

# **Sustainability in Practice: The King's College London Estate**

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January 2008



# Introduction

- College Estate
- Carbon Management
- Building Projects
- The College Environment
- Connectivity between Campuses
- Recycling
- Communications



# King's College London: Background

- The College Estate:
  - 5 academic campuses and 1 major residential campus
  - located in the historic heart of London
  - Gross area of 4 million sq ft
  - Rebuilding valuation of £1.6 billion
  - 2,500 bedrooms
  - Sports grounds of 20.6 ha



# King's College London Strand Campus



# King's College London Waterloo Campus



# King's College London Guy's Campus



# King's College London St Thomas's Campus





# King's College London Denmark Hill Campus



# Carbon Management

- Energy Efficiency Accreditation
- Carbon Footprinting and Carbon Management Plan: achieved reduction in 12% in 18 months
- Salix Investment Fund
- Reduction
  - 9,000 mwh
  - 4,935 tonnes CO<sub>2</sub>

# Building Projects

- BREEAM Target for *Excellent* on New Buildings and at least *Very Good* on Refurbishments
- Sustainable Procurement



# New Life for Historic Buildings



# New Life for 20<sup>th</sup> Century Buildings



# King's College London: Strand Campus

“The situation of King’s College is bad, very bad!... In a moral point of view the proposed site...is probably the very worst that could have been selected in the whole metropolis...It is within about a five minutes’ walk of five theatres...!”

*Mechanics Magazine, 1829*

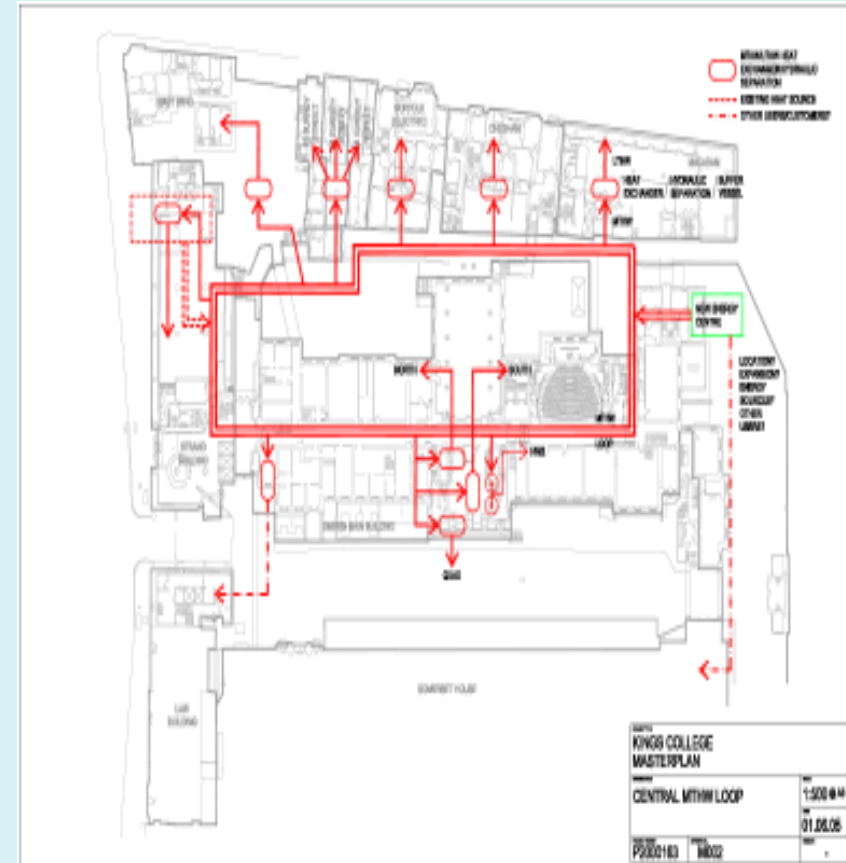
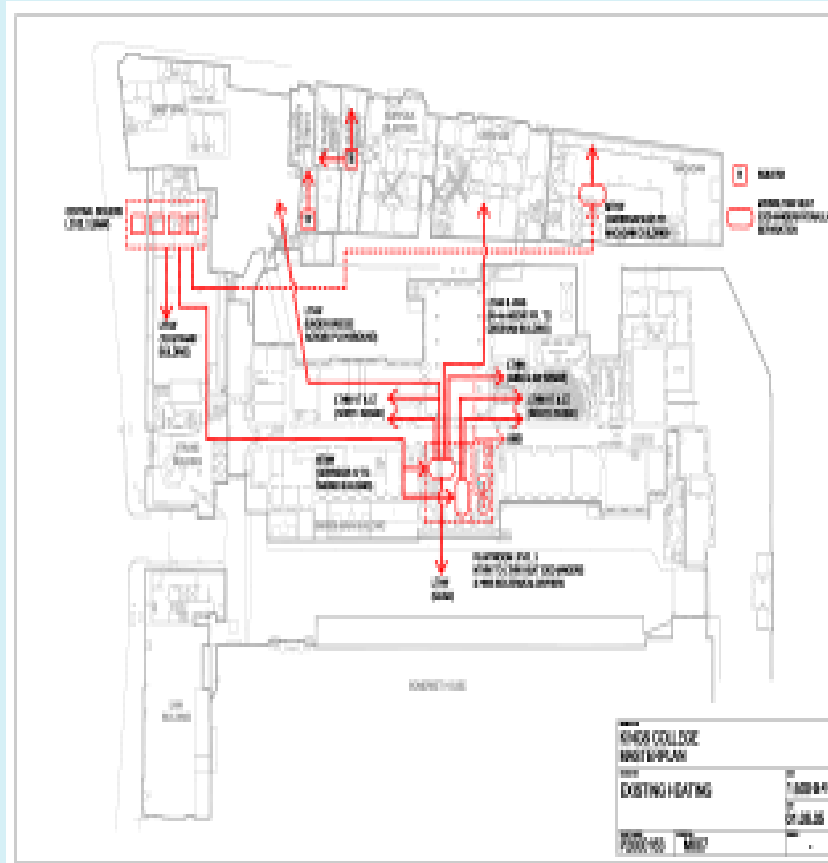


# Strand Campus Masterplan

- Context and identity
- Orientation and efficient circulation
- Appropriate use
- Adaptation, extension or redevelopment
- Sustainability
- Flexible master planning frameworks



# Masterplan strategies: heating, cooling, rainwater harvesting ...





# Phase 1: The King's Building

- 1830s Grade I Listed Building  
Designed by Sir Robert Smirke: (Architect of the British Museum)
- Had been significantly modified and adapted
- Illegible, inefficient and in poor condition
- 2 options:
  - Flexible with full air conditioning
  - A more sustainable solution

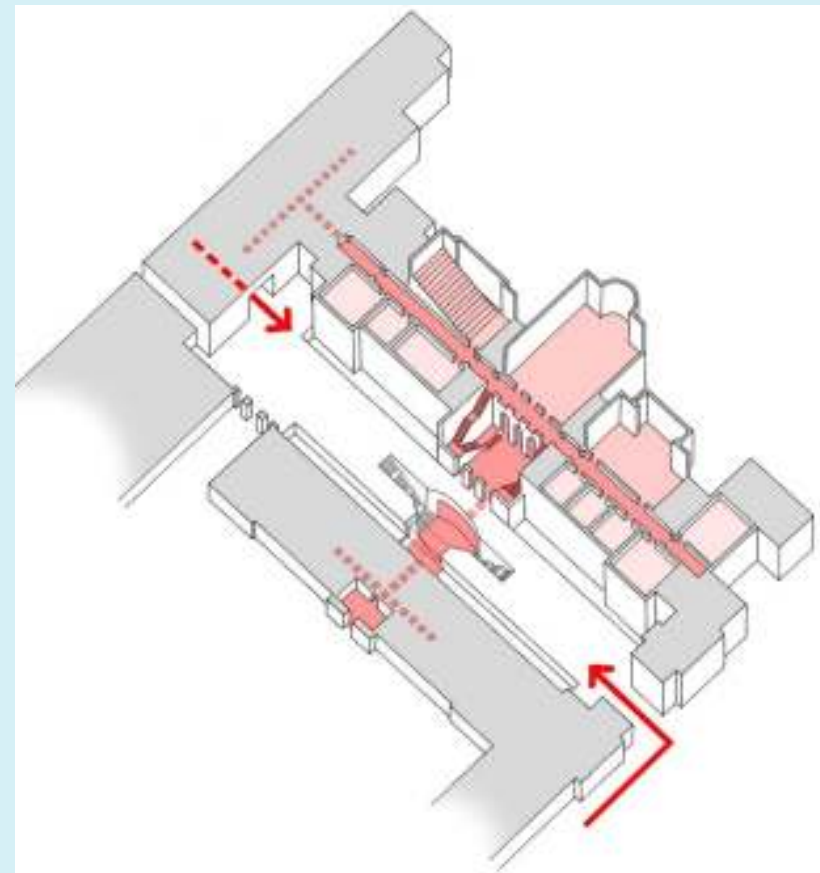


# Phase 1: The King's Building

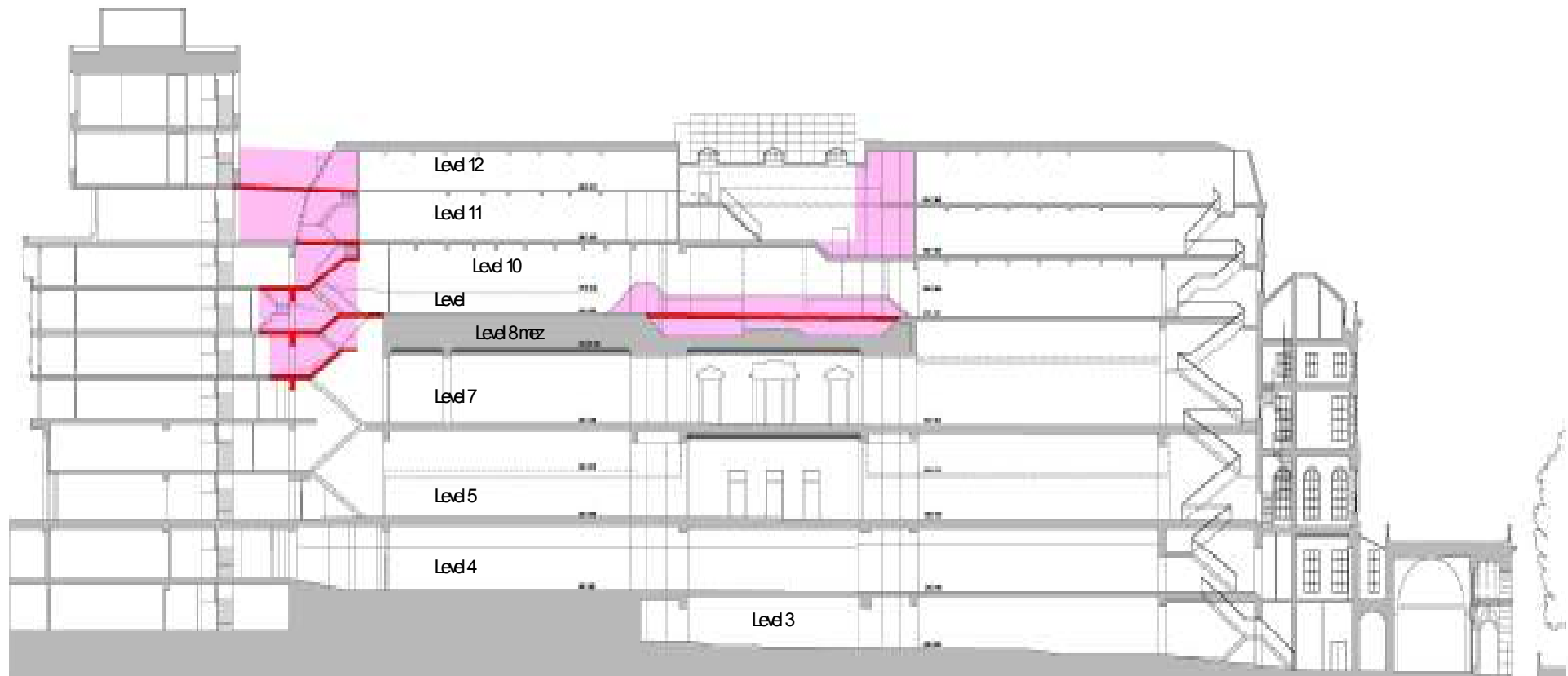
- Reordering and transforming space:
  - Clarifying orientation and circulation
  - Defining appropriate uses
  - Developing sustainable solutions
  - Strategic development framework .....
- .....South Range  
Project implemented



# Reordering and transforming



# Orientation and circulation



# Orientation and circulation

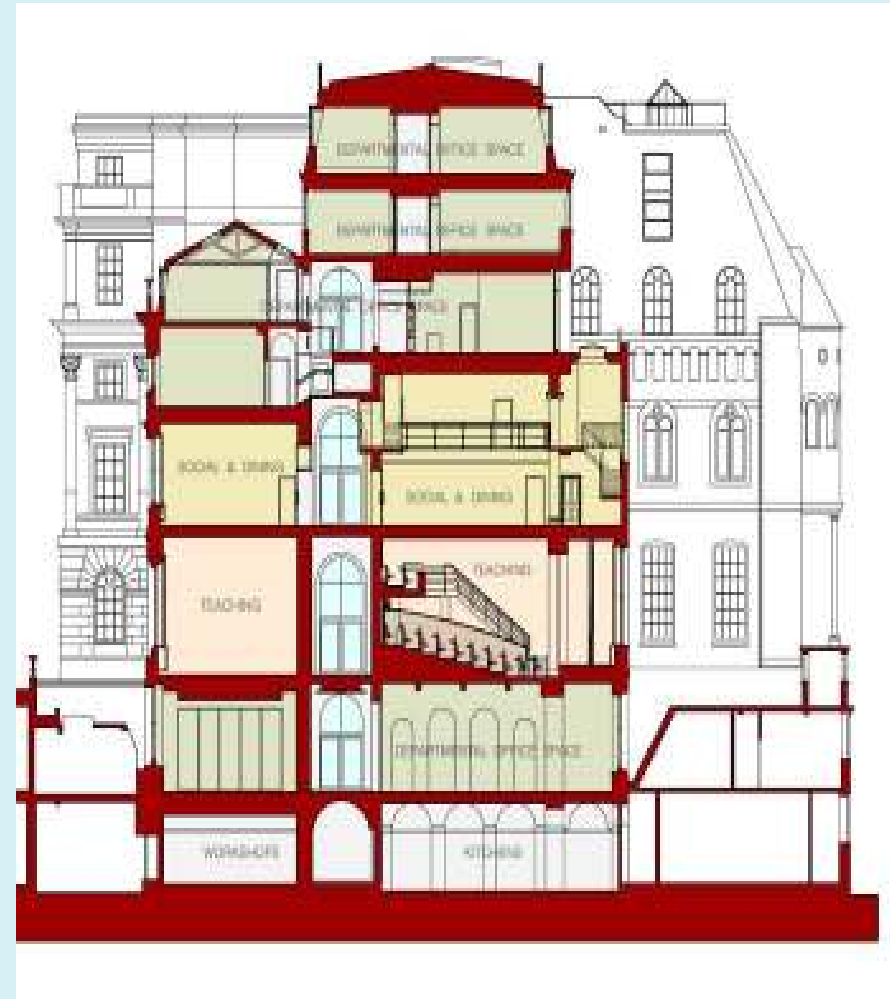


# Orientation and circulation



# Appropriate Use

- Levels 0 and 1:  
lecture and seminar spaces
- Levels 2 and 3:  
social and recreational spaces
- Levels 4 to 7:  
departmental office facilities

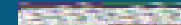
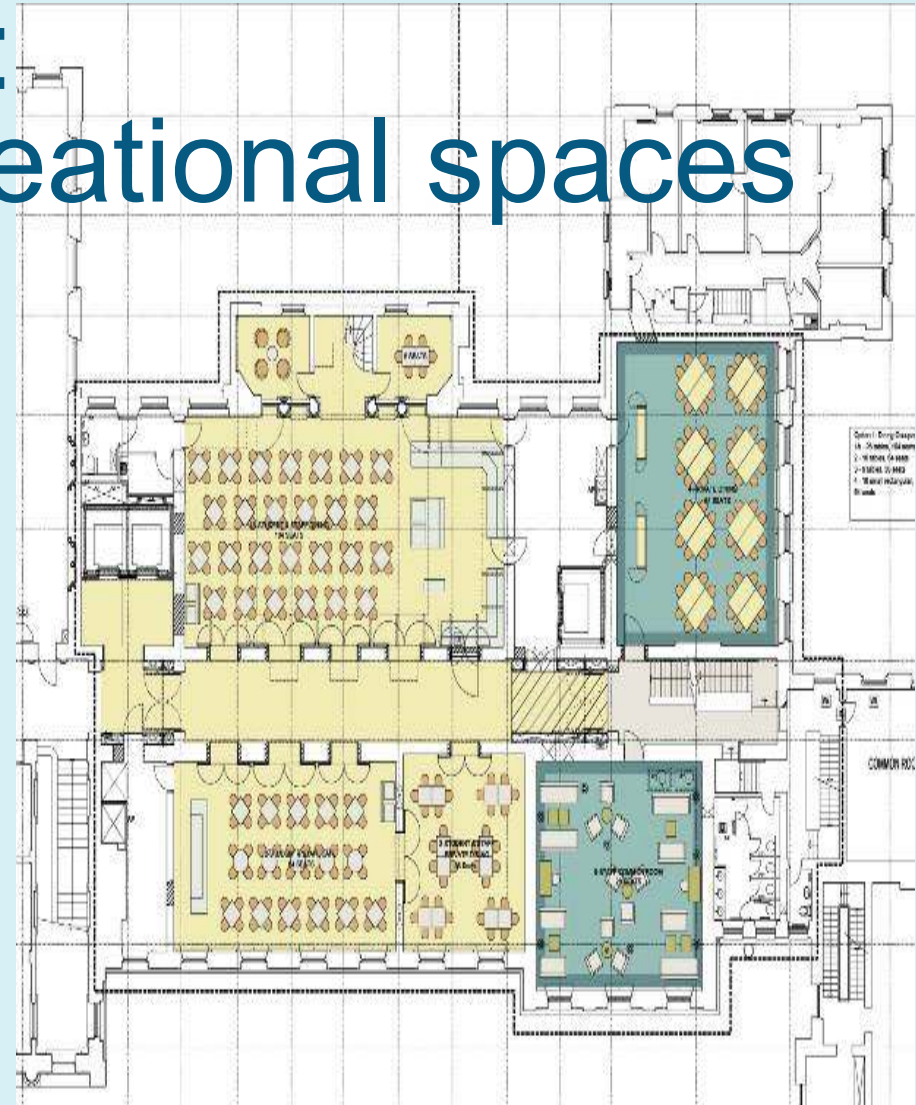


# Levels 0 and 1: lecture and seminar spaces





# Levels 2 and 3: social and recreational spaces



# Levels 2 and 3: social and recreational spaces



# Levels 4 to 7: departmental office space



# Sustainable solutions

Energy conservation ....

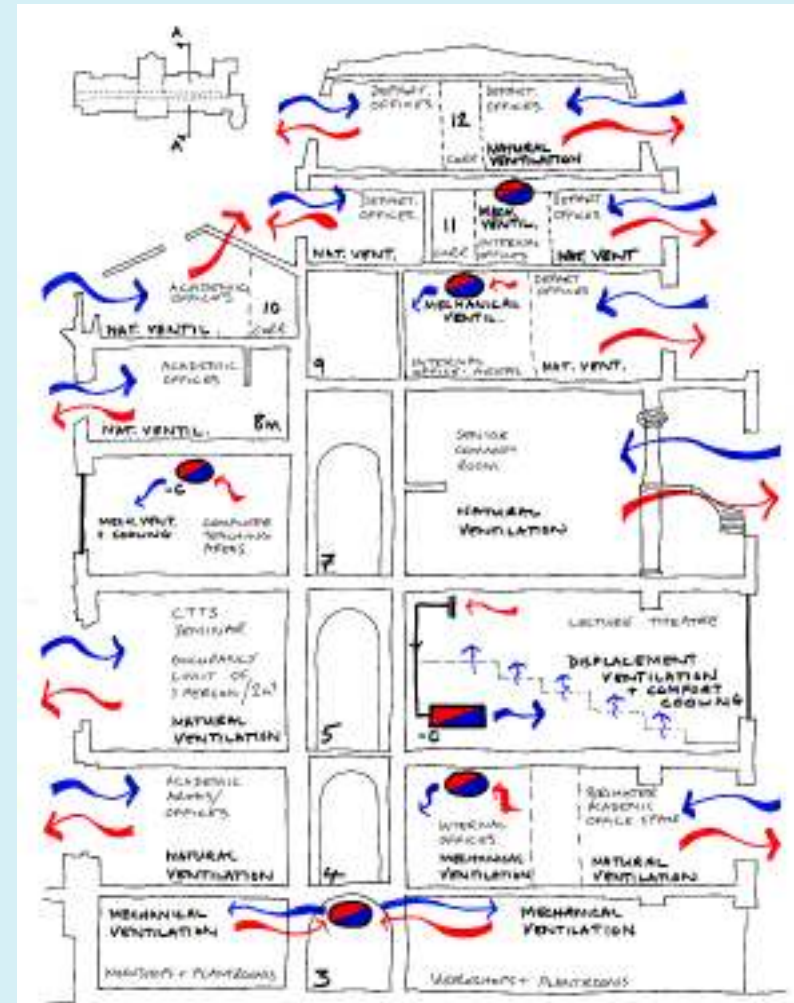
..... simple, passive technologies

- Natural light
- Natural ventilation
- Thermal mass

..... limiting mechanical services

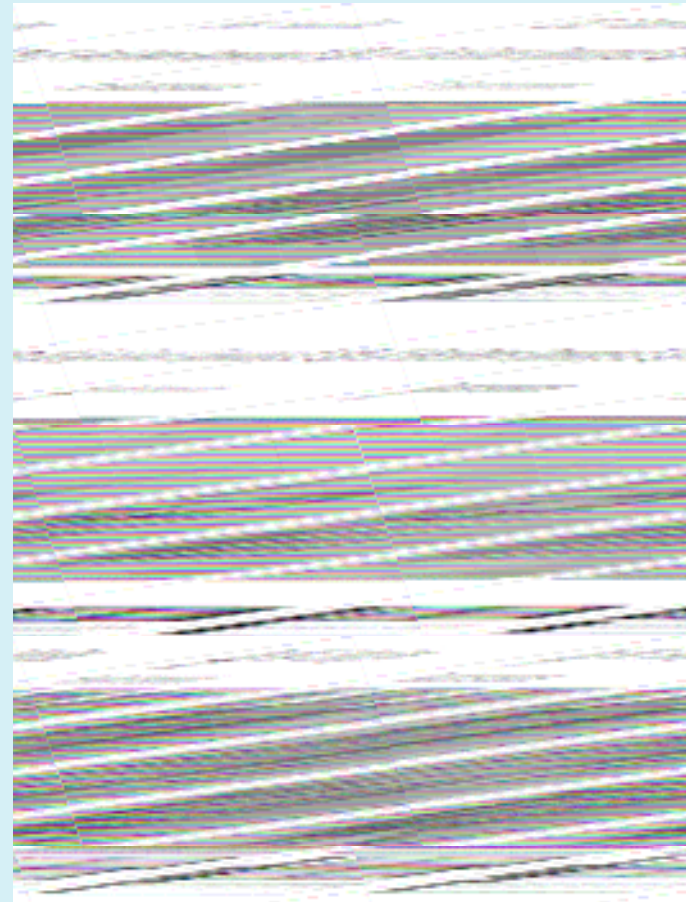
Building conservation

- Limiting risers and distribution
- Integrating building services



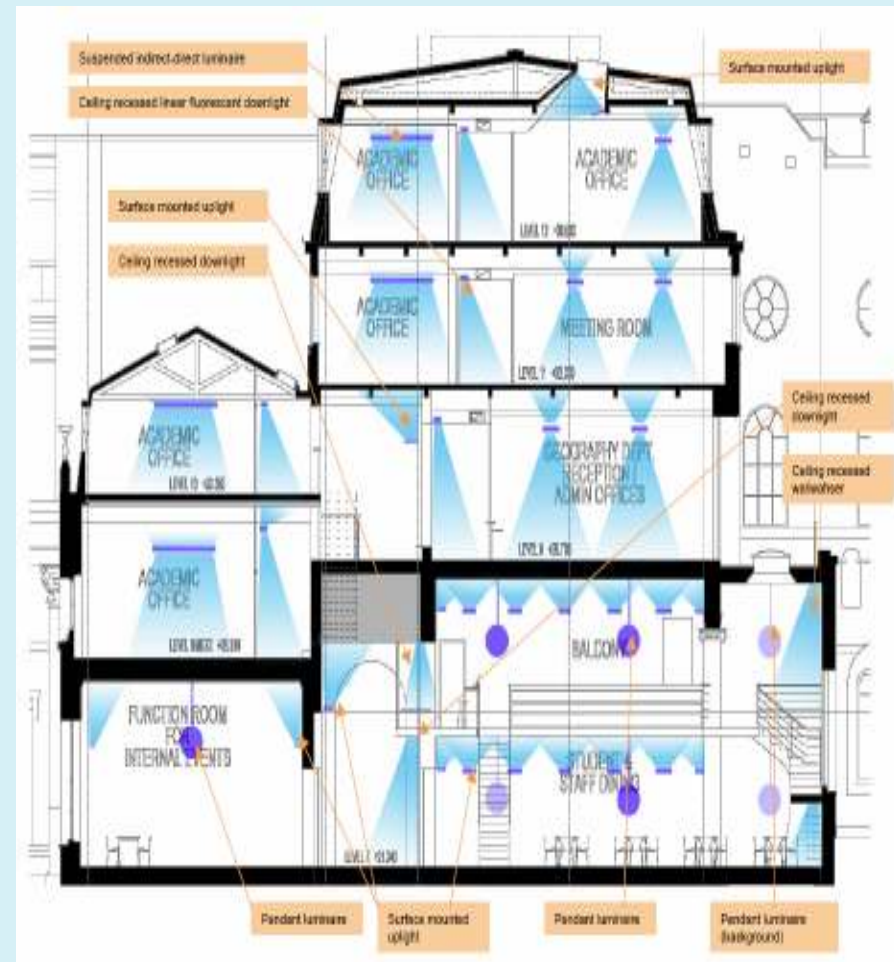
# Sustainable solutions

- Natural light and natural ventilation
- Solar shading, glare and blackout
- Limiting mechanical ventilation and cooling:  
thermal mass and mixed modes



# Sustainable solutions

- Maximising natural daylight
- Using task and background lighting
- Low energy fittings



# Sustainable solutions

- Minimising risers, integrating services
- Installation
- Maintenance
- Future adaptation
  - Saving 389 tonnes CO<sub>2</sub>/annum



# Phase 2: The Strand Building

- Iconic, 1970s Brutalist concrete building
- Strategic development framework
- Academic “hotel” to upper levels
- Solar shading, thermal mass and limited cooling





# New Buildings/Projects: Denmark Hill

- Design to minimise Energy Impact
- Whole Life Costings
- Ground Water - Sourced Heating and Cooling
- CHP



# Waste Reduction and Recycling

- Targets set for recycling
- Achievements
  - Construction: Strand Ph 1: 80%
  - Construction: Strand Ph 2: 35%
  - College Operations: Dry Waste 60-70%



# Improving College Environment: College Landscape

- Maughan Library  
Garden
- Guy's Memorial Park
- Future improvements  
planned at St  
Thomas', Strand and  
Denmark Hill



# Improving College Environment: Public Realm





# Connectivity between campuses



# Raising Awareness

- Energy Awareness Campaign
- Use of College media
- Student “Switch-Off” Campaign
- Art Competition

- **King's switches on to green electricity**
- *7 September 2005*

King's has become one of the first universities in the country to have 100 per cent of its contractual electricity supply sourced from environmentally friendly large-scale hydro generation.

A new, two-year contract with Scottish and Southern Energy means that the College will no longer consume fossil fuel but will use 'green' electricity across all its campuses.

It is estimated that this will save the emission of 37,700 tonnes of carbon dioxide into the atmosphere (equivalent to 215 return trips to the moon in a family car, or 4,100 journeys around the world).



# Issues for the Future

- Increasing Government Targets
- The Existing Estate
- Space leased from Third Parties
- Existing PPP buildings

