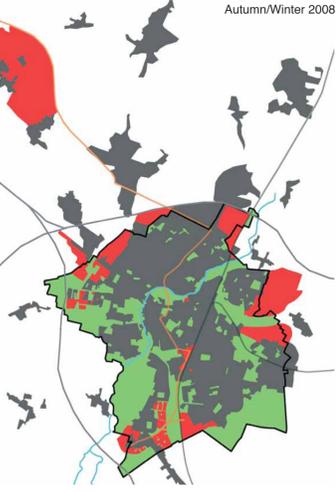


The Vertical Community: Bio-Spire

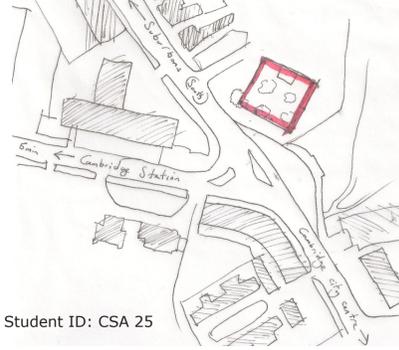
CAMBRIDGE ARCHITECTURE

57

architecture
urbanism
environmental
issues - in the
Cambridge
city region



Autumn/Winter 2008



Student ID: CSA 25

The site I have chosen for my vertical community is in Cambridge, like many cities in the south of England it is growing, economic migrants from within the UK and outside the UK are coming to the city in large numbers to work, some have come to commute taking advantage of Cambridge's proximity to London (via good rail links). As well as those who have come to study at the University or other Schools.

All in all Cambridge is under pressure; the city is fast running out of its brown field sites and is looking to start development on its precious green belt. If this is allowed Cambridge is in danger of urban sprawl, one way to take the pressure off could be to build vertically.

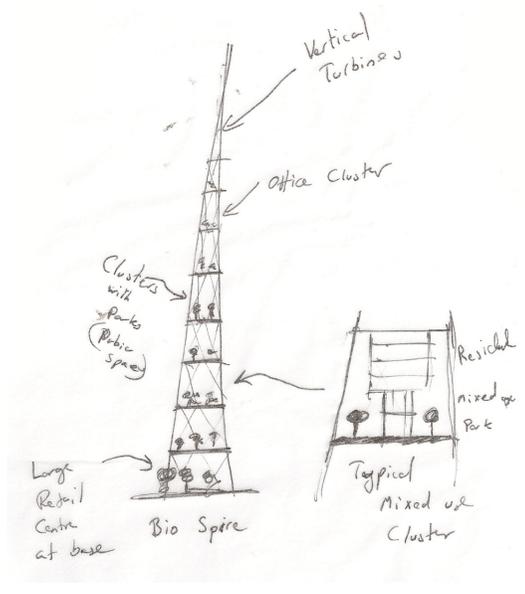
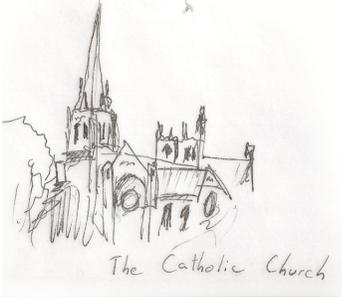
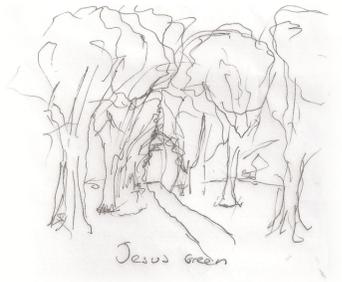
Note: excellent article in the Cambridge Architecture Gazette about the issues is available online at www.architecture.com

Expanding City

Life on the edge: the growth of Cambridge

ca

plus
Leader
News and history
Infrastructure and interview
Research on sustainable suburbs

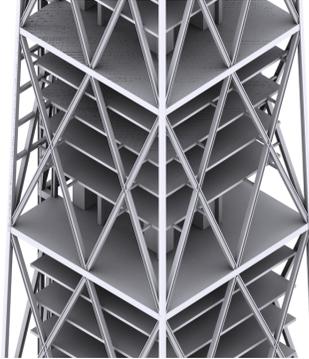
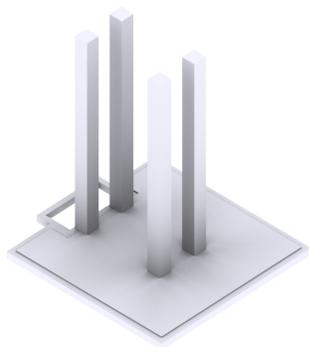


The Concept and Design:

Cambridge like many British cities has parks, but it also still has Common Land in the city centre. These green open spaces are the essence of Cambridge. The other influence I have drawn on are the church spires, they are the only structures permitted to punctuate Cambridge's low skyline.

My concept is a Bio-Spire, the structure in this case is 600 metres to the tip of the spire, the whole is broken down into smaller clusters each 30 metre in height, most will be residential however each will have another use either commercial or community. These mixed use clusters will be balanced with other clusters given over to a school or an office depending on the need. All the clusters will be serviced by a large express lift that stops at each cluster, then each cluster has its own circulation. This breaks the building into a sequence of Public - Semi Public - Semi Private and Private spaces. Making spaces for the buildings users to interact with each other.

The very top of the building, which is unsuitable for other uses could house large vertical wind turbines helping the building generate its own electrical supply.



Structure:

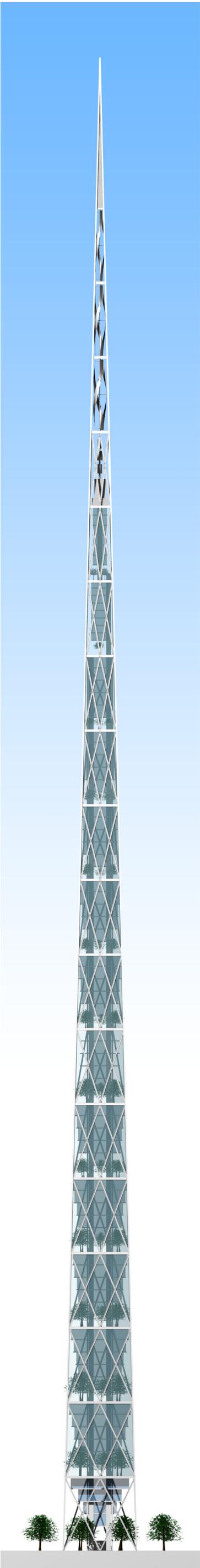
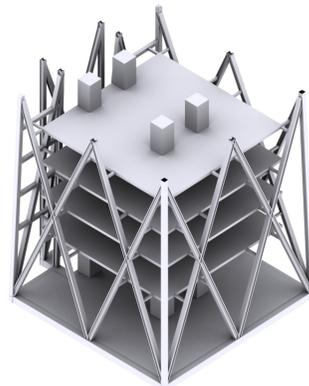
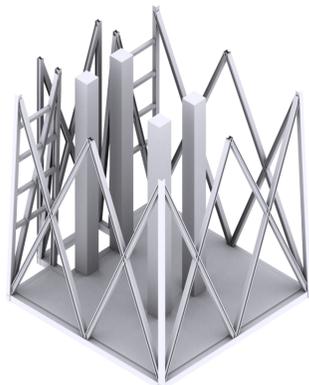
The building will be broken down into smaller structural units stacked one on top of another.

Sequence:

1. The clusters floor plate and service cores including lifts and stairs/fire escapes
2. The mega-frame built around the services cores supports the next cluster and the façade system
3. The floor slabs are supported from the mega-frame and services cores.

The structure is inspired by Rogers Habours 122 Leadenhall street tower under construction (stalled) in the City of London.

Also inspired by Norman Fosters proposed millennium tower in Tokyo. And the work of Ken Yeang



Elevation

Scale 1:750

Left: photomontage of what the Bio-Spire might look like from the north.

600m

Vertical wind turbine

Vertical wind turbine

Vertical wind turbine

Plant

Residential

Bars and restaurants

Public observation deck

Offices

Express lift

Residential

Office Unit

Residential

Day centre for the Elderly

Residential

Office Unit

Residential

Health Clinic

Sports Centre

Residential

Office Unit

Residential

Art Gallery

Residential

Office Unit

Residential

Childrens day care centre

Residential

Office Unit

Retail

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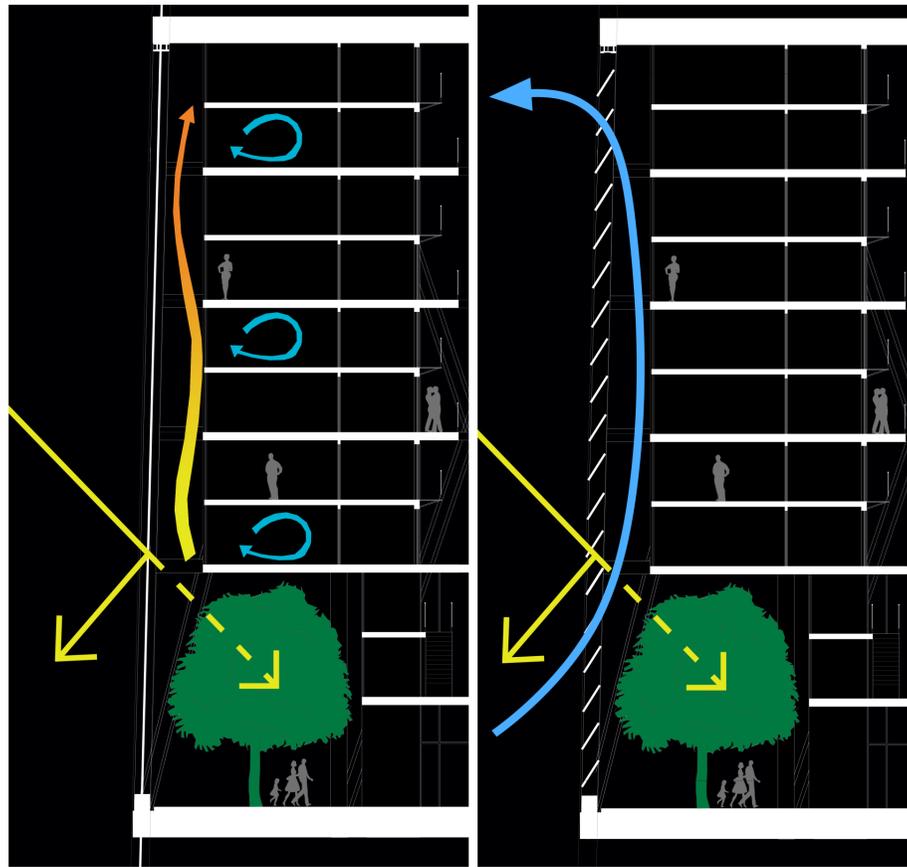
The Site:

The site I have chosen is currently occupied by a small office building, I have chosen this site because it marks the transition from the city to the north and the suburban's to the south. It also marks Cambridge's major transport link, the railway station.

I felt that for these two reasons it would make a good site, close but not in the historic city centre and close to a major transport hub. Also it could act as a marker, helping people find their way to the railway station.



Site Plan Scale 1:1000



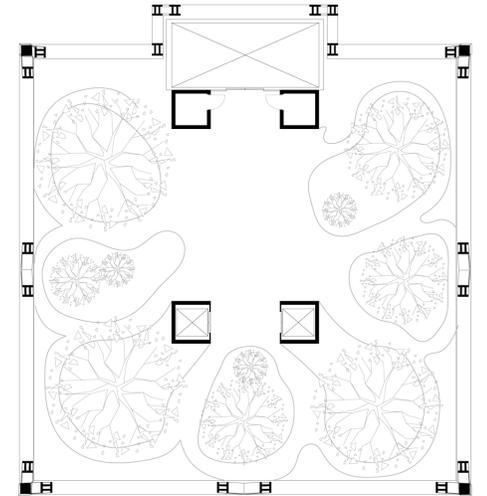
Winter

Summer

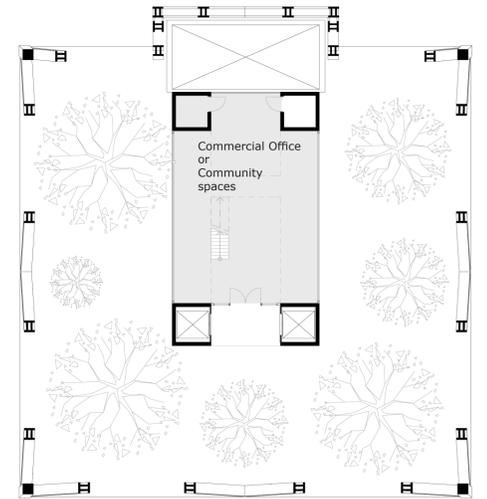
The Façade System:

The concept behind the façade is that it isolates the building users from the façade, there will always be a gap of at least two metres between the occupied zones and the façade.

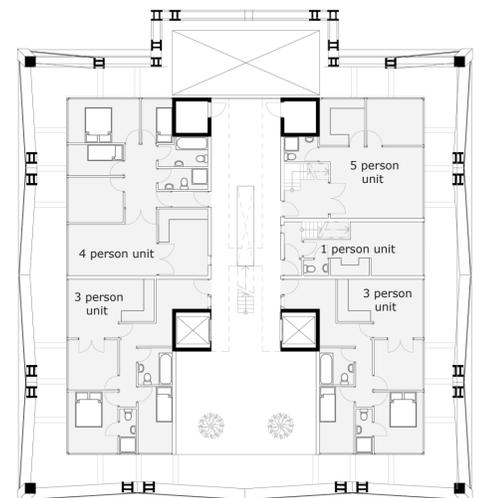
The idea is to allow the buildings occupants to open or close windows and control their own ventilation; this space would also act as a thermal buffer, in winter acting as a conservatory and in the summer acting like a thermal stack.



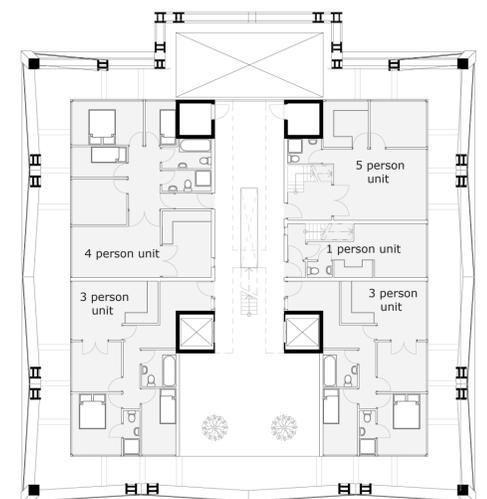
First Floor - Park Scale 1:200



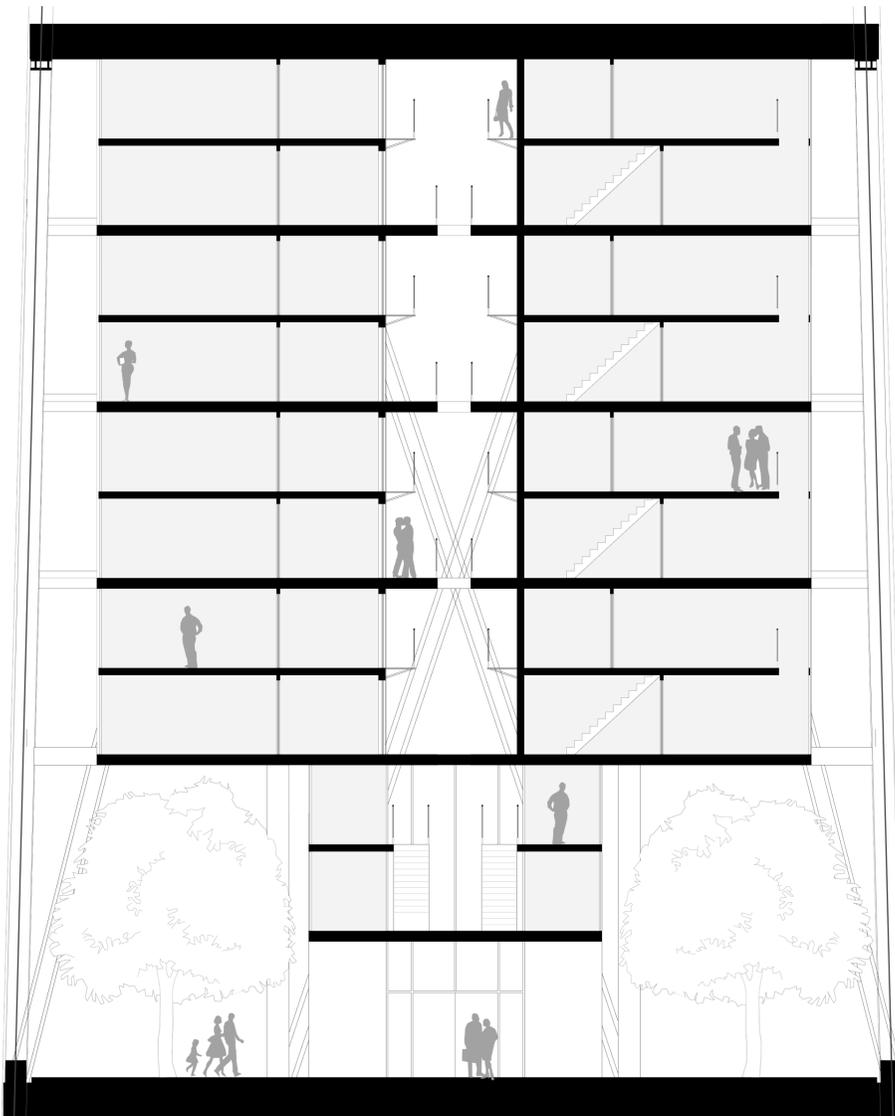
First Floor - Office Scale 1:200



Tenth Floor - Residential Scale 1:200



Twelfth Floor - Residential Scale 1:200



Cluster Section Scale 1:100

Section Scale 1:750