D4FC Factsheet 45:
The Co-operative Head Office

Contact details

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General project information

Name of project:	The Co-operative Head Office
Location of project:	Manchester
Type of project:	New build headquarter
Cost of project:	£100m

Project team

Client:	The Co-operative
Designer:	3DReid/Buro Happold
Contractor:	BAM

Project description

The Co-operative launched an international design competition for their head office in 2008. The design brief called for a 30 000m^2 office of high quality specification in Manchester City Centre, with a minimum of 5000 m^2 expansion space and a minimum of 2000m^2 floor plates. The new Head Office aspires to achieve the highest energy standard that is economically viable. The environmental targets such as BREEAM Outstanding, EPC A, DEC A as well as stringent energy benchmarks have been achieved during the detailed design stage, and the targets are also on track currently at the construction stage.

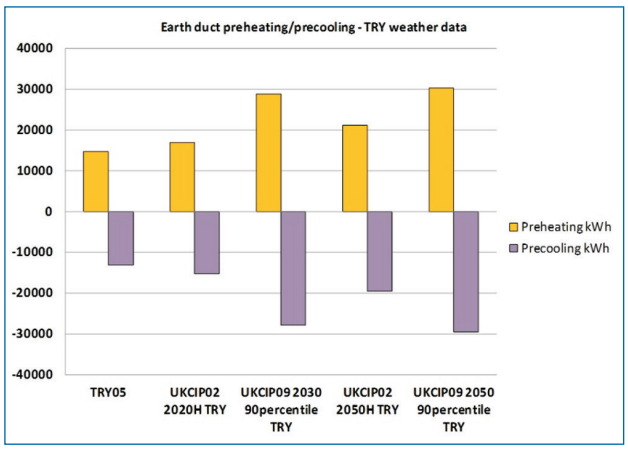
Comprehensive analysis has been undertaken at the design stage. This included checking the design against the future climate data using UKCIP02 morphed weather tape. This Climate Change Adaptation study has focused on assessing the impact of climate change on passive design measures and how management regimes can help adapt the building and its occupants further. Results have been provided with comparisons between the use of UKCIP02 and UKCP09.

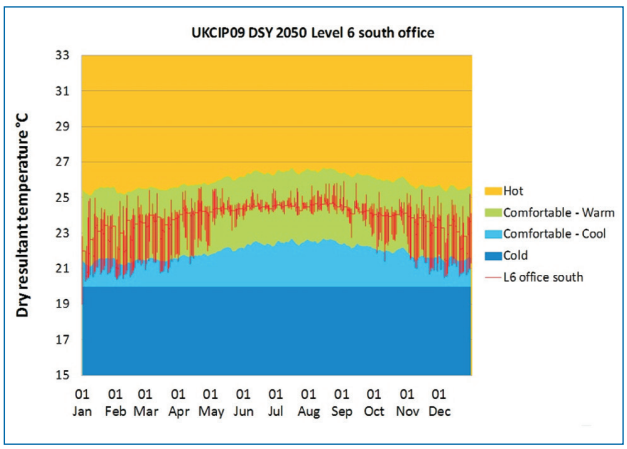
Project timescales and dates

Design and assessment period (pre-planning): 2008 to 2009

Construction period (post-consent): completed in 2012

Operation and monitoring period: started in 2012





Further project details

1 What approach did you take in assessing risks and identifying adaptation measures to mitigate the risks?

Approach taken by the study was to follow these steps of evaluation and consultation:

- scoping study to identify potential exposure to climate change
- assessment of current passive design against projected climate change scenarios
- assessment of adaptation measures
- cost-benefit analysis.

Based on the initial analysis, the following scenarios have been rated as 'high' risk exposure for the head office:

- hotter summer/heat wave
- wetter winter/increased downfall in winter.

Overheating due to rising summer temperatures:

The building has incorporated earth tubes and a double skin façade. These passive design measures have been analysed in detail.

- the study has demonstrated that earth tube is an effective and robust adaptation design measure. It is effective now and its performance will improve further due to the rise of ground temperature always at a much slower rate than ambient temperatures in future climate
- the double skin façade is effective in reducing cooling energy due to its ability of removing hot air in the cavity after it absorbs solar gains.

Stormwater management due to increased downfall:

- the building has been designed with 55 m^3 surface water attenuation tank based on 1 in 100 year event with a 30 per cent allowance for climate change
- additional tests on 1 in 200, 300, 500 and 1000 years return periods have demonstrated that no further increase in surface water attenuation is required for the building.

2 How have you communicated the risks and recommendations with your client? What methods worked well?

- based upon assessing UKCIP02 climate change scenarios, potential risk exposure from the scoping study was further analysed. Results show that the most effective adaptation measure is management, operation and occupant behavioural change to adapt to rising temperatures. Potential barriers to these measures have been explained, discussed with the project team and the client. These barriers require not only organisational changes but also institutional changes. For instance, BCO's design guide has not formally adopted adaptive thermal comfort.

3 What tools have you used to assess overheating and flood risks?

- UK Adaptation Wizard
- IES to assess overheating risk of the building including specialist tool to assess earth duct performance
- CFD was used to detailed analyse double skin façade for design development
- CIBSE adaptive thermal comfort
- MicroDrainage to assess flooding risk.

4 What has the client agreed to implement as a result of your adaptation work?

- the Co-operative has implemented flexible working hours policy for their staff. The findings of this study will help the Co-operative to further extend and promote this policy, and develop an effective and dedicated flexible working policy to deal with heat wave and rising temperatures. State-of-the-art smart grid has been installed in the head office to facilitate the implementation of the flexible operation of the building
- the Co-operative is keen to explore the feasibility of the adoption of adaptive thermal comfort with institutions such as BCO
- the Co-operative is also keen to research into the impact of adaptive thermal comfort on productivity and heath wellbeing within the workplace.

5 What were the major challenges so far in doing this adaptation work?

- UKCP09 provides the probabilistic approach for climate projections. Lack of guidance on how to choose climate projections in the construction industry
- climate change for buildings has not been put on high agenda for many organisations. Lack of awareness in the industry
- lack of guidance on thermal comfort criteria for future climate, from CIBSE and institutions such as BCO.

6 What advice would you give others undertaking adaptation strategies?

- a passive approach works well in the current climate and it can work even more beneficially in reducing overheating risk due to future rising temperatures
- management and operation measures to encourage flexible working with flexible desks are effective in adapting to rising temperatures
- smart grid and intelligent system installed in the office building can facilitate the implementation of flexible operation of the building
- engagement with BCO and institutions to promote the adoption of adaptive thermal comfort standard for office buildings.