

Background

People might expect the construction industry to know everything about the performance of the buildings it builds and refurbishes. In practice, this rarely happens. Designers design (and sometimes inspect), constructors build, and everyone goes away once the work is handed over.

As a result, there can be big differences between what the client expected and how a building actually works. Often the occupiers never quite understand the design intent, systems never get fine-tuned to suit what actually happens in operation, and niggles never get dealt with. Since design and building team members do not get feedback routinely, they may well go on to repeat the same old mistakes. They may also focus innovations on exciting new things (which may not work as intended), and neglect important principles and details that tend to cause problems.

Vehicles like the PFI might be thought to address this discontinuity. However, inside the package one often finds the same old divisions of responsibility. Sometimes disconnects between intent and actuality can even be exacerbated, for example where designers lose authority after a contract is signed, or where a whole project is sold on to a completely different team.

What is Soft Landings?

Some people are now calling for routine post-occupancy evaluations (POE) of all school projects. However, this alone is not enough. POE mustn't only be a post-mortem, making us wiser after the event. Insights from POE must also influence briefing, design, specification, construction, commissioning and handover, so clients, designers and builders can take more account of how their building is likely to perform in use, and achieve better performance where they can.

Fortunately, a process called Soft Landings already offers a way to start doing this. It was initiated by architect Mark Way and researched with a team at Cambridge University. In 2008 an industry group was set up to consider its wider application; and oversaw the *Soft Landings Framework* document, published by the Usable Buildings Trust and BSRIA in July 2009¹.

Soft Landings is not prescriptive: you can make it your own. It will help everybody to get a better building by focusing the whole design, construction and commissioning process more sharply on obtaining good performance outcomes. It can help to avoid some of the pitfalls that lead to problems cropping up after handover, or even before. It should save you, not cost you: a little more effort at the right time will help people to avoid the costs that mount up when things go wrong; and the completed building will serve its occupants better and cost less to run.

Soft Landings not an alternative procurement system. It is more of an attitude of mind, a **Golden Thread** that runs alongside your chosen method, improving the focus on outcomes and helping to make sure that continuity is maintained. It provides more emphasis in five main areas:

1. Inception and briefing.
2. Managing expectations during design and delivery.
3. Preparing for handover.
4. Initial aftercare in the weeks immediately after handover.
5. Extended aftercare and feedback over the first three years of occupancy.

The approach helps to pass on knowledge, capture learning from experiences, reduce credibility gaps between expectations and outcomes, and provide a vehicle for POE and feedback.

How can you build this Golden Thread into your projects? Some key steps are identified below. You will be doing some already, but Soft Landings helps to tie them together and maintain the thread. The *Framework* document provides more background. UBT is now working on applying Soft Landings principles to schools, while a user group is exploring details, assisted by BSRIA.

¹ A pdf can be downloaded from www.usablebuildings.co.uk and www.softlandings.org.uk

Soft Landings – Key steps

Stage 1. Inception and briefing

You can inject Soft Landings (SLs) thinking into a project at any stage. However, it works best if clients ensure that SLs is part of a project's culture at the outset. Everybody joining the team will then know that it is a SLs project, commit themselves to taking more account of outcomes, and be clear who is doing what. SLs is not just for the design and building team: the client team must participate fully and bring in the people who will use and operate the building, where they exist.

Define roles and responsibilities

A project manager should be able to incorporate SLs activities into the running of a project. In addition, another team member should also take the role of "SLs Champion", a devil's advocate that can raise issues, challenge team members, and suggest when a review or advice might be required. Who you choose will depend on the person's character, enthusiasm, and ability to take an independent view. You may also wish to include an independent adviser or facilitator.

Review past experiences

All project participants should meet and share past experiences in an open manner, allowing the project to benefit from positive lessons, and plan how to avoid the negative ones.

Set design and performance targets

Targets need to be stretching but realistic, informed by a shared understanding of how comparable buildings have performed. They should take proper account of how the building will be used, and the capabilities of the people who will occupy and manage it, as it is easy to make things too complicated. If specific means of post-occupancy evaluation (POE) are identified, the design team should be aware of the issues they will cover, the criteria used and the implications of past findings: they can then work more effectively towards achieving good outcomes.

Plan to include design reviews and sign-off gateways in the programme

Agree when the design will be reviewed routinely by the team, and when to involve others, e.g. the client, user representatives, and sometimes independent advisers. Any sign-offs should check the relevance of the performance targets, and not just the progress made to meet them.

Stage 2. Design development

Through design and then construction, aspects of a project will begin to deviate from the original intent. The SLs champion can then help to ensure that issues get aired, the implications of any agreed changes are understood, and that the stated design intent is updated as necessary.

Review the developing proposals

SLs reviews can often be part of normal design team meetings, bringing a focus on performance, usability and manageability of the product, and on how anticipated outcomes (e.g. for energy and CO₂) relate to design intent, benchmarks, and to other relevant buildings. At critical stages one can bring in independent experts to help pinpoint particular problems and solutions, and/or open up the discussion to a wider cross section of people with different jobs and levels of seniority.

Develop explanatory guidance on how the building is intended to work

To accompany the design data, it helps to prepare an illustrative narrative of how the building will work from the point of view of users and the building manager. This need not be extra work, as it can evolve into handover documentation, including O&M manuals, user guides and the log book.

Tender documentation and evaluation

Tender documents need to identify SLs procedures including toolbox talks, quality checks, robust procedures for testing and commissioning, a programme for adequate preparation for handover, and identification of requirements for post-handover support. Tender evaluation must take into account the understanding and commitment demonstrated by the tenderer.

Stage 3. Prepare for handover

Handover and practical completion is an important contractual milestone, but by no means the end of the line. SLs sees it as an event within a carefully-planned “finish” stage, at which a building is transferred in a good state of operational readiness from design and building team to the users and operators, who then obtain insight and assistance from an aftercare programme. For this to work best, the occupier’s management team need to be closely involved in the preparations and ready to take over the operation of the building. Otherwise, they will miss opportunities to learn about the design, technical systems and user interfaces, sometimes for ever.

Agree a programme for building readiness

The client, design and building team, occupiers and operators must agree sub-programmes to prepare for Stage 3 building readiness during the two or three months before handover. They should also review the occupier’s move-in plans.

Involve the occupiers

Clients need to ensure early involvement of representatives of building users and management, including operating staff who are skilled and knowledgeable enough to comment on the systems they will inherit, agree details (e.g. of user interfaces to electronic building management systems (BMS)) and receive and make good use of training, both before and after handover.

Plan for aftercare

In preparing for Stage 3, you must also plan for Stages 4 and 5, Initial and Extended Aftercare. You can find more detail in the sections below. The following items will need considering:

- Membership of the aftercare team. For most projects, one or two people coming in once or twice a week for the first few weeks after handover can make a big difference.
- A “home” in the building (not the site hut), for aftercare team members to work, experience the building, and be seen by occupants, e.g. with “surgery hours” to discuss questions.
- Proper resourcing by the occupier. The aftercare team is there to help the occupier, pass on their knowledge (and take back the experience) and identify issues that need to be tackled. If the occupier has not got the skills and resources to listen, much of this effort may be wasted.
- Arrangements for data collection and review, starting with the occupier’s record keeping, e.g. for energy use, environmental conditions and user comments and action requests.
- Post-completion commissioning and fine tuning programme, including any Stage 3 items outstanding at practical completion (as often happens if the occupier is in a hurry to get in).
- Confirmation of the independent POE work planned during Stage 5, with budgets set aside for this work to be done and reviewed.

Bring together handover documentation

Buildings come with a lot of handover documentation required for statutory and other purposes, e.g. commissioning records, O&M manuals, Health & Safety files, and energy submetering proposals. SLs includes procedures for getting these verified, signed-off and suitably filed. In addition, SLs also encourages production of guidance that is often absent, in particular a plain English user guide for occupants and a technical guide for management. Where these have been drafted as part of design development (see Section 2), they will already be familiar, and will only need final revisions.

Make arrangements for routine maintenance

Arrangements for routine maintenance also need considering, and put in place as soon as possible after the building is complete. Delays will lead to uncertainties. It can be helpful to include the first year’s maintenance in the construction and installation tender requirements, as this provides single point responsibility and helps to stop arguments about who did what. However, the work needs to be overseen independently, or problems may get buried.

Stage 4. Initial Aftercare

The initial aftercare stage covers the user's settling-in period of typically 4 – 6 weeks. A designated member or members of the design and building team visit at regular intervals to experience the building in use, pass on their knowledge, respond to queries, help to resolve emerging issues, and identify the need for any further support that may be necessary.

What the occupier should do

- Make sure a “home” space with data link is available for the aftercare team, and that occupants know where it is and when team members are likely to be there.
- Arrange one or two meetings for the aftercare team to explain the building to its users.
- Plan for suitable FM support and meetings when the aftercare team is on site.
- Establish means of two-way communication between the aftercare team and occupants, e.g. via newsletter or intranet, so occupants can be aware of any issues arising and advice given.

What the aftercare team should do

- Confirm who the key members of the team will be, and when they will visit.
- Roam about the building opportunistically, making critical observations of how it is being used, how plant is operating, and with spot checks of environmental conditions etc..
- Have regular meetings with the FM team to explain the design intent, to discuss and investigate any problems that arise, and participate in training sessions, e.g. for the BMS.
- Review any fine tuning activities, e.g. by commissioning engineers.
- Review initial data being collected, e.g. from energy meters and submeters, for compatibility with design expectations. Investigate any anomalies.

Stage 5. Extended aftercare, monitoring & post-occupancy evaluation

Once the initial aftercare stage is over, the SL service becomes one of periodic reviews.

- In Year 1, the main objective is to help everything to settle down, with reviews every three months or so, unless there are specific problems to be investigated.
- In Years 2 and 3, the reviews become less frequent, say every six months, and examine the operation of the building and its performance, and associated survey and monitoring results.

What the occupier should do

The occupier is now fully responsible for running the building. They need to:

- Collect and review building performance information routinely, e.g. BMS logs, meter readings, helpdesk complaints from individual users, changes made, and fine tuning results.
- Send collated information to the aftercare team for further review, as outlined below.
- Exchange information about problems and solutions, and update manuals where necessary.
- Assist independent post-occupancy surveys and reviews.

What the aftercare team should do

The aftercare team can provide insights, review performance and help users and operators to get the best out of their building, but should not make up for any inadequacies in the FM service.

- Confirm mechanisms for receiving data from site, e.g. through reports from the occupiers and direct links to the BMS and other monitoring data, and for updating newsletters etc..
- Review performance in relation to design intent, published benchmarks, and other buildings.
- Identify any trends and anomalies, and needs for attention or fine tuning, and alert FMs.
- Prepare a written end of year review, and a short intermediate 6-monthly reviews.
- Undertake walkabouts to observe the building in use and identify emerging changes.
- Arrange commissioning revisits for fine tuning, for seasonal adjustments or emerging issues.

Independent post-occupancy surveys and reviews

POEs will often include reviews of technical and environmental performance and a questionnaire survey of occupant satisfaction. Doing these independently provides objectivity and allows insights to be injected from a range of other buildings. The results then need to be discussed with all stakeholders to explore the issues raised, to capture the learning, and to help everybody to improve the future performance of the building and of their organisations and processes.