Soft Landings: Closing the loop

Gary Clark
Soft Landings is a process for a graduated handover of a new or refurbished building, where a period of professional aftercare by the project team is a client requirement, and planned for and carried out from project inception onwards and for up to three years post-completion.

Rod Bunn, BSRIA, February 2012
West Suffolk House

- New 4-storey, open-plan offices in Bury St Edmunds for St Edmundsbury Borough Council and West Suffolk Council
- Tight build programme to meet a target occupation date
- The designers had difficulties keeping up to date with design information. The process was cost-driven
- A compressed build programme led to other problems, notably the lack of a commissioning plan
- A year after completion, the m&e systems had not been accepted. Thankfully the Framework team has been very attentive

Design for buildability, usability and manageability
West Suffolk House

The energy consumption of West Suffolk House equates to actual emissions of 97 kgCO$_2$/m$^2$ per annum, three times the design estimate of 31.4 kgCO$_2$/m$^2$ per annum.

Design for buildability, usability and manageability
University Buildings Benchmarks

Annual CO₂ emissions from university buildings (kg/m² Treated Floor Area) at UK CO₂ factors of 0.19 for gas and 0.46 for electricity

100% Regulated reduction by 2019

Design for buildability, usability and manageability
Recurring Issues

Design for buildability, usability and manageability
This might be resolved by a collaborative, shared risk culture.

Commissioning and seasonal commissioning

Pre-commissioning activities (pipework cleaning)

Soft Landings de-bugging and fine tuning

Latent defects resolution

Capital changes & improvements

Operation and maintenance

Commissioning and seasonal commissioning

What if conventional PC was replaced by a 36 month sign-off?

‘Total commissioning’, with contractual gateways

This is not working

Snagging and defects resolution

36 month sign-off

36 month sign-off

Capital changes & improvements

Operation and maintenance

Late defects resolution

Roderic Bunn 2012

Aftercare period

Pre-commissioning activities (pipework cleaning)

Soft Landings de-bugging and fine tuning

Latent defects resolution

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Commissioning and seasonal commissioning

‘Total commissioning’, with contractual gateways

What if conventional PC was replaced by a 36 month sign-off?

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What if conventional PC was replaced by a 36 month sign-off?

Appoint independent commissioning engineer

Write commissioning plan early

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- Late 1990s: devised as ‘Sea Trials’ for new buildings, by architect Mark Way

- 2004 scope of service documentation developed with construction sponsorship

- 2008 Open-source documentation developed into a Framework by industry task group led by BSRIA


- 2010 The BSRIA Soft Landings User Group active in applying Soft Landings

- 2011 Soft Landings covered in BREEAM New Construction, the IGT report, and Government strategy

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Design for buildability, usability and manageability
Soft Landings philosophy

- It’s a way of working, a new professionalism that says we have to change the way we do things to deliver better buildings.

- It’s designed to foster greater mutual understanding between clients, project managers, designers, builders and occupiers about project objectives.

- It is designed to reduce tensions and frustrations that occur during initial occupancy, and to ensure clients and occupiers get the best out of their new asset.

- It involves greater investment in problem diagnosis and treatment, and in monitoring, review and post-occupancy evaluation.

Design for buildability, usability and manageability
Diagrammatic representation of Soft Landings activities

**Stage 1**
Inception and briefing

**Stage 2**
Design and construction

**Stage 3**
Pre-handover

- Briefing
  - Project team assembled, roles and responsibilities set
  - At inception, client champions Soft Landings

Cost-neutral or cost saving

Practical completion

Design for buildability, usability and manageability
RIBA Plan of Work

Stage 1: Briefing
- B1 Define roles and responsibilities
- B2 Review past experience
- B3 Plan evaluations & reality checks
- B4 Set performance targets
- B5 Sign-off gateways
- B6 Incentives for performance outcomes

Stage 2: Design & construct
- C to H
- Stage 2: Design & Pre-construction

Stage 3: Pre-Handover
- J to K
- Stage 3: Mobilisation & Construct

Stage 4: Initial Aftercare
- L1
- Stage 4: Post practical completion

Stage 5: Years 1 to 3 Aftercare
- L2 & L3
- Stage 5: Aftercare

SOFT LANDINGS ACTIVITIES

**B** Design brief
- D1 Review past experience
- D2 Design reviews
- D3 Tender documentation and evaluation

**C to H** Design & Pre-construction
- P1 Environmental / energy logging review
- P2 Building readiness programme
- P3 Commissioning records check
- P4 Maintenance contract
- P5 Training
- P6 BMS interface completion and demo
- P7 Migration Planning
- P8 Aftercare team ‘home’
- P9 Compile Building User’s Guide
- P10 Compile Technical Guide
- P11 O&M Manual Review

**J to K** Mobilisation & Construct
- A1 Resident on-site attendance
- A2 Provide datacomms links
- A3 Building usage guidance
- A4 Technical guidance
- A5 Communications
- A6 Walkabouts

**L1** Post practical completion
- Y1 Aftercare review meetings
- Y2 Log env’l & energy performance
- Y3 Systems and energy review
- Y4 Fine tune systems
- Y5 Record fine-tuning and change
- Y6 Communications
- Y7 Walkabouts
- Y8 Measure env’l & energy performance
- Y9 End of year review
## Soft Landings Procurement

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
<th>Additional Cost</th>
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<tbody>
<tr>
<td>Stage 1</td>
<td>Briefing and Targets</td>
<td>nil</td>
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<tr>
<td>Stage 2</td>
<td>Appoint Independent SL Consultant: Reality Checking (4 workshops)</td>
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<tr>
<td></td>
<td>Peer Review (2 days)</td>
<td>£1000</td>
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<tr>
<td>Stage 3</td>
<td>Peer Review (2 days)</td>
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<td></td>
<td>Testing</td>
<td>Inc in contract</td>
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<tr>
<td>Stage 4 (month 1-3)</td>
<td>Aftercare office</td>
<td>Inc in contract</td>
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<tr>
<td></td>
<td>Team attendance on site (8 days)</td>
<td>nil</td>
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<tr>
<td></td>
<td>Peer Review (1 day)</td>
<td>£500</td>
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<td>Stage 4 (month 4-9)</td>
<td>Team attendance on site (9 days)</td>
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<td>Peer Review (1 day)</td>
<td>£500</td>
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<td>Stage 5</td>
<td>POE (TM22 and BUS minimum)</td>
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<td></td>
<td>6 Meetings of Core Project Team</td>
<td>£12k</td>
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<td></td>
<td>(Contractor, Architect, Service Eng, Specialist Contractor)</td>
<td>Inc in POE</td>
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<tr>
<td></td>
<td>Lessons Learnt Report</td>
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<tr>
<td><strong>Total Additional Costs</strong></td>
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<td><strong>£32,000</strong></td>
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for buildability, usability and manageability
Soft Landings primer
A four-page document that provides a basic understanding of Soft Landings, and how the process runs through from project inception to design, and through to building operation and aftercare.

The Landings Framework
Includes all the procedures for applying Soft Landings, plus checklists and generic workplans.

Soft Landings for schools
This case study publication reports on how Soft Landings processes have been carried out on the UK schools rebuilding programme.

The case for Soft Landings 1: Energy cost variations
This document explains how the cost of Soft Landings is small compared to the cost variation in a building’s estimated energy consumption. This variation is greater than the nominal cost of the Soft Landings aftercare.

Download free from www.bsria.co.uk/services/design/soft-landings/
Recent developments

March 2011  The Innovation and Growth Team called for UK Government to promote Soft Landings

May 2011  Adopted within the Government Construction Strategy

October 17th 2011  Cabinet Office-led Soft Landings working group established

Aim for Sept 2012  To create Soft Landings for UK Government Procurement

(Also likely to be referenced in Building Regulations)

Design for buildability, usability and manageability
Government Soft Landings: BIM Process Map
Case Study: Ashburton Court, HCCC

Over 60% of built estate 60’s & 70’s system build.

Design for buildability, usability and manageability

44% reduction
Elizabeth II Court: BUS survey results

2008 survey

Design for buildability, usability and manageability
Case Study: Estover College, Plymouth

- The architect and Kier Western developed checklists for each soft Landings stage and ran these alongside standard handover processes.
- It was found that ICT needed much more thought. Late attempts at integration could cause difficulties with servicing, energy use, comfort conditioning and daylighting.
- Key outcome: Involve the providers of furniture, fixtures and equipment (including ICT) in good time, and alongside the main contract.

**KEY PROJECT DETAILS**

- **Client**: Plymouth City Council
- **Location**: Plymouth, Devon
- **Architect**: Feilden Clegg Bradley Studios
- **Consulting engineer**: AECOM
- **Builder**: Kier Western
- **Cost consultant**: EC Harris
- **M&E contractor**: Mitie
- **Gross floor area**: 15,500 m²
- **Student numbers**: 1206
Institute of Architecture and Design
• £61 million, 18,310sqm GIA, 7000 students
• BREEAM ‘Excellent’ objective
• Soft Landings ‘built in’ to project development, tender, D&B contractor’s proposals
• Soft Landing Champions
• Wilmott Dixon-operational review, pre and post handover, 2-3 year aftercare
• Occupation in September 2013.

Design for buildability, usability and manageability
Case Study: Heriot Watt Eco-village

A WORLD LEADING STANDARD TEST FACILITY FOR LOW CARBON RESEARCH

• Government Policy to deliver Affordable housing that meets 2016 Carbon Emission targets

• HWU will deliver first class science in support of this policy

• By investigating the system performance of construction, technology and human behaviour

• Domestic Soft Landings Case Study

Design for buildability, usability and manageability
Case Study: Soft Landings After Care

Design for buildability, usability and manageability

2000 kWh/day, or £200 per day at 10 p/kWh, or £40,000 a year saving
Soft Landings Business Case

Assets designed to meet operational outcomes and user needs
Smoother handover between Contractor and Operational Teams
Extended Aftercare service to optimise asset performance

= Lower Energy Use and Costs
Lower Carbon Emissions
Lower Maintenance Requirements
Higher occupant satisfaction
Better perceived occupant productivity and health

Design for buildability, usability and manageability
Soft Landings

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