 0. | 90. | floor\_vavc | - | slate\_scr\_struc\_rev | floor\_vavc:room\_3pos |
| 11 | 13.5 | 0. | 90. | floor\_vavv | - | slate\_scr\_struc\_rev | floor\_vavv:room\_pid |
| 12 | 13.5 | 0. | 90. | floor\_cen | - | slate\_scr\_struc\_rev | floor\_cen:room\_prop+D |
| 13 | 2.40 | 270. | 0. | left | F-FRAME | insul\_frc\_facade\_heater | external |
| 14 | 2.40 | 90. | 0. | right | DOOR | insul\_frc\_facade\_heater | external |
| 15 | 7.20 | 0. | 0. | back | - | gyp\_blk\_ptn | identical environment |
| 16 | 7.20 | 180. | 0. | facade | - | frc\_facade | external |
| 17 | 81.0 | 0. | -90. | base\_offices | - | ceiling\_rev | identical environment |
| 18 | 27.0 | 0. | -90. | base\_corid | - | ceiling\_rev | identical environment |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| left | 6.00 | 0.40 | 0.00 | F-FRAME |
| right | 6.00 | 0.40 | 0.00 | DOOR |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_blk\_ptn | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 7.2 |
| ceiling\_rev | 108.0 | 0.0 | 0.0 | 0.0 | 0.0 | 108.0 |
| slate\_scr\_struc\_re | 108.0 | 0.0 | 108.0 | 0.0 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 4.8 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 7.2 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Ventilation & infiltration is assessed via network analysis and the associated network node is: void\_low

| Daytype | ID | Label | Type | Unit | Hours | Sens.(W) | Late.(W) | Rad. Frac | Con. Frac |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| weekdays | 1 | Occupants | people | W | 0-24 | 0.0 | 10.0 | 0.60 | 0.40 |
| weekdays | 2 | Lights | lighting | Wm2 | 0- 8 | 1.0 | 0.0 | 0.80 | 0.20 |
| weekdays | 3 | Lights | lighting | Wm2 | 8-21 | 2.0 | 0.0 | 0.80 | 0.20 |
| weekdays | 4 | Lights | lighting | Wm2 | 21-24 | 1.0 | 0.0 | 0.80 | 0.20 |
| weekdays | 5 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 0.0 | 0.40 | 0.60 |
| saturday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| saturday | 2 | Lights | lighting | Wm2 | 0- 8 | 1.0 | 0.0 | 0.80 | 0.20 |
| saturday | 3 | Lights | lighting | Wm2 | 8-13 | 2.5 | 0.0 | 0.80 | 0.20 |
| saturday | 4 | Lights | lighting | Wm2 | 13-24 | 1.0 | 0.0 | 0.80 | 0.20 |
| saturday | 5 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 0.0 | 0.40 | 0.60 |
| sunday | 1 | Occupants | people | W | 0-24 | 0.5 | 0.5 | 0.60 | 0.40 |
| sunday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.80 | 0.20 |
| sunday | 3 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 1.0 | 0.40 | 0.60 |
| holiday | 1 | Occupants | people | W | 0-24 | 0.5 | 0.5 | 0.60 | 0.40 |
| holiday | 2 | Lights | lighting | Wm2 | 0-24 | 1.0 | 0.0 | 0.80 | 0.20 |
| holiday | 3 | SmallPower | equipment | Wm2 | 0-24 | 1.0 | 1.0 | 0.40 | 0.60 |

### Zone 9: room\_master

Zone room\_master ( 9) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. room\_master is office with master controler.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 56.168 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_master( 9)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_slave1 |
| 2 | 0.920 | 0. | 0. | bcr\_corid\_fr | - | sash\_fr92mm | bc\_corid\_fra:corid\_rad |
| 3 | 2.32 | 0. | 0. | bcr\_door | DOOR | door | bc\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | identical environment |
| 5 | 13.5 | 0. | 90. | ceiling\_bcr | - | ceiling | ceiling\_bcr:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_bcr | - | slate\_over\_struc room>voi | floor\_bcr:mid\_void |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | bcr\_part\_gla | - | dbl\_glz | bc\_part\_glaz:corid\_rad |
| 11 | 1.28 | 0. | 0. | bcr\_ptn\_cori | - | gyp\_gyp\_ptn | bc\_ptn\_corid:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_master |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_master |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_master |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_master |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_master |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_master |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_master |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_master |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_master |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_master |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_master |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_master |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_master |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_master |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_master |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_master |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_master |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_master |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_master |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_master |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_master |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_master |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| bcr\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 14.8 | 0.0 | 0.0 | 13.5 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | -0.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | -0.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | -0.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | -0.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | -0.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | -0.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_bcr and typcial ceiling ceiling\_bcr. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone10: room\_slave1

Zone room\_slave1 (10) is composed of 39 surfaces and 77 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. small office slaved to room\_master.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_slave1(10)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_onoffsh |
| 2 | 0.920 | 0. | 0. | radf\_corid\_f | - | sash\_fr92mm | fc\_corid\_fra:corid\_rad |
| 3 | 2.32 | 0. | 0. | radf\_door | DOOR | door | fc\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_master |
| 5 | 13.5 | 0. | 90. | ceiling\_radf | - | ceiling | ceiling\_radf:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_radf | - | slate\_over\_struc room>voi | floor\_radf:mid\_void |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | radf\_part\_gl | - | dbl\_glz | fc\_part\_glaz:corid\_rad |
| 11 | 1.28 | 0. | 0. | radf\_ptn\_cor | - | gyp\_gyp\_ptn | fc\_ptn\_corid:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_slave1 |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_slave1 |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_slave1 |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_slave1 |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_slave1 |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_slave1 |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_slave1 |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_slave1 |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_slave1 |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_slave1 |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_slave1 |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_slave1 |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_slave1 |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_slave1 |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_slave1 |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_slave1 |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_slave1 |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_slave1 |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_slave1 |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_slave1 |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_slave1 |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_slave1 |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| radf\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 2.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 2.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 2.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 2.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 2.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cseat | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdrt\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdscreen | collector\_ |
| vis | 1rot | dl\_arm\_res | steel\_gr\_3 | vis | 1rot | radiator | steel\_pl\_3 |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_radf and typcial ceiling ceiling\_radf. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone11: room\_onoffsh

Zone room\_onoffsh (11) is composed of 39 surfaces and 77 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. small office with ON OFF controller for short timesteps.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_onoffsh(11)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:floor\_heat |
| 2 | 0.920 | 0. | 0. | radw\_corid\_f | - | sash\_fr92mm | cav\_corid\_fr:corid\_rad |
| 3 | 2.32 | 0. | 0. | radw\_door | DOOR | door | cav\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_slave1 |
| 5 | 13.5 | 0. | 90. | ceiling\_radw | - | ceiling | ceiling\_radw:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_radw | - | susp\_flr\_re | floor\_radw:mid\_void |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | radw\_part\_gl | - | dbl\_glz | cav\_part\_gla:corid\_rad |
| 11 | 1.28 | 0. | 0. | radw\_ptn\_cor | - | gyp\_gyp\_ptn | cav\_ptn\_cori:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_onoffsh |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_onoffsh |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_onoffsh |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_onoffsh |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_onoffsh |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_onoffsh |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_onoffsh |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_onoffsh |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_onoffsh |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_onoffsh |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_onoffsh |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_onoffsh |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_onoffsh |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_onoffsh |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_onoffsh |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_onoffsh |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_onoffsh |
| 35 | 1.55 | 90. | -0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_onoffsh |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_onoffsh |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_onoffsh |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_onoffsh |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_onoffsh |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| radw\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| susp\_flr\_re | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 5.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 5.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 5.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 5.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 5.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 5.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cseat | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fshelf\_a | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdstand | steel\_pl\_3 |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdrt\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdscreen | collector\_ |
| vis | 1rot | dl\_arm\_res | steel\_gr\_3 | vis | 1rot | radiator | steel\_pl\_3 |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_radw and typcial ceiling ceiling\_radw. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone12: floor\_heat

Zone floor\_heat (12) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. floor\_heat office with thin zone floor heating.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in floor\_heat(12)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_vave |
| 2 | 0.920 | 0. | 0. | flrh\_corid\_f | - | sash\_fr92mm | vavc\_corid\_f:corid\_rad |
| 3 | 2.32 | 0. | 0. | flrh\_door | DOOR | door | vavc\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_onoffsh |
| 5 | 13.5 | 0. | 90. | ceiling\_flrh | - | ceiling | ceiling\_flrh:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_flrh | - | slate\_screed | floor\_flrh:thin\_floor |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | flrh\_part\_gl | - | dbl\_glz | vavc\_part\_gl:corid\_rad |
| 11 | 1.28 | 0. | 0. | flrh\_ptn\_cor | - | gyp\_gyp\_ptn | vavc\_ptn\_cor:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:floor\_heat |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:floor\_heat |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:floor\_heat |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:floor\_heat |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:floor\_heat |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:floor\_heat |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:floor\_heat |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:floor\_heat |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:floor\_heat |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:floor\_heat |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:floor\_heat |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:floor\_heat |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:floor\_heat |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:floor\_heat |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:floor\_heat |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:floor\_heat |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:floor\_heat |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:floor\_heat |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:floor\_heat |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:floor\_heat |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:floor\_heat |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:floor\_heat |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| flrh\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_screed | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 8.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 8.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 8.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 8.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 8.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 8.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 surf-to-air deltaT via in-floor heating Surface Orientation —– Inside —– —– Outside —– 1 pt\_right (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 2 flrh\_corid\_f (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 3 flrh\_door (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 4 pt\_left (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 5 ceiling\_flrh (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 6 floor\_flrh (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 7 spandral (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 8 frame (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 9 glazing (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 10 flrh\_part\_gl (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 11 flrh\_ptn\_cor (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 12 adesk\_t (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 13 adesk\_t\_ (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 14 bdesk\_t (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 15 bdesk\_t\_ (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 16 cseat (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 17 cseat\_ (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 18 cstback (SLOP) 1. 6. -1. 0. 99. 99. 99. 99. 19 cstback\_ (SLOP) 1. 6. -1. 0. 99. 99. 99. 99. 20 dseat (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 21 dseat\_ (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 22 dstback (SLOP) 1. 6. -1. 0. 99. 99. 99. 99. 23 dstback\_ (SLOP) 1. 6. -1. 0. 99. 99. 99. 99. 24 ecab\_lf (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 25 ecab\_rt (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 26 ecab\_fr (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 27 ecab\_bk (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 28 ecab\_to (FLOR) 1. 55. -1. 0. 99. 99. 99. 99. 29 ecab\_bs (CEIL) 1. 61. -1. 0. 99. 99. 99. 99. 30 fbil\_lft (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 31 fbil\_lft\_ (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 32 fbil\_rt (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 33 fbil\_rt\_ (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 34 fbooks (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 35 fbooks\_ (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 36 gcase (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 37 gcase\_ (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 38 gcircuit (VERT) 1. 6. -1. 0. 99. 99. 99. 99. 39 gcircuit\_ (VERT) 1. 6. -1. 0. 99. 99. 99. 99.

Uses same operations as zone room\_bc

### Zone13: room\_vave

Zone room\_vave (13) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. small office with ideal VAV with terminal reheat..  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 3.6800 m2 & 27.3 % of floor area & average U of 0.517 & UA of 1.9040. Facade glazing is 5.3200 m2 & 39.4 % of floor & 59.1 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 69.668 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_vave(13)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | gyp\_gyp\_ptn | pt\_left:room\_tprop |
| 2 | 0.920 | 0. | 0. | user\_corid\_f | - | sash\_fr92mm | vavv\_corid\_f:corid\_rad |
| 3 | 2.32 | 0. | 0. | user\_door | DOOR | door | vavv\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:floor\_heat |
| 5 | 13.5 | 0. | 90. | ceiling\_user | - | ceiling | ceiling\_user:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_user | - | slate\_over\_struc room>voi | floor\_vavv:mid\_void |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | F-FRAME | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | C-WINDOW | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | user\_part\_gl | - | dbl\_glz | vavv\_part\_gl:corid\_rad |
| 11 | 1.28 | 0. | 0. | user\_ptn\_cor | - | gyp\_gyp\_ptn | vavv\_ptn\_cor:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_vave |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_vave |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_vave |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_vave |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_vave |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_vave |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_vave |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_vave |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_vave |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_vave |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_vave |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_vave |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | -0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_vave |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_vave |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_vave |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_vave |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_vave |
| 35 | 1.55 | 90. | -0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_vave |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_vave |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_vave |
| 38 | 0.123 | 90. | -0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_vave |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_vave |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| user\_door | 0.80 | 2.90 | 0.00 | DOOR |
| frame | 3.00 | 2.10 | 0.90 | F-FRAME |
| glazing | 2.80 | 1.90 | 1.00 | C-WINDOW |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 28.3 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 11.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 11.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 11.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 11.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 11.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 11.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor floor\_user and typcial ceiling ceiling\_user. Floor upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external -1.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external -1.000.

Uses same operations as zone room\_bc

### Zone14: room\_tprop

Zone room\_tprop (14) is composed of 39 surfaces and 76 vertices. It encloses a volume of 40.3 m3 of space, with a total surface area of 85.4 m2 & approx floor area of 13.5 m2. small office with a time-proportioning ONOFF control.  
There is 22.500 m2 of exposed surface area, 22.500 m2 of which is vertical. Facade opaque is 17.180 m2 & 127.3 % of floor area & average U of 0.394 & UA of 6.7622. Facade glazing is 5.3200 m2 & 39.4 % of floor & 23.6 % facade with average U of 2.811 & UA of 14.953.  
Opaque partitions:ceiling:floor 56.168 m2 & trasparent partitions:ceiling:floor 4.4800 m2.

A summary of the surfaces in room\_tprop(14)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 90. | 0. | pt\_right | - | insul\_frc\_facade\_heater | external |
| 2 | 0.920 | 0. | 0. | wrmw\_corid\_f | - | sash\_fr92mm | cen\_corid\_fr:corid\_rad |
| 3 | 2.32 | 0. | 0. | warmw\_door | - | door | cen\_door:corid\_rad |
| 4 | 13.5 | 270. | 0. | pt\_left | - | gyp\_gyp\_ptn | pt\_right:room\_vave |
| 5 | 13.5 | 0. | 90. | ceiling\_warm | - | ceiling | ceiling\_warm:upper\_void |
| 6 | 13.5 | 0. | -90. | floor\_warmw | - | slate\_over\_struc room>voi | floor\_cen:mid\_void |
| 7 | 2.70 | 180. | 0. | spandral | - | frc\_facade | external |
| 8 | 0.980 | 180. | 0. | frame | - | sash\_fr92mm | external |
| 9 | 5.32 | 180. | 0. | glazing | - | dbl\_glz | external |
| 10 | 4.48 | 0. | 0. | warmw\_part\_g | - | dbl\_glz | cen\_part\_gla:corid\_rad |
| 11 | 1.28 | 0. | 0. | warmw\_ptn\_co | - | gyp\_gyp\_ptn | cen\_ptn\_cori:corid\_rad |
| 12 | 0.938 | 0. | 90. | adesk\_t | FURNI | corian\_count | adesk\_t\_:room\_tprop |
| 13 | 0.938 | 0. | -90. | adesk\_t\_ | FURNI | corian\_count | adesk\_t:room\_tprop |
| 14 | 0.938 | 0. | 90. | bdesk\_t | FURNI | corian\_count | bdesk\_t\_:room\_tprop |
| 15 | 0.938 | 0. | -90. | bdesk\_t\_ | FURNI | corian\_count | bdesk\_t:room\_tprop |
| 16 | 0.207 | 0. | 90. | cseat | FURNI | upholstery | cseat\_:room\_tprop |
| 17 | 0.207 | 0. | -90. | cseat\_ | FURNI | upholstery | cseat:room\_tprop |
| 18 | 0.231 | 225. | 6. | cstback | FURNI | upholstery | cstback\_:room\_tprop |
| 19 | 0.231 | 45. | -6. | cstback\_ | FURNI | upholstery | cstback:room\_tprop |
| 20 | 0.207 | 0. | 90. | dseat | FURNI | upholstery | dseat\_:room\_tprop |
| 21 | 0.207 | 0. | -90. | dseat\_ | FURNI | upholstery | dseat:room\_tprop |
| 22 | 0.231 | 190. | 6. | dstback | FURNI | upholstery | dstback\_:room\_tprop |
| 23 | 0.231 | 10. | -6. | dstback\_ | FURNI | upholstery | dstback:room\_tprop |
| 24 | 0.484 | 180. | 0. | ecab\_lf | FURNI | steel\_pl\_3mm | identical environment |
| 25 | 0.484 | 0. | 0. | ecab\_rt | FURNI | steel\_pl\_3mm | identical environment |
| 26 | 0.484 | 90. | 0. | ecab\_fr | FURNI | file\_papers | identical environment |
| 27 | 0.484 | 270. | 0. | ecab\_bk | FURNI | file\_papers | identical environment |
| 28 | 0.152 | 0. | -90. | ecab\_to | FURNI | steel\_gr\_3mm | identical environment |
| 29 | 0.152 | 0. | 90. | ecab\_bs | FURNI | steel\_gr\_3mm | identical environment |
| 30 | 0.500 | 180. | 0. | fbil\_lft | FURNI | furn\_wd10mm | fbil\_lft\_:room\_tprop |
| 31 | 0.500 | 360. | 0. | fbil\_lft\_ | FURNI | furn\_wd10mm | fbil\_lft:room\_tprop |
| 32 | 0.500 | 180. | 0. | fbil\_rt | FURNI | furn\_wd10mm | fbil\_rt\_:room\_tprop |
| 33 | 0.500 | 360. | 0. | fbil\_rt\_ | FURNI | furn\_wd10mm | fbil\_rt:room\_tprop |
| 34 | 1.55 | 270. | 0. | fbooks | FURNI | stuffonshelf | fbooks\_:room\_tprop |
| 35 | 1.55 | 90. | 0. | fbooks\_ | FURNI | stuffonshelf | fbooks:room\_tprop |
| 36 | 0.148 | 90. | 0. | gcase | FURNI | IT\_case | gcase\_:room\_tprop |
| 37 | 0.148 | 270. | 0. | gcase\_ | FURNI | IT\_case | gcase:room\_tprop |
| 38 | 0.123 | 90. | 0. | gcircuit | FURNI | circuit\_bd | gcircuit\_:room\_tprop |
| 39 | 0.123 | 270. | 0. | gcircuit\_ | FURNI | circuit\_bd | gcircuit:room\_tprop |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_gyp\_ptn | 14.8 | 0.0 | 14.8 | 0.0 | 0.0 | 0.0 |
| door | 2.3 | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 9.8 | 5.3 | 4.5 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 1.9 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| ceiling | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| steel\_pl\_3mm | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| circuit\_bd | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| upholstery | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| corian\_count | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| IT\_case | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| furn\_wd10mm | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| steel\_gr\_3mm | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| file\_papers | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| stuffonshelf | 1.5 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 13.5 | 13.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| slate\_over\_struc r | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 2.7 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 |

An hourly solar radiation distribution is used for this zone.  
Surfaces (all applicable) for shading analysis  
spandral frame glazing  
Insolation sources (all applicable) glazing  
Explicit viewfactors have been derived for this zone.

Blocks associated with zone

| Block | X | Y | Z | DX | DY | DZ | Orient |  | Opacity | Name | Constr |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 14.5 | -0.1 | 6.5 | 4.0 | 0.0 | 0.3 | 0.0 | 0.0 | 1.00 | ob1 | door |
| 2 | 14.5 | -0.3 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob2 | door |
| 3 | 14.5 | -0.5 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob3 | door |
| 4 | 14.5 | -0.7 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob4 | door |
| 5 | 14.5 | -0.9 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob5 | door |
| 6 | 14.5 | -1.1 | 6.5 | 4.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.00 | ob6 | door |

Visual entities:

| visual | type | name | composition | visual | type | name | composition |
| --- | --- | --- | --- | --- | --- | --- | --- |
| vis | 1rot | adesk\_top | corian\_cou | vis | 1rot | dl\_arm\_res | steel\_gr\_3 |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_a | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_b | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_c | sensor\_cas |
| vis | 1rot | adesk\_leg\_ | steel\_pl\_3 | vis | 1rot | droll\_d | sensor\_cas |
| vis | 1rot | bdesk\_top | corian\_cou | vis | 1rot | ef\_cabinet | steel\_pl\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_a | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_b | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_c | steel\_gr\_3 |
| vis | 1rot | bdesk\_leg\_ | steel\_pl\_3 | vis | 1rot | edrw\_d | steel\_gr\_3 |
| vis | 1rot | cseat | upholstery | vis | 1rot | fleft\_ver | furn\_wd10m |
| vis | 1rot | cr\_arm | upholstery | vis | 1rot | fright\_ver | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | cl\_arm | upholstery | vis | 1rot | fbil\_bk | furn\_wd10m |
| vis | 1rot | ccross\_a | steel\_gr\_3 | vis | 1rot | fshelf\_b | furn\_wd10m |
| vis | 1rot | ccross\_b | steel\_gr\_3 | vis | 1rot | fshelf\_c | furn\_wd10m |
| vis | 1rot | cpost | PH\_alu\_fra | vis | 1rot | fshelf\_d | furn\_wd10m |
| vis | 1rot | cr\_arm\_res | steel\_gr\_3 | vis | 1rot | fshelf\_e | furn\_wd10m |
| vis | 1rot | cl\_arm\_res | steel\_gr\_3 | vis | 1rot | fbil\_top | furn\_wd10m |
| vis | 1rot | croll\_a | sensor\_cas | vis | 1rot | fkick | furn\_wd10m |
| vis | 1rot | croll\_b | sensor\_cas | vis | 1rot | flow\_books | stuffonshe |
| vis | 1rot | croll\_c | sensor\_cas | vis | 1rot | f2nd\_books | stuffonshe |
| vis | 1rot | croll\_d | sensor\_cas | vis | 1rot | f3rd\_books | booksonshl |
| vis | 1rot | dseat | upholstery | vis | 1rot | f4th\_books | booksonshl |
| vis | 1rot | dr\_arm | upholstery | vis | 1rot | ftop\_books | booksonshl |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dl\_arm | upholstery | vis | 1rot | gdbase | IT\_case |
| vis | 1rot | dcross\_a | steel\_gr\_3 | vis | 1rot | gdlow\_edge | IT\_case |
| vis | 1rot | dcross\_b | steel\_gr\_3 | vis | 1rot | gdup\_edge | IT\_case |
| vis | 1rot | dpost | PH\_alu\_fra | vis | 1rot | gdlft\_edge | IT\_case |
| vis | 1rot | dr\_arm\_res | steel\_gr\_3 | vis | 1rot | gdrt\_edge | IT\_case |
|  |  |  |  | vis | 1rot | gdscreen | collector\_pl |

Shading patterns have been calculated for this zone.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 surf-to-air deltaT via wall panel heating Surface Orientation —– Inside —– —– Outside —– 1 pt\_right (VERT) 1. 14. -1. 0. 99. 99. 99. 99. 2 wrmw\_corid\_f (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 3 warmw\_door (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 4 pt\_left (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 5 ceiling\_warm (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 6 floor\_warmw (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 7 spandral (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 8 frame (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 9 glazing (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 10 warmw\_part\_g (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 11 warmw\_ptn\_co (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 12 adesk\_t (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 13 adesk\_t\_ (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 14 bdesk\_t (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 15 bdesk\_t\_ (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 16 cseat (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 17 cseat\_ (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 18 cstback (SLOP) 1. 5. -1. 0. 99. 99. 99. 99. 19 cstback\_ (SLOP) 1. 5. -1. 0. 99. 99. 99. 99. 20 dseat (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 21 dseat\_ (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 22 dstback (SLOP) 1. 5. -1. 0. 99. 99. 99. 99. 23 dstback\_ (SLOP) 1. 5. -1. 0. 99. 99. 99. 99. 24 ecab\_lf (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 25 ecab\_rt (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 26 ecab\_fr (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 27 ecab\_bk (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 28 ecab\_to (FLOR) 1. 70. -1. 0. 99. 99. 99. 99. 29 ecab\_bs (CEIL) 1. 60. -1. 0. 99. 99. 99. 99. 30 fbil\_lft (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 31 fbil\_lft\_ (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 32 fbil\_rt (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 33 fbil\_rt\_ (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 34 fbooks (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 35 fbooks\_ (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 36 gcase (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 37 gcase\_ (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 38 gcircuit (VERT) 1. 5. -1. 0. 99. 99. 99. 99. 39 gcircuit\_ (VERT) 1. 5. -1. 0. 99. 99. 99. 99.

Uses same operations as zone room\_bc

### Zone15: corid\_rad

Zone corid\_rad (15) is composed of 44 surfaces and 88 vertices. It encloses a volume of 81.0 m3 of space, with a total surface area of 171. m2 & approx floor area of 27.0 m2. corid\_rad describes corridor adjacent to radiator rooms.  
There is 9.0000 m2 of exposed surface area, 9.0000 m2 of which is vertical. Facade opaque is 9.0000 m2 & 33.3 % of floor area & average U of 0.326 & UA of 2.9318. Opaque partitions:ceiling:floor 81.120 m2 & trasparent partitions:ceiling:floor 26.880 m2.

A summary of the surfaces in corid\_rad(15)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0.920 | 180. | -0. | bc\_corid\_fra | - | sash\_fr92mm | bcr\_corid\_fr:room\_master |
| 2 | 2.32 | 180. | 0. | bc\_door | DOOR | door | bcr\_door:room\_master |
| 3 | 4.48 | 180. | 0. | bc\_part\_glaz | - | dbl\_glz | bcr\_part\_gla:room\_master |
| 4 | 1.28 | 180. | 0. | bc\_ptn\_corid | - | gyp\_gyp\_ptn | bcr\_ptn\_cori:room\_master |
| 5 | 0.920 | 180. | 0. | fc\_corid\_fra | - | sash\_fr92mm | radf\_corid\_f:room\_slave1 |
| 6 | 2.32 | 180. | 0. | fc\_door | DOOR | door | radf\_door:room\_slave1 |
| 7 | 4.48 | 180. | 0. | fc\_part\_glaz | - | dbl\_glz | radf\_part\_gl:room\_slave1 |
| 8 | 1.28 | 180. | 0. | fc\_ptn\_corid | - | gyp\_gyp\_ptn | radf\_ptn\_cor:room\_slave1 |
| 9 | 0.920 | 180. | 0. | cav\_corid\_fr | - | sash\_fr92mm | radw\_corid\_f:room\_onoffsh |
| 10 | 2.32 | 180. | 0. | cav\_door | DOOR | door | radw\_door:room\_onoffsh |
| 11 | 4.48 | 180. | 0. | cav\_part\_gla | - | dbl\_glz | radw\_part\_gl:room\_onoffsh |
| 12 | 1.28 | 180. | 0. | cav\_ptn\_cori | - | gyp\_gyp\_ptn | radw\_ptn\_cor:room\_onoffsh |
| 13 | 0.920 | 180. | 0. | vavc\_corid\_f | - | sash\_fr92mm | flrh\_corid\_f:floor\_heat |
| 14 | 2.32 | 180. | 0. | vavc\_door | DOOR | door | flrh\_door:floor\_heat |
| 15 | 4.48 | 180. | 0. | vavc\_part\_gl | - | dbl\_glz | flrh\_part\_gl:floor\_heat |
| 16 | 1.28 | 180. | 0. | vavc\_ptn\_cor | - | gyp\_gyp\_ptn | flrh\_ptn\_cor:floor\_heat |
| 17 | 0.920 | 180. | 0. | vavv\_corid\_f | - | sash\_fr92mm | user\_corid\_f:room\_vave |
| 18 | 2.32 | 180. | 0. | vavv\_door | DOOR | door | user\_door:room\_vave |
| 19 | 4.48 | 180. | 0. | vavv\_part\_gl | - | dbl\_glz | user\_part\_gl:room\_vave |
| 20 | 1.28 | 180. | 0. | vavv\_ptn\_cor | - | gyp\_gyp\_ptn | user\_ptn\_cor:room\_vave |
| 21 | 0.920 | 180. | 0. | cen\_corid\_fr | - | sash\_fr92mm | wrmw\_corid\_f:room\_tprop |
| 22 | 2.32 | 180. | 0. | cen\_door | - | door | warmw\_door:room\_tprop |
| 23 | 4.48 | 180. | 0. | cen\_part\_gla | - | dbl\_glz | warmw\_part\_g:room\_tprop |
| 24 | 1.28 | 180. | 0. | cen\_ptn\_cori | - | gyp\_gyp\_ptn | warmw\_ptn\_co:room\_tprop |
| 25 | 4.50 | 0. | -90. | cor\_floor\_a | - | slate\_over\_struc room>voi | cor\_floor\_a:mid\_void |
| 26 | 4.50 | 0. | -90. | cor\_floor\_b | - | slate\_over\_struc room>voi | cor\_floor\_b:mid\_void |
| 27 | 4.50 | 0. | -90. | cor\_floor\_c | - | slate\_over\_struc room>voi | cor\_floor\_c:mid\_void |
| 28 | 4.50 | 0. | -90. | corid\_floor\_ | - | slate\_over\_struc room>voi | corid\_floor\_:mid\_void |
| 29 | 4.50 | 0. | -90. | corid\_flr\_e | - | slate\_over\_struc room>voi | corid\_flr\_e:mid\_void |
| 30 | 4.50 | 0. | -90. | corid\_flr\_f | - | slate\_over\_struc room>voi | corid\_flr\_f:mid\_void |
| 31 | 4.50 | 0. | 90. | cor\_ceil\_a | - | ceiling | cor\_ceil\_a:upper\_void |
| 32 | 4.50 | 0. | 90. | cor\_ceil\_b | - | ceiling | cor\_ceil\_b:upper\_void |
| 33 | 4.50 | 0. | 90. | cor\_ceil\_c | - | ceiling | cor\_ceil\_c:upper\_void |
| 34 | 4.50 | 0. | 90. | cor\_ceil\_d | - | ceiling | cor\_ceil\_d:upper\_void |
| 35 | 4.50 | 0. | 90. | cor\_ceil\_e | - | ceiling | cor\_ceil\_e:upper\_void |
| 36 | 4.50 | 0. | 90. | cor\_ceil\_f | - | ceiling | cor\_ceil\_f:upper\_void |
| 37 | 4.50 | 270. | 0. | left | DOOR | frc\_facade | external |
| 38 | 4.50 | 90. | 0. | right | DOOR | insul\_frc\_facade\_heater | external |
| 39 | 9.00 | 0. | 0. | corid\_a | - | gyp\_blk\_ptn | identical environment |
| 40 | 9.00 | 0. | 0. | corid\_b | - | gyp\_blk\_ptn | identical environment |
| 41 | 9.00 | 0. | 0. | corid\_c | - | gyp\_blk\_ptn | identical environment |
| 42 | 9.00 | 0. | 0. | corid\_d | - | gyp\_blk\_ptn | identical environment |
| 43 | 9.00 | 0. | 0. | corid\_e | - | gyp\_blk\_ptn | identical environment |
| 44 | 9.00 | 0. | 0. | corid\_f | - | gyp\_blk\_ptn | identical environment |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| bc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| fc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| cav\_door | 0.80 | 2.90 | 0.00 | DOOR |
| vavc\_door | 0.80 | 2.90 | 0.00 | DOOR |
| vavv\_door | 0.80 | 2.90 | 0.00 | DOOR |
| left | 1.50 | 3.00 | 0.00 | DOOR |
| right | 1.50 | 3.00 | 0.00 | DOOR |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_blk\_ptn | 54.0 | 0.0 | 0.0 | 0.0 | 0.0 | 54.0 |
| gyp\_gyp\_ptn | 7.7 | 0.0 | 7.7 | 0.0 | 0.0 | 0.0 |
| door | 13.9 | 0.0 | 13.9 | 0.0 | 0.0 | 0.0 |
| dbl\_glz | 26.9 | 0.0 | 26.9 | 0.0 | 0.0 | 0.0 |
| sash\_fr92mm | 5.5 | 0.0 | 5.5 | 0.0 | 0.0 | 0.0 |
| ceiling | 27.0 | 0.0 | 27.0 | 0.0 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 4.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| slate\_over\_struc r | 27.0 | 0.0 | 27.0 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 4.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 CEN default hc coefficients CEN regime based on typical floor cor\_floor\_a and typcial ceiling cor\_ceil\_a. Floor upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Ceiling upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Sloped upwards flow hc is 5.000 and downwards 0.700 and external 8.000. Walls inside hc is 2.500 and other side of partitions 2.500 and external 8.000.

Uses same operations as zone corid\_conv

### Zone16: mid\_void

Zone mid\_void (16) is composed of 31 surfaces and 70 vertices. It encloses a volume of 41.9 m3 of space, with a total surface area of 236. m2 & approx floor area of 108. m2. mid\_void is the ceiling void between convective and radiant.  
There is 11.700 m2 of exposed surface area, 11.700 m2 of which is vertical. Facade opaque is 11.700 m2 & 10.8 % of floor area & average U of 0.320 & UA of 3.7397. Opaque partitions:ceiling:floor 217.20 m2.

A summary of the surfaces in mid\_void(16)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4.50 | 0. | -90. | cor\_ceil\_a | - | ceiling\_rev | cor\_ceil\_a:corid\_conv |
| 2 | 4.50 | 0. | -90. | cor\_ceil\_b | - | ceiling\_rev | cor\_ceil\_b:corid\_conv |
| 3 | 4.50 | 0. | -90. | cor\_ceil\_c | - | ceiling\_rev | cor\_ceil\_c:corid\_conv |
| 4 | 4.50 | 0. | -90. | cor\_ceil\_d | - | ceiling\_rev | cor\_ceil\_d:corid\_conv |
| 5 | 4.50 | 0. | -90. | cor\_ceil\_e | - | ceiling\_rev | cor\_ceil\_e:corid\_conv |
| 6 | 4.50 | 0. | -90. | cor\_ceil\_f | - | ceiling\_rev | cor\_ceil\_f:corid\_conv |
| 7 | 4.50 | 0. | 90. | cor\_floor\_a | - | slate\_scr\_struc\_rev | cor\_floor\_a:corid\_rad |
| 8 | 4.50 | 0. | 90. | cor\_floor\_b | - | slate\_scr\_struc\_rev | cor\_floor\_b:corid\_rad |
| 9 | 4.50 | 0. | 90. | cor\_floor\_c | - | slate\_scr\_struc\_rev | cor\_floor\_c:corid\_rad |
| 10 | 4.50 | 0. | 90. | corid\_floor\_ | - | slate\_scr\_struc\_rev | corid\_floor\_:corid\_rad |
| 11 | 4.50 | 0. | 90. | corid\_flr\_e | - | slate\_scr\_struc\_rev | corid\_flr\_e:corid\_rad |
| 12 | 4.50 | 0. | 90. | corid\_flr\_f | - | slate\_scr\_struc\_rev | corid\_flr\_f:corid\_rad |
| 13 | 13.5 | 0. | -90. | ceiling\_bc | - | ceiling\_rev | ceiling\_bc:room\_bc |
| 14 | 13.5 | 0. | -90. | ceiling\_fan | - | ceiling\_rev | ceiling\_fan:room\_prop+I |
| 15 | 13.5 | 0. | -90. | ceiling\_cav | - | ceiling\_rev | ceiling\_cav:room\_p |
| 16 | 13.5 | 0. | -90. | ceiling\_vavc | - | ceiling\_rev | ceiling\_vavc:room\_3pos |
| 17 | 13.5 | 0. | -90. | ceiling\_vavv | - | ceiling\_rev | ceiling\_vavv:room\_pid |
| 18 | 13.5 | 0. | -90. | ceiling\_cen | - | ceiling\_rev | ceiling\_cen:room\_prop+D |
| 19 | 13.5 | 0. | 90. | floor\_bcr | - | slate\_scr\_struc\_rev | floor\_bcr:room\_master |
| 20 | 13.5 | 0. | 90. | floor\_radf | - | slate\_scr\_struc\_rev | floor\_radf:room\_slave1 |
| 21 | 13.5 | 0. | 90. | floor\_radw | - | susp\_floor | floor\_radw:room\_onoffsh |
| 22 | 13.5 | 0. | 90. | floor\_vavv | - | slate\_scr\_struc\_rev | floor\_user:room\_vave |
| 23 | 13.5 | 0. | 90. | floor\_cen | - | slate\_scr\_struc\_rev | floor\_warmw:room\_tprop |
| 24 | 2.40 | 270. | 0. | left | F-FRAME | insul\_frc\_facade\_heater | external |
| 25 | 2.40 | 90. | 0. | right | DOOR | insul\_frc\_facade\_heater | external |
| 26 | 6.90 | 180. | 0. | facade | - | frc\_facade | external |
| 27 | 7.20 | 0. | 0. | back | - | gyp\_blk\_ptn | identical environment |
| 28 | 0.450 | 270. | 0. | thin\_right | - | floor\_heating\_ceil->pipe | thin\_right:thin\_floor |
| 29 | 0.300 | 180. | 0. | thin\_back | DOOR | floor\_heating\_ceil->pipe | thin\_back:thin\_floor |
| 30 | 0.450 | 90. | 0. | thin\_left | - | floor\_heating\_ceil->pipe | thin\_left:thin\_floor |
| 31 | 13.5 | 0. | 90. | thin\_base | - | floor\_heating\_ceil->pipe | thin\_base:thin\_floor |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| left | 6.00 | 0.40 | 0.00 | F-FRAME |
| right | 6.00 | 0.40 | 0.00 | DOOR |
| thin\_back | 3.00 | 0.10 | 0.30 | DOOR |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_blk\_ptn | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 7.2 |
| ceiling\_rev | 108.0 | 0.0 | 108.0 | 0.0 | 0.0 | 0.0 |
| susp\_floor | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| slate\_scr\_struc\_re | 81.0 | 0.0 | 81.0 | 0.0 | 0.0 | 0.0 |
| insul\_frc\_facade\_h | 4.8 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 6.9 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| floor\_heating\_ceil | 14.7 | 0.0 | 14.7 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Uses same operations as zone void\_low

### Zone17: thin\_floor

Zone thin\_floor (17) is composed of 6 surfaces and 10 vertices. It encloses a volume of 1.35 m3 of space, with a total surface area of 28.5 m2 & approx floor area of 13.5 m2. thin\_floor a thin zone for floor heat injection.  
There is 0.30000 m2 of exposed surface area, 0.30000 m2 of which is vertical. Facade opaque is 0.30000 m2 & 2.2 % of floor area & average U of 0.292 & UA of 0.0874928. Opaque partitions:ceiling:floor 28.200 m2.

A summary of the surfaces in thin\_floor(17)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 13.5 | 0. | 90. | floor\_flrh | - | slate\_screed\_rev | floor\_flrh:floor\_heat |
| 2 | 0.300 | 180. | 0. | facade | WALL | frc\_facade | external |
| 3 | 0.450 | 90. | 0. | thin\_right | - | heating\_struc\_pipe->ceili | thin\_right:mid\_void |
| 4 | 0.300 | 0. | 0. | thin\_back | DOOR | heating\_struc\_pipe->ceili | thin\_back:mid\_void |
| 5 | 0.450 | 270. | 0. | thin\_left | - | heating\_struc\_pipe->ceili | thin\_left:mid\_void |
| 6 | 13.5 | 0. | -90. | thin\_base | - | heating\_struc\_pipe->ceili | thin\_base:mid\_void |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| thin\_back | 3.00 | 0.10 | 0.00 | DOOR |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| slate\_screed\_rev | 13.5 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| heating\_struc\_pipe | 14.7 | 0.0 | 14.7 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Number of control periods: 1 Period 1 start 0.00 finish 24.00 User supplied hc values Surface orientation Inside Outside 1 floor\_flrh (CEIL) 40.000 default 2 facade (VERT) 40.000 default 3 thin\_right (VERT) 40.000 default 4 thin\_back (VERT) 40.000 default 5 thin\_left (VERT) 40.000 default 6 thin\_base (FLOR) 40.000 default

Ventilation & infiltration is assessed via network analysis and the associated network node is: thin\_floor

| Daytype | ID | Label | Type | Unit | Hours | Sens.(W) | Late.(W) | Rad. Frac | Con. Frac |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| weekdays | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| weekdays | 2 | Lights | lighting | W | 0-24 | 0.0 | 0.0 | 0.30 | 0.70 |
| weekdays | 3 | SmallPower | equipment | W | 0-24 | 0.0 | 0.0 | 0.40 | 0.60 |
| saturday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| saturday | 2 | Lights | lighting | W | 0-24 | 0.0 | 0.0 | 0.30 | 0.70 |
| saturday | 3 | SmallPower | equipment | W | 0-24 | 0.0 | 0.0 | 0.40 | 0.60 |
| sunday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| sunday | 2 | Lights | lighting | W | 0-24 | 0.0 | 0.0 | 0.30 | 0.70 |
| sunday | 3 | SmallPower | equipment | W | 0-24 | 0.0 | 0.0 | 0.40 | 0.60 |
| holiday | 1 | Occupants | people | W | 0-24 | 0.0 | 0.0 | 0.60 | 0.40 |
| holiday | 2 | Lights | lighting | W | 0-24 | 0.0 | 0.0 | 0.30 | 0.70 |
| holiday | 3 | SmallPower | equipment | W | 0-24 | 0.0 | 0.0 | 0.40 | 0.60 |

### Zone18: upper\_void

Zone upper\_void (18) is composed of 17 surfaces and 37 vertices. It encloses a volume of 43.2 m3 of space, with a total surface area of 235. m2 & approx floor area of 108. m2. upper\_void describes ceiling void over radiator rooms.  
There is 12.000 m2 of exposed surface area, 12.000 m2 of which is vertical. Facade opaque is 12.000 m2 & 11.1 % of floor area & average U of 0.319 & UA of 3.8272. Opaque partitions:ceiling:floor 108.00 m2.

A summary of the surfaces in upper\_void(18)

| ID | Area (m2) | Azimuth | Elevation | Name | Use | Construction name | Environment other side |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4.50 | 0. | -90. | cor\_ceil\_a | - | ceiling\_rev | cor\_ceil\_a:corid\_rad |
| 2 | 4.50 | 0. | -90. | cor\_ceil\_b | - | ceiling\_rev | cor\_ceil\_b:corid\_rad |
| 3 | 4.50 | 0. | -90. | cor\_ceil\_c | - | ceiling\_rev | cor\_ceil\_c:corid\_rad |
| 4 | 4.50 | 0. | -90. | cor\_ceil\_d | - | ceiling\_rev | cor\_ceil\_d:corid\_rad |
| 5 | 4.50 | 0. | -90. | cor\_ceil\_e | - | ceiling\_rev | cor\_ceil\_e:corid\_rad |
| 6 | 4.50 | 0. | -90. | cor\_ceil\_f | - | ceiling\_rev | cor\_ceil\_f:corid\_rad |
| 7 | 13.5 | 0. | -90. | ceiling\_bcr | - | ceiling\_rev | ceiling\_bcr:room\_master |
| 8 | 13.5 | 0. | -90. | ceiling\_radf | - | ceiling\_rev | ceiling\_radf:room\_slave1 |
| 9 | 13.5 | 0. | -90. | ceiling\_radw | - | ceiling\_rev | ceiling\_radw:room\_onoffsh |
| 10 | 13.5 | 0. | -90. | ceiling\_flrh | - | ceiling\_rev | ceiling\_flrh:floor\_heat |
| 11 | 13.5 | 0. | -90. | ceiling\_user | - | ceiling\_rev | ceiling\_user:room\_vave |
| 12 | 13.5 | 0. | -90. | ceiling\_warm | - | ceiling\_rev | ceiling\_warm:room\_tprop |
| 13 | 7.20 | 180. | 0. | facade | - | frc\_facade | external |
| 14 | 2.40 | 90. | 0. | right | DOOR | insul\_frc\_facade\_heater | external |
| 15 | 2.40 | 270. | 0. | left | F-FRAME | insul\_frc\_facade\_heater | external |
| 16 | 7.20 | 0. | 0. | back | - | gyp\_blk\_ptn | identical environment |
| 17 | 108. | 0. | 90. | upper | - | structure100mm | identical environment |

The width & height & height above the floor for surfaces marked as frames or doors or glazing is shown below.

A summary of frames

| Surface | Width(m) | Height(m) | Above ff | USE |
| --- | --- | --- | --- | --- |
| right | 6.00 | 0.40 | 0.00 | DOOR |
| left | 6.00 | 0.40 | 0.00 | F-FRAME |

A summary of the MLC areas m2

| MLC name | total | to ambient | to other z | back-back | to ground | to similar |
| --- | --- | --- | --- | --- | --- | --- |
| gyp\_blk\_ptn | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 7.2 |
| ceiling\_rev | 108.0 | 0.0 | 108.0 | 0.0 | 0.0 | 0.0 |
| structure100mm | 108.0 | 0.0 | 0.0 | 0.0 | 0.0 | 108.0 |
| insul\_frc\_facade\_h | 4.8 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| frc\_facade | 7.2 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 |

All surfaces will receive diffuse insolation (if shading not calculated).  
No shading analysis requested.  
No insolation analysis requested.

Uses same operations as zone void\_low

## Areas

Project floor area is 553.50m2, wall area is 125.16m2, window area is 63.840m2. Sloped roof area is 0.00m2, flat roof area is 0.00m2, skylight area is 0.00m2. In contact with ground 0.00m2. There is 189.00m2 of outside surface area, 189.00m2 of which is vertical.

Outside walls are 22.612 % of floor area & average U of 0.401 & UA of 50.216 & max MLC thickness 0.190 Glazing is 11.534 % of floor & 33.778 % facade with average U of 2.811 & UA of 179.43

## Constructions

Multi-layer constructions referenced in the model.

### gyp\_blk\_ptn

Details of opaque construction: gyp\_blk\_ptn with an overall thickness of 0.226m.  
In category partitions also shown in menus as: plasterbd dabs 100mm concrete bl  
partition - plasterboard on dabs over 100mm concret block.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 13.0 | 0.190 | 950. | 840. | 0.91 | 0.22 | white gypboard : White painted Gypboard (inorganic-porous) |
| 2 | 50.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| 3 | 100.0 | 0.510 | 1400. | 1000. | 0.90 | 0.65 | block inner : Block inner (3% mc) |
| 4 | 50.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| Int | 13.0 | 0.190 | 950. | 840. | 0.91 | 0.22 | white gypboard : White painted Gypboard (inorganic-porous) |

ISO 6946 U values (horiz/upward/downward heat flow)= 1.186 1.230 1.133 (partition) 1.072  
Kappa (thermal mass value) 132.2

Total area of gyp\_blk\_ptn is 129.60

### gyp\_gyp\_ptn

Details of opaque construction: gyp\_gyp\_ptn with an overall thickness of 0.074m.  
In category partitions also shown in menus as: plasterboard on 50mm studs  
partition - plasterboard on 50mm studs with no acoustic treatment.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 12.0 | 0.190 | 950. | 840. | 0.91 | 0.22 | white gypboard : White painted Gypboard (inorganic-porous) |
| 2 | 50.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| Int | 12.0 | 0.190 | 950. | 840. | 0.91 | 0.22 | white gypboard : White painted Gypboard (inorganic-porous) |

ISO 6946 U values (horiz/upward/downward heat flow)= 2.144 2.292 1.975 (partition) 1.798  
Kappa (thermal mass value) 19.2

Total area of gyp\_gyp\_ptn is 177.36

### door

Details of opaque construction: door with an overall thickness of 0.025m.  
In category doors also shown in menus as: solid wood door 25mm  
solid wood oak door 25mm.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 25.0 | 0.190 | 700. | 2390. | 0.90 | 0.65 | oak : Oak (radial cut) |

ISO 6946 U values (horiz/upward/downward heat flow)= 3.316 3.682 2.928 (partition) 2.554  
Kappa (thermal mass value) 20.9

Total area of door is 27.84

### dbl\_glz

Details of transparent construction dbl\_glz with DCF7671\_06nb optics and thickness of 0.024m.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 6.0 | 0.760 | 2710. | 837. | 0.83 | 0.05 | plate glass : Plate glass with placeholder single layer optics |
| 2 | 12.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| Int | 6.0 | 0.760 | 2710. | 837. | 0.83 | 0.05 | plate glass : Plate glass with placeholder single layer optics |

ISO 6946 U values (horiz/upward/downward heat flow)= 2.811 3.069 2.527 (partition) 2.243  
Kappa (thermal mass value) 27.2

Clear float 76/71, 6mm, no blind: with id of: DCF7671\_06nb with 3 layers [including air gaps] and visible trn: 0.76

Direct transmission @deg

| 0 | 40 | 55 | 70 | 80 |
| --- | --- | --- | --- | --- |
| 0.611 | 0.583 | 0.534 | 0.384 | 0.170 |

Absorption @deg

| Layer | 0 | 40 | 55 | 70 | 80 |
| --- | --- | --- | --- | --- | --- |
| 1 | 0.15 | 7 0.1 | 72 0. | 185 0 | .201 0.202 |
| 2 | 0.00 | 1 0.0 | 02 0. | 003 0 | .004 0.005 |
| 3 | 0.11 | 7 0.1 | 24 0. | 127 0 | .112 0.077 |

Total area of dbl\_glz is 117.60

### PH\_alu\_frame

Details of opaque construction: PH\_alu\_frame with an overall thickness of 0.079m.  
In category frames also shown in menus as: alum Passive House frame U=0.87  
A composite aluminium Passive House grade window frame with air gap resistances set to give U of 0.87

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 3.0 2 | 10.000 | 2700. | 880. | 0.82 | 0.72 | grey cotd alum : Grey coated aluminium |
| 2 | 8.0 | - | - | - | - | - | air gap resistance 0.06 0.06 0.06 |
| 3 | 3.0 2 | 10.000 | 2700. | 880. | 0.22 | 0.20 | aluminium : Aluminium |
| 4 | 8.0 | - | - | - | - | - | air gap resistance 0.06 0.06 0.06 |
| 5 | 3.0 2 | 10.000 | 2700. | 880. | 0.22 | 0.20 | aluminium : Aluminium |
| 6 | 40.0 | 0.050 | 15. | 1000. | 0.90 | 0.70 | EPS k 0.05 : EPS k=0.05 (non-hygroscopic) |
| 7 | 3.0 2 | 10.000 | 2700. | 880. | 0.22 | 0.20 | aluminium : Aluminium |
| 8 | 8.0 | - | - | - | - | - | air gap resistance 0.06 0.06 0.06 |
| Int | 3.0 2 | 10.000 | 2700. | 880. | 0.82 | 0.72 | grey cotd alum : Grey coated aluminium |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.870 0.893 0.840 (partition) 0.806  
Kappa (thermal mass value) 35.6

Total area of PH\_alu\_frame is 0.00

### sash\_fr92mm

Details of opaque construction: sash\_fr92mm with an overall thickness of 0.092m.  
In category frames also shown in menus as: sash window frame 92m thick  
A wood frame for traditional windows 92mm thick made from generic softwood.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 92.0 | 0.130 | 630. | 2760. | 0.90 | 0.65 | softwood : Softwood (generic) |

ISO 6946 U values (horiz/upward/downward heat flow)= 1.139 1.180 1.090 (partition) 1.033  
Kappa (thermal mass value) 80.0

Total area of sash\_fr92mm is 22.80

### ceiling

Details of opaque construction: ceiling linked to ceiling\_rev with an overall thickness of 0.110m.  
In category ceil\_floor also shown in menus as: suspended acoustic ceiling acous  
A mineral time with 100mm acoustic treatment. For use as a suspended ceiling. To be referenced from room. Reversed version is ceiling\_rev

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 100.0 | 0.040 | 250. | 840. | 0.90 | 0.30 | glasswool : Glasswool (generic) (non-hygroscopic) |
| Int | 10.0 | 0.030 | 290. | 2000. | 0.90 | 0.60 | ceiling mineral : Ceiling acoustic tile (mineral fibre based) |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.333 0.336 0.329 (partition) 0.323  
Kappa (thermal mass value) 0.0

Total area of ceiling is 108.00

### ceiling\_rev

Details of opaque construction: ceiling\_rev linked to ceiling with an overall thickness of 0.110m.  
In category ceil\_floor also shown in menus as: rev suspended acoustic ceiling  
A mineral time with 100mm acoustic treatment. For use as a suspended ceiling. To be referenced from ceiling void. Reversed version is ceiling

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 10.0 | 0.030 | 290. | 2000. | 0.90 | 0.60 | ceiling mineral : Ceiling acoustic tile (mineral fibre based) |
| Int | 100.0 | 0.040 | 250. | 840. | 0.90 | 0.30 | glasswool : Glasswool (generic) (non-hygroscopic) |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.333 0.336 0.329 (partition) 0.323  
Kappa (thermal mass value) 0.0

Total area of ceiling\_rev is 216.00

### susp\_floor

Details of opaque construction: susp\_floor linked to susp\_flr\_re with an overall thickness of 0.219m.  
In category ceil\_floor also shown in menus as: carpeted intermed void->room  
A commercial concrete floor structure with carpet cast on steel shuttering. For use over a ceiling void.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 6.0 | 0.060 | 186. | 1360. | 0.90 | 0.60 | Wilton : Wilton weave wool carpet (organic-hygroscopic) |
| 2 | 19.0 | 0.150 | 800. | 2093. | 0.91 | 0.65 | chipboard : Chipboard |
| 3 | 50.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| 4 | 140.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |
| Int | 4.0 | 50.000 | 7800. | 502. | 0.12 | 0.20 | steel : Steel |

ISO 6946 U values (horiz/upward/downward heat flow)= 1.500 1.570 1.415 (partition) 1.321  
Kappa (thermal mass value) 147.3

Total area of susp\_floor is 6.75

### susp\_flr\_re

Details of opaque construction: susp\_flr\_re linked to susp\_floor with an overall thickness of 0.219m.  
In category ceil\_floor also shown in menus as: carpeted intermed room->void  
A commercial concrete floor structure with carpet cast on steel shuttering. For use in the room over a ceiling void.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 4.0 | 50.000 | 7800. | 502. | 0.12 | 0.20 | steel : Steel |
| 2 | 140.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |
| 3 | 50.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| 4 | 19.0 | 0.150 | 800. | 2093. | 0.91 | 0.65 | chipboard : Chipboard |
| Int | 6.0 | 0.060 | 186. | 1360. | 0.90 | 0.60 | Wilton : Wilton weave wool carpet (organic-hygroscopic) |

ISO 6946 U values (horiz/upward/downward heat flow)= 1.500 1.570 1.415 (partition) 1.321  
Kappa (thermal mass value) 142.9

Total area of susp\_flr\_re is 6.75

### steel\_pl\_3mm

Details of opaque construction: steel\_pl\_3mm with an overall thickness of 0.003m.  
In category fittings also shown in menus as: white steel panel 3mm  
Used for furniture or in the cases of fittings or equipment.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 3.0 | 40.000 | 7800. | 502. | 0.82 | 0.30 | white ptd steel : White painted steel |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.880 7.139 4.760 (partition) 3.845  
Kappa (thermal mass value) 5.9

Total area of steel\_pl\_3mm is 11.61

### collector\_pl

Details of opaque construction: collector\_pl with an overall thickness of 0.003m.  
In category fittings also shown in menus as: black copper panel 3mm  
black coated copper plate for solar collectors or other equipment such as boiler combustion chambers.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 3.0 2 | 00.000 | 8900. | 418. | 0.52 | 0.96 | black\_coated\_copper : black\_coated\_copper coated for solar absorption eq |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.882 7.142 4.762 (partition) 3.846  
Kappa (thermal mass value) 5.6

Total area of collector\_pl is 0.00

### sensor\_case

Details of opaque construction: sensor\_case with an overall thickness of 0.002m.  
In category fittings also shown in menus as: ABS shell for control equipment  
Used for thermostat shell or furniture or other office equipment.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1.7 | 0.250 | 1020. | 1400. | 0.90 | 0.60 | ABS\_case : ABS case (Acrylonitrile Butadiene Styrene) (www.matweb.com) ( |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.656 6.812 4.613 (partition) 3.748  
Kappa (thermal mass value) 1.2

Total area of sensor\_case is 0.00

### circuit\_bd

Details of opaque construction: circuit\_bd with an overall thickness of 0.002m.  
In category fittings also shown in menus as: pcb-board for control equipment  
Used within controls or office equipment to represent internal mass.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1.7 | 0.323 | 1770. | 695. | 0.90 | 0.75 | pcb-board : pcb-board based on FR4 with a thin layer of copper from Soli |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.706 6.884 4.645 (partition) 3.770  
Kappa (thermal mass value) 1.0

Total area of circuit\_bd is 1.48

### upholstery

Details of opaque construction: upholstery with an overall thickness of 0.035m.  
In category fittings also shown in menus as: upholstery with layers of felt  
Used to represent upholstery made from layers of dense fabric and wool fibre stuffing.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 5.0 | 0.040 | 160. | 1360. | 0.90 | 0.65 | wool felt underlay : Wool felt underlay (organic-hygroscopic) |
| 2 | 25.0 | 0.060 | 198. | 1360. | 0.90 | 0.60 | sheeps wool : Sheeps wool (simulated) |
| Int | 5.0 | 0.040 | 160. | 1360. | 0.90 | 0.65 | wool felt underlay : Wool felt underlay (organic-hygroscopic) |

ISO 6946 U values (horiz/upward/downward heat flow)= 1.195 1.240 1.141 (partition) 1.079  
Kappa (thermal mass value) 0.0

Total area of upholstery is 10.52

### corian\_count

Details of opaque construction: corian\_count with an overall thickness of 0.020m.  
In category fittings also shown in menus as: non-porous countertop surface  
Used to represent the solid homogeneous non-porous surfacing of office furniture or kitchen cabinets.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 20.0 | 1.012 | 1750. | 771. | 0.80 | 0.40 | corian : corian is a solid homogeneous non-porous surfacing of natural m |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.270 6.259 4.352 (partition) 3.574  
Kappa (thermal mass value) 13.5

Total area of corian\_count is 22.51

### IT\_case

Details of opaque construction: IT\_case with an overall thickness of 0.003m.  
In category fittings also shown in menus as: dark ABS shell for equipment  
Used for dark casings (ABS) of office equipment or furniture.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2.7 | 0.250 | 1020. | 1400. | 0.90 | 0.90 | dark\_abs\_case : dark\_abs\_case dark grey ABS (Acrylonitrile Butadiene Sty |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.531 6.631 4.529 (partition) 3.693  
Kappa (thermal mass value) 1.9

Total area of IT\_case is 1.77

### furn\_wd10mm

Details of opaque construction: furn\_wd10mm with an overall thickness of 0.010m.  
In category fittings also shown in menus as: oak shelves or furniture (10mm)  
Used to represent 10mm wooden shelves and case for book storage, furniture etc.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 10.0 | 0.190 | 700. | 2390. | 0.90 | 0.65 | oak : Oak (radial cut) |

ISO 6946 U values (horiz/upward/downward heat flow)= 4.492 5.191 3.808 (partition) 3.199  
Kappa (thermal mass value) 8.4

Total area of furn\_wd10mm is 12.00

### steel\_gr\_3mm

Details of opaque construction: steel\_gr\_3mm with an overall thickness of 0.003m.  
In category fittings also shown in menus as: grey steel panel 3mm  
Used for furniture or in the cases of fittings or equipment.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 3.0 | 40.000 | 7800. | 502. | 0.82 | 0.45 | beige ptd steel : Beige painted steel |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.880 7.139 4.760 (partition) 3.845  
Kappa (thermal mass value) 5.9

Total area of steel\_gr\_3mm is 3.65

### file\_papers

Details of opaque construction: file\_papers with an overall thickness of 0.300m.  
In category fittings also shown in menus as: book paper layers on shelves  
Used to represent large paper books and files 300mm thick on a shelf or in a filing cabinet.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 100.0 | 0.100 | 720. | 1300. | 0.90 | 0.65 | book\_paper : book\_paper .72 g/cc from paperonweb.com engineering toolbox |
| 2 | 100.0 | 0.060 | 620. | 1300. | 0.90 | 0.60 | news\_paper : news\_paper .62g/cc on paperonweb.com engineering toolbox ot |
| Int | 100.0 | 0.100 | 720. | 1300. | 0.90 | 0.65 | book\_paper : book\_paper .72 g/cc from paperonweb.com engineering toolbox |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.261 0.263 0.258 (partition) 0.255  
Kappa (thermal mass value) 93.6

Total area of file\_papers is 11.61

### booksonshlf

Details of opaque construction: booksonshlf with an overall thickness of 0.210m.  
In category fittings also shown in menus as: paper-back books on shelves  
Used to represent smaller paper books and files 210mm thick on a shelf or in a filing cabinet.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 210.0 | 0.100 | 720. | 1300. | 0.90 | 0.65 | book\_paper : book\_paper .72 g/cc from paperonweb.com engineering toolbox |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.441 0.446 0.433 (partition) 0.424  
Kappa (thermal mass value) 93.6

Total area of booksonshlf is 0.00

### stuffonshelf

Details of opaque construction: stuffonshelf with an overall thickness of 0.210m.  
In category fittings also shown in menus as: mix of books clutter on shelves  
Used to represent a mix of books and boxes 210mm thick on a shelf or in a filing cabinet.

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 210.0 | 0.100 | 480. | 1300. | 0.90 | 0.60 | shelf\_clutter : shelf\_clutter mix of books magazines papers on typical s |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.441 0.446 0.433 (partition) 0.424  
Kappa (thermal mass value) 62.4

Total area of stuffonshelf is 18.60

### slate\_screed\_rev

Details of opaque construction: slate\_screed\_rev linked to slate\_screed with an overall thickness of 0.040m.  
In category ceil\_floor also shown in menus as: tile over screed\_rev struc->rm  
screed\_rev used from within a thin zone upper layer struc->room

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 20.0 | 2.000 | 2700. | 753. | 0.95 | 0.85 | Slate tile : Slate tile (inorganic-porous) |
| Int | 20.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.147 6.087 4.268 (partition) 3.518  
Kappa (thermal mass value) 27.4

Total area of slate\_screed\_rev is 6.75

### slate\_screed

Details of opaque construction: slate\_screed linked to slate\_screed\_rev with an overall thickness of 0.040m.  
In category ceil\_floor also shown in menus as: tile over screed rm->struc  
screed used in room above a heated screed (thin zone upper layer) room->struc

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 20.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |
| Int | 20.0 | 2.000 | 2700. | 753. | 0.95 | 0.85 | Slate tile : Slate tile (inorganic-porous) |

ISO 6946 U values (horiz/upward/downward heat flow)= 5.147 6.087 4.268 (partition) 3.518  
Kappa (thermal mass value) 40.7

Total area of slate\_screed is 6.75

### structure100mm

Details of opaque construction: structure100mm with an overall thickness of 0.100m.  
In category ceil\_floor also shown in menus as: 100mm concrete structure  
structure is structural floor of 100mm concrete

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 100.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |

ISO 6946 U values (horiz/upward/downward heat flow)= 4.142 4.730 3.553 (partition) 3.017  
Kappa (thermal mass value) 68.6

Total area of structure100mm is 108.00

### slate\_scr\_struc\_rev

Details of opaque construction: slate\_scr\_struc\_rev with an overall thickness of 0.160m.  
In category project specific also shown in menus as: slate\_scr\_struc void->room  
slate\_scr\_struc\_rev slate over screed over 100mm concrete slab layer struc->room

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 20.0 | 2.000 | 2700. | 753. | 0.95 | 0.85 | Slate tile : Slate tile (inorganic-porous) |
| 2 | 40.0 | 1.400 | 2100. | 650. | 0.91 | 0.65 | cement screed : Cement screed (inorganic-porous) |
| Int | 100.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |

ISO 6946 U values (horiz/upward/downward heat flow)= 3.571 4.000 3.125 (partition) 2.703  
Kappa (thermal mass value) 137.0

Total area of slate\_scr\_struc\_rev is 94.50

### insul\_frc\_facade\_heater

Details of opaque construction: insul\_frc\_facade\_heater with an overall thickness of 0.190m.  
In category project specific also shown in menus as: insul\_frc\_facade embed heater  
insul\_frc\_facade\_heater concrete panel over insulation with added pipes and fermacell

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 20.0 | 0.900 | 1950. | 840. | 0.90 | 0.65 | Glass reinf conc : Glass fibre reinforced concrete |
| 2 | 100.0 | 0.040 | 12. | 840. | 0.90 | 0.65 | glass fibre quilt : Glass Fibre Quilt (non-hygroscopic) |
| 3 | 50.0 | 0.800 | 1800. | 1100. | 0.91 | 0.70 | lime cement plaster : lime cement plaster from IBO PassivHaus (inorganic |
| Int | 20.0 | 0.830 | 1400. | 920. | 0.91 | 0.40 | White\_RK38\_baumat\_lime\_plaster : White\_RK38\_baumat\_lime\_plaster same as |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.360 0.364 0.355 (partition) 0.349  
Kappa (thermal mass value) 157.5

Total area of insul\_frc\_facade\_heater is 54.90

### slate\_over\_struc room>void

Details of opaque construction: slate\_over\_struc room>void linked to slate\_scr\_struc\_rev with an overall thickness of 0.160m.  
In category project specific also shown in menus as: slate\_scr\_struc room->void  
slate\_scr\_struc\_rev slate over screed over 100mm concrete slab layer room->structure

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 100.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |
| 2 | 40.0 | 1.400 | 2100. | 650. | 0.91 | 0.65 | cement screed : Cement screed (inorganic-porous) |
| Int | 20.0 | 2.000 | 2700. | 753. | 0.95 | 0.85 | Slate tile : Slate tile (inorganic-porous) |

ISO 6946 U values (horiz/upward/downward heat flow)= 3.571 4.000 3.125 (partition) 2.703  
Kappa (thermal mass value) 150.1

Total area of slate\_over\_struc room>void is 94.50

### frc\_facade

Details of opaque construction: frc\_facade with an overall thickness of 0.184m.  
In category project specific also shown in menus as: frc\_facade  
frc\_facade GFR concrete over insulation and double fermacell

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 20.0 | 0.900 | 1950. | 840. | 0.90 | 0.65 | Glass reinf conc : Glass fibre reinforced concrete |
| 2 | 20.0 | - | - | - | - | - | air gap resistance 0.17 0.17 0.17 |
| 3 | 120.0 | 0.040 | 12. | 840. | 0.90 | 0.65 | glass fibre quilt : Glass Fibre Quilt (non-hygroscopic) |
| Int | 24.0 | 0.360 | 1150. | 1000. | 0.91 | 0.22 | gypsum\_fibreboard : Fermacell gypsum fibreboard IBR report 3001-100 gyps |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.292 0.294 0.288 (partition) 0.284  
Kappa (thermal mass value) 60.4

Total area of frc\_facade is 58.50

### floor\_heating\_ceil->pipe

Details of opaque construction: floor\_heating\_ceil->pipe linked to heating\_struc\_pipe->ceiling with an overall thickness of 0.150m.  
In category project specific also shown in menus as: floor\_heating\_ceil->pipe  
floor\_heating\_ceil->pipe 50mm insul over 100mm concrete ceiling void to pipes of a floor heating system

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 100.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |
| Int | 50.0 | 0.040 | 105. | 1800. | 0.90 | 0.60 | mineral fibre : Mineral fibre (non-hygroscopic) |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.670 0.684 0.653 (partition) 0.632  
Kappa (thermal mass value) 102.8

Total area of floor\_heating\_ceil->pipe is 7.35

### heating\_struc\_pipe->ceiling

Details of opaque construction: heating\_struc\_pipe->ceiling linked to floor\_heating\_ceil->pipe with an overall thickness of 0.150m.  
In category project specific also shown in menus as: floor\_heating\_pipe->ceiling  
floor\_heating\_ceil->pipe 50mm insul over 100mm concrete ceiling void to pipes of a floor heating system

| Layer | Thickness (mm) | Conductivity (W/(mK)) | Density (kg/m3) | Specific heat (J/(kgK)) | Emissivity | Absorption | Description |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ext | 50.0 | 0.040 | 105. | 1800. | 0.90 | 0.60 | mineral fibre : Mineral fibre (non-hygroscopic) |
| Int | 100.0 | 1.400 | 2100. | 653. | 0.90 | 0.65 | heavy mix concrete : Heavy mix concrete |

ISO 6946 U values (horiz/upward/downward heat flow)= 0.670 0.684 0.653 (partition) 0.632  
Kappa (thermal mass value) 102.8

Total area of heating\_struc\_pipe->ceiling is 7.35