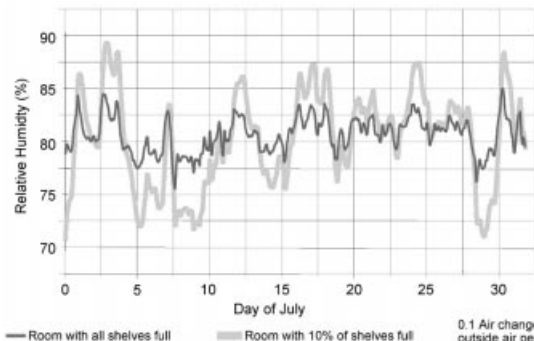


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24 Diagrammatic section through repository. Second floor shows actuator driven wall vents, perimeter heating pipe and over-door air curtain (to reduce filtration)

25 Influence of paper type archive material on room relative humidity. On a daily time-scale, the large surface area of this material provided the bulk of the moisture stability effect



25

infiltration up into the BS5454 moisture range. This is supplemented by the moisture held in the archive material itself.

Effect of outside air infiltration

Having established the need for a certain amount of moisture absorbing material, the next most important factor is the rate of outside air infiltration. The normal infiltration rates to be expected in U.K. buildings would quickly overwhelm the speed with which the building could absorb or emit moisture [Fig. 23]. Likewise the outside air change rates to be expected from conventional mechanical ventilation systems would also greatly reduce its effectiveness. After consideration of the degree of airtightness likely to be practical in the repository, an average outside infiltration rate of 0.05 air changes per hour (approximately one air change per day) was selected as an optimum.

This is comparable to the Swedish building regulations airtightness standard for buildings of all types. It involves particular care during construction but maximizes the benefit to be gained from the building fabric moisture-absorbing ability.

Ventilation

The moisture and thermal flywheel effect of the building fabric can be used in association with controlled natural ventilation. When the outdoor absolute moisture content is less than inside, introducing ventilation can remove room excess moisture. Likewise the converse can also be used. Similarly, the temperature differences between inside and out can be useful, although for this application the moisture needs have priority. What this selective ventilation means is that the repository can be kept closer to the BS5454 limits than the