Learning from our Buildings

Better Buildings Conference

15th February 2016
Why do POE?

• Opportunity to learn from past mistakes

• Understand what worked well.

• Opportunity to Review Fine Tune and Feedback.
Does low energy have to mean high complexity?

Woodland Trust POE 2015
Keep it simple do it well.....
• All timber Construction
• Simple detailing of external walls, with thermal continuity of CLT panel structure
• Woodfibre insulation
• Untreated European Larch cladding
Concrete Radiator Performance Analysis: Follow on Project
What about fixing to the Cross Laminated Timber the exact amount of Concrete required for Thermal Mass, and making it work structurally in composite with the timber?
“Concrete Radiators” radiate “coolth” during summer day
“Concrete Radiators” radiate heat during summer night
(Moderate heating during winter (windows only open for trickle vent))
Concrete Radiator Performance Analysis: POE Follow on Project
Monitoring Installation
Concrete Radiator Performance Analysis: POE Follow on Project

Friday Evening: At the end of 1 weeks occupancy

Saturday Morning after night cooling

Midday on Saturday
Findings: Reasons for initial underperformance

• Restrictions on window opening, both from insurers and H&S policy

• Incorrect external temperature sensor location = Incorrect BMS temperature measurements

• It would feel cold early in the morning, because furniture and other lightweight elements were at a much lower temperature than the concrete

• An over-complicated control strategy. Transfer control of setting to FM Manager
Actions taken

• Relocation of the external air temperature sensor

• Tempering the Monitoring and control strategies.

• Removing the interlock between heating and night cooling with independent night cooling programmes provided for weekdays and weekends.

• Changing the temperature used to control the night ventilation to the average of the open plan offices only, originally meeting rooms were included in the average

• Generally making it easier for the FM manager to adjust settings and time programmes
Conclusion

- Care needs taking in design, commissioning and fine tuning of night ventilation systems
- Review, Fine Tune and Feedback
- The importance of POE projects to ensure buildings are functioning as they should.
Dyson Centre
For
Neonatal Care
A holistic approach to NICU care – Creating a highly beneficial healing environment
Creating a space to grow:
Innovative approaches to measuring the impact of a new NICU design on developmental care

“It’s very different...I can honestly say I fell in love with this building.”  Debbie Grant

Dr. Bernie Marden
Consultant Neonatologist

Debbie Grant
Nurse Manager

Rebecca Abrey
Neonatal Research Nurse

Professor Mark Tooley
Consultant Clinical Scientist &
Director of Research &
Development
Four areas of interest and research

1. Building data – sound and light; energy efficiency; interaction with users

2. Parent well being and behaviour:
   • Qualitative semi-structured interviews conducted by psychologist and project nurse
   • 3 questionnaires (HADS, General Health, Parent)

3. Infant wellbeing – Sleep; Assessment of how settled; Opportunities for parental involvement in care

4. Staff wellbeing and behaviour
Tools

• 3 questionnaires (HADS, General Health, Parent)
• Qualitative structured interviews
• Cot side observational diaries
• Baby movement detection (accelerometer)
• Staff tracking (Wi-Fi)
• Sound meters
• Light meters
Overall: Average sound measurements (Old Build compared to New Build)

![Graph showing sound measurements over time for Old and New Builds]

All data: $P = 2.60 \times 10^{-50}$ ($P < 0.001$)
Overall: Average light measurements (Old Build compared to New Build)
Questionnaire results

• Parents reported that compared to the old unit
  – They felt less cramped
  – That they had less interference from noise and light
  – They felt less in the way
  – They felt more comfortable breast feeding

• 90% of babies on new unit V 64% of babies on old unit went home breast feeding
HADS: Average anxiety score for mothers

![Graph showing average anxiety scores over weeks since admission for 'New' and 'Build' groups. The 'New' group shows a trend of decreasing anxiety scores, while the 'Build' group shows an increasing trend.](image-url)
Average time (minutes) that parents spent visiting

14:00-18:00: *P*<0.001
Average time (minutes) - Physical contact / positive touch from parent(s)

14:00-18:00: $P<0.001$
Average time (minutes) that babies were asleep

All data $P<0.001$
09:00-14:00: $P<0.001$
‘The importance of BPE work is in understanding what works and what needs to be improved, and in influencing future policy, client and industry practices. Without this, attempts at producing more sustainable, energy efficient buildings may well disappoint.’ Bill Bordass