

Beyond Design: Best Practice Commissioning, Completion and Ongoing Operation

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Quote for the day:

“Post occupancy evaluation? Is that when you take the photos for Architecture New Zealand”



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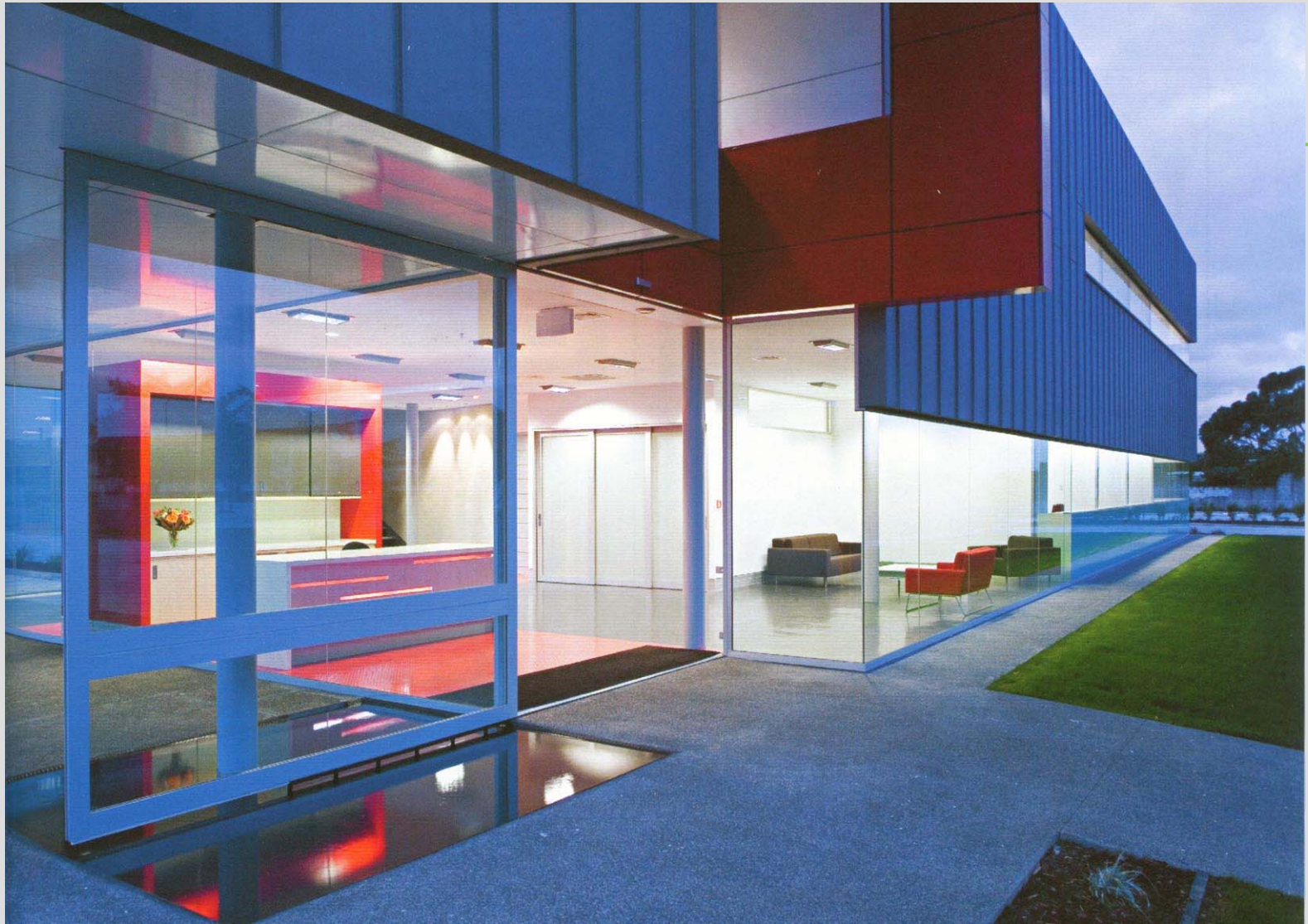
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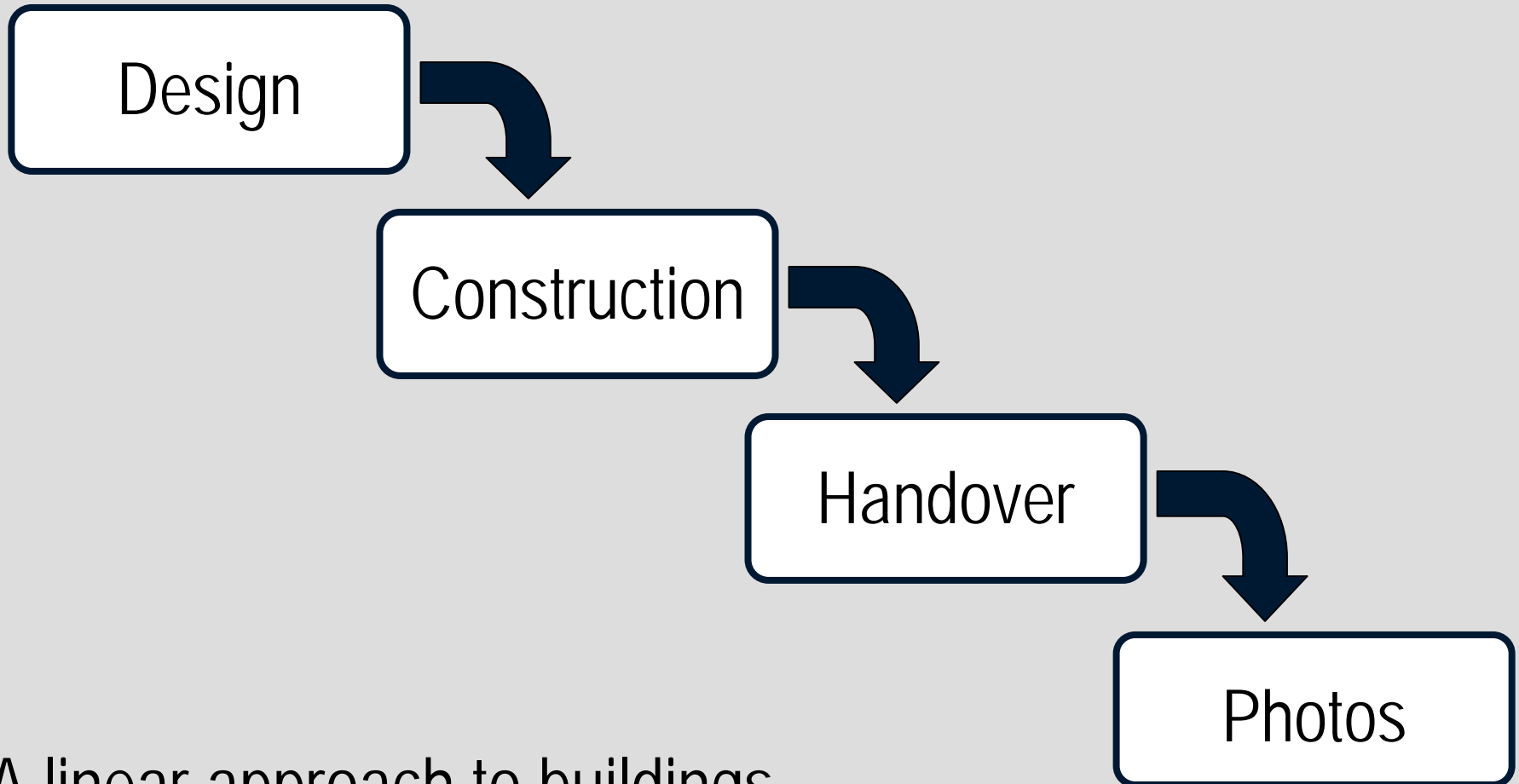


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Its All About Us!

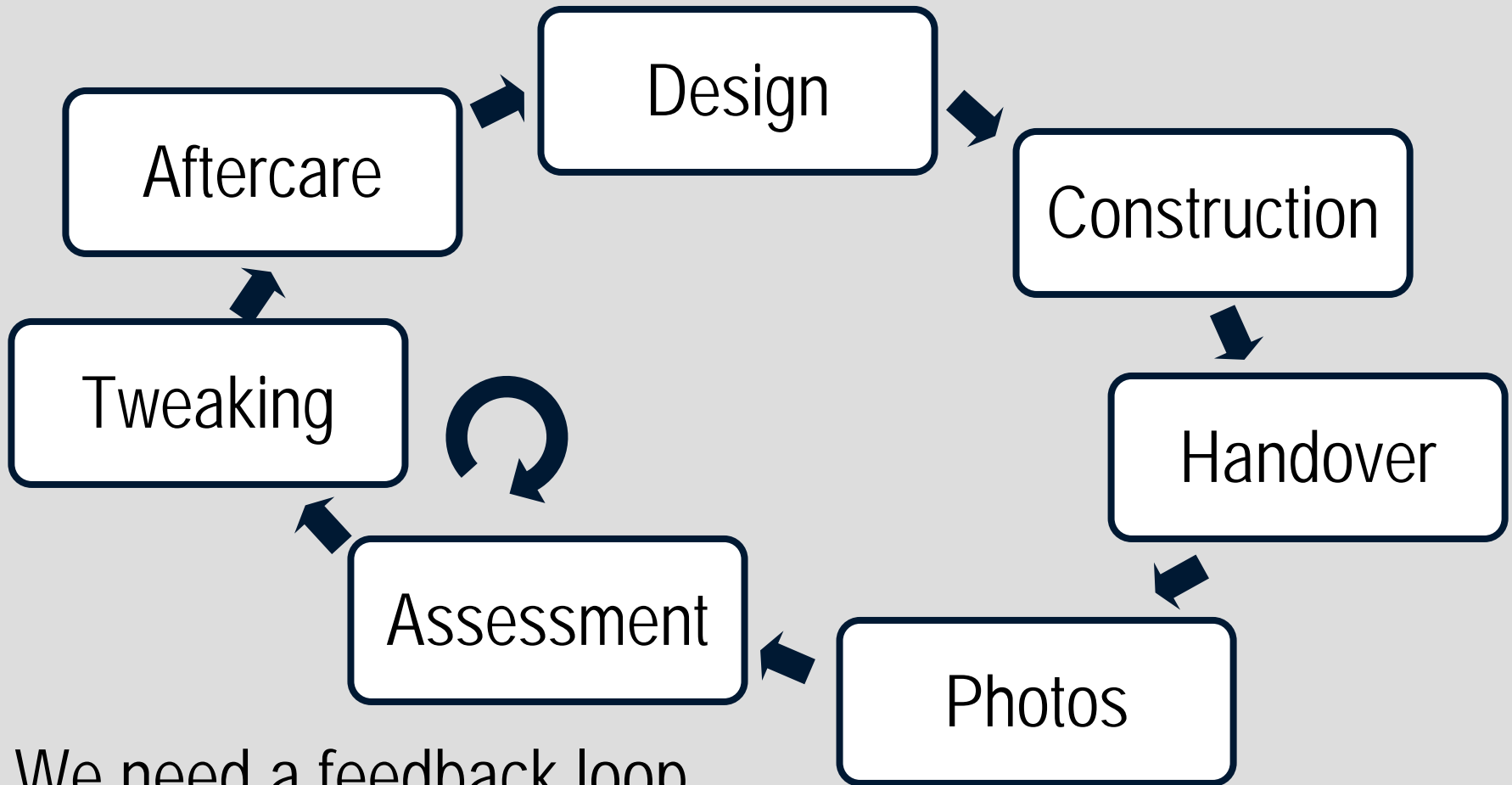
- This sort of “post occupancy evaluation” often ignores the occupants!
- This occurs across all fields
- Human factors need to be taken into account when assessing and rewarding design
- Current process sells the users (us) short

Current Practice



A linear approach to buildings...

Best Practice



We need a feedback loop...

Closing the Loop

Requires:

- a fully commissioned handover
- a continuous commissioning process
- building performance assessment (BPA) programmes
- reporting / feedback mechanism
- and buy-in from EVERYONE!

Handover and Commissioning

- Commissioning rarely completed, particularly the BMS. Up to 30% of the points are not properly commissioned. 'We sell dreams and install nightmares.'
- Needs a two week buffer prior to completion
- Need a first year fine tune to account for the mix of the building, systems and occupants.
- Needs a process of continuous commissioning by the Facilities Manager

Keep Them Honest!

An independent commissioning manager should:

- Review design and construction
- Plan commissioning, training and documentation
- Verify commissioning
- Report on commissioning
- Oversee fine tuning during first year of operation

Continuous Commissioning

- Involves the ongoing monitoring of building systems, identifying and locating faults
- The BMS can usually log pretty much anything – use it!
- Tweaking of controls and systems to suit needs
- Can use energy modelling to parallel actual performance
- Reports to, and is informed by, the BPA programme

Building Performance Assessment

Measuring how well a building interacts with its users and environment

- Post occupancy evaluation
- Energy auditing
 - Carry out after the first year, then every three years
- Continuous commissioning, monitoring and reporting

Post Occupancy Evaluation

- Probe Method developed in UK by Building Use Studies. Used under license by e3BW.
- Key issues highlighted
- User satisfaction and perceived productivity effect quantified
- Reconcile with pre occupancy evaluation
- Normally done in conjunction with energy, water and waste audits during first year

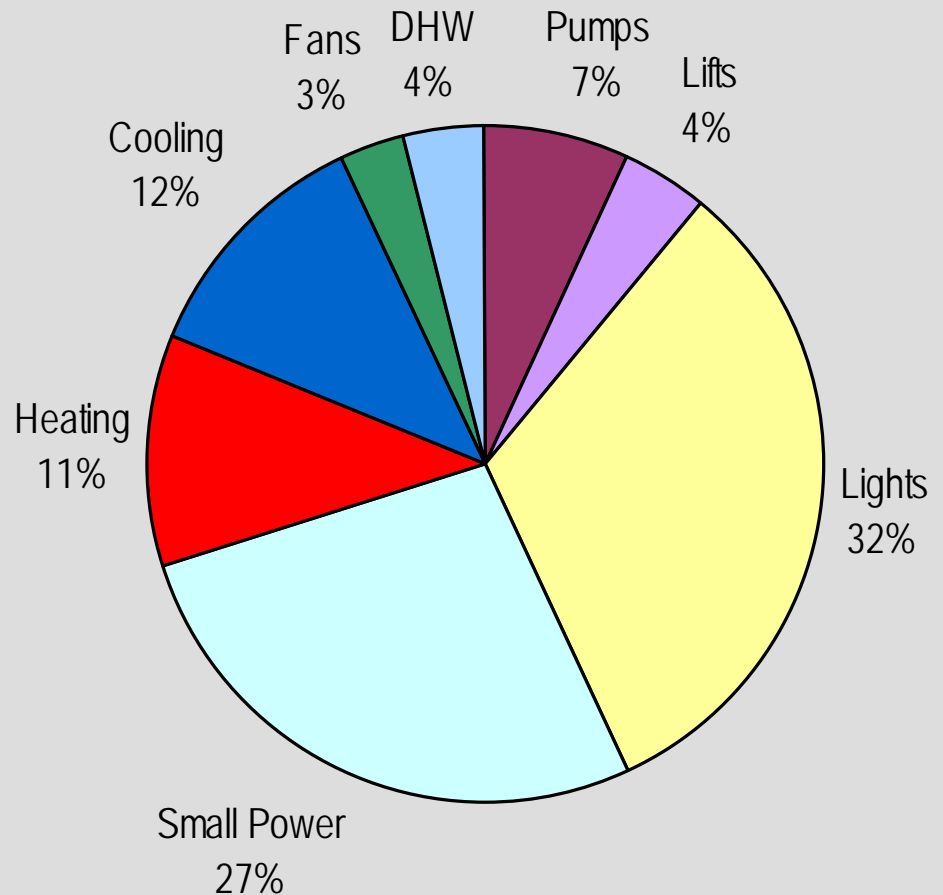
PROBE Summary

- Use 'traffic lights' to show areas of high performance, or areas of concern

	Traffic Light Rating	Mean Score	Comment
Comfort Overall		4.90	Significantly higher than both the benchmark and scale midpoint.
Temperature in Winter		4.77	Significantly higher than both the benchmark and scale midpoint. Temperature in winter comfortable.
Temperature in Summer		4.50	Significantly higher than both the benchmark and scale midpoint.
Lighting		5.22	Significantly higher than both the benchmark and scale midpoint. Lighting is satisfactory.
Noise		4.35	Significantly higher than both the benchmark and scale midpoint. Noise is satisfactory.
Space at Desk (Value Closer to 4 is better)		4.52	Significantly higher than both the benchmark and scale midpoint.
Furniture		4.90	Significantly higher than scale midpoint but no different from benchmark.
Availability of Meeting Rooms		4.50	Significantly higher than both the benchmark and scale midpoint. Availability is satisfactory.
Suitability of Storage		4.04	Significantly higher than benchmark but not scale midpoint.
Overall		4.50	Significantly higher than both benchmark and scale midpoint.

Energy Auditing

- Measures the ins and outs of the site with regards to energy
- The same process can be used for water and waste



The Need for Feedback

- Bad results are better than no results
- They can normally be put right or improved
- Or explained
- Can inform future projects
- Allows you to tell a credible story and not just show some pretty pictures – no greenwash

Green Leases

- Its not a completely different lease just a schedule usually accompanied by an Environmental Management Plan.
- Includes several KPI's for building performance
- Ensuring total occupancy costs are not exceeded
- First year may not be representative.
- Needs to be fair to both parties (include some tolerance) or will be regarded as a penalty by the building provider.
- In the process of being adopted for the procurement of all Australian Government buildings. Publicly available document.
- Meridian Building first building in NZ to include green lease schedule. All future NZ Government leases likely to include elements of a green lease.

Environmental Management

- It's a partnership between the landlord and tenants
- Post occupancy environmental management plan. Monitor performance and audit, report / feedback and identify remedial actions
- Form building management committee – make it somebody's job
- Triennial audit and potential recommissioning



Communication

- Need a Communications Strategy to ALL staff in the new building to attract buy in.
- Training for group leaders
- Simple user instructions / training manual
- More detailed training and documentation for Facilities Management

The Value Case

- 10,000m² office
- 14% saving in O&M costs
- 2.9 year payback
- \$236,273 NPV over 15 years
- 33% IRR
- Better occupant satisfaction and productivity benefits
- 7-10% contribution to Green Star NZ rating

Looking Beyond Design



From a design potential to performance culture

Acknowledgements

- This paper was adapted from a larger report commissioned by the Ministry for the Environment
- It is available for download from:
www.mfe.govt.nz/publications