SOCIETY OF CHARTERED SURVEYORS IRELAND

Managing the Design Delivery

SCSI / RICS Guidance Note

1st edition

RICS the mark of property professionalism worldwide

Managing the Design Delivery

SCSI / RICS Guidance Note

1st edition

RICS the mark of property professionalism worldwide

SOCIETY OF CHARTERED SURVEYORS IRELAND

Published June 2014

Contents

Acknowledgements

This guidance note was produced by RICS and has been adapted for the Irish market by the Society of Chartered Surveyors Ireland Project Management Surveying Professional Group. The RICS 'Managing the Design Delivery' Guidance Note (GN 76/2012) provided a foundation from which this document has emerged. Some alterations have been made in order to produce a bespoke guidance note more suitable to Ireland reflecting Irish legislation and construction disciplines.

Project Management Surveying guidance note working group

- Derry Scully FSCSI, Bruce Shaw, Kestrel House, Clanwilliam Place, Dublin 2.
- Brendan McGing MSCSI, Brendan McGing & Associates Ltd, 1-3 Fitzwilliam Street Lower, Dublin 2
- Liam Murphy, MSCSI, LJM Quantity Surveyors and Project Management, Bray Co. Wicklow.
- Kevin Sheridan FSCSI, Independent Consultant, Dublin
- Greg Flynn MSCSI, AECOM, 24 Lower Hatch Street, Dublin 2.
- Paul Mangan FSCSI, Director of Buildings, Trinity College, Dublin 2.

Foreword

This guidance note covers managing the process of delivering design in the context of construction projects. It is not a treatise on design practice, nor is it specifically about managing a drawing office.

The process of delivering design starts with the client's brief and ends up as a design delivered by the project team in a way that is timely and aligned with the requirements of the contract.

Design delivery management (DDM) is therefore a key process connecting links in the construction value chain. It is an essential connection between the interpreted response to the client's needs (which is what the design is in essence), and the construction process, which brings that response into reality as a building, structure or facility. The idea of DDM is universal to projects of any size and any location. It applies anywhere in the world, under any form of project management and any legal system and contractual form. It applies to multiple projects, programmes or portfolios with their own management structures.

It also refers to one of the areas in the construction process where mistakes are made most frequently, and made repeatedly. These problems extend from misinterpretations of the brief (or toleration of an inadequate brief) to the supply of information that is late, uncoordinated or plain wrong. It is undoubtedly true that the cost of poor information in terms of disruption and wasted energy is very high. If the design delivery was reliably right, many of the problems of construction would disappear.

The people who are responsible for managing the design delivery may seem to have a formidable task on their hands, if all is to progress smoothly. This is because of the ease with which things can go wrong, and the severity of the possible consequences. However, it is not formidable in terms of the nature of the planning involved or the actions required as, for someone who is experienced and thoughtful and who has understood the processes, managing the design delivery is not as daunting a task as it may seem. It is simply the measured employment of a range of management techniques which are not out of the ordinary or hard to understand.

This guidance note is about how that can be achieved in a managed, efficient way.

Figure 1 illustrates how an organisation (in this context, a project organisation) has an infrastructure, and makes use of this to add value to its activities. The point is that managing the design delivery, thought of as a process which ensures that connections are made effectively between activities, can add significant value to the overall process.

Figure 1: RIAI Project Stages

Stage	Royal Institute of the Architects of Ireland (RIAI) Stage
Appraisal Initial Planning	1. Inception 2. Outline Proposals
Developed Planning	3. Scheme Design 4. Detail Design 5. Production Information 6. Tender Action
Implementation	7. Project Planning 8. Operations on site
Review	

SCSI / RICS guidance notes

This is a guidance note. Where recommendations are made for specific professional tasks, these are intended to represent 'best practice', i.e. recommendations which in the opinion of SCSI/RICS meet a high standard of professional competence.

Although members are not required to follow the recommendations contained in the note, they should take into account the following points.

When an allegation of professional negligence is made against a surveyor, a court or tribunal may take account of the contents of any relevant guidance notes published by SCSI/RICS in deciding whether or not the member had acted with reasonable competence.

In the opinion of SCSI/RICS, a member conforming to the practices recommended in this note should have at least a partial defence to an allegation of negligence if they have followed those practices. However, members have the responsibility of deciding when it is inappropriate to follow the guidance.

It is for each surveyor to decide on the appropriate procedure to follow in any professional task. However, where members do not comply with the practice recommended in this note, they should do so only for a good reason. In the event of a legal dispute, a court or tribunal may require them to explain why they decided not to adopt the recommended practice. Also, if members have not followed this guidance, and their actions are questioned in an SCSI/RICS disciplinary case, they will be asked to explain the actions they did take and this may be taken into account by the Panel.

In addition, guidance notes are relevant to professional competence in that each member should be up to date and should have knowledge of guidance notes within a reasonable time of their coming into effect.

Document status defined

SCSI and RICS produce a range of standards products. These have been defined in the table below. This document is a Guidance Note.

Type of document	Definition	Status
SCSI practice statement	Document that provides members with mandatory requirements of the Rules of Conduct for members	Mandatory
SCSI code of practice	Standard approved by SCSI that provides users with recommendations for accepted good practice as followed by conscientious surveyors	Mandatory or recommended good practice (will be confirmed in the document itself)
SCSI guidance note	Document that provides users with recommendations for accepted good practice as followed by competent and conscientious surveyors	Recommended good practice
SCSI information paper	Practice based information that provides users with the latest information and/or research	Information and/or explanatory commentary

Abbreviations

APM	Association for Project Management
CIOB	The Chartered Institute of Building
CWMF	Capital Works Management Framework
DDM	Design Delivery Management
GCCC	Government Construction Contracts Committee
PM	Project Management
RIAI	The Royal Institute of the Architects of Ireland
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
SCSI	Society of Chartered Surveyors Ireland

1 Introduction

1.1 Who manages the design delivery?

Managing the design delivery is an activity of project management, but is not always carried out by a project manager with that title. It is sometimes not even conceived as a management activity at all, but just happens. For example, contract administrators and professional designers often simply do it as an unnamed part of their general activity.

In this guidance note we will consider design delivery management as a specific process and the recommendations given are for whoever is managing each specific part of that process, regardless of the job title they hold.

In order to avoid any confusion with other roles that may already exist within a project, we shall refer, for the purposes of the discussion, to the design delivery manager (DDM). This is not intended to suggest that the DDM is likely to be a separate appointment carrying that title; in all likelihood, the DDM will do his or her work as part of another role, such as:

- Project manager,
- Design team leader,
- Project leader/lead consultant/contract administrator,
- In 'design and build' situations, as part of the contractor's general management structure, or as part of a subsidiary design group.

1.2 Clarifying the roles

Many projects have a design team leader (usually the designer whose work is central to the project; usually, but not always, the architect). The design team leader, though, is not necessarily the same person as the DDM. Similarly, the role of DDM may or may not be combined with that of project manager or project leader/lead consultant/contract administrator. So, if there is both a project manager and a DDM, the DDM will be acting on behalf of the project manager in fulfilling a key part of the project manager's duties.

The most important point to remember is that the roles of the DDM should be clearly identified at the start of a project and provision should be given within the project team for these roles to work effectively, co-ordinating and integrating the flow of work and making sure that it is performed in a timely manner.

Throughout this guidance note, we will also refer, when relevant, to others who are involved in design but not specifically or solely responsible for its integrated delivery: surveyors, architects, engineers, etc.

The DDM is an integrator and brings together the various parts of the design into a coherent flow which is:

- Appropriate, and
- Time-specific.

1.3 Defining the design process

Design is rarely completely linear. It involves experiment and revisiting solutions that turn out not to be ideal. Getting design right is therefore a process that requires insight, flexibility and collaboration. Such requirements also apply to planning and managing design delivery.

Design involves various people, and during the process the intensity of their involvement changes. For instance, the architect may have a formative role during briefing and in the phase following it, and then in the later design stages and during construction the architect's role diminishes, while the role of specialist designer-contractors will probably start late and be very intense during parts of the construction process.

1.4 Where design starts and finishes

In construction, all design has the ultimate goal of addressing the client's needs. Design therefore begins with the brief, in which the client's need is interpreted into requirements for a building.

However, the brief, like the design, often evolves over a period. This is not necessarily a sign of disorganisation, but flows from reasons which affect many projects, among which are:

- the client is not entirely sure of what it wants at the outset,
- the client has not fully understood the implications of what it wants at the outset,
- the constraints of the site have not emerged at the stage when the brief is first formulated, or the site has not been identified,
- planning considerations have an effect,
- the cost of the proposals does not align with the client's budget.

Under current best practice, briefing is therefore seen as a process with several stages and review points. These stages can be understood in relation to the following documents in an Irish context;

- RIAI stages of work
- GCCC project programme
- CIOB Code of Practice for project management for construction and development.
- BS 7000-4 1996 (BSI 1996), BS6079-1:2000 (BSI 2000)
- APM Project Life Cycle (APM 2006)

Under the traditional form of procurement, it might be said that design finishes when the design information is issued for construction, according to pre-set deadlines. But in 'design and build' situations, although deadlines are still involved, the DDM will naturally link his or her work into that of the constructors, as part of a continuum.

1.5 The project plan and project life cycle

CIOB's Code of Practice for Project Management for Construction and Development (2010) is the document most likely to be used by surveyors, however, the corresponding Capital Works Management Framework (CWMF), Royal Institute of Architects of Ireland (RIAI) and Association for Project Management (APM) approaches will be considered first in this document in order to provide context.

Figure 2 demonstrates the general relationship between the Capital Works Management Framework (CWMF) and the Royal Institute of Architects of Ireland (RIAI) stages.

The Capital Works Management Framework (CWMF) drafted by the Department of Finance is part of a suite of documents for use in the management of Capital Projects. It sets out a rigid linear sequence of activities and project review stages as outlined in Figure 2.

The project proceeds in a series of distinct stages and only advances to the next stage following successful project review and approval by the sanctioning authority.

The RIAI stages set out the sequence of events through the lifecycle of a project. Again, these are set out in a linear manner, but there is no set procedure for advancing between the stages. This is the subject of arrangements that are put in place either on a project specific or perhaps client specific basis. In practice a client procures the work in discrete stages.

The standard services related to each stage are set out in detail along with a range of additional services that may be commissioned.

Figure 2: Project life cycle

CWMF		RIAI
Stage	**Action**	**Stage**
Appraisal **Initial Planning**	Project Appraisal Definitive Project Brief Appoint Design Team Definitive Procurement Strategy Outline / Sketch Design	1. Inception 2. Outline Proposals
Developed Planning	Developed Sketch Scheme Preliminary Planning Statutory Approval Detailed Design Tendering	3. Scheme Design 4. Detail Design 5. Production Information 6. Tender Action
Implementation **Review**	Contract Award Construction Handover	7. Project Planning 8. Operations on site

Note: The APM project life cycle has only four phases: concept, definition, implementation and handover and close-out. The APM project life cycle is more abstract and less task-based. Less detail is provided, and it is not specific to the construction industry. The differences between the RIAI and APM approaches make an exact correlation between both difficult.

This is the APM's supporting narrative of its project life cycle:

Project life cycles
Project life cycles consist of a number of distinct phases. All projects follow a life cycle and life cycles will differ across industries and business sectors. A life cycle allows the project to be considered as a sequence of phases which provides the structure and approach for progressively delivering the required outputs.

Concept
Concept is the first phase in the project life cycle. During this phase the need, opportunity or problem is confirmed, the overall feasibility of the project is considered and a preferred solution identified. The business case for the project will be produced in this phase.

Definition
Definition is the second phase of the project life cycle. During this phase the preferred solution is further evaluated and optimised. Often an iterative process, definition can affect requirements and the project's scope, time, cost and quality objectives. As part of this phase the project management plan (PMP) is produced and the resources required during the implementation phase will be identified.

Implementation
Implementation is the third phase of the project life cycle, during which the project management plan (PMP) is executed, monitored and controlled. In this phase the design is finalised and used to build the deliverables.

Handover and closeout
Handover and closeout is the fourth and final phase in the project life cycle. During this phase final project deliverables are handed over to the sponsor and users. Closeout is the process of finalising all project matters, carrying out final project reviews, archiving project information and redeploying the project team.

APM Body of Knowledge (2006), p.13

The differing vocabulary of the two systems says much about the way that the architectural perspective of the RIAI tends to be tied to the production of a built space, whereas the APM's definition is more elastic and thinks in terms of a 'capability that allows benefits to be achieved.' Even allowing for the fact that not all projects are building projects, and that architecture is essentially about buildings, there is still a different mind-set at work in either case; the project manager is characteristically more attuned in the early stages of a project to thinking in terms of the need, problem or opportunity to be addressed, rather than of the constraints that shape a design. That is not to say that one approach is better than the other – but managing the design delivery requires an understanding of which particular process is being followed. Also, what is not really indicated in either case is the repeated iteration that may be required within, or even beyond, each phase to review analysis and proposals.

The CIOB's Code of Practice for Project Management for Construction and Development (2010) exhibits an alternative approach to the APM, CWMF and RIAI approaches. The RICS was involved in its compilation, it is property development based and it considers the process of site acquisition in detail, which neither the APM, CWMF nor RIAI processes do. It is comprehensive and easy to use. Figure 3 shows stages in a project and some of the key documents that go with them.

Stage	Documents
Inception	Client's objectives Site selection criteria
Feasibility – strategy	Outline project brief
Pre-construction (includes submissions to and approvals from statutory authorities)	Detailed project brief. Detailed design brief. Scheme design and cost plan. Detailed design and production information. Project execution plan.
Construction	Overall design schedule
Engineering services commissioning	
Completion/handover, client occupation	
Post-completion review	

Many surveyors may be more familiar with this system. However, the APM, CWMF and RIAI equivalents should not be overlooked, and an understanding of several systems is desirable for the DDM. The CIOB's Code of Practice for Project Management for Construction and Development (2010) sets out a comparison of its stages with those of some other systems.

Overall despite the usefulness of the CIOB approach, the RIBA/RIAI Project Plan is probably the closest to being an 'industry common standard'.

A DDM should also be aware of Prince2. This is a process-based method for project management, in use internationally.

1.6 How best practice is defined

Given the four varying approaches discussed in section 1.5, and the slight tension between them, what is the stance within design management, and how is best practice defined in that quarter? There is no simple answer to this, though BS 7000-4:1996 Guide to Managing Design in Construction (BSI 1996) has a status which might put above criticism someone who followed it unswervingly. It has two other advantages as well.

The first is that it is unambiguously construction- specific. This is helpful in a situation where much project management information and guidance is generic and not tailored to the particular circumstances of the construction industry.

The second is that it places emphasis on the briefing process as one of development, which starts from the 'initial brief', and arrives in its mature form as the 'consolidated brief'. Guidelines are given on what the fundamental requirements of the initial brief might include:

(a) The purpose of the construction

(b) Functional requirements

(c) Special, innovative or unusual features

(d) Health, safety and environmental constraints

(e) Financial policy

(f) Time policy

(g) Quality strategy

(h) Aesthetic considerations

BS 7000-4:1996, 2.3.2 - After looking at brief development and project planning in some detail, BS7000-4 then considers the plan of work (BS 7000-4:1996, Figure 2), which may be based on the RIBA/RIAI plan of work (now known as the RIBA/RIAI project plan), or some bespoke equivalent. It describes this as 'a sequence of activities' or 'linear function', and comments that 'completion of a stage is conditional on co-ordination of design between all team members and the approval of the design team leader and possibly the client. To anticipate approval may result in work having to be corrected at a later stage'. (BS 7000-4: 1996, 2.5). It is apparent that the BS takes a stance on a couple of issues, which is notable:

- The linear model can only succeed and continue to be linear if there is a complete and competent review process at the end of each stage. Otherwise, back-tracking and re-work are likely to be required, and an excessively iterative model results.

- The sequence of activities is secondary to a briefing process which has priority over it and runs parallel with it; the design is, as it were, the child of that process, and the child is 'brought up' in a continuing briefing process which extends up to the start of the detail design phase (RIBA project plan stage E and RIAI project stages – Stage 4).

BS 7000 refers to the 'design team leader', and not to the 'design manager' or 'design delivery manager'. If a DDM is appointed, therefore, the role of design team leader as envisioned in BS 7000 will be part-devolved to the DDM. However, there is no single way of splitting the roles; care will be needed in defining where one set of responsibilities ends and another begins.

In any case, the really important thing is to understand the fundamental message of the evolving brief: how the client's needs are met by the design, building process and the built solution. That includes an

understanding of how a shift in the design or the building process would affect the client: would his or her needs then be met more or less fully? If consideration is given to the balance between time, cost and quality, where does the appropriate balance lie? It is worth considering all these aspects.

1.7 The work of the DDM

Many of the actions of the DDM are iterative – they are to be reviewed or used for review purposes at each stage of the job. For example, briefs and method statements for design development may originate early in the job, but they need to be revisited frequently to ascertain whether they still apply in the same way, whether the objectives concerned have changed or are endangered in any way, and what adjustment is needed.

These iterative items often originate at a point somewhere between the concept and pre-construction stages. These stages are shown coloured light and mid-blue in Figure 4 (overleaf), while the iterative items are in a separate area coloured dark blue. These items become the basis of iterative actions and a documentation system which supports those actions. They represent the core from which the DDM's activities derive; design management and design delivery stand at the point at which the analytical work of the brief and the creative response to it, the design, become fused together, or 'consolidated' to use the word from BS 7000. This can be seen clearly in Figure 4 (overleaf).

The work of the DDM is, at a fundamental level, one of consolidation and integration; it involves an understanding of the balance of the brief and the qualitative response of the design; of the priorities of time, cost and quality, which inform the design; the nature of the design team and its members, their strengths and weaknesses; and the mutual suitability of design approach and procurement route.

1.8 Recommendations

1.8.1
The DDM should be aware of the systems in use to define project processes: RIAI, APM, CIOB and RIBA.

1.8.2
The DDM or PM should establish which system is in use in a particular project, or agree a suitable composite system where there are seen to be benefits in a bespoke process.

1.8.3
he DDM may be in a position of coping with members of the team who naturally use the system they are already accustomed to. The DDM may have to 'translate' from one system to another and interpolate between systems.

1.8.4
The DDM's core work lies in the establishment of systems shown in Figure 4; the DDM's documents and actions are derived from these.

Figure 4: Project Life Cycle and the Project Execution Plan (PEP)

CIOB Code of Practice for Project Management for Construction and Development	Royal Institute of the Architects of Ireland (RIAI)	Project Execution Plan (PEP)*		Project Iterative Items
1 Inception	A Appraisal	Project definition and brief	Method statement for design	Statement of objective
2 Feasibility	B Design brief	Feasibility and value analysis	Development strategy & procurement route. Reconciled concept design & budget	All briefs
	C Concept	Business plan and market predictions		
3. Strategy		Functional & Aesthetic brief	Project planning & phasing Organisation chart	Project planning & phasing Quality assurance
	D Design development	Management of information systems		
4. Pre-construction	E Technical design	Quality assurance	Limits of authority	Design review against business plan
	F Production information		Financial procedures	Project management policy
	G Tender documentation	Statutory approvals		Risk assessment
	H Tender action			Organisation chart
	J mobilisation			Method statements
5. Construction		Work breakdown structure		
6. Engineering Services commissioning	K Construction to practical completion			

2 Documentation

This section summarises the documents a DDM will be likely to work with, or should create.

2.1 Reference documents

There are several other documents which define good practice.

2.1.1 Definitions of project stages

- RIAI work stages,
- RIBA project plan,
- GCCC capital works management framework,
- CIOB Code of Practice for construction and development project process,
- APM Project life cycle.

2.1.2 Descriptions of process

- Capital Works Management Framework,
- Design management systems. Guide to managing design in construction BS 7000-4:1996,
- Code of Practice for the collaborative production of architectural, engineering and construction information, BS 1192:2007,
- Code of Practice for Project Management for Construction & Development (CIOB 4th edition, 2010).

These documents define good practice, and every DDM should be familiar with them.

2.2 Project definition documents

2.2.1 Project brief

This defines the client's need. It may well be developed in stages.

2.2.2 Design brief

This defines the design response to the client's need. It should be developed in stages, as laid out in BS 7000-4:1996

2.2.3 Cost plan

This begins with the budget and reconciles the design to it in cost terms.

2.2.4 Project quality plan

Thus document defines the quality expectations the project must achieve and how they will be met.

2.2.5 Responsibility matrix or organisation chart
This maps out the range of activities required to develop the design information and assigns those activities to specific team members or to external bodies (for instance, statutory undertakers such as a water company). The responsibility matrix should make clear where the boundaries between responsibilities lie.

2.2.6 Procurement strategy document or development strategy and procurement route.
This describes the reasons for choosing a particular procurement route and maps out how that procurement route will be adopted, including its effects on the design team. There may be several procurement packages, and each would have its own strategy document.

2.2.7 Project execution plan.
This describes in detail the scope and plan for executing a specific project.

2.3 Documents generated in design management
This is a typical list, but not all are necessarily required, particularly for smaller projects.

2.3.1 Design management plan
This sets out the principles and procedures to be used to manage the design process. It is a sort of 'management overview' of how the design management process is to be handled. Other names for it include 'design management handbook' and 'design project handbook'.

2.3.2 Design team structure
This is something for the DDM to agree with the PM, design team leader, etc.

2.3.3 Design programme
This is subsidiary to the general project programme, and describes in detail how the design process unfolds in time.

2.3.4 Design information standard
This is a project-specific catalogue of how design information is going to be presented, referenced and indexed.

2.3.5 Design management procedures
This is a description or manual of the procedures that will be followed in design management.

2.3.6 Schedule of deliverables
This lists all the information to be produced, and is a matter of agreement between the various professional disciplines incorporating risk register and health and safety issues.

2.3.7 Design review meeting minutes
These record progress, deviations from plan, issue, problems, and the measures decided upon to resolve them.

2.3.8 Health and Safety Regulations
This states the procedures necessary in complying with legislation. The Health and Safety Authority produces useful guidance for the public.

2.4 Information control

This is sometimes described as configuration control or change control, but is, in fact, more general than that name suggests. It includes:

- Requests for information (RFI) or information requirement schedules (IRS),
- Information issue sheets, such as drawing issue sheets, which may be an extract from a drawing register,
- Instructions, such as pre-contract instructions and architect's instructions.

2.5 Information quality
The DDM should ensure that all participants in the design have quality plans and these plans should be appropriate, practical and compatible to the maximum extent possible.

A group of systems, all of which comply with ISO 9000, should have fewer problems of compatibility than others which are differently based.

2.6 Recommendations

2.6.1
The DDM should be familiar with the five definitions of project stages listed in 2.1.1.

2.6.2
The DDM should be familiar with the design management process described in BS 7000-4:1996, and the CoP for collaborative production of architectural, engineering and construction information, BS 1192:2007.

2.6.3
The DDM should have a working knowledge of the documents to be generated in design management and design delivery and be flexible as to what documents will suit any particular project best.

3 Roles and responsibilities

3.1 Appointment of consultants

It may or may not fall within the remit of the DDM to appoint consultants, or to advise on whom should be appointed. However, depending upon what procurement route is selected (section 7), the timely appointment of suitable consultants is something that may profoundly affect the DDM's work, and it is therefore in the DDM's interests to monitor the process where possible and raise any concerns at the earliest stage.

Legitimate concerns would include the completeness of the array of designers (bearing in mind that under some circumstances design input is provided in some defined areas by contractors), and the coherence of the team structure. A dysfunctional design team is not only a liability to the client, but can also make a DDM's job impossible to fulfil adequately.

It needs to be clear to all, from the start, who is going to do what, and who is going to report to whom. The relationship of any management roles (project manager, lead designer, design manager, DDM) needs to be mutually understood and expressed, including the boundaries to authority. It can prove valuable for the DDM to create a typical similar process diagram (see 4.4 Design Team Change Control), which shows how the various parties interact as the design-construction process unfolds.

Sometimes the design and construction process do not fall into a simple sequence, in which the two main phases (design and construction) are discrete. When they are fundamentally more mixed, as in a design and build or construction management process, for instance, the scheme cannot all be mapped out in advance, but has to be built up incrementally.

3.2 Design by contractors and subcontractors

Under all forms of procurement design input by contractors is possible, though it happens to a much greater extent outside traditional procurement and within vehicles configured for the purpose, like Design and Build, (D&B), Design, Build, Finance and Operate (DBFO), Public Private Partnerships (PPP).

Where contractors' design is involved, the question immediately arises of how their work is to be integrated into the work of the design team. At one extreme, it simply comes later, and gets added to a design that is otherwise more or less complete. The contractors' design fills a space that has been temporarily filled by the design team with an interim, undeveloped or provisional design solution.

At the other extreme, contractors' designers emerge early enough to be integrated into the professional design team. In that case, it is the job of the various managers to ensure that the newcomers are adequately inducted into the team and its procedures, and received by the other team members in a way that indicates a commitment to co-operate.

Between these two extremes lies an uneasy territory where specialist contractors are employed by the client outside the contract. This is one of the more difficult situations to handle, since such specialists may not perceive themselves as members of a design team, and may lack a sense of belonging to the

project. Their loyalty to the client, even if strong, may be narrowly defined and may not include inward commitment to team-working.

Two-stage tendering, in which a preferred contractor is selected on partial rather than complete project information, and cost and time certainty are arrived at by a subsequent round of negotiation once the design has been completed. Sometimes, design work is carried out by aspiring contractors pre-appointment, sometimes at the contractor's or specialist's own cost, on the basis that he or she will be rewarded only if successful in a competitive tendering situation. There can be quality problems inherent in design work carried out on such a basis resulting from the initial round of work not being properly thought-through.

3.3 Where liability resides

Responsibility for problems which may arise in the future is an ever increasing concern in these litigious times and needs to be clearly understood from the commencement of a project. This is particularly the case for design and build contracts and turnkey contracts where liability for both design and workmanship rests with or is passed over to the contractor.

Liability for design continues to reside principally with the designer, and that is why professional institutions insist on their members taking out professional indemnity insurance. When design liability is passed to the contractor it is important that a direct link between the designers and the client is established or maintained in case of default by the contractor. This is often achieved by way of collateral warranties.

Liability for defective workmanship rests with the contractor and his sub-contractors. Unfortunately though sometimes when a problem occurs it is unclear whether the issue is one of design or workmanship.

It is recommended that collateral warranties be signed by the client and the principal sub-contractors to again protect against the possibility of default by the contractor and to avail of the sub-contractors' professional indemnity insurance cover when they are undertaking elements of design.

The DDM should ensure that appropriate contractual arrangements are in place and that all relevant parties have sufficient professional indemnity insurance cover.

3.4 Recommendations

3.4.1

Ensure roles and responsibilities within the team are clear and expressed. The DDM should organise the Design Team so that all team members are aware of project expectations and making sure that duties are clearly understood. Procedures that are specific to the needs and circumstances of the project should be put in place and formalised.

3.4.2
If the DDM has doubts about the completeness or appropriateness of the array of designers, raise the issue and pursue it until it is resolved.

3.4.3
If there is any ambiguity about boundaries between roles, raise the issue and pursue it until it is resolved.

3.4.4
Understand, and ensure clarity on how the work of contractors' designers and others who will come later to the team is provided for in the design and organisational scheme.

3.4.5
If there is any ambiguity on where design liability lies, ensure that a mutual understanding is arrived at and that all parties are aware of this.

3.4.6
The DDM should prepare regular progress reports to suitably depict design status and report progress to the Design and Client Team.

4 'Hard' skills and the actions of management

4.1 Programming

Programming is the mechanism for activity scheduling and showing how project activities relate to each other in time, what dependencies exist between them, and where the critical path, which determines overall progress, lies. To speak of programming in connection with managing the design delivery may be tantamount to saying that the DDM, which doesn't need to be a PM, has to have project management training and skills. At the very least, he or she needs to be familiar with, and able to use project management tools.

Most programming work now utilises specialist software. A full working understanding of such systems is strongly recommended for a DDM.

4.2 Monitoring and review: the skill base involved

Monitoring and review depend to some extent on personal characteristics and skills, and success is likely to come from an approach that combines management technique with commitment in the areas of teamwork, co-ordination, risk management, checking and impartial judgement. A DDM needs to span a number of roles: Team worker, Coordinator, Implementer and Monitor-Evaluator.

- The teamworker helps the team to gel, using their combined expertise and versatility to identify the work required.
- The co-ordinator focuses on the team's objectives, draw out team members and delegate work appropriately.
- The implementer plans a practical, workable strategy and carry it out as efficiently as possible.
- The monitor-evaluator provides a logical eye, make impartial judgements where required and to weigh up the team's options in a dispassionate way.

Monitoring and reviewing is about measuring progress, and comparing existing and projected situations with the plan. To this extent, the practical skills involved coincide largely with those of programming (section 4.1); it is the context of ongoing review which is particularly important here.

It is often helpful for the DDM to get inside situations and spot potential problems and delays early, not after they have become both inevitable and prolonged. As part of this, he or she may break down units of work into smaller units set out in a task matrix, monitor these, and observe deviations from plan at an earlier stage than would otherwise have been possible. The important skill here is not having just a microscopic view, but combining it with a broad overview and active understanding of the main issues. Monitoring should avoid failing to see the bigger picture because of too close a focus on the detail.

The DDM, in keeping both macro and micro views, will be closely in touch with the team, and integrated into its thinking and activities, not interfering within specialities but able to help in relating them to the totality of the design effort and understand the options available in keeping the design process on track to deliver.

The DDM is also a controller of information and its quality. He or she understands where the responsibilities and authority for decision-making lie, knows the approval processes, and is skilled in programming, monitoring, reviewing and change control. He or she is able to engage in, and utilise risk management, cost control, value management and value engineering techniques.

The DDM is therefore skilled in the use of a range of 'hard' techniques in project management. But he or she should also be able to explain the techniques in use to other team members who are not familiar with them.

4.3 Risk management and the design delivery

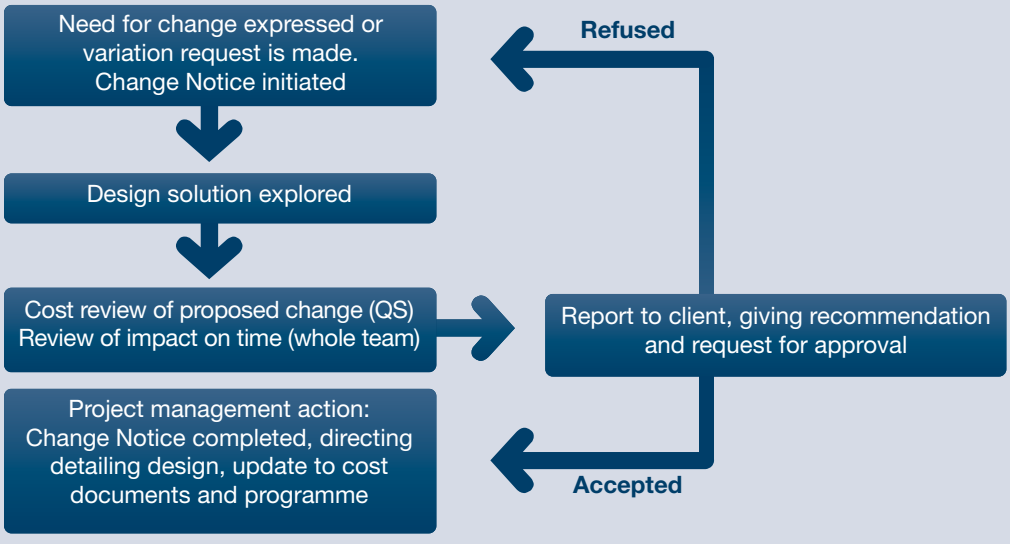
Risk management should be employed on all projects. A risk register should be compiled, and the team should work co-operatively to enumerate and rank the risks according to their severity and probability of being realised.

This is not a full risk management approach, which would be founded on a risk management plan and utilises a method such as the Project Risk Analysis and Management (PRAM) approach (APM) or Risk Analysis and Management for Projects (RAMP) approach (Institution of Civil Engineers (ICE)). The DDM should be an active and experienced practitioner in the risk management process. He / she should be aware of the risks to the project posed by the uncertain situations that have been detected by the team, and able to use this understanding to be proactive in determining measures to counter or mitigate the effects of the risk.

The risk register should be continually monitored and should be a live document.

4.4 Change control

Figure 5: Example of a design management process diagram



Changes occur on projects for a variety of reasons, many of them valid and essential for the success of the project. It is a question of control which is at the heart of the matter in terms of the management of the project.

1) Changes may be required due to client issues
2) Change may result from amended or additional design details / solutions
3) Changes may be enforced due to site requirements / complications
4) Changes may be required due to compliance issues regarding statutory requirements

Not every eventuality can be foreseen at design stage and as such there needs to be a process for monitoring and implementation of change control which includes assessment, decisions and instruction taking into account the consequences of the changes including the contractual and cost implications. The inherent risks associated with change to both cost and time must be weighed and presented for decision. In this regard the DDM has an essential function in ensuring that the design team are fully briefed and that the dialogue in respect of the change fully explores the criteria and options.

Having regard for the fact that some changes may not simply be reactive but elective, the risk management should incorporate the following measures

a) Standardise a reporting procedure for the tracking and assessment of proposed change which incorporates a hierarchy of sign off and final approval. (refer to sample sheet below)
b) Establish a line of communication on costing reports of change with relevant confirmation of information received and acted on. Passed to the design team for decision making purposes.
c) Insofar as possible anticipate possible future change through regular review of regulatory and client requirements and associated design issues in order to bring necessary change to the design team table at the earliest time. Sometimes dedicated design team meetings deal solely with change control and can be effective. A register of changes and variations needs to be maintained.

Figure 6: Example of a project change notice

Project Change Notice				
Project title				
Ref No.				
Project Manager				
Description of change (add sheets if necessary)				
Justification for change (add sheets if necessary)				
Aspects of proposal for which approval is not required				
Status:	Proposed	Implemented	Post Contract	Within P.D.
	Outside P.D.	Client Change	Design/Implementation	
Distribution List				
Project Manager ……Signature ……Date……				
Project Change Approval				
Comment				
Full approval ❑	Provisional Approval ❑	Rejection ❑		
Explanatory Notes (provisional approval or rejection), add sheets if necessary				
Authority for approving change	Name……			
Signatures				
Project Manager	Date	Date		
Client	Date	Date		
Distribution				

P.D = Project Definition

4.5 Approval processes

The client's approval, in conjunction with the approval of nominated statutory certifiers under planning, and particularly building control and related environmental and safety, health & welfare regulations is required for aspects of the design. Such approval is normally sought after the design team has done its work up to a logical point, so it may be assumed that what is presented to the client is fit for purpose and in accordance with the client's needs. However this needs to be checked for regulatory compliance. Therefore, information is usually presented to the client for approval at the end of a work stage (either one of the formal stages, defined in the project plan, or an intermediate point which is significant in the context of the particular project).

The client's approval therefore is the gate to the next work stage. Undue delays in obtaining that approval would have a straight knock-on effect to that next work-stage. For that reason, it is desirable that the approval process should be planned and even rehearsed, so that the client is aware of what is expected of him or her and has an awareness of the framework within which the approval process exists. The DDM has a significant role to play in managing the delivery of information to the client in a timely way; the approval processes should be scheduled and detailed in a timetable.

4.6 Cost control

Although cost control is not a DDM function, it is an area which affects him or her, if cost control and the work of the designers are to be integrated. A mutual understanding of what is happening in both areas will help avoid the inefficiencies of the design being found to be incompatible with regulatory compliance or the cost plan, and therefore having to be revised.

The DDM has an input to make here, as one engaged in the integration of the project effort. For that reason, it is advisable for the DDM and the designers to have access to a cost plan from the start. It is part of the skill of designers to design to a budget, and it is certainly a part of the brief of any manager, including the DDM, to check that the design work has not become detached from budgetary considerations. So, in this important respect, the DDM is once again an integrator.

Within most cost plans there are contingency sums. These exist in recognition of perceived risks, which may be only roughly quantified. It is worth exploring the risks involved in the risk register, so that the contingency sum is related to the risk of a possible expenditure, which can be quantified.

4.7 Value management and value engineering

Value management (VM) relates to the benefits that are derived by the client from the successful implementation of a project. It is about successful project implementation, delivery of required results and organisation of activities. It is a view taken within the context of the project aims; it therefore evaluates design solutions under that perspective. It is important that this task is assigned to an appropriate member of the project team.

Value engineering is a systematic method to improve the value of goods or products by a comparison of the ratio of function to cost. Value Engineering is an activity at a lower level than VM, looking to get function at optimum cost. Ideally, it follows VM, and examines the effectiveness of the building process, relative to the overriding aims of VM.

In the absence of a more comprehensive and coherent overriding VM process, VE can become little more than a cost cutting process.

4.8 Recommendations

4.8.1
The DDM should master the use of programming software in some depth, and have the ability to cope with actions like forward and backwards pass and master the workings of 'lead' and 'lag', so that he or she can not only arrive at a critical path but also manipulate activities in time.

4.8.2
The DDM should understand the human aspect of managing, and work to the strengths of those within the team. The DDM should be prepared to identify where there are weaknesses, or gaps in the group abilities, and manage tasks and responsibilities accordingly.

4.8.3
The DDM should be proactive in trying to spot delays early, so that the response can begin at the earliest moment and the damage caused can be limited.

4.8.4
The DDM should be proactive in identifying and monitoring risk, and devising control and mitigation measures.

4.8.5
The DDM should establish transparent and easy-to-use systems for change control, and discuss and agree well in advance any 'design freeze' that may be implemented.

4.8.6
The DDM should make sure the client understands both the approval process, and what s/he is being asked to approve. They should work closely with the PM (if separate from the DDM) and the designers on this.

4.8.7
The DDM should facilitate cost control and VM processes by aiding communication and the timely provision of information.

5 'Soft' skills and the techniques of design team management

The DDM is not only working with a process, but also with people, who are all unique and need to be handled in different ways. So the role of DDM is not entirely reducible to a set of actions, but also involves people skills. These are not merely intuitive but are understood within project management and enumerated (for instance, within the SCSI / RICS APC competencies and the APM Body of Knowledge). For that reason, the DDM is recommended to have project management training in both 'hard' and 'soft' techniques (Cornick & Mather 1999), particularly as the time pressure inherent in construction projects means that there are big advantages in getting people matters 'right first time'.

The DDM will also occasionally have the job of focusing the vision of some designers who may be blinkered within their own discipline, and showing them how to be more generally project-minded. This includes reinforcing an awareness of the ultimate goals of the project, as they are related to the client's need. The articulation of this need, as expressed in the evolving brief, is something that the DDM may need to repeat and call project team members back to, should they stray from it.

5.1 Understanding construction teams

The chemistry of a team depends on a feeling of belonging. Team members who feel, or begin to feel, distanced, or that the team spirit, its systems or the way it speaks to people is alien to them, are diminished by the experience and the team is therefore also diminished. The team members who facilitate communication are the leaders (Senge 1998), and the leadership group includes the DDM, who is the manager of an information exchange involving a category of communication vital to the project: the design output of the team.

Teams normally come together to undertake projects. They are therefore usually short term and ad hoc in nature. Where there is a series of projects (a 'programme of projects'), there may be standing teams which move from project to project. The construction industry is practiced at developing teams at short notice and disbanding them when a project is complete.

Within a project, team members may come and go throughout the project life, and their role may change as the project moves from phase to phase. The order in which members of the team are appointed is variable. Logically, it should be the project manager first, though sometimes it is the architect. When this is the case, the DDM (or PM as DDM) may be at a disadvantage, at least temporarily, because he or she will not have had the opportunity to participate in how the team came together, or witness and influence a process of adjustment.

It is useful for the DDM to be appointed during the initial phase, as he or she may well have input to make on how the team communicates and stores information. That is not to say that the DDM will have different ideas on such matters than other team members, but the DDM is the specialist who carries particular responsibility in that area, and it is right that his/her voice should be heard at the formative stage of the discussion. Indeed, an experienced DDM will have a significant contribution to make to that discussion. If the DDM is only appointed later then this possibility may be lost.

5.2 Sharing knowledge

One problem which has sometimes been a factor in design teams is that some team members issue information on what they perceive to be a 'need to know' basis. In other words, what they do not do is to discuss issues and the problems they have with much openness.

Being guarded with information is not generally helpful in a design team situation, where the sharing of difficulties encountered can often lead to their quicker resolution and the avoidance of delays.

The willingness to share information can be greatly encouraged by the attitude of the leaders and managers of the team, including the DDM. Steps to be taken to achieve this might include:

- active team-building approaches that facilitate mutual understanding and helpfulness
- a 'can do' atmosphere within the project team, based upon an understanding of the aims of the project, the resources and the skills necessary to succeed
- encouragement of team members to be frank about problems, air them in meetings and for everyone to co-operate in resolving them, so far as they can. This does not take blame out of such situations necessarily, but it does much to avoid the debilitating effects of a blame culture.

5.3 Leading and managing the design team

There is a strong element of project-mindedness and team-mindedness required in successful design delivery.

BS 1192-2:1987 refers to the collaborative production of construction information. Without the need for collaboration, there would not be all that much for a DDM to do beyond organising a single stream of information from one source to its destination. Immediately that stream of information has more than one source, which is the case in most construction projects of more than minimal size, ensuring collaboration becomes a matter of prime importance, in order to achieve:

- co-ordinated, consistent information, which truly fits together and is mutually explanatory
- performance on the part of the design team, which is mutually-supportive and committed to solving problems that they do not own individually.

While achieving these two aims requires sound, well-adapted management processes, it also depends on effective leadership.

5.4 Recommendations

5.4.1

It is important that the DDM has an understanding of construction teams.

5.4.2
The person acting as a DDM should have appropriate leadership skills.

5.4.3
The DDM should be able to articulate the project vision. This will require an understanding of the project aims, objectives and the design responses to them, which the DDM can communicate to the team.

5.4.4
The DDM should encourage and facilitate good team working, including the willingness to share knowledge and be frank about problems.

5.4.5
The DDM, by being supportive to the team, should be able to encourage valuable mutual supportiveness within the team.

6 Information exchange

6.1 Procedures

It is the DDM's responsibility to define and implement procedures that protect the quality of project information. 'Quality' here indicates the fitness for purpose of the information (without any comment on the fitness for purpose of the design, which is another subject). It includes considerations of whether the information is full and complete, timely and accurate.

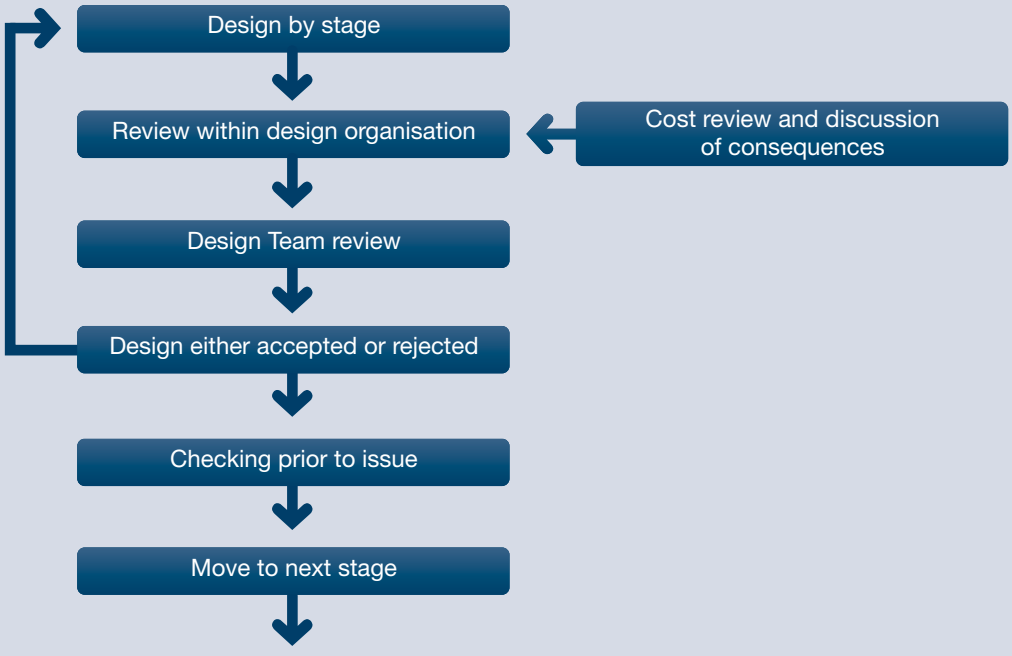
The DDM monitors how the design information is being developed and assembled, and detects problems early, so that solutions can be implemented to any problems without slippage from the agreed schedule. In addition to his/ her own overview, the DDM will usually cause the team to monitor its activities, with their skills employed in noticing when the state of information is incomplete, in accurate or in danger of causing a delay. The role of the cost management/chartered quantity surveyor (CQS), is also a vital one in this process, as timely acceptance or rejection of design information, because of its effect on cost, may make a considerable difference to the cost certainty of the job and help avoid rounds of cost cutting or value engineering.

Where a bill of quantities is used, the CQS is in an excellent position to act as a co-ordinator of information during the detailed measurement process. In the absence of this shaping force, something else is needed to fulfil that part of the design team function and complete and co-ordinate the project information. The DDM is in a position to check and co-ordinate information, and should do so, if delays, wasted effort and the resulting claims arising from incomplete and conflicting information are to be avoided.

Notice the importance of timeliness here. This involves planning to leave sufficient time for cost checks and the design revisions that may follow upon them; the DDM may not be managing the design, but he or she does have the responsibility of planning a process that involves the disruptions of adjustments to the design.

It is advisable, therefore, for the DDM to establish iterative processes that are flexible enough to adapt to situations of pressure, and robust enough in operation to hold up under pressure. It is not acceptable to short-circuit the process and thus to by-pass review or cost control stages, and it may be important for the DDM to exert discipline in this. The structure can be fairly simple, as indicated in Figure 7.

Figure 7: Structure of a design stage with review procedure



It can prove valuable to involve those who have the perspective of the documents' intended users. So, tender documents should ideally be reviewed by people who deal in procurement and construction documents by constructors. This can be difficult to arrange, particularly under traditional procurement, where the final constructors are not selected until all design and tender processes are complete.

Some of these are the points a DDM should consider when forming a programme:

(1) The team may be operating in differing locations.
(2) The team, perhaps as a consequence of (1), might be using differing systems and software.
(3) The essential timeliness of information issue.
(4) The appropriateness of the information to the right person (or role).

6.2 Document management and formats

At the most basic level, a transparent system is needed for the categorisation of documents, which clearly arranges them according to their generation in the process of development. It is advisable to articulate and agree a concept of structure with the team at an early stage.

The individual documents developed for a project should also be subject to controls or discipline relating to a number of aspects of format.

These include:

- how documents are named,
- how documents are numbered,
- the interoperability of documents within IT systems in use within the team,
- the codes and descriptions used to define revisions,
- the purposes of documents, such as ‘for construction’, or ‘for information’,
- templates such as drawing title blocks,
- subdivisions of the project into sub-projects or zones,
- the grid to be used to define position on all drawings,
- the selection of drawing scales to be used,
- standard page sizes.

These are conventions within a project. They may be developed on a bespoke basis, or a standard system can be followed, for example, Project Information: a code of procedure for the construction industry (CPIC 2003). It is important that any conventions to be followed are established right at the beginning of the project, before any other formats are used and have become habitual.

6.3 Facilitation, co-ordination and anticipation

Co-ordination of information within the project team is something we have already covered, but co-ordination with bodies external to the team may also be a part of the DDM’s remit. This has three aspects.

Firstly, the DDM serves project needs and helps the designers by establishing relationships with statutory authorities, such as planning and building control, by ascertaining their requirements for information, and providing that knowledge to the designers. In other words, the DDM becomes manager of that external relationship.

Secondly, the DDM acts between the design team and the contractor to recognise requirements for information in the timeliest way, and even to anticipate the request. This form of management can extend down into the contracting team through awareness of the plans and activities of package contractors and subcontractors, and requires a close relationship with the contracting team and a degree of study of their statements and documents, in order to make anticipation possible.

Thirdly, the DDM will ensure that all information is co-ordinated in that it cannot only be read by the software in use by team members, but also is issued in a form in which they can interact with it if necessary.

By the same token, the DDM through close liaison with the client and client team may be able to anticipate the likelihood of variations, and have design resources in place to meet them.

6.4 Project information systems

Electronic project information systems have made a gradual entry over the last ten years or so, and are now widespread. They now exist at several different levels of sophistication:

(a) Simple, secure websites, onto which project information is uploaded, indexed using a generic Microsoft® Windows (or similar) system and made available to the project team.

(b) More developed web-based software (such as Autodesk® Buzzsaw®, Sword CTSpace, Business Collaborator, the Collaborative Business Platform (CBP), Autodesk® Constructware®, Project Talk, Microsoft® Office Project Server, Oracle® Project Collaboration and Rave Build). These can vary in their sophistication, at an extreme being able to support a Building Information Modelling (BIM) workforce to some extent. Some, such as Buzzsaw®, are available as 'software as a service' (SaaS). Generally, they help facilitate the centralising and exchange of project information and underpin team collaboration through creating favourable conditions.

(c) Building Information Modelling (BIM), which is a sophisticated data base system that can represent digitally a facility's physical and functional characteristics. It is therefore a top-level design management tool enabling superior building performance to be achieved, as well as a device for managing information and solving problems. Not only does it render designs in 3D, but additional 'dimensions' can be added to the design by way of additional information. These additional dimensions might, for instance, be a fourth dimension of scheduling and sequencing, a fifth dimension of cost estimation, etc.

BIM will have a major influence on design delivery and procurement of building projects.

6.5 eTendering

Electronic tendering solutions are now promoted as something which 'facilitates the complete tendering process from the advertising of the requirement through to the placing of the contract. This includes the exchange of all relevant documents in electronic format. Benefits can include reduced tender time, fast and accurate pre-qualification and evaluation, fast response to questions and points of clarification, reduction in labour-intensive tasks of document management, and improved audit trail, higher standards of specification and supplier response, and provision of quality management information.

There is an obvious need for the DDM to check that any system to be used within a project is compatible with the software in use by the team. This should not be overlooked. The SCSI has useful guidance on this which can be downloaded by members at www.scsi.ie/membersguidancenotes

6.6 Recommendations

6.6.1

It is advisable to start at the outset of the project to develop the procedures that will be needed for managing the design delivery. Be prepared to adapt standard procedures to fit with the particular needs of the project, as these become apparent.

6.6.2
It is important to ensure that the process for design review and document issue is understood and signed up to by the design team members.

6.6.3
It is recommended that the DDM take control of document management and formatting.

6.6.4
Where e-Tendering is to be used, the DDM should ensure that the integrated process is a comfortable fit with other systems within the project, so that conflicting systems and extra work is avoided as far as possible.

7 Procurement

The choice of procurement route has a profound effect on how the design delivery is managed.

There are three generic types of procurement route:

- Traditional
- Construction management and management contracting (as variants of one type – there are important differences between them, however, and that is why both are mentioned)
- Design and build.

Hybrids of the three generic forms are now increasingly the order of the day.

The three basic types have their own individual advantages and disadvantage, which can be summarised as follows;

Traditional:	Benefits in COST and Quality at the expense of TIME
Construction	Benefits in TIME and QUALITY at the expense of COST and management contracting.
Design and build	Benefits in COST and TIME at the expense of QUALITY

(COX & CLAMP 1999)

Note: The term 'quality' is used here in the general sense of suitability to needs, as well as that of grade.

Figure 8 shows differences in the pattern of appointments within various forms of procurement. It is notable that duties and loyalties are likely to flow, or seem to flow, from who is the appointing party; the time at which the appointment is made may have ramifications for the quality of the service that can be delivered. For instance, there are advantages in having inputs from the contractor available during the design stage.

Figure 8: Appointments under various forms of procurement

	Designers	Cost consultant	Sub-contractors
Traditional procurement	**Appointed by client throughout**	**Appointed by client throughout**	**Appointed by main contractor**
Construction management	Appointed by client. Contractor not active during design stage	Appointed by client. Contractor not active during design stage	Appointed by client but managed by contractor
Management contracting	Appointed by client. Contractor active during design stage	Appointed by client. Contractor active during design stage	Contractor responsible for specialist subcontractors
Design and build	Appointed by or novated to main contractor	Appointed by client	Appointed by main contractor

Of the three methods, design and build requires the least involvement of the client, and construction management/management contracting the most.

7.1 Traditional procurement

Traditional procurement gives priority to setting in place a professional team which, if well-chosen, will have the expertise to tease out the client's requirements and preferences, and incorporate them in design and other documents for a contractor to implement at a later stage.

7.2 Design and build

Design and build represents the opposite end of the spectrum. It is a desirable route to take, particularly when the buildings to be produced are either very specialised and the contractor is an expert in that speciality (such as a specific type of laboratory or test facility), or when they are generic (such as undifferentiated industrial units). It tends to be much less appropriate when a specific response to a site is involved, and when the client has detailed requirements which cannot be met through a standardised process. Nevertheless, it is used increasingly frequently for many kinds of project, apparently in order to transfer a greater share of the project risk to the contractor.

7.3 Construction management

Construction management increases the possibilities for involving specialist trade contractors in the strategy and making use of their ability to provide critique to the design at a formative stage. It also gives greater flexibility and control of the process. This can be carried a stage further if partnering is employed. However, management contracts are now a rarity outside very large projects and for fast tracking.

There are a number of hybrids arising from combinations of these three basic types. In particular, design and build has been elaborated into distinct forms, including: build own (BO), build own operate (BOO), build own operate transfer (BOOT), and design build finance operate (DBFO). These methods have gained a great deal of currency in recent years, and are much encouraged by government adoption of the public private partnerships initiative.

7.4 International forms

The International Federation of Consulting Engineers (FIDIC) has its own forms of contract and these are in use widely (FIDIC 1987). They include the Red Book (payment monthly for work done), Yellow Book (lump sum on milestones), the Orange Book, which covers design and build and turnkey, and the Silver Book and Green Book, which cover circumstances where an employer's representative is appointed. The difference between these books arises largely from which contractual party is responsible for the design, and who bears the risk for changes in quantities. EPC (engineer, procure and construct) approaches are catered for in the Silver Book, which provides for the contractor taking almost all risks in a turnkey operation. This, of course, bears some resemblance to hybrid forms arising out of design and build, which was referred to in 7.2. The short form (Green Book) provides a simpler form of contract.

Therefore, in the FIDIC forms there is an underlying approach, which is made available so as to suit various types of procurement; the same is true of the Engineering and Construction Contract/ New Engineering Contract (NEC3) in the UK. The forms promote ethical commitments of a non-confrontational kind, and buying into that commitment may tend to influence the choice of procurement route.

From this short description, it will be immediately apparent that the choice of procurement route has a profound effect on how design delivery is managed, because depending on which choice is made, the party in control may be client or contractor. The discussion is therefore one that needs to be had early in the process, and the DDM should ensure that this happens, as the circumstances under which the design is carried out and the delivery of the design may be profoundly affected.

7.5 Partnering

There is another route available, in the form of partnering. This is not a form of procurement in itself; it is an ethos and way of working involving attitudes to sharing risk and benefits.

Partnering is an important aspect of contemporary construction, with ramifications for procurement method, and for attitudes to teamwork including sharing of risks and benefits.

7.6 Novation and its consequences

The novation of consultants presents several challenges in managing the design delivery. The culture of the project may change quite markedly as the designers are passed from client to contractor. But the change is not necessarily for the worse; the point is that things become different.

The DDM needs to be sensitive to impending change, flexible and willing to work in the new ways that are called for.

Novation may also bring about closer involvement of management in the process. Some clients are hands off, and may be represented officially by a client's agent, or with less formality by the project manager or the lead designer. In such circumstances, the project team are accountable to the team itself in day-to-day matters. But a proactive contractor in a design and build situation might be much more active in making demands on team members and such interventions might impinge on expectations for design delivery.

7.7 Recommendations

7.7.1

The DDM should be well-informed on Procurement routes and the consequences of choosing one and be able to give advice accordingly.

8 Summary

The DDM may not be an expert in all the fields of activity supervised. Nor can the DDM be an arbiter or decision-maker in areas outside their own area of responsibility. However, the DDM can raise awareness through being a good communicator, and by being master of systems which deliver timely checks and reminders. Under these circumstances, the framework of activities and supporting documents which the DDM generates may be very important indeed.

DDM involves an incisive understanding of certain key aspects of construction project management, and an adept use of systems which although not complex in themselves, must be applied judiciously, and may need to be tailored to project situations in an imaginative way.

9 References

British Standards Institution BS6079-1:2000	Guide to Project Management
BS 7000: Part 4:1996	Guide to Managing Design in Construction
BS 7000:2008	Guide to Managing Innovation [not mentioned in text]
BS 1192: Part 2:1987	Recommendations for Architectural and Engineering Drawings
Chartered Institute of Building (CIOB)	Code of Practice for Project Management for Construction & Development (4th edition.) Oxford: Blackwell, 2010
RIAI	Model plan of work

SOCIETY OF CHARTERED SURVEYORS IRELAND

Dating back to 1895, the Society of Chartered Surveyors Ireland is the independent professional body for Chartered Surveyors working and practicing in Ireland.

Working in **partnership with RICS**, the pre-eminent Chartered professional body for the **construction, land** and **property** sectors around the world, the Society and RICS act in the public interest: setting and maintaining the **highest standards of competence and integrity** among the profession; and providing **impartial, authoritative** advice on key issues for business, society and governments worldwide.

Advancing standards in construction, land and property, the Chartered Surveyor professional qualification is the **world's leading qualification** when it comes to professional standards. In a world where more and more people, governments, banks and commercial organisations demand greater certainty of professional standards and ethics, attaining the Chartered Surveyor qualification is the recognised mark of **property professionalism.**

Members of the profession are typically employed in the construction, land and property markets through private practice, in central and local government, in state agencies, in academic institutions, in business organisations and in non-governmental organisations.

Members' services are diverse and can include offering strategic advice on the economics, valuation, law, technology, finance and management in all aspects of the construction, land and property industry.

All aspects of the profession, from **education** through to **qualification** and the continuing **maintenance of the highest professional standards** are **regulated** and overseen through the partnership of the Society of Chartered Surveyors Ireland and RICS, in the public interest.

This valuable partnership with RICS enables access to a worldwide network of **research, experience** and **advice.**

www.scsi.ie

Society of Chartered Surveyors Ireland
38 Merrion Square,
Dublin 2, Ireland
Tel: + 353 (0)1 644 5500
Email: info@scsi.ie

RICS | the mark of property professionalism worldwide