UNIVERSITY OF Southampton

# ESTATES & FACILITIES

Document Title

**Entrance Design Guide**

Document Number

**ES/023/0**

**University of Southampton, Estates and Facilities**

**Entrance Design Guide, Document ES/023**

**Revision Index**

| Revision | Date of Revision | Revised By | Revision made |
|---|---|---|---|
| 0 | 20/02/14 | Peter Barnett, Studio 4 Architects | First Issue |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

This document was originally created by Studio Four Architects Ltd. for the University Of Southampton, Estates & Facilities Department, March 2013.

Appendix B - Contributions from Christian Baker-Smith (Dorma)

Appendix C - Christian Baker-Smith (Dorma)

Appendix D – Mark Turner.

Appendix E – Mick Garner.

# Contents

# 1 Introduction

The entrance to a building has to provide many functions, and do them well. This guide is for creating new entrances and re-visiting existing ones. It is offering guidance to the designer, an aide-memoir to ensure all the requirements are covered, and a specification for certain items where the University has a preference for particular products.

## 1.1 What do we need to achieve?

The Entrance has to perform a number of functions, and as is normally the case, they can be contradictory to each other. So this guidance doesn't give a set answer, but aims to provide the designer with the advice needed to prioritise the requirements of each entrance and create the best compromise.

- Access for all. The entrance must allow easy access for all under the Equality Act (2010.)
- Energy Conservation and compliance with the objectives of the University's Carbon Management Plan. To keep the heat within the building as much as possible.
- Personal Comfort. Where people are in the entrance area, possibly working (receptionists &c.), they need to be in a comfortable environment.
- A showcase for the rest of the building. As the first point of entry, it needs to set the right atmosphere and quality for the building purpose.
- Display and contain the functional and regulatory requirements of the building. Items such as the Fire Panel need to be visible and accessible in an emergency.

## 1.2 What are the problems?

These are some of the main problems perceived that need to be addressed.

- Wind entering a building with the ability to move through it.
  - Cold unwanted[1] wind.
  - Access for the wind to get in.
  - Route through the building.
  - Egress, for the wind to get out or access to a large volume.
  - Personal comfort effect by cold air flow.
- Providing access for people with restricted mobility and large and small numbers of people.
  - Manual or automatic doors.
  - Sets of doors and lobbies.

[1] Unwanted wind. Cold wind when the weather's cold. Desired Wind. Cool wind when the weather's hot.

- Corridor separation.
- The aesthetics and functionality of the entrance.
  - Position of the reception for visibility v's the wind direction.
  - Location of the functional equipment for immediate access and maintaining a pleasing arrival.

## 1.3 Working with the Brief.

The brief will assist in prioritising certain aspects of the work, and will vary depending upon whether this is an existing entrance or new.

Where we are dealing with an existing situation, then there will almost definitely be user feedback. It is important to gather this feedback and analyse it. E.g.

- Specifically feeling the draught.
Probably in direct route of a draught and near the point of entry.

- Generally cold feeling.

Could be due to draught spreading through building or heating system problem. The latter maybe affected by the former creating conditions beyond the capabilities of the heating system problem. (This could also be unconnected to a draught problem.)

## 1.4 Relationships.

Whether a new build or an alteration, the relationship with the surroundings needs to be drawn up to help establish problems and solutions. Key points to consider are:

- External routes to the building from other locations and car parks.
- External routes for wheelchairs.
- Internal routes through to other exits.
- Internal routes to stairs and lifts.
- Location of a reception counter.
- Establish areas of non-balanced extract systems. E.g. toilets and kitchens.

# 2 The Guide

Each subject is split into a description with examples of things to consider, and followed with the list of guides and rules to follow. As each of these is evaluated, it is followed through into Project Review: Evaluation.

Each section is given suggested entries for the evaluation, but each project will have its own variations from this. A rough evaluation guide is included as explained below.

Applicable ....... What type of projects is this applicable to?
Possible ........... Are there situations where this item is not possible?
Effective .......... On a 1–5 scale, how effective is this at saving energy? There are other criteria the item is responding too, not covered in this headline.
Cost ................. On a scale of 1-5 '£'s, how much could this cost?

All of the comments are subjective and probably not applicable to all situations. These are not to distract from your professional judgement or the specific project requirements.

## 2.1 Entrance Location

For planning new build or where there is potential to re-plan the entrance location.

- Regional geography.
  - Prevailing winds.
  - Local landscape effecting wind direction.

- Macro geography Landscape.
  - Surrounding Buildings.
  - Building layout can channel wind.
  - Tall buildings. The majority of wind hitting a tall building is deflected downwards and around, causing higher wind speeds around the base of buildings.

| 2.1.1 | Not located in a 'tunnel effect' of buildings. |
|---|---|

Applicable ....... New build or major redesign.
Possible ........... New build or major redesign.
Effective .......... 3
Cost ................. £----

Plan the entrance location out of the route of tunnelled wind.
Wind loading can also affect the action of automatic and manual doors.

| 2.1.2 | Position entrance away from direct regional or local prevailing winds. |
|---|---|

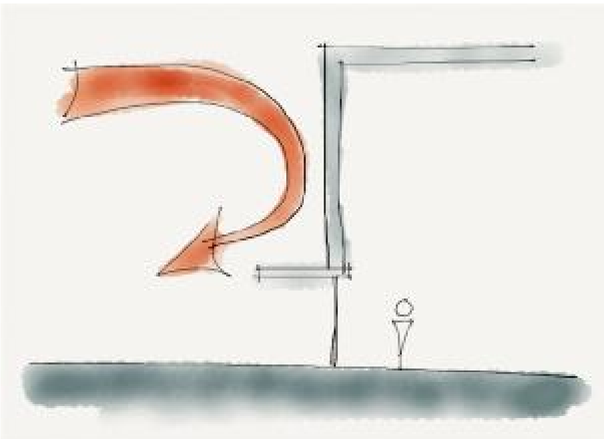
Applicable ....... New build or new lobbies.
Possible ........... New build or new lobbies.
Effective .......... 3
Cost ................. £----

Plan the entrance location out of the direct path of the prevailing winds or deflected winds. Wind loading can also affect the action of automatic and manual doors.

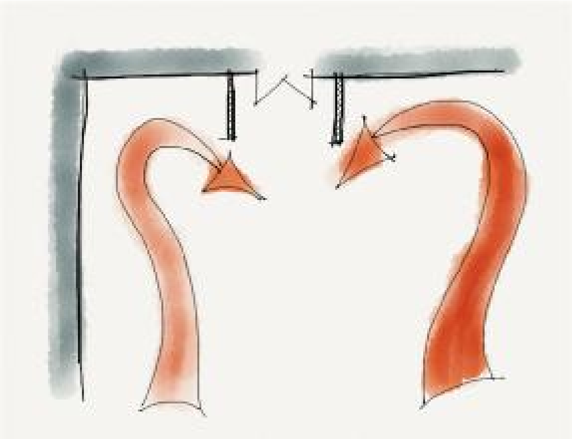
| 2.1.3 | Protect entrance/ lobby. |
|---|---|

Applicable ....... New build or new lobbies.
Possible ........... New build or new lobbies.
Effective .......... 4
Cost ................. £££--

Create a lobby out from face the of the building or use canopy/ side panels to protect from wind deflected down and around the building face.



Projecting lobby and canopy roof helps protect the entrance from the high winds deflected down and back from the tall face of the building.  Standing near the entrance, you can feel the wind blowing from the building face.



The internal corner does affect the wind direction less predictably, and it may have been a suitable example to test a model in a wind tunnel as the wind does blow through the staggered doorway straight at the reception counter. There are other items affecting this as well though.

A simpler form of protection on a straight piece of façade.

## 2.2 Entrance Purpose

Each entrance has a purpose, giving access for particular people or use.

- Can the number of entrances be reduced / amalgamated?
- There are many entrances required such as emergency exits, disabled access, fireman access, maintenance, supplies etc. How does the entrance relate to its needs?
- Main entrance. Can the quantity of public entrances by reduced? Can the various arrival points be brought to a single entrance externally?
- Service and maintenance entrances. Can ancillary entrances be amalgamated? If not, can the ancillary areas of the building be separated from the other public areas?
- Can disabled entrances be amalgamated with the main entrance? Design of disabled entrances has to be carried out in conjunction with Building Regs Part M & BS 8300. These relate to accessing the building from parking spaces, the route to the entrance and any requirement ramped access.

### 2.2.1 Reduce the number of entrances.

Applicable ....... New build or where more than 1 entrance already exists.
Possible ........... New build or major redesign.
Effective .......... 4
Cost ................. £----

Can the purpose of other doors be amalgamated to a single entrance to reduce the number used for normal building access?

### 2.2.2 Seasonally lock doors.

Applicable ....... Where more than one entrance exists.
Possible ........... Building management and Fire strategy.
Effective .......... 4
Cost ................. £----

Some doors are not required for use all year around. Check for non-obvious door usage. Emergency exit, maintenance & disabled access may need to be maintained, but might be managed.

This row of doors opens onto a patio area. Excellent use and ventilation in the summer, but during the heating season it provides more exists than are necessary, with no controls to shut them after use. They are not on any main through routes. An ideal example of doors that could be kept locked seasonally.

## 2.3 Building Occupation

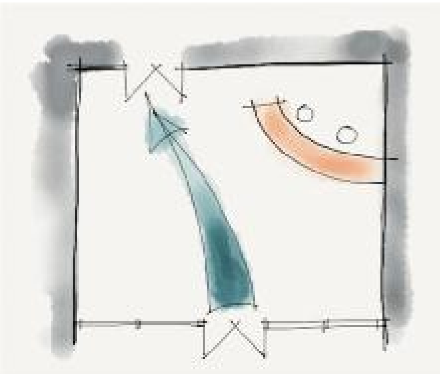
The function of the rooms and areas around the entrances can affect how people will respond to draughts. The most likely function around a main entrance is a reception. Passive and seated working activities are going to feel more discomfort from draughts.

- Can activities be separated or protected from the entrance?
- Can activities within the entrance area be protected from the direct line of the entrance doors?

### 2.3.1 Orientation & position of the reception desk.

Applicable ....... Entrance contains a reception.
Possible ........... Space to align as required.
Effective .......... 1
Cost ................. £----

The reception desk needs to be prominent and obvious for all visitors entering the building, and create a comfortable working area for the staff and visitors that have to work there. The most obvious location is directly in front of the entrance, but this is also the worst location for receiving any draughts that come through the door.



The potential route of any draught from the door through the room should be avoided for the placement of the desk.


This reception desk is in direct line of the entrance doors and suffers from strong winds blowing through. A curved glass screen has been added to reduce the direct affect.

### 2.3.2 Reception desk design.

Applicable....... Entrance contains a reception.
Possible........... Yes
Effective.......... 1
Cost................. ££---

The desk can be designed to reduce draughts reaching the receptionist. The reception desk also has to comply with Part M, BS 8300 and Part B.

- Front panels fully sealed down to the floor.
- High portions to protect the receptionists. Allow for lower access desk level, for accessibility.
- Desk to wrap around to walls.
- Reception can be a hatch to an adjacent room.
- Where the reception desk is located in an entrance that is also deemed a fire escape, there are limitations on the area, materials and equipment used there.

## 2.4 The Entrance

The entrance itself. There are many forms of doors, each having their own pros and cons. There is also the addition of a lobby. Each of these has to be evaluated depending on the frequency and quantity of people using the entrance, to enable the best selection. An incorrectly sized lobby will not protect the building from the wind blowing in.

The Appendices contain further design guidance and specifications for the different doors and lobbies.

Given a manual door, people will happily push it open when able, but given an automatic door they will get impatient if it doesn't respond quick enough. The impatience comes from giving people more automation, not the lack of it.

An entrance may contain a combination of doors either in serial (as with a lobby), or in parallel (as a by-pass door.) The combination needs to be assessed as individual doors and as the combination. The manual revolving and capsule doors aren't capable of allowing wheelchair access and so a by-pass door is required. The suitability of the chosen doors needs to be balanced with the requirement to provide a dual set, unless this entrance is not suitable for disabled access and that is provided elsewhere.

Closed doors also prevent the ingress of leaves, dust, debris, rain, snow and noise. The more a door is shut, the lower the maintenance and the better the comfort.

The door opening size is regulated by fire escape widths, accessibility widths and general quantity of people moving through. Especially when automating a door, consider how much needs to be opened in general use. A wheelchair can easily pass through a single door if designed wide enough. Consider asymmetrical paired doors where the main leaf is wide enough for a wheelchair, and both doors allow for full fire escape. Maybe only the main leaf needs to be opened in general use.

### 2.4.1 Swing doors.

Applicable....... All
Possible........... All
Effective.......... 1
Cost................. ££---

Standard swing doors.
These should be fitted with a closer. The strength of the closer mechanism must meet the requirements of BS8300. If too low powered, strong winds may be able to open the doors. However, if this is the designated disabled access, a manual door may not be acceptable for wheelchair use.
The door closer will normally have an inbuilt 'hold open' mechanism, which is useful in the summer, but can be left open in the winter months.
Manual doors may be deemed 'too restrictive' with large quantities of people.
Many entrance door systems have a manual hold open mechanism built in to the closer device. These are open to abuse in the winter months by being pulled open until they lock and then left. It should be seen as to whether this can be seasonally disabled, turn off completely, or a door stop placed to prevent the door opening fully. The latter

could be considered as a seasonal item as well. It also be considered as to whether this would cause an obstruction.

## 2.4.2 Low Power swing doors.

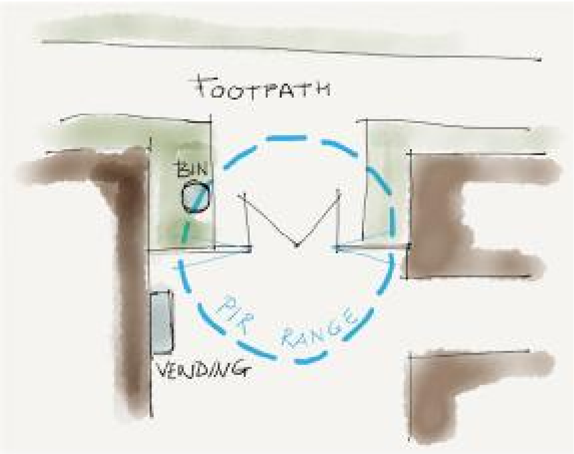
Applicable ....... All
Possible ........... Can be retro fitted to some doors.
Effective .......... 3
Cost ................. £££--

Standard swing doors with the addition of powered opening controlled by a push button and physically pushing.
This gives extra convenience to people with restricted mobility. The balance is locating the button so that it isn't used excessively by people that don't need it, and setting the opening time to a suitable duration. The door's safety mechanism works by hitting the obstruction/ person and stopping. While safe, this needs timing to allow people with restricted mobility time to proceed through.
These mechanisms have a switch which can be set to hold open or automatic, making them useful for the summer months.
See 5.Appendix B. Automatic Door Design.

## 2.4.3 Automatic PIR swing doors.

Applicable ....... All
Possible ........... Can be retro fitted to some doors.
Effective .......... 2
Cost ................. ££££-

Swing doors automated by proximity sensors.
These doors will open due to the proximity of people passing within the detection zone of the sensor.




To get the best efficiency out of automatic doors, the detection zone has to be limited to ensure that only people actually wanting to use the entrance. So the location of the doors has to be positioned so that pedestrian movements do not activate the doors when it is not the intension to use them. This diagram shows typical incorrect locations including nearby general circulation and corridors, (such as to toilets) and placing bins, vending machines or leaflet racks within the detection zone. But it also correctly shows the footpath for passers-by set away from the range of the PIR.

The timing of the doors is also crucial. Too long allows too much heat loss and too short can be disconcerting for users. However, the door will not shut on them, but may start to close before stopping. The timing on these can therefore be reduced to a shorter time, reducing the time they are open and not being used.
See 5.Appendix B. Automatic Door Design.

### 2.4.4 Automatic push button swing doors.

Applicable....... All
Possible........... Can be retro fitted to some doors.
Effective.......... 3
Cost................. ££££-

Swing doors automated by a push button.
These doors have push buttons located in suitable positions for wheelchair users. This can require the use of additional posts or rails to mount them on.
These doors have PIR sensors for safety and can follow the timing setting similar to the PIR activated doors, as they will not close on a person passing through.
The use of an ID swipe card or key fob to activate the button is not deemed ‘equal’ unless it is required for all users.
See 5.Appendix B. Automatic Door Design.

### 2.4.5 Automatic sliding doors.

Applicable....... All
Possible........... Requires wide frontage
Effective.......... 2
Cost................. ££££-

Sliding doors automated by proximity sensors.
These doors will open due to the proximity of people passing within the detection zone of the sensor. Due to the nature of the door mechanism, people expect them to be open when they reach them. This therefore requires a larger detection zone is can lead to greater false opening if incorrectly located or selected. The location of the doors has to be positioned so that pedestrian movements do not activate the doors when it is not the intension to use them. They need to be further away from possible false triggering than the auto swing doors.
The timing of the doors is also crucial. Too long allows too much heat loss and too short can be disconcerting for users. However, the door will not shut on them, but may start to close before stopping. The timing on these can therefore be reduced to a shorter time, reducing the time they are open and not being used.
The physical design of sliding doors also require a wider location to install them.
There are also additional safety requirements to prevent trapping by the sliding doors at the sides.
See 5.Appendix B. Automatic Door Design.

### 2.4.6 Revolving doors.

Applicable ....... All
Possible ........... Large space requirement
Effective .......... 4
Cost ................. ££---

The most effective style of door for preventing draughts. It moves pockets of air in and out of the building without allowing the air to blow through. At no time is there a direct route for the air, except through the brush seals.
This door is only suitable for unencumbered able bodied people, and a by-pass door is always required. The volume of people is also restricted, so the peak load has to be assessed as to the appropriateness of the door.
See 6.Appendix C. Revolving Door Design.

### 2.4.7 Powered revolving doors.

Applicable ....... Large volumes of people throughout the day.
Possible ........... Large space requirement.
Effective .......... 3
Cost ................. £££££

Powered revolving doors are much larger and can allow a greater volume of people through. They are also capable of allowing wheelchairs and pushchairs through. Although they move at a fixed speed, sensors prevent the doors from hitting people moving slower. These doors are more efficient with a generally high pedestrian movement throughout the day. At very high peaks of people, fire or hot days, the leaves of the door can be folded in to give an open access.
They also require a large amount of space.
See 6.Appendix C. Revolving Door Design.

### 2.4.8 Individual capsule doors.

Applicable ....... All
Possible ........... Special security requirement.
Effective .......... 5
Cost ................. £££££

A specialist security door to prevent tailgating in secure locations. It is activated by a security swipe card, so can only be used by registered persons. This door is only suitable for unencumbered ambulant people. Although it is powered, there is little room for more than the person and a small bag. As the revolving door, only a small amount of air is allowed move from outside in, and it is prevented from blowing through.
This door must be accompanied by a by-pass door and also manned to control non-registered visitors.

## 2.4.9 Add a lobby.

Applicable....... All
Possible........... New build or retrofit
Effective.......... 3
Cost................. ££££-

A lobby is a way of adding an extra set of doors between the outside and the inside. This can help in a number of ways.

- As long as the two sets of doors aren't open together, then there isn't a through draught.
- If the lobby projects out from the face of the building, it can reduce the wind directed towards the entrance from the surrounding building face.
- If the two sets of doors aren't in a straight line, it can reduce the speed of a draught blowing through or deflect its direction once inside the building.

To make this effective, it relies on the correct choice of doors and distance between them. As the volume of people increases, the chance of both doors open together increases. This has to be balanced with the frequency of such peaks. Short irregular peaks may not be a problem on a shorter lobby. With a generally higher throughput of people, further consideration needs to be taken into account regarding the suitability or size of the lobby.
BS8300 includes minimum lobby sizes. However these sizes are based on the suitable space required for wheelchairs to manoeuvre through them and not the distance required to keep an air lock due to the quantity of people.
See 4.Appendix A. Lobby Design

## 2.4.10 Door Heaters.

Applicable....... All
Possible........... New build or retrofit.
Effective.......... 1
Cost................. ££---

On their own, door heaters are not an efficient way to control the environment in an entrance lobby. The name 'air curtains', incorrectly implies that they form a barrier to the incoming air. They work by blowing warmed air down across the entrance, to warm the colder air coming into the building. The colder and harder the wind is blowing in, the hotter and harder the door heater needs to be, to be effective. On its own, this can lead to the door heater causing more discomfort to the people walking under it, and high energy wastage.
All of the other steps need to be investigated before the door heater should be considered, to reduce the air flow of the wind first. Then once that has been controlled, the expected environment of the entrance room needs to be evaluated. Is it still part of the entrance circulation and therefore there isn't the expectation for it to be as warm as the rest of the habitable rooms? Or is it a functional and occupied space?
See 7.Appendix D. Heaters

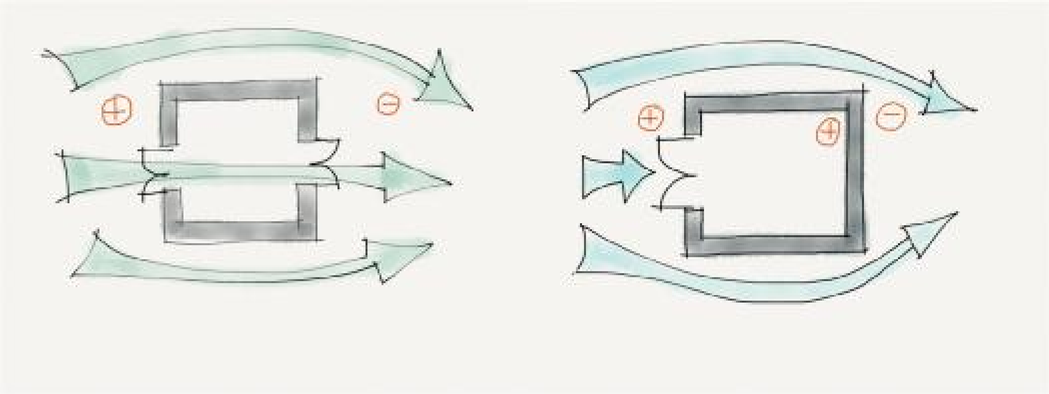
## 2.4.11 Flooring

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... NA
Cost ................. ££---

Dirt, debris and water are brought in by people coming in through the doors. Control of this dirt and water will keep the good appearance, reduce slips and reduce cleaning. This can be controlled progressively from the outside in.
Externally, shoe scrapers can be installed, but there are a lot of complications involved with creating a recessed area externally and surface mounted scrapers can be a trip hazard with raised edges.
Internally, the floor is split into zones and the aggressiveness of the material reduces progressively from the door. A suggested layout would be a recessed mat in a lobby/ at the doors. Depending on the make, there maybe 1 or 2 further carpet styles that are designed to wipe and hold, water and dirt from shoes.
The length of the entrance carpeting needs to take into account the final floor finish as well as the nature of the external environment and the quantity of people. Smooth hard surfaces may have a satisfactory slip resistance in the dry, but this may be less than satisfactory when wet. So the entrance carpeting needs to dry the foot traffic more.
BS8300 and Part M also require slip resistant surfaces, careful control of colour and no trip hazards.

## 2.5 Routes through the Buildings

Wind is air moving from an area of high pressure to low. For air to move through a building, this pressure difference must also exist. The air entering a building must be able to get through the building, in order for wind to blow through. Restricting the air movement through the building will not only reduce the amount of the building the cold air cools, but without the pressure difference, we can stop the wind moving through at all.



Reducing the number of entrances reduces the number of through routes the air has. This is covered in 2.2.1. This section will look at the design between the entrance and its way out.

On the whole, it is favourable to how as few doors as possible on the circulation. Fire compartmentation requires some, as does department separation. But these doors can also be held open to allow free movement.

Any vertical space can induce the stack effect, where the lighter warm air will rise to the top of the space, allowing the cooler air to occupy the space at the bottom. Where the vertical space is sealed, this creates a cyclic movement in the space until stratification occurs and the temperatures gradate through the space. As soon as the air has an exit at the top of the space, air will be trying to move into the bottom and if allowed to will then create a draught through the building back to the point of entry. Where the space is glazed and the sun can additionally heat it, the effect is increased.

The use of vertical spaces and the stack effect can also be used for natural cooling. If well controlled, the flow of air out of the vertical space and its route through the building can cool it. Ensuring that the controls seal the route during the heating season and the air intake doesn’t utilise the entrance doors for its supply are important. If the entrance is used during the summer as the intake, it can affect the performance of the doors.

### 2.5.1 Entrance foyer.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 2
Cost ................. ££---

The entrance foyer can be a multi-purpose space: Just circulation, with a reception, or as a function room. The more habitable its use, the more it needs protecting from the wind or separating completely. Consider all the doors leading off the foyer to be on closers and not held open. These may need to be considered for push button openers. Generally fire doors are also smoke doors and will be fitted with brush seals. Where they are not, they could be upgraded to smoke seals or draught seals added to the doors immediately off the foyer.

The foyer to the Nuffield theatre has automatic doors to both sides, with no obstruction to the air moving through one end of the foyer to the other.

## 2.5.2 Corridor doors.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 3
Cost ................. ££---

Efficient planning of the internal space can reduce the number of doors required. Aligning department separation with fire compartmentation is an obvious one. Reducing the number of doors required makes it feel less of an impedance if the doors are then left closed.
The corridor is the most likely route from one entrance to another, but you need to consider other rooms that have an external door.

## 2.5.3 Stairs.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 3
Cost ................. ££---

Staircases generally have a door or even two to them, as part of the fire compartmentation, but be aware of accommodation stairs within the foyer that open the exposure of the wind to further floors of the building.

### 2.5.4 Lifts.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 3
Cost ................. ££---

Lift doors are very hard to seal and as part of the fire strategy, they may be fitted with an open vent at the top for smoke release. As part of the building sealing, this should be considered for an automatic smoke release vent rather than a permanent vent.
A separation door should be considered between the foyer and the lift shaft, or to separate the lift lobby from the circulation on the other floors.

### 2.5.5 Service Shafts.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 3
Cost ................. £----

These should have a locked door, but the addition of draught seals should be considered, especially if they are located in the foyer area or if they go direct to a plant room which may be naturally vented.

### 2.5.6 Atrium.

Applicable ....... All
Possible ........... New build or retrofit.
Effective .......... 3
Cost ................. £----

Generally a large glazed volume, connecting many rooms and levels together. The connectivity of the space will open up the number of possible air routes. The additional heating from the sun will increase the stack effect, potentially reducing the pressure difference and therefore the increasing the air movement.

This example is more extreme and also ties in with unbalanced ventilation systems below.

The original builiding to the left lost an outside wall and its natural ventilation. It was reprovided by taking air from the atrium, but it is not obvious where the makeup air is coming from, other than through the entrance doors. This is creating a large volume of low pressure pulling air through the front entrance, even though efforts have been made to reduce the effect of the wind on the outside.

## 2.6 Air Leakage

As previously mentioned, the air needs to get through the building and out to the lower pressure in order to create an air flow and hence a draught. This section looks at leakage other than doors opening.

Some caution must be taken in sealing up an existing building without taking the ventilation strategy into account. The building may rely on natural ventilation through natural leakage and windows. Sealing an existing building may lead to a managed ventilation system being required, thus greatly affecting the overall cost. Improving the insulation and air tightness of an existing building will accentuate any cold bridges, air or water leaks, increasing the likelihood of damp and mould if the ventilation strategy has not been adjusted to the improved fabric.

### 2.6.1 Door Seals.

Applicable ....... All
Possible ........... Yes
Effective .......... 5
Cost ................. £----

Check, replace, improve seals to doors.

### 2.6.2 Window Seals.

Applicable ....... All
Possible ........... Yes
Effective .......... 5
Cost ................. £----

Check, replace, improve seals to opening windows.

### 2.6.3 Seasonally lock windows.

Applicable ....... All
Possible ........... Where lockable windows exist.
Effective .......... 5
Cost ................. £----

Where safety allows, lock windows during the heating season.

### 2.6.4 Gaps in building fabric.

Applicable ....... All
Possible ........... Yes
Effective .......... 5
Cost ................. ££---

Older building construction did not employ air tight techniques. There are many opportunities for improving air tightness in older buildings. New buildings should include this in their standard design, although best practice, (such as meeting Passivhaus standards), is still better than meeting the Building Regulations.
Many junctions between differing materials can be improved, though in existing buildings many maybe inaccessible without expensive work to open them up first.

### 2.6.5 Sealing building fabric surface.

Applicable ....... All
Possible ........... Porous surfaces
Effective .......... 3
Cost ................. ££---

Unplastered and unpainted masonry surfaces are porous. Sealing exposed masonry surfaces will reduce the air movement through the walls.

### 2.6.6 Sealing uncontrolled vents.

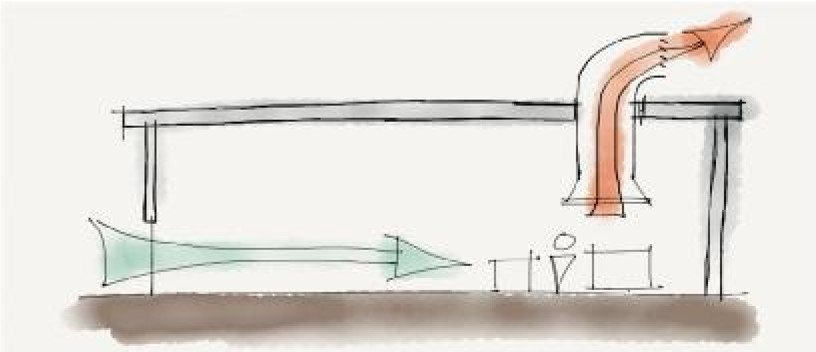
Applicable ....... Ventilated buildings.
Possible ........... When revising the ventilation strategy.
Effective .......... 4
Cost ................. £££--

Naturally ventilated buildings may contain uncontrolled vents. The building ventilation strategy needs to be reviewed before these can be decommissioned as they were originally designed into the building. It is possible that they have been superseded and forgotten as the building has been modernised. However, left open they are creating a constant opening for air movement.

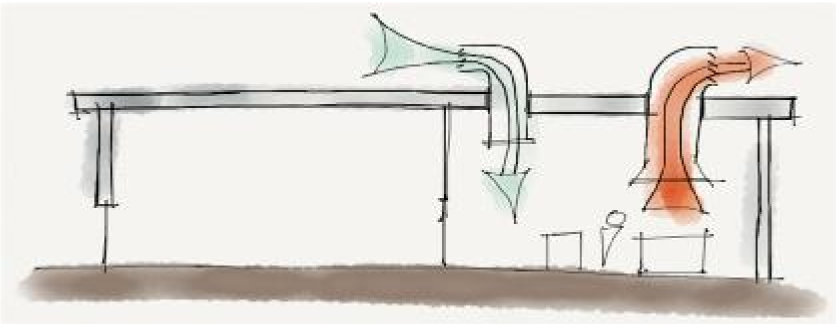
| 2.6.7 | Adjusting unbalanced ventilation systems. |
|---|---|

Applicable ....... Ventilated buildings.
Possible ........... When revising the ventilation strategy.
Effective .......... 3
Cost ................. £££--

Toilets, kitchens and laboratories (fume cupboards &c.) for example, all employ air extraction to remove unwanted smells, water vapour and gases. They need to create a negative pressure to ensure that the aforementioned are extracted and not allowed to spread around the rest of the building. Relatively speaking, the toilet extracts are small amounts, but commercial kitchens and fume cupboards can extract at high rates.



The replacement air has to come from somewhere. If it is not provided by the ventilation system, then it is made up from the air moving through the building. This gives a draught a potential route through the building.



Balancing the extract with a local managed air flow can reduce the flow of a draught, but the extract ventilation will still provide a route for the increased pressure of a gust of wind. A physical barrier such as a door is still beneficial between the entrance and the supply & extract system. Providing a local supply to kitchens will also help in naturally cooling them, as the air flow has not had chance to warm up in the rest of the building.

## 2.7 Legislative and University Requirements.

The entrance must comply with the following documents. This is not the conclusive list. Some speciality building types may also require further legislation.

The Equality Act.
BS8300:2009 *Design of buildings and their approaches to meet the needs of disabled people – Code of practice.*
Building Regulations Part B: *Fire safety. Volume 2. Buildings other than dwelling houses.*
Building Regulations Part K: *Protection from falling, collision and impact.*
Building Regulations Part L2A: *Conservation of fuel & power, in new buildings other than dwellings.*
Building Regulations Part L2B: *Conservation of fuel & power, in new buildings other than dwellings.*
Building Regulations Part M: *Access to and use of buildings.*
The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007.
University Carbon Management Plan.[2]

Consult the actual documents for the complete requirements.

The Equality Act and Access for All principles are not just aimed at the registered disabled, but must also take temporary disability and the use of pushchairs/ prams into account as well.

### 2.7.1 Wheelchair access from car park.

Applicable ....... All
Possible ........... Requirement
Effective .......... NA
Cost ................. ££---

A wheelchair suitable route must be provided from disabled designated car parking spaces and set-down area, to the entrance. The car parking spaces must be close to the entrance where possible.
Suitable access must also be provided around the building and to and from adjacent buildings.
See guidance on the detail design of the routes followed in BS 8300, Parts K & M.

[2] Available at www.southampton.ac.uk/susdev/documents/2011_carbon_management_plan.pdf. Latest University CMP Annual Review can be found at www.southampton.ac.uk/susdev/documents.

### 2.7.2 Ramped/ level access.

Applicable ....... All
Possible ........... Requirement
Effective .......... NA
Cost ................. ££---

The wheelchair access to the building must be ramped or level (shallower than 1:20.) See guidance on the detailed design of ramped access followed in BS 8300, Parts K & M.

### 2.7.3 Stepped access.

Applicable ....... All
Possible ........... Allowed with alternatives
Effective .......... NA
Cost ................. ££---

Stepped access is allowable where additional provisions are provided, but to allow ease of access for ambulant disabled and general health & safety, detailed design should be followed in BS 8300, Parts K & M.

### 2.7.4 Visual clarity

Applicable ....... All
Possible ........... Requirement
Effective .......... NA
Cost ................. ££---

The entrance location and the doors themselves must be visually clear to locate. Detailed design should be followed in BS 8300 & Part M.

### 2.7.5 Weather protection

Applicable ....... All
Possible ........... Requirement
Effective .......... NA
Cost ................. £££--

If the type of entrance doors could cause users to pause before entry, then the outside should be protected either by a canopy or by recessing the entrance.
Detailed design should be followed in BS 8300 & Part M.

### 2.7.6 Doors

Applicable ....... All
Possible ........... Requirement
Effective .......... NA
Cost ................. ££---

The door operation should be within the maximum force acceptable for disabled access, but it must also be strong enough to prevent the wind from opening it. If the wind pressure is deemed too great, then other measures should be investigated before allowing a manual door. An automatic or powered door is preferred.
The approach to automatic doors should be controlled for safety.
Vision panels are required.
Minimum effective widths apply to the door openings.
Detailed design should be followed in BS 8300, Parts K & M.

### 2.7.7 Reception desk design.

Applicable ....... Where a reception desk is required.
Possible ........... Requirement
Effective .......... N/A
Cost ................. ££---

The reception desk must conform to the requirements in BS8300 and Part M.

- Split levels.
- Audio loop system.
- Knee space to both sides.
- Waiting seating should be provided.

### 2.7.8 Colour contrast and obstruction free

Applicable ....... All
Possible ........... Requirement
Effective .......... N/A
Cost ................. £----

Colour contrasts between various surfaces must be created to assist the visually impaired.

- Floor to wall.
- Wall to door or door frame.
- Projections
- Potential obstructions
- Access controls

The use of large amounts of glass can cause confusing reflections, and full height glazing can suggest an opening. Manifestation or framing of glazing should be used.
Detailed design should be followed in BS 8300, Parts K & M.

## 2.7.9 Signage.

Applicable ....... All
Possible ........... Requirement
Effective .......... N/A
Cost ................. ££---

The quality of the signage is dependent on

- the location, accessibility, layout and height of signs;
- the size of lettering, symbols and their reading distances;
- the use of tactile letters and symbols;
- visual contrast and lighting;
- the finished surfaces of materials used for signs and symbols;
- the simultaneous use of audible and visible cues;
- integration with any other communication systems.

An orientation plan should be provided.
Directional signs should be provided.
Consistency of signage. The signage should be consistent throughout the University and should also include the international standard access symbols where applicable.
Detailed design should be followed in BS 8300, Part M.

## 2.7.10 Fire alarm system, panel and fire zone diagram location.

Applicable ....... All
Possible ........... Requirement
Effective .......... N/A
Cost ................. £££--

The entrance area must contain a fire panel or repeater panel. It must be instantly locatable and accessible by the fire service.
Call points must be installed as BS5839-1.
A visual and audible alarm should be installed.

Adjacent to the panel is a Fire Alarm Zone diagram. A3, mounted in an aluminium clip frame.
UoS to provide specification for the clip frame.

Example panel and zone map, behind a door with a glazed panel.

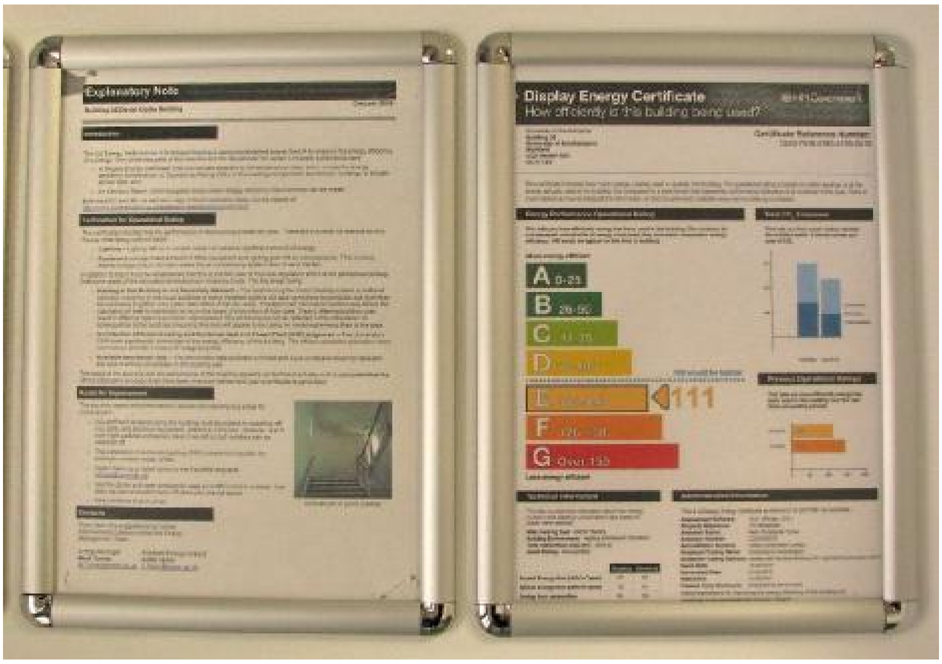
## 2.7.11 Display Energy Certificate.

Applicable ....... All
Possible ........... Requirement
Effective .......... N/A
Cost ................. £----

All public authority buildings over 500m² and are frequently visited by the public must have clearly visible to the public, a Display Energy Certificate (DEC), and have available a valid advisory report. The DEC and report should be produced by an accredited energy assessor, using an approved software tool. The registered list of accredited assessors is held at www.ndepcregister.com.
Where the total useful area is over 1000m², the certificate is valid for 12 months.
Where the total useful area is between 500m² to 1000m², the certificate is valid for 10 years.
The DEC should be no smaller than A3.

UoS will provide an A3 portrait explanatory note and (as applicable), the project will supply an A3 portrait DEC certificate. The project is to supply 2 Nº aluminium clip frames to mount the 2 notes together.

UoS to provide specification for frames.



### 2.7.12 Display Fire Assembly and Mandatory Signs

Applicable ....... All
Possible ........... Requirement
Effective .......... N/A
Cost ................. £----

As well as Exit and Fire Exit signage, as applicable, the entrance area must contain a Mandatory Fire Sign giving instructions on what to do in case of a fire, and any instructions on an Assembly point.

# 3 Project Review: Evaluation

| | Item | Applicable? | Possible? | Effective | Cost | Proposal |
|---|---|---|---|---|---|---|
| 2.1.1 | Not located in a 'tunnel effect' of buildings. | | | | | |
| 2.1.2 | Position entrance away from direct regional or local prevailing winds. | | | | | |
| 2.1.3 | Protect entrance/ lobby | | | | | |
| 2.2.1 | Reduce the number of entrances. | | | | | |
| 2.2.2 | Seasonally lock doors. | | | | | |
| 2.3.1 | Orientation & position of the reception desk. | | | | | |
| 2.3.2 | Reception desk design. | | | | | |
| 2.4.1 | Swing doors. | | | | | |
| 2.4.2 | Low Power swing doors | | | | | |
| 2.4.3 | Automatic PIR swing doors | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.4.4 | Automatic push button swing doors | | | | | |
| 2.4.5 | Automatic sliding doors | | | | | |
| 2.4.6 | Revolving doors | | | | | |
| 2.4.7 | Powered revolving doors | | | | | |
| 2.4.8 | Individual capsule doors. | | | | | |
| 2.4.9 | Add a lobby. | | | | | |
| 2.4.10 | Door Heaters. | | | | | |
| 2.4.11 | Flooring | | | | | |
| 2.5.1 | Entrance foyer | | | | | |
| 2.5.2 | Corridor doors | | | | | |
| 2.5.3 | Stairs | | | | | |
| 2.5.4 | Lifts | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| 2.5.5 | Service Shafts | | | | | |
| 2.5.6 | Atrium. | | | | | |
| 2.6.1 | Door Seals. | | | | | |
| 2.6.2 | Window Seals. | | | | | |
| 2.6.3 | Seasonally lock windows. | | | | | |
| 2.6.4 | Gaps in building fabric. | | | | | |
| 2.6.5 | Sealing building fabric surface. | | | | | |
| 2.6.6 | Sealing uncontrolled vents. | | | | | |
| 2.6.7 | Adjusting unbalanced ventilation systems. | | | | | |
| 2.7.1 | Wheelchair access from car park. | | | | | |
| 2.7.2 | Ramped/ level access. | | | | | |
| 2.7.3 | Stepped access. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| 2.7.4 | Visual clarity | | | | | |
| 2.7.5 | Weather protection | | | | | |
| 2.7.6 | Door | | | | | |
| 2.7.7 | Reception desk design. | | | | | |
| 2.7.8 | Colour contrast and obstruction free | | | | | |
| 2.7.9 | Signage. | | | | | |
| 2.7.10 | Fire alarm system, panel and fire zone diagram location. | | | | | |
| 2.7.11 | Display Energy Certificate. | | | | | |
| 2.7.12 | Display Fire Assembly and Mandatory Signs | | | | | |

# 4 Appendix A. Lobby Design

1. Position of the entrance lobby

Prevailing winds should be taken into consideration when planning the position of the entrance. Placing the entrance against the prevailing winds will considerably increase the wind speed through the lobby.

The entrance should not be located in a ‘tunnel effect’ caused by the surrounding buildings and landscape (refer to 2.1)

2. Protecting the entrance lobby

Consider projecting lobby and canopy roof to protect the entrance from winds deflected from the face of the building (refer to 2.1 & 2.2)

3. Access Requirements

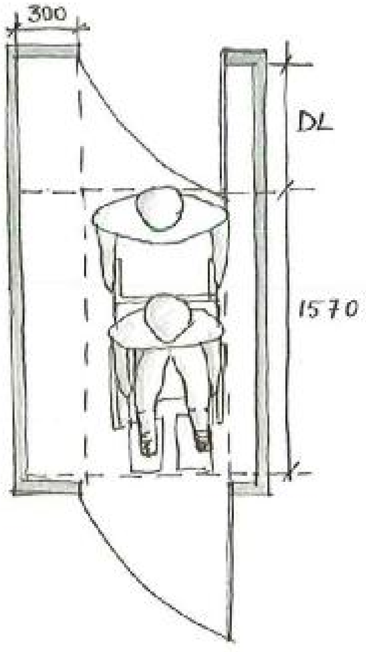
The lobby should be large enough and of a shape to allow a wheelchair user to move clear of one door before opening the second door. Space should also be provided for an assistant pushing a wheelchair (2.27, Building Regulations Part M).

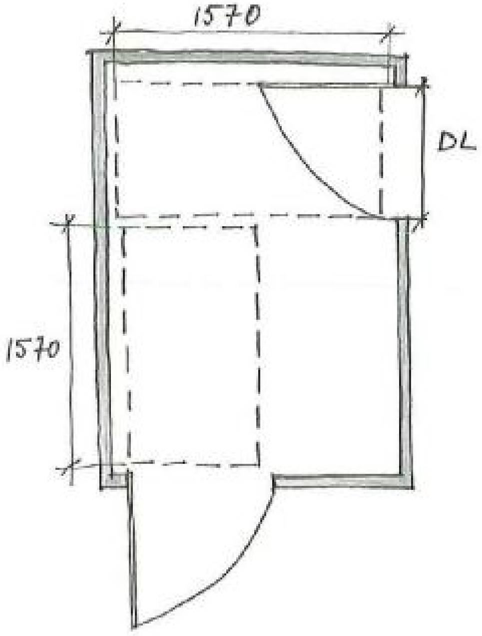
Note: The information below is provided in accordance with the requirements outlined in the British Standards and Building Regulations Part M, 2013 amendments. Please refer to the most current edition for any changes to the requirements

Minimum requirements for a single leaf door (single swing):

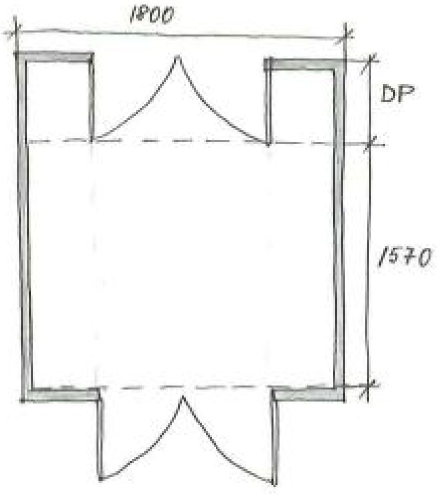
Min Length = DL + 1570mm

Min Width = DL + 300mm (Min wheelchair access space) or 1200mm, whichever is greater



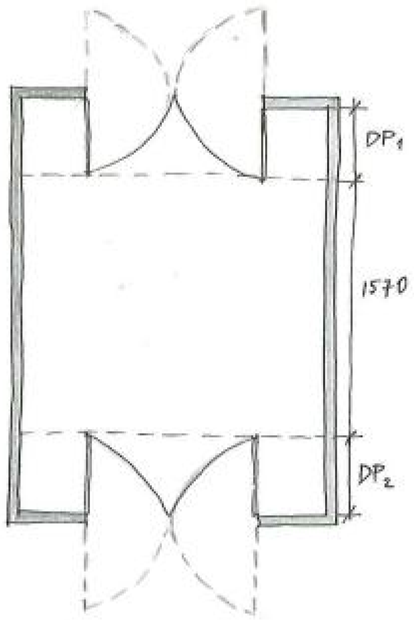
Minimum requirements for a double leaf door:




Single Swing Door

Min Length = DP + 1570mm

Min Width = 1800mm

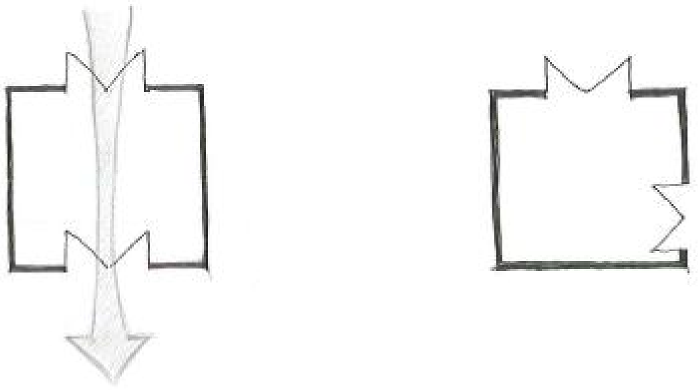



Double Swing Door

Min Length = DP1 + DP2 +1570mm

4. Direction of movement through the lobby. The direction of movement from the entrance through the lobby should be considered in relation to the prevailing winds. If the entrance is situated in the way of the prevailing or channelled winds, placing both doors opposite each other will provide a wind tunnel into the building (a).

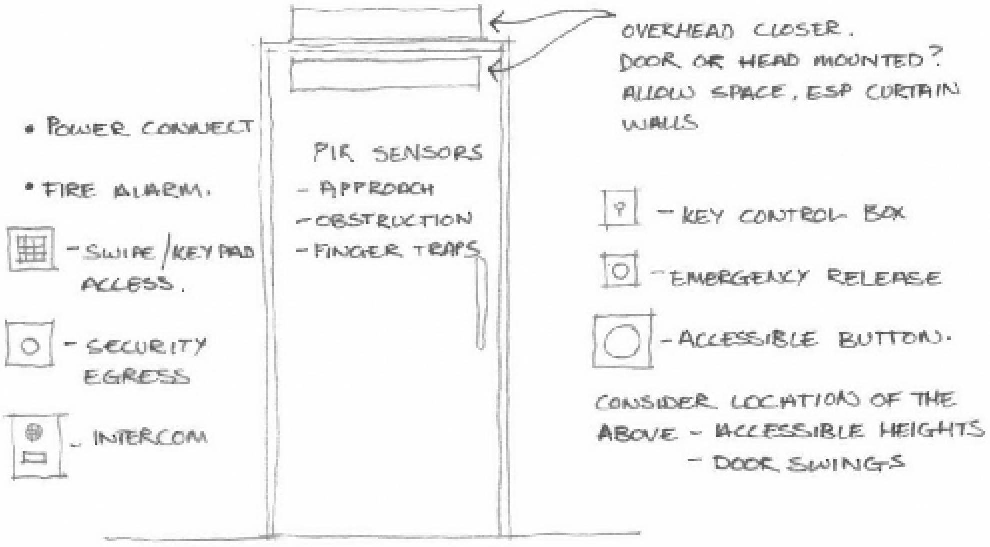
The optimal solution in such case would be to place the two doors or sets of doors in a straight angle in relation to each other (b).

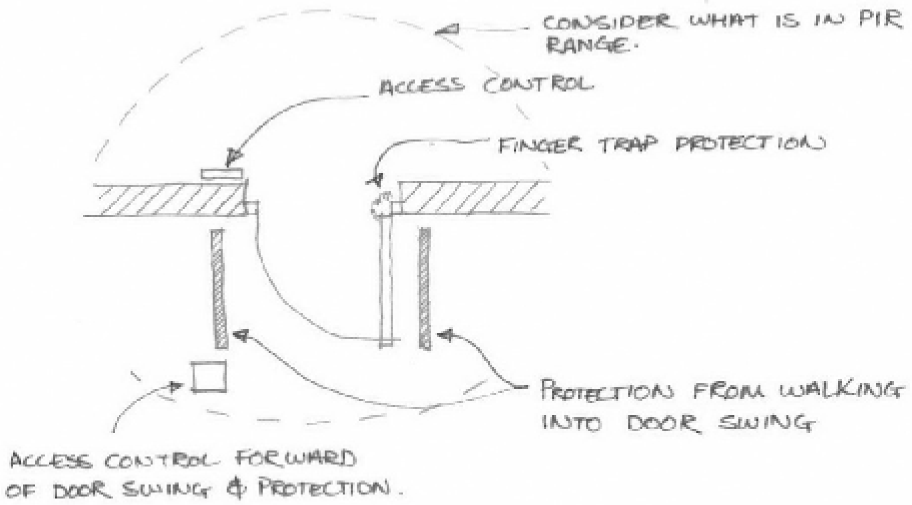


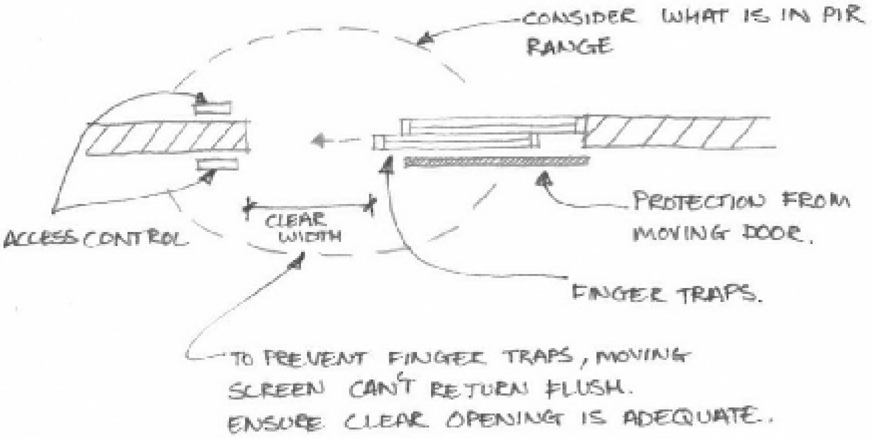
5. Lobby size in relation to the number of people passing through

The functionality of the lobby as a device to limit air infiltration and reduce the possibility of draughts decreases rapidly if a large number of people are passing through at any one time, as both doors are potentially kept open for a prolonged period of time allowing the wind straight into the building. Depending on the people flow, solution may be provided by increasing the distance between the two doors. In some cases, however, the required increase in the length of lobby may be considerable and a revolving door instead of the lobby may be more practical.

# 5 Appendix B. Automatic Door Design.



- Door Dimensions

  Width: Height:

- Is there a suitable fixing point above the door? (Over 80mm for swing, 150mm for slider)
- Is their a 240v 13 Amp spur situated to the top right of the operators fixing location?
- What are the weights of the doors in question?
- How many people are likely to use the doors each day?
- Is traffic going to peak and trough during the day?
- Is the door exposed to high wind load? If so what calculated wind speed?
- Access control.
  - Push button
  - PIR detection
  - Swipe/ keypad
  - Intercom
- Fire Alarm override – Safe or secure?

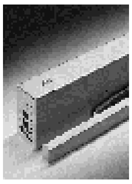
Swing Doors

- Is there a suitable fixing point for the push pads?
- Do the push pads require a post?
- Do the push pads require chasing in?
- Can people potentially walk into the door leaf when open? (Does the door open out onto a flow of traffic?) If Yes. It will require a barrier.

Sliders

- Is there a suitable fixing point for the sensor if it has to be situated off the operator?
- Are the rear leafs accessible?

  If yes: Do they require pocket screens?



**ED100 LE / ED250 LE**

| Required operating conditions | |
|---|---|
| Ambient temperature | –15 to +50 °C |
| Only suitable for dry environments | Relative humidity max. 93 % (non condensing) |
| Power supply | 230 V AC 50 Hz +/– 10 % |
| Class of protection | IP 20 |

| General specifications | |
|---|---|
| Dimensions (W x H x D) | 685 x 70 x 130 mm |
| Min. clearance between hinges (double-leaf systems) | 1,400 mm |
| Min. clearance between hinges for ESR (double-leaf systems) | 1,450 mm |
| Weight of single-leaf version | 12 kg |
| Power supply for external accessories | 24 V DC +/– 10 %, 1.5 A |
| Opening angle | Max. 110° |
| Manufactured to ISO 9001 | |

| Integrated functions | | |
|---|---|---|
| Hold-open time | | 30 s, 180 s (optional) |
| Blocking behaviour | | Reversing/Door closer function |
| Locking feedback contact | | Motor lock |
| Wind load control | | up to 150 N |
| Voltage-independent braking circuit | | Adjustable via potentiometer |
| Electronic latching action pulse | | Force adjustable |
| LED status indicator | green | – Operating voltage indicator |
| | red | – Malfunction indicator |
| | yellow | – Service interval indicator |
| Integrated program switch | | OFF<br>AUTOMATIC<br>PERMANENT OPEN<br>EXIT ONLY (only for single-leaf systems) |
| User interface with information display | | Status indicator and parameterisation |
| Slot for DORMA Upgrade Cards | | Extension of functional range |
| Update interface | | Firmware update |
| TMP – Temperature Management Program | | Temperature-related overload protection |
| IDC – Initial Drive Control | | Driving phase optimisation |
| Cycle counter | | 0 – 1,000,000 (reasonably subdivided) |
| Power Assist Funktion | | Servo-supported when opened manually |
| Push & Go Function | | Door opens when moved manually by 4° |

| Inputs, terminals max. 1.5 mm² | |
|---|---|
| Potential-free activator | Inside and outside (NO contact) |
| Energised activator | 8 – 24 V DC/AC + 10 % |
| Night-/Bank (key switch) | NO contact/NC contact |
| Safety sensor | Hinge side and opposite hinge side (NC contact) |
| Test signal for safety sensor | Hinge side and opposite hinge side |
| Emergency-Off pushbutton/ Lock switch | NC contact/NO contact |

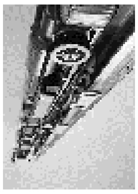
| Outputs, terminals max. 1.5 mm² | |
|---|---|
| Potential-free door status contact, alternatively | Door closed |
| | Door open |
| | Malfunction |

| ED 100 | |
|---|---|
| Max. power consumption | 120 Watts |
| Closing force EN 1154 | EN 2–4, adjustable |
| Max. door-leaf weight for lintel depths of up to 300 mm | 100 kg |
| Door-leaf width | 700–1,100 mm |
| Max. opening speed | **50° (27°*)/second |
| Max. closing speed | **50° (27°*)/second |
| Axle extension | 30/60 mm |
| Lintel depth for slide channel | +/– 30 mm |
| Lintel depth for standard arm | 0–300 mm |

| ED 250 | |
|---|---|
| Max. power consumption | 240 Watts |
| Closing force | EN 4–6, adjustable |
| Max. door-leaf weight for lintel depths of up to 300 mm | 250 kg to 1,400 mm Door-leaf width<br>190 kg for 1,600 mm Door-leaf width |
| Max. door-leaf weight for lintel depths from 301 mm to 500 mm | 160 kg |
| Door-leaf width | 700–1,600 mm |
| Door-leaf width for fire protection doors | 700 – 1,400 mm |
| Max. opening speed | 60° (27°*)/second |
| Max. closing speed | 60° (27°*)/second |
| Axle extension | 30/60/90 mm |
| Lintel depth for slide channel | +/– 30 mm |
| Lintel depth for standard arm | 0 – 500 mm |

* The values in brackets indicate the maximum speed in Low-Energy Mode without Full-Energy or Fire Protection Upgrade Card.

** Depending on the door leaf weight, it is limited automatically in accordance with DIN 18650, BS 7036-4 and ANSI 156.19.



**ES200**

| Door parameters | ES 200 |
|---|---|
| 1-panel sliding door<br>– Clear passage width LW<br>– Door panel weight, max. | <br>700 – 3000 mm<br>1 x 200 kg |
| 2-panel sliding door<br>– Clear passage width LW<br>– Door panel weight, max. | <br>800 – 3000 mm<br>2 x 160 kg |

| Technical data | |
|---|---|
| Height | 100 and 150 mm |
| Overall depth | 180 mm |
| Opening and closing force, max. 150 N | ● |
| Opening speed (incremental setting) | 10 – 70 cm/s |
| Closing speed (incremental setting) | 10 – 50 cm/s |
| Hold-open time | 0 – 180 sec. |
| Mains voltage, frequency | 230 V, 50/60 Hz |
| Power consumption | 250 W |
| Class of protection | IP 20 |
| Compliant with EU low-voltage directives | ● |
| Manufacture according to ISO 9001:2000 | ● |

| Basic module (BM) | |
|---|---|
| Modular design | ● |
| Microprocessor-controlled function programs<br>– Off<br>– Automatic<br>– Permanent open<br>– Partial opening<br>– Exit only<br>– Night-bank control | <br>●<br>●<br>●<br>●<br>●<br>● |
| Connections for<br>– electro-mechanical lock<br>– light barriers | <br>●<br>● |
| Adjustment of all basic parameters via integrated display and pushbuttons | ● |
| PALM parameter setting | ● |
| 24 V output for external loads | ● |
| Read-out error memory with error codes | ● |
| DCW bus interface | ● |
| Rechargeable battery pack for emergency operation | ● |

| Function module (FM) – optional extra | |
|---|---|
| Pharmacy control | ● |
| Door status detection (triple-mode) | ● |
| Main and secondary closing edge protection | ● |
| Emergency closing | ● |
| Bell contact | ● |
| Airlock control | ● |
| Synchronising mode | ● |

| Additional equipment | |
|---|---|
| Electro-mechanical lock (bistable) | ○ |
| Manual release of electro-mechanical lock | ○ |
| Light barriers | ○ |
| Backup battery pack (emergency opening, emergency closing) | ○ |
| Module for coupling to EIB or LON building control systems* | ○ |

* Please ask your Sales Consultant for series start date.

# 6 Appendix C. Revolving Door Design.

Revolvers

- Is their space for a pass door as well as the revolver?
- Is their provisions with in the budget for the floor? (the floor has to be situated with a ring and will require a replacement external and internal finish within the area of the revolver.
- Due to the amount of options and legal requirements surrounding revolving doors, it is recommended that the door manufacturer's technical representative is contacted.

**KTV / KTV Atrium**

**Characteristics of KTV-series**

| Detail | KTV with metal ceiling and canopy | KTV with glass ceiling | KTV Atrium full-glass system |
|---|---|---|---|
| Drum wall, framed glass | ○ | ○ | – |
| Drum wall, metal panelling | ○ | ○ | – |
| Full-glass drum wall without frame | – | – | ○ |
| For emergency exits and escape routes | ○ | 3200 – 3800mm | – |
| Wings with push handles (version M/P/S) | ○ | ○ | ○ |
| Wings with push handles (version A) | – | – | – |
| Manual night shield, internal | ○ | – | – |
| Manual night shield, external | ○ | ○ | ○ |
| Electrical night shield, internal | ○ | – | – |
| Mechanical wing locking device | ○ | ○ | ○ |
| Mechanical locking device at night shield | ○ | ○ | ○ |
| Electrical wing locking device | ○ | – | – |
| Electrical locking device, electrical night shield | ○ (internal) | – | – |
| Positioning automatic (P), canopy-integrated operator | ○ | – | – |
| Positioning automatic (P), under floor operator | ○ | ○ | ○ |
| Servomatic (S), canopy-integrated operator | ○ | – | – |
| Servomatic (S), under floor operator | ○ | ○ | ○ |
| Automatic (A), canopy-integrated operator | ○ | – | – |
| Automatic (A), under floor operator | ○ | ○ | – |
| Framed turnstile, rigid | ○ | ○ | – |
| Framed turnstile Bookfold (suitable for application in emergency exits and escape routes) | ○ | 3200 – 3800 | – |
| Framed turnstile, 1-wing, hinged (transport opening) | ○ | ○ | – |
| Turnstile with fine-frame profile, rigid | ○ | ○ | ○ |
| Wing with center midrails | ○ | ○ | – |
| Drum wall with center midrails | ○ | ○ | – |
| Floor ring | ○ | ○ | ○ |
| Floor finish | ○ | ○ | ○ |
| Ceiling-integrated downlights | ○ | – | – |
| Prepared for rainproof ceiling | ○ | – | – |
| Rainproof ceiling | ○ | ○ | – |
| Anti-vandalism brake | ○ | ○ | – |
| Speed limiter | ○ | ○ | ○ |
| Manufactured according to DIN 18650 | ○ | ○ | ○ |

○ = available as an option – = not available

# 7 Appendix D. Heaters

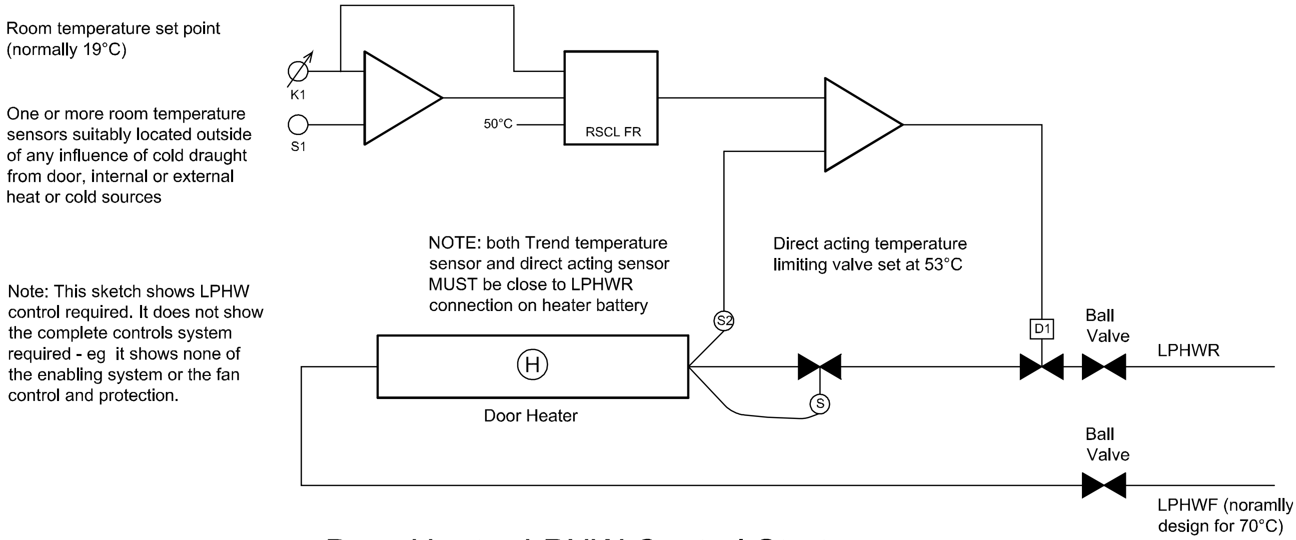
The use of over door heaters at entrances should be considered as part of the overall heat to the space and NOT as a ‘door curtain’. This is because of the way in which over door heaters work:

Over door heaters do not create a physical barrier to cold air entering a building and instead, where the design of the entrance fails to control the wind tunnel effect using the measures described elsewhere in this document, a door heater simply mixes warm air with the cold air tempering it to some extent. But, the stronger the wind tunnel effect is, the colder the mixed air temperature will be and the less likely it is that acceptable conditions will be achieved.

Where door heaters are used they should follow the following design criterion:

- Door Heaters should be controlled by the University’s Trend BEMS (refer to BEMS Briefing Document for further details). A Trend Graphics page should be created and located on the main WebServer graphics pages. This page should incorporate the time zone, knobs, switches, sensors and drivers associated with the door heater control.
- LPHW should be used in preference to electricity as the heating medium except in exceptional circumstances owing to its lower overall cost and carbon emissions.
- Door heaters should be designed to operate with condensing boiler installations. This means that the design flow temperature should normally be a maximum of 70°C with return water temperature being controlled to the minimum at all times and a maximum of 50°C at full demand. In order to prepare for future boiler upgrades this should be the case even where the current boiler arrangement is not condensing (although in such cases a temporary arrangement may be required to provide temporary boiler back end protection).
- In line with 3 above door heaters should be controlled using a two port control valve and NOT a three or four port valve.
- The two port control valve should be controlled to be fully closed whenever the door heater fan has failed or is not enabled – eg it is in the unoccupied time zone.
- During operation of the door heater, the control valve should be modulated at the dictates of one or more suitably located average room temperature sensors (ie sensor(s) located outside of the influence of cold draughts that might enter the door, sunshine, local heat or cooling sources etc. Normally they should be located in the vicinity of any fixed work positions such as reception desks that might be present. The room set point should soft knob adjustable and set at 19°C. This set point shall be rescheduled at the dictates of a return water temperature sensor to a maximum of 50°C.
- In addition to the two port control valve, return water temperature should be limited to a maximum of 53°C using a suitably located direct acting adjustable temperature limiting valve and sensor.

- NOTE: it is essential that the Trend return water temperature sensor and the direct acting return water temperature sensor are located as close to the heater battery return water connection as possible in order to avoid ‘locking up’, should a slug of hot water reach either sensor (see sketch below).




Door Heater LPHW Control Strategy

# 8 Appendix E. Access Control

## 8.1 Automatic Doors.

- Automatic doors are to be capable of accepting command signals from the Access Control system.
- A voltage-free, change-over contact on the Access System will be used to change the door mode from day to night.
- A voltage-free, change-over contact on the Access System will be used to command to door open during 'night mode' from a valid card read.
- A voltage free contact on the automatic door unit to be available for use by the access control system to provide a 'door forced' alarm. If not available it must be provided as an additional contact.

## 8.2 Operation

**Day mode:**

- Normal operation, doors opening on command from local PIR switches or PUSH pad

**Night mode:**

- Local PIR switches inhibited, doors open only via an output from the Access controller, triggered from a valid smart card read, or activation of the local internal emergency break-glass unit.
- During night mode, 'door forced' alarms are to be active.
- During night mode the automatic door mechanism must be ‘locked’ and not capable of being forced open, typically by an internal sheer-lock.
-

## 8.3 Requirements

- Automatic doors are to be interlocked directly to the local fire alarm systems to unlock, in the case of swing/power opener types and unlock and open in the case of slide types.
- Swing type doors to have sufficient battery back-up to allow normal operation for a minimum of one hour under full power fail conditions.
- Slide type doors to have sufficient battery back-up to allow normal operation for a minimum of one hour under full power fail conditions, plus an a separate battery system to motor the doors to the open position when the operational battery-back up is exhausted.

To be equipped with the following:

In reader + PIN keypad for entry.

- To be mounted externally, adjacent to the designated door, to allow easy access for normal and disabled personnel.
- Components to be weathered to IP65 or equivalent.
- Cabling to be contained within the door frame extrusions where possible.
- External cabling to be run in steel conduit and provided with a tamper loop.

Exit reader + PIN keypad for egress.

- To be mounted internally, adjacent to the designated door, to allow easy access for normal and disabled personnel.
- All exposed cabling to be provided with a tamper loop.

Door monitoring contacts.

- To be of the magnet/reed type mounted internally, or preferably be part of the door control package.
- All exposed cabling to be provided with a tamper loop.

Green emergency break-glass unit.

- To be mounted internally, adjacent to the designated door to allow easy access for normal and disabled personnel.
- Primary action to directly break the door lock supply circuits from the door controller.
- To be monitored at all times, generating an alarm on operation.

Note: If the emergency break-glass unit is to drop the 240v ac power to the door controller, a no-volt relay will need to be provided within the door controller to provide a monitor function. This will keep segregation of the different classes of cabling at the break-glass unit.

Fire Alarm Interlock

All external, electrically locked doors are to be interlocked with the local fire alarm systems to unlock during a fire alarm condition.

- The G4 Access Control System will provide 2 relays adjacent to the door set to provide:

  Signal to switch from normal day mode to night mode.

  Signal to open door from a valid card read when in the night mode.

  (Relays provide volt-free change-over contacts and operation can be maintained or pulsed).

- Door locked status to be provided from the door manufacturer’s equipment in the form of a switch contact for use by Group 4, with the connection point wired adjacent to the G4 signal relays. The status switch must be voltage-free and N.C. when doors are closed and locked.
- Doors should be arranged to lock when in the closed position, preferably at all times, but essentially when in night mode.
- Local emergency break-glass units provided by the manufacturer, or Group 4, must unlock doors for egress when activated. On activation, ‘swing’ type doors to be

capable of being simply pushed opened manually, ‘sliding’ types to motor open on their emergency batteries. NB. Swing types may also be required to power open for compliance with DDA.

- Break-glass connections MUST act on the door locks directly in the case of swing and sliding doors, the latter MUST also drive to the open position.
- It is preferred that no electronic processing is used via the door controllers for the above actions.
- Activation of the break-glass must also present an alarm signal to the G4 system. This will be a voltage free, normally closed contact, opening on alarm condition, with the connection point wired adjacent to the G4 signal relays.

**Group 4 relay, 1 Day/Night**

- The Group 4 Access Control system, via a scheduled time command, will change the state of, or pulse relay 1.
- Relay 1 will be de-energised during day mode and energised during night mode for change state mode or, pulse at the start and the end of the scheduled time command, manufacturer to state the pulse duration time required.
- Day mode to place the automatic door sets to operate under their own radar detectors and all other associated control devices i.e. push pads.
- Night mode to ignore all normal day mode sensing devices and the doors must only open for personnel access/egress on receipt of a signal from the Group 4 relay 2.

**Group 4 relay 2, valid card read**

- During the night mode, as set by relay 1, a valid card read will energise relay 2 for a period of 5 seconds.
- Relay 2 will be normally de-energised, energising for 5 seconds only after receipt of a valid card read.
- Valid card read to unlock and open the door set for personnel entry/egress.

  Note: This can be left active during day mode as it is unnecessary to block when the local radar units are active.

## 8.4 Security

- Locks should be provided at the mid point of meeting stiles of sliding doors (claw lock) and at mid point of closing stiles on swing doors (dead bolt). These will be used in emergency situations only when all powered systems have failed. Locks should be designed to accept a half Euro cylinder to the external face of the door. University will supply a mastered cylinder.

- If frameless, glazed doors are proposed, the position and type of locks must be discussed before design proposals are signed off.
- During night mode, all automatic doors must be closed and automatically locked by a physical device i.e. not held shut by drive belt tension alone. This device must be able to respond to signals from fire alarm relays, emergency break glasses and card readers.
- A single "night lock" should be provided adjacent to the door set to allow Security personnel access as required. Automatic doors may not be fitted with card entry systems and access from outside may be required to re-set internal control switches. The "night lock" should comprise a flush mounted switch controlled by a half Euro cylinder, to be provided by the University. Surface mounted devices should be avoided.
- Doors should be provided with a local internal control switch to determine operating mode (open, closed, out only, half open). Where switch is accessible to general public it should be key operated to provide anti tamper operation.
- All keys should be handed to University Security Services at handover.

**Notes:**

Swing open, or Power closer types, are to be provided with maglocks which must de-power on a fire alarm signal or emergency break glass activation. Egress to be gained by physically opening the unlocked door.

Sliding type doors are to be provided with integral locking which must de-power on a fire alarm signal, or activation of the local emergency break-glass unit, AND must move to the door(s) to the fully open position. Sufficient battery back-up is to be provided to maintain the door operational under power fail conditions for a minimum period of 1 hour. An independent battery source is also required, of sufficient capacity to guarantee door opening, after the operational battery back-up is exhausted. Additionally, an alarm output is to be provided for the access control system indicating when the operational battery back-up is exhausted, as the building will be rendered unsecured at this point.

- Emergency break-glass units and fire alarm interlocks to be active at all times.
- During night mode, the door face safety detection must be isolated to prevent unauthorized opening, but engaged when the door is in motion under a valid card entry/exit request.
- During night mode, doors must be closed, locked and monitored for being locked in the closed position.
- Automatic door controllers are to provide the G4 access system with a warning that power has failed to the door. This to be a simple volt-free contact normally-closed, opening on alarm condition with the connection point wired adjacent to the G4 signal relays.

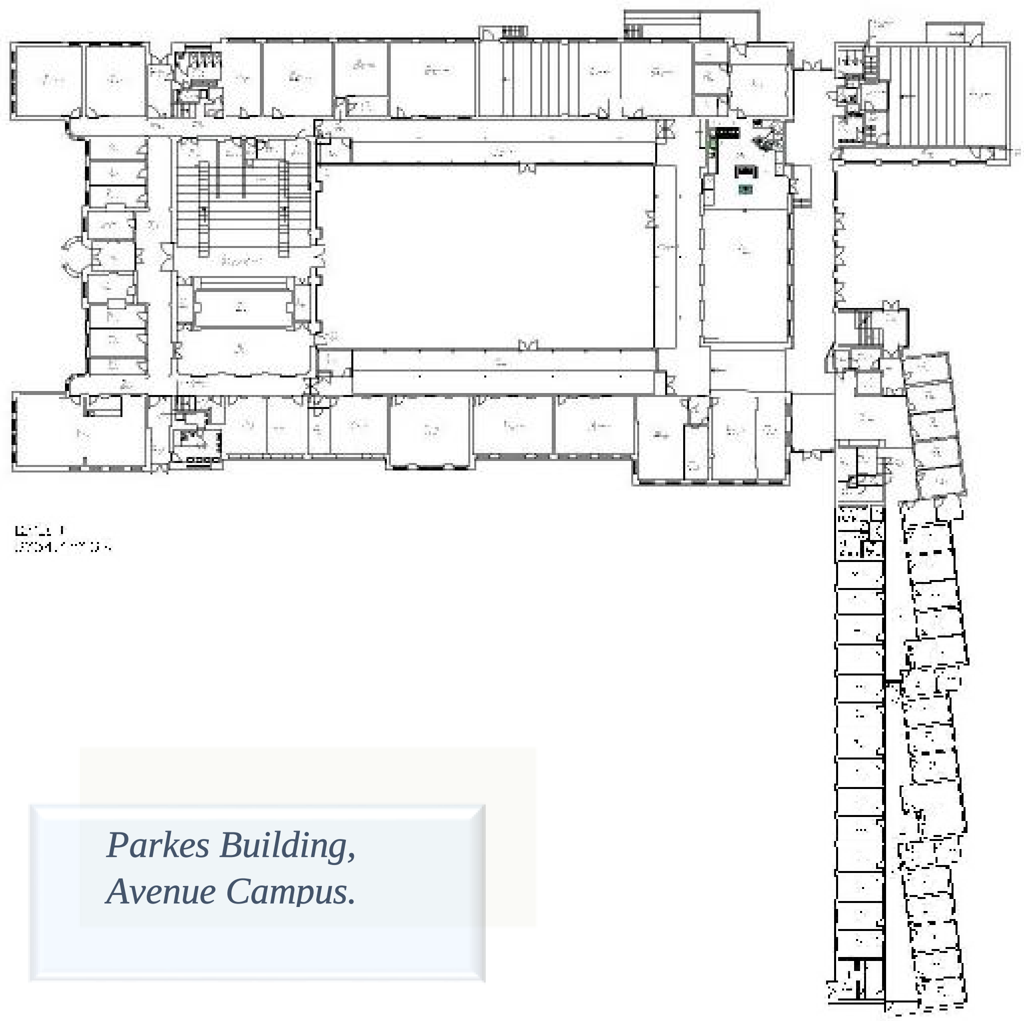
- External automatic sliding doors are to be provided with sufficient battery back-up to keep the doors operational for not less than one hour on power failure, to allow alternative security arrangements to be made.
- All selector switches located in public spaces are to be key-operated types to provide anti-tamper facilities.
- At installation, it is imperative that the door manufacturer/installer is present with G4 when devices are wired up and tested.

MG /AUTODOOR CONTROLS 2013

# 9 Appendix F. Example

## 9.1 Avenue Campus, Main Entrance and Reception.

The staff of the reception have complained of cold and draughts, so the Building Manager and Estates team were asked to investigate the problem and try and resolve the situation.



*Parkes Building, Avenue Campus.*

**External**

The entrance is located within the corner of an 'L' shape, so wind from a wide angle can be deflected towards the entrance doors. The building is not a tall structure but is two storeys at the entrance with a three storey block adjacent.

This is not currently the designated wheelchair access point, but is on a pedestrian route to a number of the surrounding buildings and car park.

**Internal**

The reception counter is facing the doors, so is exposed to any incoming draughts.

The entrance is part of a larger ‘lounge’ and circulation space.

This connects through to a staircase, a row of doors onto the piazza area, and another automatic door at the far end.

It also connects via wide corridors to the rest of the building, including the adjacent café.

**Entrances**

The main entrance doors are a manual pair of doors.

The far entrance doors are PIR automatic doors and designated for the disabled access due to their proximity to the designated parking spaces. They have a number of items such as bins within their detection zone that cause false opening. The detection zone also encompasses people visiting the adjacent toilets, causing false opening.

There are 3 pairs of manual doors opening out onto the piazza. This open area is not on a main circulation route and is not used in the cold months of the year.

All the doors have visible gaps at the meeting stiles. All the manual doors have manual hold openers built in.

**Reception**

The reception counter faces the main doors.

The counter wraps around well, but to provide the higher desk levels the shelf is open, reducing the wind protection.

An adjacent room is used by the staff to keep out of the wind.

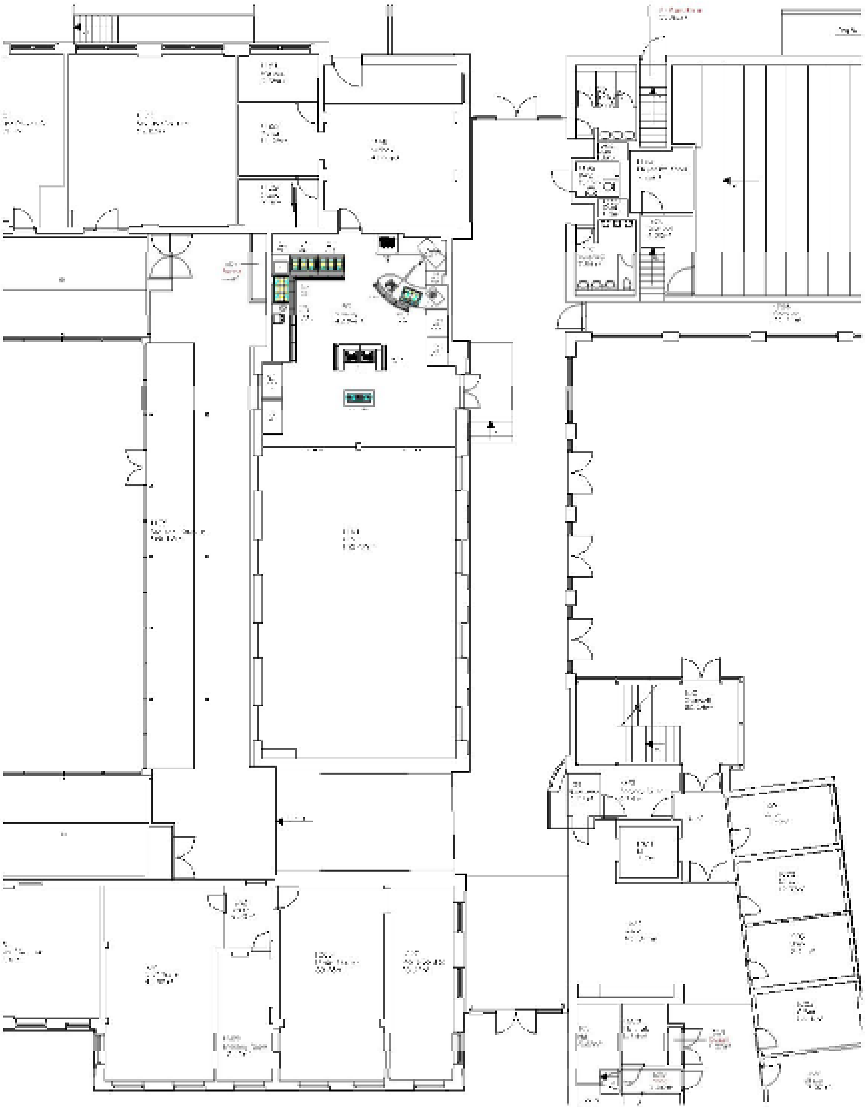
**Air Routes**

The adjacent café has open doors off the entrance area. This has an extract system off the kitchen area.

The entrance area itself is open and the air can pass through to the other entrances.

Leading directly off the entrance is the main circulation corridors. Corridor doors are provided further along, but are all held open.

The construction is mainly traditional masonry with plastered and exposed brickwork internally. Large aluminium windows are set within it. Unplastered, the walls will be more pervious. The aluminium windows system will be air tight, but the tightness of the window within the opening will need to be investigated, especially where it is set within an exposed brickwork internal finish.



Detail of the entrance area.

Entrance and reception area.

û – Faces the entrance opening.

û - Higher level reception is open to a draught.

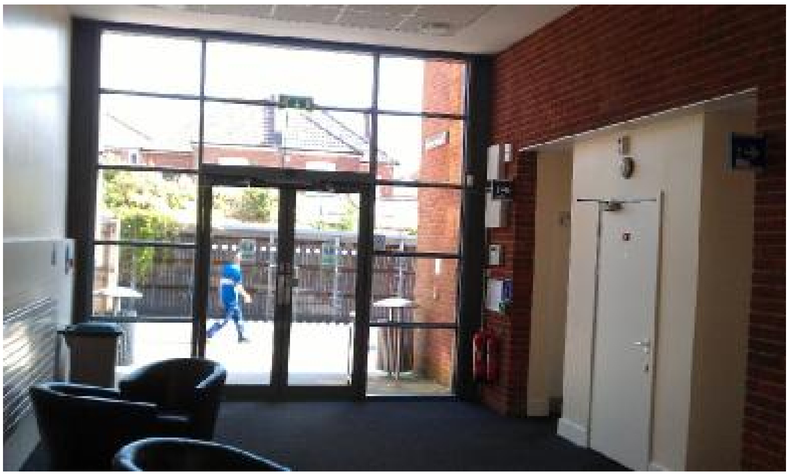
û - Side access is open.

ü - Counter front flush to floor.


Entrance Doors.

û – No protection from wind blowing down the facade.

ü - Manual doors don’t open unnecessarily.



Rear Doors providing accessible entrance.

- û – PIR activated.
- û – Waste bins within the PIR activation zone inside and out.
- û – Route to toilets within the PIR activation zone.
- ü - Doors set back from external pedestrian route.

## 3 Project Review: Evaluation

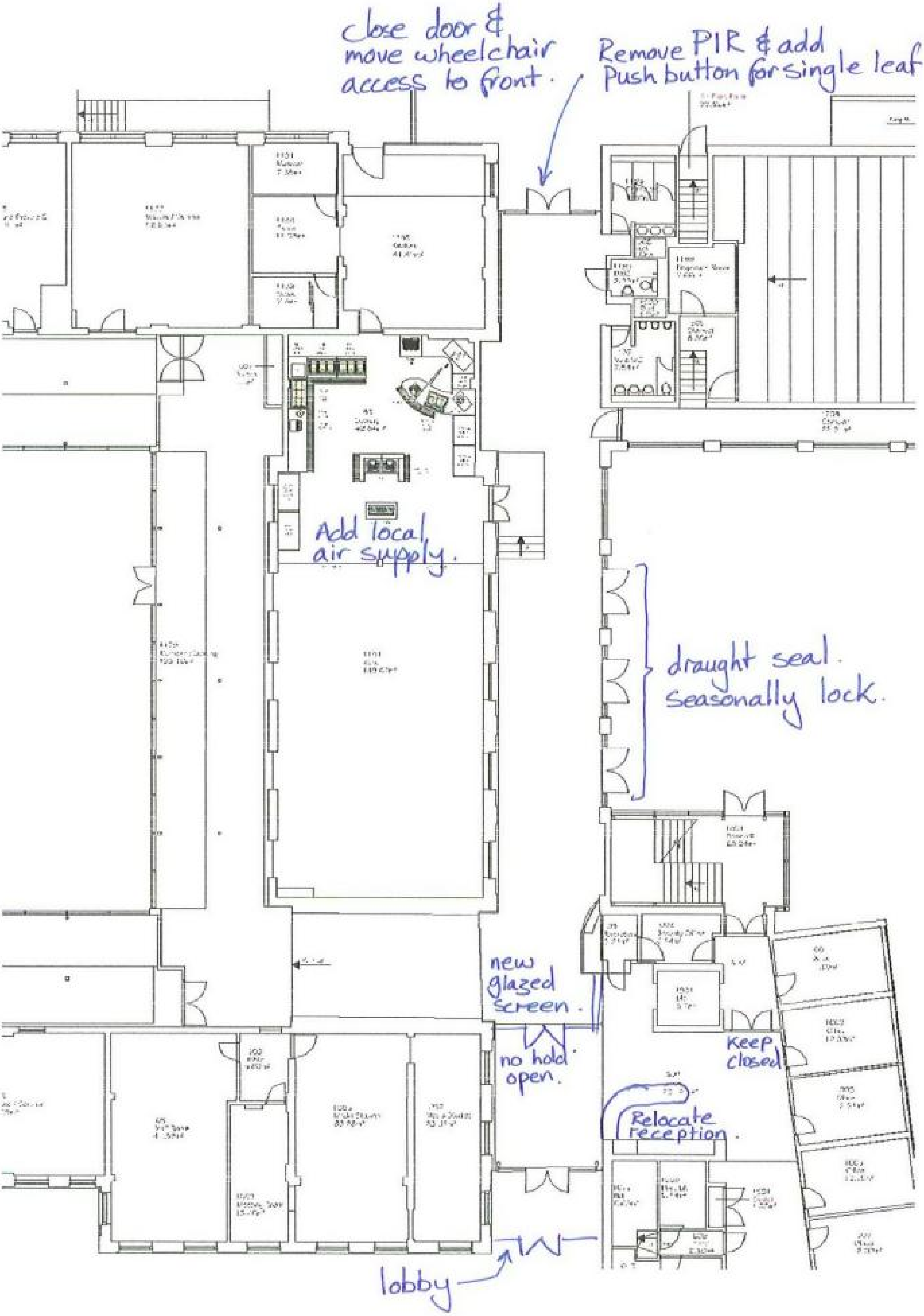
PARKES BUILDING, AVENUE CAMPUS.

| | Item | Applicable? | Possible? | Effective | Cost | Proposal |
|---|---|---|---|---|---|---|
| 2.1.1 | Not located in a 'tunnel effect' of buildings. | ✗ | | | | |
| 2.1.2 | Position entrance away from direct regional or local prevailing winds. | ✗ | | | | |
| 2.1.3 | Protect entrance/ lobby | ✓ | ✓ | | | Add a lobby or Screen entrance |
| 2.2.1 | Reduce the number of entrances. | ✓ | ✓ | | | Possibly close far entrance. Alternative wheel-chair access. |
| 2.2.2 | Seasonally lock doors. | ✓ | ✓ | ✓ | ✓ | Piazza doors could be locked over winter. |
| 2.3.1 | Orientation & position of the reception desk. | ✓ | ✓ | | | could re-orientate desk to be perpe-ndicular to entrance |
| 2.3.2 | Reception desk design. | ✓ | ✓ | | | Provide solid panels to high areas. |
| 2.4.1 | Swing doors. | ✓ | ✓ | ✓ | ✓ | Adjust entrance so no hold open. |
| 2.4.2 | Low Power swing doors | ✓ | ✓ | ✓ | | change far entrance to push button entrance. |
| 2.4.3 | Automatic PIR swing doors | ✗ | | | | Pedestrian volume too low. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.4.4 | Automatic push button swing doors | ✓ | ✓ | ↑ | | change far entrance to push button. |
| 2.4.5 | Automatic sliding doors | | ✗ | | | |
| 2.4.6 | Revolving doors | ✗ | ✗ | | | |
| 2.4.7 | Powered revolving doors | ✗ | ✗ | | | |
| 2.4.8 | Individual capsule doors. | ✗ | | | | |
| 2.4.9 | Add a lobby. | ✓ | ✓ | | | Create external lobby. |
| 2.4.10 | Door Heaters. | | ✓ | ↓ | ↑ | Last resort. |
| 2.4.11 | Flooring | ✗ | | | | |
| 2.5.1 | Entrance foyer | ✓ | ✓ | ✓ | ↑ | Create new foyer area with glazed screen. |
| 2.5.2 | Corridor doors | ✓ | | | | Review doors to keep off hold open. |
| 2.5.3 | Stairs | ✓ | | | | seal doors and keep closed leading to lift. |
| 2.5.4 | Lifts | ✓ | | | | seal doors or seal doors & keep closed leading to lift. |
| 2.5.5 | Service Shafts | ✓ | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.5.6 | Atrium. | ✓ | ✓ | | | Extend air route survey to other floors |
| 2.6.1 | Door Seals. | ✓ | ✓ | ✓ | ✓ | Plenty of visible gaps |
| 2.6.2 | Window Seals. | ✓ | ✓ | ✓ | ✓ | |
| 2.6.3 | Seasonally lock windows. | ✓ | ✓ | | | |
| 2.6.4 | Gaps in building fabric. | ✓ | ✓ | ✓ | ✓ | Plenty of visible gaps. |
| 2.6.5 | Sealing building fabric surface. | ✓ | | | | |
| 2.6.6 | Sealing uncontrolled vents. | ? | | | | Unknown if Present. |
| 2.6.7 | Adjusting unbalanced ventilation systems. | ✓ | ✓ | ✓ | | Kitchen extract will benefit from supply. |
| 2.7.1 | Wheelchair access from car park. | ✓ | | | | Remove automatic from rear door & bring to front. |
| 2.7.2 | Ramped/ level access. | ✓ | | | | If alter chosen entrance, will review. |
| 2.7.3 | Stepped access. | X | | | | |
| 2.7.4 | Visual clarity | ✓ | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.7.5 | Weather protection | ✗ | | | | |
| 2.7.6 | Door | ✓ | | | | |
| 2.7.7 | Reception desk design. | ✓ | | | | |
| 2.7.8 | Colour contrast | ✓ | | | | |
| 2.7.9 | Signage. | ✓ | | | | |
| 2.7.10 | Fire alarm system and panel location. | ✓ | | | | |
| 2.7.11 | Display Energy Certificate. | ✓ | | | | |


close door & move wheelchair access to front.
Remove PIR & add Push button for single leaf
Add local air supply.
draught seal. Seasonally lock.
new glazed screen.
no hold open.
Keep closed
Relocate reception.
lobby

**Proposals**

Applying the above principles, we can propose the following actions. Many of them are independent actions, and some are a selection.

- Seal all gaps in the fabric.
- Seal all gaps in doors.
- Seasonally lock the patio doors.
- Change the PIR disabled access route to a push button on a single door. (Ensure a single door gives the minimum clearance, otherwise activate both doors.)
- Add a balancing air supply to the kitchen.
- Add screen to separate internally, with no hold open doors.