LEV LOCAL EXHAUST VENTILATION 2024

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Hosted by

BOHS British Occupational Hygiene Society

Designing and commissioning an effective LEV system

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LEV Design Plan of Work

0

Strategic Definition

- Have we done the hierarchy of control?
- Do we need LEV?

Stage outcomes

Client Requirements are integrated into the **Business Case** and **Project Brief**, which includes unambiguous targets

Who:

Only the client team is involved at this stage with potential consultation with LEV consultant or Occupational Hygienist to help identify requirement.
The client team may seek advice from a wide range of professional advisers to help them develop the Client Requirements and Business Case that will achieve these.

1

Preparation and Briefing

Clients' requirements ⇨ Project Brief

- What is the substance?
  - SDS for products
  - DSEAR requirement
- Who is exposed?
- Other concerns e.g.
  - Noise
  - Hours of usage
  - Access
  - Location
- Type of plant required?

Quality Aspirations e.g., Level control/operator exposure to be achieved when controls are in place.

Stage outcomes

A site specific Strategy is included in the **Project Brief**.

Outcomes are defined, measurable and are shared across the project team.

Requirements for **Post Control Solution Evaluation** and handover and **Aftercare** defined.

Who:

Stage 1 involves only the client team & LEV Consultant. The skills required will vary depending on the specific needs of the client and the project. Developing the Project Brief and the other outputs of this stage are skills that can be provided by specialists, who can also assist on selecting the design team. The Feasibility Studies might need hygienist, and engineers to assess key project risks.

2

Concept Design

Discussing LEV concept design with end users and other stake holders.

May include:

- Mock-ups of hoods
- Trials
- Sketch designs
- P&ID schematics
- Controls schematic
- Cost estimates
- Estimate of time frames

Stage outcomes

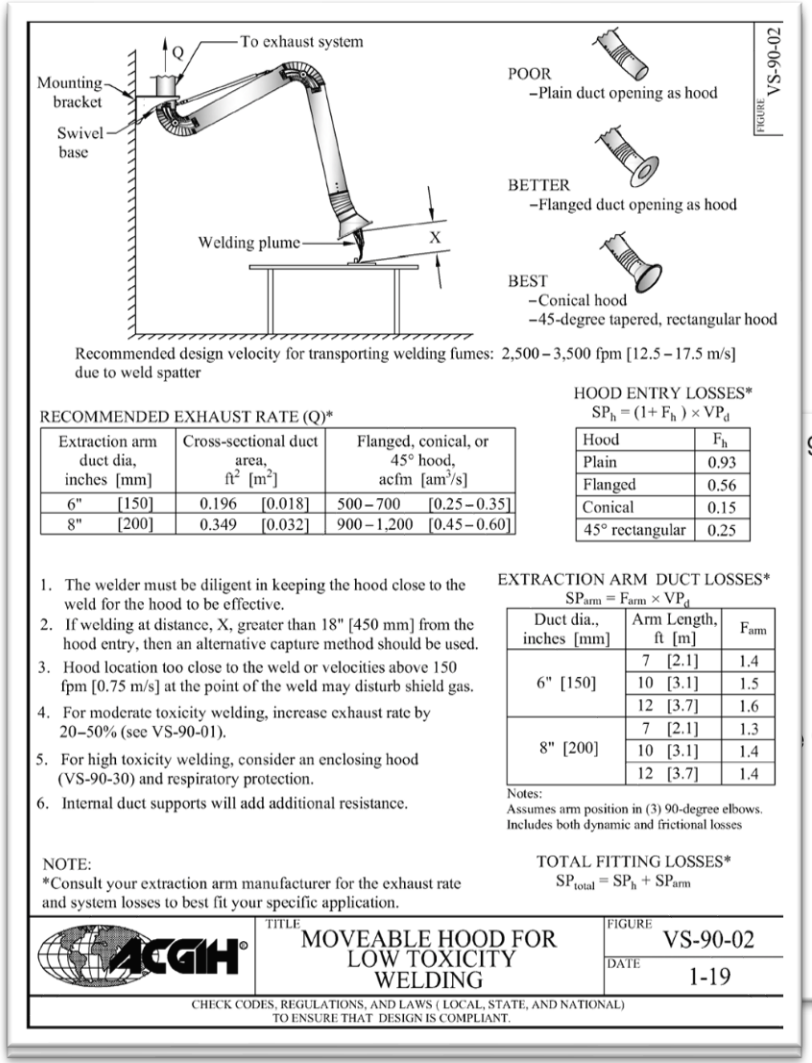
The **Concept** design integrates the Strategy with the **Project Brief.**

Outcomes are included in the **Outline Specification** and **Cost Plan**.

Who:

The client team and the design team are the key players in this stage, along with any specialist consultants, whose contributions are required to achieve a concept that is both robust and aligned with the Project Brief. Under some procurement routes, the construction team may also be engaged in this stage.

What is concept design?



9 applies to:

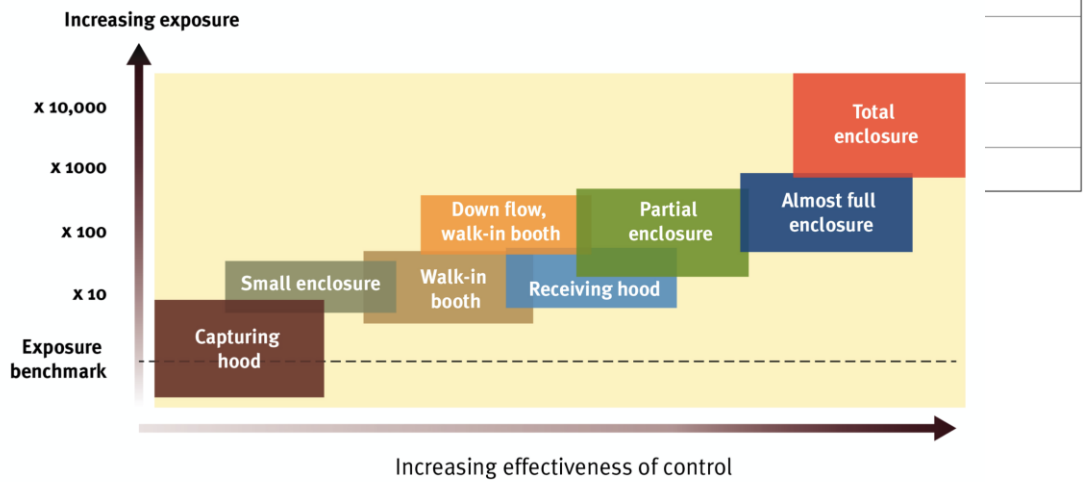
9 applies to:

Example: Welding

- What are they welding?
- How are they welding e.g., bench/frames
- LEV options to consider:
  - Bench
    - Size?
    - Velocity?
  - On-tool
    - Torch amperage?
  - Capture hood
- An
- Filt

Table 9 Capture velocities

Contaminant cloud release	Example of process	Capture velocity range, m/s
Into still air with little or no energy	Evaporation, mist from electroplating tanks	0.25 to 0.5
Into fairly still air with low energy	Welding, soldering, liquid transfer	0.5 to 1.0



3

Spatial Coordination

Will include:

- Sizing of:
  - Hoods
  - Ducting
  - Filters
  - Fans
- Design of controls
- Layout of system (drawings etc.)
- Accurate pricing of supply and installation
- Proposed program of works

Stage outcomes

System design and co-ordinated with other services & structural elements and design coordinated with the Strategy, which is made explicit and included in **Statutory Submissions** and the **Stage Report**.

Include a plain English description of the controls strategy and systems.

Cost Plan, **Planning Application** and **Outline Specification.**

Who:

The lead designer and design team are key to this stage. The client team are involved where Stage 3 coordination requires client decisions. The construction team may also be involved if the selected procurement route requires early contractor or specialist subcontractor inputs.

4

Technical Design

Will include:

- Sizing of:
  - Manufacturing drawings
  - Builders work details
  - Bracket & support system details
- Risk Assessments and Method Statements for installation
- Servicing requirements

Stage outcomes

Manufacturing Information and **Installation Information**, including specification, drawings and the performance parameters.

Who:

The design team and the specialist subcontractors employed by the contractor complete the design in this stage. Under some forms of procurement, a client monitoring team may be appointed to review the information that is produced.

5

Manufacturing and Construction

Will include:

- Manufacture and installation of the system
- Preliminary commissioning
- Commissioning
  - Air monitoring static / personal?

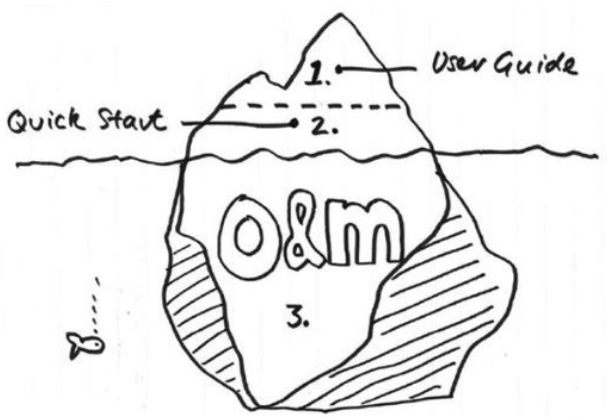


Figure 6: Sketch diagram, Mike Chater 2019

Stage outcomes

Check that adequate commissioning and maintenance contracts are in place.

Identify **Aftercare** representative(s) and when they will be available on site.

Complete the plain English **User Manual.**

Asset Information, including **User Manual**, complete and disseminated.

Who:

The installation team take centre stage at Stage 5. The contributions from the client team and design team will depend on the Procurement Strategy, and on how the client decides to review Construction Quality as installation progresses.

Commissioning

Commission in 3 Stages

Stage 1 Thorough Visual Examination

Stage 2 Measure/Examine Technical Performance

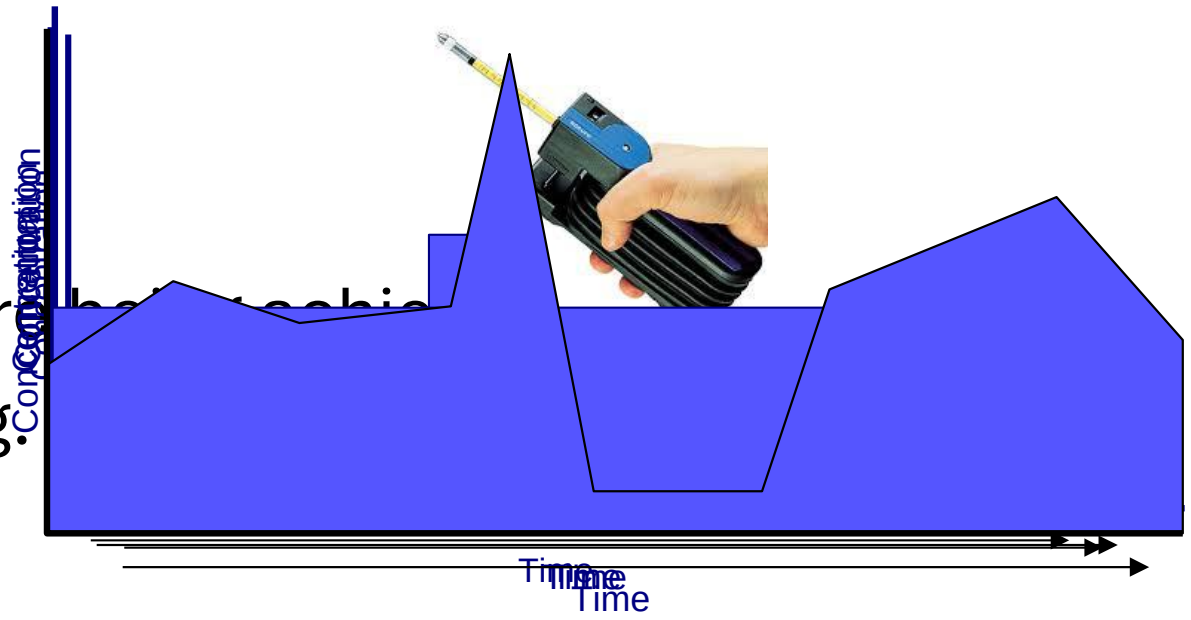
Stage 3 Assess if Worker Exposure is Adequate

Commissioning

Three aspects to commissioning:

1. Check everything has been installed in accordance with the design.
2. Check level of control being achieved, including:
    1. Proportional balancing,
        1. Air volume flow rates and record velocities,
        2. Pressures achieved at design duty,
    2. Qualitive assessments,
    3. Quantitative air monitoring.
3. Confirm the **DESIGN benchmarks** ar
4. Set the benchmarks for future testing.

Continuous Monitoring



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Handover

Will include:

- Client Witnessing of key performance elements
- User training
- Issue of handover documentation including:
  - O&M Manual
  - Logbook
  - Commissioning report
  - Servicing requirements

Stage outcomes

Training of users and managers with reference to the System Strategy.

User Manual issued to facilities managers and users.

Aftercare carried out as per Service Plan for Use protocols.

Project Feedback gathered and reported to project team to help improve their organisational performance on future projects.

Who:

The installation team and those responsible for administrating and closing out the contract complete the project in Stage 6. The project team will be required for a Project Performance session i.e. witnessing system performance!

7

Use

Will include:

- On-going User training
- Servicing requirements
- Routine TExT
- Changes to the system or process

Stage outcomes

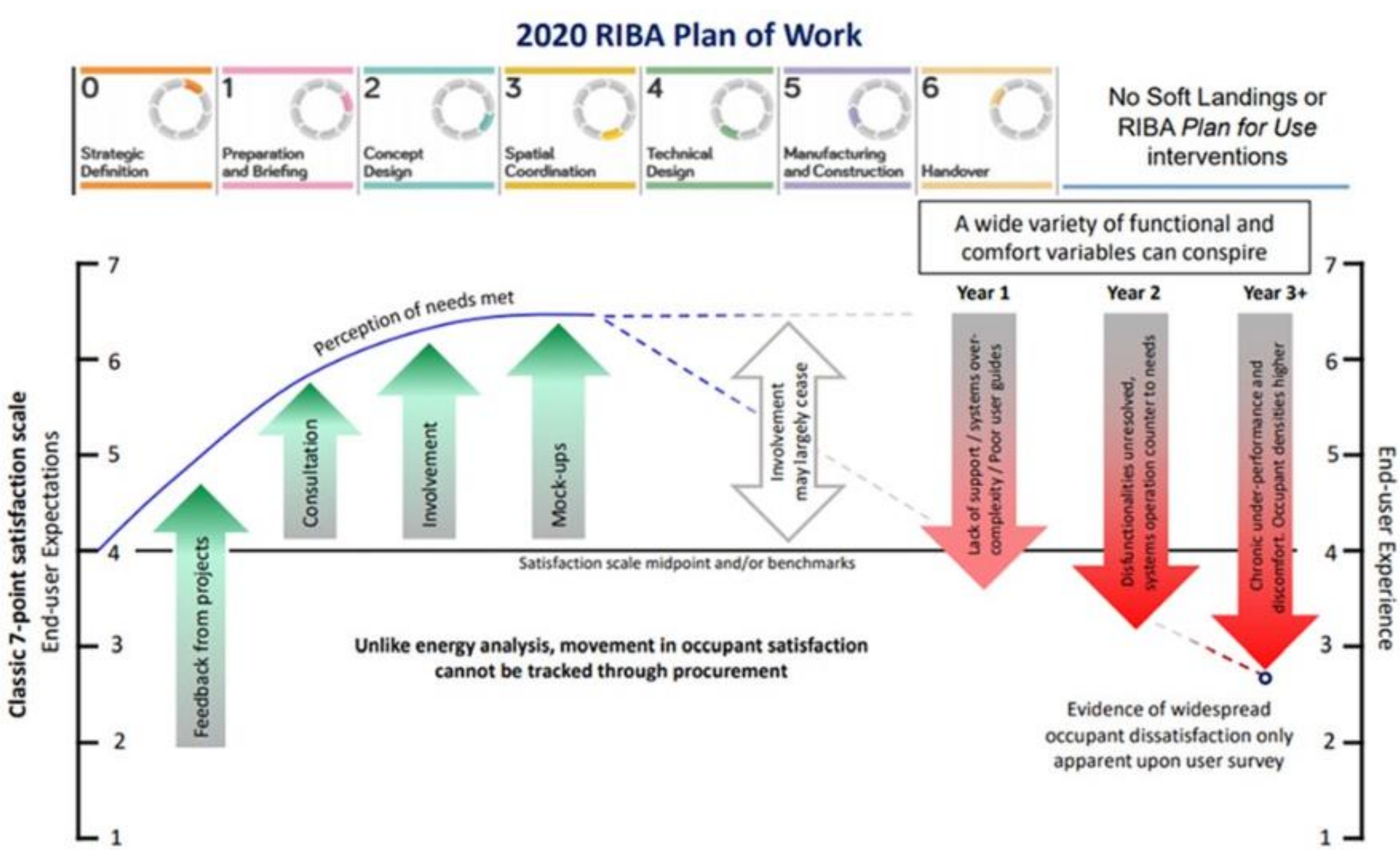
User feedback derived lessons learned fed back to all stakeholders.

Knowledge shared and performance outcomes published where possible.

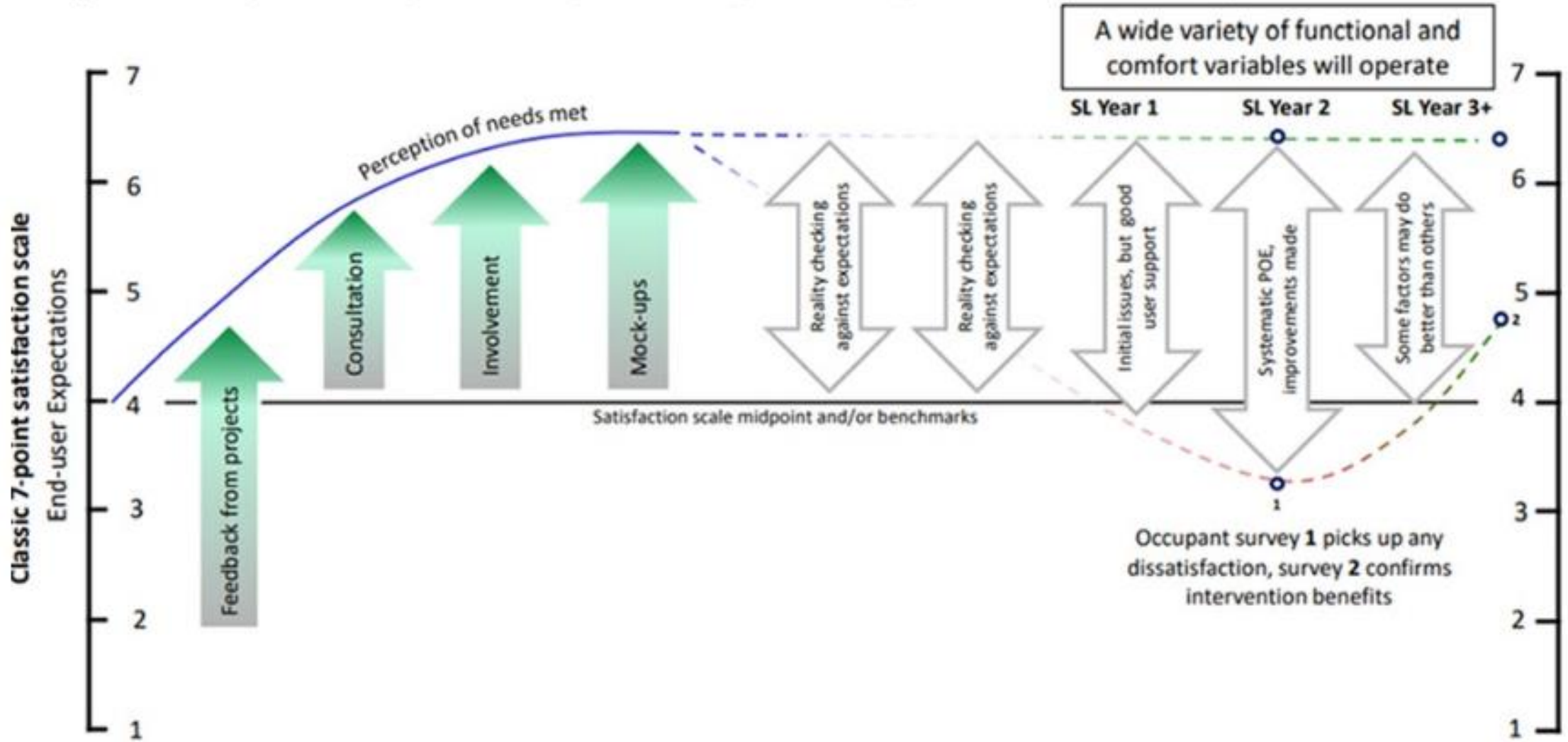
Feedback used to drive performance in use improvements to optimise building performance.

Who:

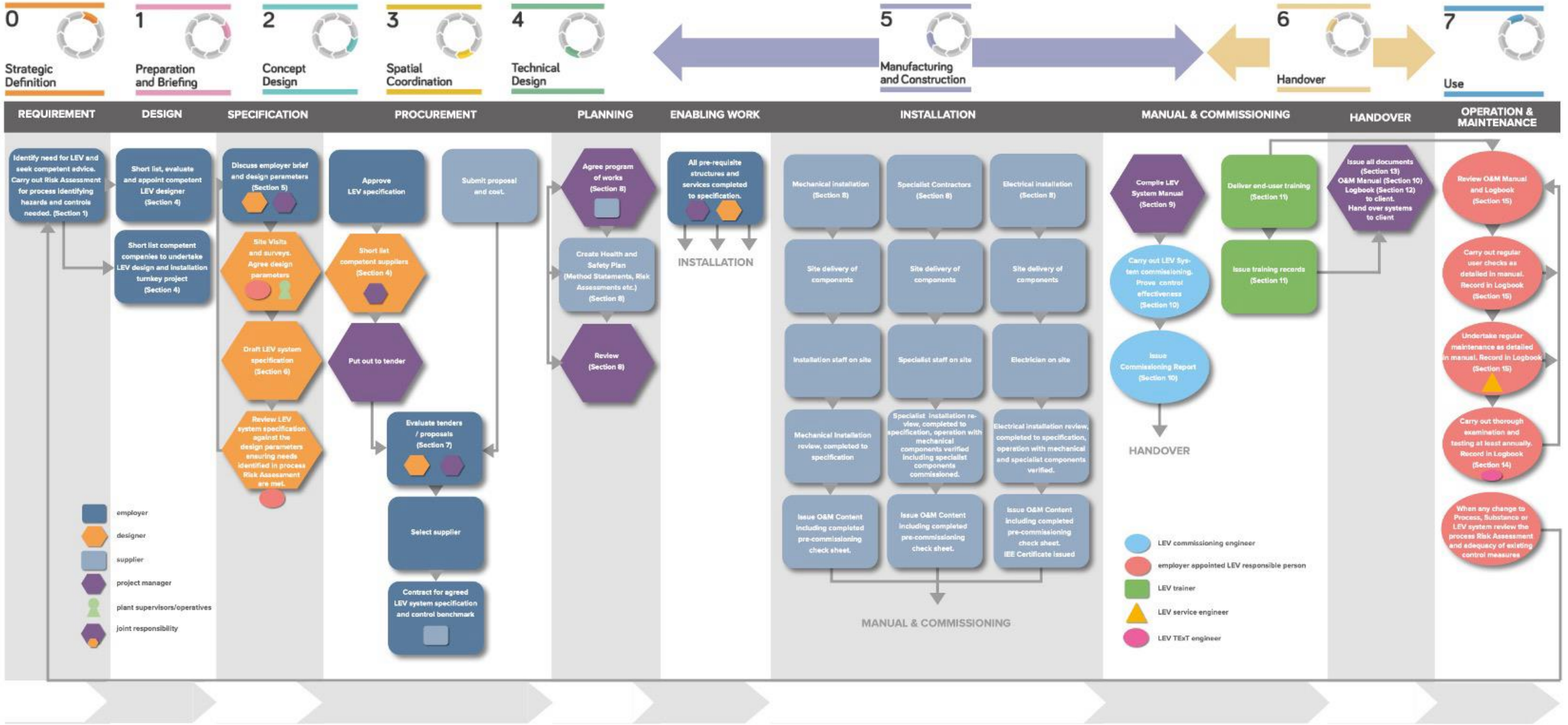
Those involved in ongoing Asset Management and Facilities Management will support the users of the system. The design team and construction team will no longer be involved, but design team members may be appointed separately to carry out Post Occupancy Evaluation tasks and some clients may require longer term strategic advice.


2020 RIBA Plan of Work
0 Strategic Definition
1 Preparation and Briefing
2 Concept Design
3 Spatial Coordination
4 Technical Design
5 Manufacturing and Construction
6 Handover
No Soft Landings or RIBA Plan for Use interventions
A wide variety of functional and comfort variables can conspire
Year 1
Year 2
Year 3+
Classic 7-point satisfaction scale
End-user Expectations
End-user Experience
Perception of needs met
Feedback from projects
Consultation
Involvement
Mock-ups
Involvement may largely cease
Lack of support / systems over-complexity / Poor user guides
Disfunctionalities unresolved, systems operation counter to needs
Chronic under-performance and discomfort. Occupant densities higher
Satisfaction scale midpoint and/or benchmarks
Unlike energy analysis, movement in occupant satisfaction cannot be tracked through procurement
Evidence of widespread occupant dissatisfaction only apparent upon user survey

2020 RIBA Plan of Work Sustainability overlay with Plan for Use (Soft Landings)



CIBSE BESA TR40 LEV Guide to Good Practice



blications used in this presentation