Jubilee Campus | University of Nottingham

Location: Nottingham, U.K.
Architect: Michael Hopkins
Construction Area: 45,000 ㎡
Population Capacity: 2,500
Programs: Dormitory / Teaching /
Information Center / Dining Hall

Climate

The city of Nottingham is located in Englan, U.K.. It's one of the major cities of Britain. Nottingham locates between Manchester and London.

The climate of Nottingham, similar to other British cities, is Maritime climates. Maritime climates has some characters: precipitation level is equal all through the year; the cloudy weather creates a low level of sunshine radiation; the humidity level is higher than continental climates.

Climate data for Nottingham Watnall, elevation: 117 m or 384 ft, 1981–2010 normals, extremes 1960–present [hide]

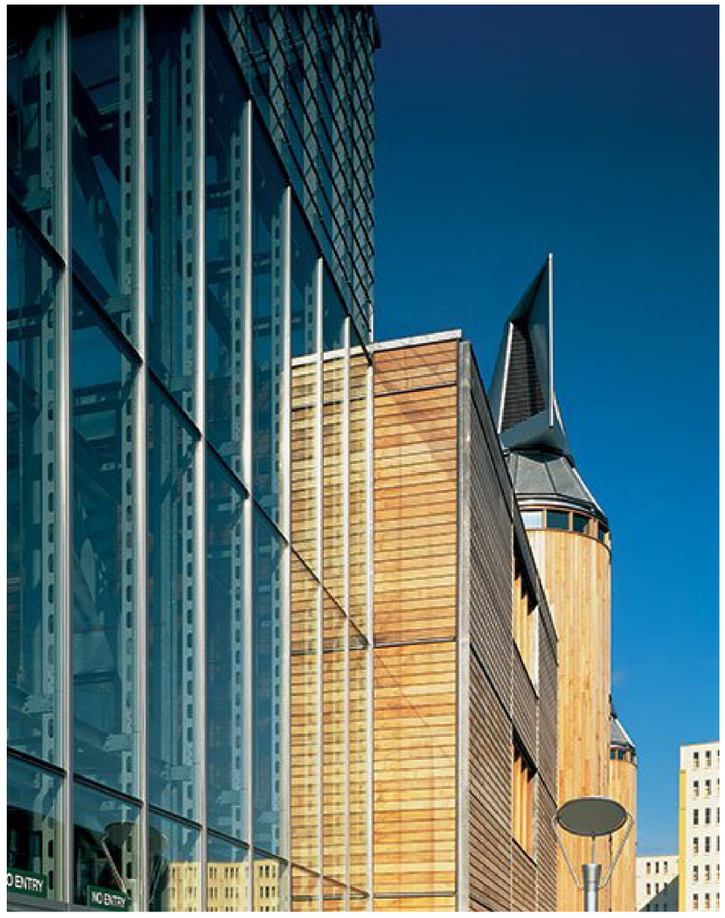
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	14.5 (58.1)	17.3 (63.1)	22.8 (73)	25.6 (78.1)	27.6 (81.7)	30.8 (87.4)	33.9 (93)	34.6 (94.3)	29.2 (84.6)	28.4 (83.1)	17.9 (64.2)	15.0 (59)	34.6 (94.3)
Average high °C (°F)	6.6 (43.9)	7.0 (44.6)	9.7 (49.5)	12.5 (54.5)	16.1 (61)	18.9 (66)	21.3 (70.3)	21.0 (69.8)	17.9 (64.2)	13.7 (56.7)	9.4 (48.9)	6.7 (44.1)	13.4 (56.1)
Daily mean °C (°F)	4.0 (39.2)	4.1 (39.4)	6.3 (43.3)	8.4 (47.1)	11.6 (52.9)	14.5 (58.1)	16.7 (62.1)	16.5 (61.7)	14.0 (57.2)	10.4 (50.7)	6.7 (44.1)	4.2 (39.6)	9.8 (49.6)
Average low °C (°F)	1.3 (34.3)	1.1 (34)	2.8 (37)	4.3 (39.7)	7.1 (44.8)	10.0 (50)	12.1 (53.8)	12.0 (53.6)	10.0 (50)	7.1 (44.8)	3.9 (39)	1.6 (34.9)	6.1 (43)
Record low °C (°F)	−13.3 (8.1)	−11.1 (12)	−10.6 (12.9)	−4.6 (23.7)	−2.1 (28.2)	1.0 (33.8)	4.4 (39.9)	4.5 (40.1)	0.9 (33.6)	−3.1 (26.4)	−9.2 (15.4)	−12.0 (10.4)	−13.3 (8.1)
Average precipitation mm (inches)	61.2 (2.409)	47.2 (1.858)	49.5 (1.949)	53.8 (2.118)	51.8 (2.039)	62.5 (2.461)	57.6 (2.268)	62.0 (2.441)	58.6 (2.307)	71.2 (2.803)	65.7 (2.587)	68.6 (2.701)	709.4 (27.929)
Average precipitation days (≥ 1.0 mm)	11.8	10.0	11.1	9.9	9.3	9.2	9.2	9.4	9.4	11.2	11.8	12.1	124.2
Mean monthly sunshine hours	54.7	73.2	104.2	141.0	181.6	170.6	191.1	180.1	131.2	99.4	63.7	49.2	1,440.1

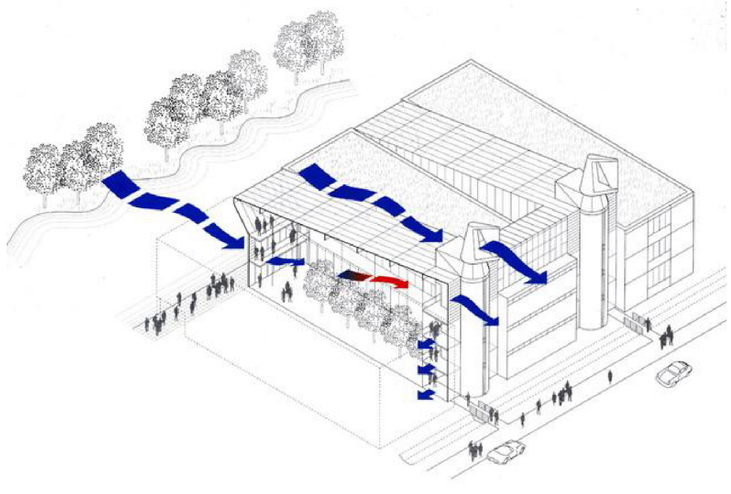
Climate data for Nottingham Watnall, elevation: 117 m or 384 ft, 1971–2000 normals [show]

Climate data for Nottingham Sutton Bonington, elevation: 48 m or 157 ft, 1981–2010 normals [hide]

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C (°F)	7.2 (45)	7.5 (45.5)	10.3 (50.5)	12.9 (55.2)	16.3 (61.3)	19.2 (66.6)	21.7 (71.1)	21.4 (70.5)	18.4 (65.1)	14.2 (57.6)	10.0 (50)	7.3 (45.1)	13.9 (57)
Daily mean °C (°F)	4.4 (39.9)	4.4 (39.9)	6.7 (44.1)	8.5 (47.3)	11.6 (52.9)	14.5 (58.1)	16.8 (62.2)	16.7 (62.1)	14.2 (57.6)	10.7 (51.3)	7.1 (44.8)	4.5 (40.1)	10.0 (50)
Average low °C (°F)	1.6 (34.9)	1.3 (34.3)	3.0 (37.4)	4.1 (39.4)	6.8 (44.2)	9.8 (49.6)	11.9 (53.4)	11.9 (53.4)	9.9 (49.8)	7.2 (45)	4.1 (39.4)	1.7 (35.1)	6.1 (43)
Average precipitation mm (inches)	52.2 (2.055)	38.9 (1.531)	43.9 (1.728)	48.9 (1.925)	44.2 (1.74)	60.2 (2.37)	54.1 (2.13)	55.5 (2.185)	51.0 (2.008)	61.0 (2.402)	54.5 (2.146)	55.9 (2.201)	620.2 (24.417)
Average precipitation days (≥ 1.0 mm)	10.9	9.1	10.6	9.7	8.7	9.4	8.7	8.6	8.2	10.2	10.2	10.9	115.2
Mean monthly sunshine hours	52.3	74.4	107.4	143.9	178.2	158.1	188.0	179.0	134.1	104.0	60.9	43.3	1,423.5

Source: Met Office[51]





VENTILATION

Different from other green buildings that utilize natural ventilation, the architects and engineers decide to use mechanical ventilation rather than natural ventilation. They took a series of tests, during which internal comfort and energy consumption can both be improved, after installation of heat exchangers.

They design a rotary heat exchangers, thermal wheels, on top of the towers of the building massings. In winter, the heat of the exhaust air is absorbed by aluminium rotor, which then delivers the heat to the supply air; in summer, it works in other way, the temperature of supply air cools down the heat of exhaust air.

In coorporation with the courtyard design, the thermal wheel can also act as exhaust air fan. This process is more like wind tower. When outside wind hits the thermal wheels, the rotary heat exchangers can create a wind path of internal air, by changing the air pressure by rotation. The hot internal air can be exhausted out, while fresh cooler air can be sucked in from a lower level.

LIGHTING

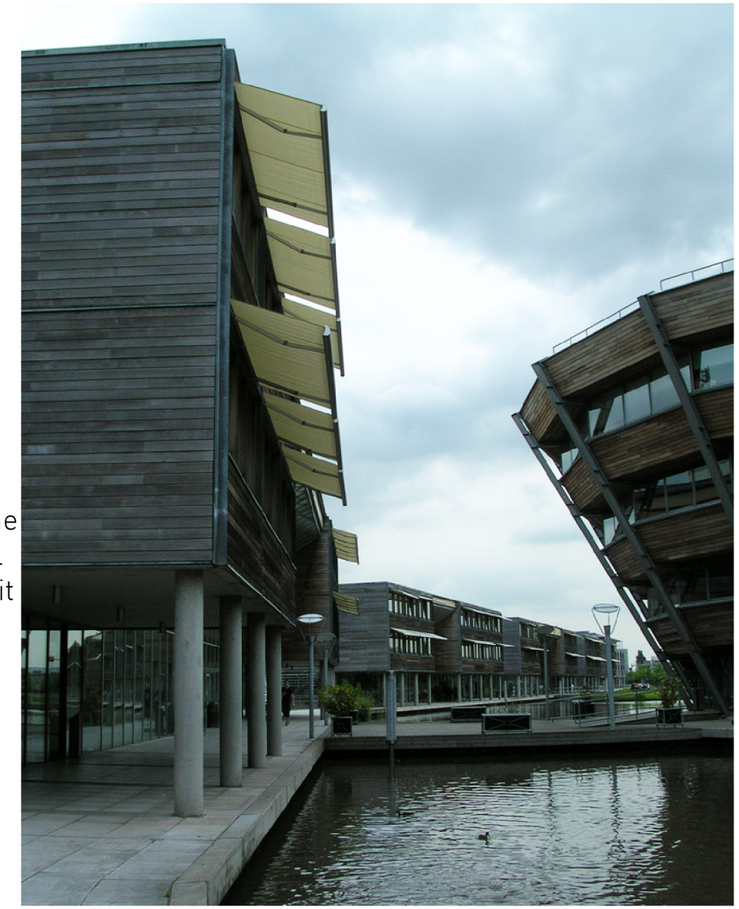
There are some light shelves, wood panels, installed onto the glass facade and some part of the roof. These panels are flexible, and controlled by daylight and movement sensors. They can rotate according to the level of daylight.

Light shelves on the facade and roof reflect light up to the ceiling, to enhance the daylight level of interior spaces. While it keeps required lighting level, it also prevents glare from direct snlight. It also creates shading for the floor to reduce overheating from solar gain in summer.

By utilizing daylight and movement sensors, the light shelves can minimise the use of artificial lights, reducing the cooling load and electrical consumption.

COURTYARD

There are lots of courtyards within the building, from 3 floor to 4 floor high. Combining with lighting and ventilation strategies, these courtyard can enhance the lighting and thermal condition, and increases the thermal efficiency. It can let natural light inside the deep section, while it performs as an access for ventilation.



SITE

The main idea for site design is to create a linear lake system. With the help of ditches near the building, the rain water can be collected for recycle use.

The main building is facing the southwest, which is the direction of main wind. This can give more wind source and solar lighting for the building. In summer, the wind can be cooled by the lake, before it reaches the building. Then together with the courtyards, the cooled air can help to cool down the internal spaces.

MY PROPOSAL

Take advantage of the linear lake system. To let the lake go inside the courtyard, then to create some micro-eco-systems inside the building, and connected with the outside natural environment. By adding more vegetation and water inside the courtyard, it might affect the micro-climate inside, and adjust the thermal condition.