

Introduction to Global Design Management (DM) Practice - Bovis Lend Lease's Systems and Procedures for DM -

Ben Salmon, Bovis Lend Lease's Country Manager



김효진, Bovis Lend Lease's Project Manager



Introduction

Design Management is concerned with ensuring that the right quality of building design information is produced at the right time and then conveyed to the right people. Historically this has been the responsibility of the lead designer; architect or engineer. However, as Global building practice has changed with moves away from site based skills towards pre-fabrication of components and site assembly, the complexity of the task has increased resulting in a re-definition of responsibilities.

Design Management has arisen as a result of a change in the industry i.e. the increased use of specialist designers, trade contractors and main contractors who are now taking responsibility for the design. The increased number of specialist designers and specialist subcontractors contributing to the overall package of design information required to practically realise a project has created the need for a defined approach to their direction and co-ordination with a new single point of responsibility. Design Management responds to this need and attempts to improve the efficiency of the design process and its integration with the construction process.

Senior project team members need to be aware of the Design Management needs of a project, the processes involved, and how it affects

their responsibilities. The specific design management input to individual construction projects will necessarily differ greatly and therefore a rigid dictation of the tasks involved is not possible.

The aim of this paper is to introduce Bovis Lend Lease's (hereinafter refer as "BLL") global practice's regarding design management. It is about identifying the activities and interaction of project and design team members and outside agencies, and the level of information required from them, at different stages in the design and construction processes. Systems and procedures used to attain and document this required information form the body of this paper.

This paper focuses on a few selected steps in each phase of design management rather than try to explain them all. Accordingly several design management tools will be given as demonstrative examples but are not exhaustive.

How do we define Design Management and Design Manager?

Design Management is about getting the right information produced at the right time and conveyed to the right people. So it's about Quality, Communication and scheduling. Design Management responds to a need to give direction, improve the efficiency of the design

process and facilitate its integration with the construction process. It bridges the gap between Design and Construction.

We are aware that there are different functions carried out by the Project Manager and the Design Manager roles as they exist within BLL. Within Bovis Lend Lease Design Management falls into two distinct areas related to the Pre-construction and Construction phases.

Pre construction Design Management is carried out within the BLL Programme Management consultancy service and includes Developing the Client Brief, Design Procurement Strategy, Consultant team Selection etc, which will be described in more detail in the next section. To protect the client's risk on any form of contract method the Design Manager's role will cover all or part of the following:

- Defining the Consultant Team's Scope of Work
- Selection of Consultant Design Team
- Preparing a Design Management Strategy
- Establishing, agreeing and monitoring the Design Programme
- Carrying out design audits to confirm completeness, technical competence & within cost allowances
- Conducting regular design workshops / reviews

- Establishing methods to ensure co-ordination is carried out
- Defining requirements for consultant design scope and deliverables
- Defining specialist trade contractors design scope, deliverables, programme and interfaces at each stage
- Identifying potential for standardisation / modularisation
- Undertaking value engineering studies
- Ensuring design information release is co-ordinated with the OTT schedule
- Ensuring the design development mirrors the construction methodology
- Management of potential change
- Carrying out Value Management reviews to ensure the design meets the clients expectations and is within cost
- Achieving client sign-off

In short the Design Manager has full responsibility for managing the design process whether the design team is innovated to us or selected and appointed by ourselves. When the Principle Services Agreement is passed on to BLL the Design Manager reviews and comments at the outset and then monitors the design input and output to ensure that the Design Team carry-out their agreed responsibilities. The Design Manager is often full time on a project, particularly in the early stages and his/her duties can be taken over by the package manager

as works proceed on site.

Manage Design Process Overview

It is critical for every large organisation to have a system which describes "the way things are done here". The Manage Design process is the result of documenting the way design projects are managed. The documentation is based on the BLL's knowledge and experience of managing projects. The process also incorporates the benefits of new technologies to improve the execution of tasks.

The objectives of the Manage Design process are to:

- gain consistency in procedures and standards
- maintain focus on correct actions to achieve business objectives
- "get it right" the first time and rely on less reviews
- reduce duplication of effort
- provide relevant tools and knowledge
- define part of the new business model
- reduce risk at all stages of the project

Successful project management involves the collaborative efforts of all BLL staff. In BLL, we have generalists and specialists, each contributing their own skills to achieve maximum potential within themselves and others.

The Manage Design process is

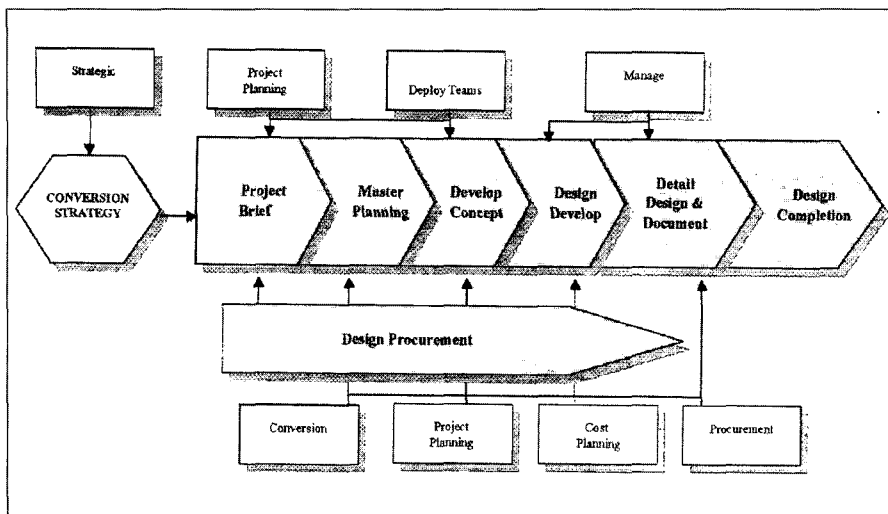


Diagram 1. Design Process

made up of 7 phases. The flow of the phases is shown in Diagram 1. The phases are generally followed in the order shown, with the exception of the Design Procurement phase, which can happen at various times throughout process. Each phase contains a series of steps that need to be performed. Diagram 1 shows the overview of the Manage Design Process and its links to other BLL process.

As shown in Chart 1, it is obvious that we have higher value improvement potential in the early phase of a project. In other words, we have better chance

to enhance "Value" with smaller cost to implement if we start to manage the project in the earlier phase. This is why BLL put more stress on project brief phase as well as design phase.

For this reason, we have selected Phase 1, Project Brief and Phase 4, Design Develop. Each phase is comprises a series of "Steps". The important step will be selected to provide comprehensive explanation with the tools as examples of BLL practice in the next section.

Phase 1 – The Project Brief Phase

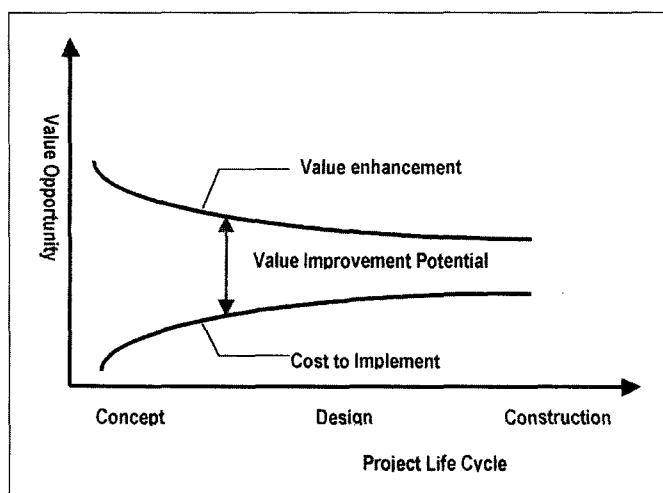


Chart 1. Diminishing potential of Value as the design progresses

the commencement of design. No design is conducted in the Project Brief phase of the Manage Design process. Authority must be given from the Client in writing to proceed with the design.

The benefits of the Project Brief phase are:

- a basic foundation for good design and value generation
- increased motivation and innovation
- less chance of incurring additional fees for abortive work
- reduced risk due to the communication and co-ordination between the various team members
- less risk to both the Client and BLL due to clearly identified needs and restraints

The steps in the Project Brief phase are as shown in Diagram 2. Among these steps, Step 3 – Commence Project Brief Research is recognized as the key step in this phase as it should give a clear direction to the next subsequent steps and also shapes the project.

A. Project Brief Step 3

– Commence Project Brief Research

The following sub-steps are the list of the recommended steps to commence Project Brief research.

I. Identify Client needs : Identifying Client design needs assists to gain Client approval of the requirements of a project. This can minimise and help to reconcile the restraints that may

limit how the Client's design needs can be satisfied. Some methods useful for defining needs include:

- Reviewing source material (documentation, reports, etc) provided by the Client
- Reviewing relevant material available from within BLL
- Interviewing the Client
- Conducting demonstrations of similar project types, by visits or pictorial representation
- Reviewing market survey information
- Consulting expert advice (form within BLL or external as appropriate)

II. Identify restraints and environment risks :

Most restrains should be identified in the initial phase of needs identification, but should be reconsidered as the project progresses. All suggested restrains should be critically examined to ensure that they are real and are based on adequate information. A special mention should be made of environmental considerations. BLL believe all damaging occurrences are preventable. Environment, health and safety issues must be tabled in the Project Brief and included as a key value engineering issue.

III. Develop Business and Development

sections of the Project Brief : Use the information gathered during the needs and restraints identification to develop these sections of the Project Brief.

IV. Conduct formal Review : Once the initial facts have been gathered, a formal review should be undertaken between the PMC, BDM and EPM. The EPM can provide an independent perspective and lend their experience to the developing project. This discussion may identify new areas for research or reveal "blind spots" the PMC may have missed through being "too close" to the project. The formal review provides an opportunity for:

- Issues to be discussed
- Risks to be minimised
- An independent party to give a fresh perspective

B. Project Brief Tool

A Project Brief is a summary of facts agreed between BLL and a Client. It is an essential tool used to ensure all team members are working from a common base of knowledge and understanding. By BLL's global standard project management procedure, every project must have written Project Brief. Writing a Project Brief is an essential part of

the way BLL conduct business. The Project Brief tool is a blank template that prompts research and data gathering, stretches thinking over a wide range of issues, produces a Brief for presentation to the Client and design team members and saves time.

It is almost impossible to capture in one place all contingences and variables that may impact a project. Therefore, the Project Brief tool is not prescriptive. It acts as a trigger for the many issues that may arise from the project we are working on. The project manager and design manager are encouraged to apply their expertise and wisdom to question further, and creatively detect the issues associated with the project. When completed, the Project Brief is the point of reference for the team. It is essential that the Project Brief be updated to reflect the latest needs of the Client.

Phase 4 – Design Development

The Design Development phase adds much greater detail to the design concept developed in the previous phase. The purpose of the phase is to generate alternatives within the

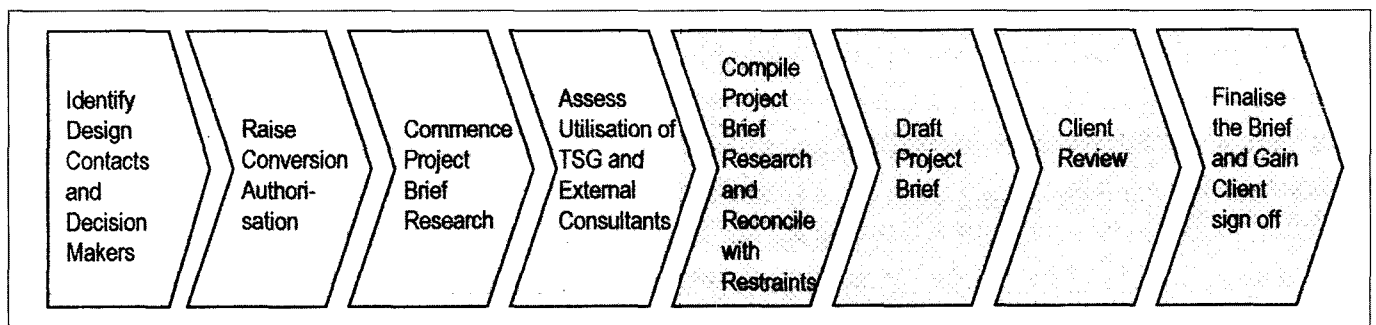


Diagram 2. Steps in the Project Brief Phase

concept outline and consider the construction implications of the design combinations. The alternatives being considered during this phase usually relate to major elements within the concept outline such as structure, facade, services etc.

This phase occurs after Develop Concept and begins the handover from concept to delivery. The benefits of the Design Development phase are:

- Increased customer service by identifying and targeting key Client and market design issues
- Better internal design coordination and proper coordination of outsourced design
- Improved quality of design with less rework
- Seamless handover of design from PMC to PMD with all key design issues considered.

Diagram 3 illustrates the steps in the Design Development phase. Step 7 – Design Review Hold Point and Step 8 – Design Handover and sign off of deliverables will be examined in detail as these steps act as a link between Design and Construction.

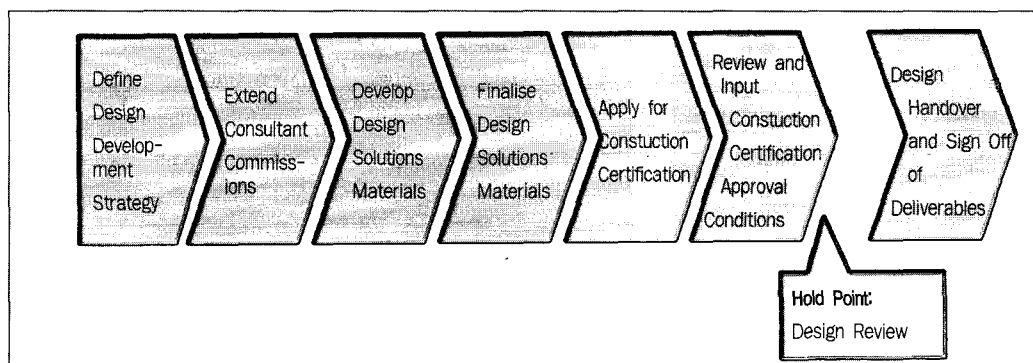


Diagram 3. Steps in the Design Development Phase

A. Design Development Step 7, 8 – Design Review Hold Point & Design Handover

Following sub-steps are the recommended steps to review the project design.

I. Update Brief : PMC updates Brief including all changes made since the original Brief.

II. Sign Cost Planner Certificate : PMC meets with CP to have certificate signed.

III. Arrange and Prepare for Design Review Meeting : Arrange the Design Review meeting with the EPM, Ops Manager, PMC, SPE and CP. In preparing for the Design Review meeting, the PMC needs to ask:

- Does the design match the Brief?
- Is the design fit for purpose? – if not, why not?
- Does the design match the price?

IV. Conduct Design Review Meeting : The Design Review meeting is a formal meeting is held between the PMC, EPM, Operations Manager, PMD, SPER and CP to review the project design. This provides an opportunity for:

- Issues to be reviewed
- Risks to be minimised
- Independent parties to give a fresh perspective

V. Review and Sign off the Project: the EPM reviews and signs off the project.

The handover of Design responsibility from PMC to PMD is the point of completion of Design Development. The main risk at Design handover is a lack of communication between PMC and PMD. This could result in that key Client and market design issues being forgotten and / or that design solutions being changed by the PMD.

B. Design Review and Design Handover Tool

The Design Review Tool should be accessed and refereed to throughout the Manage Design process. It is used particularly during Develop Concept and Design Development phases. The Design Review Tool is used to plan and review the design process and design handover. The benefits of the Design Review Tool are to ensure the design is planned around real deliverables and to ensure effective Design Handover from PMC to PMD. The tools are completed by the PMC, in consultation with the Client and the design team.

Figure 2 is an example of the Design Review Tools.

Conclusion

The BLL design management system has been developed to maximise the valuable skills of each and all professionals engaged in the project and reduce

DESIGN REVIEWS

The following is a checklist questions that may be used in a Risk & Opportunity Review of Design:

ISSUES	QUESTIONS	RELEVANT STAGES (Design Proc is 3)						
		1	2	3	4	5	6	7
Client and Brief	- Do we fully understand the Client's Needs? (Physical, financial, time, quality, environment, facility performance)	✓						
	- Have we got the right brief?	✓						
	- Have we challenged the brief?	✓						
	- Does the brief satisfy the business case?	✓						
	- Has Client signed off this design stage?	✓	✓	✓	✓	✓	✓	✓
Restrains	- Is relevant governing legislation identified?		✓		✓	✓	✓	✓
	- Are all authorities identified?		✓		✓	✓	✓	✓
	- Are there any influencing bodies?		✓		✓	✓	✓	✓
	- Are all site restraints understood?		✓		✓	✓	✓	✓
	- Are there any site or building surveys still required?		✓		✓	✓	✓	✓
Design	- Do we have the best solutions?		✓		✓	✓	✓	✓
	- Do we have too many options?		✓		✓	✓	✓	✓
	- Have we value engineered the best solution?		✓		✓	✓	✓	✓
	- Have we used the right criteria for value engineering?		✓		✓	✓	✓	✓
	- Does design satisfy the brief?		✓		✓	✓	✓	✓
	- Does design satisfy the restraints?		✓		✓	✓	✓	✓
	- Is the design fit for purpose?		✓		✓	✓	✓	✓
	- Are the deliverables understood for this design stage?		✓	✓	✓	✓	✓	✓
Design Procurement	- Is the choice of Design only v D & C subcontractor correct?			✓				
	- Are the consultants capable?		✓	✓				
	- Are scope, program and fees defined?			✓				
	- Is consultant PSA signed?			✓				
Program	- Are the right issues dealt with in the program?		✓	✓	✓	✓	✓	
	- Is the design program properly thought out?		✓	✓	✓	✓	✓	
	- Does the design program fit with project objectives?		✓	✓	✓	✓	✓	
	- Does the design program fit with procurement & construction?		✓	✓	✓	✓	✓	
Design Handover	- Have the disciplines in the Design Plan tool been adopted?					✓		
Roles	- Are responsibilities of PMC and SPE clearly defined?	✓	✓	✓	✓	✓	✓	
Design Estimates	- Are the % paid to consultants normal in this market?			✓				
	- Is the % of design to gross site cost normal in this market?			✓				
Cost Plan	- Does the design match the Cost Plan?		✓		✓	✓	✓	
Procurement	- Does the Design Team understand what Strategic Alliances should be observed?				✓	✓	✓	
Authorities	Have the right Approvals been obtained and all conditions dealt with?		✓		✓	✓	✓	
EH&S	- Does the design satisfy the EH&S requirements of:		✓		✓	✓	✓	
	- Relevant legislation		✓		✓	✓	✓	
	- The Client		✓		✓	✓	✓	
	- LLP		✓		✓	✓	✓	
	- Has the design been reviewed for safety (see Value Eng. Tool)					✓	✓	

Figure 2. Design Review Tool

project costs. This conundrum between cost and quality is to often be simplified to one limited to the Clients ability to provide further project funding. We would offer another conclusion, Design Management being past from pre-construction to the construction team can reduce project costs and enhance the durability of the project design.

Basically, Design Management is recognised in BLL as "Added Value" reducing our risk by:

- Improving the quality of design information produced – getting it right first time
- Auditing the design information for errors, omissions and change
- Bringing skills to the Design Team which they lack – e.g.

design programming

- Defining the interfaces between the packages
- Understanding the design process, raising awareness and expectations
- Bringing 'design it as how we're going to build it' thinking – bringing potential sub contractors into the frame early
- Bringing experience from other similar projects
- Value engineering / management
- Managing the co-ordination process
- Ensuring design output matches agreed expectations
- Design Team sign-off of all sub contractor drawings
- Developing systems to facilitate the design decision making process – e.g. process mapping
- Cost control
- Creating trust and belief within the Design Team

Guide to Acronyms used in this paper
The following table defines the acronyms used for job roles throughout this paper.

Acronym	Full job title
EPM	Executive Project Manager
BDM	Business Development Manager
OM	Operations Manager
PMC	Project Manager Concept
PMD	Project Manager Delivery
DL	Discipline Leader
SPE	Senior Project Engineer
PE	Project Engineer
Cons.	Internal or External Consultant (e.g. Designer)
CP	Cost Planner
CO	Contracts Officer