

## Hypothesis

Opening the main doors will decrease air temperature in the area within 30 feet of the openings

## Assumptions



- Space is generally within comfort zone
- Mid summer Conditions - Humidity is not a factor
- Door is open approx 1/3 of the time
- Building is pressurized due to no mechanical returns
- Envelope is very leaky
- HVAC System does not keep building within ASHRE comfort zone
- HVAC System is operating continually during test

## Methodology

- Measure temperature and relative humidity during normal operating conditions
- Measure temperature and relative humidity with doors held open for extended period of time
- Make additional observations using both tools supplied in tool box and team engineered devices

## Other Tools



## Observations - Envelope

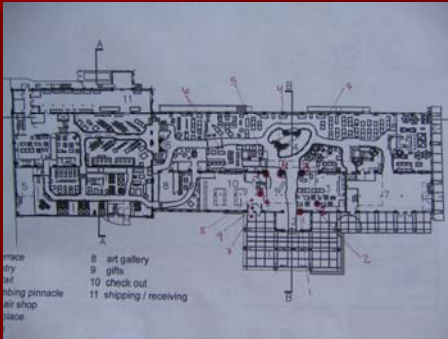
- Could not get any qualitative measures of stated infiltration through building walls.
- Both anemometer and bubble test reflected little air movement in the chimney



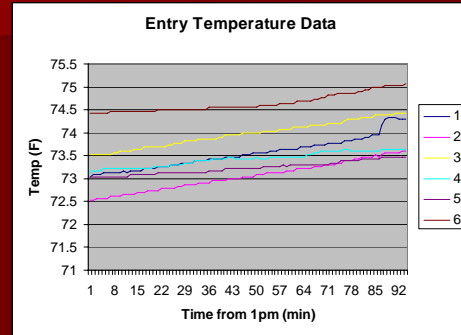
## Observations

- Could not get any qualitative measures of stated infiltration through building walls.
- At doors there was a rotational air movement – coming in at the top and exiting at the bottom
- Qualitatively it appeared that there was more air coming in than going out
- Bubbles blown off mezzanine tended to move upwards
- Both anemometer and bubble test reflected little air movement in the chimney

## Placement of Hobos



## Data



## Conclusions

- We did discover a return for the HVAC
- Opening doors seemed to bring in more air – but we didn't see a the temperature effect expected –
- Door being open all the time showed very little differentiation from standard open and closing of doors by customers

## Discussion Points

- Why might there be no apparent change in the temperature while doors are held open constantly?
- Why would we have seen an apparent in flow at the top of the doors?